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Mr. John E. Kieling, Chief
Hazardous Waste Bureau
New Mexico Environment Department
2905 Rodeo Park Drive East, Building 1
Santa Fe, NM 87505-6303

Subject: Transmittal of the Final Report for CBFO Audit A-16-15 of the Oak Ridge National Laboratory/Central Characterization Program

Dear Mr. Kieling:

This letter transmits the Final Audit Report for Carlsbad Field Office (CBFO) Audit A-16-15 of the Oak Ridge National Laboratory/Central Characterization Program (ORNL/CCP) processes performed to characterize and certify waste in accordance with the Waste Isolation Pilot Plant Hazardous Waste Facility Permit. The audit was conducted April 19 – April 21, 2016.

I certify under penalty of law that this document and all attachments were prepared under my direction or supervision according to a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fines and imprisonment for knowing violations.

Please contact Michael R. Brown, Director, CBFO Office of Quality Assurance, at (575) 234-7476, should you have any questions concerning this audit report.

Sincerely,

Todd Shrader, Manager
Carlsbad Field Office

Enclosure

160720

CBFO:OQA:MRB:BA:16-1427:UFC 2300.00

cc: w/enclosure

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WIPP Operating Record	ED
CBFO QA File	
CBFO M&RC	

*ED denotes electronic distribution

U.S. Department of Energy
Carlsbad Field Office

CONTENT MAP

Final Audit Report of Audit A-16-15 of the Oak Ridge National Laboratory (ORNL) Waste Characterization and Certification Program

Audit Number A-16-15
April 19 – 21, 2016

CONTENT MAP

This box contains the Final Audit Report of CBFO Audit A-16-15 of the ORNL CCP Quality Assurance Program and the ORNL CCP (TRU) Waste Characterization and Certification Program conducted April 19 – 21, 2016. The box also contains a list of objective evidence used to conduct the audit. The documents have been organized into color-coded folders, one each for the ORNL CCP Implementing Procedures (purple folder), Final Audit Report (manila folder), the C-6 Checklist (brown folder), Corrective Action Documentation (teal folder), General Information (green folder), Acceptable Knowledge (blue folder), Real-Time Radiography (red folder), and Visual Examination (yellow folder). The list below identifies each document by name and number and indicates where each may be found.

CONTENT MAP	**Black Folder**
Final Audit Report	**Manila Folder**
Final Audit Report	
Attachment 1: Personnel Contacted During the Audit	
Attachment 2: Personnel Contacted During the Audit by Subject Area	
Attachment 3: CDA Supporting Documentation	
Attachment 4: Objective Evidence Compiled During the Audit (provided in boxes)	
Attachment 5: Table of Audited Documents	
Attachment 6: List of Processes and Equipment Reviewed	
Attachment 7: Procedure Revision Matrix	
C6 Checklist March 2015	**Brown Folder**
C6-1	Waste Analysis Plan (WAP) Checklist
C6-2	Acceptable Knowledge (AK) Checklist
C6-3	Radiography (RTR) Checklist
C6-4	Visual Examination (VE) Checklist
Corrective Action Documentation	**Teal Folder**
CDA-1	Corrected During Audit #1 Documentation
ORNL/CCP Program Implementing Procedures Audited	**Purple Folder**
See Final Report Attachment 5 for List of Audited ORNL CCP Procedures	
Attachment 4 - Objective Evidence	
General Information (Checklist C6-1) Waste Analysis Plan (WAP)	**Green Folder**
GEN1	Batch Data Reports - OR-RTR6-0650, OR-RTR6-0652, OR-RTR6-0701, OR-RTR6-0716, OR-RTR6-0723, OR-RTR6-0736, OR-RTR6-0739, OR-RTR7-0131, and OR-RTR7-0149
GEN2	Batch Data Reports - ORVECH0135, ORVECH0142, ORVECH0145, ORNLRHVE15002, ORNLRHVE15006 ORNLRHVE15008, and ORNLRHVE16001
GEN3	Waste Stream Profile Form and Characterization Information Summaries
GEN4	ORNL Discrepancy Resolutions: DR027, DR045, DR046, and DR047
GEN5	Quarterly Repeats

GEN6	Nonconformance Reports
GEN7	CH Nonconformance Report Logs for Project Level and Data Generation Level and CH and RC Nonconformance Log Reconciliation Reports
GEN8	CH Waste Characterization Case Files
GEN9	RH Waste Characterization Case Files
GEN10	CH Records Inventory and Disposition Schedule (RIDS) dated 06/29/2015
GEN11	RH Records Inventory and Disposition Schedule (RIDS) dated 06/15/2015
GEN12	CCP – Oak Ridge National Labs (ORNL) List of Qualified Individuals dated 4/19/2016 and CCP – RH Program – ORNL List of Qualified Individuals dated 4/5/2016
GEN13	Acceptable Knowledge Expert (AKE) and Site Project Manager (SPM) Training files
Acceptable Knowledge (Checklist C6-2)	**Blue Folder**
AK1	CCP AK Summary Report for NFS CH TRU Waste Stored at ORNL, OR-NFS-CH-SOIL and OR-NFS-CH-HOM-A, CCP-AK-ORNL-001 R10
AK2	CCP AK Summary Report for ORNL REDC CH TRU Waste, OR-REDC-CH-HET, CCP-AK-ORNL-002 R4
AK3	CCP AK Summary Report for ORNL REDC RH TRU Waste, OR-REDC-RH-HET, CCP-AK-ORNL-500 R5
AK4	Q&MIS Approvals for AK Summaries for CCP-AK-ORNL-001 R10, CCP-AK-ORNL-002 R4, and CCP-AK-ORNL-500 R5
AK5	Draft Waste Stream Profile Form and attachments for Waste Stream OR-NFS-CH-SOIL
AK6	Draft Waste Stream Profile Form and attachments for Waste Stream OR-NFS-CH-HOM-A
AK7	Waste Stream Profile Form and attachments for Waste Stream OR-REDC-CH-HET
AK8	Waste Stream Profile Form and attachments for Waste Stream OR-REDC-RH-HET
AK9	AK Source Document Summaries for waste stream OR-NFS-CH-SOIL
AK10	AK Source Document Summaries for waste stream OR-NFS-CH-HOM-A
AK11	AK Source Document Summaries for waste stream OR-REDC-CH-HET
AK12	AK Source Document Summaries for waste stream OR-REDC-RH-HET
AK13	Att. 1 – AK Documentation Checklist for waste streams OR-NFS-CH-SOIL, OR-NFS-CH-HOM-A, OR-REDC-CH-HET, and OR-REDC-RH-HET
AK14	Att. 4 – AK Source Document Information Checklist for waste streams OR-NFS-CH-SOIL, OR-NFS-CH-HOM-A, OR-REDC-CH-HET, and OR-REDC-RH-HET
AK15	AK Att. 5, Hazardous Constituents for waste streams OR-NFS-CH-SOIL, OR-NFS-CH-HOM-A, OR-REDC-CH-HET, and OR-REDC-RH-HET
AK16	AK Att. 6, Waste Form, Waste Material Parameters, Prohibited Items and Packaging for waste streams OR-NFS-CH-SOIL, OR-NFS-CH-HOM-A, OR-REDC-CH-HET, and OR-REDC-RH-HET
AK17	AK Att. 8 - Waste Containers List for waste streams OR-NFS-CH-SOIL, OR-NFS-CH-HOM-A, OR-REDC-CH-HET, and OR-REDC-RH-HET
AK18	Att. 9 – Interface Waste Management Documents List for waste streams

	OR-REDC-CH-HET and OR-REDC-RH-HET
AK19	AK Discrepancies Resolutions in the AK Record
AK20	AK Discrepancy Resolutions at Characterization and AK Reevaluations
AK21	NCRs for prohibited items
AK22	Acceptable Knowledge Assessment for waste stream OR-NFS-CH-SOIL
AK23	Acceptable Knowledge Assessment for waste stream OR-NFS-CH-SOIL IDC database with "reject" field
AK24	AK CH and RH Tracking Spreadsheets for waste streams OR-NFS-CH-SOIL, OR-NFS-CH-HOM-A, OR-REDC-CH-HET, and OR-REDC-RH-HET
AK25	Container Input Forms for traceability containers
AK26	"Hold" tag
AK27	Container inspection reports
AK28	AK Accuracy Reports
AK29	CCP Internal Audits, Surveillances and Management Assessments
AK30	AK Att. 13 - Waste Stream Characterization Checklists and AK Data Reconciliation
AK31	Batch Data Report - ORNLRHVE15007
AK32	Batch Data Report - ORNLRHVE15012
AK33	Batch Data Report - OR-RTR7-0140
AK34	Batch Data Report - OR-RTR7-0102
AK35	Batch Data Report - OR-RTR7-0013
AK36	Batch Data Report - OR-RTR6-0636
AK37	Batch Data Report - OR-RTR7-0124
AK38	Batch Data Report - OR-RTR6-0581
AK39	AK Summary Report Operational Training
Real-Time Radiography (Checklist C6-3)	**Red Folder**
RTR1	Batch Data Reports - OR-RTR6-0650, OR-RTR6-0654, OR-RTR6-0676, OR-RTR6-0688, OR-RTR6-0695, OR-RTR6-0706, OR-RTR6-0713, OR-RTR6-0723, OR-RTR7-0138, and OR-RTR7-0148
RTR2	Qualification Cards for 5 RTR Operators
Visual Examination (Checklist C6-4)	**Yellow Folder**
VE1	Batch Data Reports - ORNLRHVE15003, ORNLRHVE15016, ORNLRHVE16002, ORNLRHVE16009, ORNLRHVE16010, ORVECH0136, ORVECH0138, ORVECH0142, ORVECH0143, ORVECH0144, ORVECH0146, ORVECH0148, and ORVECH0162
VE2	5 VE Operator Training Records
VE3	3 VEE Operator Training Records and VEE Appointment Letters

U.S. DEPARTMENT OF ENERGY
CARLSBAD FIELD OFFICE

FINAL AUDIT REPORT

OF THE

OAK RIDGE NATIONAL LABORATORY
CENTRAL CHARACTERIZATION PROGRAM

FOR

TRU WASTE CHARACTERIZATION ACTIVITIES
AT
OAK RIDGE, TENNESSEE
AND CARLSBAD, NEW MEXICO

AUDIT NUMBER A-16-15

APRIL 19 – 21, 2016

Prepared by: R. L. Castillo **Date:** 7/6/16
Rick L. Castillo, CTAC
Audit Team Leader

Approved by: Michael R. Brown **Date:** 7/21/16
Michael R. Brown, Director
CBFO Office of Quality Assurance

1.0 EXECUTIVE SUMMARY

U.S. Department of Energy (DOE) Carlsbad Field Office (CBFO) Recertification Audit A-16-15 was performed to evaluate the adequacy, implementation, and effectiveness of established programs for transuranic (TRU) waste characterization activities performed for the Oak Ridge National Laboratory (ORNL) by the Nuclear Waste Partnership LLC (NWP) Central Characterization Program (CCP). The audit team evaluated the programs, procedures, and processes for characterizing contact-handled (CH) Summary Category Groups (SCGs) S3000 solids, S4000 soils/gravel, and S5000 debris wastes, and remote-handled (RH) SCG S5000 debris waste. The audit was conducted relative to the requirements of the Waste Isolation Pilot Plant (WIPP) Hazardous Waste Facility Permit (HWFP) and the *CBFO Quality Assurance Program Document* (QAPD).

Audit activities were conducted at the ORNL TRU Waste Processing Center (TWPC) facilities in Oak Ridge, Tennessee, and at the Skeen-Whitlock Building in Carlsbad, New Mexico, April 19 – 21, 2016. Overall, the audit team concluded that the ORNL/CCP technical and quality assurance (QA) programs evaluated were adequately established for compliance with applicable upper-tier requirements, satisfactorily implemented, and effective in achieving the desired results.

No Waste Analysis Plan (WAP)-related conditions adverse to quality (CAQ) resulting in a corrective action report (CAR) were identified during the audit. One WAP-related deficiency, isolated in nature and requiring only remedial corrective action, was identified and corrected during the audit (CDA). No WAP-related Observations were identified during the audit.

2.0 SCOPE AND PURPOSE

2.1 Scope

The scope of the audit included evaluations for the adequacy, implementation, and effectiveness of the technical and QA activities performed by NWP CCP at ORNL for characterization of CH and RH SCG S5000 debris wastes, CH SCG S3000 solids waste, and CH SCG S4000 soils/gravel waste. The following areas were evaluated.

General

- Results of Previous Audits
- Changes in Programs or Operations
- New Programs or Activities Being Implemented
- Changes in Key Personnel

Quality Assurance

- Nonconformances
- Personnel Qualification and Training
- Records

Technical

- Acceptable Knowledge (AK) (including waste certification, e.g., Waste Stream Profile Forms)
- Project-Level Data Validation and Verification (PL V&V)
- Real-time Radiography (RTR)
- Visual Examination (VE)
- WIPP Waste Information System (WWIS)/Waste Data System (WDS)

The evaluation of the adequacy of ORNL/CCP documents was based on current versions of the following documents:

Waste Isolation Pilot Plant Hazardous Waste Facility Permit NM4890139088-TSDF

Quality Assurance Program Document (QAPD), DOE/CBFO-94-1012

Programmatic and technical checklists were developed from current versions of the following documents:

CCP Transuranic Waste Characterization Quality Assurance Project Plan (QAPjP), CCP-PO-001

Related CCP QA and technical implementing procedures

2.2 Purpose

Audit A-16-15 was conducted to determine the degree of adequacy and effective implementation of program requirements for the characterization and certification of CH and RH SCG S5000 debris wastes, CH SCG S3000 solids waste, and CH SCG S4000 soils/gravel waste at the ORNL. The audit team also evaluated specific QA elements relating to HWFP WAP requirements.

3.0 AUDIT TEAM AND OBSERVERS

AUDITORS/TECHNICAL SPECIALISTS

Michael Brown	Director, CBFO Office of Quality Assurance
Rick Castillo	Audit Team Leader, CBFO Technical Assistance Contractor (CTAC)
Porf Martinez	Auditor, CTAC
Tamara Ackman	Auditor, CTAC
Katie Martin	Auditor, CTAC
Charlie Riggs	Auditor, CTAC
Jim Schuetz	Auditor, CTAC
Bob Prentiss	Auditor, CTAC
Dick Blauvelt	Technical Specialist, CTAC
Rhett Bradford	Technical Specialist, CTAC
Paul Gomez	Technical Specialist, CTAC
Greg Knox	Technical Specialist, CTAC
Judith Stewart	Technical Specialist, CTAC

OBSERVERS

Ricardo Maestas	New Mexico Environment Department (NMED)
Coleman Smith	NMED
Tom Carver	CBFO TRU Sites and Transportation Division (TSTD)
Gary Birge	CBFO TSTD

4.0 AUDIT PARTICIPANTS

The ORNL/CCP individuals involved in the audit process are identified in Attachment 1. A pre-audit meeting was held on April 19, 2016, at the TWPC in Oak Ridge, Tennessee, and at the Skeen-Whitlock Building in Carlsbad, New Mexico. Daily management briefings were held to update ORNL/CCP management and staff on audit progress and identified concerns. A post-audit meeting was held on April 21, 2016, at the TWPC in Oak Ridge, Tennessee, and at the Skeen-Whitlock Building in Carlsbad, New Mexico.

Attachment 2 lists the ORNL/CCP personnel contacted during the audit by subject area, Attachment 3 identifies the CDA supporting documentation (provided in boxes), Attachment 4 identifies the objective evidence compiled (provided in boxes), Attachment 5 lists the audited documents, Attachment 6 lists the processes and equipment evaluated, and Attachment 7 lists the procedure revision matrix.

5.0 SUMMARY OF AUDIT RESULTS

5.1 Program Adequacy, Implementation, and Effectiveness

This audit was performed to assess the capability of ORNL/CCP to characterize CH and RH SCG S5000 debris wastes, CH SCG S3000 solids waste, and CH SCG S4000 soils/gravel waste for compliance with the requirements specified in the WIPP HWFP WAP and the CBFO QAPD. The characterization methods assessed were AK, VE, and RTR. Other areas evaluated were data generation and PL V&V, WWIS/WDS data entry, data quality objective (DQO) reconciliation, and the preparation of Waste Stream Profile Forms (WSPFs).

The audit team concluded that, based on personnel interviews, observations of operations, and review of associated documentation and records, the ORNL/CCP TRU waste characterization program and activities for characterizing CH and RH SCG S5000 debris wastes, CH SCG S3000 solids waste, and CH SCG S4000 soils/gravel waste are adequately established, satisfactorily implemented, and effective in achieving the desired results.

5.2 General

5.2.1 Results of Previous Audits

One WAP-related CBFO CAR and one WAP-related Observation were issued last year during the A-15-09 recertification audit.

5.2.2 Changes in Programs or Operations

The audit team determined through interview with the ORNL/CCP Site Project Manager (SPM) that RTR Unit #7 was taken out of service on November 19, 2015. There were no additional significant changes in the programs or operations at the ORNL TWPC since the previous recertification audit.

5.2.3 New Programs or Activities Being Implemented

In response to the breached drum event at the WIPP in February 2014, the DOE and NWP are strengthening their programs to provide more oversight of TRU waste generator site processing/treatment activities being applied to active waste streams prior to waste being transferred to CCP for characterization and certification. The audit team verified through review of CCP Management Assessment MA-CCP-0002-16 that the CCP Assessment Leader performed an evaluation of waste processes being performed at the TWPC in the Hot Cell at the Processing Building and at the Radiochemical Engineering Development Center (REDC). The results of the assessment did not identify any deficiencies.

5.2.4 Changes in Key Personnel

Changes in key personnel include the former Vendor Project Manager (VPM) assuming ORNL/CCP Project Manager duties at the direction of the CCP Operations Manager. A new VPM is assuming VPM duties at the direction of the new ORNL/CCP Project Manager.

5.2.5 ORNL/CCP Program Interface

The audit team evaluated the program interface established between the CCP and the ORNL TWPC as documented in CCP-PO-027, Rev. 6, *CCP/TRU Waste Processing Center/Oak Ridge National Laboratory Interface Document*. This document describes the interfaces, roles and responsibilities, and program requirements applicable to both organizations in support of CCP waste characterization activities at the ORNL TWPC. Program interface requirements evaluated included responsibilities of the ORNL TWPC Site Technical Representative (STR), CCP VPM, SPM, and QA Engineer. The audit team concluded that requirements evaluated, as described in the interface document, were satisfactorily implemented. No concerns were identified.

5.3 Quality Assurance Activities

The audit team evaluated the QA elements for personnel qualification and training, nonconformances, and records for compliance with requirements in the HWFP WAP. The evaluation results for each area audited are described below.

5.3.1 Personnel Qualification and Training

The audit team conducted interviews and reviewed implementing procedure CCP-QP-002, Rev. 39, *CCP Training and Qualification Plan*, to determine the degree to which the procedure adequately addresses upper-tier requirements. Results of the review indicate that the procedure adequately addresses upper-tier requirements.

Personnel training records associated with VE, RTR, AK, and site project management were examined to verify implementation of associated requirements and to verify that personnel performing waste characterization activities are appropriately qualified. Record reviews included qualification cards and other pertinent qualification documentation, such as attendance sheets/briefings on newly revised AK summaries for RTR and VE operators; appointment letters for VE Experts (VEEs), RH technical staff, comprehensive exams; test drum and training container documentation; and eye examinations for qualified RTR operators.

The audit team reviewed the draft qualification card for the SPM position, including the recent job analysis performed to support the new qualification card. The audit team determined that the job analysis and draft qualification card both address provision of training in Chemical Compatibility Evaluation Memorandum (CCEM), Acceptable Knowledge Assessment (AKA), and other appropriate sections of revision 5 of the WIPP site Documented Safety Analysis (DSA). The new qualification card will be administered to all currently qualified SPM personnel to document training to applicable details of the revised WIPP DSA regarding characterization of waste for emplacement at WIPP.

No WAP-related deficiencies regarding personnel qualification and training were identified. The procedures reviewed and objective evidence assembled provided evidence to confirm that the applicable requirements for personnel qualification and training were adequately established for compliance with upper-tier requirements, satisfactorily implemented, and effective in achieving the desired results. No concerns were identified.

5.3.2 Nonconformances

The audit team reviewed implementing procedure CCP-QP-005, Rev. 25, *CCP TRU Nonconforming Item Reporting and Control,* to determine the degree to which the procedure adequately addresses upper-tier requirements. Results of the review indicate that the procedure adequately addresses upper-tier requirements.

The audit team interviewed the CCP QA Engineer and randomly selected nonconformance reports (NCRs) for review.

The following NCRs reviewed were initiated at the data generation level (DGL):

Number	Revision	Process
NCR-ORNL-0126-15	R0	NDE
NCR-ORNL-0154-15	R0	VE

The following NCRs reviewed were initiated at the project level (PL):

Number	Revision	Process
NCR-ORNL-0053-15	R2, R1, and R0	NDE
NCR-ORNL-0125-15	R1	NDE
NCR-RH-ORNL-0335-15	R1	RH VE

The team concluded that nonconformances are being appropriately documented and tracked through resolution as required. NCRs reviewed included original and revised NCRs. The audit team determined that there were no NCRs related to RH waste characterization activities initiated at the DGL since the last ORNL/CCP recertification audit. There were no NCRs related to CH or RH waste characterization activities written at the PL that required reporting to CBFO. NCR-ORNL-0053-15 was reviewed by the audit team and was initially classified by NWP/CCP as reportable, but after review of details by NWP, the reportability determination was changed to non-reportable. The audit team discussed the NCR with NWP/CCP personnel and determined the change to non-reportability was valid and documented correctly per NWP/CCP procedures. The audit team verified CCP personnel are familiar with the process for reporting NCRs to the Permittee via email to CBFO within the time frame required by the Permit. All the NCRs examined were verified to have been entered, managed, and tracked in both the CCP Integrated Data Center (IDC) and the NCR 2015 and 2016 Logs, as well as through the required reconciliation reporting mechanism. The CCP QA Engineer performed an evaluation of all NCRs written within the last 12 months and determined that there are no NCRs of similar subject that identified a reportable trend.

No WAP-related deficiencies regarding NCRs were identified. The procedures reviewed and objective evidence assembled provided evidence to confirm that the applicable requirements for nonconformances are adequately established for compliance with upper-tier requirements, satisfactorily implemented, and effective in achieving the desired results.

5.3.3 Records

The audit team conducted interviews and reviewed implementing procedures relative to the control and administration of QA records to determine the degree to which the procedures adequately address upper-tier requirements. The audit team reviewed procedures CCP-PO-001, Rev. 22, *CCP Transuranic Waste Characterization Quality Assurance Project Plan*; CCP-QP-008, Rev. 25, *CCP Records Management;* and CCP-QP-028, Rev. 16, *CCP Records Filing, Inventorying, Scheduling, and Dispositioning*. Results of the review indicate that the procedures adequately address upper-tier requirements.

The level of control for QA records was verified through review of the CH Records Inventory and Disposition Schedule (RIDS) dated 06/29/2015, and the RH RIDS dated 06/15/2015. Each RIDS is reviewed annually, as required. The audit team reviewed a sample of EA15RM3002-1-0, *WIPP Records Inventory Work Sheet* forms related to

changes proposed for the CH and RH RIDS. Changes on the worksheet forms are adequately collected and detailed for inclusion on the next RIDS release version. The audit team evaluated a sample of transmittal forms used to document submittal of records from the ORNL/CCP host site location to the CCP Records Center in Carlsbad, New Mexico. The audit team determined that the completed forms adequately described the records being transmitted, and that the transmittal process was performed in accordance with the procedure.

The audit team verified the maintenance of records in file cabinets and in the electronic system. Records that are maintained in paper copy in the CCP Records Center are placed in locked fire-resistant cabinets. Access to the file cabinets is controlled through the use of keys, and labels placed on each cabinet post the names of personnel approved for access to the files. Files are adequately organized and maintained in both the paper and electronic file systems. Records are adequately segregated from non-record documents. Files that require control of access, such as those determined to be Unclassified Controlled Nuclear Information (UCNI), Official Use Only (OUO), Internal Use Only (IUO), and No Foreign National (NFORN) documents, are maintained on separate electronic servers where computer user access is restricted. Paper copies of these restricted access documents are stored separately from other documents. Records personnel are familiar with requirements for restricted access files and adequately control distribution. Access to electronic files and restricted files is controlled administratively in the case of physical electronic media and by use of server logon/password methods for electronic files maintained on computer servers.

No WAP-related deficiencies regarding records were identified. The procedures reviewed and objective evidence assembled provided evidence that the applicable requirements for records are adequately established for compliance with upper-tier requirements, satisfactorily implemented, and effective in achieving the desired results.

5.3.1 Technical Activities

Each technical area audited is discussed in detail in the following sections. The method used to select objective evidence is discussed, the objective evidence used to assess compliance with the HWFP is cited briefly, and the result of the assessment is provided.

5.3.2 Table C6-1, WAP Checklist

The C6-1 WAP Checklist addresses general program requirements from an overall management perspective. The general requirements checklist addresses both technical requirements and specific WAP-related QA programmatic requirements that, when collectively implemented, ensure effective overall management of TRU waste characterization activities. Requirements are integrated into controlled documents to ensure the waste characterization strategy, as defined in the WAP, is accomplished and documented in accordance with controlled processes and procedures.

Technical activities evaluated for characterization activities consisted of data generation and PL V&V, AK, RTR, VE, and preparation of WSPFs. Objective evidence was selected and reviewed to evaluate the implementation of the associated characterization activities. Batch data reports (BDRs), sampling records, and personnel qualification and training documentation were included in the evaluation. Where possible, the audit included direct observation of actual waste characterization activities. Each characterization process involves:

- Collecting raw data
- Collecting quality assurance/quality control samples or information
- Reducing the data to a useable format, including a standard report
- Review of the report by the data generation facility and the site project office
- Comparing the data against program DQOs
- Reporting the final waste characterization information to the WIPP

The flow of data from the point of generation to inclusion in the WSPF for each characterization technique was reviewed to ensure that all applicable requirements were captured in the site operating procedures. Specific procedures audited and the objective evidence reviewed is described in the following sections.

During the audit, ORNL/CCP demonstrated compliance with the waste characterization requirements of the WAP through documentation and by performing characterization activities.

Project-Level Data Validation and Verification (V&V)

The audit team conducted interviews with responsible personnel and reviewed implementing procedures CCP-TP-001, Rev. 21, *CCP Project Level Data Validation and Verification*; CCP-TP-002, Rev. 26, *CCP Reconciliation of DQOs and Reporting Characterization Data*; CCP-TP-500, Rev. 15, *CCP Remote-Handled Waste Visual Examination*; CCP-TP-504, Rev. 17, *CCP Dose-to-Curie Survey Procedure for Remote-Handled Transuranic Waste;* and CCP-TP-005, Rev. 28, *CCP Acceptable Knowledge Documentation,* to determine the degree to which the procedures address upper-tier requirements. Results of the review indicate that the procedures adequately address upper-tier requirements.

The audit team evaluated the following BDRs in support of both CH and RH waste characterization activities completed at the ORNL to verify that PL V&V activities are performed in compliance with applicable procedural requirements.

RTR

OR-RTR6-0650	OR-RTR6-0652	OR-RTR6-0701	OR-RTR6-0716
OR-RTR6-0723	OR-RTR6-0736	OR-RTR6-0739	OR-RTR7-0131
OR-RTR7-0149			

VE

ORNLRHVE15002	ORNLRHVE15006	ORNLRHVE15008	ORRHVE16001
ORVECH0135	ORVECH0142	ORVECH0145	

The audit team reviewed WSPF Change Notice #1 and WSPFs for waste streams OR-ISTP-CH-HET, OR-CHEM-CH-HET, OR-RF-CH-HET, and OR-REDC-RH-HET. The WSPFs were properly completed with characterization information summaries (CISs). AK Accuracy Reports for waste streams OR-ISTP-CH-HET (Lots 4 through 15), OR-CHEM-CH-HET (Lots 6 and 7), OR-RF-CH-HET (Lots 8 and 9), and OR-RADP-CH-HET (Lots 30 through 35) were reviewed and confirmed to include the WSPF and associated CISs.

The audit team also reviewed ORNL Discrepancy Resolutions DR027, DR045, DR046, and DR047, and found none of them required a change to the waste stream profiles regarding waste classification.

The audit team verified the required quarterly re-review of the DGL data by project-level personnel for the following:

2nd Quarter 2015 requests and results for VE, RTR, and RH-VE
3rd Quarter 2015 requests and results for VE, RTR, and RH-VE
4th Quarter 2015 requests and results for VE, RTR, and RH-VE
1st Quarter 2016 requests for VE and RTR (results have not yet been issued to Records)

Further, the results of each reported quarterly package stated there were no inconsistencies in the data.

One concern was identified during the PL V&V review. Container X10C1300177A in BDR OR-RTR6-0723 was identified as having observable liquid in the container; however, the SPM marked “N/A” on the SPM Checklist for question #12, which asks, “Does observable liquid, if present, meet the criteria of the TSDF-WAC?” The question should have been answered “Yes.” The answer to question #12 was corrected and the document was reissued and provided to the audit team.

As a result of this concern, the audit team randomly selected a total of 29 ORNL BDRs and performed an accuracy review. The sample included all BDRs reviewed by this particular SPM, as well as BDRs reviewed by other SPMs. One additional instance was found in BDR OR-RTR6-0736, where the same SPM answered question #12 incorrectly. This document was also corrected, reissued, and provided to the audit team during the audit. Because the accuracy review indicated the concern was isolated to only one SPM, it was considered to be isolated and corrected during the audit (see CDA-1 in section 6.2). No other DOE/CCP sites are actively performing routine RTR operations where BDRs can be reviewed for the same issue.

One WAP-related deficiency regarding Table C6-1 identified during the audit was determined to be isolated in nature, requiring only remedial action, and was corrected during the audit. The procedures reviewed and objective evidence assembled and evaluated during the audit provided evidence that the applicable requirements for PL V&V activities are adequately established for compliance with upper-tier requirements, satisfactorily implemented, and effective in achieving the desired results.

WIPP Waste Information System (WWIS)/Waste Data System (WDS)

The audit team conducted interviews and reviewed implementing procedures relative to the WWIS/WDS data entry process to determine the degree to which the procedures adequately address upper-tier requirements. The procedures reviewed included CCP-TP-030, Rev. 34, *CCP CH TRU Waste Certification and WWIS/WDS Data Entry,* and CCP-TP-530, Rev. 12, *CCP RH TRU Waste Certification and WWIS/WDS Data Entry*. Results of the review indicate that the procedures adequately address upper-tier requirements.

The audit team evaluated the implementation of the WWIS/WDS data entry procedures for electronic population of data, manual data updates, and electronic transfer of data from the IDC software database to the WWIS/WDS. The evaluation included review of electronic records in the IDC, review of data updates by a waste certification assistant, and waste certification by a waste certification official (WCO). Other records reviewed included container information summaries, pages from BDRs showing analyses values in the IDC, WWIS/WDS Waste Container Data Reports, and submittals for WWIS/WDS review/approval. Records for data entry of both CH- and RH-type waste characterization and certification data were reviewed.

The audit team reviewed waste characterization case files for three CH containers, six RH waste containers, and builds for two RH waste canisters. ORNL CH containers X10C0401623A, X10C0402820M1, and X10C0501703A were certified under the current procedural process, CCP-TP-030, Rev. 34, which provides for certification using modules of the IDC. ORNL RH containers ORRH00736, ORRH00737, ORRH00738, ORRH00746, ORRH00747, and ORRH00748 were certified under the new procedural process of CCP-TP-530, Rev. 12, which utilizes functions of the IDC for certification. Revision 11 of CCP-TP-530 allowed only manual data entry into the RH spreadsheet and electronic submittal to WWIS/WDS. Use of the IDC for RH containers provides for electronic certification of RH waste containers and streamlines the electronic submittal process to WWIS/WDS. Use of the IDC to build RH canisters ORR0090 and ORR0093 was reviewed. The audit team determined that the IDC processes for CH and RH waste container certification and the build process for RH canisters were performed in accordance with the appropriate procedures. Per interviews with CCP personnel, the audit team determined that implementation using the IDC process is preferred and expected to reduce time to characterize, certify, and submit CH and RH container information to WWIS/WDS for approval.

The audit team determined that there are currently no new WSPFs under consideration for submittal for approval. Because of this, no CH or RH waste containers are currently being characterized to provide data for approval of a new WSPF. NWP WCO personnel are familiar with the process of characterization of CH and RH waste containers for submitting in conjunction with a new WSPF.

No WAP-related deficiencies regarding Table C6-1 were identified during the audit. The procedures reviewed and objective evidence assembled and evaluated during the audit

provided evidence that the applicable requirements for WWIS/WDS data entry are adequately established, satisfactorily implemented, and effective in achieving the desired results.

5.3.3 Table C6-2, Acceptable Knowledge Checklist

The audit team evaluated the AK process for characterizing CH TRU mixed SCGs S3000 solids, S4000 soils/gravel, and S5000 debris wastes, and RH TRU mixed SCG S5000 debris waste. The team specifically evaluated compliance with the WAP requirements listed in the C6-2 checklist, along with portions of the C6-1 checklist. Objective evidence was reviewed and compiled to demonstrate compliance with each of the applicable requirements on these checklists.

The AK auditors reviewed the latest revisions of the following AK Summary Reports for four distinct waste streams representing the four respective SCGs identified above:

- CCP-AK-ORNL-001, Rev. 10, for CH S3000 waste stream OR-NFS-CH-HOM-A and CH S4000 waste stream OR-NFS-CH-SOIL
- CCP-AK-ORNL-002, Rev. 4, for CH S5000 waste stream OR REDC-CH-HET
- CCP-AK-ORNL-500, Rev. 5, for S5000 RH waste stream OR-REDC-RH-HET

The audit team thoroughly reviewed the AK Summary Reports with respect to specific WAP requirements. In addition, WSPFs or draft WSPFs and attachments were examined for each audited waste stream. Numerous AK source documents were reviewed to establish support for the waste stream descriptions and parameters noted in the AK summaries, including descriptions of waste processing activities, assignment of hazardous waste numbers, and the historical management of the containers in the waste streams. Furthermore, the review of AK source documentation included review of the historic and current use of all absorbents identified in the AK record.

The audit team also examined the following completed attachments from CCP-TP-005, *CCP Acceptable Knowledge Documentation,* for each waste stream: the respective AK Documentation Checklist (Attachment 1); the AK Source Document Information List (Attachment 4), the AK Hazardous Constituents List (Attachment 5), the respective AK Waste Form, Waste Material Parameters, Prohibited Items, and Packaging (Attachment 6), alongside the justification memos for waste material parameter weight estimates; the Radionuclides List (Attachment 7) and AK memos for the CH waste streams; and the Waste Containers List (Attachment 8), together with the Add-Containers documentation that demonstrates that the parameters and properties of containers added to a waste stream are examined to assure that the assignment is appropriate.

The audit team reviewed the Interface Waste Management Documents List (CCP-TP-005 Attachment 9) for the REDC waste streams relevant to activities in the TWPC. This requirement was a major addition to CCP-TP-005, Rev. 27, *CCP Acceptable Knowledge Documentation.* The objective is to work with the site to develop and maintain “a current list of generator site plans, procedures, and reports associated with current waste management and packaging (e.g., waste management, waste generation, waste

treatment, waste packaging, waste repackaging, waste remediation, waste stream delineation, and waste characterization procedures)" that have the ability to affect waste stream characterization and certification activities. The audit team examined the documents on the list and performed a detailed review of ORNL procedures CH-REF-OP-013, Rev. PCN 9-1, *Contact Handled Waste Repackaging,* and CH-REF-OP-014, Rev. PCN 5-1, *Absorbing Liquids in the Glovebox and Box Breakdown Area.* The review included discussions with the ORNL process superintendent.

Examples of the resolution of AK discrepancies in the AK record and discrepancy resolution at characterization, alongside the associated AK Reevaluation forms, were reviewed and added to the AK objective evidence. WAP-compliant AK Accuracy Reports and the most recent internal surveillance (I15-14, dated 10/8/15) were also collected and examined. Requisite training records were reviewed for three AK experts and two SPMs. The audit team also reviewed selected BDRs, discrepancy reports, and NCRs. With regard to non-compliant waste containers, the auditors examined several NCRs dealing with prohibited items and compiled objective evidence of container inspection prior to characterization activities. Additionally, it was determined that administrative controls had been used for the NCRs reviewed, rather than tagging, to maintain segregation of some of the containers due to the high radiation levels of the RH waste. AK records were evaluated with regard to compliance through preparation, legibility, accuracy, review, approval, and maintenance.

The WAP-required container traceability exercise was conducted by the audit team for eight waste containers from the four waste streams. The drums selected provided BDRs for RTR and VE processes. Additional traceability documentation was collected through IDC database screenshots, AK tracking spreadsheet data, waste container lists, and ORNL waste container input forms completed by the waste generators. Waste Stream Characterization Checklists and supporting data reconciling the results of characterization activities with the information in the AK record were also examined. The review of these checklists was coordinated with the traceability containers where possible. Eight waste containers, two from each waste stream, went through the traceability exercise.

For waste stream OR-REDC-RH-HET, the audit team compiled and reviewed objective evidence that demonstrated compliance with the requirements noted above. Documents reviewed included an AK Accuracy Report, the CCP TRU Waste Correlation and Surrogate Form, and Characterization Reconciliation Reports with the examination of relevant AK source documents supporting these requirements.

The audit team evaluated the required AK documents identified in CCP-TP-005, Rev. 27, and enhanced documents required by CCP-TP-005, Rev. 28, dated 2/29/2016. The evaluated documents included the Interface Waste Management Documents List (IWMDL) (AK Attachment 9), Acceptable Knowledge Assessment (AKA), and the Chemical Compatibility Evaluation Memorandum (CCEM). The latest revision of CCP-TP-005 provides additional detail regarding the development of the IWMDL, AKA, and the CCEM documents. These documents are required for each waste stream, or

portion thereof, that has an inventory of unshipped containers. For the two REDC waste streams that were examined during the audit, record copies of the IWMDL were available. During the audit, a records copy of the AKA for waste stream OR-NFS-CH-SOIL was received and reviewed, while others are currently being developed and implemented.

No WAP-related deficiencies regarding Table C6-2 were identified during the audit. The procedures reviewed and objective evidence assembled and evaluated during the audit provided evidence that the applicable requirements for AK data entry are adequately established, satisfactorily implemented, and effective in achieving the desired results.

5.4.3 Table C6-3, Radiography Checklist

The audit team evaluated the adequacy, implementation, and effectiveness of ORNL/CCP characterization of CH SCGs S3000 solids waste, S4000 soils/gravel waste, and S5000 debris waste using RTR Unit #6 and Unit #7. Although RTR Unit #7 was deactivated on November 19, 2015, BDRs from Unit #7 were generated and evaluated during the audit.

The audit team evaluated the following RTR-related CCP procedures: CCP-QP-002, Rev. 39, *CCP Training and Qualification Plan;* CCP-TP-028, Rev. 9, *CCP Radiographic Test Drum and Training Container Construction*; CCP-TP-053, Rev. 15, *CCP Standard Real-Time Radiography (RTR) Inspection Procedure*; CCP-TP-164, Rev. 1, *CCP Real-Time Radiography #7 Operating Procedure;* and CCP-TP-165, Rev. 3, *CCP Real-Time Radiography #6 Operating Procedure*. Results of the review indicate that the procedures adequately address upper-tier requirements.

The audit team examined the following CH RTR BDRs generated by characterizing waste in RTR Unit #6 and Unit #7:

- OR-RTR6-0650 OR-RTR6-0706
- OR-RTR6-0654 OR-RTR6-0713
- OR-RTR6-0676 OR-RTR6-0723
- OR-RTR6-0688 OR-RTR7-0138
- OR-RTR6-0695 OR-RTR7-0148

The audit team also reviewed a sampling of audio/video media recordings of containers characterized on the referenced BDRs. The audit team reviewed video recordings of RTR characterization scans for CH SCGs S3000 solids waste, S4000 soils/gravel waste, and S5000 debris waste.

The audit team observed RTR operations for RTR Unit #6, interviewed the RTR operators, and verified the use of current AK summaries and RTR operating procedures. The audit team examined RTR Unit #6 operational logbook CCP-ORNL-RTR6-004, 2016, ORNL-TWPC-RTR6, 7880J, and verified logbook entries were reviewed by the VPM as required. The audit team also verified the use of several RTR operator aids and CCP standing orders. The team observed the image (lines/pair) test and the RTR

characterization scan on container X10C1250272 from BDR OR-RTR6-0713, and waste stream OR-NFS-CH-SOIL performed on RTR Unit #6. The RTR unit contained the components required by the WAP to effectively characterize each CH SCG waste subject to the scope of the audit.

The audit team also examined RTR operational logbook CCP-ORNL-RTR-007-001, 2015, ORNL-TWPC, 7880ZZ and verified logbook entries were logged correctly and reviewed by the VPM as required. The audit team evaluated RTR operator required test and training drum audio/video media for five RTR operators. Records of RTR operator training and qualification, including test and training drum documentation, eye exams, and waste stream training were examined. The audit team verified that RTR operators were appropriately trained and qualified as required.

No WAP-related deficiencies regarding Table C6-3 were identified during the audit. The procedure reviews, field observations, and document reviews provided evidence that the applicable requirements for RTR are adequately established for compliance with upper-tier requirements, satisfactorily implemented, and effective in achieving the desired results.

5.4.4 Table C6-4, Visual Examination Checklist

The audit team evaluated the adequacy, implementation, and effectiveness of the ORNL/CCP VE characterization process for CH and RH SCG S5000 debris waste. The team reviewed procedures CCP-TP-113, Rev. 19*, CCP Standard Contact-Handled Waste Visual Examination,* CCP-TP-500, Rev. 15, *CCP Remote-Handled Waste Visual Examination,* and CCP-QP-002, Rev. 39, *CCP Training and Qualification Plan,* and determined the procedures adequately address upper-tier requirements.

ORNL/CCP uses the two-operator method when performing VE characterization. VE is performed by two qualified operators who visually examine the waste and place it into containers. The audit team interviewed VE operators and the VEE. The audit team also examined the VE operational logbooks (CCP-ORNL-VE-003 and CCP-RH-ORNL-VE-004) and verified logbook entries were logged correctly and reviewed by the VPM as required. During the audit, the team toured the TWPC Hot Cell Facility and observed VE being performed on RH container ORRH00762 and CH container X10C1001985A.

The audit team examined the following CH and RH VE BDRs generated from operations performed in the TWPC Hot Cell Facility to verify implementation and compliance with the requirements for documenting VE activities, as specified in CCP-TP-113 and CCP-TP-500:

- ORNLRHVE15003
- ORNLRHVE15016
- ORNLRHVE16002
- ORNLRHVE16009
- ORNLRHVE16010
- ORVECH0136
- ORVECH0138
- ORVECH0142
- ORVECH0143
- ORVECH0144
- ORVECH0146
- ORVECH0148
- ORVECH0162

The audit team examined training records for five VE operators/independent technical reviewers (ITRs), and confirmed the appointment of three ORNL/CCP VEEs. The audit team verified that the VE operators, ITRs, and VEE were appropriately trained and qualified as required.

The audit team also verified continued corrective actions for WAP-related CAR 15-033 identified during the previous audit (A-15-09) where there were two instances in which the VE operator did not record all of the waste items in the Waste Description field on the VE Data Form. No similar instances were identified during this audit.

No WAP-related deficiencies regarding Table C6-4 were identified during the audit. The procedure reviews, field observations, and document reviews provided evidence that the applicable requirements for VE are adequately established for compliance with upper-tier requirements, satisfactorily implemented, and effective in achieving the desired results.

6.0 CORRECTIVE ACTIONS, OBSERVATIONS, AND RECOMMENDATIONS

6.1 Corrective Action Reports

During the audit, the audit team may identify conditions adverse to quality (CAQs), as defined below, and document such conditions on CARs.

> Condition Adverse to Quality (CAQ) – Term used in reference to failures, malfunctions, deficiencies, defective items, and nonconformances.
>
> Significant Condition Adverse to Quality – A condition which, if uncorrected, could have a serious effect on safety, operability, waste confinement, TRU waste site certification, compliance demonstration, or the effective implementation of the Quality Assurance (QA) program.

No WAP-related CARs were identified during the audit.

6.2 Deficiencies Corrected During the Audit

During the audit, the audit team may identify CAQs. Audit team members, the Audit Team Leader (ATL), and the CBFO Management Representative evaluate the CAQs to determine if they are significant. Once a determination is made that the CAQ is not significant, the audit team member, in conjunction with the ATL and the CBFO QA Management Representative, determines if the CAQ is a minor and isolated case requiring only remedial action and therefore can be corrected during the audit.

Upon determination that the CAQ is minor and isolated, the audit team member, in conjunction with the ATL and the CBFO QA Management Representative, evaluates/verifies any objective evidence/actions submitted or taken by the audited organization and determines if the condition was corrected in an acceptable manner. Once it has been determined that the CAQ has been corrected, the CBFO QA

Management Representative categorizes the condition as corrected during audit (CDA) according to the definition below.

> CDAs – Isolated deficiencies that do not require a root cause determination or actions to preclude recurrence. Correction of the deficiency can be verified prior to the end of the audit. Examples include one or two minor changes required to correct a procedure (isolated), one or two forms not signed or not dated (isolated), and one or two individuals that have not completed a reading assignment.

One WAP-related CAQ was identified and corrected during this audit, as detailed below.

CDA-1

Condition:

The SPM marked “N/A” on the SPM Checklist for question #12, which states, “Does observable liquid, if present, meet the criteria of the TSDF-WAC?” Observable liquid was identified by the RTR operator for container X10C1300177A, BDR OR-RTR6-0723; therefore, the question should have been answered “Yes.”

Requirement:

CCP-TP-001, Rev. 21, section 4.2.8 states, “Answer each question on the appropriate SPM checklist after verifying that the specific criteria have been met.”

During the audit, the auditor was provided with objective evidence that included the corrected SPM Checklist for BDR OR-RTR6-0723, answering question #12 correctly. The concern was determined to be isolated in nature and evidence confirming the correction was presented to the audit team and verified prior to the conclusion of the audit.

6.3 Observations

During the audit, the audit team may identify potential problems that should be communicated to the audited organization. The audit team members, in conjunction with the ATL, evaluate these conditions and classify them as Observations using the following definition:

> Observation – A condition that, if not controlled, could result in a CAQ.

Once a determination is made, the audit team member, in conjunction with the ATL, categorizes the condition appropriately.

No WAP-related Observations were identified during the audit.

7.0 LIST OF ATTACHMENTS

Attachment 1: Personnel Contacted During the Audit
Attachment 2: Personnel Contacted During the Audit by Subject Area
Attachment 3: CDA Supporting Documentation
Attachment 4: Objective Evidence Reviewed During the Audit (provided in boxes)
Attachment 5: Table of Audited Documents
Attachment 6: List of Processes and Equipment Reviewed
Attachment 7: Procedure Revision Matrix

PERSONNEL CONTACTED DURING AUDIT A-16-15				
NAME	**ORG/TITLE**	**PRE-AUDIT MEETING**	**CONTACTED DURING AUDIT**	**POST-AUDIT MEETING**
William Bailey	DOE OR EM FR			X
Thomas Barton	TWPC/North Wind Waste Programs SMR	X	X	X
Linda Beach	North Wind Program Manager	X		X
Michele Billett	NWP/CCP TFE Training Coordinator		X	
Gary L. Birge	DOE/CBFO TRU Waste Certification Manager/Physical Scientist	X	X	X
Michael R. Brown	CBFO OQA Director	X	X	X
Tom Carver	DOE/CBFO TSTD Observer	X		
Don E. Coffey	TWPC AKPKE/ Characterization Support	X	X	X
Kevin East	WAI Operations Procurement Superintendent		X	X
A.J. Fisher	NWP/CCP Support Services Manager	X		X
Tim Forrester	UT-B ORNL Radiological Team Leader	X		X
Trey Greenwood	NWP/CCP AK Manager	X	X	
Ed Gulbransen	NWP/CCP Manager	X		X
Gilbert Gutierrez	NWP/CCP VE Operator		X	
Anthony Harley	NWP/CCP VE Operator		X	
LaTravia Harmon	NWP QA	X	X	X
Jeff Harrison	NWP/CCP AK Expert		X	
Joe P. Harvill	NWP/CCP Technical Advisor	X	X	X
Irene Joo	NWP/CCP RH Manager	X	X	
Richard Kantrowitz	NWP CCP SPM	X	X	X
Creta Kirkes	NWP/CCP WCO		X	
David Lamance	NWP/CCP RTR Operator		X	

PERSONNEL CONTACTED DURING AUDIT A-16-15				
NAME	**ORG/TITLE**	**PRE-AUDIT MEETING**	**CONTACTED DURING AUDIT**	**POST-AUDIT MEETING**
Ronnie Lee	NWP/CCP Waste Characterization Manager			X
Eric Lyles	NWP/CCP RTR Operator		X	
Ricardo Maestas	NMED Observer	X	X	X
Shelly Martinez	NWP/CCP RTR Operator	X	X	X
Derek Matheny	NWP/CCP VEE	X	X	X
Mike McCauley	TWPC WCO		X	
Martin Navarrete	CBFO Sr. QA Specialist	X		X
Brian Oakley	TWPC/ORNL TWMD			X
Fred Oney	NWP/CCP RTR Lead Operator	X	X	
Sheila Pearcy	NWP CCP Records Manager	X	X	X
Eric Pennala	MCS General Manager	X	X	
Larry Perkins	DOE-HQ EM43 Representative			X
Brandye Pyeatt	NWP QA Analyst		X	
Ron Reeves	NWP/CCP Operations Mgr.	X	X	X
Steve Schafer	NWP/CCP AK Expert	X	X	
Beverly Schrock	NWP/CCP SPM	X	X	X
Farok Sharif	NWP NTP Project Manager		X	X
Chris Shannon	TWPC QA		X	X
Jeff Shelton	UT-B ORNL TWMD			X
Coleman Smith	NMED Observer	X	X	X
Patrick Smith II	NWP/CCP Records	X		
Carolina Soaterna	NWP/CCP SPM			X
Andrew Stallings	NWP/CCP ORNL Project Mgr.	X	X	X
Rob Szozda	North Wind TSM			X
Pat Tilmon	NWP/CCP VPM	X		X
Shawn Treadway	NWP/CCP Container Manager	X	X	X
Daniel Wade	NWP/CCP SPM			X

PERSONNEL CONTACTED DURING AUDIT A-16-15				
NAME	**ORG/TITLE**	**PRE-AUDIT MEETING**	**CONTACTED DURING AUDIT**	**POST-AUDIT MEETING**
Lisa Yoder	North Wind Training Coordinator		X	
Jewell Yturralde	NWP/CCP Records Clerk III	X		X

PERSONNEL CONTACTED DURING THE AUDIT BY SUBJECT AREA

Personnel Qualification and Training	Michele Billett
Control of Nonconforming Items	Brandye Pyeatt
Records	Sheila Pearcy Jewell Yturralde
WIPP Waste Information System (WWIS Data Entry)	Creta Kirkes
Waste Certification/Project-Level Data V&V	Richard Kantrowitz Beverly Schrock
Acceptable Knowledge	Irene Joo Trey Greenwood Steve Schafer Beverly Schrock Richard Kantrowitz Ron Reeves Jeff Harrison Farok Sharif Kevin East
Real-Time Radiography	Eric Lyles Shelly Martinez David Lamance Fred Oney
Visual Examination	Derek Matheny Gilbert Gutierrez Anthony Harley

CDA Supporting Documentation

The CDA documentation supporting Audit A-16-15 is included in the shipping box(es) submitted with this report. Included in the shipping box(es) is a “Content Map” describing the location (using color coding) and identity of all required objective evidence supporting the performance of the audit.

CDA1

CORRECTED DURING THE AUDIT

1.0 CDA #	2.0 Audit Number:	3.0 Affected Organization	4.0 Identified By
#1	A-16-15	CCP	Paul Gomez

5.0 Description of Deficiency:

The SPM marked "N/A" on the SPM Checklist for Question 12, which states, "Does observable liquid, if present, meet the criteria of the TSDF-WAC?" Observable liquid was identified by the RTR Operator for container #X10C1300177A, BDR #OR-RTR6-0723, therefore, the question should have been answered "Yes."

6.0 Requirements not met (include document and paragraph):

CCP-TP-001, Rev. 21, section 4.2.8 states, "Answer each question on the appropriate SPM checklist after verifying that the specific criteria have been met."

7.0 Actions Taken By Auditee:

The document was corrected with the proper answer for question #12, issued, and provided to the audit team. Further, a total of 29 BDRs were reviewed for accuracy, which included all BDRs reviewed by this particular SPM as well as other SPMs. One additional instance was found in BDR OR-RTR6-0736, where the same SPM answered question #12 incorrectly. This document was also corrected with the proper answer for question #12, issued, and provided to the audit team during the audit. Due to the issue being isolated to involve only one SPM after the BDRs were reviewed, this concern was considered to be isolated and corrected during the audit

Verified By:		Trend Cause Code
Paul C. Gomez, Auditor	5-10-2016 Date	DV-06

FW: NDE BDR's

Yturralde, Jewell - TFE
Sent: Wednesday, April 20, 2016 12:53 PM
To: Smith, Patrick - TFE

From: Whiteaker, Roger - NWP
Sent: Wednesday, April 20, 2016 12:49 PM
To: Yturralde, Jewell - TFE
Subject: NDE BDR's

Jewell,

Please let Rich know that the following BDR's are good.

OR-RTR6-0739
OR-RTR6-0716
OR-RTR6-0705
OR-RTR6-0701
OR-RTR6-0700

OR-RTR6-0736 needs to be corrected and that I will correct it as soon as records has it ready.

I will notify you when I have completed the corrections that he requested.

Thank you,

Roger Whiteaker
Central Characterization Project
Nuclear Waste Partnership LLC
Contractor for the U.S. Department of Energy
575-234-7234
575-234-7042 (Fax)

Attachment 2 – CCP SPM Radiography Project Level Validation Checklist and Summary

BDR Number: OR-RTR6-0723 **Examination Date(s):** 02/11/2016

Description of Criteria Reviewed	Criteria Met? YES	NO	NA	Comments/Qualifiers
1. Is the completed, signed, and dated Independent Technical Reviewer Checklist included in the BDR, and the independent technical reviewer was not involved in the generation or recording of the data under review? **Reference Source: CCP-PO-001, C3-4**	X			
2. Does the BDR contain all items addressed in the BDR Table of Contents? **Reference Source: CCP-PO-001, C3-4**	X			
3. Does the BDR include a listing of all the container numbers in the batch? **Reference Source: CCP-PO-001, C3-4**	X			
4. List all containers that have met QAOs. **Reference Source: CCP-PO-001, C3-4**				Container Numbers: X10C0402810B X10C0402810G X10C0402810H X10C0402810J X10C1001131 X10C1001133 X10C1300177A X10C1300184 X10C1300185A X10C1300185C X10C9400064A
5. Does the BDR identify the current implementing procedure and revision number? **Reference Source: CCP-PO-001, Table C3-3**	X			
6. Is there a reference to or copy of any associated NCRs (if any) in the BDR? NA if no NCRs. **Reference Source: CCP-PO-001, Table C3-3**			X	
7. Are there 20 or fewer containers in the batch? **Reference Source: CCP-PO-001, C3-4**	X			
8. Are the data properly reported (i.e., data are reported in correct units and with correct significant figures)? **Reference Source: CCP-PO-001, C3-4**	X			
9. Is there evidence of verification that the physical form matches the Waste Matrix Code? **Reference Source: CCP-PO-001, Table C3-3**	X			

COPY

CCP RECORDS ORIGINAL
DATE REC'D 3/2/2016 JY

Attachment 2 – CCP SPM Radiography Project Level Validation Checklist and Summary (Continued)

BDR Number: OR-RTR6-0723 **Examination Date(s):** 02/11/2016

Description of Criteria Reviewed	Criteria Met? YES	NO	NA	Comments/Qualifiers
10. Is there evidence of verification that the physical form matches the waste stream description? **Reference Source: CCP-PO-001, Table C3-3**	X			
11. Are prohibited items absent? **Reference Source: CCP-PO-001, Table C3-3**	X			
12. Does observable liquid, if present, meet the criteria of the TSDF-WAC? **Reference Source: CCP-PO-001, C-1**	X RW 4/19/16		~~X~~ RW 4/19/16	~~No Observable Liquids~~ X10C1300177A RW 4/19/16
13. Were discrepancies between two operators with regard to identification of waste matrix code, liquids in excess of the TSDF-WAC, or compressed gases through replicate scans and independent observations reconciled? NA if no discrepancies. **Reference Source: CCP-PO-001, C3-2**			X	
14. Are the training qualifications for all radiography personnel acceptable? **Reference Source: CCP-PO-001, C3-8**	X			
15. Was evidence of the video/audio check included in the BDR? **Reference Source: CCP-PO-001, C1-1**	X			
16. Was the Lines-Pair Resolution Test or Sieve Test Check included in the BDR? **Reference Source: CCP Technical Procedures**	X			
17. Was a replicate scan performed once per day, or once per batch, whichever is LESS frequent? **Reference Source: CCP-PO-001, C1-1**	X			
18. Was an independent observation performed once per day, or once per batch, whichever is LESS frequent? **Reference Source: CCP-PO-001, C1-1**	X			

Attachment 2 – CCP SPM Radiography Project Level Validation Checklist and Summary (Continued)

BDR Number: OR-RTR6-0723 **Examination Date(s):** 02/11/2016

Description of Criteria Reviewed	Criteria Met? YES	NO	NA	Comments/Qualifiers
19. Were the replicate scan and independent observation performed on different waste containers? **Reference Source: CCP-PO-001, C1-1**	X			
20. Were the personnel performing the replicate scan and independent observation different from the individual who performed the original? **Reference Source: CCP-PO-001, C1-1**	X			
21. Does the BDR include an estimate of each material parameter weight in kg for each container? **Reference Source: CCP Technical Procedures**	X			
22. Does the BDR include a description of each material parameter for each container? **Reference Source: CCP Technical Procedures**	X			
23. Is the container gross weight recorded in kilograms (kg) for each container in the BDR? **Reference Source: CCP Technical Procedures**	X			
24. Was the Scale Weight Calibration Check included in the BDR? **Reference Source: CCP Technical Procedures**			X	Scale not used.
25. Was the Scale Weight Check included in the BDR? **Reference Source: CCP Technical Procedures**			X	Scale not used.

Comments: N/A

The container QC checks were properly performed and meet the Quality Assurance Objectives (QAOs). Proper procedures were followed during data reduction and analysis. The batch is complete, acceptable, and includes all supporting data and documentation required by the QAPjP.

Roger Whiteaker	Roger Whiteaker	03/02/2016
SPM Printed Name	Signature	Date

Checklist is to be re-signed only when a re-review is performed.

ROGER WHITEAKER	Roger Whiteaker	CORRECTION	4/19/2016
SPM Printed Name	Signature	Reason	Date
SPM Printed Name	Signature	Reason	Date

Attachment 2 – CCP SPM Radiography Project Level Validation Checklist and Summary

BDR Number: OR-RTR6-0736 **Examination Date(s):** 03/14/2016

Description of Criteria Reviewed	Criteria Met? YES	NO	NA	Comments/Qualifiers
1. Is the completed, signed, and dated Independent Technical Reviewer Checklist included in the BDR, and the independent technical reviewer was not involved in the generation or recording of the data under review? **Reference Source: CCP-PO-001, C3-4**	X			
2. Does the BDR contain all items addressed in the BDR Table of Contents? **Reference Source: CCP-PO-001, C3-4**	X			
3. Does the BDR include a listing of all the container numbers in the batch? **Reference Source: CCP-PO-001, C3-4**	X			
4. List all containers that have met QAOs. **Reference Source: CCP-PO-001, C3-4**				Container Numbers: X10C0506526E X10C0506526I X10C0702204A X10C0801685C X10C0802044A X10C0802044B X10C0802044C X10C0802044D X10C0802044E X10C0802044F X10C0802044G X10C0802044I
5. Does the BDR identify the current implementing procedure and revision number? **Reference Source: CCP-PO-001, Table C3-3**	X			
6. Is there a reference to or copy of any associated NCRs (if any) in the BDR? NA if no NCRs. **Reference Source: CCP-PO-001, Table C3-3**			X	
7. Are there 20 or fewer containers in the batch? **Reference Source: CCP-PO-001, C3-4**	X			
8. Are the data properly reported (i.e., data are reported in correct units and with correct significant figures)? **Reference Source: CCP-PO-001, C3-4**	X			
9. Is there evidence of verification that the physical form matches the Waste Matrix Code? **Reference Source: CCP-PO-001, Table C3-3**	X			

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CCP RECORDS ORIGINAL
DATE REC'D 3/31/2016 JY

Attachment 2 – CCP SPM Radiography Project Level Validation Checklist and Summary (Continued)

BDR Number: OR-RTR6-0736 **Examination Date(s):** 03/14/2016

Description of Criteria Reviewed	Criteria Met? YES	NO	NA	Comments/Qualifiers
10. Is there evidence of verification that the physical form matches the waste stream description? **Reference Source: CCP-PO-001, Table C3-3**	X			
11. Are prohibited items absent? **Reference Source: CCP-PO-001, Table C3-3**	X			
12. Does observable liquid, if present, meet the criteria of the TSDF-WAC? **Reference Source: CCP-PO-001, C-1**	X RW 4/20/16		~~X~~ RW 4/20/16	~~No Observable Liquids~~ X10C-0802044-B RW 4/20/16
13. Were discrepancies between two operators with regard to identification of waste matrix code, liquids in excess of the TSDF-WAC, or compressed gases through replicate scans and independent observations reconciled? NA if no discrepancies. **Reference Source: CCP-PO-001, C3-2**			X	
14. Are the training qualifications for all radiography personnel acceptable? **Reference Source: CCP-PO-001, C3-8**	X			
15. Was evidence of the video/audio check included in the BDR? **Reference Source: CCP-PO-001, C1-1**	X			
16. Was the Lines-Pair Resolution Test or Sieve Test Check included in the BDR? **Reference Source: CCP Technical Procedures**	X			
17. Was a replicate scan performed once per day, or once per batch, whichever is LESS frequent? **Reference Source: CCP-PO-001, C1-1**	X			
18. Was an independent observation performed once per day, or once per batch, whichever is LESS frequent? **Reference Source: CCP-PO-001, C1-1**	X			

Attachment 2 – CCP SPM Radiography Project Level Validation Checklist and Summary (Continued)

BDR Number: OR-RTR6-0736 **Examination Date(s):** 03/14/2016

Description of Criteria Reviewed	Criteria Met? YES	NO	NA	Comments/Qualifiers
19. Were the replicate scan and independent observation performed on different waste containers? **Reference Source: CCP-PO-001, C1-1**	X			
20. Were the personnel performing the replicate scan and independent observation different from the individual who performed the original? **Reference Source: CCP-PO-001, C1-1**	X			
21. Does the BDR include an estimate of each material parameter weight in kg for each container? **Reference Source: CCP Technical Procedures**	X			
22. Does the BDR include a description of each material parameter for each container? **Reference Source: CCP Technical Procedures**	X			
23. Is the container gross weight recorded in kilograms (kg) for each container in the BDR? **Reference Source: CCP Technical Procedures**	X			
24. Was the Scale Weight Calibration Check included in the BDR? **Reference Source: CCP Technical Procedures**			X	Scale not used.
25. Was the Scale Weight Check included in the BDR? **Reference Source: CCP Technical Procedures**			X	Scale not used.

Comments: N/A

The container QC checks were properly performed and meet the Quality Assurance Objectives (QAOs). Proper procedures were followed during data reduction and analysis. The batch is complete, acceptable, and includes all supporting data and documentation required by the QAPjP.

Roger Whiteaker	Roger Whiteaker	03/31/2016
SPM Printed Name	Signature	Date

Checklist is to be re-signed only when a re-review is performed.

ROGER WHITEAKER	Roger Whiteaker	CORRECTIONS	4/20/2016
SPM Printed Name	Signature	Reason	Date
SPM Printed Name	Signature	Reason	Date

Objective Evidence Reviewed During the Audit

The objective evidence supporting Audit A-16-15 is included in the shipping box(es) submitted with this report. Included in the shipping box(es) is a “Content Map” describing the location (using color coding) and identity of all required objective evidence supporting the performance of the audit.

Table C6-1 Waste Analysis Plan (WAP) Checklist
ORNL/CCP Recertification Audit A-16-15
April 19 – 21, 2016

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Waste Analysis Plan (WAP) General Checklist for use at DOE's Generator/Storage Sites

	WAP Requirement[1] ORNL CCP Audit A-16-15 Table C6-1 Waste Analysis Plan (WAP) Checklist [1]	Procedure Documented		Example of Implementation/Objective Evidence, as applicable		Comment (e.g., any change in procedure since last audit, etc.)
		Location	Adequate? Y/N (Why?)	Item Reviewed	Adequate? Y/N	
	WASTE STREAM IDENTIFICATION					
1	Does the generator/storage site define "waste stream" as waste materials that have common physical form, that contain similar hazardous constituents, and that are generated from a single process or activity? (Attachment C Section C-0a)	CCP-PO-001 S. C-0a CCP-TP-005 S. 4.4.11 NOTE above	Y	CCP AK Summary Report for NFS CH TRU Waste Stored at ORNL, OR-NFS-CH-SOIL and OR-NFS-CH-HOM-A, CCP-AK-ORNL-001 R10 **(AK-1)** CCP AK Summary Report for ORNL REDC CH TRU Waste, OR-REDC-CH-HET, CCP-AK-ORNL-002 R4 **(AK-2)** CCP AK Summary Report for ORNL REDC RH TRU Waste, OR-REDC-RH-HET, CCP-AK-ORNL-500 R5 **(AK-3)**	Y	
2	Are procedures in place to ensure that the generator/storage site assigns one of the Summary Category Groups (S3000-homogeneous solids, S4000-soils/gravel, S5000-debris waste) to each waste stream? (Section C-1b)	CCP-TP-005 S. 4.4.14 S. 4.4.15 CCP-TP-002 S. 4.3 Att. 2	Y	CCP AK Summary Report for NFS CH TRU Waste Stored at ORNL, OR-NFS-CH-SOIL and OR-NFS-CH-HOM-A, CCP-AK-ORNL-001 R10, S. 2.2 & 2.3 **(AK-1)** CCP AK Summary Report for ORNL REDC CH TRU Waste, OR-REDC-CH-HET, CCP-AK-ORNL-002 R4, S. 2.1 **(AK-2)** CCP AK Summary Report for ORNL REDC RH TRU Waste, OR-REDC-RH-HET, CCP-AK-ORNL-500 R5, S. 2.0 **(AK-3)**	Y	

	WAP Requirement[1] ORNL CCP Audit A-16-15 Table C6-1 Waste Analysis Plan (WAP) Checklist [1]	Procedure Documented		Example of Implementation/Objective Evidence, as applicable		Comment (e.g., any change in procedure since last audit, etc.)
		Location	Adequate? Y/N (Why?)	Item Reviewed	Adequate? Y/N	
				Draft Waste Stream Profile Form and attachments for Waste Stream OR-NFS-CH-SOIL **(AK-5)** Draft Waste Stream Profile Form and attachments for Waste Stream OR-NFS-CH-HOM-A **(AK-6)** Waste Stream Profile Form and attachments for Waste Stream OR-REDC-CH-HET **(AK-7)** Waste Stream Profile Form and attachments for Waste Stream OR-REDC-RH-HET **(AK-8)**		
3	Are procedures in place to ensure that the generator/storage site assigns Waste Matrix Code Groups (e.g., solidified inorganics, solidified organics, salt waste, soils, combustible waste, filters, graphite, heterogeneous debris waste, inorganic nonmetal waste, lead/cadmium metal, uncategorized metal) to each waste stream? (Section C-0a)	CCP-TP-005 S. 4.4.13 NOTE above CCP-TP-002 S. 4.3 Att. 2	Y	CCP AK Summary Report for NFS CH TRU Waste Stored at ORNL, OR-NFS-CH-SOIL and OR-NFS-CH-HOM-A, CCP-AK-ORNL-001 R10, S. 2.2 & 2.3 **(AK-1)** CCP AK Summary Report for ORNL REDC CH TRU Waste, OR-REDC-CH-HET, CCP-AK-ORNL-002 R4, S. 2.1 **(AK-2)** CCP AK Summary Report for ORNL REDC RH TRU Waste, OR-REDC-RH-HET, CCP-AK-ORNL-500 R5, S. 2.0 **(AK-3)** Draft Waste Stream Profile Form and	Y	

	WAP Requirement[1] ORNL CCP Audit A-16-15 Table C6-1 Waste Analysis Plan (WAP) Checklist [1]	Procedure Documented		Example of Implementation/Objective Evidence, as applicable		Comment (e.g., any change in procedure since last audit, etc.)
		Location	Adequate? Y/N (Why?)	Item Reviewed	Adequate? Y/N	
				attachments for Waste Stream OR-NFS-CH-SOIL **(AK-5)** Draft Waste Stream Profile Form and attachments for Waste Stream OR-NFS-CH-HOM-A **(AK-6)** Waste Stream Profile Form and attachments for Waste Stream OR-REDC-CH-HET **(AK-7)** Waste Stream Profile Form and attachments for Waste Stream OR-REDC-RH-HET **(AK-8)**		
4	Are procedures in place to ensure that the generator/storage site assigns a Waste Stream WIPP Identifier (ID) to each waste stream? (Section C3-6b(1))	CCP-TP-002 S. 4.3 Att. 2	Y	Draft Waste Stream Profile Form and attachments for Waste Stream OR-NFS-CH-SOIL **(AK-5)** Draft Waste Stream Profile Form and attachments for Waste Stream OR-NFS-CH-HOM-A **(AK-6)** Waste Stream Profile Form and attachments for Waste Stream OR-REDC-CH-HET **(AK-7)** Waste Stream Profile Form and attachments for Waste Stream OR-REDC-RH-HET **(AK-8)**	Y	

	WAP Requirement[1] ORNL CCP Audit A-16-15 Table C6-1 Waste Analysis Plan (WAP) Checklist [1]	Procedure Documented		Example of Implementation/Objective Evidence, as applicable		Comment (e.g., any change in procedure since last audit, etc.)
		Location	Adequate? Y/N (Why?)	Item Reviewed	Adequate? Y/N	
4a	Are procedures in place for generator/storage sites to submit an AK Sufficiency Determination (Determination Request) to the Permittees to meet all or part of the waste characterization requirements including: • All information specified in Permit Attachment C4, Section C4-3d • Identification of relevant hazardous constituents, and correctly identifies all toxicity characteristic and listed hazardous waste numbers • All hazardous waste number assignments must be substantiated by supporting data and, if not, whether this lack of substantiation compromises the interpretation • Resolution of data discrepancies between different AK sources must be technically correct and documented • The AK Summary includes all the identification of waste material parameter weights by percentage of the material in the waste stream, and determinations are technically correct • All prohibited items specified in the TSDF-WAC should be addressed, and conclusions drawn are technically adequate and substantiated by supporting information • If the AK record includes process control information specified in Permit Attachment C4, Section C4-3b, the information should include procedures, waste manifests, or other documentation demonstrating that the controls were adequate and sufficient. • The site must provide the supporting information necessary to substantiate technical conclusions within the Determination Request, and this information must be correctly interpreted. (Section C-0b, Section C4-3d)	CCP-TP-005 S. 4.7	Y	N/A	N/A	An AK Sufficiency Determination is not being sought for any ORNL waste streams examined during this audit
4b	If a generator/storage site does not submit a Determination Request or if the Determination Request is not approved, are procedures in place for the generator/storage site to perform radiography or VE on 100% of the containers in a waste stream as specified in Permit Attachment C1? (Section C-0b)	CCP-PO-001 S. C-0b CCP-TP-001 S. 3.1.1 CCP-TP-500 (ALL)	Y	OR-RTR6-0650 OR-RTR6-0652 OR-RTR6-0701 OR-RTR6-0716 OR-RTR6-0723 OR-RTR6-0736 OR-RTR6-0739 OR-RTR7-0131 OR-RTR7-0149 **(GEN-1)** ORVECH0135 ORVECH0142 ORVECH0145	Y	No Determination Requests have been submitted since the previous audit.

	WAP Requirement[1] ORNL CCP Audit A-16-15 Table C6-1 Waste Analysis Plan (WAP) Checklist [1]	Procedure Documented		Example of Implementation/Objective Evidence, as applicable		Comment (e.g., any change in procedure since last audit, etc.)
		Location	Adequate? Y/N (Why?)	Item Reviewed	Adequate? Y/N	
				ORNLRHVE15002 ORNLRHVE15006 ORNLRHVE15008 ORNLRHVE16001 **(GEN-2)**		

	WAP Requirement[1] ORNL CCP Audit A-16-15 Table C6-1 Waste Analysis Plan (WAP) Checklist [1]	Procedure Documented		Example of Implementation/Objective Evidence, as applicable		Comment (e.g., any change in procedure since last audit, etc.)
		Location	Adequate? Y/N (Why?)	Item Reviewed	Adequate? Y/N	
4c	Are procedures in place to ensure that the generator/storage sites complete a Waste Stream Profile Form (WSPF) and Characterization Information Summary (CIS) as specified in Permit Attachment C3, Sections C3-6b(1) and C3-6b(2)? (Section C-0c)	CCP-PO-001 S. C-0b CCP-TP-002 (ALL)	Y	CP:11:01531 – Transmittal of ORNL Site WSPF for WS OR-ISTP-CH-HET CP:15:01018 – Transmittal of ORNL CIS for WS#OR-ISTP-CH-HET Lots 4-8 CP:15:01262 – Transmittal of ORNLCIS for WS #OR-ISTP-CH-HET Lots 9-15 CP:10:01547 – Transmittal of ORNL WSPF for WS #OR-CHEM-CH-HET CP:15:01265 – Transmittal of ORNL CIS for WS #OR-CHEM-CH-HET Lot 6 CP:16:01091 – Transmittal of ORNL CIS for WS #OR-CHEM-CH-HET Lot 7 CP:10:01051 – Transmittal of ORNL WSPF for WS #OR-RF-CH-HET CP:11:01017 – Transmittal of ORNL CIS for WS #OR-RF-CH-HET Lots 8-9 CP:09:01234 – Transmittal of WSPF for OR-REDC-RH-HET at ORNL CP:16:01076 – Transmittal of WSPF Change Notice #1 for ORNL RH WS OR-REDC-RH-HET CP:16:01060 – Transmittal of CIS for RH Lots 30-33 for WS OR-REDC-RH-HET CP:16:01086 –	Y	

	WAP Requirement[1] ORNL CCP Audit A-16-15 Table C6-1 Waste Analysis Plan (WAP) Checklist [1]	Procedure Documented		Example of Implementation/Objective Evidence, as applicable		Comment (e.g., any change in procedure since last audit, etc.)
		Location	Adequate? Y/N (Why?)	Item Reviewed	Adequate? Y/N	
				Transmittal of CIS for RH Lots 34-35 WS OR-REDC-RH-HET **(GEN-3)**		
6	Are procedures in place to ensure that the generator/storage site assigns EPA hazardous waste numbers associated with the waste? If so, do these assigned EPA hazardous waste numbers correspond to the permitted EPA hazardous waste numbers in Table C-5? Are there any assigned EPA hazardous waste numbers that are not permitted EPA hazardous waste numbers on the Table C-5? If so, did the generator/storage site reject the waste for shipment to and disposal at WIPP? Did the generator assign a state hazardous waste codes or numbers? If so, is it assigned to waste that is permitted at WIPP? (Section C-1b)	CCP-TP-005 S. 4.4.16-4.4.21 Att. 5	Y	CCP AK Summary Report for NFS CH TRU Waste Stored at ORNL, OR-NFS-CH-SOIL and OR-NFS-CH-HOM-A, CCP-AK-ORNL-001 R10, S. 6.4.3, 7.4.3, Table 7-5 **(AK-1)** CCP AK Summary Report for ORNL REDC CHTRU Waste, OR-REDC-CH-HET, CCP-AK-ORNL-002 R4, S. 5.4.3, Tables 5-7 & 5-8 **(AK-2)** CCP AK Summary Report for ORNL REDC RH TRU Waste, OR-REDC-RH-HET, CCP-AK-ORNL-500 R5, S. 5.4.2, Tables 5-2 & 5-3 **(AK-3)** AK Att. 5, Hazardous Constituents for waste streams OR-NFS-CH-SOIL, OR-NFS-CH-HOM-A, OR-REDC-CH-HET, and OR-REDC-RH-HET **(AK-15)**	Y	
7	Are procedures in place to ensure that Summary Category Groups are defined as follows: S3000- Homogeneous solids are solid material, inorganic process residues, inorganic sludges, salt waste, and pyrochemical salt waste excluding soils, that do not meet NMED criteria for classification as debris and are at least 50 percent by volume homogeneous solids or comprise the majority of the waste stream S4000- Waste streams that are at least 50 percent by volume soil/gravel, or comprise the majority of the waste stream S5000- Waste streams that are at least 50 percent volume materials that meet the	CCP-TP-005 S. 4.4.14	Y	CCP AK Summary Report for NFS CH TRU Waste Stored at ORNL, OR-NFS-CH-SOIL and OR-NFS-CH-HOM-A, CCP-AK-ORNL-001 R10, S. 2.2 & 2.3 **(AK-1)** CCP AK Summary Report for ORNL REDC	Y	

	WAP Requirement[1] ORNL CCP Audit A-16-15 Table C6-1 Waste Analysis Plan (WAP) Checklist [1]	Procedure Documented		Example of Implementation/Objective Evidence, as applicable		Comment (e.g., any change in procedure since last audit, etc.)
		Location	Adequate? Y/N (Why?)	Item Reviewed	Adequate? Y/N	
	NMED criteria for debris, or comprise the majority matrix of materials. The criteria for debris are solid materials intended for disposal that exceed 2.36 inch particle size and is a manufactured object, plant or animal matter, or natural geologic material. Particles smaller than 2.36 inches in size may be considered debris if the debris is a manufactured object and if it is not a particle of S3000 or S4000 material. (Section C-0a)			CH TRU Waste, OR-REDC-CH-HET, CCP-AK-ORNL-002 R4, S. 2.1 **(AK-2)** CCP AK Summary Report for ORNL REDC RH TRU Waste, OR-REDC-RH-HET, CCP-AK-ORNL-500 R5, S. 2.0 **(AK-3)** Draft Waste Stream Profile Form and attachments for Waste Stream OR-NFS-CH-SOIL **(AK-5)** Draft Waste Stream Profile Form and attachments for Waste Stream OR-NFS-CH-HOM-A **(AK-6)** Waste Stream Profile Form and attachments for Waste Stream OR-REDC-CH-HET **(AK-7)** Waste Stream Profile Form and attachments for Waste Stream OR-REDC-RH-HET **(AK-8)**		

	WAP Requirement[1] ORNL CCP Audit A-16-15 Table C6-1 Waste Analysis Plan (WAP) Checklist [1]	Procedure Documented		Example of Implementation/Objective Evidence, as applicable		Comment (e.g., any change in procedure since last audit, etc.)
		Location	Adequate? Y/N (Why?)	Item Reviewed	Adequate? Y/N	
8	Does the generator/storage facility have procedures in place to ensure that the following waste characterization parameters will be obtained: • Determination whether TRU mixed waste streams comply with the applicable provisions of the TSDF-WAC • Determination whether TRU mixed wastes exhibit a hazardous characteristic per 20.4.1.200 NMAC (incorporating 40 CFR 261 Subpart C) • Determination whether TRU mixed wastes are listed per 20.4.1.200 NMAC (incorporating 40 CFR 261 Subpart D) • Estimation of waste material parameter weights (Section C-2)	**AK** CCP-TP-005 S. 4.4.16 S. 4.4.17 S. 4.4.30 S. 4.4.35 S. 4.4.38[D], [K], [L], [M] S. 4.13 CCP-TP-500 S. 4.0	Y	B1 - CCP AK Summary Report for NFS CH TRU Waste Stored at ORNL, OR-NFS-CH-SOIL and OR-NFS-CH-HOM-A, CCP-AK-ORNL-001 R10, S. 6.4.3.5, 6.4.3.6, 6.4.4, 7.4.3.5, 7.4.3.6 & 7.4.4 **(AK-1)** CCP AK Summary Report for ORNL REDC CH TRU Waste, OR-REDC-CH-HET, CCP-AK-ORNL-002 R4, S. 5.4.3.4, 5.4.3.5, 5.4.4 **(AK-2)** CCP AK Summary Report for ORNL REDC RH TRU Waste, OR-REDC-RH-HET, CCP-AK-ORNL-500 R5 S. 5.4.2.3, 5.4.5, 5.4.6 **(AK-3)** Acceptable Knowledge Assessment for waste stream OR-NFS-CH-SOIL **(AK-22)** NCRs for prohibited items **(AK-21)** AK Att. 6, Waste Form, Waste Material Parameters, Prohibited Items and Packaging for waste streams OR-NFS-CH-SOIL, OR-NFS-CH-HOM-A, OR-REDC-CH-HET, and OR-REDC-RH-HET **(AK-16)** ORNLRHVE15007 **(AK-31)**	Y	

	WAP Requirement[1] ORNL CCP Audit A-16-15 Table C6-1 Waste Analysis Plan (WAP) Checklist [1]	Procedure Documented		Example of Implementation/Objective Evidence, as applicable		Comment (e.g., any change in procedure since last audit, etc.)
		Location	Adequate? Y/N (Why?)	Item Reviewed	Adequate? Y/N	
				ORNLRHVE15012 **(AK-32)** B2&3 - CCP AK Summary Report for NFS CH TRU Waste Stored at ORNL, OR-NFS-CH-SOIL and OR-NFS-CH-HOM-A, CCP-AK-ORNL-001 R10, S. 6.4.3 & S. 7.4.3, Table 7-5 **(AK-1)** CCP AK Summary Report for ORNL REDC CH TRU Waste, OR-REDC-CH-HET, CCP-AK-ORNL-002 R4, S. 5.4.3, Tables 5-7 & 5-8 **(AK-2)** CCP AK Summary Report for ORNL REDC RH TRU Waste, OR-REDC-RH-HET, CCP-AK-ORNL-500 R5, S. 5.4.2, Tables 5-2 & 5-3 **(AK-3)** AK Att. 5, Hazardous Constituents for waste streams OR-NFS-CH-SOIL, OR-NFS-CH-HOM-A, OR-REDC-CH-HET, and OR-REDC-RH-HET **(AK-15)** B4 - CCP AK Summary Report for NFS CH TRU Waste Stored at ORNL, OR-NFS-CH-SOIL and OR-NFS-CH-HOM-A, CCP-AK-ORNL-001 R10, S. 6.4.1.2, Table 6-1 & 7.4.1.2, Table 7-1 **(AK-1)**		

	WAP Requirement[1] ORNL CCP Audit A-16-15 Table C6-1 Waste Analysis Plan (WAP) Checklist [1]	Procedure Documented		Example of Implementation/Objective Evidence, as applicable		Comment (e.g., any change in procedure since last audit, etc.)
		Location	Adequate? Y/N (Why?)	Item Reviewed	Adequate? Y/N	
		PL CCP-TP-001 Att. 1 & 2 CCP-TP-005 (ALL) CCP-TP-500 S. 4.1[I.12] Att. 3		CCP AK Summary Report for ORNL REDC CH TRU Waste, OR-REDC-CH-HET, CCP-AK-ORNL-002 R4, S. 5.4.1.2, Table 5-1 **(AK-2)** CCP AK Summary Report for ORNL REDC RH TRU Waste, OR-REDC-RH-HET, CCP-AK-ORNL-500 R5, S. 5.4.1.2, Table 5-1 **(AK-3)** Memo attached to AK Att. 6, Waste Form, Waste Material Parameters, Prohibited Items and Packaging for waste streams OR-NFS-CH-SOIL, OR-NFS-CH-HOM-A, OR-REDC-CH-HET, and OR-REDC-RH-HET **(AK-16)** OR-RTR6-0652 OR-RTR6-0701 OR-RTR6-0716 OR-RTR6-0723 OR-RTR6-0736 OR-RTR6-0739 OR-RTR7-0131 OR-RTR7-0149 **(GEN-1)** ORVECH0135 ORVECH0142 ORVECH0145 ORNLRHVE15002 ORNLRHVE15006 ORNLRHVE15008 ORNLRHVE16001 **(GEN-2)**		

	WAP Requirement[1] ORNL CCP Audit A-16-15 Table C6-1 Waste Analysis Plan (WAP) Checklist [1]	Procedure Documented		Example of Implementation/Objective Evidence, as applicable		Comment (e.g., any change in procedure since last audit, etc.)
		Location	Adequate? Y/N (Why?)	Item Reviewed	Adequate? Y/N	
				CP:11:01531 – Transmittal of ORNL Site WSPF for WS OR-ISTP-CH-HET CP:15:01018 – Transmittal of ORNL CIS for WS#OR-ISTP-CH-HET Lots 4-8 CP:15:01262 – Transmittal of ORNLCIS for WS #OR-ISTP-CH-HET Lots 9-15 CP:10:01547 – Transmittal of ORNL WSPF for WS #OR-CHEM-CH-HET CP:15:01265 – Transmittal of ORNL CIS for WS #OR-CHEM-CH-HET Lot 6 CP:16:01091 – Transmittal of ORNL CIS for WS #OR-CHEM-CH-HET Lot 7 CP:10:01051 – Transmittal of ORNL WSPF for WS #OR-RF-CH-HET CP:11:01017 – Transmittal of ORNL CIS for WS #OR-RF-CH-HET Lots 8-9 CP:09:01234 – Transmittal of WSPF for OR-REDC-RH-HET at ORNL CP:16:01076 – Transmittal of WSPF Change Notice #1 for ORNL RH WS OR-REDC-RH-HET CP:16:01060 – Transmittal of CIS for RH Lots 30-33 for WS OR-REDC-RH-HET CP:16:01086 –		

	WAP Requirement[1] ORNL CCP Audit A-16-15 Table C6-1 Waste Analysis Plan (WAP) Checklist [1]	Procedure Documented		Example of Implementation/Objective Evidence, as applicable		Comment (e.g., any change in procedure since last audit, etc.)
		Location	Adequate? Y/N (Why?)	Item Reviewed	Adequate? Y/N	
				Transmittal of CIS for RH Lots 34-35 WS OR-REDC-RH-HET **(GEN-3)**		
9	Are procedures in place to ensure that waste streams identified to contain incompatible materials or materials incompatible with waste containers cannot be shipped unless treated to remove the incompatibility? (Section C-1c)	CCP-TP-005 S. 4.4.35, 4.4.38[K], 4.13 Att. 6 CCP-TP-001 S. 2.7 & 4.0 CCP-TP-068 S. 4.0 Att. 2 & 3	Y	NCRs for prohibited items **(AK-21)** IDC database with "reject" field **(AK-23)** Container inspection reports **(AK-27)** "Hold" tag **(AK-26)** ORNLRHVE15007 **(AK-31)** ORNLRHVE15012 **(AK-32)** AK Att. 6, Waste Form, Waste Material Parameters, Prohibited Items and Packaging for waste streams OR-NFS-CH-SOIL, OR-NFS-CH-HOM-A, OR-REDC-CH-HET, and OR-REDC-RH-HET **(AK-16)** Acceptable Knowledge Assessment for waste stream OR-NFS-CH-SOIL **(AK-22)**	Y	
10	Are procedures in place to ensure that the generator/storage site uses acceptable knowledge and, as necessary, radiography and visual examination analysis as specified in Table C-1? (Section C-3)	**AK** CCP-TP-005 S. 4.4 S. 4.5	Y	CCP AK Summary Report for NFS CH TRU Waste Stored at ORNL, OR-NFS-CH-SOIL and OR-NFS-CH-HOM-A, CCP-AK-ORNL-001 R10 **(AK-1)** CCP AK Summary Report for ORNL REDC CH TRU Waste, OR-REDC-CH-HET, CCP-AK-ORNL-002 R4 **(AK-2)**	Y	

	WAP Requirement[1] ORNL CCP Audit A-16-15 Table C6-1 Waste Analysis Plan (WAP) Checklist [1]	Procedure Documented		Example of Implementation/Objective Evidence, as applicable		Comment (e.g., any change in procedure since last audit, etc.)
		Location	Adequate? Y/N (Why?)	Item Reviewed	Adequate? Y/N	
		PL CCP-TP-001 S. 4.2 CCP-TP-500 S. 1.1 Att. 1-3		CCP AK Summary Report for ORNL REDC RH TRU Waste, OR-REDC-RH-HET, CCP-AK-ORNL-500 R5 **(AK-3)** BDRs ORNLRHVE15007 **(AK-31)** ORNLRHVE15012 **(AK-32)** OR-RTR7-0140 (**AK-33)** OR-RTR7-0102 **(AK-34)** OR-RTR7-0013 **(AK-35)** OR-RTR6-0636 **(AK-36)** OR-RTR7-0124 **(AK-37)** OR-RTR6-0581 **(AK-38)** OR-RTR6-0650 OR-RTR6-0652 OR-RTR6-0701 OR-RTR6-0716 OR-RTR6-0723 OR-RTR6-0736 OR-RTR6-0739 OR-RTR7-0131 OR-RTR7-0149 **(GEN-1)** ORVECH0135 ORVECH0142 ORVECH0145 ORNLRHVE15002 ORNLRHVE15006 ORNLRHVE15008 ORNLRHVE16001 **(GEN-2)** CP:11:01531 – Transmittal of ORNL Site WSPF for WS OR-ISTP-CH-HET CP:15:01018 – Transmittal of ORNL CIS		

	WAP Requirement[1] ORNL CCP Audit A-16-15 Table C6-1 Waste Analysis Plan (WAP) Checklist [1]	Procedure Documented		Example of Implementation/Objective Evidence, as applicable		Comment (e.g., any change in procedure since last audit, etc.)
		Location	Adequate? Y/N (Why?)	Item Reviewed	Adequate? Y/N	
				for WS#OR-ISTP-CH-HET Lots 4-8 CP:15:01262 – Transmittal of ORNLCIS for WS #OR-ISTP-CH-HET Lots 9-15 CP:10:01547 – Transmittal of ORNL WSPF for WS #OR-CHEM-CH-HET CP:15:01265 – Transmittal of ORNL CIS for WS #OR-CHEM-CH-HET Lot 6 CP:16:01091 – Transmittal of ORNL CIS for WS #OR-CHEM-CH-HET Lot 7 CP:10:01051 – Transmittal of ORNL WSPF for WS #OR-RF-CH-HET CP:11:01017 – Transmittal of ORNL CIS for WS #OR-RF-CH-HET Lots 8-9 CP:09:01234 – Transmittal of WSPF for OR-REDC-RH-HET at ORNL CP:16:01076 – Transmittal of WSPF Change Notice #1 for ORNL RH WS OR-REDC-RH-HET CP:16:01060 – Transmittal of CIS for RH Lots 30-33 for WS OR-REDC-RH-HET CP:16:01086 – Transmittal of CIS for RH Lots 34-35 WS OR-REDC-RH-HET **(GEN-3)**		
	UNACCEPTABLE WASTE					

	WAP Requirement[1] ORNL CCP Audit A-16-15 Table C6-1 Waste Analysis Plan (WAP) Checklist [1]	Procedure Documented		Example of Implementation/Objective Evidence, as applicable		Comment (e.g., any change in procedure since last audit, etc.)
		Location	Adequate? Y/N (Why?)	Item Reviewed	Adequate? Y/N	

12	Are procedures in place to ensure that the generator/storage site ensures, through administrative and operational procedures and characterization techniques, that waste containers do not include the following unacceptable waste:
	• liquid waste is not acceptable at WIPP. Liquid in the quantities delineated below is acceptable
	  • Observable liquid shall be no more than 1 percent by volume of the outermost container at the time of radiography or visual examination
	  • Internal containers with more than 60 milliliters or 3 percent by volume observable liquid, whichever is greater, are prohibited
	  • Containers with Hazardous Waste number U134 assigned shall have no observable liquid
	  • Overpacking the outermost container that was examined during radiography or visual examination or redistributing untreated liquid within the container shall not be used to meet the liquid volume limits
	• non-radionuclide pyrophoric materials
	• hazardous wastes not occurring as co-contaminants with TRU wastes (non-mixed hazardous wastes)
	• wastes incompatible with backfill, seal and panel closures materials, container and packaging materials, shipping container materials, or other wastes
	• wastes containing explosives or compressed gases (continued below)
		CCP-TP-001
		S. 4.2
		Att. 1 & 2
		CCP-TP-500
		S. 1.1
		Att. 1-3
			Y	OR-RTR6-0650
				OR-RTR6-0652
				OR-RTR6-0701
				OR-RTR6-0716
				OR-RTR6-0723
				OR-RTR6-0736
				OR-RTR6-0739
				OR-RTR7-0131
				OR-RTR7-0149
				(GEN-1)
				
				ORVECH0135
				ORVECH0142
				ORVECH0145
				ORNLRHVE15002
				ORNLRHVE15006
				ORNLRHVE15008
				ORNLRHVE16001
				(GEN-2)
				
				CP:11:01531 – Transmittal of ORNL Site WSPF for WS OR-ISTP-CH-HET
				CP:15:01018 – Transmittal of ORNL CIS for WS#OR-ISTP-CH-HET Lots 4-8
				CP:15:01262 – Transmittal of ORNLCIS for WS #OR-ISTP-CH-HET Lots 9-15
				CP:10:01547 – Transmittal of ORNL WSPF for WS #OR-CHEM-CH-HET
				CP:15:01265 – Transmittal of ORNL CIS for WS #OR-CHEM-CH-HET Lot 6
				CP:16:01091 – Transmittal of ORNL CIS for WS #OR-CHEM-CH-HET Lot 7
				CP:10:01051 – Transmittal of ORNL WSPF for WS #OR-RF-
					Y	

	WAP Requirement[1] ORNL CCP Audit A-16-15 Table C6-1 Waste Analysis Plan (WAP) Checklist [1]	Procedure Documented		Example of Implementation/Objective Evidence, as applicable		Comment (e.g., any change in procedure since last audit, etc.)
		Location	Adequate? Y/N (Why?)	Item Reviewed	Adequate? Y/N	
				CH-HET CP:11:01017 – Transmittal of ORNL CIS for WS #OR-RF-CH-HET Lots 8-9 CP:09:01234 – Transmittal of WSPF for OR-REDC-RH-HET at ORNL CP:16:01076 – Transmittal of WSPF Change Notice #1 for ORNL RH WS OR-REDC-RH-HET CP:16:01060 – Transmittal of CIS for RH Lots 30-33 for WS OR-REDC-RH-HET CP:16:01086 – Transmittal of CIS for RH Lots 34-35 WS OR-REDC-RH-HET **(GEN-3)**		
12a	• wastes with polychlorinated biphenyls (PCBs) not authorized under an EPA PCB waste disposal authorization • wastes exhibiting the characteristic of ignitability, corrosivity, or reactivity (EPA Hazardous Waste Numbers of D001, D002, or D003) • waste that has ever been managed as high-level waste and waste from tanks specified in Table C-4, unless specifically approved through a Class 3 permit modification • any waste container from a waste stream (or waste stream lot) which has not undergone either radiographic or visual examination of a statistically representative subpopulation of the wastes stream in each shipment pursuant to Permit Attachment C7 • any waste container from a waste stream which has not been preceded by an appropriate, certified Waste Stream Profile Form (see Section C-1d) (Section C-1c)	CCP-TP-001 S. 4.2 Att. 1 & 2 CCP-TP-500 S. 1.1 Att. 1-3	Y	OR-RTR6-0650 OR-RTR6-0652 OR-RTR6-0701 OR-RTR6-0716 OR-RTR6-0723 OR-RTR6-0736 OR-RTR6-0739 OR-RTR7-0131 OR-RTR7-0149 **(GEN-1)** ORVECH0135 ORVECH0142 ORVECH0145 ORNLRHVE15002 ORNLRHVE15006 ORNLRHVE15008 ORNLRHVE16001 **(GEN-2)** CP:11:01531 – Transmittal of ORNL Site WSPF for WS OR-ISTP-CH-HET	Y	

	WAP Requirement[1] ORNL CCP Audit A-16-15 Table C6-1 Waste Analysis Plan (WAP) Checklist [1]	Procedure Documented		Example of Implementation/Objective Evidence, as applicable		Comment (e.g., any change in procedure since last audit, etc.)
		Location	Adequate? Y/N (Why?)	Item Reviewed	Adequate? Y/N	
				CP:15:01018 – Transmittal of ORNL CIS for WS#OR-ISTP-CH-HET Lots 4-8 CP:15:01262 – Transmittal of ORNLCIS for WS #OR-ISTP-CH-HET Lots 9-15 CP:10:01547 – Transmittal of ORNL WSPF for WS #OR-CHEM-CH-HET CP:15:01265 – Transmittal of ORNL CIS for WS #OR-CHEM-CH-HET Lot 6 CP:16:01091 – Transmittal of ORNL CIS for WS #OR-CHEM-CH-HET Lot 7 CP:10:01051 – Transmittal of ORNL WSPF for WS #OR-RF-CH-HET CP:11:01017 – Transmittal of ORNL CIS for WS #OR-RF-CH-HET Lots 8-9 CP:09:01234 – Transmittal of WSPF for OR-REDC-RH-HET at ORNL CP:16:01076 – Transmittal of WSPF Change Notice #1 for ORNL RH WS OR-REDC-RH-HET CP:16:01060 – Transmittal of CIS for RH Lots 30-33 for WS OR-REDC-RH-HET CP:16:01086 – Transmittal of CIS for RH Lots 34-35 WS OR-REDC-RH-HET **(GEN-3)**		

	WAP Requirement[1] ORNL CCP Audit A-16-15 Table C6-1 Waste Analysis Plan (WAP) Checklist [1]	Procedure Documented		Example of Implementation/Objective Evidence, as applicable		Comment (e.g., any change in procedure since last audit, etc.)
		Location	Adequate? Y/N (Why?)	Item Reviewed	Adequate? Y/N	
	WASTE ACCEPTANCE CONTROL					
14	Are procedures in place to ensure that the generator/storage site uses a Waste Stream Profile Form (WSPF) which includes, at a minimum, the information indicated on the attached WSPF found in Figure C-1 and a Characterization Information Summary (CIS) prior to waste disposal at the WIPP? (Section C-1d)	CCP-PO-001 S. C-1d CCP-TP-002 (ALL)	Y	CP:11:01531 – Transmittal of ORNL Site WSPF for WS OR-ISTP-CH-HET CP:15:01018 – Transmittal of ORNL CIS for WS#OR-ISTP-CH-HET Lots 4-8 CP:15:01262 – Transmittal of ORNLCIS for WS #OR-ISTP-CH-HET Lots 9-15 CP:10:01547 – Transmittal of ORNL WSPF for WS #OR-CHEM-CH-HET CP:15:01265 – Transmittal of ORNL CIS for WS #OR-CHEM-CH-HET Lot 6 CP:16:01091 – Transmittal of ORNL CIS for WS #OR-CHEM-CH-HET Lot 7 CP:10:01051 – Transmittal of ORNL WSPF for WS #OR-RF-CH-HET CP:11:01017 – Transmittal of ORNL CIS for WS #OR-RF-CH-HET Lots 8-9 CP:09:01234 – Transmittal of WSPF for OR-REDC-RH-HET at ORNL CP:16:01076 – Transmittal of WSPF Change Notice #1 for ORNL RH WS OR-REDC-RH-HET CP:16:01060 – Transmittal of CIS for RH Lots 30-33 for WS OR-	Y	

	WAP Requirement[1] ORNL CCP Audit A-16-15 Table C6-1 Waste Analysis Plan (WAP) Checklist [1]	Procedure Documented		Example of Implementation/Objective Evidence, as applicable		Comment (e.g., any change in procedure since last audit, etc.)
		Location	Adequate? Y/N (Why?)	Item Reviewed	Adequate? Y/N	
				REDC-RH-HET CP:16:01086 – Transmittal of CIS for RH Lots 34-35 WS OR-REDC-RH-HET **(GEN-3)**		
16	Are procedures in place to ensure that additional WSPFs are provided to WIPP and NMED for waste streams or portions of waste streams that are reclassified based upon waste characterization information? (Section C-1d)	CCP-PO-001 S. C-1d CCP-TP-002 (ALL)	Y	CP:11:01531 – Transmittal of ORNL Site WSPF for WS OR-ISTP-CH-HET CP:15:01018 – Transmittal of ORNL CIS for WS#OR-ISTP-CH-HET Lots 4-8 CP:15:01262 – Transmittal of ORNLCIS for WS #OR-ISTP-CH-HET Lots 9-15 CP:10:01547 – Transmittal of ORNL WSPF for WS #OR-CHEM-CH-HET CP:15:01265 – Transmittal of ORNL CIS for WS #OR-CHEM-CH-HET Lot 6 CP:16:01091 – Transmittal of ORNL CIS for WS #OR-CHEM-CH-HET Lot 7 CP:10:01051 – Transmittal of ORNL WSPF for WS #OR-RF-CH-HET CP:11:01017 – Transmittal of ORNL CIS for WS #OR-RF-CH-HET Lots 8-9 CP:09:01234 – Transmittal of WSPF for OR-REDC-RH-HET at ORNL CP:16:01076 – Transmittal of WSPF Change Notice #1 for ORNL RH WS OR-	Y	There were no waste streams or portions of waste streams that were reclassified based upon waste characterization information.

	WAP Requirement[1] ORNL CCP Audit A-16-15 Table C6-1 Waste Analysis Plan (WAP) Checklist [1]	Procedure Documented		Example of Implementation/Objective Evidence, as applicable		Comment (e.g., any change in procedure since last audit, etc.)
		Location	Adequate? Y/N (Why?)	Item Reviewed	Adequate? Y/N	
				REDC-RH-HET CP:16:01060 – Transmittal of CIS for RH Lots 30-33 for WS OR-REDC-RH-HET CP:16:01086 – Transmittal of CIS for RH Lots 34-35 WS OR-REDC-RH-HET **(GEN-3)** ORNL Discrepancy Resolutions: DR027, DR045, DR046, and DR047 **(GEN-4)**		
16a	Are criteria in place to determine the specific circumstances under which a WSPF is revised versus when a new WSPF is required? (Section C-1d)	CCP-TP-002 S. 4.7	Y	N/A	N/A	There were no examples of revisions to WSPFs for the waste streams examined during this audit.
	GENERAL CHARACTERIZATION REQUIREMENTS					
25	Are procedures in place to ensure that Acceptable Knowledge is used in waste characterization activities to delineate TRU mixed waste streams, to assess whether TRU mixed wastes comply with the TSDF-WAC, to assess whether TRU mixed waste exhibits a hazardous characteristic (20.4.1.200 NMAC, incorporating 40 CFR 261 Subpart C), and to assess whether TRU wastes are listed (20.4.1.200 NMAC, incorporating 40 CFR 261 Subpart D), and to estimate waste material parameter weights? (Section C-3a)	**AK** CCP-TP-005 S. 4.4.11 S. 4.4.16 S. 4.4.17 S. 4.4.30 S. 4.4.35 S. 4.4.38[D], [K], [L] & [M] S. 4.13 CCP-TP-500 S. 4.0	Y	CCP AK Summary Report for NFS CH TRU Waste Stored at ORNL, OR-NFS-CH-SOIL and OR-NFS-CH-HOM-A, CCP-AK-ORNL-001 R10, S. 2.2 & 2.3 **(AK-1)** CCP AK Summary Report for ORNL REDC CH TRU Waste, OR-REDC-CH-HET, CCP-AK-ORNL-002 R4, S. 2.1 **(AK-2)** CCP AK Summary Report for ORNL REDC RH TRU Waste, OR-REDC-RH-HET, CCP-AK-ORNL-500 R5, S. 2.0 **(AK-3)**	Y	

	WAP Requirement[1] ORNL CCP Audit A-16-15 Table C6-1 Waste Analysis Plan (WAP) Checklist [1]	Procedure Documented		Example of Implementation/Objective Evidence, as applicable		Comment (e.g., any change in procedure since last audit, etc.)
		Location	Adequate? Y/N (Why?)	Item Reviewed	Adequate? Y/N	
				CCP AK Summary Report for NFS CH TRU Waste Stored at ORNL, OR-NFS-CH-SOIL and OR-NFS-CH-HOM-A, CCP-AK-ORNL-001 R10, S. 6.4.3.5, 6.4.3.6, 6.4.4. 7.4.3.5, 7.4.3.6 & 7.4.4 **(AK-1)** CCP AK Summary Report for ORNL REDC CH TRU Waste, OR-REDC-CH-HET, CCP-AK-ORNL-002 R4, S. 5.4.3.4, 5.4.3.5 & 5.4.4 **(AK-2)** CCP AK Summary Report for ORNL REDC RH TRU Waste, OR-REDC-RH-HET, CCP-AK-ORNL-500 R5, S. 5.4.2.3, 5.4.5, 5.4.6 **(AK-3)** Acceptable Knowledge Assessment for waste stream OR-NFS-CH-SOIL **(AK-22)** NCRs for prohibited items **(AK-21)** AK Att. 6, Waste Form, Waste Material Parameters, Prohibited Items and Packaging for waste streams OR-NFS-CH-SOIL, OR-NFS-CH-HOM-A, OR-REDC-CH-HET, and OR-REDC-RH-HET **(AK-16)** ORNLRHVE15007 **(AK-31)**		

	WAP Requirement[1] ORNL CCP Audit A-16-15 Table C6-1 Waste Analysis Plan (WAP) Checklist [1]	Procedure Documented		Example of Implementation/Objective Evidence, as applicable		Comment (e.g., any change in procedure since last audit, etc.)
		Location	Adequate? Y/N (Why?)	Item Reviewed	Adequate? Y/N	
				ORNLRHVE15012 **(AK-32)** CCP AK Summary Report for NFS CH TRU Waste Stored at ORNL, OR-NFS-CH-SOIL and OR-NFS-CH-HOM-A, CCP-AK-ORNL-001 R10, S. 6.4.3 & 7.4.3, Table 7-5 **(AK-1)** CCP AK Summary Report for ORNL REDC CH TRU Waste, OR-REDC-CH-HET, CCP-AK-ORNL-002 R4, S. 5.4.3, Tables 5-7 & 5-8 **(AK-2)** CCP AK Summary Report for ORNL REDC RH TRU Waste, OR-REDC-RH-HET, CCP-AK-ORNL-500 R5, S. 5.4.2, Tables 5-2 & 5-3 **(AK-3)** AK Att. 5, Hazardous Constituents for waste streams OR-NFS-CH-SOIL, OR-NFS-CH-HOM-A, OR-REDC-CH-HET, and OR-REDC-RH-HET **(AK-15)** CCP AK Summary Report for NFS CH TRU Waste Stored at ORNL, OR-NFS-CH-SOIL and OR-NFS-CH-HOM-A, CCP-AK-ORNL-001 R10, S. 6.4.1.2, Table 6-1 & 7.4.1.2, Table 7-1 **(AK-1)**		

	WAP Requirement[1] ORNL CCP Audit A-16-15 Table C6-1 Waste Analysis Plan (WAP) Checklist [1]	Procedure Documented		Example of Implementation/Objective Evidence, as applicable		Comment (e.g., any change in procedure since last audit, etc.)
		Location	Adequate? Y/N (Why?)	Item Reviewed	Adequate? Y/N	
				CCP AK Summary Report for ORNL REDC CH TRU Waste, OR-REDC-CH-HET, CCP-AK-ORNL-002 R4, S. 5.4.1.2, Table 5-1 **(AK-2)** CCP AK Summary Report for ORNL REDC RH TRU Waste, OR-REDC-RH-HET, CCP-AK-ORNL-500 R5, S. 5.4.1.2, Table 5-1 **(AK-3)** Memo attached to AK Att. 6, Waste Form, Waste Material Parameters, Prohibited Items and Packaging for waste streams OR-NFS-CH-SOIL, OR-NFS-CH-HOM-A, OR-REDC-CH-HET, and OR-REDC-RH-HET **(AK-16)**		
26	Are procedures in place to ensure that radiography and/or visual examination are used as necessary to: • Examine a waste container to determine the physical form • Identify observable liquid in excess of TSDF-WAC limits and containerized gases • Verify the physical form matches the waste stream description (Section C-3b)	**RTR** CCP-TP-053 S. 1.0, Table 1 Att. 2 **VE** CCP-TP-113 S. 1.1, Table 1 Att. 2 CCP-TP-500 S. 1.0, Table 1	Y	RTR BDRs: OR-RTR6-0650 OR-RTR6-0654 OR-RTR6-0676 OR-RTR6-0688 OR-RTR6-0695 OR-RTR6-0706 OR-RTR6-0713 OR-RTR6-0723 OR-RTR7-0138 OR-RTR7-0148 **(RTR-1)** VE BDRs: ORNLRHVE15003 ORNLRHVE15016 ORNLRHVE16002 ORNLRHVE16009 ORNLRHVE16010	Y	

	WAP Requirement[1] ORNL CCP Audit A-16-15 Table C6-1 Waste Analysis Plan (WAP) Checklist [1]	Procedure Documented		Example of Implementation/Objective Evidence, as applicable		Comment (e.g., any change in procedure since last audit, etc.)
		Location	Adequate? Y/N (Why?)	Item Reviewed	Adequate? Y/N	
		Att. 1		ORVECH0136 ORVECH0138 ORVECH0142 ORVECH0143 ORVECH0144 ORVECH0146 ORVECH0148 ORVECH0162 **(VE-1)**		
28	Are procedures in place to ensure that the following characterization activities shall occur: • Acceptable Knowledge for all wastes, with testing as necessary to augment AK including; - Visual examination or radiography for all waste containers (Section C4-3e)	**AK** CCP-TP-005 S. 4.4 S. 4.5	Y	CCP AK Summary Report for NFS CH TRU Waste Stored at ORNL, OR-NFS-CH-SOIL and OR-NFS-CH-HOM-A, CCP-AK-ORNL-001 R10 **(AK-1)** CCP AK Summary Report for ORNL REDC CH TRU Waste, OR-REDC-CH-HET, CCP-AK-ORNL-002 R4 **(AK-2)** CCP AK Summary Report for ORNL REDC RH TRU Waste, OR-REDC-RH-HET, CCP-AK-ORNL-500 R5 **(AK-3)** BDRs ORNLRHVE15007 **(AK-31)** ORNLRHVE15012 **(AK-32)** OR-RTR7-0140 (**AK-33)** OR-RTR7-0102 **(AK-34)** OR-RTR7-0013 **(AK-35)** OR-RTR6-0636 **(AK-36)** OR-RTR7-0124 **(AK-37)** OR-RTR6-0581 **(AK-38)** AK Att. 13 - Waste Stream Characterization Checklists and AK Data Reconciliation **(AK-30)**	Y	

	WAP Requirement[1] ORNL CCP Audit A-16-15 Table C6-1 Waste Analysis Plan (WAP) Checklist [1]	Procedure Documented		Example of Implementation/Objective Evidence, as applicable		Comment (e.g., any change in procedure since last audit, etc.)
		Location	Adequate? Y/N (Why?)	Item Reviewed	Adequate? Y/N	
		PL CCP-TP-001 S. 3.1.1 CCP-TP-500 (ALL)		OR-RTR6-0650 OR-RTR6-0652 OR-RTR6-0701 OR-RTR6-0716 OR-RTR6-0723 OR-RTR6-0736 OR-RTR6-0739 OR-RTR7-0131 OR-RTR7-0149 **(GEN-1)** ORVECH0135 ORVECH0142 ORVECH0145 ORNLRHVE15002 ORNLRHVE15006 ORNLRHVE15008 ORNLRHVE16001 **(GEN-2)** CP:11:01531 – Transmittal of ORNL Site WSPF for WS OR-ISTP-CH-HET CP:15:01018 – Transmittal of ORNL CIS for WS#OR-ISTP-CH-HET Lots 4-8 CP:15:01262 – Transmittal of ORNLCIS for WS #OR-ISTP-CH-HET Lots 9-15 CP:10:01547 – Transmittal of ORNL WSPF for WS #OR-CHEM-CH-HET CP:15:01265 – Transmittal of ORNL CIS for WS #OR-CHEM-CH-HET Lot 6 CP:16:01091 – Transmittal of ORNL CIS for WS #OR-CHEM-CH-HET Lot 7 CP:10:01051 –		

	WAP Requirement[1] ORNL CCP Audit A-16-15 Table C6-1 Waste Analysis Plan (WAP) Checklist [1]	Procedure Documented		Example of Implementation/Objective Evidence, as applicable		Comment (e.g., any change in procedure since last audit, etc.)
		Location	Adequate? Y/N (Why?)	Item Reviewed	Adequate? Y/N	
				Transmittal of ORNL WSPF for WS #OR-RF-CH-HET CP:11:01017 – Transmittal of ORNL CIS for WS #OR-RF-CH-HET Lots 8-9 CP:09:01234 – Transmittal of WSPF for OR-REDC-RH-HET at ORNL CP:16:01076 – Transmittal of WSPF Change Notice #1 for ORNL RH WS OR-REDC-RH-HET CP:16:01060 – Transmittal of CIS for RH Lots 30-33 for WS OR-REDC-RH-HET CP:16:01086 – Transmittal of CIS for RH Lots 34-35 WS OR-REDC-RH-HET **(GEN-3)**		
	DATA GENERATION, VERIFICATION, VALIDATION, DOCUMENTATION, AND QUALITY ASSURANCE					
30	Are procedures in place to ensure that the following Data Quality Objectives are met: • Use Acceptable Knowledge to delineate TRU mixed waste streams, assess whether TRU mixed wastes comply with the applicable requirements of the TSDF-WAC, assess whether TRU mixed wastes exhibit a hazardous characteristic, assess whether TRU mixed wastes are listed and to estimate waste material parameter weights • Use radiography or visual examination to verify the physical form of the waste matches its waste stream description as determined by AK and to verify the absence of prohibited items (Section C-4a(1))	**AK** CCP-TP-005 S. 4.4.11 S. 4.4.16 S. 4.4.17 S. 4.4.30 S. 4.4.35 S. 4.4.38[D], [K], [L] & [M] S. 4.13 CCP-TP-500 S. 4.0	Y	CCP AK Summary Report for NFS CH TRU Waste Stored at ORNL, OR-NFS-CH-SOIL and OR-NFS-CH-HOM-A, CCP-AK-ORNL-001 R10, S. 2.2 & 2.3 **(AK-1)** CCP AK Summary Report for ORNL REDC CH TRU Waste, OR-REDC-CH-HET, CCP-AK-ORNL-002 R4, S. 2.1 **(AK-2)** CCP AK Summary Report for ORNL REDC RH TRU Waste, OR-REDC-RH-HET, CCP-	Y	

	WAP Requirement[1] ORNL CCP Audit A-16-15 Table C6-1 Waste Analysis Plan (WAP) Checklist [1]	Procedure Documented		Example of Implementation/Objective Evidence, as applicable		Comment (e.g., any change in procedure since last audit, etc.)
		Location	Adequate? Y/N (Why?)	Item Reviewed	Adequate? Y/N	
				AK-ORNL-500 R5, S. 2.0 **(AK-3)** CCP AK Summary Report for NFS CH TRU Waste Stored at ORNL, OR-NFS-CH-SOIL and OR-NFS-CH-HOM-A, CCP-AK-ORNL-001 R10, S. 6.4.3.5, 6.4.3.6, 6.4.4, 7.4.3.5, 7.4.3.6 & 7.4.4 **(AK-1)** CCP AK Summary Report for ORNL REDC CH TRU Waste, OR-REDC-CH-HET, CCP-AK-ORNL-002 R4, S. 5.4.3.4, 5.4.3.5 & 5.4.4 **(AK-2)** CCP AK Summary Report for ORNL REDC RH TRU Waste, OR-REDC-RH-HET, CCP-AK-ORNL-500 R5, S. 5.4.2.3, 5.4.5 & 5.4.6 **(AK-3)** Acceptable Knowledge Assessment for waste stream OR-NFS-CH-SOIL **(AK-22)** NCRs for prohibited items **(AK-21)** AK Att. 6, Waste Form, Waste Material Parameters, Prohibited Items and Packaging for waste streams OR-NFS-CH-SOIL, OR-NFS-CH-HOM-A, OR-REDC-CH-HET, and OR-REDC-RH-HET **(AK-16)**		

	WAP Requirement[1] ORNL CCP Audit A-16-15 Table C6-1 Waste Analysis Plan (WAP) Checklist [1]	Procedure Documented		Example of Implementation/Objective Evidence, as applicable		Comment (e.g., any change in procedure since last audit, etc.)
		Location	Adequate? Y/N (Why?)	Item Reviewed	Adequate? Y/N	
				ORNLRHVE15007 **(AK-31)** ORNLRHVE15012 **(AK-32)** CCP AK Summary Report for NFS CH TRU Waste Stored at ORNL, OR-NFS-CH-SOIL and OR-NFS-CH-HOM-A, CCP-AK-ORNL-001 R10, S. 6.4.3 & S. 7.4.3, Table 7-5 **(AK-1)** CCP AK Summary Report for ORNL REDC CH TRU Waste, OR-REDC-CH-HET, CCP-AK-ORNL-002 R4, S. 5.4.3, Tables 5-7 & 5-8 **(AK-2)** CCP AK Summary Report for ORNL REDC RH TRU Waste, OR-REDC-RH-HET, CCP-AK-ORNL-500 R5, S. 4.2, Tables 5-2 & 5-3 **(AK-3)** AK Att. 5, Hazardous Constituents for waste streams OR-NFS-CH-SOIL, OR-NFS-CH-HOM-A, OR-REDC-CH-HET, and OR-REDC-RH-HET **(AK-15)** CCP AK Summary Report for NFS CH TRU Waste Stored at ORNL, OR-NFS-CH-SOIL and OR-NFS-CH-HOM-A, CCP-AK-ORNL-001 R10, S. 6.4.1.2, Table 6-1 & 7.4.1.2, Table 7-1 **(AK-1)**		

	WAP Requirement[1] ORNL CCP Audit A-16-15 Table C6-1 Waste Analysis Plan (WAP) Checklist [1]	Procedure Documented		Example of Implementation/Objective Evidence, as applicable		Comment (e.g., any change in procedure since last audit, etc.)
		Location	Adequate? Y/N (Why?)	Item Reviewed	Adequate? Y/N	
		PL CCP-TP-001 S. 4.2 CCP-TP-500 S. 1.1 Att. 1-3		CCP AK Summary Report for ORNL REDC CH TRU Waste, OR-REDC-CH-HET, CCP-AK-ORNL-002 R4, S. 5.4.1.2, Table 5-1 **(AK-2)** CCP AK Summary Report for ORNL REDC RH TRU Waste, OR-REDC-RH-HET, CCP-AK-ORNL-500 R5, S. 5.4.1.2, Table 5-1 **(AK-3)** Memo attached to AK Att. 6, Waste Form, Waste Material Parameters, Prohibited Items and Packaging for waste streams OR-NFS-CH-SOIL, OR-NFS-CH-HOM-A, OR-REDC-CH-HET, and OR-REDC-RH-HET **(AK-16)** OR-RTR6-0650 OR-RTR6-0652 OR-RTR6-0701 OR-RTR6-0716 OR-RTR6-0723 OR-RTR6-0736 OR-RTR6-0739 OR-RTR7-0131 OR-RTR7-0149 **(GEN-1)** ORVECH0135 ORVECH0142 ORVECH0145 ORNLRHVE15002 ORNLRHVE15006 ORNLRHVE15008 ORNLRHVE16001 **(GEN-2)**		

	WAP Requirement[1] ORNL CCP Audit A-16-15 Table C6-1 Waste Analysis Plan (WAP) Checklist [1]	Procedure Documented		Example of Implementation/Objective Evidence, as applicable		Comment (e.g., any change in procedure since last audit, etc.)
		Location	Adequate? Y/N (Why?)	Item Reviewed	Adequate? Y/N	
				CP:11:01531 – Transmittal of ORNL Site WSPF for WS OR-ISTP-CH-HET CP:15:01018 – Transmittal of ORNL CIS for WS#OR-ISTP-CH-HET Lots 4-8 CP:15:01262 – Transmittal of ORNLCIS for WS #OR-ISTP-CH-HET Lots 9-15 CP:10:01547 – Transmittal of ORNL WSPF for WS #OR-CHEM-CH-HET CP:15:01265 – Transmittal of ORNL CIS for WS #OR-CHEM-CH-HET Lot 6 CP:16:01091 – Transmittal of ORNL CIS for WS #OR-CHEM-CH-HET Lot 7 CP:10:01051 – Transmittal of ORNL WSPF for WS #OR-RF-CH-HET CP:11:01017 – Transmittal of ORNL CIS for WS #OR-RF-CH-HET Lots 8-9 CP:09:01234 – Transmittal of WSPF for OR-REDC-RH-HET at ORNL CP:16:01076 – Transmittal of WSPF Change Notice #1 for ORNL RH WS OR-REDC-RH-HET CP:16:01060 – Transmittal of CIS for RH Lots 30-33 for WS OR-REDC-RH-HET		

	WAP Requirement[1] ORNL CCP Audit A-16-15 Table C6-1 Waste Analysis Plan (WAP) Checklist [1]	Procedure Documented		Example of Implementation/Objective Evidence, as applicable		Comment (e.g., any change in procedure since last audit, etc.)
		Location	Adequate? Y/N (Why?)	Item Reviewed	Adequate? Y/N	
				CP:16:01086 – Transmittal of CIS for RH Lots 34-35 WS OR-REDC-RH-HET **(GEN-3)**		
31	Are procedures in place to ensure that the following Quality Assurance Objectives are adequately defined and assessed for each characterization method: • Precision as a measure of the mutual agreement among multiple measurements. • Accuracy as the degree of agreement between a measurement result and a true or known value. • Completeness is a measure of the amount of valid data obtained from a method compared to the total amount of data obtained that is expressed as a percentage. • Comparability is the degree to which one data set can be compared to another data set. • Representativeness as an expression of the degree to which data represent characteristics of a population. (Section C-4a(2))	**VE** CCP-TP-113 Att. 3 CCP-TP-500 Att. 2 & 3 **RTR** CCP-TP-053 Att. 3	Y	VE BDRs: ORNLRHVE15003 ORNLRHVE15016 ORNLRHVE16002 ORNLRHVE16009 ORNLRHVE16010 ORVECH0136 ORVECH0138 ORVECH0142 ORVECH0143 ORVECH0144 ORVECH0146 ORVECH0148 ORVECH0162 **(VE-1)** RTR BDRs: OR-RTR6-0650 OR-RTR6-0654 OR-RTR6-0676 OR-RTR6-0688 OR-RTR6-0695 OR-RTR6-0706 OR-RTR6-0713 OR-RTR6-0723 OR-RTR7-0138 OR-RTR7-0148 **(RTR-1)**	Y	
32	With respect to data generation, are procedures in place to ensure that the generator/storage site's waste characterization program meets the following general requirements: • Testing data packages and batch data reports must be reported accurately in a pre-approved format, must be maintained in permanent files, and must be traceable? • All data must receive a technical review by another qualified operator? (Section C3-4a)	**VE** CCP-TP-113 S. 5.0 Att. 2 & 3 CCP-TP-500 S. 5.0 Att. 1 & 2	Y	VE BDRs: ORNLRHVE15003 ORNLRHVE15016 ORNLRHVE16002 ORNLRHVE16009 ORNLRHVE16010 ORVECH0136 ORVECH0138 ORVECH0142 ORVECH0143 ORVECH0144 ORVECH0146	Y	

	WAP Requirement[1] ORNL CCP Audit A-16-15 Table C6-1 Waste Analysis Plan (WAP) Checklist [1]	Procedure Documented		Example of Implementation/Objective Evidence, as applicable		Comment (e.g., any change in procedure since last audit, etc.)
		Location	Adequate? Y/N (Why?)	Item Reviewed	Adequate? Y/N	
		RTR CCP-TP-053 S. 4.7 S. 4.10 S. 5.0 Att. 2 & 3		ORVECH0148 ORVECH0162 **(VE-1)** RTR BDRs: OR-RTR6-0650 OR-RTR6-0654 OR-RTR6-0676 OR-RTR6-0688 OR-RTR6-0695 OR-RTR6-0706 OR-RTR6-0713 OR-RTR6-0723 OR-RTR7-0138 OR-RTR7-0148 **(RTR-1)**		
33	Are procedures in place to ensure that the generator/storage site performs validation of waste characterization data for each waste container? (Section C-4)	**VE** CCP-TP-113 Att. 2 & 3 CCP-TP-500 S. 4.2.5 Att. 2 & 3 **RTR** CCP-TP-053 S. 4.10 Att. 3	Y	VE BDRs: ORNLRHVE15003 ORNLRHVE15016 ORNLRHVE16002 ORNLRHVE16009 ORNLRHVE16010 ORVECH0136 ORVECH0138 ORVECH0142 ORVECH0143 ORVECH0144 ORVECH0146 ORVECH0148 ORVECH0162 **(VE-1)** RTR BDRs: OR-RTR6-0650 OR-RTR6-0654 OR-RTR6-0676 OR-RTR6-0688 OR-RTR6-0695 OR-RTR6-0706 OR-RTR6-0713 OR-RTR6-0723 OR-RTR7-0138 OR-RTR7-0148 **(RTR-1)**	Y	

	WAP Requirement[1] ORNL CCP Audit A-16-15 Table C6-1 Waste Analysis Plan (WAP) Checklist [1]	Procedure Documented		Example of Implementation/Objective Evidence, as applicable		Comment (e.g., any change in procedure since last audit, etc.)
		Location	Adequate? Y/N (Why?)	Item Reviewed	Adequate? Y/N	
		PL CCP-TP-001 S. 4.2 Att. 1 & 2 CCP-TP-500 S. 4.4 Att. 1-3		OR-RTR6-0650 OR-RTR6-0652 OR-RTR6-0701 OR-RTR6-0716 OR-RTR6-0723 OR-RTR6-0736 OR-RTR6-0739 OR-RTR7-0131 OR-RTR7-0149 **(GEN-1)** ORVECH0135 ORVECH0142 ORVECH0145 ORNLRHVE15002 ORNLRHVE15006 ORNLRHVE15008 ORNLRHVE16001 **(GEN-2)**		
34	Are procedures in place to ensure that the generator/storage site has a pre-approved format for reporting waste characterization data? (Section C-4a(3))	**VE** CCP-TP-113 Att. 2 & 3 CCP-TP-500 Att. 1 & 2 **RTR** CCP-TP-053 S. 4.7 Att. 2	Y	VE BDRs: ORNLRHVE15003 ORNLRHVE15016 ORNLRHVE16002 ORNLRHVE16009 ORNLRHVE16010 ORVECH0136 ORVECH0138 ORVECH0142 ORVECH0143 ORVECH0144 ORVECH0146 ORVECH0148 ORVECH0162 **(VE-1)** RTR BDRs: OR-RTR6-0650 OR-RTR6-0654 OR-RTR6-0676 OR-RTR6-0688 OR-RTR6-0695 OR-RTR6-0706 OR-RTR6-0713	Y	

	WAP Requirement[1] ORNL CCP Audit A-16-15 Table C6-1 Waste Analysis Plan (WAP) Checklist [1]	Procedure Documented		Example of Implementation/Objective Evidence, as applicable		Comment (e.g., any change in procedure since last audit, etc.)
		Location	Adequate? Y/N (Why?)	Item Reviewed	Adequate? Y/N	
		PL CCP-TP-001 S. 4.2 Att. 1 & 2 CCP-TP-500 S. 4.4 Att. 1-5		OR-RTR6-0723 OR-RTR7-0138 OR-RTR7-0148 **(RTR-1)** OR-RTR6-0650 OR-RTR6-0652 OR-RTR6-0701 OR-RTR6-0716 OR-RTR6-0723 OR-RTR6-0736 OR-RTR6-0739 OR-RTR7-0131 OR-RTR7-0149 **(GEN-1)** ORVECH0135 ORVECH0142 ORVECH0145 ORNLRHVE15002 ORNLRHVE15006 ORNLRHVE15008 ORNLRHVE16001 **(GEN-2)** CP:11:01531 – Transmittal of ORNL Site WSPF for WS OR-ISTP-CH-HET CP:15:01018 – Transmittal of ORNL CIS for WS#OR-ISTP-CH-HET Lots 4-8 CP:15:01262 – Transmittal of ORNLCIS for WS #OR-ISTP-CH-HET Lots 9-15 CP:10:01547 – Transmittal of ORNL WSPF for WS #OR-CHEM-CH-HET CP:15:01265 – Transmittal of ORNL CIS for WS #OR-CHEM-CH-HET Lot 6		

	WAP Requirement[1] ORNL CCP Audit A-16-15 Table C6-1 Waste Analysis Plan (WAP) Checklist [1]	Procedure Documented		Example of Implementation/Objective Evidence, as applicable		Comment (e.g., any change in procedure since last audit, etc.)
		Location	Adequate? Y/N (Why?)	Item Reviewed	Adequate? Y/N	
				CP:16:01091 – Transmittal of ORNL CIS for WS #OR-CHEM-CH-HET Lot 7 CP:10:01051 – Transmittal of ORNL WSPF for WS #OR-RF-CH-HET CP:11:01017 – Transmittal of ORNL CIS for WS #OR-RF-CH-HET Lots 8-9 CP:09:01234 – Transmittal of WSPF for OR-REDC-RH-HET at ORNL CP:16:01076 – Transmittal of WSPF Change Notice #1 for ORNL RH WS OR-REDC-RH-HET CP:16:01060 – Transmittal of CIS for RH Lots 30-33 for WS OR-REDC-RH-HET CP:16:01086 – Transmittal of CIS for RH Lots 34-35 WS OR-REDC-RH-HET **(GEN-3)**		
35	Are procedures in place to ensure that the generator/storage site prepares testing batch data reports to meet the requirements of their own site-specific QAPjP and/or SOPs? (Section C-4a(3))	**VE** CCP-TP-113 S. 4.6 CCP-TP-500 S. 4.3	Y	VE BDRs: ORNLRHVE15003 ORNLRHVE15016 ORNLRHVE16002 ORNLRHVE16009 ORNLRHVE16010 ORVECH0136 ORVECH0138 ORVECH0142 ORVECH0143 ORVECH0144 ORVECH0146 ORVECH0148 ORVECH0162 **(VE-1)**	Y	

	WAP Requirement[1] ORNL CCP Audit A-16-15 Table C6-1 Waste Analysis Plan (WAP) Checklist [1]	Procedure Documented		Example of Implementation/Objective Evidence, as applicable		Comment (e.g., any change in procedure since last audit, etc.)
		Location	Adequate? Y/N (Why?)	Item Reviewed	Adequate? Y/N	
		RTR CCP-PO-001 C-4a(3) CCP-TP-053 S. 4.7 Att. 2 CCP-QP-002 Att. 1 **PL** CCP-TP-001 S. 4.2 Att. 1 & 2 CCP-TP-500 S. 4.4 Att. 1-5		RTR BDRs: OR-RTR6-0650 OR-RTR6-0654 OR-RTR6-0676 OR-RTR6-0688 OR-RTR6-0695 OR-RTR6-0706 OR-RTR6-0713 OR-RTR6-0723 OR-RTR7-0138 OR-RTR7-0148 **(RTR-1)** OR-RTR6-0650 OR-RTR6-0652 OR-RTR6-0701 OR-RTR6-0716 OR-RTR6-0723 OR-RTR6-0736 OR-RTR6-0739 OR-RTR7-0131 OR-RTR7-0149 **(GEN-1)** ORVECH0135 ORVECH0142 ORVECH0145 ORNLRHVE15002 ORNLRHVE15006 ORNLRHVE15008 ORNLRHVE16001 **(GEN-2)**		

	WAP Requirement[1] ORNL CCP Audit A-16-15 Table C6-1 Waste Analysis Plan (WAP) Checklist [1]	Procedure Documented		Example of Implementation/Objective Evidence, as applicable		Comment (e.g., any change in procedure since last audit, etc.)
		Location	Adequate? Y/N (Why?)	Item Reviewed	Adequate? Y/N	
36	Are procedures in place to ensure that all raw data is collected and managed at the data generation level in accordance with the following criteria: • All raw data shall be signed and dated in reproducible ink by the individual collecting the data, or signed and dated using electronic signatures • All data shall be recorded clearly, legibly, and accurately in field records • All changes to original data shall be lined out, initialed, and dated by the individual making the change. Original data may not be obliterated or otherwise be made unreadable • All data shall be transferred and reduced from field records completely and accurately • All field records shall be maintained as specified in Table C-2 of Attachment C • Data shall be organized into standard reporting formats for reporting purposes • All electronic and video data must be stored to ensure that waste container and QC data are readily retrievable (Section C3-4a)	**VE** CCP-TP-113 S. 5.0 Att. 3 CCP-TP-500 S. 5.0 Att. 2 **RTR** CCP-TP-053 S. 4.7 S. 5.0 Att. 2 & 3	Y	VE BDRs: ORNLRHVE15003 ORNLRHVE15016 ORNLRHVE16002 ORNLRHVE16009 ORNLRHVE16010 ORVECH0136 ORVECH0138 ORVECH0142 ORVECH0143 ORVECH0144 ORVECH0146 ORVECH0148 ORVECH0162 **(VE-1)** RTR BDRs: OR-RTR6-0650 OR-RTR6-0654 OR-RTR6-0676 OR-RTR6-0688 OR-RTR6-0695 OR-RTR6-0706 OR-RTR6-0713 OR-RTR6-0723 OR-RTR7-0138 OR-RTR7-0148 **(RTR-1)**	Y	
37	Are procedures in place to ensure that 100 % of batch data reports are subject to independent technical review by an individual qualified to review the data who was not involved in the generation or recording of the data under review. The reviewer shall release the data through signature with an associated review checklist prior to characterization of the associated waste and shipment to the WIPP. The review shall ensure the following, as applicable: • Data generation and reduction were conducted according to the methods used and reported in the proper units and significant figures • Calculations have been verified by a valid calculation program, a spot check of verified calculation programs, and/or a 100 percent check of all hand calculations • The data have been reviewed for transcription errors • The testing QA documentation for BDRs is complete and includes, as	**VE** CCP-TP-113 Att. 3 CCP-TP-500 Att. 2	Y	VE BDRs: ORNLRHVE15003 ORNLRHVE15016 ORNLRHVE16002 ORNLRHVE16009 ORNLRHVE16010 ORVECH0136 ORVECH0138 ORVECH0142 ORVECH0143 ORVECH0144 ORVECH0146 ORVECH0148 ORVECH0162 **(VE-1)**	Y	

	WAP Requirement[1] ORNL CCP Audit A-16-15 Table C6-1 Waste Analysis Plan (WAP) Checklist [1]	Procedure Documented		Example of Implementation/Objective Evidence, as applicable		Comment (e.g., any change in procedure since last audit, etc.)
		Location	Adequate? Y/N (Why?)	Item Reviewed	Adequate? Y/N	
	applicable, raw data, calculation records, calibration records • Radiography tapes are reviewed on a waste container basis at a minimum of once per testing batch or once per day of operation, whichever is less frequent. The radiography tape will be reviewed against the data on the radiography form to ensure that data are complete and correct • QAOs have been met (Section C3-4a(1))	**RTR** CCP-TP-053 S. 4.6 S. 4.10 Att. 2 & 3		RTR BDRs: OR-RTR6-0650 OR-RTR6-0654 OR-RTR6-0676 OR-RTR6-0688 OR-RTR6-0695 OR-RTR6-0706 OR-RTR6-0713 OR-RTR6-0723 OR-RTR7-0138 OR-RTR7-0148 **(RTR-1)**		
40	Are procedures in place to ensure that 100 percent of all batch data reports receive a Site Project Manager signature release with an associated review checklist prior to characterization of the associated waste and shipment to the WIPP. This release shall ensure the following: • Testing batch QC checks were properly performed. Radiography data are complete and acceptable based on evidence of videotape review of one waste container per day or once per testing batch, whichever is less frequent • Data generation level independent technical review, validation, and verification have been performed as evidenced by the completed review checklists and appropriate signature releases. • Independent technical reviewers were not involved in the generation or recording of the data under review. • Batch Data review checklists are complete • Batch Data Reports are complete and data properly reported • Verify that data are within established data assessment criteria and meet all applicable QAOs (Section C3-4b(1))	CCP-TP-001 S. 4.2 Att. 1 & 2 CCP-TP-500 S. 4.4 Att. 1-5	Y	OR-RTR6-0650 OR-RTR6-0652 OR-RTR6-0701 OR-RTR6-0716 OR-RTR6-0723 OR-RTR6-0736 OR-RTR6-0739 OR-RTR7-0131 OR-RTR7-0149 **(GEN-1)** ORVECH0135 ORVECH0142 ORVECH0145 ORNLRHVE15002 ORNLRHVE15006 ORNLRHVE15008 ORNLRHVE16001 **(GEN-2)**	Y	
42	Are procedures in place to ensure that a repeat of the data review process at the data generation level will be performed on a minimum of one randomly chosen waste container every quarter to determine if the verification and validation is performed according to documented procedures? (Section C3-4b)	CCP-PO-001 S. C3-4b CCP-TP-001 S. 4.3	Y	CP:15:01130 2Q15 VE CP:15:01131 2Q15 NDE CP:15:01133 2Q15 VER CP:15:01138 2Q15 RTR CP:15:01139 2Q15 VE CP:15:01142 2Q15 VER CP:15:01203 3Q15 VER CP:15:01212 3Q15 NDE CP:15:01213 3Q15 VE	Y	

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		Location	Adequate? Y/N (Why?)	Item Reviewed	Adequate? Y/N	
				CP:15:01226 3Q15 VER CP:15:01232 3Q15 VE CP:15:01233 3Q15 RTR CP:16:01022 4Q15 VER CP:16:01047 4Q15 VER CP:16:01051 4Q15 RTR CP:16:01052 4Q15 VE CP:16:01079 4Q15 RTR CP:16:01080 4Q15 VE CP:16:01077 1Q16 VE CP:16:01078 1Q16 RTR **(GEN-5)**		
43	Are procedures in place and checklists are available to prepare a Site Project Manager (SPM) Summary and a Data Validation Summary (the summaries may be in the same document)? The SPM Summary includes a validation checklist for each batch that is of sufficient detail to document all aspects of a batch data report that could affect data quality. The Data Validation Summary must identify each Batch Data Report reviewed, describe how the validation was performed, identify all problems, and identify all acceptable and unacceptable data. Summaries must include release signatures. (Section C3-4b(2))	CCP-TP-001 S. 4.2 Att. 1 & 2 CCP-TP-500 S. 4.4 Att. 1-5	Y	OR-RTR6-0650 OR-RTR6-0652 OR-RTR6-0701 OR-RTR6-0716 OR-RTR6-0723 OR-RTR6-0736 OR-RTR6-0739 OR-RTR7-0131 OR-RTR7-0149 **(GEN-1)** ORVECH0135 ORVECH0142 ORVECH0145 ORNLRHVE15002 ORNLRHVE15006 ORNLRHVE15008 ORNLRHVE16001 **(GEN-2)**	Y	
44	Are procedures in place to ensure that non-administrative, WAP-related nonconformances first identified at the site project manager level are reported to the Permittees within seven calendar days of identification, that nonconformance reports are prepared within 30 calendar days, and that corrective action is implemented prior to waste shipment? (Section C3-7)	CCP-QP-005 S. 4.5.1[D.1], [D.2], [D.3], [D.4] Att. 4	Y	Records packages for nonconformance reports NCR-ORNL-0003-16 NCR-ORNL-0027-16 NCR-ORNL-0041-16 NCR-ORNL-0053-15 R2 NCR-ORNL-0125-15 R1 NCR-ORNL-0126-15 NCR-ORNL-0145-16 R1 NCR-ORNL-0154-15 NCR-ORNL-0403-15 NCR-RH-ORNL-0271-16 NCR-RH-ORNL-0335-15 R1 were reviewed. **(GEN-6)**	Y	

	WAP Requirement[1] ORNL CCP Audit A-16-15 Table C6-1 Waste Analysis Plan (WAP) Checklist [1]	Procedure Documented		Example of Implementation/Objective Evidence, as applicable		Comment (e.g., any change in procedure since last audit, etc.)
		Location	Adequate? Y/N (Why?)	Item Reviewed	Adequate? Y/N	
				CH Nonconformance Report Logs for Project Level and Data Generation Level and CH and RC Nonconformance Log Reconciliation Reports **(GEN-7)**		
45	Are procedures in place to ensure that any waste container for which a nonconformance report (**NCR**) has been written will not be shipped to the WIPP facility unless the condition that led to the NCR for that container is appropriately identified, reconciled, corrected, and documented? Are nonconformance reports prepared for nonconformances identified? Are nonconformances identified and tracked, and does the Site Project Manager oversee the nonconformance report process? (Section C3-7)	CCP-QP-005 (ALL)	Y	Records packages for nonconformance reports NCR-ORNL-0003-16, NCR-ORNL-0027-16, NCR-ORNL-0041-16, NCR-ORNL-0053-15 R2, NCR-ORNL-0125-15 R1, NCR-ORNL-0126-15, NCR-ORNL-0145-16 R1, NCR-ORNL-0154-15, NCR-ORNL-0403-15, NCR-RH-ORNL-0271-16, and NCR-RH-ORNL-0335-15 R1 were reviewed. **(GEN-6)** CH Nonconformance Report Logs for Project Level and Data Generation Level and CH and RC Nonconformance Log Reconciliation Reports **(GEN-7)**	Y	
	DATA TRANSMITTAL					
48	Are procedures in place to ensure that the generator/storage site transmits data by hard copy or electronic copy from the data generation level to the site project level? If electronic, does the generator/site have a hard copy available on demand? (Section C-4a(5))	CCP-TP-001 S. 4.2.23 & 4.2.24 CCP-TP-500 S. 4.4.5	Y	OR-RTR6-0650 OR-RTR6-0652 OR-RTR6-0701 OR-RTR6-0716 OR-RTR6-0723 OR-RTR6-0736 OR-RTR6-0739 OR-RTR7-0131 OR-RTR7-0149 **(GEN-1)**	Y	

	WAP Requirement[1] ORNL CCP Audit A-16-15 Table C6-1 Waste Analysis Plan (WAP) Checklist [1]	Procedure Documented		Example of Implementation/Objective Evidence, as applicable		Comment (e.g., any change in procedure since last audit, etc.)
		Location	Adequate? Y/N (Why?)	Item Reviewed	Adequate? Y/N	
				ORVECH0135 ORVECH0142 ORVECH0145 ORNLRHVE15002 ORNLRHVE15006 ORNLRHVE15008 ORNLRHVE16001 **(GEN-2)**		
50	Are procedures in place to ensure that the generator/storage site inputs the data into the WWIS manually or electronically? (Section C-4a(5))	CCP-TP-030 (ALL) CCP-TP-530 (ALL)	Y	**CH** Waste Characterization Case Files for the containers X10C0401623A, X10C0402820M1, and X10C0501703A **(GEN-8)** **RH** Waste Characterization Case Files for the containers ORRH00736, ORRH00737, and ORRH00738 that are built into RH Canister ORR0090 and containers ORRH00746, ORRH00747, and ORRH00748 that are built into RH Canister ORR0093. Canister build information is included in the case files. **(GEN-9)**	Y	CH and RH Waste Characterization Case Files for containers certified under the current versions of the procedures include AK tracking spreadsheet for vent/closure dates, Container Information Summary (CIS) reports, IDC spreadsheet printouts, excerpts from data sources, and WWIS/WDS Waste Container and canister Data Reports. CH and RH records are maintained electronically only in IDC and WWIS/WDS. Copies presented for objective evidence of procedure implementation are for information only.
51	Are procedures in place to ensure that the generator/storage site enters the data into the WWIS in the exact format required by the database? (Section C-4a(5))	CCP-TP-030 (ALL) CCP-TP-530 (ALL	Y	**CH** Waste Characterization Case Files for the containers X10C0401623A, X10C0402820M1, and X10C0501703A **(GEN-8)** **RH** Waste Characterization Case Files for the containers	Y	CH and RH Waste Characterization Case Files for containers certified under the current versions of the procedures include AK tracking spreadsheet for vent/closure dates, Container Information Summary (CIS) reports, IDC spreadsheet printouts, excerpts from data sources, and WWIS/WDS Waste Container and canister Data Reports. CH and RH records are

	WAP Requirement[1] ORNL CCP Audit A-16-15 Table C6-1 Waste Analysis Plan (WAP) Checklist [1]	Procedure Documented		Example of Implementation/Objective Evidence, as applicable		Comment (e.g., any change in procedure since last audit, etc.)
		Location	Adequate? Y/N (Why?)	Item Reviewed	Adequate? Y/N	
				ORRH00736, ORRH00737, and ORRH00738 that are built into RH Canister ORR0090 and containers ORRH00746, ORRH00747, and ORRH00748 that are built into RH Canister ORR0093. Canister build information is included in the case files. **(GEN-9)**		maintained electronically only in IDC and WWIS/WDS. Copies presented for objective evidence of procedure implementation are for information only.
52	Are procedures in place to ensure all of the data presented on Table C-3 of the Permit is transmitted to the WWIS? (Table C-3)	CCP-TP-030 (ALL) CCP-TP-530 (ALL)	Y	**CH** Waste Characterization Case Files for the containers X10C0401623A, X10C0402820M1, and X10C0501703A **(GEN-8)** **RH** Waste Characterization Case Files for the containers ORRH00736, ORRH00737, and ORRH00738 that are built into RH Canister ORR0090 and containers ORRH00746, ORRH00747, and ORRH00748 that are built into RH Canister ORR0093. Canister build information is included in the case files. **(GEN-9)**	Y	CH and RH Waste Characterization Case Files for containers certified under the current versions of the procedures include AK tracking spreadsheet for vent/closure dates, Container Information Summary (CIS) reports, IDC spreadsheet printouts, excerpts from data sources, and WWIS/WDS Waste Container and canister Data Reports. CH and RH records are maintained electronically only in IDC and WWIS/WDS. Copies presented for objective evidence of procedure implementation are for information only.
	RECORDS AND RECORD MANAGEMENT					
55	Are procedures in place to ensure that the generator/storage site's hard copy and/or electronic data reports follow the Permittees' format requirements? (Section C-4a(3))	CCP-TP-001 S. 4.2 Att. 1 & 2 CCP-TP-500 S. 4.4 Att.1-5	Y	OR-RTR6-0650 OR-RTR6-0652 OR-RTR6-0701 OR-RTR6-0716 OR-RTR6-0723 OR-RTR6-0736	Y	

	WAP Requirement[1] ORNL CCP Audit A-16-15 Table C6-1 Waste Analysis Plan (WAP) Checklist [1]	Procedure Documented		Example of Implementation/Objective Evidence, as applicable		Comment (e.g., any change in procedure since last audit, etc.)
		Location	Adequate? Y/N (Why?)	Item Reviewed	Adequate? Y/N	
				OR-RTR6-0739 OR-RTR7-0131 OR-RTR7-0149 **(GEN-1)** ORVECH0135 ORVECH0142 ORVECH0145 ORNLRHVE15002 ORNLRHVE15006 ORNLRHVE15008 ORNLRHVE16001 **(GEN-2)** CP:11:01531 – Transmittal of ORNL Site WSPF for WS OR-ISTP-CH-HET CP:15:01018 – Transmittal of ORNL CIS for WS#OR-ISTP-CH-HET Lots 4-8 CP:15:01262 – Transmittal of ORNLCIS for WS #OR-ISTP-CH-HET Lots 9-15 CP:10:01547 – Transmittal of ORNL WSPF for WS #OR-CHEM-CH-HET CP:15:01265 – Transmittal of ORNL CIS for WS #OR-CHEM-CH-HET Lot 6 CP:16:01091 – Transmittal of ORNL CIS for WS #OR-CHEM-CH-HET Lot 7 CP:10:01051 – Transmittal of ORNL WSPF for WS #OR-RF-CH-HET CP:11:01017 – Transmittal of ORNL CIS for WS #OR-RF-CH-HET Lots 8-9		

	WAP Requirement[1] ORNL CCP Audit A-16-15 Table C6-1 Waste Analysis Plan (WAP) Checklist [1]	Procedure Documented		Example of Implementation/Objective Evidence, as applicable		Comment (e.g., any change in procedure since last audit, etc.)
		Location	Adequate? Y/N (Why?)	Item Reviewed	Adequate? Y/N	
				CP:09:01234 – Transmittal of WSPF for OR-REDC-RH-HET at ORNL CP:16:01076 – Transmittal of WSPF Change Notice #1 for ORNL RH WS OR-REDC-RH-HET CP:16:01060 – Transmittal of CIS for RH Lots 30-33 for WS OR-REDC-RH-HET CP:16:01086 – Transmittal of CIS for RH Lots 34-35 WS OR-REDC-RH-HET **(GEN-3)**		
56	Are procedures in place to ensure that hard copy or electronic Waste Stream Profile Form will include the following: • Generator/storage site name • Generator/storage site EPA ID • Date of audit report approval by NMED (if obtained) • Original generator of waste stream • Whether waste is Contact-Handled or Remote-Handled • Waste Stream WIPP Identification Number • Summary Category Group • Waste Matrix Code Group • Waste Material Parameter Weight Estimates per unit of waste • Waste stream name • A description of the waste stream • Applicable EPA hazardous waste codes numbers • Applicable TRUCON codes • A listing of acceptable knowledge documentation used to identify the waste stream • The waste characterization procedures used and the reference and date of the procedure	CCP-TP-002 S. 4.3 Att. 2	Y	CP:11:01531 – Transmittal of ORNL Site WSPF for WS OR-ISTP-CH-HET CP:15:01018 – Transmittal of ORNL CIS for WS#OR-ISTP-CH-HET Lots 4-8 CP:15:01262 – Transmittal of ORNLCIS for WS #OR-ISTP-CH-HET Lots 9-15 CP:10:01547 – Transmittal of ORNL WSPF for WS #OR-CHEM-CH-HET CP:15:01265 – Transmittal of ORNL CIS for WS #OR-CHEM-CH-HET Lot 6 CP:16:01091 – Transmittal of ORNL CIS for WS #OR-CHEM-CH-HET Lot 7 CP:10:01051 – Transmittal of ORNL WSPF for WS #OR-RF-CH-HET	Y	

	WAP Requirement[1] ORNL CCP Audit A-16-15 Table C6-1 Waste Analysis Plan (WAP) Checklist [1]	Procedure Documented		Example of Implementation/Objective Evidence, as applicable		Comment (e.g., any change in procedure since last audit, etc.)
		Location	Adequate? Y/N (Why?)	Item Reviewed	Adequate? Y/N	
	• Certification signature of Site Project Manager, name, title, and date signed (Section C3-6b(1))			CP:11:01017 – Transmittal of ORNL CIS for WS #OR-RF-CH-HET Lots 8-9 CP:09:01234 – Transmittal of WSPF for OR-REDC-RH-HET at ORNL CP:16:01076 – Transmittal of WSPF Change Notice #1 for ORNL RH WS OR-REDC-RH-HET CP:16:01060 – Transmittal of CIS for RH Lots 30-33 for WS OR-REDC-RH-HET CP:16:01086 – Transmittal of CIS for RH Lots 34-35 WS OR-REDC-RH-HET **(GEN-3)**		
56a	Are procedures in place to ensure that hard copy or electronic Characterization Information Summary will include the following: • Data reconciliation with DQOs • Radiography and visual examination summary to document that all prohibited items are absent in the waste and to verify that the physical form of the waste matches its waste stream description as determined by AK (if applicable) • A complete listing of all container identification numbers used to generate the Waste Stream Profile Form, cross-referenced to each Batch Data Report • Complete AK summary, including stream name and number, point of generation, waste stream volume (current and projected), generation dates, TRUCON codes, Summary Category Group, Waste Matrix Code(s) and Waste Matrix Code Group, other TWBIR information, waste stream description, areas of operation, generating processes, RCRA determinations, radionuclide information, all references used to generate the AK summary, and any other information required by Permit Attachment C4, Section C4-2b. • Method for determining Waste Material Parameter Weights per unit of waste.	CCP-TP-001 S. 4.2 Att. 1 & 2 CCP-TP-500 S. 4.4 Att.1-5 CCP-TP-002 S. 4.4 Att. 3-5	Y	OR-RTR6-0650 OR-RTR6-0652 OR-RTR6-0701 OR-RTR6-0716 OR-RTR6-0723 OR-RTR6-0736 OR-RTR6-0739 OR-RTR7-0131 OR-RTR7-0149 **(GEN-1)** ORVECH0135 ORVECH0142 ORVECH0145 ORNLRHVE15002 ORNLRHVE15006 ORNLRHVE15008 ORNLRHVE16001 **(GEN-2)** CP:11:01531 – Transmittal of ORNL Site WSPF for WS OR-ISTP-CH-HET CP:15:01018 –	Y	No AK Sufficiency Determinations were requested.

	WAP Requirement[1] ORNL CCP Audit A-16-15 Table C6-1 Waste Analysis Plan (WAP) Checklist [1]	Procedure Documented		Example of Implementation/Objective Evidence, as applicable		Comment (e.g., any change in procedure since last audit, etc.)
		Location	Adequate? Y/N (Why?)	Item Reviewed	Adequate? Y/N	
	• List of any AK Sufficiency Determinations requested for the waste stream • Certification through acceptable knowledge or testing that any waste assigned the hazardous waste number of U134 (hydrofluoric acid) no longer exhibits the characteristic of corrosivity. This is verified by ensuring that no liquid is present in U134 waste. • A justification for the selection of radiography and/or VE as an appropriate method of characterizing the waste. (Section C3-6b(2))			Transmittal of ORNL CIS for WS#OR-ISTP-CH-HET Lots 4-8 CP:15:01262 – Transmittal of ORNLCIS for WS #OR-ISTP-CH-HET Lots 9-15 CP:10:01547 – Transmittal of ORNL WSPF for WS #OR-CHEM-CH-HET CP:15:01265 – Transmittal of ORNL CIS for WS #OR-CHEM-CH-HET Lot 6 CP:16:01091 – Transmittal of ORNL CIS for WS #OR-CHEM-CH-HET Lot 7 CP:10:01051 – Transmittal of ORNL WSPF for WS #OR-RF-CH-HET CP:11:01017 – Transmittal of ORNL CIS for WS #OR-RF-CH-HET Lots 8-9 CP:09:01234 – Transmittal of WSPF for OR-REDC-RH-HET at ORNL CP:16:01076 – Transmittal of WSPF Change Notice #1 for ORNL RH WS OR-REDC-RH-HET CP:16:01060 – Transmittal of CIS for RH Lots 30-33 for WS OR-REDC-RH-HET CP:16:01086 – Transmittal of CIS for RH Lots 34-35 WS OR-REDC-RH-HET **(GEN-3)**		

	WAP Requirement[1] ORNL CCP Audit A-16-15 Table C6-1 Waste Analysis Plan (WAP) Checklist [1]	Procedure Documented		Example of Implementation/Objective Evidence, as applicable		Comment (e.g., any change in procedure since last audit, etc.)
		Location	Adequate? Y/N (Why?)	Item Reviewed	Adequate? Y/N	
56b	Are procedures in place to assure that ongoing container characterization results are cross referenced to Batch Data Reports? (Section C3-6b)	CCP-TP-001 S. 4.2 Att. 1 & 2 CCP-TP-500 S. 4.4 Att.1 -5 CCP-TP-002 S. 4.4.2 Att. 4	Y	OR-RTR6-0650 OR-RTR6-0652 OR-RTR6-0701 OR-RTR6-0716 OR-RTR6-0723 OR-RTR6-0736 OR-RTR6-0739 OR-RTR7-0131 OR-RTR7-0149 **(GEN-1)** ORVECH0135 ORVECH0142 ORVECH0145 ORNLRHVE15002 ORNLRHVE15006 ORNLRHVE15008 ORNLRHVE16001 **(GEN-2)** CP:11:01531 – Transmittal of ORNL Site WSPF for WS OR-ISTP-CH-HET CP:15:01018 – Transmittal of ORNL CIS for WS#OR-ISTP-CH-HET Lots 4-8 CP:15:01262 – Transmittal of ORNLCIS for WS #OR-ISTP-CH-HET Lots 9-15 CP:10:01547 – Transmittal of ORNL WSPF for WS #OR-CHEM-CH-HET CP:15:01265 – Transmittal of ORNL CIS for WS #OR-CHEM-CH-HET Lot 6 CP:16:01091 – Transmittal of ORNL CIS for WS #OR-CHEM-CH-HET Lot 7 CP:10:01051 – Transmittal of ORNL	Y	

	WAP Requirement[1] ORNL CCP Audit A-16-15 Table C6-1 Waste Analysis Plan (WAP) Checklist [1]	Procedure Documented		Example of Implementation/Objective Evidence, as applicable		Comment (e.g., any change in procedure since last audit, etc.)
		Location	Adequate? Y/N (Why?)	Item Reviewed	Adequate? Y/N	
				WSPF for WS #OR-RF-CH-HET CP:11:01017 – Transmittal of ORNL CIS for WS #OR-RF-CH-HET Lots 8-9 CP:09:01234 – Transmittal of WSPF for OR-REDC-RH-HET at ORNL CP:16:01076 – Transmittal of WSPF Change Notice #1 for ORNL RH WS OR-REDC-RH-HET CP:16:01060 – Transmittal of CIS for RH Lots 30-33 for WS OR-REDC-RH-HET CP:16:01086 – Transmittal of CIS for RH Lots 34-35 WS OR-REDC-RH-HET **(GEN-3)**		
58	Are procedures in place to ensure that project level reports are compiled into Characterization Information Summaries? (Section C3-6b)	CCP-TP-002 S. 4.4 Att. 3-5	Y	CP:11:01531 – Transmittal of ORNL Site WSPF for WS OR-ISTP-CH-HET CP:15:01018 – Transmittal of ORNL CIS for WS#OR-ISTP-CH-HET Lots 4-8 CP:15:01262 – Transmittal of ORNLCIS for WS #OR-ISTP-CH-HET Lots 9-15 CP:10:01547 – Transmittal of ORNL WSPF for WS #OR-CHEM-CH-HET CP:15:01265 – Transmittal of ORNL CIS for WS #OR-CHEM-CH-HET Lot 6 CP:16:01091 – Transmittal of ORNL CIS	Y	

	WAP Requirement[1] ORNL CCP Audit A-16-15 Table C6-1 Waste Analysis Plan (WAP) Checklist [1]	Procedure Documented		Example of Implementation/Objective Evidence, as applicable		Comment (e.g., any change in procedure since last audit, etc.)
		Location	Adequate? Y/N (Why?)	Item Reviewed	Adequate? Y/N	
				for WS #OR-CHEM-CH-HET Lot 7 CP:10:01051 – Transmittal of ORNL WSPF for WS #OR-RF-CH-HET CP:11:01017 – Transmittal of ORNL CIS for WS #OR-RF-CH-HET Lots 8-9 CP:09:01234 – Transmittal of WSPF for OR-REDC-RH-HET at ORNL CP:16:01076 – Transmittal of WSPF Change Notice #1 for ORNL RH WS OR-REDC-RH-HET CP:16:01060 – Transmittal of CIS for RH Lots 30-33 for WS OR-REDC-RH-HET CP:16:01086 – Transmittal of CIS for RH Lots 34-35 WS OR-REDC-RH-HET **(GEN-3)**		
59	Are procedures in place to ensure that the generator/storage site uses forms for data reporting that are pre-approved forms in site-specific documentation? (Section C3-6)	**VE** CCP-TP-113 Att. 2 & 3 CCP-TP-500 Att. 1 & 2 **RTR** CCP-TP-053	Y	VE BDRs: ORNLRHVE15003 ORNLRHVE15016 ORNLRHVE16002 ORNLRHVE16009 ORNLRHVE16010 ORVECH0136 ORVECH0138 ORVECH0142 ORVECH0143 ORVECH0144 ORVECH0146 ORVECH0148 ORVECH0162 **(VE-1)** RTR BDRs: OR-RTR6-0650	Y	

	WAP Requirement[1] ORNL CCP Audit A-16-15 Table C6-1 Waste Analysis Plan (WAP) Checklist [1]	Procedure Documented		Example of Implementation/Objective Evidence, as applicable		Comment (e.g., any change in procedure since last audit, etc.)
		Location	Adequate? Y/N (Why?)	Item Reviewed	Adequate? Y/N	
		S. 4.4 Att. 2 & 3		OR-RTR6-0654 OR-RTR6-0676 OR-RTR6-0688 OR-RTR6-0695 OR-RTR6-0706 OR-RTR6-0713 OR-RTR6-0723 OR-RTR7-0138 OR-RTR7-0148 **(RTR-1)**		
60	Are procedures in place to ensure that the generator/storage site's site project manager submits to the WIPP facility a summary of the waste stream information and reconciliation with data quality objectives (DQOs) once a waste stream is characterized? (Section C-4a(5))	CCP-TP-002 S. 4.0 Att. 1-5 CCP-TP-005 Att. 3	Y	CP:11:01531 – Transmittal of ORNL Site WSPF for WS OR-ISTP-CH-HET CP:15:01018 – Transmittal of ORNL CIS for WS#OR-ISTP-CH-HET Lots 4-8 CP:15:01262 – Transmittal of ORNLCIS for WS #OR-ISTP-CH-HET Lots 9-15 CP:10:01547 – Transmittal of ORNL WSPF for WS #OR-CHEM-CH-HET CP:15:01265 – Transmittal of ORNL CIS for WS #OR-CHEM-CH-HET Lot 6 CP:16:01091 – Transmittal of ORNL CIS for WS #OR-CHEM-CH-HET Lot 7 CP:10:01051 – Transmittal of ORNL WSPF for WS #OR-RF-CH-HET CP:11:01017 – Transmittal of ORNL CIS for WS #OR-RF-CH-HET Lots 8-9 CP:09:01234 – Transmittal of WSPF for	Y	

	WAP Requirement[1] ORNL CCP Audit A-16-15 Table C6-1 Waste Analysis Plan (WAP) Checklist [1]	Procedure Documented		Example of Implementation/Objective Evidence, as applicable		Comment (e.g., any change in procedure since last audit, etc.)
		Location	Adequate? Y/N (Why?)	Item Reviewed	Adequate? Y/N	
				OR-REDC-RH-HET at ORNL CP:16:01076 – Transmittal of WSPF Change Notice #1 for ORNL RH WS OR-REDC-RH-HET CP:16:01060 – Transmittal of CIS for RH Lots 30-33 for WS OR-REDC-RH-HET CP:16:01086 – Transmittal of CIS for RH Lots 34-35 WS OR-REDC-RH-HET **(GEN-3)** ORNL Discrepancy Resolutions: DR027, DR045, DR046, and DR047 **(GEN-4)**		
61	Are procedures in place to ensure that the generator/storage site project office completes a WSPF based on the Batch Data Reports? (C3-6b)	CCP-TP-002 S. 4.0 Att. 1-5	Y	OR-RTR6-0650 OR-RTR6-0652 OR-RTR6-0701 OR-RTR6-0716 OR-RTR6-0723 OR-RTR6-0736 OR-RTR6-0739 OR-RTR7-0131 OR-RTR7-0149 **(GEN-1)** ORVECH0135 ORVECH0142 ORVECH0145 ORNLRHVE15002 ORNLRHVE15006 ORNLRHVE15008 ORNLRHVE16001 **(GEN-2)** CP:11:01531 – Transmittal of ORNL Site WSPF for WS OR-ISTP-CH-HET	Y	

	WAP Requirement[1] ORNL CCP Audit A-16-15 Table C6-1 Waste Analysis Plan (WAP) Checklist [1]	Procedure Documented		Example of Implementation/Objective Evidence, as applicable		Comment (e.g., any change in procedure since last audit, etc.)
		Location	Adequate? Y/N (Why?)	Item Reviewed	Adequate? Y/N	
				CP:15:01018 – Transmittal of ORNL CIS for WS#OR-ISTP-CH-HET Lots 4-8 CP:15:01262 – Transmittal of ORNLCIS for WS #OR-ISTP-CH-HET Lots 9-15 CP:10:01547 – Transmittal of ORNL WSPF for WS #OR-CHEM-CH-HET CP:15:01265 – Transmittal of ORNL CIS for WS #OR-CHEM-CH-HET Lot 6 CP:16:01091 – Transmittal of ORNL CIS for WS #OR-CHEM-CH-HET Lot 7 CP:10:01051 – Transmittal of ORNL WSPF for WS #OR-RF-CH-HET CP:11:01017 – Transmittal of ORNL CIS for WS #OR-RF-CH-HET Lots 8-9 CP:09:01234 – Transmittal of WSPF for OR-REDC-RH-HET at ORNL CP:16:01076 – Transmittal of WSPF Change Notice #1 for ORNL RH WS OR-REDC-RH-HET CP:16:01060 – Transmittal of CIS for RH Lots 30-33 for WS OR-REDC-RH-HET CP:16:01086 – Transmittal of CIS for RH Lots 34-35 WS OR-REDC-RH-HET **(GEN-3)**		

	WAP Requirement[1] ORNL CCP Audit A-16-15 Table C6-1 Waste Analysis Plan (WAP) Checklist [1]	Procedure Documented		Example of Implementation/Objective Evidence, as applicable		Comment (e.g., any change in procedure since last audit, etc.)
		Location	Adequate? Y/N (Why?)	Item Reviewed	Adequate? Y/N	
62	Are procedures in place to ensure that the generator/storage Site Project Manager submits the WSPF to the Permittees for DOE's approval along with the accompanying Characterization Information Summary for that waste stream? (Section C-4a(5))	CCP-TP-002 S. 4.3 Att. 1-5	Y	CP:11:01531 – Transmittal of ORNL Site WSPF for WS OR-ISTP-CH-HET CP:15:01018 – Transmittal of ORNL CIS for WS#OR-ISTP-CH-HET Lots 4-8 CP:15:01262 – Transmittal of ORNLCIS for WS #OR-ISTP-CH-HET Lots 9-15 CP:10:01547 – Transmittal of ORNL WSPF for WS #OR-CHEM-CH-HET CP:15:01265 – Transmittal of ORNL CIS for WS #OR-CHEM-CH-HET Lot 6 CP:16:01091 – Transmittal of ORNL CIS for WS #OR-CHEM-CH-HET Lot 7 CP:10:01051 – Transmittal of ORNL WSPF for WS #OR-RF-CH-HET CP:11:01017 – Transmittal of ORNL CIS for WS #OR-RF-CH-HET Lots 8-9 CP:09:01234 – Transmittal of WSPF for OR-REDC-RH-HET at ORNL CP:16:01076 – Transmittal of WSPF Change Notice #1 for ORNL RH WS OR-REDC-RH-HET CP:16:01060 – Transmittal of CIS for RH Lots 30-33 for WS OR-REDC-RH-HET CP:16:01086 –	Y	

	WAP Requirement[1] ORNL CCP Audit A-16-15 Table C6-1 Waste Analysis Plan (WAP) Checklist [1]	Procedure Documented		Example of Implementation/Objective Evidence, as applicable		Comment (e.g., any change in procedure since last audit, etc.)
		Location	Adequate? Y/N (Why?)	Item Reviewed	Adequate? Y/N	
				Transmittal of CIS for RH Lots 34-35 WS OR-REDC-RH-HET **(GEN-3)**		
63	Are procedures in place to ensure that the generator/storage site maintains records related to waste characterization testing activities in the testing facility files, or site project files for those facilities located on-site? (Section C-4a(6))	CCP-QP-008 (ALL) CCP-QP-028 (ALL)	Y	CH Records Inventory and Disposition Schedule (RIDS) dated 06/29/2015 **(GEN-10)** RH Records Inventory and Disposition Schedule (RIDS) dated 06/15/2015 **(GEN-11)**	Y	
64	Are procedures in place to ensure that the appropriate documented training and indoctrination is performed for all individuals and that procedures are documented in site specific QAPjPs and procedures? (Section C3-8)	CCP-PO-001 (ALL) CCP-QP-002 S. 4.0	Y	Qualification records for selected CCP personnel **(RTR-2/VE-2)** CCP – Oak Ridge National Labs (ORNL) List of Qualified Individuals dated 4/19/2016 CCP – RH Program – ORNL List of Qualified Individuals dated 4/5/2016 **(GEN-12)**	Y	
66	Are procedures in place to ensure that the generator/storage site has an appropriate records inventory and disposition schedule (RIDS) or equivalent that was prepared and approved by appropriate site personnel? (Section C-4a(6))	CCP-QP-008 S. 3.1.2 CCP-QP-028 S. 3.1.1	Y	CH Records Inventory and Disposition Schedule (RIDS) dated 06/29/2015 **(GEN-10)** RH Records Inventory and Disposition Schedule (RIDS) dated 06/15/2015 **(GEN-11)**	Y	
67	Are procedures in place to ensure that the generator/storage site maintains all records relevant to an enforcement action, regardless of disposition, until they are no longer needed for enforcement action, and then dispositioned per the approved RIDS? (Section C-4a(6))	CCP-QP-008 S. 4.15.1 (NOTE) CCP-QP-028 (ALL)	Y	CH Records Inventory and Disposition Schedule (RIDS) dated 06/29/2015 **(GEN-10)** RH Records Inventory and Disposition Schedule (RIDS) dated 06/15/2015 **(GEN-11)**	Y	

	WAP Requirement[1] ORNL CCP Audit A-16-15 Table C6-1 Waste Analysis Plan (WAP) Checklist [1]	Procedure Documented		Example of Implementation/Objective Evidence, as applicable		Comment (e.g., any change in procedure since last audit, etc.)
		Location	Adequate? Y/N (Why?)	Item Reviewed	Adequate? Y/N	
68	Are procedures in place to ensure that the generator/storage site maintains records that are designated as Lifetime Records for the life of the waste characterization program plus six years or that the records have been transferred to the WIPP Records Archive facility? Lifetime Records include: • Test facility Batch Data Reports, • Waste Stream Characterization Package, • Data reduction, validation, and reporting documentation, • Acceptable knowledge documentation, • WSPF and Characterization Information Summary (Section C-4a(6), Table C-2)	CCP-PO-001 S. C-4a(6) & Table C-2 CCP-PO-002 S. 5.5 CCP-QP-008 S. 2.3.11, & 4.10.1, 2nd NOTE CCP-QP-028 (ALL)	Y	CH Records Inventory and Disposition Schedule (RIDS) dated 06/29/2015 **(GEN-10)** RH Records Inventory and Disposition Schedule (RIDS) dated 06/15/2015 **(GEN-11)**	Y	
69	Are procedures in place to ensure that the generator/storage site maintains records that are designated as Non-Permanent Records for ten years from the date of record generation, and then dispositioned according per the approved RIDS or transferred to the WIPP Records Archive facility? Non-Permanent Records include: • Nonconformance documentation, • Variance documentation, • Assessment documentation, • Calculations and related software documentation, • Training/qualification documentation, • QAPjP documentation (all revisions), • Calibration documentation, • Procurement documentation, • QA procedures (all revisions), • Technical implementing procedures (all revisions), and • Audio/video recording (radiography, visual, etc.). (Section C-4a(6), Table C-2)	CCP-PO-001 S. C-4a(6), C-7 & Table C-2 CCP-PO-002 S. 5.5 CCP-QP-008 S. 2.3.16 & 4.10.1, 2nd NOTE CCP-QP-028 (ALL)	Y	CH Records Inventory and Disposition Schedule (RIDS) dated 06/29/2015 **(GEN-10)** RH Records Inventory and Disposition Schedule (RIDS) dated 06/15/2015 **(GEN-11)**	Y	
70	Are procedures in place to ensure that the generator/storage site has raw data that is identifiable and legible, and provides documentary evidence of quality? (Section C-4a(6))	**VE** CCP-TP-113 (ALL) CCP-TP-500 (ALL)	Y	VE BDRs: ORNLRHVE15003 ORNLRHVE15016 ORNLRHVE16002 ORNLRHVE16009 ORNLRHVE16010	Y	

	WAP Requirement[1] ORNL CCP Audit A-16-15 Table C6-1 Waste Analysis Plan (WAP) Checklist [1]	Procedure Documented		Example of Implementation/Objective Evidence, as applicable		Comment (e.g., any change in procedure since last audit, etc.)
		Location	Adequate? Y/N (Why?)	Item Reviewed	Adequate? Y/N	
		RTR CCP-TP-053 Att. 1-3		ORVECH0136 ORVECH0138 ORVECH0142 ORVECH0143 ORVECH0144 ORVECH0146 ORVECH0148 ORVECH0162 **(VE-1)** RTR BDRs: OR-RTR6-0650 OR-RTR6-0654 OR-RTR6-0676 OR-RTR6-0688 OR-RTR6-0695 OR-RTR6-0706 OR-RTR6-0713 OR-RTR6-0723 OR-RTR7-0138 OR-RTR7-0148 **(RTR-1)**		
71	Are procedures in place to ensure that if the generator/storage site ceases to operate, that all records be transferred before closeout? (Section C-4a(6))	CCP-QP-008 S. 4.10.2	Y	N/A	N/A	This site has not ceased operations.
	SHIPMENT					
72	Are procedures in place to ensure that the generator/storage site accurately completes an EPA Hazardous Waste Manifest prior to shipping the waste to WIPP that contains the following information: • Generator/storage site name and EPA ID • Generator/storage site contact name and phone number • Quantity of waste • List of up to six state and/or federal hazardous waste numbers in each line item • Listing of all container IDS • Signature of authorized generator representative (Section C-5b)	CCP-TP-033 S. 2.1 (1st bullet) S. 2.6.7 S. 4.2 CCP-TP-507 S. 2.1, *Referenced Documents* (1st bullet) S. 2.6.4 S. 2.6.6 S. 4.2	Y	N/A	N/A	CCP/ORNL has not produced any Hazardous Waste Manifests as of this audit.

	WAP Requirement[1] ORNL CCP Audit A-16-15 Table C6-1 Waste Analysis Plan (WAP) Checklist [1]	Procedure Documented		Example of Implementation/Objective Evidence, as applicable		Comment (e.g., any change in procedure since last audit, etc.)
		Location	Adequate? Y/N (Why?)	Item Reviewed	Adequate? Y/N	
73	Are procedures in place to ensure that the generator/storage site accurately completes the following container specific information: • Waste stream identification number • List of hazardous waste numbers per container • Certification data • Shipping data (Section C-5b)	CCP-TP-030 (ALL) CCP-TP-033 (ALL) CCP-TP-507 (ALL) CCP-TP-530 (ALL)	Y	N/A	N/A	CCP/ORNL has not produced any Hazardous Waste Manifests as of this audit.

1. The WAP requirements should be presented in documents, such as procedures. Each of the questions posed under WAP requirements is meant to ask whether procedures are in place or whether documents are evident which demonstrate that the specific WAP requirement is or can be met.

Attachment 2 CCP SPM Radiography Project Level Validation Checklist and Summary

BDR Number: OR-RTR6-0650				Examination Date(s): 04/27/2015
Description of Criteria Reviewed	**Criteria Met?**			**Comments/Qualifiers**
	YES	**NO**	**NA**	
1. Is the completed, signed, and dated Independent Technical Reviewer Checklist included in the BDR, and the independent technical reviewer was not involved in the generation or recording of the data under review? **Reference Source: CCP-PO-001, C3-4**	X			
2. Does the BDR contain all items addressed in the BDR Table of Contents? **Reference Source: CCP-PO-001, C3-4**	X			
3. Does the BDR include a listing of all the container numbers in the batch? **Reference Source: CCP-PO-001, C3-4**	X			
4. List all containers that have met QAOs. **Reference Source: CCP-PO-001, C3-4**				Container Numbers: X10C0402824C X10C0402824D X10C0402824E
5. Does the BDR identify the current implementing procedure and revision number? **Reference Source: CCP-PO-001, Table C3-3**	X			
6. Is there a reference to or copy of any associated NCRs (if any) in the BDR? NA if no NCRs. **Reference Source: CCP-PO-001, Table C3-3**			X	
7. Are there 20 or fewer containers in the batch? **Reference Source: CCP-PO-001, C3-4**	X			
8. Are the data properly reported (i.e., data are reported in correct units and with correct significant figures)? **Reference Source: CCP-PO-001, C3-4**	X			
9. Is there evidence of verification that the physical form matches the Waste Matrix Code? **Reference Source: CCP-PO-001, Table C3-3**	X			

CCP RECORDS ORIGINAL
DATE REC'D 5-06-15 GL

Attachment 2 – CCP SPM Radiography Project Level Validation Checklist and Summary (Continued)

BDR Number: OR-RTR6-0650			Examination Date(s): 04/27/2015	
Description of Criteria Reviewed	**Criteria Met?**			**Comments/Qualifiers**
	YES	**NO**	**NA**	
10. Is there evidence of verification that the physical form matches the waste stream description? **Reference Source: CCP-PO-001, Table C3-3**	X			
11. Are prohibited items absent? **Reference Source: CCP-PO-001, Table C3-3**	X			
12. Does observable liquid, if present, meet the criteria of the TSDF-WAC? **Reference Source: CCP-PO-001, C-1**	X			
13. Were discrepancies between two operators with regard to identification of waste matrix code, liquids in excess of the TSDF-WAC, or compressed gases through replicate scans and independent observations reconciled? NA if no discrepancies. **Reference Source: CCP-PO-001, C3-2**			X	
14. Are the training qualifications for all radiography personnel acceptable? **Reference Source: CCP-PO-001, C3-8**	X			
15. Was evidence of the video/audio check included in the BDR? **Reference Source: CCP-PO-001, C1-1**	X			
16. Was the Lines-Pair Resolution Test or Sieve Test Check included in the BDR? **Reference Source: CCP Technical Procedures**	X			
17. Was a replicate scan performed once per day, or once per batch, whichever is LESS frequent? **Reference Source: CCP-PO-001, C1-1**	X			
18. Was an independent observation performed once per day, or once per batch, whichever is LESS frequent? **Reference Source: CCP-PO-001, C1-1**	X			

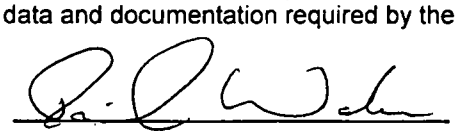
Attachment 2 – CCP SPM Radiography Project Level Validation Checklist and Summary (Continued)

BDR Number: OR-RTR6-0650 **Examination Date(s):** 04/27/2015

Description of Criteria Reviewed	Criteria Met? YES	NO	NA	Comments/Qualifiers
19. Were the replicate scan and independent observation performed on different waste containers? **Reference Source: CCP-PO-001, C1-1**	X			
20. Were the personnel performing the replicate scan and independent observation different from the individual who performed the original? **Reference Source: CCP-PO-001, C1-1**	X			
21. Does the BDR include an estimate of each material parameter weight in kg for each container? **Reference Source: CCP Technical Procedures**	X			
22. Does the BDR include a description of each material parameter for each container? **Reference Source: CCP Technical Procedures**	X			
23. Is the container gross weight recorded in kilograms (kg) for each container in the BDR? **Reference Source: CCP Technical Procedures**	X			
24. Was the Scale Weight Calibration Check included in the BDR? **Reference Source: CCP Technical Procedures**			X	Not used.
25. Was the Scale Weight Check included in the BDR? **Reference Source: CCP Technical Procedures**			X	Not used.

Comments: None.

The container QC checks were properly performed and meet the Quality Assurance Objectives (QAOs). Proper procedures were followed during data reduction and analysis. The batch is complete, acceptable, and includes all supporting data and documentation required by the QAPjP.

Daniel Wade		05/06/2015
SPM Printed Name	Signature	Date

Checklist is to be re-signed only when a re-review is performed.

SPM Printed Name	Signature	Reason	Date
SPM Printed Name	Signature	Reason	Date

Attachment 5–CCP Radiography Batch Data Report Cover Sheet

Site ID: ORNL

Batch Data Report No.: OR-RTR6-0650 ☑ CH ☐ RH Date: 4-27-15

Waste Container ID Numbers	
Replicate Scan:	X10C0402824E
Independent Observation:	X10C0402824D
1	X10C0402824C
2	X10C0402824D
3	X10C0402824E
4	N/A
5	N/A
6	N/A
7	N/A
8	N/A
9	N/A
10	N/A
11	N/A
12	N/A
13	N/A
14	N/A
15	N/A
16	N/A
17	N/A
18	N/A
19	N/A
20	N/A

RTR Operator:

Daphne Brothers	Daphne Brothers	4-27-15
Printed Name	Signature	Date

Independent Technical Reviewer:

Fred O'Neil		4-28-15
Printed Name	Signature	Date

NTPC RECORDS ORIGINAL
DATE REC'D 4-28-2015 PM

Attachment 4 – CCP Radiography Batch Data Report Table of Contents and Batch Narrative

Batch Data Report No.: OR-RTR6-0650 Date: 4-27-15

Table Of Contents		
Item	Description	Page No.
1	CCP Radiography Batch Data Report Cover Sheet	1
2	CCP Radiography Batch Data Report Table Of Contents	2
3	CCP RTR Measurement Control Report	3
4	CCP Radiography Data Sheets	4
5	Copy of NCRs (NA, If Not Applicable)	N/A
6	CCP Independent Technical Reviewer Checklist	19

Batch Narrative
All Quality Checks were performed and recorded on CCP-TP-053, Rev.15, CCP Radiography Measurement Control Report.

Daphne Brothers — RTR Operator

Signature

4-27-15 — Date

Attachment 1 – CCP RTR Measurement Control Report

Site ID: ORNL		
Batch Data Report No.: OR-RTR6-0650		
Examination Date: 4-27-15		
Control Checks		
Video/Audio Recorded Media System Check	☑ SAT	☐ UNSAT
Image Test : 10 Lines (Minimum acceptable is 5 lines-pair/cm or #6 Sieve is viewable)	☑ SAT	☐ UNSAT
Comments: N/A		
RTR Operator:		
Daphne Brothers (Printed Name)	Daphne Brothers (Signature)	4-27-15 (Date)

CCP Radiography Data Sheet

Section 1: General Information	
☐ RTR Examination ☒ RTR Replicate Scan ☐ RTR Independent Observation	
Site ID:	ORNL
Batch Number:	OR-RTR6-0650
Examination Date:	4/27/2015
Waste Container ID:	X10C0402824E
Video/Audio Recorded Media Number:	OR-RTR6-0650 A&B
Procedure and Revision No.:	CCP-TP-053 Rev. 15
NCR(s) associated with the container? (e.g., Prohibited Items)	☒ No ☐ Yes NCR No.: N/A NCR No.: N/A

Section 2: Waste Container Data	
Container Type:	55 Gallon Drum
TRUCON Code:	OR 225
Waste Matrix Code:	S5400
Waste Stream I.D.:	OR-RF-CH-HET
Waste Container Weights:	Gross Wt.: 51.0 kg Tare Wt.: 33.2 kg Net Wt.: 17.8 kg
Rigid Liner and Liner Vent Description:	Liner: ☒ No ☐ Yes Lid: ☒ No ☐ Yes Type: ☐ 30-mil ☐ 90-mil ☐ 110-mil ☐ 125-mil Vented: ☐ No ☐ Yes ☒ N/A Punctured: ☒ No ☐ Yes Mechanical Vent: ☒ No ☐ Yes Fiberboard Liner: ☒ No ☐ Yes Lead Lined: ☒ No ☐ Yes
Number of Layers of Confinement:	Appears to be 1 layer
Volume Utilization Percentage:	90 %

CCP Radiography Data Sheet

Waste Container ID: X10C0402824E

Section 3: Container Inventory and Comments	(Detailed descriptions)
IM:	Metal hardware, scissors
AM:	
OM:	
OI:	Glass container
C:	Cloth, tape roll, cardboard
R:	
XPM:	Plastic sheeting, plastic caps, plastic containers
OR:	
IN:	
S:	

Section 4: Packaging Material and Waste Material Parameters	
Packaging Material:	**Estimated Weight (kg)**
Steel (ST):	27.8
Plastics (PP): Liner bag	1.0
Other: Cardboard Liner (CP)	4.4
Total Packaging Weight	33.2
Waste Material Parameter:	**Estimated Weight (kg)**
Iron-based Metal / Alloys (IM):	0.5
Aluminum-based Metals / Alloys (AM):	
Other Metals (OM):	
Other Inorganic Materials (OI)	0.1
Cellulosics (C):	6.0
Rubber (R):	
Plastics (waste materials) (XPM):	11.2
Organic Matrix (OR):	
Inorganic Matrix (IN):	
Soils (S):	
Total WMP Weight:	17.8

CCP Radiography Data Sheet

Waste Container ID: X10C0402824E

Section 5: RTR Summary (Questions answered "Yes" will be explained in the Comment block, except for Question 1)	
Is there observable liquid?	[X] Yes [ ] No
Is there any observable liquid in internal containers, more than 60 milliliters or 3 percent by volume, whichever is greater?	[ ] Yes [X] No
Is the total volume of observable liquid in the outermost container GREATER than 1% of the container?	[ ] Yes [X] No
Is there observable liquid in payload containers with an EPA Hazardous Waste Number of U134?	[ ] Yes [X] No
Is there an indication of non-radionuclide pyrophoric materials, such as elemental potassium?	[ ] Yes [X] No
Is there an indication of hazardous wastes not occurring as co-contaminants with TRU mixed wastes (non-mixed hazardous wastes)?	[ ] Yes [X] No
Is there an indication of wastes incompatible with backfill, seal and panel closures materials, container and packaging materials, shipping container materials, or other wastes (i.e., waste does NOT match TRUCON Code[s])?	[ ] Yes [X] No
Is there an indication of wastes containing explosives or compressed gases?	[ ] Yes [X] No
Is there an indication of PCBs liquids?	[ ] Yes [X] No
Is there an indication of the waste exhibiting the characteristic of ignitability, corrosivity, or reactivity (EPA Hazardous Waste Numbers of D001, D002, or D003)?	[ ] Yes [X] No
Is the physical form of the waste inconsistent with the Waste Stream Description or the Waste Matrix Code?	[ ] Yes [X] No
CH or RH TRAMPAC	
Are there heat-sealed bags (unvented) GREATER than 4 liters and LESS than 390 square inches in the waste, or heat sealed bags not authorized in the RH TRUCON Code?	[ ] Yes [X] No
Were there Non-approved Closure Methods used on liner bags or inner bags greater than 4 liters?	[ ] Yes [X] No
Are there sealed containers GREATER than 4 liters?	[ ] Yes [X] No
Are there indications of inadequate protection for heavy and/or sharp objects?	[ ] Yes [X] No

Comments: This Replicate scan agrees with the original scan. EL 4/27/15

RTR Operator:

Eric Lyles		4/27/2015
Print Name	Signature	Date

CCP Radiography Data Sheet

Section 1: General Information		
☐ RTR Examination	☐ RTR Replicate Scan	☒ RTR Independent Observation
Site ID:	ORNL	
Batch Number:	OR-RTR6-0650	
Examination Date:	4/27/2015	
Waste Container ID:	X10C0402824D	
Video/Audio Recorded Media Number:	OR-RTR6-0650	A&B
Procedure and Revision No.:	CCP-TP-053	Rev. 15
NCR(s) associated with the container? (e.g., Prohibited Items)	☒ No ☐ Yes NCR No.: N/A NCR No.: N/A	

Section 2: Waste Container Data	
Container Type:	55 Gallon Drum
TRUCON Code:	OR 225
Waste Matrix Code:	S5400
Waste Stream I.D.:	OR-RF-CH-HET
Waste Container Weights:	Gross Wt.: 46.9 kg Tare Wt.: 33.2 kg Net Wt.: 13.7 kg
Rigid Liner and Liner Vent Description:	Liner: ☒ No ☐ Yes Lid: ☒ No ☐ Yes Type: ☐ 30-mil ☐ 90-mil ☐ 110-mil ☐ 125-mil Vented: ☐ No ☐ Yes ☒ N/A Punctured: ☒ No ☐ Yes Mechanical Vent: ☒ No ☐ Yes Fiberboard Liner: ☒ No ☐ Yes Lead Lined: ☒ No ☐ Yes
Number of Layers of Confinement:	Appears to be 1 layer
Volume Utilization Percentage:	90 %

CCP Radiography Data Sheet

Waste Container ID: X10C0402824D

Section 3: Container Inventory and Comments (Detailed descriptions)

IM: Electrical equipment, scrap metal, metal fittings

AM: Aluminum ring

OM:

OI: Broken glass

C: Cardboard

R: Rubber gloves

XPM: Plastic sheeting, plastic containers, plastic caps, manipulator boots

OR:

IN:

S:

Section 4: Packaging Material and Waste Material Parameters

Packaging Material:	Estimated Weight (kg)
Steel (ST):	27.8
Plastics (PP): Liner bag	1.0
Other: Cardboard Liner (CP)	4.4
Total Packaging Weight	33.2
Waste Material Parameter:	**Estimated Weight (kg)**
Iron-based Metal / Alloys (IM):	3.5
Aluminum-based Metals / Alloys (AM):	2.0
Other Metals (OM):	
Other Inorganic Materials (OI)	0.1
Cellulosics (C):	3.5
Rubber (R):	0.2
Plastics (waste materials) (XPM):	4.4
Organic Matrix (OR):	
Inorganic Matrix (IN):	
Soils (S):	
Total WMP Weight:	13.7

CCP Radiography Data Sheet

Waste Container ID: X10C0402824D

Section 5: RTR Summary (Questions answered "Yes" will be explained in the Comment block, except for Question 1)	
Is there observable liquid?	☐ Yes ☒ No
Is there any observable liquid in internal containers, more than 60 milliliters or 3 percent by volume, whichever is greater?	☐ Yes ☒ No
Is the total volume of observable liquid in the outermost container GREATER than 1% of the container?	☐ Yes ☒ No
Is there observable liquid in payload containers with an EPA Hazardous Waste Number of U134?	☐ Yes ☒ No
Is there an indication of non-radionuclide pyrophoric materials, such as elemental potassium?	☐ Yes ☒ No
Is there an indication of hazardous wastes not occurring as co-contaminants with TRU mixed wastes (non-mixed hazardous wastes)?	☐ Yes ☒ No
Is there an indication of wastes incompatible with backfill, seal and panel closures materials, container and packaging materials, shipping container materials, or other wastes (i.e., waste does NOT match TRUCON Code[s])?	☐ Yes ☒ No
Is there an indication of wastes containing explosives or compressed gases?	☐ Yes ☒ No
Is there an indication of PCBs liquids?	☐ Yes ☒ No
Is there an indication of the waste exhibiting the characteristic of ignitability, corrosivity, or reactivity (EPA Hazardous Waste Numbers of D001, D002, or D003)?	☐ Yes ☒ No
Is the physical form of the waste inconsistent with the Waste Stream Description or the Waste Matrix Code?	☐ Yes ☒ No
CH or RH TRAMPAC	
Are there heat-sealed bags (unvented) GREATER than 4 liters and LESS than 390 square inches in the waste, or heat sealed bags not authorized in the RH TRUCON Code?	☐ Yes ☒ No
Were there Non-approved Closure Methods used on liner bags or inner bags greater than 4 liters?	☐ Yes ☒ No
Are there sealed containers GREATER than 4 liters?	☐ Yes ☒ No
Are there indications of inadequate protection for heavy and/or sharp objects?	☐ Yes ☒ No

Comments: This Independent observation agrees with the original scan. EL 4/27/15

RTR Operator:

Eric Lyles	[signature]	4/27/2015
Print Name	Signature	Date

CCP Radiography Data Sheet

Section 1: General Information	
[X] RTR Examination [ ] RTR Replicate Scan [ ] RTR Independent Observation	
Site ID:	ORNL
Batch Number:	OR-RTR6-0650
Examination Date:	4/27/2015
Waste Container ID:	X10C0402824C
Video/Audio Recorded Media Number:	OR-RTR6-0650 A&B
Procedure and Revision No.:	CCP-TP-053 Rev. 15
NCR(s) associated with the container? (e.g., Prohibited Items)	[X] No [ ] Yes NCR No.: N/A NCR No.: N/A

Section 2: Waste Container Data	
Container Type:	55 Gallon Drum
TRUCON Code:	OR 225
Waste Matrix Code:	S5400
Waste Stream I.D.:	OR-RF-CH-HET
Waste Container Weights:	Gross Wt.: 57.5 kg Tare Wt.: 33.2 kg Net Wt.: 24.3 kg
Rigid Liner and Liner Vent Description:	Liner: [X] No [ ] Yes Lid: [X] No [ ] Yes Type: [ ] 30-mil [ ] 90-mil [ ] 110-mil [ ] 125-mil Vented: [ ] No [ ] Yes [X] N/A Punctured: [X] No [ ] Yes Mechanical Vent: [X] No [ ] Yes Fiberboard Liner: [X] No [ ] Yes Lead Lined: [X] No [ ] Yes
Number of Layers of Confinement:	Appears to be 1 layer
Volume Utilization Percentage:	80 %

CCP Radiography Data Sheet

Waste Container ID: X10C0402824C

Section 3: Container Inventory and Comments	(Detailed descriptions)
IM:	Electrical equipment, scrap metal
AM:	
OM:	
OI:	Glass labware
C:	Cloth, cardboard
R:	Rubber gloves
XPM:	Plastic sheeting, plastic containers
OR:	
IN:	
S:	

Section 4: Packaging Material and Waste Material Parameters	
Packaging Material:	**Estimated Weight (kg)**
Steel (ST):	27.8
Plastics (PP): Liner bag	1.0
Other: Cardboard Liner (CP)	4.4
Total Packaging Weight	33.2
Waste Material Parameter:	**Estimated Weight (kg)**
Iron-based Metal / Alloys (IM):	10.0
Aluminum-based Metals / Alloys (AM):	
Other Metals (OM):	
Other Inorganic Materials (OI)	1.0
Cellulosics (C):	6.0
Rubber (R):	0.3
Plastics (waste materials) (XPM):	7.0
Organic Matrix (OR):	
Inorganic Matrix (IN):	
Soils (S):	
Total WMP Weight:	24.3

CCP Radiography Data Sheet

Waste Container ID: X10C0402824C

Section 5: RTR Summary (Questions answered "Yes" will be explained in the Comment block, except for Question 1)	
Is there observable liquid?	☐ Yes ☒ No
Is there any observable liquid in internal containers, more than 60 milliliters or 3 percent by volume, whichever is greater?	☐ Yes ☒ No
Is the total volume of observable liquid in the outermost container GREATER than 1% of the container?	☐ Yes ☒ No
Is there observable liquid in payload containers with an EPA Hazardous Waste Number of U134?	☐ Yes ☒ No
Is there an indication of non-radionuclide pyrophoric materials, such as elemental potassium?	☐ Yes ☒ No
Is there an indication of hazardous wastes not occurring as co-contaminants with TRU mixed wastes (non-mixed hazardous wastes)?	☐ Yes ☒ No
Is there an indication of wastes incompatible with backfill, seal and panel closures materials, container and packaging materials, shipping container materials, or other wastes (i.e., waste does NOT match TRUCON Code[s])?	☐ Yes ☒ No
Is there an indication of wastes containing explosives or compressed gases?	☐ Yes ☒ No
Is there an indication of PCBs liquids?	☐ Yes ☒ No
Is there an indication of the waste exhibiting the characteristic of ignitability, corrosivity, or reactivity (EPA Hazardous Waste Numbers of D001, D002, or D003)?	☐ Yes ☒ No
Is the physical form of the waste inconsistent with the Waste Stream Description or the Waste Matrix Code?	☐ Yes ☒ No
CH or RH TRAMPAC	
Are there heat-sealed bags (unvented) GREATER than 4 liters and LESS than 390 square inches in the waste, or heat sealed bags not authorized in the RH TRUCON Code?	☐ Yes ☒ No
Were there Non-approved Closure Methods used on liner bags or inner bags greater than 4 liters?	☐ Yes ☒ No
Are there sealed containers GREATER than 4 liters?	☐ Yes ☒ No
Are there indications of inadequate protection for heavy and/or sharp objects?	☐ Yes ☒ No

Comments: N/A

RTR Operator:

Daphne Brothers	Daphne C Brothers	4/27/2015
Print Name	Signature	Date

CCP Radiography Data Sheet

Section 1: General Information	
[X] RTR Examination [ ] RTR Replicate Scan [ ] RTR Independent Observation	
Site ID:	ORNL
Batch Number:	OR-RTR6-0650
Examination Date:	4/27/2015
Waste Container ID:	X10C0402824D
Video/Audio Recorded Media Number:	OR-RTR6-0650 A&B
Procedure and Revision No.:	CCP-TP-053 Rev. 15
NCR(s) associated with the container? (e.g., Prohibited Items)	[X] No [ ] Yes NCR No.: N/A NCR No.: N/A

Section 2: Waste Container Data	
Container Type:	55 Gallon Drum
TRUCON Code:	OR 225
Waste Matrix Code:	S5400
Waste Stream I.D.:	OR-RF-CH-HET
Waste Container Weights:	Gross Wt.: 46.9 kg Tare Wt.: 33.2 kg Net Wt.: 13.7 kg
Rigid Liner and Liner Vent Description:	Liner: [X] No [ ] Yes Lid: [X] No [ ] Yes Type: [ ] 30-mil [ ] 90-mil [ ] 110-mil [ ] 125-mil Vented: [ ] No [ ] Yes [X] N/A Punctured: [X] No [ ] Yes Mechanical Vent: [X] No [ ] Yes Fiberboard Liner: [X] No [ ] Yes Lead Lined: [X] No [ ] Yes
Number of Layers of Confinement:	Appears to be 1 layer
Volume Utilization Percentage:	90 %

CCP Radiography Data Sheet

Waste Container ID: X10C0402824D

Section 3: Container Inventory and Comments	(Detailed descriptions)
IM:	Electrical equipment, scrap metal, metal fittings
AM:	Aluminum collar
OM:	
OI:	Broken glass
C:	Cardboard
R:	Rubber gloves
XPM:	Plastic containers, plastic sheeting, plastic caps, manipulator boots
OR:	
IN:	
S:	

Section 4: Packaging Material and Waste Material Parameters	
Packaging Material:	**Estimated Weight (kg)**
Steel (ST):	27.8
Plastics (PP): Liner bag	1.0
Other: Cardboard Liner (CP)	4.4
Total Packaging Weight	33.2
Waste Material Parameter:	**Estimated Weight (kg)**
Iron-based Metal / Alloys (IM):	3.0
Aluminum-based Metals / Alloys (AM):	2.0
Other Metals (OM):	
Other Inorganic Materials (OI)	0.1
Cellulosics (C):	3.0
Rubber (R):	0.2
Plastics (waste materials) (XPM):	5.4
Organic Matrix (OR):	
Inorganic Matrix (IN):	
Soils (S):	
Total WMP Weight:	13.7

CCP Radiography Data Sheet

Waste Container ID: X10C0402824D

Section 5: RTR Summary (Questions answered "Yes" will be explained in the Comment block, except for Question 1)	
Is there observable liquid?	☐ Yes ☒ No
Is there any observable liquid in internal containers, more than 60 milliliters or 3 percent by volume, whichever is greater?	☐ Yes ☒ No
Is the total volume of observable liquid in the outermost container GREATER than 1% of the container?	☐ Yes ☒ No
Is there observable liquid in payload containers with an EPA Hazardous Waste Number of U134?	☐ Yes ☒ No
Is there an indication of non-radionuclide pyrophoric materials, such as elemental potassium?	☐ Yes ☒ No
Is there an indication of hazardous wastes not occurring as co-contaminants with TRU mixed wastes (non-mixed hazardous wastes)?	☐ Yes ☒ No
Is there an indication of wastes incompatible with backfill, seal and panel closures materials, container and packaging materials, shipping container materials, or other wastes (i.e., waste does NOT match TRUCON Code[s])?	☐ Yes ☒ No
Is there an indication of wastes containing explosives or compressed gases?	☐ Yes ☒ No
Is there an indication of PCBs liquids?	☐ Yes ☒ No
Is there an indication of the waste exhibiting the characteristic of ignitability, corrosivity, or reactivity (EPA Hazardous Waste Numbers of D001, D002, or D003)?	☐ Yes ☒ No
Is the physical form of the waste inconsistent with the Waste Stream Description or the Waste Matrix Code?	☐ Yes ☒ No
CH or RH TRAMPAC	
Are there heat-sealed bags (unvented) GREATER than 4 liters and LESS than 390 square inches in the waste, or heat sealed bags not authorized in the RH TRUCON Code?	☐ Yes ☒ No
Were there Non-approved Closure Methods used on liner bags or inner bags greater than 4 liters?	☐ Yes ☒ No
Are there sealed containers GREATER than 4 liters?	☐ Yes ☒ No
Are there indications of inadequate protection for heavy and/or sharp objects?	☐ Yes ☒ No
Comments: N/A	

RTR Operator:

Daphne Brothers	Daphne D Brothers	4/27/2015
Print Name	Signature	Date

CCP Radiography Data Sheet

Section 1: General Information		
[X] RTR Examination	[ ] RTR Replicate Scan	[ ] RTR Independent Observation
Site ID:	ORNL	
Batch Number:	OR-RTR6-0650	
Examination Date:	4/27/2015	
Waste Container ID:	X10C0402824E	
Video/Audio Recorded Media Number:	OR-RTR6-0650	A&B
Procedure and Revision No.:	CCP-TP-053	Rev. 15
NCR(s) associated with the container? (e.g., Prohibited Items)	[X] No [ ] Yes NCR No.: N/A NCR No.: N/A	

Section 2: Waste Container Data	
Container Type:	55 Gallon Drum
TRUCON Code:	OR 225
Waste Matrix Code:	S5400
Waste Stream I.D.:	OR-RF-CH-HET
Waste Container Weights:	Gross Wt.: 51.0 kg Tare Wt.: 33.2 kg Net Wt.: 17.8 kg
Rigid Liner and Liner Vent Description:	Liner: [X] No [ ] Yes Lid: [X] No [ ] Yes Type: [ ] 30-mil [ ] 90-mil [ ] 110-mil [ ] 125-mil Vented: [ ] No [ ] Yes [X] N/A Punctured: [X] No [ ] Yes Mechanical Vent: [X] No [ ] Yes Fiberboard Liner: [X] No [ ] Yes Lead Lined: [X] No [ ] Yes
Number of Layers of Confinement:	Appears to be 1 layer
Volume Utilization Percentage:	90 %

CCP Radiography Data Sheet

Waste Container ID: X10C0402824E

Section 3: Container Inventory and Comments (Detailed descriptions)	
IM:	Metal hardware, scissors
AM:	
OM:	
OI:	Glass container
C:	Cloth, tape, cardboard
R:	
XPM:	Plastic sheeting, plastic containers, plastic caps
OR:	
IN:	
S:	

Section 4: Packaging Material and Waste Material Parameters	
Packaging Material:	**Estimated Weight (kg)**
Steel (ST):	27.8
Plastics (PP): Liner bag	1.0
Other: Cardboard Liner (CP)	4.4
Total Packaging Weight	33.2
Waste Material Parameter:	**Estimated Weight (kg)**
Iron-based Metal / Alloys (IM):	0.7
Aluminum-based Metals / Alloys (AM):	
Other Metals (OM):	
Other Inorganic Materials (OI)	0.1
Cellulosics (C):	5.0
Rubber (R):	
Plastics (waste materials) (XPM):	12.0
Organic Matrix (OR):	
Inorganic Matrix (IN):	
Soils (S):	
Total WMP Weight:	17.8

CCP Radiography Data Sheet

Waste Container ID: X10C0402824E

Section 5: RTR Summary (Questions answered "Yes" will be explained in the Comment block, except for Question 1)	
Is there observable liquid?	[X] Yes [ ] No
Is there any observable liquid in internal containers, more than 60 milliliters or 3 percent by volume, whichever is greater?	[ ] Yes [X] No
Is the total volume of observable liquid in the outermost container GREATER than 1% of the container?	[ ] Yes [X] No
Is there observable liquid in payload containers with an EPA Hazardous Waste Number of U134?	[ ] Yes [X] No
Is there an indication of non-radionuclide pyrophoric materials, such as elemental potassium?	[ ] Yes [X] No
Is there an indication of hazardous wastes not occurring as co-contaminants with TRU mixed wastes (non-mixed hazardous wastes)?	[ ] Yes [X] No
Is there an indication of wastes incompatible with backfill, seal and panel closures materials, container and packaging materials, shipping container materials, or other wastes (i.e., waste does NOT match TRUCON Code[s])?	[ ] Yes [X] No
Is there an indication of wastes containing explosives or compressed gases?	[ ] Yes [X] No
Is there an indication of PCBs liquids?	[ ] Yes [X] No
Is there an indication of the waste exhibiting the characteristic of ignitability, corrosivity, or reactivity (EPA Hazardous Waste Numbers of D001, D002, or D003)?	[ ] Yes [X] No
Is the physical form of the waste inconsistent with the Waste Stream Description or the Waste Matrix Code?	[ ] Yes [X] No
CH or RH TRAMPAC	
Are there heat-sealed bags (unvented) GREATER than 4 liters and LESS than 390 square inches in the waste, or heat sealed bags not authorized in the RH TRUCON Code?	[ ] Yes [X] No
Were there Non-approved Closure Methods used on liner bags or inner bags greater than 4 liters?	[ ] Yes [X] No
Are there sealed containers GREATER than 4 liters?	[ ] Yes [X] No
Are there indications of inadequate protection for heavy and/or sharp objects?	[ ] Yes [X] No
Comments: N/A	

RTR Operator:

Daphne Brothers	Daphne O Brothers	4/27/2015
Print Name	Signature	Date

Attachment 3 – CCP Radiography Independent Technical Reviewer Checklist

Batch Data Report No.: OR-RTR6-0650

Description			
1.	Were data generation and reduction conducted in a technically correct manner in accordance with the methods used?	☐ NO	☑ YES
2.	Was the correct revision of the procedure used? Procedure: CCP-TP-053 Rev.: 15	☐ NO	☑ YES
3.	Are the WMPs entered correctly?	☐ NO	☑ YES
4.	Do the estimated weights in Section 4 of Attachment 2 equal the container gross weight?	☐ NO	☑ YES
5.	Is the data reported in the proper units with the correct number of significant figures (e.g., one tenth of a kilogram)?	☐ NO	☑ YES
6.	Was transcription used? If no, proceed to question 7.	☑ NO	☐ YES
	6a. Has the data been verified for transcription errors?	☐ NO	☐ YES
7.	Does the Testing Batch Report include radiography for up to 20 containers?	☐ NO	☑ YES
8.	Are BDR contents complete and do they match the CCP Waste RTR Batch Data Report Table of Contents?	☐ NO	☑ YES
9.	Is all the data signed and dated in reproducible ink and by the individual(s) generating it?	☐ NO	☑ YES
10.	Is all data recorded clearly, legibly, and accurately?	☐ NO	☑ YES
11.	Have changes been made to original data? If no, proceed to question 12.	☑ NO	☐ YES
	11a. Have all changes to original data been lined out, initialed and dated by the individual making the changes?	☐ NO	☐ YES
	11b. Was justification made for changing the original data?	☐ NO	☐ YES
	11c. Were data changes made by the individual who originally collected the data?	☐ NO	☐ YES
12.	Does the waste match the Waste Matrix Code and Waste Stream description?	☐ NO	☑ YES
13.	Are the RTR Operator's decisions regarding the Radiography documented?	☐ NO	☑ YES
14.	Is there an adequate written description of the contents of each item?	☐ NO	☑ YES
15.	Was the video/audio recording media properly prepared and labeled for each waste container?	☐ NO	☑ YES
16.	Was the video/audio recording media check performed satisfactorily and recorded on Attachment 1?	☐ NO	☑ YES

Attachment 3 – CCP Radiography Independent Technical Reviewer Checklist (Continued)

Batch Data Report No.: OR-RTR6-0650

Description		
17. Was the Image Test performed satisfactorily and recorded on Attachment 1?	☐ NO	☑ YES
18. Was the Replicate Scan performed and recorded on an Attachment 2?	☐ NO	☑ YES
19. Was the Replicate Scan RTR Operator different from the first RTR Operator?	☐ NO	☑ YES
20. Did the Replicate Scan RTR Operator and the first RTR Operator agree on the results?	☐ NO	☑ YES
21. Was the Independent Observation performed and recorded on an Attachment 2?	☐ NO	☑ YES
22. Was the Independent Observation RTR Operator different from the first RTR Operator?	☐ NO	☑ YES
23. Did the Independent Observation RTR Operator and the first RTR Operator agree on the results?	☐ NO	☑ YES
24. Was the data collection performed by qualified individuals?	☐ NO	☑ YES
25. Were NCRs initiated as required at DGL? If no, proceed to question 26.	☑ NO	☐ YES
25a. Have the NCR(s) associated with RTR been included in the BDR?	☐ NO	☐ YES
26. Is the RTR examination for CH waste? If no, proceed to question 27.	☐ NO	☑ YES
26a. Have the CH Quality Assurance Objectives (QAOs) been met (if applicable)? Precision – Precision is maintained by reconciling any discrepancies between two radiography operators with regard to identification of the waste matrix code, liquids in excess of TSDF-WAC limits, and compressed gases through independent replicate scans and independent observations. Additionally, the precision of radiography is verified prior to use by tuning precisely enough to demonstrate compliance with QAOs through viewing an image test pattern. Accuracy – Accuracy is obtained by using a target to tune the image for maximum sharpness and by requiring operators to successfully identify 100 percent of the items required to meet the DQOs for radiography specified in CCP-PO-001, Section C-4a(1) in a training container during their initial qualification and subsequent requalification. Completeness – A video and audio media recording of the radiography examination and a validated radiography data form will be obtained for 100 percent of the waste containers subject to radiography. All video and audio media recordings and radiography data forms will be subject to validation as indicated in CCP-PO-001, Section C3-4. Comparability – The comparability of radiography data from different operators shall be enhanced by using standardized radiography procedures and operator qualifications.	☐ NO	☑ YES

Attachment 3 – CCP Radiography Independent Technical Reviewer Checklist (Continued)

Batch Data Report No.: OR-RTR6-0650

Description		
27. Is the RTR examination for RH waste? If no, proceed to comment section.	☑ NO	☐ YES
27a. Have the RH QAOs been met (if applicable)? Precision – Precision is maintained by reconciling any discrepancies between two operators (during Independent Observation and Replicate scans) with regard to the identification of important waste characteristics (i.e., physical form of the waste and absence of prohibited liquids) within a single container. Accuracy – Accuracy is obtained by using a target to tune the image for maximum sharpness and by requiring operators to successfully identify prohibited liquid in a training container during their initial qualification and subsequent requalification. Representativeness – All of the relevant contents in a container selected for radiography will be described. Completeness – All of the relevant waste information must be assembled and must show that each of the containers in the waste stream belongs to the waste stream. This information must be documented on videotape or other equivalent media and data form. Comparability – Comparability is ensured by meeting the program training requirements and complying with the minimum standards used to implement the radiography process.	☐ NO	☐ YES

Comments: N/A

I have reviewed 100% of the container specific and batch data in this report and find it acceptable.

Independent Technical Reviewer:

Fred Overy
Printed Name

Signature

4-28-15
Date

DIVIDER PAGE ONLY

NOT PART OF PAGE COUNT

Attachment 2 – CCP Records Transmittal/Receiving Form

CCP Records / Records Custodian, 4021 National Parks Highway - MS: GSA 212, Carlsbad, New Mexico 88220

Telephone Number: 575-234-7523

Fax Number: 575-234-7033

Attn:	CCP RECORDS	From:	PATRICK SMITH II
Ship to:	CCP RECORDS CUSTODIAN	Site:	ORNL
	4021 NATIONAL PARKS HWY.	Company:	TFE INC.
	MS GSA 212	Telephone Number:	865-574-6002
	CARLSBAD, NM 88220-9082	Date Sent:	4-29-2015
Telephone Number:	575-234-7523		

Document Number	Title/ Description	Record Date	Total Pages
OR-RTR6-0650	RTR DVD (DISK B)	4-27-2015	N/A
N/A	N/A	N/A	N/A
N/A	N/A	N/A	N/A
N/A	N/A	N/A	N/A
N/A	N/A	N/A	N/A
N/A	N/A	N/A	N/A

Comments

N/A

(When the Record accepted line has been completed, the rest of the page below may be left blank.)
Acceptance/Rejection Signature and Date

Records Accepted ☑	[signature]	Greta Leos	5-04-15
	Signature	Printed Name	Date
Records Rejected ☐			
	Signature	Printed Name	Date

Reason for Rejection:

Re-submittal:

Signature	Printed Name	Date

```
**********************************
***        Send Results        ***
**********************************

   Sending is complete.

Job No.                    3987
Address                    918655768703
Name                       ORNL
Start Time                 05/04 02:33 PM
Call Length                00'20
Sheets                     1
Result                     OK
```


Attachment 2 – CCP Records Transmittal/Receiving Form

CCP Records / Records Custodian, 4021 National Parks Highway - MS: GSA 212, Carlsbad, New Mexico 88220

Telephone Number: 575-234-7523

Fax Number: 575-234-7033

Attn:	CCP RECORDS	From:	PATRICK SMITH II
Ship to:	CCP RECORDS CUSTODIAN	Site:	ORNL
	4021 NATIONAL PARKS HWY.	Company:	TFE INC.
	MS GSA 212	Telephone Number:	865-574-6002
	CARLSBAD, NM 88220-9082	Date Sent:	4-29-2015
Telephone Number:	575-234-7523		

OR-RTR6-0650	RTR DVD (DISK B)	4-27-2015	N/A
N/A	N/A	N/A	N/A
N/A	N/A	N/A	N/A
N/A	N/A	N/A	N/A
N/A	N/A	N/A	N/A
N/A	N/A	N/A	N/A

Comments

N/A

(When the Record accepted line has been completed, the rest of the page below may be left blank.)
Acceptance/Rejection Signature and Date

Records Accepted ☑ Signature Greta Leos Printed Name 5-04-15 Date

Records Rejected ☐ _____

Attachment 2 – CCP Records Transmittal/Receiving Form

CCP Records / Records Custodian, 4021 National Parks Highway - MS: GSA 212, Carlsbad, New Mexico 88220

Telephone Number: 575-234-7523

Fax Number: 575-234-7033

Attn:	CCP RECORDS	From:	PATRICK SMITH II
Ship to:	CCP RECORDS CUSTODIAN	Site:	ORNL
	4021 NATIONAL PARKS HWY.	Company:	TFE INC.
	MS GSA 212	Telephone Number:	865-574-6002
	CARLSBAD, NM 88220-9082	Date Sent:	5-7-2015
Telephone Number:	575-234-7523		

Document Number	File Description	Record Date	Total Pages
OR-RTR6-0650	RTR BDR	4-27-2015	21
OR-RTR6-0650	RTR DVD (DISK A)	4-27-2015	N/A
N/A	N/A	N/A	N/A
N/A	N/A	N/A	N/A
N/A	N/A	N/A	N/A
N/A	N/A	N/A	N/A

Comments

N/A

(When the Record accepted line has been completed, the rest of the page below may be left blank.)
Acceptance/Rejection Signature and Date

Records Accepted	☑	Signature	Greta Leos Printed Name	5-11-15 Date
Records Rejected	☐	Signature	Printed Name	Date

Reason for Rejection:

Re-submittal:

Signature	Printed Name	Date

****
*** Send Results ***
****

Sending is complete.

Job No.	4457
Address	918655768703
Name	ORNL
Start Time	05/11 01:30 PM
Call Length	00'19
Sheets	1
Result	OK

Controlled Copy

CCP-QP-008, Rev. 24
CCP Records Management

Effective Date: 02/10/2015

Attachment 2 – CCP Records Transmittal/Receiving Form

CCP Records / Records Custodian, 4021 National Parks Highway - MS: GSA 212, Carlsbad, New Mexico 88220

Telephone Number: 575-234-7523

Fax Number: 575-234-7033

Attn:	CCP RECORDS	From:	PATRICK SMITH II
Ship to:	CCP RECORDS CUSTODIAN	Site:	ORNL
	4021 NATIONAL PARKS HWY.	Company:	TFE INC.
	MS GSA 212	Telephone Number:	865-574-6002
	CARLSBAD, NM 88220-9082	Date Sent:	5-7-2015
Telephone Number:	575-234-7523		

Document Number	Description	Date	Quantity
OR-RTR6-0650	RTR BDR	4-27-2015	21
OR-RTR6-0650	RTR DVD (DISK A)	4-27-2015	N/A
N/A	N/A	N/A	N/A
N/A	N/A	N/A	N/A
N/A	N/A	N/A	N/A
N/A	N/A	N/A	N/A

Comments

N/A

(When the Record accepted line has been completed, the rest of the page below may be left blank.)
Acceptance/Rejection Signature and Date

Records Accepted	☑	Signature	Greta Leos (Printed Name)	5-11-15 (Date)
Records Rejected	☐	Signature	Printed Name	Date

DIVIDER PAGE

Attachment 2 – CCP SPM Radiography Project Level Validation Checklist and Summary

BDR Number: OR-RTR6-0652				Examination Date(s): 05/05/15
Description of Criteria Reviewed	**Criteria Met?**			**Comments/Qualifiers**
	YES	**NO**	**NA**	
1. Is the completed, signed, and dated Independent Technical Reviewer Checklist included in the BDR, and the independent technical reviewer was not involved in the generation or recording of the data under review? **Reference Source: CCP-PO-001, C3-4**	X			
2. Does the BDR contain all items addressed in the BDR Table of Contents? **Reference Source: CCP-PO-001, C3-4**	X			
3. Does the BDR include a listing of all the container numbers in the batch? **Reference Source: CCP-PO-001, C3-4**	X			
4. List all containers that have met QAOs. **Reference Source: CCP-PO-001, C3-4**				Container Numbers: X10C1351217 X10C1351209 X10C1351216 X10C1351218 X10C1351219 X10C1351220 X10C1351231 X10C1351235 X10C1351342 X10C1351355
5. Does the BDR identify the current implementing procedure and revision number? **Reference Source: CCP-PO-001, Table C3-3**	X			
6. Is there a reference to or copy of any associated NCRs (if any) in the BDR? NA if no NCRs. **Reference Source: CCP-PO-001, Table C3-3**			X	
7. Are there 20 or fewer containers in the batch? **Reference Source: CCP-PO-001, C3-4**	X			
8. Are the data properly reported (i.e., data are reported in correct units and with correct significant figures)? **Reference Source: CCP-PO-001, C3-4**	X			
9. Is there evidence of verification that the physical form matches the Waste Matrix Code? **Reference Source: CCP-PO-001, Table C3-3**	X			

Attachment 2 – CCP SPM Radiography Project Level Validation Checklist and Summary (Continued)

BDR Number: OR-RTR6-0652	**Examination Date(s): 05/05/15**			
Description of Criteria Reviewed	**Criteria Met?**			**Comments/Qualifiers**
	YES	**NO**	**NA**	
10. Is there evidence of verification that the physical form matches the waste stream description? **Reference Source: CCP-PO-001, Table C3-3**	X			
11. Are prohibited items absent? **Reference Source: CCP-PO-001, Table C3-3**	X			
12. Does observable liquid, if present, meet the criteria of the TSDF-WAC? **Reference Source: CCP-PO-001, C-1**			X	No observable liquid.
13. Were discrepancies between two operators with regard to identification of waste matrix code, liquids in excess of the TSDF-WAC, or compressed gases through replicate scans and independent observations reconciled? NA if no discrepancies. **Reference Source: CCP-PO-001, C3-2**			X	
14. Are the training qualifications for all radiography personnel acceptable? **Reference Source: CCP-PO-001, C3-8**	X			
15. Was evidence of the video/audio check included in the BDR? **Reference Source: CCP-PO-001, C1-1**	X			
16. Was the Lines-Pair Resolution Test or Sieve Test Check included in the BDR? **Reference Source: CCP Technical Procedures**	X			
17. Was a replicate scan performed once per day, or once per batch, whichever is LESS frequent? **Reference Source: CCP-PO-001, C1-1**	X			
18. Was an independent observation performed once per day, or once per batch, whichever is LESS frequent? **Reference Source: CCP-PO-001, C1-1**	X			

Attachment 2 – CCP SPM Radiography Project Level Validation Checklist and Summary (Continued)

BDR Number: OR-RTR6-0652	Examination Date(s): 05/05/15			
Description of Criteria Reviewed	**Criteria Met?**			**Comments/Qualifiers**
	YES	**NO**	**NA**	
19. Were the replicate scan and independent observation performed on different waste containers? **Reference Source: CCP-PO-001, C1-1**	X			
20. Were the personnel performing the replicate scan and independent observation different from the individual who performed the original? **Reference Source: CCP-PO-001, C1-1**	X			
21. Does the BDR include an estimate of each material parameter weight in kg for each container? **Reference Source: CCP Technical Procedures**	X			
22. Does the BDR include a description of each material parameter for each container? **Reference Source: CCP Technical Procedures**	X			
23. Is the container gross weight recorded in kilograms (kg) for each container in the BDR? **Reference Source: CCP Technical Procedures**	X			
24. Was the Scale Weight Calibration Check included in the BDR? **Reference Source: CCP Technical Procedures**			X	Scale not used.
25. Was the Scale Weight Check included in the BDR? **Reference Source: CCP Technical Procedures**			X	Scale not used.
Comments: None				
The container QC checks were properly performed and meet the Quality Assurance Objectives (QAOs). Proper procedures were followed during data reduction and analysis. The batch is complete, acceptable, and includes all supporting data and documentation required by the QAPjP.				
Barbara Broomfield				05/19/15
SPM Printed Name	Signature			Date

Checklist is to be re-signed only when a re-review is performed.

SPM Printed Name	Signature	Reason	Date
SPM Printed Name	Signature	Reason	Date

Attachment 5–CCP Radiography Batch Data Report Cover Sheet

Site ID: ORNL

Batch Data Report No.: OR-RTR6-0652 ☑ CH ☐ RH Date: 5-5-15

Waste Container ID Numbers	
Replicate Scan:	X10C1351217
Independent Observation:	X10C1351219
1	X10C1351216
2	X10C1351209
3	X10C1351220
4	X10C1351235
5	X10C1351218
6	X10C1351342
7	X10C1351231
8	X10C1351355
9	X10C1351219
10	X10C1351217
11	N/A
12	N/A
13	N/A
14	N/A
15	N/A
16	N/A
17	N/A
18	N/A
19	N/A
20	N/A

RTR Operator:

Daphne Brothers	Daphne D Brothers	5-5-15
Printed Name	Signature	Date

Independent Technical Reviewer:

Fred Owey		5-6-15
Printed Name	Signature	Date

NTPC RECORDS ORIGINAL
DATE REC'D 5-6-2015 AE

Attachment 4 – CCP Radiography Batch Data Report Table of Contents and Batch Narrative

Batch Data Report No.: OR-RTR6-0652 Date: 5-5-15

Table Of Contents		
Item	Description	Page No.
1	CCP Radiography Batch Data Report Cover Sheet	1
2	CCP Radiography Batch Data Report Table Of Contents	2
3	CCP RTR Measurement Control Report	3
4	CCP Radiography Data Sheets	4
5	Copy of NCRs (NA, If Not Applicable)	N/A
6	CCP Independent Technical Reviewer Checklist	40

Batch Narrative
All Quality Checks were performed and recorded on CCP-TP-053, Rev.15, CCP Radiography Measurement Control Report.

Daphne Brothers — RTR Operator

Daphne Brothers — Signature

5-5-15 — Date

Attachment 1 – CCP RTR Measurement Control Report

Site ID: ORNL		
Batch Data Report No.: OR-RTR6-0652		
Examination Date: 5-5-15		
Control Checks		
Video/Audio Recorded Media System Check	☑ SAT	☐ UNSAT
Image Test : 10 Lines (Minimum acceptable is 5 lines-pair/cm or #6 Sieve is viewable)	☑ SAT	☐ UNSAT
Comments: N/A		
RTR Operator:		
Daphne Brothers (Printed Name)	Daphne Brothers (Signature)	5-5-15 (Date)

CCP Radiography Data Sheet

Section 1: General Information	
☐ RTR Examination ☒ RTR Replicate Scan ☐ RTR Independent Observation	
Site ID:	ORNL
Batch Number:	OR-RTR6-0652
Examination Date:	5/5/2015
Waste Container ID:	X10C1351217
Video/Audio Recorded Media Number:	OR-RTR6-0652 A&B
Procedure and Revision No.:	CCP-TP-053 Rev. 15
NCR(s) associated with the container? (e.g., Prohibited Items)	☒ No ☐ Yes NCR No.: N/A NCR No.: N/A

Section 2: Waste Container Data	
Container Type:	55 Gallon Drum
TRUCON Code:	OR 227
Waste Matrix Code:	S4100
Waste Stream I.D.:	OR-NFS-CH-SOIL
Waste Container Weights:	Gross Wt.: 256.0 kg Tare Wt.: 35.2 kg Net Wt.: 220.8 kg
Rigid Liner and Liner Vent Description:	Liner: ☐ No ☒ Yes Lid: ☒ No ☐ Yes Type: ☐ 30-mil ☒ 90-mil ☐ 110-mil ☐ 125-mil Vented: ☐ No ☒ Yes ☐ N/A Punctured: ☒ No ☐ Yes Mechanical Vent: ☒ No ☐ Yes Fiberboard Liner: ☒ No ☐ Yes Lead Lined: ☒ No ☐ Yes
Number of Layers of Confinement:	Appears to be 1 layer
Volume Utilization Percentage:	90 %

CCP Radiography Data Sheet

Waste Container ID: X10C1351217

Section 3: Container Inventory and Comments (Detailed descriptions)
IM:
AM:
OM:
OI:
C:
R:
XPM:
OR: Absorbent
IN:
S: Soil

Section 4: Packaging Material and Waste Material Parameters	
Packaging Material:	**Estimated Weight (kg)**
Steel (ST):	27.8
Plastics (PP): Liner bag, Rigid Liner	7.4
Other:	0.0
Total Packaging Weight	35.2
Waste Material Parameter:	**Estimated Weight (kg)**
Iron-based Metal / Alloys (IM):	
Aluminum-based Metals / Alloys (AM):	
Other Metals (OM):	
Other Inorganic Materials (OI)	
Cellulosics (C):	
Rubber (R):	
Plastics (waste materials) (XPM):	
Organic Matrix (OR):	3.0
Inorganic Matrix (IN):	
Soils (S):	217.8
Total WMP Weight:	220.8

CCP Radiography Data Sheet

Waste Container ID: X10C1351217

Section 5: RTR Summary (Questions answered "Yes" will be explained in the Comment block, except for Question 1)	
Is there observable liquid?	☐ Yes ☒ No
Is there any observable liquid in internal containers, more than 60 milliliters or 3 percent by volume, whichever is greater?	☐ Yes ☒ No
Is the total volume of observable liquid in the outermost container GREATER than 1% of the container?	☐ Yes ☒ No
Is there observable liquid in payload containers with an EPA Hazardous Waste Number of U134?	☐ Yes ☒ No
Is there an indication of non-radionuclide pyrophoric materials, such as elemental potassium?	☐ Yes ☒ No
Is there an indication of hazardous wastes not occurring as co-contaminants with TRU mixed wastes (non-mixed hazardous wastes)?	☐ Yes ☒ No
Is there an indication of wastes incompatible with backfill, seal and panel closures materials, container and packaging materials, shipping container materials, or other wastes (i.e., waste does NOT match TRUCON Code[s])?	☐ Yes ☒ No
Is there an indication of wastes containing explosives or compressed gases?	☐ Yes ☒ No
Is there an indication of PCBs liquids?	☐ Yes ☒ No
Is there an indication of the waste exhibiting the characteristic of ignitability, corrosivity, or reactivity (EPA Hazardous Waste Numbers of D001, D002, or D003)?	☐ Yes ☒ No
Is the physical form of the waste inconsistent with the Waste Stream Description or the Waste Matrix Code?	☐ Yes ☒ No
CH or RH TRAMPAC	
Are there heat-sealed bags (unvented) GREATER than 4 liters and LESS than 390 square inches in the waste, or heat sealed bags not authorized in the RH TRUCON Code?	☐ Yes ☒ No
Were there Non-approved Closure Methods used on liner bags or inner bags greater than 4 liters?	☐ Yes ☒ No
Are there sealed containers GREATER than 4 liters?	☐ Yes ☒ No
Are there indications of inadequate protection for heavy and/or sharp objects?	☐ Yes ☒ No

Comments: This replicate scan agrees with the original scan. EL 5/5/15

RTR Operator:

Eric Lyles		5/5/2015
Print Name	Signature	Date

CCP Radiography Data Sheet

Section 1: General Information	
☐ RTR Examination ☐ RTR Replicate Scan ☒ RTR Independent Observation	
Site ID:	ORNL
Batch Number:	OR-RTR6-0652
Examination Date:	5/5/2015
Waste Container ID:	X10C1351219
Video/Audio Recorded Media Number:	OR-RTR6-0652 A&B
Procedure and Revision No.:	CCP-TP-053 Rev. 15
NCR(s) associated with the container? (e.g., Prohibited Items)	☒ No ☐ Yes NCR No.: N/A NCR No.: N/A

Section 2: Waste Container Data	
Container Type:	55 Gallon Drum
TRUCON Code:	OR 227
Waste Matrix Code:	S4100
Waste Stream I.D.:	OR-NFS-CH-SOIL
Waste Container Weights:	Gross Wt.: 234.7 kg Tare Wt.: 35.2 kg Net Wt.: 199.5 kg
Rigid Liner and Liner Vent Description:	Liner: ☐ No ☒ Yes Lid: ☒ No ☐ Yes Type: ☐ 30-mil ☒ 90-mil ☐ 110-mil ☐ 125-mil Vented: ☐ No ☒ Yes ☐ N/A Punctured: ☒ No ☐ Yes Mechanical Vent: ☒ No ☐ Yes Fiberboard Liner: ☒ No ☐ Yes Lead Lined: ☒ No ☐ Yes
Number of Layers of Confinement:	Appears to be 1 layer
Volume Utilization Percentage:	90 %

CCP Radiography Data Sheet

Waste Container ID: X10C1351219

Section 3: Container Inventory and Comments (Detailed descriptions)
IM:
AM:
OM:
OI:
C:
R:
XPM:
OR: Absorbent
IN:
S: Soil

Section 4: Packaging Material and Waste Material Parameters	
Packaging Material:	**Estimated Weight (kg)**
Steel (ST):	27.8
Plastics (PP): Liner bag, Rigid Liner	7.4
Other:	0.0
Total Packaging Weight	35.2
Waste Material Parameter:	**Estimated Weight (kg)**
Iron-based Metal / Alloys (IM):	
Aluminum-based Metals / Alloys (AM):	
Other Metals (OM):	
Other Inorganic Materials (OI)	
Cellulosics (C):	
Rubber (R):	
Plastics (waste materials) (XPM):	
Organic Matrix (OR):	2.0
Inorganic Matrix (IN):	
Soils (S):	197.5
Total WMP Weight:	199.5

CCP Radiography Data Sheet

Waste Container ID: X10C1351219

Section 5: RTR Summary (Questions answered "Yes" will be explained in the Comment block, except for Question 1)	
Is there observable liquid?	☐ Yes ☒ No
Is there any observable liquid in internal containers, more than 60 milliliters or 3 percent by volume, whichever is greater?	☐ Yes ☒ No
Is the total volume of observable liquid in the outermost container GREATER than 1% of the container?	☐ Yes ☒ No
Is there observable liquid in payload containers with an EPA Hazardous Waste Number of U134?	☐ Yes ☒ No
Is there an indication of non-radionuclide pyrophoric materials, such as elemental potassium?	☐ Yes ☒ No
Is there an indication of hazardous wastes not occurring as co-contaminants with TRU mixed wastes (non-mixed hazardous wastes)?	☐ Yes ☒ No
Is there an indication of wastes incompatible with backfill, seal and panel closures materials, container and packaging materials, shipping container materials, or other wastes (i.e., waste does NOT match TRUCON Code[s])?	☐ Yes ☒ No
Is there an indication of wastes containing explosives or compressed gases?	☐ Yes ☒ No
Is there an indication of PCBs liquids?	☐ Yes ☒ No
Is there an indication of the waste exhibiting the characteristic of ignitability, corrosivity, or reactivity (EPA Hazardous Waste Numbers of D001, D002, or D003)?	☐ Yes ☒ No
Is the physical form of the waste inconsistent with the Waste Stream Description or the Waste Matrix Code?	☐ Yes ☒ No
CH or RH TRAMPAC	
Are there heat-sealed bags (unvented) GREATER than 4 liters and LESS than 390 square inches in the waste, or heat sealed bags not authorized in the RH TRUCON Code?	☐ Yes ☒ No
Were there Non-approved Closure Methods used on liner bags or inner bags greater than 4 liters?	☐ Yes ☒ No
Are there sealed containers GREATER than 4 liters?	☐ Yes ☒ No
Are there indications of inadequate protection for heavy and/or sharp objects?	☐ Yes ☒ No

Comments: This Independent Observation agrees with the original scan. EL 5/5/15

RTR Operator:

Eric Lyles		5/5/2015
Print Name	Signature	Date

CCP Radiography Data Sheet

Section 1: General Information		
[X] RTR Examination	[ ] RTR Replicate Scan	[ ] RTR Independent Observation
Site ID:	ORNL	
Batch Number:	OR-RTR6-0652	
Examination Date:	5/5/2015	
Waste Container ID:	X10C1351216	
Video/Audio Recorded Media Number:	OR-RTR6-0652	A&B
Procedure and Revision No.:	CCP-TP-053	Rev. 15
NCR(s) associated with the container? (e.g., Prohibited Items)	[X] No [ ] Yes NCR No.: N/A NCR No.: N/A	

Section 2: Waste Container Data	
Container Type:	55 Gallon Drum
TRUCON Code:	OR 227
Waste Matrix Code:	S4100
Waste Stream I.D.:	OR-NFS-CH-SOIL
Waste Container Weights:	Gross Wt.: 244.9 kg Tare Wt.: 35.2 kg Net Wt.: 209.7 kg
Rigid Liner and Liner Vent Description:	Liner: [ ] No [X] Yes Lid: [X] No [ ] Yes Type: [ ] 30-mil [X] 90-mil [ ] 110-mil [ ] 125-mil Vented: [ ] No [X] Yes [ ] N/A Punctured: [X] No [ ] Yes Mechanical Vent: [X] No [ ] Yes Fiberboard Liner: [X] No [ ] Yes Lead Lined: [X] No [ ] Yes
Number of Layers of Confinement:	Appears to be 1 layer
Volume Utilization Percentage:	90 %

CCP Radiography Data Sheet

Waste Container ID: X10C1351216

Section 3: Container Inventory and Comments (Detailed descriptions)
IM:
AM:
OM:
OI:
C:
R:
XPM:
OR: Absorbent
IN:
S: Soil

Section 4: Packaging Material and Waste Material Parameters	
Packaging Material:	**Estimated Weight (kg)**
Steel (ST):	27.8
Plastics (PP): Liner bag, Rigid Liner	7.4
Other:	0.0
Total Packaging Weight	35.2
Waste Material Parameter:	**Estimated Weight (kg)**
Iron-based Metal / Alloys (IM):	
Aluminum-based Metals / Alloys (AM):	
Other Metals (OM):	
Other Inorganic Materials (OI)	
Cellulosics (C):	
Rubber (R):	
Plastics (waste materials) (XPM):	
Organic Matrix (OR):	2.7
Inorganic Matrix (IN):	
Soils (S):	207.0
Total WMP Weight:	209.7

CCP Radiography Data Sheet

Waste Container ID: X10C1351216

Section 5: RTR Summary (Questions answered "Yes" will be explained in the Comment block, except for Question 1)	
Is there observable liquid?	☐ Yes ☒ No
Is there any observable liquid in internal containers, more than 60 milliliters or 3 percent by volume, whichever is greater?	☐ Yes ☒ No
Is the total volume of observable liquid in the outermost container GREATER than 1% of the container?	☐ Yes ☒ No
Is there observable liquid in payload containers with an EPA Hazardous Waste Number of U134?	☐ Yes ☒ No
Is there an indication of non-radionuclide pyrophoric materials, such as elemental potassium?	☐ Yes ☒ No
Is there an indication of hazardous wastes not occurring as co-contaminants with TRU mixed wastes (non-mixed hazardous wastes)?	☐ Yes ☒ No
Is there an indication of wastes incompatible with backfill, seal and panel closures materials, container and packaging materials, shipping container materials, or other wastes (i.e., waste does NOT match TRUCON Code[s])?	☐ Yes ☒ No
Is there an indication of wastes containing explosives or compressed gases?	☐ Yes ☒ No
Is there an indication of PCBs liquids?	☐ Yes ☒ No
Is there an indication of the waste exhibiting the characteristic of ignitability, corrosivity, or reactivity (EPA Hazardous Waste Numbers of D001, D002, or D003)?	☐ Yes ☒ No
Is the physical form of the waste inconsistent with the Waste Stream Description or the Waste Matrix Code?	☐ Yes ☒ No
CH or RH TRAMPAC	
Are there heat-sealed bags (unvented) GREATER than 4 liters and LESS than 390 square inches in the waste, or heat sealed bags not authorized in the RH TRUCON Code?	☐ Yes ☒ No
Were there Non-approved Closure Methods used on liner bags or inner bags greater than 4 liters?	☐ Yes ☒ No
Are there sealed containers GREATER than 4 liters?	☐ Yes ☒ No
Are there indications of inadequate protection for heavy and/or sharp objects?	☐ Yes ☒ No
Comments: N/A	

RTR Operator:

Daphne Brothers	Daphne G Brothers	5/5/2015
Print Name	Signature	Date

CCP Radiography Data Sheet

Section 1: General Information	
[X] RTR Examination [ ] RTR Replicate Scan [ ] RTR Independent Observation	
Site ID:	ORNL
Batch Number:	OR-RTR6-0652
Examination Date:	5/5/2015
Waste Container ID:	X10C1351209
Video/Audio Recorded Media Number:	OR-RTR6-0652 A&B
Procedure and Revision No.:	CCP-TP-053 Rev. 15
NCR(s) associated with the container? (e.g., Prohibited Items)	[X] No [ ] Yes NCR No.: N/A NCR No.: N/A

Section 2: Waste Container Data	
Container Type:	55 Gallon Drum
TRUCON Code:	OR 227
Waste Matrix Code:	S4100
Waste Stream I.D.:	OR-NFS-CH-SOIL
Waste Container Weights:	Gross Wt.: 212.3 kg Tare Wt.: 35.2 kg Net Wt.: 177.1 kg
Rigid Liner and Liner Vent Description:	Liner: [ ] No [X] Yes Lid: [X] No [ ] Yes Type: [ ] 30-mil [X] 90-mil [ ] 110-mil [ ] 125-mil Vented: [ ] No [X] Yes [ ] N/A Punctured: [X] No [ ] Yes Mechanical Vent: [X] No [ ] Yes Fiberboard Liner: [X] No [ ] Yes Lead Lined: [X] No [ ] Yes
Number of Layers of Confinement:	Appears to be 1 layer
Volume Utilization Percentage:	75 %

CCP Radiography Data Sheet

Waste Container ID: X10C1351209

Section 3: Container Inventory and Comments (Detailed descriptions)
IM:
AM:
OM:
OI:
C:
R:
XPM:
OR: Absorbent
IN:
S: Soil

Section 4: Packaging Material and Waste Material Parameters	
Packaging Material:	**Estimated Weight (kg)**
Steel (ST):	27.8
Plastics (PP): Liner bag, Rigid Liner	7.4
Other:	0.0
Total Packaging Weight	35.2
Waste Material Parameter:	**Estimated Weight (kg)**
Iron-based Metal / Alloys (IM):	
Aluminum-based Metals / Alloys (AM):	
Other Metals (OM):	
Other Inorganic Materials (OI)	
Cellulosics (C):	
Rubber (R):	
Plastics (waste materials) (XPM):	
Organic Matrix (OR):	2.1
Inorganic Matrix (IN):	
Soils (S):	175.0
Total WMP Weight:	177.1

CCP Radiography Data Sheet

Waste Container ID: X10C1351209

Section 5: RTR Summary (Questions answered "Yes" will be explained in the Comment block, except for Question 1)	
Is there observable liquid?	☐ Yes ☒ No
Is there any observable liquid in internal containers, more than 60 milliliters or 3 percent by volume, whichever is greater?	☐ Yes ☒ No
Is the total volume of observable liquid in the outermost container GREATER than 1% of the container?	☐ Yes ☒ No
Is there observable liquid in payload containers with an EPA Hazardous Waste Number of U134?	☐ Yes ☒ No
Is there an indication of non-radionuclide pyrophoric materials, such as elemental potassium?	☐ Yes ☒ No
Is there an indication of hazardous wastes not occurring as co-contaminants with TRU mixed wastes (non-mixed hazardous wastes)?	☐ Yes ☒ No
Is there an indication of wastes incompatible with backfill, seal and panel closures materials, container and packaging materials, shipping container materials, or other wastes (i.e., waste does NOT match TRUCON Code[s])?	☐ Yes ☒ No
Is there an indication of wastes containing explosives or compressed gases?	☐ Yes ☒ No
Is there an indication of PCBs liquids?	☐ Yes ☒ No
Is there an indication of the waste exhibiting the characteristic of ignitability, corrosivity, or reactivity (EPA Hazardous Waste Numbers of D001, D002, or D003)?	☐ Yes ☒ No
Is the physical form of the waste inconsistent with the Waste Stream Description or the Waste Matrix Code?	☐ Yes ☒ No
CH or RH TRAMPAC	
Are there heat-sealed bags (unvented) GREATER than 4 liters and LESS than 390 square inches in the waste, or heat sealed bags not authorized in the RH TRUCON Code?	☐ Yes ☒ No
Were there Non-approved Closure Methods used on liner bags or inner bags greater than 4 liters?	☐ Yes ☒ No
Are there sealed containers GREATER than 4 liters?	☐ Yes ☒ No
Are there indications of inadequate protection for heavy and/or sharp objects?	☐ Yes ☒ No
Comments: N/A	

RTR Operator:

Daphne Brothers	Daphne Brothers	5/5/2015
Print Name	Signature	Date

CCP Radiography Data Sheet

Section 1: General Information	
[X] RTR Examination [ ] RTR Replicate Scan [ ] RTR Independent Observation	
Site ID:	ORNL
Batch Number:	OR-RTR6-0652
Examination Date:	5/5/2015
Waste Container ID:	X10C1351220
Video/Audio Recorded Media Number:	OR-RTR6-0652 A&B
Procedure and Revision No.:	CCP-TP-053 Rev. 15
NCR(s) associated with the container? (e.g., Prohibited Items)	[X] No [ ] Yes NCR No.: N/A NCR No.: N/A

Section 2: Waste Container Data	
Container Type:	55 Gallon Drum
TRUCON Code:	OR 227
Waste Matrix Code:	S4100
Waste Stream I.D.:	OR-NFS-CH-SOIL
Waste Container Weights:	Gross Wt.: 259.4 kg Tare Wt.: 35.2 kg Net Wt.: 224.2 kg
Rigid Liner and Liner Vent Description:	Liner: [ ] No [X] Yes Lid: [X] No [ ] Yes Type: [ ] 30-mil [X] 90-mil [ ] 110-mil [ ] 125-mil Vented: [ ] No [X] Yes [ ] N/A Punctured: [X] No [ ] Yes Mechanical Vent: [X] No [ ] Yes Fiberboard Liner: [X] No [ ] Yes Lead Lined: [X] No [ ] Yes
Number of Layers of Confinement:	Appears to be 1 layer
Volume Utilization Percentage:	95 %

CCP Radiography Data Sheet

Waste Container ID: X10C1351220

Section 3: Container Inventory and Comments (Detailed descriptions)
IM:
AM:
OM:
OI:
C:
R:
XPM:
OR: Absorbent
IN:
S: Soil

Section 4: Packaging Material and Waste Material Parameters	
Packaging Material:	**Estimated Weight (kg)**
Steel (ST):	27.8
Plastics (PP): Liner bag, Rigid Liner	7.4
Other:	0.0
Total Packaging Weight	35.2
Waste Material Parameter:	**Estimated Weight (kg)**
Iron-based Metal / Alloys (IM):	
Aluminum-based Metals / Alloys (AM):	
Other Metals (OM):	
Other Inorganic Materials (OI)	
Cellulosics (C):	
Rubber (R):	
Plastics (waste materials) (XPM):	
Organic Matrix (OR):	3.2
Inorganic Matrix (IN):	
Soils (S):	221.0
Total WMP Weight:	224.2

CCP Radiography Data Sheet

Waste Container ID: X10C1351220

Section 5: RTR Summary (Questions answered "Yes" will be explained in the Comment block, except for Question 1)	
Is there observable liquid?	☐ Yes ☒ No
Is there any observable liquid in internal containers, more than 60 milliliters or 3 percent by volume, whichever is greater?	☐ Yes ☒ No
Is the total volume of observable liquid in the outermost container GREATER than 1% of the container?	☐ Yes ☒ No
Is there observable liquid in payload containers with an EPA Hazardous Waste Number of U134?	☐ Yes ☒ No
Is there an indication of non-radionuclide pyrophoric materials, such as elemental potassium?	☐ Yes ☒ No
Is there an indication of hazardous wastes not occurring as co-contaminants with TRU mixed wastes (non-mixed hazardous wastes)?	☐ Yes ☒ No
Is there an indication of wastes incompatible with backfill, seal and panel closures materials, container and packaging materials, shipping container materials, or other wastes (i.e., waste does NOT match TRUCON Code[s])?	☐ Yes ☒ No
Is there an indication of wastes containing explosives or compressed gases?	☐ Yes ☒ No
Is there an indication of PCBs liquids?	☐ Yes ☒ No
Is there an indication of the waste exhibiting the characteristic of ignitability, corrosivity, or reactivity (EPA Hazardous Waste Numbers of D001, D002, or D003)?	☐ Yes ☒ No
Is the physical form of the waste inconsistent with the Waste Stream Description or the Waste Matrix Code?	☐ Yes ☒ No
CH or RH TRAMPAC	
Are there heat-sealed bags (unvented) GREATER than 4 liters and LESS than 390 square inches in the waste, or heat sealed bags not authorized in the RH TRUCON Code?	☐ Yes ☒ No
Were there Non-approved Closure Methods used on liner bags or inner bags greater than 4 liters?	☐ Yes ☒ No
Are there sealed containers GREATER than 4 liters?	☐ Yes ☒ No
Are there indications of inadequate protection for heavy and/or sharp objects?	☐ Yes ☒ No
Comments: N/A	

RTR Operator:

Daphne Brothers	Daphne Brothers	5/5/2015
Print Name	Signature	Date

CCP Radiography Data Sheet

Section 1: General Information	
[X] RTR Examination [ ] RTR Replicate Scan [ ] RTR Independent Observation	
Site ID:	ORNL
Batch Number:	OR-RTR6-0652
Examination Date:	5/5/2015
Waste Container ID:	X10C1351235
Video/Audio Recorded Media Number:	OR-RTR6-0652 A&B
Procedure and Revision No.:	CCP-TP-053 Rev. 15
NCR(s) associated with the container? (e.g., Prohibited Items)	[X] No [ ] Yes NCR No.: N/A NCR No.: N/A

Section 2: Waste Container Data	
Container Type:	55 Gallon Drum
TRUCON Code:	OR 227
Waste Matrix Code:	S4100
Waste Stream I.D.:	OR-NFS-CH-SOIL
Waste Container Weights:	Gross Wt.: 238.1 kg Tare Wt.: 35.2 kg Net Wt.: 202.9 kg
Rigid Liner and Liner Vent Description:	Liner: [ ] No [X] Yes Lid: [X] No [ ] Yes Type: [ ] 30-mil [X] 90-mil [ ] 110-mil [ ] 125-mil Vented: [ ] No [X] Yes [ ] N/A Punctured: [X] No [ ] Yes Mechanical Vent: [X] No [ ] Yes Fiberboard Liner: [X] No [ ] Yes Lead Lined: [X] No [ ] Yes
Number of Layers of Confinement:	Appears to be 1 layer
Volume Utilization Percentage:	90 %

CCP Radiography Data Sheet

Waste Container ID: X10C1351235

Section 3: Container Inventory and Comments	(Detailed descriptions)
IM:	
AM:	
OM:	
OI:	
C:	
R:	
XPM:	
OR: Absorbent	
IN:	
S: Soil	

Section 4: Packaging Material and Waste Material Parameters	
Packaging Material:	**Estimated Weight (kg)**
Steel (ST):	27.8
Plastics (PP): Liner bag, Rigid Liner	7.4
Other:	0.0
Total Packaging Weight	35.2
Waste Material Parameter:	**Estimated Weight (kg)**
Iron-based Metal / Alloys (IM):	
Aluminum-based Metals / Alloys (AM):	
Other Metals (OM):	
Other Inorganic Materials (OI)	
Cellulosics (C):	
Rubber (R):	
Plastics (waste materials) (XPM):	
Organic Matrix (OR):	2.9
Inorganic Matrix (IN):	
Soils (S):	200.0
Total WMP Weight:	202.9

CCP Radiography Data Sheet

Waste Container ID: X10C1351235

Section 5: RTR Summary (Questions answered "Yes" will be explained in the Comment block, except for Question 1)	
Is there observable liquid?	☐ Yes ☒ No
Is there any observable liquid in internal containers, more than 60 milliliters or 3 percent by volume, whichever is greater?	☐ Yes ☒ No
Is the total volume of observable liquid in the outermost container GREATER than 1% of the container?	☐ Yes ☒ No
Is there observable liquid in payload containers with an EPA Hazardous Waste Number of U134?	☐ Yes ☒ No
Is there an indication of non-radionuclide pyrophoric materials, such as elemental potassium?	☐ Yes ☒ No
Is there an indication of hazardous wastes not occurring as co-contaminants with TRU mixed wastes (non-mixed hazardous wastes)?	☐ Yes ☒ No
Is there an indication of wastes incompatible with backfill, seal and panel closures materials, container and packaging materials, shipping container materials, or other wastes (i.e., waste does NOT match TRUCON Code[s])?	☐ Yes ☒ No
Is there an indication of wastes containing explosives or compressed gases?	☐ Yes ☒ No
Is there an indication of PCBs liquids?	☐ Yes ☒ No
Is there an indication of the waste exhibiting the characteristic of ignitability, corrosivity, or reactivity (EPA Hazardous Waste Numbers of D001, D002, or D003)?	☐ Yes ☒ No
Is the physical form of the waste inconsistent with the Waste Stream Description or the Waste Matrix Code?	☐ Yes ☒ No
CH or RH TRAMPAC	
Are there heat-sealed bags (unvented) GREATER than 4 liters and LESS than 390 square inches in the waste, or heat sealed bags not authorized in the RH TRUCON Code?	☐ Yes ☒ No
Were there Non-approved Closure Methods used on liner bags or inner bags greater than 4 liters?	☐ Yes ☒ No
Are there sealed containers GREATER than 4 liters?	☐ Yes ☒ No
Are there indications of inadequate protection for heavy and/or sharp objects?	☐ Yes ☒ No
Comments: N/A	

RTR Operator:

Daphne Brothers	Daphne Brothers	5/5/2015
Print Name	Signature	Date

CCP Radiography Data Sheet

Section 1: General Information		
[X] RTR Examination	[ ] RTR Replicate Scan	[ ] RTR Independent Observation
Site ID:	ORNL	
Batch Number:	OR-RTR6-0652	
Examination Date:	5/5/2015	
Waste Container ID:	X10C1351218	
Video/Audio Recorded Media Number:	OR-RTR6-0652	A&B
Procedure and Revision No.:	CCP-TP-053	Rev. 15
NCR(s) associated with the container? (e.g., Prohibited Items)	[X] No [ ] Yes NCR No.: N/A NCR No.: N/A	

Section 2: Waste Container Data	
Container Type:	55 Gallon Drum
TRUCON Code:	OR 227
Waste Matrix Code:	S4100
Waste Stream I.D.:	OR-NFS-CH-SOIL
Waste Container Weights:	Gross Wt.: 231.1 kg Tare Wt.: 35.2 kg Net Wt.: 195.9 kg
Rigid Liner and Liner Vent Description:	Liner: [ ] No [X] Yes Lid: [X] No [ ] Yes Type: [ ] 30-mil [X] 90-mil [ ] 110-mil [ ] 125-mil Vented: [ ] No [X] Yes [ ] N/A Punctured: [X] No [ ] Yes Mechanical Vent: [X] No [ ] Yes Fiberboard Liner: [X] No [ ] Yes Lead Lined: [X] No [ ] Yes
Number of Layers of Confinement:	Appears to be 1 layer
Volume Utilization Percentage:	90 %

CCP Radiography Data Sheet

Waste Container ID: X10C1351218

Section 3: Container Inventory and Comments (Detailed descriptions)	
IM:	Saw blade
AM:	
OM:	
OI:	
C:	
R:	
XPM:	
OR:	Absorbent.
IN:	
S:	Soil

Section 4: Packaging Material and Waste Material Parameters	
Packaging Material:	**Estimated Weight (kg)**
Steel (ST):	27.8
Plastics (PP): Liner bag, Rigid Liner	7.4
Other:	0.0
Total Packaging Weight	35.2
Waste Material Parameter:	**Estimated Weight (kg)**
Iron-based Metal / Alloys (IM):	0.1
Aluminum-based Metals / Alloys (AM):	
Other Metals (OM):	
Other Inorganic Materials (OI)	
Cellulosics (C):	
Rubber (R):	
Plastics (waste materials) (XPM):	
Organic Matrix (OR):	2.8
Inorganic Matrix (IN):	
Soils (S):	193.0
Total WMP Weight:	195.9

CCP Radiography Data Sheet

Waste Container ID: X10C1351218

Section 5: RTR Summary (Questions answered "Yes" will be explained in the Comment block, except for Question 1)	
Is there observable liquid?	☐ Yes ☒ No
Is there any observable liquid in internal containers, more than 60 milliliters or 3 percent by volume, whichever is greater?	☐ Yes ☒ No
Is the total volume of observable liquid in the outermost container GREATER than 1% of the container?	☐ Yes ☒ No
Is there observable liquid in payload containers with an EPA Hazardous Waste Number of U134?	☐ Yes ☒ No
Is there an indication of non-radionuclide pyrophoric materials, such as elemental potassium?	☐ Yes ☒ No
Is there an indication of hazardous wastes not occurring as co-contaminants with TRU mixed wastes (non-mixed hazardous wastes)?	☐ Yes ☒ No
Is there an indication of wastes incompatible with backfill, seal and panel closures materials, container and packaging materials, shipping container materials, or other wastes (i.e., waste does NOT match TRUCON Code[s])?	☐ Yes ☒ No
Is there an indication of wastes containing explosives or compressed gases?	☐ Yes ☒ No
Is there an indication of PCBs liquids?	☐ Yes ☒ No
Is there an indication of the waste exhibiting the characteristic of ignitability, corrosivity, or reactivity (EPA Hazardous Waste Numbers of D001, D002, or D003)?	☐ Yes ☒ No
Is the physical form of the waste inconsistent with the Waste Stream Description or the Waste Matrix Code?	☐ Yes ☒ No
CH or RH TRAMPAC	
Are there heat-sealed bags (unvented) GREATER than 4 liters and LESS than 390 square inches in the waste, or heat sealed bags not authorized in the RH TRUCON Code?	☐ Yes ☒ No
Were there Non-approved Closure Methods used on liner bags or inner bags greater than 4 liters?	☐ Yes ☒ No
Are there sealed containers GREATER than 4 liters?	☐ Yes ☒ No
Are there indications of inadequate protection for heavy and/or sharp objects?	☐ Yes ☒ No

Comments: N/A

RTR Operator:

Daphne Brothers	Daphne O Brothers	5/5/2015
Print Name	Signature	Date

CCP Radiography Data Sheet

Section 1: General Information	
[X] RTR Examination [ ] RTR Replicate Scan [ ] RTR Independent Observation	
Site ID:	ORNL
Batch Number:	OR-RTR6-0652
Examination Date:	5/5/2015
Waste Container ID:	X10C1351342
Video/Audio Recorded Media Number:	OR-RTR6-0652 A&B
Procedure and Revision No.:	CCP-TP-053 Rev. 15
NCR(s) associated with the container? (e.g., Prohibited Items)	[X] No [ ] Yes NCR No.: N/A NCR No.: N/A

Section 2: Waste Container Data	
Container Type:	55 Gallon Drum
TRUCON Code:	OR 227
Waste Matrix Code:	S4100
Waste Stream I.D.:	OR-NFS-CH-SOIL
Waste Container Weights:	Gross Wt.: 209.6 kg Tare Wt.: 35.2 kg Net Wt.: 174.4 kg
Rigid Liner and Liner Vent Description:	Liner: [ ] No [X] Yes Lid: [X] No [ ] Yes Type: [ ] 30-mil [X] 90-mil [ ] 110-mil [ ] 125-mil Vented: [ ] No [X] Yes [ ] N/A Punctured: [X] No [ ] Yes Mechanical Vent: [X] No [ ] Yes Fiberboard Liner: [X] No [ ] Yes Lead Lined: [X] No [ ] Yes
Number of Layers of Confinement:	Appears to be 1 layer
Volume Utilization Percentage:	85 %

CCP Radiography Data Sheet

Waste Container ID: X10C1351342

Section 3: Container Inventory and Comments	(Detailed descriptions)
IM:	
AM:	
OM:	
OI:	
C:	
R:	
XPM:	
OR: Absorbent	
IN:	
S: Soil	

Section 4: Packaging Material and Waste Material Parameters	
Packaging Material:	**Estimated Weight (kg)**
Steel (ST):	27.8
Plastics (PP): Liner bag, Rigid Liner	7.4
Other:	0.0
Total Packaging Weight	35.2
Waste Material Parameter:	**Estimated Weight (kg)**
Iron-based Metal / Alloys (IM):	
Aluminum-based Metals / Alloys (AM):	
Other Metals (OM):	
Other Inorganic Materials (OI)	
Cellulosics (C):	
Rubber (R):	
Plastics (waste materials) (XPM):	
Organic Matrix (OR):	2.4
Inorganic Matrix (IN):	
Soils (S):	172.0
Total WMP Weight:	174.4

CCP Radiography Data Sheet

Waste Container ID: X10C1351342

Section 5: RTR Summary (Questions answered "Yes" will be explained in the Comment block, except for Question 1)	
Is there observable liquid?	☐ Yes ☒ No
Is there any observable liquid in internal containers, more than 60 milliliters or 3 percent by volume, whichever is greater?	☐ Yes ☒ No
Is the total volume of observable liquid in the outermost container GREATER than 1% of the container?	☐ Yes ☒ No
Is there observable liquid in payload containers with an EPA Hazardous Waste Number of U134?	☐ Yes ☒ No
Is there an indication of non-radionuclide pyrophoric materials, such as elemental potassium?	☐ Yes ☒ No
Is there an indication of hazardous wastes not occurring as co-contaminants with TRU mixed wastes (non-mixed hazardous wastes)?	☐ Yes ☒ No
Is there an indication of wastes incompatible with backfill, seal and panel closures materials, container and packaging materials, shipping container materials, or other wastes (i.e., waste does NOT match TRUCON Code[s])?	☐ Yes ☒ No
Is there an indication of wastes containing explosives or compressed gases?	☐ Yes ☒ No
Is there an indication of PCBs liquids?	☐ Yes ☒ No
Is there an indication of the waste exhibiting the characteristic of ignitability, corrosivity, or reactivity (EPA Hazardous Waste Numbers of D001, D002, or D003)?	☐ Yes ☒ No
Is the physical form of the waste inconsistent with the Waste Stream Description or the Waste Matrix Code?	☐ Yes ☒ No
CH or RH TRAMPAC	
Are there heat-sealed bags (unvented) GREATER than 4 liters and LESS than 390 square inches in the waste, or heat sealed bags not authorized in the RH TRUCON Code?	☐ Yes ☒ No
Were there Non-approved Closure Methods used on liner bags or inner bags greater than 4 liters?	☐ Yes ☒ No
Are there sealed containers GREATER than 4 liters?	☐ Yes ☒ No
Are there indications of inadequate protection for heavy and/or sharp objects?	☐ Yes ☒ No
Comments: N/A	

RTR Operator:

Daphne Brothers	Daphne Brothers	5/5/2015
Print Name	Signature	Date

CCP Radiography Data Sheet

Section 1: General Information	
[X] RTR Examination [ ] RTR Replicate Scan [ ] RTR Independent Observation	
Site ID:	ORNL
Batch Number:	OR-RTR6-0652
Examination Date:	5/5/2015
Waste Container ID:	X10C1351231
Video/Audio Recorded Media Number:	OR-RTR6-0652 A&B
Procedure and Revision No.:	CCP-TP-053 Rev. 15
NCR(s) associated with the container? (e.g., Prohibited Items)	[X] No [ ] Yes NCR No.: N/A NCR No.: N/A

Section 2: Waste Container Data	
Container Type:	55 Gallon Drum
TRUCON Code:	OR 227
Waste Matrix Code:	S4100
Waste Stream I.D.:	OR-NFS-CH-SOIL
Waste Container Weights:	Gross Wt.: 186.3 kg Tare Wt.: 35.2 kg Net Wt.: 151.1 kg
Rigid Liner and Liner Vent Description:	Liner: [ ] No [X] Yes Lid: [X] No [ ] Yes Type: [ ] 30-mil [X] 90-mil [ ] 110-mil [ ] 125-mil Vented: [ ] No [X] Yes [ ] N/A Punctured: [X] No [ ] Yes Mechanical Vent: [X] No [ ] Yes Fiberboard Liner: [X] No [ ] Yes Lead Lined: [X] No [ ] Yes
Number of Layers of Confinement:	Appears to be 1 layer
Volume Utilization Percentage:	75 %

CCP Radiography Data Sheet

Waste Container ID: X10C1351231

Section 3: Container Inventory and Comments (Detailed descriptions)
IM:
AM:
OM:
OI:
C:
R:
XPM: Plastic sheeting
OR: Absorbent
IN:
S: Soil

Section 4: Packaging Material and Waste Material Parameters	
Packaging Material:	**Estimated Weight (kg)**
Steel (ST):	27.8
Plastics (PP): Liner bag, Rigid Liner	7.4
Other:	0.0
Total Packaging Weight	35.2
Waste Material Parameter:	**Estimated Weight (kg)**
Iron-based Metal / Alloys (IM):	
Aluminum-based Metals / Alloys (AM):	
Other Metals (OM):	
Other Inorganic Materials (OI)	
Cellulosics (C):	
Rubber (R):	
Plastics (waste materials) (XPM):	1.0
Organic Matrix (OR):	2.1
Inorganic Matrix (IN):	
Soils (S):	148.0
Total WMP Weight:	151.1

CCP Radiography Data Sheet

Waste Container ID: X10C1351231

Section 5: RTR Summary (Questions answered "Yes" will be explained in the Comment block, except for Question 1)	
Is there observable liquid?	☐ Yes ☒ No
Is there any observable liquid in internal containers, more than 60 milliliters or 3 percent by volume, whichever is greater?	☐ Yes ☒ No
Is the total volume of observable liquid in the outermost container GREATER than 1% of the container?	☐ Yes ☒ No
Is there observable liquid in payload containers with an EPA Hazardous Waste Number of U134?	☐ Yes ☒ No
Is there an indication of non-radionuclide pyrophoric materials, such as elemental potassium?	☐ Yes ☒ No
Is there an indication of hazardous wastes not occurring as co-contaminants with TRU mixed wastes (non-mixed hazardous wastes)?	☐ Yes ☒ No
Is there an indication of wastes incompatible with backfill, seal and panel closures materials, container and packaging materials, shipping container materials, or other wastes (i.e., waste does NOT match TRUCON Code[s])?	☐ Yes ☒ No
Is there an indication of wastes containing explosives or compressed gases?	☐ Yes ☒ No
Is there an indication of PCBs liquids?	☐ Yes ☒ No
Is there an indication of the waste exhibiting the characteristic of ignitability, corrosivity, or reactivity (EPA Hazardous Waste Numbers of D001, D002, or D003)?	☐ Yes ☒ No
Is the physical form of the waste inconsistent with the Waste Stream Description or the Waste Matrix Code?	☐ Yes ☒ No
CH or RH TRAMPAC	
Are there heat-sealed bags (unvented) GREATER than 4 liters and LESS than 390 square inches in the waste, or heat sealed bags not authorized in the RH TRUCON Code?	☐ Yes ☒ No
Were there Non-approved Closure Methods used on liner bags or inner bags greater than 4 liters?	☐ Yes ☒ No
Are there sealed containers GREATER than 4 liters?	☐ Yes ☒ No
Are there indications of inadequate protection for heavy and/or sharp objects?	☐ Yes ☒ No
Comments: N/A	
RTR Operator: Daphne Brothers (Print Name) / Daphne Brothers (Signature) / 5/5/2015 (Date)	

CCP Radiography Data Sheet

Section 1: General Information	
[X] RTR Examination [ ] RTR Replicate Scan [ ] RTR Independent Observation	
Site ID:	ORNL
Batch Number:	OR-RTR6-0652
Examination Date:	5/5/2015
Waste Container ID:	X10C1351355
Video/Audio Recorded Media Number:	OR-RTR6-0652 A&B
Procedure and Revision No.:	CCP-TP-053 Rev. 15
NCR(s) associated with the container? (e.g., Prohibited Items)	[X] No [ ] Yes NCR No.: N/A NCR No.: N/A

Section 2: Waste Container Data	
Container Type:	55 Gallon Drum
TRUCON Code:	OR 227
Waste Matrix Code:	S4100
Waste Stream I.D.:	OR-NFS-CH-SOIL
Waste Container Weights:	Gross Wt.: 217.7 kg Tare Wt.: 35.2 kg Net Wt.: 182.5 kg
Rigid Liner and Liner Vent Description:	Liner: [ ] No [X] Yes Lid: [X] No [ ] Yes Type: [ ] 30-mil [X] 90-mil [ ] 110-mil [ ] 125-mil Vented: [ ] No [X] Yes [ ] N/A Punctured: [X] No [ ] Yes Mechanical Vent: [X] No [ ] Yes Fiberboard Liner: [X] No [ ] Yes Lead Lined: [X] No [ ] Yes
Number of Layers of Confinement:	Appears to be 1 layer
Volume Utilization Percentage:	85 %

CCP Radiography Data Sheet

Waste Container ID: X10C1351355

Section 3: Container Inventory and Comments (Detailed descriptions)
IM:
AM:
OM:
OI:
C:
R:
XPM:
OR: Absorbent
IN:
S: Soil

Section 4: Packaging Material and Waste Material Parameters	
Packaging Material:	**Estimated Weight (kg)**
Steel (ST):	27.8
Plastics (PP): Liner bag, Rigid Liner	7.4
Other:	0.0
Total Packaging Weight	35.2
Waste Material Parameter:	**Estimated Weight (kg)**
Iron-based Metal / Alloys (IM):	
Aluminum-based Metals / Alloys (AM):	
Other Metals (OM):	
Other Inorganic Materials (OI)	
Cellulosics (C):	
Rubber (R):	
Plastics (waste materials) (XPM):	
Organic Matrix (OR):	2.5
Inorganic Matrix (IN):	
Soils (S):	180.0
Total WMP Weight:	182.5

CCP Radiography Data Sheet

Waste Container ID: X10C1351355

Section 5: RTR Summary (Questions answered "Yes" will be explained in the Comment block, except for Question 1)	
Is there observable liquid?	☐ Yes ☒ No
Is there any observable liquid in internal containers, more than 60 milliliters or 3 percent by volume, whichever is greater?	☐ Yes ☒ No
Is the total volume of observable liquid in the outermost container GREATER than 1% of the container?	☐ Yes ☒ No
Is there observable liquid in payload containers with an EPA Hazardous Waste Number of U134?	☐ Yes ☒ No
Is there an indication of non-radionuclide pyrophoric materials, such as elemental potassium?	☐ Yes ☒ No
Is there an indication of hazardous wastes not occurring as co-contaminants with TRU mixed wastes (non-mixed hazardous wastes)?	☐ Yes ☒ No
Is there an indication of wastes incompatible with backfill, seal and panel closures materials, container and packaging materials, shipping container materials, or other wastes (i.e., waste does NOT match TRUCON Code[s])?	☐ Yes ☒ No
Is there an indication of wastes containing explosives or compressed gases?	☐ Yes ☒ No
Is there an indication of PCBs liquids?	☐ Yes ☒ No
Is there an indication of the waste exhibiting the characteristic of ignitability, corrosivity, or reactivity (EPA Hazardous Waste Numbers of D001, D002, or D003)?	☐ Yes ☒ No
Is the physical form of the waste inconsistent with the Waste Stream Description or the Waste Matrix Code?	☐ Yes ☒ No
CH or RH TRAMPAC	
Are there heat-sealed bags (unvented) GREATER than 4 liters and LESS than 390 square inches in the waste, or heat sealed bags not authorized in the RH TRUCON Code?	☐ Yes ☒ No
Were there Non-approved Closure Methods used on liner bags or inner bags greater than 4 liters?	☐ Yes ☒ No
Are there sealed containers GREATER than 4 liters?	☐ Yes ☒ No
Are there indications of inadequate protection for heavy and/or sharp objects?	☐ Yes ☒ No
Comments: N/A	

RTR Operator:

Daphne Brothers	Daphne C Brothers	5/5/2015
Print Name	Signature	Date

CCP Radiography Data Sheet

Section 1: General Information	
[X] RTR Examination [ ] RTR Replicate Scan [ ] RTR Independent Observation	
Site ID:	ORNL
Batch Number:	OR-RTR6-0652
Examination Date:	5/5/2015
Waste Container ID:	X10C1351219
Video/Audio Recorded Media Number:	OR-RTR6-0652 A&B
Procedure and Revision No.:	CCP-TP-053 Rev. 15
NCR(s) associated with the container? (e.g., Prohibited Items)	[X] No [ ] Yes NCR No.: N/A NCR No.: N/A

Section 2: Waste Container Data	
Container Type:	55 Gallon Drum
TRUCON Code:	OR 227
Waste Matrix Code:	S4100
Waste Stream I.D.:	OR-NFS-CH-SOIL
Waste Container Weights:	Gross Wt.: 234.7 kg Tare Wt.: 35.2 kg Net Wt.: 199.5 kg
Rigid Liner and Liner Vent Description:	Liner: [ ] No [X] Yes Lid: [X] No [ ] Yes Type: [ ] 30-mil [X] 90-mil [ ] 110-mil [ ] 125-mil Vented: [ ] No [X] Yes [ ] N/A Punctured: [X] No [ ] Yes Mechanical Vent: [X] No [ ] Yes Fiberboard Liner: [X] No [ ] Yes Lead Lined: [X] No [ ] Yes
Number of Layers of Confinement:	Appears to be 1 layer
Volume Utilization Percentage:	90 %

CCP Radiography Data Sheet

Waste Container ID: X10C1351219

Section 3: Container Inventory and Comments (Detailed descriptions)
IM:
AM:
OM:
OI:
C:
R:
XPM:
OR: Absorbent
IN:
S: Soil

Section 4: Packaging Material and Waste Material Parameters	
Packaging Material:	**Estimated Weight (kg)**
Steel (ST):	27.8
Plastics (PP): Liner bag, Rigid Liner	7.4
Other:	0.0
Total Packaging Weight	35.2
Waste Material Parameter:	**Estimated Weight (kg)**
Iron-based Metal / Alloys (IM):	
Aluminum-based Metals / Alloys (AM):	
Other Metals (OM):	
Other Inorganic Materials (OI)	
Cellulosics (C):	
Rubber (R):	
Plastics (waste materials) (XPM):	
Organic Matrix (OR):	2.5
Inorganic Matrix (IN):	
Soils (S):	197.0
Total WMP Weight:	199.5

CCP Radiography Data Sheet

Waste Container ID: X10C1351219

Section 5: RTR Summary (Questions answered "Yes" will be explained in the Comment block, except for Question 1)	
Is there observable liquid?	☐ Yes ☒ No
Is there any observable liquid in internal containers, more than 60 milliliters or 3 percent by volume, whichever is greater?	☐ Yes ☒ No
Is the total volume of observable liquid in the outermost container GREATER than 1% of the container?	☐ Yes ☒ No
Is there observable liquid in payload containers with an EPA Hazardous Waste Number of U134?	☐ Yes ☒ No
Is there an indication of non-radionuclide pyrophoric materials, such as elemental potassium?	☐ Yes ☒ No
Is there an indication of hazardous wastes not occurring as co-contaminants with TRU mixed wastes (non-mixed hazardous wastes)?	☐ Yes ☒ No
Is there an indication of wastes incompatible with backfill, seal and panel closures materials, container and packaging materials, shipping container materials, or other wastes (i.e., waste does NOT match TRUCON Code[s])?	☐ Yes ☒ No
Is there an indication of wastes containing explosives or compressed gases?	☐ Yes ☒ No
Is there an indication of PCBs liquids?	☐ Yes ☒ No
Is there an indication of the waste exhibiting the characteristic of ignitability, corrosivity, or reactivity (EPA Hazardous Waste Numbers of D001, D002, or D003)?	☐ Yes ☒ No
Is the physical form of the waste inconsistent with the Waste Stream Description or the Waste Matrix Code?	☐ Yes ☒ No
CH or RH TRAMPAC	
Are there heat-sealed bags (unvented) GREATER than 4 liters and LESS than 390 square inches in the waste, or heat sealed bags not authorized in the RH TRUCON Code?	☐ Yes ☒ No
Were there Non-approved Closure Methods used on liner bags or inner bags greater than 4 liters?	☐ Yes ☒ No
Are there sealed containers GREATER than 4 liters?	☐ Yes ☒ No
Are there indications of inadequate protection for heavy and/or sharp objects?	☐ Yes ☒ No
Comments: N/A	

RTR Operator:

Daphne Brothers	[signature]	5/5/2015
Print Name	Signature	Date

CCP Radiography Data Sheet

Section 1: General Information	
[X] RTR Examination [ ] RTR Replicate Scan [ ] RTR Independent Observation	
Site ID:	ORNL
Batch Number:	OR-RTR6-0652
Examination Date:	5/5/2015
Waste Container ID:	X10C1351217
Video/Audio Recorded Media Number:	OR-RTR6-0652 A&B
Procedure and Revision No.:	CCP-TP-053 Rev. 15
NCR(s) associated with the container? (e.g., Prohibited Items)	[X] No [ ] Yes NCR No.: N/A NCR No.: N/A

Section 2: Waste Container Data	
Container Type:	55 Gallon Drum
TRUCON Code:	OR 227
Waste Matrix Code:	S4100
Waste Stream I.D.:	OR-NFS-CH-SOIL
Waste Container Weights:	Gross Wt.: 256.0 kg Tare Wt.: 35.2 kg Net Wt.: 220.8 kg
Rigid Liner and Liner Vent Description:	Liner: [ ] No [X] Yes Lid: [X] No [ ] Yes Type: [ ] 30-mil [X] 90-mil [ ] 110-mil [ ] 125-mil Vented: [ ] No [X] Yes [ ] N/A Punctured: [X] No [ ] Yes Mechanical Vent: [X] No [ ] Yes Fiberboard Liner: [X] No [ ] Yes Lead Lined: [X] No [ ] Yes
Number of Layers of Confinement:	Appears to be 1 layer
Volume Utilization Percentage:	90 %

CCP Radiography Data Sheet

Waste Container ID: X10C1351217

Section 3: Container Inventory and Comments	(Detailed descriptions)
IM:	
AM:	
OM:	
OI:	
C:	
R:	
XPM:	
OR: Absorbent	
IN:	
S: Soil	

Section 4: Packaging Material and Waste Material Parameters	
Packaging Material:	**Estimated Weight (kg)**
Steel (ST):	27.8
Plastics (PP): Liner bag, Rigid Liner	7.4
Other:	0.0
Total Packaging Weight	35.2
Waste Material Parameter:	**Estimated Weight (kg)**
Iron-based Metal / Alloys (IM):	
Aluminum-based Metals / Alloys (AM):	
Other Metals (OM):	
Other Inorganic Materials (OI)	
Cellulosics (C):	
Rubber (R):	
Plastics (waste materials) (XPM):	
Organic Matrix (OR):	2.8
Inorganic Matrix (IN):	
Soils (S):	218.0
Total WMP Weight:	220.8

CCP Radiography Data Sheet

Waste Container ID: X10C1351217

Section 5: RTR Summary (Questions answered "Yes" will be explained in the Comment block, except for Question 1)	
Is there observable liquid?	☐ Yes ☒ No
Is there any observable liquid in internal containers, more than 60 milliliters or 3 percent by volume, whichever is greater?	☐ Yes ☒ No
Is the total volume of observable liquid in the outermost container GREATER than 1% of the container?	☐ Yes ☒ No
Is there observable liquid in payload containers with an EPA Hazardous Waste Number of U134?	☐ Yes ☒ No
Is there an indication of non-radionuclide pyrophoric materials, such as *elemental potassium*?	☐ Yes ☒ No
Is there an indication of hazardous wastes not occurring as co-contaminants with TRU mixed wastes (non-mixed hazardous wastes)?	☐ Yes ☒ No
Is there an indication of wastes incompatible with backfill, seal and panel closures materials, container and packaging materials, shipping container materials, or other wastes (i.e., waste does NOT match TRUCON Code[s])?	☐ Yes ☒ No
Is there an indication of wastes containing explosives or compressed gases?	☐ Yes ☒ No
Is there an indication of PCBs liquids?	☐ Yes ☒ No
Is there an indication of the waste exhibiting the characteristic of ignitability, corrosivity, or reactivity (EPA Hazardous Waste Numbers of D001, D002, or D003)?	☐ Yes ☒ No
Is the physical form of the waste inconsistent with the Waste Stream Description or the Waste Matrix Code?	☐ Yes ☒ No
CH or RH TRAMPAC	
Are there heat-sealed bags (unvented) GREATER than 4 liters and LESS than 390 square inches in the waste, or heat sealed bags not authorized in the RH TRUCON Code?	☐ Yes ☒ No
Were there Non-approved Closure Methods used on-liner bags or inner bags greater than 4 liters?	☐ Yes ☒ No
Are there sealed containers GREATER than 4 liters?	☐ Yes ☒ No
Are there indications of inadequate protection for heavy and/or sharp objects?	☐ Yes ☒ No
Comments: N/A	

RTR Operator:		
Daphne Brothers	Daphne C Brothers	5/5/2015
Print Name	Signature	Date

Attachment 3 – CCP Radiography Independent Technical Reviewer Checklist

Batch Data Report No.: OR-RTR6-0652

Description			
1.	Were data generation and reduction conducted in a technically correct manner in accordance with the methods used?	☐ NO	☑ YES
2.	Was the correct revision of the procedure used? Procedure: CCP-TP-053 Rev.: 15	☐ NO	☑ YES
3.	Are the WMPs entered correctly?	☐ NO	☑ YES
4.	Do the estimated weights in Section 4 of Attachment 2 equal the container gross weight?	☐ NO	☑ YES
5.	Is the data reported in the proper units with the correct number of significant figures (e.g., one tenth of a kilogram)?	☐ NO	☑ YES
6.	Was transcription used? If no, proceed to question 7.	☑ NO	☐ YES
	6a. Has the data been verified for transcription errors?	☐ NO	☐ YES
7.	Does the Testing Batch Report include radiography for up to 20 containers?	☐ NO	☑ YES
8.	Are BDR contents complete and do they match the CCP Waste RTR Batch Data Report Table of Contents?	☐ NO	☑ YES
9.	Is all the data signed and dated in reproducible ink and by the individual(s) generating it?	☐ NO	☑ YES
10.	Is all data recorded clearly, legibly, and accurately?	☐ NO	☑ YES
11.	Have changes been made to original data? If no, proceed to question 12.	☑ NO	☐ YES
	11a. Have all changes to original data been lined out, initialed and dated by the individual making the changes?	☐ NO	☐ YES
	11b. Was justification made for changing the original data?	☐ NO	☐ YES
	11c. Were data changes made by the individual who originally collected the data?	☐ NO	☐ YES
12.	Does the waste match the Waste Matrix Code and Waste Stream description?	☐ NO	☑ YES
13.	Are the RTR Operator's decisions regarding the Radiography documented?	☐ NO	☑ YES
14.	Is there an adequate written description of the contents of each item?	☐ NO	☑ YES
15.	Was the video/audio recording media properly prepared and labeled for each waste container?	☐ NO	☑ YES
16.	Was the video/audio recording media check performed satisfactorily and recorded on Attachment 1?	☐ NO	☑ YES

Attachment 3 – CCP Radiography Independent Technical Reviewer Checklist (Continued)

Batch Data Report No.: OR-RTR6-0652

Description		
17. Was the Image Test performed satisfactorily and recorded on Attachment 1?	☐ NO	☑ YES
18. Was the Replicate Scan performed and recorded on an Attachment 2?	☐ NO	☑ YES
19. Was the Replicate Scan RTR Operator different from the first RTR Operator?	☐ NO	☑ YES
20. Did the Replicate Scan RTR Operator and the first RTR Operator agree on the results?	☐ NO	☑ YES
21. Was the Independent Observation performed and recorded on an Attachment 2?	☐ NO	☑ YES
22. Was the Independent Observation RTR Operator different from the first RTR Operator?	☐ NO	☑ YES
23. Did the Independent Observation RTR Operator and the first RTR Operator agree on the results?	☐ NO	☑ YES
24. Was the data collection performed by qualified individuals?	☐ NO	☑ YES
25. Were NCRs initiated as required at DGL? If no, proceed to question 26.	☑ NO	☐ YES
25a. Have the NCR(s) associated with RTR been included in the BDR?	☐ NO	☐ YES
26. Is the RTR examination for CH waste? If no, proceed to question 27.	☐ NO	☑ YES
26a. Have the CH Quality Assurance Objectives (QAOs) been met (if applicable)? Precision – Precision is maintained by reconciling any discrepancies between two radiography operators with regard to identification of the waste matrix code, liquids in excess of TSDF-WAC limits, and compressed gases through independent replicate scans and independent observations. Additionally, the precision of radiography is verified prior to use by tuning precisely enough to demonstrate compliance with QAOs through viewing an image test pattern. Accuracy – Accuracy is obtained by using a target to tune the image for maximum sharpness and by requiring operators to successfully identify 100 percent of the items required to meet the DQOs for radiography specified in CCP-PO-001, Section C-4a(1) in a training container during their initial qualification and subsequent requalification. Completeness – A video and audio media recording of the radiography examination and a validated radiography data form will be obtained for 100 percent of the waste containers subject to radiography. All video and audio media recordings and radiography data forms will be subject to validation as indicated in CCP-PO-001, Section C3-4. Comparability – The comparability of radiography data from different operators shall be enhanced by using standardized radiography procedures and operator qualifications.	☐ NO	☑ YES

Attachment 3 – CCP Radiography Independent Technical Reviewer Checklist (Continued)

Batch Data Report No.: OR-RTR6-0652

Description		
27. Is the RTR examination for RH waste? If no, proceed to comment section.	☑ NO	☐ YES
27a. Have the RH QAOs been met (if applicable)? Precision – Precision is maintained by reconciling any discrepancies between two operators (during Independent Observation and Replicate scans) with regard to the identification of important waste characteristics (i.e., physical form of the waste and absence of prohibited liquids) within a single container. Accuracy – Accuracy is obtained by using a target to tune the image for maximum sharpness and by requiring operators to successfully identify prohibited liquid in a training container during their initial qualification and subsequent requalification. Representativeness – All of the relevant contents in a container selected for radiography will be described. Completeness – All of the relevant waste information must be assembled and must show that each of the containers in the waste stream belongs to the waste stream. This information must be documented on videotape or other equivalent media and data form. Comparability – Comparability is ensured by meeting the program training requirements and complying with the minimum standards used to implement the radiography process.	☐ NO	☐ YES

Comments: N/A

I have reviewed 100% of the container specific and batch data in this report and find it acceptable.

Independent Technical Reviewer:

Fred Overy — Printed Name

Signature

5-6-15 — Date

DIVIDER PAGE ONLY

NOT PART OF PAGE COUNT

Attachment 2 – CCP Records Transmittal/Receiving Form

CCP Records / Records Custodian, 4021 National Parks Highway - MS: GSA 212, Carlsbad, New Mexico 88220

Telephone Number: 575-234-7523

Fax Number: 575-234-7033

Attn:	CCP RECORDS	From:	PATRICK SMITH II
Ship to:	CCP RECORDS CUSTODIAN	Site:	ORNL
	4021 NATIONAL PARKS HWY.	Company:	TFE INC.
	MS GSA 212	Telephone Number:	865-574-6002
	CARLSBAD, NM 88220-9082	Date Sent:	5-7-2015
Telephone Number:	575-234-7523		

OR-RTR6-0652	RTR DVD (DISK B)	5-5-2015	N/A
N/A	N/A	N/A	N/A
N/A	N/A	N/A	N/A
N/A	N/A	N/A	N/A
N/A	N/A	N/A	N/A
N/A	N/A	N/A	N/A

Comments:

N/A

(When the Record accepted line has been completed, the rest of the page below may be left blank.)
Acceptance/Rejection Signature and Date

Records Accepted ☑ _____ Greta Leos 5-11-15
Signature Printed Name Date

Records Rejected ☐ _____ _____ _____
Signature Printed Name Date

Reason for Rejection:

Re-submittal: _____ _____ _____
Signature Printed Name Date

```
**********************************
***        Send Results        ***
**********************************

   Sending is complete.

Job No.                    4448
Address                    918655768703
Name                       ORNL
Start Time                 05/11 10:23 AM
Call Length                00'21
Sheets                     1
Result                     OK
```


Attachment 2 – CCP Records Transmittal/Receiving Form

CCP Records / Records Custodian, 4021 National Parks Highway - MS: GSA 212, Carlsbad, New Mexico 88220

Telephone Number: 575-234-7523

Fax Number: 575-234-7033

Attn:	CCP RECORDS	From:	PATRICK SMITH II
Ship to:	CCP RECORDS CUSTODIAN	Site:	ORNL
	4021 NATIONAL PARKS HWY.	Company:	TFE INC.
	MS GSA 212	Telephone Number:	865-574-6002
	CARLSBAD, NM 88220-9082	Date Sent:	5-7-2015
Telephone Number:	575-234-7523		

OR-RTR6-0652	RTR DVD (DISK B)	5-5-2015	N/A
N/A	N/A	N/A	N/A
N/A	N/A	N/A	N/A
N/A	N/A	N/A	N/A
N/A	N/A	N/A	N/A
N/A	N/A	N/A	N/A

N/A

(When the Record accepted line has been completed, the rest of the page below may be left blank.)

Acceptance/Rejection Signature and Date

Records Accepted [✓] Signature Greta Leos Printed Name 5-11-15 Date

Records Rejected [ ]

Attachment 2 – CCP Records Transmittal/Receiving Form

CCP Records / Records Custodian, 4021 National Parks Highway - MS: GSA 212, Carlsbad, New Mexico 88220

Telephone Number: 575-234-7523

Fax Number: 575-234-7033

Attn:	CCP RECORDS	From:	PATRICK SMITH II
Ship to:	CCP RECORDS CUSTODIAN	Site:	ORNL
	4021 NATIONAL PARKS HWY.	Company:	TFE INC.
	MS GSA 212	Telephone Number:	865-574-6002
	CARLSBAD, NM 88220-9082	Date Sent:	5-14-2015
Telephone Number:	575-234-7523		

Package Number	Title/Description	Record Date	Item Count
OR-RTR6-0652	RTR BDR	5-05-2015	42
OR-RTR6-0652	RTR DVD (DISK A)	5-05-2015	N/A
N/A	N/A	N/A	N/A
N/A	N/A	N/A	N/A
N/A	N/A	N/A	N/A
N/A	N/A	N/A	N/A

Comments

N/A

(When the Record accepted line has been completed, the rest of the page below may be left blank.)
Acceptance/Rejection Signature and Date

Records Accepted ☑	Signature	Greta Leos (Printed Name)	5-21-15 (Date)
Records Rejected ☐	Signature	Printed Name	Date

Reason for Rejection:

Re-submittal:

Signature	Printed Name	Date

****
*** Send Results ***
****

Sending is complete.

Job No.	4943
Address	918655768703
Name	ORNL
Start Time	05/21 02:38 PM
Call Length	00'21
Sheets	1
Result	OK

Attachment 2 – CCP Records Transmittal/Receiving Form

CCP Records / Records Custodian, 4021 National Parks Highway - MS: GSA 212, Carlsbad, New Mexico 88220

Telephone Number: 575-234-7523

Fax Number: 575-234-7033

Attn:	CCP RECORDS	From:	PATRICK SMITH II
Ship to:	CCP RECORDS CUSTODIAN	Site:	ORNL
	4021 NATIONAL PARKS HWY.	Company:	TFE INC.
	MS GSA 212	Telephone Number:	865-574-6002
	CARLSBAD, NM 88220-9082	Date Sent:	5-14-2015
Telephone Number:	575-234-7523		

Package ID	Title/Description	Record Dates	Qty
OR-RTR6-0652	RTR BDR	5-05-2015	42
OR-RTR6-0652	RTR DVD (DISK A)	5-05-2015	N/A
N/A	N/A	N/A	N/A
N/A	N/A	N/A	N/A
N/A	N/A	N/A	N/A
N/A	N/A	N/A	N/A

Comments

N/A

(When the Record accepted line has been completed, the rest of the page below may be left blank.)
Acceptance/Rejection Signature and Date

Records Accepted ☑ Greta Leos Signature Greta Leos Printed Name 5-21-15 Date

Records Rejected ☐

DIVIDER PAGE

Attachment 2 – CCP SPM Radiography Project Level Validation Checklist and Summary

BDR Number: OR-RTR6-0701 **Examination Date(s):** 11/11/2015

Description of Criteria Reviewed	Criteria Met? YES	NO	NA	Comments/Qualifiers
1. Is the completed, signed, and dated Independent Technical Reviewer Checklist included in the BDR, and the independent technical reviewer was not involved in the generation or recording of the data under review? **Reference Source: CCP-PO-001, C3-4**	X			
2. Does the BDR contain all items addressed in the BDR Table of Contents? **Reference Source: CCP-PO-001, C3-4**	X			
3. Does the BDR include a listing of all the container numbers in the batch? **Reference Source: CCP-PO-001, C3-4**	X			
4. List all containers that have met QAOs. **Reference Source: CCP-PO-001, C3-4**				Container Numbers: X10C1351296 X10C1351270 X10C1351421 X10C1351424 X10C1351347 X10C1351345 X10C1351346 X10C1351356 X10C1351357 X10C1351422
5. Does the BDR identify the current implementing procedure and revision number? **Reference Source: CCP-PO-001, Table C3-3**	X			
6. Is there a reference to or copy of any associated NCRs (if any) in the BDR? NA if no NCRs. **Reference Source: CCP-PO-001, Table C3-3**			X	
7. Are there 20 or fewer containers in the batch? **Reference Source: CCP-PO-001, C3-4**	X			
8. Are the data properly reported (i.e., data are reported in correct units and with correct significant figures)? **Reference Source: CCP-PO-001, C3-4**	X			
9. Is there evidence of verification that the physical form matches the Waste Matrix Code? **Reference Source: CCP-PO-001, Table C3-3**	X			

COPY

CCP RECORDS ORIGINAL
DATE REC'D 11-13-15

Attachment 2 – CCP SPM Radiography Project Level Validation Checklist and Summary (Continued)

BDR Number: OR-RTR6-0701 **Examination Date(s):** 11/11/2015

Description of Criteria Reviewed	Criteria Met? YES	NO	NA	Comments/Qualifiers
10. Is there evidence of verification that the physical form matches the waste stream description? **Reference Source: CCP-PO-001, Table C3-3**	X			
11. Are prohibited items absent? **Reference Source: CCP-PO-001, Table C3-3**	X			
12. Does observable liquid, if present, meet the criteria of the TSDF-WAC? **Reference Source: CCP-PO-001, C-1**			X	No Observable Liquids
13. Were discrepancies between two operators with regard to identification of waste matrix code, liquids in excess of the TSDF-WAC, or compressed gases through replicate scans and independent observations reconciled? NA if no discrepancies. **Reference Source: CCP-PO-001, C3-2**			X	
14. Are the training qualifications for all radiography personnel acceptable? **Reference Source: CCP-PO-001, C3-8**	X			
15. Was evidence of the video/audio check included in the BDR? **Reference Source: CCP-PO-001, C1-1**	X			
16. Was the Lines-Pair Resolution Test or Sieve Test Check included in the BDR? **Reference Source: CCP Technical Procedures**	X			
17. Was a replicate scan performed once per day, or once per batch, whichever is LESS frequent? **Reference Source: CCP-PO-001, C1-1**	X			
18. Was an independent observation performed once per day, or once per batch, whichever is LESS frequent? **Reference Source: CCP-PO-001, C1-1**	X			

Attachment 2 – CCP SPM Radiography Project Level Validation Checklist and Summary (Continued)

BDR Number: OR-RTR6-0701 **Examination Date(s):** 11/11/2015

Description of Criteria Reviewed	Criteria Met? YES	NO	NA	Comments/Qualifiers
19. Were the replicate scan and independent observation performed on different waste containers? **Reference Source: CCP-PO-001, C1-1**	X			
20. Were the personnel performing the replicate scan and independent observation different from the individual who performed the original? **Reference Source: CCP-PO-001, C1-1**	X			
21. Does the BDR include an estimate of each material parameter weight in kg for each container? **Reference Source: CCP Technical Procedures**	X			
22. Does the BDR include a description of each material parameter for each container? **Reference Source: CCP Technical Procedures**	X			
23. Is the container gross weight recorded in kilograms (kg) for each container in the BDR? **Reference Source: CCP Technical Procedures**	X			
24. Was the Scale Weight Calibration Check included in the BDR? **Reference Source: CCP Technical Procedures**			X	Scale not used.
25. Was the Scale Weight Check included in the BDR? **Reference Source: CCP Technical Procedures**			X	Scale not used.

Comments: N/A

The container QC checks were properly performed and meet the Quality Assurance Objectives (QAOs). Proper procedures were followed during data reduction and analysis. The batch is complete, acceptable, and includes all supporting data and documentation required by the QAPjP.

Roger Whiteaker	Roger Whiteaker	11/12/2015
SPM Printed Name	Signature	Date

Checklist is to be re-signed only when a re-review is performed.

SPM Printed Name	Signature	Reason	Date
SPM Printed Name	Signature	Reason	Date

Attachment 5–CCP Radiography Batch Data Report Cover Sheet

Site ID: ORNL

Batch Data Report No.: OR-RTR6-0701 ☑ CH ☐ RH Date: 11-11-15

Waste Container ID Numbers	
Replicate Scan:	X10C1351422
Independent Observation:	X10C1351296
1	X10C1351296
2	X10C1351270
3	X10C1351421
4	X10C1351424
5	X10C1351347
6	X10C1351345
7	X10C1351346
8	X10C1351356
9	X10C1351357
10	X10C1351422
11	N/A
12	N/A
13	N/A
14	N/A
15	N/A
16	N/A
17	N/A
18	N/A
19	N/A
20	N/A

RTR Operator:

Printed Name	Signature	Date
Eric Lyles		11-11-15

Independent Technical Reviewer:

Printed Name	Signature	Date
Daphne. Brothers	Daphne D Brothers	11-11-15

NTPC RECORDS ORIGINAL
DATE REC'D 11-11-2015

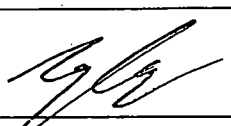
Attachment 4 – CCP Radiography Batch Data Report Table of Contents and Batch Narrative

Batch Data Report No.: OR-RTR6-0701 Date: 11-11-15

Table Of Contents		
Item	Description	Page No.
1	CCP Radiography Batch Data Report Cover Sheet	1
2	CCP Radiography Batch Data Report Table Of Contents	2
3	CCP RTR Measurement Control Report	3
4	CCP Radiography Data Sheets	4
5	Copy of NCRs (NA, If Not Applicable)	N/A
6	CCP Independent Technical Reviewer Checklist	40

Batch Narrative
All Quality Checks were performed and recorded on CCP-TP-053, Rev.15, CCP Radiography Measurement Control Report.

Eric Lyles — RTR Operator



Signature

11-11-15 — Date

Attachment 1 – CCP RTR Measurement Control Report

Site ID: ORNL		
Batch Data Report No.: OR-RTR6-0701		
Examination Date: 11-11-15		
Control Checks		
Video/Audio Recorded Media System Check	☑ SAT	☐ UNSAT
Image Test : 10 Lines (Minimum acceptable is 5 lines-pair/cm or #6 Sieve is viewable)	☑ SAT	☐ UNSAT
Comments: N/A		
RTR Operator:		
Eric Lyles (Printed Name)	(Signature)	11-11-15 (Date)

3

CCP Radiography Data Sheet

Section 1: General Information	
☐ RTR Examination ☒ RTR Replicate Scan ☐ RTR Independent Observation	
Site ID:	ORNL
Batch Number:	OR-RTR6-0701
Examination Date:	11/11/2015
Waste Container ID:	X10C1351422
Video/Audio Recorded Media Number:	OR-RTR6-0701 A&B
Procedure and Revision No.:	CCP-TP-053 Rev. 15
NCR(s) associated with the container? (e.g., Prohibited Items)	☒ No ☐ Yes NCR No.: N/A NCR No.: N/A

Section 2: Waste Container Data	
Container Type:	55 Gallon Drum
TRUCON Code:	OR 227
Waste Matrix Code:	S4100
Waste Stream I.D.:	OR-NFS-CH-SOIL
Waste Container Weights:	Gross Wt.: 220.2 kg Tare Wt.: 35.2 kg Net Wt.: 185.0 kg
Rigid Liner and Liner Vent Description:	Liner: ☐ No ☒ Yes Lid: ☒ No ☐ Yes Type: ☐ 30-mil ☒ 90-mil ☐ 110-mil ☐ 125-mil Vented: ☐ No ☒ Yes ☐ N/A Punctured: ☒ No ☐ Yes Mechanical Vent: ☒ No ☐ Yes Fiberboard Liner: ☒ No ☐ Yes Lead Lined: ☒ No ☐ Yes
Number of Layers of Confinement:	Appears to be 1 layer
Volume Utilization Percentage:	85 %

CCP Radiography Data Sheet

Waste Container ID: X10C1351422

Section 3: Container Inventory and Comments	(Detailed descriptions)
IM:	
AM:	
OM:	
OI:	
C:	
R:	
XPM: Plastic sheeting	
OR: Absorbent	
IN:	
S: Soil	

Section 4: Packaging Material and Waste Material Parameters	
Packaging Material:	**Estimated Weight (kg)**
Steel (ST):	27.8
Plastics (PP): Liner bag, Rigid Liner	7.4
Other:	0.0
Total Packaging Weight	35.2
Waste Material Parameter:	**Estimated Weight (kg)**
Iron-based Metal / Alloys (IM):	
Aluminum-based Metals / Alloys (AM):	
Other Metals (OM):	
Other Inorganic Materials (OI)	
Cellulosics (C):	
Rubber (R):	
Plastics (waste materials) (XPM):	1.0
Organic Matrix (OR):	2.5
Inorganic Matrix (IN):	
Soils (S):	181.5
Total WMP Weight:	185.0

CCP Radiography Data Sheet

Waste Container ID: X10C1351422

Section 5: RTR Summary (Questions answered "Yes" will be explained in the Comment block, except for Question 1)	
Is there observable liquid?	☐ Yes ☒ No
Is there any observable liquid in internal containers, more than 60 milliliters or 3 percent by volume, whichever is greater?	☐ Yes ☒ No
Is the total volume of observable liquid in the outermost container GREATER than 1% of the container?	☐ Yes ☒ No
Is there observable liquid in payload containers with an EPA Hazardous Waste Number of U134?	☐ Yes ☒ No
Is there an indication of non-radionuclide pyrophoric materials, such as elemental potassium?	☐ Yes ☒ No
Is there an indication of hazardous wastes not occurring as co-contaminants with TRU mixed wastes (non-mixed hazardous wastes)?	☐ Yes ☒ No
Is there an indication of wastes incompatible with backfill, seal and panel closures materials, container and packaging materials, shipping container materials, or other wastes (i.e., waste does NOT match TRUCON Code[s])?	☐ Yes ☒ No
Is there an indication of wastes containing explosives or compressed gases?	☐ Yes ☒ No
Is there an indication of PCBs liquids?	☐ Yes ☒ No
Is there an indication of the waste exhibiting the characteristic of ignitability, corrosivity, or reactivity (EPA Hazardous Waste Numbers of D001, D002, or D003)?	☐ Yes ☒ No
Is the physical form of the waste inconsistent with the Waste Stream Description or the Waste Matrix Code?	☐ Yes ☒ No
CH or RH TRAMPAC	
Are there heat-sealed bags (unvented) GREATER than 4 liters and LESS than 390 square inches in the waste, or heat sealed bags not authorized in the RH TRUCON Code?	☐ Yes ☒ No
Were there Non-approved Closure Methods used on liner bags or inner bags greater than 4 liters?	☐ Yes ☒ No
Are there sealed containers GREATER than 4 liters?	☐ Yes ☒ No
Are there indications of inadequate protection for heavy and/or sharp objects?	☐ Yes ☒ No

Comments: This Replicate Scan agrees with the Original Scan. FO 11-11-15

RTR Operator:

Fred Oney		11/11/2015
Print Name	Signature	Date

CCP Radiography Data Sheet

Section 1: General Information	
☐ RTR Examination ☐ RTR Replicate Scan ☒ RTR Independent Observation	
Site ID:	ORNL
Batch Number:	OR-RTR6-0701
Examination Date:	11/11/2015
Waste Container ID:	X10C1351296
Video/Audio Recorded Media Number:	OR-RTR6-0701 A&B
Procedure and Revision No.:	CCP-TP-053 Rev. 15
NCR(s) associated with the container? (e.g., Prohibited Items)	☒ No ☐ Yes NCR No.: N/A NCR No.: N/A

Section 2: Waste Container Data	
Container Type:	55 Gallon Drum
TRUCON Code:	OR 227
Waste Matrix Code:	S4100
Waste Stream I.D.:	OR-NFS-CH-SOIL
Waste Container Weights:	Gross Wt.: 233.2 kg Tare Wt.: 35.2 kg Net Wt.: 198.0 kg
Rigid Liner and Liner Vent Description:	Liner: ☐ No ☒ Yes Lid: ☒ No ☐ Yes Type: ☐ 30-mil ☒ 90-mil ☐ 110-mil ☐ 125-mil Vented: ☐ No ☒ Yes ☐ N/A Punctured: ☒ No ☐ Yes Mechanical Vent: ☒ No ☐ Yes Fiberboard Liner: ☒ No ☐ Yes Lead Lined: ☒ No ☐ Yes
Number of Layers of Confinement:	Appears to be 1 layer
Volume Utilization Percentage:	95 %

CCP Radiography Data Sheet

Waste Container ID: X10C1351296

Section 3: Container Inventory and Comments (Detailed descriptions)	
IM:	
AM:	
OM:	
OI:	
C:	
R:	
XPM:	
OR:	Absorbent
IN:	
S:	Soil

Section 4: Packaging Material and Waste Material Parameters	
Packaging Material:	**Estimated Weight (kg)**
Steel (ST):	27.8
Plastics (PP): Liner bag, Rigid Liner	7.4
Other:	0.0
Total Packaging Weight	35.2
Waste Material Parameter:	**Estimated Weight (kg)**
Iron-based Metal / Alloys (IM):	
Aluminum-based Metals / Alloys (AM):	
Other Metals (OM):	
Other Inorganic Materials (OI)	
Cellulosics (C):	
Rubber (R):	
Plastics (waste materials) (XPM):	
Organic Matrix (OR):	2.5
Inorganic Matrix (IN):	
Soils (S):	195.5
Total WMP Weight:	198.0

CCP Radiography Data Sheet

Waste Container ID: X10C1351296

Section 5: RTR Summary (Questions answered "Yes" will be explained in the Comment block, except for Question 1)	
Is there observable liquid?	☐ Yes ☒ No
Is there any observable liquid in internal containers, more than 60 milliliters or 3 percent by volume, whichever is greater?	☐ Yes ☒ No
Is the total volume of observable liquid in the outermost container GREATER than 1% of the container?	☐ Yes ☒ No
Is there observable liquid in payload containers with an EPA Hazardous Waste Number of U134?	☐ Yes ☒ No
Is there an indication of non-radionuclide pyrophoric materials, such as elemental potassium?	☐ Yes ☒ No
Is there an indication of hazardous wastes not occurring as co-contaminants with TRU mixed wastes (non-mixed hazardous wastes)?	☐ Yes ☒ No
Is there an indication of wastes incompatible with backfill, seal and panel closures materials, container and packaging materials, shipping container materials, or other wastes (i.e., waste does NOT match TRUCON Code[s])?	☐ Yes ☒ No
Is there an indication of wastes containing explosives or compressed gases?	☐ Yes ☒ No
Is there an indication of PCBs liquids?	☐ Yes ☒ No
Is there an indication of the waste exhibiting the characteristic of ignitability, corrosivity, or reactivity (EPA Hazardous Waste Numbers of D001, D002, or D003)?	☐ Yes ☒ No
Is the physical form of the waste inconsistent with the Waste Stream Description or the Waste Matrix Code?	☐ Yes ☒ No
CH or RH TRAMPAC	
Are there heat-sealed bags (unvented) GREATER than 4 liters and LESS than 390 square inches in the waste, or heat sealed bags not authorized in the RH TRUCON Code?	☐ Yes ☒ No
Were there Non-approved Closure Methods used on liner bags or inner bags greater than 4 liters?	☐ Yes ☒ No
Are there sealed containers GREATER than 4 liters?	☐ Yes ☒ No
Are there indications of inadequate protection for heavy and/or sharp objects?	☐ Yes ☒ No

Comments: This Independent Observation agrees with the Original Scan.

FO

11-11-15

RTR Operator:

Fred Oney		11/11/2015
Print Name	Signature	Date

CCP Radiography Data Sheet

Section 1: General Information	
[X] RTR Examination [ ] RTR Replicate Scan [ ] RTR Independent Observation	
Site ID:	ORNL
Batch Number:	OR-RTR6-0701
Examination Date:	11/11/2015
Waste Container ID:	X10C1351296
Video/Audio Recorded Media Number:	OR-RTR6-0701 A&B
Procedure and Revision No.:	CCP-TP-053 Rev. 15
NCR(s) associated with the container? (e.g., Prohibited Items)	[X] No [ ] Yes NCR No.: N/A NCR No.: N/A

Section 2: Waste Container Data	
Container Type:	55 Gallon Drum
TRUCON Code:	OR 227
Waste Matrix Code:	S4100
Waste Stream I.D.:	OR-NFS-CH-SOIL
Waste Container Weights:	Gross Wt.: 233.2 kg Tare Wt.: 35.2 kg Net Wt.: 198.0 kg
Rigid Liner and Liner Vent Description:	Liner: [ ] No [X] Yes Lid: [X] No [ ] Yes Type: [ ] 30-mil [X] 90-mil [ ] 110-mil [ ] 125-mil Vented: [ ] No [X] Yes [ ] N/A Punctured: [X] No [ ] Yes Mechanical Vent: [X] No [ ] Yes Fiberboard Liner: [X] No [ ] Yes Lead Lined: [X] No [ ] Yes
Number of Layers of Confinement:	Appears to be 1 layer
Volume Utilization Percentage:	95 %

CCP Radiography Data Sheet

Waste Container ID: X10C1351296

Section 3: Container Inventory and Comments (Detailed descriptions)

IM:

AM:

OM:

OI:

C:

R:

XPM:

OR: Absorbent

IN:

S: Soil

Section 4: Packaging Material and Waste Material Parameters

Packaging Material:	**Estimated Weight (kg)**
Steel (ST):	27.8
Plastics (PP): Liner bag, Rigid Liner	7.4
Other:	0.0
Total Packaging Weight	35.2
Waste Material Parameter:	**Estimated Weight (kg)**
Iron-based Metal / Alloys (IM):	
Aluminum-based Metals / Alloys (AM):	
Other Metals (OM):	
Other Inorganic Materials (OI)	
Cellulosics (C):	
Rubber (R):	
Plastics (waste materials) (XPM):	
Organic Matrix (OR):	2.0
Inorganic Matrix (IN):	
Soils (S):	196.0
Total WMP Weight:	198.0

CCP Radiography Data Sheet

Waste Container ID: X10C1351296

Section 5: RTR Summary (Questions answered "Yes" will be explained in the Comment block, except for Question 1)	
Is there observable liquid?	☐ Yes ☒ No
Is there any observable liquid in internal containers, more than 60 milliliters or 3 percent by volume, whichever is greater?	☐ Yes ☒ No
Is the total volume of observable liquid in the outermost container GREATER than 1% of the container?	☐ Yes ☒ No
Is there observable liquid in payload containers with an EPA Hazardous Waste Number of U134?	☐ Yes ☒ No
Is there an indication of non-radionuclide pyrophoric materials, such as elemental potassium?	☐ Yes ☒ No
Is there an indication of hazardous wastes not occurring as co-contaminants with TRU mixed wastes (non-mixed hazardous wastes)?	☐ Yes ☒ No
Is there an indication of wastes incompatible with backfill, seal and panel closures materials, container and packaging materials, shipping container materials, or other wastes (i.e., waste does NOT match TRUCON Code[s])?	☐ Yes ☒ No
Is there an indication of wastes containing explosives or compressed gases?	☐ Yes ☒ No
Is there an indication of PCBs liquids?	☐ Yes ☒ No
Is there an indication of the waste exhibiting the characteristic of ignitability, corrosivity, or reactivity (EPA Hazardous Waste Numbers of D001, D002, or D003)?	☐ Yes ☒ No
Is the physical form of the waste inconsistent with the Waste Stream Description or the Waste Matrix Code?	☐ Yes ☒ No
CH or RH TRAMPAC	
Are there heat-sealed bags (unvented) GREATER than 4 liters and LESS than 390 square inches in the waste, or heat sealed bags not authorized in the RH TRUCON Code?	☐ Yes ☒ No
Were there Non-approved Closure Methods used on liner bags or inner bags greater than 4 liters?	☐ Yes ☒ No
Are there sealed containers GREATER than 4 liters?	☐ Yes ☒ No
Are there indications of inadequate protection for heavy and/or sharp objects?	☐ Yes ☒ No
Comments: N/A	

RTR Operator:

Eric Lyles		11/11/2015
Print Name	Signature	Date

CCP Radiography Data Sheet

Section 1: General Information	
[X] RTR Examination [ ] RTR Replicate Scan [ ] RTR Independent Observation	
Site ID:	ORNL
Batch Number:	OR-RTR6-0701
Examination Date:	11/11/2015
Waste Container ID:	X10C1351270
Video/Audio Recorded Media Number:	OR-RTR6-0701 A&B
Procedure and Revision No.:	CCP-TP-053 Rev. 15
NCR(s) associated with the container? (e.g., Prohibited Items)	[X] No [ ] Yes NCR No.: N/A NCR No.: N/A

Section 2: Waste Container Data	
Container Type:	55 Gallon Drum
TRUCON Code:	OR 227
Waste Matrix Code:	S4100
Waste Stream I.D.:	OR-NFS-CH-SOIL
Waste Container Weights:	Gross Wt.: 236.7 kg Tare Wt.: 35.2 kg Net Wt.: 201.5 kg
Rigid Liner and Liner Vent Description:	Liner: [ ] No [X] Yes Lid: [X] No [ ] Yes Type: [ ] 30-mil [X] 90-mil [ ] 110-mil [ ] 125-mil Vented: [ ] No [X] Yes [ ] N/A Punctured: [X] No [ ] Yes Mechanical Vent: [X] No [ ] Yes Fiberboard Liner: [X] No [ ] Yes Lead Lined: [X] No [ ] Yes
Number of Layers of Confinement:	Appears to be 1 layer
Volume Utilization Percentage:	90 %

CCP Radiography Data Sheet

Waste Container ID: X10C1351270

Section 3: Container Inventory and Comments (Detailed descriptions)
IM:
AM:
OM:
OI:
C:
R:
XPM:
OR: Absorbent
IN:
S: Soil

Section 4: Packaging Material and Waste Material Parameters	
Packaging Material:	**Estimated Weight (kg)**
Steel (ST):	27.8
Plastics (PP): Liner bag, Rigid Liner	7.4
Other:	0.0
Total Packaging Weight	35.2
Waste Material Parameter:	**Estimated Weight (kg)**
Iron-based Metal / Alloys (IM):	
Aluminum-based Metals / Alloys (AM):	
Other Metals (OM):	
Other Inorganic Materials (OI)	
Cellulosics (C):	
Rubber (R):	
Plastics (waste materials) (XPM):	
Organic Matrix (OR):	3.0
Inorganic Matrix (IN):	
Soils (S):	198.5
Total WMP Weight:	201.5

CCP Radiography Data Sheet

Waste Container ID: X10C1351270

Section 5: RTR Summary (Questions answered "Yes" will be explained in the Comment block, except for Question 1)	
Is there observable liquid?	☐ Yes ☒ No
Is there any observable liquid in internal containers, more than 60 milliliters or 3 percent by volume, whichever is greater?	☐ Yes ☒ No
Is the total volume of observable liquid in the outermost container GREATER than 1% of the container?	☐ Yes ☒ No
Is there observable liquid in payload containers with an EPA Hazardous Waste Number of U134?	☐ Yes ☒ No
Is there an indication of non-radionuclide pyrophoric materials, such as elemental potassium?	☐ Yes ☒ No
Is there an indication of hazardous wastes not occurring as co-contaminants with TRU mixed wastes (non-mixed hazardous wastes)?	☐ Yes ☒ No
Is there an indication of wastes incompatible with backfill, seal and panel closures materials, container and packaging materials, shipping container materials, or other wastes (i.e., waste does NOT match TRUCON Code[s])?	☐ Yes ☒ No
Is there an indication of wastes containing explosives or compressed gases?	☐ Yes ☒ No
Is there an indication of PCBs liquids?	☐ Yes ☒ No
Is there an indication of the waste exhibiting the characteristic of ignitability, corrosivity, or reactivity (EPA Hazardous Waste Numbers of D001, D002, or D003)?	☐ Yes ☒ No
Is the physical form of the waste inconsistent with the Waste Stream Description or the Waste Matrix Code?	☐ Yes ☒ No
CH or RH TRAMPAC	
Are there heat-sealed bags (unvented) GREATER than 4 liters and LESS than 390 square inches in the waste, or heat sealed bags not authorized in the RH TRUCON Code?	☐ Yes ☒ No
Were there Non-approved Closure Methods used on liner bags or inner bags greater than 4 liters?	☐ Yes ☒ No
Are there sealed containers GREATER than 4 liters?	☐ Yes ☒ No
Are there indications of inadequate protection for heavy and/or sharp objects?	☐ Yes ☒ No
Comments: N/A	

RTR Operator:

Eric Lyles	[signature]	11/11/2015
Print Name	Signature	Date

CCP Radiography Data Sheet

Section 1: General Information		
[X] RTR Examination	[ ] RTR Replicate Scan	[ ] RTR Independent Observation
Site ID:	ORNL	
Batch Number:	OR-RTR6-0701	
Examination Date:	11/11/2015	
Waste Container ID:	X10C1351421	
Video/Audio Recorded Media Number:	OR-RTR6-0701	A&B
Procedure and Revision No.:	CCP-TP-053	Rev. 15
NCR(s) associated with the container? (e.g., Prohibited Items)	[X] No [ ] Yes NCR No.: N/A NCR No.: N/A	

Section 2: Waste Container Data	
Container Type:	55 Gallon Drum
TRUCON Code:	OR 227
Waste Matrix Code:	S4100
Waste Stream I.D.:	OR-NFS-CH-SOIL
Waste Container Weights:	Gross Wt.: 216.9 kg Tare Wt.: 35.2 kg Net Wt.: 181.7 kg
Rigid Liner and Liner Vent Description:	Liner: [ ] No [X] Yes Lid: [X] No [ ] Yes Type: [ ] 30-mil [X] 90-mil [ ] 110-mil [ ] 125-mil Vented: [ ] No [X] Yes [ ] N/A Punctured: [X] No [ ] Yes Mechanical Vent: [X] No [ ] Yes Fiberboard Liner: [X] No [ ] Yes Lead Lined: [X] No [ ] Yes
Number of Layers of Confinement:	Appears to be 1 layer
Volume Utilization Percentage:	85 %

CCP Radiography Data Sheet

Waste Container ID: X10C1351421

Section 3: Container Inventory and Comments (Detailed descriptions)

IM:

AM:

OM:

OI:

C:

R:

XPM:

OR: Absorbent

IN:

S: Soil

Section 4: Packaging Material and Waste Material Parameters

Packaging Material:	**Estimated Weight (kg)**
Steel (ST):	27.8
Plastics (PP): Liner bag, Rigid Liner	7.4
Other:	0.0
Total Packaging Weight	35.2
Waste Material Parameter:	**Estimated Weight (kg)**
Iron-based Metal / Alloys (IM):	
Aluminum-based Metals / Alloys (AM):	
Other Metals (OM):	
Other Inorganic Materials (OI)	
Cellulosics (C):	
Rubber (R):	
Plastics (waste materials) (XPM):	
Organic Matrix (OR):	2.0
Inorganic Matrix (IN):	
Soils (S):	179.7
Total WMP Weight:	181.7

CCP Radiography Data Sheet

Waste Container ID: X10C1351421

Section 5: RTR Summary (Questions answered "Yes" will be explained in the Comment block, except for Question 1)	
Is there observable liquid?	☐ Yes ☒ No
Is there any observable liquid in internal containers, more than 60 milliliters or 3 percent by volume, whichever is greater?	☐ Yes ☒ No
Is the total volume of observable liquid in the outermost container GREATER than 1% of the container?	☐ Yes ☒ No
Is there observable liquid in payload containers with an EPA Hazardous Waste Number of U134?	☐ Yes ☒ No
Is there an indication of non-radionuclide pyrophoric materials, such as elemental potassium?	☐ Yes ☒ No
Is there an indication of hazardous wastes not occurring as co-contaminants with TRU mixed wastes (non-mixed hazardous wastes)?	☐ Yes ☒ No
Is there an indication of wastes incompatible with backfill, seal and panel closures materials, container and packaging materials, shipping container materials, or other wastes (i.e., waste does NOT match TRUCON Code[s])?	☐ Yes ☒ No
Is there an indication of wastes containing explosives or compressed gases?	☐ Yes ☒ No
Is there an indication of PCBs liquids?	☐ Yes ☒ No
Is there an indication of the waste exhibiting the characteristic of ignitability, corrosivity, or reactivity (EPA Hazardous Waste Numbers of D001, D002, or D003)?	☐ Yes ☒ No
Is the physical form of the waste inconsistent with the Waste Stream Description or the Waste Matrix Code?	☐ Yes ☒ No
CH or RH TRAMPAC	
Are there heat-sealed bags (unvented) GREATER than 4 liters and LESS than 390 square inches in the waste, or heat sealed bags not authorized in the RH TRUCON Code?	☐ Yes ☒ No
Were there Non-approved Closure Methods used on liner bags or inner bags greater than 4 liters?	☐ Yes ☒ No
Are there sealed containers GREATER than 4 liters?	☐ Yes ☒ No
Are there indications of inadequate protection for heavy and/or sharp objects?	☐ Yes ☒ No

Comments: N/A

RTR Operator:

Eric Lyles		11/11/2015
Print Name	Signature	Date

CCP Radiography Data Sheet

Section 1: General Information	
[X] RTR Examination [ ] RTR Replicate Scan [ ] RTR Independent Observation	
Site ID:	ORNL
Batch Number:	OR-RTR6-0701
Examination Date:	11/11/2015
Waste Container ID:	X10C1351424
Video/Audio Recorded Media Number:	OR-RTR6-0701 A&B
Procedure and Revision No.:	CCP-TP-053 Rev. 15
NCR(s) associated with the container? (e.g., Prohibited Items)	[X] No [ ] Yes NCR No.: N/A NCR No.: N/A

Section 2: Waste Container Data	
Container Type:	55 Gallon Drum
TRUCON Code:	OR 227
Waste Matrix Code:	S4100
Waste Stream I.D.:	OR-NFS-CH-SOIL
Waste Container Weights:	Gross Wt.: 231.4 kg Tare Wt.: 35.2 kg Net Wt.: 196.2 kg
Rigid Liner and Liner Vent Description:	Liner: [ ] No [X] Yes Lid: [X] No [ ] Yes Type: [ ] 30-mil [X] 90-mil [ ] 110-mil [ ] 125-mil Vented: [ ] No [X] Yes [ ] N/A Punctured: [X] No [ ] Yes Mechanical Vent: [X] No [ ] Yes Fiberboard Liner: [X] No [ ] Yes Lead Lined: [X] No [ ] Yes
Number of Layers of Confinement:	Appears to be 1 layer
Volume Utilization Percentage:	85 %

CCP Radiography Data Sheet

Waste Container ID: X10C1351424

Section 3: Container Inventory and Comments (Detailed descriptions)
IM:
AM:
OM:
OI:
C:
R:
XPM:
OR: Absorbent
IN:
S: Soil

Section 4: Packaging Material and Waste Material Parameters	
Packaging Material:	**Estimated Weight (kg)**
Steel (ST):	27.8
Plastics (PP): Liner bag, Rigid Liner	7.4
Other:	0.0
Total Packaging Weight	35.2
Waste Material Parameter:	**Estimated Weight (kg)**
Iron-based Metal / Alloys (IM):	
Aluminum-based Metals / Alloys (AM):	
Other Metals (OM):	
Other Inorganic Materials (OI)	
Cellulosics (C):	
Rubber (R):	
Plastics (waste materials) (XPM):	
Organic Matrix (OR):	3.0
Inorganic Matrix (IN):	
Soils (S):	193.2
Total WMP Weight:	196.2

CCP Radiography Data Sheet

Waste Container ID: X10C1351424

Section 5: RTR Summary (Questions answered "Yes" will be explained in the Comment block, except for Question 1)	
Is there observable liquid?	☐ Yes ☒ No
Is there any observable liquid in internal containers, more than 60 milliliters or 3 percent by volume, whichever is greater?	☐ Yes ☒ No
Is the total volume of observable liquid in the outermost container GREATER than 1% of the container?	☐ Yes ☒ No
Is there observable liquid in payload containers with an EPA Hazardous Waste Number of U134?	☐ Yes ☒ No
Is there an indication of non-radionuclide pyrophoric materials, such as elemental potassium?	☐ Yes ☒ No
Is there an indication of hazardous wastes not occurring as co-contaminants with TRU mixed wastes (non-mixed hazardous wastes)?	☐ Yes ☒ No
Is there an indication of wastes incompatible with backfill, seal and panel closures materials, container and packaging materials, shipping container materials, or other wastes (i.e., waste does NOT match TRUCON Code[s])?	☐ Yes ☒ No
Is there an indication of wastes containing explosives or compressed gases?	☐ Yes ☒ No
Is there an indication of PCBs liquids?	☐ Yes ☒ No
Is there an indication of the waste exhibiting the characteristic of ignitability, corrosivity, or reactivity (EPA Hazardous Waste Numbers of D001, D002, or D003)?	☐ Yes ☒ No
Is the physical form of the waste inconsistent with the Waste Stream Description or the Waste Matrix Code?	☐ Yes ☒ No
CH or RH TRAMPAC	
Are there heat-sealed bags (unvented) GREATER than 4 liters and LESS than 390 square inches in the waste, or heat sealed bags not authorized in the RH TRUCON Code?	☐ Yes ☒ No
Were there Non-approved Closure Methods used on liner bags or inner bags greater than 4 liters?	☐ Yes ☒ No
Are there sealed containers GREATER than 4 liters?	☐ Yes ☒ No
Are there indications of inadequate protection for heavy and/or sharp objects?	☐ Yes ☒ No
Comments: N/A	

RTR Operator:

Eric Lyles		11/11/2015
Print Name	Signature	Date

CCP Radiography Data Sheet

Section 1: General Information	
[X] RTR Examination [ ] RTR Replicate Scan [ ] RTR Independent Observation	
Site ID:	ORNL
Batch Number:	OR-RTR6-0701
Examination Date:	11/11/2015
Waste Container ID:	X10C1351347
Video/Audio Recorded Media Number:	OR-RTR6-0701 A&B
Procedure and Revision No.:	CCP-TP-053 Rev. 15
NCR(s) associated with the container? (e.g., Prohibited Items)	[X] No [ ] Yes NCR No.: N/A NCR No.: N/A

Section 2: Waste Container Data	
Container Type:	55 Gallon Drum
TRUCON Code:	OR 227
Waste Matrix Code:	S4100
Waste Stream I.D.:	OR-NFS-CH-SOIL
Waste Container Weights:	Gross Wt.: 219.2 kg Tare Wt.: 35.2 kg Net Wt.: 184.0 kg
Rigid Liner and Liner Vent Description:	Liner: [ ] No [X] Yes Lid: [X] No [ ] Yes Type: [ ] 30-mil [X] 90-mil [ ] 110-mil [ ] 125-mil Vented: [ ] No [X] Yes [ ] N/A Punctured: [X] No [ ] Yes Mechanical Vent: [X] No [ ] Yes Fiberboard Liner: [X] No [ ] Yes Lead Lined: [X] No [ ] Yes
Number of Layers of Confinement:	Appears to be 1 layer
Volume Utilization Percentage:	85 %

CCP Radiography Data Sheet

Waste Container ID: X10C1351347

Section 3: Container Inventory and Comments (Detailed descriptions)

IM:

AM:

OM:

OI:

C:

R:

XPM:

OR: Absorbent

IN:

S: Soil

Section 4: Packaging Material and Waste Material Parameters

Packaging Material:	**Estimated Weight (kg)**
Steel (ST):	27.8
Plastics (PP): Liner bag, Rigid Liner	7.4
Other:	0.0
Total Packaging Weight	35.2
Waste Material Parameter:	**Estimated Weight (kg)**
Iron-based Metal / Alloys (IM):	
Aluminum-based Metals / Alloys (AM):	
Other Metals (OM):	
Other Inorganic Materials (OI)	
Cellulosics (C):	
Rubber (R):	
Plastics (waste materials) (XPM):	
Organic Matrix (OR):	2.0
Inorganic Matrix (IN):	
Soils (S):	182.0
Total WMP Weight:	184.0

CCP Radiography Data Sheet

Waste Container ID: X10C1351347

Section 5: RTR Summary (Questions answered "Yes" will be explained in the Comment block, except for Question 1)	
Is there observable liquid?	☐ Yes ☒ No
Is there any observable liquid in internal containers, more than 60 milliliters or 3 percent by volume, whichever is greater?	☐ Yes ☒ No
Is the total volume of observable liquid in the outermost container GREATER than 1% of the container?	☐ Yes ☒ No
Is there observable liquid in payload containers with an EPA Hazardous Waste Number of U134?	☐ Yes ☒ No
Is there an indication of non-radionuclide pyrophoric materials, such as elemental potassium?	☐ Yes ☒ No
Is there an indication of hazardous wastes not occurring as co-contaminants with TRU mixed wastes (non-mixed hazardous wastes)?	☐ Yes ☒ No
Is there an indication of wastes incompatible with backfill, seal and panel closures materials, container and packaging materials, shipping container materials, or other wastes (i.e., waste does NOT match TRUCON Code[s])?	☐ Yes ☒ No
Is there an indication of wastes containing explosives or compressed gases?	☐ Yes ☒ No
Is there an indication of PCBs liquids?	☐ Yes ☒ No
Is there an indication of the waste exhibiting the characteristic of ignitability, corrosivity, or reactivity (EPA Hazardous Waste Numbers of D001, D002, or D003)?	☐ Yes ☒ No
Is the physical form of the waste inconsistent with the Waste Stream Description or the Waste Matrix Code?	☐ Yes ☒ No
CH or RH TRAMPAC	
Are there heat-sealed bags (unvented) GREATER than 4 liters and LESS than 390 square inches in the waste, or heat sealed bags not authorized in the RH TRUCON Code?	☐ Yes ☒ No
Were there Non-approved Closure Methods used on liner bags or inner bags greater than 4 liters?	☐ Yes ☒ No
Are there sealed containers GREATER than 4 liters?	☐ Yes ☒ No
Are there indications of inadequate protection for heavy and/or sharp objects?	☐ Yes ☒ No
Comments: N/A	

RTR Operator:

Eric Lyles		11/11/2015
Print Name	Signature	Date

CCP Radiography Data Sheet

Section 1: General Information	
[X] RTR Examination [ ] RTR Replicate Scan [ ] RTR Independent Observation	
Site ID:	ORNL
Batch Number:	OR-RTR6-0701
Examination Date:	11/11/2015
Waste Container ID:	X10C1351345
Video/Audio Recorded Media Number:	OR-RTR6-0701 A&B
Procedure and Revision No.:	CCP-TP-053 Rev. 15
NCR(s) associated with the container? (e.g., Prohibited Items)	[X] No [ ] Yes NCR No.: N/A NCR No.: N/A

Section 2: Waste Container Data	
Container Type:	55 Gallon Drum
TRUCON Code:	OR 227
Waste Matrix Code:	S4100
Waste Stream I.D.:	OR-NFS-CH-SOIL
Waste Container Weights:	Gross Wt.: 219.9 kg Tare Wt.: 35.2 kg Net Wt.: 184.7 kg
Rigid Liner and Liner Vent Description:	Liner: [ ] No [X] Yes Lid: [X] No [ ] Yes Type: [ ] 30-mil [X] 90-mil [ ] 110-mil [ ] 125-mil Vented: [ ] No [X] Yes [ ] N/A Punctured: [X] No [ ] Yes Mechanical Vent: [X] No [ ] Yes Fiberboard Liner: [X] No [ ] Yes Lead Lined: [X] No [ ] Yes
Number of Layers of Confinement:	Appears to be 1 layer
Volume Utilization Percentage:	90 %

CCP Radiography Data Sheet

Waste Container ID: X10C1351345

Section 3: Container Inventory and Comments (Detailed descriptions)
IM:
AM:
OM:
OI:
C:
R:
XPM:
OR: Absorbent
IN:
S: Soil

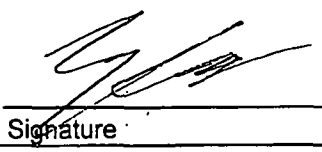
Section 4: Packaging Material and Waste Material Parameters	
Packaging Material:	**Estimated Weight (kg)**
Steel (ST):	27.8
Plastics (PP): Liner bag, Rigid Liner	7.4
Other:	0.0
Total Packaging Weight	35.2
Waste Material Parameter:	**Estimated Weight (kg)**
Iron-based Metal / Alloys (IM):	
Aluminum-based Metals / Alloys (AM):	
Other Metals (OM):	
Other Inorganic Materials (OI)	
Cellulosics (C):	
Rubber (R):	
Plastics (waste materials) (XPM):	
Organic Matrix (OR):	3.0
Inorganic Matrix (IN):	
Soils (S):	181.7
Total WMP Weight:	184.7

CCP Radiography Data Sheet

Waste Container ID: X10C1351345

Section 5: RTR Summary (Questions answered "Yes" will be explained in the Comment block, except for Question 1)	
Is there observable liquid?	☐ Yes ☒ No
Is there any observable liquid in internal containers, more than 60 milliliters or 3 percent by volume, whichever is greater?	☐ Yes ☒ No
Is the total volume of observable liquid in the outermost container GREATER than 1% of the container?	☐ Yes ☒ No
Is there observable liquid in payload containers with an EPA Hazardous Waste Number of U134?	☐ Yes ☒ No
Is there an indication of non-radionuclide pyrophoric materials, such as elemental potassium?	☐ Yes ☒ No
Is there an indication of hazardous wastes not occurring as co-contaminants with TRU mixed wastes (non-mixed hazardous wastes)?	☐ Yes ☒ No
Is there an indication of wastes incompatible with backfill, seal and panel closures materials, container and packaging materials, shipping container materials, or other wastes (i.e., waste does NOT match TRUCON Code[s])?	☐ Yes ☒ No
Is there an indication of wastes containing explosives or compressed gases?	☐ Yes ☒ No
Is there an indication of PCBs liquids?	☐ Yes ☒ No
Is there an indication of the waste exhibiting the characteristic of ignitability, corrosivity, or reactivity (EPA Hazardous Waste Numbers of D001, D002, or D003)?	☐ Yes ☒ No
Is the physical form of the waste inconsistent with the Waste Stream Description or the Waste Matrix Code?	☐ Yes ☒ No
CH or RH TRAMPAC	
Are there heat-sealed bags (unvented) GREATER than 4 liters and LESS than 390 square inches in the waste, or heat sealed bags not authorized in the RH TRUCON Code?	☐ Yes ☒ No
Were there Non-approved Closure Methods used on liner bags or inner bags greater than 4 liters?	☐ Yes ☒ No
Are there sealed containers GREATER than 4 liters?	☐ Yes ☒ No
Are there indications of inadequate protection for heavy and/or sharp objects?	☐ Yes ☒ No
Comments: N/A	

RTR Operator:

Eric Lyles		11/11/2015
Print Name	Signature	Date

CCP Radiography Data Sheet

Section 1: General Information	
[X] RTR Examination [ ] RTR Replicate Scan [ ] RTR Independent Observation	
Site ID:	ORNL
Batch Number:	OR-RTR6-0701
Examination Date:	11/11/2015
Waste Container ID:	X10C1351346
Video/Audio Recorded Media Number:	OR-RTR6-0701 A&B
Procedure and Revision No.:	CCP-TP-053 Rev. 15
NCR(s) associated with the container? (e.g., Prohibited Items)	[X] No [ ] Yes NCR No.: N/A NCR No.: N/A

Section 2: Waste Container Data	
Container Type:	55 Gallon Drum
TRUCON Code:	OR 227
Waste Matrix Code:	S4100
Waste Stream I.D.:	OR-NFS-CH-SOIL
Waste Container Weights:	Gross Wt.: 225.4 kg Tare Wt.: 35.2 kg Net Wt.: 190.2 kg
Rigid Liner and Liner Vent Description:	Liner: [ ] No [X] Yes Lid: [X] No [ ] Yes Type: [ ] 30-mil [X] 90-mil [ ] 110-mil [ ] 125-mil Vented: [ ] No [X] Yes [ ] N/A Punctured: [X] No [ ] Yes Mechanical Vent: [X] No [ ] Yes Fiberboard Liner: [X] No [ ] Yes Lead Lined: [X] No [ ] Yes
Number of Layers of Confinement:	Appears to be 1 layer
Volume Utilization Percentage:	90 %

CCP Radiography Data Sheet

Waste Container ID: X10C1351346

Section 3: Container Inventory and Comments (Detailed descriptions)

IM:

AM:

OM:

OI:

C:

R:

XPM:

OR: Absorbent

IN:

S: Soil

Section 4: Packaging Material and Waste Material Parameters

Packaging Material:	**Estimated Weight (kg)**
Steel (ST):	27.8
Plastics (PP): Liner bag, Rigid Liner	7.4
Other:	0.0
Total Packaging Weight	35.2
Waste Material Parameter:	**Estimated Weight (kg)**
Iron-based Metal / Alloys (IM):	
Aluminum-based Metals / Alloys (AM):	
Other Metals (OM):	
Other Inorganic Materials (OI)	
Cellulosics (C):	
Rubber (R):	
Plastics (waste materials) (XPM):	
Organic Matrix (OR):	2.0
Inorganic Matrix (IN):	
Soils (S):	188.2
Total WMP Weight:	190.2

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CCP Radiography Data Sheet

Waste Container ID: X10C1351346

Section 5: RTR Summary (Questions answered "Yes" will be explained in the Comment block, except for Question 1)	
Is there observable liquid?	☐ Yes ☒ No
Is there any observable liquid in internal containers, more than 60 milliliters or 3 percent by volume, whichever is greater?	☐ Yes ☒ No
Is the total volume of observable liquid in the outermost container GREATER than 1% of the container?	☐ Yes ☒ No
Is there observable liquid in payload containers with an EPA Hazardous Waste Number of U134?	☐ Yes ☒ No
Is there an indication of non-radionuclide pyrophoric materials, such as elemental potassium?	☐ Yes ☒ No
Is there an indication of hazardous wastes not occurring as co-contaminants with TRU mixed wastes (non-mixed hazardous wastes)?	☐ Yes ☒ No
Is there an indication of wastes incompatible with backfill, seal and panel closures materials, container and packaging materials, shipping container materials, or other wastes (i.e., waste does NOT match TRUCON Code[s])?	☐ Yes ☒ No
Is there an indication of wastes containing explosives or compressed gases?	☐ Yes ☒ No
Is there an indication of PCBs liquids?	☐ Yes ☒ No
Is there an indication of the waste exhibiting the characteristic of ignitability, corrosivity, or reactivity (EPA Hazardous Waste Numbers of D001, D002, or D003)?	☐ Yes ☒ No
Is the physical form of the waste inconsistent with the Waste Stream Description or the Waste Matrix Code?	☐ Yes ☒ No
CH or RH TRAMPAC	
Are there heat-sealed bags (unvented) GREATER than 4 liters and LESS than 390 square inches in the waste, or heat sealed bags not authorized in the RH TRUCON Code?	☐ Yes ☒ No
Were there Non-approved Closure Methods used on liner bags or inner bags greater than 4 liters?	☐ Yes ☒ No
Are there sealed containers GREATER than 4 liters?	☐ Yes ☒ No
Are there indications of inadequate protection for heavy and/or sharp objects?	☐ Yes ☒ No
Comments: N/A	

RTR Operator:

Eric Lyles		11/11/2015
Print Name	Signature	Date

CCP Radiography Data Sheet

Section 1: General Information	
[X] RTR Examination [ ] RTR Replicate Scan [ ] RTR Independent Observation	
Site ID:	ORNL
Batch Number:	OR-RTR6-0701
Examination Date:	11/11/2015
Waste Container ID:	X10C1351356
Video/Audio Recorded Media Number:	OR-RTR6-0701 A&B
Procedure and Revision No.:	CCP-TP-053 Rev. 15
NCR(s) associated with the container? (e.g., Prohibited Items)	[X] No [ ] Yes NCR No.: N/A NCR No.: N/A

Section 2: Waste Container Data	
Container Type:	55 Gallon Drum
TRUCON Code:	OR 227
Waste Matrix Code:	S4100
Waste Stream I.D.:	OR-NFS-CH-SOIL
Waste Container Weights:	Gross Wt.: 210.9 kg Tare Wt.: 35.2 kg Net Wt.: 175.7 kg
Rigid Liner and Liner Vent Description:	Liner: [ ] No [X] Yes Lid: [X] No [ ] Yes Type: [ ] 30-mil [X] 90-mil [ ] 110-mil [ ] 125-mil Vented: [ ] No [X] Yes [ ] N/A Punctured: [X] No [ ] Yes Mechanical Vent: [X] No [ ] Yes Fiberboard Liner: [X] No [ ] Yes Lead Lined: [X] No [ ] Yes
Number of Layers of Confinement:	Appears to be 1 layer
Volume Utilization Percentage:	80 %

CCP Radiography Data Sheet

Waste Container ID: X10C1351356

Section 3: Container Inventory and Comments (Detailed descriptions)

IM:

AM:

OM:

OI:

C:

R:

XPM:

OR: Absorbent

IN:

S: Soil

Section 4: Packaging Material and Waste Material Parameters

Packaging Material:	**Estimated Weight (kg)**
Steel (ST):	27.8
Plastics (PP): Liner bag, Rigid Liner	7.4
Other:	0.0
Total Packaging Weight	35.2
Waste Material Parameter:	**Estimated Weight (kg)**
Iron-based Metal / Alloys (IM):	
Aluminum-based Metals / Alloys (AM):	
Other Metals (OM):	
Other Inorganic Materials (OI)	
Cellulosics (C):	
Rubber (R):	
Plastics (waste materials) (XPM):	
Organic Matrix (OR):	3.0
Inorganic Matrix (IN):	
Soils (S):	172.7
Total WMP Weight:	175.7

CCP Radiography Data Sheet

Waste Container ID: X10C1351356

Section 5: RTR Summary (Questions answered "Yes" will be explained in the Comment block, except for Question 1)	
Is there observable liquid?	☐ Yes ☒ No
Is there any observable liquid in internal containers, more than 60 milliliters or 3 percent by volume, whichever is greater?	☐ Yes ☒ No
Is the total volume of observable liquid in the outermost container GREATER than 1% of the container?	☐ Yes ☒ No
Is there observable liquid in payload containers with an EPA Hazardous Waste Number of U134?	☐ Yes ☒ No
Is there an indication of non-radionuclide pyrophoric materials, such as elemental potassium?	☐ Yes ☒ No
Is there an indication of hazardous wastes not occurring as co-contaminants with TRU mixed wastes (non-mixed hazardous wastes)?	☐ Yes ☒ No
Is there an indication of wastes incompatible with backfill, seal and panel closures materials, container and packaging materials, shipping container materials, or other wastes (i.e., waste does NOT match TRUCON Code[s])?	☐ Yes ☒ No
Is there an indication of wastes containing explosives or compressed gases?	☐ Yes ☒ No
Is there an indication of PCBs liquids?	☐ Yes ☒ No
Is there an indication of the waste exhibiting the characteristic of ignitability, corrosivity, or reactivity (EPA Hazardous Waste Numbers of D001, D002, or D003)?	☐ Yes ☒ No
Is the physical form of the waste inconsistent with the Waste Stream Description or the Waste Matrix Code?	☐ Yes ☒ No
CH or RH TRAMPAC	
Are there heat-sealed bags (unvented) GREATER than 4 liters and LESS than 390 square inches in the waste, or heat sealed bags not authorized in the RH TRUCON Code?	☐ Yes ☒ No
Were there Non-approved Closure Methods used on liner bags or inner bags greater than 4 liters?	☐ Yes ☒ No
Are there sealed containers GREATER than 4 liters?	☐ Yes ☒ No
Are there indications of inadequate protection for heavy and/or sharp objects?	☐ Yes ☒ No
Comments: N/A	

RTR Operator:

Eric Lyles		11/11/2015
Print Name	Signature	Date

CCP Radiography Data Sheet

Section 1: General Information	
[X] RTR Examination [ ] RTR Replicate Scan [ ] RTR Independent Observation	
Site ID:	ORNL
Batch Number:	OR-RTR6-0701
Examination Date:	11/11/2015
Waste Container ID:	X10C1351357
Video/Audio Recorded Media Number:	OR-RTR6-0701 A&B
Procedure and Revision No.:	CCP-TP-053 Rev. 15
NCR(s) associated with the container? (e.g., Prohibited Items)	[X] No [ ] Yes NCR No.: N/A NCR No.: N/A

Section 2: Waste Container Data	
Container Type:	55 Gallon Drum
TRUCON Code:	OR 227
Waste Matrix Code:	S4100
Waste Stream I.D.:	OR-NFS-CH-SOIL
Waste Container Weights:	Gross Wt.: 207.2 kg Tare Wt.: 35.2 kg Net Wt.: 172.0 kg
Rigid Liner and Liner Vent Description:	Liner: [ ] No [X] Yes Lid: [X] No [ ] Yes Type: [ ] 30-mil [X] 90-mil [ ] 110-mil [ ] 125-mil Vented: [ ] No [X] Yes [ ] N/A Punctured: [X] No [ ] Yes Mechanical Vent: [X] No [ ] Yes Fiberboard Liner: [X] No [ ] Yes Lead Lined: [X] No [ ] Yes
Number of Layers of Confinement:	Appears to be 1 layer
Volume Utilization Percentage:	80 %

CCP Radiography Data Sheet

Waste Container ID: X10C1351357

Section 3: Container Inventory and Comments	(Detailed descriptions)
IM:	
AM:	
OM:	
OI:	
C:	
R:	
XPM:	
OR:	Absorbent
IN:	
S:	Soil

Section 4: Packaging Material and Waste Material Parameters	
Packaging Material:	**Estimated Weight (kg)**
Steel (ST):	27.8
Plastics (PP): Liner bag, Rigid Liner	7.4
Other:	0.0
Total Packaging Weight	35.2
Waste Material Parameter:	**Estimated Weight (kg)**
Iron-based Metal / Alloys (IM):	
Aluminum-based Metals / Alloys (AM):	
Other Metals (OM):	
Other Inorganic Materials (OI)	
Cellulosics (C):	
Rubber (R):	
Plastics (waste materials) (XPM):	
Organic Matrix (OR):	2.0
Inorganic Matrix (IN):	
Soils (S):	170.0
Total WMP Weight:	172.0

CCP Radiography Data Sheet

Waste Container ID: X10C1351357

Section 5: RTR Summary (Questions answered "Yes" will be explained in the Comment block, except for Question 1)	
Is there observable liquid?	☐ Yes ☒ No
Is there any observable liquid in internal containers, more than 60 milliliters or 3 percent by volume, whichever is greater?	☐ Yes ☒ No
Is the total volume of observable liquid in the outermost container GREATER than 1% of the container?	☐ Yes ☒ No
Is there observable liquid in payload containers with an EPA Hazardous Waste Number of U134?	☐ Yes ☒ No
Is there an indication of non-radionuclide pyrophoric materials, such as elemental potassium?	☐ Yes ☒ No
Is there an indication of hazardous wastes not occurring as co-contaminants with TRU mixed wastes (non-mixed hazardous wastes)?	☐ Yes ☒ No
Is there an indication of wastes incompatible with backfill, seal and panel closures materials, container and packaging materials, shipping container materials, or other wastes (i.e., waste does NOT match TRUCON Code[s])?	☐ Yes ☒ No
Is there an indication of wastes containing explosives or compressed gases?	☐ Yes ☒ No
Is there an indication of PCBs liquids?	☐ Yes ☒ No
Is there an indication of the waste exhibiting the characteristic of ignitability, corrosivity, or reactivity (EPA Hazardous Waste Numbers of D001, D002, or D003)?	☐ Yes ☒ No
Is the physical form of the waste inconsistent with the Waste Stream Description or the Waste Matrix Code?	☐ Yes ☒ No
CH or RH TRAMPAC	
Are there heat-sealed bags (unvented) GREATER than 4 liters and LESS than 390 square inches in the waste, or heat sealed bags not authorized in the RH TRUCON Code?	☐ Yes ☒ No
Were there Non-approved Closure Methods used on liner bags or inner bags greater than 4 liters?	☐ Yes ☒ No
Are there sealed containers GREATER than 4 liters?	☐ Yes ☒ No
Are there indications of inadequate protection for heavy and/or sharp objects?	☐ Yes ☒ No

Comments: N/A

RTR Operator:

Eric Lyles		11/11/2015
Print Name	Signature	Date

CCP Radiography Data Sheet

Section 1: General Information	
[X] RTR Examination [ ] RTR Replicate Scan [ ] RTR Independent Observation	
Site ID:	ORNL
Batch Number:	OR-RTR6-0701
Examination Date:	11/11/2015
Waste Container ID:	X10C1351422
Video/Audio Recorded Media Number:	OR-RTR6-0701 A&B
Procedure and Revision No.:	CCP-TP-053 Rev. 15
NCR(s) associated with the container? (e.g., Prohibited Items)	[X] No [ ] Yes NCR No.: N/A NCR No.: N/A

Section 2: Waste Container Data	
Container Type:	55 Gallon Drum
TRUCON Code:	OR 227
Waste Matrix Code:	S4100
Waste Stream I.D.:	OR-NFS-CH-SOIL
Waste Container Weights:	Gross Wt.: 220.2 kg Tare Wt.: 35.2 kg Net Wt.: 185.0 kg
Rigid Liner and Liner Vent Description:	Liner: [ ] No [X] Yes Lid: [X] No [ ] Yes Type: [ ] 30-mil [X] 90-mil [ ] 110-mil [ ] 125-mil Vented: [ ] No [X] Yes [ ] N/A Punctured: [X] No [ ] Yes Mechanical Vent: [X] No [ ] Yes Fiberboard Liner: [X] No [ ] Yes Lead Lined: [X] No [ ] Yes
Number of Layers of Confinement:	Appears to be 1 layer
Volume Utilization Percentage:	85 %

CCP Radiography Data Sheet

Waste Container ID: X10C1351422

Section 3: Container Inventory and Comments (Detailed descriptions)
IM:
AM:
OM:
OI:
C:
R:
XPM: Plastic sheeting
OR: Absorbent
IN:
S: Soil

Section 4: Packaging Material and Waste Material Parameters	
Packaging Material:	**Estimated Weight (kg)**
Steel (ST):	27.8
Plastics (PP): Liner bag, Rigid Liner	7.4
Other:	0.0
Total Packaging Weight	35.2
Waste Material Parameter:	**Estimated Weight (kg)**
Iron-based Metal / Alloys (IM):	
Aluminum-based Metals / Alloys (AM):	
Other Metals (OM):	
Other Inorganic Materials (OI)	
Cellulosics (C):	
Rubber (R):	
Plastics (waste materials) (XPM):	1.0
Organic Matrix (OR):	3.0
Inorganic Matrix (IN):	
Soils (S):	181.0
Total WMP Weight:	185.0

CCP Radiography Data Sheet

Waste Container ID: X10C1351422

Section 5: RTR Summary (Questions answered "Yes" will be explained in the Comment block, except for Question 1)	
Is there observable liquid?	☐ Yes ☒ No
Is there any observable liquid in internal containers, more than 60 milliliters or 3 percent by volume, whichever is greater?	☐ Yes ☒ No
Is the total volume of observable liquid in the outermost container GREATER than 1% of the container?	☐ Yes ☒ No
Is there observable liquid in payload containers with an EPA Hazardous Waste Number of U134?	☐ Yes ☒ No
Is there an indication of non-radionuclide pyrophoric materials, such as elemental potassium?	☐ Yes ☒ No
Is there an indication of hazardous wastes not occurring as co-contaminants with TRU mixed wastes (non-mixed hazardous wastes)?	☐ Yes ☒ No
Is there an indication of wastes incompatible with backfill, seal and panel closures materials, container and packaging materials, shipping container materials, or other wastes (i.e., waste does NOT match TRUCON Code[s])?	☐ Yes ☒ No
Is there an indication of wastes containing explosives or compressed gases?	☐ Yes ☒ No
Is there an indication of PCBs liquids?	☐ Yes ☒ No
Is there an indication of the waste exhibiting the characteristic of ignitability, corrosivity, or reactivity (EPA Hazardous Waste Numbers of D001, D002, or D003)?	☐ Yes ☒ No
Is the physical form of the waste inconsistent with the Waste Stream Description or the Waste Matrix Code?	☐ Yes ☒ No
CH or RH TRAMPAC	
Are there heat-sealed bags (unvented) GREATER than 4 liters and LESS than 390 square inches in the waste, or heat sealed bags not authorized in the RH TRUCON Code?	☐ Yes ☒ No
Were there Non-approved Closure Methods used on liner bags or inner bags greater than 4 liters?	☐ Yes ☒ No
Are there sealed containers GREATER than 4 liters?	☐ Yes ☒ No
Are there indications of inadequate protection for heavy and/or sharp objects?	☐ Yes ☒ No
Comments: N/A	

RTR Operator:

Eric Lyles		11/11/2015
Print Name	Signature	Date

Attachment 3 – CCP Radiography Independent Technical Reviewer Checklist

Batch Data Report No.: OR-RTR6-0701

Description			
1.	Were data generation and reduction conducted in a technically correct manner in accordance with the methods used?	☐ NO	☒ YES
2.	Was the correct revision of the procedure used? Procedure: CCP-TP-053 Rev.: 15	☐ NO	☒ YES
3.	Are the WMPs entered correctly?	☐ NO	☒ YES
4.	Do the estimated weights in Section 4 of Attachment 2 equal the container gross weight?	☐ NO	☒ YES
5.	Is the data reported in the proper units with the correct number of significant figures (e.g., one tenth of a kilogram)?	☐ NO	☒ YES
6.	Was transcription used? If no, proceed to question 7.	☒ NO	☐ YES
	6a. Has the data been verified for transcription errors?	☐ NO	☐ YES
7.	Does the Testing Batch Report include radiography for up to 20 containers?	☐ NO	☒ YES
8.	Are BDR contents complete and do they match the CCP Waste RTR Batch Data Report Table of Contents?	☐ NO	☒ YES
9.	Is all the data signed and dated in reproducible ink and by the individual(s) generating it?	☐ NO	☒ YES
10.	Is all data recorded clearly, legibly, and accurately?	☐ NO	☒ YES
11.	Have changes been made to original data? If no, proceed to question 12.	☒ NO	☐ YES
	11a. Have all changes to original data been lined out, initialed and dated by the individual making the changes?	☐ NO	☐ YES
	11b. Was justification made for changing the original data?	☐ NO	☐ YES
	11c. Were data changes made by the individual who originally collected the data?	☐ NO	☐ YES
12.	Does the waste match the Waste Matrix Code and Waste Stream description?	☐ NO	☒ YES
13.	Are the RTR Operator's decisions regarding the Radiography documented?	☐ NO	☒ YES
14.	Is there an adequate written description of the contents of each item?	☐ NO	☒ YES
15.	Was the video/audio recording media properly prepared and labeled for each waste container?	☐ NO	☒ YES
16.	Was the video/audio recording media check performed satisfactorily and recorded on Attachment 1?	☐ NO	☒ YES

Attachment 3 – CCP Radiography Independent Technical Reviewer Checklist (Continued)

Batch Data Report No.: OR-RTR6-0701

Description		
17. Was the Image Test performed satisfactorily and recorded on Attachment 1?	☐NO	☒YES
18. Was the Replicate Scan performed and recorded on an Attachment 2?	☐NO	☒YES
19. Was the Replicate Scan RTR Operator different from the first RTR Operator?	☐NO	☒YES
20. Did the Replicate Scan RTR Operator and the first RTR Operator agree on the results?	☐NO	☒YES
21. Was the Independent Observation performed and recorded on an Attachment 2?	☐NO	☒YES
22. Was the Independent Observation RTR Operator different from the first RTR Operator?	☐NO	☒YES
23. Did the Independent Observation RTR Operator and the first RTR Operator agree on the results?	☐NO	☒YES
24. Was the data collection performed by qualified individuals?	☐NO	☒YES
25. Were NCRs initiated as required at DGL? If no, proceed to question 26.	☒NO	☐YES
25a. Have the NCR(s) associated with RTR been included in the BDR?	☐NO	☐YES
26. Is the RTR examination for CH waste? If no, proceed to question 27.	☐NO	☒YES
26a. Have the CH Quality Assurance Objectives (QAOs) been met (If applicable)? Precision – Precision is maintained by reconciling any discrepancies between two radiography operators with regard to identification of the waste matrix code, liquids in excess of TSDF-WAC limits, and compressed gases through independent replicate scans and independent observations. Additionally, the precision of radiography is verified prior to use by tuning precisely enough to demonstrate compliance with QAOs through viewing an image test pattern. Accuracy – Accuracy is obtained by using a target to tune the image for maximum sharpness and by requiring operators to successfully identify 100 percent of the items required to meet the DQOs for radiography specified in CCP-PO-001, Section C-4a(1) in a training container during their initial qualification and subsequent requalification. Completeness – A video and audio media recording of the radiography examination and a validated radiography data form will be obtained for 100 percent of the waste containers subject to radiography. All video and audio media recordings and radiography data forms will be subject to validation as indicated in CCP-PO-001, Section C3-4. Comparability – The comparability of radiography data from different operators shall be enhanced by using standardized radiography procedures and operator qualifications.	☐NO	☒YES

Attachment 3 – CCP Radiography Independent Technical Reviewer Checklist (Continued)

Batch Data Report No.: OR-RTR6-0701

Description		
27. Is the RTR examination for RH waste? If no, proceed to comment section.	☒ NO	☐ YES
27a. Have the RH QAOs been met (if applicable)? Precision – Precision is maintained by reconciling any discrepancies between two operators (during Independent Observation and Replicate scans) with regard to the identification of important waste characteristics (i.e., physical form of the waste and absence of prohibited liquids) within a single container. Accuracy – Accuracy is obtained by using a target to tune the image for maximum sharpness and by requiring operators to successfully identify prohibited liquid in a training container during their initial qualification and subsequent requalification. Representativeness – All of the relevant contents in a container selected for radiography will be described. Completeness – All of the relevant waste information must be assembled and must show that each of the containers in the waste stream belongs to the waste stream. This information must be documented on videotape or other equivalent media and data form. Comparability – Comparability is ensured by meeting the program training requirements and complying with the minimum standards used to implement the radiography process.	☐ NO	☐ YES

Comments: N/A

I have reviewed 100% of the container specific and batch data in this report and find it acceptable.

Independent Technical Reviewer:

Daphne Brothers	Daphne Brothers	11-11-15
Printed Name	Signature	Date

DIVIDER PAGE ONLY

Not Part of Page Count

Attachment 2 – CCP Records Transmittal/Receiving Form

CCP Records / Records Custodian, 4021 National Parks Highway - MS: GSA 212, Carlsbad, New Mexico 88220

Telephone Number: 575-234-7523

Fax Number: 575-234-7033

Attn:	CCP RECORDS	From:	PATRICK SMITH II
Ship to:	CCP RECORDS CUSTODIAN	Site:	ORNL
	4021 NATIONAL PARKS HWY.	Company:	TFE INC.
	MS GSA 212	Telephone Number:	865-574-6002
	CARLSBAD, NM 88220-9082	Date Sent:	11-12-2015
Telephone Number:	575-234-7523		

Document Number(s)	Title / Description	Record Date	Total Pages
OR-RTR6-0701	RTR DVD (DISK B)	11-11-2015	N/A
N/A	N/A	N/A	N/A
N/A	N/A	N/A	N/A
N/A	N/A	N/A	N/A
N/A	N/A	N/A	N/A
N/A	N/A	N/A	N/A

Comments:

N/A

(When the Record accepted line has been completed, the rest of the page below may be left blank.)

Acceptance/Rejection Signature and Date

Records Accepted ☑ [signature] Jewell Hurable 11-17-15.

Signature | Printed Name | Date

Records Rejected ☐ _____ _____ _____

Signature | Printed Name | Date

Reason for Rejection:

Re-submittal: _____ _____ _____

Signature | Printed Name | Date

```
**********************************
***        Send Results        ***
**********************************

   Sending is complete.

Job No.                    3282
Address                    918655768703
Name                       ORNL
Start Time                 11/17 09:43 AM
Call Length                00'21
Sheets                     1
Result                     OK
```

Controlled Copy

Attachment 2 – CCP Records Transmittal/Receiving Form

CCP Records / Records Custodian, 4021 National Parks Highway - MS: GSA 212, Carlsbad, New Mexico 88220

Telephone Number: 575-234-7523

Fax Number: 575-234-7033

Attn:	CCP RECORDS	From:	PATRICK SMITH II
Ship to:	CCP RECORDS CUSTODIAN	Site:	ORNL
	4021 NATIONAL PARKS HWY.	Company:	TFE INC.
	MS GSA 212	Telephone Number:	865-574-6002
	CARLSBAD, NM 88220-9082	Date Sent:	11-12-2015
Telephone Number:	575-234-7523		

OR-RTR6-0701	RTR DVD (DISK B)	11-11-2015	N/A
N/A	N/A	N/A	N/A
N/A	N/A	N/A	N/A
N/A	N/A	N/A	N/A
N/A	N/A	N/A	N/A
N/A	N/A	N/A	N/A

N/A

(When the Record accepted line has been completed, the rest of the page below may be left blank.)
Acceptance/Rejection Signature and Date

Records Accepted	☑	[signature]	Jewell Hurrable	11-17-15.
		Signature	Printed Name	Date
Records Rejected	☐			
		Signature	Printed Name	Date

Attachment 2 – CCP Records Transmittal/Receiving Form

CCP Records / Records Custodian, 4021 National Parks Highway - MS: GSA 212, Carlsbad, New Mexico 88220

Telephone Number: 575-234-7523

Fax Number: 575-234-7033

Attn:	CCP RECORDS	From:	PATRICK SMITH II
Ship to:	CCP RECORDS CUSTODIAN	Site:	ORNL
	4021 NATIONAL PARKS HWY.	Company:	TFE INC.
	MS GSA 212	Telephone Number:	865-574-6002
	CARLSBAD, NM 88220-9082	Date Sent:	11-18-2015
Telephone Number:	575-234-7523		

Document Number	Title / Description	Record Date	Total Pages
OR-RTR6-0701	RTR BDR	11-11-2015	42
OR-RTR6-0701	RTR DVD (DISK A)	11-11-2015	N/A
N/A	N/A	N/A	N/A
N/A	N/A	N/A	N/A
N/A	N/A	N/A	N/A
N/A	N/A	N/A	N/A

Comments

N/A

(When the Record accepted line has been completed, the rest of the page below may be left blank.)

Acceptance/Rejection Signature and Date

Records Accepted ☑ [signature] Jewell Hurrelde 11-23-2015.

Signature | Printed Name | Date

Records Rejected ☐ _____ _____ _____

Signature | Printed Name | Date

Reason for Rejection:

Re-submittal: _____ _____ _____

Signature | Printed Name | Date

```
**********************************
***        Send Results        ***
**********************************

   Sending is complete.

Job No.                    3378
Address                    918655768703
Name                       ORNL
Start Time                 11/23 02:58 PM
Call Length                00'20
Sheets                     1
Result                     OK
```


Attachment 2 – CCP Records Transmittal/Receiving Form

CCP Records / Records Custodian, 4021 National Parks Highway - MS: GSA 212, Carlsbad, New Mexico 88220

Telephone Number: 575-234-7523

Fax Number: 575-234-7033

Attn:	CCP RECORDS	From:	PATRICK SMITH II
Ship to:	CCP RECORDS CUSTODIAN	Site:	ORNL
	4021 NATIONAL PARKS HWY.	Company:	TFE INC.
	MS GSA 212	Telephone Number:	865-574-6002
	CARLSBAD, NM 88220-9082	Date Sent:	11-18-2015
Telephone Number:	575-234-7523		

OR-RTR6-0701	RTR BDR	11-11-2015	42
OR-RTR6-0701	RTR DVD (DISK A)	11-11-2015	N/A
N/A	N/A	N/A	N/A
N/A	N/A	N/A	N/A
N/A	N/A	N/A	N/A
N/A	N/A	N/A	N/A

N/A

(When the Record accepted line has been completed, the rest of the page below may be left blank.)

Acceptance/Rejection Signature and Date

		Signature	Printed Name	Date
Records Accepted	[√]	[signature]	Jewell Hurrelde	11-23-2015
Records Rejected	[ ]			

DIVIDER PAGE

Attachment 2 – CCP SPM Radiography Project Level Validation Checklist and Summary

BDR Number: OR-RTR6-0716 **Examination Date(s):** 01/26/2016

Description of Criteria Reviewed	Criteria Met? YES	NO	NA	Comments/Qualifiers
1. Is the completed, signed, and dated Independent Technical Reviewer Checklist included in the BDR, and the independent technical reviewer was not involved in the generation or recording of the data under review? **Reference Source: CCP-PO-001, C3-4**	X			
2. Does the BDR contain all items addressed in the BDR Table of Contents? **Reference Source: CCP-PO-001, C3-4**	X			
3. Does the BDR include a listing of all the container numbers in the batch? **Reference Source: CCP-PO-001, C3-4**	X			
4. List all containers that have met QAOs. **Reference Source: CCP-PO-001, C3-4**				Container Numbers: X10C1250229 X10C1250232 X10C1250233 X10C1250234 X10C1250235 X10C1250236 X10C1250237 X10C1250238 X10C1250239 X10C1250242 X10C1250243 X10C1250244 X10C1250245 X10C1250248 X10C1250250 X10C1250257 X10C1250259 X10C1250260 X10C1250261 X10C1250264
5. Does the BDR identify the current implementing procedure and revision number? **Reference Source: CCP-PO-001, Table C3-3**	X			
6. Is there a reference to or copy of any associated NCRs (if any) in the BDR? NA if no NCRs. **Reference Source: CCP-PO-001, Table C3-3**			X	
7. Are there 20 or fewer containers in the batch? **Reference Source: CCP-PO-001, C3-4**	X			
8. Are the data properly reported (i.e., data are reported in correct units and with correct significant figures)? **Reference Source: CCP-PO-001, C3-4**	X			
9. Is there evidence of verification that the physical form matches the Waste Matrix Code? **Reference Source: CCP-PO-001, Table C3-3**	X			

CCP RECORDS ORIGINAL
DATE REC'D 2/10/16

COPY

Attachment 2 – CCP SPM Radiography Project Level Validation Checklist and Summary (Continued)

BDR Number: OR-RTR6-0716 **Examination Date(s):** 01/26/2016

Description of Criteria Reviewed	Criteria Met? YES	NO	NA	Comments/Qualifiers
10. Is there evidence of verification that the physical form matches the waste stream description? **Reference Source: CCP-PO-001, Table C3-3**	X			
11. Are prohibited items absent? **Reference Source: CCP-PO-001, Table C3-3**	X			
12. Does observable liquid, if present, meet the criteria of the TSDF-WAC? **Reference Source: CCP-PO-001, C-1**			X	No Observable Liquids
13. Were discrepancies between two operators with regard to identification of waste matrix code, liquids in excess of the TSDF-WAC, or compressed gases through replicate scans and independent observations reconciled? NA if no discrepancies. **Reference Source: CCP-PO-001, C3-2**			X	
14. Are the training qualifications for all radiography personnel acceptable? **Reference Source: CCP-PO-001, C3-8**	X			
15. Was evidence of the video/audio check included in the BDR? **Reference Source: CCP-PO-001, C1-1**	X			
16. Was the Lines-Pair Resolution Test or Sieve Test Check included in the BDR? **Reference Source: CCP Technical Procedures**	X			
17. Was a replicate scan performed once per day, or once per batch, whichever is LESS frequent? **Reference Source: CCP-PO-001, C1-1**	X			
18. Was an independent observation performed once per day, or once per batch, whichever is LESS frequent? **Reference Source: CCP-PO-001, C1-1**	X			

Attachment 2 – CCP SPM Radiography Project Level Validation Checklist and Summary (Continued)

BDR Number: OR-RTR6-0716 **Examination Date(s):** 01/26/2016

Description of Criteria Reviewed	Criteria Met? YES	NO	NA	Comments/Qualifiers
19. Were the replicate scan and independent observation performed on different waste containers? **Reference Source: CCP-PO-001, C1-1**	X			
20. Were the personnel performing the replicate scan and independent observation different from the individual who performed the original? **Reference Source: CCP-PO-001, C1-1**	X			
21. Does the BDR include an estimate of each material parameter weight in kg for each container? **Reference Source: CCP Technical Procedures**	X			
22. Does the BDR include a description of each material parameter for each container? **Reference Source: CCP Technical Procedures**	X			
23. Is the container gross weight recorded in kilograms (kg) for each container in the BDR? **Reference Source: CCP Technical Procedures**	X			
24. Was the Scale Weight Calibration Check included in the BDR? **Reference Source: CCP Technical Procedures**			X	Scale not used.
25. Was the Scale Weight Check included in the BDR? **Reference Source: CCP Technical Procedures**			X	Scale not used.

Comments: N/A

The container QC checks were properly performed and meet the Quality Assurance Objectives (QAOs). Proper procedures were followed during data reduction and analysis. The batch is complete, acceptable, and includes all supporting data and documentation required by the QAPjP.

Roger Whiteaker	Roger Whiteaker	02/10/2016
SPM Printed Name	Signature	Date

Checklist is to be re-signed only when a re-review is performed.

SPM Printed Name	Signature	Reason	Date
SPM Printed Name	Signature	Reason	Date

Attachment 5–CCP Radiography Batch Data Report Cover Sheet

Site ID: ORNL

Batch Data Report No.: OR-RTR6-0716 ☑ CH ☐ RH Date: 1-26-16

Waste Container ID Numbers	
Replicate Scan:	X10C1250229
Independent Observation:	X10C1250248
1	X10C1250248
2	X10C1250261
3	X10C1250250
4	X10C1250259
5	X10C1250242
6	X10C1250244
7	X10C1250237
8	X10C1250233
9	X10C1250264
10	X10C1250235
11	X10C1250238
12	X10C1250239
13	X10C1250234
14	X10C1250257
15	X10C1250236
16	X10C1250229
17	X10C1250232
18	X10C1250243
19	X10C1250260
20	X10C1250245

RTR Operator:

Eric Lyles — Printed Name

Signature

1-26-16 — Date

Independent Technical Reviewer:

THAD HASSELSTROM — Printed Name

Signature

2-4-16 — Date

CCP RECORDS ORIGINAL
DATE REC'D 2/4/16

Attachment 4 – CCP Radiography Batch Data Report Table of Contents and Batch Narrative

Batch Data Report No.: OR-RTR6-0716 Date: 1-26-16

Table Of Contents		
Item	Description	Page No.
1	CCP Radiography Batch Data Report Cover Sheet	1
2	CCP Radiography Batch Data Report Table Of Contents	2
3	CCP RTR Measurement Control Report	3
4	CCP Radiography Data Sheets	4
5	Copy of NCRs (NA, If Not Applicable)	N/A
6	CCP Independent Technical Reviewer Checklist	70

Batch Narrative
All Quality Checks were performed and recorded on CCP-TP-053, Rev.15, CCP Radiography Measurement Control Report.

Eric Lyles — RTR Operator

Signature

1-26-16 — Date

Attachment 1 – CCP RTR Measurement Control Report

Site ID: ORNL		
Batch Data Report No.: OR-RTR6-0716		
Examination Date: 1-26-16		
Control Checks		
Video/Audio Recorded Media System Check	☑ SAT	☐ UNSAT
Image Test : 10 Lines (Minimum acceptable is 5 lines-pair/cm or #6 Sieve is viewable)	☑ SAT	☐ UNSAT
Comments: N/A		
RTR Operator:		
Eric Lyles	[signature]	1-26-16
Printed Name	Signature	Date

CCP Radiography Data Sheet

Section 1: General Information	
☐ RTR Examination ☒ RTR Replicate Scan ☐ RTR Independent Observation	
Site ID:	ORNL
Batch Number:	OR-RTR6-0716
Examination Date:	1/26/2016
Waste Container ID:	X10C1250229
Video/Audio Recorded Media Number:	OR-RTR6-0716 A&B
Procedure and Revision No.:	CCP-TP-053 Rev. 15
NCR(s) associated with the container? (e.g., Prohibited Items)	☒ No ☐ Yes NCR No.: N/A NCR No.: N/A

Section 2: Waste Container Data	
Container Type:	55 Gallon Drum
TRUCON Code:	OR 227
Waste Matrix Code:	S4100
Waste Stream I.D.:	OR-NFS-CH-SOIL
Waste Container Weights:	Gross Wt.: 240.0 kg Tare Wt.: 35.2 kg Net Wt.: 204.8 kg
Rigid Liner and Liner Vent Description:	Liner: ☐ No ☒ Yes Lid: ☒ No ☐ Yes Type: ☐ 30-mil ☒ 90-mil ☐ 110-mil ☐ 125-mil Vented: ☐ No ☒ Yes ☐ N/A Punctured: ☒ No ☐ Yes Mechanical Vent: ☒ No ☐ Yes Fiberboard Liner: ☒ No ☐ Yes Lead Lined: ☒ No ☐ Yes
Number of Layers of Confinement:	Appears to be 1 layer
Volume Utilization Percentage:	80 %

CCP Radiography Data Sheet

Waste Container ID: X10C1250229

Section 3: Container Inventory and Comments (Detailed descriptions)	
IM:	
AM:	
OM:	
OI:	
C:	
R:	
XPM:	
OR:	Absorbent
IN:	
S:	Soil

Section 4: Packaging Material and Waste Material Parameters	
Packaging Material:	**Estimated Weight (kg)**
Steel (ST):	27.8
Plastics (PP): Liner bag, Rigid Liner	7.4
Other:	0.0
Total Packaging Weight	35.2
Waste Material Parameter:	**Estimated Weight (kg)**
Iron-based Metal / Alloys (IM):	
Aluminum-based Metals / Alloys (AM):	
Other Metals (OM):	
Other Inorganic Materials (OI)	
Cellulosics (C):	
Rubber (R):	
Plastics (waste materials) (XPM):	
Organic Matrix (OR):	2.0
Inorganic Matrix (IN):	
Soils (S):	202.8
Total WMP Weight:	204.8

CCP Radiography Data Sheet

Waste Container ID: X10C1250229

Section 5: RTR Summary (Questions answered "Yes" will be explained in the Comment block, except for Question 1)	
Is there observable liquid?	☐ Yes ☒ No
Is there any observable liquid in internal containers, more than 60 milliliters or 3 percent by volume, whichever is greater?	☐ Yes ☒ No
Is the total volume of observable liquid in the outermost container GREATER than 1% of the container?	☐ Yes ☒ No
Is there observable liquid in payload containers with an EPA Hazardous Waste Number of U134?	☐ Yes ☒ No
Is there an indication of non-radionuclide pyrophoric materials, such as elemental potassium?	☐ Yes ☒ No
Is there an indication of hazardous wastes not occurring as co-contaminants with TRU mixed wastes (non-mixed hazardous wastes)?	☐ Yes ☒ No
Is there an indication of wastes incompatible with backfill, seal and panel closures materials, container and packaging materials, shipping container materials, or other wastes (i.e., waste does NOT match TRUCON Code[s])?	☐ Yes ☒ No
Is there an indication of wastes containing explosives or compressed gases?	☐ Yes ☒ No
Is there an indication of PCBs liquids?	☐ Yes ☒ No
Is there an indication of the waste exhibiting the characteristic of ignitability, corrosivity, or reactivity (EPA Hazardous Waste Numbers of D001, D002, or D003)?	☐ Yes ☒ No
Is the physical form of the waste inconsistent with the Waste Stream Description or the Waste Matrix Code?	☐ Yes ☒ No
CH or RH TRAMPAC	
Are there heat-sealed bags (unvented) GREATER than 4 liters and LESS than 390 square inches in the waste, or heat sealed bags not authorized in the RH TRUCON Code?	☐ Yes ☒ No
Were there Non-approved Closure Methods used on liner bags or inner bags greater than 4 liters?	☐ Yes ☒ No
Are there sealed containers GREATER than 4 liters?	☐ Yes ☒ No
Are there indications of inadequate protection for heavy and/or sharp objects?	☐ Yes ☒ No

Comments: This Replicate Scan Agrees with the ORigNal Scan.

1-26-16

RTR Operator:

Print Name	Signature	Date
Fred Oney		1/26/2016

CCP Radiography Data Sheet

Section 1: General Information	
☐ RTR Examination ☐ RTR Replicate Scan ☒ RTR Independent Observation	
Site ID:	ORNL
Batch Number:	OR-RTR6-0716
Examination Date:	1/26/2016
Waste Container ID:	X10C1250248
Video/Audio Recorded Media Number:	OR-RTR6-0716 A&B
Procedure and Revision No.:	CCP-TP-053 Rev. 15
NCR(s) associated with the container? (e.g., Prohibited Items)	☒ No ☐ Yes NCR No.: N/A NCR No.: N/A

Section 2: Waste Container Data	
Container Type:	55 Gallon Drum
TRUCON Code:	OR 227
Waste Matrix Code:	S4100
Waste Stream I.D.:	OR-NFS-CH-SOIL
Waste Container Weights:	Gross Wt.: 246.8 kg Tare Wt.: 35.2 kg Net Wt.: 211.6 kg
Rigid Liner and Liner Vent Description:	Liner: ☐ No ☒ Yes Lid: ☒ No ☐ Yes Type: ☐ 30-mil ☒ 90-mil ☐ 110-mil ☐ 125-mil Vented: ☐ No ☒ Yes ☐ N/A Punctured: ☒ No ☐ Yes Mechanical Vent: ☒ No ☐ Yes Fiberboard Liner: ☒ No ☐ Yes Lead Lined: ☒ No ☐ Yes
Number of Layers of Confinement:	Appears to be 1 layer
Volume Utilization Percentage:	90 %

CCP Radiography Data Sheet

Waste Container ID: X10C1250248

Section 3: Container Inventory and Comments (Detailed descriptions)
IM:
AM:
OM:
OI:
C:
R:
XPM:
OR: Absorbent
IN:
S: Soil

Section 4: Packaging Material and Waste Material Parameters	
Packaging Material:	**Estimated Weight (kg)**
Steel (ST):	27.8
Plastics (PP): Liner bag, Rigid Liner	7.4
Other:	0.0
Total Packaging Weight	35.2
Waste Material Parameter:	**Estimated Weight (kg)**
Iron-based Metal / Alloys (IM):	
Aluminum-based Metals / Alloys (AM):	
Other Metals (OM):	
Other Inorganic Materials (OI)	
Cellulosics (C):	
Rubber (R):	
Plastics (waste materials) (XPM):	
Organic Matrix (OR):	2.0
Inorganic Matrix (IN):	
Soils (S):	209.6
Total WMP Weight:	211.6

CCP Radiography Data Sheet

Waste Container ID: X10C1250248

Section 5: RTR Summary (Questions answered "Yes" will be explained in the Comment block, except for Question 1)	
Is there observable liquid?	☐ Yes ☒ No
Is there any observable liquid in internal containers, more than 60 milliliters or 3 percent by volume, whichever is greater?	☐ Yes ☒ No
Is the total volume of observable liquid in the outermost container GREATER than 1% of the container?	☐ Yes ☒ No
Is there observable liquid in payload containers with an EPA Hazardous Waste Number of U134?	☐ Yes ☒ No
Is there an indication of non-radionuclide pyrophoric materials, such as elemental potassium?	☐ Yes ☒ No
Is there an indication of hazardous wastes not occurring as co-contaminants with TRU mixed wastes (non-mixed hazardous wastes)?	☐ Yes ☒ No
Is there an indication of wastes incompatible with backfill, seal and panel closures materials, container and packaging materials, shipping container materials, or other wastes (i.e., waste does NOT match TRUCON Code[s])?	☐ Yes ☒ No
Is there an indication of wastes containing explosives or compressed gases?	☐ Yes ☒ No
Is there an indication of PCBs liquids?	☐ Yes ☒ No
Is there an indication of the waste exhibiting the characteristic of ignitability, corrosivity, or reactivity (EPA Hazardous Waste Numbers of D001, D002, or D003)?	☐ Yes ☒ No
Is the physical form of the waste inconsistent with the Waste Stream Description or the Waste Matrix Code?	☐ Yes ☒ No
CH or RH TRAMPAC	
Are there heat-sealed bags (unvented) GREATER than 4 liters and LESS than 390 square inches in the waste, or heat sealed bags not authorized in the RH TRUCON Code?	☐ Yes ☒ No
Were there Non-approved Closure Methods used on liner bags or inner bags greater than 4 liters?	☐ Yes ☒ No
Are there sealed containers GREATER than 4 liters?	☐ Yes ☒ No
Are there indications of inadequate protection for heavy and/or sharp objects?	☐ Yes ☒ No

Comments: This Independent OBSERVATION Agrees with the ORIGINAL SCAN.

1-26-16

RTR Operator:

Fred Oney		1/26/2016
Print Name	Signature	Date

CCP Radiography Data Sheet

Section 1: General Information	
[X] RTR Examination [ ] RTR Replicate Scan [ ] RTR Independent Observation	
Site ID:	ORNL
Batch Number:	OR-RTR6-0716
Examination Date:	1/26/2016
Waste Container ID:	X10C1250248
Video/Audio Recorded Media Number:	OR-RTR6-0716 A&B
Procedure and Revision No.:	CCP-TP-053 Rev. 15
NCR(s) associated with the container? (e.g., Prohibited Items)	[X] No [ ] Yes NCR No.: N/A NCR No.: N/A

Section 2: Waste Container Data	
Container Type:	55 Gallon Drum
TRUCON Code:	OR 227
Waste Matrix Code:	S4100
Waste Stream I.D.:	OR-NFS-CH-SOIL
Waste Container Weights:	Gross Wt.: 246.8 kg Tare Wt.: 35.2 kg Net Wt.: 211.6 kg
Rigid Liner and Liner Vent Description:	Liner: [ ] No [X] Yes Lid: [X] No [ ] Yes Type: [ ] 30-mil [X] 90-mil [ ] 110-mil [ ] 125-mil Vented: [ ] No [X] Yes [ ] N/A Punctured: [X] No [ ] Yes Mechanical Vent: [X] No [ ] Yes Fiberboard Liner: [X] No [ ] Yes Lead Lined: [X] No [ ] Yes
Number of Layers of Confinement:	Appears to be 1 layer
Volume Utilization Percentage:	90 %

CCP Radiography Data Sheet

Waste Container ID: X10C1250248

Section 3: Container Inventory and Comments (Detailed descriptions)
IM:
AM:
OM:
OI:
C:
R:
XPM:
OR: Absorbent
IN:
S: Soil

Section 4: Packaging Material and Waste Material Parameters	
Packaging Material:	**Estimated Weight (kg)**
Steel (ST):	27.8
Plastics (PP): Liner bag, Rigid Liner	7.4
Other:	0.0
Total Packaging Weight	35.2
Waste Material Parameter:	**Estimated Weight (kg)**
Iron-based Metal / Alloys (IM):	
Aluminum-based Metals / Alloys (AM):	
Other Metals (OM):	
Other Inorganic Materials (OI)	
Cellulosics (C):	
Rubber (R):	
Plastics (waste materials) (XPM):	
Organic Matrix (OR):	3.0
Inorganic Matrix (IN):	
Soils (S):	208.6
Total WMP Weight:	211.6

//

CCP Radiography Data Sheet

Waste Container ID: X10C1250248

Section 5: RTR Summary (Questions answered "Yes" will be explained in the Comment block, except for Question 1)	
Is there observable liquid?	☐ Yes ☒ No
Is there any observable liquid in internal containers, more than 60 milliliters or 3 percent by volume, whichever is greater?	☐ Yes ☒ No
Is the total volume of observable liquid in the outermost container GREATER than 1% of the container?	☐ Yes ☒ No
Is there observable liquid in payload containers with an EPA Hazardous Waste Number of U134?	☐ Yes ☒ No
Is there an indication of non-radionuclide pyrophoric materials, such as elemental potassium?	☐ Yes ☒ No
Is there an indication of hazardous wastes not occurring as co-contaminants with TRU mixed wastes (non-mixed hazardous wastes)?	☐ Yes ☒ No
Is there an indication of wastes incompatible with backfill, seal and panel closures materials, container and packaging materials, shipping container materials, or other wastes (i.e., waste does NOT match TRUCON Code[s])?	☐ Yes ☒ No
Is there an indication of wastes containing explosives or compressed gases?	☐ Yes ☒ No
Is there an indication of PCBs liquids?	☐ Yes ☒ No
Is there an indication of the waste exhibiting the characteristic of ignitability, corrosivity, or reactivity (EPA Hazardous Waste Numbers of D001, D002, or D003)?	☐ Yes ☒ No
Is the physical form of the waste inconsistent with the Waste Stream Description or the Waste Matrix Code?	☐ Yes ☒ No
CH or RH TRAMPAC	
Are there heat-sealed bags (unvented) GREATER than 4 liters and LESS than 390 square inches in the waste, or heat sealed bags not authorized in the RH TRUCON Code?	☐ Yes ☒ No
Were there Non-approved Closure Methods used on liner bags or inner bags greater than 4 liters?	☐ Yes ☒ No
Are there sealed containers GREATER than 4 liters?	☐ Yes ☒ No
Are there indications of inadequate protection for heavy and/or sharp objects?	☐ Yes ☒ No
Comments: N/A	

RTR Operator:

Eric Lyles		1/26/2016
Print Name	Signature	Date

CCP Radiography Data Sheet

Section 1: General Information	
[X] RTR Examination [ ] RTR Replicate Scan [ ] RTR Independent Observation	
Site ID:	ORNL
Batch Number:	OR-RTR6-0716
Examination Date:	1/26/2016
Waste Container ID:	X10C1250261
Video/Audio Recorded Media Number:	OR-RTR6-0716 A&B
Procedure and Revision No.:	CCP-TP-053 Rev. 15
NCR(s) associated with the container? (e.g., Prohibited Items)	[X] No [ ] Yes NCR No.: N/A NCR No.: N/A

Section 2: Waste Container Data	
Container Type:	55 Gallon Drum
TRUCON Code:	OR 227
Waste Matrix Code:	S4100
Waste Stream I.D.:	OR-NFS-CH-SOIL
Waste Container Weights:	Gross Wt.: 214.4 kg Tare Wt.: 35.2 kg Net Wt.: 179.2 kg
Rigid Liner and Liner Vent Description:	Liner: [ ] No [X] Yes Lid: [X] No [ ] Yes Type: [ ] 30-mil [X] 90-mil [ ] 110-mil [ ] 125-mil Vented: [ ] No [X] Yes [ ] N/A Punctured: [X] No [ ] Yes Mechanical Vent: [X] No [ ] Yes Fiberboard Liner: [X] No [ ] Yes Lead Lined: [X] No [ ] Yes
Number of Layers of Confinement:	Appears to be 1 layer
Volume Utilization Percentage:	80 %

CCP Radiography Data Sheet

Waste Container ID: X10C1250261

Section 3: Container Inventory and Comments (Detailed descriptions)
IM:
AM:
OM:
OI:
C:
R:
XPM:
OR: Absorbent
IN:
S: Soil

Section 4: Packaging Material and Waste Material Parameters	
Packaging Material:	**Estimated Weight (kg)**
Steel (ST):	27.8
Plastics (PP): Liner bag, Rigid Liner	7.4
Other:	0.0
Total Packaging Weight	35.2
Waste Material Parameter:	**Estimated Weight (kg)**
Iron-based Metal / Alloys (IM):	
Aluminum-based Metals / Alloys (AM):	
Other Metals (OM):	
Other Inorganic Materials (OI)	
Cellulosics (C):	
Rubber (R):	
Plastics (waste materials) (XPM):	
Organic Matrix (OR):	2.0
Inorganic Matrix (IN):	
Soils (S):	177.2
Total WMP Weight:	179.2

CCP Radiography Data Sheet

Waste Container ID: X10C1250261

Section 5: RTR Summary (Questions answered "Yes" will be explained in the Comment block, except for Question 1)	
Is there observable liquid?	☐ Yes ☒ No
Is there any observable liquid in internal containers, more than 60 milliliters or 3 percent by volume, whichever is greater?	☐ Yes ☒ No
Is the total volume of observable liquid in the outermost container GREATER than 1% of the container?	☐ Yes ☒ No
Is there observable liquid in payload containers with an EPA Hazardous Waste Number of U134?	☐ Yes ☒ No
Is there an indication of non-radionuclide pyrophoric materials, such as elemental potassium?	☐ Yes ☒ No
Is there an indication of hazardous wastes not occurring as co-contaminants with TRU mixed wastes (non-mixed hazardous wastes)?	☐ Yes ☒ No
Is there an indication of wastes incompatible with backfill, seal and panel closures materials, container and packaging materials, shipping container materials, or other wastes (i.e., waste does NOT match TRUCON Code[s])?	☐ Yes ☒ No
Is there an indication of wastes containing explosives or compressed gases?	☐ Yes ☒ No
Is there an indication of PCBs liquids?	☐ Yes ☒ No
Is there an indication of the waste exhibiting the characteristic of ignitability, corrosivity, or reactivity (EPA Hazardous Waste Numbers of D001, D002, or D003)?	☐ Yes ☒ No
Is the physical form of the waste inconsistent with the Waste Stream Description or the Waste Matrix Code?	☐ Yes ☒ No
CH or RH TRAMPAC	
Are there heat-sealed bags (unvented) GREATER than 4 liters and LESS than 390 square inches in the waste, or heat sealed bags not authorized in the RH TRUCON Code?	☐ Yes ☒ No
Were there Non-approved Closure Methods used on liner bags or inner bags greater than 4 liters?	☐ Yes ☒ No
Are there sealed containers GREATER than 4 liters?	☐ Yes ☒ No
Are there indications of inadequate protection for heavy and/or sharp objects?	☐ Yes ☒ No
Comments: N/A	

RTR Operator:

Eric Lyles		1/26/2016
Print Name	Signature	Date

CCP Radiography Data Sheet

Section 1: General Information	
[X] RTR Examination [ ] RTR Replicate Scan [ ] RTR Independent Observation	
Site ID:	ORNL
Batch Number:	OR-RTR6-0716
Examination Date:	1/26/2016
Waste Container ID:	X10C1250250
Video/Audio Recorded Media Number:	OR-RTR6-0716 A&B
Procedure and Revision No.:	CCP-TP-053 Rev. 15
NCR(s) associated with the container? (e.g., Prohibited Items)	[X] No [ ] Yes NCR No.: N/A NCR No.: N/A

Section 2: Waste Container Data	
Container Type:	55 Gallon Drum
TRUCON Code:	OR 227
Waste Matrix Code:	S4100
Waste Stream I.D.:	OR-NFS-CH-SOIL
Waste Container Weights:	Gross Wt.: 252.6 kg Tare Wt.: 35.2 kg Net Wt.: 217.4 kg
Rigid Liner and Liner Vent Description:	Liner: [ ] No [X] Yes Lid: [X] No [ ] Yes Type: [ ] 30-mil [X] 90-mil [ ] 110-mil [ ] 125-mil Vented: [ ] No [X] Yes [ ] N/A Punctured: [X] No [ ] Yes Mechanical Vent: [X] No [ ] Yes Fiberboard Liner: [X] No [ ] Yes Lead Lined: [X] No [ ] Yes
Number of Layers of Confinement:	Appears to be 1 layer
Volume Utilization Percentage:	90 %

CCP Radiography Data Sheet

Waste Container ID: X10C1250250

Section 3: Container Inventory and Comments (Detailed descriptions)
IM:
AM:
OM:
OI:
C:
R:
XPM:
OR: Absorbent
IN:
S: Soil

Section 4: Packaging Material and Waste Material Parameters	
Packaging Material:	**Estimated Weight (kg)**
Steel (ST):	27.8
Plastics (PP): Liner bag, Rigid Liner	7.4
Other:	0.0
Total Packaging Weight	35.2
Waste Material Parameter:	**Estimated Weight (kg)**
Iron-based Metal / Alloys (IM):	
Aluminum-based Metals / Alloys (AM):	
Other Metals (OM):	
Other Inorganic Materials (OI)	
Cellulosics (C):	
Rubber (R):	
Plastics (waste materials) (XPM):	
Organic Matrix (OR):	3.0
Inorganic Matrix (IN):	
Soils (S):	214.4
Total WMP Weight:	217.4

CCP Radiography Data Sheet

Waste Container ID: X10C1250250

Section 5: RTR Summary (Questions answered "Yes" will be explained in the Comment block, except for Question 1)	
Is there observable liquid?	☐ Yes ☒ No
Is there any observable liquid in internal containers, more than 60 milliliters or 3 percent by volume, whichever is greater?	☐ Yes ☒ No
Is the total volume of observable liquid in the outermost container GREATER than 1% of the container?	☐ Yes ☒ No
Is there observable liquid in payload containers with an EPA Hazardous Waste Number of U134?	☐ Yes ☒ No
Is there an indication of non-radionuclide pyrophoric materials, such as elemental potassium?	☐ Yes ☒ No
Is there an indication of hazardous wastes not occurring as co-contaminants with TRU mixed wastes (non-mixed hazardous wastes)?	☐ Yes ☒ No
Is there an indication of wastes incompatible with backfill, seal and panel closures materials, container and packaging materials, shipping container materials, or other wastes (i.e., waste does NOT match TRUCON Code[s])?	☐ Yes ☒ No
Is there an indication of wastes containing explosives or compressed gases?	☐ Yes ☒ No
Is there an indication of PCBs liquids?	☐ Yes ☒ No
Is there an indication of the waste exhibiting the characteristic of ignitability, corrosivity, or reactivity (EPA Hazardous Waste Numbers of D001, D002, or D003)?	☐ Yes ☒ No
Is the physical form of the waste inconsistent with the Waste Stream Description or the Waste Matrix Code?	☐ Yes ☒ No
CH or RH TRAMPAC	
Are there heat-sealed bags (unvented) GREATER than 4 liters and LESS than 390 square inches in the waste, or heat sealed bags not authorized in the RH TRUCON Code?	☐ Yes ☒ No
Were there Non-approved Closure Methods used on liner bags or inner bags greater than 4 liters?	☐ Yes ☒ No
Are there sealed containers GREATER than 4 liters?	☐ Yes ☒ No
Are there indications of inadequate protection for heavy and/or sharp objects?	☐ Yes ☒ No
Comments: N/A	

RTR Operator:

Eric Lyles		1/26/2016
Print Name	Signature	Date

CCP Radiography Data Sheet

Section 1: General Information	
[X] RTR Examination [ ] RTR Replicate Scan [ ] RTR Independent Observation	
Site ID:	ORNL
Batch Number:	OR-RTR6-0716
Examination Date:	1/26/2016
Waste Container ID:	X10C1250259
Video/Audio Recorded Media Number:	OR-RTR6-0716 A&B
Procedure and Revision No.:	CCP-TP-053 Rev. 15
NCR(s) associated with the container? (e.g., Prohibited Items)	[X] No [ ] Yes NCR No.: N/A NCR No.: N/A

Section 2: Waste Container Data	
Container Type:	55 Gallon Drum
TRUCON Code:	OR 227
Waste Matrix Code:	S4100
Waste Stream I.D.:	OR-NFS-CH-SOIL
Waste Container Weights:	Gross Wt.: 241.5 kg Tare Wt.: 35.2 kg Net Wt.: 206.3 kg
Rigid Liner and Liner Vent Description:	Liner: [ ] No [X] Yes Lid: [X] No [ ] Yes Type: [ ] 30-mil [X] 90-mil [ ] 110-mil [ ] 125-mil Vented: [ ] No [X] Yes [ ] N/A Punctured: [X] No [ ] Yes Mechanical Vent: [X] No [ ] Yes Fiberboard Liner: [X] No [ ] Yes Lead Lined: [X] No [ ] Yes
Number of Layers of Confinement:	Appears to be 1 layer
Volume Utilization Percentage:	85 %

CCP Radiography Data Sheet

Waste Container ID: X10C1250259

Section 3: Container Inventory and Comments (Detailed descriptions)
IM:
AM:
OM:
OI:
C:
R:
XPM:
OR: Absorbent
IN:
S: Soil

Section 4: Packaging Material and Waste Material Parameters	
Packaging Material:	**Estimated Weight (kg)**
Steel (ST):	27.8
Plastics (PP): Liner bag, Rigid Liner	7.4
Other:	0.0
Total Packaging Weight	35.2
Waste Material Parameter:	**Estimated Weight (kg)**
Iron-based Metal / Alloys (IM):	
Aluminum-based Metals / Alloys (AM):	
Other Metals (OM):	
Other Inorganic Materials (OI)	
Cellulosics (C):	
Rubber (R):	
Plastics (waste materials) (XPM):	
Organic Matrix (OR):	2.0
Inorganic Matrix (IN):	
Soils (S):	204.3
Total WMP Weight:	206.3

CCP Radiography Data Sheet

Waste Container ID: X10C1250259

Section 5: RTR Summary (Questions answered "Yes" will be explained in the Comment block, except for Question 1)	
Is there observable liquid?	☐ Yes ☒ No
Is there any observable liquid in internal containers, more than 60 milliliters or 3 percent by volume, whichever is greater?	☐ Yes ☒ No
Is the total volume of observable liquid in the outermost container GREATER than 1% of the container?	☐ Yes ☒ No
Is there observable liquid in payload containers with an EPA Hazardous Waste Number of U134?	☐ Yes ☒ No
Is there an indication of non-radionuclide pyrophoric materials, such as elemental potassium?	☐ Yes ☒ No
Is there an indication of hazardous wastes not occurring as co-contaminants with TRU mixed wastes (non-mixed hazardous wastes)?	☐ Yes ☒ No
Is there an indication of wastes incompatible with backfill, seal and panel closures materials, container and packaging materials, shipping container materials, or other wastes (i.e., waste does NOT match TRUCON Code[s])?	☐ Yes ☒ No
Is there an indication of wastes containing explosives or compressed gases?	☐ Yes ☒ No
Is there an indication of PCBs liquids?	☐ Yes ☒ No
Is there an indication of the waste exhibiting the characteristic of ignitability, corrosivity, or reactivity (EPA Hazardous Waste Numbers of D001, D002, or D003)?	☐ Yes ☒ No
Is the physical form of the waste inconsistent with the Waste Stream Description or the Waste Matrix Code?	☐ Yes ☒ No
CH or RH TRAMPAC	
Are there heat-sealed bags (unvented) GREATER than 4 liters and LESS than 390 square inches in the waste, or heat sealed bags not authorized in the RH TRUCON Code?	☐ Yes ☒ No
Were there Non-approved Closure Methods used on liner bags or inner bags greater than 4 liters?	☐ Yes ☒ No
Are there sealed containers GREATER than 4 liters?	☐ Yes ☒ No
Are there indications of inadequate protection for heavy and/or sharp objects?	☐ Yes ☒ No
Comments: N/A	

RTR Operator:

Eric Lyles		1/26/2016
Print Name	Signature	Date

CCP Radiography Data Sheet

Section 1: General Information	
[X] RTR Examination [ ] RTR Replicate Scan [ ] RTR Independent Observation	
Site ID:	ORNL
Batch Number:	OR-RTR6-0716
Examination Date:	1/26/2016
Waste Container ID:	X10C1250242
Video/Audio Recorded Media Number:	OR-RTR6-0716 A&B
Procedure and Revision No.:	CCP-TP-053 Rev. 15
NCR(s) associated with the container? (e.g., Prohibited Items)	[X] No [ ] Yes NCR No.: N/A NCR No.: N/A

Section 2: Waste Container Data	
Container Type:	55 Gallon Drum
TRUCON Code:	OR 227
Waste Matrix Code:	S4100
Waste Stream I.D.:	OR-NFS-CH-SOIL
Waste Container Weights:	Gross Wt.: 248.5 kg Tare Wt.: 35.2 kg Net Wt.: 213.3 kg
Rigid Liner and Liner Vent Description:	Liner: [ ] No [X] Yes Lid: [X] No [ ] Yes Type: [ ] 30-mil [X] 90-mil [ ] 110-mil [ ] 125-mil Vented: [ ] No [X] Yes [ ] N/A Punctured: [X] No [ ] Yes Mechanical Vent: [X] No [ ] Yes Fiberboard Liner: [X] No [ ] Yes Lead Lined: [X] No [ ] Yes
Number of Layers of Confinement:	Appears to be 1 layer
Volume Utilization Percentage:	90 %

CCP Radiography Data Sheet

Waste Container ID: X10C1250242

Section 3: Container Inventory and Comments (Detailed descriptions)
IM:
AM:
OM:
OI:
C:
R:
XPM:
OR: Absorbent
IN:
S: Soil

Section 4: Packaging Material and Waste Material Parameters	
Packaging Material:	**Estimated Weight (kg)**
Steel (ST):	27.8
Plastics (PP): Liner bag, Rigid Liner	7.4
Other:	0.0
Total Packaging Weight	35.2
Waste Material Parameter:	**Estimated Weight (kg)**
Iron-based Metal / Alloys (IM):	
Aluminum-based Metals / Alloys (AM):	
Other Metals (OM):	
Other Inorganic Materials (OI)	
Cellulosics (C):	
Rubber (R):	
Plastics (waste materials) (XPM):	
Organic Matrix (OR):	3.0
Inorganic Matrix (IN):	
Soils (S):	210.3
Total WMP Weight:	213.3

CCP Radiography Data Sheet

Waste Container ID: X10C1250242

Section 5: RTR Summary (Questions answered "Yes" will be explained in the Comment block, except for Question 1)	
Is there observable liquid?	☐ Yes ☒ No
Is there any observable liquid in internal containers, more than 60 milliliters or 3 percent by volume, whichever is greater?	☐ Yes ☒ No
Is the total volume of observable liquid in the outermost container GREATER than 1% of the container?	☐ Yes ☒ No
Is there observable liquid in payload containers with an EPA Hazardous Waste Number of U134?	☐ Yes ☒ No
Is there an indication of non-radionuclide pyrophoric materials, such as elemental potassium?	☐ Yes ☒ No
Is there an indication of hazardous wastes not occurring as co-contaminants with TRU mixed wastes (non-mixed hazardous wastes)?	☐ Yes ☒ No
Is there an indication of wastes incompatible with backfill, seal and panel closures materials, container and packaging materials, shipping container materials, or other wastes (i.e., waste does NOT match TRUCON Code[s])?	☐ Yes ☒ No
Is there an indication of wastes containing explosives or compressed gases?	☐ Yes ☒ No
Is there an indication of PCBs liquids?	☐ Yes ☒ No
Is there an indication of the waste exhibiting the characteristic of ignitability, corrosivity, or reactivity (EPA Hazardous Waste Numbers of D001, D002, or D003)?	☐ Yes ☒ No
Is the physical form of the waste inconsistent with the Waste Stream Description or the Waste Matrix Code?	☐ Yes ☒ No
CH or RH TRAMPAC	
Are there heat-sealed bags (unvented) GREATER than 4 liters and LESS than 390 square inches in the waste, or heat sealed bags not authorized in the RH TRUCON Code?	☐ Yes ☒ No
Were there Non-approved Closure Methods used on liner bags or inner bags greater than 4 liters?	☐ Yes ☒ No
Are there sealed containers GREATER than 4 liters?	☐ Yes ☒ No
Are there indications of inadequate protection for heavy and/or sharp objects?	☐ Yes ☒ No
Comments: N/A	

RTR Operator:

Eric Lyles		1/26/2016
Print Name	Signature	Date

CCP Radiography Data Sheet

Section 1: General Information	
[X] RTR Examination [ ] RTR Replicate Scan [ ] RTR Independent Observation	
Site ID:	ORNL
Batch Number:	OR-RTR6-0716
Examination Date:	1/26/2016
Waste Container ID:	X10C1250244
Video/Audio Recorded Media Number:	OR-RTR6-0716 A&B
Procedure and Revision No.:	CCP-TP-053 Rev. 15
NCR(s) associated with the container? (e.g., Prohibited Items)	[X] No [ ] Yes NCR No.: N/A NCR No.: N/A

Section 2: Waste Container Data	
Container Type:	55 Gallon Drum
TRUCON Code:	OR 227
Waste Matrix Code:	S4100
Waste Stream I.D.:	OR-NFS-CH-SOIL
Waste Container Weights:	Gross Wt.: 212.5 kg Tare Wt.: 35.2 kg Net Wt.: 177.3 kg
Rigid Liner and Liner Vent Description:	Liner: [ ] No [X] Yes Lid: [X] No [ ] Yes Type: [ ] 30-mil [X] 90-mil [ ] 110-mil [ ] 125-mil Vented: [ ] No [X] Yes [ ] N/A Punctured: [X] No [ ] Yes Mechanical Vent: [X] No [ ] Yes Fiberboard Liner: [X] No [ ] Yes Lead Lined: [X] No [ ] Yes
Number of Layers of Confinement:	Appears to be 1 layer
Volume Utilization Percentage:	80 %

CCP Radiography Data Sheet

Waste Container ID: X10C1250244

Section 3: Container Inventory and Comments (Detailed descriptions)
IM:
AM:
OM:
OI:
C:
R:
XPM:
OR: Absorbent
IN:
S: Soil

Section 4: Packaging Material and Waste Material Parameters	
Packaging Material:	**Estimated Weight (kg)**
Steel (ST):	27.8
Plastics (PP): Liner bag, Rigid Liner	7.4
Other:	0.0
Total Packaging Weight	35.2
Waste Material Parameter:	**Estimated Weight (kg)**
Iron-based Metal / Alloys (IM):	
Aluminum-based Metals / Alloys (AM):	
Other Metals (OM):	
Other Inorganic Materials (OI)	
Cellulosics (C):	
Rubber (R):	
Plastics (waste materials) (XPM):	
Organic Matrix (OR):	2.0
Inorganic Matrix (IN):	
Soils (S):	175.3
Total WMP Weight:	177.3

CCP Radiography Data Sheet

Waste Container ID: X10C1250244

Section 5: RTR Summary (Questions answered "Yes" will be explained in the Comment block, except for Question 1)	
Is there observable liquid?	☐ Yes ☒ No
Is there any observable liquid in internal containers, more than 60 milliliters or 3 percent by volume, whichever is greater?	☐ Yes ☒ No
Is the total volume of observable liquid in the outermost container GREATER than 1% of the container?	☐ Yes ☒ No
Is there observable liquid in payload containers with an EPA Hazardous Waste Number of U134?	☐ Yes ☒ No
Is there an indication of non-radionuclide pyrophoric materials, such as elemental potassium?	☐ Yes ☒ No
Is there an indication of hazardous wastes not occurring as co-contaminants with TRU mixed wastes (non-mixed hazardous wastes)?	☐ Yes ☒ No
Is there an indication of wastes incompatible with backfill, seal and panel closures materials, container and packaging materials, shipping container materials, or other wastes (i.e., waste does NOT match TRUCON Code[s])?	☐ Yes ☒ No
Is there an indication of wastes containing explosives or compressed gases?	☐ Yes ☒ No
Is there an indication of PCBs liquids?	☐ Yes ☒ No
Is there an indication of the waste exhibiting the characteristic of ignitability, corrosivity, or reactivity (EPA Hazardous Waste Numbers of D001, D002, or D003)?	☐ Yes ☒ No
Is the physical form of the waste inconsistent with the Waste Stream Description or the Waste Matrix Code?	☐ Yes ☒ No
CH or RH TRAMPAC	
Are there heat-sealed bags (unvented) GREATER than 4 liters and LESS than 390 square inches in the waste, or heat sealed bags not authorized in the RH TRUCON Code?	☐ Yes ☒ No
Were there Non-approved Closure Methods used on liner bags or inner bags greater than 4 liters?	☐ Yes ☒ No
Are there sealed containers GREATER than 4 liters?	☐ Yes ☒ No
Are there indications of inadequate protection for heavy and/or sharp objects?	☐ Yes ☒ No
Comments: N/A	

RTR Operator:

Eric Lyles		1/26/2016
Print Name	Signature	Date

CCP Radiography Data Sheet

CCP-TP-053 Attachment 2

Section 1: General Information	
[X] RTR Examination [ ] RTR Replicate Scan [ ] RTR Independent Observation	
Site ID:	ORNL
Batch Number:	OR-RTR6-0716
Examination Date:	1/26/2016
Waste Container ID:	X10C1250237
Video/Audio Recorded Media Number:	OR-RTR6-0716 A&B
Procedure and Revision No.:	CCP-TP-053 Rev. 15
NCR(s) associated with the container? (e.g., Prohibited Items)	[X] No [ ] Yes NCR No.: N/A NCR No.: N/A

Section 2: Waste Container Data	
Container Type:	55 Gallon Drum
TRUCON Code:	OR 227
Waste Matrix Code:	S4100
Waste Stream I.D.:	OR-NFS-CH-SOIL
Waste Container Weights:	Gross Wt.: 237.1 kg Tare Wt.: 35.2 kg Net Wt.: 201.9 kg
Rigid Liner and Liner Vent Description:	Liner: [ ] No [X] Yes Lid: [X] No [ ] Yes Type: [ ] 30-mil [X] 90-mil [ ] 110-mil [ ] 125-mil Vented: [ ] No [X] Yes [ ] N/A Punctured: [X] No [ ] Yes Mechanical Vent: [X] No [ ] Yes Fiberboard Liner: [X] No [ ] Yes Lead Lined: [X] No [ ] Yes
Number of Layers of Confinement:	Appears to be 1 layer
Volume Utilization Percentage:	90 %

CCP Radiography Data Sheet

Waste Container ID: X10C1250237

Section 3: Container Inventory and Comments (Detailed descriptions)
IM:
AM:
OM:
OI:
C:
R:
XPM:
OR: Absorbent
IN:
S: Soil

Section 4: Packaging Material and Waste Material Parameters	
Packaging Material:	**Estimated Weight (kg)**
Steel (ST):	27.8
Plastics (PP): Liner bag, Rigid Liner	7.4
Other:	0.0
Total Packaging Weight	35.2
Waste Material Parameter:	**Estimated Weight (kg)**
Iron-based Metal / Alloys (IM):	
Aluminum-based Metals / Alloys (AM):	
Other Metals (OM):	
Other Inorganic Materials (OI)	
Cellulosics (C):	
Rubber (R):	
Plastics (waste materials) (XPM):	
Organic Matrix (OR):	3.0
Inorganic Matrix (IN):	
Soils (S):	198.9
Total WMP Weight:	201.9

CCP Radiography Data Sheet

Waste Container ID: X10C1250237

Section 5: RTR Summary (Questions answered "Yes" will be explained in the Comment block, except for Question 1)	
Is there observable liquid?	☐ Yes ☒ No
Is there any observable liquid in internal containers, more than 60 milliliters or 3 percent by volume, whichever is greater?	☐ Yes ☒ No
Is the total volume of observable liquid in the outermost container GREATER than 1% of the container?	☐ Yes ☒ No
Is there observable liquid in payload containers with an EPA Hazardous Waste Number of U134?	☐ Yes ☒ No
Is there an indication of non-radionuclide pyrophoric materials, such as elemental potassium?	☐ Yes ☒ No
Is there an indication of hazardous wastes not occurring as co-contaminants with TRU mixed wastes (non-mixed hazardous wastes)?	☐ Yes ☒ No
Is there an indication of wastes incompatible with backfill, seal and panel closures materials, container and packaging materials, shipping container materials, or other wastes (i.e., waste does NOT match TRUCON Code[s])?	☐ Yes ☒ No
Is there an indication of wastes containing explosives or compressed gases?	☐ Yes ☒ No
Is there an indication of PCBs liquids?	☐ Yes ☒ No
Is there an indication of the waste exhibiting the characteristic of ignitability, corrosivity, or reactivity (EPA Hazardous Waste Numbers of D001, D002, or D003)?	☐ Yes ☒ No
Is the physical form of the waste inconsistent with the Waste Stream Description or the Waste Matrix Code?	☐ Yes ☒ No
CH or RH TRAMPAC	
Are there heat-sealed bags (unvented) GREATER than 4 liters and LESS than 390 square inches in the waste, or heat sealed bags not authorized in the RH TRUCON Code?	☐ Yes ☒ No
Were there Non-approved Closure Methods used on liner bags or inner bags greater than 4 liters?	☐ Yes ☒ No
Are there sealed containers GREATER than 4 liters?	☐ Yes ☒ No
Are there indications of inadequate protection for heavy and/or sharp objects?	☐ Yes ☒ No
Comments: N/A	

RTR Operator:

Eric Lyles		1/26/2016
Print Name	Signature	Date

CCP Radiography Data Sheet

Section 1: General Information	
[X] RTR Examination [ ] RTR Replicate Scan [ ] RTR Independent Observation	
Site ID:	ORNL
Batch Number:	OR-RTR6-0716
Examination Date:	1/26/2016
Waste Container ID:	X10C1250233
Video/Audio Recorded Media Number:	OR-RTR6-0716 A&B
Procedure and Revision No.:	CCP-TP-053 Rev. 15
NCR(s) associated with the container? (e.g., Prohibited Items)	[X] No [ ] Yes NCR No.: N/A NCR No.: N/A

Section 2: Waste Container Data	
Container Type:	55 Gallon Drum
TRUCON Code:	OR 227
Waste Matrix Code:	S4100
Waste Stream I.D.:	OR-NFS-CH-SOIL
Waste Container Weights:	Gross Wt.: 246.8 kg Tare Wt.: 35.2 kg Net Wt.: 211.6 kg
Rigid Liner and Liner Vent Description:	Liner: [ ] No [X] Yes Lid: [X] No [ ] Yes Type: [ ] 30-mil [X] 90-mil [ ] 110-mil [ ] 125-mil Vented: [ ] No [X] Yes [ ] N/A Punctured: [X] No [ ] Yes Mechanical Vent: [X] No [ ] Yes Fiberboard Liner: [X] No [ ] Yes Lead Lined: [X] No [ ] Yes
Number of Layers of Confinement:	Appears to be 1 layer
Volume Utilization Percentage:	80 %

CCP Radiography Data Sheet

Waste Container ID: X10C1250233

Section 3: Container Inventory and Comments (Detailed descriptions)
IM:
AM:
OM:
OI:
C:
R:
XPM:
OR: Absorbent
IN:
S: Soil

Section 4: Packaging Material and Waste Material Parameters	
Packaging Material:	**Estimated Weight (kg)**
Steel (ST):	27.8
Plastics (PP): Liner bag, Rigid Liner	7.4
Other:	0.0
Total Packaging Weight	35.2
Waste Material Parameter:	**Estimated Weight (kg)**
Iron-based Metal / Alloys (IM):	
Aluminum-based Metals / Alloys (AM):	
Other Metals (OM):	
Other Inorganic Materials (OI)	
Cellulosics (C):	
Rubber (R):	
Plastics (waste materials) (XPM):	
Organic Matrix (OR):	2.0
Inorganic Matrix (IN):	
Soils (S):	209.6
Total WMP Weight:	211.6

CCP Radiography Data Sheet

Waste Container ID: X10C1250233

Section 5: RTR Summary (Questions answered "Yes" will be explained in the Comment block, except for Question 1)	
Is there observable liquid?	☐ Yes ☒ No
Is there any observable liquid in internal containers, more than 60 milliliters or 3 percent by volume, whichever is greater?	☐ Yes ☒ No
Is the total volume of observable liquid in the outermost container GREATER than 1% of the container?	☐ Yes ☒ No
Is there observable liquid in payload containers with an EPA Hazardous Waste Number of U134?	☐ Yes ☒ No
Is there an indication of non-radionuclide pyrophoric materials, such as elemental potassium?	☐ Yes ☒ No
Is there an indication of hazardous wastes not occurring as co-contaminants with TRU mixed wastes (non-mixed hazardous wastes)?	☐ Yes ☒ No
Is there an indication of wastes incompatible with backfill, seal and panel closures materials, container and packaging materials, shipping container materials, or other wastes (i.e., waste does NOT match TRUCON Code[s])?	☐ Yes ☒ No
Is there an indication of wastes containing explosives or compressed gases?	☐ Yes ☒ No
Is there an indication of PCBs liquids?	☐ Yes ☒ No
Is there an indication of the waste exhibiting the characteristic of ignitability, corrosivity, or reactivity (EPA Hazardous Waste Numbers of D001, D002, or D003)?	☐ Yes ☒ No
Is the physical form of the waste inconsistent with the Waste Stream Description or the Waste Matrix Code?	☐ Yes ☒ No
CH or RH TRAMPAC	
Are there heat-sealed bags (unvented) GREATER than 4 liters and LESS than 390 square inches in the waste, or heat sealed bags not authorized in the RH TRUCON Code?	☐ Yes ☒ No
Were there Non-approved Closure Methods used on liner bags or inner bags greater than 4 liters?	☐ Yes ☒ No
Are there sealed containers GREATER than 4 liters?	☐ Yes ☒ No
Are there indications of inadequate protection for heavy and/or sharp objects?	☐ Yes ☒ No
Comments: N/A	

RTR Operator:

Eric Lyles		1/26/2016
Print Name	Signature	Date

CCP Radiography Data Sheet

Section 1: General Information	
[X] RTR Examination [ ] RTR Replicate Scan [ ] RTR Independent Observation	
Site ID:	ORNL
Batch Number:	OR-RTR6-0716
Examination Date:	1/26/2016
Waste Container ID:	X10C1250264
Video/Audio Recorded Media Number:	OR-RTR6-0716 A&B
Procedure and Revision No.:	CCP-TP-053 Rev. 15
NCR(s) associated with the container? (e.g., Prohibited Items)	[X] No [ ] Yes NCR No.: N/A NCR No.: N/A

Section 2: Waste Container Data	
Container Type:	55 Gallon Drum
TRUCON Code:	OR 227
Waste Matrix Code:	S4100
Waste Stream I.D.:	OR-NFS-CH-SOIL
Waste Container Weights:	Gross Wt.: 221.7 kg Tare Wt.: 35.2 kg Net Wt.: 186.5 kg
Rigid Liner and Liner Vent Description:	Liner: [ ] No [X] Yes Lid: [X] No [ ] Yes Type: [ ] 30-mil [X] 90-mil [ ] 110-mil [ ] 125-mil Vented: [ ] No [X] Yes [ ] N/A Punctured: [X] No [ ] Yes Mechanical Vent: [X] No [ ] Yes Fiberboard Liner: [X] No [ ] Yes Lead Lined: [X] No [ ] Yes
Number of Layers of Confinement:	Appears to be 1 layer
Volume Utilization Percentage:	80 %

CCP Radiography Data Sheet

Waste Container ID: X10C1250264

Section 3: Container Inventory and Comments (Detailed descriptions)
IM:
AM:
OM:
OI:
C:
R:
XPM:
OR: Absorbent
IN:
S: Soil

Section 4: Packaging Material and Waste Material Parameters	
Packaging Material:	**Estimated Weight (kg)**
Steel (ST):	27.8
Plastics (PP): Liner bag, Rigid Liner	7.4
Other:	0.0
Total Packaging Weight	35.2
Waste Material Parameter:	**Estimated Weight (kg)**
Iron-based Metal / Alloys (IM):	
Aluminum-based Metals / Alloys (AM):	
Other Metals (OM):	
Other Inorganic Materials (OI)	
Cellulosics (C):	
Rubber (R):	
Plastics (waste materials) (XPM):	
Organic Matrix (OR):	3.0
Inorganic Matrix (IN):	
Soils (S):	183.5
Total WMP Weight:	186.5

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CCP Radiography Data Sheet

Waste Container ID: X10C1250264

Section 5: RTR Summary (Questions answered "Yes" will be explained in the Comment block, except for Question 1)	
Is there observable liquid?	☐ Yes ☒ No
Is there any observable liquid in internal containers, more than 60 milliliters or 3 percent by volume, whichever is greater?	☐ Yes ☒ No
Is the total volume of observable liquid in the outermost container GREATER than 1% of the container?	☐ Yes ☒ No
Is there observable liquid in payload containers with an EPA Hazardous Waste Number of U134?	☐ Yes ☒ No
Is there an indication of non-radionuclide pyrophoric materials, such as elemental potassium?	☐ Yes ☒ No
Is there an indication of hazardous wastes not occurring as co-contaminants with TRU mixed wastes (non-mixed hazardous wastes)?	☐ Yes ☒ No
Is there an indication of wastes incompatible with backfill, seal and panel closures materials, container and packaging materials, shipping container materials, or other wastes (i.e., waste does NOT match TRUCON Code[s])?	☐ Yes ☒ No
Is there an indication of wastes containing explosives or compressed gases?	☐ Yes ☒ No
Is there an indication of PCBs liquids?	☐ Yes ☒ No
Is there an indication of the waste exhibiting the characteristic of ignitability, corrosivity, or reactivity (EPA Hazardous Waste Numbers of D001, D002, or D003)?	☐ Yes ☒ No
Is the physical form of the waste inconsistent with the Waste Stream Description or the Waste Matrix Code?	☐ Yes ☒ No
CH or RH TRAMPAC	
Are there heat-sealed bags (unvented) GREATER than 4 liters and LESS than 390 square inches in the waste, or heat sealed bags not authorized in the RH TRUCON Code?	☐ Yes ☒ No
Were there Non-approved Closure Methods used on liner bags or inner bags greater than 4 liters?	☐ Yes ☒ No
Are there sealed containers GREATER than 4 liters?	☐ Yes ☒ No
Are there indications of inadequate protection for heavy and/or sharp objects?	☐ Yes ☒ No
Comments: N/A	

RTR Operator:

Eric Lyles		1/26/2016
Print Name	Signature	Date

CCP Radiography Data Sheet

Section 1: General Information	
[X] RTR Examination [ ] RTR Replicate Scan [ ] RTR Independent Observation	
Site ID:	ORNL
Batch Number:	OR-RTR6-0716
Examination Date:	1/26/2016
Waste Container ID:	X10C1250235
Video/Audio Recorded Media Number:	OR-RTR6-0716 A&B
Procedure and Revision No.:	CCP-TP-053 Rev. 15
NCR(s) associated with the container? (e.g., Prohibited Items)	[X] No [ ] Yes NCR No.: N/A NCR No.: N/A

Section 2: Waste Container Data	
Container Type:	55 Gallon Drum
TRUCON Code:	OR 227
Waste Matrix Code:	S4100
Waste Stream I.D.:	OR-NFS-CH-SOIL
Waste Container Weights:	Gross Wt.: 253.4 kg Tare Wt.: 35.2 kg Net Wt.: 218.2 kg
Rigid Liner and Liner Vent Description:	Liner: [ ] No [X] Yes Lid: [X] No [ ] Yes Type: [ ] 30-mil [X] 90-mil [ ] 110-mil [ ] 125-mil Vented: [ ] No [X] Yes [ ] N/A Punctured: [X] No [ ] Yes Mechanical Vent: [X] No [ ] Yes Fiberboard Liner: [X] No [ ] Yes Lead Lined: [X] No [ ] Yes
Number of Layers of Confinement:	Appears to be 1 layer
Volume Utilization Percentage:	90 %

CCP Radiography Data Sheet

Waste Container ID: X10C1250235

Section 3: Container Inventory and Comments (Detailed descriptions)
IM:
AM:
OM:
OI:
C:
R:
XPM:
OR: Absorbent
IN:
S: Soil

Section 4: Packaging Material and Waste Material Parameters	
Packaging Material:	**Estimated Weight (kg)**
Steel (ST):	27.8
Plastics (PP): Liner bag, Rigid Liner	7.4
Other:	0.0
Total Packaging Weight	35.2
Waste Material Parameter:	**Estimated Weight (kg)**
Iron-based Metal / Alloys (IM):	
Aluminum-based Metals / Alloys (AM):	
Other Metals (OM):	
Other Inorganic Materials (OI)	
Cellulosics (C):	
Rubber (R):	
Plastics (waste materials) (XPM):	
Organic Matrix (OR):	2.0
Inorganic Matrix (IN):	
Soils (S):	216.2
Total WMP Weight:	218.2

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CCP Radiography Data Sheet

Waste Container ID: X10C1250235

Section 5: RTR Summary (Questions answered "Yes" will be explained in the Comment block, except for Question 1)	
Is there observable liquid?	☐ Yes ☒ No
Is there any observable liquid in internal containers, more than 60 milliliters or 3 percent by volume, whichever is greater?	☐ Yes ☒ No
Is the total volume of observable liquid in the outermost container GREATER than 1% of the container?	☐ Yes ☒ No
Is there observable liquid in payload containers with an EPA Hazardous Waste Number of U134?	☐ Yes ☒ No
Is there an indication of non-radionuclide pyrophoric materials, such as elemental potassium?	☐ Yes ☒ No
Is there an indication of hazardous wastes not occurring as co-contaminants with TRU mixed wastes (non-mixed hazardous wastes)?	☐ Yes ☒ No
Is there an indication of wastes incompatible with backfill, seal and panel closures materials, container and packaging materials, shipping container materials, or other wastes (i.e., waste does NOT match TRUCON Code[s])?	☐ Yes ☒ No
Is there an indication of wastes containing explosives or compressed gases?	☐ Yes ☒ No
Is there an indication of PCBs liquids?	☐ Yes ☒ No
Is there an indication of the waste exhibiting the characteristic of ignitability, corrosivity, or reactivity (EPA Hazardous Waste Numbers of D001, D002, or D003)?	☐ Yes ☒ No
Is the physical form of the waste inconsistent with the Waste Stream Description or the Waste Matrix Code?	☐ Yes ☒ No
CH or RH TRAMPAC	
Are there heat-sealed bags (unvented) GREATER than 4 liters and LESS than 390 square inches in the waste, or heat sealed bags not authorized in the RH TRUCON Code?	☐ Yes ☒ No
Were there Non-approved Closure Methods used on liner bags or inner bags greater than 4 liters?	☐ Yes ☒ No
Are there sealed containers GREATER than 4 liters?	☐ Yes ☒ No
Are there indications of inadequate protection for heavy and/or sharp objects?	☐ Yes ☒ No
Comments: N/A	

RTR Operator:

Eric Lyles		1/26/2016
Print Name	Signature	Date

CCP Radiography Data Sheet

Section 1: General Information	
[X] RTR Examination [ ] RTR Replicate Scan [ ] RTR Independent Observation	
Site ID:	ORNL
Batch Number:	OR-RTR6-0716
Examination Date:	1/26/2016
Waste Container ID:	X10C1250238
Video/Audio Recorded Media Number:	OR-RTR6-0716 A&B
Procedure and Revision No.:	CCP-TP-053 Rev. 15
NCR(s) associated with the container? (e.g., Prohibited Items)	[X] No [ ] Yes NCR No.: N/A NCR No.: N/A

Section 2: Waste Container Data	
Container Type:	55 Gallon Drum
TRUCON Code:	OR 227
Waste Matrix Code:	S4100
Waste Stream I.D.:	OR-NFS-CH-SOIL
Waste Container Weights:	Gross Wt.: 191.6 kg Tare Wt.: 35.2 kg Net Wt.: 156.4 kg
Rigid Liner and Liner Vent Description:	Liner: [ ] No [X] Yes Lid: [X] No [ ] Yes Type: [ ] 30-mil [X] 90-mil [ ] 110-mil [ ] 125-mil Vented: [ ] No [X] Yes [ ] N/A Punctured: [X] No [ ] Yes Mechanical Vent: [X] No [ ] Yes Fiberboard Liner: [X] No [ ] Yes Lead Lined: [X] No [ ] Yes
Number of Layers of Confinement:	Appears to be 1 layer
Volume Utilization Percentage:	75 %

CCP Radiography Data Sheet

Waste Container ID: X10C1250238

Section 3: Container Inventory and Comments (Detailed descriptions)
IM:
AM:
OM:
OI:
C:
R:
XPM:
OR: Absorbent
IN:
S: Soil

Section 4: Packaging Material and Waste Material Parameters	
Packaging Material:	**Estimated Weight (kg)**
Steel (ST):	27.8
Plastics (PP): Liner bag, Rigid Liner	7.4
Other:	0.0
Total Packaging Weight	35.2
Waste Material Parameter:	**Estimated Weight (kg)**
Iron-based Metal / Alloys (IM):	
Aluminum-based Metals / Alloys (AM):	
Other Metals (OM):	
Other Inorganic Materials (OI)	
Cellulosics (C):	
Rubber (R):	
Plastics (waste materials) (XPM):	
Organic Matrix (OR):	3.0
Inorganic Matrix (IN):	
Soils (S):	153.4
Total WMP Weight:	156.4

CCP Radiography Data Sheet

Waste Container ID: X10C1250238

Section 5: RTR Summary (Questions answered "Yes" will be explained in the Comment block, except for Question 1)	
Is there observable liquid?	☐ Yes ☒ No
Is there any observable liquid in internal containers, more than 60 milliliters or 3 percent by volume, whichever is greater?	☐ Yes ☒ No
Is the total volume of observable liquid in the outermost container GREATER than 1% of the container?	☐ Yes ☒ No
Is there observable liquid in payload containers with an EPA Hazardous Waste Number of U134?	☐ Yes ☒ No
Is there an indication of non-radionuclide pyrophoric materials, such as elemental potassium?	☐ Yes ☒ No
Is there an indication of hazardous wastes not occurring as co-contaminants with TRU mixed wastes (non-mixed hazardous wastes)?	☐ Yes ☒ No
Is there an indication of wastes incompatible with backfill, seal and panel closures materials, container and packaging materials, shipping container materials, or other wastes (i.e., waste does NOT match TRUCON Code[s])?	☐ Yes ☒ No
Is there an indication of wastes containing explosives or compressed gases?	☐ Yes ☒ No
Is there an indication of PCBs liquids?	☐ Yes ☒ No
Is there an indication of the waste exhibiting the characteristic of ignitability, corrosivity, or reactivity (EPA Hazardous Waste Numbers of D001, D002, or D003)?	☐ Yes ☒ No
Is the physical form of the waste inconsistent with the Waste Stream Description or the Waste Matrix Code?	☐ Yes ☒ No
CH or RH TRAMPAC	
Are there heat-sealed bags (unvented) GREATER than 4 liters and LESS than 390 square inches in the waste, or heat sealed bags not authorized in the RH TRUCON Code?	☐ Yes ☒ No
Were there Non-approved Closure Methods used on liner bags or inner bags greater than 4 liters?	☐ Yes ☒ No
Are there sealed containers GREATER than 4 liters?	☐ Yes ☒ No
Are there indications of inadequate protection for heavy and/or sharp objects?	☐ Yes ☒ No
Comments: N/A	

RTR Operator:

Eric Lyles		1/26/2016
Print Name	Signature	Date

CCP Radiography Data Sheet

Section 1: General Information	
[X] RTR Examination [ ] RTR Replicate Scan [ ] RTR Independent Observation	
Site ID:	ORNL
Batch Number:	OR-RTR6-0716
Examination Date:	1/26/2016
Waste Container ID:	X10C1250239
Video/Audio Recorded Media Number:	OR-RTR6-0716 A&B
Procedure and Revision No.:	CCP-TP-053 Rev. 15
NCR(s) associated with the container? (e.g., Prohibited Items)	[X] No [ ] Yes NCR No.: N/A NCR No.: N/A

Section 2: Waste Container Data	
Container Type:	55 Gallon Drum
TRUCON Code:	OR 227
Waste Matrix Code:	S4100
Waste Stream I.D.:	OR-NFS-CH-SOIL
Waste Container Weights:	Gross Wt.: 244.9 kg Tare Wt.: 35.2 kg Net Wt.: 209.7 kg
Rigid Liner and Liner Vent Description:	Liner: [ ] No [X] Yes Lid: [X] No [ ] Yes Type: [ ] 30-mil [X] 90-mil [ ] 110-mil [ ] 125-mil Vented: [ ] No [X] Yes [ ] N/A Punctured: [X] No [ ] Yes Mechanical Vent: [X] No [ ] Yes Fiberboard Liner: [X] No [ ] Yes Lead Lined: [X] No [ ] Yes
Number of Layers of Confinement:	Appears to be 1 layer
Volume Utilization Percentage:	85 %

CCP Radiography Data Sheet

Waste Container ID: X10C1250239

Section 3: Container Inventory and Comments (Detailed descriptions)
IM:
AM:
OM:
OI:
C:
R:
XPM:
OR: Absorbent
IN:
S: Soil

Section 4: Packaging Material and Waste Material Parameters	
Packaging Material:	**Estimated Weight (kg)**
Steel (ST):	27.8
Plastics (PP): Liner bag, Rigid Liner	7.4
Other:	0.0
Total Packaging Weight	35.2
Waste Material Parameter:	**Estimated Weight (kg)**
Iron-based Metal / Alloys (IM):	
Aluminum-based Metals / Alloys (AM):	
Other Metals (OM):	
Other Inorganic Materials (OI)	
Cellulosics (C):	
Rubber (R):	
Plastics (waste materials) (XPM):	
Organic Matrix (OR):	2.0
Inorganic Matrix (IN):	
Soils (S):	207.7
Total WMP Weight:	209.7

CCP Radiography Data Sheet

Waste Container ID: X10C1250239

Section 5: RTR Summary (Questions answered "Yes" will be explained in the Comment block, except for Question 1)	
Is there observable liquid?	☐ Yes ☒ No
Is there any observable liquid in internal containers, more than 60 milliliters or 3 percent by volume, whichever is greater?	☐ Yes ☒ No
Is the total volume of observable liquid in the outermost container GREATER than 1% of the container?	☐ Yes ☒ No
Is there observable liquid in payload containers with an EPA Hazardous Waste Number of U134?	☐ Yes ☒ No
Is there an indication of non-radionuclide pyrophoric materials, such as elemental potassium?	☐ Yes ☒ No
Is there an indication of hazardous wastes not occurring as co-contaminants with TRU mixed wastes (non-mixed hazardous wastes)?	☐ Yes ☒ No
Is there an indication of wastes incompatible with backfill, seal and panel closures materials, container and packaging materials, shipping container materials, or other wastes (i.e., waste does NOT match TRUCON Code[s])?	☐ Yes ☒ No
Is there an indication of wastes containing explosives or compressed gases?	☐ Yes ☒ No
Is there an indication of PCBs liquids?	☐ Yes ☒ No
Is there an indication of the waste exhibiting the characteristic of ignitability, corrosivity, or reactivity (EPA Hazardous Waste Numbers of D001, D002, or D003)?	☐ Yes ☒ No
Is the physical form of the waste inconsistent with the Waste Stream Description or the Waste Matrix Code?	☐ Yes ☒ No
CH or RH TRAMPAC	
Are there heat-sealed bags (unvented) GREATER than 4 liters and LESS than 390 square inches in the waste, or heat sealed bags not authorized in the RH TRUCON Code?	☐ Yes ☒ No
Were there Non-approved Closure Methods used on liner bags or inner bags greater than 4 liters?	☐ Yes ☒ No
Are there sealed containers GREATER than 4 liters?	☐ Yes ☒ No
Are there indications of inadequate protection for heavy and/or sharp objects?	☐ Yes ☒ No
Comments: N/A	

RTR Operator:

Eric Lyles		1/26/2016
Print Name	Signature	Date

CCP Radiography Data Sheet

Section 1: General Information	
[X] RTR Examination [ ] RTR Replicate Scan [ ] RTR Independent Observation	
Site ID:	ORNL
Batch Number:	OR-RTR6-0716
Examination Date:	1/26/2016
Waste Container ID:	X10C1250234
Video/Audio Recorded Media Number:	OR-RTR6-0716 A&B
Procedure and Revision No.:	CCP-TP-053 Rev. 15
NCR(s) associated with the container? (e.g., Prohibited Items)	[X] No [ ] Yes NCR No.: N/A NCR No.: N/A

Section 2: Waste Container Data	
Container Type:	55 Gallon Drum
TRUCON Code:	OR 227
Waste Matrix Code:	S4100
Waste Stream I.D.:	OR-NFS-CH-SOIL
Waste Container Weights:	Gross Wt.: 230.7 kg Tare Wt.: 35.2 kg Net Wt.: 195.5 kg
Rigid Liner and Liner Vent Description:	Liner: [ ] No [X] Yes Lid: [X] No [ ] Yes Type: [ ] 30-mil [X] 90-mil [ ] 110-mil [ ] 125-mil Vented: [ ] No [X] Yes [ ] N/A Punctured: [X] No [ ] Yes Mechanical Vent: [X] No [ ] Yes Fiberboard Liner: [X] No [ ] Yes Lead Lined: [X] No [ ] Yes
Number of Layers of Confinement:	Appears to be 1 layer
Volume Utilization Percentage:	80 %

CCP Radiography Data Sheet

Waste Container ID: X10C1250234

Section 3: Container Inventory and Comments (Detailed descriptions)
IM:
AM:
OM:
OI:
C:
R:
XPM:
OR: Absorbent
IN:
S: Soil

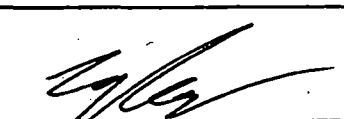
Section 4: Packaging Material and Waste Material Parameters	
Packaging Material:	**Estimated Weight (kg)**
Steel (ST):	27.8
Plastics (PP): Liner bag, Rigid Liner	7.4
Other:	0.0
Total Packaging Weight	35.2
Waste Material Parameter:	**Estimated Weight (kg)**
Iron-based Metal / Alloys (IM):	
Aluminum-based Metals / Alloys (AM):	
Other Metals (OM):	
Other Inorganic Materials (OI)	
Cellulosics (C):	
Rubber (R):	
Plastics (waste materials) (XPM):	
Organic Matrix (OR):	3.0
Inorganic Matrix (IN):	
Soils (S):	192.5
Total WMP Weight:	195.5

CCP Radiography Data Sheet

Waste Container ID: X10C1250234

Section 5: RTR Summary (Questions answered "Yes" will be explained in the Comment block, except for Question 1)	
Is there observable liquid?	☐ Yes ☒ No
Is there any observable liquid in internal containers, more than 60 milliliters or 3 percent by volume, whichever is greater?	☐ Yes ☒ No
Is the total volume of observable liquid in the outermost container GREATER than 1% of the container?	☐ Yes ☒ No
Is there observable liquid in payload containers with an EPA Hazardous Waste Number of U134?	☐ Yes ☒ No
Is there an indication of non-radionuclide pyrophoric materials, such as elemental potassium?	☐ Yes ☒ No
Is there an indication of hazardous wastes not occurring as co-contaminants with TRU mixed wastes (non-mixed hazardous wastes)?	☐ Yes ☒ No
Is there an indication of wastes incompatible with backfill, seal and panel closures materials, container and packaging materials, shipping container materials, or other wastes (i.e., waste does NOT match TRUCON Code[s])?	☐ Yes ☒ No
Is there an indication of wastes containing explosives or compressed gases?	☐ Yes ☒ No
Is there an indication of PCBs liquids?	☐ Yes ☒ No
Is there an indication of the waste exhibiting the characteristic of ignitability, corrosivity, or reactivity (EPA Hazardous Waste Numbers of D001, D002, or D003)?	☐ Yes ☒ No
Is the physical form of the waste inconsistent with the Waste Stream Description or the Waste Matrix Code?	☐ Yes ☒ No
CH or RH TRAMPAC	
Are there heat-sealed bags (unvented) GREATER than 4 liters and LESS than 390 square inches in the waste, or heat sealed bags not authorized in the RH TRUCON Code?	☐ Yes ☒ No
Were there Non-approved Closure Methods used on liner bags or inner bags greater than 4 liters?	☐ Yes ☒ No
Are there sealed containers GREATER than 4 liters?	☐ Yes ☒ No
Are there indications of inadequate protection for heavy and/or sharp objects?	☐ Yes ☒ No
Comments: N/A	

RTR Operator:

Eric Lyles		1/26/2016
Print Name	Signature	Date

CCP Radiography Data Sheet

Section 1: General Information	
[X] RTR Examination [ ] RTR Replicate Scan [ ] RTR Independent Observation	
Site ID:	ORNL
Batch Number:	OR-RTR6-0716
Examination Date:	1/26/2016
Waste Container ID:	X10C1250257
Video/Audio Recorded Media Number:	OR-RTR6-0716 A&B
Procedure and Revision No.:	CCP-TP-053 Rev. 15
NCR(s) associated with the container? (e.g., Prohibited Items)	[X] No [ ] Yes NCR No.: N/A NCR No.: N/A

Section 2: Waste Container Data	
Container Type:	55 Gallon Drum
TRUCON Code:	OR 227
Waste Matrix Code:	S4100
Waste Stream I.D.:	OR-NFS-CH-SOIL
Waste Container Weights:	Gross Wt.: 238.1 kg Tare Wt.: 35.2 kg Net Wt.: 202.9 kg
Rigid Liner and Liner Vent Description:	Liner: [ ] No [X] Yes Lid: [X] No [ ] Yes Type: [ ] 30-mil [X] 90-mil [ ] 110-mil [ ] 125-mil Vented: [ ] No [X] Yes [ ] N/A Punctured: [X] No [ ] Yes Mechanical Vent: [X] No [ ] Yes Fiberboard Liner: [X] No [ ] Yes Lead Lined: [X] No [ ] Yes
Number of Layers of Confinement:	Appears to be 1 layer
Volume Utilization Percentage:	90 %

CCP Radiography Data Sheet

Waste Container ID: X10C1250257

Section 3: Container Inventory and Comments (Detailed descriptions)
IM:
AM:
OM:
OI:
C:
R:
XPM:
OR: Absorbent
IN:
S: Soil

Section 4: Packaging Material and Waste Material Parameters	
Packaging Material:	**Estimated Weight (kg)**
Steel (ST):	27.8
Plastics (PP): Liner bag, Rigid Liner	7.4
Other:	0.0
Total Packaging Weight	35.2
Waste Material Parameter:	**Estimated Weight (kg)**
Iron-based Metal / Alloys (IM):	
Aluminum-based Metals / Alloys (AM):	
Other Metals (OM):	
Other Inorganic Materials (OI)	
Cellulosics (C):	
Rubber (R):	
Plastics (waste materials) (XPM):	
Organic Matrix (OR):	2.0
Inorganic Matrix (IN):	
Soils (S):	200.9
Total WMP Weight:	202.9

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CCP Radiography Data Sheet

Waste Container ID: X10C1250257

Section 5: RTR Summary (Questions answered "Yes" will be explained in the Comment block, except for Question 1)	
Is there observable liquid?	☐ Yes ☒ No
Is there any observable liquid in internal containers, more than 60 milliliters or 3 percent by volume, whichever is greater?	☐ Yes ☒ No
Is the total volume of observable liquid in the outermost container GREATER than 1% of the container?	☐ Yes ☒ No
Is there observable liquid in payload containers with an EPA Hazardous Waste Number of U134?	☐ Yes ☒ No
Is there an indication of non-radionuclide pyrophoric materials, such as elemental potassium?	☐ Yes ☒ No
Is there an indication of hazardous wastes not occurring as co-contaminants with TRU mixed wastes (non-mixed hazardous wastes)?	☐ Yes ☒ No
Is there an indication of wastes incompatible with backfill, seal and panel closures materials, container and packaging materials, shipping container materials, or other wastes (i.e., waste does NOT match TRUCON Code[s])?	☐ Yes ☒ No
Is there an indication of wastes containing explosives or compressed gases?	☐ Yes ☒ No
Is there an indication of PCBs liquids?	☐ Yes ☒ No
Is there an indication of the waste exhibiting the characteristic of ignitability, corrosivity, or reactivity (EPA Hazardous Waste Numbers of D001, D002, or D003)?	☐ Yes ☒ No
Is the physical form of the waste inconsistent with the Waste Stream Description or the Waste Matrix Code?	☐ Yes ☒ No
CH or RH TRAMPAC	
Are there heat-sealed bags (unvented) GREATER than 4 liters and LESS than 390 square inches in the waste, or heat sealed bags not authorized in the RH TRUCON Code?	☐ Yes ☒ No
Were there Non-approved Closure Methods used on liner bags or inner bags greater than 4 liters?	☐ Yes ☒ No
Are there sealed containers GREATER than 4 liters?	☐ Yes ☒ No
Are there indications of inadequate protection for heavy and/or sharp objects?	☐ Yes ☒ No
Comments: N/A	

RTR Operator:

Eric Lyles		1/26/2016
Print Name	Signature	Date

CCP Radiography Data Sheet

Section 1: General Information	
[X] RTR Examination [ ] RTR Replicate Scan [ ] RTR Independent Observation	
Site ID:	ORNL
Batch Number:	OR-RTR6-0716
Examination Date:	1/26/2016
Waste Container ID:	X10C1250236
Video/Audio Recorded Media Number:	OR-RTR6-0716 A&B
Procedure and Revision No.:	CCP-TP-053 Rev. 15
NCR(s) associated with the container? (e.g., Prohibited Items)	[X] No [ ] Yes NCR No.: N/A NCR No.: N/A

Section 2: Waste Container Data	
Container Type:	55 Gallon Drum
TRUCON Code:	OR 227
Waste Matrix Code:	S4100
Waste Stream I.D.:	OR-NFS-CH-SOIL
Waste Container Weights:	Gross Wt.: 247.5 kg Tare Wt.: 35.2 kg Net Wt.: 212.3 kg
Rigid Liner and Liner Vent Description:	Liner: [ ] No [X] Yes Lid: [X] No [ ] Yes Type: [ ] 30-mil [X] 90-mil [ ] 110-mil [ ] 125-mil Vented: [ ] No [X] Yes [ ] N/A Punctured: [X] No [ ] Yes Mechanical Vent: [X] No [ ] Yes Fiberboard Liner: [X] No [ ] Yes Lead Lined: [X] No [ ] Yes
Number of Layers of Confinement:	Appears to be 1 layer
Volume Utilization Percentage:	85 %

CCP Radiography Data Sheet

Waste Container ID: X10C1250236

Section 3: Container Inventory and Comments (Detailed descriptions)
IM:
AM:
OM:
OI:
C:
R:
XPM:
OR: Absorbent
IN:
S: Soil

Section 4: Packaging Material and Waste Material Parameters	
Packaging Material:	**Estimated Weight (kg)**
Steel (ST):	27.8
Plastics (PP): Liner bag, Rigid Liner	7.4
Other:	0.0
Total Packaging Weight	35.2
Waste Material Parameter:	**Estimated Weight (kg)**
Iron-based Metal / Alloys (IM):	
Aluminum-based Metals / Alloys (AM):	
Other Metals (OM):	
Other Inorganic Materials (OI)	
Cellulosics (C):	
Rubber (R):	
Plastics (waste materials) (XPM):	
Organic Matrix (OR):	3.0
Inorganic Matrix (IN):	
Soils (S):	209.3
Total WMP Weight:	212.3

CCP Radiography Data Sheet

Waste Container ID: X10C1250236

Section 5: RTR Summary (Questions answered "Yes" will be explained in the Comment block, except for Question 1)	
Is there observable liquid?	☐ Yes ☒ No
Is there any observable liquid in internal containers, more than 60 milliliters or 3 percent by volume, whichever is greater?	☐ Yes ☒ No
Is the total volume of observable liquid in the outermost container GREATER than 1% of the container?	☐ Yes ☒ No
Is there observable liquid in payload containers with an EPA Hazardous Waste Number of U134?	☐ Yes ☒ No
Is there an indication of non-radionuclide pyrophoric materials, such as elemental potassium?	☐ Yes ☒ No
Is there an indication of hazardous wastes not occurring as co-contaminants with TRU mixed wastes (non-mixed hazardous wastes)?	☐ Yes ☒ No
Is there an indication of wastes incompatible with backfill, seal and panel closures materials, container and packaging materials, shipping container materials, or other wastes (i.e., waste does NOT match TRUCON Code[s])?	☐ Yes ☒ No
Is there an indication of wastes containing explosives or compressed gases?	☐ Yes ☒ No
Is there an indication of PCBs liquids?	☐ Yes ☒ No
Is there an indication of the waste exhibiting the characteristic of ignitability, corrosivity, or reactivity (EPA Hazardous Waste Numbers of D001, D002, or D003)?	☐ Yes ☒ No
Is the physical form of the waste inconsistent with the Waste Stream Description or the Waste Matrix Code?	☐ Yes ☒ No
CH or RH TRAMPAC	
Are there heat-sealed bags (unvented) GREATER than 4 liters and LESS than 390 square inches in the waste, or heat sealed bags not authorized in the RH TRUCON Code?	☐ Yes ☒ No
Were there Non-approved Closure Methods used on liner bags or inner bags greater than 4 liters?	☐ Yes ☒ No
Are there sealed containers GREATER than 4 liters?	☐ Yes ☒ No
Are there indications of inadequate protection for heavy and/or sharp objects?	☐ Yes ☒ No
Comments: N/A	

RTR Operator:

Eric Lyles		1/26/2016
Print Name	Signature	Date

CCP Radiography Data Sheet

Section 1: General Information	
[X] RTR Examination [ ] RTR Replicate Scan [ ] RTR Independent Observation	
Site ID:	ORNL
Batch Number:	OR-RTR6-0716
Examination Date:	1/26/2016
Waste Container ID:	X10C1250229
Video/Audio Recorded Media Number:	OR-RTR6-0716 A&B
Procedure and Revision No.:	CCP-TP-053 Rev. 15
NCR(s) associated with the container? (e.g., Prohibited Items)	[X] No [ ] Yes NCR No.: N/A NCR No.: N/A

Section 2: Waste Container Data	
Container Type:	55 Gallon Drum
TRUCON Code:	OR 227
Waste Matrix Code:	S4100
Waste Stream I.D.:	OR-NFS-CH-SOIL
Waste Container Weights:	Gross Wt.: 240.0 kg Tare Wt.: 35.2 kg Net Wt.: 204.8 kg
Rigid Liner and Liner Vent Description:	Liner: [ ] No [X] Yes Lid: [X] No [ ] Yes Type: [ ] 30-mil [X] 90-mil [ ] 110-mil [ ] 125-mil Vented: [ ] No [X] Yes [ ] N/A Punctured: [X] No [ ] Yes Mechanical Vent: [X] No [ ] Yes Fiberboard Liner: [X] No [ ] Yes Lead Lined: [X] No [ ] Yes
Number of Layers of Confinement:	Appears to be 1 layer
Volume Utilization Percentage:	80 %

CCP Radiography Data Sheet

Waste Container ID: X10C1250229

Section 3: Container Inventory and Comments (Detailed descriptions)
IM:
AM:
OM:
OI:
C:
R:
XPM:
OR: Absorbent
IN:
S: Soil

Section 4: Packaging Material and Waste Material Parameters	
Packaging Material:	**Estimated Weight (kg)**
Steel (ST):	27.8
Plastics (PP): Liner bag, Rigid Liner	7.4
Other:	0.0
Total Packaging Weight	35.2
Waste Material Parameter:	**Estimated Weight (kg)**
Iron-based Metal / Alloys (IM):	
Aluminum-based Metals / Alloys (AM):	
Other Metals (OM):	
Other Inorganic Materials (OI)	
Cellulosics (C):	
Rubber (R):	
Plastics (waste materials) (XPM):	
Organic Matrix (OR):	2.0
Inorganic Matrix (IN):	
Soils (S):	202.8
Total WMP Weight:	204.8

CCP Radiography Data Sheet

Waste Container ID: X10C1250229

Section 5: RTR Summary (Questions answered "Yes" will be explained in the Comment block, except for Question 1)	
Is there observable liquid?	☐ Yes ☒ No
Is there any observable liquid in internal containers, more than 60 milliliters or 3 percent by volume, whichever is greater?	☐ Yes ☒ No
Is the total volume of observable liquid in the outermost container GREATER than 1% of the container?	☐ Yes ☒ No
Is there observable liquid in payload containers with an EPA Hazardous Waste Number of U134?	☐ Yes ☒ No
Is there an indication of non-radionuclide pyrophoric materials, such as elemental potassium?	☐ Yes ☒ No
Is there an indication of hazardous wastes not occurring as co-contaminants with TRU mixed wastes (non-mixed hazardous wastes)?	☐ Yes ☒ No
Is there an indication of wastes incompatible with backfill, seal and panel closures materials, container and packaging materials, shipping container materials, or other wastes (i.e., waste does NOT match TRUCON Code[s])?	☐ Yes ☒ No
Is there an indication of wastes containing explosives or compressed gases?	☐ Yes ☒ No
Is there an indication of PCBs liquids?	☐ Yes ☒ No
Is there an indication of the waste exhibiting the characteristic of ignitability, corrosivity, or reactivity (EPA Hazardous Waste Numbers of D001, D002, or D003)?	☐ Yes ☒ No
Is the physical form of the waste inconsistent with the Waste Stream Description or the Waste Matrix Code?	☐ Yes ☒ No
CH or RH TRAMPAC	
Are there heat-sealed bags (unvented) GREATER than 4 liters and LESS than 390 square inches in the waste, or heat sealed bags not authorized in the RH TRUCON Code?	☐ Yes ☒ No
Were there Non-approved Closure Methods used on liner bags or inner bags greater than 4 liters?	☐ Yes ☒ No
Are there sealed containers GREATER than 4 liters?	☐ Yes ☒ No
Are there indications of inadequate protection for heavy and/or sharp objects?	☐ Yes ☒ No
Comments: N/A	

RTR Operator:

Eric Lyles		1/26/2016
Print Name	Signature	Date

CCP Radiography Data Sheet

Section 1: General Information	
[X] RTR Examination [ ] RTR Replicate Scan [ ] RTR Independent Observation	
Site ID:	ORNL
Batch Number:	OR-RTR6-0716
Examination Date:	1/26/2016
Waste Container ID:	X10C1250232
Video/Audio Recorded Media Number:	OR-RTR6-0716 A&B
Procedure and Revision No.:	CCP-TP-053 Rev. 15
NCR(s) associated with the container? (e.g., Prohibited Items)	[X] No [ ] Yes NCR No.: N/A NCR No.: N/A

Section 2: Waste Container Data	
Container Type:	55 Gallon Drum
TRUCON Code:	OR 227
Waste Matrix Code:	S4100
Waste Stream I.D.:	OR-NFS-CH-SOIL
Waste Container Weights:	Gross Wt.: 233.0 kg Tare Wt.: 35.2 kg Net Wt.: 197.8 kg
Rigid Liner and Liner Vent Description:	Liner: [ ] No [X] Yes Lid: [X] No [ ] Yes Type: [ ] 30-mil [X] 90-mil [ ] 110-mil [ ] 125-mil Vented: [ ] No [X] Yes [ ] N/A Punctured: [X] No [ ] Yes Mechanical Vent: [X] No [ ] Yes Fiberboard Liner: [X] No [ ] Yes Lead Lined: [X] No [ ] Yes
Number of Layers of Confinement:	Appears to be 1 layer
Volume Utilization Percentage:	85 %

CCP Radiography Data Sheet

Waste Container ID: X10C1250232

Section 3: Container Inventory and Comments (Detailed descriptions)
IM:
AM:
OM:
OI:
C:
R:
XPM:
OR: Absorbent
IN:
S: Soil

Section 4: Packaging Material and Waste Material Parameters	
Packaging Material:	**Estimated Weight (kg)**
Steel (ST):	27.8
Plastics (PP): Liner bag, Rigid Liner	7.4
Other:	0.0
Total Packaging Weight	35.2
Waste Material Parameter:	**Estimated Weight (kg)**
Iron-based Metal / Alloys (IM):	
Aluminum-based Metals / Alloys (AM):	
Other Metals (OM):	
Other Inorganic Materials (OI)	
Cellulosics (C):	
Rubber (R):	
Plastics (waste materials) (XPM):	
Organic Matrix (OR):	2.0
Inorganic Matrix (IN):	
Soils (S):	195.8
Total WMP Weight:	197.8

CCP Radiography Data Sheet

Waste Container ID: X10C1250232

Section 5: RTR Summary (Questions answered "Yes" will be explained in the Comment block, except for Question 1)	
Is there observable liquid?	☐ Yes ☒ No
Is there any observable liquid in internal containers, more than 60 milliliters or 3 percent by volume, whichever is greater?	☐ Yes ☒ No
Is the total volume of observable liquid in the outermost container GREATER than 1% of the container?	☐ Yes ☒ No
Is there observable liquid in payload containers with an EPA Hazardous Waste Number of U134?	☐ Yes ☒ No
Is there an indication of non-radionuclide pyrophoric materials, such as elemental potassium?	☐ Yes ☒ No
Is there an indication of hazardous wastes not occurring as co-contaminants with TRU mixed wastes (non-mixed hazardous wastes)?	☐ Yes ☒ No
Is there an indication of wastes incompatible with backfill, seal and panel closures materials, container and packaging materials, shipping container materials, or other wastes (i.e., waste does NOT match TRUCON Code[s])?	☐ Yes ☒ No
Is there an indication of wastes containing explosives or compressed gases?	☐ Yes ☒ No
Is there an indication of PCBs liquids?	☐ Yes ☒ No
Is there an indication of the waste exhibiting the characteristic of ignitability, corrosivity, or reactivity (EPA Hazardous Waste Numbers of D001, D002, or D003)?	☐ Yes ☒ No
Is the physical form of the waste inconsistent with the Waste Stream Description or the Waste Matrix Code?	☐ Yes ☒ No
CH or RH TRAMPAC	
Are there heat-sealed bags (unvented) GREATER than 4 liters and LESS than 390 square inches in the waste, or heat sealed bags not authorized in the RH TRUCON Code?	☐ Yes ☒ No
Were there Non-approved Closure Methods used on liner bags or inner bags greater than 4 liters?	☐ Yes ☒ No
Are there sealed containers GREATER than 4 liters?	☐ Yes ☒ No
Are there indications of inadequate protection for heavy and/or sharp objects?	☐ Yes ☒ No
Comments: N/A	

RTR Operator:

Eric Lyles		1/26/2016
Print Name	Signature	Date

CCP Radiography Data Sheet

Section 1: General Information	
[X] RTR Examination [ ] RTR Replicate Scan [ ] RTR Independent Observation	
Site ID:	ORNL
Batch Number:	OR-RTR6-0716
Examination Date:	1/26/2016
Waste Container ID:	X10C1250243
Video/Audio Recorded Media Number:	OR-RTR6-0716 A&B
Procedure and Revision No.:	CCP-TP-053 Rev. 15
NCR(s) associated with the container? (e.g., Prohibited Items)	[X] No [ ] Yes NCR No.: N/A NCR No.: N/A

Section 2: Waste Container Data	
Container Type:	55 Gallon Drum
TRUCON Code:	OR 227
Waste Matrix Code:	S4100
Waste Stream I.D.:	OR-NFS-CH-SOIL
Waste Container Weights:	Gross Wt.: 236.9 kg Tare Wt.: 35.2 kg Net Wt.: 201.7 kg
Rigid Liner and Liner Vent Description:	Liner: [ ] No [X] Yes Lid: [X] No [ ] Yes Type: [ ] 30-mil [X] 90-mil [ ] 110-mil [ ] 125-mil Vented: [ ] No [X] Yes [ ] N/A Punctured: [X] No [ ] Yes Mechanical Vent: [X] No [ ] Yes Fiberboard Liner: [X] No [ ] Yes Lead Lined: [X] No [ ] Yes
Number of Layers of Confinement:	Appears to be 1 layer
Volume Utilization Percentage:	90 %

CCP Radiography Data Sheet

Waste Container ID: X10C1250243

Section 3: Container Inventory and Comments (Detailed descriptions)	
IM:	
AM:	
OM:	
OI:	
C:	
R:	
XPM:	
OR:	Absorbent
IN:	
S:	Soil

Section 4: Packaging Material and Waste Material Parameters	
Packaging Material:	**Estimated Weight (kg)**
Steel (ST):	27.8
Plastics (PP): Liner bag, Rigid Liner,	7.4
Other:	0.0
Total Packaging Weight	35.2
Waste Material Parameter:	**Estimated Weight (kg)**
Iron-based Metal / Alloys (IM):	
Aluminum-based Metals / Alloys (AM):	
Other Metals (OM):	
Other Inorganic Materials (OI)	
Cellulosics (C):	
Rubber (R):	
Plastics (waste materials) (XPM):	
Organic Matrix (OR):	3.0
Inorganic Matrix (IN):	
Soils (S):	198.7
Total WMP Weight:	201.7

CCP Radiography Data Sheet

Waste Container ID: X10C1250243

Section 5: RTR Summary (Questions answered "Yes" will be explained in the Comment block, except for Question 1)	
Is there observable liquid?	☐ Yes ☒ No
Is there any observable liquid in internal containers, more than 60 milliliters or 3 percent by volume, whichever is greater?	☐ Yes ☒ No
Is the total volume of observable liquid in the outermost container GREATER than 1% of the container?	☐ Yes ☒ No
Is there observable liquid in payload containers with an EPA Hazardous Waste Number of U134?	☐ Yes ☒ No
Is there an indication of non-radionuclide pyrophoric materials, such as elemental potassium?	☐ Yes ☒ No
Is there an indication of hazardous wastes not occurring as co-contaminants with TRU mixed wastes (non-mixed hazardous wastes)?	☐ Yes ☒ No
Is there an indication of wastes incompatible with backfill, seal and panel closures materials, container and packaging materials, shipping container materials, or other wastes (i.e., waste does NOT match TRUCON Code[s])?	☐ Yes ☒ No
Is there an indication of wastes containing explosives or compressed gases?	☐ Yes ☒ No
Is there an indication of PCBs liquids?	☐ Yes ☒ No
Is there an indication of the waste exhibiting the characteristic of ignitability, corrosivity, or reactivity (EPA Hazardous Waste Numbers of D001, D002, or D003)?	☐ Yes ☒ No
Is the physical form of the waste inconsistent with the Waste Stream Description or the Waste Matrix Code?	☐ Yes ☒ No
CH or RH TRAMPAC	
Are there heat-sealed bags (unvented) GREATER than 4 liters and LESS than 390 square inches in the waste, or heat sealed bags not authorized in the RH TRUCON Code?	☐ Yes ☒ No
Were there Non-approved Closure Methods used on liner bags or inner bags greater than 4 liters?	☐ Yes ☒ No
Are there sealed containers GREATER than 4 liters?	☐ Yes ☒ No
Are there indications of inadequate protection for heavy and/or sharp objects?	☐ Yes ☒ No
Comments: N/A	

RTR Operator:

Eric Lyles		1/26/2016
Print Name	Signature	Date

CCP Radiography Data Sheet

Section 1: General Information	
[X] RTR Examination [ ] RTR Replicate Scan [ ] RTR Independent Observation	
Site ID:	ORNL
Batch Number:	OR-RTR6-0716
Examination Date:	1/26/2016
Waste Container ID:	X10C1250260
Video/Audio Recorded Media Number:	OR-RTR6-0716 A&B
Procedure and Revision No.:	CCP-TP-053 Rev. 15
NCR(s) associated with the container? (e.g., Prohibited Items)	[X] No [ ] Yes NCR No.: N/A NCR No.: N/A

Section 2: Waste Container Data	
Container Type:	55 Gallon Drum
TRUCON Code:	OR 227
Waste Matrix Code:	S4100
Waste Stream I.D.:	OR-NFS-CH-SOIL
Waste Container Weights:	Gross Wt.: 220.2 kg Tare Wt.: 35.2 kg Net Wt.: 185.0 kg
Rigid Liner and Liner Vent Description:	Liner: [ ] No [X] Yes Lid: [X] No [ ] Yes Type: [ ] 30-mil [X] 90-mil [ ] 110-mil [ ] 125-mil Vented: [ ] No [X] Yes [ ] N/A Punctured: [X] No [ ] Yes Mechanical Vent: [X] No [ ] Yes Fiberboard Liner: [X] No [ ] Yes Lead Lined: [X] No [ ] Yes
Number of Layers of Confinement:	Appears to be 1 layer
Volume Utilization Percentage:	80 %

CCP Radiography Data Sheet

Waste Container ID: X10C1250260

Section 3: Container Inventory and Comments (Detailed descriptions)
IM:
AM:
OM:
OI:
C:
R:
XPM:
OR: Absorbent
IN:
S: Soil

Section 4: Packaging Material and Waste Material Parameters	
Packaging Material:	**Estimated Weight (kg)**
Steel (ST):	27.8
Plastics (PP): Liner bag, Rigid Liner	7.4
Other:	0.0
Total Packaging Weight	35.2
Waste Material Parameter:	**Estimated Weight (kg)**
Iron-based Metal / Alloys (IM):	
Aluminum-based Metals / Alloys (AM):	
Other Metals (OM):	
Other Inorganic Materials (OI)	
Cellulosics (C):	
Rubber (R):	
Plastics (waste materials) (XPM):	
Organic Matrix (OR):	2.0
Inorganic Matrix (IN):	
Soils (S):	183.0
Total WMP Weight:	185.0

CCP Radiography Data Sheet

Waste Container ID: X10C1250260

Section 5: RTR Summary (Questions answered "Yes" will be explained in the Comment block, except for Question 1)	
Is there observable liquid?	☐ Yes ☒ No
Is there any observable liquid in internal containers, more than 60 milliliters or 3 percent by volume, whichever is greater?	☐ Yes ☒ No
Is the total volume of observable liquid in the outermost container GREATER than 1% of the container?	☐ Yes ☒ No
Is there observable liquid in payload containers with an EPA Hazardous Waste Number of U134?	☐ Yes ☒ No
Is there an indication of non-radionuclide pyrophoric materials, such as elemental potassium?	☐ Yes ☒ No
Is there an indication of hazardous wastes not occurring as co-contaminants with TRU mixed wastes (non-mixed hazardous wastes)?	☐ Yes ☒ No
Is there an indication of wastes incompatible with backfill, seal and panel closures materials, container and packaging materials, shipping container materials, or other wastes (i.e., waste does NOT match TRUCON Code[s])?	☐ Yes ☒ No
Is there an indication of wastes containing explosives or compressed gases?	☐ Yes ☒ No
Is there an indication of PCBs liquids?	☐ Yes ☒ No
Is there an indication of the waste exhibiting the characteristic of ignitability, corrosivity, or reactivity (EPA Hazardous Waste Numbers of D001, D002, or D003)?	☐ Yes ☒ No
Is the physical form of the waste inconsistent with the Waste Stream Description or the Waste Matrix Code?	☐ Yes ☒ No
CH or RH TRAMPAC	
Are there heat-sealed bags (unvented) GREATER than 4 liters and LESS than 390 square inches in the waste, or heat sealed bags not authorized in the RH TRUCON Code?	☐ Yes ☒ No
Were there Non-approved Closure Methods used on liner bags or inner bags greater than 4 liters?	☐ Yes ☒ No
Are there sealed containers GREATER than 4 liters?	☐ Yes ☒ No
Are there indications of inadequate protection for heavy and/or sharp objects?	☐ Yes ☒ No
Comments: N/A	

RTR Operator:

Eric Lyles		1/26/2016
Print Name	Signature	Date

CCP Radiography Data Sheet

Section 1: General Information	
[X] RTR Examination [ ] RTR Replicate Scan [ ] RTR Independent Observation	
Site ID:	ORNL
Batch Number:	OR-RTR6-0716
Examination Date:	1/26/2016
Waste Container ID:	X10C1250245
Video/Audio Recorded Media Number:	OR-RTR6-0716 A&B
Procedure and Revision No.:	CCP-TP-053 Rev. 15
NCR(s) associated with the container? (e.g., Prohibited Items)	[X] No [ ] Yes NCR No.: N/A NCR No.: N/A

Section 2: Waste Container Data	
Container Type:	55 Gallon Drum
TRUCON Code:	OR 227
Waste Matrix Code:	S4100
Waste Stream I.D.:	OR-NFS-CH-SOIL
Waste Container Weights:	Gross Wt.: 234.6 kg Tare Wt.: 35.2 kg Net Wt.: 199.4 kg
Rigid Liner and Liner Vent Description:	Liner: [ ] No [X] Yes Lid: [X] No [ ] Yes Type: [ ] 30-mil [X] 90-mil [ ] 110-mil [ ] 125-mil Vented: [ ] No [X] Yes [ ] N/A Punctured: [X] No [ ] Yes Mechanical Vent: [X] No [ ] Yes Fiberboard Liner: [X] No [ ] Yes Lead Lined: [X] No [ ] Yes
Number of Layers of Confinement:	Appears to be 1 layer
Volume Utilization Percentage:	95 %

CCP Radiography Data Sheet

Waste Container ID: X10C1250245

Section 3: Container Inventory and Comments (Detailed descriptions)	
IM:	
AM:	
OM:	
OI:	
C:	
R:	
XPM:	
OR:	Absorbent
IN:	
S:	Soil

Section 4: Packaging Material and Waste Material Parameters	
Packaging Material:	**Estimated Weight (kg)**
Steel (ST):	27.8
Plastics (PP): Liner bag, Rigid Liner	7.4
Other:	0.0
Total Packaging Weight	35.2
Waste Material Parameter:	**Estimated Weight (kg)**
Iron-based Metal / Alloys (IM):	
Aluminum-based Metals / Alloys (AM):	
Other Metals (OM):	
Other Inorganic Materials (OI)	
Cellulosics (C):	
Rubber (R):	
Plastics (waste materials) (XPM):	
Organic Matrix (OR):	3.0
Inorganic Matrix (IN):	
Soils (S):	196.4
Total WMP Weight:	199.4

CCP Radiography Data Sheet

Waste Container ID: X10C1250245

Section 5: RTR Summary (Questions answered "Yes" will be explained in the Comment block, except for Question 1)	
Is there observable liquid?	☐ Yes ☒ No
Is there any observable liquid in internal containers, more than 60 milliliters or 3 percent by volume, whichever is greater?	☐ Yes ☒ No
Is the total volume of observable liquid in the outermost container GREATER than 1% of the container?	☐ Yes ☒ No
Is there observable liquid in payload containers with an EPA Hazardous Waste Number of U134?	☐ Yes ☒ No
Is there an indication of non-radionuclide pyrophoric materials, such as elemental potassium?	☐ Yes ☒ No
Is there an indication of hazardous wastes not occurring as co-contaminants with TRU mixed wastes (non-mixed hazardous wastes)?	☐ Yes ☒ No
Is there an indication of wastes incompatible with backfill, seal and panel closures materials, container and packaging materials, shipping container materials, or other wastes (i.e., waste does NOT match TRUCON Code[s])?	☐ Yes ☒ No
Is there an indication of wastes containing explosives or compressed gases?	☐ Yes ☒ No
Is there an indication of PCBs liquids?	☐ Yes ☒ No
Is there an indication of the waste exhibiting the characteristic of ignitability, corrosivity, or reactivity (EPA Hazardous Waste Numbers of D001, D002, or D003)?	☐ Yes ☒ No
Is the physical form of the waste inconsistent with the Waste Stream Description or the Waste Matrix Code?	☐ Yes ☒ No
CH or RH TRAMPAC	
Are there heat-sealed bags (unvented) GREATER than 4 liters and LESS than 390 square inches in the waste, or heat sealed bags not authorized in the RH TRUCON Code?	☐ Yes ☒ No
Were there Non-approved Closure Methods used on liner bags or inner bags greater than 4 liters?	☐ Yes ☒ No
Are there sealed containers GREATER than 4 liters?	☐ Yes ☒ No
Are there indications of inadequate protection for heavy and/or sharp objects?	☐ Yes ☒ No
Comments: N/A	

RTR Operator:

Eric Lyles		1/26/2016
Print Name	Signature	Date

Attachment 3 – CCP Radiography Independent Technical Reviewer Checklist

Batch Data Report No.: OR-RTR6-0716

Description			
1.	Were data generation and reduction conducted in a technically correct manner in accordance with the methods used?	☐ NO	☑ YES
2.	Was the correct revision of the procedure used? Procedure: CCP-TP-053 Rev.: 15	☐ NO	☑ YES
3.	Are the WMPs entered correctly?	☐ NO	☑ YES
4.	Do the estimated weights in Section 4 of Attachment 2 equal the container gross weight?	☐ NO	☑ YES
5.	Is the data reported in the proper units with the correct number of significant figures (e.g., one tenth of a kilogram)?	☐ NO	☑ YES
6.	Was transcription used? If no, proceed to question 7.	☑ NO	☐ YES
	6a. Has the data been verified for transcription errors?	☐ NO	☐ YES
7.	Does the Testing Batch Report include radiography for up to 20 containers?	☐ NO	☑ YES
8.	Are BDR contents complete and do they match the CCP Waste RTR Batch Data Report Table of Contents?	☐ NO	☑ YES
9.	Is all the data signed and dated in reproducible ink and by the individual(s) generating it?	☐ NO	☑ YES
10.	Is all data recorded clearly, legibly, and accurately?	☐ NO	☑ YES
11.	Have changes been made to original data? If no, proceed to question 12.	☑ NO	☐ YES
	11a. Have all changes to original data been lined out, initialed and dated by the individual making the changes?	☐ NO	☐ YES
	11b. Was justification made for changing the original data?	☐ NO	☐ YES
	11c. Were data changes made by the individual who originally collected the data?	☐ NO	☐ YES
12.	Does the waste match the Waste Matrix Code and Waste Stream description?	☐ NO	☑ YES
13.	Are the RTR Operator's decisions regarding the Radiography documented?	☐ NO	☑ YES
14.	Is there an adequate written description of the contents of each item?	☐ NO	☑ YES
15.	Was the video/audio recording media properly prepared and labeled for each waste container?	☐ NO	☑ YES
16.	Was the video/audio recording media check performed satisfactorily and recorded on Attachment 1?	☐ NO	☑ YES

Attachment 3 – CCP Radiography Independent Technical Reviewer Checklist (Continued)

Batch Data Report No.: OR-RTR6-0716

Description			
17.	Was the Image Test performed satisfactorily and recorded on Attachment 1?	☐NO	☑YES
18.	Was the Replicate Scan performed and recorded on an Attachment 2?	☐NO	☑YES
19.	Was the Replicate Scan RTR Operator different from the first RTR Operator?	☐NO	☑YES
20.	Did the Replicate Scan RTR Operator and the first RTR Operator agree on the results?	☐NO	☑YES
21.	Was the Independent Observation performed and recorded on an Attachment 2?	☐NO	☑YES
22.	Was the Independent Observation RTR Operator different from the first RTR Operator?	☐NO	☑YES
23.	Did the Independent Observation RTR Operator and the first RTR Operator agree on the results?	☐NO	☑YES
24.	Was the data collection performed by qualified individuals?	☐NO	☑YES
25.	Were NCRs initiated as required at DGL? If no, proceed to question 26.	☑NO	☐YES
	25a. Have the NCR(s) associated with RTR been included in the BDR?	☐NO	☐YES
26.	Is the RTR examination for CH waste? If no, proceed to question 27.	☐NO	☑YES
	26a. Have the CH Quality Assurance Objectives (QAOs) been met (if applicable)? Precision – Precision is maintained by reconciling any discrepancies between two radiography operators with regard to identification of the waste matrix code, liquids in excess of TSDF-WAC limits, and compressed gases through independent replicate scans and independent observations. Additionally, the precision of radiography is verified prior to use by tuning precisely enough to demonstrate compliance with QAOs through viewing an image test pattern. Accuracy – Accuracy is obtained by using a target to tune the image for maximum sharpness and by requiring operators to successfully identify 100 percent of the items required to meet the DQOs for radiography specified in CCP-PO-001, Section C-4a(1) in a training container during their initial qualification and subsequent requalification. Completeness – A video and audio media recording of the radiography examination and a validated radiography data form will be obtained for 100 percent of the waste containers subject to radiography. All video and audio media recordings and radiography data forms will be subject to validation as indicated in CCP-PO-001, Section C3-4. Comparability – The comparability of radiography data from different operators shall be enhanced by using standardized radiography procedures and operator qualifications.	☐NO	☑YES

Attachment 3 – CCP Radiography Independent Technical Reviewer Checklist (Continued)

Batch Data Report No.: OR-RTR6-0716

Description		
27. Is the RTR examination for RH waste? If no, proceed to comment section.	☑ NO	☐ YES
27a. Have the RH QAOs been met (if applicable)? Precision – Precision is maintained by reconciling any discrepancies between two operators (during Independent Observation and Replicate scans) with regard to the identification of important waste characteristics (i.e., physical form of the waste and absence of prohibited liquids) within a single container. Accuracy – Accuracy is obtained by using a target to tune the image for maximum sharpness and by requiring operators to successfully identify prohibited liquid in a training container during their initial qualification and subsequent requalification. Representativeness – All of the relevant contents in a container selected for radiography will be described. Completeness – All of the relevant waste information must be assembled and must show that each of the containers in the waste stream belongs to the waste stream. This information must be documented on videotape or other equivalent media and data form. Comparability – Comparability is ensured by meeting the program training requirements and complying with the minimum standards used to implement the radiography process.	☐ NO	☐ YES

Comments: N/A

I have reviewed 100% of the container specific and batch data in this report and find it acceptable.

Independent Technical Reviewer:

THAD HASSELSTROM		2-4-16
Printed Name	Signature	Date

DIVIDER PAGE ONLY

Not part of page count

Attachment 2 – CCP Records Transmittal/Receiving Form

CCP Records / Records Custodian, 4021 National Parks Highway - MS: GSA 212, Carlsbad, New Mexico 88220

Telephone Number: 575-234-7523

Fax Number: 575-234-7033

Attn:	CCP RECORDS	From:	RANADA T BACA
Ship to:	4021 NATIONAL PARKS HWY	Site:	LANL
	CARLSBAD, NM 88220	Company:	TFE, INC
	GSA-212	Telephone Number:	505-667-0181
	N/A	Date Sent:	02-04-16
Telephone Number:	505-234-7523		

Document Number	Title / Description	Record Date	Total Pages
OR-RTR6-0716	NDE BACKUP DVD B	01-26-16	N/A
	N/A		

Comments

N/A

(When the Record accepted line has been completed, the rest of the page below may be left blank.)
Acceptance/Rejection Signature and Date

Records Accepted ☑ — Signature: [signature] — Printed Name: Jewell Humrabe — Date: 2-1-2016

Records Rejected ☐ — Signature: _____ — Printed Name: _____ — Date: _____

Reason for Rejection:

Re-submittal: Signature: _____ — Printed Name: _____ — Date: _____

```
**********************************
***        Send Results        ***
**********************************

   Sending is complete.

Job No.                    4068
Address                    915056656753
Name                       TERRI ANN
Start Time                 02/09 09:05 AM
Call Length                01'01
Sheets                     1
Result                     OK
```


Attachment 2 – CCP Records Transmittal/Receiving Form

CCP Records / Records Custodian, 4021 National Parks Highway - MS: GSA 212, Carlsbad, New Mexico 88220

Telephone Number: 575-234-7523

Fax Number: 575-234-7033

Attn:	CCP RECORDS	From:	RANADA T BACA
Ship to:	4021 NATIONAL PARKS HWY	Site:	LANL
	CARLSBAD, NM 88220	Company:	TFE, INC
	GSA-212	Telephone Number:	505-667-0181
	N/A	Date Sent:	02-04-16
Telephone Number:	505-234-7523		

Document Number	Title / Description	Record Date	Total Pages
OR-RTR6-0716	NDE BACKUP DVD B	01-26-16	N/A
	N/A		

Comments

N/A

(When the Record accepted line has been completed, the rest of the page below may be left blank.)

Acceptance/Rejection Signature and Date

Records Accepted ☑ [signature] Jewell Humable 2-1-2016
Signature | Printed Name | Date

Records Rejected ☐ _____ _____ _____
Signature | Printed Name | Date

Reason for Rejection:

Attachment 2 – CCP Records Transmittal/Receiving Form

CCP Records / Records Custodian, 4021 National Parks Highway - MS: GSA 212, Carlsbad, New Mexico 88220

Telephone Number: 575-234-7523

Fax Number: 575-234-7033

Attn:	CCP RECORDS	From:	RANADA T BACA
Ship to:	4021 NATIONAL PARKS HWY	Site:	LANL
	CARLSBAD, NM 88220	Company:	TFE, INC
	GSA-212	Telephone Number:	505-667-0181
	N/A	Date Sent:	02-25-16
Telephone Number:	505-234-7523		

Document Number	Title / Description	Record Date	Total Pages
OR-RTR6-0716	NDE BDR	01-26-16	72
OR-RTR6-0716	NDE PRIMARY DVD A	01-26-16	N/A
	N/A		

Comments

SPM CHECKLIST WAS COMPLETED IN CARLSBAD

(When the Record accepted line has been completed, the rest of the page below may be left blank.)
Acceptance/Rejection Signature and Date

Records Accepted ☑ — Signature: [signature] Printed Name: Lewell Hurrabide Date: 3/2/2016

Records Rejected ☐ — Signature _____ Printed Name _____ Date _____

Reason for Rejection:

Re-submittal: Signature _____ Printed Name _____ Date _____

****
*** Send Results ***
****

Sending is complete.

Job No.	4424
Address	918655768703
Name	ORNL
Start Time	03/02 03:26 PM
Call Length	00'18
Sheets	1
Result	OK

Attachment 2 – CCP Records Transmittal/Receiving Form

CCP Records / Records Custodian, 4021 National Parks Highway - MS: GSA 212, Carlsbad, New Mexico 88220

Telephone Number: 575-234-7523

Fax Number: 575-234-7033

Attn:	CCP RECORDS	From:	RANADA T BACA
Ship to:	4021 NATIONAL PARKS HWY	Site:	LANL
	CARLSBAD, NM 88220	Company:	TFE, INC
	GSA-212	Telephone Number:	505-667-0181
	N/A	Date Sent:	02-25-16
Telephone Number:	505-234-7523		

Document Number	Title / Description	Record Date	Total Pages
OR-RTR6-0716	NDE BDR	01-26-16	72
OR-RTR6-0716	NDE PRIMARY DVD A	01-26-16	N/A
	N/A		

Comments

SPM CHECKLIST WAS COMPLETED IN CARLSBAD

(When the Record accepted line has been completed, the rest of the page below may be left blank.)
Acceptance/Rejection Signature and Date

Records Accepted ☑ [signature] Lowell Hurnalde 3/2/2016

Signature Printed Name Date

Records Rejected ☐ _____ _____ _____

Signature Printed Name Date

Reason for Rejection:

DIVIDER PAGE

Attachment 2 – CCP SPM Radiography Project Level Validation Checklist and Summary

BDR Number: OR-RTR6-0723 **Examination Date(s):** 02/11/2016

Description of Criteria Reviewed	Criteria Met? YES	NO	NA	Comments/Qualifiers
1. Is the completed, signed, and dated Independent Technical Reviewer Checklist included in the BDR, and the independent technical reviewer was not involved in the generation or recording of the data under review? **Reference Source: CCP-PO-001, C3-4**	X			
2. Does the BDR contain all items addressed in the BDR Table of Contents? **Reference Source: CCP-PO-001, C3-4**	X			
3. Does the BDR include a listing of all the container numbers in the batch? **Reference Source: CCP-PO-001, C3-4**	X			
4. List all containers that have met QAOs. **Reference Source: CCP-PO-001, C3-4**				Container Numbers: X10C0402810B X10C0402810G X10C0402810H X10C0402810J X10C1001131 X10C1001133 X10C1300177A X10C1300184 X10C1300185A X10C1300185C X10C9400064A
5. Does the BDR identify the current implementing procedure and revision number? **Reference Source: CCP-PO-001, Table C3-3**	X			
6. Is there a reference to or copy of any associated NCRs (if any) in the BDR? NA if no NCRs. **Reference Source: CCP-PO-001, Table C3-3**			X	
7. Are there 20 or fewer containers in the batch? **Reference Source: CCP-PO-001, C3-4**	X			
8. Are the data properly reported (i.e., data are reported in correct units and with correct significant figures)? **Reference Source: CCP-PO-001, C3-4**	X			
9. Is there evidence of verification that the physical form matches the Waste Matrix Code? **Reference Source: CCP-PO-001, Table C3-3**	X			

COPY

CCP RECORDS ORIGINAL
DATE RECD 3/2/2016 JY

Attachment 2 – CCP SPM Radiography Project Level Validation Checklist and Summary (Continued)

BDR Number: OR-RTR6-0723 **Examination Date(s):** 02/11/2016

Description of Criteria Reviewed	Criteria Met? YES	NO	NA	Comments/Qualifiers
10. Is there evidence of verification that the physical form matches the waste stream description? **Reference Source: CCP-PO-001, Table C3-3**	X			
11. Are prohibited items absent? **Reference Source: CCP-PO-001, Table C3-3**	X			
12. Does observable liquid, if present, meet the criteria of the TSDF-WAC? **Reference Source: CCP-PO-001, C-1**	X RW 4/19/16		~~X~~ RW 4/19/16	~~No Observable Liquids~~ X10C1300177A RW 4/19/16
13. Were discrepancies between two operators with regard to identification of waste matrix code, liquids in excess of the TSDF-WAC, or compressed gases through replicate scans and independent observations reconciled? NA if no discrepancies. **Reference Source: CCP-PO-001, C3-2**			X	
14. Are the training qualifications for all radiography personnel acceptable? **Reference Source: CCP-PO-001, C3-8**	X			
15. Was evidence of the video/audio check included in the BDR? **Reference Source: CCP-PO-001, C1-1**	X			
16. Was the Lines-Pair Resolution Test or Sieve Test Check included in the BDR? **Reference Source: CCP Technical Procedures**	X			
17. Was a replicate scan performed once per day, or once per batch, whichever is LESS frequent? **Reference Source: CCP-PO-001, C1-1**	X			
18. Was an independent observation performed once per day, or once per batch, whichever is LESS frequent? **Reference Source: CCP-PO-001, C1-1**	X			

Attachment 2 – CCP SPM Radiography Project Level Validation Checklist and Summary (Continued)

BDR Number: OR-RTR6-0723 **Examination Date(s):** 02/11/2016

Description of Criteria Reviewed	Criteria Met? YES	NO	NA	Comments/Qualifiers
19. Were the replicate scan and independent observation performed on different waste containers? **Reference Source: CCP-PO-001, C1-1**	X			
20. Were the personnel performing the replicate scan and independent observation different from the individual who performed the original? **Reference Source: CCP-PO-001, C1-1**	X			
21. Does the BDR include an estimate of each material parameter weight in kg for each container? **Reference Source: CCP Technical Procedures**	X			
22. Does the BDR include a description of each material parameter for each container? **Reference Source: CCP Technical Procedures**	X			
23. Is the container gross weight recorded in kilograms (kg) for each container in the BDR? **Reference Source: CCP Technical Procedures**	X			
24. Was the Scale Weight Calibration Check included in the BDR? **Reference Source: CCP Technical Procedures**			X	Scale not used.
25. Was the Scale Weight Check included in the BDR? **Reference Source: CCP Technical Procedures**			X	Scale not used.
Comments: N/A				

The container QC checks were properly performed and meet the Quality Assurance Objectives (QAOs). Proper procedures were followed during data reduction and analysis. The batch is complete, acceptable, and includes all supporting data and documentation required by the QAPjP.

Roger Whiteaker	Roger Whiteaker	03/02/2016
SPM Printed Name	Signature	Date

Checklist is to be re-signed only when a re-review is performed.

ROGER WHITEAKER	Roger Whiteaker	CORRECTION	4/19/2016
SPM Printed Name	Signature	Reason	Date
SPM Printed Name	Signature	Reason	Date

Attachment 2 – CCP SPM Radiography Project Level Validation Checklist and Summary

BDR Number: OR-RTR6-0723 **Examination Date(s):** 02/11/2016

Description of Criteria Reviewed	Criteria Met? YES	NO	NA	Comments/Qualifiers
1. Is the completed, signed, and dated Independent Technical Reviewer Checklist included in the BDR, and the independent technical reviewer was not involved in the generation or recording of the data under review? **Reference Source: CCP-PO-001, C3-4**	X			
2. Does the BDR contain all items addressed in the BDR Table of Contents? **Reference Source: CCP-PO-001, C3-4**	X			
3. Does the BDR include a listing of all the container numbers in the batch? **Reference Source: CCP-PO-001, C3-4**	X			
4. List all containers that have met QAOs. **Reference Source: CCP-PO-001, C3-4**				Container Numbers: X10C0402810B X10C0402810G X10C0402810H X10C0402810J X10C1001131 X10C1001133 X10C1300177A X10C1300184 X10C1300185A X10C1300185C X10C9400064A
5. Does the BDR identify the current implementing procedure and revision number? **Reference Source: CCP-PO-001, Table C3-3**	X			
6. Is there a reference to or copy of any associated NCRs (if any) in the BDR? NA if no NCRs. **Reference Source: CCP-PO-001, Table C3-3**			X	
7. Are there 20 or fewer containers in the batch? **Reference Source: CCP-PO-001, C3-4**	X			
8. Are the data properly reported (i.e., data are reported in correct units and with correct significant figures)? **Reference Source: CCP-PO-001, C3-4**	X			
9. Is there evidence of verification that the physical form matches the Waste Matrix Code? **Reference Source: CCP-PO-001, Table C3-3**	X			

CCP RECORDS ORIGINAL
DATE REC'D 3/2/2016 JY

Attachment 2 – CCP SPM Radiography Project Level Validation Checklist and Summary (Continued)

BDR Number: OR-RTR6-0723				Examination Date(s): 02/11/2016
Description of Criteria Reviewed	**Criteria Met?**			**Comments/Qualifiers**
	YES	**NO**	**NA**	
10. Is there evidence of verification that the physical form matches the waste stream description? **Reference Source: CCP-PO-001, Table C3-3**	X			
11. Are prohibited items absent? **Reference Source: CCP-PO-001, Table C3-3**	X			
12. Does observable liquid, if present, meet the criteria of the TSDF-WAC? **Reference Source: CCP-PO-001, C-1**			X	No Observable Liquids
13. Were discrepancies between two operators with regard to identification of waste matrix code, liquids in excess of the TSDF-WAC, or compressed gases through replicate scans and independent observations reconciled? NA if no discrepancies. **Reference Source: CCP-PO-001, C3-2**			X	
14. Are the training qualifications for all radiography personnel acceptable? **Reference Source: CCP-PO-001, C3-8**	X			
15. Was evidence of the video/audio check included in the BDR? **Reference Source: CCP-PO-001, C1-1**	X			
16. Was the Lines-Pair Resolution Test or Sieve Test Check included in the BDR? **Reference Source: CCP Technical Procedures**	X			
17. Was a replicate scan performed once per day, or once per batch, whichever is LESS frequent? **Reference Source: CCP-PO-001, C1-1**	X			
18. Was an independent observation performed once per day, or once per batch, whichever is LESS frequent? **Reference Source: CCP-PO-001, C1-1**	X			

Attachment 2 – CCP SPM Radiography Project Level Validation Checklist and Summary (Continued)

BDR Number: OR-RTR6-0723 **Examination Date(s):** 02/11/2016

Description of Criteria Reviewed	Criteria Met? YES	NO	NA	Comments/Qualifiers
19. Were the replicate scan and independent observation performed on different waste containers? **Reference Source: CCP-PO-001, C1-1**	X			
20. Were the personnel performing the replicate scan and independent observation different from the individual who performed the original? **Reference Source: CCP-PO-001, C1-1**	X			
21. Does the BDR include an estimate of each material parameter weight in kg for each container? **Reference Source: CCP Technical Procedures**	X			
22. Does the BDR include a description of each material parameter for each container? **Reference Source: CCP Technical Procedures**	X			
23. Is the container gross weight recorded in kilograms (kg) for each container in the BDR? **Reference Source: CCP Technical Procedures**	X			
24. Was the Scale Weight Calibration Check included in the BDR? **Reference Source: CCP Technical Procedures**			X	Scale not used.
25. Was the Scale Weight Check included in the BDR? **Reference Source: CCP Technical Procedures**			X	Scale not used.

Comments: N/A

The container QC checks were properly performed and meet the Quality Assurance Objectives (QAOs). Proper procedures were followed during data reduction and analysis. The batch is complete, acceptable, and includes all supporting data and documentation required by the QAPjP.

Roger Whiteaker	Roger Whiteaker	03/02/2016
SPM Printed Name	Signature	Date

Checklist is to be re-signed only when a re-review is performed.

SPM Printed Name	Signature	Reason	Date
SPM Printed Name	Signature	Reason	Date

Attachment 5–CCP Radiography Batch Data Report Cover Sheet

Site ID: ORNL

Batch Data Report No.: OR-RTR6-0723 ☑ CH ☐ RH Date: 2-11-16

Waste Container ID Numbers	
Replicate Scan:	X10C1300184
Independent Observation:	X10C1001131
1	X10C1300177A
2	X10C0402810H
3	X10C1300185C
4	X10C0402810B
5	X10C1001131
6	X10C0402810G
7	X10C1300185A
8	X10C0402810J
9	X10C1001133
10	X10C9400064A
11	X10C1300184
12	N/A
13	N/A
14	N/A
15	N/A
16	N/A
17	N/A
18	N/A
19	N/A
20	N/A

RTR Operator:

Eric Lyles — Printed Name | Signature | 2-11-16 — Date

Independent Technical Reviewer:

AARON ELLIOTT — Printed Name | Signature | 3/1/16 — Date

CCP RECORDS ORIGINAL
DATE REC'D 3/1/16

Attachment 4 – CCP Radiography Batch Data Report Table of Contents and Batch Narrative

Batch Data Report No.: OR-RTR6-0723 Date: 2-11-16

Table Of Contents

Item	Description	Page No.
1	CCP Radiography Batch Data Report Cover Sheet	1
2	CCP Radiography Batch Data Report Table Of Contents	2
3	CCP RTR Measurement Control Report	3
4	CCP Radiography Data Sheets	4
5	Copy of NCRs (NA, If Not Applicable)	N/A
6	CCP Independent Technical Reviewer Checklist	43

Batch Narrative

All Quality Checks were performed and recorded on CCP-TP-053, Rev.15, CCP Radiography Measurement Control Report.

Eric Lyles — RTR Operator

Signature

2-11-16 — Date

Attachment 1 – CCP RTR Measurement Control Report

Site ID: ORNL		
Batch Data Report No.: OR-RTR6-0723		
Examination Date: 2-11-16		
Control Checks		
Video/Audio Recorded Media System Check	☑ SAT	☐ UNSAT
Image Test : 10 Lines (Minimum acceptable is 5 lines-pair/cm or #6 Sieve is viewable)	☑ SAT	☐ UNSAT
Comments: N/A		
RTR Operator: Eric Lyles (Printed Name) / [signature] (Signature) / 2-11-16 (Date)		

3

CCP Radiography Data Sheet

Section 1: General Information	
☐ RTR Examination ☒ RTR Replicate Scan ☐ RTR Independent Observation	
Site ID:	ORNL
Batch Number:	OR-RTR6-0723
Examination Date:	2/11/2016
Waste Container ID:	X10C1300184
Video/Audio Recorded Media Number:	OR-RTR6-0723 A&B
Procedure and Revision No.:	CCP-TP-053 Rev. 15
NCR(s) associated with the container? (e.g., Prohibited Items)	☒ No ☐ Yes NCR No.: N/A NCR No.: N/A

Section 2: Waste Container Data	
Container Type:	55 Gallon Drum
TRUCON Code:	OR 225
Waste Matrix Code:	S5400
Waste Stream I.D.:	OR-CHEM-CH-HET
Waste Container Weights:	Gross Wt.: 57.2 kg Tare Wt.: 28.8 kg Net Wt.: 28.4 kg
Rigid Liner and Liner Vent Description:	Liner: ☒ No ☐ Yes Lid: ☒ No ☐ Yes Type: ☐ 30-mil ☐ 90-mil ☐ 110-mil ☐ 125-mil Vented: ☐ No ☐ Yes ☒ N/A Punctured: ☒ No ☐ Yes Mechanical Vent: ☒ No ☐ Yes Fiberboard Liner: ☒ No ☐ Yes Lead Lined: ☒ No ☐ Yes
Number of Layers of Confinement:	Appears to be 1 layer
Volume Utilization Percentage:	90 %

CCP Radiography Data Sheet

Waste Container ID: X10C1300184

Section 3: Container Inventory and Comments (Detailed descriptions)	
IM:	Scrap metal, electrical equipment, electric motor
AM:	
OM:	
OI:	
C:	Cloth
R:	
XPM:	Plastic containers, plastic caps, plastic tubing, plastic sheeting
OR:	Absorbent
IN:	
S:	

Section 4: Packaging Material and Waste Material Parameters	
Packaging Material:	**Estimated Weight (kg)**
Steel (ST):	27.8
Plastics (PP): Liner bag	1.0
Other:	0.0
Total Packaging Weight	28.8
Waste Material Parameter:	**Estimated Weight (kg)**
Iron-based Metal / Alloys (IM):	10.5
Aluminum-based Metals / Alloys (AM):	
Other Metals (OM):	
Other Inorganic Materials (OI)	
Cellulosics (C):	4.0
Rubber (R):	
Plastics (waste materials) (XPM):	13.8
Organic Matrix (OR):	0.1
Inorganic Matrix (IN):	
Soils (S):	
Total WMP Weight:	28.4

CCP Radiography Data Sheet

Waste Container ID: X10C1300184

Section 5: RTR Summary (Questions answered "Yes" will be explained in the Comment block, except for Question 1)	
Is there observable liquid?	☐ Yes ☒ No
Is there any observable liquid in internal containers, more than 60 milliliters or 3 percent by volume, whichever is greater?	☐ Yes ☒ No
Is the total volume of observable liquid in the outermost container GREATER than 1% of the container?	☐ Yes ☒ No
Is there observable liquid in payload containers with an EPA Hazardous Waste Number of U134?	☐ Yes ☒ No
Is there an indication of non-radionuclide pyrophoric materials, such as elemental potassium?	☐ Yes ☒ No
Is there an indication of hazardous wastes not occurring as co-contaminants with TRU mixed wastes (non-mixed hazardous wastes)?	☐ Yes ☒ No
Is there an indication of wastes incompatible with backfill, seal and panel closures materials, container and packaging materials, shipping container materials, or other wastes (i.e., waste does NOT match TRUCON Code[s])?	☐ Yes ☒ No
Is there an indication of wastes containing explosives or compressed gases?	☐ Yes ☒ No
Is there an indication of PCBs liquids?	☐ Yes ☒ No
Is there an indication of the waste exhibiting the characteristic of ignitability, corrosivity, or reactivity (EPA Hazardous Waste Numbers of D001, D002, or D003)?	☐ Yes ☒ No
Is the physical form of the waste inconsistent with the Waste Stream Description or the Waste Matrix Code?	☐ Yes ☒ No
CH or RH TRAMPAC	
Are there heat-sealed bags (unvented) GREATER than 4 liters and LESS than 390 square inches in the waste, or heat sealed bags not authorized in the RH TRUCON Code?	☐ Yes ☒ No
Were there Non-approved Closure Methods used on liner bags or inner bags greater than 4 liters?	☐ Yes ☒ No
Are there sealed containers GREATER than 4 liters?	☐ Yes ☒ No
Are there indications of inadequate protection for heavy and/or sharp objects?	☐ Yes ☒ No

Comments: This Replicate Scan agrees with the ORignal Scan.
FO 2-11-16

RTR Operator:

Fred Oney		2/11/2016
Print Name	Signature	Date

CCP Radiography Data Sheet

Section 1: General Information	
☐ RTR Examination ☐ RTR Replicate Scan ☒ RTR Independent Observation	
Site ID:	ORNL
Batch Number:	OR-RTR6-0723
Examination Date:	2/11/2016
Waste Container ID:	X10C1001131
Video/Audio Recorded Media Number:	OR-RTR6-0723 A&B
Procedure and Revision No.:	CCP-TP-053 Rev. 15
NCR(s) associated with the container? (e.g., Prohibited Items)	☒ No ☐ Yes NCR No.: N/A NCR No.: N/A

Section 2: Waste Container Data	
Container Type:	55 Gallon Drum
TRUCON Code:	OR 225
Waste Matrix Code:	S5400
Waste Stream I.D.:	OR-CHEM-CH-HET
Waste Container Weights:	Gross Wt.: 42.0 kg Tare Wt.: 28.8 kg Net Wt.: 13.2 kg
Rigid Liner and Liner Vent Description:	Liner: ☒ No ☐ Yes Lid: ☒ No ☐ Yes Type: ☐ 30-mil ☐ 90-mil ☐ 110-mil ☐ 125-mil Vented: ☐ No ☐ Yes ☒ N/A Punctured: ☒ No ☐ Yes Mechanical Vent: ☒ No ☐ Yes Fiberboard Liner: ☒ No ☐ Yes Lead Lined: ☒ No ☐ Yes
Number of Layers of Confinement:	Appears to be 1 layer
Volume Utilization Percentage:	80 %

CCP Radiography Data Sheet

Waste Container ID: X10C1001131

Section 3: Container Inventory and Comments (Detailed descriptions)
IM:
AM:
OM:
OI:
C: Coveralls
R:
XPM: Plastic sheeting, plastic containers, plastic caps
OR: Absorbent
IN:
S:

Section 4: Packaging Material and Waste Material Parameters	
Packaging Material:	**Estimated Weight (kg)**
Steel (ST):	27.8
Plastics (PP): Liner bag	1.0
Other:	0.0
Total Packaging Weight	28.8
Waste Material Parameter:	**Estimated Weight (kg)**
Iron-based Metal / Alloys (IM):	
Aluminum-based Metals / Alloys (AM):	
Other Metals (OM):	
Other Inorganic Materials (OI)	
Cellulosics (C):	4.0
Rubber (R):	
Plastics (waste materials) (XPM):	8.2
Organic Matrix (OR):	1.0
Inorganic Matrix (IN):	
Soils (S):	
Total WMP Weight:	13.2

CCP Radiography Data Sheet

Waste Container ID: X10C1001131

Section 5: RTR Summary (Questions answered "Yes" will be explained in the Comment block, except for Question 1)	
Is there observable liquid?	☐ Yes ☒ No
Is there any observable liquid in internal containers, more than 60 milliliters or 3 percent by volume, whichever is greater?	☐ Yes ☒ No
Is the total volume of observable liquid in the outermost container GREATER than 1% of the container?	☐ Yes ☒ No
Is there observable liquid in payload containers with an EPA Hazardous Waste Number of U134?	☐ Yes ☒ No
Is there an indication of non-radionuclide pyrophoric materials, such as elemental potassium?	☐ Yes ☒ No
Is there an indication of hazardous wastes not occurring as co-contaminants with TRU mixed wastes (non-mixed hazardous wastes)?	☐ Yes ☒ No
Is there an indication of wastes incompatible with backfill, seal and panel closures materials, container and packaging materials, shipping container materials, or other wastes (i.e., waste does NOT match TRUCON Code[s])?	☐ Yes ☒ No
Is there an indication of wastes containing explosives or compressed gases?	☐ Yes ☒ No
Is there an indication of PCBs liquids?	☐ Yes ☒ No
Is there an indication of the waste exhibiting the characteristic of ignitability, corrosivity, or reactivity (EPA Hazardous Waste Numbers of D001, D002, or D003)?	☐ Yes ☒ No
Is the physical form of the waste inconsistent with the Waste Stream Description or the Waste Matrix Code?	☐ Yes ☒ No
CH or RH TRAMPAC	
Are there heat-sealed bags (unvented) GREATER than 4 liters and LESS than 390 square inches in the waste, or heat sealed bags not authorized in the RH TRUCON Code?	☐ Yes ☒ No
Were there Non-approved Closure Methods used on liner bags or inner bags greater than 4 liters?	☐ Yes ☒ No
Are there sealed containers GREATER than 4 liters?	☐ Yes ☒ No
Are there indications of inadequate protection for heavy and/or sharp objects?	☐ Yes ☒ No

Comments: This Independent OBSERVATION AGREES With the ORIGINAL SCAN.

FO

2-11-16

RTR Operator:

Fred Oney		2/11/2016
Print Name	Signature	Date

CCP Radiography Data Sheet

Section 1: General Information		
[X] RTR Examination	[ ] RTR Replicate Scan	[ ] RTR Independent Observation
Site ID:	ORNL	
Batch Number:	OR-RTR6-0723	
Examination Date:	2/11/2016	
Waste Container ID:	X10C1300177A	
Video/Audio Recorded Media Number:	OR-RTR6-0723	A&B
Procedure and Revision No.:	CCP-TP-053	Rev. 15
NCR(s) associated with the container? (e.g., Prohibited Items)	[X] No [ ] Yes NCR No.: N/A NCR No.: N/A	

Section 2: Waste Container Data	
Container Type:	55 Gallon Drum
TRUCON Code:	OR 225
Waste Matrix Code:	S5400
Waste Stream I.D.:	OR-CHEM-CH-HET
Waste Container Weights:	Gross Wt.: 62.6 kg Tare Wt.: 33.2 kg Net Wt.: 29.4 kg
Rigid Liner and Liner Vent Description:	Liner: [X] No [ ] Yes Lid: [X] No [ ] Yes Type: [ ] 30-mil [ ] 90-mil [ ] 110-mil [ ] 125-mil Vented: [ ] No [ ] Yes [X] N/A Punctured: [X] No [ ] Yes Mechanical Vent: [X] No [ ] Yes Fiberboard Liner: [X] No [ ] Yes Lead Lined: [X] No [ ] Yes
Number of Layers of Confinement:	Appears to be 1 layer
Volume Utilization Percentage:	75 %

CCP Radiography Data Sheet

Waste Container ID: X10C1300177A

Section 3: Container Inventory and Comments (Detailed descriptions)
IM: Electrical equipment, saw blade, motor, scrap metal
AM:
OM:
OI:
C:
R:
XPM: Plastic sheeting, plastic containers, plastic caps, plastic tubing
OR:
IN:
S:

Section 4: Packaging Material and Waste Material Parameters	
Packaging Material:	**Estimated Weight (kg)**
Steel (ST):	27.8
Plastics (PP): Liner bag	1.0
Other: Cardboard Liner (CP)	4.4
Total Packaging Weight	33.2
Waste Material Parameter:	**Estimated Weight (kg)**
Iron-based Metal / Alloys (IM):	19.4
Aluminum-based Metals / Alloys (AM):	
Other Metals (OM):	
Other Inorganic Materials (OI)	
Cellulosics (C):	
Rubber (R):	
Plastics (waste materials) (XPM):	10.0
Organic Matrix (OR):	
Inorganic Matrix (IN):	
Soils (S):	
Total WMP Weight:	29.4

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CCP Radiography Data Sheet

Waste Container ID: X10C1300177A

Section 5: RTR Summary (Questions answered "Yes" will be explained in the Comment block, except for Question 1)	
Is there observable liquid?	[X] Yes [ ] No
Is there any observable liquid in internal containers, more than 60 milliliters or 3 percent by volume, whichever is greater?	[ ] Yes [X] No
Is the total volume of observable liquid in the outermost container GREATER than 1% of the container?	[ ] Yes [X] No
Is there observable liquid in payload containers with an EPA Hazardous Waste Number of U134?	[ ] Yes [X] No
Is there an indication of non-radionuclide pyrophoric materials, such as elemental potassium?	[ ] Yes [X] No
Is there an indication of hazardous wastes not occurring as co-contaminants with TRU mixed wastes (non-mixed hazardous wastes)?	[ ] Yes [X] No
Is there an indication of wastes incompatible with backfill, seal and panel closures materials, container and packaging materials, shipping container materials, or other wastes (i.e., waste does NOT match TRUCON Code[s])?	[ ] Yes [X] No
Is there an indication of wastes containing explosives or compressed gases?	[ ] Yes [X] No
Is there an indication of PCBs liquids?	[ ] Yes [X] No
Is there an indication of the waste exhibiting the characteristic of ignitability, corrosivity, or reactivity (EPA Hazardous Waste Numbers of D001, D002, or D003)?	[ ] Yes [X] No
Is the physical form of the waste inconsistent with the Waste Stream Description or the Waste Matrix Code?	[ ] Yes [X] No
CH or RH TRAMPAC	
Are there heat-sealed bags (unvented) GREATER than 4 liters and LESS than 390 square inches in the waste, or heat sealed bags not authorized in the RH TRUCON Code?	[ ] Yes [X] No
Were there Non-approved Closure Methods used on liner bags or inner bags greater than 4 liters?	[ ] Yes [X] No
Are there sealed containers GREATER than 4 liters?	[ ] Yes [X] No
Are there indications of inadequate protection for heavy and/or sharp objects?	[ ] Yes [X] No
Comments: N/A	

RTR Operator:

Eric Lyles		2/11/2016
Print Name	Signature	Date

CCP Radiography Data Sheet

Section 1: General Information	
[X] RTR Examination [ ] RTR Replicate Scan [ ] RTR Independent Observation	
Site ID:	ORNL
Batch Number:	OR-RTR6-0723
Examination Date:	2/11/2016
Waste Container ID:	X10C0402810H
Video/Audio Recorded Media Number:	OR-RTR6-0723 A&B
Procedure and Revision No.:	CCP-TP-053 Rev. 15
NCR(s) associated with the container? (e.g., Prohibited Items)	[X] No [ ] Yes NCR No.: N/A NCR No.: N/A

Section 2: Waste Container Data	
Container Type:	55 Gallon Drum
TRUCON Code:	OR 225
Waste Matrix Code:	S5400
Waste Stream I.D.:	OR-CHEM-CH-HET
Waste Container Weights:	Gross Wt.: 80.2 kg Tare Wt.: 33.2 kg Net Wt.: 47.0 kg
Rigid Liner and Liner Vent Description:	Liner: [X] No [ ] Yes Lid: [X] No [ ] Yes Type: [ ] 30-mil [ ] 90-mil [ ] 110-mil [ ] 125-mil Vented: [ ] No [ ] Yes [X] N/A Punctured: [X] No [ ] Yes Mechanical Vent: [X] No [ ] Yes Fiberboard Liner: [X] No [ ] Yes Lead Lined: [X] No [ ] Yes
Number of Layers of Confinement:	Appears to be 1 layer
Volume Utilization Percentage:	75 %

CCP Radiography Data Sheet

Waste Container ID: X10C0402810H

Section 3: Container Inventory and Comments (Detailed descriptions)	
IM:	Metal hardware, scrap metal
AM:	
OM:	
OI:	
C:	Cloth, coveralls
R:	
XPM:	Plastic sheeting, plastic tubing
OR:	Absorbent
IN:	
S:	

Section 4: Packaging Material and Waste Material Parameters	
Packaging Material:	**Estimated Weight (kg)**
Steel (ST):	27.8
Plastics (PP): Liner bag	1.0
Other: Cardboard Liner (CP)	4.4
Total Packaging Weight	33.2
Waste Material Parameter:	**Estimated Weight (kg)**
Iron-based Metal / Alloys (IM):	32.0
Aluminum-based Metals / Alloys (AM):	
Other Metals (OM):	
Other Inorganic Materials (OI)	
Cellulosics (C):	7.0
Rubber (R):	
Plastics (waste materials) (XPM):	6.0
Organic Matrix (OR):	2.0
Inorganic Matrix (IN):	
Soils (S):	
Total WMP Weight:	47.0

CCP Radiography Data Sheet

Waste Container ID: X10C0402810H

Section 5: RTR Summary (Questions answered "Yes" will be explained in the Comment block, except for Question 1)	
Is there observable liquid?	☐ Yes ☒ No
Is there any observable liquid in internal containers, more than 60 milliliters or 3 percent by volume, whichever is greater?	☐ Yes ☒ No
Is the total volume of observable liquid in the outermost container GREATER than 1% of the container?	☐ Yes ☒ No
Is there observable liquid in payload containers with an EPA Hazardous Waste Number of U134?	☐ Yes ☒ No
Is there an indication of non-radionuclide pyrophoric materials, such as elemental potassium?	☐ Yes ☒ No
Is there an indication of hazardous wastes not occurring as co-contaminants with TRU mixed wastes (non-mixed hazardous wastes)?	☐ Yes ☒ No
Is there an indication of wastes incompatible with backfill, seal and panel closures materials, container and packaging materials, shipping container materials, or other wastes (i.e., waste does NOT match TRUCON Code[s])?	☐ Yes ☒ No
Is there an indication of wastes containing explosives or compressed gases?	☐ Yes ☒ No
Is there an indication of PCBs liquids?	☐ Yes ☒ No
Is there an indication of the waste exhibiting the characteristic of ignitability, corrosivity, or reactivity (EPA Hazardous Waste Numbers of D001, D002, or D003)?	☐ Yes ☒ No
Is the physical form of the waste inconsistent with the Waste Stream Description or the Waste Matrix Code?	☐ Yes ☒ No
CH or RH TRAMPAC	
Are there heat-sealed bags (unvented) GREATER than 4 liters and LESS than 390 square inches in the waste, or heat sealed bags not authorized in the RH TRUCON Code?	☐ Yes ☒ No
Were there Non-approved Closure Methods used on liner bags or inner bags greater than 4 liters?	☐ Yes ☒ No
Are there sealed containers GREATER than 4 liters?	☐ Yes ☒ No
Are there indications of inadequate protection for heavy and/or sharp objects?	☐ Yes ☒ No
Comments: N/A	

RTR Operator:

Eric Lyles		2/11/2016
Print Name	Signature	Date

CCP Radiography Data Sheet

Section 1: General Information	
[X] RTR Examination [ ] RTR Replicate Scan [ ] RTR Independent Observation	
Site ID:	ORNL
Batch Number:	OR-RTR6-0723
Examination Date:	2/11/2016
Waste Container ID:	X10C1300185C
Video/Audio Recorded Media Number:	OR-RTR6-0723 A&B
Procedure and Revision No.:	CCP-TP-053 Rev. 15
NCR(s) associated with the container? (e.g., Prohibited Items)	[X] No [ ] Yes NCR No.: N/A NCR No.: N/A

Section 2: Waste Container Data	
Container Type:	55 Gallon Drum
TRUCON Code:	OR 225
Waste Matrix Code:	S5400
Waste Stream I.D.:	OR-CHEM-CH-HET
Waste Container Weights:	Gross Wt.: 66.3 kg Tare Wt.: 33.2 kg Net Wt.: 33.1 kg
Rigid Liner and Liner Vent Description:	Liner: [X] No [ ] Yes Lid: [X] No [ ] Yes Type: [ ] 30-mil [ ] 90-mil [ ] 110-mil [ ] 125-mil Vented: [ ] No [ ] Yes [X] N/A Punctured: [X] No [ ] Yes Mechanical Vent: [X] No [ ] Yes Fiberboard Liner: [X] No [ ] Yes Lead Lined: [X] No [ ] Yes
Number of Layers of Confinement:	Appears to be 1 layer
Volume Utilization Percentage:	100 %

CCP Radiography Data Sheet

Waste Container ID: X10C1300185C

Section 3: Container Inventory and Comments (Detailed descriptions)	
IM:	Scrap metal, metal cans, metal lids
AM:	
OM:	Scrap lead
OI:	Glass containers
C:	
R:	
XPM:	Plastic sheeting, plastic containers, plastic caps
OR:	Absorbent
IN:	
S:	

Section 4: Packaging Material and Waste Material Parameters	
Packaging Material:	**Estimated Weight (kg)**
Steel (ST):	27.8
Plastics (PP): Liner bag	1.0
Other: Cardboard Liner (CP)	4.4
Total Packaging Weight	33.2
Waste Material Parameter:	**Estimated Weight (kg)**
Iron-based Metal / Alloys (IM):	13.1
Aluminum-based Metals / Alloys (AM):	
Other Metals (OM):	2.0
Other Inorganic Materials (OI)	5.0
Cellulosics (C):	
Rubber (R):	
Plastics (waste materials) (XPM):	10.0
Organic Matrix (OR):	3.0
Inorganic Matrix (IN):	
Soils (S):	
Total WMP Weight:	33.1

CCP Radiography Data Sheet

Waste Container ID: X10C1300185C

Section 5: RTR Summary (Questions answered "Yes" will be explained in the Comment block, except for Question 1)	
Is there observable liquid?	☐ Yes ☒ No
Is there any observable liquid in internal containers, more than 60 milliliters or 3 percent by volume, whichever is greater?	☐ Yes ☒ No
Is the total volume of observable liquid in the outermost container GREATER than 1% of the container?	☐ Yes ☒ No
Is there observable liquid in payload containers with an EPA Hazardous Waste Number of U134?	☐ Yes ☒ No
Is there an indication of non-radionuclide pyrophoric materials, such as elemental potassium?	☐ Yes ☒ No
Is there an indication of hazardous wastes not occurring as co-contaminants with TRU mixed wastes (non-mixed hazardous wastes)?	☐ Yes ☒ No
Is there an indication of wastes incompatible with backfill, seal and panel closures materials, container and packaging materials, shipping container materials, or other wastes (i.e., waste does NOT match TRUCON Code[s])?	☐ Yes ☒ No
Is there an indication of wastes containing explosives or compressed gases?	☐ Yes ☒ No
Is there an indication of PCBs liquids?	☐ Yes ☒ No
Is there an indication of the waste exhibiting the characteristic of ignitability, corrosivity, or reactivity (EPA Hazardous Waste Numbers of D001, D002, or D003)?	☐ Yes ☒ No
Is the physical form of the waste inconsistent with the Waste Stream Description or the Waste Matrix Code?	☐ Yes ☒ No
CH or RH TRAMPAC	
Are there heat-sealed bags (unvented) GREATER than 4 liters and LESS than 390 square inches in the waste, or heat sealed bags not authorized in the RH TRUCON Code?	☐ Yes ☒ No
Were there Non-approved Closure Methods used on liner bags or inner bags greater than 4 liters?	☐ Yes ☒ No
Are there sealed containers GREATER than 4 liters?	☐ Yes ☒ No
Are there indications of inadequate protection for heavy and/or sharp objects?	☐ Yes ☒ No
Comments: N/A	

RTR Operator:

Eric Lyles		2/11/2016
Print Name	Signature	Date

CCP Radiography Data Sheet

Section 1: General Information	
[X] RTR Examination [ ] RTR Replicate Scan [ ] RTR Independent Observation	
Site ID:	ORNL
Batch Number:	OR-RTR6-0723
Examination Date:	2/11/2016
Waste Container ID:	X10C0402810B
Video/Audio Recorded Media Number:	OR-RTR6-0723 A&B
Procedure and Revision No.:	CCP-TP-053 Rev. 15
NCR(s) associated with the container? (e.g., Prohibited Items)	[X] No [ ] Yes NCR No.: N/A NCR No.: N/A

Section 2: Waste Container Data	
Container Type:	55 Gallon Drum
TRUCON Code:	OR 225
Waste Matrix Code:	S5400
Waste Stream I.D.:	OR-CHEM-CH-HET
Waste Container Weights:	Gross Wt.: 86.1 kg Tare Wt.: 33.2 kg Net Wt.: 52.9 kg
Rigid Liner and Liner Vent Description:	Liner: [X] No [ ] Yes Lid: [X] No [ ] Yes Type: [ ] 30-mil [ ] 90-mil [ ] 110-mil [ ] 125-mil Vented: [ ] No [ ] Yes [X] N/A Punctured: [X] No [ ] Yes Mechanical Vent: [X] No [ ] Yes Fiberboard Liner: [X] No [ ] Yes Lead Lined: [X] No [ ] Yes
Number of Layers of Confinement:	Appears to be 1 layer
Volume Utilization Percentage:	95 %

CCP Radiography Data Sheet

Waste Container ID: X10C0402810B

Section 3: Container Inventory and Comments (Detailed descriptions)	
IM:	Metal hardware
AM:	
OM:	
OI:	
C:	Cloth, coveralls, wood
R:	Rubber gloves
XPM:	Plastic sheeting, plastic tubing
OR:	Absorbent
IN:	
S:	

Section 4: Packaging Material and Waste Material Parameters	
Packaging Material:	**Estimated Weight (kg)**
Steel (ST):	27.8
Plastics (PP): Liner bag	1.0
Other: Cardboard Liner (CP)	4.4
Total Packaging Weight	33.2
Waste Material Parameter:	**Estimated Weight (kg)**
Iron-based Metal / Alloys (IM):	0.1
Aluminum-based Metals / Alloys (AM):	
Other Metals (OM):	
Other Inorganic Materials (OI)	
Cellulosics (C):	36.8
Rubber (R):	1.0
Plastics (waste materials) (XPM):	10.0
Organic Matrix (OR):	5.0
Inorganic Matrix (IN):	
Soils (S):	
Total WMP Weight:	52.9

CCP Radiography Data Sheet

Waste Container ID: X10C0402810B

Section 5: RTR Summary (Questions answered "Yes" will be explained in the Comment block, except for Question 1)	
Is there observable liquid?	☐ Yes ☒ No
Is there any observable liquid in internal containers, more than 60 milliliters or 3 percent by volume, whichever is greater?	☐ Yes ☒ No
Is the total volume of observable liquid in the outermost container GREATER than 1% of the container?	☐ Yes ☒ No
Is there observable liquid in payload containers with an EPA Hazardous Waste Number of U134?	☐ Yes ☒ No
Is there an indication of non-radionuclide pyrophoric materials, such as elemental potassium?	☐ Yes ☒ No
Is there an indication of hazardous wastes not occurring as co-contaminants with TRU mixed wastes (non-mixed hazardous wastes)?	☐ Yes ☒ No
Is there an indication of wastes incompatible with backfill, seal and panel closures materials, container and packaging materials, shipping container materials, or other wastes (i.e., waste does NOT match TRUCON Code[s])?	☐ Yes ☒ No
Is there an indication of wastes containing explosives or compressed gases?	☐ Yes ☒ No
Is there an indication of PCBs liquids?	☐ Yes ☒ No
Is there an indication of the waste exhibiting the characteristic of ignitability, corrosivity, or reactivity (EPA Hazardous Waste Numbers of D001, D002, or D003)?	☐ Yes ☒ No
Is the physical form of the waste inconsistent with the Waste Stream Description or the Waste Matrix Code?	☐ Yes ☒ No
CH or RH TRAMPAC	
Are there heat-sealed bags (unvented) GREATER than 4 liters and LESS than 390 square inches in the waste, or heat sealed bags not authorized in the RH TRUCON Code?	☐ Yes ☒ No
Were there Non-approved Closure Methods used on liner bags or inner bags greater than 4 liters?	☐ Yes ☒ No
Are there sealed containers GREATER than 4 liters?	☐ Yes ☒ No
Are there indications of inadequate protection for heavy and/or sharp objects?	☐ Yes ☒ No
Comments: N/A	

RTR Operator:

Eric Lyles		2/11/2016
Print Name	Signature	Date

CCP Radiography Data Sheet

Section 1: General Information	
[X] RTR Examination [ ] RTR Replicate Scan [ ] RTR Independent Observation	
Site ID:	ORNL
Batch Number:	OR-RTR6-0723
Examination Date:	2/11/2016
Waste Container ID:	X10C1001131
Video/Audio Recorded Media Number:	OR-RTR6-0723 A&B
Procedure and Revision No.:	CCP-TP-053 Rev. 15
NCR(s) associated with the container? (e.g., Prohibited Items)	[X] No [ ] Yes NCR No.: N/A NCR No.: N/A

Section 2: Waste Container Data	
Container Type:	55 Gallon Drum
TRUCON Code:	OR 225
Waste Matrix Code:	S5400
Waste Stream I.D.:	OR-CHEM-CH-HET
Waste Container Weights:	Gross Wt.: 42.0 kg Tare Wt.: 28.8 kg Net Wt.: 13.2 kg
Rigid Liner and Liner Vent Description:	Liner: [X] No [ ] Yes Lid: [X] No [ ] Yes Type: [ ] 30-mil [ ] 90-mil [ ] 110-mil [ ] 125-mil Vented: [ ] No [ ] Yes [X] N/A Punctured: [X] No [ ] Yes Mechanical Vent: [X] No [ ] Yes Fiberboard Liner: [X] No [ ] Yes Lead Lined: [X] No [ ] Yes
Number of Layers of Confinement:	Appears to be 1 layer
Volume Utilization Percentage:	80 %

CCP Radiography Data Sheet

Waste Container ID: X10C1001131

Section 3: Container Inventory and Comments (Detailed descriptions)
IM:
AM:
OM:
OI:
C: Cloth, coveralls
R:
XPM: Plastic containers, plastic sheeting, plastic caps
OR: Absorbent
IN:
S:

Section 4: Packaging Material and Waste Material Parameters	
Packaging Material:	**Estimated Weight (kg)**
Steel (ST):	27.8
Plastics (PP): Liner bag	1.0
Other:	0.0
Total Packaging Weight	28.8
Waste Material Parameter:	**Estimated Weight (kg)**
Iron-based Metal / Alloys (IM):	
Aluminum-based Metals / Alloys (AM):	
Other Metals (OM):	
Other Inorganic Materials (OI)	
Cellulosics (C):	3.5
Rubber (R):	
Plastics (waste materials) (XPM):	8.7
Organic Matrix (OR):	1.0
Inorganic Matrix (IN):	
Soils (S):	
Total WMP Weight:	13.2

CCP Radiography Data Sheet

Waste Container ID: X10C1001131

Section 5: RTR Summary (Questions answered "Yes" will be explained in the Comment block, except for Question 1)	
Is there observable liquid?	☐ Yes ☒ No
Is there any observable liquid in internal containers, more than 60 milliliters or 3 percent by volume, whichever is greater?	☐ Yes ☒ No
Is the total volume of observable liquid in the outermost container GREATER than 1% of the container?	☐ Yes ☒ No
Is there observable liquid in payload containers with an EPA Hazardous Waste Number of U134?	☐ Yes ☒ No
Is there an indication of non-radionuclide pyrophoric materials, such as elemental potassium?	☐ Yes ☒ No
Is there an indication of hazardous wastes not occurring as co-contaminants with TRU mixed wastes (non-mixed hazardous wastes)?	☐ Yes ☒ No
Is there an indication of wastes incompatible with backfill, seal and panel closures materials, container and packaging materials, shipping container materials, or other wastes (i.e., waste does NOT match TRUCON Code[s])?	☐ Yes ☒ No
Is there an indication of wastes containing explosives or compressed gases?	☐ Yes ☒ No
Is there an indication of PCBs liquids?	☐ Yes ☒ No
Is there an indication of the waste exhibiting the characteristic of ignitability, corrosivity, or reactivity (EPA Hazardous Waste Numbers of D001, D002, or D003)?	☐ Yes ☒ No
Is the physical form of the waste inconsistent with the Waste Stream Description or the Waste Matrix Code?	☐ Yes ☒ No
CH or RH TRAMPAC	
Are there heat-sealed bags (unvented) GREATER than 4 liters and LESS than 390 square inches in the waste, or heat sealed bags not authorized in the RH TRUCON Code?	☐ Yes ☒ No
Were there Non-approved Closure Methods used on liner bags or inner bags greater than 4 liters?	☐ Yes ☒ No
Are there sealed containers GREATER than 4 liters?	☐ Yes ☒ No
Are there indications of inadequate protection for heavy and/or sharp objects?	☐ Yes ☒ No
Comments: N/A	

RTR Operator:

Eric Lyles		2/11/2016
Print Name	Signature	Date

CCP Radiography Data Sheet

Section 1: General Information	
[X] RTR Examination [ ] RTR Replicate Scan [ ] RTR Independent Observation	
Site ID:	ORNL
Batch Number:	OR-RTR6-0723
Examination Date:	2/11/2016
Waste Container ID:	X10C0402810G
Video/Audio Recorded Media Number:	OR-RTR6-0723 A&B
Procedure and Revision No.:	CCP-TP-053 Rev. 15
NCR(s) associated with the container? (e.g., Prohibited Items)	[X] No [ ] Yes NCR No.: N/A NCR No.: N/A

Section 2: Waste Container Data	
Container Type:	55 Gallon Drum
TRUCON Code:	OR 225
Waste Matrix Code:	S5400
Waste Stream I.D.:	OR-CHEM-CH-HET
Waste Container Weights:	Gross Wt.: 68.0 kg Tare Wt.: 33.2 kg Net Wt.: 34.8 kg
Rigid Liner and Liner Vent Description:	Liner: [X] No [ ] Yes Lid: [X] No [ ] Yes Type: [ ] 30-mil [ ] 90-mil [ ] 110-mil [ ] 125-mil Vented: [ ] No [ ] Yes [X] N/A Punctured: [X] No [ ] Yes Mechanical Vent: [X] No [ ] Yes Fiberboard Liner: [X] No [ ] Yes Lead Lined: [X] No [ ] Yes
Number of Layers of Confinement:	Appears to be 1 layer
Volume Utilization Percentage:	90 %

CCP Radiography Data Sheet

Waste Container ID: X10C0402810G

Section 3: Container Inventory and Comments (Detailed descriptions)	
IM:	Scrap metal, metal respirator filter
AM:	
OM:	
OI:	Light bulbs, broken glass
C:	Cloth, coveralls, wood, cardboard
R:	
XPM:	Plastic tubing, plastic sheeting
OR:	Absorbent
IN:	
S:	

Section 4: Packaging Material and Waste Material Parameters	
Packaging Material:	**Estimated Weight (kg)**
Steel (ST):	27.8
Plastics (PP): Liner bag	1.0
Other: Cardboard Liner (CP)	4.4
Total Packaging Weight	33.2
Waste Material Parameter:	**Estimated Weight (kg)**
Iron-based Metal / Alloys (IM):	1.0
Aluminum-based Metals / Alloys (AM):	
Other Metals (OM):	
Other Inorganic Materials (OI)	1.0
Cellulosics (C):	21.8
Rubber (R):	
Plastics (waste materials) (XPM):	6.0
Organic Matrix (OR):	5.0
Inorganic Matrix (IN):	
Soils (S):	
Total WMP Weight:	34.8

CCP Radiography Data Sheet

Waste Container ID: X10C0402810G

Section 5: RTR Summary (Questions answered "Yes" will be explained in the Comment block, except for Question 1)	
Is there observable liquid?	☐ Yes ☒ No
Is there any observable liquid in internal containers, more than 60 milliliters or 3 percent by volume, whichever is greater?	☐ Yes ☒ No
Is the total volume of observable liquid in the outermost container GREATER than 1% of the container?	☐ Yes ☒ No
Is there observable liquid in payload containers with an EPA Hazardous Waste Number of U134?	☐ Yes ☒ No
Is there an indication of non-radionuclide pyrophoric materials, such as elemental potassium?	☐ Yes ☒ No
Is there an indication of hazardous wastes not occurring as co-contaminants with TRU mixed wastes (non-mixed hazardous wastes)?	☐ Yes ☒ No
Is there an indication of wastes incompatible with backfill, seal and panel closures materials, container and packaging materials, shipping container materials, or other wastes (i.e., waste does NOT match TRUCON Code[s])?	☐ Yes ☒ No
Is there an indication of wastes containing explosives or compressed gases?	☐ Yes ☒ No
Is there an indication of PCBs liquids?	☐ Yes ☒ No
Is there an indication of the waste exhibiting the characteristic of ignitability, corrosivity, or reactivity (EPA Hazardous Waste Numbers of D001, D002, or D003)?	☐ Yes ☒ No
Is the physical form of the waste inconsistent with the Waste Stream Description or the Waste Matrix Code?	☐ Yes ☒ No
CH or RH TRAMPAC	
Are there heat-sealed bags (unvented) GREATER than 4 liters and LESS than 390 square inches in the waste, or heat sealed bags not authorized in the RH TRUCON Code?	☐ Yes ☒ No
Were there Non-approved Closure Methods used on liner bags or inner bags greater than 4 liters?	☐ Yes ☒ No
Are there sealed containers GREATER than 4 liters?	☐ Yes ☒ No
Are there indications of inadequate protection for heavy and/or sharp objects?	☐ Yes ☒ No
Comments: N/A	

RTR Operator:

Eric Lyles		2/11/2016
Print Name	Signature	Date

CCP Radiography Data Sheet

Section 1: General Information	
[X] RTR Examination [ ] RTR Replicate Scan [ ] RTR Independent Observation	
Site ID:	ORNL
Batch Number:	OR-RTR6-0723
Examination Date:	2/11/2016
Waste Container ID:	X10C1300185A
Video/Audio Recorded Media Number:	OR-RTR6-0723 A&B
Procedure and Revision No.:	CCP-TP-053 Rev. 15
NCR(s) associated with the container? (e.g., Prohibited Items)	[X] No [ ] Yes NCR No.: N/A NCR No.: N/A

Section 2: Waste Container Data	
Container Type:	55 Gallon Drum
TRUCON Code:	OR 225
Waste Matrix Code:	S5400
Waste Stream I.D.:	OR-CHEM-CH-HET
Waste Container Weights:	Gross Wt.: 75.9 kg Tare Wt.: 33.2 kg Net Wt.: 42.7 kg
Rigid Liner and Liner Vent Description:	Liner: [X] No [ ] Yes Lid: [X] No [ ] Yes Type: [ ] 30-mil [ ] 90-mil [ ] 110-mil [ ] 125-mil Vented: [ ] No [ ] Yes [X] N/A Punctured: [X] No [ ] Yes Mechanical Vent: [X] No [ ] Yes Fiberboard Liner: [X] No [ ] Yes Lead Lined: [X] No [ ] Yes
Number of Layers of Confinement:	Appears to be 1 layer
Volume Utilization Percentage:	70 %

CCP Radiography Data Sheet

Waste Container ID: X10C1300185A

Section 3: Container Inventory and Comments (Detailed descriptions)	
IM:	Scrap metal, saw blade, hand tools, utility knife
AM:	
OM:	
OI:	Glass containers
C:	Cloth, coveralls
R:	
XPM:	Plastic sheeting, plastic tubing
OR:	
IN:	
S:	

Section 4: Packaging Material and Waste Material Parameters	
Packaging Material:	**Estimated Weight (kg)**
Steel (ST):	27.8
Plastics (PP): Liner bag	1.0
Other: Cardboard Liner (CP)	4.4
Total Packaging Weight	33.2
Waste Material Parameter:	**Estimated Weight (kg)**
Iron-based Metal / Alloys (IM):	3.0
Aluminum-based Metals / Alloys (AM):	
Other Metals (OM):	
Other Inorganic Materials (OI)	8.0
Cellulosics (C):	21.7
Rubber (R):	
Plastics (waste materials) (XPM):	10.0
Organic Matrix (OR):	
Inorganic Matrix (IN):	
Soils (S):	
Total WMP Weight:	42.7

CCP Radiography Data Sheet

Waste Container ID: X10C1300185A

Section 5: RTR Summary (Questions answered "Yes" will be explained in the Comment block, except for Question 1)	
Is there observable liquid?	☐ Yes ☒ No
Is there any observable liquid in internal containers, more than 60 milliliters or 3 percent by volume, whichever is greater?	☐ Yes ☒ No
Is the total volume of observable liquid in the outermost container GREATER than 1% of the container?	☐ Yes ☒ No
Is there observable liquid in payload containers with an EPA Hazardous Waste Number of U134?	☐ Yes ☒ No
Is there an indication of non-radionuclide pyrophoric materials, such as elemental potassium?	☐ Yes ☒ No
Is there an indication of hazardous wastes not occurring as co-contaminants with TRU mixed wastes (non-mixed hazardous wastes)?	☐ Yes ☒ No
Is there an indication of wastes incompatible with backfill, seal and panel closures materials, container and packaging materials, shipping container materials, or other wastes (i.e., waste does NOT match TRUCON Code[s])?	☐ Yes ☒ No
Is there an indication of wastes containing explosives or compressed gases?	☐ Yes ☒ No
Is there an indication of PCBs liquids?	☐ Yes ☒ No
Is there an indication of the waste exhibiting the characteristic of ignitability, corrosivity, or reactivity (EPA Hazardous Waste Numbers of D001, D002, or D003)?	☐ Yes ☒ No
Is the physical form of the waste inconsistent with the Waste Stream Description or the Waste Matrix Code?	☐ Yes ☒ No
CH or RH TRAMPAC	
Are there heat-sealed bags (unvented) GREATER than 4 liters and LESS than 390 square inches in the waste, or heat sealed bags not authorized in the RH TRUCON Code?	☐ Yes ☒ No
Were there Non-approved Closure Methods used on liner bags or inner bags greater than 4 liters?	☐ Yes ☒ No
Are there sealed containers GREATER than 4 liters?	☐ Yes ☒ No
Are there indications of inadequate protection for heavy and/or sharp objects?	☐ Yes ☒ No
Comments: N/A	

RTR Operator:

Eric Lyles		2/11/2016
Print Name	Signature	Date

CCP Radiography Data Sheet

Section 1: General Information	
[X] RTR Examination [ ] RTR Replicate Scan [ ] RTR Independent Observation	
Site ID:	ORNL
Batch Number:	OR-RTR6-0723
Examination Date:	2/11/2016
Waste Container ID:	X10C0402810J
Video/Audio Recorded Media Number:	OR-RTR6-0723 A&B
Procedure and Revision No.:	CCP-TP-053 Rev. 15
NCR(s) associated with the container? (e.g., Prohibited Items)	[X] No [ ] Yes NCR No.: N/A NCR No.: N/A

Section 2: Waste Container Data	
Container Type:	55 Gallon Drum
TRUCON Code:	OR 225
Waste Matrix Code:	S5400
Waste Stream I.D.:	OR-CHEM-CH-HET
Waste Container Weights:	Gross Wt.: 68.4 kg Tare Wt.: 33.2 kg Net Wt.: 35.2 kg
Rigid Liner and Liner Vent Description:	Liner: [X] No [ ] Yes Lid: [X] No [ ] Yes Type: [ ] 30-mil [ ] 90-mil [ ] 110-mil [ ] 125-mil Vented: [ ] No [ ] Yes [X] N/A Punctured: [X] No [ ] Yes Mechanical Vent: [X] No [ ] Yes Fiberboard Liner: [X] No [ ] Yes Lead Lined: [X] No [ ] Yes
Number of Layers of Confinement:	Appears to be 1 layer
Volume Utilization Percentage:	90 %

CCP Radiography Data Sheet

Waste Container ID: X10C0402810J

Section 3: Container Inventory and Comments (Detailed descriptions)	
IM:	Scrap metal, electrical equipment
AM:	
OM:	
OI:	Broken glass
C:	Cloth, coveralls, cardboard
R:	
XPM:	Plastic sheeting, plastic tubing
OR:	Absorbent
IN:	
S:	

Section 4: Packaging Material and Waste Material Parameters	
Packaging Material:	**Estimated Weight (kg)**
Steel (ST):	27.8
Plastics (PP): Liner bag	1.0
Other: Cardboard Liner (CP)	4.4
Total Packaging Weight	33.2
Waste Material Parameter:	**Estimated Weight (kg)**
Iron-based Metal / Alloys (IM):	4.0
Aluminum-based Metals / Alloys (AM):	
Other Metals (OM):	
Other Inorganic Materials (OI)	1.0
Cellulosics (C):	19.2
Rubber (R):	
Plastics (waste materials) (XPM):	8.0
Organic Matrix (OR):	3.0
Inorganic Matrix (IN):	
Soils (S):	
Total WMP Weight:	35.2

CCP Radiography Data Sheet

Waste Container ID: X10C0402810J

Section 5: RTR Summary (Questions answered "Yes" will be explained in the Comment block, except for Question 1)	
Is there observable liquid?	☐ Yes ☒ No
Is there any observable liquid in internal containers, more than 60 milliliters or 3 percent by volume, whichever is greater?	☐ Yes ☒ No
Is the total volume of observable liquid in the outermost container GREATER than 1% of the container?	☐ Yes ☒ No
Is there observable liquid in payload containers with an EPA Hazardous Waste Number of U134?	☐ Yes ☒ No
Is there an indication of non-radionuclide pyrophoric materials, such as elemental potassium?	☐ Yes ☒ No
Is there an indication of hazardous wastes not occurring as co-contaminants with TRU mixed wastes (non-mixed hazardous wastes)?	☐ Yes ☒ No
Is there an indication of wastes incompatible with backfill, seal and panel closures materials, container and packaging materials, shipping container materials, or other wastes (i.e., waste does NOT match TRUCON Code[s])?	☐ Yes ☒ No
Is there an indication of wastes containing explosives or compressed gases?	☐ Yes ☒ No
Is there an indication of PCBs liquids?	☐ Yes ☒ No
Is there an indication of the waste exhibiting the characteristic of ignitability, corrosivity, or reactivity (EPA Hazardous Waste Numbers of D001, D002, or D003)?	☐ Yes ☒ No
Is the physical form of the waste inconsistent with the Waste Stream Description or the Waste Matrix Code?	☐ Yes ☒ No
CH or RH TRAMPAC	
Are there heat-sealed bags (unvented) GREATER than 4 liters and LESS than 390 square inches in the waste, or heat sealed bags not authorized in the RH TRUCON Code?	☐ Yes ☒ No
Were there Non-approved Closure Methods used on liner bags or inner bags greater than 4 liters?	☐ Yes ☒ No
Are there sealed containers GREATER than 4 liters?	☐ Yes ☒ No
Are there indications of inadequate protection for heavy and/or sharp objects?	☐ Yes ☒ No
Comments: N/A	

RTR Operator:

Eric Lyles		2/11/2016
Print Name	Signature	Date

CCP Radiography Data Sheet

Section 1: General Information		
[X] RTR Examination	[ ] RTR Replicate Scan	[ ] RTR Independent Observation
Site ID:	ORNL	
Batch Number:	OR-RTR6-0723	
Examination Date:	2/11/2016	
Waste Container ID:	X10C1001133	
Video/Audio Recorded Media Number:	OR-RTR6-0723	A&B
Procedure and Revision No.:	CCP-TP-053	Rev. 15
NCR(s) associated with the container? (e.g., Prohibited Items)	[X] No [ ] Yes NCR No.: N/A NCR No.: N/A	

Section 2: Waste Container Data	
Container Type:	55 Gallon Drum
TRUCON Code:	OR 225
Waste Matrix Code:	S5400
Waste Stream I.D.:	OR-CHEM-CH-HET
Waste Container Weights:	Gross Wt.: 45.0 kg Tare Wt.: 28.8 kg Net Wt.: 16.2 kg
Rigid Liner and Liner Vent Description:	Liner: [X] No [ ] Yes Lid: [X] No [ ] Yes Type: [ ] 30-mil [ ] 90-mil [ ] 110-mil [ ] 125-mil Vented: [ ] No [ ] Yes [X] N/A Punctured: [X] No [ ] Yes Mechanical Vent: [X] No [ ] Yes Fiberboard Liner: [X] No [ ] Yes Lead Lined: [X] No [ ] Yes
Number of Layers of Confinement:	Appears to be 1 layer
Volume Utilization Percentage:	90 %

CCP Radiography Data Sheet

Waste Container ID: X10C1001133

Section 3: Container Inventory and Comments (Detailed descriptions)	
IM:	Open metal can, scrap metal
AM:	
OM:	
OI:	
C:	Cardboard, cloth, coveralls
R:	
XPM:	Plastic sheeting, plastic tubing
OR:	Absorbent
IN:	
S:	

Section 4: Packaging Material and Waste Material Parameters	
Packaging Material:	**Estimated Weight (kg)**
Steel (ST):	27.8
Plastics (PP): Liner bag	1.0
Other:	0.0
Total Packaging Weight	28.8
Waste Material Parameter:	**Estimated Weight (kg)**
Iron-based Metal / Alloys (IM):	1.0
Aluminum-based Metals / Alloys (AM):	
Other Metals (OM):	
Other Inorganic Materials (OI)	
Cellulosics (C):*	5.0
Rubber (R):	
Plastics (waste materials) (XPM):	9.7
Organic Matrix (OR):	0.5
Inorganic Matrix (IN):	
Soils (S):	
Total WMP Weight:	16.2

CCP Radiography Data Sheet

Waste Container ID: X10C1001133

Section 5: RTR Summary (Questions answered "Yes" will be explained in the Comment block, except for Question 1)	
Is there observable liquid?	☐ Yes ☒ No
Is there any observable liquid in internal containers, more than 60 milliliters or 3 percent by volume, whichever is greater?	☐ Yes ☒ No
Is the total volume of observable liquid in the outermost container GREATER than 1% of the container?	☐ Yes ☒ No
Is there observable liquid in payload containers with an EPA Hazardous Waste Number of U134?	☐ Yes ☒ No
Is there an indication of non-radionuclide pyrophoric materials, such as elemental potassium?	☐ Yes ☒ No
Is there an indication of hazardous wastes not occurring as co-contaminants with TRU mixed wastes (non-mixed hazardous wastes)?	☐ Yes ☒ No
Is there an indication of wastes incompatible with backfill, seal and panel closures materials, container and packaging materials, shipping container materials, or other wastes (i.e., waste does NOT match TRUCON Code[s])?	☐ Yes ☒ No
Is there an indication of wastes containing explosives or compressed gases?	☐ Yes ☒ No
Is there an indication of PCBs liquids?	☐ Yes ☒ No
Is there an indication of the waste exhibiting the characteristic of ignitability, corrosivity, or reactivity (EPA Hazardous Waste Numbers of D001, D002, or D003)?	☐ Yes ☒ No
Is the physical form of the waste inconsistent with the Waste Stream Description or the Waste Matrix Code?	☐ Yes ☒ No
CH or RH TRAMPAC	
Are there heat-sealed bags (unvented) GREATER than 4 liters and LESS than 390 square inches in the waste, or heat sealed bags not authorized in the RH TRUCON Code?	☐ Yes ☒ No
Were there Non-approved Closure Methods used on liner bags or inner bags greater than 4 liters?	☐ Yes ☒ No
Are there sealed containers GREATER than 4 liters?	☐ Yes ☒ No
Are there indications of inadequate protection for heavy and/or sharp objects?	☐ Yes ☒ No
Comments: N/A	

RTR Operator:

Eric Lyles		2/11/2016
Print Name	Signature	Date

CCP Radiography Data Sheet

Section 1: General Information	
[X] RTR Examination [ ] RTR Replicate Scan [ ] RTR Independent Observation	
Site ID:	ORNL
Batch Number:	OR-RTR6-0723
Examination Date:	2/11/2016
Waste Container ID:	X10C9400064A
Video/Audio Recorded Media Number:	OR-RTR6-0723 A&B
Procedure and Revision No.:	CCP-TP-053 Rev. 15
NCR(s) associated with the container? (e.g., Prohibited Items)	[X] No [ ] Yes NCR No.: N/A NCR No.: N/A

Section 2: Waste Container Data	
Container Type:	55 Gallon Drum
TRUCON Code:	OR 225
Waste Matrix Code:	S5400
Waste Stream I.D.:	OR-CHEM-CH-HET
Waste Container Weights:	Gross Wt.: 57.3 kg Tare Wt.: 33.2 kg Net Wt.: 24.1 kg
Rigid Liner and Liner Vent Description:	Liner: [X] No [ ] Yes Lid: [X] No [ ] Yes Type: [ ] 30-mil [ ] 90-mil [ ] 110-mil [ ] 125-mil Vented: [ ] No [ ] Yes [X] N/A Punctured: [X] No [ ] Yes Mechanical Vent: [X] No [ ] Yes Fiberboard Liner: [X] No [ ] Yes Lead Lined: [X] No [ ] Yes
Number of Layers of Confinement:	Appears to be 1 layer
Volume Utilization Percentage:	85 %

CCP Radiography Data Sheet

Waste Container ID: X10C9400064A

Section 3: Container Inventory and Comments (Detailed descriptions)	
IM:	Bolt, scrap metal, utility knives
AM:	
OM:	
OI:	Glass containers, light bulb, broken glass
C:	
R:	Rubber hoses
XPM:	Vacuum cleaner, plastic sheeting, plastic containers, plastic caps
OR:	
IN:	
S:	

Section 4: Packaging Material and Waste Material Parameters	
Packaging Material:	**Estimated Weight (kg)**
Steel (ST):	27.8
Plastics (PP): Liner bag	1.0
Other: Cardboard Liner (CP)	4.4
Total Packaging Weight	33.2
Waste Material Parameter:	**Estimated Weight (kg)**
Iron-based Metal / Alloys (IM):	2.0
Aluminum-based Metals / Alloys (AM):	
Other Metals (OM):	
Other Inorganic Materials (OI)	12.0
Cellulosics (C):	
Rubber (R):	1.0
Plastics (waste materials) (XPM):	9.1
Organic Matrix (OR):	
Inorganic Matrix (IN):	
Soils (S):	
Total WMP Weight:	24.1

CCP Radiography Data Sheet

Waste Container ID: X10C9400064A

Section 5: RTR Summary (Questions answered "Yes" will be explained in the Comment block, except for Question 1)	
Is there observable liquid?	☐ Yes ☒ No
Is there any observable liquid in internal containers, more than 60 milliliters or 3 percent by volume, whichever is greater?	☐ Yes ☒ No
Is the total volume of observable liquid in the outermost container GREATER than 1% of the container?	☐ Yes ☒ No
Is there observable liquid in payload containers with an EPA Hazardous Waste Number of U134?	☐ Yes ☒ No
Is there an indication of non-radionuclide pyrophoric materials, such as elemental potassium?	☐ Yes ☒ No
Is there an indication of hazardous wastes not occurring as co-contaminants with TRU mixed wastes (non-mixed hazardous wastes)?	☐ Yes ☒ No
Is there an indication of wastes incompatible with backfill, seal and panel closures materials, container and packaging materials, shipping container materials, or other wastes (i.e., waste does NOT match TRUCON Code[s])?	☐ Yes ☒ No
Is there an indication of wastes containing explosives or compressed gases?	☐ Yes ☒ No
Is there an indication of PCBs liquids?	☐ Yes ☒ No
Is there an indication of the waste exhibiting the characteristic of ignitability, corrosivity, or reactivity (EPA Hazardous Waste Numbers of D001, D002, or D003)?	☐ Yes ☒ No
Is the physical form of the waste inconsistent with the Waste Stream Description or the Waste Matrix Code?	☐ Yes ☒ No
CH or RH TRAMPAC	
Are there heat-sealed bags (unvented) GREATER than 4 liters and LESS than 390 square inches in the waste, or heat sealed bags not authorized in the RH TRUCON Code?	☐ Yes ☒ No
Were there Non-approved Closure Methods used on liner bags or inner bags greater than 4 liters?	☐ Yes ☒ No
Are there sealed containers GREATER than 4 liters?	☐ Yes ☒ No
Are there indications of inadequate protection for heavy and/or sharp objects?	☐ Yes ☒ No
Comments: N/A	

RTR Operator:

Eric Lyles		2/11/2016
Print Name	Signature	Date

CCP Radiography Data Sheet

Section 1: General Information	
[X] RTR Examination [ ] RTR Replicate Scan [ ] RTR Independent Observation	
Site ID:	ORNL
Batch Number:	OR-RTR6-0723
Examination Date:	2/11/2016
Waste Container ID:	X10C1300184
Video/Audio Recorded Media Number:	OR-RTR6-0723 A&B
Procedure and Revision No.:	CCP-TP-053 Rev. 15
NCR(s) associated with the container? (e.g., Prohibited Items)	[X] No [ ] Yes NCR No.: N/A NCR No.: N/A

Section 2: Waste Container Data	
Container Type:	55 Gallon Drum
TRUCON Code:	OR 225
Waste Matrix Code:	S5400
Waste Stream I.D.:	OR-CHEM-CH-HET
Waste Container Weights:	Gross Wt.: 57.2 kg Tare Wt.: 28.8 kg Net Wt.: 28.4 kg
Rigid Liner and Liner Vent Description:	Liner: [X] No [ ] Yes Lid: [X] No [ ] Yes Type: [ ] 30-mil [ ] 90-mil [ ] 110-mil [ ] 125-mil Vented: [ ] No [ ] Yes [X] N/A Punctured: [X] No [ ] Yes Mechanical Vent: [X] No [ ] Yes Fiberboard Liner: [X] No [ ] Yes Lead Lined: [X] No [ ] Yes
Number of Layers of Confinement:	Appears to be 1 layer
Volume Utilization Percentage:	90 %

CCP Radiography Data Sheet

Waste Container ID: X10C1300184

Section 3: Container Inventory and Comments (Detailed descriptions)
IM: Scrap metal, electrical equipment
AM:
OM:
OI:
C: Cloth
R:
XPM: Plastic tubing, plastic containers, plastic caps
OR: Absorbent
IN:
S:

Section 4: Packaging Material and Waste Material Parameters	
Packaging Material:	**Estimated Weight (kg)**
Steel (ST):	27.8
Plastics (PP): Liner bag	1.0
Other:	0.0
Total Packaging Weight	28.8
Waste Material Parameter:	**Estimated Weight (kg)**
Iron-based Metal / Alloys (IM):	10.0
Aluminum-based Metals / Alloys (AM):	
Other Metals (OM):	
Other Inorganic Materials (OI)	
Cellulosics (C):	5.0
Rubber (R):	
Plastics (waste materials) (XPM):	13.0
Organic Matrix (OR):	0.4
Inorganic Matrix (IN):	
Soils (S):	
Total WMP Weight:	28.4

CCP Radiography Data Sheet

Waste Container ID: X10C1300184

Section 5: RTR Summary (Questions answered "Yes" will be explained in the Comment block, except for Question 1)	
Is there observable liquid?	☐ Yes ☒ No
Is there any observable liquid in internal containers, more than 60 milliliters or 3 percent by volume, whichever is greater?	☐ Yes ☒ No
Is the total volume of observable liquid in the outermost container GREATER than 1% of the container?	☐ Yes ☒ No
Is there observable liquid in payload containers with an EPA Hazardous Waste Number of U134?	☐ Yes ☒ No
Is there an indication of non-radionuclide pyrophoric materials, such as elemental potassium?	☐ Yes ☒ No
Is there an indication of hazardous wastes not occurring as co-contaminants with TRU mixed wastes (non-mixed hazardous wastes)?	☐ Yes ☒ No
Is there an indication of wastes incompatible with backfill, seal and panel closures materials, container and packaging materials, shipping container materials, or other wastes (i.e., waste does NOT match TRUCON Code[s])?	☐ Yes ☒ No
Is there an indication of wastes containing explosives or compressed gases?	☐ Yes ☒ No
Is there an indication of PCBs liquids?	☐ Yes ☒ No
Is there an indication of the waste exhibiting the characteristic of ignitability, corrosivity, or reactivity (EPA Hazardous Waste Numbers of D001, D002, or D003)?	☐ Yes ☒ No
Is the physical form of the waste inconsistent with the Waste Stream Description or the Waste Matrix Code?	☐ Yes ☒ No
CH or RH TRAMPAC	
Are there heat-sealed bags (unvented) GREATER than 4 liters and LESS than 390 square inches in the waste, or heat sealed bags not authorized in the RH TRUCON Code?	☐ Yes ☒ No
Were there Non-approved Closure Methods used on liner bags or inner bags greater than 4 liters?	☐ Yes ☒ No
Are there sealed containers GREATER than 4 liters?	☐ Yes ☒ No
Are there indications of inadequate protection for heavy and/or sharp objects?	☐ Yes ☒ No
Comments: N/A	

RTR Operator:

Eric Lyles		2/11/2016
Print Name	Signature	Date

Attachment 3 – CCP Radiography Independent Technical Reviewer Checklist

Batch Data Report No.: OR-RTR6-0723

Description			
1.	Were data generation and reduction conducted in a technically correct manner in accordance with the methods used?	☐ NO	☑ YES
2.	Was the correct revision of the procedure used? Procedure: CCP-TP-053 Rev.: 15	☐ NO	☑ YES
3.	Are the WMPs entered correctly?	☐ NO	☑ YES
4.	Do the estimated weights in Section 4 of Attachment 2 equal the container gross weight?	☐ NO	☑ YES
5.	Is the data reported in the proper units with the correct number of significant figures (e.g., one tenth of a kilogram)?	☐ NO	☑ YES
6.	Was transcription used? If no, proceed to question 7.	☑ NO	☐ YES
	6a. Has the data been verified for transcription errors?	☐ NO	☐ YES
7.	Does the Testing Batch Report include radiography for up to 20 containers?	☐ NO	☑ YES
8.	Are BDR contents complete and do they match the CCP Waste RTR Batch Data Report Table of Contents?	☐ NO	☑ YES
9.	Is all the data signed and dated in reproducible ink and by the individual(s) generating it?	☐ NO	☑ YES
10.	Is all data recorded clearly, legibly, and accurately?	☐ NO	☑ YES
11.	Have changes been made to original data? If no, proceed to question 12.	☑ NO	☐ YES
	11a. Have all changes to original data been lined out, initialed and dated by the individual making the changes?	☐ NO	☐ YES
	11b. Was justification made for changing the original data?	☐ NO	☐ YES
	11c. Were data changes made by the individual who originally collected the data?	☐ NO	☐ YES
12.	Does the waste match the Waste Matrix Code and Waste Stream description?	☐ NO	☑ YES
13.	Are the RTR Operator's decisions regarding the Radiography documented?	☐ NO	☑ YES
14.	Is there an adequate written description of the contents of each item?	☐ NO	☑ YES
15.	Was the video/audio recording media properly prepared and labeled for each waste container?	☐ NO	☑ YES
16.	Was the video/audio recording media check performed satisfactorily and recorded on Attachment 1?	☐ NO	☑ YES

Attachment 3 – CCP Radiography Independent Technical Reviewer Checklist (Continued)

Batch Data Report No.: OR-RTR6-0723

Description		
17. Was the Image Test performed satisfactorily and recorded on Attachment 1?	☐ NO	☑ YES
18. Was the Replicate Scan performed and recorded on an Attachment 2?	☐ NO	☑ YES
19. Was the Replicate Scan RTR Operator different from the first RTR Operator?	☐ NO	☑ YES
20. Did the Replicate Scan RTR Operator and the first RTR Operator agree on the results?	☐ NO	☑ YES
21. Was the Independent Observation performed and recorded on an Attachment 2?	☐ NO	☑ YES
22. Was the Independent Observation RTR Operator different from the first RTR Operator?	☐ NO	☑ YES
23. Did the Independent Observation RTR Operator and the first RTR Operator agree on the results?	☐ NO	☑ YES
24. Was the data collection performed by qualified individuals?	☐ NO	☑ YES
25. Were NCRs initiated as required at DGL? If no, proceed to question 26.	☑ NO	☐ YES
25a. Have the NCR(s) associated with RTR been included in the BDR?	☐ NO	☐ YES
26. Is the RTR examination for CH waste? If no, proceed to question 27.	☐ NO	☑ YES
26a. Have the CH Quality Assurance Objectives (QAOs) been met (if applicable)? Precision – Precision is maintained by reconciling any discrepancies between two radiography operators with regard to identification of the waste matrix code, liquids in excess of TSDF-WAC limits, and compressed gases through independent replicate scans and independent observations. Additionally, the precision of radiography is verified prior to use by tuning precisely enough to demonstrate compliance with QAOs through viewing an image test pattern. Accuracy – Accuracy is obtained by using a target to tune the image for maximum sharpness and by requiring operators to successfully identify 100 percent of the items required to meet the DQOs for radiography specified in CCP-PO-001, Section C-4a(1) in a training container during their initial qualification and subsequent requalification. Completeness – A video and audio media recording of the radiography examination and a validated radiography data form will be obtained for 100 percent of the waste containers subject to radiography. All video and audio media recordings and radiography data forms will be subject to validation as indicated in CCP-PO-001, Section C3-4. Comparability – The comparability of radiography data from different operators shall be enhanced by using standardized radiography procedures and operator qualifications.	☐ NO	☑ YES

Attachment 3 – CCP Radiography Independent Technical Reviewer Checklist (Continued)

Batch Data Report No.: OR-RTR6-0723

Description		
27. Is the RTR examination for RH waste? If no, proceed to comment section.	☑ NO	☐ YES
27a. Have the RH QAOs been met (if applicable)? Precision – Precision is maintained by reconciling any discrepancies between two operators (during Independent Observation and Replicate scans) with regard to the identification of important waste characteristics (i.e., physical form of the waste and absence of prohibited liquids) within a single container. Accuracy – Accuracy is obtained by using a target to tune the image for maximum sharpness and by requiring operators to successfully identify prohibited liquid in a training container during their initial qualification and subsequent requalification. Representativeness – All of the relevant contents in a container selected for radiography will be described. Completeness – All of the relevant waste information must be assembled and must show that each of the containers in the waste stream belongs to the waste stream. This information must be documented on videotape or other equivalent media and data form. Comparability – Comparability is ensured by meeting the program training requirements and complying with the minimum standards used to implement the radiography process.	☐ NO	☐ YES

Comments:
N/A

I have reviewed 100% of the container specific and batch data in this report and find it acceptable.

Independent Technical Reviewer:

AARON ELLIOTT — Printed Name

Signature

3/1/16 — Date

DIVIDER PAGE ONLY

Not part of page count

Attachment 2 – CCP Records Transmittal/Receiving Form

CCP Records / Records Custodian, 4021 National Parks Highway - MS: GSA 212, Carlsbad, New Mexico 88220

Telephone Number: 575-234-7523

Fax Number: 575-234-7033

Attn:	CCP RECORDS	From:	RANADA T BACA
Ship to:	4021 NATIONAL PARKS HWY	Site:	LANL
	CARLSBAD, NM 88220	Company:	TFE, INC
	GSA-212	Telephone Number:	505-667-0181
	N/A	Date Sent:	03-01-16
Telephone Number:	505-234-7523		

Document Number	Title / Description	Record Date	Total Pages
OR-RTR6-0723	NDE BACKUP DVD B	02-11-16	N/A
	N/A		

Comments

N/A

(When the Record accepted line has been completed, the rest of the page below may be left blank.)

Acceptance/Rejection Signature and Date

Records Accepted ☑ — Signature: [signature] — Printed Name: Jewell Hurrelde — Date: 3/7/16

Records Rejected ☐ — Signature: _____ — Printed Name: _____ — Date: _____

Reason for Rejection:

Re-submittal: Signature: _____ — Printed Name: _____ — Date: _____

```
**************************************
***         Send Results           ***
**************************************

   Sending is complete.

Job No.                    4449
Address                    915056656753
Name                       TERRI ANN
Start Time                 03/07 12:26 PM
Call Length                00'33
Sheets                     1
Result                     OK
```


Attachment 2 – CCP Records Transmittal/Receiving Form

CCP Records / Records Custodian, 4021 National Parks Highway - MS: GSA 212, Carlsbad, New Mexico 88220

Telephone Number: 575-234-7523

Fax Number: 575-234-7033

Attn:	CCP RECORDS	From:	RANADA T BACA
Ship to:	4021 NATIONAL PARKS HWY	Site:	LANL
	CARLSBAD, NM 88220	Company:	TFE, INC
	GSA-212	Telephone Number:	505-667-0181
	N/A	Date Sent:	03-01-16
Telephone Number:	505-234-7523		

Document Number	Title / Description	Record Date	Total Pages
OR-RTR6-0723	NDE BACKUP OVD B	02-11-16	N/A
	N/A		

Comments

N/A

(When the Record accepted line has been completed, the rest of the page below may be left blank.)
Acceptance/Rejection Signature and Date

Records Accepted ☑ Jewell Hurrelde 3/7/16

Signature | Printed Name | Date

Records Rejected ☐

Signature | Printed Name | Date

Reason for Rejection:

DIVIDER PAGE

Attachment 2 – CCP SPM Radiography Project Level Validation Checklist and Summary

BDR Number: OR-RTR6-0736				Examination Date(s): 03/14/2016
Description of Criteria Reviewed	Criteria Met? YES	NO	NA	Comments/Qualifiers
1. Is the completed, signed, and dated Independent Technical Reviewer Checklist included in the BDR, and the independent technical reviewer was not involved in the generation or recording of the data under review? **Reference Source: CCP-PO-001, C3-4**	X			
2. Does the BDR contain all items addressed in the BDR Table of Contents? **Reference Source: CCP-PO-001, C3-4**	X			
3. Does the BDR include a listing of all the container numbers in the batch? **Reference Source: CCP-PO-001, C3-4**	X			
4. List all containers that have met QAOs. **Reference Source: CCP-PO-001, C3-4**				Container Numbers: X10C0506526E X10C0506526I X10C0702204A X10C0801685C X10C0802044A X10C0802044B X10C0802044C X10C0802044D X10C0802044E X10C0802044F X10C0802044G X10C0802044I
5. Does the BDR identify the current implementing procedure and revision number? **Reference Source: CCP-PO-001, Table C3-3**	X			
6. Is there a reference to or copy of any associated NCRs (if any) in the BDR? NA if no NCRs. **Reference Source: CCP-PO-001, Table C3-3**			X	
7. Are there 20 or fewer containers in the batch? **Reference Source: CCP-PO-001, C3-4**	X			
8. Are the data properly reported (i.e., data are reported in correct units and with correct significant figures)? **Reference Source: CCP-PO-001, C3-4**	X			
9. Is there evidence of verification that the physical form matches the Waste Matrix Code? **Reference Source: CCP-PO-001, Table C3-3**	X			

COPY

CCP RECORDS ORIGINAL
DATE REC'D 3/31/2016 JY

Attachment 2 – CCP SPM Radiography Project Level Validation Checklist and Summary (Continued)

BDR Number: OR-RTR6-0736 **Examination Date(s):** 03/14/2016

Description of Criteria Reviewed	Criteria Met? YES	NO	NA	Comments/Qualifiers
10. Is there evidence of verification that the physical form matches the waste stream description? **Reference Source: CCP-PO-001, Table C3-3**	X			
11. Are prohibited items absent? **Reference Source: CCP-PO-001, Table C3-3**	X			
12. Does observable liquid, if present, meet the criteria of the TSDF-WAC? **Reference Source: CCP-PO-001, C-1**	X RW 4/20/16		~~X~~ RW 4/20/16	~~No Observable Liquids~~ X10C0802044B RW 4/20/16
13. Were discrepancies between two operators with regard to identification of waste matrix code, liquids in excess of the TSDF-WAC, or compressed gases through replicate scans and independent observations reconciled? NA if no discrepancies. **Reference Source: CCP-PO-001, C3-2**			X	
14. Are the training qualifications for all radiography personnel acceptable? **Reference Source: CCP-PO-001, C3-8**	X			
15. Was evidence of the video/audio check included in the BDR? **Reference Source: CCP-PO-001, C1-1**	X			
16. Was the Lines-Pair Resolution Test or Sieve Test Check included in the BDR? **Reference Source: CCP Technical Procedures**	X			
17. Was a replicate scan performed once per day, or once per batch, whichever is LESS frequent? **Reference Source: CCP-PO-001, C1-1**	X			
18. Was an independent observation performed once per day, or once per batch, whichever is LESS frequent? **Reference Source: CCP-PO-001, C1-1**	X			

Attachment 2 – CCP SPM Radiography Project Level Validation Checklist and Summary (Continued)

BDR Number: OR-RTR6-0736 **Examination Date(s):** 03/14/2016

Description of Criteria Reviewed	Criteria Met? YES	NO	NA	Comments/Qualifiers
19. Were the replicate scan and independent observation performed on different waste containers? **Reference Source: CCP-PO-001, C1-1**	X			
20. Were the personnel performing the replicate scan and independent observation different from the individual who performed the original? **Reference Source: CCP-PO-001, C1-1**	X			
21. Does the BDR include an estimate of each material parameter weight in kg for each container? **Reference Source: CCP Technical Procedures**	X			
22. Does the BDR include a description of each material parameter for each container? **Reference Source: CCP Technical Procedures**	X			
23. Is the container gross weight recorded in kilograms (kg) for each container in the BDR? **Reference Source: CCP Technical Procedures**	X			
24. Was the Scale Weight Calibration Check included in the BDR? **Reference Source: CCP Technical Procedures**			X	Scale not used.
25. Was the Scale Weight Check included in the BDR? **Reference Source: CCP Technical Procedures**			X	Scale not used.

Comments: N/A

The container QC checks were properly performed and meet the Quality Assurance Objectives (QAOs). Proper procedures were followed during data reduction and analysis. The batch is complete, acceptable, and includes all supporting data and documentation required by the QAPjP.

Roger Whiteaker	Roger Whiteaker	03/31/2016
SPM Printed Name	Signature	Date

Checklist is to be re-signed only when a re-review is performed.

ROGER WHITEAKER	Roger Whiteaker	CORRECTIONS	4/20/2016
SPM Printed Name	Signature	Reason	Date
SPM Printed Name	Signature	Reason	Date

Attachment 5–CCP Radiography Batch Data Report Cover Sheet

Site ID: ORNL

Batch Data Report No.: OR-RTR6-0736 ☑ CH ☐ RH Date: 3-14-16

Waste Container ID Numbers	
Replicate Scan:	X10C0506526E
Independent Observation:	X10C0702204A
1	X10C0801685C
2	X10C0702204A
3	X10C0802044G
4	X10C0802044A
5	X10C0802044C
6	X10C0802044B
7	X10C0802044E
8	X10C0802044D
9	X10C0506526E
10	X10C0506526I
11	X10C0802044F
12	X10C0802044I
13	N/A
14	N/A
15	N/A
16	N/A
17	N/A
18	N/A
19	N/A
20	N/A

RTR Operator:

Eric Lyles — Printed Name | Signature | 3-14-16 — Date

Independent Technical Reviewer:

Kenneth Simpson — Printed Name | Signature | 3-23-2016 — Date

CCP RECORDS ORIGINAL
DATE REC'D 3/23/16

Attachment 4 – CCP Radiography Batch Data Report Table of Contents and Batch Narrative

Batch Data Report No.: OR-RTR6-0736 Date: 3-14-16

Table Of Contents		
Item	Description	Page No.
1	CCP Radiography Batch Data Report Cover Sheet	1
2	CCP Radiography Batch Data Report Table Of Contents	2
3	CCP RTR Measurement Control Report	3
4	CCP Radiography Data Sheets	4
5	Copy of NCRs (NA, If Not Applicable)	N/A
6	CCP Independent Technical Reviewer Checklist	46

Batch Narrative
All Quality Checks were performed and recorded on CCP-TP-053, Rev.15, CCP Radiography Measurement Control Report.

Eric Lyles — RTR Operator

Signature

3-14-16 — Date

Attachment 1 – CCP RTR Measurement Control Report

Site ID: ORNL		
Batch Data Report No.: OR-RTR6-0736		
Examination Date: 3-14-16		
Control Checks		
Video/Audio Recorded Media System Check	☑ SAT	☐ UNSAT
Image Test : 10 Lines (Minimum acceptable is 5 lines-pair/cm or #6 Sieve is viewable)	☑ SAT	☐ UNSAT
Comments: N/A		
RTR Operator:		
Eric Lyles	[signature]	3-14-16
Printed Name	Signature	Date

CCP Radiography Data Sheet

Section 1: General Information	
[ ] RTR Examination [X] RTR Replicate Scan [ ] RTR Independent Observation	
Site ID:	ORNL
Batch Number:	OR-RTR6-0736
Examination Date:	3/14/2016
Waste Container ID:	X10C0506526E
Video/Audio Recorded Media Number:	OR-RTR6-0736 A&B
Procedure and Revision No.:	CCP-TP-053 Rev. 15
NCR(s) associated with the container? (e.g., Prohibited Items)	[X] No [ ] Yes NCR No.: N/A NCR No.: N/A

Section 2: Waste Container Data	
Container Type:	55 Gallon Drum
TRUCON Code:	OR 225
Waste Matrix Code:	S5400
Waste Stream I.D.:	OR-REDC-CH-HET
Waste Container Weights:	Gross Wt.: 75.0 kg Tare Wt.: 33.2 kg Net Wt.: 41.8 kg
Rigid Liner and Liner Vent Description:	Liner: [X] No [ ] Yes Lid: [X] No [ ] Yes Type: [ ] 30-mil [ ] 90-mil [ ] 110-mil [ ] 125-mil Vented: [ ] No [ ] Yes [X] N/A Punctured: [X] No [ ] Yes Mechanical Vent: [X] No [ ] Yes Fiberboard Liner: [X] No [ ] Yes Lead Lined: [X] No [ ] Yes
Number of Layers of Confinement:	Appears to be 1 layer
Volume Utilization Percentage:	85 %

CCP Radiography Data Sheet

Waste Container ID: X10C0506526E

Section 3: Container Inventory and Comments	(Detailed descriptions)
IM:	Scrap metal, metal hardware
AM:	
OM:	
OI:	Absorbent
C:	Coveralls, tape roll
R:	
XPM:	Scrap plastic, plastic sheeting, plastic tubing with metal fittings, coax cable
OR:	
IN:	
S:	

Section 4: Packaging Material and Waste Material Parameters	
Packaging Material:	**Estimated Weight (kg)**
Steel (ST):	27.8
Plastics (PP): Liner bag	1.0
Other: Cardboard Liner (CP)	4.4
Total Packaging Weight	33.2
Waste Material Parameter:	**Estimated Weight (kg)**
Iron-based Metal / Alloys (IM):	25.3
Aluminum-based Metals / Alloys (AM):	
Other Metals (OM):	
Other Inorganic Materials (OI)	1.5
Cellulosics (C):	9.0
Rubber (R):	
Plastics (waste materials) (XPM):	6.0
Organic Matrix (OR):	
Inorganic Matrix (IN):	
Soils (S):	
Total WMP Weight:	41.8

CCP Radiography Data Sheet

Waste Container ID: X10C0506526E

Section 5: RTR Summary (Questions answered "Yes" will be explained in the Comment block, except for Question 1)	
Is there observable liquid?	☐ Yes ☒ No
Is there any observable liquid in internal containers, more than 60 milliliters or 3 percent by volume, whichever is greater?	☐ Yes ☒ No
Is the total volume of observable liquid in the outermost container GREATER than 1% of the container?	☐ Yes ☒ No
Is there observable liquid in payload containers with an EPA Hazardous Waste Number of U134?	☐ Yes ☒ No
Is there an indication of non-radionuclide pyrophoric materials, such as elemental potassium?	☐ Yes ☒ No
Is there an indication of hazardous wastes not occurring as co-contaminants with TRU mixed wastes (non-mixed hazardous wastes)?	☐ Yes ☒ No
Is there an indication of wastes incompatible with backfill, seal and panel closures materials, container and packaging materials, shipping container materials, or other wastes (i.e., waste does NOT match TRUCON Code[s])?	☐ Yes ☒ No
Is there an indication of wastes containing explosives or compressed gases?	☐ Yes ☒ No
Is there an indication of PCBs liquids?	☐ Yes ☒ No
Is there an indication of the waste exhibiting the characteristic of ignitability, corrosivity, or reactivity (EPA Hazardous Waste Numbers of D001, D002, or D003)?	☐ Yes ☒ No
Is the physical form of the waste inconsistent with the Waste Stream Description or the Waste Matrix Code?	☐ Yes ☒ No
CH or RH TRAMPAC	
Are there heat-sealed bags (unvented) GREATER than 4 liters and LESS than 390 square inches in the waste, or heat sealed bags not authorized in the RH TRUCON Code?	☐ Yes ☒ No
Were there Non-approved Closure Methods used on liner bags or inner bags greater than 4 liters?	☐ Yes ☒ No
Are there sealed containers GREATER than 4 liters?	☐ Yes ☒ No
Are there indications of inadequate protection for heavy and/or sharp objects?	☐ Yes ☒ No

Comments: This Replicate Scan Agrees with the Original Scan.

3-14-16

RTR Operator:

Fred Oney		3/14/2016
Print Name	Signature	Date

CCP Radiography Data Sheet

Section 1: General Information	
☐ RTR Examination ☐ RTR Replicate Scan ☒ RTR Independent Observation	
Site ID:	ORNL
Batch Number:	OR-RTR6-0736
Examination Date:	3/14/2016
Waste Container ID:	X10C0702204A
Video/Audio Recorded Media Number:	OR-RTR6-0736 A&B
Procedure and Revision No.:	CCP-TP-053 Rev. 15
NCR(s) associated with the container? (e.g., Prohibited Items)	☒ No ☐ Yes NCR No.: N/A NCR No.: N/A

Section 2: Waste Container Data	
Container Type:	55 Gallon Drum
TRUCON Code:	OR 225
Waste Matrix Code:	S5400
Waste Stream I.D.:	OR-REDC-CH-HET
Waste Container Weights:	Gross Wt.: 64.4 kg Tare Wt.: 33.2 kg Net Wt.: 31.2 kg
Rigid Liner and Liner Vent Description:	Liner: ☒ No ☐ Yes Lid: ☒ No ☐ Yes Type: ☐ 30-mil ☐ 90-mil ☐ 110-mil ☐ 125-mil Vented: ☐ No ☐ Yes ☒ N/A Punctured: ☒ No ☐ Yes Mechanical Vent: ☒ No ☐ Yes Fiberboard Liner: ☒ No ☐ Yes Lead Lined: ☒ No ☐ Yes
Number of Layers of Confinement:	Appears to be 1 layer
Volume Utilization Percentage:	90 %

CCP Radiography Data Sheet

Waste Container ID: X10C0702204A

Section 3: Container Inventory and Comments	(Detailed descriptions)
IM:	Scrap metal , metal fittings
AM:	Aluminum collars
OM:	
OI:	Absorbent
C:	
R:	
XPM:	Plastic sheeting, scrap plastic, manipulator boots
OR:	
IN:	
S:	

Section 4: Packaging Material and Waste Material Parameters	
Packaging Material:	**Estimated Weight (kg)**
Steel (ST):	27.8
Plastics (PP): Liner bag	1.0
Other: Cardboard Liner (CP)	4.4
Total Packaging Weight	33.2
Waste Material Parameter:	**Estimated Weight (kg)**
Iron-based Metal / Alloys (IM):	1.5
Aluminum-based Metals / Alloys (AM):	9.0
Other Metals (OM):	
Other Inorganic Materials (OI)	1.0
Cellulosics (C):	
Rubber (R):	
Plastics (waste materials) (XPM):	19.7
Organic Matrix (OR):	
Inorganic Matrix (IN):	
Soils (S):	
Total WMP Weight:	31.2

CCP Radiography Data Sheet

Waste Container ID: X10C0702204A

Section 5: RTR Summary (Questions answered "Yes" will be explained in the Comment block, except for Question 1)	
Is there observable liquid?	☐ Yes ☒ No
Is there any observable liquid in internal containers, more than 60 milliliters or 3 percent by volume, whichever is greater?	☐ Yes ☒ No
Is the total volume of observable liquid in the outermost container GREATER than 1% of the container?	☐ Yes ☒ No
Is there observable liquid in payload containers with an EPA Hazardous Waste Number of U134?	☐ Yes ☒ No
Is there an indication of non-radionuclide pyrophoric materials, such as elemental potassium?	☐ Yes ☒ No
Is there an indication of hazardous wastes not occurring as co-contaminants with TRU mixed wastes (non-mixed hazardous wastes)?	☐ Yes ☒ No
Is there an indication of wastes incompatible with backfill, seal and panel closures materials, container and packaging materials, shipping container materials, or other wastes (i.e., waste does NOT match TRUCON Code[s])?	☐ Yes ☒ No
Is there an indication of wastes containing explosives or compressed gases?	☐ Yes ☒ No
Is there an indication of PCBs liquids?	☐ Yes ☒ No
Is there an indication of the waste exhibiting the characteristic of ignitability, corrosivity, or reactivity (EPA Hazardous Waste Numbers of D001, D002, or D003)?	☐ Yes ☒ No
Is the physical form of the waste inconsistent with the Waste Stream Description or the Waste Matrix Code?	☐ Yes ☒ No
CH or RH TRAMPAC	
Are there heat-sealed bags (unvented) GREATER than 4 liters and LESS than 390 square inches in the waste, or heat sealed bags not authorized in the RH TRUCON Code?	☐ Yes ☒ No
Were there Non-approved Closure Methods used on liner bags or inner bags greater than 4 liters?	☐ Yes ☒ No
Are there sealed containers GREATER than 4 liters?	☐ Yes ☒ No
Are there indications of inadequate protection for heavy and/or sharp objects?	☐ Yes ☒ No

Comments: THIS INDEPENDENT OBSERVATION AGREES WITH THE ORIGNAL SCAN.

FO

3-14-16

RTR Operator:

Fred Oney		3/14/2016
Print Name	Signature	Date

CCP Radiography Data Sheet

Section 1: General Information	
[X] RTR Examination [ ] RTR Replicate Scan [ ] RTR Independent Observation	
Site ID:	ORNL
Batch Number:	OR-RTR6-0736
Examination Date:	3/14/2016
Waste Container ID:	X10C0801685C
Video/Audio Recorded Media Number:	OR-RTR6-0736 A&B
Procedure and Revision No.:	CCP-TP-053 Rev. 15
NCR(s) associated with the container? (e.g., Prohibited Items)	[X] No [ ] Yes NCR No.: N/A NCR No.: N/A

Section 2: Waste Container Data	
Container Type:	55 Gallon Drum
TRUCON Code:	OR 225
Waste Matrix Code:	S5400
Waste Stream I.D.:	OR-REDC-CH-HET
Waste Container Weights:	Gross Wt.: 52.0 kg Tare Wt.: 33.2 kg Net Wt.: 18.8 kg
Rigid Liner and Liner Vent Description:	Liner: [X] No [ ] Yes Lid: [X] No [ ] Yes Type: [ ] 30-mil [ ] 90-mil [ ] 110-mil [ ] 125-mil Vented: [ ] No [ ] Yes [X] N/A Punctured: [X] No [ ] Yes Mechanical Vent: [X] No [ ] Yes Fiberboard Liner: [X] No [ ] Yes Lead Lined: [X] No [ ] Yes
Number of Layers of Confinement:	Appears to be 1 layer
Volume Utilization Percentage:	80 %

CCP Radiography Data Sheet

Waste Container ID: X10C0801685C

Section 3: Container Inventory and Comments (Detailed descriptions)	
IM:	Utility knife, scrap metal
AM:	
OM:	
OI:	Absorbent
C:	Tape roll, cloth
R:	
XPM:	Plastic sheeting
OR:	
IN:	
S:	

Section 4: Packaging Material and Waste Material Parameters	
Packaging Material:	**Estimated Weight (kg)**
Steel (ST):	27.8
Plastics (PP): Liner bag	1.0
Other: Cardboard Liner (CP)	4.4
Total Packaging Weight	33.2
Waste Material Parameter:	**Estimated Weight (kg)**
Iron-based Metal / Alloys (IM):	1.0
Aluminum-based Metals / Alloys (AM):	
Other Metals (OM):	
Other Inorganic Materials (OI)	2.0
Cellulosics (C):	6.0
Rubber (R):	
Plastics (waste materials) (XPM):	9.8
Organic Matrix (OR):	
Inorganic Matrix (IN):	
Soils (S):	
Total WMP Weight:	18.8

CCP Radiography Data Sheet

Waste Container ID: X10C0801685C

Section 5: RTR Summary (Questions answered "Yes" will be explained in the Comment block, except for Question 1)	
Is there observable liquid?	☐ Yes ☒ No
Is there any observable liquid in internal containers, more than 60 milliliters or 3 percent by volume, whichever is greater?	☐ Yes ☒ No
Is the total volume of observable liquid in the outermost container GREATER than 1% of the container?	☐ Yes ☒ No
Is there observable liquid in payload containers with an EPA Hazardous Waste Number of U134?	☐ Yes ☒ No
Is there an indication of non-radionuclide pyrophoric materials, such as elemental potassium?	☐ Yes ☒ No
Is there an indication of hazardous wastes not occurring as co-contaminants with TRU mixed wastes (non-mixed hazardous wastes)?	☐ Yes ☒ No
Is there an indication of wastes incompatible with backfill, seal and panel closures materials; container and packaging materials, shipping container materials, or other wastes (i.e., waste does NOT match TRUCON Code[s])?	☐ Yes ☒ No
Is there an indication of wastes containing explosives or compressed gases?	☐ Yes ☒ No
Is there an indication of PCBs liquids?	☐ Yes ☒ No
Is there an indication of the waste exhibiting the characteristic of ignitability, corrosivity, or reactivity (EPA Hazardous Waste Numbers of D001, D002, or D003)?	☐ Yes ☒ No
Is the physical form of the waste inconsistent with the Waste Stream Description or the Waste Matrix Code?	☐ Yes ☒ No
CH or RH TRAMPAC	
Are there heat-sealed bags (unvented) GREATER than 4 liters and LESS than 390 square inches in the waste, or heat sealed bags not authorized in the RH TRUCON Code?	☐ Yes ☒ No
Were there Non-approved Closure Methods used on liner bags or inner bags greater than 4 liters?	☐ Yes ☒ No
Are there sealed containers GREATER than 4 liters?	☐ Yes ☒ No
Are there indications of inadequate protection for heavy and/or sharp objects?	☐ Yes ☒ No
Comments: N/A	

RTR Operator:

Eric Lyles		3/14/2016
Print Name	Signature	Date

CCP Radiography Data Sheet

Section 1: General Information	
[X] RTR Examination [ ] RTR Replicate Scan [ ] RTR Independent Observation	
Site ID:	ORNL
Batch Number:	OR-RTR6-0736
Examination Date:	3/14/2016
Waste Container ID:	X10C0702204A
Video/Audio Recorded Media Number:	OR-RTR6-0736 A&B
Procedure and Revision No.:	CCP-TP-053 Rev. 15
NCR(s) associated with the container? (e.g., Prohibited Items)	[X] No [ ] Yes NCR No.: N/A NCR No.: N/A

Section 2: Waste Container Data	
Container Type:	55 Gallon Drum
TRUCON Code:	OR 225
Waste Matrix Code:	S5400
Waste Stream I.D.:	OR-REDC-CH-HET
Waste Container Weights:	Gross Wt.: 64.4 kg Tare Wt.: 33.2 kg Net Wt.: 31.2 kg
Rigid Liner and Liner Vent Description:	Liner: [X] No [ ] Yes Lid: [X] No [ ] Yes Type: [ ] 30-mil [ ] 90-mil [ ] 110-mil [ ] 125-mil Vented: [ ] No [ ] Yes [X] N/A Punctured: [X] No [ ] Yes Mechanical Vent: [X] No [ ] Yes Fiberboard Liner: [X] No [ ] Yes Lead Lined: [X] No [ ] Yes
Number of Layers of Confinement:	Appears to be 1 layer
Volume Utilization Percentage:	90 %

CCP Radiography Data Sheet

Waste Container ID: X10C0702204A

Section 3: Container Inventory and Comments	(Detailed descriptions)
IM:	Scrap metal
AM:	Aluminum collars
OM:	
OI:	Absorbent
C:	
R:	
XPM:	Plastic sheeting, manipulator boots
OR:	
IN:	
S:	

Section 4: Packaging Material and Waste Material Parameters	
Packaging Material:	**Estimated Weight (kg)**
Steel (ST):	27.8
Plastics (PP): Liner bag	1.0
Other: Cardboard Liner (CP)	4.4
Total Packaging Weight	33.2
Waste Material Parameter:	**Estimated Weight (kg)**
Iron-based Metal / Alloys (IM):	0.5
Aluminum-based Metals / Alloys (AM):	10.0
Other Metals (OM):	
Other Inorganic Materials (OI)	0.5
Cellulosics (C):	
Rubber (R):	
Plastics (waste materials) (XPM):	20.2
Organic Matrix (OR):	
Inorganic Matrix (IN):	
Soils (S):	
Total WMP Weight:	31.2

CCP Radiography Data Sheet

Waste Container ID: X10C0702204A

Section 5: RTR Summary (Questions answered "Yes" will be explained in the Comment block, except for Question 1)	
Is there observable liquid?	☐ Yes ☒ No
Is there any observable liquid in internal containers, more than 60 milliliters or 3 percent by volume, whichever is greater?	☐ Yes ☒ No
Is the total volume of observable liquid in the outermost container GREATER than 1% of the container?	☐ Yes ☒ No
Is there observable liquid in payload containers with an EPA Hazardous Waste Number of U134?	☐ Yes ☒ No
Is there an indication of non-radionuclide pyrophoric materials, such as elemental potassium?	☐ Yes ☒ No
Is there an indication of hazardous wastes not occurring as co-contaminants with TRU mixed wastes (non-mixed hazardous wastes)?	☐ Yes ☒ No
Is there an indication of wastes incompatible with backfill, seal and panel closures materials, container and packaging materials, shipping container materials, or other wastes (i.e., waste does NOT match TRUCON Code[s])?	☐ Yes ☒ No
Is there an indication of wastes containing explosives or compressed gases?	☐ Yes ☒ No
Is there an indication of PCBs liquids?	☐ Yes ☒ No
Is there an indication of the waste exhibiting the characteristic of ignitability, corrosivity, or reactivity (EPA Hazardous Waste Numbers of D001, D002, or D003)?	☐ Yes ☒ No
Is the physical form of the waste inconsistent with the Waste Stream Description or the Waste Matrix Code?	☐ Yes ☒ No
CH or RH TRAMPAC	
Are there heat-sealed bags (unvented) GREATER than 4 liters and LESS than 390 square inches in the waste, or heat sealed bags not authorized in the RH TRUCON Code?	☐ Yes ☒ No
Were there Non-approved Closure Methods used on liner bags or inner bags greater than 4 liters?	☐ Yes ☒ No
Are there sealed containers GREATER than 4 liters?	☐ Yes ☒ No
Are there indications of inadequate protection for heavy and/or sharp objects?	☐ Yes ☒ No
Comments: N/A	

RTR Operator:

Eric Lyles		3/14/2016
Print Name	Signature	Date

CCP Radiography Data Sheet

CCP-TP-053 Attachment 2

Section 1: General Information	
[X] RTR Examination [ ] RTR Replicate Scan [ ] RTR Independent Observation	
Site ID:	ORNL
Batch Number:	OR-RTR6-0736
Examination Date:	3/14/2016
Waste Container ID:	X10C0802044G
Video/Audio Recorded Media Number:	OR-RTR6-0736 A&B
Procedure and Revision No.:	CCP-TP-053 Rev. 15
NCR(s) associated with the container? (e.g., Prohibited Items)	[X] No [ ] Yes NCR No.: N/A NCR No.: N/A

Section 2: Waste Container Data	
Container Type:	55 Gallon Drum
TRUCON Code:	OR 225
Waste Matrix Code:	S5400
Waste Stream I.D.:	OR-REDC-CH-HET
Waste Container Weights:	Gross Wt.: 69.3 kg Tare Wt.: 33.2 kg Net Wt.: 36.1 kg
Rigid Liner and Liner Vent Description:	Liner: [X] No [ ] Yes Lid: [X] No [ ] Yes Type: [ ] 30-mil [ ] 90-mil [ ] 110-mil [ ] 125-mil Vented: [ ] No [ ] Yes [X] N/A Punctured: [X] No [ ] Yes Mechanical Vent: [X] No [ ] Yes Fiberboard Liner: [X] No [ ] Yes Lead Lined: [X] No [ ] Yes
Number of Layers of Confinement:	Appears to be 1 layer
Volume Utilization Percentage:	90 %

CCP Radiography Data Sheet

Waste Container ID: X10C0802044G

Section 3: Container Inventory and Comments (Detailed descriptions)	
IM:	Saw blade, scrap metal, electrical equipment, power tool
AM:	Aluminum respirator filters
OM:	
OI:	Absorbent
C:	Cloth, coveralls, leather gloves
R:	Rubber gloves
XPM:	Plastic sheeting, plastic tubing, plastic tubing with metal fittings
OR:	
IN:	
S:	

Section 4: Packaging Material and Waste Material Parameters	
Packaging Material:	**Estimated Weight (kg)**
Steel (ST):	27.8
Plastics (PP): Liner bag	1.0
Other: Cardboard Liner (CP)	4.4
Total Packaging Weight	33.2
Waste Material Parameter:	**Estimated Weight (kg)**
Iron-based Metal / Alloys (IM):	16.0
Aluminum-based Metals / Alloys (AM):	0.4
Other Metals (OM):	
Other Inorganic Materials (OI)	1.0
Cellulosics (C):	7.0
Rubber (R):	0.5
Plastics (waste materials) (XPM):	11.2
Organic Matrix (OR):	
Inorganic Matrix (IN):	
Soils (S):	
Total WMP Weight:	36.1

CCP Radiography Data Sheet

Waste Container ID: X10C0802044G

Section 5: RTR Summary (Questions answered "Yes" will be explained in the Comment block, except for Question 1)	
Is there observable liquid?	☐ Yes ☒ No
Is there any observable liquid in internal containers, more than 60 milliliters or 3 percent by volume, whichever is greater?	☐ Yes ☒ No
Is the total volume of observable liquid in the outermost container GREATER than 1% of the container?	☐ Yes ☒ No
Is there observable liquid in payload containers with an EPA Hazardous Waste Number of U134?	☐ Yes ☒ No
Is there an indication of non-radionuclide pyrophoric materials, such as elemental potassium?	☐ Yes ☒ No
Is there an indication of hazardous wastes not occurring as co-contaminants with TRU mixed wastes (non-mixed hazardous wastes)?	☐ Yes ☒ No
Is there an indication of wastes incompatible with backfill, seal and panel closures materials, container and packaging materials, shipping container materials, or other wastes (i.e., waste does NOT match TRUCON Code[s])?	☐ Yes ☒ No
Is there an indication of wastes containing explosives or compressed gases?	☐ Yes ☒ No
Is there an indication of PCBs liquids?	☐ Yes ☒ No
Is there an indication of the waste exhibiting the characteristic of ignitability, corrosivity, or reactivity (EPA Hazardous Waste Numbers of D001, D002, or D003)?	☐ Yes ☒ No
Is the physical form of the waste inconsistent with the Waste Stream Description or the Waste Matrix Code?	☐ Yes ☒ No
CH or RH TRAMPAC	
Are there heat-sealed bags (unvented) GREATER than 4 liters and LESS than 390 square inches in the waste, or heat sealed bags not authorized in the RH TRUCON Code?	☐ Yes ☒ No
Were there Non-approved Closure Methods used on liner bags or inner bags greater than 4 liters?	☐ Yes ☒ No
Are there sealed containers GREATER than 4 liters?	☐ Yes ☒ No
Are there indications of inadequate protection for heavy and/or sharp objects?	☐ Yes ☒ No
Comments: N/A	

RTR Operator:

Eric Lyles	[signature]	3/14/2016
Print Name	Signature	Date

CCP Radiography Data Sheet

Section 1: General Information	
[X] RTR Examination [ ] RTR Replicate Scan [ ] RTR Independent Observation	
Site ID:	ORNL
Batch Number:	OR-RTR6-0736
Examination Date:	3/14/2016
Waste Container ID:	X10C0802044A
Video/Audio Recorded Media Number:	OR-RTR6-0736 A&B
Procedure and Revision No.:	CCP-TP-053 Rev. 15
NCR(s) associated with the container? (e.g., Prohibited Items)	[X] No [ ] Yes NCR No.: N/A NCR No.: N/A

Section 2: Waste Container Data	
Container Type:	55 Gallon Drum
TRUCON Code:	OR 225
Waste Matrix Code:	S5400
Waste Stream I.D.:	OR-REDC-CH-HET
Waste Container Weights:	Gross Wt.: 50.5 kg Tare Wt.: 33.2 kg Net Wt.: 17.3 kg
Rigid Liner and Liner Vent Description:	Liner: [X] No [ ] Yes Lid: [X] No [ ] Yes Type: [ ] 30-mil [ ] 90-mil [ ] 110-mil [ ] 125-mil Vented: [ ] No [ ] Yes [X] N/A Punctured: [X] No [ ] Yes Mechanical Vent: [X] No [ ] Yes Fiberboard Liner: [X] No [ ] Yes Lead Lined: [X] No [ ] Yes
Number of Layers of Confinement:	Appears to be 1 layer
Volume Utilization Percentage:	90 %

CCP Radiography Data Sheet

Waste Container ID: X10C0802044A

Section 3: Container Inventory and Comments (Detailed descriptions)	
IM:	Saw blades
AM:	Aluminum rings
OM:	
OI:	
C:	Leather gloves
R:	Leaded rubber glove
XPM:	Plastic sheeting
OR:	
IN:	
S:	

Section 4: Packaging Material and Waste Material Parameters	
Packaging Material:	**Estimated Weight (kg)**
Steel (ST):	27.8
Plastics (PP): Liner bag	1.0
Other: Cardboard Liner (CP)	4.4
Total Packaging Weight	33.2
Waste Material Parameter:	**Estimated Weight (kg)**
Iron-based Metal / Alloys (IM):	0.2
Aluminum-based Metals / Alloys (AM):	2.0
Other Metals (OM):	
Other Inorganic Materials (OI)	
Cellulosics (C):	0.5
Rubber (R):	2.5
Plastics (waste materials) (XPM):	12.1
Organic Matrix (OR):	
Inorganic Matrix (IN):	
Soils (S):	
Total WMP Weight:	17.3

CCP Radiography Data Sheet

Waste Container ID: X10C0802044A

Section 5: RTR Summary (Questions answered "Yes" will be explained in the Comment block, except for Question 1)	
Is there observable liquid?	☐ Yes ☒ No
Is there any observable liquid in internal containers, more than 60 milliliters or 3 percent by volume, whichever is greater?	☐ Yes ☒ No
Is the total volume of observable liquid in the outermost container GREATER than 1% of the container?	☐ Yes ☒ No
Is there observable liquid in payload containers with an EPA Hazardous Waste Number of U134?	☐ Yes ☒ No
Is there an indication of non-radionuclide pyrophoric materials, such as elemental potassium?	☐ Yes ☒ No
Is there an indication of hazardous wastes not occurring as co-contaminants with TRU mixed wastes (non-mixed hazardous wastes)?	☐ Yes ☒ No
Is there an indication of wastes incompatible with backfill, seal and panel closures materials, container and packaging materials, shipping container materials, or other wastes (i.e., waste does NOT match TRUCON Code[s])?	☐ Yes ☒ No
Is there an indication of wastes containing explosives or compressed gases?	☐ Yes ☒ No
Is there an indication of PCBs liquids?	☐ Yes ☒ No
Is there an indication of the waste exhibiting the characteristic of ignitability, corrosivity, or reactivity (EPA Hazardous Waste Numbers of D001, D002, or D003)?	☐ Yes ☒ No
Is the physical form of the waste inconsistent with the Waste Stream Description or the Waste Matrix Code?	☐ Yes ☒ No
CH or RH TRAMPAC	
Are there heat-sealed bags (unvented) GREATER than 4 liters and LESS than 390 square inches in the waste, or heat sealed bags not authorized in the RH TRUCON Code?	☐ Yes ☒ No
Were there Non-approved Closure Methods used on liner bags or inner bags greater than 4 liters?	☐ Yes ☒ No
Are there sealed containers GREATER than 4 liters?	☐ Yes ☒ No
Are there indications of inadequate protection for heavy and/or sharp objects?	☐ Yes ☒ No
Comments: N/A	

RTR Operator:

Eric Lyles		3/14/2016
Print Name	Signature	Date

CCP Radiography Data Sheet

Section 1: General Information	
[X] RTR Examination [ ] RTR Replicate Scan [ ] RTR Independent Observation	
Site ID:	ORNL
Batch Number:	OR-RTR6-0736
Examination Date:	3/14/2016
Waste Container ID:	X10C0802044C
Video/Audio Recorded Media Number:	OR-RTR6-0736 A&B
Procedure and Revision No.:	CCP-TP-053 Rev. 15
NCR(s) associated with the container? (e.g., Prohibited Items)	[X] No [ ] Yes NCR No.: N/A NCR No.: N/A

Section 2: Waste Container Data	
Container Type:	55 Gallon Drum
TRUCON Code:	OR 225
Waste Matrix Code:	S5400
Waste Stream I.D.:	OR-REDC-CH-HET
Waste Container Weights:	Gross Wt.: 80.8 kg Tare Wt.: 33.2 kg Net Wt.: 47.6 kg
Rigid Liner and Liner Vent Description:	Liner: [X] No [ ] Yes Lid: [X] No [ ] Yes Type: [ ] 30-mil [ ] 90-mil [ ] 110-mil [ ] 125-mil Vented: [ ] No [ ] Yes [X] N/A Punctured: [X] No [ ] Yes Mechanical Vent: [X] No [ ] Yes Fiberboard Liner: [X] No [ ] Yes Lead Lined: [X] No [ ] Yes
Number of Layers of Confinement:	Appears to be 1 layer
Volume Utilization Percentage:	95 %

CCP Radiography Data Sheet

Waste Container ID: X10C0802044C

Section 3: Container Inventory and Comments (Detailed descriptions)	
IM:	Scrap metal
AM:	
OM:	
OI:	Absorbent
C:	
R:	Leaded rubber gloves
XPM:	Plastic sheeting
OR:	
IN:	
S:	

Section 4: Packaging Material and Waste Material Parameters	
Packaging Material:	**Estimated Weight (kg)**
Steel (ST):	27.8
Plastics (PP): Liner bag	1.0
Other: Cardboard Liner (CP)	4.4
Total Packaging Weight	33.2
Waste Material Parameter:	**Estimated Weight (kg)**
Iron-based Metal / Alloys (IM):	36.1
Aluminum-based Metals / Alloys (AM):	
Other Metals (OM):	
Other Inorganic Materials (OI)	1.0
Cellulosics (C):	
Rubber (R):	2.5
Plastics (waste materials) (XPM):	8.0
Organic Matrix (OR):	
Inorganic Matrix (IN):	
Soils (S):	
Total WMP Weight:	47.6

CCP Radiography Data Sheet

Waste Container ID: X10C0802044C

Section 5: RTR Summary (Questions answered "Yes" will be explained in the Comment block, except for Question 1)	
Is there observable liquid?	☐ Yes ☒ No
Is there any observable liquid in internal containers, more than 60 milliliters or 3 percent by volume, whichever is greater?	☐ Yes ☒ No
Is the total volume of observable liquid in the outermost container GREATER than 1% of the container?	☐ Yes ☒ No
Is there observable liquid in payload containers with an EPA Hazardous Waste Number of U134?	☐ Yes ☒ No
Is there an indication of non-radionuclide pyrophoric materials, such as elemental potassium?	☐ Yes ☒ No
Is there an indication of hazardous wastes not occurring as co-contaminants with TRU mixed wastes (non-mixed hazardous wastes)?	☐ Yes ☒ No
Is there an indication of wastes incompatible with backfill, seal and panel closures materials, container and packaging materials, shipping container materials, or other wastes (i.e., waste does NOT match TRUCON Code[s])?	☐ Yes ☒ No
Is there an indication of wastes containing explosives or compressed gases?	☐ Yes ☒ No
Is there an indication of PCBs liquids?	☐ Yes ☒ No
Is there an indication of the waste exhibiting the characteristic of ignitability, corrosivity, or reactivity (EPA Hazardous Waste Numbers of D001, D002, or D003)?	☐ Yes ☒ No
Is the physical form of the waste inconsistent with the Waste Stream Description or the Waste Matrix Code?	☐ Yes ☒ No
CH or RH TRAMPAC	
Are there heat-sealed bags (unvented) GREATER than 4 liters and LESS than 390 square inches in the waste, or heat sealed bags not authorized in the RH TRUCON Code?	☐ Yes ☒ No
Were there Non-approved Closure Methods used on liner bags or inner bags greater than 4 liters?	☐ Yes ☒ No
Are there sealed containers GREATER than 4 liters?	☐ Yes ☒ No
Are there indications of inadequate protection for heavy and/or sharp objects?	☐ Yes ☒ No
Comments: N/A	

RTR Operator:

Eric Lyles		3/14/2016
Print Name	Signature	Date

CCP Radiography Data Sheet

CCP-TP-053 Attachment 2

Section 1: General Information	
[X] RTR Examination [ ] RTR Replicate Scan [ ] RTR Independent Observation	
Site ID:	ORNL
Batch Number:	OR-RTR6-0736
Examination Date:	3/14/2016
Waste Container ID:	X10C0802044B
Video/Audio Recorded Media Number:	OR-RTR6-0736 A&B
Procedure and Revision No.:	CCP-TP-053 Rev. 15
NCR(s) associated with the container? (e.g., Prohibited Items)	[X] No [ ] Yes NCR No.: N/A NCR No.: N/A

Section 2: Waste Container Data	
Container Type:	55 Gallon Drum
TRUCON Code:	OR 225
Waste Matrix Code:	S5400
Waste Stream I.D.:	OR-REDC-CH-HET
Waste Container Weights:	Gross Wt.: 77.9 kg Tare Wt.: 33.2 kg Net Wt.: 44.7 kg
Rigid Liner and Liner Vent Description:	Liner: [X] No [ ] Yes Lid: [X] No [ ] Yes Type: [ ] 30-mil [ ] 90-mil [ ] 110-mil [ ] 125-mil Vented: [ ] No [ ] Yes [X] N/A Punctured: [X] No [ ] Yes Mechanical Vent: [X] No [ ] Yes Fiberboard Liner: [X] No [ ] Yes Lead Lined: [X] No [ ] Yes
Number of Layers of Confinement:	Appears to be 1 layer
Volume Utilization Percentage:	90 %

CCP Radiography Data Sheet

Waste Container ID: X10C0802044B

Section 3: Container Inventory and Comments (Detailed descriptions)	
IM:	Scrap metal
AM:	
OM:	
OI:	Absorbent
C:	Leather gloves
R:	
XPM:	Plastic sheeting
OR:	
IN:	
S:	

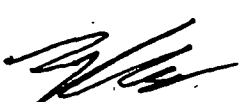
Section 4: Packaging Material and Waste Material Parameters	
Packaging Material:	**Estimated Weight (kg)**
Steel (ST):	27.8
Plastics (PP): Liner bag	1.0
Other: Cardboard Liner (CP)	4.4
Total Packaging Weight	33.2
Waste Material Parameter:	**Estimated Weight (kg)**
Iron-based Metal / Alloys (IM):	30.7
Aluminum-based Metals / Alloys (AM):	
Other Metals (OM):	
Other Inorganic Materials (OI)	5.0
Cellulosics (C):	1.0
Rubber (R):	
Plastics (waste materials) (XPM):	8.0
Organic Matrix (OR):	
Inorganic Matrix (IN):	
Soils (S):	
Total WMP Weight:	44.7

CCP Radiography Data Sheet

Waste Container ID: X10C0802044B

Section 5: RTR Summary (Questions answered "Yes" will be explained in the Comment block, except for Question 1)	
Is there observable liquid?	[X] Yes [ ] No
Is there any observable liquid in internal containers, more than 60 milliliters or 3 percent by volume, whichever is greater?	[ ] Yes [X] No
Is the total volume of observable liquid in the outermost container GREATER than 1% of the container?	[ ] Yes [X] No
Is there observable liquid in payload containers with an EPA Hazardous Waste Number of U134?	[ ] Yes [X] No
Is there an indication of non-radionuclide pyrophoric materials, such as elemental potassium?	[ ] Yes [X] No
Is there an indication of hazardous wastes not occurring as co-contaminants with TRU mixed wastes (non-mixed hazardous wastes)?	[ ] Yes [X] No
Is there an indication of wastes incompatible with backfill, seal and panel closures materials, container and packaging materials, shipping container materials, or other wastes (i.e., waste does NOT match TRUCON Code[s])?	[ ] Yes [X] No
Is there an indication of wastes containing explosives or compressed gases?	[ ] Yes [X] No
Is there an indication of PCBs liquids?	[ ] Yes [X] No
Is there an indication of the waste exhibiting the characteristic of ignitability, corrosivity, or reactivity (EPA Hazardous Waste Numbers of D001, D002, or D003)?	[ ] Yes [X] No
Is the physical form of the waste inconsistent with the Waste Stream Description or the Waste Matrix Code?	[ ] Yes [X] No
CH or RH TRAMPAC	
Are there heat-sealed bags (unvented) GREATER than 4 liters and LESS than 390 square inches in the waste, or heat sealed bags not authorized in the RH TRUCON Code?	[ ] Yes [X] No
Were there Non-approved Closure Methods used on liner bags or inner bags greater than 4 liters?	[ ] Yes [X] No
Are there sealed containers GREATER than 4 liters?	[ ] Yes [X] No
Are there indications of inadequate protection for heavy and/or sharp objects?	[ ] Yes [X] No
Comments: N/A	

RTR Operator:

Eric Lyles		3/14/2016
Print Name	Signature	Date

CCP Radiography Data Sheet

Section 1: General Information	
[X] RTR Examination [ ] RTR Replicate Scan [ ] RTR Independent Observation	
Site ID:	ORNL
Batch Number:	OR-RTR6-0736
Examination Date:	3/14/2016
Waste Container ID:	X10C0802044E
Video/Audio Recorded Media Number:	OR-RTR6-0736 A&B
Procedure and Revision No.:	CCP-TP-053 Rev. 15
NCR(s) associated with the container? (e.g., Prohibited Items)	[X] No [ ] Yes NCR No.: N/A NCR No.: N/A

Section 2: Waste Container Data	
Container Type:	55 Gallon Drum
TRUCON Code:	OR 225
Waste Matrix Code:	S5400
Waste Stream I.D.:	OR-REDC-CH-HET
Waste Container Weights:	Gross Wt.: 76.6 kg Tare Wt.: 33.2 kg Net Wt.: 43.4 kg
Rigid Liner and Liner Vent Description:	Liner: [X] No [ ] Yes Lid: [X] No [ ] Yes Type: [ ] 30-mil [ ] 90-mil [ ] 110-mil [ ] 125-mil Vented: [ ] No [ ] Yes [X] N/A Punctured: [X] No [ ] Yes Mechanical Vent: [X] No [ ] Yes Fiberboard Liner: [X] No [ ] Yes Lead Lined: [X] No [ ] Yes
Number of Layers of Confinement:	Appears to be 1 layer
Volume Utilization Percentage:	90 %

CCP Radiography Data Sheet

Waste Container ID: X10C0802044E

Section 3: Container Inventory and Comments (Detailed descriptions)	
IM:	Scrap metal, saw blade, electrical equipment, utility knife
AM:	
OM:	
OI:	Absorbent
C:	Wood
R:	
XPM:	Plastic sheeting
OR:	
IN:	
S:	

Section 4: Packaging Material and Waste Material Parameters	
Packaging Material:	**Estimated Weight (kg)**
Steel (ST):	27.8
Plastics (PP): Liner bag	1.0
Other: Cardboard Liner (CP)	4.4
Total Packaging Weight	33.2
Waste Material Parameter:	**Estimated Weight (kg)**
Iron-based Metal / Alloys (IM):	28.4
Aluminum-based Metals / Alloys (AM):	
Other Metals (OM):	
Other Inorganic Materials (OI)	2.0
Cellulosics (C):	5.0
Rubber (R):	
Plastics (waste materials) (XPM):	8.0
Organic Matrix (OR):	
Inorganic Matrix (IN):	
Soils (S):	
Total WMP Weight:	43.4

CCP Radiography Data Sheet

Waste Container ID: X10C0802044E

Section 5: RTR Summary (Questions answered "Yes" will be explained in the Comment block, except for Question 1)	
Is there observable liquid?	☐ Yes ☒ No
Is there any observable liquid in internal containers, more than 60 milliliters or 3 percent by volume, whichever is greater?	☐ Yes ☒ No
Is the total volume of observable liquid in the outermost container GREATER than 1% of the container?	☐ Yes ☒ No
Is there observable liquid in payload containers with an EPA Hazardous Waste Number of U134?	☐ Yes ☒ No
Is there an indication of non-radionuclide pyrophoric materials, such as elemental potassium?	☐ Yes ☒ No
Is there an indication of hazardous wastes not occurring as co-contaminants with TRU mixed wastes (non-mixed hazardous wastes)?	☐ Yes ☒ No
Is there an indication of wastes incompatible with backfill, seal and panel closures materials, container and packaging materials, shipping container materials, or other wastes (i.e., waste does NOT match TRUCON Code[s])?	☐ Yes ☒ No
Is there an indication of wastes containing explosives or compressed gases?	☐ Yes ☒ No
Is there an indication of PCBs liquids?	☐ Yes ☒ No
Is there an indication of the waste exhibiting the characteristic of ignitability, corrosivity, or reactivity (EPA Hazardous Waste Numbers of D001, D002, or D003)?	☐ Yes ☒ No
Is the physical form of the waste inconsistent with the Waste Stream Description or the Waste Matrix Code?	☐ Yes ☒ No
CH or RH TRAMPAC	
Are there heat-sealed bags (unvented) GREATER than 4 liters and LESS than 390 square inches in the waste, or heat sealed bags not authorized in the RH TRUCON Code?	☐ Yes ☒ No
Were there Non-approved Closure Methods used on liner bags or inner bags greater than 4 liters?	☐ Yes ☒ No
Are there sealed containers GREATER than 4 liters?	☐ Yes ☒ No
Are there indications of inadequate protection for heavy and/or sharp objects?	☐ Yes ☒ No
Comments: N/A	

RTR Operator:

Eric Lyles		3/14/2016
Print Name	Signature	Date

CCP Radiography Data Sheet

Section 1: General Information	
[X] RTR Examination [ ] RTR Replicate Scan [ ] RTR Independent Observation	
Site ID:	ORNL
Batch Number:	OR-RTR6-0736
Examination Date:	3/14/2016
Waste Container ID:	X10C0802044D
Video/Audio Recorded Media Number:	OR-RTR6-0736 A&B
Procedure and Revision No.:	CCP-TP-053 Rev. 15
NCR(s) associated with the container? (e.g., Prohibited Items)	[X] No [ ] Yes NCR No.: N/A NCR No.: N/A

Section 2: Waste Container Data	
Container Type:	55 Gallon Drum
TRUCON Code:	OR 225
Waste Matrix Code:	S5400
Waste Stream I.D.:	OR-REDC-CH-HET
Waste Container Weights:	Gross Wt.: 68.7 kg Tare Wt.: 33.2 kg Net Wt.: 35.5 kg
Rigid Liner and Liner Vent Description:	Liner: [X] No [ ] Yes Lid: [X] No [ ] Yes Type: [ ] 30-mil [ ] 90-mil [ ] 110-mil [ ] 125-mil Vented: [ ] No [ ] Yes [X] N/A Punctured: [X] No [ ] Yes Mechanical Vent: [X] No [ ] Yes Fiberboard Liner: [X] No [ ] Yes Lead Lined: [X] No [ ] Yes
Number of Layers of Confinement:	Appears to be 1 layer
Volume Utilization Percentage:	90 %

CCP Radiography Data Sheet

Waste Container ID: X10C0802044D

Section 3: Container Inventory and Comments	(Detailed descriptions)
IM:	Scrap metal, metal hardware, metal screen
AM:	
OM:	
OI:	Absorbent
C:	Wood, cloth
R:	Leaded rubber gloves
XPM:	Plastic sheeting
OR:	
IN:	
S:	

Section 4: Packaging Material and Waste Material Parameters	
Packaging Material:	**Estimated Weight (kg)**
Steel (ST):	27.8
Plastics (PP): Liner bag	1.0
Other: Cardboard Liner (CP)	4.4
Total Packaging Weight	33.2
Waste Material Parameter:	**Estimated Weight (kg)**
Iron-based Metal / Alloys (IM):	19.0
Aluminum-based Metals / Alloys (AM):	
Other Metals (OM):	
Other Inorganic Materials (OI)	1.0
Cellulosics (C):	6.0
Rubber (R):	2.5
Plastics (waste materials) (XPM):	7.0
Organic Matrix (OR):	
Inorganic Matrix (IN):	
Soils (S):	
Total WMP Weight:	35.5

CCP Radiography Data Sheet

Waste Container ID: X10C0802044D

Section 5: RTR Summary (Questions answered "Yes" will be explained in the Comment block, except for Question 1)	
Is there observable liquid?	☐ Yes ☒ No
Is there any observable liquid in internal containers, more than 60 milliliters or 3 percent by volume, whichever is greater?	☐ Yes ☒ No
Is the total volume of observable liquid in the outermost container GREATER than 1% of the container?	☐ Yes ☒ No
Is there observable liquid in payload containers with an EPA Hazardous Waste Number of U134?	☐ Yes ☒ No
Is there an indication of non-radionuclide pyrophoric materials, such as elemental potassium?	☐ Yes ☒ No
Is there an indication of hazardous wastes not occurring as co-contaminants with TRU mixed wastes (non-mixed hazardous wastes)?	☐ Yes ☒ No
Is there an indication of wastes incompatible with backfill, seal and panel closures materials, container and packaging materials, shipping container materials, or other wastes (i.e., waste does NOT match TRUCON Code[s])?	☐ Yes ☒ No
Is there an indication of wastes containing explosives or compressed gases?	☐ Yes ☒ No
Is there an indication of PCBs liquids?	☐ Yes ☒ No
Is there an indication of the waste exhibiting the characteristic of ignitability, corrosivity, or reactivity (EPA Hazardous Waste Numbers of D001, D002, or D003)?	☐ Yes ☒ No
Is the physical form of the waste inconsistent with the Waste Stream Description or the Waste Matrix Code?	☐ Yes ☒ No
CH or RH TRAMPAC	
Are there heat-sealed bags (unvented) GREATER than 4 liters and LESS than 390 square inches in the waste, or heat sealed bags not authorized in the RH TRUCON Code?	☐ Yes ☒ No
Were there Non-approved Closure Methods used on liner bags or inner bags greater than 4 liters?	☐ Yes ☒ No
Are there sealed containers GREATER than 4 liters?	☐ Yes ☒ No
Are there indications of inadequate protection for heavy and/or sharp objects?	☐ Yes ☒ No
Comments: N/A	

RTR Operator:

Eric Lyles		3/14/2016
Print Name	Signature	Date

CCP Radiography Data Sheet

Section 1: General Information	
[X] RTR Examination [ ] RTR Replicate Scan [ ] RTR Independent Observation	
Site ID:	ORNL
Batch Number:	OR-RTR6-0736
Examination Date:	3/14/2016
Waste Container ID:	X10C0506526E
Video/Audio Recorded Media Number:	OR-RTR6-0736 A&B
Procedure and Revision No.:	CCP-TP-053 Rev. 15
NCR(s) associated with the container? (e.g., Prohibited Items)	[X] No [ ] Yes NCR No.: N/A NCR No.: N/A

Section 2: Waste Container Data	
Container Type:	55 Gallon Drum
TRUCON Code:	OR 225
Waste Matrix Code:	S5400
Waste Stream I.D.:	OR-REDC-CH-HET
Waste Container Weights:	Gross Wt.: 75.0 kg Tare Wt.: 33.2 kg Net Wt.: 41.8 kg
Rigid Liner and Liner Vent Description:	Liner: [X] No [ ] Yes Lid: [X] No [ ] Yes Type: [ ] 30-mil [ ] 90-mil [ ] 110-mil [ ] 125-mil Vented: [ ] No [ ] Yes [X] N/A Punctured: [X] No [ ] Yes Mechanical Vent: [X] No [ ] Yes Fiberboard Liner: [X] No [ ] Yes Lead Lined: [X] No [ ] Yes
Number of Layers of Confinement:	Appears to be 1 layer
Volume Utilization Percentage:	85 %

CCP Radiography Data Sheet

Waste Container ID: X10C0506526E

Section 3: Container Inventory and Comments (Detailed descriptions)	
IM:	Scrap metal, metal hardware
AM:	
OM:	
OI:	Absorbent
C:	Cloth, coveralls
R:	
XPM:	Plastic sheeting, plastic tubing with metal fittings, coax cable
OR:	
IN:	
S:	

Section 4: Packaging Material and Waste Material Parameters	
Packaging Material:	**Estimated Weight (kg)**
Steel (ST):	27.8
Plastics (PP): Liner bag	1.0
Other: Cardboard Liner (CP)	4.4
Total Packaging Weight	33.2
Waste Material Parameter:	**Estimated Weight (kg)**
Iron-based Metal / Alloys (IM):	25.8
Aluminum-based Metals / Alloys (AM):	
Other Metals (OM):	
Other Inorganic Materials (OI)	1.0
Cellulosics (C):	8.0
Rubber (R):	
Plastics (waste materials) (XPM):	7.0
Organic Matrix (OR):	
Inorganic Matrix (IN):	
Soils (S):	
Total WMP Weight:	41.8

CCP Radiography Data Sheet

Waste Container ID: X10C0506526E

Section 5: RTR Summary (Questions answered "Yes" will be explained in the Comment block, except for Question 1)	
Is there observable liquid?	☐ Yes ☒ No
Is there any observable liquid in internal containers, more than 60 milliliters or 3 percent by volume, whichever is greater?	☐ Yes ☒ No
Is the total volume of observable liquid in the outermost container GREATER than 1% of the container?	☐ Yes ☒ No
Is there observable liquid in payload containers with an EPA Hazardous Waste Number of U134?	☐ Yes ☒ No
Is there an indication of non-radionuclide pyrophoric materials, such as elemental potassium?	☐ Yes ☒ No
Is there an indication of hazardous wastes not occurring as co-contaminants with TRU mixed wastes (non-mixed hazardous wastes)?	☐ Yes ☒ No
Is there an indication of wastes incompatible with backfill, seal and panel closures materials, container and packaging materials, shipping container materials, or other wastes (i.e., waste does NOT match TRUCON Code[s])?	☐ Yes ☒ No
Is there an indication of wastes containing explosives or compressed gases?	☐ Yes ☒ No
Is there an indication of PCBs liquids?	☐ Yes ☒ No
Is there an indication of the waste exhibiting the characteristic of ignitability, corrosivity, or reactivity (EPA Hazardous Waste Numbers of D001, D002, or D003)?	☐ Yes ☒ No
Is the physical form of the waste inconsistent with the Waste Stream Description or the Waste Matrix Code?	☐ Yes ☒ No
CH or RH TRAMPAC	
Are there heat-sealed bags (unvented) GREATER than 4 liters and LESS than 390 square inches in the waste, or heat sealed bags not authorized in the RH TRUCON Code?	☐ Yes ☒ No
Were there Non-approved Closure Methods used on liner bags or inner bags greater than 4 liters?	☐ Yes ☒ No
Are there sealed containers GREATER than 4 liters?	☐ Yes ☒ No
Are there indications of inadequate protection for heavy and/or sharp objects?	☐ Yes ☒ No
Comments: N/A	

RTR Operator:

Eric Lyles		3/14/2016
Print Name	Signature	Date

CCP Radiography Data Sheet

Section 1: General Information	
[X] RTR Examination [ ] RTR Replicate Scan [ ] RTR Independent Observation	
Site ID:	ORNL
Batch Number:	OR-RTR6-0736
Examination Date:	3/14/2016
Waste Container ID:	X10C05065261
Video/Audio Recorded Media Number:	OR-RTR6-0736 A&B
Procedure and Revision No.:	CCP-TP-053 Rev. 15
NCR(s) associated with the container? (e.g., Prohibited Items)	[X] No [ ] Yes NCR No.: N/A NCR No.: N/A

Section 2: Waste Container Data	
Container Type:	55 Gallon Drum
TRUCON Code:	OR 225
Waste Matrix Code:	S5400
Waste Stream I.D.:	OR-REDC-CH-HET
Waste Container Weights:	Gross Wt.: 79.1 kg Tare Wt.: 33.2 kg Net Wt.: 45.9 kg
Rigid Liner and Liner Vent Description:	Liner: [X] No [ ] Yes Lid: [X] No [ ] Yes Type: [ ] 30-mil [ ] 90-mil [ ] 110-mil [ ] 125-mil Vented: [ ] No [ ] Yes [X] N/A Punctured: [X] No [ ] Yes Mechanical Vent: [X] No [ ] Yes Fiberboard Liner: [X] No [ ] Yes Lead Lined: [X] No [ ] Yes
Number of Layers of Confinement:	Appears to be 1 layer
Volume Utilization Percentage:	95 %

CCP Radiography Data Sheet

Waste Container ID: X10C0506526I

Section 3: Container Inventory and Comments	(Detailed descriptions)
IM:	Metal hardware, scrap metal
AM:	Aluminum collars
OM:	
OI:	Absorbent
C:	
R:	
XPM:	Plastic sheeting
OR:	
IN:	
S:	

Section 4: Packaging Material and Waste Material Parameters	
Packaging Material:	**Estimated Weight (kg)**
Steel (ST):	27.8
Plastics (PP): Liner bag	1.0
Other: Cardboard Liner (CP)	4.4
Total Packaging Weight	33.2
Waste Material Parameter:	**Estimated Weight (kg)**
Iron-based Metal / Alloys (IM):	28.9
Aluminum-based Metals / Alloys (AM):	4.0
Other Metals (OM):	
Other Inorganic Materials (OI)	3.0
Cellulosics (C):	
Rubber (R):	
Plastics (waste materials) (XPM):	10.0
Organic Matrix (OR):	
Inorganic Matrix (IN):	
Soils (S):	
Total WMP Weight:	45.9

30

CCP Radiography Data Sheet

Waste Container ID: X10C0506526I

Section 5: RTR Summary (Questions answered "Yes" will be explained in the Comment block, except for Question 1)	
Is there observable liquid?	☐ Yes ☒ No
Is there any observable liquid in internal containers, more than 60 milliliters or 3 percent by volume, whichever is greater?	☐ Yes ☒ No
Is the total volume of observable liquid in the outermost container GREATER than 1% of the container?	☐ Yes ☒ No
Is there observable liquid in payload containers with an EPA Hazardous Waste Number of U134?	☐ Yes ☒ No
Is there an indication of non-radionuclide pyrophoric materials, such as elemental potassium?	☐ Yes ☒ No
Is there an indication of hazardous wastes not occurring as co-contaminants with TRU mixed wastes (non-mixed hazardous wastes)?	☐ Yes ☒ No
Is there an indication of wastes incompatible with backfill, seal and panel closures materials, container and packaging materials, shipping container materials, or other wastes (i.e., waste does NOT match TRUCON Code[s])?	☐ Yes ☒ No
Is there an indication of wastes containing explosives or compressed gases?	☐ Yes ☒ No
Is there an indication of PCBs liquids?	☐ Yes ☒ No
Is there an indication of the waste exhibiting the characteristic of ignitability, corrosivity, or reactivity (EPA Hazardous Waste Numbers of D001, D002, or D003)?	☐ Yes ☒ No
Is the physical form of the waste inconsistent with the Waste Stream Description or the Waste Matrix Code?	☐ Yes ☒ No
CH or RH TRAMPAC	
Are there heat-sealed bags (unvented) GREATER than 4 liters and LESS than 390 square inches in the waste, or heat sealed bags not authorized in the RH TRUCON Code?	☐ Yes ☒ No
Were there Non-approved Closure Methods used on liner bags or inner bags greater than 4 liters?	☐ Yes ☒ No
Are there sealed containers GREATER than 4 liters?	☐ Yes ☒ No
Are there indications of inadequate protection for heavy and/or sharp objects?	☐ Yes ☒ No
Comments: N/A	

RTR Operator:

Eric Lyles		3/14/2016
Print Name	Signature	Date

CCP Radiography Data Sheet

Section 1: General Information	
[X] RTR Examination [ ] RTR Replicate Scan [ ] RTR Independent Observation	
Site ID:	ORNL
Batch Number:	OR-RTR6-0736
Examination Date:	3/14/2016
Waste Container ID:	X10C0802044F
Video/Audio Recorded Media Number:	OR-RTR6-0736 A&B
Procedure and Revision No.:	CCP-TP-053 Rev. 15
NCR(s) associated with the container? (e.g., Prohibited Items)	[X] No [ ] Yes NCR No.: N/A NCR No.: N/A

Section 2: Waste Container Data	
Container Type:	55 Gallon Drum
TRUCON Code:	OR 225
Waste Matrix Code:	S5400
Waste Stream I.D.:	OR-REDC-CH-HET
Waste Container Weights:	Gross Wt.: 60.6 kg Tare Wt.: 33.2 kg Net Wt.: 27.4 kg
Rigid Liner and Liner Vent Description:	Liner: [X] No [ ] Yes Lid: [X] No [ ] Yes Type: [ ] 30-mil [ ] 90-mil [ ] 110-mil [ ] 125-mil Vented: [ ] No [ ] Yes [X] N/A Punctured: [X] No [ ] Yes Mechanical Vent: [X] No [ ] Yes Fiberboard Liner: [X] No [ ] Yes Lead Lined: [X] No [ ] Yes
Number of Layers of Confinement:	Appears to be 1 layer
Volume Utilization Percentage:	80 %

CCP Radiography Data Sheet

Waste Container ID: X10C0802044F

Section 3: Container Inventory and Comments (Detailed descriptions)	
IM:	Metal framed filter, scrap metal
AM:	
OM:	
OI:	
C:	Cloth, coveralls
R:	
XPM:	Plastic sheeting, plastic hose, plastic tubing with metal fittings
OR:	
IN:	
S:	

Section 4: Packaging Material and Waste Material Parameters	
Packaging Material:	**Estimated Weight (kg)**
Steel (ST):	27.8
Plastics (PP): Liner bag	1.0
Other: Cardboard Liner (CP)	4.4
Total Packaging Weight	33.2
Waste Material Parameter:	**Estimated Weight (kg)**
Iron-based Metal / Alloys (IM):	18.4
Aluminum-based Metals / Alloys (AM):	
Other Metals (OM):	
Other Inorganic Materials (OI)	
Cellulosics (C):	2.0
Rubber (R):	
Plastics (waste materials) (XPM):	7.0
Organic Matrix (OR):	
Inorganic Matrix (IN):	
Soils (S):	
Total WMP Weight:	27.4

CCP Radiography Data Sheet

Waste Container ID: X10C0802044F

Section 5: RTR Summary (Questions answered "Yes" will be explained in the Comment block, except for Question 1)	
Is there observable liquid?	☐ Yes ☒ No
Is there any observable liquid in internal containers, more than 60 milliliters or 3 percent by volume, whichever is greater?	☐ Yes ☒ No
Is the total volume of observable liquid in the outermost container GREATER than 1% of the container?	☐ Yes ☒ No
Is there observable liquid in payload containers with an EPA Hazardous Waste Number of U134?	☐ Yes ☒ No
Is there an indication of non-radionuclide pyrophoric materials, such as elemental potassium?	☐ Yes ☒ No
Is there an indication of hazardous wastes not occurring as co-contaminants with TRU mixed wastes (non-mixed hazardous wastes)?	☐ Yes ☒ No
Is there an indication of wastes incompatible with backfill, seal and panel closures materials, container and packaging materials, shipping container materials, or other wastes (i.e., waste does NOT match TRUCON Code[s])?	☐ Yes ☒ No
Is there an indication of wastes containing explosives or compressed gases?	☐ Yes ☒ No
Is there an indication of PCBs liquids?	☐ Yes ☒ No
Is there an indication of the waste exhibiting the characteristic of ignitability, corrosivity, or reactivity (EPA Hazardous Waste Numbers of D001, D002, or D003)?	☐ Yes ☒ No
Is the physical form of the waste inconsistent with the Waste Stream Description or the Waste Matrix Code?	☐ Yes ☒ No
CH or RH TRAMPAC	
Are there heat-sealed bags (unvented) GREATER than 4 liters and LESS than 390 square inches in the waste, or heat sealed bags not authorized in the RH TRUCON Code?	☐ Yes ☒ No
Were there Non-approved Closure Methods used on liner bags or inner bags greater than 4 liters?	☐ Yes ☒ No
Are there sealed containers GREATER than 4 liters?	☐ Yes ☒ No
Are there indications of inadequate protection for heavy and/or sharp objects?	☐ Yes ☒ No
Comments: N/A	

RTR Operator:

Eric Lyles		3/14/2016
Print Name	Signature	Date

CCP Radiography Data Sheet

Section 1: General Information		
[X] RTR Examination	[ ] RTR Replicate Scan	[ ] RTR Independent Observation
Site ID:	ORNL	
Batch Number:	OR-RTR6-0736	
Examination Date:	3/14/2016	
Waste Container ID:	X10C0802044I	
Video/Audio Recorded Media Number:	OR-RTR6-0736	A&B
Procedure and Revision No.:	CCP-TP-053	Rev. 15
NCR(s) associated with the container? (e.g., Prohibited Items)	[X] No [ ] Yes NCR No.: N/A NCR No.: N/A	

Section 2: Waste Container Data	
Container Type:	55 Gallon Drum
TRUCON Code:	OR 225
Waste Matrix Code:	S5400
Waste Stream I.D.:	OR-REDC-CH-HET
Waste Container Weights:	Gross Wt.: 53.8 kg Tare Wt.: 33.2 kg Net Wt.: 20.6 kg
Rigid Liner and Liner Vent Description:	Liner: [X] No [ ] Yes Lid: [X] No [ ] Yes Type: [ ] 30-mil [ ] 90-mil [ ] 110-mil [ ] 125-mil Vented: [ ] No [ ] Yes [X] N/A Punctured: [X] No [ ] Yes Mechanical Vent: [X] No [ ] Yes Fiberboard Liner: [X] No [ ] Yes Lead Lined: [X] No [ ] Yes
Number of Layers of Confinement:	Appears to be 1 layer
Volume Utilization Percentage:	70 %

CCP Radiography Data Sheet

Waste Container ID: X10C0802044I

Section 3: Container Inventory and Comments (Detailed descriptions)	
IM:	Scrap metal
AM:	
OM:	
OI:	
C:	Cloth, coveralls
R:	
XPM:	Plastic sheeting, plastic containers, plastic tubing with metal fittings, plastic pipe
OR:	
IN:	
S:	

Section 4: Packaging Material and Waste Material Parameters	
Packaging Material:	**Estimated Weight (kg)**
Steel (ST):	27.8
Plastics (PP): Liner bag	1.0
Other: Cardboard Liner (CP)	4.4
Total Packaging Weight	33.2
Waste Material Parameter:	**Estimated Weight (kg)**
Iron-based Metal / Alloys (IM):	2.0
Aluminum-based Metals / Alloys (AM):	
Other Metals (OM):	
Other Inorganic Materials (OI)	
Cellulosics (C):	10.6
Rubber (R):	
Plastics (waste materials) (XPM):	8.0
Organic Matrix (OR):	
Inorganic Matrix (IN):	
Soils (S):	
Total WMP Weight:	20.6

CCP Radiography Data Sheet

Waste Container ID: X10C0802044I

Section 5: RTR Summary (Questions answered "Yes" will be explained in the Comment block, except for Question 1)	
Is there observable liquid?	☐ Yes ☒ No
Is there any observable liquid in internal containers, more than 60 milliliters or 3 percent by volume, whichever is greater?	☐ Yes ☒ No
Is the total volume of observable liquid in the outermost container GREATER than 1% of the container?	☐ Yes ☒ No
Is there observable liquid in payload containers with an EPA Hazardous Waste Number of U134?	☐ Yes ☒ No
Is there an indication of non-radionuclide pyrophoric materials, such as elemental potassium?	☐ Yes ☒ No
Is there an indication of hazardous wastes not occurring as co-contaminants with TRU mixed wastes (non-mixed hazardous wastes)?	☐ Yes ☒ No
Is there an indication of wastes incompatible with backfill, seal and panel closures materials, container and packaging materials, shipping container materials, or other wastes (i.e., waste does NOT match TRUCON Code[s])?	☐ Yes ☒ No
Is there an indication of wastes containing explosives or compressed gases?	☐ Yes ☒ No
Is there an indication of PCBs liquids?	☐ Yes ☒ No
Is there an indication of the waste exhibiting the characteristic of ignitability, corrosivity, or reactivity (EPA Hazardous Waste Numbers of D001, D002, or D003)?	☐ Yes ☒ No
Is the physical form of the waste inconsistent with the Waste Stream Description or the Waste Matrix Code?	☐ Yes ☒ No
CH or RH TRAMPAC	
Are there heat-sealed bags (unvented) GREATER than 4 liters and LESS than 390 square inches in the waste, or heat sealed bags not authorized in the RH-TRUCON Code?	☐ Yes ☒ No
Were there Non-approved Closure Methods used on liner bags or inner bags greater than 4 liters?	☐ Yes ☒ No
Are there sealed containers GREATER than 4 liters?	☐ Yes ☒ No
Are there indications of inadequate protection for heavy and/or sharp objects?	☐ Yes ☒ No
Comments: N/A	

RTR Operator:

Eric Lyles		3/14/2016
Print Name	Signature	Date

Attachment 3 – CCP Radiography Independent Technical Reviewer Checklist

Batch Data Report No.: OR-RTR6-0736

Description			
1.	Were data generation and reduction conducted in a technically correct manner in accordance with the methods used?	☐ NO	☑ YES
2.	Was the correct revision of the procedure used? Procedure: CCP-TP-053 Rev.: 15	☐ NO	☑ YES
3.	Are the WMPs entered correctly?	☐ NO	☑ YES
4.	Do the estimated weights in Section 4 of Attachment 2 equal the container gross weight?	☐ NO	☑ YES
5.	Is the data reported in the proper units with the correct number of significant figures (e.g., one tenth of a kilogram)?	☐ NO	☑ YES
6.	Was transcription used? If no, proceed to question 7.	☐ NO	☑ YES
	6a. Has the data been verified for transcription errors?	☐ NO	☑ YES
7.	Does the Testing Batch Report include radiography for up to 20 containers?	☐ NO	☑ YES
8.	Are BDR contents complete and do they match the CCP Waste RTR Batch Data Report Table of Contents?	☐ NO	☑ YES
9.	Is all the data signed and dated in reproducible ink and by the individual(s) generating it?	☐ NO	☑ YES
10.	Is all data recorded clearly, legibly, and accurately?	☐ NO	☑ YES
11.	Have changes been made to original data? If no, proceed to question 12.	☑ NO	☐ YES
	11a. Have all changes to original data been lined out, initialed and dated by the individual making the changes?	☐ NO	☐ YES
	11b. Was justification made for changing the original data?	☐ NO	☐ YES
	11c. Were data changes made by the individual who originally collected the data?	☐ NO	☐ YES
12.	Does the waste match the Waste Matrix Code and Waste Stream description?	☐ NO	☑ YES
13.	Are the RTR Operator's decisions regarding the Radiography documented?	☐ NO	☑ YES
14.	Is there an adequate written description of the contents of each item?	☐ NO	☑ YES
15.	Was the video/audio recording media properly prepared and labeled for each waste container?	☐ NO	☑ YES
16.	Was the video/audio recording media check performed satisfactorily and recorded on Attachment 1?	☐ NO	☑ YES

Attachment 3 – CCP Radiography Independent Technical Reviewer Checklist (Continued)

Batch Data Report No.: OR-RTR6-0736

Description		
17. Was the Image Test performed satisfactorily and recorded on Attachment 1?	☐ NO	☑ YES
18. Was the Replicate Scan performed and recorded on an Attachment 2?	☐ NO	☑ YES
19. Was the Replicate Scan RTR Operator different from the first RTR Operator?	☐ NO	☑ YES
20. Did the Replicate Scan RTR Operator and the first RTR Operator agree on the results?	☐ NO	☑ YES
21. Was the Independent Observation performed and recorded on an Attachment 2?	☐ NO	☑ YES
22. Was the Independent Observation RTR Operator different from the first RTR Operator?	☐ NO	☑ YES
23. Did the Independent Observation RTR Operator and the first RTR Operator agree on the results?	☐ NO	☑ YES
24. Was the data collection performed by qualified individuals?	☐ NO	☑ YES
25. Were NCRs initiated as required at DGL? If no, proceed to question 26.	☑ NO	☐ YES
25a. Have the NCR(s) associated with RTR been included in the BDR?	☐ NO	☐ YES
26. Is the RTR examination for CH waste? If no, proceed to question 27.	☐ NO	☑ YES
26a. Have the CH Quality Assurance Objectives (QAOs) been met (if applicable)? Precision – Precision is maintained by reconciling any discrepancies between two radiography operators with regard to identification of the waste matrix code, liquids in excess of TSDF-WAC limits, and compressed gases through independent replicate scans and independent observations. Additionally, the precision of radiography is verified prior to use by tuning precisely enough to demonstrate compliance with QAOs through viewing an image test pattern. Accuracy – Accuracy is obtained by using a target to tune the image for maximum sharpness and by requiring operators to successfully identify 100 percent of the items required to meet the DQOs for radiography specified in CCP-PO-001, Section C-4a(1) in a training container during their initial qualification and subsequent requalification. Completeness – A video and audio media recording of the radiography examination and a validated radiography data form will be obtained for 100 percent of the waste containers subject to radiography. All video and audio media recordings and radiography data forms will be subject to validation as indicated in CCP-PO-001, Section C3-4. Comparability – The comparability of radiography data from different operators shall be enhanced by using standardized radiography procedures and operator qualifications.	☐ NO	☑ YES

Attachment 3 – CCP Radiography Independent Technical Reviewer Checklist (Continued)

Batch Data Report No.: OR-RTR6-0736

Description		
27. Is the RTR examination for RH waste? If no, proceed to comment section.	☑ NO	☐ YES
27a. Have the RH QAOs been met (if applicable)? Precision – Precision is maintained by reconciling any discrepancies between two operators (during Independent Observation and Replicate scans) with regard to the identification of important waste characteristics (i.e., physical form of the waste and absence of prohibited liquids) within a single container. Accuracy – Accuracy is obtained by using a target to tune the image for maximum sharpness and by requiring operators to successfully identify prohibited liquid in a training container during their initial qualification and subsequent requalification. Representativeness – All of the relevant contents in a container selected for radiography will be described. Completeness – All of the relevant waste information must be assembled and must show that each of the containers in the waste stream belongs to the waste stream. This information must be documented on videotape or other equivalent media and data form. Comparability – Comparability is ensured by meeting the program training requirements and complying with the minimum standards used to implement the radiography process.	☐ NO	☐ YES

Comments: N/A KKS 3-23-2016

I have reviewed 100% of the container specific and batch data in this report and find it acceptable.

Independent Technical Reviewer:

Printed Name	Signature	Date
Kenneth Simpson	Kenneth Simpson	3-23-2016

DIVIDER PAGE

Attachment 2 – CCP SPM Radiography Project Level Validation Checklist and Summary

BDR Number: OR-RTR6-0739 **Examination Date(s):** 03/17/2016

Description of Criteria Reviewed	Criteria Met? YES	NO	NA	Comments/Qualifiers
1. Is the completed, signed, and dated Independent Technical Reviewer Checklist included in the BDR, and the independent technical reviewer was not involved in the generation or recording of the data under review? **Reference Source: CCP-PO-001, C3-4**	X			
2. Does the BDR contain all items addressed in the BDR Table of Contents? **Reference Source: CCP-PO-001, C3-4**	X			
3. Does the BDR include a listing of all the container numbers in the batch? **Reference Source: CCP-PO-001, C3-4**	X			
4. List all containers that have met QAOs. **Reference Source: CCP-PO-001, C3-4**				Container Numbers: X10C0402057A1 X10C0701294A X10C0702202A X10C0702205A X10C0702222A X10C0800175A X10C0801685A X10C0801685B X10C0900761A X10C0901941A X10C1001963A X10C1001967A X10C1001973A X10C1200337A X10C1200366A X10C1300503A
5. Does the BDR identify the current implementing procedure and revision number? **Reference Source: CCP-PO-001, Table C3-3**	X			
6. Is there a reference to or copy of any associated NCRs (if any) in the BDR? NA if no NCRs. **Reference Source: CCP-PO-001, Table C3-3**	X			NCR-ORNL-0078-16 (X10C1001956A)
7. Are there 20 or fewer containers in the batch? **Reference Source: CCP-PO-001, C3-4**	X			
8. Are the data properly reported (i.e., data are reported in correct units and with correct significant figures)? **Reference Source: CCP-PO-001, C3-4**	X			
9. Is there evidence of verification that the physical form matches the Waste Matrix Code? **Reference Source: CCP-PO-001, Table C3-3**	X			

CCP RECORDS ORIGINAL
DATE REC'D 4/12/2016 JY

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Attachment 2 – CCP SPM Radiography Project Level Validation Checklist and Summary (Continued)

BDR Number: OR-RTR6-0739 **Examination Date(s):** 03/17/2016

Description of Criteria Reviewed	Criteria Met? YES	NO	NA	Comments/Qualifiers
10. Is there evidence of verification that the physical form matches the waste stream description? **Reference Source: CCP-PO-001, Table C3-3**	X			
11. Are prohibited items absent? **Reference Source: CCP-PO-001, Table C3-3**	X			Except for container X10C1001956A
12. Does observable liquid, if present, meet the criteria of the TSDF-WAC? **Reference Source: CCP-PO-001, C-1**	X			
13. Were discrepancies between two operators with regard to identification of waste matrix code, liquids in excess of the TSDF-WAC, or compressed gases through replicate scans and independent observations reconciled? NA if no discrepancies. **Reference Source: CCP-PO-001, C3-2**			X	
14. Are the training qualifications for all radiography personnel acceptable? **Reference Source: CCP-PO-001, C3-8**	X			
15. Was evidence of the video/audio check included in the BDR? **Reference Source: CCP-PO-001, C1-1**	X			
16. Was the Lines-Pair Resolution Test or Sieve Test Check included in the BDR? **Reference Source: CCP Technical Procedures**	X			
17. Was a replicate scan performed once per day, or once per batch, whichever is LESS frequent? **Reference Source: CCP-PO-001, C1-1**	X			
18. Was an independent observation performed once per day, or once per batch, whichever is LESS frequent? **Reference Source: CCP-PO-001, C1-1**	X			

Attachment 2 – CCP SPM Radiography Project Level Validation Checklist and Summary (Continued)

BDR Number: OR-RTR6-0739 **Examination Date(s):** 03/17/2016

Description of Criteria Reviewed	Criteria Met? YES	NO	NA	Comments/Qualifiers
19. Were the replicate scan and independent observation performed on different waste containers? **Reference Source: CCP-PO-001, C1-1**	X			
20. Were the personnel performing the replicate scan and independent observation different from the individual who performed the original? **Reference Source: CCP-PO-001, C1-1**	X			
21. Does the BDR include an estimate of each material parameter weight in kg for each container? **Reference Source: CCP Technical Procedures**	X			
22. Does the BDR include a description of each material parameter for each container? **Reference Source: CCP Technical Procedures**	X			
23. Is the container gross weight recorded in kilograms (kg) for each container in the BDR? **Reference Source: CCP Technical Procedures**	X			
24. Was the Scale Weight Calibration Check included in the BDR? **Reference Source: CCP Technical Procedures**			X	Scale not used.
25. Was the Scale Weight Check included in the BDR? **Reference Source: CCP Technical Procedures**			X	Scale not used.

Comments: N/A

The container QC checks were properly performed and meet the Quality Assurance Objectives (QAOs). Proper procedures were followed during data reduction and analysis. The batch is complete, acceptable, and includes all supporting data and documentation required by the QAPjP.

Roger Whiteaker	Roger Whiteaker	04/05/2016
SPM Printed Name	Signature	Date

Checklist is to be re-signed only when a re-review is performed.

SPM Printed Name	Signature	Reason	Date

Attachment 5–CCP Radiography Batch Data Report Cover Sheet

Site ID: ORNL

Batch Data Report No.: OR-RTR6-0739 ☑ CH ☐ RH Date: 3-17-16

Waste Container ID Numbers	
Replicate Scan:	X10C0702205A
Independent Observation:	X10C1200337A
1	X10C1200337A
2	X10C0702205A
3	X10C1001956A
4	X10C0702202A
5	X10C0701294A
6	X10C0901941A
7	X10C0702222A
8	X10C1300503A
9	X10C1001967A
10	X10C0800175A
11	X10C0801685A
12	X10C1200366A
13	X10C1001973A
14	X10C0801685B
15	X10C0900761A
16	X10C0402057A1
17	X10C1001963A
18	N/A
19	N/A
20	N/A

RTR Operator:

Eric Lyles		3-17-16
Printed Name	Signature	Date

Independent Technical Reviewer:

THAD HASSELSTROM		3-31-16
Printed Name	Signature	Date

CCP RECORDS ORIGINAL
DATE REC'D 3/31/16

Attachment 4 – CCP Radiography Batch Data Report Table of Contents and Batch Narrative

Batch Data Report No.: OR-RTR6-0739 Date: 3-17-16

Table Of Contents		
Item	Description	Page No.
1	CCP Radiography Batch Data Report Cover Sheet	1
2	CCP Radiography Batch Data Report Table Of Contents	2
3	CCP RTR Measurement Control Report	3
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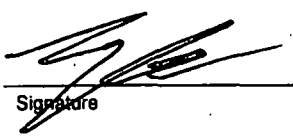
Batch Narrative
All Quality Checks were performed and recorded on CCP-TP-053 Rev.15, CCP Radiography Measurement Control Report.

Eric Lyles — RTR Operator


Signature

3-17-16 — Date

2

Attachment 1 – CCP RTR Measurement Control Report

Site ID: ORNL		
Batch Data Report No.: OR-RTR6-0739		
Examination Date: 3-17-16		
Control Checks		
Video/Audio Recorded Media System Check	☑ SAT	☐ UNSAT
Image Test : 10 Lines (Minimum acceptable is 5 lines-pair/cm or #6 Sieve is viewable)	☑ SAT	☐ UNSAT
Comments: N/A		
RTR Operator:		
Eric Lyles	[signature]	3-17-16
Printed Name	Signature	Date

CCP Radiography Data Sheet

Section 1: General Information	
☐ RTR Examination ☒ RTR Replicate Scan ☐ RTR Independent Observation	
Site ID:	ORNL
Batch Number:	OR-RTR6-0739
Examination Date:	3/17/2016
Waste Container ID:	X10C0702205A
Video/Audio Recorded Media Number:	OR-RTR6-0739 A&B
Procedure and Revision No.:	CCP-TP-053 Rev. 15
NCR(s) associated with the container? (e.g., Prohibited Items)	☒ No ☐ Yes NCR No.: N/A NCR No.: N/A

Section 2: Waste Container Data	
Container Type:	55 Gallon Drum
TRUCON Code:	OR 225
Waste Matrix Code:	S5400
Waste Stream I.D.:	OR-REDC-CH-HET
Waste Container Weights:	Gross Wt.: 64.0 kg Tare Wt.: 33.2 kg Net Wt.: 30.8 kg
Rigid Liner and Liner Vent Description:	Liner: ☒ No ☐ Yes Lid: ☒ No ☐ Yes Type: ☐ 30-mil ☐ 90-mil ☐ 110-mil ☐ 125-mil Vented: ☐ No ☐ Yes ☒ N/A Punctured: ☒ No ☐ Yes Mechanical Vent: ☒ No ☐ Yes Fiberboard Liner: ☒ No ☐ Yes Lead Lined: ☒ No ☐ Yes
Number of Layers of Confinement:	Appears to be 1 layer
Volume Utilization Percentage:	95 %

CCP Radiography Data Sheet

Waste Container ID: X10C0702205A

Section 3: Container Inventory and Comments (Detailed descriptions)	
IM:	Metal hardware, scrap metal, metal fittings, hand tools
AM:	Aluminum collars
OM:	
OI:	Absorbent
C:	
R:	
XPM:	Plastic pipes, scrap plastic, plastic sheeting, manipulator boots
OR:	
IN:	
S:	

Section 4: Packaging Material and Waste Material Parameters	
Packaging Material:	**Estimated Weight (kg)**
Steel (ST):	27.8
Plastics (PP): Liner bag	1.0
Other: Cardboard Liner (CP)	4.4
Total Packaging Weight	33.2
Waste Material Parameter:	**Estimated Weight (kg)**
Iron-based Metal / Alloys (IM):	4.0
Aluminum-based Metals / Alloys (AM):	9.0
Other Metals (OM):	
Other Inorganic Materials (OI)	2.5
Cellulosics (C):	
Rubber (R):	
Plastics (waste materials) (XPM):	15.3
Organic Matrix (OR):	
Inorganic Matrix (IN):	
Soils (S):	
Total WMP Weight:	30.8

CCP Radiography Data Sheet

Waste Container ID: X10C0702205A

Section 5: RTR Summary (Questions answered "Yes" will be explained in the Comment block, except for Question 1)	
Is there observable liquid?	☐ Yes ☒ No
Is there any observable liquid in internal containers, more than 60 milliliters or 3 percent by volume, whichever is greater?	☐ Yes ☒ No
Is the total volume of observable liquid in the outermost container GREATER than 1% of the container?	☐ Yes ☒ No
Is there observable liquid in payload containers with an EPA Hazardous Waste Number of U134?	☐ Yes ☒ No
Is there an indication of non-radionuclide pyrophoric materials, such as elemental potassium?	☐ Yes ☒ No
Is there an indication of hazardous wastes not occurring as co-contaminants with TRU mixed wastes (non-mixed hazardous wastes)?	☐ Yes ☒ No
Is there an indication of wastes incompatible with backfill, seal and panel closures materials, container and packaging materials, shipping container materials, or other wastes (i.e., waste does NOT match TRUCON Code[s])?	☐ Yes ☒ No
Is there an indication of wastes containing explosives or compressed gases?	☐ Yes ☒ No
Is there an indication of PCBs liquids?	☐ Yes ☒ No
Is there an indication of the waste exhibiting the characteristic of ignitability, corrosivity, or reactivity (EPA Hazardous Waste Numbers of D001, D002, or D003)?	☐ Yes ☒ No
Is the physical form of the waste inconsistent with the Waste Stream Description or the Waste Matrix Code?	☐ Yes ☒ No
CH or RH TRAMPAC	
Are there heat-sealed bags (unvented) GREATER than 4 liters and LESS than 390 square inches in the waste, or heat sealed bags not authorized in the RH TRUCON Code?	☐ Yes ☒ No
Were there Non-approved Closure Methods used on liner bags or inner bags greater than 4 liters?	☐ Yes ☒ No
Are there sealed containers GREATER than 4 liters?	☐ Yes ☒ No
Are there indications of inadequate protection for heavy and/or sharp objects?	☐ Yes ☒ No

Comments: This Replicate Scan Agrees With the Original Scan.
FO 3-17-16

RTR Operator:

Fred Oney		3/17/2016
Print Name	Signature	Date

CCP Radiography Data Sheet

Section 1: General Information	
☐ RTR Examination ☐ RTR Replicate Scan ☒ RTR Independent Observation	
Site ID:	ORNL
Batch Number:	OR-RTR6-0739
Examination Date:	3/17/2016
Waste Container ID:	X10C1200337A
Video/Audio Recorded Media Number:	OR-RTR6-0739 A&B
Procedure and Revision No.:	CCP-TP-053 Rev. 15
NCR(s) associated with the container? (e.g., Prohibited Items)	☒ No ☐ Yes NCR No.: N/A NCR No.: N/A

Section 2: Waste Container Data	
Container Type:	55 Gallon Drum
TRUCON Code:	OR 225
Waste Matrix Code:	S5400
Waste Stream I.D.:	OR-REDC-CH-HET
Waste Container Weights:	Gross Wt.: 65.6 kg Tare Wt.: 33.2 kg Net Wt.: 32.4 kg
Rigid Liner and Liner Vent Description:	Liner: ☒ No ☐ Yes Lid: ☒ No ☐ Yes Type: ☐ 30-mil ☐ 90-mil ☐ 110-mil ☐ 125-mil Vented: ☐ No ☐ Yes ☒ N/A Punctured: ☒ No ☐ Yes Mechanical Vent: ☒ No ☐ Yes Fiberboard Liner: ☒ No ☐ Yes Lead Lined: ☒ No ☐ Yes
Number of Layers of Confinement:	Appears to be 1 layer
Volume Utilization Percentage:	90 %

CCP Radiography Data Sheet

Waste Container ID: X10C1200337A

Section 3: Container Inventory and Comments (Detailed descriptions)	
IM:	Scrap metal, metal hardware, metal lid
AM:	
OM:	
OI:	Glass containers, broken glass, glass labware, absorbent
C:	Cloth
R:	
XPM:	Plastic containers, plastic sheeting, plastic caps, plastic labware
OR:	
IN:	
S:	

Section 4: Packaging Material and Waste Material Parameters	
Packaging Material:	**Estimated Weight (kg)**
Steel (ST):	27.8
Plastics (PP): Liner bag	1.0
Other: Cardboard Liner (CP)	4.4
Total Packaging Weight	33.2
Waste Material Parameter:	**Estimated Weight (kg)**
Iron-based Metal / Alloys (IM):	2.5
Aluminum-based Metals / Alloys (AM):	
Other Metals (OM):	
Other Inorganic Materials (OI)	11.0
Cellulosics (C):	12.0
Rubber (R):	
Plastics (waste materials) (XPM):	6.9
Organic Matrix (OR):	
Inorganic Matrix (IN):	
Soils (S):	
Total WMP Weight:	32.4

CCP Radiography Data Sheet

Waste Container ID: X10C1200337A

Section 5: RTR Summary (Questions answered "Yes" will be explained in the Comment block, except for Question 1)	
Is there observable liquid?	☐ Yes ☒ No
Is there any observable liquid in internal containers, more than 60 milliliters or 3 percent by volume, whichever is greater?	☐ Yes ☒ No
Is the total volume of observable liquid in the outermost container GREATER than 1% of the container?	☐ Yes ☒ No
Is there observable liquid in payload containers with an EPA Hazardous Waste Number of U134?	☐ Yes ☒ No
Is there an indication of non-radionuclide pyrophoric materials, such as elemental potassium?	☐ Yes ☒ No
Is there an indication of hazardous wastes not occurring as co-contaminants with TRU mixed wastes (non-mixed hazardous wastes)?	☐ Yes ☒ No
Is there an indication of wastes incompatible with backfill, seal and panel closures materials, container and packaging materials, shipping container materials, or other wastes (i.e., waste does NOT match TRUCON Code[s])?	☐ Yes ☒ No
Is there an indication of wastes containing explosives or compressed gases?	☐ Yes ☒ No
Is there an indication of PCBs liquids?	☐ Yes ☒ No
Is there an indication of the waste exhibiting the characteristic of ignitability, corrosivity, or reactivity (EPA Hazardous Waste Numbers of D001, D002, or D003)?	☐ Yes ☒ No
Is the physical form of the waste inconsistent with the Waste Stream Description or the Waste Matrix Code?	☐ Yes ☒ No
CH or RH TRAMPAC	
Are there heat-sealed bags (unvented) GREATER than 4 liters and LESS than 390 square inches in the waste, or heat sealed bags not authorized in the RH TRUCON Code?	☐ Yes ☒ No
Were there Non-approved Closure Methods used on liner bags or inner bags greater than 4 liters?	☐ Yes ☒ No
Are there sealed containers GREATER than 4 liters?	☐ Yes ☒ No
Are there indications of inadequate protection for heavy and/or sharp objects?	☐ Yes ☒ No

Comments: This Independent Observation Agrees with the Original Scan.
FO 3-17-16

RTR Operator:

Fred Oney	FO	3/17/2016
Print Name	Signature	Date

CCP Radiography Data Sheet

Section 1: General Information	
[X] RTR Examination [ ] RTR Replicate Scan [ ] RTR Independent Observation	
Site ID:	ORNL
Batch Number:	OR-RTR6-0739
Examination Date:	3/17/2016
Waste Container ID:	X10C1200337A
Video/Audio Recorded Media Number:	OR-RTR6-0739 A&B
Procedure and Revision No.:	CCP-TP-053 Rev. 15
NCR(s) associated with the container? (e.g., Prohibited Items)	[X] No [ ] Yes NCR No.: N/A NCR No.: N/A

Section 2: Waste Container Data	
Container Type:	55 Gallon Drum
TRUCON Code:	OR 225
Waste Matrix Code:	S5400
Waste Stream I.D.:	OR-REDC-CH-HET
Waste Container Weights:	Gross Wt.: 65.6 kg Tare Wt.: 33.2 kg Net Wt.: 32.4 kg
Rigid Liner and Liner Vent Description:	Liner: [X] No [ ] Yes Lid: [X] No [ ] Yes Type: [ ] 30-mil [ ] 90-mil [ ] 110-mil [ ] 125-mil Vented: [ ] No [ ] Yes [X] N/A Punctured: [X] No [ ] Yes Mechanical Vent: [X] No [ ] Yes Fiberboard Liner: [X] No [ ] Yes Lead Lined: [X] No [ ] Yes
Number of Layers of Confinement:	Appears to be 1 layer
Volume Utilization Percentage:	90 %

CCP Radiography Data Sheet

Waste Container ID: X10C1200337A

Section 3: Container Inventory and Comments	(Detailed descriptions)
IM:	Scrap metal, metal lid
AM:	
OM:	
OI:	Glass containers, glass labware, broken glass, absorbent
C:	Cloth
R:	
XPM:	Plastic containers, plastic sheeting, plastic caps, plastic labware, plastic tubing
OR:	
IN:	
S:	

Section 4: Packaging Material and Waste Material Parameters	
Packaging Material:	**Estimated Weight (kg)**
Steel (ST):	27.8
Plastics (PP): Liner bag	1.0
Other: Cardboard Liner (CP)	4.4
Total Packaging Weight	33.2
Waste Material Parameter:	**Estimated Weight (kg)**
Iron-based Metal / Alloys (IM):	2.0
Aluminum-based Metals / Alloys (AM):	
Other Metals (OM):	
Other Inorganic Materials (OI)	12.0
Cellulosics (C):	10.0
Rubber (R):	
Plastics (waste materials) (XPM):	8.4
Organic Matrix (OR):	
Inorganic Matrix (IN):	
Soils (S):	
Total WMP Weight:	32.4

//

CCP Radiography Data Sheet

Waste Container ID: X10C1200337A

Section 5: RTR Summary (Questions answered "Yes" will be explained in the Comment block, except for Question 1)	
Is there observable liquid?	☐ Yes ☒ No
Is there any observable liquid in internal containers, more than 60 milliliters or 3 percent by volume, whichever is greater?	☐ Yes ☒ No
Is the total volume of observable liquid in the outermost container GREATER than 1% of the container?	☐ Yes ☒ No
Is there observable liquid in payload containers with an EPA Hazardous Waste Number of U134?	☐ Yes ☒ No
Is there an indication of non-radionuclide pyrophoric materials, such as elemental potassium?	☐ Yes ☒ No
Is there an indication of hazardous wastes not occurring as co-contaminants with TRU mixed wastes (non-mixed hazardous wastes)?	☐ Yes ☒ No
Is there an indication of wastes incompatible with backfill, seal and panel closures materials, container and packaging materials, shipping container materials, or other wastes (i.e., waste does NOT match TRUCON Code[s])?	☐ Yes ☒ No
Is there an indication of wastes containing explosives or compressed gases?	☐ Yes ☒ No
Is there an indication of PCBs liquids?	☐ Yes ☒ No
Is there an indication of the waste exhibiting the characteristic of ignitability, corrosivity, or reactivity (EPA Hazardous Waste Numbers of D001, D002, or D003)?	☐ Yes ☒ No
Is the physical form of the waste inconsistent with the Waste Stream Description or the Waste Matrix Code?	☐ Yes ☒ No
CH or RH TRAMPAC	
Are there heat-sealed bags (unvented) GREATER than 4 liters and LESS than 390 square inches in the waste, or heat sealed bags not authorized in the RH TRUCON Code?	☐ Yes ☒ No
Were there Non-approved Closure Methods used on liner bags or inner bags greater than 4 liters?	☐ Yes ☒ No
Are there sealed containers GREATER than 4 liters?	☐ Yes ☒ No
Are there indications of inadequate protection for heavy and/or sharp objects?	☐ Yes ☒ No
Comments: N/A	

RTR Operator:

Eric Lyles		3/17/2016
Print Name	Signature	Date

CCP Radiography Data Sheet

Section 1: General Information	
[X] RTR Examination [ ] RTR Replicate Scan [ ] RTR Independent Observation	
Site ID:	ORNL
Batch Number:	OR-RTR6-0739
Examination Date:	3/17/2016
Waste Container ID:	X10C0702205A
Video/Audio Recorded Media Number:	OR-RTR6-0739 A&B
Procedure and Revision No.:	CCP-TP-053 Rev. 15
NCR(s) associated with the container? (e.g., Prohibited Items)	[X] No [ ] Yes NCR No.: N/A NCR No.: N/A

Section 2: Waste Container Data	
Container Type:	55 Gallon Drum
TRUCON Code:	OR 225
Waste Matrix Code:	S5400
Waste Stream I.D.:	OR-REDC-CH-HET
Waste Container Weights:	Gross Wt.: 64.0 kg Tare Wt.: 33.2 kg Net Wt.: 30.8 kg
Rigid Liner and Liner Vent Description:	Liner: [X] No [ ] Yes Lid: [X] No [ ] Yes Type: [ ] 30-mil [ ] 90-mil [ ] 110-mil [ ] 125-mil Vented: [ ] No [ ] Yes [X] N/A Punctured: [X] No [ ] Yes Mechanical Vent: [X] No [ ] Yes Fiberboard Liner: [X] No [ ] Yes Lead Lined: [X] No [ ] Yes
Number of Layers of Confinement:	Appears to be 1 layer
Volume Utilization Percentage:	95 %

CCP Radiography Data Sheet

Waste Container ID: X10C0702205A

Section 3: Container Inventory and Comments (Detailed descriptions)	
IM:	Metal fittings, utility knife, scrap metal
AM:	Aluminum collars
OM:	
OI:	Absorbent
C:	
R:	
XPM:	Plastic tubing, plastic sheeting, manipulator boots
OR:	
IN:	
S:	

Section 4: Packaging Material and Waste Material Parameters	
Packaging Material:	**Estimated Weight (kg)**
Steel (ST):	27.8
Plastics (PP): Liner bag	1.0
Other: Cardboard Liner (CP)	4.4
Total Packaging Weight	33.2
Waste Material Parameter:	**Estimated Weight (kg)**
Iron-based Metal / Alloys (IM):	5.0
Aluminum-based Metals / Alloys (AM):	8.0
Other Metals (OM):	
Other Inorganic Materials (OI)	3.0
Cellulosics (C):	
Rubber (R):	
Plastics (waste materials) (XPM):	14.8
Organic Matrix (OR):	
Inorganic Matrix (IN):	
Soils (S):	
Total WMP Weight:	30.8

CCP Radiography Data Sheet

Waste Container ID: X10C0702205A

Section 5: RTR Summary (Questions answered "Yes" will be explained in the Comment block, except for Question 1)	
Is there *observable liquid*?	☐ Yes ☒ No
Is there any observable liquid in internal containers, more than 60 milliliters or 3 percent by volume, whichever is greater?	☐ Yes ☒ No
Is the total volume of observable liquid in the outermost container GREATER than 1% of the container?	☐ Yes ☒ No
Is there observable liquid in payload containers with an EPA Hazardous Waste Number of U134?	☐ Yes ☒ No
Is there an indication of non-radionuclide pyrophoric materials, such as elemental potassium?	☐ Yes ☒ No
Is there an indication of hazardous wastes not occurring as co-contaminants with TRU mixed wastes (non-mixed hazardous wastes)?	☐ Yes ☒ No
Is there an indication of wastes incompatible with backfill, seal and panel closures materials, container and packaging materials, shipping container materials, or other wastes (i.e., waste does NOT match TRUCON Code[s])?	☐ Yes ☒ No
Is there an indication of wastes containing explosives or compressed gases?	☐ Yes ☒ No
Is there an indication of PCBs liquids?	☐ Yes ☒ No
Is there an indication of the waste exhibiting the characteristic of ignitability, corrosivity, or reactivity (EPA Hazardous Waste Numbers of D001, D002, or D003)?	☐ Yes ☒ No
Is the physical form of the waste inconsistent with the Waste Stream Description or the Waste Matrix Code?	☐ Yes ☒ No
CH or RH TRAMPAC	
Are there heat-sealed bags (unvented) GREATER than 4 liters and LESS than 390 square inches in the waste, or heat sealed bags not authorized in the RH TRUCON Code?	☐ Yes ☒ No
Were there Non-approved Closure Methods used on liner bags or inner bags greater than 4 liters?	☐ Yes ☒ No
Are there sealed containers GREATER than 4 liters?	☐ Yes ☒ No
Are there indications of inadequate protection for heavy and/or sharp objects?	☐ Yes ☒ No

Comments: N/A

RTR Operator:

Eric Lyles		3/17/2016
Print Name	Signature	Date

CCP Radiography Data Sheet

Section 1: General Information	
[X] RTR Examination [ ] RTR Replicate Scan [ ] RTR Independent Observation	
Site ID:	ORNL
Batch Number:	OR-RTR6-0739
Examination Date:	3/17/2016
Waste Container ID:	X10C1001956A
Video/Audio Recorded Media Number:	OR-RTR6-0739 A&B
Procedure and Revision No.:	CCP-TP-053 Rev. 15
NCR(s) associated with the container? (e.g., Prohibited Items)	[ ] No [X] Yes NCR No.: NCR-ORNL-0078-16 NCR No.: N/A

Section 2: Waste Container Data	
Container Type:	55 Gallon Drum
TRUCON Code:	OR 225
Waste Matrix Code:	S5400
Waste Stream I.D.:	OR-REDC-CH-HET
Waste Container Weights:	Gross Wt.: 58.7 kg Tare Wt.: 33.2 kg Net Wt.: 25.5 kg
Rigid Liner and Liner Vent Description:	Liner: [X] No [ ] Yes Lid: [X] No [ ] Yes Type: [ ] 30-mil [ ] 90-mil [ ] 110-mil [ ] 125-mil Vented: [ ] No [ ] Yes [X] N/A Punctured: [X] No [ ] Yes Mechanical Vent: [X] No [ ] Yes Fiberboard Liner: [X] No [ ] Yes Lead Lined: [X] No [ ] Yes
Number of Layers of Confinement:	Appears to be 1 layer
Volume Utilization Percentage:	95 %

CCP Radiography Data Sheet

Waste Container ID: X10C1001956A

Section 3: Container Inventory and Comments (Detailed descriptions)	
IM:	Paint cans, scrap metal, electrical equipment, welding striker, metal hardware, metal lid
AM:	
OM:	
OI:	Glass labware, glass containers
C:	
R:	
XPM:	Plastic containers, plastic sheeting, plastic labware, plastic caps, plastic pan
OR:	
IN:	
S:	

Section 4: Packaging Material and Waste Material Parameters	
Packaging Material:	**Estimated Weight (kg)**
Steel (ST):	27.8
Plastics (PP): Liner bag	1.0
Other: Cardboard Liner (CP)	4.4
Total Packaging Weight	33.2
Waste Material Parameter:	**Estimated Weight (kg)**
Iron-based Metal / Alloys (IM):	5.0
Aluminum-based Metals / Alloys (AM):	
Other Metals (OM):	
Other Inorganic Materials (OI)	8.0
Cellulosics (C):	
Rubber (R):	
Plastics (waste materials) (XPM):	12.5
Organic Matrix (OR):	
Inorganic Matrix (IN):	
Soils (S):	
Total WMP Weight:	25.5

CCP Radiography Data Sheet

Waste Container ID: X10C1001956A

Section 5: RTR Summary (Questions answered "Yes" will be explained in the Comment block, except for Question 1)	
Is there observable liquid?	☐ Yes ☒ No
Is there any observable liquid in internal containers, more than 60 milliliters or 3 percent by volume, whichever is greater?	☐ Yes ☒ No
Is the total volume of observable liquid in the outermost container GREATER than 1% of the container?	☐ Yes ☒ No
Is there observable liquid in payload containers with an EPA Hazardous Waste Number of U134?	☐ Yes ☒ No
Is there an indication of non-radionuclide pyrophoric materials, such as elemental potassium?	☐ Yes ☒ No
Is there an indication of hazardous wastes not occurring as co-contaminants with TRU mixed wastes (non-mixed hazardous wastes)?	☐ Yes ☒ No
Is there an indication of wastes incompatible with backfill, seal and panel closures materials, container and packaging materials, shipping container materials, or other wastes (i.e., waste does NOT match TRUCON Code[s])?	☐ Yes ☒ No
Is there an indication of wastes containing explosives or compressed gases?	☐ Yes ☒ No
Is there an indication of PCBs liquids?	☐ Yes ☒ No
Is there an indication of the waste exhibiting the characteristic of ignitability, corrosivity, or reactivity (EPA Hazardous Waste Numbers of D001, D002, or D003)?	☒ Yes ☐ No
Is the physical form of the waste inconsistent with the Waste Stream Description or the Waste Matrix Code?	☐ Yes ☒ No
CH or RH TRAMPAC	
Are there heat-sealed bags (unvented) GREATER than 4 liters and LESS than 390 square inches in the waste, or heat sealed bags not authorized in the RH TRUCON Code?	☐ Yes ☒ No
Were there Non-approved Closure Methods used on liner bags or inner bags greater than 4 liters?	☐ Yes ☒ No
Are there sealed containers GREATER than 4 liters?	☐ Yes ☒ No
Are there indications of inadequate protection for heavy and/or sharp objects?	☐ Yes ☒ No
Comments: NCR-ORNL-0078-16	

RTR Operator:

Eric Lyles		3/17/2016
Print Name	Signature	Date

CCP Radiography Data Sheet

Section 1: General Information	
[X] RTR Examination [ ] RTR Replicate Scan [ ] RTR Independent Observation	
Site ID:	ORNL
Batch Number:	OR-RTR6-0739
Examination Date:	3/17/2016
Waste Container ID:	X10C0702202A
Video/Audio Recorded Media Number:	OR-RTR6-0739 A&B
Procedure and Revision No.:	CCP-TP-053 Rev. 15
NCR(s) associated with the container? (e.g., Prohibited Items)	[X] No [ ] Yes NCR No.: N/A NCR No.: N/A

Section 2: Waste Container Data	
Container Type:	55 Gallon Drum
TRUCON Code:	OR 225
Waste Matrix Code:	S5400
Waste Stream I.D.:	OR-REDC-CH-HET
Waste Container Weights:	Gross Wt.: 69.2 kg Tare Wt.: 33.2 kg Net Wt.: 36.0 kg
Rigid Liner and Liner Vent Description:	Liner: [X] No [ ] Yes Lid: [X] No [ ] Yes Type: [ ] 30-mil [ ] 90-mil [ ] 110-mil [ ] 125-mil Vented: [ ] No [ ] Yes [X] N/A Punctured: [X] No [ ] Yes Mechanical Vent: [X] No [ ] Yes Fiberboard Liner: [X] No [ ] Yes Lead Lined: [X] No [ ] Yes
Number of Layers of Confinement:	Appears to be 1 layer
Volume Utilization Percentage:	90 %

CCP Radiography Data Sheet

Waste Container ID: X10C0702202A

Section 3: Container Inventory and Comments (Detailed descriptions)	
IM:	Scrap metal, metal hardware, metal lid
AM:	
OM:	
OI:	Glass containers, glass labware
C:	
R:	Rubber gloves
XPM:	Plastic sheeting, plastic caps, plastic containers, plastic labware
OR:	
IN:	
S:	

Section 4: Packaging Material and Waste Material Parameters	
Packaging Material:	**Estimated Weight (kg)**
Steel (ST):	27.8
Plastics (PP): Liner bag	1.0
Other: Cardboard Liner (CP)	4.4
Total Packaging Weight	33.2
Waste Material Parameter:	**Estimated Weight (kg)**
Iron-based Metal / Alloys (IM):	3.0
Aluminum-based Metals / Alloys (AM):	
Other Metals (OM):	
Other Inorganic Materials (OI)	16.0
Cellulosics (C):	
Rubber (R):	0.5
Plastics (waste materials) (XPM):	16.5
Organic Matrix (OR):	
Inorganic Matrix (IN):	
Soils (S):	
Total WMP Weight:	36.0

CCP Radiography Data Sheet

Waste Container ID: X10C0702202A

Section 5: RTR Summary (Questions answered "Yes" will be explained in the Comment block, except for Question 1)	
Is there observable liquid?	☐ Yes ☒ No
Is there any observable liquid in internal containers, more than 60 milliliters or 3 percent by volume, whichever is greater?	☐ Yes ☒ No
Is the total volume of observable liquid in the outermost container GREATER than 1% of the container?	☐ Yes ☒ No
Is there observable liquid in payload containers with an EPA Hazardous Waste Number of U134?	☐ Yes ☒ No
Is there an indication of non-radionuclide pyrophoric materials, such as elemental potassium?	☐ Yes ☒ No
Is there an indication of hazardous wastes not occurring as co-contaminants with TRU mixed wastes (non-mixed hazardous wastes)?	☐ Yes ☒ No
Is there an indication of wastes incompatible with backfill, seal and panel closures materials, container and packaging materials, shipping container materials, or other wastes (i.e., waste does NOT match TRUCON Code[s])?	☐ Yes ☒ No
Is there an indication of wastes containing explosives or compressed gases?	☐ Yes ☒ No
Is there an indication of PCBs liquids?	☐ Yes ☒ No
Is there an indication of the waste exhibiting the characteristic of ignitability, corrosivity, or reactivity (EPA Hazardous Waste Numbers of D001, D002, or D003)?	☐ Yes ☒ No
Is the physical form of the waste inconsistent with the Waste Stream Description or the Waste Matrix Code?	☐ Yes ☒ No
CH or RH TRAMPAC	
Are there heat-sealed bags (unvented) GREATER than 4 liters and LESS than 390 square inches in the waste, or heat sealed bags not authorized in the RH TRUCON Code?	☐ Yes ☒ No
Were there Non-approved Closure Methods used on liner bags or inner bags greater than 4 liters?	☐ Yes ☒ No
Are there sealed containers GREATER than 4 liters?	☐ Yes ☒ No
Are there indications of inadequate protection for heavy and/or sharp objects?	☐ Yes ☒ No
Comments: N/A	

RTR Operator:

Eric Lyles		3/17/2016
Print Name	Signature	Date

CCP Radiography Data Sheet

Section 1: General Information	
[X] RTR Examination [ ] RTR Replicate Scan [ ] RTR Independent Observation	
Site ID:	ORNL
Batch Number:	OR-RTR6-0739
Examination Date:	3/17/2016
Waste Container ID:	X10C0701294A
Video/Audio Recorded Media Number:	OR-RTR6-0739 A&B
Procedure and Revision No.:	CCP-TP-053 Rev. 15
NCR(s) associated with the container? (e.g., Prohibited Items)	[X] No [ ] Yes NCR No.: N/A NCR No.: N/A

Section 2: Waste Container Data	
Container Type:	55 Gallon Drum
TRUCON Code:	OR 225
Waste Matrix Code:	S5400
Waste Stream I.D.:	OR-REDC-CH-HET
Waste Container Weights:	Gross Wt.: 55.9 kg Tare Wt.: 33.2 kg Net Wt.: 22.7 kg
Rigid Liner and Liner Vent Description:	Liner: [X] No [ ] Yes Lid: [X] No [ ] Yes Type: [ ] 30-mil [ ] 90-mil [ ] 110-mil [ ] 125-mil Vented: [ ] No [ ] Yes [X] N/A Punctured: [X] No [ ] Yes Mechanical Vent: [X] No [ ] Yes Fiberboard Liner: [X] No [ ] Yes Lead Lined: [X] No [ ] Yes
Number of Layers of Confinement:	Appears to be 1 layer
Volume Utilization Percentage:	90 %

CCP Radiography Data Sheet

Waste Container ID: X10C0701294A

Section 3: Container Inventory and Comments (Detailed descriptions)	
IM:	Scrap metal, metal lid, metal hardware
AM:	
OM:	
OI:	Absorbent, glass containers, glass labware
C:	Cloth, tape rolls
R:	Rubber gloves
XPM:	Plastic sheeting, plastic caps, plastic containers, plastic labware
OR:	
IN:	
S:	

Section 4: Packaging Material and Waste Material Parameters	
Packaging Material:	**Estimated Weight (kg)**
Steel (ST):	27.8
Plastics (PP): Liner bag	1.0
Other: Cardboard Liner (CP)	4.4
Total Packaging Weight	33.2
Waste Material Parameter:	**Estimated Weight (kg)**
Iron-based Metal / Alloys (IM):	2.0
Aluminum-based Metals / Alloys (AM):	
Other Metals (OM):	
Other Inorganic Materials (OI)	8.7
Cellulosics (C):	3.0
Rubber (R):	1.0
Plastics (waste materials) (XPM):	8.0
Organic Matrix (OR):	
Inorganic Matrix (IN):	
Soils (S):	
Total WMP Weight:	22.7

CCP Radiography Data Sheet

Waste Container ID: X10C0701294A

Section 5: RTR Summary (Questions answered "Yes" will be explained in the Comment block, except for Question 1)	
Is there observable liquid?	☐ Yes ☒ No
Is there any observable liquid in internal containers, more than 60 milliliters or 3 percent by volume, whichever is greater?	☐ Yes ☒ No
Is the total volume of observable liquid in the outermost container GREATER than 1% of the container?	☐ Yes ☒ No
Is there observable liquid in payload containers with an EPA Hazardous Waste Number of U134?	☐ Yes ☒ No
Is there an indication of non-radionuclide pyrophoric materials, such as elemental potassium?	☐ Yes ☒ No
Is there an indication of hazardous wastes not occurring as co-contaminants with TRU mixed wastes (non-mixed hazardous wastes)?	☐ Yes ☒ No
Is there an indication of wastes incompatible with backfill, seal and panel closures materials, container and packaging materials, shipping container materials, or other wastes (i.e., waste does NOT match TRUCON Code[s])?	☐ Yes ☒ No
Is there an indication of wastes containing explosives or compressed gases?	☐ Yes ☒ No
Is there an indication of PCBs liquids?	☐ Yes ☒ No
Is there an indication of the waste exhibiting the characteristic of ignitability, corrosivity, or reactivity (EPA Hazardous Waste Numbers of D001, D002, or D003)?	☐ Yes ☒ No
Is the physical form of the waste inconsistent with the Waste Stream Description or the Waste Matrix Code?	☐ Yes ☒ No
CH or RH TRAMPAC	
Are there heat-sealed bags (unvented) GREATER than 4 liters and LESS than 390 square inches in the waste, or heat sealed bags not authorized in the RH TRUCON Code?	☐ Yes ☒ No
Were there Non-approved Closure Methods used on liner bags or inner bags greater than 4 liters?	☐ Yes ☒ No
Are there sealed containers GREATER than 4 liters?	☐ Yes ☒ No
Are there indications of inadequate protection for heavy and/or sharp objects?	☐ Yes ☒ No
Comments: N/A	

RTR Operator:

Eric Lyles		3/17/2016
Print Name	Signature	Date

CCP Radiography Data Sheet

CCP-TP-053 Attachment 2

Section 1: General Information	
[X] RTR Examination [ ] RTR Replicate Scan [ ] RTR Independent Observation	
Site ID:	ORNL
Batch Number:	OR-RTR6-0739
Examination Date:	3/17/2016
Waste Container ID:	X10C0901941A
Video/Audio Recorded Media Number:	OR-RTR6-0739 A&B
Procedure and Revision No.:	CCP-TP-053 Rev. 15
NCR(s) associated with the container? (e.g., Prohibited Items)	[X] No [ ] Yes NCR No.: N/A NCR No.: N/A

Section 2: Waste Container Data	
Container Type:	55 Gallon Drum
TRUCON Code:	OR 225
Waste Matrix Code:	S5400
Waste Stream I.D.:	OR-REDC-CH-HET
Waste Container Weights:	Gross Wt.: 77.8 kg Tare Wt.: 33.2 kg Net Wt.: 44.6 kg
Rigid Liner and Liner Vent Description:	Liner: [X] No [ ] Yes Lid: [X] No [ ] Yes Type: [ ] 30-mil [ ] 90-mil [ ] 110-mil [ ] 125-mil Vented: [ ] No [ ] Yes [X] N/A Punctured: [X] No [ ] Yes Mechanical Vent: [X] No [ ] Yes Fiberboard Liner: [X] No [ ] Yes Lead Lined: [X] No [ ] Yes
Number of Layers of Confinement:	Appears to be 1 layer
Volume Utilization Percentage:	90 %

CCP Radiography Data Sheet

Waste Container ID: X10C0901941A

Section 3: Container Inventory and Comments (Detailed descriptions)	
IM:	Scrap metal, metal hardware, electrical equipment
AM:	
OM:	
OI:	Glass containers, glass labware, broken glass, absorbent
C:	
R:	
XPM:	Plastic sheeting, plastic containers, plastic caps, plastic labware, open plastic container
OR:	
IN:	
S:	

Section 4: Packaging Material and Waste Material Parameters	
Packaging Material:	**Estimated Weight (kg)**
Steel (ST):	27.8
Plastics (PP): Liner bag	1.0
Other: Cardboard Liner (CP)	4.4
Total Packaging Weight	33.2
Waste Material Parameter:	**Estimated Weight (kg)**
Iron-based Metal / Alloys (IM):	24.6
Aluminum-based Metals / Alloys (AM):	
Other Metals (OM):	
Other Inorganic Materials (OI)	8.0
Cellulosics (C):	
Rubber (R):	
Plastics (waste materials) (XPM):	12.0
Organic Matrix (OR):	
Inorganic Matrix (IN):	
Soils (S):	
Total WMP Weight:	44.6

CCP Radiography Data Sheet

Waste Container ID: X10C0901941A

Section 5: RTR Summary (Questions answered "Yes" will be explained in the Comment block, except for Question 1)	
Is there observable liquid?	☐ Yes ☒ No
Is there any observable liquid in internal containers, more than 60 milliliters or 3 percent by volume, whichever is greater?	☐ Yes ☒ No
Is the total volume of observable liquid in the outermost container GREATER than 1% of the container?	☐ Yes ☒ No
Is there observable liquid in payload containers with an EPA Hazardous Waste Number of U134?	☐ Yes ☒ No
Is there an indication of non-radionuclide pyrophoric materials, such as elemental potassium?	☐ Yes ☒ No
Is there an indication of hazardous wastes not occurring as co-contaminants with TRU mixed wastes (non-mixed hazardous wastes)?	☐ Yes ☒ No
Is there an indication of wastes incompatible with backfill, seal and panel closures materials, container and packaging materials, shipping container materials, or other wastes (i.e., waste does NOT match TRUCON Code[s])?	☐ Yes ☒ No
Is there an indication of wastes containing explosives or compressed gases?	☐ Yes ☒ No
Is there an indication of PCBs liquids?	☐ Yes ☒ No
Is there an indication of the waste exhibiting the characteristic of ignitability, corrosivity, or reactivity (EPA Hazardous Waste Numbers of D001, D002, or D003)?	☐ Yes ☒ No
Is the physical form of the waste inconsistent with the Waste Stream Description or the Waste Matrix Code?	☐ Yes ☒ No
CH or RH TRAMPAC	
Are there heat-sealed bags (unvented) GREATER than 4 liters and LESS than 390 square inches in the waste, or heat sealed bags not authorized in the RH TRUCON Code?	☐ Yes ☒ No
Were there Non-approved Closure Methods used on liner bags or inner bags greater than 4 liters?	☐ Yes ☒ No
Are there sealed containers GREATER than 4 liters?	☐ Yes ☒ No
Are there indications of inadequate protection for heavy and/or sharp objects?	☐ Yes ☒ No
Comments: N/A	

RTR Operator:

Eric Lyles		3/17/2016
Print Name	Signature	Date

CCP Radiography Data Sheet

Section 1: General Information	
[X] RTR Examination [ ] RTR Replicate Scan [ ] RTR Independent Observation	
Site ID:	ORNL
Batch Number:	OR-RTR6-0739
Examination Date:	3/17/2016
Waste Container ID:	X10C0702222A
Video/Audio Recorded Media Number:	OR-RTR6-0739 A&B
Procedure and Revision No.:	CCP-TP-053 Rev. 15
NCR(s) associated with the container? (e.g., Prohibited Items)	[X] No [ ] Yes NCR No.: N/A NCR No.: N/A

Section 2: Waste Container Data	
Container Type:	55 Gallon Drum
TRUCON Code:	OR 225
Waste Matrix Code:	S5400
Waste Stream I.D.:	OR-REDC-CH-HET
Waste Container Weights:	Gross Wt.: 52.4 kg Tare Wt.: 33.2 kg Net Wt.: 19.2 kg
Rigid Liner and Liner Vent Description:	Liner: [X] No [ ] Yes Lid: [X] No [ ] Yes Type: [ ] 30-mil [ ] 90-mil [ ] 110-mil [ ] 125-mil Vented: [ ] No [ ] Yes [X] N/A Punctured: [X] No [ ] Yes Mechanical Vent: [X] No [ ] Yes Fiberboard Liner: [X] No [ ] Yes Lead Lined: [X] No [ ] Yes
Number of Layers of Confinement:	Appears to be 1 layer
Volume Utilization Percentage:	90 %

CCP Radiography Data Sheet

Waste Container ID: X10C0702222A

Section 3: Container Inventory and Comments	(Detailed descriptions)
IM:	Scrap metal
AM:	
OM:	
OI:	Glass containers, glass labware, absorbent
C:	Wood, cloth
R:	
XPM:	Plastic sheeting, plastic containers, plastic labware, plastic caps
OR:	
IN:	
S:	

Section 4: Packaging Material and Waste Material Parameters	
Packaging Material:	**Estimated Weight (kg)**
Steel (ST):	27.8
Plastics (PP): Liner bag	1.0
Other: Cardboard Liner (CP)	4.4
Total Packaging Weight	33.2
Waste Material Parameter:	**Estimated Weight (kg)**
Iron-based Metal / Alloys (IM):	1.0
Aluminum-based Metals / Alloys (AM):	
Other Metals (OM):	
Other Inorganic Materials (OI)	7.2
Cellulosics (C):	3.0
Rubber (R):	
Plastics (waste materials) (XPM):	8.0
Organic Matrix (OR):	
Inorganic Matrix (IN):	
Soils (S):	
Total WMP Weight:	19.2

CCP Radiography Data Sheet

Waste Container ID: X10C0702222A

Section 5: RTR Summary (Questions answered "Yes" will be explained in the Comment block, except for Question 1)	
Is there observable liquid?	☐ Yes ☒ No
Is there any observable liquid in internal containers, more than 60 milliliters or 3 percent by volume, whichever is greater?	☐ Yes ☒ No
Is the total volume of observable liquid in the outermost container GREATER than 1% of the container?	☐ Yes ☒ No
Is there observable liquid in payload containers with an EPA Hazardous Waste Number of U134?	☐ Yes ☒ No
Is there an indication of non-radionuclide pyrophoric materials, such as elemental potassium?	☐ Yes ☒ No
Is there an indication of hazardous wastes not occurring as co-contaminants with TRU mixed wastes (non-mixed hazardous wastes)?	☐ Yes ☒ No
Is there an indication of wastes incompatible with backfill, seal and panel closures materials, container and packaging materials, shipping container materials, or other wastes (i.e., waste does NOT match TRUCON Code[s])?	☐ Yes ☒ No
Is there an indication of wastes containing explosives or compressed gases?	☐ Yes ☒ No
Is there an indication of PCBs liquids?	☐ Yes ☒ No
Is there an indication of the waste exhibiting the characteristic of ignitability, corrosivity, or reactivity (EPA Hazardous Waste Numbers of D001, D002, or D003)?	☐ Yes ☒ No
Is the physical form of the waste inconsistent with the Waste Stream Description or the Waste Matrix Code?	☐ Yes ☒ No
CH or RH TRAMPAC	
Are there heat-sealed bags (unvented) GREATER than 4 liters and LESS than 390 square inches in the waste, or heat sealed bags not authorized in the RH TRUCON Code?	☐ Yes ☒ No
Were there Non-approved Closure Methods used on liner bags or inner bags greater than 4 liters?	☐ Yes ☒ No
Are there sealed containers GREATER than 4 liters?	☐ Yes ☒ No
Are there indications of inadequate protection for heavy and/or sharp objects?	☐ Yes ☒ No
Comments: N/A	

RTR Operator:

Eric Lyles		3/17/2016
Print Name	Signature	Date

CCP Radiography Data Sheet

CCP-TP-053 Attachment 2

Section 1: General Information	
[X] RTR Examination [ ] RTR Replicate Scan [ ] RTR Independent Observation	
Site ID:	ORNL
Batch Number:	OR-RTR6-0739
Examination Date:	3/17/2016
Waste Container ID:	X10C1300503A
Video/Audio Recorded Media Number:	OR-RTR6-0739 A&B
Procedure and Revision No.:	CCP-TP-053 Rev. 15
NCR(s) associated with the container? (e.g., Prohibited Items)	[X] No [ ] Yes NCR No.: N/A NCR No.: N/A

Section 2: Waste Container Data	
Container Type:	55 Gallon Drum
TRUCON Code:	OR 225
Waste Matrix Code:	S5400
Waste Stream I.D.:	OR-REDC-CH-HET
Waste Container Weights:	Gross Wt.: 61.9 kg Tare Wt.: 33.2 kg Net Wt.: 28.7 kg
Rigid Liner and Liner Vent Description:	Liner: [X] No [ ] Yes Lid: [X] No [ ] Yes Type: [ ] 30-mil [ ] 90-mil [ ] 110-mil [ ] 125-mil Vented: [ ] No [ ] Yes [X] N/A Punctured: [X] No [ ] Yes Mechanical Vent: [X] No [ ] Yes Fiberboard Liner: [X] No [ ] Yes Lead Lined: [X] No [ ] Yes
Number of Layers of Confinement:	Appears to be 1 layer
Volume Utilization Percentage:	90 %

CCP Radiography Data Sheet

Waste Container ID: X10C1300503A

Section 3: Container Inventory and Comments (Detailed descriptions)	
IM:	Electrical equipment, metal hardware, scrap metal
AM:	
OM:	
OI:	Glass containers, glass labware, absorbent
C:	Cloth
R:	
XPM:	Plastic caps, plastic containers, plastic sheeting, plastic labware, open 5 GAL. plastic bucket
OR:	
IN:	
S:	

Section 4: Packaging Material and Waste Material Parameters	
Packaging Material:	**Estimated Weight (kg)**
Steel (ST):	27.8
Plastics (PP): Liner bag	1.0
Other: Cardboard Liner (CP)	4.4
Total Packaging Weight	33.2
Waste Material Parameter:	**Estimated Weight (kg)**
Iron-based Metal / Alloys (IM):	12.7
Aluminum-based Metals / Alloys (AM):	
Other Metals (OM):	
Other Inorganic Materials (OI)	5.0
Cellulosics (C):	3.0
Rubber (R):	
Plastics (waste materials) (XPM):	8.0
Organic Matrix (OR):	
Inorganic Matrix (IN):	
Soils (S):	
Total WMP Weight:	28.7

CCP Radiography Data Sheet

Waste Container ID: X10C1300503A

Section 5: RTR Summary (Questions answered "Yes" will be explained in the Comment block, except for Question 1)	
Is there observable liquid?	☐ Yes ☒ No
Is there any observable liquid in internal containers, more than 60 milliliters or 3 percent by volume, whichever is greater?	☐ Yes ☒ No
Is the total volume of observable liquid in the outermost container GREATER than 1% of the container?	☐ Yes ☒ No
Is there observable liquid in payload containers with an EPA Hazardous Waste Number of U134?	☐ Yes ☒ No
Is there an indication of non-radionuclide pyrophoric materials, such as elemental potassium?	☐ Yes ☒ No
Is there an indication of hazardous wastes not occurring as co-contaminants with TRU mixed wastes (non-mixed hazardous wastes)?	☐ Yes ☒ No
Is there an indication of wastes incompatible with backfill, seal and panel closures materials, container and packaging materials, shipping container materials, or other wastes (i.e., waste does NOT match TRUCON Code[s])?	☐ Yes ☒ No
Is there an indication of wastes containing explosives or compressed gases?	☐ Yes ☒ No
Is there an indication of PCBs liquids?	☐ Yes ☒ No
Is there an indication of the waste exhibiting the characteristic of ignitability, corrosivity, or reactivity (EPA Hazardous Waste Numbers of D001, D002, or D003)?	☐ Yes ☒ No
Is the physical form of the waste inconsistent with the Waste Stream Description or the Waste Matrix Code?	☐ Yes ☒ No
CH or RH TRAMPAC	
Are there heat-sealed bags (unvented) GREATER than 4 liters and LESS than 390 square inches in the waste, or heat sealed bags not authorized in the RH TRUCON Code?	☐ Yes ☒ No
Were there Non-approved Closure Methods used on liner bags or inner bags greater than 4 liters?	☐ Yes ☒ No
Are there sealed containers GREATER than 4 liters?	☐ Yes ☒ No
Are there indications of inadequate protection for heavy and/or sharp objects?	☐ Yes ☒ No
Comments: N/A	

RTR Operator:

Eric Lyles		3/17/2016
Print Name	Signature	Date

CCP Radiography Data Sheet

Section 1: General Information		
[X] RTR Examination	[ ] RTR Replicate Scan	[ ] RTR Independent Observation
Site ID:	ORNL	
Batch Number:	OR-RTR6-0739	
Examination Date:	3/17/2016	
Waste Container ID:	X10C1001967A	
Video/Audio Recorded Media Number:	OR-RTR6-0739	A&B
Procedure and Revision No.:	CCP-TP-053	Rev. 15
NCR(s) associated with the container? (e.g., Prohibited Items)	[X] No [ ] Yes NCR No.: N/A NCR No.: N/A	

Section 2: Waste Container Data	
Container Type:	55 Gallon Drum
TRUCON Code:	OR 225
Waste Matrix Code:	S5400
Waste Stream I.D.:	OR-REDC-CH-HET
Waste Container Weights:	Gross Wt.: 59.7 kg Tare Wt.: 33.2 kg Net Wt.: 26.5 kg
Rigid Liner and Liner Vent Description:	Liner: [X] No [ ] Yes Lid: [X] No [ ] Yes Type: [ ] 30-mil [ ] 90-mil [ ] 110-mil [ ] 125-mil Vented: [ ] No [ ] Yes [X] N/A Punctured: [X] No [ ] Yes Mechanical Vent: [X] No [ ] Yes Fiberboard Liner: [X] No [ ] Yes Lead Lined: [X] No [ ] Yes
Number of Layers of Confinement:	Appears to be 1 layer
Volume Utilization Percentage:	95 %

CCP Radiography Data Sheet

Waste Container ID: X10C1001967A

Section 3: Container Inventory and Comments (Detailed descriptions)	
IM:	Scrap metal, paint can, metal lid
AM:	
OM:	
OI:	Absorbent, glass containers, glass labware, broken glass
C:	Cloth
R:	
XPM:	Plastic pans, plastic containers, plastic labware, plastic caps
OR:	
IN:	
S:	

Section 4: Packaging Material and Waste Material Parameters	
Packaging Material:	**Estimated Weight (kg)**
Steel (ST):	27.8
Plastics (PP): Liner bag	1.0
Other: Cardboard Liner (CP)	4.4
Total Packaging Weight	33.2
Waste Material Parameter:	**Estimated Weight (kg)**
Iron-based Metal / Alloys (IM):	1.0
Aluminum-based Metals / Alloys (AM):	
Other Metals (OM):	
Other Inorganic Materials (OI)	12.0
Cellulosics (C):	4.0
Rubber (R):	
Plastics (waste materials) (XPM):	9.5
Organic Matrix (OR):	
Inorganic Matrix (IN):	
Soils (S):	
Total WMP Weight:	26.5

CCP Radiography Data Sheet

Waste Container ID: X10C1001967A

Section 5: RTR Summary (Questions answered "Yes" will be explained in the Comment block, except for Question 1)	
Is there observable liquid?	☐ Yes ☒ No
Is there any observable liquid in internal containers, more than 60 milliliters or 3 percent by volume, whichever is greater?	☐ Yes ☒ No
Is the total volume of observable liquid in the outermost container GREATER than 1% of the container?	☐ Yes ☒ No
Is there observable liquid in payload containers with an EPA Hazardous Waste Number of U134?	☐ Yes ☒ No
Is there an indication of non-radionuclide pyrophoric materials, such as elemental potassium?	☐ Yes ☒ No
Is there an indication of hazardous wastes not occurring as co-contaminants with TRU mixed wastes (non-mixed hazardous wastes)?	☐ Yes ☒ No
Is there an indication of wastes incompatible with backfill, seal and panel closures materials, container and packaging materials, shipping container materials, or other wastes (i.e., waste does NOT match TRUCON Code[s])?	☐ Yes ☒ No
Is there an indication of wastes containing explosives or compressed gases?	☐ Yes ☒ No
Is there an indication of PCBs liquids?	☐ Yes ☒ No
Is there an indication of the waste exhibiting the characteristic of ignitability, corrosivity, or reactivity (EPA Hazardous Waste Numbers of D001, D002, or D003)?	☐ Yes ☒ No
Is the physical form of the waste inconsistent with the Waste Stream Description or the Waste Matrix Code?	☐ Yes ☒ No
CH or RH TRAMPAC	
Are there heat-sealed bags (unvented) GREATER than 4 liters and LESS than 390 square inches in the waste, or heat sealed bags not authorized in the RH TRUCON Code?	☐ Yes ☒ No
Were there Non-approved Closure Methods used on liner bags or inner bags greater than 4 liters?	☐ Yes ☒ No
Are there sealed containers GREATER than 4 liters?	☐ Yes ☒ No
Are there indications of inadequate protection for heavy and/or sharp objects?	☐ Yes ☒ No
Comments: N/A	

RTR Operator:

Eric Lyles		3/17/2016
Print Name	Signature	Date

CCP Radiography Data Sheet

Section 1: General Information	
[X] RTR Examination [ ] RTR Replicate Scan [ ] RTR Independent Observation	
Site ID:	ORNL
Batch Number:	OR-RTR6-0739
Examination Date:	3/17/2016
Waste Container ID:	X10C0800175A
Video/Audio Recorded Media Number:	OR-RTR6-0739 A&B
Procedure and Revision No.:	CCP-TP-053 Rev. 15
NCR(s) associated with the container? (e.g., Prohibited Items)	[X] No [ ] Yes NCR No.: N/A NCR No.: N/A

Section 2: Waste Container Data	
Container Type:	55 Gallon Drum
TRUCON Code:	OR 225
Waste Matrix Code:	S5400
Waste Stream I.D.:	OR-REDC-CH-HET
Waste Container Weights:	Gross Wt.: 61.9 kg Tare Wt.: 33.2 kg Net Wt.: 28.7 kg
Rigid Liner and Liner Vent Description:	Liner: [X] No [ ] Yes Lid: [X] No [ ] Yes Type: [ ] 30-mil [ ] 90-mil [ ] 110-mil [ ] 125-mil Vented: [ ] No [ ] Yes [X] N/A Punctured: [X] No [ ] Yes Mechanical Vent: [X] No [ ] Yes Fiberboard Liner: [X] No [ ] Yes Lead Lined: [X] No [ ] Yes
Number of Layers of Confinement:	Appears to be 1 layer
Volume Utilization Percentage:	90 %

CCP Radiography Data Sheet

Waste Container ID: X10C0800175A

Section 3: Container Inventory and Comments (Detailed descriptions)	
IM:	Washers, scrap metal, hand tools, scissors
AM:	
OM:	
OI:	Absorbent, glass containers, glass labware, broken glass
C:	
R:	
XPM:	Plastic sheeting, plastic containers, plastic labware, plastic caps
OR:	
IN:	
S:	

Section 4: Packaging Material and Waste Material Parameters	
Packaging Material:	**Estimated Weight (kg)**
Steel (ST):	27.8
Plastics (PP): Liner bag	1.0
Other: Cardboard Liner (CP)	4.4
Total Packaging Weight	33.2
Waste Material Parameter:	**Estimated Weight (kg)**
Iron-based Metal / Alloys (IM):	2.0
Aluminum-based Metals / Alloys (AM):	
Other Metals (OM):	
Other Inorganic Materials (OI)	15.7
Cellulosics (C):	
Rubber (R):	
Plastics (waste materials) (XPM):	11.0
Organic Matrix (OR):	
Inorganic Matrix (IN):	
Soils (S):	
Total WMP Weight:	28.7

CCP Radiography Data Sheet

Waste Container ID: X10C0800175A

Section 5: RTR Summary (Questions answered "Yes" will be explained in the Comment block, except for Question 1)	
Is there observable liquid?	☐ Yes ☒ No
Is there any observable liquid in internal containers, more than 60 milliliters or 3 percent by volume, whichever is greater?	☐ Yes ☒ No
Is the total volume of observable liquid in the outermost container GREATER than 1% of the container?	☐ Yes ☒ No
Is there observable liquid in payload containers with an EPA Hazardous Waste Number of U134?	☐ Yes ☒ No
Is there an indication of non-radionuclide pyrophoric materials, such as elemental potassium?	☐ Yes ☒ No
Is there an indication of hazardous wastes not occurring as co-contaminants with TRU mixed wastes (non-mixed hazardous wastes)?	☐ Yes ☒ No
Is there an indication of wastes incompatible with backfill, seal and panel closures materials, container and packaging materials, shipping container materials, or other wastes (i.e., waste does NOT match TRUCON Code[s])?	☐ Yes ☒ No
Is there an indication of wastes containing explosives or compressed gases?	☐ Yes ☒ No
Is there an indication of PCBs liquids?	☐ Yes ☒ No
Is there an indication of the waste exhibiting the characteristic of ignitability, corrosivity, or reactivity (EPA Hazardous Waste Numbers of D001, D002, or D003)?	☐ Yes ☒ No
Is the physical form of the waste inconsistent with the Waste Stream Description or the Waste Matrix Code?	☐ Yes ☒ No
CH or RH TRAMPAC	
Are there heat-sealed bags (unvented) GREATER than 4 liters and LESS than 390 square inches in the waste, or heat sealed bags not authorized in the RH TRUCON Code?	☐ Yes ☒ No
Were there Non-approved Closure Methods used on liner bags or inner bags greater than 4 liters?	☐ Yes ☒ No
Are there sealed containers GREATER than 4 liters?	☐ Yes ☒ No
Are there indications of inadequate protection for heavy and/or sharp objects?	☐ Yes ☒ No
Comments: N/A	

RTR Operator:

Eric Lyles		3/17/2016
Print Name	Signature	Date

CCP Radiography Data Sheet

Section 1: General Information	
[X] RTR Examination [ ] RTR Replicate Scan [ ] RTR Independent Observation	
Site ID:	ORNL
Batch Number:	OR-RTR6-0739
Examination Date:	3/17/2016
Waste Container ID:	X10C0801685A
Video/Audio Recorded Media Number:	OR-RTR6-0739 A&B
Procedure and Revision No.:	CCP-TP-053 Rev. 15
NCR(s) associated with the container? (e.g., Prohibited Items)	[X] No [ ] Yes NCR No.: N/A NCR No.: N/A

Section 2: Waste Container Data	
Container Type:	55 Gallon Drum
TRUCON Code:	OR 225
Waste Matrix Code:	S5400
Waste Stream I.D.:	OR-REDC-CH-HET
Waste Container Weights:	Gross Wt.: 91.8 kg Tare Wt.: 33.2 kg Net Wt.: 58.6 kg
Rigid Liner and Liner Vent Description:	Liner: [X] No [ ] Yes Lid: [X] No [ ] Yes Type: [ ] 30-mil [ ] 90-mil [ ] 110-mil [ ] 125-mil Vented: [ ] No [ ] Yes [X] N/A Punctured: [X] No [ ] Yes Mechanical Vent: [X] No [ ] Yes Fiberboard Liner: [X] No [ ] Yes Lead Lined: [X] No [ ] Yes
Number of Layers of Confinement:	Appears to be 1 layer
Volume Utilization Percentage:	85 %

CCP Radiography Data Sheet

Waste Container ID: X10C0801685A

Section 3: Container Inventory and Comments (Detailed descriptions)	
IM:	Power tools, scrap metal, metal hardware, electrical equipment, saw blades
AM:	
OM:	
OI:	Absorbent
C:	Cloth
R:	
XPM:	Plastic sheeting
OR:	
IN:	
S:	

Section 4: Packaging Material and Waste Material Parameters	
Packaging Material:	**Estimated Weight (kg)**
Steel (ST):	27.8
Plastics (PP): Liner bag	1.0
Other: Cardboard Liner (CP)	4.4
Total Packaging Weight	33.2
Waste Material Parameter:	**Estimated Weight (kg)**
Iron-based Metal / Alloys (IM):	47.6
Aluminum-based Metals / Alloys (AM):	
Other Metals (OM):	
Other Inorganic Materials (OI)	4.0
Cellulosics (C):	3.0
Rubber (R):	
Plastics (waste materials) (XPM):	4.0
Organic Matrix (OR):	
Inorganic Matrix (IN):	
Soils (S):	
Total WMP Weight:	58.6

CCP Radiography Data Sheet

Waste Container ID: X10C0801685A

Section 5: RTR Summary (Questions answered "Yes" will be explained in the Comment block, except for Question 1)	
Is there observable liquid?	☐ Yes ☒ No
Is there any observable liquid in internal containers, more than 60 milliliters or 3 percent by volume, whichever is greater?	☐ Yes ☒ No
Is the total volume of observable liquid in the outermost container GREATER than 1% of the container?	☐ Yes ☒ No
Is there observable liquid in payload containers with an EPA Hazardous Waste Number of U134?	☐ Yes ☒ No
Is there an indication of non-radionuclide pyrophoric materials, such as elemental potassium?	☐ Yes ☒ No
Is there an indication of hazardous wastes not occurring as co-contaminants with TRU mixed wastes (non-mixed hazardous wastes)?	☐ Yes ☒ No
Is there an indication of wastes incompatible with backfill, seal and panel closures materials, container and packaging materials, shipping container materials, or other wastes (i.e., waste does NOT match TRUCON Code[s])?	☐ Yes ☒ No
Is there an indication of wastes containing explosives or compressed gases?	☐ Yes ☒ No
Is there an indication of PCBs liquids?	☐ Yes ☒ No
Is there an indication of the waste exhibiting the characteristic of ignitability, corrosivity, or reactivity (EPA Hazardous Waste Numbers of D001, D002, or D003)?	☐ Yes ☒ No
Is the physical form of the waste inconsistent with the Waste Stream Description or the Waste Matrix Code?	☐ Yes ☒ No
CH or RH TRAMPAC	
Are there heat-sealed bags (unvented) GREATER than 4 liters and LESS than 390 square inches in the waste, or heat sealed bags not authorized in the RH TRUCON Code?	☐ Yes ☒ No
Were there Non-approved Closure Methods used on liner bags or inner bags greater than 4 liters?	☐ Yes ☒ No
Are there sealed containers GREATER than 4 liters?	☐ Yes ☒ No
Are there indications of inadequate protection for heavy and/or sharp objects?	☐ Yes ☒ No
Comments: N/A	

RTR Operator:

Eric Lyles		3/17/2016
Print Name	Signature	Date

CCP Radiography Data Sheet

Section 1: General Information	
[X] RTR Examination [ ] RTR Replicate Scan [ ] RTR Independent Observation	
Site ID:	ORNL
Batch Number:	OR-RTR6-0739
Examination Date:	3/17/2016
Waste Container ID:	X10C1200366A
Video/Audio Recorded Media Number:	OR-RTR6-0739 A&B
Procedure and Revision No.:	CCP-TP-053 Rev. 15
NCR(s) associated with the container? (e.g., Prohibited Items)	[X] No [ ] Yes NCR No.: N/A NCR No.: N/A

Section 2: Waste Container Data	
Container Type:	55 Gallon Drum
TRUCON Code:	OR 225
Waste Matrix Code:	S5400
Waste Stream I.D.:	OR-REDC-CH-HET
Waste Container Weights:	Gross Wt.: 59.2 kg Tare Wt.: 33.2 kg Net Wt.: 26.0 kg
Rigid Liner and Liner Vent Description:	Liner: [X] No [ ] Yes Lid: [X] No [ ] Yes Type: [ ] 30-mil [ ] 90-mil [ ] 110-mil [ ] 125-mil Vented: [ ] No [ ] Yes [X] N/A Punctured: [X] No [ ] Yes Mechanical Vent: [X] No [ ] Yes Fiberboard Liner: [X] No [ ] Yes Lead Lined: [X] No [ ] Yes
Number of Layers of Confinement:	Appears to be 1 layer
Volume Utilization Percentage:	85 %

CCP Radiography Data Sheet

Waste Container ID: X10C1200366A

Section 3: Container Inventory and Comments (Detailed descriptions)	
IM:	Scrap metal, scissors, hand tools
AM:	
OM:	
OI:	Glass containers, glass labware, absorbent
C:	Cloth
R:	
XPM:	Plastic sheeting, plastic containers, plastic caps, plastic labware
OR:	
IN:	
S:	

Section 4: Packaging Material and Waste Material Parameters	
Packaging Material:	**Estimated Weight (kg)**
Steel (ST):	27.8
Plastics (PP): Liner bag	1.0
Other: Cardboard Liner (CP)	4.4
Total Packaging Weight	33.2
Waste Material Parameter:	**Estimated Weight (kg)**
Iron-based Metal / Alloys (IM):	5.0
Aluminum-based Metals / Alloys (AM):	
Other Metals (OM):	
Other Inorganic Materials (OI)	10.0
Cellulosics (C):	3.0
Rubber (R):	
Plastics (waste materials) (XPM):	8.0
Organic Matrix (OR):	
Inorganic Matrix (IN):	
Soils (S):	
Total WMP Weight:	26.0

CCP Radiography Data Sheet

Waste Container ID: X10C1200366A

Section 5: RTR Summary (Questions answered "Yes" will be explained in the Comment block, except for Question 1)	
Is there observable liquid?	☐ Yes ☒ No
Is there any observable liquid in internal containers, more than 60 milliliters or 3 percent by volume, whichever is greater?	☐ Yes ☒ No
Is the total volume of observable liquid in the outermost container GREATER than 1% of the container?	☐ Yes ☒ No
Is there observable liquid in payload containers with an EPA Hazardous Waste Number of U134?	☐ Yes ☒ No
Is there an indication of non-radionuclide pyrophoric materials, such as elemental potassium?	☐ Yes ☒ No
Is there an indication of hazardous wastes not occurring as co-contaminants with TRU mixed wastes (non-mixed hazardous wastes)?	☐ Yes ☒ No
Is there an indication of wastes incompatible with backfill, seal and panel closures materials, container and packaging materials, shipping container materials, or other wastes (i.e., waste does NOT match TRUCON Code[s])?	☐ Yes ☒ No
Is there an indication of wastes containing explosives or compressed gases?	☐ Yes ☒ No
Is there an indication of PCBs liquids?	☐ Yes ☒ No
Is there an indication of the waste exhibiting the characteristic of ignitability, corrosivity, or reactivity (EPA Hazardous Waste Numbers of D001, D002, or D003)?	☐ Yes ☒ No
Is the physical form of the waste inconsistent with the Waste Stream Description or the Waste Matrix Code?	☐ Yes ☒ No
CH or RH TRAMPAC	
Are there heat-sealed bags (unvented) GREATER than 4 liters and LESS than 390 square inches in the waste, or heat sealed bags not authorized in the RH TRUCON Code?	☐ Yes ☒ No
Were there Non-approved Closure Methods used on liner bags or inner bags greater than 4 liters?	☐ Yes ☒ No
Are there sealed containers GREATER than 4 liters?	☐ Yes ☒ No
Are there indications of inadequate protection for heavy and/or sharp objects?	☐ Yes ☒ No
Comments: N/A	

RTR Operator:

Eric Lyles		3/17/2016
Print Name	Signature	Date

CCP Radiography Data Sheet

Section 1: General Information	
[X] RTR Examination [ ] RTR Replicate Scan [ ] RTR Independent Observation	
Site ID:	ORNL
Batch Number:	OR-RTR6-0739
Examination Date:	3/17/2016
Waste Container ID:	X10C1001973A
Video/Audio Recorded Media Number:	OR-RTR6-0739 A&B
Procedure and Revision No.:	CCP-TP-053 Rev. 15
NCR(s) associated with the container? (e.g., Prohibited Items)	[X] No [ ] Yes NCR No.: N/A NCR No.: N/A

Section 2: Waste Container Data	
Container Type:	55 Gallon Drum
TRUCON Code:	OR 225
Waste Matrix Code:	S5400
Waste Stream I.D.:	OR-REDC-CH-HET
Waste Container Weights:	Gross Wt.: 62.4 kg Tare Wt.: 33.2 kg Net Wt.: 29.2 kg
Rigid Liner and Liner Vent Description:	Liner: [X] No [ ] Yes Lid: [X] No [ ] Yes Type: [ ] 30-mil [ ] 90-mil [ ] 110-mil [ ] 125-mil Vented: [ ] No [ ] Yes [X] N/A Punctured: [X] No [ ] Yes Mechanical Vent: [X] No [ ] Yes Fiberboard Liner: [X] No [ ] Yes Lead Lined: [X] No [ ] Yes
Number of Layers of Confinement:	Appears to be 1 layer
Volume Utilization Percentage:	90 %

CCP Radiography Data Sheet

Waste Container ID: X10C1001973A

Section 3: Container Inventory and Comments (Detailed descriptions)	
IM:	Paint can, scrap metal, metal lids
AM:	
OM:	
OI:	Broken glass, absorbent, glass containers, glass labware
C:	
R:	
XPM:	Plastic sheeting, plastic containers, plastic caps, plastic labware
OR:	
IN:	
S:	

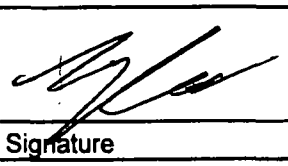
Section 4: Packaging Material and Waste Material Parameters	
Packaging Material:	**Estimated Weight (kg)**
Steel (ST):	27.8
Plastics (PP): Liner bag	1.0
Other: Cardboard Liner (CP)	4.4
Total Packaging Weight	33.2
Waste Material Parameter:	**Estimated Weight (kg)**
Iron-based Metal / Alloys (IM):	8.0
Aluminum-based Metals / Alloys (AM):	
Other Metals (OM):	
Other Inorganic Materials (OI)	9.2
Cellulosics (C):	
Rubber (R):	
Plastics (waste materials) (XPM):	12.0
Organic Matrix (OR):	
Inorganic Matrix (IN):	
Soils (S):	
Total WMP Weight:	29.2

CCP Radiography Data Sheet

Waste Container ID: X10C1001973A

Section 5: RTR Summary (Questions answered "Yes" will be explained in the Comment block, except for Question 1)	
Is there observable liquid?	☐ Yes ☒ No
Is there any observable liquid in internal containers, more than 60 milliliters or 3 percent by volume, whichever is greater?	☐ Yes ☒ No
Is the total volume of observable liquid in the outermost container GREATER than 1% of the container?	☐ Yes ☒ No
Is there observable liquid in payload containers with an EPA Hazardous Waste Number of U134?	☐ Yes ☒ No
Is there an indication of non-radionuclide pyrophoric materials, such as elemental potassium?	☐ Yes ☒ No
Is there an indication of hazardous wastes not occurring as co-contaminants with TRU mixed wastes (non-mixed hazardous wastes)?	☐ Yes ☒ No
Is there an indication of wastes incompatible with backfill, seal and panel closures materials, container and packaging materials, shipping container materials, or other wastes (i.e., waste does NOT match TRUCON Code[s])?	☐ Yes ☒ No
Is there an indication of wastes containing explosives or compressed gases?	☐ Yes ☒ No
Is there an indication of PCBs liquids?	☐ Yes ☒ No
Is there an indication of the waste exhibiting the characteristic of ignitability, corrosivity, or reactivity (EPA Hazardous Waste Numbers of D001, D002, or D003)?	☐ Yes ☒ No
Is the physical form of the waste inconsistent with the Waste Stream Description or the Waste Matrix Code?	☐ Yes ☒ No
CH or RH TRAMPAC	
Are there heat-sealed bags (unvented) GREATER than 4 liters and LESS than 390 square inches in the waste, or heat sealed bags not authorized in the RH TRUCON Code?	☐ Yes ☒ No
Were there Non-approved Closure Methods used on liner bags or inner bags greater than 4 liters?	☐ Yes ☒ No
Are there sealed containers GREATER than 4 liters?	☐ Yes ☒ No
Are there indications of inadequate protection for heavy and/or sharp objects?	☐ Yes ☒ No
Comments: N/A	

RTR Operator:

Eric Lyles		3/17/2016
Print Name	Signature	Date

CCP Radiography Data Sheet

Section 1: General Information	
[X] RTR Examination [ ] RTR Replicate Scan [ ] RTR Independent Observation	
Site ID:	ORNL
Batch Number:	OR-RTR6-0739
Examination Date:	3/17/2016
Waste Container ID:	X10C0801685B
Video/Audio Recorded Media Number:	OR-RTR6-0739 A&B
Procedure and Revision No.:	CCP-TP-053 Rev. 15
NCR(s) associated with the container? (e.g., Prohibited Items)	[X] No [ ] Yes NCR No.: N/A NCR No.: N/A

Section 2: Waste Container Data	
Container Type:	55 Gallon Drum
TRUCON Code:	OR 225
Waste Matrix Code:	S5400
Waste Stream I.D.:	OR-REDC-CH-HET
Waste Container Weights:	Gross Wt.: 72.4 kg Tare Wt.: 33.2 kg Net Wt.: 39.2 kg
Rigid Liner and Liner Vent Description:	Liner: [X] No [ ] Yes Lid: [X] No [ ] Yes Type: [ ] 30-mil [ ] 90-mil [ ] 110-mil [ ] 125-mil Vented: [ ] No [ ] Yes [X] N/A Punctured: [X] No [ ] Yes Mechanical Vent: [X] No [ ] Yes Fiberboard Liner: [X] No [ ] Yes Lead Lined: [X] No [ ] Yes
Number of Layers of Confinement:	Appears to be 1 layer
Volume Utilization Percentage:	80 %

CCP Radiography Data Sheet

Waste Container ID: X10C0801685B

Section 3: Container Inventory and Comments (Detailed descriptions)	
IM:	Hand tool, utility knife, scrap metal
AM:	
OM:	
OI:	Absorbent
C:	Cloth
R:	
XPM:	Plastic sheeting
OR:	
IN:	
S:	

Section 4: Packaging Material and Waste Material Parameters	
Packaging Material:	**Estimated Weight (kg)**
Steel (ST):	27.8
Plastics (PP): Liner bag	1.0
Other: Cardboard Liner (CP)	4.4
Total Packaging Weight	33.2
Waste Material Parameter:	**Estimated Weight (kg)**
Iron-based Metal / Alloys (IM):	29.2
Aluminum-based Metals / Alloys (AM):	
Other Metals (OM):	
Other Inorganic Materials (OI)	2.0
Cellulosics (C):	3.0
Rubber (R):	
Plastics (waste materials) (XPM):	5.0
Organic Matrix (OR):	
Inorganic Matrix (IN):	
Soils (S):	
Total WMP Weight:	39.2

CCP Radiography Data Sheet

Waste Container ID: X10C0801685B

Section 5: RTR Summary (Questions answered "Yes" will be explained in the Comment block, except for Question 1)	
Is there observable liquid?	☐ Yes ☒ No
Is there any observable liquid in internal containers, more than 60 milliliters or 3 percent by volume, whichever is greater?	☐ Yes ☒ No
Is the total volume of observable liquid in the outermost container GREATER than 1% of the container?	☐ Yes ☒ No
Is there observable liquid in payload containers with an EPA Hazardous Waste Number of U134?	☐ Yes ☒ No
Is there an indication of non-radionuclide pyrophoric materials, such as elemental potassium?	☐ Yes ☒ No
Is there an indication of hazardous wastes not occurring as co-contaminants with TRU mixed wastes (non-mixed hazardous wastes)?	☐ Yes ☒ No
Is there an indication of wastes incompatible with backfill, seal and panel closures materials, container and packaging materials, shipping container materials, or other wastes (i.e., waste does NOT match TRUCON Code[s])?	☐ Yes ☒ No
Is there an indication of wastes containing explosives or compressed gases?	☐ Yes ☒ No
Is there an indication of PCBs liquids?	☐ Yes ☒ No
Is there an indication of the waste exhibiting the characteristic of ignitability, corrosivity, or reactivity (EPA Hazardous Waste Numbers of D001, D002, or D003)?	☐ Yes ☒ No
Is the physical form of the waste inconsistent with the Waste Stream Description or the Waste Matrix Code?	☐ Yes ☒ No
CH or RH TRAMPAC	
Are there heat-sealed bags (unvented) GREATER than 4 liters and LESS than 390 square inches in the waste, or heat sealed bags not authorized in the RH TRUCON Code?	☐ Yes ☒ No
Were there Non-approved Closure Methods used on liner bags or inner bags greater than 4 liters?	☐ Yes ☒ No
Are there sealed containers GREATER than 4 liters?	☐ Yes ☒ No
Are there indications of inadequate protection for heavy and/or sharp objects?	☐ Yes ☒ No
Comments: N/A	

RTR Operator:

Eric Lyles		3/17/2016
Print Name	Signature	Date

CCP Radiography Data Sheet

CCP-TP-053 Attachment 2

Section 1: General Information	
[X] RTR Examination [ ] RTR Replicate Scan [ ] RTR Independent Observation	
Site ID:	ORNL
Batch Number:	OR-RTR6-0739
Examination Date:	3/17/2016
Waste Container ID:	X10C0900761A
Video/Audio Recorded Media Number:	OR-RTR6-0739 A&B
Procedure and Revision No.:	CCP-TP-053 Rev. 15
NCR(s) associated with the container? (e.g., Prohibited Items)	[X] No [ ] Yes NCR No.: N/A NCR No.: N/A

Section 2: Waste Container Data	
Container Type:	55 Gallon Drum
TRUCON Code:	OR 225
Waste Matrix Code:	S5400
Waste Stream I.D.:	OR-REDC-CH-HET
Waste Container Weights:	Gross Wt.: 61.9 kg Tare Wt.: 33.2 kg Net Wt.: 28.7 kg
Rigid Liner and Liner Vent Description:	Liner: [X] No [ ] Yes Lid: [X] No [ ] Yes Type: [ ] 30-mil [ ] 90-mil [ ] 110-mil [ ] 125-mil Vented: [ ] No [ ] Yes [X] N/A Punctured: [X] No [ ] Yes Mechanical Vent: [X] No [ ] Yes Fiberboard Liner: [X] No [ ] Yes Lead Lined: [X] No [ ] Yes
Number of Layers of Confinement:	Appears to be 1 layer
Volume Utilization Percentage:	90 %

CCP Radiography Data Sheet

Waste Container ID: X10C0900761A

Section 3: Container Inventory and Comments (Detailed descriptions)	
IM:	Scrap metal, hand tools, metal lids, scissors, utility knife
AM:	
OM:	
OI:	Glass containers, broken glass, glass labware
C:	Wooden framed filter, cloth, paint brush
R:	
XPM:	Plastic sheeting, plastic containers, plastic caps
OR:	
IN:	
S:	

Section 4: Packaging Material and Waste Material Parameters	
Packaging Material:	**Estimated Weight (kg)**
Steel (ST):	27.8
Plastics (PP): Liner bag	1.0
Other: Cardboard Liner (CP)	4.4
Total Packaging Weight	33.2
Waste Material Parameter:	**Estimated Weight (kg)**
Iron-based Metal / Alloys (IM):	6.0
Aluminum-based Metals / Alloys (AM):	
Other Metals (OM):	
Other Inorganic Materials (OI)	7.7
Cellulosics (C):	8.0
Rubber (R):	
Plastics (waste materials) (XPM):	7.0
Organic Matrix (OR):	
Inorganic Matrix (IN):	
Soils (S):	
Total WMP Weight:	28.7

CCP Radiography Data Sheet

Waste Container ID: X10C0900761A

Section 5: RTR Summary (Questions answered "Yes" will be explained in the Comment block, except for Question 1)	
Is there observable liquid?	☐ Yes ☒ No
Is there any observable liquid in internal containers, more than 60 milliliters or 3 percent by volume, whichever is greater?	☐ Yes ☒ No
Is the total volume of observable liquid in the outermost container GREATER than 1% of the container?	☐ Yes ☒ No
Is there observable liquid in payload containers with an EPA Hazardous Waste Number of U134?	☐ Yes ☒ No
Is there an indication of non-radionuclide pyrophoric materials, such as elemental potassium?	☐ Yes ☒ No
Is there an indication of hazardous wastes not occurring as co-contaminants with TRU mixed wastes (non-mixed hazardous wastes)?	☐ Yes ☒ No
Is there an indication of wastes incompatible with backfill, seal and panel closures materials, container and packaging materials, shipping container materials, or other wastes (i.e., waste does NOT match TRUCON Code[s])?	☐ Yes ☒ No
Is there an indication of wastes containing explosives or compressed gases?	☐ Yes ☒ No
Is there an indication of PCBs liquids?	☐ Yes ☒ No
Is there an indication of the waste exhibiting the characteristic of ignitability, corrosivity, or reactivity (EPA Hazardous Waste Numbers of D001, D002, or D003)?	☐ Yes ☒ No
Is the physical form of the waste inconsistent with the Waste Stream Description or the Waste Matrix Code?	☐ Yes ☒ No
CH or RH TRAMPAC	
Are there heat-sealed bags (unvented) GREATER than 4 liters and LESS than 390 square inches in the waste, or heat sealed bags not authorized in the RH TRUCON Code?	☐ Yes ☒ No
Were there Non-approved Closure Methods used on liner bags or inner bags greater than 4 liters?	☐ Yes ☒ No
Are there sealed containers GREATER than 4 liters?	☐ Yes ☒ No
Are there indications of inadequate protection for heavy and/or sharp objects?	☐ Yes ☒ No
Comments: N/A	

RTR Operator:

Eric Lyles		3/17/2016
Print Name	Signature	Date

CCP Radiography Data Sheet

Section 1: General Information	
[X] RTR Examination [ ] RTR Replicate Scan [ ] RTR Independent Observation	
Site ID:	ORNL
Batch Number:	OR-RTR6-0739
Examination Date:	3/17/2016
Waste Container ID:	X10C0402057A1
Video/Audio Recorded Media Number:	OR-RTR6-0739 A&B
Procedure and Revision No.:	CCP-TP-053 Rev. 15
NCR(s) associated with the container? (e.g., Prohibited Items)	[X] No [ ] Yes NCR No.: N/A NCR No.: N/A

Section 2: Waste Container Data	
Container Type:	55 Gallon Drum
TRUCON Code:	OR 225
Waste Matrix Code:	S5400
Waste Stream I.D.:	OR-REDC-CH-HET
Waste Container Weights:	Gross Wt.: 70.6 kg Tare Wt.: 33.2 kg Net Wt.: 37.4 kg
Rigid Liner and Liner Vent Description:	Liner: [X] No [ ] Yes Lid: [X] No [ ] Yes Type: [ ] 30-mil [ ] 90-mil [ ] 110-mil [ ] 125-mil Vented: [ ] No [ ] Yes [X] N/A Punctured: [X] No [ ] Yes Mechanical Vent: [X] No [ ] Yes Fiberboard Liner: [X] No [ ] Yes Lead Lined: [X] No [ ] Yes
Number of Layers of Confinement:	Appears to be 1 layer
Volume Utilization Percentage:	100 %

CCP Radiography Data Sheet

Waste Container ID: X10C0402057A1

Section 3: Container Inventory and Comments (Detailed descriptions)	
IM:	Washers, scrap metal, hand tool
AM:	
OM:	
OI:	Glass containers, broken glass, absorbent, glass labware
C:	Cardboard, cloth
R:	
XPM:	Plastic containers, plastic sheeting, plastic labware, plastic caps
OR:	
IN:	
S:	

Section 4: Packaging Material and Waste Material Parameters	
Packaging Material:	**Estimated Weight (kg)**
Steel (ST):	27.8
Plastics (PP): Liner bag	1.0
Other: Cardboard Liner (CP)	4.4
Total Packaging Weight	33.2
Waste Material Parameter:	**Estimated Weight (kg)**
Iron-based Metal / Alloys (IM):	3.0
Aluminum-based Metals / Alloys (AM):	
Other Metals (OM):	
Other Inorganic Materials (OI)	14.4
Cellulosics (C):	8.0
Rubber (R):	
Plastics (waste materials) (XPM):	12.0
Organic Matrix (OR):	
Inorganic Matrix (IN):	
Soils (S):	
Total WMP Weight:	37.4

CCP Radiography Data Sheet

Waste Container ID: X10C0402057A1

Section 5: RTR Summary (Questions answered "Yes" will be explained in the Comment block, except for Question 1)	
Is there observable liquid?	☐ Yes ☒ No
Is there any observable liquid in internal containers, more than 60 milliliters or 3 percent by volume, whichever is greater?	☐ Yes ☒ No
Is the total volume of observable liquid in the outermost container GREATER than 1% of the container?	☐ Yes ☒ No
Is there observable liquid in payload containers with an EPA Hazardous Waste Number of U134?	☐ Yes ☒ No
Is there an indication of non-radionuclide pyrophoric materials, such as elemental potassium?	☐ Yes ☒ No
Is there an indication of hazardous wastes not occurring as co-contaminants with TRU mixed wastes (non-mixed hazardous wastes)?	☐ Yes ☒ No
Is there an indication of wastes incompatible with backfill, seal and panel closures materials, container and packaging materials, shipping container materials, or other wastes (i.e., waste does NOT match TRUCON Code[s])?	☐ Yes ☒ No
Is there an indication of wastes containing explosives or compressed gases?	☐ Yes ☒ No
Is there an indication of PCBs liquids?	☐ Yes ☒ No
Is there an indication of the waste exhibiting the characteristic of ignitability, corrosivity, or reactivity (EPA Hazardous Waste Numbers of D001, D002, or D003)?	☐ Yes ☒ No
Is the physical form of the waste inconsistent with the Waste Stream Description or the Waste Matrix Code?	☐ Yes ☒ No
CH or RH TRAMPAC	
Are there heat-sealed bags (unvented) GREATER than 4 liters and LESS than 390 square inches in the waste, or heat sealed bags not authorized in the RH TRUCON Code?	☐ Yes ☒ No
Were there Non-approved Closure Methods used on liner bags or inner bags greater than 4 liters?	☐ Yes ☒ No
Are there sealed containers GREATER than 4 liters?	☐ Yes ☒ No
Are there indications of inadequate protection for heavy and/or sharp objects?	☐ Yes ☒ No
Comments: N/A	

RTR Operator:

Eric Lyles		3/17/2016
Print Name	Signature	Date

CCP Radiography Data Sheet

Section 1: General Information	
[X] RTR Examination [ ] RTR Replicate Scan [ ] RTR Independent Observation	
Site ID:	ORNL
Batch Number:	OR-RTR6-0739
Examination Date:	3/17/2016
Waste Container ID:	X10C1001963A
Video/Audio Recorded Media Number:	OR-RTR6-0739 A&B
Procedure and Revision No.:	CCP-TP-053 Rev. 15
NCR(s) associated with the container? (e.g., Prohibited Items)	[X] No [ ] Yes NCR No.: N/A NCR No.: N/A

Section 2: Waste Container Data	
Container Type:	55 Gallon Drum
TRUCON Code:	OR 225
Waste Matrix Code:	S5400
Waste Stream I.D.:	OR-REDC-CH-HET
Waste Container Weights:	Gross Wt.: 58.3 kg Tare Wt.: 33.2 kg Net Wt.: 25.1 kg
Rigid Liner and Liner Vent Description:	Liner: [X] No [ ] Yes Lid: [X] No [ ] Yes Type: [ ] 30-mil [ ] 90-mil [ ] 110-mil [ ] 125-mil Vented: [ ] No [ ] Yes [X] N/A Punctured: [X] No [ ] Yes Mechanical Vent: [X] No [ ] Yes Fiberboard Liner: [X] No [ ] Yes Lead Lined: [X] No [ ] Yes
Number of Layers of Confinement:	Appears to be 1 layer
Volume Utilization Percentage:	85 %

CCP Radiography Data Sheet

Waste Container ID: X10C1001963A

Section 3: Container Inventory and Comments (Detailed descriptions)	
IM:	Scrap metal, utility knife, metal lid
AM:	
OM:	
OI:	Glass containers, glass labware, absorbent, broken glass
C:	
R:	
XPM:	Plastic sheeting, plastic caps, plastic containers, plastic labware
OR:	
IN:	
S:	

Section 4: Packaging Material and Waste Material Parameters	
Packaging Material:	**Estimated Weight (kg)**
Steel (ST):	27.8
Plastics (PP): Liner bag	1.0
Other: Cardboard Liner (CP)	4.4
Total Packaging Weight	33.2
Waste Material Parameter:	**Estimated Weight (kg)**
Iron-based Metal / Alloys (IM):	2.0
Aluminum-based Metals / Alloys (AM):	
Other Metals (OM):	
Other Inorganic Materials (OI)	8.0
Cellulosics (C):	
Rubber (R):	
Plastics (waste materials) (XPM):	15.1
Organic Matrix (OR):	
Inorganic Matrix (IN):	
Soils (S):	
Total WMP Weight:	25.1

CCP Radiography Data Sheet

Waste Container ID: X10C1001963A

Section 5: RTR Summary (Questions answered "Yes" will be explained in the Comment block, except for Question 1)	
Is there observable liquid?	[X] Yes [ ] No
Is there any observable liquid in internal containers, more than 60 milliliters or 3 percent by volume, whichever is greater?	[ ] Yes [X] No
Is the total volume of observable liquid in the outermost container GREATER than 1% of the container?	[ ] Yes [X] No
Is there observable liquid in payload containers with an EPA Hazardous Waste Number of U134?	[ ] Yes [X] No
Is there an indication of non-radionuclide pyrophoric materials, such as elemental potassium?	[ ] Yes [X] No
Is there an indication of hazardous wastes not occurring as co-contaminants with TRU mixed wastes (non-mixed hazardous wastes)?	[ ] Yes [X] No
Is there an indication of wastes incompatible with backfill, seal and panel closures materials, container and packaging materials, shipping container materials, or other wastes (i.e., waste does NOT match TRUCON Code[s])?	[ ] Yes [X] No
Is there an indication of wastes containing explosives or compressed gases?	[ ] Yes [X] No
Is there an indication of PCBs liquids?	[ ] Yes [X] No
Is there an indication of the waste exhibiting the characteristic of ignitability, corrosivity, or reactivity (EPA Hazardous Waste Numbers of D001, D002, or D003)?	[ ] Yes [X] No
Is the physical form of the waste inconsistent with the Waste Stream Description or the Waste Matrix Code?	[ ] Yes [X] No
CH or RH TRAMPAC	
Are there heat-sealed bags (unvented) GREATER than 4 liters and LESS than 390 square inches in the waste, or heat sealed bags not authorized in the RH TRUCON Code?	[ ] Yes [X] No
Were there Non-approved Closure Methods used on liner bags or inner bags greater than 4 liters?	[ ] Yes [X] No
Are there sealed containers GREATER than 4 liters?	[ ] Yes [X] No
Are there indications of inadequate protection for heavy and/or sharp objects?	[ ] Yes [X] No
Comments: N/A	

RTR Operator:

Eric Lyles		3/17/2016
Print Name	Signature	Date

Attachment 1 – CCP Nonconformance Report (NCR)

CCP NONCONFORMANCE REPORT (NCR)

(Use NCR Continuation, Attachment 3, if necessary)

NCR No. NCR-ORNL-0078-16 Revision 0

1. Lot No., Heat No., or Serial No. (if applicable): N/A	2. Process (e.g., NDA, NDE, VE, Other): NDE	3. Batch Data Report #(s): OR-RTR6-0739
4. Order/Work Order/Job Control Number (if applicable): N/A	5. PO # (if applicable): N/A	Container #(s): X10C1001956A
	6. Supplier (if applicable): N/A	

DESCRIPTION OF NONCONFORMANCE

7a. NCR Description: ☐ < 100 nCi/g ☒ Prohibited Item ☐ E-Flag ☐ Receipt Inspection ☐ Transportation ☐ WWIS/WDS ☐ Other

7b. Requirement(s) (Enter Implementing Procedure No., Revision, Section No., & Quoted Text):
CCP-TP-053, Standard Real Time Radiography (RTR) Inspection Procedure, Rev. 15, Section 4.4.3 [A] states in part "Using Table 1, Prohibited Items, as a reference, confirm there are **NO** prohibited items in the waste container. **IF** any nonconforming/prohibited items are noted during the RTR examination, **THEN** perform the following:" Initiate an NCR in accordance with CCP-QP-005, CCP *TRU Nonconforming Item Reporting and Control*. Table 1, Prohibited Items lists, in part, "Ignitables"

7c. Actual Condition: Welding Striker

7d. Have the CCP HOLD TAGS associated with this NCR been applied? ☒ YES ☐ NO If no is checked, explain:

8. NCR Originator:
Eric Lyles (printed name) — signature — 3-17-16 (date)

9. Does the identified condition have the potential to impact AK? If YES or INDETERMINATE, enter Trend Code L in Block 10. ☐ YES ☒ NO ☐ INDETERMINATE

10. Trend Code: K

11. Responsible Manager: Beverly Schrock

12. Recurring Condition? ☐ YES ☒ NO (If Yes, list NCRs and WIPP Forms):

13. Significant Condition? ☐ YES ☒ NO (If Yes, enter WIPP Form No.):

14. QA Engineer or QA Designee validation:
Fred Oney (printed name) — signature — 3-21-16 (date)

COPY

Attachment 1 – CCP Nonconformance Report (NCR) (Continued)

NCR No. NCR-ORNL-0078-16 Revision 0

INTERIM DISPOSITION

15a. Interim Disposition (Check Only One):
☒ N/A (See Final Disposition) ☐ Hold ☐ Conditionally Accept ☐ Conditionally Use
☐ Sort ☐ Reinspect or Retest ☐ Remediate

15b. Instructions for Completion of the Interim Disposition:

INTERIM DISPOSITION APPROVALS

16a. Responsible Manager or Individual:

printed name _____ signature _____ date _____

16b. QA Engineer or QA Designee:

printed name _____ signature _____ date _____

Additional Approval:

printed name _____ signature _____ date _____

COMPLETION OF INTERIM DISPOSITION

17. Interim Disposition Complete – Responsible Manager or Individual:

printed name _____ signature _____ date _____

18. Interim Disposition Verified – QA Engineer:

printed name _____ signature _____ date _____

COPY

Attachment 1 – CCP Nonconformance Report (NCR) (Continued)

NCR No. NCR-ORNL-0078-16 Revision 0

FINAL DISPOSITION

19. Final Disposition (Check Only One: Use-As-Is, Repair, Reject, Rework, or Scrap):
☐ Use-As-Is ☐ Repair
19a. Technical Justification – Required for Use-As-Is or Repair dispositions. [☒ N/A for Reject, Rework, or Scrap]

☒ Reject ☐ Rework ☐ Scrap
19b. Instructions for Completion – Required for Reject, Repair, Rework, or Scrap [☐ N/A for Use-As-Is]
Return to Host Site for prohibited item remediation

19c. Corrective Actions (Actions to Prevent Recurrence – For Repair or Rework, if applicable.
[☒ N/A if not applicable, and for Use-As-Is, Reject, and Scrap]

FINAL DISPOSITION APPROVALS

20. Responsible Manager or Individual:

Andrew Stallings for Beverly Schrock	for Beverly Schrock	3-21-16
printed name	signature	date

21. QA Engineer or QA Designee:

Fred Oney		3-21-16
printed name	signature	date

Additional Approval:

printed name	signature	date

CLOSURE

22. Final Disposition Complete - Responsible Manager or Individual:

printed name	signature	date

23. Attachments:

24a. HOLD TAG removal has been verified and reconciled for all nonconforming items on the NCR: ☐
24b. If HOLD TAG is not applicable, check: ☐ and explain:

25. Final Disposition Verified – NCR Closed QA Engineer:

printed name	signature	date

COPY

Attachment 3 – CCP Radiography Independent Technical Reviewer Checklist

Batch Data Report No.: OR-RTR6-0739

Description			
1.	Were data generation and reduction conducted in a technically correct manner in accordance with the methods used?	☐ NO	☒ YES
2.	Was the correct revision of the procedure used? Procedure: CCP-TP-053 Rev.: 15	☐ NO	☒ YES
3.	Are the WMPs entered correctly?	☐ NO	☒ YES
4.	Do the estimated weights in Section 4 of Attachment 2 equal the container gross weight?	☐ NO	☒ YES
5.	Is the data reported in the proper units with the correct number of significant figures (e.g., one tenth of a kilogram)?	☐ NO	☒ YES
6.	Was transcription used? If no, proceed to question 7.	☐ NO	☒ YES
	6a. Has the data been verified for transcription errors?	☐ NO	☒ YES
7.	Does the Testing Batch Report include radiography for up to 20 containers?	☐ NO	☒ YES
8.	Are BDR contents complete and do they match the CCP Waste RTR Batch Data Report Table of Contents?	☐ NO	☒ YES
9.	Is all the data signed and dated in reproducible ink and by the individual(s) generating it?	☐ NO	☒ YES
10.	Is all data recorded clearly, legibly, and accurately?	☐ NO	☒ YES
11.	Have changes been made to original data? If no, proceed to question 12.	☒ NO	☐ YES
	11a. Have all changes to original data been lined out, initialed and dated by the individual making the changes?	☐ NO	☐ YES
	11b. Was justification made for changing the original data?	☐ NO	☐ YES
	11c. Were data changes made by the individual who originally collected the data?	☐ NO	☐ YES
12.	Does the waste match the Waste Matrix Code and Waste Stream description?	☐ NO	☒ YES
13.	Are the RTR Operator's decisions regarding the Radiography documented?	☐ NO	☒ YES
14.	Is there an adequate written description of the contents of each item?	☐ NO	☒ YES
15.	Was the video/audio recording media properly prepared and labeled for each waste container?	☐ NO	☒ YES
16.	Was the video/audio recording media check performed satisfactorily and recorded on Attachment 1?	☐ NO	☒ YES

Attachment 3 – CCP Radiography Independent Technical Reviewer Checklist (Continued)

Batch Data Report No.: OR-RTR6-0739

Description			
17.	Was the Image Test performed satisfactorily and recorded on Attachment 1?	☐ NO	☒ YES
18.	Was the Replicate Scan performed and recorded on an Attachment 2?	☐ NO	☒ YES
19.	Was the Replicate Scan RTR Operator different from the first RTR Operator?	☐ NO	☒ YES
20.	Did the Replicate Scan RTR Operator and the first RTR Operator agree on the results?	☐ NO	☒ YES
21.	Was the Independent Observation performed and recorded on an Attachment 2?	☐ NO	☒ YES
22.	Was the Independent Observation RTR Operator different from the first RTR Operator?	☐ NO	☒ YES
23.	Did the Independent Observation RTR Operator and the first RTR Operator agree on the results?	☐ NO	☒ YES
24.	Was the data collection performed by qualified individuals?	☐ NO	☒ YES
25.	Were NCRs initiated as required at DGL? If no, proceed to question 26.	☐ NO	☒ YES
	25a. Have the NCR(s) associated with RTR been included in the BDR?	☐ NO	☑ YES
26.	Is the RTR examination for CH waste? If no, proceed to question 27.	☐ NO	☒ YES
	26a. Have the CH Quality Assurance Objectives (QAOs) been met (if applicable)? Precision – Precision is maintained by reconciling any discrepancies between two radiography operators with regard to identification of the waste matrix code, liquids in excess of TSDF-WAC limits, and compressed gases through independent replicate scans and independent observations. Additionally, the precision of radiography is verified prior to use by tuning precisely enough to demonstrate compliance with QAOs through viewing an image test pattern. Accuracy – Accuracy is obtained by using a target to tune the image for maximum sharpness and by requiring operators to successfully identify 100 percent of the items required to meet the DQOs for radiography specified in CCP-PO-001, Section C-4a(1) in a training container during their initial qualification and subsequent requalification. Completeness – A video and audio media recording of the radiography examination and a validated radiography data form will be obtained for 100 percent of the waste containers subject to radiography. All video and audio media recordings and radiography data forms will be subject to validation as indicated in CCP-PO-001, Section C3-4. Comparability – The comparability of radiography data from different operators shall be enhanced by using standardized radiography procedures and operator qualifications.	☐ NO	☒ YES

Attachment 3 – CCP Radiography Independent Technical Reviewer Checklist (Continued)

Batch Data Report No.: OR-RTR6-0739

Description		
27. Is the RTR examination for RH waste? If no, proceed to comment section.	[X] NO	[ ] YES
27a. Have the RH QAOs been met (if applicable)? Precision – Precision is maintained by reconciling any discrepancies between two operators (during Independent Observation and Replicate scans) with regard to the identification of important waste characteristics (i.e., physical form of the waste and absence of prohibited liquids) within a single container. Accuracy – Accuracy is obtained by using a target to tune the image for maximum sharpness and by requiring operators to successfully identify prohibited liquid in a training container during their initial qualification and subsequent requalification. Representativeness – All of the relevant contents in a container selected for radiography will be described. Completeness – All of the relevant waste information must be assembled and must show that each of the containers in the waste stream belongs to the waste stream. This information must be documented on videotape or other equivalent media and data form. Comparability – Comparability is ensured by meeting the program training requirements and complying with the minimum standards used to implement the radiography process.	[ ] NO	[ ] YES

Comments: N/A TJH 3-31-16

I have reviewed 100% of the container specific and batch data in this report and find it acceptable.

Independent Technical Reviewer:

THAD HASELTKORN	Thad Haseltkorn	3-31-16
Printed Name	Signature	Date

DIVIDER PAGE

Attachment 2 – CCP SPM Radiography Project Level Validation Checklist and Summary

BDR Number: OR-RTR7-0131				Examination Date(s): 04/22/2015
Description of Criteria Reviewed	**Criteria Met?**			**Comments/Qualifiers**
	YES	**NO**	**NA**	
1. Is the completed, signed, and dated Independent Technical Reviewer Checklist included in the BDR, and the independent technical reviewer was not involved in the generation or recording of the data under review? **Reference Source: CCP-PO-001, C3-4**	X			
2. Does the BDR contain all items addressed in the BDR Table of Contents? **Reference Source: CCP-PO-001, C3-4**	X			
3. Does the BDR include a listing of all the container numbers in the batch? **Reference Source: CCP-PO-001, C3-4**	X			
4. List all containers that have met QAOs. **Reference Source: CCP-PO-001, C3-4**				Container Numbers: X10C0402870M X10C0402870N X10C0402870O X10C0402870P X10C0402870Q
5. Does the BDR identify the current implementing procedure and revision number? **Reference Source: CCP-PO-001, Table C3-3**	X			
6. Is there a reference to or copy of any associated NCRs (if any) in the BDR? NA if no NCRs. **Reference Source: CCP-PO-001, Table C3-3**	X			NCR-ORNL-0123-15 Rev1 (X10C0402870R)
7. Are there 20 or fewer containers in the batch? **Reference Source: CCP-PO-001, C3-4**	X			
8. Are the data properly reported (i.e., data are reported in correct units and with correct significant figures)? **Reference Source: CCP-PO-001, C3-4**	X			
9. Is there evidence of verification that the physical form matches the Waste Matrix Code? **Reference Source: CCP-PO-001, Table C3-3**	X			

CCP RECORDS ORIGINAL
DATE REC'D 4-29-15 GL

Attachment 2 – CCP SPM Radiography Project Level Validation Checklist and Summary (Continued)

BDR Number: OR-RTR7-0131			Examination Date(s): 04/22/2015	
Description of Criteria Reviewed	**Criteria Met?**			**Comments/Qualifiers**
	YES	**NO**	**NA**	
10. Is there evidence of verification that the physical form matches the waste stream description? **Reference Source: CCP-PO-001, Table C3-3**	X			
11. Are prohibited items absent? **Reference Source: CCP-PO-001, Table C3-3**	X			Except for X10C0402870R
12. Does observable liquid, if present, meet the criteria of the TSDF-WAC? **Reference Source: CCP-PO-001, C-1**	X			Except for X10C0402870R
13. Were discrepancies between two operators with regard to identification of waste matrix code, liquids in excess of the TSDF-WAC, or compressed gases through replicate scans and independent observations reconciled? NA if no discrepancies. **Reference Source: CCP-PO-001, C3-2**			X	
14. Are the training qualifications for all radiography personnel acceptable? **Reference Source: CCP-PO-001, C3-8**	X			
15. Was evidence of the video/audio check included in the BDR? **Reference Source: CCP-PO-001, C1-1**	X			
16. Was the Lines-Pair Resolution Test or Sieve Test Check included in the BDR? **Reference Source: CCP Technical Procedures**	X			
17. Was a replicate scan performed once per day, or once per batch, whichever is LESS frequent? **Reference Source: CCP-PO-001, C1-1**	X			
18. Was an independent observation performed once per day, or once per batch, whichever is LESS frequent? **Reference Source: CCP-PO-001, C1-1**	X			

Attachment 2 – CCP SPM Radiography Project Level Validation Checklist and Summary (Continued)

BDR Number: OR-RTR7-0131	**Examination Date(s): 04/22/2015**			
Description of Criteria Reviewed	**Criteria Met?**			**Comments/Qualifiers**
	YES	**NO**	**NA**	
19. Were the replicate scan and independent observation performed on different waste containers? **Reference Source: CCP-PO-001, C1-1**	X			
20. Were the personnel performing the replicate scan and independent observation different from the individual who performed the original? **Reference Source: CCP-PO-001, C1-1**	X			
21. Does the BDR include an estimate of each material parameter weight in kg for each container? **Reference Source: CCP Technical Procedures**	X			
22. Does the BDR include a description of each material parameter for each container? **Reference Source: CCP Technical Procedures**	X			
23. Is the container gross weight recorded in kilograms (kg) for each container in the BDR? **Reference Source: CCP Technical Procedures**	X			
24. Was the Scale Weight Calibration Check included in the BDR? **Reference Source: CCP Technical Procedures**			X	Scale not used.
25. Was the Scale Weight Check included in the BDR? **Reference Source: CCP Technical Procedures**			X	Scale not used.
Comments: None				
The container QC checks were properly performed and meet the Quality Assurance Objectives (QAOs). Proper procedures were followed during data reduction and analysis. The batch is complete, acceptable, and includes all supporting data and documentation required by the QAPjP.				
Carolina Soaterna	Carolina Soaterna			04/28/2015
SPM Printed Name	Signature			Date

Checklist is to be re-signed only when a re-review is performed.

SPM Printed Name	Signature	Reason	Date
SPM Printed Name	Signature	Reason	Date

Attachment 5–CCP Radiography Batch Data Report Cover Sheet

Site ID: ORNL

Batch Data Report No.: OR-RTR7-0131 ☑ CH ☐ RH Date: 4/22/15

Waste Container ID Numbers	
Replicate Scan:	X10C0402870O
Independent Observation:	X10C0402870Q
1	X10C0402870Q
2	X10C0402870R
3	X10C0402870M
4	X10C0402870P
5	X10C0402870N
6	X10C0402870O
7	N/A
8	N/A
9	N/A
10	N/A
11	N/A
12	N/A
13	N/A
14	N/A
15	N/A
16	N/A
17	N/A
18	N/A
19	N/A
20	N/A

RTR Operator:

Eric Lyles — Printed Name

Signature — 4/22/15 — Date 4/27/15

Independent Technical Reviewer:

Fred Owey — Printed Name

Signature — Date 4-23-15

4-27-15

NTPC RECORDS ORIGINAL
DATE REC'D 4-27-2015 PH

Attachment 4 – CCP Radiography Batch Data Report Table of Contents and Batch Narrative

Batch Data Report No.: OR-RTR7-0131 Date: 4/22/15

Table Of Contents		
Item	Description	Page No.
1	CCP Radiography Batch Data Report Cover Sheet	1
2	CCP Radiography Batch Data Report Table Of Contents	2
3	CCP RTR Measurement Control Report	3
4	CCP Radiography Data Sheets	4
5	Copy of NCRs (NA, If Not Applicable)	28
6	CCP Independent Technical Reviewer Checklist	31

Batch Narrative
All Quality Checks were performed and recorded on CCP-TP-053, Rev. 15 CCP Radiography Measurement Control Report.

Eric Lyles — RTR Operator

Signature

4/22/15 — Date

Attachment 1 – CCP RTR Measurement Control Report

Site ID: ORNL		
Batch Data Report No.: OR-RTR7-0131		
Examination Date: 4/22/15		
Control Checks		
Video/Audio Recorded Media System Check	☑ SAT	☐ UNSAT
Image Test : 10 Lines (Minimum acceptable is 5 lines-pair/cm or #6 Sieve is viewable)	☑ SAT	☐ UNSAT
Comments: N/A		
RTR Operator:		
Eric Lyles	[signature]	4/22/15
Printed Name	Signature	Date

3

CCP Radiography Data Sheet

Section 1: General Information	
☐ RTR Examination ☒ RTR Replicate Scan ☐ RTR Independent Observation	
Site ID:	ORNL
Batch Number:	OR-RTR7-0131
Examination Date:	4/22/2015
Waste Container ID:	X10C0402870O
Video/Audio Recorded Media Number:	OR-RTR7-0131 A&B
Procedure and Revision No.:	CCP-TP-053 Rev. 15
NCR(s) associated with the container? (e.g., Prohibited Items)	☒ No ☐ Yes NCR No.: N/A NCR No.: N/A

Section 2: Waste Container Data	
Container Type:	55 Gallon Drum
TRUCON Code:	OR 225
Waste Matrix Code:	S5400
Waste Stream I.D.:	OR-REDC-CH-HET
Waste Container Weights:	Gross Wt.: 73.4 kg Tare Wt.: 33.2 kg Net Wt.: 40.2 kg
Rigid Liner and Liner Vent Description:	Liner: ☒ No ☐ Yes Lid: ☒ No ☐ Yes Type: ☐ 30-mil ☐ 90-mil ☐ 110-mil ☐ 125-mil Vented: ☐ No ☐ Yes ☒ N/A Punctured: ☒ No ☐ Yes Mechanical Vent: ☒ No ☐ Yes Fiberboard Liner: ☒ No ☐ Yes Lead Lined: ☒ No ☐ Yes
Number of Layers of Confinement:	Appears to be 1 layer
Volume Utilization Percentage:	90 %

CCP Radiography Data Sheet

Waste Container ID: X10C04028700

Section 3: Container Inventory and Comments	(Detailed descriptions)
IM:	Scrap metal, open metal can, metal hardware, metal lid
AM:	
OM:	
OI:	Absorbent
C:	Cloth, coveralls
R:	
XPM:	Plastic sheeting, plastic tubing, scrap plastic
OR:	
IN:	
S:	

Section 4: Packaging Material and Waste Material Parameters	
Packaging Material:	**Estimated Weight (kg)**
Steel (ST):	27.8
Plastics (PP): Liner bag	1.0
Other: Cardboard Liner (CP)	4.4
Total Packaging Weight	33.2
Waste Material Parameter:	**Estimated Weight (kg)**
Iron-based Metal / Alloys (IM):	18.0
Aluminum-based Metals / Alloys (AM):	
Other Metals (OM):	
Other Inorganic Materials (OI)	9.0
Cellulosics (C):	5.0
Rubber (R):	
Plastics (waste materials) (XPM):	8.2
Organic Matrix (OR):	
Inorganic Matrix (IN):	
Soils (S):	
Total WMP Weight:	40.2

CCP Radiography Data Sheet

Waste Container ID: X10C04028700

Section 5: RTR Summary (Questions answered "Yes" will be explained in the Comment block, except for Question 1)	
Is there observable liquid?	☐ Yes ☒ No
Is there any observable liquid in internal containers, more than 60 milliliters or 3 percent by volume, whichever is greater?	☐ Yes ☒ No
Is the total volume of observable liquid in the outermost container GREATER than 1% of the container?	☐ Yes ☒ No
Is there observable liquid in payload containers with an EPA Hazardous Waste Number of U134?	☐ Yes ☒ No
Is there an indication of non-radionuclide pyrophoric materials, such as elemental potassium?	☐ Yes ☒ No
Is there an indication of hazardous wastes not occurring as co-contaminants with TRU mixed wastes (non-mixed hazardous wastes)?	☐ Yes ☒ No
Is there an indication of wastes incompatible with backfill, seal and panel closures materials, container and packaging materials, shipping container materials, or other wastes (i.e., waste does NOT match TRUCON Code[s])?	☐ Yes ☒ No
Is there an indication of wastes containing explosives or compressed gases?	☐ Yes ☒ No
Is there an indication of PCBs liquids?	☐ Yes ☒ No
Is there an indication of the waste exhibiting the characteristic of ignitability, corrosivity, or reactivity (EPA Hazardous Waste Numbers of D001, D002, or D003)?	☐ Yes ☒ No
Is the physical form of the waste inconsistent with the Waste Stream Description or the Waste Matrix Code?	☐ Yes ☒ No
CH or RH TRAMPAC	
Are there heat-sealed bags (unvented) GREATER than 4 liters and LESS than 390 square inches in the waste, or heat sealed bags not authorized in the RH TRUCON Code?	☐ Yes ☒ No
Were there Non-approved Closure Methods used on liner bags or inner bags greater than 4 liters?	☐ Yes ☒ No
Are there sealed containers GREATER than 4 liters?	☐ Yes ☒ No
Are there indications of inadequate protection for heavy and/or sharp objects?	☐ Yes ☒ No

Comments: This Replicate Scan agrees with the original scan. DB 4-22-15

RTR Operator:

Daphne Brothers	Daphne Brothers	4/22/2015
Print Name	Signature	Date

CCP Radiography Data Sheet

Section 1: General Information	
[ ] RTR Examination [ ] RTR Replicate Scan [X] RTR Independent Observation	
Site ID:	ORNL
Batch Number:	OR-RTR7-0131
Examination Date:	4/22/2015
Waste Container ID:	X10C0402870Q
Video/Audio Recorded Media Number:	OR-RTR7-0131 A&B
Procedure and Revision No.:	CCP-TP-053 Rev. 15
NCR(s) associated with the container? (e.g., Prohibited Items)	[X] No [ ] Yes NCR No.: N/A NCR No.: N/A

Section 2: Waste Container Data	
Container Type:	55 Gallon Drum
TRUCON Code:	OR 225
Waste Matrix Code:	S5400
Waste Stream I.D.:	OR-REDC-CH-HET
Waste Container Weights:	Gross Wt.: 69.1 kg Tare Wt.: 33.2 kg Net Wt.: 35.9 kg
Rigid Liner and Liner Vent Description:	Liner: [X] No [ ] Yes Lid: [X] No [ ] Yes Type: [ ] 30-mil [ ] 90-mil [ ] 110-mil [ ] 125-mil Vented: [ ] No [ ] Yes [X] N/A Punctured: [X] No [ ] Yes Mechanical Vent: [X] No [ ] Yes Fiberboard Liner: [X] No [ ] Yes Lead Lined: [X] No [ ] Yes
Number of Layers of Confinement:	Appears to be 1 layer
Volume Utilization Percentage:	85 %

CCP Radiography Data Sheet

Waste Container ID: X10C0402870Q

Section 3: Container Inventory and Comments	(Detailed descriptions)
IM:	Metal hardware, scrap metal, metal fittings
AM:	
OM:	
OI:	Absorbent
C:	Cloth, tape roll, coveralls
R:	
XPM:	Plastic sheeting, plastic tubing
OR:	
IN:	
S:	

Section 4: Packaging Material and Waste Material Parameters	
Packaging Material:	**Estimated Weight (kg)**
Steel (ST):	27.8
Plastics (PP): Liner bag	1.0
Other: Cardboard Liner (CP)	4.4
Total Packaging Weight	33.2
Waste Material Parameter:	**Estimated Weight (kg)**
Iron-based Metal / Alloys (IM):	11.0
Aluminum-based Metals / Alloys (AM):	
Other Metals (OM):	
Other Inorganic Materials (OI)	3.9
Cellulosics (C):	7.0
Rubber (R):	
Plastics (waste materials) (XPM):	14.0
Organic Matrix (OR):	
Inorganic Matrix (IN):	
Soils (S):	
Total WMP Weight:	35.9

CCP Radiography Data Sheet

Waste Container ID: X10C0402870Q

Section 5: RTR Summary (Questions answered "Yes" will be explained in the Comment block, except for Question 1)	
Is there observable liquid?	☐ Yes ☒ No
Is there any observable liquid in internal containers, more than 60 milliliters or 3 percent by volume, whichever is greater?	☐ Yes ☒ No
Is the total volume of observable liquid in the outermost container GREATER than 1% of the container?	☐ Yes ☒ No
Is there observable liquid in payload containers with an EPA Hazardous Waste Number of U134?	☐ Yes ☒ No
Is there an indication of non-radionuclide pyrophoric materials, such as elemental potassium?	☐ Yes ☒ No
Is there an indication of hazardous wastes not occurring as co-contaminants with TRU mixed wastes (non-mixed hazardous wastes)?	☐ Yes ☒ No
Is there an indication of wastes incompatible with backfill, seal and panel closures materials, container and packaging materials, shipping container materials, or other wastes (i.e., waste does NOT match TRUCON Code[s])?	☐ Yes ☒ No
Is there an indication of wastes containing explosives or compressed gases?	☐ Yes ☒ No
Is there an indication of PCBs liquids?	☐ Yes ☒ No
Is there an indication of the waste exhibiting the characteristic of ignitability, corrosivity, or reactivity (EPA Hazardous Waste Numbers of D001, D002, or D003)?	☐ Yes ☒ No
Is the physical form of the waste inconsistent with the Waste Stream Description or the Waste Matrix Code?	☐ Yes ☒ No
CH or RH TRAMPAC	
Are there heat-sealed bags (unvented) GREATER than 4 liters and LESS than 390 square inches in the waste, or heat sealed bags not authorized in the RH TRUCON Code?	☐ Yes ☒ No
Were there Non-approved Closure Methods used on liner bags or inner bags greater than 4 liters?	☐ Yes ☒ No
Are there sealed containers GREATER than 4 liters?	☐ Yes ☒ No
Are there indications of inadequate protection for heavy and/or sharp objects?	☐ Yes ☒ No

Comments: This Independent observation agrees with the original Scan. DB 4-22-15

RTR Operator:

Daphne Brothers	Daphne Brothers	4/22/2015
Print Name	Signature	Date

CCP Radiography Data Sheet

Section 1: General Information	
[X] RTR Examination [ ] RTR Replicate Scan [ ] RTR Independent Observation	
Site ID:	ORNL
Batch Number:	OR-RTR7-0131
Examination Date:	4/22/2015
Waste Container ID:	X10C0402870Q
Video/Audio Recorded Media Number:	OR-RTR7-0131 A&B
Procedure and Revision No.:	CCP-TP-053 Rev. 15
NCR(s) associated with the container? (e.g., Prohibited Items)	[X] No [ ] Yes NCR No.: N/A NCR No.: N/A

Section 2: Waste Container Data	
Container Type:	55 Gallon Drum
TRUCON Code:	OR 225
Waste Matrix Code:	S5400
Waste Stream I.D.:	OR-REDC-CH-HET
Waste Container Weights:	Gross Wt.: 69.1 kg Tare Wt.: 33.2 kg Net Wt.: 35.9 kg
Rigid Liner and Liner Vent Description:	Liner: [X] No [ ] Yes Lid: [X] No [ ] Yes Type: [ ] 30-mil [ ] 90-mil [ ] 110-mil [ ] 125-mil Vented: [ ] No [ ] Yes [X] N/A Punctured: [X] No [ ] Yes Mechanical Vent: [X] No [ ] Yes Fiberboard Liner: [X] No [ ] Yes Lead Lined: [X] No [ ] Yes
Number of Layers of Confinement:	Appears to be 1 layer
Volume Utilization Percentage:	85 %

CCP Radiography Data Sheet

Waste Container ID: X10C0402870Q

Section 3: Container Inventory and Comments	(Detailed descriptions)
IM:	Metal hardware, scrap metal, metal fittings
AM:	
OM:	
OI:	Absorbent
C:	Cloth, tape roll, coveralls
R:	
XPM:	Plastic sheeting, plastic tubing
OR:	
IN:	
S:	

Section 4: Packaging Material and Waste Material Parameters	
Packaging Material:	**Estimated Weight (kg)**
Steel (ST):	27.8
Plastics (PP): Liner bag	1.0
Other: Cardboard Liner (CP)	4.4
Total Packaging Weight	33.2
Waste Material Parameter:	**Estimated Weight (kg)**
Iron-based Metal / Alloys (IM):	10.0
Aluminum-based Metals / Alloys (AM):	
Other Metals (OM):	
Other Inorganic Materials (OI)	3.0
Cellulosics (C):	8.0
Rubber (R):	
Plastics (waste materials) (XPM):	14.9
Organic Matrix (OR):	
Inorganic Matrix (IN):	
Soils (S):	
Total WMP Weight:	35.9

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CCP Radiography Data Sheet

Waste Container ID: X10C0402870Q

Section 5: RTR Summary (Questions answered "Yes" will be explained in the Comment block, except for Question 1)	
Is there observable liquid?	☐ Yes ☒ No
Is there any observable liquid in internal containers, more than 60 milliliters or 3 percent by volume, whichever is greater?	☐ Yes ☒ No
Is the total volume of observable liquid in the outermost container GREATER than 1% of the container?	☐ Yes ☒ No
Is there observable liquid in payload containers with an EPA Hazardous Waste Number of U134?	☐ Yes ☒ No
Is there an indication of non-radionuclide pyrophoric materials, such as elemental potassium?	☐ Yes ☒ No
Is there an indication of hazardous wastes not occurring as co-contaminants with TRU mixed wastes (non-mixed hazardous wastes)?	☐ Yes ☒ No
Is there an indication of wastes incompatible with backfill, seal and panel closures materials, container and packaging materials, shipping container materials, or other wastes (i.e., waste does NOT match TRUCON Code[s])?	☐ Yes ☒ No
Is there an indication of wastes containing explosives or compressed gases?	☐ Yes ☒ No
Is there an indication of PCBs liquids?	☐ Yes ☒ No
Is there an indication of the waste exhibiting the characteristic of ignitability, corrosivity, or reactivity (EPA Hazardous Waste Numbers of D001, D002, or D003)?	☐ Yes ☒ No
Is the physical form of the waste inconsistent with the Waste Stream Description or the Waste Matrix Code?	☐ Yes ☒ No
CH or RH TRAMPAC	
Are there heat-sealed bags (unvented) GREATER than 4 liters and LESS than 390 square inches in the waste, or heat sealed bags not authorized in the RH TRUCON Code?	☐ Yes ☒ No
Were there Non-approved Closure Methods used on liner bags or inner bags greater than 4 liters?	☐ Yes ☒ No
Are there sealed containers GREATER than 4 liters?	☐ Yes ☒ No
Are there indications of inadequate protection for heavy and/or sharp objects?	☐ Yes ☒ No
Comments: N/A	

RTR Operator:

Eric Lyles		4/22/2015
Print Name	Signature	Date

CCP Radiography Data Sheet

Section 1: General Information	
[X] RTR Examination [ ] RTR Replicate Scan [ ] RTR Independent Observation	
Site ID:	ORNL
Batch Number:	OR-RTR7-0131
Examination Date:	4/22/2015
Waste Container ID:	X10C0402870R
Video/Audio Recorded Media Number:	OR-RTR7-0131 A&B
Procedure and Revision No.:	CCP-TP-053 Rev. 15
NCR(s) associated with the container? (e.g., Prohibited Items)	[ ] No [X] Yes NCR No.: NCR-ORNL-0123-15 NCR No.: N/A

Section 2: Waste Container Data	
Container Type:	55 Gallon Drum
TRUCON Code:	OR 225
Waste Matrix Code:	S5400
Waste Stream I.D.:	OR-REDC-CH-HET
Waste Container Weights:	Gross Wt.: 71.8 kg Tare Wt.: 33.2 kg Net Wt.: 38.6 kg
Rigid Liner and Liner Vent Description:	Liner: [X] No [ ] Yes Lid: [X] No [ ] Yes Type: [ ] 30-mil [ ] 90-mil [ ] 110-mil [ ] 125-mil Vented: [ ] No [ ] Yes [X] N/A Punctured: [X] No [ ] Yes Mechanical Vent: [X] No [ ] Yes Fiberboard Liner: [X] No [ ] Yes Lead Lined: [X] No [ ] Yes
Number of Layers of Confinement:	Appears to be 1 layer
Volume Utilization Percentage:	95 %

CCP Radiography Data Sheet

Waste Container ID: X10C0402870R

Section 3: Container Inventory and Comments	(Detailed descriptions)
IM:	Metal hardware, electrical equipment, scrap metal, saw blade, hand tools, utility knife
AM:	
OM:	
OI:	Absorbent
C:	Brush, cloth, coveralls
R:	
XPM:	Plastic sheeting, plastic containers, plastic tubing, plastic caps
OR:	
IN:	
S:	

Section 4: Packaging Material and Waste Material Parameters	
Packaging Material:	**Estimated Weight (kg)**
Steel (ST):	27.8
Plastics (PP): Liner bag	1.0
Other: Cardboard Liner (CP)	4.4
Total Packaging Weight	33.2
Waste Material Parameter:	**Estimated Weight (kg)**
Iron-based Metal / Alloys (IM):	13.6
Aluminum-based Metals / Alloys (AM):	
Other Metals (OM):	
Other Inorganic Materials (OI)	5.0
Cellulosics (C):	8.0
Rubber (R):	
Plastics (waste materials) (XPM):	12.0
Organic Matrix (OR):	
Inorganic Matrix (IN):	
Soils (S):	
Total WMP Weight:	38.6

CCP Radiography Data Sheet

Waste Container ID: X10C0402870R

Section 5: RTR Summary (Questions answered "Yes" will be explained in the Comment block, except for Question 1)	
Is there observable liquid?	[X] Yes [ ] No
Is there any observable liquid in internal containers, more than 60 milliliters or 3 percent by volume, whichever is greater?	[X] Yes [ ] No
Is the total volume of observable liquid in the outermost container GREATER than 1% of the container?	[ ] Yes [X] No
Is there observable liquid in payload containers with an EPA Hazardous Waste Number of U134?	[ ] Yes [X] No
Is there an indication of non-radionuclide pyrophoric materials, such as elemental potassium?	[ ] Yes [X] No
Is there an indication of hazardous wastes not occurring as co-contaminants with TRU mixed wastes (non-mixed hazardous wastes)?	[ ] Yes [X] No
Is there an indication of wastes incompatible with backfill, seal and panel closures materials, container and packaging materials, shipping container materials, or other wastes (i.e., waste does NOT match TRUCON Code[s])?	[ ] Yes [X] No
Is there an indication of wastes containing explosives or compressed gases?	[ ] Yes [X] No
Is there an indication of PCBs liquids?	[ ] Yes [X] No
Is there an indication of the waste exhibiting the characteristic of ignitability, corrosivity, or reactivity (EPA Hazardous Waste Numbers of D001, D002, or D003)?	[ ] Yes [X] No
Is the physical form of the waste inconsistent with the Waste Stream Description or the Waste Matrix Code?	[ ] Yes [X] No
CH or RH TRAMPAC	
Are there heat-sealed bags (unvented) GREATER than 4 liters and LESS than 390 square inches in the waste, or heat sealed bags not authorized in the RH TRUCON Code?	[ ] Yes [X] No
Were there Non-approved Closure Methods used on liner bags or inner bags greater than 4 liters?	[ ] Yes [X] No
Are there sealed containers GREATER than 4 liters?	[ ] Yes [X] No
Are there indications of inadequate protection for heavy and/or sharp objects?	[ ] Yes [X] No
Comments: NCR-ORNL-0123-15	

RTR Operator:

Eric Lyles		4/22/2015
Print Name	Signature	Date

CCP Radiography Data Sheet

Section 1: General Information	
[X] RTR Examination [ ] RTR Replicate Scan [ ] RTR Independent Observation	
Site ID:	ORNL
Batch Number:	OR-RTR7-0131
Examination Date:	4/22/2015
Waste Container ID:	X10C0402870M
Video/Audio Recorded Media Number:	OR-RTR7-0131 A&B
Procedure and Revision No.:	CCP-TP-053 Rev. 15
NCR(s) associated with the container? (e.g., Prohibited Items)	[X] No [ ] Yes NCR No.: N/A NCR No.: N/A

Section 2: Waste Container Data	
Container Type:	55 Gallon Drum
TRUCON Code:	OR 225
Waste Matrix Code:	S5400
Waste Stream I.D.:	OR-REDC-CH-HET
Waste Container Weights:	Gross Wt.: 63.2 kg Tare Wt.: 33.2 kg Net Wt.: 30.0 kg
Rigid Liner and Liner Vent Description:	Liner: [X] No [ ] Yes Lid: [X] No [ ] Yes Type: [ ] 30-mil [ ] 90-mil [ ] 110-mil [ ] 125-mil Vented: [ ] No [ ] Yes [X] N/A Punctured: [X] No [ ] Yes Mechanical Vent: [X] No [ ] Yes Fiberboard Liner: [X] No [ ] Yes Lead Lined: [X] No [ ] Yes
Number of Layers of Confinement:	Appears to be 1 layer
Volume Utilization Percentage:	90 %

CCP Radiography Data Sheet

Waste Container ID: X10C0402870M

Section 3: Container Inventory and Comments	(Detailed descriptions)
IM:	Scrap metal, metal hardware, hand tool
AM:	
OM:	Scrap lead
OI:	Absorbent
C:	Cloth, tape roll
R:	
XPM:	Plastic sheeting, plastic containers
OR:	
IN:	
S:	

Section 4: Packaging Material and Waste Material Parameters	
Packaging Material:	**Estimated Weight (kg)**
Steel (ST):	27.8
Plastics (PP): Liner bag	1.0
Other: Cardboard Liner (CP)	4.4
Total Packaging Weight	33.2
Waste Material Parameter:	**Estimated Weight (kg)**
Iron-based Metal / Alloys (IM):	10.0
Aluminum-based Metals / Alloys (AM):	
Other Metals (OM):	5.0
Other Inorganic Materials (OI)	3.0
Cellulosics (C):	4.0
Rubber (R):	
Plastics (waste materials) (XPM):	8.0
Organic Matrix (OR):	
Inorganic Matrix (IN):	
Soils (S):	
Total WMP Weight:	30.0

CCP Radiography Data Sheet

Waste Container ID: X10C0402870M

Section 5: RTR Summary (Questions answered "Yes" will be explained in the Comment block, except for Question 1)	
Is there observable liquid?	☐ Yes ☒ No
Is there any observable liquid in internal containers, more than 60 milliliters or 3 percent by volume, whichever is greater?	☐ Yes ☒ No
Is the total volume of observable liquid in the outermost container GREATER than 1% of the container?	☐ Yes ☒ No
Is there observable liquid in payload containers with an EPA Hazardous Waste Number of U134?	☐ Yes ☒ No
Is there an indication of non-radionuclide pyrophoric materials, such as elemental potassium?	☐ Yes ☒ No
Is there an indication of hazardous wastes not occurring as co-contaminants with TRU mixed wastes (non-mixed hazardous wastes)?	☐ Yes ☒ No
Is there an indication of wastes incompatible with backfill, seal and panel closures materials, container and packaging materials, shipping container materials, or other wastes (i.e., waste does NOT match TRUCON Code[s])?	☐ Yes ☒ No
Is there an indication of wastes containing explosives or compressed gases?	☐ Yes ☒ No
Is there an indication of PCBs liquids?	☐ Yes ☒ No
Is there an indication of the waste exhibiting the characteristic of ignitability, corrosivity, or reactivity (EPA Hazardous Waste Numbers of D001, D002, or D003)?	☐ Yes ☒ No
Is the physical form of the waste inconsistent with the Waste Stream Description or the Waste Matrix Code?	☐ Yes ☒ No
CH or RH TRAMPAC	
Are there heat-sealed bags (unvented) GREATER than 4 liters and LESS than 390 square inches in the waste, or heat sealed bags not authorized in the RH TRUCON Code?	☐ Yes ☒ No
Were there Non-approved Closure Methods used on liner bags or inner bags greater than 4 liters?	☐ Yes ☒ No
Are there sealed containers GREATER than 4 liters?	☐ Yes ☒ No
Are there indications of inadequate protection for heavy and/or sharp objects?	☐ Yes ☒ No
Comments: N/A	

RTR Operator:

Eric Lyles		4/22/2015
Print Name	Signature	Date

CCP Radiography Data Sheet

Section 1: General Information	
[X] RTR Examination [ ] RTR Replicate Scan [ ] RTR Independent Observation	
Site ID:	ORNL
Batch Number:	OR-RTR7-0131
Examination Date:	4/22/2015
Waste Container ID:	X10C0402870P
Video/Audio Recorded Media Number:	OR-RTR7-0131 A&B
Procedure and Revision No.:	CCP-TP-053 Rev. 15
NCR(s) associated with the container? (e.g., Prohibited Items)	[X] No [ ] Yes NCR No.: N/A NCR No.: N/A

Section 2: Waste Container Data	
Container Type:	55 Gallon Drum
TRUCON Code:	OR 225
Waste Matrix Code:	S5400
Waste Stream I.D.:	OR-REDC-CH-HET
Waste Container Weights:	Gross Wt.: 62.4 kg Tare Wt.: 33.2 kg Net Wt.: 29.2 kg
Rigid Liner and Liner Vent Description:	Liner: [X] No [ ] Yes Lid: [X] No [ ] Yes Type: [ ] 30-mil [ ] 90-mil [ ] 110-mil [ ] 125-mil Vented: [ ] No [ ] Yes [X] N/A Punctured: [X] No [ ] Yes Mechanical Vent: [X] No [ ] Yes Fiberboard Liner: [X] No [ ] Yes Lead Lined: [X] No [ ] Yes
Number of Layers of Confinement:	Appears to be 1 layer
Volume Utilization Percentage:	90 %

CCP Radiography Data Sheet

Waste Container ID: X10C0402870P

Section 3: Container Inventory and Comments	(Detailed descriptions)
IM:	Scrap metal, metal fittings, metal hardware
AM:	
OM:	
OI:	Absorbent
C:	Cardboard, cloth, coveralls, filters
R:	
XPM:	Plastic sheeting, plastic tubing, plastic hose
OR:	
IN:	
S:	

Section 4: Packaging Material and Waste Material Parameters	
Packaging Material:	**Estimated Weight (kg)**
Steel (ST):	27.8
Plastics (PP): Liner bag	1.0
Other: Cardboard Liner (CP)	4.4
Total Packaging Weight	33.2
Waste Material Parameter:	**Estimated Weight (kg)**
Iron-based Metal / Alloys (IM):	6.0
Aluminum-based Metals / Alloys (AM):	
Other Metals (OM):	
Other Inorganic Materials (OI)	5.0
Cellulosics (C):	6.0
Rubber (R):	
Plastics (waste materials) (XPM):	12.2
Organic Matrix (OR):	
Inorganic Matrix (IN):	
Soils (S):	
Total WMP Weight:	29.2

CCP Radiography Data Sheet

Waste Container ID: X10C0402870P

Section 5: RTR Summary (Questions answered "Yes" will be explained in the Comment block, except for Question 1)	
Is there observable liquid?	☐ Yes ☒ No
Is there any observable liquid in internal containers, more than 60 milliliters or 3 percent by volume, whichever is greater?	☐ Yes ☒ No
Is the total volume of observable liquid in the outermost container GREATER than 1% of the container?	☐ Yes ☒ No
Is there observable liquid in payload containers with an EPA Hazardous Waste Number of U134?	☐ Yes ☒ No
Is there an indication of non-radionuclide pyrophoric materials, such as elemental potassium?	☐ Yes ☒ No
Is there an indication of hazardous wastes not occurring as co-contaminants with TRU mixed wastes (non-mixed hazardous wastes)?	☐ Yes ☒ No
Is there an indication of wastes incompatible with backfill, seal and panel closures materials, container and packaging materials, shipping container materials, or other wastes (i.e., waste does NOT match TRUCON Code[s])?	☐ Yes ☒ No
Is there an indication of wastes containing explosives or compressed gases?	☐ Yes ☒ No
Is there an indication of PCBs liquids?	☐ Yes ☒ No
Is there an indication of the waste exhibiting the characteristic of ignitability, corrosivity, or reactivity (EPA Hazardous Waste Numbers of D001, D002, or D003)?	☐ Yes ☒ No
Is the physical form of the waste inconsistent with the Waste Stream Description or the Waste Matrix Code?	☐ Yes ☒ No
CH or RH TRAMPAC	
Are there heat-sealed bags (unvented) GREATER than 4 liters and LESS than 390 square inches in the waste, or heat sealed bags not authorized in the RH TRUCON Code?	☐ Yes ☒ No
Were there Non-approved Closure Methods used on liner bags or inner bags greater than 4 liters?	☐ Yes ☒ No
Are there sealed containers GREATER than 4 liters?	☐ Yes ☒ No
Are there indications of inadequate protection for heavy and/or sharp objects?	☐ Yes ☒ No
Comments: N/A	

RTR Operator:

Eric Lyles		4/22/2015
Print Name	Signature	Date

CCP Radiography Data Sheet

Section 1: General Information	
[X] RTR Examination [ ] RTR Replicate Scan [ ] RTR Independent Observation	
Site ID:	ORNL
Batch Number:	OR-RTR7-0131
Examination Date:	4/22/2015
Waste Container ID:	X10C0402870N
Video/Audio Recorded Media Number:	OR-RTR7-0131 A&B
Procedure and Revision No.:	CCP-TP-053 Rev. 15
NCR(s) associated with the container? (e.g., Prohibited Items)	[X] No [ ] Yes NCR No.: N/A NCR No.: N/A

Section 2: Waste Container Data	
Container Type:	55 Gallon Drum
TRUCON Code:	OR 225
Waste Matrix Code:	S5400
Waste Stream I.D.:	OR-REDC-CH-HET
Waste Container Weights:	Gross Wt.: 77.7 kg Tare Wt.: 33.2 kg Net Wt.: 44.5 kg
Rigid Liner and Liner Vent Description:	Liner: [X] No [ ] Yes Lid: [X] No [ ] Yes Type: [ ] 30-mil [ ] 90-mil [ ] 110-mil [ ] 125-mil Vented: [ ] No [ ] Yes [X] N/A Punctured: [X] No [ ] Yes Mechanical Vent: [X] No [ ] Yes Fiberboard Liner: [X] No [ ] Yes Lead Lined: [X] No [ ] Yes
Number of Layers of Confinement:	Appears to be 1 layer
Volume Utilization Percentage:	90 %

CCP Radiography Data Sheet

Waste Container ID: X10C0402870N

Section 3: Container Inventory and Comments	(Detailed descriptions)
IM:	Metal hardware, scrap metal, metal clamps
AM:	
OM:	
OI:	
C:	Cloth, coveralls
R:	Rubber hose
XPM:	Plastic sheeting, plastic tubing, plastic containers
OR:	
IN:	
S:	

Section 4: Packaging Material and Waste Material Parameters	
Packaging Material:	**Estimated Weight (kg)**
Steel (ST):	27.8
Plastics (PP): Liner bag	1.0
Other: Cardboard Liner (CP)	4.4
Total Packaging Weight	33.2
Waste Material Parameter:	**Estimated Weight (kg)**
Iron-based Metal / Alloys (IM):	23.5
Aluminum-based Metals / Alloys (AM):	
Other Metals (OM):	
Other Inorganic Materials (OI)	
Cellulosics (C):	4.0
Rubber (R):	5.0
Plastics (waste materials) (XPM):	12.0
Organic Matrix (OR):	
Inorganic Matrix (IN):	
Soils (S):	
Total WMP Weight:	44.5

CCP Radiography Data Sheet

Waste Container ID: X10C0402870N

Section 5: RTR Summary (Questions answered "Yes" will be explained in the Comment block, except for Question 1)	
Is there observable liquid?	☐ Yes ☒ No
Is there any observable liquid in internal containers, more than 60 milliliters or 3 percent by volume, whichever is greater?	☐ Yes ☒ No
Is the total volume of observable liquid in the outermost container GREATER than 1% of the container?	☐ Yes ☒ No
Is there observable liquid in payload containers with an EPA Hazardous Waste Number of U134?	☐ Yes ☒ No
Is there an indication of non-radionuclide pyrophoric materials, such as elemental potassium?	☐ Yes ☒ No
Is there an indication of hazardous wastes not occurring as co-contaminants with TRU mixed wastes (non-mixed hazardous wastes)?	☐ Yes ☒ No
Is there an indication of wastes incompatible with backfill, seal and panel closures materials, container and packaging materials, shipping container materials, or other wastes (i.e., waste does NOT match TRUCON Code[s])?	☐ Yes ☒ No
Is there an indication of wastes containing explosives or compressed gases?	☐ Yes ☒ No
Is there an indication of PCBs liquids?	☐ Yes ☒ No
Is there an indication of the waste exhibiting the characteristic of ignitability, corrosivity, or reactivity (EPA Hazardous Waste Numbers of D001, D002, or D003)?	☐ Yes ☒ No
Is the physical form of the waste inconsistent with the Waste Stream Description or the Waste Matrix Code?	☐ Yes ☒ No
CH or RH TRAMPAC	
Are there heat-sealed bags (unvented) GREATER than 4 liters and LESS than 390 square inches in the waste, or heat sealed bags not authorized in the RH TRUCON Code?	☐ Yes ☒ No
Were there Non-approved Closure Methods used on liner bags or inner bags greater than 4 liters?	☐ Yes ☒ No
Are there sealed containers GREATER than 4 liters?	☐ Yes ☒ No
Are there indications of inadequate protection for heavy and/or sharp objects?	☐ Yes ☒ No
Comments: N/A	

RTR Operator:

Eric Lyles		4/22/2015
Print Name	Signature	Date

CCP Radiography Data Sheet

Section 1: General Information	
[X] RTR Examination [ ] RTR Replicate Scan [ ] RTR Independent Observation	
Site ID:	ORNL
Batch Number:	OR-RTR7-0131
Examination Date:	4/22/2015
Waste Container ID:	X10C0402870O
Video/Audio Recorded Media Number:	OR-RTR7-0131 A&B
Procedure and Revision No.:	CCP-TP-053 Rev. 15
NCR(s) associated with the container? (e.g., Prohibited Items)	[X] No [ ] Yes NCR No.: N/A NCR No.: N/A

Section 2: Waste Container Data	
Container Type:	55 Gallon Drum
TRUCON Code:	OR 225
Waste Matrix Code:	S5400
Waste Stream I.D.:	OR-REDC-CH-HET
Waste Container Weights:	Gross Wt.: 73.4 kg Tare Wt.: 33.2 kg Net Wt.: 40.2 kg
Rigid Liner and Liner Vent Description:	Liner: [X] No [ ] Yes Lid: [X] No [ ] Yes Type: [ ] 30-mil [ ] 90-mil [ ] 110-mil [ ] 125-mil Vented: [ ] No [ ] Yes [X] N/A Punctured: [X] No [ ] Yes Mechanical Vent: [X] No [ ] Yes Fiberboard Liner: [X] No [ ] Yes Lead Lined: [X] No [ ] Yes
Number of Layers of Confinement:	Appears to be 1 layer
Volume Utilization Percentage:	90 %

CCP Radiography Data Sheet

Waste Container ID: X10C04028700

Section 3: Container Inventory and Comments (Detailed descriptions)

IM: Scrap metal, metal lid, open metal can

AM:

OM:

OI: Absorbent

C: Cloth, coveralls

R:

XPM: Plastic sheeting, plastic tubing

OR:

IN:

S:

Section 4: Packaging Material and Waste Material Parameters

Packaging Material:	Estimated Weight (kg)
Steel (ST):	27.8
Plastics (PP): Liner bag	1.0
Other: Cardboard Liner (CP)	4.4
Total Packaging Weight	33.2
Waste Material Parameter:	**Estimated Weight (kg)**
Iron-based Metal / Alloys (IM):	17.2
Aluminum-based Metals / Alloys (AM):	
Other Metals (OM):	
Other Inorganic Materials (OI)	10.0
Cellulosics (C):	5.0
Rubber (R):	
Plastics (waste materials) (XPM):	8.0
Organic Matrix (OR):	
Inorganic Matrix (IN):	
Soils (S):	
Total WMP Weight:	40.2

CCP Radiography Data Sheet

Waste Container ID: X10C0402870O

Section 5: RTR Summary (Questions answered "Yes" will be explained in the Comment block, except for Question 1)	
Is there observable liquid?	☐ Yes ☒ No
Is there any observable liquid in internal containers, more than 60 milliliters or 3 percent by volume, whichever is greater?	☐ Yes ☒ No
Is the total volume of observable liquid in the outermost container GREATER than 1% of the container?	☐ Yes ☒ No
Is there observable liquid in payload containers with an EPA Hazardous Waste Number of U134?	☐ Yes ☒ No
Is there an indication of non-radionuclide pyrophoric materials, such as elemental potassium?	☐ Yes ☒ No
Is there an indication of hazardous wastes not occurring as co-contaminants with TRU mixed wastes (non-mixed hazardous wastes)?	☐ Yes ☒ No
Is there an indication of wastes incompatible with backfill, seal and panel closures materials, container and packaging materials, shipping container materials, or other wastes (i.e., waste does NOT match TRUCON Code[s])?	☐ Yes ☒ No
Is there an indication of wastes containing explosives or compressed gases?	☐ Yes ☒ No
Is there an indication of PCBs liquids?	☐ Yes ☒ No
Is there an indication of the waste exhibiting the characteristic of ignitability, corrosivity, or reactivity (EPA Hazardous Waste Numbers of D001, D002, or D003)?	☐ Yes ☒ No
Is the physical form of the waste inconsistent with the Waste Stream Description or the Waste Matrix Code?	☐ Yes ☒ No
CH or RH TRAMPAC	
Are there heat-sealed bags (unvented) GREATER than 4 liters and LESS than 390 square inches in the waste, or heat sealed bags not authorized in the RH TRUCON Code?	☐ Yes ☒ No
Were there Non-approved Closure Methods used on liner bags or inner bags greater than 4 liters?	☐ Yes ☒ No
Are there sealed containers GREATER than 4 liters?	☐ Yes ☒ No
Are there indications of inadequate protection for heavy and/or sharp objects?	☐ Yes ☒ No
Comments: N/A	

RTR Operator:

Eric Lyles		4/22/2015
Print Name	Signature	Date

DIVIDER

PAGE

Attachment 2 – CCP SPM Radiography Project Level Validation Checklist and Summary

BDR Number: OR-RTR7-0149				Examination Date(s): 08/03/2015
Description of Criteria Reviewed	**Criteria Met?**			**Comments/Qualifiers**
	YES	**NO**	**NA**	
1. Is the completed, signed, and dated Independent Technical Reviewer Checklist included in the BDR, and the independent technical reviewer was not involved in the generation or recording of the data under review? **Reference Source: CCP-PO-001, C3-4**	X			
2. Does the BDR contain all items addressed in the BDR Table of Contents? **Reference Source: CCP-PO-001, C3-4**	X			
3. Does the BDR include a listing of all the container numbers in the batch? **Reference Source: CCP-PO-001, C3-4**	X			
4. List all containers that have met QAOs. **Reference Source: CCP-PO-001, C3-4**				Container Numbers: X10C0501446A X10CSATN03211AC X10CSATN03211AF X10CSATN03211AG X10CSATN03211K X10CSATN03211L X10CSATN03211R X10CSATN03211T X10CSATN03211U X10CSATN03211X X10CSATN03211Y
5. Does the BDR identify the current implementing procedure and revision number? **Reference Source: CCP-PO-001, Table C3-3**	X			
6. Is there a reference to or copy of any associated NCRs (if any) in the BDR? NA if no NCRs. **Reference Source: CCP-PO-001, Table C3-3**	X			NCR-ORNL-0129-15 X10C0402997Y1
7. Are there 20 or fewer containers in the batch? **Reference Source: CCP-PO-001, C3-4**	X			
8. Are the data properly reported (i.e., data are reported in correct units and with correct significant figures)? **Reference Source: CCP-PO-001, C3-4**	X			
9. Is there evidence of verification that the physical form matches the Waste Matrix Code? **Reference Source: CCP-PO-001, Table C3-3**	X			

CCP RECORDS ORIGINAL
DATE REC'D 8.10.15 JV

Attachment 2 – CCP SPM Radiography Project Level Validation Checklist and Summary (Continued)

BDR Number: OR-RTR7-0149			Examination Date(s): 08/03/2015	
Description of Criteria Reviewed	**Criteria Met?**			**Comments/Qualifiers**
	YES	**NO**	**NA**	
10. Is there evidence of verification that the physical form matches the waste stream description? **Reference Source: CCP-PO-001, Table C3-3**	X			
11. Are prohibited items absent? **Reference Source: CCP-PO-001, Table C3-3**	X			
12. Does observable liquid, if present, meet the criteria of the TSDF-WAC? **Reference Source: CCP-PO-001, C-1**	X			
13. Were discrepancies between two operators with regard to identification of waste matrix code, liquids in excess of the TSDF-WAC, or compressed gases through replicate scans and independent observations reconciled? NA if no discrepancies. **Reference Source: CCP-PO-001, C3-2**			X	
14. Are the training qualifications for all radiography personnel acceptable? **Reference Source: CCP-PO-001, C3-8**	X			
15. Was evidence of the video/audio check included in the BDR? **Reference Source: CCP-PO-001, C1-1**	X			
16. Was the Lines-Pair Resolution Test or Sieve Test Check included in the BDR? **Reference Source: CCP Technical Procedures**	X			
17. Was a replicate scan performed once per day, or once per batch, whichever is LESS frequent? **Reference Source: CCP-PO-001, C1-1**	X			
18. Was an independent observation performed once per day, or once per batch, whichever is LESS frequent? **Reference Source: CCP-PO-001, C1-1**	X			

Attachment 2 – CCP SPM Radiography Project Level Validation Checklist and Summary (Continued)

BDR Number: OR-RTR7-0149				Examination Date(s): 08/03/2015
Description of Criteria Reviewed	**Criteria Met?**			**Comments/Qualifiers**
	YES	**NO**	**NA**	
19. Were the replicate scan and independent observation performed on different waste containers? **Reference Source: CCP-PO-001, C1-1**	X			
20. Were the personnel performing the replicate scan and independent observation different from the individual who performed the original? **Reference Source: CCP-PO-001, C1-1**	X			
21. Does the BDR include an estimate of each material parameter weight in kg for each container? **Reference Source: CCP Technical Procedures**	X			
22. Does the BDR include a description of each material parameter for each container? **Reference Source: CCP Technical Procedures**	X			
23. Is the container gross weight recorded in kilograms (kg) for each container in the BDR? **Reference Source: CCP Technical Procedures**	X			
24. Was the Scale Weight Calibration Check included in the BDR? **Reference Source: CCP Technical Procedures**			X	Scale not used.
25. Was the Scale Weight Check included in the BDR? **Reference Source: CCP Technical Procedures**			X	Scale not used.
Comments: None				
The container QC checks were properly performed and meet the Quality Assurance Objectives (QAOs). Proper procedures were followed during data reduction and analysis. The batch is complete, acceptable, and includes all supporting data and documentation required by the QAPjP.				
Carolina Soaterna	Carolina Soaterna			08/05/2015
SPM Printed Name	Signature			Date

Checklist is to be re-signed only when a re-review is performed.

SPM Printed Name	Signature	Reason	Date
SPM Printed Name	Signature	Reason	Date

Attachment 5–CCP Radiography Batch Data Report Cover Sheet

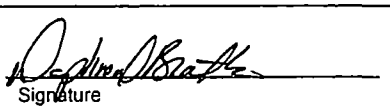
Site ID: ORNL

Batch Data Report No.: OR-RTR7-0149 ☑ CH ☐ RH Date: 8-3-15

Waste Container ID Numbers	
Replicate Scan:	X10CSATN03211T
Independent Observation:	X10CSATN03211AC
1	X10CSATN03211AC
2	X10CSATN03211K
3	X10CSATN03211L
4	X10CSATN03211X
5	X10CSATN03211AF
6	X10CSATN03211Y
7	X10CSATN03211T
8	X10CSATN03211AG
9	X10CSATN03211U
10	X10CSATN03211R
11	X10C0501446A
12	X10C0402997Y1
13	N/A
14	N/A
15	N/A
16	N/A
17	N/A
18	N/A
19	N/A
20	N/A

RTR Operator:

Daphne Brothers — Printed Name

 — Signature

8-3-15 — Date

Independent Technical Reviewer:

Fred Oney — Printed Name

— Signature

8-4-15 — Date

NTPC RECORDS ORIGINAL
DATE REC'D 8-04-2015

Attachment 4 – CCP Radiography Batch Data Report Table of Contents and Batch Narrative

Batch Data Report No.: OR-RTR7-0149 Date: 8-3-15

Table Of Contents		
Item	Description	Page No.
1	CCP Radiography Batch Data Report Cover Sheet	1
2	CCP Radiography Batch Data Report Table Of Contents	2
3	CCP RTR Measurement Control Report	3
4	CCP Radiography Data Sheets	4
5	Copy of NCRs (NA, If Not Applicable)	46
6	CCP Independent Technical Reviewer Checklist	49

Batch Narrative

All Quality Checks were performed and recorded on CCP-TP-053, Rev.15, CCP Radiography Measurement Control Report.

Daphne Brothers
RTR Operator

Signature

8-3-15
Date

Attachment 1 – CCP RTR Measurement Control Report

Site ID: ORNL		
Batch Data Report No.: OR-RTR7-0149		
Examination Date: 8-3-15		
Control Checks		
Video/Audio Recorded Media System Check	☑ SAT	☐ UNSAT
Image Test : 10 Lines (Minimum acceptable is 5 lines-pair/cm or #6 Sieve is viewable)	☑ SAT	☐ UNSAT
Comments: N/A		
RTR Operator:		
Daphne Brothers (Printed Name)	Daphne Brothers (Signature)	8-3-15 (Date)

CCP Radiography Data Sheet

Section 1: General Information	
[ ] RTR Examination [X] RTR Replicate Scan [ ] RTR Independent Observation	
Site ID:	ORNL
Batch Number:	OR-RTR7-0149
Examination Date:	8/3/2015
Waste Container ID:	X10CSATN03211T
Video/Audio Recorded Media Number:	OR-RTR7-0149 A&B
Procedure and Revision No.:	CCP-TP-053 Rev. 15
NCR(s) associated with the container? (e.g., Prohibited Items)	[X] No [ ] Yes NCR No.: N/A NCR No.: N/A

Section 2: Waste Container Data	
Container Type:	55 Gallon Drum
TRUCON Code:	OR 225
Waste Matrix Code:	S5400
Waste Stream I.D.:	OR-REDC-CH-HET
Waste Container Weights:	Gross Wt.: 66.8 kg Tare Wt.: 33.2 kg Net Wt.: 33.6 kg
Rigid Liner and Liner Vent Description:	Liner: [X] No [ ] Yes Lid: [X] No [ ] Yes Type: [ ] 30-mil [ ] 90-mil [ ] 110-mil [ ] 125-mil Vented: [ ] No [ ] Yes [X] N/A Punctured: [X] No [ ] Yes Mechanical Vent: [X] No [ ] Yes Fiberboard Liner: [X] No [ ] Yes Lead Lined: [X] No [ ] Yes
Number of Layers of Confinement:	Appears to be 1 layer
Volume Utilization Percentage:	85 %

CCP Radiography Data Sheet

Waste Container ID: X10CSATN03211T

Section 3: Container Inventory and Comments (Detailed descriptions)	
IM:	Metal fittings
AM:	Aluminum ring
OM:	
OI:	
C:	Cloth, coveralls
R:	
XPM:	Plastic sheeting, manipulator boots, plastic tubing, plastic suits
OR:	
IN:	
S:	

Section 4: Packaging Material and Waste Material Parameters	
Packaging Material:	**Estimated Weight (kg)**
Steel (ST):	27.8
Plastics (PP): Liner bag	1.0
Other: Cardboard (CP)	4.4
Total Packaging Weight	33.2
Waste Material Parameter:	**Estimated Weight (kg)**
Iron-based Metal / Alloys (IM):	0.2
Aluminum-based Metals / Alloys (AM):	2.0
Other Metals (OM):	
Other Inorganic Materials (OI)	
Cellulosics (C):	11.4
Rubber (R):	
Plastics (waste materials) (XPM):	20.0
Organic Matrix (OR):	
Inorganic Matrix (IN):	
Soils (S):	
Total WMP Weight:	33.6

CCP Radiography Data Sheet

Waste Container ID: X10CSATN03211T

Section 5: RTR Summary (Questions answered "Yes" will be explained in the Comment block, except for Question 1)	
Is there observable liquid?	☐ Yes ☒ No
Is there any observable liquid in internal containers, more than 60 milliliters or 3 percent by volume, whichever is greater?	☐ Yes ☒ No
Is the total volume of observable liquid in the outermost container GREATER than 1% of the container?	☐ Yes ☒ No
Is there observable liquid in payload containers with an EPA Hazardous Waste Number of U134?	☐ Yes ☒ No
Is there an indication of non-radionuclide pyrophoric materials, such as elemental potassium?	☐ Yes ☒ No
Is there an indication of hazardous wastes not occurring as co-contaminants with TRU mixed wastes (non-mixed hazardous wastes)?	☐ Yes ☒ No
Is there an indication of wastes incompatible with backfill, seal and panel closures materials, container and packaging materials, shipping container materials, or other wastes (i.e., waste does NOT match TRUCON Code[s])?	☐ Yes ☒ No
Is there an indication of wastes containing explosives or compressed gases?	☐ Yes ☒ No
Is there an indication of PCBs liquids?	☐ Yes ☒ No
Is there an indication of the waste exhibiting the characteristic of ignitability, corrosivity, or reactivity (EPA Hazardous Waste Numbers of D001, D002, or D003)?	☐ Yes ☒ No
Is the physical form of the waste inconsistent with the Waste Stream Description or the Waste Matrix Code?	☐ Yes ☒ No
CH or RH TRAMPAC	
Are there heat-sealed bags (unvented) GREATER than 4 liters and LESS than 390 square inches in the waste, or heat sealed bags not authorized in the RH TRUCON Code?	☐ Yes ☒ No
Were there Non-approved Closure Methods used on liner bags or inner bags greater than 4 liters?	☐ Yes ☒ No
Are there sealed containers GREATER than 4 liters?	☐ Yes ☒ No
Are there indications of inadequate protection for heavy and/or sharp objects?	☐ Yes ☒ No

Comments: This Replicate scan agrees with the original scan. EL 8/3/15

RTR Operator:

Print Name	Signature	Date
Eric Lyles		8/3/2015

CCP Radiography Data Sheet

Section 1: General Information	
☐ RTR Examination ☐ RTR Replicate Scan ☒ RTR Independent Observation	
Site ID:	ORNL
Batch Number:	OR-RTR7-0149
Examination Date:	8/3/2015
Waste Container ID:	X10CSATN03211AC
Video/Audio Recorded Media Number:	OR-RTR7-0149 A&B
Procedure and Revision No.:	CCP-TP-053 Rev. 15
NCR(s) associated with the container? (e.g., Prohibited Items)	☒ No ☐ Yes NCR No.: N/A NCR No.: N/A

Section 2: Waste Container Data	
Container Type:	55 Gallon Drum
TRUCON Code:	OR 225
Waste Matrix Code:	S5400
Waste Stream I.D.:	OR-REDC-CH-HET
Waste Container Weights:	Gross Wt.: 60.6 kg Tare Wt.: 33.2 kg Net Wt.: 27.4 kg
Rigid Liner and Liner Vent Description:	Liner: ☒ No ☐ Yes Lid: ☒ No ☐ Yes Type: ☐ 30-mil ☐ 90-mil ☐ 110-mil ☐ 125-mil Vented: ☐ No ☐ Yes ☒ N/A Punctured: ☒ No ☐ Yes Mechanical Vent: ☒ No ☐ Yes Fiberboard Liner: ☒ No ☐ Yes Lead Lined: ☒ No ☐ Yes
Number of Layers of Confinement:	Appears to be 1 layer
Volume Utilization Percentage:	80 %

CCP Radiography Data Sheet

Waste Container ID: X10CSATN03211AC

Section 3: Container Inventory and Comments (Detailed descriptions)	
IM:	
AM:	
OM:	
OI:	
C:	Cloth, coveralls
R:	Rubber gloves
XPM:	Plastic sheeting, plastic tubing
OR:	
IN:	
S:	

Section 4: Packaging Material and Waste Material Parameters	
Packaging Material:	**Estimated Weight (kg)**
Steel (ST):	27.8
Plastics (PP): Liner bag	1.0
Other: Cardboard (CP)	4.4
Total Packaging Weight	33.2
Waste Material Parameter:	**Estimated Weight (kg)**
Iron-based Metal / Alloys (IM):	
Aluminum-based Metals / Alloys (AM):	
Other Metals (OM):	
Other Inorganic Materials (OI)	
Cellulosics (C):	10.0
Rubber (R):	0.5
Plastics (waste materials) (XPM):	16.9
Organic Matrix (OR):	
Inorganic Matrix (IN):	
Soils (S):	
Total WMP Weight:	27.4

CCP Radiography Data Sheet

Waste Container ID: X10CSATN03211AC

Section 5: RTR Summary (Questions answered "Yes" will be explained in the Comment block, except for Question 1)	
Is there observable liquid?	☐ Yes ☒ No
Is there any observable liquid in internal containers, more than 60 milliliters or 3 percent by volume, whichever is greater?	☐ Yes ☒ No
Is the total volume of observable liquid in the outermost container GREATER than 1% of the container?	☐ Yes ☒ No
Is there observable liquid in payload containers with an EPA Hazardous Waste Number of U134?	☐ Yes ☒ No
Is there an indication of non-radionuclide pyrophoric materials, such as elemental potassium?	☐ Yes ☒ No
Is there an indication of hazardous wastes not occurring as co-contaminants with TRU mixed wastes (non-mixed hazardous wastes)?	☐ Yes ☒ No
Is there an indication of wastes incompatible with backfill, seal and panel closures materials, container and packaging materials, shipping container materials, or other wastes (i.e., waste does NOT match TRUCON Code[s])?	☐ Yes ☒ No
Is there an indication of wastes containing explosives or compressed gases?	☐ Yes ☒ No
Is there an indication of PCBs-liquids?	☐ Yes ☒ No
Is there an indication of the waste exhibiting the characteristic of ignitability, corrosivity, or reactivity (EPA Hazardous Waste Numbers of D001, D002, or D003)?	☐ Yes ☒ No
Is the physical form of the waste inconsistent with the Waste Stream Description or the Waste Matrix Code?	☐ Yes ☒ No
CH or RH TRAMPAC	
Are there heat-sealed bags (unvented) GREATER than 4 liters and LESS than 390 square inches in the waste, or heat sealed bags not authorized in the RH TRUCON Code?	☐ Yes ☒ No
Were there Non-approved Closure Methods used on liner bags or inner bags greater than 4 liters?	☐ Yes ☒ No
Are there sealed containers GREATER than 4 liters?	☐ Yes ☒ No
Are there indications of inadequate protection for heavy and/or sharp objects?	☐ Yes ☒ No

Comments: This Independent observation agrees with the original scan. EL 8/3/15

RTR Operator:

Print Name	Signature	Date
Eric Lyles		8/3/2015

CCP Radiography Data Sheet

Section 1: General Information	
[X] RTR Examination [ ] RTR Replicate Scan [ ] RTR Independent Observation	
Site ID:	ORNL
Batch Number:	OR-RTR7-0149
Examination Date:	8/3/2015
Waste Container ID:	X10CSATN03211AC
Video/Audio Recorded Media Number:	OR-RTR7-0149 A&B
Procedure and Revision No.:	CCP-TP-053 Rev. 15
NCR(s) associated with the container? (e.g., Prohibited Items)	[X] No [ ] Yes NCR No.: N/A NCR No.: N/A

Section 2: Waste Container Data	
Container Type:	55 Gallon Drum
TRUCON Code:	OR 225
Waste Matrix Code:	S5400
Waste Stream I.D.:	OR-REDC-CH-HET
Waste Container Weights:	Gross Wt.: 60.6 kg Tare Wt.: 33.2 kg Net Wt.: 27.4 kg
Rigid Liner and Liner Vent Description:	Liner: [X] No [ ] Yes Lid: [X] No [ ] Yes Type: [ ] 30-mil [ ] 90-mil [ ] 110-mil [ ] 125-mil Vented: [ ] No [ ] Yes [X] N/A Punctured: [X] No [ ] Yes Mechanical Vent: [X] No [ ] Yes Fiberboard Liner: [X] No [ ] Yes Lead Lined: [X] No [ ] Yes
Number of Layers of Confinement:	Appears to be 1 layer
Volume Utilization Percentage:	80 %

CCP Radiography Data Sheet

Waste Container ID: X10CSATN03211AC

Section 3: Container Inventory and Comments (Detailed descriptions)	
IM:	
AM:	
OM:	
OI:	
C:	Cloth, coveralls
R:	Rubber gloves
XPM:	Plastic sheeting, plastic tubing, scrap plastic
OR:	
IN:	
S:	

Section 4: Packaging Material and Waste Material Parameters	
Packaging Material:	**Estimated Weight (kg)**
Steel (ST):	27.8
Plastics (PP): Liner bag	1.0
Other: Cardboard (CP)	4.4
Total Packaging Weight	33.2
Waste Material Parameter:	**Estimated Weight (kg)**
Iron-based Metal / Alloys (IM):	
Aluminum-based Metals / Alloys (AM):	
Other Metals (OM):	
Other Inorganic Materials (OI)	
Cellulosics (C):	10.0
Rubber (R):	0.4
Plastics (waste materials) (XPM):	17.0
Organic Matrix (OR):	
Inorganic Matrix (IN):	
Soils (S):	
Total WMP Weight:	27.4

CCP Radiography Data Sheet

Waste Container ID: X10CSATN03211AC

Section 5: RTR Summary (Questions answered "Yes" will be explained in the Comment block, except for Question 1)	
Is there observable liquid?	☐ Yes ☒ No
Is there any observable liquid in internal containers, more than 60 milliliters or 3 percent by volume, whichever is greater?	☐ Yes ☒ No
Is the total volume of observable liquid in the outermost container GREATER than 1% of the container?	☐ Yes ☒ No
Is there observable liquid in payload containers with an EPA Hazardous Waste Number of U134?	☐ Yes ☒ No
Is there an indication of non-radionuclide pyrophoric materials, such as elemental potassium?	☐ Yes ☒ No
Is there an indication of hazardous wastes not occurring as co-contaminants with TRU mixed wastes (non-mixed hazardous wastes)?	☐ Yes ☒ No
Is there an indication of wastes incompatible with backfill, seal and panel closures materials, container and packaging materials, shipping container materials, or other wastes (i.e., waste does NOT match TRUCON Code[s])?	☐ Yes ☒ No
Is there an indication of wastes containing explosives or compressed gases?	☐ Yes ☒ No
Is there an indication of PCBs liquids?	☐ Yes ☒ No
Is there an indication of the waste exhibiting the characteristic of ignitability, corrosivity, or reactivity (EPA Hazardous Waste Numbers of D001, D002, or D003)?	☐ Yes ☒ No
Is the physical form of the waste inconsistent with the Waste Stream Description or the Waste Matrix Code?	☐ Yes ☒ No
CH or RH TRAMPAC	
Are there heat-sealed bags (unvented) GREATER than 4 liters and LESS than 390 square inches in the waste, or heat sealed bags not authorized in the RH TRUCON Code?	☐ Yes ☒ No
Were there Non-approved Closure Methods used on liner bags or inner bags greater than 4 liters?	☐ Yes ☒ No
Are there sealed containers GREATER than 4 liters?	☐ Yes ☒ No
Are there indications of inadequate protection for heavy and/or sharp objects?	☐ Yes ☒ No

Comments: N/A

RTR Operator:

Daphne Brothers	Daphne D Brothers	8/3/2015
Print Name	Signature	Date

CCP Radiography Data Sheet

Section 1: General Information	
[X] RTR Examination [ ] RTR Replicate Scan [ ] RTR Independent Observation	
Site ID:	ORNL
Batch Number:	OR-RTR7-0149
Examination Date:	8/3/2015
Waste Container ID:	X10CSATN03211K
Video/Audio Recorded Media Number:	OR-RTR7-0149 A&B
Procedure and Revision No.:	CCP-TP-053 Rev. 15
NCR(s) associated with the container? (e.g., Prohibited Items)	[X] No [ ] Yes NCR No.: N/A NCR No.: N/A

Section 2: Waste Container Data	
Container Type:	55 Gallon Drum
TRUCON Code:	OR 225
Waste Matrix Code:	S5400
Waste Stream I.D.:	OR-REDC-CH-HET
Waste Container Weights:	Gross Wt.: 59.5 kg Tare Wt.: 33.2 kg Net Wt.: 26.3 kg
Rigid Liner and Liner Vent Description:	Liner: [X] No [ ] Yes Lid: [X] No [ ] Yes Type: [ ] 30-mil [ ] 90-mil [ ] 110-mil [ ] 125-mil Vented: [ ] No [ ] Yes [X] N/A Punctured: [X] No [ ] Yes Mechanical Vent: [X] No [ ] Yes Fiberboard Liner: [X] No [ ] Yes Lead Lined: [X] No [ ] Yes
Number of Layers of Confinement:	Appears to be 1 layer
Volume Utilization Percentage:	85 %

CCP Radiography Data Sheet

Waste Container ID: X10CSATN03211K

Section 3: Container Inventory and Comments (Detailed descriptions)	
IM:	Electrical equipment, metal pipes, saw blades, metal can, scrap metal
AM:	
OM:	
OI:	Broken glass
C:	Cloth
R:	
XPM:	Plastic sheeting, open plastic bucket, plastic container
OR:	
IN:	
S:	

Section 4: Packaging Material and Waste Material Parameters	
Packaging Material:	**Estimated Weight (kg)**
Steel (ST):	27.8
Plastics (PP): Liner bag	1.0
Other: Cardboard (CP)	4.4
Total Packaging Weight	33.2
Waste Material Parameter:	**Estimated Weight (kg)**
Iron-based Metal / Alloys (IM):	16.3
Aluminum-based Metals / Alloys (AM):	
Other Metals (OM):	
Other Inorganic Materials (OI)	1.0
Cellulosics (C):	1.0
Rubber (R):	
Plastics (waste materials) (XPM):	8.0
Organic Matrix (OR):	
Inorganic Matrix (IN):	
Soils (S):	
Total WMP Weight:	26.3

CCP Radiography Data Sheet

Waste Container ID: X10CSATN03211K

Section 5: RTR Summary (Questions answered "Yes" will be explained in the Comment block, except for Question 1)	
Is there observable liquid?	☐ Yes ☒ No
Is there any observable liquid in internal containers, more than 60 milliliters or 3 percent by volume, whichever is greater?	☐ Yes ☒ No
Is the total volume of observable liquid in the outermost container GREATER than 1% of the container?	☐ Yes ☒ No
Is there observable liquid in payload containers with an EPA Hazardous Waste Number of U134?	☐ Yes ☒ No
Is there an indication of non-radionuclide pyrophoric materials, such as elemental potassium?	☐ Yes ☒ No
Is there an indication of hazardous wastes not occurring as co-contaminants with TRU mixed wastes (non-mixed hazardous wastes)?	☐ Yes ☒ No
Is there an indication of wastes incompatible with backfill, seal and panel closures materials, container and packaging materials, shipping container materials, or other wastes (i.e., waste does NOT match TRUCON Code[s])?	☐ Yes ☒ No
Is there an indication of wastes containing explosives or compressed gases?	☐ Yes ☒ No
Is there an indication of PCBs liquids?	☐ Yes ☒ No
Is there an indication of the waste exhibiting the characteristic of ignitability, corrosivity, or reactivity (EPA Hazardous Waste Numbers of D001, D002, or D003)?	☐ Yes ☒ No
Is the physical form of the waste inconsistent with the Waste Stream Description or the Waste Matrix Code?	☐ Yes ☒ No
CH or RH TRAMPAC	
Are there heat-sealed bags (unvented) GREATER than 4 liters and LESS than 390 square inches in the waste, or heat sealed bags not authorized in the RH TRUCON Code?	☐ Yes ☒ No
Were there Non-approved Closure Methods used on liner bags or inner bags greater than 4 liters?	☐ Yes ☒ No
Are there sealed containers GREATER than 4 liters?	☐ Yes ☒ No
Are there indications of inadequate protection for heavy and/or sharp objects?	☐ Yes ☒ No
Comments: N/A	

RTR Operator:

Daphne Brothers	Daphne A Brothers	8/3/2015
Print Name	Signature	Date

CCP Radiography Data Sheet

Section 1: General Information	
[X] RTR Examination [ ] RTR Replicate Scan [ ] RTR Independent Observation	
Site ID:	ORNL
Batch Number:	OR-RTR7-0149
Examination Date:	8/3/2015
Waste Container ID:	X10CSATN03211L
Video/Audio Recorded Media Number:	OR-RTR7-0149 A&B
Procedure and Revision No.:	CCP-TP-053 Rev. 15
NCR(s) associated with the container? (e.g., Prohibited Items)	[X] No [ ] Yes NCR No.: N/A NCR No.: N/A

Section 2: Waste Container Data	
Container Type:	55 Gallon Drum
TRUCON Code:	OR 225
Waste Matrix Code:	S5400
Waste Stream I.D.:	OR-REDC-CH-HET
Waste Container Weights:	Gross Wt.: 64.8 kg Tare Wt.: 33.2 kg Net Wt.: 31.6 kg
Rigid Liner and Liner Vent Description:	Liner: [X] No [ ] Yes Lid: [X] No [ ] Yes Type: [ ] 30-mil [ ] 90-mil [ ] 110-mil [ ] 125-mil Vented: [ ] No [ ] Yes [X] N/A Punctured: [X] No [ ] Yes Mechanical Vent: [X] No [ ] Yes Fiberboard Liner: [X] No [ ] Yes Lead Lined: [X] No [ ] Yes
Number of Layers of Confinement:	Appears to be 1 layer
Volume Utilization Percentage:	80 %

CCP Radiography Data Sheet

Waste Container ID: X10CSATN03211L

Section 3: Container Inventory and Comments (Detailed descriptions)	
IM:	Metal pipes, saw blades, scrap metal
AM:	
OM:	
OI:	Floor sweepings
C:	Cloth
R:	
XPM:	Plastic sheeting, plastic flex hose, open plastic bucket, scrap plastic
OR:	
IN:	
S:	

Section 4: Packaging Material and Waste Material Parameters	
Packaging Material:	**Estimated Weight (kg)**
Steel (ST):	27.8
Plastics (PP): Liner bag	1.0
Other: Cardboard (CP)	4.4
Total Packaging Weight	33.2
Waste Material Parameter:	**Estimated Weight (kg)**
Iron-based Metal / Alloys (IM):	19.0
Aluminum-based Metals / Alloys (AM):	
Other Metals (OM):	
Other Inorganic Materials (OI)	1.6
Cellulosics (C):	1.0
Rubber (R):	
Plastics (waste materials) (XPM):	10.0
Organic Matrix (OR):	
Inorganic Matrix (IN):	
Soils (S):	
Total WMP Weight:	31.6

CCP Radiography Data Sheet

Waste Container ID: X10CSATN03211L

Section 5: RTR Summary (Questions answered "Yes" will be explained in the Comment block, except for Question 1)	
Is there observable liquid?	☐ Yes ☒ No
Is there any observable liquid in internal containers, more than 60 milliliters or 3 percent by volume, whichever is greater?	☐ Yes ☒ No
Is the total volume of observable liquid in the outermost container GREATER than 1% of the container?	☐ Yes ☒ No
Is there observable liquid in payload containers with an EPA Hazardous Waste Number of U134?	☐ Yes ☒ No
Is there an indication of non-radionuclide pyrophoric materials, such as elemental potassium?	☐ Yes ☒ No
Is there an indication of hazardous wastes not occurring as co-contaminants with TRU mixed wastes (non-mixed hazardous wastes)?	☐ Yes ☒ No
Is there an indication of wastes incompatible with backfill, seal and panel closures materials, container and packaging materials, shipping container materials, or other wastes (i.e., waste does NOT match TRUCON Code[s])?	☐ Yes ☒ No
Is there an indication of wastes containing explosives or compressed gases?	☐ Yes ☒ No
Is there an indication of PCBs liquids?	☐ Yes ☒ No
Is there an indication of the waste exhibiting the characteristic of ignitability, corrosivity, or reactivity (EPA Hazardous Waste Numbers of D001, D002, or D003)?	☐ Yes ☒ No
Is the physical form of the waste inconsistent with the Waste Stream Description or the Waste Matrix Code?	☐ Yes ☒ No
CH or RH TRAMPAC	
Are there heat-sealed bags (unvented) GREATER than 4 liters and LESS than 390 square inches in the waste, or heat sealed bags not authorized in the RH TRUCON Code?	☐ Yes ☒ No
Were there Non-approved Closure Methods used on liner bags or inner bags greater than 4 liters?	☐ Yes ☒ No
Are there sealed containers GREATER than 4 liters?	☐ Yes ☒ No
Are there indications of inadequate protection for heavy and/or sharp objects?	☐ Yes ☒ No
Comments: N/A	

RTR Operator:

Daphne Brothers		8/3/2015
Print Name	Signature	Date

CCP Radiography Data Sheet

Section 1: General Information	
[X] RTR Examination [ ] RTR Replicate Scan [ ] RTR Independent Observation	
Site ID:	ORNL
Batch Number:	OR-RTR7-0149
Examination Date:	8/3/2015
Waste Container ID:	X10CSATN03211X
Video/Audio Recorded Media Number:	OR-RTR7-0149 A&B
Procedure and Revision No.:	CCP-TP-053 Rev. 15
NCR(s) associated with the container? (e.g., Prohibited Items)	[X] No [ ] Yes NCR No.: N/A NCR No.: N/A

Section 2: Waste Container Data	
Container Type:	55 Gallon Drum
TRUCON Code:	OR 225
Waste Matrix Code:	S5400
Waste Stream I.D.:	OR-REDC-CH-HET
Waste Container Weights:	Gross Wt.: 65.5 kg Tare Wt.: 33.2 kg Net Wt.: 32.3 kg
Rigid Liner and Liner Vent Description:	Liner: [X] No [ ] Yes Lid: [X] No [ ] Yes Type: [ ] 30-mil [ ] 90-mil [ ] 110-mil [ ] 125-mil Vented: [ ] No [ ] Yes [X] N/A Punctured: [X] No [ ] Yes Mechanical Vent: [X] No [ ] Yes Fiberboard Liner: [X] No [ ] Yes Lead Lined: [X] No [ ] Yes
Number of Layers of Confinement:	Appears to be 1 layer
Volume Utilization Percentage:	90 %

CCP Radiography Data Sheet

Waste Container ID: X10CSATN03211X

Section 3: Container Inventory and Comments (Detailed descriptions)	
IM:	
AM:	
OM:	
OI:	
C:	Cloth, coveralls, tape
R:	Rubber gloves
XPM:	Plastic sheeting, plastic suits, plastic tubing, scrap plastic
OR:	
IN:	
S:	

Section 4: Packaging Material and Waste Material Parameters	
Packaging Material:	**Estimated Weight (kg)**
Steel (ST):	27.8
Plastics (PP): Liner bag	1.0
Other: Cardboard (CP)	4.4
Total Packaging Weight	33.2
Waste Material Parameter:	**Estimated Weight (kg)**
Iron-based Metal / Alloys (IM):	
Aluminum-based Metals / Alloys (AM):	
Other Metals (OM):	
Other Inorganic Materials (OI)	
Cellulosics (C):	10.0
Rubber (R):	0.3
Plastics (waste materials) (XPM):	22.0
Organic Matrix (OR):	
Inorganic Matrix (IN):	
Soils (S):	
Total WMP Weight:	32.3

CCP Radiography Data Sheet

Waste Container ID: X10CSATN03211X

Section 5: RTR Summary (Questions answered "Yes" will be explained in the Comment block, except for Question 1)	
Is there observable liquid?	☐ Yes ☒ No
Is there any observable liquid in internal containers, more than 60 milliliters or 3 percent by volume, whichever is greater?	☐ Yes ☒ No
Is the total volume of observable liquid in the outermost container GREATER than 1% of the container?	☐ Yes ☒ No
Is there observable liquid in payload containers with an EPA Hazardous Waste Number of U134?	☐ Yes ☒ No
Is there an indication of non-radionuclide pyrophoric materials, such as elemental potassium?	☐ Yes ☒ No
Is there an indication of hazardous wastes not occurring as co-contaminants with TRU mixed wastes (non-mixed hazardous wastes)?	☐ Yes ☒ No
Is there an indication of wastes incompatible with backfill, seal and panel closures materials, container and packaging materials, shipping container materials, or other wastes (i.e., waste does NOT match TRUCON Code[s])?	☐ Yes ☒ No
Is there an indication of wastes containing explosives or compressed gases?	☐ Yes ☒ No
Is there an indication of PCBs liquids?	☐ Yes ☒ No
Is there an indication of the waste exhibiting the characteristic of ignitability, corrosivity, or reactivity (EPA Hazardous Waste Numbers of D001, D002, or D003)?	☐ Yes ☒ No
Is the physical form of the waste inconsistent with the Waste Stream Description or the Waste Matrix Code?	☐ Yes ☒ No
CH or RH TRAMPAC	
Are there heat-sealed bags (unvented) GREATER than 4 liters and LESS than 390 square inches in the waste, or heat sealed bags not authorized in the RH TRUCON Code?	☐ Yes ☒ No
Were there Non-approved Closure Methods used on liner bags or inner bags greater than 4 liters?	☐ Yes ☒ No
Are there sealed containers GREATER than 4 liters?	☐ Yes ☒ No
Are there indications of inadequate protection for heavy and/or sharp objects?	☐ Yes ☒ No

Comments: N/A

RTR Operator:

Daphne Brothers	Daphne D Brothers	8/3/2015
Print Name	Signature	Date

CCP Radiography Data Sheet

Section 1: General Information	
[X] RTR Examination [ ] RTR Replicate Scan [ ] RTR Independent Observation	
Site ID:	ORNL
Batch Number:	OR-RTR7-0149
Examination Date:	8/3/2015
Waste Container ID:	X10CSATN03211AF
Video/Audio Recorded Media Number:	OR-RTR7-0149 A&B
Procedure and Revision No.:	CCP-TP-053 Rev. 15
NCR(s) associated with the container? (e.g., Prohibited Items)	[X] No [ ] Yes NCR No.: N/A NCR No.: N/A

Section 2: Waste Container Data	
Container Type:	55 Gallon Drum
TRUCON Code:	OR 225
Waste Matrix Code:	S5400
Waste Stream I.D.:	OR-REDC-CH-HET
Waste Container Weights:	Gross Wt.: 67.4 kg Tare Wt.: 33.2 kg Net Wt.: 34.2 kg
Rigid Liner and Liner Vent Description:	Liner: [X] No [ ] Yes Lid: [X] No [ ] Yes Type: [ ] 30-mil [ ] 90-mil [ ] 110-mil [ ] 125-mil Vented: [ ] No [ ] Yes [X] N/A Punctured: [X] No [ ] Yes Mechanical Vent: [X] No [ ] Yes Fiberboard Liner: [X] No [ ] Yes Lead Lined: [X] No [ ] Yes
Number of Layers of Confinement:	Appears to be 1 layer
Volume Utilization Percentage:	90 %

CCP Radiography Data Sheet

Waste Container ID: X10CSATN03211AF

Section 3: Container Inventory and Comments (Detailed descriptions)	
IM:	Scrap metal
AM:	
OM:	
OI:	
C:	Cloth , coveralls
R:	Rubber gloves
XPM:	Plastic sheeting, scrap plastic, plastic tubing, plastic suits
OR:	
IN:	
S:	

Section 4: Packaging Material and Waste Material Parameters	
Packaging Material:	**Estimated Weight (kg)**
Steel (ST):	27.8
Plastics (PP): Liner bag	1.0
Other: Cardboard (CP)	4.4
Total Packaging Weight	33.2
Waste Material Parameter:	**Estimated Weight (kg)**
Iron-based Metal / Alloys (IM):	0.1
Aluminum-based Metals / Alloys (AM):	
Other Metals (OM):	
Other Inorganic Materials (OI)	
Cellulosics (C):	10.0
Rubber (R):	0.6
Plastics (waste materials) (XPM):	23.5
Organic Matrix (OR):	
Inorganic Matrix (IN):	
Soils (S):	
Total WMP Weight:	34.2

CCP Radiography Data Sheet

Waste Container ID: X10CSATN03211AF

Section 5: RTR Summary (Questions answered "Yes" will be explained in the Comment block, except for Question 1)	
Is there observable liquid?	☐ Yes ☒ No
Is there any observable liquid in internal containers, more than 60 milliliters or 3 percent by volume, whichever is greater?	☐ Yes ☒ No
Is the total volume of observable liquid in the outermost container GREATER than 1% of the container?	☐ Yes ☒ No
Is there observable liquid in payload containers with an EPA Hazardous Waste Number of U134?	☐ Yes ☒ No
Is there an indication of non-radionuclide pyrophoric materials, such as elemental potassium?	☐ Yes ☒ No
Is there an indication of hazardous wastes not occurring as co-contaminants with TRU mixed wastes (non-mixed hazardous wastes)?	☐ Yes ☒ No
Is there an indication of wastes incompatible with backfill, seal and panel closures materials, container and packaging materials, shipping container materials, or other wastes (i.e., waste does NOT match TRUCON Code[s])?	☐ Yes ☒ No
Is there an indication of wastes containing explosives or compressed gases?	☐ Yes ☒ No
Is there an indication of PCBs liquids?	☐ Yes ☒ No
Is there an indication of the waste exhibiting the characteristic of ignitability, corrosivity, or reactivity (EPA Hazardous Waste Numbers of D001, D002, or D003)?	☐ Yes ☒ No
Is the physical form of the waste inconsistent with the Waste Stream Description or the Waste Matrix Code?	☐ Yes ☒ No
CH or RH TRAMPAC	
Are there heat-sealed bags (unvented) GREATER than 4 liters and LESS than 390 square inches in the waste, or heat sealed bags not authorized in the RH TRUCON Code?	☐ Yes ☒ No
Were there Non-approved Closure Methods used on liner bags or inner bags greater than 4 liters?	☐ Yes ☒ No
Are there sealed containers GREATER than 4 liters?	☐ Yes ☒ No
Are there indications of inadequate protection for heavy and/or sharp objects?	☐ Yes ☒ No
Comments: N/A	

RTR Operator:

Daphne Brothers	Daphne O Brothers	8/3/2015
Print Name	Signature	Date

CCP Radiography Data Sheet

Section 1: General Information	
[X] RTR Examination [ ] RTR Replicate Scan [ ] RTR Independent Observation	
Site ID:	ORNL
Batch Number:	OR-RTR7-0149
Examination Date:	8/3/2015
Waste Container ID:	X10CSATN03211Y
Video/Audio Recorded Media Number:	OR-RTR7-0149 A&B
Procedure and Revision No.:	CCP-TP-053 Rev. 15
NCR(s) associated with the container? (e.g., Prohibited Items)	[X] No [ ] Yes NCR No.: N/A NCR No.: N/A

Section 2: Waste Container Data	
Container Type:	55 Gallon Drum
TRUCON Code:	OR 225
Waste Matrix Code:	S5400
Waste Stream I.D.:	OR-REDC-CH-HET
Waste Container Weights:	Gross Wt.: 58.2 kg Tare Wt.: 33.2 kg Net Wt.: 25.0 kg
Rigid Liner and Liner Vent Description:	Liner: [X] No [ ] Yes Lid: [X] No [ ] Yes Type: [ ] 30-mil [ ] 90-mil [ ] 110-mil [ ] 125-mil Vented: [ ] No [ ] Yes [X] N/A Punctured: [X] No [ ] Yes Mechanical Vent: [X] No [ ] Yes Fiberboard Liner: [X] No [ ] Yes Lead Lined: [X] No [ ] Yes
Number of Layers of Confinement:	Appears to be 1 layer
Volume Utilization Percentage:	85 %

CCP Radiography Data Sheet

Waste Container ID: X10CSATN03211Y

Section 3: Container Inventory and Comments (Detailed descriptions)

IM: Scrap metal

AM:

OM:

OI:

C: Cloth, coveralls

R: Rubber gloves

XPM: Plastic sheeting, scrap plastic, plastic tubing

OR:

IN:

S:

Section 4: Packaging Material and Waste Material Parameters

Packaging Material:	Estimated Weight (kg)
Steel (ST):	27.8
Plastics (PP): Liner bag	1.0
Other: Cardboard (CP)	4.4
Total Packaging Weight	33.2
Waste Material Parameter:	**Estimated Weight (kg)**
Iron-based Metal / Alloys (IM):	0.5
Aluminum-based Metals / Alloys (AM):	
Other Metals (OM):	
Other Inorganic Materials (OI)	
Cellulosics (C):	10.0
Rubber (R):	0.5
Plastics (waste materials) (XPM):	14.0
Organic Matrix (OR):	
Inorganic Matrix (IN):	
Soils (S):	
Total WMP Weight:	25.0

CCP Radiography Data Sheet

Waste Container ID: X10CSATN03211Y

Section 5: RTR Summary (Questions answered "Yes" will be explained in the Comment block, except for Question 1)	
Is there observable liquid?	[X] Yes [ ] No
Is there any observable liquid in internal containers, more than 60 milliliters or 3 percent by volume, whichever is greater?	[ ] Yes [X] No
Is the total volume of observable liquid in the outermost container GREATER than 1% of the container?	[ ] Yes [X] No
Is there observable liquid in payload containers with an EPA Hazardous Waste Number of U134?	[ ] Yes [X] No
Is there an indication of non-radionuclide pyrophoric materials, such as elemental potassium?	[ ] Yes [X] No
Is there an indication of hazardous wastes not occurring as co-contaminants with TRU mixed wastes (non-mixed hazardous wastes)?	[ ] Yes [X] No
Is there an indication of wastes incompatible with backfill, seal and panel closures materials, container and packaging materials, shipping container materials, or other wastes (i.e., waste does NOT match TRUCON Code[s])?	[ ] Yes [X] No
Is there an indication of wastes containing explosives or compressed gases?	[ ] Yes [X] No
Is there an indication of PCBs liquids?	[ ] Yes [X] No
Is there an indication of the waste exhibiting the characteristic of ignitability, corrosivity, or reactivity (EPA Hazardous Waste Numbers of D001, D002, or D003)?	[ ] Yes [X] No
Is the physical form of the waste inconsistent with the Waste Stream Description or the Waste Matrix Code?	[ ] Yes [X] No
CH or RH TRAMPAC	
Are there heat-sealed bags (unvented) GREATER than 4 liters and LESS than 390 square inches in the waste, or heat sealed bags not authorized in the RH TRUCON Code?	[ ] Yes [X] No
Were there Non-approved Closure Methods used on liner bags or inner bags greater than 4 liters?	[ ] Yes [X] No
Are there sealed containers GREATER than 4 liters?	[ ] Yes [X] No
Are there indications of inadequate protection for heavy and/or sharp objects?	[ ] Yes [X] No
Comments: N/A	

RTR Operator:

Daphne Brothers	Daphne O'Brothers	8/3/2015
Print Name	Signature	Date

CCP Radiography Data Sheet

Section 1: General Information	
[X] RTR Examination [ ] RTR Replicate Scan [ ] RTR Independent Observation	
Site ID:	ORNL
Batch Number:	OR-RTR7-0149
Examination Date:	8/3/2015
Waste Container ID:	X10CSATN03211T
Video/Audio Recorded Media Number:	OR-RTR7-0149 A&B
Procedure and Revision No.:	CCP-TP-053 Rev. 15
NCR(s) associated with the container? (e.g., Prohibited Items)	[X] No [ ] Yes NCR No.: N/A NCR No.: N/A

Section 2: Waste Container Data	
Container Type:	55 Gallon Drum
TRUCON Code:	OR 225
Waste Matrix Code:	S5400
Waste Stream I.D.:	OR-REDC-CH-HET
Waste Container Weights:	Gross Wt.: 66.8 kg Tare Wt.: 33.2 kg Net Wt.: 33.6 kg
Rigid Liner and Liner Vent Description:	Liner: [X] No [ ] Yes Lid: [X] No [ ] Yes Type: [ ] 30-mil [ ] 90-mil [ ] 110-mil [ ] 125-mil Vented: [ ] No [ ] Yes [X] N/A Punctured: [X] No [ ] Yes Mechanical Vent: [X] No [ ] Yes Fiberboard Liner: [X] No [ ] Yes Lead Lined: [X] No [ ] Yes
Number of Layers of Confinement:	Appears to be 1 layer
Volume Utilization Percentage:	85 %

CCP Radiography Data Sheet

Waste Container ID: X10CSATN03211T

Section 3: Container Inventory and Comments (Detailed descriptions)	
IM:	Metal fittings
AM:	Aluminum collar
OM:	
OI:	
C:	Cloth, coveralls
R:	
XPM:	Plastic sheeting, manipulator boots, scrap plastic, plastic tubing, plastic suits
OR:	
IN:	
S:	

Section 4: Packaging Material and Waste Material Parameters	
Packaging Material:	**Estimated Weight (kg)**
Steel (ST):	27.8
Plastics (PP): Liner bag	1.0
Other: Cardboard (CP)	4.4
Total Packaging Weight	33.2
Waste Material Parameter:	**Estimated Weight (kg)**
Iron-based Metal / Alloys (IM):	0.2
Aluminum-based Metals / Alloys (AM):	2.0
Other Metals (OM):	
Other Inorganic Materials (OI)	
Cellulosics (C):	10.4
Rubber (R):	
Plastics (waste materials) (XPM):	21.0
Organic Matrix (OR):	
Inorganic Matrix (IN):	
Soils (S):	
Total WMP Weight:	33.6

CCP Radiography Data Sheet

Waste Container ID: X10CSATN03211T

Section 5: RTR Summary (Questions answered "Yes" will be explained in the Comment block, except for Question 1)	
Is there observable liquid?	☐ Yes ☒ No
Is there any observable liquid in internal containers, more than 60 milliliters or 3 percent by volume, whichever is greater?	☐ Yes ☒ No
Is the total volume of observable liquid in the outermost container GREATER than 1% of the container?	☐ Yes ☒ No
Is there observable liquid in payload containers with an EPA Hazardous Waste Number of U134?	☐ Yes ☒ No
Is there an indication of non-radionuclide pyrophoric materials, such as *elemental potassium*?	☐ Yes ☒ No
Is there an indication of hazardous wastes not occurring as co-contaminants with TRU mixed wastes (non-mixed hazardous wastes)?	☐ Yes ☒ No
Is there an indication of wastes incompatible with backfill, seal and panel closures materials, container and packaging materials, shipping container materials, or other wastes (i.e., waste does NOT match TRUCON Code[s])?	☐ Yes ☒ No
Is there an indication of wastes containing explosives or compressed gases?	☐ Yes ☒ No
Is there an indication of PCBs liquids?	☐ Yes ☒ No
Is there an indication of the waste exhibiting the characteristic of ignitability, corrosivity, or reactivity (EPA Hazardous Waste Numbers of D001, D002, or D003)?	☐ Yes ☒ No
Is the physical form of the waste inconsistent with the Waste Stream Description or the Waste Matrix Code?	☐ Yes ☒ No
CH or RH TRAMPAC	
Are there heat-sealed bags (unvented) GREATER than 4 liters and LESS than 390 square inches in the waste, or heat sealed bags not authorized in the RH TRUCON Code?	☐ Yes ☒ No
Were there Non-approved Closure Methods used on liner bags or inner bags greater than 4 liters?	☐ Yes ☒ No
Are there sealed containers GREATER than 4 liters?	☐ Yes ☒ No
Are there indications of inadequate protection for heavy and/or sharp objects?	☐ Yes ☒ No

Comments: N/A

RTR Operator:

Daphne Brothers	Daphne Brothers	8/3/2015
Print Name	Signature	Date

CCP Radiography Data Sheet

Section 1: General Information	
[X] RTR Examination [ ] RTR Replicate Scan [ ] RTR Independent Observation	
Site ID:	ORNL
Batch Number:	OR-RTR7-0149
Examination Date:	8/3/2015
Waste Container ID:	X10CSATN03211AG
Video/Audio Recorded Media Number:	OR-RTR7-0149 A&B
Procedure and Revision No.:	CCP-TP-053 Rev. 15
NCR(s) associated with the container? (e.g., Prohibited Items)	[X] No [ ] Yes NCR No.: N/A NCR No.: N/A

Section 2: Waste Container Data	
Container Type:	55 Gallon Drum
TRUCON Code:	OR 225
Waste Matrix Code:	S5400
Waste Stream I.D.:	OR-REDC-CH-HET
Waste Container Weights:	Gross Wt.: 67.5 kg Tare Wt.: 33.2 kg Net Wt.: 34.3 kg
Rigid Liner and Liner Vent Description:	Liner: [X] No [ ] Yes Lid: [X] No [ ] Yes Type: [ ] 30-mil [ ] 90-mil [ ] 110-mil [ ] 125-mil Vented: [ ] No [ ] Yes [X] N/A Punctured: [X] No [ ] Yes Mechanical Vent: [X] No [ ] Yes Fiberboard Liner: [X] No [ ] Yes Lead Lined: [X] No [ ] Yes
Number of Layers of Confinement:	Appears to be 1 layer
Volume Utilization Percentage:	90 %

CCP Radiography Data Sheet

Waste Container ID: X10CSATN03211AG

Section 3: Container Inventory and Comments	(Detailed descriptions)
IM:	
AM:	
OM:	
OI:	
C:	Cloth, coveralls
R:	
XPM:	Plastic sheeting, plastic tubing, scrap plastic
OR:	
IN:	
S:	

Section 4: Packaging Material and Waste Material Parameters	
Packaging Material:	**Estimated Weight (kg)**
Steel (ST):	27.8
Plastics (PP): Liner bag	1.0
Other: Cardboard (CP)	4.4
Total Packaging Weight	33.2
Waste Material Parameter:	**Estimated Weight (kg)**
Iron-based Metal / Alloys (IM):	
Aluminum-based Metals / Alloys (AM):	
Other Metals (OM):	
Other Inorganic Materials (OI)	
Cellulosics (C):	10.3
Rubber (R):	
Plastics (waste materials) (XPM):	24.0
Organic Matrix (OR):	
Inorganic Matrix (IN):	
Soils (S):	
Total WMP Weight:	34.3

CCP Radiography Data Sheet

Waste Container ID: X10CSATN03211AG

Section 5: RTR Summary (Questions answered "Yes" will be explained in the Comment block, except for Question 1)	
Is there observable liquid?	☐ Yes ☒ No
Is there any observable liquid in internal containers, more than 60 milliliters or 3 percent by volume, whichever is greater?	☐ Yes ☒ No
Is the total volume of observable liquid in the outermost container GREATER than 1% of the container?	☐ Yes ☒ No
Is there observable liquid in payload containers with an EPA Hazardous Waste Number of U134?	☐ Yes ☒ No
Is there an indication of non-radionuclide pyrophoric materials, such as elemental potassium?	☐ Yes ☒ No
Is there an indication of hazardous wastes not occurring as co-contaminants with TRU mixed wastes (non-mixed hazardous wastes)?	☐ Yes ☒ No
Is there an indication of wastes incompatible with backfill, seal and panel closures materials, container and packaging materials, shipping container materials, or other wastes (i.e., waste does NOT match TRUCON Code[s])?	☐ Yes ☒ No
Is there an indication of wastes containing explosives or compressed gases?	☐ Yes ☒ No
Is there an indication of PCBs liquids?	☐ Yes ☒ No
Is there an indication of the waste exhibiting the characteristic of ignitability, corrosivity, or reactivity (EPA Hazardous Waste Numbers of D001, D002, or D003)?	☐ Yes ☒ No
Is the physical form of the waste inconsistent with the Waste Stream Description or the Waste Matrix Code?	☐ Yes ☒ No
CH or RH TRAMPAC	
Are there heat-sealed bags (unvented) GREATER than 4 liters and LESS than 390 square inches in the waste, or heat sealed bags not authorized in the RH TRUCON Code?	☐ Yes ☒ No
Were there Non-approved Closure Methods used on liner bags or inner bags greater than 4 liters?	☐ Yes ☒ No
Are there sealed containers GREATER than 4 liters?	☐ Yes ☒ No
Are there indications of inadequate protection for heavy and/or sharp objects?	☐ Yes ☒ No
Comments: N/A	

RTR Operator:

Daphne Brothers	Daphne C Brothers	8/3/2015
Print Name	Signature	Date

CCP Radiography Data Sheet

Section 1: General Information	
[X] RTR Examination [ ] RTR Replicate Scan [ ] RTR Independent Observation	
Site ID:	ORNL
Batch Number:	OR-RTR7-0149
Examination Date:	8/3/2015
Waste Container ID:	X10CSATN03211U
Video/Audio Recorded Media Number:	OR-RTR7-0149 A&B
Procedure and Revision No.:	CCP-TP-053 Rev. 15
NCR(s) associated with the container? (e.g., Prohibited Items)	[X] No [ ] Yes NCR No.: N/A NCR No.: N/A

Section 2: Waste Container Data	
Container Type:	55 Gallon Drum
TRUCON Code:	OR 225
Waste Matrix Code:	S5400
Waste Stream I.D.:	OR-REDC-CH-HET
Waste Container Weights:	Gross Wt.: 63.2 kg Tare Wt.: 33.2 kg Net Wt.: 30.0 kg
Rigid Liner and Liner Vent Description:	Liner: [X] No [ ] Yes Lid: [X] No [ ] Yes Type: [ ] 30-mil [ ] 90-mil [ ] 110-mil [ ] 125-mil Vented: [ ] No [ ] Yes [X] N/A Punctured: [X] No [ ] Yes Mechanical Vent: [X] No [ ] Yes Fiberboard Liner: [X] No [ ] Yes Lead Lined: [X] No [ ] Yes
Number of Layers of Confinement:	Appears to be 1 layer
Volume Utilization Percentage:	80 %

CCP Radiography Data Sheet

Waste Container ID: X10CSATN03211U

Section 3: Container Inventory and Comments (Detailed descriptions)	
IM:	Scrap metal
AM:	
OM:	
OI:	Absorbent
C:	Cloth, coveralls
R:	Rubber gloves
XPM:	Plastic sheeting, scrap plastic, plastic tubing
OR:	
IN:	
S:	

Section 4: Packaging Material and Waste Material Parameters	
Packaging Material:	**Estimated Weight (kg)**
Steel (ST):	27.8
Plastics (PP): Liner bag	1.0
Other: Cardboard (CP)	4.4
Total Packaging Weight	33.2
Waste Material Parameter:	**Estimated Weight (kg)**
Iron-based Metal / Alloys (IM):	0.2
Aluminum-based Metals / Alloys (AM):	
Other Metals (OM):	
Other Inorganic Materials (OI)	1.4
Cellulosics (C):	10.0
Rubber (R):	0.4
Plastics (waste materials) (XPM):	18.0
Organic Matrix (OR):	
Inorganic Matrix (IN):	
Soils (S):	
Total WMP Weight:	30.0

CCP Radiography Data Sheet

Waste Container ID: X10CSATN03211U

Section 5: RTR Summary (Questions answered "Yes" will be explained in the Comment block, except for Question 1)	
Is there observable liquid?	☐ Yes ☒ No
Is there any observable liquid in internal containers, more than 60 milliliters or 3 percent by volume, whichever is greater?	☐ Yes ☒ No
Is the total volume of observable liquid in the outermost container GREATER than 1% of the container?	☐ Yes ☒ No
Is there observable liquid in payload containers with an EPA Hazardous Waste Number of U134?	☐ Yes ☒ No
Is there an indication of non-radionuclide pyrophoric materials, such as elemental potassium?	☐ Yes ☒ No
Is there an indication of hazardous wastes not occurring as co-contaminants with TRU mixed wastes (non-mixed hazardous wastes)?	☐ Yes ☒ No
Is there an indication of wastes incompatible with backfill, seal and panel closures materials, container and packaging materials, shipping container materials, or other wastes (i.e., waste does NOT match TRUCON Code[s])?	☐ Yes ☒ No
Is there an indication of wastes containing explosives or compressed gases?	☐ Yes ☒ No
Is there an indication of PCBs liquids?	☐ Yes ☒ No
Is there an indication of the waste exhibiting the characteristic of ignitability, corrosivity, or reactivity (EPA Hazardous Waste Numbers of D001, D002, or D003)?	☐ Yes ☒ No
Is the physical form of the waste inconsistent with the Waste Stream Description or the Waste Matrix Code?	☐ Yes ☒ No
CH or RH TRAMPAC	
Are there heat-sealed bags (unvented) GREATER than 4 liters and LESS than 390 square inches in the waste, or heat sealed bags not authorized in the RH TRUCON Code?	☐ Yes ☒ No
Were there Non-approved Closure Methods used on liner bags or inner bags greater than 4 liters?	☐ Yes ☒ No
Are there sealed containers GREATER than 4 liters?	☐ Yes ☒ No
Are there indications of inadequate protection for heavy and/or sharp objects?	☐ Yes ☒ No
Comments: N/A	

RTR Operator:

Daphne Brothers	Daphne C Brothers	8/3/2015
Print Name	Signature	Date

CCP Radiography Data Sheet

Section 1: General Information	
[X] RTR Examination [ ] RTR Replicate Scan [ ] RTR Independent Observation	
Site ID:	ORNL
Batch Number:	OR-RTR7-0149
Examination Date:	8/3/2015
Waste Container ID:	X10CSATN03211R
Video/Audio Recorded Media Number:	OR-RTR7-0149 A&B
Procedure and Revision No.:	CCP-TP-053 Rev. 15
NCR(s) associated with the container? (e.g., Prohibited Items)	[X] No [ ] Yes NCR No.: N/A NCR No.: N/A

Section 2: Waste Container Data	
Container Type:	55 Gallon Drum
TRUCON Code:	OR 225
Waste Matrix Code:	S5400
Waste Stream I.D.:	OR-REDC-CH-HET
Waste Container Weights:	Gross Wt.: 75.5 kg Tare Wt.: 33.2 kg Net Wt.: 42.3 kg
Rigid Liner and Liner Vent Description:	Liner: [X] No [ ] Yes Lid: [X] No [ ] Yes Type: [ ] 30-mil [ ] 90-mil [ ] 110-mil [ ] 125-mil Vented: [ ] No [ ] Yes [X] N/A Punctured: [X] No [ ] Yes Mechanical Vent: [X] No [ ] Yes Fiberboard Liner: [X] No [ ] Yes Lead Lined: [X] No [ ] Yes
Number of Layers of Confinement:	Appears to be 1 layer
Volume Utilization Percentage:	85 %

CCP Radiography Data Sheet

Waste Container ID: X10CSATN03211R

Section 3: Container Inventory and Comments	(Detailed descriptions)
IM:	
AM:	
OM:	
OI:	Concrete, floor sweepings
C:	Coveralls, cloth
R:	Rubber gloves
XPM:	Plastic sheeting, plastic tubing
OR:	
IN:	
S:	

Section 4: Packaging Material and Waste Material Parameters	
Packaging Material:	**Estimated Weight (kg)**
Steel (ST):	27.8
Plastics (PP): Liner bag	1.0
Other: Cardboard (CP)	4.4
Total Packaging Weight	33.2
Waste Material Parameter:	**Estimated Weight (kg)**
Iron-based Metal / Alloys (IM):	
Aluminum-based Metals / Alloys (AM):	
Other Metals (OM):	
Other Inorganic Materials (OI)	17.0
Cellulosics (C):	10.0
Rubber (R):	0.3
Plastics (waste materials) (XPM):	15.0
Organic Matrix (OR):	
Inorganic Matrix (IN):	
Soils (S):	
Total WMP Weight:	42.3

CCP Radiography Data Sheet

Waste Container ID: X10CSATN03211R

Section 5: RTR Summary (Questions answered "Yes" will be explained in the Comment block, except for Question 1)	
Is there observable liquid?	☐ Yes ☒ No
Is there any observable liquid in internal containers, more than 60 milliliters or 3 percent by volume, whichever is greater?	☐ Yes ☒ No
Is the total volume of observable liquid in the outermost container GREATER than 1% of the container?	☐ Yes ☒ No
Is there observable liquid in payload containers with an EPA Hazardous Waste Number of U134?	☐ Yes ☒ No
Is there an indication of non-radionuclide pyrophoric materials, such as elemental potassium?	☐ Yes ☒ No
Is there an indication of hazardous wastes not occurring as co-contaminants with TRU mixed wastes (non-mixed hazardous wastes)?	☐ Yes ☒ No
Is there an indication of wastes incompatible with backfill, seal and panel closures materials, container and packaging materials, shipping container materials, or other wastes (i.e., waste does NOT match TRUCON Code[s])?	☐ Yes ☒ No
Is there an indication of wastes containing explosives or compressed gases?	☐ Yes ☒ No
Is there an indication of PCBs liquids?	☐ Yes ☒ No
Is there an indication of the waste exhibiting the characteristic of ignitability, corrosivity, or reactivity (EPA Hazardous Waste Numbers of D001, D002, or D003)?	☐ Yes ☒ No
Is the physical form of the waste inconsistent with the Waste Stream Description or the Waste Matrix Code?	☐ Yes ☒ No
CH or RH TRAMPAC	
Are there heat-sealed bags (unvented) GREATER than 4 liters and LESS than 390 square inches in the waste, or heat sealed bags not authorized in the RH TRUCON Code?	☐ Yes ☒ No
Were there Non-approved Closure Methods used on liner bags or inner bags greater than 4 liters?	☐ Yes ☒ No
Are there sealed containers GREATER than 4 liters?	☐ Yes ☒ No
Are there indications of inadequate protection for heavy and/or sharp objects?	☐ Yes ☒ No
Comments: N/A	

RTR Operator:

Daphne Brothers		8/3/2015
Print Name	Signature	Date

CCP Radiography Data Sheet

Section 1: General Information	
[X] RTR Examination [ ] RTR Replicate Scan [ ] RTR Independent Observation	
Site ID:	ORNL
Batch Number:	OR-RTR7-0149
Examination Date:	8/3/2015
Waste Container ID:	X10C0501446A
Video/Audio Recorded Media Number:	OR-RTR7-0149 A&B
Procedure and Revision No.:	CCP-TP-053 Rev. 15
NCR(s) associated with the container? (e.g., Prohibited Items)	[X] No [ ] Yes NCR No.: N/A NCR No.: N/A

Section 2: Waste Container Data	
Container Type:	55 Gallon Drum
TRUCON Code:	OR 225
Waste Matrix Code:	S5400
Waste Stream I.D.:	OR-RF-CH-HET
Waste Container Weights:	Gross Wt.: 80.6 kg Tare Wt.: 33.2 kg Net Wt.: 47.4 kg
Rigid Liner and Liner Vent Description:	Liner: [X] No [ ] Yes Lid: [X] No [ ] Yes Type: [ ] 30-mil [ ] 90-mil [ ] 110-mil [ ] 125-mil Vented: [ ] No [ ] Yes [X] N/A Punctured: [X] No [ ] Yes Mechanical Vent: [X] No [ ] Yes Fiberboard Liner: [X] No [ ] Yes Lead Lined: [X] No [ ] Yes
Number of Layers of Confinement:	Appears to be 2 layers
Volume Utilization Percentage:	95 %

CCP Radiography Data Sheet

Waste Container ID: X10C0501446A

Section 3: Container Inventory and Comments	(Detailed descriptions)
IM:	Saw blade, metal hardware, scissors, scrap metal
AM:	
OM:	
OI:	Absorbent, glass container
C:	Cardboard, tape
R:	
XPM:	Plastic sheeting, scrap plastic, plastic caps, plastic containers, plastic bags
OR:	
IN:	
S:	

Section 4: Packaging Material and Waste Material Parameters	
Packaging Material:	**Estimated Weight (kg)**
Steel (ST):	27.8
Plastics (PP): Liner bag	1.0
Other: Cardboard (CP)	4.4
Total Packaging Weight	33.2
Waste Material Parameter:	**Estimated Weight (kg)**
Iron-based Metal / Alloys (IM):	2.4
Aluminum-based Metals / Alloys (AM):	
Other Metals (OM):	
Other Inorganic Materials (OI)	15.0
Cellulosics (C):	4.0
Rubber (R):	
Plastics (waste materials) (XPM):	26.0
Organic Matrix (OR):	
Inorganic Matrix (IN):	
Soils (S):	
Total WMP Weight:	47.4

CCP Radiography Data Sheet

Waste Container ID: X10C0501446A

Section 5: RTR Summary (Questions answered "Yes" will be explained in the Comment block, except for Question 1)	
Is there observable liquid?	☐ Yes ☒ No
Is there any observable liquid in internal containers, more than 60 milliliters or 3 percent by volume, whichever is greater?	☐ Yes ☒ No
Is the total volume of observable liquid in the outermost container GREATER than 1% of the container?	☐ Yes ☒ No
Is there observable liquid in payload containers with an EPA Hazardous Waste Number of U134?	☐ Yes ☒ No
Is there an indication of non-radionuclide pyrophoric materials, such as elemental potassium?	☐ Yes ☒ No
Is there an indication of hazardous wastes not occurring as co-contaminants with TRU mixed wastes (non-mixed hazardous wastes)?	☐ Yes ☒ No
Is there an indication of wastes incompatible with backfill, seal and panel closures materials, container and packaging materials, shipping container materials, or other wastes (i.e., waste does NOT match TRUCON Code[s])?	☐ Yes ☒ No
Is there an indication of wastes containing explosives or compressed gases?	☐ Yes ☒ No
Is there an indication of PCBs liquids?	☐ Yes ☒ No
Is there an indication of the waste exhibiting the characteristic of ignitability, corrosivity, or reactivity (EPA Hazardous Waste Numbers of D001, D002, or D003)?	☐ Yes ☒ No
Is the *physical form of the waste inconsistent with the Waste Stream Description* or the Waste Matrix Code?	☐ Yes ☒ No
CH or RH TRAMPAC	
Are there heat-sealed bags (unvented) GREATER than 4 liters and LESS than 390 square inches in the waste, or heat sealed bags not authorized in the RH TRUCON Code?	☐ Yes ☒ No
Were there Non-approved Closure Methods used on liner bags or inner bags greater than 4 liters?	☐ Yes ☒ No
Are there sealed containers GREATER than 4 liters?	☐ Yes ☒ No
Are there indications of inadequate protection for heavy and/or sharp objects?	☐ Yes ☒ No

Comments: N/A

RTR Operator:

Daphne Brothers	Daphne O Brothers	8/3/2015
Print Name	Signature	Date

CCP Radiography Data Sheet

Section 1: General Information	
[X] RTR Examination [ ] RTR Replicate Scan [ ] RTR Independent Observation	
Site ID:	ORNL
Batch Number:	OR-RTR7-0149
Examination Date:	8/3/2015
Waste Container ID:	X10C0402997Y1
Video/Audio Recorded Media Number:	OR-RTR7-0149 A&B
Procedure and Revision No.:	CCP-TP-053 Rev. 15
NCR(s) associated with the container? (e.g., Prohibited Items)	[ ] No [X] Yes NCR No.: NCR-ORNL-0129-15 NCR No.: N/A

Section 2: Waste Container Data	
Container Type:	55 Gallon Drum
TRUCON Code:	OR 225
Waste Matrix Code:	S5400
Waste Stream I.D.:	OR-RF-CH-HET
Waste Container Weights:	Gross Wt.: 157.6 kg Tare Wt.: 33.2 kg Net Wt.: 124.4 kg
Rigid Liner and Liner Vent Description:	Liner: [X] No [ ] Yes Lid: [X] No [ ] Yes Type: [ ] 30-mil [ ] 90-mil [ ] 110-mil [ ] 125-mil Vented: [ ] No [ ] Yes [X] N/A Punctured: [X] No [ ] Yes Mechanical Vent: [X] No [ ] Yes Fiberboard Liner: [X] No [ ] Yes Lead Lined: [X] No [ ] Yes
Number of Layers of Confinement:	Appears to be 1 layer
Volume Utilization Percentage:	80 %

CCP Radiography Data Sheet

Waste Container ID: X10C0402997Y1

Section 3: Container Inventory and Comments (Detailed descriptions)	
IM:	
AM:	
OM:	
OI:	Concrete pieces
C:	Cardboard, coveralls
R:	
XPM:	Plastic sheeting, plastic tubing
OR:	
IN:	
S:	

Section 4: Packaging Material and Waste Material Parameters	
Packaging Material:	**Estimated Weight (kg)**
Steel (ST):	27.8
Plastics (PP): Liner bag	1.0
Other: Cardboard (CP)	4.4
Total Packaging Weight	33.2
Waste Material Parameter:	**Estimated Weight (kg)**
Iron-based Metal / Alloys (IM):	
Aluminum-based Metals / Alloys (AM):	
Other Metals (OM):	
Other Inorganic Materials (OI)	102.4
Cellulosics (C):	7.0
Rubber (R):	
Plastics (waste materials) (XPM):	15.0
Organic Matrix (OR):	
Inorganic Matrix (IN):	
Soils (S):	
Total WMP Weight:	124.4

CCP Radiography Data Sheet

Waste Container ID: X10C0402997Y1

Section 5: RTR Summary (Questions answered "Yes" will be explained in the Comment block, except for Question 1)	
Is there observable liquid?	☐ Yes ☐ No
Is there any observable liquid in internal containers, more than 60 milliliters or 3 percent by volume, whichever is greater?	☐ Yes ☐ No
Is the total volume of observable liquid in the outermost container GREATER than 1% of the container?	☐ Yes ☐ No
Is there observable liquid in payload containers with an EPA Hazardous Waste Number of U134?	☐ Yes ☐ No
Is there an indication of non-radionuclide pyrophoric materials, such as elemental potassium?	☐ Yes ☐ No
Is there an indication of hazardous wastes not occurring as co-contaminants with TRU mixed wastes (non-mixed hazardous wastes)?	☐ Yes ☐ No
Is there an indication of wastes incompatible with backfill, seal and panel closures materials, container and packaging materials, shipping container materials, or other wastes (i.e., waste does NOT match TRUCON Code[s])?	☐ Yes ☐ No
Is there an indication of wastes containing explosives or compressed gases?	☐ Yes ☐ No
Is there an indication of PCBs liquids?	☐ Yes ☐ No
Is there an indication of the waste exhibiting the characteristic of ignitability, corrosivity, or reactivity (EPA Hazardous Waste Numbers of D001, D002, or D003)?	☐ Yes ☐ No
Is the physical form of the waste inconsistent with the Waste Stream Description or the Waste Matrix Code?	☐ Yes ☒ No
CH or RH TRAMPAC	
Are there heat-sealed bags (unvented) GREATER than 4 liters and LESS than 390 square inches in the waste, or heat sealed bags not authorized in the RH TRUCON Code?	☐ Yes ☐ No
Were there Non-approved Closure Methods used on liner bags or inner bags greater than 4 liters?	☐ Yes ☐ No
Are there sealed containers GREATER than 4 liters?	☐ Yes ☐ No
Are there indications of inadequate protection for heavy and/or sharp objects?	☐ Yes ☐ No

Comments: Impenetrable item(s) in the container limited the ability to complete the scan on this container, all questions in section 5 could not be answered due to this limitation. The impenetrable condition is documented in NCR-ORNL-0129-15.

RTR Operator:

Daphne Brothers	Daphne G Brothers	8/3/2015
Print Name	Signature	Date

Attachment 1 – CCP Nonconformance Report (NCR)

CCP NONCONFORMANCE REPORT (NCR)

(Use NCR Continuation, Attachment 3, if necessary)

NCR No. NCR-ORNL-0129-15 Revision 0

1. Lot No., Heat No., or Serial No. (if applicable): N/A	2. Process (e.g., NDA, NDE, VE, Other): NDE	3. Batch Data Report #(s): OR-RTR7-0149
4. Order/Work Order/Job Control Number (if applicable): N/A	5. PO # (if applicable): N/A	Container #(s): X10C0402997Y1
	6. Supplier (if applicable): N/A	

DESCRIPTION OF NONCONFORMANCE

7a. NCR Description: ☐ < 100 nCi/g ☐ Prohibited Item ☐ E-Flag ☐ Receipt Inspection ☐ Transportation ☐ WWIS/WDS ☒ Other

7b. Requirement(s) (Enter Implementing Procedure No., Revision, Section No., & Quoted Text):
CCP-TP-053, Standard Real Time Radiography (RTR) Inspection Procedure, Rev. 15, section 4.4.3 [E] states: **IF a container is identified in the S5000 summary category group that CAN NOT be penetrated by the RTR method because of the presence of lead, or other shielding, THEN ...** Initiate an NCR in accordance with CCP-QP-005, *CCP TRU Nonconforming Item Reporting and Control.*

7c. Actual Condition: Impenetrable material at 12" to 26" (concrete pieces)

7d. Have the CCP HOLD TAGS associated with this NCR been applied? ☒ YES ☐ NO If no is checked, explain:

8. NCR Originator:
Daphne Brothers (printed name) — Daphne Brothers (signature) — 8-3-15 (date)

9. Does the identified condition have the potential to impact AK? If YES or INDETERMINATE, enter Trend Code L in Block 10. ☐ YES ☒ NO ☐ INDETERMINATE

10. Trend Code: **K**	11. Responsible Manager: **Beverly Schrock**
12. Recurring Condition? ☐ YES ☒ NO (If Yes, list NCRs and WIPP Forms):	13. Significant Condition? ☐ YES ☒ NO (If Yes, enter WIPP Form No.):

14. QA Engineer or QA Designee validation:
Fred Oney (printed name) — (signature) — 8-4-15 (date)

COPY

Attachment 1 – CCP Nonconformance Report (NCR) (Continued)

NCR No. NCR-ORNL-0129-15 Revision 0

INTERIM DISPOSITION

15a. Interim Disposition (Check Only One):
☐ N/A (See Final Disposition) ☒ Hold ☐ Conditionally Accept ☐ Conditionally Use
☐ Sort ☐ Reinspect or Retest ☐ Remediate

15b. Instructions for Completion of the Interim Disposition:
Container to be evaluated by the Host Site Planning Committee for determination of best path forward for container.
1. Responsible Manager send this NCR to the Host Site Planning Committee for Review.
2. Host Site Planning Committee determines best path forward.
3. SPM determines Final Disposition (block 19) based on results from the Host Site Planning Committee.

INTERIM DISPOSITION APPROVALS

16a. Responsible Manager or Individual:

printed name	signature	date
Andrew Stallings Beverly Schrock	for Beverly Schrock	8.4.15

16b. QA Engineer or QA Designee:

printed name	signature	date
Fred Oney		8-4-15

Additional Approval:

printed name	signature	date

COMPLETION OF INTERIM DISPOSITION

17. Interim Disposition Complete – Responsible Manager or Individual:

printed name	signature	date

18. Interim Disposition Verified – QA Engineer:

printed name	signature	date

COPY

Attachment 1 – CCP Nonconformance Report (NCR) (Continued)

NCR No. NCR-ORNL-0129-15 Revision 0

FINAL DISPOSITION

19. Final Disposition (Check Only One: Use-As-Is, Repair, Reject, Rework, or Scrap):
☐ Use-As-Is ☐ Repair

19a. Technical Justification – Required for Use-As-Is or Repair dispositions. [☐ N/A for Reject, Rework, or Scrap]

☐ Reject ☐ Rework ☐ Scrap

19b. Instructions for Completion – Required for Reject, Repair, Rework, or Scrap [☐ N/A for Use-As-Is]

19c. Corrective Actions (Actions to Prevent Recurrence – For Repair or Rework, if applicable.
[☐ N/A if not applicable, and for Use-As-Is, Reject, and Scrap]

FINAL DISPOSITION APPROVALS

20. Responsible Manager or Individual:

printed name _____ signature _____ date _____

21. QA Engineer or QA Designee:

printed name _____ signature _____ date _____

Additional Approval:

printed name _____ signature _____ date _____

CLOSURE

22. Final Disposition Complete - Responsible Manager or Individual:

printed name _____ signature _____ date _____

23. Attachments:

24a. HOLD TAG removal has been verified and reconciled for all nonconforming items on the NCR: ☐
24b. If HOLD TAG is not applicable, check: ☐ and explain:

25. Final Disposition Verified – NCR Closed QA Engineer:

printed name _____ signature _____ date _____

COPY

Attachment 3 – CCP Radiography Independent Technical Reviewer Checklist

Batch Data Report No.: OR-RTR7-0149

	Description		
1.	Were data generation and reduction conducted in a technically correct manner in accordance with the methods used?	☐ NO	☑ YES
2.	Was the correct revision of the procedure used? Procedure: CCP-TP-053 Rev.: 15	☐ NO	☑ YES
3.	Are the WMPs entered correctly?	☐ NO	☑ YES
4.	Do the estimated weights in Section 4 of Attachment 2 equal the container gross weight?	☐ NO	☑ YES
5.	Is the data reported in the proper units with the correct number of significant figures (e.g., one tenth of a kilogram)?	☐ NO	☑ YES
6.	Was transcription used? If no, proceed to question 7.	☑ NO	☐ YES
	6a. Has the data been verified for transcription errors?	☐ NO	☐ YES
7.	Does the Testing Batch Report include radiography for up to 20 containers?	☐ NO	☑ YES
8.	Are BDR contents complete and do they match the CCP Waste RTR Batch Data Report Table of Contents?	☐ NO	☑ YES
9.	Is all the data signed and dated in reproducible ink and by the individual(s) generating it?	☐ NO	☑ YES
10.	Is all data recorded clearly, legibly, and accurately?	☐ NO	☑ YES
11.	Have changes been made to original data? If no, proceed to question 12.	☑ NO	☐ YES
	11a. Have all changes to original data been lined out, initialed and dated by the individual making the changes?	☐ NO	☐ YES
	11b. Was justification made for changing the original data?	☐ NO	☐ YES
	11c. Were data changes made by the individual who originally collected the data?	☐ NO	☐ YES
12.	Does the waste match the Waste Matrix Code and Waste Stream description?	☐ NO	☑ YES
13.	Are the RTR Operator's decisions regarding the Radiography documented?	☐ NO	☑ YES
14.	Is there an adequate written description of the contents of each item?	☐ NO	☑ YES
15.	Was the video/audio recording media properly prepared and labeled for each waste container?	☐ NO	☑ YES
16.	Was the video/audio recording media check performed satisfactorily and recorded on Attachment 1?	☐ NO	☑ YES

Attachment 3 – CCP Radiography Independent Technical Reviewer Checklist (Continued)

Batch Data Report No.: OR-RTR7-0149

Description			
17.	Was the Image Test performed satisfactorily and recorded on Attachment 1?	☐NO	☑YES
18.	Was the Replicate Scan performed and recorded on an Attachment 2?	☐NO	☑YES
19.	Was the Replicate Scan RTR Operator different from the first RTR Operator?	☐NO	☑YES
20.	Did the Replicate Scan RTR Operator and the first RTR Operator agree on the results?	☐NO	☑YES
21.	Was the Independent Observation performed and recorded on an Attachment 2?	☐NO	☑YES
22.	Was the Independent Observation RTR Operator different from the first RTR Operator?	☐NO	☑YES
23.	Did the Independent Observation RTR Operator and the first RTR Operator agree on the results?	☐NO	☑YES
24.	Was the data collection performed by qualified individuals?	☐NO	☑YES
25.	Were NCRs initiated as required at DGL? If no, proceed to question 26.	☐NO	☑YES
	25a. Have the NCR(s) associated with RTR been included in the BDR?	☐NO	☑YES
26.	Is the RTR examination for CH waste? If no, proceed to question 27.	☐NO	☑YES
	26a. Have the CH Quality Assurance Objectives (QAOs) been met (if applicable)? Precision – Precision is maintained by reconciling any discrepancies between two radiography operators with regard to identification of the waste matrix code, liquids in excess of TSDF-WAC limits, and compressed gases through independent replicate scans and independent observations. Additionally, the precision of radiography is verified prior to use by tuning precisely enough to demonstrate compliance with QAOs through viewing an image test pattern. Accuracy – Accuracy is obtained by using a target to tune the image for maximum sharpness and by requiring operators to successfully identify 100 percent of the items required to meet the DQOs for radiography specified in CCP-PO-001, Section C-4a(1) in a training container during their initial qualification and subsequent requalification. Completeness – A video and audio media recording of the radiography examination and a validated radiography data form will be obtained for 100 percent of the waste containers subject to radiography. All video and audio media recordings and radiography data forms will be subject to validation as indicated in CCP-PO-001, Section C3-4. Comparability – The comparability of radiography data from different operators shall be enhanced by using standardized radiography procedures and operator qualifications.	☐NO	☑YES

Attachment 3 – CCP Radiography Independent Technical Reviewer Checklist (Continued)

Batch Data Report No.: OR-RTR7-0149

Description		
27. Is the RTR examination for RH waste? If no, proceed to comment section.	☑ NO	☐ YES
27a. Have the RH QAOs been met (if applicable)? Precision – Precision is maintained by reconciling any discrepancies between two operators (during Independent Observation and Replicate scans) with regard to the identification of important waste characteristics (i.e., physical form of the waste and absence of prohibited liquids) within a single container. Accuracy – Accuracy is obtained by using a target to tune the image for maximum sharpness and by requiring operators to successfully identify prohibited liquid in a training container during their initial qualification and subsequent requalification. Representativeness – All of the relevant contents in a container selected for radiography will be described. Completeness – All of the relevant waste information must be assembled and must show that each of the containers in the waste stream belongs to the waste stream. This information must be documented on videotape or other equivalent media and data form. Comparability – Comparability is ensured by meeting the program training requirements and complying with the minimum standards used to implement the radiography process.	☐ NO	☐ YES

Comments:
N/A

I have reviewed 100% of the container specific and batch data in this report and find it acceptable.

Independent Technical Reviewer:

Fred Olney		8-4-15
Printed Name	Signature	Date

DIVIDER PAGE ONLY

Not Part of Page Count

Attachment 2 – CCP Records Transmittal/Receiving Form

CCP Records / Records Custodian, 4021 National Parks Highway - MS: GSA 212, Carlsbad, New Mexico 88220

Telephone Number: 575-234-7523

Fax Number: 575-234-7033

Attn:	CCP RECORDS	From:	PATRICK SMITH II
Ship to:	CCP RECORDS CUSTODIAN	Site:	ORNL
	4021 NATIONAL PARKS HWY.	Company:	TFE INC.
	MS GSA 212	Telephone Number:	865-574-6002
	CARLSBAD, NM 88220-9082	Date Sent:	8-06-2015
Telephone Number:	575-234-7523		

Document Number	Title / Description	Record Date	Total Pages
OR-RTR7-0149	RTR DVD (DISK B)	8-3-2015	N/A
N/A	N/A	N/A	N/A
N/A	N/A	N/A	N/A
N/A	N/A	N/A	N/A
N/A	N/A	N/A	N/A
N/A	N/A	N/A	N/A

Comments:

N/A

(When the Record accepted line has been completed, the rest of the page below may be left blank.)

Acceptance/Rejection Signature and Date

Records Accepted ☑ — Signature: [signature] — Printed Name: Jewell Hurrahde — Date: 8.11.15.

Records Rejected ☐ — Signature: _____ — Printed Name: _____ — Date: _____

Reason for Rejection:

Re-submittal: Signature: _____ — Printed Name: _____ — Date: _____

****
*** Send Results ***
****

Sending is complete.

Job No.	1554
Address	918655768703
Name	ORNL
Start Time	08/11 12:31 PM
Call Length	00'32
Sheets	1
Result	OK

Attachment 2 – CCP Records Transmittal/Receiving Form

CCP Records / Records Custodian, 4021 National Parks Highway - MS: GSA 212, Carlsbad, New Mexico 88220

Telephone Number: 575-234-7523

Fax Number: 575-234-7033

Attn:	CCP RECORDS	From:	PATRICK SMITH II
Ship to:	CCP RECORDS CUSTODIAN	Site:	ORNL
	4021 NATIONAL PARKS HWY.	Company:	TFE INC.
	MS GSA 212	Telephone Number:	865-574-6002
	CARLSBAD, NM 88220-9082	Date Sent:	8-06-2015
Telephone Number:	575-234-7523		

OR-RTR7-0149	RTR DVD (DISK B)	8-3-2015	N/A
N/A	N/A	N/A	N/A
N/A	N/A	N/A	N/A
N/A	N/A	N/A	N/A
N/A	N/A	N/A	N/A
N/A	N/A	N/A	N/A

N/A

(When the Record accepted line has been completed, the rest of the page below may be left blank.)
Acceptance/Rejection Signature and Date

Records Accepted ☑ — Signature — Printed Name: Jewell Hunnicutt — Date: 8-11-15.

Records Rejected ☐

Attachment 2 – CCP Records Transmittal/Receiving Form

CCP Records / Records Custodian, 4021 National Parks Highway - MS: GSA 212, Carlsbad, New Mexico 88220

Telephone Number: 575-234-7523

Fax Number: 575-234-7033

Attn:	CCP RECORDS	From:	PATRICK SMITH II
Ship to:	CCP RECORDS CUSTODIAN	Site:	ORNL
	4021 NATIONAL PARKS HWY.	Company:	TFE INC.
	MS GSA 212	Telephone Number:	865-574-6002
	CARLSBAD, NM 88220-9082	Date Sent:	8-20-2015
Telephone Number:	575-234-7523		

Document Number	Title / Description	Record Date	Total Pages
OR-RTR7-0149	RTR BDR	8-3-2015	51
OR-RTR7-0149	RTR DVD (DISK A)	8-3-2015	N/A
N/A	N/A	N/A	N/A
N/A	N/A	N/A	N/A
N/A	N/A	N/A	N/A
N/A	N/A	N/A	N/A

Comments:

N/A

(When the Record accepted line has been completed, the rest of the page below may be left blank.)

Acceptance/Rejection Signature and Date

Records Accepted	☑	[signature]	Jewell Humable	8.25.15.
		Signature	Printed Name	Date
Records Rejected	☐			
		Signature	Printed Name	Date

Reason for Rejection:

Re-submittal:

Signature	Printed Name	Date

****
*** Send Results ***
****

Sending is complete.

Job No.	1685
Address	918655768703
Name	ORNL
Start Time	08/25 08:35 AM
Call Length	00'21
Sheets	1
Result	OK

Attachment 2 – CCP Records Transmittal/Receiving Form

CCP Records / Records Custodian, 4021 National Parks Highway - MS: GSA 212, Carlsbad, New Mexico 88220

Telephone Number: 575-234-7523

Fax Number: 575-234-7033

Attn:	CCP RECORDS	From:	PATRICK SMITH II
Ship to:	CCP RECORDS CUSTODIAN	Site:	ORNL
	4021 NATIONAL PARKS HWY.	Company:	TFE INC.
	MS GSA 212	Telephone Number:	865-574-6002
	CARLSBAD, NM 88220-9082	Date Sent:	8-20-2015
Telephone Number:	575-234-7523		

Document Number	Description	Record Date	Page Number
OR-RTR7-0149	RTR BDR	8-3-2015	51
OR-RTR7-0149	RTR DVD (DISK A)	8-3-2015	N/A
N/A	N/A	N/A	N/A
N/A	N/A	N/A	N/A
N/A	N/A	N/A	N/A
N/A	N/A	N/A	N/A

Comments

N/A

(When the Record accepted line has been completed, the rest of the page below may be left blank.)

Acceptance/Rejection Signature and Date

Records Accepted ☑ — Signature: [signature] — Printed Name: Jewell Humphrey — Date: 8.25.15.

Records Rejected ☐

Attachment 1 – CCP SPM Visual Examination Project Level Validation Checklist and Summary

BDR Number: ORVECH0135				Examination Date(s): 04/09/2015
Description of Criteria Reviewed	**Criteria Met?**			**Comments/Qualifiers**
	YES	**NO**	**NA**	
1. Is the completed, signed and dated Independent Technical Reviewer Checklist included in the BDR, and the independent technical reviewer was not involved in the generation or recording of the data under review? **Reference Source: CCP-PO-001, C3-4**	X			
2. Does the BDR contain all items addressed in the BDR Table of Contents? **Reference Source: CCP-PO-001, C3-4**	X			
3. Does the BDR include a listing of all container numbers in the batch? **Reference Source: CCP-PO-001, C3-4**	X			
4. List all containers that have met QAOs. **Reference Source: CCP-PO-001, C3-4**				Container Numbers: X10C9312019A1
5. Is the current implementing procedure and revision number included in the BDR? **Reference Source: CCP-PO-001, Table C3-3**	X			
6. Is the BDR date included? **Reference Source: CCP-PO-001, Table C3-3**	X			
7. Is there a reference to or copy of any associated NCRs (if any) in the BDR? **Reference Source: CCP-PO-001, Table C3-3**			X	No NCRs.
8. Are there 20 or fewer containers in the batch? **Reference Source: CCP-PO-001 C3-4**	X			
9. Are the data properly reported (i.e., data are reported in correct units and with correct significant figures). **Reference Source: CCP-PO-001 C3-4**	X			
10. Is there evidence of verification that the physical form matches the Waste Matrix Code? **Reference Source: CCP-PO-001, Table C3-3**	X			
11. Is there evidence of verification that the physical form matches the waste stream description? **Reference Source: CCP-PO-001, Table C3-3**	X			
12. Are prohibited items absent? **Reference Source: CCP-PO-001, Table C3-3**	X			

CCP RECORDS ORIGINAL
DATE REC'D 4/24/15

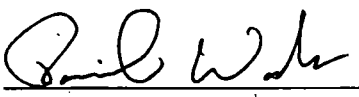
Attachment 1 – CCP SPM Visual Examination Project Level Validation Checklist and Summary (Continued)

BDR Number: ORVECH0135				Examination Date(s): 04/09/2015
Description of Criteria Reviewed	**Criteria Met?**			**Comments/Qualifiers**
	YES	**NO**	**NA**	
13. Does observable liquid, if present, meet the criteria of the TSDF-WAC? **Reference Source: CCP-PO-001, C-1**			X	No observable liquid.
14. Were discrepancies between the Visual Examination operator and the ITR with regards to identification of waste matrix code, liquids in excess of the TSDF-WAC, or compressed gases reconciled? NA if no discrepancies. **Reference Source: CCP-PO-001, C3-2**			X	
15. Are the training requirements met for the VE Expert and VE Operators who have signed the data forms? **Reference Source: CCP-PO-001, C3-8**	X			
16. Is evidence of a satisfactory audio/video test included in the BDR? NA [not applicable] for VE Method for Newly Generated Waste. **Reference Source: CCP-PO-001, C1-2**			X	
17. If the VE was not recorded using audio/video media, does the data sheet contain the signature of two qualified operators who observed for themselves the waste being placed into the container? NA if audio/video used. **Reference Source: CCP-PO-001, C1-2**	X			
18. Are the weights/estimated weights for the 12 waste material parameters reported in kilograms (kg)? **Reference Source: CCP Technical Procedures**	X			
19. Are the descriptions for each waste material parameter included in the BDR? **Reference Source: CCP-PO-001, C1-2**	X			
20. Is the gross weight reported (in kg) for each container included in the BDR? **Reference Source: CCP Technical Procedures**	X			
21. Is the number of layers of confinement recorded? **Reference Source: CCP-PO-001, C1-2**	X			
22. Is sufficient information included in the BDR to determine the packaging configuration? **Reference Source: CCP-PO-001, C1-2**	X			

Attachment 1 – CCP SPM Visual Examination Project Level Validation Checklist and Summary (Continued)

BDR Number: ORVECH0135				Examination Date(s): 04/09/2015
Description of Criteria Reviewed	**Criteria Met?**			**Comments/Qualifiers**
	YES	**NO**	**NA**	
23. Is the type and number of filters recorded? **Reference Source: CCP-PO-001, CCP Technical Procedures**	X			
24. Is the size of the rigid liner vent hole recorded? NA if no liner lid. **Reference Source: CCP-PO-001, CCP Technical Procedures**			X	
25. For Los Alamos National Laboratory (LANL) Sealed Sources, does the characterized waste container meet the definition of sealed sources per Title 10 Code of Federal Regulations (CFR) 30.4 and Title 10 CFR 835.2 (effective January 1, 2004) evidence of which is assembled as part of AK documentation? **Reference Source: CCP Technical Procedures**			X	Not a LANL Sealed Source.
26. For LANL Sealed Sources, are sealed sources the only non-packaging items in the waste container? **Reference Source: CCP-TP-069, 4.1.4**			X	Not a LANL Sealed Source.
27. For LANL Sealed Sources, are the sealed sources a U.S. Department of Transportation (DOT) Special Form Class 7 (Radioactive Material) per Title 49 CFR 34.27 (effective January 1, 2004) and the certification of which is assembled as part of the AK documentation? **Reference Source: CCP Technical Procedures**			X	Not a LANL Sealed Source.
28. For LANL Sealed Sources, is the integrity of each sealed source validated by documented contamination survey results to meet the requirements of Title 10 CFR 34.27 (effective January 1, 2004), and assembled as part of AK documentation? **Reference Source: CCP Technical Procedures**			X	Not a LANL Sealed Source.

Attachment 1 – CCP SPM Visual Examination Project Level Validation Checklist and Summary (Continued)

BDR Number: ORVECH0135				**Examination Date(s): 04/09/2015**
Description of Criteria Reviewed	**Criteria Met?**			**Comments/Qualifiers**
	YES	**NO**	**NA**	
29. For LANL Sealed Sources, is each sealed source a rigid sealed container less than or equal to 4 L in size or in a rigid sealed container less than or equal to 4 L? **Reference Source: CCP Technical Procedures**			X	Not a LANL Sealed Source.
30. For LANL Sealed Sources, AK documentation does not indicate the use of volatile organic compounds (VOCs) or VOC-bearing materials as constituents of sealed sources? **Reference Source: CCP Technical Procedures**			X	Not a LANL Sealed Source.
31. For LANL Sealed Sources, the outer casing of each sealed source is of a non VOC-bearing material which is verified using the VE technique at the time of packaging? **Reference Source: CCP Technical Procedures**			X	Not a LANL Sealed Source.
Comments: None.				
The container QC checks were properly performed and meet the Quality Assurance Objectives (QAOs). Proper procedures were followed during data reduction and analysis. The batch is complete, acceptable, and includes all supporting data and documentation required by the QAPjP. Daniel Wade  04/23/2015				
SPM Printed Name	Signature			Date

Checklist is to be re-signed only when a re-review is performed.

SPM Printed Name	Signature	Reason	Date
SPM Printed Name	Signature	Reason	Date

Attachment 5 – CCP Waste VE Batch Data Report Cover Sheet

Batch Data Report No.: ORVECH0135 Examination Date: 4-9-15

	Waste Container ID Number
1	X10C9312019A1
2	
3	
4	
5	
6	
7	
8	
9	
10	
11	
12	N/A
13	
14	A.H.
15	
16	4-9-15
17	
18	
19	
20	

Independent Technical Reviewer:

Derek Matheny — Print Name
Signature
4/13/15 — Date

NTPC RECORDS ORIGINAL
DATE REC'D 4-14-2015 RT

Attachment 4 – CCP Waste VE Batch Data Report Table of Contents

Batch Data Report No.: ORVECH0135 Examination Date: 4-9-15

Table of Contents

Item	Description	Page No.
1	CCP Waste VE Batch Data Report Cover Sheet	1
2	CCP Waste VE Batch Data Report Table of Contents	2
3	CCP Waste Visual Examination General Information Form	3
4	CCP Waste Visual Examination Data Forms	4
5	CCP Waste VE Independent Technical Reviewer Checklist	9
6	Copy of NCRs (N/A, If Not Applicable)	N/A
7	Field Records (N/A, If Not Applicable)	N/A

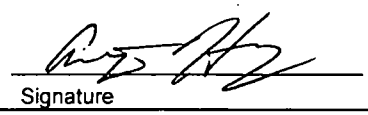
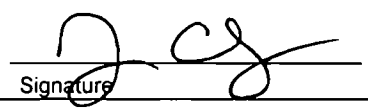
Attachment 1 – CCP Waste Visual Examination General Information Form

Batch Data Report No.: ORVECH0135

☑ VE for Previously Packaged Waste ☐ VE for Newly Generated Waste	
☐ Method 1 ☑ Method 2	
Site ID: OR	
Examination Date: 4-9-15	
Procedure No.: CCP-TP-113 Revision No.: 18	
Camera/Audio/Video Media Recording Check: ☑ N/A	☐ SAT
VE Scale Information: ☑ N/A	Serial/ID Number: Calibration Due Date: Operational Check: ☐ SAT ☐ UNSAT
Test Weight Information Test Weight Total: kg. Tray Weight: kg.	Serial/ID Number: Calibration Due Date: Serial/ID Number: Calibration Due Date: Serial/ID Number: Calibration Due Date:
Container Scale Information:	Serial/ID Number: WIPP002 Calibration Due Date: 6-10-15 Operational Check: ☑ SAT ☐ UNSAT

Comments:

The VEE has determined VE scale shall not be used.

Visual Examination Operator 1:		
Anthony Harley Print Name	 Signature	4-9-15 Date
Visual Examination Operator 2:		
Jason Cofer Print Name	 Signature	4-9-15 Date

Attachment 2 – CCP Waste Visual Examination Data Form Page 1 of 5

Batch Data Report No.: ORVECH0135

Section 1, Output Waste Container Data		
Input Waste Container ID, as applicable: X10C 9312019A		
Output Waste Container ID: X10C 9312019A1	Waste Stream ID: OR-RF-CH-HET	
Container Type: 55 gallon drum	TRUCON Code: OR 125/225	Waste Matrix Code: S5400
Audio/Video Media Recording Number: ☑ N/A		
Waste Container Weights: Tare Wt: 33.2 kg.	Gross Wt: 118.2 kg.	
Rigid Liner Present? ☐ NO ☑ YES Type of Liner: ☐ Lead ☐ Plastic ☑ Fiberboard ☐ Other: Thickness: ☐ 30-mil ☑ 90-mil ☐ 110-mil ☐ 125-mil	Rigid Liner Lid Present? ☑ NO ☐ YES Rigid Liner Lid is Vented (>0.3 in.) or Filtered? ☐ NO ☐ YES ☑ N/A ☐ Vented: Hole Size: ☑ N/A ☐ Filtered: Model No.: ☑ N/A Serial No.: ☑ N/A	
Bag Liner Present? ☐ NO ☑ YES	Volume Utilization Percentage: 75 %	
Does the physical form of the waste match the Waste Stream Description (i.e., Homogeneous Solids, Soil/Gravel, or Debris Waste [including uncategorized metals])? ☐ NO ☑ YES		
Does the physical form of the waste match the Waste Matrix Code? ☐ NO ☑ YES		
Closure Method: TTF Number of Layers of Confinement: 1		
Filter Torque Wrench Serial/ID No.: WIPP 124 Calibration Due Date: 9-2-15 Filter: Model No.: UT9424X Serial No.: 00238 0363 Torque Value: 72 in/lbs	Lid Ring/Bolt Torque Wrench Serial/ID No.: WIPP 177 Calibration Due Date: 6-5-15 Lid Ring/Bolt Torque Value: 60 ft/lbs	
Is total dose rate greater than 200mrem/hr? ☑ NO ☐ YES		
NCR(s) associated with the output container? ☑ NO ☐ YES NCR No.: N/A NCR No.: N/A		
Comments: N/A		

Attachment 2 – CCP Waste Visual Examination Data Form (continued) Page 2 of 5

Batch Data Report No.: ORVECH0135 **Date:** 4-9-15

Section 2: Waste Package Data

Package and Package TID Number (as applicable)	Waste Description	WMP [Table 3]	Weight (kg) [Table 4,[a]]	Weighing Code(s) [Table 4[b]]
N/A	ear plugs plastic bags plastic sleeves	PW	6.0	E
N/A	paper smears cloth rags cardboard pieces	C	8.0	E
N/A	absorbent pads	C	2.0	E
N/A	metal cans metal lids	IM	5.0	E
N/A	rubber gloves	R	2.0	E
N/A	Nochar absorbent	OR	2.0	E
N/A	uranium oxide	OI	60.0	E

N/A	N/A	N/A
VEO 1: Print Name	Signature	Date
N/A	N/A	N/A
VEO 2: Print Name	Signature	Date

Signatures annotate the absence of prohibited items.

Output Waste Container ID: XIDC 9312019A1

TID Removed: N/A **TID Applied:** MP85W 43851

N/A	N/A	N/A
VEO 1: Print Name	Signature	Date
N/A	N/A	N/A
VEO 2: Print Name	Signature	Date

Signatures of VEO's verifying the loading of the Output Waste Container.

Attachment 2 – CCP Waste Visual Examination Data Form (continued) Page 3 of 5

Batch Data Report No.: ORVECH0135

Output Waste Container ID: XIDC 93I2019AI

Section 3: Packaging Material and Waste Material Parameters	
Packaging Material:	Estimated Weight (kg)
Steel (ST):	27.8
Plastics (PP):	1.0
Others: (c)	4.4
Total Packaging Weight:	33.2
Waste Material Parameter:	Estimated Weight (kg)
Iron-based Metal/Alloys (IM):	5.0
Aluminum-based Metals/Alloys (AM):	N/A
Other Metals (OM):	N/A
Other Inorganic Materials (OI):	60.0
Cellulosics (C):	10.0
Rubber (R):	2.0
Plastics (waste materials) (PW):	6.0
Organic Matrix (OR):	2.0
Inorganic Matrix (IN):	N/A
Soils (S):	N/A
Total WMP Weight:	85.0

Attachment 2 – CCP Waste Visual Examination Data Form (continued) Page 4 of 5

Batch Data Report No.: ORVECH0135 **Output Waste Container ID:** X10C931201941

Section 4: Prohibited Item(s) Summary (Questions answered "YES" will be explained in the comments block)	Yes	No
Is there any observable liquid in internal containers, that is more than 60 milliliters or 3 percent by volume, whichever is greater?	☐	☑
Is the total volume of observable liquid in the outermost container **GREATER** than 1% of the container?	☐	☑
Is there detectable observable liquid in outermost containers with an EPA Hazardous Waste Number of U134?	☐	☑
Is there an indication of non-radionuclide pyrophoric materials, such as elemental potassium?	☐	☑
Is there an indication of hazardous wastes not occurring as co-contaminants with TRU mixed wastes (non-mixed hazardous wastes)?	☐	☑
Is there an indication of wastes incompatible with backfill, seal and panel closures materials, container and packaging materials, shipping container materials, or other wastes (i.e., waste does **NOT** match TRUCON Code[s])?	☐	☑
Is there an indication of wastes containing explosives or compressed gases?	☐	☑
Is there PCB liquids present?	☐	☑
Is there an indication of the waste exhibiting the characteristic of ignitability, corrosivity, or reactivity (EPA Hazardous Waste Numbers of D001, D002, or D003)?	☐	☑
Is the physical form of the waste inconsistent with the Waste Stream Description or the Waste Matrix Code?	☐	☑
TRUPACT II Criteria		
Are there heat-sealed bags (unvented) **GREATER** than 4 liters and LESS than 390 square inches in the waste?	☐	☑
Were there Non-approved Closure Methods used on liner bags or inner bags greater than 4 liters?	☐	☑
Are there sealed containers **GREATER** than 4 liters?	☐	☑
Are there indications of inadequate protection (blocked or braced) for heavy and/or sharp objects?	☐	☑

Attachment 2 – CCP Waste Visual Examination Data Form (continued) Page 5 of 5

Batch Data Report No.: ORVECH0135 **Output Waste Container ID:** XIDC 931 2019 A1

Section 4: Prohibited Item(s) Summary (Continued)
(Questions answered 'YES' will be explained in the Comments block)

Comments:

N/A

Section 5: Approvals

Visual Examination Operator 1:
Anthony Harley — Print Name
[signature] — Signature
4-9-15 — Date

Visual Examination Operator 2:
Jason Cafe — Print Name
[signature] — Signature
4-9-15 — Date

Attachment 3 – CCP Waste VE Independent Technical Reviewer Checklist

Batch Data Report No.: ORVECH0135 Page 1 of 2

Description			
1. Data generation and reduction were conducted in a technically correct manner in accordance with the methods used?	☐ NO	☑ YES	☐ N/A
2. Was the correct revision of operating procedure used?	☐ NO	☑ YES	☐ N/A
3. Are the waste material parameters (WMPs) entered correctly?	☐ NO	☑ YES	☐ N/A
4. Verify the hand calculations on the VE Data Form for the following:			
a. WMP weight totals	☐ NO	☑ YES	☐ N/A
b. Weight totals	☐ NO	☑ YES	☐ N/A
c. Summed volume of observable liquid, as necessary	☐ NO	☐ YES	☑ N/A
d. The total of the WMP weights is within 5% of the net weight of waste of the Output Waste Container obtained from subtracting the tare weight from the gross weight.	☐ NO	☑ YES	☐ N/A
5. Is the data reported in the correct units and correct number of significant figures?	☐ NO	☑ YES	☐ N/A
6. Has the data been reviewed for transcription errors?	☐ NO	☐ YES	☑ N/A
7. Does the Testing Batch Report include VE for up to 20 containers?	☐ NO	☑ YES	☐ N/A
8. BDR contents are complete and match the CCP Waste VE Batch Data Report Table of Contents?	☐ NO	☑ YES	☐ N/A
9. Is all the data signed and dated in reproducible ink and by the individual(s) generating it?	☐ NO	☑ YES	☐ N/A
10. Is all data recorded clearly, legibly, and accurately?	☐ NO	☑ YES	☐ N/A
11. All changes to original data lined out, initialed and dated by the individual making the changes?	☐ NO	☐ YES	☑ N/A
12. Were data changes made by the individual who originally collected the data or an equally qualified individual?	☐ NO	☐ YES	☑ N/A
13. Did the physical form of the waste match the Waste Matrix Code and Waste Stream Description?	☐ NO	☑ YES	☐ N/A

Attachment 3 – CCP Waste VE Independent Technical Reviewer Checklist (continued)

Batch Data Report No.: ORIECH0135 Page 2 of 2

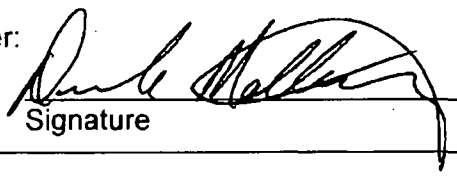
Description			
14. Was the waste in the Output Waste Container(s) *examined for prohibited items?*	☐ NO	☑ YES	☐ N/A
15. Is there an adequate written description of the contents of each item?	☐ NO	☑ YES	☐ N/A
16. Were the scale(s) in calibration prior to the VE and documented correctly?	☐ NO	☑ YES	☐ N/A
17. Were the scale checks SAT prior to the VE and documented correctly?	☐ NO	☑ YES	☐ N/A
18. Was the audio/video media recording properly prepared and labeled for each waste container?	☐ NO	☐ YES	☑ N/A
19. Was the audio/video media recording check performed satisfactorily prior to the VE?	☐ NO	☐ YES	☑ N/A
20. Precision: Was precision maintained by reconciling any discrepancies between the operator and the independent technical reviewer with regard to identification of waste matrix code, liquids in excess of TSDF-WAC limits, and compressed gases?	☐ NO	☐ YES	☑ N/A
21. Accuracy: Was accuracy maintained by requiring operators to pass a comprehensive examination and demonstrate satisfactory performance in the presence of the VE expert during their initial qualification and subsequent requalification (operators on LOQI)?	☐ NO	☑ YES	☐ N/A
22. Completeness: Is there a completed VE data form for each waste container in the BDR?	☐ NO	☑ YES	☐ N/A
23. Were NCRs initiated as required?	☐ NO	☐ YES	☑ N/A

Comments: N/A

I have reviewed 100 percent of the container-specific and batch data in this report and find it acceptable.

Independent Technical Reviewer:

Derek Matheny — Printed Name

 — Signature

4/13/15 — Date

DIVIDER PAGE ONLY

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Attachment 2 – CCP Records Transmittal/Receiving Form

CCP Records / Records Custodian, 4021 National Parks Highway - MS: GSA 212, Carlsbad, New Mexico 88220

Telephone Number: 575-234-7523

Fax Number: 575-234-7033

Attn:	CCP RECORDS	From:	PATRICK SMITH II
Ship to:	CCP RECORDS CUSTODIAN	Site:	ORNL
	4021 NATIONAL PARKS HWY.	Company:	TFE INC.
	MS GSA 212	Telephone Number:	865-574-6002
	CARLSBAD, NM 88220-9082	Date Sent:	4-29-2015
Telephone Number:	575-234-7523		

Document Number	Title/Description	Record Date	Total Pages
ORVECH0135	VE BDR	4-9-2015	10
N/A	N/A	N/A	N/A
N/A	N/A	N/A	N/A
N/A	N/A	N/A	N/A
N/A	N/A	N/A	N/A
N/A	N/A	N/A	N/A

Comments

N/A

(When the Record accepted line has been completed, the rest of the page below may be left blank.)

Acceptance/Rejection Signature and Date

Records Accepted ☑ Signature: Greta Leos — Printed Name: Greta Leos — Date: 5-04-15

Records Rejected ☐ Signature _____ — Printed Name _____ — Date _____

Reason for Rejection:

Re-submittal: Signature _____ — Printed Name _____ — Date _____

```
**********************************
***        Send Results        ***
**********************************

   Sending is complete.

Job No.                    3982
Address                    918655768703
Name                       ORNL
Start Time                 05/04 02:16 PM
Call Length                00'20
Sheets                     1
Result                     OK
```

Controlled Copy

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Document Number	Title/Description	Date	Total Pages
ORVECH0135	VE BDR	4-9-2015	10
N/A	N/A	N/A	N/A
N/A	N/A	N/A	N/A
N/A	N/A	N/A	N/A
N/A	N/A	N/A	N/A
N/A	N/A	N/A	N/A

Comments

N/A

(When the Record accepted line has been completed, the rest of the page below may be left blank.)

Acceptance/Rejection Signature and Date

Records Accepted ☑ Signature Greta Leos Printed Name 5-04-15 Date

Records Rejected ☐

DIVIDER PAGE

Attachment 1 – CCP SPM Visual Examination Project Level Validation Checklist and Summary

BDR Number: ORVECH0142				Examination Date(s): 06/04/2015
Description of Criteria Reviewed	**Criteria Met?**			**Comments/Qualifiers**
	YES	**NO**	**NA**	
1. Is the completed, signed and dated Independent Technical Reviewer Checklist included in the BDR, and the independent technical reviewer was not involved in the generation or recording of the data under review? **Reference Source: CCP-PO-001, C3-4**	X			
2. Does the BDR contain all items addressed in the BDR Table of Contents? **Reference Source: CCP-PO-001, C3-4**	X			
3. Does the BDR include a listing of all container numbers in the batch? **Reference Source: CCP-PO-001, C3-4**	X			
4. List all containers that have met QAOs. **Reference Source: CCP-PO-001, C3-4**				Container Numbers: X10C9311083A1
5. Is the current implementing procedure and revision number included in the BDR? **Reference Source: CCP-PO-001, Table C3-3**	X			
6. Is the BDR date included? **Reference Source: CCP-PO-001, Table C3-3**	X			
7. Is there a reference to or copy of any associated NCRs (if any) in the BDR? **Reference Source: CCP-PO-001, Table C3-3**			X	No NCRs.
8. Are there 20 or fewer containers in the batch? **Reference Source: CCP-PO-001 C3-4**	X			
9. Are the data properly reported (i.e., data are reported in correct units and with correct significant figures). **Reference Source: CCP-PO-001 C3-4**	X			
10. Is there evidence of verification that the physical form matches the Waste Matrix Code? **Reference Source: CCP-PO-001, Table C3-3**	X			
11. Is there evidence of verification that the physical form matches the waste stream description? **Reference Source: CCP-PO-001, Table C3-3**	X			
12. Are prohibited items absent? **Reference Source: CCP-PO-001, Table C3-3**	X			

CCP RECORDS ORIGINAL
DATE REC'D 7-1-15 GL

Attachment 1 – CCP SPM Visual Examination Project Level Validation Checklist and Summary (Continued)

BDR Number: ORVECH0142				**Examination Date(s): 06/04/2015**
Description of Criteria Reviewed	**Criteria Met?**			**Comments/Qualifiers**
	YES	**NO**	**NA**	
13. Does observable liquid, if present, meet the criteria of the TSDF-WAC? **Reference Source: CCP-PO-001, C-1**			X	No observable liquid.
14. Were discrepancies between the Visual Examination operator and the ITR with regards to identification of waste matrix code, liquids in excess of the TSDF-WAC, or compressed gases reconciled? NA if no discrepancies. **Reference Source: CCP-PO-001, C3-2**			X	
15. Are the training requirements met for the VE Expert and VE Operators who have signed the data forms? **Reference Source: CCP-PO-001, C3-8**	X			
16. Is evidence of a satisfactory audio/video test included in the BDR? NA [not applicable] for VE Method for Newly Generated Waste. **Reference Source: CCP-PO-001, C1-2**			X	
17. If the VE was not recorded using audio/video media, does the data sheet contain the signature of two qualified operators who observed for themselves the waste being placed into the container? NA if audio/video used. **Reference Source: CCP-PO-001, C1-2**	X			
18. Are the weights/estimated weights for the 12 waste material parameters reported in kilograms (kg)? **Reference Source: CCP Technical Procedures**	X			
19. Are the descriptions for each waste material parameter included in the BDR? **Reference Source: CCP-PO-001, C1-2**	X			
20. Is the gross weight reported (in kg) for each container included in the BDR? **Reference Source: CCP Technical Procedures**	X			
21. Is the number of layers of confinement recorded? **Reference Source: CCP-PO-001, C1-2**	X			
22. Is sufficient information included in the BDR to determine the packaging configuration? **Reference Source: CCP-PO-001, C1-2**	X			

Attachment 1 – CCP SPM Visual Examination Project Level Validation Checklist and Summary (Continued)

BDR Number: ORVECH0142				Examination Date(s): 06/04/2015
Description of Criteria Reviewed	**Criteria Met?**			**Comments/Qualifiers**
	YES	**NO**	**NA**	
23. Is the type and number of filters recorded? **Reference Source: CCP-PO-001, CCP Technical Procedures**	X			
24. Is the size of the rigid liner vent hole recorded? NA if no liner lid. **Reference Source: CCP-PO-001, CCP Technical Procedures**			X	
25. For Los Alamos National Laboratory (LANL) Sealed Sources, does the characterized waste container meet the definition of sealed sources per Title 10 Code of Federal Regulations (CFR) 30.4 and Title 10 CFR 835.2 (effective January 1, 2004) evidence of which is assembled as part of AK documentation? **Reference Source: CCP Technical Procedures**			X	Not a LANL Sealed Source.
26. For LANL Sealed Sources, are sealed sources the only non-packaging items in the waste container? **Reference Source: CCP-TP-069, 4.1.4**			X	Not a LANL Sealed Source.
27. For LANL Sealed Sources, are the sealed sources a U.S. Department of Transportation (DOT) Special Form Class 7 (Radioactive Material) per Title 49 CFR 34.27 (effective January 1, 2004) and the certification of which is assembled as part of the AK documentation? **Reference Source: CCP Technical Procedures**			X	Not a LANL Sealed Source.
28. For LANL Sealed Sources, is the integrity of each sealed source validated by documented contamination survey results to meet the requirements of Title 10 CFR 34.27 (effective January 1, 2004), and assembled as part of AK documentation? **Reference Source: CCP Technical Procedures**			X	Not a LANL Sealed Source.

Attachment 1 – CCP SPM Visual Examination Project Level Validation Checklist and Summary (Continued)

BDR Number: ORVECH0142 **Examination Date(s): 06/04/2015**

Description of Criteria Reviewed	Criteria Met? YES	NO	NA	Comments/Qualifiers
29. For LANL Sealed Sources, is each sealed source a rigid sealed container less than or equal to 4 L in size or in a rigid sealed container less than or equal to 4 L? **Reference Source: CCP Technical Procedures**			X	Not a LANL Sealed Source.
30. For LANL Sealed Sources, AK documentation does not indicate the use of volatile organic compounds (VOCs) or VOC-bearing materials as constituents of sealed sources? **Reference Source: CCP Technical Procedures**			X	Not a LANL Sealed Source.
31. For LANL Sealed Sources, the outer casing of each sealed source is of a non VOC-bearing material which is verified using the VE technique at the time of packaging? **Reference Source: CCP Technical Procedures**			X	Not a LANL Sealed Source.

Comments: None.

The container QC checks were properly performed and meet the Quality Assurance Objectives (QAOs). Proper procedures were followed during data reduction and analysis. The batch is complete, acceptable, and includes all supporting data and documentation required by the QAPjP.

Daniel Wade		06/29/2015
SPM Printed Name	Signature	Date

Checklist is to be re-signed only when a re-review is performed.

SPM Printed Name	Signature	Reason	Date
SPM Printed Name	Signature	Reason	Date

Attachment 5 – CCP Waste VE Batch Data Report Cover Sheet

Batch Data Report No.: ORVECH0142 Examination Date: 6-4-15

	Waste Container ID Number
1	X10C9311083A1
2	
3	
4	
5	
6	
7	
8	
9	
10	
11	
12	
13	
14	
15	
16	
17	
18	
19	
20	

N/A
A.H. 6-16-15

Independent Technical Reviewer:

Derek Matheny
Print Name

Signature

6/16/15
Date

NTPC RECORDS ORIGINAL
DATE REC'D 6-17-2015

Attachment 4 – CCP Waste VE Batch Data Report Table of Contents

Batch Data Report No.: ORVECH0142 Examination Date: 6-4-15

Table of Contents

Item	Description	Page No.
1	CCP Waste VE Batch Data Report Cover Sheet	1
2	CCP Waste VE Batch Data Report Table of Contents	2
3	CCP Waste Visual Examination General Information Form	3
4	CCP Waste Visual Examination Data Forms	4
5	CCP Waste VE Independent Technical Reviewer Checklist	9
6	Copy of NCRs (N/A, If Not Applicable)	N/A
7	Field Records (N/A, If Not Applicable)	N/A

Attachment 1 – CCP Waste Visual Examination General Information Form

Batch Data Report No.: ORVECH0142

☑ VE for Previously Packaged Waste ☐ VE for Newly Generated Waste	
☐ Method 1 ☑ Method 2	
Site ID: OR	
Examination Date: 6-4-15	
Procedure No.: CCP-TP-113 Revision No.: 18	
Camera/Audio/Video Media Recording Check: ☑ N/A	☐ SAT
VE Scale Information: ☑ N/A	Serial/ID Number: Calibration Due Date: Operational Check: ☐ SAT ☐ UNSAT
Test Weight Information Test Weight Total: kg. Tray Weight: kg.	Serial/ID Number: Calibration Due Date: Serial/ID Number: Calibration Due Date: Serial/ID Number: Calibration Due Date:
Container Scale Information:	Serial/ID Number: WIPP151 Calibration Due Date: 1-7-16 Operational Check: ☑ SAT ☐ UNSAT

Comments:
The VEE has determined VE scale shall not be used.

Visual Examination Operator 1: Anthony Harley (Print Name)	Signature	6-16-15 (Date)
Visual Examination Operator 2: Jason Cote (Print Name)	Signature	6-16-15 (Date)

Attachment 2 – CCP Waste Visual Examination Data Form Page 1 of 5

Batch Data Report No.: ORVECH0142

Section 1: Output Waste Container Data		
Input Waste Container ID, as applicable: X10C9311083A		
Output Waste Container ID: X10C9311083A1	Waste Stream ID: OR-MRF-CH-HET	
Container Type: 55gallon drum	TRUCON Code: OR125/225	Waste Matrix Code: S5400
Audio/Video Media Recording Number: ☑ N/A		
Waste Container Weights: Tare Wt: 33.2 kg.	Gross Wt: 179.6 kg.	
Rigid Liner Present? ☐ NO ☑ YES Type of Liner: ☐ Lead ☐ Plastic ☑ Fiberboard ☐ Other: Thickness: ☐ 30-mil ☑ 90-mil ☐ 110-mil ☐ 125-mil	Rigid Liner Lid Present? ☑ NO ☐ YES Rigid Liner Lid is Vented (>0.3 in.) or Filtered? ☐ NO ☐ YES ☑ N/A ☐ Vented: Hole Size: ☑ N/A ☐ Filtered: Model No.: ☑ N/A Serial No.: ☑ N/A	
Bag Liner Present? ☐ NO ☑ YES	Volume Utilization Percentage: 100 %	
Does the physical form of the waste match the Waste Stream Description (i.e., Homogeneous Solids, Soil/Gravel, or Debris Waste [including uncategorized metals])? ☐ NO ☑ YES		
Does the physical form of the waste match the Waste Matrix Code? ☐ NO ☑ YES		
Closure Method: TTF Number of Layers of Confinement: 1		
Filter Torque Wrench Serial/ID No.: WIPP169 Calibration Due Date: 10-7-15 Filter: Model No.: UT9424X Serial No.: 00238 0304 Torque Value: 72 in/lbs	Lid Ring/Bolt Torque Wrench Serial/ID No.: WIPP150 Calibration Due Date: 4-8-2016 Lid Ring/Bolt Torque Value: 60 ft/lbs	
Is total dose rate greater than 200mrem/hr? ☑ NO ☐ YES		
NCR(s) associated with the output container? ☑ NO ☐ YES NCR No.: N/A NCR No.: N/A		
Comments: Output container was started on 6-4-15. VE was paused due to host site inventory system being disabled. Drum was removed from BBA and completed on 6-16-15. All contents of the output container were completely VE'd on 6-4-15.		

Attachment 2 – CCP Waste Visual Examination Data Form (continued) Page 2 of 5

Batch Data Report No.: ORVECH0142 **Date:** 6-4-15

Section 2: Waste Package Data

Package and Package TID Number (as applicable)	Waste Description	WMP [Table 3]	Weight (kg) [Table 4.a]	Weighing Code(s) [Table 4.b]
N/A	cardboard wood absorbent pads	C	10.0	E
N/A	metal bolts -- metal valves metal pipes metal nuts	IM	60.0	E
N/A	paper gaskets paper filters	C	1.2	E
N/A	rubber tubing	R	2.2	E
N/A	plastic bags vinyl tape	PW	3.0	E
N/A	metal filter housings metal flange	IM	70.0	E
		N/A	A.H. 6-4-15	

N/A	N/A	N/A
VEO 1: Print Name	Signature	Date
N/A	N/A	N/A
VEO 2: Print Name	Signature	Date

Signatures annotate the absence of prohibited items.

Output Waste Container ID: X10C9311083A1

TID Removed: N/A **TID Applied:** MP85W 61364

N/A	N/A	N/A
VEO 1: Print Name	Signature	Date
N/A	N/A	N/A
VEO 2: Print Name	Signature	Date

Signatures of VEO's verifying the loading of the Output Waste Container.

Attachment 2 – CCP Waste Visual Examination Data Form (continued) Page 3 of 5

Batch Data Report No.: ORVECH0142

Output Waste Container ID: X10C9311083A1

Section 3: Packaging Material and Waste Material Parameters	
Packaging Material:	Estimated Weight (kg)
Steel (ST):	27.8
Plastics (PP):	1.0
Others: (c)	4.4
Total Packaging Weight:	33.2
Waste Material Parameter:	Estimated Weight (kg)
Iron-based Metal/Alloys (IM):	130.0
Aluminum-based Metals/Alloys (AM):	N/A
Other Metals (OM):	N/A
Other Inorganic Materials (OI):	N/A
Cellulosics (C):	11.2
Rubber (R):	2.2
Plastics (waste materials) (PW):	3.0
Organic Matrix (OR):	N/A
Inorganic Matrix (IN):	N/A
Soils (S):	N/A
Total WMP Weight:	146.4

Attachment 2 – CCP Waste Visual Examination Data Form (continued) Page 4 of 5

Batch Data Report No.: ORVECH0142 **Output Waste Container ID:** X10C9311083A1

Section 4: Prohibited Item(s) Summary (Questions answered "YES" will be explained in the Comments Block)		
	Yes	No
Is there any observable liquid in internal containers, that is more than 60 milliliters or 3 percent by volume, whichever is greater?	☐	☑
Is the total volume of observable liquid in the outermost container **GREATER** than 1% of the container?	☐	☑
Is there detectable observable liquid in outermost containers with an EPA Hazardous Waste Number of U134?	☐	☑
Is there an indication of non-radionuclide pyrophoric materials, such as elemental potassium?	☐	☑
Is there an indication of hazardous wastes not occurring as co-contaminants with TRU mixed wastes (non-mixed hazardous wastes)?	☐	☑
Is there an indication of wastes incompatible with backfill, seal and panel closures materials, container and packaging materials, shipping container materials, or other wastes (i.e., waste does **NOT** match TRUCON Code[s])?	☐	☑
Is there an indication of wastes containing explosives or compressed gases?	☐	☑
Is there PCB liquids present?	☐	☑
Is there an indication of the waste exhibiting the characteristic of ignitability, corrosivity, or reactivity (EPA Hazardous Waste Numbers of D001, D002, or D003)?	☐	☑
Is the physical form of the waste inconsistent with the Waste Stream Description or the Waste Matrix Code?	☐	☑
TRUPACT-II Checklist		
Are there heat-sealed bags (unvented) **GREATER** than 4 liters and LESS than 390 square inches in the waste?	☐	☑
Were there Non-approved Closure Methods used on liner bags or inner bags greater than 4 liters?	☐	☑
Are there sealed containers **GREATER** than 4 liters?	☐	☑
Are there indications of inadequate protection (blocked or braced) for heavy and/or sharp objects?	☐	☑

Attachment 2 – CCP Waste Visual Examination Data Form (continued) Page 5 of 5

Batch Data Report No.: ORVECH0142 **Output Waste Container ID:** X10C93110833A1

Section 4: Prohibited Item(s) Summary (Continued)
(Questions answered "YES" will be explained in the Comments block)

Comments:

N/A

Section 5: Approvals

Visual Examination Operator 1:

Print Name	Signature	Date
Anthony Harley		6-16-15

Visual Examination Operator 2:

Print Name	Signature	Date
Jason Cofer		6-16-15

Attachment 3 – CCP Waste VE Independent Technical Reviewer Checklist

Batch Data Report No.: ORVECH0142 Page 1 of 2

Description			
1. Data generation and reduction were conducted in a technically correct manner in accordance with the methods used?	☐ NO	☑ YES	☐ N/A
2. Was the correct revision of operating procedure used?	☐ NO	☑ YES	☐ N/A
3. Are the waste material parameters (WMPs) entered correctly?	☐ NO	☑ YES	☐ N/A
4. Verify the hand calculations on the VE Data Form for the following:			
a. WMP weight totals	☐ NO	☑ YES	☐ N/A
b. Weight totals	☐ NO	☑ YES	☐ N/A
c. Summed volume of observable liquid, as necessary	☐ NO	☐ YES	☑ N/A
d. The total of the WMP weights is within 5% of the net weight of waste of the Output Waste Container obtained from subtracting the tare weight from the gross weight.	☐ NO	☑ YES	☐ N/A
5. Is the data reported in the correct units and correct number of significant figures?	☐ NO	☑ YES	☐ N/A
6. Has the data been reviewed for transcription errors?	☐ NO	☐ YES	☑ N/A
7. Does the Testing Batch Report include VE for up to 20 containers?	☐ NO	☑ YES	☐ N/A
8. BDR contents are complete and match the CCP Waste VE Batch Data Report Table of Contents?	☐ NO	☑ YES	☐ N/A
9. Is all the data signed and dated in reproducible ink and by the individual(s) generating it?	☐ NO	☑ YES	☐ N/A
10. Is all data recorded clearly, legibly, and accurately?	☐ NO	☑ YES	☐ N/A
11. All changes to original data lined out, initialed and dated by the individual making the changes?	☐ NO	☐ YES	☑ N/A
12. Were data changes made by the individual who originally collected the data or an equally qualified individual?	☐ NO	☐ YES	☑ N/A
13. Did the physical form of the waste match the Waste Matrix Code and Waste Stream Description?	☐ NO	☑ YES	☐ N/A

Attachment 3 – CCP Waste VE Independent Technical Reviewer Checklist (continued)

Batch Data Report No.: ORVECH0142 Page 2 of 2

Description			
14. Was the waste in the Output Waste Container(s) examined for prohibited items?	☐ NO	☑ YES	☐ N/A
15. Is there an adequate written description of the contents of each item?	☐ NO	☑ YES	☐ N/A
16. Were the scale(s) in calibration prior to the VE and documented correctly?	☐ NO	☑ YES	☐ N/A
17. Were the scale checks SAT prior to the VE and documented correctly?	☐ NO	☑ YES	☐ N/A
18. Was the audio/video media recording properly prepared and labeled for each waste container?	☐ NO	☐ YES	☑ N/A
19. Was the audio/video media recording check performed satisfactorily prior to the VE?	☐ NO	☐ YES	☑ N/A
20. Precision: Was precision maintained by reconciling any discrepancies between the operator and the independent technical reviewer with regard to identification of waste matrix code, liquids in excess of TSDF-WAC limits, and compressed gases?	☐ NO	☐ YES	☑ N/A
21. Accuracy: Was accuracy maintained by requiring operators to pass a comprehensive examination and demonstrate satisfactory performance in the presence of the VE expert during their initial qualification and subsequent requalification (operators on LOQI)?	☐ NO	☑ YES	☐ N/A
22. Completeness: Is there a completed VE data form for each waste container in the BDR?	☐ NO	☑ YES	☐ N/A
23. Were NCRs initiated as required?	☐ NO	☐ YES	☑ N/A

Comments: N/A

I have reviewed 100 percent of the container-specific and batch data in this report and find it acceptable.

Independent Technical Reviewer:

Derek Matheny	Derek Matheny	6/16/15
Printed Name	Signature	Date

DIVIDER PAGE ONLY

Not Part of Page Count

Attachment 2 – CCP Records Transmittal/Receiving Form

CCP Records / Records Custodian, 4021 National Parks Highway - MS: GSA 212, Carlsbad, New Mexico 88220

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Ship to:	4021 National Parks Highway	Site:	ORNL
	Carlsbad NM 88220	Company:	TFE Inc.
	MS GSA 212	Telephone Number:	865-574-6002
		Date Sent:	7/8/2015
Telephone Number:	575-234-7523		

Document Number	Title / Description	Record Date	Total Pages
ORVECH0142	VE BDR	6/4/15	10
N/A	N/A	N/A	N/A
N/A	N/A	N/A	N/A
N/A	N/A	N/A	N/A
N/A	N/A	N/A	N/A
N/A	N/A	N/A	N/A

Comments

(When the Record accepted line has been completed, the rest of the page below may be left blank.)

Acceptance/Rejection Signature and Date

Records Accepted	☑	[signature]	Jewell Yturralde	7.14.15.
		Signature	Printed Name	Date
Records Rejected	☐			
		Signature	Printed Name	Date

Reason for Rejection:

Re-submittal:

Signature	Printed Name	Date

****
*** Send Results ***
****

Sending is complete.

Job No.	1007
Address	918655768703
Name	ORNL
Start Time	07/14 12:08 PM
Call Length	00'20
Sheets	1
Result	OK

Controlled Copy

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		Date Sent:	7/8/2015
Telephone Number:	575-234-7523		

ORVECH0142	VE BDR	6/4/15	10
N/A	N/A	N/A	N/A
N/A	N/A	N/A	N/A
N/A	N/A	N/A	N/A
N/A	N/A	N/A	N/A
N/A	N/A	N/A	N/A

(When the Record accepted line has been completed, the rest of the page below may be left blank.)

Acceptance/Rejection Signature and Date

Records Accepted ☑ [signature] Jewell Yturralde 7-14-15.
Signature Printed Name Date

Records Rejected ☐

DIVIDER PAGE

Attachment 1 – CCP SPM Visual Examination Project Level Validation Checklist and Summary

BDR Number: ORVECH0145				Examination Date(s): 06/30/2015
Description of Criteria Reviewed	Criteria Met? YES	NO	NA	Comments/Qualifiers
1. Is the completed, signed and dated Independent Technical Reviewer Checklist included in the BDR, and the independent technical reviewer was not involved in the generation or recording of the data under review? **Reference Source: CCP-PO-001, C3-4**	X			
2. Does the BDR contain all items addressed in the BDR Table of Contents? **Reference Source: CCP-PO-001, C3-4**	X			
3. Does the BDR include a listing of all container numbers in the batch? **Reference Source: CCP-PO-001, C3-4**	X			
4. List all containers that have met QAOs. **Reference Source: CCP-PO-001, C3-4**				Container Numbers: X10C9311173A1, X10C9311173A2, X10C9311173A3
5. Is the current implementing procedure and revision number included in the BDR? **Reference Source: CCP-PO-001, Table C3-3**	X			
6. Is the BDR date included? **Reference Source: CCP-PO-001, Table C3-3**	X			
7. Is there a reference to or copy of any associated NCRs (if any) in the BDR? **Reference Source: CCP-PO-001, Table C3-3**			X	No NCRs
8. Are there 20 or fewer containers in the batch? **Reference Source: CCP-PO-001 C3-4**	X			
9. Are the data properly reported (i.e., data are reported in correct units and with correct significant figures). **Reference Source: CCP-PO-001 C3-4**	X			
10. Is there evidence of verification that the physical form matches the Waste Matrix Code? **Reference Source: CCP-PO-001, Table C3-3**	X			
11. Is there evidence of verification that the physical form matches the waste stream description? **Reference Source: CCP-PO-001, Table C3-3**	X			
12. Are prohibited items absent? **Reference Source: CCP-PO-001, Table C3-3**	X			

CCP RECORDS ORIGINAL

DATE REC'D 7.22.15 SY

Attachment 1 – CCP SPM Visual Examination Project Level Validation Checklist and Summary (Continued)

BDR Number: ORVECH0145				Examination Date(s): 06/30/2015
Description of Criteria Reviewed	Criteria Met? YES	NO	NA	Comments/Qualifiers
13. Does observable liquid, if present, meet the criteria of the TSDF-WAC? **Reference Source: CCP-PO-001, C-1**			X	No liquids identified in the BDR
14. Were discrepancies between the Visual Examination operator and the ITR with regards to identification of waste matrix code, liquids in excess of the TSDF-WAC, or compressed gases reconciled? NA if no discrepancies. **Reference Source: CCP-PO-001, C3-2**			X	
15. Are the training requirements met for the VE Expert and VE Operators who have signed the data forms? **Reference Source: CCP-PO-001, C3-8**	X			
16. Is evidence of a satisfactory audio/video test included in the BDR? NA [not applicable] for VE Method for Newly Generated Waste. **Reference Source: CCP-PO-001, C1-2**			X	
17. If the VE was not recorded using audio/video media, does the data sheet contain the signature of two qualified operators who observed for themselves the waste being placed into the container? NA if audio/video used. **Reference Source: CCP-PO-001, C1-2**	X			
18. Are the weights/estimated weights for the 12 waste material parameters reported in kilograms (kg)? **Reference Source: CCP Technical Procedures**	X			
19. Are the descriptions for each waste material parameter included in the BDR? **Reference Source: CCP-PO-001, C1-2**	X			
20. Is the gross weight reported (in kg) for each container included in the BDR? **Reference Source: CCP Technical Procedures**	X			
21. Is the number of layers of confinement recorded? **Reference Source: CCP-PO-001, C1-2**	X			
22. Is sufficient information included in the BDR to determine the packaging configuration? **Reference Source: CCP-PO-001, C1-2**	X			

Attachment 1 – CCP SPM Visual Examination Project Level Validation Checklist and Summary (Continued)

BDR Number: ORVECH0145				Examination Date(s): 06/30/2015
Description of Criteria Reviewed	**Criteria Met?**			**Comments/Qualifiers**
	YES	**NO**	**NA**	
23. Is the type and number of filters recorded? **Reference Source: CCP-PO-001, CCP Technical Procedures**	X			
24. Is the size of the rigid liner vent hole recorded? NA if no liner lid. **Reference Source: CCP-PO-001, CCP Technical Procedures**			X	
25. For Los Alamos National Laboratory (LANL) Sealed Sources, does the characterized waste container meet the definition of sealed sources per Title 10 Code of Federal Regulations (CFR) 30.4 and Title 10 CFR 835.2 (effective January 1, 2004) evidence of which is assembled as part of AK documentation? **Reference Source: CCP Technical Procedures**			X	Not LANL Sealed Sources
26. For LANL Sealed Sources, are sealed sources the only non-packaging items in the waste container? **Reference Source: CCP-TP-069, 4.1.4**			X	Not LANL Sealed Sources
27. For LANL Sealed Sources, are the sealed sources a U.S. Department of Transportation (DOT) Special Form Class 7 (Radioactive Material) per Title 49 CFR 34.27 (effective January 1, 2004) and the certification of which is assembled as part of the AK documentation? **Reference Source: CCP Technical Procedures**			X	Not LANL Sealed Sources
28. For LANL Sealed Sources, is the integrity of each sealed source validated by documented contamination survey results to meet the requirements of Title 10 CFR 34.27 (effective January 1, 2004), and assembled as part of AK documentation? **Reference Source: CCP Technical Procedures**			X	Not LANL Sealed Sources

Attachment 1 – CCP SPM Visual Examination Project Level Validation Checklist and Summary (Continued)

BDR Number: ORVECH0145				**Examination Date(s): 06/30/2015**
Description of Criteria Reviewed	**Criteria Met?**			**Comments/Qualifiers**
	YES	**NO**	**NA**	
29. For LANL Sealed Sources, is each sealed source a rigid sealed container less than or equal to 4 L in size or in a rigid sealed container less than or equal to 4 L? **Reference Source: CCP Technical Procedures**			X	Not LANL Sealed Sources
30. For LANL Sealed Sources, AK documentation does not indicate the use of volatile organic compounds (VOCs) or VOC-bearing materials as constituents of sealed sources? **Reference Source: CCP Technical Procedures**			X	Not LANL Sealed Sources
31. For LANL Sealed Sources, the outer casing of each sealed source is of a non VOC-bearing material which is verified using the VE technique at the time of packaging? **Reference Source: CCP Technical Procedures**			X	Not LANL Sealed Sources
Comments: **NONE**				
The container QC checks were properly performed and meet the Quality Assurance Objectives (QAOs). Proper procedures were followed during data reduction and analysis. The batch is complete, acceptable, and includes all supporting data and documentation required by the QAPjP.				
Rick Whiteley	Rick Whiteley			07/27/2015
SPM Printed Name	Signature			Date

Checklist is to be re-signed only when a re-review is performed.

SPM Printed Name	Signature	Reason	Date
SPM Printed Name	Signature	Reason	Date

Attachment 5 – CCP Waste VE Batch Data Report Cover Sheet

Batch Data Report No.: ORVECH0145 Examination Date: 6-30-15

	Waste Container ID Number
1	X10C93111173A1
2	X10C93111173A2
3	X10C93111173A3
4	
5	
6	
7	
8	
9	
10	
11	
12	
13	
14	
15	
16	
17	
18	
19	
20	

N/A A.H. 10-30-15

Independent Technical Reviewer:

Pat Tilmon	Pat Tilmon	7-7-15
Print Name	Signature	Date

NTPC RECORDS ORIGINAL
DATE REC'D 7-7-15 JV

Attachment 4 – CCP Waste VE Batch Data Report Table of Contents

Batch Data Report No.: ORVECH0145 Examination Date: 6-30-15

Table of Contents

Item	Description	Page No.
1	CCP Waste VE Batch Data Report Cover Sheet	1
2	CCP Waste VE Batch Data Report Table of Contents	2
3	CCP Waste Visual Examination General Information Form	3
4	CCP Waste Visual Examination Data Forms	4
5	CCP Waste VE Independent Technical Reviewer Checklist	19
6	Copy of NCRs (N/A, If Not Applicable)	N/A
7	Field Records (N/A, If Not Applicable)	N/A

Attachment 1 – CCP Waste Visual Examination General Information Form

Batch Data Report No.: ORVECH0145

☑ VE for Previously Packaged Waste ☐ VE for Newly Generated Waste	
☐ Method 1 ☑ Method 2	
Site ID: OR	
Examination Date: 6-30-15	
Procedure No.: CCP-TP-113 Revision No.: 19	
Camera/Audio/Video Media Recording Check: ☑ N/A ☐ SAT	
VE Scale Information: ☑ N/A	Serial/ID Number: Calibration Due Date: Operational Check: ☐ SAT
Test Weight Information Test Weight Total: kg. Tray Weight: kg.	Serial/ID Number: Calibration Due Date: Serial/ID Number: Calibration Due Date: Serial/ID Number: Calibration Due Date:
Container Scale Information:	Serial/ID Number: WIPP002 Calibration Due Date: 12-8-15 Operational Check: ☑ SAT ☐ UNSAT
Comments: N/A	
Visual Examination Operator 1: Anthony Harley (Print Name)	Signature	6-30-15 (Date)
Visual Examination Operator 2: Jason Cofer (Print Name)	Signature	6-30-15 (Date)

Attachment 2 – CCP Waste Visual Examination Data Form Page 1 of 5

Batch Data Report No.: ORVECH0145

Section 1: Output Waste Container Data

Input Waste Container ID, as applicable: X10C9311173A

Output Waste Container ID: X10C9311173A1 | Waste Stream ID: OR-ISTP-CH-HET

Container Type: 55 gallon drum | TRUCON Code: OR125/225 | Waste Matrix Code: S5400

Audio/Video Media Recording Number: ☑ N/A Output Container Verified Empty ☐ NO ☑ YES

Waste Container Weights:
Tare Wt: 33.2 kg. Gross Wt: 119.8 kg.

Poly Rigid Liner Present? ☑ NO ☐ YES

Thickness: ☐ 30-mil ☐ 90-mil ☐ 110-mil ☐ 125-mil

Other liner: ☐ Lead ☑ Fiberboard/Cardboard ☐ Other:

Poly Rigid Liner Lid Present? ☑ NO ☐ YES

Poly Rigid Liner Lid is Vented (>0.3 in.) or Filtered? ☐ NO ☐ YES ☑ N/A

☐ Vented: Hole Size: ☑ N/A
☐ Filtered: Model No.: ☑ N/A

Serial No.: ☑ N/A

Bag Liner Present? ☐ NO ☑ YES

Volume Utilization Percentage: 100 %

Does the physical form of the waste match the Waste Stream Description (i.e., Homogeneous Solids, Soil/Gravel, or Debris Waste [including uncategorized metals])?
☐ NO ☑ YES

Does the physical form of the waste match the Waste Matrix Code?
☐ NO ☑ YES

Closure Method: TTF
Number of Layers of Confinement: 1

Filter Torque Wrench
Serial/ID No.: WIPP169
Calibration Due Date: 10-7-15
Filter: Model No.: UT9424X
Serial No.: 00240 0387
Torque Value: 72 in/lbs

Lid Ring/Bolt Torque Wrench
Serial/ID No.: WIPP150
Calibration Due Date: 4-8-16
Lid Ring/Bolt Torque Value: 60 ft/lbs

Is total dose rate greater than 200mrem/hr? ☑ NO ☐ YES

NCR(s) associated with the output container? ☑ NO ☐ YES
NCR No.: N/A
NCR No.: N/A

Comments:
N/A

Attachment 2 – CCP Waste Visual Examination Data Form (continued) Page 2 of 5

Batch Data Report No.: ORVECH0145 **Date:** 6-30-15

Section 2: Waste Package Data

Package and Package TID Number (as applicable)	Waste Description	WMP [Table 3]	Weight (kg) [Table 4.a]	Weighing Code(s) [Table 4.b]
N/A	cloth cardboard cloth suits leather gloves	C	8.0	E
N/A	plastic suits latex gloves A.H. 7-7-15 plastic bags vinyl tape	PW	10.6	E
N/A	saw blade metal pieces	IM	60.0	E
N/A	rubber gasket ~~latex gloves~~ A.H. 7-7-15 rubber booties	R	4.0	E
N/A	absorbent	OI	4.0	E
		N/A	A.H. 6-30-15	

Are there any indirect load containers associated with this BDR? Yes ☐ No ☑

N/A	N/A	N/A
VEO 1: Print Name	Signature	Date
N/A	N/A	N/A
VEO 2: Print Name	Signature	Date

VEO's signatures verify the absence of prohibited items in indirect load containers.

Output Waste Container ID: X10C93111 73A1

TID Removed: N/A **TID Applied:** MP85W 61170

N/A	N/A	N/A
VEO 1: Print Name	Signature	Date
N/A	N/A	N/A
VEO 2: Print Name	Signature	Date

VEO's signatures verify the loading of the indirect load container(s) into the output waste container.

Attachment 2 – CCP Waste Visual Examination Data Form (continued) Page 3 of 5

Batch Data Report No.: ORIECH0145

Output Waste Container ID: X10C93111Z3A1

Section 3: Packaging Material and Waste Material Parameters	
Packaging Material:	Estimated Weight (kg)
Steel (ST):	27.8
Plastics (PP):	1.0
Cellulosic (C):	4.4
Others:	N/A
Total Packaging Weight:	33.2
Waste Material Parameter:	Estimated Weight (kg)
Iron-based Metal/Alloys (IM):	60.0
Aluminum-based Metals/Alloys (AM):	N/A
Other Metals (OM):	N/A
Other Inorganic Materials (OI):	4.0
Cellulosics (C):	8.0
Rubber (R):	4.0
Plastics (waste materials) (PW):	10.6
Organic Matrix (OR):	N/A
Inorganic Matrix (IN):	N/A
Soils (S):	N/A
Total WMP Weight:	86.6

Attachment 2 – CCP Waste Visual Examination Data Form (continued) Page 4 of 5

Batch Data Report No.: ORWECH0145 **Output Waste Container ID:** X10C9311173A1

Section 4: Prohibited Item(s) Summary (Questions answered YES will be explained in the Comments block)			
		Yes	No
1.	Is there any observable liquid present? If no, proceed to question 5	☐	☑ A.H. 7-6-15
2.	Is there any observable liquid in internal containers, that is more than 60 milliliters or 3 percent by volume, whichever is greater?	☐	☑ A.H. 7-6-15
3.	Is the total volume of observable liquid in the outermost container **GREATER** than 1% of the container?	☐	☑ A.H. 7-6-15
4.	Is there detectable observable liquid in containers with an EPA Hazardous Waste Number of U134?	☐	☑
5.	Is there an indication of non-radionuclide pyrophoric materials, such as elemental potassium?	☐	☑
6.	Is there an indication of hazardous wastes not occurring as co-contaminants with TRU mixed wastes (non-mixed hazardous wastes)?	☐	☑
7.	Is there an indication of wastes incompatible with backfill, seal and panel closures materials, container and packaging materials, shipping container materials, or other wastes (i.e., waste does **NOT** match TRUCON Code[s])?	☐	☑
8.	Is there an indication of wastes containing explosives or compressed gases?	☐	☑
9.	Is there PCB liquids present?	☐	☑
10.	Is there an indication of the waste exhibiting the characteristic of ignitability, corrosivity, or reactivity (EPA Hazardous Waste Numbers of D001, D002, or D003)?	☐	☑
11.	Is the physical form of the waste inconsistent with the Waste Stream Description or the Waste Matrix Code?	☐	☑
TRUPACT-II Criteria			
12.	Are there heat-sealed bags (unvented) **GREATER** than 4 liters and LESS than 390 square inches in the waste?	☐	☑
13.	Were there Non-approved Closure Methods used on liner bags or inner bags greater than 4 liters?	☐	☑
14.	Are there sealed containers **GREATER** than 4 liters?	☐	☑
15.	Are there indications of inadequate protection (blocked or braced) for heavy and/or sharp objects?	☐	☑

Attachment 2 – CCP Waste Visual Examination Data Form (continued) Page 5 of 5

Batch Data Report No.: ORVECH0145 **Output Waste Container ID:** X10C93111 73A1

Section 4: Prohibited Item(s) Summary (Continued)
(Questions answered "YES" will be explained in the Comments block)

Comments:

N/A

Section 5: Approvals

Visual Examination Operator 1:
Anthony Harley
Print Name

Signature

6-30-15
Date

Visual Examination Operator 2:
Jason Cofer
Print Name

Signature

7-6-15
7-7-15
6-30-15
Date
7-6-15
7-7-15

Attachment 2 – CCP Waste Visual Examination Data Form Page 1 of 5

Batch Data Report No.: ORVECH0145

Section 1: Output Waste Container Data

Input Waste Container ID, as applicable: X10C9311173A

Output Waste Container ID: X10C9311173A2 | Waste Stream ID: OR-ISTP-CH-HET

Container Type: 55 gallon drum | TRUCON Code: OR125/225 | Waste Matrix Code: S5400

Audio/Video Media Recording Number: ☑ N/A Output Container Verified Empty ☐ NO ☑ YES

Waste Container Weights:
Tare Wt: 33.2 kg. Gross Wt: 126.4 kg.

Poly Rigid Liner Present? ☑ NO ☐ YES

Thickness: ☐ 30-mil ☐ 90-mil ☐ 110-mil ☐ 125-mil

Other liner: ☐ Lead ☑ Fiberboard/Cardboard ☐ Other:

Poly Rigid Liner Lid Present? ☑ NO ☐ YES

Poly Rigid Liner Lid is Vented (>0.3 in.) or Filtered? ☐ NO ☐ YES ☑ N/A

☐ Vented: Hole Size: ☑ N/A
☐ Filtered: Model No.: ☑ N/A

Serial No.: ☑ N/A

Bag Liner Present? ☐ NO ☑ YES

Volume Utilization Percentage: 100 %

Does the physical form of the waste match the Waste Stream Description (i.e., Homogeneous Solids, Soil/Gravel, or Debris Waste [including uncategorized metals])?
☐ NO ☑ YES

Does the physical form of the waste match the Waste Matrix Code?
☐ NO ☑ YES

Closure Method: TTF
Number of Layers of Confinement: 1

Filter Torque Wrench
Serial/ID No.: WIPP169
Calibration Due Date: 10-7-15
Filter: Model No.: UT9424X
Serial No.: 00240 0388
Torque Value: 72 in/lbs

Lid Ring/Bolt Torque Wrench
Serial/ID No.: WIPP150
Calibration Due Date: 4-8-16
Lid Ring/Bolt Torque Value: 60 ft/lbs

Is total dose rate greater than 200mrem/hr? ☑ NO ☐ YES

NCR(s) associated with the output container? ☑ NO ☐ YES
NCR No.: N/A
NCR No.: N/A

Comments:
N/A

Attachment 2 – CCP Waste Visual Examination Data Form (continued) Page 2 of 5

Batch Data Report No.: ORVECH0145 **Date:** 6-30-15

Section 2: Waste Package Data

Package and Package TID Number (as applicable)	Waste Description	WMP [Table 3]	Weight (kg) [Table 4,[a]]	Weighing Code(s) [Table 4[b]]
N/A.	metal pieces	IM	80.0	E
N/A	cloth leather gloves	C	3.2	E
N/A	vinyl tape plastic suits plastic bags	PW	10.0	E
		N/A A.H. 6-30-15		

Are there any indirect load containers associated with this BDR? Yes ☐ No ☑

N/A	N/A	N/A
VEO 1: Print Name	Signature	Date
N/A	N/A	N/A
VEO 2: Print Name	Signature	Date

VEO's signatures verify the absence of prohibited items in indirect load containers.

Output Waste Container ID: X10C9311173A2

TID Removed: N/A **TID Applied:** MP85W 61174

N/A	N/A	N/A
VEO 1: Print Name	Signature	Date
N/A	N/A	N/A
VEO 2: Print Name	Signature	Date

VEO's signatures verify the loading of the indirect load container(s) into the output waste container.

Page 1 of 1

Attachment 2 – CCP Waste Visual Examination Data Form (continued) Page 3 of 5

Batch Data Report No.: ORVECH0145

Output Waste Container ID: X10c9311173A2

Section 3: Packaging Material and Waste Material Parameters	
Packaging Material:	Estimated Weight (kg)
Steel (ST):	27.8
Plastics (PP):	1.0
Cellulosic (C):	4.4
Others:	N/A
Total Packaging Weight:	33.2
Waste Material Parameter:	Estimated Weight (kg)
Iron-based Metal/Alloys (IM):	80.0
Aluminum-based Metals/Alloys (AM):	N/A
Other Metals (OM):	N/A
Other Inorganic Materials (OI):	N/A
Cellulosics (C):	3.2
Rubber (R):	N/A
Plastics (waste materials) (PW):	10.0
Organic Matrix (OR):	N/A
Inorganic Matrix (IN):	N/A
Soils (S):	N/A
Total WMP Weight:	93.2

Attachment 2 – CCP Waste Visual Examination Data Form (continued) Page 4 of 5

Batch Data Report No.: ORWEC H0145 **Output Waste Container ID:** X10C93111123A2

Section 4: Prohibited Item(s) Summary (Questions answered "YES" will be explained in the Comments block)		
	Yes	No
1. Is there any observable liquid present? If no, proceed to question 5	☐	☑
2. Is there any observable liquid in internal containers, that is more than 60 milliliters or 3 percent by volume, whichever is greater?	☐	☑ A.H. 7-6-15
3. Is the total volume of observable liquid in the outermost container **GREATER** than 1% of the container?	☐	☑ A.H. 7-6-15
4. Is there detectable observable liquid in containers with an EPA Hazardous Waste Number of U134?	☐	☑ A.H. 7-6-15
5. Is there an indication of non-radionuclide pyrophoric materials, such as elemental potassium?	☐	☑
6. Is there an indication of hazardous wastes not occurring as co-contaminants with TRU mixed wastes (non-mixed hazardous wastes)?	☐	☑
7. Is there an indication of wastes incompatible with backfill, seal and panel closures materials, container and packaging materials, shipping container materials, or other wastes (i.e., waste does **NOT** match TRUCON Code[s])?	☐	☑
8. Is there an indication of wastes containing explosives or compressed gases?	☐	☑
9. Is there PCB liquids present?	☐	☑
10. Is there an indication of the waste exhibiting the characteristic of ignitability, corrosivity, or reactivity (EPA Hazardous Waste Numbers of D001, D002, or D003)?	☐	☑
11. Is the physical form of the waste inconsistent with the Waste Stream Description or the Waste Matrix Code?	☐	☑
TRUPACT-II Criteria		
12. Are there heat-sealed bags (unvented) **GREATER** than 4 liters and LESS than 390 square inches in the waste?	☐	☑
13. Were there Non-approved Closure Methods used on liner bags or inner bags greater than 4 liters?	☐	☑
14. Are there sealed containers **GREATER** than 4 liters?	☐	☑
15. Are there indications of inadequate protection (blocked or braced) for heavy and/or sharp objects?	☐	☑

Attachment 2 – CCP Waste Visual Examination Data Form (continued) Page 5 of 5

Batch Data Report No.: ORVECH0145 **Output Waste Container ID:** X10C931117 3A2

Section 4: Prohibited Item(s) Summary (Continued)

(Questions answered "YES" will be explained in the Comments block)

Comments:

N/A

Section 5: Approvals

Visual Examination Operator 1: Anthony Harley (Print Name)	Signature	Date: 6-30-15
		7-6-15
Visual Examination Operator 2: Jason Cafe (Print Name)	Signature	Date: 6-30-15
		7-6-15

Attachment 2 – CCP Waste Visual Examination Data Form Page 1 of 5

Batch Data Report No.: ORVECH0145

Section 1: Output Waste Container Data

Input Waste Container ID, as applicable: X10C9311173A

Output Waste Container ID: X10C9311173A3 | Waste Stream ID: OR-ISTP-CH-HET

Container Type: 55 gallon drum | TRUCON Code: OR 125/225 | Waste Matrix Code: S 5400

Audio/Video Media Recording Number: ☑ N/A Output Container Verified Empty ☐ NO ☑ YES

Waste Container Weights:
Tare Wt: 33.2 kg. Gross Wt: 84.6 kg.

Poly Rigid Liner Present? ☑ NO ☐ YES

Thickness: ☐ 30-mil ☐ 90-mil ☐ 110-mil ☐ 125-mil

Other liner: ☐ Lead ☑ Fiberboard/Cardboard ☐ Other:

Poly Rigid Liner Lid Present? ☑ NO ☐ YES

Poly Rigid Liner Lid is Vented (>0.3 in.) or Filtered? ☐ NO ☐ YES ☑ N/A

☐ Vented: Hole Size: ☑ N/A
☐ Filtered: Model No.: ☑ N/A

Serial No.: ☑ N/A

Bag Liner Present? ☐ NO ☑ YES

Volume Utilization Percentage: 100 %

Does the physical form of the waste match the Waste Stream Description (i.e., Homogeneous Solids, Soil/Gravel, or Debris Waste [including uncategorized metals])?
☐ NO ☑ YES

Does the physical form of the waste match the Waste Matrix Code?
☐ NO ☑ YES

Closure Method: TTF
Number of Layers of Confinement: 1

Filter Torque Wrench
Serial/ID No.: WIPP169
Calibration Due Date: 10-7-15
Filter: Model No.: UT9424X
Serial No.: 00240 0316
Torque Value: 72 in/lbs

Lid Ring/Bolt Torque Wrench
Serial/ID No.: WIPP150
Calibration Due Date: 4-8-16
Lid Ring/Bolt Torque Value: 60 ft/lbs

Is total dose rate greater than 200mrem/hr? ☑ NO ☐ YES

NCR(s) associated with the output container? ☑ NO ☐ YES
NCR No.: N/A
NCR No.: N/A

Comments:
N/A

Attachment 2 – CCP Waste Visual Examination Data Form (continued) Page 2 of 5

Batch Data Report No.: ORVECH0145 **Date:** 6-30-15

Section 2: Waste Package Data

Package and Package TID Number (as applicable)	Waste Description	WMP [Table 3]	Weight (kg) [Table 4,[a]]	Weighing Code(s) [Table 4[b]]
N/A	electric pump	IM	23.0	E
N/A	cloth suits cloth rags absorbent pads cardboard	C	15.0	E
N/A	absorbent	OI	3.0	E
N/A	plastic suits latex gloves A.H. 7-7-15 plastic bags	PW	8.4	E
N/A	rubber booties ~~latex gloves~~ A.H. 7-7-15	R	2.0	E
		N/A A.H. 6-30-15		

Are there any indirect load containers associated with this BDR? Yes ☐ No ☑

N/A	N/A	N/A
VEO 1: Print Name	Signature	Date
N/A	N/A	N/A
VEO 2: Print Name	Signature	Date

VEO's signatures verify the absence of prohibited items in indirect load containers.

Output Waste Container ID: X10C93111 73A3

TID Removed: N/A **TID Applied:** MP85W 61171

N/A	N/A	N/A
VEO 1: Print Name	Signature	Date
N/A	N/A	N/A
VEO 2: Print Name	Signature	Date

VEO's signatures verify the loading of the indirect load container(s) into the output waste container.

Attachment 2 – CCP Waste Visual Examination Data Form (continued) Page 3 of 5

Batch Data Report No.: ORVECH0145

Output Waste Container ID: X10C9311173A3

Section 3: Packaging Material and Waste Material Parameters	
Packaging Material:	Estimated Weight (kg)
Steel (ST):	27.8
Plastics (PP):	1.0
Cellulosic (C):	4.4
Others:	N/A
Total Packaging Weight:	33.2
Waste Material Parameter:	Estimated Weight (kg)
Iron-based Metal/Alloys (IM):	23.0
Aluminum-based Metals/Alloys (AM):	N/A
Other Metals (OM):	N/A
Other Inorganic Materials (OI):	3.0
Cellulosics (C):	15.0
Rubber (R):	2.0
Plastics (waste materials) (PW):	8.4
Organic Matrix (OR):	N/A
Inorganic Matrix (IN):	N/A
Soils (S):	N/A
Total WMP Weight:	51.4

Attachment 2 – CCP Waste Visual Examination Data Form (continued) Page 4 of 5

Batch Data Report No.: ORVECH0145 **Output Waste Container ID:** X10C93111734 3

Section 4: Prohibited Item(s) Summary (Questions answered YES will be explained in the Comments block)	Yes	No
1. Is there any observable liquid present? If no, proceed to question 5	☐	☑
2. Is there any observable liquid in internal containers, that is more than 60 milliliters or 3 percent by volume, whichever is greater?	☐	☑ A.H. 7-6-15
3. Is the total volume of observable liquid in the outermost container **GREATER** than 1% of the container?	☐	☑ A.H. 7-6-15
4. Is there detectable observable liquid in containers with an EPA Hazardous Waste Number of U134?	☐	☑ A.H. 7-6-15
5. Is there an indication of non-radionuclide pyrophoric materials, such as elemental potassium?	☐	☑
6. Is there an indication of hazardous wastes not occurring as co-contaminants with TRU *mixed wastes (non-mixed hazardous wastes)*?	☐	☑
7. Is there an indication of wastes incompatible with backfill, seal and panel closures materials, container and packaging materials, shipping container materials, or other wastes (i.e., waste does **NOT** match TRUCON Code[s])?	☐	☑
8. Is there an indication of wastes containing explosives or compressed gases?	☐	☑
9. Is there PCB liquids present?	☐	☑
10. Is there an indication of the waste exhibiting the characteristic of ignitability, corrosivity, or reactivity (EPA Hazardous Waste Numbers of D001, D002, or D003)?	☐	☑
11. Is the physical form of the waste inconsistent with the Waste Stream Description or the Waste Matrix Code?	☐	☑
TRUPACT-II Criteria		
12. Are there heat-sealed bags (unvented) **GREATER** than 4 liters and LESS than 390 square inches in the waste?	☐	☑
13. Were there Non-approved Closure Methods used on liner bags or inner bags greater than 4 liters?	☐	☑
14. Are there sealed containers **GREATER** than 4 liters?	☐	☑
15. Are there indications of inadequate protection (blocked or braced) for heavy and/or sharp objects?	☐	☑

Attachment 2 – CCP Waste Visual Examination Data Form (continued) Page 5 of 5

Batch Data Report No.: ORVECH0145 **Output Waste Container ID:** X10C93111 73A3

Section 4: Prohibited Item(s) Summary (Continued)
(Questions answered "YES" will be explained in the Comments block)

Comments:
N/A

Section 5: Approvals

Visual Examination Operator 1:
Anthony Harley
Print Name

Signature

6-30-15
Date

Visual Examination Operator 2:
Jason Cook
Print Name

Signature

7-6-15
7-7-15
6-30-15
7-6-15
7-7-15
Date

Attachment 3 – CCP Waste VE Independent Technical Reviewer Checklist

Batch Data Report No.: ORVECH0143 Page 1 of 2

	Description		
1.	Were data generation and reduction conducted in a technically correct manner in accordance with the methods used?	☐ NO	☑ YES
2.	Was the correct revision of operating procedure used?	☐ NO	☑ YES
3.	Are the waste material parameters (WMPs) entered correctly?	☐ NO	☑ YES
4.	Are the calculations performed on the VE Data Form correct?	☐ NO	☑ YES
5.	Is the data reported in the correct units and correct number of significant figures?	☐ NO	☑ YES
6.	Has the data been reviewed for transcription errors?	☐ NO	☑ YES
7.	Does the Testing Batch Report include VE for 20 containers or less?	☐ NO	☑ YES
8.	Are BDR contents complete and do they match BDR Table of Contents?	☐ NO	☑ YES
9.	Is all the data signed and dated in reproducible ink and by the individual(s) generating it?	☐ NO	☑ YES
10.	Is all data recorded clearly, legibly, and accurately?	☐ NO	☑ YES
11.	Were changes made to original data? If NO, proceed to question 14.	☐ NO	☑ YES
12.	Have all changes to original data been lined out, initialed and dated by the individual making the changes?	☐ NO	☑ YES
13.	Were the data changes made by the individual who originally collected the data or by an equally qualified individual?	☐ NO	☑ YES
14.	Did the physical form of the waste match the Waste Matrix Code and Waste Stream Description?	☐ NO	☑ YES
15.	Has each container in this BDR been evaluated for the presence of prohibited items?	☐ NO	☑ YES
16.	Is there an adequate written description of the contents of each container?	☐ NO	☑ YES
17.	Was a scale(s) used? If NO, proceed to question 20.	☐ NO	☑ YES
18.	Were the scale(s) in calibration prior to the VE and documented correctly?	☐ NO	☑ YES
19.	Were the scale(s) checks SAT prior to the VE and documented correctly?	☐ NO	☑ YES
20.	Was VE of each container performed by at least two qualified VEO's or was an Audio/Video recording properly prepared for each container?	☐ NO	☑ YES

Attachment 3 – CCP Waste VE Independent Technical Reviewer Checklist (continued)

Batch Data Report No.: ORVECH0145 Page 2 of 2

Description		
21. Was an NCR required at the data generation level? If NO, proceed to question 23.	☑ NO	☐ YES
22. Is a copy of the NCR included in the BDR?	☐ NO	☐ YES
23. Were the QAO's (precision, accuracy, completeness, comparability) met?	☐ NO	☑ YES
Precision – Precision is maintained by reconciling any discrepancies between the operator and the independent technical reviewer with regard to identification of waste matrix code, liquids in excess of TSDF-WAC limits, and compressed gases. Accuracy – Accuracy is maintained by requiring operators to pass a comprehensive examination and demonstrate satisfactory performance in the presence of the VE expert during their initial qualification. VE operators shall be re-qualified every two years. Completeness – A validated VE data form will be obtained for 100 percent of the waste containers subject to VE. Comparability – The comparability of VE data from different operators shall be enhanced by using standardized VE procedures and operator qualifications.		

Comments:

N/A

I have reviewed 100 percent of the container-specific and batch data in this report and find it acceptable.

Independent Technical Reviewer:

Pat Tilmon	[signature]	7-7-15
Printed Name	Signature	Date

Attachment 2 – CCP Records Transmittal/Receiving Form

CCP Records / Records Custodian, 4021 National Parks Highway - MS: GSA 212, Carlsbad, New Mexico 88220

Telephone Number: 575-234-7523

Fax Number: 575-234-7033

Attn:	CCP RECORDS	From:	PATRICK SMITH II
Ship to:	CCP RECORDS CUSTODIAN	Site:	ORNL
	4021 NATIONAL PARKS HWY.	Company:	TFE INC.
	MS GSA 212	Telephone Number:	865-574-6002
	CARLSBAD, NM 88220-9082	Date Sent:	7-30-2015
Telephone Number:	575-234-7523		

Record Number	Title or Subject	Record Date	Number of Pages
ORVECH0145	VE BDR	6-30-2015	20
N/A	N/A	N/A	N/A
N/A	N/A	N/A	N/A
N/A	N/A	N/A	N/A
N/A	N/A	N/A	N/A
N/A	N/A	N/A	N/A

Comments

N/A

(When the Record accepted line has been completed, the rest of the page below may be left blank.)

Acceptance/Rejection Signature and Date

Records Accepted ☑ — Signature: [signature] — Printed Name: Jewell Yturralde — Date: 8.4.15.

Records Rejected ☐ — Signature: _____ — Printed Name: _____ — Date: _____

Reason for Rejection:

Re-submittal: Signature: _____ — Printed Name: _____ — Date: _____

```
**********************************
***        Send Results        ***
**********************************

   Sending is complete.

Job No.                    1477
Address                    918655768703
Name                       ORNL
Start Time                 08/04 02:46 PM
Call Length                00'20
Sheets                     1
Result                     OK
```

Controlled Copy

Attachment 2 – CCP Records Transmittal/Receiving Form

CCP Records / Records Custodian, 4021 National Parks Highway - MS: GSA 212, Carlsbad, New Mexico 88220

Telephone Number: 575-234-7523

Fax Number: 575-234-7033

Attn:	CCP RECORDS	From:	PATRICK SMITH II
Ship to:	CCP RECORDS CUSTODIAN	Site:	ORNL
	4021 NATIONAL PARKS HWY.	Company:	TFE INC.
	MS GSA 212	Telephone Number:	865-574-6002
	CARLSBAD, NM 88220-9082	Date Sent:	7-30-2015
Telephone Number:	575-234-7523		

Document Number	Document Title	Record Date	Pages
ORVECH0145	VE BDR	6-30-2015	20
N/A	N/A	N/A	N/A
N/A	N/A	N/A	N/A
N/A	N/A	N/A	N/A
N/A	N/A	N/A	N/A
N/A	N/A	N/A	N/A

Comments:

N/A

(When the Record accepted line has been completed, the rest of the page below may be left blank.)

Acceptance/Rejection Signature and Date

Records Accepted ☑ Signature — Lowell Yurralde Printed Name — 8.4.15 Date

Records Rejected ☐ _____ _____

DIVIDER PAGE

Attachment 3 – CCP SPM Nondestructive Assay Project Level Validation Checklist and Summary

BDR Number: OR-IQ3-0483	Examination Date(s): 4/13/2015			
Description of Criteria Reviewed	**Criteria Met?**			**Comments/Qualifiers**
	YES	**NO**	**NA**	
1. Are the background measurements performed and recorded daily and included in the BDR? **Reference Source: CCP-PO-002, Attachment 1, A.4.2**	X			
2. Is the efficiency/energy calibration and resolution check performed and recorded daily and included in the BDR? **Reference Source: CCP-PO-002, Attachment 1, A.4.2**	X			
3. Were the performance checks and backgrounds done prior to the analysis of the samples? **Reference Source: CCP-PO-002, Attachment 1, A.4.2**	X			
4. Are the required QC checks specified on the ITR checklist within acceptable limits? **Reference Source: CCP-PO-002, Attachment 1, A.4.2**	X			
5. Is the matrix drum performed at least once per operational week? **Reference Source: CCP-PO-002, Attachment 1, A.4.2**	X			
6. List all containers that have met all QC criteria thresholds. **Reference Source: CCP-PO-002, Attachment 1, A.5.2**				Container Numbers: X10C1351425 X10C1351426 X10C1351441 X10C1351444 X10C1351449 X10C1351455
7. Is there evidence of participation in the PDP program or any relevant approved comparison program? **Reference Source: CCP-PO-002, Attachment 1, A.4.1**	X			
8. Are the personnel training records acceptable? **Reference Source: CCP-PO-002, Attachment 1, A.4.1**	X			
9. Is a standard cover sheet included in the BDR? **Reference Source: CCP Technical Procedures**	X			
10. Is there reference to or copy of associated NCRs included in the BDR? NA if no NCRs associated with BDR. **Reference Source: CCP-QP-005**			X	

CCP RECORDS ORIGINAL
DATE REC'D 4/24/15

Attachment 3 – CCP SPM Nondestructive Assay Project Level Validation Checklist and Summary (Continued)

BDR Number: OR-IQ3-0483	**Examination Date(s): 4/13/2015**			
Description of Criteria Reviewed	**Criteria Met?**			**Comments/Qualifiers**
	YES	**NO**	**NA**	
11. Is the method used for radioassay identified by the implementing procedure(s) and revision number(s) referenced for each container in the BDR? **Reference Source: CCP Technical Procedures**	X			
12. Is the current software revision number correct for each container in the BDR? **Reference Source: CCP-QP-022**	X			
13. Is the completed, signed, and dated Independent Technical Reviewer Checklist included in the BDR, and the independent technical reviewer was not involved in the generation or recording of the data under review? **Reference Source: CCP-PO-002, Attachment 1, A.5.1**	X			
14. Is the correct Waste Matrix Code referenced in the BDR? **Reference Source: CCP Technical Procedures**	X			
15. Is the method of expressing TMU specified in the BDR? **Reference Source: CCP-PO-002, 3.3.1**	X			
16. Does the instrument performing TRU/low-level waste measurement have an LLD of 100 nCi/g or less? **Reference Source: CCP-PO-002, Attachment 1, A.3**	X			
17. Are the ten WIPP tracked radionuclides of 241Am, 238Pu, 239Pu, 240Pu, 242Pu, 233U, 234U, 238U, 90Sr, 137Cs estimated activities and masses, including their associated TMU reported on each radioassay data sheet? **Reference Source: CCP-PO-002, 3.3.1**	X			
18. Is 235U (in order to calculate FGE) reported as present or absent on each radioassay data sheet? **Reference Source: CCP-PO-002, Attachment 1, A.3**	X			
19. If 235U is reported as present, is 234U reported as present? NA, if 235U is not present. **Reference Source: CCP Technical Procedures**	X			
20. Is the TRU alpha activity concentration and associated TMU reported for each container in the BDR? **Reference Source: CCP-PO-002, 3.3.1**	X			

Attachment 3 – CCP SPM Nondestructive Assay Project Level Validation Checklist and Summary (Continued)

BDR Number: OR-IQ3-0483	**Examination Date(s): 4/13/2015**			
Description of Criteria Reviewed	**Criteria Met?**			**Comments/Qualifiers**
	YES	**NO**	**NA**	
21. Is the TRU alpha activity concentration limit of >100 nCi/g met for containers in the BDR? **Reference Source: CCP-PO-002, 3.3.3**	X			
22. Is the Total Pu239 FGE (g) and associated TMU reported for each container in the BDR? **Reference Source: CCP-PO-002, 3.3.1**	X			
23. Is the FGE plus two times the TMU less than or equal to the limits for containers in this BDR? 200 FGE for 55-gal drums/325 FGE for SWBs. Note: TMU equals one standard deviation. **Reference Source: CCP-PO-002, Table A-3**	X			
24. Is the decay heat reported for each container in the BDR? **Reference Source: CCP-PO-002, 3.3.1**	X			
25. Are all the appropriate QC forms (background, efficiency checks, control charts, and matrix drum) included in the BDR? **Reference Source: CCP-PO-002, Attachment 1, A.5.2**	X			
26. Is the name of the testing facility included in the BDR? **Reference Source: CCP-PO-002, Attachment 1, A.5.2**	X			
27. Is the batch number included in the BDR? **Reference Source: CCP-PO-002, Attachment 1, A.5.2**	X			
28. Is a listing of all container numbers in the BDR? **Reference Source: CCP-PO-002, Attachment 1, A.5.2**	X			
29. Does the BDR contain a BDR Table of Contents? **Reference Source: CCP-PO-002, Attachment 1, A.5.2**	X			
30. Are the testing report data sheets including the waste container number for each container included in the BDR? **Reference Source: CCP-PO-002, Attachment 1, A.5.2**	X			
31. Is the title "Radioassay Data Sheet" included for each container in the BDR? **Reference Source: CCP-PO-002, Attachment 1, A.5.2**	X			

Attachment 3 – CCP SPM Nondestructive Assay Project Level Validation Checklist and Summary (Continued)

BDR Number: OR-IQ3-0483				**Examination Date(s): 4/13/2015**
Description of Criteria Reviewed	**Criteria Met?**			**Comments/Qualifiers**
	YES	**NO**	**NA**	
32. Is the date of radioassay included for each container in the BDR? **Reference Source: CCP-PO-002, Attachment 1, A.5.2**	X			
33. Is the operator and reviewer signature release and date included for each container in the BDR? **Reference Source: CCP-PO-002, Attachment 1, A.5.2**	X			
34. Is the total Pu239 equivalent activity (Ci) reported for each container in the BDR? **Reference Source: CCP-PO-002, Attachment 1, A.5.2**	X			
35. Are the NDA net weights within 5% of the NDE net weight or the VE net weight, whichever is applicable, for each container in the BDR? **Reference Source: CCP Technical Procedures**	X			
Comments: None				
The container QC checks were properly performed and meet the Quality Assurance Objectives (QAOs). Proper procedures were followed during data reduction and analysis. The batch is complete, acceptable, and includes all supporting data and documentation required by CCP-PO-002.				
Carolina Soaterna	Carolina Soaterna			04/23/2015
SPM Printed Name	Signature			Date

Checklist is to be re-signed only when a re-review is performed.

SPM Printed Name	Signature	Reason	Date
SPM Printed Name	Signature	Reason	Date

Attachment 4 – NDA Batch Data Report Cover Sheet

Site ID: ORNL	NDA Batch Number: OR-IQ3-0483
NDA Counter ID: IQ3	NDA Batch Date: 4/13/2015
Waste Containers	
X10C1351425 X10C1351449	
X10C1351455	
X10C1351426	
X10C1351444	
X10C1351441	

NDA Independent Technical Reviewer's Printed Name: Maria Steade

Approval Signature and Date: Maria Steade / 4-16-15

NTPC RECORDS ORIGINAL
DATE REC'D 4-20-2015 001

Attachment 2 – NDA Batch Data Report Table of Contents

NDA BATCH NUMBER: **OR-IQ3-0483**

TESTING FACILITY: **IQ3**

SECTION	PAGE NUMBER
NDA Batch Data Report Cover Sheet	**1**
NDA Batch Data Report Table of Contents	**2**
NDA Batch Data Report Narrative Summary	**3**
QA Last Results Report(s)	**4**
Copy of NCR(s), if applicable	**N/A**
Radioassay Data	**7**
Independent Technical Reviewer Checklist	**21**

Attachment 5 – NDA Batch Data Report Narrative Summary

NDA Batch Number: **OR-IQ3-0483**

Date: **4/13/2015**

Quality Control Summary:

The Quality Control measurements were performed on 4/13/2015
The Weekly Interfering Matrix measurement was performed on 4/13/2015

Nonconformances:

None

NDA Independent Technical Reviewer Comments:

The Waste Matrix Code for drums in this BDR: S4100

Printed Name: Maria Steade

Signature and Date: Maria Steade 4-16-15

****
***** GENIE QUALITY ASSURANCE *****
****

Last Results Report
4/13/15 8:43:26 AM

QA File: C:\CANBERRA\NDA2K\QA\CNTR0001_DC
Sample ID: Background
Sample Quantity: 1.0000E+000
Sample Date: 4/13/15 8:33:58 AM
Measurement Date: 4/13/15 8:34:05 AM
Elapsed Live Time: 158.2 seconds
Elapsed Real Time: 200.0 seconds

Parameter Description [Mean +/- Std. Dev.]	Value	Deviation/Flags	< LU : SD : UD : BS >
SS Peak Centroid 81 keV [0.00+/-0.00]	3.2455E+002	0.00	< : : : >
SS Peak Centroid 356 keV [0.00+/-0.00]	1.4237E+003	0.00	< : : : >
SS Peak FWHM 81 keV [0.00+/-0.00]	1.1735E+000	0.00	< : : : >
SS Peak FWHM 356 keV [0.00+/-0.00]	1.3612E+000	0.00	< : : : >
SS Peak cts/sec 356 keV [0.00+/-0.00]	8.4892E+003	0.00	< : : : >

Flags Key: LU = Lower/Upper Bounds Test (Ab = Above, Be = Below)
SD = Sample Driven N-Sigma Test (In = Investigate, Ac = Action)
UD = User Driven N-Sigma Test (In = Investigate, Ac = Action)
BS = Measurement Bias Test (In = Investigate, Ac = Action)

Susan Henderson Susan Henderson 4/13/15

Chad Gerlock Chad Gerlock 4/13/15

****
***** GENIE QUALITY ASSURANCE *****
****

Last Results Report
4/13/15 8:43:09 AM

QA File: C:\CANBERRA\NDA2K\QA\CNTR0001_DC
Sample ID: Background
Sample Quantity: 1.0000E+000
Sample Date: 4/13/15 8:33:58 AM
Measurement Date: 4/13/15 8:37:28 AM
Elapsed Live Time: 297.8 seconds
Elapsed Real Time: 300.0 seconds

Parameter Description [Mean +/- Std. Dev.]	Value	Deviation/Flags < LU : SD : UD : BS >
SS Background Count Rate [0.00+/-0.00]	1.3376E+002	0.00 < : : : >
SS Peak Centroid 7200 [0.00+/-0.00]	7.2003E+003	0.00 < : : : >
SS Peak FWHM 7200 [0.00+/-0.00]	1.0461E+000	0.00 < : : : >
SS Peak cts/sec 7200 [0.00+/-0.00]	3.0100E+002	0.00 < : : : >

Flags Key: LU = Lower/Upper Bounds Test (Ab = Above, Be = Below)
SD = Sample Driven N-Sigma Test (In = Investigate, Ac = Action)
UD = User Driven N-Sigma Test (In = Investigate, Ac = Action)
BS = Measurement Bias Test (In = Investigate, Ac = Action)

Susan Anderson Susan Anderson 4/13/15

Chad Gerlock 4/13/15

****
***** GENIE QUALITY ASSURANCE *****
****

Last Results Report
4/13/15 9:13:40 AM

QA File: C:\CANBERRA\NDA2K\QA\CNTR0001_DC
Sample ID: PERFCHECK
Sample Quantity: 1.0000E+000
Sample Date: 7/1/05 12:00:00 PM
Measurement Date: 4/13/15 8:51:50 AM
Elapsed Live Time: 1143.1 seconds
Elapsed Real Time: 1200.0 seconds

Parameter Description [Mean +/- Std. Dev.]	Value	Deviation/Flags < LU : SD : UD : BS >
Co-60 DC Activity (uCi) [SD: 5.4683E+000+/- 0.182]	5.5185E+000	2.7475E-001 < : : : >
1332 keV Centroid [0.00+/-0.00]	5.3302E+003	0.00 < : : : >
1332 keV FWHM [0.00+/-0.00]	2.0126E+000	0.00 < : : : >

Flags Key: LU = Lower/Upper Bounds Test (Ab = Above, Be = Below)
SD = Sample Driven N-Sigma Test (In = Investigate, Ac = Action)
UD = User Driven N-Sigma Test (In = Investigate, Ac = Action)
BS = Measurement Bias Test (In = Investigate, Ac = Action)

Susan Anderson Susan Anderson 4/13/15

Chad Gerlock Chad Gerlock 4/13/15

********** Radioassay Data Sheet **********

Engine Version: TMU Gamma 1.5 SS

Count Sequence Number: 7468 Batch Number: N/A
Assay Instrument: MCS IQ3 Location: ORNL
Analysis Method: CCP-TP-047 v 12 Software Version: NDA 2000 V.4.0
Item ID: NDA-002 Assay Start: 4/13/2015 9:28:59 AM
GW: 0.0 kg TW: 0.0 kg NW: 20.9 kg Fill:100 % WS:Weekly Interfering Matrix

NID identified fiducial nuclide PU-239
Source of isotopics: MEASURED

Density	0.101 kg /l	
Pu mass	2.63E-001 +-	4.04E-002 g
TRU Alpha Activity	2.04E-002 +-	2.57E-003 Ci
TRU Activity Concentration	9.77E+002 +-	1.23E+002 nCi/g
Pu-239 Equivalent Activity	2.08E-002 +-	2.57E-003 Ci
Pu-239 FGE	2.48E-001 +-	4.03E-002 g
Decay heat	6.40E-004 +-	8.01E-005 W

NNSS PE-g: 4.30E-001 g NNSS U-235 FGE: 3.96E-001 g

Nuclide	Mass g	Activity Ci	Activity Uncert. Ci	MDA Ci
SR90	6.14E-009	8.48E-007	1.37E-007	0.00E+000
CS137	9.76E-009	8.48E-007	1.37E-007	9.91E-009
RA226	2.34E-008	2.32E-008	4.17E-009	1.40E-008
U233	<LLD	<LLD	0.00E+000	9.25E-005
U234	<LLD	<LLD	0.00E+000	0.00E+000
U235	0.00E+000	0.00E+000	0.00E+000	1.53E-008
NP237	3.41E-005	2.41E-008	5.17E-009	1.69E-008
PU238	3.17E-005	5.41E-004	1.18E-004	8.16E-006
U238	<LLD	<LLD	0.00E+000	3.01E-007
PU239	2.47E-001	1.53E-002	2.50E-003	2.31E-004
PU240	1.51E-002	3.44E-003	5.69E-004	5.18E-005
AM241	3.29E-004	1.13E-003	1.93E-004	7.06E-007
PU241	2.19E-004	2.26E-002	3.78E-003	3.40E-004
PU242	5.91E-005	2.33E-007	4.59E-008	0.00E+000
AM243	0.00E+000	0.00E+000	0.00E+000	5.03E-008

Errors quoted at 1.000 sigma

Operator: Dan Crosby Dan Crosby Date: 4-15-15

ITR: Ronald Whitson Date: 4/15/2015

Automated Independent Technical Review

Count Sequence Number: 7468 Batch Number: N/A
Assay Instrument: MCS IQ3 Location: ORNL
Analysis Method: CCP-TP-047 v 12 Software Version: NDA 2000 V.4.0
Item ID: NDA-002 Assay Start: 4/13/2015 9:22:10 AM

MGA Analysis:

Note: The measured and declared isotopics are inconsistent.

DISPOSITION: MGA isotopics are acceptable; Pu-239 is the fiducial nuclide.

Gamma Analysis:

Analysis Status: No errors.
Spectrum Validity Check engine has suggested data review.

DISPOSITION: Summed Segment spectrum reviewed, and is acceptable.
Am-241 determined by direct measurement.

Segment Data Review:

Segment: 1 OK
Segment: 2 OK
Segment: 3 Analysis Warnings:
Reference Peak Error 1: The reference peak was not found.

DISPOSITION: Indeterminate dead time in Segment 3.
Transmission-corrected assay results are rejected.

Miscellaneous:

DISPOSITION: No additional radionuclides contributing to 95% of the radiological hazard were identified.

Expert Review by: R.N. Ceo Date: 4/14/15
7468

********** Radioassay Data Sheet **********

Engine Version: TMU Gamma 1.5 SS

Count Sequence Number: 7469 Batch Number: OR-IQ3-0483
Assay Instrument: MCS IQ3 Location: ORNL
Analysis Method: CCP-TP-047 v 12 Software Version: NDA 2000 V.4.0
Item ID: X10C1351425 Assay Start: 4/13/2015 10:03:18 AM
GW:221.0 kg TW: 35.2 kg NW:185.8 kg Fill: 85 % WS:OR-NFS-CH-SOIL

NID identified fiducial nuclide PU-239
Source of isotopics: MEASURED

Density	1.050 kg /l		
Pu mass	4.34E-001 +-	1.67E-001	g
TRU Alpha Activity	4.70E-002 +-	1.21E-002	Ci
TRU Activity Concentration	2.53E+002 +-	6.52E+001	nCi/g
Pu-239 Equivalent Activity	4.75E-002 +-	1.21E-002	Ci
Pu-239 FGE	4.02E-001 +-	1.66E-001	g
Decay heat	1.49E-003 +-	3.83E-004	W
NNSS PE-g: 1.86E+000 g	NNSS U-235 FGE:	6.42E-001	g

Nuclide	Mass g	Activity Ci	Activity Uncert. Ci	MDA Ci
SR90	1.50E-008	2.07E-006	8.56E-007	0.00E+000
CS137	2.38E-008	2.07E-006	8.56E-007	3.14E-008
RA226	1.44E-007	1.43E-007	5.94E-008	4.59E-008
U233	<LLD	<LLD	0.00E+000	3.39E-004
U234	<LLD	<LLD	0.00E+000	0.00E+000
U235	0.00E+000	0.00E+000	0.00E+000	6.47E-008
NP237	2.43E-004	1.71E-007	7.18E-008	7.76E-008
PU238	7.30E-005	1.25E-003	5.62E-004	3.72E-005
U238	5.36E+000	1.80E-006	7.96E-007	1.10E-006
PU239	4.00E-001	2.48E-002	1.03E-002	7.41E-004
PU240	3.36E-002	7.63E-003	3.18E-003	2.28E-004
AM241	3.87E-003	1.33E-002	5.51E-003	1.21E-005
PU241	3.15E-004	3.25E-002	1.37E-002	9.69E-004
PU242	2.07E-004	8.16E-007	3.50E-007	0.00E+000
AM243	0.00E+000	0.00E+000	0.00E+000	1.94E-007

Errors quoted at 1.000 sigma

Operator: Dan Crosby Dan Crosby Date: 4-15-15

ITR: Maria Steade Maria Steade Date: 4-16-15

Automated Independent Technical Review

Count Sequence Number: 7469 Batch Number: OR-IQ3-0483
Assay Instrument: MCS IQ3 Location: ORNL
Analysis Method: CCP-TP-047 v 12 Software Version: NDA 2000 V.4.0
Item ID: X10C1351425 Assay Start: 4/13/2015 9:57:00 AM

MGA Analysis:
Expert review is recommended; the following validity tests failed:
Am separation time (53.4 years)is greater than allowed (50.0).

DISPOSITION: MGA isotopics are acceptable; Pu-239 is the fiducial nuclide.
This item contains elevated Am-241.

Gamma Analysis:
Analysis Status: No errors.
Spectrum Validity Check engine has suggested data review.

DISPOSITION: Summed Segment spectrum reviewed, and is acceptable.
Am-241 determined by direct measurement.

Segment Data Review:
Segment: 1 OK
Segment: 2 Analysis Warnings:
Minimum transmission used.
Segment: 3 Analysis Warnings:
Minimum transmission used.

DISPOSITION: Unacceptable transmission through Segments 2 & 3.
Transmission-corrected assay results are rejected.

Miscellaneous:

DISPOSITION: No additional radionuclides contributing to 95% of the radiological hazard were identified.

Expert Review by: Robert N Ceo Date: 4/14/15
R.N. Ceo # 7469

********** Radioassay Data Sheet **********

Engine Version: TMU Gamma 1.5 SS

Count Sequence Number: 7470 Batch Number: OR-IQ3-0483
Assay Instrument: MCS IQ3 Location: ORNL
Analysis Method: CCP-TP-047 v 12 Software Version: NDA 2000 v.4.0
Item ID: X10C1351455 Assay Start: 4/13/2015 10:32:06 AM
GW:223.4 kg TW: 35.2 kg NW:188.2 kg Fill: 85 % WS:OR-NFS-CH-SOIL

NID identified fiducial nuclide PU-239
Source of isotopics: MEASURED

Density	1.060 kg /l		
Pu mass	4.43E-001 +-	1.71E-001	g
TRU Alpha Activity	4.73E-002 +-	1.24E-002	Ci
TRU Activity Concentration	2.51E+002 +-	6.59E+001	nCi/g
Pu-239 Equivalent Activity	4.79E-002 +-	1.24E-002	Ci
Pu-239 FGE	4.29E-001 +-	1.70E-001	g
Decay heat	1.50E-003 +-	3.92E-004	W

NNSS PE-g: 1.88E+000 g NNSS U-235 FGE: 6.85E-001 g

Nuclide	Mass g	Activity Ci	Activity Uncert. Ci	MDA Ci
SR90	1.55E-008	2.14E-006	8.92E-007	0.00E+000
CS137	2.47E-008	2.14E-006	8.92E-007	3.34E-008
RA226	1.65E-007	1.63E-007	6.84E-008	5.61E-008
U233	<LLD	<LLD	0.00E+000	3.33E-004
U234	6.16E-005	3.83E-007	1.72E-007	0.00E+000
U235	3.07E-002	6.64E-008	2.98E-008	5.91E-008
NP237	2.60E-004	1.83E-007	7.73E-008	7.34E-008
PU238	4.08E-005	6.98E-004	3.54E-004	2.48E-005
U238	6.43E+000	2.16E-006	9.45E-007	1.18E-006
PU239	4.08E-001	2.53E-002	1.05E-002	8.99E-004
PU240	3.42E-002	7.76E-003	3.24E-003	2.76E-004
AM241	3.94E-003	1.35E-002	5.64E-003	1.24E-005
PU241	3.22E-004	3.32E-002	1.41E-002	1.18E-003
PU242	2.07E-004	8.16E-007	3.52E-007	0.00E+000
AM243	0.00E+000	0.00E+000	0.00E+000	1.99E-007

Errors quoted at 1.000 sigma

Operator: Dan Crosby Dan Crosby Date: 4-15-15

ITR: Maria Steade Maria Steade Date: 4-16-15

Automated Independent Technical Review

Count Sequence Number: 7470 Batch Number: OR-IQ3-0483
Assay Instrument: MCS IQ3 Location: ORNL
Analysis Method: CCP-TP-047 v 12 Software Version: NDA 2000 V.4.0
Item ID: X10C1351455 Assay Start: 4/13/2015 10:25:47 AM

MGA Analysis:
Expert review is recommended; the following validity tests failed:
Am separation time (53.8 years)is greater than allowed (50.0).

DISPOSITION: MGA isotopics are acceptable; Pu-239 is the fiducial nuclide.
This item contains elevated Am-241.

Gamma Analysis:
Analysis Status: No errors.
Spectrum Validity Check engine has suggested data review.

DISPOSITION: Summed Segment spectrum reviewed, and is acceptable.
Am-241 determined by direct measurement.

Segment Data Review:
Segment: 1 OK
Segment: 2 Analysis Warnings:
Minimum transmission used.
Segment: 3 Analysis Warnings:
Minimum transmission used.

DISPOSITION: Unacceptable transmission through Segments 2 & 3.
Transmission-corrected assay results are rejected.

Miscellaneous:

DISPOSITION: No additional radionuclides contributing to 95% of the
radiological hazard were identified.

Expert Review by: Robert N. Ceo R.N. Ceo Date: 4/14/15 # 7470

********** Radioassay Data Sheet **********

Engine Version: TMU Gamma 1.5 SS

Count Sequence Number: 7471 Batch Number: OR-IQ3-0483
Assay Instrument: MCS IQ3 Location: ORNL
Analysis Method: CCP-TP-047 v 12 Software Version: NDA 2000 V.4.0
Item ID: X10C1351426 Assay Start: 4/13/2015 11:01:31 AM
GW:226.7 kg TW: 35.2 kg NW:191.5 kg Fill: 80 % WS:OR-NFS-CH-SOIL

NID identified fiducial nuclide PU-239
Source of isotopics: MEASURED

Density	1.150 kg /l		
Pu mass	5.05E-001 +-	2.04E-001	g
TRU Alpha Activity	5.35E-002 +-	1.47E-002	Ci
TRU Activity Concentration	2.79E+002 +-	7.67E+001	nCi/g
Pu-239 Equivalent Activity	5.42E-002 +-	1.47E-002	Ci
Pu-239 FGE	4.93E-001 +-	2.04E-001	g
Decay heat	1.70E-003 +-	4.64E-004	W
NNSS PE-g: 2.11E+000 g	NNSS U-235 FGE:	7.87E-001	g

Nuclide	Mass g	Activity Ci	Activity Uncert. Ci	MDA Ci
SR90	1.68E-008	2.31E-006	1.01E-006	0.00E+000
CS137	2.66E-008	2.31E-006	1.01E-006	3.69E-008
RA226	1.83E-007	1.81E-007	7.89E-008	5.75E-008
U233	<LLD	<LLD	0.00E+000	3.76E-004
U234	7.67E-005	4.77E-007	2.20E-007	0.00E+000
U235	3.83E-002	8.27E-008	3.82E-008	6.25E-008
NP237	2.89E-004	2.04E-007	8.99E-008	7.78E-008
PU238	6.38E-005	1.09E-003	5.40E-004	4.11E-005
U238	8.01E+000	2.69E-006	1.21E-006	1.25E-006
PU239	4.67E-001	2.89E-002	1.26E-002	1.09E-003
PU240	3.70E-002	8.40E-003	3.67E-003	3.17E-004
AM241	4.38E-003	1.50E-002	6.54E-003	1.36E-005
PU241	4.09E-004	4.21E-002	1.86E-002	1.59E-003
PU242	2.37E-004	9.35E-007	4.20E-007	0.00E+000
AM243	0.00E+000	0.00E+000	0.00E+000	2.18E-007

Errors quoted at 1.000 sigma

Operator: DAn Crosby Dan Crosby Date: 4-15-15

ITR: Maria Steade Maria Steade Date: 4-16-15

Automated Independent Technical Review

Count Sequence Number: 7471 Batch Number: OR-IQ3-0483
Assay Instrument: MCS IQ3 Location: ORNL
Analysis Method: CCP-TP-047 v 12 Software Version: NDA 2000 V.4.0
Item ID: X10C1351426 Assay Start: 4/13/2015 10:54:41 AM

MGA Analysis:
Expert review is recommended; the following validity tests failed:
Am separation time (52.8 years)is greater than allowed (50.0).

DISPOSITION: MGA isotopics are acceptable; Pu-239 is the fiducial nuclide.
This item contains elevated Am-241.

Gamma Analysis:
Analysis Status: No errors.
Spectrum Validity Check engine has suggested data review.

DISPOSITION: Summed Segment spectrum reviewed, and is acceptable.
Am-241 determined by direct measurement.

Segment Data Review:
Segment: 1 OK
Segment: 2 Analysis Warnings:
Minimum transmission used.
Segment: 3 Analysis Warnings:
Minimum transmission used.

DISPOSITION: Unacceptable transmission through Segments 2 & 3.
Transmission-corrected assay results are rejected.

Miscellaneous:

DISPOSITION: No additional radionuclides contributing to 95% of the radiological hazard were identified.

Expert Review by: Robert N Ceo Date: 4/14/15
R.N. Ceo # 7471

********** Radioassay Data Sheet **********

Engine Version: TMU Gamma 1.5 SS

Count Sequence Number: 7472 Batch Number: OR-IQ3-0483
Assay Instrument: MCS IQ3 Location: ORNL
Analysis Method: CCP-TP-047 v 12 Software Version: NDA 2000 V.4.0
Item ID: X10C1351444 Assay Start: 4/13/2015 12:31:11 PM
GW:237.8 kg TW: 35.2 kg NW:202.6 kg Fill: 85 % WS:OR-NFS-CH-SOIL

NID identified fiducial nuclide PU-239
Source of isotopics: MEASURED

Density	1.150 kg /l		
Pu mass	5.31E-001 +-	2.13E-001	g
TRU Alpha Activity	5.60E-002 +-	1.53E-002	Ci
TRU Activity Concentration	2.76E+002 +-	7.56E+001	nCi/g
Pu-239 Equivalent Activity	5.70E-002 +-	1.53E-002	Ci
Pu-239 FGE	5.23E-001 +-	2.13E-001	g
Decay heat	1.78E-003 +-	4.83E-004	W
NNSS PE-g: 2.16E+000 g	NNSS U-235 FGE:	8.34E-001	g

Nuclide	Mass g	Activity Ci	Activity Uncert. Ci	MDA Ci
SR90	1.36E-008	1.87E-006	8.13E-007	0.00E+000
CS137	2.15E-008	1.87E-006	8.13E-007	3.34E-008
RA226	1.71E-007	1.69E-007	7.37E-008	5.20E-008
U233	<LLD	<LLD	0.00E+000	3.72E-004
U234	1.04E-004	6.47E-007	2.95E-007	0.00E+000
U235	5.19E-002	1.12E-007	5.11E-008	8.00E-008
NP237	2.41E-004	1.70E-007	7.49E-008	8.09E-008
PU238	6.28E-005	1.07E-003	5.39E-004	3.78E-005
U238	9.97E+000	3.35E-006	1.50E-006	1.06E-006
PU239	4.87E-001	3.02E-002	1.32E-002	1.07E-003
PU240	4.24E-002	9.61E-003	4.20E-003	3.39E-004
AM241	4.40E-003	1.51E-002	6.58E-003	1.41E-005
PU241	5.41E-004	5.57E-002	2.45E-002	1.97E-003
PU242	2.70E-004	1.06E-006	4.78E-007	0.00E+000
AM243	0.00E+000	0.00E+000	0.00E+000	2.16E-007

Errors quoted at 1.000 sigma

Operator: Dan Crosby Dan Crosby Date: 4-15-15

ITR: Maria Steade Maria Steade Date: 4-16-15

Automated Independent Technical Review

Count Sequence Number: 7472
Batch Number: OR-IQ3-0483
Assay Instrument: MCS IQ3
Location: ORNL
Analysis Method: CCP-TP-047 v 12
Software Version: NDA 2000 V.4.0
Item ID: X10C1351444
Assay Start: 4/13/2015 12:24:51 PM

MGA Analysis:

DISPOSITION: MGA isotopics are acceptable; Pu-239 is the fiducial nuclide.

Gamma Analysis:

Analysis Status: No errors.
Spectrum Validity Check engine has suggested data review.

DISPOSITION: Summed Segment spectrum reviewed, and is acceptable.
Am-241 determined by direct measurement.

Segment Data Review:

Segment: 1 OK
Segment: 2 Analysis Warnings:
Minimum transmission used.
Segment: 3 Analysis Warnings:
Minimum transmission used.

DISPOSITION: Unacceptable transmission through Segments 2 & 3.
Transmission-corrected assay results are rejected.

Miscellaneous:

DISPOSITION: No additional radionuclides contributing to 95% of the radiological hazard were identified.

Expert Review by: R.N. Ceo Date: 4/14/15
7472

********** Radioassay Data Sheet **********

Engine Version: TMU Gamma 1.5 SS

Count Sequence Number: 7473 Batch Number: OR-IQ3-0483
Assay Instrument: MCS IQ3 Location: ORNL
Analysis Method: CCP-TP-047 v 12 Software Version: NDA 2000 V.4.0
Item ID: X10C1351441 Assay Start: 4/13/2015 1:01:14 PM
GW:246.5 kg TW: 35.2 kg NW:211.3 kg Fill: 90 % WS:OR-NFS-CH-SOIL

NID identified fiducial nuclide PU-239
Source of isotopics: MEASURED

Density	1.130 kg /l	
Pu mass	4.92E-001 +-	1.97E-001 g
TRU Alpha Activity	5.15E-002 +-	1.41E-002 Ci
TRU Activity Concentration	2.44E+002 +-	6.65E+001 nCi/g
Pu-239 Equivalent Activity	5.21E-002 +-	1.41E-002 Ci
Pu-239 FGE	4.79E-001 +-	1.97E-001 g
Decay heat	1.63E-003 +-	4.43E-004 W
NNSS PE-g: 1.99E+000 g	NNSS U-235 FGE:	7.63E-001 g

Nuclide	Mass g	Activity Ci	Activity Uncert. Ci	MDA Ci
SR90	1.68E-008	2.32E-006	1.00E-006	0.00E+000
CS137	2.67E-008	2.32E-006	1.00E-006	3.54E-008
RA226	1.82E-007	1.80E-007	7.79E-008	5.90E-008
U233	<LLD	<LLD	0.00E+000	3.67E-004
U234	6.83E-005	4.25E-007	1.98E-007	0.00E+000
U235	3.41E-002	7.37E-008	3.43E-008	7.01E-008
NP237	2.23E-004	1.57E-007	6.89E-008	7.25E-008
PU238	5.98E-005	1.02E-003	4.99E-004	2.79E-005
U238	5.02E+000	1.69E-006	7.74E-007	1.07E-006
PU239	4.55E-001	2.82E-002	1.22E-002	7.69E-004
PU240	3.63E-002	8.24E-003	3.57E-003	2.25E-004
AM241	4.08E-003	1.40E-002	6.04E-003	1.32E-005
PU241	3.87E-004	3.98E-002	1.74E-002	1.09E-003
PU242	2.20E-004	8.67E-007	3.86E-007	0.00E+000
AM243	0.00E+000	0.00E+000	0.00E+000	2.13E-007

Errors quoted at 1.000 sigma

Operator: Dan Crosby Dan Crosby Date: 4-15-15

ITR: Maria Steade Maria Steade Date: 4-16-15

Automated Independent Technical Review

Count Sequence Number: 7473 Batch Number: OR-IQ3-0483
Assay Instrument: MCS IQ3 Location: ORNL
Analysis Method: CCP-TP-047 v 12 Software Version: NDA 2000 V.4.0
Item ID: X10C1351441 Assay Start: 4/13/2015 12:54:55 PM

MGA Analysis:

Expert review is recommended; the following validity tests failed:
Am separation time (51.0 years) is greater than allowed (50.0).

DISPOSITION: MGA isotopics are acceptable; Pu-239 is the fiducial nuclide.
This item contains elevated Am-241.

Gamma Analysis:

Analysis Status: No errors.
Spectrum Validity Check engine has suggested data review.

DISPOSITION: Summed Segment spectrum reviewed, and is acceptable.
Am-241 determined by direct measurement.

Segment Data Review:

Segment: 1 OK
Segment: 2 Analysis Warnings:
Minimum transmission used.
Segment: 3 Analysis Warnings:
Minimum transmission used.

DISPOSITION: Unacceptable transmission through Segments 2 & 3.
Transmission-corrected assay results are rejected.

Miscellaneous:

DISPOSITION: No additional radionuclides contributing to 95% of the radiological hazard were identified.

Expert Review by: R.N. Ceo Date: 4/14/15
7473

********** Radioassay Data Sheet **********

Engine Version: TMU Gamma 1.5 SS

Count Sequence Number: 7474 Batch Number: OR-IQ3-0483
Assay Instrument: MCS IQ3 Location: ORNL
Analysis Method: CCP-TP-047 v 12 Software Version: NDA 2000 V.4.0
Item ID: X10C1351449 Assay Start: 4/13/2015 1:30:08 PM
GW:245.1 kg TW: 35.2 kg NW:209.9 kg Fill: 90 % WS:OR-NFS-CH-SOIL

NID identified fiducial nuclide PU-239
Source of isotopics: MEASURED

Density	1.120 kg /l	
Pu mass	5.29E-001 +-	2.10E-001 g
TRU Alpha Activity	5.55E-002 +-	1.50E-002 Ci
TRU Activity Concentration	2.64E+002 +-	7.15E+001 nCi/g
Pu-239 Equivalent Activity	5.63E-002 +-	1.50E-002 Ci
Pu-239 FGE	5.12E-001 +-	2.10E-001 g
Decay heat	1.76E-003 +-	4.73E-004 W
NNSS PE-g: 2.13E+000 g	NNSS U-235 FGE:	8.16E-001 g

Nuclide	Mass g	Activity Ci	Activity Uncert. Ci	MDA Ci
SR90	1.65E-008	2.27E-006	9.74E-007	0.00E+000
CS137	2.61E-008	2.27E-006	9.74E-007	3.51E-008
RA226	1.73E-007	1.71E-007	7.36E-008	5.17E-008
U233	<LLD	<LLD	0.00E+000	3.76E-004
U234	6.82E-005	4.24E-007	1.95E-007	0.00E+000
U235	3.40E-002	7.35E-008	3.37E-008	5.98E-008
NP237	2.38E-004	1.67E-007	7.29E-008	7.01E-008
PU238	7.04E-005	1.20E-003	5.64E-004	3.30E-005
U238	4.53E+000	1.52E-006	7.15E-007	1.27E-006
PU239	4.88E-001	3.03E-002	1.30E-002	8.29E-004
PU240	4.03E-002	9.14E-003	3.94E-003	2.51E-004
AM241	4.34E-003	1.49E-002	6.39E-003	1.39E-005
PU241	4.63E-004	4.76E-002	2.07E-002	1.31E-003
PU242	2.35E-004	9.27E-007	4.11E-007	0.00E+000
AM243	0.00E+000	0.00E+000	0.00E+000	2.15E-007

Errors quoted at 1.000 sigma

Operator: Dan Crosby Dan Crosby Date: 4-15-15

ITR: Maria Steade Maria Steade Date: 4-16-15

Automated Independent Technical Review

Count Sequence Number: 7474 Batch Number: OR-IQ3-0483
Assay Instrument: MCS IQ3 Location: ORNL
Analysis Method: CCP-TP-047 v 12 Software Version: NDA 2000 V.4.0
Item ID: X10C1351449 Assay Start: 4/13/2015 1:23:18 PM

MGA Analysis:

DISPOSITION: MGA isotopics are acceptable; Pu-239 is the fiducial nuclide.

Gamma Analysis:

Analysis Status: No errors.
Spectrum Validity Check engine has suggested data review.

DISPOSITION: Summed Segment spectrum reviewed, and is acceptable.
Am-241 determined by direct measurement.

Segment Data Review:

Segment: 1 OK
Segment: 2 Analysis Warnings:
Minimum transmission used.
Segment: 3 Analysis Warnings:
Minimum transmission used.

DISPOSITION: Unacceptable transmission through Segments 2 & 3.
Transmission-corrected assay results are rejected.

Miscellaneous:

DISPOSITION: No additional radionuclides contributing to 95% of the radiological hazard were identified.

Expert Review by: R.N. Ceo Date: 4/14/15
7474

Attachment 3 – Independent Technical Reviewer Checklist

Site ID:ORNL	NDA Batch Number: OR-IQ3-0483
Procedure and Rev. No.:CCP-TP-047 REV12	NDA Counter ID: IQ3
Description of Criteria Reviewed	**Criteria Met**
Correct waste drum weight(s) were entered and used in the radioassay process and calculations.	☒ Yes ☐ No
Data generation and reduction were conducted in a technically correct manner in accordance with the standard operating procedures for the NDA methods used.	☒ Yes ☐ No
Data are reported in the proper units.	☒ Yes ☐ No
Calculations have been validated by a valid calculation program, a spot check of verified calculation programs, and/or 100 percent check of all hand calculations.	☒ Yes ☐ No
The testing QA documentation is complete as defined in Section 4.0.	☒ Yes ☐ No
QC measurements were made at the beginning of the counting session(s)	☒ Yes ☐ No

Attachment 3 –Independent Technical Reviewer Checklist (Continued)

Description of Criteria Reviewed	Criteria Met
QC measurement results are within established control limits per standard operating procedures and out of tolerance flags are resolved. (Reference Range of Applicability, CCP-PO-002.)	☒ Yes ☐ No
Weekly Interfering Matrix Measurement is properly performed and has been used to assess the long-term stability of the NDA instrument's matrix correction.	☒ Yes ☐ No
The activities and masses (including TMU expressed in one sigma) are reported for the 10 WIPP-reportable radionuclides. **NOTE**: < Lower Limit of Detection (LLD) or zero shall be reported in accordance with the CCP-PO-002.	☒ Yes ☐ No
Are there any additional radionuclides that contribute to 95 percent of the radioactive hazard in any drum?	☐ Yes ☒ No
IF YES, are they reported?	☐ Yes ☐ No ☒ NA
^{235}U detected in any waste drum?	☒ Yes ☐ No
IF YES, is it reported?	☒ Yes ☐ No ☐ NA

NDA Independent Technical Reviewer's Printed Name: Maria Steade

Approval Signature and Date: Maria Steade / 4-16-15

DIVIDER PAGE ONLY

Not Part of Page Count

Attachment 2 – CCP Records Transmittal/Receiving Form

CCP Records / Records Custodian, 4021 National Parks Highway - MS: GSA 212, Carlsbad, New Mexico 88220

Telephone Number: 575-234-7523

Fax Number: 575-234-7033

Attn:	CCP RECORDS	From:	PATRICK SMITH II
Ship to:	CCP RECORDS CUSTODIAN	Site:	ORNL
	4021 NATIONAL PARKS HWY.	Company:	TFE INC.
	MS GSA 212	Telephone Number:	865-574-6002
	CARLSBAD, NM 88220-9082	Date Sent:	4-21-2015
Telephone Number:	575-234-7523		

Document Number	Title/Description	Record Date	Total Pages
OR-IQ3-0483	IQ3 RAW DATA DISK (BACKUP)	4-16-2015	N/A
N/A	N/A	N/A	N/A
N/A	N/A	N/A	N/A
N/A	N/A	N/A	N/A
N/A	N/A	N/A	N/A
N/A	N/A	N/A	N/A

Comments:

N/A

(When the Record accepted line has been completed, the rest of the page below may be left blank.)
Acceptance/Rejection Signature and Date

Records Accepted ☑ [signature] Jewell Hurrabe 4/23/15.
Signature | Printed Name | Date

Records Rejected ☐ _____ _____ _____
Signature | Printed Name | Date

Reason for Rejection:

Re-submittal: _____ _____ _____
Signature | Printed Name | Date

****
*** Send Results ***
****

Sending is complete.

Job No.	3500
Address	918655768703
Name	ORNL
Start Time	04/23 12:49 PM
Call Length	00'43
Sheets	1
Result	OK

Attachment 2 – CCP Records Transmittal/Receiving Form

CCP Records / Records Custodian, 4021 National Parks Highway - MS: GSA 212, Carlsbad, New Mexico 88220

Telephone Number: 575-234-7523

Fax Number: 575-234-7033

Attn:	CCP RECORDS	From:	PATRICK SMITH II
Ship to:	CCP RECORDS CUSTODIAN	Site:	ORNL
	4021 NATIONAL PARKS HWY.	Company:	TFE INC.
	MS GSA 212	Telephone Number:	865-574-6002
	CARLSBAD, NM 88220-9082	Date Sent:	4-21-2015
Telephone Number:	575-234-7523		

OR-IQ3-0483	IQ3 RAW DATA DISK (BACKUP)	4-16-2015	N/A
N/A	N/A	N/A	N/A
N/A	N/A	N/A	N/A
N/A	N/A	N/A	N/A
N/A	N/A	N/A	N/A
N/A	N/A	N/A	N/A

N/A

(When the Record accepted line has been completed, the rest of the page below may be left blank.)
Acceptance/Rejection Signature and Date

Records Accepted ☑ [signature] (Signature) Jewell Hurrabb (Printed Name) 4/23/15 (Date)

Records Rejected ☐ _____ _____

Attachment 2 – CCP Records Transmittal/Receiving Form

CCP Records / Records Custodian, 4021 National Parks Highway - MS: GSA 212, Carlsbad, New Mexico 88220

Telephone Number: 575-234-7523

Fax Number: 575-234-7033

Attn:	CCP RECORDS	From:	PATRICK SMITH II
Ship to:	CCP RECORDS CUSTODIAN	Site:	ORNL
	4021 NATIONAL PARKS HWY.	Company:	TFE INC.
	MS GSA 212	Telephone Number:	865-574-6002
	CARLSBAD, NM 88220-9082	Date Sent:	5-7-2015
Telephone Number:	575-234-7523		

Document Number	Title/Description	Record Date	Total Pages
OR-IQ3-0483	IQ3 BDR	4-13-2015	22
OR-IQ3-0483	IQ3 RAW DATA DISK (PRIMARY)	4-16-2015	N/A
N/A	N/A	N/A	N/A
N/A	N/A	N/A	N/A
N/A	N/A	N/A	N/A
N/A	N/A	N/A	N/A

Comments

N/A

(When the Record accepted line has been completed, the rest of the page below may be left blank.)
Acceptance/Rejection Signature and Date

Records Accepted ☑	Signature	Greta Leos (Printed Name)	5-11-15 (Date)
Records Rejected ☐	Signature	Printed Name	Date

Reason for Rejection:

Re-submittal:	Signature	Printed Name	Date

****
*** Send Results ***
****

Sending is complete.

Job No.	4460
Address	918655768703
Name	ORNL
Start Time	05/11 01:33 PM
Call Length	00'30
Sheets	1
Result	OK

Attachment 2 – CCP Records Transmittal/Receiving Form

CCP Records / Records Custodian, 4021 National Parks Highway - MS: GSA 212, Carlsbad, New Mexico 88220

Telephone Number: 575-234-7523

Fax Number: 575-234-7033

Attn:	CCP RECORDS	From:	PATRICK SMITH II
Ship to:	CCP RECORDS CUSTODIAN	Site:	ORNL
	4021 NATIONAL PARKS HWY.	Company:	TFE INC.
	MS GSA 212	Telephone Number:	865-574-6002
	CARLSBAD, NM 88220-9082	Date Sent:	5-7-2015
Telephone Number:	575-234-7523		

Document Number(s)	Description	Record Date(s)	Page Count
OR-IQ3-0483	IQ3 BDR	4-13-2015	22
OR-IQ3-0483	IQ3 RAW DATA DISK (PRIMARY)	4-16-2015	N/A
N/A	N/A	N/A	N/A
N/A	N/A	N/A	N/A
N/A	N/A	N/A	N/A
N/A	N/A	N/A	N/A

Comments

N/A

(When the Record accepted line has been completed, the rest of the page below may be left blank.)
Acceptance/Rejection Signature and Date

Records Accepted	☑	[signature] Signature	Greta Leos Printed Name	5-11-15 Date
Records Rejected	☐	Signature	Printed Name	Date

DIVIDER

PAGE

Attachment 3 – Visual Examination Site Project Manager Checklist

Batch Data Report No.: ORNLRHVE15002

1. Has all the data received an independent technical review as evidenced by a completed checklist (Attachment 2) and the appropriate ITR signature?		☐ NO	☒ YES
2. Are BDR contents complete and match the Visual Examination Batch Data Report Table of Contents?		☐ NO	☒ YES
3. Is the BDR complete (appropriately filled in forms for each container)?		☐ NO	☒ YES
4. Have the RH Quality Assurance Objectives (QAOs) for VE been met? Precision – reconciled discrepancies between operators Accuracy – trained operators Representativeness – description of container contents Completeness – completed data form and/or recording Comparability – proper training and adequate AK for unopened containers		☐ NO ☐ NO ☐ NO ☐ NO ☐ NO ☐ NO	☒ YES ☒ YES ☒ YES ☒ YES ☒ YES ☒ YES
5. Were NCRs generated included in the BDR?	☐ NO	☒ YES RK 1/6/16	☒ ~~N/A~~ RK 1/6/16

Comments: ~~None~~
NCR-RHORNL-0337-15 added as SPM attachment. RK 1/6/16

SPM:

David W. Moody
Printed Name

David W Moody
Signature

22 April 2015
Date

Richard Kantrowitz

Richard Kantrowitz

~~12~~ 1/6/16
RK 1/6/16

CCP RECORDS ORIGINAL

DATE REC'D 04/22/15
LC

Attachment 1 – CCP Nonconformance Report (NCR)

CCP NONCONFORMANCE REPORT (NCR)

(Use NCR Continuation, Attachment 3, if necessary)

NCR No. NCR-RHORNL-0337-15 Revision 0

1. Lot No., Heat No., or Serial No. (if applicable): NA	2. Process (e.g., NDA, NDE, VE, Other): RH-VE	3. Batch Data Report #(s): See Attachment 1
4. Order/Work Order/Job Control Number (if applicable): NA	5. PO # (if applicable): NA	Container #(s): See Attachment 1
	6. Supplier (if applicable): NA	

DESCRIPTION OF NONCONFORMANCE

7a. NCR Description: ☐ < 100 nCi/g ☐ Prohibited Item ☐ E-Flag ☐ Receipt Inspection ☐ Transportation ☐ WWIS/WDS ☒ Other

7b. Requirement(s) (Enter Implementing Procedure No., Revision, Section No., & Quoted Text):

CCP-TP-500, Rev. 15, Section 4.1.1 [A], "Record the following information on Attachment1: [A.1] Site Identification."

7c. Actual Condition:

The Site ID is incorrectly listed on the Visual Examination Data Form. The "RH" designator is missing.

7d. Have the CCP HOLD TAGS associated with this NCR been applied? ☐ YES ☒ NO If no is checked, explain:

HOLD TAGS will not be applied to items identified on this NCR because of ALARA consideration. Container Management will apply through administrative control. In addition, these containers have been identified on the CCP sftp site. Container information from this NCR has been included in the list, which is to alert Mobile Loading Unit personnel as a second method of control of non-tagged containers.

8. NCR Originator:

Richard Kantrowitz (printed name) Richard Kantrowitz (signature) 12/22/15 (date)

9. Does the identified condition have the potential to impact AK? If YES or INDETERMINATE, enter Trend Code L in Block 10. ☐ YES ☒ NO ☐ INDETERMINATE

10. Trend Code: A	11. Responsible Manager: Richard Kantrowitz
12. Recurring Condition? ☐ YES ☒ NO (If Yes, list NCRs and WIPP Forms):	13. Significant Condition? ☐ YES ☒ NO (If Yes, enter WIPP Form No.):

14. QA Engineer or QA Designee validation:

Veronica Waldram (printed name) Veronica Waldram (signature) 12/22/15 (date)

SPM-1 RK 1/6/16

Attachment 1 – CCP Nonconformance Report (NCR) (Continued)

NCR No. NCR-RHORNL-0337-15 Revision 0

INTERIM DISPOSITION

15a. Interim Disposition (Check Only One):
☒ N/A (See Final Disposition) ☐ Hold ☐ Conditionally Accept ☐ Conditionally Use
☐ Sort ☐ Reinspect or Retest ☐ Remediate

15b. Instructions for Completion of the Interim Disposition:

INTERIM DISPOSITION APPROVALS

16a. Responsible Manager or Individual:

printed name _____ signature _____ date _____

16b. QA Engineer or QA Designee:

printed name _____ signature _____ date _____

Additional Approval:

printed name _____ signature _____ date _____

COMPLETION OF INTERIM DISPOSITION

17. Interim Disposition Complete – Responsible Manager or Individual:

printed name _____ signature _____ date _____

18. Interim Disposition Verified – QA Engineer:

printed name _____ signature _____ date _____

SPM-2 AK 1/6/16

Attachment 1 – CCP Nonconformance Report (NCR) (Continued)

NCR No. NCR-RHORNL-0337-15 Revision 0

FINAL DISPOSITION

19. Final Disposition (Check Only One: Use-As-Is, Repair, Reject, Rework, or Scrap):
☐ Use-As-Is ☐ Repair

19a. Technical Justification – Required for Use-As-Is or Repair dispositions. [☒ N/A for Reject, Rework, or Scrap]

N/A

☐ Reject ☒ Rework ☐ Scrap

19b. Instructions for Completion – Required for Reject, Repair, Rework, or Scrap [☐ N/A for Use-As-Is]
1) DGL to correct the Site ID on the Visual Examination Data Form.
2) DGL to add NCR to the BDR.
3) DGL to correct/update Attachments 2 and 5 as necessary – including re-sign and date.
4) DGL to submit corrections to Records.
5) SPM to insert corrected pages and re-review.

19c. Corrective Actions (Actions to Prevent Recurrence – For Repair or Rework, if applicable.
[☒ N/A if not applicable, and for Use-As-Is, Reject, and Scrap]

FINAL DISPOSITION APPROVALS

20. Responsible Manager or Individual:
Richard Kantrowitz (printed name) — signature — 12/22/15 (date)

21. QA Engineer or QA Designee:
Veronica Waldram (printed name) Veronica Waldram (signature) 12/22/15 (date)

Additional Approval:
printed name — signature — date

CLOSURE

22. Final Disposition Complete - Responsible Manager or Individual:
printed name — signature — date

23. Attachments: 1- BDR/Container Combination. 2.- Email Documenting Reportability.

24a. HOLD TAG removal has been verified and reconciled for all nonconforming items on the NCR: ☐
24b. If HOLD TAG is not applicable, check: ☐ and explain:

25. Final Disposition Verified – NCR Closed QA Engineer:
printed name — signature — date

SPM-3 RK 1/6/16

Attachment 3 – CCP Nonconformance Report (NCR) Continuation Sheet

NCR No. NCR-RHORNL-0337-15 Revision 0 Attachment # 1 (Page 1 of 1

Continuation from Section Number: 3

List of affected containers/BDRs:

Container ID	BDR ID
ORRH00708	ORNLRHVE15001
ORRH00708	ORNLRHVE15001_QTR0215
ORRH00709	ORNLRHVE15002
ORRH00725	ORNLRHVE15012
ORRH00726	ORNLRHVE15013

SPM-4 AK 1/6/16

Attachment 4 – Visual Examination Batch Data Report Cover Sheet

Batch Data Report No.: ORNLRHVE15002 Date: 4-16-15

	Waste Container ID Number:
1	ORRH00709
2	
3	
4	
5	
6	
7	N/A
8	
9	JC 4-16-15
10	
11	
12	
13	
14	
15	
16	
17	
18	
19	
20	

NTPC RECORDS ORIGINAL
DATE REC'D 4-22-2015 EVF

Attachment 5 – Visual Examination Batch Data Report Table of Contents

Batch Data Report No.: ORNLRHVE15002 Date: 4-16-15

Item	Description	Page No.
1	Visual Examination Batch Data Report Cover Sheet (Attachment 4)	1
2	Visual Examination Batch Data Report Table of Contents (Attachment 5)	2
3	Visual Examination Data Forms (Attachment 1)	3
4	Visual Examination Independent Technical Reviewer Checklist (Attachment 2)	5
5	Copy of NCRs (N/A [if not applicable])	N/A

Attachment 1 – Visual Examination Data Form

Site ID: ~~ORNL~~ RHORNL 12130115 JDM			
Examination Date: 4-16-15	Batch Number: ORNLRHVE15002		
Procedure #: CCP-TP-500	Revision #: 14	Video #: N/A	
Recording Equipment Check: ☐SAT ☐UNSAT ☑N/A	Recording Start: N/A	Recording Stop: N/A	
Inspection of Container to be loaded during VE: ☑SAT ☐UNSAT			
Indirect load Container ☑ N/A	Final Output Container ☐ N/A		
Container ID Number:	Container ID Number: ORRH00709		
Container Type:	Container Type: 55gallondrum		
Waste Matrix Code:	Waste Matrix Code: 55400		
Waste Stream:	Waste Stream: 02-REDC-RH-#ET		
	Rigid Liner: ☐Y ☑N Type:	Rigid Liner Lid: ☐ Y ☑N	
	Rigid Liner Vented or Hole Size: N/A		
Percent Fill: / Percent Organic Waste:	Percent Fill: 100 / Percent Organic Waste: 30		
Layers of Confinement: / Closure Method:	Layers of Confinement: 0 / Closure Method: N/A		

Comments (e.g., filter information, NCRs):
Nucfil-0190S FK-726
CASK# X10CSATN03208

Waste Description:

SuperSack (P)
Cardboard Liner (C)
Plastic Buckets (P)
Plastic Tubing (P)
Filter Media (C)
Floor Sweepings (IM)(OIM)(AM)(P)(C)
Broken Glass ~~(OIM)~~ (OIM) JC 4-16-15
Metal Cans (IM)
Poly Blocks (P)
Insulation (OIM)
Glass Bottles (OIM)
Aluminum Cans (AM)
Cloth Wipes (C)
Plastic Bottles (P)
Paper (C)
Protective Clothing (C)

Attachment 1 – Visual Examination Data Form (continued)

Container ID Number ORRH00709

	YES	NO
Does the container have observable liquid equal to or greater than 1 percent by volume of the outermost container at the time of RTR or VE?	☐	☑
Does the container have observable liquid more than 60 milliliters or 3 percent by volume, whichever is greater in an internal container?	☐	☑
Does the container have observable liquid with an EPA hazardous waste number (HWN) U134 assigned?	☐	☑
Does the container have observable liquid containing PCBs?	☐	☑
Is there an indication of non-radionuclide pyrophoric materials, such as elemental potassium?	☐	☑
Is there an indication of hazardous wastes not occurring as co-contaminants with TRU mixed wastes (non-mixed hazardous wastes)?	☐	☑
Is there an indication of wastes incompatible with backfill, seal and panel closures materials, container and packaging materials, shipping container materials, or other wastes (i.e., waste does **NOT** match Table of Allowable Materials for RH-TRU Waste in the RH-TRAMPAC)?	☐	☑
Is there an indication of wastes containing explosives or compressed gases?	☐	☑
Is there an indication of polychlorinated biphenyls (PCBs) not authorized under an EPA PCB waste disposal authorization?	☐	☑
Is there an indication of the waste exhibiting the characteristic of ignitability, corrosivity, or reactivity (EPA Hazardous Waste Numbers of D001, D002, or D003)?	☐	☑
Is the physical form of the waste inconsistent with the Waste Stream Description or the Waste Matrix Code?	☐	☑
Were there Non-approved Closure Methods used on liner bags or inner bags greater than 4 liters?	☐	☑
Are there sealed containers GREATER than 4 liters or heat sealed bags **NOT** defined in the applicable TRUCON Code?	☐	☑
Are there indications of inadequate protection (blocked or braced) for heavy and/or sharp objects?	☐	☑
Is the waste consistent with the TRUCON Code?	☑	☐

Comments: N/A

Visual Examination Operator 1:
Jason Cofer
Print Name Gilbert Gutierrez Signature Date 4-16-15 12-30-15

Visual Examination Operator 2:
Derek Matheny
Print Name Signature Date 4-16-15 12/30/15

Attachment 2 – Visual Examination Independent Technical Reviewer Checklist

Batch Data Report No.: ORNLRHVE15002

1. Were data generation and reduction conducted in a technically correct manner in accordance with the methods (procedure) used?	☐ NO	☑ YES
2. Was the correct revision of the operating procedure used?	☐ NO	☑ YES
3. Has the data been reviewed for errors?	☐ NO	☑ YES
4. Are BDR contents complete and do they match CCP waste VE Batch Data report Table of Contents?	☐ NO	☑ YES
5. Does the testing batch report include VE for up to 20 containers?	☐ NO	☑ YES
6. Is all data signed and dated in reproducible ink by the individual(s) generating it?	☐ NO	☑ YES
7. Is all data recorded clearly, legibly, and accurately?	☐ NO	☑ YES
8. Were changes made to original data? If NO, proceed to question 11.	☐ NO	☑ YES
9. Have all changes made to original data been lined out, initialed and dated by the individual making the changes?	☐ NO	☑ YES
10. Were the data changes made by the individual who originally collected the data or by an equally qualified individual?	☐ NO	☑ YES
11. Is there an adequate written description of the contents of each container?	☐ NO	☑ YES
12. Was VE of each container performed by at least two qualified VEO's or was an Audio/Video recording properly prepared for each container?	☐ NO	☑ YES
13. Has each container in this BDR been evaluated for the presence of prohibited wastes?	☐ NO	☑ YES
14. Did the physical form of the waste match the waste matrix code and waste stream description?	☐ NO	☑ YES
15. Was an NCR required at the data generation level? If NO, proceed to question 17.	☑ NO	☐ YES
16. Is a copy of the NCR included in the BDR?	☐ NO	☐ YES
17. Have the RH Quality Assurance Objectives (QAOs) for VE been met? **Precision** – Precision is maintained by reconciling any discrepancies between two operators (or between the operator and the Independent Technical Reviewer) with regard to the identification of important waste characteristics (i.e., physical form of the waste and absence of prohibited liquids) within a single container. **Accuracy** – Accuracy is maintained by requiring operators to pass a comprehensive examination with a score of 80% and demonstrate satisfactory performance in the presence of the VE expert during their initial qualification and subsequent requalification. **Representativeness** – The contents placed in a container will be described on the data forms.	☐ NO	☑ YES

Attachment 2 – Visual Examination Independent Technical Reviewer Checklist (Continued)

Batch Data Report No.: ORNLRHVE15002

Completeness – The relevant waste information must be collected. This information must be documented on a videotape and/or data form, or other unalterable media. **Comparability** – Comparability is ensured by the characterization program meeting the training requirements and complying with the minimum standards used to implement this characterization process. In some instances, waste will be contained in opaque containers and not all items will be visible to the operator (e.g., sealed paint cans or 5-gallon buckets). If these containers are not opened during VE, source documents must be available in the AK record that allow the operator to identify the contents of the closed containers.		

Comments:
N/A

Independent Technical Reviewer		
Anthony Harley		4-22-15
Printed Name	Signature	Date

12-30-15

RK 1/6/16

DIVIDER PAGE ONLY

Not part of page count

Attachment 2 – CCP Records Transmittal/Receiving Form

CCP Records / Records Custodian, 4021 National Parks Highway - MS: GSA 212, Carlsbad, New Mexico 88220

Telephone Number: 575-234-7523

Fax Number: 575-234-7033

Attn:	Linda Castro	From:	David W. Moody
Ship to:	CCP Records	Site:	Denver
	4021 National Parks Hwy	Company:	NWP
	MS:GSA:212	Telephone Number:	303-963-5036
	Carlsbad NM 88220	Date Sent:	22 April 2015
Telephone Number:	575-234-7130		

Document Number	Title / Description	Record Date	Total Pages
ORNLRHVE15002 SPM	SPM checklist for ORNLRHVE15002	22April 2015	1
	NA		

Comments

None

(When the Record accepted line has been completed, the rest of the page below may be left blank.)

Acceptance/Rejection Signature and Date

Records Accepted ☒	Linda Castro	Linda Castro	04/22/15
	Signature	Printed Name	Date
Records Rejected ☐	_____	_____	_____
	Signature	Printed Name	Date

Reason for Rejection:

Re-submittal:	_____	_____	_____
	Signature	Printed Name	Date

```
**********************************
***        Send Results        ***
**********************************

   Sending is complete.

Job No.                    3464
Address                    913038432208
Name                       DENVER SPMS
Start Time                 04/22 12:20 PM
Call Length                00'16
Sheets                     1
Result                     OK
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Controlled Copy

Attachment 2 – CCP Records Transmittal/Receiving Form

CCP Records / Records Custodian, 4021 National Parks Highway - MS: GSA 212, Carlsbad, New Mexico 88220

Telephone Number: 575-234-7523

Fax Number: 575-234-7033

Attn:	Linda Castro	From:	David W. Moody
Ship to:	CCP Records	Site:	Denver
	4021 National Parks Hwy	Company:	NWP
	MS:GSA:212	Telephone Number:	303-963-5036
	Carlsbad NM 88220	Date Sent:	22 April 2015
Telephone Number:	575-234-7130		

Document Number	Title / Description	Record Date	Total Pages
ORNLRHVE15002 SPM	SPM checklist for ORNLRHVE15002	22April 2015	1
	NA		

Comments

None

(When the Record accepted line has been completed, the rest of the page below may be left blank.)
Acceptance/Rejection Signature and Date

Records Accepted ☒ Linda Castro (Signature) Linda Castro (Printed Name) 04/22/15 (Date)

Records Rejected ☐ _____ _____ _____

Attachment 2 – CCP Records Transmittal/Receiving Form

CCP Records / Records Custodian, 4021 National Parks Highway - MS: GSA 212, Carlsbad, New Mexico 88220

Telephone Number: 575-234-7523

Fax Number: 575-234-7033

Attn:	CCP RECORDS	From:	PATRICK SMITH II
Ship to:	CCP RECORDS CUSTODIAN	Site:	ORNL
	4021 NATIONAL PARKS HWY.	Company:	TFE INC.
	MS GSA 212	Telephone Number:	865-574-6002
	CARLSBAD, NM 88220-9082	Date Sent:	4-29-2015
Telephone Number:	575-234-7523		

Document Number	Title/Description	Record Date	Total Pages
ORNLRHVE15002	RH VE BDR	4-16-2015	6
N/A	N/A	N/A	N/A
N/A	N/A	N/A	N/A
N/A	N/A	N/A	N/A
N/A	N/A	N/A	N/A
N/A	N/A	N/A	N/A

Comments

N/A

(When the Record accepted line has been completed, the rest of the page below may be left blank.)
Acceptance/Rejection Signature and Date

Records Accepted ☒	Linda Castro (Signature)	Linda Castro (Printed Name)	05/04/15 (Date)
Records Rejected ☐	_____ (Signature)	_____ (Printed Name)	_____ (Date)

Reason for Rejection:

Re-submittal:

_____ (Signature)	_____ (Printed Name)	_____ (Date)

****
*** Send Results ***
****

Sending is complete.

Job No.	3917
Address	918655768703
Name	ORNL
Start Time	05/01 06:30 AM
Call Length	00'21
Sheets	1
Result	OK

Controlled Copy

Attachment 2 – CCP Records Transmittal/Receiving Form

CCP Records / Records Custodian, 4021 National Parks Highway - MS: GSA 212, Carlsbad, New Mexico 88220

Telephone Number: 575-234-7523

Fax Number: 575-234-7033

Attn:	CCP RECORDS	From:	PATRICK SMITH II
Ship to:	CCP RECORDS CUSTODIAN	Site:	ORNL
	4021 NATIONAL PARKS HWY.	Company:	TFE INC.
	MS GSA 212	Telephone Number:	865-574-6002
	CARLSBAD, NM 88220-9082	Date Sent:	4-29-2015
Telephone Number:	575-234-7523		

ORNLRHVE15002	RH VE BDR	4-16-2015	6
N/A	N/A	N/A	N/A
N/A	N/A	N/A	N/A
N/A	N/A	N/A	N/A
N/A	N/A	N/A	N/A
N/A	N/A	N/A	N/A

N/A

(When the Record accepted line has been completed, the rest of the page below may be left blank.)
Acceptance/Rejection Signature and Date

Records Accepted [X] Linda Castro (Signature) Linda Castro (Printed Name) 05/01/15 (Date)

Records Rejected [ ]

Attachment 2 – CCP Records Transmittal/Receiving Form

CCP Records / Records Custodian, 4021 National Parks Highway - MS: GSA 212, Carlsbad, New Mexico 88220

Telephone Number: 575-234-7523

Fax Number: 575-234-7033

Attn:	CCP RECORDS	From:	PATRICK SMITH II
Ship to:	CCP RECORDS CUSTODIAN	Site:	ORNL
	4021 NATIONAL PARKS HWY.	Company:	TFE INC.
	MS GSA 212	Telephone Number:	865-574-6002
	CARLSBAD, NM 88220-9082	Date Sent:	12-31-2015
Telephone Number:	575-234-7523		

Document Number	Title / Description	Record Date	Total Pages
ORNLRHVE15002	Attachment 1 – Visual Examination Data Form Container: ORRH00709 (CORRECTED)	4-16-2015	2
ORNLRHVE15002	Attachment 2 – Visual Examination Independent Technical Reviewer Checklist (CORRECTED)	4-16-2015	2
N/A	N/A	N/A	N/A
N/A	N/A	N/A	N/A
N/A	N/A	N/A	N/A
N/A	N/A	N/A	N/A

Comments

N/A

(When the Record accepted line has been completed, the rest of the page below may be left blank.)

Acceptance/Rejection Signature and Date

	Signature	Printed Name	Date
Records Accepted ☑	[signature]	[signature]	1/12/2016
Records Rejected ☐			

Reason for Rejection:

Re-submittal:

Signature	Printed Name	Date

```
**********************************
***        Send Results        ***
**********************************

   Sending is complete.

Job No.                    3740
Address                    918655768703
Name                       ORNL
Start Time                 01/06 09:44 AM
Call Length                00'21
Sheets                     1
Result                     OK
```


Attachment 2 – CCP Records Transmittal/Receiving Form

CCP Records / Records Custodian, 4021 National Parks Highway - MS: GSA 212, Carlsbad, New Mexico 88220

Telephone Number: 575-234-7523

Fax Number: 575-234-7033

Attn:	CCP RECORDS	From:	PATRICK SMITH II
Ship to:	CCP RECORDS CUSTODIAN	Site:	ORNL
	4021 NATIONAL PARKS HWY.	Company:	TFE INC.
	MS GSA 212	Telephone Number:	865-574-6002
	CARLSBAD, NM 88220-9082	Date Sent:	12-31-2015
Telephone Number:	575-234-7523		

ORNLRHVE15002	Attachment 1 – Visual Examination Data Form Container: ORRH00709 (CORRECTED)	4-16-2015	2
ORNLRHVE15002	Attachment 2 – Visual Examination Independent Technical Reviewer Checklist (CORRECTED)	4-16-2015	2
N/A	N/A	N/A	N/A
N/A	N/A	N/A	N/A
N/A	N/A	N/A	N/A
N/A	N/A	N/A	N/A

N/A

(When the Record accepted line has been completed, the rest of the page below may be left blank.)
Acceptance/Rejection Signature and Date

Attachment 3 – Visual Examination Site Project Manager Checklist

Batch Data Report No.: ORNLRHVE15006

1. Has all the data received an independent technical review as evidenced by a completed checklist (Attachment 2) and the appropriate ITR signature?		☐ NO	☒ YES
2. Are BDR contents complete and match the Visual Examination Batch Data Report Table of Contents?		☐ NO	☒ YES
3. Is the BDR complete (appropriately filled in forms for each container)?		☐ NO	☒ YES
4. Have the RH Quality Assurance Objectives (QAOs) for VE been met?			
Precision – reconciled discrepancies between operators		☐ NO	☒ YES
Accuracy – trained operators		☐ NO	☒ YES
Representativeness – description of container contents		☐ NO	☒ YES
Completeness – completed data form and/or recording		☐ NO	☒ YES
Comparability – proper training and adequate AK for unopened containers		☐ NO	☒ YES
5. Were NCRs generated included in the BDR?	☐ NO	☐ YES	☒ N/A

Comments: None

SPM:

David W. Moody
Printed Name

Signature

23 September 2015
Date

CCP RECORDS ORIGINAL
DATE REC'D 09/23/15

Attachment 4 – Visual Examination Batch Data Report Cover Sheet

Batch Data Report No.: ORNLRHVE15006 Date: 9-22-15

	Waste Container ID Number:
1	ORRH00716
2	ORRH00717
3	
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N/A
A.H. 9-22-15

NTPC RECORDS ORIGINAL
DATE REC'D 9-23-2015

Attachment 5 – Visual Examination Batch Data Report Table of Contents

Batch Data Report No.: ORAILRHVE15006 Date: 9-22-15

Item	Description	Page No.
1	Visual Examination Batch Data Report Cover Sheet (Attachment 4)	1
2	Visual Examination Batch Data Report Table of Contents (Attachment 5)	2
3	Visual Examination Data Forms (Attachment 1)	3
4	Visual Examination Independent Technical Reviewer Checklist (Attachment 2)	7
5	Copy of NCRs (N/A [if not applicable])	N/A

Attachment 1 – Visual Examination Data Form

Site ID: RHORNL			
Examination Date: 9-22-15	Batch Number: ORNL RHVE15006		
Procedure #: CCP-TP-500	Revision #: 15	Video #: N/A	
Recording Equipment Check: ☐SAT ☐UNSAT ☑N/A	Recording Start: N/A	Recording Stop: N/A	
Inspection of Container to be loaded during VE: ☑SAT ☐UNSAT			

Indirect load Container ☑N/A		Final Output Container ☐ N/A	
Container ID Number:		Container ID Number: ORRH00716	
Container Type:		Container Type: 55 gallon drum	
Waste Matrix Code:		Waste Matrix Code: S5400	
Waste Stream:		Waste Stream: OR-REDC-RH-HET	
		Poly Rigid Liner: ☐Y ☑N Thickness:	Poly Rigid Liner Lid: ☐Y ☑N
		Poly Rigid Liner Vented or Hole Size: N/A	
Percent Fill:	Percent Organic Waste:	Percent Fill: 100%	Percent Organic Waste: 20%
Layers of Confinement:	Closure Method:	Layers of Confinement: 0	Closure Method: N/A

Comments (e.g., filter information, NCRs):
Nucfil-0190S BK-40
cask # X10C940 2652

Waste Description:
super sack (P)
cardboard liner (C)
metal cans (IM)
poly block (P)
metal bolts (IM)
metal lids (IM)
glass vials (OIM)
rubber gloves (R)
electrical cords (R) (OM)
plastic bottles (P)
metal labware (IM)
~~hurcelite (P)~~ A.H. 9-23-15 heraulite (P)
floor sweepings (P) (IM) (C) (OIM) (R)

Attachment 1 – Visual Examination Data Form (continued)

Container ID Number ORRH00716

Prohibited Item(s) Summary	YES	NO
Does the container have observable liquid equal to or greater than 1 percent by volume of the outermost container at the time of RTR or VE?	☐	☑
Does the container have observable liquid more than 60 milliliters or 3 percent by volume, whichever is greater in an internal container?	☐	☑
Does the container have observable liquid with an EPA hazardous waste number (HWN) U134 assigned?	☐	☑
Does the container have observable liquid containing PCBs?	☐	☑
Is there an indication of non-radionuclide pyrophoric materials, such as elemental potassium?	☐	☑
Is there an indication of hazardous wastes not occurring as co-contaminants with TRU mixed wastes (non-mixed hazardous wastes)?	☐	☑
Is there an indication of wastes incompatible with backfill, seal and panel closures materials, container and packaging materials, shipping container materials, or other wastes (i.e., waste does **NOT** match Table of Allowable Materials for RH-TRU Waste in the RH-TRAMPAC)?	☐	☑
Is there an indication of wastes containing explosives or compressed gases?	☐	☑
Is there an indication of polychlorinated biphenyls (PCBs) not authorized under an EPA PCB waste disposal authorization?	☐	☑
Is there an indication of the waste exhibiting the characteristic of ignitability, corrosivity, or reactivity (EPA Hazardous Waste Numbers of D001, D002, or D003)?	☐	☑
Is the physical form of the waste inconsistent with the Waste Stream Description or the Waste Matrix Code?	☐	☑
RH-72B Criteria		
Were there Non-approved Closure Methods used on liner bags or inner bags greater than 4 liters?	☐	☑
Are there sealed containers GREATER than 4 liters or heat sealed bags **NOT** defined in the applicable TRUCON Code?	☐	☑
Are there indications of inadequate protection (blocked or braced) for heavy and/or sharp objects?	☐	☑
Is the waste consistent with the TRUCON Code?	☑	☐

Comments: N/A

Visual Examination Operator 1:
Anthony Harley (Print Name) — Signature — 9-22-15 (Date) 9-23-15

Visual Examination Operator 2:
Jason Cofer (Print Name) — Signature — 9-22-15 (Date) 9-23-15

Attachment 1 – Visual Examination Data Form

Site ID: RHORNL			
Examination Date: 9-22-15	Batch Number: ORNL RHVE 15006		
Procedure #: CCP-TP-500	Revision #: 15	Video #: N/A	
Recording Equipment Check: ☐SAT ☐UNSAT ☑N/A	Recording Start: N/A	Recording Stop: N/A	
Inspection of Container to be loaded during VE: ☑SAT ☐UNSAT			

Indirect load Container ☑N/A	Final Output Container ☐ N/A
Container ID Number:	Container ID Number: ORRH00717
Container Type:	Container Type: 55 gallon drum
Waste Matrix Code:	Waste Matrix Code: S5400
Waste Stream:	Waste Stream: OR.REDC.RH-HET
	Poly Rigid Liner: ☐Y ☑N Thickness: / Poly Rigid Liner Lid: ☐Y ☑N
	Poly Rigid Liner Vented or Hole Size: N/A
Percent Fill: / Percent Organic Waste:	Percent Fill: 80 / Percent Organic Waste: 10%
Layers of Confinement: / Closure Method:	Layers of Confinement: 0 / Closure Method: N/A

Comments (e.g., filter information, NCRs):
Nucfil-0190S BK-47

cask # X10 c9402652

Waste Description:
super sack (P)
cardboard liner (C)
plastic bags (P)
floor sweepings (IM)(P)(OIM)(R)(C)
wood pieces (C)
metal parts (IM)
poly blocks (P)
metal cans (IM)
metal lids (IM)
glass vials (OIM)
metal labware (IM)
cloth booty (C)
cloth rags (C)
saw zal blades (IM)

Attachment 1 – Visual Examination Data Form (continued)

Container ID Number ORRH00717

Prohibited Item(s) Summary	YES	NO
Does the container have observable liquid equal to or greater than 1 percent by volume of the outermost container at the time of RTR or VE?	☐	☑
Does the container have observable liquid more than 60 milliliters or 3 percent by volume, whichever is greater in an internal container?	☐	☑
Does the container have observable liquid with an EPA hazardous waste number (HWN) U134 assigned?	☐	☑
Does the container have observable liquid containing PCBs?	☐	☑
Is there an indication of non-radionuclide pyrophoric materials, such as elemental potassium?	☐	☑
Is there an indication of hazardous wastes not occurring as co-contaminants with TRU mixed wastes (non-mixed hazardous wastes)?	☐	☑
Is there an indication of wastes incompatible with backfill, seal and panel closures materials, container and packaging materials, shipping container materials, or other wastes (i.e., waste does **NOT** match Table of Allowable Materials for RH-TRU Waste in the RH-TRAMPAC)?	☐	☑
Is there an indication of wastes containing explosives or compressed gases?	☐	☑
Is there an indication of polychlorinated biphenyls (PCBs) not authorized under an EPA PCB waste disposal authorization?	☐	☑
Is there an indication of the waste exhibiting the characteristic of ignitability, corrosivity, or reactivity (EPA Hazardous Waste Numbers of D001, D002, or D003)?	☐	☑
Is the physical form of the waste inconsistent with the Waste Stream Description or the Waste Matrix Code?	☐	☑
RH-72B Criteria		
Were there Non-approved Closure Methods used on liner bags or inner bags greater than 4 liters?	☐	☑
Are there sealed containers GREATER than 4 liters or heat sealed bags **NOT** defined in the applicable TRUCON Code?	☐	☑
Are there indications of inadequate protection (blocked or braced) for heavy and/or sharp objects?	☐	☑
Is the waste consistent with the TRUCON Code?	☑	☐

Comments: N/A

Visual Examination Operator 1:
Anthony Harley — Print Name
[signature] — Signature
9-22-15 — Date

Visual Examination Operator 2:
Jason Cole — Print Name
[signature] — Signature
9-22-15 — Date

Attachment 2 – Visual Examination Independent Technical Reviewer Checklist

Batch Data Report No.: ORNLRHVE150016

1. Were data generation and reduction conducted in a technically correct manner in accordance with the methods (procedure) used?	☐ NO	☑ YES
2. Was the correct revision of the operating procedure used?	☐ NO	☑ YES
3. Has the data been reviewed for errors?	☐ NO	☑ YES
4. Are BDR contents complete and do they match CCP waste VE Batch Data report Table of Contents?	☐ NO	☑ YES
5. Does the testing batch report include VE for up to 20 containers?	☐ NO	☑ YES
6. Is all data signed and dated in reproducible ink by the individual(s) generating it?	☐ NO	☑ YES
7. Is all data recorded clearly, legibly, and accurately?	☐ NO	☑ YES
8. Were changes made to original data? If NO, proceed to question 11.	☑ NO DM 9/23/15	☑ YES
9. Have all changes made to original data been lined out, initialed and dated by the individual making the changes?	☐ NO	☑ YES
10. Were the data changes made by the individual who originally collected the data or by an equally qualified individual?	☐ NO	☑ YES
11. Is there an adequate written description of the contents of each container?	☐ NO	☑ YES
12. Was VE of each container performed by at least two qualified VEO's or was an Audio/Video recording properly prepared for each container?	☐ NO	☑ YES
13. Has each container in this BDR been evaluated for the presence of prohibited wastes?	☐ NO	☑ YES
14. Did the physical form of the waste match the waste matrix code and waste stream description?	☐ NO	☑ YES
15. Was an NCR required at the data generation level? If NO, proceed to question 17.	☑ NO	☐ YES
16. Is a copy of the NCR included in the BDR?	☐ NO	☐ YES
17. Have the RH Quality Assurance Objectives (QAOs) for VE been met? **Precision** – Precision is maintained by reconciling any discrepancies between two operators (or between the operator and the Independent Technical Reviewer) with regard to the identification of important waste characteristics (i.e., physical form of the waste and absence of prohibited liquids) within a single container. **Accuracy** – Accuracy is maintained by requiring operators to pass a comprehensive examination with a score of 80% and demonstrate satisfactory performance in the presence of the VE expert during their initial qualification and subsequent requalification. **Representativeness** – The contents placed in a container will be described on the data forms.	☐ NO	☑ YES

Attachment 2 – Visual Examination Independent Technical Reviewer Checklist (Continued)

Batch Data Report No.: ORNLRHVE15006

Completeness – The relevant waste information must be collected. This information must be documented on a videotape and/or data form, or other unalterable media. **Comparability** – Comparability is ensured by the characterization program meeting the training requirements and complying with the minimum standards used to implement this characterization process. In some instances, waste will be contained in opaque containers and not all items will be visible to the operator (e.g., sealed paint cans or 5-gallon buckets). If these containers are not opened during VE, source documents must be available in the AK record that allow the operator to identify the contents of the closed containers.		
Comments: N/A		
Independent Technical Reviewer Derek Matheny Printed Name	Signature	Date: 9/23/15 9/22/15 DM 9/23/15

DIVIDER PAGE ONLY

Not Part of Page Count

Attachment 2 – CCP Records Transmittal/Receiving Form

CCP Records / Records Custodian, 4021 National Parks Highway - MS: GSA 212, Carlsbad, New Mexico 88220

Telephone Number: 575-234-7523

Fax Number: 575-234-7033

Attn:	Linda Castro	From:	David W. Moody
Ship to:	CCP Records	Site:	ORNL RH
	4021 National Parks Hwy	Company:	NWP
	MS:GSA:212	Telephone Number:	303-963-5036
	Carlsbad NM 88220	Date Sent:	23 September 2015
Telephone Number:	575-234-7130		

Document Number	Title / Description	Record Date	Total Pages
ORNLRHVE15006	SPM Checklist for ORNL RH VE BDR ORNLRHVE15006	23 Sept 2015	1
	NA		

Comments

None

(When the Record accepted line has been completed, the rest of the page below may be left blank.)
Acceptance/Rejection Signature and Date

Records Accepted ☑	Linda Castro	Linda Castro	09/23/2015
	Signature	Printed Name	Date
Records Rejected ☐			
	Signature	Printed Name	Date

Reason for Rejection:

Re-submittal:			
	Signature	Printed Name	Date

****
*** TX REPORT ***
****

TRANSMISSION OK

TX/RX NO	2561
DESTINATION TEL #	913038432208
DESTINATION ID	DENVER
ST. TIME	09/23 15:10
TIME USE	00'20
PAGES SENT	1
RESULT	OK

Attachment 2 – CCP Records Transmittal/Receiving Form

CCP Records / Records Custodian, 4021 National Parks Highway - MS: GSA 212, Carlsbad, New Mexico 88220

Telephone Number: 575-234-7523

Fax Number: 575-234-7033

Attn:	Linda Castro	From:	David W. Moody
Ship to:	CCP Records	Site:	ORNL RH
	4021 National Parks Hwy	Company:	NWP
	MS:GSA:212	Telephone Number:	303-963-5036
	Carlsbad NM 88220	Date Sent:	23 September 2015
Telephone Number:	575-234-7130		

Document Number	Title / Description	Record Date	Total Pages
ORNLRHVE15006	SPM Checklist for ORNL RH VE BDR ORNLRHVE15006	23 Sept 2015	1
	NA		

Comments

None

(When the Record accepted line has been completed, the rest of the page below may be left blank.)

Acceptance/Rejection Signature and Date

Linda Castro

Attachment 2 – CCP Records Transmittal/Receiving Form

CCP Records / Records Custodian, 4021 National Parks Highway - MS: GSA 212, Carlsbad, New Mexico 88220

Telephone Number: 575-234-7523

Fax Number: 575-234-7033

Attn:	CCP RECORDS	From:	PATRICK SMITH II
Ship to:	CCP RECORDS CUSTODIAN	Site:	ORNL
	4021 NATIONAL PARKS HWY.	Company:	TFE INC.
	MS GSA 212	Telephone Number:	865-574-6002
	CARLSBAD, NM 88220-9082	Date Sent:	09-24-2015
Telephone Number:	575-234-7523		

Document Number	Title/Description	Record Date	Total Disks
ORNLRHVE15006	RH VE BDR	9-22-2015	8
N/A	N/A	N/A	N/A
N/A	N/A	N/A	N/A
N/A	N/A	N/A	N/A
N/A	N/A	N/A	N/A
N/A	N/A	N/A	N/A

Comments

N/A

(When the Record accepted line has been completed, the rest of the page below may be left blank.)

Acceptance/Rejection Signature and Date

Records Accepted ☑	Linda Castro	Linda Castro	09/28/15
	Signature	Printed Name	Date
Records Rejected ☐			
	Signature	Printed Name	Date

Reason for Rejection:

Re-submittal:

Signature	Printed Name	Date

****
*** Send Results ***
****

Sending is complete.

Job No.	2259
Address	918655768703
Name	ORNL
Start Time	09/28 06:54 AM
Call Length	00'20
Sheets	1
Result	OK

Attachment 2 – CCP Records Transmittal/Receiving Form

CCP Records / Records Custodian, 4021 National Parks Highway - MS: GSA 212, Carlsbad, New Mexico 88220

Telephone Number: 575-234-7523

Fax Number: 575-234-7033

Attn:	CCP RECORDS	From:	PATRICK SMITH II
Ship to:	CCP RECORDS CUSTODIAN	Site:	ORNL
	4021 NATIONAL PARKS HWY.	Company:	TFE INC.
	MS GSA 212	Telephone Number:	865-574-6002
	CARLSBAD, NM 88220-9082	Date Sent:	09-24-2015
Telephone Number:	575-234-7523		

ORNLRHVE15006	RH VE BDR	9-22-2015	8
N/A	N/A	N/A	N/A
N/A	N/A	N/A	N/A
N/A	N/A	N/A	N/A
N/A	N/A	N/A	N/A
N/A	N/A	N/A	N/A

N/A

(When the Record accepted line has been completed, the rest of the page below may be left blank.)
Acceptance/Rejection Signature and Date

Records Accepted ☒ Linda Castro (Signature) Linda Castro (Printed Name) 09/28/15 (Date)

Records Rejected ☐

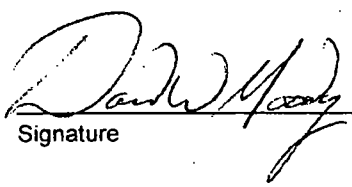
Attachment 3 – Visual Examination Site Project Manager Checklist

Batch Data Report No.: ORNLRHVE15008

1. Has all the data received an independent technical review as evidenced by a completed checklist (Attachment 2) and the appropriate ITR signature?		☐ NO	☒ YES
2. Are BDR contents complete and match the Visual Examination Batch Data Report Table of Contents?		☐ NO	☒ YES
3. Is the BDR complete (appropriately filled in forms for each container)?		☐ NO	☒ YES
4. Have the RH Quality Assurance Objectives (QAOs) for VE been met?			
Precision – reconciled discrepancies between operators		☐ NO	☒ YES
Accuracy – trained operators		☐ NO	☒ YES
Representativeness – description of container contents		☐ NO	☒ YES
Completeness – completed data form and/or recording		☐ NO	☒ YES
Comparability – proper training and adequate AK for unopened containers		☐ NO	☒ YES
5. Were NCRs generated included in the BDR?	☐ NO	☐ YES	☒ N/A
Comments: None			

SPM:

David W. Moody
Printed Name


Signature

28 September 2015
Date

CCP RECORDS ORIGINAL
DATE REC'D 9/28/15

Attachment 4 – Visual Examination Batch Data Report Cover Sheet

Batch Data Report No.: ORNLRHVE15008 Date: 9-24-15

	Waste Container ID Number:
1	ORRH00720
2	
3	
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10	N/A
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12	A.H.
13	
14	
15	9-24-15
16	
17	
18	
19	
20	

NTPC RECORDS ORIGINAL
DATE REC'D 9-24-2015

Attachment 5 – Visual Examination Batch Data Report Table of Contents

Batch Data Report No.: ORNLRHVE15008 Date: 9-24-15

Item	Description	Page No.
1	Visual Examination Batch Data Report Cover Sheet (Attachment 4)	1
2	Visual Examination Batch Data Report Table of Contents (Attachment 5)	2
3	Visual Examination Data Forms (Attachment 1)	3
4	Visual Examination Independent Technical Reviewer Checklist (Attachment 2)	5
5	Copy of NCRs (N/A [if not applicable])	N/A

Attachment 1 – Visual Examination Data Form

Site ID: RHORNL			
Examination Date: 9-24-15		Batch Number: ORNLRHVE15008	
Procedure #: CCP-TP-500		Revision #: 15	Video #: N/A
Recording Equipment Check: ☐SAT ☐UNSAT ☑N/A		Recording Start: N/A	Recording Stop: N/A
Inspection of Container to be loaded during VE: ☑SAT ☐UNSAT			
Indirect load Container ☑N/A		Final Output Container ☐ N/A	
Container ID Number:		Container ID Number: ORRH00720	
Container Type:		Container Type: 55 gallon drum	
Waste Matrix Code:		Waste Matrix Code: S5400	
Waste Stream;		Waste Stream: OR-REDC-RH-HET	
		Poly Rigid Liner: ☐Y ☑N Thickness:	Poly Rigid Liner Lid: ☐ Y ☑N
		Poly Rigid Liner Vented or Hole Size: N/A	
Percent Fill:	Percent Organic Waste:	Percent Fill: 100%	Percent Organic Waste: 20%
Layers of Confinement:	Closure Method:	Layers of Confinement: 0	Closure Method: N/A

Comments (e.g., filter information, NCRs):
Nucfil-019DS 3K-46
cask # X10C9402631

Waste Description:
super sack (P)
cardboard liner (C)
glass vials (OIm)
metal tools (Im)
metal labware (Im)
cloth pieces (C)
metal saw (Im)
electrical wires (P)(Om)
metal canisters (Im)
floor sweepings (Im)(Am)(OIm)(R)
string (C)
rubber glove (R)
poly blocks (P)
plastic bag (P)

Attachment 1 – Visual Examination Data Form (continued)

Container ID Number ORRH007220

Prohibited Item(s) Summary	YES	NO
Does the container have observable liquid equal to or greater than 1 percent by volume of the outermost container at the time of RTR or VE?	☐	☑
Does the container have observable liquid more than 60 milliliters or 3 percent by volume, whichever is greater in an internal container?	☐	☑
Does the container have observable liquid with an EPA hazardous waste number (HWN) U134 assigned?	☐	☑
Does the container have observable liquid containing PCBs?	☐	☑
Is there an indication of non-radionuclide pyrophoric materials, such as elemental potassium?	☐	☑
Is there an indication of hazardous wastes not occurring as co-contaminants with TRU mixed wastes (non-mixed hazardous wastes)?	☐	☑
Is there an indication of wastes incompatible with backfill, seal and panel closures materials, container and packaging materials, shipping container materials, or other wastes (i.e., waste does **NOT** match Table of Allowable Materials for RH-TRU Waste in the RH-TRAMPAC)?	☐	☑
Is there an indication of wastes containing explosives or compressed gases?	☐	☑
Is there an indication of polychlorinated biphenyls (PCBs) not authorized under an EPA PCB waste disposal authorization?	☐	☑
Is there an indication of the waste exhibiting the characteristic of ignitability, corrosivity, or reactivity (EPA Hazardous Waste Numbers of D001, D002, or D003)?	☐	☑
Is the physical form of the waste inconsistent with the Waste Stream Description or the Waste Matrix Code?	☐	☑
RH-72B Criteria		
Were there Non-approved Closure Methods used on liner bags or inner bags greater than 4 liters?	☐	☑
Are there sealed containers GREATER than 4 liters or heat sealed bags **NOT** defined in the applicable TRUCON Code?	☐	☑
Are there indications of inadequate protection (blocked or braced) for heavy and/or sharp objects?	☐	☑
Is the waste consistent with the TRUCON Code?	☑	☐

Comments: N/A

Visual Examination Operator 1:
Anthony Hardy (Print Name) — Signature — 9-24-15 (Date)

Visual Examination Operator 2:
Jason Cole (Print Name) — Signature — 9-24-15 (Date)

Attachment 2 – Visual Examination Independent Technical Reviewer Checklist

Batch Data Report No.: ORAILRHVE15008

1. Were data generation and reduction conducted in a technically correct manner in accordance with the methods (procedure) used?	☐ NO	☑ YES
2. Was the correct revision of the operating procedure used?	☐ NO	☑ YES
3. Has the data been reviewed for errors?	☐ NO	☑ YES
4. Are BDR contents complete and do they match CCP waste VE Batch Data report Table of Contents?	☐ NO	☑ YES
5. Does the testing batch report include VE for up to 20 containers?	☐ NO	☑ YES
6. Is all data signed and dated in reproducible ink by the individual(s) generating it?	☐ NO	☑ YES
7. Is all data recorded clearly, legibly, and accurately?	☐ NO	☑ YES
8. Were changes made to original data? If NO, proceed to question 11.	☑ NO	☐ YES
9. Have all changes made to original data been lined out, initialed and dated by the individual making the changes?	☐ NO	☐ YES
10. Were the data changes made by the individual who originally collected the data or by an equally qualified individual?	☐ NO	☐ YES
11. Is there an adequate written description of the contents of each container?	☐ NO	☑ YES
12. Was VE of each container performed by at least two qualified VEO's or was an Audio/Video recording properly prepared for each container?	☐ NO	☑ YES
13. Has each container in this BDR been evaluated for the presence of prohibited wastes?	☐ NO	☑ YES
14. Did the physical form of the waste match the waste matrix code and waste stream description?	☐ NO	☑ YES
15. Was an NCR required at the data generation level? If NO, proceed to question 17.	☑ NO	☐ YES
16. Is a copy of the NCR included in the BDR?	☐ NO	☐ YES
17. Have the RH Quality Assurance Objectives (QAOs) for VE been met? **Precision** – Precision is maintained by reconciling any discrepancies between two operators (or between the operator and the Independent Technical Reviewer) with regard to the identification of important waste characteristics (i.e., physical form of the waste and absence of prohibited liquids) within a single container. **Accuracy** – Accuracy is maintained by requiring operators to pass a comprehensive examination with a score of 80% and demonstrate satisfactory performance in the presence of the VE expert during their initial qualification and subsequent requalification. **Representativeness** – The contents placed in a container will be described on the data forms.	☐ NO	☑ YES

Attachment 2 – Visual Examination Independent Technical Reviewer Checklist (Continued)

Batch Data Report No.: ORNLRHVE15008

Completeness – The relevant waste information must be collected. This information must be documented on a videotape and/or data form, or other unalterable media. **Comparability** – Comparability is ensured by the characterization program meeting the training requirements and complying with the minimum standards used to implement this characterization process. In some instances, waste will be contained in opaque containers and not all items will be visible to the operator (e.g., sealed paint cans or 5-gallon buckets). If these containers are not opened during VE, source documents must be available in the AK record that allow the operator to identify the contents of the closed containers.		
Comments: N/A		
Independent Technical Reviewer Derek Matheny Printed Name	Signature	9/24/15 Date

DIVIDER PAGE ONLY

Not part of page count

Attachment 2 – CCP Records Transmittal/Receiving Form

CCP Records / Records Custodian, 4021 National Parks Highway - MS: GSA 212, Carlsbad, New Mexico 88220

Telephone Number: 575-234-7523

Fax Number: 575-234-7033

Attn:	Linda Castro	From:	David W. Moody
Ship to:	CCP Records	Site:	ORNL RH
	4021 National Parks Hwy	Company:	NWP
	MS:GSA:212	Telephone Number:	303-963-5036
	Carlsbad NM 88220	Date Sent:	28 September 2015

Telephone Number: 575-234-7130

Document Number	Title / Description	Record Date	Total Pages
ORNLRHVE15008	SPM Checklist for ORNL RH VE BDR ORNLRHVE15008	28 Sept 2015	1
	NA		

Comments

None

(When the Record accepted line has been completed, the rest of the page below may be left blank.)

Acceptance/Rejection Signature and Date

Records Accepted ☒	Linda Castro (Signature)	Linda Castro (Printed Name)	09/28/15 (Date)
Records Rejected ☐	_____ (Signature)	_____ (Printed Name)	_____ (Date)

Reason for Rejection:

Re-submittal:

_____ (Signature)	_____ (Printed Name)	_____ (Date)

****
*** Send Results ***
****

Sending is complete.

Job No.	2277
Address	913038432208
Name	DENVER SPMS
Start Time	09/28 01:10 PM
Call Length	00'17
Sheets	1
Result	OK

Controlled Copy

Attachment 2 – CCP Records Transmittal/Receiving Form

CCP Records / Records Custodian, 4021 National Parks Highway - MS: GSA 212, Carlsbad, New Mexico 88220

Telephone Number: 575-234-7523

Fax Number: 575-234-7033

Attn:	Linda Castro	From:	David W. Moody
Ship to:	CCP Records	Site:	ORNL RH
	4021 National Parks Hwy	Company:	NWP
	MS:GSA:212	Telephone Number:	303-963-5036
	Carlsbad NM 88220	Date Sent:	28 September 2015
Telephone Number:	575-234-7130		

Document Number	Title / Description	Record Date	Total Pages
ORNLRHVE15008	SPM Checklist for ORNL RH VE BDR ORNLRHVE15008	28 Sept 2015	1
	NA		

Comments

None

(When the Record accepted line has been completed, the rest of the page below may be left blank.)

Acceptance/Rejection Signature and Date

Records Accepted ☒	Linda Castro (Signature)	Linda Castro (Printed Name)	09/28/15 (Date)
Records Rejected ☐	(Signature)	(Printed Name)	(Date)

Attachment 2 – CCP Records Transmittal/Receiving Form

CCP Records / Records Custodian, 4021 National Parks Highway - MS: GSA 212, Carlsbad, New Mexico 88220

Telephone Number: 575-234-7523

Fax Number: 575-234-7033

Attn:	CCP RECORDS	From:	PATRICK SMITH II
Ship to:	CCP RECORDS CUSTODIAN	Site:	ORNL
	4021 NATIONAL PARKS HWY.	Company:	TFE INC.
	MS GSA 212	Telephone Number:	865-574-6002
	CARLSBAD, NM 88220-9082	Date Sent:	9-30-2015
Telephone Number:	575-234-7523		

Document Number	Title/Description	Record Date	Doc Pages
ORNLRHVE15008	RH VE BDR	9-24-2015	6
N/A	N/A	N/A	N/A
N/A	N/A	N/A	N/A
N/A	N/A	N/A	N/A
N/A	N/A	N/A	N/A
N/A	N/A	N/A	N/A

Comments

N/A

(When the Record accepted line has been completed, the rest of the page below may be left blank.)

Acceptance/Rejection Signature and Date

Records Accepted ☒	Linda Castro (Signature)	Linda Castro (Printed Name)	10/04/15 (Date)
Records Rejected ☐	_____ (Signature)	_____ (Printed Name)	_____ (Date)

Reason for Rejection:

Re-submittal:	_____ (Signature)	_____ (Printed Name)	_____ (Date)

****
*** TX REPORT ***
****

TRANSMISSION OK

TX/RX NO	2583
DESTINATION TEL #	918655768703
DESTINATION ID	ORNL
ST. TIME	10/01 15:44
TIME USE	00'16
PAGES SENT	1
RESULT	OK

Attachment 2 – CCP Records Transmittal/Receiving Form

CCP Records / Records Custodian, 4021 National Parks Highway - MS: GSA 212, Carlsbad, New Mexico 88220

Telephone Number: 575-234-7523

Fax Number: 575-234-7033

Attn:	CCP RECORDS	From:	PATRICK SMITH II
Ship to:	CCP RECORDS CUSTODIAN	Site:	ORNL
	4021 NATIONAL PARKS HWY.	Company:	TFE INC.
	MS GSA 212	Telephone Number:	865-574-6002
	CARLSBAD, NM 88220-9082	Date Sent:	9-30-2015
Telephone Number:	575-234-7523		

ORNLRHVE15008	RH VE BDR	9-24-2015	6
N/A	N/A	N/A	N/A
N/A	N/A	N/A	N/A
N/A	N/A	N/A	N/A
N/A	N/A	N/A	N/A
N/A	N/A	N/A	N/A

N/A

(When the Record accepted line has been completed, the rest of the page below may be left blank.)
Acceptance/Rejection Signature and Date

Attachment 3 – Visual Examination Site Project Manager Checklist

Batch Data Report No.: ORNLRHVE16001

1. Has all the data received an independent technical review as evidenced by a completed checklist (Attachment 2) and the appropriate ITR signature?		☐ NO	☒ YES
2. Are BDR contents complete and match the Visual Examination Batch Data Report Table of Contents?		☐ NO	☒ YES
3. Is the BDR complete (appropriately filled in forms for each container)?		☐ NO	☒ YES
4. Have the RH Quality Assurance Objectives (QAOs) for VE been met?			
Precision – reconciled discrepancies between operators		☐ NO	☒ YES
Accuracy – trained operators		☐ NO	☒ YES
Representativeness – description of container contents		☐ NO	☒ YES
Completeness – completed data form and/or recording		☐ NO	☒ YES
Comparability – proper training and adequate AK for unopened containers		☐ NO	☒ YES
5. Were NCRs generated included in the BDR?	☐ NO	☐ YES	☒ N/A

Comments: None

SPM:

David W. Moody
Printed Name

David W Moody
Signature

20 January 2016
Date

CCP RECORDS ORIGINAL
DATE REC'D 1/20/2016 JH.

Attachment 4 – Visual Examination Batch Data Report Cover Sheet

Batch Data Report No.: ORNLRHVE16001 Date: 1-19-16

	Waste Container ID Number:
1	ORRH00734
2	
3	
4	
5	
6	
7	
8	
9	
10	
11	
12	
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14	
15	
16	
17	
18	
19	
20	

1-19-16 N/A

NTPC RECORDS ORIGINAL.
DATE REC'D 1-20-2016

Attachment 5 – Visual Examination Batch Data Report Table of Contents

Batch Data Report No.: ORNLRHVE16001 Date: 1-19-16

Item	Description	Page No.
1	Visual Examination Batch Data Report Cover Sheet (Attachment 4)	1
2	Visual Examination Batch Data Report Table of Contents (Attachment 5)	2
3	Visual Examination Data Forms (Attachment 1)	3
4	Visual Examination Independent Technical Reviewer Checklist (Attachment 2)	5
5	Copy of NCRs (N/A [if not applicable])	N/A

Attachment 1 – Visual Examination Data Form

Site ID: RH ORNL			
Examination Date: 1-19-16		Batch Number: ORNLRHVE 16001	
Procedure #: CCP-TP-500		Revision #: 15	Video #: N/A
Recording Equipment Check: ☐SAT ☐UNSAT ☑N/A		Recording Start: N/A	Recording Stop: N/A
Inspection of Container to be loaded during VE: ☑SAT ☐UNSAT			
Indirect load Container ☑N/A		Final Output Container ☐N/A	
Container ID Number:		Container ID Number: ORRH00734	
Container Type:		Container Type: 55 gal. drum	
Waste Matrix Code:		Waste Matrix Code: S5400	
Waste Stream:		Waste Stream: OR-REDC-RH-HET	
		Poly Rigid Liner: ☐Y ☑N Thickness: N/A	Poly Rigid Liner Lid: ☐Y ☑N
		Poly Rigid Liner Vented or Hole Size: N/A	
Percent Fill:	Percent Organic Waste:	Percent Fill: 100	Percent Organic Waste: 30
Layers of Confinement:	Closure Method:	Layers of Confinement: 0	Closure Method: N/A

Comments (e.g., filter information, NCRs):

NUCFIL-019DSFK825 CASK#X10C9802684

Waste Description:

Super sack (P)
Cardboard liner (C)
Metal cans (1M)
Metal Lids (1M)
plastic Lids (P)
cheesecloth (C)
glass vials (0IM)
broken glass (0IM)
String (C)
poly blocks (P)
Metal pieces (1M)
Floor sweepings (1M)(P)(C)(0IM)
rubber hose (R)
electrical cord (1M)(0IM)(P)(C)

Attachment 1 – Visual Examination Data Form (continued)

Container ID Number ORAH00734

Prohibited Item(s) Summary	YES	NO
Does the container have observable liquid equal to or greater than 1 percent by volume of the outermost container at the time of RTR or VE?	☐	☑
Does the container have observable liquid more than 60 milliliters or 3 percent by volume, whichever is greater in an internal container?	☐	☑
Does the container have observable liquid with an EPA hazardous waste number (HWN) U134 assigned?	☐	☑
Does the container have observable liquid containing PCBs?	☐	☑
Is there an indication of non-radionuclide pyrophoric materials, such as elemental potassium?	☐	☑
Is there an indication of hazardous wastes not occurring as co-contaminants with TRU mixed wastes (non-mixed hazardous wastes)?	☐	☑
Is there an indication of wastes incompatible with backfill, seal and panel closures materials, container and packaging materials, shipping container materials, or other wastes (i.e., waste does **NOT** match Table of Allowable Materials for RH-TRU Waste in the RH-TRAMPAC)?	☐	☑
Is there an indication of wastes containing explosives or compressed gases?	☐	☑
Is there an indication of polychlorinated biphenyls (PCBs) not authorized under an EPA PCB waste disposal authorization?	☐	☑
Is there an indication of the waste exhibiting the characteristic of ignitability, corrosivity, or reactivity (EPA Hazardous Waste Numbers of D001, D002, or D003)?	☐	☑
Is the physical form of the waste inconsistent with the Waste Stream Description or the Waste Matrix Code?	☐	☑
RH-72B Criteria		
Were there Non-approved Closure Methods used on liner bags or inner bags greater than 4 liters?	☐	☑
Are there sealed containers GREATER than 4 liters or heat sealed bags **NOT** defined in the applicable TRUCON Code?	☐	☑
Are there indications of inadequate protection (blocked or braced) for heavy and/or sharp objects?	☐	☑
Is the waste consistent with the TRUCON Code?	☑	☐
Comments: N/A		
Visual Examination Operator 1: Gilbert Gutierrez (Print Name) — Signature — 1-19-16 (Date)		
Visual Examination Operator 2: Anthony Harley (Print Name) — Signature — 1-19-16 (Date)		

Attachment 2 – Visual Examination Independent Technical Reviewer Checklist

Batch Data Report No.: ORNLRHVE160001

1. Were data generation and reduction conducted in a technically correct manner in accordance with the methods (procedure) used?	☐ NO	☑ YES
2. Was the correct revision of the operating procedure used?	☐ NO	☑ YES
3. Has the data been reviewed for errors?	☐ NO	☑ YES
4. Are BDR contents complete and do they match CCP waste VE Batch Data report Table of Contents?	☐ NO	☑ YES
5. Does the testing batch report include VE for up to 20 containers?	☐ NO	☑ YES
6. Is all data signed and dated in reproducible ink by the individual(s) generating it?	☐ NO	☑ YES
7. Is all data recorded clearly, legibly, and accurately?	☐ NO	☑ YES
8. Were changes made to original data? If NO, proceed to question 11.	☑ NO	☐ YES
9. Have all changes made to original data been lined out, initialed and dated by the individual making the changes?	☐ NO	☐ YES
10. Were the data changes made by the individual who originally collected the data or by an equally qualified individual?	☐ NO	☐ YES
11. Is there an adequate written description of the contents of each container?	☐ NO	☑ YES
12. Was VE of each container performed by at least two qualified VEO's or was an Audio/Video recording properly prepared for each container?	☐ NO	☑ YES
13. Has each container in this BDR been evaluated for the presence of prohibited wastes?	☐ NO	☑ YES
14. Did the physical form of the waste match the waste matrix code and waste stream description?	☐ NO	☑ YES
15. Was an NCR required at the data generation level? If NO, proceed to question 17.	☑ NO	☐ YES
16. Is a copy of the NCR included in the BDR?	☐ NO	☐ YES
17. Have the RH Quality Assurance Objectives (QAOs) for VE been met? **Precision** – Precision is maintained by reconciling any discrepancies between two operators (or between the operator and the Independent Technical Reviewer) with regard to the identification of important waste characteristics (i.e., physical form of the waste and absence of prohibited liquids) within a single container. **Accuracy** – Accuracy is maintained by requiring operators to pass a comprehensive examination with a score of 80% and demonstrate satisfactory performance in the presence of the VE expert during their initial qualification and subsequent requalification. **Representativeness** – The contents placed in a container will be described on the data forms.	☐ NO	☑ YES

Attachment 2 – Visual Examination Independent Technical Reviewer Checklist (Continued)

Batch Data Report No.: ORNLRHVE16001

Completeness – The relevant waste information must be collected. This information must be documented on a videotape and/or data form, or other unalterable media. **Comparability** – Comparability is ensured by the characterization program meeting the training requirements and complying with the minimum standards used to implement this characterization process. In some instances, waste will be contained in opaque containers and not all items will be visible to the operator (e.g., sealed paint cans or 5-gallon buckets). If these containers are not opened during VE, source documents must be available in the AK record that allow the operator to identify the contents of the closed containers.		

Comments: N/A

Independent Technical Reviewer		
Derek Matheny		1/20/16
Printed Name	Signature	Date

DIVIDER PAGE ONLY

NOT PART OF PAGE COUNT

Attachment 2 – CCP Records Transmittal/Receiving Form

CCP Records / Records Custodian, 4021 National Parks Highway - MS: GSA 212, Carlsbad, New Mexico 88220

Telephone Number: 575-234-7523

Fax Number: 575-234-7033

Attn:	Jewell Yturralde	From:	David W. Moody
Ship to:	CCP Records	Site:	ORNL RH
	4021 National Parks Hwy	Company:	NWP
	MS:GSA:212	Telephone Number:	303-963-5036
	Carlsbad, NM 88220	Date Sent:	20 January 2016
Telephone Number:	575-234-7514		

Document Number	Title / Description	Record Date	Total Pages
ORNLRHVE16001	SPM Checklist for ORNL RH VE BDR: ORNLRHVE16001	20 Jan 2016	1
	NA		

Comments

None

(When the Record accepted line has been completed, the rest of the page below may be left blank.)
Acceptance/Rejection Signature and Date

	Signature	Printed Name	Date
Records Accepted ☑	[signature]	Jewell Yturralde	1/20/2016
Records Rejected ☐			

Reason for Rejection:

Re-submittal:

Signature	Printed Name	Date

```
**********************************
***        Send Results        ***
**********************************

Sending is complete.

Job No.                    3916
Address                    912085333935
Name
Start Time                 01/20 10:17 AM
Call Length                00'45
Sheets                     1
Result                     OK
```


Attachment 2 – CCP Records Transmittal/Receiving Form

CCP Records / Records Custodian, 4021 National Parks Highway - MS: GSA 212, Carlsbad, New Mexico 88220

Telephone Number: 575-234-7523

Fax Number: 575-234-7033

Attn:	Jewell Yturralde	From:	David W. Moody
Ship to:	CCP Records	Site:	ORNL RH
	4021 National Parks Hwy	Company:	NWP
	MS:GSA:212	Telephone Number:	303-963-5036
	Carlsbad, NM 88220	Date Sent:	20 January 2016
Telephone Number:	575-234-7514		

Document Number	Title / Description	Record Date	Total Pages
ORNLRHVE16001	SPM Checklist for ORNL RH VE BDR: ORNLRHVE16001	20 Jan 2016	1
	NA		

Comments

None

(When the Record accepted line has been completed, the rest of the page below may be left blank.)
Acceptance/Rejection Signature and Date:

Records Accepted [√] Signature Jewell Yturralde 1/20/2016a
Printed Name Date

Attachment 1 – CCP Nonconformance Report (NCR)

CCP NONCONFORMANCE REPORT (NCR)

(Use NCR Continuation, Attachment 3, if necessary)

NCR No. NCR-ORNL-0123-15 Revision 1

1. Lot No., Heat No., or Serial No. (if applicable): N/A	2. Process (e.g., NDA, NDE, VE, Other): NDE	3. Batch Data Report #(s): OR-RTR7-0131
4. Order/Work Order/Job Control Number (if applicable): N/A	5. PO # (if applicable): N/A	Container #(s): X10C0402870R
	6. Supplier (if applicable): N/A	

DESCRIPTION OF NONCONFORMANCE

7a. NCR Description: ☐ < 100 nCi/g ☒ Prohibited Item ☐ E-Flag ☐ Receipt Inspection ☐ Transportation ☐ WWIS/WDS ☐ Other

7b. *Requirement(s) (Enter Implementing Procedure No., Revision, Section No., & Quoted Text):*
CCP-TP-053, Standard Real Time Radiography (RTR) Inspection Procedure, Rev. 15, Section 4.4.3 [A] states in part "Using Table 1, Prohibited Items, as a reference, confirm there are **NO** prohibited items in the waste container. **IF** any nonconforming/prohibited items are noted during the RTR examination, **THEN** perform the following:" Initiate an NCR in accordance with CCP-QP-005, CCP *TRU Nonconforming Item Reporting and Control.* Table 1, Prohibited Items, in part, "Internal containers with more than 60 milliliters or 3 percent by volume observable liquid, whichever is greater, are prohibited."

7c. Actual Condition: 500 ML. of prohibited liquid in a plastic container at 10".
NCR was revised to correct container number from X10C0402780R to X10C0402870R

7d. Have the CCP HOLD TAGS associated with this NCR been applied? ☒ YES ☐ NO If no is checked, explain:

8. NCR Originator:
Eric Lyles (printed name) — signature — 4/27/15 (date)

9. Does the identified condition have the potential to impact AK? If YES or INDETERMINATE, enter Trend Code L in Block 10. ☐ YES ☒ NO ☐ INDETERMINATE

10. Trend Code: **K**	11. Responsible Manager: **Fred Oney**
12. Significant Condition? ☐ YES ☒ NO (If Yes, enter WIPP Form No.):	13. Recurring Condition? ☐ YES ☒ NO (If Yes, list NCRs and WIPP Forms):

14. QA Engineer or QA Designee validation:
Daphne Brothers (printed name) — signature — 4-27-15 (date)

COPY

28

Attachment 1 – CCP Nonconformance Report (NCR) (Continued)

NCR No. NCR-ORNL-0123-15 Revision 1

INTERIM DISPOSITION

15a. Interim Disposition (Check Only One):

☒ N/A (See Final Disposition) ☐ Hold ☐ Conditionally Accept ☐ Conditionally Use

☐ Sort ☐ Reinspect or Retest ☐ Remediate

15b. Instructions for Completion of the Interim Disposition:

INTERIM DISPOSITION APPROVALS

16a. Responsible Manager or Individual:

printed name signature date

16b. QA Engineer or QA Designee:

printed name signature date

Additional Approval:

printed name signature date

Additional Approval:

printed name signature date

COMPLETION OF INTERIM DISPOSITION

17. Interim Disposition Complete – Responsible Manager or Individual:

printed name signature date

18. Interim Disposition Verified – QA Engineer:

printed name signature date

COPY

Attachment 1 – CCP Nonconformance Report (NCR) (Continued)

NCR No. NCR-ORNL-0123-15 Revision 1

FINAL DISPOSITION

19. Final Disposition (Check Only One: Use-As-Is, Repair, Reject, Rework, or Scrap):
☐ Use-As-Is ☐ Repair

19a. Technical Justification – Required for Use-As-Is or Repair dispositions. [☒ N/A for Reject, Rework, or Scrap]

☒ Reject ☐ Rework ☐ Scrap

19b. Instructions for Completion – Required for Reject, Repair, Rework, or Scrap [☐ N/A for Use-As-Is]
Return to Host Site for prohibited item remediation.

19c. Corrective Actions (Actions to Prevent Recurrence – For Repair or Rework, if applicable.
[☒ N/A if not applicable, and for Use-As-Is, Reject, and Scrap]

FINAL DISPOSITION APPROVALS

20. Responsible Manager or Individual:

Fred Oney	FO	4-27-15
printed name	signature	date

21. QA Engineer or QA Designee:

Daphne Brothers	Daphne D Brothers	4-27-15
printed name	signature	date

Additional Approval:

printed name	signature	date

Additional Approval:

printed name	signature	date

CLOSURE

22. Final Disposition Complete - Responsible Manager or Individual:

printed name	signature	date

23. Attachments:

24a. HOLD TAG removal has been verified and reconciled for all nonconforming items on the NCR: ☐
24b. If HOLD TAG is not applicable, check: ☐ and explain:

25. Final Disposition Verified – NCR Closed QA Engineer:

printed name	signature	date

COPY

Attachment 1 – CCP Nonconformance Report (NCR)

CCP NONCONFORMANCE REPORT (NCR)

(Use NCR Continuation, Attachment 3, if necessary)

NCR No. NCR-ORNL-0123-15 Revision 0

1. Lot No., Heat No., or Serial No. (if applicable): N/A	2. Process (e.g., NDA, NDE, VE, Other): NDE	3. Batch Data Report #(s): OR-RTR7-0131
4. Order/Work Order/Job Control Number (if applicable): N/A	5. PO # (if applicable): N/A	Container #(s): X10C0402780R
	6. Supplier (if applicable): N/A	

DESCRIPTION OF NONCONFORMANCE

7a. NCR Description: ☐ < 100 nCi/g ☒ Prohibited Item ☐ E-Flag ☐ Receipt Inspection ☐ Transportation ☐ WWIS/WDS ☐ Other

7b. Requirement(s) (Enter Implementing Procedure No., Revision, Section No., & Quoted Text):
CCP-TP-053, Standard Real Time Radiography (RTR) Inspection Procedure, Rev. 15, Section 4.4.3 [A] states in part "Using Table 1, Prohibited Items, as a reference, confirm there are **NO** prohibited items in the waste container. **IF** any nonconforming/prohibited items are noted during the RTR examination, **THEN** perform the following:" Initiate an NCR in accordance with CCP-QP-005, CCP *TRU Nonconforming Item Reporting and Control*. Table 1, Prohibited Items, in part, "Internal containers with more than 60 milliliters or 3 percent by volume observable liquid, whichever is greater, are prohibited."

7c. Actual Condition: 500 ML. of prohibited liquid in a plastic container at 10"

7d. Have the CCP HOLD TAGS associated with this NCR been applied? ☒ YES ☐ NO If no is checked, explain:

8. NCR Originator:
Eric Lyles (printed name) — signature — 4/22/15 (date)

9. Does the identified condition have the potential to impact AK? If YES or INDETERMINATE, enter Trend Code L in Block 10. ☐ YES ☒ NO ☐ INDETERMINATE

10. Trend Code: K	11. Responsible Manager: **Fred Oney**
12. Significant Condition? ☐ YES ☒ NO (If Yes, enter WIPP Form No.):	13. Recurring Condition? ☐ YES ☒ NO (If Yes, list NCRs and WIPP Forms):

14. QA Engineer or QA Designee validation:
Daphne Brothers (printed name) — signature — 4-23-15 (date)

SUPERSEDED BY REV 1 — dcvh 4/27/15

SUPERSEDED BY REV — dcvh 4/27/15

COPY

30A

Attachment 1 – CCP Nonconformance Report (NCR) (Continued)

NCR No. NCR-ORNL-0123-15 Revision 0

INTERIM DISPOSITION

15a. Interim Disposition (Check Only One):
☒ N/A (See Final Disposition) ☐ Hold ☐ Conditionally Accept ☐ Conditionally Use
☐ Sort ☐ Reinspect or Retest ☐ Remediate

15b. Instructions for Completion of the Interim Disposition:

INTERIM DISPOSITION APPROVALS

16a. Responsible Manager or Individual:

printed name signature date

16b. QA Engineer or QA Designee:

printed name signature date

Additional Approval:

printed name signature date

Additional Approval:

printed name signature date

COMPLETION OF INTERIM DISPOSITION

17. Interim Disposition Complete – Responsible Manager or Individual:

printed name signature date

18. Interim Disposition Verified – QA Engineer:

printed name signature date

COPY

30 B

Attachment 1 – CCP Nonconformance Report (NCR) (Continued)

NCR No. NCR-ORNL-0123-15 Revision 0

FINAL DISPOSITION

19. Final Disposition (Check Only One: Use-As-Is, Repair, Reject, Rework, or Scrap):
☐ Use-As-Is ☐ Repair

19a. Technical Justification – Required for Use-As-Is or Repair dispositions. [☒ N/A for Reject, Rework, or Scrap]

☒ Reject ☐ Rework ☐ Scrap

19b. Instructions for Completion – Required for Reject, Repair, Rework, or Scrap [☐ N/A for Use-As-Is]
Return to Host Site for prohibited item remediation.

19c. Corrective Actions (Actions to Prevent Recurrence – For Repair or Rework, if applicable.
[☒ N/A if not applicable, and for Use-As-Is, Reject, and Scrap]

FINAL DISPOSITION APPROVALS

20. Responsible Manager or Individual:

Fred Oney		4-23-15
printed name	signature	date

21. QA Engineer or QA Designee:

Daphne Brothers		4-23-15
printed name	signature	date

Additional Approval:

printed name	signature	date

Additional Approval:

printed name	signature	date

CLOSURE

22. Final Disposition Complete - Responsible Manager or Individual:

printed name	signature	date

23. Attachments:

24a. HOLD TAG removal has been verified and reconciled for all nonconforming items on the NCR: ☐
24b. If HOLD TAG is not applicable, check: ☐ and explain:

25. Final Disposition Verified – NCR Closed QA Engineer:

printed name	signature	date

COPY

30C

Attachment 3 – CCP Radiography Independent Technical Reviewer Checklist

Batch Data Report No.: OR-RTR7-0131

Description			
1.	Were data generation and reduction conducted in a technically correct manner in accordance with the methods used?	☐ NO	☑ YES
2.	Was the correct revision of the procedure used? Procedure: CCP-TP-053 Rev.: 15	☐ NO	☑ YES
3.	Are the WMPs entered correctly?	☐ NO	☑ YES
4.	Do the estimated weights in Section 4 of Attachment 2 equal the container gross weight?	☐ NO	☑ YES
5.	Is the data reported in the proper units with the correct number of significant figures (e.g., one tenth of a kilogram)?	☐ NO	☑ YES
6.	Was transcription used? If no, proceed to question 7.	☑ NO	☐ YES
	6a. Has the data been verified for transcription errors?	☐ NO	☐ YES
7.	Does the Testing Batch Report include radiography for up to 20 containers?	☐ NO	☑ YES
8.	Are BDR contents complete and do they match the CCP Waste RTR Batch *Data Report Table of Contents*?	☐ NO	☑ YES
9.	Is all the data signed and dated in reproducible ink and by the individual(s) generating it?	☐ NO	☑ YES
10.	Is all data recorded clearly, legibly, and accurately?	☐ NO	☑ YES
11.	Have changes been made to original data? If no, proceed to question 12.	~~☑ NO~~ LO 4-27-15	☑ YES LO 4-27-15
	11a. Have all changes to original data been lined out, initialed and dated by the individual making the changes?	☐ NO	☑ YES
	11b. Was justification made for changing the original data?	☐ NO	☑ YES
	11c. Were data changes made by the individual who originally collected the data?	☐ NO	☑ YES
12.	Does the waste match the Waste Matrix Code and Waste Stream description?	☐ NO	☑ YES
13.	Are the RTR Operator's decisions regarding the Radiography documented?	☐ NO	☑ YES
14.	Is there an adequate written description of the contents of each item?	☐ NO	☑ YES
15.	Was the video/audio recording media properly prepared and labeled for each waste container?	☐ NO	☑ YES
16.	Was the video/audio recording media check performed satisfactorily and recorded on Attachment 1?	☐ NO	☑ YES

Attachment 3 – CCP Radiography Independent Technical Reviewer Checklist (Continued)

Batch Data Report No.: OR-RTR7-0131

Description		
17. Was the Image Test performed satisfactorily and recorded on Attachment 1?	☐ NO	☑ YES
18. Was the Replicate Scan performed and recorded on an Attachment 2?	☐ NO	☑ YES
19. Was the Replicate Scan RTR Operator different from the first RTR Operator?	☐ NO	☑ YES
20. Did the Replicate Scan RTR Operator and the first RTR Operator agree on the results?	☐ NO	☑ YES
21. Was the Independent Observation performed and recorded on an Attachment 2?	☐ NO	☑ YES
22. Was the Independent Observation RTR Operator different from the first RTR Operator?	☐ NO	☑ YES
23. Did the Independent Observation RTR Operator and the first RTR Operator agree on the results?	☐ NO	☑ YES
24. Was the data collection performed by qualified individuals?	☐ NO	☑ YES
25. Were NCRs initiated as required at DGL? If no, proceed to question 26.	☐ NO	☑ YES
25a. Have the NCR(s) associated with RTR been included in the BDR?	☐ NO	☑ YES
26. Is the RTR examination for CH waste? If no, proceed to question 27.	☐ NO	☑ YES
26a. Have the CH Quality Assurance Objectives (QAOs) been met (if applicable)? Precision – Precision is maintained by reconciling any discrepancies between two radiography operators with regard to identification of the waste matrix code, liquids in excess of TSDF-WAC limits, and compressed gases through independent replicate scans and independent observations. Additionally, the precision of radiography is verified prior to use by tuning precisely enough to demonstrate compliance with QAOs through viewing an image test pattern. Accuracy – Accuracy is obtained by using a target to tune the image for maximum sharpness and by requiring operators to successfully identify 100 percent of the items required to meet the DQOs for radiography specified in CCP-PO-001, Section C-4a(1) in a training container during their initial qualification and subsequent requalification. Completeness – A video and audio media recording of the radiography examination and a validated radiography data form will be obtained for 100 percent of the waste containers subject to radiography. All video and audio media recordings and radiography data forms will be subject to validation as indicated in CCP-PO-001, Section C3-4. Comparability – The comparability of radiography data from different operators shall be enhanced by using standardized radiography procedures and operator qualifications.	☐ NO	☑ YES

Attachment 3 – CCP Radiography Independent Technical Reviewer Checklist (Continued)

Batch Data Report No.: OR-RTR7-0131

Description		
27. Is the RTR examination for RH waste? If no, proceed to comment section.	☑ NO	☐ YES
27a. Have the RH QAOs been met (if applicable)? Precision – Precision is maintained by reconciling any discrepancies between two operators (during Independent Observation and Replicate scans) with regard to the identification of important waste characteristics (i.e., physical form of the waste and absence of prohibited liquids) within a single container. Accuracy – Accuracy is obtained by using a target to tune the image for maximum sharpness and by requiring operators to successfully identify prohibited liquid in a training container during their initial qualification and subsequent requalification. Representativeness – All of the relevant contents in a container selected for radiography will be described. Completeness – All of the relevant waste information must be assembled and must show that each of the containers in the waste stream belongs to the waste stream. This information must be documented on videotape or other equivalent media and data form. Comparability – Comparability is ensured by meeting the program training requirements and complying with the minimum standards used to implement the radiography process.	☐ NO	☐ YES

Comments: N/A

I have reviewed 100% of the container specific and batch data in this report and find it acceptable.

Independent Technical Reviewer:

Printed Name	Signature	Date
Fred Olney		4-23-15

4-27-15

DIVIDER PAGE ONLY

NOT PART OF PAGE COUNT

Attachment 2 – CCP Records Transmittal/Receiving Form

CCP Records / Records Custodian, 4021 National Parks Highway - MS: GSA 212, Carlsbad, New Mexico 88220

Telephone Number: 575-234-7523

Fax Number: 575-234-7033

Attn:	CCP RECORDS	From:	PATRICK SMITH II
Ship to:	CCP RECORDS CUSTODIAN	Site:	ORNL
	4021 NATIONAL PARKS HWY.	Company:	TFE INC.
	MS GSA 212	Telephone Number:	865-574-6002
	CARLSBAD, NM 88220-9082	Date Sent:	4-29-2015
Telephone Number:	575-234-7523		

Document Number	Title/Description	Record Date	Total Pages
OR-RTR7-0131	RTR DVD (DISK B)	4-22-2015	N/A
N/A	N/A	N/A	N/A
N/A	N/A	N/A	N/A
N/A	N/A	N/A	N/A
N/A	N/A	N/A	N/A
N/A	N/A	N/A	N/A

Comments

N/A

(When the Record accepted line has been completed, the rest of the page below may be left blank.)

Acceptance/Rejection Signature and Date

Records Accepted ☑	Greta Leos	Greta Leos	5-04-15
	Signature	Printed Name	Date
Records Rejected ☐			
	Signature	Printed Name	Date

Reason for Rejection:

Re-submittal:

Signature	Printed Name	Date

****
*** Send Results ***
****

Sending is complete.

Job No.	3972
Address	918655768703
Name	ORNL
Start Time	05/04 01:54 PM
Call Length	00'19
Sheets	1
Result	OK

Attachment 2 – CCP Records Transmittal/Receiving Form

CCP Records / Records Custodian, 4021 National Parks Highway - MS: GSA 212, Carlsbad, New Mexico 88220

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Telephone Number:	575-234-7523		

Document Number	Title/Description	Record Date	Page Count
OR-RTR7-0131	RTR DVD (DISK B)	4-22-2015	N/A
N/A	N/A	N/A	N/A
N/A	N/A	N/A	N/A
N/A	N/A	N/A	N/A
N/A	N/A	N/A	N/A
N/A	N/A	N/A	N/A

Comments

N/A

(When the Record accepted line has been completed, the rest of the page below may be left blank.)
Acceptance/Rejection Signature and Date

Records Accepted ☑ Signature Greta Leos Printed Name 5-04-15 Date

Records Rejected ☐

Attachment 2 – CCP Records Transmittal/Receiving Form

CCP Records / Records Custodian, 4021 National Parks Highway - MS: GSA 212, Carlsbad, New Mexico 88220

Telephone Number: 575-234-7523

Fax Number: 575-234-7033

Attn:	CCP RECORDS	From:	PATRICK SMITH II
Ship to:	CCP RECORDS CUSTODIAN	Site:	ORNL
	4021 NATIONAL PARKS HWY.	Company:	TFE INC.
	MS GSA 212	Telephone Number:	865-574-6002
	CARLSBAD, NM 88220-9082	Date Sent:	5-7-2015
Telephone Number:	575-234-7523		

Document Number	Title / Description	Record Date	Total Pages
OR-RTR7-0131	RTR BDR	4-22-2015	36
OR-RTR7-0131	RTR DVD (DISK A)	4-22-2015	N/A
N/A	N/A	N/A	N/A
N/A	N/A	N/A	N/A
N/A	N/A	N/A	N/A
N/A	N/A	N/A	N/A

Comments:

N/A

(When the Record accepted line has been completed, the rest of the page below may be left blank.)

Acceptance/Rejection Signature and Date

Records Accepted ☑	Signature	Greta Leos Printed Name	5-11-15 Date
Records Rejected ☐	Signature	Printed Name	Date

Reason for Rejection:

Re-submittal:	Signature	Printed Name	Date

```
**********************************
***        Send Results        ***
**********************************

Sending is complete.

Job No.          4455
Address          918655768703
Name             ORNL
Start Time       05/11 01:29 PM
Call Length      00'20
Sheets           1
Result           OK
```

Controlled Copy

CCP-QP-008, Rev. 24
CCP Records Management

Effective Date: 02/10/2015

Attachment 2 – CCP Records Transmittal/Receiving Form

CCP Records / Records Custodian, 4021 National Parks Highway - MS: GSA 212; Carlsbad, New Mexico 88220

Telephone Number: 575-234-7523

Fax Number: 575-234-7033

Attn:	CCP RECORDS	From:	PATRICK SMITH II
Ship to:	CCP RECORDS CUSTODIAN	Site:	ORNL
	4021 NATIONAL PARKS HWY.	Company:	TFE INC.
	MS GSA 212	Telephone Number:	865-574-6002
	CARLSBAD, NM 88220-9082	Date Sent:	5-7-2015
Telephone Number:	575-234-7523		

Document Number	Title/Description	Record Date	Number of Pages
OR-RTR7-0131	RTR BDR	4-22-2015	36
OR-RTR7-0131	RTR DVD (DISK A)	4-22-2015	N/A
N/A	N/A	N/A	N/A
N/A	N/A	N/A	N/A
N/A	N/A	N/A	N/A
N/A	N/A	N/A	N/A

Comments:

N/A

(When the Record accepted line has been completed, the rest of the page below may be left blank.)

Acceptance/Rejection Signature and Date

Records Accepted	☑	Greta Leos	Greta Leos	5-11-15
		Signature	Printed Name	Date
Records Rejected	☐			
		Signature	Printed Name	Date

GEN3

URS

CP:11:01531
UFC 5900 00

Washington TRU Solutions LLC

INTER-OFFICE CORRESPONDENCE

DATE: August 4, 2011

FROM: ~~G. R. Kirkes CRK~~ M. F. RAMIREZ MR 3-7-12 MR — LOCATION: Certification

TO: CCP Records Custodian GSA-212 — LOCATION: Retrieval, Characterization and Transportation

SUBJECT: TRANSMITTAL OF OAK RIDGE NATIONAL LABORATORY SITE WASTE STREAM PROFILE FORM FOR WASTE STREAM OR-ISTP-CH-HET

Please accept the attached Oak Ridge National Laboratory site Waste Stream Profile Form to be placed in Records for Waste Stream #OR-ISTP-CH-HET.

CRK:jmc

Attachment

cc: (without attachment)
M. Pearcy ED
W. Weyerman ED

COPY

CCP RECORDS ORIGINAL
DATE REC'D 3/7/12

Attachment 2 – CCP Waste Stream Profile Form

(1) Waste Stream Profile Number: OR-ISTP-CH-HET						
(2) Generator site name: Oak Ridge National Laboratory				(4)Technical contact: Beverly Schrock		
(3) Generator site EPA ID: TN1890090003				(6) Technical contact phone number: (575) 234-7444		
(5) Date of audit report approval by New Mexico Environment Department (NMED): April 24, 2008; April 23, 2009; August 12, 2010, June 17, 2011						
(7) Title, version number, and date of documents used for WAP Certification: CCP-PO-001, CCP Transuranic Waste Characterization Quality Assurance Project Plan, Revision 20, June 16, 2011, CCP-PO-002, CCP Transuranic Waste Certification Plan, Revision 26, July 14, 2011 CCP-PO-027 CCP/TRU Waste Processing Center/Oakridge National Laboratory Interface Document, Revision 3, December 29, 2010 CCP-AK-ORNL-008, Central Characterization Project Acceptable Knowledge Summary Report for Oak Ridge National Laboratory Isotopes Programs Contact-Handled Transuranic Waste, Waste Stream: OR-ISTP-CH-HET, Revision 0, July 06, 2010						
(8) Did your facility generate this waste?	YES	X	NO			
(9) If no, provide the name and EPA ID of the original generator: N/A						
Waste Stream Information[1]						
(10) WIPP ID: OR-ISTP-CH-HET				(11) Summary Category Group: S5000		
(12) Waste Matrix Code Group: Heterogeneous Debris Waste				(13) Waste Stream Name: Heterogeneous Debris Waste From Isotopes Production and Distribution		
(14) Description from the TWBIR: Waste consists of CH-TRU debris from isotopes production at ORNL.						
(15) Defense TRU Waste:	YES	X	NO			
(16) Check One:	CH	X	RH			
(17) Number of SWBs N/A	(18) Number of Drums 598 55-gallon drums			(19) Number of Canisters N/A		
(20) Batch Data Report numbers supporting this waste stream characterization: See Characterization Information Summary for correlation of containers identification numbers to batch data report numbers.						
(21) List applicable EPA Hazardous Waste Numbers:[2] D005, D006, D007, D008, D009, D011, D019, D022, F002, and F005						
(22) Applicable TRUCON Content Numbers: OR 125/225, SQ 154						
(23)**Acceptable Knowledge Information**[1]						
(For the following, enter the supporting documentation used [i.e., references and dates])						
Required Program Information						
(23A) Map of site: CCP-AK-ORNL-008, Revision 0, July 6, 2010, Figures 1, 2, 3 and 4						
(23B) Facility mission description: CCP-AK-ORNL-008, Revision 0, July 6, 2010, Section 4.2						
(23C) Description of operations that generate waste: CCP-AK-ORNL-008, Revision 0, July 6, 2010, Section 4.4						
(23D) Waste identification/categorization schemes: CCP-AK-ORNL-008, Revision 0, July 6, 2010, Section 4.5						
(23E) Types and quantities of waste generated: CCP-AK-ORNL-008, Revision 0, July 6, 2010, Section 4.6.1						
(23F) Correlation of waste streams generated from the same building and process, as applicable: CCP-AK-ORNL-008, Revision 0, July 6, 2010, Section 4.6.2						
(24) Waste certification procedures: CCP-TP-030, Revision 29, April 26, 2011						
(25)Required Waste Stream Information						
(25A) Area(s) and building(s) from which the waste stream was generated: CCP-AK-ORNL-008, Revision 0, July 6, 2010, Section 5.1						

(25B) Waste stream volume and time period of generation: CCP-AK-ORNL-008, Revision 0, July 6, 2010, Section 5.2			
(25C) Waste generating process description for each building: CCP-AK-ORNL-008, Revision 0, July 6, 2010, Section 5.3			
(25D) Waste Process flow diagrams: CCP-AK-ORNL-008, Revision 0, July 6, 2010, Figure 16 and 17			
(25E) Material inputs or other information identifying chemical/radionuclide content and physical waste form: CCP-AK-ORNL-008, Revision 0, July 6, 2010, Section 5.4			
(25F) Waste Material Parameter Weight Estimates per unit of waste: See Table 2 of the Summation of Aspects of AK Summary Report: Waste Stream OR-ISTP-CH-HET			
(26) Which Defense Activity generated the waste[3]: (check one)			
	Weapons activities including defense inertial confinement fusion		Naval Reactors development
	Verification and control technology		Defense research and development
	Defense nuclear waste and material by products management	X	Defense nuclear material production
	Defense nuclear waste and materials security and safeguards and security investigations		
(27)Supplemental Documentation			
(27A) Process design documents: See S1 AK#s on Attachment 1 to Summation of Aspects of AK Summary Report			
(27B) Standard operating procedures: See S2 AK#s on Attachment 1 to Summation of Aspects of AK Summary Report			
(27C) Safety Analysis Reports: See S3 AK#s on Attachment 1 to Summation of Aspects of AK Summary Report			
(27D) Waste packaging logs: See S4 AK#s on Attachment 1 to Summation of Aspects of AK Summary Report			
(28E) Test plans/research project reports: See S5 AK#s on Attachment 1 to Summation of Aspects of AK Summary Report			
(27F) Site databases: See S6 AK#s on Attachment 1 to Summation of Aspects of AK Summary Report			
(27G) Information from site personnel: See S7 AK#s on Attachment 1 to Summation of Aspects of AK Summary Report			
(27H) Standard industry documents: See S8 AK#s on Attachment 1 to Summation of Aspects of AK Summary Report			
(27I) Previous analytical data: See S9 AK#s on Attachment 1 to Summation of Aspects of AK Summary Report			
(27J) Material safety data sheets: See S10 AK#s on Attachment 1 to Summation of Aspects of AK Summary Report			
(27K) Sampling and analysis data from comparable/surrogate Waste: N/A			
(27L) Laboratory notebooks: See S11 AK#s on Attachment 1 to Summation of Aspects of AK Summary Report			
Confirmation Information[2]			
For the following, when applicable, enter procedure title(s), number(s) and date(s)			
(28)	Radiography: CCP-TP-053, Revision 11, July 20, 2011		
(29)	Visual Examination: N/A		

(30) Comments: For a list of the waste characterization procedures used and dates of the respective procedures see the list of procedures on the attached CIS.

Reviewed by AK Expert: YES [X] Date: 6-10-2011

Reviewed by STR (if necessary): YES [X] N/A [ ] Date: 6-22-2011

Waste Stream Profile Form Certification:

I hereby certify that I have reviewed the information in this Waste Stream Profile Form, and it is complete and accurate to the best of my knowledge. I understand that this information will be made available to regulatory agencies and that there are significant penalties for submitting false information, including the possibility of fines and imprisonment for knowing violations.

(31) BSSchrock	(32) Beverly Schrock	(33) 7-25-2011
Signature of Site Project Manager	Printed Name	Date

NOTE:
(1) Use back of sheet or continuation sheets, if required.
(2) If, radiography, visual examination were used to confirm EPA Hazardous Waste Numbers, attach signed Characterization Information Summary documenting this determination.
(3) This was also generated from naval reactors development, weapons activities including defense inertial confinement fusion, defense nuclear waste and materials by products management, defense nuclear waste and materials security and safeguards and security investigations and defense research and development

CHARACTERIZATION INFORMATION SUMMARY

WSPF # OR-ISTP-CH-HET

Lot 1

TABLE OF CONTENTS

Characterization Information Cover Page..... 002

Correlation of Container Identification Numbers to Batch Data Report Numbers..... 003

CCP Headspace Gas UCL_{90} Evaluation Form..... 004

Headspace Gas Summary Data..... 006

RTR/VE Summary of Prohibited Items and AK Confirmation..... 007

Reconciliation with Data Quality Objectives..... 008

CCP Characterization Information Summary Cover Page

Waste Stream # OR-ISTP-CH-HET Lot #: 1

AK Expert Review: N/A Date: N/A

SPM Review: Richard Kantrowitz Date: 7/14/2011

SPM signature certifies that through Acceptable Knowledge testing and/or analysis that the waste identified in this summary is not corrosive, ignitable, reactive, or incompatible with the TSDF.

A summary of the Acceptable Knowledge regarding this waste stream containing specific information about the corrosivity, reactivity, and ignitability of the waste stream is included as an attachment to the Waste Stream Profile Form. By reference, that information is included in this lot.

List of procedures used:

Radiography (RTR/NDE):

CCP-TP-053	Rev. 10	03/04/11	CCP Standard Real-Time Radiography (RTR) Inspection Procedure
CCP-TP-053	Rev. 9	09/30/10	CCP Standard Real-Time Radiography (RTR) Inspection Procedure
CCP-TP-053	Rev. 8	06/30/10	CCP Standard Real-Time Radiography (RTR) Inspection Procedure
CCP-TP-053	Rev. 7	10/21/09	CCP Standard Real-Time Radiography (RTR) Inspection Procedure

Non Destructive Assay (NDA):

CCP-TP-048	Rev. 15	03/24/11	CCP Mobile IQ3 System Data Reviewing, Validating, and Reporting Procedure
CCP-TP-048	Rev. 14	03/08/10	CCP Mobile IQ3 System Data Reviewing, Validating, and Reporting Procedure
CCP-TP-048	Rev. 13	10/12/09	CCP Mobile IQ3 System Data Reviewing, Validating, and Reporting Procedure
CCP-TP-166	Rev. 3	02/26/10	CCP Drum Waste Assay System Imaging Passive/Active Neutron Operations
CCP-TP-166	Rev. 2	12/05/08	CCP Drum Waste Assay System Imaging Passive/Active Neutron Operations
CCP-TP-168	Rev. 3	11/17/09	CCP Drum Waste Assay System Imaging Passive/Active Neutron/Segmented Gamma Scanner Data Generation Level Validation
CCP-TP-169	Rev. 2	11/18/09	CCP Operating the Mobile Segmented Gamma Scanner

Headspace Gas Sampling and Analysis (HSG):

CCP-TP-093	Rev. 15	03/10/11	CCP Sampling of TRU Waste Containers
CCP-TP-093	Rev. 14	12/29/10	CCP Sampling of TRU Waste Containers
CCP-TP-093	Rev. 13	03/19/07	CCP Sampling of TRU Waste Containers
CCP-TP-106	Rev. 7	12/29/10	CCP Headspace Gas Sampling Batch Data Report Preparation
CCP-TP-106	Rev. 6	07/12/07	CCP Headspace Gas Sampling Batch Data Report Preparation
CCP-TP-173	Rev. 1	09/30/09	CCP Analysis of Gas Samples for VOCs by GC/FID
CCP-TP-175	Rev. 2	12/29/10	CCP Analysis of Gas Samples for VOCs by GC/MS
CCP-TP-175	Rev. 1	03/29/10	CCP Analysis of Gas Samples for VOCs by GC/MS

Project Level Data Validation / DQO Reconciliation:

CCP-TP-001	Rev. 19	12/29/10	CCP Project Level Data Validation and Verification
CCP-TP-001	Rev. 18	08/09/10	CCP Project Level Data Validation and Verification
CCP-TP-001	Rev. 17	09/24/07	CCP Project Level Data Validation and Verification
CCP-TP-002	Rev. 23	12/29/10	CCP Reconciliation of DQOs and Reporting Characterization Data
CCP-TP-002	Rev. 22	06/30/10	CCP Reconciliation of DQOs and Reporting Characterization Data
CCP-TP-002	Rev. 21	08/04/09	CCP Reconciliation of DQOs and Reporting Characterization Data
CCP-TP-003	Rev. 18	12/29/10	CCP Data Analysis for S3000, S4000, and S5000 Characterization
CCP-TP-003	Rev. 17	11/09/09	CCP Data Analysis for S3000, S4000, and S5000 Characterization
CCP-TP-005	Rev. 23	06/30/11	CCP Acceptable Knowledge Documentation
CCP-TP-005	Rev. 22	04/21/11	CCP Acceptable Knowledge Documentation
CCP-TP-005	Rev. 21	12/29/10	CCP Acceptable Knowledge Documentation
CCP-TP-005	Rev. 20	11/01/10	CCP Acceptable Knowledge Documentation
CCP-TP-005	Rev. 19	07/06/10	CCP Acceptable Knowledge Documentation
CCP-TP-005	Rev. 18	11/16/06	CCP Acceptable Knowledge Documentation
CCP-TP-030	Rev. 29	04/26/11	CCP CH TRU Waste Certification and WWIS/WDS Data Entry
CCP-TP-030	Rev. 28	05/12/10	CCP CH TRU Waste Certification and WWIS/WDS Data Entry

WAP Certification:

CCP-PO-001	Rev. 20	06/16/11	CCP Transuranic Waste Characterization Quality Assurance Project Plan
CCP-PO-001	Rev. 19	12/29/10	CCP Transuranic Waste Characterization Quality Assurance Project Plan
CCP-PO-001	Rev. 18	06/30/10	CCP Transuranic Waste Characterization Quality Assurance Project Plan
CCP-PO-001	Rev. 17	06/23/09	CCP Transuranic Waste Characterization Quality Assurance Project Plan
CCP-PO-002	Rev. 26	07/14/11	CCP Transuranic Waste Certification Plan
CCP-PO-002	Rev. 25	12/29/10	CCP Transuranic Waste Certification Plan
CCP-PO-002	Rev. 24	06/30/10	CCP Transuranic Waste Certification Plan
CCP-PO-002	Rev. 23	04/07/10	CCP Transuranic Waste Certification Plan
CCP-PO-027	Rev. 3	12/29/10	CCP/TRU Waste Processing Center/Oakridge National Laboratory Interface Document
CCP-PO-027	Rev. 2	04/22/10	CCP/TRU Waste Processing Center/Oakridge National Laboratory Interface Document

CI5002

CCP Correlation of Container Identification Numbers to Batch Data Report Numbers

Waste Stream: # OR-ISTP-CH-HET

Lot # 1

Container ID Number	NDA BDR	RTR BDR	VE BDR	Solids Sampling BDR	Solids Analytical BDR	Load Management/ Overpack Yes	Headspace Gas BDR		
							Sample	Analysis	
X10C0501590	OR-IQ3-0110	OR-RTR6-0339	N/A	N/A	N/A		ORHSGS100012	ECL10036M	ECL10036G
X10C9311302A	OR-IQ3-0136	OR-RTR6-0355	N/A	N/A	N/A		N/A	N/A	N/A
X10C9311511A	OR-IQ3-0135	OR-RTR6-0356	N/A	N/A	N/A		N/A	N/A	N/A
X10C9311680B	OR-IQ3-0130	OR-RTR6-0349	N/A	N/A	N/A		ORHSGS100012	ECL10036M	ECL10036G
X10C9311915A	OR-IQ3-0136	OR-RTR6-0356	N/A	N/A	N/A		N/A	N/A	N/A
X10C9312272A	OR-IQ3-0135	OR-RTR6-0356	N/A	N/A	N/A		N/A	N/A	N/A
X10C9312553A	OR-IQ3-0135	OR-RTR6-0354	N/A	N/A	N/A		N/A	N/A	N/A
X10C9312721A	OR-IQ3-0141	OR-RTR6-0356	N/A	N/A	N/A		N/A	N/A	N/A
X10C9312822A	OR-IQ3-0130	OR-RTR6-0351	N/A	N/A	N/A		N/A	N/A	N/A
X10C9312857A	OR-IQ3-0136	OR-RTR6-0355	N/A	N/A	N/A		N/A	N/A	N/A
**The eight containers below were randomly selected for headspace gas sampling and analysis and are included to resolve EPA hazardous waste number assignment only. NDE and NDA BDR numbers are included for information purposes only.									
X10C0501530A	OR-IQ3-0109	OR-RTR6-0338	N/A	N/A	N/A		ORHSGS100012	ECL10036M	ECL10036G
X10C0501536	OR-IQ3-0152	OR-RTR6-0342	N/A	N/A	N/A		ORHSGS100012	ECL10036M	ECL10036G
X10C0501541	OR-IQ3-0109	OR-RTR6-0339	N/A	N/A	N/A		ORHSGS100012	ECL10036M	ECL10036G
X10C0501599	OR-IQ3-0152	OR-RTR6-0353	N/A	N/A	N/A		ORHSGS100013	ECL10043M	ECL10043G
X10C0501741	OR-IQ3-0177	OR-RTR6-0360	N/A	N/A	N/A		ORHSGS100012	ECL10036M	ECL10036G
X10C9309168A	OR-IQ3-0136	OR-RTR6-0356	N/A	N/A	N/A		ORHSGS100012	ECL10036M	ECL10036G
X10C9312154A	OR-IQ3-0178	OR-RTR6-0360	N/A	N/A	N/A		ORHSGS100012	ECL10036M	ECL10036G
X10C9400066A	OR-IQ3-0119	OR-RTR6-0342	N/A	N/A	N/A		ORHSGS100012	ECL10036M	ECL10036G

Signature of Site Project Manager

Richard Kantrowitz
Printed Name

7/14/2011
Date

CI5a)

CCP Headspace Gas UCL_{90} Evaluation Form

WSPF #: OR-ISTP-CH-HET **Waste Stream Headspace Gas Lot Number** 1 through 1

ANALYTE	Transform Data Used (No, Data-Log, SQRT, other)	# Samples above MDL (1)	# Samples	Maximum (ppmv)	Mean (ppmv)	SD (ppmv)	UCL_{90} (ppmv)	PRQL (ppmv)	Transformed PRQL (N/A or Value)	UCL_{90} > PRQL Yes	EPA Hazardous Waste Number
Benzene	Log	3	10	-1.27	-3.18	0.81	-2.82	10	2.30		
Bromoform	Log	0	10	-4.61	-4.83	0.11	-4.78	10	2.30		
Carbon Tetrachloride	Log	0	10	-4.23	-4.41	0.10	-4.37	10	2.30		
Chlorobenzene	Log	0	10	-3.77	-3.97	0.10	-3.93	10	2.30		
Chloroform	Log	0	10	-3.49	-3.69	0.10	-3.64	10	2.30		
Cyclohexane[a]	Log	0	10	-3.27	-3.47	0.10	-3.42	10	2.30		
1,1-Dichloroethane	Log	0	10	-3.94	-4.14	0.10	-4.10	10	2.30		
1,2-Dichloroethane	Log	0	10	-3.31	-3.52	0.11	-3.47	10	2.30		
1,1-Dichloroethylene	Log	0	10	-3.94	-4.15	0.11	-4.10	10	2.30		
cis-1,2-Dichloroethylene[c]	SQRT	0	10	0.20	0.18	0.01	0.18	10	3.16		
trans 1,2-Dichloroethylene	Log	0	10	-3.40	-3.60	0.10	-3.55	10	2.30		
Ethyl benzene	No	2	10	0.15	0.04	0.05	0.06	10	N/A		
Ethyl Ether	No	0	10	0.02	0.02	0.00	0.02	10	N/A		
Methylene chloride	No	1	10	0.15	0.04	0.04	0.06	10	N/A		
1,1,2,2-Tetrachloroethane	Log	0	10	-4.23	-4.44	0.10	-4.39	10	2.30		
Tetrachloroethylene	Log	0	10	-3.86	-4.07	0.10	-4.02	10	2.30		
Toluene	Log	9	10	2.26	-0.86	1.76	-0.08	10	2.30		
1,1,1-Trichloroethane	No	0	10	0.02	0.01	0.00	0.01	10	N/A		
Trichloroethylene	Log	0	10	-3.94	-4.15	0.11	-4.10	10	2.30		
Trichlorofluoromethane[c]	Log	0	10	-3.38	-3.59	0.11	-3.54	10	2.30		
1,1,2-Trichloro-1,2,2-trifluoroethane	Log	0	10	-4.07	-4.27	0.11	-4.23	10	2.30		
1,2,4-Trimethylbenzene[a]	No	1	10	0.37	0.06	0.11	0.10	10	N/A		
1,3,5-Trimethylbenzene[a]	No	1	10	0.11	0.03	0.03	0.04	10	N/A		
m,p-Xylenes[b]	No	1	10	0.14	0.04	0.04	0.05	10	N/A		
o-Xylene	No	2	10	0.07	0.04	0.02	0.04	100	N/A		
Acetone	No	8	10	4.50	2.13	1.62	2.83	100	N/A		
Butanol	Log	3	10	0.00	-2.50	1.08	-2.03	100	4.61		
Methanol	No	7	10	220.00	98.75	71.82	130.16	100	N/A	Yes	(2)
Methyl ethyl ketone	Log	8	10	1.10	-1.82	1.64	-1.11	100	4.61		

CCP Headspace Gas UCL_{90} Evaluation Form

WSPF #: OR-ISTP-CH-HET **Waste Stream Headspace Gas Lot Number** 1 through 1

ANALYTE	Transform Data Used (No, Data-Log, SQRT, other)	# Samples above MDL (1)	# Samples	Maximum (ppmv)	Mean (ppmv)	SD (ppmv)	UCL_{90} (ppmv)	PRQL (ppmv)	Transformed PRQL (N/A or Value)	UCL_{90} > PRQL Yes	EPA Hazardous Waste Number
Methyl isobutyl ketone	Log	4	10	-3.02	-3.64	0.39	-3.47	10	2.30		
Chloromethane[e]	No	3	10	6.20	0.66	1.95	1.51	10	N/A		
Carbon Disulfide[e]	Log	8	10	-0.54	-2.04	1.12	-1.55	10	2.30		
1,2-Dichloropropane[e]	Log	0	10	-3.75	-3.96	0.11	-3.91	10	2.30		
Formaldehyde[c]	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Hydrazine[d]	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

[a] These compounds are from CCP-PO-003, CCP Transuranic Authorized Methods for Payload Control (CCP CH-TRAMPAC) and are flammable VOCs that do not appear in CCP-PO-001. These are not part of the target analyte list, but samples may be analyzed for these compounds.

[b] These xylene isomers cannot be resolved by the analytical methods employed in the program. m-Xylene and p-Xylene will be reported as "Total m-p-Xylene."

[c] Required only for homogenous solids and soil/gravel waste from Savannah River Site.

[d] Required only for homogenous solids and soil/gravel waste from Oak Ridge National Laboratory and Savannah River Site.

[e] These compounds are reported by the Laboratory and are included for completeness.

Comments:

(1) For analytes where there were no samples measured above the MDL value, 1/2 of the MDL value was used. (Per section C4 of the WAP, 1/2 of the MDL value is used in calculating the mean concentration.)

(2) EPA HWN F003 is not assigned to this waste stream for Methanol because the waste is not liquid and is therefore not ignitable. This is consistent with acceptable knowledge.

Signature of Site Project Manager

Richard Kantrowitz
Printed Name

7/14/2011
Date

C1500

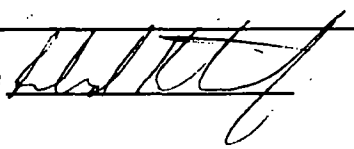
CCP Headspace Gas Summary Data

Waste Stream Number OR-ISTP-CH-HET Lot Number (s) 1

Tentatively Identified Compound	Maximum Observed Estimated Concentrations (ppmv)	# Samples Containing TIC	% Detected
2-Methyl-1-propanol	1.00	1	10.00%

Data Supports EPA Hazardous Waste Numbers Assigned by AK? ☑ Yes ☐ No

If no, describe the basis for assigning the EPA Hazardous Waste Codes:

SPM Signature  Date 7/14/2011

CIS006

CCP RTR/VE Summary of Prohibited Items and AK Confirmation

Waste Stream Number: OR-ISTP-CH-HET Lot(s)#: 1

Container Number	RTR Prohibited Items [a,b]	Visual Examination Prohibited Items [a,b]
See correlation of container ID numbers for list of remaining drum numbers in this Lot.	None of the containers in this lot had prohibited items identified during RTR.	VE was not performed on any of the containers in this Lot.

a. See Batch Data Reports

b. If AK has assigned U134 to this waste stream, then any liquids in these containers are prohibited items (not acceptable by the TSDF).

Justification for the selection of RTR: RTR was selected as the characterization method for the containers because the waste was previously packaged and RTR meets all the Data Quality Objectives for NDE for waste stream OR-ISTP-CH-HET.

Site Project Manager Signature | Richard Kantrowitz (Printed Name) | 7/14/2011 (Date)

CI5007

CCP Reconciliation with Data Quality Objectives

WS# OR-ISTP-CH-HET Lot # 1

Sampling Completeness

RTR/VE:

Number of Valid Samples: 10 Number of Total Samples Analyzed: 10
Percent Complete: 100 (QAO is 100%)

NDA

Number of Valid Samples: 10 Number of Total Samples Analyzed: 10
Percent Complete: 100 (QAO is 100%)

HSG

Number of Valid Samples: 10 Number of Total Samples Collected: 10
Percent Complete: 100 (QAO is ≥90%)
Number of Valid Samples: 10 Number of Total Samples Analyzed: 10
Percent Complete: 100 (QAO is ≥90%)

Total VOC

Number of Valid Samples: NA Number of Total Samples Collected: NA
Percent Complete: NA (QAO is ≥90%)
Number of Valid Samples: NA Number of Total Samples Analyzed: NA
Percent Complete: NA (QAO is ≥90%)

Total SVOC

Number of Valid Samples: NA Number of Total Samples Collected: NA
Percent Complete: NA (QAO is ≥90%)
Number of Valid Samples: NA Number of Total Samples Analyzed: NA
Percent Complete: NA (QAO is ≥90%)

Total Metals

Number of Valid Samples: NA Number of Total Samples Collected: NA
Percent Complete: NA (QAO is ≥90%)
Number of Valid Samples: NA Number of Total Samples Analyzed: NA
Percent Complete: NA (QAO is ≥90%)

CIS008

CCP Reconciliation with Data Quality Objectives

WS# OR-ISTP-CH-HET Lot # 1

	Y/N/NA	Reconciliation Parameter
1	Y	Waste Matrix Code.
2	Y	Waste Material Parameter Weights..
3	Y	The waste matrix code identified is consistent with the type of sampling and analysis used to characterize the waste.
4	Y	The TRU activity reported in the BDRs for each container demonstrates with a 95% probability that the container of waste contains TRU radioactive waste.
5	N	AK Sufficiency. Is there an approved AK sufficiency Determination for this waste stream?
6	Y	Mean concentrations, UCL_{90} values for the mean concentration, standard deviations, and the number of samples collected for each VOC in the HSG of each container were calculated and compared with the program required quantitation limits, as reported in CCP-TP-003 Attachment 3, and additional U.S. Environmental Protection Agency (EPA) Hazardous Waste Numbers were assigned as required. Samples were randomly collected (when appropriate).
7a	NA	Mean concentrations, UCL_{90} values for the mean concentration, standard deviations, and the number of samples collected for solids VOCs were calculated and compared with the program required quantitation limits and regulatory thresholds, as reported in the Characterization Information Summary, CCP-TP-003, Attachment 4, and additional EPA HWNs were assigned as required. Samples were randomly collected.
7b	NA	Mean concentrations, (UCL_{90}) values for the mean concentration, standard deviations, and the number of samples collected for solids SVOCs were calculated and compared with the program required quantitation limits and regulatory thresholds, as reported in the Characterization Information Summary, CCP-TP-003, Attachment 5, and additional EPA HWNs were assigned as required. Samples were randomly collected.
7c	NA	Mean concentrations, (UCL_{90}) values for the mean concentration, standard deviations, and the number of samples collected for total metals were calculated and compared with the program required quantitation limits and regulatory thresholds, as reported in the Characterization Information Summary, CCP-TP-003 Attachment 6, and additional EPA HWNs were assigned as required. Samples were randomly collected.

 CCS007

CCP Reconciliation with Data Quality Objectives

WS# OR-ISTP-CH-HET Lot # 1

8	Y	The data demonstrates whether the waste stream exhibits a toxicity characteristic under Title 40 Code of Federal Regulations (CFR), Part 261, Identification and Listing of Hazardous Waste, Subpart C, Characteristics of Hazardous Waste.
9	Y	Does the waste stream contain listed waste found in 20.4.1.200 NMAC incorporating 40 CFR Part 261, Subpart D, Lists of Hazardous Wastes.
10	Y	Waste stream can be classified as hazardous or nonhazardous at the 90-percent confidence level.
11	Y	Appropriate packaging configuration and Drum Age Criteria (DAC) is applied and documented in the headspace gas sampling documentation, and the drum age met prior to sampling.
12	Y	TICs were appropriately identified and reported in accordance with the requirements of Section C3-1 of the QAPjP.
13	Y	The PRQLs for headspace gas VOCs were met for all analyses as evidenced by the analytical batch data reports.
14		The overall completeness, comparability, and representativeness QAOs were met for each of the analytical and testing procedures as specified in the WAP Sections C3-2 through C3-9 prior to submittal of a waste stream profile form for a waste steam or waste stream lot.

	Completeness	Comparability	Representativeness
Radiography	Y	Y	Y
VE	NA	NA	NA
Headspace Gas Analysis	Y	Y	Y
Solids Sampling	NA	NA	NA
Solids VOCs	NA	NA	NA
Solids SVOCs	NA	NA	NA
Solids Metals	NA	NA	NA

Comments: NONE

Signature of Site Project Manager

Richard Kantrowitz
Printed Name

7/14/2011
Date

 CCS010

SUMMATION OF ASPECTS OF ACCEPTABLE KNOWLEDGE SUMMARY REPORT: WASTE STREAM OR-ISTP-CH-HET

Overview

Waste stream OR-ISTP-CH-HET is contact-handled (CH) transuranic (TRU) heterogeneous debris waste generated in several Isotopes Programs facilities. Specifically, the waste was generated in Buildings 3028, 3029, 3030, 3031, 3032, 3033-A, 3038, and 3047 at the Oak Ridge National Laboratory (ORNL) and Building 9204-3 at the Y-12 National Security Complex (Y-12) in Oak Ridge, Tennessee. The primary missions of these facilities were production and distribution of isotopes used in nuclear medicine, radiation processing, industrial controls, and other applications as well as research and development (R&D) in every scientific and engineering discipline. As it specifically related to the generation of TRU waste, these facilities produced and distributed "Other Special Materials" or OSM, which are radioactive isotopes with atomic numbers 84 (Polonium) and above, sometimes referred to as "heavy elements."

There are several atomic energy defense activities that apply to this waste stream, including naval reactors development, weapons activities including defense inertial confinement fusion, defense nuclear materials production, defense nuclear waste and materials byproducts management, defense nuclear materials security and safeguards and security investigations, and defense R&D. The one defense activity that is probably the best representation of the waste stream as a whole is "defense nuclear materials production" because the primary waste generating activity was isotopes production and distribution.

This Summation of Aspects of the Acceptable Knowledge (AK) Summary Report includes information to support Waste Stream Profile Form number OR-ISTP-CH-HET for CH TRU heterogeneous debris. The primary source of information for this summation is CCP-AK-ORNL-008, *Central Characterization Project Acceptable Knowledge Summary Report for Oak Ridge National Laboratory Isotopes Programs Contact-Handled Transuranic Waste, Waste Stream: OR-ISTP-CH-HET*, Revision 0, July 6, 2010. CCP-AK-ORNL-008 includes information obtained from various sources, including safety analysis reports, research project reports, waste packaging and shipping forms, site databases, and correspondence.

Waste Stream Identification Summary

Waste Stream Name:	Heterogeneous Debris Waste from Isotopes Production and Distribution
Waste Stream Number:	OR-ISTP-CH-HET
Site Where TRU Waste Was Generated:	ORNL and Y-12
Facility Where TRU Waste Was Generated:	Buildings 3028, 3029, 3030, 3031, 3032, 3033-A, 3038, and 3047 at ORNL and Building 9204-3 at Y-12
Site Where TRU Waste Is Currently Stored:	Oak Ridge National Laboratory
Waste Stream Volume – Current:	543 55-gallon drums
Waste Stream Volume – Projected:	55 55-gallon drum
Dates of Waste Generation:	1970 – 2004
TRUPACT-II Content (TRUCON) Codes:	OR 125, OR 225, SQ 154

Summary Category Group	S5000- Debris Waste
Waste Matrix Code:	S5400, Heterogeneous Debris
Waste Matrix Code Group	Heterogeneous Debris Waste
Annual Transuranic Waste Inventory Report Identification Number:	OR-ISTP-CH-HET
Environmental Protection Agency (EPA) Hazardous Waste Numbers (HWNs):	D005, D006, D007, D008, D009, D011, D019, D022, F002, and F005

Waste Stream Description and Physical Form

Waste stream OR-ISTP-CH-HET is comprised primarily of organic and inorganic debris waste items and generally consists of cellulosics, plastic, rubber, glass, ceramic, graphite and metal. Examples of waste items include:

- Iron-based metal items including alkaline batteries, banding, cables, capped pipe nipples, caps, conduit, containers (e.g., buckets, cans, cylinders, drums), discs, drain traps, dust pans, electrical boxes, fittings, flanges, gauges, glovebox floor sweepings, hand tools (e.g., caulk gun, channel locks, files, hack saws, hammers, hole punches, knives, pipe cutters, pliers, scissors, screwdrivers, tape measure, vices, wire brushes, wrenches), hardware (e.g., bolts, clamps, clips, connectors, nails, nuts, screws, washers), labware (e.g., beakers, funnels, ring stands, scalpels, spoons, stirrers, tongs, tweezers), lids, light fixtures, needles, pans, pins, piping, planchets, portal covers, rebar, rods, saw blades, scrap metal (e.g., angle iron, blocks, plate, tank pieces), sealed (stainless steel cladding) radiation sources (e.g., Am-241/Beryllium, Pu-239/Beryllium, Cf-252, Ra-226), sleeves, strapping, tool bits, tubing, valves, weights, welding fixtures, wire mesh, and wire,
- Aluminum metal items such as cages, cans, foil, glove portal inserts, pans, piping, respirator cartridges, rods, scrap, and screen,
- Other metals such as beryllium pieces, brass (e.g., brackets, fittings, pipe, valves), copper (e.g., cables, fittings, foil, plate, scrap, tubing, wire), lead (e.g., blankets, bricks, cylinders, pigs, scrap, sheeting, shielding, solder, tape), tantalum shielding, plutonium metal, and uranium metal (e.g., discs),
- Other inorganic materials including actinide oxide powder, absorbent (e.g., kitty litter, vermiculite), asbestos (e.g., insulation), ceramics (e.g., bowls, dowels, firebrick, pipe, porcelain), concrete, filter media, glassware and broken glass (e.g., beakers, bottles, funnels, jars, jugs, light bulbs, mirrors, tubes, vials), graphite (e.g., block, calutron collector pockets, die bodies, rings), mortar/pestle, and paint chips,
- Cellulosic items such as absorbent pads, brooms, brushes, cardboard, cloth (e.g., cheesecloth, cotton glove liners, coveralls, gloves, mops, rags), containers (e.g., ice cream cartons), cork, cotton swabs, fiberboard, gauze, leather gloves, masking tape, paper (e.g., filters, sandpaper, smears, suits, tissue, towels, wipes), sponges, and wood (e.g., handles, rulers, shavings),
- Plastic items including bags, caps, containers (e.g., bottles, buckets, jugs), electrical cord, fittings, foam (e.g., ear plugs), Herculite® (industrial fabric), hose, ion-exchange resin (may be grouted), labware (e.g., funnels), Lexan®, liner remnants, nylon rope, plexiglass, pipe, sheeting, sleeves, styrofoam, suits, syringes, tape (e.g., Teflon®, vinyl), tie straps, tubing, and Velcro®,

- Rubber items such as aspirators, belts, gasket material, gloves, grommets, hoods, hose, manipulator boots, o-rings, respirators, shoe covers, stoppers, and suits,
- Electrical devices and equipment (e.g., ball mill rollers, calutron source units, circuit boards, compressors, cutting tools, evaporators, furnaces, heat exchangers, hot plates, motors, paint sprayers, power supply, presses, probes, pumps, scales, smoke detectors, vacuum cleaners),
- Metal-framed and wood-framed High Efficiency Particulate Air filters with inorganic filter media, and
- Small amounts of homogenous materials such as grease, grouted resin, and absorbed liquids (absorbents may include Absorbal, Nochar, Solid-a-sorb, vermiculite). Examples of liquids absorbed include ammonium hydroxide, sodium hydroxide, hydrochloric acid, and nitric acid.

The waste materials that comprise waste stream OR-ISTP-CH-HET have common physical form, contain similar hazardous constituents, and were generated from a single process or activity and is therefore a single waste stream. This waste stream was generated in several different facilities; however, the activity in each of these facilities the generated TRU waste was isotopes production and distribution, and ancillary operations that supported this activity (R&D, facility maintenance, and facility deactivation).

Point of Generation

Location

Waste stream OR-ISTP-CH-HET was generated at the ORNL and Y-12 which are located on the Department of Energy (DOE) Oak Ridge Reservation. The waste was generated in Buildings 3028, 3029, 3030, 3031, 3032, 3033-A, 3038, and 3047 at ORNL and in Building 9204-3 at Y-12. The waste is currently stored at ORNL.

Area and/or Buildings of Generation

Building 3028, located on the northwest corner of Isotope Circle in the ORNL Isotopes Area, was divided into three separate facilities: the Short-Lived Fission Products Facility on the west side of the facility, the Curium Source Fabrication Facility (CSFF) on the east side of the facility, and the Target Fabrication Facility (TFF) located on the three upper floors of the building. The Short-Lived Fission Products Facility did not generate TRU waste. The CSFF consisted of six hot cells, and the TFF operations were performed in vacuum-inert-gas type gloveboxes or plexiglass enclosures.

Building 3029, located on the northwest corner of the central portion of Isotope Circle, was divided into an operating area consisting mainly of four manipulator cells and a cell access area. The hot cell operations did not generate TRU waste. Building 3029 also included an Alpha Handling Facility (AHF) that consisted of two gloveboxes located in the northeast corner of the building that supported curium source fabrication or Isotope Sales activities in Building 3028.

Building 3030, located on the west end of the central portion of Isotope circle, contained one manipulator-type hot cell which did not generate TRU waste. There were not processes in Building 3030 that generated TRU waste, and there are no TRU waste drums exclusively from Building 3030. The only TRU waste from Building 3030 consists of several Am-241/Beryllium neutron sources that were taken to Building 3038 and disposed.

Building 3031, located second from the west end of the central portion of Isotope Circle immediately to the north of Building 3038, had one manipulator cell and three laboratory hoods. These operations

did not generate TRU waste. However, Building 3031 contained a glovebox during the 1970s that was used for operations with Am-241.

Building 3032, located near the middle of the central portion of Isotope circle immediately east of Building 3031, did not have a hot cell but had a series of five hoods utilized for radiochemical analysis. Operations in these hoods did not generate TRU waste; however, Building 3032 had previously housed gloveboxes used for operations with Am-241.

The Building 3033 Annex (3033-A), located in the central portion of Isotope Circle, contained three portable gloveboxes and a radiochemical hood. The gloveboxes were equipped to operate under an argon atmosphere.

Building 3038, located on the southwest corner of Isotope Circle, was divided into four separate facilities: the AHF in the western portion of the building (3038-W), the Isotopes Shipping Facility (ISF) in the middle portion of the building (3038-M), and the Isotope Research Materials Laboratory (IRML) in the eastern portion of the building (3038-E). The middle portion of the building also housed the Isotope Technology Laboratories which did not generate TRU waste. The AHF consisted of three gloveboxes and five hot cells. There were seven gloveboxes in the adjacent room, the AHF Annex, equipped with argon atmosphere capability. The ISF consisted of a barricade for storage of isotope products, pipetting station, and canning and packaging station. The IRML consisted of a water-shielded hot cell, gloveboxes, hoods, and radioactivity-counting equipment. Several of the IRML gloveboxes were equipped with argon atmosphere capability or Dri-Train purification systems for achieving an inert atmosphere.

Building 3047, located in the north east corner of Isotopes Circle, housed five hot cells, four laboratories, and three alpha-handling laboratories. Four of the hot cells and three of the laboratories were in one of the two containment zones of the building. The three alpha-handling laboratories (Rooms 110, 211, and 212) were in the other containment zone and contained one alpha hot cell (Room 110).

Building 9204-3, located in the south central portion of the Y-12 complex, was devoted mostly to stable isotopes production. In about 1962, an area at the east end of the building was modified for the purposes of separating actinide isotopes. This area became known as the Actinide Processing Area (APA) and included a 24-inch radius calutron separation unit that was used to separate isotopes, and a series of glovebox operations that included a components wash area and actinide chemical processing area.

Historical Waste Management

Waste stream OR-ISTP-CH-HET has been historically managed in accordance with ORNL waste management practices in compliance with the requirements imposed by the Tennessee Department of Environment and Conservation. Approximately 90 percent of this waste stream was generated prior to ORNL implementing a Resource Conservation and Recovery Act (RCRA) program. This waste has subsequently been characterized by ORNL as RCRA-regulated. About 10 percent of the waste stream was generated since ORNL implemented a RCRA program. Several of these containers were assigned EPA HWNs by the generator; however, many were characterized by ORNL as nonhazardous waste. The AK program at the Transuranic Waste Processing Center (TWPC) subsequently characterized this entire waste stream as RCRA-regulated.

Generating Processes

Description of Waste Generating Processes

The waste was generated in several Isotopes Programs facilities whose primary mission was production and distribution of isotopes used in nuclear medicine, radiation processing, industrial controls, and other applications as well as R&D in every scientific and engineering discipline. As it is specifically related to the generation of TRU waste, these facilities produced and distributed OSM, which are radioactive isotopes with atomic numbers 85 (polonium) and above, sometimes referred to as "heavy elements." The Isotopes Programs consisted of four main elements:

- Radioisotopes services – Production and technical services not available from private industry, R&D support to DOE and outside customers, packaging of all ORNL radioisotope products for shipment, and shipping and receiving of all radioactive materials for ORNL.
- Isotope enrichment – Production of high-purity stable and radioactive isotopes for research, industrial, medical, and governmental uses via the electromagnetic isotope separation and processing facilities and management of the ORNL isotope inventory referred to as the Research Materials Collection (RMC).
- IRML – Target fabrication, preparation of isotope research materials, fabrication of neutron dosimeters, and wide array of isotope R&D activities.
- Isotope Distribution (Sales) Office – Work-side distribution of isotopes and related isotopic materials, coordination of procurement of isotopes and services both from and for other DOE facilities, and management of the ORNL Sales Pool of radioisotopes.

Building 3028, Curium Source Fabrication and Target Fabrication Facilities

The TFF was used to prepare target films, foils, and other shapes. The activities involved in the production of targets included:

- Evaporating actinide oxides using an electron-bombardment heat source,
- Converting the oxide to metal by simultaneous reduction-distillation, and
- Rolling, punching, and welding of the metals.

The CSFF was used to fabricate heat sources of Cm-242 and Cm-244 and to conduct tests and experiments involving these radioisotopes. The preparation of the materials processed in the facility required a variety of operations consisting of:

- Precipitating the curium solution and filtering the solids,
- Calcining the solids to an oxide,
- Blending of the oxide for pressing into pellets,
- Encapsulating the pellets by inert gas welding, and
- Helium leak testing and ultrasonic decontamination of the heat source

Decontamination of the CSFF in 1981 and 1982 prior to its new use as the Alpha Powder Facility was a significant TRU waste generation activity. The primary objective of this decontamination effort was to reduce the radioactivity in the cells and in the operating areas to an acceptable level for refurbishing the facility for a new program. The project objectives were to:

- Remove curium sesquioxide powder remaining in the cells,
- Remove obsolete contaminated equipment from the cells, and

- Decontaminate the cells to acceptable levels for personnel entry.

The Alpha Powder Facility was designed to package and distribute gram quantities of alpha materials. Oxides of Am-241, Am-243, Cm-244, Np-237, and Pu-238 were packaged and shipped upon customer request. Operations included:

- Weighing oxide powder and loading into an inner container,
- Wiping of the inner container to remove contamination,
- Placing the inner container in an outer stainless steel capsule,
- Inert gas welding of the outer capsule, and
- Vacuum leak testing and cleaning of the capsule.

Building 3029, Source Development Laboratory

The AHF in Building 3029 consisted of two gloveboxes used to encapsulate (weld) and test small amounts of alpha-emitting isotopes (Pu-238, Cm-242, Cm-244) in support of curium source fabrication or Isotope Sales activities in Building 3028. These welding capabilities were relocated to the Building 3038 AHF Annex in 1972, and the gloveboxes were decontaminated.

Building 3031, Radioisotope Production Laboratory D

Building 3031 contained a glovebox which was devoted to production of small Am-241 sources for the Isotopes Sales organization during the early-1970s. See Building 3038 below for additional details on sealed source fabrication.

Building 3032, Radioisotope Production Laboratory E

Building 3032 contained gloveboxes for preparation of Am-241 for the Isotopes Sales Office during the early-1970s for use in production of Am-241/Beryllium neutron sources. See Building 3038 below for additional details on sealed source fabrication.

Building 3033-A, Actinide Fabrication Laboratory

The Actinide Fabrication Laboratory (AFL) was used for the preparation of research materials by personnel of the IRML. Sources of radioisotopes at ORNL included the RMC of actinide isotopes maintained in Building 9204-3. Activities in the AFL included the following:

<u>Fabrication of Neutron Dosimeters</u>

Neutron dosimeters were fabricated for placement in reactors and activated by neutrons to determine integral reaction rates from which fission characteristics at a particular location within the reactor could be computed.

- Milligram quantities of actinide oxides in the form of powders or ceramic oxide wires were weighed on a microbalance.
- The actinide materials were loaded into the vanadium capsules which were sealed by inert gas welding and decontaminated ultrasonically.

<u>Fabrication of Ceramic Oxide Wire</u>

- Actinide oxide powders were mixed with wax, and the mixture was extruded through a small orifice and wound on a collecting spool.

- The actinide oxide wire product was cut into small lengths and loaded into magnesium oxide tubes which were placed in aluminum oxide tubes.
- The aluminum oxide tubes were heated in a furnace to remove the wax binder, and the wires were cut into the appropriate lengths.

Packaging of Actinide Materials

Milligram to gram quantities of actinide materials were prepared for use by experimentalists in various areas of research. This work involved:

- Encapsulating actinide materials in standard metal powder cans,
- Inserting top plugs into the cans and sealing by inert gas welding, or
- Placing inside another metal can and then sealing by welding, and
- Ultrasonically decontaminating the metal containers.

Building 3038, Alpha Handling Facility, Isotopes Shipping Facility, and Isotope Research Materials Laboratory

Building 3038 was used for the study of transuranium elements, fabrication of alpha- and neutron-emitting targets and sources, shipment of radioisotopes, and the study of chemical processes involving tracer level activities. These processes were performed in various areas of the building as described in the following paragraphs.

The AHF was utilized primarily for studying the physical and chemical characteristics of transuranium elements, fabrication of alpha- and neutron-emitting targets and sources, and fabrication of beta and low-energy gamma sources. Examples of AHF activities are outlined below:

- Evaporated targets were produced by sweeping a small pellet of target feed material with an electron beam. The electron beam evaporated the target feed material which condensed evenly on a substrate.
- U-234 was obtained by separation from its Pu-238 parent isotope. This was accomplished by a series of steps involving dissolution, precipitation, filtration, calcination, evaporation, ion-exchange, and reduction.
- Fabrication and destructive testing of Plutonium/Beryllium neutron sources. Sources were fabricated by combining plutonium oxide and beryllium powder in a metal capsule and sealed by inert gas welding.

A separate room in the southwest corner of Building 3038, referred to as the AHF Annex, began glovebox operations in 1972. This facility performed the following activities:

- Weighing and dispensing of milligram to gram quantities of oxide powders such as Am-241, Pu-238, and U-234.
- The actinide powders were encased in stainless steel capsules using inert gas welding and leak tested prior to shipment.

The eastern portion of the building was converted to R&D and production facilities for the IRML in 1977. Gloveboxes in this facility were used for the fabrication of radioactive targets and the examination of materials by destructive and non-destructive means. The northern portion of the IRML was dedicated to target production, and the southern portion was dedicated to R&D activities.

Target production involved:

- Evaporation,
- Hot pressing,
- Metal rolling,
- Sputtering (target over-coating), and
- Welding.

R&D activities included:

- X-ray fluorescence,
- X-ray diffraction,
- Scanning electron microscopy,
- Microprobe analysis,
- Low geometry counting,
- Fabrication and examination of uranium and plutonium alloys, and
- Pm-147-doped crystal development

The ISF dispensed, canned, boxed, and labeled isotope containers prior to shipping. The ISF was comprised of the following three areas:

- Barricade Storage Area – Heavy density concrete behind which were two "Lazy Susan" lead-shielded storage racks.
- Pipetting Station – Equipment for remote work with product bottles, including sampling, examining, solution transferring, and bottle capping.
- Canning and Packaging Station – Equipment for the shielding and sealing of containers prior to being boxed for shipment.

Building 3047, Radioisotope Development Laboratory

The Building 3047 Radioisotope Development Laboratory performed R&D and produced radioisotopic materials. The majority of the waste was from the Rooms 110, 211, and 212 alpha handling laboratories. Since Building 3047 was an R&D facility, there was no standardized routine chemical processing. Operations generally consisted of solvent extraction, ion exchange, precipitation, volatilization, condensation, distillation, dissolution, shearing, grinding, crystallization, heating, and cooling. A wide variety of activities were carried out on an experimental basis, such as:

- Fabrication of Cf-244 and Cf-252 targets,
- Fabrication of various actinide metals and alloys by arc melting,
- High-temperature experiments with encapsulated Cm-244,
- Mechanical testing of sources,
- Packaging of Pu-238 oxide,
- Purification of Np-237, and
- Welding of target fuel pins.

Building 9204-3, Electromagnetic Isotope Separation Facility

The APA in Building 9204-3 separated actinide isotopes for research purposes using electromagnetic separation using eight 24-inch radius calutron units (two plutonium separators and six separators for other transuranium elements). The APA also contained several glovebox lines designed for recovery and recycle of products, components washing and servicing, and preparation of shipments of enriched actinide isotopes from the RMC.

Heavy element isotope separation was accomplished by ionizing a suitable charge material in a vacuum tank, passing the ionized beam through a magnetic field which spread the various masses apart, and collecting the separated beams in receiver pockets. After the mass separation had been accomplished, the unresolved material was recycled and the separated isotope products were recovered from the receiver pockets. Only 10 to 20 percent of the starting material was collected in the product pockets, and 80 to 90 percent of the charge was volatilized onto the liner, source, and receiver parts, and was recycled and reused as charge material.

Isotopes Facilities Deactivation Project (IFDP)

Implementation of the IFDP began in 1991 and was completed in June 2004. The goal of the project was to place the Isotopes Programs facilities in a radiologically and industrially safe and stable condition for an extended period of minimum surveillance and maintenance prior to eventual decontamination and decommissioning. Facilities that generated TRU waste since 1991 included Buildings 3028, 3038, 3033-A, and 3047. Deactivation activities included:

- Nuclear material inventory was packaged and transferred to storage or disposal.
- Waste and loose equipment from hot cells was removed and size-reduced.
- Hot cells were wiped down.
- Hot cell manipulator boots were replaced and in-cell filters removed.
- Piping services to hot cells and gloveboxes were drained and plugged.
- Gloveboxes were wiped down and painted to fix contamination.
- Gloves from glovebox ports were removed and the ports sealed.
- Gloveboxes were packaged for disposal.

Transuranic Waste Processing Center

Drums containing CH-TRU waste in storage are moved individually to the TWPC (Building 7880) glovebox airlock. Once inside the glovebox airlock, the drum is moved to the drum tipper where the lid is removed and the drum contents are emptied into sorting trays. The waste articles are manually sorted and segregated via glove ports to remove prohibited items and repackaged at one of the four load-out stations along the glovebox. Boxes containing CH-TRU waste are moved into the box breakdown area (BBA) via airlocks. Within the BBA, the box lid is removed. The waste is inspected, removed, size reduced, and sorted manually within the BBA, and either packaged into new drums directly from the BBA or processed through the glovebox as described above. Prohibited items identified during repackaging of drums and boxes are removed from the waste stream or are remediated. Glovebox internal walls are periodically wiped down using damp rags. Secondary wastes created during waste processing, such as rubber glovebox gloves and tools, are placed into TRU waste drums that are included in this waste stream.

Table 1 identifies the toxicity characteristic and F-listed constituents in waste stream OR-ISTP-CH-HET.

Table 1 –Toxicity Characteristic and F-Listed Constituents Waste Stream OR-ISTP-CH-HET

Constituent	CAS #	EPA HWNs
Barium	7440-39-3	D005
Cadmium	7440-43-9	D006
Chromium	7440-47-3	D007
Lead	7439-92-1	D008
Mercury	7439-97-6	D009
Silver	7440-22-4	D011
Carbon tetrachloride	56-23-5	D019
Chloroform	67-66-3	D022
Trichloroethylene	79-01-6	F002
Benzene	71-43-2	F005
Toluene	108-88-3	F005

RCRA Determinations

Ignitability, Corrosivity, Reactivity

Waste generated in this waste stream does not qualify for any of the exclusions outlined in 40 Code of Federal Regulations (CFR) 260 or 261. Real Time Radiography (RTR) or visual examination (VE) is used to verify that the waste stream is not a liquid waste and does not contain explosives, non-radioactive pyrophoric materials, compressed gases or reactive waste. Therefore, this waste stream does not exhibit the characteristic for ignitability (D001), corrosivity (D002), or reactivity (D003).

Ignitability

The waste does not exhibit the characteristic of ignitability as identified in 40 CFR 261.21. The materials are not liquid, compressed gases, or oxidizers, and are not capable of causing fire through friction, absorption of moisture, or spontaneous chemical change. The materials are not liquid, and RTR and/or VE are performed to ensure the absence of prohibited liquids.

Solid waste handling procedures stated that liquids were disposed in the appropriate liquid disposal system and not intermixed with solid waste. Procedures also indicated that equipment was washed and drained before removal (References P568, P1085). Since ORNL first implemented the Waste Isolation Pilot Plant (WIPP) Waste Acceptance Criteria (WAC) (WIPP-WAC), free liquid, pyrophoric material, and compressed gases were verified to be absent in TRU waste in accordance with the ORNL Health Physics Manual (References P241, P244, P566, P917, P956). The Isotopes Programs facilities established their own procedure for handling and packaging CH-TRU waste. The procedure stated that pyrophoric materials were not to exceed one percent of the waste weight, and free liquids, compressed gases, and explosives were prohibited (References P829, P863, P865, P875, P876).

Ignitable liquids used in the Isotopes Programs facilities included acetone, benzene, diethylbenzene, dodecane, isopropyl alcohol, methanol, toluene, xylene, and several commercial products. These facilities understood the hazards associated with flammable and pyrophoric materials and have always taken measures to prevent fire or explosion (e.g., prohibiting or limiting the amount of material

that could be used in a glovebox or hot cell and the use of fire sensors and water detectors in gloveboxes). Solutions containing oxidizing compounds were also used in the Isotopes Programs facilities, including aluminum nitrate, ammonium peroxysulfate, ammonium nitrate, hydrogen peroxide, hydroxylamine nitrate, mercury nitrate, potassium permanganate, and sodium nitrite. Waste management practices in these facilities required liquids to be collected separately from solid waste. Liquids were released to the liquid waste system drains (References P294, P398, P400, P528, P529, P1085, P1272, P1292, U007).

To ensure the waste does not exhibit the characteristic of ignitability, liquid in excess of Treatment, Storage, and Disposal Facility (TSDF)-WAC limits is removed or immobilized, and compressed gases (e.g., aerosol cans) are removed or vented prior to WIPP disposal. Therefore, this waste does not exhibit the characteristic of ignitability (D001).

Corrosivity

This waste does not exhibit the characteristic of corrosivity as defined in 40 CFR 261.22. The materials are not liquid, and RTR and/or VE are performed to ensure the absence of prohibited liquids.

Solid waste handling procedures stated that liquids were disposed in the appropriate liquid disposal system and not intermixed with solid waste. Procedures also indicated that equipment was washed and drained before removal (References P568, P1085). Since ORNL first implemented the WIPP-WAC, free liquids were verified to be absent in TRU waste in accordance with the ORNL Health Physics Manual (References P241, P244, P566, P917, P956). The Isotopes Programs facilities established their own procedure for handling and packaging CH-TRU waste. This procedure stated that free liquids were prohibited (References P829, P863, P865, P875, P876).

Corrosive liquids used in the Isotopes Programs facilities included acids (e.g., acetic, formic, hydrochloric, hydrofluoric, nitric, oxalic, sulfuric, sulfurous, and trichloroacetic) and caustics (e.g., ammonium hydroxide, sodium hydroxide). Waste management practices in these facilities required liquids to be collected separately from solid waste. Liquids were released to the liquid waste system drains (References P294, P398, P400, P528, P529, P1085, P1272, P1292, U007).

To ensure the waste does not exhibit the characteristic of corrosivity, liquid in excess of TSDF-WAC limits is removed or immobilized prior to WIPP disposal. Therefore, this waste does not exhibit the characteristic of corrosivity (D002).

Reactivity

This waste stream does not exhibit the characteristic of reactivity as defined in 40 CFR 261.23. The materials are stable and will not undergo violent chemical change. The materials will not react violently with water, form potentially explosive mixtures with water, or generate toxic gases, vapors, or fumes when mixed with water.

Solid waste handling procedures stated that liquids were disposed in the appropriate liquid disposal system and not intermixed with solid waste. Procedures also indicated that equipment was washed and drained before removal (References P568, P1085). Since ORNL first implemented the WIPP-WAC, free liquid and compressed gases were verified to be absent in TRU waste in accordance with the ORNL Health Physics Manual (References P241, P244, P566, P917, P956). The Isotopes Programs facilities established their own procedure for handling and packaging CH-TRU waste. This procedure stated that free liquids, compressed gases, and explosives were prohibited (References P829, P863, P865, P875, P876).

Reactive compounds used in the Isotopes Programs facilities included alkyl chlorates, aluminum nitrate, ammonium nitrate, calcium metal, cellulose nitrate, hydrogen peroxide, hydroxylamine hydrochloride, and hydroxylamine nitrate. Reactive cyanide or sulfide compounds have not been identified in the process that generated this waste stream. These facilities understood the hazards associated with reactive materials and have always taken measures to prevent fire or explosion (e.g., prohibiting or limiting the amount of material that could be used in a glovebox or hot cell and the use of fire sensors and water detectors in gloveboxes). Compounds that could decompose explosively, such as alkali chlorates and ammonium nitrate, were used in the hot cells only in small quantities unless they were in solutions known to be safe and to have no chance of being concentrated to dryness. Waste management practices in these facilities also required liquids to be collected separately from solid waste. Liquids were released to the liquid waste system drains (References P294, P398, P400, P528, P529, P1085, P1272, P1292, U007).

To ensure the waste does not exhibit the characteristic of reactivity, liquid in excess of TSDF-WAC limits is removed or immobilized, and compressed gases (e.g., aerosol cans) are removed or vented prior to WIPP disposal. Therefore this waste stream does not exhibit the characteristic of reactivity (D003).

Toxicity

This waste stream exhibits the characteristic of toxicity per 40 CFR 261.24. The toxicity characteristic contaminants fall into two categories; metals and organics. Where a constituent has been identified and there is no quantitative data available to demonstrate that the concentration is below regulatory threshold, the applicable EPA HWN is applied to the waste stream.

Several uses and sources have been identified for barium (D005), cadmium (D006), chromium (D007), lead (D008), mercury (D009), and silver (D011). Barium carbonate was used as a precipitation agent to remove the Th-234 daughter from depleted uranium (Reference P526). Cadmium was used as a coating for plutonium and uranium isotopes, was used as shielding, and is contained in small batteries in electronic equipment (References M187, M191, U038). Chromium was used in the study of uranium-chromium alloys by the Solid State Division and the Operations Division (References P225, P1363, U472). The Isotope Separations Section of the Chemical Technology Division conducted waste fixation studies on concrete specimens containing Cm-244, and chromium oxide was one of the components of the simulated waste solids solidified in concrete (Reference P1361). Lead is most commonly found in the form of shielding such as bricks, foil, pigs, sheet, rubber glove lining, and leaded glass windows (References P092, P101, P175, P227, P289, P291, P294, P327, P335, P346, P348, P453, P455, P526, P528, P876, U038). Mercury vapor lamps were used for lighting during hot cell operations (References P289, P291). Alkaline batteries also contain mercury (References M187, M191, U038). Silver is present in solder in electrical equipment (References M187, M191, U038).

Uses have also been identified for carbon tetrachloride (D019) and chloroform (D022). Carbon tetrachloride was used as a chlorination agent and to charge material (References P098, P348, P399, P526, P941, P1357). Chloroform was used as an extraction agent and as an organic solvent (Reference P1312).

Since analytical data are not available to demonstrate the concentrations of these metal and organic compounds in this debris waste stream are less than the regulatory threshold, EPA HWNs D005, D006, D007, D008, D009, D011, D019, and D022 are assigned to waste stream OR-ISTP-CH-HET.

Since the more specific F-listed EPA HWNs have been assigned for benzene and trichloroethylene, the corresponding toxicity characteristic HWNs D018 and D040 are not applied.

Listed Waste

F-Listed Waste

Waste stream OR-ISTP-CH-HET was mixed with or derived from F-listed hazardous wastes from non-specific sources as listed in 40 CFR 261.31. F002 and F005 listed solvents were used in the Isotopes Programs facilities. The following F-listed constituents were used and contaminate the waste (Reference DR024):

- Trichloroethylene was identified in a logbook for Building 3047. This solvent was used to clean samples prior to acid etching. It is unclear whether the sample was an actinide material (Reference U580). Therefore, EPA HWN F002 is assigned.
- Benzene was identified in a Building 3038 plutonium processing procedure. A solution of thenoyltrifluoroacetone and benzene was used for plutonium extraction (Reference P762). Benzene was also identified as a major laboratory solvent used in Building 3047 although its specific use was not stated (Reference P1312). Additionally, an Isotopes Program facilities assessment report identified benzene as an example of a hazardous chemical used, but the specific building and use were not provided (Reference P175). Since plutonium extraction is a solvent use, EPA HWN F005 is assigned.
- Toluene was identified in a safety analysis report for Building 3047. This solvent was utilized only infrequently for maintenance activities such as hot cell window cleaning (Reference (P1316). Therefore, EPA HWN F005 is assigned.

Although F001-listed solvents were identified in the AK record (i.e., carbon tetrachloride and trichloroethylene), these listed solvents were not used in a "large-scale" degreasing operation such as cold cleaning or vapor degreasing. The Isotopes Programs facilities did not conduct large-scale degreasing operations, and therefore, EPA HWN F001 is not assigned to this waste stream.

The F003-listed solvents acetone, methanol, and xylene were identified as potentially present in this waste stream as contaminants of the debris waste. However, F003-listed waste is listed solely for ignitability, and this waste stream does not exhibit the characteristic of ignitability because the solvents are not in liquid form. Therefore, this waste stream is not an F003-listed hazardous waste.

The following F-listed constituents contaminate the waste and are applied:

F002 – Trichloroethylene

F005 – Benzene and toluene

U, K and P-Listed Wastes

Waste stream OR-ISTP-CH-HET was not mixed with a discarded commercial chemical product, an off-specification commercial chemical product, or a container residue or spill residue thereof (40 CFR 261.33). Based on the AK documentation reviewed, there is no evidence that unused commercial products were disposed of in TRU waste drums.

Hydrofluoric acid was used for cleaning, as a dissolution agent, and as an eluant (References P348, P458, P526, P874, P941). The hydrofluoric acid was used for its intended purpose and would not have been disposed of as an unused commercial product. Therefore, TRU waste contaminated with residual hydrofluoric acid does not meet the definition of a U134-listed waste.

One of the operations conducted by the Isotopes Programs facilities was the fabrication of neutron radiation sources using beryllium powder and Am-241, Pu-238, or Pu-239 oxide (References P753,

P1147, P1351, P1357, U468). This process used commercial beryllium powder; however, the beryllium was used for its intended purpose and would not have been disposed of as an unused material. Therefore, TRU waste generated as a result of this operation does not meet the definition of a P015-listed waste. Some of these neutron sources were disposed as TRU waste, and there was a program for destructive testing of Plutonium/Beryllium neutron sources (References M191, P1351, U038). This waste also does not meet the definition of a P015-listed waste.

Waste stream OR-ISTP-CH-HET does not include any of the manufacturing process wastes from the specific industries or sources listed in 40 CFR 261.32. Therefore, Waste Stream OR-ISTP-CH-HET is not assigned any U-, K-, or P-Listed EPA HWNs.

Headspace Gas/Volatile Organic Compound Information

Headspace gas analysis was performed on 10 randomly selected containers in Lot 1 of this waste stream. Only the 90 percent upper confidence limit for Methanol exceeded the Program Required Quantitation Limit. Methanol should require an F003 hazardous waste number, however, as F003 is only assigned on the basis of ignitability and this waste stream is not ignitable, F003 was not assigned. A single tentatively identified compound (TIC), 2-methly-1-propanol was found in one container. Since the TIC was found in less than 25 percent of the containers, no action was taken.

No new EPA hazardous waste numbers were added as a consequence of headspace gas sampling and analysis. The specifics of this information are included in the attached Characterization Information Summary report.

Conclusion

The EPA HWNs that apply to the waste stream are D005, D006, D007, D008, D009, D011, D019, D022, F002, and F005.

Polychlorinated Biphenyls (PCBs)

This waste stream contains PCBs, and therefore is regulated as Toxic Substances Control Act waste under 40 CFR 761.

Based on discussions with ORNL personnel, some drums in this waste stream may contain equipment with small PCB capacitors and pumps that contained PCB oil. The oil was drained from the pumps and was not placed into TRU waste. Examples of equipment containing small capacitors include fluorescent light ballasts and electric motors such as a vacuum pump motor. ORNL did not make a concerted effort to inventory pumps or electrical equipment containing small capacitors to determine if they contained PCBs so these items are potentially present in this waste stream (Reference C308).

Containers with PCB waste identified during RTR and/or VE are managed in accordance with the PCB disposal requirements in the WIPP-WAC.

Prohibited Items

The absence of prohibited items is determined and documented through acceptable knowledge and characterization activities. RTR or VE is performed on each container to verify the absence of prohibited items. The following items have been determined as not present in the waste:

- Liquid waste,
- Non-radioactive pyrophoric materials,
- Hazardous wastes not occurring as co-contaminants with TRU mixed wastes (non-mixed hazardous waste),
- Waste incompatible with backfill, seal and panel closure materials, container and packaging materials, or other wastes,
- Explosives or compressed gases,
- Waste with PCBs not authorized under an EPA PCB waste disposal authorization,
- Waste exhibiting the characteristics of ignitability, corrosivity, or reactivity, and
- Waste that has ever been managed as high-level waste and waste from tanks specified in Table C-8 of the WIPP Hazardous Waste Facility Permit, unless specifically approved through a Class 3 permit modification.

Each container of waste is certified and shipped only after RTR or VE either:

- Did not identify any prohibited items in the waste container, or
- All prohibited items found in a waste container by RTR or VE are identified and corrected (i.e., eliminated or removed) through the site non-conformance reporting system.

Justification for the Selection of RTR and/or VE

RTR was selected as the characterization method for this lot because the waste was previously packaged and RTR meets all the Data Quality Objectives for waste stream OR-ISTP-CH-HET.

Method for Determining Waste Material Parameter Weights per Unit of Waste

The waste material parameter weight estimates for waste stream OR-ISTP-CH-HET were derived from limited VE (36 drums) performed at the TWPC. The average weight percent and weight percent range for each waste material parameter are presented in Table 2. This evaluation is documented in a memorandum at required by CCP-TP- 005, *CCP Acceptable Knowledge Documentation.*

Table 2. Waste Stream OR-ISTP-CH-HET Waste Material Parameter Estimates

Waste Material Parameter	Average Weight Percent	Weight Percent Range
Iron-based Metals/Alloys	32.4%	0% – 89.2%
Aluminum-based Metals/Alloys	1.7%	0% – 18.1%
Other Metals	9.3%	0% – 80.0%
Other Inorganic Materials	2.0%	0% – 25.6%
Cellulosics	16.2%	0% – 73.2%
Plastics (waste materials)	29.3%	0% – 90.0%
Rubber	8.9%	0% – 90.0%
Organic Matrix	<0.1%	0% – 2.4%
Inorganic Matrix	0.3%	0% – 6.3%
Soils/Gravel	0%	0% – 0%

List of Any AK Sufficiency Determinations Requested for the Waste Stream

No AK Sufficiency Determinations were requested for this waste stream.

Transportation

This waste stream and its chemical constituents have been reviewed for consistency with the listed TRUCON Codes and they are consistent.

Beryllium

Beryllium will not be present in amounts greater than one percent by weight of the waste in each drum.

Radionuclide Information

The two most prevalent radionuclides, by mass, in this waste stream are Th-232 and U-238. The isotopes expected to be present in this waste stream are listed in Table 3.

Table 3 – Summary of Waste Stream OR-ISTP-CH-HET Radionuclides

WIPP Tracked	Other Radionuclides Present		
Am-241	Co-60	Th-230	Am-243
Pu-238	Pm-147	Th-232	Cm-242
Pu-239	Sm-151	Pa-231	Cm-243
Pu-240	Eu-152	U-232	Cm-244
Pu-242	Bi-211	U-235	Cm-245
U-233	Ra-223	U-236	Cm-246
U-234	Ra-226	Np-237	Bk-249
U-238	Th-227	Np-239	Cf-249
Cs-137	Th-228	Pu-241	Cf-252
Sr-90	Th-229	Pu-244	

Payload management will not be implemented for this waste stream.

Attachment 1 - AK SOURCE DOCUMENTS, SUPPLEMENTAL DOCUMENTATION

Source Document Number	AK #	Title	Document Number	Revision	Date
C031	S7	Letter to J. E. Ratledge, Isotope Sales, ORNL re: Addendum to Letter Dated February 1, 1980	NA	NA	06/16/1980
C034	S7	Memo to file re: Documentation of Defense-Related Activities Conducted in the Isotopes Research Materials Laboratory (IRML) at Oak Ridge National Laboratory (ORNL)	NA	NA	07/16/1999
C082	S7	Interview with Bob Eversole: Historical operations and waste management at Building 3028	NA	NA	05/10/2005
C085	S7	Interview with David Drake: Historical operations and waste management at Building 3028	NA	NA	05/10/2005
C087	S7	Interview with Jack Collins: Historical operations and waste management at Building 9204-3 at Y-12	NA	NA	05/18/2005
C089	S7	Interview with Joe Devore: Historical operations and waste management at Building 3028	NA	NA	05/10/2005
C096	S7	Interview with Tom Miner: Historical operations and waste management at Building 3028	NA	NA	05/18/2005
C097	S7	Interview with Tom Miner: Historical operations and waste management at Building 3038	NA	NA	05/18/2005
C153	S7	Email Releasing ORNL Container Paperwork. Subject: The Release of Generator Disposal Forms (2822 and 2109) Forms.	NA	NA	04/2008-05/2008
C308	S7	Interview of Jason Taylor, ORNL-PCB Coordinator from 1997 - 2004 re: PCB Management at ORNL	NA	NA	04/08/2008
DR024	N/A	Discrepancy Resolution – Waste Stream OR-ISTP-CH-HET EPA Hazardous Waste Number Assignment	NA	NA	06/29/2010
I015	S7	Memo to File regarding Utilization of Glove Boxes on the Second Floor of Building 3047 by staff of the Isotopes Research Materials Laboratory (IRML) at ORNL	NA	NA	07/26/1999
M171	S5	ORNL EM Waste Database Query	DR-10-000450	NA	11/9/2009
M187	N/A	EnergX Repack Forms for Waste Stream OR-ISTP-CH-HET	NA	NA	Various
M189	S9	EnergX RTR Data for Waste Stream OR-ISTP-CH-HET	NA	NA	Various
M190	S9	EnergX VE Data for Waste Stream OR-ISTP-CH-HET	NA	NA	04/27/2006-04/25/2007
M191	N/A	UCN-2109 and UCN-2822 Forms and Associated Container Paperwork for Waste Stream OR-ISTP-CH-HET	NA	NA	Various
M194	S10	MSDS Collection for Waste Stream OR-ISTP-CH-HET	NA	NA	Various
M196	S9	WEAF RTR Tapes (M126) Review	NA	NA	06/07/2010

Source Document Number	AK #	Title	Document Number	Revision	Date
P022	S5	Site Descriptions of Environmental Restoration Units at Oak Ridge National Laboratory, Oak Ridge, Tennessee	ORNL/ER-391	NA	02/1997
P087	S9	History of Disposal of Radioactive Wastes into the Ground at Oak Ridge National Laboratory	ORNL/TM-10269	NA	10/1986
P089	S5	The Preparation of Multi-gram Quantities of Curium-242 for SNAP-11	NA	NA	06/1969
P092	S5	Preparation of Actinide Specimens for the US/UK Joint Experiment in the Dounreay Prototype Fast Reactor	ORNL-5858	NA	05/1982
P098	S5, S9	Chemical Technology Division Annual Progress Report, for the Period April 1, 1979 to March 31, 1971	ORNL-5757	NA	11/1981
P101	S1	Isotopes White Paper, Volume II: Appendices	NA	NA	01/1988
P164	S5	Chemical Technology Division Annual Progress Report; Period Ending March 31, 1976	ORNL-5172	NA	09/1976
P175	N/A	Isotopes White Paper: Volume 1: Assessments of Selected Isotopes Circle Facilities, Evaluation of Isotope Processing Alternatives, and Funding Justification for LLW-CAT System for Isotopes Area	NA	NA	12/1987
P225	N/A	Solid State Division Annual Progress Report Period Ending December 31, 1975	ORNL-5135	NA	05/1976
P227	N/A	Solid State Division Annual Progress Report Period Ending April 30, 1977	ORNL-5328	NA	10/1977
P241	S2	Oak Ridge National Laboratory Contact-Handled Transuranic Waste Certification Program Plan	ORNL/TM-10322	1, 2, 3	06/1992
P244	S2	Certification Document for Newly Generated Contact-Handled Transuranic Waste	ORNL-5985	1	05/1984
P251	S2	Box Breakdown Area Operations	CH-P-OP-003	7, 9, 12, 15, 18	03/13/2007-09/03/2009
P252	S2	Glove Box Operations	CH-P-OP-004	8, 10, 14, 17, 18	03/13/2007-07/008/2009
P253	S2	Drum Bag In/Bag Out and Glove Ports	CH-P-OP-011	10, 12, 13, 14, 18	05/02/2007-08/21/2009
P254	S2	Contact Handled Waste Repackaging	CH-P-OP-013	6, 7, 8, 9	04/30/2007-03/23/2009
P256	S3	TRU/Alpha Low Level Waste (LLW) Treatment Project Documented Safety Analysis	T-CM-FW-R-AD-001	13	03/01/2007
P289	N/A	Radioisotope Development Laboratory Building 3047 Hazards Report	ORNL-TM-946	0	03/1971
P291	S2	Radioisotope Development Laboratory Building 3047 Hazards Report	ORNL-TM-946	2	05/24/1974
P293	S5	Radioisotope Distribution Program Progress Report for February 1975	ORNL-TM-4893	NA	04/1975
P294	S3	Radioisotope Development Laboratory Building 3047 Safety Analysis	ORNL-TM-946	3	03/1978
P295	S5	Radioisotope Department Progress Report for December 1979	ORNL/TM-7252	NA	02/1980
P297	S5	Final Report on Cermet High-level Waste Forms	ORNL-5760	NA	08/1981

Source Document Number	AK #	Title	Document Number	Revision	Date
P299	S5	Isotope Program (5000) Progress Report for Quarter Ending March 31, 1971	ORNL-TM-3406	NA	05/1971
P327	N/A	ORNL Isotopes Facilities Shutdown Program Plan	ORNL/TM-11689	NA	10/01/1990
P335	N/A	Final Deactivation Report on the Radioactive Gas Processing Facility, Building 3033, and the Actinide Fabrication Facility, Building 3033A, at ORNL	ORNL/ER-419	NA	09/24/1997
P337	S5	Radioisotope Program (8000) Progress Report for December 1972	ORNL-TM-4090	NA	01/01/1973
P338	S5	Isotopes Development Center Progress Report Reactor-and Cyclotron-Produced Isotopes, November - December 1962	ORNL-TM-530	NA	08/28/1963
P340	S5	Isotopes Development Center Progress Report Radioisotope Applications / July - September 1962	ORNL-TM-437	NA	02/06/1963
P341	S8	Project Management Plan for the Isotopes Facilities Deactivation Project at ORNL	ORNL/ER-376	NA	08/01/1996
P343	S5	Radioisotope Program (8000) Progress Report For December 1971	ORNL-TM-3677	NA	01/01/1972
P346	N/A	Work Plan for the Isotopes Facilities Deactivation Project at ORNL	ORNL/ER-249	1	05/01/1995
P347	S2, S8	ORNL Isotopes Facilities Shutdown Program Management Plan	ORNL/TM-11829	NA	05/01/1992
P348	S2	Radiation Safety and Control for The Electromagnetic Isotope Separation of the Heavy Metals in Building 9204-3, Y-12 Plant, Including Operational Procedures and Facility Layouts	ORNL-TM-4013	NA	03/01/1973
P398	S2, S3	Safety Analysis of Isotopes Alpha Handling Facility including Appendix C: Isotopes Division Solid Waste Handling Procedure	ORNL-TM-2845	0	03/19/1970
P399	S5	Isotope Program (5000) Progress Report For Quarter Ending December 31, 1969	ORNL-TM-2889	0	03/10/1970
P400	N/A	Safety Analysis of Building 3028	ORNL-TM-3192	0	12/14/1970
P407	S5	ORNL Isotopes Facilities Shutdown Program Plan	ORNL/TM-11689	NA	01/22/1991
P432	S3	TRU Waste Processing Center Document Safety Analysis	CM-R-AD-001	15, 16, 17, 18	10/31/2007-06/23/2009
P453	S3	Basis for Interim Operation for the Isotopes Development Laboratory, Building 3038	BIO/3038/F/RT-15	0B	02/10/1997
P455	S3	Phase 1 Safety Analysis Report Update Program (SARUP) Hazard Screening for the Radioisotope Laboratory A, Building 3028	HS/3028/F/RT-05	0,1	02/05/1992, 12/20/1994
P457	S3	Operational Safety Requirements for the Isotopes Development Laboratory, Building 3038	OSR/3038/F/RT-15	2B	02/10/1997
P458	S3	Final Safety Analysis Report for Building 3038	NA	NA	04/03/1984
P526	S2	The Chemical Processing Procedures of Radioactive Isotopes in the Special Separations Program	NA	0	05/1983
P528	S3	Safety Analysis Review - Building 3028	NA	NA	04/27/1984

Source Document Number	AK #	Title	Document Number	Revision	Date
P529	S3	Safety Analysis of the Source Development Laboratory - Building 3029	ORNL/CF-78/97	0	04/05/1978
P539	S2	Radioisotope Development Laboratory Building 3047 Hazards Report (Isotopes Development Center)	ORNL-TM-946	0	10/5/1964
P550	S3	Final Safety Analysis for the Source Development Laboratory, Building 3029	ORNL/CF-85/294	NA	08/30/1985
P566	N/A	ORNL Health Physics Manual	ORNL/M-804; RP-4.1; RP-4.2; RP-5.1	NA	11/02/1994
P568	S2	Isotopes Division Solid Waste handling Procedure	CF-73-8-40	NA	08/29/1973
P753	S2, S5	Problem Safety Summary: Bldg 3038 (Alpha Handling Facility Cells 4 & 5): Texas Nuclear Pu-239-Be Neutron Source Fabrication. Two Sources	CD-130	NA	04/18/1989
P762	S2	Internal Procedures / Radioisotope Development and Technology: Building 3038	IP-201 - IP-215	0	12/12/1985-03/30/1988
P763	S2	Internal Procedure Building 3032 / Isotope Production Department Helium Leak Test	IP-202; 223; 227; 227A; 242	0	03/28/1988
P829	N/A	Operations Division, Isotope Production Department, Operating Procedure: CH-TRU Waste	IP-001	0, 1, 3	09/01/1987; 03/17/1989; 01/03/1986
P834	S2	Glove Box Operation (Building 3038, ALPA Handling Facility Annex)	IP-1006	1	04/29/1994
P837	S3	Operational Safety Requirements for Building 3038	NA	1	04/15/1991
P847	S2	Manipulator Removal, Repair, and Replacement - Building 3038	IP-1610	1	06/24/1994
P860	S2, S5	Problem Safety Summary for Building 3038 Manipulator Cell Laboratory - Separation of Y-90 from Sr-90	CDS No. 123	NA	04/25/1990
P862	S3, S5	Problem Safety Summary for Building 3047, Isotope Circle - Decontamination of Cell D	CD-120	1	02/10/1989
P863	S2	Transuranic Waste Handling (Contact-Handled)	RPD-002	1	04/19/1993
P865	S2, S10	Solid Low Level Waste Handling (Bldg 3028, 3029, 3038, 3517)	RPD-001	0	12/21/1992
P867	S6	Isotopes Facilities Shutdown Program, ORNL, Buildings 3026-C, 3028, 3029, 3031, 3033 Annex, 3038, 3047, 3118, 3517, 7025, 9204-3	NA	NA	1990
P872	S2	Procedure for Yttrium-90/Strontium-90 Waste Removal from Building 3038 Hot Cell	RDT-600	5	01/16/1990
P873	S2	Procedure for Yttrium-90 Product Transfer, Building 3038 Hot Lab	RDT-601	2	01/25/1989
P874	S2, S5	Procedure for Separation & Purification of U-234 from Pu-238 in Building 3038, Alpha Handling Facility	RDT-608	1	08/30/1989
P875	S2, S5	Procedure for Solid Low Level Waste Handling for Buildings 3019 Complex, 3026-C, 3028, 3029, 3030, 3031, 3032, 3033, 3033 Annex, 3036, 3038, 3047, 3118, 3503, 3517, and 7025	RTS-024	0	11/02/1993

Source Document Number	AK #	Title	Document Number	Revision	Date
P876	S2, S5	Procedure for Transuranic Waste Handling in Buildings 3019 Complex, 3028, 3033 Annex, and 3047	RTS-025	0	11/02/1993
P899	S2	Isotopes Program Review - Compliance Issues / Vulnerability and Risk Report Oak Ridge National Laboratory: Safety Analysis Report Update	NA	NA	10/17/1988
P905	S2	Health Physics Procedure - Handling and Transfer of Radioactive Materials within the Laboratory and Guide for the Transfer of Materials Between Contaminated Enclosure Systems and Non-Contaminated Areas	Procedure 4.1	NA	01/01/1976
P906	S2	Chemical Technology Division Isotope Preparation Department Operating Procedure: Management of Contaminated Lead	IP-004	2	06/20/1989
P907	S3	Operational Safety Requirements for Building 3038 (ORNL Operations Division)	NA	NA	04/03/1984
P917	S2	Procedure 5.1 - Segregation and Management of solid Radioactive Waste Materials and supporting Solid Waste Management Documentation	Procedure 5.1	NA	12/15/1983, 12/15/1985
P941	N/A	Electromagnetic Isotope Separations - Special Separations Program	NA	NA	09/1969-1980
P956	N/A	Segregation and Management of Solid Radioactive Materials	NA	NA	11/27/1985, 05/15/1986
P1082	N/A	Lockheed Martin Energy Research Corporation, ORNL, Environmental Protection Procedure: Disposal of PCB (Polychlorinated Biphenyl) Oils	EPM-3.1	0A	05/01/1993
P1083	N/A	Environmental Protection Procedure: Polychlorinated Biphenyls (PCBs)	EPM-4.0	NA	11/20/1989; 01/15/1987
P1085	S2, S3	Safety Analysis of the Source Development Laboratory and Isotopes Division Solid Waste Handling Procedure	ORNL-TM-2568	NA	05/28/1969, 04/01/1968
P1100	N/A	PCB Annual Report for Oak Ridge National Laboratory - 1986	ORNL/TM-10495	NA	07/1987
P1101	N/A	PCB Annual Report for Oak Ridge National Laboratory - 1987	ORNL/TM-10858	NA	10/1988
P1102	N/A	PCB Annual Report for Oak Ridge National Laboratory - 1988	ORNL/TM-11247	NA	06/1989
P1103	N/A	PCB Annual Report for Oak Ridge National Laboratory - January 1, 1989 - February 5, 1990	ORNL/TM-11665	NA	07/01/1990
P1104	N/A	PCB Annual Report for Oak Ridge National Laboratory - January 1, 1991 - December 31, 1991	ORNL/TM-12132	NA	07/01/1992
P1105	N/A	PCB Annual Report for Oak Ridge National Laboratory - February 6, 1990 - December 31, 1990	ORNL/TM-11883	1	10/15/1991
P1106	N/A	PCB Annual Report for Oak Ridge National Laboratory - 1982	ORNL/TM-9035	NA	07/1984
P1108	N/A	PCB Annual Report for Oak Ridge National Laboratory - 1984	ORNL/TM-9701	NA	09/1986

Source Document Number	AK #	Title	Document Number	Revision	Date
P1109	N/A	PCB Annual Report for Oak Ridge National Laboratory - 1985	ORNL/TM-10121	NA	08/10/1986
P1112	N/A	Radioactive Solid Waste Operations Manual	ORNL/CF-85/205	1, 2	07/1985 – 01/29/1986
P1147	N/A	Chemical Technology Division Progress Report for the Period July 1, 1988 to September 30, 1989	ORNL-6596	NA	03/1990
P1271	S5	The neptunium-iron phase diagram	0022-3115(94)00305-8	NA	04/18/1994
P1272	S3	Phase I Safety Analysis Report Update Program (SARUP) Hazard Screening; The Isotope Development Laboratory; Building 3038	HS/3038/F/RT-15	0	02/14/1992
P1286	S3	Basis for Interim Operation for the Isotopes Development Laboratory Bldg 3038	BIO/3038/F/RT-15/R-0b	0b	02/10/1997
P1287	S3	Basis for Interim Operation for the Radioisotope Development Laboratory Bldg 3047	BIO/3047/F/RT-16	1	04/07/1997
P1289	S3	Final Safety Analysis for the Source Development Laboratory, Bldg 3029	ORNL/CF-85/294	NA	08/30/1985
P1290	S3	Operational Safety Requirements for Bldg 3029	NA	NA	07/28/1986
P1291	S3	Operational Safety Requirements for Bldg 3033 Annex	NA	Draft	03/12/1984
P1292	S3	Safety Analysis Report for Bldg 3033 Annex	NA	Draft	03/12/1984
P1294	S3	Operational Safety Requirements for Bldg 3038	NA	NA	06/29/1988
P1295	S3	Operational Safety Requirements for Bldg 3047	NA	NA	Undated
P1310	S3	Phase I Safety Analysis Report Update program (SARUP) hazard Screening - Building 3028	HS/3028/F/RT-05/Rev 0	0	02/05/1992
P1312	S3	Phase I Safety Documentation The Radioisotope Development Laboratory - Building 3047	HS/3047/F/RT-16	1	08/07/1995
P1316	S3	Safety Analysis Report for The Radioisotope Development Laboratory Building 3047	ORNL/CTD/SAR/3047/F/RT-16	0	~1999
P1321	S3	Final Safety Analysis for the Source Development Laboratory, Building 3029	ORNL/CF-85/295	NA	08/27/1985
P1324	S3	Draft Safety Assessment of Building 3031	CF-86/281	NA	09/1986
P1332	S2	Isotopes Division: Zoning Procedures	CF-73-9-13	NA	09/15/1973
P1351	N/A	Radioactive Operations Committee Reviews of Isotopes Facilities, Buildings 3028, 3029, 3030, 3031, 3032, 3033A, 3038, 3047, and 9204-3	Multiple	NA	1962-1988
P1357	N/A	Isotopes Separations Progress Report for 1976	Multiple	NA	07/1976-12/1976
P1360	S5	Isotope Separations Progress Reports for 1979	Multiple	NA	04/1979-12/1979
P1361	N/A	Isotope Separations Progress Reports for 1980	Multiple	NA	01/1980-12/1980
P1363	N/A	Isotopes Section Progress Reports for 1982	Multiple	NA	01/1982-12/1982
P1376	S5	Review of Isotopes Target Program, January 1965 – December 1967	ORNL-4308	NA	10/1968
P1377	S5	Review of Isotopes Target Program, October 1963-December 1964	ORNL-3829	NA	09/1965

Source Document Number	AK #	Title	Document Number	Revision	Date
U007	N/A	Safety Analysis of Building 3028	ORNL/CF-78/84	NA	06/26/1978
U038	S5, S9	ORNL TRU Waste Historical Survey	BJC/OR-395-V/1,2,3	Draft	09/2001
U044	S2, S9	Acceptable Knowledge Summary Report for Oak Ridge National Laboratory Contact-Handled TRU Debris Waste Facility Maintenance Operations	AK-ORNL-001	3A, 4	05/24/2006; 06/19/2006
U124	S2	Contamination Control Plan for Hot Cell (TWPC Hot Cell)	NA	NA	Draft
U427	S11	Unclassified Notebook, R. E. Kerry, Health Physics Division, Building 3047	A-6042	NA	06/07/1971-06/30/1971
U451	S11	ORNL Technical Notebook, D. D. Drake, Operations Division, Isotope Production (Bldg 3028)	Logbook No. A-103091	NA	10/05/1988-08/03/1995
U458	S11	RTS Facility Logbook JMD : Buildings 3038; 3038E; 3033A; 7025; 3047	Misc/1984/0001	0	01/3/1984-07/25/1986
U459	S2, S4, S11	RTS Facility Logbook; Buildings 3038 AHF; 3038E; 7025; 3047; 3033A – JM Daily Logbook – Isotopes	Misc/1982/0001	0	01/11/1982-2/22/1985
U466	S11	RTS Facility Logbook; Buildings 7025; 3038E; 3038; 3033A; 3047	Misc/1979/0001	0	11/05/1979-02/25/1980
U467	S11	RTS Facility Logbook; Buildings 3938, 3038E, 3033A, 7025, 3047	Misc/1978/0001	NA	1978-1979
U468	S11	RTC Facility Logbook; Buildings 7025; 3038E; 3038; 3033A; 3047 – J. M. Dailey (Isotopes)	Misc/1988/0001	NA	01/4/1988-12/18/1989
U469	S11	RTS Facility Logbook; Buildings 3038, 3038E, 3033A, 7025, 3047	Misc/1986/0002	0	07/28/1986-12/31/1987
U471	S11	RTS Facility Logbook: MISC/1980/0001; Buildings 3038, 3038E, 3033A, 7025, 3047; 03/1980-12/1985	Misc/1980/0001	NA	01/2/1980 - 12/28/1981
U472	S11	RTS Facility Logbook; Buildings 3038, 3038E, 3033A, 7025, 3047	Misc/1974/0001	NA	05/08/1974-07/02/1980
U473	S11	RTS Facility Logbook; Buildings 3038, 3038E, 3033A, 7025, 3047	Misc/1986/0001	0	10/7/1987-04/29/1987
U474	S11	RTS Facility Logbook; Building 3033A; 7025; 3038E; 3038; 3047	Misc/1977/0001	0	01/3/1977-12/21/1977
U475	S7, S11	RTS Facility Logbook; Buildings 3038; 3038E; 3033A; 7025; 3047	Misc/1970/0001	NA	3/26/1970-08/27/1979
U483	S11	ORNL Technical Logbook; C. E. McFarland; Building 3038	Logbook A-9372	NA	02/20/1980-12/30/1980
U569	S11	Logbook, Building 3047. P.R. Kuehn, Isotopes Facilities	NA	NA	02/13/1976-01/26/1977
U575	S11	Logbook, Building 3047. P.R. Kuehn, Isotopes Facilities	NA	NA	09/27/1965-11/12/1969
U577	S11	RTS Facility Logbook	3047/1971/0004	NA	11/1971-07/1972
U579	S11	Logbook, Building 3047, P. R. Kuehn. CmO2 Targets	NA	NA	1/15/1971-12/19/1973
U580	S11	Logbook, Building 3047. P.R. Kuehn, Isotopes Facilities	NA	NA	05/28/1975-09/03/1976

Source Document Number	AK #	Title	Document Number	Revision	Date
U582	S11	RTS Facility Logbook; Building 3033A, 3038E, 3038, 3047, 7025	Misc/1981/0001	NA	08/1981-08/1982
U586	S11	Logbook – FTR-O Rejects – RTS Facility – Buildings 3038E, 3038AHF, 3033A, 7025, 3047	Misc/1983/0002	NA	1983
U587	S11	Logbook – RTS Facility Buildings 3038, 3038E, 3033A, 7025, 3047	Misc/1975/0001	NA	09/23/1975-11/11/1977
U588	S11	Logbook Misc/1980/0001 - RTS Facility Buildings 3038, 3038E, 3033A, 7025, 3041, - 1/1980 thru 6/1981	Logbook Misc/1980/0001/RTS	NA	01/1980 - 06/1981
U589	S11	Logbook – RTS Facility – Buildings 3033A, 3038E, 3038, 3047, 7025	Misc/1967/0001	NA	06/12/1967-12/15/1975
U590	S11	Logbook – Lovegrove – Buildings 3038, 3038E, 3033A, 7025, 3047	Misc/1977/0002	NA	11/03/1977-12/10/1979
U591	S11	Logbook – Buildings 3033A, 3047, 7025 – S. D. Brandel	Misc/1986/0003	NA	03/03/1986-02/09/1988
U592	S11	Logbook – Buildings 3038, 3047, 3038E, 7025, 3033A – J. R. Gibson	Misc/1987/0001	NA	10/09/1987-12/21/1989
U593	S11	Logbook MISC/1967/0001 - RTS Facility Buildings 3033A, 3038E, 3038, 3047, 7025 - 6/1967 thru 12/1975	Logbook MISC 1967/0001	NA	06/12/1967 - 12/15/1975
U594	S11	Logbook – RTS Facility Buildings 7025, 3038E, 3038, 3033A, 3047 – Joni Lovegrove	Misc/1980/0001	NA	01/01/1980-06/08/1981
U680	S11	RTS Facility Logbook; W.S. Aaron; Buildings 3038, 3038E, 3033A, 7025, 3047	A-8783	NA	11/17/1976-03/09/1984

Alphanumeric Designations

C Correspondence
DR Discrepancy Resolution
I Internal Procedures and Notes
M Miscellaneous
P Published Documents
U Unpublished Documents

AK Numbers

S1	Process Design Documents
S2	Standard Operating Procedure
S3	Safety Analysis Reports
S4	Waste Packaging Logs
S5	Test plans/research project reports
S6	Site databases
S7	Information from site personnel
S8	Standard industry documents
S9	Previous analytical data
S10	Material safety data sheets
S11	Laboratory Notebooks
S12	Comparable or surrogate sampling and analysis data
NA	Not applicable

DIVIDER

PAGE

NWP
Nuclear Waste Partnership LLC

A URS-led partnership with B&W and AREVA

CP:15:01018
UFC:5900.00

INTER-OFFICE CORRESPONDENCE

DATE: January ~~15~~ 12, 2015
BSS 1.13.15

FROM: B. S. Schrock BSSchrock LOCATION: Certification

TO: CCP Records Custodian GSA-212 LOCATION: Central Characterization Program

SUBJECT: TRANSMITTAL OF OAK RIDGE NATIONAL LABORATORY CHARATERIZATION INFORMATION SUMMARY FOR WASTE STREAM #OR-ISTP-CH-HET (CCP-AK-ORNL-008), LOT 4 , LOT 5, LOT 6, LOT 7 AND LOT 8

Please accept the attached Oak Ridge National Laboratory Characterization Information Summaries to be placed in Records for Waste Stream #OR-ISTP-CH-HET (CCP-AK-ORNL-008), Lot 4, Lot 5, Lot 6, Lot 7 and Lot 8.

BSS:jmc

Attachment

cc: (without attachment)
D. Wade ED
M. Ramirez ED
R. Reeves ED

COPY

CCP RECORDS ORIGINAL
DATE REC'D 1/12/2015 JY

P.O. Box 2078 • Carlsbad, New Mexico USA 88221-2078
Phone: (575) 234-7200 • Fax: (575) 234-7083

CHARACTERIZATION INFORMATION SUMMARY

WSPF# OR-ISTP-CH-HET Rev. 0 (CCP-AK-ORNL-008)

Lot 4

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CCP Characterization Information Summary Cover Page

Waste Stream # OR-ISTP-CH-HET Lot #: 4

AK Expert Review: N/A Date: N/A

SPM Review: Jerry Jess Fisher Jr. Date: 08/08/2014

SPM signature certifies that through Acceptable Knowledge testing and/or analysis that the waste identified in this summary is not corrosive, ignitable, reactive, or incompatible with the TSDF.

A summary of the Acceptable Knowledge regarding this waste stream containing specific information about the corrosivity, reactivity, and ignitability of the waste stream is included as an attachment to the Waste Stream Profile Form. By reference, that information is included in this lot.

List of procedures used:

Non Destructive Assay (NDA):

CCP-TP-048	Rev. 16	11/01/2013 Mobile IQ3 System Data Reviewing, Validating, and Reporting Procedure
CCP-TP-048	Rev. 15	03/24/2011 Mobile IQ3 System Data Reviewing, Validating, and Reporting Procedure
CCP-TP-048	Rev. 14	03/08/2010 Mobile IQ3 System Data Reviewing, Validating, and Reporting Procedure
CCP-TP-048	Rev. 13	10/12/2009 Mobile IQ3 System Data Reviewing, Validating, and Reporting Procedure
CCP-TP-048	Rev. 12	09/09/2009 Mobile IQ3 System Data Reviewing, Validating, and Reporting Procedure
CCP-TP-048	Rev. 11	02/19/2008 Mobile IQ3 System Data Reviewing, Validating, and Reporting Procedure
CCP-TP-048	Rev. 10	11/16/2006 Mobile IQ3 System Data Reviewing, Validating, and Reporting Procedure
CCP-TP-048	Rev. 9	11/03/2005 Mobile IQ3 System Data Reviewing, Validating, and Reporting Procedure
CCP-TP-048	Rev. 8	09/21/2005 Mobile IQ3 System Data Reviewing, Validating, and Reporting Procedure
CCP-TP-048	Rev. 7	03/14/2005 Mobile IQ3 System Data Reviewing, Validating, and Reporting Procedure
CCP-TP-048	Rev. 6	10/18/2004 Mobile IQ3 System Data Reviewing, Validating, and Reporting Procedure
CCP-TP-048	Rev. 5	08/06/2004 Mobile IQ3 System Data Reviewing, Validating, and Reporting Procedure
CCP-TP-048	Rev. 4	12/04/2003 Mobile IQ3 System Data Reviewing, Validating, and Reporting Procedure
CCP-TP-048	Rev. 3	09/03/2003 Mobile IQ3 System Data Reviewing, Validating, and Reporting Procedure
CCP-TP-048	Rev. 2	04/25/2003 Mobile IQ3 System Data Reviewing, Validating, and Reporting Procedure
CCP-TP-048	Rev. 1	03/21/2003 Mobile IQ3 System Data Reviewing, Validating, and Reporting Procedure
CCP-TP-048	Rev. 0	02/05/2003 Mobile IQ3 System Data Reviewing, Validating, and Reporting Procedure

Project Level Data Validation / DQO Reconciliation:

CCP-TP-001	Rev. 21	06/06/2013 CCP Project Level Data Validation and Verification
CCP-TP-001	Rev. 20	09/27/2012 CCP Project Level Data Validation and Verification
CCP-TP-001	Rev. 19	12/29/2010 CCP Project Level Data Validation and Verification
CCP-TP-001	Rev. 18	08/09/2010 CCP Project Level Data Validation and Verification
CCP-TP-001	Rev. 17	09/24/2007 CCP Project Level Data Validation and Verification
CCP-TP-001	Rev. 16	04/26/2007 CCP Project Level Data Validation and Verification
CCP-TP-001	Rev. 15	11/22/2006 CCP Project Level Data Validation and Verification
CCP-TP-001	Rev. 14	11/16/2006 CCP Project Level Data Validation and Verification
CCP-TP-001	Rev. 13	07/21/2006 CCP Project Level Data Validation and Verification
CCP-TP-001	Rev. 12	05/25/2006 CCP Project Level Data Validation and Verification
CCP-TP-001	Rev. 11	03/23/2005 CCP Project Level Data Validation and Verification

CCP-TP-002	Rev. 26	06/19/2013 CCP Reconciliation of DQOs and Reporting Characterization Data
CCP-TP-002	Rev. 25	02/11/2013 CCP Reconciliation of DQOs and Reporting Characterization Data
CCP-TP-002	Rev. 24	12/28/2011 CCP Reconciliation of DQOs and Reporting Characterization Data
CCP-TP-002	Rev. 23	12/29/2010 CCP Reconciliation of DQOs and Reporting Characterization Data
CCP-TP-002	Rev. 22	06/30/2010 CCP Reconciliation of DQOs and Reporting Characterization Data
CCP-TP-002	Rev. 21	08/04/2009 CCP Reconciliation of DQOs and Reporting Characterization Data
CCP-TP-002	Rev. 20	08/18/2008 CCP Reconciliation of DQOs and Reporting Characterization Data
CCP-TP-002	Rev. 19	12/22/2006 CCP Reconciliation of DQOs and Reporting Characterization Data
CCP-TP-002	Rev. 18	11/16/2006 CCP Reconciliation of DQOs and Reporting Characterization Data
CCP-TP-002	Rev. 17	10/10/2006 CCP Reconciliation of DQOs and Reporting Characterization Data
CCP-TP-002	Rev. 16	06/06/2006 CCP Reconciliation of DQOs and Reporting Characterization Data
CCP-TP-002	Rev. 15	08/16/2005 CCP Reconciliation of DQOs and Reporting Characterization Data
CCP-TP-002	Rev. 14	03/29/2005 CCP Reconciliation of DQOs and Reporting Characterization Data

CCP-TP-005	Rev. 26	08/12/2013 CCP Acceptable Knowledge Documentation
CCP-TP-005	Rev. 25	06/19/2013 CCP Acceptable Knowledge Documentation
CCP-TP-005	Rev. 24	11/28/2011 CCP Acceptable Knowledge Documentation
CCP-TP-005	Rev. 23	06/30/2011 CCP Acceptable Knowledge Documentation
CCP-TP-005	Rev. 22	04/21/2011 CCP Acceptable Knowledge Documentation
CCP-TP-005	Rev. 21	12/29/2010 CCP Acceptable Knowledge Documentation
CCP-TP-005	Rev. 20	11/01/2010 CCP Acceptable Knowledge Documentation
CCP-TP-005	Rev. 19	07/06/2010 CCP Acceptable Knowledge Documentation
CCP-TP-005	Rev. 18	11/16/2006 CCP Acceptable Knowledge Documentation

CCP-TP-005	Rev. 17	08/05/2008 CCP Acceptable Knowledge Documentation
CCP-TP-005	Rev. 16	02/27/2008 CCP Acceptable Knowledge Documentation
CCP-TP-005	Rev. 15	03/31/2005 CCP Acceptable Knowledge Documentation

CCP-TP-030	Rev. 33	11/19/2013 CCP CH TRU Waste Certification and WWIS/WDS Data Entry
CCP-TP-030	Rev. 32	08/20/2013 CCP CH TRU Waste Certification and WWIS/WDS Data Entry
CCP-TP-030	Rev. 31	11/19/2012 CCP CH TRU Waste Certification and WWIS/WDS Data Entry
CCP-TP-030	Rev. 30	05/21/2012 CCP CH TRU Waste Certification and WWIS/WDS Data Entry
CCP-TP-030	Rev. 29	04/26/2011 CCP CH TRU Waste Certification and WWIS/WDS Data Entry
CCP-TP-030	Rev. 28	05/12/2010 CCP CH TRU Waste Certification and WWIS/WDS Data Entry
CCP-TP-030	Rev. 27	12/14/2009 CCP CH TRU Waste Certification and WWIS Data Entry
CCP-TP-030	Rev. 26	05/27/2009 CCP CH TRU Waste Certification and WWIS Data Entry
CCP-TP-030	Rev. 25	01/22/2009 CCP CH TRU Waste Certification and WWIS Data Entry
CCP-TP-030	Rev. 24	08/20/2008 CCP CH TRU Waste Certification and WWIS Data Entry
CCP-TP-030	Rev. 23	03/12/2008 CCP CH TRU Waste Certification and WWIS Data Entry
CCP-TP-030	Rev. 22	07/24/2007 CCP CH TRU Waste Certification and WWIS Data Entry
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CCP-TP-030	Rev. 18	05/01/2006 CCP TRU Waste Certification and WWIS Data Entry
CCP-TP-030	Rev. 17	12/29/2005 CCP TRU Waste Certification and WWIS Data Entry
CCP-TP-030	Rev. 16	04/22/2005 CCP TRU Waste Certification and WWIS Data Entry

Radiography (RTR/NDE):

CCP-TP-053	Rev. 14	09/25/2013 CCP Standard Real-Time Radiography (RTR) Inspection Procedure
CCP-TP-053	Rev. 13	05/14/2013 CCP Standard Real-Time Radiography (RTR) Inspection Procedure
CCP-TP-053	Rev. 12	08/22/2012 CCP Standard Real-Time Radiography (RTR) Inspection Procedure
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CCP-TP-053	Rev. 5	11/16/2006 CCP Standard Real-Time Radiography (RTR) Inspection Procedure
CCP-TP-053	Rev. 4	12/22/2005 CCP Standard Real-Time Radiography (RTR) Inspection Procedure
CCP-TP-053	Rev. 3	03/21/2005 CCP Standard Real-Time Radiography (RTR) Inspection Procedure
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WAP Certification:

CCP-PO-001	Rev. 21	05/31/2013 CCP Transuranic Waste Characterization Quality Assurance Project Plan
CCP-PO-001	Rev. 20	08/16/2011 CCP Transuranic Waste Characterization Quality Assurance Project Plan
CCP-PO-001	Rev. 19	12/29/2010 CCP Transuranic Waste Characterization Quality Assurance Project Plan
CCP-PO-001	Rev. 18	08/30/2010 CCP Transuranic Waste Characterization Quality Assurance Project Plan
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CCP-PO-001	Rev. 16	10/31/2007 CCP Transuranic Waste Characterization Quality Assurance Project Plan
CCP-PO-001	Rev. 15	08/10/2007 CCP Transuranic Waste Characterization Quality Assurance Project Plan
CCP-PO-001	Rev. 14	03/28/2007 CCP Transuranic Waste Characterization Quality Assurance Project Plan
CCP-PO-001	Rev. 13	11/16/2006 CCP Transuranic Waste Characterization Quality Assurance Project Plan
CCP-PO-001	Rev. 12	03/22/2006 CCP Transuranic Waste Characterization Quality Assurance Project Plan
CCP-PO-001	Rev. 11	03/10/2005 CCP Transuranic Waste Characterization Quality Assurance Project Plan

CCP-PO-002	Rev. 27	05/31/2013 CCP Transuranic Waste Certification Plan
CCP-PO-002	Rev. 26	07/14/2011 CCP Transuranic Waste Certification Plan
CCP-PO-002	Rev. 25	12/29/2010 CCP Transuranic Waste Certification Plan
CCP-PO-002	Rev. 24	08/30/2010 CCP Transuranic Waste Certification Plan
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CCP-PO-002	Rev. 22	01/12/2010 CCP Transuranic Waste Certification Plan
CCP-PO-002	Rev. 21	01/26/2009 CCP Transuranic Waste Certification Plan
CCP-PO-002	Rev. 20	11/02/2007 CCP Transuranic Waste Certification Plan
CCP-PO-002	Rev. 19	05/22/2007 CCP Transuranic Waste Certification Plan
CCP-PO-002	Rev. 18	11/16/2006 CCP Transuranic Waste Certification Plan
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CCP-PO-002	Rev. 15	03/22/2006 CCP Transuranic Waste Certification Plan
CCP-PO-002	Rev. 14	12/28/2005 CCP Transuranic Waste Certification Plan
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CCP-PO-003	Rev. 13	07/31/2013 Transuranic Authorized Methods for Payload Control (CCP CH-TRAMPC)
CCP-PO-003	Rev. 12	12/29/2010 Transuranic Authorized Methods for Payload Control (CCP CH-TRAMPC)

CCP-PO-003	Rev. 11	06/04/2009	Transuranic Authorized Methods for Payload Control (CCP CH-TRAMPC)
CCP-PO-003	Rev. 10	11/16/2006	Transuranic Authorized Methods for Payload Control (CCP CH-TRAMPC)
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CCP-PO-003	Rev. 6	08/08/2004	Transuranic Authorized Methods for Payload Control (CCP CH-TRAMPC)
CCP-PO-003	Rev. 5	09/19/2003	Transuranic Authorized Methods for Payload Control (CCP CH-TRAMPC)
CCP-PO-003	Rev. 4	02/11/2003	Transuranic Authorized Methods for Payload Control (CCP CH-TRAMPC)
CCP-PO-003	Rev. 3	05/31/2002	Transuranic Authorized Methods for Payload Control (CCP CH-TRAMPC)

CCP Correlation of Container Identification Numbers to Batch Data Report Numbers

Waste Stream: # OR-ISTP-CH-HET Lot # 4

Container ID Number	Historical Container ID	NDA BDR	RTR BDR	VE BDR	Load/Manage Overpack Yes	Transportation Headspace Gas	
						FGA	GGT
X10C0501624O	N/A	OR-IQ3-0303	OR-RTR6-0510	N/A	No	OR14FG8054	N/A
X10C0600038A	N/A	OR-IQ3-0298	OR-RTR6-0505	N/A	No	OR14FG8050	N/A
X10C9309204A	N/A	OR-IQ3-0321	OR-RTR6-0526	N/A	No	OR14FG8068	N/A
X10C9311051B	N/A	OR-IQ3-0319	OR-RTR6-0525	N/A	No	OR14FG4043	N/A
X10C9311063A1	N/A	OR-IQ3-0298	OR-RTR6-0505	N/A	No	OR14FG8050	N/A
X10C9311066C	N/A	OR-IQ3-0331	OR-RTR6-0536	N/A	No	OR14FG8076	N/A
X10C9311066D	N/A	OR-IQ3-0308	OR-RTR6-0511	N/A	No	OR14FG8057	N/A
X10C9311067D	N/A	OR-IQ3-0296	OR-RTR6-0503	N/A	No	OR14FG8048	N/A
X10C9311220C1	N/A	OR-IQ3-0302	OR-RTR6-0510	N/A	No	OR14FG8056	N/A
X10C9311222A	N/A	OR-IQ3-0300	OR-RTR6-0507	N/A	No	OR14FG8054	N/A
X10C9311222B	N/A	OR-IQ3-0324	OR-RTR6-0530	N/A	No	OR14FG8070	N/A
X10C9311225F1	N/A	OR-IQ3-0302	OR-RTR6-0510	N/A	No	OR14FG8056	N/A
X10C9311234A	N/A	OR-IQ3-0335	OR-RTR6-0541	N/A	No	OR14FG8080	N/A
X10C9311237A	N/A	OR-IQ3-0334	OR-RTR6-0540	N/A	No	OR14FG8080	N/A
X10C9311317A	N/A	OR-IQ3-0321	OR-RTR6-0527	N/A	No	OR14FG8068	N/A
X10C9311380A1	N/A	OR-IQ3-0341	OR-RTR6-0547	N/A	No	OR14FG8087	N/A
X10C9311490A	N/A	OR-IQ3-0316	OR-RTR6-0521	N/A	No	OR14FG4040	N/A
X10C9311512A1	N/A	OR-IQ3-0316	OR-RTR6-0522	N/A	No	OR14FG8064	N/A
X10C9311776A	N/A	OR-IQ3-0303	OR-RTR6-0510	N/A	No	OR14FG8054	N/A
X10C9311780A	N/A	OR-IQ3-0296	OR-RTR6-0503	N/A	No	OR14FG8048	N/A
X10C9312144B	N/A	OR-IQ3-0300	OR-RTR6-0507	N/A	No	OR14FG4028	N/A
X10C9312486A	N/A	OR-IQ3-0296	OR-RTR6-0503	N/A	No	OR14FG8048	N/A
X10C9312540A	N/A	OR-IQ3-0320	OR-RTR6-0526	N/A	No	OR14FG8067	N/A
X10C9312542A	N/A	OR-IQ3-0320	OR-RTR6-0526	N/A	No	OR14FG8069	N/A
X10C9312587B	N/A	OR-IQ3-0319	OR-RTR6-0525	N/A	No	OR14FG8066	N/A
X10C9312590A	N/A	OR-IQ3-0321	OR-RTR6-0527	N/A	No	OR14FG8068	N/A
X10C9312698A	N/A	OR-IQ3-0317	OR-RTR6-0522	N/A	No	OR14FG4041	N/A
X10C9312768D	N/A	OR-IQ3-0321	OR-RTR6-0526	N/A	No	OR14FG8068	N/A
X10C9312768E	N/A	OR-IQ3-0302	OR-RTR6-0510	N/A	No	OR14FG8054	N/A
X10C9312768G	N/A	OR-IQ3-0302	OR-RTR6-0510	N/A	No	OR14FG8056	N/A
X10C9312787A	N/A	OR-IQ3-0321	OR-RTR6-0527	N/A	No	OR14FG8068	N/A
X10C9312915A	N/A	OR-IQ3-0331	OR-RTR6-0537	N/A	No	OR14FG8076	N/A
X10C9312993A	N/A	OR-IQ3-0296	OR-RTR6-0503	N/A	No	OR14FG4025	N/A

CCP Correlation of Container Identification Numbers to Batch Data Report Numbers

Waste Stream: # OR-ISTP-CH-HET Lot # 4

Container ID Number	Historical Container ID	NDA BDR	RTR BDR	VE BDR	Load/Manage Overpack Yes	Transportation Headspace Gas	
						FGA	GGT
X10C9313094A	N/A	OR-IQ3-0290	OR-RTR6-0497	N/A	No	OR14FG4021	N/A
X10C9400097B	N/A	OR-IQ3-0296	OR-RTR6-0503	N/A	No	OR14FG4025	N/A
X10C9400126A	N/A	OR-IQ3-0342	OR-RTR6-0547	N/A	No	OR14FG8087	N/A
X10C9400147A	N/A	OR-IQ3-0300	OR-RTR6-0508	N/A	No	OR14FG8056	N/A
X10C9400226A	N/A	OR-IQ3-0310	OR-RTR6-0511	N/A	No	OR14FG8057	N/A
X10C9400246A	N/A	OR-IQ3-0296	OR-RTR6-0503	N/A	No	OR14FG4025	N/A
X10CSATN03551D	N/A	OR-IQ3-0315	OR-RTR6-0520	N/A	No	OR14FG4039	N/A

Signature of Site Project Manager | Jerry Jess Fisher Jr. (Printed Name) | 08/08/2014 (Date)

CCP RTR/VE Summary of Prohibited Items and AK Confirmation

Waste Stream Number: OR-ISTP-CH-HET Lot #: 4

Container Number	RTR Prohibited Items [a,b]	Visual Examination Prohibited Items [a,b]	Does the Physical Form of the Waste Match the Waste Stream Description as Determined by AK
See correlation of container ID numbers for list of remaining drum numbers in this Lot.	None of the containers in this lot had prohibited items identified during RTR.	VE was not used to certify any containers in this Lot.	The physical form of the waste matches the waste stream description as determined by AK.
a. See Batch Data Reports b. If AK has assigned U134 to this waste stream, then any liquids in these containers are prohibited items (not acceptable by the TSDF).			
Justification for the selection of RTR and/or VE: RTR was selected as the characterization method for this lot because the waste was previously packaged and RTR meets all the Data Quality Objectives for NDE for the waste.			

Site Project Manager Signature | Jerry Jess Fisher Jr. Printed Name | 08/08/2014 Date

CCP Reconciliation with Data Quality Objectives

WSPF# OR-ISTP-CH-HET Rev. 0 Lot # 4

Sampling Completeness

RTR/VE:

Number of Valid Samples: 40 Number of Total Samples Analyzed: 40

Percent Complete: 100 (QAO is 100%)

Radiological:

Number of Valid Samples: 40 Number of Total Samples Analyzed: 40

Percent Complete: 100 (QAO is 100%)

	Y/N/NA	Reconciliation Parameter
1	Y	Waste Matrix Code.
2	Y	Waste Material Parameter Weights.
3	Y	The TRU activity reported in the BDRs for each container demonstrates with a 95% probability that the container of waste contains TRU radioactive waste.
4	N	AK Sufficiency. Is there an approved AK sufficiency Determination for this waste stream?
5	Y	The data demonstrates whether the waste stream exhibits a toxicity characteristic under Title 40 Code of Federal Regulations (CFR), Part 261, Identification and Listing of Hazardous Waste, Subpart C, Characteristics of Hazardous Waste.
6	Y	Does the waste stream contain listed waste found in 20.4.1.200 NMAC incorporating 40 CFR Part 261, Subpart D, Lists of Hazardous Wastes.
7	Y	Waste stream can be classified as hazardous or nonhazardous.
8	Y	The overall completeness, comparability, and representativeness QAOs were met for each of the analytical and testing procedures as specified in the WAP Sections C3-1 through C3-2 prior to submittal of a waste stream profile form for a waste steam or waste stream lot.

	Completeness	Comparability	Representativeness
Radiography	Y	Y	Y
VE	NA	NA	NA

Comments: None

Jerry Jess Fisher Jr. 08/08/2014

Signature of Site Project Manager Printed Name Date

CHARACTERIZATION INFORMATION SUMMARY

WSPF# OR-ISTP-CH-HET Rev. 0 (CCP-AK-ORNL-008)

Lot 5

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CCP Characterization Information Summary Cover Page

Waste Stream # OR-ISTP-CH-HET Lot #: 5

AK Expert Review: N/A Date: N/A

SPM Review: Rick Whiteley Date: 08/11/2014

SPM signature certifies that through Acceptable Knowledge testing and/or analysis that the waste identified in this summary is not corrosive, ignitable, reactive, or incompatible with the TSDF.

A summary of the Acceptable Knowledge regarding this waste stream containing specific information about the corrosivity, reactivity, and ignitability of the waste stream is included as an attachment to the Waste Stream Profile Form. By reference, that information is included in this lot.

List of procedures used:

Non Destructive Assay (NDA):

CCP-TP-048	Rev. 16	11/01/2013	Mobile IQ3 System Data Reviewing, Validating, and Reporting Procedure
CCP-TP-048	Rev. 15	03/24/2011	Mobile IQ3 System Data Reviewing, Validating, and Reporting Procedure
CCP-TP-048	Rev. 14	03/08/2010	Mobile IQ3 System Data Reviewing, Validating, and Reporting Procedure
CCP-TP-048	Rev. 13	10/12/2009	Mobile IQ3 System Data Reviewing, Validating, and Reporting Procedure
CCP-TP-048	Rev. 12	09/09/2009	Mobile IQ3 System Data Reviewing, Validating, and Reporting Procedure
CCP-TP-048	Rev. 11	02/19/2008	Mobile IQ3 System Data Reviewing, Validating, and Reporting Procedure
CCP-TP-048	Rev. 10	11/18/2006	Mobile IQ3 System Data Reviewing, Validating, and Reporting Procedure
CCP-TP-048	Rev. 9	11/03/2005	Mobile IQ3 System Data Reviewing, Validating, and Reporting Procedure
CCP-TP-048	Rev. 8	09/21/2005	Mobile IQ3 System Data Reviewing, Validating, and Reporting Procedure
CCP-TP-048	Rev. 7	03/14/2005	Mobile IQ3 System Data Reviewing, Validating, and Reporting Procedure
CCP-TP-048	Rev. 6	10/18/2004	Mobile IQ3 System Data Reviewing, Validating, and Reporting Procedure
CCP-TP-048	Rev. 5	06/08/2004	Mobile IQ3 System Data Reviewing, Validating, and Reporting Procedure
CCP-TP-048	Rev. 4	12/04/2003	Mobile IQ3 System Data Reviewing, Validating, and Reporting Procedure
CCP-TP-048	Rev. 3	09/03/2003	Mobile IQ3 System Data Reviewing, Validating, and Reporting Procedure
CCP-TP-048	Rev. 2	04/25/2003	Mobile IQ3 System Data Reviewing, Validating, and Reporting Procedure
CCP-TP-048	Rev. 1	03/21/2003	Mobile IQ3 System Data Reviewing, Validating, and Reporting Procedure
CCP-TP-048	Rev. 0	02/05/2003	Mobile IQ3 System Data Reviewing, Validating, and Reporting Procedure

Project Level Data Validation / DQO Reconciliation:

CCP-TP-001	Rev. 21	06/06/2013	CCP Project Level Data Validation and Verification
CCP-TP-001	Rev. 20	09/27/2012	CCP Project Level Data Validation and Verification
CCP-TP-001	Rev. 19	12/28/2010	CCP Project Level Data Validation and Verification
CCP-TP-001	Rev. 18	08/09/2010	CCP Project Level Data Validation and Verification
CCP-TP-001	Rev. 17	09/24/2007	CCP Project Level Data Validation and Verification
CCP-TP-001	Rev. 16	04/26/2007	CCP Project Level Data Validation and Verification
CCP-TP-001	Rev. 15	11/22/2006	CCP Project Level Data Validation and Verification
CCP-TP-001	Rev. 14	11/16/2006	CCP Project Level Data Validation and Verification
CCP-TP-001	Rev. 13	07/21/2006	CCP Project Level Data Validation and Verification
CCP-TP-001	Rev. 12	05/25/2006	CCP Project Level Data Validation and Verification
CCP-TP-001	Rev. 11	03/23/2005	CCP Project Level Data Validation and Verification

CCP-TP-002	Rev. 26	06/19/2013	CCP Reconciliation of DQOs and Reporting Characterization Data
CCP-TP-002	Rev. 25	02/11/2013	CCP Reconciliation of DQOs and Reporting Characterization Data
CCP-TP-002	Rev. 24	12/28/2011	CCP Reconciliation of DQOs and Reporting Characterization Data
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CCP-PO-001	Rev. 18	06/30/2010 CCP Transuranic Waste Characterization Quality Assurance Project Plan
CCP-PO-001	Rev. 17	06/23/2009 CCP Transuranic Waste Characterization Quality Assurance Project Plan
CCP-PO-001	Rev. 16	10/31/2007 CCP Transuranic Waste Characterization Quality Assurance Project Plan
CCP-PO-001	Rev. 15	08/10/2007 CCP Transuranic Waste Characterization Quality Assurance Project Plan
CCP-PO-001	Rev. 14	03/28/2007 CCP Transuranic Waste Characterization Quality Assurance Project Plan
CCP-PO-001	Rev. 13	11/16/2006 CCP Transuranic Waste Characterization Quality Assurance Project Plan
CCP-PO-001	Rev. 12	03/22/2006 CCP Transuranic Waste Characterization Quality Assurance Project Plan
CCP-PO-001	Rev. 11	03/10/2005 CCP Transuranic Waste Characterization Quality Assurance Project Plan

CCP-PO-002	Rev. 27	05/31/2013 CCP Transuranic Waste Certification Plan
CCP-PO-002	Rev. 26	07/14/2011 CCP Transuranic Waste Certification Plan
CCP-PO-002	Rev. 25	12/29/2010 CCP Transuranic Waste Certification Plan
CCP-PO-002	Rev. 24	06/30/2010 CCP Transuranic Waste Certification Plan
CCP-PO-002	Rev. 23	04/07/2010 CCP Transuranic Waste Certification Plan
CCP-PO-002	Rev. 22	01/12/2010 CCP Transuranic Waste Certification Plan
CCP-PO-002	Rev. 21	01/26/2009 CCP Transuranic Waste Certification Plan
CCP-PO-002	Rev. 20	11/02/2007 CCP Transuranic Waste Certification Plan
CCP-PO-002	Rev. 19	05/22/2007 CCP Transuranic Waste Certification Plan
CCP-PO-002	Rev. 18	11/16/2006 CCP Transuranic Waste Certification Plan
CCP-PO-002	Rev. 17	11/16/2006 CCP Transuranic Waste Certification Plan
CCP-PO-002	Rev. 16	11/16/2006 CCP Transuranic Waste Certification Plan
CCP-PO-002	Rev. 15	03/22/2006 CCP Transuranic Waste Certification Plan
CCP-PO-002	Rev. 14	12/29/2005 CCP Transuranic Waste Certification Plan
CCP-PO-002	Rev. 13	05/09/2005 CCP Transuranic Waste Certification Plan

CCP-PO-003	Rev. 13	07/31/2013 Transuranic Authorized Methods for Payload Control (CCP CH-TRAMPC)
CCP-PO-003	Rev. 12	12/29/2010 Transuranic Authorized Methods for Payload Control (CCP CH-TRAMPC)

CCP-PO-003	Rev. 11	06/04/2009	Transuranic Authorized Methods for Payload Control (CCP CH-TRAMPC)
CCP-PO-003	Rev. 10	11/16/2008	Transuranic Authorized Methods for Payload Control (CCP CH-TRAMPC)
CCP-PO-003	Rev. 9	12/29/2005	Transuranic Authorized Methods for Payload Control (CCP CH-TRAMPC)
CCP-PO-003	Rev. 8	01/25/2005	Transuranic Authorized Methods for Payload Control (CCP CH-TRAMPC)
CCP-PO-003	Rev. 7	11/22/2004	Transuranic Authorized Methods for Payload Control (CCP CH-TRAMPC)
CCP-PO-003	Rev. 6	06/08/2004	Transuranic Authorized Methods for Payload Control (CCP CH-TRAMPC)
CCP-PO-003	Rev. 5	09/19/2003	Transuranic Authorized Methods for Payload Control (CCP CH-TRAMPC)
CCP-PO-003	Rev. 4	02/11/2003	Transuranic Authorized Methods for Payload Control (CCP CH-TRAMPC)
CCP-PO-003	Rev. 3	05/31/2002	Transuranic Authorized Methods for Payload Control (CCP CH-TRAMPC)

CCP Correlation of Container Identification Numbers to Batch Data Report Numbers

Waste Stream: # OR-ISTP-CH-HET Lot # 5

Container ID Number	Historical Container ID	NDA BDR	RTR BDR	VE BDR	Load/Manage Overpack Yes	Transportation Headspace Gas	
						FGA	GGT
X10C9309201Y	N/A	OR-IQ3-0313	OR-RTR6-0460	N/A	No	OR14FG4037	N/A
X10C9311033A	N/A	OR-IQ3-0271	OR-RTR6-0479	N/A	No	OR14FG4011	N/A
X10C9311059C	N/A	OR-IQ3-0284	OR-RTR6-0492	N/A	No	OR14FG4018	N/A
X10C9311059E	N/A	OR-IQ3-0275	OR-RTR6-0482	N/A	No	OR14FG4015	N/A
X10C9311066F	N/A	OR-IQ3-0262	OR-RTR6-0470	N/A	No	OR14FG8064	N/A
X10C9311204A	N/A	OR-IQ3-0289	OR-RTR6-0496	N/A	No	OR14FG8042	N/A
X10C9311218A	N/A	OR-IQ3-0279	OR-RTR6-0486	N/A	No	OR14FG8034	N/A
X10C9311220E	N/A	OR-IQ3-0276	OR-RTR6-0483	N/A	No	OR14FG8031	N/A
X10C9311225F2	N/A	OR-IQ3-0267	OR-RTR6-0474	N/A	No	OR14FG4010	N/A
X10C9311238A	N/A	OR-IQ3-0273	OR-RTR6-0481	N/A	No	OR14FG8030	N/A
X10C9311289A	N/A	OR-IQ3-0272	OR-RTR6-0479	N/A	No	OR14FG4012	N/A
X10C9311323D	N/A	OR-IQ3-0272	OR-RTR6-0479	N/A	No	OR14FG4012	N/A
X10C9311323E	N/A	OR-IQ3-0273	OR-RTR6-0480	N/A	No	OR14FG4014	N/A
X10C9311431A	N/A	OR-IQ3-0262	OR-RTR6-0470	N/A	No	OR14FG8064	N/A
X10C9311605A	N/A	OR-IQ3-0313	OR-RTR6-0460	N/A	No	OR14FG4037	N/A
X10C9311681E	N/A	OR-IQ3-0273	OR-RTR6-0480	N/A	No	OR14FG8030	N/A
X10C9311778A	N/A	OR-IQ3-0279	OR-RTR6-0486	N/A	No	OR14FG4017	N/A
X10C9311781A	N/A	OR-IQ3-0274	OR-RTR6-0482	N/A	No	OR14FG4014	N/A
X10C9311954C	N/A	OR-IQ3-0273	OR-RTR6-0480	N/A	No	OR14FG8030	N/A
X10C9312063A	N/A	OR-IQ3-0276	OR-RTR6-0484	N/A	No	OR14FG4017	N/A
X10C9312063C	N/A	OR-IQ3-0274	OR-RTR6-0482	N/A	No	OR14FG4014	N/A
X10C9312256A	N/A	OR-IQ3-0261	OR-RTR6-0469	N/A	No	OR14FG8021	N/A
X10C9312467A	N/A	OR-IQ3-0268	OR-RTR6-0476	N/A	No	OR14FG8028	N/A
X10C9312544A	N/A	OR-IQ3-0284	OR-RTR6-0492	N/A	No	OR14FG4018	N/A
X10C9312550B	N/A	OR-IQ3-0279	OR-RTR6-0486	N/A	No	OR14FG8034	N/A
X10C9312610E	N/A	OR-IQ3-0264	OR-RTR6-0472	N/A	No	OR14FG8024	N/A
X10C9312617A	N/A	OR-IQ3-0276	OR-RTR6-0483	N/A	No	OR14FG8031	N/A
X10C9312627A	N/A	OR-IQ3-0274	OR-RTR6-0481	N/A	No	OR14FG4014	N/A
X10C9312634C	N/A	OR-IQ3-0313	OR-RTR6-0460	N/A	No	OR14FG4037	N/A
X10C9312719D	N/A	OR-IQ3-0273	OR-RTR6-0480	N/A	No	OR14FG8030	N/A
X10C9312740A	N/A	OR-IQ3-0269	OR-RTR6-0477	N/A	No	OR14FG8028	N/A
X10C9312768H	N/A	OR-IQ3-0284	OR-RTR6-0492	N/A	No	OR14FG4018	N/A
X10C9312790B	N/A	OR-IQ3-0274	OR-RTR6-0482	N/A	No	OR14FG4014	N/A

CCP Correlation of Container Identification Numbers to Batch Data Report Numbers

Waste Stream: # OR-ISTP-CH-HET Lot # 5

Container ID Number	Historical Container ID	NDA BDR	RTR BDR	VE BDR	Load/Manage Overpack Yes	Transportation Headspace Gas	
						FGA	GGT
X10C9312938A	N/A	OR-IQ3-0263	OR-RTR6-0461	N/A	No	OR14FG4011	N/A
X10C9313001A	N/A	OR-IQ3-0265	OR-RTR6-0472	N/A	No	OR14FG4013	N/A
X10C9313017A	N/A	OR-IQ3-0279	OR-RTR6-0486	N/A	No	OR14FG4017	N/A
X10C9400129C	N/A	OR-IQ3-0273	OR-RTR6-0481	N/A	No	OR14FG8030	N/A
X10C9400132A	N/A	OR-IQ3-0272	OR-RTR6-0479	N/A	No	OR14FG4012	N/A
X10C9400134A	N/A	OR-IQ3-0273	OR-RTR6-0480	N/A	No	OR14FG8030	N/A
X10CSATN03195B	N/A	OR-IQ3-0264	OR-RTR6-0472	N/A	No	OR14FG8024	N/A

Rick Whiteley — Signature of Site Project Manager
Rick Whiteley — Printed Name
08/11/2014 — Date

CCP RTR/VE Summary of Prohibited Items and AK Confirmation

Waste Stream Number: OR-ISTP-CH-HET Lot #: 5

Container Number	RTR Prohibited Items [a,b]	Visual Examination Prohibited Items [a,b]	Does the Physical Form of the Waste Match the Waste Stream Description as Determined by AK
See correlation of container ID numbers for list of remaining drum numbers in this Lot.	None of the containers in this lot had prohibited items identified during RTR.	VE was not used to certify any containers in this Lot.	The physical form of the waste matches the waste stream description as determined by AK.

a. See Batch Data Reports

b. If AK has assigned U134 to this waste stream, then any liquids in these containers are prohibited items (not acceptable by the TSDF).

Justification for the selection of RTR and/or VE: RTR was selected as the characterization method for this lot because the waste was previously packaged and RTR meets all the Data Quality Objectives for NDE for the waste.

Rick Whiteley — Site Project Manager Signature
Rick Whiteley — Printed Name
08/11/2014 — Date

CCP Reconciliation with Data Quality Objectives

WSPF# OR-ISTP-CH-HET Rev. 0 Lot # 5

Sampling Completeness

RTR/VE:

Number of Valid Samples: 40 Number of Total Samples Analyzed: 40

Percent Complete: 100 (QAO is 100%)

Radiological:

Number of Valid Samples: 40 Number of Total Samples Analyzed: 40

Percent Complete: 100 (QAO is 100%)

	Y/N/NA	Reconciliation Parameter
1	Y	Waste Matrix Code.
2	Y	Waste Material Parameter Weights.
3	Y	The TRU activity reported in the BDRs for each container demonstrates with a 95% probability that the container of waste contains TRU radioactive waste.
4	N	AK Sufficiency. Is there an approved AK sufficiency Determination for this waste stream?
5	Y	The data demonstrates whether the waste stream exhibits a toxicity characteristic under Title 40 Code of Federal Regulations (CFR), Part 261, Identification and Listing of Hazardous Waste, Subpart C, Characteristics of Hazardous Waste.
6	Y	Does the waste stream contain listed waste found in 20.4.1.200 NMAC incorporating 40 CFR Part 261, Subpart D, Lists of Hazardous Wastes.
7	Y	Waste stream can be classified as hazardous or nonhazardous.
8	Y	The overall completeness, comparability, and representativeness QAOs were met for each of the analytical and testing procedures as specified in the WAP Sections C3-1 through C3-2 prior to submittal of a waste stream profile form for a waste steam or waste stream lot.

	Completeness	Comparability	Representativeness
Radiography	Y	Y	Y
VE	NA	NA	NA

Comments: None

R Whiteley

Signature of Site Project Manager | Rick Whiteley (Printed Name) | 08/11/2014 (Date)

CHARACTERIZATION INFORMATION SUMMARY

WSPF# OR-ISTP-CH-HET Rev. 0 (CCP-AK-ORNL-008)

Lot 6

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CCP Characterization Information Summary Cover Page

Waste Stream # OR-ISTP-CH-HET Lot #: 6

AK Expert Review: N/A Date: N/A

SPM Review: Jerry Jess Fisher Jr. Date: 08/11/2014

SPM signature certifies that through Acceptable Knowledge testing and/or analysis that the waste identified in this summary is not corrosive, ignitable, reactive, or incompatible with the TSDF.

A summary of the Acceptable Knowledge regarding this waste stream containing specific information about the corrosivity, reactivity, and ignitability of the waste stream is included as an attachment to the Waste Stream Profile Form. By reference, that information is included in this lot.

List of procedures used:

Non Destructive Assay (NDA):

CCP-TP-048	Rev. 16	11/01/2013 Mobile IQ3 System Data Reviewing, Validating, and Reporting Procedure
CCP-TP-048	Rev. 15	03/24/2011 Mobile IQ3 System Data Reviewing, Validating, and Reporting Procedure
CCP-TP-048	Rev. 14	03/08/2010 Mobile IQ3 System Data Reviewing, Validating, and Reporting Procedure
CCP-TP-048	Rev. 13	10/12/2009 Mobile IQ3 System Data Reviewing, Validating, and Reporting Procedure
CCP-TP-048	Rev. 12	09/08/2009 Mobile IQ3 System Data Reviewing, Validating, and Reporting Procedure
CCP-TP-048	Rev. 11	02/19/2008 Mobile IQ3 System Data Reviewing, Validating, and Reporting Procedure
CCP-TP-048	Rev. 10	11/16/2006 Mobile IQ3 System Data Reviewing, Validating, and Reporting Procedure
CCP-TP-048	Rev. 9	11/03/2005 Mobile IQ3 System Data Reviewing, Validating, and Reporting Procedure
CCP-TP-048	Rev. 8	09/21/2005 Mobile IQ3 System Data Reviewing, Validating, and Reporting Procedure
CCP-TP-048	Rev. 7	03/14/2005 Mobile IQ3 System Data Reviewing, Validating, and Reporting Procedure
CCP-TP-048	Rev. 6	10/18/2004 Mobile IQ3 System Data Reviewing, Validating, and Reporting Procedure
CCP-TP-048	Rev. 5	06/08/2004 Mobile IQ3 System Data Reviewing, Validating, and Reporting Procedure
CCP-TP-048	Rev. 4	12/04/2003 Mobile IQ3 System Data Reviewing, Validating, and Reporting Procedure
CCP-TP-048	Rev. 3	09/03/2003 Mobile IQ3 System Data Reviewing, Validating, and Reporting Procedure
CCP-TP-048	Rev. 2	04/25/2003 Mobile IQ3 System Data Reviewing, Validating, and Reporting Procedure
CCP-TP-048	Rev. 1	03/21/2003 Mobile IQ3 System Data Reviewing, Validating, and Reporting Procedure
CCP-TP-048	Rev. 0	02/05/2003 Mobile IQ3 System Data Reviewing, Validating, and Reporting Procedure

Project Level Data Validation / DQO Reconciliation:

CCP-TP-001	Rev. 21	06/06/2013 CCP Project Level Data Validation and Verification
CCP-TP-001	Rev. 20	09/27/2012 CCP Project Level Data Validation and Verification
CCP-TP-001	Rev. 19	12/29/2010 CCP Project Level Data Validation and Verification
CCP-TP-001	Rev. 18	08/09/2010 CCP Project Level Data Validation and Verification
CCP-TP-001	Rev. 17	09/24/2007 CCP Project Level Data Validation and Verification
CCP-TP-001	Rev. 16	04/26/2007 CCP Project Level Data Validation and Verification
CCP-TP-001	Rev. 15	11/22/2006 CCP Project Level Data Validation and Verification
CCP-TP-001	Rev. 14	11/16/2006 CCP Project Level Data Validation and Verification
CCP-TP-001	Rev. 13	07/21/2006 CCP Project Level Data Validation and Verification
CCP-TP-001	Rev. 12	05/25/2006 CCP Project Level Data Validation and Verification
CCP-TP-001	Rev. 11	03/23/2005 CCP Project Level Data Validation and Verification

CCP-TP-002	Rev. 26	06/19/2013 CCP Reconciliation of DQOs and Reporting Characterization Data
CCP-TP-002	Rev. 25	02/11/2013 CCP Reconciliation of DQOs and Reporting Characterization Data
CCP-TP-002	Rev. 24	12/28/2011 CCP Reconciliation of DQOs and Reporting Characterization Data
CCP-TP-002	Rev. 23	12/29/2010 CCP Reconciliation of DQOs and Reporting Characterization Data
CCP-TP-002	Rev. 22	06/30/2010 CCP Reconciliation of DQOs and Reporting Characterization Data
CCP-TP-002	Rev. 21	08/04/2009 CCP Reconciliation of DQOs and Reporting Characterization Data
CCP-TP-002	Rev. 20	08/18/2008 CCP Reconciliation of DQOs and Reporting Characterization Data
CCP-TP-002	Rev. 19	12/22/2006 CCP Reconciliation of DQOs and Reporting Characterization Data
CCP-TP-002	Rev. 18	11/16/2006 CCP Reconciliation of DQOs and Reporting Characterization Data
CCP-TP-002	Rev. 17	10/10/2006 CCP Reconciliation of DQOs and Reporting Characterization Data
CCP-TP-002	Rev. 16	06/06/2006 CCP Reconciliation of DQOs and Reporting Characterization Data
CCP-TP-002	Rev. 15	08/16/2005 CCP Reconciliation of DQOs and Reporting Characterization Data
CCP-TP-002	Rev. 14	03/29/2005 CCP Reconciliation of DQOs and Reporting Characterization Data

CCP-TP-005	Rev. 26	08/12/2013 CCP Acceptable Knowledge Documentation
CCP-TP-005	Rev. 25	06/19/2013 CCP Acceptable Knowledge Documentation
CCP-TP-005	Rev. 24	11/28/2011 CCP Acceptable Knowledge Documentation
CCP-TP-005	Rev. 23	06/30/2011 CCP Acceptable Knowledge Documentation
CCP-TP-005	Rev. 22	04/21/2011 CCP Acceptable Knowledge Documentation
CCP-TP-005	Rev. 21	12/29/2010 CCP Acceptable Knowledge Documentation
CCP-TP-005	Rev. 20	11/01/2010 CCP Acceptable Knowledge Documentation
CCP-TP-005	Rev. 19	07/06/2010 CCP Acceptable Knowledge Documentation
CCP-TP-005	Rev. 18	11/16/2006 CCP Acceptable Knowledge Documentation

CCP-TP-005	Rev. 17	08/05/2006 CCP Acceptable Knowledge Documentation
CCP-TP-005	Rev. 16	02/27/2006 CCP Acceptable Knowledge Documentation
CCP-TP-005	Rev. 15	03/31/2005 CCP Acceptable Knowledge Documentation

CCP-TP-030	Rev. 33	11/19/2013 CCP CH TRU Waste Certification and WWIS/WDS Data Entry
CCP-TP-030	Rev. 32	06/20/2013 CCP CH TRU Waste Certification and WWIS/WDS Data Entry
CCP-TP-030	Rev. 31	11/19/2012 CCP CH TRU Waste Certification and WWIS/WDS Data Entry
CCP-TP-030	Rev. 30	05/21/2012 CCP CH TRU Waste Certification and WWIS/WDS Data Entry
CCP-TP-030	Rev. 29	04/26/2011 CCP CH TRU Waste Certification and WWIS/WDS Data Entry
CCP-TP-030	Rev. 28	05/12/2010 CCP CH TRU Waste Certification and WWIS/WDS Data Entry
CCP-TP-030	Rev. 27	12/14/2009 CCP CH TRU Waste Certification and WWIS Data Entry
CCP-TP-030	Rev. 26	05/27/2009 CCP CH TRU Waste Certification and WWIS Data Entry
CCP-TP-030	Rev. 25	01/22/2009 CCP CH TRU Waste Certification and WWIS Data Entry
CCP-TP-030	Rev. 24	08/20/2008 CCP CH TRU Waste Certification and WWIS Data Entry
CCP-TP-030	Rev. 23	03/12/2008 CCP CH TRU Waste Certification and WWIS Data Entry
CCP-TP-030	Rev. 22	07/24/2007 CCP CH TRU Waste Certification and WWIS Data Entry
CCP-TP-030	Rev. 21	05/21/2007 CCP CH TRU Waste Certification and WWIS Data Entry
CCP-TP-030	Rev. 20	02/07/2007 CCP CH TRU Waste Certification and WWIS Data Entry
CCP-TP-030	Rev. 19	11/16/2006 CCP CH TRU Waste Certification and WWIS Data Entry
CCP-TP-030	Rev. 18	05/01/2006 CCP TRU Waste Certification and WWIS Data Entry
CCP-TP-030	Rev. 17	12/29/2005 CCP TRU Waste Certification and WWIS Data Entry
CCP-TP-030	Rev. 16	04/22/2005 CCP TRU Waste Certification and WWIS Data Entry

Radiography (RTR/NDE):

CCP-TP-053	Rev. 14	09/25/2013 CCP Standard Real-Time Radiography (RTR) Inspection Procedure
CCP-TP-053	Rev. 13	05/14/2013 CCP Standard Real-Time Radiography (RTR) Inspection Procedure
CCP-TP-053	Rev. 12	08/22/2012 CCP Standard Real-Time Radiography (RTR) Inspection Procedure
CCP-TP-053	Rev. 11	07/20/2011 CCP Standard Real-Time Radiography (RTR) Inspection Procedure
CCP-TP-053	Rev. 10	03/04/2011 CCP Standard Real-Time Radiography (RTR) Inspection Procedure
CCP-TP-053	Rev. 9	09/30/2010 CCP Standard Real-Time Radiography (RTR) Inspection Procedure
CCP-TP-053	Rev. 8	08/30/2010 CCP Standard Real-Time Radiography (RTR) Inspection Procedure
CCP-TP-053	Rev. 7	10/21/2009 CCP Standard Real-Time Radiography (RTR) Inspection Procedure
CCP-TP-053	Rev. 6	03/04/2008 CCP Standard Real-Time Radiography (RTR) Inspection Procedure
CCP-TP-053	Rev. 5	11/16/2006 CCP Standard Real-Time Radiography (RTR) Inspection Procedure
CCP-TP-053	Rev. 4	12/22/2005 CCP Standard Real-Time Radiography (RTR) Inspection Procedure
CCP-TP-053	Rev. 3	03/21/2005 CCP Standard Real-Time Radiography (RTR) Inspection Procedure
CCP-TP-053	Rev. 2	07/14/2004 CCP Standard Real-Time Radiography (RTR) Inspection Procedure

WAP Certification:

CCP-PO-001	Rev. 21	05/31/2013 CCP Transuranic Waste Characterization Quality Assurance Project Plan
CCP-PO-001	Rev. 20	08/16/2011 CCP Transuranic Waste Characterization Quality Assurance Project Plan
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CCP-PO-003	Rev. 12	12/29/2010 Transuranic Authorized Methods for Payload Control (CCP CH-TRAMPC)

CCP-PO-003	Rev. 11	08/04/2009	Transuranic Authorized Methods for Payload Control (CCP CH-TRAMPC)
CCP-PO-003	Rev. 10	11/16/2006	Transuranic Authorized Methods for Payload Control (CCP CH-TRAMPC)
CCP-PO-003	Rev. 9	12/29/2005	Transuranic Authorized Methods for Payload Control (CCP CH-TRAMPC)
CCP-PO-003	Rev. 8	01/25/2005	Transuranic Authorized Methods for Payload Control (CCP CH-TRAMPC)
CCP-PO-003	Rev. 7	11/22/2004	Transuranic Authorized Methods for Payload Control (CCP CH-TRAMPC)
CCP-PO-003	Rev. 6	06/08/2004	Transuranic Authorized Methods for Payload Control (CCP CH-TRAMPC)
CCP-PO-003	Rev. 5	09/19/2003	Transuranic Authorized Methods for Payload Control (CCP CH-TRAMPC)
CCP-PO-003	Rev. 4	02/11/2003	Transuranic Authorized Methods for Payload Control (CCP CH-TRAMPC)
CCP-PO-003	Rev. 3	05/31/2002	Transuranic Authorized Methods for Payload Control (CCP CH-TRAMPC)

CCP Correlation of Container Identification Numbers to Batch Data Report Numbers

Waste Stream: # OR-ISTP-CH-HET Lot # 6

Container ID Number	Historical Container ID	NDA BDR	RTR BDR	VE BDR	Load/Manage Overpack Yes	Transportation Headspace Gas	
						FGA	GGT
X10C9309201U	N/A	OR-IQ3-0255	OR-RTR6-0463	N/A	No	OR14FG8016	N/A
X10C9311035B	N/A	OR-IQ3-0252	OR-RTR6-0457	N/A	No	OR14FG8014	N/A
X10C9311210A	N/A	OR-IQ3-0259	OR-RTR6-0467	N/A	No	OR14FG8019	N/A
X10C9311218B	N/A	OR-IQ3-0256	OR-RTR6-0464	N/A	No	OR14FG8017	N/A
X10C9311226D	N/A	OR-IQ3-0243	OR-RTR6-0453	N/A	No	OR14FG8009	N/A
X10C9311226E	N/A	OR-IQ3-0242	OR-RTR6-0453	N/A	No	OR14FG8008	N/A
X10C9311229A	N/A	OR-IQ3-0243	OR-RTR6-0453	N/A	No	OR14FG8009	N/A
X10C9311230B	N/A	OR-IQ3-0243	OR-RTR6-0453	N/A	No	OR14FG8010	N/A
X10C9311278A	N/A	OR-IQ3-0241	OR-RTR6-0451	N/A	No	OR14FG8006	N/A
X10C9311313A	N/A	OR-IQ3-0256	OR-RTR6-0464	N/A	No	OR14FG8017	N/A
X10C9311332A	N/A	OR-IQ3-0257	OR-RTR6-0465	N/A	No	OR14FG8018	N/A
X10C9311336A	N/A	OR-IQ3-0257	OR-RTR6-0465	N/A	No	OR14FG8018	N/A
X10C9311341B	N/A	OR-IQ3-0250	OR-RTR6-0454	N/A	No	OR14FG8013	N/A
X10C9311353B1	N/A	OR-IQ3-0261	OR-RTR6-0469	N/A	No	OR14FG8021	N/A
X10C9311422A	N/A	OR-IQ3-0244	OR-RTR6-0454	N/A	No	OR14FG8010	N/A
X10C9311461A	N/A	OR-IQ3-0243	OR-RTR6-0453	N/A	No	OR14FG8010	N/A
X10C9311466A	N/A	OR-IQ3-0242	OR-RTR6-0452	N/A	No	OR14FG8008	N/A
X10C9311509A1	N/A	OR-IQ3-0249	OR-RTR6-0455	N/A	No	OR14FG8012	N/A
X10C9311688A	N/A	OR-IQ3-0249	OR-RTR6-0455	N/A	No	OR14FG8012	N/A
X10C9311697A	N/A	OR-IQ3-0249	OR-RTR6-0455	N/A	No	OR14FG8012	N/A
X10C9311710A	N/A	OR-IQ3-0261	OR-RTR6-0469	N/A	No	OR14FG8021	N/A
X10C9311726B	N/A	OR-IQ3-0249	OR-RTR6-0455	N/A	No	OR14FG8012	N/A
X10C9311774A	N/A	OR-IQ3-0243	OR-RTR6-0453	N/A	No	OR14FG8010	N/A
X10C9311775B	N/A	OR-IQ3-0243	OR-RTR6-0453	N/A	No	OR14FG8010	N/A
X10C9311811A	N/A	OR-IQ3-0242	OR-RTR6-0452	N/A	No	OR14FG8008	N/A
X10C9312056A	N/A	OR-IQ3-0242	OR-RTR6-0452	N/A	No	OR14FG8008	N/A
X10C9312620A	N/A	OR-IQ3-0258	OR-RTR6-0466	N/A	No	OR14FG8019	N/A
X10C9312621A	N/A	OR-IQ3-0260	OR-RTR6-0468	N/A	No	OR14FG8021	N/A
X10C9312884A	N/A	OR-IQ3-0244	OR-RTR6-0454	N/A	No	OR14FG8011	N/A
X10C9312926A	N/A	OR-IQ3-0244	OR-RTR6-0454	N/A	No	OR14FG8011	N/A
X10C9312980D	N/A	OR-IQ3-0252	OR-RTR6-0457	N/A	No	OR14FG4003	N/A
X10C9312983A	N/A	OR-IQ3-0249	OR-RTR6-0455	N/A	No	OR14FG8012	N/A
X10C9312988A	N/A	OR-IQ3-0257	OR-RTR6-0465	N/A	No	OR14FG4007	N/A

CCP Correlation of Container Identification Numbers to Batch Data Report Numbers

Waste Stream: # OR-ISTP-CH-HET Lot # 6

Container ID Number	Historical Container ID	NDA BDR	RTR BDR	VE BDR	Load/Manage Overpack Yes	Transportation Headspace Gas	
						FGA	GGT
X10C9313119B	N/A	OR-IQ3-0243	OR-RTR6-0453	N/A	No	OR14FG8010	N/A
X10C9400031A	N/A	OR-IQ3-0242	OR-RTR6-0452	N/A	No	OR14FG8008	N/A
X10C9400103A	N/A	OR-IQ3-0244	OR-RTR6-0454	N/A	No	OR14FG8010	N/A
X10C9400123A	N/A	OR-IQ3-0249	OR-RTR6-0455	N/A	No	OR14FG8012	N/A
X10C9400218A	N/A	OR-IQ3-0242	OR-RTR6-0452	N/A	No	OR14FG8008	N/A
X10C9602104C	N/A	OR-IQ3-0243	OR-RTR6-0453	N/A	No	OR14FG8010	N/A
X10C9602104S	N/A	OR-IQ3-0241	OR-RTR6-0451	N/A	No	OR14FG8006	N/A

Signature of Site Project Manager | Jerry Jess Fisher Jr. (Printed Name) | 08/11/2014 (Date)

CCP RTR/VE Summary of Prohibited Items and AK Confirmation

Waste Stream Number: OR-ISTP-CH-HET Lot #: 6

Container Number	RTR Prohibited Items [a,b]	Visual Examination Prohibited Items [a,b]	Does the Physical Form of the Waste Match the Waste Stream Description as Determined by AK
See correlation of container ID numbers for list of remaining drum numbers in this Lot.	None of the containers in this lot had prohibited items identified during RTR.	VE was not used to certify any containers in this Lot.	The physical form of the waste matches the waste stream description as determined by AK.
a. See Batch Data Reports b. If AK has assigned U134 to this waste stream, then any liquids in these containers are prohibited items (not acceptable by the TSDF).			
Justification for the selection of RTR and/or VE: RTR was selected as the characterization method for this lot because the waste was previously packaged and RTR meets all the Data Quality Objectives for NDE for the waste.			

Site Project Manager Signature | Jerry Jess Fisher Jr. Printed Name | 08/11/2014 Date

CCP Reconciliation with Data Quality Objectives

WSPF# OR-ISTP-CH-HET Rev. 0 Lot # 6

Sampling Completeness

RTR/VE:

Number of Valid Samples: 40 Number of Total Samples Analyzed: 40

Percent Complete: 100 (QAO is 100%)

Radiological:

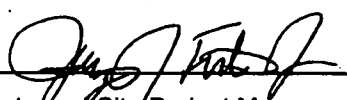
Number of Valid Samples: 40 Number of Total Samples Analyzed: 40

Percent Complete: 100 (QAO is 100%)

	Y/N/NA	Reconciliation Parameter
1	Y	Waste Matrix Code.
2	Y	Waste Material Parameter Weights.
3	Y	The TRU activity reported in the BDRs for each container demonstrates with a 95% probability that the container of waste contains TRU radioactive waste.
4	N	AK Sufficiency. Is there an approved AK sufficiency Determination for this waste stream?
5	Y	The data demonstrates whether the waste stream exhibits a toxicity characteristic under Title 40 Code of Federal Regulations (CFR), Part 261, Identification and Listing of Hazardous Waste, Subpart C, Characteristics of Hazardous Waste.
6	Y	Does the waste stream contain listed waste found in 20.4.1.200 NMAC incorporating 40 CFR Part 261, Subpart D, Lists of Hazardous Wastes.
7	Y	Waste stream can be classified as hazardous or nonhazardous.
8	Y	The overall completeness, comparability, and representativeness QAOs were met for each of the analytical and testing procedures as specified in the WAP Sections C3-1 through C3-2 prior to submittal of a waste stream profile form for a waste steam or waste stream lot.

	Completeness	Comparability	Representativeness
Radiography	Y	Y	Y
VE	NA	NA	NA

Comments: None



Signature of Site Project Manager | Jerry Jess Fisher Jr. (Printed Name) | 08/11/2014 (Date)

CHARACTERIZATION INFORMATION SUMMARY

WSPF# OR-ISTP-CH-HET Rev. 0 (CCP-AK-ORNL-008)

Lot 7

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CCP Characterization Information Summary Cover Page

Waste Stream # OR-ISTP-CH-HET Lot #: 7

AK Expert Review: N/A Date: N/A

SPM Review: Roger Whiteaker Date: 08/28/2014

SPM signature certifies that through Acceptable Knowledge testing and/or analysis that the waste identified in this summary is not corrosive, ignitable, reactive, or incompatible with the TSDF.

A summary of the Acceptable Knowledge regarding this waste stream containing specific information about the corrosivity, reactivity, and ignitability of the waste stream is included as an attachment to the Waste Stream Profile Form. By reference, that information is included in this lot.

List of procedures used:

Non Destructive Assay (NDA):

CCP-TP-048	Rev. 16	11/01/2013 Mobile IQ3 System Data Reviewing, Validating, and Reporting Procedure
CCP-TP-048	Rev. 15	03/24/2011 Mobile IQ3 System Data Reviewing, Validating, and Reporting Procedure
CCP-TP-048	Rev. 14	03/08/2010 Mobile IQ3 System Data Reviewing, Validating, and Reporting Procedure
CCP-TP-048	Rev. 13	10/12/2009 Mobile IQ3 System Data Reviewing, Validating, and Reporting Procedure
CCP-TP-048	Rev. 12	09/09/2009 Mobile IQ3 System Data Reviewing, Validating, and Reporting Procedure
CCP-TP-048	Rev. 11	02/19/2008 Mobile IQ3 System Data Reviewing, Validating, and Reporting Procedure
CCP-TP-048	Rev. 10	11/16/2006 Mobile IQ3 System Data Reviewing, Validating, and Reporting Procedure
CCP-TP-048	Rev. 9	11/03/2005 Mobile IQ3 System Data Reviewing, Validating, and Reporting Procedure
CCP-TP-048	Rev. 8	09/21/2005 Mobile IQ3 System Data Reviewing, Validating, and Reporting Procedure
CCP-TP-048	Rev. 7	03/14/2005 Mobile IQ3 System Data Reviewing, Validating, and Reporting Procedure
CCP-TP-048	Rev. 6	10/18/2004 Mobile IQ3 System Data Reviewing, Validating, and Reporting Procedure
CCP-TP-048	Rev. 5	06/08/2004 Mobile IQ3 System Data Reviewing, Validating, and Reporting Procedure
CCP-TP-048	Rev. 4	12/04/2003 Mobile IQ3 System Data Reviewing, Validating, and Reporting Procedure
CCP-TP-048	Rev. 3	09/03/2003 Mobile IQ3 System Data Reviewing, Validating, and Reporting Procedure
CCP-TP-048	Rev. 2	04/25/2003 Mobile IQ3 System Data Reviewing, Validating, and Reporting Procedure
CCP-TP-048	Rev. 1	03/21/2003 Mobile IQ3 System Data Reviewing, Validating, and Reporting Procedure
CCP-TP-048	Rev. 0	02/05/2003 Mobile IQ3 System Data Reviewing, Validating, and Reporting Procedure

Project Level Data Validation / DQO Reconciliation:

CCP-TP-001	Rev. 21	08/06/2013 CCP Project Level Data Validation and Verification
CCP-TP-001	Rev. 20	09/27/2012 CCP Project Level Data Validation and Verification
CCP-TP-001	Rev. 19	12/29/2010 CCP Project Level Data Validation and Verification
CCP-TP-001	Rev. 18	08/09/2010 CCP Project Level Data Validation and Verification
CCP-TP-001	Rev. 17	09/24/2007 CCP Project Level Data Validation and Verification
CCP-TP-001	Rev. 16	04/26/2007 CCP Project Level Data Validation and Verification
CCP-TP-001	Rev. 15	11/22/2006 CCP Project Level Data Validation and Verification
CCP-TP-001	Rev. 14	11/16/2006 CCP Project Level Data Validation and Verification
CCP-TP-001	Rev. 13	07/21/2006 CCP Project Level Data Validation and Verification
CCP-TP-001	Rev. 12	05/25/2006 CCP Project Level Data Validation and Verification
CCP-TP-001	Rev. 11	03/23/2005 CCP Project Level Data Validation and Verification

CCP-TP-002	Rev. 26	06/19/2013 CCP Reconciliation of DQOs and Reporting Characterization Data
CCP-TP-002	Rev. 25	02/11/2013 CCP Reconciliation of DQOs and Reporting Characterization Data
CCP-TP-002	Rev. 24	12/28/2011 CCP Reconciliation of DQOs and Reporting Characterization Data
CCP-TP-002	Rev. 23	12/29/2010 CCP Reconciliation of DQOs and Reporting Characterization Data
CCP-TP-002	Rev. 22	06/30/2010 CCP Reconciliation of DQOs and Reporting Characterization Data
CCP-TP-002	Rev. 21	08/04/2009 CCP Reconciliation of DQOs and Reporting Characterization Data
CCP-TP-002	Rev. 20	08/18/2008 CCP Reconciliation of DQOs and Reporting Characterization Data
CCP-TP-002	Rev. 19	12/22/2006 CCP Reconciliation of DQOs and Reporting Characterization Data
CCP-TP-002	Rev. 18	11/16/2006 CCP Reconciliation of DQOs and Reporting Characterization Data
CCP-TP-002	Rev. 17	10/10/2006 CCP Reconciliation of DQOs and Reporting Characterization Data
CCP-TP-002	Rev. 16	06/06/2006 CCP Reconciliation of DQOs and Reporting Characterization Data
CCP-TP-002	Rev. 15	08/16/2005 CCP Reconciliation of DQOs and Reporting Characterization Data
CCP-TP-002	Rev. 14	03/29/2005 CCP Reconciliation of DQOs and Reporting Characterization Data

CCP-TP-005	Rev. 26	08/12/2013 CCP Acceptable Knowledge Documentation
CCP-TP-005	Rev. 25	06/19/2013 CCP Acceptable Knowledge Documentation
CCP-TP-005	Rev. 24	11/28/2011 CCP Acceptable Knowledge Documentation
CCP-TP-005	Rev. 23	06/30/2011 CCP Acceptable Knowledge Documentation
CCP-TP-005	Rev. 22	04/21/2011 CCP Acceptable Knowledge Documentation
CCP-TP-005	Rev. 21	12/29/2010 CCP Acceptable Knowledge Documentation
CCP-TP-005	Rev. 20	11/01/2010 CCP Acceptable Knowledge Documentation
CCP-TP-005	Rev. 19	07/06/2010 CCP Acceptable Knowledge Documentation
CCP-TP-005	Rev. 18	11/16/2006 CCP Acceptable Knowledge Documentation

CCP-TP-005	Rev. 17	06/05/2006 CCP Acceptable Knowledge Documentation
CCP-TP-005	Rev. 16	02/27/2006 CCP Acceptable Knowledge Documentation
CCP-TP-005	Rev. 15	03/31/2005 CCP Acceptable Knowledge Documentation

CCP-TP-030	Rev. 33	11/19/2013 CCP CH TRU Waste Certification and WWIS/WDS Data Entry
CCP-TP-030	Rev. 32	06/20/2013 CCP CH TRU Waste Certification and WWIS/WDS Data Entry
CCP-TP-030	Rev. 31	11/19/2012 CCP CH TRU Waste Certification and WWIS/WDS Data Entry
CCP-TP-030	Rev. 30	05/21/2012 CCP CH TRU Waste Certification and WWIS/WDS Data Entry
CCP-TP-030	Rev. 29	04/26/2011 CCP CH TRU Waste Certification and WWIS/WDS Data Entry
CCP-TP-030	Rev. 28	05/12/2010 CCP CH TRU Waste Certification and WWIS/WDS Data Entry
CCP-TP-030	Rev. 27	12/14/2009 CCP CH TRU Waste Certification and WWIS Data Entry
CCP-TP-030	Rev. 26	05/27/2009 CCP CH TRU Waste Certification and WWIS Data Entry
CCP-TP-030	Rev. 25	01/22/2009 CCP CH TRU Waste Certification and WWIS Data Entry
CCP-TP-030	Rev. 24	08/20/2008 CCP CH TRU Waste Certification and WWIS Data Entry
CCP-TP-030	Rev. 23	03/12/2008 CCP CH TRU Waste Certification and WWIS Data Entry
CCP-TP-030	Rev. 22	07/24/2007 CCP CH TRU Waste Certification and WWIS Data Entry
CCP-TP-030	Rev. 21	05/21/2007 CCP CH TRU Waste Certification and WWIS Data Entry
CCP-TP-030	Rev. 20	02/07/2007 CCP CH TRU Waste Certification and WWIS Data Entry
CCP-TP-030	Rev. 19	11/16/2006 CCP CH TRU Waste Certification and WWIS Data Entry
CCP-TP-030	Rev. 18	05/01/2006 CCP TRU Waste Certification and WWIS Data Entry
CCP-TP-030	Rev. 17	12/29/2005 CCP TRU Waste Certification and WWIS Data Entry
CCP-TP-030	Rev. 16	04/22/2005 CCP TRU Waste Certification and WWIS Data Entry

Radiography (RTR/NDE):

CCP-TP-053	Rev. 14	09/25/2013 CCP Standard Real-Time Radiography (RTR) Inspection Procedure
CCP-TP-053	Rev. 13	05/14/2013 CCP Standard Real-Time Radiography (RTR) Inspection Procedure
CCP-TP-053	Rev. 12	08/22/2012 CCP Standard Real-Time Radiography (RTR) Inspection Procedure
CCP-TP-053	Rev. 11	07/20/2011 CCP Standard Real-Time Radiography (RTR) Inspection Procedure
CCP-TP-053	Rev. 10	03/04/2011 CCP Standard Real-Time Radiography (RTR) Inspection Procedure
CCP-TP-053	Rev. 9	09/30/2010 CCP Standard Real-Time Radiography (RTR) Inspection Procedure
CCP-TP-053	Rev. 8	06/30/2010 CCP Standard Real-Time Radiography (RTR) Inspection Procedure
CCP-TP-053	Rev. 7	10/21/2009 CCP Standard Real-Time Radiography (RTR) Inspection Procedure
CCP-TP-053	Rev. 6	03/04/2008 CCP Standard Real-Time Radiography (RTR) Inspection Procedure
CCP-TP-053	Rev. 5	11/16/2006 CCP Standard Real-Time Radiography (RTR) Inspection Procedure
CCP-TP-053	Rev. 4	12/22/2005 CCP Standard Real-Time Radiography (RTR) Inspection Procedure
CCP-TP-053	Rev. 3	03/21/2005 CCP Standard Real-Time Radiography (RTR) Inspection Procedure
CCP-TP-053	Rev. 2	07/14/2004 CCP Standard Real-Time Radiography (RTR) Inspection Procedure

WAP Certification:

CCP-PO-001	Rev. 21	05/31/2013 CCP Transuranic Waste Characterization Quality Assurance Project Plan
CCP-PO-001	Rev. 20	06/16/2011 CCP Transuranic Waste Characterization Quality Assurance Project Plan
CCP-PO-001	Rev. 19	12/29/2010 CCP Transuranic Waste Characterization Quality Assurance Project Plan
CCP-PO-001	Rev. 18	06/30/2010 CCP Transuranic Waste Characterization Quality Assurance Project Plan
CCP-PO-001	Rev. 17	06/23/2009 CCP Transuranic Waste Characterization Quality Assurance Project Plan
CCP-PO-001	Rev. 16	10/31/2007 CCP Transuranic Waste Characterization Quality Assurance Project Plan
CCP-PO-001	Rev. 15	08/10/2007 CCP Transuranic Waste Characterization Quality Assurance Project Plan
CCP-PO-001	Rev. 14	03/28/2007 CCP Transuranic Waste Characterization Quality Assurance Project Plan
CCP-PO-001	Rev. 13	11/16/2006 CCP Transuranic Waste Characterization Quality Assurance Project Plan
CCP-PO-001	Rev. 12	03/22/2006 CCP Transuranic Waste Characterization Quality Assurance Project Plan
CCP-PO-001	Rev. 11	03/10/2005 CCP Transuranic Waste Characterization Quality Assurance Project Plan

CCP-PO-002	Rev. 27	05/31/2013 CCP Transuranic Waste Certification Plan
CCP-PO-002	Rev. 26	07/14/2011 CCP Transuranic Waste Certification Plan
CCP-PO-002	Rev. 25	12/29/2010 CCP Transuranic Waste Certification Plan
CCP-PO-002	Rev. 24	08/30/2010 CCP Transuranic Waste Certification Plan
CCP-PO-002	Rev. 23	04/07/2010 CCP Transuranic Waste Certification Plan
CCP-PO-002	Rev. 22	01/12/2010 CCP Transuranic Waste Certification Plan
CCP-PO-002	Rev. 21	01/26/2009 CCP Transuranic Waste Certification Plan
CCP-PO-002	Rev. 20	11/02/2007 CCP Transuranic Waste Certification Plan
CCP-PO-002	Rev. 19	05/22/2007 CCP Transuranic Waste Certification Plan
CCP-PO-002	Rev. 18	11/16/2006 CCP Transuranic Waste Certification Plan
CCP-PO-002	Rev. 17	11/16/2006 CCP Transuranic Waste Certification Plan
CCP-PO-002	Rev. 16	11/16/2006 CCP Transuranic Waste Certification Plan
CCP-PO-002	Rev. 15	03/22/2006 CCP Transuranic Waste Certification Plan
CCP-PO-002	Rev. 14	12/29/2005 CCP Transuranic Waste Certification Plan
CCP-PO-002	Rev. 13	05/09/2005 CCP Transuranic Waste Certification Plan

CCP-PO-003	Rev. 13	07/31/2013 Transuranic Authorized Methods for Payload Control (CCP CH-TRAMPC)
CCP-PO-003	Rev. 12	12/29/2010 Transuranic Authorized Methods for Payload Control (CCP CH-TRAMPC)

CCP-PO-003	Rev. 11	06/04/2009	Transuranic Authorized Methods for Payload Control (CCP CH-TRAMPC)
CCP-PO-003	Rev. 10	11/16/2006	Transuranic Authorized Methods for Payload Control (CCP CH-TRAMPC)
CCP-PO-003	Rev. 9	12/29/2005	Transuranic Authorized Methods for Payload Control (CCP CH-TRAMPC)
CCP-PO-003	Rev. 8	01/25/2005	Transuranic Authorized Methods for Payload Control (CCP CH-TRAMPC)
CCP-PO-003	Rev. 7	11/22/2004	Transuranic Authorized Methods for Payload Control (CCP CH-TRAMPC)
CCP-PO-003	Rev. 6	06/08/2004	Transuranic Authorized Methods for Payload Control (CCP CH-TRAMPC)
CCP-PO-003	Rev. 5	09/19/2003	Transuranic Authorized Methods for Payload Control (CCP CH-TRAMPC)
CCP-PO-003	Rev. 4	02/11/2003	Transuranic Authorized Methods for Payload Control (CCP CH-TRAMPC)
CCP-PO-003	Rev. 3	05/31/2002	Transuranic Authorized Methods for Payload Control (CCP CH-TRAMPC)

CCP Correlation of Container Identification Numbers to Batch Data Report Numbers

Waste Stream: # OR-ISTP-CH-HET Lot # 7

Container ID Number	Historical Container ID	NDA BDR	RTR BDR	VE BDR	Load/Manage Overpack Yes	Transportation Headspace Gas	
						FGA	GGT
X10C0501624E	N/A	OR-IQ3-0290	OR-RTR6-0497	N/A	No	OR14FG4021	N/A
X10C0501624H	N/A	OR-IQ3-0290	OR-RTR6-0497	N/A	No	OR14FG4021	N/A
X10C0501624K	N/A	OR-IQ3-0341	OR-RTR6-0546	N/A	No	OR14FG8086	N/A
X10C0501624M	N/A	OR-IQ3-0315	OR-RTR6-0520	N/A	No	OR14FG4045	N/A
X10C0501624N	N/A	OR-IQ3-0341	OR-RTR6-0546	N/A	No	OR14FG8086	N/A
X10C0501624Q	N/A	OR-IQ3-0332	OR-RTR6-0537	N/A	No	OR14FG8078	N/A
X10C0501624S	N/A	OR-IQ3-0327	OR-RTR6-0532	N/A	No	OR14FG8072	N/A
X10C0501748	N/A	OR-IQ3-0269	OR-RTR6-0477	N/A	No	OR14FG8028	N/A
X10C0600041B	N/A	OR-IQ3-0350	OR-RTR6-0555	N/A	No	OR14FG8095	N/A
X10C9311062A	N/A	OR-IQ3-0344	OR-RTR6-0549	N/A	No	OR14FG8089	N/A
X10C9311062C	N/A	OR-IQ3-0344	OR-RTR6-0549	N/A	No	OR14FG8092	N/A
X10C9311067E	N/A	OR-IQ3-0285	OR-RTR6-0493	N/A	No	OR14FG4019	N/A
X10C9311225C	N/A	OR-IQ3-0344	OR-RTR6-0549	N/A	No	OR14FG8089	N/A
X10C9311225E	N/A	OR-IQ3-0344	OR-RTR6-0549	N/A	No	OR14FG8089	N/A
X10C9311360B1	N/A	OR-IQ3-0338	OR-RTR6-0543	N/A	No	OR14FG8083	N/A
X10C9311552G	N/A	OR-IQ3-0344	OR-RTR6-0549	N/A	No	OR14FG8089	N/A
X10C9311556A	N/A	OR-IQ3-0332	OR-RTR6-0537	N/A	No	OR14FG8078	N/A
X10C9313111A	N/A	OR-IQ3-0344	OR-RTR6-0550	N/A	No	OR14FG8089	N/A
X10C9400105A	N/A	OR-IQ3-0350	OR-RTR6-0555	N/A	No	OR14FG8095	N/A

Roger Whiteaker — Signature of Site Project Manager
Roger Whiteaker — Printed Name
08/28/2014 — Date

CCP RTR/VE Summary of Prohibited Items and AK Confirmation

Waste Stream Number: OR-ISTP-CH-HET Lot #: 7

Container Number	RTR Prohibited Items [a,b]	Visual Examination Prohibited Items [a,b]	Does the Physical Form of the Waste Match the Waste Stream Description as Determined by AK
See correlation of container ID numbers for list of remaining drum numbers in this Lot.	None of the containers in this lot had prohibited items identified during RTR.	VE was not used to certify any containers in this Lot.	The physical form of the waste matches the waste stream description as determined by AK.

a. See Batch Data Reports

b. If AK has assigned U134 to this waste stream, then any liquids in these containers are prohibited items (not acceptable by the TSDF).

Justification for the selection of RTR and/or VE: RTR was selected as the characterization method for this lot because the waste was previously packaged and RTR meets all the Data Quality Objectives for NDE for the waste.

Roger Whitaker — Site Project Manager Signature

Roger Whitaker — Printed Name

08/28/2014 — Date

CCP Reconciliation with Data Quality Objectives

WSPF# OR-ISTP-CH-HET Rev. 0 Lot # 7

Sampling Completeness

RTR/VE:

Number of Valid Samples: 19 Number of Total Samples Analyzed: 19

Percent Complete: 100 (QAO is 100%)

Radiological:

Number of Valid Samples: 19 Number of Total Samples Analyzed: 19

Percent Complete: 100 (QAO is 100%)

	Y/N/NA	Reconciliation Parameter
1	Y	Waste Matrix Code.
2	Y	Waste Material Parameter Weights.
3	Y	The TRU activity reported in the BDRs for each container demonstrates with a 95% probability that the container of waste contains TRU radioactive waste.
4	N	AK Sufficiency. Is there an approved AK sufficiency Determination for this waste stream?
5	Y	The data demonstrates whether the waste stream exhibits a toxicity characteristic under Title 40 Code of Federal Regulations (CFR), Part 261, Identification and Listing of Hazardous Waste, Subpart C, Characteristics of Hazardous Waste.
6	Y	Does the waste stream contain listed waste found in 20.4.1.200 NMAC incorporating 40 CFR Part 261, Subpart D, Lists of Hazardous Wastes.
7	Y	Waste stream can be classified as hazardous or nonhazardous.
8	Y	The overall completeness, comparability, and representativeness QAOs were met for each of the analytical and testing procedures as specified in the WAP Sections C3-1 through C3-2 prior to submittal of a waste stream profile form for a waste steam or waste stream lot.

	Completeness	Comparability	Representativeness
Radiography	Y	Y	Y
VE	NA	NA	NA

Comments: None

Roger Whiteaker 08/28/2014

Signature of Site Project Manager Printed Name Date

CHARACTERIZATION INFORMATION SUMMARY

WSPF# OR-ISTP-CH-HET Rev. 0 (CCP-AK-ORNL-008)

Lot 8

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Waste Stream # OR-ISTP-CH-HET Lot #: 8

AK Expert Review: N/A Date: N/A

SPM Review: Jerry Jess Fisher Jr. Date: 11/17/2014

SPM signature certifies that through Acceptable Knowledge testing and/or analysis that the waste identified in this summary is not corrosive, ignitable, reactive, or incompatible with the TSDF.

A summary of the Acceptable Knowledge regarding this waste stream containing specific information about the corrosivity, reactivity, and ignitability of the waste stream is included as an attachment to the Waste Stream Profile Form. By reference, that information is included in this lot.

List of procedures used:

Non Destructive Assay (NDA):

CCP-TP-048	Rev. 16	11/01/2013 Mobile IQ3 System Data Reviewing, Validating, and Reporting Procedure
CCP-TP-048	Rev. 15	03/24/2011 Mobile IQ3 System Data Reviewing, Validating, and Reporting Procedure
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CCP-TP-005	Rev. 26	08/12/2013 CCP Acceptable Knowledge Documentation
CCP-TP-005	Rev. 25	06/19/2013 CCP Acceptable Knowledge Documentation
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CCP-TP-005	Rev. 19	07/06/2010 CCP Acceptable Knowledge Documentation
CCP-TP-005	Rev. 18	11/16/2006 CCP Acceptable Knowledge Documentation
CCP-TP-005	Rev. 17	06/05/2006 CCP Acceptable Knowledge Documentation

CCP-TP-005	Rev. 16	02/27/2008 CCP Acceptable Knowledge Documentation
CCP-TP-005	Rev. 15	03/31/2005 CCP Acceptable Knowledge Documentation
CCP-TP-030	Rev. 33	11/19/2013 CCP CH TRU Waste Certification and WWIS/WDS Data Entry
CCP-TP-030	Rev. 32	06/20/2013 CCP CH TRU Waste Certification and WWIS/WDS Data Entry
CCP-TP-030	Rev. 31	11/19/2012 CCP CH TRU Waste Certification and WWIS/WDS Data Entry
CCP-TP-030	Rev. 30	05/21/2012 CCP CH TRU Waste Certification and WWIS/WDS Data Entry
CCP-TP-030	Rev. 29	04/26/2011 CCP CH TRU Waste Certification and WWIS/WDS Data Entry
CCP-TP-030	Rev. 28	05/12/2010 CCP CH TRU Waste Certification and WWIS/WDS Data Entry
CCP-TP-030	Rev. 27	12/14/2009 CCP CH TRU Waste Certification and WWIS Data Entry
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CCP-TP-030	Rev. 17	12/29/2005 CCP TRU Waste Certification and WWIS Data Entry
CCP-TP-030	Rev. 16	04/22/2005 CCP TRU Waste Certification and WWIS Data Entry

Radiography (RTR/NDE):

CCP-TP-053	Rev. 15	09/11/2014 CCP Standard Real-Time Radiography (RTR) Inspection Procedure
CCP-TP-053	Rev. 14	09/25/2013 CCP Standard Real-Time Radiography (RTR) Inspection Procedure
CCP-TP-053	Rev. 13	05/14/2013 CCP Standard Real-Time Radiography (RTR) Inspection Procedure
CCP-TP-053	Rev. 12	08/22/2012 CCP Standard Real-Time Radiography (RTR) Inspection Procedure
CCP-TP-053	Rev. 11	07/20/2011 CCP Standard Real-Time Radiography (RTR) Inspection Procedure
CCP-TP-053	Rev. 10	03/04/2011 CCP Standard Real-Time Radiography (RTR) Inspection Procedure
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CCP-TP-053	Rev. 8	08/30/2010 CCP Standard Real-Time Radiography (RTR) Inspection Procedure
CCP-TP-053	Rev. 7	10/21/2009 CCP Standard Real-Time Radiography (RTR) Inspection Procedure
CCP-TP-053	Rev. 6	03/04/2008 CCP Standard Real-Time Radiography (RTR) Inspection Procedure
CCP-TP-053	Rev. 5	11/16/2006 CCP Standard Real-Time Radiography (RTR) Inspection Procedure
CCP-TP-053	Rev. 4	12/22/2005 CCP Standard Real-Time Radiography (RTR) Inspection Procedure
CCP-TP-053	Rev. 3	03/21/2005 CCP Standard Real-Time Radiography (RTR) Inspection Procedure
CCP-TP-053	Rev. 2	07/14/2004 CCP Standard Real-Time Radiography (RTR) Inspection Procedure

WAP Certification:

CCP-PO-001	Rev. 21	05/31/2013 CCP Transuranic Waste Characterization Quality Assurance Project Plan
CCP-PO-001	Rev. 20	06/16/2011 CCP Transuranic Waste Characterization Quality Assurance Project Plan
CCP-PO-001	Rev. 19	12/29/2010 CCP Transuranic Waste Characterization Quality Assurance Project Plan
CCP-PO-001	Rev. 18	08/30/2010 CCP Transuranic Waste Characterization Quality Assurance Project Plan
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CCP-PO-002	Rev. 27	05/31/2013 CCP Transuranic Waste Certification Plan
CCP-PO-002	Rev. 26	07/14/2011 CCP Transuranic Waste Certification Plan
CCP-PO-002	Rev. 25	12/29/2010 CCP Transuranic Waste Certification Plan
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CCP-PO-002	Rev. 21	01/26/2009 CCP Transuranic Waste Certification Plan
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CCP-PO-002	Rev. 14	12/29/2005 CCP Transuranic Waste Certification Plan
CCP-PO-002	Rev. 13	05/09/2005 CCP Transuranic Waste Certification Plan
CCP-PO-003	Rev. 13	07/31/2013 Transuranic Authorized Methods for Payload Control (CCP CH-TRAMPC)
CCP-PO-003	Rev. 12	12/29/2010 Transuranic Authorized Methods for Payload Control (CCP CH-TRAMPC)

CCP-PO-003	Rev. 11	06/04/2009	Transuranic Authorized Methods for Payload Control (CCP CH-TRAMPC)
CCP-PO-003	Rev. 10	11/16/2008	Transuranic Authorized Methods for Payload Control (CCP CH-TRAMPC)
CCP-PO-003	Rev. 9	12/29/2005	Transuranic Authorized Methods for Payload Control (CCP CH-TRAMPC)
CCP-PO-003	Rev. 8	01/25/2005	Transuranic Authorized Methods for Payload Control (CCP CH-TRAMPC)
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CCP-PO-003	Rev. 6	08/08/2004	Transuranic Authorized Methods for Payload Control (CCP CH-TRAMPC)
CCP-PO-003	Rev. 5	09/19/2003	Transuranic Authorized Methods for Payload Control (CCP CH-TRAMPC)
CCP-PO-003	Rev. 4	02/11/2003	Transuranic Authorized Methods for Payload Control (CCP CH-TRAMPC)
CCP-PO-003	Rev. 3	05/31/2002	Transuranic Authorized Methods for Payload Control (CCP CH-TRAMPC)

CCP Correlation of Container Identification Numbers to Batch Data Report Numbers

Waste Stream: # OR-ISTP-CH-HET Lot # 8

Container ID Number	Historical Container ID	NDA BDR	RTR BDR	VE BDR	Load/Manage Overpack Yes	Transportation Headspace Gas	
						FGA	GGT
X10C0901715A	N/A	OR-IQ3-0390	OR-RTR6-0588	N/A	No	OR14FG8134	N/A
X10C9311069C1	N/A	OR-IQ3-0367	OR-RTR6-0571	N/A	No	OR14FG8112	N/A
X10C9311239B	N/A	OR-IQ3-0391	OR-RTR6-0589	N/A	No	OR14FG8136	N/A
X10C9311279A	N/A	OR-IQ3-0361	OR-RTR6-0565	N/A	No	OR14FG8109	N/A
X10C9311303A	N/A	OR-IQ3-0366	OR-RTR6-0570	N/A	No	OR14FG8111	N/A
X10C9311304B	N/A	OR-IQ3-0387	OR-RTR6-0585	N/A	No	OR14FG8131	N/A
X10C9311456I	N/A	OR-IQ3-0362	OR-RTR6-0567	N/A	No	OR14FG8108	N/A
X10C9311460A	N/A	OR-IQ3-0387	OR-RTR6-0586	N/A	No	OR14FG8132	N/A
X10C9311954D	N/A	OR-IQ3-0368	OR-RTR6-0572	N/A	No	OR14FG8112	N/A
X10C9311955B	N/A	OR-IQ3-0367	OR-RTR6-0571	N/A	No	OR14FG8112	N/A
X10C9311966A	N/A	OR-IQ3-0389	OR-RTR6-0587	N/A	No	OR14FG8132	N/A
X10C9311966B	N/A	OR-IQ3-0367	OR-RTR6-0571	N/A	No	OR14FG8112	N/A
X10C9311966C	N/A	OR-IQ3-0389	OR-RTR6-0587	N/A	No	OR14FG8132	N/A
X10C9312527A	N/A	OR-IQ3-0363	OR-RTR6-0568	N/A	No	OR14FG8108	N/A
X10C9312539A	N/A	OR-IQ3-0389	OR-RTR6-0587	N/A	No	OR14FG8138	N/A
X10C9312634E1	N/A	OR-IQ3-0389	OR-RTR6-0587	N/A	No	OR14FG8134	N/A
X10C9312890A	N/A	OR-IQ3-0390	OR-RTR6-0587	N/A	No	OR14FG8134	N/A
X10C9312904A	N/A	OR-IQ3-0362	OR-RTR6-0567	N/A	No	OR14FG8108	N/A
X10C9600555A1	N/A	OR-IQ3-0362	OR-RTR6-0567	N/A	No	OR14FG8111	N/A
X10C9600555A2	N/A	OR-IQ3-0362	OR-RTR6-0567	N/A	No	OR14FG4060	N/A

Signature of Site Project Manager | Jerry Jess Fisher Jr. (Printed Name) | 11/17/2014 (Date)

CCP RTR/VE Summary of Prohibited Items and AK Confirmation

Waste Stream Number: OR-ISTP-CH-HET Lot #: 8

Container Number	RTR Prohibited Items [a,b]	Visual Examination Prohibited Items [a,b]	Does the Physical Form of the Waste Match the Waste Stream Description as Determined by AK
See correlation of container ID numbers for list of remaining drum numbers in this Lot.	None of the containers in this lot had prohibited items identified during RTR.	VE was not used to certify any containers in this Lot.	The physical form of the waste matches the waste stream description as determined by AK.
a. See Batch Data Reports			
b. If AK has assigned U134 to this waste stream, then any liquids in these containers are prohibited items (not acceptable by the TSDF).			
Justification for the selection of RTR and/or VE: RTR was selected as the characterization method for this lot because the waste was previously packaged and RTR meets all the Data Quality Objectives for NDE for the waste.			

Site Project Manager Signature | Jerry Jess Fisher Jr. Printed Name | 11/17/2014 Date

CCP Reconciliation with Data Quality Objectives

WSPF# OR-ISTP-CH-HET Rev. 0 Lot # 8

Sampling Completeness

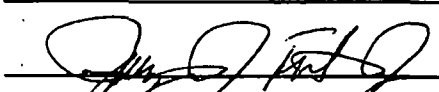
RTR/VE:
Number of Valid Samples: 20 Number of Total Samples Analyzed: 20
Percent Complete: 100 (QAO is 100%)

Radiological:
Number of Valid Samples: 20 Number of Total Samples Analyzed: 20
Percent Complete: 100 (QAO is 100%)

	Y/N/NA	Reconciliation Parameter
1	Y	Waste Matrix Code.
2	Y	Waste Material Parameter Weights.
3	Y	The TRU activity reported in the BDRs for each container demonstrates with a 95% probability that the container of waste contains TRU radioactive waste.
4	N	AK Sufficiency. Is there an approved AK sufficiency Determination for this waste stream?
5	Y	The data demonstrates whether the waste stream exhibits a toxicity characteristic under Title 40 Code of Federal Regulations (CFR), Part 261, Identification and Listing of Hazardous Waste, Subpart C, Characteristics of Hazardous Waste.
6	Y	Does the waste stream contain listed waste found in 20.4.1.200 NMAC incorporating 40 CFR Part 261, Subpart D, Lists of Hazardous Wastes.
7	Y	Waste stream can be classified as hazardous or nonhazardous.
8	Y	The overall completeness, comparability, and representativeness QAOs were met for each of the analytical and testing procedures as specified in the WAP Sections C3-1 through C3-2 prior to submittal of a waste stream profile form for a waste steam or waste stream lot.

	Completeness	Comparability	Representativeness
Radiography	Y	Y	Y
VE	NA	NA	NA

Comments: None



Signature of Site Project Manager | Jerry Jess Fisher Jr. (Printed Name) | 11/17/2014 (Date)

DIVIDER

PAGE

NWP
Nuclear Waste Partnership LLC
An AECOM-led partnership with B&W and AREVA

CP:15:01262
UFC:5900.00

INTER-OFFICE CORRESPONDENCE

DATE: December 3, 2015

FROM: B. S. Schrock BSSchrock LOCATION: Certification

TO: CCP Records Custodian GSA-212 LOCATION: Central Characterization Program

SUBJECT: TRANSMITTAL OF OAK RIDGE NATIONAL LABORATORY CHARACTERIZATION INFORMATION SUMMARY FOR WASTE STREAM #OR-ISTP-CH-HET (CCP-AK-ORNL-008), LOT 9 , LOT 10, LOT 11, LOT 12, LOT 13, LOT 14 AND LOT 15

Please accept the attached Oak Ridge National Laboratory Characterization Information Summaries to be placed in Records for Waste Stream #OR-ISTP-CH-HET (CCP-AK-ORNL-008), Lot 9, Lot 10, Lot 11, Lot 12, Lot 13, Lot 14 and Lot 15.

BSS:lcg

Attachment

cc: (without attachment)
M. F. Ramirez ED
A. O. Stallings ED
D. Wade ED

COPY

CCP RECORDS ORIGINAL
DATE REC'D 12-08-2015 JY

P.O. Box 2078 • Carlsbad, New Mexico USA 88221-2078
Phone: (575) 234-7200 • Fax: (575) 234-7083

CHARACTERIZATION INFORMATION SUMMARY

WSPF# OR-ISTP-CH-HET Rev. 0 (CCP-AK-ORNL-008)

Lot 9

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CCP Characterization Information Summary Cover Page

Waste Stream #	OR-ISTP-CH-HET	Lot #:	9
AK Expert Review:	N/A	Date:	N/A
SPM Review:	Roger Whitesker	Date:	02/04/2015

SPM signature certifies that through Acceptable Knowledge testing and/or analysis that the waste identified in this summary is not corrosive, ignitable, reactive, or incompatible with the TSDF.

A summary of the Acceptable Knowledge regarding this waste stream containing specific information about the corrosivity, reactivity, and ignitability of the waste stream is included as an attachment to the Waste Stream Profile Form. By reference, that information is included in this lot.

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CCP-TP-005	Rev. 19	07/06/2010 CCP Acceptable Knowledge Documentation
CCP-TP-005	Rev. 18	11/16/2006 CCP Acceptable Knowledge Documentation

CCP-TP-005	Rev. 17	06/05/2006 CCP Acceptable Knowledge Documentation
CCP-TP-005	Rev. 16	02/27/2006 CCP Acceptable Knowledge Documentation
CCP-TP-005	Rev. 15	03/31/2005 CCP Acceptable Knowledge Documentation

CCP-TP-030	Rev. 34	02/02/2015 CCP CH TRU Waste Certification and WWIS/WDS Data Entry
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CCP-TP-030	Rev. 16	04/22/2005 CCP TRU Waste Certification and WWIS Data Entry

Radiography (RTR/NDE):

CCP-TP-053	Rev. 15	09/11/2014 CCP Standard Real-Time Radiography (RTR) Inspection Procedure
CCP-TP-053	Rev. 14	09/25/2013 CCP Standard Real-Time Radiography (RTR) Inspection Procedure
CCP-TP-053	Rev. 13	05/14/2013 CCP Standard Real-Time Radiography (RTR) Inspection Procedure
CCP-TP-053	Rev. 12	08/22/2012 CCP Standard Real-Time Radiography (RTR) Inspection Procedure
CCP-TP-053	Rev. 11	07/20/2011 CCP Standard Real-Time Radiography (RTR) Inspection Procedure
CCP-TP-053	Rev. 10	03/04/2011 CCP Standard Real-Time Radiography (RTR) Inspection Procedure
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CCP-TP-053	Rev. 6	03/04/2008 CCP Standard Real-Time Radiography (RTR) Inspection Procedure
CCP-TP-053	Rev. 5	11/16/2006 CCP Standard Real-Time Radiography (RTR) Inspection Procedure
CCP-TP-053	Rev. 4	12/22/2005 CCP Standard Real-Time Radiography (RTR) Inspection Procedure
CCP-TP-053	Rev. 3	03/21/2005 CCP Standard Real-Time Radiography (RTR) Inspection Procedure
CCP-TP-053	Rev. 2	07/14/2004 CCP Standard Real-Time Radiography (RTR) Inspection Procedure

WAP Certification:

CCP-PO-001	Rev. 21	05/31/2013 CCP Transuranic Waste Characterization Quality Assurance Project Plan
CCP-PO-001	Rev. 20	08/16/2011 CCP Transuranic Waste Characterization Quality Assurance Project Plan
CCP-PO-001	Rev. 19	12/28/2010 CCP Transuranic Waste Characterization Quality Assurance Project Plan
CCP-PO-001	Rev. 18	08/30/2010 CCP Transuranic Waste Characterization Quality Assurance Project Plan
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CCP-PO-002	Rev. 14	12/29/2005 CCP Transuranic Waste Certification Plan
CCP-PO-002	Rev. 13	05/09/2005 CCP Transuranic Waste Certification Plan

CCP-PO-003	Rev. 13	07/31/2013	Transuranic Authorized Methods for Payload Control (CCP CH-TRAMPC)
CCP-PO-003	Rev. 12	12/28/2010	Transuranic Authorized Methods for Payload Control (CCP CH-TRAMPC)
CCP-PO-003	Rev. 11	08/04/2009	Transuranic Authorized Methods for Payload Control (CCP CH-TRAMPC)
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CCP-PO-003	Rev. 5	09/19/2003	Transuranic Authorized Methods for Payload Control (CCP CH-TRAMPC)
CCP-PO-003	Rev. 4	02/11/2003	Transuranic Authorized Methods for Payload Control (CCP CH-TRAMPC)
CCP-PO-003	Rev. 3	05/31/2002	Transuranic Authorized Methods for Payload Control (CCP CH-TRAMPC)

CCP Correlation of Container Identification Numbers to Batch Data Report Numbers

Waste Stream: # OR-ISTP-CH-HET Lot # 9

Container ID Number	Historical Container ID	NDA BDR	RTR BDR	VE BDR	Load/Manage Overpack Yes	Transportation Headspace Gas	
						FGA	GGT
X10C0501624I	N/A	OR-MILCC2-0024	OR-RTR6-0510	N/A	No	OR14FG4040	N/A
X10C9311089A	N/A	OR-MILCC2-0016	OR-RTR6-0509	N/A	No	OR14FG8067	N/A
X10C9311226A	N/A	OR-MILCC2-0016	OR-RTR6-0509	N/A	No	OR14FG8067	N/A
X10C9311226B	N/A	OR-MILCC2-0024	OR-RTR6-0509	N/A	No	OR14FG4040	N/A
X10C9311226M	N/A	OR-MILCC2-0010	OR-RTR7-0039	N/A	No	OR14FG8054	N/A
X10C9311265A	N/A	OR-MILCC2-0034	OR-RTR7-0038	N/A	No	OR14FG8071	N/A
X10C9311320A	N/A	OR-MILCC2-0010	OR-RTR7-0039	N/A	No	OR14FG4040	N/A
X10C9311342A	N/A	OR-MILCC2-0105	OR-RTR7-0059	N/A	No	OR14FG8147	N/A
X10C9311386A1	N/A	OR-MILCC2-0005	OR-RTR6-0472	N/A	No	OR14FG8049	N/A
X10C9311419A	N/A	OR-MILCC2-0006	OR-RTR6-0472	N/A	No	OR14FG8048	N/A
X10C9311429F	N/A	OR-MILCC2-0010	OR-RTR7-0039	N/A	No	OR14FG4040	N/A
X10C9311523B1	N/A	OR-IQ3-0415	OR-RTR6-0601	N/A	No	OR14FG8166	N/A
X10C9311772H	N/A	OR-IQ3-0414	OR-RTR6-0600	N/A	No	OR14FG8169	N/A
X10C9312163A	N/A	OR-MILCC2-0032	OR-RTR7-0038	N/A	No	OR14FG8070	N/A
X10C9312293A	N/A	OR-MILCC2-0001	OR-RTR7-0024	N/A	No	OR14FG8036	N/A
X10C9312472A	N/A	OR-MILCC2-0119	OR-RTR6-0603	N/A	No	OR14FG8170	N/A
X10C9312484A	N/A	OR-MILCC2-0032	OR-RTR7-0038	N/A	No	OR14FG8070	N/A
X10C9312486C	N/A	OR-MILCC2-0026	OR-RTR7-0038	N/A	No	OR14FG4042	N/A
X10C9312532A	N/A	OR-MILCC2-0067	OR-RTR7-0077	N/A	No	OR14FG8104	N/A
X10C9312533A	N/A	OR-MILCC2-0067	OR-RTR7-0077	N/A	No	OR14FG8104	N/A
X10C9312533B	N/A	OR-MILCC2-0067	OR-RTR7-0077	N/A	No	OR14FG8104	N/A
X10C9312548B	N/A	OR-MILCC2-0004	OR-RTR6-0472	N/A	No	OR14FG8048	N/A
X10C9312590B	N/A	OR-MILCC2-0105	OR-RTR7-0059	N/A	No	OR14FG8147	N/A
X10C9312765A	N/A	OR-MILCC2-0024	OR-RTR6-0509	N/A	No	OR14FG4040	N/A
X10C9312770A	N/A	OR-MILCC2-0003	OR-RTR6-0472	N/A	No	OR14FG4024	N/A
X10C9312828A	N/A	OR-MILCC2-0067	OR-RTR7-0077	N/A	No	OR14FG8104	N/A
X10C9312843A	N/A	OR-MILCC2-0067	OR-RTR7-0077	N/A	No	OR14FG8104	N/A
X10C9312995A	N/A	OR-MILCC2-0067	OR-RTR7-0077	N/A	No	OR14FG8104	N/A
X10C9313016A	N/A	OR-MILCC2-0005	OR-RTR6-0472	N/A	No	OR14FG4026	N/A

CCP Correlation of Container Identification Numbers to Batch Data Report Numbers

Waste Stream: # OR-ISTP-CH-HET Lot # 9

Container ID Number	Historical Container ID	NDA BDR	RTR BDR	VE BDR	Load/Manage Overpack Yes	Transportation Headspace Gas	
						FGA	GGT
X10C9313031A	N/A	OR-MILCC2-0001	OR-RTR7-0024	N/A	No	OR14FG8036	N/A
X10C9313031B	N/A	OR-MILCC2-0002	OR-RTR7-0024	N/A	No	OR14FG8036	N/A
X10C9313108A	N/A	OR-MILCC2-0105	OR-RTR7-0059	N/A	No	OR14FG8147	N/A
X10C9313651A	N/A	OR-MILCC2-0002	OR-RTR7-0024	N/A	No	OR14FG8036	N/A
X10C9400117A	N/A	OR-MILCC2-0006	OR-RTR6-0472	N/A	No	OR14FG4025	N/A
X10CSATN01942A	N/A	OR-MILCC2-0072	OR-RTR6-0567	N/A	No	OR14FG4061	N/A
X10CSATN01942B	N/A	OR-MILCC2-0089	OR-RTR6-0567	N/A	No	OR14FG8130	N/A
X10CSATN01942C	N/A	OR-MILCC2-0071	OR-RTR6-0567	N/A	No	OR14FG4060	N/A
X10CSATN01942D	N/A	OR-MILCC2-0071	OR-RTR6-0567	N/A	No	OR14FG4060	N/A
X10CSATN02307C	N/A	OR-MILCC2-0117	OR-RTR6-0600	N/A	No	OR14FG8169	N/A
X10CSATN02307D	N/A	OR-MILCC2-0117	OR-RTR6-0600	N/A	No	OR14FG8169	N/A
X10CSATN02307E	N/A	OR-MILCC2-0116	OR-RTR6-0601	N/A	No	OR14FG8160	N/A
X10CSATN02350C	N/A	OR-MILCC2-0116	OR-RTR6-0601	N/A	No	OR14FG8166	N/A
X10CSATN02350E	N/A	OR-IQ3-0415	OR-RTR6-0601	N/A	No	OR14FG8170	N/A
X10CSATN02350F	N/A	OR-MILCC2-0118	OR-RTR6-0600	N/A	No	OR14FG8165	N/A
X10CSATN02384A	N/A	OR-MILCC2-0072	OR-RTR6-0567	N/A	No	OR14FG4061	N/A
X10CSATN02521A	N/A	OR-MILCC2-0072	OR-RTR6-0567	N/A	No	OR14FG4061	N/A
X10CSATN02521B	N/A	OR-MILCC2-0089	OR-RTR6-0567	N/A	No	OR14FG8130	N/A
X10CSATN02521C	N/A	OR-MILCC2-0071	OR-RTR6-0567	N/A	No	OR14FG4060	N/A
X10CSATN02521D	N/A	OR-MILCC2-0119	OR-RTR6-0603	N/A	No	OR14FG8162	N/A
X10CSATN02521E	N/A	OR-MILCC2-0072	OR-RTR6-0567	N/A	No	OR14FG4061	N/A

Roger Whiteaker — Signature of Site Project Manager
Roger Whiteaker — Printed Name
02/04/2015 — Date

CCP RTR/VE Summary of Prohibited Items and AK Confirmation

Waste Stream Number: OR-ISTP-CH-HET Lot #: 9

Container Number	RTR Prohibited Items [a,b]	Visual Examination Prohibited Items [a,b]	Does the Physical Form of the Waste Match the Waste Stream Description as Determined by AK
See correlation of container ID numbers for list of remaining drum numbers in this Lot.	None of the containers in this lot had prohibited items identified during RTR.	VE was not used to certify any containers in this Lot.	The physical form of the waste matches the waste stream description as determined by AK.

a. See Batch Data Reports

b. If AK has assigned U134 to this waste stream, then any liquids in these containers are prohibited items (not acceptable by the TSDF).

Justification for the selection of RTR and/or VE: RTR was selected as the characterization method for this lot because the waste was previously packaged and RTR meets all the Data Quality Objectives for NDE for the waste.

Site Project Manager Signature | Roger Whitesker (Printed Name) | 02/04/2015 (Date)

CCP Reconciliation with Data Quality Objectives

WSPF# OR-ISTP-CH-HET Rev. 0 Lot # 9

Sampling Completeness

RTR/VE:

Number of Valid Samples: 50 Number of Total Samples Analyzed: 50

Percent Complete: 100 (QAO is 100%)

Radiological:

Number of Valid Samples: 50 Number of Total Samples Analyzed: 50

Percent Complete: 100 (QAO is 100%)

	Y/N/NA	Reconciliation Parameter
1	Y	Waste Matrix Code.
2	Y	Waste Material Parameter Weights.
3	Y	The TRU activity reported in the BDRs for each container demonstrates with a 95% probability that the container of waste contains TRU radioactive waste.
4	N	AK Sufficiency. Is there an approved AK sufficiency Determination for this waste stream?
5	Y	The data demonstrates whether the waste stream exhibits a toxicity characteristic under Title 40 Code of Federal Regulations (CFR), Part 261, Identification and Listing of Hazardous Waste, Subpart C, Characteristics of Hazardous Waste.
6	Y	Does the waste stream contain listed waste found in 20.4.1.200 NMAC incorporating 40 CFR Part 261, Subpart D, Lists of Hazardous Wastes.
7	Y	Waste stream can be classified as hazardous or nonhazardous.
8	Y	The overall completeness, comparability, and representativeness QAOs were met for each of the analytical and testing procedures as specified in the WAP Sections C3-1 through C3-2 prior to submittal of a waste stream profile form for a waste steam or waste stream lot.

	Completeness	Comparability	Representativeness
Radiography	Y	Y	Y
VE	NA	NA	NA

Comments: None

Roger Whiteaker — Roger Whiteaker — 02/04/2015

Signature of Site Project Manager — Printed Name — Date

CHARACTERIZATION INFORMATION SUMMARY

WSPF# OR-ISTP-CH-HET Rev. 0 (CCP-AK-ORNL-008)

Lot 10

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CCP Characterization Information Summary Cover Page

Waste Stream # OR-ISTP-CH-HET Lot #: 10

AK Expert Review: N/A Date: N/A

SPM Review: Roger Whiteaker Roger Whiteaker Date: 02/12/2015

SPM signature certifies that through Acceptable Knowledge testing and/or analysis that the waste identified in this summary is not corrosive, ignitable, reactive, or incompatible with the TSDF.

A summary of the Acceptable Knowledge regarding this waste stream containing specific information about the corrosivity, reactivity, and ignitability of the waste stream is included as an attachment to the Waste Stream Profile Form. By reference, that information is included in this lot.

List of procedures used:

Non Destructive Assay (NDA):

CCP-TP-048	Rev. 16	11/01/2013 Mobile IQ3 System Data Reviewing, Validating, and Reporting Procedure
CCP-TP-048	Rev. 15	03/24/2011 Mobile IQ3 System Data Reviewing, Validating, and Reporting Procedure
CCP-TP-048	Rev. 14	03/08/2010 Mobile IQ3 System Data Reviewing, Validating, and Reporting Procedure
CCP-TP-048	Rev. 13	10/12/2009 Mobile IQ3 System Data Reviewing, Validating, and Reporting Procedure
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Project Level Data Validation / DQO Reconciliation:

CCP-TP-001	Rev. 21	06/06/2013 CCP Project Level Data Validation and Verification
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CCP-TP-030	Rev. 25	01/22/2009	CCP CH TRU Waste Certification and WWIS Data Entry
CCP-TP-030	Rev. 24	08/20/2008	CCP CH TRU Waste Certification and WWIS Data Entry
CCP-TP-030	Rev. 23	03/12/2008	CCP CH TRU Waste Certification and WWIS Data Entry
CCP-TP-030	Rev. 22	07/24/2007	CCP CH TRU Waste Certification and WWIS Data Entry
CCP-TP-030	Rev. 21	05/21/2007	CCP CH TRU Waste Certification and WWIS Data Entry
CCP-TP-030	Rev. 20	02/07/2007	CCP CH TRU Waste Certification and WWIS Data Entry
CCP-TP-030	Rev. 19	11/16/2006	CCP CH TRU Waste Certification and WWIS Data Entry
CCP-TP-030	Rev. 18	05/01/2006	CCP TRU Waste Certification and WWIS Data Entry
CCP-TP-030	Rev. 17	12/29/2005	CCP TRU Waste Certification and WWIS Data Entry
CCP-TP-030	Rev. 16	04/22/2005	CCP TRU Waste Certification and WWIS Data Entry

Radiography (RTR/NDE):

CCP-TP-053	Rev. 15	09/11/2014	CCP Standard Real-Time Radiography (RTR) Inspection Procedure
CCP-TP-053	Rev. 14	09/25/2013	CCP Standard Real-Time Radiography (RTR) Inspection Procedure
CCP-TP-053	Rev. 13	05/14/2013	CCP Standard Real-Time Radiography (RTR) Inspection Procedure
CCP-TP-053	Rev. 12	08/22/2012	CCP Standard Real-Time Radiography (RTR) Inspection Procedure
CCP-TP-053	Rev. 11	07/20/2011	CCP Standard Real-Time Radiography (RTR) Inspection Procedure
CCP-TP-053	Rev. 10	03/04/2011	CCP Standard Real-Time Radiography (RTR) Inspection Procedure
CCP-TP-053	Rev. 9	09/30/2010	CCP Standard Real-Time Radiography (RTR) Inspection Procedure
CCP-TP-053	Rev. 8	08/30/2010	CCP Standard Real-Time Radiography (RTR) Inspection Procedure
CCP-TP-053	Rev. 7	10/21/2009	CCP Standard Real-Time Radiography (RTR) Inspection Procedure
CCP-TP-053	Rev. 6	03/04/2008	CCP Standard Real-Time Radiography (RTR) Inspection Procedure
CCP-TP-053	Rev. 5	11/18/2006	CCP Standard Real-Time Radiography (RTR) Inspection Procedure
CCP-TP-053	Rev. 4	12/22/2005	CCP Standard Real-Time Radiography (RTR) Inspection Procedure
CCP-TP-053	Rev. 3	03/21/2005	CCP Standard Real-Time Radiography (RTR) Inspection Procedure
CCP-TP-053	Rev. 2	07/14/2004	CCP Standard Real-Time Radiography (RTR) Inspection Procedure

Visual Examination (VE):

CCP-TP-113	Rev. 18	09/25/2013	CCP Standard Contact-Handled Waste Visual Examination
CCP-TP-113	Rev. 17	06/04/2013	CCP Standard Contact-Handled Waste Visual Examination
CCP-TP-113	Rev. 16	04/25/2011	CCP Standard Contact-Handled Waste Visual Examination
CCP-TP-113	Rev. 15	12/29/2010	CCP Standard Contact-Handled Waste Visual Examination
CCP-TP-113	Rev. 14	08/30/2010	CCP Standard Contact-Handled Waste Visual Examination
CCP-TP-113	Rev. 13	03/11/2009	CCP Standard Contact-Handled Waste Visual Examination
CCP-TP-113	Rev. 12	12/01/2008	CCP Standard Contact-Handled Waste Visual Examination
CCP-TP-113	Rev. 11	11/12/2008	CCP Standard Contact-Handled Waste Visual Examination
CCP-TP-113	Rev. 10	07/09/2008	CCP Standard Contact-Handled Waste Visual Examination
CCP-TP-113	Rev. 9	03/05/2008	CCP Standard Waste Visual Examination
CCP-TP-113	Rev. 8	09/04/2007	CCP Standard Waste Visual Examination
CCP-TP-113	Rev. 7	03/19/2007	CCP Standard Waste Visual Examination
CCP-TP-113	Rev. 6	11/16/2006	CCP Standard Waste Visual Examination
CCP-TP-113	Rev. 5	08/28/2006	CCP Standard Waste Visual Examination
CCP-TP-113	Rev. 4	12/22/2005	CCP Standard Waste Visual Examination

WAP Certification:

CCP-PO-001	Rev. 21	05/31/2013	CCP Transuranic Waste Characterization Quality Assurance Project Plan
CCP-PO-001	Rev. 20	06/16/2011	CCP Transuranic Waste Characterization Quality Assurance Project Plan
CCP-PO-001	Rev. 19	12/28/2010	CCP Transuranic Waste Characterization Quality Assurance Project Plan
CCP-PO-001	Rev. 18	06/30/2010	CCP Transuranic Waste Characterization Quality Assurance Project Plan
CCP-PO-001	Rev. 17	06/23/2009	CCP Transuranic Waste Characterization Quality Assurance Project Plan
CCP-PO-001	Rev. 16	10/31/2007	CCP Transuranic Waste Characterization Quality Assurance Project Plan
CCP-PO-001	Rev. 15	08/10/2007	CCP Transuranic Waste Characterization Quality Assurance Project Plan
CCP-PO-001	Rev. 14	03/28/2007	CCP Transuranic Waste Characterization Quality Assurance Project Plan
CCP-PO-001	Rev. 13	11/16/2006	CCP Transuranic Waste Characterization Quality Assurance Project Plan
CCP-PO-001	Rev. 12	03/22/2006	CCP Transuranic Waste Characterization Quality Assurance Project Plan
CCP-PO-001	Rev. 11	03/10/2005	CCP Transuranic Waste Characterization Quality Assurance Project Plan

CCP-PO-002	Rev. 27	05/31/2013	CCP Transuranic Waste Certification Plan
CCP-PO-002	Rev. 26	07/14/2011	CCP Transuranic Waste Certification Plan
CCP-PO-002	Rev. 25	12/28/2010	CCP Transuranic Waste Certification Plan
CCP-PO-002	Rev. 24	06/30/2010	CCP Transuranic Waste Certification Plan
CCP-PO-002	Rev. 23	04/07/2010	CCP Transuranic Waste Certification Plan
CCP-PO-002	Rev. 22	01/12/2010	CCP Transuranic Waste Certification Plan
CCP-PO-002	Rev. 21	01/26/2009	CCP Transuranic Waste Certification Plan
CCP-PO-002	Rev. 20	11/02/2007	CCP Transuranic Waste Certification Plan
CCP-PO-002	Rev. 19	05/22/2007	CCP Transuranic Waste Certification Plan
CCP-PO-002	Rev. 18	11/18/2006	CCP Transuranic Waste Certification Plan
CCP-PO-002	Rev. 17	11/18/2006	CCP Transuranic Waste Certification Plan
CCP-PO-002	Rev. 16	11/18/2006	CCP Transuranic Waste Certification Plan
CCP-PO-002	Rev. 15	03/22/2006	CCP Transuranic Waste Certification Plan
CCP-PO-002	Rev. 14	12/29/2005	CCP Transuranic Waste Certification Plan
CCP-PO-002	Rev. 13	05/09/2005	CCP Transuranic Waste Certification Plan

CCP-PO-003	Rev. 13	07/31/2013	Transuranic Authorized Methods for Payload Control (CCP CH-TRAMPC)
CCP-PO-003	Rev. 12	12/29/2010	Transuranic Authorized Methods for Payload Control (CCP CH-TRAMPC)
CCP-PO-003	Rev. 11	06/04/2009	Transuranic Authorized Methods for Payload Control (CCP CH-TRAMPC)
CCP-PO-003	Rev. 10	11/18/2006	Transuranic Authorized Methods for Payload Control (CCP CH-TRAMPC)
CCP-PO-003	Rev. 9	12/29/2005	Transuranic Authorized Methods for Payload Control (CCP CH-TRAMPC)
CCP-PO-003	Rev. 8	01/25/2005	Transuranic Authorized Methods for Payload Control (CCP CH-TRAMPC)
CCP-PO-003	Rev. 7	11/22/2004	Transuranic Authorized Methods for Payload Control (CCP CH-TRAMPC)
CCP-PO-003	Rev. 6	08/08/2004	Transuranic Authorized Methods for Payload Control (CCP CH-TRAMPC)
CCP-PO-003	Rev. 5	09/19/2003	Transuranic Authorized Methods for Payload Control (CCP CH-TRAMPC)
CCP-PO-003	Rev. 4	02/11/2003	Transuranic Authorized Methods for Payload Control (CCP CH-TRAMPC)
CCP-PO-003	Rev. 3	05/31/2002	Transuranic Authorized Methods for Payload Control (CCP CH-TRAMPC)

CCP Correlation of Container Identification Numbers to Batch Data Report Numbers

Waste Stream: # OR-ISTP-CH-HET Lot # 10

Container ID Number	Historical Container ID	NDA BDR	RTR BDR	VE BDR	Load/Manage Overpack Yes	Transportation Headspace Gas	
						FGA	GGT
X10C0501525A	N/A	OR-IQ3-0386	OR-RTR6-0585	N/A	No	OR14FG8132	N/A
X10C0506610B	N/A	OR-IQ3-0443	OR-RTR6-0620	N/A	No	OR15FG8010	N/A
X10C0802038D	N/A	OR-IQ3-0443	OR-RTR6-0619	N/A	No	OR15FG8010	N/A
X10C1100354	N/A	OR-IQ3-0443	OR-RTR6-0619	N/A	No	OR15FG8010	N/A
X10C1100359	N/A	OR-IQ3-0444	OR-RTR7-0126	N/A	No	OR15FG8013	N/A
X10C1100360	N/A	OR-IQ3-0444	OR-RTR7-0126	N/A	No	OR15FG8013	N/A
X10C1100364	N/A	OR-IQ3-0444	OR-RTR7-0126	N/A	No	OR15FG8013	N/A
X10C1100371	N/A	OR-IQ3-0443	OR-RTR6-0619	N/A	No	OR15FG8010	N/A
X10C1100372	N/A	OR-IQ3-0443	OR-RTR6-0620	N/A	No	OR15FG8010	N/A
X10C1100374A	N/A	OR-IQ3-0443	OR-RTR6-0620	N/A	No	OR15FG8010	N/A
X10C1100384	N/A	OR-IQ3-0443	OR-RTR6-0619	N/A	No	OR15FG8010	N/A
X10C1100385	N/A	OR-IQ3-0443	OR-RTR6-0620	N/A	No	OR15FG8010	N/A
X10C1100388A	N/A	OR-IQ3-0443	OR-RTR6-0619	N/A	No	OR15FG8010	N/A
X10C9311035A	N/A	OR-IQ3-0420	OR-RTR7-0125	N/A	No	OR14FG8164	N/A
X10C9311113A1	N/A	OR-MILCC2-0097	N/A	ORVECH0102	No	OR14FG8139	N/A
X10C9311211A	N/A	OR-MILCC2-0112	OR-RTR6-0542	N/A	No	OR14FG8154	N/A
X10C9311226F	N/A	OR-MILCC2-0040	OR-RTR7-0031	N/A	No	OR14FG8077	N/A
X10C9311238D	N/A	OR-MILCC2-0027	OR-RTR6-0480	N/A	No	OR14FG4043	N/A
X10C9311238H	N/A	OR-MILCC2-0027	OR-RTR6-0480	N/A	No	OR14FG8066	N/A
X10C9311298A	N/A	OR-MILCC2-0133	OR-RTR7-0057	N/A	No	OR15FG8007	N/A
X10C9311340C	N/A	OR-MILCC2-0026	OR-RTR6-0481	N/A	No	OR14FG4042	N/A
X10C9311429D1	N/A	OR-MILCC2-0097	N/A	ORVECH0101	No	OR14FG8139	N/A
X10C9311769A	N/A	OR-MILCC2-0023	OR-RTR6-0497	N/A	No	OR14FG8062	N/A
X10C9311775A	N/A	OR-MILCC2-0108	OR-RTR7-0072	N/A	No	OR14FG8150	N/A
X10C9311954B	N/A	OR-IQ3-0420	OR-RTR6-0607	N/A	No	OR14FG8164	N/A
X10C9312108A	N/A	OR-MILCC2-0108	OR-RTR7-0058	N/A	No	OR14FG8150	N/A
X10C9312162B	N/A	OR-MILCC2-0133	OR-RTR7-0057	N/A	No	OR15FG8007	N/A
X10C9312166A	N/A	OR-MILCC2-0123	OR-RTR7-0044	N/A	No	OR14FG8171	N/A

CCP Correlation of Container Identification Numbers to Batch Data Report Numbers

Waste Stream: # OR-ISTP-CH-HET Lot # 10

Container ID Number	Historical Container ID	NDA BDR	RTR BDR	VE BDR	Load/Manage Overpack Yes	Transportation Headspace Gas	
						FGA	GGT
X10C9312171A	N/A	OR-MILCC2-0110	OR-RTR7-0076	N/A	No	OR14FG8152	N/A
X10C9312235B	N/A	OR-MILCC2-0124	OR-RTR6-0611	N/A	No	OR14FG8171	N/A
X10C9312547A	N/A	OR-MILCC2-0040	OR-RTR7-0050	N/A	No	OR14FG8077	N/A
X10C9312550A	N/A	OR-MILCC2-0003	OR-RTR6-0474	N/A	No	OR14FG4024	N/A
X10C9312643A	N/A	OR-MILCC2-0002	OR-RTR6-0483	N/A	No	OR14FG8036	N/A
X10C9312666E	N/A	OR-MILCC2-0044	OR-RTR6-0540	N/A	No	OR14FG4053	N/A
X10C9312666G1	N/A	OR-MILCC2-0023	OR-RTR6-0505	N/A	No	OR14FG4039	N/A
X10C9312719C	N/A	OR-MILCC2-0108	OR-RTR7-0061	N/A	No	OR14FG8150	N/A
X10C9312842A1	N/A	OR-MILCC2-0097	N/A	ORVECH0103	No	OR14FG8139	N/A
X10C9312911A	N/A	OR-MILCC2-0044	OR-RTR7-0015	N/A	No	OR14FG8081	N/A
X10C9312924A	N/A	OR-MILCC2-0002	OR-RTR6-0474	N/A	No	OR14FG4024	N/A
X10C9312980C	N/A	OR-MILCC2-0026	OR-RTR6-0480	N/A	No	OR14FG4044	N/A
X10C9312985A	N/A	OR-MILCC2-0002	OR-RTR7-0016	N/A	No	OR14FG4021	N/A
X10C9312989A	N/A	OR-MILCC2-0113	OR-RTR6-0596	N/A	No	OR14FG8155	N/A
X10C9313006A	N/A	OR-MILCC2-0108	OR-RTR7-0058	N/A	No	OR14FG8150	N/A
X10C9313110A	N/A	OR-MILCC2-0108	OR-RTR7-0061	N/A	No	OR14FG8150	N/A
X10C9400032A1	N/A	OR-MILCC2-0023	OR-RTR6-0510	N/A	No	OR14FG4039	N/A
X10C9400066A	N/A	OR-MILCC2-0110	OR-RTR7-0072	N/A	No	OR14FG8152	N/A
X10C9400097A	N/A	OR-MILCC2-0123	OR-RTR6-0517	N/A	No	OR14FG8171	N/A
X10C9400120A	N/A	OR-MILCC2-0027	OR-RTR7-0020	N/A	No	OR14FG8066	N/A
X10C9400241A	N/A	OR-MILCC2-0113	OR-RTR7-0029	N/A	No	OR14FG8155	N/A
X10C9802784A	N/A	OR-MILCC2-0023	OR-RTR6-0510	N/A	No	OR14FG4039	N/A

Signature of Site Project Manager | Roger Whiteaker (Printed Name) | 02/12/2015 (Date)

CCP RTR/VE Summary of Prohibited Items and AK Confirmation

Waste Stream Number: OR-ISTP-CH-HET Lot #: 10

Container Number	RTR Prohibited Items [a,b]	Visual Examination Prohibited Items [a,b]	Does the Physical Form of the Waste Match the Waste Stream Description as Determined by AK
See correlation of container ID numbers for list of remaining drum numbers in this Lot.	None of the containers in this lot had prohibited items identified during RTR.	None of the containers in this Lot had prohibited items identified during Visual Examination technique.	The physical form of the waste matches the waste stream description as determined by AK.
a. See Batch Data Reports			
b. If AK has assigned U134 to this waste stream, then any liquids in these containers are prohibited items (not acceptable by the TSDF).			
Justification for the selection of RTR and/or VE: RTR was selected as the characterization method for this lot because the waste was previously packaged and RTR meets all the Data Quality Objectives for NDE for the waste, VE was selected as the characterization method because VE meets the Data Quality Objectives'			

Site Project Manager Signature — Roger Whiteaker Printed Name — 02/12/2015 Date

CCP Reconciliation with Data Quality Objectives

WSPF# OR-ISTP-CH-HET Rev. 0 Lot # 10

Sampling Completeness

RTR/VE:

Number of Valid Samples: 50 Number of Total Samples Analyzed: 50

Percent Complete: 100 (QAO is 100%)

Radiological:

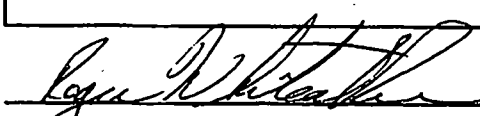
Number of Valid Samples: 50 Number of Total Samples Analyzed: 50

Percent Complete: 100 (QAO is 100%)

	Y/N/NA	Reconciliation Parameter
1	Y	Waste Matrix Code.
2	Y	Waste Material Parameter Weights.
3	Y	The TRU activity reported in the BDRs for each container demonstrates with a 95% probability that the container of waste contains TRU radioactive waste.
4	N	AK Sufficiency. Is there an approved AK sufficiency Determination for this waste stream?
5	Y	The data demonstrates whether the waste stream exhibits a toxicity characteristic under Title 40 Code of Federal Regulations (CFR), Part 261, Identification and Listing of Hazardous Waste, Subpart C, Characteristics of Hazardous Waste.
6	Y	Does the waste stream contain listed waste found in 20.4.1.200 NMAC incorporating 40 CFR Part 261, Subpart D, Lists of Hazardous Wastes.
7	Y	Waste stream can be classified as hazardous or nonhazardous.
8	Y	The overall completeness, comparability, and representativeness QAOs were met for each of the analytical and testing procedures as specified in the WAP Sections C3-1 through C3-2 prior to submittal of a waste stream profile form for a waste steam or waste stream lot.

	Completeness	Comparability	Representativeness
Radiography	Y	Y	Y
VE	Y	Y	Y

Comments: None



Roger Whiteaker 02/12/2015

Signature of Site Project Manager Printed Name Date

CHARACTERIZATION INFORMATION SUMMARY

WSPF# OR-ISTP-CH-HET Rev. 0 (CCP-AK-ORNL-008)

Lot 11

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CCP Characterization Information Summary Cover Page

Waste Stream #: OR-ISTP-CH-HET Lot #: 11

AK Expert Review: N/A Date: N/A

SPM Review: Rick Whiteley Rick Whiteley Date: 03/05/2015

SPM signature certifies that through Acceptable Knowledge testing and/or analysis that the waste identified in this summary is not corrosive, ignitable, reactive, or incompatible with the TSDF.

A summary of the Acceptable Knowledge regarding this waste stream containing specific information about the corrosivity, reactivity, and ignitability of the waste stream is included as an attachment to the Waste Stream Profile Form. By reference, that information is included in this lot.

List of procedures used:

Non Destructive Assay (NDA):

CCP-TP-048	Rev. 16	11/01/2013 Mobile IQ3 System Data Reviewing, Validating, and Reporting Procedure
CCP-TP-048	Rev. 15	03/24/2011 Mobile IQ3 System Data Reviewing, Validating, and Reporting Procedure
CCP-TP-048	Rev. 14	03/08/2010 Mobile IQ3 System Data Reviewing, Validating, and Reporting Procedure
CCP-TP-048	Rev. 13	10/12/2009 Mobile IQ3 System Data Reviewing, Validating, and Reporting Procedure
CCP-TP-048	Rev. 12	09/08/2009 Mobile IQ3 System Data Reviewing, Validating, and Reporting Procedure
CCP-TP-048	Rev. 11	02/18/2008 Mobile IQ3 System Data Reviewing, Validating, and Reporting Procedure
CCP-TP-048	Rev. 10	11/18/2006 Mobile IQ3 System Data Reviewing, Validating, and Reporting Procedure
CCP-TP-048	Rev. 9	11/03/2005 Mobile IQ3 System Data Reviewing, Validating, and Reporting Procedure
CCP-TP-048	Rev. 8	09/21/2005 Mobile IQ3 System Data Reviewing, Validating, and Reporting Procedure
CCP-TP-048	Rev. 7	03/14/2005 Mobile IQ3 System Data Reviewing, Validating, and Reporting Procedure
CCP-TP-048	Rev. 6	10/18/2004 Mobile IQ3 System Data Reviewing, Validating, and Reporting Procedure
CCP-TP-048	Rev. 5	06/08/2004 Mobile IQ3 System Data Reviewing, Validating, and Reporting Procedure
CCP-TP-048	Rev. 4	12/04/2003 Mobile IQ3 System Data Reviewing, Validating, and Reporting Procedure
CCP-TP-048	Rev. 3	09/03/2003 Mobile IQ3 System Data Reviewing, Validating, and Reporting Procedure
CCP-TP-048	Rev. 2	04/25/2003 Mobile IQ3 System Data Reviewing, Validating, and Reporting Procedure
CCP-TP-048	Rev. 1	03/21/2003 Mobile IQ3 System Data Reviewing, Validating, and Reporting Procedure
CCP-TP-048	Rev. 0	02/05/2003 Mobile IQ3 System Data Reviewing, Validating, and Reporting Procedure

Project Level Data Validation / DQO Reconciliation:

CCP-TP-001	Rev. 21	08/08/2013 CCP Project Level Data Validation and Verification
CCP-TP-001	Rev. 20	09/27/2012 CCP Project Level Data Validation and Verification
CCP-TP-001	Rev. 19	12/28/2010 CCP Project Level Data Validation and Verification
CCP-TP-001	Rev. 18	08/09/2010 CCP Project Level Data Validation and Verification
CCP-TP-001	Rev. 17	09/24/2007 CCP Project Level Data Validation and Verification
CCP-TP-001	Rev. 16	04/26/2007 CCP Project Level Data Validation and Verification
CCP-TP-001	Rev. 15	11/22/2006 CCP Project Level Data Validation and Verification
CCP-TP-001	Rev. 14	11/16/2006 CCP Project Level Data Validation and Verification
CCP-TP-001	Rev. 13	07/21/2006 CCP Project Level Data Validation and Verification
CCP-TP-001	Rev. 12	09/25/2006 CCP Project Level Data Validation and Verification
CCP-TP-001	Rev. 11	03/23/2005 CCP Project Level Data Validation and Verification

CCP-TP-002	Rev. 26	06/19/2013 CCP Reconciliation of DQOs and Reporting Characterization Data
CCP-TP-002	Rev. 25	02/11/2013 CCP Reconciliation of DQOs and Reporting Characterization Data
CCP-TP-002	Rev. 24	12/28/2011 CCP Reconciliation of DQOs and Reporting Characterization Data
CCP-TP-002	Rev. 23	12/28/2010 CCP Reconciliation of DQOs and Reporting Characterization Data
CCP-TP-002	Rev. 22	08/30/2010 CCP Reconciliation of DQOs and Reporting Characterization Data
CCP-TP-002	Rev. 21	08/04/2009 CCP Reconciliation of DQOs and Reporting Characterization Data
CCP-TP-002	Rev. 20	08/18/2008 CCP Reconciliation of DQOs and Reporting Characterization Data
CCP-TP-002	Rev. 19	12/22/2006 CCP Reconciliation of DQOs and Reporting Characterization Data
CCP-TP-002	Rev. 18	11/16/2006 CCP Reconciliation of DQOs and Reporting Characterization Data
CCP-TP-002	Rev. 17	10/10/2006 CCP Reconciliation of DQOs and Reporting Characterization Data
CCP-TP-002	Rev. 16	06/06/2006 CCP Reconciliation of DQOs and Reporting Characterization Data
CCP-TP-002	Rev. 15	08/16/2005 CCP Reconciliation of DQOs and Reporting Characterization Data
CCP-TP-002	Rev. 14	03/28/2005 CCP Reconciliation of DQOs and Reporting Characterization Data

CCP-TP-005	Rev. 26	08/12/2013 CCP Acceptable Knowledge Documentation
CCP-TP-005	Rev. 25	06/19/2013 CCP Acceptable Knowledge Documentation
CCP-TP-005	Rev. 24	11/28/2011 CCP Acceptable Knowledge Documentation
CCP-TP-005	Rev. 23	06/30/2011 CCP Acceptable Knowledge Documentation
CCP-TP-005	Rev. 22	04/21/2011 CCP Acceptable Knowledge Documentation
CCP-TP-005	Rev. 21	12/28/2010 CCP Acceptable Knowledge Documentation
CCP-TP-005	Rev. 20	11/01/2010 CCP Acceptable Knowledge Documentation
CCP-TP-005	Rev. 19	07/06/2010 CCP Acceptable Knowledge Documentation
CCP-TP-005	Rev. 18	11/16/2006 CCP Acceptable Knowledge Documentation
CCP-TP-005	Rev. 17	08/05/2006 CCP Acceptable Knowledge Documentation

CCP-TP-005	Rev. 16	02/27/2008 CCP Acceptable Knowledge Documentation
CCP-TP-005	Rev. 15	03/31/2005 CCP Acceptable Knowledge Documentation

CCP-TP-030	Rev. 34	02/02/2015 CCP CH TRU Waste Certification and WWIS/WDS Data Entry
CCP-TP-030	Rev. 33	11/19/2013 CCP CH TRU Waste Certification and WWIS/WDS Data Entry
CCP-TP-030	Rev. 32	06/20/2013 CCP CH TRU Waste Certification and WWIS/WDS Data Entry
CCP-TP-030	Rev. 31	11/19/2012 CCP CH TRU Waste Certification and WWIS/WDS Data Entry
CCP-TP-030	Rev. 30	05/21/2012 CCP CH TRU Waste Certification and WWIS/WDS Data Entry
CCP-TP-030	Rev. 29	04/26/2011 CCP CH TRU Waste Certification and WWIS/WDS Data Entry
CCP-TP-030	Rev. 28	05/12/2010 CCP CH TRU Waste Certification and WWIS/WDS Data Entry
CCP-TP-030	Rev. 27	12/14/2009 CCP CH TRU Waste Certification and WWIS Data Entry
CCP-TP-030	Rev. 26	05/27/2009 CCP CH TRU Waste Certification and WWIS Data Entry
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CCP-TP-030	Rev. 22	07/24/2007 CCP CH TRU Waste Certification and WWIS Data Entry
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CCP-TP-030	Rev. 20	02/07/2007 CCP CH TRU Waste Certification and WWIS Data Entry
CCP-TP-030	Rev. 19	11/16/2006 CCP CH TRU Waste Certification and WWIS Data Entry
CCP-TP-030	Rev. 18	05/01/2006 CCP TRU Waste Certification and WWIS Data Entry
CCP-TP-030	Rev. 17	12/28/2005 CCP TRU Waste Certification and WWIS Data Entry
CCP-TP-030	Rev. 16	04/22/2005 CCP TRU Waste Certification and WWIS Data Entry

Radiography (RTR/NDE):

CCP-TP-053	Rev. 15	09/11/2014 CCP Standard Real-Time Radiography (RTR) Inspection Procedure
CCP-TP-053	Rev. 14	09/25/2013 CCP Standard Real-Time Radiography (RTR) Inspection Procedure
CCP-TP-053	Rev. 13	05/14/2013 CCP Standard Real-Time Radiography (RTR) Inspection Procedure
CCP-TP-053	Rev. 12	08/22/2012 CCP Standard Real-Time Radiography (RTR) Inspection Procedure
CCP-TP-053	Rev. 11	07/20/2011 CCP Standard Real-Time Radiography (RTR) Inspection Procedure
CCP-TP-053	Rev. 10	03/04/2011 CCP Standard Real-Time Radiography (RTR) Inspection Procedure
CCP-TP-053	Rev. 9	09/30/2010 CCP Standard Real-Time Radiography (RTR) Inspection Procedure
CCP-TP-053	Rev. 8	09/30/2010 CCP Standard Real-Time Radiography (RTR) Inspection Procedure
CCP-TP-053	Rev. 7	10/21/2009 CCP Standard Real-Time Radiography (RTR) Inspection Procedure
CCP-TP-053	Rev. 6	03/04/2008 CCP Standard Real-Time Radiography (RTR) Inspection Procedure
CCP-TP-053	Rev. 5	11/16/2006 CCP Standard Real-Time Radiography (RTR) Inspection Procedure
CCP-TP-053	Rev. 4	12/22/2005 CCP Standard Real-Time Radiography (RTR) Inspection Procedure
CCP-TP-053	Rev. 3	03/21/2005 CCP Standard Real-Time Radiography (RTR) Inspection Procedure
CCP-TP-053	Rev. 2	07/14/2004 CCP Standard Real-Time Radiography (RTR) Inspection Procedure

WAP Certification:

CCP-PO-001	Rev. 21	05/31/2013 CCP Transuranic Waste Characterization Quality Assurance Project Plan
CCP-PO-001	Rev. 20	06/16/2011 CCP Transuranic Waste Characterization Quality Assurance Project Plan
CCP-PO-001	Rev. 19	12/28/2010 CCP Transuranic Waste Characterization Quality Assurance Project Plan
CCP-PO-001	Rev. 18	09/30/2010 CCP Transuranic Waste Characterization Quality Assurance Project Plan
CCP-PO-001	Rev. 17	09/23/2009 CCP Transuranic Waste Characterization Quality Assurance Project Plan
CCP-PO-001	Rev. 16	10/31/2007 CCP Transuranic Waste Characterization Quality Assurance Project Plan
CCP-PO-001	Rev. 15	08/10/2007 CCP Transuranic Waste Characterization Quality Assurance Project Plan
CCP-PO-001	Rev. 14	03/28/2007 CCP Transuranic Waste Characterization Quality Assurance Project Plan
CCP-PO-001	Rev. 13	11/16/2006 CCP Transuranic Waste Characterization Quality Assurance Project Plan
CCP-PO-001	Rev. 12	03/22/2006 CCP Transuranic Waste Characterization Quality Assurance Project Plan
CCP-PO-001	Rev. 11	03/10/2005 CCP Transuranic Waste Characterization Quality Assurance Project Plan

CCP-PO-002	Rev. 27	05/31/2013 CCP Transuranic Waste Certification Plan
CCP-PO-002	Rev. 26	07/14/2011 CCP Transuranic Waste Certification Plan
CCP-PO-002	Rev. 25	12/29/2010 CCP Transuranic Waste Certification Plan
CCP-PO-002	Rev. 24	09/30/2010 CCP Transuranic Waste Certification Plan
CCP-PO-002	Rev. 23	04/07/2010 CCP Transuranic Waste Certification Plan
CCP-PO-002	Rev. 22	01/12/2010 CCP Transuranic Waste Certification Plan
CCP-PO-002	Rev. 21	01/29/2009 CCP Transuranic Waste Certification Plan
CCP-PO-002	Rev. 20	11/02/2007 CCP Transuranic Waste Certification Plan
CCP-PO-002	Rev. 19	05/22/2007 CCP Transuranic Waste Certification Plan
CCP-PO-002	Rev. 18	11/16/2006 CCP Transuranic Waste Certification Plan
CCP-PO-002	Rev. 17	11/16/2006 CCP Transuranic Waste Certification Plan
CCP-PO-002	Rev. 16	11/16/2006 CCP Transuranic Waste Certification Plan
CCP-PO-002	Rev. 15	03/22/2006 CCP Transuranic Waste Certification Plan
CCP-PO-002	Rev. 14	12/28/2005 CCP Transuranic Waste Certification Plan
CCP-PO-002	Rev. 13	05/09/2005 CCP Transuranic Waste Certification Plan

CCP-PO-003	Rev. 13	07/31/2013 Transuranic Authorized Methods for Payload Control (CCP CH-TRAMPC)
CCP-PO-003	Rev. 12	12/28/2010 Transuranic Authorized Methods for Payload Control (CCP CH-TRAMPC)
CCP-PO-003	Rev. 11	08/04/2009 Transuranic Authorized Methods for Payload Control (CCP CH-TRAMPC)
CCP-PO-003	Rev. 10	11/16/2006 Transuranic Authorized Methods for Payload Control (CCP CH-TRAMPC)
CCP-PO-003	Rev. 9	12/29/2005 Transuranic Authorized Methods for Payload Control (CCP CH-TRAMPC)
CCP-PO-003	Rev. 8	01/25/2005 Transuranic Authorized Methods for Payload Control (CCP CH-TRAMPC)
CCP-PO-003	Rev. 7	11/22/2004 Transuranic Authorized Methods for Payload Control (CCP CH-TRAMPC)
CCP-PO-003	Rev. 6	06/08/2004 Transuranic Authorized Methods for Payload Control (CCP CH-TRAMPC)
CCP-PO-003	Rev. 5	08/19/2003 Transuranic Authorized Methods for Payload Control (CCP CH-TRAMPC)
CCP-PO-003	Rev. 4	02/11/2003 Transuranic Authorized Methods for Payload Control (CCP CH-TRAMPC)
CCP-PO-003	Rev. 3	05/31/2002 Transuranic Authorized Methods for Payload Control (CCP CH-TRAMPC)

CCP Correlation of Container Identification Numbers to Batch Data Report Numbers

Waste Stream: # OR-ISTP-CH-HET Lot # 11

Container ID Number	Historical Container ID	NDA BDR	RTR BDR	VE BDR	Load/Manage Overpack Yes	Transportation Headspace Gas	
						FGA	GGT
X10C0404147A	N/A	OR-MILCC2-0144	OR-RTR6-0455	N/A	No	OR14FG8015	N/A
X10C0802038A	N/A	OR-IQ3-0442	OR-RTR6-0619	N/A	No	OR15FG8010	N/A
X10C0802038I	N/A	OR-IQ3-0444	OR-RTR6-0620	N/A	No	OR15FG8014	N/A
X10C1100357	N/A	OR-IQ3-0442	OR-RTR6-0619	N/A	No	OR15FG8010	N/A
X10C1100358	N/A	OR-IQ3-0442	OR-RTR6-0619	N/A	No	OR15FG8010	N/A
X10C1100361A	N/A	OR-IQ3-0444	OR-RTR6-0620	N/A	No	OR15FG8014	N/A
X10C1100361B	N/A	OR-IQ3-0444	OR-RTR6-0620	N/A	No	OR15FG8014	N/A
X10C1100362A	N/A	OR-IQ3-0444	OR-RTR6-0620	N/A	No	OR15FG8014	N/A
X10C1100363	N/A	OR-IQ3-0442	OR-RTR6-0619	N/A	No	OR15FG8010	N/A
X10C1100382A	N/A	OR-IQ3-0442	OR-RTR6-0619	N/A	No	OR15FG8010	N/A
X10C1100383A	N/A	OR-IQ3-0442	OR-RTR6-0619	N/A	No	OR15FG8010	N/A
X10C9311082D	N/A	OR-MILCC2-0071	OR-RTR6-0471	N/A	No	OR14FG8024	N/A
X10C9311220A	N/A	OR-MILCC2-0035	OR-RTR7-0020	N/A	No	OR14FG8072	N/A
X10C9311233A	N/A	OR-MILCC2-0126	OR-RTR6-0512	N/A	No	OR15FG8019	N/A
X10C9311238G	N/A	OR-MILCC2-0145	OR-RTR6-0456	N/A	No	OR14FG8015	N/A
X10C9311291A	N/A	OR-MILCC2-0146	OR-RTR6-0504	N/A	No	OR15FG8021	N/A
X10C9311344A	N/A	OR-MILCC2-0143	OR-RTR6-0456	N/A	No	OR14FG8015	N/A
X10C9311416A	N/A	OR-MILCC2-0057	OR-RTR6-0549	N/A	No	OR14FG8095	N/A
X10C9311429J	N/A	OR-MILCC2-0092	OR-RTR6-0498	N/A	No	OR14FG8133	N/A
X10C9311459A	N/A	OR-MILCC2-0118	OR-RTR6-0599	N/A	No	OR14FG8165	N/A
X10C9311571A	N/A	OR-MILCC2-0050	OR-RTR7-0022	N/A	No	OR14FG8031	N/A
X10C9311685A	N/A	OR-MILCC2-0037	OR-RTR7-0020	N/A	No	OR14FG8075	N/A
X10C9311739A	N/A	OR-IQ3-0431	OR-RTR6-0546	N/A	No	OR15FG8003	N/A
X10C9311777A	N/A	OR-MILCC2-0082	OR-RTR6-0544	N/A	No	OR14FG8122	N/A
X10C9311955A	N/A	OR-IQ3-0386	OR-RTR6-0585	N/A	No	OR14FG8132	N/A
X10C9312029A	N/A	OR-MILCC2-0032	OR-RTR6-0452	N/A	No	OR14FG8016	N/A
X10C9312108B	N/A	OR-IQ3-0409	OR-RTR7-0010	N/A	No	OR14FG8155	N/A
X10C9312162A	N/A	OR-IQ3-0410	OR-RTR7-0010	N/A	No	OR14FG8154	N/A

CCP Correlation of Container Identification Numbers to Batch Data Report Numbers

Waste Stream: # OR-ISTP-CH-HET Lot # 11

Container ID Number	Historical Container ID	NDA BDR	RTR BDR	VE BDR	Load/Manage Overpack Yes	Transportation Headspace Gas	
						FGA	GGT
X10C9312176A	N/A	OR-MILCC2-0134	OR-RTR6-0615	N/A	No	OR15FG8005	N/A
X10C9312189A1	N/A	OR-MILCC2-0142	OR-RTR6-0586	N/A	No	OR15FG8016	N/A
X10C9312548A	N/A	OR-MILCC2-0143	OR-RTR6-0456	N/A	No	OR14FG4004	N/A
X10C9312576A	N/A	OR-MILCC2-0144	OR-RTR6-0455	N/A	No	OR14FG4004	N/A
X10C9312599A	N/A	OR-MILCC2-0061	OR-RTR6-0477	N/A	No	OR14FG8105	N/A
X10C9312601A	N/A	OR-MILCC2-0080	OR-RTR6-0541	N/A	No	OR14FG8118	N/A
X10C9312625A	N/A	OR-MILCC2-0039	OR-RTR6-0464	N/A	No	OR14FG4007	N/A
~~X10C9312631A~~	~~N/A~~	~~OR-MILCC2-0143~~	~~OR-RTR6-0456~~	~~N/A~~	~~No~~	~~OR14FG8015~~	~~N/A~~
X10C9312666A	N/A	OR-MILCC2-0145	OR-RTR6-0452	N/A	No	OR14FG4004	N/A
X10C9312674B1	N/A	OR-MILCC2-0059	OR-RTR6-0483	N/A	No	OR14FG8031	N/A
X10C9312756A	N/A	OR-MILCC2-0070	OR-RTR6-0468	N/A	No	OR14FG8021	N/A
X10C9312825A	N/A	OR-MILCC2-0009	OR-RTR7-0035	N/A	No	OR14FG8051	N/A
X10C9312980F	N/A	OR-IQ3-0447	OR-RTR6-0512	N/A	No	OR15FG8014	N/A
X10C9313013A	N/A	OR-MILCC2-0033	OR-RTR6-0486	N/A	No	OR14FG8034	N/A
X10C9313118A	N/A	OR-MILCC2-0096	OR-RTR6-0588	N/A	No	OR14FG8137	N/A
X10C9313648A	N/A	OR-MILCC2-0085	OR-RTR6-0581	N/A	No	OR14FG8126	N/A
X10C9400125A	N/A	OR-MILCC2-0069	OR-RTR6-0489	N/A	No	OR14FG8106	N/A
X10C9400148A	N/A	OR-MILCC2-0005	OR-RTR6-0471	N/A	No	OR14FG4026	N/A
X10C9400173A	N/A	OR-MILCC2-0021	OR-RTR6-0514	N/A	No	OR14FG4037	N/A
X10C9802783A	N/A	OR-MILCC2-0136	OR-RTR7-0042	N/A	No	OR15FG8008	N/A
X10CSATN02384C	N/A	OR-MILCC2-0141	OR-RTR6-0571	N/A	No	OR15FG8015	N/A
X10CSATN02824A	N/A	OR-IQ3-0390	OR-RTR6-0587	N/A	No	OR14FG8134	N/A

> 200 MR/HR RW 5/13/15

R Whiteley
Signature of Site Project Manager

Rick Whiteley
Printed Name

03/05/2015
Date

Roger Whiteaker
ROGER WHITEAKER 5/13/2015

CCP RTR/VE Summary of Prohibited Items and AK Confirmation

Waste Stream Number: OR-ISTP-CH-HET Lot #: 11

Container Number	RTR Prohibited Items [a,b]	Visual Examination Prohibited Items [a,b]	Does the Physical Form of the Waste Match the Waste Stream Description as Determined by AK
See correlation of container ID numbers for list of remaining drum numbers in this Lot.	None of the containers in this lot had prohibited items identified during RTR.	VE was not used to certify any containers in this Lot.	The physical form of the waste matches the waste stream description as determined by AK.
a. See Batch Data Reports			
b. If AK has assigned U134 to this waste stream, then any liquids in these containers are prohibited items (not acceptable by the TSDF).			
Justification for the selection of RTR and/or VE: RTR was selected as the characterization method for this lot because the waste was previously packaged and RTR meets all the Data Quality Objectives for NDE for the waste.			

R Whiteley
Site Project Manager Signature Rick Whiteley Printed Name 03/05/2015 Date

CCP Reconciliation with Data Quality Objectives

WSPF# OR-ISTP-CH-HET Rev. 0 Lot # 11

Sampling Completeness

RTR/VE:

Number of Valid Samples: 50 Number of Total Samples Analyzed: 50

Percent Complete: 100 (QAO is 100%)

Radiological:

Number of Valid Samples: 50 Number of Total Samples Analyzed: 50

Percent Complete: 100 (QAO is 100%)

	Y/N/NA	Reconciliation Parameter
1	Y	Waste Matrix Code.
2	Y	Waste Material Parameter Weights.
3	Y	The TRU activity reported in the BDRs for each container demonstrates with a 95% probability that the container of waste contains TRU radioactive waste.
4	N	AK Sufficiency. Is there an approved AK sufficiency Determination for this waste stream?
5	Y	The data demonstrates whether the waste stream exhibits a toxicity characteristic under Title 40 Code of Federal Regulations (CFR), Part 261, Identification and Listing of Hazardous Waste, Subpart C, Characteristics of Hazardous Waste.
6	Y	Does the waste stream contain listed waste found in 20.4.1.200 NMAC incorporating 40 CFR Part 261, Subpart D, Lists of Hazardous Wastes.
7	Y	Waste stream can be classified as hazardous or nonhazardous.
8	Y	The overall completeness, comparability, and representativeness QAOs were met for each of the analytical and testing procedures as specified in the WAP Sections C3-1 through C3-2 prior to submittal of a waste stream profile form for a waste steam or waste stream lot.

	Completeness	Comparability	Representativeness
Radiography	Y	Y	Y
VE	NA	NA	NA

Comments: None

Rick Whiteley Rick Whiteley 03/05/2015

Signature of Site Project Manager Printed Name Date

CHARACTERIZATION INFORMATION SUMMARY

WSPF# OR-ISTP-CH-HET Rev. 0 (CCP-AK-ORNL-008)

Lot 12

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CCP Characterization Information Summary Cover Page

Waste Stream # OR-ISTP-CH-HET Lot #: 12

AK Expert Review: N/A Date: N/A

SPM Review: Rick Whiteley Date: 04/14/2015

SPM signature certifies that through Acceptable Knowledge testing and/or analysis that the waste identified in this summary is not corrosive, ignitable, reactive, or incompatible with the TSDF.

A summary of the Acceptable Knowledge regarding this waste stream containing specific information about the corrosivity, reactivity, and ignitability of the waste stream is included as an attachment to the Waste Stream Profile Form. By reference, that information is included in this lot.

List of procedures used:

Non Destructive Assay (NDA):

CCP-TP-048	Rev. 16	11/01/2013 Mobile IQ3 System Data Reviewing, Validating, and Reporting Procedure
CCP-TP-048	Rev. 15	03/24/2011 Mobile IQ3 System Data Reviewing, Validating, and Reporting Procedure
CCP-TP-048	Rev. 14	03/08/2010 Mobile IQ3 System Data Reviewing, Validating, and Reporting Procedure
CCP-TP-048	Rev. 13	10/12/2009 Mobile IQ3 System Data Reviewing, Validating, and Reporting Procedure
CCP-TP-048	Rev. 12	09/09/2009 Mobile IQ3 System Data Reviewing, Validating, and Reporting Procedure
CCP-TP-048	Rev. 11	02/18/2008 Mobile IQ3 System Data Reviewing, Validating, and Reporting Procedure
CCP-TP-048	Rev. 10	11/18/2008 Mobile IQ3 System Data Reviewing, Validating, and Reporting Procedure
CCP-TP-048	Rev. 9	11/03/2005 Mobile IQ3 System Data Reviewing, Validating, and Reporting Procedure
CCP-TP-048	Rev. 8	09/21/2005 Mobile IQ3 System Data Reviewing, Validating, and Reporting Procedure
CCP-TP-048	Rev. 7	03/14/2005 Mobile IQ3 System Data Reviewing, Validating, and Reporting Procedure
CCP-TP-048	Rev. 6	10/18/2004 Mobile IQ3 System Data Reviewing, Validating, and Reporting Procedure
CCP-TP-048	Rev. 5	06/08/2004 Mobile IQ3 System Data Reviewing, Validating, and Reporting Procedure
CCP-TP-048	Rev. 4	12/04/2003 Mobile IQ3 System Data Reviewing, Validating, and Reporting Procedure
CCP-TP-048	Rev. 3	09/03/2003 Mobile IQ3 System Data Reviewing, Validating, and Reporting Procedure
CCP-TP-048	Rev. 2	04/25/2003 Mobile IQ3 System Data Reviewing, Validating, and Reporting Procedure
CCP-TP-048	Rev. 1	03/21/2003 Mobile IQ3 System Data Reviewing, Validating, and Reporting Procedure
CCP-TP-048	Rev. 0	02/05/2003 Mobile IQ3 System Data Reviewing, Validating, and Reporting Procedure

Project Level Data Validation / DQO Reconciliation:

CCP-TP-001	Rev. 21	06/06/2013 CCP Project Level Data Validation and Verification
CCP-TP-001	Rev. 20	08/27/2012 CCP Project Level Data Validation and Verification
CCP-TP-001	Rev. 19	12/29/2010 CCP Project Level Data Validation and Verification
CCP-TP-001	Rev. 18	08/09/2010 CCP Project Level Data Validation and Verification
CCP-TP-001	Rev. 17	09/24/2007 CCP Project Level Data Validation and Verification
CCP-TP-001	Rev. 16	04/26/2007 CCP Project Level Data Validation and Verification
CCP-TP-001	Rev. 15	11/22/2006 CCP Project Level Data Validation and Verification
CCP-TP-001	Rev. 14	11/16/2006 CCP Project Level Data Validation and Verification
CCP-TP-001	Rev. 13	07/21/2006 CCP Project Level Data Validation and Verification
CCP-TP-001	Rev. 12	05/25/2006 CCP Project Level Data Validation and Verification
CCP-TP-001	Rev. 11	03/23/2005 CCP Project Level Data Validation and Verification

CCP-TP-002	Rev. 26	06/19/2013 CCP Reconciliation of DQOs and Reporting Characterization Data
CCP-TP-002	Rev. 25	02/11/2013 CCP Reconciliation of DQOs and Reporting Characterization Data
CCP-TP-002	Rev. 24	12/28/2011 CCP Reconciliation of DQOs and Reporting Characterization Data
CCP-TP-002	Rev. 23	12/29/2010 CCP Reconciliation of DQOs and Reporting Characterization Data
CCP-TP-002	Rev. 22	08/30/2010 CCP Reconciliation of DQOs and Reporting Characterization Data
CCP-TP-002	Rev. 21	08/04/2009 CCP Reconciliation of DQOs and Reporting Characterization Data
CCP-TP-002	Rev. 20	08/18/2008 CCP Reconciliation of DQOs and Reporting Characterization Data
CCP-TP-002	Rev. 19	12/22/2006 CCP Reconciliation of DQOs and Reporting Characterization Data
CCP-TP-002	Rev. 18	11/16/2006 CCP Reconciliation of DQOs and Reporting Characterization Data
CCP-TP-002	Rev. 17	10/10/2006 CCP Reconciliation of DQOs and Reporting Characterization Data
CCP-TP-002	Rev. 16	08/08/2006 CCP Reconciliation of DQOs and Reporting Characterization Data
CCP-TP-002	Rev. 15	08/16/2005 CCP Reconciliation of DQOs and Reporting Characterization Data
CCP-TP-002	Rev. 14	03/29/2005 CCP Reconciliation of DQOs and Reporting Characterization Data

CCP-TP-005	Rev. 26	08/12/2013 CCP Acceptable Knowledge Documentation
CCP-TP-005	Rev. 25	06/19/2013 CCP Acceptable Knowledge Documentation
CCP-TP-005	Rev. 24	11/28/2011 CCP Acceptable Knowledge Documentation
CCP-TP-005	Rev. 23	06/30/2011 CCP Acceptable Knowledge Documentation
CCP-TP-005	Rev. 22	04/21/2011 CCP Acceptable Knowledge Documentation
CCP-TP-005	Rev. 21	12/29/2010 CCP Acceptable Knowledge Documentation
CCP-TP-005	Rev. 20	11/01/2010 CCP Acceptable Knowledge Documentation
CCP-TP-005	Rev. 19	07/06/2010 CCP Acceptable Knowledge Documentation
CCP-TP-005	Rev. 18	11/16/2006 CCP Acceptable Knowledge Documentation
CCP-TP-005	Rev. 17	08/05/2006 CCP Acceptable Knowledge Documentation

CCP-TP-005	Rev. 16	02/27/2008 CCP Acceptable Knowledge Documentation
CCP-TP-005	Rev. 15	03/31/2005 CCP Acceptable Knowledge Documentation

CCP-TP-030	Rev. 34	02/02/2015 CCP CH TRU Waste Certification and WWIS/WDS Data Entry
CCP-TP-030	Rev. 33	11/18/2013 CCP CH TRU Waste Certification and WWIS/WDS Data Entry
CCP-TP-030	Rev. 32	09/20/2013 CCP CH TRU Waste Certification and WWIS/WDS Data Entry
CCP-TP-030	Rev. 31	11/18/2012 CCP CH TRU Waste Certification and WWIS/WDS Data Entry
CCP-TP-030	Rev. 30	05/21/2012 CCP CH TRU Waste Certification and WWIS/WDS Data Entry
CCP-TP-030	Rev. 29	04/28/2011 CCP CH TRU Waste Certification and WWIS/WDS Data Entry
CCP-TP-030	Rev. 28	05/12/2010 CCP CH TRU Waste Certification and WWIS/WDS Data Entry
CCP-TP-030	Rev. 27	12/14/2009 CCP CH TRU Waste Certification and WWIS Data Entry
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CCP-TP-030	Rev. 25	01/22/2009 CCP CH TRU Waste Certification and WWIS Data Entry
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CCP-TP-053	Rev. 3	03/21/2005 CCP Standard Real-Time Radiography (RTR) Inspection Procedure
CCP-TP-053	Rev. 2	07/14/2004 CCP Standard Real-Time Radiography (RTR) Inspection Procedure

Visual Examination (VE):

CCP-TP-113	Rev. 18	09/25/2013 CCP Standard Contact-Handled Waste Visual Examination
CCP-TP-113	Rev. 17	06/04/2013 CCP Standard Contact-Handled Waste Visual Examination
CCP-TP-113	Rev. 16	04/25/2011 CCP Standard Contact-Handled Waste Visual Examination
CCP-TP-113	Rev. 15	12/29/2010 CCP Standard Contact-Handled Waste Visual Examination
CCP-TP-113	Rev. 14	06/30/2010 CCP Standard Contact-Handled Waste Visual Examination
CCP-TP-113	Rev. 13	03/11/2009 CCP Standard Contact-Handled Waste Visual Examination
CCP-TP-113	Rev. 12	12/01/2008 CCP Standard Contact-Handled Waste Visual Examination
CCP-TP-113	Rev. 11	11/12/2008 CCP Standard Contact-Handled Waste Visual Examination
CCP-TP-113	Rev. 10	07/09/2008 CCP Standard Contact-Handled Waste Visual Examination
CCP-TP-113	Rev. 9	03/05/2008 CCP Standard Waste Visual Examination
CCP-TP-113	Rev. 8	08/04/2007 CCP Standard Waste Visual Examination
CCP-TP-113	Rev. 7	03/19/2007 CCP Standard Waste Visual Examination
CCP-TP-113	Rev. 6	11/16/2006 CCP Standard Waste Visual Examination
CCP-TP-113	Rev. 5	08/28/2006 CCP Standard Waste Visual Examination
CCP-TP-113	Rev. 4	12/22/2005 CCP Standard Waste Visual Examination

WAP Certification:

CCP-PO-001	Rev. 21	05/31/2013 CCP Transuranic Waste Characterization Quality Assurance Project Plan
CCP-PO-001	Rev. 20	06/16/2011 CCP Transuranic Waste Characterization Quality Assurance Project Plan
CCP-PO-001	Rev. 19	12/28/2010 CCP Transuranic Waste Characterization Quality Assurance Project Plan
CCP-PO-001	Rev. 18	06/30/2010 CCP Transuranic Waste Characterization Quality Assurance Project Plan
CCP-PO-001	Rev. 17	06/23/2009 CCP Transuranic Waste Characterization Quality Assurance Project Plan
CCP-PO-001	Rev. 16	10/31/2007 CCP Transuranic Waste Characterization Quality Assurance Project Plan
CCP-PO-001	Rev. 15	08/10/2007 CCP Transuranic Waste Characterization Quality Assurance Project Plan
CCP-PO-001	Rev. 14	03/26/2007 CCP Transuranic Waste Characterization Quality Assurance Project Plan
CCP-PO-001	Rev. 13	11/16/2006 CCP Transuranic Waste Characterization Quality Assurance Project Plan
CCP-PO-001	Rev. 12	03/22/2006 CCP Transuranic Waste Characterization Quality Assurance Project Plan
CCP-PO-001	Rev. 11	03/10/2005 CCP Transuranic Waste Characterization Quality Assurance Project Plan

CCP-PO-002	Rev. 27	05/31/2013 CCP Transuranic Waste Certification Plan
CCP-PO-002	Rev. 26	07/14/2011 CCP Transuranic Waste Certification Plan
CCP-PO-002	Rev. 25	12/28/2010 CCP Transuranic Waste Certification Plan
CCP-PO-002	Rev. 24	08/30/2010 CCP Transuranic Waste Certification Plan
CCP-PO-002	Rev. 23	04/07/2010 CCP Transuranic Waste Certification Plan
CCP-PO-002	Rev. 22	01/12/2010 CCP Transuranic Waste Certification Plan
CCP-PO-002	Rev. 21	01/26/2009 CCP Transuranic Waste Certification Plan
CCP-PO-002	Rev. 20	11/02/2007 CCP Transuranic Waste Certification Plan
CCP-PO-002	Rev. 19	05/22/2007 CCP Transuranic Waste Certification Plan
CCP-PO-002	Rev. 18	11/16/2006 CCP Transuranic Waste Certification Plan
CCP-PO-002	Rev. 17	11/16/2006 CCP Transuranic Waste Certification Plan
CCP-PO-002	Rev. 16	11/16/2006 CCP Transuranic Waste Certification Plan
CCP-PO-002	Rev. 15	03/22/2006 CCP Transuranic Waste Certification Plan
CCP-PO-002	Rev. 14	12/29/2005 CCP Transuranic Waste Certification Plan
CCP-PO-002	Rev. 13	05/09/2005 CCP Transuranic Waste Certification Plan

CCP-PO-003	Rev. 13	07/31/2013 Transuranic Authorized Methods for Payload Control (CCP CH-TRAMPC)
CCP-PO-003	Rev. 12	12/28/2010 Transuranic Authorized Methods for Payload Control (CCP CH-TRAMPC)
CCP-PO-003	Rev. 11	08/04/2009 Transuranic Authorized Methods for Payload Control (CCP CH-TRAMPC)
CCP-PO-003	Rev. 10	11/16/2006 Transuranic Authorized Methods for Payload Control (CCP CH-TRAMPC)
CCP-PO-003	Rev. 9	12/29/2005 Transuranic Authorized Methods for Payload Control (CCP CH-TRAMPC)
CCP-PO-003	Rev. 8	01/25/2005 Transuranic Authorized Methods for Payload Control (CCP CH-TRAMPC)
CCP-PO-003	Rev. 7	11/22/2004 Transuranic Authorized Methods for Payload Control (CCP CH-TRAMPC)
CCP-PO-003	Rev. 6	08/08/2004 Transuranic Authorized Methods for Payload Control (CCP CH-TRAMPC)
CCP-PO-003	Rev. 5	09/18/2003 Transuranic Authorized Methods for Payload Control (CCP CH-TRAMPC)
CCP-PO-003	Rev. 4	02/11/2003 Transuranic Authorized Methods for Payload Control (CCP CH-TRAMPC)
CCP-PO-003	Rev. 3	05/31/2002 Transuranic Authorized Methods for Payload Control (CCP CH-TRAMPC)

CCP Correlation of Container Identification Numbers to Batch Data Report Numbers

Waste Stream: # OR-ISTP-CH-HET Lot # 12

Container ID Number	Historical Container ID	NDA BDR	RTR BDR	VE BDR	Load/Manage Overpack Yes	Transportation Headspace Gas	
						FGA	GGT
X10C0501624B	N/A	OR-MILCC2-0139	OR-RTR7-0043	N/A	No	OR15FG8009	N/A
X10C0501624J	N/A	OR-MILCC2-0043	OR-RTR7-0055	N/A	No	OR14FG8081	N/A
X10C0600035D1	N/A	OR-MILCC2-0116	N/A	ORVECH0118	No	OR14FG8166	N/A
X10C0802038C	N/A	OR-IQ3-0445	OR-RTR7-0126	N/A	No	OR15FG8013	N/A
X10C0802038G	N/A	OR-MILCC2-0153	OR-RTR6-0620	N/A	No	OR15FG8014	N/A
X10C0802038H	N/A	OR-MILCC2-0159	OR-RTR6-0619	N/A	No	OR15FG8036	N/A
X10C0802038J	N/A	OR-MILCC2-0154	OR-RTR6-0620	N/A	No	OR15FG8014	N/A
X10C1100352	N/A	OR-IQ3-0445	OR-RTR7-0126	N/A	No	OR15FG8013	N/A
X10C1100365	N/A	OR-IQ3-0445	OR-RTR7-0126	N/A	No	OR15FG8013	N/A
X10C1100387	N/A	OR-IQ3-0445	OR-RTR7-0126	N/A	No	OR15FG8013	N/A
X10C9307318A	N/A	OR-MILCC2-0161	OR-RTR7-0023	N/A	No	OR14FG8032	N/A
X10C9310152A	N/A	OR-IQ3-0432	N/A	ORVECH0124	No	OR15FG8001	N/A
X10C9311031A1	N/A	OR-MILCC2-0107	N/A	ORVECH0103	No	OR14FG8149	N/A
X10C9311066A	N/A	OR-MILCC2-0150	OR-RTR7-0023	N/A	No	OR14FG8032	N/A
X10C9311133A	N/A	OR-MILCC2-0160	OR-RTR7-0024	N/A	No	OR14FG8033	N/A
X10C9311429C	N/A	OR-MILCC2-0154	OR-RTR6-0537	N/A	No	OR14FG8078	N/A
X10C9311434A	N/A	OR-MILCC2-0153	OR-RTR6-0612	N/A	No	OR15FG8026	N/A
X10C9311698A	N/A	OR-MILCC2-0147	OR-RTR7-0023	N/A	No	OR14FG8032	N/A
X10C9312093A	N/A	OR-MILCC2-0104	OR-RTR7-0058	N/A	No	OR14FG8147	N/A
X10C9312098A	N/A	OR-MILCC2-0100	OR-RTR7-0115	N/A	No	OR14FG8143	N/A
X10C9312199A	N/A	OR-MILCC2-0147	OR-RTR7-0036	N/A	No	OR15FG8021	N/A
X10C9312222A	N/A	OR-MILCC2-0160	OR-RTR7-0016	N/A	No	OR14FG8033	N/A
X10C9312227A1	N/A	OR-MILCC2-0083	N/A	ORVECH0059	No	OR14FG8124	N/A
X10C9312231A	N/A	OR-MILCC2-0076	OR-RTR7-0049	N/A	No	OR14FG4062	N/A
X10C9312235A	N/A	OR-MILCC2-0160	OR-RTR7-0016	N/A	No	OR14FG8033	N/A
X10C9312402D	N/A	OR-MILCC2-0036	OR-RTR7-0055	N/A	No	OR14FG8073	N/A
X10C9312458A	N/A	OR-IQ3-0422	OR-RTR7-0125	N/A	No	OR15FG8034	N/A
~~X10C9312460A~~	~~N/A~~	~~OR-MILCC2-0148~~	~~OR-RTR7-0036~~	~~N/A~~	~~No~~	~~OR15FG8023~~	~~N/A~~
~~X10C9312486D~~	~~N/A~~	~~OR-MILCC2-0149~~	~~OR-RTR7-0036~~	~~N/A~~	~~No~~	~~OR15FG8023~~	~~N/A~~
X10C9312527B	N/A	OR-MILCC2-0076	OR-RTR7-0049	N/A	No	OR14FG8115	N/A
X10C9312551C	N/A	OR-MILCC2-0120	OR-RTR7-0125	N/A	No	OR14FG8163	N/A
X10C9312555A	N/A	OR-MILCC2-0155	OR-RTR7-0058	N/A	No	OR15FG8029	N/A

(1) RW 6/15/15

>200 mR/hr RW 6/9/15

CCP Correlation of Container Identification Numbers to Batch Data Report Numbers

Waste Stream: # OR-ISTP-CH-HET Lot # 12

Container ID Number	Historical Container ID	NDA BDR	RTR BDR	VE BDR	Load/Manage Overpack Yes	Transportation Headspace Gas	
						FGA	GGT
X10C9312754A	N/A	OR-MILCC2-0153	OR-RTR6-0464	N/A	No	OR14FG8020	N/A
X10C9312766C	N/A	OR-IQ3-0260	OR-RTR6-0468	N/A	No	OR15FG8039	N/A
X10C9312768A	N/A	OR-MILCC2-0077	OR-RTR7-0049	N/A	No	OR14FG4063	N/A
X10C9312832B1	N/A	OR-MILCC2-0149	OR-RTR6-0503	N/A	No	OR15FG8023	N/A
X10C9312958A	N/A	OR-MILCC2-0155	OR-RTR6-0541	N/A	No	OR14FG4053	N/A
X10C9312990B	N/A	OR-MILCC2-0148	OR-RTR7-0036	N/A	No	OR15FG8023	N/A
X10C9313591A	N/A	OR-MILCC2-0145	OR-RTR6-0624	N/A	No	OR15FG11002	N/A
X10C9313591F	N/A	OR-MILCC2-0145	OR-RTR6-0624	N/A	No	OR15FG11002	N/A
X10C9400131A	N/A	OR-MILCC2-0056	OR-RTR7-0071	N/A	No	OR14FG8097	N/A
X10C9400154A	N/A	OR-MILCC2-0161	OR-RTR7-0023	N/A	No	OR14FG8032	N/A
X10C9400232A	N/A	OR-MILCC2-0078	OR-RTR7-0049	N/A	No	OR14FG4082	N/A
X10C9400277B	N/A	OR-MILCC2-0156	OR-RTR7-0062	N/A	No	OR15FG8028	N/A
X10C9400277E	N/A	OR-MILCC2-0154	OR-RTR7-0060	N/A	No	OR15FG8029	N/A
X10CSATN01942E	N/A	OR-MILCC2-0075	OR-RTR7-0086	N/A	No	OR14FG8113	N/A
X10CSATN02350A	N/A	OR-MILCC2-0151	OR-RTR6-0600	N/A	No	OR15FG8025	N/A
X10CSATN02350B	N/A	OR-MILCC2-0088	OR-RTR7-0104	N/A	No	OR14FG8128	N/A
X10CSATN02384B	N/A	OR-MILCC2-0074	OR-RTR7-0086	N/A	No	OR14FG8113	N/A
X10CSATN03195A1	N/A	OR-IQ3-0405	N/A	ORVECH0104	No	OR14FG8156	N/A

R A Whiteley — Rick Whiteley — 04/14/2015

Signature of Site Project Manager | Printed Name | Date

Roger Whitaker — ROGER WHITEAKER — 6/9/2015

Roger Whitaker — ROGER WHITEAKER — 6/15/2015

(1) CH CONTAINER >200 M/REM RW 6/15/15

CCP RTR/VE Summary of Prohibited Items and AK Confirmation

Waste Stream Number: OR-ISTP-CH-HET Lot #: 12

Container Number	RTR Prohibited Items [a,b]	Visual Examination Prohibited Items [a,b]	Does the Physical Form of the Waste Match the Waste Stream Description as Determined by AK
See correlation of container ID numbers for list of remaining drum numbers in this Lot.	None of the containers in this lot had prohibited items identified during RTR.	None of the containers in this Lot had prohibited items identified during Visual Examination technique.	The physical form of the waste matches the waste stream description as determined by AK.
a. See Batch Data Reports			
b. If AK has assigned U134 to this waste stream, then any liquids in these containers are prohibited items (not acceptable by the TSDF).			
Justification for the selection of RTR and/or VE: RTR was selected as the characterization method for this lot because the waste was previously packaged and RTR meets all the Data Quality Objectives for NDE for the waste, VE was selected as the characterization method because VE meets the Data Quality Objectives'			

R Whiteley
Site Project Manager Signature

Rick Whiteley
Printed Name

04/14/2015
Date

CCP Reconciliation with Data Quality Objectives

WSPF# OR-ISTP-CH-HET Rev. 0 Lot # 12

Sampling Completeness

RTR/VE:

Number of Valid Samples: 50 Number of Total Samples Analyzed: 50

Percent Complete: 100 (QAO is 100%)

Radiological:

Number of Valid Samples: 50 Number of Total Samples Analyzed: 50

Percent Complete: 100 (QAO is 100%)

	Y/N/NA	Reconciliation Parameter
1	Y	Waste Matrix Code.
2	Y	Waste Material Parameter Weights.
3	Y	The TRU activity reported in the BDRs for each container demonstrates with a 95% probability that the container of waste contains TRU radioactive waste.
4	N	AK Sufficiency. Is there an approved AK sufficiency Determination for this waste stream?
5	Y	The data demonstrates whether the waste stream exhibits a toxicity characteristic under Title 40 Code of Federal Regulations (CFR), Part 261, Identification and Listing of Hazardous Waste, Subpart C, Characteristics of Hazardous Waste.
6	Y	Does the waste stream contain listed waste found in 20.4.1.200 NMAC incorporating 40 CFR Part 261, Subpart D, Lists of Hazardous Wastes.
7	Y	Waste stream can be classified as hazardous or nonhazardous.
8	Y	The overall completeness, comparability, and representativeness QAOs were met for each of the analytical and testing procedures as specified in the WAP Sections C3-1 through C3-2 prior to submittal of a waste stream profile form for a waste steam or waste stream lot.

	Completeness	Comparability	Representativeness
Radiography	Y	Y	Y
VE	Y	Y	Y

Comments: None

Rick Whiteley 04/14/2015

Signature of Site Project Manager | Printed Name | Date

CHARACTERIZATION INFORMATION SUMMARY

WSPF# OR-ISTP-CH-HET Rev. 0 (CCP-AK-ORNL-008)

Lot 13

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CCP Characterization Information Summary Cover Page

Waste Stream # OR-ISTP-CH-HET Lot #: 13

AK Expert Review: N/A Date: N/A

SPM Review: Rick Whiteley Date: 06/22/2015

SPM signature certifies that through Acceptable Knowledge testing and/or analysis that the waste identified in this summary is not corrosive, ignitable, reactive, or incompatible with the TSDF.

A summary of the Acceptable Knowledge regarding this waste stream containing specific information about the corrosivity, reactivity, and ignitability of the waste stream is included as an attachment to the Waste Stream Profile Form. By reference, that information is included in this lot.

List of procedures used:

Non Destructive Assay (NDA):

CCP-TP-048	Rev. 16	11/01/2013 Mobile IQ3 System Data Reviewing, Validating, and Reporting Procedure
CCP-TP-048	Rev. 15	03/24/2011 Mobile IQ3 System Data Reviewing, Validating, and Reporting Procedure
CCP-TP-048	Rev. 14	03/08/2010 Mobile IQ3 System Data Reviewing, Validating, and Reporting Procedure
CCP-TP-048	Rev. 13	10/12/2009 Mobile IQ3 System Data Reviewing, Validating, and Reporting Procedure
CCP-TP-048	Rev. 12	09/09/2009 Mobile IQ3 System Data Reviewing, Validating, and Reporting Procedure
CCP-TP-048	Rev. 11	02/19/2008 Mobile IQ3 System Data Reviewing, Validating, and Reporting Procedure
CCP-TP-048	Rev. 10	11/16/2008 Mobile IQ3 System Data Reviewing, Validating, and Reporting Procedure
CCP-TP-048	Rev. 9	11/03/2005 Mobile IQ3 System Data Reviewing, Validating, and Reporting Procedure
CCP-TP-048	Rev. 8	09/21/2005 Mobile IQ3 System Data Reviewing, Validating, and Reporting Procedure
CCP-TP-048	Rev. 7	03/14/2005 Mobile IQ3 System Data Reviewing, Validating, and Reporting Procedure
CCP-TP-048	Rev. 6	10/18/2004 Mobile IQ3 System Data Reviewing, Validating, and Reporting Procedure
CCP-TP-048	Rev. 5	06/08/2004 Mobile IQ3 System Data Reviewing, Validating, and Reporting Procedure
CCP-TP-048	Rev. 4	12/04/2003 Mobile IQ3 System Data Reviewing, Validating, and Reporting Procedure
CCP-TP-048	Rev. 3	09/03/2003 Mobile IQ3 System Data Reviewing, Validating, and Reporting Procedure
CCP-TP-048	Rev. 2	04/25/2003 Mobile IQ3 System Data Reviewing, Validating, and Reporting Procedure
CCP-TP-048	Rev. 1	03/21/2003 Mobile IQ3 System Data Reviewing, Validating, and Reporting Procedure
CCP-TP-048	Rev. 0	02/05/2003 Mobile IQ3 System Data Reviewing, Validating, and Reporting Procedure

Project Level Data Validation / DQO Reconciliation:

CCP-TP-001	Rev. 21	08/06/2013 CCP Project Level Data Validation and Verification
CCP-TP-001	Rev. 20	09/27/2012 CCP Project Level Data Validation and Verification
CCP-TP-001	Rev. 19	12/28/2010 CCP Project Level Data Validation and Verification
CCP-TP-001	Rev. 18	08/09/2010 CCP Project Level Data Validation and Verification
CCP-TP-001	Rev. 17	09/24/2007 CCP Project Level Data Validation and Verification
CCP-TP-001	Rev. 16	04/26/2007 CCP Project Level Data Validation and Verification
CCP-TP-001	Rev. 15	11/22/2006 CCP Project Level Data Validation and Verification
CCP-TP-001	Rev. 14	11/16/2006 CCP Project Level Data Validation and Verification
CCP-TP-001	Rev. 13	07/21/2006 CCP Project Level Data Validation and Verification
CCP-TP-001	Rev. 12	05/25/2006 CCP Project Level Data Validation and Verification
CCP-TP-001	Rev. 11	03/23/2005 CCP Project Level Data Validation and Verification

CCP-TP-002	Rev. 26	06/19/2013 CCP Reconciliation of DQOs and Reporting Characterization Data
CCP-TP-002	Rev. 25	02/11/2013 CCP Reconciliation of DQOs and Reporting Characterization Data
CCP-TP-002	Rev. 24	12/28/2011 CCP Reconciliation of DQOs and Reporting Characterization Data
CCP-TP-002	Rev. 23	12/29/2010 CCP Reconciliation of DQOs and Reporting Characterization Data
CCP-TP-002	Rev. 22	06/30/2010 CCP Reconciliation of DQOs and Reporting Characterization Data
CCP-TP-002	Rev. 21	08/04/2009 CCP Reconciliation of DQOs and Reporting Characterization Data
CCP-TP-002	Rev. 20	08/18/2008 CCP Reconciliation of DQOs and Reporting Characterization Data
CCP-TP-002	Rev. 19	12/22/2006 CCP Reconciliation of DQOs and Reporting Characterization Data
CCP-TP-002	Rev. 18	11/16/2006 CCP Reconciliation of DQOs and Reporting Characterization Data
CCP-TP-002	Rev. 17	10/10/2006 CCP Reconciliation of DQOs and Reporting Characterization Data
CCP-TP-002	Rev. 16	06/06/2006 CCP Reconciliation of DQOs and Reporting Characterization Data
CCP-TP-002	Rev. 15	08/16/2005 CCP Reconciliation of DQOs and Reporting Characterization Data
CCP-TP-002	Rev. 14	03/29/2005 CCP Reconciliation of DQOs and Reporting Characterization Data

CCP-TP-005	Rev. 28	08/12/2013 CCP Acceptable Knowledge Documentation
CCP-TP-005	Rev. 25	06/19/2013 CCP Acceptable Knowledge Documentation
CCP-TP-005	Rev. 24	11/28/2011 CCP Acceptable Knowledge Documentation
CCP-TP-005	Rev. 23	06/30/2011 CCP Acceptable Knowledge Documentation
CCP-TP-005	Rev. 22	04/21/2011 CCP Acceptable Knowledge Documentation
CCP-TP-005	Rev. 21	12/29/2010 CCP Acceptable Knowledge Documentation
CCP-TP-005	Rev. 20	11/01/2010 CCP Acceptable Knowledge Documentation
CCP-TP-005	Rev. 19	07/08/2010 CCP Acceptable Knowledge Documentation
CCP-TP-005	Rev. 18	11/16/2006 CCP Acceptable Knowledge Documentation
CCP-TP-005	Rev. 17	08/05/2006 CCP Acceptable Knowledge Documentation

CCP-TP-005	Rev. 16	02/27/2008 CCP Acceptable Knowledge Documentation
CCP-TP-005	Rev. 15	03/31/2005 CCP Acceptable Knowledge Documentation

CCP-TP-030	Rev. 34	02/02/2015 CCP CH TRU Waste Certification and WWIS/WDS Data Entry
CCP-TP-030	Rev. 33	11/19/2013 CCP CH TRU Waste Certification and WWIS/WDS Data Entry
CCP-TP-030	Rev. 32	06/20/2013 CCP CH TRU Waste Certification and WWIS/WDS Data Entry
CCP-TP-030	Rev. 31	11/19/2012 CCP CH TRU Waste Certification and WWIS/WDS Data Entry
CCP-TP-030	Rev. 30	05/21/2012 CCP CH TRU Waste Certification and WWIS/WDS Data Entry
CCP-TP-030	Rev. 29	04/28/2011 CCP CH TRU Waste Certification and WWIS/WDS Data Entry
CCP-TP-030	Rev. 28	05/12/2010 CCP CH TRU Waste Certification and WWIS/WDS Data Entry
CCP-TP-030	Rev. 27	12/14/2009 CCP CH TRU Waste Certification and WWIS Data Entry
CCP-TP-030	Rev. 26	05/27/2009 CCP CH TRU Waste Certification and WWIS Data Entry
CCP-TP-030	Rev. 25	01/22/2009 CCP CH TRU Waste Certification and WWIS Data Entry
CCP-TP-030	Rev. 24	08/20/2008 CCP CH TRU Waste Certification and WWIS Data Entry
CCP-TP-030	Rev. 23	03/12/2008 CCP CH TRU Waste Certification and WWIS Data Entry
CCP-TP-030	Rev. 22	07/24/2007 CCP CH TRU Waste Certification and WWIS Data Entry
CCP-TP-030	Rev. 21	05/21/2007 CCP CH TRU Waste Certification and WWIS Data Entry
CCP-TP-030	Rev. 20	02/07/2007 CCP CH TRU Waste Certification and WWIS Data Entry
CCP-TP-030	Rev. 19	11/16/2006 CCP CH TRU Waste Certification and WWIS Data Entry
CCP-TP-030	Rev. 18	05/01/2006 CCP TRU Waste Certification and WWIS Data Entry
CCP-TP-030	Rev. 17	12/29/2005 CCP TRU Waste Certification and WWIS Data Entry
CCP-TP-030	Rev. 16	04/22/2005 CCP TRU Waste Certification and WWIS Data Entry

Radiography (RTR/NDE):

CCP-TP-053	Rev. 15	09/11/2014 CCP Standard Real-Time Radiography (RTR) Inspection Procedure
CCP-TP-053	Rev. 14	09/25/2013 CCP Standard Real-Time Radiography (RTR) Inspection Procedure
CCP-TP-053	Rev. 13	05/14/2013 CCP Standard Real-Time Radiography (RTR) Inspection Procedure
CCP-TP-053	Rev. 12	08/22/2012 CCP Standard Real-Time Radiography (RTR) Inspection Procedure
CCP-TP-053	Rev. 11	07/20/2011 CCP Standard Real-Time Radiography (RTR) Inspection Procedure
CCP-TP-053	Rev. 10	03/04/2011 CCP Standard Real-Time Radiography (RTR) Inspection Procedure
CCP-TP-053	Rev. 9	09/30/2010 CCP Standard Real-Time Radiography (RTR) Inspection Procedure
CCP-TP-053	Rev. 8	06/30/2010 CCP Standard Real-Time Radiography (RTR) Inspection Procedure
CCP-TP-053	Rev. 7	10/21/2009 CCP Standard Real-Time Radiography (RTR) Inspection Procedure
CCP-TP-053	Rev. 6	03/04/2008 CCP Standard Real-Time Radiography (RTR) Inspection Procedure
CCP-TP-053	Rev. 5	11/16/2006 CCP Standard Real-Time Radiography (RTR) Inspection Procedure
CCP-TP-053	Rev. 4	12/22/2005 CCP Standard Real-Time Radiography (RTR) Inspection Procedure
CCP-TP-053	Rev. 3	03/21/2005 CCP Standard Real-Time Radiography (RTR) Inspection Procedure
CCP-TP-053	Rev. 2	07/14/2004 CCP Standard Real-Time Radiography (RTR) Inspection Procedure

Visual Examination (VE):

CCP-TP-113	Rev. 18	08/25/2013 CCP Standard Contact-Handled Waste Visual Examination
CCP-TP-113	Rev. 17	06/04/2013 CCP Standard Contact-Handled Waste Visual Examination
CCP-TP-113	Rev. 16	04/25/2011 CCP Standard Contact-Handled Waste Visual Examination
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CCP-TP-113	Rev. 6	11/16/2006 CCP Standard Waste Visual Examination
CCP-TP-113	Rev. 5	08/28/2006 CCP Standard Waste Visual Examination
CCP-TP-113	Rev. 4	12/22/2005 CCP Standard Waste Visual Examination

WAP Certification:

CCP-PO-001	Rev. 21	05/31/2013 CCP Transuranic Waste Characterization Quality Assurance Project Plan
CCP-PO-001	Rev. 20	06/16/2011 CCP Transuranic Waste Characterization Quality Assurance Project Plan
CCP-PO-001	Rev. 19	12/29/2010 CCP Transuranic Waste Characterization Quality Assurance Project Plan
CCP-PO-001	Rev. 18	06/30/2010 CCP Transuranic Waste Characterization Quality Assurance Project Plan
CCP-PO-001	Rev. 17	06/23/2009 CCP Transuranic Waste Characterization Quality Assurance Project Plan
CCP-PO-001	Rev. 16	10/31/2007 CCP Transuranic Waste Characterization Quality Assurance Project Plan
CCP-PO-001	Rev. 15	08/10/2007 CCP Transuranic Waste Characterization Quality Assurance Project Plan
CCP-PO-001	Rev. 14	03/26/2007 CCP Transuranic Waste Characterization Quality Assurance Project Plan
CCP-PO-001	Rev. 13	11/16/2006 CCP Transuranic Waste Characterization Quality Assurance Project Plan
CCP-PO-001	Rev. 12	03/22/2006 CCP Transuranic Waste Characterization Quality Assurance Project Plan
CCP-PO-001	Rev. 11	03/10/2005 CCP Transuranic Waste Characterization Quality Assurance Project Plan

CCP-PO-002	Rev. 27	05/31/2013 CCP Transuranic Waste Certification Plan
CCP-PO-002	Rev. 26	07/14/2011 CCP Transuranic Waste Certification Plan
CCP-PO-002	Rev. 25	12/29/2010 CCP Transuranic Waste Certification Plan
CCP-PO-002	Rev. 24	08/30/2010 CCP Transuranic Waste Certification Plan
CCP-PO-002	Rev. 23	04/07/2010 CCP Transuranic Waste Certification Plan
CCP-PO-002	Rev. 22	01/12/2010 CCP Transuranic Waste Certification Plan
CCP-PO-002	Rev. 21	01/26/2009 CCP Transuranic Waste Certification Plan
CCP-PO-002	Rev. 20	11/02/2007 CCP Transuranic Waste Certification Plan
CCP-PO-002	Rev. 19	05/22/2007 CCP Transuranic Waste Certification Plan
CCP-PO-002	Rev. 18	11/18/2006 CCP Transuranic Waste Certification Plan
CCP-PO-002	Rev. 17	11/16/2006 CCP Transuranic Waste Certification Plan
CCP-PO-002	Rev. 16	11/16/2006 CCP Transuranic Waste Certification Plan
CCP-PO-002	Rev. 15	03/22/2006 CCP Transuranic Waste Certification Plan
CCP-PO-002	Rev. 14	12/29/2005 CCP Transuranic Waste Certification Plan
CCP-PO-002	Rev. 13	05/09/2005 CCP Transuranic Waste Certification Plan

CCP-PO-003	Rev. 13	07/31/2013 Transuranic Authorized Methods for Payload Control (CCP CH-TRAMPC)
CCP-PO-003	Rev. 12	12/28/2010 Transuranic Authorized Methods for Payload Control (CCP CH-TRAMPC)
CCP-PO-003	Rev. 11	08/04/2009 Transuranic Authorized Methods for Payload Control (CCP CH-TRAMPC)
CCP-PO-003	Rev. 10	11/16/2006 Transuranic Authorized Methods for Payload Control (CCP CH-TRAMPC)
CCP-PO-003	Rev. 9	12/29/2005 Transuranic Authorized Methods for Payload Control (CCP CH-TRAMPC)
CCP-PO-003	Rev. 8	01/25/2005 Transuranic Authorized Methods for Payload Control (CCP CH-TRAMPC)
CCP-PO-003	Rev. 7	11/22/2004 Transuranic Authorized Methods for Payload Control (CCP CH-TRAMPC)
CCP-PO-003	Rev. 6	08/08/2004 Transuranic Authorized Methods for Payload Control (CCP CH-TRAMPC)
CCP-PO-003	Rev. 5	09/19/2003 Transuranic Authorized Methods for Payload Control (CCP CH-TRAMPC)
CCP-PO-003	Rev. 4	02/11/2003 Transuranic Authorized Methods for Payload Control (CCP CH-TRAMPC)
CCP-PO-003	Rev. 3	05/31/2002 Transuranic Authorized Methods for Payload Control (CCP CH-TRAMPC)

CCP Correlation of Container Identification Numbers to Batch Data Report Numbers

Waste Stream: # OR-ISTP-CH-HET Lot # 13

Container ID Number	Historical Container ID	NDA BDR	RTR BDR	VE BDR	Load/Manage Overpack Yes	Transportation Headspace Gas	
						FGA	GGT
X10C0505885A	N/A	OR-MILCC2-0164	OR-RTR6-0589	N/A	No	OR15FG8037	N/A
X10C1100355A	N/A	OR-MILCC2-0177	N/A	ORVECH0131	No	OR15FG8054	N/A
X10C1351376A	N/A	OR-IQ3-0476	OR-RTR7-0130	N/A	No	OR15FG8046	N/A
X10C9310151A	N/A	OR-MILCC2-0161	OR-RTR6-0548	N/A	No	OR14FG8089	N/A
X10C9311216A	N/A	OR-MILCC2-0167	OR-RTR7-0023	N/A	No	OR14FG8032	N/A
X10C9311326A	N/A	OR-MILCC2-0160	OR-RTR6-0476	N/A	No	OR14FG8033	N/A
X10C9311810A2	N/A	OR-IQ3-0501	N/A	ORVECH0133	No	OR15FG8057	N/A
X10C9312064A	N/A	OR-MILCC2-0160	N/A	ORVECH0125	No	OR15FG8033	N/A
X10C9312084A1	N/A	OR-IQ3-0476	OR-RTR7-0130	N/A	No	OR15FG8046	N/A
X10C9312366A1	N/A	OR-MILCC2-0164	OR-RTR6-0587	N/A	No	OR15FG8037	N/A
X10C9312615A1	N/A	OR-MILCC2-0170	OR-RTR6-0571	N/A	No	OR14FG8112	N/A
X10C9312745A	N/A	OR-MILCC2-0169	OR-RTR7-0017	N/A	No	OR15FG8042	N/A
X10C9312824A	N/A	OR-MILCC2-0161	OR-RTR6-0483	N/A	No	OR14FG4015	N/A
X10C9313101A	N/A	OR-MILCC2-0169	OR-RTR7-0017	N/A	No	OR15FG8042	N/A
X10C9400097C1	N/A	OR-MILCC2-0168	OR-RTR7-0130	N/A	No	OR15FG8042	N/A
X10C9400242A	N/A	OR-MILCC2-0163	OR-RTR6-0588	N/A	No	OR15FG8036	N/A

Rick Whiteley — Signature of Site Project Manager
Rick Whiteley — Printed Name
06/22/2015 — Date

CCP RTR/VE Summary of Prohibited Items and AK Confirmation

Waste Stream Number: OR-ISTP-CH-HET Lot #: 13

Container Number	RTR Prohibited Items [a,b]	Visual Examination Prohibited Items [a,b]	Does the Physical Form of the Waste Match the Waste Stream Description as Determined by AK
See correlation of container ID numbers for list of remaining drum numbers in this Lot.	None of the containers in this lot had prohibited items identified during RTR.	None of the containers in this Lot had prohibited items identified during Visual Examination technique.	The physical form of the waste matches the waste stream description as determined by AK.
a. See Batch Data Reports			
b. If AK has assigned U134 to this waste stream, then any liquids in these containers are prohibited items (not acceptable by the TSDF).			
Justification for the selection of RTR and/or VE: RTR was selected as the characterization method for this lot because the waste was previously packaged and RTR meets all the Data Quality Objectives for NDE for the waste, VE was selected as the characterization method because VE meets the Data Quality Objectives'			

R Whiteley — Site Project Manager Signature
Rick Whiteley — Printed Name
06/22/2015 — Date

CCP Reconciliation with Data Quality Objectives

WSPF# OR-ISTP-CH-HET Rev. 0 Lot # 13

Sampling Completeness

RTR/VE:

Number of Valid Samples: 16 Number of Total Samples Analyzed: 16

Percent Complete: 100 (QAO is 100%)

Radiological:

Number of Valid Samples: 16 Number of Total Samples Analyzed: 16

Percent Complete: 100 (QAO is 100%)

	Y/N/NA	Reconciliation Parameter
1	Y	Waste Matrix Code.
2	Y	Waste Material Parameter Weights.
3	Y	The TRU activity reported in the BDRs for each container demonstrates with a 95% probability that the container of waste contains TRU radioactive waste.
4	N	AK Sufficiency. Is there an approved AK sufficiency Determination for this waste stream?
5	Y	The data demonstrates whether the waste stream exhibits a toxicity characteristic under Title 40 Code of Federal Regulations (CFR), Part 261, Identification and Listing of Hazardous Waste, Subpart C, Characteristics of Hazardous Waste.
6	Y	Does the waste stream contain listed waste found in 20.4.1.200 NMAC incorporating 40 CFR Part 261, Subpart D, Lists of Hazardous Wastes.
7	Y	Waste stream can be classified as hazardous or nonhazardous.
8	Y	The overall completeness, comparability, and representativeness QAOs were met for each of the analytical and testing procedures as specified in the WAP Sections C3-1 through C3-2 prior to submittal of a waste stream profile form for a waste steam or waste stream lot.

	Completeness	Comparability	Representativeness
Radiography	Y	Y	Y
VE	Y	Y	Y

Comments: None

Rick Whiteley 06/22/2015

Signature of Site Project Manager Printed Name Date

CHARACTERIZATION INFORMATION SUMMARY

WSPF# OR-ISTP-CH-HET Rev. 0 (CCP-AK-ORNL-008)

Lot 14

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CCP Characterization Information Summary Cover Page

Waste Stream #: OR-ISTP-CH-HET Lot #: 14

AK Expert Review: N/A Date: N/A

SPM Review: Rick Whiteley Date: 07/30/2015

SPM signature certifies that through Acceptable Knowledge testing and/or analysis that the waste identified in this summary is not corrosive, ignitable, reactive, or incompatible with the TSDF.

A summary of the Acceptable Knowledge regarding this waste stream containing specific information about the corrosivity, reactivity, and ignitability of the waste stream is included as an attachment to the Waste Stream Profile Form. By reference, that information is included in this lot.

List of procedures used:

Non Destructive Assay (NDA):

CCP-TP-048	Rev. 16	11/01/2013 Mobile IQ3 System Data Reviewing, Validating, and Reporting Procedure
CCP-TP-048	Rev. 15	03/24/2011 Mobile IQ3 System Data Reviewing, Validating, and Reporting Procedure
CCP-TP-048	Rev. 14	03/08/2010 Mobile IQ3 System Data Reviewing, Validating, and Reporting Procedure
CCP-TP-048	Rev. 13	10/12/2009 Mobile IQ3 System Data Reviewing, Validating, and Reporting Procedure
CCP-TP-048	Rev. 12	09/08/2009 Mobile IQ3 System Data Reviewing, Validating, and Reporting Procedure
CCP-TP-048	Rev. 11	02/18/2008 Mobile IQ3 System Data Reviewing, Validating, and Reporting Procedure
CCP-TP-048	Rev. 10	11/18/2006 Mobile IQ3 System Data Reviewing, Validating, and Reporting Procedure
CCP-TP-048	Rev. 9	11/03/2005 Mobile IQ3 System Data Reviewing, Validating, and Reporting Procedure
CCP-TP-048	Rev. 8	09/21/2005 Mobile IQ3 System Data Reviewing, Validating, and Reporting Procedure
CCP-TP-048	Rev. 7	03/14/2005 Mobile IQ3 System Data Reviewing, Validating, and Reporting Procedure
CCP-TP-048	Rev. 6	10/18/2004 Mobile IQ3 System Data Reviewing, Validating, and Reporting Procedure
CCP-TP-048	Rev. 5	06/08/2004 Mobile IQ3 System Data Reviewing, Validating, and Reporting Procedure
CCP-TP-048	Rev. 4	12/04/2003 Mobile IQ3 System Data Reviewing, Validating, and Reporting Procedure
CCP-TP-048	Rev. 3	09/03/2003 Mobile IQ3 System Data Reviewing, Validating, and Reporting Procedure
CCP-TP-048	Rev. 2	04/25/2003 Mobile IQ3 System Data Reviewing, Validating, and Reporting Procedure
CCP-TP-048	Rev. 1	03/21/2003 Mobile IQ3 System Data Reviewing, Validating, and Reporting Procedure
CCP-TP-048	Rev. 0	02/05/2003 Mobile IQ3 System Data Reviewing, Validating, and Reporting Procedure

Project Level Data Validation / DQO Reconciliation:

CCP-TP-001	Rev. 21	06/06/2013 CCP Project Level Data Validation and Verification
CCP-TP-001	Rev. 20	09/27/2012 CCP Project Level Data Validation and Verification
CCP-TP-001	Rev. 19	12/28/2010 CCP Project Level Data Validation and Verification
CCP-TP-001	Rev. 18	08/09/2010 CCP Project Level Data Validation and Verification
CCP-TP-001	Rev. 17	09/24/2007 CCP Project Level Data Validation and Verification
CCP-TP-001	Rev. 16	04/26/2007 CCP Project Level Data Validation and Verification
CCP-TP-001	Rev. 15	11/22/2006 CCP Project Level Data Validation and Verification
CCP-TP-001	Rev. 14	11/16/2006 CCP Project Level Data Validation and Verification
CCP-TP-001	Rev. 13	07/21/2006 CCP Project Level Data Validation and Verification
CCP-TP-001	Rev. 12	05/25/2006 CCP Project Level Data Validation and Verification
CCP-TP-001	Rev. 11	03/23/2005 CCP Project Level Data Validation and Verification

CCP-TP-002	Rev. 26	06/18/2013 CCP Reconciliation of DQOs and Reporting Characterization Data
CCP-TP-002	Rev. 25	02/11/2013 CCP Reconciliation of DQOs and Reporting Characterization Data
CCP-TP-002	Rev. 24	12/28/2011 CCP Reconciliation of DQOs and Reporting Characterization Data
CCP-TP-002	Rev. 23	12/29/2010 CCP Reconciliation of DQOs and Reporting Characterization Data
CCP-TP-002	Rev. 22	08/30/2010 CCP Reconciliation of DQOs and Reporting Characterization Data
CCP-TP-002	Rev. 21	08/04/2009 CCP Reconciliation of DQOs and Reporting Characterization Data
CCP-TP-002	Rev. 20	08/18/2008 CCP Reconciliation of DQOs and Reporting Characterization Data
CCP-TP-002	Rev. 19	12/22/2006 CCP Reconciliation of DQOs and Reporting Characterization Data
CCP-TP-002	Rev. 18	11/16/2006 CCP Reconciliation of DQOs and Reporting Characterization Data
CCP-TP-002	Rev. 17	10/10/2006 CCP Reconciliation of DQOs and Reporting Characterization Data
CCP-TP-002	Rev. 16	06/06/2006 CCP Reconciliation of DQOs and Reporting Characterization Data
CCP-TP-002	Rev. 15	08/16/2005 CCP Reconciliation of DQOs and Reporting Characterization Data
CCP-TP-002	Rev. 14	03/28/2005 CCP Reconciliation of DQOs and Reporting Characterization Data

CCP-TP-005	Rev. 26	08/12/2013 CCP Acceptable Knowledge Documentation
CCP-TP-005	Rev. 25	06/18/2013 CCP Acceptable Knowledge Documentation
CCP-TP-005	Rev. 24	11/28/2011 CCP Acceptable Knowledge Documentation
CCP-TP-005	Rev. 23	06/30/2011 CCP Acceptable Knowledge Documentation
CCP-TP-005	Rev. 22	04/21/2011 CCP Acceptable Knowledge Documentation
CCP-TP-005	Rev. 21	12/29/2010 CCP Acceptable Knowledge Documentation
CCP-TP-005	Rev. 20	11/01/2010 CCP Acceptable Knowledge Documentation
CCP-TP-005	Rev. 19	07/08/2010 CCP Acceptable Knowledge Documentation
CCP-TP-005	Rev. 18	11/16/2006 CCP Acceptable Knowledge Documentation
CCP-TP-005	Rev. 17	06/05/2006 CCP Acceptable Knowledge Documentation

CCP-TP-005	Rev. 16	02/27/2008	CCP Acceptable Knowledge Documentation
CCP-TP-005	Rev. 15	03/31/2005	CCP Acceptable Knowledge Documentation
CCP-TP-030	Rev. 34	02/02/2015	CCP CH TRU Waste Certification and WWIS/WDS Data Entry
CCP-TP-030	Rev. 33	11/18/2013	CCP CH TRU Waste Certification and WWIS/WDS Data Entry
CCP-TP-030	Rev. 32	08/20/2013	CCP CH TRU Waste Certification and WWIS/WDS Data Entry
CCP-TP-030	Rev. 31	11/19/2012	CCP CH TRU Waste Certification and WWIS/WDS Data Entry
CCP-TP-030	Rev. 30	05/21/2012	CCP CH TRU Waste Certification and WWIS/WDS Data Entry
CCP-TP-030	Rev. 29	04/26/2011	CCP CH TRU Waste Certification and WWIS/WDS Data Entry
CCP-TP-030	Rev. 28	05/12/2010	CCP CH TRU Waste Certification and WWIS/WDS Data Entry
CCP-TP-030	Rev. 27	12/14/2009	CCP CH TRU Waste Certification and WWIS Data Entry
CCP-TP-030	Rev. 26	05/27/2009	CCP CH TRU Waste Certification and WWIS Data Entry
CCP-TP-030	Rev. 25	01/22/2009	CCP CH TRU Waste Certification and WWIS Data Entry
CCP-TP-030	Rev. 24	08/20/2008	CCP CH TRU Waste Certification and WWIS Data Entry
CCP-TP-030	Rev. 23	03/12/2008	CCP CH TRU Waste Certification and WWIS Data Entry
CCP-TP-030	Rev. 22	07/24/2007	CCP CH TRU Waste Certification and WWIS Data Entry
CCP-TP-030	Rev. 21	05/21/2007	CCP CH TRU Waste Certification and WWIS Data Entry
CCP-TP-030	Rev. 20	02/07/2007	CCP CH TRU Waste Certification and WWIS Data Entry
CCP-TP-030	Rev. 19	11/16/2006	CCP CH TRU Waste Certification and WWIS Data Entry
CCP-TP-030	Rev. 18	09/01/2006	CCP TRU Waste Certification and WWIS Data Entry
CCP-TP-030	Rev. 17	12/28/2005	CCP TRU Waste Certification and WWIS Data Entry
CCP-TP-030	Rev. 16	04/22/2005	CCP TRU Waste Certification and WWIS Data Entry

Radiography (RTR/NDE):

CCP-TP-053	Rev. 15	09/11/2014	CCP Standard Real-Time Radiography (RTR) Inspection Procedure
CCP-TP-053	Rev. 14	09/25/2013	CCP Standard Real-Time Radiography (RTR) Inspection Procedure
CCP-TP-053	Rev. 13	05/14/2013	CCP Standard Real-Time Radiography (RTR) Inspection Procedure
CCP-TP-053	Rev. 12	08/22/2012	CCP Standard Real-Time Radiography (RTR) Inspection Procedure
CCP-TP-053	Rev. 11	07/20/2011	CCP Standard Real-Time Radiography (RTR) Inspection Procedure
CCP-TP-053	Rev. 10	03/04/2011	CCP Standard Real-Time Radiography (RTR) Inspection Procedure
CCP-TP-053	Rev. 9	09/30/2010	CCP Standard Real-Time Radiography (RTR) Inspection Procedure
CCP-TP-053	Rev. 8	06/30/2010	CCP Standard Real-Time Radiography (RTR) Inspection Procedure
CCP-TP-053	Rev. 7	10/21/2009	CCP Standard Real-Time Radiography (RTR) Inspection Procedure
CCP-TP-053	Rev. 6	03/04/2008	CCP Standard Real-Time Radiography (RTR) Inspection Procedure
CCP-TP-053	Rev. 5	11/16/2006	CCP Standard Real-Time Radiography (RTR) Inspection Procedure
CCP-TP-053	Rev. 4	12/22/2005	CCP Standard Real-Time Radiography (RTR) Inspection Procedure
CCP-TP-053	Rev. 3	03/21/2005	CCP Standard Real-Time Radiography (RTR) Inspection Procedure
CCP-TP-053	Rev. 2	07/14/2004	CCP Standard Real-Time Radiography (RTR) Inspection Procedure

Visual Examination (VE):

CCP-TP-113	Rev. 19	09/23/2015	CCP Standard Contact-Handled Waste Visual Examination
CCP-TP-113	Rev. 18	09/25/2013	CCP Standard Contact-Handled Waste Visual Examination
CCP-TP-113	Rev. 17	06/04/2013	CCP Standard Contact-Handled Waste Visual Examination
CCP-TP-113	Rev. 16	04/25/2011	CCP Standard Contact-Handled Waste Visual Examination
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CCP-TP-113	Rev. 13	03/11/2009	CCP Standard Contact-Handled Waste Visual Examination
CCP-TP-113	Rev. 12	12/01/2008	CCP Standard Contact-Handled Waste Visual Examination
CCP-TP-113	Rev. 11	11/12/2008	CCP Standard Contact-Handled Waste Visual Examination
CCP-TP-113	Rev. 10	07/09/2008	CCP Standard Contact-Handled Waste Visual Examination
CCP-TP-113	Rev. 9	03/05/2008	CCP Standard Waste Visual Examination
CCP-TP-113	Rev. 8	09/04/2007	CCP Standard Waste Visual Examination
CCP-TP-113	Rev. 7	03/19/2007	CCP Standard Waste Visual Examination
CCP-TP-113	Rev. 6	11/16/2006	CCP Standard Waste Visual Examination
CCP-TP-113	Rev. 5	08/28/2006	CCP Standard Waste Visual Examination
CCP-TP-113	Rev. 4	12/22/2005	CCP Standard Waste Visual Examination

WAP Certification:

CCP-PO-001	Rev. 21	05/31/2013	CCP Transuranic Waste Characterization Quality Assurance Project Plan
CCP-PO-001	Rev. 20	06/16/2011	CCP Transuranic Waste Characterization Quality Assurance Project Plan
CCP-PO-001	Rev. 19	12/29/2010	CCP Transuranic Waste Characterization Quality Assurance Project Plan
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CCP-PO-001	Rev. 12	03/22/2006	CCP Transuranic Waste Characterization Quality Assurance Project Plan
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CCP-PO-002	Rev. 22	01/12/2010	CCP Transuranic Waste Certification Plan
CCP-PO-002	Rev. 21	01/26/2009	CCP Transuranic Waste Certification Plan
CCP-PO-002	Rev. 20	11/02/2007	CCP Transuranic Waste Certification Plan
CCP-PO-002	Rev. 19	05/22/2007	CCP Transuranic Waste Certification Plan
CCP-PO-002	Rev. 18	11/16/2006	CCP Transuranic Waste Certification Plan
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CCP-PO-002	Rev. 16	11/16/2006	CCP Transuranic Waste Certification Plan
CCP-PO-002	Rev. 15	03/22/2006	CCP Transuranic Waste Certification Plan
CCP-PO-002	Rev. 14	12/29/2005	CCP Transuranic Waste Certification Plan
CCP-PO-002	Rev. 13	05/09/2005	CCP Transuranic Waste Certification Plan

CCP-PO-003	Rev. 13	07/31/2013	Transuranic Authorized Methods for Payload Control (CCP CH-TRAMPC)
CCP-PO-003	Rev. 12	12/29/2010	Transuranic Authorized Methods for Payload Control (CCP CH-TRAMPC)
CCP-PO-003	Rev. 11	08/04/2009	Transuranic Authorized Methods for Payload Control (CCP CH-TRAMPC)
CCP-PO-003	Rev. 10	11/16/2006	Transuranic Authorized Methods for Payload Control (CCP CH-TRAMPC)
CCP-PO-003	Rev. 9	12/29/2005	Transuranic Authorized Methods for Payload Control (CCP CH-TRAMPC)
CCP-PO-003	Rev. 8	01/25/2005	Transuranic Authorized Methods for Payload Control (CCP CH-TRAMPC)
CCP-PO-003	Rev. 7	11/22/2004	Transuranic Authorized Methods for Payload Control (CCP CH-TRAMPC)
CCP-PO-003	Rev. 6	06/08/2004	Transuranic Authorized Methods for Payload Control (CCP CH-TRAMPC)
CCP-PO-003	Rev. 5	09/18/2003	Transuranic Authorized Methods for Payload Control (CCP CH-TRAMPC)
CCP-PO-003	Rev. 4	02/11/2003	Transuranic Authorized Methods for Payload Control (CCP CH-TRAMPC)
CCP-PO-003	Rev. 3	05/31/2002	Transuranic Authorized Methods for Payload Control (CCP CH-TRAMPC)

CCP Correlation of Container Identification Numbers to Batch Data Report Numbers

Waste Stream: # OR-ISTP-CH-HET Lot # 14

Container ID Number	Historical Container ID	NDA BDR	RTR BDR	VE BDR	Load/Manage Overpack Yes	Transportation Headspace Gas	
						FGA	GGT
X10C0501748A	N/A	OR-IQ3-0429	N/A	ORVECH0113	No	OR15FG8069	N/A
X10C1100386A	N/A	OR-MILCC2-0200	OR-RTR7-0142	N/A	No	OR15FG8071	N/A
X10C9311067A	N/A	OR-IQ3-0502	OR-RTR6-0493	N/A	No	OR14FG8039	N/A
X10C9311078A1	N/A	OR-MILCC2-0192	OR-RTR7-0139	N/A	No	OR15FG11011	N/A
X10C9311078A2	N/A	OR-MILCC2-0192	OR-RTR7-0139	N/A	No	OR15FG11011	N/A
X10C9311223G1	N/A	OR-IQ3-0499	OR-RTR6-0601	N/A	No	OR14FG8166	N/A
X10C9311370A	N/A	OR-MILCC2-0145	OR-RTR6-0452	N/A	No	OR14FG8015	N/A
X10C9311456A1	N/A	OR-MILCC2-0193	OR-RTR7-0140	N/A	No	OR15FG11012	N/A
X10C9311550A1	N/A	OR-MILCC2-0172	N/A	ORVECH0130	No	OR15FG8070	N/A
X10C9311681B	N/A	OR-IQ3-0499	OR-RTR6-0495	N/A	No	OR14FG8040	N/A
X10C9312366B	N/A	OR-MILCC2-0200	OR-RTR7-0142	N/A	No	OR15FG8071	N/A
X10C9312387B	N/A	OR-MILCC2-0196	OR-RTR6-0541	N/A	No	OR15FG8089	N/A
X10C9312647A	N/A	OR-MILCC2-0187	OR-RTR7-0038	N/A	No	OR14FG4042	N/A
X10C9313006B	N/A	OR-MILCC2-0200	OR-RTR7-0142	N/A	No	OR15FG8071	N/A
X10C9400083B1	N/A	OR-MILCC2-0200	OR-RTR7-0142	N/A	No	OR15FG8071	N/A

Rick Whiteley — Signature of Site Project Manager
Rick Whiteley — Printed Name
07/30/2015 — Date

CCP RTR/VE Summary of Prohibited Items and AK Confirmation

Waste Stream Number: OR-ISTP-CH-HET Lot #: 14

Container Number	RTR Prohibited Items [a,b]	Visual Examination Prohibited Items [a,b]	Does the Physical Form of the Waste Match the Waste Stream Description as Determined by AK
See correlation of container ID numbers for list of remaining drum numbers in this Lot.	None of the containers in this lot had prohibited items identified during RTR.	None of the containers in this Lot had prohibited items identified during Visual Examination technique.	The physical form of the waste matches the waste stream description as determined by AK.
a. See Batch Data Reports			
b. If AK has assigned U134 to this waste stream, then any liquids in these containers are prohibited items (not acceptable by the TSDF).			
Justification for the selection of RTR and/or VE: RTR was selected as the characterization method for this lot because the waste was previously packaged and RTR meets all the Data Quality Objectives for NDE for the waste, VE was selected as the characterization method because VE meets the Data Quality Objectives'			

Rick Whiteley — Site Project Manager Signature
Rick Whiteley — Printed Name
07/30/2015 — Date

CCP Reconciliation with Data Quality Objectives

WSPF# OR-ISTP-CH-HET Rev. 0 Lot # 14

Sampling Completeness

RTR/VE:

Number of Valid Samples: 15 Number of Total Samples Analyzed: 15

Percent Complete: 100 (QAO is 100%)

Radiological:

Number of Valid Samples: 15 Number of Total Samples Analyzed: 15

Percent Complete: 100 (QAO is 100%)

	Y/N/NA	Reconciliation Parameter
1	Y	Waste Matrix Code.
2	Y	Waste Material Parameter Weights.
3	Y	The TRU activity reported in the BDRs for each container demonstrates with a 95% probability that the container of waste contains TRU radioactive waste.
4	N	AK Sufficiency. Is there an approved AK sufficiency Determination for this waste stream?
5	Y	The data demonstrates whether the waste stream exhibits a toxicity characteristic under Title 40 Code of Federal Regulations (CFR), Part 261, Identification and Listing of Hazardous Waste, Subpart C, Characteristics of Hazardous Waste.
6	Y	Does the waste stream contain listed waste found in 20.4.1.200 NMAC incorporating 40 CFR Part 261, Subpart D, Lists of Hazardous Wastes.
7	Y	Waste stream can be classified as hazardous or nonhazardous.
8	Y	The overall completeness, comparability, and representativeness QAOs were met for each of the analytical and testing procedures as specified in the WAP Sections C3-1 through C3-2 prior to submittal of a waste stream profile form for a waste steam or waste stream lot.

	Completeness	Comparability	Representativeness
Radiography	Y	Y	Y
VE	Y	Y	Y

Comments: None

Signature of Site Project Manager | Rick Whiteley (Printed Name) | 07/30/2015 (Date)

CHARACTERIZATION INFORMATION SUMMARY

WSPF# OR-ISTP-CH-HET Rev. 0 (CCP-AK-ORNL-008)

Lot 15

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CCP Characterization Information Summary Cover Page

Waste Stream # OR-ISTP-CH-HET Lot #: 15

AK Expert Review: N/A Date: N/A

SPM Review: Laura Turner Laura Turner Date: 09/02/2015

SPM signature certifies that through Acceptable Knowledge testing and/or analysis that the waste identified in this summary is not corrosive, ignitable, reactive, or incompatible with the TSDF.

A summary of the Acceptable Knowledge regarding this waste stream containing specific information about the corrosivity, reactivity, and ignitability of the waste stream is included as an attachment to the Waste Stream Profile Form. By reference, that information is included in this lot.

List of procedures used:

Non Destructive Assay (NDA):

CCP-TP-048	Rev. 16	11/01/2013 Mobile IQ3 System Data Reviewing, Validating, and Reporting Procedure
CCP-TP-048	Rev. 15	03/24/2011 Mobile IQ3 System Data Reviewing, Validating, and Reporting Procedure
CCP-TP-048	Rev. 14	03/08/2010 Mobile IQ3 System Data Reviewing, Validating, and Reporting Procedure
CCP-TP-048	Rev. 13	10/12/2009 Mobile IQ3 System Data Reviewing, Validating, and Reporting Procedure
CCP-TP-048	Rev. 12	09/09/2009 Mobile IQ3 System Data Reviewing, Validating, and Reporting Procedure
CCP-TP-048	Rev. 11	02/18/2008 Mobile IQ3 System Data Reviewing, Validating, and Reporting Procedure
CCP-TP-048	Rev. 10	11/16/2006 Mobile IQ3 System Data Reviewing, Validating, and Reporting Procedure
CCP-TP-048	Rev. 9	11/03/2005 Mobile IQ3 System Data Reviewing, Validating, and Reporting Procedure
CCP-TP-048	Rev. 8	09/21/2005 Mobile IQ3 System Data Reviewing, Validating, and Reporting Procedure
CCP-TP-048	Rev. 7	03/14/2005 Mobile IQ3 System Data Reviewing, Validating, and Reporting Procedure
CCP-TP-048	Rev. 6	10/18/2004 Mobile IQ3 System Data Reviewing, Validating, and Reporting Procedure
CCP-TP-048	Rev. 5	06/08/2004 Mobile IQ3 System Data Reviewing, Validating, and Reporting Procedure
CCP-TP-048	Rev. 4	12/04/2003 Mobile IQ3 System Data Reviewing, Validating, and Reporting Procedure
CCP-TP-048	Rev. 3	09/03/2003 Mobile IQ3 System Data Reviewing, Validating, and Reporting Procedure
CCP-TP-048	Rev. 2	04/25/2003 Mobile IQ3 System Data Reviewing, Validating, and Reporting Procedure
CCP-TP-048	Rev. 1	03/21/2003 Mobile IQ3 System Data Reviewing, Validating, and Reporting Procedure
CCP-TP-048	Rev. 0	02/05/2003 Mobile IQ3 System Data Reviewing, Validating, and Reporting Procedure

Project Level Data Validation / DQO Reconciliation:

CCP-TP-001	Rev. 21	06/06/2013 CCP Project Level Data Validation and Verification
CCP-TP-001	Rev. 20	09/27/2012 CCP Project Level Data Validation and Verification
CCP-TP-001	Rev. 19	12/29/2010 CCP Project Level Data Validation and Verification
CCP-TP-001	Rev 18	09/09/2010 CCP Project Level Data Validation and Verification
CCP-TP-001	Rev. 17	09/24/2007 CCP Project Level Data Validation and Verification
CCP-TP-001	Rev. 16	04/26/2007 CCP Project Level Data Validation and Verification
CCP-TP-001	Rev. 15	11/22/2006 CCP Project Level Data Validation and Verification
CCP-TP-001	Rev. 14	11/16/2006 CCP Project Level Data Validation and Verification
CCP-TP-001	Rev. 13	07/21/2006 CCP Project Level Data Validation and Verification
CCP-TP-001	Rev 12	05/25/2006 CCP Project Level Data Validation and Verification
CCP-TP-001	Rev. 11	03/23/2006 CCP Project Level Data Validation and Verification

CCP-TP-002	Rev. 26	06/19/2013 CCP Reconciliation of DQOs and Reporting Characterization Data
CCP-TP-002	Rev. 25	02/11/2013 CCP Reconciliation of DQOs and Reporting Characterization Data
CCP-TP-002	Rev. 24	12/28/2011 CCP Reconciliation of DQOs and Reporting Characterization Data
CCP-TP-002	Rev. 23	12/29/2010 CCP Reconciliation of DQOs and Reporting Characterization Data
CCP-TP-002	Rev. 22	09/30/2010 CCP Reconciliation of DQOs and Reporting Characterization Data
CCP-TP-002	Rev 21	08/04/2009 CCP Reconciliation of DQOs and Reporting Characterization Data
CCP-TP-002	Rev. 20	08/18/2008 CCP Reconciliation of DQOs and Reporting Characterization Data
CCP-TP-002	Rev. 19	12/22/2006 CCP Reconciliation of DQOs and Reporting Characterization Data
CCP-TP-002	Rev. 18	11/16/2006 CCP Reconciliation of DQOs and Reporting Characterization Data
CCP-TP-002	Rev. 17	10/10/2006 CCP Reconciliation of DQOs and Reporting Characterization Data
CCP-TP-002	Rev. 16	06/06/2006 CCP Reconciliation of DQOs and Reporting Characterization Data
CCP-TP-002	Rev. 15	08/16/2005 CCP Reconciliation of DQOs and Reporting Characterization Data
CCP-TP-002	Rev. 14	03/29/2006 CCP Reconciliation of DQOs and Reporting Characterization Data

CCP-TP-005	Rev. 27	08/28/2013 CCP Acceptable Knowledge Documentation
CCP-TP-005	Rev. 26	08/12/2013 CCP Acceptable Knowledge Documentation
CCP-TP-005	Rev. 25	08/19/2013 CCP Acceptable Knowledge Documentation
CCP-TP-005	Rev. 24	11/28/2011 CCP Acceptable Knowledge Documentation
CCP-TP-005	Rev. 23	06/30/2011 CCP Acceptable Knowledge Documentation
CCP-TP-005	Rev. 22	04/21/2011 CCP Acceptable Knowledge Documentation
CCP-TP-005	Rev. 21	12/29/2010 CCP Acceptable Knowledge Documentation

CCP-TP-005	Rev. 20	11/01/2010	CCP Acceptable Knowledge Documentation
CCP-TP-005	Rev. 19	07/08/2010	CCP Acceptable Knowledge Documentation
CCP-TP-005	Rev. 18	11/16/2006	CCP Acceptable Knowledge Documentation
CCP-TP-005	Rev. 17	06/05/2006	CCP Acceptable Knowledge Documentation
CCP-TP-005	Rev. 16	02/27/2006	CCP Acceptable Knowledge Documentation
CCP-TP-005	Rev. 15	03/31/2005	CCP Acceptable Knowledge Documentation

CCP-TP-030	Rev. 34	02/02/2015	CCP CH TRU Waste Certification and WWIS/WDS Data Entry
CCP-TP-030	Rev. 33	11/18/2013	CCP CH TRU Waste Certification and WWIS/WDS Data Entry
CCP-TP-030	Rev. 32	06/20/2013	CCP CH TRU Waste Certification and WWIS/WDS Data Entry
CCP-TP-030	Rev. 31	11/19/2012	CCP CH TRU Waste Certification and WWIS/WDS Data Entry
CCP-TP-030	Rev. 30	06/21/2012	CCP CH TRU Waste Certification and WWIS/WDS Data Entry
CCP-TP-030	Rev. 29	04/26/2011	CCP CH TRU Waste Certification and WWIS/WDS Data Entry
CCP-TP-030	Rev. 28	05/12/2010	CCP CH TRU Waste Certification and WWIS/WDS Data Entry
CCP-TP-030	Rev. 27	12/14/2009	CCP CH TRU Waste Certification and WWIS Data Entry
CCP-TP-030	Rev. 26	05/27/2009	CCP CH TRU Waste Certification and WWIS Data Entry
CCP-TP-030	Rev. 25	01/22/2009	CCP CH TRU Waste Certification and WWIS Data Entry
CCP-TP-030	Rev. 24	08/20/2008	CCP CH TRU Waste Certification and WWIS Data Entry
CCP-TP-030	Rev. 23	03/12/2008	CCP CH TRU Waste Certification and WWIS Data Entry
CCP-TP-030	Rev. 22	07/24/2007	CCP CH TRU Waste Certification and WWIS Data Entry
CCP-TP-030	Rev. 21	05/21/2007	CCP CH TRU Waste Certification and WWIS Data Entry
CCP-TP-030	Rev. 20	02/07/2007	CCP CH TRU Waste Certification and WWIS Data Entry
CCP-TP-030	Rev. 19	11/16/2006	CCP CH TRU Waste Certification and WWIS Data Entry
CCP-TP-030	Rev. 18	05/01/2006	CCP TRU Waste Certification and WWIS Data Entry
CCP-TP-030	Rev. 17	12/29/2005	CCP TRU Waste Certification and WWIS Data Entry
CCP-TP-030	Rev. 16	04/22/2005	CCP TRU Waste Certification and WWIS Data Entry

Radiography (RTR/NDE):

CCP-TP-053	Rev. 15	09/11/2014	CCP Standard Real-Time Radiography (RTR) Inspection Procedure
CCP-TP-053	Rev. 14	09/25/2013	CCP Standard Real-Time Radiography (RTR) Inspection Procedure
CCP-TP-053	Rev. 13	05/14/2013	CCP Standard Real-Time Radiography (RTR) Inspection Procedure
CCP-TP-053	Rev. 12	08/22/2012	CCP Standard Real-Time Radiography (RTR) Inspection Procedure
CCP-TP-053	Rev. 11	07/20/2011	CCP Standard Real-Time Radiography (RTR) Inspection Procedure
CCP-TP-053	Rev. 10	03/04/2011	CCP Standard Real-Time Radiography (RTR) Inspection Procedure
CCP-TP-053	Rev. 9	09/30/2010	CCP Standard Real-Time Radiography (RTR) Inspection Procedure
CCP-TP-053	Rev. 8	06/30/2010	CCP Standard Real-Time Radiography (RTR) Inspection Procedure
CCP-TP-053	Rev. 7	10/21/2009	CCP Standard Real-Time Radiography (RTR) Inspection Procedure
CCP-TP-053	Rev. 6	03/04/2008	CCP Standard Real-Time Radiography (RTR) Inspection Procedure
CCP-TP-053	Rev. 5	11/16/2006	CCP Standard Real-Time Radiography (RTR) Inspection Procedure
CCP-TP-053	Rev. 4	12/22/2005	CCP Standard Real-Time Radiography (RTR) Inspection Procedure
CCP-TP-053	Rev. 3	03/21/2005	CCP Standard Real-Time Radiography (RTR) Inspection Procedure
CCP-TP-053	Rev. 2	07/14/2004	CCP Standard Real-Time Radiography (RTR) Inspection Procedure

WAP Certification:

CCP-PO-001	Rev. 21	05/31/2013	CCP Transuranic Waste Characterization Quality Assurance Project Plan
CCP-PO-001	Rev. 20	09/16/2011	CCP Transuranic Waste Characterization Quality Assurance Project Plan
CCP-PO-001	Rev. 19	12/29/2010	CCP Transuranic Waste Characterization Quality Assurance Project Plan
CCP-PO-001	Rev. 18	06/30/2010	CCP Transuranic Waste Characterization Quality Assurance Project Plan
CCP-PO-001	Rev. 17	06/23/2009	CCP Transuranic Waste Characterization Quality Assurance Project Plan
CCP-PO-001	Rev. 16	10/31/2007	CCP Transuranic Waste Characterization Quality Assurance Project Plan
CCP-PO-001	Rev. 15	08/10/2007	CCP Transuranic Waste Characterization Quality Assurance Project Plan
CCP-PO-001	Rev. 14	03/28/2007	CCP Transuranic Waste Characterization Quality Assurance Project Plan
CCP-PO-001	Rev. 13	11/16/2006	CCP Transuranic Waste Characterization Quality Assurance Project Plan
CCP-PO-001	Rev. 12	03/22/2006	CCP Transuranic Waste Characterization Quality Assurance Project Plan
CCP-PO-001	Rev. 11	03/10/2005	CCP Transuranic Waste Characterization Quality Assurance Project Plan

CCP-PO-002	Rev. 27	05/31/2013	CCP Transuranic Waste Certification Plan
CCP-PO-002	Rev. 26	07/14/2011	CCP Transuranic Waste Certification Plan
CCP-PO-002	Rev. 25	12/28/2010	CCP Transuranic Waste Certification Plan
CCP-PO-002	Rev. 24	06/30/2010	CCP Transuranic Waste Certification Plan
CCP-PO-002	Rev. 23	04/07/2010	CCP Transuranic Waste Certification Plan
CCP-PO-002	Rev. 22	01/12/2010	CCP Transuranic Waste Certification Plan
CCP-PO-002	Rev. 21	01/26/2009	CCP Transuranic Waste Certification Plan
CCP-PO-002	Rev. 20	11/02/2007	CCP Transuranic Waste Certification Plan
CCP-PO-002	Rev. 19	05/22/2007	CCP Transuranic Waste Certification Plan
CCP-PO-002	Rev. 18	11/16/2006	CCP Transuranic Waste Certification Plan
CCP-PO-002	Rev. 17	11/16/2006	CCP Transuranic Waste Certification Plan
CCP-PO-002	Rev. 18	11/16/2006	CCP Transuranic Waste Certification Plan

CCP-PO-002	Rev. 15	03/22/2006	CCP Transuranic Waste Certification Plan
CCP-PO-002	Rev. 14	12/29/2005	CCP Transuranic Waste Certification Plan
CCP-PO-002	Rev. 13	05/09/2006	CCP Transuranic Waste Certification Plan

CCP-PO-003	Rev. 13	07/31/2013	Transuranic Authorized Methods for Payload Control (CCP CH-TRAMPC)
CCP-PO-003	Rev. 12	12/29/2010	Transuranic Authorized Methods for Payload Control (CCP CH-TRAMPC)
CCP-PO-003	Rev. 11	06/04/2009	Transuranic Authorized Methods for Payload Control (CCP CH-TRAMPC)
CCP-PO-003	Rev. 10	11/16/2006	Transuranic Authorized Methods for Payload Control (CCP CH-TRAMPC)
CCP-PO-003	Rev. 9	12/29/2006	Transuranic Authorized Methods for Payload Control (CCP CH-TRAMPC)
CCP-PO-003	Rev. 8	01/25/2005	Transuranic Authorized Methods for Payload Control (CCP CH-TRAMPC)
CCP-PO-003	Rev. 7	11/22/2004	Transuranic Authorized Methods for Payload Control (CCP CH-TRAMPC)
CCP-PO-003	Rev. 6	06/03/2004	Transuranic Authorized Methods for Payload Control (CCP CH-TRAMPC)
CCP-PO-003	Rev. 5	09/18/2003	Transuranic Authorized Methods for Payload Control (CCP CH-TRAMPC)
CCP-PO-003	Rev. 4	02/11/2003	Transuranic Authorized Methods for Payload Control (CCP CH-TRAMPC)
CCP-PO-003	Rev. 3	05/31/2002	Transuranic Authorized Methods for Payload Control (CCP CH-TRAMPC)

CCP Correlation of Container Identification Numbers to Batch Data Report Numbers

Waste Stream: # OR-ISTP-CH-HET Lot # 15

Container ID Number	Historical Container ID	NDA BDR	RTR BDR	VE BDR	Load/Manage Overpack Yes	Transportation Headspace Gas	
						FGA	GGT
X10C0600039C	N/A	OR-IQ3-0270	OR-RTR6-0478	N/A	No	OR15FG8082	N/A
X10C9311476B1	N/A	OR-IQ3-0522	OR-RTR7-0142	N/A	No	OR15FG8079	N/A
X10C9311476B2	N/A	OR-IQ3-0522	OR-RTR7-0142	N/A	No	OR15FG8079	N/A
X10C9311476B3	N/A	OR-IQ3-0522	OR-RTR7-0142	N/A	No	OR15FG8079	N/A
X10C9312947A	N/A	OR-IQ3-0316	OR-RTR6-0522	N/A	No	OR15FG8082	N/A
X10C9312947B	N/A	OR-IQ3-0316	OR-RTR6-0522	N/A	No	OR15FG8082	N/A
X10C9312947C	N/A	OR-IQ3-0316	OR-RTR6-0522	N/A	No	OR15FG8082	N/A
X10C9312947D	N/A	OR-IQ3-0316	OR-RTR6-0522	N/A	No	OR15FG8082	N/A
X10C9313131A	N/A	OR-MILCC2-0210	OR-RTR7-0145	N/A	No	OR15FG8084	N/A
X10C9400110A	N/A	OR-MILCC2-0183	OR-RTR7-0134	N/A	No	OR15FG8068	N/A
X10C9400110B	N/A	OR-MILCC2-0183	OR-RTR7-0134	N/A	No	OR15FG8068	N/A
X10C9400110C	N/A	OR-MILCC2-0183	OR-RTR7-0134	N/A	No	OR15FG8068	N/A
X10C9400110D	N/A	OR-MILCC2-0183	OR-RTR7-0134	N/A	No	OR15FG8068	N/A
X10C9400110E	N/A	OR-MILCC2-0183	OR-RTR7-0134	N/A	No	OR15FG8068	N/A
X10CSATN03194B	N/A	OR-IQ3-0250	OR-RTR6-0457	N/A	No	OR15FG8068	N/A

Laura Turner — Laura Turner — 09/02/2015

Signature of Site Project Manager | Printed Name | Date

CCP RTR/VE Summary of Prohibited Items and AK Confirmation

Waste Stream Number: OR-ISTP-CH-HET Lot #: 15

Container Number	RTR Prohibited Items [a,b]	Visual Examination Prohibited Items [a,b]	Does the Physical Form of the Waste Match the Waste Stream Description as Determined by AK
See correlation of container ID numbers for list of remaining drum numbers in this Lot.	None of the containers in this lot had prohibited items identified during RTR.	VE was not used to certify any containers in this Lot.	The physical form of the waste matches the waste stream description as determined by AK.
a. See Batch Data Reports			
b. If AK has assigned U134 to this waste stream, then any liquids in these containers are prohibited items (not acceptable by the TSDF).			
Justification for the selection of RTR and/or VE: RTR was selected as the characterization method for this lot because the waste was previously packaged and RTR meets all the Data Quality Objectives for NDE for the waste.			

Laura Turner — Laura Turner — 09/02/2015
Site Project Manager Signature — Printed Name — Date

CCP Reconciliation with Data Quality Objectives

WSPF# OR-ISTP-CH-HET Rev. 0 Lot # 15

Sampling Completeness

RTR/VE:

Number of Valid Samples: 15 Number of Total Samples Analyzed: 15

Percent Complete: 100 (QAO is 100%)

Radiological:

Number of Valid Samples: 15 Number of Total Samples Analyzed: 15

Percent Complete: 100 (QAO is 100%)

	Y/N/NA	Reconciliation Parameter
1	Y	Waste Matrix Code.
2	Y	Waste Material Parameter Weights.
3	Y	The TRU activity reported in the BDRs for each container demonstrates with a 95% probability that the container of waste contains TRU radioactive waste.
4	N	AK Sufficiency. Is there an approved AK sufficiency Determination for this waste stream?
5	Y	The data demonstrates whether the waste stream exhibits a toxicity characteristic under Title 40 Code of Federal Regulations (CFR), Part 261, Identification and Listing of Hazardous Waste, Subpart C, Characteristics of Hazardous Waste.
6	Y	Does the waste stream contain listed waste found in 20.4.1.200 NMAC incorporating 40 CFR Part 261, Subpart D, Lists of Hazardous Wastes.
7	Y	Waste stream can be classified as hazardous or nonhazardous.
8	Y	The overall completeness, comparability, and representativeness QAOs were met for each of the analytical and testing procedures as specified in the WAP Sections C3-1 through C3-2 prior to submittal of a waste stream profile form for a waste steam or waste stream lot.

	Completeness	Comparability	Representativeness
Radiography	Y	Y	Y
VE	NA	NA	NA

Comments: None

Laura Jessmer Laura Jessmer 09/02/2015

Signature of Site Project Manager Printed Name Date

DIVIDER

PAGE

URS

Washington TRU Solutions LLC

COPY

CP:10:01547
UFC:5900.00

INTER-OFFICE CORRESPONDENCE

DATE: August 18, 2010

FROM: R. P. Kantrowitz R.P.K. LOCATION: Certification

TO: CCP Records Custodian GSA-212 LOCATION: Retrieval, Characterization and Transportation

SUBJECT: TRANSMITTAL OF OAK RIDGE NATIONAL LABORATORY WASTE STREAM PROFILE FORM FOR WASTE STREAM #OR-CHEM-CH-HET

Please accept the attached Oak Ridge National Laboratory Waste Stream Profile Form to be placed in Records for Waste Stream #OR-CHEM-CH-HET.

RPK:yhs

Attachment

cc: (without attachment)
M. Pearcy ED
W. Weyerman ED

ORIGINAL

Attachment 2 –CCP Waste Stream Profile Form

(1) Waste Stream Profile Number: OR-CHEM-CH-HET						
(2) Generator site name: Oak Ridge National Laboratory				(4)Technical contact: Richard Kantrowitz		
(3) Generator site EPA ID: TN1890090003				(6) Technical contact phone number: 575-234-7511		
(5) Date of audit report approval by New Mexico Environment Department (NMED): April 24, 2008; April 3, 2009						
(7) Title, version number, and date of documents used for WAP Certification: CCP-PO-001, CCP *Transuranic Waste Characterization Quality Assurance Project Plan*, Revision 17, June 23, 2009. CCP-PO-002, CCP Transuranic Waste Certification Plan, Revision 23, April 7, 2010 CCP-PO-027 CCP/TRU Waste Processing Center/Oakridge National Laboratory Interface Document, Revision 1, February 17, 2010.						
(8) Did your facility generate this waste?	YES	X	NO			
(9) If no, provide the name and EPA ID of the original generator: NA						
Waste Stream Information[1]						
(10) WIPP ID: OR-CHEM-CH-HET				(11) Summary Category Group: S5000		
(12) Waste Matrix Code Group: Heterogeneous Debris Waste				(13) Waste Stream Name: Heterogeneous Debris from Analytical Chemistry Laboratory Operations		
(14) Description from the TWBIR: Waste consists of CH-TRU debris from analytical chemistry operations at ORNL.						
(15) Defense TRU Waste:	YES	X	NO			
(16) Check One:	CH	X	RH			
(17) Number of SWBs: N/A		(18) Number of Drums: 210 55-gallon			(19) Number of Canisters: N/A	
(20) Batch Data report numbers supporting this waste stream characterization: See Characterization Information Summary (CIS) Correlation of Container Identification Numbers to Batch Data Report Numbers						
(21) List applicable EPA Hazardous Waste Numbers: D004, D005, D006, D007, D008, D009, D011, D019, D022, F002, and F005						
(22) Applicable TRUCON Content Numbers: OR 125, OR 225, SQ154						
(23)**Acceptable Knowledge Information**[1]						
[For the following, enter the supporting documentation used (i.e., references and dates)]						
Required Program Information						
(23A) Map of site: CCP-AK-ORNL-005, Revision 0, September 24, 2009, Figures 3, 4, and 5						
(23B) Facility mission description: CCP-AK-ORNL-005, Revision 0, September 24, 2009, Section 4.2						
(23C) Description of operations that generate waste: CCP-AK-ORNL-005, Revision 0, September 24, 2009, Sections 4.4 and 5.3						
(23D) Waste identification/categorization schemes: CCP-AK-ORNL-005, Revision 0, September 24, 2009, Section 4.5						
(23E) Types and quantities of waste generated: CCP-AK-ORNL-005, Revision 0, September 24, 2009, Sections 4.6.1 and 5.2						
(23F) Correlation of waste streams generated from the same building and process, as applicable: CCP-AK-ORNL-005, Revision 0, September 24, 2009, Section 4.6.2						
(24) Waste certification procedures: CCP-TP-030, Rev. 27, CCP CH TRU Waste Certification and WWIS/WDS Data Entry, December 14, 2009						
(25)Required Waste Stream Information						

(25A) Area(s) and building(s) from which the waste stream was generated: CCP-AK-ORNL-005, Revision 0, September 24, 2009, Section 5.1			
(25B) Waste stream volume and time period of generation: CCP-AK-ORNL-005, Revision 0, September 24, 2009, Section 5.2			
(25C) Waste generating process description for each building: CCP-AK-ORNL-005, Revision 0, September 24, 2009, Section 5.3			
(25D) Waste Process flow diagrams: CCP-AK-ORNL-005, Revision 0, September 24, 2009, Figures 8 and 9			
(25E) Material inputs or other information identifying chemical/radionuclide content and physical waste form: CCP-AK-ORNL-005, Revision 0, September 24, 2009, Section 5.4.			
(25F) Waste Material Parameter Weight Estimates per unit of waste: See Table 2 of the Summation of Aspects of AK Summary Report: OR-NFS-CH-SOIL			
(26) Which Defense Activity generated the waste: (check one)			
	Weapons activities including defense inertial confinement fusion		Naval Reactors development
	Verification and control technology		Defense research and development
X	Defense nuclear waste and material by products management		Defense nuclear material production
	Defense nuclear waste and materials security and safeguards and security investigations		
(27)Supplemental Documentation			
(27A) Process design documents: NA			
(27B) Standard operating procedures: See S2 AK#s on Attachment 1 to Summation of Aspects of AK Summary Report			
(27C) Safety Analysis Reports: See S3 AK#s on Attachment 1 to Summation of Aspects of AK Summary Report			
(27D) Waste packaging logs: NA			
(27E) Test plans/research project reports: See S5 AK#s on Attachment 1 to Summation of Aspects of AK Summary Report			
(27F) Site databases: See S6 AK#s on Attachment 1 to Summation of Aspects of AK Summary Report			
(27G) Information from site personnel: See S7 AK#s on Attachment 1 to Summation of Aspects of AK Summary Report			
(27H) Standard industry documents: NA			
(27I) Previous analytical data: See S9 AK#s on Attachment 1 to Summation of Aspects of AK Summary Report			
(27J) Material safety data sheets: See S10 AK#s on Attachment 1 to Summation of Aspects of AK Summary Report			
(27K) Sampling and analysis data from comparable/surrogate Waste: See S12 AK#s on Attachment 1 to Summation of Aspects of AK Summary Report			
(27L) Laboratory notebooks: NA			
Confirmation Information[2]			
For the following, when applicable, enter procedure title(s), number(s) and date(s)			
(28)	Radiography: CCP-TP-053, Revision 7, October 21, 2009		
(29)	Visual Examination: NA		

(30)Comments:

For a list of the waste characterization procedures used and date of the respective procedures see the list of procedures on the attached CIS.

Reviewed by AK Expert:	**YES**	[X]		**Date:** March 1, 2010
Reviewed by STR (if necessary):	**YES**	[X]	**NA** [ ]	**Date:** March 4, 2010

Waste Stream Profile Form Certification:

I hereby certify that I have reviewed the information in this Waste Stream Profile Form, and it is complete and accurate to the best of my knowledge. I understand that this information will be made available to regulatory agencies and that there are significant penalties for submitting false information, including the possibility of fines and imprisonment for knowing violations.

(31)	(32) Richard Kantrowitz	(33) 6/17/10
Signature of Site Project Manager	Printed Name	Date

NOTE: (1) Use back of sheet or continuation sheets, if required.
(2) If, radiography, visual examination were used to confirm EPA Hazardous Waste Numbers, attach signed Characterization Information Summary documenting this determination.

CHARACTERIZATION INFORMATION SUMMARY

WSPF # OR-CHEM-CH-HET

Lot 1

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CCP Characterization Information Summary Cover Page

Waste Stream # OR-CHEM-CH-HET Lot #: 1

AK Expert Review: N/A Date: N/A

SPM Review: Richard Kantrowitz Date: 5/18/2010

SPM signature certifies that through Acceptable Knowledge testing and/or analysis that the waste identified in this summary is not corrosive, ignitable, reactive, or incompatible with the TSDF.

A summary of the Acceptable Knowledge regarding this waste stream containing specific information about the corrosivity, reactivity, and ignitability of the waste stream is included as an attachment to the Waste Stream Profile Form. By reference, that information is included in this lot.

List of procedures used:

Radiography (RTR/NDE)

CCP-TP-053	Rev. 7	10/21/09	CCP Standard Real-Time Radiography (RTR) Inspection Procedure
CCP-TP-053	Rev. 6	03/04/08	CCP Standard Real-Time Radiography (RTR) Inspection Procedure

Non Destructive Assay (NDA):

CCP-TP-166	Rev. 3	02/26/10	CCP Drum Waste Assay System Imaging Passive/Active Neutron Operations
CCP-TP-166	Rev. 2	12/05/08	CCP Drum Waste Assay System Imaging Passive/Active Neutron Operations
CCP-TP-168	Rev. 3	11/17/09	CCP DWAS IPAN/SGS Data Generation Level Validation
CCP-TP-168	Rev. 2	12/02/08	CCP DWAS IPAN/SGS Data Generation Level Validation
CCP-TP-169	Rev. 2	11/18/09	CCP Operating the Mobile Segmented Gamma Scanner
CCP-TP-169	Rev. 1	06/19/08	CCP Operating the Mobile Segmented Gamma Scanner
CCP-TP-169	Rev. 0	10/12/07	CCP Operating the Mobile Segmented Gamma Scanner

Headspace Gas Sampling and Analysis (HSG):

CCP-TP-093	Rev. 13	03/19/07	CCP Sampling of TRU Waste Containers
CCP-TP-106	Rev. 6	07/12/07	CCP Headspace Gas Sampling Batch Data Report Preparation
CCP-TP-173	Rev. 1	09/30/09	CCP Analysis of Gas Samples for VOCs by GC/FID
CCP-TP-173	Rev. 0	05/03/07	CCP Analysis of Gas Samples for VOCs by GC/FID
CCP-TP-175	Rev. 1	03/29/10	CCP Analysis of Gas Samples for VOCs by GC/MS
CCP-TP-175	Rev. 0	05/02/07	CCP Analysis of Gas Samples for VOCs by GC/MS

Project Level Data Validation / DQO Reconciliation:

CCP-TP-001	Rev. 17	09/24/07	CCP Project Level Data Validation and Verification
CCP-TP-002	Rev. 21	08/04/09	CCP Reconciliation of DQOs and Reporting Characterization Data
CCP-TP-002	Rev. 20	08/18/08	CCP Reconciliation of DQOs and Reporting Characterization Data
CCP-TP-003	Rev. 17	11/09/09	CCP Data Analysis for S3000, S4000, and S5000 Characterization
CCP-TP-003	Rev. 16	10/02/07	CCP Data Analysis for S3000, S4000, and S5000 Characterization
CCP-TP-005	Rev. 18	11/16/06	CCP Acceptable Knowledge Documentation
CCP-TP-030	Rev. 28	05/12/10	CCP CH TRU Waste Certification and WWIS/WDS Data Entry
CCP-TP-030	Rev. 27	12/14/09	CCP CH TRU Waste Certification and WWIS/WDS Data Entry
CCP-TP-030	Rev. 26	05/27/09	CCP CH TRU Waste Certification and WWIS Data Entry

WAP Certification:

CCP-PO-001	Rev. 17	06/23/09	CCP Transuranic Waste Characterization Quality Assurance Project Plan
CCP-PO-002	Rev. 23	04/07/10	CCP Transuranic Waste Certification Plan
CCP-PO-002	Rev. 22	01/12/10	CCP Transuranic Waste Certification Plan
CCP-PO-002	Rev. 21	01/26/09	CCP Transuranic Waste Certification Plan
CCP-PO-027	Rev. 2	04/22/10	CCP/TWPC/ORNL Interface Document
CCP-PO-027	Rev. 1	02/17/10	CCP/TWPC/ORNL Interface Document
CCP-PO-027	Rev. 0	10/02/07	CCP/TWPC/ORNL Interface Document

CCP Correlation of Container Identification Numbers to Batch Data Report Numbers

Waste Stream: # OR-CHEM-CH-HET

Lot # 1

Container ID Number	NDA BDR	RTR BDR	VE BDR	Solids Sampling BDR	Solids Analytical BDR	Load Management/ Overpack Yes	Headspace Gas BDR			
							Sample	Analysis		Transportation
X10C0401575A	OR-DWAS-0341	OR-RTR6-0265	NA	NA	NA		NA	NA	NA	OR09FG4121
X10C0401708A	OR-DWAS-0341	OR-RTR6-0265	NA	NA	NA		NA	NA	NA	OR09FG4121
X10C0401709A	OR-DWAS-0343	OR-RTR6-0258	NA	NA	NA		NA	NA	NA	OR09FG4122
X10C0501607	OR-DWAS-0325	OR-RTR6-0257	NA	NA	NA		ORHSGS090008	ECL09039M	ECL09039G	OR09FG4105
X10C0501693	OR-DWAS-0325	OR-RTR6-0256	NA	NA	NA		ORHSGS090008	ECL09039M	ECL09039G	OR09FG4105
X10C9311145F	OR-DWAS-0338	OR-RTR6-0268	NA	NA	NA		NA	NA	NA	OR09FG4122
X10C9312738A	OR-DWAS-0336	OR-RTR6-0264	NA	NA	NA		NA	NA	NA	OR09FG4117
X10C9313024A	OR-DWAS-0342	OR-RTR6-0258	NA	NA	NA		NA	NA	NA	OR09FG4121
X10C9313640A	OR-DWAS-0343	OR-RTR6-0258	NA	NA	NA		NA	NA	NA	OR09FG4122
X10C9313647A	OR-DWAS-0336	OR-RTR6-0264	NA	NA	NA		NA	NA	NA	OR09FG4117
** These containers were randomly selected for headspace gas sampling and analysis and are included to resolve EPA hazardous waste number assignment only. NDE and NDA BDR numbers for these eight containers are included for information purposes only.										
**X10C0501626A	OR-DWAS-0321	OR-RTR6-0252	NA	NA	NA		ORHSGS090008	ECL09039M	ECL09039G	NA
**X10C0501626B	OR-DWAS-0321	OR-RTR6-0252	NA	NA	NA		ORHSGS090008	ECL09039M	ECL09039G	NA
**X10C0501626C	OR-DWAS-0321	OR-RTR6-0252	NA	NA	NA		ORHSGS090008	ECL09039M	ECL09039G	NA
**X10C0501626D	OR-DWAS-0321	OR-RTR6-0252	NA	NA	NA		ORHSGS090008	ECL09039M	ECL09039G	NA
**X10C0501655	OR-DWAS-0321	OR-RTR6-0252	NA	NA	NA		ORHSGS090008	ECL09039M	ECL09039G	NA
**X10C0501686	OR-DWAS-0325	OR-RTR6-0257	NA	NA	NA		ORHSGS090008	ECL09039M	ECL09039G	NA
**X10C9309189A	OR-DWAS-0321	OR-RTR6-0252	NA	NA	NA		ORHSGS090008	ECL09039M	ECL09039G	NA
**X10C9309189B1	OR-DWAS-0321	OR-RTR6-0252	NA	NA	NA		ORHSGS090008	ECL09039M	ECL09039G	NA

Signature of Site Project Manager

Richard Kantrowitz
Printed Name

5/18/2010
Date

CIS 003

CCP Headspace Gas UCL_{90} Evaluation Form

WSPF #: OR-CHEM-CH-HET **Waste Stream Headspace Gas Lot Number** 1 through 1

ANALYTE	Transform Data Used (No, Data-Log, SQRT, other)	# Samples above MDL (1)	# Samples	Maximum (ppmv)	Mean (ppmv)	SD (ppmv)	UCL_{90} (ppmv)	PRQL (ppmv)	Transformed PRQL (N/A or Value)	UCL_{90} > PRQL Yes	EPA Hazardous Waste Number
Benzene	Log	0	10	-3.56	-3.58	0.02	-3.57	10	2.30		
Bromoform	No	0	10	0.01	0.01	0.00	0.01	10	N/A		
Carbon Tetrachloride	Log	1	10	-1.90	-4.08	0.77	-3.74	10	2.30		
Chlorobenzene	No	0	10	0.02	0.02	0.00	0.02	10	N/A		
Chloroform	Log	1	10	-3.02	-3.69	0.24	-3.59	10	2.30		
Cyclohexane[a]	Log	2	10	-2.04	-3.41	0.66	-3.12	10	2.30		
1,1-Dichloroethane	No	0	10	0.02	0.02	0.00	0.02	10	N/A		
1,2-Dichloroethane	Log	1	10	-2.12	-3.48	0.48	-3.27	10	2.30		
1,1-Dichloroethylene	No	0	10	0.02	0.02	0.00	0.02	10	N/A		
cis-1,2-Dichloroethylene	Log	0	10	-3.54	-3.57	0.02	-3.56	10	2.30		
trans 1,2-Dichloroethylene	No	0	10	0.04	0.04	0.00	0.04	10	N/A		
Ethyl benzene	Log	1	10	-2.40	-3.67	0.45	-3.47	10	2.30		
Ethyl Ether	Log	0	10	-3.10	-3.12	0.02	-3.11	10	2.30		
Methylene chloride	No	0	10	0.03	0.03	0.00	0.03	10	N/A		
1,1,2,2-Tetrachloroethane	No	0	10	0.02	0.02	0.00	0.02	10	N/A		
Tetrachloroethylene	No	0	10	0.02	0.02	0.00	0.02	10	N/A		
Toluene	No	8	10	7.40	2.83	2.37	3.87	10	N/A		
1,1,1-Trichloroethane	Log	1	10	-1.56	-3.83	0.80	-3.48	10	2.30		
Trichloroethylene	No	0	10	0.02	0.02	0.00	0.02	10	N/A		
Trichlorofluoromethane[c]	No	0	10	0.01	0.01	0.00	0.01	10	N/A		
1,1,2-Trichloro-1,2,2-trifluoroethene	No	0	10	0.01	0.01	0.00	0.01	10	N/A		
1,2,4-Trimethylbenzene[a]	Log	3	10	-1.51	-3.02	0.81	-2.67	10	2.30		
1,3,5-Trimethylbenzene[a]	Log	2	10	-1.90	-3.26	0.60	-3.00	10	2.30		
m,p-Xylenes[b]	SQRT	8	10	0.39	0.25	0.08	0.29	10	3.16		
o-Xylene	No	3	10	0.11	0.05	0.04	0.06	100	N/A		
Acetone	Log	10	10	1.06	-0.57	1.16	-0.07	100	4.61		
Butanol	Log	9	10	0.59	-1.98	1.33	-1.40	100	4.61		
Methanol	No	7	10	190.00	96.83	75.74	129.95	100	N/A	Yes	(2)
Methyl ethyl ketone	No	4	10	0.41	0.15	0.14	0.21	100	N/A		

CT5004

CCP Headspace Gas UCL_{90} Evaluation Form

WSPF #: OR-CHEM-CH-HET **Waste Stream Headspace Gas Lot Number** 1 through 1

ANALYTE	Transform Data Used (No, Data-Log, SQRT, other)	# Samples above MDL (1)	# Samples	Maximum (ppmv)	Mean (ppmv)	SD (ppmv)	UCL_{90} (ppmv)	PRQL (ppmv)	Transformed PRQL (N/A or Value)	UCL_{90} > PRQL Yes	EPA Hazardous Waste Number
Methyl isobutyl ketone	Log	5	10	-0.49	-3.00	1.15	-2.50	10	2.30		
Chloromethane[e]	Log	0	10	-3.38	-3.40	0.02	-3.39	10	2.30		
Carbon Disulfide[e]	Log	7	10	2.56	-0.80	2.04	0.09	10	2.30		
1,2-Dichloropropane[e]	Log	1	10	-3.06	-4.11	0.37	-3.95	10	2.30		
Formaldehyde[c]	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Hydrazine[d]	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

[a] These compounds are from the TRAMPAC and are flammable VOCs that do not appear in the QAPjP or the WIPP WAP. These are not part of the target analyte list, but samples may be analyzed for these compounds.

[b] These xylene isomers cannot be resolved by the analytical methods employed in the program. m-Xylene and p-Xylene will be reported as "Total m-p-Xylene."

[c] Required only for homogenous solids and soil/gravel waste from Savannah River Site.

[d] Required only for homogenous solids and soil/gravel waste from Oak Ridge National Laboratory and Savannah River Site.

[e] These compounds are reported by the Laboratory and are included for completeness.

Comments:

(1) For analytes where there were no samples measured above the MDL value, 1/2 of the MDL value was used. (Per section B4 of the WAP, 1/2 of the MDL value is used in calculating the mean concentration.)

(2) EPA HWN F003 is not assigned to this waste stream for Methanol because the waste is not liquid and is therefore not ignitable. This is consistent with acceptable knowledge.

Signature of Site Project Manager

Richard Kantrowitz
Printed Name

5/18/2010
Date

CR5005

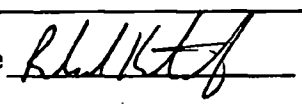
CCP Headspace Gas Summary Data

Waste Stream Number OR-CHEM-CH-HET Lot Number (s) 1

Tentatively Identified Compound	Maximum Observed Estimated Concentrations (ppmv)	# Samples Containing TIC	% Detected
None	NA	NA	NA

Data Supports EPA Hazardous Waste Numbers Assigned by AK? ☑ Yes ☐ No

If no, describe the basis for assigning the EPA Hazardous Waste Codes:

SPM Signature  Date 5/18/2010

CCP RTR/VE Summary of Prohibited Items and AK Confirmation

Waste Stream Number: OR-CHEM-CH-HET Lot(s)#: 1

Container Number	RTR Prohibited Items [a]	Visual Examination Prohibited Items [a]
See correlation of container ID numbers for list of remaining drum numbers in this Lot.	RTR Data confirm that none of the containers in this lot contain any prohibited items.	None of the containers in this lot were processed through VE.

a. See Batch Data Reports

Site Project Manager Signature | Richard Kantrowitz Printed Name | 5/18/2010 Date

CCP Reconciliation with Data Quality Objectives

WSF# OR-CHEM-CH-HET Lot # 1

Sampling Completeness

RTR:

Number of Valid Samples: 10 Number of Total Samples Analyzed: 10
Percent Complete: 100 (QAO is 100%)

NDA

Number of Valid Samples: 10 Number of Total Samples Analyzed: 10
Percent Complete: 100 (QAO is 100%)

HSG

Number of Valid Samples: 10 Number of Total Samples Collected: 10
Percent Complete: 100 (QAO is ≥90%)
Number of Valid Samples: 10 Number of Total Samples Analyzed: 10
Percent Complete: 100 (QAO is ≥90%)

Total VOC

Number of Valid Samples: NA Number of Total Samples Collected: NA
Percent Complete: NA (QAO is ≥90%)
Number of Valid Samples: NA Number of Total Samples Analyzed: NA
Percent Complete: NA (QAO is ≥90%)

Total SVOC

Number of Valid Samples: NA Number of Total Samples Collected: NA
Percent Complete: NA (QAO is ≥90%)
Number of Valid Samples: NA Number of Total Samples Analyzed: NA
Percent Complete: NA (QAO is ≥90%)

Total Metals

Number of Valid Samples: NA Number of Total Samples Collected: NA
Percent Complete: NA (QAO is ≥90%)
Number of Valid Samples: NA Number of Total Samples Analyzed: NA
Percent Complete: NA (QAO is ≥90%)

CCP Reconciliation with Data Quality Objectives

WSF# OR-CHEM-CH-HET Lot # 1

	Y/N/NA	Reconciliation Parameter
1	Y	Waste Matrix Code.
2	Y	Waste Material Parameter Weights.
3	Y	The waste matrix code identified is consistent with the type of sampling and analysis used to characterize the waste.
4	Y	The TRU activity reported in the BDRs for each container demonstrates with a 95% probability that the container of waste contains TRU radioactive waste.
5	N	AK Sufficiency. Is there an approved AK sufficiency Determination for this waste stream?
6	Y	Mean concentrations, UCL_{90} values for the mean concentration, standard deviations, and the number of samples collected for each VOC in the HSG of each container were calculated and compared with the program required quantitation limits, as reported in CCP-TP-003 Attachment 3, and additional U.S. Environmental Protection Agency (EPA) Hazardous Waste Numbers were assigned as required. Samples were randomly collected (when appropriate).
7a	NA	Mean concentrations, UCL_{90} values for the mean concentration, standard deviations, and the number of samples collected for solids VOCs were calculated and compared with the program required quantitation limits and regulatory thresholds, as reported in the Characterization Information Summary, CCP-TP-003 Attachment 4, and additional EPA HWNs were assigned as required. Samples were randomly collected.
7b	NA	Mean concentrations, (UCL_{90}) values for the mean concentration, standard deviations, and the number of samples collected for solids SVOCs were calculated and compared with the program required quantitation limits and regulatory thresholds, as reported in the Characterization Information Summary, CCP-TP-003 Attachment 5, and additional EPA HWNs were assigned as required. Samples were randomly collected.
7c	NA	Mean concentrations, (UCL_{90}) values for the mean concentration, standard deviations, and the number of samples collected for total metals were calculated and compared with the program required quantitation limits and regulatory thresholds, as reported in the Characterization Information Summary, CCP-TP-003 Attachment 6, and additional EPA HWNs were assigned as required. Samples were randomly collected.

CCP Reconciliation with Data Quality Objectives

WSF# OR-CHEM-CH-HET Lot # 1

8	Y	The data demonstrates whether the waste stream exhibits a toxicity characteristic under Title 40 Code of Federal Regulations (CFR), Part 261, Identification and Listing of Hazardous Waste, Subpart C, Characteristics of Hazardous Waste.
9	Y	Does the waste stream contain listed waste found in 20.4.1.200 NMAC incorporating 40 CFR Part 261, Subpart D, Lists of Hazardous Wastes.
10	Y	Waste stream can be classified as hazardous or nonhazardous at the 90-percent confidence level.
11	Y	Appropriate packaging configuration and Drum Age Criteria (DAC) is applied and documented in the headspace gas sampling documentation, and the drum age met prior to sampling.
12	Y	TICs were appropriately identified and reported in accordance with the *requirements of Section B3-1 of the QAPjP.*
13	Y	The PRQLs for headspace gas VOCs were met for all analyses as evidenced by the analytical batch data reports.
14		The overall completeness, comparability, and representativeness QAOs were met for each of the analytical and testing procedures as specified in the WAP Sections B3-2 through B3-9 prior to submittal of a waste stream profile form for a waste steam or waste stream lot.

	Completeness	Comparability	Representativeness
Radiography	Y	Y	Y
VE	NA	NA	NA
Headspace Gas Analysis	Y	Y	Y
Solids Sampling	NA	NA	NA
Solids VOCs	NA	NA	NA
Solids SVOCs	NA	NA	NA
Solids Metals	NA	NA	NA

Comments: NONE

Signature of Site Project Manager | Richard Kantrowitz (Printed Name) | 5/18/2010 (Date)

SUMMATION OF ASPECTS OF AK SUMMARY REPORT: WASTE STREAM OR-CHEM-CH-HET

Overview

Waste stream OR-CHEM-CH-HET is contact-handled (CH) transuranic (TRU) heterogeneous debris waste generated in the Radioactive Materials Analytical Laboratory (RMAL) in Building 2026 at the Oak Ridge National Laboratory (ORNL) in Oak Ridge, Tennessee. Building 2026 provided analytical services support to a variety of programs including advanced reactor programs, isotopes production programs, and waste characterization programs as well as analytical development work and research and development (R&D) activities. Building 2026 is being deactivated.

Waste stream OR-CHEM-CH-HET was generated from the analysis of samples originating from defense and non-defense programs. The defense programs included the Liquid-Metal Fast Breeder Reactor (LMFBR) Program, the Light-Water Breeder Reactor (LWBR) Program, the Consolidated Fuel Reprocessing Program (CFRP), the Gunite and Associated Tank (GAAT) characterization program, and the Low-Level Liquid Waste (LLLW) storage tank characterization program. The defense activity that generated waste stream OR-CHEM-CH-HET is "defense nuclear waste and materials by-products management" because the waste was derived from the analysis of samples originating from defense programs. Samples analyzed in Building 2026 originated from defense and non-defense programs; however, waste management practices did not require segregation of the waste derived from the analysis. Therefore, the waste generated from the analysis of these samples is commingled.

This Summation of Aspects of the AK Summary Report includes information to support Waste Stream Profile Form (WSPF) number OR-CHEM-CH-HET for CH TRU heterogeneous debris. The primary source of information for this summation is CCP-AK-ORNL-005, *Central Characterization Project Acceptable Knowledge Summary Report For Oak Ridge National Laboratory Contact-Handled Transuranic Waste from Analytical Chemistry Laboratory Operations, Waste Stream: OR-CHEM-CH-HET,* Revision 0, September 24, 2009. CCP-AK-ORNL-005 includes information obtained from numerous sources, including facility safety basis documentation, historical document archives, generator and storage facility waste records and documents, program/processing documentation, and interviews with knowledgeable personnel.

Waste Stream Identification Summary

Waste Stream Name:	Heterogeneous Debris from Analytical Chemistry Laboratory Operations
Waste Stream Number:	OR-CHEM-CH-HET
Site Where TRU Waste Was Generated:	Oak Ridge National Laboratory
Site Where TRU Waste Is Currently Stored:	Oak Ridge National Laboratory
Facility Where TRU Waste Was Generated:	Building 2026
Waste Stream Volume – Current:	88 55-gallon drums
Waste Stream Volume – Projected:	122 55-gallon drum equivalents (from repackaging of 8 boxes totaling 900 cubic feet)
Dates of Waste Generation:	1971 – 2005
TRUPACT-II Content code (TRUCON):	OR 125, OR 225, SQ 154
Summary Category Group	S5000- Debris Waste

Waste Matrix Code:	S5400, Heterogeneous Debris
Waste Matrix Code Group	Heterogeneous Debris Waste
Waste Stream TWBIR Identification:	OR-CHEM-CH-HET
RCRA EPA Hazardous Waste Numbers:	D004, D005, D006, D007, D008, D009, D011, D019, D022, F002, and F005

Waste Stream Description and Physical Form

Waste stream OR-CHEM-CH-HET is comprised primarily of organic and inorganic debris waste items and generally consists of cellulosics, plastic, rubber, glass, and metal. Examples of waste items include:

- Iron-based metal items consist of angle iron, banding, bearings, clips, containers (e.g., buckets, cans, drums), fittings, gloveboxes (disassembled and packaged into drums), hand tools (e.g., flashlight, forceps, scissors, sprayers, tweezers, vise, wrenches), hardware (e.g., bolts, clamps, nails, nuts, screws, washers), labware (e.g., beakers, funnels, pans, ring stands, stir rods), lids, pipe, planchets, plates, racks, radiation sources (e.g., Am-241, Cd-109), rods, saw blades, screens, weights, and wire.
- Aluminum metal items include cans, foil, manipulator rings, respirator cartridges, sample mounts, and weighing tins.
- Other metals may include copper (e.g., tubing, wire) and lead (e.g., bricks, pigs, and shot).
- Other inorganic materials consist of absorbents/adsorbents (e.g., Nochar [proprietary organic polymer absorbent], Quick-Solid [organic polymer absorbent], silica gel, vermiculite), asbestos, ceramics (e.g., crucibles), charcoal, concrete chunks and chips, glass (e.g., beakers, bottles, burettes, columns, desiccators, flasks, glovebox windows, jars, light bulbs, Petri dishes, pipettes, thermometers, tubing), and graphite.
- Cellulosic items include cardboard (e.g., boxes, cartons, liner inserts), cheesecloth, cloth liners, cloth rags, coveralls, filter paper, Herculite cloth, leather gloves, masking tape, mop heads, paint brushes, paper (e.g., sheet, towels), smears, wipes, and wood (e.g., cart, handles).
- Plastic items include bags, bottle caps, containers (e.g., bottles, buckets, jugs), disks, electrical cord, fittings, hoods, labware (e.g., beakers, pipette tips, vials), nylon belts, pipe, plexiglass, rope, sheeting, suits, tape, tubing, and wax.
- Rubber items consist of bands, booties, bulbs, gaskets, gloves, hose, o-rings, respirators, stoppers, and styrofoam.
- Other waste items may include lab equipment and electrical devices (e.g., alkaline batteries, balance, centrifuge, hot plate, jack, light fixture, motors, muffle furnace, probe, pump, scale, tumbler, and vacuum cleaner), wood and metal framed high efficiency particulate air (HEPA) filters and roughing filters, and small amounts of absorbed liquids, filter cake, floor sweepings, ion-exchange resin, sludge sample residue, and soil samples.

Waste stream OR-CHEM-CH-HET was generated from a single process or from an activity that is similar in material, physical form, and hazardous constituents and is therefore a single waste stream.

Point of Generation

Location

Waste stream OR-CHEM-CH-HET was generated at the ORNL which is located on the DOE Oak Ridge Reservation within the Bethel and Melton Valleys of Roane County, Tennessee, approximately six miles southwest of the city of Oak Ridge and about 23 miles west of downtown Knoxville.

Area and/or Buildings of Generation

Waste stream OR-CHEM-CH-HET was generated in the RMAL in Building 2026 located in the main ORNL area on Hillside Avenue and Third Street. TRU waste from Building 2026 was generated primarily in several glovebox laboratories but also includes some waste from the hot cell containment area and the facility ventilation system.

Generating Processes

Description of Waste Generating Processes

TRU waste was generated in Building 2026 from a wide range of analytical chemistry support activities including inorganic, organic, and radiochemical analyses to both the R&D divisions and plant operations. In addition, the facility performed R&D activities involving a broad range of physical, chemical, and radiochemical measurements on radioactive materials. TRU waste was also generated during facility maintenance and cleanup.

RCRA-regulated chemicals used or present in this waste stream are provided below in Table 1. The use/source of the RCRA-regulated chemicals are provided in the Hazardous Waste Determinations section below. Examples of ignitable, corrosive, and reactive chemicals used in Building 2026 are also provided in the Hazardous Waste Determinations section below.

Analytical Laboratory Operations

Routine sample preparation and analytical activities were conducted following controlled standard analytical methods. Sample preparation techniques include dilution, dissolution, distillation, evaporation, extraction, Florosil cleanup, ion-exchange separation, microwave assisted acid digestion, precipitation, sulfuric acid/permanganate cleanup, and titration. Numerous analytical techniques have been identified and include:

- Alpha Counting
- Alpha Pulse Height Analysis
- Alpha Spectrometry
- Atomic Absorption Spectroscopy
- Beta Counting
- Cold Vapor Atomic Absorption
- Coulometry
- Density Determination
- Electrochemistry
- Electrometric pH Measurement
- Emission Spectroscopy
- Extraction Chromatography
- Free Acid Determination
- Gamma-ray Spectrometry
- Gas Chromatography
- Gas Chromatography-Electron Capture Detection
- Gas Chromatography-Flame Ionization Detection
- Gas Chromatography-Mass Spectrometry
- Graphite Furnace Atomic Absorption

- Gross Alpha Measurement
- Ignitability Determination
- Inductively Coupled Plasma-Atomic Emission Spectroscopy
- Inductively Coupled Plasma-Mass Spectrometry
- Infrared Analysis for Carbon
- Ion Chromatography
- Isotope Dilution Mass Spectrometry
- Liquid Scintillation Counting
- Mercury Porosimetry
- Moisture Content Analysis
- Optical Fluorescence
- Optical Spectrophotometry
- Oxygen and Hydrogen Content Analysis
- Oxygen-to-Metal Ratio
- Particle Size Analysis
- Potentiometric titration
- Spark-Source Mass Spectrometry
- Surface Area Determination
- Thermal Ionization Mass Spectrometry
- Total Organic Carbon
- Total Plutonium Analysis
- Toxicity Characteristic Leaching Procedure
- X-ray Absorption
- X-ray Fluorescence

Research and Development Operations

In addition to the primary analytical laboratory functions, R&D activities were also conducted in Building 2026, as follows.

- Nuclear-coating test program which included decontamination factor, radiation resistance, and simulated loss of coolant accident testing
- Nuclear fuel cycle studies including water chemistry of nuclear reactors, nuclear waste management, and separations processes
- Irradiated-fuel fission-product release studies
- Liquid waste treatment and decontamination process development studies
- Separation of Ag-110 from Pd-109 wire for use in cancer therapy

Facility Maintenance and Cleanup

Facility maintenance and cleanup activities included the following:

- Equipment repairs (e.g., refurbishment of the hot cell manipulators, repair of intercell conveyor).
- Removal of obsolete or un-repairable equipment from the hot cells.
- Cell repair (e.g., clearing of clogged drain lines, replacement of drain headers).
- Renovation, decontamination, and painting of the cell interiors.
- Routine exhaust filter changes, and facility ventilation system upgrades.
- Installation and repair of the building drain system.
- Decontamination of the filter pit area.
- Contamination incident cleanup.

Transuranic Waste Processing Center (TWPC)

Repackaging of this waste stream began in 2006 and is an ongoing process.

- Drums containing CH-TRU waste in this waste stream were emptied into sorting trays in the TWPC.
- The waste was sorted and segregated to remove prohibited items and repackaged.
- Prohibited items identified during repackaging of drums and boxes were removed from the waste stream or were remediated.
- Secondary wastes created during waste processing, such as rubber glovebox gloves and tools, were placed into the same TRU waste drums.

Table 1 identifies the toxicity characteristic (TC) and F-listed chemicals, as applicable, in waste stream OR-CHEM-CH-HET.

Table 1 – Metal and Organic Toxicity Characteristic and F-Listed Waste Stream Contaminants

Constituent	CAS #	EPA Hazardous Waste Number
Arsenic	7440-38-2	D004
Barium	7440-39-3	D005
Cadmium	7440-43-9	D006
Chromium	7440-47-3	D007
Lead	7439-92-1	D008
Mercury	7439-97-6	D009
Silver	7440-22-4	D011
Carbon tetrachloride	56-23-5	D019
Chloroform	67-66-3	D022
Chlorobenzene	108-90-7	F002
Methylene chloride	75-09-2	F002
Tetrachloroethylene	127-18-4	F002
Trichloroethylene	79-01-6	F002
1,1,1-Trichloroethane	71-55-6	F002
1,1,2-Trichloroethane	79-00-5	F002
Benzene	71-43-2	F005
Carbon disulfide	75-15-0	F005
Methyl ethyl ketone	78-93-3	F005
Pyridine	110-86-1	F005
Toluene	108-88-3	F005

RCRA Determinations

Ignitability, Corrosivity, Reactivity

Waste generated in this waste stream does not qualify for any of the exclusions outlined in 40 Code of Federal Regulations (CFR) 260 or 261. Real Time Radiography (RTR) or visual examination (VE) is used to verify that the waste stream is not a liquid waste and does not contain explosives, non-radioactive pyrophoric materials, compressed gases or reactive waste. Therefore, this waste stream does not exhibit the characteristic for ignitability (D001), corrosivity (D002), or reactivity (D003).

Ignitability

The waste does not exhibit the characteristic of ignitability as identified in 40 CFR 261.21. The materials are not liquid, compressed gases, or oxidizers, and are not capable of causing fire through friction, absorption of moisture, or spontaneous chemical change. The materials are not liquid, and RTR and/or VE are performed to ensure the absence of prohibited liquids.

Examples of ignitable liquids used in Building 2026 include acetone, benzene, dodecane, methanol, methyl isobutyl ketone, and xylene. Solutions containing oxidizing compounds were also used in Building 2026. Examples of oxidizing compounds include dichromate, hypochlorite, nitrate, perchlorate, permanganate, and peroxide compounds. Waste management practices in the facility prohibited the accumulation of liquids in this waste stream and the waste stream is not liquid waste (References C154, C155, C156, P111, P1174, P1178, P1182, P1183, P1186, P1193, P1225, P1228).

Free liquid, pyrophoric material, and compressed gases were verified to be absent in TRU waste in accordance with the ORNL Health Physics Manual and facility-specific procedures (References P241, P244, P566, P956, P1176, P1184). Small quantities of pyrophoric material were handled in Building 2026 as analytical samples or as analytical reagents or standards. The total amount of pyrophoric materials present in the facility were typical for laboratory operations and were not a significant hazard (Reference P1174). Because hot cells and gloveboxes were operated under an air atmosphere, pyrophoric materials were completely reacted and are not in TRU waste (Reference P1228).

To ensure the waste does not exhibit the characteristic of ignitability, liquid in excess of TSDF-WAC limits are removed or immobilized, and compressed gases (e.g., aerosol cans) will be removed or vented prior to WIPP disposal. Therefore, this waste does not exhibit the characteristic of ignitability (D001).

Corrosivity

This waste does not meet the definition of corrosivity as defined in 40 CFR 261.22. The materials are not liquid, and RTR and/or VE are performed to ensure the absence of prohibited liquids.

Numerous acidic and caustic liquids were used in Building 2026. Examples of acids and caustic liquids include: hydrochloric acid, hydrofluoric acid, nitric acid, oxalic acid, perchloric acid, phosphoric acid, sulfuric acid, ammonium hydroxide, barium hydroxide, potassium hydroxide, sodium carbonate, and sodium hydroxide. Waste management practices in the facility prohibited the accumulation of liquids in this waste stream. (References C154, C155, C156, P111, P1174, P1225, P1228, P1178, P1182, P1183, P1186, P1193, U113, U115).

Free liquid and corrosive materials were verified to be absent in TRU waste in accordance with the ORNL Health Physics Manual and facility-specific procedures (References P241, P244, P566, P956, P1176, P1184).

To ensure the waste does not exhibit the characteristic of corrosivity, liquid in excess of TSDF-WAC limits are removed or immobilized prior to WIPP disposal. Therefore, this waste does not exhibit the characteristic of corrosivity (D002).

Reactivity

This waste stream does not meet the definition of reactivity as defined in 40 CFR 261.23. The materials are stable and will not undergo violent chemical change. The materials will not react violently with water, form potentially explosive mixtures with water, or generate toxic gases, vapors, or fumes when mixed with water.

Releasable cyanides and sulfides were measured in samples but at low concentrations that would not be reactive or explosive (References P090, P228, P1232). The use of alpha radiation as a primary excitation source by mixing americium oxide powder with selected inorganic phosphors (cadmium sulfide-silver, zinc sulfide-copper, and zinc-cadmium sulfide-copper) was also evaluated in Building 2026 (Reference P958). Lithium was the only reactive metal identified as being used in analytical activities. The lithium was used as a reducing agent and was completely reacted during the activity (Reference P958).

Small quantities of explosive material were handled in Building 2026 as analytical samples or standards. The total amount of explosive material did not exceed the limits of Class A, Class B, or Class C explosives (Reference P1174). Several chemicals with explosive properties (e.g. 2,4-dinitrophenol, hydrazine, and perchloric acid) were used in Building 2026 or were detected in samples. Waste management practices in the facility required liquids to be collected separately from solid waste. Therefore, they are not included in this waste stream. Liquids were released to the liquid waste system drains (References C154, C155, C156, P111, P1174, P1178, P1182, P1183, P1186, P1193, P1225, P1228).

Free liquid and explosives were verified to be absent in TRU waste in accordance with the ORNL Health Physics Manual and facility-specific procedures (References P241, P244, P566, P956, P1176, P1184).

To ensure the waste does not exhibit the characteristic of reactivity, liquid in excess of TSDF-WAC limits are removed or immobilized, and compressed gases (e.g., aerosol cans) are removed or vented prior to WIPP disposal. Therefore this waste stream does not exhibit the characteristic of reactivity (D003).

Toxicity

This waste stream exhibits the characteristic of toxicity per 40 CFR 261.24. The toxicity characteristic contaminants fall into two categories; metals and organics. Where a constituent has been identified and there is no quantitative data available to demonstrate that the concentration is below regulatory threshold, the applicable EPA HWN is conservatively applied to the waste stream.

Several uses and sources have been identified for arsenic, barium, cadmium, chromium, lead, mercury, silver, carbon tetrachloride, and chloroform. Arsenic is a component of Arsenazo (III) used as a color reagent and thorium stripping agent (References P958, P959, P963). Tetraphenylarsonium pertechnetate was used as a precipitation agent (Reference P963). Barium chloride was a stock solution (Reference P1223). Barium hydroxide was used as a precipitation agent (Reference P015). Cadmium oxide was a stock solution (Reference P1223). Cadmium sulfide was a phosphor component (Reference P958). Chromium oxide and chromium fluoride were test materials (References P082, P478). Potassium dichromate was used as an oxidizing agent (References P477, P964, P1192). Lead was used as shielding (e.g., pig) and is present in solder from incandescent

lights used in hot cells (References I028, P015, P034, P053, P054, P080, P085, P090, P221, P228, P246, P961, P963, P964, P1225, P1230, P1231, P1232, P1233). Mercury was used in mercury porosimetry analysis, complexometric titration, and is present in mercury vapor lights used in hot cells (References I028, P011, P015, P034, P053, P054, P080, P082, P083, P085, P090, P133, P221, P228, P451, P477, P958, P959, P960, P961, P963, P964, P971, P976, P1192, P1225, P1228, P1230, P1231, P1232, P1233). Silver oxide was used as an oxidizing agent (Reference P015). Silver nitrate was used as a titrant and a precipitation agent (References P015, P082, P961, P1179, P1191, P1223)

Carbon tetrachloride was used as a chlorination agent and as an organic solvent (References P015, P053, P054, P056, P085, P221, P958, P1225, P1233). Chloroform was used as an organic solvent (References P085, P090, P959).

Since analytical data are not available to demonstrate the concentrations of these metal and organic compounds in this debris waste stream are less than the regulatory threshold, EPA hazardous waste numbers D004, D005, D006, D007, D008, D009, D011, D019, and D022 are assigned to waste stream OR-CHEM-CH-HET (Reference DR014).

Benzene, chlorobenzene, methyl ethyl ketone, pyridine, tetrachloroethylene, and trichloroethylene were used in the process that generated this waste stream. As described below, the F-listed EPA hazardous waste numbers have been assigned for these compounds, and therefore, EPA hazardous waste numbers D018, D021, D035, D038, D039, and D040 are not assigned to the waste stream.

Selenious acid was used in the preparation of analytical standard samples. Based on the concentration of selenium in the standard and presence in discarded material, the concentration of selenium (D010) is below regulatory threshold. Therefore, EPA hazardous waste number D010 is not assigned to the waste stream (Reference DR014).

Toxicity characteristic pesticides and other organic compounds consisting of endrin (D012), lindane (D013), methoxychlor (D014), toxaphene (D015), cresols (D026), 1,4-dichlorobenzene (D027), 1,2-dichloroethane (D028), 1,1-dichloroethylene (D029), 2,4-dinitrotoluene (D030), heptachlor (D031), hexachlorobenzene (D032), hexachloroethane (D034), nitrobenzene (D036), pentachlorophenol (D037), and 2,4,5-trichlorophenol (D041) were used as analytical standards and some of these chemicals were detected in tank waste samples that contaminate the waste. No other use or source for these compounds has been identified. The amount of these compounds present in this waste stream from discarded solid sample material (e.g., sludge) or contaminated secondary waste (e.g., lab equipment, and wipes) is below the regulatory threshold. Therefore, EPA hazardous waste numbers D012, D013, D014, D015, D026, D027, D028, D029, D030, D031, D032, D034, D036, D037, and D041 are not assigned to the waste stream.

Listed Waste

F-Listed Waste

Waste stream OR-CHEM-CH-HET was mixed with or derived from F-listed hazardous wastes from non-specific sources as listed in Title 40 *Code of Federal Regulations* (CFR) 261.31. F002 and F005 listed solvents were used in the Radioactive Materials Analytical Laboratory (RMAL) in Building 2026 and contaminate the waste (Reference DR014).

Although several F001-listed solvents were identified in the AK record (i.e., carbon tetrachloride), these listed solvents were not used in a "large-scale" degreasing operation such as cold cleaning or vapor degreasing. The RMAL in Building 2026 did not conduct large-scale degreasing operations, and therefore, EPA HWN F001 is not assigned to this waste stream.

The F002-listed solvent methylene chloride was used as an organic solvent, elution solvent, and extraction agent, and was detected in tank waste samples (References P034, P053, P054, P080, P085, P221, P228, P1223, P1231, P1233). Therefore, EPA hazardous waste number F002 is assigned to this waste stream.

Tetrachloroethylene was identified in gas scrubbing solution effluent and in tank waste samples (References P085, P963, P1231). 1,1,1-Trichloroethane and 1,1,2-trichloroethane were detected in tank waste samples (References I028, P090). Chlorobenzene and trichloroethylene were used to prepare analytical standards and were detected in tank waste samples (References P053, P085, P1223, P1233). The use of these solvents in the preparation of standards does not constitute solvent use under RCRA, and the specific use of the solvents in tank waste samples has not been identified. However, since this waste stream is assigned EPA hazardous waste number F002 due to methylene chloride solvent use, the F002 HWN is also conservatively assigned for the additional solvents.

The F005-listed solvents benzene, carbon disulfide, methyl ethyl ketone, pyridine, and toluene were used as organic solvents in the laboratory (References P053, P054, P082, P085, P090, P959, P960, P963, P1223, P1225). Therefore, EPA hazardous waste number F005 is assigned to this waste stream.

F003 constituents including acetone, n-butyl alcohol, cyclohexanone, ethyl acetate, ethyl benzene, methanol, methyl isobutyl ketone, and xylene were also used in Building 2026. These solvents are listed solely as ignitable in the liquid form. The waste stream does not exhibit the characteristic of ignitability because it is not liquid; therefore, F003 is not assigned.

The following F-listed constituents may contaminate the waste and are conservatively applied:

F002 – Chlorobenzene, methylene chloride, tetrachloroethylene, trichloroethylene, 1,1,1-trichloroethane, and 1,1,2-trichloroethane

F005 – Benzene, carbon disulfide, methyl ethyl ketone, pyridine, and toluene.

U, K and P-Listed Wastes

Waste stream OR-CHEM-CH-HET was not mixed with a discarded commercial chemical product, an off-specification commercial chemical product, or a container residue or spill residue thereof (40 CFR 261.33). Based on the AK documentation reviewed, there is no evidence that unused commercial products were disposed of in TRU waste drums.

Beryllium and beryllium compounds may contaminate this waste stream. Based on the AK documentation reviewed, the form of beryllium used does not meet the definition of commercial chemical product beryllium powder (40 CFR 261.33). Therefore, the waste stream does not meet the definition of P015 waste.

The review of the AK source documentation did not identify the disposal of unused hydrofluoric acid (U134) or disposal of materials contaminated with spills of this acid; therefore the EPA HWN U134 is not assigned to waste stream OR-CHEM-CH-HET.

Waste stream OR-CHEM-CH-HET does not include any of the manufacturing process wastes from the specific industries or sources listed in 40 CFR 261.32.

Waste Stream OR-CHEM-CH-HET is not assigned any U-, K-, or P-Listed EPA HWNs.

Conclusion

The EPA hazardous waste numbers that apply to the waste stream are D004, D005, D006, D007, D008, D009, D011, D019, D022, F002, and F005.

Headspace Gas/Volatile Organic Compound Information

Headspace gas analysis was performed on 10 randomly selected containers in Lot 1 of this waste stream. One target analyte UCL_{90} value (methanol) exceeded its respective program required quantitation limits (PRQLs). Because this waste is not liquid, F003 (methanol) is not applied. No tentatively identified compounds were identified.

No new EPA hazardous waste numbers were added as a consequence of headspace gas sampling and analysis. The specifics of this information are included in the attached Characterization Information Summary report.

Polychlorinated Biphenyls

This waste stream contains PCBs, and therefore is regulated as Toxic Substances Control Act waste under 40 CFR 761.

Based on discussions with ORNL personnel, some drums in this waste stream contain equipment with small PCB capacitors and pumps that contained PCB oil. The oil was drained from the pumps and is not included in this waste stream. Residual oil that could not be drained from the pump was absorbed. Examples of equipment containing small capacitors include fluorescent light ballasts and electric motors such as a vacuum pump motor. There was no concerted effort to inventory pumps or electrical equipment containing small capacitors to determine if they contained PCBs so these items are potentially present in this waste stream (Reference C308).

Sludge and liquid samples were collected from numerous tanks at ORNL and analyzed for PCBs (References I028, P053, P054, P085, P221, P228, P1230, P1232). Most of the samples did not contain regulated levels of PCBs, but one tank sampled in 1993 did contain sludge with between 105 and 241 parts-per-million (ppm) Aroclor-1248 (Reference P228).

Containers with PCB waste, identified during RTR and/or VE, will be managed in accordance with the PCB disposal requirements in the Waste Isolation Pilot Plant-Waste Acceptance Criteria.

Prohibited Items

The absence of prohibited items is determined and documented through acceptable knowledge and characterization activities. Radiography or VE is performed on each container to verify the absence of prohibited items. The following items have been determined as not present in the waste:

- Liquid waste
- Non-radioactive pyrophoric materials
- Hazardous wastes not occurring as co-contaminants with TRU mixed wastes (non-mixed hazardous waste)
- Waste incompatible with backfill, seal and panel closure materials, container and packaging materials, or other wastes
- Explosives or compressed gases
- Waste with PCBs not authorized under an EPA PCB waste disposal authorization
- Waste exhibiting the characteristics of ignitability, corrosivity, or reactivity

- Waste that has ever been managed as high-level waste and waste from tanks specified in Table B-8 of the WIPP HWFP, unless specifically approved through a Class 3 permit modification.
- Any waste container from a waste stream (or waste stream lot) which has not undergone either radiographic or visual examination of a statistically representative subpopulation of the waste stream in each shipment, as described in WIPP HWFP Attachment B7.

Each container of waste is certified and shipped only after radiography or VE either:

- Did not identify any prohibited items in the waste container, or
- All prohibited items found in a waste container by radiography or VE are identified and corrected (i.e., eliminated or removed) through the site non-conformance reporting system.

Method for Determining Waste Material Parameter Weights per Unit of Waste

The waste material parameters (WMPs) for waste stream OR-CHEM-CH-HET were derived from limited VE performed at the TWPC. An analysis of the VE data was performed, the results of which are presented in Table 2. This evaluation is documented in a memorandum as required by CCP-TP-005, *CCP Acceptable Knowledge Documentation.*

The WMPs, average weight percent and weight percent range are presented in Table 2.

Table 2. Waste Stream OR-CHEM-CH-HET Waste Material Parameter Estimates

Waste Material Parameter	Average Weight Percent	Weight Percent Range
Iron-based Metals/Alloys	16.7%	0% – 43.5%
Aluminum-based Metals/Alloys	2.0%	0% – 6.3%
Other Metals	2.7%	0% – 8.7%
Other Inorganic Materials	3.9%	0% – 12.5%
Cellulosics	30.9%	0% – 64.9%
Plastics (waste materials)	24.2%	0% – 32.4%
Rubber	19.6%	0% – 52.5%
Organic Matrix [1]	<1.0%	0% – <50%
Inorganic Matrix [2]	<1.0%	0% – <50%
Soil/Gravel [3]	<1.0%	0% – <50%

1. Although not identified in limited VE data, small amounts of organic matrix may be present in this waste stream. The TWPC uses NOCHAR Petrobond ® (organic polymer absorbent) to absorb residual liquids. Building 2026 used Quick-Solid (organic polymer absorbent) to absorb residual liquids. Some ion-exchange resin may also be present in the waste stream.
2. Although not identified in limited VE data, small amounts of inorganic matrix may be present in this waste stream in the form of filter cake, floor sweepings, and sludge sample residues.
3. Although not identified in limited VE data, small amounts of soil samples may be present in the waste stream.

List of Any AK Sufficiency Determinations Requested for the Waste Stream

No AK Sufficiency Determinations were requested for this waste stream.

Transportation

This waste stream and its chemical constituents have been reviewed for consistency with the listed TRUCON codes and they are consistent.

Beryllium

Beryllium will not be present in amounts greater than 1% by weight of the waste in each drum.

Radionuclide Information

The two most prevalent radionuclides in this waste stream, by weight, based on the un-decayed data reported in AK are U-238 and Th-232. The isotopes expected to be present in this waste stream are listed in Table 3.

Table 3 – Radionuclides in Waste Stream OR-CHEM-CH-HET

WIPP-Tracked	Other Radionuclides Present		
Am-241	Co-60	Eu-154	Cm-242
Pu-238	Zr-95	Eu-155	Cm-244
Pu-239	Ru-106	Ac-227	Cf-252
Pu-240	Cd-109	Th-232	
Pu-242	Ag-110m	U-232	
U-233	Cs-134	U-235	
U-234	Ce-141	U-236	
U-238	Ce-144	Np-237	
Cs-137	Pm-147	Pu-241	
Sr-90	Eu-152	Am-243	

Payload management will not be implemented for this waste stream.

Attachment 1, AK SOURCE DOCUMENTS, SUPPLEMENTAL DOCUMENTATION

Source Document Number	AK #	Title	Document Number	Revision	Date
C080	S7	Interview with John Keller: Waste generating activities and waste management practices at Building 2026.	NA	NA	05/09/2005
C154	NA	Interview of John Keller	NA	NA	06/23/2009
C155	NA	Interview of Rob Peacher	NA	NA	06/25/2009
C156	NA	Interview of Harold Hall	NA	NA	06/25/2009
C308	S7	Interview of Jason Taylor, ORNL-PCB Coordinator from 1997 - 2004 re: PCB Management at ORNL	NA	NA	04/08/2008
DR014	S2	Discrepancy Resolution – Waste Stream OR-CHEM-CH-HET EPA Hazardous Waste Number Assignment	NA	NA	12/30/2009
I028	S9	Results of the Characterization and Acid Dissolution Tests of Sludge Samples from Waste Tank W1-I at ORNL	ORNL/CF-98/23	NA	07/1998
M151	S6	EM Waste Database Query	DR-09-001168	NA	04/29/2009
M163	S10	Material Safety Data Sheets for Chemicals Used in Building 2026	NA	NA	NA
P011	NA	Analytical Chemistry Division Annual Progress Report, Period Ending November 30, 1976	ORNL-5244	NA	02/1977
P015	NA	Analytical Chemistry Division Annual Progress Report for Period Ending December 31, 1979	ORNL-5619	NA	05/1980
P022	S5	Site Descriptions of Environmental Restoration Units at Oak Ridge National Laboratory, Oak Ridge, Tennessee	ORNL/ER-391	NA	02/1997
P034	S5 S9	Characterization of the Old Hydrofracture Facility (OHF) Waste Tanks Located at ORNL	ORNL/TM-13394	NA	04/1997
P053	S9	Characterization of Selected Waste Tanks from the Active LLLW System	ORNL/TM-13248	NA	08/1996
P054	S9	Characterization of the BVEST Waste Tanks Located at ORNL	ORNL/TM-13358	NA	01/1997
P056	S5	Analytical Chemistry Division Annual Progress Report, Period Ending November 30, 1975	ORNL-5100	NA	02/1976
P080	S9	Characterization of the C1 and C2 Waste Tanks Located in the BVEST System at ORNL	ORNL/TM-13546	NA	02/1998
P082	NA	Analytical Chemistry Division Annual Progress Report, Period Ending September 30, 1974	ORNL-5006	NA	01/1975
P083	NA	Analytical Chemistry Division Annual Progress Report for Period Ending December 31, 1982	ORNL-5949	NA	05/1983

Source Document Number	AK #	Title	Document Number	Revision	Date
P085	S9	Sampling and Analysis of the Inactive Waste Storage Tank Contents at ORNL	ORNL/ER-13	NA	09/1990
P090	S9	Sampling and Analysis of the Inactive Waste Tanks TH-2, WC-1, and WC-15	ORNL/ER-19	NA	02/1992
P111	S5 S7	Review of Opportunities For Consolidation of Operations Within the ORNL Hot Cells	ORNL/M-2971	NA	08/1993
P133	NA	Analytical Chemistry Division Annual Progress Report for Period Ending December 31, 1980	ORNL-5738	NA	05/1981
P221	S9	Characterization of the MVST Waste Tanks Located at ORNL	ORNL/TM-13357	NA	12/1996
P228	S9	Sampling and Analysis of Inactive Radioactive Waste Tanks W-17, W-18, WC-5, WC-6, WC-8, and WC-11 through WC-14 at ORNL	ORNL/TM-13017	NA	12/1995
P241	S2	Oak Ridge National Laboratory Contact-Handled Transuranic Waste Certification Program Plan	ORNL/TM-10322	Revs. 1, 2, 3	06/1992
P244	S2	Certification Document for Newly Generated Contact-Handled Transuranic Waste	ORNL-5985/R1	Rev. 1	05/1984
P246	NA	Preliminary Radiological Characterization of Fifteen Waste Tanks at Oak Ridge National Laboratory	ORNL/CF-84/203	NA	09/1984
P251	S2	Box Breakdown Area Operations	CH-P-OP-003	Revs. 7, 9, 12, 15	03/13/2007 - 03/23/2009
P252	S2	Glove Box Operations	CH-P-OP-004	Revs. 8, 10, 14, 17	03/13/2007 - 03/23/2009
P253	S2	Drum Bag In/Bag Out and Glove Ports	CH-P-OP-011	Rev. 10, 12, 13, 14	05/02/2007 - 03/23/2009
P254	S2	Contact Handled Waste Repackaging	CH-P-OP-013	Revs. 6, 7, 8, 9	04/30/2007 - 03/23/2009
P256	S3	TRU/Alpha Low Level Waste (LLW) Treatment Project Documented Safety Analysis	T-CM-FW-R-AD-001	Rev. 13	03/01/2007
P364	S5	Analytical Chemistry Division Annual Progress Report for Period ending December 31, 1992	ORNL-6749	NA	04/1993
P432	S3	TRU Waste Processing Center Document Safety Analysis	CM-R-AD-001	Revs. 15, 16, 17	10/31/2007 10/24/2008
P451	NA	Analytical Chemistry Division Annual Progress Report for Period Ending December 31, 1991	ORNL-6701	NA	02/21/1992
P477	NA	Analytical Chemistry Division Annual Progress	ORNL-6236	NA	05/08/1986

Source Document Number	AK #	Title	Document Number	Revision	Date
		Report for Period Ending December 31, 1985			
P478	NA	Analytical Chemistry Division Annual Progress Report for period Ending December 31, 1984	ORNL-6139	NA	04/19/1985
P485	S10	Problem Safety Summary for Lab-Scale Hot-Cell Studies (Consolidated Fuel Cycle Studies) for Cell 5, Building 2026	CD-65	NA	1984-1994
P566	NA	ORNL Health Physics Manual; Procedures RP-4.1; RP-4.2; RP-5.1	ORNL/M-804	NA	11/02/1994
P905	S2	Health Physics Procedure - Handling and Transfer of Radioactive Materials within the Laboratory and Guide for the Transfer of Materials Between Contaminated Enclosure Systems and Non-Contaminated Areas	Procedure 4.1	NA	01/01/1976
P956	NA	Procedure 5.1 - Segregation and Management of solid Radioactive Waste Materials and supporting Solid Waste Management Documentation	Procedure 5.1	NA	12/15/1983 12/15/1985
P958	S5	Analytical Chemistry Division Annual Progress Report for Period Ending September 30, 1970	ORNL-4636	NA	01/18/1971
P959	S5	Analytical Chemistry Division Annual Progress Report for Period Ending September 30, 1971	ORNL-4749	NA	01/11/1972
P960	S5	Analytical Chemistry Division Annual Progress Report Period Ending September 30, 1972	ORNL-4838	NA	01/12/1973
P961	S5	Analytical Chemistry Division Annual Progress Report Period Ending September 30, 1973	ORNL-4930	NA	01/23/1971
P962	S5	Analytical Chemistry Division Annual Progress Report Period Ending November 30, 1977	ORNL-5360	NA	03/1978
P963	S5	Analytical Chemistry Division Annual Progress Report Period Ending December 31, 1978	ORNL-5518	NA	06/05/1979
P964	S5	Analytical Chemistry Division Annual Progress Report for Period Ending December 31, 1983	ORNL-6039	NA	05/23/1984
P965	S5	Analytical Chemistry Division Annual Progress Report for Period Ending December 31, 1986	ORNL-6357	NA	05/20/1987
P966	S5	Analytical Chemistry Division Annual Progress Report for Period Ending December 31, 1988	ORNL-6547	NA	06/01/1989
P971	NA	From: Radioactive Operations Committee, To: Alvin M. Weinberg; F. L. Culler, Subject: Radioactive Operations Committee Review of High Level Analytical Laboratory, Building 2026, November 18, 1971	72-2-3	Rev. 0	02/01/1972
P976	NA	Chemical and Analytical Sciences Division Progress Report for the Period January 1, 1993,	ORNL-6876	Rev. 0	06/1995

Source Document Number	AK #	Title	Document Number	Revision	Date
		through December 31,1994			
P1082	NA	Lockheed Martin Energy Research Corporation, ORNL, Environmental Protection Procedure: Disposal of PCB (Polychlorinated Biphenyl) Oils	EPM-3.1	Rev. 0A	05/01/1993
P1083	NA	Environmental Protection Procedure: Polychlorinated Biphenyls (PCBs)	EPM-4.0	NA	11/20/1989 01/15/1987
P1174	NA	Safety Analysis Report Radioactive Materials Analytical Laboratory Building 2026	ORNL/CASD/2026/SAR	Rev. 0, 2-6	09/09/1999
P1175	S2	Bagging Practices and Techniques for Standard Glovebox Operations	AC-OP-100-0910	Rev. 0	06/14/1990 04/05/1989
P1176	NA	Solid Low Level Waste Certification Pain for the Low-Level Radiochemical Analysis Group	AC-OP-101-2106	Rev. 0	09/12/1994
P1177	S2	Total VOCs and SVOCs Analysis of Homogeneous Solids and Soil/Gravel for the TRU Waste Characterization Project	CASD-OP-RML-WP02	Rev. 1	02/15/1996
P1178	S2	Operating and Safety Rules For The High Radiation Level Analytical Laboratory - Building 2026	AC-OP-104-0103	Rev. 0	08/18/1989
P1179	S2	Palladium Target Processing	AC-OP-104-0906	Rev. 0	08/14/1992
P1180	S2	Cleaning Laboratory Glassware	AC-OP-104-1203	Rev. 0	06/18/1990
P1182	S2	Radiation Reduction Project For Analytical Hot Cell No. 1 ORNL Building 2026	AC-OP-105-0914	Rev. 0	08/26/1991
P1183	S2	UHP Water Pump Operations	AC-OP- 105-1209	Rev. 0	08/21/1991
P1184	S2	Handling and Packaging of Contact-Handled Transuranic Waste (CH-TRU) - HRLAL, Building 2026	AC-OP-105-2101	Revs. 0, 1	02/01/1991 08/30/1993
P1185	S2	Procedure For The Preparation And Disposal Of Solid Low-Level Radioactive Waste (LLW) - Radioactive Materials Analytical Laboratory (RMAL), Building 2026	AC-OP-105-2104	Rev. 0	09/01/1993
P1186	S2	Interim Procedure for Disposal of Liquid Radioactive Waste in the Radioactive Materials Analytical Laboratory, (RMAL), Building 2026	AC-OP-105-210	Rev. 0	10/25/1993
P1189	S2	Hot Cell Operations, Radioactive Materials Analytical Laboratory (RMAL), Building 2026	CASD-OP-RML-HC01	Rev. 2	06/08/2001
P1190	S2	Use of Glove Boxes in the Radioactive Materials Analytical Laboratory, Building 2026	CASD-OP-RML-GB01	Rev. 2	05/25/2001
P1191	S2	Palladium Target Processing, Radioactive	CASD-OP-RML-	Rev. 0	06/08/2001

Source Document Number	AK #	Title	Document Number	Revision	Date
		Materials Analytical Laboratory (RMAL), Building 2026	HC02		
P1192	S2	Immediate Action Directive For CASD-OP-RML-IN04: Activity Based Hazard Analysis	CASD-OP-RML-IN04	Rev. 0	09/30/2005
P1193	S2	Procedure For Disposal Of Liquid Radioactive Waste In The Radioactive Materials Analysis Laboratory, Building 2026	CASD-OP-RML-WM03	Rev. 0	02/24/1995
P1194	S2	Total Metals Analysis of Homogeneous Solids and Soil/Gravel for the TRU Waste Characterization Program (TWCP)	CASD-OP-RML-WP02	Rev. 1	02/15/1996
P1199	S2	Sample Management In The Radioactive Materials Analytical Laboratory (RMAL), Building 2026	CSD-OP-RML-AD02	Rev. 6	09/25/2004
P1200	S2	Use Of Glove Boxes In The Radioactive Materials Analytical Laboratory, Building 2026	CASD-OP-RML-GB01	Revs. 1, 2, 3	11/01/2006 05/25/2001 08/01/1997
P1201	S2	Guidelines for Inductively Couple Plasma Atomic Emission Spectroscopy Operation for the Radioactive Materials Analytical Laboratory.	CSD-OP-RML-IN01	Rev. 1	09/02/2003
P1202	S2	Total Plutonium, 2-Thenoyltrifluoroacetone Extraction Method	CSD-AM-RML-RA11	Rev.1	12/06/2002
P1203	S2	Determination Of Radioactive Strontium In High Level Samples Using Extraction Chromatography	CSD-AM-RML-RA-13	Rev.1	12/06/2002
P1223	S2	Standard Analytical Methods for Radioactive Materials Analytical Laboratory (RMAL) Building 2026	NA	NA	1997
P1225	S5	High Radiation Level Analytical Laboratory Building 2026 Operating And Safety Rules	NA	Rev. 0	11/1987
P1226	S5	Radioactive Operations Committee Review of the Radioactive Materials Analytical Laboratory (RMAL), Building 2026, February 9, 1979	ORNL/CF-79/54	Rev. 0	03/21/1979
P1227	S5	Radioactive Operations Committee Review of the Radioactive Materials Analytical Laboratory (RMAL), Building 2026	ORNL/CF-81/241	Rev. 0	08/11/1981
P1228	S5	Safety Analysis Report - Radioactive Materials Analytical Laboratory (Building 2026)	ORNL/CF-82/31	Rev. 0	04/12/1982
P1229	S2	ORNL Analytical Master Methods Manual	NA	Rev. 0	01/11/1988
P1230	S9 S12	Results of Fall 1994 Sampling of Gunite and Associated Tanks at the Oak Ridge National Laboratory, Oak Ridge, Tennessee.	ORNL/ER/Sub/87-99053/74	NA	06/1995
P1231	S9	Results of 1995 Characterization of Gunite and	ORNL/ER/Sub/8	NA	02/1996

Source Document Number	AK #	Title	Document Number	Revision	Date
	S12	Associated Tanks at Oak Ridge National Laboratory, Oak Ridge, Tennessee	7-99053/79		
P1232	S9 S12	Results of Sampling the Contents of the Liquid Low-Level Waste Evaporator Feed Tank W-22 at ORNL	ORNL-TM-13234	NA	09/1996
P1233	S9	Sampling and Analysis of Radioactive Liquid Wastes and Sludges in the Melton Valley and Evaporator Facility Storage Tanks at ORNL	ORNL-TM-11652	NA	09/1990
U038	S5 S9	ORNL TRU Waste Historical Survey; Volumes 1, 2, and 3	BJC/OR-395	Draft	09/2001
U044	S2 S9	Acceptable Knowledge Summary Report for Oak Ridge National Laboratory Contact-Handled TRU Debris Waste Facility Maintenance Operations	AK-ORNL-001	Revs. 3A, 4	05/24/2006 06/19/2006
U113	NA	Waste Characterization Checklist and Supporting Documentation for Building 2026	WCC-2026-Facility	Revs. 0, 1	05/24/2005 07/11/2005
U115	NA	Waste Characterization Checklist and Supporting Documentation for Separation of Th-229 from U-233 in Building 2026	WCC-2026-U233	Rev. 3	12/05/2006

Alphanumeric Designations

C	Correspondence
DR	Discrepancy Resolution
I	Internal Procedures and Notes
M	Miscellaneous
P	Published Documents
U	Unpublished Documents

AK Numbers

S1	Process Design Documents
S2	Standard Operating Procedure
S3	Safety Analysis Reports
S4	Waste Packaging Logs
S5	Test plans/research project reports
S6	Site databases
S7	Information from site personnel
S8	Standard industry documents
S9	Previous analytical data
S10	Material safety data sheets
S11	Laboratory Notebooks
S12	Comparable or surrogate sampling and analysis data
NA	Not applicable

DIVIDER

PAGE

NWP
Nuclear Waste Partnership LLC
An AECOM-led partnership with B&W and AREVA

COPY

CP:15:01265
UFC:5900.00

INTER-OFFICE CORRESPONDENCE

DATE: December 3, 2015

FROM: B. S. Schrock BSSchrock LOCATION: Certification

TO: CCP Records Custodian GSA-212 LOCATION: Central Characterization Program

SUBJECT: TRANSMITTAL OF OAK RIDGE NATIONAL LABORATORY CHARACTERIZATION INFORMATION SUMMARY FOR WASTE STREAM #OR-CHEM-CH-HET (CCP-AK-ORNL-005), LOT 6

Please accept the attached Oak Ridge National Laboratory Characterization Information Summaries to be placed in Records for Waste Stream #OR-CHEM-CH-HET (CCP-AK-ORNL-005), Lot 6.

BSS:lcg

Attachment

cc: (without attachment)
M. F. Ramirez ED
A. O. Stallings ED
D. Wade ED

CCP RECORDS ORIGINAL
DATE REC'D 12-08-2015 JY

P.O. Box 2078 • Carlsbad, New Mexico USA 88221-2078
Phone: (575) 234-7200 • Fax: (575) 234-7083

CHARACTERIZATION INFORMATION SUMMARY

WSPF# OR-CHEM-CH-HET Rev. 0 (CCP-AK-ORNL-005)

Lot 6

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CCP Characterization Information Summary Cover Page

Waste Stream #: OR-CHEM-CH-HET Lot #: 6

AK Expert Review: N/A Date: N/A

SPM Review: Rick Whiteley Date: 08/22/2015

SPM signature certifies that through Acceptable Knowledge testing and/or analysis that the waste identified in this summary is not corrosive, ignitable, reactive, or incompatible with the TSDF.

A summary of the Acceptable Knowledge regarding this waste stream containing specific information about the corrosivity, reactivity, and ignitability of the waste stream is included as an attachment to the Waste Stream Profile Form. By reference, that information is included in this lot.

List of procedures used:

Non Destructive Assay (NDA):

CCP-TP-048	Rev. 16	11/01/2013 Mobile IQ3 System Data Reviewing, Validating, and Reporting Procedure
CCP-TP-048	Rev. 15	03/24/2011 Mobile IQ3 System Data Reviewing, Validating, and Reporting Procedure
CCP-TP-048	Rev. 14	03/08/2010 Mobile IQ3 System Data Reviewing, Validating, and Reporting Procedure
CCP-TP-048	Rev. 13	10/12/2009 Mobile IQ3 System Data Reviewing, Validating, and Reporting Procedure
CCP-TP-048	Rev. 12	06/09/2009 Mobile IQ3 System Data Reviewing, Validating, and Reporting Procedure
CCP-TP-048	Rev. 11	02/19/2008 Mobile IQ3 System Data Reviewing, Validating, and Reporting Procedure
CCP-TP-048	Rev. 10	11/16/2006 Mobile IQ3 System Data Reviewing, Validating, and Reporting Procedure
CCP-TP-048	Rev. 9	11/03/2005 Mobile IQ3 System Data Reviewing, Validating, and Reporting Procedure
CCP-TP-048	Rev. 8	09/21/2005 Mobile IQ3 System Data Reviewing, Validating, and Reporting Procedure
CCP-TP-048	Rev. 7	03/14/2005 Mobile IQ3 System Data Reviewing, Validating, and Reporting Procedure
CCP-TP-048	Rev. 6	10/18/2004 Mobile IQ3 System Data Reviewing, Validating, and Reporting Procedure
CCP-TP-048	Rev. 5	06/08/2004 Mobile IQ3 System Data Reviewing, Validating, and Reporting Procedure
CCP-TP-048	Rev. 4	12/04/2003 Mobile IQ3 System Data Reviewing, Validating, and Reporting Procedure
CCP-TP-048	Rev. 3	09/03/2003 Mobile IQ3 System Data Reviewing, Validating, and Reporting Procedure
CCP-TP-048	Rev. 2	04/25/2003 Mobile IQ3 System Data Reviewing, Validating, and Reporting Procedure
CCP-TP-048	Rev. 1	03/21/2003 Mobile IQ3 System Data Reviewing, Validating, and Reporting Procedure
CCP-TP-048	Rev. 0	02/05/2003 Mobile IQ3 System Data Reviewing, Validating, and Reporting Procedure

Project Level Data Validation / DQO Reconciliation:

CCP-TP-001	Rev. 21	08/08/2013 CCP Project Level Data Validation and Verification
CCP-TP-001	Rev. 20	09/27/2012 CCP Project Level Data Validation and Verification
CCP-TP-001	Rev. 19	12/28/2010 CCP Project Level Data Validation and Verification
CCP-TP-001	Rev. 18	08/09/2010 CCP Project Level Data Validation and Verification
CCP-TP-001	Rev. 17	09/24/2007 CCP Project Level Data Validation and Verification
CCP-TP-001	Rev. 16	04/26/2007 CCP Project Level Data Validation and Verification
CCP-TP-001	Rev. 15	11/22/2006 CCP Project Level Data Validation and Verification
CCP-TP-001	Rev. 14	11/16/2006 CCP Project Level Data Validation and Verification
CCP-TP-001	Rev. 13	07/21/2006 CCP Project Level Data Validation and Verification
CCP-TP-001	Rev. 12	05/25/2006 CCP Project Level Data Validation and Verification
CCP-TP-001	Rev. 11	03/23/2005 CCP Project Level Data Validation and Verification

CCP-TP-002	Rev. 26	08/19/2013 CCP Reconciliation of DQOs and Reporting Characterization Data
CCP-TP-002	Rev. 25	02/11/2013 CCP Reconciliation of DQOs and Reporting Characterization Data
CCP-TP-002	Rev. 24	12/28/2011 CCP Reconciliation of DQOs and Reporting Characterization Data
CCP-TP-002	Rev. 23	12/28/2010 CCP Reconciliation of DQOs and Reporting Characterization Data
CCP-TP-002	Rev. 22	08/30/2010 CCP Reconciliation of DQOs and Reporting Characterization Data
CCP-TP-002	Rev. 21	08/04/2009 CCP Reconciliation of DQOs and Reporting Characterization Data
CCP-TP-002	Rev. 20	08/18/2008 CCP Reconciliation of DQOs and Reporting Characterization Data
CCP-TP-002	Rev. 19	12/22/2006 CCP Reconciliation of DQOs and Reporting Characterization Data
CCP-TP-002	Rev. 18	11/16/2006 CCP Reconciliation of DQOs and Reporting Characterization Data
CCP-TP-002	Rev. 17	10/10/2006 CCP Reconciliation of DQOs and Reporting Characterization Data
CCP-TP-002	Rev. 16	06/06/2006 CCP Reconciliation of DQOs and Reporting Characterization Data
CCP-TP-002	Rev. 15	08/16/2005 CCP Reconciliation of DQOs and Reporting Characterization Data
CCP-TP-002	Rev. 14	03/28/2005 CCP Reconciliation of DQOs and Reporting Characterization Data

CCP-TP-005	Rev. 28	08/12/2013 CCP Acceptable Knowledge Documentation
CCP-TP-005	Rev. 25	09/19/2013 CCP Acceptable Knowledge Documentation
CCP-TP-005	Rev. 24	11/28/2011 CCP Acceptable Knowledge Documentation
CCP-TP-005	Rev. 23	08/30/2011 CCP Acceptable Knowledge Documentation
CCP-TP-005	Rev. 22	04/21/2011 CCP Acceptable Knowledge Documentation
CCP-TP-005	Rev. 21	12/28/2010 CCP Acceptable Knowledge Documentation
CCP-TP-005	Rev. 20	11/01/2010 CCP Acceptable Knowledge Documentation
CCP-TP-005	Rev. 19	07/06/2010 CCP Acceptable Knowledge Documentation
CCP-TP-005	Rev. 18	11/16/2006 CCP Acceptable Knowledge Documentation
CCP-TP-005	Rev. 17	06/05/2006 CCP Acceptable Knowledge Documentation

CCP-TP-005	Rev. 16	02/27/2006 CCP Acceptable Knowledge Documentation
CCP-TP-005	Rev. 15	03/31/2005 CCP Acceptable Knowledge Documentation

CCP-TP-030	Rev. 34	02/02/2015 CCP CH TRU Waste Certification and WWIS/WDS Data Entry
CCP-TP-030	Rev. 33	11/19/2013 CCP CH TRU Waste Certification and WWIS/WDS Data Entry
CCP-TP-030	Rev. 32	06/20/2013 CCP CH TRU Waste Certification and WWIS/WDS Data Entry
CCP-TP-030	Rev. 31	11/16/2012 CCP CH TRU Waste Certification and WWIS/WDS Data Entry
CCP-TP-030	Rev. 30	05/21/2012 CCP CH TRU Waste Certification and WWIS/WDS Data Entry
CCP-TP-030	Rev. 29	04/26/2011 CCP CH TRU Waste Certification and WWIS/WDS Data Entry
CCP-TP-030	Rev. 28	05/12/2010 CCP CH TRU Waste Certification and WWIS/WDS Data Entry
CCP-TP-030	Rev. 27	12/14/2009 CCP CH TRU Waste Certification and WWIS Data Entry
CCP-TP-030	Rev. 26	05/27/2009 CCP CH TRU Waste Certification and WWIS Data Entry
CCP-TP-030	Rev. 25	01/22/2009 CCP CH TRU Waste Certification and WWIS Data Entry
CCP-TP-030	Rev. 24	08/20/2008 CCP CH TRU Waste Certification and WWIS Data Entry
CCP-TP-030	Rev. 23	03/12/2008 CCP CH TRU Waste Certification and WWIS Data Entry
CCP-TP-030	Rev. 22	07/24/2007 CCP CH TRU Waste Certification and WWIS Data Entry
CCP-TP-030	Rev. 21	05/21/2007 CCP CH TRU Waste Certification and WWIS Data Entry
CCP-TP-030	Rev. 20	02/07/2007 CCP CH TRU Waste Certification and WWIS Data Entry
CCP-TP-030	Rev. 19	11/16/2006 CCP CH TRU Waste Certification and WWIS Data Entry
CCP-TP-030	Rev. 18	05/01/2006 CCP TRU Waste Certification and WWIS Data Entry
CCP-TP-030	Rev. 17	12/28/2005 CCP TRU Waste Certification and WWIS Data Entry
CCP-TP-030	Rev. 16	04/22/2005 CCP TRU Waste Certification and WWIS Data Entry

Radiography (RTR/NDE):

CCP-TP-053	Rev. 15	09/11/2014 CCP Standard Real-Time Radiography (RTR) Inspection Procedure
CCP-TP-053	Rev. 14	09/25/2013 CCP Standard Real-Time Radiography (RTR) Inspection Procedure
CCP-TP-053	Rev. 13	05/14/2013 CCP Standard Real-Time Radiography (RTR) Inspection Procedure
CCP-TP-053	Rev. 12	08/22/2012 CCP Standard Real-Time Radiography (RTR) Inspection Procedure
CCP-TP-053	Rev. 11	07/20/2011 CCP Standard Real-Time Radiography (RTR) Inspection Procedure
CCP-TP-053	Rev. 10	03/04/2011 CCP Standard Real-Time Radiography (RTR) Inspection Procedure
CCP-TP-053	Rev. 9	09/30/2010 CCP Standard Real-Time Radiography (RTR) Inspection Procedure
CCP-TP-053	Rev. 8	06/30/2010 CCP Standard Real-Time Radiography (RTR) Inspection Procedure
CCP-TP-053	Rev. 7	10/21/2009 CCP Standard Real-Time Radiography (RTR) Inspection Procedure
CCP-TP-053	Rev. 6	03/04/2008 CCP Standard Real-Time Radiography (RTR) Inspection Procedure
CCP-TP-053	Rev. 5	11/16/2006 CCP Standard Real-Time Radiography (RTR) Inspection Procedure
CCP-TP-053	Rev. 4	12/22/2005 CCP Standard Real-Time Radiography (RTR) Inspection Procedure
CCP-TP-053	Rev. 3	03/21/2005 CCP Standard Real-Time Radiography (RTR) Inspection Procedure
CCP-TP-053	Rev. 2	07/14/2004 CCP Standard Real-Time Radiography (RTR) Inspection Procedure

WAP Certification:

CCP-PO-001	Rev. 21	05/31/2013 CCP Transuranic Waste Characterization Quality Assurance Project Plan
CCP-PO-001	Rev. 20	09/16/2011 CCP Transuranic Waste Characterization Quality Assurance Project Plan
CCP-PO-001	Rev. 19	12/29/2010 CCP Transuranic Waste Characterization Quality Assurance Project Plan
CCP-PO-001	Rev. 18	06/30/2010 CCP Transuranic Waste Characterization Quality Assurance Project Plan
CCP-PO-001	Rev. 17	09/23/2009 CCP Transuranic Waste Characterization Quality Assurance Project Plan
CCP-PO-001	Rev. 16	10/31/2007 CCP Transuranic Waste Characterization Quality Assurance Project Plan
CCP-PO-001	Rev. 15	08/10/2007 CCP Transuranic Waste Characterization Quality Assurance Project Plan
CCP-PO-001	Rev. 14	03/28/2007 CCP Transuranic Waste Characterization Quality Assurance Project Plan
CCP-PO-001	Rev. 13	11/16/2006 CCP Transuranic Waste Characterization Quality Assurance Project Plan
CCP-PO-001	Rev. 12	03/22/2006 CCP Transuranic Waste Characterization Quality Assurance Project Plan
CCP-PO-001	Rev. 11	03/10/2005 CCP Transuranic Waste Characterization Quality Assurance Project Plan

CCP-PO-002	Rev. 27	05/31/2013 CCP Transuranic Waste Certification Plan
CCP-PO-002	Rev. 26	07/14/2011 CCP Transuranic Waste Certification Plan
CCP-PO-002	Rev. 25	12/29/2010 CCP Transuranic Waste Certification Plan
CCP-PO-002	Rev. 24	06/30/2010 CCP Transuranic Waste Certification Plan
CCP-PO-002	Rev. 23	04/07/2010 CCP Transuranic Waste Certification Plan
CCP-PO-002	Rev. 22	01/12/2010 CCP Transuranic Waste Certification Plan
CCP-PO-002	Rev. 21	01/26/2009 CCP Transuranic Waste Certification Plan
CCP-PO-002	Rev. 20	11/02/2007 CCP Transuranic Waste Certification Plan
CCP-PO-002	Rev. 19	05/22/2007 CCP Transuranic Waste Certification Plan
CCP-PO-002	Rev. 18	11/16/2006 CCP Transuranic Waste Certification Plan
CCP-PO-002	Rev. 17	11/16/2006 CCP Transuranic Waste Certification Plan
CCP-PO-002	Rev. 16	11/16/2006 CCP Transuranic Waste Certification Plan
CCP-PO-002	Rev. 15	03/22/2006 CCP Transuranic Waste Certification Plan
CCP-PO-002	Rev. 14	12/28/2005 CCP Transuranic Waste Certification Plan
CCP-PO-002	Rev. 13	05/06/2005 CCP Transuranic Waste Certification Plan

CCP-PO-003	Rev. 13	07/31/2013	Transuranic Authorized Methods for Payload Control (CCP CH-TRAMPC)
CCP-PO-003	Rev. 12	12/20/2010	Transuranic Authorized Methods for Payload Control (CCP CH-TRAMPC)
CCP-PO-003	Rev. 11	06/04/2009	Transuranic Authorized Methods for Payload Control (CCP CH-TRAMPC)
CCP-PO-003	Rev. 10	11/18/2008	Transuranic Authorized Methods for Payload Control (CCP CH-TRAMPC)
CCP-PO-003	Rev. 9	12/29/2005	Transuranic Authorized Methods for Payload Control (CCP CH-TRAMPC)
CCP-PO-003	Rev. 8	01/25/2005	Transuranic Authorized Methods for Payload Control (CCP CH-TRAMPC)
CCP-PO-003	Rev. 7	11/22/2004	Transuranic Authorized Methods for Payload Control (CCP CH-TRAMPC)
CCP-PO-003	Rev. 6	06/09/2004	Transuranic Authorized Methods for Payload Control (CCP CH-TRAMPC)
CCP-PO-003	Rev. 5	09/19/2003	Transuranic Authorized Methods for Payload Control (CCP CH-TRAMPC)
CCP-PO-003	Rev. 4	02/11/2003	Transuranic Authorized Methods for Payload Control (CCP CH-TRAMPC)
CCP-PO-003	Rev. 3	08/31/2002	Transuranic Authorized Methods for Payload Control (CCP CH-TRAMPC)

CCP Correlation of Container Identification Numbers to Batch Data Report Numbers

Waste Stream: # OR-CHEM-CH-HET Lot # 6

Container ID Number	Historical Container ID	NDA BDR	RTR BDR	VE BDR	Load/Manage Overpack Yes	Transportation Headspace Gas	
						FGA	GGT
X10C0011382A	N/A	OR-MILCC2-0088	OR-RTR6-0582	N/A	No	OR14FG8128	N/A
X10C0401573A	N/A	OR-MILCC2-0087	OR-RTR6-0582	N/A	No	OR14FG8128	N/A
X10C0401623A	N/A	OR-MILCC2-0141	OR-RTR6-0585	N/A	No	OR15FG8015	N/A
X10C0401722A	N/A	OR-IQ3-0335	OR-RTR6-0541	N/A	No	OR14FG8081	N/A
X10C0501681A	N/A	OR-IQ3-0343	OR-RTR6-0548	N/A	No	OR14FG8089	N/A
X10C9307939M	N/A	OR-IQ3-0333	OR-RTR6-0538	N/A	No	OR14FG8078	N/A
X10C9311043A	N/A	OR-IQ3-0330	OR-RTR6-0536	N/A	No	OR14FG8076	N/A
X10C9311057A	N/A	OR-MILCC2-0137	OR-RTR6-0618	N/A	No	OR15FG8012	N/A
X10C9311259A	N/A	OR-IQ3-0347	OR-RTR6-0552	N/A	No	OR14FG8092	N/A
X10C9311390A	N/A	OR-MILCC2-0133	OR-RTR6-0607	N/A	No	OR15FG8018	N/A
X10C9311400B	N/A	OR-MILCC2-0170	OR-RTR6-0558	N/A	No	OR14FG8098	N/A
X10C9311522A	N/A	OR-IQ3-0321	OR-RTR6-0527	N/A	No	OR14FG8068	N/A
X10C9311686A	N/A	OR-MILCC2-0105	OR-RTR7-0059	N/A	No	OR14FG8147	N/A
X10C9311714A	N/A	OR-MILCC2-0105	OR-RTR7-0059	N/A	No	OR14FG8147	N/A
X10C9311844A	N/A	OR-MILCC2-0108	OR-RTR7-0058	N/A	No	OR14FG8150	N/A
X10C9312820A	N/A	OR-IQ3-0432	OR-RTR6-0546	N/A	No	OR15FG8004	N/A
X10C9312994A	N/A	OR-IQ3-0341	OR-RTR6-0547	N/A	No	OR14FG8086	N/A
X10C9400003A	N/A	OR-IQ3-0352	OR-RTR6-0556	N/A	No	OR14FG8098	N/A
X10C9400028A	N/A	OR-MILCC2-0110	OR-RTR7-0072	N/A	No	OR14FG8152	N/A
X10C9400030A	N/A	OR-MILCC2-0105	OR-RTR7-0059	N/A	No	OR14FG8147	N/A
X10C9400037A	N/A	OR-IQ3-0346	OR-RTR6-0551	N/A	No	OR14FG8091	N/A
X10C9400046A	N/A	OR-IQ3-0339	OR-RTR6-0545	N/A	No	OR14FG8084	N/A
X10C9400073A	N/A	OR-IQ3-0346	OR-RTR6-0551	N/A	No	OR14FG8091	N/A
X10C9600206I	N/A	OR-MILCC2-0103	OR-RTR7-0061	N/A	No	OR14FG8145	N/A
X10C9600206S	N/A	OR-MILCC2-0157	OR-RTR7-0073	N/A	No	OR15FG8030	N/A
X10C9600206T	N/A	OR-IQ3-0455	OR-RTR6-0538	N/A	No	OR15FG8022	N/A
X10CSATN03123A	N/A	OR-MILCC2-0116	OR-RTR7-0124	N/A	No	OR14FG8160	N/A
X10CSATN03196A	N/A	OR-MILCC2-0074	OR-RTR7-0080	N/A	No	OR14FG8113	N/A

Rick Whiteley — Signature of Site Project Manager
Rick Whiteley — Printed Name
06/22/2015 — Date

CCP RTR/VE Summary of Prohibited Items and AK Confirmation

Waste Stream Number: OR-CHEM-CH-HET Lot #: 6

Container Number	RTR Prohibited Items [a,b]	Visual Examination Prohibited Items [a,b]	Does the Physical Form of the Waste Match the Waste Stream Description as Determined by AK
See correlation of container ID numbers for list of remaining drum numbers in this Lot.	None of the containers in this lot had prohibited items identified during RTR.	VE was not used to certify any containers in this Lot.	The physical form of the waste matches the waste stream description as determined by AK.
a. See Batch Data Reports			
b. If AK has assigned U134 to this waste stream, then any liquids in these containers are prohibited items (not acceptable by the TSDF).			
Justification for the selection of RTR and/or VE: RTR was selected as the characterization method for this lot because the waste was previously packaged and RTR meets all the Data Quality Objectives for NDE for the waste.			

Rick Whiteley — Site Project Manager Signature
Rick Whiteley — Printed Name
08/22/2015 — Date

CCP Reconciliation with Data Quality Objectives

WSPF# OR-CHEM-CH-HET Rev. 0 Lot # 6

Sampling Completeness

RTR/VE:

Number of Valid Samples: 28 Number of Total Samples Analyzed: 28

Percent Complete: 100 (QAO is 100%)

Radiological:

Number of Valid Samples: 28 Number of Total Samples Analyzed: 28

Percent Complete: 100 (QAO is 100%)

	Y/N/NA	Reconciliation Parameter
1	Y	Waste Matrix Code.
2	Y	Waste Material Parameter Weights.
3	Y	The TRU activity reported in the BDRs for each container demonstrates with a 95% probability that the container of waste contains TRU radioactive waste.
4	N	AK Sufficiency. Is there an approved AK sufficiency Determination for this waste stream?
5	Y	The data demonstrates whether the waste stream exhibits a toxicity characteristic under Title 40 Code of Federal Regulations (CFR), Part 261, Identification and Listing of Hazardous Waste, Subpart C, Characteristics of Hazardous Waste.
6	Y	Does the waste stream contain listed waste found in 20.4.1.200 NMAC incorporating 40 CFR Part 261, Subpart D, Lists of Hazardous Wastes.
7	Y	Waste stream can be classified as hazardous or nonhazardous.
8	Y	The overall completeness, comparability, and representativeness QAOs were met for each of the analytical and testing procedures as specified in the WAP Sections C3-1 through C3-2 prior to submittal of a waste stream profile form for a waste steam or waste stream lot.

	Completeness	Comparability	Representativeness
Radiography	Y	Y	Y
VE	NA	NA	NA

Comments: None

Rick Whiteley 06/22/2015

Signature of Site Project Manager Printed Name Date

DIVIDER

PAGE

NWP
Nuclear Waste Partnership LLC
An AECOM-led partnership with BWXT and AREVA

CP:16:01091
UFC:5900.00

COPY

INTER-OFFICE CORRESPONDENCE

DATE: April 15, 2016

FROM: B. S. Schrock BSSchrock LOCATION: Certification

TO: CCP Records Custodian GSA-212 LOCATION: Central Characterization Program

SUBJECT: TRANSMITTAL OF OAK RIDGE NATIONAL LABORATORY CHARATERIZATION INFORMATION SUMMARY FOR WASTE STREAM #OR-CHEM-CH-HET (CCP-AK-ORNL-005), LOT 7

Please accept the attached Oak Ridge National Laboratory Characterization Information Summaries to be placed in Records for Waste Stream #OR-CHEM-CH-HET (CCP-AK-ORNL-005), Lot 7.

BSS:rg

Attachment

cc: (without attachment)
D. Wade ED
M. F. Ramirez ED
A. O. Stallings ED

CCP RECORDS ORIGINAL
DATE REC'D 4/15/2016 JY

CHARACTERIZATION INFORMATION SUMMARY

WSPF# OR-CHEM-CH-HET Rev. 0 (CCP-AK-ORNL-005)

Lot 7

TABLE OF CONTENTS

Characterization Information Summary Cover Page.....2

Correlation of Container Identification Numbers to Batch Data Report Numbers.....5

RTR/VE Summary of Prohibited Items and AK Confirmation.....6

Reconciliation with Data Quality Objectives.....7

CCP Characterization Information Summary Cover Page

Waste Stream # OR-CHEM-CH-HET Lot #: 7

AK Expert Review: N/A Date: N/A

SPM Review: Rick Whiteley Rick Whiteley Date: 04/07/2016

SPM signature certifies that through Acceptable Knowledge testing and/or analysis that the waste identified in this summary is not corrosive, ignitable, reactive, or incompatible with the TSDF.

A summary of the Acceptable Knowledge regarding this waste stream containing specific information about the corrosivity, reactivity, and ignitability of the waste stream is included as an attachment to the Waste Stream Profile Form. By reference, that information is included in this lot.

List of procedures used:

Non Destructive Assay (NDA):

CCP-TP-048	Rev. 16	11/01/2013 Mobile IQ3 System Data Reviewing, Validating, and Reporting Procedure
CCP-TP-048	Rev. 15	03/24/2011 Mobile IQ3 System Data Reviewing, Validating, and Reporting Procedure
CCP-TP-048	Rev. 14	03/08/2010 Mobile IQ3 System Data Reviewing, Validating, and Reporting Procedure
CCP-TP-048	Rev. 13	10/12/2009 Mobile IQ3 System Data Reviewing, Validating, and Reporting Procedure
CCP-TP-048	Rev. 12	09/09/2009 Mobile IQ3 System Data Reviewing, Validating, and Reporting Procedure
CCP-TP-048	Rev. 11	02/19/2008 Mobile IQ3 System Data Reviewing, Validating, and Reporting Procedure
CCP-TP-048	Rev. 10	11/16/2006 Mobile IQ3 System Data Reviewing, Validating, and Reporting Procedure
CCP-TP-048	Rev. 9	11/03/2005 Mobile IQ3 System Data Reviewing, Validating, and Reporting Procedure
CCP-TP-048	Rev. 8	09/21/2005 Mobile IQ3 System Data Reviewing, Validating, and Reporting Procedure
CCP-TP-048	Rev. 7	03/14/2005 Mobile IQ3 System Data Reviewing, Validating, and Reporting Procedure
CCP-TP-048	Rev. 6	10/18/2004 Mobile IQ3 System Data Reviewing, Validating, and Reporting Procedure
CCP-TP-048	Rev. 5	06/08/2004 Mobile IQ3 System Data Reviewing, Validating, and Reporting Procedure
CCP-TP-048	Rev. 4	12/04/2003 Mobile IQ3 System Data Reviewing, Validating, and Reporting Procedure
CCP-TP-048	Rev. 3	09/03/2003 Mobile IQ3 System Data Reviewing, Validating, and Reporting Procedure
CCP-TP-048	Rev. 2	04/25/2003 Mobile IQ3 System Data Reviewing, Validating, and Reporting Procedure
CCP-TP-048	Rev. 1	03/21/2003 Mobile IQ3 System Data Reviewing, Validating, and Reporting Procedure
CCP-TP-048	Rev. 0	02/05/2003 Mobile IQ3 System Data Reviewing, Validating, and Reporting Procedure

Project Level Data Validation / DQO Reconciliation:

CCP-TP-001	Rev. 21	08/08/2013 CCP Project Level Data Validation and Verification
CCP-TP-001	Rev. 20	09/27/2012 CCP Project Level Data Validation and Verification
CCP-TP-001	Rev. 19	12/29/2010 CCP Project Level Data Validation and Verification
CCP-TP-001	Rev. 18	08/09/2010 CCP Project Level Data Validation and Verification
CCP-TP-001	Rev. 17	09/24/2007 CCP Project Level Data Validation and Verification
CCP-TP-001	Rev. 16	04/26/2007 CCP Project Level Data Validation and Verification
CCP-TP-001	Rev. 15	11/22/2006 CCP Project Level Data Validation and Verification
CCP-TP-001	Rev. 14	11/16/2006 CCP Project Level Data Validation and Verification
CCP-TP-001	Rev. 13	07/21/2006 CCP Project Level Data Validation and Verification
CCP-TP-001	Rev. 12	05/25/2006 CCP Project Level Data Validation and Verification
CCP-TP-001	Rev. 11	03/23/2005 CCP Project Level Data Validation and Verification

CCP-TP-002	Rev. 26	08/19/2013 CCP Reconciliation of DQOs and Reporting Characterization Data
CCP-TP-002	Rev. 25	02/11/2013 CCP Reconciliation of DQOs and Reporting Characterization Data
CCP-TP-002	Rev. 24	12/28/2011 CCP Reconciliation of DQOs and Reporting Characterization Data
CCP-TP-002	Rev. 23	12/29/2010 CCP Reconciliation of DQOs and Reporting Characterization Data
CCP-TP-002	Rev. 22	08/30/2010 CCP Reconciliation of DQOs and Reporting Characterization Data
CCP-TP-002	Rev. 21	08/04/2009 CCP Reconciliation of DQOs and Reporting Characterization Data
CCP-TP-002	Rev. 20	08/18/2008 CCP Reconciliation of DQOs and Reporting Characterization Data
CCP-TP-002	Rev. 19	12/22/2006 CCP Reconciliation of DQOs and Reporting Characterization Data
CCP-TP-002	Rev. 18	11/16/2006 CCP Reconciliation of DQOs and Reporting Characterization Data
CCP-TP-002	Rev. 17	10/10/2006 CCP Reconciliation of DQOs and Reporting Characterization Data
CCP-TP-002	Rev. 16	08/06/2006 CCP Reconciliation of DQOs and Reporting Characterization Data
CCP-TP-002	Rev. 15	08/16/2005 CCP Reconciliation of DQOs and Reporting Characterization Data
CCP-TP-002	Rev. 14	03/29/2005 CCP Reconciliation of DQOs and Reporting Characterization Data

CCP-TP-005	Rev. 28	02/29/2016 CCP Acceptable Knowledge Documentation
CCP-TP-005	Rev. 27	08/26/2015 CCP Acceptable Knowledge Documentation
CCP-TP-005	Rev. 26	08/12/2013 CCP Acceptable Knowledge Documentation
CCP-TP-005	Rev. 25	06/19/2013 CCP Acceptable Knowledge Documentation
CCP-TP-005	Rev. 24	11/28/2011 CCP Acceptable Knowledge Documentation
CCP-TP-005	Rev. 23	08/30/2011 CCP Acceptable Knowledge Documentation
CCP-TP-005	Rev. 22	04/21/2011 CCP Acceptable Knowledge Documentation
CCP-TP-005	Rev. 21	12/29/2010 CCP Acceptable Knowledge Documentation
CCP-TP-005	Rev. 20	11/01/2010 CCP Acceptable Knowledge Documentation
CCP-TP-005	Rev. 19	07/08/2010 CCP Acceptable Knowledge Documentation

CCP-TP-005	Rev. 18	11/16/2009 CCP Acceptable Knowledge Documentation
CCP-TP-005	Rev. 17	08/05/2008 CCP Acceptable Knowledge Documentation
CCP-TP-005	Rev. 16	02/27/2008 CCP Acceptable Knowledge Documentation
CCP-TP-005	Rev. 15	03/31/2005 CCP Acceptable Knowledge Documentation

CCP-TP-030	Rev. 34	02/02/2015 CCP CH TRU Waste Certification and WWIS/WDS Data Entry
CCP-TP-030	Rev. 33	11/19/2013 CCP CH TRU Waste Certification and WWIS/WDS Data Entry
CCP-TP-030	Rev. 32	06/20/2013 CCP CH TRU Waste Certification and WWIS/WDS Data Entry
CCP-TP-030	Rev. 31	11/19/2012 CCP CH TRU Waste Certification and WWIS/WDS Data Entry
CCP-TP-030	Rev. 30	05/21/2012 CCP CH TRU Waste Certification and WWIS/WDS Data Entry
CCP-TP-030	Rev. 29	04/26/2011 CCP CH TRU Waste Certification and WWIS/WDS Data Entry
CCP-TP-030	Rev. 28	05/12/2010 CCP CH TRU Waste Certification and WWIS/WDS Data Entry
CCP-TP-030	Rev. 27	12/14/2009 CCP CH TRU Waste Certification and WWIS Data Entry
CCP-TP-030	Rev. 26	05/27/2009 CCP CH TRU Waste Certification and WWIS Data Entry
CCP-TP-030	Rev. 25	01/22/2009 CCP CH TRU Waste Certification and WWIS Data Entry
CCP-TP-030	Rev. 24	08/20/2008 CCP CH TRU Waste Certification and WWIS Data Entry
CCP-TP-030	Rev. 23	03/12/2008 CCP CH TRU Waste Certification and WWIS Data Entry
CCP-TP-030	Rev. 22	07/24/2007 CCP CH TRU Waste Certification and WWIS Data Entry
CCP-TP-030	Rev. 21	05/21/2007 CCP CH TRU Waste Certification and WWIS Data Entry
CCP-TP-030	Rev. 20	02/07/2007 CCP CH TRU Waste Certification and WWIS Data Entry
CCP-TP-030	Rev. 19	11/16/2006 CCP CH TRU Waste Certification and WWIS Data Entry
CCP-TP-030	Rev. 18	05/01/2006 CCP TRU Waste Certification and WWIS Data Entry
CCP-TP-030	Rev. 17	12/29/2005 CCP TRU Waste Certification and WWIS Data Entry
CCP-TP-030	Rev. 16	04/22/2005 CCP TRU Waste Certification and WWIS Data Entry

Radiography (RTR/NDE):

CCP-TP-053	Rev. 15	09/11/2014 CCP Standard Real-Time Radiography (RTR) Inspection Procedure
CCP-TP-053	Rev. 14	09/25/2013 CCP Standard Real-Time Radiography (RTR) Inspection Procedure
CCP-TP-053	Rev. 13	05/14/2013 CCP Standard Real-Time Radiography (RTR) Inspection Procedure
CCP-TP-053	Rev. 12	08/22/2012 CCP Standard Real-Time Radiography (RTR) Inspection Procedure
CCP-TP-053	Rev. 11	07/20/2011 CCP Standard Real-Time Radiography (RTR) Inspection Procedure
CCP-TP-053	Rev. 10	03/04/2011 CCP Standard Real-Time Radiography (RTR) Inspection Procedure
CCP-TP-053	Rev. 9	09/30/2010 CCP Standard Real-Time Radiography (RTR) Inspection Procedure
CCP-TP-053	Rev. 8	06/30/2010 CCP Standard Real-Time Radiography (RTR) Inspection Procedure
CCP-TP-053	Rev. 7	10/21/2009 CCP Standard Real-Time Radiography (RTR) Inspection Procedure
CCP-TP-053	Rev. 6	03/04/2008 CCP Standard Real-Time Radiography (RTR) Inspection Procedure
CCP-TP-053	Rev. 5	11/16/2006 CCP Standard Real-Time Radiography (RTR) Inspection Procedure
CCP-TP-053	Rev. 4	12/22/2005 CCP Standard Real-Time Radiography (RTR) Inspection Procedure
CCP-TP-053	Rev. 3	03/21/2005 CCP Standard Real-Time Radiography (RTR) Inspection Procedure
CCP-TP-053	Rev. 2	07/14/2004 CCP Standard Real-Time Radiography (RTR) Inspection Procedure

WAP Certification:

CCP-PO-001	Rev. 22	01/13/2016 CCP Transuranic Waste Characterization Quality Assurance Project Plan
CCP-PO-001	Rev. 21	05/31/2013 CCP Transuranic Waste Characterization Quality Assurance Project Plan
CCP-PO-001	Rev. 20	09/16/2011 CCP Transuranic Waste Characterization Quality Assurance Project Plan
CCP-PO-001	Rev. 19	12/28/2010 CCP Transuranic Waste Characterization Quality Assurance Project Plan
CCP-PO-001	Rev. 18	06/30/2010 CCP Transuranic Waste Characterization Quality Assurance Project Plan
CCP-PO-001	Rev. 17	06/23/2009 CCP Transuranic Waste Characterization Quality Assurance Project Plan
CCP-PO-001	Rev. 16	10/31/2007 CCP Transuranic Waste Characterization Quality Assurance Project Plan
CCP-PO-001	Rev. 15	08/10/2007 CCP Transuranic Waste Characterization Quality Assurance Project Plan
CCP-PO-001	Rev. 14	03/28/2007 CCP Transuranic Waste Characterization Quality Assurance Project Plan
CCP-PO-001	Rev. 13	11/16/2006 CCP Transuranic Waste Characterization Quality Assurance Project Plan
CCP-PO-001	Rev. 12	03/22/2006 CCP Transuranic Waste Characterization Quality Assurance Project Plan
CCP-PO-001	Rev. 11	03/10/2005 CCP Transuranic Waste Characterization Quality Assurance Project Plan

CCP-PO-002	Rev. 27	05/31/2013 CCP Transuranic Waste Certification Plan
CCP-PO-002	Rev. 26	07/14/2011 CCP Transuranic Waste Certification Plan
CCP-PO-002	Rev. 25	12/28/2010 CCP Transuranic Waste Certification Plan
CCP-PO-002	Rev. 24	06/30/2010 CCP Transuranic Waste Certification Plan
CCP-PO-002	Rev. 23	04/07/2010 CCP Transuranic Waste Certification Plan
CCP-PO-002	Rev. 22	01/12/2010 CCP Transuranic Waste Certification Plan
CCP-PO-002	Rev. 21	01/28/2009 CCP Transuranic Waste Certification Plan
CCP-PO-002	Rev. 20	11/02/2007 CCP Transuranic Waste Certification Plan
CCP-PO-002	Rev. 19	05/22/2007 CCP Transuranic Waste Certification Plan
CCP-PO-002	Rev. 18	11/16/2006 CCP Transuranic Waste Certification Plan
CCP-PO-002	Rev. 17	11/16/2006 CCP Transuranic Waste Certification Plan
CCP-PO-002	Rev. 16	11/16/2006 CCP Transuranic Waste Certification Plan
CCP-PO-002	Rev. 15	03/22/2006 CCP Transuranic Waste Certification Plan
CCP-PO-002	Rev. 14	12/28/2005 CCP Transuranic Waste Certification Plan
CCP-PO-002	Rev. 13	05/09/2005 CCP Transuranic Waste Certification Plan

CCP-PO-003	Rev. 13	07/31/2013	Transuranic Authorized Methods for Payload Control (CCP CH-TRAMPC)
CCP-PO-003	Rev. 12	12/29/2010	Transuranic Authorized Methods for Payload Control (CCP CH-TRAMPC)
CCP-PO-003	Rev. 11	08/04/2009	Transuranic Authorized Methods for Payload Control (CCP CH-TRAMPC)
CCP-PO-003	Rev. 10	11/18/2008	Transuranic Authorized Methods for Payload Control (CCP CH-TRAMPC)
CCP-PO-003	Rev. 9	12/29/2005	Transuranic Authorized Methods for Payload Control (CCP CH-TRAMPC)
CCP-PO-003	Rev. 8	01/25/2005	Transuranic Authorized Methods for Payload Control (CCP CH-TRAMPC)
CCP-PO-003	Rev. 7	11/22/2004	Transuranic Authorized Methods for Payload Control (CCP CH-TRAMPC)
CCP-PO-003	Rev. 6	08/08/2004	Transuranic Authorized Methods for Payload Control (CCP CH-TRAMPC)
CCP-PO-003	Rev. 5	09/19/2003	Transuranic Authorized Methods for Payload Control (CCP CH-TRAMPC)
CCP-PO-003	Rev. 4	02/11/2003	Transuranic Authorized Methods for Payload Control (CCP CH-TRAMPC)
CCP-PO-003	Rev. 3	05/31/2002	Transuranic Authorized Methods for Payload Control (CCP CH-TRAMPC)

CCP Correlation of Container Identification Numbers to Batch Data Report Numbers

Waste Stream: # OR-CHEM-CH-HET Lot # 7

Container ID Number	Historical Container ID	NDA BDR	RTR BDR	VE BDR	Load/Manage Overpack Yes	Transportation Headspace Gas	
						FGA	GGT
X10C0800040A	N/A	OR-IQ3-0617	OR-RTR6-0721	N/A	No	OR16FG8017	N/A
X10C1001131	N/A	OR-MILCC2-0281	OR-RTR6-0723	N/A	No	OR16FG8021	N/A
X10C1001133	N/A	OR-MILCC2-0280	OR-RTR6-0723	N/A	No	OR16FG8020	N/A
X10C1300176A	N/A	OR-MILCC2-0278	OR-RTR6-0721	N/A	No	OR16FG8018	N/A
X10C1300177A	N/A	OR-MILCC2-0281	OR-RTR6-0723	N/A	No	OR16FG8021	N/A
X10C9400024A	N/A	OR-MILCC2-0081	OR-RTR7-0065	N/A	No	OR14FG8121	N/A
X10C9400064A	N/A	OR-MILCC2-0280	OR-RTR6-0723	N/A	No	OR16FG8020	N/A

Rick Whiteley — Rick Whiteley — 04/07/2016

Signature of Site Project Manager | Printed Name | Date

CCP RTR/VE Summary of Prohibited Items and AK Confirmation

Waste Stream Number: OR-CHEM-CH-HET Lot #: 7

Container Number	RTR Prohibited Items [a,b]	Visual Examination Prohibited Items [a,b]	Does the Physical Form of the Waste Match the Waste Stream Description as Determined by AK
See correlation of container ID numbers for list of remaining drum numbers in this Lot.	None of the containers in this lot had prohibited items identified during RTR.	VE was not used to certify any containers in this Lot.	The physical form of the waste matches the waste stream description as determined by AK.
a. See Batch Data Reports			
b. If AK has assigned U134 to this waste stream, then any liquids in these containers are prohibited items (not acceptable by the TSDF).			
Justification for the selection of RTR and/or VE: RTR was selected as the characterization method for this lot because the waste was previously packaged and RTR meets all the Data Quality Objectives for NDE for the waste.			

Rick Whiteley — Site Project Manager Signature
Rick Whiteley — Printed Name
04/07/2016 — Date

CCP Reconciliation with Data Quality Objectives

WSPF# OR-CHEM-CH-HET Rev. 0 Lot # 7

Sampling Completeness

RTR/VE:

Number of Valid Samples: 7 Number of Total Samples Analyzed: 7
Percent Complete: 100 (QAO is 100%)

Radiological:

Number of Valid Samples: 7 Number of Total Samples Analyzed: 7
Percent Complete: 100 (QAO is 100%)

	Y/N/NA	Reconciliation Parameter
1	Y	Waste Matrix Code.
2	Y	Waste Material Parameter Weights.
3	Y	The TRU activity reported in the BDRs for each container demonstrates with a 95% probability that the container of waste contains TRU radioactive waste.
4	N	AK Sufficiency. Is there an approved AK sufficiency Determination for this waste stream?
5	Y	The data demonstrates whether the waste stream exhibits a toxicity characteristic under Title 40 Code of Federal Regulations (CFR), Part 261, Identification and Listing of Hazardous Waste, Subpart C, Characteristics of Hazardous Waste.
6	Y	Does the waste stream contain listed waste found in 20.4.1.200 NMAC incorporating 40 CFR Part 261, Subpart D, Lists of Hazardous Wastes.
7	Y	Waste stream can be classified as hazardous or nonhazardous.
8	Y	The overall completeness, comparability, and representativeness QAOs were met for each of the analytical and testing procedures as specified in the WAP Sections C3-1 through C3-2 prior to submittal of a waste stream profile form for a waste steam or waste stream lot.

	Completeness	Comparability	Representativeness
Radiography	Y	Y	Y
VE	NA	NA	NA

Comments: None

Signature of Site Project Manager | Rick Whiteley (Printed Name) | 04/07/2016 (Date)

DIVIDER

PAGE

Washington
TRU Solutions LLC

COPY

CP:10:01051
UFC:5900.00

INTER-OFFICE CORRESPONDENCE

DATE: January 25, 2010

FROM: R. P. Kantrowitz LOCATION: Certification

TO: CCP Records Custodian GSA-212 LOCATION: Retrieval, Characterization & Transportation

SUBJECT: TRANSMITTAL OF OAK RIDGE NATIONAL LABORATORY WASTE STREAM PROFILE FORM FOR WASTE STREAM #OR-RF-CH-HET

Please accept the attached Oak Ridge National Laboratory Waste Stream Profile Form to be placed in Records for Waste Stream #OR-RF-CH-HET.

RPK:jmc

Attachment

cc: (without attachment)

M. Pearcy ED
W. Weyerman ED

ORIGINAL

Department of Energy
Carlsbad Field Office
P. O. Box 3090
Carlsbad, New Mexico 88221

DEC - 2 2009

Mr. D. K. Ploetz, Manager
Central Characterization Project
Washington TRU Solutions LLC
P. O. Box 2078
Carlsbad, NM 88221-2078

Subject: Review of CCP-ORNL Waste Stream Profile Form Number OR-RF-CH-HET, Heterogeneous Debris from Reactor Fuels Research & Development

Dear Mr. Ploetz:

The Carlsbad Field Office (CBFO) has reviewed the subject Waste Stream Profile Form (WSPF) OR-RF-CH-HET, Heterogeneous Debris from Reactor Fuels Research & Development and has concluded that the WSPF is complete and that the waste stream determinations were made in accordance with applicable procedures and guidance.

The CBFO therefore approves the WSPF as submitted. Using the methods approved for CCP-INL, CCP-INL may enter the data into the certification and shipping modules of the WIPP Waste Information System.

If you have questions on this matter, please contact me at (575) 234-7313.

Sincerely,

J. R. Stroble

J. R. Stroble, Acting Director
Office of the National TRU Program

cc:
G. Basabilvazo, CBFO *ED
C. Gadbury, CBFO ED
S. McCauslin, CBFO ED
D. Miehls, CBFO ED
M. Navarrete, CBFO ED
K. Watson, CBFO ED
P. Gilbert, LANL ED
S. Lott, LANL ED
G. Lyshik, LANL ED
CBFO, M&RC
*ED denotes electronic distribution

CBFO:NTP:JRS:GS:09-2031:UFC 5900.00

Attachment 2 –CCP Waste Stream Profile Form

(1) Waste Stream Profile Number: OR-RF-CH-HET							
(2) Generator site name: Oak Ridge National Laboratory					(4)Technical contact: Richard Kantrowitz		
(3) Generator site EPA ID: TN1890090003					(6) Technical contact phone number: 575-234-7511		
(5) Date of audit report approval by New Mexico Environment Department (NMED): 04/24/2008, 04/23/2009							
(7) Title, version number, and date of documents used for WAP Certification: CCP-PO-001, CCP Transuranic Waste Characterization Quality Assurance Project Plan, Revision 17, June 23, 2009 CCP-PO-002, CCP Transuranic Waste Certification Plan, Revision 21, January 26, 2009 CCP-PO-027 CCP/TRU Waste Processing Center/Oakridge National Laboratory Interface Document, Revision 0, October 2, 2007							
(8) Did your facility generate this waste?	YES	X	NO				
(9) If no, provide the name and EPA ID of the original generator:							
Waste Stream Information[1]							
(10) WIPP ID: OR-RF-CH-HET					(11) Summary Category Group: S5000		
(12) Waste Matrix Code Group: Heterogeneous Debris Waste					(13) Waste Stream Name: Heterogeneous Debris from Reactor Fuels Research & Development		
(14) Description from the TWBIR: Waste consists of CH-TRU debris from reactor fuels R&D at ORNL.							
(15) Defense TRU Waste:	YES	X	NO				
(16) Check One:	CH	X	RH				
(17) Number of SWBs: N/A			(18) Number of Drums: 494 55-gallon			(19) Number of Canisters: N/A	
(20) Batch Data report numbers supporting this waste stream characterization: See Characterization Information Summary (CIS) Correlation of Container Identification Numbers to Batch Data Report Numbers							
(21) List applicable EPA Hazardous Waste Numbers:[2] D006, D007, D008, D009, D011, D019, F001, F002, F005							
(22) Applicable TRUCON Content Numbers: OR 125, OR 225, SQ 154							
(23)**Acceptable Knowledge Information**[1]							
[For the following, enter the supporting documentation used (i.e., references and dates)]							
Required Program Information							
(23A) Map of site: CCP-AK-ORNL-004, Revision 0, March 16, 2009, Figures 4, 5 & 6							
(23B) Facility mission description: CCP-AK-ORNL-004, Revision 0, March 16, 2009, Section 4.2							
(23C) Description of operations that generate waste: CCP-AK-ORNL-004, Revision 0, March 16, 2009, Section 4.4 and 5.3							
(23D) Waste identification/categorization schemes: CCP-AK-ORNL-004, Revision 0, March 16, 2009, Section 4.5							
(23E) Types and quantities of waste generated: CCP-AK-ORNL-004, Revision 0, March 16, 2009, Section 4.6.1 and 5.4							
(23F) Correlation of waste streams generated from the same building and process, as applicable: CCP-AK-ORNL-004, Revision 0, March 16, 2009, Section 4.6.2							
(24) Waste certification procedures: CCP-TP-030, Rev. 26, CCP CH TRU Waste Certification and WWIS Data Entry, May 27, 2009							

(25)Required Waste Stream Information			
(25A) Area(s) and building(s) from which the waste stream was generated: CCP-AK-ORNL-004, Revision 0, March 16, 2009, Section 5.1			
(25B) Waste stream volume and time period of generation: CCP-AK-ORNL-004, Revision 0, March 16, 2009, Section 5.2			
(25C) Waste generating process description for each building: CCP-AK-ORNL-004, Revision 0, March 16, 2009, Sections 4.4 and 5.3			
(25D) Waste Process flow diagrams: CCP-AK-ORNL-004, Revision 0, March 16, 2009, Figures 7 and 8			
(25E) Material inputs or other information identifying chemical/radionuclide content and physical waste form: CCP-AK-ORNL-004, Revision 0, March 16, 2009, Sections 4.5, and 5.4			
(25F) Waste Material Parameter Weight Estimates per unit of waste: See Table 2 of the Summation of Aspects of AK Summary Report: OR-RF-CH-HET			
(26) Which Defense Activity generated the waste: (check one)[3]			
	Weapons activities including defense inertial confinement fusion		Naval Reactors development
	Verification and control technology	X	Defense research and development
	Defense nuclear waste and material by products management		Defense nuclear material production
	Defense nuclear waste and materials security and safeguards and security investigations		
(27)Supplemental Documentation			
(27A) Process design documents: See S1 AK#s on Attachment 1 to Summation of Aspects of AK Summary Report			
(27B) Standard operating procedures: See S2 AK#s on Attachment 1 to Summation of Aspects of AK Summary Report			
(27C) Safety Analysis Reports: See S3 AK#s on Attachment 1 to Summation of Aspects of AK Summary Report			
(27D) Waste packaging logs: See S4 AK#s on Attachment 1 to Summation of Aspects of AK Summary Report			
(28E) Test plans/research project reports: See S5 AK#s on Attachment 1 to Summation of Aspects of AK Summary Report			
(27F) Site databases: See S6 AK#s on Attachment 1 to Summation of Aspects of AK Summary Report			
(27G) Information from site personnel: See S7 AK#s on Attachment 1 to Summation of Aspects of AK Summary Report			
(27H) Standard industry documents: See S8 AK#s on Attachment 1 to Summation of Aspects of AK Summary Report			
(27I) Previous analytical data: See S9 AK#s on Attachment 1 to Summation of Aspects of AK Summary Report			
(27J) Material safety data sheets: NA			
(27K) Sampling and analysis data from comparable/surrogate Waste: NA			
(27L) Laboratory notebooks: See S11 AK#s on Attachment 1 to Summation of Aspects of AK Summary Report			
Confirmation Information[2]			
For the following, when applicable, enter procedure title(s), number(s) and date(s)			
(28)	Radiography: CCP-TP-053, Revision 7, October 21, 2009		
(29)	Visual Examination: NA		

(30)Comments:
For a list of the waste characterization procedures used and date of the respective procedures see the list of procedures on the attached CIS.

Reviewed by AK Expert: YES [X] **Date:** 10/15/09

Reviewed by STR (if necessary): YES [X] NA [ ] **Date:** 10/27/09

Waste Stream Profile Form Certification:

I hereby certify that I have reviewed the information in this Waste Stream Profile Form, and it is complete and accurate to the best of my knowledge. I understand that this information will be made available to regulatory agencies and that there are significant penalties for submitting false information, including the possibility of fines and imprisonment for knowing violations.

(31)	(32)	(33)
	Richard Kantrowitz	11/19/09
Signature of Site Project Manager	Printed Name	Date

NOTE: (1) Use back of sheet or continuation sheets, if required.
(2) If, radiography, visual examination were used to confirm EPA Hazardous Waste Numbers, attach signed Characterization Information Summary documenting this determination.
(3) Defense activities that also generated this waste are: naval reactors development and defense nuclear waste and materials security and safeguards and security investigations.

CHARACTERIZATION INFORMATION SUMMARY

WSPF # OR-RF-CH-HET

Lot 1

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CCP Characterization Information Summary Cover Page

Waste Stream # OR-RF-CH-HET Lot #: 1

AK Expert Review: N/A Date: N/A

SPM Review: Richard Kantrowitz Date: 11/19/2009

SPM signature certifies that through Acceptable Knowledge testing and/or analysis that the waste identified in this summary is not corrosive, ignitable, reactive, or incompatible with the TSDF.

A summary of the Acceptable Knowledge regarding this waste stream containing specific information about the corrosivity, reactivity, and ignitability of the waste stream is included as an attachment to the Waste Stream Profile Form. By reference, that information is included in this lot.

List of procedures used:

Radiography (RTR/NDE)

CCP-TP-053	Rev. 7	10/21/09	CCP Standard Real-Time Radiography (RTR) Inspection Procedure
CCP-TP-053	Rev. 6	03/04/08	CCP Standard Real-Time Radiography (RTR) Inspection Procedure

Non Destructive Assay (NDA):

CCP-TP-166	Rev. 2	12/05/08	CCP Drum Waste Assay System Imaging Passive/Active Neutron Operations
CCP-TP-166	Rev. 1	06/19/08	CCP Drum Waste Assay System Imaging Passive/Active Neutron Operations
CCP-TP-166	Rev. 0	10/12/07	CCP Drum Waste Assay System Imaging Passive/Active Neutron Operations
CCP-TP-168	Rev. 2	12/02/08	CCP DWAS IPAN/SGS Data Generation Level Validation
CCP-TP-168	Rev. 1	11/17/08	CCP DWAS IPAN/SGS Data Generation Level Validation
CCP-TP-168	Rev. 0	10/18/07	CCP DWAS IPAN/SGS Data Generation Level Validation
CCP-TP-169	Rev. 1	06/19/08	CCP Operating the Mobile Segmented Gamma Scanner
CCP-TP-169	Rev. 0	10/12/07	CCP Operating the Mobile Segmented Gamma Scanner

Headspace Gas Sampling and Analysis (HSG):

CCP-TP-093	Rev. 13	03/19/07	CCP Sampling of TRU Waste Containers
CCP-TP-106	Rev. 6	07/12/07	CCP Headspace Gas Sampling Batch Data Report Preparation
CCP-TP-173	Rev. 1	09/30/09	CCP Analysis of Gas Samples for VOCs by GC/FID
CCP-TP-173	Rev. 0	05/03/07	CCP Analysis of Gas Samples for VOCs by GC/FID
CCP-TP-175	Rev. 0	05/02/07	CCP Analysis of Gas Samples for VOCs by GC/MS

Project Level Data Validation / DQO Reconciliation:

CCP-TP-001	Rev. 17	09/24/07	CCP Project Level Data Validation and Verification
CCP-TP-002	Rev. 21	08/04/09	CCP Reconciliation of DQOs and Reporting Characterization Data
CCP-TP-002	Rev. 20	08/18/08	CCP Reconciliation of DQOs and Reporting Characterization Data
CCP-TP-003	Rev. 16	10/02/07	CCP Data Analysis for S3000, S4000, and S5000 Characterization
CCP-TP-005	Rev. 18	11/16/06	CCP Acceptable Knowledge Documentation
CCP-TP-030	Rev. 26	05/27/09	CCP CH TRU Waste Certification and WWIS Data Entry
CCP-TP-030	Rev. 25	01/22/09	CCP CH TRU Waste Certification and WWIS Data Entry
CCP-TP-030	Rev. 24	08/20/08	CCP CH TRU Waste Certification and WWIS Data Entry
CCP-TP-030	Rev. 23	03/12/08	CCP CH TRU Waste Certification and WWIS Data Entry
CCP-TP-030	Rev. 22	07/24/07	CCP CH TRU Waste Certification and WWIS Data Entry

WAP Certification:

CCP-PO-001	Rev. 17	06/23/09	CCP Transuranic Waste Characterization Quality Assurance Project Plan
CCP-PO-001	Rev. 16	10/31/07	CCP Transuranic Waste Characterization Quality Assurance Project Plan
CCP-PO-002	Rev. 21	01/26/09	CCP Transuranic Waste Certification Plan
CCP-PO-002	Rev. 20	11/02/07	CCP Transuranic Waste Certification Plan
CCP-PO-027	Rev. 0	10/02/07	CCP/TWPC/ORNL Interface Document

CIS002

CCP Correlation of Container Identification Numbers to Batch Data Report Numbers

Waste Stream: # OR-RF-CH-HET

Lot # 1

Container ID Number	NDA BDR	RTR BDR	VE BDR	Solids Sampling BDR	Solids Analytical BDR	Load Management/ Overpack Yes	Headspace Gas BDR			
							Sample	Analysis		
X10C0501620	OR-DWAS-0263	OR-RTR6-0200	NA	NA	NA		NA	NA	NA	OR09FG4062
X10C0501622	OR-DWAS-0263	OR-RTR6-0199	NA	NA	NA		ORHSGS090004	ECL09016M	ECL09016G	OR09FG4062
X10C0501827	OR-DWAS-0263	OR-RTR6-0200	NA	NA	NA		ORHSGS090004	ECL09016M	ECL09016G	OR09FG4062
X10C9309199L	OR-DWAS-0272	OR-RTR6-0202	NA	NA	NA		NA	NA	NA	OR09FG4065
~~X10C9309199Y~~	~~OR-DWAS-0263~~	~~OR-RTR6-0199~~	~~NA~~	~~NA~~	~~NA~~		~~ORHSGS090004~~	~~ECL09016M~~	~~ECL09016G~~	~~OR09FG4062~~
X10C9309200M	OR-DWAS-0256	OR-RTR6-0194	NA	NA	NA		NA	NA	NA	OR09FG4057
X10C9309200T	OR-DWAS-0254	OR-RTR6-0189	NA	NA	NA		ORHSGS090004	ECL09016M	ECL09016G	OR09FG4056
X10C9309200U	OR-DWAS-0256	OR-RTR6-0194	NA	NA	NA		NA	NA	NA	OR09FG4057
X10C9311503A	OR-DWAS-0255	OR-RTR6-0192	NA	NA	NA		NA	NA	NA	OR09FG4056
X10C9313037A	OR-DWAS-0254	OR-RTR6-0192	NA	NA	NA		NA	NA	NA	OR09FG4055
** These containers were randomly selected for headspace gas sampling and analysis and are included to resolve EPA hazardous waste number assignment only. NDE and NDA BDR numbers for these six containers are included for information purposes only.										
**X10C0501632A	OR-DWAS-0263	OR-RTR6-0200	NA	NA	NA		ORHSGS090004	ECL09016M	ECL09016G	NA
**X10C0501829	OR-DWAS-0255	OR-RTR6-0188	NA	NA	NA		ORHSGS090004	ECL09016M	ECL09016G	NA
**X10C9309200G1A	OR-DWAS-0263	OR-RTR6-0199	NA	NA	NA		ORHSGS090004	ECL09016M	ECL09016G	NA
**X10C9309200H1	OR-DWAS-0254	OR-RTR6-0189	NA	NA	NA		ORHSGS090004	ECL09016M	ECL09016G	NA
**X10C930920011	OR-DWAS-0254	OR-RTR6-0189	NA	NA	NA		ORHSGS090004	ECL09016M	ECL09016G	NA
**X10C93092000	OR-DWAS-0254	OR-RTR6-0189	NA	NA	NA		ORHSGS090004	ECL09016M	ECL09016G	NA

(1) AK 2/19/10

Signature of Site Project Manager

Richard Kantrowitz
Printed Name

11/19/2009
Date

(1) per NCR-ORNL-0500-10 RK 3/8/10.

CFS003

CCP Headspace Gas UCL_{90} Evaluation Form

WSPF #: OR-RF-CH-HET **Waste Stream Headspace Gas Lot Number** 1 through 1

ANALYTE	Transform Data Used (No, Data-Log, SQRT, other)	# Samples above MDL (1)	# Samples	Maximum (ppmv)	Mean (ppmv)	SD (ppmv)	UCL_{90} (ppmv)	PRQL (ppmv)	Transformed PRQL (N/A or Value)	UCL_{90} > PRQL Yes	EPA Hazardous Waste Number
Benzene	Log	0	10	-2.53	-3.45	0.52	-3.22	10	2.30		
Bromoform	Log	0	10	-3.79	-4.70	0.52	-4.47	10	2.30		
Carbon Tetrachloride	Log	0	10	-3.00	-3.86	0.50	-3.64	10	2.30		
Chlorobenzene	Log	0	10	-2.73	-3.65	0.53	-3.42	10	2.30		
Chloroform	Log	0	10	-2.53	-3.43	0.53	-3.20	10	2.30		
Cyclohexane[a]	Log	0	10	-2.41	-3.31	0.53	-3.08	10	2.30		
1,1-Dichloroethane	Log	0	10	-2.00	-2.90	0.52	-2.67	10	2.30		
1,2-Dichloroethane	Log	0	10	-2.53	-3.43	0.52	-3.20	10	2.30		
1,1-Dichloroethylene	Log	0	10	-2.41	-3.30	0.52	-3.08	10	2.30		
cis-1,2-Dichloroethylene	Log	0	10	-2.90	-3.81	0.53	-3.58	10	2.30		
trans 1,2-Dichloroethylene	Log	0	10	-2.81	-3.73	0.53	-3.50	10	2.30		
Ethyl benzene	Log	0	10	-2.73	-3.67	0.52	-3.44	10	2.30		
Ethyl Ether	Log	0	10	-2.21	-3.10	0.51	-2.87	10	2.30		
Methylene chloride	Log	0	10	-2.41	-3.34	0.52	-3.11	10	2.30		
1,1,2,2-Tetrachloroethane	Log	0	10	-3.02	-3.92	0.52	-3.70	10	2.30		
Tetrachloroethylene	Log	0	10	-3.00	-3.88	0.52	-3.66	10	2.30		
Toluene	Log	9	10	2.48	-0.59	1.85	0.22	10	2.30		
1,1,1-Trichloroethane	Log	0	10	-3.21	-4.11	0.52	-3.88	10	2.30		
Trichloroethylene	Log	0	10	-3.11	-4.02	0.52	-3.79	10	2.30		
1,1,2-Trichloro-1,2,2-trifluoroethene	Log	0	10	-3.03	-3.93	0.52	-3.70	10	2.30		
1,2,4-Trimethylbenzene[a]	Log	0	10	-2.81	-3.72	0.53	-3.49	10	2.30		
1,3,5-Trimethylbenzene[a]	Log	0	10	-2.81	-3.70	0.52	-3.48	10	2.30		
m,p-Xylenes[b]	No	3	10	0.08	0.04	0.02	0.05	10	N/A		
o-Xylene	Log	0	10	-2.59	-3.50	0.53	-3.27	10	2.30		
Acetone	SQRT	9	10	1.95	1.01	0.57	1.26	100	10.00		
Butanol	Log	5	10	-1.11	-2.33	0.71	-2.02	100	4.61		
Methanol	No	0	10	8.00	7.55	0.16	7.62	100	N/A		
Methyl ethyl ketone	SQRT	1	10	0.36	0.24	0.08	0.27	100	10.00		
Methyl isobutyl ketone	Log	1	10	-1.97	-3.24	0.68	-2.94	100	4.61		

CBI5004

CCP Headspace Gas UCL_{90} Evaluation Form

WSPF #: OR-RF-CH-HET **Waste Stream Headspace Gas Lot Number** 1 through 1

ANALYTE	Transform Data Used (No, Data-Log, SQRT, other)	# Samples above MDL (1)	# Samples	Maximum (ppmv)	Mean (ppmv)	SD (ppmv)	UCL_{90} (ppmv)	PRQL (ppmv)	Transformed PRQL (N/A or Value)	UCL_{90} > PRQL Yes	EPA Hazardous Waste Number
Chloromethane[e]	Log	0	10	-2.25	-3.14	0.52	-2.91	10	2.30		
Carbon Disulfide[e]	Log	8	10	0.47	-1.90	1.22	-1.37	10	2.30		
1,2-Dichloropropane[e]	Log	0	10	-3.43	-4.34	0.52	-4.11	10	2.30		
Trichlorofluoromethane[e]	Log	2	10	2.83	-2.48	2.76	-1.27	10	2.30		
Formaldehyde[c]	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Hydrazine[d]	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

[a] These compounds are from the TRAMPAC and are flammable VOCs that do not appear in the QAPjP or the WIPP WAP. These are not part of the target analyte list, but samples may be analyzed for these compounds.

[b] These xylene isomers cannot be resolved by the analytical methods employed in the program. m-Xylene and p-Xylene will be reported as "Total m-p-Xylene."

[c] Required only for homogenous solids and soil/gravel waste from Savannah River Site.

[d] Required only for homogenous solids and soil/gravel waste from Oak Ridge National Laboratory and Savannah River Site.

[e] These compounds are reported by the Laboratory and are included for completeness.

Comments:

(1) For analytes where there were no samples measured above the MDL value, 1/2 of the MDL value was used. (Per section B4 of the WAP, 1/2 of the MDL value is used in calculating the mean concentration.)

Signature of Site Project Manager

Richard Kantrowitz
Printed Name

11/19/2009
Date

CTS005

CCP Headspace Gas Summary Data

Waste Stream Number OR-RF-CH-HET Lot Number (s) 1

Tentatively Identified Compound	Maximum Observed Estimated Concentrations (ppmv)	# Samples Containing TIC	% Detected
None	NA	NA	NA

Data Supports EPA Hazardous Waste Numbers Assigned by AK? ☑ Yes ☐ No

If no, describe the basis for assigning the EPA Hazardous Waste Codes:

SPM Signature [signature] Date 11/19/2009

CIS006

CCP RTR/VE Summary of Prohibited Items and AK Confirmation

Waste Stream Number: OR-RF-CH-HET Lot(s)#: 1

Container Number	RTR Prohibited Items [a]	Visual Examination Prohibited Items [a]
See correlation of container ID numbers for list of remaining drum numbers in this Lot.	RTR Data confirm that none of the containers in this lot contain any prohibited items.	None of the containers in this lot were processed through VE.

a. See Batch Data Reports

Site Project Manager Signature | Richard Kantrowitz (Printed Name) | 11/19/2009 (Date)

CIS007

CCP Reconciliation with Data Quality Objectives

WSF# OR-RF-CH-HET Lot # 1

Sampling Completeness

RTR:

Number of Valid Samples: 10 Number of Total Samples Analyzed: 10
Percent Complete: 100 (QAO is 100%)

NDA

Number of Valid Samples: 10 Number of Total Samples Analyzed: 10
Percent Complete: 100 (QAO is 100%)

HSG

Number of Valid Samples: 10 Number of Total Samples Collected: 10
Percent Complete: 100 (QAO is ≥90%)
Number of Valid Samples: 10 Number of Total Samples Analyzed: 10
Percent Complete: 100 (QAO is ≥90%)

Total VOC

Number of Valid Samples: NA Number of Total Samples Collected: NA
Percent Complete: NA (QAO is ≥90%)
Number of Valid Samples: NA Number of Total Samples Analyzed: NA
Percent Complete: NA (QAO is ≥90%)

Total SVOC

Number of Valid Samples: NA Number of Total Samples Collected: NA
Percent Complete: NA (QAO is ≥90%)
Number of Valid Samples: NA Number of Total Samples Analyzed: NA
Percent Complete: NA (QAO is ≥90%)

Total Metals

Number of Valid Samples: NA Number of Total Samples Collected: NA
Percent Complete: NA (QAO is ≥90%)
Number of Valid Samples: NA Number of Total Samples Analyzed: NA
Percent Complete: NA (QAO is ≥90%)

CIS008

CCP Reconciliation with Data Quality Objectives

WSF# OR-RF-CH-HET Lot # 1

	Y/N/NA	Reconciliation Parameter
1	Y	Waste Matrix Code.
2	Y	Waste Material Parameter Weights.
3	Y	The waste matrix code identified is consistent with the type of sampling and analysis used to characterize the waste.
4	Y	The TRU activity reported in the BDRs for each container demonstrates with a 95% probability that the container of waste contains TRU radioactive waste.
5	N	AK Sufficiency. Is there an approved AK sufficiency Determination for this waste stream?
6	Y	Mean concentrations, UCL_{90} values for the mean concentration, standard deviations, and the number of samples collected for each VOC in the HSG of each container were calculated and compared with the program required quantitation limits, as reported in CCP-TP-003 Attachment 3, and additional U.S. Environmental Protection Agency (EPA) Hazardous Waste Numbers were assigned as required. Samples were randomly collected (when appropriate).
7a	NA	Mean concentrations, UCL_{90} values for the mean concentration, standard deviations, and the number of samples collected for solids VOCs were calculated and compared with the program required quantitation limits and regulatory thresholds, as reported in the Characterization Information Summary, CCP-TP-003 Attachment 4, and additional EPA HWNs were assigned as required. Samples were randomly collected.
7b	NA	Mean concentrations, (UCL_{90}) values for the mean concentration, standard deviations, and the number of samples collected for solids SVOCs were calculated and compared with the program required quantitation limits and regulatory thresholds, as reported in the Characterization Information Summary, CCP-TP-003 Attachment 5, and additional EPA HWNs were assigned as required. Samples were randomly collected.
7c	NA	Mean concentrations, (UCL_{90}) values for the mean concentration, standard deviations, and the number of samples collected for total metals were calculated and compared with the program required quantitation limits and regulatory thresholds, as reported in the Characterization Information Summary, CCP-TP-003 Attachment 6, and additional EPA HWNs were assigned as required. Samples were randomly collected.

CCP Reconciliation with Data Quality Objectives

WSF# OR-RF-CH-HET Lot # 1

8	Y	The data demonstrates whether the waste stream exhibits a toxicity characteristic under Title 40 Code of Federal Regulations (CFR), Part 261, Identification and Listing of Hazardous Waste, Subpart C, Characteristics of Hazardous Waste.
9	Y	Does the waste stream contain listed waste found in 20.4.1.200 NMAC incorporating 40 CFR Part 261, Subpart D, Lists of Hazardous Wastes.
10	Y	Waste stream can be classified as hazardous or nonhazardous at the 90-percent confidence level.
11	Y	Appropriate packaging configuration and Drum Age Criteria (DAC) is applied and documented in the headspace gas sampling documentation, and the drum age met prior to sampling.
12	Y	TICs were appropriately identified and reported in accordance with the requirements of Section B3-1 of the QAPjP.
13	Y	The PRQLs for headspace gas VOCs were met for all analyses as evidenced by the analytical batch data reports.
14		The overall completeness, comparability, and representativeness QAOs were met for each of the analytical and testing procedures as specified in the WAP Sections B3-2 through B3-9 prior to submittal of a waste stream profile form for a waste steam or waste stream lot.

	Completeness	Comparability	Representativeness
Radiography	Y	Y	Y
VE	NA	NA	NA
Headspace Gas Analysis	Y	Y	Y
Solids Sampling	NA	NA	NA
Solids VOCs	NA	NA	NA
Solids SVOCs	NA	NA	NA
Solids Metals	NA	NA	NA

Comments: NONE

Signature of Site Project Manager | Richard Kantrowitz (Printed Name) | 11/19/2009 (Date)

CIS010

SUMMATION OF ASPECTS OF AK SUMMARY REPORT: OR-RF-CH-HET

Overview:

Waste Stream OR-RF-CH-HET is contact-handled (CH) transuranic (TRU) mixed heterogeneous debris that was generated, and is subsequently stored, at the Oak Ridge National Laboratory (ORNL) in Oak Ridge, Tennessee. The waste was generated from research and development (R&D) activities associated with reactor fuel development in Buildings 3019-A and 4508, as well as decommissioning of these facilities. This waste was generated from 1970 through 2002.

Building 3019-A was the radiochemical development facility and was utilized to conduct nuclear energy research and development (R&D). CH TRU waste from Building 3019-A was generated from preparation of plutonium or plutonium-uranium solutions (sols) and plutonium-uranium oxide microspheres utilized in the production of fast-reactor fuels. CH TRU waste from Building 3019-A is commingled with waste generated from activities involving reactor fuel development using thorium-uranium oxide.

Building 4508 was the metals and ceramics laboratory and also conducted fuel development work using plutonium-uranium oxide and thorium-uranium fuels. The objectives of this work were to establish performance characteristics and limitations of fuels from different processes, obtain a fundamental understanding of the mechanisms for the differences in performance characteristics, develop fuel fabrication techniques, and develop analytical models to optimize design of those fuels fabricated.

Waste from ORNL was generated primarily from defense related research and development operations. Defense activities that also generated this waste are: naval reactors development, and defense nuclear waste and materials security and safeguards and security investigations. Waste stream OR-RF-CH-HET is therefore defense related waste.

This Summation of Aspects of the AK Summary Report includes information to support Waste Stream Profile Form (WSPF) number OR-RF-CH-HET for CH TRU heterogeneous debris. The primary source of information for this Summation is CCP-AK-ORNL-004, *Central Characterization Project Acceptable Knowledge Summary Report For Oak Ridge National Laboratory Reactor Fuels Research & Development Contact-Handled Transuranic Waste, Waste Stream: OR-RF-CH-HET*, Revision 0, March 16, 2009. CCP-AK-ORNL-004 includes information obtained from numerous sources, including facility safety basis documentation, historical document archives, generator and storage facility waste records and documents, program/processing documentation, and interviews with knowledgeable personnel.

Waste Stream Identification Summary:

Site Where TRU Waste Was Generated:	Oak Ridge National Laboratory
Waste Stream Name:	Heterogeneous Debris from Reactor Fuels Research & Development
Waste Stream Number:	OR-RF-CH-HET
Dates of Waste Generation:	1970 to 2002
Summary Category Group:	S5000 – Debris Waste

Waste Matrix Code Group:	Heterogeneous Debris Waste
Waste Matrix Code:	S5400 – Heterogeneous Debris
Waste Stream TWBIR Identification:	OR-RF-CH-HET
Waste Stream Volume:	224 55-gallon drums (current) 270 55-gallon drums (projected)
RCRA EPA Hazardous Waste Numbers:	D006, D007, D008, D009, D011, D019, F001, F002, F005
TRUCON Content Numbers:	OR 125, OR 225, SQ 154

Waste Stream Description and Physical Form:

Waste stream OR-RF-CH-HET is comprised of organic and inorganic debris and includes cellulosics, plastic, rubber, glass, and metal. Iron-based debris includes clips, closure rings, containers (e.g., buckets, cans), cylinders, electrical motors, fuel pellets (unirradiated), hand tools (e.g., wire brushes, scissors, utility knives), fittings, gauges, hardware (e.g., bolts, hose clamps, nails, washers), piping, rods, saw blades, shavings, trays, valves, and wire. Aluminum debris includes cans, hand tools, plates, and respirator cartridges. Other metal includes alkaline batteries, copper tubing, lead shot, and lead shielding. Other inorganic materials consist of absorbent (e.g., vermiculite, Nochar {a proprietary polymer absorbent}), ceramics (e.g., fire brick), concrete pieces, glass (e.g., beakers, pipettes, sample bottles), insulation, and leaded glass. Cellulosic debris includes absorbent pads, cardboard (e.g., cartons, liner inserts, sleeves), cloth rags, coveralls, cotton gauze, filters, Herculite (industrial fabric), masking tape, mop heads, paint brushes, paper (e.g., sheets, suits, towels), smears, wipes, and wood. Plastic debris includes bags, containers (e.g., bottles, buckets), duct tape, electrical cord, labware, nylon sleeves, piping, plexiglass, sheeting, suits, and tubing. Rubber debris consists of booties, gaskets, gloves, hose, o-rings, and stoppers. Other waste items include electrical equipment/devices (e.g., ball mill, furnace parts, powder grinder, pumps, and rotameters), metal-framed High Efficiency Particulate Air (HEPA) filters with filter media, and small amounts of floor sweepings, grouted resin, salts (such as pyrochemical salt waste) and absorbed liquid (such as ammonium hydroxide, hydrochloric acid, nitric acid, oxalic acid, phosphoric acid, sodium bicarbonate, sodium carbonate, and sodium hydroxide absorbed with Nochar and vermiculite).

This waste stream is assigned Waste Matrix Code S5400, Heterogeneous Debris. The debris that comprises waste stream OR-RF-CH-HET was generated from a single process or from an activity that is similar in material, physical form, and hazardous constituents and is therefore, a single waste stream.

Point of Generation - Area and Building of Generation

Waste stream OR-RF-CH-HET was generated in Buildings 3019-A and 4508 at ORNL in Oak Ridge, TN.

Generating Process

Following are the waste generating activities that contributed to this waste stream.

Reactor Fuel Process Development

ORNL conducted research and development related to preparing the oxides, carbides, and nitrides of thorium, uranium, plutonium, and their mixtures for use as reactor fuels. The process steps in reactor fuel development include dissolution of the actinide powder, sol preparation, formation, drying and calcining of microspheres, and packaging the product. The sols were dried and calcined to pellets, or formed into microspheres that were calcined to oxide spheres. In the mixed oxide process, plutonium and uranium or other elements (such as americium, curium and thorium) sols were combined for forming spheres, or plutonium and uranium powders were blended, pressed into pellets, and sintered. Methods evaluated for preparation of sols, microspheres, powders (oxides), and fuel pin fabrication are as follows:

- Methods used for the preparation of sols included solvent extraction, precipitation-peptization, partial neutralization, and hydrothermal denitration. The formation of a microsphere required the suspension of droplets of solution until enough water was extracted to cause gelation. This was accomplished by extraction of water in an immiscible organic liquid such as hexanol.
- Formation of gel microspheres was also achieved by chemical gelation. In external gelation, gel spheres were prepared using ammonia, ammonia gas, an immiscible liquid (e.g. hexanol) or a mixture thereof.
- Microsphere formation using ion-exchange and carbonizing the ion-exchange resin.
- Powder preparation including chemical reduction of metal nitrates and converting uranyl and plutonium nitrates to oxide powder.
- Uranium-plutonium nitride powder preparation from uranium-plutonium alloy by hydriding and nitriding, followed by pressing into fuel pellets and sintering.
- Uranium and plutonium nitrate solutions mixing. Plutonium hydroxide-ammonium diuranate was precipitated using ammonia or ammonium hydroxide, and dried. The resulting powder was packed into fuel tubes or pressed into pellets and sintered.
- Plutonium-uranium powders preparation using denitration in which a nitrate solution was converted to a mixed oxide.
- Oxide and carbide fuel particles coating with pyrolytic carbon and silicon carbide.
- A plutonium recycle program that required the molding, ejecting, carbonizing, graphitizing of fuel sticks which were then loaded into fuel element blocks.
- Fuel pin loading that involved the packing of microspheres.

Reactor Fuel Characterization Support

Pre-irradiation characterization of fuel material involved the examination and evaluation of the properties of the fuel. Examples of these characterization activities include:

- Metallographic sample preparation and examination, including x-ray diffractometry, hardness testing, and microradiography.
- Gravimetric determination of oxygen-to-metal ratio in oxide fuel.
- Evaluation of gas release from oxide fuels.

- Characterization of the microstructure of the sol-gel using gamma ray spectroscopy, electron microscopy, alpha autoradiography, and electron microprobe analysis.
- Thermal conductivity measurements on powders (oxides) and solids (such as Pu-U fuel powders and solids).
- Fission product evaluation in oxide fuels by measuring weight changes and thermal expansion using high temperature x-ray diffraction in samples of uranium-europium oxide solids and solutions.
- Uranium-plutonium nitride characterization studies.
- Carbonization studies and the investigation of warm molding and extrusion.
- Fission gas release analyses on irradiated fuel sticks.

Facility Cleanup and Decommissioning

Building 3019-A was used throughout the 1970s and early-1980s. During idle times, gloveboxes were cleaned and the facility was placed into standby condition. In early-1980, equipment and gloveboxes were removed to support a new microsphere program which was dismantled by 1989. Building 3019-A was placed in standby status in 1988.

Building 3019-A stored plutonium nitrate solutions for use in the microsphere facility. In 1976, the nitrate solutions were solidified and moved to the Building 3100 Storage Vault. Sol-gel operations involving plutonium oxide and plutonium-uranium oxide were conducted in Building 3019-A in the late-1960s. In 1976 and 1977, equipment was removed and the area was decontaminated. Floor tile was removed, the concrete floor was scarified to remove contamination, off-gas filters were replaced, and conduit and piping was removed.

Building 4508 plutonium operations were shut down by 1978. The facility was cleaned by removing waste from the gloveboxes and decontaminating surfaces using cleaners such as soap/water, and caustic cleaning products (such as Formula 409 and Ajax with ammonia). The facility was decommissioned by 1984.

Uranium nitrate product solution from Consolidated Edison Indian Point-I Reactor and the Nuclear Fuel Services Plant in West Valley, New York, was sent to ORNL for storage. Soluble poisons (cadmium nitrate and gadolinium nitrate) were added to ensure subcriticality of these solutions during storage in Building 3019-A. When no use for the uranium solutions was identified, the material was solidified for safe long-term storage. Several drums from cleanup of the solidification process have been identified as part of this waste stream.

Building 3019-A was also used to convert uranium to an oxide powder for use in preparing thorium-uranium fuel pellets. The work began in the early-1970s and was completed at the end of 1976. Work began in 1978 to provide U-233 oxide to Argonne National Laboratory. The work was completed in 1979. Processing continued until the facilities were shut down in 1987. The processing cells and gloveboxes were cleaned and placed in standby in 1989.

Building 3019-A Support Systems

Building 3019-A support systems (such as the penthouse, sample gallery, pipe tunnel, and cell plenum chamber room) generated drums of TRU waste. This waste stream includes vacuum pumps, surge pots, rotameters, piping, filters, gloves, plastic, and rags from these support systems.

Transuranic Waste Processing Center (TWPC)

Drums containing CH TRU waste were emptied into sorting trays in the TWPC. The waste was sorted and segregated to remove prohibited items and repackaged. Prohibited items identified during repackaging of drums and boxes were removed from the waste stream or were remediated. Secondary wastes created during waste processing, such as rubber glovebox gloves and tools, were placed into the same TRU waste drums. Repackaging of this waste stream began in 2006 and is an ongoing process.

Table 1 identifies the RCRA toxicity characteristic and listed constituents identified in this waste stream.

Table 1 – TC and F-Listed Contaminants for Waste Stream OR-RF-CH-HET

Chemical	CAS Number	EPA Hazardous Waste Numbers
Cadmium	7440-43-9	D006
Chromium	7440-47-3	D007
Lead	7439-92-1	D008
Mercury	7439-97-6	D009
Silver	7440-22-4	D011
Carbon tetrachloride	56-23-5	D019
Trichloroethylene	79-01-6	F001
Tetrachloroethylene	127-18-4	F002
1,1,2-Trichloro-1,2,2-trifluoroethane	76-13-1	F002
Benzene	71-43-2	F005
Toluene	108-88-3	F005

RCRA Determinations - Hazardous Waste Determinations

Waste generated in this waste stream does not qualify for any of the exclusions outlined in 40 CFR 260 or 261. Real-time radiography (RTR) or visual examination is used to verify that the waste stream is not a liquid waste and does not contain explosives, non-radioactive pyrophoric material, compressed gases or reactive waste. Therefore, this waste stream does not exhibit the characteristic for ignitability (D001), corrosivity (D002), or reactivity (D003).

Ignitability

The waste does not meet the definition of ignitability as defined in 40 CFR 261.21. The waste is not a liquid, an ignitable compressed gas, or an oxidizer, and is not capable of causing fire through friction, absorption of moisture, or spontaneous chemical change.

Ignitable liquids used in Buildings 3019-A and 4508 include acetone, benzene, diethylbenzene, dodecane, ethanol, methyltrichlorosilane, and n-paraffin. Solutions containing oxidizing compounds were also used in Buildings 3019-A and 4508, including ammonium nitrate, cadmium nitrate, hydrogen peroxide, hydroxylamine nitrate, magnesium perchlorate, and sodium nitrate. Waste management practices in the facilities required collection of liquids separate from solid waste. Liquids were released to the liquid waste system drains or were sent off-site for disposal (References C313, C315, C618, P508, P531, P1020, P1127, P1141, and P1146).

Radiography or visual examination is performed to ensure the absence of prohibited items. Any container identified with compressed gases, or non-residual liquids will be segregated from the waste stream during characterization and will not be eligible for disposal at WIPP until further characterization or remediation is conducted. Therefore, this waste stream does not exhibit the characteristic of ignitability (D001).

Corrosivity

The waste does not meet the definition of corrosivity as defined in 40 CFR 261.22. The waste is not a liquid waste. Acidic and caustic liquids used in Buildings 3019-A and 4508 include ammonium hydroxide, hydrochloric acid, hydrofluoric acid, nitric acid, oxalic acid, phosphoric acid, sodium bicarbonate, sodium carbonate, and sodium hydroxide. Waste management practices in the facilities required liquid removal (i.e., drained or squeezed), separate liquid collection or absorption of the liquid (using vermiculite). Aqueous liquids were released to the liquid waste system drains (References C313, C315, C618, P508, P531, P1020, P1127, P1141, and P1146). Oxidizers and corrosive chemicals such as permanganates, perchlorates, and nitrates were neutralized (using ammonia, ammonia hydroxide, magnesium hydroxide, sodium hydroxide calcium oxide) (References P876 and P1154).

Liquids are removed or immobilized at the TWPC prior to WIPP disposal. Radiography or visual examination is performed to ensure the absence of prohibited liquids. Therefore the characteristic of corrosivity (D002) does not apply to this waste stream.

Reactivity

The waste does not meet the definition of reactivity as defined in 40 CFR 261.23. The materials are stable and will not undergo violent chemical change. The materials will not react violently with water, form potentially explosive mixtures with water, or generate toxic gases, vapors, or fumes when mixed with water. The waste does not contain reactive cyanide or sulfide compounds. The materials are not capable of detonation or explosive reaction if subjected to a strong initiating source or if heated under confinement. The materials are not readily capable of detonation or explosive decomposition or reaction at standard temperature and pressure.

Liquid and explosives are verified as absent in TRU waste in accordance with the ORNL Health Physics Manual (References P241, P244, P566, P917 and P1032). Building 3019-A established its own procedure for handling and packaging CH TRU waste. Reactive cyanide or sulfide compounds were not in the processes that generated this waste stream. Liquids were released to the liquid waste system or were sent off-site for disposal (References C313, C315, C618, P508, P531, P1020, P1127, P1141, and P1146).

Sodium metal and sodium-potassium alloy were used in Building 4508. One of the steps in fuel rod assembly involved loading sodium metal or sodium-potassium alloy into the gap between the fuel and the cladding or between the fuel pin and the outer capsule. These gloveboxes were operated in a clean condition, and the materials used in this operation were carefully

cleaned, smeared, and probed for external contamination before being introduced into the glovebox. As a result, sodium metal or sodium-potassium alloy would not be generated as TRU waste (Reference P531). Nitrated anion-exchange resins were neutralized by converting the resin to the hydroxide form using a dilute caustic solution before disposal (Reference P1020).

Hydrazine hydrate (i.e., water solution) was used as a reducing agent for converting plutonium and uranium nitrates into oxide powders suitable for use in making pellet fuels. Hydrazine hydrate was also used for uranium oxide sol preparation as a precipitant and decantation wash solution. Waste hydrazine hydrate solutions were pumped into a waste tank and were not placed in TRU waste drums. (References M632, P114, P1118.)

To ensure the waste does not exhibit the characteristic of reactivity, liquids are removed or immobilized at the TWPC prior to WIPP disposal. Waste stream OR-RF-CH-HET is therefore not reactive (D003).

Toxicity Characteristic

This waste stream exhibits the characteristic of toxicity per 40 CFR 261.24. The toxicity characteristic contaminants fall into two categories; metals and organics. The debris may contain toxicity characteristic metals. The following toxicity characteristic metals and metal compounds were used and may contaminate this waste stream (Reference DR011).

Cadmium nitrate (D006) was added to uranium nitrate hexahydrate solutions to keep the material subcritical. It is also a fuel impurity (References C620, P021, P145, P151, P1141, P1147, and P1160). Chromium (D007) was alloyed with uranium, and is a fuel impurity References C620, P1005, and P1147). Potassium dichromate was used as an etchant and an oxidizing agent (References P1009 and P1043). Lead (D008) is present as bricks, lead shot, and leaded glass. Lead is also contained in solder from electrical devices containing circuit boards (References M141, M144, M145, U845, and U846). Mercury (D009) is present in alkaline batteries, and a small amount of liquid mercury was identified in a drum on the UCN-2822 form (References M141, M144, and M145). Mercury porosimetry was used for density examination of carbides, carbonitrides, and product microspheres (References P110, P145, and P1146). Silver (D011) is present due to solder from electrical devices containing circuit boards (References M144, and M145). Since analytical data are not available to demonstrate the concentrations of these metals are less than the regulatory thresholds, EPA hazardous waste numbers (HWNs) D006, D007, D008, D009, and D011 are conservatively assigned to this waste stream.

Waste stream OR-RF-CH-HET meets the definition of toxicity for organic compounds as defined in 40 CFR Part 261, Subpart C (40 CFR 261.24). Benzene, trichloroethylene, and tetrachloroethylene were used in the processes that generated this waste stream. Because the more specific F-listed EPA HWNs have been assigned for these compounds, EPA HWNs D018, D039, and D040 are not assigned to the waste stream. Carbon tetrachloride was used as a stabilization agent but is not an F001-listed waste because it was not used for large-scale degreasing operations. However, since analytical data are not available to demonstrate the concentration of carbon tetrachloride is less than the toxicity characteristic regulatory threshold, EPA HWN D019 is conservatively assigned to this waste stream.

F-Listed Waste

Waste stream OR-RF-CH-HET is an F-listed hazardous waste because the debris was mixed with hazardous wastes from non-specific sources as listed in 40 CFR Part 261, Subpart D (40

CFR 261.31). The following F-listed constituents were used in Buildings 3019-A and 4508 and may contaminate the materials in this waste stream (Reference DR011).

Trichloroethylene (F001) was used in large scale degreasing operations to remove silicon oil from microspheres (Reference P1020). In addition, it was used as a gelation medium, cleaning solution, and was contained in a binder used for fuel rod fabrication development (References M629, P020, P488, P1005, P1009, P1020, P1050, and P1143). Tetrachloroethylene (F002) was used as a coolant for a gas injector assembly and was a component of a binary organic gelation medium (References M629, P1043, P1063, and P1070). 1,1,2-trichloro-1,2,2-trifluoroethane (F002) was used for washing metallography specimens (Reference P531). Benzene (F005) was used to clean fuel molds (Reference P531). Toluene (F005) was contained in a binder used for fuel rod fabrication development (Reference P1009).

The F003-listed solvents acetone and methanol were identified as present in this waste stream as contaminants of debris waste (References P531, P1009, P1051, P1070, P1119, and P1160). However, F003-listed solvents are listed solely for ignitability, and this waste stream does not exhibit the characteristic of ignitability because the solvents are not in liquid form. Therefore, waste stream OR-RF-CH-HET is not an F003-listed hazardous waste.

Following is a listing of the F-listed EPA HWNs and associated constituents.

(F001)
Trichloroethylene

(F002)
Tetrachloroethylene, 1,1,2-trichloro-1,2,2-trifluoroethane

(F005)
Benzene, toluene

U, K, and P-Listed Chemicals

Waste stream OR-RF-CH-HET does not contain a discarded commercial chemical product, an off-specification commercial chemical product, or a container residue or spill residue thereof (40 CFR 261.33).

Beryllium is present in the waste stream but does not meet the definition of a P015-listed waste. Beryllium exists only as contamination from fuel materials and does not exist as the commercial chemical product beryllium powder (P015). Therefore, P015 (beryllium)is not applied. The review of the AK source documentation did not identify the disposal of unused hydrofluoric acid or disposal of materials contaminated with spills of hydrofluoric acid (U134). Therefore, EPA HWN U134 (hydrofluoric acid) is not assigned to the waste stream. U and P-listed EPA HWNs are not assigned to this waste stream.

Waste stream OR-RF-CH-HET does not contain hazardous waste from any of the specific sources in 40 CFR 261.32, and therefore, is not a K-listed waste.

Headspace Gas/Volatile Organic Compound Information

Headspace gas sampling was performed on 10 randomly selected containers in this waste stream. No target analyte UCL_{90} values exceeded respective program required quantitation limits (PRQLs). No tentatively identified compounds were identified.

No new EPA HWNs were assigned as a consequence of headspace gas sampling and analysis. The specifics of this information are included in the attached Characterization Information Summary report.

Conclusion

The following EPA HWNs are assigned to this waste stream: D006, D007, D008, D009, D011, D019, F001, F002, and F005.

Polychlorinated Biphenyls (PCBs)

This waste stream may contain regulated levels of polychlorinated biphenyls (PCBs), and therefore, is regulated as Toxic Substance Control Act (TSCA) wastes under 40 CFR 761.

Based on AK, some drums in this waste stream may contain equipment with small PCB capacitors and pumps that contained PCB oil. Oil was drained from the pumps and was not placed into TRU waste containers. Oil that could not be drained from the pump was absorbed. Examples of equipment containing small capacitors include fluorescent light ballasts and electric motors such as a vacuum pump motor. These items may be present in waste generated before 1979 (References C308 and C315). Drums found to contain pumps, small capacitors contained in electric motors and light ballasts, or other PCB-containing items during RTR will be managed in accordance with the PCB disposal requirements of the WIPP waste acceptance criteria.

Prohibited Items

The absence of prohibited items is determined and documented through acceptable knowledge and confirmation activities. Radiography (RTR) or visual examination (VE) is performed on each container in this waste stream as a confirmation activity. The following items have been determined as not present in the waste:

- Liquids
- Non-radioactive pyrophoric materials
- Waste incompatible with backfill, seal and panel closure materials, container and packaging materials, or other wastes
- Explosives or compressed gases
- Waste with PCBs not authorized under an EPA PCB waste disposal authorization
- Waste exhibiting the characteristics of ignitability, corrosivity, or reactivity
- Non-mixed hazardous wastes
- Waste that has ever been managed as high-level waste and waste from tanks specified in Table B-8 of the WIPP Hazardous Waste Facility Permit, unless specifically approved through a Class 3 permit modification.
- Any waste container from a waste stream (or waste stream lot) which has not undergone either radiographic or visual examination of a statistically representative subpopulation of the waste stream in each shipment, as described in the WIPP Hazardous Waste Facility Permit, Attachment B7.

Each container of waste is certified and shipped only after VE or RTR:

- Did not identify any prohibited items in the waste container, or
- All prohibited items found in a waste container by VE or RTR are identified and corrected (i.e., eliminated or removed) through the site non-conformance reporting system.

Method for Determining Waste Material Parameter Weights per Unit of Waste

The waste material parameter weight estimates for waste stream OR-RF-CH-HET were derived from VE data. These waste material parameter estimates are derived from 31 drums. The analysis of the data is documented in a memorandum as required by CCP-TP-005, CCP Acceptable Knowledge Documentation. The results of this analysis are presented in Table 2.

Table 2. Waste Stream OR-RF-CH-HET Waste Material Parameters

Waste Material Parameter	Weight Percent	Weight Percent Range
Aluminum-based Metals/Alloys	4%	0 – 40%
Iron-based Metals/Alloys	22%	0 – 87%
Other Metals	10%	0 – 98%
Other Inorganic Materials	2%	0 – 20%
Cellulosics	17%	0 – 82%
Plastics (waste materials)	26%	0 – 88%
Rubber	14%	0 – 76%
Soils/gravel	0%	0 - 0%
Organic Matrix	0%	0 – 0%
Inorganic Matrix	5%	0 – 91%

List of AK Sufficiency Determinations

No AK Sufficiency Determinations were requested for this waste stream.

Transportation

This waste stream and its chemical constituents have been reviewed for consistency with listed TRUCON codes and they are consistent.

Beryllium

The level of beryllium contamination in individual drums is expected to be less than one weight percent.

Radionuclide Information

The two most prevalent radionuclides by mass in this waste stream are Th-232 and Pu-239. The isotopes expected to be present in the waste stream are listed in Table 3.

Table 3. Radionuclides in Waste Stream OR-RF-CH-HET

WIPP Tracked Radionuclides	Additional Reported Radionuclides	
Am-241	Am-243	U-235
Pu-238	Cf-252	
Pu-239	Cm-244	
Pu-240	Th-229	
Pu-242	Th-232	
U-233	Np-237	
U-234	Pa-231	
U-238	Pu-241	
Cs-137	U-232	
Sr-90	U-236	

Payload management will not be employed for this waste stream by Oak Ridge National Laboratory.

Attachment 1

AK SOURCE DOCUMENTS, SUPPLEMENTAL DOCUMENTATION

Source Document Number	AK Element #	Title	Document Number	Rev. #	Date
C083	S7	Interview with Curtis Maples: Historical operations and waste management at Building 4508	NA	NA	05/19/2005
C153	S7	Email Releasing ORNL Container Paperwork. Subject: The Release of Generator Disposal Forms (2822 and 2109) Forms.	NA	NA	4/2008 - 5/2008
C308	S7	Interview of Jason Taylor, ORNL-PCB *Coordinator from 1997 - 2004 re:* PCB Management at ORNL	NA	NA	04/08/2008
C313	NA	Interview with Billy Starns re: D&D of the PUMP Facility and Chemicals used for Decon Building 3019A	C313	NA	2/12/2009
C314	S7	Interview with Alan Krichinsky: re Building 3019A Operations, Waste Management and Chemicals used for Decon	C314	NA	12/8/2008
C315	S7	Interview with Judy Butler re: Building 3019A Operations, Waste Management, and Chemicals used for Decon	C315	NA	12/4/2008
C618	S2	Safety Summary for PuO2 Sol and PuO2-UO2 Microsphere Demonstration Located in Room 211, Building 3019	NA	NA	04/12/1966
C620	NA	Miscellaneous Intra-Laboratory Correspondence Relating to Plutonium Microsphere Preparation	NA	NA	03/70 thru 11/70
DR011	NA	Discrepancy Resolution – Waste Stream OR-RF-CH-HET EPA Hazardous Waste Number Assignment	NA	NA	3/11/2009
M141	NA	UCN-2109 and UCN-2822 Forms and Associated Container Paperwork for Buildings 3019-A and 4508	NA	NA	Various
M144	S9	EnergX RTR Data for the Reactor Fuel Waste Stream (Container Paperwork)	NA	NA	Various
M145	NA	EnergX VE Data for the Reactor Fuel Waste Stream (Container Paperwork)	NA	NA	2007 - 2009
M151	S6	ORNL EM Waste Database	DR-09-001168	NA	04/22/2009
M629	NA	DIPRES Monthly Reports	NA	NA	02/82 thru 10/84

Source Document Number	AK Element #	Title	Document Number	Rev. #	Date
M632	S2	ENRICHED U02-SOL PREPARATION - - Room 209 Facility (March 1970)	NA	NA	08/26/1970
P020	NA	Chemical Technology Division Annual Progress Report Period Ending March 31, 1979	ORNL-5542	NA	Nov-79
P021	S5	Chemical Technology Division Progress Report for the Period April 1, 1981 to March 31, 1983	ORNL-5933	NA	09/1983
P037	S5	Chemical Technology Division Annual Progress Report for Period Ending May 31, 1968	ORNL-4272	NA	09/1968
P043	S5	Oak Ridge National Laboratory, Institutional Plan, FY 1996 – FY 2001	ORNL/PPA-95/1	NA	12/1995
P095	S5, S9	Shippingport Operations With The Light Water Breeder Reactor Core	WAPD-TM-1542	NA	03/1986
P096	S5, S9	Chemical Technology Division Annual Progress Report, Period Ending March 31, 1974	ORNL-4966	NA	08/1974
P097	S5, S9	Chemical Technology Division Annual Progress Report, Period Ending March 31, 1978	ORNL-5383	NA	03/31/1978
P098	S5, S9	Chemical Technology Division Annual Progress Report, for the Period April 1, 1979 to March 31, 1971	ORNL-5757	NA	11/1981
P110	S5	Chemical Technology Division Annual Progress Report for Period Ending March 31, 1972	ORNL-4794	NA	08/1972
P112	NA	Safety Analysis Of The Alpha Isolation Laboratory, Building 3508	ORNL-TM-3938	NA	01/1973
P114	S5	Chemical Technology Division Annual Progress Report for Period Ending March 31, 1971	ORNL-4682	NA	07/1971
P118	S5, S9	Metals and Ceramics Division Annual Progress Report For Period Ending June 30, 1971	ORNL-4770	NA	09/1971
P136	S5	Chemical Technology Division Annual Progress Report for Period Ending May 31, 1967	ORNL-4145	NA	10/1967
P145	NA	Chemical Technology Division Annual Progress Report for Period Ending May 31, 1970	ORNL-4572	NA	Oct-70
P151	S5	Chemical Technology Division Annual Progress Report for Period Ending May 31, 1973	ORNL-4883, UC-10	NA	08/1973
P153	S5	Chemical Technology Division Annual Progress Report; Period Ending March 31, 1975	ORNL-5050, UC-10	NA	10/1975

Source Document Number	AK Element #	Title	Document Number	Rev. #	Date
P160	S5	Chemical Technology Division Annual Progress Report; Period Ending March 31, 1977	ORNL-5295 UC-10	NA	10/1977
P164	S5	Chemical Technology Division Annual Progress Report; Period Ending March 31, 1976	ORNL-5172 UC-10	NA	09/1976
P177	S5	A New Solvent Extraction Process for Preparing PuO2 Sols	Vol. 18	NA	06/1973
P241	S2	Oak Ridge National Laboratory Contact-Handled Transuranic Waste Certification Program Plan	ORNL/TM-10322/2	1, 2, 3	June 1992
P242	S11	Oak Ridge National Laboratory Contact-Handled Transuranic Waste Certification Program Plan	ORNL/TM-10322/R3	1, 2, 3	06/1992
P244	S2	Certification Document for Newly Generated Contact-Handled Transuranic Waste	ORNL-5985/R1	1	05/1984
P251	S2	Box Breakdown Area Operations	CH-P-OP-003	7, 5, 12	03/13/2007 10/11/2007 7/29/2008, 3/23/09
P252	S2	Glove Box Operations	CH-P-OP-004	8, 10,14	03/13/2007 10/11/2007 7/29/2008, 03/23/2009
P253	S2	Drum Bag In/Bag Out and Glove Ports	CH-P-OP-011	10,12, 13	05/02/2007 1/15/2008, 03/23/2009
P254	S2	Contact Handled Waste Repackaging (Rewritten)	CH-P-OP-013	6,7, 8	4/30/2007; 10/3/2007; 2/22/2008; 03-23-09
P256	S3	TRU/Alpha Low Level Waste (LLW) Treatment Project Documented Safety Analysis	T-CM-FW-R-AD-001	13	3/01/2007
P362	S5	Metals and Ceramics Division Materials Sciences Program Annual Progress Report for Period Ending June 30, 1987	ORNL/TM-10601	NA	04/25/1988
P432	S3	TRU Waste Processing Center Document Safety Analysis	CM-R-AD-001	NA	10/31/2007 12/20/2007 10/24/2008
P446	S8, S13	Organizational Chart Manual	NA	NA	09/1990
P479	S13	Metals and Ceramics Division Research Staff Directory	ORNL/M-749	NA	06/18/1990
P488	NA	A Gel Sphere Process for the FBR Fuel Fabrication from Co processed Feed	ORNL/TM-8399	NA	Feb-83
P508	NA	Safety Analysis: LWBR Support Program in Building 3019 Pilot Plant	ORNL-TM-3567	NA	3/22/1972

Source Document Number	AK Element #	Title	Document Number	Rev. #	Date
P509	S2, S9	Criticality Analysis: LWBR Assistance Program in Building 3019	ORNL-TM-3469	NA	March 1972
P518	S3	Safety Analysis: LWBR Support Program in Building 3019 Pilot Plant	ORNL-TM-3567	NA	March 1972
P531	S3	Safety Analysis of the Fuel Cycle Alpha Facility (Building 4508, Room 265)	ORNL/CF-71-8-37	NA	8/25/1971
P566	NA	ORNL Health Physics Manual; Procedures RP-4.1; RP-4.2; RP-5.1	ORNL/M-804; RP-4.1; RP-4.2; RP-5.1	NA	11/02/1994
P868	S2, S5	Problem Safety Summary for Building 3019, Penthouse 201 - Dissolution ~28 grams of Pu-239	RTS No. 95-2	1	07/24/1995
P869	S2, S5	Problem Safety Summary for Building 3019, Lab 114 - dissolution ~1 kilogram of Normal Uranium and ~50 grams of Enriched Uranium	RTS No. 95-3	1	07/24/1995
P871	S2, S5	Problem Safety Summary for Building 3019, Cell 6 - Remediation of Cell 6 Raschig Rings	RTS No. 95-6	NA	12/05/1995
P876	S2, S5	Procedure for Transuranic Waste Handling in Buildings 3019 Complex, 3028, 3033 Annex, and 3047	RTS-025	0	11/02/1993
P905	S2	Health Physics Procedure - Handling and Transfer of Radioactive Materials within the Laboratory and Guide for the Transfer of Materials Between Contaminated Enclosure Systems and Non-Contaminated Areas	Procedure 4.1	NA	01/01/1976
P917	S2	Procedure 5.1 - Segregation and Management of solid Radioactive Waste Materials and supporting Solid Waste Management Documentation	Procedure 5.1	NA	12/15/1983 12/15/1985
P1005	NA	Consolidated Fuel Reprocessing Program progress Report For period July 1 to September 30, 1980	ORNL/TM-7557	NA	Dec-80
P1006	S5	Metals and Ceramics Division, Conversion of Uranium Nitrate to Ceramic-Grade Oxide for the Light Water Breeder Reactor; Process Development	ORNL-4755	NA	4/1972
P1007	S5	Chemical Technology Division - The Dissolution of Unirradiated and Irradiated (U,Pu)O2 in Nitric Acid	ORNL-5015	NA	02/1975
P1009	S5	Gas-Cooled Reactor Programs: High Temperature Gas-Cooled Reactor Base-Technology Program Progress Report for January 1, 1974, through June 30, 1975	ORNL-5108	NA	11/1976

Source Document Number	AK Element #	Title	Document Number	Rev. #	Date
P1011	S5	Gas-Cooled Reactor Programs: High-Temperature Gas-Cooled Reactor Base-Technology Program progress report for July 1, 1975, Through December 31, 1976	ORNL-5274	NA	11/1977
P1012	S5	Gas Cooled Reactor programs: High-Temperature Gas-Cooled Reactor base-Technology Program Annual Progress Report for the period Ending December 31, 1978	ORNL-5536	NA	6/1979
P1013	S5	Gas-Cooled Reactor Programs: High-Temperature Gas-Cooled Reactor Base-Technology Program Annual progress Report for Period Ending December 31, 1979	ORNL-5643	NA	7/1980
P1014	S5	Consolidated Fuel reprocessing Program: Development of Thermal Denitration to prepare Uranium Oxide and Mixed Oxides for Nuclear Fuel Fabrication (Metals and Ceramics Division)	ORNL-5735	NA	9/1981
P1020	S3	Final Safety Analysis Report for the Plutonium-Uranium Oxide Microsphere preparation (PUMP) Facility in Building 3019 at ORNL	ORNL/CF-82/18	NA	3/1984
P1026	S2	Safety Review and Operating Procedures for Prototype Remotely Operated Coating Furnace	ORNL-CF-70-1-33	NA	1/6/1970
P1027	NA	Radioactive Operations Committee Review of Building 3019A Radiochemical Processing Plant	ORNL/CF-73-1-39	NA	1/23/1973
P1032	NA	Chemical Technology Division: Oak Ridge National laboratory Transuranic Waste Training Manual	ORNL/CF-86/90	NA	11/1986
P1033	S5	Radioactive Operations Committee Review of the Radiochemical Processing Plant (RPP) at Building 3019 from the Radioactive Operations Committee to R. S. Wiltshire.	ORNL/CF-87/53	NA	3/4/1987
P1043	S5	Gas-Cooled Reactor Programs - Thorium Utilization Program Progress Report for January 1, 1976 Through June 30, 1975	ORNL-5128	NA	05/1976
P1045	S5	LWR Fuel Reprocessing and Recycle Program Quarterly Report for Period January 1 to March 31, 1977	ORNL/TM-5864	NA	05/1977
P1046	S5	Advanced Fuel Recycle Program Progress Report for Period January 1 to March 31, 1978	ORNL/TM-6306	NA	05/1978
P1050	NA	Consolidated Fuel Reprocessing Program for Period January 1 to March	ORNL/TM-8731	NA	Jun-83

Source Document Number	AK Element #	Title	Document Number	Rev. #	Date
		31, 1983			
P1051	NA	Consolidated Fuel Reprocessing Program Progress Report for Period October 1 to December 31, 1983	ORNL/TM-9050	NA	Apr-84
P1060	S5	Consolidated Fuel Reprocessing Program Progress Report for Period Ending January 1 to March 31, 1981	ORNL-TM-7773	NA	06/1981
P1063	NA	Gas-Cooled Reactor Programs - Thorium Utilization Program Progress Report for July 1, 1975, Through September 30, 1976	ORNL-5266	NA	Jul-77
P1065	S5	Chemical Technology Division - Aqueous Fuel Reprocessing Quarterly Report for Period Ending June 30, 1973	ORNL-TM-4301	NA	08/1973
P1070	NA	Gas-Cooled Reactor Programs - High-Temperature Gas-Cooled Reactor Fuel Recycle Development Annual Progress Report for Period Ending September 30, 1977	ORNL-5423	NA	Sep-78
P1072	S5	Metals and Ceramics Division Fuels and Materials Development Program Quarterly Progress Report for Period Ending September 30, 1973	ORNL-TM-4405	NA	01/1974
P1075	S5	LWR Fuel Reprocessing and Recycle Program Quarterly Report for Period January 1 to March 31, 1976	ORNL/TM-5447	NA	05/1976
P1080	S5	Metals and Ceramics Division - Fuels and Materials Development Program Quarterly Progress Report for period Ending December 31, 1973	ORNL-TM-4524	NA	05/1974
P1081	S5	Consolidated Fuel Reprocessing Program Progress Report for Period October 1 to December 31, 1979	ORNL/TM-7192	NA	05/1980
P1111	S5	Metals and Ceramics Division Progress Report for Period Ending December 31, 1992	ORNL-6745	NA	04/1993
P1118	S5	Laboratory Studies of Sol-Gel Processes at the Oak Ridge National Laboratory	ORNL-TM-1980	NA	September 1967
P1119	S5	Laboratory and Engineering Studies of Sol-Gel Processes at the Oak Ridge National Laboratory	ORNL-TM-2205	NA	05/03/1968
P1121	S4	Sol-Gel Sphere-Pac Activities for the Fuel Refabrication and Development Program Quarterly Progress Report for period Ending December 31, 1977	ORNL/TM-6746	NA	March 1979
P1127	NA	The Oak Ridge National Laboratory Ceramic Fuels Alpha Facility	CONF-791103-79	NA	01/01/1979

Source Document Number	AK Element #	Title	Document Number	Rev. #	Date
P1137	S1	The Sphere-Cal Process: Fabrication of Fuel Pellets From Gel Microspheres	ORNL/TM-6906	NA	September 1979
P1138	S5	Critical Evaluation of Gel-Derived Spheroidized Feed for Fast Breeder Reactor Pellet Fabrication	ORNL/TM-8014	NA	September 1982
P1141	NA	Final Safety Analysis Report for the Consolidated Edison Uranium Solidification Program (CEUSP) Facility	ORNL/ENG/INF-83/2	NA	Jun-84
P1143	NA	Gel-Sphere Engineering - Scale Development	NA	NA	9/9/1981
P1146	NA	Sol-Gel Urania-Plutonia Microsphere Preparation and Fabrication into Fuel Rods	NA	NA	Undated
P1147	NA	Chemical Technology Division Progress Report for the Period July 1, 1988 to September 30, 1989	ORNL-6596	NA	Mar-90
P1152	NA	Process Knowledge Documentation for Building 3019A, 233U Material Downblending and Disposition Project	ISO-OPS-117	1	Dec-08
P1153	S2	General Operations of the RDF	RDF-OP-001	0	06/08/1992
P1154	S2	Handling and Packaging of Contact-Handled Transuranic Waste (CH-TRU Waste)	RDF-OP-002	2	06/19/1990
P1155	S2	Alpha Glove Box Operating Procedures	RDF-OP-013	0	05/15/1990
P1160	NA	Chemical Technology Division Progress Report for the Period April 1, 1985, to December 31, 1986	73-9-5 ORNL-6343	NA	Aug-87
U038	S5, S9	ORNL TRU Waste Historical Survey; Volumes 1, 2, and 3—Origins and Characteristics of Remote-Handled Transuranic Wastes (Trabalka report) Plus Appendices	BJC/OR-395-V/1,2,3	Draft	09/2001
U044	S2, S9	Weston Report: Acceptable Knowledge Summary Report for Oak Ridge National Laboratory Contact-Handled TRU Debris Waste Facility Maintenance Operations	Weston AK-ORNL-001	3A, 4	0524/2006; 06/19/2006
U845	S11	3019 Operating Logbook - 1988	NA	NA	1988
U846	S11	3019 Operating Logbook - 1989	NA	NA	1989

Alphanumeric Designations

C	Correspondence
D	Documents
DR	Discrepancy Resolution
M	Miscellaneous
P	Procedures and Published Documents
U	Unpublished Documents

AK Numbers

S1	Process Design Documents
S2	Standard Operating Procedure
S3	Safety Analysis Reports
S4	Waste Packaging Logs
S5	Test plans/research project reports
S6	Site databases
S7	Information from site personnel
S8	Standard industry documents
S9	Previous analytical data
S10	Material safety data sheets
S11	Laboratory Notebooks
S12	Comparable or surrogate sampling and analysis data
S13	Other

DIVIDER

PAGE

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CP:11:01017
UFC:5900.00

Washington TRU Solutions LLC

INTER-OFFICE CORRESPONDENCE

DATE: January 5, 2011

FROM: R. P. Kantrowitz R.P.K. LOCATION: Certification

TO: CCP Records Custodian GSA-212 LOCATION: Retrieval, Characterization and Transportation

SUBJECT: TRANSMITTAL OF OAK RIDGE NATIONAL LABORATORY CHARACTERIZATION INFORMATION SUMMARY FOR WASTE STREAM #OR-RF-CH-HET, LOT 8 AND LOT 9

Please accept the attached Oak Ridge National Laboratory Characterization Information Summary to be placed in records for Waste Stream #OR-RF-CH-HET, Lot 8 and Lot 9.

RPK:yhs

Attachment

cc: (without attachment)
M. W. Pearcy ED
B. S. Schrock ED

ORIGINAL

CHARACTERIZATION INFORMATION SUMMARY

WSPF # OR-RF-CH-HET

Lot 9

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CCP Characterization Information Summary Cover Page

Waste Stream # OR-RF-CH-HET Lot #: 9

AK Expert Review: N/A Date: N/A

SPM Review: Julius Lyons Date: 11/11/2010

SPM signature certifies that through Acceptable Knowledge, testing and/or analysis that the waste identified in this summary is not corrosive, ignitable, reactive, or incompatible with the TSDF.

A summary of the Acceptable Knowledge regarding this waste stream containing specific information about the corrosivity, reactivity, and ignitability of the waste stream is included as an attachment to the Waste Stream Profile Form. By reference, that information is included in this lot.

List of procedures used:

Radiography (RTR/NDE)

CCP-TP-053	Rev. 9	09/30/10	CCP Standard Real-Time Radiography (RTR) Inspection Procedure
CCP-TP-053	Rev. 8	06/30/10	CCP Standard Real-Time Radiography (RTR) Inspection Procedure
CCP-TP-053	Rev. 7	10/21/09	CCP Standard Real-Time Radiography (RTR) Inspection Procedure
CCP-TP-053	Rev. 6	03/04/08	CCP Standard Real-Time Radiography (RTR) Inspection Procedure

Visual Examination (VE)

CCP-TP-113	Rev. 14	06/30/10	CCP Standard Contact-Handled Waste Visual Examination
CCP-TP-113	Rev. 13	03/11/09	CCP Standard Contact-Handled Waste Visual Examination

Non Destructive Assay (NDA):

CCP-TP-166	Rev. 3	02/26/10	CCP Drum Waste Assay System Imaging Passive/Active Neutron Operations
CCP-TP-166	Rev. 2	12/05/08	CCP Drum Waste Assay System Imaging Passive/Active Neutron Operations
CCP-TP-166	Rev. 1	06/19/08	CCP Drum Waste Assay System Imaging Passive/Active Neutron Operations
CCP-TP-166	Rev. 0	10/12/07	CCP Drum Waste Assay System Imaging Passive/Active Neutron Operations
CCP-TP-168	Rev. 3	11/17/09	CCP DWAS IPAN/SGS Data Generation Level Validation
CCP-TP-168	Rev. 2	12/02/08	CCP DWAS IPAN/SGS Data Generation Level Validation
CCP-TP-168	Rev. 1	11/17/08	CCP DWAS IPAN/SGS Data Generation Level Validation
CCP-TP-168	Rev. 0	10/18/07	CCP DWAS IPAN/SGS Data Generation Level Validation
CCP-TP-169	Rev. 2	11/18/09	CCP Operating the Mobile Segmented Gamma Scanner
CCP-TP-169	Rev. 1	06/19/08	CCP Operating the Mobile Segmented Gamma Scanner
CCP-TP-169	Rev. 0	10/12/07	CCP Operating the Mobile Segmented Gamma Scanner
CCP-TP-046	Rev. 3	9/14/2009	CCP Mobile IQ3 System Calibration Procedure
CCP-TP-047	Rev. 10	10/20/2010	CCP Mobile IQ3 Gamma Scanner Operations
CCP-TP-047	Rev. 9	1/22/2010	CCP Mobile IQ3 Gamma Scanner Operations
CCP-TP-047	Rev. 8	9/22/2009	CCP Mobile IQ3 Gamma Scanner Operations
CCP-TP-048	Rev. 14	3/8/2010	CCP Modile IQ3 System Data Reviewing, Validating and Reporting Procedure

Headspace Gas Sampling and Analysis (HSG):

CCP-TP-093	Rev. 13	03/19/07	CCP Sampling of TRU Waste Containers
CCP-TP-106	Rev. 6	07/12/07	CCP Headspace Gas Sampling Batch Data Report Preparation
CCP-TP-173	Rev. 1	09/30/09	CCP Analysis of Gas Samples for VOCs by GC/FID
CCP-TP-173	Rev. 0	05/03/07	CCP Analysis of Gas Samples for VOCs by GC/FID
CCP-TP-175	Rev. 1	03/29/10	CCP Analysis of Gas Samples for VOCs by GC/MS
CCP-TP-175	Rev. 0	05/02/07	CCP Analysis of Gas Samples for VOCs by GC/MS

Project Level Data Validation / DQO Reconciliation:

CCP-TP-001	Rev. 18	08/09/10	CCP Project Level Data Validation and Verification
CCP-TP-001	Rev. 17	09/24/07	CCP Project Level Data Validation and Verification
CCP-TP-002	Rev. 22	06/30/10	CCP Reconciliation of DQOs and Reporting Characterization Data
CCP-TP-002	Rev. 21	08/04/09	CCP Reconciliation of DQOs and Reporting Characterization Data
CCP-TP-002	Rev. 20	08/18/08	CCP Reconciliation of DQOs and Reporting Characterization Data
CCP-TP-003	Rev. 17	11/09/09	CCP Data Analysis for S3000, S4000, and S5000 Characterization
CCP-TP-003	Rev. 16	10/02/07	CCP Data Analysis for S3000, S4000, and S5000 Characterization
CCP-TP-005	Rev. 19	07/06/10	CCP Acceptable Knowledge Documentation
CCP-TP-005	Rev. 18	11/16/06	CCP Acceptable Knowledge Documentation
CCP-TP-030	Rev. 28	05/12/10	CCP CH TRU Waste Certification and WWIS/WDS Data Entry
CCP-TP-030	Rev. 27	12/14/10	CCP CH TRU Waste Certification and WWIS/WDS Data Entry
CCP-TP-030	Rev. 26	05/27/09	CCP CH TRU Waste Certification and WWIS/WDS Data Entry
CCP-TP-030	Rev. 25	01/22/09	CCP CH TRU Waste Certification and WWIS Data Entry

CCP-TP-030	Rev. 24	08/20/08	CCP CH TRU Waste Certification and WWIS Data Entry
CCP-TP-030	Rev. 23	03/12/08	CCP CH TRU Waste Certification and WWIS Data Entry
CCP-TP-030	Rev. 22	07/24/07	CCP CH TRU Waste Certification and WWIS Data Entry

WAP Certification:

CCP-PO-001	Rev. 18	06/30/10	CCP Transuranic Waste Characterization Quality Assurance Project Plan
CCP-PO-001	Rev. 17	06/23/09	CCP Transuranic Waste Characterization Quality Assurance Project Plan
CCP-PO-001	Rev. 16	10/31/07	CCP Transuranic Waste Characterization Quality Assurance Project Plan
CCP-PO-002	Rev. 24	06/30/10	CCP Transurenic Waste Certification Plan
CCP-PO-002	Rev. 23	04/07/10	CCP Transuranic Waste Certification Plan
CCP-PO-002	Rev. 22	01/12/10	CCP Transuranic Waste Certification Plan
CCP-PO-002	Rev. 21	01/26/09	CCP Transuranic Waste Certification Plan
CCP-PO-002	Rev. 20	11/02/07	CCP Transuranic Waste Certification Plan
CCP-PO-027	Rev. 2	04/22/10	CCP/TWPC/ORNL Interface Document
CCP-PO-027	Rev. 1	02/17/10	CCP/TWPC/ORNL Interface Document
CCP-PO-027	Rev. 0	10/02/07	CCP/TWPC/ORNL Interface Document

CB5003

CCP Correlation of Container Identification Numbers to Batch Data Report Numbers

Waste Stream: # OR-RF-CH-HET

Lot # 9

Container ID Number	NDA BDR	RTR BDR	VE BDR	Solids Sampling BDR	Solids Analytical BDR	Load Management/ Overpack Yes	Headspace Gas BDR			
							Sample	Analysis		
X10C0010360S	OR-DWAS-0381	OR-RTR6-0331	NA	NA	NA		NA	NA	NA	OR10FG4034
X10C0010703E	OR-DWAS-0385	OR-RTR6-0331	NA	NA	NA		NA	NA	NA	OR10FG4037
X10C9309183O	OR-DWAS-0405	OR-RTR6-0254	NA	NA	NA		NA	NA	NA	OR09FG4108
X10C9309198A	OR-DWAS-0396	OR-RTR6-0304	NA	NA	NA		NA	NA	NA	OR10FG4083
X10C9309198AA	OR-DWAS-0402	OR-RTR6-0311	NA	NA	NA		NA	NA	NA	OR10FG4071
X10C9309198AD	OR-DWAS-0403	OR-RTR6-0312	NA	NA	NA		NA	NA	NA	OR10FG4078
X10C9309198AE	OR-DWAS-0405	OR-RTR6-0311	NA	NA	NA		NA	NA	NA	OR10FG4078
X10C9309198K	OR-DWAS-0393	OR-RTR6-0303	NA	NA	NA		NA	NA	NA	OR10FG4140
X10C9309198M	OR-DWAS-0403	OR-RTR6-0312	NA	NA	NA		NA	NA	NA	OR10FG4078
X10C9309198N	OR-DWAS-0403	OR-RTR6-0311	NA	NA	NA		NA	NA	NA	OR10FG4078
X10C9309198Q	OR-DWAS-0393	OR-RTR6-0304	NA	NA	NA		NA	NA	NA	OR10FG4061
X10C9309198Y	OR-DWAS-0403	OR-RTR6-0312	NA	NA	NA		NA	NA	NA	OR10FG4078
X10C9312741A	OR-IQ3-0133	OR-RTR6-0354	NA	NA	NA		NA	NA	NA	OR10FG4142

Signature of Site Project Manager

Julius Lyons
Printed Name

11/11/2010
Date

CCP Headspace Gas UCL_{90} Evaluation Form

WSPF #: OR-RF-CH-HET **Waste Stream Headspace Gas Lot Number** 1 through 3

ANALYTE	Transform Data Used (No, Data-Log, SQRT, other)	# Samples above MDL (1)	# Samples	Maximum (ppmv)	Mean (ppmv)	SD (ppmv)	UCL_{90} (ppmv)	PRQL (ppmv)	Transformed PRQL (N/A or Value)	UCL_{90} > PRQL Yes	EPA Hazardous Waste Number
Benzene	Log	1	23	-0.83	-3.20	0.84	-2.97	10	2.30		
Bromoform	Log	0	23	-1.74	-4.36	0.76	-4.15	10	2.30		
Carbon Tetrachloride	Log	0	23	-1.58	-3.89	0.67	-3.70	10	2.30		
Chlorobenzene	Log	0	23	-1.06	-3.55	0.69	-3.36	10	2.30		
Chloroform	Log	0	23	-1.02	-3.43	0.68	-3.24	10	2.30		
Cyclohexane[a]	Log	3	23	-0.97	-3.09	0.79	-2.87	10	2.30		
1,1-Dichloroethane	Log	0	23	-0.97	-3.07	0.71	-2.87	10	2.30		
1,2-Dichloroethane	Log	0	23	-0.88	-3.30	0.69	-3.11	10	2.30		
1,1-Dichloroethylene	Log	0	23	-1.16	-3.32	0.71	-3.13	10	2.30		
cis-1,2-Dichloroethylene	Log	1	23	0.83	-3.44	1.03	-3.16	10	2.30		
trans 1,2-Dichloroethylene	Log	0	23	-0.51	-3.26	0.83	-3.03	10	2.30		
Ethyl benzene	Log	0	23	-1.06	-3.50	0.70	-3.31	10	2.30		
Ethyl Ether	Log	0	23	-0.36	-2.90	0.70	-2.70	10	2.30		
Methylene chloride	Log	0	23	-0.80	-3.23	0.69	-3.04	10	2.30		
1,1,2,2-Tetrachloroethane	Log	0	23	-1.04	-3.73	0.71	-3.54	10	2.30		
Tetrachloroethylene	Log	0	23	-1.41	-3.78	0.69	-3.59	10	2.30		
Toluene	Log	18	23	2.64	-0.10	1.58	0.34	10	2.30		
1,1,1-Trichloroethane	Log	1	23	0.79	-3.83	1.09	-3.53	10	2.30		
Trichloroethylene	Log	1	23	4.43	-3.54	1.81	-3.04	10	2.30		
1,1,2-Trichloro-1,2,2-trifluoroethene	Log	0	23	-1.56	-3.90	0.68	-3.72	10	2.30		
1,2,4-Trimethylbenzene[a]	Log	0	23	-0.76	-3.41	0.74	-3.21	10	2.30		
1,3,5-Trimethylbenzene[a]	Log	0	23	-0.79	-3.41	0.74	-3.20	10	2.30		
m,p-Xylenes[b]	Log	3	23	-1.08	-3.49	0.71	-3.29	10	2.30		
o-Xylene	Log	0	23	-0.95	-3.41	0.69	-3.22	10	2.30		
Acetone	Log	17	23	3.58	0.00	1.62	0.45	100	4.61		
Butanol	Log	8	23	-0.95	-2.49	0.83	-2.27	100	4.61		
Methanol	Log	2	23	5.25	2.43	1.20	2.76	100	4.61		
Methyl ethyl ketone	Log	3	23	0.41	-2.37	1.17	-2.05	100	4.61		
Methyl isobutyl ketone	Log	1	23	-1.17	-3.32	0.76	-3.11	100	4.61		

CCP Headspace Gas UCL_{90} Evaluation Form

WSPF #: OR-RF-CH-HET **Waste Stream Headspace Gas Lot Number** 1 through 3

ANALYTE	Transform Data Used (No, Data-Log, SQRT, other)	# Samples above MDL (1)	# Samples	Maximum (ppmv)	Mean (ppmv)	SD (ppmv)	UCL_{90} (ppmv)	PRQL (ppmv)	Transformed PRQL (N/A or Value)	UCL_{90} > PRQL Yes	EPA Hazardous Waste Number
Chloromethane[e]	Log	0	23	-0.69	-3.09	0.67	-2.90	10	2.30		
Carbon Disulfide[e]	Log	14	23	3.09	-1.40	1.72	-0.93	10	2.30		
1,2-Dichloropropane[e]	Log	0	23	-1.49	-3.99	0.78	-3.78	10	2.30		
Trichlorofluoromethane[e]	Log	2	23	2.83	-3.20	1.98	-2.65	10	2.30		
Formaldehyde[c]	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Hydrazine[d]	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

[a] These compounds are from the TRAMPAC and are flammable VOCs that do not appear in the QAPjP or the WIPP WAP. These are not part of the target analyte list, but samples may be analyzed for these compounds.
[b] These xylene isomers cannot be resolved by the analytical methods employed in the program. m-Xylene and p-Xylene will be reported as "Total m-p-Xylene."
[c] Required only for homogenous solids and soil/gravel waste from Savannah River Site.
[d] Required only for homogenous solids and soil/gravel waste from Oak Ridge National Laboratory and Savannah River Site.
[e] These compounds are reported by the Laboratory and are included for completeness.

Comments:

(1) For analytes where there were no samples measured above the MDL value, 1/2 of the MDL value was used. (Per section B4 of the WAP, 1/2 of the MDL value is used in calculating the mean concentration.)

Signature of Site Project Manager

Julius Lyons
Printed Name

11/11/2010
Date

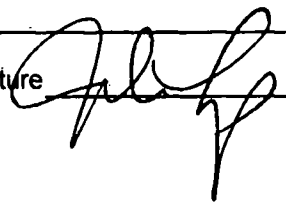
CCP Headspace Gas Summary Data

Waste Stream Number OR-RF-CH-HET Lot Number (s) 9

Tentatively Identified Compound	Maximum Observed Estimated Concentrations (ppmv)	# Samples Containing TIC	% Detected
None	NA	NA	NA

Data Supports EPA Hazardous Waste Numbers Assigned by AK? ☑ Yes ☐ No

If no, describe the basis for assigning the EPA Hazardous Waste Codes:

SPM Signature  Date 11/11/2010

CI500

CCP RTR/VE Summary of Prohibited Items and AK Confirmation

Waste Stream Number: OR-RF-CH-HET Lot(s)#: 9

Container Number	RTR Prohibited Items [a,b]	Visual Examination Prohibited Items [a,b]
See correlation of container ID numbers for list of remaining drum numbers in this Lot.	None of the containers in this lot had prohibited items identified during RTR.	VE was not used to certify any containers in this Lot.

a. See Batch Data Reports

b. If AK has assigned U134 to this waste stream, then any liquids in these containers are prohibited items (not acceptable by the TSDF).

Justification for the selection of RTR and/or VE: RTR was selected as the characterization method because RTR meets all the Data Quality Objectives for NDE for the waste.

Site Project Manager Signature | Julius Lyons (Printed Name) | 11/11/2010 (Date)

ATS008

CCP Reconciliation with Data Quality Objectives

WSF# OR-RF-CH-HET Lot # 9

Sampling Completeness

RTR:

Number of Valid Samples: 13 Number of Total Samples Analyzed: 13
Percent Complete: 100 (QAO is 100%)

NDA

Number of Valid Samples: 13 Number of Total Samples Analyzed: 13
Percent Complete: 100 (QAO is 100%)

HSG

Number of Valid Samples: 23 Number of Total Samples Collected: 23
Percent Complete: 100 (QAO is ≥90%)
Number of Valid Samples: 23 Number of Total Samples Analyzed: 23
Percent Complete: 100 (QAO is ≥90%)

Total VOC

Number of Valid Samples: NA Number of Total Samples Collected: NA
Percent Complete: NA (QAO is ≥90%)
Number of Valid Samples: NA Number of Total Samples Analyzed: NA
Percent Complete: NA (QAO is ≥90%)

Total SVOC

Number of Valid Samples: NA Number of Total Samples Collected: NA
Percent Complete: NA (QAO is ≥90%)
Number of Valid Samples: NA Number of Total Samples Analyzed: NA
Percent Complete: NA (QAO is ≥90%)

Total Metals

Number of Valid Samples: NA Number of Total Samples Collected: NA
Percent Complete: NA (QAO is ≥90%)
Number of Valid Samples: NA Number of Total Samples Analyzed: NA
Percent Complete: NA (QAO is ≥90%)

C3009

CCP Reconciliation with Data Quality Objectives

WSF# OR-RF-CH-HET Lot # 9

	Y/N/NA	Reconciliation Parameter
1	Y	Waste Matrix Code.
2	Y	Waste Material Parameter Weights.
3	Y	The waste matrix code identified is consistent with the type of sampling and analysis used to characterize the waste.
4	Y	The TRU activity reported in the BDRs for each container demonstrates with a 95% probability that the container of waste contains TRU radioactive waste.
5	N	AK Sufficiency. Is there an approved AK sufficiency Determination for this waste stream?
6	Y	Mean concentrations, UCL_{90} values for the mean concentration, standard deviations, and the number of samples collected for each VOC in the HSG of each container were calculated and compared with the program required quantitation limits, as reported in CCP-TP-003 Attachment 3, and additional U.S. Environmental Protection Agency (EPA) Hazardous Waste Numbers were assigned as required. Samples were randomly collected (when appropriate).
7a	NA	Mean concentrations, UCL_{90} values for the mean concentration, standard deviations, and the number of samples collected for solids VOCs were calculated and compared with the program required quantitation limits and regulatory thresholds, as reported in the Characterization Information Summary, CCP-TP-003 Attachment 4, and additional EPA HWNs were assigned as required. Samples were randomly collected.
7b	NA	Mean concentrations, (UCL_{90}) values for the mean concentration, standard deviations, and the number of samples collected for solids SVOCs were calculated and compared with the program required quantitation limits and regulatory thresholds, as reported in the Characterization Information Summary, CCP-TP-003 Attachment 5, and additional EPA HWNs were assigned as required. Samples were randomly collected.
7c	NA	Mean concentrations, (UCL_{90}) values for the mean concentration, standard deviations, and the number of samples collected for total metals were calculated and compared with the program required quantitation limits and regulatory thresholds, as reported in the Characterization Information Summary, CCP-TP-003 Attachment 6, and additional EPA HWNs were assigned as required. Samples were randomly collected.

IIS010

CCP Reconciliation with Data Quality Objectives

WSF# OR-RF-CH-HET Lot # 9

8	Y	The data demonstrates whether the waste stream exhibits a toxicity characteristic under Title 40 Code of Federal Regulations (CFR), Part 261, Identification and Listing of Hazardous Waste, Subpart C, Characteristics of Hazardous Waste.
9	Y	Does the waste stream contain listed waste found in 20.4.1.200 NMAC incorporating 40 CFR Part 261, Subpart D, Lists of Hazardous Wastes.
10	Y	Waste stream can be classified as hazardous or nonhazardous at the 90-percent confidence level.
11	Y	Appropriate packaging configuration and Drum Age Criteria (DAC) is applied and documented in the headspace gas sampling documentation, and the drum age met prior to sampling.
12	Y	TICs were appropriately identified and reported in accordance with the requirements of Section B3-1 of the QAPjP.
13	Y	The PRQLs for headspace gas VOCs were met for all analyses as evidenced by the analytical batch data reports.
14		The overall completeness, comparability, and representativeness QAOs were met for each of the analytical and testing procedures as specified in the WAP Sections B3-2 through B3-9 prior to submittal of a waste stream profile form for a waste steam or waste stream lot.

	Completeness	Comparability	Representativeness
Radiography	Y	Y	Y
VE	NA	NA	NA
Headspace Gas Analysis	Y	Y	Y
Solids Sampling	NA	NA	NA
Solids VOCs	NA	NA	NA
Solids SVOCs	NA	NA	NA
Solids Metals	NA	NA	NA

Comments: NONE

Signature of Site Project Manager | Julius Lyons (Printed Name) | 11/11/2010 (Date)

DIVIDER

PAGE

Washington
TRU Solutions LLC

CP:09:01234
UFC:5900.00

INTER-OFFICE CORRESPONDENCE

DATE: June 3, 2009

FROM: H. J. Neely

LOCATION: Special Operations and Remote-Handled Development

TO: CCP Records Custodian GSA-103

LOCATION: Retrieval, Characterization & Transportation

SUBJECT: TRANSMITTAL OF WASTE STREAM PROFILE FORM FOR OR-REDC-RH-HET, AT THE OAK RIDGE NATIONAL LABORATORY

Please accept the attached waste stream profile form for OR-REDC-RH-HET, to be placed in records for the Oak Ridge National Laboratory.

HJN:jmc

Attachment

cc: (without enclosure)
I. S. Quintana ED
M. Sensibaugh ED

COPY

Attachment 2 –CCP Waste Stream Profile Form

(1) Waste Stream Profile Number: OR-REDC-RH-HET				
(2) Generator site name: Oak Ridge National Laboratory			(4)Technical contact: Mike Sensibaugh	
(3) Generator site EPA ID: TN1890090003			(6) Technical contact phone number: 575-234-7122	
(5) Date of audit report approval by New Mexico Environment Department (NMED): September 9, 2008				
(7) Title, version number, and date of documents used for WAP Certification: CCP-PO-001, CCP Transuranic Waste Characterization Quality Assurance Project Plan, Rev. 16, October 31, 2007 CCP-PO-002, CCP Transuranic Waste Certification Plan, Rev. 21, January 26, 2009 CCP-PO-027 CCP/TRU Waste Processing Center/Oakridge National Laboratory Interface Document, Revision 0, October 2, 2007.				
(8) Did your facility generate this waste?	YES	X	NO	
(9) If no, provide the name and EPA ID of the original generator: NA				
Waste Stream Information[1]				
(10) WIPP ID: OR-W212[3]			(11) Summary Category Group: S5000	
(12) Waste Matrix Code Group: Heterogeneous Debris Waste			(13) Waste Stream Name: Remote Handled Heterogeneous Debris Waste from the Radiochemistry Engineering Development Center	
(14) Description from the TWBIR: Radionuclides from updated model. Mixed waste treated to LDR.				
(15) Defense TRU Waste:	YES	X	NO	
(16) Check One:	CH		RH	X
(17) Number of SWBs: N/A	(18) Number of Drums: NA		(19) Number of Canisters: 691[4]	
(20) Batch Data report numbers supporting this waste stream characterization: See Characterization Information Summary (CIS) Correlation of Container Identification Numbers to Batch Data Report Numbers				
(21) List applicable EPA Hazardous Waste Numbers:[2] D004, D005, D006, D007, D008, D009, D010, D011, D019, F002, and F005				
(22) Applicable TRUCON Content Numbers: OR 325				
(23)**Acceptable Knowledge Information**[1]				
[For the following, enter the supporting documentation used (i.e., references and dates)]				
Required Program Information				
(23A) Map of site: CCP-AK-ORNL-500, Revision 1, October 3, 2008, Figures 1, 2, and 3				
(23B) Facility mission description: CCP-AK-ORNL-500, Revision 1, October 3, 2008, Section 4.1				
(23C) Description of operations that generate waste: CCP-AK-ORNL-500, Revision 1, October 3, 2008, Section 5.3				
(23D) Waste identification/categorization schemes: CCP-AK-ORNL-500, Revision 1, October 3, 2008, Section 4.2 and 5.4				
(23E) Types and quantities of waste generated: CCP-AK-ORNL-500, Revision 0, May 2, 2008, Section 4.2.1				
(23F) Correlation of waste streams generated from the same building and process, as applicable: CCP-AK-ORNL-500, Revision 1, October 3, 2008, Section 4.2.2				
(24) Waste certification procedures: : CCP-TP-530, Rev. 7, CCP TRU Waste Certification and WWIS Data Entry, July 11, 2008				

(25)Required Waste Stream Information			
(25A) Area(s) and building(s) from which the waste stream was generated: CCP-AK-ORNL-500, Revision 1, October 3, 2008, Section 5.1			
(25B) Waste stream volume and time period of generation: CCP-AK-ORNL-500, Revision 1, October 3, 2008, Section 5.2			
(25C) Waste generating process description for each building: CCP-AK-ORNL-500, Revision 1, October 3, 2008, Section 5.3			
(25D) Waste Process flow diagrams: CCP-AK-ORNL-500, Revision 1, October 3, 2008, Figures 4, 5, 6, 7, 8 and 9			
(25E) Material inputs or other information identifying chemical/radionuclide content and physical waste form: CCP-AK-ORNL-500, Revision 1, October 3, 2008, Section 5.4			
(25F) Waste Material Parameter Weight Estimates per unit of waste: See Table 2 of the Summation of Aspects of AK Summary Report: OR-REDC-RH-HET			
(26) Which Defense Activity generated the waste: (check one)[5]			
	Weapons activities including defense inertial confinement fusion		Naval Reactors development
	Verification and control technology		Defense research and development
	Defense nuclear waste and material by products management	X	Defense nuclear material production
	Defense nuclear waste and materials security and safeguards and security investigations		
(27)Supplemental Documentation			
(27A) Process design documents: See S1 AK#s on Attachment 1 to Summation of Aspects of AK Summary Report			
(27B) Standard operating procedures: See S2 AK#s on Attachment 1 to Summation of Aspects of AK Summary Report			
(27C) Safety Analysis Reports: See S3 AK#s on Attachment 1 to Summation of Aspects of AK Summary Report			
(27D) Waste packaging logs: NA			
(28E) Test plans/research project reports: See S5 AK#s on Attachment 1 to Summation of Aspects of AK Summary Report			
(27F) Site databases: NA			
(27G) Information from site personnel: See S7 AK#s on Attachment 1 to Summation of Aspects of AK Summary Report			
(27H) Standard industry documents: See S8 AK#s on Attachment 1 to Summation of Aspects of AK Summary Report			
(27I) Previous analytical data: See S9 AK#s on Attachment 1 to Summation of Aspects of AK Summary Report			
(27J) Material safety data sheets: See S10 AK#s on Attachment 1 to Summation of Aspects of AK Summary Report			
(27K) Sampling and analysis data from comparable/surrogate Waste: See S12 AK#s on Attachment 1 to Summation of Aspects of AK Summary Report			
(27L) Laboratory notebooks: See S11 AK#s on Attachment 1 to Summation of Aspects of AK Summary Report			
Confirmation Information[2]			
For the following, when applicable, enter procedure title(s), number(s) and date(s)			
(28)	Radiography: NA		
(29)	Visual Examination: CCP Remote-Handled Waste Visual Examination, CCP-TP-500, Revision 8, 7/24/2008		

(30)Comments:
For a list of the waste characterization procedures used and date of the respective procedures see the list of procedures on the attached CIS.

Reviewed by AK Expert: YES [X] **Date: 2/18/09**

Reviewed by STR (if necessary): YES [ ] NA [ ] **Date:**

Waste Stream Profile Form Certification:

I hereby certify that I have reviewed the information in this Waste Stream Profile Form, and it is complete and accurate to the best of my knowledge. I understand that this information will be made available to regulatory agencies and that there are significant penalties for submitting false information, including the possibility of fines and imprisonment for knowing violations.

(31)	(32)	(33)
Signature of Site Project Manager	Irene Quintana Printed Name	2/18/09 Date

NOTE:
(1) Use back of sheet or continuation sheets, if required.
(2) If, radiography, visual examination were used to confirm EPA Hazardous Waste Numbers, attach signed Characterization Information Summary documenting this determination.
(3) TWBIR numbers OR-W211 and OR-W214 also apply.
(4) Waste stream OR-REDC-RH-HET consists of casks, 55-gallon drums and a B-88 box that will be packaged into 2055 55-gallon drums and then into 685 canisters. Six additional canisters are projected for this waste stream.
(5) The following defense activities also resulted in generation of this waste: naval reactors development, defense nuclear waste and by-products management and defense research and development activities.

CHARACTERIZATION INFORMATION SUMMARY

WSPF # OR-REDC-RH-HET

Lot 1

TABLE OF CONTENTS

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CCP Characterization Information Summary Cover Page

Waste Stream #: OR-REOC-RH-HET Sub-Lot #: 1

AK Expert Review: Kevin Perera Date: 2/18/2009

SPM Review: Hilpi Nealy Date: 2/18/2009

SPM signature certifies that through Acceptable Knowledge testing and/or analysis that the waste identified in this summary is not corrosive, ignitable, reactive, or incompatible with the TSDF.

A summary of the Acceptable Knowledge regarding this waste stream containing specific information about the corrosivity, reactivity, and ignitability of the waste stream is included as an attachment to the Waste Stream Profile Form. By reference, that information is included in this lot.

List of procedures used:

Headspace Gas Sampling and Analysis (HSG):

CCP-TP-050	Rev. 13	03/19/07	CCP Sampling of TRU Waste Containers
CCP-TP-106	Rev. 6	07/12/07	CCP Headspace Gas Sampling Batch Data Report Preparation
CCP-TP-173	Rev. 0	05/03/07	CCP Analysis of Gas Samples for VOCs by GC/FID
CCP-TP-175	Rev. 0	05/01/07	CCP Analysis of Gas Samples for VOCs by GC/MS

Visual Examination (VE):

CCP-TP-500	Rev. 7	02/27/08	CCP Remote-Handled Waste Visual Examination
CCP-TP-600	Rev. 8	07/24/08	CCP Remote-Handled Waste Visual Examination

Project Level Data Validation / DQO Reconciliation:

CCP-TP-001	Rev. 17	09/24/07	CCP Project Level Data Validation and Verification
CCP-TP-002	Rev. 20	08/16/08	CCP Reconciliation of DQOs and Reporting Characterization Data
CCP-TP-003	Rev. 16	10/02/07	CCP Data Analysis for S3000, S4000, and S5000 Characterization
CCP-TP-005	Rev. 16	11/16/06	CCP Acceptable Knowledge Documentation

WAP Certification:

CCP-PO-001	Rev. 16	10/31/07	CCP Transuranic Waste Characterization Quality Assurance Project Plan

CCP Correlation of Container Identification Numbers to Batch Data Report Numbers

Waste Stream: # OR-REDC-RH-HET Sub-Lot # 1

Container ID Number	Historical Container ID	NDA BDR or Radiological Characterization BDR (CH only)	RTR BDR	VE BDR	Solids Sampling BDR	Solids Analytical BDR	Load Management/ Overpack Yes	Permit Required Headspace Gas BDR			
								Sample	Analysis		
ORRH00001	NA	NA	NA	RHORVE080005	NA	NA		ORHSGS08005	ECL08012M	ECL08012G	NA
ORRH00002	NA	NA	NA	RHORVE080005	NA	NA		ORHSGS08005	ECL08012M	ECL08012G	NA
ORRH00003	NA	NA	NA	RHORVE080005	NA	NA		ORHSGS08005	ECL08012M	ECL08012G	NA
ORRH00004	NA	NA	NA	RHORVE080002	NA	NA		ORHSGS08003	ECL08010M	ECL08010G	NA
ORRH00005*	NA	NA	NA	NA	NA	NA		ORHSGS08003	ECL08010M	ECL08010G	NA
ORRH00006	NA	NA	NA	RHORVE080002	NA	NA		ORHSGS08003	ECL08010M	ECL08010G	NA
ORRH00007*	NA	NA	NA	NA	NA	NA		ORHSGS08003	ECL08010M	ECL08010G	NA
ORRH00008*	NA	NA	NA	NA	NA	NA		ORHSGS08003	ECL08010M	ECL08010G	NA
ORRH00009*	NA	NA	NA	NA	NA	NA		ORHSGS08003	ECL08010M	ECL08010G	NA
ORRH00010*	NA	NA	NA	NA	NA	NA		ORHSGS08003	ECL08010M	ECL08010G	NA
ORRH00011	NA	NA	NA	RHORVE080004	NA	NA		NA	NA	NA	NA
ORRH00012	NA	NA	NA	RHORVE080004	NA	NA		NA	NA	NA	NA
ORRH00013	NA	NA	NA	RHORVE080005	NA	NA		ORHSGS08005	ECL08012M	ECL08012G	NA
ORRH00014	NA	NA	NA	RHORVE080006	NA	NA		NA	NA	NA	NA
ORRH00015	NA	NA	NA	RHORVE080006	NA	NA		NA	NA	NA	NA
ORRH00016	NA	NA	NA	RHORVE080006	NA	NA		NA	NA	NA	NA
ORRH00017	NA	NA	NA	RHORVE080006	NA	NA		NA	NA	NA	NA

* Container is included for the HSG Characterization Module for WWIS but are not certifiable

for Hillari J. Neely
Signature of Site Project Manager

Hillari J. Neely
Printed Name

2/19/2009
Date

CCP Headspace Gas UCL_{90} Evaluation Form

WSPF #: OR-REDC-RH-HET **Waste Stream Lot Number** 1 through 1

ANALYTE	Transform Data Used (No, Data-Log, SQRT, other)	# Samples above MDL (1)	# Samples	Maximum (ppmv)	Mean (ppmv)	SD (ppmv)	UCL_{90} (ppmv)	PRQL (ppmv)	Transformed PRQL (N/A or Value)	UCL_{90} > PRQL Yes	EPA Code
Benzene	SQRT	9	11	1.76	0.95	0.55	1.18	10	3.16		
Bromoform	SQRT	0	11	0.32	0.18	0.09	0.21	10	3.16		
Carbon tetrachloride	Log	0	11	-2.12	-3.60	0.96	-3.20	10	2.30		
Chlorobenzene	Log	0	11	-1.97	-3.43	0.97	-3.03	10	2.30		
Chloroform	SQRT	1	11	0.32	0.18	0.08	0.21	10	3.16		
Cyclohexane [a]	Log	0	11	-1.29	-2.77	0.97	-2.37	10	2.30		
1,1-Dichloroethane	SQRT	0	11	0.41	0.22	0.11	0.26	10	3.16		
1,2-Dichloroethane	Log	0	11	-1.97	-3.44	0.97	-3.04	10	2.30		
1,1-Dichloroethylene	SQRT	0	11	0.49	0.26	0.13	0.32	10	3.16		
cis-1,2-Dichloroethylene	Log	0	11	-1.83	-3.31	0.97	-2.90	10	2.30		
trans-1,2-Dichloroethylene	Log	0	11	-1.49	-2.96	0.97	-2.56	10	2.30		
Ethyl benzene	SQRT	0	11	0.39	0.21	0.10	0.25	10	3.16		
Ethyl ether	Log	0	11	-1.43	-2.89	0.97	-2.49	10	2.30		
Methylene chloride	No	3	11	0.27	0.11	0.08	0.15	10	N/A		
1,1,2,2-Tetrachloroethane	SQRT	0	11	0.51	0.28	0.13	0.33	10	3.16		
Tetrachloroethylene	SQRT	0	11	0.34	0.18	0.09	0.22	10	3.16		
Toluene	SQRT	5	11	0.61	0.37	0.18	0.45	10	3.16		
1,1,1-Trichloroethane	Log	0	11	-1.97	-3.46	0.97	-3.06	10	2.30		
Trichloroethylene	SQRT	0	11	0.32	0.17	0.08	0.21	10	3.16		
1,1,2-Trichloro-1,2,2-trifluoroethane	Log	0	11	-2.21	-3.66	0.97	-3.26	10	2.30		
1,2,4-Trimethylbenzene [a]	SQRT	0	11	0.41	0.22	0.11	0.26	10	3.16		
1,3,5-Trimethylbenzene [a]	SQRT	0	11	0.41	0.22	0.11	0.26	10	3.16		
m-Xylene [b]	Log	0	11	-1.80	-3.28	0.97	-2.88	10	2.30		
p-Xylene [b]	Log	0	11	-1.80	-3.28	0.97	-2.88	10	2.30		
o-Xylene	SQRT	0	11	0.36	0.19	0.09	0.23	10	3.16		
Acetone	SQRT	11	11	11.40	5.83	3.45	7.26	100	10.00		
1-Butanol	Log	10	11	2.25	-0.17	1.69	0.53	100	4.61		
Methanol	No	0	11	4.55	4.35	0.13	4.41	100	N/A		
Methyl ethyl ketone	SQRT	10	11	3.87	1.95	1.17	2.44	100	10.00		
Methyl isobutyl ketone	SQRT	9	11	1.52	0.82	0.48	1.02	100	10.00		

CCP Headspace Gas UCL_{90} Evaluation Form

WSPF #: OR-REDC-RH-HET **Waste Stream Lot Number** 1 through 1

ANALYTE	Transform Data Used (No, Data-Log, SQRT, other)	# Samples above MDL (1)	# Samples	Maximum (ppmv)	Mean (ppmv)	SD (ppmv)	UCL_{90} (ppmv)	PRQL (ppmv)	Transformed PRQL (N/A or Value)	UCL_{90} > PRQL Yes	EPA Code
Chloromethane[a]	SQRT	10	11	2.98	1.61	0.95	2.00	100	3.16		
Carbon Disulfide[a]	Log	1	11	-0.45	-3.03	1.25	-2.51	10	2.30		
1,2-Dichloropropane[a]	Log	0	11	-1.77	-3.23	0.96	-2.83	10	2.30		
Trichlorofluoromethane[c]	Log	0	11	-1.22	-2.69	0.97	-2.29	10	2.30		

[a] These compounds are from the TRAMPAC and or CH TRUCON Appendix B and are flammable VOCs that do not appear in the QAPjP or the WIPP WAP. These are not part of the target analyte list, but samples may be analyzed for these compounds.

[b] These xylene isomers cannot be resolved by the analytical methods employed in the program. m-Xylene and p-Xylene will be reported as "Total m-p-Xylene."

[c] Noted analytes are not required but are reported by the Environmental Chemistry Laboratory at Idaho and are included on the UCL90 for completeness.

Comments:

(1) For analytes where there were no samples measured above the MDL value, 1/2 of the MDL value was used. (Per section B4 of the WAP, 1/2 of the MDL value is used in calculating the mean concentration.)

for Hillari J. Neely — Signature of Site Project Manager

Hillari Neely — Printed Name

2/18/2009 — Date

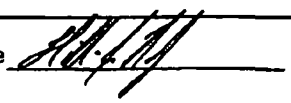
CCP Headspace Gas Summary Data

Waste Stream Number OR-REDC-RH-HET Sub-Lot Number (s) 1

Tentatively Identified Compound	Maximum Observed Estimated Concentrations (ppmv)	# Samples Containing TIC	% Detected
2-Methyl-1-propanol	3.10	1	9.09%

Data Supports EPA Hazardous Waste Numbers Assigned by AK? Yes ☑ No ☐

If no, describe the basis for assigning the EPA Hazardous Waste Codes:

SPM Signature  Date 2/18/2009

CCP RTR/VE Summary of Prohibited Items and AK Confirmation

Waste Stream Number: OR-REDC-RH-HET Sub-Lot(s)#: 1

Container Number	RTR Prohibited Items [a]	Visual Examination Prohibited Items [a]
See correlation of container ID numbers for list of remaining drum numbers in this Lot.	Radiography was not used to verify prohibited items.	None of the containers in this lot had prohibited items identified during Visual Examination.

a. See Batch Data Reports

b. If AK has assigned U134 to this waste stream, then any liquids in these containers are prohibited items (not acceptable by the TSDF).

Site Project Manager Signature	Hillari Neely	2/18/2009
	Printed Name	Date

CCP Reconcilliation with Data Quality Objectives

WSF# OR-REDC-RH-HET Lot # 1

Sampling Completeness

VE
Number of Valid Samples: 11 Number of Total Samples Analyzed: 11
Percent Complete: 100 (QAO is 100%)

RTR
Number of Valid Samples: NA Number of Total Samples Analyzed: NA
Percent Complete: NA (QAO is 100%)

HSG
Number of Valid Samples: 11 Number of Total Samples collected: 11
Percent Complete: 100 (QAO is ≥90%)

Total VOC
Number of Valid Samples: NA Number of Total Samples collected: NA
Percent Complete: NA (QAO is ≥90%)
Number of Valid Samples: NA Number of Total Samples analyzed: NA
Percent Complete: NA (QAO is ≥90%)

Total SVOC
Number of Valid Samples: NA Number of Total Samples collected: NA
Percent Complete: NA (QAO is ≥90%)
Number of Valid Samples: NA Number of Total Samples analyzed: NA
Percent Complete: NA (QAO is ≥90%)

Total Metals
Number of Valid Samples: NA Number of Total Samples collected: NA
Percent Complete: NA (QAO is ≥90%)
Number of Valid Samples: NA Number of Total Samples analyzed: NA
Percent Complete: NA (QAO is ≥90%)

CCP Reconcilliation with Data Quality Objectives

WSF# OR-REDC-RH-HET Lot # 1

	Y/N/NA	Reconcilliation Parameter
1	Y	Waste Matrix Code.
2	Y	Waste Material Parameter Weights.
3	Y	The waste matrix code identified is consistent with the type of sampling and analysis used to characterize the waste.
4	Y	The TRU activity reported in the BDRs for each container demonstrates with a 95% probability that the container of waste contains TRU radioactive waste.
5	NA	AK Sufficiency. Is there an approved AK sufficiency Determination for this waste stream?
6	Y	Mean concentrations, UCL90 values for the mean concentration, standard deviations, and the number of samples collected for each VOC in the HSG of each container were calculated and compared with the program required quantitation limits, as reported in CCP TP 003, Attachment 3, and additional Environmental Protection Agency (EPA) Hazardous Waste Numbers were assigned as required. Samples were randomly collected (when appropriate).
7a	NA	Mean concentrations, UCL90 values for the mean concentration, standard deviations, and the number of samples collected for solids VOCs were calculated and compared with the program required quantitation limits and regulatory thresholds, as reported in the Characterization Information Summary, CCP-TP-003-Attachment 4, and additional EPA Hazardous Waste Numbers were assigned as required. Samples were randomly collected.
7b	NA	Mean concentrations, UCL90 values for the mean concentration, standard deviations, and the number of samples collected for solids SVOCs were calculated and compared with the program required quantitation limits and regulatory thresholds, as reported in the Characterization Information Summary, CCP TP 003 Attachment 5, and additional EPA Hazardous Waste Numbers were assigned as required. Samples were randomly collected.
7c	NA	Mean concentrations, (UCL90) values for the mean concentration, standard deviations, and the number of samples collected for total metals were calculated and compared with the program required quantitation limits and regulatory thresholds, as reported in the Characterization Information Summary, CCP TP 003 Attachment 6, and additional EPA Hazardous Waste Numbers were assigned as required. Samples were randomly collected.

CCP Reconcilliation with Data Quality Objectives

WSF# OR-REDC-RH-HET Lot # 1

8	Y	The data demonstrates whether the waste stream exhibits a toxicity characteristic under Title 40 Code of Federal Regulations (CFR), Part 261, Identification and Listing of Hazardous Waste, Subpart C, Characteristics of Hazardous Waste.
9	Y	Does the waste stream contain listed waste found in 20.4.1.200 NMAC incorporating 40 CFR Part 261, Subpart D, Lists of Hazardous Wastes.
10	Y	Waste stream can be classified as hazardous or nonhazardous at the 90-percent confidence level.
11	Y	Appropriate packaging configuration and Drum Age Criteria (DAC) is applied and documented in the headspace gas sampling documentation, and the drum age met prior to sampling.
12	Y	TICs were appropriately identified and reported in accordance with the requirements of Section B3-1 of the QAPjP.
13	Y	The PRQLs for headspace gas VOCs were met for all analyses as evidenced by the analytical batch data reports.
14		The overall completeness, comparability, and representativeness QAOs were met for each of the analytical and testing procedures as specified in CCP-PO-001 Sections B3-2 through B3-9 prior to submittal of a waste stream profile form for a waste steam or waste stream lot.

	Completeness	Comparability	Representativeness
Radiography	NA	NA	NA
VE	Y	Y	Y
Headspace Gas Analysis	Y	Y	Y
Solids Sampling	NA	NA	NA
Solids VOCs	NA	NA	NA
Solids SVOCs	NA	NA	NA
Solids Metals	NA	NA	NA

Comments. N/A

Signature of Site Project Manager | Hillari Neely (Printed Name) | 2/19/2009 (Date)

SUMMATION OF ASPECTS OF AK SUMMARY REPORT: OR-REDC-RH-HET

Overview:

Waste Stream OR-REDC-RH-HET is Remote-Handled (RH) Transuranic (TRU) heterogeneous debris generated in Building 7920 of the Radiochemical Engineering Development Center (REDC) and has subsequently been repackaged in Building 7880 of the Transuranic Waste Processing Center (TWPC) at the Oak Ridge National Laboratory (ORNL) in Oak Ridge, Tennessee. The waste was generated from 1972 to present. Waste Stream OR-REDC-RH-HET includes debris originating from target fabrication and processing, analytical chemistry, and process development activities. This debris is currently stored in storage containers such as concrete casks, boxes, and drums at the ORNL. These storage containers are transferred to the TWPC hot cell in the Building 7880 for repackaging and WIPP certification.

Since 1966, the REDC was the production, storage, and distribution center for the Department of Energy (DOE) heavy element research program, producing Berkelium (Bk)-249, Californium (Cf)-252, Einsteinium (Es)-253, and Fermium (Fm)-257. In approximately 1970, target rods containing plutonium, americium, and curium were remotely fabricated in the Building 7920 hot cells, irradiated in the High Flux Isotope Reactor (HFIR) facility, and then processed in the Building 7920 hot cells for the separation and purification of the heavy actinide elements. The purified Bk-249, Es-253, and Fm-257 were packaged for shipment whereas the Cf-252 was fabricated into neutron sources. Between 1979 and 1986, some uranium fuel cycle development work was performed in the Building 7920 Solvent Extraction Test Facility (SETF). Solvent extraction flow sheets for processing irradiated fuels from commercial light water reactors and fast breeder reactors were developed and tested, and plutonium recovery schemes were demonstrated. Since 1991, the REDC has processed Mark-42 target assemblies that were irradiated at the Savannah River Site (SRS). High-purity Americium (Am)-243, Curium (Cm)-244, and Plutonium (Pu)-242 are separated and recovered in Building 7920 for shipment to the Los Alamos National Laboratory (LANL).

The Cf-252 neutron sources are utilized for defense related applications that include neutron radiography of weapons components and military aircraft, neutron counting of fissile material and transuranic waste, land mine detection, and in-field inspection and identification of chemical weapons and high explosives. Special production of targets (referred to as campaigns) ran concurrently with the Solvent Extraction Test Facility (SETF) and Mark-42 campaigns. Due to the similarity in radiological contamination from HFIR target campaigns, the waste generated from SETF and Mark-42 campaigns were not segregated from waste generated by the HFIR target campaigns. Therefore, the TRU wastes generated from the REDC, waste stream OR-REDC-RH-HET, is defense related waste generated from nuclear materials production in addition to naval reactor development, and defense nuclear waste and by-products management.

This Summation of the AK Summary Report includes information to support Waste Stream Profile Form (WSPF) number OR-REDC-RH-HET for RH TRU debris. The primary source of information for this Summation is CCP-AK-ORNL-500, Central Characterization Project Acceptable Knowledge Summary Report For Oak Ridge National Laboratory Radiochemical Engineering Development Center Remote-Handled Transuranic Waste, Waste Stream: OR-REDC-RH-HET, Rev. 1, October 3, 2008. CCP-AK-ORNL-500 includes information obtained from numerous sources, including facility safety basis documentation, historical document archives, generator and storage facility waste records and documents, program/processing documentation, and interviews with knowledgeable personnel.

Waste Stream Identification Summary:

Site Where TRU Waste Was Generated:	Oak Ridge National Laboratory
Waste Stream Name:	Remote Handled Heterogeneous Debris Waste from the Radiochemistry Engineering Development Center
Waste Stream Number:	OR-REDC-RH-HET
Dates of Waste Generation:	1972 to present
Summary Category Group:	S5000 – Debris Waste
Waste Matrix Code Group:	Heterogeneous Debris Waste
Waste Matrix Code:	S5400, Heterogeneous Debris
Waste Stream TWBIR Identification:	OR-W212[1]
Waste Stream Volume:	685 canisters (current)[2] 6 canisters (projected)[3]
RCRA EPA Hazardous Waste Numbers:	D004, D005, D006, D007, D008, D009, D010, D011, D019, F002, and F005
TRUCON Content Numbers:	OR 325

Waste Stream Description and Physical Form:

Waste Stream OR-REDC-RH-HET is comprised primarily of repackaged organic and inorganic debris waste items. The waste includes cellulosics, plastic, rubber, metal, and glass items as follows: paper, cotton, cloth, and wood, including wipes, swabs, bags, towels, rags, protective clothing, gloves, rope, string, cardboard, brushes, blotter paper, and filter paper; polyethylene, polypropylene, polyvinyl chloride, Tygon tubing, nylon, Bakelite (methacrylate polymer plastic), and Plexiglass items, including sheeting, melted plastic, beads, blocks, tape, tubing, bags, fittings, buckets, bottles, caps, pans, discs, brushes, laboratory equipment (pipettes, syringes), circuit boards, gloves, manipulator boots; gaskets, rings, hose/tubing, squeegees, bulbs, stoppers, gloves, boots, leaded glovebox gloves, wire/cord/cable insulation; glass bottles, laboratory glassware, pipettes, columns, plates, thermometers, light bulbs (mercury and incandescent), mirrors, lenses, insulation, and broken glass; carbon steel, stainless steel, and iron. Non-ferrous materials include items made from aluminum, brass, copper, and lead. Metal waste items include cans, needles, tubes, valves, cable, wire, planchets, piping, tools (tongs, dies, punches, wrenches, knives, clamps, tweezers), foil,

[1] TWBIR numbers OR-W211 and OR-W214 also apply.
[2] Waste stream OR-REDC-RH-HET consists of casks, 55-gallon drums and a B-88 box that will be packaged into 2055 55-gallon drums and then into 685 canisters.
[3] Building 7920 REDC operations will generate approximately 3.4 m3 (two casks) of waste to be reprocessed in the TWPC with no projected end date. The projected waste stream volume includes one year of newly generated waste that will be packaged into canisters.

weights, blocks, plates, frames, columns, racks, shielding, sheeting, light fixtures, equipment (circuit boards, pumps, motors, balances, ultrasonic cleaners, hot plates, furnaces, centrifuges), hardware (nuts, bolts, brackets, washers), manipulator parts, and metal filter components.

Secondary waste generated during repackaging operations in the TWPC hot cell includes amalgamated mercury, water absorbed with Nochar (a proprietary nonhazardous polymer absorbent) and vermiculite, personal protective equipment (PPE), and equipment (tools and manipulator parts).

This waste stream is assigned Waste Matrix Code S5400, Heterogeneous Debris. This category includes waste that is at least 50 percent, by volume, debris materials that do not meet the criteria for assignment as either an Inorganic Debris (S5100) or Organic Debris (S5300). The debris that comprises waste stream OR-REDC-RH-HET was generated from a single process or from an activity that is similar in material, physical form, and hazardous constituents and is therefore, a single waste stream.

Point of Generation - Area and Building of Generation

This heterogeneous debris waste stream was generated in Building 7920 which is part of the REDC located at the ORNL in Oak Ridge, Tennessee. The waste is transferred to the TWPC hot cell in Building 7880 for repackaging and certification.

Generating Process

Building 7920 operations include chemical processing, target fabrication, analytical laboratory, and process development activities. These operations represent the chemical processing activities in the REDC; however, special separation projects, referred to as campaigns, were periodically performed. These special small scale separation campaigns (e.g., separating Cf-249 from decaying Bk-249 or purifying a sample for shipment to another site) were performed in the hot cell. Chemicals used in Building 7920 operations or that were identified as part of the REDC chemical inventory may contaminate this waste stream.

Chemical Processing

Transuranium element processing includes the dissolution of irradiated targets, the separation of the transuranium elements and the removal of impurities and fission products. This is accomplished using solvent extraction, precipitation, and ion-exchange. Recovered americium and curium are purified and converted to oxide for fabrication of new targets.

Berkelium, einsteinium, and fermium are separated from curium and californium and purified further by additional cycles of ion-exchange. The purified products are then packaged for shipment. The californium is sorbed on resin and calcined to convert the californium to the oxysulfate for future use.

The Solvent Extraction Test Facility (SETF) operated from 1979 through 1986 and recovered uranium and plutonium from irradiated commercial power reactor fuels. This was achieved by dissolution of irradiated fuel assembly sections, solvent extraction, ion-exchange, precipitation, and calcination.

The Mark-42 program began operation in 1991 and includes the dissolution of irradiated segments; the separation of the transuranium elements and removal of impurities, activation products, and fission products. This is accomplished using solvent extraction, precipitation, and ion-exchange process steps.

The Global Nuclear Energy Partnering (GNEP) program initiated in May 2007 involves the demonstration of isotopic separations technologies using fuel from the H.B. Robinson and Dresden LWR reactors.

The REDC supports small-scale experiments involving the separation of fission products such as tritium, C-14, iodine, krypton, and xenon from uranium fuel oxides followed by chemical extraction.

Hazardous chemicals used in these processes include: acids (2-ethylhexyl phenylphosphonic, ascorbic, citric, hydrochloric, hydrofluoric, nitric, and oxalic), bases (ammonium hydroxide, lithium hydroxide, potassium hydroxide, and sodium hydroxide), and solvents (1,1,2-trichloro ethane, acetone, benzene, hydrazine, methanol, methyl isobutyl ketone, trichloroethylene, toluene, and xylene).

Target Fabrication

Actinide oxide (americium and curium) is incorporated into aluminum target rods for irradiation in the High Flux Isotope Reactor (HFIR). The operations and inspections performed to incorporate the actinide oxide include pellet forming, weighing, measurement, calorimetry, thermal cleaning, target loading, welding, x-ray examination, helium leak tests, dimensional inspections, hydrostatic compression of the aluminum tube around the pellets, coolant shroud attachment, decontamination, and carrier loading for transfer to the HFIR.

Analytical Laboratory

Samples are collected and then stored in the analytical laboratory. Radiochemical analyses are performed on highly-radioactive samples in analytical chemistry gloveboxes. Sample preparation includes pipetting, titration, dissolution, filtration, solvent extraction, and centrifugation.

Hazardous chemicals used in these processes include: acids (ascorbic, citric, formic, hydrobromic, hydrochloric, hydrofluoric, nitric, nitrous, oxalic, selenic, sulfamic, and sulfuric), bases (ammonium hydroxide, lithium hydroxide, potassium hydroxide, sodium hydroxide, and tetraethylammonium hydroxide), and solvents (1,1,1-trichloroethane, acetone, benzene, hydrazine, methanol, methyl isobutyl ketone, trichloroethylene, toluene, and xylene).

Process Development

The process development alpha laboratories have been used for studies and process development of alpha-active materials. Early work focused on development of sol-gel processes (fuel pellet processes) and isolation and purification of alpha-active materials. Other research and process development work included reprocessing of reactor fuels, conversion of recovered uranium and plutonium for use in reactor fuel elements, and development of waste separation processes. The chemical processes (e.g., solvent extraction, ion-exchange, and precipitation) performed in process development are similar to those processes performed in the hot cells but on a smaller scale.

Maintenance Operations

The processing equipment in the hot cells was maintained or replaced within the hot cell cubicles using remote techniques. Occasionally, large equipment and equipment racks require maintenance that cannot be performed in the cubicles. These items are moved to the decontamination glovebox for cleaning (using acetone, and ethanol-methanol mixtures) and repaired. For maintenance operations in a tank pit, work may be performed directly in the pit or remotely from the top of the pit. Maintenance of the off-gas systems for the cells and the process tanks generate HEPA filters, charcoal and Hopcalite organic vapor trap filters (mixture of copper and manganese oxide used as a catalyst to convert carbon monoxide to carbon dioxide). Glovebox operations are performed using neoprene or leaded glovebox gloves which are periodically replaced. Glovebox equipment and components require periodic decontamination, inspection, maintenance, repair and replacement. Glovebox interiors require regular decontamination using pentasodium diethylene triamine pentaacetate, ethanol and Ajax.

Process Waste Handling

Glovebox waste transfers are accomplished using plastic bags and cardboard ice cream cartons. Large pieces of equipment are transferred through the roof door. Liquid waste is transferred out of the gloveboxes through liquid waste lines and is not part of the waste stream.

Prior to 1976, Building 7920 solid waste was managed as RH TRU waste, even though a significant portion of the inventory produced was CH-TRU waste. In March 1976, operations were initiated to segregate RH from CH-TRU waste but were not fully implemented until 1978. Most of the waste generated prior to 1978 was placed into concrete casks. This waste contains lower dose rate waste (paper, glassware, PPE, wipes, glovebox equipment, and HEPA filters) generated from the laboratory and support areas. The quantity of lower dose rate waste decreased significantly in RH casks loaded after 1978, which contain greater volumes of waste from hot cell activities.

In the hot cell cubicles, waste is placed into small containers (e.g., plastic buckets or metal cans) and monitored for radiation. Depending on the type of waste and radiation level, the item is leached using nitric acid, rinsed with water, and dried before placement into the bucket or can. Larger waste items are cut up to fit into the buckets. To reduce the volume of waste, a furnace is used to melt plastic items such as polyethylene bottles and to consolidate them in a metal bucket.

Spent cation-exchange resins are calcined, leached with nitric acid, collected in a polyethylene bottle and melted in the furnace, then placed into a metal bucket. Spent anion-exchange resins are de-nitrated, rinsed with water and grouted (using concrete) in a metal bucket. Empty metal buckets are crushed. Waste buckets are transferred from the hot cell cubicles for characterization. The buckets are also transferred for monitoring of beta-gamma and neutron radiation. Buckets that have low radiation levels are disposed as waste and are not part of this waste stream.

Larger equipment, such as processing racks, charcoal filter beds, and Hopcalite organic filters traps are directly loaded into the casks. Racks were packaged in polyethylene bags then placed into the concrete cask. Lead bricks were used to balance the processing racks and will be found in the disposal casks. The concrete casks of TRU waste are loaded in a solid waste loading station. The cask lid is installed, sealed with roofing pitch, and secured.

REDC waste has been generated with limited segregation based on the radiological and chemical properties. Solid waste from the REDC is accumulated over a long period of time,

resulting in mixing of campaigns of waste. As containers of REDC debris are generated during repackaging in the TWPC, the container-specific documentation is reviewed to ensure that each container included in waste stream OR-REDC-RH-HET meets the requirements identified in the WIPP-WAP and the WCPIP.

Table 1 identifies the RCRA toxicity characteristic constituents in this waste stream.

Table 1 – Metal and organic TC and F-Listed Contaminants for Waste Stream OR-REDC-RH-HET

Chemical	CAS Number	EPA Hazardous Waste Numbers
Arsenic	7440-38-2	D004
Barium	7440-39-3	D005
Benzene	71-43-2	F005
Cadmium	7440-43-9	D006
Carbon tetrachloride	56-23-5	D019
Chromium	7440-47-3	D007
Lead	7439-92-1	D008
Mercury	7439-97-6	D009
Selenium	7782-49-2	D010
Silver	7440-22-4	D011
Toluene	108-88-3	F005
1,1,1-Trichloroethane	71-55-6	F002
1,1,2-Trichloroethane	79-00-5	F002
Trichloroethylene	79-01-6	F002

RCRA Determinations - Hazardous Waste Determinations

Waste generated in this waste stream does not qualify for any of the exclusions outlined in 40 CFR 260 or 261. Visual examination is used to verify that the waste stream is not a liquid waste and does not contain explosives, non-radioactive pyrophoric material, compressed gasses or reactive waste. Therefore, this waste stream does not exhibit the characteristic for ignitability (D001), corrosivity (D002), or reactivity (D003).

Ignitability

The waste does not meet the definition of ignitability as defined in 40 CFR 261.21. The material is not a liquid, an ignitable compressed gas, or an oxidizer, and is not capable of causing fire through friction, absorption of moisture, or spontaneous chemical change. The waste does not meet the definition of a DOT oxidizer as defined in 49 CFR 173.

REDC process solutions and reagents (such as hydrazine) were not prepared in the gloveboxes and hot cells and were introduced into the closed loop process tanks. The resulting waste process solutions were piped out of the facility and are not included in the inventory of REDC waste for repackage (References P161, P241, P242, P263, P282, and U011). Acetone and ethanol-methanol mixtures were used for equipment degreasing in the REDC but are not present in liquid form.

Visual examination is performed to ensure the absence of compressed gases (e.g., un-punctured aerosol cans) and that liquids do not exceed the amount allowed by the WIPP-WAP. Any container identified with compressed gases, or liquids will be segregated from the waste stream during characterization and will not be eligible for disposal at WIPP until further characterization and/or processing is conducted. Therefore, this waste stream does not exhibit the characteristic of ignitability (D001).

Corrosivity

The waste does not meet the definition of corrosivity as defined in 40 CFR 261.22. The debris is not liquid and VE is performed to ensure liquids were not added to containers.

Chemicals such as acetic, citric, hydrofluoric, hydrochloric, oxalic and sulfuric acid; hydrazine and lithium hydroxide were used during dissolution, extraction, and titration processes or were identified on chemical inventories. Prohibited quantities of liquids identified during VE will be removed and/or immobilized using concrete grout, Nochar and vermiculite. Therefore the characteristic of corrosivity (D002) does not apply to this waste stream. (References P161, U011 and U046)

Reactivity

The waste does not meet the definition of reactivity as defined in 40 CFR 261.23. The materials are stable and will not undergo violent chemical change. The materials will not react violently with water, form potentially explosive mixtures with water, or generate toxic gases, vapors, or fumes when mixed with water. The waste does not contain reactive cyanide or sulfide compounds. The materials are not capable of detonation or explosive reaction if subjected to a strong initiating source if heated under confinement. The materials are not readily capable of detonation or explosive decomposition or reaction at standard temperature and pressure.

Hazardous chemical reagents may contaminate this waste stream. Preventative measures have been taken to ensure that nitrated ion-exchange resins are treated prior to disposal as follows. Anion-exchange resins used with nitric acid are flushed from the column, rinsed with ammonium hydroxide to convert the resin to the hydroxide form, air dried, and grouted in metal cans. Spent cation-exchange resins are calcined to an oxysulfate ash, and the ash is leached with nitric acid and dried prior to assimilation (and fixing) into melted polyethylene waste in a metal bucket. Prohibited quantities of liquids identified during VE are removed and/or immobilized during repackaging. Waste Stream OR-REDC-RH-HET is therefore not reactive (HWN D003) (References P161 and U011).

Toxicity Characteristic Metals

This waste stream exhibits the characteristic of toxicity per 40 CFR 261.24. The toxicity characteristic contaminants fall into two categories; metals and organics. The debris may contain toxicity characteristic metals based on the following identified uses/sources and is toxicity characteristic for organics. Where a constituent has been identified and there is no quantitative data available to demonstrate that the concentration of a constituent is below regulatory threshold levels, the applicable EPA HWN is conservatively applied to the waste stream in accordance with the CCP AK procedure CCP-TP-005.

Arsenic (D004) was used in actinide and lanthanide hydride and metallide studies. Barium (D005), cadmium (D006), chromium (D007), and lead (D008) have been attributed to fission product contaminants, product solution impurities (e.g. Berkelium-Californium separation, fission product contaminants) and target cladding. Cadmium is also attributed to flashlight batteries and electronic equipment. The presence of lead (D008) in this waste stream is attributed to lead shielding, gloves, batteries, electronic equipment and is a fission product contaminant of the HFIR targets. The presence of mercury (D009) in this waste stream is attributed to vapor lamps, electronic equipment, thermostats and solder. Selenium (D010) metal was identified on an REDC inorganic chemical inventory. Silver (D011) is assigned due to photographic development solutions and circuit boards in the waste. Based on AK, EPA HWNs D004, D005, D006, D007, D008, D009, D010, D011 are assigned to waste stream OR-REDC-CH-HET (Reference DR005 and DR602).

Toxicity Characteristic Organics

Waste stream OR-REDC-RH-HET does meet the definition of toxicity for organic compounds as defined in 40 CFR Part 261, Subpart C (40 CFR 261.24). Toxicity characteristic organic compounds were identified in the REDC processes. Where a constituent has been identified and there is no quantitative data available to demonstrate that the concentration is below regulatory threshold, the applicable EPA HWN is conservatively applied to the waste stream.

The AK identified the use of organic toxicity characteristic compounds including benzene (D018), carbon tetrachloride (HWN D019), and trichloroethylene (D040). EPA HWNs F005 and F002 are assigned to the waste stream for F-listed solvents benzene (F005) and trichloroethylene (F002). Because the more specific F-listed EPA HWNs have been assigned for these compounds, assignment of the corresponding toxicity characteristic HWNs D018 and D040 is not necessary. Therefore only D019 is conservatively assigned to waste stream OR-REDC-RH-HET for carbon tetrachloride (identified in the REDC inorganic chemical inventory). (Reference DR005 and DR602).

F-Listed Waste

Waste stream OR-REDC-RH-HET is an F-listed hazardous waste because the debris was mixed with or contains hazardous wastes from non-specific sources listed in 40 CFR Part 261, Subpart D (40 CFR 261.31).

F002 and F005-listed solvents were identified on REDC chemical inventories. Toluene (F005) was identified as a constituent in the liquid scintillation reagent Ultima Gold that was used in the laboratory. F003 constituents, including acetone, methanol, methyl isobutyl ketone, and xylene are listed solely because these solvents are ignitable. The waste stream will not exhibit the characteristic of ignitability because it is not liquid; therefore, F003 is not assigned. Although F001-listed solvents were identified in the AK record (carbon tetrachloride and trichloroethylene), no "large-scale" degreasing operation such as cold cleaning or vapor degreasing on an industrial scale was performed and F001 is not applied.

The following is a listing of the EPA HWNs and associated constituents assigned to waste stream OR-REDC-RH-HET.

(F002)
1,1,1-Trichloroethane, 1,1,2-trichloroethane, trichloroethylene

(F005)
Benzene and toluene

U, K, and P-Listed Chemicals

Waste stream OR-REDC-RH-HET does not contain a discarded commercial chemical product, an off-specification commercial chemical product, or a container residue or spill residue thereof (40 CFR 261.33). No U, K and P- listed chemicals were identified in the AK record for waste stream OR-REDC-RH-HET. The only sources identified for beryllium were small foil targets and source plates electroplated with microgram quantities of transplutonium elements. Review of the container documentation did not identify beryllium as a component of the waste in these containers. Therefore, if present, beryllium is a process contaminant. Since no beryllium powder will be present in the debris waste, P015 is not assigned to the waste stream.

Hydrofluoric acid (U134) was used as a dissolution reagent; however, there is no indication that unused acids or other reagents, or spills of these reagents were disposed of in this waste stream. Therefore, no U-and P-listed EPA HWNs are assigned to waste stream OR-REDC-RH-HET (References M005, M100 and P223).

The material in waste stream OR-REDC-RH-HET is not a hazardous waste from sources specified in 40 CFR 261.32. Waste stream OR-REDC-RH-HET is therefore not assigned a K-listed HWN.

Headspace Gas/Volatile Organic Compound Information

Headspace gas sampling was performed on 11 randomly selected containers. No UCL_{90} values exceeded the PRQLs for VOCs and SVOCs. One TIC (2-methyl-1-propanol) was identified but was not found in greater than 25% of the containers in this lot. These data are consistent with AK. The specifics of this information are included in the attached Characterization Information Summary Report. No EPA hazardous waste numbers were assigned based on headspace gas sampling analysis results.

Conclusion

The following EPA hazardous waste numbers are assigned to this waste stream: D004, D005, D006, D007, D008, D009, D010, D011, D019, F002 and F005.

Polychlorinated Biphenyls (PCBs)

Based on a review of the AK record, incandescent bulbs, mercury-vapor bulbs, vacuum pumps, and lighting fixtures (bases) were identified in the RH container documentation, however items potentially containing polychlorinated biphenyl (PCB) compounds were not specifically identified (capacitors, ballasts, etc.). No other potential sources for PCBs were identified in the AK record for this stream; however the ORNL waste management practices described in the AK record did not historically identify PCB materials as prohibited items or special management of these materials in the REDC. Additionally, interviews with ORNL waste management personnel have identified that vacuum pumps and capacitors containing PCB liquids could potentially be present in ORNL waste containers. If the waste is found to contain fluorescent light ballasts or other potential PCB-containing items during repackaging, these items will be managed in accordance with the PCB disposal requirements in the WIPP-WAC. (References C307, C308, M024, M100, P240, and P263).

Prohibited Items

The absence of prohibited items is determined and documented through acceptable knowledge and characterization activities. Visual examination is performed on each container in this waste stream as a confirmation activity. The following items have been determined as not present in the waste:

- Liquids
- Non-radioactive pyrophoric materials
- Waste incompatible with backfill, seal and panel closure materials, container and packaging materials, or other wastes
- Explosives or compressed gases
- Waste with PCBs not authorized under an EPA PCB waste disposal authorization
- Waste exhibiting the characteristics of ignitability, corrosivity, or reactivity
- Non-mixed hazardous wastes
- Waste that has ever been managed as high-level waste and waste from tanks specified in Table B-8 of the WIPP Hazardous Waste Facility Permit, unless specifically approved through a Class 3 permit modification.
- Any waste container from a waste stream (or waste stream lot) which has not undergone either radiographic or visual examination of a statistically representative subpopulation of the waste stream in each shipment, as described in the WIPP Hazardous Waste Facility Permit, Attachment B7.

Each container of waste is certified and shipped only after visual examination:

- Did not identify any prohibited items in the waste container, or
- All prohibited items found in a waste container by visual examination are identified and corrected (i.e., eliminated or removed) through the site non-conformance reporting system.

Method for Determining Waste Material Parameter Weights per Unit of Waste

The waste material parameter weight estimates for waste stream OR-REDC-RH-HET were derived from data located on site-specific waste disposal, transportation, and storage forms from 45 casks generated from 1991 through 2007. These containers are considered representative of the waste stream because the production operations that generated this waste

were consistent through the generation timeline. An analysis of the site-specific and VE data were performed, the results of which are presented in Table 2.

Table 2. Waste Stream OR-REDC-RH-HET Waste Material Parameters

Waste Material Parameter	Weight Percent	Weight Percent Range
Iron-based Metals/Alloys	59.13%	30.23% – 95.51%
Aluminum based Metals/Alloys	0.01%	0.0% – 0.64%
Other Metals	5.91%	0.0% – 52.38%
Other Inorganic Materials	16.78%	0.0% – 47.51%
Cellulosics	6.68%	0.0% – 18.03%
Plastics (waste materials)	8.62%	1.44% – 30.97%
Rubber	1.66%	0.0% – 11.9%
Organic Matrix	0.00%	0.0% – 0.0%
Inorganic Matrix	1.21%	0.0% – 7.93%
Soils/Gravel	0.00%	0.0% – 0.0%

List of AK Sufficiency Determinations

No AK Sufficiency Determinations apply to this waste stream.

Transportation

This waste stream and its chemical constituents have been reviewed for consistency with listed TRUCON codes and they are consistent. The waste stream and chemical constituents will be reviewed for consistency with the applicable TRUCON Content Number prior to shipment.

Radionuclide Information

The two most prevalent radionuclides by mass in this waste stream are Pu-239 and Cm-246. The isotopes expected to be present in the waste stream are listed in Table 3.

Table 3. Radionuclides in Waste Stream OR-REDC-RH-HET

WIPP Tracked Radionuclides	Additional Reported Radionuclides		
Am-241	Am-243	Cm-242	Ru-103
Pu-238	Ba-137m	Cm-244	Ru-106
Pu-239	Cf-249	Cm-246	Ag-110m
Pu-240	Cf-250	Cm-248	Sb-125
Pu-242	Cf-251	Eu-152	U-235
U-233 (Not expected)	Cf-252	Eu-154	U-236
U-234	Ce-141	Eu-155	Y-90
U-238	Ce-144	Nb-95	Zr-95
Cs-137	Cs-134	Np-239	
Sr-90	Co-60	Pu-241	

Payload management will not be employed for Oak Ridge National Laboratory.

Attachment 1

AK SOURCE DOCUMENTS, SUPPLEMENTAL DOCUMENTATION

Source Document Tracking Number	AK #	Title	Document Number	Date
C046	S5	Memo to J. A. Lenhard, DOE OR re: Materials Management Plan-ORNL	NA	06/13/1984
C307	NA	Interview of Walt Bond. Subject: Processes and Waste in Building 3508 at ORNL	NA	2/21/2008
C308	NA	Interview of Jason Taylor. Subject: PCB Management at ORNL.	NA	4/8/2008
DR005	NA	EPA Hazardous Waste Number Discrepancies	NA	06/24/08
DR602	NA	Discrepancy Resolution Follow-up on DR005 for EPA Hazardous Waste Number Discrepancy	NA	07/02/08
M005	NA	UCN-2109 Forms and Related Container Paperwork.	NA	Various
M024	S6, S9	RH EM Waste Database Query	NA	10/04/2007
P146	S9	C-Tank Transfers; Transuranic Sludge Removal From the C-1, C-2, and W-23 Waste Storage Tanks at Oak Ridge National Laboratory. Oak Ridge, Tennessee	BJC/OR-279	05/1999
P161	NA	Safety Analysis Report Radiochemical Engineering Development Center Building 7920	SAR/7920-CTD/0	3/14/2001
P223	NA	Chemical Technology Division Annual Progress Report for Period Ending 5/31/1969	ORNL-4422	Oct-69
P240	NA	Packaging and Disposition of Contact-Handled Transuranic Waste At the Radiochemical Engineering Development Center	REDC FO/WH 5100, Rev. 1 & 2	1/26/1995;7/15/1998
P241	NA	Oak Ridge National Laboratory Contact-Handled Transuranic Waste Certification Program Plan	ORNL/TM-10322/2, Rev. 2	8/1/1990

Source Document Tracking Number	AK #	Title	Document Number	Date
P242	NA	Oak Ridge National Laboratory Contact-Handled Transuranic Waste Certification Program Plan	ORNL/TM-10322/R3, Rev. 3	Jun-92
P263	NA	TRU Operating Manual and Supporting Documentation	NA	10/10/1980
P282	NA	Building 7920 Analytical Chemistry Procedures	Various	Various
P324	S3	Technical Safety Requirements Irradiated Fuels Examination Laboratory Building 3525	ORNL/3525/TSR	8/1/2004
P325	S3	Oak Ridge National Laboratory Standardized Safety Analysis Report for Nonreactor Nuclear Facilities	ORNL/NNFD/SSAR	5/12/2004
P330	S3	Safety Analysis Report Irradiated Fuels Examination Laboratory / Building 3525	ORNL/3525/SAR	6/22/2006
P401	S13	Radioactive materials Analysis laboratory Quality Assurance Plan for the Characterization of Radioactive Waste	QAP-X-96-CASD/RML-001	10/1997
P424	S5	Californium-252: A Remarkable Versatile Radioisotope	ORNL/TM-12706	10/10/1995
U011	NA	Safety Analysis: Transuranium Processing Plant, Building 7920	ORNL/TM-7688, Draft	Dec-84
U049	S9	Waste Stream Profile Sheet for 7920-HCAL-005 and Supporting documentation	7920-HCAL-005	08/18/1999
U601	S9	CCP Calculation Package: Sample Radionuclide Information Input Check	ORNL-RH-01	04/19/2008
U602	S9	CCP Calculation Package: Sample Data Decay Correction	ORNL-RH-02	04/19/2008
U603	S9	CCP Calculation Package: Campaigns 69 and M5 Information Input Check	ORNL-RH-03	04/19/2008
U605	S9	CCP Calculation Package: Mark 42 Campaigns Inventory Information Input Check	ORNL-RH-05	04/19/2008
Source Document Tracking	AK #	Title	Document Number	Date

Number				
U606	S9	CCP Calculation Package: Radiological Inventories for SETF Campaigns	ORNL-RH-06	04/19/2008
U607	S9	CCP Calculation Package: Dose-to-Curie Derivation for Cs-137, Eu-152 and Eu-154	ORNL-RH-07	04/19/2008; 05/23/2008
U608	S9	CCP Calculation Package: Determination of Reportable Isotopes-Mark 42 Period	ORNL-RH-08	04/19/2008
U609	S9	CCP Calculation Package: Campaign Inventory Information Input Check	ORNL-RH-09	04/19/2008
U610	S9	CCP Calculation Package: Uncertainty Analysis	ORNL-RH-10	05/13/2008
U611	S9	CCP Calculation Package: DTC Spreadsheet for Mark 42 Time-Mark/HFIR	ORNL-RH-11	05/22/2008
U612	S9	CCP Calculation Package: Development of Cs-137 Partition Factors	ORNL-RH-12	04/19/2008
U613	S9	CCP Calculation Package: MCNP5 Uncertainty Analysis	ORNL-RH-13	04/19/2008
U614	S9	CCP Calculation Package: Determination of Cm-242 Processed in Campaign 69	ORNL-RH-14	04/19/2008
U615	S9	CCP Calculation Package: Development of Campaigns 69 and M5 Inventories	ORNL-RH-15	04/19/2008
U616	S9	CCP Calculation Package: Direct Assay Information Input Check	ORNL-RH-16	05/13/2008
U617	S9	CCP Calculation Package: Direct Assay Data Analysis	ORNL-RH-17	05/13/2008
U618	S9	CCP Calculation Package: Scaling Factor Development for Mark 42 Time Period	ORNL-RH-18	04/19/2008
U620	S9	CCP Calculation Package: Fission Product Contribution to Total Dose Rate	ORNL-RH-20	04/19/2008
U621	S9	CCP Calculation Package: Sample Scaling Factor Development	ORNL-RH-21	04/19/2008
U622	S9	CCP Calculation Package: SR-90/Cs-137 Scaling Factor Development	ORNL-RH-22	05/14/2008
Source Document Tracking	AK #	Title	Document Number	Date

Number				
U623	S9	CCP Calculation Package: DTC Spreadsheet for Mark 42 Time-HFIR/HFIR	ORNL-RH-23	05/22/2008
U626	S9	CCP Calculation Package for: Determination of Neutron Surface to 1-m Dose Ratio	ORNL-RH-26	05/23/2008
U627	S9	CCP Calculation Package for: Ratio Between Contact and One Meter Dose Rates	ORNL-RH-27	05/23/2008

Alphanumeric Designations

C Correspondence
D Documents
DR Discrepancy Resolution
M Miscellaneous
P Procedures and Published Documents
U Unpublished Documents

AK Numbers

S1 Process Design Documents
S2 Standard Operating Procedure
S3 Safety Analysis Reports
S4 Waste Packaging Logs
S5 Test plans/research project reports
S6 Site databases
S7 Information from site personnel
S8 Standard industry documents
S9 Previous analytical data
S10 Material safety data sheets
S11 Laboratory Notebooks
S12 Comparable or surrogate sampling and analysis data
S13 Other

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PAGE

NWP
Nuclear Waste Partnership LLC

A URS-led partnership with B&W and AREVA

CP:16:01076
UFC:5900.00

INTER-OFFICE CORRESPONDENCE

DATE: April 6, 2016

FROM: R. P. Kantrowitz R.P.K. LOCATION: Certification

TO: CCP Records Custodian GSA-212 LOCATION: Central Characterization Program

SUBJECT: TRANSMITTAL OF WASTE STREAM PROFILE FORM CHANGE NOTICE #1 FOR OAK RIDGE NATIONAL LABORATORY REMOTE-HANDLED WASTE STREAM OR-REDC-RH-HET (CCP-AK-ORNL-500)

Please accept the attached Waste Stream Profile Form Change Notice #1 for the Oak Ridge National Laboratory Remote-Handled Waste Stream OR-REDC-RH-HET (CCP-AK-ORNL-500).

RPK:rg

Attachment

cc: NWP
(without attachment)
I. Joo ED

CCP RECORDS ORIGINAL
DATE REC'D 4/13/2016

COPY

P.O. Box 2078 • Carlsbad, New Mexico USA 88221-2078
Phone: (575) 234-7200 • Fax: (575) 234-7083

Update for WIPP Operating Record (Change Notice #1)

Remote Handled Heterogeneous Debris Waste from the Radiochemistry Engineering Development Center

(OR-REDC-RH-HET)

Please add the following information to the WIPP operating record for Waste Stream Profile Form (WSPF) OR-REDC-RH-HET. This waste stream is Remote Handled Heterogeneous Debris Waste from the Radiochemistry Engineering Development Center and was approved by DOE/CBFO on February 20, 2009.

This WSPF is being revised. The WSPF components are bolded. The updates are:

1. **WSPF, Date of audit report approval by NMED**

   Update the audit approval date to include September 9, 2008, November 2, 2009 and August 12, 2010.

2. **WSPF, Title, version, number, and date of documents used for WAP certification**

   Update the following procedure revision numbers and approval dates:

   CCP-PO-001, CCP Transuranic Waste Characterization Quality Assurance Project Plan, Revision 19, December 29, 2010

   CCP-PO-002, CCP Transuranic Waste Certification Plan, Revision 25, December 29, 2010

   CCP-PO-027 CCP/TRU Waste Processing Center/Oakridge National Laboratory Interface Document, Revision 3, December 29, 2010

3. **WSPF, Waste Stream Information, Applicable TRUCON Content Codes**

   Update the list of applicable TRUCON Content Codes to include OR 321 and OR 322.

   The revised section will identify the following TRUCON Content Codes: OR 321, OR 322 and OR 325.

4. **WSPF, Required Program Information, Required Waste Stream Information, and Supplemental Documentation**

   Update reference CCP-AK-ORNL-500, revision 1, October 3, 2008 to CCP-AK-ORNL-500, revision 2, January 13, 2011.

5. **WSPF, Note (3)**

   Revise Note (3) as follows: TWBIR numbers OR-W211, OR-W214 and OR-REDC-RH-HET also apply.

6. **Summation of Aspects of AK Summary Report: OR-REDC-RH-HET, Overview**

Update reference CCP-AK-ORNL-500, revision 1, October 3, 2008 to CCP-AK-ORNL-500, revision 2, January 13, 2011

7. **Summation of Aspects of AK Summary Report: OR-REDC-RH-HET, Waste Stream Identification Summary, TRUCON Content Number (TRUCON):**

Update the list of applicable TRUCON Content Codes to include OR 321 and OR 322.

8. **Summation of Aspects of AK Summary Report: OR-REDC-RH-HET, Waste Stream TWBIR Identification, Footnote 1**

Revise Footnote 1 as follows: TWBIR numbers OR-W211, OR-W214 and OR-REDC-RH-HET also apply.

9. **Summation of Aspects of AK Summary Report: OR-REDC-RH-HET, RCRA Determinations - Hazardous Waste Determinations, new section entitled Hazardous Waste Management**

The REDC waste has been historically managed in accordance with ORNL waste management practices in compliance with the requirements required by the Tennessee Department of Environment and Conservation. The assignment of EPA HWNs to ORNL waste began in 1994. EPA inspections were conducted as late as 2003 and the containers were subsequently identified as "RCRA suspect" with no specific HWNs assigned. Therefore, the historical waste management was considered with respect to characterization of waste stream OR-REDC-RH-HET.

10. **Summation of Aspects of AK Summary Report: OR-REDC-RH-HET, new section entitled Justification for the Selection of Radiography or Visual Examination**

Visual examination (VE) has been used to characterize waste stream OR-REDC-RH-HET. Visual examination was selected as the characterization method because the waste containers were not previously packaged and VE is an acceptable characterization method for meeting all the Data Quality Objectives for NDE of waste stream OR-REDC-RH-HET.

Reason/justification for the change

The audit report approval date has been revised to reflect the most recent approval date.

Documents used for WAP certification have been revised to reflect the most recent revisions.

Reference to CCP-AK-ORNL-500, revision 1, October 23, 2008 is being updated to reflect the most current version, CCP-AK-ORNL-500, revision 2, January 13, 2011.

The approved TRUCON Content Codes are being added to support higher container wattage limits for waste stream OR-REDC-RH-HET. The TRUCON Content Codes were approved in October 2008.

The TWBIR number OR-REDC-RH-HET has been added to reflect the current ATWIR. Two new sections entitled Hazardous Waste Management and Justification for the Selection of Radiography or Visual Examination have been added to reflect current WIPP HWFP requirements.

11. EPA Hazardous Waste Number Assignment

The EPA Hazardous Waste Numbers assigned to the waste stream have not changed.

Update for the WIPP Operating Record (OR-REDC-RH-HET) certification:

I hereby certify that I have reviewed this Update for WIPP Operating Record, and it is complete and accurate to the best of my knowledge. I understand that this information will be made available to regulatory agencies and that there are significant penalties for submitting false information, including the possibility of fines and imprisonment for knowing violations.

Signature of Site Project Manager	Irene Quintana SPM	5/4/11
	Printed Name and Title	Date

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PAGE

Nuclear Waste Partnership LLC

An AECOM-led partnership with B&W and AREVA

CP:16:01060
UFC:5900.00

INTER-OFFICE CORRESPONDENCE

DATE: February 29, 2016

FROM: Irene Joo LOCATION: RH Operations

TO: CCP Records Custodian GSA-212 LOCATION: Central Characterization Program

SUBJECT: TRANSMITTAL OF CHARACTERIZATION INFORMATION SUMMARY FOR REMOTE-HANDLED LOTS 30-33 FOR WASTE STREAM OR-REDC-RH-HET (CCP-AK-ORNL-500)

Please accept the attached Characterization Information Summary for the Remote-Handled Oak Ridge National Laboratory Lots 30-33 for waste stream OR-REDC-RH-HET (CCP-AK-ORNL-500).

IJ:rg

Attachment

cc: (without attachment)
R. Kantrowitz

COPY

CCP RECORDS ORIGINAL
DATE REC'D 3/3/16

CHARACTERIZATION INFORMATION SUMMARY

WSPF# OR-REDC-RH-HET Rev. 0 (CCP-AK-ORNL-500)

Lot 30

TABLE OF CONTENTS

Characterization Information Summary Cover Page..... 2

Correlation of Container Identification Numbers to Batch Data Report Numbers..... 4

RTR/VE Summary of Prohibited Items and AK Confirmation..... 5

Reconciliation with Data Quality Objectives..... 6

CCP Characterization Information Summary Cover Page

Waste Stream #: OR-REDC-RH-HET Lot #: 30

AK Expert Review: N/A Date: N/A

SPM Review: Irene Joo Date: 02/29/2016

SPM signature certifies that through Acceptable Knowledge testing and/or analysis that the waste identified in this summary is not corrosive, ignitable, reactive, or incompatible with the TSDF.

A summary of the Acceptable Knowledge regarding this waste stream containing specific information about the corrosivity, reactivity, and ignitability of the waste stream is included as an attachment to the Waste Stream Profile Form. By reference, that information is included in this lot.

List of procedures used:

Dose to Curie (DTC)

CCP-TP-504	Rev. 17	12/10/2014 CCP Dose-to-Curie Survey Procedure for Remote-Handled Transuranic Waste
CCP-TP-504	Rev. 16	08/15/2014 CCP Dose-to-Curie Survey Procedure for Remote-Handled Transuranic Waste
CCP-TP-504	Rev. 15	04/15/2014 CCP Dose-to-Curie Survey Procedure for Remote-Handled Transuranic Waste
CCP-TP-504	Rev. 14	07/09/2013 CCP Dose-to-Curie Survey Procedure for Remote-Handled Transuranic Waste
CCP-TP-504	Rev. 13	06/17/2012 CCP Dose-to-Curie Survey Procedure for Remote-Handled Transuranic Waste
CCP-TP-504	Rev. 12	03/20/2012 CCP Dose-to-Curie Survey Procedure for Remote-Handled Transuranic Waste
CCP-TP-504	Rev. 11	04/25/2011 CCP Dose-to-Curie Survey Procedure for Remote-Handled Transuranic Waste
CCP-TP-504	Rev. 10	05/13/2010 CCP Dose-to-Curie Survey Procedure for Remote-Handled Transuranic Waste

Project Level Data Validation / DQO Reconciliation:

CCP-TP-001	Rev. 21	06/06/2013 CCP Project Level Data Validation and Verification
CCP-TP-001	Rev. 20	09/27/2012 CCP Project Level Data Validation and Verification
CCP-TP-001	Rev. 19	12/29/2010 CCP Project Level Data Validation and Verification
CCP-TP-001	Rev. 18	08/09/2010 CCP Project Level Data Validation and Verification
CCP-TP-001	Rev. 17	09/24/2007 CCP Project Level Data Validation and Verification
CCP-TP-001	Rev. 16	04/26/2007 CCP Project Level Data Validation and Verification
CCP-TP-001	Rev. 15	11/22/2006 CCP Project Level Data Validation and Verification
CCP-TP-001	Rev. 14	11/16/2006 CCP Project Level Data Validation and Verification
CCP-TP-001	Rev. 13	07/21/2006 CCP Project Level Data Validation and Verification
CCP-TP-001	Rev. 12	05/25/2006 CCP Project Level Data Validation and Verification
CCP-TP-001	Rev. 11	03/23/2005 CCP Project Level Data Validation and Verification

CCP-TP-002	Rev. 26	06/19/2013 CCP Reconciliation of DQOs and Reporting Characterization Data
CCP-TP-002	Rev. 25	02/11/2013 CCP Reconciliation of DQOs and Reporting Characterization Data
CCP-TP-002	Rev. 24	12/29/2011 CCP Reconciliation of DQOs and Reporting Characterization Data
CCP-TP-002	Rev. 23	12/29/2010 CCP Reconciliation of DQOs and Reporting Characterization Data
CCP-TP-002	Rev. 22	06/30/2010 CCP Reconciliation of DQOs and Reporting Characterization Data
CCP-TP-002	Rev. 21	06/04/2009 CCP Reconciliation of DQOs and Reporting Characterization Data
CCP-TP-002	Rev. 20	06/16/2008 CCP Reconciliation of DQOs and Reporting Characterization Data
CCP-TP-002	Rev. 19	12/22/2008 CCP Reconciliation of DQOs and Reporting Characterization Data
CCP-TP-002	Rev. 18	11/16/2008 CCP Reconciliation of DQOs and Reporting Characterization Data
CCP-TP-002	Rev. 17	10/10/2008 CCP Reconciliation of DQOs and Reporting Characterization Data
CCP-TP-002	Rev. 16	06/06/2008 CCP Reconciliation of DQOs and Reporting Characterization Data
CCP-TP-002	Rev. 15	06/16/2008 CCP Reconciliation of DQOs and Reporting Characterization Data
CCP-TP-002	Rev. 14	03/29/2005 CCP Reconciliation of DQOs and Reporting Characterization Data

CCP-TP-005	Rev. 27	08/29/2013 CCP Acceptable Knowledge Documentation
CCP-TP-005	Rev. 26	06/12/2013 CCP Acceptable Knowledge Documentation
CCP-TP-005	Rev. 25	06/19/2013 CCP Acceptable Knowledge Documentation
CCP-TP-005	Rev. 24	11/28/2011 CCP Acceptable Knowledge Documentation
CCP-TP-005	Rev. 23	08/30/2011 CCP Acceptable Knowledge Documentation
CCP-TP-005	Rev. 22	04/21/2011 CCP Acceptable Knowledge Documentation
CCP-TP-005	Rev. 21	12/29/2010 CCP Acceptable Knowledge Documentation
CCP-TP-005	Rev. 20	11/01/2010 CCP Acceptable Knowledge Documentation
CCP-TP-005	Rev. 19	07/09/2010 CCP Acceptable Knowledge Documentation
CCP-TP-005	Rev. 18	11/16/2008 CCP Acceptable Knowledge Documentation
CCP-TP-005	Rev. 17	06/06/2008 CCP Acceptable Knowledge Documentation
CCP-TP-005	Rev. 16	02/27/2008 CCP Acceptable Knowledge Documentation
CCP-TP-005	Rev. 15	03/31/2005 CCP Acceptable Knowledge Documentation

CCP-TP-530	Rev. 12	03/19/2014 CCP RH TRU Waste Certification and WWIS/WDS Data Entry
CCP-TP-530	Rev. 11	06/19/2013 CCP RH TRU Waste Certification and WWIS/WDS Data Entry
CCP-TP-530	Rev. 10	04/25/2011 CCP RH TRU Waste Certification and WWIS/WDS Data Entry

CCP-TP-530	Rev. 9	12/11/2009 CCP RH TRU Waste Certification and WWIS/WDS Data Entry
CCP-TP-530	Rev. 8	09/08/2009 RH TRU Waste Certification and WWIS Data Entry
CCP-TP-530	Rev. 7	07/11/2008 RH TRU Waste Certification and WWIS Data Entry
CCP-TP-530	Rev. 6	06/23/2008 CCP RH TRU Waste Certification and WWIS/WDS Data Entry
CCP-TP-530	Rev. 5	07/23/2007 CCP RH TRU Waste Certification and WWIS/WDS Data Entry
CCP-TP-530	Rev. 4	04/20/2007 CCP RH TRU Waste Certification and WWIS/WDS Data Entry
CCP-TP-530	Rev. 3	11/16/2006 CCP RH TRU Waste Certification and WWIS/WDS Data Entry
CCP-TP-530	Rev. 2	06/19/2006 CCP RH TRU Waste Certification and WWIS/WDS Data Entry
CCP-TP-530	Rev. 1	05/05/2006 CCP RH TRU Waste Certification and WWIS/WDS Data Entry
CCP-TP-530	Rev. 0	04/25/2006 CCP RH TRU Waste Certification and WWIS/WDS Data Entry

Visual Examination (VE):

CCP-TP-500	Rev. 13	09/23/2013 CCP Remote-Handled Waste Visual Examination
CCP-TP-500	Rev. 12	07/18/2013 CCP Remote-Handled Waste Visual Examination
CCP-TP-500	Rev. 11	04/21/2011 CCP Remote-Handled Waste Visual Examination
CCP-TP-500	Rev.11	04/21/2011 CCP Remote-Handled Waste Visual Examination
CCP-TP-500	Rev. 10	12/29/2010 CCP Remote-Handled Waste Visual Examination
CCP-TP-500	Rev. 9	06/30/2010 CCP Remote-Handled Waste Visual Examination
CCP-TP-500	Rev. 8	07/24/2008 CCP Remote-Handled Waste Visual Examination
CCP-TP-500	Rev. 7	02/27/2008 CCP Remote-Handled Waste Visual Examination
CCP-TP-500	Rev. 6	10/25/2007 CCP Remote-Handled Waste Visual Examination
CCP-TP-500	Rev. 5	08/01/2007 CCP Remote-Handled Waste Visual Examination
CCP-TP-500	Rev. 4	11/16/2006 CCP Remote-Handled Waste Visual Examination
CCP-TP-500	Rev. 3	10/12/2006 CCP Remote-Handled Waste Visual Examination
CCP-TP-500	Rev. 2	06/19/2006 CCP Remote-Handled Waste Visual Examination
CCP-TP-500	Rev. 1	04/27/2006 CCP Remote-Handled Waste Visual Examination
CCP-TP-500	Rev. 0	02/15/2006 CCP Remote-Handled Waste Visual Examination

WAP Certification:

CCP-PO-001	Rev. 22	01/13/2016 CCP Transuranic Waste Characterization Quality Assurance Project Plan
CCP-PO-001	Rev. 21	05/31/2013 CCP Transuranic Waste Characterization Quality Assurance Project Plan
CCP-PO-001	Rev. 20	06/18/2011 CCP Transuranic Waste Characterization Quality Assurance Project Plan
CCP-PO-001	Rev. 19	12/29/2010 CCP Transuranic Waste Characterization Quality Assurance Project Plan
CCP-PO-001	Rev. 18	06/30/2010 CCP Transuranic Waste Characterization Quality Assurance Project Plan
CCP-PO-001	Rev. 17	06/29/2009 CCP Transuranic Waste Characterization Quality Assurance Project Plan
CCP-PO-001	Rev. 16	10/31/2007 CCP Transuranic Waste Characterization Quality Assurance Project Plan
CCP-PO-001	Rev. 15	08/10/2007 CCP Transuranic Waste Characterization Quality Assurance Project Plan
CCP-PO-001	Rev. 14	03/28/2007 CCP Transuranic Waste Characterization Quality Assurance Project Plan
CCP-PO-001	Rev. 13	11/16/2006 CCP Transuranic Waste Characterization Quality Assurance Project Plan
CCP-PO-001	Rev. 12	03/22/2006 CCP Transuranic Waste Characterization Quality Assurance Project Plan
CCP-PO-001	Rev. 11	03/10/2005 CCP Transuranic Waste Characterization Quality Assurance Project Plan

CCP-PO-002	Rev. 27	05/31/2013 CCP Transuranic Waste Certification Plan
CCP-PO-002	Rev. 26	07/14/2011 CCP Transuranic Waste Certification Plan
CCP-PO-002	Rev. 25	12/29/2010 CCP Transuranic Waste Certification Plan
CCP-PO-002	Rev. 24	06/30/2010 CCP Transuranic Waste Certification Plan
CCP-PO-002	Rev. 23	04/07/2010 CCP Transuranic Waste Certification Plan
CCP-PO-002	Rev. 22	01/12/2010 CCP Transuranic Waste Certification Plan
CCP-PO-002	Rev. 21	01/26/2009 CCP Transuranic Waste Certification Plan
CCP-PO-002	Rev. 20	11/02/2007 CCP Transuranic Waste Certification Plan
CCP-PO-002	Rev. 19	05/22/2007 CCP Transuranic Waste Certification Plan
CCP-PO-002	Rev. 18	11/16/2006 CCP Transuranic Waste Certification Plan
CCP-PO-002	Rev. 17	11/16/2006 CCP Transuranic Waste Certification Plan
CCP-PO-002	Rev. 18	11/16/2006 CCP Transuranic Waste Certification Plan
CCP-PO-002	Rev. 15	03/22/2006 CCP Transuranic Waste Certification Plan
CCP-PO-002	Rev. 14	12/29/2005 CCP Transuranic Waste Certification Plan
CCP-PO-002	Rev. 13	05/09/2005 CCP Transuranic Waste Certification Plan

CCP-PO-027	Rev. 5	10/02/2013 CCP/TRU Waste Processing Center/Oakridge National Laboratory Interface Document
CCP-PO-027	Rev. 4	10/01/2012 CCP/TRU Waste Processing Center/Oakridge National Laboratory Interface Document
CCP-PO-027	Rev. 3	12/29/2010 CCP/TRU Waste Processing Center/Oakridge National Laboratory Interface Document
CCP-PO-027	Rev. 2	04/22/2010 CCP/TRU Waste Processing Center/Oakridge National Laboratory Interface Document
CCP-PO-027	Rev. 1	02/17/2010 CCP/TRU Waste Processing Center/Oakridge National Laboratory Interface Document
CCP-PO-027	Rev. 0	10/02/2007 CCP/TRU Waste Processing Center/Oakridge National Laboratory Interface Document

CCP Correlation of Container Identification Numbers to Batch Data Report Numbers

Waste Stream: # OR-REDC-RH-HET Lot # 30

Container ID Number	Radiological BDR	RTR BDR	VE BDR	FGA BDR
ORRH00685	ORRHDTC14001	N/A	ORNLRHVE14001	OR15FG11003
ORRH00686	ORRHDTC14001	N/A	ORNLRHVE14003	OR15FG11003
ORRH00690	ORRHDTC14001	N/A	ORNLRHVE14006	OR15FG11003
ORRH00696	ORRHDTC14002	N/A	ORNLRHVE14013	OR15FG11008
ORRH00701	ORRHDTC15002	N/A	ORNLRHVE14014	OR15FG11006
ORRH00707	ORRHDTC15001	N/A	ORNLRHVE14016	OR15FG11003

Signature of Site Project Manager | Irene Joo (Printed Name) | 02/29/2016 (Date)

CCP RTR/VE Summary of Prohibited Items and AK Confirmation

Waste Stream Number: OR-REDC-RH-HET Lot #: 30

Container Number	RTR Prohibited Items [a,b]	Visual Examination Prohibited Items [a,b]	Does the Physical Form of the Waste Match the Waste Stream Description as Determined by AK
See correlation of container ID numbers for list of remaining drum numbers in this Lot.	RTR was not used to certify any containers in this lot.	None of the containers in this Lot had prohibited items identified during Visual Examination technique.	The physical form of the waste matches the waste stream description as determined by AK.
a. See Batch Data Reports			
b. If AK has assigned U134 to this waste stream, then any liquids in these containers are prohibited items (not acceptable by the TSDF).			
Justification for the selection of RTR and/or VE: VE was selected as the characterization method for this lot because the containers were newly generated and met all the Data Quality Objectives for NDE for the waste.			

Site Project Manager Signature | Irene Joo Printed Name | 02/29/2016 Date

CCP Reconciliation with Data Quality Objectives

WSPF# OR-REDC-RH-HET Rev. 0 Lot # 30

Sampling Completeness

RTR/VE:
Number of Valid Samples: 6 Number of Total Samples Analyzed: 6
Percent Complete: 100 (QAO is 100%)

Radiological:
Number of Valid Samples: 6 Number of Total Samples Analyzed: 6
Percent Complete: 100 (QAO is 100%)

	Y/N/NA	Reconciliation Parameter
1	Y	Waste Matrix Code.
2	Y	Waste Material Parameter Weights.
3	Y	The TRU activity reported in the BDRs for each container demonstrates with a 95% probability that the container of waste contains TRU radioactive waste.
4	N	AK Sufficiency. Is there an approved AK sufficiency Determination for this waste stream?
5	Y	The data demonstrates whether the waste stream exhibits a toxicity characteristic under Title 40 Code of Federal Regulations (CFR), Part 261, Identification and Listing of Hazardous Waste, Subpart C, Characteristics of Hazardous Waste.
6	Y	Does the waste stream contain listed waste found in 20.4.1.200 NMAC incorporating 40 CFR Part 261, Subpart D, Lists of Hazardous Wastes.
7	Y	Waste stream can be classified as hazardous or nonhazardous.
8	Y	The overall completeness, comparability, and representativeness QAOs were met for each of the analytical and testing procedures as specified in the WAP Sections C3-1 through C3-2 prior to submittal of a waste stream profile form for a waste steam or waste stream lot.

	Completeness	Comparability	Representativeness
Radiography	NA	NA	NA
VE	Y	Y	Y

Comments: None

Irene Joo 02/29/2016
Signature of Site Project Manager Printed Name Date

CHARACTERIZATION INFORMATION SUMMARY

WSPF# OR-REDC-RH-HET Rev. 0 (CCP-AK-ORNL-500)

Lot 31

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CCP Characterization Information Summary Cover Page

Waste Stream #: OR-REDC-RH-HET Lot #: 31

AK Expert Review: N/A Date: N/A

SPM Review: Irene Joo Date: 05/14/2015

SPM signature certifies that through Acceptable Knowledge testing and/or analysis that the waste identified in this summary is not corrosive, ignitable, reactive, or incompatible with the TSDF.

A summary of the Acceptable Knowledge regarding this waste stream containing specific information about the corrosivity, reactivity, and ignitability of the waste stream is included as an attachment to the Waste Stream Profile Form. By reference, that information is included in this lot.

List of procedures used:

Project Level Data Validation / DQO Reconciliation:

CCP-TP-001	Rev. 21	06/06/2013 CCP Project Level Data Validation and Verification
CCP-TP-001	Rev. 20	09/27/2012 CCP Project Level Data Validation and Verification
CCP-TP-001	Rev. 19	12/28/2010 CCP Project Level Data Validation and Verification
CCP-TP-001	Rev. 18	09/09/2010 CCP Project Level Data Validation and Verification
CCP-TP-001	Rev. 17	09/24/2007 CCP Project Level Data Validation and Verification
CCP-TP-001	Rev. 16	04/26/2007 CCP Project Level Data Validation and Verification
CCP-TP-001	Rev. 15	11/22/2006 CCP Project Level Data Validation and Verification
CCP-TP-001	Rev. 14	11/16/2006 CCP Project Level Data Validation and Verification
CCP-TP-001	Rev. 13	07/21/2006 CCP Project Level Data Validation and Verification
CCP-TP-001	Rev. 12	05/25/2006 CCP Project Level Data Validation and Verification
CCP-TP-001	Rev. 11	03/23/2005 CCP Project Level Data Validation and Verification

CCP-TP-002	Rev. 26	06/19/2013 CCP Reconciliation of DQOs and Reporting Characterization Data
CCP-TP-002	Rev. 25	02/11/2013 CCP Reconciliation of DQOs and Reporting Characterization Data
CCP-TP-002	Rev. 24	12/28/2011 CCP Reconciliation of DQOs and Reporting Characterization Data
CCP-TP-002	Rev. 23	12/29/2010 CCP Reconciliation of DQOs and Reporting Characterization Data
CCP-TP-002	Rev. 22	08/30/2010 CCP Reconciliation of DQOs and Reporting Characterization Data
CCP-TP-002	Rev. 21	08/04/2009 CCP Reconciliation of DQOs and Reporting Characterization Data
CCP-TP-002	Rev. 20	08/18/2008 CCP Reconciliation of DQOs and Reporting Characterization Data
CCP-TP-002	Rev. 19	12/22/2008 CCP Reconciliation of DQOs and Reporting Characterization Data
CCP-TP-002	Rev. 18	11/16/2006 CCP Reconciliation of DQOs and Reporting Characterization Data
CCP-TP-002	Rev. 17	10/10/2006 CCP Reconciliation of DQOs and Reporting Characterization Data
CCP-TP-002	Rev. 16	08/08/2006 CCP Reconciliation of DQOs and Reporting Characterization Data
CCP-TP-002	Rev. 15	09/16/2005 CCP Reconciliation of DQOs and Reporting Characterization Data
CCP-TP-002	Rev. 14	03/29/2005 CCP Reconciliation of DQOs and Reporting Characterization Data

CCP-TP-005	Rev. 29	08/12/2013 CCP Acceptable Knowledge Documentation
CCP-TP-005	Rev. 25	09/18/2013 CCP Acceptable Knowledge Documentation
CCP-TP-005	Rev. 24	11/28/2011 CCP Acceptable Knowledge Documentation
CCP-TP-005	Rev. 23	09/30/2011 CCP Acceptable Knowledge Documentation
CCP-TP-005	Rev. 22	04/21/2011 CCP Acceptable Knowledge Documentation
CCP-TP-005	Rev. 21	12/29/2010 CCP Acceptable Knowledge Documentation
CCP-TP-005	Rev. 20	11/01/2010 CCP Acceptable Knowledge Documentation
CCP-TP-005	Rev. 19	07/06/2010 CCP Acceptable Knowledge Documentation
CCP-TP-005	Rev. 18	11/16/2006 CCP Acceptable Knowledge Documentation
CCP-TP-005	Rev. 17	06/05/2006 CCP Acceptable Knowledge Documentation
CCP-TP-005	Rev. 16	02/27/2006 CCP Acceptable Knowledge Documentation
CCP-TP-005	Rev. 15	03/31/2005 CCP Acceptable Knowledge Documentation

CCP-TP-530	Rev. 12	03/19/2014 CCP RH TRU Waste Certification and WWIS/WDS Data Entry
CCP-TP-530	Rev. 11	08/19/2013 CCP RH TRU Waste Certification and WWIS/WDS Data Entry
CCP-TP-530	Rev. 10	04/28/2011 CCP RH TRU Waste Certification and WWIS/WDS Data Entry
CCP-TP-530	Rev. 9	12/11/2009 CCP RH TRU Waste Certification and WWIS/WDS Data Entry
CCP-TP-530	Rev. 8	09/09/2009 RH TRU Waste Certification and WWIS Data Entry
CCP-TP-530	Rev. 7	07/11/2008 RH TRU Waste Certification and WWIS Data Entry.
CCP-TP-530	Rev. 6	08/25/2008 CCP RH TRU Waste Certification and WWIS/WDS Data Entry
CCP-TP-530	Rev. 5	07/23/2007 CCP RH TRU Waste Certification and WWIS/WDS Data Entry
CCP-TP-530	Rev. 4	04/20/2007 CCP RH TRU Waste Certification and WWIS/WDS Data Entry
CCP-TP-530	Rev. 3	11/16/2006 CCP RH TRU Waste Certification and WWIS/WDS Data Entry
CCP-TP-530	Rev. 2	08/15/2006 CCP RH TRU Waste Certification and WWIS/WDS Data Entry
CCP-TP-530	Rev. 1	06/05/2006 CCP RH TRU Waste Certification and WWIS/WDS Data Entry
CCP-TP-530	Rev. 0	04/25/2006 CCP RH TRU Waste Certification and WWIS/WDS Data Entry

Visual Examination (VE):

CCP-TP-500	Rev. 13	09/23/2013 CCP Remote-Handled Waste Visual Examination
CCP-TP-500	Rev. 12	07/18/2013 CCP Remote-Handled Waste Visual Examination
CCP-TP-500	Rev. 11	04/21/2011 CCP Remote-Handled Waste Visual Examination
CCP-TP-500	Rev.11	04/21/2011 CCP Remote-Handled Waste Visual Examination
CCP-TP-500	Rev. 10	12/28/2010 CCP Remote-Handled Waste Visual Examination
CCP-TP-500	Rev. 9	06/30/2010 CCP Remote-Handled Waste Visual Examination
CCP-TP-500	Rev. 8	07/24/2008 CCP Remote-Handled Waste Visual Examination
CCP-TP-500	Rev. 7	02/27/2008 CCP Remote-Handled Waste Visual Examination
CCP-TP-500	Rev. 6	10/25/2007 CCP Remote-Handled Waste Visual Examination
CCP-TP-500	Rev. 5	06/01/2007 CCP Remote-Handled Waste Visual Examination
CCP-TP-500	Rev. 4	11/16/2006 CCP Remote-Handled Waste Visual Examination
CCP-TP-500	Rev. 3	10/12/2006 CCP Remote-Handled Waste Visual Examination
CCP-TP-500	Rev. 2	06/19/2006 CCP Remote-Handled Waste Visual Examination
CCP-TP-500	Rev. 1	04/27/2006 CCP Remote-Handled Waste Visual Examination
CCP-TP-500	Rev. 0	02/15/2006 CCP Remote-Handled Waste Visual Examination

WAP Certification:

CCP-PO-001	Rev. 21	05/31/2013 CCP Transuranic Waste Characterization Quality Assurance Project Plan
CCP-PO-001	Rev. 20	06/16/2011 CCP Transuranic Waste Characterization Quality Assurance Project Plan
CCP-PO-001	Rev. 19	12/28/2010 CCP Transuranic Waste Characterization Quality Assurance Project Plan
CCP-PO-001	Rev. 18	06/30/2010 CCP Transuranic Waste Characterization Quality Assurance Project Plan
CCP-PO-001	Rev. 17	06/23/2009 CCP Transuranic Waste Characterization Quality Assurance Project Plan
CCP-PO-001	Rev. 16	10/31/2007 CCP Transuranic Waste Characterization Quality Assurance Project Plan
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CCP-PO-001	Rev. 11	03/10/2005 CCP Transuranic Waste Characterization Quality Assurance Project Plan

CCP-PO-002	Rev. 27	08/31/2013 CCP Transuranic Waste Certification Plan
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CCP-PO-002	Rev. 25	12/28/2010 CCP Transuranic Waste Certification Plan
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CCP-PO-002	Rev. 23	04/07/2010 CCP Transuranic Waste Certification Plan
CCP-PO-002	Rev. 22	01/12/2010 CCP Transuranic Waste Certification Plan
CCP-PO-002	Rev. 21	01/26/2009 CCP Transuranic Waste Certification Plan
CCP-PO-002	Rev. 20	11/02/2007 CCP Transuranic Waste Certification Plan
CCP-PO-002	Rev. 19	05/22/2007 CCP Transuranic Waste Certification Plan
CCP-PO-002	Rev. 18	11/16/2006 CCP Transuranic Waste Certification Plan
CCP-PO-002	Rev. 17	11/16/2006 CCP Transuranic Waste Certification Plan
CCP-PO-002	Rev. 16	11/16/2006 CCP Transuranic Waste Certification Plan
CCP-PO-002	Rev. 15	03/22/2006 CCP Transuranic Waste Certification Plan
CCP-PO-002	Rev. 14	12/29/2005 CCP Transuranic Waste Certification Plan
CCP-PO-002	Rev. 13	05/09/2005 CCP Transuranic Waste Certification Plan

CCP-PO-027	Rev. 5	10/02/2013 CCP/TRU Waste Processing Center/Oakridge National Laboratory Interface Document
CCP-PO-027	Rev. 4	10/01/2012 CCP/TRU Waste Processing Center/Oakridge National Laboratory Interface Document
CCP-PO-027	Rev. 3	12/28/2010 CCP/TRU Waste Processing Center/Oakridge National Laboratory Interface Document
CCP-PO-027	Rev. 2	04/22/2010 CCP/TRU Waste Processing Center/Oakridge National Laboratory Interface Document
CCP-PO-027	Rev. 1	02/17/2010 CCP/TRU Waste Processing Center/Oakridge National Laboratory Interface Document
CCP-PO-027	Rev. 0	10/02/2007 CCP/TRU Waste Processing Center/Oakridge National Laboratory Interface Document

CCP Correlation of Container Identification Numbers to Batch Data Report Numbers

Waste Stream: # OR-REDC-RH-HET

Lot # 31

Container ID Number	Radiological BDR	RTR BDR	VE BDR	FGA BDR
ORRH00708	ORRHDTC15003	N/A	ORNLRHVE15001	OR15FG11008
ORRH00709	ORRHDTC15004	N/A	ORNLRHVE15002	OR15FG11009

Signature of Site Project Manager | Irene Joo (Printed Name) | 05/14/2015 (Date)

CCP RTR/VE Summary of Prohibited Items and AK Confirmation

Waste Stream Number: OR-REDC-RH-HET Lot #: 31

Container Number	RTR Prohibited Items [a,b]	Visual Examination Prohibited Items [a,b]	Does the Physical Form of the Waste Match the Waste Stream Description as Determined by AK
See correlation of container ID numbers for list of remaining drum numbers in this Lot.	RTR was not used to certify any containers in this lot.	None of the containers in this Lot had prohibited items identified during Visual Examination technique.	The physical form of the waste matches the waste stream description as determined by AK.
a. See Batch Data Reports			
b. If AK has assigned U134 to this waste stream, then any liquids in these containers are prohibited items (not acceptable by the TSDF).			
Justification for the selection of RTR and/or VE: VE was selected as the characterization method for this lot because the containers were newly generated and met all the Data Quality Objectives for NDE for the waste.			

Site Project Manager Signature | Irene Joo (Printed Name) | 05/14/2015 (Date)

CCP Reconciliation with Data Quality Objectives

WSPF# OR-REDC-RH-HET Rev. 0 Lot # 31

Sampling Completeness

RTR/VE:
Number of Valid Samples: 2 Number of Total Samples Analyzed: 2
Percent Complete: 100 (QAO is 100%)

Radiological:
Number of Valid Samples: 2 Number of Total Samples Analyzed: 2
Percent Complete: 100 (QAO is 100%)

	Y/N/NA	Reconciliation Parameter
1	Y	Waste Matrix Code.
2	Y	Waste Material Parameter Weights.
3	Y	The TRU activity reported in the BDRs for each container demonstrates with a 95% probability that the container of waste contains TRU radioactive waste.
4	N	AK Sufficiency. Is there an approved AK sufficiency Determination for this waste stream?
5	Y	The data demonstrates whether the waste stream exhibits a toxicity characteristic under Title 40 Code of Federal Regulations (CFR), Part 261, Identification and Listing of Hazardous Waste, Subpart C, Characteristics of Hazardous Waste.
6	Y	Does the waste stream contain listed waste found in 20.4.1.200 NMAC incorporating 40 CFR Part 261, Subpart D, Lists of Hazardous Wastes.
7	Y	Waste stream can be classified as hazardous or nonhazardous.
8	Y	The overall completeness, comparability, and representativeness QAOs were met for each of the analytical and testing procedures as specified in the WAP Sections C3-1 through C3-2 prior to submittal of a waste stream profile form for a waste steam or waste stream lot.

	Completeness	Comparability	Representativeness
Radiography	NA	NA	NA
VE	Y	Y	Y

Comments: None

Irene Joo 05/14/2015
Signature of Site Project Manager Printed Name Date

CHARACTERIZATION INFORMATION SUMMARY

WSPF# OR-REDC-RH-HET Rev. 0 (CCP-AK-ORNL-500)

Lot 32

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CCP Characterization Information Summary Cover Page

Waste Stream #: OR-REDC-RH-HET Lot #: 32

AK Expert Review: N/A Date: N/A

SPM Review: Irene Joo Date: 11/02/2015

SPM signature certifies that through Acceptable Knowledge testing and/or analysis that the waste identified in this summary is not corrosive, ignitable, reactive, or incompatible with the TSDF.

A summary of the Acceptable Knowledge regarding this waste stream containing specific information about the corrosivity, reactivity, and ignitability of the waste stream is included as an attachment to the Waste Stream Profile Form. By reference, that information is included in this lot.

List of procedures used:

Dose to Curie (DTC)

CCP-TP-504	Rev. 17	12/10/2014 CCP Dose-to-Curie Survey Procedure for Remote-Handled Transuranic Waste
CCP-TP-504	Rev. 16	08/15/2014 CCP Dose-to-Curie Survey Procedure for Remote-Handled Transuranic Waste
CCP-TP-504	Rev. 15	04/16/2014 CCP Dose-to-Curie Survey Procedure for Remote-Handled Transuranic Waste
CCP-TP-504	Rev. 14	07/09/2013 CCP Dose-to-Curie Survey Procedure for Remote-Handled Transuranic Waste
CCP-TP-504	Rev. 13	09/17/2012 CCP Dose-to-Curie Survey Procedure for Remote-Handled Transuranic Waste
CCP-TP-504	Rev. 12	03/20/2012 CCP Dose-to-Curie Survey Procedure for Remote-Handled Transuranic Waste
CCP-TP-504	Rev. 11	04/25/2011 CCP Dose-to-Curie Survey Procedure for Remote-Handled Transuranic Waste
CCP-TP-504	Rev. 10	05/13/2010 CCP Dose-to-Curie Survey Procedure for Remote-Handled Transuranic Waste

Project Level Data Validation / DQO Reconciliation:

CCP-TP-001	Rev. 21	08/08/2013 CCP Project Level Data Validation and Verification
CCP-TP-001	Rev. 20	09/27/2012 CCP Project Level Data Validation and Verification
CCP-TP-001	Rev. 19	12/29/2010 CCP Project Level Data Validation and Verification
CCP-TP-001	Rev. 18	08/09/2010 CCP Project Level Data Validation and Verification
CCP-TP-001	Rev. 17	09/24/2007 CCP Project Level Data Validation and Verification
CCP-TP-001	Rev. 16	04/26/2007 CCP Project Level Data Validation and Verification
CCP-TP-001	Rev. 15	11/22/2006 CCP Project Level Data Validation and Verification
CCP-TP-001	Rev. 14	11/16/2006 CCP Project Level Data Validation and Verification
CCP-TP-001	Rev. 13	07/21/2006 CCP Project Level Data Validation and Verification
CCP-TP-001	Rev. 12	05/25/2006 CCP Project Level Data Validation and Verification
CCP-TP-001	Rev. 11	03/23/2005 CCP Project Level Data Validation and Verification

CCP-TP-002	Rev. 26	06/19/2013 CCP Reconciliation of DQOs and Reporting Characterization Data
CCP-TP-002	Rev. 25	02/11/2013 CCP Reconciliation of DQOs and Reporting Characterization Data
CCP-TP-002	Rev. 24	12/29/2011 CCP Reconciliation of DQOs and Reporting Characterization Data
CCP-TP-002	Rev. 23	12/29/2010 CCP Reconciliation of DQOs and Reporting Characterization Data
CCP-TP-002	Rev. 22	06/30/2010 CCP Reconciliation of DQOs and Reporting Characterization Data
CCP-TP-002	Rev. 21	08/04/2009 CCP Reconciliation of DQOs and Reporting Characterization Data
CCP-TP-002	Rev. 20	06/18/2008 CCP Reconciliation of DQOs and Reporting Characterization Data
CCP-TP-002	Rev. 19	12/22/2006 CCP Reconciliation of DQOs and Reporting Characterization Data
CCP-TP-002	Rev. 18	11/16/2006 CCP Reconciliation of DQOs and Reporting Characterization Data
CCP-TP-002	Rev. 17	10/10/2006 CCP Reconciliation of DQOs and Reporting Characterization Data
CCP-TP-002	Rev. 16	06/06/2006 CCP Reconciliation of DQOs and Reporting Characterization Data
CCP-TP-002	Rev. 15	08/16/2005 CCP Reconciliation of DQOs and Reporting Characterization Data
CCP-TP-002	Rev. 14	03/29/2005 CCP Reconciliation of DQOs and Reporting Characterization Data

CCP-TP-005	Rev. 27	08/29/2015 CCP Acceptable Knowledge Documentation
CCP-TP-005	Rev. 26	08/12/2013 CCP Acceptable Knowledge Documentation
CCP-TP-005	Rev. 25	06/19/2013 CCP Acceptable Knowledge Documentation
CCP-TP-005	Rev. 24	11/28/2011 CCP Acceptable Knowledge Documentation
CCP-TP-005	Rev. 23	06/30/2011 CCP Acceptable Knowledge Documentation
CCP-TP-005	Rev. 22	04/21/2011 CCP Acceptable Knowledge Documentation
CCP-TP-005	Rev. 21	12/29/2010 CCP Acceptable Knowledge Documentation
CCP-TP-005	Rev. 20	11/01/2010 CCP Acceptable Knowledge Documentation
CCP-TP-005	Rev. 19	07/08/2010 CCP Acceptable Knowledge Documentation
CCP-TP-005	Rev. 18	11/16/2006 CCP Acceptable Knowledge Documentation
CCP-TP-005	Rev. 17	08/05/2008 CCP Acceptable Knowledge Documentation
CCP-TP-005	Rev. 16	02/27/2006 CCP Acceptable Knowledge Documentation
CCP-TP-005	Rev. 15	03/31/2005 CCP Acceptable Knowledge Documentation

CCP-TP-530	Rev. 12	03/18/2014 CCP RH TRU Waste Certification and WWIS/WDS Data Entry
CCP-TP-530	Rev. 11	06/18/2013 CCP RH TRU Waste Certification and WWIS/WDS Data Entry
CCP-TP-530	Rev. 10	04/28/2011 CCP RH TRU Waste Certification and WWIS/WDS Data Entry

CCP-TP-530	Rev. 9	12/11/2009 CCP RH TRU Waste Certification and WWIS/WDS Data Entry
CCP-TP-530	Rev. 8	09/09/2009 RH TRU Waste Certification and WWIS Data Entry
CCP-TP-530	Rev. 7	07/11/2008 RH TRU Waste Certification and WWIS Data Entry
CCP-TP-530	Rev. 6	08/25/2008 CCP RH TRU Waste Certification and WWIS/WDS Data Entry
CCP-TP-530	Rev. 5	07/23/2007 CCP RH TRU Waste Certification and WWIS/WDS Data Entry
CCP-TP-530	Rev. 4	04/20/2007 CCP RH TRU Waste Certification and WWIS/WDS Data Entry
CCP-TP-530	Rev. 3	11/16/2006 CCP RH TRU Waste Certification and WWIS/WDS Data Entry
CCP-TP-530	Rev. 2	08/15/2006 CCP RH TRU Waste Certification and WWIS/WDS Data Entry
CCP-TP-530	Rev. 1	05/05/2006 CCP RH TRU Waste Certification and WWIS/WDS Data Entry
CCP-TP-530	Rev. 0	04/25/2006 CCP RH TRU Waste Certification and WWIS/WDS Data Entry

Visual Examination (VE):

CCP-TP-500	Rev. 13	09/23/2013 CCP Remote-Handled Waste Visual Examination
CCP-TP-500	Rev. 12	07/16/2013 CCP Remote-Handled Waste Visual Examination
CCP-TP-500	Rev. 11	04/21/2011 CCP Remote-Handled Waste Visual Examination
CCP-TP-500	Rev.11	04/21/2011 CCP Remote-Handled Waste Visual Examination
CCP-TP-500	Rev. 10	12/28/2010 CCP Remote-Handled Waste Visual Examination
CCP-TP-500	Rev. 9	06/30/2010 CCP Remote-Handled Waste Visual Examination
CCP-TP-500	Rev. 8	07/24/2008 CCP Remote-Handled Waste Visual Examination
CCP-TP-500	Rev. 7	02/27/2008 CCP Remote-Handled Waste Visual Examination
CCP-TP-500	Rev. 6	10/25/2007 CCP Remote-Handled Waste Visual Examination
CCP-TP-500	Rev. 5	09/01/2007 CCP Remote-Handled Waste Visual Examination
CCP-TP-500	Rev. 4	11/16/2006 CCP Remote-Handled Waste Visual Examination
CCP-TP-500	Rev. 3	10/12/2006 CCP Remote-Handled Waste Visual Examination
CCP-TP-500	Rev. 2	08/18/2006 CCP Remote-Handled Waste Visual Examination
CCP-TP-500	Rev. 1	04/27/2006 CCP Remote-Handled Waste Visual Examination
CCP-TP-500	Rev. 0	02/15/2006 CCP Remote-Handled Waste Visual Examination

WAP Certification:

CCP-PO-001	Rev. 21	05/31/2013 CCP Transuranic Waste Characterization Quality Assurance Project Plan
CCP-PO-001	Rev. 20	08/18/2011 CCP Transuranic Waste Characterization Quality Assurance Project Plan
CCP-PO-001	Rev. 19	12/28/2010 CCP Transuranic Waste Characterization Quality Assurance Project Plan
CCP-PO-001	Rev. 18	06/30/2010 CCP Transuranic Waste Characterization Quality Assurance Project Plan
CCP-PO-001	Rev. 17	09/23/2009 CCP Transuranic Waste Characterization Quality Assurance Project Plan
CCP-PO-001	Rev. 16	10/31/2007 CCP Transuranic Waste Characterization Quality Assurance Project Plan
CCP-PO-001	Rev. 15	08/10/2007 CCP Transuranic Waste Characterization Quality Assurance Project Plan
CCP-PO-001	Rev. 14	03/28/2007 CCP Transuranic Waste Characterization Quality Assurance Project Plan
CCP-PO-001	Rev. 13	11/16/2006 CCP Transuranic Waste Characterization Quality Assurance Project Plan
CCP-PO-001	Rev. 12	09/22/2006 CCP Transuranic Waste Characterization Quality Assurance Project Plan
CCP-PO-001	Rev. 11	03/10/2005 CCP Transuranic Waste Characterization Quality Assurance Project Plan

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CCP-PO-002	Rev. 26	07/14/2011 CCP Transuranic Waste Certification Plan
CCP-PO-002	Rev. 25	12/28/2010 CCP Transuranic Waste Certification Plan
CCP-PO-002	Rev. 24	09/30/2010 CCP Transuranic Waste Certification Plan
CCP-PO-002	Rev. 23	04/07/2010 CCP Transuranic Waste Certification Plan
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CCP-PO-002	Rev. 21	01/28/2009 CCP Transuranic Waste Certification Plan
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CCP-PO-002	Rev. 15	03/22/2006 CCP Transuranic Waste Certification Plan
CCP-PO-002	Rev. 14	12/29/2005 CCP Transuranic Waste Certification Plan
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CCP-PO-027	Rev. 5	10/02/2013 CCP/TRU Waste Processing Center/Oakridge National Laboratory Interface Document
CCP-PO-027	Rev. 4	10/01/2012 CCP/TRU Waste Processing Center/Oakridge National Laboratory Interface Document
CCP-PO-027	Rev. 3	12/29/2010 CCP/TRU Waste Processing Center/Oakridge National Laboratory Interface Document
CCP-PO-027	Rev. 2	04/22/2010 CCP/TRU Waste Processing Center/Oakridge National Laboratory Interface Document
CCP-PO-027	Rev. 1	02/17/2010 CCP/TRU Waste Processing Center/Oakridge National Laboratory Interface Document
CCP-PO-027	Rev. 0	10/02/2007 CCP/TRU Waste Processing Center/Oakridge National Laboratory Interface Document

CCP Correlation of Container Identification Numbers to Batch Data Report Numbers

Waste Stream: # OR-REDC-RH-HET Lot # 32

Container ID Number	Radiological BDR	RTR BDR	VE BDR	FGA BDR
ORRH00710	ORRHDTC15005	N/A	ORNLRHVE15003	OR15FG11014
ORRH00711	ORRHDTC15005	N/A	ORNLRHVE15003	OR15FG11014
ORRH00712	ORRHDTC15005	N/A	ORNLRHVE15005	OR15FG11014
ORRH00713	ORRHDTC15005	N/A	ORNLRHVE15004	OR15FG11014
ORRH00714	ORRHDTC15005	N/A	ORNLRHVE15005	OR15FG11014
ORRH00715	ORRHDTC15005	N/A	ORNLRHVE15005	OR15FG11014
ORRH00716	ORRHDTC15005	N/A	ORNLRHVE15006	OR15FG11015
ORRH00717	ORRHDTC15005	N/A	ORNLRHVE15006	OR15FG11015
ORRH00718	ORRHDTC15005	N/A	ORNLRHVE15007	OR15FG11015
ORRH00719	ORRHDTC15005	N/A	ORNLRHVE15007	OR15FG11015
ORRH00720	ORRHDTC15005	N/A	ORNLRHVE15008	OR15FG11015
ORRH00721	ORRHDTC15005	N/A	ORNLRHVE15009	OR15FG11015

Signature of Site Project Manager | Irene Joo (Printed Name) | 11/02/2015 (Date)

CCP RTR/VE Summary of Prohibited Items and AK Confirmation

Waste Stream Number: OR-REDC-RH-HET Lot #: 32

Container Number	RTR Prohibited Items [a,b]	Visual Examination Prohibited Items [a,b]	Does the Physical Form of the Waste Match the Waste Stream Description as Determined by AK
See correlation of container ID numbers for list of remaining drum numbers in this Lot.	RTR was not used to certify any containers in this lot.	None of the containers in this Lot had prohibited items identified during Visual Examination technique.	The physical form of the waste matches the waste stream description as determined by AK.
a. See Batch Data Reports			
b. If AK has assigned U134 to this waste stream, then any liquids in these containers are prohibited items (not acceptable by the TSDF).			
Justification for the selection of RTR and/or VE: VE was selected as the characterization method for this lot because the containers were newly generated and met all the Data Quality Objectives for NDE for the waste.			

Site Project Manager Signature | Irene Joo (Printed Name) | 11/02/2015 (Date)

CCP Reconciliation with Data Quality Objectives

WSPF# OR-REDC-RH-HET Rev. 0 Lot # 32

Sampling Completeness

RTR/VE:
Number of Valid Samples: 12 Number of Total Samples Analyzed: 12
Percent Complete: 100 (QAO is 100%)

Radiological:
Number of Valid Samples: 12 Number of Total Samples Analyzed: 12
Percent Complete: 100 (QAO is 100%)

	Y/N/NA	Reconciliation Parameter
1	Y	Waste Matrix Code.
2	Y	Waste Material Parameter Weights.
3	Y	The TRU activity reported in the BDRs for each container demonstrates with a 95% probability that the container of waste contains TRU radioactive waste.
4	N	AK Sufficiency. Is there an approved AK sufficiency Determination for this waste stream?
5	Y	The data demonstrates whether the waste stream exhibits a toxicity characteristic under Title 40 Code of Federal Regulations (CFR), Part 261, Identification and Listing of Hazardous Waste, Subpart C, Characteristics of Hazardous Waste.
6	Y	Does the waste stream contain listed waste found in 20.4.1.200 NMAC incorporating 40 CFR Part 261, Subpart D, Lists of Hazardous Wastes.
7	Y	Waste stream can be classified as hazardous or nonhazardous.
8	Y	The overall completeness, comparability, and representativeness QAOs were met for each of the analytical and testing procedures as specified in the WAP Sections C3-1 through C3-2 prior to submittal of a waste stream profile form for a waste steam or waste stream lot.

	Completeness	Comparability	Representativeness
Radiography	NA	NA	NA
VE	Y	Y	Y

Comments: None

Irene Joo 11/02/2015
Signature of Site Project Manager Printed Name Date

CHARACTERIZATION INFORMATION SUMMARY

WSPF# OR-REDC-RH-HET Rev. 0 (CCP-AK-ORNL-500)

Lot 33

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CCP Characterization Information Summary Cover Page

Waste Stream #: OR-REDC-RH-HET Lot #: 33

AK Expert Review: N/A Date: N/A

SPM Review: Irene Joo Date: 01/12/2016

SPM signature certifies that through Acceptable Knowledge testing and/or analysis that the waste identified in this summary is not corrosive, ignitable, reactive, or incompatible with the TSDF.

A summary of the Acceptable Knowledge regarding this waste stream containing specific information about the corrosivity, reactivity, and ignitability of the waste stream is included as an attachment to the Waste Stream Profile Form. By reference, that information is included in this lot.

List of procedures used:

Dose to Curie (DTC)

CCP-TP-504	Rev. 17	12/10/2014 CCP Dose-to-Curie Survey Procedure for Remote-Handled Transuranic Waste
CCP-TP-504	Rev. 16	08/15/2014 CCP Dose-to-Curie Survey Procedure for Remote-Handled Transuranic Waste
CCP-TP-504	Rev. 15	04/16/2014 CCP Dose-to-Curie Survey Procedure for Remote-Handled Transuranic Waste
CCP-TP-504	Rev. 14	07/09/2013 CCP Dose-to-Curie Survey Procedure for Remote-Handled Transuranic Waste
CCP-TP-504	Rev. 13	09/17/2012 CCP Dose-to-Curie Survey Procedure for Remote-Handled Transuranic Waste
CCP-TP-504	Rev. 12	03/20/2012 CCP Dose-to-Curie Survey Procedure for Remote-Handled Transuranic Waste
CCP-TP-504	Rev. 11	04/25/2011 CCP Dose-to-Curie Survey Procedure for Remote-Handled Transuranic Waste
CCP-TP-504	Rev. 10	05/13/2010 CCP Dose-to-Curie Survey Procedure for Remote-Handled Transuranic Waste

Project Level Data Validation / DQO Reconciliation:

CCP-TP-001	Rev. 21	09/06/2013 CCP Project Level Data Validation and Verification
CCP-TP-001	Rev. 20	09/27/2012 CCP Project Level Data Validation and Verification
CCP-TP-001	Rev. 19	12/29/2010 CCP Project Level Data Validation and Verification
CCP-TP-001	Rev. 18	09/09/2010 CCP Project Level Data Validation and Verification
CCP-TP-001	Rev. 17	09/24/2007 CCP Project Level Data Validation and Verification
CCP-TP-001	Rev. 16	04/28/2007 CCP Project Level Data Validation and Verification
CCP-TP-001	Rev. 15	11/22/2006 CCP Project Level Data Validation and Verification
CCP-TP-001	Rev. 14	11/16/2006 CCP Project Level Data Validation and Verification
CCP-TP-001	Rev. 13	07/21/2006 CCP Project Level Data Validation and Verification
CCP-TP-001	Rev. 12	05/25/2006 CCP Project Level Data Validation and Verification
CCP-TP-001	Rev. 11	09/23/2005 CCP Project Level Data Validation and Verification

CCP-TP-002	Rev. 26	06/18/2013 CCP Reconciliation of DQOs and Reporting Characterization Data
CCP-TP-002	Rev. 25	02/11/2013 CCP Reconciliation of DQOs and Reporting Characterization Data
CCP-TP-002	Rev. 24	12/28/2011 CCP Reconciliation of DQOs and Reporting Characterization Data
CCP-TP-002	Rev. 23	12/28/2010 CCP Reconciliation of DQOs and Reporting Characterization Data
CCP-TP-002	Rev. 22	08/30/2010 CCP Reconciliation of DQOs and Reporting Characterization Data
CCP-TP-002	Rev. 21	08/04/2009 CCP Reconciliation of DQOs and Reporting Characterization Data
CCP-TP-002	Rev. 20	08/18/2008 CCP Reconciliation of DQOs and Reporting Characterization Data
CCP-TP-002	Rev. 19	12/22/2006 CCP Reconciliation of DQOs and Reporting Characterization Data
CCP-TP-002	Rev. 18	11/16/2006 CCP Reconciliation of DQOs and Reporting Characterization Data
CCP-TP-002	Rev. 17	10/10/2006 CCP Reconciliation of DQOs and Reporting Characterization Data
CCP-TP-002	Rev. 16	06/06/2006 CCP Reconciliation of DQOs and Reporting Characterization Data
CCP-TP-002	Rev. 15	08/16/2005 CCP Reconciliation of DQOs and Reporting Characterization Data
CCP-TP-002	Rev. 14	03/29/2005 CCP Reconciliation of DQOs and Reporting Characterization Data

CCP-TP-005	Rev. 27	09/29/2015 CCP Acceptable Knowledge Documentation
CCP-TP-005	Rev. 26	08/12/2013 CCP Acceptable Knowledge Documentation
CCP-TP-005	Rev. 25	06/19/2013 CCP Acceptable Knowledge Documentation
CCP-TP-005	Rev. 24	11/29/2011 CCP Acceptable Knowledge Documentation
CCP-TP-005	Rev. 23	08/30/2011 CCP Acceptable Knowledge Documentation
CCP-TP-005	Rev. 22	04/21/2011 CCP Acceptable Knowledge Documentation
CCP-TP-005	Rev. 21	12/29/2010 CCP Acceptable Knowledge Documentation
CCP-TP-005	Rev. 20	11/01/2010 CCP Acceptable Knowledge Documentation
CCP-TP-005	Rev. 19	07/06/2010 CCP Acceptable Knowledge Documentation
CCP-TP-005	Rev. 18	11/16/2006 CCP Acceptable Knowledge Documentation
CCP-TP-005	Rev. 17	08/05/2006 CCP Acceptable Knowledge Documentation
CCP-TP-005	Rev. 16	02/27/2006 CCP Acceptable Knowledge Documentation
CCP-TP-005	Rev. 15	03/31/2005 CCP Acceptable Knowledge Documentation

CCP-TP-530	Rev. 12	03/19/2014 CCP RH TRU Waste Certification and WWIS/WDS Data Entry
CCP-TP-530	Rev. 11	06/19/2013 CCP RH TRU Waste Certification and WWIS/WDS Data Entry
CCP-TP-530	Rev. 10	04/25/2011 CCP RH TRU Waste Certification and WWIS/WDS Data Entry

CCP-TP-530	Rev. 9	12/11/2009 CCP RH TRU Waste Certification and WWIS/WDS Data Entry
CCP-TP-530	Rev. 8	09/09/2009 RH TRU Waste Certification and WWIS Data Entry
CCP-TP-530	Rev. 7	07/11/2008 RH TRU Waste Certification and WWIS Data Entry
CCP-TP-530	Rev. 6	09/25/2008 CCP RH TRU Waste Certification and WWIS/WDS Data Entry
CCP-TP-530	Rev. 5	07/23/2007 CCP RH TRU Waste Certification and WWIS/WDS Data Entry
CCP-TP-530	Rev. 4	04/20/2007 CCP RH TRU Waste Certification and WWIS/WDS Data Entry
CCP-TP-530	Rev. 3	11/16/2006 CCP RH TRU Waste Certification and WWIS/WDS Data Entry
CCP-TP-530	Rev. 2	08/15/2006 CCP RH TRU Waste Certification and WWIS/WDS Data Entry
CCP-TP-530	Rev. 1	05/05/2006 CCP RH TRU Waste Certification and WWIS/WDS Data Entry
CCP-TP-530	Rev. 0	04/25/2006 CCP RH TRU Waste Certification and WWIS/WDS Data Entry

Visual Examination (VE):

CCP-TP-500	Rev. 13	09/23/2013 CCP Remote-Handled Waste Visual Examination
CCP-TP-500	Rev. 12	07/18/2013 CCP Remote-Handled Waste Visual Examination
CCP-TP-500	Rev. 11	04/21/2011 CCP Remote-Handled Waste Visual Examination
CCP-TP-500	Rev.11	04/21/2011 CCP Remote-Handled Waste Visual Examination
CCP-TP-500	Rev. 10	12/28/2010 CCP Remote-Handled Waste Visual Examination
CCP-TP-500	Rev. 9	08/30/2010 CCP Remote-Handled Waste Visual Examination
CCP-TP-500	Rev. 8	07/24/2009 CCP Remote-Handled Waste Visual Examination
CCP-TP-500	Rev. 7	02/27/2009 CCP Remote-Handled Waste Visual Examination
CCP-TP-500	Rev. 6	10/25/2007 CCP Remote-Handled Waste Visual Examination
CCP-TP-500	Rev. 5	06/01/2007 CCP Remote-Handled Waste Visual Examination
CCP-TP-500	Rev. 4	11/16/2006 CCP Remote-Handled Waste Visual Examination
CCP-TP-500	Rev. 3	10/12/2006 CCP Remote-Handled Waste Visual Examination
CCP-TP-500	Rev. 2	08/18/2006 CCP Remote-Handled Waste Visual Examination
CCP-TP-500	Rev. 1	04/27/2006 CCP Remote-Handled Waste Visual Examination
CCP-TP-500	Rev. 0	02/16/2006 CCP Remote-Handled Waste Visual Examination

WAP Certification:

CCP-PO-001	Rev. 21	05/31/2013 CCP Transuranic Waste Characterization Quality Assurance Project Plan
CCP-PO-001	Rev. 20	08/16/2011 CCP Transuranic Waste Characterization Quality Assurance Project Plan
CCP-PO-001	Rev. 19	12/28/2010 CCP Transuranic Waste Characterization Quality Assurance Project Plan
CCP-PO-001	Rev. 18	08/30/2010 CCP Transuranic Waste Characterization Quality Assurance Project Plan
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CCP-PO-001	Rev. 16	10/31/2007 CCP Transuranic Waste Characterization Quality Assurance Project Plan
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CCP-PO-001	Rev. 13	11/16/2006 CCP Transuranic Waste Characterization Quality Assurance Project Plan
CCP-PO-001	Rev. 12	09/22/2006 CCP Transuranic Waste Characterization Quality Assurance Project Plan
CCP-PO-001	Rev. 11	03/10/2005 CCP Transuranic Waste Characterization Quality Assurance Project Plan

CCP-PO-002	Rev. 27	05/31/2013 CCP Transuranic Waste Certification Plan
CCP-PO-002	Rev. 26	07/14/2011 CCP Transuranic Waste Certification Plan
CCP-PO-002	Rev. 25	12/29/2010 CCP Transuranic Waste Certification Plan
CCP-PO-002	Rev. 24	08/30/2010 CCP Transuranic Waste Certification Plan
CCP-PO-002	Rev. 23	04/07/2010 CCP Transuranic Waste Certification Plan
CCP-PO-002	Rev. 22	01/12/2010 CCP Transuranic Waste Certification Plan
CCP-PO-002	Rev. 21	01/28/2009 CCP Transuranic Waste Certification Plan
CCP-PO-002	Rev. 20	11/02/2007 CCP Transuranic Waste Certification Plan
CCP-PO-002	Rev. 19	05/22/2007 CCP Transuranic Waste Certification Plan
CCP-PO-002	Rev. 18	11/16/2006 CCP Transuranic Waste Certification Plan
CCP-PO-002	Rev. 17	11/16/2006 CCP Transuranic Waste Certification Plan
CCP-PO-002	Rev. 16	11/16/2006 CCP Transuranic Waste Certification Plan
CCP-PO-002	Rev. 15	03/22/2006 CCP Transuranic Waste Certification Plan
CCP-PO-002	Rev. 14	12/29/2005 CCP Transuranic Waste Certification Plan
CCP-PO-002	Rev. 13	05/09/2005 CCP Transuranic Waste Certification Plan

CCP-PO-027	Rev. 5	10/02/2013 CCP/TRU Waste Processing Center/Oakridge National Laboratory Interface Document
CCP-PO-027	Rev. 4	10/01/2012 CCP/TRU Waste Processing Center/Oakridge National Laboratory Interface Document
CCP-PO-027	Rev. 3	12/28/2010 CCP/TRU Waste Processing Center/Oakridge National Laboratory Interface Document
CCP-PO-027	Rev. 2	04/22/2010 CCP/TRU Waste Processing Center/Oakridge National Laboratory Interface Document
CCP-PO-027	Rev. 1	02/17/2010 CCP/TRU Waste Processing Center/Oakridge National Laboratory Interface Document
CCP-PO-027	Rev. 0	10/02/2007 CCP/TRU Waste Processing Center/Oakridge National Laboratory Interface Document

CCP Correlation of Container Identification Numbers to Batch Data Report Numbers

Waste Stream: # OR-REDC-RH-HET

Lot # 33

Container ID Number	Radiological BDR	RTR BDR	VE BDR	FGA BDR
ORRH00722	ORRHDTC15006	N/A	ORNLRHVE15010	OR15FG11016
ORRH00723	ORRHDTC15006	N/A	ORNLRHVE15011	OR15FG11016
ORRH00725	ORRHDTC15007	N/A	ORNLRHVE15012	OR15FG11017

Signature of Site Project Manager | Irene Joo (Printed Name) | 01/12/2016 (Date)

CCP RTR/VE Summary of Prohibited Items and AK Confirmation

Waste Stream Number: OR-REDC-RH-HET Lot #: 33

Container Number	RTR Prohibited Items [a,b]	Visual Examination Prohibited Items [a,b]	Does the Physical Form of the Waste Match the Waste Stream Description as Determined by AK
See correlation of container ID numbers for list of remaining drum numbers in this Lot.	RTR was not used to certify any containers in this lot.	None of the containers in this Lot had prohibited items identified during Visual Examination technique.	The physical form of the waste matches the waste stream description as determined by AK.
a. See Batch Data Reports			
b. If AK has assigned U134 to this waste stream, then any liquids in these containers are prohibited items (not acceptable by the TSDF).			
Justification for the selection of RTR and/or VE: VE was selected as the characterization method for this lot because the containers were newly generated and met all the Data Quality Objectives for NDE for the waste.			

Site Project Manager Signature | Irene Joo Printed Name | 01/12/2016 Date

CCP Reconciliation with Data Quality Objectives

WSPF# OR-REDC-RH-HET Rev. 0 Lot # 33

Sampling Completeness

RTR/VE:
Number of Valid Samples: 3 Number of Total Samples Analyzed: 3
Percent Complete: 100 (QAO is 100%)

Radiological:
Number of Valid Samples: 3 Number of Total Samples Analyzed: 3
Percent Complete: 100 (QAO is 100%)

	Y/N/NA	Reconciliation Parameter
1	Y	Waste Matrix Code.
2	Y	Waste Material Parameter Weights.
3	Y	The TRU activity reported in the BDRs for each container demonstrates with a 95% probability that the container of waste contains TRU radioactive waste.
4	N	AK Sufficiency. Is there an approved AK sufficiency Determination for this waste stream?
5	Y	The data demonstrates whether the waste stream exhibits a toxicity characteristic under Title 40 Code of Federal Regulations (CFR), Part 261, Identification and Listing of Hazardous Waste, Subpart C, Characteristics of Hazardous Waste.
6	Y	Does the waste stream contain listed waste found in 20.4.1.200 NMAC incorporating 40 CFR Part 261, Subpart D, Lists of Hazardous Wastes.
7	Y	Waste stream can be classified as hazardous or nonhazardous.
8	Y	The overall completeness, comparability, and representativeness QAOs were met for each of the analytical and testing procedures as specified in the WAP Sections C3-1 through C3-2 prior to submittal of a waste stream profile form for a waste steam or waste stream lot.

	Completeness	Comparability	Representativeness
Radiography	NA	NA	NA
VE	Y	Y	Y

Comments: None

Irene Joo 01/12/2016
Signature of Site Project Manager Printed Name Date

DIVIDER

PAGE

NWP
Nuclear Waste Partnership LLC
An AECOM-led partnership with BWXT and AREVA

CP:16:01086
UFC:5900.00

INTER-OFFICE CORRESPONDENCE

DATE: April 14, 2016

FROM: Irene Joo LOCATION: RH Operations

TO: CCP Records Custodian LOCATION: Central Characterization Program
GSA-212

SUBJECT: TRANSMITTAL OF CHARACTERIZATION INFORMATION SUMMARY FOR REMOTE-HANDLED LOTS 34 and 35 WASTE STREAM OR-REDC-RH-HET (CCP-AK-ORNL-500)

Please accept the attached Characterization Information Summary for the Remote-Handled Oak Ridge National Laboratory Lots 34 and 35 for waste stream OR-REDC-RH-HET (CCP-AK-ORNL-500).

IJ:rg

Attachment

cc: (without attachment)
R. Kantrowitz

COPY

P.O. Box 2078 • Carlsbad, New Mexico USA 88221-2078
Phone: (575) 234-7200 • Fax: (575) 234-7083

CCP RECORDS ORIGINAL
DATE REC'D 4/14/16 SY

CHARACTERIZATION INFORMATION SUMMARY

WSPF# OR-REDC-RH-HET Rev. 0 (CCP-AK-ORNL-500)

Lot 34

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CCP Characterization Information Summary Cover Page

Waste Stream #	OR-REDC-RH-HET	Lot #:	34
AK Expert Review:	N/A	Date:	N/A
SPM Review:	Irene Joo	Date:	03/24/2016

SPM signature certifies that through Acceptable Knowledge testing and/or analysis that the waste identified in this summary is not corrosive, ignitable, reactive, or incompatible with the TSDF.

A summary of the Acceptable Knowledge regarding this waste stream containing specific information about the corrosivity, reactivity, and ignitability of the waste stream is included as an attachment to the Waste Stream Profile Form. By reference, that information is included in this lot.

List of procedures used:

Dose to Curie (DTC)

CCP-TP-504	Rev. 17	12/10/2014 CCP Dose-to-Curie Survey Procedure for Remote-Handled Transuranic Waste
CCP-TP-504	Rev. 16	08/15/2014 CCP Dose-to-Curie Survey Procedure for Remote-Handled Transuranic Waste
CCP-TP-504	Rev. 15	04/16/2014 CCP Dose-to-Curie Survey Procedure for Remote-Handled Transuranic Waste
CCP-TP-504	Rev. 14	07/09/2013 CCP Dose-to-Curie Survey Procedure for Remote-Handled Transuranic Waste
CCP-TP-504	Rev. 13	09/17/2012 CCP Dose-to-Curie Survey Procedure for Remote-Handled Transuranic Waste
CCP-TP-504	Rev. 12	03/20/2012 CCP Dose-to-Curie Survey Procedure for Remote-Handled Transuranic Waste
CCP-TP-504	Rev. 11	04/25/2011 CCP Dose-to-Curie Survey Procedure for Remote-Handled Transuranic Waste
CCP-TP-504	Rev. 10	05/13/2010 CCP Dose-to-Curie Survey Procedure for Remote-Handled Transuranic Waste

Project Level Data Validation / DQO Reconciliation:

CCP-TP-001	Rev. 21	06/06/2013 CCP Project Level Data Validation and Verification
CCP-TP-001	Rev. 20	09/27/2012 CCP Project Level Data Validation and Verification
CCP-TP-001	Rev. 19	12/29/2010 CCP Project Level Data Validation and Verification
CCP-TP-001	Rev. 18	08/09/2010 CCP Project Level Data Validation and Verification
CCP-TP-001	Rev. 17	09/24/2007 CCP Project Level Data Validation and Verification
CCP-TP-001	Rev. 16	04/26/2007 CCP Project Level Data Validation and Verification
CCP-TP-001	Rev. 15	11/22/2006 CCP Project Level Data Validation and Verification
CCP-TP-001	Rev. 14	11/16/2006 CCP Project Level Data Validation and Verification
CCP-TP-001	Rev. 13	07/21/2006 CCP Project Level Data Validation and Verification
CCP-TP-001	Rev. 12	06/25/2006 CCP Project Level Data Validation and Verification
CCP-TP-001	Rev. 11	03/23/2005 CCP Project Level Data Validation and Verification

CCP-TP-002	Rev. 26	06/19/2013 CCP Reconciliation of DQOs and Reporting Characterization Data
CCP-TP-002	Rev. 25	02/11/2013 CCP Reconciliation of DQOs and Reporting Characterization Data
CCP-TP-002	Rev. 24	12/28/2011 CCP Reconciliation of DQOs and Reporting Characterization Data
CCP-TP-002	Rev. 23	12/29/2010 CCP Reconciliation of DQOs and Reporting Characterization Data
CCP-TP-002	Rev. 22	06/30/2010 CCP Reconciliation of DQOs and Reporting Characterization Data
CCP-TP-002	Rev. 21	08/04/2009 CCP Reconciliation of DQOs and Reporting Characterization Data
CCP-TP-002	Rev. 20	08/18/2008 CCP Reconciliation of DQOs and Reporting Characterization Data
CCP-TP-002	Rev. 19	12/22/2006 CCP Reconciliation of DQOs and Reporting Characterization Data
CCP-TP-002	Rev. 18	11/16/2006 CCP Reconciliation of DQOs and Reporting Characterization Data
CCP-TP-002	Rev. 17	10/10/2006 CCP Reconciliation of DQOs and Reporting Characterization Data
CCP-TP-002	Rev. 16	06/06/2006 CCP Reconciliation of DQOs and Reporting Characterization Data
CCP-TP-002	Rev. 15	08/16/2005 CCP Reconciliation of DQOs and Reporting Characterization Data
CCP-TP-002	Rev. 14	03/29/2005 CCP Reconciliation of DQOs and Reporting Characterization Data

CCP-TP-005	Rev. 28	02/29/2016 CCP Acceptable Knowledge Documentation
CCP-TP-005	Rev. 27	08/26/2015 CCP Acceptable Knowledge Documentation
CCP-TP-005	Rev. 26	08/12/2013 CCP Acceptable Knowledge Documentation
CCP-TP-005	Rev. 25	08/19/2013 CCP Acceptable Knowledge Documentation
CCP-TP-005	Rev. 24	11/28/2011 CCP Acceptable Knowledge Documentation
CCP-TP-005	Rev. 23	06/30/2011 CCP Acceptable Knowledge Documentation
CCP-TP-005	Rev. 22	04/21/2011 CCP Acceptable Knowledge Documentation
CCP-TP-005	Rev. 21	12/29/2010 CCP Acceptable Knowledge Documentation
CCP-TP-005	Rev. 20	11/01/2010 CCP Acceptable Knowledge Documentation
CCP-TP-005	Rev. 19	07/06/2010 CCP Acceptable Knowledge Documentation
CCP-TP-005	Rev. 18	11/16/2006 CCP Acceptable Knowledge Documentation
CCP-TP-005	Rev. 17	08/05/2006 CCP Acceptable Knowledge Documentation
CCP-TP-005	Rev. 16	02/27/2006 CCP Acceptable Knowledge Documentation
CCP-TP-005	Rev. 15	03/31/2005 CCP Acceptable Knowledge Documentation

CCP-TP-530	Rev. 12	03/19/2014 CCP RH TRU Waste Certification and WWIS/WDS Data Entry
CCP-TP-530	Rev. 11	08/19/2013 CCP RH TRU Waste Certification and WWIS/WDS Data Entry

CCP-TP-530	Rev. 10	04/25/2011 CCP RH TRU Waste Certification and WWIS/WDS Data Entry
CCP-TP-530	Rev. 9	12/11/2009 CCP RH TRU Waste Certification and WWIS/WDS Data Entry
CCP-TP-530	Rev. 8	09/09/2009 RH TRU Waste Certification and WWIS Data Entry
CCP-TP-530	Rev. 7	07/11/2008 RH TRU Waste Certification and WWIS Data Entry
CCP-TP-530	Rev. 6	06/25/2008 CCP RH TRU Waste Certification and WWIS/WDS Data Entry
CCP-TP-530	Rev. 5	07/23/2007 CCP RH TRU Waste Certification and WWIS/WDS Data Entry
CCP-TP-530	Rev. 4	04/20/2007 CCP RH TRU Waste Certification and WWIS/WDS Data Entry
CCP-TP-530	Rev. 3	11/16/2006 CCP RH TRU Waste Certification and WWIS/WDS Data Entry
CCP-TP-530	Rev. 2	06/15/2006 CCP RH TRU Waste Certification and WWIS/WDS Data Entry
CCP-TP-530	Rev. 1	05/05/2006 CCP RH TRU Waste Certification and WWIS/WDS Data Entry
CCP-TP-530	Rev. 0	04/25/2006 CCP RH TRU Waste Certification and WWIS/WDS Data Entry

Visual Examination (VE):

CCP-TP-500	Rev. 13	09/23/2013 CCP Remote-Handled Waste Visual Examination
CCP-TP-500	Rev. 12	07/18/2013 CCP Remote-Handled Waste Visual Examination
CCP-TP-500	Rev. 11	04/21/2011 CCP Remote-Handled Waste Visual Examination
CCP-TP-500	Rev.11	04/21/2011 CCP Remote-Handled Waste Visual Examination
CCP-TP-500	Rev. 10	12/29/2010 CCP Remote-Handled Waste Visual Examination
CCP-TP-500	Rev. 9	08/30/2010 CCP Remote-Handled Waste Visual Examination
CCP-TP-500	Rev. 8	07/24/2008 CCP Remote-Handled Waste Visual Examination
CCP-TP-500	Rev. 7	02/27/2008 CCP Remote-Handled Waste Visual Examination
CCP-TP-500	Rev. 6	10/25/2007 CCP Remote-Handled Waste Visual Examination
CCP-TP-500	Rev. 5	06/01/2007 CCP Remote-Handled Waste Visual Examination
CCP-TP-500	Rev. 4	11/16/2006 CCP Remote-Handled Waste Visual Examination
CCP-TP-500	Rev. 3	10/12/2006 CCP Remote-Handled Waste Visual Examination
CCP-TP-500	Rev. 2	06/19/2006 CCP Remote-Handled Waste Visual Examination
CCP-TP-500	Rev. 1	04/27/2006 CCP Remote-Handled Waste Visual Examination
CCP-TP-500	Rev. 0	02/15/2006 CCP Remote-Handled Waste Visual Examination

WAP Certification:

CCP-PO-001	Rev. 22	01/13/2016 CCP Transuranic Waste Characterization Quality Assurance Project Plan
CCP-PO-001	Rev. 21	05/31/2013 CCP Transuranic Waste Characterization Quality Assurance Project Plan
CCP-PO-001	Rev. 20	06/16/2011 CCP Transuranic Waste Characterization Quality Assurance Project Plan
CCP-PO-001	Rev. 19	12/29/2010 CCP Transuranic Waste Characterization Quality Assurance Project Plan
CCP-PO-001	Rev. 18	08/30/2010 CCP Transuranic Waste Characterization Quality Assurance Project Plan
CCP-PO-001	Rev. 17	06/23/2009 CCP Transuranic Waste Characterization Quality Assurance Project Plan
CCP-PO-001	Rev. 16	10/31/2007 CCP Transuranic Waste Characterization Quality Assurance Project Plan
CCP-PO-001	Rev. 15	08/10/2007 CCP Transuranic Waste Characterization Quality Assurance Project Plan
CCP-PO-001	Rev. 14	03/28/2007 CCP Transuranic Waste Characterization Quality Assurance Project Plan
CCP-PO-001	Rev. 13	11/16/2006 CCP Transuranic Waste Characterization Quality Assurance Project Plan
CCP-PO-001	Rev. 12	03/22/2006 CCP Transuranic Waste Characterization Quality Assurance Project Plan
CCP-PO-001	Rev. 11	03/10/2005 CCP Transuranic Waste Characterization Quality Assurance Project Plan

CCP-PO-002	Rev. 27	05/31/2013 CCP Transuranic Waste Certification Plan
CCP-PO-002	Rev. 26	07/14/2011 CCP Transuranic Waste Certification Plan
CCP-PO-002	Rev. 25	12/29/2010 CCP Transuranic Waste Certification Plan
CCP-PO-002	Rev. 24	08/30/2010 CCP Transuranic Waste Certification Plan
CCP-PO-002	Rev. 23	04/07/2010 CCP Transuranic Waste Certification Plan
CCP-PO-002	Rev. 22	01/12/2010 CCP Transuranic Waste Certification Plan
CCP-PO-002	Rev. 21	01/26/2009 CCP Transuranic Waste Certification Plan
CCP-PO-002	Rev. 20	11/02/2007 CCP Transuranic Waste Certification Plan
CCP-PO-002	Rev. 19	05/22/2007 CCP Transuranic Waste Certification Plan
CCP-PO-002	Rev. 18	11/16/2006 CCP Transuranic Waste Certification Plan
CCP-PO-002	Rev. 17	11/16/2006 CCP Transuranic Waste Certification Plan
CCP-PO-002	Rev. 16	11/16/2006 CCP Transuranic Waste Certification Plan
CCP-PO-002	Rev. 15	03/22/2006 CCP Transuranic Waste Certification Plan
CCP-PO-002	Rev. 14	12/29/2005 CCP Transuranic Waste Certification Plan
CCP-PO-002	Rev. 13	05/09/2005 CCP Transuranic Waste Certification Plan

CCP-PO-027	Rev. 5	10/02/2013 CCP/TRU Waste Processing Center/Oakridge National Laboratory Interface Document
CCP-PO-027	Rev. 4	10/01/2012 CCP/TRU Waste Processing Center/Oakridge National Laboratory Interface Document
CCP-PO-027	Rev. 3	12/29/2010 CCP/TRU Waste Processing Center/Oakridge National Laboratory Interface Document
CCP-PO-027	Rev. 2	04/22/2010 CCP/TRU Waste Processing Center/Oakridge National Laboratory Interface Document
CCP-PO-027	Rev. 1	02/17/2010 CCP/TRU Waste Processing Center/Oakridge National Laboratory Interface Document
CCP-PO-027	Rev. 0	10/02/2007 CCP/TRU Waste Processing Center/Oakridge National Laboratory Interface Document

CCP Correlation of Container Identification Numbers to Batch Data Report Numbers

Waste Stream: # OR-REDC-RH-HET

Lot # 34

Container ID Number	Radiological BDR	RTR BDR	VE BDR	FGA BDR
ORRH00730	ORRHDTC16002	N/A	ORNLRHVE15014	OR16FG8009
ORRH00731	ORRHDTC16002	N/A	ORNLRHVE15015	OR16FG8009
ORRH00732	ORRHDTC16002	N/A	ORNLRHVE15016	OR16FG8009
ORRH00734	ORRHDTC16002	N/A	ORNLRHVE16001	OR16FG8011
ORRH00735	ORRHDTC16002	N/A	ORNLRHVE16002	OR16FG8011
ORRH00736	ORRHDTC16003	N/A	ORNLRHVE16003	OR16FG8023
ORRH00737	ORRHDTC16003	N/A	ORNLRHVE16003	OR16FG8023
ORRH00738	ORRHDTC16003	N/A	ORNLRHVE16004	OR16FG8023
ORRH00739	ORRHDTC16003	N/A	ORNLRHVE16004	OR16FG8023

Irene Joo — Signature of Site Project Manager

Irene Joo — Printed Name

03/24/2016 — Date

CCP RTR/VE Summary of Prohibited Items and AK Confirmation

Waste Stream Number: OR-REDC-RH-HET Lot #: 34

Container Number	RTR Prohibited Items [a,b]	Visual Examination Prohibited Items [a,b]	Does the Physical Form of the Waste Match the Waste Stream Description as Determined by AK
See correlation of container ID numbers for list of remaining drum numbers in this Lot.	RTR was not used to certify any containers in this lot.	None of the containers in this Lot had prohibited items identified during Visual Examination technique.	The physical form of the waste matches the waste stream description as determined by AK.

a. See Batch Data Reports

b. If AK has assigned U134 to this waste stream, then any liquids in these containers are prohibited items (not acceptable by the TSDF).

Justification for the selection of RTR and/or VE: VE was selected as the characterization method for this lot because the containers were newly generated and met all the Data Quality Objectives for NDE for the waste.

Irene Joo — Site Project Manager Signature
Irene Joo — Printed Name
03/24/2016 — Date

CCP Reconciliation with Data Quality Objectives

WSPF# OR-REDC-RH-HET Rev. 0 Lot # 34

Sampling Completeness

RTR/VE:

Number of Valid Samples: 9 Number of Total Samples Analyzed: 9

Percent Complete: 100 (QAO is 100%)

Radiological:

Number of Valid Samples: 9 Number of Total Samples Analyzed: 9

Percent Complete: 100 (QAO is 100%)

	Y/N/NA	Reconciliation Parameter
1	Y	Waste Matrix Code.
2	Y	Waste Material Parameter Weights.
3	Y	The TRU activity reported in the BDRs for each container demonstrates with a 95% probability that the container of waste contains TRU radioactive waste.
4	N	AK Sufficiency. Is there an approved AK sufficiency Determination for this waste stream?
5	Y	The data demonstrates whether the waste stream exhibits a toxicity characteristic under Title 40 Code of Federal Regulations (CFR), Part 261, Identification and Listing of Hazardous Waste, Subpart C, Characteristics of Hazardous Waste.
6	Y	Does the waste stream contain listed waste found in 20.4.1.200 NMAC incorporating 40 CFR Part 261, Subpart D, Lists of Hazardous Wastes.
7	Y	Waste stream can be classified as hazardous or nonhazardous.
8	Y	The overall completeness, comparability, and representativeness QAOs were met for each of the analytical and testing procedures as specified in the WAP Sections C3-1 through C3-2 prior to submittal of a waste stream profile form for a waste steam or waste stream lot.

	Completeness	Comparability	Representativeness
Radiography	NA	NA	NA
VE	Y	Y	Y

Comments: None

Irene Joo 03/24/2016

Signature of Site Project Manager Printed Name Date

CHARACTERIZATION INFORMATION SUMMARY

WSPF# OR-REDC-RH-HET Rev. 0 (CCP-AK-ORNL-500)

Lot 35

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RTR/VE Summary of Prohibited Items and AK Confirmation..... 5

Reconciliation with Data Quality Objectives..... 6

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CCP Characterization Information Summary Cover Page

Waste Stream # OR-REDC-RH-HET Lot #: 35

AK Expert Review: N/A Date: N/A

SPM Review: Irene Joo Date: 09/30/2016

SPM signature certifies that through Acceptable Knowledge testing and/or analysis that the waste identified in this summary is not corrosive, ignitable, reactive, or incompatible with the TSDF.

A summary of the Acceptable Knowledge regarding this waste stream containing specific information about the corrosivity, reactivity, and ignitability of the waste stream is included as an attachment to the Waste Stream Profile Form. By reference, that information is included in this lot.

List of procedures used:

Dose to Curie (DTC)

CCP-TP-504	Rev. 17	12/10/2014 CCP Dose-to-Curie Survey Procedure for Remote-Handled Transuranic Waste
CCP-TP-504	Rev. 16	08/15/2014 CCP Dose-to-Curie Survey Procedure for Remote-Handled Transuranic Waste
CCP-TP-504	Rev. 15	04/16/2014 CCP Dose-to-Curie Survey Procedure for Remote-Handled Transuranic Waste
CCP-TP-504	Rev. 14	07/09/2013 CCP Dose-to-Curie Survey Procedure for Remote-Handled Transuranic Waste
CCP-TP-504	Rev. 13	09/17/2012 CCP Dose-to-Curie Survey Procedure for Remote-Handled Transuranic Waste
CCP-TP-504	Rev. 12	03/20/2012 CCP Dose-to-Curie Survey Procedure for Remote-Handled Transuranic Waste
CCP-TP-504	Rev. 11	04/25/2011 CCP Dose-to-Curie Survey Procedure for Remote-Handled Transuranic Waste
CCP-TP-504	Rev. 10	05/13/2010 CCP Dose-to-Curie Survey Procedure for Remote-Handled Transuranic Waste

Project Level Data Validation / DQO Reconciliation:

CCP-TP-001	Rev. 21	06/06/2013 CCP Project Level Data Validation and Verification
CCP-TP-001	Rev. 20	09/27/2012 CCP Project Level Data Validation and Verification
CCP-TP-001	Rev. 19	12/29/2010 CCP Project Level Data Validation and Verification
CCP-TP-001	Rev. 18	08/09/2010 CCP Project Level Data Validation and Verification
CCP-TP-001	Rev. 17	09/24/2007 CCP Project Level Data Validation and Verification
CCP-TP-001	Rev. 16	04/26/2007 CCP Project Level Data Validation and Verification
CCP-TP-001	Rev. 15	11/22/2006 CCP Project Level Data Validation and Verification
CCP-TP-001	Rev. 14	11/16/2006 CCP Project Level Data Validation and Verification
CCP-TP-001	Rev. 13	07/21/2006 CCP Project Level Data Validation and Verification
CCP-TP-001	Rev. 12	05/25/2006 CCP Project Level Data Validation and Verification
CCP-TP-001	Rev. 11	03/23/2005 CCP Project Level Data Validation and Verification

CCP-TP-002	Rev. 26	06/19/2013 CCP Reconciliation of DQOs and Reporting Characterization Data
CCP-TP-002	Rev. 25	02/11/2013 CCP Reconciliation of DQOs and Reporting Characterization Data
CCP-TP-002	Rev. 24	12/28/2011 CCP Reconciliation of DQOs and Reporting Characterization Data
CCP-TP-002	Rev. 23	12/29/2010 CCP Reconciliation of DQOs and Reporting Characterization Data
CCP-TP-002	Rev. 22	06/30/2010 CCP Reconciliation of DQOs and Reporting Characterization Data
CCP-TP-002	Rev. 21	08/04/2009 CCP Reconciliation of DQOs and Reporting Characterization Data
CCP-TP-002	Rev. 20	09/18/2008 CCP Reconciliation of DQOs and Reporting Characterization Data
CCP-TP-002	Rev. 19	12/22/2006 CCP Reconciliation of DQOs and Reporting Characterization Data
CCP-TP-002	Rev. 18	11/16/2006 CCP Reconciliation of DQOs and Reporting Characterization Data
CCP-TP-002	Rev. 17	10/10/2006 CCP Reconciliation of DQOs and Reporting Characterization Data
CCP-TP-002	Rev. 16	09/06/2006 CCP Reconciliation of DQOs and Reporting Characterization Data
CCP-TP-002	Rev. 15	08/16/2005 CCP Reconciliation of DQOs and Reporting Characterization Data
CCP-TP-002	Rev. 14	03/29/2005 CCP Reconciliation of DQOs and Reporting Characterization Data

CCP-TP-005	Rev. 28	02/29/2016 CCP Acceptable Knowledge Documentation
CCP-TP-005	Rev. 27	08/28/2015 CCP Acceptable Knowledge Documentation
CCP-TP-005	Rev. 26	08/12/2013 CCP Acceptable Knowledge Documentation
CCP-TP-005	Rev. 25	06/19/2013 CCP Acceptable Knowledge Documentation
CCP-TP-005	Rev. 24	11/28/2011 CCP Acceptable Knowledge Documentation
CCP-TP-005	Rev. 23	08/30/2011 CCP Acceptable Knowledge Documentation
CCP-TP-005	Rev. 22	04/21/2011 CCP Acceptable Knowledge Documentation
CCP-TP-005	Rev. 21	12/29/2010 CCP Acceptable Knowledge Documentation
CCP-TP-005	Rev. 20	11/01/2010 CCP Acceptable Knowledge Documentation
CCP-TP-005	Rev. 19	07/08/2010 CCP Acceptable Knowledge Documentation
CCP-TP-005	Rev. 18	11/16/2006 CCP Acceptable Knowledge Documentation
CCP-TP-005	Rev. 17	08/05/2006 CCP Acceptable Knowledge Documentation
CCP-TP-005	Rev. 16	02/27/2006 CCP Acceptable Knowledge Documentation
CCP-TP-005	Rev. 15	03/31/2005 CCP Acceptable Knowledge Documentation

CCP-TP-530	Rev. 12	03/19/2014 CCP RH TRU Waste Certification and WWIS/WDS Data Entry
CCP-TP-530	Rev. 11	05/19/2013 CCP RH TRU Waste Certification and WWIS/WDS Data Entry

CCP-TP-530	Rev. 10	04/25/2011 CCP RH TRU Waste Certification and WWIS/WDS Data Entry
CCP-TP-530	Rev. 9	12/11/2009 CCP RH TRU Waste Certification and WWIS/WDS Data Entry
CCP-TP-530	Rev. 8	09/09/2009 RH TRU Waste Certification and WWIS Data Entry
CCP-TP-530	Rev. 7	07/11/2008 RH TRU Waste Certification and WWIS Data Entry
CCP-TP-530	Rev. 6	06/25/2008 CCP RH TRU Waste Certification and WWIS/WDS Data Entry
CCP-TP-530	Rev. 5	07/23/2007 CCP RH TRU Waste Certification and WWIS/WDS Data Entry
CCP-TP-530	Rev. 4	04/20/2007 CCP RH TRU Waste Certification and WWIS/WDS Data Entry
CCP-TP-530	Rev. 3	11/16/2006 CCP RH TRU Waste Certification and WWIS/WDS Data Entry
CCP-TP-530	Rev. 2	08/15/2006 CCP RH TRU Waste Certification and WWIS/WDS Data Entry
CCP-TP-530	Rev. 1	05/05/2006 CCP RH TRU Waste Certification and WWIS/WDS Data Entry
CCP-TP-530	Rev. 0	04/25/2006 CCP RH TRU Waste Certification and WWIS/WDS Data Entry

Visual Examination (VE):

CCP-TP-500	Rev. 13	09/23/2013 CCP Remote-Handled Waste Visual Examination
CCP-TP-500	Rev. 12	07/18/2013 CCP Remote-Handled Waste Visual Examination
CCP-TP-500	Rev. 11	04/21/2011 CCP Remote-Handled Waste Visual Examination
CCP-TP-500	Rev.11	04/21/2011 CCP Remote-Handled Waste Visual Examination
CCP-TP-500	Rev. 10	12/29/2010 CCP Remote-Handled Waste Visual Examination
CCP-TP-500	Rev. 9	09/30/2010 CCP Remote-Handled Waste Visual Examination
CCP-TP-500	Rev. 8	07/24/2008 CCP Remote-Handled Waste Visual Examination
CCP-TP-500	Rev. 7	02/27/2008 CCP Remote-Handled Waste Visual Examination
CCP-TP-500	Rev. 6	10/25/2007 CCP Remote-Handled Waste Visual Examination
CCP-TP-500	Rev. 5	06/01/2007 CCP Remote-Handled Waste Visual Examination
CCP-TP-500	Rev. 4	11/16/2006 CCP Remote-Handled Waste Visual Examination
CCP-TP-500	Rev. 3	10/12/2006 CCP Remote-Handled Waste Visual Examination
CCP-TP-500	Rev. 2	08/18/2006 CCP Remote-Handled Waste Visual Examination
CCP-TP-500	Rev. 1	04/27/2006 CCP Remote-Handled Waste Visual Examination
CCP-TP-500	Rev. 0	02/15/2006 CCP Remote-Handled Waste Visual Examination

WAP Certification:

CCP-PO-001	Rev. 22	01/13/2016 CCP Transuranic Waste Characterization Quality Assurance Project Plan
CCP-PO-001	Rev. 21	05/31/2013 CCP Transuranic Waste Characterization Quality Assurance Project Plan
CCP-PO-001	Rev. 20	08/10/2011 CCP Transuranic Waste Characterization Quality Assurance Project Plan
CCP-PO-001	Rev. 19	12/29/2010 CCP Transuranic Waste Characterization Quality Assurance Project Plan
CCP-PO-001	Rev. 18	08/30/2010 CCP Transuranic Waste Characterization Quality Assurance Project Plan
CCP-PO-001	Rev. 17	08/23/2009 CCP Transuranic Waste Characterization Quality Assurance Project Plan
CCP-PO-001	Rev. 16	10/31/2007 CCP Transuranic Waste Characterization Quality Assurance Project Plan
CCP-PO-001	Rev. 15	08/10/2007 CCP Transuranic Waste Characterization Quality Assurance Project Plan
CCP-PO-001	Rev. 14	03/28/2007 CCP Transuranic Waste Characterization Quality Assurance Project Plan
CCP-PO-001	Rev. 13	11/16/2006 CCP Transuranic Waste Characterization Quality Assurance Project Plan
CCP-PO-001	Rev. 12	03/22/2006 CCP Transuranic Waste Characterization Quality Assurance Project Plan
CCP-PO-001	Rev. 11	03/10/2005 CCP Transuranic Waste Characterization Quality Assurance Project Plan

CCP-PO-002	Rev. 27	05/31/2013 CCP Transuranic Waste Certification Plan
CCP-PO-002	Rev. 26	07/14/2011 CCP Transuranic Waste Certification Plan
CCP-PO-002	Rev. 25	12/29/2010 CCP Transuranic Waste Certification Plan
CCP-PO-002	Rev. 24	06/30/2010 CCP Transuranic Waste Certification Plan
CCP-PO-002	Rev. 23	04/07/2010 CCP Transuranic Waste Certification Plan
CCP-PO-002	Rev. 22	01/12/2010 CCP Transuranic Waste Certification Plan
CCP-PO-002	Rev. 21	01/26/2009 CCP Transuranic Waste Certification Plan
CCP-PO-002	Rev. 20	11/02/2007 CCP Transuranic Waste Certification Plan
CCP-PO-002	Rev. 19	05/22/2007 CCP Transuranic Waste Certification Plan
CCP-PO-002	Rev. 18	11/16/2006 CCP Transuranic Waste Certification Plan
CCP-PO-002	Rev. 17	11/16/2006 CCP Transuranic Waste Certification Plan
CCP-PO-002	Rev. 16	11/16/2006 CCP Transuranic Waste Certification Plan
CCP-PO-002	Rev. 15	03/22/2006 CCP Transuranic Waste Certification Plan
CCP-PO-002	Rev. 14	12/29/2005 CCP Transuranic Waste Certification Plan
CCP-PO-002	Rev. 13	05/09/2005 CCP Transuranic Waste Certification Plan

CCP-PO-027	Rev. 5	10/02/2013 CCP/TRU Waste Processing Center/Oakridge National Laboratory Interface Document
CCP-PO-027	Rev. 4	10/01/2012 CCP/TRU Waste Processing Center/Oakridge National Laboratory Interface Document
CCP-PO-027	Rev. 3	12/29/2010 CCP/TRU Waste Processing Center/Oakridge National Laboratory Interface Document
CCP-PO-027	Rev. 2	04/22/2010 CCP/TRU Waste Processing Center/Oakridge National Laboratory Interface Document
CCP-PO-027	Rev. 1	02/17/2010 CCP/TRU Waste Processing Center/Oakridge National Laboratory Interface Document
CCP-PO-027	Rev. 0	10/02/2007 CCP/TRU Waste Processing Center/Oakridge National Laboratory Interface Document

CCP Correlation of Container Identification Numbers to Batch Data Report Numbers

Waste Stream: # OR-REDC-RH-HET Lot # 35

Container ID Number	Radiological BDR	RTR BDR	VE BDR	FGA BDR
ORRH00740	ORRHDTC16004	N/A	ORNLRHVE16005	OR16FG11002
ORRH00741	ORRHDTC16004	N/A	ORNLRHVE16006	OR16FG11002
ORRH00742	ORRHDTC16004	N/A	ORNLRHVE16006	OR16FG11002
ORRH00743	ORRHDTC16004	N/A	ORNLRHVE16007	OR16FG11002
ORRH00744	ORRHDTC16004	N/A	ORNLRHVE16007	OR16FG11002
ORRH00745	ORRHDTC16004	N/A	ORNLRHVE16008	OR16FG11002
ORRH00746	ORRHDTC16004	N/A	ORNLRHVE16009	OR16FG11002
ORRH00747	ORRHDTC16004	N/A	ORNLRHVE16010	OR16FG11002
ORRH00748	ORRHDTC16004	N/A	ORNLRHVE16010	OR16FG11003

Signature of Site Project Manager | Irene Joo (Printed Name) | 03/30/2016 (Date)

CCP RTR/VE Summary of Prohibited Items and AK Confirmation

Waste Stream Number: OR-REDC-RH-HET Lot #: 35

Container Number	RTR Prohibited Items [a,b]	Visual Examination Prohibited Items [a,b]	Does the Physical Form of the Waste Match the Waste Stream Description as Determined by AK
See correlation of container ID numbers for list of remaining drum numbers in this Lot.	RTR was not used to certify any containers in this lot.	None of the containers in this Lot had prohibited items identified during Visual Examination technique.	The physical form of the waste matches the waste stream description as determined by AK.
a. See Batch Data Reports			
b. If AK has assigned U134 to this waste stream, then any liquids in these containers are prohibited items (not acceptable by the TSDF).			
Justification for the selection of RTR and/or VE: VE was selected as the characterization method for this lot because the containers were newly generated and met all the Data Quality Objectives for NDE for the waste.			

Site Project Manager Signature | Irene Joo Printed Name | 03/30/2016 Date

CCP Reconciliation with Data Quality Objectives

WSPF# OR-REDC-RH-HET Rev. 0 Lot # 35

Sampling Completeness

RTR/VE:

Number of Valid Samples: 9 Number of Total Samples Analyzed: 9

Percent Complete: 100 (QAO is 100%)

Radiological:

Number of Valid Samples: 9 Number of Total Samples Analyzed: 9

Percent Complete: 100 (QAO is 100%)

	Y/N/NA	Reconciliation Parameter
1	Y	Waste Matrix Code.
2	Y	Waste Material Parameter Weights.
3	Y	The TRU activity reported in the BDRs for each container demonstrates with a 95% probability that the container of waste contains TRU radioactive waste.
4	N	AK Sufficiency. Is there an approved AK sufficiency Determination for this waste stream?
5	Y	The data demonstrates whether the waste stream exhibits a toxicity characteristic under Title 40 Code of Federal Regulations (CFR), Part 261, Identification and Listing of Hazardous Waste, Subpart C, Characteristics of Hazardous Waste.
6	Y	Does the waste stream contain listed waste found in 20.4.1.200 NMAC incorporating 40 CFR Part 261, Subpart D, Lists of Hazardous Wastes.
7	Y	Waste stream can be classified as hazardous or nonhazardous.
8	Y	The overall completeness, comparability, and representativeness QAOs were met for each of the analytical and testing procedures as specified in the WAP Sections C3-1 through C3-2 prior to submittal of a waste stream profile form for a waste steam or waste stream lot.

	Completeness	Comparability	Representativeness
Radiography	NA	NA	NA
VE	Y	Y	Y

Comments: None

Irene Joo — Signature of Site Project Manager

Irene Joo — Printed Name

03/30/2016 — Date

Attachment 3 - Acceptable Knowledge Source Document Summary

Site(s): Oak Ridge National Laboratory	Source Document Tracking Number: DR027
Waste Stream Number(s): ORNL Non-specific Library Files (Applicable only when site library is not in use)	
Acceptable Knowledge Documentation Type: ☐ TRU Waste Management Program Information ☑ Waste Stream-Specific Information ☐ Additional Information	Category: ☐ Correspondence ☑ Discrepancy Resolution ☐ Internal Procedure ☐ Miscellaneous ☐ Published Document or Internal Procedure ☐ Unpublished Documents
Title or Description of Source Document [a]: Discrepancy Resolution, Re: AK Re-Evaluation for Two Most Prevalent Radionuclides	
Source Document Reference Information (author(s), document and revision number, date, publisher): Jeff Harrison, DR027, NA, 07/22/2010, CCP	

AK # [b]	Source Doc. Page # [c]	AK Information Summary
WS1, WS2, WS11	Throughout	Nature of Discrepancy: CCP-AK-ORNL-005, Table 5-5 identifies Cm-244 and Sr-90 as the two most prevalent nuclides, by activity, at 56.04% and 11.92%, respectively. The CCP Waste Stream Characterization Checklist Through Lot 17 (375 drums) shows that CCP assay has identified Cm-244 and Pu-241 as the two most prevalent nuclides, by activity, at 74.98% and 17.39%, respectively. Sr-90 is the third most prevalent by activity at 1.89%. Resolution: Based on a 6-21-2010 query of the P-TS database, 482 drums have been rejected by NDA and given back to the host site. This is a reject rate of 56% (482 / (482 + 375). About 700 more drums in the waste stream have not been assayed and included in a lot. Assuming a reject rate of 56%, it will be assumed for the purposes of the discrepancy resolution that nearly 400 of these 700 drums will be rejected by NDA leaving about 300 drums that will be shippable. In other words, over 50% of the drums in the waste stream expected to be shippable have been through NDA. The total Sr-90 activity reported for the 375 drums in Lots 1 through 17 is 5.51 Ci with an average of 0.0147 Ci per drum. The total Pu-241 activity reported for the 375 drums in Lots 1 through 17 is 50.7 Ci with an average of 0.135 Ci per drum. Therefore, the average Pu-241 is 9 times greater than the average Sr-90. It will be almost impossible for the total Sr-90 activity to catch up with the total Pu-241 activity even if Pu-241 is not reported in any more drums going forward. Pu-241 being the second most prevalent nuclide by activity is the result of a combination of less Sr-90 in CCP assay than in AK, and more Pu-241 in CCP assay than in AK. This is the case for both PDL and non-PDL waste. Even though there is 263 times more Sr-90 activity per drum in AK than in CCP assay for PDL waste, there are only 13 PDL drums in AK that reported Sr-90 so this has little effect. It's difficult to tell why there is more Sr-90 activity per drum in AK than in CCP assay for the non-PDL waste. It may be because ORNL developed a default distribution that included many nuclides including Sr-90 and then scaled all of these nuclides based on a dose rate measurement. Whereas CCP developed a scaling factor for calculating Sr-90 based on measured Cs-137 using swipe sample data for these two nuclides. Much of the dose rate is probably from CS-137, but there are other nuclides that contribute to the dose rate. This may have resulted in an inflated Sr-90 result in AK.

COPY

CCP RECORDS ORIGINAL
DATE REC'D 2/16/16

Attachment 3 - Acceptable Knowledge Source Document Summary (continued)

Site(s): Oak Ridge National Laboratory		Source Document Tracking Number: DR027
AK # [b]	Source Doc. Page # [c]	AK Information Summary
		The Pu-241 is a little more clear. CCP assay has reported 35.9 Ci of Pu-241 in 45 of the 57 PDL drums assayed through lot 17. AK only reported Pu-241 in 12 of the 410 PDL drums in the waste stream. Pu-239 was also reported by AK in these 12 drums, but Pu-239 was also reported in another 32 PDL drums. It was typical for the generator to report a dominant nuclide like PU-239, and not report other nuclides present in smaller amounts. A default fuel grade Pu distribution was developed for PDL drums where Pu-239 was the dominant nuclide, by mass, not activity (see NDA Memo). Pu-241 is a small contributor by mass but a large contributor by activity. Whether CCP assay was able to get measured Pu isotopics or had to use the default distribution to scale other Pu isotopes, including PU-241, this would have resulted in much more Pu-241 being reported by CCP assay. This appears to be the reason why Pu-241 is the second most prevalent nuclide in waste stream OR-REDC-CH-HET. Pages 5 – 24 are the CCP Assay Data for OR-REDC-CH-HET Lots 1 – 17.

Source Document Data Limitations (if any):

1. None.

Acceptable Knowlege Expert:

Travis Smith / Travis Smith Date: 02/15/2016

Print /Sign

[a] Provide description for non-titled information (i.e., container paperwork, MSDS sheets, etc)
[b] Obtain from Acceptable Knowledge Documentation Checklist
[c] For microfilm or microfiche, identify box, tape, reel number and location.

DIVIDER PAGE ONLY

Not part of page count

Attachment 11 - Acceptable Knowledge Source Document Discrepancy Resolution – OR-REDC-CH-HET Radionuclide Re-evaluation

Waste Stream Number(s): OR-REDC-CH-HET

Waste Stream Description: Heterogeneous debris waste from the Radiochemical Engineering Development Center at ORNL

AK Documentation Type: ☐ TRU Waste Management Program Information ☒ Waste Stream Specific Information ☒ Supporting Information

AK Source Document Discrepancy Form Tracking Number: **DR027**

Tracking #	*Category*[a]	*Title*	*Document #*	*Date*	*Page #*
N/A	N/A	Central Characterization Project Acceptable Knowledge Summary Report For Oak Ridge National Laboratory Radiochemical Engineering Development Center Contact-Handled Transuranic Waste, Waste Stream: OR-REDC-CH-HET	CCP-AK-ORNL-002, Rev. 1	10/30/08	35
N/A	N/A	CCP Waste Stream Characterization Checklist, Waste Stream OR-REDC-CH-HET, Lot #17	N/A	5/4/10	3 – 9
N/A	N/A	Attachment 8 – Waste Containers, Oak Ridge National Laboratory, Waste Stream OR-REDC-CH-HET	CCP-TP-005, Rev. 18	7/7/10	All
N/A	N/A	Radiological Evaluation of Waste Stream OR-REDC-CH-HET, Oak Ridge National Laboratory Radiochemical Engineering Development Center Contact-Handled Transuranic Waste	CCP-AK-ORNL-002 NDA Memo, Rev. 3	10/19/09	All

Nature of Discrepancy:

CCP-AK-ORNL-005, Table 5-5 identifies Cm-244 and Sr-90 as the two most prevalent nuclides, by activity, at 56.04% and 11.92%, respectively. The CCP Waste Stream Characterization Checklist Through Lot 17 (375 drums) shows that CCP assay has identified Cm-244 and Pu-241 as the two most prevalent nuclides, by activity, at 74.98% and 17.39%, respectively. Sr-90 is the third most prevalent by activity at 1.89%.

NTPC RECORDS ORIGINAL
DATE REC'D 1/3/14 SP

Resolution:

As shown in the table below, of the 375 drums in Lots 1 through 17, the number of drums represented by each of the different radiological distributions is somewhat comparable to the overall percentage of drums in each of the radiological distributions for the waste stream. Therefore, the waste stream as a whole is well represented by the CCP assay data for these 375 drums.

Rad Distribution	Number of Drums Assayed	Total Number of Drums
1	62 (16.5%)	116 (7.5%)
2A	162 (43.2%)	579 (37.5%)
2B	1 (0.3%)	4 (0.3%)
2C	3 (0.8%)	5 (0.3%)
3A	85 (22.3%)	415 (26.9%)
3B	5 (1.3%)	15 (1.0%)
PDL*	57 (15.2%)	410 (26.6%)
Sum Total	375	1544

* Process development labs

Based on a 6-21-2010 query of the P-TS database, 482 drums have been rejected by NDA and given back to the host site. This is a reject rate of 56% (482 / (482 + 375). About 700 more drums in the waste stream have not been assayed and included in a lot. Assuming a reject rate of 56%, it will be assumed for the purposes of the discrepancy resolution that nearly 400 of these 700 drums will be rejected by NDA leaving about 300 drums that will be shippable. In other words, over 50% of the drums in the waste stream expected to be shippable have been through NDA.

The total Sr-90 activity reported for the 375 drums in Lots 1 through 17 is 5.51 Ci with an average of 0.0147 Ci per drum. The total Pu-241 activity reported for the 375 drums in Lots 1 through 17 is 50.7 Ci with an average of 0.135 Ci per drum. Therefore, the average Pu-241 is 9 times greater than the average Sr-90. It will be almost impossible for the total Sr-90 activity to catch up with the total Pu-241 activity even if Pu-241 is not reported in any more drums going forward.

The following is a breakdown of the number of drums that report Sr-90 and Pu-241, the total activity of each of these nuclides, and the average amount per drum for both AK data and CCP assay data.

- Total number of non-PDL drums in CCP assay with Sr-90 is 295
- Total number of non-PDL drums in AK with Sr-90 is 268
- Total number of non-PDL drums in CCP assay with Pu-241 is 318
- Total number of non-PDL drums in AK with Pu-241 is 683

- Total number of PDL drums in CCP assay with Sr-90 is 57
- Total number of PDL drums in AK with Sr-90 is 13
- Total number of PDL drums in CCP assay with Pu-241 is 45
- Total number of PDL drums in AK with Pu-241 is 12

- Total Sr-90 in non-PDL waste in CCP assay is 5.5 Ci with an average of 0.0187 Ci per drum.
- Total Sr-90 in non-PDL waste in AK is 20.4 Ci with an average of 0.0762 Ci per drum (4.1 times more per drum than CCP assay).
- Total Pu-241 in non-PDL waste in CCP assay is 14.7 Ci with an average of 0.0463 Ci per drum (4.3 times more per drum than AK).
- Total Pu-241 in non-PDL waste in AK is 7.31 Ci with an average of 0.0107 Ci per drum.

- Total Sr-90 in PDL waste in CCP assay is 5.06E-03 Ci with an average of 8.87E-05 Ci per drum.
- Total Sr-90 in PDL waste in AK is 0.303 Ci with an average of 0.0233 Ci per drum (263 times more per drum than CCP assay).
- Total Pu-241 in PDL waste in CCP assay is 35.9 Ci with an average of 0.799 Ci per drum (8.7 times more per drum than AK).
- Total Pu-241 in PDL waste in AK is 1.1 Ci with an average of 0.0914 Ci per drum.

Pu-241 being the second most prevalent nuclide by activity is the result of a combination of less Sr-90 in CCP assay than in AK, and more Pu-241 in CCP assay than in AK. This is the case for both PDL and non-PDL waste. Even though there is 263 times more Sr-90 activity per drum in AK than in CCP assay for PDL waste, there are only 13 PDL drums in AK that reported Sr-90 so this has little effect. It's difficult to tell why there is more Sr-90 activity per drum in AK than in CCP assay for the non-PDL waste. It may be because ORNL developed a default distribution that included many nuclides including Sr-90 and then scaled all of these nuclides based on a dose rate measurement. Whereas CCP developed a scaling factor for calculating Sr-90 based on measured Cs-137 using swipe sample data for these two nuclides. Much of the dose rate is probably from Cs-137, but there are other nuclides that contribute to the dose rate. This may have resulted in an inflated Sr-90 result in AK.

The Pu-241 is a little more clear. CCP assay has reported 35.9 Ci of Pu-241 in 45 of the 57 PDL drums assayed through Lot 17. AK only reported Pu-241 in 12 of the 410 PDL drums in the waste stream. Pu-239 was also reported by AK in these 12 drums, but Pu-239 was also reported in another 32 PDL drums. It was typical for the generator to report a dominant nuclide, like Pu-239, and not report other nuclides present in smaller amounts. A default fuel-grade Pu distribution was developed for PDL drums where Pu-239 was the dominant nuclide, by mass, not activity (see NDA Memo). Pu-241 is a small contributor by mass but a large contributor by activity. Whether CCP assay was able to get measured Pu isotopics or had to use the default distribution to scale other Pu isotopes, including Pu-241, this would have resulted in much more Pu-241 being reported by CCP assay. This appears to be the reason why Pu-241 is the second most prevalent nuclide in waste stream OR-REDC-CH-HET.

Discrepancy Resolved: ☒ Yes ☐ No

Acceptable Knowledge Expert: Jeff Harrison / [signature] Date: 7/22/10
Print Sign

Site Project Manager: Candice Weston / [signature] Date: 07/22/10
Print Sign

[a] Published Document or Controlled Database (Pub.); Unpublished Data (Unpub.); Internal Procedure or Note (Proc.); Correspondence (Corr.) or Discrepancy (Disc.)

BEST AVAILABLE

CCP Assay Data for OR-REDC-CH-HET Lots 1 - 17

CONTAINERID	Original ID	Original Package Date	Generation Area	Rad Distribution	NDADDR	Cm-244	Pu-241	Sr-90	Pu-239	Am-241	Pu-240	Pu-238	Cm-246	Cs-137
X10C9311819A	X10C9311819	11/21/1977	108	Rad Dist 1	OR-DWAS-0215	7.3E-02	6.7E-05	2.3E-04		1.6E-03	6.1E-04	3.0E-05	5.6E-04	1.3E-05
X10C9312129A	X10C9312129	11/28/1977	108	Rad Dist 1	OR-DWAS-0237	1.2E+00	1.1E-03	6.1E-05		3.9E-03	9.8E-03	4.8E-04	9.1E-03	3.6E-06
X10C9400276A	X10C9400276	11/28/1977	108	Rad Dist 1	OR-DWAS-0320	6.4E+00	5.9E-03	2.3E-03		2.8E-03	5.4E-02	2.6E-03	5.0E-02	1.3E-04
X10C9312389A	X10C9312389	12/14/1977	108	Rad Dist 1	OR-DWAS-0318	4.8E-01	4.4E-04	1.6E-04		3.9E-04	4.0E-03	1.9E-04	3.7E-03	9.5E-06
X10C0501808A	X10C9400240	1/10/1978	108	Rad Dist 1	OR-DWAS-0303	2.7E+00	2.5E-03		1.3E-02	3.9E-03	2.3E-02	1.1E-03	2.1E-02	
X10C9312392A	X10C9312392	2/7/1978	108	Rad Dist 1	OR-DWAS-0225	2.8E+00	2.6E-03	4.5E-04		3.6E-03	2.3E-02	1.1E-03	2.2E-02	2.6E-05
X10C9312417A	X10C9312417	2/28/1978	108	Rad Dist 1	OR-DWAS-0372	5.8E+00	5.3E-03	1.8E-04		3.7E-04	4.9E-02	2.4E-03	4.5E-02	1.0E-05
X10C9312373A	X10C9312373	3/3/1978	108	Rad Dist 1	OR-DWAS-0271	2.6E-01	2.4E-04	1.1E-04		2.9E-04	2.2E-03	1.1E-04	2.1E-03	6.1E-06
X10C9400228A1	X10C9400228	4/5/1978	108	Rad Dist 1	OR-DWAS-0314	3.3E+00	3.0E-03	1.2E-04		6.9E-04	2.7E-02	1.3E-03	2.5E-02	7.2E-06
X10C9312327A	X10C9312327	4/19/1978	108	Rad Dist 1	OR-DWAS-0271	6.4E-01	5.9E-04	1.4E-04		3.4E-04	5.4E-03	2.6E-04	5.0E-03	8.0E-06
X10C9400231A	X10C9400231	5/4/1978	108	Rad Dist 1	OR-DWAS-0271	2.3E-01	2.1E-04	2.5E-05		9.5E-04	1.9E-03	9.4E-05	1.8E-03	1.4E-06
X10C9312059A	X10C9312059	5/30/1978	108	Rad Dist 1	OR-DWAS-0230	2.3E-01	2.1E-04	1.9E-04		4.4E-04	1.9E-03	9.2E-05	1.8E-03	1.1E-05
X10C9311532A	X10C9311532	6/2/1978	108	Rad Dist 1	OR-DWAS-0237	1.6E+00	1.5E-03	4.5E-05		9.7E-03	1.4E-02	6.7E-04	1.3E-02	2.6E-06
X10C9311394A	X10C9311394	6/15/1978	108	Rad Dist 1	OR-DWAS-0225	3.1E-01	2.9E-04	4.1E-05		2.1E-04	2.6E-03	1.3E-04	2.4E-03	2.4E-06
X10C9312388A	X10C9312388	7/6/1978	108	Rad Dist 1	OR-DWAS-0151	2.6E+01	2.4E-02	6.9E-05		2.0E-03	2.2E-01	1.1E-02	2.1E-01	4.0E-06
X10C9312746A	X10C9312746	7/18/1978	108	Rad Dist 1	OR-DWAS-0215	5.2E+00	4.8E-03	2.9E-05		1.5E-04	4.3E-02	2.1E-03	4.0E-02	1.7E-06
X10C9312203A	X10C9312203	7/27/1978	108	Rad Dist 1	OR-DWAS-0225	1.5E-01	1.4E-04	6.3E-06		2.1E-04	1.2E-03	6.1E-05	1.2E-03	3.6E-07
X10C9312164A	X10C9312164	8/28/1978	108	Rad Dist 1	OR-DWAS-0363	1.8E-01	4.2E-03	1.6E-04		2.1E-03	3.8E-02	1.9E-03	3.5E-02	9.1E-06
X10C9311676A	X10C9311676	9/11/1978	108	Rad Dist 1	OR-DWAS-0314	2.5E-01	2.3E-04	1.9E-04		1.1E-03	2.1E-03	1.0E-04	1.9E-03	1.1E-05
X10C9312258A	X10C9312258	9/11/1978	108	Rad Dist 1	OR-DWAS-0151	2.0E-01	1.9E-04	3.4E-05		4.1E-04	1.7E-03	8.2E-05	1.6E-03	2.0E-06
X10C9311568A	X10C9311568	9/21/1978	108	Rad Dist 1	OR-DWAS-0363	1.1E-01	9.7E-05	7.2E-05		1.6E-03	8.8E-04	4.3E-05	8.2E-04	4.2E-06
X10C9312349A	X10C9312349	10/2/1978	108	Rad Dist 1	OR-DWAS-0271	1.7E-01	1.6E-04	4.2E-05		5.1E-03	1.5E-03	7.1E-05	1.4E-03	2.5E-06
X10C9311162A	X10C9311162	10/17/1978	108	Rad Dist 1	OR-DWAS-0311	2.7E-01	2.4E-04	9.5E-04		2.0E-02	2.2E-03	1.1E-04	2.1E-03	5.5E-05
X10C9312582A	X10C9312582	11/6/1978	108	Rad Dist 1	OR-DWAS-0308	1.7E-01	1.5E-04	5.9E-06		1.3E-02	1.4E-03	6.8E-05	1.3E-03	3.4E-07
X10C9311125A	X10C9311125	1/17/1978	118 (TA)	Rad Dist 1	OR-DWAS-0322	1.2E-01	1.1E-04	3.7E-04		4.5E-04	1.0E-03	5.1E-05	9.6E-04	2.2E-05
X10C0501737	X10C9312736	4/19/1978	118 (TA), 120 (LAA)	Rad Dist 1	OR-DWAS-0271	4.0E+00	3.6E-03	5.5E-05			3.3E-02	1.6E-03	3.1E-02	3.2E-06
X10C9312195A	X10C9312195	2/28/1978	120 (LAA)	Rad Dist 1	OR-DWAS-0354	3.6E+00	3.3E-03	3.5E-05		2.1E-03	3.0E-02	1.5E-03	2.8E-02	2.0E-06
X10C9312568A	X10C9312568	9/14/1978	120 (LAA)	Rad Dist 1	OR-DWAS-0314	4.1E+00	3.7E-03	1.4E-03		5.5E-04	3.4E-02	1.7E-03	3.2E-02	8.1E-05
X10C0402859C	X10C0402859	4/9/1974	Cell Bank	Rad Dist 1	OR-DWAS-0113	3.6E-01	3.3E-04	2.4E-03		5.1E-04	3.0E-03	1.5E-04	2.8E-03	1.4E-04
X10C0402859E	X10C0402859	4/9/1974	Cell Bank	Rad Dist 1	OR-DWAS-0113	8.4E-01	7.7E-04	1.7E-02		1.2E-03	7.1E-03	3.4E-04	6.5E-03	1.0E-03
X10C0402859G	X10C0402859	4/9/1974	Cell Bank	Rad Dist 1	OR-DWAS-0113	4.6E-01	4.2E-04	2.2E-03		6.5E-04	3.8E-03	1.9E-04	3.6E-03	1.3E-04
X10C0403030B	X10C0403030	10/2/1975	Cell Bank	Rad Dist 1	OR-DWAS-0142	1.9E+00	1.7E-03	6.8E-04		2.7E-03	1.6E-02	7.6E-04	1.4E-02	4.0E-05
X10C0403030C	X10C0403030	10/2/1975	Cell Bank	Rad Dist 1	OR-DWAS-0141	1.9E+00	1.8E-03	7.7E-03		3.1E-04	1.6E-02	7.8E-04	1.5E-02	4.5E-04
X10C0403030D1	X10C0403030	10/2/1975	Cell Bank	Rad Dist 1	OR-DWAS-0326	6.7E-01	6.2E-04	1.1E-03		1.7E-04	5.6E-03	2.7E-04	5.2E-03	6.4E-05
X10C0403030E	X10C0403030	10/2/1975	Cell Bank	Rad Dist 1	OR-DWAS-0142	1.5E+00	1.4E-03	1.2E-03		2.7E-04	1.3E-02	6.2E-04	1.2E-02	6.7E-05
X10C0403030F	X10C0403030	10/2/1975	Cell Bank	Rad Dist 1	OR-DWAS-0142	1.5E+00	1.4E-03	3.4E-03		2.2E-03	1.3E-02	6.3E-04	1.2E-02	2.0E-04
X10C0403030G	X10C0403030	10/2/1975	Cell Bank	Rad Dist 1	OR-DWAS-0141	2.3E-01	2.1E-04	9.5E-04		3.3E-04	1.9E-03	9.4E-05	1.8E-03	5.5E-05
X10C0403030J	X10C0403030	10/2/1975	Cell Bank	Rad Dist 1	OR-DWAS-0141	9.3E-01	8.5E-04	1.9E-03		1.3E-03	7.8E-03	3.8E-04	7.2E-03	1.1E-04
X10C0402815B	X10C0402815	5/19/1972	Cubicles	Rad Dist 1	OR-DWAS-0230	2.1E-01	1.9E-04	1.4E-02		2.9E-04	1.7E-03	8.4E-05	1.6E-03	8.3E-04
X10C0402815F	X10C0402815	5/19/1972	Cubicles	Rad Dist 1	OR-DWAS-0237	2.9E-01	2.7E-04	3.5E-03		1.5E-04	2.5E-03	1.2E-04	2.3E-03	2.1E-04
X10C0402815G	X10C0402815	5/19/1972	Cubicles	Rad Dist 1	OR-DWAS-0237	1.8E-01	1.6E-04	1.7E-02		1.9E-04	1.4E-03	6.9E-05	1.3E-03	1.0E-03

CCP Assay Data for OR-REDC-CH-HET Lots 1 - 17

CONTAINERID	Original ID	Original Package Date	Generation Area	Rad Distribution	NDAEDR	Cm-244	Pu-241	Sr-90	Pu-239	Am-241	Pu-240	Pu-238	Cm-246	Cs-137
X10C0402815H	X10C0402815	5/19/1972	Cubicles	Rad Dist 1	OR-DWAS-0230	2.3E-01	2.1E-04	9.9E-03		4.1E-04	1.9E-03	9.5E-05	1.8E-03	5.7E-04
X10C0402897B	X10C0402897	12/18/1975	Cubicles	Rad Dist 1	OR-DWAS-0154	1.5E+00	1.4E-03	2.0E-02		2.2E-03	1.3E-02	6.3E-04	1.2E-02	1.1E-03
X10C0402897D	X10C0402897	12/18/1975	Cubicles	Rad Dist 1	OR-DWAS-0154	1.5E-01	1.4E-04	3.8E-03		2.2E-04	1.3E-03	6.2E-05	1.2E-03	2.2E-04
X10C0402897E	X10C0402897	12/18/1975	Cubicles	Rad Dist 1	OR-DWAS-0154	1.5E+00	1.4E-03	1.0E-02		1.4E-05	1.3E-02	6.2E-04	1.2E-02	6.0E-04
X10C0402897F	X10C0402897	12/18/1975	Cubicles	Rad Dist 1	OR-DWAS-0154	1.6E+00	1.5E-03	7.7E-03		2.3E-03	1.4E-02	6.6E-04	1.3E-02	4.5E-04
X10C0402897H	X10C0402897	12/18/1975	Cubicles	Rad Dist 1	OR-DWAS-0154	2.2E+00	2.0E-03	4.9E-03		1.4E-05	1.9E-02	9.1E-04	1.7E-02	2.9E-04
X10C0402897J	X10C0402897	12/18/1975	Cubicles	Rad Dist 1	OR-DWAS-0154	1.2E+00	1.1E-03	7.5E-03		1.7E-03	9.9E-03	4.8E-04	9.2E-03	4.3E-04
X10C0402897K	X10C0402897	12/18/1975	Cubicles	Rad Dist 1	OR-DWAS-0154	1.4E+00	1.3E-03	5.9E-03		4.9E-05	1.2E-02	5.9E-04	1.1E-02	3.4E-04
X10C0402925C	X10C0402925	8/6/1976	Cubicles	Rad Dist 1	OR-DWAS-0157	2.0E+00	1.8E-03	3.9E-02		4.9E-05	1.7E-02	8.2E-04	1.6E-02	2.3E-03
X10C0402925D	X10C0402925	8/6/1976	Cubicles	Rad Dist 1	OR-DWAS-0157	1.6E+00	1.5E-03	8.8E-02		5.0E-03	1.4E-02	6.6E-04	1.3E-02	5.1E-03
X10C0402925E	X10C0402925	8/6/1976	Cubicles	Rad Dist 1	OR-DWAS-0157	4.2E+00	3.9E-03	1.1E-01			3.5E-02	1.7E-03	3.3E-02	6.1E-03
X10C0402925F	X10C0402925	8/6/1976	Cubicles	Rad Dist 1	OR-DWAS-0157	8.0E-01	7.4E-04	7.8E-03		5.2E-05	6.7E-03	3.3E-04	6.2E-03	4.5E-04
X10C0402925H	X10C0402925	8/6/1976	Cubicles	Rad Dist 1	OR-DWAS-0157	5.5E-01	5.1E-04	1.2E-02		3.2E-05	4.6E-03	2.3E-04	4.3E-03	6.6E-04
X10C0402925I	X10C0402925	8/6/1976	Cubicles	Rad Dist 1	OR-DWAS-0157	8.7E-01	8.0E-04	5.5E-03		3.9E-05	7.3E-03	3.6E-04	6.8E-03	3.2E-04
X10C0402945B	X10C0402945	3/10/1977	Cubicles	Rad Dist 1	OR-DWAS-0179	3.7E-01	3.4E-04	6.3E-02		5.2E-04	3.1E-03	1.5E-04	2.8E-03	3.7E-03
X10C0402945C	X10C0402945	3/10/1977	Cubicles	Rad Dist 1	OR-DWAS-0179	3.9E-01	3.5E-04	8.3E-02		5.5E-04	3.2E-03	1.6E-04	3.0E-03	4.8E-03
X10C0402945E	X10C0402945	3/10/1977	Cubicles	Rad Dist 1	OR-DWAS-0179	3.9E-01	3.6E-04	1.1E-01		5.6E-04	3.3E-03	1.6E-04	3.0E-03	6.4E-03
X10C0402945F	X10C0402945	3/10/1977	Cubicles	Rad Dist 1	OR-DWAS-0178	1.3E-01	1.2E-04	1.0E-01		1.0E-03	1.1E-03	5.4E-05	1.0E-03	6.0E-03
X10C0402945G	X10C0402945	3/10/1977	Cubicles	Rad Dist 1	OR-DWAS-0179	2.1E+00	1.9E-03	1.8E-01		3.0E-03	1.8E-02	8.6E-04	1.6E-02	1.0E-02
X10C0402945H	X10C0402945	3/10/1977	Cubicles	Rad Dist 1	OR-DWAS-0179	1.4E+00	1.3E-03	6.8E-03		1.5E-04	1.2E-02	5.7E-04	1.1E-02	4.0E-04
X10C0402945I	X10C0402945	3/10/1977	Cubicles	Rad Dist 1	OR-DWAS-0178	5.3E-01	4.9E-04	1.5E-01		5.5E-04	4.5E-03	2.2E-04	4.1E-03	8.7E-03
				Rad Dist 1 Total		1.1E+02	1.0E-01	1.1E+00	1.3E-02	1.1E-01	9.3E-01	4.5E-02	8.6E-01	6.4E-02
X10C0501812	X10C9400081	11/28/1978	108	Rad Dist 2A	OR-DWAS-0308	3.8E-02	1.2E-02	7.4E-03	7.0E-04	1.8E-02	1.2E-03	7.5E-04	7.8E-04	4.3E-04
X10C9312332A	X10C9312332	1/30/1979	108	Rad Dist 2A	OR-DWAS-0349	5.4E-01	6.6E-02	2.2E-03	3.9E-03	1.1E-02	6.7E-03	4.2E-03	4.4E-03	1.3E-04
X10C9312325A	X10C9312325	3/20/1979	108	Rad Dist 2A	OR-DWAS-0332	4.5E-01	5.5E-02	8.5E-05	3.3E-03	7.0E-04	5.6E-03	3.5E-03	3.7E-03	4.9E-06
X10C9312689A	X10C9312689	4/2/1979	108	Rad Dist 2A	OR-DWAS-0214	3.7E+00	4.5E-01	3.0E-03	2.7E-02	1.2E-03	4.6E-02	2.9E-02	3.0E-02	1.7E-04
X10C9311599A	X10C9311599	4/20/1979	108	Rad Dist 2A	OR-DWAS-0275	1.9E-01	2.3E-02	6.4E-05	1.4E-03	2.1E-03	2.3E-03	1.5E-03	1.5E-03	3.7E-06
X10C9312036A	X10C9312036	5/4/1979	108	Rad Dist 2A	OR-DWAS-0264	9.1E-01	1.1E-01	4.5E-05	6.6E-03	4.3E-03	1.1E-02	7.0E-03	7.3E-03	2.6E-06
X10C0501824	X10C9400095	5/11/1979	108	Rad Dist 2A	OR-DWAS-0147	1.9E+00	2.3E-01	5.6E-04	1.4E-02	2.3E-02	2.4E-02	1.5E-02	1.5E-02	3.2E-05
X10C9311586A	X10C9311586	5/21/1979	108	Rad Dist 2A	OR-DWAS-0304	1.6E+00	2.0E-01	2.5E-03	1.2E-02	6.3E-04	2.0E-02	1.2E-02	1.3E-02	1.5E-04
X10C9311530A	X10C9311530	6/5/1979	108	Rad Dist 2A	OR-DWAS-0332	7.9E-02	9.6E-03	6.8E-03	5.7E-04	4.3E-03	9.7E-04	6.1E-04	6.4E-04	4.0E-04
X10C0501706	X10C9312042	6/15/1979	108	Rad Dist 2A	OR-DWAS-0265	1.3E-02	1.6E-03	2.0E-04	9.5E-05	8.8E-03	1.6E-04	1.0E-04	1.1E-04	1.2E-05
X10C9311310A	X10C9311310	6/29/1979	108	Rad Dist 2A	OR-DWAS-0305	2.6E+00	3.1E-01	2.5E-02	1.9E-02	6.2E-02	3.2E-02	2.0E-02	2.1E-02	1.4E-03
X10C9312111A	X10C9312111	6/29/1979	108	Rad Dist 2A	OR-DWAS-0238	2.8E-02	3.4E-03	9.9E-04	2.0E-04	1.4E-02	3.4E-04	2.1E-04	2.2E-04	5.7E-05
X10C9312420A	X10C9312420	7/25/1979	108	Rad Dist 2A	OR-DWAS-0223	5.3E-02	6.4E-03	2.1E-03	3.8E-04	1.3E-03	6.5E-04	4.1E-04	4.3E-04	1.2E-04
X10C9311393A	X10C9311393	10/29/1979	108	Rad Dist 2A	OR-DWAS-0332	7.1E-02	8.6E-03	2.7E-03	5.1E-04	1.0E-03	8.7E-04	5.4E-04	5.7E-04	1.5E-04
X10C0501730	X10C9312668	11/6/1979	108	Rad Dist 2A	OR-DWAS-0265	3.6E-01	4.4E-02	1.6E-03	2.6E-03	8.6E-03	4.4E-03	2.8E-03	2.9E-03	9.0E-05
X10C9400284A	X10C9400284	12/6/1979	108	Rad Dist 2A	OR-DWAS-0238	1.4E-02	1.7E-03	5.3E-03	1.0E-04	3.1E-03	1.7E-04	1.1E-04	1.1E-04	3.1E-04
X10C9312492A	X10C9312492	12/20/1979	108	Rad Dist 2A	OR-DWAS-0275	5.0E-01	6.0E-02	5.0E-02	3.6E-03	1.5E-02	6.1E-03	3.8E-03	4.0E-03	2.9E-03
X10C9312292A	X10C9312292	1/22/1980	108	Rad Dist 2A	OR-DWAS-0264	3.9E-01	4.7E-02	7.6E-03	2.8E-03	7.2E-03	4.8E-03	3.0E-03	3.1E-03	4.4E-04

CCP Assay Data for OR-REDC-CH-HET Lots 1 - 17

CONTAINERID	Original ID	Original Package Date	Generation Area	Rad Distribution	NDABDR	Cm-244	Pu-241	Sr-90	Pu-239	Am-241	Pu-240	Pu-238	Cm-246	Cs-137
X10C9312665A	X10C9312665	1/25/1980	108	Rad Dist 2A	OR-DWAS-0274	3.7E-01	4.5E-02	4.5E-04	2.7E-03	1.0E-03	4.6E-03	2.9E-03	3.0E-03	2.6E-05
X10C9312459A	X10C9312459	3/3/1980	108	Rad Dist 2A	OR-DWAS-0304	1.0E-01	1.3E+00	1.4E-04	7.4E-02	2.3E-02	1.3E-01	7.9E-02	8.3E-02	8.1E-06
X10C9312398A	X10C9312398	3/11/1980	108	Rad Dist 2A	OR-DWAS-0316	5.0E-01	6.1E-02	1.1E-03	3.6E-03	2.8E-03	6.1E-03	3.8E-03	4.0E-03	6.5E-05
X10C9400163A	X10C9400163	3/19/1980	108	Rad Dist 2A	OR-DWAS-0246	3.7E-02	4.5E-03	2.9E-04	2.7E-04	3.0E-04	4.6E-04	8.0E-02	3.0E-04	1.7E-05
X10C9400185A	X10C9400185	4/25/1980	108	Rad Dist 2A	OR-DWAS-0211	1.1E-01	1.3E-02	2.5E-03	8.0E-04	8.5E-04	1.4E-03	8.5E-04	8.9E-04	1.4E-04
X10C9312295A	X10C9312295	5/13/1980	108	Rad Dist 2A	OR-DWAS-0253	7.3E-02	8.9E-03	5.9E-04	5.3E-04	1.7E-03	9.0E-04	5.6E-04	5.9E-04	3.4E-05
X10C9313668A	X10C9313668	6/11/1980	108	Rad Dist 2A	OR-DWAS-0324	1.0E-02	1.2E-03	7.9E-02	7.2E-05	7.5E-03	1.2E-04	7.7E-05	8.0E-05	4.6E-03
X10C9311657A	X10C9311657	6/18/1980	108	Rad Dist 2A	OR-DWAS-0274	7.7E-04	9.4E-05		5.6E-06	2.3E-02	9.5E-06	5.9E-06	6.2E-06	
X10C0501825	X10C9312796	7/11/1980	108	Rad Dist 2A	OR-DWAS-0265	2.9E-02	3.5E-03	4.1E-02	2.1E-04	9.0E-03	3.5E-04	2.2E-04	2.3E-04	2.4E-03
X10C9400153A	X10C9400153	8/7/1980	108	Rad Dist 2A	OR-DWAS-0274	3.8E-02	4.7E-03	2.0E-04	2.8E-04	1.5E-03	4.7E-04	2.9E-04	3.1E-04	1.2E-05
X10C9311668A	X10C9311668	8/18/1980	108	Rad Dist 2A	OR-DWAS-0303	5.7E-01	6.9E-02	1.7E-03	4.1E-03	1.8E-03	7.0E-03	4.4E-03	4.6E-03	9.7E-05
X10C9311205A	X10C9311205	10/1/1980	108	Rad Dist 2A	OR-DWAS-0307	1.3E-01	1.5E-02	2.4E-04	9.0E-04	3.0E-03	1.5E-03	9.6E-04	1.0E-03	1.4E-05
X10C9311379A	X10C9311379	10/24/1980	108	Rad Dist 2A	OR-DWAS-0207	1.5E-01	1.9E-02	2.5E-03	1.1E-03	3.7E-03	1.9E-03	1.2E-03	1.2E-03	1.5E-04
X10C9312469A	X10C9312469	11/7/1980	108	Rad Dist 2A	OR-DWAS-0303	3.1E-01	3.8E-02	2.4E-04	2.3E-03	8.2E-03	3.9E-03	2.4E-03	2.5E-03	1.4E-05
X10C9312748A	X10C9312748	2/25/1981	108	Rad Dist 2A	OR-DWAS-0332	1.9E-02	2.3E-03	1.1E-04	1.4E-04	3.5E-03	2.3E-04	1.5E-04	1.5E-04	6.4E-06
X10C9400160A	X10C9400160	3/20/1981	108	Rad Dist 2A	OR-DWAS-0218	1.3E-02	1.5E-03	1.8E-04	9.1E-05	2.8E-03	1.6E-04	9.7E-05	1.0E-04	1.0E-05
X10C9312457A	X10C9312457	4/27/1981	108	Rad Dist 2A	OR-DWAS-0317	1.1E-01	1.3E-02	1.0E-03	7.7E-04	2.5E-03	1.3E-03	8.2E-04	8.6E-04	5.9E-05
X10C9311381A	X10C9311381	5/7/1981	108	Rad Dist 2A	OR-DWAS-0218	1.7E-01	2.1E-02	2.7E-03	1.2E-03	1.2E-02	2.1E-03	1.3E-03	1.4E-03	1.5E-04
X10C9312858A	X10C9312858	5/18/1981	108	Rad Dist 2A	OR-DWAS-0214	5.7E+00	7.0E-01	9.1E-04	4.1E-02	5.4E-03	7.1E-02	4.4E-02	4.6E-02	5.3E-05
X10C0501813	X10C9400186	7/1/1981	108	Rad Dist 2A	OR-DWAS-0262	2.8E-01	3.4E-02	1.3E-02	2.0E-03	3.1E-02	3.4E-03	2.1E-03	2.2E-03	7.6E-04
X10C9312205A	X10C9312205	7/1/1981	108	Rad Dist 2A	OR-DWAS-0274	2.5E-01	3.0E-02	9.5E-05	1.8E-03	2.4E-03	3.1E-03	1.9E-03	2.0E-03	5.5E-06
X10C9400175A	X10C9400175	7/1/1981	108	Rad Dist 2A	OR-DWAS-0363	2.1E-02	2.5E-03	2.2E-04	1.5E-04	4.1E-03	2.5E-04	1.6E-04	1.7E-04	1.3E-05
X10C9400172A	X10C9400172	7/31/1981	108	Rad Dist 2A	OR-DWAS-0262	1.8E+00	2.2E-01	3.1E-03	1.3E-02	2.9E-03	2.2E-02	1.4E-02	1.5E-02	1.8E-04
X10C0501691	X10C9312257	8/13/1981	108	Rad Dist 2A	OR-DWAS-0303	2.2E-01	2.6E-02	2.7E-04	1.6E-03	4.4E-03	2.7E-03	1.7E-03	1.7E-03	1.6E-05
X10C0501803	X10C9312432	9/4/1981	108	Rad Dist 2A	OR-DWAS-0046	1.2E-01	1.4E-02	2.2E-02	8.6E-04	1.2E-02	1.5E-03	9.1E-04	9.6E-04	1.3E-03
X10C9311573A	X10C9311573	9/4/1981	108	Rad Dist 2A	OR-DWAS-0320	2.5E-02	1.9E-01	8.0E-04	1.2E-02	3.9E-02	2.0E-02	1.2E-02	2.0E-04	4.7E-05
X10C9312414A	X10C9312414	10/28/1981	108	Rad Dist 2A	OR-DWAS-0349	9.5E-01	1.2E-01	5.5E-04	6.8E-03	1.9E-03	1.2E-02	7.3E-03	7.6E-03	3.2E-05
X10C9312148A	X10C9312148	11/18/1981	108	Rad Dist 2A	OR-DWAS-0316	3.6E-01	4.4E-02	1.7E-03	2.6E-03	1.5E-03	4.5E-03	2.8E-03	2.9E-03	1.0E-04
X10C9312489A	X10C9312489	12/9/1981	108	Rad Dist 2A	OR-DWAS-0354	1.0E+00	1.3E-01	1.6E-02	7.5E-03	2.5E-02	1.3E-02	8.0E-03	8.3E-03	9.3E-04
X10C0501719	X10C9312483	12/21/1981	108	Rad Dist 2A	OR-DWAS-0158	2.8E+00	3.4E-01	3.1E-02	2.0E-02	3.2E-03	3.5E-02	2.2E-02	2.3E-02	1.8E-03
X10C9312304A	X10C9312304	12/21/1981	108	Rad Dist 2A	OR-DWAS-0304	1.4E-01	1.6E-02	6.4E-03	9.7E-04	2.0E-03	1.7E-03	1.0E-03	1.1E-03	3.7E-04
X10C9312407A	X10C9312407	1/7/1982	108	Rad Dist 2A	OR-DWAS-0246	2.3E-01	2.8E-02	1.4E-03	1.7E-03	2.5E-03	2.9E-03	1.8E-03	1.9E-03	8.2E-05
X10C9309191A	X10C9309191	2/10/1982	108	Rad Dist 2A	OR-DWAS-0249	1.3E+00	1.1E-01	6.6E-04	1.8E-02	3.0E-02	8.0E-03	5.4E-03	1.0E-02	3.9E-05
X10C0501809	X10C9311167	2/12/1982	108	Rad Dist 2A	OR-DWAS-0265	5.8E+00	2.7E-01	9.1E-03	1.6E-02	2.3E-02	2.7E-02	1.7E-02	1.8E-02	5.3E-04
X10C9311199A	X10C9311199	3/24/1982	108	Rad Dist 2A	OR-DWAS-0363	9.2E-01	1.1E-01	2.3E-04	6.6E-03	1.3E-03	1.1E-02	7.0E-03	7.4E-03	1.3E-05
X10C9312204A	X10C9312204	4/28/1982	108	Rad Dist 2A	OR-DWAS-0253	6.4E-02	7.8E-03	2.9E-04	4.6E-04	1.5E-03	7.9E-04	4.9E-04	5.2E-04	1.7E-05
X10C9312273A	X10C9312273	7/8/1982	108	Rad Dist 2A	OR-DWAS-0322	1.0E+00	1.2E-01	3.1E-04	7.3E-03	3.0E-03	1.3E-02	7.8E-03	8.2E-03	1.8E-05
X10C9312491A	X10C9312491	7/29/1982	108	Rad Dist 2A	OR-DWAS-0246	7.3E-02	8.9E-03	1.2E-04	5.3E-04	2.3E-03	9.0E-04	5.6E-04	5.9E-04	7.1E-06
X10C9312315A	X10C9312315	9/10/1982	108	Rad Dist 2A	OR-DWAS-0214	3.5E-01	4.2E-02	1.3E-04	2.5E-03	2.7E-03	4.3E-03	2.7E-03	2.8E-03	7.8E-06
X10C0501654A	X10C9400280	10/13/1982	108	Rad Dist 2A	OR-DWAS-0053	4.7E-02	5.7E-03	1.4E-04	3.4E-04	2.2E-03	5.8E-04	3.6E-04	3.8E-04	8.2E-06

CCP Assay Data for OR-REDC-CH-HET Lots 1 - 17

CONTAINERID	Original ID	Original Package Date	Generation Area	Rad Distribution	NDADDR	Cm-244	Pu-241	Sr-90	Pu-239	Am-241	Pu-240	Pu-238	Cm-246	Cs-137
X10C9312425A	X10C9312425	10/29/1982	108	Rad Dist 2A	OR-DWAS-0328	4.3E+00	5.3E-01	2.6E-03	3.1E-02	2.2E-02	5.3E-02	3.3E-02	3.5E-02	1.5E-04
X10C9400216A	X10C9400216	10/29/1982	108	Rad Dist 2A	OR-DWAS-0262	4.1E-01	5.0E-02	3.7E-04	3.0E-03	3.0E-03	5.0E-03	3.1E-03	3.3E-03	2.1E-05
X10C9312117A	X10C9312117	12/10/1982	108	Rad Dist 2A	OR-DWAS-0246	1.3E-01	1.6E-02	3.3E-04	9.4E-04	2.2E-03	1.6E-03	1.0E-03	1.0E-03	1.9E-05
X10C9312297A	X10C9312297	12/29/1982	108	Rad Dist 2A	OR-DWAS-0238	5.7E-02	6.9E-03	7.5E-04	4.1E-04	1.4E-02	7.0E-04	4.4E-04	4.6E-04	4.4E-05
X10C9312462A	X10C9312462	2/22/1983	108	Rad Dist 2A	OR-DWAS-0314	1.5E-01	1.8E-02	1.5E-04	1.1E-03	3.6E-03	1.9E-03	1.2E-03	1.2E-03	8.5E-06
X10C9313676A	X10C9313676	4/4/1983	108	Rad Dist 2A	OR-DWAS-0307	9.7E-01	1.2E-01	8.7E-05	7.0E-03	2.3E-02	1.2E-02	7.4E-03	7.8E-03	5.1E-06
X10C9311547A	X10C9311547	5/10/1983	108	Rad Dist 2A	OR-DWAS-0274	1.2E-01	1.5E-02	7.0E-04	8.6E-04	3.8E-02	1.5E-03	9.2E-04	9.6E-04	4.1E-05
X10C9311703A	X10C9311703	5/10/1983	108	Rad Dist 2A	OR-DWAS-0214	5.3E-02	6.4E-03	4.6E-04	6.4E-03	8.1E-03	6.5E-04	4.1E-04	4.3E-04	2.7E-05
X10C9311597A	X10C9311597	6/21/1983	108	Rad Dist 2A	OR-DWAS-0304	7.5E-02	9.1E-03	8.1E-05	5.4E-04	1.6E-03	9.2E-04	5.7E-04	6.0E-04	4.7E-06
X10C9312288A	X10C9312288	6/21/1983	108	Rad Dist 2A	OR-DWAS-0253	5.6E-02	6.8E-03	1.1E-04	4.0E-04	1.3E-03	6.9E-04	4.3E-04	4.5E-04	6.1E-06
X10C9311269A	X10C9311269	6/23/1983	108	Rad Dist 2A	OR-DWAS-0239	1.8E-01	2.2E-02	1.0E-03	1.3E-03	4.3E-03	2.2E-03	1.4E-03	1.4E-03	5.9E-05
X10C9311128A	X10C9311128	8/24/1983	108	Rad Dist 2A	OR-DWAS-0307	4.5E-01	9.5E-01	2.4E-02	5.8E-02	5.2E-02	1.0E-01	6.2E-02	3.6E-03	1.4E-03
X10C9312372A	X10C9312372	8/24/1983	108	Rad Dist 2A	OR-DWAS-0274	4.5E-02	5.5E-03	5.6E-04	3.3E-04	1.3E-03	5.6E-04	3.5E-04	3.7E-04	3.2E-05
X10C9312368A	X10C9312368	1/24/1984	108	Rad Dist 2A	OR-DWAS-0208	1.2E-01	1.4E-02	1.7E-03	8.4E-04	1.8E-03	1.4E-03	9.0E-04	9.4E-04	1.0E-04
X10C9313071A	X10C9313071	3/7/1984	108	Rad Dist 2A	OR-DWAS-0285	5.5E-01	6.7E-02	8.9E-05	4.0E-03	1.3E-02	6.7E-03	4.2E-03	3.2E-03	5.2E-06
X10C0501640	X10C9312930	5/16/1984	108	Rad Dist 2A	OR-DWAS-0262	1.7E-01	2.0E-02	2.1E-04	1.2E-03	4.0E-03	2.0E-03	1.3E-03	1.3E-03	1.2E-05
X10C9312954A	X10C9312954	6/7/1984	108	Rad Dist 2A	OR-DWAS-0214	4.1E-03	5.0E-04	1.4E-02	3.0E-05	1.1E-02	5.1E-05	3.2E-05	3.3E-05	8.3E-04
X10C9311497A	X10C9311497	7/2/1984	108	Rad Dist 2A	OR-DWAS-0262	4.1E-02	5.0E-03	2.2E-03	2.9E-04	1.1E-02	5.0E-04	3.1E-04	3.3E-04	1.3E-04
X10C9312274A	X10C9312274	7/31/1984	108	Rad Dist 2A	OR-DWAS-0045	2.2E-01	2.6E-02	9.5E-04	1.6E-03	5.1E-03	2.6E-03	1.7E-03	1.7E-03	5.5E-05
X10C9400217A1A	X10C9400217	3/1/1985	108	Rad Dist 2A	OR-DWAS-0275	5.6E-02	6.8E-03	1.4E-04	4.0E-04	3.4E-03	6.8E-04	4.3E-04	4.5E-04	7.9E-06
X10C9400249A	X10C9400249	3/25/1985	108	Rad Dist 2A	OR-DWAS-0239	4.0E+00	2.1E-02	3.3E-03	1.2E-03	7.2E-04	2.1E-03	1.3E-03	1.4E-03	1.9E-04
X10C9312089A	X10C9312089	4/29/1985	108	Rad Dist 2A	OR-DWAS-0324	1.8E-01	2.2E-02	6.5E-04	1.3E-03	6.1E-03	2.2E-03	1.4E-03	1.5E-03	3.8E-05
X10C9312688A	X10C9312688	5/8/1985	108	Rad Dist 2A	OR-DWAS-0315	1.4E-01	1.7E-02	6.6E-04	1.0E-03	3.4E-03	1.8E-03	1.1E-03	1.2E-03	3.8E-05
X10C9311161A	X10C9311161	7/2/1985	108	Rad Dist 2A	OR-DWAS-0275	3.6E-02	4.3E-03	7.6E-03	2.6E-04	5.3E-03	4.4E-04	2.7E-04	2.9E-04	4.4E-04
X10C9311911A	X10C9311911	8/1/1988	108	Rad Dist 2A	OR-DWAS-0315	2.9E-01	3.5E-02	9.8E-04	2.1E-03	6.8E-03	3.5E-03	2.2E-03	2.3E-03	5.7E-05
X10C9311921A	X10C9311921	6/14/1989	108	Rad Dist 2A	OR-DWAS-0274	7.7E-01	9.4E-02	8.0E-04	5.6E-03	8.0E-03	9.5E-03	5.9E-03	6.2E-03	4.6E-05
X10C9311185A	X10C9311185	8/5/1985	208	Rad Dist 2A	OR-DWAS-0332	6.0E-01	7.2E-02	1.8E-03	4.3E-03	7.5E-03	7.3E-03	4.6E-03	4.8E-03	1.1E-04
X10C9311746A	X10C9311746	9/17/1985	208	Rad Dist 2A	OR-DWAS-0185	1.6E-01	1.9E-02	4.3E-04	1.1E-03	3.6E-03	1.9E-03	1.2E-03	1.3E-03	2.5E-05
X10C9311088A	X10C9311088	12/18/1985	208	Rad Dist 2A	OR-DWAS-0372	1.5E-01	1.8E-02	1.2E-04	1.1E-03	3.2E-03	1.9E-03	1.2E-03	1.2E-03	6.8E-06
X10C9311762A	X10C9311762	2/7/1986	208	Rad Dist 2A	OR-DWAS-0304	1.0E-01	1.2E-02	2.2E-04	7.2E-04	1.1E-03	1.2E-03	7.7E-04	8.1E-04	1.3E-05
X10C9311763A	X10C9311763	3/24/1986	208	Rad Dist 2A	OR-DWAS-0372	1.1E-01	1.5E-02	1.9E-03	8.9E-04	4.4E-03	1.5E-03	9.5E-04	9.9E-04	1.1E-04
X10C9311747A	X10C9311747	4/1/1986	208	Rad Dist 2A	OR-DWAS-0208	5.0E-02	6.1E-03	8.9E-04	3.6E-04	6.1E-03	6.2E-04	3.9E-04	4.0E-04	5.1E-05
X10C9311387A	X10C9311387	4/14/1986	208	Rad Dist 2A	OR-DWAS-0239	3.3E-01	4.0E-02	5.2E-03	2.4E-03	7.8E-03	4.0E-03	2.5E-03	2.6E-03	3.0E-04
X10C9400077A	X10C9400077	11/20/1986	208	Rad Dist 2A	OR-DWAS-0359	3.4E-01	2.8E-02	2.2E-03	1.6E-03	1.2E-03	2.8E-03	1.8E-03	1.8E-03	1.3E-04
X10C9400071A	X10C9400071	12/8/1986	208	Rad Dist 2A	OR-DWAS-0320	6.3E-02	7.7E-03	4.2E-04	4.6E-04	2.6E-03	7.8E-04	4.8E-04	5.1E-04	2.5E-05
X10C9400050A	X10C9400050	4/16/1988	208	Rad Dist 2A	OR-DWAS-0286	3.2E-01	3.9E-02	8.0E-03	2.3E-03	7.6E-03	3.9E-03	2.5E-03	2.6E-03	4.6E-04
X10C9311826A	X10C9311826	5/6/1988	208	Rad Dist 2A	OR-DWAS-0304	3.1E-01	7.5E-03	9.2E-03	2.3E-03	3.7E-06	3.8E-03	2.4E-03	2.5E-03	5.3E-04
X10C9309211V	X10C9309211	11/29/1989	108, 120 (LAA)	Rad Dist 2A	OR-DWAS-0162	1.3E+00	1.6E-01	4.5E-06	9.2E-03	9.2E-04	1.6E-02	9.8E-03	1.0E-02	2.6E-07
X10C9311760A	X10C9311760	7/6/1984	108, 208	Rad Dist 2A	OR-DWAS-0311	1.3E-01	1.5E-02	2.7E-03	9.2E-04	3.0E-03	1.6E-03	9.8E-04	1.0E-03	1.6E-04
X10C9312735A	X10C9312735	12/7/1978	118 (TA)	Rad Dist 2A	OR-DWAS-0246	1.2E-01	1.4E-02	5.7E-02	8.4E-04	2.8E-03	1.4E-03	8.9E-04	9.3E-04	3.3E-03

CCP Assay Data for OR-REDC-CH-HET Lots 1 - 17

CONTAINERID	Original ID	Original Package Date	Generation Area	Rad Distribution	NDAABDR	Cm-244	Pu-241	Sr-90	Pu-239	Am-241	Pu-240	Pu-238	Cm-246	Cs-137
X10C9312016A	X10C9312016	11/14/1979	118 (TA)	Rad Dist 2A	OR-DWAS-0320	3.4E+00	4.1E-01	6.3E-04	2.4E-02	3.7E-04	4.2E-02	2.6E-02	2.7E-02	3.7E-05
X10C9311202A	X10C9311202	4/28/1982	118 (TA)	Rad Dist 2A	OR-DWAS-0223	2.5E-01	3.1E-02	2.3E-04	1.8E-03	6.0E-03	3.1E-03	1.9E-03	2.0E-03	1.3E-05
X10C9312482A	X10C9312482	4/28/1982	118 (TA)	Rad Dist 2A	OR-DWAS-0265	1.3E+01	1.6E+00	8.0E-03	9.3E-02	9.8E-03	1.6E-01	9.9E-02	1.0E-01	4.7E-04
X10C9311544A	X10C9311544	6/11/1982	118 (TA)	Rad Dist 2A	OR-DWAS-0316	4.2E-02	5.1E-03	7.0E-05	3.1E-04	9.3E-05	5.2E-04	3.3E-04	3.4E-04	4.1E-06
X10C9312299A	X10C9312299	12/29/1982	118 (TA)	Rad Dist 2A	OR-DWAS-0223	2.2E-01	2.7E-02	6.8E-03	1.6E-03	5.2E-03	2.7E-03	1.7E-03	1.8E-03	4.0E-04
X10C9400002A	X10C9400002	12/2/1988	118 (TA), 120 (LAA)	Rad Dist 2A	OR-DWAS-0322	3.8E-01	4.7E-02	5.3E-03	2.8E-03	1.7E-03	4.7E-03	2.9E-03	3.1E-03	3.1E-04
X10C9313635A	X10C9313635	9/25/1990	119 (LAA)	Rad Dist 2A	OR-DWAS-0275	1.9E+00	2.3E-01	1.2E-03	1.4E-02	4.6E-04	2.4E-02	1.5E-02	1.5E-02	6.8E-05
X10C9313663A	X10C9313663	4/5/1979	120 (LAA)	Rad Dist 2A	OR-DWAS-0307	3.4E-01	4.1E-02	6.2E-04	2.4E-03	8.1E-03	4.2E-03	2.6E-03	2.7E-03	3.6E-05
X10C9312450A	X10C9312450	5/25/1979	120 (LAA)	Rad Dist 2A	OR-DWAS-0313	7.8E-02	9.5E-03	3.5E-04	5.6E-04	4.7E-03	9.6E-04	6.0E-04	6.3E-04	2.0E-05
X10C9312069A	X10C9312069	6/15/1979	120 (LAA)	Rad Dist 2A	OR-DWAS-0304	1.1E-01	1.4E-02	2.9E-03	8.1E-04	2.7E-03	1.4E-03	8.6E-04	9.0E-04	1.7E-04
X10C9313099A	X10C9313099	6/27/1979	120 (LAA)	Rad Dist 2A	OR-DWAS-0223	6.6E-01	8.0E-02	3.3E-02	4.7E-03	4.6E-02	8.1E-03	5.1E-03	5.3E-03	1.9E-03
X10C9400219A	X10C9400219	10/4/1979	120 (LAA)	Rad Dist 2A	OR-DWAS-0313	1.1E-01	1.3E-02	1.4E-04	7.7E-04	2.5E-03	1.3E-03	8.2E-04	8.5E-04	8.2E-06
X10C9312399A	X10C9312399	1/25/1980	120 (LAA)	Rad Dist 2A	OR-DWAS-0139	3.6E-02	4.4E-03	3.6E-03	2.6E-04	1.7E-03	4.5E-04	2.8E-04	2.9E-04	2.1E-04
X10C9312242A	X10C9312242	2/11/1980	120 (LAA)	Rad Dist 2A	OR-DWAS-0246	1.6E-02	1.9E-03	8.1E-04	1.1E-04	1.6E-03	1.9E-04	1.2E-04	1.3E-04	4.7E-05
X10C9311620A	X10C9311620	7/30/1980	120 (LAA)	Rad Dist 2A	OR-DWAS-0320	2.0E-01	2.4E-02	1.3E-04	1.5E-03	1.9E-03	2.5E-03	1.6E-03	1.6E-03	7.3E-06
X10C9311297A	X10C9311297	12/18/1980	120 (LAA)	Rad Dist 2A	OR-DWAS-0318	6.7E-02	8.2E-03	4.9E-04	4.9E-04	3.1E-04	8.3E-04	5.2E-04	5.4E-04	2.8E-05
X10C9311679A	X10C9311679	1/16/1981	120 (LAA)	Rad Dist 2A	OR-DWAS-0214	5.2E-01	6.3E-02	1.9E-02	3.8E-03	9.5E-04	6.4E-03	4.0E-03	4.2E-03	1.1E-03
X10C9312434A	X10C9312434	8/13/1981	120 (LAA)	Rad Dist 2A	OR-DWAS-0223	7.6E-01	9.2E-02	1.5E-02	5.4E-03	1.8E-02	9.3E-03	5.8E-03	6.1E-03	8.6E-04
X10C9312412A	X10C9312412	10/28/1981	120 (LAA)	Rad Dist 2A	OR-DWAS-0305	5.9E-02	7.2E-03	2.3E-03	4.3E-04	1.4E-03	7.3E-04	4.6E-04	4.8E-04	1.3E-04
X10C9312782A	X10C9312782	4/6/1983	120 (LAA)	Rad Dist 2A	OR-DWAS-0214	6.0E-03	7.2E-04	2.2E-05	4.3E-05	5.0E-03	7.3E-05	4.6E-05	4.8E-05	1.3E-06
X10C9312872A	X10C9312872	4/6/1983	120 (LAA)	Rad Dist 2A	OR-DWAS-0262	9.3E-02	1.1E-02	5.0E-05	6.7E-04	2.2E-03	1.1E-03	7.1E-04	7.4E-04	2.9E-06
X10C9311761A	X10C9311761	7/2/1984	120 (LAA)	Rad Dist 2A	OR-DWAS-0363	5.2E-02	6.3E-03	1.7E-02	3.8E-04	1.3E-02	6.4E-04	4.0E-04	4.2E-04	9.9E-04
X10C9400274A	X10C9400274	3/25/1985	120 (LAA)	Rad Dist 2A	OR-DWAS-0218	2.5E-02	3.0E-03	3.2E-04	1.8E-04	6.4E-04	3.0E-04	5.1E-02	2.0E-04	1.9E-05
X10C9311678A	X10C9311678	5/10/1985	120 (LAA)	Rad Dist 2A	OR-DWAS-0218	8.1E-02	9.9E-03	1.6E-03	5.9E-04	1.9E-03	1.0E-02	6.2E-04	6.5E-04	9.3E-05
X10C9311388A	X10C9311388	4/14/1986	120 (LAA)	Rad Dist 2A	OR-DWAS-0304	1.3E-01	1.6E-02	2.6E-03	9.2E-04	3.0E-03	1.6E-03	9.8E-04	1.0E-03	1.5E-04
X10C9400033A	X10C9400033	7/14/1988	120 (LAA)	Rad Dist 2A	OR-DWAS-0304	1.6E-02	2.0E-03	1.3E-03	1.2E-04	2.0E-03	2.0E-04	1.2E-04	1.3E-04	7.5E-05
X10C9400019A	X10C9400019	11/1/1988	120 (LAA)	Rad Dist 2A	OR-DWAS-0138	4.0E+00	1.0E-01	1.8E-03	6.2E-03	7.3E-04	1.1E-02	6.6E-03	6.9E-03	1.0E-04
X10C9311908A	X10C9311908	12/12/1988	120 (LAA)	Rad Dist 2A	OR-DWAS-0324	9.1E-01	1.1E-01	3.9E-03	6.6E-03	7.7E-04	1.1E-02	7.0E-03	7.3E-03	2.3E-04
X10C9311909A1	X10C9311909	1/27/1989	120 (LAA)	Rad Dist 2A	OR-DWAS-0315	6.0E-01	7.3E-02	3.8E-02	4.3E-03	4.5E-03	7.4E-03	4.6E-03	4.8E-03	2.2E-03
X10C9311909B	X10C9311909	1/27/1989	120 (LAA)	Rad Dist 2A	OR-DWAS-0145	8.0E-02	9.7E-03	1.1E-02	5.8E-04	2.8E-03	9.8E-04	6.1E-04	6.4E-04	6.6E-04
X10C9400043A	X10C9400043	8/15/1989	120 (LAA)	Rad Dist 2A	OR-DWAS-0139	2.9E-01	3.5E-02	1.3E-03	2.1E-03	2.7E-03	3.6E-03	2.2E-03	2.3E-03	7.6E-05
X10C9311881A	X10C9311881	12/8/1989	120 (LAA)	Rad Dist 2A	OR-DWAS-0332	7.4E-02	1.6E-02	2.6E-04	9.3E-04	3.7E-04	1.6E-03	9.9E-04	1.0E-03	1.5E-05
X10C0501699	X10C9400018	7/6/1989	120 (LAA), 208	Rad Dist 2A	OR-DWAS-0308	3.6E-02	4.4E-03	4.6E-03	2.6E-04	1.9E-02	4.4E-04	2.8E-04	2.9E-04	2.6E-04
X10C9400244A	X10C9400244	12/20/1979	216 (Decon Rm)	Rad Dist 2A	OR-DWAS-0208	1.6E-01	2.0E-02	2.5E-02	1.2E-03	4.5E-03	2.0E-03	1.3E-03	1.3E-03	1.5E-03
X10C9312655A	X10C9312655	5/1/1980	216 (Decon Rm)	Rad Dist 2A	OR-DWAS-0303	3.0E-03	3.7E-04	2.4E-05	2.2E-05	1.5E-03	3.7E-05	2.3E-05	2.4E-05	1.4E-06
X10C9313069A	X10C9313069	5/13/1980	216 (Decon Rm)	Rad Dist 2A	OR-DWAS-0223	1.2E-01	1.4E-02	6.3E-04	8.4E-04	2.8E-03	1.4E-03	9.0E-04	9.4E-04	3.7E-05
X10C9312254A	X10C9312254	6/18/1980	216 (Decon Rm)	Rad Dist 2A	OR-DWAS-0314	1.2E-01	1.5E-02	1.2E-02	8.8E-04	2.9E-03	1.5E-03	9.4E-04	9.9E-04	6.8E-04
X10C9312091A	X10C9312091	7/21/1980	216 (Decon Rm)	Rad Dist 2A	OR-DWAS-0317	1.0E-01	1.3E-02	1.0E-03	7.5E-04	2.5E-03	1.3E-03	8.0E-04	8.4E-04	5.8E-05
X10C9312720A	X10C9312720	11/7/1980	216 (Decon Rm)	Rad Dist 2A	OR-DWAS-0285	6.8E-02	8.3E-03	2.0E-04	4.9E-04	1.6E-03	8.4E-04	5.3E-04	5.5E-04	1.1E-05
X10C9312851A	X10C9312851	12/9/1980	216 (Decon Rm)	Rad Dist 2A	OR-DWAS-0303	7.2E-02	8.8E-03	4.7E-05	5.2E-04	5.5E-02	8.9E-04	5.5E-04	5.8E-04	2.7E-06

CCP Assay Data for OR-REDC-CH-HET Lots 1 - 17

CONTAINERID	Original ID	Original Package Date	Generation Area	Rad Distribution	NDADDR	Cm-244	Pu-241	Sr-90	Pu-239	Am-241	Pu-240	Pu-238	Cm-246	Cs-137
X10C9312046A	X10C9312046	2/25/1981	216 (Decon Rm)	Rad Dist 2A	OR-DWAS-0262	1.2E-02	1.5E-03	1.3E-04	8.7E-05	4.3E-03	1.5E-04	9.3E-05	9.7E-05	7.3E-06
X10C9311397A	X10C9311397	3/6/1981	216 (Decon Rm)	Rad Dist 2A	OR-DWAS-0314	5.6E-02	6.8E-03	2.8E-04	4.1E-04	1.3E-03	6.9E-04	4.3E-04	4.5E-04	1.6E-05
X10C9311189A	X10C9311189	5/18/1981	216 (Decon Rm)	Rad Dist 2A	OR-DWAS-0304	1.4E-02	1.8E-03	1.7E-03	1.0E-04	4.2E-03	1.8E-04	1.1E-04	1.2E-04	9.7E-05
X10C9312202A	X10C9312202	5/18/1981	216 (Decon Rm)	Rad Dist 2A	OR-DWAS-0208	3.1E-02	3.8E-03	1.4E-04	2.3E-04	3.1E-03	3.9E-04	2.4E-04	2.5E-04	8.2E-06
X10C9311570A	X10C9311570	7/31/1981	216 (Decon Rm)	Rad Dist 2A	OR-DWAS-0275	7.1E-04	8.6E-05		5.1E-06	2.5E-03	8.7E-06	5.5E-06	5.7E-06	
X10C9312309A	X10C9312309	8/24/1981	216 (Decon Rm)	Rad Dist 2A	OR-DWAS-0320	4.7E-03	5.7E-04	5.9E-05	3.4E-05	2.1E-03	5.7E-05	3.6E-05	3.8E-05	3.4E-06
X10C9400137A	X10C9400137	11/12/1981	216 (Decon Rm)	Rad Dist 2A	OR-DWAS-0322	6.5E-01	7.8E-02	2.9E-04	4.7E-03	1.7E-03	7.9E-03	5.0E-03	5.2E-03	1.7E-05
X10C9311572A	X10C9311572	11/18/1981	216 (Decon Rm)	Rad Dist 2A	OR-DWAS-0332	1.8E-01	2.2E-02	3.2E-04	1.3E-03	4.4E-03	2.2E-03	1.4E-03	1.5E-03	1.9E-05
X10C9312307A	X10C9312307	1/7/1982	216 (Decon Rm)	Rad Dist 2A	OR-DWAS-0315	7.1E-01	8.7E-02	8.0E-04	5.1E-03	1.7E-02	8.8E-03	5.5E-03	5.7E-03	4.6E-05
X10C9311802A	X10C9311802	2/12/1982	216 (Decon Rm)	Rad Dist 2A	OR-DWAS-0323	2.3E-01	2.7E-02	3.7E-04	1.6E-03	6.5E-03	2.8E-03	1.7E-03	1.8E-03	2.2E-05
X10C9312503A	X10C9312503	4/28/1982	216 (Decon Rm)	Rad Dist 2A	OR-DWAS-0304	9.1E-02	1.1E-02	8.8E-05	6.6E-04	3.7E-04	1.1E-03	7.0E-04	7.3E-04	5.1E-06
X10C9311562A	X10C9311562	6/11/1982	216 (Decon Rm)	Rad Dist 2A	OR-DWAS-0223	1.5E-01	1.9E-02	3.7E-04	1.1E-03	3.7E-03	1.9E-03	1.2E-03	1.2E-03	2.1E-05
X10C9312024A	X10C9312024	9/10/1982	216 (Decon Rm)	Rad Dist 2A	OR-DWAS-0262	8.5E-03	1.0E-03	1.1E-04	6.1E-05	2.4E-03	1.0E-04	6.5E-05	6.8E-05	6.2E-06
X10C9312039A	X10C9312039	12/29/1982	216 (Decon Rm)	Rad Dist 2A	OR-DWAS-0262	7.1E-02	8.6E-03	1.0E-04	5.1E-04	1.5E-02	8.7E-04	5.5E-04	5.7E-04	5.8E-06
X10C9312043A	X10C9312043	12/29/1982	216 (Decon Rm)	Rad Dist 2A	OR-DWAS-0265	4.7E-02	5.7E-03	2.0E-03	3.4E-04	7.8E-03	5.8E-04	3.6E-04	3.8E-04	1.2E-04
X10C9312290A	X10C9312290	11/18/1983	216 (Decon Rm)	Rad Dist 2A	OR-DWAS-0249	4.2E-03	5.1E-04	1.6E-04	3.0E-05	1.3E-03	5.2E-05	3.2E-05	3.4E-05	9.2E-06
X10C9312463A	X10C9312463	1/24/1984	216 (Decon Rm)	Rad Dist 2A	OR-DWAS-0218	3.8E-01	4.6E-02	3.5E-05	2.7E-03	4.0E-04	4.6E-03	2.9E-03	3.0E-03	2.0E-06
X10C9312952A	X10C9312952	5/16/1984	216 (Decon Rm)	Rad Dist 2A	OR-DWAS-0262	2.9E-02	3.5E-03	6.3E-04	2.1E-04	2.3E-03	3.6E-04	2.2E-04	2.3E-04	3.6E-05
X10C0501665A	X10C9313132	1/8/1985	216 (Decon Rm)	Rad Dist 2A	OR-DWAS-0349	9.3E-02	1.1E-02	2.4E-03	6.7E-04	7.5E-04	1.1E-03	7.1E-04	7.4E-04	1.4E-04
X10C9312695A	X10C9312695	5/8/1985	216 (Decon Rm)	Rad Dist 2A	OR-DWAS-0223	3.4E-02	4.1E-03	6.4E-05	2.5E-04	8.1E-04	4.2E-04	2.6E-04	2.7E-04	3.7E-06
X10C9311869A	X10C9311869	7/14/1988	216 (Decon Rm)	Rad Dist 2A	OR-DWAS-0246	8.5E-02	1.0E-02	1.6E-03	6.1E-04	2.0E-03	1.0E-03	6.5E-04	6.8E-04	9.5E-05
X10C9311890A	X10C9311890	7/14/1988	216 (Decon Rm)	Rad Dist 2A	OR-DWAS-0207	6.9E-02	8.4E-03	5.7E-05	5.0E-04	1.7E-03	8.5E-04	5.3E-04	5.6E-04	3.3E-06
X10C9311914A	X10C9311914	7/21/1988	216 (Decon Rm)	Rad Dist 2A	OR-DWAS-0303	1.6E-02	1.9E-03	2.5E-04	1.1E-04	4.5E-03	1.9E-04	1.2E-04	1.3E-04	1.4E-05
X10C9313652A	X10C9313652	6/28/1991	216 (Decon Rm)	Rad Dist 2A	OR-DWAS-0303	2.0E-02	2.4E-03	1.4E-04	1.5E-04	3.2E-03	2.5E-04	1.5E-04	1.6E-04	8.1E-06
				Rad Dist 2A Total		**8.9E+01**	**1.2E+01**	**7.5E-01**	**7.2E-01**	**1.1E+00**	**1.2E+00**	**8.8E-01**	**7.1E-01**	**4.3E-02**
X10C9312871A	X10C9312871	8/21/1979	108	Rad Dist 2B	OR-DWAS-0322	5.9E+00	5.1E-01	1.0E-04	1.6E-02	8.8E-02	1.5E-02	3.9E-02	2.5E-02	5.9E-06
				Rad Dist 2B Total		**5.9E+00**	**5.1E-01**	**1.0E-04**	**1.6E-02**	**8.8E-02**	**1.5E-02**	**3.9E-02**	**2.5E-02**	**5.9E-06**
X10C9311273A	X10C9311273	9/12/1979	108	Rad Dist 2C	OR-DWAS-0334	5.3E-02	1.4E-04	1.3E-05	6.7E-06	1.5E-03	4.7E-04	1.0E-02	4.0E-05	7.5E-07
X10C9311516A1	X10C9311516	9/21/1979	120 (LAA)	Rad Dist 2C	OR-DWAS-0211	3.0E-02	8.0E-06	2.9E-02	3.8E-06	1.9E-02	2.7E-04	5.7E-03	2.3E-05	1.7E-03
X10C9312034A	X10C9312034	9/21/1979	120 (LAA)	Rad Dist 2C	OR-DWAS-0214	3.5E-03	9.3E-06	9.8E-05	4.5E-07	1.9E-03	3.1E-05	6.7E-04	2.7E-06	5.7E-06
				Rad Dist 2C Total		**8.6E-02**	**1.6E-04**	**2.9E-02**	**1.1E-05**	**2.2E-02**	**7.7E-04**	**1.7E-02**	**6.6E-05**	**1.7E-03**
X10C9307234A	X10C9307234	9/26/1994	108	Rad Dist 3A	OR-DWAS-0137	5.9E-02	9.5E-03	4.3E-03	1.4E-06	2.9E-03	3.0E-04	1.2E-03	2.2E-04	2.5E-04
X10C0401650A	X10C0401650	5/31/2001	108	Rad Dist 3A	OR-DWAS-0137	2.3E-01	3.8E-02	1.2E-04	5.7E-06	2.0E-02	1.2E-03	4.6E-03	8.7E-04	6.8E-06
X10C0011103A	X10C0011103	5/4/2004	208	Rad Dist 3A	OR-DWAS-0206	5.6E-01	9.0E-02	2.6E-04	1.4E-05	1.5E-01	2.9E-03	1.1E-02	2.1E-03	1.5E-05
X10C9307222A	X10C9307222	4/20/1994	118 (TA)	Rad Dist 3A	OR-DWAS-0181	9.3E-02	1.5E-02	8.5E-02	2.3E-06	6.2E-03	4.8E-04	1.8E-03	3.5E-04	4.9E-03
X10C9307224A	X10C9307224	5/16/1994	118 (TA)	Rad Dist 3A	OR-DWAS-0173	1.1E+00	1.8E-01	1.1E-01	2.7E-05	4.8E-03	5.7E-03	2.2E-02	4.1E-03	6.1E-03
X10C9307216A	X10C9307216	6/17/1994	118 (TA)	Rad Dist 3A	OR-DWAS-0181	2.9E-01	4.6E-02	1.5E-01	6.9E-06	9.8E-03	1.5E-03	5.6E-03	1.1E-03	8.9E-03
X10C9307236A1	X10C9307236	11/28/1994	118 (TA)	Rad Dist 3A	OR-DWAS-0189	8.3E-02	1.3E-02	4.8E-02	2.0E-06	3.3E-03	4.3E-04	1.6E-03	3.1E-04	2.8E-03
X10C9307236B	X10C9307236	11/28/1994	118 (TA)	Rad Dist 3A	OR-DWAS-0028	2.8E-01	4.4E-02	2.6E-02	6.6E-06	3.0E-03	1.4E-03	5.4E-03	1.0E-03	1.5E-03
X10C9307239A1	X10C9307239	12/2/1994	118 (TA)	Rad Dist 3A	OR-DWAS-0326	1.4E-01	2.2E-02	1.5E-01	3.4E-06	7.0E-03	7.2E-04	2.7E-03	5.2E-04	8.9E-03

CCP Assay Data for OR-REDC-CH-HET Lots 1 - 17

CONTAINERID	Original ID	Original Package Date	Generation Area	Rad Distribution	NDABDR	Cm-244	Pu-241	Sr-90	Pu-239	Am-241	Pu-240	Pu-238	Cm-246	Cs-137
X10C9400348A	X10C9400348	3/17/1995	118 (TA)	Rad Dist 3A	OR-DWAS-0304	8.4E-02	1.3E-02	4.6E-03	2.0E-06	9.1E-04	4.3E-04	1.6E-03	3.1E-04	2.7E-04
X10C9307227A	X10C9307227	5/3/1995	118 (TA)	Rad Dist 3A	OR-DWAS-0213	3.1E-02	4.9E-03	2.7E-02	7.4E-07	1.4E-03	1.6E-04	2.2E-04	1.1E-04	1.6E-03
X10C9400382A	X10C9400382	6/30/1995	118 (TA)	Rad Dist 3A	OR-DWAS-0213	1.4E-01	2.3E-02	1.9E-02	3.5E-06	7.7E-04	7.4E-04	2.8E-03	5.3E-04	1.1E-03
X10C9400396A	X10C9400396	8/2/1995	118 (TA)	Rad Dist 3A	OR-DWAS-0361	1.7E-01	2.6E-02	1.3E-02	4.0E-06	3.9E-03	8.5E-04	3.2E-03	6.1E-04	7.5E-04
X10C9310043A	X10C9310043	3/15/1996	118 (TA)	Rad Dist 3A	OR-DWAS-0210	5.2E-02	8.3E-03	2.2E-02	1.3E-06	2.6E-03	2.7E-04	1.0E-03	1.9E-04	1.3E-03
X10C9400961A	X10C9400961	3/10/1997	118 (TA)	Rad Dist 3A	OR-DWAS-0172	6.1E-02	9.8E-03	6.0E-02	1.5E-06	9.0E-03	3.2E-04	1.2E-03	2.3E-04	3.5E-03
X10C9700240A	X10C9700240	6/13/1997	118 (TA)	Rad Dist 3A	OR-DWAS-0213	5.0E-02	8.1E-03	5.1E-02	1.2E-06	1.0E-03	2.6E-04	9.9E-04	1.9E-04	2.9E-03
X10C9700309A	X10C9700309	12/8/1997	118 (TA)	Rad Dist 3A	OR-DWAS-0188	8.7E-02	1.4E-02	6.7E-02	2.1E-06	1.4E-03	4.5E-04	1.7E-03	3.2E-04	3.9E-03
X10C9700315A	X10C9700315	2/20/1998	118 (TA)	Rad Dist 3A	OR-DWAS-0189	4.7E-02	7.6E-03	5.0E-02	1.2E-06	1.2E-03	2.5E-04	9.3E-04	1.8E-04	2.9E-03
X10C9702555A	X10C9702555	3/31/1998	118 (TA)	Rad Dist 3A	OR-DWAS-0191	3.1E-01	4.9E-02	1.2E-01	7.4E-06	6.0E-03	1.6E-03	6.0E-03	1.1E-03	6.9E-03
X10C9702556A	X10C9702556	4/6/1998	118 (TA)	Rad Dist 3A	OR-DWAS-0180	1.3E-01	2.1E-02	6.3E-02	3.2E-06	2.7E-03	6.9E-04	2.6E-03	5.0E-04	3.6E-03
X10C9702557A	X10C9702557	4/6/1998	118 (TA)	Rad Dist 3A	OR-DWAS-0188	2.2E-01	3.5E-02	1.0E-01	5.3E-06	2.9E-03	1.1E-03	4.3E-03	8.2E-04	5.8E-03
X10C9801314A	X10C9801314	11/19/1998	118 (TA)	Rad Dist 3A	OR-DWAS-0188	7.7E-02	1.2E-02	4.2E-02	1.9E-06	1.7E-03	4.0E-04	1.5E-03	2.9E-04	2.4E-03
X10C9802682A	X10C9802682	2/16/1999	118 (TA)	Rad Dist 3A	OR-DWAS-0355	1.0E-01	1.7E-02	5.6E-02	2.5E-06	4.4E-03	5.4E-04	2.0E-03	3.9E-04	3.2E-03
X10C9802669A	X10C9802669	9/24/1999	118 (TA)	Rad Dist 3A	OR-DWAS-0189	1.1E-01	1.7E-02	1.7E-02	2.6E-06	1.6E-03	5.5E-04	2.1E-03	4.0E-04	9.7E-04
X10C9802673A	X10C9802673	2/22/2000	118 (TA)	Rad Dist 3A	OR-DWAS-0213	9.5E-02	1.5E-02	2.0E-02	2.3E-06	1.8E-03	4.9E-04	1.9E-03	3.5E-04	1.1E-03
X10C9802677A	X10C9802677	3/14/2000	118 (TA)	Rad Dist 3A	OR-DWAS-0361	5.9E-02	9.5E-03	2.0E-02	1.4E-06	1.1E-03	3.0E-04	1.2E-03	2.2E-04	1.1E-03
X10C0011107A	X10C0011107	10/2/2001	118 (TA)	Rad Dist 3A	OR-DWAS-0213	8.4E-02	1.3E-02	9.0E-02	2.0E-06	1.8E-03	4.3E-04	1.6E-03	3.1E-04	5.2E-03
X10C0011100A	X10C0011100	3/28/2002	118 (TA)	Rad Dist 3A	OR-DWAS-0210	6.1E-02	9.8E-03	1.5E-01	1.5E-06	1.3E-03	3.1E-04	1.2E-03	2.3E-04	8.6E-03
X10C0012920A	X10C0012920	1/7/2003	118 (TA)	Rad Dist 3A	OR-DWAS-0182	6.0E-02	9.6E-03	5.4E-02	1.5E-06	3.0E-03	3.1E-04	1.2E-03	2.2E-04	3.1E-03
X10C0402068A	X10C0402068	2/3/2005	118 (TA)	Rad Dist 3A	OR-DWAS-0180	1.7E-01	2.7E-02	3.9E-04	4.1E-06	1.9E-03	8.8E-04	3.4E-03	6.4E-04	3.1E-03
X10C0402070A	X10C0402070	2/3/2005	118 (TA)	Rad Dist 3A	OR-DWAS-0137	1.7E+00	2.8E-01	4.1E-03	4.2E-05	5.0E-03	9.0E-03	3.4E-02	6.4E-03	2.4E-04
X10C9700239A	X10C9700239	5/29/1997	118 (TA), 216 (Decon Rm)	Rad Dist 3A	OR-DWAS-0191	2.6E-01	4.2E-02	3.0E-02	6.3E-06	3.7E-03	1.4E-03	5.1E-03	9.7E-04	1.7E-03
X10CSATN03043D	X10CSATN03043	3/30/1992	120 (LAA)	Rad Dist 3A	OR-DWAS-0349	1.6E-02	2.6E-03	2.0E-02	3.9E-07	1.0E-03	8.2E-05	3.1E-04	5.9E-05	1.2E-03
X10CSATN03210A	X10CSATN03210	8/17/1993	120 (LAA)	Rad Dist 3A	OR-DWAS-0327	4.1E-02	6.6E-03	4.2E-02	1.0E-06	1.6E-03	2.1E-04	8.1E-04	1.5E-04	2.5E-03
X10CSATN03210C	X10CSATN03210	8/17/1993	120 (LAA)	Rad Dist 3A	OR-DWAS-0328	3.8E-02	6.0E-03	1.0E-02	9.1E-07	1.4E-03	1.9E-04	7.4E-04	1.4E-04	6.1E-04
X10CSATN03210D	X10CSATN03210	8/17/1993	120 (LAA)	Rad Dist 3A	OR-DWAS-0326	3.2E-01	5.1E-02	1.5E-01	7.7E-06	1.1E-02	1.6E-03	6.2E-03	1.2E-03	8.5E-03
X10C9304039A	X10C9304039	11/8/1993	120 (LAA)	Rad Dist 3A	OR-DWAS-0322	2.9E-02	4.6E-03	3.2E-02	7.0E-07	1.1E-03	1.5E-04	5.6E-04	1.1E-04	1.8E-03
X10C9310023A	X10C9310023	11/14/1994	120 (LAA)	Rad Dist 3A	OR-DWAS-0328	4.1E-02	6.6E-03	3.3E-02	1.0E-06	8.9E-04	2.1E-04	8.1E-04	1.5E-04	1.9E-03
X10C0011093A	X10C0011093	6/8/2000	120 (LAA)	Rad Dist 3A	OR-DWAS-0181	1.2E-01	1.9E-02	8.5E-03	2.9E-06	3.2E-03	6.1E-04	2.3E-03	4.4E-04	4.9E-04
X10C0012923A1	X10C0012923	2/1/2001	120 (LAA)	Rad Dist 3A	OR-DWAS-0213	5.0E-02	8.1E-03	2.8E-02	1.2E-06	1.5E-03	2.6E-04	9.9E-04	1.9E-04	1.6E-03
X10C0011102A	X10C0011102	4/26/2001	120 (LAA)	Rad Dist 3A	OR-DWAS-0305	1.8E-01	2.8E-02	8.1E-02	4.3E-06	1.9E-03	9.1E-04	3.5E-03	6.6E-04	4.7E-03
X10C0011102B	X10C0011102	4/26/2001	120 (LAA)	Rad Dist 3A	OR-DWAS-0305	9.0E-02	1.4E-02	4.4E-01	2.2E-06	9.9E-04	4.6E-04	1.8E-03	3.4E-04	2.5E-02
X10C0011102D	X10C0011102	4/26/2001	120 (LAA)	Rad Dist 3A	OR-DWAS-0305	1.0E-01	1.7E-02	3.9E-02	2.5E-06	1.1E-03	5.3E-04	2.0E-03	3.9E-04	2.2E-03
X10C0201072G	X10C0201072	12/18/2003	120 (LAA)	Rad Dist 3A	OR-DWAS-0292	1.2E-01	2.0E-02	6.9E-02	2.9E-06	3.0E-03	6.3E-04	2.4E-03	4.5E-04	4.0E-03
X10C0201078A	X10C0201078	2/6/2004	120 (LAA)	Rad Dist 3A	OR-DWAS-0181	9.3E-02	1.5E-02	3.5E-02	2.3E-06	2.4E-03	4.8E-04	1.8E-03	2.5E-04	3.2E-05
X10C0301192A	X10C0301192	5/25/2005	120 (LAA)	Rad Dist 3A	OR-DWAS-0174	1.2E-01	1.9E-02		2.8E-06	1.3E-03	6.0E-04	2.3E-03	4.6E-04	
X10C0301192B	X10C0301192	5/25/2005	120 (LAA)	Rad Dist 3A	OR-DWAS-0081	1.4E-01	2.2E-02	6.9E-06	3.4E-06	1.5E-03	7.2E-04	2.7E-03	5.5E-04	4.0E-07
X10C0301192D	X10C0301192	5/25/2005	120 (LAA)	Rad Dist 3A	OR-DWAS-0176	9.7E-02	1.6E-02		2.3E-06	1.1E-03	5.0E-04	1.9E-03	3.9E-04	
X10C0301192E	X10C0301192	5/25/2005	120 (LAA)	Rad Dist 3A	OR-DWAS-0070	1.0E-01	1.6E-02		2.4E-06	1.1E-03	5.2E-04	2.0E-03	4.0E-04	

CCP Assay Data for OR-REDC-CH-HET Lots 1 - 17

CONTAINERID	Original ID	Original Package Date	Generation Area	Rad Distribution	NDABDR	Cm-244	Pu-241	Sr-90	Pu-239	Am-241	Pu-240	Pu-238	Cm-246	Cs-137
X10C0301192F	X10C0301192	5/25/2005	120 (LAA)	Rad Dist 3A	OR-DWAS-0174	1.1E-01	1.8E-02		2.7E-06	1.2E-03	5.9E-04	2.2E-03	4.5E-04	
X10C0301192G	X10C0301192	5/25/2005	120 (LAA)	Rad Dist 3A	OR-DWAS-0174	2.8E-01	4.5E-02		6.7E-06	3.1E-03	1.4E-03	5.5E-03	1.1E-03	
X10C0301192H	X10C0301192	5/25/2005	120 (LAA)	Rad Dist 3A	OR-DWAS-0070	1.1E-01	1.7E-02		2.6E-06	1.2E-03	5.5E-04	2.1E-03	4.2E-04	
X10C0301192I	X10C0301192	5/25/2005	120 (LAA)	Rad Dist 3A	OR-DWAS-0072	9.2E-02	1.5E-02	7.8E-06	2.2E-06	1.0E-03	4.7E-04	1.8E-03	3.6E-04	4.5E-07
X10C0301192II	X10C0301192	5/25/2005	120 (LAA)	Rad Dist 3A	OR-DWAS-0175	7.5E-02	1.2E-02		1.8E-06	8.2E-04	3.9E-04	1.5E-03	3.0E-04	
X10C0301192J	X10C0301192	5/25/2005	120 (LAA)	Rad Dist 3A	OR-DWAS-0070	2.8E-02	4.5E-03	8.5E-02	6.8E-07	5.2E-04	1.5E-04	5.5E-04	1.1E-04	4.9E-03
X10C0301192KK	X10C0301192	5/25/2005	120 (LAA)	Rad Dist 3A	OR-DWAS-0175	1.3E-01	2.0E-02		3.1E-06	2.0E-03	6.6E-04	2.5E-03	5.0E-04	
X10C0301192L	X10C0301192	5/25/2005	120 (LAA)	Rad Dist 3A	OR-DWAS-0070	3.8E-02	6.0E-03	9.4E-02	9.1E-07	8.0E-04	1.9E-04	7.4E-04	1.4E-04	5.5E-03
X10C0301192N	X10C0301192	5/25/2005	120 (LAA)	Rad Dist 3A	OR-DWAS-0085	2.1E-02	3.4E-03	9.0E-02	5.1E-07	3.1E-04	1.1E-04	4.2E-04	7.9E-05	5.2E-03
X10C0301192O	X10C0301192	5/25/2005	120 (LAA)	Rad Dist 3A	OR-DWAS-0176	2.7E-01	4.4E-02		6.5E-06	3.0E-03	1.4E-03	5.3E-03	1.1E-03	
X10C0301193A	X10C0301193	5/25/2005	120 (LAA)	Rad Dist 3A	OR-DWAS-0175	9.9E-02	1.6E-02		2.4E-06	1.1E-03	5.1E-04	1.9E-03	3.9E-04	
X10C0301193B	X10C0301193	5/25/2005	120 (LAA)	Rad Dist 3A	OR-DWAS-0176	1.3E-01	2.0E-02		3.1E-06	1.4E-03	6.6E-04	2.5E-03	5.1E-04	
X10C0301193C	X10C0301193	5/25/2005	120 (LAA)	Rad Dist 3A	OR-DWAS-0066	1.3E-01	2.1E-02		3.2E-06	1.4E-03	6.8E-04	2.6E-03	5.2E-04	
X10C0301193E	X10C0301193	5/25/2005	120 (LAA)	Rad Dist 3A	OR-DWAS-0072	2.1E-01	3.3E-02	2.4E-04	5.0E-06	2.3E-03	1.1E-03	4.1E-03	8.2E-04	1.4E-05
X10C0301193F	X10C0301193	5/25/2005	120 (LAA)	Rad Dist 3A	OR-DWAS-0175	5.5E-01	8.8E-02		1.3E-05	6.0E-03	2.9E-03	1.1E-02	2.2E-03	
X10C0301193G	X10C0301193	5/25/2005	120 (LAA)	Rad Dist 3A	OR-DWAS-0072	6.8E-02	1.1E-02	1.1E-01	1.7E-06	2.2E-03	3.5E-04	1.3E-03	2.5E-04	6.5E-03
X10C0301193II	X10C0301193	5/25/2005	120 (LAA)	Rad Dist 3A	OR-DWAS-0074	4.8E-02	7.8E-03	1.2E-01	1.2E-06	1.1E-03	2.5E-04	9.5E-04	1.8E-04	6.9E-03
X10C0301193IJ	X10C0301193	5/25/2005	120 (LAA)	Rad Dist 3A	OR-DWAS-0072	6.1E-02	9.8E-03	1.1E-01	1.5E-06	1.8E-03	3.2E-04	1.2E-03	2.3E-04	6.2E-03
X10C0301193P	X10C0301193	5/25/2005	120 (LAA)	Rad Dist 3A	OR-DWAS-0174	4.4E-01	7.1E-02		1.1E-05	4.8E-03	2.3E-03	8.7E-03	1.8E-03	
X10C0301193Q	X10C0301193	5/25/2005	120 (LAA)	Rad Dist 3A	OR-DWAS-0176	1.1E-01	1.8E-02		2.8E-06	1.3E-03	5.9E-04	2.3E-03	4.6E-04	
X10C0301193R	X10C0301193	5/25/2005	120 (LAA)	Rad Dist 3A	OR-DWAS-0075	1.4E-01	2.3E-02		3.5E-06	1.6E-03	7.4E-04	2.8E-03	5.7E-04	
X10C0402064A	X10C0402064	4/19/2006	120 (LAA)	Rad Dist 3A	OR-DWAS-0125	2.4E-02	3.8E-03	2.6E-02	5.7E-07	1.1E-03	1.2E-04	4.7E-04	8.8E-05	1.5E-03
X10C0402064B	X10C0402064	4/19/2006	120 (LAA)	Rad Dist 3A	OR-DWAS-0174	1.7E-01	2.7E-02		4.0E-06	1.8E-03	8.6E-04	3.2E-03	6.6E-04	
X10C0402064C	X10C0402064	4/19/2006	120 (LAA)	Rad Dist 3A	OR-DWAS-0174	9.7E-02	1.5E-02		2.3E-06	1.1E-03	5.0E-04	1.9E-03	3.8E-04	
X10C0402064E	X10C0402064	4/19/2006	120 (LAA)	Rad Dist 3A	OR-DWAS-0174	1.3E-01	2.1E-02		3.2E-06	1.4E-03	6.9E-04	2.6E-03	5.3E-04	
X10C0402064H	X10C0402064	4/19/2006	120 (LAA)	Rad Dist 3A	OR-DWAS-0174	8.7E-02	1.4E-02		2.1E-06	9.6E-04	4.5E-04	1.7E-03	3.5E-04	
X10C0402064K	X10C0402064	4/19/2006	120 (LAA)	Rad Dist 3A	OR-DWAS-0123	2.8E-02	4.5E-03	3.2E-02	6.8E-07	9.8E-04	1.5E-04	5.5E-04	1.0E-04	1.9E-03
X10C0402065N	X10C0402065	4/19/2006	120 (LAA)	Rad Dist 3A	OR-DWAS-0125	6.2E-02	1.0E-02	7.1E-02	1.5E-06	8.0E-04	3.2E-04	1.2E-03	2.3E-04	4.1E-03
X10C0402065O	X10C0402065	4/19/2006	120 (LAA)	Rad Dist 3A	OR-DWAS-0125	3.5E-02	5.7E-03	4.0E-02	8.6E-07	5.7E-04	1.8E-04	7.0E-04	1.3E-04	2.3E-03
X10C0402065Y	X10C0402065	4/19/2006	120 (LAA)	Rad Dist 3A	OR-DWAS-0137	1.2E-02	2.0E-03	1.4E-03	3.0E-07	4.7E-03	6.3E-05	2.4E-04	4.6E-05	8.3E-05
X10C0300538A	X10C0300538	7/23/2004	120 (LAA), 208	Rad Dist 3A	OR-DWAS-0189	7.0E-02	1.1E-02	3.5E-02	1.7E-06	1.6E-03	3.6E-04	1.4E-03	2.6E-04	2.0E-03
X10C9312837A	X10C9312837	6/16/1992	216 (Decon Rm)	Rad Dist 3A	OR-DWAS-0189	5.3E-02	8.5E-03	2.7E-04	1.3E-06	1.4E-03	2.7E-04	1.0E-03	2.0E-04	1.6E-05
X10C9402621A	X10C9402621	12/17/1996	216 (Decon Rm)	Rad Dist 3A	OR-DWAS-0363	3.6E-01	5.8E-02	4.6E-03	8.8E-06	1.0E-03	1.9E-03	7.1E-03	1.4E-03	2.7E-04
X10C9801086A	X10C9801086	5/29/1998	216 (Decon Rm)	Rad Dist 3A	OR-DWAS-0191	8.1E-02	1.3E-02	5.3E-02	2.0E-06	2.0E-03	4.2E-04	1.6E-03	3.0E-04	3.1E-03
X10C0300536A	X10C0300536	1/21/2005	216 (Decon Rm)	Rad Dist 3A	OR-DWAS-0236	9.2E-01	1.5E-01	2.2E-02	2.2E-05	6.9E-03	4.8E-03	1.8E-02	3.4E-03	1.3E-03
X10C9802680A	X10C9802680	6/9/2000	Cell Bank	Rad Dist 3A	OR-DWAS-0189	2.4E-01	3.9E-02	5.6E-02	5.8E-06	6.6E-03	1.3E-03	4.7E-03	9.0E-04	3.1E-03
				Rad Dist 3A Total		1.4E+01	2.3E+00	3.6E+00	3.4E-04	3.7E-01	7.4E-02	2.8E-01	5.4E-02	2.1E-01
X10C9310046A	X10C9310046	5/22/1996	118 (TA)	Rad Dist 3B	OR-IQ3-0033	2.5E-01	2.6E-04	1.3E-02	2.6E-07		1.1E-03	9.8E-04	2.2E-03	7.6E-04
X10C9600496A	X10C9600496	8/15/1996	118 (TA)	Rad Dist 3B	OR-IQ3-0044	2.7E-01	2.5E-04	8.8E-03	2.4E-07		1.1E-03	9.2E-04	2.0E-03	5.1E-04
X10C9600499A	X10C9600499	9/17/1996	118 (TA)	Rad Dist 3B	OR-IQ3-0044	5.7E-01	5.9E-04	1.3E-02	5.8E-07		2.6E-03	2.2E-03	4.9E-03	7.7E-04

CCP Assay Data for OR-REDC-CH-HET Lots 1 - 17

CONTAINERID	Original ID	Original Package Date	Generation Area	Rad Distribution	NDA8DR	Cm-244	Pu-241	Sr-90	Pu-239	Am-241	Pu-240	Pu-238	Cm-246	Cs-137
X10C9402616A	X10C9402616	9/24/1996	118 (TA)	Rad Dist 3B	OR-DWAS-0361	3.2E-01	3.4E-04	2.2E-03	3.3E-07	5.9E-04	1.5E-03	1.3E-03	2.8E-03	1.3E-04
X10C9600500A	X10C9600500	9/17/1996	118 (TA), 120 (LAA)	Rad Dist 3B	OR-DWAS-0189	2.8E-01	3.0E-04	2.8E-03	2.9E-07	8.4E-04	1.3E-03	1.1E-03	2.4E-03	1.6E-04
				Rad Dist 3B Total		1.7E+00	1.7E-03	4.0E-02	1.7E-06	1.4E-03	7.5E-03	6.5E-03	1.4E-02	2.3E-03
X10C0501815	X10C9312261	7/31/1984	109	Rad Dist PDL	OR-IQ3-0033	5.4E-02		1.0E-05		8.3E-02				6.0E-07
X10C9312395A	X10C9312395	11/18/1977	209	Rad Dist PDL	OR-IQ3-0019		3.5E-02	2.3E-05	1.3E-02	2.8E-03	4.4E-03	2.3E-03		1.3E-06
X10C9311538A	X10C9311538	11/28/1977	209	Rad Dist PDL	OR-IQ3-0017		2.3E-02	1.1E-05	6.8E-03	1.9E-03		6.5E-03		6.3E-07
X10C9312493A	X10C9312493	1/10/1978	209	Rad Dist PDL	OR-IQ3-0019		5.8E-01	7.2E-06	2.5E-02	1.1E-02	1.0E-02	3.4E-03		4.2E-07
X10C9312125A	X10C9312125	3/23/1978	209	Rad Dist PDL	OR-IQ3-0011			1.7E-05	7.6E-03	4.1E-03	1.8E-02			9.7E-07
X10C9311524A	X10C9311524	4/11/1978	209	Rad Dist PDL	OR-IQ3-0019		1.4E-01	2.3E-05	9.1E-02	3.3E-02	3.4E-02	2.0E-02		1.4E-06
X10C9311524B	X10C9311524	4/11/1978	209	Rad Dist PDL	OR-IQ3-0018		1.1E-01	5.9E-04	4.5E-03	1.3E-03	1.9E-03	6.2E-04		3.4E-05
X10C9400245A	X10C9400245	4/11/1978	209	Rad Dist PDL	OR-IQ3-0025		1.4E-02	1.7E-05	9.9E-03	2.8E-03	2.2E-03	3.4E-04		9.9E-07
X10C9400278A	X10C9400278	5/4/1978	209	Rad Dist PDL	OR-IQ3-0047		3.0E-02	1.8E-06	2.0E-02	6.3E-03	5.3E-03	1.3E-03		1.0E-07
X10C9312010A	X10C9312010	5/25/1978	209	Rad Dist PDL	OR-IQ3-0017		3.0E-01	5.6E-06	2.6E-01	6.6E-02	5.2E-02	6.7E-03		3.3E-07
X10C9312121A	X10C9312121	6/21/1978	209	Rad Dist PDL	OR-IQ3-0022		3.5E-01	1.6E-05	1.5E-02	5.5E-03	6.0E-03	2.0E-03		9.2E-07
X10C9311942A	X10C9311942	7/18/1978	209	Rad Dist PDL	OR-IQ3-0017		2.1E-02	2.4E-06	7.9E-03	2.5E-03	2.4E-03	2.9E-04		1.4E-07
X10C9313061A	X10C9313061	8/3/1978	209	Rad Dist PDL	OR-IQ3-0013			1.7E-05	3.3E-02	6.1E-03		2.4E-02		9.6E-07
X10C9313673A	X10C9313673	8/21/1978	209	Rad Dist PDL	OR-IQ3-0019		5.7E-02	5.3E-06	2.3E-02	6.1E-03	4.8E-03	1.7E-03		3.1E-07
X10C9312589A	X10C9312589	12/7/1978	209	Rad Dist PDL	OR-IQ3-0018		2.2E-02	3.0E-06	7.6E-03	2.7E-03	1.8E-03	5.2E-04		1.7E-07
X10C9312583A	X10C9312583	12/15/1978	209	Rad Dist PDL	OR-IQ3-0017		1.9E-01	1.2E-05	7.9E-03	1.7E-03	3.2E-03	1.1E-03		6.8E-07
X10C9311945A	X10C9311945	2/12/1979	209	Rad Dist PDL	OR-IQ3-0017		1.0E-01	8.2E-05	2.5E-02	1.1E-02	9.8E-03	1.8E-04		4.7E-06
X10C9312556A	X10C9312556	2/26/1979	209	Rad Dist PDL	OR-IQ3-0013		1.4E-01	2.2E-05	4.6E-02	1.7E-02	1.7E-02	8.6E-03		1.3E-06
X10C9312848A	X10C9312848	3/20/1979	209	Rad Dist PDL	OR-IQ3-0013			6.7E-06	6.6E-03	1.5E-03	2.0E-02	1.7E-02		3.9E-07
X10C9311299A	X10C9311299	6/27/1979	209	Rad Dist PDL	OR-IQ3-0017		2.0E-02	6.9E-06	5.3E-03	2.5E-03	2.1E-03	6.0E-04		4.0E-07
X10C9311786A	X10C9311786	11/6/1979	209	Rad Dist PDL	OR-IQ3-0019		1.9E-01	2.1E-05	8.0E-03	1.3E-02	3.2E-03	1.1E-03		1.2E-06
X10C9313038A1	X10C9313038	1/22/1980	209	Rad Dist PDL	OR-IQ3-0013			2.9E-04	5.8E-03	3.1E-03				1.7E-05
X10C9400156A	X10C9400156	4/25/1980	209	Rad Dist PDL	OR-IQ3-0017			1.2E-03	4.5E-03	3.9E-03		6.0E-01		6.7E-05
X10C9312711A	X10C9312711	7/23/1980	209	Rad Dist PDL	OR-IQ3-0013		1.9E-01	6.3E-06	2.1E-02	1.5E-02	9.2E-03	3.8E-03		3.7E-07
X10C9311367A	X10C9311367	8/7/1980	209	Rad Dist PDL	OR-IQ3-0019		1.4E-01	1.7E-05	2.8E-02	1.3E-02	7.6E-03	6.0E-03		1.0E-06
X10C9312902A	X10C9312902	10/1/1980	209	Rad Dist PDL	OR-IQ3-0017		1.4E-01	1.9E-06	4.9E-02	1.8E-02	9.3E-03	3.8E-03		1.1E-07
X10C9311677A	X10C9311677	10/13/1980	209	Rad Dist PDL	OR-IQ3-0018		4.9E-01	1.2E-05	8.7E-02	3.7E-02	1.1E-02	5.0E-03		7.1E-07
X10C9312712A	X10C9312712	4/27/1981	209	Rad Dist PDL	OR-IQ3-0020		2.4E+00	4.8E-04	1.0E-01	2.0E-01	4.2E-02	1.4E-02		2.8E-05
X10C9312481A	X10C9312481	9/4/1981	209	Rad Dist PDL	OR-IQ3-0046		8.9E-01	9.4E-06	2.9E-01	1.3E-01	6.5E-02	1.8E-02		5.4E-07
X10C9311807A1	X10C9311807	2/10/1982	209	Rad Dist PDL	OR-IQ3-0011		6.0E-01	3.1E-06	1.0E-01	6.2E-02	5.0E-02	1.9E-02		3.1E-06
X10C9312478A	X10C9312478	2/10/1982	209	Rad Dist PDL	OR-IQ3-0018		3.7E-01	6.6E-05	8.3E-02	3.3E-02	2.0E-02	4.4E-03		3.8E-06
X10C9312406A	X10C9312406	5/10/1982	209	Rad Dist PDL	OR-IQ3-0046		1.7E+00	4.9E-06	5.9E-01	2.2E-01	1.7E-01	6.2E-02		2.8E-07
X10C9312966A	X10C9312966	12/10/1982	209	Rad Dist PDL	OR-IQ3-0018		2.1E-01	9.3E-06	5.6E-02	3.1E-02	1.3E-02	3.4E-03		5.4E-07
X10C9312892A	X10C9312892	10/12/1983	209	Rad Dist PDL	OR-IQ3-0033		5.6E+00	2.8E-04	2.8E-01	8.7E-02	9.7E-02	3.3E-02		1.6E-05
X10C0501697	X10C9311850	10/23/1989	209	Rad Dist PDL	OR-IQ3-0017		1.0E-01	3.7E-06	1.8E-02	1.2E-02	7.0E-03	2.4E-02		2.2E-07
X10C0501698	X10C9311849	10/23/1989	209	Rad Dist PDL	OR-IQ3-0019		4.3E-01	1.1E-05	7.9E-02	3.6E-02	2.6E-02	8.0E-03		6.6E-07
X10C9311854A	X10C9311854	10/26/1989	209	Rad Dist PDL	OR-IQ3-0019		1.0E-01	8.8E-05	2.6E-02	1.6E-02	5.1E-03	1.7E-02		5.1E-06

CCP Assay Data for OR-REDC-CH-HET Lots 1 - 17

CONTAINERID	Original ID	Original Package Date	Generation Area	Rad Distribution	NDADDR	Cm-244	Pu-241	Sr-90	Pu-239	Am-241	Pu-240	Pu-238	Cm-246	Cs-137
X10C9309206L	X10C9309206	11/28/1989	209	Rad Dist PDL	OR-IQ3-0027			1.1E-03		3.2E-04		1.5E-02		6.1E-05
X10C9309206U	X10C9309206	11/28/1989	209	Rad Dist PDL	OR-IQ3-0028			6.0E-07		2.2E-07		3.1E-03		3.5E-08
X10C9312393A	X10C9312393	2/21/1979	211	Rad Dist PDL	OR-IQ3-0017		1.0E-01	3.0E-05	2.5E-02	1.3E-02	1.4E-02	2.0E-03		1.7E-06
X10C9312470A	X10C9312470	11/6/1979	211	Rad Dist PDL	OR-IQ3-0046			1.7E-05		7.8E-02				9.7E-07
X10C9312874A	X10C9312874	3/3/1980	211	Rad Dist PDL	OR-IQ3-0021		6.3E-01	1.0E-05	2.7E-02	1.1E-02	1.1E-02	3.6E-03		6.0E-07
X10C9311663A	X10C9311663	12/18/1980	211	Rad Dist PDL	OR-IQ3-0026		7.8E-01	3.1E-04	3.3E-02		1.4E-02	4.5E-03		1.8E-05
X10C9400178A	X10C9400178	5/29/1981	211	Rad Dist PDL	OR-IQ3-0026			1.3E-05						7.3E-07
X10C9312401A	X10C9312401	7/31/1981	211	Rad Dist PDL	OR-IQ3-0016			3.2E-06	4.2E-02					1.8E-07
X10C9312404A	X10C9312404	10/2/1981	211	Rad Dist PDL	OR-IQ3-0017		9.1E-01	2.1E-06	3.4E-02	1.9E-01	1.4E-01	2.0E-06		1.2E-07
X10C9312710A	X10C9312710	10/13/1982	211	Rad Dist PDL	OR-IQ3-0023		6.0E-01	2.1E-05	1.2E-01	7.2E-02	5.6E-02	2.3E-02		1.2E-06
X10C9313683A	X10C9313683	10/13/1982	211	Rad Dist PDL	OR-IQ3-0026		1.6E+00	1.3E-04	6.6E-02		2.7E-02	9.1E-03		7.8E-06
X10C9312683A	X10C9312683	1/19/1983	211	Rad Dist PDL	OR-IQ3-0019		5.5E-01	5.5E-05	2.3E-02	1.1E-02	9.5E-03	3.2E-03		3.2E-06
X10C9312887A	X10C9312887	1/19/1983	211	Rad Dist PDL	OR-IQ3-0017		2.2E-01	2.0E-06	5.3E-02	2.1E-02	1.3E-02	5.1E-03		1.5E-07
X10C9312264A	X10C9312264	9/4/1984	211	Rad Dist PDL	OR-IQ3-0011		2.3E-01	2.0E-05	6.6E-02	3.9E-02	3.5E-02	1.7E-02		1.2E-06
X10C9309194L	X10C9309194	8/16/1988	211	Rad Dist PDL	OR-IQ3-0019		3.6E-02	7.4E-07	6.1E-03	2.7E-03	1.7E-03	6.5E-04		4.3E-08
X10C0501733	X10C9311904	9/28/1989	211	Rad Dist PDL	OR-IQ3-0017			3.2E-06	1.7E-02	1.3E-02		1.3E-02		1.9E-07
X10C9309195F	X10C9309195	8/16/1988	120 (LAA), 211	Rad Dist PDL	OR-IQ3-0048		2.3E-02	1.3E-06	4.1E-03	1.9E-03	1.6E-03	7.6E-04		7.6E-08
X10C9312651A	X10C9312651	8/22/1978	Process Development Lab	Rad Dist PDL	OR-IQ3-0013		9.9E-01	5.0E-06	3.7E-01	1.1E-01	1.0E-01	1.8E-02		2.9E-07
X10C9313083A	X10C9313083	3/8/1979	Process Development Lab	Rad Dist PDL	OR-IQ3-0019		1.5E-01	4.5E-06	6.0E-02	1.9E-02	1.4E-02	1.6E-03		2.6E-07
X10C9313662A	X10C9313662	2/22/1980	Process Development Lab	Rad Dist PDL	OR-IQ3-0020		1.4E+01	5.2E-05	5.7E-01	1.6E-01	2.3E-01	7.8E-02		3.0E-06
				Rad Dist PDL Total		5.4E-02	3.6E+01	5.1E-03	4.0E+00	1.9E+00	1.4E+00	1.1E+00	0.0E+00	3.0E-04
				Grand Total		2.2E+02	5.1E+01	5.5E+00	4.7E+00	3.7E+00	3.6E+00	2.4E+00	1.7E+00	3.2E-01
				Activity %		74.98%	17.39%	1.89%	1.62%	1.26%	1.25%	0.82%	0.57%	0.11%
				Total Non-PDL			14.71	5.50						
				Average (Ci)			0.0463	0.0187						
				Total PDL			35.95	0.005						
				Average (Ci)			0.799	8.87E-05						
				Count non-PDL			318	295						
				Count PDL			45	57						

CCP Assay Data for OR-REDC-CH-HET Lots 1 - 17

Am-243	Pu-242	Cm-245	Cf-249	Eu-154	U-232	U-233	U-234	U-235	U-238	Np-237	Cm-243	Th-232	Co-60	Eu-152	Sb-125	Ra-226	Cs-134	Th-229	Ac-227
3.7E-05	1.5E-07	7.4E-06	1.2E-06																
6.0E-04	2.4E-06	1.2E-04	1.3E-06							5.9E-06									
3.3E-03	1.3E-05	6.5E-04	7.7E-05							1.5E-06									
2.4E-04	9.7E-07	4.9E-05	1.1E-06							2.2E-06				7.1E-07					
5.8E-06	5.5E-06	2.8E-04	5.2E-07		4.5E-06													1.3E-06	
1.4E-03	5.7E-06	2.8E-04	1.1E-05											4.6E-06					
3.0E-03	1.2E-05	5.9E-04	1.6E-05																
1.4E-04	5.4E-07	2.7E-05	1.9E-05																
1.7E-03	6.6E-06	3.3E-04	6.3E-06											1.3E-06					
3.3E-04	1.3E-06	6.6E-05	8.2E-07																
1.2E-04	4.7E-07	2.4E-05	5.9E-06											3.5E-07					
1.2E-04	4.6E-07	2.3E-05	2.0E-06																
8.4E-04	3.4E-06	1.7E-04	9.3E-07											1.6E-06					
1.6E-04	6.3E-06	3.2E-05	1.9E-06																
1.4E-02	5.4E-05	2.7E-03																	
2.7E-03	1.1E-05	5.3E-04	1.0E-04																
2.6E-05	3.0E-07	1.5E-05																	
2.3E-03	9.3E-06	4.7E-04	8.4E-05							7.8E-06									
1.3E-04	5.1E-07	2.5E-05	2.9E-06							1.2E-06				5.2E-07					
1.0E-04	4.1E-07	2.1E-05			5.6E-07														
5.4E-05	2.2E-07	1.1E-05	1.6E-06							2.5E-06									
8.9E-05	3.6E-07	1.8E-05	6.9E-07							5.5E-07				7.2E-07					
1.4E-04	5.4E-07	2.7E-05	4.1E-06											8.2E-07					
8.5E-05	3.4E-07	1.7E-05	4.6E-06																
6.3E-05	2.5E-07	1.3E-05	1.7E-06																
2.0E-03	8.1E-06	4.0E-04																	
1.8E-03	7.3E-06	3.6E-04	7.4E-04																
2.1E-03	3.3E-06	4.1E-04	5.5E-06																
1.8E-04	7.3E-07	3.6E-05	5.3E-05	1.8E-05	1.8E-05								2.1E-06		2.0E-05				
4.3E-04	1.7E-06	8.6E-05		9.9E-05									1.4E-05		1.4E-04				
2.3E-04	9.4E-07	4.7E-05	3.2E-06	8.9E-06									4.8E-07		8.5E-06				
9.5E-04	3.8E-06	1.9E-04	5.8E-06	3.4E-05									3.9E-06						
9.7E-04	3.9E-06	1.9E-04	1.6E-05	8.4E-05									1.4E-05						
3.4E-04	1.4E-06	6.8E-05	2.5E-05	4.1E-05									5.3E-06						
7.8E-04	3.1E-06	1.6E-04	5.0E-05	5.1E-05									1.2E-05						
7.8E-04	3.1E-06	1.6E-04	6.8E-05	3.8E-05									1.2E-05						
1.2E-04	4.7E-07	2.4E-05	2.8E-06	9.9E-06											4.2E-06				
4.7E-04	1.9E-06	9.5E-05	4.5E-04										3.6E-07		1.1E-05				
5.5E-05	4.2E-07	2.1E-05	8.6E-06	1.2E-04									6.2E-06						
1.5E-04	6.0E-07	3.0E-05	7.1E-06	1.3E-06									1.6E-06						
8.6E-05	3.5E-07	1.7E-05	9.1E-06	9.9E-05									5.4E-06		1.4E-05				

CCP Assay Data for OR-REDC-CH-HET Lots 1 - 17

Am-243	Pu-242	Cm-245	Cf-249	Eu-154	U-232	U-233	U-234	U-235	U-238	Np-237	Cm-243	Th-232	Co-60	Eu-152	Sb-125	Ra-226	Cs-134	Th-229	Ac-227
1.2E-04	4.7E-07	2.4E-05	1.9E-06	1.4E-05									1.4E-06						
7.8E-04	3.1E-06	1.6E-04	2.5E-05	9.9E-05									1.7E-05						
7.7E-05	3.1E-07	1.5E-05	3.2E-06	2.0E-05									3.2E-06		6.6E-06				
7.8E-04	3.1E-06	1.6E-04	2.3E-05	1.4E-04									2.9E-05						
8.2E-04	3.3E-06	1.7E-04	7.2E-06	2.6E-05									9.3E-06						
1.1E-03	4.5E-06	2.3E-04	1.1E-05	1.6E-05									6.9E-06						
6.1E-04	2.4E-06	1.2E-04	8.4E-06	4.2E-05									4.3E-06		1.6E-05				
7.3E-04	2.9E-06	1.5E-04	2.7E-05	5.7E-05									6.1E-06						
1.0E-03	4.1E-06	2.0E-04		2.9E-05									9.3E-07						
8.2E-04	3.3E-06	1.7E-04		5.8E-05															
2.2E-03	8.6E-06	4.3E-04	7.3E-06	3.2E-05									1.0E-06						
4.1E-04	1.6E-06	8.2E-05	8.5E-06	2.9E-06															
2.8E-04	1.1E-06	5.6E-05	2.7E-06	1.8E-05									4.7E-07						
4.4E-04	1.8E-06	8.9E-05	1.8E-06	4.1E-06															
	7.5E-07	3.7E-05		2.5E-05															
1.2E-05	7.9E-07	3.9E-05	1.9E-06	2.8E-05									1.9E-06						
	8.0E-07	4.0E-05		2.9E-05									4.7E-07						
6.8E-05	2.7E-07	1.4E-05		4.3E-05															
	4.3E-06	2.2E-04		7.5E-05									2.0E-06						
7.1E-04	2.8E-06	1.4E-04	8.6E-06	2.5E-06									6.3E-07						
2.7E-04	1.1E-06	5.5E-05		3.7E-05															
5.4E-02	2.3E-04	1.1E-02	1.9E-03	1.4E-03	2.3E-05	0.0E+00	0.0E+00	0.0E+00	0.0E+00	2.2E-05	0.0E+00	0.0E+00	1.6E-04	1.1E-05	2.2E-04	0.0E+00	0.0E+00	1.3E-06	0.0E+00
8.1E-05	1.2E-06	1.2E-05	6.5E-04	3.8E-06	1.4E-06														
4.5E-04	6.4E-06	6.4E-05	3.9E-04	1.2E-05									1.8E-06	2.6E-05					
3.8E-04	5.4E-06	5.4E-05	1.1E-04		3.5E-03														
3.1E-03	4.4E-05	4.4E-04	5.7E-06											1.7E-06					
1.6E-04	2.2E-06	2.2E-05	3.1E-06																
7.5E-04	1.1E-05	1.1E-04																	
1.6E-03	2.3E-05	2.3E-04								8.6E-07									
1.3E-03	1.9E-05	1.9E-04	2.3E-06																
6.5E-05	9.4E-07	9.3E-06		4.4E-05										3.3E-06					
1.1E-05	1.6E-07	1.6E-06	5.7E-05	2.2E-06	8.6E-07														
4.2E-06	3.1E-05	3.0E-04	4.3E-06	2.5E-05															
2.3E-05	3.3E-07	3.3E-06	1.3E-05	9.9E-07															
6.5E-06	6.3E-07	6.3E-06	1.1E-04																
5.8E-05	8.4E-07	8.3E-06																	1.7E-05
	4.3E-06	4.3E-05		2.0E-06															
1.2E-05	1.7E-07	1.7E-06		1.3E-06															
4.1E-04	5.9E-06	5.9E-05		7.9E-05															
3.2E-04	4.6E-05	4.6E-05	6.6E-05	1.1E-05															

CCP Assay Data for OR-REDC-CH-HET Lots 1 - 17

Am-243	Pu-242	Cm-245	Cf-249	Eu-154	U-232	U-233	U-234	U-235	U-238	Np-237	Cm-243	Th-232	Co-60	Eu-152	Sb-125	Ra-226	Cs-134	Th-229	Ac-227
3.1E-04	4.4E-06	4.4E-05	3.1E-05							2.5E-06									
8.5E-03	1.2E-04	1.2E-03	4.2E-03																
4.1E-04	5.9E-06	5.9E-05	8.1E-04																
3.1E-05	4.4E-07	4.4E-06	4.4E-05																
9.1E-05	1.3E-06	1.3E-05	1.4E-04							1.4E-06									
5.3E-06	8.7E-07	8.6E-06								2.0E-06			1.2E-06						
8.3E-06	1.2E-07	1.2E-06	2.7E-04	2.2E-05						2.5E-04			1.1E-06						
6.4E-07	9.1E-09	9.1E-08																	
2.4E-05	3.4E-07	3.4E-06		3.5E-05						2.1E-05									
3.2E-05	4.5E-07	4.5E-06	1.8E-05																
4.7E-04	6.7E-06	6.7E-05	2.4E-04							4.0E-06									
2.5E-05	1.5E-06	1.5E-05	7.1E-06		6.5E-07									2.3E-06					
1.5E-05	1.8E-06	1.8E-05	5.0E-06							3.4E-06			5.3E-06						
2.6E-04	3.7E-06	3.7E-05	2.6E-06																
1.6E-05	2.3E-07	2.3E-06	1.6E-05	1.3E-05															
1.1E-05	1.5E-07	1.5E-06	1.5E-04																
6.9E-06	1.3E-06	1.3E-05	9.0E-05							2.0E-06									
1.4E-04	2.0E-06	2.0E-05		4.3E-05						3.1E-06									
4.8E-03	6.8E-05	6.8E-04	6.8E-06	1.2E-05															
2.3E-04	3.3E-06	3.3E-05	1.4E-04	4.7E-06															
2.1E-04	3.0E-06	3.0E-05	4.0E-06																
1.7E-05	2.4E-07	2.4E-06	2.0E-05	6.8E-07						1.2E-05									9.3E-06
1.5E-03	2.2E-05	2.2E-04	4.7E-06																
1.8E-04	2.6E-05	2.6E-05			2.3E-05														
9.8E-05	1.4E-06	1.4E-05		6.6E-06	9.4E-06					6.9E-06									
2.0E-05	1.9E-05	2.9E-06	2.3E-06																
7.8E-04	1.1E-05	1.1E-04	4.0E-05											1.3E-06					
3.0E-04	4.3E-06	4.3E-05	6.1E-06							1.7E-06									
1.1E-03	1.2E-05	1.2E-04	8.2E-06	6.3E-06										4.3E-05					
2.3E-03	3.3E-05	3.3E-04	7.6E-04	1.3E-05										1.2E-05					
1.1E-04	1.6E-06	1.6E-05	6.8E-06	2.1E-06						1.2E-06									
1.9E-04	2.8E-06	2.7E-05																	
1.7E-05	2.3E-06	1.5E-04	3.3E-07																
1.8E-03	2.6E-05	2.6E-04	3.4E-06		4.3E-06														
7.6E-04	1.1E-05	1.1E-04	5.6E-06							3.1E-07									
1.6E-04	7.7E-07	7.6E-06	5.4E-05							4.7E-07									
8.4E-04	1.2E-05	1.2E-04	1.0E-04							1.7E-06									
6.1E-05	8.7E-07	8.7E-06								2.0E-06									
2.9E-04	4.1E-06	4.1E-05								3.4E-06									
3.9E-05	5.6E-07	5.6E-06								4.2E-07									

CCP Assay Data for OR-REDC-CH-HET Lots 1 - 17

Am-243	Pu-242	Cm-245	Cf-249	Eu-154	U-232	U-233	U-234	U-235	U-238	Np-237	Cm-243	Th-232	Co-60	Eu-152	Sb-125	Ra-226	Cs-134	Th-229	Ac-227
3.6E-03	5.1E-05	5.1E-04		2.6E-05															
3.4E-04	4.8E-06	4.8E-05	7.7E-04		8.6E-06					2.2E-05									
1.1E-04	1.5E-06	1.5E-05					3.6E-04	6.2E-06		1.1E-06						9.9E-05			
4.7E-05	6.7E-07	6.7E-06	1.6E-05																
2.1E-05	1.8E-06	1.8E-05	2.4E-05											1.5E-06		1.4E-06			
1.1E-04	1.2E-05	1.1E-04	1.2E-06							1.2E-06						1.8E-06			1.9E-04
9.9E-05	1.4E-06	1.4E-05	7.9E-06							1.1E-06						7.8E-07			
4.4E-05	6.3E-07	6.3E-06	2.4E-05		8.6E-07					8.1E-06									
6.2E-05	8.8E-07	8.8E-06	1.2E-04																
3.8E-05	6.7E-07	6.6E-06	3.3E-05													7.9E-07			
1.4E-05	2.1E-06	2.1E-05	1.0E-06																
3.7E-04	9.6E-05	5.3E-05	8.0E-06										2.3E-07			1.5E-06			
3.8E-05	5.4E-07	5.4E-06	1.5E-06																
9.7E-05	1.4E-06	2.3E-05	1.0E-05																
1.7E-04	6.5E-06	6.5E-05	1.5E-05							6.2E-07									
	2.0E-06	2.0E-05	2.1E-05																
3.4E-06	4.9E-08	4.9E-07	5.3E-05																
3.4E-05	4.8E-07	4.8E-06	4.1E-06																
3.2E-05	2.6E-06	2.5E-05								1.1E-06									
4.6E-05	6.6E-07	6.6E-06	2.7E-04		2.5E-06														
1.4E-04	2.0E-06	3.4E-05	3.0E-05																
1.5E-04	2.1E-06	2.1E-05	6.5E-05													8.5E-07			
6.6E-06	1.7E-06	1.7E-05	6.6E-06																
2.9E-05	4.2E-07	4.2E-06	5.3E-05																
1.4E-04	3.4E-06	3.4E-05	4.2E-04																
6.4E-04	9.1E-06	9.1E-05	3.6E-06		1.1E-06														
4.9E-04	7.0E-06	7.0E-05	2.0E-05	3.7E-05															
1.3E-04	1.8E-06	1.8E-05	2.3E-06	5.0E-05															
1.3E-04	1.8E-06	8.4E-06	7.7E-05							7.0E-07									
8.3E-05	1.2E-06	1.2E-05	1.5E-05		1.8E-06									1.1E-06					
1.0E-04	1.5E-06	8.3E-06	8.1E-05							1.5E-06									
4.1E-05	5.9E-07	5.9E-06	1.5E-06							3.9E-06									
	3.9E-06	3.9E-05																	
1.9E-04	2.7E-06	2.9E-05	2.4E-06		6.4E-06									9.4E-06					
5.2E-05	7.5E-07	7.5E-06	3.0E-06							1.0E-05				4.8E-07					
3.3E-05	3.8E-06	3.8E-05	2.2E-05	1.3E-05										2.2E-05					
1.3E-05	3.8E-02	3.7E-05	4.0E-06	1.5E-06										4.8E-06					
1.1E-03	1.5E-05	1.5E-04																	
9.0E-06	1.5E-06	1.5E-05																	
	1.4E-06	1.4E-05		3.2E-05															

CCP Assay Data for OR-REDC-CH-HET Lots 1 - 17

Am-243	Pu-242	Cm-245	Cf-249	Eu-154	U-232	U-233	U-234	U-235	U-238	Np-237	Cm-243	Th-232	Co-60	Eu-152	Sb-125	Ra-226	Cs-134	Th-229	Ac-227
2.8E-03	4.0E-05	4.0E-04																	
6.1E-03	3.0E-06	3.0E-05	6.8E-05																
1.1E-02	1.5E-04	1.5E-03	1.5E-03	2.8E-06															
3.5E-05	5.0E-07	5.0E-06	3.5E-06																
8.6E-04	2.6E-06	2.6E-05	5.9E-05	6.7E-06			5.7E-05	1.9E-06								2.7E-04			
3.2E-04	4.5E-06	4.5E-05	3.0E-06				3.7E-05	6.4E-07					2.7E-06	3.5E-06		7.1E-05			
1.6E-03	2.3E-05	2.3E-04	9.8E-07	1.2E-06									6.9E-07			4.1E-06			
3.1E-05	4.0E-06	4.0E-05	5.9E-06							7.8E-07									
6.4E-05	9.2E-07	9.2E-06	2.8E-07																
	1.3E-06	1.3E-05	6.0E-06																
8.1E-04	7.9E-06	7.8E-05	2.2E-05	1.8E-05															
8.0E-05	1.3E-06	1.3E-05	4.4E-07																
3.0E-05	4.3E-07	4.3E-06		2.0E-06															
1.3E-05	1.9E-07	1.9E-06		7.5E-07															
4.7E-04	2.4E-06	2.4E-05	3.0E-06																
5.6E-05	8.0E-07	8.0E-06	8.7E-07																
4.3E-04	6.2E-06	6.1E-05	8.1E-05	1.1E-04									7.3E-07	1.6E-06					
6.2E-04	9.0E-06	8.9E-05	1.4E-05	6.7E-06															
3.4E-05	7.1E-07	7.0E-06	7.1E-07																
4.9E-06	7.0E-08	7.0E-07																	
	1.1E-06	1.1E-05	2.2E-06							6.5E-07				3.1E-06					
4.3E-05	6.2E-07	6.2E-06	2.2E-05							1.6E-06						2.7E-06			2.6E-06
2.0E-05	2.9E-07	2.9E-06	2.3E-06																
	9.7E-07	9.6E-06	3.6E-04																
	1.5E-06	1.5E-05	8.8E-07																
1.3E-05	1.9E-07	1.9E-06	3.9E-06	5.0E-07															
7.1E-04	1.0E-05	5.1E-05	5.9E-07				7.5E-05	1.3E-06					1.1E-05			2.1E-05			
7.5E-04	1.1E-05	1.1E-04	1.9E-06	9.0E-06															
5.0E-04	7.1E-06	7.1E-05	8.8E-05	4.0E-05			9.9E-05	1.7E-06					9.8E-06			5.5E-05			
6.6E-05	9.5E-07	9.5E-06	6.8E-07	1.2E-04									2.2E-06						
2.4E-04	3.4E-06	3.4E-05	1.9E-06	8.9E-06												1.2E-05			
1.1E-04	1.5E-06	6.6E-06	1.7E-07													1.3E-05			
3.0E-05	4.2E-07	4.2E-06	2.5E-04	1.9E-06									1.1E-06						
1.4E-04	1.9E-06	1.9E-05	5.5E-06	4.0E-05						4.8E-05									
2.5E-06	3.6E-08	3.6E-07	6.6E-06																
6.1E-05	1.4E-06	1.4E-05	1.3E-06							1.9E-05									
1.0E-05	1.5E-06	1.5E-05																	
8.9E-06	1.2E-06	1.2E-05	9.2E-05							1.5E-06									
2.4E-05	8.2E-07	8.1E-06	1.4E-06							1.8E-05									
6.0E-05	8.5E-07	8.5E-06	1.3E-04							3.1E-05									

CCP Assay Data for OR-REDC-CH-HET Lots 1 - 17

Am-243	Pu-242	Cm-245	Cf-249	Eu-154	U-232	U-233	U-234	U-235	U-238	Np-237	Cm-243	Th-232	Co-60	Eu-152	Sb-125	Ra-226	Cs-134	Th-229	Ac-227
1.0E-05	1.4E-07	1.4E-06	3.0E-05	1.1E-06															
5.5E-06	6.7E-07	6.6E-06	1.9E-06																
1.2E-05	1.7E-07	1.7E-06	7.9E-07																
2.6E-05	3.7E-07	3.7E-06	1.7E-05																
5.9E-07	8.4E-09	8.4E-08	2.2E-07																
3.9E-06	5.5E-08	5.5E-07	1.7E-06																
5.3E-04	7.6E-06	7.6E-05	2.7E-05	2.9E-06															
4.0E-06	2.2E-06	2.2E-05								1.9E-06									
3.8E-04	8.5E-06	8.4E-05	1.1E-05		4.9E-07														
1.9E-04	2.7E-06	2.7E-05	9.6E-06											1.4E-06					
7.6E-05	1.1E-06	1.1E-05	6.2E-07																
4.5E-05	1.8E-06	1.8E-05	5.7E-07	4.3E-06						5.9E-06									
7.0E-06	1.0E-07	1.0E-06	2.0E-05																
5.9E-05	8.4E-07	8.4E-06	6.7E-06							3.1E-06									
3.9E-05	5.6E-07	5.6E-06	5.4E-05	3.1E-05									1.8E-06	3.1E-06	3.2E-06				
3.5E-06	5.0E-08	5.0E-07																	
3.1E-04	4.5E-06	4.5E-05	1.6E-04																
2.4E-05	3.4E-07	3.4E-06	5.9E-06																
7.7E-05	1.1E-06	1.1E-05			7.0E-06					1.7E-04									
4.8E-07	4.1E-07	4.0E-06	2.7E-07																
4.7E-06	1.0E-06	1.0E-05	1.7E-06							3.1E-05				9.0E-07					
	8.3E-07	8.2E-06	2.4E-05		4.0E-07														
1.3E-05	1.8E-07	1.8E-05	1.8E-06	6.8E-06															
1.7E-05	2.4E-07	2.4E-06	1.3E-06										8.2E-07						
7.3E-02	3.9E-02	1.0E-02	1.4E-02	9.2E-04	3.5E-03	0.0E+00	6.2E-04	1.2E-05	0.0E+00	7.0E-04	0.0E+00	0.0E+00	4.0E-05	1.4E-04	3.2E-06	5.5E-04	0.0E+00	0.0E+00	2.2E-04
3.0E-06	2.3E-05	6.7E-04	6.7E-06							1.4E-06									
3.0E-06	2.3E-05	6.7E-04	6.7E-06	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	1.4E-06	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00
1.7E-03	6.9E-07	6.7E-06	1.2E-04																
9.8E-04	3.9E-07	3.8E-06	1.9E-04	6.3E-06															
1.1E-04	4.6E-08	4.5E-07	1.7E-05																
2.8E-03	1.1E-06	1.1E-05	3.3E-04	6.3E-06	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00
2.1E-04	1.6E-05	7.0E-06		5.3E-06	2.4E-06										5.8E-06				
8.4E-04	6.2E-05	2.8E-05		6.0E-06															
2.0E-03	1.5E-04	6.7E-05	9.1E-07							2.9E-06									
3.4E-04	2.5E-05	1.1E-05		7.2E-04									2.1E-05		2.7E-05				
4.0E-03	2.9E-04	1.3E-04		8.9E-04									6.5E-05		1.2E-04				
1.0E-03	7.5E-05	3.4E-05		9.9E-04									4.3E-05		1.9E-04	1.6E-05			
3.0E-04	2.2E-05	9.9E-06																	
1.2E-04	7.2E-05	3.3E-05																	
5.0E-04	3.7E-05	1.7E-05		1.0E-03									3.2E-06	1.3E-04	1.7E-05		1.7E-06		

CCP Assay Data for OR-REDC-CH-HET Lots 1 - 17

Am-243	Pu-242	Cm-245	Cf-249	Eu-154	U-232	U-233	U-234	U-235	U-238	Np-237	Cm-243	Th-232	Co-60	Eu-152	Sb-125	Ra-226	Cs-134	Th-229	Ac-227
2.3E-05	2.2E-05	1.0E-05	5.3E-06	6.7E-05									4.1E-07	7.9E-06					
1.1E-04	8.1E-06	3.7E-06																	
5.2E-04	3.8E-05	1.7E-05	1.1E-05							4.3E-06									
6.0E-04	4.4E-05	2.0E-05	1.0E-04	2.5E-04						2.9E-06			1.9E-06		1.1E-05	2.1E-05			
1.9E-04	1.4E-05	6.2E-06	5.3E-06																
2.2E-04	1.6E-05	7.3E-06	6.9E-06																
1.8E-04	1.3E-05	6.0E-06								6.5E-06									
3.1E-04	2.3E-05	1.0E-05		1.1E-03									6.6E-06		6.8E-05				
1.7E-04	1.3E-05	5.6E-06	2.1E-06																
1.1E-03	8.1E-05	3.6E-05	4.2E-06	1.5E-03									1.7E-05		6.6E-05				
4.8E-04	3.5E-05	1.6E-05	3.8E-06	9.1E-04									3.9E-05	5.7E-06	4.6E-05				
7.9E-04	5.8E-05	2.6E-05		2.2E-03									1.7E-05		8.7E-05				
2.8E-04	2.0E-05	9.2E-06		1.0E-03									1.4E-05		5.3E-05				
3.8E-04	2.7E-05	1.2E-05		1.3E-03									7.3E-06		8.5E-05				
3.9E-04	2.8E-05	1.3E-05																	
3.4E-04	2.5E-05	1.1E-05	2.5E-06																
2.1E-04	1.6E-05	7.0E-06	1.4E-04	2.8E-04						5.5E-06			1.6E-06						
3.0E-04	2.2E-05	1.0E-05																	
2.2E-04	1.6E-05	7.3E-06		6.5E-06															
2.2E-04	1.6E-05	7.1E-06	2.1E-05	4.8E-04									3.1E-06	4.7E-06	6.6E-05				
2.6E-04	4.5E-05	2.1E-05	1.4E-06	5.2E-04									1.3E-05		7.5E-05				
6.3E-03	4.6E-04	2.1E-04	9.7E-04							3.0E-04			5.5E-07		5.2E-04				
9.5E-04	6.9E-05	3.1E-05																	
5.8E-05	4.2E-06	1.9E-06	7.8E-06	3.3E-05									1.5E-05	7.9E-06		1.1E-06			
1.5E-04	1.1E-05	4.9E-06	5.5E-05	5.1E-04									1.2E-05		1.6E-05				
1.4E-04	9.9E-06	4.5E-06	3.8E-05	7.7E-05									2.3E-06		3.9E-06				
1.2E-03	8.4E-05	3.8E-05	4.1E-04	1.3E-03									4.1E-05	5.4E-05					
1.0E-04	7.6E-06	3.4E-06		2.4E-04									6.1E-07		1.7E-04				
1.5E-04	1.1E-05	4.9E-06		2.0E-04									1.2E-06						
4.3E-04	3.1E-05	1.4E-05	1.2E-06	4.6E-04									9.3E-07		3.6E-05				
1.8E-04	1.3E-05	6.0E-06	3.0E-05																
3.1E-04	4.7E-05	2.1E-05		8.7E-04									7.1E-05		4.8E-05		5.1E-05		
1.8E-04	2.4E-05	1.1E-05		2.3E-03									1.8E-04				2.2E-04		
1.3E-04	2.7E-05	1.3E-05	5.2E-06	4.2E-04									2.9E-05		7.8E-06		1.7E-05		
4.4E-04	3.2E-05	1.5E-05	4.7E-06	1.4E-03									2.6E-04		2.3E-05		1.8E-04		
3.4E-04	2.5E-05	1.1E-05	2.5E-06	4.0E-04									1.8E-05		6.2E-05				
4.2E-04	2.8E-05	1.4E-05																	
5.0E-04	3.4E-05	1.7E-05																	
3.5E-04	2.3E-05	1.2E-05																	
3.6E-04	2.4E-05	1.2E-05																	

CCP Assay Data for OR-REDC-CH-HET Lots 1 - 17

Am-243	Pu-242	Cm-245	Cf-249	Eu-154	U-232	U-233	U-234	U-235	U-238	Np-237	Cm-243	Th-232	Co-60	Eu-152	Sb-125	Ra-226	Cs-134	Th-229	Ac-227
4.1E-04	2.7E-05	1.4E-05																	
1.0E-03	6.7E-05	3.4E-05																	
3.9E-04	2.6E-05	1.3E-05																	
3.3E-04	2.2E-05	1.1E-05																	
2.7E-04	1.8E-05	9.0E-06																	
1.0E-04	7.4E-06	3.4E-06		3.3E-04									5.3E-06	3.1E-06					
4.6E-04	3.1E-05	1.5E-05																	
1.4E-04	9.9E-06	4.5E-06	4.2E-06	4.2E-04									6.9E-06	4.2E-06					
7.7E-05	5.6E-06	2.5E-06		2.8E-04					7.1E-05				4.9E-06	4.0E-06					
9.8E-04	6.5E-05	3.3E-05																	
3.6E-04	2.4E-05	1.2E-05																	
4.6E-04	3.1E-05	1.5E-05																	
4.7E-04	3.2E-05	1.6E-05																	
7.5E-04	5.0E-05	2.5E-05																	
2.0E-03	1.3E-04	6.6E-05																	
2.5E-04	1.8E-05	8.1E-06	6.8E-06	7.7E-04	3.5E-06								1.0E-05						
1.8E-04	1.3E-05	5.8E-06		5.4E-04	3.4E-06								8.1E-06	3.4E-06					
2.2E-04	1.6E-05	7.3E-06	7.3E-06	6.8E-04									9.0E-06						
1.6E-03	1.1E-04	5.3E-05																	
4.2E-04	2.8E-05	1.4E-05																	
5.2E-04	3.5E-05	1.7E-05																	
8.6E-05	6.3E-06	2.8E-06	3.2E-06	2.4E-04									2.9E-06						
6.0E-04	4.0E-05	2.0E-05																	
3.5E-04	2.3E-05	1.2E-05																	
4.8E-04	3.2E-05	1.6E-05																	
3.2E-04	2.1E-05	1.1E-05																	
1.0E-04	7.4E-06	3.3E-06	2.9E-06																
2.3E-04	1.6E-05	7.4E-06	6.2E-06	7.7E-04									1.0E-05						
1.3E-04	9.3E-06	4.2E-06	4.3E-06	4.4E-04									5.1E-06						
4.4E-05	3.2E-06	1.5E-06	1.3E-06	1.6E-05	7.5E-06														
2.5E-04	1.8E-05	8.3E-06																	
1.9E-04	1.4E-05	6.3E-06	2.5E-05																
1.3E-03	9.5E-05	4.3E-05	9.5E-04	9.6E-05						3.8E-05									
2.9E-04	2.1E-05	9.7E-06		7.3E-04											8.2E-05				
3.3E-03	2.4E-04	1.1E-04	5.1E-06	1.3E-03									3.6E-06		8.8E-06	2.3E-05			
8.7E-04	6.4E-05	2.9E-05	3.2E-06																
4.9E-02	3.7E-03	1.7E-03	2.9E-03	2.8E-02	1.7E-05	0.0E+00	0.0E+00	0.0E+00	7.1E-05	3.6E-04	0.0E+00	0.0E+00	9.5E-04	2.3E-04	1.9E-03	6.2E-05	4.7E-04	0.0E+00	0.0E+00
7.7E-05	2.6E-07	1.9E-05	4.9E-06	2.3E-04									2.4E-06			3.2E-06			
7.3E-05	2.4E-07	1.8E-05	1.7E-06	1.7E-04	3.3E-06								6.4E-06			1.4E-06			
1.7E-04	5.8E-07	4.4E-05	3.5E-05	2.7E-04	4.2E-06								6.5E-06			3.4E-06			

CCP Assay Data for OR-REDC-CH-HET Lots 1 - 17

Am-243	Pu-242	Cm-245	Cf-249	Eu-154	U-232	U-233	U-234	U-235	U-238	Np-237	Cm-243	Th-232	Co-60	Eu-152	Sb-125	Ra-226	Cs-134	Th-229	Ac-227
9.9E-05	3.3E-07	2.5E-05	1.2E-04	5.3E-05						8.1E-06			1.2E-06	5.2E-06	4.4E-06				
8.7E-05	2.9E-07	2.2E-05	8.2E-06																
5.1E-04	1.7E-06	1.3E-04	1.7E-04	7.2E-04	7.5E-06	0.0E+00	0.0E+00	0.0E+00	0.0E+00	8.1E-06	0.0E+00	0.0E+00	1.7E-05	5.2E-06	4.4E-06	8.0E-06	0.0E+00	0.0E+00	0.0E+00
2.2E-05		1.7E-05	2.4E-04		3.0E-07					4.1E-06						2.3E-07			
2.2E-07	3.5E-07		6.4E-07	1.9E-07						6.0E-08			5.6E-08						
1.4E-06		3.5E-07	2.0E-07	1.2E-07	1.9E-07				6.3E-06	7.6E-06									
1.9E-06	2.6E-06	1.9E-06	9.2E-05	2.3E-07			1.2E-05	2.0E-07	4.8E-06				8.8E-09						
2.4E-06		1.3E-06	2.8E-05	4.7E-08	2.4E-07					6.5E-08			3.1E-09						
3.9E-06	1.1E-05		2.8E-05	2.3E-07	5.2E-07					2.3E-07			1.3E-08						
6.2E-05	4.7E-07	4.9E-06	1.2E-04	6.9E-06	1.4E-06					5.6E-07			1.8E-07			2.4E-07			
7.2E-07	1.7E-07		1.5E-06		2.6E-07				7.4E-07	2.8E-06									
2.0E-06	4.3E-07		1.2E-05		5.8E-08				1.1E-06	1.9E-06									
1.2E-06	4.3E-06	2.9E-06	3.9E-05	7.1E-08	1.3E-07					6.6E-07									
4.0E-05	1.5E-06		7.0E-07		7.0E-07					4.4E-07									
3.4E-07	2.2E-07		2.6E-07		3.4E-08					3.2E-08									
1.6E-05			3.9E-06	1.0E-05	1.0E-07				6.3E-06										
3.2E-07	9.2E-07		2.5E-08	3.6E-08	9.3E-08					4.3E-08									
1.3E-07	3.4E-07		5.4E-08	1.5E-08	8.7E-08					1.1E-07			6.3E-09						
3.3E-07	8.2E-07		2.0E-06	1.7E-08	6.0E-08					3.6E-08									
4.8E-06	1.8E-08		1.7E-06	5.3E-08	6.3E-08				1.0E-06	3.4E-07			4.8E-08						
9.4E-07	1.6E-06		3.0E-06	1.4E-07	5.8E-07				2.4E-06	4.3E-07			7.4E-09						
1.6E-06		1.6E-06	8.0E-05	3.2E-08															
1.3E-06	5.2E-07		7.2E-08		3.1E-08		1.9E-06	3.3E-08	1.3E-06	4.6E-08									
1.1E-05	8.3E-07	1.2E-06	5.7E-06	7.0E-08	8.3E-08					3.9E-07									
1.3E-05		1.8E-06	2.1E-05	1.0E-06	2.8E-07					2.6E-07			8.5E-09						
1.5E-04			9.6E-06	6.6E-08	7.8E-08					8.6E-06			6.7E-08						
6.0E-07	1.3E-06		3.4E-07	1.8E-08	4.3E-08					1.7E-06			1.8E-08			1.4E-08			
1.9E-06	2.8E-06		2.6E-07							1.5E-07									
1.3E-07	9.8E-07		6.6E-08							1.7E-07									
5.6E-07	1.6E-06		2.7E-07	2.2E-08	1.6E-08				1.9E-06	7.3E-07									
	1.1E-05		1.0E-05	6.6E-06	4.1E-07					2.4E-06			1.2E-07						
2.7E-05	6.7E-06		1.1E-06		4.0E-08				2.6E-06	1.3E-06									
2.5E-06	1.6E-05		1.4E-06	2.2E-07						3.9E-07									
	2.2E-06		5.4E-08	1.8E-08					6.1E-06	6.7E-07			6.1E-09						
1.8E-06	3.9E-05		1.3E-07		6.7E-07					3.6E-07									
2.2E-06	1.3E-06		5.5E-07	2.0E-08	1.5E-07					6.0E-07			7.0E-09						
1.9E-05	2.5E-05		1.2E-06	2.2E-06	4.3E-05					2.4E-05									
	6.4E-06				4.1E-06	1.0E-03				8.7E-07									
5.0E-07	6.3E-06				1.9E-06	3.5E-04				3.3E-07			8.1E-09						
2.0E-06	3.6E-06	1.8E-05	6.5E-07		2.9E-06					1.0E-07									

CCP Assay Data for OR-REDC-CH-HET Lots 1 - 17

Am-243	Pu-242	Cm-245	Cf-249	Eu-154	U-232	U-233	U-234	U-235	U-238	Np-237	Cm-243	Th-232	Co-60	Eu-152	Sb-125	Ra-226	Cs-134	Th-229	Ac-227
4.9E-05	4.6E-09		5.3E-07	1.9E-05	9.9E-07		2.6E-06						2.7E-07			6.8E-08			
1.6E-07	9.5E-10						5.5E-07												
3.0E-06	7.7E-07		9.1E-07	2.2E-08	1.3E-06					1.4E-07									
7.9E-06			4.9E-04		3.1E-07														
6.2E-07	2.8E-06		5.8E-07	2.8E-08	8.5E-08				2.6E-06	3.5E-07									
8.2E-06	3.5E-06		8.7E-04	6.6E-07						1.3E-06			2.0E-08						
1.2E-05			1.7E-03		1.5E-06				9.8E-06										
			7.1E-04	6.8E-08					7.9E-06										
8.4E-07	1.2E-04		8.6E-08	2.7E-08	7.0E-08				5.6E-07	1.7E-07									
4.8E-06	1.7E-05	8.0E-06	1.9E-06						2.0E-06	9.7E-07			1.6E-08						
1.5E-04	6.9E-06		7.1E-04	1.4E-06	1.4E-07		3.7E-04	7.9E-06											
3.7E-05	2.4E-06		9.2E-06	2.6E-06	6.4E-07		9.7E-05	1.7E-06	9.4E-05	7.4E-07			1.4E-06						
8.9E-07	1.4E-06		3.6E-07							1.4E-07									
3.8E-06	5.1E-06		4.4E-06	1.7E-07	1.9E-06					3.8E-07									
2.6E-07	4.4E-07		1.9E-08							5.8E-08									
			1.1E-04		3.4E-08														
	1.8E-07		2.2E-08																
	1.6E-05		3.7E-09	1.9E-08	4.6E-07					5.1E-07									
2.2E-07	1.6E-06		5.3E-08			2.8E-04				1.6E-07									
1.5E-06	6.0E-05		2.8E-06	2.9E-07	1.5E-07	6.8E-04			1.8E-05	2.7E-06									
6.8E-04	3.8E-04	5.8E-05	5.3E-03	5.2E-05	6.6E-05	2.3E-03	4.8E-04	9.8E-06	1.7E-04	7.0E-05	0.0E+00	0.0E+00	2.3E-06	0.0E+00	0.0E+00	5.5E-07	0.0E+00	0.0E+00	0.0E+00
1.8E-01	4.3E-02	2.4E-02	2.4E-02	3.1E-02	3.7E-03	2.3E-03	1.1E-03	2.2E-05	2.4E-04	1.2E-03	0.0E+00	0.0E+00	1.2E-03	3.8E-04	2.1E-03	6.2E-04	4.7E-04	1.3E-05	2.2E-04
0.06%	0.01%	0.01%	0.01%	0.01%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%

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Attachment 3 - Acceptable Knowledge Source Document Summary

Site(s): Oak Ridge National Laboratory	Source Document Tracking Number: DR047
Waste Stream Number(s): ORNL Non-specific Library Files (Applicable only when site library is not in use)	
Acceptable Knowledge Documentation Type: ☐ TRU Waste Management Program Information ☑ Waste Stream-Specific Information ☑ Additional Information	*Category:* ☐ Correspondence ☑ Discrepancy Resolution ☐ Internal Procedure ☐ Miscellaneous ☐ Published Document or Internal Procedure ☐ Unpublished Documents
Title or Description of Source Document [a]: Discrepancy Resolution, re: Ac-227 Measured by Assay	
Source Document Reference Information (author(s), document and revision number, date, publisher): Jeff Harrison, DR047, NA, 04/14/2015, CCP	

AK # [b]	Source Doc. Page # [c]	AK Information Summary
WS2, WS3, WS11, S9	Throughout	Nature of Discrepancy: Shipping lot 5 for waste stream OR-GENR-CH-HET includes six drums with measured Ac-227, which is not identified in AK as expected present. An evaluation of the NDA data for these drums (which are attached to the SD) indicates Ac-227 contributes to 95% of the hazard in three of the six drums (X10C9311425A, X10C9311287A, and X10C0101599A). Resolution: Ac-227 is in the natural U-235 decay series. If Ac-227 were present from U-235 decay, the two isotopes would be present in close to equal activities as they are in secular equilibrium. NDA did not measure U-235 in any of these drums, so the Ac-227 would not be attributable to U-235 decay. For the three drums where Ac-227 contributes to 95% of the hazard (X10C9311425A, X10C9311287A, and X10C0101599A), the generator paperwork for the parent drums does not identify the presence of Ac-227. X10C9311425 was generated in September 1971, X10C9311287 was generated in January 1975, and X10C0101599 was generated in April 2005 (M165). Based on the variation in generation dates, the use of Ac-227 would not be associated with any one R&D activity in Building 5505. Numerous source documents cited in CCP-AK-ORNL-006 describing historical operations were reviewed, and none of them described Ac-227 use. A Safety Analysis Report for the Transuranium Research Laboratory identified Ac-227 as anticipated in the facility as experimental samples, but does not describe the specific use of this isotope (P1251). Ac-227 will be added to Table 5-2 in CCP-AK-ORNL-006 as expected present.

COPY

CCP RECORDS ORIGINAL
DATE RECD 4/7/2016

Attachment 3 - Acceptable Knowledge Source Document Summary (continued)

Site(s): Oak Ridge National Laboratory	Source Document Tracking Number: DR047

Source Document Data Limitations (if any):

1. None.

Acceptable Knowlege Expert:

Travis Smith _____ Date: 04/15/2015
Print /Sign

[a] Provide description for non-titled information (i.e., container paperwork, MSDS sheets, etc)
[b] Obtain from Acceptable Knowledge Documentation Checklist
[c] *For microfilm or microfiche, identify box, tape, reel number and location.*

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Not part of page count

Attachment 11 - Acceptable Knowledge Source Document Discrepancy Resolution

Waste Stream Number(s): OR-GENR-CH-HET

Waste Stream Description: Heterogeneous debris waste from general research and development operations at ORNL

AK Source Document Discrepancy Form Tracking Number: **DR047**

Tracking #	Title	Document/Rev#	Author	Date	Page #
N/A	Radioassay Data for X10C9311425A	OR-MILCC2-0058	K. Meyer	7/28/14	X10C9311425A
N/A	Radioassay Data for X10C9311287A	OR-MILCC2-0071	K. Meyer	8/22/14	X10C9311287A
N/A	Radioassay Data for X10C0101599A	OR-MILCC2-0075	K. Meyer	8/29/14	X10C0101599A
N/A	Central Characterization Program Acceptable Knowledge Summary Report For Oak Ridge National Laboratory General Research and Development Contact-Handled Transuranic Waste	CCP-AK-ORNL-006, Revision 2	CCP	4/21/14	28, 29
M165	UCN-2109 and UCN-2822 Forms and Associated Container Paperwork for Building 5505	N/A	ORNL	Various	X10C9311425A, X10C9311287A, X10C0101599A
P1251	The ORNL Transuranium Research Laboratory Description and Safety Analysis	ORNL/CF-84/85	C. Haynes, et. al.	3/28/84	18, 111

Nature of Discrepancy: Shipping lot 5 for waste stream OR-GENR-CH-HET includes six drums with measured Ac-227 which is not identified in AK as expected present. An evaluation of the NDA data for these drums (see attached) indicates Ac-227 contributes to 95% of the hazard in three of the six drums (X10C9311425A, X10C9311287A, and X10C0101599A).

Resolution: Ac-227 is in the natural U-235 decay series. If Ac-227 were present from U-235 decay, the two isotopes would be present in close to equal activities as they are in secular equilibrium. NDA did not measure U-235 in any of these drums so the Ac-227 would not be attributable to U-235 decay.

For the three drums where Ac-227 contributes to 95% of the hazard (X10C9311425A, X10C9311287A, and X10C0101599A), the generator paperwork for the parent drums does not identify the presence of Ac-227. X10C9311425 was generated in September 1971, X10C9311287 was generated in January 1975, and X10C0101599 was generated in April 2005 (M165). Based on the variation in generation dates, the use of Ac-227 would not be associated with any one R&D activity in Building 5505. Numerous source documents cited in CCP-AK-ORNL-006 describing historical operations were reviewed, and none of them described Ac-227 use. A Safety Analysis Report for the Transuranium Research Laboratory identified Ac-227 as anticipated in the facility as experimental samples but does not describe the specific use of this isotope (P1251). Ac-227 will be added to Table 5-2 in CCP-AK-ORNL-006 as expected present.

CCP RECORDS ORIGINAL
DATE REC'D 4/7/2014 JY

Discrepancy Resolved: ☒ Yes ☐ No

Acceptable Knowledge Expert: Jeff Harrison (Print) Jeff Harrison (Sign) Date: 4/14/15

Site Project Manager: Beverly Schrock (Print) BSSchrock (Sign) Date: 4/14/15

Mass (g)

CONTAINERID	SR-90	CS-137	AC-227	U-238	NP-237	PU-238	PU-239	AM-241	AM-243	CM-243	CM-244	CM-245	CF-249	Sum
X10C9311756A	4.01E-07	6.37E-07	1.43E-07	1.63E+01	1.43E-03	1.09E-01	1.87E-01	8.04E-04	1.86E-05					1.66E+01
X10C0102697H	7.04E-10	1.12E-09	1.91E-07					9.20E-04	3.26E-04	1.09E-07			1.63E-04	1.41E-03
X10C9311287A	9.51E-09	1.51E-08	4.05E-07		6.61E-02			5.69E-04	5.13E-03	1.17E-05			1.12E-04	7.19E-02
X10C9312197B	2.11E-06	3.35E-06	8.31E-07		8.51E-02		4.20E-01	3.52E-03	1.27E-03	6.55E-06	2.50E-03	7.05E-05	5.10E-05	5.13E-01
X10C9311425A	1.50E-08	2.38E-08	7.63E-06		1.53E-02		1.04E+00	1.31E-02	1.08E-02	2.56E-05			3.11E-07	1.08E+00
X10C0101599A	6.61E-06	1.05E-05	1.08E-05		2.28E-01			4.09E-03	8.38E-02	2.39E-04			3.76E-03	3.20E-01
Ci/g	1.38E+02	8.69E+01	7.23E+01	3.36E-07	7.05E-04	1.71E+01	6.20E-02	3.43E+00	2.00E-01	4.90E+01	8.14E+01	1.72E-01	4.09E+00	

Wt%

CONTAINERID	SR-90	CS-137	AC-227	U-238	NP-237	PU-238	PU-239	AM-241	AM-243	CM-243	CM-244	CM-245	CF-249	Sum
X10C9311756A	0.00%	0.00%	0.00%	98.20%	0.01%	0.66%	1.13%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	100.00%
X10C0102697H	0.00%	0.00%	0.01%	0.00%	0.00%	0.00%	0.00%	65.28%	23.13%	0.01%	0.00%	0.00%	11.57%	100.00%
X10C9311287A	0.00%	0.00%	0.00%	0.00%	91.90%	0.00%	0.00%	0.79%	7.13%	0.02%	0.00%	0.00%	0.16%	100.00%
X10C9312197B	0.00%	0.00%	0.00%	0.00%	16.60%	0.00%	81.95%	0.69%	0.25%	0.00%	0.49%	0.01%	0.01%	100.00%
X10C9311425A	0.00%	0.00%	0.00%	0.00%	1.42%	0.00%	96.36%	1.21%	1.00%	0.00%	0.00%	0.00%	0.00%	100.00%
X10C0101599A	0.00%	0.00%	0.00%	0.00%	71.27%	0.00%	0.00%	1.28%	26.19%	0.07%	0.00%	0.00%	1.18%	100.00%

Activity (Ci)

CONTAINERID	SR-90	CS-137	AC-227	U-238	NP-237	PU-238	PU-239	AM-241	AM-243	CM-243	CM-244	CM-245	CF-249	Sum
X10C9311756A	5.53E-05	5.54E-05	1.03E-05	5.48E-06	1.01E-06	1.86E+00	1.16E-02	2.76E-03	3.72E-06	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.88E+00
X10C0102697H	9.72E-08	9.73E-08	1.38E-05	0.00E+00	0.00E+00	0.00E+00	0.00E+00	3.16E-03	6.52E-05	5.34E-06	0.00E+00	0.00E+00	6.67E-04	3.91E-03
X10C9311287A	1.31E-06	1.31E-06	2.93E-05	0.00E+00	4.66E-05	0.00E+00	0.00E+00	1.95E-03	1.03E-03	5.73E-04	0.00E+00	0.00E+00	4.58E-04	4.09E-03
X10C9312197B	2.91E-04	2.91E-04	6.01E-05	0.00E+00	6.00E-05	0.00E+00	2.60E-02	1.21E-02	2.54E-04	3.21E-04	2.04E-01	1.21E-05	2.09E-04	2.43E-01
X10C9311425A	2.07E-06	2.07E-06	5.52E-04	0.00E+00	1.08E-05	0.00E+00	6.45E-02	4.49E-02	2.16E-03	1.25E-03	0.00E+00	0.00E+00	1.27E-06	1.13E-01
X10C0101599A	9.12E-04	9.12E-04	7.81E-04	0.00E+00	1.61E-04	0.00E+00	0.00E+00	1.40E-02	1.68E-02	1.17E-02	0.00E+00	0.00E+00	1.54E-02	6.06E-02
A2 Ci	8.1	16	2.40E-03	1.00E+99	5.40E-02	2.70E-02	2.70E-02	2.70E-02	2.70E-02	2.70E-02	5.40E-02	2.40E-02	2.20E-02	

Ci%

CONTAINERID	SR-90	CS-137	AC-227	U-238	NP-237	PU-238	PU-239	AM-241	AM-243	CM-243	CM-244	CM-245	CF-249	Sum
X10C9311756A	0.00%	0.00%	0.00%	0.00%	0.00%	99.23%	0.62%	0.15%	0.00%	0.00%	0.00%	0.00%	0.00%	100.00%
X10C0102697H	0.00%	0.00%	0.35%	0.00%	0.00%	0.00%	0.00%	80.77%	1.67%	0.14%	0.00%	0.00%	17.06%	100.00%
X10C9311287A	0.03%	0.03%	0.72%	0.00%	1.14%	0.00%	0.00%	47.75%	25.10%	14.03%	0.00%	0.00%	11.21%	100.00%
X10C9312197B	0.12%	0.12%	0.02%	0.00%	0.02%	0.00%	10.71%	4.97%	0.10%	0.13%	83.71%	0.00%	0.09%	100.00%
X10C9311425A	0.00%	0.00%	0.49%	0.00%	0.01%	0.00%	56.86%	39.63%	1.90%	1.11%	0.00%	0.00%	0.00%	100.00%
X10C0101599A	1.50%	1.50%	1.29%	0.00%	0.27%	0.00%	0.00%	23.13%	27.64%	19.31%	0.00%	0.00%	25.36%	100.00%

A2

CONTAINERID	SR-90	CS-137	AC-227	U-238	NP-237	PU-238	PU-239	AM-241	AM-243	CM-243	CM-244	CM-245	CF-249	Sum
X10C9311756A	6.83E-06	3.46E-06	4.31E-03	5.48E-105	1.87E-05	6.90E+01	4.29E-01	1.02E-01	1.38E-04	0.00E+00	0.00E+00	0.00E+00	0.00E+00	**6.96E+01**
X10C0102697H	1.20E-08	6.08E-09	5.75E-03	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.17E-01	2.41E-03	1.98E-04	0.00E+00	0.00E+00	3.03E-02	**1.56E-01**
X10C9311287A	1.62E-07	8.20E-08	1.22E-02	0.00E+00	8.63E-04	0.00E+00	0.00E+00	7.23E-02	3.80E-02	2.12E-02	0.00E+00	0.00E+00	2.08E-02	**1.65E-01**
X10C9312197B	3.59E-05	1.82E-05	2.50E-02	0.00E+00	1.11E-03	0.00E+00	9.64E-01	4.47E-01	9.41E-03	1.19E-02	3.77E+00	5.05E-04	9.48E-03	**5.24E+00**
X10C9311425A	2.56E-07	1.29E-07	2.30E-01	0.00E+00	2.00E-04	0.00E+00	2.39E+00	1.66E+00	8.00E-02	4.65E-02	0.00E+00	0.00E+00	5.78E-05	**4.41E+00**
X10C0101599A	1.13E-04	5.70E-05	3.25E-01	0.00E+00	2.98E-03	0.00E+00	0.00E+00	5.20E-01	6.21E-01	4.34E-01	0.00E+00	0.00E+00	6.99E-01	**2.60E+00**

A2%

CONTAINERID	SR-90	CS-137	AC-227	U-238	NP-237	PU-238	PU-239	AM-241	AM-243	CM-243	CM-244	CM-245	CF-249	95%
X10C9311756A	0.00%	0.00%	0.01%	0.00%	0.00%	99.23%	0.62%	0.15%	0.00%	0.00%	0.00%	0.00%	0.00%	**99.23%**
X10C0102697H	0.00%	0.00%	3.70%	0.00%	0.00%	0.00%	0.00%	75.14%	1.55%	0.13%	0.00%	0.00%	19.48%	**96.17%**
X10C9311287A	0.00%	0.00%	7.38%	0.00%	0.52%	0.00%	0.00%	43.70%	22.97%	12.84%	0.00%	0.00%	12.59%	**99.48%**
X10C9312197B	0.00%	0.00%	0.48%	0.00%	0.02%	0.00%	18.41%	8.54%	0.18%	0.23%	71.95%	0.01%	0.18%	**98.90%**
X10C9311425A	0.00%	0.00%	5.21%	0.00%	0.00%	0.00%	54.17%	37.75%	1.81%	1.05%	0.00%	0.00%	0.00%	**97.13%**
X10C0101599A	0.00%	0.00%	12.51%	0.00%	0.11%	0.00%	0.00%	19.97%	23.86%	16.67%	0.00%	0.00%	26.87%	**99.88%**

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Attachment 3 - Acceptable Knowledge Source Document Summary

Site(s): Oak Ridge National Laboratory	Source Document Tracking Number: DR046

Waste Stream Number(s): ORNL Non-specific Library Files
(Applicable only when site library is not in use)

Acceptable Knowledge Documentation Type:	Category:
☐ TRU Waste Management Program Information	☐ Correspondence
☑ Waste Stream-Specific Information	☑ Discrepancy Resolution
☐ Additional Information	☐ Internal Procedure
	☐ Miscellaneous
	☐ Published Document or Internal Procedure
	☐ Unpublished Documents

Title or Description of Source Document [a]: Discrepancy Resolution, re: Radionuclides in X10C9311325B

Source Document Reference Information (author(s), document and revision number, date, publisher): Jeff Harrison, DR046, NA, 04/06/2015, CCP

AK # [b]	Source Doc. Page #[c]	AK Information Summary
WS11	1	Nature of Discrepancy: Ac-227, Ra-226, and Cm-245 were found in drums, but not identified in the AK as expected present. Resolution: An evaluation of the NDA data for the drums indicates Ra-226 and Cm-245 do not contribute to 95% of the hazard in any of the drums. The Ac-227 is not attributable to U-235 decay because U-235 was not measured in container X10C9311325B. The AK paperwork does not identify Ac-227 use. Ac-227 will be added to Table 5-2 in CCP-AK-ORNL-004 as expected present even though a source for this isotope has not been determined.

Source Document Data Limitations (if any):

1. None.

COPY

Acceptable Knowlege Expert:

Travis Smith _____ Date: 04/07/2015
Print /Sign

[a] Provide description for non-titled information (i.e., container paperwork, MSDS sheets, etc)
[b] Obtain from Acceptable Knowledge Documentation Checklist
[c] For microfilm or microfiche, identify box, tape, reel number and location.

CCP RECORDS ORIGINAL
DATE REC'D 6/10/2015
EPF

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Attachment 11 - Acceptable Knowledge Source Document Discrepancy Resolution

Waste Stream Number(s): OR-RF-CH-HET

Waste Stream Description: ORNL Reactor Fuels Research & Development CH-TRU Debris Waste

AK Source Document Discrepancy Form Tracking Number: **DR046**

Tracking #	Title	Document/Rev#	Author	Date	Page #
N/A	Radioassay Data for X10C9311325B	OR-MILCC2-0053	R.N. Ceo	7/24/14	X10C9311325B
N/A	Central Characterization Program Acceptable Knowledge Summary Report For Oak Ridge National Laboratory Reactor Fuels Research & Development Contact-Handled Transuranic Waste	CCP-AK-ORNL-004, Revision 2	CCP	4/23/14	27
M141	UCN-2109 and UCN-2822 Forms and Associated Container Paperwork for Buildings 3019-A and 4508	N/A	ORNL	Various	X10C9311325

Nature of Discrepancy: Shipping lot 15 for waste stream OR-RF-CH-HET includes several drums with Ac-227, Ra-226, and Cm-245 not identified in AK as expected present. An evaluation of the NDA data for these drums indicates Ra-226 and Cm-245 do not contribute to 95% of the hazard in any of these drums. However, the Ac-227 in X10C9311325B (see OR-MILCC2-0053) does contribute to 95% of the hazard in this drum (see attached evaluation).

Resolution: Ac-227 is in the natural U-235 decay series. If Ac-227 were present from U-235 decay, the two isotopes would be present in close to equal activities as they are in secular equilibrium. NDA measured 2.26E-03 Ci of Ac-227 but did not measure U-235 was not measured in X10C9311325B. 2.26E-03 Ci of U-235 is equivalent to more than one kg of U-235 so the Ac-227 would not be attributable to U-235 decay.

The generator paperwork for parent drum X10C9311325 does not identify the presence of Ac-227. The paperwork identifies U-233 (116 grams) as the principle isotope in this waste, and that the waste was generated in October 1975 in the Building 3019-A basement from Bettis Atomic Power Laboratory (BAPL) reprocessing (M141). Source documents cited in CCP-AK-ORNL-004 pertaining to BAPL reprocessing were reviewed which did not identify Ac-227 use. Other documents cited in CCP-AK-ORNL-004 describing historical operations were also reviewed which did not identify Ac-227 use. Ac-227 will be added to Table 5-2 in CCP-AK-ORNL-004 as expected present even though a source for this isotope has not been determined.

Discrepancy Resolved: ☒ Yes ☐ No

Acceptable Knowledge Expert: Jeff Harrison (Print) / Jeff Harrison (Sign) Date: 4/3/15

Site Project Manager: Beverly Schrock (Print) / BS Schrock (Sign) Date: 4-6-15

CCP RECORDS ORIGINAL
DATE REC'D 6/10/2015
TPF

		Mass (g)										
CONTAINERID	NDABDR	SR-90	CS-137	RA-226	AC-227	TH-229	TH-232	U-232	U-233	U-234	U-235	U-238
X10C9311325B	OR-MILCC2-0053	1.73E-06	2.75E-06		3.12E-05							
X10C9311316B	OR-MILCC2-0103	3.42E-09	5.43E-09	1.37E-07								1.18E+02
X10C9400104A	OR-MILCC2-0051	4.63E-08	7.35E-08	4.52E-07		7.54E-05	5.10E+00			4.87E-02	3.04E+00	
X10C9311124A	OR-MILCC2-0127	1.05E-08	1.66E-08	4.98E-07						3.74E-02	2.34E+00	
X10C9311232A	OR-MILCC2-0128	4.60E-09	7.31E-09	7.91E-07								
X10C0501747A	OR-MILCC2-0137	2.00E-08	3.18E-08	8.13E-07					3.01E-01	3.67E-03		
X10C9311417A	OR-MILCC2-0118			9.02E-07								
X10C9311316A	OR-MILCC2-0103	6.59E-09	1.05E-08	9.40E-07								
X10C9311254A	OR-MILCC2-0053	4.31E-08	6.84E-08	2.79E-06				5.12E-05	1.09E+01	1.33E-01		
X10C9400044G1	OR-MILCC2-0102	4.58E-07	7.27E-07	3.21E-06								
X10C9311481A	OR-MILCC2-0105	9.52E-08	1.51E-07	3.25E-06						5.32E-02	3.33E+00	
X10C0402989FD	OR-MILCC2-0108	9.72E-09	1.54E-08									
X10C9312810A	OR-MILCC2-0077	2.79E-09	4.42E-09							6.97E-02	4.35E+00	
X10C9312537A	OR-MILCC2-0077	1.07E-09	1.69E-09									1.46E+01
X10C9312220A	OR-MILCC2-0075	5.23E-08	8.31E-08						9.11E-01	1.13E-02		1.80E+02
X10C9311711A	OR-MILCC2-0075	1.87E-08	2.97E-08						2.84E+00	3.52E-02		
	CI/g	**138**	**86.9**	**0.989**	**72.3**	**0.213**	**1.10E-07**	**22.1**	**9.63E-03**	**6.22E-03**	**2.16E-06**	**3.36E-07**

CONTAINERID	NP-237	PU-238	PU-239	PU-240	PU-241	PU-242	AM-241	AM-243	CM-243	CM-244	CM-245	CF-249	
X10C9311325B	5.46E-02						3.94E-03						**5.86E-02**
X10C9311316B		4.20E-05	4.64E-02	6.30E-03	1.48E-04	1.07E-04	1.57E-04	6.04E-06				6.68E-08	**1.18E+02**
X10C9400104A	3.63E-03	2.23E-03	3.03E+00	2.35E-01	4.90E-03	1.72E-03	3.79E-02	3.09E-05					**1.15E+01**
X10C9311124A	1.09E-02	6.87E-03	1.24E+01	1.47E+00	3.62E-02	1.59E-02	2.07E-01					2.34E-07	**1.65E+01**
X10C9311232A	1.16E-02	2.63E-03	6.66E+00	1.37E+00	3.08E-02	3.32E-02	1.97E-01						**8.31E+00**
X10C0501747A	9.29E-04	1.35E-03	1.33E+00	1.40E-01	4.02E-03	9.50E-04	1.61E-02	1.48E-05	9.14E-08			6.39E-07	**1.80E+00**
X10C9311417A	1.60E-02	9.75E-03	2.46E+01	2.07E+00	4.41E-02	1.41E-02	2.76E-01	1.30E-04					**2.70E+01**
X10C9311316A	2.25E-03	9.44E-04	1.69E+00	2.02E-01	4.89E-03	1.93E-03	1.98E-02	2.49E-04				1.27E-06	**1.92E+00**
X10C9311254A					1.38E-01		1.42E-01	7.06E-05					**1.13E+01**
X10C9400044G1	8.67E-02						7.61E-01	4.67E-04			9.29E-05	7.14E-07	**8.48E-01**
X10C9311481A	5.14E-03	2.15E-03	5.92E+00	6.67E-01	1.01E-02	5.30E-03	7.69E-02	2.31E-05	5.12E-08			4.25E-07	**1.01E+01**
X10C0402989FD	5.82E-03	1.25E-04	6.04E-02	6.72E-03	1.69E-04	1.94E-04	1.75E-03	6.08E-05			3.56E-06	2.94E-07	**7.52E-02**
X10C9312810A	1.25E-03	2.79E-04	1.52E+00	1.18E-01	1.47E-03	7.39E-04	1.46E-02	2.11E-05	3.05E-08		6.40E-06	4.38E-08	**6.08E+00**
X10C9312537A	7.49E-04						2.02E-03	7.23E-04	1.41E-06	1.99E-04	3.36E-05	5.46E-05	**1.46E+01**
X10C9312220A	1.96E-02	5.12E-02	8.98E+01	8.29E+00	1.26E-01	4.78E-02	7.46E-01	7.47E-04	2.29E-06		1.43E-04	7.91E-07	**2.80E+02**
X10C9311711A	2.40E-03						1.77E-03	5.65E-03		3.73E-02	1.46E-03	6.74E-07	**2.92E+00**
	7.05E-04	**1.71E+01**	**6.20E-02**	**2.27E-01**	**1.03E+02**	**3.95E-03**	**3.43E+00**	**2.00E-01**	**4.90E+01**	**8.14E+01**	**1.72E-01**	**4.09E+00**	**Max**

Wt%

CONTAINERID	SR-90	CS-137	RA-226	AC-227	TH-229	TH-232	U-232	U-233	U-234	U-235	U-238	NP-237	PU-238	PU-239	PU-240	PU-241
X10C9311325B	0.00%	0.00%	0.00%	0.05%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	93.21%	0.00%	0.00%	0.00%	0.00%
X10C9311316B	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	99.95%	0.00%	0.00%	0.04%	0.01%	0.00%
X10C9400104A	0.00%	0.00%	0.00%	0.00%	0.00%	44.33%	0.00%	0.00%	0.42%	26.43%	0.00%	0.03%	0.02%	26.34%	2.04%	0.04%
X10C9311124A	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.23%	14.16%	0.00%	0.07%	0.04%	75.04%	8.90%	0.22%
X10C9311232A	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.14%	0.03%	80.19%	16.50%	0.37%
X10C0501747A	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	16.74%	0.20%	0.00%	0.00%	0.05%	0.08%	73.97%	7.79%	0.22%
X10C9311417A	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.06%	0.04%	91.01%	7.66%	0.16%
X10C9311316A	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.12%	0.05%	87.93%	10.51%	0.25%
X10C9311254A	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	96.35%	1.18%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	1.22%
X10C9400044G1	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	10.22%	0.00%	0.00%	0.00%	0.00%
X10C9311481A	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.53%	33.07%	0.00%	0.05%	0.02%	58.79%	6.62%	0.10%
X10C0402989FD	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	7.73%	0.17%	80.27%	8.93%	0.22%
X10C9312810A	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	1.15%	71.59%	0.00%	0.02%	0.00%	25.02%	1.94%	0.02%
X10C9312537A	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	99.97%	0.01%	0.00%	0.00%	0.00%	0.00%
X10C9312220A	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.33%	0.00%	0.00%	64.28%	0.01%	0.02%	32.07%	2.96%	0.04%
X10C9311711A	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	97.13%	1.20%	0.00%	0.00%	0.08%	0.00%	0.00%	0.00%	0.00%
	0.00%	**0.00%**	**0.00%**	**0.05%**	**0.00%**	**44.33%**	**0.00%**	**97.13%**	**1.20%**	**71.59%**	**99.97%**	**93.21%**	**0.17%**	**91.01%**	**16.50%**	**1.22%**

CONTAINERID	PU-242	AM-241	AM-243	CM-243	CM-244	CM-245	CF-249
X10C9311325B	0.00%	6.73%	0.00%	0.00%	0.00%	0.00%	0.00%
X10C9311316B	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
X10C9400104A	0.01%	0.33%	0.00%	0.00%	0.00%	0.00%	0.00%
X10C9311124A	0.10%	1.25%	0.00%	0.00%	0.00%	0.00%	0.00%
X10C9311232A	0.40%	2.37%	0.00%	0.00%	0.00%	0.00%	0.00%
X10C0501747A	0.05%	0.90%	0.00%	0.00%	0.00%	0.00%	0.00%
X10C9311417A	0.05%	1.02%	0.00%	0.00%	0.00%	0.00%	0.00%
X10C9311316A	0.10%	1.03%	0.01%	0.00%	0.00%	0.00%	0.00%
X10C9311254A	0.00%	1.26%	0.00%	0.00%	0.00%	0.00%	0.00%
X10C9400044G1	0.00%	89.71%	0.06%	0.00%	0.00%	0.01%	0.00%
X10C9311481A	0.05%	0.76%	0.00%	0.00%	0.00%	0.00%	0.00%
X10C0402989FD	0.26%	2.33%	0.08%	0.00%	0.00%	0.00%	0.00%
X10C9312810A	0.01%	0.24%	0.00%	0.00%	0.00%	0.00%	0.00%
X10C9312537A	0.00%	0.01%	0.00%	0.00%	0.00%	0.00%	0.00%
X10C9312220A	0.02%	0.27%	0.00%	0.00%	0.00%	0.00%	0.00%
X10C9311711A	0.00%	0.06%	0.19%	0.00%	1.28%	0.05%	0.00%
	0.40%	**89.71%**	**0.19%**	**0.00%**	**1.28%**	**0.05%**	**0.00%**

		Activity (Ci)											
CONTAINERID		SR-90	CS-137	RA-226	AC-227	TH-229	TH-232	U-232	U-233	U-234	U-235	U-238	NP-237
X10C9311325B		2.39E-04	2.39E-04	0.00E+00	2.26E-03	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	3.85E-05
X10C9311316B		4.72E-07	4.72E-07	1.35E-07	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	3.96E-05	0.00E+00
X10C9400104A		6.39E-06	6.39E-06	4.47E-07	0.00E+00	1.61E-05	5.61E-07	0.00E+00	0.00E+00	3.03E-04	6.57E-06	0.00E+00	2.56E-06
X10C9311124A		1.45E-06	1.44E-06	4.93E-07	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	2.33E-04	5.05E-06	0.00E+00	7.68E-06
X10C9311232A		6.35E-07	6.35E-07	7.82E-07	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	8.18E-06
X10C0501747A		2.76E-06	2.76E-06	8.04E-07	0.00E+00	0.00E+00	0.00E+00	0.00E+00	2.90E-03	2.28E-05	0.00E+00	0.00E+00	6.55E-07
X10C9311417A		0.00E+00	0.00E+00	8.92E-07	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.13E-05
X10C9311316A		9.09E-07	9.12E-07	9.30E-07	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.59E-06
X10C9311254A		5.95E-06	5.94E-06	2.76E-06	0.00E+00	0.00E+00	0.00E+00	1.13E-03	1.05E-01	8.27E-04	0.00E+00	0.00E+00	0.00E+00
X10C9400044G1		6.32E-05	6.32E-05	3.17E-06	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	6.11E-05
X10C9311481A		1.31E-05	1.31E-05	3.21E-06	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	3.31E-04	7.19E-06	0.00E+00	3.62E-06
X10C0402989FD		1.34E-06	1.34E-06	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	4.10E-06
X10C9312810A		3.85E-07	3.84E-07	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	4.34E-04	9.40E-06	0.00E+00	8.81E-07
X10C9312537A		1.48E-07	1.47E-07	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	4.91E-06	5.28E-07
X10C9312220A		7.22E-06	7.22E-06	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	8.77E-03	7.03E-05	0.00E+00	6.05E-05	1.38E-05
X10C9311711A		2.58E-06	2.58E-06	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	2.73E-02	2.19E-04	0.00E+00	0.00E+00	1.69E-06
	A2 Ci	**8.1**	**16**	**8.10E-02**	**2.40E-03**	**1.40E-02**	**1.00E+99**	**1.90E-01**	**5.40E-01**	**5.40E-01**	**1.00E+99**	**1.00E+99**	**5.40E-02**

CONTAINERID	PU-238	PU-239	PU-240	PU-241	PU-242	AM-241	AM-243	CM-243	CM-244	CM-245	CF-249	
X10C9311325B	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.35E-02	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	**1.63E-02**
X10C9311316B	7.18E-04	2.88E-03	1.43E-03	1.52E-02	4.23E-07	5.39E-04	1.21E-06	0.00E+00	0.00E+00	0.00E+00	2.73E-07	**2.09E-02**
X10C9400104A	3.81E-02	1.88E-01	5.33E-02	5.05E-01	6.79E-06	1.30E-01	6.18E-06	0.00E+00	0.00E+00	0.00E+00	0.00E+00	**9.14E-01**
X10C9311124A	1.17E-01	7.69E-01	3.34E-01	3.73E+00	6.28E-05	7.10E-01	0.00E+00	0.00E+00	0.00E+00	0.00E+00	9.57E-07	**5.66E+00**
X10C9311232A	4.50E-02	4.13E-01	3.11E-01	3.17E+00	1.31E-04	6.76E-01	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	**4.62E+00**
X10C0501747A	2.31E-02	8.25E-02	3.18E-02	4.14E-01	3.75E-06	5.52E-02	2.96E-06	4.48E-06	0.00E+00	0.00E+00	2.61E-06	**6.10E-01**
X10C9311417A	1.67E-01	1.53E+00	4.70E-01	4.54E+00	5.57E-05	9.47E-01	2.60E-05	0.00E+00	0.00E+00	0.00E+00	0.00E+00	**7.65E+00**
X10C9311316A	1.61E-02	1.05E-01	4.59E-02	5.04E-01	7.62E-06	6.79E-02	4.98E-05	0.00E+00	0.00E+00	0.00E+00	5.19E-06	**7.38E-01**
X10C9311254A	0.00E+00	0.00E+00	0.00E+00	1.42E+01	0.00E+00	4.87E-01	1.41E-05	0.00E+00	0.00E+00	0.00E+00	0.00E+00	**1.48E+01**
X10C9400044G1	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	2.61E+00	9.34E-05	0.00E+00	0.00E+00	1.60E-05	2.92E-06	**2.61E+00**
X10C9311481A	3.68E-02	3.67E-01	1.51E-01	1.04E+00	2.09E-05	2.64E-01	4.62E-06	2.51E-06	0.00E+00	0.00E+00	1.74E-06	**1.86E+00**
X10C0402989FD	2.14E-03	3.74E-03	1.53E-03	1.74E-02	7.66E-07	6.00E-03	1.22E-05	0.00E+00	0.00E+00	6.12E-07	1.20E-06	**3.08E-02**
X10C9312810A	4.77E-03	9.42E-02	2.68E-02	1.51E-01	2.92E-06	5.01E-02	4.22E-06	1.49E-06	0.00E+00	1.10E-06	1.79E-07	**3.28E-01**
X10C9312537A	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	6.93E-03	1.45E-04	6.91E-05	1.62E-02	5.78E-06	2.23E-04	**2.36E-02**
X10C9312220A	8.76E-01	5.57E+00	1.88E+00	1.30E+01	1.89E-04	2.56E+00	1.49E-04	1.12E-04	0.00E+00	2.46E-05	3.24E-06	**2.39E+01**
X10C9311711A	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	6.07E-03	1.13E-03	0.00E+00	3.04E+00	2.51E-04	2.76E-06	**3.07E+00**
	2.70E-02	**2.70E-02**	**2.70E-02**	**1.6**	**2.70E-02**	**2.70E-02**	**2.70E-02**	**2.70E-02**	**5.40E-02**	**2.40E-02**	**2.20E-02**	**Max**

Ci%

CONTAINERID	SR-90	CS-137	RA-226	AC-227	TH-229	TH-232	U-232	U-233	U-234	U-235	U-238	NP-237	PU-238	PU-239	PU-240	PU-241
X10C9311325B	1.47%	1.47%	0.00%	13.85%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.24%	0.00%	0.00%	0.00%	0.00%
X10C9311316B	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.19%	0.00%	3.44%	13.80%	6.86%	73.11%
X10C9400104A	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.03%	0.00%	0.00%	0.00%	4.17%	20.54%	5.83%	55.20%
X10C9311124A	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	2.08%	13.59%	5.90%	65.89%
X10C9311232A	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.97%	8.94%	6.74%	68.71%
X10C0501747A	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.48%	0.00%	0.00%	0.00%	0.00%	3.79%	13.53%	5.21%	67.93%
X10C9311417A	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	2.18%	19.93%	6.14%	59.37%
X10C9311316A	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	2.19%	14.19%	6.21%	68.21%
X10C9311254A	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.01%	0.71%	0.01%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	95.99%
X10C9400044G1	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
X10C9311481A	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.02%	0.00%	0.00%	0.00%	1.98%	19.74%	8.14%	55.94%
X10C0402989FD	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.01%	6.93%	12.14%	4.95%	56.45%
X10C9312810A	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.13%	0.00%	0.00%	0.00%	1.46%	28.75%	8.17%	46.20%
X10C9312537A	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.02%	0.00%	0.00%	0.00%	0.00%	0.00%
X10C9312220A	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.04%	0.00%	0.00%	0.00%	0.00%	3.67%	23.32%	7.88%	54.37%
X10C9311711A	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.89%	0.01%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
	1.47%	**1.47%**	**0.00%**	**13.85%**	**0.00%**	**0.00%**	**0.01%**	**0.89%**	**0.13%**	**0.00%**	**0.19%**	**0.24%**	**6.93%**	**28.75%**	**8.17%**	**95.99%**

CONTAINERID	PU-242	AM-241	AM-243	CM-243	CM-244	CM-245	CF-249
X10C9311325B	0.00%	82.98%	0.00%	0.00%	0.00%	0.00%	0.00%
X10C9311316B	0.00%	2.58%	0.01%	0.00%	0.00%	0.00%	0.00%
X10C9400104A	0.00%	14.22%	0.00%	0.00%	0.00%	0.00%	0.00%
X10C9311124A	0.00%	12.55%	0.00%	0.00%	0.00%	0.00%	0.00%
X10C9311232A	0.00%	14.63%	0.00%	0.00%	0.00%	0.00%	0.00%
X10C0501747A	0.00%	9.06%	0.00%	0.00%	0.00%	0.00%	0.00%
X10C9311417A	0.00%	12.37%	0.00%	0.00%	0.00%	0.00%	0.00%
X10C9311316A	0.00%	9.20%	0.01%	0.00%	0.00%	0.00%	0.00%
X10C9311254A	0.00%	3.29%	0.00%	0.00%	0.00%	0.00%	0.00%
X10C9400044G1	0.00%	99.99%	0.00%	0.00%	0.00%	0.00%	0.00%
X10C9311481A	0.00%	14.18%	0.00%	0.00%	0.00%	0.00%	0.00%
X10C0402989FD	0.00%	19.46%	0.04%	0.00%	0.00%	0.00%	0.00%
X10C9312810A	0.00%	15.28%	0.00%	0.00%	0.00%	0.00%	0.00%
X10C9312537A	0.00%	29.39%	0.61%	0.29%	68.71%	0.02%	0.95%
X10C9312220A	0.00%	10.72%	0.00%	0.00%	0.00%	0.00%	0.00%
X10C9311711A	0.00%	0.20%	0.04%	0.00%	98.86%	0.01%	0.00%
	0.00%	**99.99%**	**0.61%**	**0.29%**	**98.86%**	**0.02%**	**0.95%**

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CONTAINERID	SR-90	CS-137	RA-226	AC-227	TH-229	TH-232	U-232	U-233	U-234	U-235	U-238	NP-237
X10C9311325B	2.95E-05	1.49E-05	0.00E+00	9.40E-01	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	7.13E-04
X10C9311316B	5.83E-08	2.95E-08	1.67E-06	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	3.96E-104	0.00E+00
X10C9400104A	7.89E-07	3.99E-07	5.52E-06	0.00E+00	1.15E-03	5.61E-106	0.00E+00	0.00E+00	5.61E-04	6.57E-105	0.00E+00	4.74E-05
X10C9311124A	1.79E-07	9.02E-08	6.08E-06	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	4.31E-04	5.05E-105	0.00E+00	1.42E-04
X10C9311232A	7.84E-08	3.97E-08	9.66E-06	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.51E-04
X10C0501747A	3.41E-07	1.73E-07	9.93E-06	0.00E+00	0.00E+00	0.00E+00	0.00E+00	5.37E-03	4.23E-05	0.00E+00	0.00E+00	1.21E-05
X10C9311417A	0.00E+00	0.00E+00	1.10E-05	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	2.09E-04
X10C9311316A	1.12E-07	5.70E-08	1.15E-05	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	2.94E-05
X10C9311254A	7.34E-07	3.71E-07	3.41E-05	0.00E+00	0.00E+00	0.00E+00	5.96E-03	1.94E-01	1.53E-03	0.00E+00	0.00E+00	0.00E+00
X10C9400044G1	7.80E-06	3.95E-06	3.92E-05	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.13E-03
X10C9311481A	1.62E-06	8.20E-07	3.97E-05	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	6.13E-04	7.19E-105	0.00E+00	6.71E-05
X10C0402989FD	1.66E-07	8.36E-08	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	7.60E-05
X10C9312810A	4.75E-08	2.40E-08	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	8.03E-04	9.40E-105	0.00E+00	1.63E-05
X10C9312537A	1.82E-08	9.18E-09	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	4.91E-105	9.78E-06
X10C9312220A	8.91E-07	4.51E-07	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.62E-02	1.30E-04	0.00E+00	6.05E-104	2.56E-04
X10C9311711A	3.19E-07	1.61E-07	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	5.06E-02	4.05E-04	0.00E+00	0.00E+00	3.13E-05

CONTAINERID	PU-238	PU-239	PU-240	PU-241	PU-242	AM-241	AM-243	CM-243	CM-244	CM-245	CF-249	
X10C9311325B	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	5.01E-01	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	**1.44E+00**
X10C9311316B	2.66E-02	1.07E-01	5.30E-02	9.53E-03	1.57E-05	1.99E-02	4.47E-05	0.00E+00	0.00E+00	0.00E+00	1.24E-05	**2.16E-01**
X10C9400104A	1.41E+00	6.96E+00	1.98E+00	3.15E-01	2.52E-04	4.81E+00	2.29E-04	0.00E+00	0.00E+00	0.00E+00	0.00E+00	**1.55E+01**
X10C9311124A	4.35E+00	2.85E+01	1.24E+01	2.33E+00	2.33E-03	2.63E+01	0.00E+00	0.00E+00	0.00E+00	0.00E+00	4.35E-05	**7.38E+01**
X10C9311232A	1.67E+00	1.53E+01	1.15E+01	1.98E+00	4.86E-03	2.50E+01	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	**5.55E+01**
X10C0501747A	8.55E-01	3.05E+00	1.18E+00	2.59E-01	1.39E-04	2.05E+00	1.10E-04	1.66E-04	0.00E+00	0.00E+00	1.19E-04	**7.40E+00**
X10C9311417A	6.18E+00	5.65E+01	1.74E+01	2.84E+00	2.06E-03	3.51E+01	9.63E-04	0.00E+00	0.00E+00	0.00E+00	0.00E+00	**1.18E+02**
X10C9311316A	5.98E-01	3.88E+00	1.70E+00	3.15E-01	2.82E-04	2.52E+00	1.84E-03	0.00E+00	0.00E+00	0.00E+00	2.36E-04	**9.01E+00**
X10C9311254A	0.00E+00	0.00E+00	0.00E+00	8.88E+00	0.00E+00	1.80E+01	5.23E-04	0.00E+00	0.00E+00	0.00E+00	0.00E+00	**2.71E+01**
X10C9400044G1	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	9.67E+01	3.46E-03	0.00E+00	0.00E+00	6.66E-04	1.33E-04	**9.67E+01**
X10C9311481A	1.36E+00	1.36E+01	5.61E+00	6.50E-01	7.75E-04	9.77E+00	1.71E-04	9.29E-05	0.00E+00	0.00E+00	7.90E-05	**3.10E+01**
X10C0402989FD	7.92E-02	1.39E-01	5.65E-02	1.09E-02	2.84E-05	2.22E-01	4.50E-04	0.00E+00	0.00E+00	2.55E-05	5.47E-05	**5.08E-01**
X10C9312810A	1.77E-01	3.49E+00	9.92E-01	9.46E-02	1.08E-04	1.85E+00	1.56E-04	5.54E-05	0.00E+00	4.59E-05	8.14E-06	**6.61E+00**
X10C9312537A	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	2.57E-01	5.36E-03	2.56E-03	3.00E-01	2.41E-04	1.02E-02	**5.75E-01**
X10C9312220A	3.24E+01	2.06E+02	6.97E+01	8.11E+00	6.99E-03	9.48E+01	5.53E-03	4.16E-03	0.00E+00	1.02E-03	1.47E-04	**4.11E+02**
X10C9311711A	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	2.25E-01	4.19E-02	0.00E+00	5.62E+01	1.05E-02	1.25E-04	**5.66E+01**

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CONTAINERID	SR-90	CS-137	RA-226	AC-227	TH-229	TH-232	U-232	U-233	U-234	U-235	U-238	NP-237	PU-238	PU-239	PU-240	PU-241
X10C9311325B	0.00%	0.00%	0.00%	65.22%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.05%	0.00%	0.00%	0.00%	0.00%
X10C9311316B	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	12.33%	49.41%	24.56%	4.42%
X10C9400104A	0.00%	0.00%	0.00%	0.00%	0.01%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	9.12%	44.95%	12.76%	2.04%
X10C9311124A	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	5.89%	38.58%	16.74%	3.16%
X10C9311232A	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	3.00%	27.56%	20.76%	3.57%
X10C0501747A	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.07%	0.00%	0.00%	0.00%	0.00%	11.56%	41.29%	15.91%	3.50%
X10C9311417A	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	5.23%	47.88%	14.75%	2.41%
X10C9311316A	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	6.64%	43.07%	18.85%	3.49%
X10C9311254A	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.02%	0.72%	0.01%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	32.75%
X10C9400044G1	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
X10C9311481A	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	4.39%	43.87%	18.10%	2.10%
X10C0402989FD	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.01%	15.58%	27.29%	11.12%	2.14%
X10C9312810A	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.01%	0.00%	0.00%	0.00%	2.67%	52.81%	15.01%	1.43%
X10C9312537A	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
X10C9312220A	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	7.88%	50.14%	16.95%	1.97%
X10C9311711A	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.09%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%

CONTAINERID	PU-242	AM-241	AM-243	CM-243	CM-244	CM-245	CF-249
X10C9311325B	0.00%	34.73%	0.00%	0.00%	0.00%	0.00%	0.00%
X10C9311316B	0.01%	9.25%	0.02%	0.00%	0.00%	0.00%	0.01%
X10C9400104A	0.00%	31.11%	0.00%	0.00%	0.00%	0.00%	0.00%
X10C9311124A	0.00%	35.63%	0.00%	0.00%	0.00%	0.00%	0.00%
X10C9311232A	0.01%	45.10%	0.00%	0.00%	0.00%	0.00%	0.00%
X10C0501747A	0.00%	27.65%	0.00%	0.00%	0.00%	0.00%	0.00%
X10C9311417A	0.00%	29.72%	0.00%	0.00%	0.00%	0.00%	0.00%
X10C9311316A	0.00%	27.92%	0.02%	0.00%	0.00%	0.00%	0.00%
X10C9311254A	0.00%	66.50%	0.00%	0.00%	0.00%	0.00%	0.00%
X10C9400044G1	0.00%	99.99%	0.00%	0.00%	0.00%	0.00%	0.00%
X10C9311481A	0.00%	31.53%	0.00%	0.00%	0.00%	0.00%	0.00%
X10C0402989FD	0.01%	43.75%	0.09%	0.00%	0.00%	0.01%	0.01%
X10C9312810A	0.00%	28.06%	0.00%	0.00%	0.00%	0.00%	0.00%
X10C9312537A	0.00%	44.64%	0.93%	0.45%	52.18%	0.04%	1.77%
X10C9312220A	0.00%	23.04%	0.00%	0.00%	0.00%	0.00%	0.00%
X10C9311711A	0.00%	0.40%	0.07%	0.00%	99.42%	0.02%	0.00%

DIVIDER

PAGE

Attachment 3 - Acceptable Knowledge Source Document Summary

Site(s): Oak Ridge National Laboratory	Source Document Tracking Number: DR045
Waste Stream Number(s): ORNL Non-specific Library Files (Applicable only when site library is not in use)	
Acceptable Knowledge Documentation Type: ☐ TRU Waste Management Program Information ☑ Waste Stream-Specific Information ☐ Additional Information	Category: ☐ Correspondence ☑ Discrepancy Resolution ☐ Internal Procedure ☐ Miscellaneous ☐ Published Document or Internal Procedure ☐ Unpublished Documents
Title or Description of Source Document [a]: Discrepancy Resolution - EPA Hazardous Waste Numbers for Building 9204-3 Waste Generated in 2011	
Source Document Reference Information (author(s), document and revision number, date, publisher): Jeff Harrison, DR045, NA, 09/29/2014, CCP	

AK # [b]	Source Doc. Page # [c]	AK Information Summary
WS1, WS2, WS6, WS8, WS9, WS12	Throughout	Nature of Discrepancy: Several containers generated in the Actinide Processing Area (APA) in Building 9204-3 in 2011 are assigned EPA hazardous waste numbers D004 - D011 and D019 by the waste generator on the UCN-2109 forms (Reference M191). Waste stream OR-ISTP-CH-HET is not assigned EPA hazardous waste numbers D004 or D010, but is assigned the others. The container numbers are as follows: X10C0506610 X10C1100350 X10C1100351 X10C1100352 X10C1100353 X10C1100354 X10C1100355 X10C1100356 X10C1100357 X10C1100358 X10C1100359 X10C1100360 X10C1100361 X10C1100362 X10C1100363 X10C1100364 X10C1100365 X10C1100371 X10C1100372 X10C1100382 X10C1100383 X10C1100384 X10C1100385 X10C1100388 Resolution: The rationale for the EPA hazardous waste numbers assigned by the generator is as follows: "The HEPA filter waste and debris with circuit boards has been conservatively assigned the characteristic codes D004 - D011 for metals and D019 for carbon tetrachloride. The characteristic code D008 will apply to the radioactive lead solids. The glove box operations did not include the use of pesticides/herbicides or other characteristic chemicals" (References M091, M092, M191). This rationale does not provide specific chemical usage to indicate exactly what

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DATE REC'D 11/6/2015

Attachment 3 - Acceptable Knowledge Source Document Summary (continued)

Site(s): Oak Ridge National Laboratory		Source Document Tracking Number: DR045
AK # [b]	Source Doc. Page #[c]	AK Information Summary
		was used and why these EPA hazardous waste numbers are applicable; it simply says they have been conservatively assigned. The above listed waste containers were generated from change out of HEPA filters and cleanout of gloveboxes containing legacy materials leftover from prior operations in Building 9204-3. It was not a new operation in the facility. The only chemicals used in the cleanout operation were a fixative (CC Doff) and several decontamination agents (Decon Gel, Formula 409, and Mr. Clean), none of which are assigned toxicity characteristic metal codes (Reference P593). The rationale for the EPA hazardous waste numbers assigned to waste stream OR-ISTP-CH-HET is based on a thorough review of numerous historical documents over the period of waste generation starting in 1970. This includes process documentation describing chemical usage in the various Isotopes Programs Facilities, which includes Building 9204-3. Based on this review, arsenic and selenium were not used in the Building 9204-3 APA or any other Isotopes Program Facility (Reference DR024). Therefore, EPA hazardous waste numbers D004 and D010 will not be assigned to waste stream OR-ISTP-CH-HET.

Source Document Data Limitations (if any):

1. None.

Acceptable Knowlege Expert:

Travis Smith _____ Date: 01/08/2015
Print /Sign

[a] Provide description for non-titled information (i.e., container paperwork, MSDS sheets, etc)
[b] Obtain from Acceptable Knowledge Documentation Checklist
[c] For microfilm or microfiche, identify box, tape, reel number and location.

DIVIDER PAGE ONLY

NOT PART OF PAGE COUNT

Attachment 11 - Acceptable Knowledge Source Document Discrepancy Resolution

Waste Stream Number(s): OR-ISTP-CH-HET

Waste Stream Description: ORNL Isotopes Facilities CH-TRU Debris Waste

AK Source Document Discrepancy Form Tracking Number: **DR045**					
Tracking #	**Title**	**Document/Rev#**	**Author**	**Date**	**Page #**
N/A	Central Characterization Program Acceptable Knowledge Summary Report For Oak Ridge National Laboratory Isotopes Programs Contact-Handled Transuranic Waste, Waste Stream OR-ISTP-CH-HET	CCP-AK-ORNL-008, Rev. 2	CCP	4/11/14	47 – 55
DR024	Discrepancy Resolution – Waste Stream OR-ISTP-CH-HET EPA Hazardous Waste Number Assignment	N/A	J. Harrison	2/22/11	All
M091	Waste Characterization Checklist (WCC), WCC Number: Beta 3 TRU Glove Box Debris	N/A, Revs. 0, 1	W. Ely A. Rosenman	6/1/11 11/16/11	7
M092	Waste Characterization Checklist (WCC), WCC Number: Beta 3 TRU Mixed (Non-PCB) Glove Box Debris	N/A, Revs. 0, 1	W. Ely A. Rosenman	7/7/2011 11/16/11	7
M191	UCN-2109 and UCN-2822 Forms and Associated Container Paperwork for Waste Stream OR-ISTP-CH-HET	N/A	ORNL	Various	See Container numbers below
M194	MSDS Collection for Waste Stream OR-ISTP-CH-HET	N/A	N/A	Various	See below
P593	Project Completion Report for the Removal and Disposition of Certain Legacy Material from Building 9204-3 (Beta-3), an Oak Ridge National Laboratory Facility Located at the Y-12 National Security Complex	DOE/OR/01-2570/D1	ORNL	May 2012	21, 22

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DATE REC'D 1/6/2015
EPF

Nature of Discrepancy: Several containers generated in the Actinide Processing Area (APA) in Building 9204-3 in 2011 are assigned EPA hazardous waste numbers D004 – D011 and D019 by the waste generator on the UCN-2109 forms (Reference M191). Waste stream OR-ISTP-CH-HET is not assigned EPA hazardous waste numbers D004 or D010 but is assigned the others. The container numbers are as follows:

X10C0506610	X10C1100352	X10C1100355	X10C1100358	X10C1100361	X10C1100364	X10C1100372	X10C1100384
X10C1100350	X10C1100353	X10C1100356	X10C1100359	X10C1100362	X10C1100365	X10C1100382	X10C1100385
X10C1100351	X10C1100354	X10C1100357	X10C1100360	X10C1100363	X10C1100371	X10C1100383	X10C1100388

Resolution: The rationale for the EPA hazardous waste numbers assigned by the generator is as follows: "The HEPA filter waste and debris with circuit boards has been conservatively assigned the characteristic codes D004 – D011 for metals and D019 for carbon tetrachloride. The characteristic code D008 will apply to the radioactive lead solids. The glove box operations did not include the use of pesticides/herbicides or other characteristic chemicals." (References M091, M092, M191). This rationale does not provide specific chemical usage to indicate exactly what was used and why these EPA hazardous waste numbers are applicable; it simply says they have been conservatively assigned.

The above listed waste containers were generated from change out of HEPA filters and cleanout of gloveboxes containing legacy materials leftover from prior operations in Building 9204-3. It was not a new operation in the facility. The only chemicals used in the cleanout operation were a fixative (CC Doff) and several decontamination agents (Decon Gel, Formula 409, and Mr. Clean), none of which are assigned toxicity characteristic metal codes (References P593).

The rationale for the EPA hazardous waste numbers assigned to waste stream OR-ISTP-CH-HET is based on a thorough review of numerous historical documents over the period of waste generation starting in 1970. This includes process documentation describing chemical usage in the various Isotopes Programs Facilities, which includes Building 9204-3. Based on this review, arsenic and selenium were not used in the Building 9204-3 APA or any other Isotopes Program Facility (Reference DR024). Therefore, EPA hazardous waste numbers D004 and D010 will not be assigned to waste stream OR-ISTP-CH-HET.

Discrepancy Resolved: ☒ Yes ☐ No

Acceptable Knowledge Expert: Jeff Harrison / Jeff Harrison / Date: 9/29/14
Print Sign

Site Project Manager: Beverly Schrock / BSSchrock / Date: 9/29/14
Print Sign

NWP
Nuclear Waste Partnership LLC
An AECOM-led partnership with B&W and AREVA

COPY

GEN5

CP:15:01130
UFC:5900.00

INTER-OFFICE CORRESPONDENCE

DATE: July 15, 2015

FROM: D.R. Wade DRW LOCATION: Certification

TO: R. D. Reeves ED LOCATION: Host Site Operations
Oak Ridge National Laboratory

SUBJECT: SECOND QUARTER 2015 (APRIL 1, 2015 THROUGH JUNE 30, 2015) VISUAL EXAMINATION QUARTERLY REPEAT OF DATA GENERATION LEVEL DATA REVIEW, VALIDATION, AND VERIFICATION AT THE OAK RIDGE NATIONAL LABORATORY

Procedure CCP-TP-001, *Project Level Data Validation and Verification,* and Section C3-10b of the Waste Analysis Plan require that a repeat of the Data Generation Level (DGL) review, validation, and verification is performed on a quarterly basis for a minimum of one randomly chosen waste container. The repeat DGL data review, validation, and verification are completed for each required characterization methodology that was performed in the last quarter, at each Host site where CCP performed characterization.

Visual Examination (VE) at the Oak Ridge National Laboratory has completed 90 days of reporting from April 1, 2015 through June 30, 2015. Container number X10C9400140A, BDR ORVECH0140, was randomly selected from among all the drums processed through Data Generation Level (DGL) review, validation, and verification during this time frame. This container will be processed through the quarterly repeat of DGL review as described in CCP-TP-001. The original letter will be retained in the letter correspondence file.

Please assign available qualified personnel to serve as Independent Technical Reviewers in performing the review as well as preparing a Cover sheet, Table of Contents, and Independent Reviewer Checklist.

Please perform the VE quarterly repeat of DGL review, validation, and verification and return the information by July 30, 2015 to the Central Characterization Program Records Department, naming the BDR as ORVECH0140_QTR0215

If you have any questions, please call me at Extension 7505.

DRW:lcg

Attachment

cc: NWP

(without attachment)
L. N. Harmon ED
M.F. Ramirez ED
B.S. Schrock ED

CCP RECORDS ORIGINAL
DATE REC'D 7-20-15 JY

P.O. Box 2078 • Carlsbad, New Mexico USA 88221-2078
Phone: (575) 234-7200 • Fax: (575) 234-7083

cc: NWP

(with attachment)
A.O. Stallings ED
CCP Records Custodian GSA-212

ORNL

(with attachment)
T. Barton ED

Attachment 1 – CCP Waste Visual Examination General Information Form

Batch Data Report No.: ORVECH0140

☑ VE for Previously Packaged Waste ☐ VE for Newly Generated Waste	
☐ Method 1 ☑ Method 2	
Site ID: OR	
Examination Date: 6-1-15	
Procedure No.: CCP-TP-113	Revision No.: 18
Camera/Audio/Video Media Recording Check: ☑ N/A	☐ SAT
VE Scale Information: ☑ N/A	Serial/ID Number: Calibration Due Date: Operational Check: ☐ SAT ☐ UNSAT
Test Weight Information Test Weight Total: kg. Tray Weight: kg.	Serial/ID Number: Calibration Due Date: Serial/ID Number: Calibration Due Date: Serial/ID Number: Calibration Due Date:
Container Scale Information:	Serial/ID Number: WIPP-002 Calibration Due Date: 6-10-15 Operational Check: ☑ SAT ☐ UNSAT

Comments:
The VEE has determined VE scale shall not be used.

Visual Examination Operator 1: Jason Cote Print Name	Signature	6-1-15 Date
Visual Examination Operator 2: Anthony Harley Print Name	Signature	6-1-15 Date

Attachment 2 – CCP Waste Visual Examination Data Form Page 1 of 5

Batch Data Report No.: ORVECH0140

Section 1: Output Waste Container Data

Input Waste Container ID, as applicable: X10C 9400140

Output Waste Container ID: X10C 9400140A | Waste Stream ID: OR-PGDP-CH-HET-A

Container Type: 55 gallon drum | TRUCON Code: OR125/225 | Waste Matrix Code: S5400

Audio/Video Media Recording Number: ☑ N/A

Waste Container Weights:
Tare Wt: 33.2 kg. Gross Wt: 159.0 kg.

Rigid Liner Present? ☐ NO ☑ YES
Type of Liner: ☐ Lead ☐ Plastic ☑ Fiberboard ☐ Other:
Thickness: ☐ 30-mil ☑ 90-mil ☐ 110-mil ☐ 125-mil

Rigid Liner Lid Present? ☑ NO ☐ YES
Rigid Liner Lid is Vented (>0.3 in.) or Filtered? ☐ NO ☐ YES ☑ N/A
☐ Vented: Hole Size: ☑ N/A
☐ Filtered: Model No.: ☑ N/A
Serial No.: ☑ N/A

Bag Liner Present? ☐ NO ☑ YES

Volume Utilization Percentage: 100 %

Does the physical form of the waste match the Waste Stream Description (i.e., Homogeneous Solids, Soil/Gravel, or Debris Waste [including uncategorized metals])?
☐ NO ☑ YES

Does the physical form of the waste match the Waste Matrix Code?
☐ NO ☑ YES

Closure Method: TTF
Number of Layers of Confinement: 1

Filter Torque Wrench
Serial/ID No.: WIPP 124
Calibration Due Date: 9-2-15
Filter: Model No.: UT9424X
Serial No.: 00238 0013
Torque Value: 72 in/lbs

Lid Ring/Bolt Torque Wrench
Serial/ID No.: WIPP 150
Calibration Due Date: 4-8-16
Lid Ring/Bolt Torque Value: 60 ft/lbs

Is total dose rate greater than 200mrem/hr? ☑ NO ☐ YES

NCR(s) associated with the output container? ☑ NO ☐ YES
NCR No.: N/A
NCR No.: N/A

Comments:
N/A

Attachment 2 – CCP Waste Visual Examination Data Form (continued) Page 2 of 5

Batch Data Report No.: ORVECH0140 **Date:** 6-1-15

Section 2: Waste Package Data

Package and Package TID Number (as applicable)	Waste Description	WMP [Table 3]	Weight (kg) [Table 4.]	Weighing Code(s) [Table 4]
N/A	plastic pieces plastic bags vinyl tape	PW	4.0	E
N/A	latex gloves rubber tubing	R	3.0	E
N/A	metal gauges pressure transducers metal bolts metal nuts	IM	60.0	E
N/A	absorbent asbestos	OI	5.0	E
N/A	copper pipes copper fittings	OM	20.0	E
N/A	cloth leather gloves	C	3.8	E
N/A	metal tubes metal fittings	IM	30.0	E

N/A	N/A	N/A
VEO 1: Print Name	Signature	Date
N/A	N/A	N/A
VEO 2: Print Name	Signature	Date

Signatures annotate the absence of prohibited items.

Output Waste Container ID: XIDC9400140A

TID Removed: N/A **TID Applied:** MP85W 61141

N/A	N/A	N/A
VEO 1: Print Name	Signature	Date
N/A	N/A	N/A
VEO 2: Print Name	Signature	Date

Signatures of VEO's verifying the loading of the Output Waste Container.

Attachment 2 – CCP Waste Visual Examination Data Form (continued) Page 3 of 5

Batch Data Report No.: ORVECH0140

Output Waste Container ID: XIDC9400140A

Section 3: Packaging Material and Waste Material Parameters	
Packaging Material:	Estimated Weight (kg)
Steel (ST):	27.8
Plastics (PP):	1.0
Others: (c)	4.4
Total Packaging Weight:	33.2
Waste Material Parameter:	Estimated Weight (kg)
Iron-based Metal/Alloys (IM):	90.0
Aluminum-based Metals/Alloys (AM):	N/A
Other Metals (OM):	20.0
Other Inorganic Materials (OI):	5.0
Cellulosics (C):	3.8
Rubber (R):	3.0
Plastics (waste materials) (PW):	4.0
Organic Matrix (OR):	N/A
Inorganic Matrix (IN):	N/A
Soils (S):	N/A
Total WMP Weight:	125.8

Attachment 2 – CCP Waste Visual Examination Data Form (continued) Page 4 of 5

Batch Data Report No.: ORVECH0140 **Output Waste Container ID:** X10C9400140A

	Yes	No
Is there any observable liquid in internal containers, that is more than 60 milliliters or 3 percent by volume, whichever is greater?	☐	☑
Is the total volume of observable liquid in the outermost container **GREATER** than 1% of the container?	☐	☑
Is there detectable observable liquid in outermost containers with an EPA Hazardous Waste Number of U134?	☐	☑
Is there an indication of non-radionuclide pyrophoric materials, such as elemental potassium?	☐	☑
Is there an indication of hazardous wastes not occurring as co-contaminants with TRU mixed wastes (non-mixed hazardous wastes)?	☐	☑
Is there an indication of wastes incompatible with backfill, seal and panel closures materials, container and packaging materials, shipping container materials, or other wastes (i.e., waste does **NOT** match TRUCON Code[s])?	☐	☑
Is there an indication of wastes containing explosives or compressed gases?	☐	☑
Is there PCB liquids present?	☐	☑
Is there an indication of the waste exhibiting the characteristic of ignitability, corrosivity, or reactivity (EPA Hazardous Waste Numbers of D001, D002, or D003)?	☐	☑
Is the physical form of the waste inconsistent with the Waste Stream Description or the Waste Matrix Code?	☐	☑
Are there heat-sealed bags (unvented) **GREATER** than 4 liters and LESS than 390 square inches in the waste?	☐	☑
Were there Non-approved Closure Methods used on liner bags or inner bags greater than 4 liters?	☐	☑
Are there sealed containers **GREATER** than 4 liters?	☐	☑
Are there indications of inadequate protection (blocked or braced) for heavy and/or sharp objects?	☐	☑

Attachment 2 – CCP Waste Visual Examination Data Form (continued) Page 5 of 5

Batch Data Report No.: DRVECH0140 **Output Waste Container ID:** X10C9400140A

Section 4: Prohibited Item(s) Evidence (Continued)
(Questions answered "YES" are to be explained in the Comments block)

Comments:

N/A

Section 5: Approvals

Visual Examination Operator 1:

Print Name	Signature	Date
Anthony Harley		6-1-15

Visual Examination Operator 2:

Print Name	Signature	Date
Jason Cote		6-1-15

DIVIDER

PAGE

NWP
Nuclear Waste Partnership LLC
An AECOM-led partnership with B&W and AREVA

CP:15:01131
UFC:5900.00

INTER-OFFICE CORRESPONDENCE

DATE: July 15, 2015

FROM: D.R. Wade DRW LOCATION: Certification

TO: R. D. Reeves ED LOCATION: Host Site Operations
Oak Ridge National Laboratory

SUBJECT: SECOND QUARTER 2015 (APRIL 1, 2015 THROUGH JUNE 30, 2015) NONDESTRUCTIVE QUARTERLY REPEAT OF DATA GENERATION LEVEL DATA REVIEW, VALIDATION, AND VERIFICATION AT THE OAK RIDGE NATIONAL LABORATORY

The Oak Ridge National Laboratory has completed data generation level (DGL) review, validation, and verification of Nondestructive Examination (NDE) results for containers processed during the second quarter of 2015 (April 1, 2015 through June, 2015). Container number X10C0402910G, Batch Data Report (BDR) OR-RTR7-0133 was randomly selected from all the containers processed for NDE analysis during this time frame. The data from this container and other pertinent documents are incorporated into a modified BDR (attachment) and will be used for the Quarterly Repeat of DGL Data Review, Validation, and Verification, as described in CCP-TP-001, CCP Project Level Data Validation and Verification, to document DGL data review, validation, and verification are being performed in accordance with applicable procedures.

Please assign qualified DGL personnel to review the submitted data and complete the BDR by generating a new Table of Contents, Batch Data Report Cover Sheet, BDR Narrative and applicable DGL checklists. Please have the data reviewed and the BDR completed and returned to the National TRU Certification Program Records Department by July 30, 2015, naming the BDR as OR-RTR7-0133_QTR0215.

If you have any questions, please call me at Extension 7505.

DRW:lcg

Attachment

cc: NWP
(without attachment)
L. Harmon ED
M.F. Ramirez ED
B.S. Schrock ED

(with attachment)
A.O. Stallings ED
CCP Records Custodian ED

ORNL
(with attachment)
T. Barton ED

COPY

CCP RECORDS ORIGINAL
DATE REC'D 7.20.15 JV

P.O. Box 2078 • Carlsbad, New Mexico USA 88221-2078
Phone: (575) 234-7200 • Fax: (575) 234-7083

Attachment 1 – CCP RTR Measurement Control Report

Site ID: ORNL		
Batch Data Report No.: OR-RTR7-0133		
Examination Date: 5/11/15		
Control Checks		
Video/Audio Recorded Media System Check	☑ SAT	☐ UNSAT
Image Test : 10 Lines (Minimum acceptable is 5 lines-pair/cm or #6 Sieve is viewable)	☑ SAT	☐ UNSAT
Comments: N/A		
RTR Operator:		
Eric Lyles (Printed Name)	(Signature)	5/11/15 (Date)

CCP Radiography Data Sheet

Section 1: General Information	
☐ RTR Examination ☒ RTR Replicate Scan ☐ RTR Independent Observation	
Site ID:	ORNL
Batch Number:	OR-RTR7-0133
Examination Date:	5/11/2015
Waste Container ID:	X10C0402910H
Video/Audio Recorded Media Number:	OR-RTR7-0133 A&B
Procedure and Revision No.:	CCP-TP-053 Rev. 15
NCR(s) associated with the container? (e.g., Prohibited Items)	☒ No ☐ Yes NCR No.: N/A NCR No.: N/A

Section 2: Waste Container Data	
Container Type:	55 Gallon Drum
TRUCON Code:	OR 225
Waste Matrix Code:	S5400
Waste Stream I.D.:	OR-RF-CH-HET
Waste Container Weights:	Gross Wt.: 72.3 kg Tare Wt.: 33.2 kg Net Wt.: 39.1 kg
Rigid Liner and Liner Vent Description:	Liner: ☒ No ☐ Yes Lid: ☒ No ☐ Yes Type: ☐ 30-mil ☐ 90-mil ☐ 110-mil ☐ 125-mil Vented: ☐ No ☐ Yes ☒ N/A Punctured: ☒ No ☐ Yes Mechanical Vent: ☒ No ☐ Yes Fiberboard Liner: ☒ No ☐ Yes Lead Lined: ☒ No ☐ Yes
Number of Layers of Confinement:	Appears to be 1 layer
Volume Utilization Percentage:	90 %

CCP Radiography Data Sheet

Waste Container ID: X10C0402910H

Section 3: Container Inventory and Comments (Detailed descriptions)	
IM:	Scrap metal, hand tools
AM:	
OM:	
OI:	Glass containers, absorbent
C:	
R:	
XPM:	Plastic sheeting, plastic containers
OR:	
IN:	
S:	

Section 4: Packaging Material and Waste Material Parameters	
Packaging Material:	**Estimated Weight (kg)**
Steel (ST):	27.8
Plastics (PP): Liner bag	1.0
Other: Cardboard Liner (CP)	4.4
Total Packaging Weight	33.2
Waste Material Parameter:	**Estimated Weight (kg)**
Iron-based Metal / Alloys (IM):	15.0
Aluminum-based Metals / Alloys (AM):	
Other Metals (OM):	
Other Inorganic Materials (OI)	15.0
Cellulosics (C):	
Rubber (R):	
Plastics (waste materials) (XPM):	9.1
Organic Matrix (OR):	
Inorganic Matrix (IN):	
Soils (S):	
Total WMP Weight:	39.1

CCP Radiography Data Sheet

Waste Container ID: X10C0402910H

Section 5: RTR Summary (Questions answered "Yes" will be explained in the Comment block, except for Question 1)	
Is there observable liquid?	☐ Yes ☒ No
Is there any observable liquid in internal containers, more than 60 milliliters or 3 percent by volume, whichever is greater?	☐ Yes ☒ No
Is the total volume of observable liquid in the outermost container GREATER than 1% of the container?	☐ Yes ☒ No
Is there observable liquid in payload containers with an EPA Hazardous Waste Number of U134?	☐ Yes ☒ No
Is there an indication of non-radionuclide pyrophoric materials, such as elemental potassium?	☐ Yes ☒ No
Is there an indication of hazardous wastes not occurring as co-contaminants with TRU mixed wastes (non-mixed hazardous wastes)?	☐ Yes ☒ No
Is there an indication of wastes incompatible with backfill, seal and panel closures materials, container and packaging materials, shipping container materials, or other wastes (i.e., waste does NOT match TRUCON Code[s])?	☐ Yes ☒ No
Is there an indication of wastes containing explosives or compressed gases?	☐ Yes ☒ No
Is there an indication of PCBs liquids?	☐ Yes ☒ No
Is there an indication of the waste exhibiting the characteristic of ignitability, corrosivity, or reactivity (EPA Hazardous Waste Numbers of D001, D002, or D003)?	☐ Yes ☒ No
Is the physical form of the waste inconsistent with the Waste Stream Description or the Waste Matrix Code?	☐ Yes ☒ No
CH or RH TRAMPAC	
Are there heat-sealed bags (unvented) GREATER than 4 liters and LESS than 390 square inches in the waste, or heat sealed bags not authorized in the RH TRUCON Code?	☐ Yes ☒ No
Were there Non-approved Closure Methods used on liner bags or inner bags greater than 4 liters?	☐ Yes ☒ No
Are there sealed containers GREATER than 4 liters?	☐ Yes ☒ No
Are there indications of inadequate protection for heavy and/or sharp objects?	☐ Yes ☒ No

Comments: This Replicate Scan agrees with the original Scan. DB 5-11-15

RTR Operator:

Daphne Brothers	Daphne Brothers	5/11/2015
Print Name	Signature	Date

CCP Radiography Data Sheet

Section 1: General Information	
☐ RTR Examination ☐ RTR Replicate Scan ☒ RTR Independent Observation	
Site ID:	ORNL
Batch Number:	OR-RTR7-0133
Examination Date:	5/11/2015
Waste Container ID:	X10C0402910G
Video/Audio Recorded Media Number:	OR-RTR7-0133 A&B
Procedure and Revision No.:	CCP-TP-053 Rev. 15
NCR(s) associated with the container? (e.g., Prohibited Items)	☒ No ☐ Yes NCR No.: N/A NCR No.: N/A

Section 2: Waste Container Data	
Container Type:	55 Gallon Drum
TRUCON Code:	OR 225
Waste Matrix Code:	S5400
Waste Stream I.D.:	OR-RF-CH-HET
Waste Container Weights:	Gross Wt.: 50.8 kg Tare Wt.: 33.2 kg Net Wt.: 17.6 kg
Rigid Liner and Liner Vent Description:	Liner: ☒ No ☐ Yes Lid: ☒ No ☐ Yes Type: ☐ 30-mil ☐ 90-mil ☐ 110-mil ☐ 125-mil Vented: ☐ No ☐ Yes ☒ N/A Punctured: ☒ No ☐ Yes Mechanical Vent: ☒ No ☐ Yes Fiberboard Liner: ☒ No ☐ Yes Lead Lined: ☒ No ☐ Yes
Number of Layers of Confinement:	Appears to be 1 layer
Volume Utilization Percentage:	85 %

CCP Radiography Data Sheet

Waste Container ID: X10C0402910G

Section 3: Container Inventory and Comments (Detailed descriptions)	
IM:	Scrap metal
AM:	
OM:	
OI:	Glass containers, absorbent
C:	
R:	
XPM:	Plastic sheeting, plastic containers, plastic caps
OR:	
IN:	
S:	

Section 4: Packaging Material and Waste Material Parameters	
Packaging Material:	**Estimated Weight (kg)**
Steel (ST):	27.8
Plastics (PP): Liner bag	1.0
Other: Cardboard Liner (CP)	4.4
Total Packaging Weight	33.2
Waste Material Parameter:	**Estimated Weight (kg)**
Iron-based Metal / Alloys (IM):	3.6
Aluminum-based Metals / Alloys (AM):	
Other Metals (OM):	
Other Inorganic Materials (OI)	9.0
Cellulosics (C):	
Rubber (R):	
Plastics (waste materials) (XPM):	5.0
Organic Matrix (OR):	
Inorganic Matrix (IN):	
Soils (S):	
Total WMP Weight:	17.6

8

CCP Radiography Data Sheet

Waste Container ID: X10C0402910G

Section 5: RTR Summary (Questions answered "Yes" will be explained in the Comment block, except for Question 1)	
Is there observable liquid?	☐ Yes ☒ No
Is there any observable liquid in internal containers, more than 60 milliliters or 3 percent by volume, whichever is greater?	☐ Yes ☒ No
Is the total volume of observable liquid in the outermost container GREATER than 1% of the container?	☐ Yes ☒ No
Is there observable liquid in payload containers with an EPA Hazardous Waste Number of U134?	☐ Yes ☒ No
Is there an indication of non-radionuclide pyrophoric materials, such as elemental potassium?	☐ Yes ☒ No
Is there an indication of hazardous wastes not occurring as co-contaminants with TRU mixed wastes (non-mixed hazardous wastes)?	☐ Yes ☒ No
Is there an indication of wastes incompatible with backfill, seal and panel closures materials, container and packaging materials, shipping container materials, or other wastes (i.e., waste does NOT match TRUCON Code[s])?	☐ Yes ☒ No
Is there an indication of wastes containing explosives or compressed gases?	☐ Yes ☒ No
Is there an indication of PCBs liquids?	☐ Yes ☒ No
Is there an indication of the waste exhibiting the characteristic of ignitability, corrosivity, or reactivity (EPA Hazardous Waste Numbers of D001, D002, or D003)?	☐ Yes ☒ No
Is the physical form of the waste inconsistent with the Waste Stream Description or the Waste Matrix Code?	☐ Yes ☒ No
CH or RH TRAMPAC	
Are there heat-sealed bags (unvented) GREATER than 4 liters and LESS than 390 square inches in the waste, or heat sealed bags not authorized in the RH TRUCON Code?	☐ Yes ☒ No
Were there Non-approved Closure Methods used on liner bags or inner bags greater than 4 liters?	☐ Yes ☒ No
Are there sealed containers GREATER than 4 liters?	☐ Yes ☒ No
Are there indications of inadequate protection for heavy and/or sharp objects?	☐ Yes ☒ No

Comments: This Independent Observation agrees with the Original Scan. DB 5-11-15

RTR Operator:

Daphne Brothers	Daphne Brothers	5/11/2015
Print Name	Signature	Date

CCP Radiography Data Sheet

Section 1: General Information		
[X] RTR Examination	[ ] RTR Replicate Scan	[ ] RTR Independent Observation
Site ID:	ORNL	
Batch Number:	OR-RTR7-0133	
Examination Date:	5/11/2015	
Waste Container ID:	X10C0402910G	
Video/Audio Recorded Media Number:	OR-RTR7-0133	A&B
Procedure and Revision No.:	CCP-TP-053	Rev. 15
NCR(s) associated with the container? (e.g., Prohibited Items)	[X] No [ ] Yes NCR No.: N/A NCR No.: N/A	

Section 2: Waste Container Data		
Container Type:	55 Gallon Drum	
TRUCON Code:	OR 225	
Waste Matrix Code:	S5400	
Waste Stream I.D.:	OR-RF-CH-HET	
Waste Container Weights:	Gross Wt.: 50.8 kg Tare Wt.: 33.2 kg Net Wt.: 17.6 kg	
Rigid Liner and Liner Vent Description:	Liner: [X] No [ ] Yes Lid: [X] No [ ] Yes Type: [ ] 30-mil [ ] 90-mil [ ] 110-mil [ ] 125-mil Vented: [ ] No [ ] Yes [X] N/A Punctured: [X] No [ ] Yes Mechanical Vent: [X] No [ ] Yes Fiberboard Liner: [X] No [ ] Yes Lead Lined: [X] No [ ] Yes	
Number of Layers of Confinement:	Appears to be 1 layer	
Volume Utilization Percentage:	85 %	

CCP Radiography Data Sheet

Waste Container ID: X10C0402910G

Section 3: Container Inventory and Comments (Detailed descriptions)	
IM:	Scrap metal
AM:	
OM:	
OI:	Glass containers, absorbent
C:	
R:	
XPM:	Plastic sheeting, plastic containers, plastic caps
OR:	
IN:	
S:	

Section 4: Packaging Material and Waste Material Parameters	
Packaging Material:	**Estimated Weight (kg)**
Steel (ST):	27.8
Plastics (PP): Liner bag	1.0
Other: Cardboard Liner (CP)	4.4
Total Packaging Weight	33.2
Waste Material Parameter:	**Estimated Weight (kg)**
Iron-based Metal / Alloys (IM):	3.0
Aluminum-based Metals / Alloys (AM):	
Other Metals (OM):	
Other Inorganic Materials (OI)	8.6
Cellulosics (C):	
Rubber (R):	
Plastics (waste materials) (XPM):	6.0
Organic Matrix (OR):	
Inorganic Matrix (IN):	
Soils (S):	
Total WMP Weight:	17.6

CCP Radiography Data Sheet

Waste Container ID: X10C0402910G

Section 5: RTR Summary (Questions answered "Yes" will be explained in the Comment block, except for Question 1)	
Is there observable liquid?	☐ Yes ☒ No
Is there any observable liquid in internal containers, more than 60 milliliters or 3 percent by volume, whichever is greater?	☐ Yes ☒ No
Is the total volume of observable liquid in the outermost container GREATER than 1% of the container?	☐ Yes ☒ No
Is there observable liquid in payload containers with an EPA Hazardous Waste Number of U134?	☐ Yes ☒ No
Is there an indication of non-radionuclide pyrophoric materials, such as elemental potassium?	☐ Yes ☒ No
Is there an indication of hazardous wastes not occurring as co-contaminants with TRU mixed wastes (non-mixed hazardous wastes)?	☐ Yes ☒ No
Is there an indication of wastes incompatible with backfill, seal and panel closures materials, container and packaging materials, shipping container materials, or other wastes (i.e., waste does NOT match TRUCON Code[s])?	☐ Yes ☒ No
Is there an indication of wastes containing explosives or compressed gases?	☐ Yes ☒ No
Is there an indication of PCBs liquids?	☐ Yes ☒ No
Is there an indication of the waste exhibiting the characteristic of ignitability, corrosivity, or reactivity (EPA Hazardous Waste Numbers of D001, D002, or D003)?	☐ Yes ☒ No
Is the physical form of the waste inconsistent with the Waste Stream Description or the Waste Matrix Code?	☐ Yes ☒ No
CH or RH TRAMPAC	
Are there heat-sealed bags (unvented) GREATER than 4 liters and LESS than 390 square inches in the waste, or heat sealed bags not authorized in the RH TRUCON Code?	☐ Yes ☒ No
Were there Non-approved Closure Methods used on liner bags or inner bags greater than 4 liters?	☐ Yes ☒ No
Are there sealed containers GREATER than 4 liters?	☐ Yes ☒ No
Are there indications of inadequate protection for heavy and/or sharp objects?	☐ Yes ☒ No
Comments: N/A	

RTR Operator:

Eric Lyles		5/11/2015
Print Name	Signature	Date

CCP Radiography Data Sheet

Section 1: General Information		
[X] RTR Examination	[ ] RTR Replicate Scan	[ ] RTR Independent Observation
Site ID:	ORNL	
Batch Number:	OR-RTR7-0133	
Examination Date:	5/11/2015	
Waste Container ID:	X10C0402910H	
Video/Audio Recorded Media Number:	OR-RTR7-0133	A&B
Procedure and Revision No.:	CCP-TP-053	Rev. 15
NCR(s) associated with the container? (e.g., Prohibited Items)	[X] No [ ] Yes NCR No.: N/A NCR No.: N/A	

Section 2: Waste Container Data	
Container Type:	55 Gallon Drum
TRUCON Code:	OR 225
Waste Matrix Code:	S5400
Waste Stream I.D.:	OR-RF-CH-HET
Waste Container Weights:	Gross Wt.: 72.3 kg Tare Wt.: 33.2 kg Net Wt.: 39.1 kg
Rigid Liner and Liner Vent Description:	Liner: [X] No [ ] Yes Lid: [X] No [ ] Yes Type: [ ] 30-mil [ ] 90-mil [ ] 110-mil [ ] 125-mil Vented: [ ] No [ ] Yes [X] N/A Punctured: [X] No [ ] Yes Mechanical Vent: [X] No [ ] Yes Fiberboard Liner: [X] No [ ] Yes Lead Lined: [X] No [ ] Yes
Number of Layers of Confinement:	Appears to be 1 layer
Volume Utilization Percentage:	90 %

25

CCP Radiography Data Sheet

Waste Container ID: X10C0402910H

Section 3: Container Inventory and Comments (Detailed descriptions)	
IM:	Scrap metal, metal lid
AM:	
OM:	
OI:	Glass containers, absorbent
C:	
R:	
XPM:	Plastic sheeting, plastic caps, plastic containers
OR:	
IN:	
S:	

Section 4: Packaging Material and Waste Material Parameters	
Packaging Material:	**Estimated Weight (kg)**
Steel (ST):	27.8
Plastics (PP): Liner bag	1.0
Other: Cardboard Liner (CP)	4.4
Total Packaging Weight	33.2
Waste Material Parameter:	**Estimated Weight (kg)**
Iron-based Metal / Alloys (IM):	15.0
Aluminum-based Metals / Alloys (AM):	
Other Metals (OM):	
Other Inorganic Materials (OI)	14.1
Cellulosics (C):	
Rubber (R):	
Plastics (waste materials) (XPM):	10.0
Organic Matrix (OR):	
Inorganic Matrix (IN):	
Soils (S):	
Total WMP Weight:	39.1

CCP Radiography Data Sheet

Waste Container ID: X10C0402910H

Section 5: RTR Summary (Questions answered "Yes" will be explained in the Comment block, except for Question 1)	
Is there observable liquid?	☐ Yes ☒ No
Is there any observable liquid in internal containers, more than 60 milliliters or 3 percent by volume, whichever is greater?	☐ Yes ☒ No
Is the total volume of observable liquid in the outermost container GREATER than 1% of the container?	☐ Yes ☒ No
Is there observable liquid in payload containers with an EPA Hazardous Waste Number of U134?	☐ Yes ☒ No
Is there an indication of non-radionuclide pyrophoric materials, such as elemental potassium?	☐ Yes ☒ No
Is there an indication of hazardous wastes not occurring as co-contaminants with TRU mixed wastes (non-mixed hazardous wastes)?	☐ Yes ☒ No
Is there an indication of wastes incompatible with backfill, seal and panel closures materials, container and packaging materials, shipping container materials, or other wastes (i.e., waste does NOT match TRUCON Code[s])?	☐ Yes ☒ No
Is there an indication of wastes containing explosives or compressed gases?	☐ Yes ☒ No
Is there an indication of PCBs liquids?	☐ Yes ☒ No
Is there an indication of the waste exhibiting the characteristic of ignitability, corrosivity, or reactivity (EPA Hazardous Waste Numbers of D001, D002, or D003)?	☐ Yes ☒ No
Is the physical form of the waste inconsistent with the Waste Stream Description or the Waste Matrix Code?	☐ Yes ☒ No
CH or RH TRAMPAC	
Are there heat-sealed bags (unvented) GREATER than 4 liters and LESS than 390 square inches in the waste, or heat sealed bags not authorized in the RH TRUCON Code?	☐ Yes ☒ No
Were there Non-approved Closure Methods used on liner bags or inner bags greater than 4 liters?	☐ Yes ☒ No
Are there sealed containers GREATER than 4 liters?	☐ Yes ☒ No
Are there indications of inadequate protection for heavy and/or sharp objects?	☐ Yes ☒ No
Comments: N/A	

RTR Operator:

Eric Lyles		5/11/2015
Print Name	Signature	Date

DIVIDER

PAGE

Nuclear Waste Partnership LLC

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CP:15:01133
UFC:5900.00

INTER-OFFICE CORRESPONDENCE

DATE: July 21, 2015

FROM: C. Turner — LOCATION: Certification

TO: Andrew Stallings ED — LOCATION: Host Site Operations
Oak Ridge National Laboratory

SUBJECT: SECOND QUARTER 2015 (APRIL 1, 2015 THROUGH JUNE 30, 2015) VISUAL EXAMINATION QUARTERLY REPEAT OF DATA GENERATION LEVEL REVIEW AT THE OAK RIDGE NATIONAL LABORATORY

Remote-Handled (RH) Visual Examination (VE) at the Oak Ridge National Laboratory (ORNL) has completed reporting from April 1, 2015 through June 30, 2015. Container number ORRH00708, in Batch Data Report (BDR) ORNLRHVE15001, was randomly selected from among all the drums processed through Site Project Manager reviews during this period. This container will be processed through the Quarterly Repeat of Data Generation Level (DGL) Review as described in CCP-TP-001, *CCP Project Level Data Validation and Verification*.

Please forward the attached single drum BDR to a qualified VE operator for the completion of an Independent Technical Review quarterly repeat. The attached BDR has all the pertinent information to complete the review. Not all containers included in the original BDR will be included for this review. Only the selected drum noted above must be reviewed along with any quality control information.

Please perform the quarterly repeat of VE DGL review and return the attached BDR with the naming convention "ORNLRHVE15001_QTR0215" to the Central Characterization Program Records Department.

If you have any questions, please call me at (720) 284-8137.

CT:lcg

Attachment

cc: (without attachment)
I. S. Joo ED
D. W. Moody ED

(with attachment)
CCP Records Custodian GSA-212

COPY

CCP RECORDS ORIGINAL
DATE REC'D 7/19/16 SP

Attachment 1 – Visual Examination Data Form

Site ID: ORNL			
Examination Date: 3-31-15		Batch Number: ORNLRHVE150006 AM 3-31-15	
Procedure #: CCP-TP-500		Revision #: 13	Video Number: N/A
Recording Equipment Check: ☐SAT ☐UNSAT ☑N/A		Recording Start: N/A	Recording Stop: N/A
Initial Container ☑N/A		Final Container ☐N/A	
Container or Package ID Number:		Container or Package ID Number: ORRH00708	
Container Type:		Container Type: 55 gallon drum	
Waste Matrix Code:		Waste Matrix Code: S5400	
Waste Stream:		Waste Stream: OR-REDC-RH-HET	
		Rigid Liner: ☐Y ☑N Type:	Rigid Liner Lid: ☐Y ☑N
		Rigid Liner Vented or Hole Size: N/A	
Percent Fill:	Percent Organic Waste:	Percent Fill: 100	Percent Organic Waste: 30
Layers of Confinement:	Closure Method:	Layers of Confinement: 0	Closure Method: N/A
Comments (e.g., filter information, NCRs): cask number X10CSATN03208 Nucfil-019DS SK-32			

Waste Description:

Super sack (P)
plastic tubing (P)
light fixtures (Im)
Nylon rope (P)
tape (P) AM 4-6-15
poly blocks (P)
glass bottles (OIm)
broken light bulbs (OIm)(Im)
metal labware (Im)
metal pieces (Im)
manipulator boot (P)
poly buckets (P)
poly lids (P)
plastic bags (P)
metal filter housings (Im)
saw blade (Im)
rubber hose (R)
tygon tubing (P)
floor sweepings (Im)(C)(P)(R)

Attachment 1 – Visual Examination Data Form (continued)

Container or Package ID Number ORRH00708

	YES	NO	N/A
Does the container have observable liquid equal to or greater than 1 percent by volume of the outermost container at the time of RTR or VE?	☐	☑	
Does the container have observable liquid more than 60 milliliters or 3 percent by volume, whichever is greater in an internal container?	☐	☑	
Does the container have observable liquid with an EPA hazardous waste number (HWN) U134 assigned?	☐	☑	
Does the container have observable liquid containing PCBs?	☐	☑	
Is there an indication of non-radionuclide pyrophoric materials, such as elemental potassium?	☐	☑	
Is there an indication of hazardous wastes not occurring as co-contaminants with TRU mixed wastes (non-mixed hazardous wastes)?	☐	☑	
Is there an indication of wastes incompatible with backfill, seal and panel closures materials, container and packaging materials, shipping container materials, or other wastes (i.e., waste does **NOT** match Table of Allowable Materials for RH-TRU Waste in the RH-TRAMPAC)?	☐	☑	
Is there an indication of wastes containing explosives or compressed gases?	☐	☑	
Is there an indication of polychlorinated biphenyls (PCBs) not authorized under an EPA PCB waste disposal authorization?	☐	☑	
Is there an indication of the waste exhibiting the characteristic of ignitability, corrosivity, or reactivity (EPA Hazardous Waste Numbers of D001, D002, or D003)?	☐	☑	
Is the physical form of the waste inconsistent with the Waste Stream Description or the Waste Matrix Code?	☐	☑	
Were there Non-approved Closure Methods used on liner bags or inner bags greater than 4 liters?	☐	☑	
Are there sealed containers GREATER than 4 liters or heat sealed bags **NOT** defined in the applicable TRUCON Code?	☐	☑	
Are there indications of inadequate protection (blocked or braced) for heavy and/or sharp objects?	☐	☑	
Is the waste consistent with the TRUCON Code?	☑	☐	

Comments: N/A

Visual Examination Operator 1:
Anthony Harley (Print Name) — Signature — 3-31-15 (Date) 4-6-15

Visual Examination Operator 2:
Jason Cofer (Print Name) — Signature — 3-31-15 (Date) 4-6-15

DIVIDER

PAGE

NWP
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CP:15:01138
UFC:5900.00

INTER-OFFICE CORRESPONDENCE

DATE: July 29, 2015

FROM: D. R. Wade DW. LOCATION: Certification

TO: R. Reeves ED LOCATION: Host Site Operations
Oak Ridge National Laboratory

SUBJECT: RESULTS FOR SECOND QUARTER 2015 (APRIL 1, 2015 THROUGH JUNE 30, 2015) REAL-TIME RADIOGRAPHY QUARTERLY REPEAT OF DATA GENERATION LEVEL DATA REVIEW, VALIDATION, AND VERIFICATION AT THE OAK RIDGE NATIONAL LABORATORY.

Procedure CCP-TP-001, *CCP Project Level Data Validation and Verification*, and section C3-10b of the Waste Analysis Plan require that a repeat of Data Generation Level (DGL) review, validation and verification is performed on a quarterly basis for a minimum of one randomly chosen waste container. CCP-TP-001 further specifies that the repeat DGL Data Review, Validation, and Verification are completed for each required characterization methodology that was performed in the last quarter, at each Host site where the Central Characterization Program performed characterization. The purpose of this exercise is to document that the DGL data review, validation, and verification are being performed in accordance with applicable procedures.

The mini-Batch Data Report Containing container X10C0402910G was reviewed for the quarterly repeat review on July 21, 2015. The result of this review indicates that the data quality remains acceptable and no discrepancies were identified. The Project Level Verification and Validation Checklist (Attachment 2, Revision 21 of Procedure CCP-TP-001) has been completed and authenticated.

If you have any questions, please call me at Extension 7505.

DRW:lcg

cc: NWP
L. N. Harmon ED
M. F. Ramirez ED
B. S. Schrock ED
A. O. Stallings ED
CCP Records Custodian GSA-212

ORNL
T. Barton ED.

COPY

P.O. Box 2078 • Carlsbad, New Mexico USA 88221-2078
Phone: (575) 234-7200 • Fax: (575) 234-7083

CCP RECORDS ORIGINAL

DATE REC'D 7-30-15 JY

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NWP
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CP:15:01139
UFC:5900.00

INTER-OFFICE CORRESPONDENCE

DATE: July 29, 2015

FROM: D. R. Wade D.W. LOCATION: Certification

TO: R. D. Reeves ED LOCATION: Host Site Operations
Oak Ridge National Laboratory

SUBJECT: RESULTS OF VISUAL EXAMINATION QUARTERLY REPEAT DATA GENERATION LEVEL DATA REVIEW: OAK RIDGE NATIONAL LABORATORY SECOND QUARTER OF 2015.

Procedure CCP-TP-001, *CCP Project Level Data Validation and Verification,* requires that a repeat of Data Generation Level (DGL) review, validation and verification be performed on the data for a minimum of one randomly chosen waste container each quarter. The Site Project Manager uses this information to document that the DGL data review is being performed according to procedures.

Inter-Office Correspondence Number CP:15:01130 was issued July 15, 2015. This memorandum identified Waste container X10C9400140A, as the randomly-selected container for DGL repeat of Visual Examination at the Oak Ridge National Laboratory for the second quarter of 2015.

The mini-Batch Data Report containing X10C9400140A was reviewed for the quarterly repeat review on July 21, 2015. The result of this review indicates that the data quality remains acceptable and no discrepancies were identified. The Project Level Verification and Validation Checklist (Attachment 1, Revision 21 of Procedure CCP-TP-001) has been completed and authenticated.

If you have any questions, please call me at Extension 7505.

DRW:lcg

cc: NWP

L. N. Harmon	ED
M. F. Ramirez	ED
B. S. Schrock	ED
A. O. Stallings	ED
CCP Records Custodian	GSA-212

ORNL

T. Barton	ED

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DATE REC'D 7.30.15 SY

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Nuclear Waste Partnership LLC
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CP: 15:01142
UFC:5900.00

INTER-OFFICE CORRESPONDENCE

DATE: August 4, 2015

FROM: C. Turner LOCATION: Remote-Handled Projects

TO: CCP Records Custodian GSA-212 LOCATION: Central Characterization Project

SUBJECT: RESULTS OF QUARTERLY REPEAT DATA GENERATION LEVEL REVIEW FOR VISUAL EXAMINATION DATA: SECOND CALENDER QUARTER 2015

Procedure CCP-TP-001, *CCP Project Level Data Validation and Verification*, requires that a repeat of Data Generation Level (DGL) review, validation and verification be performed quarterly on the data for a minimum of one randomly chosen waste container. The Site Project Manager uses this information to document that the DGL data review is being performed according to procedures.

The 2015 second quarter repeat VE Batch Data Report, ORNLRHVE15001_QTR0215 was reviewed and no deficiencies were identified during the review.

If you have any questions, please call me at (720) 284-8137.

CT:lcg

cc: I. S. Joo ED
D. W. Moody ED
M. F. Ramirez ED

CCP RECORDS ORIGINAL
DATE REC'D 08/06/15

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PAGE

Nuclear Waste Partnership LLC

An AECOM-led partnership with B&W and AREVA

CP: 15:01203
UFC:5900.00

INTER-OFFICE CORRESPONDENCE

DATE: October 1, 2015

FROM: C. A. Turner LOCATION: Remote-Handled Projects

TO: A. O. Stallings ED LOCATION: Host Site Operations
Oak Ridge National Laboratory

SUBJECT: THIRD QUARTER 2015 (JULY 1, 2015 THROUGH SEPTEMBER 30, 2015) VISUAL EXAMINATION QUARTERLY REPEAT OF DATA GENERATION LEVEL REVIEW AT THE OAK RIDGE NATIONAL LABORATORY

Container number ORRH00721, in Batch Data Report (BDR) ORNLRHVE15009, was randomly selected from among all the drums processed through Site Project Manager reviews during this period. This container will be processed through the Quarterly Repeat of Data Generation Level (DGL) Review as described in CCP-TP-001, *CCP Project Level Data Validation and Verification*.

Please forward the attached single drum BDR to a qualified VE operator for the completion of an Independent Technical Review quarterly repeat. The attached BDR has all the pertinent information to complete the review. Not all containers included in the original BDR will be included for this review. Only the selected drum noted above must be reviewed along with any quality control information.

Please perform the quarterly repeat of VE DGL review and return the attached BDR with the naming convention "ORNLRHVE15009_QTR0315" to the Central Characterization Program Records Department.

If you have any questions, please call me at (720) 284-8137.

CAT:lcg

Attachment

cc: (without attachment)
I. S. Joo ED
D. W. Moody ED

(with attachment)
CCP Records Custodian GSA-212

COPY

CCP RECORDS ORIGINAL
DATE REC'D 10·20·15
JH 10-2-15

P.O. Box 2078 • Carlsbad, New Mexico USA 88221-2078
Phone: (575) 234-7200 • Fax: (575) 234-7083

Attachment 1 – Visual Examination Data Form

Site ID: RHORNL			
Examination Date: 9-29-15	Batch Number: ORNLRHVE15009		
Procedure #: CCP-TP-500	Revision #: 15	Video #: N/A	
Recording Equipment Check: ☐SAT ☐UNSAT ☑N/A	Recording Start: N/A	Recording Stop: N/A	
Inspection of Container to be loaded during VE: ☑SAT ☐UNSAT			

Indirect load Container ☑N/A	Final Output Container ☐ N/A.
Container ID Number:	Container ID Number: ORRH00721
Container Type:	Container Type: 55 gallon drum
Waste Matrix Code:	Waste Matrix Code: S5400
Waste Stream:	Waste Stream: OR-REDC-RH-HET
	Poly Rigid Liner: ☐Y ☑N Thickness: / Poly Rigid Liner Lid: ☐Y ☑N
	Poly Rigid Liner Vented or Hole Size: N/A
Percent Fill: / Percent Organic Waste:	Percent Fill: 100% / Percent Organic Waste: 20%
Layers of Confinement: / Closure Method:	Layers of Confinement: 0 / Closure Method: N/A

Comments (e.g., filter information, NCRs):
Nuctfil -019 DS BK-29
cask # X10C94D2631

Waste Description:

super sack (P)
cardboard liner (C)
metal pipe (IM)
metal pieces (IM)
cloth sack (C)
electrical cords (R)(OM)
metal cans (IM)
saw blades (IM)
electrical box (IM)(OM)(P)
electric mixer (IM)
poly buckets (P)
manipulator boot (P)
metal clamp (IM)
plastic bags (P)
rubber gloves (R)
glass vials (OIM)
cloth rags (C)
metal lids (IM)
string (C)
floor sweepings (OIM)(IM)(P)

Attachment 1 – Visual Examination Data Form (continued)

Container ID Number ORRH00721

Prohibited Item(s) Summary	YES	NO
Does the container have observable liquid equal to or greater than 1 percent by volume of the outermost container at the time of RTR or VE?	☐	☑
Does the container have observable liquid more than 60 milliliters or 3 percent by volume, whichever is greater in an internal container?	☐	☑
Does the container have observable liquid with an EPA hazardous waste number (HWN) U134 assigned?	☐	☑
Does the container have observable liquid containing PCBs?	☐	☑
Is there an indication of non-radionuclide pyrophoric materials, such as elemental potassium?	☐	☑
Is there an indication of hazardous wastes not occurring as co-contaminants with TRU mixed wastes (non-mixed hazardous wastes)?	☐	☑
Is there an indication of wastes incompatible with backfill, seal and panel closures materials, container and packaging materials, shipping container materials, or other wastes (i.e., waste does **NOT** match Table of Allowable Materials for RH-TRU Waste in the RH-TRAMPAC)?	☐	☑
Is there an indication of wastes containing explosives or compressed gases?	☐	☑
Is there an indication of polychlorinated biphenyls (PCBs) not authorized under an EPA PCB waste disposal authorization?	☐	☑
Is there an indication of the waste exhibiting the characteristic of ignitability, corrosivity, or reactivity (EPA Hazardous Waste Numbers of D001, D002, or D003)?	☐	☑
Is the physical form of the waste inconsistent with the Waste Stream Description or the Waste Matrix Code?	☐	☑
RH 72B Criteria		
Were there Non-approved Closure Methods used on liner bags or inner bags greater than 4 liters?	☐	☑
Are there sealed containers GREATER than 4 liters or heat sealed bags **NOT** defined in the applicable TRUCON Code?	☐	☑
Are there indications of inadequate protection (blocked or braced) for heavy and/or sharp objects?	☐	☑
Is the waste consistent with the TRUCON Code?	☑	☐

Comments: N/A

Visual Examination Operator 1:
Anthony Harley (Print Name) — [signature] (Signature) — 9-29-15 (Date)

Visual Examination Operator 2:
Jason Cofer (Print Name) — [signature] (Signature) — 9-29-15 (Date)

DIVIDER

PAGE

NWP
Nuclear Waste Partnership LLC
An AECOM-led partnership with B&W and AREVA

CP:15:01212
UFC:5900.00

INTER-OFFICE CORRESPONDENCE

DATE: October 12, 2015

FROM: D. R. Wade LOCATION: CCP Certification

TO: A. O. Stallings ED LOCATION: Host Site Operations
Oak Ridge National Laboratory

SUBJECT: THIRD QUARTER 2015 (JULY 1, 2015 THROUGH SEPTEMBER 30, 2015) NONDESTRUCTIVE QUARTERLY REPEAT OF DATA GENERATION LEVEL DATA REVIEW, VALIDATION, AND VERIFICATION AT THE OAK RIDGE NATIONAL LABORATORY

The Oak Ridge National Laboratory has completed data generation level (DGL) review, validation, and verification of Nondestructive Examination (NDE) results for containers processed during the third quarter of 2015 (July 1, 2015 through September 30, 2015). Container number X10CSATN03211AA, Batch Data Report (BDR) OR-RTR7-0147 was randomly selected from all the containers processed for NDE analysis during this time frame. The data from this container and other pertinent documents are incorporated into a modified BDR (attachment) and will be used for the Quarterly Repeat of DGL Data Review, Validation, and Verification, as described in CCP-TP-001, CCP Project Level Data Validation and Verification, to document DGL data review, validation, and verification are being performed in accordance with applicable procedures.

Please assign qualified DGL personnel to review the submitted data and complete the BDR by generating a new Table of Contents, Batch Data Report Cover Sheet, BDR Narrative and applicable DGL checklists. Please have the data reviewed and the BDR completed and returned to the National TRU Certification Program Records Department by November 2, 2015, naming the BDR as OR-RTR7-0147_QTR0315.

If you have any questions, please call me at Extension 7505.

DRW:lcg

Attachment

cc: NWP

(without attachment)
L. Harmon ED
M. F. Ramirez ED
B. S. Schrock ED

(with attachment)
P.Tilmon ED
CCP Records Custodian GSA-212

ORNL

(with attachment)
T. Barton ED

COPY

CCP RECORDS ORIGINAL

DATE REC'D 10-13-2015 JY

P.O. Box 2078 • Carlsbad, New Mexico USA 88221-2078
Phone: (575) 234-7200 • Fax: (575) 234-7083

Attachment 1 – CCP RTR Measurement Control Report

Site ID: ORNL		
Batch Data Report No.: OR-RTR7-0147		
Examination Date: 7-23-15		
Control Checks		
Video/Audio Recorded Media System Check	☑ SAT	☐ UNSAT
Image Test : 10 Lines (Minimum acceptable is 5 lines-pair/cm or #6 Sieve is viewable)	☑ SAT	☐ UNSAT
Comments: N/A		
RTR Operator:		
Daphne Brothers (Printed Name)	Daphne Brothers (Signature)	7-23-15 (Date)

CCP Radiography Data Sheet

Section 1: General Information	
☐ RTR Examination ☒ RTR Replicate Scan ☐ RTR Independent Observation	
Site ID:	ORNL
Batch Number:	OR-RTR7-0147
Examination Date:	7/23/2015
Waste Container ID:	X10CSATN03211AA
Video/Audio Recorded Media Number:	OR-RTR7-0147 A&B
Procedure and Revision No.:	CCP-TP-053 Rev. 15
NCR(s) associated with the container? (e.g., Prohibited Items)	☒ No ☐ Yes NCR No.: N/A NCR No.: N/A

Section 2: Waste Container Data	
Container Type:	55 Gallon Drum
TRUCON Code:	OR 225
Waste Matrix Code:	S5400
Waste Stream I.D.:	OR-REDC-CH-HET
Waste Container Weights:	Gross Wt.: 64.7 kg Tare Wt.: 33.2 kg Net Wt.: 31.5 kg
Rigid Liner and Liner Vent Description:	Liner: ☒ No ☐ Yes Lid: ☒ No ☐ Yes Type: ☐ 30-mil ☐ 90-mil ☐ 110-mil ☐ 125-mil Vented: ☐ No ☐ Yes ☒ N/A Punctured: ☒ No ☐ Yes Mechanical Vent: ☒ No ☐ Yes Fiberboard Liner: ☒ No ☐ Yes Lead Lined: ☒ No ☐ Yes
Number of Layers of Confinement:	Appears to be 1 layer
Volume Utilization Percentage:	90 %

CCP Radiography Data Sheet

Waste Container ID: X10CSATN03211AA

Section 3: Container Inventory and Comments (Detailed descriptions)	
IM:	Metal pipes
AM:	
OM:	
OI:	
C:	Cloth, coveralls
R:	
XPM:	Plastic sheeting, plastic tubing
OR:	
IN:	
S:	

Section 4: Packaging Material and Waste Material Parameters	
Packaging Material:	**Estimated Weight (kg)**
Steel (ST):	27.8
Plastics (PP): Liner bag	1.0
Other: Cardboard (CP)	4.4
Total Packaging Weight	33.2
Waste Material Parameter:	**Estimated Weight (kg)**
Iron-based Metal / Alloys (IM):	0.5
Aluminum-based Metals / Alloys (AM):	
Other Metals (OM):	
Other Inorganic Materials (OI)	
Cellulosics (C):	9.0
Rubber (R):	
Plastics (waste materials) (XPM):	22.0
Organic Matrix (OR):	
Inorganic Matrix (IN):	
Soils (S):	
Total WMP Weight:	31.5

CCP Radiography Data Sheet

Waste Container ID: X10CSATN03211AA

Section 5: RTR Summary (Questions answered "Yes" will be explained in the Comment block, except for Question 1)	
Is there observable liquid?	☐ Yes ☒ No
Is there any observable liquid in internal containers, more than 60 milliliters or 3 percent by volume, whichever is greater?	☐ Yes ☒ No
Is the total volume of observable liquid in the outermost container GREATER than 1% of the container?	☐ Yes ☒ No
Is there observable liquid in payload containers with an EPA Hazardous Waste Number of U134?	☐ Yes ☒ No
Is there an indication of non-radionuclide pyrophoric materials, such as elemental potassium?	☐ Yes ☒ No
Is there an indication of hazardous wastes not occurring as co-contaminants with TRU mixed wastes (non-mixed hazardous wastes)?	☐ Yes ☒ No
Is there an indication of wastes incompatible with backfill, seal and panel closures materials, container and packaging materials, shipping container materials, or other wastes (i.e., waste does NOT match TRUCON Code[s])?	☐ Yes ☒ No
Is there an indication of wastes containing explosives or compressed gases?	☐ Yes ☒ No
Is there an indication of PCBs liquids?	☐ Yes ☒ No
Is there an indication of the waste exhibiting the characteristic of ignitability, corrosivity, or reactivity (EPA Hazardous Waste Numbers of D001, D002, or D003)?	☐ Yes ☒ No
Is the physical form of the waste inconsistent with the Waste Stream Description or the Waste Matrix Code?	☐ Yes ☒ No
CH or RH TRAMPAC	
Are there heat-sealed bags (unvented) GREATER than 4 liters and LESS than 390 square inches in the waste, or heat sealed bags not authorized in the RH TRUCON Code?	☐ Yes ☒ No
Were there Non-approved Closure Methods used on liner bags or inner bags greater than 4 liters?	☐ Yes ☒ No
Are there sealed containers GREATER than 4 liters?	☐ Yes ☒ No
Are there indications of inadequate protection for heavy and/or sharp objects?	☐ Yes ☒ No

Comments: This Replicate Scan agrees with the original Scan. EL 7/23/15

RTR Operator:

Eric Lyles		7/23/2015
Print Name	Signature	Date

CCP Radiography Data Sheet

Section 1: General Information	
☐ RTR Examination ☐ RTR Replicate Scan ☒ RTR Independent Observation	
Site ID:	ORNL
Batch Number:	OR-RTR7-0147
Examination Date:	7/23/2015
Waste Container ID:	X10CSATN03211AH
Video/Audio Recorded Media Number:	OR-RTR7-0147 A&B
Procedure and Revision No.:	CCP-TP-053 Rev. 15
NCR(s) associated with the container? (e.g., Prohibited Items)	☒ No ☐ Yes NCR No.: N/A NCR No.: N/A

Section 2: Waste Container Data	
Container Type:	55 Gallon Drum
TRUCON Code:	OR 225
Waste Matrix Code:	S5400
Waste Stream I.D.:	OR-REDC-CH-HET
Waste Container Weights:	Gross Wt.: 69.5 kg Tare Wt.: 33.2 kg Net Wt.: 36.3 kg
Rigid Liner and Liner Vent Description:	Liner: ☒ No ☐ Yes Lid: ☒ No ☐ Yes Type: ☐ 30-mil ☐ 90-mil ☐ 110-mil ☐ 125-mil Vented: ☐ No ☐ Yes ☒ N/A Punctured: ☒ No ☐ Yes Mechanical Vent: ☒ No ☐ Yes Fiberboard Liner: ☒ No ☐ Yes Lead Lined: ☒ No ☐ Yes
Number of Layers of Confinement:	Appears to be 1 layer
Volume Utilization Percentage:	95 %

CCP Radiography Data Sheet

Waste Container ID: X10CSATN03211AH

Section 3: Container Inventory and Comments (Detailed descriptions)	
IM:	
AM:	
OM:	
OI:	
C:	Coveralls, cloth
R:	
XPM:	Plastic sheeting, plastic tubing
OR:	
IN:	
S:	

Section 4: Packaging Material and Waste Material Parameters	
Packaging Material:	**Estimated Weight (kg)**
Steel (ST):	27.8
Plastics (PP): Liner bag	1.0
Other: Cardboard (CP)	4.4
Total Packaging Weight	33.2
Waste Material Parameter:	**Estimated Weight (kg)**
Iron-based Metal / Alloys (IM):	
Aluminum-based Metals / Alloys (AM):	
Other Metals (OM):	
Other Inorganic Materials (OI)	
Cellulosics (C):	12.0
Rubber (R):	
Plastics (waste materials) (XPM):	24.3
Organic Matrix (OR):	
Inorganic Matrix (IN):	
Soils (S):	
Total WMP Weight:	36.3

CCP Radiography Data Sheet

Waste Container ID: X10CSATN03211AH

Section 5: RTR Summary (Questions answered "Yes" will be explained in the Comment block, except for Question 1)	
Is there observable liquid?	☐ Yes ☒ No
Is there any observable liquid in internal containers, more than 60 milliliters or 3 percent by volume, whichever is greater?	☐ Yes ☒ No
Is the total volume of observable liquid in the outermost container GREATER than 1% of the container?	☐ Yes ☒ No
Is there observable liquid in payload containers with an EPA Hazardous Waste Number of U134?	☐ Yes ☒ No
Is there an indication of non-radionuclide pyrophoric materials, such as elemental potassium?	☐ Yes ☒ No
Is there an indication of hazardous wastes not occurring as co-contaminants with TRU mixed wastes (non-mixed hazardous wastes)?	☐ Yes ☒ No
Is there an indication of wastes incompatible with backfill, seal and panel closures materials, container and packaging materials, shipping container materials, or other wastes (i.e., waste does NOT match TRUCON Code[s])?	☐ Yes ☒ No
Is there an indication of wastes containing explosives or compressed gases?	☐ Yes ☒ No
Is there an indication of PCBs liquids?	☐ Yes ☒ No
Is there an indication of the waste exhibiting the characteristic of ignitability, corrosivity, or reactivity (EPA Hazardous Waste Numbers of D001, D002, or D003)?	☐ Yes ☒ No
Is the physical form of the waste inconsistent with the Waste Stream Description or the Waste Matrix Code?	☐ Yes ☒ No
CH or RH TRAMPAC	
Are there heat-sealed bags (unvented) GREATER than 4 liters and LESS than 390 square inches in the waste, or heat sealed bags not authorized in the RH TRUCON Code?	☐ Yes ☒ No
Were there Non-approved Closure Methods used on liner bags or inner bags greater than 4 liters?	☐ Yes ☒ No
Are there sealed containers GREATER than 4 liters?	☐ Yes ☒ No
Are there indications of inadequate protection for heavy and/or sharp objects?	☐ Yes ☒ No

Comments: This independent observation agrees with the original scan, EL 7/23/15

RTR Operator:

Eric Lyles		7/23/2015
Print Name	Signature	Date

CCP Radiography Data Sheet

Section 1: General Information	
[X] RTR Examination [ ] RTR Replicate Scan [ ] RTR Independent Observation	
Site ID:	ORNL
Batch Number:	OR-RTR7-0147
Examination Date:	7/23/2015
Waste Container ID:	X10CSATN03211AH
Video/Audio Recorded Media Number:	OR-RTR7-0147 A&B
Procedure and Revision No.:	CCP-TP-053 Rev. 15
NCR(s) associated with the container? (e.g., Prohibited Items)	[X] No [ ] Yes NCR No.: N/A NCR No.: N/A

Section 2: Waste Container Data	
Container Type:	55 Gallon Drum
TRUCON Code:	OR 225
Waste Matrix Code:	S5400
Waste Stream I.D.:	OR-REDC-CH-HET
Waste Container Weights:	Gross Wt.: 69.5 kg Tare Wt.: 33.2 kg Net Wt.: 36.3 kg
Rigid Liner and Liner Vent Description:	Liner: [X] No [ ] Yes Lid: [X] No [ ] Yes Type: [ ] 30-mil [ ] 90-mil [ ] 110-mil [ ] 125-mil Vented: [ ] No [ ] Yes [X] N/A Punctured: [X] No [ ] Yes Mechanical Vent: [X] No [ ] Yes Fiberboard Liner: [X] No [ ] Yes Lead Lined: [X] No [ ] Yes
Number of Layers of Confinement:	Appears to be 1 layer
Volume Utilization Percentage:	95 %

CCP Radiography Data Sheet

Waste Container ID: X10CSATN03211AH

Section 3: Container Inventory and Comments (Detailed descriptions)	
IM:	
AM:	
OM:	
OI:	
C:	Coveralls, cloth
R:	
XPM:	Plastic sheeting, plastic tubing
OR:	
IN:	
S:	

Section 4: Packaging Material and Waste Material Parameters	
Packaging Material:	**Estimated Weight (kg)**
Steel (ST):	27.8
Plastics (PP): Liner bag	1.0
Other: Cardboard (CP)	4.4
Total Packaging Weight	33.2
Waste Material Parameter:	**Estimated Weight (kg)**
Iron-based Metal / Alloys (IM):	
Aluminum-based Metals / Alloys (AM):	
Other Metals (OM):	
Other Inorganic Materials (OI)	
Cellulosics (C):	12.3
Rubber (R):	
Plastics (waste materials) (XPM):	24.0
Organic Matrix (OR):	
Inorganic Matrix (IN):	
Soils (S):	
Total WMP Weight:	36.3

CCP Radiography Data Sheet

Waste Container ID: X10CSATN03211AH

Section 5: RTR Summary (Questions answered "Yes" will be explained in the Comment block, except for Question 1)	
Is there observable liquid?	☐ Yes ☒ No
Is there any observable liquid in internal containers, more than 60 milliliters or 3 percent by volume, whichever is greater?	☐ Yes ☒ No
Is the total volume of observable liquid in the outermost container GREATER than 1% of the container?	☐ Yes ☒ No
Is there observable liquid in payload containers with an EPA Hazardous Waste Number of U134?	☐ Yes ☒ No
Is there an indication of non-radionuclide pyrophoric materials, such as elemental potassium?	☐ Yes ☒ No
Is there an indication of hazardous wastes not occurring as co-contaminants with TRU mixed wastes (non-mixed hazardous wastes)?	☐ Yes ☒ No
Is there an indication of wastes incompatible with backfill, seal and panel closures materials, container and packaging materials, shipping container materials, or other wastes (i.e., waste does NOT match TRUCON Code[s])?	☐ Yes ☒ No
Is there an indication of wastes containing explosives or compressed gases?	☐ Yes ☒ No
Is there an indication of PCBs liquids?	☐ Yes ☒ No
Is there an indication of the waste exhibiting the characteristic of ignitability, corrosivity, or reactivity (EPA Hazardous Waste Numbers of D001, D002, or D003)?	☐ Yes ☒ No
Is the physical form of the waste inconsistent with the Waste Stream Description or the Waste Matrix Code?	☐ Yes ☒ No
CH or RH TRAMPAC	
Are there heat-sealed bags (unvented) GREATER than 4 liters and LESS than 390 square inches in the waste, or heat sealed bags not authorized in the RH TRUCON Code?	☐ Yes ☒ No
Were there Non-approved Closure Methods used on liner bags or inner bags greater than 4 liters?	☐ Yes ☒ No
Are there sealed containers GREATER than 4 liters?	☐ Yes ☒ No
Are there indications of inadequate protection for heavy and/or sharp objects?	☐ Yes ☒ No
Comments: N/A	

RTR Operator:

Daphne Brothers	Daphne Brothers	7/23/2015
Print Name	Signature	Date

CCP Radiography Data Sheet

Section 1: General Information	
[X] RTR Examination [ ] RTR Replicate Scan [ ] RTR Independent Observation	
Site ID:	ORNL
Batch Number:	OR-RTR7-0147
Examination Date:	7/23/2015
Waste Container ID:	X10CSATN03211AA
Video/Audio Recorded Media Number:	OR-RTR7-0147 A&B
Procedure and Revision No.:	CCP-TP-053 Rev. 15
NCR(s) associated with the container? (e.g., Prohibited Items)	[X] No [ ] Yes NCR No.: N/A NCR No.: N/A

Section 2: Waste Container Data	
Container Type:	55 Gallon Drum
TRUCON Code:	OR 225
Waste Matrix Code:	S5400
Waste Stream I.D.:	OR-REDC-CH-HET
Waste Container Weights:	Gross Wt.: 64.7 kg Tare Wt.: 33.2 kg Net Wt.: 31.5 kg
Rigid Liner and Liner Vent Description:	Liner: [X] No [ ] Yes Lid: [X] No [ ] Yes Type: [ ] 30-mil [ ] 90-mil [ ] 110-mil [ ] 125-mil Vented: [ ] No [ ] Yes [X] N/A Punctured: [X] No [ ] Yes Mechanical Vent: [X] No [ ] Yes Fiberboard Liner: [X] No [ ] Yes Lead Lined: [X] No [ ] Yes
Number of Layers of Confinement:	Appears to be 1 layer
Volume Utilization Percentage:	90 %

CCP Radiography Data Sheet

Waste Container ID: X10CSATN03211AA

Section 3: Container Inventory and Comments (Detailed descriptions)	
IM:	Metal tubes
AM:	
OM:	
OI:	
C:	Cloth, coveralls
R:	
XPM:	Plastic sheeting, scrap plastic, plastic tubing
OR:	
IN:	
S:	

Section 4: Packaging Material and Waste Material Parameters	
Packaging Material:	**Estimated Weight (kg)**
Steel (ST):	27.8
Plastics (PP): Liner bag	1.0
Other: Cardboard (CP)	4.4
Total Packaging Weight	33.2
Waste Material Parameter:	**Estimated Weight (kg)**
Iron-based Metal / Alloys (IM):	0.5
Aluminum-based Metals / Alloys (AM):	
Other Metals (OM):	
Other Inorganic Materials (OI)	
Cellulosics (C):	10.0
Rubber (R):	
Plastics (waste materials) (XPM):	21.0
Organic Matrix (OR):	
Inorganic Matrix (IN):	
Soils (S):	
Total WMP Weight:	31.5

CCP Radiography Data Sheet

Waste Container ID: X10CSATN03211AA

Section 5: RTR Summary (Questions answered "Yes" will be explained in the Comment block, except for Question 1)	
Is there observable liquid?	☐ Yes ☒ No
Is there any observable liquid in internal containers, more than 60 milliliters or 3 percent by volume, whichever is greater?	☐ Yes ☒ No
Is the total volume of observable liquid in the outermost container GREATER than 1% of the container?	☐ Yes ☒ No
Is there observable liquid in payload containers with an EPA Hazardous Waste Number of U134?	☐ Yes ☒ No
Is there an indication of non-radionuclide pyrophoric materials, such as elemental potassium?	☐ Yes ☒ No
Is there an indication of hazardous wastes not occurring as co-contaminants with TRU mixed wastes (non-mixed hazardous wastes)?	☐ Yes ☒ No
Is there an indication of wastes incompatible with backfill, seal and panel closures materials, container and packaging materials, shipping container materials, or other wastes (i.e., waste does NOT match TRUCON Code[s])?	☐ Yes ☒ No
Is there an indication of wastes containing explosives or compressed gases?	☐ Yes ☒ No
Is there an indication of PCBs liquids?	☐ Yes ☒ No
Is there an indication of the waste exhibiting the characteristic of ignitability, corrosivity, or reactivity (EPA Hazardous Waste Numbers of D001, D002, or D003)?	☐ Yes ☒ No
Is the physical form of the waste inconsistent with the Waste Stream Description or the Waste Matrix Code?	☐ Yes ☒ No
CH or RH TRAMPAC	
Are there heat-sealed bags (unvented) GREATER than 4 liters and LESS than 390 square inches in the waste, or heat sealed bags not authorized in the RH TRUCON Code?	☐ Yes ☒ No
Were there Non-approved Closure Methods used on liner bags or inner bags greater than 4 liters?	☐ Yes ☒ No
Are there sealed containers GREATER than 4 liters?	☐ Yes ☒ No
Are there indications of inadequate protection for heavy and/or sharp objects?	☐ Yes ☒ No
Comments: N/A	

RTR Operator:

Daphne Brothers		7/23/2015
Print Name	Signature	Date

DIVIDER

PAGE

NWP
Nuclear Waste Partnership LLC
An AECOM-led partnership with B&W and AREVA

CP:15:01213
UFC:5900.00

INTER-OFFICE CORRESPONDENCE

DATE: October 12, 2015

FROM: D. R. Wade D.R. Wade LOCATION: CCP Certification

TO: A. O. Stallings ED LOCATION: Host Site Operations
Oak Ridge National Laboratory

SUBJECT: THIRD QUARTER 2015 (JULY 1, 2015 THROUGH SEPTEMBER 30, 2015) VISUAL EXAMINATION QUARTERLY REPEAT OF DATA GENERATION LEVEL DATA REVIEW, VALIDATION, AND VERIFICATION AT THE OAK RIDGE NATIONAL LABORATORY

Procedure CCP-TP-001, *Project Level Data Validation and Verification,* and Section C3-10b of the Waste Analysis Plan require that a repeat of the Data Generation Level (DGL) review, validation, and verification is performed on a quarterly basis for a minimum of one randomly chosen waste container. The repeat DGL data review, validation, and verification are completed for each required characterization methodology that was performed in the last quarter, at each Host site where CCP performed characterization.

Visual Examination (VE) at the Oak Ridge National Laboratory has completed 92 days of reporting from July 1, 2015 through September 30, 2015. Container number X10C9312807A1, BDR ORVECH0148, was randomly selected from among all the drums processed through Data Generation Level (DGL) review, validation, and verification during this time frame. This container will be processed through the quarterly repeat of DGL review as described in CCP-TP-001. The original letter will be retained in the letter correspondence file.

Please assign available qualified personnel to serve as Independent Technical Reviewers in performing the review as well as preparing a Cover sheet, Table of Contents, and Independent Reviewer Checklist.

Please perform the VE quarterly repeat of DGL review, validation, and verification and return the information by November 2, 2015 to the Central Characterization Program Records Department, naming the BDR as ORVECH0148_QTR0315

If you have any questions, please call me at Extension 7505.

DRW:lcg

Attachment

cc: NWP

(without attachment)
L. Harmon ED
M. F. Ramirez ED
B. S. Schrock ED

(with attachment)
P. Tilmon ED
CCP Records Custodian GSA-212

ORNL

(with attachment)
T. Barton ED

COPY

CCP RECORDS ORIGINAL
DATE REC'D 10-13-15 JY

P.O. Box 2078 • Carlsbad, New Mexico USA 88221-2078
Phone: (575) 234-7200 • Fax: (575) 234-7083

Attachment 1 – CCP Waste Visual Examination General Information Form

Batch Data Report No.: ORVECH0148

☑ VE for Previously Packaged Waste ☐ VE for Newly Generated Waste	
☐ Method 1 ☑ Method 2	
Site ID: OR	
Examination Date: 7-16-15	
Procedure No.: CCP-TP-113 Revision No.: 19	
Camera/Audio/Video Media Recording Check: ☑ N/A ☐ SAT	
VE Scale Information: ☑ N/A	Serial/ID Number: Calibration Due Date: Operational Check: ☐ SAT
Test Weight Information Test Weight Total: - kg. Tray Weight: kg.	Serial/ID Number: Calibration Due Date: Serial/ID Number: Calibration Due Date: Serial/ID Number: Calibration Due Date:
Container Scale Information:	Serial/ID Number: WIPP002 Calibration Due Date: 12-8-15 Operational Check: ☑ SAT ☐ UNSAT
Comments: N/A	
Visual Examination Operator 1: Anthony Harley (Print Name) — Signature — 7-16-15 (Date)	
Visual Examination Operator 2: Jason Cole (Print Name) — Signature — 7-16-15 (Date)	

Attachment 2 – CCP Waste Visual Examination Data Form Page 1 of 5

Batch Data Report No.: ORVECH0148

Section 1: Output Waste Container Data		
Input Waste Container ID, as applicable: X10C931280 7A		
Output Waste Container ID: X10C931280 7A1	Waste Stream ID: OR-ISTP-CH-HET	
Container Type: 55 gallon drum	TRUCON Code: OR125/225	Waste Matrix Code: S5400
Audio/Video Media Recording Number: ☑ N/A	Output Container Verified Empty ☐ NO ☑ YES	
Waste Container Weights: Tare Wt: 33.2 kg.	Gross Wt: 126.0 kg.	
Poly Rigid Liner Present? ☑ NO ☐ YES Thickness: ☐ 30-mil ☐ 90-mil ☐ 110-mil ☐ 125-mil Other liner: ☐ Lead ☑ Fiberboard/Cardboard ☐ Other:	Poly Rigid Liner Lid Present? ☑ NO ☐ YES Poly Rigid Liner Lid is Vented (>0.3 in.) or Filtered? ☐ NO ☐ YES ☑ N/A ☐ Vented: Hole Size: ☑ N/A ☐ Filtered: Model No.: ☑ N/A Serial No.: ☑ N/A	
Bag Liner Present? ☐ NO ☑ YES	Volume Utilization Percentage: 100 %	
Does the physical form of the waste match the Waste Stream Description (i.e., Homogeneous Solids, Soil/Gravel, or Debris Waste [including uncategorized metals])? ☐ NO ☑ YES		
Does the physical form of the waste match the Waste Matrix Code? ☐ NO ☑ YES		
Closure Method: TTF Number of Layers of Confinement: 1		
Filter Torque Wrench Serial/ID No.: WIPP124 Calibration Due Date: 9-2-15 Filter: Model No.: LT9424X Serial No.: 00240 0309 Torque Value: 72 in/lbs	Lid Ring/Bolt Torque Wrench Serial/ID No.: WIPP150 Calibration Due Date: 4-8-16 Lid Ring/Bolt Torque Value: 60 ft/lbs	
Is total dose rate greater than 200mrem/hr? ☑ NO ☐ YES		
NCR(s) associated with the output container? ☑ NO ☐ YES NCR No.: N/A NCR No.: N/A		
Comments: N/A		

Attachment 2 – CCP Waste Visual Examination Data Form (continued) Page 2 of 5

Batch Data Report No.: ORVECH0148 **Date:** 7-16-15

Section 2: Waste Package Data

Package and Package TID Number (as applicable)	Waste Description	WMP [Table 3]	Weight (kg) [Table 4.a]	Weighing Code(s) [Table 4.b]
N/A	metal heat exchanger metal probe metal valve caltron source unit	IM	35.0	E
N/A	metal pump metal furnace	IM	30.0	E
N/A	leather gloves cardboard cloth rags absorbent pads	C	10.0	E
N/A	plastic bags vinyl tape	PW	8.8	E
N/A	electrical wires	OM	5.0	E
N/A	absorbent	OI	2.0	E
N/A	rubber gaskets	R	2.0	E

Are there any indirect load containers associated with this BDR? Yes ☐ No ☑

N/A	N/A	N/A
VEO 1: Print Name	Signature	Date
N/A	N/A	N/A
VEO 2: Print Name	Signature	Date

VEO's signatures verify the absence of prohibited items in indirect load containers.

Output Waste Container ID: X10C9312807A1

TID Removed: N/A **TID Applied:** MP8SW 61430

N/A	N/A	N/A
VEO 1: Print Name	Signature	Date
N/A	N/A	N/A
VEO 2: Print Name	Signature	Date

VEO's signatures verify the loading of the indirect load container(s) into the output waste container.

Attachment 2 – CCP Waste Visual Examination Data Form (continued) Page 3 of 5

Batch Data Report No.: ORVECH0148

Output Waste Container ID: X10C9312807A1

Section 3: Packaging Material and Waste Material Parameters	
Packaging Material:	Estimated Weight (kg)
Steel (ST):	27.8
Plastics (PP):	1.0
Cellulosic (C):	4.4
Others:	N/A
Total Packaging Weight:	33.2
Waste Material Parameter:	Estimated Weight (kg)
Iron-based Metal/Alloys (IM):	65.0
Aluminum-based Metals/Alloys (AM):	N/A
Other Metals (OM):	5.0
Other Inorganic Materials (OI):	2.0
Cellulosics (C):	10.0
Rubber (R):	2.0
Plastics (waste materials) (PW):	8.8
Organic Matrix (OR):	N/A
Inorganic Matrix (IN):	N/A
Soils (S):	N/A
Total WMP Weight:	92.8

Attachment 2 – CCP Waste Visual Examination Data Form (continued) Page 4 of 5

Batch Data Report No.: ORVECHD148 **Output Waste Container ID:** XIDC931280TA1

Section 4: Prohibited Item(s) Summary
(Questions answered 'YES' will be explained in the Comments block)

	Yes	No
1. Is there any observable liquid present? If no, proceed to question 5	☐	☑
2. Is there any observable liquid in internal containers, that is more than 60 milliliters or 3 percent by volume, whichever is greater?	☐	☐
3. Is the total volume of observable liquid in the outermost container **GREATER** than 1% of the container?	☐	☐
4. *Is there detectable observable liquid in containers with an EPA Hazardous Waste* Number of U134?	☐	☐
5. Is there an indication of non-radionuclide pyrophoric materials, such as elemental potassium?	☐	☑
6. Is there an indication of hazardous wastes not occurring as co-contaminants with TRU mixed wastes (non-mixed hazardous wastes)?	☐	☑
7. Is there an indication of wastes incompatible with backfill, seal and panel closures materials, container and packaging materials, shipping container materials, or other wastes (i.e., waste does **NOT** match TRUCON Code[s])?	☐	☑
8. Is there an indication of wastes containing explosives or compressed gases?	☐	☑
9. Is there PCB liquids present?	☐	☑
10. Is there an indication of the waste exhibiting the characteristic of ignitability, corrosivity, or reactivity (EPA Hazardous Waste Numbers of D001, D002, or D003)?	☐	☑
11. Is the physical form of the waste inconsistent with the Waste Stream Description or the Waste Matrix Code?	☐	☑
12. Are there heat-sealed bags (unvented) **GREATER** than 4 liters and LESS than 390 square inches in the waste?	☐	☑
13. *Were there Non-approved Closure Methods used on liner bags or inner bags greater* than 4 liters?	☐	☑
14. Are there sealed containers **GREATER** than 4 liters?	☐	☑
15. Are there indications of inadequate protection (blocked or braced) for heavy and/or sharp objects?	☐	☑

Attachment 2 – CCP Waste Visual Examination Data Form (continued) Page 5 of 5

Batch Data Report No.: ORVECH0148 **Output Waste Container ID:** X10C931280 7A1

Section 4: Prohibited Item(s) Summary (Continued)

(Questions answered "YES" will be explained in the Comments block)

Comments:

N/A

Section 5: Approvals

Visual Examination Operator 1:

Print Name	Signature	Date
Anthony Harley		7-16-15

Visual Examination Operator 2:

Print Name	Signature	Date
Jason Cofer		7-16-15

DIVIDER

PAGE

Nuclear Waste Partnership LLC
An ABCOM-led partnership with B&W and AREVA

CP:15:01226
UFC:5900.00

INTER-OFFICE CORRESPONDENCE

DATE: October 28, 2015

FROM: C. Turner LOCATION: Remote-Handled Projects

TO: CCP Records Custodian GSA-212 LOCATION: Central Characterization Program

SUBJECT: RESULTS OF QUARTERLY REPEAT DATA GENERATION LEVEL REVIEW FOR VISUAL EXAMINATION DATA: CALENDER THIRD QUARTER 2015

Procedure CCP-TP-001, *CCP Project Level Data Validation and Verification*, requires that a repeat of Data Generation Level (DGL) review, validation and verification be performed quarterly on the data for a minimum of one randomly chosen waste container. The Site Project Manager uses this information to document that the DGL data review is being performed according to procedures.

The 2015 ~~second~~ third RK 2/16/16 quarter repeat VE Batch Data Report, ORNLRHVE15009_QTR0315 was reviewed and no deficiencies were identified during the review.

If you have any questions, please call me at (720) 284-8137.

CT:lcg

cc: I. S. Joo ED
D. W. Moody ED

COPY

CCP RECORDS ORIGINAL
DATE REC'D 2/17/16

NWP
Nuclear Waste Partnership LLC
An AECOM-led partnership with B&W and AREVA

COPY

CP:15:01232
UFC:5900.00

INTER-OFFICE CORRESPONDENCE

DATE: November 19, 2015

FROM: D. R. Wade LOCATION: Certification

TO: A. O. Stallings ED LOCATION: Host Site Operations
Oak Ridge National Laboratory

SUBJECT: RESULTS OF VISUAL EXAMINATION QUARTERLY REPEAT DATA GENERATION LEVEL DATA REVIEW: OAK RIDGE NATIONAL LABORATORY THIRD QUARTER OF 2015.

Procedure CCP-TP-001, *CCP Project Level Data Validation and Verification,* requires that a repeat of Data Generation Level (DGL) review, validation and verification be performed on the data for a minimum of one randomly chosen waste container each quarter. The Site Project Manager uses this information to document that the DGL data review is being performed according to procedures.

Inter-Office Correspondence Number CP:15:01213 was issued October 12, 2015. This memorandum identified Waste container X10C9312807A1, as the randomly-selected container for DGL repeat of Visual Examination at the Oak Ridge National Laboratory for the third quarter of 2015.

The mini-Batch Data Report containing X10C9312807A1 was reviewed for the quarterly repeat review on October 15, 2015. The result of this review indicates that the data quality remains acceptable and no discrepancies were identified. The Project Level Verification and Validation Checklist (Attachment 1, Revision 21 of Procedure CCP-TP-001) has been completed and authenticated.

If you have any questions, please call me at Extension 7505.

DRW:lcg

cc: NWP

L. N. Harmon	ED
M. F. Ramirez	ED
B. S. Schrock	ED
P. Tilmon	ED
CCP Records Custodian	GSA-212

ORNL

T. Barton	ED

CCP RECORDS ORIGINAL
DATE REC'D 11/20/15

P.O. Box 2078 • Carlsbad, New Mexico USA 88221-2078
Phone: (575) 234-7200 • Fax: (575) 234-7083

NWP
Nuclear Waste Partnership LLC
An AECOM-led partnership with B&W and AREVA

CP:15:01233
UFC:5900.00

INTER-OFFICE CORRESPONDENCE

DATE: November 19, 2015

FROM: D. R. Wade LOCATION: Certification

TO: A. O. Stallings ED LOCATION: Host Site Operations
Oak Ridge National Laboratory

SUBJECT: RESULTS FOR THIRD QUARTER 2015 (JULY 1, 2015 THROUGH SEPTEMBER 30, 2015) REAL-TIME RADIOGRAPHY QUARTERLY REPEAT OF DATA GENERATION LEVEL DATA REVIEW, VALIDATION, AND VERIFICATION AT THE OAK RIDGE NATIONAL LABORATORY.

Procedure CCP-TP-001, *CCP Project Level Data Validation and Verification,* and section C3-10b of the Waste Analysis Plan require that a repeat of Data Generation Level (DGL) review, validation and verification is performed on a quarterly basis for a minimum of one randomly chosen waste container. CCP-TP-001 further specifies that the repeat DGL Data Review, Validation, and Verification are completed for each required characterization methodology that was performed in the last quarter, at each Host site where the Central Characterization Program performed characterization. The purpose of this exercise is to document that the DGL data review, validation, and verification are being performed in accordance with applicable procedures.

The mini-Batch Data Report Containing container X10CSATN03211AA was reviewed for the quarterly repeat review on October 21, 2015. The result of this review indicates that the data quality remains acceptable and no discrepancies were identified. The Project level Verification and Validation Checklist (Attachment 2, Revision 21 of Procedure CCP-TP-001) has been completed and authenticated.

If you have any questions, please call me at Extension 7505.

DRW:lcg

cc: NWP

L. Harmon	ED
M. F. Ramirez	ED
B. S. Schrock	ED
P. Tilmon	ED
CCP Records Custodian	GSA-212

ORNL

T. Barton	ED

CCP RECORDS ORIGINAL
DATE REC'D 11/20/15

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NWP
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CP:16:01022
UFC:5900.00

INTER-OFFICE CORRESPONDENCE

DATE: January 12, 2016

FROM: C. Turner LOCATION: Remote-Handled Projects

TO: A. O. Stallings ED LOCATION: Host Site Operations
Oak Ridge National Laboratory

SUBJECT: FOURTH QUARTER 2015 VISUAL EXAMINATION QUARTERLY REPEAT OF DATA GENERATION LEVEL REVIEW AT THE OAK RIDGE NATIONAL LABORATORY

Container number ORRH00732, in Batch Data Report (BDR) ORNLRHVE15016, was randomly selected from among all the drums processed through Site Project Manager reviews during this period. This container will be processed through the Quarterly Repeat of Data Generation Level (DGL) Review as described in CCP-TP-001, *CCP Project Level Data Validation and Verification*.

Please forward the attached single drum BDR to a qualified VE operator for the completion of an Independent Technical Review quarterly repeat. The attached BDR has all the pertinent information to complete the review. Not all containers included in the original BDR will be included for this review. Only the selected drum noted above must be reviewed along with any quality control information.

Please perform the quarterly repeat of VE DGL review and return the attached BDR with the naming convention "ORNLRHVE15016_QTR0415" to the Central Characterization Program Records Department.

If you have any questions, please call me at (720)-284-8137.

CT:jmc

Attachment

cc: (without attachment)
I. S. Joo ED
D. W. Moody ED

(with attachment)
CCP Records Custodian GSA-212

COPY

CCP RECORDS ORIGINAL
DATE REC'D 1/19/2016
JY.

P.O. Box 2078 • Carlsbad, New Mexico USA 88221-2078
Phone: (575) 234-7200 • Fax: (575) 234-7083

Attachment 4 – Visual Examination Batch Data Report Cover Sheet

Batch Data Report No.: ORNLRHVE15016 Date: 12/29/15

	Waste Container ID Number:
1	ORRH00732
2	
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17	
18	
19	
20	

12/29/15

NTPC RECORDS ORIGINAL
DATE REC'D 12-29-2015

Attachment 5 – Visual Examination Batch Data Report Table of Contents

Batch Data Report No.: ORNL-RHVE 15016 Date: 12/29/15

Item	Description	Page No.
1	Visual Examination Batch Data Report Cover Sheet (Attachment 4)	1
2	Visual Examination Batch Data Report Table of Contents (Attachment 5)	2
3	Visual Examination Data Forms (Attachment 1)	3
4	Visual Examination Independent Technical Reviewer Checklist (Attachment 2)	5
5	Copy of NCRs (N/A [if not applicable])	N/A

Attachment 1 – Visual Examination Data Form

Site ID: RHORNL			
Examination Date: 12/29/15		Batch Number: ORNLRHVE15016	
Procedure #: CCP-TP-500		Revision #: 15	Video #: N/A
Recording Equipment Check: ☐SAT ☐UNSAT ☒N/A		Recording Start: N/A	Recording Stop: N/A
Inspection of Container to be loaded during VE: ☒SAT ☐UNSAT			
Indirect load Container ☒N/A		Final Output Container ☐ N/A	
Container ID Number:		Container ID Number: ORRH00732	
Container Type:		Container Type: 55 Gal. Drum	
Waste Matrix Code:		Waste Matrix Code: 55400	
Waste Stream:		Waste Stream: OR-REDC-RH-HET	
		Poly Rigid Liner: ☐Y ☒N Thickness: N/A	Poly Rigid Liner Lid: ☐Y ☒N
		Poly Rigid Liner Vented or Hole Size: N/A	
Percent Fill:	Percent Organic Waste:	Percent Fill: 100%	Percent Organic Waste: 10%
Layers of Confinement:	Closure Method:	Layers of Confinement: 0	Closure Method: N/A
Comments (e.g., filter information, NCRs): Cask # Y10CD505647 NUCFIL-0190S KS-613			

Waste Description:

Super Sack (P)
Cardboard Liner (C)
Saw Blades (IM)
Plastic Bags (P)
Metal Cans (IM)
Metal Lids (IM)
Poly Blocks (P)
Poly Bag (P)
String (C)
Metal Pieces (IM)
Glass Vials (OIM)
Cloth (C)
Gauze (C)
Floor Sweepings (C)(IM)(OIM)(P)
Plywood (C)
Paper (C)
Aluminum Disc (AM)

Attachment 1 – Visual Examination Data Form (continued)

Container ID Number ORH00732

Prohibited Item(s) Summary	YES	NO
Does the container have observable liquid equal to or greater than 1 percent by volume of the outermost container at the time of RTR or VE?	☐	☑
Does the container have observable liquid more than 60 milliliters or 3 percent by volume, whichever is greater in an internal container?	☐	☑
Does the container have observable liquid with an EPA hazardous waste number (HWN) U134 assigned?	☐	☑
Does the container have observable liquid containing PCBs?	☐	☑
Is there an indication of non-radionuclide pyrophoric materials, such as elemental potassium?	☐	☑
Is there an indication of hazardous wastes not occurring as co-contaminants with TRU mixed wastes (non-mixed hazardous wastes)?	☐	☑
Is there an indication of wastes incompatible with backfill, seal and panel closures materials, container and packaging materials, shipping container materials, or other wastes (i.e., waste does NOT match Table of Allowable Materials for RH-TRU Waste in the RH-TRAMPAC)?	☐	☑
Is there an indication of wastes containing explosives or compressed gases?	☐	☑
Is there an indication of polychlorinated biphenyls (PCBs) not authorized under an EPA PCB waste disposal authorization?	☐	☑
Is there an indication of the waste exhibiting the characteristic of ignitability, corrosivity, or reactivity (EPA Hazardous Waste Numbers of D001, D002, or D003)?	☐	☑
Is the physical form of the waste inconsistent with the Waste Stream Description or the Waste Matrix Code?	☐	☑
RH-TRUCON Check		
Were there Non-approved Closure Methods used on liner bags or inner bags greater than 4 liters?	☐	☑
Are there sealed containers GREATER than 4 liters or heat sealed bags NOT defined in the applicable TRUCON Code?	☐	☑
Are there indications of inadequate protection (blocked or braced) for heavy and/or sharp objects?	☐	☑
Is the waste consistent with the TRUCON Code?	☑	☐

Comments: N/A

Visual Examination Operator 1:
Derek Matheny (Print Name) — Signature — 12/29/15 (Date)

Visual Examination Operator 2:
Anthony Harley (Print Name) — Signature — 12-29-15 (Date)

DIVIDER

PAGE

NWP
Nuclear Waste Partnership LLC
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CP: 16:01047
UFC:5900.00

INTER-OFFICE CORRESPONDENCE

DATE: February 16, 2016

FROM: C. Turner LOCATION: Remote-Handled Projects

TO: CCP Records Custodian GSA-212 LOCATION: Central Characterization Project

SUBJECT: RESULTS OF QUARTERLY REPEAT DATA GENERATION LEVEL REVIEW FOR VISUAL EXAMINATION DATA: CALENDER FOURTH QUARTER 2015

Procedure CCP-TP-001, *CCP Project Level Data Validation and Verification*, requires that a repeat of Data Generation Level (DGL) review, validation and verification be performed quarterly on the data for a minimum of one randomly chosen waste container. The Site Project Manager (SPM) uses this information to document that the DGL data review is being performed according to procedures.

The 2015 fourth quarter repeat VE Batch Data Report, ORNLRHVE15016_QTR0415 was reviewed and no deficiencies were identified during the review.

If you have any questions, please call me at (720)-284-8137.

CT:jmc

cc: I.S. Joo ED
D. W. Moody ED

COPY

CCP RECORDS ORIGINAL
DATE REC'D 2/18/16 SY

DIVIDER

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NWP
Nuclear Waste Partnership LLC
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COPY

CP:16:01051
UFC: 5900.00

INTER-OFFICE CORRESPONDENCE

DATE: February 19, 2016

FROM: B. S. Schrock BSSchrock LOCATION: Certification

TO: A. O. Stallings ED LOCATION: Host Site Operations
Oak Ridge National Laboratory

SUBJECT: REQUEST OF FOURTH QUARTER 2015 (OCTOBER 1, 2015 THROUGH DECEMBER 31, 2015) REAL-TIME RADIOGRAPHY (RTR) QUARTERLY REPEAT OF DATA GENERATION LEVEL DATA REVIEW, VALIDATION, AND VERIFICATION AT THE OAK RIDGE NATIONAL LABORATORY

Container number X10C1351332, in Batch Data Report (BDR) OR-RTR6-0698, was randomly selected from among all the drums processed through Site Project Manager's review during this period. This container will be processed through the Quarterly Repeat of Data Generation Level (DGL) Review as described in CCP-TP-001, *CCP Project Level Data Validation and Verification.*

Please assign qualified personnel to review the submitted data and complete the BDR by generating a new BDR that includes preparing a Cover Sheet, Table of Contents, BDR Narrative and applicable DGL checklists.

Please perform the quarterly repeat of RTR DGL review and return to the Central Characterization Program Records Department by March 1, 2016, naming the BDR as OR-RTR6-0698_QTR0415.

If you have any questions, please call me at Extension 7444.

BSS:rg

Attachment

cc: NWP

(without attachment)
L. Harmon ED
M.F. Ramirez ED
D. Wade ED

(with attachment)
CCP Records Custodian GSA-212

ORNL

(with attachment)
T. Barton ED

CCP RECORDS ORIGINAL
DATE REC'D 2/23/2016
SY

Attachment 1 – CCP RTR Measurement Control Report

Site ID: ORNL		
Batch Data Report No.: OR-RTR6-0698		
Examination Date: 10-22-15		
Control Checks		
Video/Audio Recorded Media System Check	☑ SAT	☐ UNSAT
Image Test : 10 Lines (Minimum acceptable is 5 lines-pair/cm or #6 Sieve is viewable)	☑ SAT	☐ UNSAT
Comments: N/A		
RTR Operator:		
Daphne Brothers (Printed Name)	Daphne Brothers (Signature)	10-22-15 (Date)

3

CCP Radiography Data Sheet

CCP-TP-053 Attachment 2

Section 1: General Information	
[X] RTR Examination [ ] RTR Replicate Scan [ ] RTR Independent Observation	
Site ID:	ORNL
Batch Number:	OR-RTR6-0698
Examination Date:	10/22/2015
Waste Container ID:	X10C1351332
Video/Audio Recorded Media Number:	OR-RTR6-0698 A&B
Procedure and Revision No.:	CCP-TP-053 Rev. 15
NCR(s) associated with the container? (e.g., Prohibited Items)	[X] No [ ] Yes NCR No.: N/A NCR No.: N/A

Section 2: Waste Container Data	
Container Type:	55 Gallon Drum
TRUCON Code:	OR 227
Waste Matrix Code:	S4100
Waste Stream I.D.:	OR-NFS-CH-SOIL
Waste Container Weights:	Gross Wt.: 210.4 kg Tare Wt.: 35.2 kg Net Wt.: 175.2 kg
Rigid Liner and Liner Vent Description:	Liner: [ ] No [X] Yes Lid: [X] No [ ] Yes Type: [ ] 30-mil [X] 90-mil [ ] 110-mil [ ] 125-mil Vented: [ ] No [X] Yes [ ] N/A Punctured: [X] No [ ] Yes Mechanical Vent: [X] No [ ] Yes Fiberboard Liner: [X] No [ ] Yes Lead Lined: [X] No [ ] Yes
Number of Layers of Confinement:	Appears to be 1 layer
Volume Utilization Percentage:	85 %

CCP Radiography Data Sheet

Waste Container ID: X10C1351332

Section 3: Container Inventory and Comments (Detailed descriptions)
IM:
AM:
OM:
OI:
C:
R:
XPM:
OR: Absorbent
IN:
S: Soil

Section 4: Packaging Material and Waste Material Parameters	
Packaging Material:	**Estimated Weight (kg)**
Steel (ST):	27.8
Plastics (PP): Liner bag, Rigid Liner	7.4
Other:	0.0
Total Packaging Weight	35.2
Waste Material Parameter:	**Estimated Weight (kg)**
Iron-based Metal / Alloys (IM):	
Aluminum-based Metals / Alloys (AM):	
Other Metals (OM):	
Other Inorganic Materials (OI)	
Cellulosics (C):	
Rubber (R):	
Plastics (waste materials) (XPM):	
Organic Matrix (OR):	2.2
Inorganic Matrix (IN):	
Soils (S):	173.0
Total WMP Weight:	175.2

CCP Radiography Data Sheet

Waste Container ID: X10C1351332

Section 5: RTR Summary (Questions answered "Yes" will be explained in the Comment block, except for Question 1)	
Is there observable liquid?	☐ Yes ☒ No
Is there any observable liquid in internal containers, more than 60 milliliters or 3 percent by volume, whichever is greater?	☐ Yes ☒ No
Is the total volume of observable liquid in the outermost container GREATER than 1% of the container?	☐ Yes ☒ No
Is there observable liquid in payload containers with an EPA Hazardous Waste Number of U134?	☐ Yes ☒ No
Is there an indication of non-radionuclide pyrophoric materials, such as elemental potassium?	☐ Yes ☒ No
Is there an indication of hazardous wastes not occurring as co-contaminants with TRU mixed wastes (non-mixed hazardous wastes)?	☐ Yes ☒ No
Is there an indication of wastes incompatible with backfill, seal and panel closures materials, container and packaging materials, shipping container materials, or other wastes (i.e., waste does NOT match TRUCON Code[s])?	☐ Yes ☒ No
Is there an indication of wastes containing explosives or compressed gases?	☐ Yes ☒ No
Is there an indication of PCBs liquids?	☐ Yes ☒ No
Is there an indication of the waste exhibiting the characteristic of ignitability, corrosivity, or reactivity (EPA Hazardous Waste Numbers of D001, D002, or D003)?	☐ Yes ☒ No
Is the physical form of the waste inconsistent with the Waste Stream Description or the Waste Matrix Code?	☐ Yes ☒ No
CH or RH TRAMPAC	
Are there heat-sealed bags (unvented) GREATER than 4 liters and LESS than 390 square inches in the waste, or heat sealed bags not authorized in the RH TRUCON Code?	☐ Yes ☒ No
Were there Non-approved Closure Methods used on liner bags or inner bags greater than 4 liters?	☐ Yes ☒ No
Are there sealed containers GREATER than 4 liters?	☐ Yes ☒ No
Are there indications of inadequate protection for heavy and/or sharp objects?	☐ Yes ☒ No
Comments: N/A	

RTR Operator:

Daphne Brothers	Daphne O Brothers	10/22/2015
Print Name	Signature	Date

DIVIDER

PAGE

NWP
Nuclear Waste Partnership LLC
An AECOM-led partnership with B&W and AREVA

CP: 16:01052
UFC: 5900.00

INTER-OFFICE CORRESPONDENCE

DATE: February 19, 2016

FROM: B.S. Schrock BSSchrock LOCATION: Certification

TO: A.O. Stallings ED LOCATION: Host Site Operations
Oak Ridge National Laboratory

SUBJECT: REQUEST OF FOURTH QUARTER 2015 (OCTOBER 1, 2015 THROUGH DECEMBER 31, 2015) VISUAL EXAMINATION QUARTERLY REPEAT OF DATA GENERATION LEVEL DATA REVIEW, VALIDATION, AND VERIFICATION AT THE OAK RIDGE NATIONAL LABORATORY

Container number X10C9400398A, in Batch Data Report (BDR) ORVECH0153, was randomly selected from among all the drums processed through Site Project Manager's review during this period. This container will be processed through the Quarterly Repeat of Data Generation Level (DGL) review as described in CCP-TP-001, *CCP Project Level Data Validation and Verification.*

Please assign qualified personnel to review the submitted data and complete the BDR by generating a new BDR that includes preparing a Cover sheet, Table of Contents, BDR Narrative and applicable DGL checklists.

Please perform the quarterly repeat of VE DGL review and return to the Central Characterization Program Records Department by March 1, 2015, naming the BDR as ORVECH0153_QTR0415.

If you have any questions, please call me at Extension 7444.

BSS:rg

cc: NWP

(without attachment)
L. Harmon ED
M. F. Ramirez ED
D. Wade ED

(with attachment)
CCP Records Custodian GSA-212

ORNL
(with Attachment)
T. Barton ED

COPY

CCP RECORDS ORIGINAL
DATE REC'D 2/23/2016
JY

P.O. Box 2078 • Carlsbad, New Mexico USA 88221-2078
Phone: (575) 234-7200 • Fax: (575) 234-7083

Attachment 1 – CCP Waste Visual Examination General Information Form

Batch Data Report No.: ORVECH0153

☑ VE for Previously Packaged Waste ☐ VE for Newly Generated Waste	
☐ Method 1 ☑ Method 2	
Site ID: OR	
Examination Date: 10-29-15	
Procedure No.: CCP-TP-113 Revision No.: 19	
Camera/Audio/Video Media Recording Check: ☑ N/A ☐ SAT	
VE Scale Information: ☑ N/A	Serial/ID Number: Calibration Due Date: Operational Check: ☐ SAT
Test Weight Information Test Weight Total: kg. Tray Weight: kg.	Serial/ID Number: Calibration Due Date: Serial/ID Number: Calibration Due Date: Serial/ID Number: Calibration Due Date:
Container Scale Information:	Serial/ID Number: WIPP002 Calibration Due Date: 12-8-15 Operational Check: ☑ SAT ☐ UNSAT
Comments: N/A	
Visual Examination Operator 1: Anthony Harley (Print Name) — Signature — 10-29-15 (Date)	
Visual Examination Operator 2: Pat Tilmon (Print Name) — Signature — 10-29-15 (Date)	

Attachment 2 – CCP Waste Visual Examination Data Form Page 1 of 5

Batch Data Report No.: ORVECH0153

Section 1: Output Waste Container Data

Input Waste Container ID, as applicable: X10C9400398

Output Waste Container ID: X10C9400398A | Waste Stream ID: OR-RFDC-CH-HET

Container Type: 55 gallon drum | TRUCON Code: OR125/225 | Waste Matrix Code: S5400

Audio/Video Media Recording Number: ☑ N/A Output Container Verified Empty ☐ NO ☑ YES

Waste Container Weights:
Tare Wt: 33.2 kg. Gross Wt: 99.4 kg.

Poly Rigid Liner Present? ☑ NO ☐ YES

Thickness: ☐ 30-mil ☐ 90-mil ☐ 110-mil ☐ 125-mil

Other liner: ☐ Lead ☑ Fiberboard/Cardboard ☐ Other:

Poly Rigid Liner Lid Present? ☑ NO ☐ YES
Poly Rigid Liner Lid is Vented (≥0.3 in.) or Filtered? ☐ NO ☐ YES ☑ N/A

☐ Vented: Hole Size: ☑ N/A
☐ Filtered: Model No.: ☑ N/A

Serial No.: ☑ N/A

Bag Liner Present? ☐ NO ☑ YES

Volume Utilization Percentage: 100 %

Does the physical form of the waste match the Waste Stream Description (i.e., Homogeneous Solids, Soil/Gravel, or Debris Waste [including uncategorized metals])?
☐ NO ☑ YES

Does the physical form of the waste match the Waste Matrix Code?
☐ NO ☑ YES

Closure Method: TTF
Number of Layers of Confinement: 1

Filter Torque Wrench
Serial/ID No.: WIPP152
Calibration Due Date: 4-8-16
Filter: Model No.: UT9424X
Serial No.: 00238 0136
Torque Value: 72 in/lbs

Lid Ring/Bolt Torque Wrench
Serial/ID No.: WIPP178
Calibration Due Date: 6-3-16
Lid Ring/Bolt Torque Value: 60 ft/lbs

Is total dose rate greater than 200mrem/hr? ☑ NO ☐ YES

NCR(s) associated with the output container? ☑ NO ☐ YES
NCR No.: N/A
NCR No.: N/A

Comments:
N/A

Attachment 2 – CCP Waste Visual Examination Data Form (continued) Page 2 of 5

Batch Data Report No.: ORVECH0153 **Date:** 10-29-15

Section 2: Waste Package Data

Package and Package TID Number (as applicable)	Waste Description	WMP [Table 3]	Weight (kg) [Table 4.[a]]	Weighing Code(s) [Table 4[b]]
N/A	tape plastic bags plastic bottles	PM	8.5	E
N/A	absorbent pads cheese cloth cardboard wood disk gauze	C	20.0	E
N/A	cloth rags leather gloves vaccum bag	C	8.0	E
N/A	utility knife, bolt, pans knives A.H. 10-29-15	IM	6.0	E
N/A	absorbent	OR	0.5	E
N/A	zinc bromide oxides	IN	23.2	E
		N/A	A.H. 10-29-15	

Are there any indirect load containers associated with this BDR? Yes ☐ No ☑

N/A	N/A	N/A
VEO 1: Print Name	Signature	Date
N/A	N/A	N/A
VEO 2: Print Name	Signature	Date

VEO's signatures verify the absence of prohibited items in indirect load containers.

Output Waste Container ID: X10C9400398A

TID Removed: N/A **TID Applied:** MP85M 61086

N/A	N/A	N/A
VEO 1: Print Name	Signature	Date
N/A	N/A	N/A
VEO 2: Print Name	Signature	Date

VEO's signatures verify the loading of the indirect load container(s) into the output waste container.

Attachment 2 – CCP Waste Visual Examination Data Form (continued) Page 3 of 5

Batch Data Report No.: ORVECH0153

Output Waste Container ID: X10C9400398A

Section 3: Packaging Material and Waste Material Parameters	
Packaging Material:	Estimated Weight (kg)
Steel (ST):	27.8
Plastics (PP):	1.0
Cellulosic (C):	4.4
Others:	N/A
Total Packaging Weight:	33.2
Waste Material Parameter:	Estimated Weight (kg)
Iron-based Metal/Alloys (IM):	6.0
Aluminum-based Metals/Alloys (AM):	N/A
Other Metals (OM):	N/A
Other Inorganic Materials (OI):	N/A
Cellulosics (C):	28.0
Rubber (R):	N/A
Plastics (waste materials) (PW):	8.5
Organic Matrix (OR):	0.5
Inorganic Matrix (IN):	23.2
Soils (S):	N/A
Total WMP Weight:	66.2

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NWP
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CP:16:01079
UFC:5900.00

INTER-OFFICE CORRESPONDENCE

DATE: April 6, 2016

FROM: B.S. Schrock BSSchrock LOCATION: Certification

TO: A.O. Stallings LOCATION: Host Site Operations
Oak Ridge National Laboratory

SUBJECT: RESULTS OF QUARTERLY REPEAT DATA GENERATION LEVEL REVIEW FOR REAL-TIME RADIOGRAPHY (RTR) DATA: FOURTH QUARTER 2015 (OCTOBER 1 THROUGH DECEMBER 31)

Procedure CCP-TP-001, *CCP Project Level Data Validation and Verification*, requires that a repeat of Data Generation Level (DGL) review, validation and verification be performed quarterly on the data for a minimum of one randomly chosen waste container. The Site Project Manager (SPM) uses this information to document that the DGL data review is being performed according to procedures.

Inter-office Correspondence Number CP:16:01051 was issued February 19, 2016. This memorandum identified waste container X10C1351332 from Batch Data Report (BDR) OR-RTR6-0698, as the randomly selected container for DGL repeat of RTR at Oak Ridge National Laboratory for the fourth quarter of 2015.

The BDR OR-RTR6-0698_QTR0415 was reviewed and no deficiencies were identified during the review.

If you have any questions, please call me at Extention 7444.

BSS:rg

cc: NWP
L. Harmon ED
M. F. Ramirez ED
D. Wade ED
CCP Records Custodian GSA-212

ORNL
T. Barton ED

CCP RECORDS ORIGINAL
DATE REC'D 4/19/16

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Phone: (575) 234-7200 • Fax: (575) 234-7083

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NWP
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CP:16:01080
UFC:5900.00

INTER-OFFICE CORRESPONDENCE

DATE: April 6, 2016

FROM: B.S. Schrock BSSchrock LOCATION: Certification

TO: A.O. Stalllings LOCATION: Host Site Operations
Oak Ridge National Laboratory

SUBJECT: RESULTS OF QUARTERLY REPEAT DATA GENERATION LEVEL REVIEW FOR VISUAL EXAMINATION (VE) DATA: FOURTH QUARTER 2015 (OCTOBER 1 THROUGH DECEMBER 31)

Procedure CCP-TP-001, *CCP Project Level Data Validation and Verification*, requires that a repeat of Data Generation Level (DGL) review, validation and verification be performed quarterly on the data for a minimum of one randomly chosen waste container. The Site Project Manager (SPM) uses this information to document that the DGL data review is being performed according to procedures.

Inter-office Correspondence Number CP:16:01052 was issued February 19, 2016. This memorandum identified waste container X10C9400398A from Batch Data Report (BDR) ORVECH0153, as the randomly selected container for DGL repeat of VE at Oak Ridge National Laboratory for the fourth quarter of 2015..

The BDR ORVECH0153_QTR0415 was reviewed and no deficiencies were identified during the review.

If you have any questions, please call me at Extension 7444.

BSS:rg

cc: NWP
L. Harmon ED
M. F. Ramirez ED
D. Wade ED
CCP Records Custodian GSA-212

ORNL
T. Barton ED

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DATE REC'D 4/13/16 JY

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NWP
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CP:16:01077
UFC:5900.00

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INTER-OFFICE CORRESPONDENCE

DATE: April 7, 2016

FROM: B. S. Schrock BSSchrock LOCATION: Certification

TO: A. O. Stallings LOCATION: Host Site Operations
Oak Ridge National Laboratory

SUBJECT: REQUEST OF FIRST QUARTER 2016 (JANUARY 1 THROUGH MARCH 31) VISUAL EXAMINATION (VE) QUARTERLY REPEAT OF DATA GENERATION LEVEL DATA REVIEW, VALIDATION, AND VERIFICATION AT THE OAK RIDGE NATIONAL LABORATORY

Container NFS0489B1, in Batch Data Report (BDR) ORVECH0157, was randomly selected from among all the containers processed through Site Project Manager's review during this period. This container will be processed through the Quarterly Repeat of Data Generation Level (DGL) review as described in CCP-TP-001, *CCP Project Level Data Validation and Verification.*

Please assign qualified personnel to review the submitted data and complete the BDR by generating a new BDR that includes preparing a Cover Sheet, Table of Contents, BDR Narrative and applicable DGL checklists.

Please perform the quarterly repeat of VE DGL review and return to the Central Characterization Program Records Department by April 28, 2016, naming the BDR as ORVECH0157_QTR0116.

If you have any questions, please call me at Extension 7444.

BSS:rg

Attachment

cc: NWP

(without attachment)
L. Harmon ED
M. F. Ramirez ED
D. Wade ED

(with attachment)
CCP Records Custodian GSA-212

ORNL

(with attachment)
T. Barton ED

CCP RECORDS ORIGINAL
DATE REC'D 4/19/16

P.O. Box 2078 • Carlsbad, New Mexico USA 88221-2078
Phone: (575) 234-7200 • Fax: (575) 234-7083

Attachment 1 – CCP Waste Visual Examination General Information Form

Batch Data Report No.: ORVECH0157

☑ VE for Previously Packaged Waste ☐ VE for Newly Generated Waste	
☐ Method 1 ☑ Method 2	
Site ID: OR	
Examination Date: 1-6-16	
Procedure No.: CCP-TP-113 Revision No.: 19	
Camera/Audio/Video Media Recording Check: ☑ N/A ☐ SAT	
VE Scale Information: ☑ N/A	Serial/ID Number: Calibration Due Date: Operational Check: ☐ SAT
Test Weight Information Test Weight Total: kg. Tray Weight: kg.	Serial/ID Number: Calibration Due Date: Serial/ID Number: Calibration Due Date: Serial/ID Number: Calibration Due Date:
Container Scale Information:	Serial/ID Number: WIPP 002 Calibration Due Date: 6-8-16 Operational Check: ☑ SAT ☐ UNSAT
Comments: N/A	
Visual Examination Operator 1: Anthony Hartley (Print Name) — Signature — 1-6-16 (Date)	
Visual Examination Operator 2: Gilbert Gutierrez (Print Name) — Signature — 1-6-16 (Date)	

Attachment 2 – CCP Waste Visual Examination Data Form Page 1 of 5

Batch Data Report No.: ORVECH0157

Section 1: Output Waste Container Data

Input Waste Container ID, as applicable: NFS0489B

Output Waste Container ID: NFS048981 | Waste Stream ID: OR-NFS-CH-HET-A

Container Type: 55 gallon drum | TRUCON Code: OR 125/225 | Waste Matrix Code: S5400

Audio/Video Media Recording Number: ☑ N/A Output Container Verified Empty ☐ NO ☑ YES

Waste Container Weights:
Tare Wt: 33.2 kg. Gross Wt: 83.0 kg.

Poly Rigid Liner Present? ☑ NO ☐ YES

Thickness: ☐ 30-mil ☐ 90-mil ☐ 110-mil ☐ 125-mil

Other liner: ☐ Lead ☑ Fiberboard/Cardboard ☐ Other:

Poly Rigid Liner Lid Present? ☑ NO ☐ YES

Poly Rigid Liner Lid is Vented (>0.3 in.) or Filtered? ☐ NO ☐ YES ☑ N/A

☐ Vented: Hole Size: ☑ N/A
☐ Filtered: Model No.: ☑ N/A
Serial No.: ☑ N/A

Bag Liner Present? ☐ NO ☑ YES

Volume Utilization Percentage: 100 %

Does the physical form of the waste match the Waste Stream Description (i.e., Homogeneous Solids, Soil/Gravel, or Debris Waste [including uncategorized metals])?
☐ NO ☑ YES

Does the physical form of the waste match the Waste Matrix Code?
☐ NO ☑ YES

Closure Method: TTF
Number of Layers of Confinement: 1

Filter Torque Wrench
Serial/ID No.: WIPP 152
Calibration Due Date: 4-8-16
Filter: Model No.: UT9424X
Serial No.: 00238 0096
Torque Value: 72 in/lbs

Lid Ring/Bolt Torque Wrench
Serial/ID No.: WIPP 178
Calibration Due Date: 6-3-16
Lid Ring/Bolt Torque Value: 60ft/lbs

Is total dose rate greater than 200mrem/hr? ☑ NO ☐ YES

NCR(s) associated with the output container? ☑ NO ☐ YES
NCR No.: N/A
NCR No.: N/A

Comments:
N/A

Attachment 2 – CCP Waste Visual Examination Data Form (continued) Page 2 of 5

Batch Data Report No.: ORVECH0157 **Date:** 1-6-16

Section 2: Waste Package Data

Package and Package TID Number (as applicable)	Waste Description	WMP [Table 3]	Weight (kg) [Table 4.[a]]	Weighing Code(s) [Table 4.[b]]
N/A	saw blades	IM	0.8	E
N/A	latex gloves, plastic sheeting, poly liner Herculite, plastic bags, tape	PW	20.0	E
N/A	leather gloves vacuum bag cardboard liner	C	6.0	E
N/A	Solid-A-Sorb	IN	23.0	E
	N/A	A,K	1-6-16	

Are there any indirect load containers associated with this BDR? Yes ☐ No ☑

N/A	N/A	N/A
VEO 1: Print Name	Signature	Date
N/A	N/A	N/A
VEO 2: Print Name	Signature	Date

VEO's signatures verify the absence of prohibited items in indirect load containers.

Output Waste Container ID: NES048931

TID Removed: N/A **TID Applied:** MP85W 61256

N/A	N/A	N/A
VEO 1: Print Name	Signature	Date
N/A	N/A	N/A
VEO 2: Print Name	Signature	Date

VEO's signatures verify the loading of the indirect load container(s) into the output waste container.

Attachment 2 – CCP Waste Visual Examination Data Form (continued) Page 3 of 5

Batch Data Report No.: ORVECH0157

Output Waste Container ID: NFS 0489B1

Section 3: Packaging Material and Waste Material Parameters	
Packaging Material:	Estimated Weight (kg)
Steel (ST):	27.8
Plastics (PP):	1.0
Cellulosic (C):	4.4
Others:	N/A
Total Packaging Weight:	33.2
Waste Material Parameter:	Estimated Weight (kg)
Iron-based Metal/Alloys (IM):	0.8
Aluminum-based Metals/Alloys (AM):	N/A
Other Metals (OM):	N/A
Other Inorganic Materials (OI):	N/A
Cellulosics (C):	6.0
Rubber (R):	N/A
Plastics (waste materials) (PW):	20.0
Organic Matrix (OR):	N/A
Inorganic Matrix (IN):	23.0
Soils (S):	N/A
Total WMP Weight:	49.8

Attachment 2 – CCP Waste Visual Examination Data Form (continued) Page 4 of 5

Batch Data Report No.: ORIECH0157 **Output Waste Container ID:** NES048983

Section 4: Prohibited Item(s) Summary (Questions answered "YES" will be explained in the Comments block)	Yes	No
1. Is there any observable liquid present? If no, proceed to question 5	☐	☑
2. Is there any observable liquid in internal containers, that is more than 60 milliliters or 3 percent by volume, whichever is greater?	☐	☐
3. Is the total volume of observable liquid in the outermost container **GREATER** than 1% of the container?	☐	☐
4. Is there detectable observable liquid in containers with an EPA Hazardous Waste Number of U134?	☐	☐
5. Is there an indication of non-radionuclide pyrophoric materials, such as elemental potassium?	☐	☑
6. Is there an indication of hazardous wastes not occurring as co-contaminants with TRU mixed wastes (non-mixed hazardous wastes)?	☐	☑
7. Is there an indication of wastes incompatible with backfill, seal and panel closures materials, container and packaging materials, shipping container materials, or other wastes (i.e., waste does **NOT** match TRUCON Code[s])?	☐	☑
8. Is there an indication of wastes containing explosives or compressed gases?	☐	☑
9. Is there PCB liquids present?	☐	☑
10. Is there an indication of the waste exhibiting the characteristic of ignitability, corrosivity, or reactivity (EPA Hazardous Waste Numbers of D001, D002, or D003)?	☐	☑
11. Is the physical form of the waste inconsistent with the Waste Stream Description or the Waste Matrix Code?	☐	☑
TRUPACT-II Criteria		
12. Are there heat-sealed bags (unvented) **GREATER** than 4 liters and LESS than 390 square inches in the waste?	☐	☑
13. Were there Non-approved Closure Methods used on liner bags or inner bags greater than 4 liters?	☐	☑
14. Are there sealed containers **GREATER** than 4 liters?	☐	☑
15. Are there indications of inadequate protection (blocked or braced) for heavy and/or sharp objects?	☐	☑

Attachment 2 – CCP Waste Visual Examination Data Form (continued) Page 5 of 5

Batch Data Report No.: ORVECH0157 **Output Waste Container ID:** NES 0489 B 1

Section 4: Prohibited Item(s) Summary (Continued)
(Questions answered "YES" will be explained in the Comments block)

Comments:

N/A

Section 5: Approvals

Visual Examination Operator 1:
Anthony Harley (Print Name) — Signature — 1-6-16 (Date)

Visual Examination Operator 2:
Gilbert Gutierrez (Print Name) — Signature — 1-6-16 (Date)

DIVIDER

PAGE

NWP
Nuclear Waste Partnership LLC
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CP:16:01078
UFC:5900.00

INTER-OFFICE CORRESPONDENCE

DATE: April 7, 2016

FROM: B. S. Schrock BSSchrock LOCATION: Certification

TO: A. O. Stallings LOCATION: Host Site Operations
Oak Ridge National Laboratory

SUBJECT: REQUEST OF FIRST QUARTER 2016 (JANUARY 1 THROUGH MARCH 31) REAL-TIME RADIOGRAPHY (RTR) QUARTERLY REPEAT OF DATA GENERATION LEVEL DATA REVIEW, VALIDATION, AND VERIFICATION AT THE OAK RIDGE NATIONAL LABORATORY

Container X10C1300500A, in Batch Data Report (BDR) OR-RTR6-0737, was randomly selected from among all the containers processed through Site Project Manager's review during this period. This container will be processed through the Quarterly Repeat of Data Generation Level (DGL) review as described in CCP-TP-001, *CCP Project Level Data Validation and Verification.*

Please assign qualified personnel to review the submitted data and complete the BDR by generating a new BDR that includes preparing a Cover Sheet, Table of Contents, BDR Narrative and applicable DGL checklists.

Please perform the quarterly repeat of RTR DGL review and return to the Central Characterization Program Records Department by April 28, 2016, naming the BDR as OR-RTR6-0737_QTR0116.

If you have any questions, please call me at Extension 7444.

BSS:rg

Attachment

cc: NWP

(without attachment)
L. Harmon ED
M. F. Ramirez ED
D. Wade ED

(with attachment)
CCP Records Custodian GSA-212

ORNL

(with attachment)
T. Barton ED

COPY

CCP RECORDS ORIGINAL
DATE REC'D 4/19/16

P.O. Box 2078 • Carlsbad, New Mexico USA 88221-2078
Phone: (575) 234-7200 • Fax: (575) 234-7083

Attachment 1 – CCP RTR Measurement Control Report

Site ID: ORNL		
Batch Data Report No.: OR-RTR6-0737		
Examination Date: 3-15-16		
Control Checks		
Video/Audio Recorded Media System Check	☑ SAT	☐ UNSAT
Image Test : 10 Lines (Minimum acceptable is 5 lines-pair/cm or #6 Sieve is viewable)	☑ SAT	☐ UNSAT
Comments: N/A		
RTR Operator:		
Eric Lyles	[signature]	3-15-16
Printed Name	Signature	Date

CCP Radiography Data Sheet

Section 1: General Information	
☐ RTR Examination ☒ RTR Replicate Scan ☐ RTR Independent Observation	
Site ID:	ORNL
Batch Number:	OR-RTR6-0737
Examination Date:	3/15/2016
Waste Container ID:	X10C1200372A
Video/Audio Recorded Media Number:	OR-RTR6-0737 A&B
Procedure and Revision No.:	CCP-TP-053 Rev. 15
NCR(s) associated with the container? (e.g., Prohibited Items)	☒ No ☐ Yes NCR No.: N/A NCR No.: N/A

Section 2: Waste Container Data	
Container Type:	55 Gallon Drum
TRUCON Code:	OR 225
Waste Matrix Code:	S5400
Waste Stream I.D.:	OR-REDC-CH-HET
Waste Container Weights:	Gross Wt.: 54.0 kg Tare Wt.: 33.2 kg Net Wt.: 20.8 kg
Rigid Liner and Liner Vent Description:	Liner: ☒ No ☐ Yes Lid: ☒ No ☐ Yes Type: ☐ 30-mil ☐ 90-mil ☐ 110-mil ☐ 125-mil Vented: ☐ No ☐ Yes ☒ N/A Punctured: ☒ No ☐ Yes Mechanical Vent: ☒ No ☐ Yes Fiberboard Liner: ☒ No ☐ Yes Lead Lined: ☒ No ☐ Yes
Number of Layers of Confinement:	Appears to be 1 layer
Volume Utilization Percentage:	95 %

CCP Radiography Data Sheet

Waste Container ID: X10C1200372A

Section 3: Container Inventory and Comments (Detailed descriptions)	
IM:	Scrap metal, electrical equipment, hand tool
AM:	
OM:	Scrap lead
OI:	Glass containers, absorbent
C:	Cloth, tape roll
R:	
XPM:	Plastic sheeting, plastic containers, open plastic buckets, plastic caps, plastic lids
OR:	
IN:	
S:	

Section 4: Packaging Material and Waste Material Parameters	
Packaging Material:	**Estimated Weight (kg)**
Steel (ST):	27.8
Plastics (PP): Liner bag	1.0
Other: Cardboard Liner (CP)	4.4
Total Packaging Weight	33.2
Waste Material Parameter:	**Estimated Weight (kg)**
Iron-based Metal / Alloys (IM):	2.5
Aluminum-based Metals / Alloys (AM):	
Other Metals (OM):	4.0
Other Inorganic Materials (OI)	4.0
Cellulosics (C):	2.5
Rubber (R):	
Plastics (waste materials) (XPM):	7.8
Organic Matrix (OR):	
Inorganic Matrix (IN):	
Soils (S):	
Total WMP Weight:	20.8

CCP Radiography Data Sheet

Waste Container ID: X10C1200372A

Section 5: RTR Summary (Questions answered "Yes" will be explained in the Comment block, except for Question 1)	
Is there observable liquid?	☐ Yes ☒ No
Is there any observable liquid in internal containers, more than 60 milliliters or 3 percent by volume, whichever is greater?	☐ Yes ☒ No
Is the total volume of observable liquid in the outermost container GREATER than 1% of the container?	☐ Yes ☒ No
Is there observable liquid in payload containers with an EPA Hazardous Waste Number of U134?	☐ Yes ☒ No
Is there an indication of non-radionuclide pyrophoric materials, such as elemental potassium?	☐ Yes ☒ No
Is there an indication of hazardous wastes not occurring as co-contaminants with TRU mixed wastes (non-mixed hazardous wastes)?	☐ Yes ☒ No
Is there an indication of wastes incompatible with backfill, seal and panel closures materials, container and packaging materials, shipping container materials, or other wastes (i.e., waste does NOT match TRUCON Code[s])?	☐ Yes ☒ No
Is there an indication of wastes containing explosives or compressed gases?	☐ Yes ☒ No
Is there an indication of PCBs liquids?	☐ Yes ☒ No
Is there an indication of the waste exhibiting the characteristic of ignitability, corrosivity, or reactivity (EPA Hazardous Waste Numbers of D001, D002, or D003)?	☐ Yes ☒ No
Is the physical form of the waste inconsistent with the Waste Stream Description or the Waste Matrix Code?	☐ Yes ☒ No
CH or RH TRAMPAC	
Are there heat-sealed bags (unvented) GREATER than 4 liters and LESS than 390 square inches in the waste, or heat sealed bags not authorized in the RH TRUCON Code?	☐ Yes ☒ No
Were there Non-approved Closure Methods used on liner bags or inner bags greater than 4 liters?	☐ Yes ☒ No
Are there sealed containers GREATER than 4 liters?	☐ Yes ☒ No
Are there indications of inadequate protection for heavy and/or sharp objects?	☐ Yes ☒ No

Comments: This Replicate Scan Agrees with the ORIGNAL SCAN.

FO 3-15-16

RTR Operator:

Fred Oney		3/15/2016
Print Name	Signature	Date

CCP Radiography Data Sheet

Section 1: General Information	
☐ RTR Examination ☐ RTR Replicate Scan ☒ RTR Independent Observation	
Site ID:	ORNL
Batch Number:	OR-RTR6-0737
Examination Date:	3/15/2016
Waste Container ID:	X10C1200332A
Video/Audio Recorded Media Number:	OR-RTR6-0737 A&B
Procedure and Revision No.:	CCP-TP-053 Rev. 15
NCR(s) associated with the container? (e.g., Prohibited Items)	☒ No ☐ Yes NCR No.: N/A NCR No.: N/A

Section 2: Waste Container Data	
Container Type:	55 Gallon Drum
TRUCON Code:	OR 225
Waste Matrix Code:	S5400
Waste Stream I.D.:	OR-REDC-CH-HET
Waste Container Weights:	Gross Wt.: 53.0 kg Tare Wt.: 33.2 kg Net Wt.: 19.8 kg
Rigid Liner and Liner Vent Description:	Liner: ☒ No ☐ Yes Lid: ☒ No ☐ Yes Type: ☐ 30-mil ☐ 90-mil ☐ 110-mil ☐ 125-mil Vented: ☐ No ☐ Yes ☒ N/A Punctured: ☒ No ☐ Yes Mechanical Vent: ☒ No ☐ Yes Fiberboard Liner: ☒ No ☐ Yes Lead Lined: ☒ No ☐ Yes
Number of Layers of Confinement:	Appears to be 1 layer
Volume Utilization Percentage:	85 %

CCP Radiography Data Sheet

Waste Container ID: X10C1200332A

Section 3: Container Inventory and Comments (Detailed descriptions)	
IM:	Scrap metal, electrical equipment, hand tools
AM:	
OM:	
OI:	Glass containers, glass labware, light bulb, absorbent
C:	Cloth
R:	
XPM:	Plastic sheeting, plastic caps, plastic containers
OR:	
IN:	
S:	

Section 4: Packaging Material and Waste Material Parameters	
Packaging Material:	**Estimated Weight (kg)**
Steel (ST):	27.8
Plastics (PP): Liner bag	1.0
Other: Cardboard Liner (CP)	4.4
Total Packaging Weight	33.2
Waste Material Parameter:	**Estimated Weight (kg)**
Iron-based Metal / Alloys (IM):	7.5
Aluminum-based Metals / Alloys (AM):	
Other Metals (OM):	
Other Inorganic Materials (OI)	3.5
Cellulosics (C):	2.0
Rubber (R):	
Plastics (waste materials) (XPM):	6.8
Organic Matrix (OR):	
Inorganic Matrix (IN):	
Soils (S):	
Total WMP Weight:	19.8

CCP Radiography Data Sheet

Waste Container ID: X10C1200332A

Section 5: RTR Summary (Questions answered "Yes" will be explained in the Comment block, except for Question 1)	
Is there observable liquid?	☐ Yes ☒ No
Is there any observable liquid in internal containers, more than 60 milliliters or 3 percent by volume, whichever is greater?	☐ Yes ☒ No
Is the total volume of observable liquid in the outermost container GREATER than 1% of the container?	☐ Yes ☒ No
Is there observable liquid in payload containers with an EPA Hazardous Waste Number of U134?	☐ Yes ☒ No
Is there an indication of non-radionuclide pyrophoric materials, such as elemental potassium?	☐ Yes ☒ No
Is there an indication of hazardous wastes not occurring as co-contaminants with TRU mixed wastes (non-mixed hazardous wastes)?	☐ Yes ☒ No
Is there an indication of wastes incompatible with backfill, seal and panel closures materials, container and packaging materials, shipping container materials, or other wastes (i.e., waste does NOT match TRUCON Code[s])?	☐ Yes ☒ No
Is there an indication of wastes containing explosives or compressed gases?	☐ Yes ☒ No
Is there an indication of PCBs liquids?	☐ Yes ☒ No
Is there an indication of the waste exhibiting the characteristic of ignitability, corrosivity, or reactivity (EPA Hazardous Waste Numbers of D001, D002, or D003)?	☐ Yes ☒ No
Is the physical form of the waste inconsistent with the Waste Stream Description or the Waste Matrix Code?	☐ Yes ☒ No
CH or RH TRAMPAC	
Are there heat-sealed bags (unvented) GREATER than 4 liters and LESS than 390 square inches in the waste, or heat sealed bags not authorized in the RH TRUCON Code?	☐ Yes ☒ No
Were there Non-approved Closure Methods used on liner bags or inner bags greater than 4 liters?	☐ Yes ☒ No
Are there sealed containers GREATER than 4 liters?	☐ Yes ☒ No
Are there indications of inadequate protection for heavy and/or sharp objects?	☐ Yes ☒ No

Comments: This Independent Observation Agrees with the Original Scan.

FO 3-15-16

RTR Operator:

Fred Oney		3/15/2016
Print Name	Signature	Date

FO

CCP Radiography Data Sheet

Section 1: General Information		
[X] RTR Examination	[ ] RTR Replicate Scan	[ ] RTR Independent Observation
Site ID:	ORNL	
Batch Number:	OR-RTR6-0737	
Examination Date:	3/15/2016	
Waste Container ID:	X10C1300500A	
Video/Audio Recorded Media Number:	OR-RTR6-0737	A&B
Procedure and Revision No.:	CCP-TP-053	Rev. 15
NCR(s) associated with the container? (e.g., Prohibited Items)	[X] No [ ] Yes NCR No.: N/A NCR No.: N/A	

Section 2: Waste Container Data	
Container Type:	55 Gallon Drum
TRUCON Code:	OR 225
Waste Matrix Code:	S5400
Waste Stream I.D.:	OR-REDC-CH-HET
Waste Container Weights:	Gross Wt.: 57.9 kg Tare Wt.: 33.2 kg Net Wt.: 24.7 kg
Rigid Liner and Liner Vent Description:	Liner: [X] No [ ] Yes Lid: [X] No [ ] Yes Type: [ ] 30-mil [ ] 90-mil [ ] 110-mil [ ] 125-mil Vented: [ ] No [ ] Yes [X] N/A Punctured: [X] No [ ] Yes Mechanical Vent: [X] No [ ] Yes Fiberboard Liner: [X] No [ ] Yes Lead Lined: [X] No [ ] Yes
Number of Layers of Confinement:	Appears to be 1 layer
Volume Utilization Percentage:	95 %

CCP Radiography Data Sheet

Waste Container ID: X10C1300500A

Section 3: Container Inventory and Comments (Detailed descriptions)	
IM:	Scrap metal
AM:	
OM:	EL 3/15/16 Scrap Lead
OI:	
C:	Cloth, tape roll
R:	
XPM:	Plastic sheeting, plastic containers, plastic caps, plastic lid, open plastic container
OR:	Absorbent
IN:	
S:	

Section 4: Packaging Material and Waste Material Parameters	
Packaging Material:	**Estimated Weight (kg)**
Steel (ST):	27.8
Plastics (PP): Liner bag	1.0
Other: Cardboard Liner (CP)	4.4
Total Packaging Weight	33.2
Waste Material Parameter:	**Estimated Weight (kg)**
Iron-based Metal / Alloys (IM):	~~13.2~~ EL 3/15/16 11.2
Aluminum-based Metals / Alloys (AM):	
Other Metals (OM):	2.0 EL 3/15/16
Other Inorganic Materials (OI)	
Cellulosics (C):	3.0
Rubber (R):	
Plastics (waste materials) (XPM):	8.0
Organic Matrix (OR):	0.5
Inorganic Matrix (IN):	
Soils (S):	
Total WMP Weight:	24.7

CCP Radiography Data Sheet

Waste Container ID: X10C1300500A

Section 5: RTR Summary (Questions answered "Yes" will be explained in the Comment block, except for Question 1)	
Is there observable liquid?	☐ Yes ☒ No
Is there any observable liquid in internal containers, more than 60 milliliters or 3 percent by volume, whichever is greater?	☐ Yes ☒ No
Is the total volume of observable liquid in the outermost container GREATER than 1% of the container?	☐ Yes ☒ No
Is there observable liquid in payload containers with an EPA Hazardous Waste Number of U134?	☐ Yes ☒ No
Is there an indication of non-radionuclide pyrophoric materials, such as elemental potassium?	☐ Yes ☒ No
Is there an indication of hazardous wastes not occurring as co-contaminants with TRU mixed wastes (non-mixed hazardous wastes)?	☐ Yes ☒ No
Is there an indication of wastes incompatible with backfill, seal and panel closures materials, container and packaging materials, shipping container materials, or other wastes (i.e., waste does NOT match TRUCON Code(s))?	☐ Yes ☒ No
Is there an indication of wastes containing explosives or compressed gases?	☐ Yes ☒ No
Is there an indication of PCBs liquids?	☐ Yes ☒ No
Is there an indication of the waste exhibiting the characteristic of ignitability, corrosivity, or reactivity (EPA Hazardous Waste Numbers of D001, D002, or D003)?	☐ Yes ☒ No
Is the physical form of the waste inconsistent with the Waste Stream Description or the Waste Matrix Code?	☐ Yes ☒ No
CH or RH TRAMPAC	
Are there heat-sealed bags (unvented) GREATER than 4 liters and LESS than 390 square inches in the waste, or heat sealed bags not authorized in the RH TRUCON Code?	☐ Yes ☒ No
Were there Non-approved Closure Methods used on liner bags or inner bags greater than 4 liters?	☐ Yes ☒ No
Are there sealed containers GREATER than 4 liters?	☐ Yes ☒ No
Are there indications of inadequate protection for heavy and/or sharp objects?	☐ Yes ☒ No

Comments: ~~N/A~~ EL 3/15/16
on the audio video recording the two items that was identified as scrap metal at 32" was misidentified. the actual items is Scrap Lead. This attachment 2 reflects my decision. EL 3/15/16

RTR Operator:

Eric Lyles		3/15/2016
Print Name	Signature	Date

Attachment 1 – CCP Nonconformance Report (NCR)

CCP NONCONFORMANCE REPORT (NCR)

(Use NCR Continuation, Attachment 3, if necessary)

NCR No. NCR-ORNL-0003-16 Revision 0

1. Lot No., Heat No., or Serial No. (if applicable): N/A	2. Process (e.g., NDA, NDE, VE, Other): NDA	3. Batch Data Report #(s): OR-MILCC2-0275 Container #(s): X10C0402810E; X10C1300188A
4. Order/Work Order/Job Control Number (if applicable): N/A	5. PO # (if applicable): N/A	
	6. Supplier (if applicable): N/A	

DESCRIPTION OF NONCONFORMANCE

7a. NCR Description: ☐ < 100 nCi/g ☐ Prohibited Item ☐ E-Flag ☐ Receipt Inspection ☐ Transportation ☐ WWIS/WDS ☑ Other

7b. Requirement(s) (Enter Implementing Procedure No., Revision, Section No., & Quoted Text):

CCP-TP-048, Rev 16, Section 4.1.2 [D]
Resolve problems flagged by the AITR, and document resolution on the Final AITR...

7c. Actual Condition:

The containers in Box 3 are rejected by the Expert Analyst as MDA-TRU.

7d. Have the CCP HOLD TAGS associated with this NCR been applied? ☑ YES ☐ NO If no is checked, explain:

8. NCR Originator:

Dan Crosby (printed name) Dan Crosby (signature) 2-9-16 (date)

9. Does the identified condition have the potential to impact AK? If YES or INDETERMINATE, enter Trend Code L in Block 10. ☐ YES ☑ NO ☐ INDETERMINATE

10. Trend Code: K	11. Responsible Manager: Beverly Schrock
12. Recurring Condition? ☐ YES ☑ NO (If Yes, list NCRs and WIPP Forms):	13. Significant Condition? ☐ YES ☑ NO (If Yes, enter WIPP Form No.):

14. QA Engineer or QA Designee validation:

Susan Anderson (printed name) Susan Anderson (signature) 2/9/16 (date)

COPY

Attachment 1 – CCP Nonconformance Report (NCR) (Continued)

NCR No. NCR-ORNL- 0003 -16 Revision 0

INTERIM DISPOSITION

15a. Interim Disposition (Check Only One):
☐ N/A (See Final Disposition) ☑ Hold ☐ Conditionally Accept ☐ Conditionally Use
☐ Sort ☐ Reinspect or Retest ☐ Remediate

15b. Instructions for Completion of the Interim Disposition:

The NDA Cognizant Engineer will evaluate the containers in Box 3 and advise a path forward.

INTERIM DISPOSITION APPROVALS

16a. Responsible Manager or Individual:

printed name	signature	date
Ronald Whitson	[signature]	2/9/2016

16b. QA Engineer or QA Designee:

printed name	signature	date
Susan Anderson	Susan Anderson	2/9/16

Additional Approval:

printed name	signature	date

COMPLETION OF INTERIM DISPOSITION

17. Interim Disposition Complete – Responsible Manager or Individual:

printed name	signature	date

18. Interim Disposition Verified – QA Engineer:

printed name	signature	date

Attachment 1 – CCP Nonconformance Report (NCR) (Continued)

NCR No. NCR- ORNL- 0003 -16 Revision 0

FINAL DISPOSITION

19. Final Disposition (Check Only One: Use-As-Is, Repair, Reject, Rework, or Scrap):
☐ Use-As-Is ☐ Repair
19a. Technical Justification – Required for Use-As-Is or Repair dispositions. [☐ N/A for Reject, Rework, or Scrap]

☐ Reject ☐ Rework ☐ Scrap
19b. Instructions for Completion – Required for Reject, Repair, Rework, or Scrap [☐ N/A for Use-As-Is]

19c. Corrective Actions (Actions to Prevent Recurrence – For Repair or Rework, if applicable.
[☐ N/A if not applicable, and for Use-As-Is, Reject, and Scrap]

FINAL DISPOSITION APPROVALS

20. Responsible Manager or Individual:

printed name _____ signature _____ date _____

21. QA Engineer or QA Designee:

printed name _____ signature _____ date _____

Additional Approval:

printed name _____ signature _____ date _____

CLOSURE

22. Final Disposition Complete - Responsible Manager or Individual:

printed name _____ signature _____ date _____

23. Attachments:

24a. HOLD TAG removal has been verified and reconciled for all nonconforming items on the NCR: ☐
24b. If HOLD TAG is not applicable, check: ☐ and explain:

25. Final Disposition Verified – NCR Closed QA Engineer:

printed name _____ signature _____ date _____

DIVIDER

PAGE

Attachment 1 – CCP Nonconformance Report (NCR)

CCP NONCONFORMANCE REPORT (NCR)

(Use NCR Continuation, Attachment 3, if necessary)

NCR No. NCR-ORNL- 0027 -16 Revision 0

1. Lot No., Heat No., or Serial No. (if applicable): N/A	2. Process (e.g., NDA, NDE, VE, Other): NDA	3. Batch Data Report #(s): OR-IQ3-0628 Container #(s): X10C1100249; X10C1250108; X10C1250104; X10C1250112; X10C1250102; X10C1250113; X10C1250111; X10C1250103; X10C1250106
4. Order/Work Order/Job Control Number (if applicable): N/A	5. PO # (if applicable): N/A	
	6. Supplier (if applicable): N/A	

DESCRIPTION OF NONCONFORMANCE

7a. NCR Description: ☑ < 100 nCi/g ☐ Prohibited Item ☐ E-Flag ☐ Receipt Inspection ☐ Transportation ☐ WWIS/WDS ☐ Other

7b. Requirement(s) (Enter Implementing Procedure No., Revision, Section No., & Quoted Text):

CCP-PO-002, Rev 27, Section 3.3.3 [A.1]
TRU waste containers to be disposed of at the WIPP shall contain greater than 100 nCi/g of waste of alpha-emitting TRU isotopes...

7c. Actual Condition:

The containers in Box 3 are less than or equal to 100 nCi/g.

7d. Have the CCP HOLD TAGS associated with this NCR been applied? ☐ YES ☑ NO If no is checked, explain:

Permanent Reject Labels Applied

8. NCR Originator:

Dan Crosby (printed name) Dan Crosby (signature) 3-7-16 (date)

9. Does the identified condition have the potential to impact AK? If YES or INDETERMINATE, enter Trend Code L in Block 10. ☐ YES ☑ NO ☐ INDETERMINATE

10. *Trend Code:* K	11. *Responsible Manager:* Ronald Whitson
12. Recurring Condition? ☐ YES ☑ NO (If Yes, list NCRs and WIPP Forms):	13. Significant Condition? ☐ YES ☑ NO (If Yes, enter WIPP Form No.):

14. QA Engineer or QA Designee validation:

Susan Anderson (printed name) Susan Anderson (signature) 3/10/16 (date)

CCP RECORDS ORIGINAL
DATE REC'D 4/12/16

COPY

Attachment 1 – CCP Nonconformance Report (NCR) (Continued)

NCR No. NCR-ORNL- 0027 -16 Revision 0

INTERIM DISPOSITION

15a. Interim Disposition (Check Only One):

☑ N/A (See Final Disposition) ☐ Hold ☐ Conditionally Accept ☐ Conditionally Use

☐ Sort ☐ Reinspect or Retest ☐ Remediate

15b. Instructions for Completion of the Interim Disposition:

INTERIM DISPOSITION APPROVALS

16a. Responsible Manager or Individual:

printed name _____ signature _____ date _____

16b. QA Engineer or QA Designee:

printed name _____ signature _____ date _____

Additional Approval:

printed name _____ signature _____ date _____

COMPLETION OF INTERIM DISPOSITION

17. Interim Disposition Complete – Responsible Manager or Individual:

printed name _____ signature _____ date _____

18. Interim Disposition Verified – QA Engineer:

printed name _____ signature _____ date _____

Attachment 1 – CCP Nonconformance Report (NCR) (Continued)

NCR No. NCR- ORNL- 0027 -16 Revision 0

FINAL DISPOSITION

19. Final Disposition (Check Only One: Use-As-Is, Repair, Reject, Rework, or Scrap):
☐ Use-As-Is ☐ Repair

19a. Technical Justification – Required for Use-As-Is or Repair dispositions. [☑ N/A for Reject, Rework, or Scrap]

☑ Reject ☐ Rework ☐ Scrap

19b. Instructions for Completion – Required for Reject, Repair, Rework, or Scrap [☐ N/A for Use-As-Is]

1. Containers are not certifiable for shipment to WIPP and are permanently returned to the host site.
2. Remove containers from the AK Tracking Spreadsheet.
3. After containers are removed, close NCR.

19c. Corrective Actions (Actions to Prevent Recurrence – For Repair or Rework, if applicable.
[☑ N/A if not applicable, and for Use-As-Is, Reject, and Scrap]

FINAL DISPOSITION APPROVALS

20. Responsible Manager or Individual:

Ronald Whitson	[signature]	3/10/2016
printed name	signature	date

21. QA Engineer or QA Designee:

Susan Anderson	Susan Anderson	3/10/16
printed name	signature	date

Additional Approval:

printed name	signature	date

CLOSURE

22. Final Disposition Complete - Responsible Manager or Individual:

BSSchrock	BSSchrock	4/11/16
printed name	signature	date

23. Attachments: 1 - evidence for closure

24a. HOLD TAG removal has been verified and reconciled for all nonconforming items on the NCR: ☐
24b. If HOLD TAG is not applicable, check: ☒ and explain:
See Section 7d.

25. Final Disposition Verified – NCR Closed QA Engineer:

Veronica Waldrom	Veronica Waldrom	4/12/16
printed name	signature	date

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CONTAINERID: X10C1100249

ORNL

AK DATA

Container ID	Container Type	AKA Matrix	WDS Status	AK Excluded	WSID	LOTID	LOT Excluded
X10C1100249	55G		NO WDS STATUS	YES (Inactive)	OR-NFS-CH-SOIL	NONE	

BDR DATA

BDRID	Type	Status	Generation Date
OR-IQ3-0628	NDA	Complete	2016-03-01
OR-RTR6-0729	RTR	Complete	2016-03-01
OR16FG8026	HSG_TRANS	Complete	2016-03-03

NCR DATA

Container ID	NCRID	Status	Release Code
X10C1100249	NCR-ORNL0027160	Open	None

REJECT DATA

Container ID	BDRID	NCRID	NCR Status	Release Code	Actual Condition
X10C1100249	OR-IQ3-0628	NCR-ORNL0027160	Open	None	The containers in Box 3 are less than or equal to 100 nCi/g.

CONTAINERID: X10C1250108

ORNL

AK DATA

Container ID	Container Type	AKA Matrix	WDS Status	AK Excluded	WSID	LOTID	LOT Excluded
X10C1250108	55G		NO WDS STATUS	YES (Inactive)	OR-NFS-CH-SOIL	NONE	

BDR DATA

BDRID	Type	Status	Generation Date
OR-IQ3-0628	NDA	Complete	2016-03-01
OR-RTR6-0729	RTR	Complete	2016-03-01
OR16FG8026	HSG_TRANS	Complete	2016-03-03

NCR DATA

Container ID	NCRID	Status	Release Code
X10C1250108	NCR-ORNL0027160	Open	None

REJECT DATA

Container ID	BDRID	NCRID	NCR Status	Release Code	Actual Condition
X10C1250108	OR-IQ3-0628	NCR-ORNL0027160	Open	None	The containers in Box 3 are less than or equal to 100 nCi/g.

CONTAINERID: X10C1250104

ORNL

NCR ORNL-0027-160 Page 3 of 9 Attachment 1

AK DATA

Container ID	Container Type	AKA Matrix	WDS Status	AK Excluded	WSID	LOTID	LOT Excluded
X10C1250104	55G		NO WDS STATUS	YES (Inactive)	OR-NFS-CH-SOIL	NONE	

BDR DATA

BDRID	Type	Status	Generation Date
OR-IQ3-0628	NDA	Complete	2016-03-01
OR-RTR6-0729	RTR	Complete	2016-03-01
OR16FG8026	HSG_TRANS	Complete	2016-03-03

NCR DATA

Container ID	NCRID	Status	Release Code
X10C1250104	NCR-ORNL0027160	Open	None

REJECT DATA

Container ID	BDRID	NCRID	NCR Status	Release Code	Actual Condition
X10C1250104	OR-IQ3-0628	NCR-ORNL0027160	Open	None	The containers in Box 3 are less than or equal to 100 nCi/g.

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CONTAINERID: X10C1250112

ORNL

AK DATA

Container ID	Container Type	AKA Matrix	WDS Status	AK Excluded	WSID	LOTID	LOT Excluded
X10C1250112	55G		NO WDS STATUS	YES (Inactive)	OR-NFS-CH-SOIL	NONE	

BDR DATA

BDRID	Type	Status	Generation Date
OR-IQ3-0628	NDA	Complete	2016-03-01
OR-RTR6-0729	RTR	Complete	2016-03-01
OR16FG8026	HSG_TRANS	Complete	2016-03-03

NCR DATA

Container ID	NCRID	Status	Release Code
X10C1250112	NCR-ORNL0027160	Open	None

REJECT DATA

Container ID	BDRID	NCRID	NCR Status	Release Code	Actual Condition
X10C1250112	OR-IQ3-0628	NCR-ORNL0027160	Open	None	The containers in Box 3 are less than or equal to 100 nCi/g.

CONTAINERID: X10C1250102

ORNL

AK DATA

Container ID	Container Type	AKA Matrix	WDS Status	AK Excluded	WSID	LOTID	LOT Excluded
X10C1250102	55G		NO WDS STATUS	YES (Inactive)	OR-NFS-CH-SOIL	NONE	

BDR DATA

BDRID	Type	Status	Generation Date
OR-IQ3-0628	NDA	Complete	2016-03-01
OR-RTR6-0729	RTR	Complete	2016-03-01
OR16FG8026	HSG_TRANS	Complete	2016-03-03

NCR DATA

Container ID	NCRID	Status	Release Code
X10C1250102	NCR-ORNL0027160	Open	None

REJECT DATA

Container ID	BDRID	NCRID	NCR Status	Release Code	Actual Condition
X10C1250102	OR-IQ3-0628	NCR-ORNL0027160	Open	None	The containers in Box 3 are less than or equal to 100 nCi/g.

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Page 2 of 9

CONTAINERID: X10C1250113

ORNL

NCR ORNL-0027-1600 Page 2 of 9 Attachment 1

AK DATA

Container ID	Container Type	AKA Matrix	WDS Status	AK Excluded	WSID	LOTID	LOT Excluded
X10C1250113	55G		NO WDS STATUS	YES (Inactive)	OR-NFS-CH-SOIL	NONE	

BDR DATA

BDRID	Type	Status	Generation Date
OR-IQ3-0628	NDA	Complete	2016-03-01
OR-RTR6-0729	RTR	Complete	2016-03-01
OR16FG8026	HSG_TRANS	Complete	2016-03-03

NCR DATA

Container ID	NCRID	Status	Release Code
X10C1250113	NCR-ORNL0027160	Open	None

REJECT DATA

Container ID	BDRID	NCRID	NCR Status	Release Code	Actual Condition
X10C1250113	OR-IQ3-0628	NCR-ORNL0027160	Open	None	The containers in Box 3 are less than or equal to 100 nCi/g.

CONTAINERID: X10C1250111

ORNL

NCR ORNL-0027-16-0 Page 1 of 9 Attachment 1

AK DATA

Container ID	Container Type	AKA Matrix	WDS Status	AK Excluded	WSID	LOTID	LOT Excluded
X10C1250111	55G		NO WDS STATUS	YES (Inactive)	OR-NFS-CH-SOIL	NONE	

BDR DATA

BDRID	Type	Status	Generation Date
OR-IQ3-0628	NDA	Complete	2016-03-01
OR-RTR6-0729	RTR	Complete	2016-03-01
OR16FG8026	HSG_TRANS	Complete	2016-03-03

NCR DATA

Container ID	NCRID	Status	Release Code
X10C1250111	NCR-ORNL0027160	Open	None

REJECT DATA

Container ID	BDRID	NCRID	NCR Status	Release Code	Actual Condition
X10C1250111	OR-IQ3-0628	NCR-ORNL0027160	Open	None	The containers in Box 3 are less than or equal to 100 nCi/g.

CONTAINERID: X10C1250103

ORNL

AK DATA

Container ID	Container Type	AKA Matrix	WDS Status	AK Excluded	WSID	LOTID	LOT Excluded
X10C1250103	55G		NO WDS STATUS	YES (Inactive)	OR-NFS-CH-SOIL	NONE	

BDR DATA

BDRID	Type	Status	Generation Date
OR-IQ3-0628	NDA	Complete	2016-03-01
OR-RTR6-0729	RTR	Complete	2016-03-01
OR16FG8026	HSG_TRANS	Complete	2016-03-03

NCR DATA

Container ID	NCRID	Status	Release Code
X10C1250103	NCR-ORNL0027160	Open	None

REJECT DATA

Container ID	BDRID	NCRID	NCR Status	Release Code	Actual Condition
X10C1250103	OR-IQ3-0628	NCR-ORNL0027160	Open	None	The containers in Box 3 are less than or equal to 100 nCi/g.

CONTAINERID: X10C1250106

ORNL

NCR ORNL-0027-16-0 Attachment 1 Page 9 of 9

AK DATA

Container ID	Container Type	AKA Matrix	WDS Status	AK Excluded	WSID	LOTID	LOT Excluded
X10C1250106	55G		NO WDS STATUS	YES (Inactive)	OR-NFS-CH-SOIL	NONE	

BDR DATA

BDRID	Type	Status	Generation Date
OR-IQ3-0628	NDA	Complete	2016-03-01
OR-RTR6-0729	RTR	Complete	2016-03-01
OR16FG8026	HSG_TRANS	Complete	2016-03-03

NCR DATA

Container ID	NCRID	Status	Release Code
X10C1250106	NCR-ORNL0027160	Open	None

REJECT DATA

Container ID	BDRID	NCRID	NCR Status	Release Code	Actual Condition
X10C1250106	OR-IQ3-0628	NCR-ORNL0027160	Open	None	The containers in Box 3 are less than or equal to 100 nCi/g.

DIVIDER

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Attachment 1 – CCP Nonconformance Report (NCR)

CCP NONCONFORMANCE REPORT (NCR)

(Use NCR Continuation, Attachment 3, if necessary)

NCR No. NCR-ORNL-0041-16 **Revision 0**

1. Lot No., Heat No., or Serial No. (if applicable): N/A	2. Process (e.g., NDA, NDE, VE, Other): NDA	3. Batch Data Report #(s): OR-IQ3-0639 Container #(s): X10C1001978A2
4. Order/Work Order/Job Control Number (if applicable): N/A	5. PO # (if applicable): N/A	
	6. Supplier (if applicable): N/A	

DESCRIPTION OF NONCONFORMANCE

7a. NCR Description: ☐ < 100 nCi/g ☐ Prohibited Item ☐ E-Flag ☐ Receipt Inspection ☐ Transportation ☐ WWIS/WDS ☑ Other

7b. Requirement(s) (Enter Implementing Procedure No., Revision, Section No., & Quoted Text):

CCP-TP-048, Rev 16, Section 4.1.2 [D]
Resolve problems flagged by the AITR, and document resolution on the Final AITR...

7c. Actual Condition:

The container in Box 3 is rejected by the Expert Analyst as MDA-TRU.

7d. Have the CCP HOLD TAGS associated with this NCR been applied? ☑ YES ☐ NO If no is checked, explain:

8. NCR Originator:

Susan Anderson (printed name) Susan Anderson (signature) 3/23/16 (date)

9. Does the identified condition have the potential to impact AK? If YES or INDETERMINATE, enter Trend Code L in Block 10. ☐ YES ☑ NO ☐ INDETERMINATE

10. Trend Code: K	11. Responsible Manager: Beverly Schrock
12. Recurring Condition? ☐ YES ☑ NO (If Yes, list NCRs and WIPP Forms):	13. Significant Condition? ☐ YES ☑ NO (If Yes, enter WIPP Form No.):

14. QA Engineer or QA Designee validation:

Chad Gerlock (printed name) (signature) 3/29/16 (date)

COPY

Attachment 1 – CCP Nonconformance Report (NCR) (Continued)

NCR No. NCR-ORNL-0041-16 Revision 0

INTERIM DISPOSITION

15a. Interim Disposition (Check Only One):

☐ N/A (See Final Disposition) ☑ Hold ☐ Conditionally Accept ☐ Conditionally Use

☐ Sort ☐ Reinspect or Retest ☐ Remediate

15b. Instructions for Completion of the Interim Disposition:

The NDA Cognizant Engineer will evaluate the container in Box 3 and advise a path forward.

INTERIM DISPOSITION APPROVALS

16a. Responsible Manager or Individual:

printed name	signature	date
Ronald Whitson	[signature]	3/29/2016

16b. QA Engineer or QA Designee:

printed name	signature	date
Chad Gerlock	[signature]	3/29/16

Additional Approval:

printed name	signature	date

COMPLETION OF INTERIM DISPOSITION

17. Interim Disposition Complete – Responsible Manager or Individual:

printed name	signature	date

18. Interim Disposition Verified – QA Engineer:

printed name	signature	date

Attachment 1 – CCP Nonconformance Report (NCR) (Continued)

NCR No. NCR- ORNL- 0041 -16 Revision 0

FINAL DISPOSITION

19. Final Disposition (Check Only One: Use-As-Is, Repair, Reject, Rework, or Scrap):
☐ Use-As-Is ☐ Repair

19a. Technical Justification – Required for Use-As-Is or Repair dispositions. [☐ N/A for Reject, Rework, or Scrap]

☐ Reject ☐ Rework ☐ Scrap

19b. Instructions for Completion – Required for Reject, Repair, Rework, or Scrap [☐ N/A for Use-As-Is]

19c. Corrective Actions (Actions to Prevent Recurrence – For Repair or Rework, if applicable.
[☐ N/A if not applicable, and for Use-As-Is, Reject, and Scrap]

FINAL DISPOSITION APPROVALS

20. Responsible Manager or Individual:

printed name _____ signature _____ date _____

21. QA Engineer or QA Designee:

printed name _____ signature _____ date _____

Additional Approval:

printed name _____ signature _____ date _____

CLOSURE

22. Final Disposition Complete - Responsible Manager or Individual:

printed name _____ signature _____ date _____

23. Attachments:

24a. HOLD TAG removal has been verified and reconciled for all nonconforming items on the NCR: ☐
24b. If HOLD TAG is not applicable, check: ☐ and explain:

25. Final Disposition Verified – NCR Closed QA Engineer:

printed name _____ signature _____ date _____

CONTAINERID: X10C1001978A2

ORNL

AK DATA

Container ID	Container Type	AKA Matrix	WDS Status	AK Excluded	WSID	LOTID	LOT Excluded
X10C1001978A2	55G		NO WDS STATUS	NO	OR-REDC-CH-HET	NONE	

BDR DATA

BDRID	Type	Status	Generation Date
OR-IQ3-0639	NDA	Complete	2016-03-21
OR-RTR6-0740	RTR	Complete	2016-03-21
OR16FG8033	HSG_TRANS	Complete	2016-03-22

NCR DATA

Container ID	NCRID	Status	Release Code
X10C1001978A2	NCR-ORNL0041160	Open	None

REJECT DATA

Container ID	BDRID	NCRID	NCR Status	Release Code	Actual Condition
X10C1001978A2	NO DATA				

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Attachment 1 – CCP Nonconformance Report (NCR)

CCP NONCONFORMANCE REPORT (NCR)

(Use NCR Continuation, Attachment 3, if necessary)

NCR No. NCR-ORNL-0053-15 Revision 2

1. Lot No., Heat No., or Serial No. (if applicable): N/A	2. Process (e.g., NDA, NDE, VE, Other): NDE	3. Batch Data Report #(s): OR-RTR7-0117 OR-RTR7-0035
4. Order/Work Order/Job Control Number (if applicable): N/A	5. PO # (if applicable): N/A	Container #(s): X10C0402857E X10C0402984I
	6. Supplier (if applicable): N/A	

DESCRIPTION OF NONCONFORMANCE

7a. NCR Description: ☐ < 100 nCi/g ☒ Prohibited Item ☐ E-Flag ☐ Receipt Inspection ☐ Transportation ☐ WWIS/WDS ☐ Other

7b. Requirement(s) (Enter Implementing Procedure No., Revision, Section No., & Quoted Text):
CCP-TP-053, Rev. 15, "CCP Standard Real- Time Radiography (RTR) Inspection Procedure, Section 4.4.3 [A] states in part "Using Table 1, Prohibited Items, as a reference ...confirm there are NO prohibited items in the waste container." Table 1, Prohibited Items lists, in part, "PCB liquids", THEN ...initiate a nonconformance report

7c. Actual Condition:
Liquid inside of a PCB identified waste container.

Reason for Revision 1: Added steps to final disposition
Reason for Revision 2: Added container X10C0402984I

7d. Have the CCP HOLD TAGS associated with this NCR been applied? ☒ YES ☐ NO If no is checked, explain:
Refer to Attachment 6, 09/03/15 LRR

8. NCR Originator:
Beverly S. Schrock (printed name) BSSchrock (signature) 6/3/15 (date)

9. Does the identified condition have the potential to impact AK? If YES or INDETERMINATE, enter Trend Code L in Block 10. ☐ YES ☒ NO ☐ INDETERMINATE

10. Trend Code: K

11. Responsible Manager: **Beverly Schrock**

12. Significant Condition? ☐ YES ☒ NO (If Yes, enter WIPP Form No.):

13. Recurring Condition? ☐ YES ☒ NO (If Yes, list NCRs and WIPP Forms):

14. QA Engineer or QA Designee validation:
Laura R. Jones (printed name) Laura Lawson Jones (signature) 06/03/15 (date)

COPY

CCP RECORDS ORIGINAL
DATE REC'D 9-4-15

Attachment 1 – CCP Nonconformance Report (NCR) (Continued)

NCR No. NCR-ORNL-0053-15 **Revision 2**

INTERIM DISPOSITION

15a. Interim Disposition (Check Only One):

☒ N/A (See Final Disposition) ☐ Hold ☐ Conditionally Accept ☐ Conditionally Use

☐ Sort ☐ Reinspect or Retest ☐ Remediate

15b. Instructions for Completion of the Interim Disposition:

INTERIM DISPOSITION APPROVALS

16a. Responsible Manager or Individual:

printed name _____ signature _____ date _____

16b. QA Engineer or QA Designee:

printed name _____ signature _____ date _____

Additional Approval:

printed name _____ signature _____ date _____

Additional Approval:

printed name _____ signature _____ date _____

COMPLETION OF INTERIM DISPOSITION

17. Interim Disposition Complete – Responsible Manager or Individual:

printed name _____ signature _____ date _____

18. Interim Disposition Verified – QA Engineer:

printed name _____ signature _____ date _____

Attachment 1 – CCP Nonconformance Report (NCR) (Continued)

NCR No. NCR-ORNL-0053-15 Revision 2

FINAL DISPOSITION

19. Final Disposition (Check Only One: Use-As-Is, Repair, Reject, Rework, or Scrap):
☐ Use-As-Is ☐ Repair
19a. Technical Justification – Required for Use-As-Is or Repair dispositions. [☒ N/A for Reject, Rework, or Scrap]

☒ Reject ☐ Rework ☐ Scrap
19b. Instructions for Completion – Required for Reject, Repair, Rework, or Scrap [☐ N/A for Use-As-Is]
Container is not certifiable for shipment to WIPP.
1. Return containers to Host Site for remediation.
2. Exclude containers on AKTSS
3. Remove Containers from WDS.
*4. Remove containers from certification lot
5. Add this NCR to OR-RTR7-0117 as SPM attachment
6. Operator make corrections to BDR
7. ITR re-review BDR
8. SPM re-review BDR

19c. Corrective Actions (Actions to Prevent Recurrence – For Repair or Rework, if applicable.
[☒ N/A if not applicable, and for Use-As-Is, Reject, and Scrap]

FINAL DISPOSITION APPROVALS

20. Responsible Manager or Individual:

Beverly S. Schrock	BSSchrock	6/4/15
printed name	signature	date

21. QA Engineer or QA Designee:

Laura R. Jones	Laura Raven Jones	6/4/2015
printed name	signature	date

Additional Approval:

printed name	signature	date

Additional Approval:

printed name	signature	date

CLOSURE

22. Final Disposition Complete - Responsible Manager or Individual:

BSSchrock	BSSchrock	8/19/15
printed name	signature	date

04/11/2016 LRT

23. Attachments: 1.- Email PCB Drum with liquid. 2.- Email Documenting Reportability. 3.- Hold tag Documentation. 3.- Evidence for NCR Closure.

24a. HOLD TAG removal has been verified and reconciled for all nonconforming items on the NCR: ☑
24b. If HOLD TAG is not applicable, check: ☐ and explain:

See Attachment 6.

25. Final Disposition Verified – NCR Closed QA Engineer:

Laura R. Jones	Laura Raven Jones 9/3/15 LRJ	08/03/2015
printed name	signature	date

* Verified Containers are not in a LOT. 08/19/2015 LRJ
Attachment 5.- Email Documenting Corrections have been done
Attachment 6.- Hold tag removal notification. 09/03/15 LRJ

Schrock, Beverly - NWP

From: Jeff Harrison <Trash_Talk@msn.com>
Sent: Wednesday, June 03, 2015 1:40 PM
To: Schrock, Beverly - NWP; 'Diana Mccabe'
Cc: Wade, Daniel NWP; Kirkes, Creta - NWP
Subject: RE: PCB Drum with liquid
Attachments: More PCB Changes to the AKTSS.xlsx

Bev,
The TWPC has completed their review of these 29 drums to determine if they are PCB. As you will see in the attached, 4 drums have since been repackaged, 5 drums are not PCB (2 of these 5 drums have a WDS status of Approved_Cert), and the rest are PCB waste, including X10C0402984I which is the one with liquid. Once Diana makes these changes we should be aligned with the TWPC database.

Diana,
Please make the changes in the attached. As noted in column G, the first 4 drums highlighted in red should be inactive. The next 5 drums need deletions made to the comments, PCB, and out_of_service_date fields. The 14 drums after that highlighted in yellow need additions to the PCB and out_of_service_date fields. The last 6 drums do not need any changes.

Please let me know if you have any questions.

Jeff Harrison
Nuclear Waste Partership LLC
Contractor for the U.S. Department of Energy
Trash_Talk@msn.com (e-mail)
720.977.7042 (office)
303.918.8791 (cell)
720.977.7042 (fax)

From: Jeff Harrison [mailto:Trash_Talk@msn.com]
Sent: Friday, May 29, 2015 5:36 PM
To: 'Schrock, Beverly - NWP'
Cc: 'Wade, Daniel NWP'; 'Kirkes, Creta - NWP'
Subject: RE: PCB Drum with liquid

This drum is on a list of 29 that we have identified as PCB but the TWPC database does not. I sent Don this list about a month ago for review to make sure they agree with us. I think he forgot about it so I'll call him next week and see if they can review the list.

Jeff Harrison
Nuclear Waste Partership LLC
Contractor for the U.S. Department of Energy
Trash_Talk@msn.com (e-mail)
720.977.7042 (office)
303.918.8791 (cell)
720.977.7042 (fax)

From: Schrock, Beverly - NWP [mailto:Beverly.Schrock@wipp.ws]
Sent: Friday, May 29, 2015 1:28 PM

NCR ORNL-0053-15-2
Attachment 1 Page 1 of 3

To: Harrison, Jeff
Cc: Wade, Daniel NWP; Kirkes, Creta - NWP
Subject: PCB Drum with liquid

Jeff,

Container X10C04029841 was discovered to be a PCB drum with liquid that had made it into our WDS system as a certified container. Last I remember, you were digging into records and talking to ORNL to see if we were confident that the container was a PCB container. If so, I need to have it removed from WDS, and write an NCR.....

I was out for several weeks on jury duty and I dropped the ball on this. Just trying to tie up loose ends.

Thank you,
Bev

Beverly S. Schrock
Site Project Manager
Central Characterization Program
Nuclear Waste Partnership, LLC
Contractor for the U.S. Department of Energy
(575) 234-7444
(575) 706-0809 Cell

NCR ORNL-0053-15-2
Attachment 1 Page 2 of 2

CONTAINERID	WDS_STATUS	WASTESTREAM	COMMENTS	PCB	OUT_OF_SERVICE_DATE	
[redacted]		OR-REDC-CH-HET	Potential PCB - electric motor.			X10C0402985G1 should be inactive. It has been repackaged into X10C0402985G1A on the AKTSS and is not PCB
		OR-NBL-CH-HET	PCB Item - pump with gear box.			X10C9311030A is already inactive becuase it was repackaged into X10C9311030A1 which is correctly identified as PCB
		OR-REDC-CH-HET	PCB Item - vacuum pump.			X10CSATN01905L should be inactive. It has been repackaged into X10CSATN01905L1A on the AKTSS which is correctly identified as PCB
		OR-REDC-CH-HET	Potential PCB Item-light fixture			X10CSATN02461G should be inactive. It has been repackaged into X10CSATN02461G1 on the AKTSS and is not PCB
X10C0503050A		OR-MRF-CH-HET	~~PCB Item - transformer/capacitor~~	~~Yes~~	~~4/2/2001~~	The TWPC determined this is not PCB
X10C9311900A1		OR-REDC-CH-HET	~~PCB Item-electric pump~~	~~Yes~~	~~6/3/1988~~	The TWPC determined this is not PCB
X10C9311954B	APPROVED_CERT	OR-ISTP-CH-HET	~~PCB Item - absorbed suspect PCB oil.~~	~~Yes~~	~~9/22/1977~~	The TWPC determined this is not PCB
X10C9400204A1	APPROVED_CERT	OR-RF-CH-HET	~~PCB Item - electric pump.~~	~~Yes~~	~~9/24/1975~~	The TWPC determined this is not PCB
X10CSATN02455E		OR-REDC-CH-HET	~~Potential PCB Item-light fixture.~~			The TWPC determined this is not PCB
X10C0402894H	APPROVED_CERT	OR-REDC-CH-HET	Potential PCB - electric motor.	Yes	10/10/1975	The TWPC agrees that this is a PCB
X10C0402982N	APPROVED_CERT	OR-REDC-CH-HET	Potential PCB - electric motor.	Yes	9/26/1979	The TWPC agrees that this is a PCB
X10C0402984I	APPROVED_CERT	OR-REDC-CH-HET	Potential PCB - electric motor.	Yes	9/10/1979	The TWPC agrees that this is a PCB
X10C0402986P	APPROVED_CERT	OR-REDC-CH-HET	PCB Item - pump (cut up)	Yes	6/27/1979	The TWPC agrees that this is a PCB
X10C0402988D	APPROVED_CERT	OR-REDC-CH-HET	Potential PCB - electric motor.	Yes	3/21/1979	The TWPC agrees that this is a PCB
X10C0402988O1	APPROVED_CERT	OR-REDC-CH-HET	PCB Item - capacitor.	Yes	3/21/1979	The TWPC agrees that this is a PCB
X10C9311215A	APPROVED_CERT	OR-REDC-CH-HET	Potential PCB - electric motor.	Yes	10/4/1979	The TWPC agrees that this is a PCB
X10C9312041A		OR-PGDP-CH-HET-A	Potential PCB - electric motor, electric furnace	Yes	11/4/1971	The TWPC agrees that this is a PCB
X10C9312747A		OR-ISTP-CH-HET	Potential PCB - electric motor with gear box.	Yes	5/31/1973	The TWPC agrees that this is a PCB
X10C9312841A	APPROVED_CERT	OR-RADP-CH-HET	Potential PCB - electric motor.	Yes	4/15/1971	The TWPC agrees that this is a PCB
X10C9312911A	APPROVED_CERT	OR-ISTP-CH-HET	Potential PCB - electrical device.	Yes	6/26/1987	The TWPC agrees that this is a PCB
X10C9312988A	APPROVED_CERT	OR-ISTP-CH-HET	Potential PCB - electric motor.	Yes	8/27/1971	The TWPC agrees that this is a PCB
X10CSATN02275F	APPROVED_CERT	OR-REDC-CH-HET	Potential PCB - blower motor.	Yes	8/6/1982	The TWPC agrees that this is a PCB
X10CSATN02279A	APPROVED_CERT	OR-REDC-CH-HET	PCB Item - motor capacitor.	Yes	1/4/1983	The TWPC agrees that this is a PCB
X10C9307229		OR-REDC-CH-HET	PCB Item - vacuum pump	Yes	8/1/1994	The TWPC agrees that this is a PCB
X10C9307232		OR-REDC-CH-HET	PCB Item - vacuum pump	Yes	8/1/1994	The TWPC agrees that this is a PCB
X10C9312615A1		OR-ISTP-CH-HET	PCB Item - transformer	Yes	9/29/1971	The TWPC agrees that this is a PCB
X10C9312672A	APPROVED_CERT	OR-RADP-CH-HET	PCB Item - absorbed oil residue; suspect PCB.	Yes	3/13/1980	The TWPC agrees that this is a PCB
X10C9313625		OR-REDC-CH-HET	PCB Item - vacuum pump	Yes	9/9/1991	The TWPC agrees that this is a PCB
X10C9400112A	APPROVED_CERT	OR-GENR-CH-HET	PCB Item - vacuum pump.	Yes	12/13/1971	The TWPC agrees that this is a PCB

NCR ORNL-0053-15-2

Attachment 1 Page 3 of 3

Jones, Laura - NWP

From: Ramirez, Mike - NWP
Sent: Thursday, June 04, 2015 10:32 AM
To: Jones, Laura - NWP
Subject: RE: Revised NCR-ORNL-0053-15-2

Not reportable

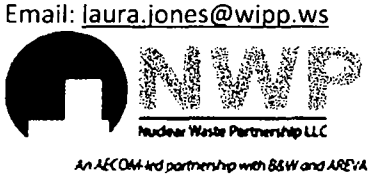
Mike Ramirez
Central Characterization Program
Certification Manager
Nuclear Waste Partnership LLC
Contractor for the U.S. Department of Energy
(575)-234-7034 Work
(575) 200-8535 Cell

From: Jones, Laura - NWP
Sent: Thursday, June 04, 2015 10:28 AM
To: Harmon, Latravia; Harmon, LaTravia - NWP; Leos, Greta - TFE; Navarrete, Leon - TFE; Tilmon, Pat; Pearcy, Sheila - TFE; Ramirez, Mike - NWP; Reeves, Ron - NWP; Schrock, Beverly - NWP; Stallings, Andrew - ORNL; Wade, Daniel NWP
Cc: Ledford, Wayne - NWP; Waldram, Veronica - NWP; Jones, Laura - NWP
Subject: Revised NCR-ORNL-0053-15-2

All – For your information
Mike – Please review for notification purposes, a container was added to the NCR.
Greta – Please post this open revised NCR.

Thanks and Best Regards

Laura R. Jones
Quality Assurance NCR Coordinator
Nuclear Waste Partnership, LLC
Contractor for the U.S. Department of Energy
575-234-7244 (office)
Email: laura.jones@wipp.ws



NCR-ORNL-0053-15 Rev. 2
Attachment 2 Page 1 of 2

Jones, Laura - NWP

From: IDC (No Reply) <NOREPLY@wipp.ws>
Sent: Thursday, June 04, 2015 10:32 AM
To: DL CCP QA CBFO Notify
Subject: Project Office NCR [NCR-ORNL0053152] was just reviewed.

Certification Manager/Designee has just reviewed the project office NCR NCR-ORNL0053152 and has indicated that it [should **NOT**] be reported to CBFO. IDC has already updated the NCR for you.

Friday, August 7, 2015

CONTAINERID: X10C0402857E

ORNL

AK DATA

Container ID	Container Type	AKA Matrix	WDS Status	AK Excluded	WSID	LOTID	LOT Excluded
X10C0402857E	55G		NO WDS STATUS	YES (Inactive)	OR-REDC-CH-HET	NONE	PCB container with liquid

BDR DATA

BDRID	Type	Status	Generation Date
OR-MILCC2-0101	NDA	Complete	2014-10-22
OR-RTR7-0117	RTR	Complete	2014-10-16
OR14FG8143	HSG_TRANS	Complete	2014-10-23

NCR DATA

Container ID	NCRID	Status	Release Code
X10C0402857E	NCR-ORNL0053150	Superseded	None
X10C0402857E	NCR-ORNL0053151	Superseded	None
X10C0402857E	NCR-ORNL0053152	Open	None

REJECT DATA

Container ID	BDRID	NCRID	NCR Status	Release Code	Actual Condition
X10C0402857E	OR-RTR7-0117	NCR-ORNL0053150	Superseded	None	Liquid inside of a PCB identified waste container.Reason for Revision 1: Added steps to final disposition.
X10C0402857E	OR-RTR7-0117	NCR-ORNL0053151	Superseded	None	Liquid inside of a PCB identified waste container.Reason for Revision 1: Added steps to final disposition.Reason for Revision 2: Added Container Number X10C04029811.
X10C0402857E	OR-RTR7-0117	NCR-ORNL0053152	Open	None	Liquid inside of a PCB identified waste container.Reason for Revision 1: Added steps to final disposition.Reason for Revision 2: Added Container Number X10C04029811.

NCR ORNL-0053-15-2

Attachment 3 Page 1 of 25

CCP Radiography Data Sheet

CCP-TP-053 Attachment 2

Section 1: General Information		
[X] RTR Examination	[ ] RTR Replicate Scan	[ ] RTR Independent Observation
Site ID:	ORNL	
Batch Number:	OR-RTR7-0117	
Examination Date:	10/16/2014	
Waste Container ID:	X10C0402857E	
Video/Audio Recorded Media Number:	OR-RTR7-0117	A&B
Procedure and Revision No.:	CCP-TP-053	Rev. 15
NCR(s) associated with the container? (e.g., Prohibited Items)	~~[X] No~~ [✓] Yes EL 4/20/15 EL 4/20/15 NCR No.: ~~N/A~~ NCR-ORNL-0053-15 NCR No.: N/A	

Section 2: Waste Container Data		
Container Type:	55 Gallon Drum	
TRUCON Code:	OR 225	
Waste Matrix Code:	S5400	
Waste Stream I.D.:	OR-REDC-CH-HET	
Waste Container Weights:	Gross Wt.: 70.9 kg Tare Wt.: 33.2 kg Net Wt.: 37.7 kg	
Rigid Liner and Liner Vent Description:	Liner: [X] No [ ] Yes Lid: [X] No [ ] Yes Type: [ ] 30-mil [ ] 90-mil [ ] 110-mil [ ] 125-mil Vented: [ ] No [ ] Yes [X] N/A Punctured: [X] No [ ] Yes Mechanical Vent: [X] No [ ] Yes Fiberboard Liner: [X] No [ ] Yes Lead Lined: [X] No [ ] Yes	
Number of Layers of Confinement:	Appears to be 1 layer	
Volume Utilization Percentage:	85 %	

CCP Radiography Data Sheet

Waste Container ID: X10C0402857E

Section 3: Container Inventory and Comments	(Detailed descriptions)
IM:	Scrap metal, electrical equipment
AM:	
OM:	
OI:	Absorbent, glass containers, broken glass, light bulb
C:	Cloth, cardboard
R:	
XPM:	Plastic sheeting, plastic containers, plastic suits, plastic tubing, coax cable
OR:	
IN:	
S:	

Section 4: Packaging Material and Waste Material Parameters	
Packaging Material:	**Estimated Weight (kg)**
Steel (ST):	27.8
Plastics (PP): Liner bag	1.0
Other: Cardboard Liner (CP)	4.4
Total Packaging Weight	33.2
Waste Material Parameter:	**Estimated Weight (kg)**
Iron-based Metal / Alloys (IM):	10.0
Aluminum-based Metals / Alloys (AM):	
Other Metals (OM):	
Other Inorganic Materials (OI)	8.0
Cellulosics (C):	5.0
Rubber (R):	
Plastics (waste materials) (XPM):	14.7
Organic Matrix (OR):	
Inorganic Matrix (IN):	
Soils (S):	
Total WMP Weight:	37.7

CCP Radiography Data Sheet

Waste Container ID: X10C0402857E

Section 5: RTR Summary (Questions answered "Yes" will be explained in the Comment block, except for Question 1)	
Is there observable liquid?	[X] Yes [ ] No
Is there any observable liquid in internal containers, more than 60 milliliters or 3 percent by volume, whichever is greater?	[ ] Yes [X] No
Is the total volume of observable liquid in the outermost container GREATER than 1% of the container?	[ ] Yes [X] No
Is there observable liquid in payload containers with an EPA Hazardous Waste Number of U134?	[ ] Yes [X] No
Is there an indication of non-radionuclide pyrophoric materials, such as elemental potassium?	[ ] Yes [X] No
Is there an indication of hazardous wastes not occurring as co-contaminants with TRU mixed wastes (non-mixed hazardous wastes)?	[ ] Yes [X] No
Is there an indication of wastes incompatible with backfill, seal and panel closures materials, container and packaging materials, shipping container materials, or other wastes (i.e., waste does NOT match TRUCON Code[s])?	[ ] Yes [X] No
Is there an indication of wastes containing explosives or compressed gases?	[ ] Yes [X] No
Is there an indication of PCBs liquids?	EL 4/20/15 [✓] Yes [~~X~~] No
Is there an indication of the waste exhibiting the characteristic of ignitability, corrosivity, or reactivity (EPA Hazardous Waste Numbers of D001, D002, or D003)?	[ ] Yes [X] No
Is the physical form of the waste inconsistent with the Waste Stream Description or the Waste Matrix Code?	[ ] Yes [X] No
CH or RH TRAMPAC	
Are there heat-sealed bags (unvented) GREATER than 4 liters and LESS than 390 square inches in the waste, or heat sealed bags not authorized in the RH TRUCON Code?	[ ] Yes [X] No
Were there Non-approved Closure Methods used on liner bags or inner bags greater than 4 liters?	[ ] Yes [X] No
Are there sealed containers GREATER than 4 liters?	[ ] Yes [X] No
Are there indications of inadequate protection for heavy and/or sharp objects?	[ ] Yes [X] No

Comments: ~~N/A~~ CL 4/20/15
NCR-ORNL-0053-15

RTR Operator:

Eric Lyles		10/16/2014 4/20/15
Print Name	Signature	Date

Attachment 3 – CCP Radiography Independent Technical Reviewer Checklist

Batch Data Report No.: OR-RTR7-0117

Description			
1.	Were data generation and reduction conducted in a technically correct manner in accordance with the methods used?	☐ NO	☒ YES
2.	Was the correct revision of the procedure used? Procedure: CCP-TP-053 Rev.: 15	☐ NO	☒ YES
3.	Are the WMPs entered correctly?	☐ NO	☒ YES
4.	Do the estimated weights in Section 4 of Attachment 2 equal the container gross weight?	☐ NO	☒ YES
5.	Is the data reported in the proper units with the correct number of significant figures (e.g., one tenth of a kilogram)?	☐ NO	☒ YES
6.	Was transcription used? If no, proceed to question 7.	☒ NO	☐ YES
	6a. Has the data been verified for transcription errors?	☐ NO	☐ YES
7.	Does the Testing Batch Report include radiography for up to 20 containers?	☐ NO	☒ YES
8.	Are BDR contents complete and do they match the CCP Waste RTR Batch Data Report Table of Contents?	☐ NO	☒ YES
9.	Is all the data signed and dated in reproducible ink and by the individual(s) generating it?	☐ NO	☒ YES
10.	Is all data recorded clearly, legibly, and accurately?	☐ NO	☒ YES
11.	Have changes been made to original data? If no, proceed to question 12.	☒ NO DB 4-20-15	☒ YES
	11a. Have all changes to original data been lined out, initialed and dated by the individual making the changes?	☐ NO DB 4-20-15	☒ YES
	11b. Was justification made for changing the original data?	☐ NO DB 4-20-15	☒ YES
	11c. Were data changes made by the individual who originally collected the data?	☐ NO DB 4-20-15	☒ YES
12.	Does the waste match the Waste Matrix Code and Waste Stream description?	☐ NO	☒ YES
13.	Are the RTR Operator's decisions regarding the Radiography documented?	☐ NO	☒ YES
14.	Is there an adequate written description of the contents of each item?	☐ NO	☒ YES
15.	Was the video/audio recording media properly prepared and labeled for each waste container?	☐ NO	☒ YES
16.	Was the video/audio recording media check performed satisfactorily and recorded on Attachment 1?	☐ NO	☒ YES

Attachment 3 – CCP Radiography Independent Technical Reviewer Checklist (Continued)

Batch Data Report No.: OR-RTR7-0117

Description			
17.	Was the Image Test performed satisfactorily and recorded on Attachment 1?	☐ NO	☒ YES
18.	Was the Replicate Scan performed and recorded on an Attachment 2?	☐ NO	☒ YES
19.	Was the Replicate Scan RTR Operator different from the first RTR Operator?	☐ NO	☒ YES
20.	Did the Replicate Scan RTR Operator and the first RTR Operator agree on the results?	☐ NO	☒ YES
21.	Was the Independent Observation performed and recorded on an Attachment 2?	☐ NO	☒ YES
22.	Was the Independent Observation RTR Operator different from the first RTR Operator?	☐ NO	☒ YES
23.	Did the Independent Observation RTR Operator and the first RTR Operator agree on the results?	☐ NO	☒ YES
24.	Was the data collection performed by qualified individuals?	☐ NO	☒ YES
25.	Were NCRs initiated as required at DGL? If no, proceed to question 26.	☒ NO	☐ YES
25a.	Have the NCR(s) associated with RTR been included in the BDR?	☐ NO	☐ YES
26.	Is the RTR examination for CH waste? If no, proceed to question 27.	☐ NO	☒ YES
26a.	Have the CH Quality Assurance Objectives (QAOs) been met (if applicable)? Precision – Precision is maintained by reconciling any discrepancies between two radiography operators with regard to identification of the waste matrix code, liquids in excess of TSDF-WAC limits, and compressed gases through independent replicate scans and independent observations. Additionally, the precision of radiography is verified prior to use by tuning precisely enough to demonstrate compliance with QAOs through viewing an image test pattern. Accuracy – Accuracy is obtained by using a target to tune the image for maximum sharpness and by requiring operators to successfully identify 100 percent of the items required to meet the DQOs for radiography specified in CCP-PO-001, Section C-4a(1) in a training container during their initial qualification and subsequent requalification. Completeness – A video and audio media recording of the radiography examination and a validated radiography data form will be obtained for 100 percent of the waste containers subject to radiography. All video and audio media recordings and radiography data forms will be subject to validation as indicated in CCP-PO-001, Section C3-4. Comparability – The comparability of radiography data from different operators shall be enhanced by using standardized radiography procedures and operator qualifications.	☐ NO	☒ YES

Attachment 3 – CCP Radiography Independent Technical Reviewer Checklist (Continued)

Batch Data Report No.: OR-RTR7-0117

Description		
27. Is the RTR examination for RH waste? If no, proceed to comment section.	☒NO	☐YES
27a. Have the RH QAOs been met (if applicable)? Precision – Precision is maintained by reconciling any discrepancies between two operators (during Independent Observation and Replicate scans) with regard to the identification of important waste characteristics (i.e., physical form of the waste and absence of prohibited liquids) within a single container. Accuracy – Accuracy is obtained by using a target to tune the image for maximum sharpness and by requiring operators to successfully identify prohibited liquid in a training container during their initial qualification and subsequent requalification. Representativeness – All of the relevant contents in a container selected for radiography will be described. Completeness – All of the relevant waste information must be assembled and must show that each of the containers in the waste stream belongs to the waste stream. This information must be documented on videotape or other equivalent media and data form. Comparability – Comparability is ensured by meeting the program training requirements and complying with the minimum standards used to implement the radiography process.	☐NO	☐YES

Comments: ~~N/A~~ NCR-ORNL-0053-15 was initiated at SPM level. DB 4-20-15

I have reviewed 100% of the container specific and batch data in this report and find it acceptable.

Independent Technical Reviewer:

Printed Name	Signature	Date
Daphne Brothers	Daphne Brothers	10-20-14
	Daphne Brothers	4-20-15

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Attachment 2 – CCP SPM Radiography Project Level Validation Checklist and Summary

BDR Number: OR-RTR7-0117				Examination Date(s): 10/16/2014
Description of Criteria Reviewed	**Criteria Met?**			**Comments/Qualifiers**
	YES	**NO**	**NA**	
1. Is the completed, signed, and dated Independent Technical Reviewer Checklist included in the BDR, and the independent technical reviewer was not involved in the generation or recording of the data under review? **Reference Source: CCP-PO-001, C3-4**	X			
2. Does the BDR contain all items addressed in the BDR Table of Contents? **Reference Source: CCP-PO-001, C3-4**	X			
3. Does the BDR include a listing of all the container numbers in the batch? **Reference Source: CCP-PO-001, C3-4**	X			
4. List all containers that have met QAOs. **Reference Source: CCP-PO-001, C3-4**				Container Numbers: X10C0402965A X10C0402965L X10C0402965J X10C0402965K X10C0402998F X10C0402998L X10C0402857G X10C0402857H X10C0402839A X10C0402839B X10C0402839E X10C0402839H X10C0402857F ~~X10C0402857E~~ QA 5/4/15
5. Does the BDR identify the current implementing procedure and revision number? **Reference Source: CCP-PO-001, Table C3-3**	X			
6. Is there a reference to or copy of any associated NCRs (if any) in the BDR? NA if no NCRs. **Reference Source: CCP-PO-001, Table C3-3**	X BSS 4/14/15		BSS 4/14/15 *	NCR-ORNL-0053-15 BSS 4/14/15
7. Are there 20 or fewer containers in the batch? **Reference Source: CCP-PO-001, C3-4**	X			
8. Are the data properly reported (i.e., data are reported in correct units and with correct significant figures)? **Reference Source: CCP-PO-001, C3-4**	X			
9. Is there evidence of verification that the physical form matches the Waste Matrix Code? **Reference Source: CCP-PO-001, Table C3-3**	X			

Attachment 3 NCR ORNL-0053-15-2 Page 3 of 25

CCP RECORDS ORIGINAL
DATE RECD 10-22-14 QA

Attachment 2 – CCP SPM Radiography Project Level Validation Checklist and Summary (Continued)

BDR Number: OR-RTR7-0117				Examination Date(s): 10/16/2014
Description of Criteria Reviewed	**Criteria Met?**			**Comments/Qualifiers**
	YES	**NO**	**NA**	
10. Is there evidence of verification that the physical form matches the waste stream description? **Reference Source: CCP-PO-001, Table C3-3**	X			
11. Are prohibited items absent? **Reference Source: CCP-PO-001, Table C3-3**	X			Except for container X10C0402857E; PCB Liquid. QW 5/4/15
12. Does observable liquid, if present, meet the criteria of the TSDF-WAC? **Reference Source: CCP-PO-001, C-1**	X			
13. Were discrepancies between two operators with regard to identification of waste matrix code, liquids in excess of the TSDF-WAC, or compressed gases through replicate scans and independent observations reconciled? NA if no discrepancies. **Reference Source: CCP-PO-001, C3-2**			X	
14. Are the training qualifications for all radiography personnel acceptable? **Reference Source: CCP-PO-001, C3-8**	X			
15. Was evidence of the video/audio check included in the BDR? **Reference Source: CCP-PO-001, C1-1**	X			
16. Was the Lines-Pair Resolution Test or Sieve Test Check included in the BDR? **Reference Source: CCP Technical Procedures**	X			
17. Was a replicate scan performed once per day, or once per batch, whichever is LESS frequent? **Reference Source: CCP-PO-001, C1-1**	X			
18. Was an independent observation performed once per day, or once per batch, whichever is LESS frequent? **Reference Source: CCP-PO-001, C1-1**	X			

NCR WVC-CCS3-15-3
Attachment 3
Page 9 of 25

Attachment 2 – CCP SPM Radiography Project Level Validation Checklist and Summary (Continued)

BDR Number: OR-RTR7-0117	Examination Date(s): 10/16/2014			
Description of Criteria Reviewed	**Criteria Met?**			**Comments/Qualifiers**
	YES	**NO**	**NA**	
19. Were the replicate scan and independent observation performed on different waste containers? **Reference Source: CCP-PO-001, C1-1**	X			
20. Were the personnel performing the replicate scan and independent observation different from the individual who performed the original? **Reference Source: CCP-PO-001, C1-1**	X			
21. Does the BDR include an estimate of each material parameter weight in kg for each container? **Reference Source: CCP Technical Procedures**	X			
22. Does the BDR include a description of each material parameter for each container? **Reference Source: CCP Technical Procedures**	X			
23. Is the container gross weight recorded in kilograms (kg) for each container in the BDR? **Reference Source: CCP Technical Procedures**	X			
24. Was the Scale Weight Calibration Check included in the BDR? **Reference Source: CCP Technical Procedures**			X	Scale not used.
25. Was the Scale Weight Check included in the BDR? **Reference Source: CCP Technical Procedures**			X	Scale not used.
Comments: ~~None~~ BSS 4/16/15 added NCR-ORNL-0053-15 as SPM1, SPM2 & SPM3 BSS 4/16/15				
The container QC checks were properly performed and meet the Quality Assurance Objectives (QAOs). Proper procedures were followed during data reduction and analysis. The batch is complete, acceptable, and includes all supporting data and documentation required by the QAPjP.				
Carolina Soaterna — SPM Printed Name	Carolina Soaterna — Signature			10/21/14 — Date

Checklist is to be re-signed only when a re-review is performed.

Beverly Schrock — SPM Printed Name	BSSchrock — Signature	added NCR-ORNL-0053-15 — Reason	4/16/15 — Date
Daniel Wade — SPM Printed Name	Daniel Wade — Signature	Inserted collections — Reason	5/4/15 — Date

NCR ORNL-0053-15-2

Attachment 1 – CCP Nonconformance Report (NCR)

CCP NONCONFORMANCE REPORT (NCR)

(Use NCR Continuation, Attachment 3, if necessary)

NCR No. NCR-ORNL-0053-15 Revision 1

1. Lot No., Heat No., or Serial No. (if applicable): N/A	2. Process (e.g., NDA, NDE, VE, Other): NDE	3. Batch Data Report #(s): OR-RTR7-0117
4. Order/Work Order/Job Control Number (if applicable): N/A	5. PO # (if applicable): N/A	Container #(s): X10C0402857E
	6. Supplier (if applicable): N/A	

DESCRIPTION OF NONCONFORMANCE

7a. NCR Description: ☐ < 100 nCi/g ☒ Prohibited Item ☐ E-Flag ☐ Receipt Inspection ☐ Transportation ☐ WWIS/WDS ☐ Other

7b. *Requirement(s) (Enter Implementing Procedure No., Revision, Section No., & Quoted Text):*
CCP-TP-053, Rev. 15, "CCP Standard Real- Time Radiography (RTR) Inspection Procedure, Section 4.4.3 [A] states in part "Using Table 1, Prohibited Items, as a reference ...confirm there are NO prohibited items in the waste container." Table 1, Prohibited Items lists, in part, "PCB liquids", THEN ...initiate a nonconformance report

7c. *Actual Condition:*
Liquid inside of a PCB identified waste container.

Reason for Revision 1: Added steps to final disposition

7d. Have the CCP HOLD TAGS associated with this NCR been applied? ☒ YES ☐ NO If no is checked, explain:
04/16/15 LPS
Attachment 2.

8. NCR Originator:
Beverly S. Schrock (printed name) BSSchrock (signature) 4/16/15 (date)

9. Does the identified condition have the potential to impact AK? If YES or INDETERMINATE, enter Trend Code L in Block 10. ☐ YES ☒ NO ☐ INDETERMINATE

10. Trend Code: K

11. Responsible Manager: **Beverly Schrock**

12. Significant Condition? ☐ YES ☒ NO (If Yes, enter WIPP Form No.):

13. Recurring Condition? ☐ YES ☒ NO (If Yes, list NCRs and WIPP Forms):

14. QA Engineer or QA Designee validation:
Laura R. Jones (printed name) Laura Ramsey Jones (signature) 4/16/15 (date)

NCR ORNL-0053-15-2 Attachment 3 Page 11 of 25

SPM-1
BSS 4/16/15

Attachment 1 – CCP Nonconformance Report (NCR) (Continued)

NCR No. NCR-ORNL-0053-15 Revision 1

INTERIM DISPOSITION

15a. Interim Disposition (Check Only One):

☒ N/A (See Final Disposition) ☐ Hold ☐ Conditionally Accept ☐ Conditionally Use

☐ Sort ☐ Reinspect or Retest ☐ Remediate

15b. Instructions for Completion of the Interim Disposition:

INTERIM DISPOSITION APPROVALS

16a. Responsible Manager or Individual:

printed name _____ signature _____ date _____

16b. QA Engineer or QA Designee:

printed name _____ signature _____ date _____

Additional Approval:

printed name _____ signature _____ date _____

Additional Approval:

printed name _____ signature _____ date _____

COMPLETION OF INTERIM DISPOSITION

17. Interim Disposition Complete – Responsible Manager or Individual:

printed name _____ signature _____ date _____

18. Interim Disposition Verified – QA Engineer:

printed name _____ signature _____ date _____

NCR ORNL-0053-15-2
Attachment 3 Page 12 of 25

SPM-2
BSS 4/16/15

Attachment 1 – CCP Nonconformance Report (NCR) (Continued)

NCR No. NCR-ORNL-0053-15 Revision 1

FINAL DISPOSITION

19. Final Disposition (Check Only One: Use-As-Is, Repair, Reject, Rework, or Scrap):
☐ Use-As-Is ☐ Repair

19a. Technical Justification – Required for Use-As-Is or Repair dispositions. [☒ N/A for Reject, Rework, or Scrap]

☒ Reject ☐ Rework ☐ Scrap

19b. Instructions for Completion – Required for Reject, Repair, Rework, or Scrap [☐ N/A for Use-As-Is]
Container is not certifiable for shipment to WIPP.

1. Return container to Host Site for remediation.
2. Exclude container on AKTSS
3. Remove Container from WDS.
4. Remove container from certification lot
5. Add this NCR to OR-RTR7-0117 as SPM attachment
6. Operator make corrections to BDR
7. ITR re-review BDR
8. SPM re-review BDR

19c. Corrective Actions (Actions to Prevent Recurrence – For Repair or Rework, if applicable.
[☒ N/A if not applicable, and for Use-As-Is, Reject, and Scrap]

FINAL DISPOSITION APPROVALS

20. Responsible Manager or Individual:

Beverly S. Schrock	BSSchrock	4/16/15
printed name	signature	date

21. QA Engineer or QA Designee:

Laura R. Jones	Laura Ramon Jones	4/16/15
printed name	signature	date

Additional Approval:

printed name	signature	date

Additional Approval:

printed name	signature	date

CLOSURE

22. Final Disposition Complete - Responsible Manager or Individual:

printed name	signature	date

23. Attachments: 1- Hold tag application notification.

24a. HOLD TAG removal has been verified and reconciled for all nonconforming items on the NCR: ☐
24b. If HOLD TAG is not applicable, check: ☐ and explain:

25. Final Disposition Verified – NCR Closed QA Engineer:

printed name	signature	date

NCR ORNL-0053-15-2 Page 13 of 85

SPM-3
BSS 4/16/15

CONTAINERID: X10C04029841

ORNL

AK DATA

Container ID	Container Type	AKA Matrix	WDS Status	AK Excluded	WSID	LOTID	LOT Excluded
X10C04029841	55G		NO WDS STATUS	YES (Inactive)	OR-REDC-CH-HET	NONE	PCB container with liquid

BDR DATA

BDRID	Type	Status	Generation Date
OR-MILCC2-0010	NDA	Complete	2014-05-01
OR-RTR7-0035	RTR	Complete	2014-04-17
OR14FG8051	HSG_TRANS	Complete	2014-04-29

NCR DATA

Container ID	NCRID	Status	Release Code
X10C04029841	NCR-ORNL0053152	Open	None

REJECT DATA

Container ID	BDRID	NCRID	NCR Status	Release Code	Actual Condition
X10C04029841	OR-RTR7-0035	NCR-ORNL0053152	Open	None	Liquid inside of a PCB identified waste container.Reason for Revision 1: Added steps to final disposition.Reason for Revision 2: Added Container Number X10C04029811.

CCP Radiography Data Sheet

Section 1: General Information		
[X] RTR Examination	[ ] RTR Replicate Scan	[ ] RTR Independent Observation
Site ID:	ORNL	
Batch Number:	OR-RTR7-0035	
Examination Date:	4/17/2014	
Waste Container ID:	X10C0402984I	
Video/Audio Recorded Media Number:	OR-RTR7-0035	A&B
Procedure and Revision No.:	CCP-TP-053	Rev. 14
NCR(s) associated with the container? (e.g., Prohibited Items)	~~[X] No~~ [X] Yes DS 8-10-15 NCR No.: ~~N/A~~ NCR-ORNL-0053-15 DS 8-10-15 NCR No.: N/A	

Section 2: Waste Container Data	
Container Type:	55 Gallon Drum
TRUCON Code:	OR 225
Waste Matrix Code:	S5400
Waste Stream I.D.:	OR-REDC-CH-HET
Waste Container Weights:	Gross Wt.: 99.0 kg Tare Wt.: 33.2 kg Net Wt.: 65.8 kg
Rigid Liner and Liner Vent Description:	Liner: [X] No [ ] Yes Lid: [X] No [ ] Yes Type: [ ] 30-mil [ ] 90-mil [ ] 110-mil [ ] 125-mil Vented: [ ] No [ ] Yes [X] N/A Punctured: [X] No [ ] Yes Mechanical Vent: [X] No [ ] Yes Fiberboard Liner: [X] No [ ] Yes Lead Lined: [X] No [ ] Yes
Number of Layers of Confinement:	Appears to be 1 layer
Volume Utilization Percentage:	70 %

CCP Radiography Data Sheet

Waste Container ID: X10C0402984I

Section 3: Container Inventory and Comments	(Detailed descriptions)
IM:	Scrap metal, metal tubing, ~~metla~~ metal 4/21/14 hardware, metal fittings, hand tool, motorized equipment, saw blade
AM:	
OM:	
OI:	Absorbent, glass containers, floor sweepings
C:	Wood
R:	
XPM:	Plastic bag, plastic labware, plastic tubing, coax cable, plastic sheeting
OR:	
IN:	
S:	

Section 4: Packaging Material and Waste Material Parameters	
Packaging Material:	**Estimated Weight (kg)**
Steel (ST):	27.8
Plastics (PP):Liner bag	1.0
Other: Cardboard liner (CP)	4.4
Total Packaging Weight	33.2
Waste Material Parameter:	**Estimated Weight (kg)**
Iron-based Metal / Alloys (IM):	25.0
Aluminum-based Metals / Alloys (AM):	
Other Metals (OM):	
Other Inorganic Materials (OI)	15.0
Cellulosics (C):	10.0
Rubber (R):	
Plastics (waste materials) (XPM):	15.8
Organic Matrix (OR):	
Inorganic Matrix (IN):	
Soils (S):	
Total WMP Weight:	65.8

CCP Radiography Data Sheet

Waste Container ID: X10C0402984I

Section 5: RTR Summary (Questions answered "Yes" will be explained in the Comment block, except for Question 1)	
Is there observable liquid?	[X] Yes [ ] No
Is there any observable liquid in internal containers, more than 60 milliliters or 3 percent by volume, whichever is greater?	[ ] Yes [X] No
Is the total volume of observable liquid in the outermost container GREATER than 1% of the container?	[ ] Yes [X] No
Is there observable liquid in payload containers with an EPA Hazardous Waste Number of U134?	[ ] Yes [X] No
Is there an indication of non-radionuclide pyrophoric materials, such as elemental potassium?	[ ] Yes [X] No
Is there an indication of hazardous wastes not occurring as co-contaminants with TRU mixed wastes (non-mixed hazardous wastes)?	[ ] Yes [X] No
Is there an indication of wastes incompatible with backfill, seal and panel closures materials, container and packaging materials, shipping container materials, or other wastes (i.e., waste does NOT match TRUCON Code[s])?	[ ] Yes [X] No
Is there an indication of wastes containing explosives or compressed gases?	[ ] Yes [X] No
Is there an indication of PCBs liquids?	[X] Yes [X] No DS 8-10-15
Is there an indication of the waste exhibiting the characteristic of ignitability, corrosivity, or reactivity (EPA Hazardous Waste Numbers of D001, D002, or D003)?	[ ] Yes [X] No
Is the physical form of the waste inconsistent with the Waste Stream Description or the Waste Matrix Code?	[ ] Yes [X] No
CH or RH TRAMPAC	
Are there heat-sealed bags (unvented) GREATER than 4 liters and LESS than 390 square inches in the waste, or heat sealed bags not authorized in the RH TRUCON Code?	[ ] Yes [X] No
Were there Non-approved Closure Methods used on liner bags or inner bags greater than 4 liters?	[ ] Yes [X] No
Are there sealed containers GREATER than 4 liters?	[ ] Yes [X] No
Are there indications of inadequate protection for heavy and/or sharp objects?	[ ] Yes [X] No

Comments: ~~N/A~~ NCR- ORNL-0053-15 DS 8-10-15

RTR Operator:

Daphne Brothers		4/17/2014
Print Name	Signature	Date

NCR ORNL-0053-15-2

4/21/14
8-10-15

Attachment 3 – CCP Radiography Independent Technical Reviewer Checklist

Batch Data Report No.: OR-RTR7-0035

Description				
1.	Data generation and reduction were conducted in a technically correct manner in accordance with the methods used?	☐ NO	☑ YES	
2.	Was the correct revision of the procedure used? Procedure: CCP-TP-053 Rev.: 14	☐ NO	☑ YES	
3.	Are the WMPs entered correctly?	☐ NO	☑ YES	
4.	Do the estimated weights in Section 4 of Attachment 2 equal the container gross weight?	☐ NO	☑ YES	
5.	Is the data reported in the proper units with the correct number of significant figures (e.g., one tenth of a kilogram)?	☐ NO	☑ YES	
6.	Has the data been verified for transcription errors?	☐ NO	☐ YES	☑ N/A
7.	Does the Testing Batch Report include radiography for up to 20 containers?	☐ NO	☑ YES	
8.	BDR contents are complete and match the CCP Waste RTR Batch Data Report Table of Contents?	☐ NO	☑ YES	
9.	Is all the data signed and dated in reproducible ink and by the individual(s) generating it?	☐ NO	☑ YES	
10.	Is all data recorded clearly, legibly, and accurately?	☐ NO	☑ YES	
11.	All changes to original data lined out, initialed and dated by the individual making the changes?	☐ NO	☑ YES	☐ N/A
12.	Was justification made for changing the original data? Fo 8-10-5	~~☑ NO~~	☑ YES	☐ N/A
13.	Were data changes made by the individual who originally collected the data?	☐ NO	☑ YES	☐ N/A
14.	Does the waste match the Waste Matrix Code and Waste Stream description?	☐ NO	☑ YES	
15.	Are the RTR Operator's decisions regarding the Radiography documented?	☐ NO	☑ YES	
16.	Is there an adequate written description of the contents of each item?	☐ NO	☑ YES	
17.	Was the video/audio recording media properly prepared and labeled for each waste container?	☐ NO	☑ YES	
18.	Was the video/audio recording media check performed satisfactorily and recorded on Attachment 1?	☐ NO	☑ YES	

Attachment 3 – CCP Radiography Independent Technical Reviewer Checklist (Continued)

Batch Data Report No.: OR-RTR7-0035

Description				
19.	Was the Image Test performed satisfactorily and recorded on Attachment 1?	☐ NO	☑ YES	
20.	Was the Replicate Scan performed and recorded on an Attachment 2?	☐ NO	☑ YES	
21.	Was the Replicate Scan RTR Operator different from the first RTR Operator?	☐ NO	☑ YES	
22.	Did the Replicate Scan RTR Operator and the first RTR Operator agree on the results?	☐ NO	☑ YES	
23.	Was the Independent Observation performed and recorded on an Attachment 2?	☐ NO	☑ YES	
24.	Was the Independent Observation RTR Operator different from the first RTR Operator?	☐ NO	☑ YES	
25.	Did the Independent Observation RTR Operator and the first RTR Operator agree on the results?	☐ NO	☑ YES	
26.	Was the data collection performed by qualified individuals?	☐ NO	☑ YES	
27.	Are the NCR(s) associated with the RTR examination included in the BDR?	☐ NO	☑ YES	~~☑ N/A~~ fo 8-10-15
28.	QAOs (precision, accuracy, completeness, representativeness) have been met?	☐ NO	☑ YES	

Comments: ~~N/A~~ fo 8-10-15
OPERATOR BROOKSHIRE IS NO LONGER WORKS WITH THE CCP PROJECT. OPERATOR FRADONEY HAS PERFORMED THE ITR FOR THIS BATCH. fo 8-10-15

I have reviewed 100% of the container specific and batch data in this report and find it acceptable.

Independent Technical Reviewer:

John Brookshire	John Brookshire	4/21/14
Printed Name	Signature	Date
Fred Oney	Fred Oney	8-10-15

Attachment 2 – CCP SPM Radiography Project Level Validation Checklist and Summary

BDR Number: OR-RTR7-0035				Examination Date(s): 04/17/2014
Description of Criteria Reviewed	**Criteria Met?**			**Comments/Qualifiers**
	YES	**NO**	**NA**	
1. Is the completed, signed, and dated Independent Technical Reviewer Checklist included in the BDR, and the independent technical reviewer was not involved in the generation or recording of the data under review? **Reference Source: CCP-PO-001, C3-4**	X			
2. Does the BDR contain all items addressed in the BDR Table of Contents? **Reference Source: CCP-PO-001, C3-4**	X			
3. Does the BDR include a listing of all the container numbers in the batch? **Reference Source: CCP-PO-001, C3-4**	X			
4. List all containers that have met QAOs. **Reference Source: CCP-PO-001, C3-4**				Container Numbers: X10C9312825A ~~X10C9402984T~~ GSS 5/7/15 X10CSATN02247K X10CSATN02247L X10CSATN02247J
5. Does the BDR identify the current implementing procedure and revision number? **Reference Source: CCP-PO-001, Table C3-3**	X			
6. Is there a reference to or copy of any associated NCRs (if any) in the BDR? NA if no NCRs. **Reference Source: CCP-PO-001, Table C3-3**	X		GSS 5/7/15 *	NCR-ORNL-0053-15 GSS 5/7/15
7. Are there 20 or fewer containers in the batch? **Reference Source: CCP-PO-001, C3-4**	X			
8. Are the data properly reported (i.e., data are reported in correct units and with correct significant figures)? **Reference Source: CCP-PO-001, C3-4**	X			
9. Is there evidence of verification that the physical form matches the Waste Matrix Code? **Reference Source: CCP-PO-001, Table C3-3**	X			

NTPC RECORDS ORIGINAL

NCR ORNL-0053-15-2 DATE REC'D 4/24/15

Attachment 3 Page 20 of 25

Attachment 2 – CCP SPM Radiography Project Level Validation Checklist and Summary (Continued)

BDR Number: OR-RTR7-0035				Examination Date(s): 04/17/2014
Description of Criteria Reviewed	**Criteria Met?**			**Comments/Qualifiers**
	YES	**NO**	**NA**	
10. Is there evidence of verification that the physical form matches the waste stream description? **Reference Source: CCP-PO-001, Table C3-3**	X			
11. Are prohibited items absent? **Reference Source: CCP-PO-001, Table C3-3**	X			except for X10CI402984I - liquid in 8B container. OSS 8/7/15
12. Does observable liquid, if present, meet the criteria of the TSDF-WAC? **Reference Source: CCP-PO-001, C-1**	X			
13. Were discrepancies between two operators with regard to identification of waste matrix code, liquids in excess of the TSDF-WAC, or compressed gases through replicate scans and independent observations reconciled? NA if no discrepancies. **Reference Source: CCP-PO-001, C3-2**			X	
14. Are the training qualifications for all radiography personnel acceptable? **Reference Source: CCP-PO-001, C3-8**	X			
15. Was evidence of the video/audio check included in the BDR? **Reference Source: CCP-PO-001, C1-1**	X			
16. Was the Lines-Pair Resolution Test or Sieve Test Check included in the BDR? **Reference Source: CCP Technical Procedures**	X			
17. Was a replicate scan performed once per day, or once per batch, whichever is LESS frequent? **Reference Source: CCP-PO-001, C1-1**	X			
18. Was an independent observation performed once per day, or once per batch, whichever is LESS frequent? **Reference Source: CCP-PO-001, C1-1**	X			

Attachment 2 – CCP SPM Radiography Project Level Validation Checklist and Summary (Continued)

BDR Number: OR-RTR7-0035 **Examination Date(s): 04/17/2014**

Description of Criteria Reviewed	Criteria Met? YES	NO	NA	Comments/Qualifiers
19. Were the replicate scan and independent observation performed on different waste containers? **Reference Source: CCP-PO-001, C1-1**	X			
20. Were the personnel performing the replicate scan and independent observation different from the individual who performed the original? **Reference Source: CCP-PO-001, C1-1**	X			
21. Does the BDR include an estimate of each material parameter weight in kg for each container? **Reference Source: CCP Technical Procedures**	X			
22. Does the BDR include a description of each material parameter for each container? **Reference Source: CCP Technical Procedures**	X			
23. Is the container gross weight recorded in kilograms (kg) for each container in the BDR? **Reference Source: CCP Technical Procedures**	X			
24. Was the Scale Weight Calibration Check included in the BDR? **Reference Source: CCP Technical Procedures**			X	Not used.
25. Was the Scale Weight Check included in the BDR? **Reference Source: CCP Technical Procedures**			X	Not used.

Comments: ~~None~~ BSS 8/7/15 Added NCR-ORNL-0053-15 as SPM1, SPM2, SPM3 BSS 8/7/15

The container QC checks were properly performed and meet the Quality Assurance Objectives (QAOs). Proper procedures were followed during data reduction and analysis. The batch is complete, acceptable, and includes all supporting data and documentation required by the QAPjP.

Daniel Wade	D. L. Wade	04/24/2014
SPM Printed Name	Signature	Date

Checklist is to be re-signed only when a re-review is performed.

BSSchrock	BSSchrock	Added NCR-ORNL-0053-15	8/7/15
SPM Printed Name	Signature	Reason	Date
BSSchrock	BSSchrock	Inserted corrections into BDR	8/23/15
SPM Printed Name	Signature	Reason	Date

NCR ORNL-0053-15-2

Attachment 1 – CCP Nonconformance Report (NCR)

CCP NONCONFORMANCE REPORT (NCR)

(Use NCR Continuation, Attachment 3, if necessary)

NCR No. NCR-ORNL-0053-15 Revision 2

1. Lot No., Heat No., or Serial No. (if applicable): N/A	2. Process (e.g., NDA, NDE, VE, Other): NDE	3. Batch Data Report #(s): OR-RTR7-0117 OR-RTR7-0035
4. Order/Work Order/Job Control Number (if applicable): N/A	5. PO # (if applicable): N/A	Container #(s): X10C0402857E X10C0402984I
	6. Supplier (if applicable): N/A	

DESCRIPTION OF NONCONFORMANCE

7a. NCR Description: ☐ < 100 nCi/g ☒ Prohibited Item ☐ E-Flag ☐ Receipt Inspection ☐ Transportation ☐ WWIS/WDS ☐ Other

7b. Requirement(s) (Enter Implementing Procedure No., Revision, Section No., & Quoted Text):
CCP-TP-053, Rev. 15, "CCP Standard Real- Time Radiography (RTR) Inspection Procedure, Section 4.4.3 [A] states in part "Using Table 1, Prohibited Items, as a reference ...confirm there are NO prohibited items in the waste container." Table 1, Prohibited Items lists, in part, "PCB liquids", THEN ...initiate a nonconformance report

7c. Actual Condition:
Liquid inside of a PCB identified waste container.

Reason for Revision 1: Added steps to final disposition
Reason for Revision 2: Added container X10C0402984I

7d. Have the CCP HOLD TAGS associated with this NCR been applied? ☐ YES ☐ NO If no is checked, explain:

8. NCR Originator:
Beverly S. Schrock (printed name) BSSchrock (signature) 6/3/15 (date)

9. Does the identified condition have the potential to impact AK? If YES or INDETERMINATE, enter Trend Code L in Block 10. ☐ YES ☒ NO ☐ INDETERMINATE

10. Trend Code: K	11. Responsible Manager: **Beverly Schrock**
12. Significant Condition? ☐ YES ☒ NO (If Yes, enter WIPP Form No.):	13. Recurring Condition? ☐ YES ☒ NO (If Yes, list NCRs and WIPP Forms):

14. QA Engineer or QA Designee validation:
Laura R. Jones (printed name) Laura Lawson Jones 06/03/15 (signature, date)

SPM-1
BSS 9/7/15

NCR ORNL-0053-15-2
Attachment 3 Page 23 of 25

Attachment 1 – CCP Nonconformance Report (NCR) (Continued)

NCR No. NCR-ORNL-0053-15 Revision 2

INTERIM DISPOSITION

15a. Interim Disposition (Check Only One):

☒ N/A (See Final Disposition) ☐ Hold ☐ Conditionally Accept ☐ Conditionally Use

☐ Sort ☐ Reinspect or Retest ☐ Remediate

15b. Instructions for Completion of the Interim Disposition:

INTERIM DISPOSITION APPROVALS

16a. Responsible Manager or Individual:

printed name _____ signature _____ date _____

16b. QA Engineer or QA Designee:

printed name _____ signature _____ date _____

Additional Approval:

printed name _____ signature _____ date _____

Additional Approval:

printed name _____ signature _____ date _____

COMPLETION OF INTERIM DISPOSITION

17. Interim Disposition Complete – Responsible Manager or Individual:

printed name _____ signature _____ date _____

18. Interim Disposition Verified – QA Engineer:

printed name _____ signature _____ date _____

SPM-2
8/7/15

Attachment 1 – CCP Nonconformance Report (NCR) (Continued)

NCR No. NCR-ORNL-0053-15 Revision 2

FINAL DISPOSITION

19. Final Disposition (Check Only One: Use-As-Is, Repair, Reject, Rework, or Scrap):
☐ Use-As-Is ☐ Repair

19a. Technical Justification – Required for Use-As-Is or Repair dispositions. [☒ N/A for Reject, Rework, or Scrap]

☒ Reject ☐ Rework ☐ Scrap

19b. Instructions for Completion – Required for Reject, Repair, Rework, or Scrap [☐ N/A for Use-As-Is]
Container is not certifiable for shipment to WIPP.
1. Return containers to Host Site for remediation.
2. *Exclude containers on AKTSS*
3. Remove Containers from WDS.
4. Remove containers from certification lot
5. Add this NCR to OR-RTR7-0117 as SPM attachment
6. *Operator make corrections to BDR*
7. ITR re-review BDR
8. SPM re-review BDR

19c. Corrective Actions (Actions to Prevent Recurrence – For Repair or Rework, if applicable.
[☒ N/A if not applicable, and for Use-As-Is, Reject, and Scrap]

FINAL DISPOSITION APPROVALS

20. Responsible Manager or Individual:

Beverly S. Schrock	BSSchrock	6/4/15
printed name	signature	date

21. QA Engineer or QA Designee:

Laura R. Jones	Laura Rameau Jones	6/4/2015
printed name	signature	date

Additional Approval:

printed name	signature	date

Additional Approval:

printed name	signature	date

CLOSURE

22. Final Disposition Complete - Responsible Manager or Individual:

printed name	signature	date

23. Attachments: 1.- Email PCB Drum with liquid. 2.- Email Documenting Reportability

24a. HOLD TAG removal has been verified and reconciled for all nonconforming items on the NCR: ☐
24b. If HOLD TAG is not applicable, check: ☐ and explain:

25. Final Disposition Verified – NCR Closed QA Engineer:

printed name	signature	date

NCR ORNL-0053-15-2

SPM-3
BSS 8/7/15

Jones, Laura - NWP

From: Harmon, Latravia <Latravia.Harmon@truproject.com>
Sent: Monday, June 08, 2015 6:13 AM
To: Jones, Laura - NWP
Cc: Ledford, Wayne - NWP; Waldram, Veronica - NWP; Harmon, Latravia
Subject: Revised NCR-ORNL-0053-15-2 (container inaccessible)

Laura,

This container is inaccessible at the current time. It was shipped to UCOR (drum storage) area on 1/6/2015. In the event the container becomes accessible, I will make notification that the hold tag was applied.

Thanks and Best Regards

LaTravia N. Harmon

Quality Assurance Engineer
Nuclear Waste Partnership LLC
Contractor to the United States Department of Energy
(865)576-1650 Office
(865)441-2706 Cell
latravia.harmon@truproject.com

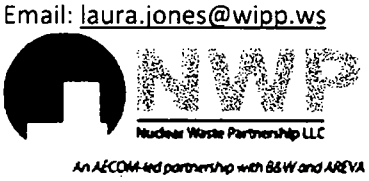
From: Jones, Laura - NWP [laura.jones@wipp.ws]
Sent: Thursday, June 04, 2015 12:31 PM
To: Harmon, Latravia
Cc: Ledford, Wayne - NWP; Waldram, Veronica - NWP; Jones, Laura - NWP
Subject: FW: Revised NCR-ORNL-0053-15-2

Latravia,

Please apply hold tag for Container Number X10C0402984I, since this container was added to NCR. Thank you.

Thanks and Best Regards

Laura R. Jones
Quality Assurance NCR Coordinator
Nuclear Waste Partnership, LLC
Contractor for the U.S. Department of Energy
575-234-7244 (office)
Email: laura.jones@wipp.ws



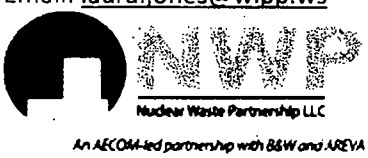
From: Jones, Laura - NWP
Sent: Thursday, June 04, 2015 10:28 AM

To: Harmon, Latravia; Harmon, LaTravia - NWP; Leos, Greta - TFE; Navarrete, Leon - TFE; Tilmon, Pat; Pearcy, Sheila - TFE; Ramirez, Mike - NWP; Reeves, Ron - NWP; Schrock, Beverly - NWP; Stallings, Andrew - ORNL; Wade, Daniel NWP
Cc: Ledford, Wayne - NWP; Waldram, Veronica - NWP; Jones, Laura - NWP
Subject: Revised NCR-ORNL-0053-15-2

All – For your information
Mike – Please review for notification purposes, a container was added to the NCR.
Greta – Please post this open revised NCR.

Thanks and Best Regards

Laura R. Jones
Quality Assurance NCR Coordinator
Nuclear Waste Partnership, LLC
Contractor for the U.S. Department of Energy
575-234-7244 (office)
Email: laura.jones@wipp.ws



Schrock, Beverly - NWP

From: Oney Fred <Fred.Oney@truproject.com>
Sent: Monday, August 10, 2015 5:57 AM
To: Schrock, Beverly - NWP
Subject: RE: Corrections needed

Bev,

The corrections have been made .

Thanks,

Fred

From: Schrock, Beverly - NWP [Beverly.Schrock@wipp.ws]
Sent: Friday, August 07, 2015 2:10 PM
To: Oney Fred
Cc: Stallings,Andrew; Pat Tilmon
Subject: Corrections needed

Fred,

Please see attached NCR-ORNL-0053-15-2.

Containers X10C0402857E in BDR OR-RTR7-0117 and X10C0402984I on BDR OR-RTR7-0035 both have liquid in a PCB identified container. Please have your operators correct their paperwork, re-ITR for me and have Patrick process as quick as you can so I can close this NCR.

If you have any questions, please let me know.

Thank you for your help,
Bev

Beverly S. Schrock
Site Project Manager
Central Characterization Program
Nuclear Waste Partnership, LLC
Contractor for the U.S. Department of Energy
(575) 234-7444
(575) 706-0809 Cell

NCR – ORNL-0053-15 Rev. 2
Attachment 5 Page 1 of 1

Jones, Laura - NWP

From: Harmon, Latravia <Latravia.Harmon@truproject.com>
Sent: Thursday, August 20, 2015 5:29 AM
To: Jones, Laura - NWP
Cc: Harmon, Latravia
Subject: Hold tags pulled NCR-ORNL-0053-15-2

Laura

The hold tags for the containers below were removed. Please use this email as notification to proceed with closure of applicable NCRs. Container X10C0402857E was returned to the host site and repacked.

OR-RTR7-0117	X10C0402857E	Resolved	Instruction for final disposition have been completed, ITR and SPM reviewed BDR.	NCR-ORNL-0053-15-2
OR-RTR7-0035	X10C04029841	Resolved	Instruction for final disposition have been completed, ITR and SPM reviewed BDR.	NCR-ORNL-0053-15-2

thanks and Best Regards

LaTravia N. Harmon
Quality Assurance Engineer
Nuclear Waste Partnership LLC
Contractor to the United States Department of Energy
(865)576-1650 Office
(865)441-2706 Cell
latravia.harmon@truproject.com
Quality is the Pride of Workmanship.

From: Jones, Laura - NWP [laura.jones@wipp.ws]
Sent: Wednesday, August 19, 2015 5:08 PM
To: Harmon, Latravia
Subject: Hold tags to be pulled NCR-ORNL-0053-15-2

Hello Latravia,

Containers listed have been resolved at the project office please remove hold tags and notify to close NCR.

BDR ID	Container ID	Release Code	Reason	NCR
OR-RTR7-0117	X10C0402857E	Resolved.	Instruction for final disposition have been completed, ITR and SPM reviewed BDR.	NCR-ORNL-0053-15-2
OR-RTR7-0035	X10C04029841	Resolved	Instruction for final disposition have been completed, ITR and SPM reviewed BDR.	NCR-ORNL-0053-15-2

Thanks and Best Regards

Laura R. Jones
Quality Assurance NCR Coordinator

NCR ORNL-0053-15 Rev. 2
Attachment 6 Page 1 of 1

DIVIDER

PAGE

Attachment 1 – CCP Nonconformance Report (NCR)

CCP NONCONFORMANCE REPORT (NCR)

(Use NCR Continuation, Attachment 3, if necessary)

NCR No. NCR-ORNL-0053-15 Revision 1

1. Lot No., Heat No., or Serial No. (if applicable): N/A	2. Process (e.g., NDA, NDE, VE, Other): NDE	3. Batch Data Report #(s): OR-RTR7-0117
4. Order/Work Order/Job Control Number (if applicable): N/A	5. PO # (if applicable): N/A	Container #(s): X10C0402857E
	6. Supplier (if applicable): N/A	

DESCRIPTION OF NONCONFORMANCE

7a. NCR Description: ☐ < 100 nCi/g ☒ Prohibited Item ☐ E-Flag ☐ Receipt Inspection ☐ Transportation ☐ WWIS/WDS ☐ Other

7b. Requirement(s) (Enter Implementing Procedure No., Revision, Section No., & Quoted Text):
CCP-TP-053, Rev. 15, "CCP Standard Real- Time Radiography (RTR) Inspection Procedure, Section 4.4.3 [A] states in part "Using Table 1, Prohibited Items, as a reference ...confirm there are NO prohibited items in the waste container." Table 1, Prohibited Items lists, in part, "PCB liquids", THEN ...initiate a nonconformance report

7c. Actual Condition:
Liquid inside of a PCB identified waste container.

Reason for Revision 1: Added steps to final disposition

7d. Have the CCP HOLD TAGS associated with this NCR been applied? ☒ YES ☐ NO If no is checked, explain:
04/16/15 LRT
Attachment 4.

8. NCR Originator:
Beverly S. Schrock (printed name) BSSchrock (signature) 4/16/15 (date)

9. Does the identified condition have the potential to impact AK? If YES or INDETERMINATE, enter Trend Code L in Block 10. ☐ YES ☒ NO ☐ INDETERMINATE

10. Trend Code: K	11. Responsible Manager: **Beverly Schrock**
12. Significant Condition? ☐ YES ☒ NO (If Yes, enter WIPP Form No.):	13. Recurring Condition? ☐ YES ☒ NO (If Yes, list NCRs and WIPP Forms):

14. QA Engineer or QA Designee validation:
Laura R. Jones (printed name) Laura Raines Jones (signature) 4/16/15 (date)

SUPERSEDED BY REV 2 06/04/15 LRT

COPY

CCP RECORDS ORIGINAL
DATE REC'D 9.4.15 SY

Attachment 1 – CCP Nonconformance Report (NCR) (Continued)

NCR No. NCR-ORNL-0053-15 Revision 1

INTERIM DISPOSITION

15a. Interim Disposition (Check Only One):

☒ N/A (See Final Disposition) ☐ Hold ☐ Conditionally Accept ☐ Conditionally Use

☐ Sort ☐ Reinspect or Retest ☐ Remediate

15b. *Instructions for Completion of the Interim Disposition:*

INTERIM DISPOSITION APPROVALS

16a. Responsible Manager or Individual:

printed name signature date

16b. QA Engineer or QA Designee:

printed name signature date

Additional Approval:

printed name signature date

Additional Approval:

printed name signature date

COMPLETION OF INTERIM DISPOSITION

17. Interim Disposition Complete – Responsible Manager or Individual:

printed name signature date

18. Interim Disposition Verified – QA Engineer:

printed name signature date

COPY

Attachment 1 – CCP Nonconformance Report (NCR) (Continued)

NCR No. NCR-ORNL-0053-15 **Revision 1**

FINAL DISPOSITION

19. Final Disposition (Check Only One: Use-As-Is, Repair, Reject, Rework, or Scrap):
☐ Use-As-Is ☐ Repair

19a. Technical Justification – Required for Use-As-Is or Repair dispositions. [☒ N/A for Reject, Rework, or Scrap]

☒ Reject ☐ Rework ☐ Scrap

19b. Instructions for Completion – Required for Reject, Repair, Rework, or Scrap [☐ N/A for Use-As-Is]
Container is not certifiable for shipment to WIPP.
1. Return container to Host Site for remediation.
2. Exclude container on AKTSS
3. Remove Container from WDS.
4. Remove container from certification lot
5. Add this NCR to OR-RTR7-0117 as SPM attachment
6. Operator make corrections to BDR
7. ITR re-review BDR
8. SPM re-review BDR

19c. Corrective Actions (Actions to Prevent Recurrence – For Repair or Rework, if applicable.
[☒ N/A if not applicable, and for Use-As-Is, Reject, and Scrap]

FINAL DISPOSITION APPROVALS

20. Responsible Manager or Individual:

Beverly S. Schrock	BSSchrock	4/16/15
printed name	signature	date

21. QA Engineer or QA Designee:

Laura R. Jones	Laura Ramon Jones	4/16/15
printed name	signature	date

Additional Approval:

printed name	signature	date

Additional Approval:

printed name	signature	date

CLOSURE

22. Final Disposition Complete - Responsible Manager or Individual:

printed name	signature	date

23. Attachments: 1- Hold tag application notifications. 2- Email Documenting Reputability.

24a. HOLD TAG removal has been verified and reconciled for all nonconforming items on the NCR: ☐
24b. If HOLD TAG is not applicable, check: ☐ and explain:

25. Final Disposition Verified – NCR Closed QA Engineer:

printed name	signature	date

Jones, Laura - NWP

From: Harmon, Latravia <Latravia.Harmon@truproject.com>
Sent: Thursday, April 16, 2015 12:03 PM
To: Harmon, Latravia; Jones, Laura - NWP
Subject: FW: NCR Hold tag

Laura

Please see confirmation below. Please update Section 7d for NCR-ORNL-0053-15.

Thanks and Best Regards

LaTravia N. Harmon
Quality Assurance Engineer
Nuclear Waste Partnership LLC
Contractor to the United States Department of Energy
(865)576-1650 Office
(865)441-2706 Cell
latravia.harmon@truproject.com

From: Fred Oney
Sent: Thursday, April 16, 2015 1:47 PM
To: Harmon, Latravia
Subject: NCR Hold tag

LaTravia,

The hold tag for NCR-ONRL-0053-15 has been applied at 1340.

Thanks,

Fred Oney

NCR -ORNL-0053-15 Rev. 1
Attachment 1 Page 1 of 1

Jones, Laura - NWP

From: Ramirez, Mike - NWP
Sent: Thursday, April 16, 2015 1:42 PM
To: Jones, Laura - NWP
Subject: RE: Revised NCR-ORNL-0053-15-1

Not reportable

Mike Ramirez
Central Characterization Program
Certification Manager
Nuclear Waste Partnership LLC
Contractor for the U.S. Department of Energy
(575)-234-7034 Work
(575) 200-8535 Cell

From: Jones, Laura - NWP
Sent: Thursday, April 16, 2015 1:38 PM
To: Harmon, Latravia; Harmon, LaTravia - NWP; Leos, Greta - TFE; Navarrete, Leon - TFE; Tilmon, Pat; Pearcy, Sheila - TFE; Ramirez, Mike - NWP; Reeves, Ron - NWP; Schrock, Beverly - NWP; Stallings, Andrew - ORNL; Wade, Daniel NWP
Cc: Waldram, Veronica - NWP; Ledford, Wayne - NWP; Jones, Laura - NWP
Subject: Revised NCR-ORNL-0053-15-1

All – For your information. Section 7d for hold tag has been updated
Mike – Please review for notification purposes. (Added steps on final disposition).
Greta – Please post this open revised NCR.

Thanks and Best Regards

Laura R. Jones
Quality Assurance NCR Coordinator
Nuclear Waste Partnership, LLC
Contractor for the U.S. Department of Energy
575-234-7244 (office)
Email: laura.jones@wipp.ws

Jones, Laura - NWP

From: IDC (No Reply) <NOREPLY@wipp.ws>
Sent: Thursday, April 16, 2015 1:42 PM
To: DL CCP QA CBFO Notify
Subject: Project Office NCR [NCR-ORNL0053151] was just reviewed.

Certification Manager/Designee has just reviewed the project office NCR NCR-ORNL0053151 and has indicated that it [should **NOT**] be reported to CBFO. IDC has already updated the NCR for you.

NCR -ORNL-0053-15 Rev. 1
Attachment 2 Page 2 of 2

DIVIDER

PAGE

Attachment 1 – CCP Nonconformance Report (NCR)

CCP NONCONFORMANCE REPORT (NCR)

(Use NCR Continuation, Attachment 3, if necessary)

NCR No. NCR-ORNL-0053-15 Revision 0

1. Lot No., Heat No., or Serial No. (if applicable): N/A	2. Process (e.g., NDA, NDE, VE, Other): NDE	3. Batch Data Report #(s): OR-RTR7-0117
4. Order/Work Order/Job Control Number (if applicable): N/A	5. PO # (if applicable): N/A	Container #(s): X10C04028657E
	6. Supplier (if applicable): N/A	

DESCRIPTION OF NONCONFORMANCE

7a. NCR Description: ☐ < 100 nCi/g ☒ Prohibited Item ☐ E-Flag ☐ Receipt Inspection ☐ Transportation ☑ WWIS/WDS ☐ Other

7b. Requirement(s) (Enter Implementing Procedure No., Revision, Section No., & Quoted Text):
CCP-TP-053, Rev. 15, "CCP Standard Real- Time Radiography (RTR) Inspection Procedure, Section 4.4.3 [A] states in part "Using Table 1, Prohibited Items, as a reference ...confirm there are NO prohibited items in the waste container." Table 1, Prohibited Items lists, in part, "PCB liquids", THEN ...initiate a nonconformance report

7c. Actual Condition:
Liquid inside of a PCB identified waste container.

7d. Have the CCP HOLD TAGS associated with this NCR been applied? ☐ YES ☐ NO If no is checked, explain:

8. NCR Originator:
Beverly S. Schrock (printed name) BSSchrock (signature) 4/13/15 (date)

9. Does the identified condition have the potential to impact AK? If YES or INDETERMINATE, enter Trend Code L in Block 10. ☐ YES ☒ NO ☐ INDETERMINATE

10. Trend Code: K

11. Responsible Manager: **Beverly Schrock**

12. Significant Condition? ☐ YES ☒ NO (If Yes, enter WIPP Form No.):

13. Recurring Condition? ☐ YES ☒ NO (If Yes, list NCRs and WIPP Forms):

14. QA Engineer or QA Designee validation:
Laura R. Jones (printed name) Laura R. Jones (signature) 4/15/2015 (date)

SUPERSEDED BY REV 1 04/16/15 LRS

COPY

CCP RECORDS ORIGINAL
DATE REC'D 9.4.15 N

Attachment 1 – CCP Nonconformance Report (NCR) (Continued)

NCR No. NCR-ORNL-0053-15 Revision 0

INTERIM DISPOSITION

15a. Interim Disposition (Check Only One):

☒ N/A (See Final Disposition) ☐ Hold ☐ Conditionally Accept ☐ Conditionally Use

☐ Sort ☐ Reinspect or Retest ☐ Remediate

15b. Instructions for Completion of the Interim Disposition:

INTERIM DISPOSITION APPROVALS

16a. Responsible Manager or Individual:

printed name _____ signature _____ date _____

16b. QA Engineer or QA Designee:

printed name _____ signature _____ date _____

Additional Approval:

printed name _____ signature _____ date _____

Additional Approval:

printed name _____ signature _____ date _____

COMPLETION OF INTERIM DISPOSITION

17. Interim Disposition Complete – Responsible Manager or Individual:

printed name _____ signature _____ date _____

18. Interim Disposition Verified – QA Engineer:

printed name _____ signature _____ date _____

COPY

Attachment 1 – CCP Nonconformance Report (NCR) (Continued)

0 4/15/15 LAS

NCR No. NCR-ORNL-053-15 Revision 0

FINAL DISPOSITION

19. Final Disposition (Check Only One: Use-As-Is, Repair, Reject, Rework, or Scrap):
☐ Use-As-Is ☐ Repair

19a. Technical Justification – Required for Use-As-Is or Repair dispositions. [☒ N/A for Reject, Rework, or Scrap]

☒ Reject ☐ Rework ☐ Scrap

19b. Instructions for Completion – Required for Reject, Repair, Rework, or Scrap [☐ N/A for Use-As-Is]
Container is not certifiable for shipment to WIPP.
1. Return container to Host Site for remediation.
2. Exclude container on AKTSS
3. Remove Container from WDS.
4. Remove container from certification lot
5. Add this NCR to OR-RTR7-0117 as SPM attachment

19c. Corrective Actions (Actions to Prevent Recurrence – For Repair or Rework, if applicable.
[☒ N/A if not applicable, and for Use-As-Is, Reject, and Scrap]

FINAL DISPOSITION APPROVALS

20. Responsible Manager or Individual:

Beverly S. Schrock	BSSchrock	4/15/15
printed name	signature	date

21. QA Engineer or QA Designee:

Laura R. Jones	Laura Ramon Jones	4/15/2015
printed name	signature	date

Additional Approval:

printed name	signature	date

Additional Approval:

printed name	signature	date

CLOSURE

22. Final Disposition Complete - Responsible Manager or Individual:

printed name	signature	date

23. Attachments: 1- Email Documenting Reportability.

24a. HOLD TAG removal has been verified and reconciled for all nonconforming items on the NCR: ☐
24b. If HOLD TAG is not applicable, check: ☐ and explain:

25. Final Disposition Verified – NCR Closed QA Engineer:

printed name	signature	date

Jones, Laura - NWP

From: Ramirez, Mike - NWP
Sent: Thursday, April 16, 2015 6:58 AM
To: Jones, Laura - NWP
Subject: RE: New NCR-ORNL-0053-15

reportable

Mike Ramirez
Central Characterization Program
Certification Manager
Nuclear Waste Partnership LLC
Contractor for the U.S. Department of Energy
(575)-234-7034 Work
(575) 200-8535 Cell

From: Jones, Laura - NWP
Sent: Wednesday, April 15, 2015 3:29 PM
To: Harmon, Latravia; Harmon, LaTravia - NWP; Leos, Greta - TFE; Navarrete, Leon - TFE; Tilmon, Pat; Pearcy, Sheila - TFE; Ramirez, Mike - NWP; Reeves, Ron - NWP; Schrock, Beverly - NWP; Stallings, Andrew - ORNL; Wade, Daniel NWP
Cc: Waldram, Veronica - NWP; Ledford, Wayne - NWP; Jones, Laura - NWP
Subject: New NCR-ORNL-0053-15

Latravia / Bev / Andrew / Daniel – Please apply hold tag and notify
Mike – Please review for notification purposes
Greta – Please post this open NCR.

Thanks and Best Regards

Laura R. Jones
Quality Assurance NCR Coordinator
Nuclear Waste Partnership, LLC
Contractor for the U.S. Department of Energy
575-234-7244 (office)
Email: laura.jones@wipp.ws

NCR – ORNL-0053-15 Rev.0
Attachment 1 Page 1 of 4

Jones, Laura - NWP

From: IDC (No Reply) <NOREPLY@wipp.ws>
Sent: Thursday, April 16, 2015 8:03 AM
To: DL CCP QA CBFO Notify
Subject: Project Office NCR [NCR-ORNL0053150] was just reviewed.

Importance: High

Certification Manager/Designee has just reviewed the project office NCR NCR-ORNL0053150 and has indicated that it **[SHOULD]** be reported to CBFO. IDC has already updated the NCR for you.

NCR -ORNL-0053-15 Rev. 0
Attachment 1 Page 2 of 4

Jones, Laura - NWP

From:	Schrock, Beverly - NWP
Sent:	Thursday, April 16, 2015 8:53 AM
To:	WIPP Notify - Special Purpose
Cc:	Ramirez, Mike - NWP; Jones, Laura - NWP; Reeves, Ron - NWP; Ledford, Wayne - NWP; Wade, Daniel NWP
Subject:	[ncr] NCR-ORNL-0053-15-0
Attachments:	NCR-ORNL-0053-15.pdf

The attached NCR is submitted as required by CCP-QP-005, *CCP TRU Nonconforming Item Reporting and Control*, Attachment 4.

- **Site NCR #:**
  NCR-ORNL-0053-15-0

- **Responsible organization:**
  CCP

- **Date initiated:**
  4/13/2015

- **Individual who identified the NCR:**
  Beverly Schrock

- **Deficiency:**
  Liquid inside of a PCB identified waste container.

Requirement Violated:
CCP-TP-053, Rev. 15, "CCP Standard Real- Time Radiography (RTR) Inspection Procedure, Section 4.4.3 [A] states in part "Using Table 1, Prohibited Items, as a reference ...confirm there are NO prohibited items in the waste container."
Table 1, Prohibited Items lists, in part, "PCB liquids", THEN ...initiate a nonconformance report

- **Actions:**
  Container is not certifiable for shipment to WIPP.
  1. Return container to Host Site for remediation.
  2. Exclude container on AKTSS
  3. Remove Container from WDS.
  4. Remove container from certification lot
  5. Add this NCR to OR-RTR7-0117 as SPM attachment

Date closed, if applicable:
Not closed.

NCR – ORNL-0053-15 Rev. 0
Attachment 1 Page 3 of 4

Beverly S. Schrock
Site Project Manager
Central Characterization Program
Nuclear Waste Partnership, LLC

Contractor for the U.S. Department of Energy
(575) 234-7444
(575) 706-0809 Cell

DIVIDER

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Attachment 1 – CCP Nonconformance Report (NCR)

CCP NONCONFORMANCE REPORT (NCR)

(Use NCR Continuation, Attachment 3, if necessary)

NCR No. NCR-ORNL-0125-15 Revision 1

1. Lot No., Heat No., or Serial No. (if applicable): N/A	2. Process (e.g., NDA, NDE, VE, Other): NDE	3. Batch Data Report #(s): OR-RTR6-0662
4. Order/Work Order/Job Control Number (if applicable): N/A	5. PO # (if applicable): N/A	Container #(s): X10C9312559A, X10C9400196A, X10C9311948A, X10C9400195B, X10C9312593A
	6. Supplier (if applicable): N/A	

DESCRIPTION OF NONCONFORMANCE

7a. NCR Description: ☐ < 100 nCi/g ☐ Prohibited Item ☐ E-Flag ☐ Receipt Inspection ☐ Transportation ☐ WWIS/WDS ☒ Other

7b. Requirement(s) (Enter Implementing Procedure No., Revision, Section No., & Quoted Text):

CCP-TP-053, *Standard Real Time Radiography (RTR) Inspection Procedure*, Rev. 15, Section 4.4.3 [E] states: IF a container is identified in the S5000 summary category group that CAN NOT be penetrated by the RTR method because of the presence of lead, or other shielding, THEN ....Initiate an NCR in accordance with CCP-QP-005, *CCP TRU Nonconforming Item Reporting and Control.*

7c. Actual Condition:
Impenetrable Material

Revision 1: Removed container X10C9400195A and placed on NCR-ORNL-0057-15-0.
Final Disposition changed due to containers being found LLW per NCR-ORNL-0368-15-0, to be returned to the Host Site.

7d. Have the CCP HOLD TAGS associated with this NCR been applied? ☒ YES ☐ NO If no is checked, explain:
07/15/15 LRJ

8. NCR Originator:
Beverly S. Schrock (printed name) BSSchrock (signature) 7/15/15 (date)

9. Does the identified condition have the potential to impact AK? If YES or INDETERMINATE, enter Trend Code L in Block 10. ☐ YES ☒ NO ☐ INDETERMINATE

10. Trend Code: K	11. Responsible Manager: **Beverly Schrock**
12. Significant Condition? ☐ YES ☒ NO (If Yes, enter WIPP Form No.):	13. Recurring Condition? ☐ YES ☒ NO (If Yes, list NCRs and WIPP Forms):

14. QA Engineer or QA Designee validation:
Laura R. Jones (printed name) Laura Raven Jones (signature) 7/15/15 (date)

COPY

CCP RECORDS ORIGINAL
DATE REC'D 8/2/15 SY

Attachment 1 – CCP Nonconformance Report (NCR) (Continued)

NCR No. NCR-ORNL-0125-15 Revision 1

INTERIM DISPOSITION

15a. Interim Disposition (Check Only One):
☒ N/A (See Final Disposition) ☐ Hold ☐ Conditionally Accept ☐ Conditionally Use
☐ Sort ☐ Reinspect or Retest ☐ Remediate

15b. Instructions for Completion of the Interim Disposition:

INTERIM DISPOSITION APPROVALS

16a. Responsible Manager or Individual:

printed name _____ signature _____ date _____

16b. QA Engineer or QA Designee:

printed name _____ signature _____ date _____

Additional Approval:

printed name _____ signature _____ date _____

Additional Approval:

printed name _____ signature _____ date _____

COMPLETION OF INTERIM DISPOSITION

17. Interim Disposition Complete – Responsible Manager or Individual:

printed name _____ signature _____ date _____

18. Interim Disposition Verified – QA Engineer:

printed name _____ signature _____ date _____

COPY

Attachment 1 – CCP Nonconformance Report (NCR) (Continued)

NCR No. NCR-ORNL-0125-15 Revision 1

FINAL DISPOSITION

19. Final Disposition (Check Only One: Use-As-Is, Repair, Reject, Rework, or Scrap):
☐ Use-As-Is ☐ Repair

19a. Technical Justification – Required for Use-As-Is or Repair dispositions. [☒ N/A for Reject, Rework, or Scrap]

☒ Reject ☐ Rework ☐ Scrap

19b. Instructions for Completion – Required for Reject, Repair, Rework, or Scrap [☐ N/A for Use-As-Is]
Containers have been found to be LLW per NCR-ORNL-0368-15.
1. Container is not certifiable for shipment to WIPP and is permanently returned to the host site.
2. Remove container from the AK Tracking Spreadsheet.
3. After container is removed, close NCR.

19c. Corrective Actions (Actions to Prevent Recurrence – For Repair or Rework, if applicable.
[☒ N/A if not applicable, and for Use-As-Is, Reject, and Scrap]

FINAL DISPOSITION APPROVALS

20. Responsible Manager or Individual:

Beverly S, Schrock	BSSchrock	7/15/15
printed name	signature	date

21. QA Engineer or QA Designee:

Laura R. Jones	Laura Raines Jones	7/15/15
printed name	signature	date

Additional Approval:

printed name	signature	date

Additional Approval:

printed name	signature	date

CLOSURE

22. Final Disposition Complete - Responsible Manager or Individual:

BSSchrock	BSSchrock	7/15/15
printed name	signature	date

23. Attachments: 1- Evidence for NCR closure. 2.-Hold tag removal notification.

24a. HOLD TAG removal has been verified and reconciled for all nonconforming items on the NCR: ☑
24b. If HOLD TAG is not applicable, check: ☐ and explain:

See Attachment 2.

25. Final Disposition Verified – NCR Closed QA Engineer:

Laura R. Jones	Laura Raines Jones	08/10/2015
printed name	signature	date

NCR ORNL-0125-15-1 Page 1 of 5 Attachment 1

CONTAINERID: X10C9312559A

ORNL

AK DATA

Container ID	Container Type	AKA Matrix	WDS Status	AK Excluded	WSID	LOTID	LOT Excluded
X10C9312559A	55G		NO WDS STATUS	YES (Inactive)	OR-PGDP-CH-HET	NONE	

BDR DATA

BDRID	Type	Status	Generation Date
OR-IQ3-0511	NDA	Complete	2015-06-17
OR-RTR6-0662	RTR	Complete	2015-06-08
OR-RTR7-0135	RTR	Complete	2015-06-16
OR15FG8064	HSG_TRANS	Complete	2015-06-22

NCR DATA

Container ID	NCRID	Status	Release Code
X10C9312559A	NCR-ORNL0125150	Open	None
X10C9312559A	NCR-ORNL0368150	Open	None

REJECT DATA

Container ID	BDRID	NCRID	NCR Status	Release Code	Actual Condition
X10C9312559A	OR-IQ3-0511	NCR-ORNL0368150	Open	None	The drums in Box 3 are less than or equal to 100nCi/g.
X10C9312559A	OR-RTR6-0662	NCR-ORNL0125150	Open	None	Impenetrable Material.

NCR ORNL-0125-15-1 Page 2 of 5 Attachment 1

CONTAINERID: X10C9400196A

ORNL

AK DATA

Container ID	Container Type	AKA Matrix	WDS Status	AK Excluded	WSID	LOTID	LOT Excluded
X10C9400196A	55G		NO WDS STATUS	YES (Inactive)	OR-PGDP-CH-HET	NONE	

BDR DATA

BDRID	Type	Status	Generation Date
OR-IQ3-0511	NDA	Complete	2015-06-17
OR-RTR6-0662	RTR	Complete	2015-06-08
OR-RTR7-0135	RTR	Complete	2015-06-16
OR15FG8064	HSG_TRANS	Complete	2015-06-22

NCR DATA

Container ID	NCRID	Status	Release Code
X10C9400196A	NCR-ORNL0125150	Open	None
X10C9400196A	NCR-ORNL0368150	Open	None

REJECT DATA

Container ID	BDRID	NCRID	NCR Status	Release Code	Actual Condition
X10C9400196A	OR-IQ3-0511	NCR-ORNL0368150	Open	None	The drums in Box 3 are less than or equal to 100nCi/g.
X10C9400196A	OR-RTR6-0662	NCR-ORNL0125150	Open	None	Impenetrable Material.

CONTAINERID: X10C9311948A

ORNL

NCR ORNL-0125-15-1 Page 3 of 5
Attachment 1

AK DATA

Container ID	Container Type	AKA Matrix	WDS Status	AK Excluded	WSID	LOTID	LOT Excluded
X10C9311948A	55G		NO WDS STATUS	YES (Inactive)	OR-PGDP-CH-HET	NONE	

BDR DATA

BDRID	Type	Status	Generation Date
OR-IQ3-0511	NDA	Complete	2015-06-17
OR-RTR6-0662	RTR	Complete	2015-06-08
OR-RTR7-0135	RTR	Complete	2015-06-16
OR15FG8064	HSG_TRANS	Complete	2015-06-22

NCR DATA

Container ID	NCRID	Status	Release Code
X10C9311948A	NCR-ORNL0125150	Open	None
X10C9311948A	NCR-ORNL0368150	Open	None

REJECT DATA

Container ID	BDRID	NCRID	NCR Status	Release Code	Actual Condition
X10C9311948A	OR-IQ3-0511	NCR-ORNL0368150	Open	None	The drums in Box 3 are less than or equal to 100nCi/g.
X10C9311948A	OR-RTR6-0662	NCR-ORNL0125150	Open	None	Impenetrable Material.

NCR ORNL-0125-15-1 Page 4 of 5 Attachment 1

CONTAINERID: X10C9400195B

ORNL

AK DATA

Container ID	Container Type	AKA Matrix	WDS Status	AK Excluded	WSID	LOTID	LOT Excluded
X10C9400195B	55G		NO WDS STATUS	YES (Inactive)	OR-PGDP-CH-HET	NONE	

BDR DATA

BDRID	Type	Status	Generation Date
OR-IQ3-0511	NDA	Complete	2015-06-17
OR-RTR6-0662	RTR	Complete	2015-06-08
OR-RTR7-0135	RTR	Complete	2015-06-16
OR15FG8064	HSG_TRANS	Complete	2015-06-22

NCR DATA

Container ID	NCRID	Status	Release Code
X10C9400195B	NCR-ORNL0125150	Open	None
X10C9400195B	NCR-ORNL0368150	Open	None

REJECT DATA

Container ID	BDRID	NCRID	NCR Status	Release Code	Actual Condition
X10C9400195B	OR-IQ3-0511	NCR-ORNL0368150	Open	None	The drums in Box 3 are less than or equal to 100nCi/g.
X10C9400195B	OR-RTR6-0662	NCR-ORNL0125150	Open	None	Impenetrable Material.

NCR ORNL-0125-15-1 Page 5 of 5 Attachment 1

CONTAINERID: X10C9312593A

ORNL

AK DATA

Container ID	Container Type	AK'A Matrix	WDS Status	AK Excluded	WSID	LOTID	LOT Excluded
X10C9312593A	55G		NO WDS STATUS	YES (Inactive)	OR-PGDP-CH-HET	NONE	

BDR DATA

BDRID	Type	Status	Generation Date
OR-IQ3-0511	NDA	Complete	2015-06-17
OR-RTR6-0662	RTR	Complete	2015-06-08
OR-RTR7-0135	RTR	Complete	2015-06-16
OR15FG8064	HSG_TRANS	Complete	2015-06-22

NCR DATA

Container ID	NCRID	Status	Release Code
X10C9312593A	NCR-ORNL0125150	Open	None
X10C9312593A	NCR-ORNL0368150	Open	None

REJECT DATA

Container ID	BDRID	NCRID	NCR Status	Release Code	Actual Condition
X10C9312593A	OR-IQ3-0511	NCR-ORNL0368150	Open	None	The drums in Box 3 are less than or equal to 100nCi/g.
X10C9312593A	OR-RTR6-0662	NCR-ORNL0125150	Open	None	Impenetrable Material.

Jones, Laura - NWP

From: Harmon, Latravia <Latravia.Harmon@truproject.com>
Sent: Thursday, July 16, 2015 12:55 PM
To: Jones, Laura - NWP
Cc: Schrock, Beverly - NWP; Wade, Daniel NWP; Waldram, Veronica - NWP; Kuhn, Ronald - NWP
Subject: RE: Hold tags to be pulled NCR-ORNL-0125-15-1

Laura

Hold tags for the following containers were removed. Please use this email as notification to proceed with closure of applicable NCRs.

Thanks

Have a Great Day

LaTravia N. Harmon
Quality Assurance Engineer
Nuclear Waste Partnership LLC
Contractor to the United States Department of Energy
(865)576-1650 Office
(865)441-2706 Cell
latravia.harmon@truproject.com
Quality is the Pride of Workmanship.

BDR ID	Container ID	Release Code	Reason	NCR
OR-RTR6-0662	X10C9312559A	Returned	Container has been excluded from the AKTSS.	NCR-ORNL-0125-15-1 8/10/15 LRS
OR-RTR6-0662	X10C9400196A	Returned	Container has been excluded from the AKTSS.	NCR-ORNL-0125-15-1 08/10/15 LRS
OR-RTR6-0662	X10C9311948A	Returned	Container has been excluded from the AKTSS.	NCR-ORNL-0125-15-1 08/10/15 LRS
OR-RTR6-0662	X10C9400195B	Returned	Container has been excluded from the AKTSS.	NCR-ORNL-0125-15-1 08/10/15 LRS
OR-RTR6-0662	X10C9312593A	Returned	Container has been excluded from the AKTSS.	NCR-ORNL-0125-15-1 08/10/15 LRS

NCR ORNL-0125-15 Rev. 1
Attachment 2 Page 1 of 1

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PAGE

Attachment 1 – CCP Nonconformance Report (NCR)

CCP NONCONFORMANCE REPORT (NCR)

(Use NCR Continuation, Attachment 3, if necessary)

NCR No. NCR-ORNL-0126-15 Revision 0

1. Lot No., Heat No., or Serial No. (if applicable): N/A	2. Process (e.g., NDA, NDE, VE, Other): NDE	3. Batch Data Report #(s): OR-RTR7-0143
4. Order/Work Order/Job Control Number (if applicable): N/A	5. PO # (if applicable): N/A	Container #(s): NFS0822C, NFS0822D
	6. Supplier (if applicable): N/A	

DESCRIPTION OF NONCONFORMANCE

7a. NCR Description: ☐ < 100 nCi/g ☐ Prohibited Item ☐ E-Flag ☐ Receipt Inspection ☐ Transportation ☐ WWIS/WDS ☒ Other

7b. Requirement(s) (Enter Implementing Procedure No., Revision, Section No., & Quoted Text):
CCP-TP-053, Standard Real Time Radiography (RTR) Inspection Procedure, Rev. 15, section 4.4.3 [C] states: **IF** the physical form of the waste DOES NOT match the Waste Stream Description and/or the Waste Matrix Code, **THEN** ... Initiate an NCR in accordance with CCP-QP-005, *CCP TRU Nonconforming Item Reporting and Control.*

7c. Actual Condition: DOES NOT match the Waste Stream Description and/or the Waste Matrix Code.

7d. Have the CCP HOLD TAGS associated with this NCR been applied? ☒ YES ☐ NO If no is checked, explain:

8. NCR Originator:
Eric Lyles (printed name) — signature — 7-15-15 (date)

9. Does the identified condition have the potential to impact AK? If YES or INDETERMINATE, enter Trend Code L in Block 10. ☒ YES ☐ NO ☐ INDETERMINATE

10. Trend Code: **L**

11. Responsible Manager: **Beverly Schrock**

12. Significant Condition? ☐ YES ☒ NO (If Yes, enter WIPP Form No.):

13. Recurring Condition? ☐ YES ☒ NO (If Yes, list NCRs and WIPP Forms):

14. QA Engineer or QA Designee validation:
LaTravia Harmon (printed name) — LaTravia Harmon (signature) — 7/16/15 (date)

COPY

Attachment 1 – CCP Nonconformance Report (NCR) (Continued)

NCR No. NCR-ORNL-0126-15 Revision 0

INTERIM DISPOSITION

15a. Interim Disposition (Check Only One):

☐ N/A (See Final Disposition) ☒ Hold ☐ Conditionally Accept ☐ Conditionally Use

☐ Sort ☐ Reinspect or Retest ☐ Remediate

15b. Instructions for Completion of the Interim Disposition:

1. Responsible Manager send this NCR to AK Expert for re-evaluation in accordance with CCP-TP-005.
2. AK Expert perform the AK re-evaluation and include a copy of documented results as an attachment to this NCR.
3. SPM determine the Final Disposition (block 19) based on the results of the AK Expert re-evaluation.

INTERIM DISPOSITION APPROVALS

16a. Responsible Manager or Individual:

Andrew Stallings for Beverly Schrock

Beverly Schrock	for Beverly Schrock	7-16-15
printed name	signature	date

16b. QA Engineer or QA Designee:

LaTravia Harmon	LaTravia Harmon	7/16/15
printed name	signature	date

Additional Approval:

printed name	signature	date

Additional Approval:

printed name	signature	date

COMPLETION OF INTERIM DISPOSITION

17. Interim Disposition Complete – Responsible Manager or Individual:

BSSchrock	BSSchrock	8/13/15
printed name	signature	date

18. Interim Disposition Verified – QA Engineer:

Laura R. Jones	Laura Renee Jones	8/13/2015
printed name	signature	date

COPY

Attachment 1 – CCP Nonconformance Report (NCR) (Continued)

NCR No. NCR-ORNL-0126-15 Revision 0

FINAL DISPOSITION

19. Final Disposition (Check Only One: Use-As-Is, Repair, Reject, Rework, or Scrap):
☐ Use-As-Is ☐ Repair

19a. *Technical Justification – Required for Use-As-Is or Repair dispositions.* [☒ N/A for Reject, Rework, or Scrap]

☒ Reject ☐ Rework ☐ Scrap

19b. Instructions for Completion – Required for Reject, Repair, Rework, or Scrap [☐ N/A for Use-As-Is]
1. Containers to have the Waste Stream corrected from OR-NFS-CH-SOIL to OR-NFS-CH-HET-A on the AKTSS.
2. Containers to be re-ran on RTR.

19c. Corrective Actions (Actions to Prevent Recurrence – For Repair or Rework, if applicable.
[☒ N/A if not applicable, and for Use-As-Is, Reject, and Scrap]

FINAL DISPOSITION APPROVALS

20. Responsible Manager or Individual:

Beverly S. Schrock	BSSchrock	8/13/15
printed name	signature	date

21. QA Engineer or QA Designee:

Laura R. Jones	Laura Lauren Jones	8/13/2015
printed name	signature	date

Additional Approval:

printed name	signature	date

CLOSURE

22. Final Disposition Complete - Responsible Manager or Individual:

printed name	signature	date

23. Attachments: 1.- Email Documenting OR-NFS-CH-HET-A Additions.

24a. HOLD TAG removal has been verified and reconciled for all nonconforming items on the NCR: ☐
24b. If HOLD TAG is not applicable, check: ☐ and explain:

25. Final Disposition Verified – NCR Closed QA Engineer:

printed name	signature	date

Schrock, Beverly - NWP

From: Jeff Harrison <Trash_Talk@msn.com>
Sent: Wednesday, August 12, 2015 12:56 PM
To: Schrock, Beverly - NWP
Subject: FW: NFS0822C and D
Attachments: OR-NFS-CH-HET-A Additions 071015.pdf

Bev,

I had Diana add NFS0822C and D to AK on 7/10/15. The spreadsheet I sent her indicated they should be added to OR-NFS-CH-HET-A. But because parent NFS0822 and daughters A and B were in SOIL, she mistakenly added C and D to SOIL. I caught this mistake and asked her to change them to HET-A on 7/20/15. Unfortunately RTR ran them on 7/15/15.

I've also attached the Container Evaluation Memo showing I added these to HET-A. Since adding them to the SOIL stream was an error, can you just void this NCR and have them re-run them now that they're in the correct waste stream?

Jeff Harrison
Nuclear Waste Partership LLC
Contractor for the U.S. Department of Energy
Trash_Talk@msn.com (e-mail)
720.977.7042 (office)
303.918.8791 (cell)
720.977.7042 (fax)

From: Jeff Harrison [mailto:Trash_Talk@msn.com]
Sent: Monday, July 20, 2015 2:31 PM
To: 'Diana Mccabe' <dianakmccabe.dkm@gmail.com>
Cc: 'Schrock, Beverly - NWP' <Beverly.Schrock@wipp.ws>; 'Andrew Stallings' <Andrew.Stallings@truproject.com>; 'Wade, Daniel NWP' <Daniel.Wade@wipp.ws>
Subject: NFS0822C and D

Diana,

I just noticed you included NFS0822C and D in the SOIL waste stream, but the spreadsheet I sent you has these in the HET-A waste stream. The parent NFS0822 was a SOIL drum, and the A and B daughters are SOIL drums, but daughters C and D are secondary debris and belong in the HET-A waste stream. Please make this correction. Thank you.

Jeff Harrison
Nuclear Waste Partership LLC
Contractor for the U.S. Department of Energy
Trash_Talk@msn.com (e-mail)
720.977.7042 (office)
303.918.8791 (cell)
720.977.7042 (fax)

NCR ORNL-0126-15-0
Attachment 1 Page 1 of 4

Waste container information has been reviewed for three 55-gallon drums (NFS0822C, NFS0822D, and X10C0505986A) to verify that the containers are bounded by the existing CCP-AK-ORNL-001, Rev. 10 AK Summary Report (ORNL-001) for the OR-NFS-CH-HET-A (HET-A) waste stream. NFS0822C and NFS0822D were produced from repackaging NFS0822, and X10C0505986A was produced from repackaging X10C0505986 at the TWPC. Information reviewed consists of the original container paperwork generated by ORNL (UCN-2822 and UCN-2109 forms), the original NFS paperwork (e.g., *TRU Waste Data Package, Data Log Sheet for Packaging TRU waste*, and the *Waste Certification Checklist for CH-TRU*), TWPC repackaging data forms, and TWPC and *eMWaste* database queries (References M003, M075, M244, M245).

Time Period Of Generation

The HET-A waste stream from the initial phase of decommissioning was generated and packaged at NFS from July 1993 to May 1994. The wastes from the second phase of decommissioning were generated and packaged at NFS from April 2001 to September 2003. Size reduction and repackaging at the TWPC began in December 2005 and will continue (Section 5.2).

Parent NFS0822 was generated in September 1993, and parent X10C0505986 was generated in October 2001. Therefore, the additional drums are bounded by the HET-A waste stream.

Waste Generation Location And Process

The HET-A waste stream originated primarily from the initial and second phases of decommissioning of the Building 234 MOX fuel fabrication facility and the Building 110 analytical laboratory. This waste stream was also generated from the removal of the Building 110 laboratory underground waste tank. In addition, a few drums were generated from excavation of Trench B in the NFS RBG during the second phase of decommissioning. Drums and boxes from NFS are repackaged, as necessary, at the TWPC (Sections 4.4.2, 5.1, and 5.3).

The UCN-2822 indicates parent NFS0822 was generated in either Building 110 or Building 234. The NFS container paperwork does not specify the building number. The NFS container paperwork indicates parent X10C0505986 was generated in Building 234. Therefore, the additional drums are bounded by the HET-A waste stream.

Physical Form

The HET-A waste stream is comprised primarily of numerous organic and inorganic debris waste items and generally consists of cellulosics, plastic, rubber, concrete, glass, and metal. Some drums in this waste stream contain machine-compacted waste. Some of the specific waste items include aluminum sheeting and tubing, angle iron, steel framing, metal fittings, hardware (e.g., bolts, nuts, screws), pipe, saw blades, sheet metal, copper tubing, inorganic absorbent, concrete, glassware, glass Raschig rings, rags, paper suits, tape, wipes, wood, plastic bags and

sheeting, bottles, flex hose, hoods, strippable coating, tubing, rubber gaskets, rubber gloves, shoe covers, electric motors, electrical equipment (e.g., drills, saws, and vacuums), and High Efficiency Particulate Air (HEPA) filters. Small quantities of soil, floor sweepings, absorbed oil, and cemented aqueous solutions may also be present (Section 5.4.1).

The HET-A waste stream is assigned waste matrix code is S5400, which is waste that is at least 50 percent, by volume, debris materials. The waste material parameters included in the HET-A waste stream consist of aluminum-based metals/alloys, iron-based metals/alloys, other metals, other inorganic materials, cellulosics, plastics, rubber, organic matrix, inorganic matrix, and soils/gravel (Sections 5.4.1.1 and 5.4.1.2).

The UCN-2822 and the NFS container paperwork indicates parent NFS0822 contains soil. However, the TWPC repack form indicates daughters NFS0822C and NFS0822D contain only debris waste and no soil. NFS0822A and NFS0822B are predominantly soil and were added to waste stream OR-NFS-CH-SOIL. NFS0822C and NFS0822D contain only secondary debris waste from repackaging soil drum NFS0822. The UCN-2822, NFS container paperwork, and TWPC repack forms indicate parent X10C0505986 and daughter X10C0505986A contain debris waste. The waste items in these three daughter drums are similar to and consistent with the waste stream description for the HET-A waste stream. Therefore, the additional drums are bounded by the HET-A waste stream.

Chemical Content

EPA hazardous waste numbers assigned to the HET-A waste stream consist of D006, D008, D009, D011, and F002 (Section 5.4.3).

The ORNL waste disposal forms, original NFS container paperwork, and *eMWaste* database do not indicate any EPA hazardous waste numbers assigned to the waste that are not already identified in the ORNL-001 AK for the HET-A waste stream. Therefore, the additional drums are bounded by the HET-A waste stream.

Radionuclides

As shown in Table 5-4 of the ORNL-001 AK, U-238 and Pu-239 are the two most prevalent radionuclides, by mass, for the HET-A waste stream at 81.07% and 12.4%, respectively (Section 5.4.2.3).

The two prevalent nuclides by mass in the two parent containers are U-238 and Pu-239 which is consistent with AK. Other nuclides present in these drums include Am-241, Pu-238, Pu-240, Pu-241, Th-228, Th-232, U-232, U-233, U-234, U-235, and Tc-99. Tc-99, Th-228, Th-232, and U-232, which reported by the generator, are not identified as expected present in Table 5-4. However, these nuclides do not contribute to 95 percent of the hazard in any of the parent containers. Therefore, Table 5-4 does not require revision to add these nuclides.

Prohibited Items

The TWPC VE and Repackaging Data Forms did not indicate the presence of prohibited items, or described the remediation of prohibited items (e.g., absorbent added to immobilize liquids). Repackaging was done to remediate any prohibited items.

Conclusion

The existing ORNL-001 AK bounds these three repackaged drums and are therefore eligible to be included in the HET-A waste stream. The inclusion of these drums will not alter the waste matrix code, EPA hazardous waste numbers, or the expected radionuclides (including the two most prevalent radionuclides) for the HET-A waste stream. The inclusion of these drums will not necessitate additional operator training.

DIVIDER

PAGE

Attachment 1 – CCP Nonconformance Report (NCR)

CCP NONCONFORMANCE REPORT (NCR)

(Use NCR Continuation, Attachment 3, if necessary)

NCR No. NCR-ORNL-0145-16 Revision 1

1. Lot No., Heat No., or Serial No. (if applicable): N/A	2. Process (e.g., NDA, NDE, VE, Other): NDA	3. Batch Data Report #(s): OR-IQ3-0631 OR-IQ3-0630
4. Order/Work Order/Job Control Number (if applicable): N/A	5. PO # (if applicable): N/A	Container #(s): X10C1100293 X10C1100275 X10C1100291
	6. Supplier (if applicable): N/A	

DESCRIPTION OF NONCONFORMANCE

7a. NCR Description: ☐ < 100 nCi/g ☐ Prohibited Item ☐ E-Flag ☐ Receipt Inspection ☐ Transportation ☐ WWIS/WDS ☒ Other

7b. Requirement(s) (Enter Implementing Procedure No., Revision, Section No., & Quoted Text):
CCP-TP-047, Rev. 12 CCP Mobile IQ3 Gamma Scanner Operation,
Section 4.6.5 On the item information screen enter the following data:
- Percent Full

7c. Actual Condition:

For container X10C1100293 the percent fill does not match the percent fill in RTR data.

Revision 1: Include containers X10C1100275 and X10C1100291 from BDR OR-IQ3-0630. Change Trend Code from A to M since there was inadequate communication between RTR and NDA operators.

7d. Have the CCP HOLD TAGS associated with this NCR been applied? ☐ YES ☐ NO If no is checked, explain:

8. NCR Originator:

Carolina Soaterna (printed name) Carolina Soaterna (signature) 3/30/2016 (date)

9. Does the identified condition have the potential to impact AK? If YES or INDETERMINATE, enter Trend Code L in Block 10. ☐ YES ☒ NO ☐ INDETERMINATE

10. Trend Code: M

11. Responsible Manager: **Beverly S. Schrock**

12. Recurring Condition? ☐ YES ☒ NO (If Yes, list NCRs and WIPP Forms):

13. Significant Condition? ☐ YES ☒ NO (If Yes, enter WIPP Form No.):

14. QA Engineer or QA Designee validation:

Laura R. Jones (printed name) Laura Romero Jones (signature) 3/30/2016 (date)

COPY

Attachment 1 – CCP Nonconformance Report (NCR) (Continued)

NCR No. NCR-ORNL-0145-16 Revision 1

INTERIM DISPOSITION

15a. Interim Disposition (Check Only One):

☒ N/A (See Final Disposition) ☐ Hold ☐ Conditionally Accept ☐ Conditionally Use

☐ Sort ☐ Reinspect or Retest ☐ Remediate

15b. Instructions for Completion of the Interim Disposition:

INTERIM DISPOSITION APPROVALS

16a. Responsible Manager or Individual:

printed name _____ signature _____ date _____

16b. QA Engineer or QA Designee:

printed name _____ signature _____ date _____

Additional Approval:

printed name _____ signature _____ date _____

COMPLETION OF INTERIM DISPOSITION

17. Interim Disposition Complete – Responsible Manager or Individual:

printed name _____ signature _____ date _____

18. Interim Disposition Verified – QA Engineer:

printed name _____ signature _____ date _____

Y90J

Attachment 1 – CCP Nonconformance Report (NCR) (Continued)

NCR No. NCR-ORNL-0145-16 Revision 1

FINAL DISPOSITION

19. Final Disposition (Check Only One: Use-As-Is, Repair, Reject, Rework, or Scrap):
☐ Use-As-Is ☐ Repair
19a. Technical Justification – Required for Use-As-Is or Repair dispositions. [☒ N/A for Reject, Rework, or Scrap]

☐ Reject ☒ Rework ☐ Scrap
19b. Instructions for Completion – Required for Reject, Repair, Rework, or Scrap [☐ N/A for Use-As-Is]
1. DGL make necessary corrections and re-sign Radioassay Data Sheet
2. ITR review corrections and re-sign ITR checklist and cover sheet
3. SPM review corrections.

19c. Corrective Actions (Actions to Prevent Recurrence – For Repair or Rework, if applicable.
[☒ N/A if not applicable, and for Use-As-Is, Reject, and Scrap]

FINAL DISPOSITION APPROVALS

20. Responsible Manager or Individual:

printed name	signature	date
Daniel Wade		3/31/2016

21. QA Engineer or QA Designee:

printed name	signature	date
Laura R. Jones	Laura Rowen Jones	3/31/2016

Additional Approval:

printed name	signature	date

CLOSURE

22. Final Disposition Complete - Responsible Manager or Individual:

printed name	signature	date

23. Attachments:

24a. HOLD TAG removal has been verified and reconciled for all nonconforming items on the NCR: ☐
24b. If HOLD TAG is not applicable, check: ☐ and explain:

25. Final Disposition Verified – NCR Closed QA Engineer:

printed name	signature	date

Attachment 1 – CCP Nonconformance Report (NCR)

CCP NONCONFORMANCE REPORT (NCR)

(Use NCR Continuation, Attachment 3, if necessary)

NCR No. NCR-ORNL-0145-16 Revision 0

1. Lot No., Heat No., or Serial No. (if applicable): N/A	2. Process (e.g., NDA, NDE, VE, Other): NDA	3. Batch Data Report #(s): OR-IQ3-0631
4. Order/Work Order/Job Control Number (if applicable): N/A	5. PO # (if applicable): N/A	Container #(s): X10C1100293
	6. Supplier (if applicable): N/A	

DESCRIPTION OF NONCONFORMANCE

7a. NCR Description: ☐ < 100 nCi/g ☐ Prohibited Item ☐ E-Flag ☐ Receipt Inspection ☐ Transportation ☑ WWIS/WDS ☒ Other

7b. Requirement(s) (Enter Implementing Procedure No., Revision, Section No., & Quoted Text):
CCP-TP-047, Rev. 12 CCP Mobile IQ3 Gamma Scanner Operation,
Section 4.6.5 On the item information screen enter the following data:
- Percent Full

7c. Actual Condition:
For container X10C1100293 the percent fill does not match the percent fill in RTR data.

7d. Have the CCP HOLD TAGS associated with this NCR been applied? ☐ YES ☐ NO If no is checked, explain:

8. NCR Originator:
Carolina Soaterna (printed name) Carolina Soaterna (signature) 3/29/16 (date)

9. Does the identified condition have the potential to impact AK? If YES or INDETERMINATE, enter Trend Code L in Block 10. ☐ YES ☒ NO ☐ INDETERMINATE

10. Trend Code: A

11. Responsible Manager: **Beverly S. Schrock**

12. Recurring Condition? ☐ YES ☒ NO (If Yes, list NCRs and WIPP Forms):

13. Significant Condition? ☐ YES ☒ NO (If Yes, enter WIPP Form No.):

14. QA Engineer or QA Designee validation:
Laura R. Jones (printed name) Laura Raven Jones (signature) 3/29/2016 (date)

SUPERCEDED by Revision 1
03/31/16 LRJ

Attachment 1 – CCP Nonconformance Report (NCR) (Continued)

NCR No. NCR-ORNL-0145-16 **Revision 0**

INTERIM DISPOSITION

15a. Interim Disposition (Check Only One):

☒ N/A (See Final Disposition) ☐ Hold ☐ Conditionally Accept ☐ Conditionally Use

☐ Sort ☐ Reinspect or Retest ☐ Remediate

15b. Instructions for Completion of the Interim Disposition:

INTERIM DISPOSITION APPROVALS

16a. Responsible Manager or Individual:

printed name _____ signature _____ date _____

16b. QA Engineer or QA Designee:

printed name _____ signature _____ date _____

Additional Approval:

printed name _____ signature _____ date _____

COMPLETION OF INTERIM DISPOSITION

17. Interim Disposition Complete – Responsible Manager or Individual:

printed name _____ signature _____ date _____

18. Interim Disposition Verified – QA Engineer:

printed name _____ signature _____ date _____

Attachment 1 – CCP Nonconformance Report (NCR) (Continued)

NCR No. NCR-ORNL-0145-16 Revision 0

FINAL DISPOSITION

19. Final Disposition (Check Only One: Use-As-Is, Repair, Reject, Rework, or Scrap):
☐ Use-As-Is ☐ Repair

19a. Technical Justification – Required for Use-As-Is or Repair dispositions. [☒ N/A for Reject, Rework, or Scrap]

☐ Reject ☒ Rework ☐ Scrap

19b. Instructions for Completion – Required for Reject, Repair, Rework, or Scrap [☐ N/A for Use-As-Is]
1. DGL make necessary corrections and re-sign Radioassay Data Sheet
2. ITR review corrections and re-sign ITR checklist and cover sheet
3. SPM complete BDR review.

19c. Corrective Actions (Actions to Prevent Recurrence – For Repair or Rework, if applicable.
[☒ N/A if not applicable, and for Use-As-Is, Reject, and Scrap]

FINAL DISPOSITION APPROVALS

20. Responsible Manager or Individual:

printed name	signature	date
Daniel Wade	D. L. Wade	3/29/2016

21. QA Engineer or QA Designee:

printed name	signature	date
Laura R. Jones	Laura Renee Jones	3/29/2016

Additional Approval:

printed name	signature	date

CLOSURE

22. Final Disposition Complete - Responsible Manager or Individual:

printed name	signature	date

23. Attachments: 1 - Email Documenting Reportability.

24a. HOLD TAG removal has been verified and reconciled for all nonconforming items on the NCR: ☐
24b. If HOLD TAG is not applicable, check: ☐ and explain:

25. Final Disposition Verified – NCR Closed QA Engineer:

printed name	signature	date

Jones, Laura - NWP

From: Ramirez, Mike - NWP
Sent: Tuesday, March 29, 2016 4:22 PM
To: Jones, Laura - NWP
Cc: Nesser, Cathy - NWP
Subject: RE: New NCR-ORNL-0145-16

Not reportable

Mike Ramirez
Central Characterization Program
Certification Manager
Nuclear Waste Partnership LLC
Contractor for the U.S. Department of Energy
(575)-234-7034 Work
(575) 200-8535 Cell

From: Jones, Laura - NWP
Sent: Tuesday, March 29, 2016 4:14 PM
To: Harmon, Latravia; Harmon, LaTravia - NWP; Navarrete, Leon - TFE; Tilmon, Pat; Pearcy, Sheila - TFE; Ramirez, Mike - NWP; Reeves, Ron - NWP; Schrock, Beverly - NWP; Stallings, Andrew - ORNL; Tilmon, Pat; Wade, Daniel NWP; Yturralde, Jewell - TFE; Soaterna, Carolina - NWP
Cc: Nesser, Cathy - NWP; Allen, Bill (W.W.) -NWP; Jones, Laura - NWP
Subject: New NCR-ORNL-0145-16

Bev / Andrew / Daniel – For your information
Latravia – Please apply hold tag and notify
Mike – Please review for notification purposes
Leon / Jewell – please post this open NCR

Laura R. Jones
Quality Assurance Engineer
Nuclear Waste Partnership LLC
Contractor of the US Department of Energy
Phone (575)234-7244, 8221
Email: laura.jones@wipp.ws

NCR – ORNL-0145-16 Rev.0
Attachment 1 Page 1 of 2

Jones, Laura - NWP

From: IDC (No Reply) <NOREPLY@wipp.ws>
Sent: Tuesday, March 29, 2016 4:22 PM
To: DL CCP QA CBFO Notify
Subject: Project Office NCR [NCR-ORNL0145160] was just reviewed.

Certification Manager/Designee has just reviewed the project office NCR NCR-ORNL0145160 and has indicated that it [should **NOT**] be reported to CBFO. IDC has already updated the NCR for you.

NCR-ORNL-0145-16, Rev. 0
Attachment 1 Page 2 of 2

DIVIDER

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Attachment 1 – CCP Nonconformance Report (NCR)

CCP NONCONFORMANCE REPORT (NCR)

(Use NCR Continuation, Attachment 3, if necessary)

NCR No. NCR-ORNL-0154-15 Revision 0

1. Lot No., Heat No., or Serial No. (if applicable): N/A	2. Process (e.g., NDA, NDE, VE, Other): VE	3. Batch Data Report #(s): ORVECH0144
4. Order/Work Order/Job Control Number (if applicable): N/A	5. PO # (if applicable): N/A	Container #(s): X10C9313060A
	6. Supplier (if applicable): N/A	

DESCRIPTION OF NONCONFORMANCE

7a. NCR Description: ☐ < 100 nCi/g ☐ Prohibited Item ☐ E-Flag ☐ Receipt Inspection ☐ Transportation ☐ WWIS/WDS ☑ Other

7b. Requirement(s) (Enter Implementing Procedure No., Revision, Section No., & Quoted Text):

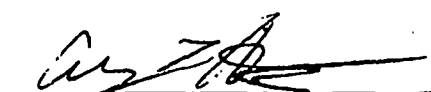
CCP-TP-113, Rev. 18, "CCP Standard Contact-Handled Waste Visual Examination, Step 4.4.12, [B.2] Record NO or YES to indicate whether the waste is consistent with the assigned Waste Stream Description and Waste Matrix Code.

(a) IF NO, THEN initiate a Nonconformance Report (NCR) in accordance with CCP-QP-005, AND record the NCR No in Section 1 of Attachment 2.

7c. Actual Condition: Drum contents did not match Waste Stream Description or Waste Matrix Code.

7d. Have the CCP HOLD TAGS associated with this NCR been applied? ☑ YES ☐ NO If no is checked, explain:

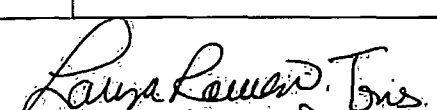
8. NCR Originator:

Anthony Harley (printed name)  (signature) 6-23-2015 (date)

9. Does the identified condition have the potential to impact AK? If YES or INDETERMINATE, enter Trend Code L in Block 10. ☒ YES ☐ NO ☐ INDETERMINATE

10. Trend Code: L	11. Responsible Manager: **Beverly Schrock**
12. Significant Condition? ☐ YES ☒ NO (If Yes, enter WIPP Form No.):	13. Recurring Condition? ☐ YES ☒ NO (If Yes, list NCRs and WIPP Forms):

14. QA Engineer or QA Designee validation:

Laura R Jones (printed name)  (signature) 06/24/2015 (date)

COPY

Attachment 1 – CCP Nonconformance Report (NCR) (Continued)

NCR No. NCR-ORNL-0154-15 Revision 0

INTERIM DISPOSITION

15a. Interim Disposition (Check Only One):

☐ N/A (See Final Disposition) ☑ Hold ☐ Conditionally Accept ☐ Conditionally Use

☐ Sort ☐ Reinspect or Retest ☐ Remediate

15b. Instructions for Completion of the Interim Disposition:

1. Responsible Manager send this NCR to the AK Expert for re-evaluation in accordance with CCP-TP-005.
2. AK Expert perform the AK re-evaluation and include a copy of documented results as an attachment to this NCR.
3. SPM determine Final Disposition based on these results.

INTERIM DISPOSITION APPROVALS

16a. Responsible Manager or Individual:

BSSchrock (printed name) BSSchrock (signature) 6/24/15 (date)

16b. QA Engineer or QA Designee:

Laura L Jones (printed name) Laura Lauren Jones (signature) 6/24/2015 (date)

Additional Approval:

printed name signature date

Additional Approval:

printed name signature date

COMPLETION OF INTERIM DISPOSITION

17. Interim Disposition Complete – Responsible Manager or Individual:

printed name signature date

18. Interim Disposition Verified – QA Engineer:

printed name signature date

Y40

Attachment 1 – CCP Nonconformance Report (NCR) (Continued)

NCR No. NCR-ORNL-0154-15 Revision 0

FINAL DISPOSITION

19. Final Disposition (Check Only One: Use-As-Is, Repair, Reject, Rework, or Scrap):
☐ Use-As-Is ☐ Repair

19a. Technical Justification – Required for Use-As-Is or Repair dispositions. [☐ N/A for Reject, Rework, or Scrap]

☐ Reject ☐ Rework ☐ Scrap

19b. Instructions for Completion – Required for Reject, Repair, Rework, or Scrap [☐ N/A for Use-As-Is]

19c. Corrective Actions (Actions to Prevent Recurrence – For Repair or Rework, if applicable.
[☐ N/A if not applicable, and for Use-As-Is, Reject, and Scrap]

FINAL DISPOSITION APPROVALS

20. Responsible Manager or Individual:

printed name _____ signature _____ date _____

21. QA Engineer or QA Designee:

printed name _____ signature _____ date _____

Additional Approval:

printed name _____ signature _____ date _____

Additional Approval:

printed name _____ signature _____ date _____

CLOSURE

22. Final Disposition Complete - Responsible Manager or Individual:

printed name _____ signature _____ date _____

23. Attachments:

24a. HOLD TAG removal has been verified and reconciled for all nonconforming items on the NCR: ☐
24b. If HOLD TAG is not applicable, check: ☐ and explain:

25. Final Disposition Verified – NCR Closed QA Engineer:

printed name _____ signature _____ date _____

DIVIDER

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Attachment 1 – CCP Nonconformance Report (NCR)

CCP NONCONFORMANCE REPORT (NCR)

(Use NCR Continuation, Attachment 3, if necessary)

NCR No. NCR-ORNL- 0403 -15 Revision 0

1. Lot No., Heat No., or Serial No. (if applicable): N/A	2. Process (e.g., NDA, NDE, VE, Other): NDA	3. Batch Data Report #(s): OR-MILCC2-0209 Container #(s): X10CSATN03211I, X10CSATN03211M, X10CSATN03211J
4. Order/Work Order/Job Control Number (if applicable): N/A	5. PO # (if applicable): N/A	
	6. Supplier (if applicable): N/A	

DESCRIPTION OF NONCONFORMANCE

7a. NCR Description: ☐ < 100 nCi/g ☐ Prohibited Item ☐ E-Flag ☐ Receipt Inspection ☐ Transportation ☐ WWIS/WDS ☑ Other

7b. Requirement(s) (Enter Implementing Procedure No., Revision, Section No., & Quoted Text):

CCP-PO-002, Rev. 27, Table A-3:
States in part, "...all assays performed since the last acceptable performance check are suspect, pending satisfactory resolution."

7c. Actual Condition:

The assays for the containers in Box 3 are suspect due to failed performance check on 7/29/2015.

7d. Have the CCP HOLD TAGS associated with this NCR been applied? ☑ YES / ☐ NO If no is checked, explain:

8. NCR Originator:

Ronald Whitson (printed name) _____ (signature) 7/28/2015 (date)

9. Does the identified condition have the potential to impact AK? If YES or INDETERMINATE, enter Trend Code L in Block 10. ☐ YES ☑ NO ☐ INDETERMINATE

10. Trend Code: K	11. Responsible Manager: Ronald Whitson
12. Significant Condition? ☐ YES ☑ NO (If Yes, enter WIPP Form No.):	13. Recurring Condition? ☐ YES ☑ NO (If Yes, list NCRs and WIPP Forms):

14. QA Engineer or QA Designee validation:

Susan Anderson (printed name) _____ (signature) 7/29/15 (date)

COPY

CCP RECORDS ORIGINAL
DATE REC'D 11-18-15 JV

Attachment 1 – CCP Nonconformance Report (NCR) (Continued)

NCR No. NCR-ORNL- 0403 -15 **Revision 0**

INTERIM DISPOSITION

15a. Interim Disposition (Check Only One):
☑ N/A (See Final Disposition) ☐ Hold ☐ Conditionally Accept ☐ Conditionally Use
☐ Sort ☐ Reinspect or Retest ☐ Remediate

15b. Instructions for Completion of the Interim Disposition:

INTERIM DISPOSITION APPROVALS

16a. Responsible Manager or Individual:

printed name _____ signature _____ date _____

16b. QA Engineer or QA Designee:

printed name _____ signature _____ date _____

Additional Approval:

printed name _____ signature _____ date _____

Additional Approval:

printed name _____ signature _____ date _____

COMPLETION OF INTERIM DISPOSITION

17. Interim Disposition Complete – Responsible Manager or Individual:

printed name _____ signature _____ date _____

18. Interim Disposition Verified – QA Engineer:

printed name _____ signature _____ date _____

Attachment 1 – CCP Nonconformance Report (NCR) (Continued)

NCR No. NCR- ORNL- 0403 -15 Revision 0

FINAL DISPOSITION

19. Final Disposition (Check Only One: Use-As-Is, Repair, Reject, Rework, or Scrap):
☐ Use-As-Is ☐ Repair

19a. Technical Justification – Required for Use-As-Is or Repair dispositions. [☑ N/A for Reject, Rework, or Scrap]

☑ Reject ☐ Rework ☐ Scrap

19b. Instructions for Completion – Required for Reject, Repair, Rework, or Scrap [☐ N/A for Use-As-Is]

1. Containers in Box 3 are rejected from BDR OR-MILCC2-0209.
2. Return containers to the MILCC2 system and document in new BDR.

19c. Corrective Actions (Actions to Prevent Recurrence – For Repair or Rework, if applicable.
[☑ N/A if not applicable, and for Use-As-Is, Reject, and Scrap]

FINAL DISPOSITION APPROVALS

20. Responsible Manager or Individual:
Ronald Whitson (printed name) _____ (signature) 7/28/2015 (date)

21. QA Engineer or QA Designee:
Susan Anderson (printed name) Susan Anderson (signature) 7/29/15 (date)

Additional Approval:
_____ (printed name) _____ (signature) _____ (date)

Additional Approval:
_____ (printed name) _____ (signature) _____ (date)

CLOSURE

22. Final Disposition Complete - Responsible Manager or Individual:
BSSchrock (printed name) BSSchrock (signature) 10/20/15 (date)

23. Attachments: 1- Basis for NCR closure
2- Hold tag removal notification.

24a. HOLD TAG removal has been verified and reconciled for all nonconforming items on the NCR: ☒
24b. If HOLD TAG is not applicable, check: ☐ and explain:

See Attachment 2.

25. Final Disposition Verified – NCR Closed QA Engineer:
Laura R. Jones (printed name) Laura Rauen Jones (signature) November 17, 2015 (date)

Attachment 3 – CCP Nonconformance Report (NCR) Continuation Sheet

NCR No. NCR-ORNL-0403-15 Revision 0 Attachment # / Page 1 of 4
Continuation from Section Number: n/a X10CSATN03211I has been re-ran in OR-MILCC2-0217 X10CSATN03211J has been re-ran in OR-MILCC2-0218 X10CSATN03211M has been re-ran in OR-MILCC2-0218

Tuesday, October 20, 2015

CONTAINERID: X10CSATN03211I

ORNL

AK DATA

Container ID	Container Type	AKA Matrix	WDS Status	AK Excluded	WSID	LOTID	LOT Excluded
X10CSATN03211I	55G		NO WDS STATUS	NO	OR-REDC-CH-HET	NONE	

BDR DATA

BDRID	Type	Status	Generation Date
OR-MILCC2-0217	NDA	Complete	2015-08-13
OR-RTR7-0146	RTR	Complete	2015-07-22
OR15FG8079	HSG_TRANS	Complete	2015-07-29

NCR DATA

Container ID	NCRID	Status	Release Code
X10CSATN03211I	NCR-ORNL0403150	Open	None

REJECT DATA

Container ID	BDRID	NCRID	NCR Status	Release Code	Actual Condition
X10CSATN03211I	OR-MILCC2-0209	NCR-ORNL0403150	Open	None	The assays for the containers in Box 3 are suspect due to failed performance check on 7/29/2015.

NCR ORNL-0403-15-0 Attachment 1 Page 2 of 4

Tuesday, October 20, 2015

CONTAINERID: X10CSATN03211J

ORNL

AK DATA

Container ID	Container Type	AKA Matrix	WDS Status	AK Excluded	WSID	LOTID	LOT Excluded
X10CSATN03211J	55G		NO WDS STATUS	NO	OR-REDC-CH-HET	NONE	

BDR DATA

BDRID	Type	Status	Generation Date
OR-MILCC2-0218	NDA	Complete	2015-08-17
OR-RTR7-0146	RTR	Complete	2015-07-22
OR15FG8079	HSG_TRANS	Complete	2015-07-29

NCR DATA

Container ID	NCRID	Status	Release Code
X10CSATN03211J	NCR-ORNL0403150	Open	None

REJECT DATA

Container ID	BDRID	NCRID	NCR Status	Release Code	Actual Condition
X10CSATN03211J	OR-MILCC2-0209	NCR-ORNL0403150	Open	None	The assays for the containers in Box 3 are suspect due to failed performance check on 7/29/2015.

NCR ORNL-0403-150

Page 3 of 4

Attachment 1

Tuesday, October 20, 2015

CONTAINERID: X10CSATN03211M

ORNL

NCR ORNL-0403-15-0 Page 4 of 4 Attachment 1

AK DATA

Container ID	Container Type	AKA Matrix	WDS Status	AK Excluded	WSID	LOTID	LOT Excluded
X10CSATN03211M	55G		NO WDS STATUS	NO	OR-REDC-CH-HET	NONE	

BDR DATA

BDRID	Type	Status	Generation Date
OR-MILCC2-0218	NDA	Complete	2015-08-17
OR-RTR7-0146	RTR	Complete	2015-07-22
OR15FG8079	HSG_TRANS	Complete	2015-07-29

NCR DATA

Container ID	NCRID	Status	Release Code
X10CSATN03211M	NCR-ORNL0403150	Open	None

REJECT DATA

Container ID	BDRID	NCRID	NCR Status	Release Code	Actual Condition
X10CSATN03211M	OR-MILCC2-0209	NCR-ORNL0403150	Open	None	

The assays for the containers in Box 3 are suspect due to failed performance check on 7/29/2015.

Jones, Laura - NWP

From: Harmon, Latravia <Latravia.Harmon@truproject.com>
Sent: Thursday, October 22, 2015 5:26 AM
To: Jones, Laura - NWP
Cc: Schrock, Beverly - NWP; Wade, Daniel NWP; Waldram, Veronica - NWP; Kuhn, Ronald - NWP
Subject: RE: Hold tags to be pulled.

10/22/2015

Laura,

Hold tags for the containers listed below were removed. Please use this email as notification to proceed with closure of applicable NCRs.

thanks and Best Regards

LaTravia N. Harmon

Quality Assurance Engineer
Nuclear Waste Partnership LLC
Contractor to the United States Department of Energy
(865)576-1650 Office
(865)441-2706 Cell
latravia.harmon@truproject.com
Quality is the Pride of Workmanship.

From: Jones, Laura - NWP [laura.jones@wipp.ws]
Sent: Wednesday, October 21, 2015 10:06 AM
To: Harmon, Latravia
Cc: Schrock, Beverly - NWP; Wade, Daniel NWP; Waldram, Veronica - NWP; Kuhn, Ronald - NWP
Subject: Hold tags to be pulled.

Latravia – Containers listed below have been resolved at the project office please remove hold tags and notify to close the NCR.

BDR ID	Container ID	Waste Code	Reason	NCR
OR-MILCC2-0209	X10CSATN03211I	Resolved	Container has been re-ran in BDR OR-MILCC2-0217.	NCR-ORNL-0403-15
OR-MILCC2-0209	X10CSATN03211M	Resolved	Container has been re-ran in BDR OR-MILCC2-0218.	NCR-ORNL-0403-15
OR-MILCC2-0209	X10CSATN03211J	Resolved	Container has been re-ran in BDR OR-MILCC2-0218.	NCR-ORNL-0403-15

Thanks and Best Regards

Laura R. Jones
Quality Assurance NCR Coordinator
Nuclear Waste Partnership, LLC
Contractor for the U.S. Department of Energy
575-234-7244 (office)
Email: laura.jones@wipp.ws

NCR-ORNL-0403-15 Rev. 0

Attachment 2 Page 1 of 1

Non-conformance Reports (NCRs):

NCR-RH-ORNL-0271-16, Rev. 0;

This is evidence of an Open RH NCR related to an RH-DTC process.

Attachment 1 – CCP Nonconformance Report (NCR)

CCP NONCONFORMANCE REPORT (NCR)

(Use NCR Continuation, Attachment 3, if necessary)

NCR No. NCR-RHORNL-0271-16 Revision 0

1. Lot No., Heat No., or Serial No. (if applicable): NA	2. Process (e.g., NDA, NDE, VE, Other): RH-DTC	3. Batch Data Report #(s): ORRHDTC16004 Container #(s): NA
4. Order/Work Order/Job Control Number (if applicable): NA	5. PO # (if applicable): NA	
	6. Supplier (if applicable): NA	

DESCRIPTION OF NONCONFORMANCE

7a. NCR Description: ☐ < 100 nCi/g ☐ Prohibited Item ☐ E-Flag ☐ Receipt Inspection ☐ Transportation ☐ WWIS/WDS ☒ Other

7b. Requirement(s) (Enter Implementing Procedure No., Revision, Section No., & Quoted Text):
CCP-TP-504, Revision 17 states:

"Section 4.2.1 Record the following on Attachment 10, Duplicate Container Data Sheet:
- Container No."

"ITR, 4.4.5 Review BDR Attachment 1(s), Attachment 2(s) Waste Container Dose-to-Curie Conversion Record(s), Attachment 10(s), Relative Percent Difference Spreadsheet(s), AND resolve any comments with the DTC Operator."

7c. Actual Condition:

The Attachment 10 – Duplicate Container Data Sheet lists an incorrect Container Number.

7d. Have the CCP HOLD TAGS associated with this NCR been applied? ☐ YES ☒ NO If no is checked, explain:

"HOLD TAGS will not be applied to items identified on this NCR because of ALARA consideration. Container management will apply through administrative control. In addition, these containers have been identified on the CCP sftp site. Container information from this NCR has been included in the list, which is to alert Mobile Loading Unit personnel as a second method of control of non-tagged containers."

8. NCR Originator:

Richard Kantrowitz (printed name) Richard Kantrowitz (signature) 3/23/16 (date)

9. Does the identified condition have the potential to impact AK? If YES or INDETERMINATE, enter Trend Code L in Block 10. ☐ YES ☒ NO ☐ INDETERMINATE

10. Trend Code: A	11. Responsible Manager: **Richard Kantrowitz**
12. Recurring Condition? ☐ YES ☒ NO (If Yes, list NCRs and WIPP Forms):	13. Significant Condition? ☐ YES ☒ NO (If Yes, enter WIPP Form No.):

14. QA Engineer or QA Designee validation:

Laura R Jones (printed name) Laura Raines Jones (signature) 3/23/2016 (date)

COPY

Attachment 1 – CCP Nonconformance Report (NCR) (Continued)

NCR No. NCR-RHORNL-0271-16 Revision 0

INTERIM DISPOSITION

15a. Interim Disposition (Check Only One):
☒ N/A (See Final Disposition) ☐ Hold ☐ Conditionally Accept ☐ Conditionally Use
☐ Sort ☐ Reinspect or Retest ☐ Remediate

15b. Instructions for Completion of the Interim Disposition:

INTERIM DISPOSITION APPROVALS

16a. Responsible Manager or Individual:

printed name _____ signature _____ date _____

16b. QA Engineer or QA Designee:

printed name _____ signature _____ date _____

Additional Approval:

printed name _____ signature _____ date _____

COMPLETION OF INTERIM DISPOSITION

17. Interim Disposition Complete – Responsible Manager or Individual:

printed name _____ signature _____ date _____

18. Interim Disposition Verified – QA Engineer:

printed name _____ signature _____ date _____

Attachment 1 – CCP Nonconformance Report (NCR) (Continued)

NCR No. NCR-RHORNL-0271-16 Revision 0

FINAL DISPOSITION

19. Final Disposition (Check Only One: Use-As-Is, Repair, Reject, Rework, or Scrap):
☐ Use-As-Is ☐ Repair

19a. Technical Justification – Required for Use-As-Is or Repair dispositions. [☒ N/A for Reject, Rework, or Scrap]

N/A

☐ Reject ☒ Rework ☐ Scrap

19b. Instructions for Completion – Required for Reject, Repair, Rework, or Scrap [☐ N/A for Use-As-Is]

1) DGL to include NCR in BDR.
2) DGL to correct (including re-signing if necessary) Attachments 5, 6, 7 and 10.
3) DGL to submit corrections to CCP Records.
4) SPM to complete review.

19c. Corrective Actions (Actions to Prevent Recurrence – For Repair or Rework, if applicable.
[☒ N/A if not applicable, and for Use-As-Is, Reject, and Scrap]

FINAL DISPOSITION APPROVALS

20. Responsible Manager or Individual:

printed name	signature	date
Richard Kantrowitz	Richard Kantrowitz	3/23/16

21. QA Engineer or QA Designee:

printed name	signature	date
Laura R. Jones	Laura Renee Jones	3/23/2016

Additional Approval:

printed name	signature	date

CLOSURE

22. Final Disposition Complete - Responsible Manager or Individual:

printed name	signature	date

23. Attachments: 1 - Email Documenting Reportability.

24a. HOLD TAG removal has been verified and reconciled for all nonconforming items on the NCR: ☐
24b. If HOLD TAG is not applicable, check: ☐ and explain:

25. Final Disposition Verified – NCR Closed QA Engineer:

printed name	signature	date

Jones, Laura - NWP

From: Ramirez, Mike - NWP
Sent: Wednesday, March 23, 2016 4:11 PM
To: Jones, Laura - NWP
Cc: Nesser, Cathy - NWP
Subject: RE: New NCR-RHORNL-0271-16

Not reportable

Mike Ramirez
Central Characterization Program
Certification Manager
Nuclear Waste Partnership LLC
Contractor for the U.S. Department of Energy
(575)-234-7034 Work
(575) 200-8535 Cell

From: Jones, Laura - NWP
Sent: Wednesday, March 23, 2016 3:27 PM
To: Broomfield, Barbara - NWP; Harmon, Latravia; Harmon, LaTravia - NWP; Joo, Irene - NWP; Kantrowitz, Rich - NWP; Moody, Dave W. - NWP; Navarrete, Leon - TFE; Pearcy, Sheila - TFE; Poole, Jeffrey; Ramirez, Mike - NWP; Tilmon, Pat; Turner, Charles - NWP; Root, Wes - ANL
Cc: Nesser, Cathy - NWP; Allen, Bill (W.W.) -NWP; Jones, Laura - NWP
Subject: New NCR-RHORNL-0271-16

All – For your information
Mike – Please review for notification purposes
Leon / Jewell – Please post this open NCR.

Thanks and Best Regards

Laura R. Jones
Quality Assurance Engineer
Nuclear Waste Partnership, LLC
Contractor for the U.S. Department of Energy
575-234-8221 (office)
Email: laura.jones@wipp.ws

NCR-RHORNL-0271-16 Rev. 0
Attachment 1 Page 1 of 2

Jones, Laura - NWP

From: IDC (No Reply) <NOREPLY@wipp.ws>
Sent: Wednesday, March 23, 2016 4:11 PM
To: DL CCP QA CBFO Notify
Subject: Project Office NCR [NCR-RHORNL0271160] was just reviewed.

Certification Manager/Designee has just reviewed the project office NCR NCR-RHORNL0271160 and has indicated that it [should **NOT**] be reported to CBFO. IDC has already updated the NCR for you.

NCR - RHORNL-0271-16 Rev.0
Attachment 1 Page 2 of 2

Non-conformance Reports (NCRs):

NCR-RH-ORNL-0335-15, Rev. 1;

This is evidence of a Closed RH NCR related to an RH-VE process.

Closed 12-07-2015

Attachment 1 – CCP Nonconformance Report (NCR)

CCP NONCONFORMANCE REPORT (NCR)

(Use NCR Continuation, Attachment 3, if necessary)

NCR No. NCR-RHORNL-0335-15 **Revision 1**

1. Lot No., Heat No., or Serial No. (if applicable): **n/a**	2. Process (e.g., NDA, NDE, VE, Other): **RH VE**	3. Batch Data Report #(s): **ORNLRHVE15012**
4. Order/Work Order/Job Control Number (if applicable): **n/a**	5. PO # (if applicable): **n/a**	Container #(s): **ORRH00725**
	6. Supplier (if applicable): **n/a**	

DESCRIPTION OF NONCONFORMANCE

7a. NCR Description: ☐ < 100 nCi/g ☐ Prohibited Item ☐ E-Flag ☐ Receipt Inspection ☐ Transportation ☐ WWIS/WDS ☒ Other

7b. Requirement(s) (Enter Implementing Procedure No., Revision, Section No., & Quoted Text):

CCP-TP-500 Rev 15

4.1.2[C] Examine the container packaging and waste, **AND** record the description of the material in the Waste Description field on Attachment 1.

4.4.3[A] **IF** data affecting inconsistencies, mistakes, omissions, etc., are noted during the SPM review, that impact or change the characterization data, **THEN** initiate an NCR in accordance with CCP-QP-005.

7c. Actual Condition:

A waste item, super sack, was missing from the Attachment 1.

This NCR was revised to add Cardboard Liner which was left off the original NCR.

7d. Have the CCP HOLD TAGS associated with this NCR been applied? ☐ YES ☒ NO If no is checked, explain:

Due to ALARA considerations, NCR tagging will not be applied for this NCR. Administrative control will be applied through container entry in the CCP Data center In addition a listing of containers will be posted on the CCP sftp. Site identifying those containers where NCR tagging is not being applied. Container information for this NCR will be included in the listing which is to alert Mobile Loading Unit personnel as a second control mechanism for non-tagged containers

8. NCR Originator:

David W. Moody (printed name) — David W Moody (signature) — 18 Nov 2015 (date)

9. Does the identified condition have the potential to impact AK? If YES or INDETERMINATE, enter Trend Code L in Block 10. ☐ YES ☒ NO ☐ INDETERMINATE

10. Trend Code: A	11. Responsible Manager: **Rich Kantrowitz**
12. Recurring Condition? ☐ YES ☒ NO (If Yes, list NCRs and WIPP Forms):	13. Significant Condition? ☐ YES ☒ NO (If Yes, enter WIPP Form No.):

14. QA Engineer or QA Designee validation:

Laura R. Jones (printed name) — Laura Ramos Jones (signature) — 11/19/15 (date)

CCP RECORDS ORIGINAL

DATE REC'D 12/8/15

COPY

Attachment 1 – CCP Nonconformance Report (NCR) (Continued)

NCR No. NCR-RHORNL-0335-15 Revision 1

INTERIM DISPOSITION

15a. Interim Disposition (Check Only One):

☒ N/A (See Final Disposition) ☐ Hold ☐ Conditionally Accept ☐ Conditionally Use

☐ Sort ☐ Reinspect or Retest ☐ Remediate

15b. Instructions for Completion of the Interim Disposition:

INTERIM DISPOSITION APPROVALS

16a. Responsible Manager or Individual:

printed name signature date

16b. QA Engineer or QA Designee:

printed name signature date

Additional Approval:

printed name signature date

COMPLETION OF INTERIM DISPOSITION

17. Interim Disposition Complete – Responsible Manager or Individual:

printed name signature date

18. Interim Disposition Verified – QA Engineer:

printed name signature date

Attachment 1 – CCP Nonconformance Report (NCR) (Continued)

NCR No. NCR-RHORNL-0335-15 Revision 1

FINAL DISPOSITION

19. Final Disposition (Check Only One: Use-As-Is, Repair, Reject, Rework, or Scrap):
☐ Use-As-Is ☐ Repair

19a. Technical Justification – Required for Use-As-Is or Repair dispositions. [☒ N/A for Reject, Rework, or Scrap]

☐ Reject ☒ Rework ☐ Scrap

19b. Instructions for Completion – Required for Reject, Repair, Rework, or Scrap [☐ N/A for Use-As-Is]

1. Have Operator add missing waste items to Attachment 1 and document changes.
2. Add NCR and NCR information to the BDR
3. Have ITR perform re-review
4. Submit BDR to CCP Records

19c. Corrective Actions (Actions to Prevent Recurrence – For Repair or Rework, if applicable.
[☒ N/A if not applicable, and for Use-As-Is, Reject, and Scrap]

FINAL DISPOSITION APPROVALS

20. Responsible Manager or Individual:
Richard Kantrowitz (printed name) [signature] 11/19/15 (date)

21. QA Engineer or QA Designee:
Laura R. Jones (printed name) [signature] 11/19/15 (date)

Additional Approval:
(printed name) (signature) (date)

CLOSURE

22. Final Disposition Complete - Responsible Manager or Individual:
Richard Kantrowitz (printed name) [signature] 12/7/15 (date)

23. Attachments: 1- Email Documenting Reportability.
2- Evidence for NCR Closure.

24a. HOLD TAG removal has been verified and reconciled for all nonconforming items on the NCR: ☐
24b. If HOLD TAG is not applicable, check: ☒ and explain:

See Section 7d.

25. Final Disposition Verified – NCR Closed QA Engineer:
Laura R. Jones (printed name) [signature] 12/7/2015 (date)

Jones, Laura - NWP

From: Ramirez, Mike - NWP
Sent: Thursday, November 19, 2015 9:33 AM
To: Jones, Laura - NWP
Subject: RE: Revised NCR-RHORNL-0335-15-1

Not reportable

Mike Ramirez
Central Characterization Program
Certification Manager
Nuclear Waste Partnership LLC
Contractor for the U.S. Department of Energy
(575)-234-7034 Work
(575) 200-8535 Cell

From: Jones, Laura - NWP
Sent: Thursday, November 19, 2015 8:44 AM
To: Broomfield, Barbara - NWP; Castro, Linda - TFE; Harmon, Latravia; Harmon, LaTravia - NWP; Joo, Irene - NWP; Kantrowitz, Rich - NWP; Moody, Dave W. - NWP; Navarrete, Leon - TFE; Pearcy, Sheila - TFE; Poole, Jeffrey; Ramirez, Mike - NWP; Tilmon, Pat; Turner, Charles - NWP
Cc: Waldram, Veronica - NWP; Kuhn, Ronald - NWP; Jones, Laura - NWP
Subject: Revised NCR-RHORNL-0335-15-1

All – For your information
Mike – Please review for notification purposes
Linda – Please post this open revised NCR.

Thanks and Best Regards

Laura R. Jones
Quality Assurance NCR Coordinator
Nuclear Waste Partnership, LLC
Contractor for the U.S. Department of Energy
575-234-7244 (office)
Email: laura.jones@wipp.ws

NCR – RHORNL-0335-15 Rev. 1
Attachment 1 Page 1 of 2

Jones, Laura - NWP

From: IDC (No Reply) <NOREPLY@wipp.ws>
Sent: Thursday, November 19, 2015 9:33 AM
To: DL CCP QA CBFO Notify
Subject: Project Office NCR [NCR-RHORNL0335151] was just reviewed.

Certification Manager/Designee has just reviewed the project office NCR NCR-RHORNL0335151 and has indicated that it [should **NOT**] be reported to CBFO. IDC has already updated the NCR for you.

NCR-RHORNL-0335-15 Rev. 1
Attachment 1 Page 2 of 2

Attachment 1 – Visual Examination Data Form

Site ID: ORNL			
Examination Date: 11-5-15		Batch Number: ORNLRHVE15012	
Procedure #: CCP-TP-500		Revision #: 15	Video #: N/A
Recording Equipment Check: ☐SAT ☐UNSAT ☑N/A		Recording Start: N/A	Recording Stop: N/A
Inspection of Container to be loaded during VE: ☑SAT ☐UNSAT			
Indirect load Container ☑N/A		Final Output Container ☐ N/A	
Container ID Number:		Container ID Number: ORRH00725	
Container Type:		Container Type: 55 gallon drum	
Waste Matrix Code:		Waste Matrix Code: S5400	
Waste Stream:		Waste Stream: OR-REDC-RH-HET	
		Poly Rigid Liner: ☐Y ☑N Thickness: N/A	Poly Rigid Liner Lid: ☐Y ☑N
		Poly Rigid Liner Vented or Hole Size: N/A	
Percent Fill:	Percent Organic Waste:	Percent Fill: 100%	Percent Organic Waste: 40%
Layers of Confinement:	Closure Method:	Layers of Confinement: 0	Closure Method: N/A

Comments (e.g., filter information, NCRs):
Nucfil-019DS BK-49
cask# X10C9402660 - 40%
cask# X10C9802665 - 60%

Waste Description:

filter media (C)
plastic pieces (P)
saw blades (IN)
cloth rag (C)
aluminum foil (AM)
glass vials (OIN)
broken glass (OIN)
wooden stick (C)
electrical plugs (IN) (C) (P)
rubber hose (R)
plastic caps (P)
electrical cord (P)(OM)
metal scrap (IN)
metal lids (IN)
metal cans (IN)
paper (C)
concrete block (OIN)

electrical connector (OM)(IN)
string (C)
absorbent pad (C)
manipulator finger (IN)
plastic bag (P)
cardboard liner (C) A.H. 11-19-15
Super sack (P) A.H. 11-19-15

NCR - RHORNL-0335-15 Rev. 1
Attachment 2 Page 1 of 5

Attachment 1 – Visual Examination Data Form (continued)

Container ID Number ORRHU0725

Prohibited Item(s) Summary	YES	NO
Does the container have observable liquid equal to or greater than 1 percent by volume of the outermost container at the time of RTR or VE?	☐	☑
Does the container have observable liquid more than 60 milliliters or 3 percent by volume, whichever is greater in an internal container?	☐	☑
Does the container have observable liquid with an EPA hazardous waste number (HWN) U134 assigned?	☐	☑
Does the container have observable liquid containing PCBs?	☐	☑
Is there an indication of non-radionuclide pyrophoric materials, such as elemental potassium?	☐	☑
Is there an indication of hazardous wastes not occurring as co-contaminants with TRU mixed wastes (non-mixed hazardous wastes)?	☐	☑
Is there an indication of wastes incompatible with backfill, seal and panel closures materials, container and packaging materials, shipping container materials, or other wastes (i.e., waste does **NOT** match Table of Allowable Materials for RH-TRU Waste in the RH-TRAMPAC)?	☐	☑
Is there an indication of wastes containing explosives or compressed gases?	☐	☑
Is there an indication of polychlorinated biphenyls (PCBs) not authorized under an EPA PCB waste disposal authorization?	☐	☑
Is there an indication of the waste exhibiting the characteristic of ignitability, corrosivity, or reactivity (EPA Hazardous Waste Numbers of D001, D002, or D003)?	☐	☑
Is the physical form of the waste inconsistent with the Waste Stream Description or the Waste Matrix Code?	☐	☑
RH-72B Criteria		
Were there Non-approved Closure Methods used on liner bags or inner bags greater than 4 liters?	☐	☑
Are there sealed containers GREATER than 4 liters or heat sealed bags **NOT** defined in the applicable TRUCON Code?	☐	☑
Are there indications of inadequate protection (blocked or braced) for heavy and/or sharp objects?	☐	☑
Is the waste consistent with the TRUCON Code?	☑	☐

Comments: N/A

Visual Examination Operator 1:
Anthony Harley (Print Name) — Signature — Date 11-5-15

Visual Examination Operator 2:
Pat Tilman (Print Name) — Signature — Date 11-5-15

Pat Tilman — 11-19-15

NCR -RHORWL-0335-15 Rev. 1

Attachment 2 Page 2 of 5

Attachment 2 – Visual Examination Independent Technical Reviewer Checklist

Batch Data Report No.: ORNLRHVE 15012

1. Were data generation and reduction conducted in a technically correct manner in accordance with the methods (procedure) used?	☐ NO	☑ YES
2. Was the correct revision of the operating procedure used?	☐ NO	☑ YES
3. Has the data been reviewed for errors?	☐ NO	☑ YES
4. Are BDR contents complete and do they match CCP waste VE Batch Data report Table of Contents?	☐ NO	☑ YES
5. Does the testing batch report include VE for up to 20 containers?	☐ NO	☑ YES
6. Is all data signed and dated in reproducible ink by the individual(s) generating it?	☐ NO	☑ YES
7. Is all data recorded clearly, legibly, and accurately?	☐ NO	☑ YES
8. Were changes made to original data? If NO, proceed to question 11.	☑ ~~NO~~ DM 11/19/15	☑ YES
9. Have all changes made to original data been lined out, initialed and dated by the individual making the changes?	☐ NO	☑ YES DM 11/19/15
10. Were the data changes made by the individual who originally collected the data or by an equally qualified individual?	☐ NO	☑ YES DM 11/19/15
11. Is there an adequate written description of the contents of each container?	☐ NO	☑ YES
12. Was VE of each container performed by at least two qualified VEO's or was an Audio/Video recording properly prepared for each container?	☐ NO	☑ YES
13. Has each container in this BDR been evaluated for the presence of prohibited wastes?	☐ NO	☑ YES
14. Did the physical form of the waste match the waste matrix code and waste stream description?	☐ NO	☑ YES
15. Was an NCR required at the data generation level? If NO, proceed to question 17.	☑ NO	☐ YES
16. Is a copy of the NCR included in the BDR?	☐ NO	☐ YES
17. Have the RH Quality Assurance Objectives (QAOs) for VE been met?	☐ NO	☑ YES

Precision – Precision is maintained by reconciling any discrepancies between two operators (or between the operator and the Independent Technical Reviewer) with regard to the identification of important waste characteristics (i.e., physical form of the waste and absence of prohibited liquids) within a single container.

Accuracy – Accuracy is maintained by requiring operators to pass a comprehensive examination with a score of 80% and demonstrate satisfactory performance in the presence of the VE expert during their initial qualification and subsequent requalification.

Representativeness – The contents placed in a container will be described on the data forms.

NCR-RHORNL-0335-15 Rev. 1

Attachment 2 Page 3 of 5

Attachment 2 – Visual Examination Independent Technical Reviewer Checklist (Continued)

Batch Data Report No.: ORNLRHVE15012

Completeness – The relevant waste information must be collected. This information must be documented on a videotape and/or data form, or other unalterable media. **Comparability** – Comparability is ensured by the characterization program meeting the training requirements and complying with the minimum standards used to implement this characterization process. In some instances, waste will be contained in opaque containers and not all items will be visible to the operator (e.g., sealed paint cans or 5-gallon buckets). If these containers are not opened during VE, source documents must be available in the AK record that allow the operator to identify the contents of the closed containers.		
Comments: N/A		
Independent Technical Reviewer Derek Mathews (Printed Name)	Signature	11/10/15 (Date)

11/19/15

NCR - RHORNL-0335-15 Rev. 1

Attachment 2 Page 4 of 5

10

Attachment 3 – Visual Examination Site Project Manager Checklist

Batch Data Report No.: ORNLRHVE15012

1.	Has all the data received an independent technical review as evidenced by a completed checklist (Attachment 2) and the appropriate ITR signature?		☐ NO	☒ YES
2.	Are BDR contents complete and match the Visual Examination Batch Data Report Table of Contents?		☐ NO	☒ YES
3.	Is the BDR complete (appropriately filled in forms for each container)?		☐ NO	☒ YES
4.	Have the RH Quality Assurance Objectives (QAOs) for VE been met?			
	Precision – reconciled discrepancies between operators		☐ NO	☒ YES
	Accuracy – trained operators		☐ NO	☒ YES
	Representativeness – description of container contents		☐ NO	☒ YES
	Completeness – completed data form and/or recording		☐ NO	☒ YES
	Comparability – proper training and adequate AK for unopened containers		☐ NO	☒ YES
5.	Were NCRs generated included in the BDR?	☐ NO	☐ YES	☒ N/A

Comments: ~~None~~ RK 12/7/15
NCR-RHORNL-0335-15 R.1 Added as SPM Attachment RK 12/7/15

SPM:

David W. Moody — Printed Name
Signature — 10 November 2015 — Date

Richard Kantrowitz — 12/7/15

NCR -RHORNL-0335-15 Rev. 1

CCP RECORDS ORIGINAL
DATE REC'D 12/11/15

Attachment 2 Page 5 of 5

Non-conformance Reports (NCRs):

CH and RH Non-conformance Report Logs for Project Level (PL) and Data Generation Level (DGL); all dated 05/01/2015;

NOTE: There is no RH DGL NCR log as there were no NCRs generated at the DCR level during the last 12 months.

Note: The CH and RH NCR Logs were printed from the CCP Integrated Data Center (IDC) database.

NOTE: CH and RC Nonconformance Log Reconciliation Reports are included showing an evaluation indicating numbers that were assigned to the ORNL host site location and those that were assigned but not used.

INTEROFFICE MEMORANDUM

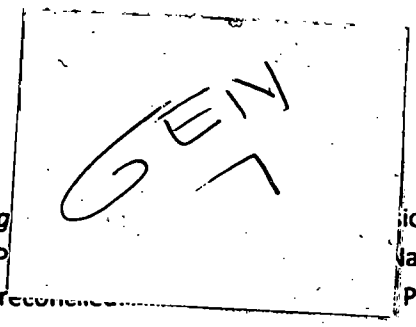
TO: CCP RECORDS

FROM: L.R. JONES, QUALITY ASSURANCE ENGINEER NONCONFORMANCE (NCR) COORDINATOR

SUBJECT: REMOTE HANDLED OAKRIDGE NATIONAL LABORATORY (RHORNL) PROJECT LEVEL (PL) NCR LOG RECONCILIATION REPORT FOR 2015.

DATE: 01/19/2016

CC: BILL W. ALLEN



As required by CCP-QP-005, *CCP TRU Nonconforming* ion 25, Section 4.12, the NCR Log in the NCRM for Data Project Level (P lational Laboratory (RHORNL) for calendar year 2015 has been r PL NCRs has resulted in complete resolution.

The results of the review indicate that PROJECT LEVEL RH NCR numbers NCR-RHORNL-0330-15 through NCR-RHORNL-0337-15 were issued and utilized (see Attachment 1).

The review indicates that the following NCR numbers were reserved but not utilized.
For a detailed list of NCRs that were NOT used see Attachment 2.

NCR-RHORNL-0338-15 and NCR-RHINL-0339-15

CCP RECORDS ORIGINAL
DATE REC'D 1/22/16 JY

INTEROFFICE MEMORANDUM

TO: CCP RECORDS

FROM: L.R. JONES, QUALITY ASSURANCE ENGINEER NONCONFORMANCE (NCR) COORDINATOR

SUBJECT: REMOTE HANDLED OAKRIDGE NATIONAL LABORATORY (RHORNL) PROJECT LEVEL (PL) NCR LOG RECONCILIATION REPORT FOR 2015.

DATE: 01/19/2016

CC: BILL W. ALLEN

As required by CCP-QP-005, *CCP TRU Nonconforming Item Reporting and Control,* Revision 25, Section 4.12, the NCR Log in the NCRM for Data Project Level (PL) NCRs written for the Oakridge National Laboratory (RHORNL) for calendar year 2015 has been reconciled. A review of all relevant PL NCRs has resulted in complete resolution.

The results of the review indicate that PROJECT LEVEL RH NCR numbers NCR-RHORNL-0330-15 through NCR-RHORNL-0337-15 were issued and utilized (see Attachment 1).

The review indicates that the following NCR numbers were reserved but not utilized.
For a detailed list of NCRs that were NOT used see Attachment 2.

NCR-RHORNL-0338-15 and NCR-RHINL-0339-15

CCP RECORDS ORIGINAL
DATE REC'D 1/22/16

2015 REMOTE HANDLED ORNL PROJECT LEVEL NCR RECONCILIATION
Issued RH NCRs
Attachment 1
Page 1 of 1

NCR ID	NCR Originator
NCR-RHORNL0330150	David Moody
NCR-RHORNL0331150	Mike Ramirez
NCR-RHORNL0332150	Charles Turner
NCR-RHORNL0333150	Charles Turner
NCR-RHORNL0334150	David Moody
NCR-RHORNL0335150	David Moody
NCR-RHORNL0336150	Rich Kantrowitz
NCR-RHORNL0337150	Rich Kantrowitz

2015 REMOTE HANDLED ORNL PROJECT LEVEL NCR RECONCILIATION
Issued RH NCRs
Attachment 2
Page 1 of 1

NCR ID	NCR Originator
NCR-RHORNL0338150	Not Used
NCR-RHORNL0339150	Not Used

RH Project Level >5/1/15

NCR ID	NCR Originator	Init Date	Used?	Partial Entry?
NCR-RHORNL0271160	Rich Kantrowitz	3/23/2016 0:00	Checked	Unchecked
NCR-RHORNL0332150	Charles Turner	5/13/2015 0:00	Checked	Unchecked
NCR-RHORNL0333150	Charles Turner	5/11/2015 0:00	Checked	Unchecked
NCR-RHORNL0334150	David Moody	10/12/2015 0:00	Checked	Unchecked
NCR-RHORNL0335150	David Moody	11/17/2015 0:00	Checked	Unchecked
NCR-RHORNL0336150	Rich Kantrowitz	12/17/2015 0:00	Checked	Unchecked
NCR-RHORNL0337150	Rich Kantrowitz	12/22/2015 0:00	Checked	Unchecked

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TO: Laura Jones, NCR Coordinator

FROM: **LaTravia Harmon, CCP Quality Engineer**

SUBJECT: DATA GENERATION LEVEL NCR LOG RECONCILIATION REPORT FOR ORNL FY 2015

DATE: 1/5/16

In accordance **with CCP-QP-005, Revision 25, Section 4.12,** the NCR Log maintained for data generation level (DGL) NCRs at the Oakridge National Laboratory (TRU Waste Processing Center) for calendar year 2015 has been reconciled.

The following CH numbers were reserved in IDC and issued to DGL personnel at ORNL by the Quality Engineer at ORNL for calendar 2015; however there were no RH NCRs neither reserved nor issued.

NCR RESERVED AND USED:

NCR-ORNL-0064-15 through NCR-ORNL-0580-15.

There were no RH NCRS issued to DGL personnel at ORNL for calendar year 2015.

A review of all relevant NCRs has resulted in complete resolution. The results of the review indicate that the following NCR numbers were reserved and issued but not used.

"Number Not Used" in the Report.

NCR RESERVED BUT NOT USED:

NCR-ORNL-0132-15 through NCR-ORNL-0148-15
NCR-ORNL-0152-15 through NCR-ORNL-0153-15
NCR-ORNL-0155-15 through NCR-ORNL-0163-15
NCR-ORNL-0363-15
NCR-ORNL-0581-15 through NCR-ORNL-0598-15

LaTravia N. Harmon

LaTravia N. Harmon, CCP Quality Engineer

1/5/2016
Date

CCP RECORDS ORIGINAL
DATE REC'D 1/28/16

CH DGL
75/1/15

NCR ID	NCR Originator	Init Date	Used?	Partial Entry?
NCR-ORNL0001160	Susan Anderson	1/18/2016 0:00	Checked	Unchecked
NCR-ORNL0002160	Chad Gerlock	2/4/2016 0:00	Checked	Unchecked
NCR-ORNL0003160	Daniel Crosby	2/9/2016 0:00	Checked	Unchecked
NCR-ORNL0004160	Daniel Crosby	2/9/2016 0:00	Checked	Unchecked
NCR-ORNL0005160	Daniel Crosby	2/10/2016 0:00	Checked	Unchecked
NCR-ORNL0006160	Daniel Crosby	2/10/2016 0:00	Checked	Unchecked
NCR-ORNL0007160	Chad Gerlock	2/11/2016 0:00	Checked	Unchecked
NCR-ORNL0008160	Chad Gerlock	2/11/2016 0:00	Checked	Unchecked
NCR-ORNL0009160	Daniel Crosby	2/15/2016 0:00	Checked	Unchecked
NCR-ORNL0010160	Daniel Crosby	2/17/2016 0:00	Checked	Unchecked
NCR-ORNL0011160	Chad Gerlock	2/18/2016 0:00	Checked	Unchecked
NCR-ORNL0012160	Susan Anderson	3/1/2016 0:00	Checked	Unchecked
NCR-ORNL0013160	Chad Gerlock	2/23/2016 0:00	Checked	Unchecked
NCR-ORNL0014160	Daniel Crosby	2/22/2016 0:00	Checked	Unchecked
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NCR-ORNL0016160	Daniel Crosby	2/23/2016 0:00	Checked	Unchecked
NCR-ORNL0017160	Daniel Crosby	2/24/2016 0:00	Checked	Unchecked
NCR-ORNL0018160	Daniel Crosby	2/24/2016 0:00	Checked	Unchecked
NCR-ORNL0019160	Chad Gerlock	2/25/2016 0:00	Checked	Unchecked
NCR-ORNL0020160	Chad Gerlock	2/25/2016 0:00	Checked	Unchecked
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NCR-ORNL0023160	Daniel Crosby	3/2/2016 0:00	Checked	Unchecked
NCR-ORNL0024160	Daniel Crosby	2/29/2016 0:00	Checked	Unchecked
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NCR-ORNL0026160	Daniel Crosby	3/2/2016 0:00	Checked	Unchecked
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NCR-ORNL0037160	Ron Whitson	3/24/2016 0:00	Checked	Unchecked
NCR-ORNL0038160	Ron Whitson	3/24/2016 0:00	Checked	Unchecked
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NCR-ORNL0043160	Susan Anderson	4/5/2016 0:00	Checked	Unchecked
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NCR-ORNL0127150	Eric Lyles	7/20/2015 0:00	Checked	Unchecked
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NCR-ORNL0480150	Daniel Crosby	9/22/2015 0:00	Checked	Unchecked
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NCR-ORNL0543150	Susan Anderson	11/9/2015 0:00	Checked	Unchecked
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NCR-ORNL0548150	Chad Gerlock	11/24/2015 0:00	Checked	Unchecked
NCR-ORNL0549150	Ron Whitson	12/1/2015 0:00	Checked	Unchecked
NCR-ORNL0550150	Daniel Crosby	11/30/2015 0:00	Checked	Unchecked
NCR-ORNL0551150	Daniel Crosby	11/30/2015 0:00	Checked	Unchecked
NCR-ORNL0552150	Daniel Crosby	11/30/2015 0:00	Checked	Unchecked
NCR-ORNL0553150	Susan Anderson	12/1/2015 0:00	Checked	Unchecked
NCR-ORNL0554150	Susan Anderson	12/3/2015 0:00	Checked	Unchecked
NCR-ORNL0555150	Daniel Crosby	12/7/2015 0:00	Checked	Unchecked
NCR-ORNL0556150	Daniel Crosby	12/7/2015 0:00	Checked	Unchecked
NCR-ORNL0557150	Daniel Crosby	12/14/2015 0:00	Checked	Unchecked
NCR-ORNL0558150	Daniel Crosby	12/22/2015 0:00	Checked	Unchecked
NCR-ORNL0559150	Chad Gerlock	12/21/2015 0:00	Checked	Unchecked
NCR-ORNL0579150	Daniel Crosby	12/22/2015 0:00	Checked	Unchecked
NCR-ORNL0580150	Daniel Crosby	12/28/2015 0:00	Checked	Unchecked

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INTEROFFICE MEMORANDUM

TO: CCP RECORDS

FROM: L.R. JONES, QUALITY ASSURANCE ENGINEER NONCONFORMANCE (NCR) COORDINATOR

SUBJECT: CONTACT HANDLED OAKRIDGE NATIONAL LABORATORY (ORNL) PROJECT LEVEL (PL) NCR LOG RECONCILIATION REPORT FOR 2015.

DATE: 01/15/2016

CC: BILL W. ALLEN

As required by CCP-QP-005, *CCP TRU Nonconforming Item Reporting and Control,* Revision 25, Section 4.12, the NCR Log in the NCRM for Data Project Level (PL) NCRs written for the Oakridge National Laboratory (ORNL) for calendar year 2015 has been reconciled. A review of all relevant PL NCRs has resulted in complete resolution.

The following NCR numbers were utilized in 2015 for Project Level NCRs. For a detailed list of assigned NCRs see Attachment 1.

NCR-ORNL-0044-15 through NCR-ORNL-0063-15 and NCR-ORNL-0563-15

The review indicates that the following NCR numbers were reserved but not utilized. For a detailed list of NCRs that were NOT used see Attachment 2.

NCR-ORNL-0056-15 and NCR-ORNL-0564-15 through NCR-ORNL-0573-15

CCP RECORDS ORIGINAL
DATE REC'D 1/28/16

2015 ORNL PROJECT LEVEL NCR RECONCILIATION
Issued CH NCRs
Attachment 1
Page 1 of 1

NCR ID	NCR Originator
NCR-ORNL0044150	Carolina Soaterna
NCR-ORNL0045150	Beverly Schrock
NCR-ORNL0046150	Beverly Schrock
NCR-ORNL0047150	Ryan Martin
NCR-ORNL0048150	Beverly Schrock
NCR-ORNL0049150	Rick Whiteley
NCR-ORNL0050150	Beverly Schrock
NCR-ORNL0051150	Derek Matheny
NCR-ORNL0052150	Daniel Wade
NCR-ORNL0053150	Beverly Schrock
NCR-ORNL0054150	Creta Kirkes
NCR-ORNL0055150	Daniel Wade
NCR-ORNL0057150	Beverly Schrock
NCR-ORNL0058150	Daniel Wade
NCR-ORNL0059150	Ryan Martin
NCR-ORNL0060150	Barbara Broomfield
NCR-ORNL0061150	Rick Whiteley
NCR-ORNL0062150	Daniel Wade
NCR-ORNL0063150	Beverly Schrock
NCR-ORNL0563150	Barbara Broomfield

CH Project Level
7/1/15

NCR ID	NCR Originator	Init Date	Used?	Partial Entry?
NCR-ORNL0054150	Creta Kirkes	5/26/2015 0:00	Checked	Unchecked
NCR-ORNL0055150	Daniel Wade	7/6/2015 0:00	Checked	Unchecked
NCR-ORNL0057150	Beverly Schrock	7/15/2015 0:00	Checked	Unchecked
NCR-ORNL0058150	Daniel Wade	7/21/2015 0:00	Checked	Unchecked
NCR-ORNL0059150	Ryan Martin	8/6/2015 0:00	Checked	Unchecked
NCR-ORNL0060150	Barbara Broomfield	8/17/2015 0:00	Checked	Unchecked
NCR-ORNL0061150	Rick Whiteley	10/19/2015 0:00	Checked	Unchecked
NCR-ORNL0062150	Daniel Wade	9/29/2015 0:00	Checked	Unchecked
NCR-ORNL0063150	Beverly Schrock	11/17/2015 0:00	Checked	Unchecked
NCR-ORNL0143160	Carolina Soaterna	3/11/2016 0:00	Checked	Unchecked
NCR-ORNL0144160	Daniel Wade	3/29/2016 0:00	Checked	Unchecked
NCR-ORNL0145160	Carolina Soaterna	3/29/2016 0:00	Checked	Unchecked
NCR-ORNL0563150	Barbara Broomfield	11/18/2015 0:00	Checked	Unchecked

DIVIDER

PAGE

INTEROFFICE MEMORANDUM

TO: CCP RECORDS

FROM: L.R. JONES, QUALITY ASSURANCE ENGINEER NONCONFORMANCE (NCR) COORDINATOR

SUBJECT: REMOTE HANDLED OAKRIDGE NATIONAL LABORATORY (RHORNL) DATA GENERATION LEVEL (DGL) NCR LOG RECONCILIATION REPORT FOR 2015.

DATE: 01/15/2016

CC: BILL W. ALLEN

As required by CCP-QP-005, *CCP TRU Nonconforming Item Reporting and Control,* Revision 25, Section 4.12, the NCR Log in the NCRM for Data Generation Level (DGL) NCRs written for the Oakridge National Laboratory (RHORNL) for calendar year 2015 has been reconciled. A review of all relevant DGL NCRs has resulted in complete resolution.

The results of the review indicate that no DGL NCR numbers were issued during calendar year 2015.

Laura Kaweas Jones

1/15/2016

Laura Jones
Quality Assurance Engineer
Nuclear Waste partnership, LLC
Contractor for the U.S. Department of Energy
Office: 575-234-7244
Email: laura.jones@wipp.ws

Date

CCP RECORDS ORIGINAL
DATE REC'D 1/22/2016.
JY

2015 ORNL PROJECT LEVEL NCR RECONCILIATION
Issued CH NCRs
Attachment 2
Page 1 of 1

NCR ID	NCR Originator
NCR-ORNL0056150	Not Used
NCR-ORNL0564150	Not Used
NCR-ORNL0565150	Not Used
NCR-ORNL0566150	Not Used
NCR-ORNL0567150	Not Used
NCR-ORNL0568150	Not Used
NCR-ORNL0569150	Not Used
NCR-ORNL0570150	Not Used
NCR-ORNL0571150	Not Used
NCR-ORNL0572150	Not Used
NCR-ORNL0573150	Not Used

Waste Characterization Case File:

including AK tracking spreadsheet for vent/closure dates, Container Information Summary (CIS), IDC spreadsheet printout, excerpts from data sources, and WWIS/WDS Waste Container and canister Data Reports for…

Container: X10C0401623A

(a 55 gal CH S5400 waste category debris container)

WDS WCA/WCO CERTIFICATION PACKAGE
CH ORNL Audit - April 19-24, 2016

1. AK Tracking Spreadsheet to obtain vent/closure date
   a. X10C0401623A (OR-CHEM-CH-HET, Lot 6)
   b. X10C0402820M1 (OR-REDC-CH-HET, Lot 58)
   c. X10C0501703A (OR-REDS-CH-HET, Lot 77)

CH Package for X10C0401623A (WS OR-CHEM-CH-HET)

1. Container Information Summary (CIS) – CCP Correlation of Container Identification Numbers to Batch Data Report Numbers – Lot 6
2. NCR Verification from QA
3. IDC Container Summary
4. IDC Spreadsheet
5. RAD Survey
6. RTR Data
7. NDA Data
8. Flam Gas Data & Filter information
9. WDS Waste Container Data Report

CH Package for X10C0402820M1 (WS OR-REDC-CH-HET)

1. Container Information Summary (CIS) – CCP Correlation of Container Identification Numbers to Batch Data Report Numbers – Lot 58
2. NCR Verification from QA
3. IDC Container Summary
4. IDC Spreadsheet
5. RAD Survey
6. VE Data
7. NDA Data
8. Flam Gas Data & Filter information
9. WDS Waste Container Data Report

WDS WCA/WCO CERTIFICATION PACKAGE
CH ORNL Audit - April 19-21, 2016
(Continued)

CH Package for X10C0501703A (WS OR-REDC-CH-HET)

1. Container Information Summary (CIS) – CCP Correlation of Container Identification Numbers to Batch Data Report Numbers – Lot 77
2. NCR Verification from QA
3. IDC Container Summary
4. IDC Spreadsheet
5. RAD Survey
6. VE Data
7. NDA Data
8. Flam Gas Data & Filter information
9. WDS Waste Container Data Report

CH AK Tracking Spreadsheet - Vent/Closure Dates
ORNL Audit - April 19-21, 2016

CONTAINER ID	WASTE STREAM	CLOSURE DATE	VENT DATE	PCB	OUT OF SERVICE DATE
X10C0401623A	OR-CHEM-CH-HET	02/24/2010	02/24/2010	Yes	11/18/2004
X10C0402820M1	OR-REDC-CH-HET	09/03/2014	09/03/2014	Yes	07/03/1972
X10C0501703A	OR-REDC-CH-HET	02/01/2011	02/01/2011	NO	N/A

CCP Correlation of Container Identification Numbers to Batch Data Report Numbers

Waste Stream: # OR-CHEM-CH-HET Lot # 6

Container ID Number	Historical Container ID	NDA BDR	RTR BDR	VE BDR	Load/Manage Overpack Yes	Transportation Headspace Gas	
						FGA	GGT
X10C0011382A	N/A	OR-MILCC2-0088	OR-RTR6-0582	N/A	No	OR14FG8128	N/A
X10C0401573A	N/A	OR-MILCC2-0087	OR-RTR6-0582	N/A	No	OR14FG8128	N/A
X10C0401623A	N/A	OR-MILCC2-0141	OR-RTR6-0585	N/A	No	OR15FG8015	N/A
X10C0401722A	N/A	OR-IQ3-0335	OR-RTR6-0541	N/A	No	OR14FG8081	N/A
X10C0501681A	N/A	OR-IQ3-0343	OR-RTR6-0548	N/A	No	OR14FG8089	N/A
X10C9307939M	N/A	OR-IQ3-0333	OR-RTR6-0538	N/A	No	OR14FG8078	N/A
X10C9311043A	N/A	OR-IQ3-0330	OR-RTR6-0536	N/A	No	OR14FG8076	N/A
X10C9311057A	N/A	OR-MILCC2-0137	OR-RTR6-0618	N/A	No	OR15FG8012	N/A
X10C9311259A	N/A	OR-IQ3-0347	OR-RTR6-0552	N/A	No	OR14FG8092	N/A
X10C9311390A	N/A	OR-MILCC2-0133	OR-RTR6-0607	N/A	No	OR15FG8018	N/A
X10C93114008	N/A	OR-MILCC2-0170	OR-RTR6-0558	N/A	No	OR14FG8098	N/A
X10C9311522A	N/A	OR-IQ3-0321	OR-RTR6-0527	N/A	No	OR14FG8068	N/A
X10C9311686A	N/A	OR-MILCC2-0105	OR-RTR7-0059	N/A	No	OR14FG8147	N/A
X10C9311714A	N/A	OR-MILCC2-0105	OR-RTR7-0059	N/A	No	OR14FG8147	N/A
X10C9311844A	N/A	OR-MILCC2-0108	OR-RTR7-0058	N/A	No	OR14FG8150	N/A
X10C9312820A	N/A	OR-IQ3-0432	OR-RTR6-0546	N/A	No	OR15FG8004	N/A
X10C9312994A	N/A	OR-IQ3-0341	OR-RTR6-0547	N/A	No	OR14FG8086	N/A
X10C9400003A	N/A	OR-IQ3-0352	OR-RTR6-0556	N/A	No	OR14FG8098	N/A
X10C9400028A	N/A	OR-MILCC2-0110	OR-RTR7-0072	N/A	No	OR14FG8152	N/A
X10C9400030A	N/A	OR-MILCC2-0105	OR-RTR7-0059	N/A	No	OR14FG8147	N/A
X10C9400037A	N/A	OR-IQ3-0346	OR-RTR6-0551	N/A	No	OR14FG8091	N/A
X10C9400046A	N/A	OR-IQ3-0339	OR-RTR6-0545	N/A	No	OR14FG8084	N/A
X10C9400073A	N/A	OR-IQ3-0346	OR-RTR6-0551	N/A	No	OR14FG8091	N/A
X10C96002061	N/A	OR-MILCC2-0103	OR-RTR7-0061	N/A	No	OR14FG8145	N/A
X10C9600206S	N/A	OR-MILCC2-0157	OR-RTR7-0073	N/A	No	OR15FG8030	N/A
X10C9600206T	N/A	OR-IQ3-0455	OR-RTR6-0538	N/A	No	OR15FG8022	N/A
X10CSATN03123A	N/A	OR-MILCC2-0116	OR-RTR7-0124	N/A	No	OR14FG8160	N/A
X10CSATN03196A	N/A	OR-MILCC2-0074	OR-RTR7-0080	N/A	No	OR14FG8113	N/A

Rick Whiteley — Signature of Site Project Manager
Rick Whiteley — Printed Name
06/22/2015 — Date

COPY

NCR Verification from QA
ORNL CH Audit April 19-21, 2016

Container ID: X10C0401623A

Container Status	Status Date	Status User
Ready	06/15/2015	Lot System
QA Ready	06/15/2015	Lot System
CO For Entry	06/23/2015	Helen Pettus
Entered	06/23/2015	Helen Pettus
CO For Validation	06/23/2015	Carolina Soaterna
Validated	06/23/2015	Carolina Soaterna
Sent To QA	07/16/2015	Lorraine Hensley
QA Certified	07/17/2015	Laura Jones
CO For Certification	07/24/2015	Ryan Martin
Validated	07/24/2015	Ryan Martin
QA Ready	07/27/2015	System QA Expire
Sent To QA	07/27/2015	Lorraine Hensley
QA Certified	07/27/2015	Laura Jones
QA Ready	08/04/2015	System QA Expire
Sent To QA	08/07/2015	Lorraine Hensley
QA Certified	08/07/2015	Laura Jones
QA Ready	08/17/2015	System QA Expire
Sent To QA	08/21/2015	Ryan Martin
QA Certified	08/24/2015	Veronica Waldram
CO For Certification	08/31/2015	Lorraine Hensley
Certified	08/31/2015	Lorraine Hensley
[CO For Certification] DeCertified with reason: change shipcat	08/31/2015	Lorraine Hensley
Certified	08/31/2015	Lorraine Hensley
WDS Uploaded	08/31/2015	Lorraine Hensley

CONTAINERID: X10C0401623A

ORNL

AK DATA

Container ID	Container Type	AKA Matrix	WDS Status	AK Excluded	WSID	LOTID	LOT Excluded
X10C0401623A	55G		APPROVED_CERT	NO	OR-CHEM-CH-HET	OR-CHEM-CH-HET-Lot 6 (OR-CHEM-CH-HET-Lot 6)	

BDR DATA

BDRID	Type	Status	Generation Date
OR-IQ3-0136	NDA	Complete	2010-09-30
OR-MILCC2-0141	NDA	Complete	2015-01-28
OR-RTR6-0356	RTR	Complete	2010-09-30
OR-RTR6-0585	RTR	Complete	2014-09-29
OR10FG11005	HSG_TRANS	Complete	2010-10-14
OR15FG8015	HSG_TRANS	Complete	2015-01-29

NCR DATA

Container ID	NCRID	Status	Release Code
X10C0401623A	NCR-ORNL0970100	Closed	Resolved

REJECT DATA

Container ID	BDRID	NCRID	NCR Status	Release Code	Actual Condition
X10C0401623A	OR-IQ3-0136	NCR-ORNL0970100	Closed	Resolved	X10C9801093A & X10C9600491A ARE REJECTED BY THE EA FOR EXCESSIVE DEAD TIMEX10C9312076A & X10C9312496A ARE REJECTED BY THE EA AS BEING INDETERMINATE ASSAYS NOTE: THESE CONTAINERS DO NOT HAVE A PATH FORWARD TO DETERMINE THEM ACCEPTABLE FOR CERTIFICATION AND SHIPMENT TO WIPP AND ARE PERMANENTLY RETURNED TO THE HOST SITE.

IDC 2.13 SCO 1029 Addendum 49	Units	data	comments									
Shipper Site ID		C6	Location ID	Dest Program ID	Shipping Purpose	AK Report	AK Revision		X10C0401623A			
Waste Stream Profile		OR-CHEM-CH-HET	OR	WI	D	CCP-AK-ORNL-005						
Container Number		X10C0401623A				Cur Ref AK Rev:	0					
Container Type		55GD						U-235 FEM	U-235 FEM Uncert	FGGR Flag	FGGR Test Period	
WAC Rev #		7.4						NULL	NULL	N		
Cert Site		C6					Be mass<=100 k	Be <= 1%	Be Present	Aqueous Material	Compacted Wst	
Cert Date		08/31/2015					Y	Y	Y	N	N	
Waste Handling Code		CH										
Waste Type Code		MTRU	TRU, MTRU									
Waste Stream BIR ID		OR-CHEM-CH-HET										
Waste Stream MWIR ID		NONE										
Generator Site ID		OR										
IDC Code		NONE										
Matrix Code		S5400										
Trucon Code		OR225C										
Shipping Category		3003400084	> 0.012 Watt-years									
Tru Alpha Act	Ci	3.30E-02		3.30E-02								
Tru Alpha Act Uncert	1sigma Ci	3.00E-03	3.90E-02	Tru Alpha Act + 2sigma (Ci)								
Tru Alpha Act Conc	nCi/g	8.48E+02						Drum Weight	27.8			
Pu239 Fiss Gm Eq	g	5.39E+00		5.31E+00				PP	1			
Pu239 Fiss Gm Eq Uncert	1sigma g	4.25E-01	6.24E+00	Pu239 Fiss Gm Eq + 2sigma (Ci)				CP	4.4			
Pu239 Eq Act	Ci	4.78E-02		4.78E-02				LP				
Decay Heat	watts	2.78E-03		2.78E-03				SL				
Decay Heat Uncert	1sigma watts	1.66E-04	2.95E-03	Decay Heat + 1sigma (watts)								
Layers of Packaging		1										
Fill Factor		80	percentage	Liner Lid Present	N							
Liner Type			1 = plastic drum liner									
Liner Punctured				Liner Hole Size								
PCB Conc		NULL		(mm)		PCB Waste	PCB Mass (kg)	Out of Service				
Closure Date		02/24/2010	Watt-years	Waste Gen Date		Y	38.9	02/24/2010				
Vent Date		02/24/2010	0.015329006	NULL								
Filter Install Date		02/24/2010			Filter Reduction Date							
Filter Model Number		NF019D			Reduced Filter Model							
Number of Filters Installed		1										
Aspiration Method ID		N										
Gas Gen Rate			.04E-09	<<Gas Gen Rate Calculated								
Hydrogen/Methane Gen Rate												
Gas Gen Comp Date				Waste (kg)	Packaging (kg)	Total (kg)						
Gross Weight	kg	72.1		38.9	33.2	72.1						
Gross Weight Uncert	1sigma kg	2.3										
Alpha Surf Cont	dpm/100 cm^2	19										
Beta/Gamma Surf Cont	dpm/100 cm^2	199										
Neutron Dose Rate	mrem/hr	0.75										
Beta/Gamma Dose Rate	mrem/hr	20										

Radionuclide		SR-90	CS-137	RA-226	U-233	U-234	U-235	NP-237	PU-238	U-238	PU-239
Activity	Ci	1.21E-03	1.21E-03	0.00E+00	5.76E-02	-1.00E+00	0.00E+00	0.00E+00	-1.00E+00	-1.00E+00	-1.00E+00
Activity Uncert	1sigma Ci	9.28E-05	9.28E-05	0.00E+00	4.54E-03	-1.00E+00	0.00E+00	0.00E+00	-1.00E+00	-1.00E+00	-1.00E+00
Mass	grams	8.77E-06	1.39E-05	0.00E+00	5.99E+00	-1.00E+00	0.00E+00	0.00E+00	-1.00E+00	-1.00E+00	-1.00E+00
Mass Uncert	1sigma grams	6.72E-07	1.05E-06	0.00E+00	4.65E-01	-1.00E+00	0.00E+00	0.00E+00	-1.00E+00	-1.00E+00	-1.00E+00

Radionuclide		PU-240	AM-241	PU-241	PU-242	AM-243	CM-243	CM-244	CM-245	CF-249	CF-251
Activity	Ci	-1.00E+00	3.30E-02	0.00E+00	-1.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Activity Uncert	1sigma Ci	-1.00E+00	3.00E-03	0.00E+00	-1.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Mass	grams	-1.00E+00	9.62E-03	0.00E+00	-1.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Mass Uncert	1sigma grams	-1.00E+00	8.65E-04	0.00E+00	-1.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00

Waste Material Parameters		IM	OI	C	XPM
Wgt of Mat Parms	kg	32.00	0.70	0.20	6.00
Radio Assay Method		16MILCC2	PAN, FRAM, TGS, HENC		
Data Package Number		OR-MILCC2-0141			
Assay Date		01/27/2015			
Charz Method ID		16RR1	RTRM, VISUAL		
Data Package Number		OR-RTR6-0585			
Charz Method Date		09/29/2014			

Haz Codes		F002	D008	D007	D011	F005	D004	D005	D006	D009	D019
Haz Codes		D022									

Sample ID	Headspace Gas HM	X10C0401623A
Sample Type		HGHM-T
Sample Type		HGVO-T
Layer No. Sampled		0
Date Sampled		01/29/2015
Method ID		16HG2
Data Package Number		OR15FG8015

Sample Site
C6

CAS #		1333-74-0	74-82-8	67-56-1	60-29-7	75-35-4	67-64-1	75-34-3	156-59-2	78-93-3	110-82-7
Analyte		Hydrogen	Methane	Methanol	Ethyl ether	1,1-Dichloroethylene	Acetone	1,1-Dichloroethane	cis-1,2-Dichloroethylene	Methyl ethyl ketone	Cyclohexane
Concentration		92.1	213.4	27.87	1.25	5.71	16.9	4.24	0.55	9.86	5.84
Date Analyzed		01/29/2015	01/29/2015	01/29/2015	01/29/2015	01/29/2015	01/29/2015	01/29/2015	01/29/2015	01/29/2015	01/29/2015
D Detectable Flag											
U Detectable Flag		U	U	U	U	U	U	U	U	U	U
NA Detectable Flag											

CAS #		71-43-2	107-06-2	71-36-3	108-10-1	108-88-3	108-90-7	100-41-4	108-38-3/106-42-3	95-47-6	108-67-8
Analyte		Benzene	1,2-Dichloroethane	Butanol	Methyl isobutyl ketone	Toluene	Chlorobenzene	Ethyl benzene	m,p-Xylene	o-xylene	1,3,5-Trimethylbenzene
Concentration		0.71	1.51	1.36	9.34	3.09	1.69	2.62	1.48	1.76	3.14
Date Analyzed		01/29/2015	01/29/2015	01/29/2015	01/29/2015	01/29/2015	01/29/2015	01/29/2015	01/29/2015	01/29/2015	01/29/2015
D Detectable Flag											
U Detectable Flag		U	U	U	U	U	U	U	U	U	U
NA Detectable Flag											

CAS #		95-63-6
Analyte		1,2,4-Trimethylbenzene
Concentration		3.92
Date Analyzed		01/29/2015
D Detectable Flag		
U Detectable Flag		U
NA Detectable Flag		

		Requirements Met?
Free liquids <1% by volume		YES
No non-rad. pyrophorics		YES
Chemical compatability		YES
No explosives		YES
No corrosives		YES
No pressurized containers		YES
No sealed Containers >4 liters		YES
Liner punctured/ filtered		YES
Flammable VOCs <500ppmv		YES
Container is in Approved Waste Stream Profile Form?	OR-CHEM-CH-HET	YES
Can it be established through Process Knowledge that the concentration of flammable VOCs present in the headspace of the container is <= 500 ppm?		NO

		type	comment
Comment	1	GEN	PCB Remediation Waste

V&V Initials	Date
HP/CS	6/23/2015

Lorraine Hensley
CCP Certification Official

Date

Radiation & Contamination Survey Form

CM-P-RP-306 Rev. 4, Radiation/Contamination Surveys

SURVEY NO: 10-SUR-00958 | PAGE | OF | PAGES

Instruments Used

Instrument Type	Serial Number	Cal Due Date	Alpha Eff.	Beta Eff.
LM 12-4 / LM 42-31	215331 / 215331	03/27/10	N/A	N/A
LM-2360 / 43-93	225214 / 244518	01/13/11	23.18%	18.54%
LM-3 / 44-38	245361 / 260035	01/26/11	N/A	N/A
LM-3030E / LM-3030	259077 / 259077	05/07/10	38.8%	32.6%

LOCATION / TYPE: CHGB Drum Out

PURPOSE: Job Coverage

DATE/TIME: 02/25/10 13:18 | RWP/ALARA: 10-TRU-007

Station #		3		2		2		N/A		N/A		N/A	
Drum ID		X10C9313056A		X10C0401623A		X10C9801321A							
Gamma Dose Rate (mR/hr)	OC	20		20		50							
	30 cm	6		8		13							
	1m	0.5		1.3		2							
Neutron Dose Rate (mrem/hr)	OC	0.5		0.75		0.75							
	30 cm	<0.5		<0.5		<0.5							
	1m	<0.5		<0.5		<0.5							
LAS (dpm/probe)		α	β	α	β	α	β	α	β	α	β	α	β
	Umbilical Cut	<100	N/A	<100	N/A	<100	N/A						
	Tool	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓
	Drum	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓
	Cart	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓
	Station	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓
Smears (dpm/100 cm²)	Lid	<20	<200	<20	<200	<20	<200						
	Lid Ring	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓
	Drum	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓
	Cart	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓
	Station	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓
	Sleeve Ring	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓

✱ On Contact (OC) or OC/30cm (#) Smear [#] LAS #̲ Direct

REMARKS: All dose rates in mR/hr gamma and mrem/hr neutron unless otherwise noted. LAS in dpm/probe, smears in dpm/100 sq. cm.

RCT SIGNATURE: Eric Golliher Eric Golliher | RCO SIGNATURE: E. NEEL Elizabeth Neel | Date: 2.26.2010

The signature(s) on this sheet are that of the responsible technician(s) who certify that the data recorded represent the readings, measurements, and/or observations at the time indicated.

CCP Radiography Data Sheet

Section 1: General Information		
[X] RTR Examination	[ ] RTR Replicate Scan	[ ] RTR Independent Observation
Site ID:	ORNL	
Batch Number:	OR-RTR6-0585	
Examination Date:	9/29/2014	
Waste Container ID:	X10C0401623A	
Video/Audio Recorded Media Number:	OR-RTR6-0585	A&B
Procedure and Revision No.:	CCP-TP-053	Rev. 15
NCR(s) associated with the container? (e.g., Prohibited Items)	[X] No [ ] Yes NCR No.: N/A NCR No.: N/A	

Section 2: Waste Container Data	
Container Type:	55 Gallon Drum
TRUCON Code:	OR 225
Waste Matrix Code:	S5400
Waste Stream I.D.:	OR-CHEM-CH-HET
Waste Container Weights:	Gross Wt.: 72.1 kg Tare Wt.: 33.2 kg Net Wt.: 38.9 kg
Rigid Liner and Liner Vent Description:	Liner: [X] No [ ] Yes Lid: [X] No [ ] Yes Type: [ ] 30-mil [ ] 90-mil [ ] 110-mil [ ] 125-mil Vented: [ ] No [ ] Yes [X] N/A Punctured: [X] No [ ] Yes Mechanical Vent: [X] No [ ] Yes Fiberboard Liner: [X] No [ ] Yes Lead Lined: [X] No [ ] Yes
Number of Layers of Confinement:	Appears to be 1 layer
Volume Utilization Percentage:	80 %

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CCP Radiography Data Sheet

Waste Container ID: X10C0401623A

Section 3: Container Inventory and Comments (Detailed descriptions)	
IM:	Scrap metal, electrical equipment, metal hardware, hand tool
AM:	
OM:	
OI:	Absorbent
C:	Tape
R:	
XPM:	Plastic sheeting
OR:	
IN:	
S:	

Section 4: Packaging Material and Waste Material Parameters	
Packaging Material:	**Estimated Weight (kg)**
Steel (ST):	27.8
Plastics (PP):Liner bag	1.0
Other: Cardboard liner (CP)	4.4
Total Packaging Weight	33.2
Waste Material Parameter:	**Estimated Weight (kg)**
Iron-based Metal / Alloys (IM):	32.0
Aluminum-based Metals / Alloys (AM):	
Other Metals (OM):	
Other Inorganic Materials (OI)	0.7
Cellulosics (C):	0.2
Rubber (R):	
Plastics (waste materials) (XPM):	6.0
Organic Matrix (OR):	
Inorganic Matrix (IN):	
Soils (S):	
Total WMP Weight:	38.9

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CCP Radiography Data Sheet

Waste Container ID: X10C0401623A

Section 5: RTR Summary (Questions answered "Yes" will be explained in the Comment block, except for Question 1)	
Is there observable liquid?	☐ Yes ☒ No
Is there any observable liquid in internal containers, more than 60 milliliters or 3 percent by volume, whichever is greater?	☐ Yes ☒ No
Is the total volume of observable liquid in the outermost container GREATER than 1% of the container?	☐ Yes ☒ No
Is there observable liquid in payload containers with an EPA Hazardous Waste Number of U134?	☐ Yes ☒ No
Is there an indication of non-radionuclide pyrophoric materials, such as elemental potassium?	☐ Yes ☒ No
Is there an indication of hazardous wastes not occurring as co-contaminants with TRU mixed wastes (non-mixed hazardous wastes)?	☐ Yes ☒ No
Is there an indication of wastes incompatible with backfill, seal and panel closures materials, container and packaging materials, shipping container materials, or other wastes (i.e., waste does NOT match TRUCON Code[s])?	☐ Yes ☒ No
Is there an indication of wastes containing explosives or compressed gases?	☐ Yes ☒ No
Is there an indication of PCBs liquids?	☐ Yes ☒ No
Is there an indication of the waste exhibiting the characteristic of ignitability, corrosivity, or reactivity (EPA Hazardous Waste Numbers of D001, D002, or D003)?	☐ Yes ☒ No
Is the physical form of the waste inconsistent with the Waste Stream Description or the Waste Matrix Code?	☐ Yes ☒ No
CH or RH TRAMPAC	
Are there heat-sealed bags (unvented) GREATER than 4 liters and LESS than 390 square inches in the waste, or heat sealed bags not authorized in the RH TRUCON Code?	☐ Yes ☒ No
Were there Non-approved Closure Methods used on liner bags or inner bags greater than 4 liters?	☐ Yes ☒ No
Are there sealed containers GREATER than 4 liters?	☐ Yes ☒ No
Are there indications of inadequate protection for heavy and/or sharp objects?	☐ Yes ☒ No

Comments: N/A

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RTR Operator:

Daphne Brothers	Daphne D Brothers	9/29/2014
Print Name	Signature	Date

********** Radioassay Data Sheet **********

Engine Version: TMU Gamma 1.5 SS

Count Sequence Number: 2311 Batch Number: OR-MILCC2-0141
Assay Instrument: MV MILCC2 Location: ORNL
Analysis Method: CCP-TP-076, R 1 Software Version: NDA 2000 V.4.0
Item ID: X10C0401623A Assay Start: 1/27/2015 1:44:33 PM
GW: 72.1 kg TW: 33.2 kg NW: 38.9 kg Fill: 80 % WS:OR-CHEM-CH-HET

NID identified fiducial nuclide AM-241
Source of isotopics: DECLARED

Density	0.234 kg /l		
Pu mass	0.00E+000 +-	0.00E+000	g
TRU Alpha Activity	3.30E-002 +-	3.00E-003	Ci
TRU Activity Concentration	8.48E+002 +-	7.72E+001	nCi/g
Pu-239 Equivalent Activity	4.78E-002 +-	3.22E-003	Ci
Pu-239 FGE	5.39E+000 +-	4.25E-001	g
Decay heat	2.78E-003 +-	1.66E-004	W
NNSS PE-g: 3.80E+000 g	NNSS U-235 FGE:	8.38E+000	g

Nuclide	Mass g	Activity Ci	Activity Uncert. Ci	MDA Ci
SR90	8.77E-006	1.21E-003	9.28E-005	0.00E+000
CS137	1.39E-005	1.21E-003	9.28E-005	1.54E-006
RA226	0.00E+000	0.00E+000	0.00E+000	1.35E-006
U233	5.99E+000	5.76E-002	4.54E-003	9.55E-003
U234	<LLD	<LLD	0.00E+000	0.00E+000
U235	0.00E+000	0.00E+000	0.00E+000	1.66E-006
NP237	0.00E+000	0.00E+000	0.00E+000	2.14E-006
PU238	<LLD	<LLD	0.00E+000	9.68E-002
U238	<LLD	<LLD	0.00E+000	4.27E-005
PU239	<LLD	<LLD	0.00E+000	1.70E-002
PU240	<LLD	<LLD	0.00E+000	2.29E-001
AM241	9.62E-003	3.30E-002	3.00E-003	6.17E-005
PU241	0.00E+000	0.00E+000	0.00E+000	5.11E-001
PU242	<LLD	<LLD	0.00E+000	0.00E+000
AM243	0.00E+000	0.00E+000	0.00E+000	4.92E-006
CM243	0.00E+000	0.00E+000	0.00E+000	9.69E-006
CM244	0.00E+000	0.00E+000	0.00E+000	9.43E-002
CM245	0.00E+000	0.00E+000	0.00E+000	9.46E-006
CF249	0.00E+000	0.00E+000	0.00E+000	1.50E-006
CF251	0.00E+000	0.00E+000	0.00E+000	5.20E-006

Errors quoted at 1.000 sigma

Operator: Dan Crosby Dan Crosby Date: 2-9-15

ITR: Ronald Whitson Ronald Whitson Date: 2/18/2015

OR-MILCC2-0141 COPY 024

Automated Independent Technical Review

Count Sequence Number:	2311	Batch Number:	OR-MILCC2-0141
Assay Instrument:	MV MILCC2	Location:	ORNL
Analysis Method:	CCP-TP-076, R 1	Software Version:	NDA 2000 V.4.0
Item ID:	X10C0401623A	Assay Start:	1/27/2015 1:44:33 PM

MGA Analysis:

Results are marked as invalid.

DISPOSITION: No measured isotopics are available. No Pu isotopes identified, therefore declared CHEM isotopics cannot be applied. Am-241 is the fiducial nuclide.

Gamma Analysis:

Analysis Status: No errors.

DISPOSITION: OK

Segment Data Review:

DISPOSITION: OK

Miscellaneous:

DISPOSITION: No additional radionuclides contributing to 95% of the radiological hazard identified.

Expert Review by: Kevin Meyer Date: 2/5/15

K.E.Meyer

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Attachment 4 – Flammable Gas Analysis Form

SCO 1049 Add 4 - Win XP SP3/Win 7 SP1
Excel 2003/2007/2010

Waste Container ID: **X10C0401623A**

BDR Number: **OR15FG8015**

Sampling Date: **1/29/2015**

CAS NUMBER	COMPOUND	Measured ppmv	Reporting Flag
1333-74-0	Hydrogen	92.10	U
74-82-8	Methane	213.40	U
67-56-1	Methanol	27.87	U
60-29-7	Ethyl Ether	1.25	U
75-35-4	1,1-Dichloroethylene	5.71	U
67-64-1	Acetone	16.90	U
75-34-3	1,1-Dichloroethane	4.24	U
156-59-2	cis-1,2-Dichloroethene	0.55	U
78-93-3	Methyl ethyl ketone	9.86	U
110-82-7	Cyclohexane	5.84	U
71-43-2	Benzene	0.71	U
107-06-2	1,2-Dichloroethane	1.51	U
71-36-3	1-Butanol	1.36	U
108-10-1	Methyl isobutyl ketone	9.34	U
108-88-3	Toluene	3.09	U
108-90-7	Chlorobenzene	1.69	U
100-41-4	Ethylbenzene	2.62	U
108-38-3/106-42-3	m- and p-Xylene	1.48	U
95-47-6	o-Xylene	1.76	U
108-67-8	1,3,5-Trimethylbenzene	3.14	U
95-63-6	1,2,4-Trimethylbenzene	3.92	U

CAS Number	IDENTIFIED TIC COMPOUND	Est. Amount ppmv
N/A	N/A	N/A
N/A	N/A	N/A
N/A	N/A	N/A
N/A	N/A	N/A
N/A	N/A	N/A
N/A	N/A	N/A
N/A	N/A	N/A
N/A	N/A	N/A

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Attachment 1 – Sample Container Data Form

SCO 1049 Add 4 - Win XP SP3/Win 7 SP1
Excel 2003/2007/2010

BDR Number: OR15FG8015

	Waste Container ID	8 Filter Model Number	9 Hydrogen Diffusivity of Filter (mol/s/mf)	10 Package Configuration Group Number	11 Closure Date	12 Vent Date	13 Required DAC Value (in days)	14 Drum Age (in days)	15 Can this container be sampled?
1	X10C0401623A	NucFil-019DS	1.85E-05	3	2/24/2010	2/24/2010	12	1800	Y
2	X10C0402786A	UltraTech-9424X	1.85E-05	3	7/15/2014	7/15/2014	12	198	Y
3	X10C0402786D	UltraTech-9424X	1.85E-05	3	7/16/2014	7/16/2014	12	197	Y
4	X10C0402786E	UltraTech-9424X	1.85E-05	3	7/16/2014	7/16/2014	12	197	Y
5	X10C0402786I	UltraTech-9424X	1.85E-05	3	7/16/2014	7/16/2014	12	197	Y
6	X10C0402786K	UltraTech-9424X	1.85E-05	3	7/17/2014	7/17/2014	12	196	Y
7	X10C0402786L	UltraTech-9424X	1.85E-05	3	7/17/2014	7/17/2014	12	196	Y
8	X10C0402806C	UltraTech-9424X	1.85E-05	3	7/25/2014	7/25/2014	12	188	Y
9	X10C0402806D	UltraTech-9424X	1.85E-05	3	7/28/2014	7/28/2014	12	185	Y
10	X10C0402806E	UltraTech-9424X	1.85E-05	3	7/28/2014	7/28/2014	12	185	Y
11	X10C0402827E	UltraTech-9424X	1.85E-05	3	8/6/2014	8/6/2014	12	176	Y
12	X10C0402873F	UltraTech-9424X	1.85E-05	3	7/18/2014	7/18/2014	12	195	Y
13	X10C9307228A	UltraTech-9424X	1.85E-05	3	1/19/2010	1/19/2010	12	1836	Y
14	X10C9311919A	UltraTech-9424X	1.85E-05	3	12/17/2009	12/17/2009	12	1869	Y
15	X10C9400162A	UltraTech-9424X	1.85E-05	3	8/5/2009	8/5/2009	12	2003	Y
16	X10C9400177A	UltraTech-9424X	1.85E-05	3	6/3/2010	6/3/2010	12	1701	Y
17	X10CSATN02024E	UltraTech-9424X	1.85E-05	3	10/19/2011	10/19/2011	12	1198	Y
18	X10CSATN02384C	UltraTech-9424X	1.85E-05	3	5/28/2014	5/28/2014	12	246	Y
19	X10CSATN02493D	NucFil-019DS	1.85E-05	3	4/7/2010	4/7/2010	12	1758	Y
20	X10CSATN03175A	UltraTech-9424X	1.85E-05	3	8/13/2014	8/13/2014	12	169	Y

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Operator: Jeremy Robinson
Printed Name

Signature

1/29/15
Date

Waste Isolation Pilot Plant
Container Data Report

Report Statistics

Report Version:	**2.5.4**
WDS Instance:	**prd05.wipp.carlsbad.nm.us**
Generated on:	**April 05, 2016 07:05 AM**
Generated by:	**KIRKES, CRETA**
Total Pages:	**9**

Selection Criteria

Container Number: **X10C0401623A**

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Container: X10C0401623A
Type: 1 - 55 gal

Current Status

Extended Status: APPROVED CERT
Container Status: CERTIFICATION DATA APPROVED
Certification Date: 08/31/2015
Waste Handling Code: CH
Disposal Date:

Current Location Site: OR
Generator Site: OR
Destination Site ID: WI

Certification Program ID: C6
Shipping Program ID: C6

Neutron Dose Rate (mrem/hr): 0.75
Beta Gamma Dose Rate (mrem/hr): 20.0
Total Dose Rate (mrem/hr): 20.75

FGE (g): 5.39E00
FGE Uncertainty (g): 4.25E-01

Gross Weight (kg): 72.00
Gross Weight Uncert (kg): 2.30

Decay Heat (W): 2.78E-03
Decay Heat Uncertainty (W): 1.66E-04

Certification Data Values

Waste Stream Profile Code: OR-CHEM-CH-HET
Waste Type Code: MTRU
IDC Code: NONE
Waste Matrix Code: S5400
WAC Revision Number: 7.4
Fill Factor (%): 80.00
Waste Stream BIR ID: OR-CHEM-CH-HET
Waste Stream MWIR ID: NONE

TRU Alpha Activity (Ci): 3.3E-02
TRU Alpha Activity Uncertainty (Ci): 3.0E-03
TRU Alpha Activity Concentration (Ci/g): 8.48E-07
PU-239 Equivalent Activity (PE-Ci): 4.78E-02
Alpha Surface Contamination (dpm/cm^2): 19.0
Beta/Gamma Surface Contamination (dpm/cm^2): 199.0

Transportation Data Values

Closure Date: 02/24/2010
Vent Date: 02/24/2010
Process Knowledge? N

TRUCON Code: OR225C
Shipping Category: 3003400084
Aspiration Method: N

Shipment Purpose: DISPOSAL
Machine Compacted? N
Liner Exists? N
Liner Hole Size(mm):
Liner Lid Present?
Layers of Packaging 1
Aqueous Material? N

Gas Generation Data Values

Measured FGGR (mol/s)	Measured TGRR (mol/s)	Truncated FGGR Test (Y/N)	Truncated FGGR Test Period (days)
		N	

Container: X10C0401623A
Type: 1 - 55 gal

Current Status

Extended Status: APPROVED CERT
Container Status: CERTIFICATION DATA APPROVED
Certification Date: 08/31/2015
Waste Handling Code: CH
Disposal Date:

PCB Waste?	Y
PCB Mass (kg):	38.9
PCB Concentration (ppm):	
PCB Out of Service Date:	02/24/2010
Be Present?	Y
Be <= 1% by weight?	Y
Be mass <= 100kg?	Y
Separation OK?	
Packing Fraction (compaction level):	non-compacted

Filters

Filter Model Number	Filter Diffusivity (mol/s/ml)	Quantity	Install Date
NF019D	1.85E-05	1	02/24/2010

Certification Comments

PCB Remediation Waste

Radionuclides

Radionuclide	Activity (Ci)	Activity Uncert (Ci)	Mass (g)	Mass Uncert (g)
AM-241	3.300E-02	3.000E-03	9.620E-03	8.646E-04
AM-243	.000E00	.000E00	.000E00	.000E00
CF-249	.000E00	.000E00	.000E00	.000E00
CF-251	.000E00	.000E00	.000E00	.000E00
CM-243	.000E00	.000E00	.000E00	.000E00
CM-244	.000E00	.000E00	.000E00	.000E00
CM-245	.000E00	.000E00	.000E00	.000E00
CS-137	1.210E-03	9.280E-05	1.390E-05	1.055E-06
NP-237	.000E00	.000E00	.000E00	.000E00
PU-238	<LLD	<LLD	<LLD	<LLD
PU-239	<LLD	<LLD	<LLD	<LLD

COPY

Container: X10C0401623A
Type: 1 - 55 gal

Current Status

Extended Status: APPROVED CERT
Container Status: CERTIFICATION DATA APPROVED
Certification Date: 08/31/2015
Waste Handling Code: CH
Disposal Date:

Radionuclides

Radionuclide	Activity (Ci)	Activity Uncert (Ci)	Mass (g)	Mass Uncert (g)
PU-240	<LLD	<LLD	<LLD	<LLD
PU-241	.000E00	.000E00	.000E00	.000E00
PU-242	<LLD	<LLD	<LLD	<LLD
RA-226	.000E00	.000E00	.000E00	.000E00
SR-90	1.210E-03	9.280E-05	8.770E-06	6.725E-07
U-233	5.760E-02	4.540E-03	5.990E00	4.652E-01
U-234	<LLD	<LLD	<LLD	<LLD
U-235	.000E00	.000E00	.000E00	.000E00
U-238	<LLD	<LLD	<LLD	<LLD

Samples

Sample ID	Sample Type Code	Sample Type Description	Sample Date	Layer Sampled
H-X10C0401623A	HGHM-T	HEADSPACE GAS HYDROGEN AND METHANE	01/29/2015	0

Unique Samples

CAS Number	Analyte Description	Concentration (ppm)	Analysis Date	Analysis Method	Reporting Flags
1333-74-0	HYDROGEN	92.1	01/29/2015	16HG2	U
74-82-8	METHANE	213.4	01/29/2015	16HG2	U

Container: X10C0401623A
Type: 1 - 55 gal

Current Status
Extended Status: APPROVED CERT
Container Status: CERTIFICATION DATA APPROVED
Certification Date: 08/31/2015
Waste Handling Code: CH
Disposal Date:

Samples

Sample ID	Sample Type Code	Sample Type Description	Sample Date	Layer Sampled
X10C0401623A	HGVO-T	HEADSPACE GAS VOC	01/29/2015	0

Unique Samples

CAS Number	Analyte Description	Concentration (ppm)	Analysis Date	Analysis Method	Reporting Flags
100-41-4	ETHYL BENZENE	2.62	01/29/2015	16HG2	U
107-06-2	1,2-DICHLOROETHANE	1.51	01/29/2015	16HG2	U
108-10-1	METHYL ISOBUTYL KETONE	9.34	01/29/2015	16HG2	U
108-67-8	1,3,5-TRIMETHYLBENZENE	3.14	01/29/2015	16HG2	U
108-88-3	TOLUENE	3.09	01/29/2015	16HG2	U
108-90-7	CHLOROBENZENE	1.69	01/29/2015	16HG2	U
108383/106423	M,P-XYLENE	1.48	01/29/2015	16HG2	U
110-82-7	CYCLOHEXANE	5.84	01/29/2015	16HG2	U
156-59-2	CIS-1,2-DICHLOROETHYLENE	0.55	01/29/2015	16HG2	U
60-29-7	ETHYL ETHER	1.25	01/29/2015	16HG2	U
67-56-1	METHANOL	27.87	01/29/2015	16HG2	U
67-64-1	ACETONE	16.9	01/29/2015	16HG2	U
71-36-3	BUTANOL	1.36	01/29/2015	16HG2	U
71-43-2	BENZENE	0.71	01/29/2015	16HG2	U
75-34-3	1,1-DICHLOROETHANE	4.24	01/29/2015	16HG2	U
75-35-4	1,1-DICHLOROETHYLENE	5.71	01/29/2015	16HG2	U
78-93-3	METHYL ETHYL KETONE	9.86	01/29/2015	16HG2	U
95-47-6	O-XYLENE	1.76	01/29/2015	16HG2	U

COPY

Container: X10C0401623A
Type: 1 - 55 gal

Current Status

Extended Status: APPROVED CERT
Container Status: CERTIFICATION DATA APPROVED
Certification Date: 08/31/2015
Waste Handling Code: CH
Disposal Date:

Samples

Sample ID	Sample Type Code	Sample Type Description	Sample Date	Layer Sampled
X10C0401623A	HGVO-T	HEADSPACE GAS VOC	01/29/2015	0

Unique Samples

CAS Number	Analyte Description	Concentration (ppm)	Analysis Date	Analysis Method	Reporting Flags
95-63-6	1,2,4-TRIMETHYLBENZENE	3.92	01/29/2015	16HG2	U

Material Parameters

Material Parameter	Description	Weight (kg)
1	IRON BASE METAL ALLOYS	32.00
4	OTHER INORGANIC MATERIALS	0.70
6	CELLULOSICS	0.20
8	PLASTICS	6.00
13	STEEL CONTAINER MATERIALS	27.80
14	PLASTIC/LINERS CONTAINER MATERIALS	1.00
15	CELLULOSICS PACKAGING MATERIALS	4.40
	Waste Weight:	38.90
	Packaging Weight:	33.20
	Total Material Weight:	72.10

Hazardous Codes

Hazardous Code	Description
D004	ARSENIC
D005	BARIUM

Container: X10C0401623A
Type: 1 - 55 gal

Current Status

Extended Status: APPROVED CERT
Container Status: CERTIFICATION DATA APPROVED
Certification Date: 08/31/2015
Waste Handling Code: CH
Disposal Date:

Hazardous Codes

Hazardous Code	Description
D006	CADMIUM
D007	CHROMIUM
D008	LEAD
D009	MERCURY
D011	SILVER
D019	CARBON TETRACHLORIDE
D022	CHLOROFORM
F002	SPENT HALOGENATED SOLVENTS
F005	SPENT NON-HALOGENATED SOLVENTS

Assay Methods

Assay Method	Description	Assay Date
16MILCC2	MOBILE ISOCS LARGE CONTAINER COUNTER	01/27/2015

Non-Destructive Examination (NDE)

NDE Method	Description	Examination Date
16RR1	RTR MCS MOBILE CHARACTERIZATION SYSTEM	09/29/2014

Edit Limit Check Results

Evaluation Date: 08/31/2015 13:18:12 Overall Status: PASS

Evaluation Code	Status	Return Code	Detailed Description
DI_CERT_ALL	PASS		
DI_CERT_BE	PASS		

Container: X10C0401623A
Type: 1 - 55 gal

Current Status
Extended Status: APPROVED CERT
Container Status: CERTIFICATION DATA APPROVED
Certification Date: 08/31/2015
Waste Handling Code: CH
Disposal Date:

Edit Limit Check Results
Evaluation Date: 08/31/2015 13:18:12 Overall Status: PASS

Evaluation Code	Status
DI_CERT_CERT	PASS
DI_CERT_CHARZ	PASS
DI_CERT_ED	PASS
DI_CERT_EPA	PASS
DI_CERT_PCB	PASS
DI_CERT_PERC	PASS
DI_CERT_TRAMPAC	PASS
DSA	PASS
WAC	PASS
WAP_CERT	PASS

TRAMPAC Evaluation Results
Evaluation Date: 08/31/2015 13:18:12 Overall Status: PASS

Evaluation Code	Status	Return Code	Detailed Description
CE_ACT	PASS		
CE_ALL	PASS		
CE_ASP	PASS		
CE_DDH	PASS		
CE_FGE	PASS		
CE_FIL	PASS		
CE_GVE	PASS		
CE_RDR	PASS		
CE_TRU	PASS		
CE_WGT	PASS		

Container: X10C0401623A
Type: 1 - 55 gal

Current Status

Extended Status:	APPROVED CERT		
Container Status:	CERTIFICATION DATA APPROVED	Waste Handling Code:	CH
Certification Date:	08/31/2015	Disposal Date:	

TRAMPAC Evaluation Results

Evaluation Date: 08/31/2015 13:18:12 Overall Status: PASS

Details

Matrix Depleted Shipping Category:	3001090084	Compliance Method:	ANALYTICAL
Decay Heat Limit (w):	0.16892226890756304	FGE Limit (g):	200
FGGR (mol/s):	9.796803393848185E-10	FGGR Limit (mol/s):	5.952380952380953E-8
Volume Model:		Required Aspiration Time (days):	
Total Headspace VOCs (ppm):	102.84	DAC Scenario:	3
Packaging Configuration:	COMMON_PACKAGING 2		
Closure Time (days):	0	Minimum Closure Time Applied (days):	53
Sample-Vent Time (days):	1800	Min Sample-Vent Time Applied (days):	9
TFGVC in ICL (mol fr):		MLEL (mol fr):	0.05

History

Event Date/Time	Container Number	Event Description	Reason
08/31/2015 13:18:16	X10C0401623A	SUCCESSFUL SUBMISSION FOR CERT VIA THE WEB SERVICE	
08/31/2015 13:19:59	X10C0401623A	APPROVED FOR CERT	

OK

DIVIDER

PAGE

Waste Characterization Case File:

including AK tracking spreadsheet for vent/closure dates, Container Information Summary (CIS), IDC spreadsheet printout, excerpts from data sources, and WWIS/WDS Waste Container and canister Data Reports for…

Container: X10C0402820M1

(a 55 gal CH S5400 waste category debris container)

WDS WCA/WCO CERTIFICATION PACKAGE
CH ORNL Audit - April 19-24, 2016

1. AK Tracking Spreadsheet to obtain vent/closure date
   a. X10C0401623A (OR-CHEM-CH-HET, Lot 6)
   b. X10C0402820M1 (OR-REDC-CH-HET, Lot 58)
   c. X10C0501703A (OR-REDS-CH-HET, Lot 77)

CH Package for X10C0401623A (WS OR-CHEM-CH-HET)

1. Container Information Summary (CIS) – CCP Correlation of Container Identification Numbers to Batch Data Report Numbers – Lot 6
2. NCR Verification from QA
3. IDC Container Summary
4. IDC Spreadsheet
5. RAD Survey
6. RTR Data
7. NDA Data
8. Flam Gas Data & Filter information
9. WDS Waste Container Data Report

CH Package for X10C0402820M1 (WS OR-REDC-CH-HET)

1. Container Information Summary (CIS) – CCP Correlation of Container Identification Numbers to Batch Data Report Numbers – Lot 58
2. NCR Verification from QA
3. IDC Container Summary
4. IDC Spreadsheet
5. RAD Survey
6. VE Data
7. NDA Data
8. Flam Gas Data & Filter information
9. WDS Waste Container Data Report

WDS WCA/WCO CERTIFICATION PACKAGE
CH ORNL Audit - April 19-21, 2016
(Continued)

CH Package for X10C0501703A (WS OR-REDC-CH-HET)

1. Container Information Summary (CIS) – CCP Correlation of Container Identification Numbers to Batch Data Report Numbers – Lot 77
2. NCR Verification from QA
3. IDC Container Summary
4. IDC Spreadsheet
5. RAD Survey
6. VE Data
7. NDA Data
8. Flam Gas Data & Filter information
9. WDS Waste Container Data Report

CCP Correlation of Container Identification Numbers to Batch Data Report Numbers

Waste Stream: # OR-REDC-CH-HET Lot # 58

Container ID Number	Historical Container ID	NDA BDR	RTR BDR	VE BDR	Load/Manage Overpack Yes	Transportation Headspace Gas	
						FGA	GGT
X10C0402817D1	N/A	OR-IQ3-0427	OR-RTR6-0612	N/A	No	OR15FG8002	N/A
X10C0402820M1	N/A	OR-IQ3-0415	N/A	ORVECH0116	No	OR14FG8169	N/A
X10C0402829B	N/A	OR-IQ3-0415	OR-RTR7-0010	N/A	No	OR14FG8169	N/A
X10C0402837D	N/A	OR-IQ3-0414	OR-RTR6-0600	N/A	No	OR14FG8169	N/A
X10C0402891D	N/A	OR-IQ3-0420	OR-RTR6-0604	N/A	No	OR14FG8164	N/A
X10C0402909D	N/A	OR-IQ3-0432	OR-RTR6-0556	N/A	No	OR15FG8004	N/A
X10C0402918BZ	N/A	OR-IQ3-0432	OR-RTR6-0614	N/A	No	OR14FG8173	N/A
X10C0402932A	N/A	OR-IQ3-0427	OR-RTR6-0612	N/A	No	OR15FG8002	N/A
X10C0402961B	N/A	OR-IQ3-0431	OR-RTR6-0544	N/A	No	OR15FG8003	N/A
X10C0402963D	N/A	OR-IQ3-0430	OR-RTR6-0545	N/A	No	OR14FG8173	N/A
X10C0402987H1	N/A	OR-IQ3-0413	OR-RTR7-0011	N/A	No	OR14FG8157	N/A
X10C0403029E	N/A	OR-MILCC2-0010	OR-RTR7-0039	N/A	No	OR14FG8165	N/A
X10C9311203B	N/A	OR-MILCC2-0010	OR-RTR7-0039	N/A	No	OR14FG8054	N/A
X10C9311827A	N/A	OR-IQ3-0415	OR-RTR6-0601	N/A	No	OR14FG8166	N/A
X10C9312194A	N/A	OR-IQ3-0431	OR-RTR6-0546	N/A	No	OR15FG8003	N/A
~~X10C9402620A~~	~~N/A~~	~~OR-MILCC2-0021~~	~~OR-RTR6-0517~~	~~N/A~~	~~No~~	~~OR14FG4037~~	~~N/A~~
X10CSATN01937AJ	N/A	OR-MILCC2-0003	OR-RTR6-0470	N/A	No	OR14FG4024	N/A
X10CSATN01937C	N/A	OR-MILCC2-0027	OR-RTR6-0479	N/A	No	OR14FG8066	N/A
X10CSATN01937G	N/A	OR-MILCC2-0026	OR-RTR6-0451	N/A	No	OR14FG4042	N/A
X10CSATN02012A	N/A	OR-MILCC2-0004	OR-RTR6-0460	N/A	No	OR14FG4023	N/A
X10CSATN02012I	N/A	OR-MILCC2-0004	OR-RTR6-0459	N/A	No	OR14FG4023	N/A
X10CSATN02024L	N/A	OR-MILCC2-0007	OR-RTR7-0018	N/A	No	OR14FG8036	N/A
X10CSATN02062D	N/A	OR-MILCC2-0027	OR-RTR6-0450	N/A	No	OR14FG8020	N/A
X10CSATN02077G1	N/A	OR-MILCC2-0021	OR-RTR6-0517	N/A	No	OR14FG4037	N/A
X10CSATN02093K	N/A	OR-MILCC2-0026	OR-RTR6-0480	N/A	No	OR14FG4042	N/A
X10CSATN02093M	N/A	OR-MILCC2-0026	OR-RTR6-0479	N/A	No	OR14FG4042	N/A
X10CSATN02093O	N/A	OR-MILCC2-0032	OR-RTR6-0480	N/A	No	OR14FG4048	N/A
X10CSATN02200A	N/A	OR-MILCC2-0010	OR-RTR7-0034	N/A	No	OR14FG4027	N/A
X10CSATN02200M	N/A	OR-MILCC2-0004	OR-RTR6-0502	N/A	No	OR14FG4024	N/A
X10CSATN02229B1	N/A	OR-MILCC2-0020	OR-RTR6-0515	N/A	No	OR14FG4036	N/A
X10CSATN02229C1	N/A	OR-MILCC2-0020	OR-RTR6-0516	N/A	No	OR14FG4035	N/A
X10CSATN02406A	N/A	OR-MILCC2-0016	OR-RTR6-0508	N/A	No	OR14FG4044	N/A

7250 MR RW

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CCP Correlation of Container Identification Numbers to Batch Data Report Numbers

Waste Stream: # OR-REDC-CH-HET Lot # 58

Container ID Number	Historical Container ID	NDA BDR	RTR BDR	VE BDR	Load/Manage Overpack Yes	Transportation Headspace Gas	
						FGA	GGT
X10CSATN02406G	N/A	OR-MILCC2-0016	OR-RTR6-0495	N/A	No	OR14FG4044	N/A
X10CSATN02406P	N/A	OR-MILCC2-0027	OR-RTR6-0450	N/A	No	OR14FG8020	N/A
X10CSATN02461G1	N/A	OR-MILCC2-0020	OR-RTR6-0515	N/A	No	OR14FG4036	N/A
X10CSATN02475M	N/A	OR-IQ3-0415	OR-RTR7-0010	N/A	No	OR14FG8169	N/A
X10CSATN02475O	N/A	OR-IQ3-0415	OR-RTR7-0010	N/A	No	OR14FG8166	N/A
X10CSATN02499G	N/A	OR-IQ3-0413	OR-RTR7-0011	N/A	No	OR14FG8157	N/A
X10CSATN02499O	N/A	OR-IQ3-0413	OR-RTR7-0011	N/A	No	OR14FG8156	N/A
X10CSATN02607C1	N/A	OR-IQ3-0404	N/A	ORVECH0109	No	OR14FG8151	N/A
X10CSATN02607D	N/A	OR-MILCC2-0016	OR-RTR6-0510	N/A	No	OR14FG4044	N/A
X10CSATN02607J1	N/A	OR-MILCC2-0020	OR-RTR6-0515	N/A	No	OR14FG4036	N/A
X10CSATN02632J	N/A	OR-IQ3-0430	OR-RTR6-0544	N/A	No	OR15FG8002	N/A
X10CSATN02634A	N/A	OR-MILCC2-0026	OR-RTR6-0481	N/A	No	OR14FG4042	N/A
X10CSATN02640E	N/A	OR-MILCC2-0010	OR-RTR7-0039	N/A	No	OR14FG8054	N/A
X10CSATN02640H	N/A	OR-MILCC2-0027	OR-RTR7-0020	N/A	No	OR14FG8066	N/A
X10CSATN02644H1	N/A	OR-IQ3-0430	OR-RTR6-0545	N/A	No	OR15FG8002	N/A
X10CSATN02698H	N/A	OR-MILCC2-0027	OR-RTR7-0020	N/A	No	OR14FG8066	N/A
X10CSATN03042F	N/A	OR-MILCC2-0025	OR-RTR7-0038	N/A	No	OR14FG4044	N/A
X10CSATN03042I	N/A	OR-MILCC2-0025	OR-RTR7-0038	N/A	No	OR14FG4044	N/A

R C Whiteley — Signature of Site Project Manager | Rick Whiteley — Printed Name | 03/02/2015 — Date

Roger Whitaker — ROGER WHITAKER — 5/13/15

COPY

NCR Verification from QA
ORNL CH Audit April 19-21, 2016

Container ID: X10C0402820M1

Container Status	Status Date	Status User
Ready	02/26/2015	Lot System
QA Ready	02/26/2015	Lot System
CO For Entry	03/05/2015	Lena Dominguez
Entered	03/05/2015	Lena Dominguez
CO For Validation	03/05/2015	Helen Pettus
Validated	03/05/2015	Helen Pettus
Sent To QA	03/13/2015	Connie Hernandez
QA Certified	03/13/2015	Laura Jones
CO For Certification	03/17/2015	Lorraine Hensley
Certified	03/17/2015	Lorraine Hensley
WDS Uploaded	03/17/2015	Lorraine Hensley
[CO For Certification] DeCertified with reason: Add Comment	03/27/2015	knoxja
Certified	03/27/2015	knoxja
QA Ready	03/30/2015	System QA Expire
[CO For Certification] DeCertified with reason: Re-Upload to WDS for Record Purposes	03/30/2015	knoxja
Sent To QA	03/30/2015	knoxja
QA Certified	03/30/2015	Laura Jones
Validated	03/31/2015	Nightly Reset
CO For Certification	03/31/2015	knoxja
CO For Certification	03/31/2015	knoxja
CO For Certification	03/31/2015	knoxja
CO For Certification	03/31/2015	knoxja
CO For Certification	03/31/2015	knoxja
CO For Certification	03/31/2015	knoxja
CO For Certification	03/31/2015	knoxja
CO For Certification	03/31/2015	knoxja
CO For Certification	03/31/2015	knoxja
CO For Certification	03/31/2015	knoxja
CO For Certification	03/31/2015	knoxja

NCR Verification from QA
ORNL CH Audit April 19-21, 2016

Container ID: X10C0402820M1

CO For Certification	03/31/2015	mcginnr
CO For Certification	03/31/2015	knoxja
Validated	04/01/2015	Nightly Reset
CO For Certification	04/02/2015	knoxja
Certified	04/02/2015	knoxja
WDS Uploaded	04/02/2015	knoxja
[CO For Certification] DeCertified with reason: Changed rigid liner option	04/15/2015	Ryan Martin
QA Ready	04/15/2015	System QA Expire
Certified	04/15/2015	Ryan Martin
Sent To QA	04/15/2015	Ryan Martin
QA Certified	04/16/2015	Laura Jones
WDS Uploaded	04/16/2015	Ryan Martin

CONTAINERID: X10C0402820M1

ORNL

AK DATA

Container ID	Container Type	AKA Matrix	WDS Status	AK Excluded	WSID	LOTID	LOT Excluded
X10C0402820M1	55G		APPROVED_CERT	NO	OR-REDC-CH-HET	OR-REDC-CH-HET-Lot 58 (OR-REDC-CH-HET-Lot 58)	

BDR DATA

BDRID	Type	Status	Generation Date
OR-IQ3-0415	NDA	Complete	2014-11-18
OR14FG8169	HSG_TRANS	Complete	2014-12-18
ORVECH0116	VE	Complete	2014-09-03

NCR DATA

Container ID	NCRID	Status	Release Code
X10C0402820M1	NO DATA		

REJECT DATA

Container ID	BDRID	NCRID	NCR Status	Release Code	Actual Condition
X10C0402820M1	NO DATA				

IDC 2.13 SCO 1029 Addendum 49	Units	data	comments									
Shipper Site ID		C6	Location ID	Dest Program ID	Shipping Purpose	AK Report	AK Revision		X10C0402820M1			
Waste Stream Profile		OR-REDC-CH-HET	OR	WI	D	CCP-AK-ORNL-002						
Container Number		X10C0402820M1				Cur Ref AK Rev:	0					
Container Type		55GD						U-235 FEM	U-235 FEM Uncert	FGGR Flag	FGGR Test Period	
WAC Rev #		7.4						NULL	NULL	N		
Cert Site		C6					Be mass<=100 k	Be <= 1%	Be Present	Aqueous Material	Compacted Wst	
Cert Date		04/15/2015					Y	Y	Y	N	N	
Waste Handling Code		CH										
Waste Type Code		MTRU	TRU, MTRU									
Waste Stream BIR ID		OR-W203										
Waste Stream MWIR ID		NONE										
Generator Site ID		OR										
IDC Code		NONE										
Matrix Code		S5400										
Trucon Code		OR225C										
Shipping Category		3003400084	> 0.012 Watt-years									
Tru Alpha Act	Ci	1.64E-02		1.64E-02								
Tru Alpha Act Uncert	1sigma Ci	1.52E-02	4.68E-02	Tru Alpha Act + 2sigma (Ci)								
Tru Alpha Act Conc	nCi/g	2.51E+02						Drum Weight	27.8			
Pu239 Fiss Gm Eq	g	1.13E+00		1.12E+00				PP	1			
Pu239 Fiss Gm Eq Uncert	1sigma g	2.48E-01	1.63E+00	Pu239 Fiss Gm Eq + 2sigma (Ci)				CP	4.4			
Pu239 Eq Act	Ci	5.05E-01		5.05E-01				LP				
Decay Heat	watts	3.31E-02		3.30E-02				SL				
Decay Heat Uncert	1sigma watts	5.67E-02	8.98E-02	Decay Heat + 1sigma (watts)								
Layers of Packaging		1										
Fill Factor		100	percentage	Liner Lid Present	N							
Liner Type			1 = plastic drum liner									
Liner Punctured				Liner Hole Size	478							
PCB Conc		NULL		(mm)		PCB Waste	PCB Mass (kg)	Out of Service				
Closure Date		09/03/2014	Watt-years	Waste Gen Date		Y	65.2	09/03/2014				
Vent Date		09/03/2014	0.020299502	NULL								
Filter Install Date		09/03/2014			Filter Reduction Date							
Filter Model Number		U9424X			Reduced Filter Model							
Number of Filters Installed		1										
Aspiration Method ID		N										
Gas Gen Rate			3.16E-08	<<Gas Gen Rate Calculated								
Hydrogen/Methane Gen Rate												
Gas Gen Comp Date				Waste (kg)	Packaging (kg)	Total (kg)						
Gross Weight	kg	98.4		65.2	33.2	98.4						
Gross Weight Uncert	1sigma kg	2.3										
Alpha Surf Cont	dpm/100 cm^2	19										
Beta/Gamma Surf Cont	dpm/100 cm^2	199										
Neutron Dose Rate	mrem/hr	0.5										
Beta/Gamma Dose Rate	mrem/hr	2										

Radionuclide		SR-90	CS-137	RA-226	U-233	U-234	U-235	NP-237	PU-238	U-238	PU-239
Activity	Ci	3.00E-03	1.74E-04	6.02E-07	-1.00E+00	2.17E-04	3.77E-06	0.00E+00	3.79E-04	1.51E-03	-1.00E+00
Activity Uncert	1sigma Ci	6.60E-04	3.83E-05	1.34E-07	-1.00E+00	4.79E-05	8.33E-07	0.00E+00	5.42E-04	3.32E-04	-1.00E+00
Mass	grams	2.17E-05	2.00E-06	6.09E-07	-1.00E+00	3.49E-02	1.75E+00	0.00E+00	2.21E-05	4.49E+03	-1.00E+00
Mass Uncert	1sigma grams	4.78E-06	4.35E-07	1.34E-07	-1.00E+00	7.58E-03	3.80E-01	0.00E+00	3.13E-05	9.76E+02	-1.00E+00

Radionuclide		PU-240	AM-241	PU-241	PU-242	AM-243	CM-244	CM-245	CM-246	CF-249
Activity	Ci	7.76E-03	4.77E-04	8.52E-04	1.89E-06	4.73E-04	9.28E-01	9.46E-05	7.19E-03	9.10E-06
Activity Uncert	1sigma Ci	1.11E-02	1.07E-04	1.22E-03	2.71E-06	1.56E-04	1.62E+00	1.65E-04	1.03E-02	2.00E-06
Mass	grams	3.42E-02	1.39E-04	8.27E-06	4.79E-04	2.37E-03	1.14E-02	5.50E-04	2.34E-02	2.22E-06
Mass Uncert	1sigma grams	4.83E-02	3.08E-05	1.17E-05	6.83E-04	7.72E-04	1.98E-02	9.48E-04	3.31E-02	4.83E-07

Waste Material Parameters		IM	C	XPM	OR
Wgt of Mat Parms	kg	50.00	5.70	1.50	8.00
Radio Assay Method		16IQ1	PAN, FRAM, TGS, HENC		
Data Package Number		OR-IQ3-0415			
Assay Date		11/18/2014			
Charz Method ID		16VE1	RTRM, VISUAL		
Data Package Number		ORVECH0116			
Charz Method Date		09/03/2014			

Haz Codes		F002	D008	D007	D011	F005	D004	D005	D006	D009	D010
Haz Codes		D019									

Sample ID	Headspace Gas HM	X10C0402820M1
Sample Type		HGHM-T
Sample Type		HGVO-T
Layer No. Sampled		0
Date Sampled		12/17/2014
Method ID		16HG2
Data Package Number		OR14FG8169

Sample Site
C6

CAS #		1333-74-0	74-82-8	67-56-1	60-29-7	75-35-4	67-64-1	75-34-3	156-59-2	78-93-3	110-82-7
Analyte		Hydrogen	Methane	Methanol	Ethyl ether	1,1-Dichloroethylene	Acetone	1,1-Dichloroethane	cis-1,2-Dichloroethylene	Methyl ethyl ketone	Cyclohexane
Concentration		92.1	213.4	27.87	1.25	5.71	16.9	4.24	0.55	9.86	5.84
Date Analyzed		12/17/2014	12/17/2014	12/17/2014	12/17/2014	12/17/2014	12/17/2014	12/17/2014	12/17/2014	12/17/2014	12/17/2014
D Detectable Flag											
U Detectable Flag		U	U	U	U	U	U	U	U	U	U
NA Detectable Flag											

CAS #		71-43-2	107-06-2	71-36-3	108-10-1	108-88-3	108-90-7	100-41-4	108-38-3/106-42-3	95-47-6	108-67-8
Analyte		Benzene	1,2-Dichloroethane	Butanol	Methyl isobutyl ketone	Toluene	Chlorobenzene	Ethyl benzene	m,p-Xylene	o-xylene	1,3,5-Trimethylbenzene
Concentration		0.71	1.51	1.36	9.34	3.09	1.69	2.62	1.48	1.76	3.14
Date Analyzed		12/17/2014	12/17/2014	12/17/2014	12/17/2014	12/17/2014	12/17/2014	12/17/2014	12/17/2014	12/17/2014	12/17/2014
D Detectable Flag											
U Detectable Flag		U	U	U	U	U	U	U	U	U	U
NA Detectable Flag											

CAS #		95-63-6
Analyte		1,2,4-Trimethylbenzene
Concentration		3.92
Date Analyzed		12/17/2014
D Detectable Flag		
U Detectable Flag		U
NA Detectable Flag		

		Requirements Met?
Free liquids <1% by volume		YES
No non-rad. pyrophorics		YES
Chemical compatability		YES
No explosives		YES
No corrosives		YES
No pressurized containers		YES
No sealed Containers >4 liters		YES
Liner punctured/ filtered		YES
Flammable VOCs <500ppmv		YES
Container is in Approved Waste Stream Profile Form?	OR-REDC-CH-HET	YES
Can it be established through Process Knowledge that the concentration of flammable VOCs present in the headspace of the container is <= 500 ppm?		NO

		type	comment
Comment	1	GEN	PCB Remediation Waste

V&V Initials	Date
LD/HP	3/5/2015

Ryan Martin
CCP Certification Official

Date

Attachment 2 – CCP Waste Visual Examination Data Form Page 1 of 5

Batch Data Report No.: ORVECH0116

Section 1: Output Waste Container Data		
Input Waste Container ID, as applicable: X10C0402820M		
Output Waste Container ID: X10C0402820M1	Waste Stream ID: OR-REDC-CH-HET	
Container Type: 55 gallon drum	TRUCON Code: OR 125/225	Waste Matrix Code: S5400
Audio/Video Media Recording Number: ☑ N/A		
Waste Container Weights: Tare Wt: 33.2 kg.	Gross Wt: 98.4 kg.	
Rigid Liner Present? ☐ NO ☑ YES Type of Liner: ☐ Lead ☐ Plastic ☑ Fiberboard ☐ Other: Thickness: ☐ 30-mil ☑ 90-mil ☐ 110-mil ☐ 125-mil	Rigid Liner Lid Present? ☑ NO ☐ YES Rigid Liner Lid is Vented (>0.3 in.) or Filtered? ☐ NO ☐ YES ☑ N/A ☐ Vented: Hole Size: ☑ N/A ☐ Filtered: Model No.: ☑ N/A Serial No.: ☑ N/A	
Bag Liner Present? ☐ NO ☑ YES	Volume Utilization Percentage: 100 %	
Does the physical form of the waste match the Waste Stream Description (i.e., Homogeneous Solids, Soil/Gravel or Debris Waste [including uncategorized metals])? ☐ NO ☑ YES		
Does the physical form of the waste match the Waste Matrix Code? ☐ NO ☑ YES		
Closure Method: TT Number of Layers of Confinement: 1		
Filter Torque Wrench Serial/ID No.: WIPP168 Calibration Due Date: 10/14/14 Filter: Model No.: UT9424x Serial No.: 00236 0146 Torque Value: 72 in lbs	Lid Ring/Bolt Torque Wrench Serial/ID No.: WIPP150 Calibration Due Date: 3/10/15 Lid Ring/Bolt Torque Value: 600 Ft lbs	
Is total dose rate greater than 200mrem/hr? ☑ NO ☐ YES		
NCR(s) associated with the output container? ☑ NO ☐ YES NCR No.: N/A NCR No.: N/A		
Comments: N/A		

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Attachment 2 – CCP Waste Visual Examination Data Form (continued) Page 2 of 5

Batch Data Report No.: ORVECH0116 **Date:** 9-3-14

Section 2: Waste Package Data

Package and Package TID Number (as applicable)	Waste Description	WMP [Table 3]	Weight (kg) [Table 4,a]	Weighing Code(s) [Table 4b]
N/A	Plastic Bags, Plastic Tape, Herculite layer gloves, Nylon Mesh, Plastic Scoop	PW	1.5	E
N/A	Rope, Cardboard, Rags, Paper Towels Cheese Cloth, Wood pieces	C	5.7	E
N/A	Nochar, Fire Blanket	OR	8.0	E
N/A	Hand Tools, ~~Pieces Metal~~, Metal Scrap 9-3-14 JC Metal Pieces	IM	50.0	E
	N/A 9-3-14 JC			

N/A
VEO 1: Print Name

N/A
Signature

N/A
Date

N/A
VEO 2: Print Name

N/A
Signature

N/A
Date

Signatures annotate the absence of prohibited items.

Output Waste Container ID: X10C0402820M1

TID Removed: N/A **TID Applied:** MP85W33631

N/A
VEO 1: Print Name

N/A
Signature

N/A
Date

N/A
VEO 2: Print Name

N/A
Signature

N/A
Date

Signatures of VEO's verifying the loading of the Output Waste Container.

Page 1 of 1

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Attachment 2 – CCP Waste Visual Examination Data Form (continued) Page 3 of 5

Batch Data Report No.: ORVECH0116

Output Waste Container ID: X10C0402820M1

Section 3: Packaging Material and Waste Material Parameters	
Packaging Material:	Estimated Weight (kg)
Steel (ST):	27.8
Plastics (PP):	1.0
Others: (C)	4.4
Total Packaging Weight:	33.2
Waste Material Parameter:	Estimated Weight (kg)
Iron-based Metal/Alloys (IM):	50.0
Aluminum-based Metals/Alloys (AM):	N/A
Other Metals (OM):	N/A
Other Inorganic Materials (OI):	N/A
Cellulosics (C):	5.7
Rubber (R):	N/A
Plastics (waste materials) (PW):	1.5
Organic Matrix (OR):	8.0
Inorganic Matrix (IN):	N/A
Soils (S):	N/A
Total WMP Weight:	65.2

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Attachment 2 – CCP Waste Visual Examination Data Form (continued) Page 4 of 5

Batch Data Report No.: ORVECH0116 **Output Waste Container ID:** X10C0402820M1

Section 4: Prohibited Items Summary Questions answered "Yes" must be explained in the comments field.		
	Yes	No
Is there any observable liquid in internal containers, that is more than 60 milliliters or 3 percent by volume, whichever is greater?	☐	☑
Is the total volume of observable liquid in the outermost container **GREATER** than 1% of the container?	☐	☑
Is there detectable observable liquid in outermost containers with an EPA Hazardous Waste Number of U134?	☐	☑
Is there an indication of non-radionuclide pyrophoric materials, such as elemental potassium?	☐	☑
Is there an indication of hazardous wastes not occurring as co-contaminants with TRU mixed wastes (non-mixed hazardous wastes)?	☐	☑
Is there an indication of wastes incompatible with backfill, seal and panel closures materials, container and packaging materials, shipping container materials, or other wastes (i.e., waste does **NOT** match TRUCON Code[s])?	☐	☑
Is there an indication of wastes containing explosives or compressed gases?	☐	☑
Is there PCB liquids present?	☐	☑
Is there an indication of the waste exhibiting the characteristic of ignitability, corrosivity, or reactivity (EPA Hazardous Waste Numbers of D001, D002, or D003)?	☐	☑
Is the physical form of the waste inconsistent with the Waste Stream Description or the Waste Matrix Code?	☐	☑
Prohibited Items		
Are there heat-sealed bags (unvented) **GREATER** than 4 liters and LESS than 390 square inches in the waste?	☐	☑
Were there Non-approved Closure Methods used on liner bags or inner bags greater than 4 liters?	☐	☑
Are there sealed containers **GREATER** than 4 liters?	☐	☑
Are there indications of inadequate protection (blocked or braced) for heavy and/or sharp objects?	☐	☑

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Attachment 2 – CCP Waste Visual Examination Data Form (continued) Page 5 of 5

Batch Data Report No.: ORVECH0116 **Output Waste Container ID:** X10C0402820M1

Section 4: Prohibited Item(s) Summary (Continued)
(Questions answered "YES" will be explained in the Comments block)

Comments: N/A

Section 5: Approvals

Visual Examination Operator 1: Jason Cofer (Print Name)	Signature	9/3/14 (Date)
Visual Examination Operator 2: Chuck Wallace (Print Name)	Signature	09/03/14 (Date)

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********** Radioassay Data Sheet **********

Engine Version: TMU Gamma 1.5 SS

Count Sequence Number: 6705 Batch Number: OR-IQ3-0415
Assay Instrument: MCS IQ3 Location: ORNL
Analysis Method: CCP-TP-047 v 12 Software Version: NDA 2000 V.4.0
Item ID: X10C0402820M1 Assay Start: 11/18/2014 9:38:08 AM
GW: 98.4 kg TW: 33.2 kg NW: 65.2 kg Fill:100 % WS:OR-REDC-CH-HET-1

NID identified fiducial nuclide Am-243
Source of isotopics: DECLARED

Density	0.313 kg /l		
Pu mass	3.47E-002	+- 4.89E-002	g
TRU Alpha Activity	1.64E-002	+- 1.52E-002	Ci
TRU Activity Concentration	2.51E+002	+- 2.32E+002	nCi/g
Pu-239 Equivalent Activity	5.05E-001	+- 8.53E-001	Ci
Pu-239 FGE	1.13E+000	+- 2.48E-001	g
Decay heat	3.31E-002	+- 5.67E-002	W
NNSS PE-g: 5.49E+001 g	NNSS U-235 FGE:	1.76E+000	g

Nuclide	Mass g	Activity Ci	Activity Uncert. Ci	MDA Ci
SR90	2.17E-005	3.00E-003	6.60E-004	0.00E+000
CS137	2.00E-006	1.74E-004	3.83E-005	9.97E-008
RA226	6.09E-007	6.02E-007	1.34E-007	1.76E-007
U233	<LLD	<LLD	0.00E+000	1.85E-003
U234	3.49E-002	2.17E-004	4.79E-005	0.00E+000
U235	1.75E+000	3.77E-006	8.33E-007	3.42E-007
NP237	0.00E+000	0.00E+000	0.00E+000	3.26E-007
PU238	2.21E-005	3.79E-004	5.42E-004	1.00E-006
U238	4.49E+003	1.51E-003	3.32E-004	4.38E-006
PU239	<LLD	<LLD	0.00E+000	2.71E-003
PU240	3.42E-002	7.76E-003	1.11E-002	2.05E-005
AM241	1.39E-004	4.77E-004	1.07E-004	6.75E-006
PU241	8.27E-006	8.52E-004	1.22E-003	2.25E-006
PU242	4.79E-004	1.89E-006	2.71E-006	0.00E+000
AM243	2.37E-003	4.73E-004	1.56E-004	1.25E-006
CM244	1.14E-002	9.28E-001	1.62E+000	2.46E-003
CM245	5.50E-004	9.46E-005	1.65E-004	2.50E-007
CM246	2.34E-002	7.19E-003	1.03E-002	1.90E-005
CF249	2.22E-006	9.10E-006	2.00E-006	2.45E-007

Errors quoted at 1.000 sigma

Operator: Chad Gerlock Date: 11/25/14

ITR: Ronald Whitson Date: 12/2/2014

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Automated Independent Technical Review

Count Sequence Number: 6705 Batch Number: OR-IQ3-0415
Assay Instrument: MCS IQ3 Location: ORNL
Analysis Method: CCP-TP-047 v 12 Software Version: NDA 2000 V.4.0
Item ID: X10C0402820M1 Assay Start: 11/18/2014 9:31:43 AM

MGA Analysis:
Results are marked as invalid.

DISPOSITION: No MGA isotopics are available. Declared REDC-1 isotopics applied as default values; Am-243 is the fiducial nuclide. Pu-239 not identified.

Gamma Analysis:
Analysis Status: No errors.
Total U mass is greater than the upper limit of 35.0 g.
Spectrum Validity Check engine has suggested data review.

DISPOSITION: Refit 228 keV, 277 keV regions in Summed Segment spectrum.
Total U mass = 4.49E+003 g. OK.

Segment Data Review:
Segment: 1 Analysis Warnings:
Transmission Error 11: The xmission ratio > 1 for one or more peaks.
Segment: 2 Analysis Warnings:
Minimum transmission used.
Segment: 3 Analysis Warnings:
Transmission Error 11: The xmission ratio > 1 for one or more peaks.
Minimum transmission used.

DISPOSITION: Transmission-corrected assay results not used as final results.

Miscellaneous:

DISPOSITION: No additional radionuclides contributing to 95% of the radiological hazard were identified.

Expert Review by: Robert N Ceo R.N. Ceo Date: 11/19/14 # 6705

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Attachment 4 – Flammable Gas Analysis Form

SCO 1049 Add 4 - Win XP SP3/Win 7 SP1
Excel 2003/2007/2010

Waste Container ID: **X10C0402820M1**

BDR Number: **OR14FG8169**

Sampling Date: **12/17/2014**

CAS NUMBER	COMPOUND	Measured ppmv	Reporting Flag
1333-74-0	Hydrogen	92.10	U
74-82-8	Methane	213.40	U
67-56-1	Methanol	27.87	U
60-29-7	Ethyl Ether	1.25	U
75-35-4	1,1-Dichloroethylene	5.71	U
67-64-1	Acetone	16.90	U
75-34-3	1,1-Dichloroethane	4.24	U
156-59-2	cis-1,2-Dichloroethene	0.55	U
78-93-3	Methyl ethyl ketone	9.86	U
110-82-7	Cyclohexane	5.84	U
71-43-2	Benzene	0.71	U
107-06-2	1,2-Dichloroethane	1.51	U
71-36-3	1-Butanol	1.36	U
108-10-1	Methyl isobutyl ketone	9.34	U
108-88-3	Toluene	3.09	U
108-90-7	Chlorobenzene	1.69	U
100-41-4	Ethylbenzene	2.62	U
108-38-3/106-42-3	m- and p-Xylene	1.48	U
95-47-6	o-Xylene	1.76	U
108-67-8	1,3,5-Trimethylbenzene	3.14	U
95-63-6	1,2,4-Trimethylbenzene	3.92	U

CAS Number	IDENTIFIED TIC COMPOUND	Est. Amount ppmv
N/A	N/A	N/A
N/A	N/A	N/A
N/A	N/A	N/A
N/A	N/A	N/A
N/A	N/A	N/A
N/A	N/A	N/A
N/A	N/A	N/A
N/A	N/A	N/A

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11

BDR Number: OR14FG8169

Waste Container ID		8 Filter Model Number	9 Hydrogen Diffusivity of Filter (mol/s/mf)	10 Package Configuration Group Number	11 Closure Date	12 Vent Date	13 Required DAC Value (in days)	14 Drum Age (in days)	15 Can this container be sampled?
1	X10C0007054A	UltraTech-9424X	1.85E-05	3	1/3/2013	1/3/2013	12	713	Y
2	X10C0007057A	UltraTech-9424X	1.85E-05	3	1/3/2013	1/3/2013	12	713	Y
3	X10C0013435E	UltraTech-9424X	1.85E-05	3	4/30/2012	4/30/2012	12	961	Y
4	X10C0200314A	UltraTech-9424X	1.85E-05	3	1/15/2010	1/15/2010	12	1797	Y
5	X10C0402820M1	UltraTech-9424X	1.85E-05	3	9/3/2014	9/3/2014	44	105	Y
6	X10C0402829B	UltraTech-9424X	1.85E-05	3	10/2/2012	10/2/2012	12	806	Y
7	X10C0402837D	UltraTech-9424X	1.85E-05	3	8/12/2014	8/12/2014	12	127	Y
8	X10C0402989BD	UltraTech-9424X	1.85E-05	3	5/26/2010	5/26/2010	12	1666	Y
9	X10C9311755C1	UltraTech-9424X	1.85E-05	3	7/12/2012	7/12/2012	12	888	Y
10	X10C9311772H	UltraTech-9424X	1.85E-05	3	12/6/2012	12/6/2012	12	741	Y
11	X10C9400004A1	UltraTech-9424X	1.85E-05	3	10/9/2014	10/9/2014	44	69	Y
12	X10C9400389A	NucFil-019DS	1.85E-05	3	3/31/2010	3/31/2010	12	1722	Y
13	X10C9902202A1	UltraTech-9424X	1.85E-05	3	9/24/2014	9/24/2014	44	84	Y
14	X10CSATN02307C	UltraTech-9424X	1.85E-05	3	5/29/2014	5/29/2014	12	202	Y
15	X10CSATN02307D	UltraTech-9424X	1.85E-05	3	6/2/2014	6/2/2014	12	198	Y
16	X10CSATN02475M	UltraTech-9424X	1.85E-05	3	8/8/2011	8/8/2011	12	1227	Y
17	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
18	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
19	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
20	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

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Operator: Carmel Byrd
Printed Name

Carmel Byrd
Signature

12-17-14
Date

Radiation & Contamination Survey Form

SURVEY NO: 14-SUR-03085

Instruments Used

Instrument Type	Serial Number	Cal Due Date	Alpha Eff.	Beta Eff.
LM 12-4 / LM 42-31	215335 / 215335	07/03/15	N/A	N/A
LM-3030 / LM-3030	259088 / 259088	07/29/15	34.03	22.19
LM-2360 / 43-93	268446 / 286569	04/10/15	20.91%	15.56%
RadEye GX / HP-270	681 / 9092	03/26/15	N/A	N/A

LOCATION / TYPE: CHGB Drum Out

PURPOSE: Job Coverage

DATE/TIME: 09/03/14 8:41 | RWP/ALARA: 14-TRU-007

Station:	2
Container ID:	X10C0402825H1

Dose Rates:	On Contact	30 cm	1 meter
Gamma (mR/hr):	5	1	<0.1
Neutron (mrem/hr):	<0.5	<0.5	<0.5

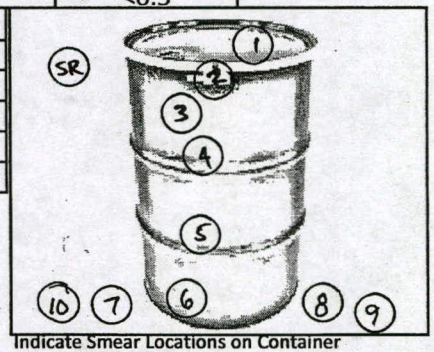
LAS Results*	α	β–γ
Umbilical Cut:	<100	<1000
Tool:	<100	<1000
Drum:	<100	<1000
Cart:	<100	<1000
Station:	<100	<1000

*dpm/probe ☑ Drum-out Station Downposted

Smear Results**	α	β–γ
Lid:	<20	<200
Lid Ring:	<20	<200
Drum:	<20	<200
	<20	<200
	<20	<200
	<20	<200

Smear Results**	α	β–γ
Glovebox Station:	<20	<200
	<20	<200
Cart:	<20	<200
	<20	<200
Sleeve Ring:	<20	<200

**dpm/100 sq. cm.



Indicate Smear Locations on Container

Station:	2
Container ID:	X10C0402820M1

Dose Rates:	On Contact	30 cm	1 meter
Gamma (mR/hr):	2.0	0.6	<0.1
Neutron (mrem/hr):	0.5	<0.5	<0.5

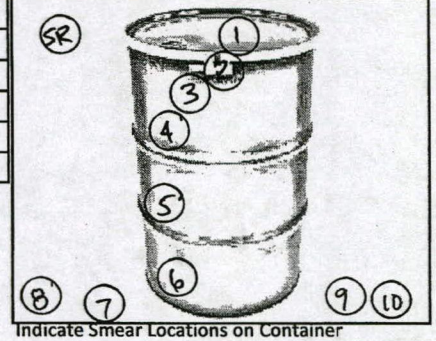
LAS Results*	α	β–γ
Umbilical Cut:	<100	<1000
Tool:	<100	<1000
Drum:	<100	<1000
Cart:	<100	<1000
Station:	<100	<1000

*dpm/probe ☑ Drum-out Station Downposted

Smear Results**	α	β–γ
Lid:	<20	<200
Lid Ring:	<20	<200
Drum:	<20	<200
	<20	<200
	<20	<200
	<20	<200

Smear Results**	α	β–γ
Glovebox Station:	<20	<200
	<20	<200
Cart:	<20	<200
	<20	<200
Sleeve Ring:	<20	<200

**dpm/100 sq. cm.



Indicate Smear Locations on Container

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✱On Contact (OC) or $\frac{OC}{30cm}$ (#)Smear #→LAS #△Direct

UNITS: If performed, dose rates are in mR/hr γ and mrem/hr n, LAS in dpm/probe, smears and direct measurements in dpm/100 cm² (unless otherwise annotated). REMARKS: 12-4 30 cm readings x2

RCT SIGNATURE: Brian Jestes | RCM SIGNATURE: | Date: 9/8/14

The signature(s) on this sheet are that of the responsible technician(s) who certify that the data recorded represent the readings, measurements, and/or observations at the time indicated.

Waste Isolation Pilot Plant
Container Data Report

Report Statistics

Report Version:	**2.5.4**
WDS Instance:	**prd05.wipp.carlsbad.nm.us**
Generated on:	**April 05, 2016 07:07 AM**
Generated by:	**KIRKES, CRETA**
Total Pages:	**10**

Selection Criteria

Container Number: **X10C0402820M1**

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Container: X10C0402820M1
Type: 1 - 55 gal

Current Status

Extended Status: APPROVED CERT
Container Status: CERTIFICATION DATA APPROVED
Certification Date: 04/15/2015
Waste Handling Code: CH
Disposal Date:

Current Location Site: OR
Generator Site: OR
Destination Site ID: WI

Certification Program ID: C6
Shipping Program ID: C6

Neutron Dose Rate (mrem/hr): 0.5
Beta Gamma Dose Rate (mrem/hr): 2.0
Total Dose Rate (mrem/hr): 2.5

FGE (g): 1.13E00
FGE Uncertainty (g): 2.48E-01

Gross Weight (kg): 98.00
Gross Weight Uncert (kg): 2.30

Decay Heat (W): 3.31E-02
Decay Heat Uncertainty (W): 5.67E-02

Certification Data Values

Waste Stream Profile Code: OR-REDC-CH-HET
Waste Type Code: MTRU
IDC Code: NONE
Waste Matrix Code: S5400
WAC Revision Number: 7.4
Fill Factor (%): 100.00
Waste Stream BIR ID: OR-W203
Waste Stream MWIR ID: NONE

TRU Alpha Activity (Ci): 1.64E-02
TRU Alpha Activity Uncertainty (Ci): 1.52E-02
TRU Alpha Activity Concentration (Ci/g): 2.51E-07
PU-239 Equivalent Activity (PE-Ci): 5.05E-01
Alpha Surface Contamination (dpm/cm^2): 19.0
Beta/Gamma Surface Contamination (dpm/cm^2): 199.0

Transportation Data Values

Closure Date: 09/03/2014
Vent Date: 09/03/2014
Process Knowledge? N

TRUCON Code: OR225C
Shipping Category: 3003400084
Aspiration Method: N

Shipment Purpose: DISPOSAL
Machine Compacted? N
Liner Exists? N
Liner Hole Size(mm):
Liner Lid Present?
Layers of Packaging 1
Aqueous Material? N

Gas Generation Data Values

Measured FGGR (mol/s)	Measured TGRR (mol/s)	Truncated FGGR Test (Y/N)	Truncated FGGR Test Period (days)
		N	

Container: X10C0402820M1
Type: 1 - 55 gal

Current Status
Extended Status: APPROVED CERT
Container Status: CERTIFICATION DATA APPROVED
Certification Date: 04/15/2015
Waste Handling Code: CH
Disposal Date:

Radionuclides

Radionuclide	Activity (Ci)	Activity Uncert (Ci)	Mass (g)	Mass Uncert (g)
PU-241	8.520E-04	1.220E-03	8.270E-06	1.173E-05
PU-242	1.890E-06	2.710E-06	4.790E-04	6.826E-04
RA-226	6.020E-07	1.340E-07	6.090E-07	1.340E-07
SR-90	3.000E-03	6.600E-04	2.170E-05	4.783E-06
U-233	<LLD	<LLD	<LLD	<LLD
U-234	2.170E-04	4.790E-05	3.490E-02	7.579E-03
U-235	3.770E-06	8.330E-07	1.750E00	3.804E-01
U-238	1.510E-03	3.320E-04	4.490E03	9.765E02

Samples

Sample ID	Sample Type Code	Sample Type Description	Sample Date	Layer Sampled
H-X10C0402820M1	HGHM-T	HEADSPACE GAS HYDROGEN AND METHANE	12/17/2014	0

Unique Samples

CAS Number	Analyte Description	Concentration (ppm)	Analysis Date	Analysis Method	Reporting Flags
1333-74-0	HYDROGEN	92.1	12/17/2014	16HG2	U
74-82-8	METHANE	213.4	12/17/2014	16HG2	U

Sample ID	Sample Type Code	Sample Type Description	Sample Date	Layer Sampled
X10C0402820M1	HGVO-T	HEADSPACE GAS VOC	12/17/2014	0

Unique Samples

CAS Number	Analyte Description	Concentration (ppm)	Analysis Date	Analysis Method	Reporting Flags

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Container: X10C0402820M1
Type: 1 - 55 gal

Current Status

Extended Status:	APPROVED CERT		
Container Status:	CERTIFICATION DATA APPROVED	Waste Handling Code:	CH
Certification Date:	04/15/2015	Disposal Date:	

PCB Waste?	Y
PCB Mass (kg):	65.2
PCB Concentration (ppm):	
PCB Out of Service Date:	09/03/2014
Be Present?	Y
Be <= 1% by weight?	Y
Be mass <= 100kg?	Y
Separation OK?	
Packing Fraction (compaction level):	non-compacted

Filters

Filter Model Number	Filter Diffusivity (mol/s/ml)	Quantity	Install Date
U9424X	1.85E-05	1	09/03/2014

Certification Comments

PCB Remediation Waste

Radionuclides

Radionuclide	Activity (Ci)	Activity Uncert (Ci)	Mass (g)	Mass Uncert (g)
AM-241	4.770E-04	1.070E-04	1.390E-04	3.084E-05
AM-243	4.730E-04	1.560E-04	2.370E-03	7.723E-04
CF-249	9.100E-06	2.000E-06	2.220E-06	4.831E-07
CM-244	9.280E-01	1.620E00	1.140E-02	1.980E-02
CM-245	9.460E-05	1.650E-04	5.500E-04	9.483E-04
CM-246	7.190E-03	1.030E-02	2.340E-02	3.312E-02
CS-137	1.740E-04	3.830E-05	2.000E-06	4.352E-07
NP-237	.000E00	.000E00	.000E00	.000E00
PU-238	3.790E-04	5.420E-04	2.210E-05	3.133E-05
PU-239	<LLD	<LLD	<LLD	<LLD
PU-240	7.760E-03	1.110E-02	3.420E-02	4.826E-02

Container: X10C0402820M1
Type: 1 - 55 gal

Current Status
Extended Status: APPROVED CERT
Container Status: CERTIFICATION DATA APPROVED
Certification Date: 04/15/2015
Waste Handling Code: CH
Disposal Date:

Samples

Sample ID	Sample Type Code	Sample Type Description	Sample Date	Layer Sampled
X10C0402820M1	HGVO-T	HEADSPACE GAS VOC	12/17/2014	0

Unique Samples

CAS Number	Analyte Description	Concentration (ppm)	Analysis Date	Analysis Method	Reporting Flags
100-41-4	ETHYL BENZENE	2.62	12/17/2014	16HG2	U
107-06-2	1,2-DICHLOROETHANE	1.51	12/17/2014	16HG2	U
108-10-1	METHYL ISOBUTYL KETONE	9.34	12/17/2014	16HG2	U
108-67-8	1,3,5-TRIMETHYLBENZENE	3.14	12/17/2014	16HG2	U
108-88-3	TOLUENE	3.09	12/17/2014	16HG2	U
108-90-7	CHLOROBENZENE	1.69	12/17/2014	16HG2	U
108383/106423	M,P-XYLENE	1.48	12/17/2014	16HG2	U
110-82-7	CYCLOHEXANE	5.84	12/17/2014	16HG2	U
156-59-2	CIS-1,2-DICHLOROETHYLENE	0.55	12/17/2014	16HG2	U
60-29-7	ETHYL ETHER	1.25	12/17/2014	16HG2	U
67-56-1	METHANOL	27.87	12/17/2014	16HG2	U
67-64-1	ACETONE	16.9	12/17/2014	16HG2	U
71-36-3	BUTANOL	1.36	12/17/2014	16HG2	U
71-43-2	BENZENE	0.71	12/17/2014	16HG2	U
75-34-3	1,1-DICHLOROETHANE	4.24	12/17/2014	16HG2	U
75-35-4	1,1-DICHLOROETHYLENE	5.71	12/17/2014	16HG2	U
78-93-3	METHYL ETHYL KETONE	9.86	12/17/2014	16HG2	U
95-47-6	O-XYLENE	1.76	12/17/2014	16HG2	U

COPY

Container: X10C0402820M1
Type: 1 - 55 gal

Current Status
Extended Status: APPROVED CERT
Container Status: CERTIFICATION DATA APPROVED
Certification Date: 04/15/2015
Waste Handling Code: CH
Disposal Date:

Samples

Sample ID	Sample Type Code	Sample Type Description	Sample Date	Layer Sampled
X10C0402820M1	HGVO-T	HEADSPACE GAS VOC	12/17/2014	0

Unique Samples

CAS Number	Analyte Description	Concentration (ppm)	Analysis Date	Analysis Method	Reporting Flags
95-63-6	1,2,4-TRIMETHYLBENZENE	3.92	12/17/2014	16HG2	U

Material Parameters

Material Parameter	Description	Weight (kg)
1	IRON BASE METAL ALLOYS	50.00
6	CELLULOSICS	5.70
8	PLASTICS	1.50
10	SOLIDIFIED ORGANIC MATERIAL	8.00
13	STEEL CONTAINER MATERIALS	27.80
14	PLASTIC/LINERS CONTAINER MATERIALS	1.00
15	CELLULOSICS PACKAGING MATERIALS	4.40
	Waste Weight:	65.20
	Packaging Weight:	33.20
	Total Material Weight:	98.40

Hazardous Codes

Hazardous Code	Description
D004	ARSENIC
D005	BARIUM

Container: X10C0402820M1
Type: 1 - 55 gal

Current Status

Extended Status: APPROVED CERT
Container Status: CERTIFICATION DATA APPROVED
Certification Date: 04/15/2015
Waste Handling Code: CH
Disposal Date:

Hazardous Codes

Hazardous Code	Description
D006	CADMIUM
D007	CHROMIUM
D008	LEAD
D009	MERCURY
D010	SELENIUM
D011	SILVER
D019	CARBON TETRACHLORIDE
F002	SPENT HALOGENATED SOLVENTS
F005	SPENT NON-HALOGENATED SOLVENTS

COPY

Assay Methods

Assay Method	Description	Assay Date
16IQ1	CANBERRA MOBILE DRUM COUNTER (IQ3)	11/18/2014

Non-Destructive Examination (NDE)

NDE Method	Description	Examination Date
16VE1	VISUAL EXAMINATION	09/03/2014

Edit Limit Check Results

Evaluation Date: 04/16/2015 09:38:25 Overall Status: PASS

Evaluation Code	Status	Return Code	Detailed Description
DI_CERT_ALL	PASS		
DI_CERT_BE	PASS		

Container: X10C0402820M1
Type: 1 - 55 gal

Current Status
Extended Status: APPROVED CERT
Container Status: CERTIFICATION DATA APPROVED
Certification Date: 04/15/2015
Waste Handling Code: CH
Disposal Date:

Edit Limit Check Results
Evaluation Date: 04/16/2015 09:38:25 Overall Status: PASS

Evaluation Code	Status
DI_CERT_CERT	PASS
DI_CERT_CHARZ	PASS
DI_CERT_ED	PASS
DI_CERT_EPA	PASS
DI_CERT_PCB	PASS
DI_CERT_PERC	PASS
DI_CERT_TRAMPAC	PASS
DSA	PASS
WAC	PASS
WAP_CERT	PASS

TRAMPAC Evaluation Results
Evaluation Date: 04/16/2015 09:38:26 Overall Status: PASS

Evaluation Code	Status	Return Code	Detailed Description
CE_ACT	PASS		
CE_ALL	PASS		
CE_ASP	PASS		
CE_DDH	PASS		
CE_FGE	PASS		
CE_FIL	PASS		
CE_GVE	PASS		
CE_RDR	PASS		
CE_TRU	PASS		
CE_WGT	PASS		

Container: X10C0402820M1
Type: 1 - 55 gal

Current Status

Extended Status: APPROVED CERT
Container Status: CERTIFICATION DATA APPROVED
Certification Date: 04/15/2015
Waste Handling Code: CH
Disposal Date:

TRAMPAC Evaluation Results

Evaluation Date: 04/16/2015 09:38:26 Overall Status: PASS

Details

Matrix Depleted Shipping Category:	3001090084	Compliance Method:	ANALYTICAL
Decay Heat Limit (w):	0.16892226890756304	FGE Limit (g):	200
FGGR (mol/s):	1.1664539292675355E-8	FGGR Limit (mol/s):	5.952380952380953E-8
Volume Model:		Required Aspiration Time (days):	
Total Headspace VOCs (ppm):	102.84	DAC Scenario:	3
Packaging Configuration:	COMMON_PACKAGING 2		
Closure Time (days):	0	Minimum Closure Time Applied (days):	53
Sample-Vent Time (days):	105	Min Sample-Vent Time Applied (days):	9
TFGVC in ICL (mol fr):		MLEL (mol fr):	0.05

QA

History

Event Date/Time	Container Number	Event Description	Reason
03/17/2015 15:41:16	X10C0402820M1	SUCCESSFUL SUBMISSION FOR CERT VIA THE WEB SERVICE	
03/17/2015 15:50:57	X10C0402820M1	APPROVED FOR CERT	
03/27/2015 11:46:15	X10C0402820M1	RESET TO PRESUBMITTAL CERT	Change Comment
03/27/2015 11:47:47	X10C0402820M1	SUCCESSFUL SUBMISSION FOR CERT	
03/27/2015 12:06:21	X10C0402820M1	APPROVED FOR CERT	
03/30/2015 14:22:59	X10C0402820M1	RESET TO PRESUBMITTAL CERT	Reupload from IDC for Record Purposes

Container: X10C0402820M1
Type: 1 - 55 gal

Current Status

Extended Status: APPROVED CERT
Container Status: CERTIFICATION DATA APPROVED
Certification Date: 04/15/2015
Waste Handling Code: CH
Disposal Date:

History

Event Date/Time	Container Number	Event Description	Reason
04/02/2015 15:47:32	X10C0402820M1	SUCCESSFUL SUBMISSION FOR CERT VIA THE WEB SERVICE	
04/02/2015 16:05:29	X10C0402820M1	APPROVED FOR CERT	
04/15/2015 16:11:19	X10C0402820M1	RESET TO PRESUBMITTAL CERT	Changing rigid liner option
04/16/2015 09:38:29	X10C0402820M1	SUCCESSFUL SUBMISSION FOR CERT VIA THE WEB SERVICE	
04/16/2015 10:17:40	X10C0402820M1	APPROVED FOR CERT	

DIVIDER

PAGE

Waste Characterization Case File:

including AK tracking spreadsheet for vent/closure dates, Container Information Summary (CIS), IDC spreadsheet printout, excerpts from data sources, and WWIS/WDS Waste Container and canister Data Reports for…

Container: X10C0501703A

(a 55 gal CH S5400 waste category debris container)

WDS WCA/WCO CERTIFICATION PACKAGE
CH ORNL Audit - April 19-24, 2016

1. AK Tracking Spreadsheet to obtain vent/closure date
   a. X10C0401623A (OR-CHEM-CH-HET, Lot 6)
   b. X10C0402820M1 (OR-REDC-CH-HET, Lot 58)
   c. X10C0501703A (OR-REDS-CH-HET, Lot 77)

CH Package for X10C0401623A (WS OR-CHEM-CH-HET)

1. Container Information Summary (CIS) – CCP Correlation of Container Identification Numbers to Batch Data Report Numbers – Lot 6
2. NCR Verification from QA
3. IDC Container Summary
4. IDC Spreadsheet
5. RAD Survey
6. RTR Data
7. NDA Data
8. Flam Gas Data & Filter information
9. WDS Waste Container Data Report

CH Package for X10C0402820M1 (WS OR-REDC-CH-HET)

1. Container Information Summary (CIS) – CCP Correlation of Container Identification Numbers to Batch Data Report Numbers – Lot 58
2. NCR Verification from QA
3. IDC Container Summary
4. IDC Spreadsheet
5. RAD Survey
6. VE Data
7. NDA Data
8. Flam Gas Data & Filter information
9. WDS Waste Container Data Report

WDS WCA/WCO CERTIFICATION PACKAGE
CH ORNL Audit - April 19-21, 2016
(Continued)

CH Package for X10C0501703A (WS OR-REDC-CH-HET)

1. Container Information Summary (CIS) – CCP Correlation of Container Identification Numbers to Batch Data Report Numbers – Lot 77
2. NCR Verification from QA
3. IDC Container Summary
4. IDC Spreadsheet
5. RAD Survey
6. VE Data
7. NDA Data
8. Flam Gas Data & Filter information
9. WDS Waste Container Data Report

CCP Correlation of Container Identification Numbers to Batch Data Report Numbers

Waste Stream: # OR-REDC-CH-HET Lot # 77

Container ID Number	Historical Container ID	NDA BDR	RTR BDR	VE BDR	Load/Manage Overpack Yes	Transportation Headspace Gas	
						FGA	GGT
X10C0201074A	N/A	OR-MILCC2-0096	N/A	ORVECH0014	No	OR14FG8137	N/A
X10C0402911F	N/A	OR-MILCC2-0145	OR-RTR6-0441	N/A	No	OR14FG8015	N/A
X10C0402977G	N/A	OR-IQ3-0237	OR-RTR6-0441	N/A	No	OR15FG8069	N/A
X10C0501703A	N/A	OR-MILCC2-0174	N/A	ORVECH0068	No	OR15FG8051	N/A
X10C9306659A	N/A	OR-MILCC2-0080	N/A	ORVECH0084	No	OR14FG8118	N/A
X10C9309968A	N/A	OR-MILCC2-0163	N/A	ORVECH0011	No	OR15FG8036	N/A
X10C9310044A	N/A	OR-MILCC2-0111	N/A	ORVECH0018	No	OR14FG8153	N/A
X10C9312455A	N/A	OR-MILCC2-0165	N/A	ORVECH0011	No	OR15FG8037	N/A
X10C9312488A	N/A	OR-MILCC2-0167	N/A	ORVECH0060	No	OR15FG8039	N/A
X10C9312565A	N/A	OR-IQ3-0452	N/A	ORVECH0058	No	OR15FG8019	N/A
X10C9600491A	N/A	OR-MILCC2-0165	N/A	ORVECH0033	No	OR15FG8042	N/A
X10C9601930A	N/A	OR-MILCC2-0165	N/A	ORVECH0028	No	OR15FG8037	N/A
X10C9801088A	N/A	OR-MILCC2-0163	N/A	ORVECH0031	No	OR15FG8036	N/A
X10C9801096A	N/A	OR-MILCC2-0165	N/A	ORVECH0010	No	OR15FG8042	N/A
X10CSATN02260H	N/A	OR-MILCC2-0036	OR-RTR6-0441	N/A	No	OR14FG8022	N/A
X10CSATN02285J	N/A	OR-MILCC2-0069	OR-RTR7-0027	N/A	No	OR14FG8106	N/A
X10CSATN02870D	N/A	OR-MILCC2-0081	OR-RTR7-0065	N/A	No	OR14FG8121	N/A
X10CSATN03224A	N/A	OR-MILCC2-0147	N/A	ORVECH0091	No	OR15FG8021	N/A

Signature of Site Project Manager | Roger Whiteaker (Printed Name) | 03/03/2016 (Date)

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NCR Verification from QA
ORNL CH Audit April 19-21, 2016

Container ID: X10C0501703A

Container Status	Status Date	Status User
Ready	01/15/2016	Lot System
QA Ready	01/15/2016	Lot System
CO For Entry	03/22/2016	Helen Pettus
Entered	03/22/2016	Helen Pettus
CO For Validation	03/22/2016	Carolina Soaterna
Validated	03/22/2016	Carolina Soaterna
CO For Certification	03/23/2016	Ryan Martin
Sent To QA	03/23/2016	Ryan Martin
QA Certified	03/23/2016	Laura Jones
Certified	03/23/2016	Ryan Martin
WDS Uploaded	03/23/2016	Ryan Martin

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CONTAINERID: X10C0501703A

ORNL

AK DATA

Container ID	Container Type	AKA Matrix	WDS Status	AK Excluded	WSID	LOTID	LOT Excluded
X10C0501703A	55G		APPROVED_CERT	NO	OR-REDC-CH-HET	OR-REDC-CH-HET-Lot 77 (OR-REDC-CH-HET-Lot 77)	

BDR DATA

BDRID	Type	Status	Generation Date
OR-MILCC2-0174	NDA	Complete	2015-04-23
OR15FG8051	HSG_TRANS	Complete	2015-05-07
ORVECH0068	VE	Complete	2011-02-02

NCR DATA

Container ID	NCRID	Status	Release Code
X10C0501703A	NCR-ORNL0295150	Closed	Resolved

REJECT DATA

Container ID	BDRID	NCRID	NCR Status	Release Code	Actual Condition
X10C0501703A	N/A	NCR-ORNL0295150	Closed	Resolved	The drum in box 3 exceeded 90% dead time.

IDC 2.13 SCO 1029 Addendum 49	Units	data	comments									
Shipper Site ID		C6	Location ID	Dest Program ID	Shipping Purpose	AK Report	AK Revision		X10C0501703A			
Waste Stream Profile		OR-REDC-CH-HET	OR	WI	D	CCP-AK-ORNL-002	0					
Container Number		X10C0501703A				Cur Ref AK Rev:	0					
Container Type		55GD						U-235 FEM	U-235 FEM Uncert	FGGR Flag	FGGR Test Period	
WAC Rev #		7.4						NULL	NULL	N		
Cert Site		C6					Be mass<=100 g	Be <= 1%	Be Present	Aqueous Material	Compacted Wst	
Cert Date		03/23/2016					Y	Y	Y	N	N	
Waste Handling Code		CH										
Waste Type Code		MTRU	TRU, MTRU									
Waste Stream BIR ID		OR-W203										
Waste Stream MWIR ID		NONE										
Generator Site ID		OR										
IDC Code		NONE										
Matrix Code		S5400										
Trucon Code		OR225C										
Shipping Category		3003400084	> 0.012 Watt-years									
Tru Alpha Act	Ci	1.40E-01		1.40E-01								
Tru Alpha Act Uncert	1sigma Ci	2.21E-02	1.84E-01	Tru Alpha Act + 2sigma (Ci)								
Tru Alpha Act Conc	nCi/g	1.81E+03						Drum Weight	27.8			
Pu239 Fiss Gm Eq	g	9.76E-03		9.65E-03				PP	1			
Pu239 Fiss Gm Eq Uncert	1sigma g	1.32E-03	1.24E-02	Pu239 Fiss Gm Eq + 2sigma (Ci)				CP	4.4			
Pu239 Eq Act	Ci	1.40E-01		1.40E-01				LP				
Decay Heat	watts	4.68E-03		4.70E-03				SL				
Decay Heat Uncert	1sigma watts	7.36E-04	5.42E-03	Decay Heat + 1sigma (watts)								
Layers of Packaging		1										
Fill Factor		95	percentage	Liner Lid Present	N							
Liner Type			1 = plastic drum liner									
Liner Punctured				Liner Hole Size								
PCB Conc		NULL		(mm)		PCB Waste	PCB Mass (kg)	Out of Service				
Closure Date		02/01/2011	Watt-years	Waste Gen Date								
Vent Date		02/01/2011	0.024050263	NULL								
Filter Install Date		02/01/2011			Filter Reduction Date							
Filter Model Number		U9424X			Reduced Filter Model							
Number of Filters Installed		1										
Aspiration Method ID		N										
Gas Gen Rate			1.91E-09	<<Gas Gen Rate Calculated								
Hydrogen/Methane Gen Rate												
Gas Gen Comp Date				Waste (kg)	Packaging (kg)	Total (kg)						
Gross Weight	kg	110.6		77.4	33.2	110.6						
Gross Weight Uncert	1sigma kg	2.3										
Alpha Surf Cont	dpm/100 cm^2	19										
Beta/Gamma Surf Cont	dpm/100 cm^2	199										
Neutron Dose Rate	mrem/hr	0.5										
Beta/Gamma Dose Rate	mrem/hr	9										

Radionuclide		SR-90	CS-137	RA-226	PA-231	U-233	U-234	U-235	NP-237	PU-238	U-238
Activity	Ci	9.36E-03	5.42E-04	1.19E-06	3.69E-04	-1.00E+00	-1.00E+00	0.00E+00	1.61E-05	-1.00E+00	-1.00E+00
Activity Uncert	1sigma Ci	1.43E-03	8.27E-05	4.31E-07	5.61E-05	-1.00E+00	-1.00E+00	0.00E+00	2.52E-06	-1.00E+00	-1.00E+00
Mass	grams	6.78E-05	6.24E-06	1.20E-06	7.81E-03	-1.00E+00	-1.00E+00	0.00E+00	2.29E-02	-1.00E+00	-1.00E+00
Mass Uncert	1sigma grams	1.04E-05	9.40E-07	4.31E-07	1.17E-03	-1.00E+00	-1.00E+00	0.00E+00	3.53E-03	-1.00E+00	-1.00E+00

Radionuclide		PU-239	PU-240	AM-241	PU-241	PU-242	AM-243	CM-244	CM-245	CF-249
Activity	Ci	-1.00E+00	-1.00E+00	1.39E-01	0.00E+00	-1.00E+00	9.76E-05	0.00E+00	0.00E+00	7.87E-04
Activity Uncert	1sigma Ci	-1.00E+00	-1.00E+00	2.21E-02	0.00E+00	-1.00E+00	1.51E-05	0.00E+00	0.00E+00	1.20E-04
Mass	grams	-1.00E+00	-1.00E+00	4.06E-02	0.00E+00	-1.00E+00	4.88E-04	0.00E+00	0.00E+00	1.92E-04
Mass Uncert	1sigma grams	-1.00E+00	-1.00E+00	6.37E-03	0.00E+00	-1.00E+00	7.48E-05	0.00E+00	0.00E+00	2.90E-05

Waste Material Parameters		IM	AM	OM	OI	C	R	XPM	OR
Wgt of Mat Parms	kg	12.90	0.50	3.30	43.10	4.80	1.20	11.50	0.10
Radio Assay Method		16MILCC2	PAN, FRAM, TGS, HENC						
Data Package Number		OR-MILCC2-0174							
Assay Date		04/23/2015							
Charz Method ID		16VE1	RTRM, VISUAL						
Data Package Number		ORVECH0068							
Charz Method Date		02/01/2011							

Haz Codes		F002	D008	D007	D011	F005	D004	D005	D006	D009	D010
Haz Codes		D019									

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Sample ID	Headspace Gas HM	X10C0501703A
Sample Type		HGHM-T
Sample Type		HGVO-T
Layer No. Sampled		0
Date Sampled		05/07/2015
Method ID		16HG2
Data Package Number		OR15FG8051

Sample Site
C6

CAS #		1333-74-0	74-82-8	67-56-1	60-29-7	75-35-4	67-64-1	75-34-3	156-59-2	78-93-3	110-82-7
Analyte		Hydrogen	Methane	Methanol	Ethyl ether	1,1-Dichloroethylene	Acetone	1,1-Dichloroethane	cis-1,2-Dichloroethylene	Methyl ethyl ketone	Cyclohexane
Concentration		514.74	213.4	178.57	1.25	5.71	16.9	4.24	0.55	9.86	5.84
Date Analyzed		05/07/2015	05/07/2015	05/07/2015	05/07/2015	05/07/2015	05/07/2015	05/07/2015	05/07/2015	05/07/2015	05/07/2015
D Detectable Flag											
U Detectable Flag			U		U	U	U	U	U	U	U
NA Detectable Flag		NA		NA							

CAS #		71-43-2	107-06-2	71-36-3	108-10-1	108-88-3	108-90-7	100-41-4	108-38-3/106-42-3	95-47-6	108-67-8
Analyte		Benzene	1,2-Dichloroethane	Butanol	Methyl isobutyl ketone	Toluene	Chlorobenzene	Ethyl benzene	m,p-Xylene	o-xylene	1,3,5-Trimethylbenzene
Concentration		0.74	2.1	1.36	9.34	3.09	1.69	2.69	4.1	1.76	3.14
Date Analyzed		05/07/2015	05/07/2015	05/07/2015	05/07/2015	05/07/2015	05/07/2015	05/07/2015	05/07/2015	05/07/2015	05/07/2015
D Detectable Flag											
U Detectable Flag				U	U	U	U			U	U
NA Detectable Flag		NA	NA					NA	NA		

CAS #		95-63-6
Analyte		1,2,4-Trimethylbenzene
Concentration		3.92
Date Analyzed		05/07/2015
D Detectable Flag		
U Detectable Flag		U
NA Detectable Flag		

		Requirements Met?
Free liquids <1% by volume		YES
No non-rad. pyrophorics		YES
Chemical compatability		YES
No explosives		YES
No corrosives		YES
No pressurized containers		YES
No sealed Containers >4 liters		YES
Liner punctured/ filtered		YES
Flammable VOCs <500ppmv		YES
Container is in Approved Waste Stream Profile Form?	OR-REDC-CH-HET	YES
Can it be established through Process Knowledge that the concentration of flammable VOCs present in the headspace of the container is <= 500 ppm?		NO

V&V Initials	Date
HP/CS	3/22/2016

Ryan Martin
CCP Certification Official

Date

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Radiation & Contamination Survey Form

CM-P-RP-306 Rev. 6, Radiation/Contamination Surveys

SURVEY NO: 11-SUR-00509

PAGE 1 OF PAGES

Instruments Used

Instrument Type	Serial Number	Cal Due Date	Alpha Eff.	Beta Eff.
LM 12-4 / LM 42-31	215335 / 215335	09/16/11	N/A	N/A
LM-2360 / 43-93	268510 / 286570	11/01/11	23.47%	21.12%
LM-3 / 44-38	245361 / 260035	05/18/11	N/A	N/A
LM-3030E / LM-3030	259088 / 259088	09/22/11	36.9	26.5
LM-3030E / LM-3030	259093 / 259093	05/14/11	35.57%	26.99%
REM 500 / REM 500	409 / 409	04/23/11	N/A	N/A

LOCATION / TYPE: CHGB Drum Out

PURPOSE: Job Coverage

DATE/TIME: 02/01/11 7:37

RWP/ALARA: 11-TRU-007

		Station #	3		1							
		Drum ID	x10c0501703a		x10c0502640							
Gamma Dose Rate (mR/hr)		OC	9		<0.1							
		30 cm	2		↓							
		1m	0.5		↓							
Neutron Dose Rate (mrem/hr)		OC	<0.5		<0.5							
		30 cm	↓		↓							
		1m	↓		↓							
			α	β	α	β	α	β	α	β	α	β
LAS (dpm/probe)		Umbilical Cut	<100	<1K	<100	<1K						
		Tool										
		Drum										
		Cart										
		Station										
Smears (dpm/100 cm²)		Lid	<25	<200	<20	<200						
		Lid Ring										
		Drum										
		Cart										
		Station										
		Sleeve Ring										

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✱On Contact (OC) or OC/30cm (#) Smear [#] LAS ⟨#⟩ Direct

REMARKS: All dose rates in mR/hr gamma and mrem/hr neutron unless otherwise noted. LAS in dpm/probe, smears in dpm/100 sq. cm.

VERIFIED STATION 3 <10 E³ dpm α PRIOR TO DRUM OUT. SEE 11-SUR-0518 - FOR SURVEY RESULTS

RCT SIGNATURE: Steve Thompson

RCO SIGNATURE:

Date: 2/1/11

The signature(s) on this sheet are that of the responsible technician(s) who certify that the data recorded represent the readings, measurements, and/or observations at the time indicated.

Attachment 2 – CCP Waste Visual Examination Data Form Page 1 of 5

Batch Data Report No.: ORVECH0068

Section 1: Output Waste Container Data		
Input Waste Container ID, as applicable: X10C0501703		
Output Waste Container ID: X10C0501703A	Waste Stream ID: OR-REDC-CH-HET	
Container Type: 55 GALLON	TRUCON Code: OR 125/225	Waste Matrix Code: S5400
Audio/Video Media Recording Number: ☑ N/A		
Waste Container Weights: Tare Wt: 33.2 kg.	Gross Wt: 110.6 kg.	
Rigid Liner Present? ☑ NO ☐ YES Type of Liner: ☐ Lead ☐ Plastic ☐ Fiberboard ☐ Other: Thickness: ☐ 30-mil ☐ 90-mil ☐ 110-mil ☐ 125-mil	Rigid Liner Lid Present? ☑ NO ☐ YES Rigid Liner Lid is Vented (>0.3 in.) or Filtered? ☐ NO ☐ YES ☑ N/A ☐ Vented: Hole Size: ☑ N/A ☐ Filtered: Model No: ☑ N/A Serial No.: ☑ N/A	
Bag Liner Present? ☐ NO ☑ YES	Volume Utilization Percentage: 95 %	
Does the physical form of the waste match the Waste Stream Description (i.e., Homogeneous Solids, Soil/Gravel, or Debris Waste [including uncategorized metals])? ☐ NO ☑ YES		
Does the physical form of the waste match the Waste Matrix Code? ☐ NO ☑ YES		
Closure Method: TTF Number of Layers of Confinement: ONE		
Filter Torque Wrench Serial/ID No.: WIPP122 Calibration Due Date: 05/04/11 Filter: Model No.: UT9424X-00213 Serial No.: 0187 Torque Value: 72 IN. LBS.	Lid Ring/Bolt Torque Wrench Serial/ID No.: WIPP112 Calibration Due Date: 04/19/11 Lid Ring/Bolt Torque Value: 60 FT. LBS.	
Is total dose rate greater than 200mrem/hr? ☑ NO ☐ YES		
NCR(s) associated with the output container? ☑ NO ☐ YES NCR No.: N/A NCR No.: N/A		
Comments: This drum contains a cardboard insert, weight is accounted for in Attachment 2, Section 3; Others (C).		

017

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Attachment 2 – CCP Waste Visual Examination Data Form (continued) Page 2 of 5

Batch Data Report No.: ORVECH0068 **Date:** 02/01/11

Examination Location: ORNL, RM 231, TWPC

Section 2: Waste Package Data

Package and Package PCI Number (as applicable)	Waste Description	WMP [Table 3]	Weight (kg) [Table 4,[a]]	Weighing Code(s) [Table 4[b]]
N/A	GLOVES, SHEETING, TAPE, LIDS, BAG OUT STUBS w/bungees, ZIP TIES, LABWARE, BOOTIES, OPEN BOTTLES, TAG	PW	11.5	E
N/A	CARDBOARD, TAPE, GLOVES, PAPER, SHEET, OPEN CARTON, OPEN VACUUM BAG	C	4.8	E
N/A	BROKEN GLASS, OPEN BOTTLES, LABWARE, LENS	OI	43.1	E
N/A	HARDWARE, HAND TOOL, OPEN CANS, LIDS, PLATES, RODS, PROBE, DISCS	IM	12.9	E
N/A	FOIL, ROD, HARDWARE	AM	0.5	E
N/A	GLOVES, BELT, ASPIRATOR BULBS	R	1.2	E
N/A	ABSORBENT	OR	0.1	E

N/A	N/A	N/A
VEO 1: Print Name	Signature	Date
N/A	N/A	N/A
VEO 2: Print Name	Signature	Date

Signatures annotate the absence of prohibited items.

Output Waste Container ID: X10C0501703A

TID/LOCK Number Removed: N/A **TID/LOCK Number Applied:** N/A

N/A	N/A	N/A
VEO 1: Print Name	Signature	Date
N/A	N/A	N/A
VEO 2: Print Name	Signature	Date

Signatures of VEO's verifying the loading of the Output Waste Container.

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Attachment 2 – CCP Waste Visual Examination Data Form (continued) Page 2 of 5

Batch Data Report No.: ORVECH0068 **Date:** 02/01/11

Examination Location: ORNL, RM 231, TWPC

Section 2: Waste Package Data

Package and Package PCI Number (as applicable)	Waste Description	WMP [Table 3]	Weight (kg) [Table 4.[a]]	Weighing Code(s) [Table 4[b]]
N/A	SENSOR w/cord, LEAD TAPE, PIG LIDS, STRIP	OM	3.3	E

N A Pwf 02/01/11

N/A	N/A	N/A
VEO 1: Print Name	Signature	Date
N/A	N/A	N/A
VEO 2: Print Name	Signature	Date

Signatures annotate the absence of prohibited items.

Output Waste Container ID: X10C0501703A

TID/LOCK Number Removed: N/A **TID/LOCK Number Applied:** N/A

N/A	N/A	N/A
VEO 1: Print Name	Signature	Date
N/A	N/A	N/A
VEO 2: Print Name	Signature	Date

Signatures of VEO's verifying the loading of the Output Waste Container.

019

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Attachment 2 – CCP Waste Visual Examination Data Form (continued) Page 3 of 5

Batch Data Report No.: ORVECH0068

Output Waste Container ID: X10C0501703A

Section 3: Packaging Material and Waste Material Parameters	
Packaging Material:	Estimated Weight (kg)
Steel (ST):	27.8
Plastics (PP):	1.0
Others (C):	4.4
Total Packaging Weight:	33.2
Waste Material Parameter:	Estimated Weight (kg)
Iron-based Metal/Alloys (IM):	12.9
Aluminum-based Metals/Alloys (AM):	0.5
Other Metals (OM):	3.3
Other Inorganic Materials (OI):	43.1
Cellulosics (C):	4.8
Rubber (R):	1.2
Plastics (waste materials) (PW):	11.5
Organic Matrix (OR):	0.1
Inorganic Matrix (IN):	0.0
Soils (S):	0.0
Total WMP Weight:	77.4

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020

Attachment 2 – CCP Waste Visual Examination Data Form (continued) Page 4 of 5

Batch Data Report No.: ORVECH0068 **Output Waste Container ID:** X10C0501703A

Section 4: Prohibited Item(s) Summary (Questions answered "YES" will be explained in the Comments block.)			
	Yes	No	N/A
Is there liquid in the container?	☐	☑	
Is there any observable liquid in internal containers, that is more than 60 milliliters or 3 percent by volume, whichever is greater.	☐	☐	☑
Is the total volume of observable liquid in the outermost container **GREATER** than 1% of the container?	☐	☐	☑
Is there detectable observable liquid in outermost containers with an EPA Hazardous Waste Number of U134?	☐	☑	
Is there an indication of non-radionuclide pyrophoric materials, such as elemental potassium?	☐	☑	
Is there an indication of hazardous wastes not occurring as co-contaminants with TRU mixed wastes (non-mixed hazardous wastes)?	☐	☑	
Is there an indication of wastes incompatible with backfill, seal and panel closures materials, container and packaging materials, shipping container materials, or other wastes (i.e., waste does **NOT** match TRUCON Code[s])?	☐	☑	
Is there an indication of wastes containing explosives or compressed gases?	☐	☑	
Is there PCB liquids present?	☐	☑	
Is there an indication of the waste exhibiting the characteristic of ignitability, corrosivity, or reactivity (EPA Hazardous Waste Numbers of D001, D002, or D003)?	☐	☑	
Is the physical form of the waste inconsistent with the Waste Stream Description or the Waste Matrix Code?	☐	☑	
TRUPACT-II Criteria			
Are there heat-sealed bags (unvented) **GREATER** than 4 liters and LESS than 390 square inches in the waste?	☐	☑	
Were there Non-approved Closure Methods used on liner bags or inner bags greater than 4 liters?	☐	☑	
Are there sealed containers **GREATER** than 4 liters?	☐	☑	
Are there indications of inadequate protection (blocked or braced) for heavy and/or sharp objects?	☐	☑	

021

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Attachment 2 – CCP Waste Visual Examination Data Form (continued) Page 5 of 5

Batch Data Report No.: ORVECH0068 **Output Waste Container ID:** X10C0501703A

Section 4: Prohibited Item(s) Summary (Continued)

(Questions answered "YES" will be explained in the Comments block)

Comments:

N/A

Section 5: Approvals

Visual Examination Operator 1: Paul Gambill Print Name	Paul w Gambill Signature	02/01/11 Date
Visual Examination Operator 2: Gary Ward Print Name	Gary Ward Signature	02/01/11 Date

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********** Radioassay Data Sheet **********

Engine Version: TMU Gamma 1.5 SS

Count Sequence Number: 2719 Batch Number: OR-MILCC2-0174
Assay Instrument: MV MILCC2 Location: ORNL
Analysis Method: CCP-TP-076, R 1 Software Version: NDA 2000 V.4.0
Item ID: X10C0501703A Assay Start: 4/23/2015 1:07:06 PM
GW:110.6 kg TW: 33.2 kg NW: 77.4 kg Fill: 95 % WS:OR-REDC-CH-HET-PDL

NID identified fiducial nuclide AM-241
Source of isotopics: DECLARED

Density	0.392 kg /l		
Pu mass	0.00E+000 +-	0.00E+000	g
TRU Alpha Activity	1.40E-001 +-	2.21E-002	Ci
TRU Activity Concentration	1.81E+003 +-	2.86E+002	nCi/g
Pu-239 Equivalent Activity	1.40E-001 +-	2.21E-002	Ci
Pu-239 FGE	9.76E-003 +-	1.32E-003	g
Decay heat	4.68E-003 +-	7.36E-004	W
NNSS PE-g: 1.39E+001 g	NNSS U-235 FGE:	1.35E-002	g

Nuclide	Mass g	Activity Ci	Activity Uncert. Ci	MDA Ci
SR90	6.78E-005	9.36E-003	1.43E-003	0.00E+000
CS137	6.24E-006	5.42E-004	8.27E-005	1.03E-006
RA226	1.20E-006	1.19E-006	4.31E-007	1.01E-006
PA231	7.81E-003	3.69E-004	5.61E-005	5.81E-006
U233	<LLD	<LLD	0.00E+000	1.17E-002
U234	<LLD	<LLD	0.00E+000	0.00E+000
U235	0.00E+000	0.00E+000	0.00E+000	2.24E-006
NP237	2.29E-002	1.61E-005	2.52E-006	2.40E-006
PU238	<LLD	<LLD	0.00E+000	1.42E-001
U238	<LLD	<LLD	0.00E+000	1.89E-005
PU239	<LLD	<LLD	0.00E+000	2.56E-002
PU240	<LLD	<LLD	0.00E+000	3.42E-001
AM241	4.06E-002	1.39E-001	2.21E-002	1.47E-004
PU241	0.00E+000	0.00E+000	0.00E+000	7.47E-001
PU242	<LLD	<LLD	0.00E+000	0.00E+000
AM243	4.88E-004	9.76E-005	1.51E-005	7.35E-006
CM244	0.00E+000	0.00E+000	0.00E+000	1.43E-001
CM245	0.00E+000	0.00E+000	0.00E+000	1.34E-005
CF249	1.92E-004	7.87E-004	1.20E-004	2.11E-006

Errors quoted at 1.000 sigma

Operator: **Chad Gerlock** Date: 4/27/15

ITR: **Ronald Whitson** Date: 4/28/2015

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Automated Independent Technical Review

Count Sequence Number:	2719	Batch Number:	OR-MILCC2-0174
Assay Instrument:	MV MILCC2	Location:	ORNL
Analysis Method:	CCP-TP-076, R 1	Software Version:	NDA 2000 V.4.0
Item ID:	X10C0501703A	Assay Start:	4/23/2015 1:07:06 PM

MGA Analysis:

Results are marked as invalid.

DISPOSITION: No measured isotopics are available. No Pu isotopes identified, therefore declared PDL isotopics cannot be applied. Am-241 is the fiducial nuclide. Cf-249 is identified, but Cf-251 is not identified. Cf-249 presence is therefore attributed to decay of Bk-249, and Cf isotopic distribution is not applied.

Gamma Analysis:

Analysis Status: No errors.

DISPOSITION: OK

Segment Data Review:

DISPOSITION: OK

Miscellaneous:

DISPOSITION: No additional radionuclides contributing to 95% of the radiological hazard identified.

Expert Review by: Kevin Meyer Date: 4/24/15

K.E.Meyer

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Attachment 4 – Flammable Gas Analysis Form

SCO 1049 Add 4 - Win XP SP3/Win 7 SP1
Excel 2003/2007/2010

Waste Container ID: **X10C0501703A**

BDR Number: **OR15FG8051**

Sampling Date: **5/7/2015**

CAS NUMBER	COMPOUND	Measured ppmv	Reporting Flag
1333-74-0	Hydrogen	514.74	
74-82-8	Methane	213.40	U
67-56-1	Methanol	178.57	
60-29-7	Ethyl Ether	1.25	U
75-35-4	1,1-Dichloroethylene	5.71	U
67-64-1	Acetone	16.90	U
75-34-3	1,1-Dichloroethane	4.24	U
156-59-2	cis-1,2-Dichloroethene	0.55	U
78-93-3	Methyl ethyl ketone	9.86	U
110-82-7	Cyclohexane	5.84	U
71-43-2	Benzene	0.74	
107-06-2	1,2-Dichloroethane	2.10	
71-36-3	1-Butanol	1.36	U
108-10-1	Methyl isobutyl ketone	9.34	U
108-88-3	Toluene	3.09	U
108-90-7	Chlorobenzene	1.69	U
100-41-4	Ethylbenzene	2.69	
108-38-3/106-42-3	m- and p-Xylene	4.10	
95-47-6	o-Xylene	1.76	U
108-67-8	1,3,5-Trimethylbenzene	3.14	U
95-63-6	1,2,4-Trimethylbenzene	3.92	U

CAS Number	IDENTIFIED TIC COMPOUND	Est. Amount ppmv
N/A	N/A	N/A
N/A	N/A	N/A
N/A	N/A	N/A
N/A	N/A	N/A
N/A	N/A	N/A
N/A	N/A	N/A
N/A	N/A	N/A
N/A	N/A	N/A

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BDR Number: OR15FG8051

	Waste Container ID	8 Filter Model Number	9 Hydrogen Diffusivity of Filter (mol/s/mf)	10 Package Configuration Group Number	11 Closure Date	12 Vent Date	13 Required DAC Value (in days)	14 Drum Age (in days)	15 Can this container be sampled?
1	X10C0501703A	UltraTech-9424X	1.85E-05	3	2/1/2011	2/1/2011	12	1556	Y
2	X10CSATN01937AR	UltraTech-9424X	1.85E-05	3	10/13/2011	10/13/2011	12	1302	Y
3	X10CSATN02071K	UltraTech-9424X	1.85E-05	3	3/7/2011	3/7/2011	12	1522	Y
4	X10CSATN02446P	UltraTech-9424X	1.85E-05	3	3/8/2011	3/8/2011	12	1521	Y
5	X10CSATN02698G	UltraTech-9424X	1.85E-05	3	9/15/2010	9/15/2010	12	1695	Y
6	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
7	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
8	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
9	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
10	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
11	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
12	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
13	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
14	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
15	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
16	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
17	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
18	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
19	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
20	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

COPY 3

Operator: Carmel Byrd
Printed Name

C Byrd
Signature

5-7-15
Date

Waste Isolation Pilot Plant
Container Data Report

Report Statistics

Report Version:	**2.5.4**
WDS Instance:	**prd05.wipp.carlsbad.nm.us**
Generated on:	**April 19, 2016 04:28 PM**
Generated by:	**KIRKES, CRETA**
Total Pages:	**9**

Selection Criteria

Container Number: **X10C0501703A**

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Container: X10C0501703A
Type: 1 - 55 gal

Current Status

Extended Status: APPROVED CERT
Container Status: CERTIFICATION DATA APPROVED
Certification Date: 03/23/2016
Waste Handling Code: CH
Disposal Date:

Current Location Site: OR
Generator Site: OR
Destination Site ID: WI

Certification Program ID: C6
Shipping Program ID: C6

Neutron Dose Rate (mrem/hr): 0.5
Beta Gamma Dose Rate (mrem/hr): 9.0
Total Dose Rate (mrem/hr): 9.5

FGE (g): 9.76E-03
FGE Uncertainty (g): 1.32E-03

Gross Weight (kg): 111.00
Gross Weight Uncert (kg): 2.30

Decay Heat (W): 4.68E-03
Decay Heat Uncertainty (W): 7.36E-04

Certification Data Values

Waste Stream Profile Code: OR-REDC-CH-HET
Waste Type Code: MTRU
IDC Code: NONE
Waste Matrix Code: S5400
WAC Revision Number: 7.4
Fill Factor (%): 95.00
Waste Stream BIR ID: OR-W203
Waste Stream MWIR ID: NONE

TRU Alpha Activity (Ci): 1.4E-01
TRU Alpha Activity Uncertainty (Ci): 2.21E-02
TRU Alpha Activity Concentration (Ci/g): 1.81E-06
PU-239 Equivalent Activity (PE-Ci): 1.4E-01
Alpha Surface Contamination (dpm/cm^2): 19.0
Beta/Gamma Surface Contamination (dpm/cm^2): 199.0

Transportation Data Values

Closure Date: 02/01/2011
Vent Date: 02/01/2011
Process Knowledge? N

TRUCON Code: OR225C
Shipping Category: 3003400084
Aspiration Method: N

Shipment Purpose: DISPOSAL
Machine Compacted? N
Liner Exists? N
Liner Hole Size(mm):
Liner Lid Present?
Layers of Packaging 1
Aqueous Material? N

Gas Generation Data Values

Measured FGGR (mol/s)	Measured TGRR (mol/s)	Truncated FGGR Test (Y/N)	Truncated FGGR Test Period (days)
		N	

COPY

Container: X10C0501703A
Type: 1 - 55 gal

Current Status

Extended Status: APPROVED CERT
Container Status: CERTIFICATION DATA APPROVED
Certification Date: 03/23/2016
Waste Handling Code: CH
Disposal Date:

PCB Waste? N
PCB Mass (kg):
PCB Concentration (ppm):
PCB Out of Service Date:
Be Present? Y
Be <= 1% by weight? Y
Be mass <= 100kg? Y
Separation OK?
Packing Fraction (compaction level): non-compacted

Filters

Filter Model Number	Filter Diffusivity (mol/s/ml)	Quantity	Install Date
U9424X	1.85E-05	1	02/01/2011

Certification Comments

Radionuclides

Radionuclide	Activity (Ci)	Activity Uncert (Ci)	Mass (g)	Mass Uncert (g)
AM-241	1.390E-01	2.210E-02	4.060E-02	6.369E-03
AM-243	9.760E-05	1.510E-05	4.880E-04	7.475E-05
CF-249	7.870E-04	1.200E-04	1.920E-04	2.899E-05
CM-244	.000E00	.000E00	.000E00	.000E00
CM-245	.000E00	.000E00	.000E00	.000E00
CS-137	5.420E-04	8.270E-05	6.240E-06	9.398E-07
NP-237	1.610E-05	2.520E-06	2.290E-02	3.534E-03
PA-231	3.690E-04	5.610E-05	7.810E-03	1.174E-03
PU-238	<LLD	<LLD	<LLD	<LLD
PU-239	<LLD	<LLD	<LLD	<LLD
PU-240	<LLD	<LLD	<LLD	<LLD
PU-241	.000E00	.000E00	.000E00	.000E00

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Container: X10C0501703A
Type: 1 - 55 gal

Current Status

Extended Status: APPROVED CERT
Container Status: CERTIFICATION DATA APPROVED
Certification Date: 03/23/2016
Waste Handling Code: CH
Disposal Date:

Radionuclides

Radionuclide	Activity (Ci)	Activity Uncert (Ci)	Mass (g)	Mass Uncert (g)
PU-242	<LLD	<LLD	<LLD	<LLD
RA-226	1.190E-06	4.310E-07	1.200E-06	4.310E-07
SR-90	9.360E-03	1.430E-03	6.780E-05	1.036E-05
U-233	<LLD	<LLD	<LLD	<LLD
U-234	<LLD	<LLD	<LLD	<LLD
U-235	.000E00	.000E00	.000E00	.000E00
U-238	<LLD	<LLD	<LLD	<LLD

Samples

Sample ID	Sample Type Code	Sample Type Description	Sample Date	Layer Sampled
H-X10C0501703A	HGHM-T	HEADSPACE GAS HYDROGEN AND METHANE	05/07/2015	0

Unique Samples

CAS Number	Analyte Description	Concentration (ppm)	Analysis Date	Analysis Method	Reporting Flags
1333-74-0	HYDROGEN	514.74	05/07/2015	16HG2	NA
74-82-8	METHANE	213.4	05/07/2015	16HG2	U

Sample ID	Sample Type Code	Sample Type Description	Sample Date	Layer Sampled
X10C0501703A	HGVO-T	HEADSPACE GAS VOC	05/07/2015	0

Unique Samples

CAS Number	Analyte Description	Concentration (ppm)	Analysis Date	Analysis Method	Reporting Flags
100-41-4	ETHYL BENZENE	2.69	05/07/2015	16HG2	NA

COPY

Container: X10C0501703A
Type: 1 - 55 gal

Current Status

Extended Status: APPROVED CERT
Container Status: CERTIFICATION DATA APPROVED
Certification Date: 03/23/2016
Waste Handling Code: CH
Disposal Date:

Samples

Sample ID	Sample Type Code	Sample Type Description	Sample Date	Layer Sampled
X10C0501703A	HGVO-T	HEADSPACE GAS VOC	05/07/2015	0

Unique Samples

CAS Number	Analyte Description	Concentration (ppm)	Analysis Date	Analysis Method	Reporting Flags
107-06-2	1,2-DICHLOROETHANE	2.1	05/07/2015	16HG2	NA
108-10-1	METHYL ISOBUTYL KETONE	9.34	05/07/2015	16HG2	U
108-67-8	1,3,5-TRIMETHYLBENZENE	3.14	05/07/2015	16HG2	U
108-88-3	TOLUENE	3.09	05/07/2015	16HG2	U
108-90-7	CHLOROBENZENE	1.69	05/07/2015	16HG2	U
108383/106423	M,P-XYLENE	4.1	05/07/2015	16HG2	NA
110-82-7	CYCLOHEXANE	5.84	05/07/2015	16HG2	U
156-59-2	CIS-1,2-DICHLOROETHYLENE	0.55	05/07/2015	16HG2	U
60-29-7	ETHYL ETHER	1.25	05/07/2015	16HG2	U
67-56-1	METHANOL	178.57	05/07/2015	16HG2	NA
67-64-1	ACETONE	16.9	05/07/2015	16HG2	U
71-36-3	BUTANOL	1.36	05/07/2015	16HG2	U
71-43-2	BENZENE	0.74	05/07/2015	16HG2	NA
75-34-3	1,1-DICHLOROETHANE	4.24	05/07/2015	16HG2	U
75-35-4	1,1-DICHLOROETHYLENE	5.71	05/07/2015	16HG2	U
78-93-3	METHYL ETHYL KETONE	9.86	05/07/2015	16HG2	U
95-47-6	O-XYLENE	1.76	05/07/2015	16HG2	U
95-63-6	1,2,4-TRIMETHYLBENZENE	3.92	05/07/2015	16HG2	U

COPY

Container: X10C0501703A
Type: 1 - 55 gal

Current Status

Extended Status: APPROVED CERT
Container Status: CERTIFICATION DATA APPROVED
Certification Date: 03/23/2016
Waste Handling Code: CH
Disposal Date:

Samples

Sample ID	Sample Type Code	Sample Type Description	Sample Date	Layer Sampled
X10C0501703A	HGVO-T	HEADSPACE GAS VOC	05/07/2015	0

Unique Samples

CAS Number	Analyte Description	Concentration (ppm)	Analysis Date	Analysis Method	Reporting Flags

Material Parameters

Material Parameter	Description	Weight (kg)
1	IRON BASE METAL ALLOYS	12.90
2	ALUMINUM BASE METAL/ALLOYS	0.50
3	OTHER METAL/ALLOYS	3.30
4	OTHER INORGANIC MATERIALS	43.10
6	CELLULOSICS	4.80
7	RUBBER	1.20
8	PLASTICS	11.50
10	SOLIDIFIED ORGANIC MATERIAL	0.10
13	STEEL CONTAINER MATERIALS	27.80
14	PLASTIC/LINERS CONTAINER MATERIALS	1.00
15	CELLULOSICS PACKAGING MATERIALS	4.40

Waste Weight:	77.40
Packaging Weight:	33.20
Total Material Weight:	110.60

Hazardous Codes

Container: X10C0501703A
Type: 1 - 55 gal

Current Status

Extended Status: APPROVED CERT
Container Status: CERTIFICATION DATA APPROVED
Certification Date: 03/23/2016
Waste Handling Code: CH
Disposal Date:

Hazardous Codes

Hazardous Code	Description
D004	ARSENIC
D005	BARIUM
D006	CADMIUM
D007	CHROMIUM
D008	LEAD
D009	MERCURY
D010	SELENIUM
D011	SILVER
D019	CARBON TETRACHLORIDE
F002	SPENT HALOGENATED SOLVENTS
F005	SPENT NON-HALOGENATED SOLVENTS

Assay Methods

Assay Method	Description	Assay Date
16MILCC2	MOBILE ISOCS LARGE CONTAINER COUNTER	04/23/2015

Non-Destructive Examination (NDE)

NDE Method	Description	Examination Date
16VE1	VISUAL EXAMINATION	02/01/2011

Edit Limit Check Results

Evaluation Date: 03/23/2016 11:07:46 Overall Status: PASS

Evaluation Code	Status	Return Code	Detailed Description

Container: X10C0501703A
Type: 1 - 55 gal

Current Status

Extended Status: APPROVED CERT
Container Status: CERTIFICATION DATA APPROVED
Certification Date: 03/23/2016
Waste Handling Code: CH
Disposal Date:

Edit Limit Check Results

Evaluation Date: 03/23/2016 11:07:46 Overall Status: PASS

Evaluation Code	Status
DI_CERT_ALL	PASS
DI_CERT_BE	PASS
DI_CERT_CERT	PASS
DI_CERT_CHARZ	PASS
DI_CERT_ED	PASS
DI_CERT_EPA	PASS
DI_CERT_PCB	PASS
DI_CERT_PERC	PASS
DI_CERT_TRAMPAC	PASS
DSA	PASS
WAC	PASS
WAP_CERT	PASS

TRAMPAC Evaluation Results

Evaluation Date: 03/23/2016 11:07:48 Overall Status: PASS

Evaluation Code	Status
CE_ACT	PASS
CE_ALL	PASS
CE_ASP	PASS
CE_DDH	PASS
CE_FGE	PASS
CE_FIL	PASS
CE_GVE	PASS
CE_RDR	PASS
CE_TRU	PASS

Return Code	Detailed Description

COPY

Container: X10C0501703A
Type: 1 - 55 gal

Current Status

Extended Status: APPROVED CERT
Container Status: CERTIFICATION DATA APPROVED
Certification Date: 03/23/2016
Waste Handling Code: CH
Disposal Date:

TRAMPAC Evaluation Results

Evaluation Date: 03/23/2016 11:07:48 Overall Status: PASS

Evaluation Code	Status
CE_WGT	PASS

Details

Matrix Depleted Shipping Category:	3001090084	Compliance Method:	ANALYTICAL
Decay Heat Limit (w):	0.16892226890756304	FGE Limit (g):	200
FGGR (mol/s):	1.6492460389643705E-9	FGGR Limit (mol/s):	5.952380952380953E-8
Volume Model:		Required Aspiration Time (days):	
Total Headspace VOCs (ppm):	256.85	DAC Scenario:	3
Packaging Configuration:	COMMON_PACKAGING 2		
Closure Time (days):	0	Minimum Closure Time Applied (days):	53
Sample-Vent Time (days):	1556	Min Sample-Vent Time Applied (days):	9
TFGVC in ICL (mol fr):		MLEL (mol fr):	0.05

History

Event Date/Time	Container Number	Event Description	Reason
03/23/2016 11:07:53	X10C0501703A	SUCCESSFUL SUBMISSION FOR CERT VIA THE WEB SERVICE	
03/28/2016 07:18:07	X10C0501703A	APPROVED FOR CERT	

DIVIDER

PAGE

RH Waste Characterization Case File:

including AK tracking spreadsheet for vent/closure dates, Container Information Summary (CIS), IDC spreadsheet printout, excerpts from data sources, and WWIS/WDS Waste Container and canister Data Reports

ORR0090 – RH Canister

Containing the following RH containers:

1) ORRH00736 (a 55 gal RH S5400 waste category debris container)
2) ORRH00737 (a 55 gal RH S5400 waste category debris container) and
3) ORRH00738 (a 55 gal RH S5400 waste category debris container)

WDS WCA/WCO CERTIFICATION PACKAGE
RH ORNL – Audit, April 19-21, 2016

Waste Stream OR-REDC-RH-HET – Lot 34

1. AK Tracking Spreadsheet to obtain vent/closure dates
2. Container Information Summary (CIS) – CCP Correlation of Container Identification Numbers to Batch Data Report Numbers

RH ORNL Canister OR0090

1. WDS Canister Build Sheet
2. WDS Canister Data Report

RH Package for ORRH00736 – Lot 34

1. NCR Verification from QA
2. IDC Container Summary
3. IDC Spreadsheet
4. RAD Survey
5. RTR Data with Filter
6. DTC Data
7. Flam Gas Data – Hydrogen/Methane only
8. WDS Waste Container Data Report

RH Package for ORRH00737 – Lot 34

1. NCR Verification from QA
2. IDC Container Summary
3. IDC Spreadsheet
4. RAD Survey
5. RTR Data with Filter
6. DTC Data
7. Flam Gas Data – Hydrogen/Methane only
8. WDS Waste Container Data Report

RH Package for ORRH00738 – Lot 34

1. NCR Verification from QA
2. IDC Container Summary
3. IDC Spreadsheet
4. RAD Survey
5. RTR Data with Filter
6. DTC Data
7. Flam Gas Data – Hydrogen/Methane only
8. WDS Waste Container Data Report

Waste Stream OR-REDC-RH-HET – Lot 35

1. AK Tracking Spreadsheet to obtain vent/closure dates
2. Container Information Summary (CIS) – CCP Correlation of Container Identification Numbers to Batch Data Report Numbers

RH ORNL Canister OR0093

1. WDS Canister Build Sheet
2. WDS Canister Data Report

RH Package for ORRH00746 – Lot 35

1. NCR Verification from QA
2. IDC Container Summary
3. IDC Spreadsheet
4. RAD Survey
5. RTR Data with Filter
6. DTC Data
7. Flam Gas Data – Hydrogen/Methane only
8. WDS Waste Container Data Report

RH Package for ORRH00747 – Lot 35

1. NCR Verification from QA
2. IDC Container Summary
3. IDC Spreadsheet
4. RAD Survey
5. RTR Data with Filter
6. DTC Data
7. Flam Gas Data – Hydrogen/Methane only
8. WDS Waste Container Data Report

RH Package for ORRH00748 – Lot 35

1. NCR Verification from QA
2. IDC Container Summary
3. IDC Spreadsheet
4. RAD Survey
5. RTR Data with Filter
6. DTC Data
7. Flam Gas Data – Hydrogen/Methane only
8. WDS Waste Container Data Report

ORNL RH Canister OR0090

RH AK Tracking Spreadsheet - Vent/Closure Dates
ORNL Audit - April 19-21, 2016

CONTAINER ID	CLOSURE DATE	VENT DATE	WASTE STREAM
Canister OR0090			
ORRH00736	02/01/2016	02/01/2016	OR-REDC-RH-HET
ORRH00737	02/01/2016	02/01/2016	OR-REDC-RH-HET
ORRH00738	02/04/2016	02/04/2016	OR-REDC-RH-HET

CCP Correlation of Container Identification Numbers to Batch Data Report Numbers

Waste Stream: # OR-REDC-RH-HET

Lot # 34

Container ID Number	Radiological BDR	RTR BDR	VE BDR	FGA BDR
ORRH00730	ORRHDTC16002	N/A	ORNLRHVE15014	OR16FG8009
ORRH00731	ORRHDTC16002	N/A	ORNLRHVE15015	OR16FG8009
ORRH00732	ORRHDTC16002	N/A	ORNLRHVE15016	OR16FG8009
ORRH00734	ORRHDTC16002	N/A	ORNLRHVE16001	OR16FG8011
ORRH00735	ORRHDTC16002	N/A	ORNLRHVE16002	OR16FG8011
ORRH00736	ORRHDTC16003	N/A	ORNLRHVE16003	OR16FG8023
ORRH00737	ORRHDTC16003	N/A	ORNLRHVE16003	OR16FG8023
ORRH00738	ORRHDTC16003	N/A	ORNLRHVE16004	OR16FG8023
ORRH00739	ORRHDTC16003	N/A	ORNLRHVE16004	OR16FG8023

Irene Joo — Signature of Site Project Manager

Irene Joo — Printed Name

03/24/2016 — Date

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Generated: 4/5/16 6:48 AM

Canister #: OR0090

Canister Gross Weight + Error

871.13 kg

1,920.85 lbs

Canister Content Code/Governing Shipping Period (days): OR321M / 60

Canister Filters

Filter Model	Quantity
NF019D	1

Inner Containers

Container Number	GrossWgt+Err (kg)	(lbs)	PCB Waste?	Be Present?	Total Dose Rate (mrem/hr)	Content Code	Waste Stream Profile	Filter Model	Qty
ORRH00738	110.50	243.65	N	Y	1091.81	OR321M	OR-REDC-RH-HET	NF019D	1
ORRH00737	109.50	241.45	N	Y	1071.57	OR321M	OR-REDC-RH-HET	NF019D	1
ORRH00736	105.50	232.63	N	Y	1169.09	OR321M	OR-REDC-RH-HET	NF019D	1

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Waste Isolation Pilot Plant
Canister Data Report

Report Statistics

Report Version:	**2.5.4**
WDS Instance:	**prd05.wipp.carlsbad.nm.us**
Generated on:	**April 05, 2016 06:47 AM**
Generated by:	**KIRKES, CRETA**
Total Pages:	**7**

Selection Criteria

Container Number: **OR0090**

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Container: OR0090
Type: 11 - 72-B Removable Lid OP

Current Status

Extended Status: PRESUB CERT
Container Status: PRESUBMITTAL TO CERTIFICATION
Certification Date:
Waste Handling Code: RH
Disposal Date:

Current Location Site: OR
Generator Site: OR
Destination Site ID: WI

Certification Program ID: C7
Shipping Program ID: C7

Neutron Dose Rate (mrem/hr):
Beta Gamma Dose Rate (mrem/hr):
Total Dose Rate (mrem/hr):

FGE (g): 3.439E-01
FGE Uncertainty (g): 1.239E-01

Gross Weight (kg): 845.27
Gross Weight Uncert (kg): 25.86

Decay Heat (W): 6.642E-01
Decay Heat Uncertainty (W): 3.78E-01

Certification Data Values

Waste Stream Profile Code: OR-REDC-RH-HET
Waste Type Code: MTRU
IDC Code: NONE
Waste Matrix Code: S5400
WAC Revision Number: 7.4
Fill Factor (%): 70.79

TRU Alpha Activity (Ci): 9.765E-01
TRU Alpha Activity Uncertainty (Ci): 2.84E-01
TRU Alpha Activity Concentration (Ci/g): 4.836E-06
PU-239 Equivalent Activity (PE-Ci): 9.616E00
Alpha Surface Contamination (dpm/cm^2): 19.0
Beta/Gamma Surface Contamination (dpm/cm^2): 199.0

Transportation Data Values

Closure Date:
Vent Date:
Shipment Purpose: DISPOSAL
Machine Compacted? N

Waste Gen Date:
Content Code: OR321M
U-235 FEM (g):
U-235 FEM Uncert (g):
Be chemically/
mechanically bound: N

Container: OR0090
Type: 11 - 72-B Removable Lid OP

Current Status

Extended Status:	PRESUB CERT		
Container Status:	PRESUBMITTAL TO CERTIFICATION	Waste Handling Code:	RH
Certification Date:		Disposal Date:	

PCB Waste?	N
PCB Mass (kg):	
PCB Concentration (ppm):	
PCB Out of Service Date:	
Be Present?	Y
Be <= 1% by weight?	Y

Governing Packing Fraction (compaction level): non-compacted

Filters

Filter Model Number	Filter Diffusivity (mol/s/ml)	Quantity	Install Date
NF019D	1.85E-05	1	03/30/2016

Certification Comments

Radionuclides

Radionuclide	Activity (Ci)	Activity Uncert (Ci)	Mass (g)	Mass Uncert (g)
AM-241	2.656E-01	1.702E-01	7.653E-02	4.904E-02
AM-243	7.895E-02	4.354E-02	3.953E-01	2.155E-01
BA-137M	5.420E-01	9.825E-02	1.008E-09	1.826E-10
CM-244	1.639E01	9.697E00	2.026E-01	1.185E-01
CM-245	2.640E-03	1.428E-03	1.538E-02	8.209E-03
CM-246	7.918E-02	6.887E-02	2.578E-01	2.214E-01
CS-137	5.729E-01	1.039E-01	6.511E-03	1.180E-03
PU-238	4.216E-01	2.410E-01	2.437E-02	1.393E-02
PU-239	6.365E-04	4.216E-04	1.012E-02	6.702E-03
PU-240	1.223E-01	6.913E-02	5.317E-01	3.005E-01
PU-241	2.447E00	1.753E00	2.353E-02	1.686E-02
PU-242	5.614E-03	3.167E-03	1.414E00	7.976E-01

COPY

Container: OR0090
Type: 11 - 72-B Removable Lid OP

Current Status

Extended Status: PRESUB CERT
Container Status: PRESUBMITTAL TO CERTIFICATION
Certification Date:
Waste Handling Code: RH
Disposal Date:

Radionuclides

Radionuclide	Activity (Ci)	Activity Uncert (Ci)	Mass (g)	Mass Uncert (g)
SR-90	9.794E00	2.457E00	7.097E-02	1.780E-02
U-233	.000E00	.000E00	.000E00	.000E00
U-234	.000E00	.000E00	.000E00	.000E00
U-235	.000E00	.000E00	.000E00	.000E00
U-238	.000E00	.000E00	.000E00	.000E00
Y-90	9.794E00	2.457E00	1.800E-05	4.516E-06

Material Parameters

Material Parameter	Description	Weight (kg)
1	IRON BASE METAL ALLOYS	122.10
8	PLASTICS	201.90
13	STEEL CONTAINER MATERIALS	517.01
14	PLASTIC/LINERS CONTAINER MATERIALS	4.26
	Waste Weight:	324.00
	Packaging Weight:	521.27
	Total Material Weight:	845.27

Hazardous Codes

Hazardous Code	Description
D004	ARSENIC
D005	BARIUM
D006	CADMIUM

Container: OR0090
Type: 11 - 72-B Removable Lid OP

Current Status

Extended Status: PRESUB CERT
Container Status: PRESUBMITTAL TO CERTIFICATION
Certification Date:
Waste Handling Code: RH
Disposal Date:

Hazardous Codes

Hazardous Code	Description
D007	CHROMIUM
D008	LEAD
D009	MERCURY
D010	SELENIUM
D011	SILVER
D019	CARBON TETRACHLORIDE
F002	SPENT HALOGENATED SOLVENTS
F005	SPENT NON-HALOGENATED SOLVENTS

Edit Limit Check Results

Evaluation Date: 03/30/2016 14:38:13 Overall Status: FAIL

Evaluation Code	Status
DI_CERT_ALL	FAIL
DI_CERT_BE	PASS
DI_CERT_CERT	FAIL
DI_CERT_CHARZ	PASS
DI_CERT_ED	PASS
DI_CERT_EPA	PASS
DI_CERT_PCB	PASS
DI_CERT_PERC	PASS
DI_CERT_TRAMPAC	FAIL
DSA	PASS

Return Code	Detailed Description
DI_CERT_CDE	THE CERTIFICATION DATE IS BEFORE ONE OR MORE REPORTED CONTAINER DATES.
DI_TRAMPAC_CDN	THE CLOSURE DATE IS NULL.
DI_TRAMPAC_VDN	THE VENT DATE IS NULL.
WAC_ALL_BGD	THE BETA/GAMMA DOSE EQUIVALENT RATE IS NULL.
WAC_ALL_CDN	THE CERTIFICATION DATE IS NULL.
WAC_ALL_NDR	THE NEUTRON DOSE EQUIVALENT RATE IS NULL.
WAP_CERT_BGN	THE BETA/GAMMA DOSE EQUIVALENT RATE IS NULL.
WAP_CERT_CDN	THE CERTIFICATION DATE IS NULL.
WAP_CERT_CLN	THE CLOSURE DATE IS NULL.

COPY

Container: OR0090
Type: 11 - 72-B Removable Lid OP

Current Status
Extended Status: PRESUB CERT
Container Status: PRESUBMITTAL TO CERTIFICATION
Certification Date:
Waste Handling Code: RH
Disposal Date:

Edit Limit Check Results

Evaluation Date: 03/30/2016 14:38:13 Overall Status: FAIL

Evaluation Code	Status	Return Code	Detailed Description
WAC	FAIL	WAP_CERT_NDN	THE NEUTRON DOSE EQUIVALENT RATE IS NULL.
WAP_CERT	FAIL		

TRAMPAC Evaluation Results

Evaluation Date: 03/30/2016 14:38:15 Overall Status: FAIL

Evaluation Code	Status	Return Code	Detailed Description
CANISTER_72B_ALL	FAIL	CANISTER_72B_ASP_CDN	The closure date was null for the canister.
CANISTER_72B_ASP	FAIL	CANISTER_72B_ASP_VDN	The vent date was null for the canister.
CANISTER_72B_CONT	PASS		
CANISTER_72B_FIL	PASS		
CANISTER_72B_GVE	PASS		
CANISTER_72B_NUC	PASS		
CANISTER_72B_PDH	PASS		
CANISTER_72B_RDR	PASS		
CANISTER_72B_WGT	PASS		

Canister Results

FGE Limit (g):	315
Elapsed Time (yrs):	0.152138
Matrix-Depletion Applied?:	true

Confinement Results

Layer ID	Layer Description	Decay Heat (w)	Decay Heat Err (w)	DH Limit (w)	FGGR (mol/s)	Allow FGGR (mol/s)
ORRH00736	55-Gallon Drum	2.337E-01	2.299E-01	1.126E+00		6.392E-08
ORRH00737	55-Gallon Drum	2.200E-01	2.167E-01	1.126E+00		6.392E-08

Container: OR0090
Type: 11 - 72-B Removable Lid OP

Current Status
Extended Status: PRESUB CERT
Container Status: PRESUBMITTAL TO CERTIFICATION
Certification Date:
Waste Handling Code: RH
Disposal Date:

TRAMPAC Evaluation Results
Evaluation Date: 03/30/2016 14:38:15 Overall Status: FAIL

ORRH00738	55-Gallon Drum	2.105E-01	2.075E-01	1.126E+00	6.392E-08

Inner Containers

Container Number	Type Code	Content Code	Gross Weight + Error	FGE + 2x Error	Waste Stream
ORRH00736	39 - RH 55 gal TBO	OR321M	105.50	2.716E-01	OR-REDC-RH-HET
ORRH00737	39 - RH 55 gal TBO	OR321M	109.50	2.56E-01	OR-REDC-RH-HET
ORRH00738	39 - RH 55 gal TBO	OR321M	110.50	2.451E-01	OR-REDC-RH-HET

History

Event Date/Time	Container Number	Event Description	Reason
03/30/2016 14:37:29	OR0090	INSERT DATA INTO THE DATABASE	

COPY

NCR Verification from QA
ORNL RH Audit April 19-21, 2016

Container ID: ORRH00736

Container Status	Status Date	Status User
Ready	03/24/2016	Lot System
QA Ready	03/24/2016	Lot System
CO For Entry	03/24/2016	Helen Pettus
Entered	03/24/2016	Helen Pettus
CO For Validation	03/24/2016	Carolina Soaterna
Validated	03/24/2016	Carolina Soaterna
Sent To QA	03/24/2016	Creta Kirkes
CO For Certification	03/28/2016	Creta Kirkes
Certified	03/28/2016	Creta Kirkes
QA Certified	03/29/2016	Laura Jones
[CO For Certification] DeCertified with reason: Add steel material	03/30/2016	Creta Kirkes
Certified	03/30/2016	Creta Kirkes
WDS Uploaded	03/30/2016	Creta Kirkes

CONTAINERID: ORRH00736

ORNL

AK DATA

Container ID	Container Type	AKA Matrix	WDS Status	AK Excluded	WSID	LOTID	LOT Excluded
ORRH00736			APPROVED_CERT	NO	OR-REDC-RH-HET	OR-REDC-RH-HET-Lot 34 (OR-REDC-RH-HET Lot 34)	NONE

BDR DATA

BDRID	Type	Status	Generation Date
OR16FG8023	HSG_TRANS	Complete	2016-02-23
ORNLRHVE16003	VE	Complete	2016-02-01
ORRHDTC16003	DTC	Complete	2016-02-23

NCR DATA

Container ID	NCRID	Status	Release Code
ORRH00736	NO DATA		

REJECT DATA

Container ID	BDRID	NCRID	NCR Status	Release Code	Actual Condition
ORRH00736	NO DATA				

IDC 2.13 SCO 1029 Addendum 49	Units	data	comments									
Shipper Site ID		C7	Location ID	Dest Program ID	Shipping Purpose	AK Report	AK Revision		ORRH00736			
Waste Stream Profile		OR-REDC-RH-HET	OR	WI	D	CCP-AK-ORNL-500	4					
Container Number		ORRH00736				Cur Ref AK Rev:	4					
Container Type		RH DRUM-55 TBO						U-235 FEM	U-235 FEM Uncert	FGGR Flag	FGGR Test Period	
WAC Rev #		7.4						NULL	NULL	NULL		
Cert Site		C7					Be mass<=100 k	Be <= 1%	Be Present	Aqueous Material	Compacted Wst	
Cert Date		03/30/2016					Y	Y	Y	N	N	
Waste Handling Code		RH										
Waste Type Code		MTRU	TRU, MTRU									
Waste Stream BIR ID		OR-W211										
Waste Stream MWIR ID		NONE										
Generator Site ID		OR										
IDC Code		NONE										
Matrix Code		S5400										
Trucon Code		OR321M										
Shipping Category			> 0.012 Watt-years									
Tru Alpha Act	Ci	3.44E-01		3.44E-01								
Tru Alpha Act Uncert	1sigma Ci	1.73E-01	6.89E-01	Tru Alpha Act + 2sigma (Ci)								
Tru Alpha Act Conc	nCi/g	5.33E+03										
Pu239 Fiss Gm Eq	g	1.21E-01		1.20E-01								
Pu239 Fiss Gm Eq Uncert	1sigma g	7.53E-02	2.72E-01	Pu239 Fiss Gm Eq + 2sigma (Ci)								
Pu239 Eq Act	Ci	3.38E+00		3.38E+00								
Decay Heat	watts	2.34E-01		2.37E-01								
Decay Heat Uncert	1sigma watts	2.30E-01	4.64E-01	Decay Heat + 1sigma (watts)								
Layers of Packaging		0										
Fill Factor		100	percentage	Liner Lid Present	N							
Liner Type			1 = plastic drum liner									
Liner Punctured				Liner Hole Size								
PCB Conc		NULL		(mm)		PCB Waste	PCB Mass (kg)	Out of Service				
Closure Date		02/01/2016	Watt-years	Waste Gen Date								
Vent Date		02/01/2016	0.037105671	NULL								
Filter Install Date		02/01/2016			Filter Reduction Date							
Filter Model Number		NF019D			Reduced Filter Model							
Number of Filters Installed		1										
Aspiration Method ID		N										
Gas Gen Rate				<<Gas Gen Rate Calculated								
Hydrogen/Methane Gen Rate												
Gas Gen Comp Date				Waste (kg)	Packaging (kg)	Total (kg)						
Gross Weight	kg	105.2		64.5	40.7	105.2						
Gross Weight Uncert	1sigma kg	0.5										
Alpha Surf Cont	dpm/100 cm^2											
Beta/Gamma Surf Cont	dpm/100 cm^2											
Neutron Dose Rate	mrem/hr	86										
Beta/Gamma Dose Rate	mrem/hr	1084										

Drum Weight	40.7
PP	
CP	
LP	
SL	

Radionuclide		U-233	U-234	U-235	U-238	PU-238	PU-239	PU-240	PU-241	PU-242	AM-241
Activity	Ci	-1.00E+00	-1.00E+00	0.00E+00	-1.00E+00	1.48E-01	2.24E-04	4.30E-02	8.61E-01	1.97E-03	9.34E-02
Activity Uncert	1sigma Ci	-1.00E+00	-1.00E+00	0.00E+00	-1.00E+00	1.47E-01	2.57E-04	4.21E-02	1.07E+00	1.93E-03	1.04E-01
Mass	grams	-1.00E+00	-1.00E+00	0.00E+00	-1.00E+00	8.57E-03	3.56E-03	1.87E-01	8.28E-03	4.97E-01	2.69E-02
Mass Uncert	1sigma grams	-1.00E+00	-1.00E+00	0.00E+00	-1.00E+00	8.48E-03	4.08E-03	1.83E-01	1.03E-02	4.85E-01	2.98E-02

Radionuclide		AM-243	CM-244	CM-245	CM-246	CS-137	BA-137M	SR-90	Y-90
Activity	Ci	2.78E-02	5.77E+00	9.29E-04	2.79E-02	2.02E-01	1.91E-01	3.45E+00	3.45E+00
Activity Uncert	1sigma Ci	2.65E-02	5.90E+00	8.69E-04	4.19E-02	6.28E-02	5.94E-02	1.49E+00	1.49E+00
Mass	grams	1.39E-01	7.13E-02	5.41E-03	9.07E-02	2.29E-03	3.55E-10	2.50E-02	6.33E-06
Mass Uncert	1sigma grams	1.31E-01	7.21E-02	4.99E-03	1.35E-01	7.14E-04	1.10E-10	1.08E-02	2.74E-06

Waste Material Parameters		PW	
Wgt of Mat Parms	kg	64.5	
Radio Assay Method		16DTC1	PAN, FRAM, TGS, HENC
Data Package Number		ORRHDTC16003	
Assay Date		02/23/2016	
Charz Method ID		16RHVE1	RTRM, VISUAL
Data Package Number		ORNLRHVE16003	
Charz Method Date		02/01/2016	

Haz Codes		D005	D006	D007	D008	D009	D010	D011	D019	F002	F005
Haz Codes		D004									

Sample ID	Headspace Gas HM	ORRH00736
Sample Type		HGHM-T
Sample Type		HGVO-T
Layer No. Sampled		0
Date Sampled		02/23/2016
Method ID		16HG2
Data Package Number		OR16FG8023

Sample Site
C7

CAS #		1333-74-0	74-82-8
Analyte		Hydrogen	Methane
Concentration		92.1	213.4
Date Analyzed		02/23/2016	02/23/2016
D Detectable Flag			
U Detectable Flag		U	U
NA Detectable Flag			

		Requirements Met?
Free liquids <1% by volume		YES
No non-rad. pyrophorics		YES
Chemical compatability		YES
No explosives		YES
No corrosives		YES
No pressurized containers		YES
No sealed Containers >4 liters		YES
Liner punctured/ filtered		YES
Flammable VOCs <500ppmv		YES
Container is in Approved Waste Stream Profile Form?	OR-REDC-RH-HET	YES
Can it be established through Process Knowledge that the concentration of flammable VOCs present in the headspace of the container is <= 500 ppm?		YES

V&V Initials	Date
HP/CS	3/24/2016

Creta Kirkes
CCP Certification Official

Date

Radiation & Contamination Survey Form

CM-REF-RP-306 Rev. 1, Radiation/Contamination Surveys

SURVEY NO: 16-SUR-00485

PAGE 1 OF 1 PAGES

Instruments Used

Instrument Type	Serial Number	Cal Due Date	Alpha Eff.	Beta Eff.
LM 12-4 / LM 42-31	290889 / 315829	04/01/16	N/A	N/A
FHZ 612	XC0894	10/2/2016		

LOCATION / TYPE: RH DTC Drum Measurement

PURPOSE: Job Coverage

DATE/TIME: 02/22/16 9:13 RWP/ALARA: 16-TRU-005

Drum Barcode	Measurement Location	Gamma Bkg: .158 mR/hr			Neutron Bkg: 2 mrem/hr			Total Surface Dose Rate Gamma + Neutron (mrem/hr)
		Net Gamma @ 1m (mR/hr)	Correction Factor	Calculated Gamma Surface Dose Rate (mR/hr)	Net Neutron @ 1m* (mrem/hr)	Correction Factor	Calculated Neutron Surface Dose Rate (mrem/hr)	
ORRH00736	1	67.3	16.1	1083.53	12	7.13	85.56	1169.09
	2	65.7	16.1	1057.77	12	7.13	85.56	1143.33
	3	58.5	16.1	941.85	10	7.13	71.3	1013.15
	4	56.3	16.1	906.43	10	7.13	71.3	977.73
ORRH00737	1	58.7	16.1	945.07	6	7.13	42.78	987.85
	2	53.2	16.1	856.52	6	7.13	42.78	899.30
	3	55.1	16.1	887.11	6	7.13	42.78	929.89
	4	63.9	16.1	1028.79	6	7.13	42.78	1071.57
ORRH00738	1	62.5	16.1	1006.25	12	7.13	85.56	1091.81
	2	57.8	16.1	930.58	12	7.13	85.56	1016.14
	3	44.1	16.1	710.01	10	7.13	71.3	781.31
	4	55.8	16.1	898.38	12	7.13	85.56	983.94
ORRH00739	1	22.3	16.1	359.03	4	7.13	28.52	387.55
	2	23.9	16.1	384.79	8	7.13	57.04	441.83
	3	24.6	16.1	396.06	6	7.13	42.78	438.84
	4	23.8	16.1	383.18	6	7.13	42.78	425.96

***Contact Shift Superintendent if neutron dose rate is great than 40 mrem/hr at 1 meter.**

NOTES: Neutron and gamma measurements are taken at 180 degrees apart (eg. Gamma measurement at location 1 and neutron measurement at location 3 are taken simultaneously). Add calculated gamma measurement at position 1,2,3,4 to calculated neutron measurement at position 1,2,3,4 respectively to obtain total surface dose rate. The gamma and neutron 1 meter to surface calculation is based on T-RH-FW-C-RP-006.

✱On Contact (OC) or OC/30cm #Smear #LAS #Direct

UNITS: If performed, dose rates are in mR/hr γ and mrem/hr n, LAS in dpm/probe, smears and direct measurements in dpm/100 cm² (unless otherwise annotated). REMARKS:

RCT SIGNATURE: Christina Britt RCM SIGNATURE: Date: 2/23/16

Signature(s) on this sheet are that of the responsible technician(s) who certify that the data recorded represent the readings, measurements, and/or observations at the time indicated.

NTPC RECORDS ORIGINAL

DATE REC'D 2-24-2016

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Attachment 1 – Visual Examination Data Form

Site ID: RHORNL			
Examination Date: 2-1-16	Batch Number: ORNLRHVE16003		
Procedure #: CCP-TP-500	Revision #: 15	Video #: N/A	
Recording Equipment Check: ☐SAT ☐UNSAT ☑N/A	Recording Start: N/A	Recording Stop: N/A	
Inspection of Container to be loaded during VE: ☑SAT ☐UNSAT			

Indirect-load Container ☑N/A		Final Output Container ☐N/A	
Container ID Number:		Container ID Number: ORRH00736	
Container Type:		Container Type: 55 gallon drum	
Waste Matrix Code:		Waste Matrix Code: S5400	
Waste Stream:		Waste Stream: OR-REDC-RH-HET	
		Poly Rigid Liner: ☐Y ☑N Thickness: N/A	Poly Rigid Liner Lid: ☐Y ☑N
		Poly Rigid Liner Vented or Hole Size: N/A	
Percent Fill:	Percent Organic Waste:	Percent Fill: 100%	Percent Organic Waste: 20%
Layers of Confinement:	Closure Method:	Layers of Confinement: 0	Closure Method: N/A

Comments (e.g., filter information, NCRs):
Nucfil-0190S KJ-604
cask # X10C0201071

Waste Description:
cardboard liner (C)
super sack (P)
metal columns (IM)
poly blocks (P)
metal cans (IM)
plastic bags (P)
glass vials (OIM)
metal block (IM)
plastic disks (P)
paper (C)
metal rack (IM)

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Attachment 1 – Visual Examination Data Form (continued)

Container ID Number ORRH00736

Prohibited Item(s) Summary	YES	NO
Does the container have observable liquid equal to or greater than 1 percent by volume of the outermost container at the time of RTR or VE?	☐	☑
Does the container have observable liquid more than 60 milliliters or 3 percent by volume, whichever is greater in an internal container?	☐	☑
Does the container have observable liquid with an EPA hazardous waste number (HWN) U134 assigned?	☐	☑
Does the container have observable liquid containing PCBs?	☐	☑
Is there an indication of non-radionuclide pyrophoric materials, such as elemental potassium?	☐	☑
Is there an indication of hazardous wastes not occurring as co-contaminants with TRU mixed wastes *(non-mixed hazardous wastes)*?	☐	☑
Is there an indication of wastes incompatible with backfill, seal and panel closures materials, container and packaging materials, shipping container materials, or other wastes (i.e., waste does **NOT** match Table of Allowable Materials for RH-TRU Waste in the RH-TRAMPAC)?	☐	☑
Is there an indication of wastes containing explosives or compressed gases?	☐	☑
Is there an indication of polychlorinated biphenyls (PCBs) not authorized under an EPA PCB waste disposal authorization?	☐	☑
Is there an indication of the waste exhibiting the characteristic of ignitability, corrosivity, or reactivity (EPA Hazardous Waste Numbers of D001, D002, or D003)?	☐	☑
Is the physical form of the waste inconsistent with the Waste Stream Description or the Waste Matrix Code?	☐	☑
RH 72B Criteria		
Were there Non-approved Closure Methods used on liner bags or inner bags greater than 4 liters?	☐	☑
Are there sealed containers GREATER than 4 liters or heat sealed bags **NOT** defined in the applicable TRUCON Code?	☐	☑
Are there indications of inadequate protection (blocked or braced) for heavy and/or sharp objects?	☐	☑
Is the waste consistent with the TRUCON Code?	☑	☐

Comments: N/A

Visual Examination Operator 1:
Anthony Harley — Print Name
[signature] — Signature
2-1-16 — Date

Visual Examination Operator 2:
Gilbert Gutierrez — Print Name
[signature] — Signature
2-1-16 — Date

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Attachment 2 – Container Data Sheet

BDR Number: ORRHDTC16003

Date:	2/23/2016
Container No.:	ORRH007736
Probe Position:	55-GALLON
Instrument No.:	023553
Probe No.:	XC0894
Measured Background Dose Rate (mR/hr):	.158
Gross Weight (kg):	105.2
Dose Rate 1 (mR/hr):	67.3
Dose Rate 2 (mR/hr):	65.7
Dose Rate 3 (mR/hr):	58.5
Dose Rate 4 (mR/hr):	56.3
Highest measured dose rate is greater than three times the measured background.	(YES) NO

Printed Name	Signature	Date
RONALD WATSON	[signature]	2/23/2016

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REV 2/24/2016
007
~~015~~

BDR #: ORRHDTC16003 Site ID: ORNL

Waste Container Dose-to-Curie Conversion Record

SCO 1000 ORNL DTC-Mark-HFIR.xlsx Version 7, Addendum 7 Windows 7 Microsoft Excel 2007& 2010 Minor Change 10/23/2015

Operating Procedure	CCP-TP-504 REV 17		
Date of Survey	2/23/2016		
Waste Stream Designation	OR-REDC-RH-HET		
Cask Number	X10C0201071		
Drum ID	ORRH007365		
Container Gross Weight	105.2 kg		
Estimate Fill Percentages	100 %		
Container Net Weight	64.5 kg		
Measured Container Dose Rate		Background	
Quadrant #1	67.3 mR/hr	0.158	mR/hr
Quadrant #2	65.7 mR/hr		
Quadrant #3	58.5 mR/hr		
Quadrant #4	56.3 mR/hr		
Average Dose Rate Minus Background	62 mR/hr		

Nuclide	Curie Scaling Factors	Activity (Ci)	Grams	FGE	PECi	Watts	Uncertainty	Uncertainty in Curies	Uncertainty in Grams
U-233	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00%	0.00E+00	0.00E+00
U-234	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00%	0.00E+00	0.00E+00
U-235	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00%	0.00E+00	0.00E+00
U-238	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00%	0.00E+00	0.00E+00
Pu-238	6.24E-01	1.48E-01	8.57E-03	9.69E-04	1.35E-01	4.91E-03	98.86%	1.47E-01	8.48E-03
Pu-239	9.43E-04	2.24E-04	3.56E-03	3.56E-03	2.24E-04	6.94E-06	114.56%	2.57E-04	4.08E-03
Pu-240	1.63E-01	4.30E-02	1.87E-01	4.21E-03	4.30E-02	1.34E-03	97.74%	4.21E-02	1.83E-01
Pu-241	5.11E+00	8.61E-01	8.28E-03	1.86E-02	1.69E-02	2.74E-05	123.89%	1.07E+00	1.03E-02
Pu-242	8.32E-03	1.97E-03	4.97E-01	3.73E-03	1.80E-03	5.82E-05	97.54%	1.93E-03	4.85E-01
Am-241	3.51E-01	9.34E-02	2.69E-02	5.03E-04	9.34E-02	3.12E-03	110.82%	1.04E-01	2.98E-02
Am-243	1.17E-01	2.78E-02	1.39E-01	1.79E-03	2.78E-02	8.96E-04	95.36%	2.65E-02	1.33E-01
Cm-244	3.19E+01	5.77E+00	7.13E-02	6.42E-03	3.03E+00	1.98E-01	102.33%	5.90E+00	7.30E-02
Cm-245	3.91E-03	9.29E-04	5.41E-03	8.12E-02	9.88E-04	3.10E-05	93.57%	8.69E-04	5.06E-03
Cm-246	1.17E-01	2.79E-02	9.07E-02	0.00E+00	2.96E-02	9.14E-04	150.47%	4.19E-02	1.36E-01
Cs-137	1.00E+00	2.02E-01	2.29E-03	0.00E+00	0.00E+00	2.23E-04	31.17%	6.28E-02	7.14E-04
Ba-137m	9.46E-01	1.91E-01	3.55E-10	0.00E+00	0.00E+00	7.52E-04	31.17%	5.94E-02	1.10E-10
Sr-90	1.73E+01	3.45E+00	2.50E-02	0.00E+00	0.00E+00	4.00E-03	43.26%	1.49E+00	1.08E-02
Y-90	1.73E+01	3.45E+00	6.33E-06	0.00E+00	0.00E+00	1.91E-02	43.26%	1.49E+00	2.74E-06
Totals		1.43E+01	1.07E+00	1.21E-01	3.38E+00	2.34E-01			

	Value	(one Sigma)	
TRU Alpha Activity Concentration	5.33E+03	2.68E+03	nCi/g
TRU Alpha Activity	3.44E-01	1.73E-01	Ci
Total Pu-239 Equiv Activity	3.38E+00	3.50E+00	Ci
Total Pu-239 Fissile Gram Equiv	1.21E-01	7.53E-02	g
Total Decay Heat	2.34E-01	2.30E-01	W
Volume Activity	6.58E-02	3.79E-02	Ci/L

Originator **Ronald Whitson** (Print Name)

Signed [signature] Date 2/24/2016

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Attachment 4 – Flammable Gas Analysis Form

FGA Attachments.xls Revision 4
SCO 1049 Add 4 Min. Chg. 06/17/2015
Win XP SP3/Win 7 SP1, Excel 2003/2007/2010

Waste Container ID: **ORRH00736**

BDR Number: **OR16FG8023**

Sampling Date: **2/23/2016**

CAS NUMBER	COMPOUND	Measured ppmv	Reporting Flag
1333-74-0	Hydrogen	92.10	U
74-82-8	Methane	213.40	U
67-56-1	Methanol	N/A	U
60-29-7	Ethyl Ether	N/A	U
75-35-4	1,1-Dichloroethylene	N/A	U
67-64-1	Acetone	N/A	U
75-34-3	1,1-Dichloroethane	N/A	U
156-59-2	cis-1,2-Dichloroethene	N/A	U
78-93-3	Methyl ethyl ketone	N/A	U
110-82-7	Cyclohexane	N/A	U
71-43-2	Benzene	N/A	U
107-06-2	1,2-Dichloroethane	N/A	U
71-36-3	1-Butanol	N/A	U
108-10-1	Methyl isobutyl ketone	N/A	U
108-88-3	Toluene	N/A	U
108-90-7	Chlorobenzene	N/A	U
100-41-4	Ethylbenzene	N/A	U
108-38-3/106-42-3	m- and p-Xylene	N/A	U
95-47-6	o-Xylene	N/A	U
108-67-8	1,3,5-Trimethylbenzene	N/A	U
95-63-6	1,2,4-Trimethylbenzene	N/A	U

CAS Number	IDENTIFIED TIC COMPOUND	Est. Amount ppmv
N/A	N/A	N/A
N/A	N/A	N/A
N/A	N/A	N/A
N/A	N/A	N/A
N/A	N/A	N/A
N/A	N/A	N/A
N/A	N/A	N/A
N/A	N/A	N/A

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Waste Isolation Pilot Plant
Container Data Report

Report Statistics

Report Version:	**2.5.4**
WDS Instance:	**prd05.wipp.carlsbad.nm.us**
Generated on:	**April 05, 2016 06:49 AM**
Generated by:	**KIRKES, CRETA**
Total Pages:	**7**

Selection Criteria

Container Number: **ORRH00736**

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Container: ORRH00736
Type: 39 - RH 55 gal TBO

Current Status

Extended Status: APPROVED CERT IN PRESUB CERT CANISTER
Container Status: CERTIFICATION DATA APPROVED
Certification Date: 03/30/2016
Waste Handling Code: RH
Disposal Date:

Current Location Site: OR
Generator Site: OR
Destination Site ID: WI

Certification Program ID: C7
Shipping Program ID: C7

Overpack Container: OR0090
Overpack Type: REMOVABLE-LID 72-B CANISTER
Overpack Status: PRESUBMITTAL TO CERTIFICATION

Neutron Dose Rate (mrem/hr): 85.56
Beta Gamma Dose Rate (mrem/hr): 1083.53
Total Dose Rate (mrem/hr): 1169.09

FGE (g): 1.21E-01
FGE Uncertainty (g): 7.533E-02

Gross Weight (kg): 105.00
Gross Weight Uncert (kg): 0.50

Decay Heat (W): 2.337E-01
Decay Heat Uncertainty (W): 2.299E-01

Certification Data Values

Waste Stream Profile Code: OR-REDC-RH-HET
Waste Type Code: MTRU
IDC Code: NONE
Waste Matrix Code: S5400
WAC Revision Number: 7.4
Fill Factor (%): 100.00
Waste Stream BIR ID: OR-W211
Waste Stream MWIR ID: NONE

TRU Alpha Activity (Ci): 3.435E-01
TRU Alpha Activity Uncertainty (Ci): 1.726E-01
TRU Alpha Activity Concentration (Ci/g): 5.326E-06
PU-239 Equivalent Activity (PE-Ci): 3.383E00
Alpha Surface Contamination (dpm/cm^2):
Beta/Gamma Surface Contamination (dpm/cm^2):

Transportation Data Values

Closure Date: 02/01/2016
Vent Date: 02/01/2016
Process Knowledge? Y
Waste Gen Date:
Content Code: OR321M
U-235 FEM (g):
U-235 FEM Uncert (g):
Be chemically/ mechanically bound:

Shipment Purpose: DISPOSAL
Machine Compacted? N
Liner Exists? N
Liner Hole Size(mm):
Liner Lid Present?
Layers of Packaging 0
Aqueous Material? N

Gas Generation Data Values

Measured FGGR (mol/s)	Measured TGRR (mol/s)	Truncated FGGR Test (Y/N)	Truncated FGGR Test Period (days)

Container: ORRH00736
Type: 39 - RH 55 gal TBO

Current Status

Extended Status: APPROVED CERT IN PRESUB CERT CANISTER
Container Status: CERTIFICATION DATA APPROVED
Certification Date: 03/30/2016
Waste Handling Code: RH
Disposal Date:

Radionuclides

Radionuclide	Activity (Ci)	Activity Uncert (Ci)	Mass (g)	Mass Uncert (g)
SR-90	3.446E00	1.491E00	2.497E-02	1.080E-02
U-233	.000E00	.000E00	.000E00	.000E00
U-234	.000E00	.000E00	.000E00	.000E00
U-235	.000E00	.000E00	.000E00	.000E00
U-238	.000E00	.000E00	.000E00	.000E00
Y-90	3.446E00	1.491E00	6.334E-06	2.740E-06

Samples

Sample ID	Sample Type Code	Sample Type Description	Sample Date	Layer Sampled
H-ORRH00736	HGHM-T	HEADSPACE GAS HYDROGEN AND METHANE	02/23/2016	0

Unique Samples

CAS Number	Analyte Description	Concentration (ppm)	Analysis Date	Analysis Method	Reporting Flags
1333-74-0	HYDROGEN	92.1	02/23/2016	16HG2	U
74-82-8	METHANE	213.4	02/23/2016	16HG2	U

Material Parameters

Material Parameter	Description	Weight (kg)
8	PLASTICS	64.50
13	STEEL CONTAINER MATERIALS	40.70

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Container: ORRH00736
Type: 39 - RH 55 gal TBO

Current Status

Extended Status: APPROVED CERT IN PRESUB CERT CANISTER
Container Status: CERTIFICATION DATA APPROVED
Certification Date: 03/30/2016
Waste Handling Code: RH
Disposal Date:

PCB Waste? N
PCB Mass (kg):
PCB Concentration (ppm):
PCB Out of Service Date:
Be Present? Y
Be <= 1% by weight? Y
Be mass <= 100kg? Y
Separation OK?
Packing Fraction (compaction level): non-compacted

Filters

Filter Model Number	Filter Diffusivity (mol/s/ml)	Quantity	Install Date
NF019D	1.85E-05	1	02/01/2016

Certification Comments

Radionuclides

Radionuclide	Activity (Ci)	Activity Uncert (Ci)	Mass (g)	Mass Uncert (g)
AM-241	9.343E-02	1.035E-01	2.692E-02	2.984E-02
AM-243	2.778E-02	2.649E-02	1.391E-01	1.311E-01
BA-137M	1.907E-01	5.942E-02	3.545E-10	1.105E-10
CM-244	5.765E00	5.900E00	7.129E-02	7.213E-02
CM-245	9.287E-04	8.690E-04	5.412E-03	4.994E-03
CM-246	2.786E-02	4.192E-02	9.068E-02	1.348E-01
CS-137	2.016E-01	6.282E-02	2.290E-03	7.138E-04
PU-238	1.483E-01	1.466E-01	8.573E-03	8.475E-03
PU-239	2.239E-04	2.565E-04	3.560E-03	4.078E-03
PU-240	4.303E-02	4.205E-02	1.871E-01	1.828E-01
PU-241	8.610E-01	1.067E00	8.279E-03	1.026E-02
PU-242	1.975E-03	1.926E-03	4.975E-01	4.853E-01

Container: ORRH00736
Type: 39 - RH 55 gal TBO

Current Status

Extended Status: APPROVED CERT IN PRESUB CERT CANISTER
Container Status: CERTIFICATION DATA APPROVED
Certification Date: 03/30/2016
Waste Handling Code: RH
Disposal Date:

Waste Weight:	64.50
Packaging Weight:	40.70
Total Material Weight:	105.20

Hazardous Codes

Hazardous Code	Description
D004	ARSENIC
D005	BARIUM
D006	CADMIUM
D007	CHROMIUM
D008	LEAD
D009	MERCURY
D010	SELENIUM
D011	SILVER
D019	CARBON TETRACHLORIDE
F002	SPENT HALOGENATED SOLVENTS
F005	SPENT NON-HALOGENATED SOLVENTS

Assay Methods

Assay Method	Description	Assay Date
16DTC1	DOSE-TO-CURIE	02/23/2016

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Non-Destructive Examination (NDE)

NDE Method	Description	Examination Date

Container: ORRH00736
Type: 39 - RH 55 gal TBO

Current Status:
Extended Status: APPROVED CERT IN PRESUB CERT CANISTER
Container Status: CERTIFICATION DATA APPROVED
Certification Date: 03/30/2016
Waste Handling Code: RH
Disposal Date:

Non-Destructive Examination (NDE)

NDE Method	Description	Examination Date
16RHVE1	VISUAL EXAMINATION	02/01/2016

Edit Limit Check Results

Evaluation Date: 03/30/2016 11:55:16 Overall Status: PASS

Evaluation Code	Status	Return Code	Detailed Description
DI_CERT_ALL	PASS		
DI_CERT_BE	PASS		
DI_CERT_CERT	PASS		
DI_CERT_CHARZ	PASS		
DI_CERT_ED	PASS		
DI_CERT_EPA	PASS		
DI_CERT_PCB	PASS		
DI_CERT_PERC	PASS		
DI_CERT_TRAMPAC	PASS		
DSA	PASS		
WAC	PASS		
WAP_CERT	PASS		

TRAMPAC Evaluation Results

Evaluation Date: Overall Status:

Evaluation Code	Status	Return Code	Detailed Description

Container: ORRH00736
Type: 39 - RH 55 gal TBO

Current Status

Extended Status: APPROVED CERT IN PRESUB CERT CANISTER
Container Status: CERTIFICATION DATA APPROVED
Certification Date: 03/30/2016
Waste Handling Code: RH
Disposal Date:

History

Event Date/Time	Container Number	Event Description	Reason
03/30/2016 11:55:19	ORRH00736	SUCCESSFUL SUBMISSION FOR CERT VIA THE WEB SERVICE	
03/30/2016 12:36:44	ORRH00736	APPROVED FOR CERT	

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DIVIDER

PAGE

NCR Verification from QA

ORNL RH Audit April 19-21, 2016

Container ID: ORRH00737

Container Status	Status Date	Status User
Ready	03/24/2016	Lot System
QA Ready	03/24/2016	Lot System
CO For Entry	03/24/2016	Helen Pettus
Entered	03/24/2016	Helen Pettus
CO For Validation	03/24/2016	Carolina Soaterna
Validated	03/24/2016	Carolina Soaterna
Sent To QA	03/24/2016	Creta Kirkes
CO For Certification	03/28/2016	Connie Hernandez
Certified	03/28/2016	Connie Hernandez
QA Certified	03/29/2016	Laura Jones
[CO For Certification] DeCertified with reason: ADDED STEEL WEIGHT	03/30/2016	Connie Hernandez
Certified	03/30/2016	Connie Hernandez
WDS Uploaded	03/30/2016	Connie Hernandez

CONTAINERID: ORRH00737

ORNL

AK DATA

Container ID	Container Type	AKA Matrix	WDS Status	AK Excluded	WSID	LOTID	LOT Excluded
ORRH00737			APPROVED_CERT	NO	OR-REDC-RH-HET	OR-REDC-RH-HET-Lot 34 (OR-REDC-RH-HET Lot 34)	NONE

BDR DATA

BDRID	Type	Status	Generation Date
OR16FG8023	HSG_TRANS	Complete	2016-02-23
ORNLRHVE16003	VE	Complete	2016-02-01
ORRHDTC16003	DTC	Complete	2016-02-23

NCR DATA

Container ID	NCRID	Status	Release Code
ORRH00737	NO DATA		

REJECT DATA

Container ID	BDRID	NCRID	NCR Status	Release Code	Actual Condition
ORRH00737	NO DATA				

IDC 2.13 SCO 1029 Addendum 49	Units	data	comments									
Shipper Site ID		C7	Location ID	Dest Program ID	Shipping Purpose	AK Report	AK Revision		ORRH00737			
Waste Stream Profile		OR-REDC-RH-HET	OR	WI	D	CCP-AK-ORNL-500	4					
Container Number		ORRH00737				Cur Ref AK Rev:	4					
Container Type		RH DRUM-55 TBO						U-235 FEM	U-235 FEM Uncert	FGGR Flag	FGGR Test Period	
WAC Rev #		7.4						NULL	NULL	NULL		
Cert Site		C7					Be mass<=100 g	Be <= 1%	Be Present	Aqueous Material	Compacted Wst	
Cert Date		03/30/2016					Y	Y	Y	N	N	
Waste Handling Code		RH										
Waste Type Code		MTRU	TRU, MTRU									
Waste Stream BIR ID		OR-W211										
Waste Stream MWIR ID		NONE										
Generator Site ID		OR										
IDC Code		NONE										
Matrix Code		S5400										
Trucon Code		OR321M										
Shipping Category			> 0.012 Watt-years									
Tru Alpha Act	Ci	3.23E-01		3.23E-01								
Tru Alpha Act Uncert	1sigma Ci	1.63E-01	6.49E-01	Tru Alpha Act + 2sigma (Ci)								
Tru Alpha Act Conc	nCi/g	4.75E+03						Drum Weight	40.7			
Pu239 Fiss Gm Eq	g	1.14E-01		1.13E-01				PP				
Pu239 Fiss Gm Eq Uncert	1sigma g	7.11E-02	2.56E-01	Pu239 Fiss Gm Eq + 2sigma (Ci)				CP				
Pu239 Eq Act	Ci	3.19E+00		3.18E+00				LP				
Decay Heat	watts	2.20E-01		2.23E-01				SL				
Decay Heat Uncert	1sigma watts	2.17E-01	4.37E-01	Decay Heat + 1sigma (watts)								
Layers of Packaging												
Fill Factor		100	percentage	Liner Lid Present	N							
Liner Type			1 = plastic drum liner									
Liner Punctured				Liner Hole Size								
PCB Conc		NULL		(mm)		PCB Waste	PCB Mass (kg)	Out of Service				
Closure Date		02/01/2016	Watt-years	Waste Gen Date								
Vent Date		02/01/2016	0.034935647	NULL								
Filter Install Date		02/01/2016			Filter Reduction Date							
Filter Model Number		NF019D			Reduced Filter Model							
Number of Filters Installed		1										
Aspiration Method ID		N										
Gas Gen Rate				<<Gas Gen Rate Calculated								
Hydrogen/Methane Gen Rate												
Gas Gen Comp Date				Waste (kg)	Packaging (kg)	Total (kg)						
Gross Weight	kg	108.8		68.1	40.7	108.8						
Gross Weight Uncert	1sigma kg	0.5										
Alpha Surf Cont	dpm/100 cm^2											
Beta/Gamma Surf Cont	dpm/100 cm^2											
Neutron Dose Rate	mrem/hr	43										
Beta/Gamma Dose Rate	mrem/hr	1029										

Radionuclide		U-233	U-234	U-235	U-238	PU-238	PU-239	PU-240	PU-241	PU-242	AM-241
Activity	Ci	-1.00E+00	-1.00E+00	0.00E+00	-1.00E+00	1.40E-01	2.11E-04	4.05E-02	8.11E-01	1.86E-03	8.80E-02
Activity Uncert	1sigma Ci	-1.00E+00	-1.00E+00	0.00E+00	-1.00E+00	1.38E-01	2.42E-04	3.96E-02	1.00E+00	1.82E-03	9.76E-02
Mass	grams	-1.00E+00	-1.00E+00	0.00E+00	-1.00E+00	8.07E-03	3.35E-03	1.76E-01	7.80E-03	4.68E-01	2.53E-02
Mass Uncert	1sigma grams	-1.00E+00	-1.00E+00	0.00E+00	-1.00E+00	7.99E-03	3.84E-03	1.72E-01	9.66E-03	4.57E-01	2.81E-02

Radionuclide		AM-243	CM-244	CM-245	CM-246	CS-137	BA-137M	SR-90	Y-90
Activity	Ci	2.62E-02	5.43E+00	8.74E-04	2.62E-02	1.90E-01	1.80E-01	3.24E+00	3.24E+00
Activity Uncert	1sigma Ci	2.50E-02	5.56E+00	8.19E-04	3.95E-02	5.97E-02	5.65E-02	1.41E+00	1.41E+00
Mass	grams	1.31E-01	6.71E-02	5.10E-03	8.54E-02	2.16E-03	3.34E-10	2.35E-02	5.96E-06
Mass Uncert	1sigma grams	1.24E-01	6.80E-02	4.71E-03	1.27E-01	6.78E-04	1.05E-10	1.02E-02	2.59E-06

Waste Material Parameters		PW	
Wgt of Mat Parms	kg	68.1	
Radio Assay Method		16DTC1	PAN, FRAM, TGS, HENC
Data Package Number		ORRHDTC16003	
Assay Date		02/23/2016	
Charz Method ID		16RHVE1	RTRM, VISUAL
Data Package Number		ORNLRHVE16003	
Charz Method Date		02/01/2016	

Haz Codes		D005	D006	D007	D008	D009	D010	D011	D019	F002	F005
Haz Codes		D004									

Sample ID	Headspace Gas HM	ORRH00737
Sample Type		HGHM-T
Sample Type		HGVO-T
Layer No. Sampled		0
Date Sampled		02/23/2016
Method ID		16HG2
Data Package Number		OR16FG8023

Sample Site
C7

CAS #		1333-74-0	74-82-8
Analyte		Hydrogen	Methane
Concentration		92.1	213.4
Date Analyzed		02/23/2016	02/23/2016
D Detectable Flag			
U Detectable Flag		U	U
NA Detectable Flag			

		Requirements Met?
Free liquids <1% by volume		YES
No non-rad. pyrophorics		YES
Chemical compatability		YES
No explosives		YES
No corrosives		YES
No pressurized containers		YES
No sealed Containers >4 liters		YES
Liner punctured/ filtered		YES
Flammable VOCs <500ppmv		YES
Container is in Approved Waste Stream Profile Form?	OR-REDC-RH-HET	YES
Can it be established through Process Knowledge that the concentration of flammable VOCs present in the headspace of the container is <= 500 ppm?		YES

V&V Initials	**Date**
HP/CS	3/24/2016

Connie Hernandez
CCP Certification Official

Date

Radiation & Contamination Survey Form

CM-REF-RP-306 Rev. 1, Radiation/Contamination Surveys

SURVEY NO: 16-SUR-00485

PAGE 1 OF 1 PAGES

Instruments Used

Instrument Type	Serial Number	Cal Due Date	Alpha Eff.	Beta Eff.
LM 12-4 / LM 42-31	290889 / 315829	04/01/16	N/A	N/A
FHZ 612	XC0894	10/2/2016		

LOCATION / TYPE: RH DTC Drum Measurement

PURPOSE: Job Coverage

DATE/TIME: 02/22/16 9:13 RWP/ALARA: 16-TRU-005

Drum Barcode	Measurement Location	Gamma Bkg: .158 mR/hr			Neutron Bkg: 2 mrem/hr			Total Surface Dose Rate Gamma + Neutron (mrem/hr)
		Net Gamma @ 1m (mR/hr)	Correction Factor	Calculated Gamma Surface Dose Rate (mR/hr)	Net Neutron @ 1m* (mrem/hr)	Correction Factor	Calculated Neutron Surface Dose Rate (mrem/hr)	
ORRH00736	1	67.3	16.1	1083.53	12	7.13	85.56	1169.09
	2	65.7	16.1	1057.77	12	7.13	85.56	1143.33
	3	58.5	16.1	941.85	10	7.13	71.3	1013.15
	4	56.3	16.1	906.43	10	7.13	71.3	977.73
ORRH00737	1	58.7	16.1	945.07	6	7.13	42.78	987.85
	2	53.2	16.1	856.52	6	7.13	42.78	899.30
	3	55.1	16.1	887.11	6	7.13	42.78	929.89
	4	63.9	16.1	1028.79	6	7.13	42.78	1071.57
ORRH00738	1	62.5	16.1	1006.25	12	7.13	85.56	1091.81
	2	57.8	16.1	930.58	12	7.13	85.56	1016.14
	3	44.1	16.1	710.01	10	7.13	71.3	781.31
	4	55.8	16.1	898.38	12	7.13	85.56	983.94
ORRH00739	1	22.3	16.1	359.03	4	7.13	28.52	387.55
	2	23.9	16.1	384.79	8	7.13	57.04	441.83
	3	24.6	16.1	396.06	6	7.13	42.78	438.84
	4	23.8	16.1	383.18	6	7.13	42.78	425.96

***Contact Shift Superintendent if neutron dose rate is great than 40 mrem/hr at 1 meter.**

NOTES: Neutron and gamma measurements are taken at 180 degrees apart (eg. Gamma measurement at location 1 and neutron measurement at location 3 are taken simultaneously). Add calculated gamma measurement at position 1,2,3,4 to calculated neutron measurement at position 1,2,3,4 respectively to obtain total surface dose rate. The gamma and neutron 1 meter to surface calculation is based on T-RH-FW-C-RP-006.

*On Contact (OC) or OC/30cm (#) Smear #LAS #Direct

UNITS: If performed, dose rates are in mR/hr γ and mrem/hr n, LAS in dpm/probe, smears and direct measurements in dpm/100 cm² (unless otherwise annotated). REMARKS:

RCT SIGNATURE: Christina Britt RCM SIGNATURE: Date: 2/23/16

Signature(s) on this sheet are that of the responsible technician(s) who certify that the data recorded represent the readings, measurements, and/or observations at the time indicated.

NTPC RECORDS ORIGINAL

DATE REC'D 2-24-2016

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Attachment 1 – Visual Examination Data Form

Site ID: RHORNL			
Examination Date: 2-1-16	Batch Number: ORNLRHVE16003		
Procedure #: CCP-TP-500	Revision #: 15	Video #: N/A	
Recording Equipment Check: ☐SAT ☐UNSAT ☑N/A	Recording Start: N/A	Recording Stop: N/A	
Inspection of Container to be loaded during VE: ☑SAT ☐UNSAT			

Indirect load Container ☑N/A	Final Output Container ☐ N/A
Container ID Number:	Container ID Number: ORRH00737
Container Type:	Container Type: 55 gallon
Waste Matrix Code:	Waste Matrix Code: S5400
Waste Stream:	Waste Stream: OR-REDC-RH-HET
	Poly Rigid Liner: ☐Y ☑N Thickness: N/A; Poly Rigid Liner Lid: ☐Y ☑N
	Poly Rigid Liner Vented or Hole Size: N/A
Percent Fill: ; Percent Organic Waste:	Percent Fill: 100% Percent Organic Waste: 20 %
Layers of Confinement: ; Closure Method:	Layers of Confinement: 0 Closure Method: N/A

Comments (e.g., filter information, NCRs):
Nucfil-019DS KJ-606
cask # X10C020 1071

Waste Description:
cardboard liner (C)
super sack (P)
metal columns (IM)
plastic bucket (P)
electrical cords (P) (OM)
string (C)
poly blocks (P)
glass vials (OIM)
broken glass (OIM)
metal tools (IM)
manipulator fingers (IM)
wood (C)
metal cans (IM)
Scale (P) (OIM) (IM)
paper (C)
metal lids (IM)
floor sweepings (OIM) (IM) (C)

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Attachment 1 – Visual Examination Data Form (continued)

Container ID Number ORRH00737

Prohibited Item(s) Summary	YES	NO
Does the container have observable liquid equal to or greater than 1 percent by volume of the outermost container at the time of RTR or VE?	☐	☑
Does the container have observable liquid more than 60 milliliters or 3 percent by volume, whichever is greater in an internal container?	☐	☑
Does the container have observable liquid with an EPA hazardous waste number (HWN) U134 assigned?	☐	☑
Does the container have observable liquid containing PCBs?	☐	☑
Is there an indication of non-radionuclide pyrophoric materials, such as elemental potassium?	☐	☑
Is there an indication of hazardous wastes not occurring as co-contaminants with TRU mixed wastes (non-mixed hazardous wastes)?	☐	☑
Is there an indication of wastes incompatible with backfill, seal and panel closures materials, container and packaging materials, shipping container materials, or other wastes (i.e., waste does **NOT** match Table of Allowable Materials for RH-TRU Waste in the RH-TRAMPAC)?	☐	☑
Is there an indication of wastes containing explosives or compressed gases?	☐	☑
Is there an indication of polychlorinated biphenyls (PCBs) not authorized under an EPA PCB waste disposal authorization?	☐	☑
Is there an indication of the waste exhibiting the characteristic of ignitability, corrosivity, or reactivity (EPA Hazardous Waste Numbers of D001, D002, or D003)?	☐	☑
Is the physical form of the waste inconsistent with the Waste Stream Description or the Waste Matrix Code?	☐	☑
RH-72B Criteria		
Were there Non-approved Closure Methods used on liner bags or inner bags greater than 4 liters?	☐	☑
Are there sealed containers GREATER than 4 liters or heat sealed bags **NOT** defined in the applicable TRUCON Code?	☐	☑
Are there indications of inadequate protection (blocked or braced) for heavy and/or sharp objects?	☐	☑
Is the waste consistent with the TRUCON Code?	☑	☐

Comments: N/A

Visual Examination Operator 1:
Anthony Harley — Print Name
Signature
2-1-16 — Date

Visual Examination Operator 2:
Gilbert Gutierrez — Print Name
Signature
2-1-16 — Date

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Attachment 2 – Container Data Sheet

BDR Number: ORRHDTC16003

Date:	2/23/2016
Container No.:	ORRH00737
Probe Position:	55-GALLON
Instrument No.:	023553
Probe No.:	XC0894
Measured Background Dose Rate (mR/hr):	.178
Gross Weight (kg):	108.8
Dose Rate 1 (mR/hr):	58.7
Dose Rate 2 (mR/hr):	53.2
Dose Rate 3 (mR/hr):	55.1
Dose Rate 4 (mR/hr):	63.9
Highest measured dose rate is greater than three times the measured background.	(YES) NO

RONALD WATSON	[signature]	2/23/2016
Printed Name	Signature	Date

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BDR #: ORRHDTC16003 Site ID: ORNL

Waste Container Dose-to-Curie Conversion Record

SCO 1000 ORNL DTC-Mark-HFIR.xlsx Version 7, Addendum 7 Windows 7 Microsoft Excel 2007& 2010 Minor Change 10/23/2015

Operating Procedure	CCP-TP-504 REV 17	
Date of Survey	2/23/2016	
Waste Stream Designation	OR-REDC-RH-HET	
Cask Number	X10C020107.1	
Drum ID	ORRH00737	
Container Gross Weight	108.8 kg	
Estimate Fill Percentages	100 %	
Container Net Weight	68.1 kg	
Measured Container Dose Rate		Background
Quadrant #1	58.7 mR/hr	0.178 mR/hr
Quadrant #2	53.2 mR/hr	
Quadrant #3	55.1 mR/hr	
Quadrant #4	63.9 mR/hr	
Average Dose Rate Minus Background	58 mR/hr	

Nuclide	Curie Scaling Factors	Activity (Ci)	Grams	FGE	PECi	Watts	Uncertainty	Uncertainty in Curies	Uncertainty in Grams
U-233	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00%	0.00E+00	0.00E+00
U-234	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00%	0.00E+00	0.00E+00
U-235	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00%	0.00E+00	0.00E+00
U-238	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00%	0.00E+00	0.00E+00
Pu-238	6.24E-01	1.40E-01	8.07E-03	9.12E-04	1.27E-01	4.63E-03	98.95%	1.38E-01	7.99E-03
Pu-239	9.43E-04	2.11E-04	3.35E-03	3.35E-03	2.11E-04	6.54E-06	114.63%	2.42E-04	3.84E-03
Pu-240	1.63E-01	4.05E-02	1.76E-01	3.96E-03	4.05E-02	1.26E-03	97.83%	3.96E-02	1.72E-01
Pu-241	5.11E+00	8.11E-01	7.80E-03	1.75E-02	1.59E-02	2.58E-05	123.96%	1.00E+00	9.66E-03
Pu-242	8.32E-03	1.86E-03	4.68E-01	3.51E-03	1.69E-03	5.48E-05	97.63%	1.82E-03	4.57E-01
Am-241	3.51E-01	8.80E-02	2.53E-02	4.74E-04	8.80E-02	2.94E-03	110.90%	9.76E-02	2.81E-02
Am-243	1.17E-01	2.62E-02	1.31E-01	1.69E-03	2.62E-02	8.43E-04	95.45%	2.50E-02	1.25E-01
Cm-244	3.19E+01	5.43E+00	6.71E-02	6.04E-03	2.86E+00	1.87E-01	102.42%	5.56E+00	6.87E-02
Cm-245	3.91E-03	8.74E-04	5.10E-03	7.64E-02	9.30E-04	2.92E-05	93.67%	8.19E-04	4.77E-03
Cm-246	1.17E-01	2.62E-02	8.54E-02	0.00E+00	2.79E-02	8.61E-04	150.53%	3.95E-02	1.29E-01
Cs-137	1.00E+00	1.90E-01	2.16E-03	0.00E+00	0.00E+00	2.10E-04	31.45%	5.97E-02	6.78E-04
Ba-137m	9.46E-01	1.80E-01	3.34E-10	0.00E+00	0.00E+00	7.08E-04	31.45%	5.65E-02	1.05E-10
Sr-90	1.73E+01	3.24E+00	2.35E-02	0.00E+00	0.00E+00	3.76E-03	43.46%	1.41E+00	1.02E-02
Y-90	1.73E+01	3.24E+00	5.96E-06	0.00E+00	0.00E+00	1.80E-02	43.46%	1.41E+00	2.59E-06
Totals		1.34E+01	1.00E+00	1.14E-01	3.19E+00	2.20E-01			

	Value	(one Sigma)	
TRU Alpha Activity Concentration	4.75E+03	2.39E+03	nCi/g
TRU Alpha Activity	3.23E-01	1.63E-01	Ci
Total Pu-239 Equiv Activity	3.19E+00	3.29E+00	Ci
Total Pu-239 Fissile Gram Equiv	1.14E-01	7.11E-02	g
Total Decay Heat	2.20E-01	2.17E-01	W
Volume Activity	6.19E-02	3.58E-02	Ci/L

Originator Ronald Whitson (Print Name)

Signed [signature] Date 2/24/2016

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Attachment 4 – Flammable Gas Analysis Form

FGA Attachments.xls Revision 4
SCO 1049 Add 4 Min. Chg. 06/17/2015
Win XP SP3/Win 7 SP1, Excel 2003/2007/2010

Waste Container ID: **ORRH00737**

BDR Number: **OR16FG8023**

Sampling Date: **2/23/2016**

CAS NUMBER	COMPOUND	Measured ppmv	Reporting Flag
1333-74-0	Hydrogen	92.10	U
74-82-8	Methane	213.40	U
67-56-1	Methanol	N/A	U
60-29-7	Ethyl Ether	N/A	U
75-35-4	1,1-Dichloroethylene	N/A	U
67-64-1	Acetone	N/A	U
75-34-3	1,1-Dichloroethane	N/A	U
156-59-2	cis-1,2-Dichloroethene	N/A	U
78-93-3	Methyl ethyl ketone	N/A	U
110-82-7	Cyclohexane	N/A	U
71-43-2	Benzene	N/A	U
107-06-2	1,2-Dichloroethane	N/A	U
71-36-3	1-Butanol	N/A	U
108-10-1	Methyl isobutyl ketone	N/A	U
108-88-3	Toluene	N/A	U
108-90-7	Chlorobenzene	N/A	U
100-41-4	Ethylbenzene	N/A	U
108-38-3/106-42-3	m- and p-Xylene	N/A	U
95-47-6	o-Xylene	N/A	U
108-67-8	1,3,5-Trimethylbenzene	N/A	U
95-63-6	1,2,4-Trimethylbenzene	N/A	U

CAS Number	IDENTIFIED TIC COMPOUND	Est. Amount ppmv
N/A	N/A	N/A
N/A	N/A	N/A
N/A	N/A	N/A
N/A	N/A	N/A
N/A	N/A	N/A
N/A	N/A	N/A
N/A	N/A	N/A
N/A	N/A	N/A

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Waste Isolation Pilot Plant
Container Data Report

Report Statistics

Report Version:	**2.5.4**
WDS Instance:	**prd05.wipp.carlsbad.nm.us**
Generated on:	**April 05, 2016 06:49 AM**
Generated by:	**KIRKES, CRETA**
Total Pages:	**7**

Selection Criteria

Container Number: **ORRH00737**

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Container: ORRH00737
Type: 39 - RH 55 gal TBO

Current Status

Extended Status: APPROVED CERT IN PRESUB CERT CANISTER
Container Status: CERTIFICATION DATA APPROVED
Certification Date: 03/30/2016
Waste Handling Code: RH
Disposal Date:

Current Location Site: OR
Generator Site: OR
Destination Site ID: WI

Certification Program ID: C7
Shipping Program ID: C7

Overpack Container: OR0090
Overpack Type: REMOVABLE-LID 72-B CANISTER
Overpack Status: PRESUBMITTAL TO CERTIFICATION

Neutron Dose Rate (mrem/hr): 42.78
Beta Gamma Dose Rate (mrem/hr): 1028.79
Total Dose Rate (mrem/hr): 1071.57

FGE (g): 1.139E-01
FGE Uncertainty (g): 7.106E-02

Gross Weight (kg): 109.00
Gross Weight Uncert (kg): 0.50

Decay Heat (W): 2.2E-01
Decay Heat Uncertainty (W): 2.167E-01

Certification Data Values

Waste Stream Profile Code: OR-REDC-RH-HET
Waste Type Code: MTRU
IDC Code: NONE
Waste Matrix Code: S5400
WAC Revision Number: 7.4
Fill Factor (%): 100.00
Waste Stream BIR ID: OR-W211
Waste Stream MWIR ID: NONE

TRU Alpha Activity (Ci): 3.234E-01
TRU Alpha Activity Uncertainty (Ci): 1.629E-01
TRU Alpha Activity Concentration (Ci/g): 4.749E-06
PU-239 Equivalent Activity (PE-Ci): 3.185E00
Alpha Surface Contamination (dpm/cm^2):
Beta/Gamma Surface Contamination (dpm/cm^2):

Transportation Data Values

Closure Date: 02/01/2016
Vent Date: 02/01/2016
Process Knowledge? Y
Waste Gen Date:
Content Code: OR321M
U-235 FEM (g):
U-235 FEM Uncert (g):
Be chemically/ mechanically bound:

Shipment Purpose: DISPOSAL
Machine Compacted? N
Liner Exists? N
Liner Hole Size(mm):
Liner Lid Present?
Layers of Packaging 0
Aqueous Material? N

Gas Generation Data Values

Measured FGGR (mol/s)	Measured TGRR (mol/s)	Truncated FGGR Test (Y/N)	Truncated FGGR Test Period (days)

Container: ORRH00737
Type: 39 - RH 55 gal TBO

Current Status

Extended Status: APPROVED CERT IN PRESUB CERT CANISTER
Container Status: CERTIFICATION DATA APPROVED
Certification Date: 03/30/2016
Waste Handling Code: RH
Disposal Date:

PCB Waste? N
PCB Mass (kg):
PCB Concentration (ppm):
PCB Out of Service Date:
Be Present? Y
Be <= 1% by weight? Y
Be mass <= 100kg? Y
Separation OK?
Packing Fraction (compaction level): non-compacted

Filters

Filter Model Number	Filter Diffusivity (mol/s/ml)	Quantity	Install Date
NF019D	1.85E-05	1	02/01/2016

Certification Comments

Radionuclides

Radionuclide	Activity (Ci)	Activity Uncert (Ci)	Mass (g)	Mass Uncert (g)
AM-241	8.796E-02	9.755E-02	2.535E-02	2.811E-02
AM-243	2.615E-02	2.496E-02	1.310E-01	1.236E-01
BA-137M	1.795E-01	5.645E-02	3.338E-10	1.049E-10
CM-244	5.428E00	5.559E00	6.712E-02	6.796E-02
CM-245	8.744E-04	8.190E-04	5.095E-03	4.707E-03
CM-246	2.623E-02	3.948E-02	8.538E-02	1.269E-01
CS-137	1.898E-01	5.967E-02	2.156E-03	6.781E-04
PU-238	1.396E-01	1.382E-01	8.072E-03	7.987E-03
PU-239	2.108E-04	2.417E-04	3.352E-03	3.842E-03
PU-240	4.051E-02	3.963E-02	1.761E-01	1.723E-01
PU-241	8.107E-01	1.005E00	7.795E-03	9.663E-03
PU-242	1.859E-03	1.815E-03	4.684E-01	4.573E-01

COPY

Container: ORRH00737
Type: 39 - RH 55 gal TBO

Current Status

Extended Status: APPROVED CERT IN PRESUB CERT CANISTER
Container Status: CERTIFICATION DATA APPROVED
Certification Date: 03/30/2016
Waste Handling Code: RH
Disposal Date:

Radionuclides

Radionuclide	Activity (Ci)	Activity Uncert (Ci)	Mass (g)	Mass Uncert (g)
SR-90	3.244E00	1.410E00	2.351E-02	1.022E-02
U-233	.000E00	.000E00	.000E00	.000E00
U-234	.000E00	.000E00	.000E00	.000E00
U-235	.000E00	.000E00	.000E00	.000E00
U-238	.000E00	.000E00	.000E00	.000E00
Y-90	3.244E00	1.410E00	5.964E-06	2.592E-06

Samples

Sample ID	Sample Type Code	Sample Type Description	Sample Date	Layer Sampled
H-ORRH00737	HGHM-T	HEADSPACE GAS HYDROGEN AND METHANE	02/23/2016	0

Unique Samples

CAS Number	Analyte Description	Concentration (ppm)	Analysis Date	Analysis Method	Reporting Flags
1333-74-0	HYDROGEN	92.1	02/23/2016	16HG2	U
74-82-8	METHANE	213.4	02/23/2016	16HG2	U

Material Parameters

Material Parameter	Description	Weight (kg)
8	PLASTICS	68.10
13	STEEL CONTAINER MATERIALS	40.70

Container: ORRH00737
Type: 39 - RH 55 gal TBO

Current Status

Extended Status: APPROVED CERT IN PRESUB CERT CANISTER
Container Status: CERTIFICATION DATA APPROVED
Certification Date: 03/30/2016
Waste Handling Code: RH
Disposal Date:

Waste Weight:	68.10
Packaging Weight:	40.70
Total Material Weight:	108.80

Hazardous Codes

Hazardous Code	Description
D004	ARSENIC
D005	BARIUM
D006	CADMIUM
D007	CHROMIUM
D008	LEAD
D009	MERCURY
D010	SELENIUM
D011	SILVER
D019	CARBON TETRACHLORIDE
F002	SPENT HALOGENATED SOLVENTS
F005	SPENT NON-HALOGENATED SOLVENTS

Assay Methods

Assay Method	Description	Assay Date
16DTC1	DOSE-TO-CURIE	02/23/2016

Non-Destructive Examination (NDE)

NDE Method	Description	Examination Date

COPY

Container: ORRH00737
Type: 39 - RH 55 gal TBO

Current Status
Extended Status: APPROVED CERT IN PRESUB CERT CANISTER
Container Status: CERTIFICATION DATA APPROVED
Certification Date: 03/30/2016
Waste Handling Code: RH
Disposal Date:

Non-Destructive Examination (NDE)

NDE Method	Description	Examination Date
16RHVE1	VISUAL EXAMINATION	02/01/2016

Edit Limit Check Results

Evaluation Date: 03/30/2016 14:11:09 Overall Status: PASS

Evaluation Code	Status	Return Code	Detailed Description
DI_CERT_ALL	PASS		
DI_CERT_BE	PASS		
DI_CERT_CERT	PASS		
DI_CERT_CHARZ	PASS		
DI_CERT_ED	PASS		
DI_CERT_EPA	PASS		
DI_CERT_PCB	PASS		
DI_CERT_PERC	PASS		
DI_CERT_TRAMPAC	PASS		
DSA	PASS		
WAC	PASS		
WAP_CERT	PASS		

TRAMPAC Evaluation Results

Evaluation Date: Overall Status:

Evaluation Code	Status	Return Code	Detailed Description

Container: ORRH00737
Type: 39 - RH 55 gal TBO

Current Status

Extended Status: APPROVED CERT IN PRESUB CERT CANISTER
Container Status: CERTIFICATION DATA APPROVED
Certification Date: 03/30/2016
Waste Handling Code: RH
Disposal Date:

History

Event Date/Time	Container Number	Event Description	Reason
03/30/2016 14:11:12	ORRH00737	SUCCESSFUL SUBMISSION FOR CERT VIA THE WEB SERVICE	
03/30/2016 14:16:21	ORRH00737	APPROVED FOR CERT	

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DIVIDER

PAGE

NCR Verification from QA
ORNL RH Audit April 19-21, 2016

Container ID: ORRH00738

Container Status	Status Date	Status User
Ready	03/24/2016	Lot System
QA Ready	03/24/2016	Lot System
CO For Entry	03/24/2016	Helen Pettus
Entered	03/24/2016	Helen Pettus
CO For Validation	03/24/2016	Carolina Soaterna
Validated	03/24/2016	Carolina Soaterna
Sent To QA	03/24/2016	Creta Kirkes
CO For Certification	03/28/2016	Connie Hernandez
Certified	03/28/2016	Connie Hernandez
QA Certified	03/29/2016	Laura Jones
[CO For Certification] DeCertified with reason: ADDED STEEL WEIGHT	03/30/2016	Connie Hernandez
Certified	03/30/2016	Connie Hernandez
WDS Uploaded	03/30/2016	Connie Hernandez

CONTAINERID: ORRH00738

ORNL

AK DATA

Container ID	Container Type	AKA Matrix	WDS Status	AK Excluded	WSID	LOTID	LOT Excluded
ORRH00738			APPROVED_CERT	NO	OR-REDC-RH-HET	OR-REDC-RH-HET-Lot 34 (OR-REDC-RH-HET Lot 34)	NONE

BDR DATA

BDRID	Type	Status	Generation Date
OR16FG8023	HSG_TRANS	Complete	2016-02-23
ORNLRHVE16004	VE	Complete	2016-02-04
ORRHDTC16003	DTC	Complete	2016-02-23

NCR DATA

Container ID	NCRID	Status	Release Code
ORRH00738	NO DATA		

REJECT DATA

Container ID	BDRID	NCRID	NCR Status	Release Code	Actual Condition
ORRH00738	NO DATA				

IDC 2.13 SCO 1029 Addendum 49	Units	data	comments									
Shipper Site ID		C7	Location ID	Dest Program ID	Shipping Purpose	AK Report	AK Revision		ORRH00738			
Waste Stream Profile		OR-REDC-RH-HET	OR	WI	D	CCP-AK-ORNL-500	4					
Container Number		ORRH00738				Cur Ref AK Rev:	4					
Container Type		RH DRUM-55 TBO						U-235 FEM	U-235 FEM Uncert	FGGR Flag	FGGR Test Period	
WAC Rev #		7.4						NULL	NULL	NULL		
Cert Site		C7					Be mass<=100 k	Be <= 1%	Be Present	Aqueous Material	Compacted Wst	
Cert Date		03/30/2016					Y	Y	Y	N	N	
Waste Handling Code		RH										
Waste Type Code		MTRU	TRU, MTRU									
Waste Stream BIR ID		OR-W211										
Waste Stream MWIR ID		NONE										
Generator Site ID		OR										
IDC Code		NONE										
Matrix Code		S5400										
Trucon Code		OR321M										
Shipping Category			> 0.012 Watt-years									
Tru Alpha Act	Ci	3.10E-01		3.10E-01								
Tru Alpha Act Uncert	1sigma Ci	1.56E-01	6.21E-01	Tru Alpha Act + 2sigma (Ci)								
Tru Alpha Act Conc	nCi/g	4.47E+03						Drum Weight	40.7			
Pu239 Fiss Gm Eq	g	1.09E-01		1.08E-01				PP				
Pu239 Fiss Gm Eq Uncert	1sigma g	6.80E-02	2.45E-01	Pu239 Fiss Gm Eq + 2sigma (Ci)				CP				
Pu239 Eq Act	Ci	3.05E+00		3.05E+00				LP				
Decay Heat	watts	2.11E-01		2.13E-01				SL				
Decay Heat Uncert	1sigma watts	2.07E-01	4.18E-01	Decay Heat + 1sigma (watts)								
Layers of Packaging												
Fill Factor		100	percentage	Liner Lid Present	N							
Liner Type			1 = plastic drum liner									
Liner Punctured				Liner Hole Size								
PCB Conc		NULL		(mm)		PCB Waste	PCB Mass (kg)	Out of Service				
Closure Date		02/04/2016	Watt-years	Waste Gen Date								
Vent Date		02/04/2016	0.031701553	NULL								
Filter Install Date		02/04/2016			Filter Reduction Date							
Filter Model Number		NF019D			Reduced Filter Model							
Number of Filters Installed		1										
Aspiration Method ID		N										
Gas Gen Rate				<<Gas Gen Rate Calculated								
Hydrogen/Methane Gen Rate												
Gas Gen Comp Date				Waste (kg)	Packaging (kg)	Total (kg)						
Gross Weight	kg	110		69.3	40.7	110						
Gross Weight Uncert	1sigma kg	0.5										
Alpha Surf Cont	dpm/100 cm^2											
Beta/Gamma Surf Cont	dpm/100 cm^2											
Neutron Dose Rate	mrem/hr	86										
Beta/Gamma Dose Rate	mrem/hr	1006										

Radionuclide		U-233	U-234	U-235	U-238	PU-238	PU-239	PU-240	PU-241	PU-242	AM-241
Activity	Ci	-1.00E+00	-1.00E+00	0.00E+00	-1.00E+00	1.34E-01	2.02E-04	3.88E-02	7.76E-01	1.78E-03	8.42E-02
Activity Uncert	1sigma Ci	-1.00E+00	-1.00E+00	0.00E+00	-1.00E+00	1.32E-01	2.31E-04	3.79E-02	9.62E-01	1.74E-03	9.34E-02
Mass	grams	-1.00E+00	-1.00E+00	0.00E+00	-1.00E+00	7.72E-03	3.21E-03	1.69E-01	7.46E-03	4.48E-01	2.43E-02
Mass Uncert	1sigma grams	-1.00E+00	-1.00E+00	0.00E+00	-1.00E+00	7.65E-03	3.68E-03	1.65E-01	9.25E-03	4.38E-01	2.69E-02

Radionuclide		AM-243	CM-244	CM-245	CM-246	CS-137	BA-137M	SR-90	Y-90
Activity	Ci	2.50E-02	5.19E+00	8.37E-04	2.51E-02	1.82E-01	1.72E-01	3.10E+00	3.10E+00
Activity Uncert	1sigma Ci	2.39E-02	5.32E+00	7.84E-04	3.78E-02	5.73E-02	5.42E-02	1.35E+00	1.35E+00
Mass	grams	1.25E-01	6.42E-02	4.88E-03	8.17E-02	2.06E-03	3.19E-10	2.25E-02	5.71E-06
Mass Uncert	1sigma grams	1.18E-01	6.51E-02	4.51E-03	1.21E-01	6.51E-04	1.01E-10	9.79E-03	2.48E-06

Waste Material Parameters		PW	
Wgt of Mat Parms	kg	69.3	
Radio Assay Method		16DTC1	PAN, FRAM, TGS, HENC
Data Package Number		ORRHDTC16003	
Assay Date		02/23/2016	
Charz Method ID		16RHVE1	RTRM, VISUAL
Data Package Number		ORNLRHVE16004	
Charz Method Date		02/04/2016	

Haz Codes		D005	D006	D007	D008	D009	D010	D011	D019	F002	F005
Haz Codes		D004									

Sample ID	Headspace Gas HM	ORRH00738
Sample Type		HGHM-T
Sample Type		HGVO-T
Layer No. Sampled		0
Date Sampled		02/23/2016
Method ID		16HG2
Data Package Number		OR16FG8023

Sample Site
C7

CAS #		1333-74-0	74-82-8
Analyte		Hydrogen	Methane
Concentration		202.16	213.4
Date Analyzed		02/23/2016	02/23/2016
D Detectable Flag			
U Detectable Flag			U
NA Detectable Flag		NA	

		Requirements Met?
Free liquids <1% by volume		YES
No non-rad. pyrophorics		YES
Chemical compatability		YES
No explosives		YES
No corrosives		YES
No pressurized containers		YES
No sealed Containers >4 liters		YES
Liner punctured/ filtered		YES
Flammable VOCs <500ppmv		YES
Container is in Approved Waste Stream Profile Form?	OR-REDC-RH-HET	YES
Can it be established through Process Knowledge that the concentration of flammable VOCs present in the headspace of the container is <= 500 ppm?		YES

V&V Initials	Date
HP/CS	3/24/2016

Connie Hernandez
CCP Certification Official

Date

Radiation & Contamination Survey Form

CM-REF-RP-306 Rev. 1, Radiation/Contamination Surveys

SURVEY NO: 16-SUR-00485

PAGE 1 OF 1 PAGES

Instruments Used

Instrument Type	Serial Number	Cal Due Date	Alpha Eff.	Beta Eff.
LM 12-4 / LM 42-31	290889 / 315829	04/01/16	N/A	N/A
FHZ 612	XC0894	10/2/2016		

LOCATION / TYPE: RH DTC Drum Measurement

PURPOSE: Job Coverage

DATE/TIME: 02/22/16 9:13 RWP/ALARA: 16-TRU-005

Drum Barcode	Measurement Location	Gamma Bkg: .158 mR/hr Net Gamma @ 1m (mR/hr)	Correction Factor	Calculated Gamma Surface Dose Rate (mR/hr)	Neutron Bkg: 2 mrem/hr Net Neutron @ 1m* (mrem/hr)	Correction Factor	Calculated Neutron Surface Dose Rate (mrem/hr)	Total Surface Dose Rate Gamma + Neutron (mrem/hr)
ORRH00736	1	67.3	16.1	1083.53	12	7.13	85.56	1169.09
	2	65.7	16.1	1057.77	12	7.13	85.56	1143.33
	3	58.5	16.1	941.85	10	7.13	71.3	1013.15
	4	56.3	16.1	906.43	10	7.13	71.3	977.73
ORRH00737	1	58.7	16.1	945.07	6	7.13	42.78	987.85
	2	53.2	16.1	856.52	6	7.13	42.78	899.30
	3	55.1	16.1	887.11	6	7.13	42.78	929.89
	4	63.9	16.1	1028.79	6	7.13	42.78	1071.57
ORRH00738	1	62.5	16.1	1006.25	12	7.13	85.56	1091.81
	2	57.8	16.1	930.58	12	7.13	85.56	1016.14
	3	44.1	16.1	710.01	10	7.13	71.3	781.31
	4	55.8	16.1	898.38	12	7.13	85.56	983.94
ORRH00739	1	22.3	16.1	359.03	4	7.13	28.52	387.55
	2	23.9	16.1	384.79	8	7.13	57.04	441.83
	3	24.6	16.1	396.06	6	7.13	42.78	438.84
	4	23.8	16.1	383.18	6	7.13	42.78	425.96

***Contact Shift Superintendent if neutron dose rate is great than 40 mrem/hr at 1 meter.**

NOTES: Neutron and gamma measurements are taken at 180 degrees apart (eg. Gamma measurement at location 1 and neutron measurement at location 3 are taken simultaneously). Add calculated gamma measurement at position 1,2,3,4 to calculated neutron measurement at position 1,2,3,4 respectively to obtain total surface dose rate. The gamma and neutron 1 meter to surface calculation is based on T-RH-FW-C-RP-006.

*On Contact (OC) or $\frac{OC}{30cm}$ (#) Smear (#) LAS (#) Direct

UNITS: If performed, dose rates are in mR/hr γ and mrem/hr n, LAS in dpm/probe, smears and direct measurements in dpm/100 cm² (unless otherwise annotated). REMARKS:

RCT SIGNATURE: Christina Britt RCM SIGNATURE: Date: 2/25/16

Signature(s) on this sheet are that of the responsible technician(s) who certify that the data recorded represent the readings, measurements, and/or observations at the time indicated.

NTPC RECORDS ORIGINAL

DATE REC'D 2-24-2016

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Attachment 3 – Visual Examination Site Project Manager Checklist

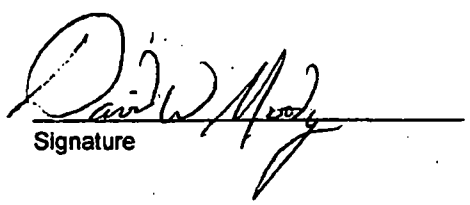
Batch Data Report No.: ORNLRHVE16004

1. Has all the data received an independent technical review as evidenced by a completed checklist (Attachment 2) and the appropriate ITR signature?		☐ NO	☒ YES
2. Are BDR contents complete and match the Visual Examination Batch Data Report Table of Contents?		☐ NO	☒ YES
3. Is the BDR complete (appropriately filled in forms for each container)?		☐ NO	☒ YES
4. Have the RH Quality Assurance Objectives (QAOs) for VE been met?			
Precision – reconciled discrepancies between operators		☐ NO	☒ YES
Accuracy – trained operators		☐ NO	☒ YES
Representativeness – description of container contents		☐ NO	☒ YES
Completeness – completed data form and/or recording		☐ NO	☒ YES
Comparability – proper training and adequate AK for unopened containers		☐ NO	☒ YES
5. Were NCRs generated included in the BDR?	☐ NO	☐ YES	☒ N/A

Comments: None

SPM:

David W. Moody
Printed Name


Signature

11 February 2016
Date

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CCP RECORDS ORIGINAL
DATE REC'D 2/12/16

Attachment 1 – Visual Examination Data Form

Site ID: RHORNL			
Examination Date: 2-4-16	Batch Number: ORNLRHVE16004		
Procedure #: CCP-TP-500	Revision #: 15	Video #: N/A	
Recording Equipment Check: ☐SAT ☐UNSAT ☑N/A	Recording Start: N/A	Recording Stop: N/A	
Inspection of Container to be loaded during VE: ☑SAT ☐UNSAT			

Indirect load Container ☐N/A	Final Output Container ☐N/A
Container ID Number:	Container ID Number: ORRH00738
Container Type:	Container Type: 55 gallon drum
Waste Matrix Code:	Waste Matrix Code: S5400
Waste Stream:	Waste Stream: OR-REDC-RH-HET
	Poly Rigid Liner: ☐Y ☑N Thickness: N/A; Poly Rigid Liner Lid: ☐Y ☑N
	Poly Rigid Liner Vented or Hole Size: N/A
Percent Fill: ; Percent Organic Waste:	Percent Fill: 100%; Percent Organic Waste: 20%
Layers of Confinement: ; Closure Method:	Layers of Confinement: 0; Closure Method: N/A

Comments (e.g., filter information, NCRs):
NucFil-0190S 15J-602
cask # X10C0201071

Waste Description:
cardboard liner (C)
super sack (P)
metal columns (IM)
plastic bucket (P)
glass vials (OIM)
plastic beads (P)
manipulator parts (IM)
plastic sheeting (P)
broken glass (OIM)
poly blocks (P)
metal can (IM)
electrical cord (OM) (P)(C)(IM)(R)
floor sweepings (IM) (OIM) (P)
rubber rings (R)

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Attachment 1 – Visual Examination Data Form (continued)

Container ID Number ORRH007738

Prohibited Item(s) Summary	YES	NO
Does the container have observable liquid equal to or greater than 1 percent by volume of the outermost container at the time of RTR or VE?	☐	☑
Does the container have observable liquid more than 60 milliliters or 3 percent by volume, whichever is greater in an internal container?	☐	☑
Does the container have observable liquid with an EPA hazardous waste number (HWN) U134 assigned?	☐	☑
Does the container have observable liquid containing PCBs?	☐	☑
Is there an indication of non-radionuclide pyrophoric materials, such as elemental potassium?	☐	☑
Is there an indication of hazardous wastes not occurring as co-contaminants with TRU mixed wastes (non-mixed hazardous wastes)?	☐	☑
Is there an indication of wastes incompatible with backfill, seal and panel closures materials, container and packaging materials, shipping container materials, or other wastes (i.e., waste does **NOT** match Table of Allowable Materials for RH-TRU Waste in the RH-TRAMPAC)?	☐	☑
Is there an indication of wastes containing explosives or compressed gases?	☐	☑
Is there an indication of polychlorinated biphenyls (PCBs) not authorized under an EPA PCB waste disposal authorization?	☐	☑
Is there an indication of the waste exhibiting the characteristic of ignitability, corrosivity, or reactivity (EPA Hazardous Waste Numbers of D001, D002, or D003)?	☐	☑
Is the physical form of the waste inconsistent with the Waste Stream Description or the Waste Matrix Code?	☐	☑
RH 72B Criteria		
Were there Non-approved Closure Methods used on liner bags or inner bags greater than 4 liters?	☐	☑
Are there sealed containers GREATER than 4 liters or heat sealed bags **NOT** defined in the applicable TRUCON Code?	☐	☑
Are there indications of inadequate protection (blocked or braced) for heavy and/or sharp objects?	☐	☑
Is the waste consistent with the TRUCON Code?	☑	☐

Comments: N/A

Visual Examination Operator 1:
Anthony Harley — Print Name
Signature
2-4-16 — Date

Visual Examination Operator 2:
Gilbert Gutierrez — Print Name
Signature
2-4-16 — Date

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Attachment 2 – Container Data Sheet

BDR Number: ORRHDTC16003

Date:	2/23/2016
Container No.:	ORRH00738
Probe Position:	55-GALLON
Instrument No.:	023553
Probe No.:	XC0894
Measured Background Dose Rate (mR/hr):	.182
Gross Weight (kg):	110.0
Dose Rate 1 (mR/hr):	62.5
Dose Rate 2 (mR/hr):	57.8
Dose Rate 3 (mR/hr):	44.1
Dose Rate 4 (mR/hr):	55.8
Highest measured dose rate is greater than three times the measured background.	(YES) NO

RONALD WHITSON	[signature]	2/23/2016
Printed Name	Signature	Date

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BDR #: ORRHDTC16003 Site ID: ORNL

Waste Container Dose-to-Curie Conversion Record

SCO 1000 ORNL DTC-Mark-HFIR.xlsx Version 7, Addendum 7 Windows 7 Microsoft Excel 2007& 2010 Minor Change 10/23/2015

Operating Procedure	CCP-TP-504 REV 17	
Date of Survey	2/23/2016	
Waste Stream Designation	OR-REDC-RH-HET	
Cask Number	X10C0201071	
Drum ID	ORRH00738	
Container Gross Weight	110 kg	
Estimate Fill Percentages	100 %	
Container Net Weight	69.3 kg	
Measured Container Dose Rate		Background
Quadrant #1	62.5 mR/hr	0.182 mR/hr
Quadrant #2	57.8 mR/hr	
Quadrant #3	44.1 mR/hr	
Quadrant #4	55.8 mR/hr	
Average Dose Rate Minus Background	55 mR/hr	

Nuclide	Curie Scaling Factors	Activity (Ci)	Grams	FGE	PECi	Watts	Uncertainty	Uncertainty in Curies	Uncertainty in Grams
U-233	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00%	0.00E+00	0.00E+00
U-234	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00%	0.00E+00	0.00E+00
U-235	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00%	0.00E+00	0.00E+00
U-238	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00%	0.00E+00	0.00E+00
Pu-238	6.24E-01	1.34E-01	7.72E-03	8.73E-04	1.21E-01	4.43E-03	98.98%	1.32E-01	7.65E-03
Pu-239	9.43E-04	2.02E-04	3.21E-03	3.21E-03	2.02E-04	6.25E-06	114.66%	2.31E-04	3.68E-03
Pu-240	1.63E-01	3.88E-02	1.69E-01	3.79E-03	3.88E-02	1.21E-03	97.86%	3.79E-02	1.65E-01
Pu-241	5.11E+00	7.76E-01	7.46E-03	1.68E-02	1.52E-02	2.47E-05	123.99%	9.62E-01	9.25E-03
Pu-242	8.32E-03	1.78E-03	4.48E-01	3.36E-03	1.62E-03	5.24E-05	97.66%	1.74E-03	4.38E-01
Am-241	3.51E-01	8.42E-02	2.43E-02	4.54E-04	8.42E-02	2.81E-03	110.93%	9.34E-02	2.69E-02
Am-243	1.17E-01	2.50E-02	1.25E-01	1.62E-03	2.50E-02	8.07E-04	95.48%	2.39E-02	1.20E-01
Cm-244	3.19E+01	5.19E+00	6.42E-02	5.78E-03	2.73E+00	1.79E-01	102.45%	5.32E+00	6.58E-02
Cm-245	3.91E-03	8.37E-04	4.88E-03	7.31E-02	8.90E-04	2.79E-05	93.70%	7.84E-04	4.57E-03
Cm-246	1.17E-01	2.51E-02	8.17E-02	0.00E+00	2.67E-02	8.24E-04	150.55%	3.78E-02	1.23E-01
Cs-137	1.00E+00	1.82E-01	2.06E-03	0.00E+00	0.00E+00	2.01E-04	31.54%	5.73E-02	6.51E-04
Ba-137m	9.46E-01	1.72E-01	3.19E-10	0.00E+00	0.00E+00	6.77E-04	31.54%	5.42E-02	1.01E-10
Sr-90	1.73E+01	3.10E+00	2.25E-02	0.00E+00	0.00E+00	3.60E-03	43.53%	1.35E+00	9.79E-03
Y-90	1.73E+01	3.10E+00	5.71E-06	0.00E+00	0.00E+00	1.72E-02	43.53%	1.35E+00	2.48E-06
Totals		1.28E+01	9.60E-01	1.09E-01	3.05E+00	2.11E-01			

	Value	(one Sigma)	
TRU Alpha Activity Concentration	4.47E+03	2.25E+03	nCi/g
TRU Alpha Activity	3.10E-01	1.56E-01	Ci
Total Pu-239 Equiv Activity	3.05E+00	3.15E+00	Ci
Total Pu-239 Fissile Gram Equiv	1.09E-01	6.80E-02	g
Total Decay Heat	2.11E-01	2.07E-01	W
Volume Activity	5.93E-02	3.43E-02	Ci/L

Originator Ronald Whitson (Print Name)

Signed [signature] Date 2/24/2016

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Attachment 4 – Flammable Gas Analysis Form

FGA Attachments.xls Revision 4
SCO 1049 Add 4 Min. Chg. 06/17/2015
Win XP SP3/Win 7 SP1, Excel 2003/2007/2010

Waste Container ID: **ORRH00738**

BDR Number: **OR16FG8023**

Sampling Date: **2/23/2016**

CAS NUMBER	COMPOUND	Measured ppmv	Reporting Flag
1333-74-0	Hydrogen	202.16	
74-82-8	Methane	213.40	U
67-56-1	Methanol	N/A	U
60-29-7	Ethyl Ether	N/A	U
75-35-4	1,1-Dichloroethylene	N/A	U
67-64-1	Acetone	N/A	U
75-34-3	1,1-Dichloroethane	N/A	U
156-59-2	cis-1,2-Dichloroethene	N/A	U
78-93-3	Methyl ethyl ketone	N/A	U
110-82-7	Cyclohexane	N/A	U
71-43-2	Benzene	N/A	U
107-06-2	1,2-Dichloroethane	N/A	U
71-36-3	1-Butanol	N/A	U
108-10-1	Methyl isobutyl ketone	N/A	U
108-88-3	Toluene	N/A	U
108-90-7	Chlorobenzene	N/A	U
100-41-4	Ethylbenzene	N/A	U
108-38-3/106-42-3	m- and p-Xylene	N/A	U
95-47-6	o-Xylene	N/A	U
108-67-8	1,3,5-Trimethylbenzene	N/A	U
95-63-6	1,2,4-Trimethylbenzene	N/A	U

CAS Number	IDENTIFIED TIC COMPOUND	Est. Amount ppmv
N/A	N/A	N/A
N/A	N/A	N/A
N/A	N/A	N/A
N/A	N/A	N/A
N/A	N/A	N/A
N/A	N/A	N/A
N/A	N/A	N/A
N/A	N/A	N/A

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Waste Isolation Pilot Plant
Container Data Report

Report Statistics

Report Version:	**2.5.4**
WDS Instance:	**prd05.wipp.carlsbad.nm.us**
Generated on:	**April 05, 2016 06:50 AM**
Generated by:	**KIRKES, CRETA**
Total Pages:	**7**

Selection Criteria

Container Number: **ORRH00738**

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Container: ORRH00738
Type: 39 - RH 55 gal TBO

Current Status

Extended Status:	APPROVED CERT IN PRESUB CERT CANISTER
Container Status:	CERTIFICATION DATA APPROVED
Certification Date:	03/30/2016
Waste Handling Code:	RH
Disposal Date:	

Current Location Site:	OR
Generator Site:	OR
Destination Site ID:	WI
Certification Program ID:	C7
Shipping Program ID:	C7
Overpack Container:	OR0090
Overpack Type:	REMOVABLE-LID 72-B CANISTER
Overpack Status:	PRESUBMITTAL TO CERTIFICATION

Neutron Dose Rate (mrem/hr):	85.56
Beta Gamma Dose Rate (mrem/hr):	1006.25
Total Dose Rate (mrem/hr):	1091.81

FGE (g):	1.09E-01
FGE Uncertainty (g):	6.804E-02
Gross Weight (kg):	110.00
Gross Weight Uncert (kg):	0.50
Decay Heat (W):	2.105E-01
Decay Heat Uncertainty (W):	2.075E-01

Certification Data Values

Waste Stream Profile Code:	OR-REDC-RH-HET
Waste Type Code:	MTRU
IDC Code:	NONE
Waste Matrix Code:	S5400
WAC Revision Number:	7.4
Fill Factor (%):	100.00
Waste Stream BIR ID:	OR-W211
Waste Stream MWIR ID:	NONE

TRU Alpha Activity (Ci):	3.095E-01
TRU Alpha Activity Uncertainty (Ci):	1.56E-01
TRU Alpha Activity Concentration (Ci/g):	4.466E-06
PU-239 Equivalent Activity (PE-Ci):	3.048E00
Alpha Surface Contamination (dpm/cm^2):	
Beta/Gamma Surface Contamination (dpm/cm^2):	

Transportation Data Values

Closure Date:	02/04/2016	Shipment Purpose:	DISPOSAL
Vent Date:	02/04/2016	Machine Compacted?	N
Process Knowledge?	Y	Liner Exists?	N
Waste Gen Date:		Liner Hole Size(mm):	
Content Code:	OR321M	Liner Lid Present?	
U-235 FEM (g):		Layers of Packaging	0
U-235 FEM Uncert (g):		Aqueous Material?	N
Be chemically/ mechanically bound:			

Gas Generation Data Values

Measured FGGR (mol/s)	Measured TGRR (mol/s)	Truncated FGGR Test (Y/N)	Truncated FGGR Test Period (days)

Container: ORRH00738
Type: 39 - RH 55 gal TBO

Current Status

Extended Status: APPROVED CERT IN PRESUB CERT CANISTER
Container Status: CERTIFICATION DATA APPROVED
Certification Date: 03/30/2016
Waste Handling Code: RH
Disposal Date:

Radionuclides

Radionuclide	Activity (Ci)	Activity Uncert (Ci)	Mass (g)	Mass Uncert (g)
SR-90	3.104E00	1.351E00	2.250E-02	9.792E-03
U-233	.000E00	.000E00	.000E00	.000E00
U-234	.000E00	.000E00	.000E00	.000E00
U-235	.000E00	.000E00	.000E00	.000E00
U-238	.000E00	.000E00	.000E00	.000E00
Y-90	3.104E00	1.351E00	5.707E-06	2.484E-06

Samples

Sample ID	Sample Type Code	Sample Type Description	Sample Date	Layer Sampled
H-ORRH00738	HGHM-T	HEADSPACE GAS HYDROGEN AND METHANE	02/23/2016	0

Unique Samples

CAS Number	Analyte Description	Concentration (ppm)	Analysis Date	Analysis Method	Reporting Flags
1333-74-0	HYDROGEN	202.16	02/23/2016	16HG2	NA
74-82-8	METHANE	213.4	02/23/2016	16HG2	U

Material Parameters

Material Parameter	Description	Weight (kg)
8	PLASTICS	69.30
13	STEEL CONTAINER MATERIALS	40.70

COPY

Container: ORRH00738
Type: 39 - RH 55 gal TBO

Current Status

Extended Status: APPROVED CERT IN PRESUB CERT CANISTER
Container Status: CERTIFICATION DATA APPROVED
Certification Date: 03/30/2016
Waste Handling Code: RH
Disposal Date:

PCB Waste? N
PCB Mass (kg):
PCB Concentration (ppm):
PCB Out of Service Date:
Be Present? Y
Be <= 1% by weight? Y
Be mass <= 100kg? Y
Separation OK?
Packing Fraction (compaction level): non-compacted

Filters

Filter Model Number	Filter Diffusivity (mol/s/ml)	Quantity	Install Date
NF019D	1.85E-05	1	02/04/2016

Certification Comments

Radionuclides

Radionuclide	Activity (Ci)	Activity Uncert (Ci)	Mass (g)	Mass Uncert (g)
AM-241	8.417E-02	9.337E-02	2.426E-02	2.691E-02
AM-243	2.502E-02	2.389E-02	1.253E-01	1.183E-01
BA-137M	1.718E-01	5.418E-02	3.194E-10	1.007E-10
CM-244	5.194E00	5.322E00	6.423E-02	6.506E-02
CM-245	8.367E-04	7.840E-04	4.876E-03	4.506E-03
CM-246	2.510E-02	3.778E-02	8.170E-02	1.215E-01
CS-137	1.816E-01	5.728E-02	2.064E-03	6.509E-04
PU-238	1.336E-01	1.323E-01	7.724E-03	7.645E-03
PU-239	2.017E-04	2.313E-04	3.207E-03	3.678E-03
PU-240	3.877E-02	3.794E-02	1.685E-01	1.649E-01
PU-241	7.758E-01	9.618E-01	7.459E-03	9.248E-03
PU-242	1.779E-03	1.738E-03	4.482E-01	4.377E-01

Container: ORRH00738
Type: 39 - RH 55 gal TBO

Current Status

Extended Status:	APPROVED CERT IN PRESUB CERT CANISTER		
Container Status:	CERTIFICATION DATA APPROVED	Waste Handling Code:	RH
Certification Date:	03/30/2016	Disposal Date:	

Waste Weight:	69.30
Packaging Weight:	40.70
Total Material Weight:	110.00

Hazardous Codes

Hazardous Code	Description
D004	ARSENIC
D005	BARIUM
D006	CADMIUM
D007	CHROMIUM
D008	LEAD
D009	MERCURY
D010	SELENIUM
D011	SILVER
D019	CARBON TETRACHLORIDE
F002	SPENT HALOGENATED SOLVENTS
F005	SPENT NON-HALOGENATED SOLVENTS

Assay Methods

Assay Method	Description	Assay Date
16DTC1	DOSE-TO-CURIE	02/23/2016

Non-Destructive Examination (NDE)

NDE Method	Description	Examination Date

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Container: ORRH00738
Type: 39 - RH 55 gal TBO

Current Status
Extended Status: APPROVED CERT IN PRESUB CERT CANISTER
Container Status: CERTIFICATION DATA APPROVED
Certification Date: 03/30/2016
Waste Handling Code: RH
Disposal Date:

Non-Destructive Examination (NDE)

NDE Method	Description	Examination Date
16RHVE1	VISUAL EXAMINATION	02/04/2016

Edit Limit Check Results

Evaluation Date: 03/30/2016 14:10:53 Overall Status: PASS

Evaluation Code	Status	Return Code	Detailed Description
DI_CERT_ALL	PASS		
DI_CERT_BE	PASS		
DI_CERT_CERT	PASS		
DI_CERT_CHARZ	PASS		
DI_CERT_ED	PASS		
DI_CERT_EPA	PASS		
DI_CERT_PCB	PASS		
DI_CERT_PERC	PASS		
DI_CERT_TRAMPAC	PASS		
DSA	PASS		
WAC	PASS		
WAP_CERT	PASS		

TRAMPAC Evaluation Results

Evaluation Date: Overall Status:

Evaluation Code	Status	Return Code	Detailed Description

Container: ORRH00738
Type: 39 - RH 55 gal TBO

Current Status

Extended Status: APPROVED CERT IN PRESUB CERT CANISTER
Container Status: CERTIFICATION DATA APPROVED
Certification Date: 03/30/2016
Waste Handling Code: RH
Disposal Date:

History

Event Date/Time	Container Number	Event Description	Reason
03/30/2016 14:10:56	ORRH00738	SUCCESSFUL SUBMISSION FOR CERT VIA THE WEB SERVICE	
03/30/2016 14:16:23	ORRH00738	APPROVED FOR CERT	

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DIVIDER

PAGE

RH Waste Characterization Case File:

including AK tracking spreadsheet for vent/closure dates, Container Information Summary (CIS), IDC spreadsheet printout, excerpts from data sources, and WWIS/WDS Waste Container and canister Data Reports

ORR0093 – RH Canister

Containing the following RH containers:

1) ORRH00736 (a 55 gal RH S5400 waste category debris container)
2) ORRH00737 (a 55 gal RH S5400 waste category debris container) and
3) ORRH00738 (a 55 gal RH S5400 waste category debris container)

RH AK Tracking Spreadsheet - Vent/Closure Dates
ORNL Audit - April 19-21, 2016

CONTAINER ID	CLOSURE DATE	VENT DATE	WASTE STREAM
Canister OR0093			
ORRH00746	02/29/2016	02/29/2016	OR-REDC-RH-HET
ORRH00747	03/01/2016	03/01/2016	OR-REDC-RH-HET
ORRH00748	03/01/2016	03/01/2016	OR-REDC-RH-HET

CCP Correlation of Container Identification Numbers to Batch Data Report Numbers

Waste Stream: # OR-REDC-RH-HET Lot # 35

Container ID Number	Radiological BDR	RTR BDR	VE BDR	FGA BDR
ORRH00740	ORRHDTC16004	N/A	ORNLRHVE16005	OR16FG11002
ORRH00741	ORRHDTC16004	N/A	ORNLRHVE16006	OR16FG11002
ORRH00742	ORRHDTC16004	N/A	ORNLRHVE16006	OR16FG11002
ORRH00743	ORRHDTC16004	N/A	ORNLRHVE16007	OR16FG11002
ORRH00744	ORRHDTC16004	N/A	ORNLRHVE16007	OR16FG11002
ORRH00745	ORRHDTC16004	N/A	ORNLRHVE16008	OR16FG11002
ORRH00746	ORRHDTC16004	N/A	ORNLRHVE16009	OR16FG11002
ORRH00747	ORRHDTC16004	N/A	ORNLRHVE16010	OR16FG11002
ORRH00748	ORRHDTC16004	N/A	ORNLRHVE16010	OR16FG11003

Signature of Site Project Manager | Irene Joo (Printed Name) | 03/30/2016 (Date)

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Generated: 4/11/16 11:07 AM

Canister #: OR0093

Canister Gross Weight + Error

872.13 kg

1,923.06 lbs

Canister Content Code/Governing Shipping Period (days): OR321M / 60

Canister Filters

Filter Model	Quantity
NF019D	1

Inner Containers

Container Number	GrossWgt+Err (kg)	(lbs)	PCB Waste?	Be Present?	Total Dose Rate (mrem/hr)	Content Code	Waste Stream Profile	Filter Model	Qty
ORRH00746	121.50	267.91	N	Y	1195.08	OR321M	OR-REDC-RH-HET	NF019D	1
ORRH00748	107.50	237.04	N	Y	320.85	OR321M	OR-REDC-RH-HET	NF019D	1
ORRH00747	97.50	214.99	N	Y	963.24	OR321M	OR-REDC-RH-HET	NF019D	1

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Waste Isolation Pilot Plant
Canister Data Report

Report Statistics

Report Version:	**2.5.4**
WDS Instance:	**prd05.wipp.carlsbad.nm.us**
Generated on:	**April 11, 2016 11:05 AM**
Generated by:	**KIRKES, CRETA**
Total Pages:	**7**

Selection Criteria

Container Number: **OR0093**

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Container: OR0093
Type: 11 - 72-B Removable Lid OP

Current Status

Extended Status: PRESUB CERT
Container Status: PRESUBMITTAL TO CERTIFICATION
Certification Date:
Waste Handling Code: RH
Disposal Date:

Current Location Site: OR
Generator Site: OR
Destination Site ID: WI

Certification Program ID: C7
Shipping Program ID: C7

Neutron Dose Rate (mrem/hr):
Beta Gamma Dose Rate (mrem/hr):
Total Dose Rate (mrem/hr):

FGE (g): 2.383E-01
FGE Uncertainty (g): 9.676E-02

Gross Weight (kg): 846.27
Gross Weight Uncert (kg): 25.86

Decay Heat (W): 4.595E-01
Decay Heat Uncertainty (W): 2.947E-01

Certification Data Values

Waste Stream Profile Code: OR-REDC-RH-HET
Waste Type Code: MTRU
IDC Code: NONE
Waste Matrix Code: S5400
WAC Revision Number: 7.4
Fill Factor (%): 69.61

TRU Alpha Activity (Ci): 6.771E-01
TRU Alpha Activity Uncertainty (Ci): 2.22E-01
TRU Alpha Activity Concentration (Ci/g): 3.34E-06
PU-239 Equivalent Activity (PE-Ci): 6.653E00
Alpha Surface Contamination (dpm/cm^2): 19.0
Beta/Gamma Surface Contamination (dpm/cm^2): 199.0

Transportation Data Values

Closure Date:
Vent Date:
Shipment Purpose: DISPOSAL
Machine Compacted? N

Waste Gen Date:
Content Code: OR321M
U-235 FEM (g):
U-235 FEM Uncert (g):
Be chemically/
mechanically bound: N

Container: OR0093
Type: 11 - 72-B Removable Lid OP

Current Status

Extended Status: PRESUB CERT
Container Status: PRESUBMITTAL TO CERTIFICATION
Certification Date:
Waste Handling Code: RH
Disposal Date:

PCB Waste? N
PCB Mass (kg):
PCB Concentration (ppm):
PCB Out of Service Date:
Be Present? Y
Be <= 1% by weight? Y

Governing Packing Fraction (compaction level): non-compacted

Filters

Filter Model Number	Filter Diffusivity (mol/s/ml)	Quantity	Install Date
NF019D	1.85E-05	1	04/01/2016

Certification Comments

Radionuclides

Radionuclide	Activity (Ci)	Activity Uncert (Ci)	Mass (g)	Mass Uncert (g)
AM-241	1.842E-01	1.328E-01	5.309E-02	3.828E-02
AM-243	5.473E-02	3.398E-02	2.741E-01	1.682E-01
BA-137M	3.752E-01	7.781E-02	6.976E-10	1.446E-10
CM-244	1.133E01	7.549E00	1.402E-01	9.229E-02
CM-245	1.830E-03	1.115E-03	1.066E-02	6.408E-03
CM-246	5.489E-02	5.369E-02	1.787E-01	1.726E-01
CS-137	3.966E-01	8.225E-02	4.507E-03	9.347E-04
PU-238	2.923E-01	1.881E-01	1.689E-02	1.087E-02
PU-239	4.412E-04	3.288E-04	7.015E-03	5.228E-03
PU-240	8.484E-02	5.398E-02	3.688E-01	2.347E-01
PU-241	1.692E00	1.363E00	1.627E-02	1.311E-02
PU-242	3.892E-03	2.471E-03	9.803E-01	6.225E-01

COPY

Container: OR0093
Type: 11 - 72-B Removable Lid OP

Current Status

Extended Status: PRESUB CERT
Container Status: PRESUBMITTAL TO CERTIFICATION
Certification Date:
Waste Handling Code: RH
Disposal Date:

Radionuclides

Radionuclide	Activity (Ci)	Activity Uncert (Ci)	Mass (g)	Mass Uncert (g)
SR-90	6.780E00	1.929E00	4.913E-02	1.398E-02
U-233	.000E00	.000E00	.000E00	.000E00
U-234	.000E00	.000E00	.000E00	.000E00
U-235	.000E00	.000E00	.000E00	.000E00
U-238	.000E00	.000E00	.000E00	.000E00
Y-90	6.780E00	1.929E00	1.246E-05	3.546E-06

Material Parameters

Material Parameter	Description	Weight (kg)
1	IRON BASE METAL ALLOYS	122.10
8	PLASTICS	202.70
13	STEEL CONTAINER MATERIALS	517.01
14	PLASTIC/LINERS CONTAINER MATERIALS	4.26
	Waste Weight:	324.80
	Packaging Weight:	521.27
	Total Material Weight:	846.07

Hazardous Codes

Hazardous Code	Description
D004	ARSENIC
D005	BARIUM
D006	CADMIUM

Container: OR0093
Type: 11 - 72-B Removable Lid OP

Current Status

Extended Status: PRESUB CERT
Container Status: PRESUBMITTAL TO CERTIFICATION
Certification Date:
Waste Handling Code: RH
Disposal Date:

Hazardous Codes

Hazardous Code	Description
D007	CHROMIUM
D008	LEAD
D009	MERCURY
D010	SELENIUM
D011	SILVER
D019	CARBON TETRACHLORIDE
F002	SPENT HALOGENATED SOLVENTS
F005	SPENT NON-HALOGENATED SOLVENTS

Edit Limit Check Results

Evaluation Date: 04/01/2016 11:18:26 Overall Status: FAIL

Evaluation Code	Status	Return Code	Detailed Description
DI_CERT_ALL	FAIL	DI_CERT_CDE	THE CERTIFICATION DATE IS BEFORE ONE OR MORE REPORTED CONTAINER DATES.
DI_CERT_BE	PASS	DI_TRAMPAC_CDN	THE CLOSURE DATE IS NULL.
DI_CERT_CERT	FAIL	DI_TRAMPAC_VDN	THE VENT DATE IS NULL.
DI_CERT_CHARZ	PASS	WAC_ALL_BGD	THE BETA/GAMMA DOSE EQUIVALENT RATE IS NULL.
DI_CERT_ED	PASS	WAC_ALL_CDN	THE CERTIFICATION DATE IS NULL.
DI_CERT_EPA	PASS	WAC_ALL_NDR	THE NEUTRON DOSE EQUIVALENT RATE IS NULL.
DI_CERT_PCB	PASS	WAP_CERT_BGN	THE BETA/GAMMA DOSE EQUIVALENT RATE IS NULL.
DI_CERT_PERC	PASS	WAP_CERT_CDN	THE CERTIFICATION DATE IS NULL.
DI_CERT_TRAMPAC	FAIL	WAP_CERT_CLN	THE CLOSURE DATE IS NULL.
DSA	PASS		

COPY

Container: OR0093
Type: 11 - 72-B Removable Lid OP

Current Status
Extended Status: PRESUB CERT
Container Status: PRESUBMITTAL TO CERTIFICATION
Certification Date:
Waste Handling Code: RH
Disposal Date:

Edit Limit Check Results

Evaluation Date: 04/01/2016 11:18:26 Overall Status: FAIL

Evaluation Code	Status	Return Code	Detailed Description
WAC	FAIL	WAP_CERT_NDN	THE NEUTRON DOSE EQUIVALENT RATE IS NULL.
WAP_CERT	FAIL		

TRAMPAC Evaluation Results

Evaluation Date: 04/01/2016 11:18:28 Overall Status: FAIL

Evaluation Code	Status	Return Code	Detailed Description
CANISTER_72B_ALL	FAIL	CANISTER_72B_ASP_CDN	The closure date was null for the canister.
CANISTER_72B_ASP	FAIL	CANISTER_72B_ASP_VDN	The vent date was null for the canister.
CANISTER_72B_CONT	PASS		
CANISTER_72B_FIL	PASS		
CANISTER_72B_GVE	PASS		
CANISTER_72B_NUC	PASS		
CANISTER_72B_PDH	PASS		
CANISTER_72B_RDR	PASS		
CANISTER_72B_WGT	PASS		

Canister Results

FGE Limit (g): 315
Elapsed Time (yrs): 0.086049
Matrix-Depletion Applied?: false

Confinement Results

Layer ID	Layer Description	Decay Heat (w)	Decay Heat Err (w)	DH Limit (w)	FGGR (mol/s)	Allow FGGR (mol/s)
ORRH00746	55-Gallon Drum	2.410E-01	2.386E-01	4.199E-01	1.067E-08	6.392E-08
ORRH00747	55-Gallon Drum	1.688E-01	1.659E-01	4.199E-01		6.392E-08

Container: OR0093
Type: 11 - 72-B Removable Lid OP

Current Status
Extended Status: PRESUB CERT
Container Status: PRESUBMITTAL TO CERTIFICATION
Certification Date:
Waste Handling Code: RH
Disposal Date:

TRAMPAC Evaluation Results
Evaluation Date: 04/01/2016 11:18:28 Overall Status: FAIL

ORRH00748	55-Gallon Drum	4.974E-02	4.903E-02	4.199E-01	6.392E-08

Inner Containers

Container Number	Type Code	Content Code	Gross Weight + Error	FGE + 2x Error	Waste Stream
ORRH00746	39 - RH 55 gal TBO	OR321M	121.50	2.819E-01	OR-REDC-RH-HET
ORRH00747	39 - RH 55 gal TBO	OR321M	97.50	1.961E-01	OR-REDC-RH-HET
ORRH00748	39 - RH 55 gal TBO	OR321M	107.50	5.794E-02	OR-REDC-RH-HET

History

Event Date/Time	Container Number	Event Description	Reason
04/01/2016 11:17:56	OR0093	INSERT DATA INTO THE DATABASE	

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PAGE

NCR-Verification from QA
ORNL RH Audit April 19-21, 2016

Container ID: ORRH00746

Container Status	Status Date	Status User
Ready	03/30/2016	Lot System
QA Ready	03/30/2016	Lot System
CO For Entry	03/30/2016	Helen Pettus
Entered	03/30/2016	Helen Pettus
CO For Validation	03/30/2016	Carolina Soaterna
Validated	03/30/2016	Carolina Soaterna
Sent To QA	03/31/2016	Creta Kirkes
QA Certified	03/31/2016	Laura Jones
CO For Certification	04/01/2016	Creta Kirkes
Certified	04/01/2016	Creta Kirkes
WDS Uploaded	04/01/2016	Creta Kirkes

CONTAINERID: ORRH00746

ORNL

AK DATA

Container ID	Container Type	AKA Matrix	WDS Status	AK Excluded	WSID	LOTID	LOT Excluded
ORRH00746			APPROVED_CERT	NO	OR-REDC-RH-HET	OR-REDC-RH-HET- Lot 35 (Shipping Lot 35 OR-REDC-RH-HET)	NONE

BDR DATA

BDRID	Type	Status	Generation Date
OR16FGI1002	HSG_TRANS	Complete	2016-03-16
ORNLRHVE16009	VE	Complete	2016-02-29
ORRHDTC16004	DTC	Complete	2016-03-21

NCR DATA

Container ID	NCRID	Status	Release Code
ORRH00746	NO DATA		

REJECT DATA

Container ID	BDRID	NCRID	NCR Status	Release Code	Actual Condition
ORRH00746	NO DATA				

IDC 2.13 SCO 1029 Addendum 49	Units	data	comments									
Shipper Site ID		C7	Location ID	Dest Program ID	Shipping Purpose	AK Report	AK Revision		ORRH00746			
Waste Stream Profile		OR-REDC-RH-HET	OR	WI	D	CCP-AK-ORNL-500	4					
Container Number		ORRH00746				Cur Ref AK Rev:	4					
Container Type		RH DRUM-55 TBO						U-235 FEM	U-235 FEM Uncert	FGGR Flag	FGGR Test Period	
WAC Rev #		7.4						NULL	NULL	NULL		
Cert Site		C7					Be mass<=100 k	Be <= 1%	Be Present	Aqueous Material	Compacted Wst	
Cert Date		04/01/2016					Y	Y	Y	N	N	
Waste Handling Code		RH										
Waste Type Code		MTRU	TRU, MTRU									
Waste Stream BIR ID		OR-W211										
Waste Stream MWIR ID		NONE										
Generator Site ID		OR										
IDC Code		NONE										
Matrix Code		S5400										
Trucon Code		OR321M										
Shipping Category			> 0.012 Watt-years									
Tru Alpha Act	Ci	3.55E-01		3.55E-01								
Tru Alpha Act Uncert	1sigma Ci	1.80E-01	7.15E-01	Tru Alpha Act + 2sigma (Ci)								
Tru Alpha Act Conc	nCi/g	4.44E+03						Drum Weight	40.7			
Pu239 Fiss Gm Eq	g	1.25E-01		1.24E-01				PP				
Pu239 Fiss Gm Eq Uncert	1sigma g	7.85E-02	2.82E-01	Pu239 Fiss Gm Eq + 2sigma (Ci)				CP				
Pu239 Eq Act	Ci	3.49E+00		3.49E+00				LP				
Decay Heat	watts	2.41E-01		2.44E-01				SL				
Decay Heat Uncert	1sigma watts	2.39E-01	4.80E-01	Decay Heat + 1sigma (watts)								
Layers of Packaging		0										
Fill Factor		95	percentage	Liner Lid Present	N							
Liner Type			1 = plastic drum liner									
Liner Punctured				Liner Hole Size								
PCB Conc		NULL		(mm)		PCB Waste	PCB Mass (kg)	Out of Service				
Closure Date		02/29/2016	Watt-years	Waste Gen Date								
Vent Date		02/29/2016	0.019791555	NULL								
Filter Install Date		02/29/2016			Filter Reduction Date							
Filter Model Number		NF019D			Reduced Filter Model							
Number of Filters Installed		1										
Aspiration Method ID		N										
Gas Gen Rate				<<Gas Gen Rate Calculated								
Hydrogen/Methane Gen Rate												
Gas Gen Comp Date				Waste (kg)	Packaging (kg)	Total (kg)						
Gross Weight	kg	120.6		79.9	40.7	120.6						
Gross Weight Uncert	1sigma kg	0.5										
Alpha Surf Cont	dpm/100 cm^2											
Beta/Gamma Surf Cont	dpm/100 cm^2											
Neutron Dose Rate	mrem/hr	57										
Beta/Gamma Dose Rate	mrem/hr	1124										

Radionuclide		U-233	U-234	U-235	U-238	PU-238	PU-239	PU-240	PU-241	PU-242	AM-241
Activity	Ci	-1.00E+00	-1.00E+00	0.00E+00	-1.00E+00	1.53E-01	2.31E-04	4.45E-02	8.87E-01	2.04E-03	9.66E-02
Activity Uncert	1sigma Ci	-1.00E+00	-1.00E+00	0.00E+00	-1.00E+00	1.52E-01	2.66E-04	4.37E-02	1.10E+00	2.00E-03	1.07E-01
Mass	grams	-1.00E+00	-1.00E+00	0.00E+00	-1.00E+00	8.86E-03	3.68E-03	1.93E-01	8.53E-03	5.14E-01	2.78E-02
Mass Uncert	1sigma grams	-1.00E+00	-1.00E+00	0.00E+00	-1.00E+00	8.80E-03	4.23E-03	1.90E-01	1.06E-02	5.04E-01	3.10E-02

Radionuclide		AM-243	CM-244	CM-245	CM-246	CS-137	BA-137M	SR-90	Y-90
Activity	Ci	2.87E-02	5.94E+00	9.60E-04	2.88E-02	2.08E-01	1.97E-01	3.56E+00	3.56E+00
Activity Uncert	1sigma Ci	2.75E-02	6.11E+00	9.02E-04	4.34E-02	6.77E-02	6.40E-02	1.57E+00	1.57E+00
Mass	grams	1.44E-01	7.35E-02	5.59E-03	9.37E-02	2.36E-03	3.66E-10	2.58E-02	6.54E-06
Mass Uncert	1sigma grams	1.36E-01	7.47E-02	5.19E-03	1.40E-01	7.69E-04	1.19E-10	1.14E-02	2.89E-06

Waste Material Parameters		PW	
Wgt of Mat Parms	kg	79.9	
Radio Assay Method		16DTC1	PAN, FRAM, TGS, HENC
Data Package Number		ORRHDTC16004	
Assay Date		03/16/2016	
Charz Method ID		16RHVE1	RTRM, VISUAL
Data Package Number		ORNLRHVE16009	
Charz Method Date		02/29/2016	

Haz Codes		D005	D006	D007	D008	D009	D010	D011	D019	F002	F005
Haz Codes		D004									

Sample ID	Headspace Gas HM	ORRH00746
Sample Type		HGHM-T
Sample Type		HGVO-T
Layer No. Sampled		0
Date Sampled		03/16/2016
Method ID		16HG2
Data Package Number		OR16FG11002

Sample Site
C7

CAS #		1333-74-0	74-82-8
Analyte		Hydrogen	Methane
Concentration		439.34	27.02
Date Analyzed		03/16/2016	03/16/2016
D Detectable Flag			
U Detectable Flag			
NA Detectable Flag		NA	NA

		Requirements Met?
Free liquids <1% by volume		YES
No non-rad. pyrophorics		YES
Chemical compatability		YES
No explosives		YES
No corrosives		YES
No pressurized containers		YES
No sealed Containers >4 liters		YES
Liner punctured/ filtered		YES
Flammable VOCs <500ppmv		YES
Container is in Approved Waste Stream Profile Form?	OR-REDC-RH-HET	YES
Can it be established through Process Knowledge that the concentration of flammable VOCs present in the headspace of the container is <= 500 ppm?		YES

V&V Initials	Date
HP/CS	3/30/2016

Creta Kirkes
CCP Certification Official

Date

Radiation & Contamination Survey Form

CM-REF-RP-306 Rev. 1, Radiation/Contamination Surveys

SURVEY NO: 16-SUR-00766

PAGE 1 OF 1 PAGES

Instruments Used

Instrument Type	Serial Number	Cal Due Date	Alpha Eff.	Beta Eff.
LM 12-4 / LM 42-31	215368 / 215368	08/20/16	N/A	N/A
FHZ612	XC0761	10/2/16		

LOCATION / TYPE: RH DTC Drum Measurement

PURPOSE: Job Coverage

DATE/TIME: 03/16/16 13:20 RWP/ALARA: 16-TRU-009

Drum Barcode	Measurement Location	Gamma			Neutron			Total Surface Dose Rate Gamma + Neutron (mrem/hr)
		Gamma Bkg: 169		mR/hr	Neutron Bkg: <0.5		mrem/hr	
		Net Gamma @ 1m (mR/hr)	Correction Factor	Calculated Gamma Surface Dose Rate (mR/hr)	Net Neutron @ 1m* (mrem/hr)	Correction Factor	Calculated Neutron Surface Dose Rate (mrem/hr)	
ORRH00744	1	10.1	16.1	162.61	2	7.13	14.26	176.87
	2	12.2	16.1	196.42	2	7.13	14.26	210.68
	3	10.5	16.1	169.05	2	7.13	14.26	183.31
	4	12.9	16.1	207.69	1	7.13	7.13	214.82
ORRH00745	1	16.8	16.1	270.48	6	7.13	42.78	313.26
	2	14.8	16.1	238.28	2	7.13	14.26	252.54
	3	16.8	16.1	270.48	6	7.13	42.78	313.26
	4	15.7	16.1	252.77	2	7.13	14.26	267.03
ORRH00746	1	69.8	16.1	1123.78	10	7.13	71.3	1195.08
	2	66.2	16.1	1065.82	5	7.13	35.65	1101.47
	3	62.3	16.1	1003.03	10	7.13	71.3	1074.33
	4	59.2	16.1	953.12	8	7.13	57.04	1010.17
ORRH00747	1	48.8	16.1	785.68	10	7.13	71.3	856.98
	2	44.8	16.1	721.28	6	7.13	42.78	764.06
	3	47.3	16.1	761.53	4	7.13	28.52	790.05
	4	55.4	16.1	891.94	6	7.13	42.78	934.69

*Contact Shift Superintendent if neutron dose rate is great than 40 mrem/hr at 1 meter.

NOTES: Neutron and gamma measurements are taken at 180 degrees apart (eg. Gamma measurement at location 1 and neutron measurement at location 3 are taken simultaneously). Add calculated gamma measurement at position 1.2.3.4 to calculated neutron measurement at position 1.2.3.4 respectively to obtain total surface dose rate. The gamma and neutron 1 meter to surface calculation is based on T-RH-FW-C-RP-006.

*On Contact (OC) or OC/30cm (#) Smear #LAS #Direct

UNITS: If performed, dose rates are in mR/hr γ and mrem/hr n. LAS in dpm/probe, smears and direct measurements in dpm/100 cm² (unless otherwise annotated). REMARKS: On contact and 1 meter neutron readings on containers performed using a LM 12-4 as read; all other neutron readings performed using a LM 12-4 and a 2X scaling factor.

RCT SIGNATURE: Jeff Bilyeu Jeff Bilyeu RCM SIGNATURE: Edward D Neal Date: 3.18.2016

The signature(s) on this sheet are that of the responsible technician(s) who certify that the data recorded represent the readings, measurements, and/or observations at the time indicated.

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Attachment 1 – Visual Examination Data Form

Site ID: RHORNL			
Examination Date: 2-29-16	Batch Number: ORNLRHVE16009		
Procedure #: CCP-TP-500	Revision #: 15	Video #: N/A	
Recording Equipment Check: ☐SAT ☐UNSAT ☑N/A	Recording Start: N/A	Recording Stop: N/A	
Inspection of Container to be loaded during VE: ☑SAT ☐UNSAT			

Indirect load Container ☑N/A		Final Output Container ☐ N/A	
Container ID Number:		Container ID Number: ORRH00746	
Container Type:		Container Type: 55 gallon drum	
Waste Matrix Code:		Waste Matrix Code: S5400	
Waste Stream:		Waste Stream: OR-REDC-RH-HET	
		Poly Rigid Liner: ☐Y ☑N Thickness: N/A	Poly Rigid Liner Lid: ☐Y ☑N
		Poly Rigid Liner Vented or Hole Size: N/A	
Percent Fill:	Percent Organic Waste:	Percent Fill: 95%	Percent Organic Waste: 20%
Layers of Confinement:	Closure Method:	Layers of Confinement: 0	Closure Method: N/A

Comments (e.g., filter information, NCRs):
Nucfil-0190S FR-770
cask # X10C040205S

Waste Description:
metal filter components (IM)
filter media (C)
saw blades (IM)
glass vials (OIM)
Nylon straps (P)
plastic bags (P)

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Attachment 1 – Visual Examination Data Form (continued)

Container ID Number ORRH00746

Prohibited Item(s) Summary	YES	NO
Does the container have observable liquid equal to or greater than 1 percent by volume of the outermost container at the time of RTR or VE?	☐	☑
Does the container have observable liquid more than 60 milliliters or 3 percent by volume, whichever is greater in an internal container?	☐	☑
Does the container have observable liquid with an EPA hazardous waste number (HWN) U134 assigned?	☐	☑
Does the container have observable liquid containing PCBs?	☐	☑
Is there an indication of non-radionuclide pyrophoric materials, such as elemental potassium?	☐	☑
Is there an indication of hazardous wastes not occurring as co-contaminants with TRU mixed wastes (non-mixed hazardous wastes)?	☐	☑
Is there an indication of wastes incompatible with backfill, seal and panel closures materials, container and packaging materials, shipping container materials, or other wastes (i.e., waste does **NOT** match Table of Allowable Materials for RH-TRU Waste in the RH-TRAMPAC)?	☐	☑
Is there an indication of wastes containing explosives or compressed gases?	☐	☑
Is there an indication of polychlorinated biphenyls (PCBs) not authorized under an EPA PCB waste disposal authorization?	☐	☑
Is there an indication of the waste exhibiting the characteristic of ignitability, corrosivity, or reactivity (EPA Hazardous Waste Numbers of D001, D002, or D003)?	☐	☑
Is the physical form of the waste inconsistent with the Waste Stream Description or the Waste Matrix Code?	☐	☑
RH-72B Criteria		
Were there Non-approved Closure Methods used on liner bags or inner bags greater than 4 liters?	☐	☑
Are there sealed containers GREATER than 4 liters or heat sealed bags **NOT** defined in the applicable TRUCON Code?	☐	☑
Are there indications of inadequate protection (blocked or braced) for heavy and/or sharp objects?	☐	☑
Is the waste consistent with the TRUCON Code?	☑	☐

Comments: N/A

Visual Examination Operator 1:
Anthony Harley (Print Name) — Signature — 2-29-16 (Date)

Visual Examination Operator 2:
Gilbert Gutierrez (Print Name) — Signature — 2-29-16 (Date)

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Attachment 2 – Container Data Sheet

BDR Number: ORRHDTC16004

Date:	3/16/16
Container No.:	ORRH00746
Probe Position:	55-gallon
Instrument No.:	023553
Probe No.:	XC0894
Measured Background Dose Rate (mR/hr):	0.188
Gross Weight (kg):	120.6
Dose Rate 1 (mR/hr):	69.8
Dose Rate 2 (mR/hr):	66.2
Dose Rate 3 (mR/hr):	62.3
Dose Rate 4 (mR/hr):	59.2
Highest measured dose rate is greater than three times the measured background.	(YES) NO

Chad Gerlock	Chad Gerlock	3/16/16
Printed Name	Signature	Date

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BDR #: ORRHDTC16004 Site ID: ORNL

Waste Container Dose-to-Curie Conversion Record

SCO 1000 ORNL DTC-Mark-HFIR.xlsx Version 7, Addendum 7 Windows 7 Microsoft Excel 2007& 2010 Minor.Change 10/23/2015

Operating Procedure	CCP-TP-504 REV.17	
Date of Survey	3/16/2016	
Waste Stream Designation	OR-REDC-RH-HET	
Cask Number	X10C0402055	
Drum ID	ORR100746	
Container Gross Weight	120.6 kg	
Estimate Fill Percentages	95 %	
Container Net Weight	79.9 kg	
Measured Container Dose Rate		Background
Quadrant #1	69.8 mR/hr	0.188 mR/hr
Quadrant #2	66.2 mR/hr	
Quadrant #3	62.3 mR/hr	
Quadrant #4	59.2 mR/hr	
Average Dose Rate Minus Background	64 mR/hr	

Nuclide	Curie Scaling Factors	Activity (Ci)	Grams	FGE	PECi	Watts	Uncertainty	Uncertainty in Curies	Uncertainty in Grams
U-233	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00%	0.00E+00	0.00E+00
U-234	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00%	0.00E+00	0.00E+00
U-235	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00%	0.00E+00	0.00E+00
U-238	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00%	0.00E+00	0.00E+00
Pu-238	6.24E-01	1.53E-01	8.86E-03	1.00E-03	1.39E-01	5.08E-03	99.31%	1.52E-01	8.80E-03
Pu-239	9.43E-04	2.31E-04	3.68E-03	3.68E-03	2.31E-04	7.17E-06	114.94%	2.66E-04	4.23E-03
Pu-240	1.63E-01	4.45E-02	1.93E-01	4.35E-03	4.45E-02	1.38E-03	98.19%	4.37E-02	1.90E-01
Pu-241	5.11E+00	8.87E-01	8.53E-03	1.92E-02	1.74E-02	2.82E-05	124.25%	1.10E+00	1.06E-02
Pu-242	8.32E-03	2.04E-03	5.14E-01	3.86E-03	1.86E-03	6.01E-05	97.99%	2.00E-03	5.04E-01
Am-241	3.51E-01	9.66E-02	2.78E-02	5.21E-04	9.66E-02	3.23E-03	111.22%	1.07E-01	3.10E-02
Am-243	1.17E-01	2.87E-02	1.44E-01	1.85E-03	2.87E-02	9.26E-04	95.82%	2.75E-02	1.38E-01
Cm-244	3.19E+01	5.94E+00	7.35E-02	6.61E-03	3.13E+00	2.04E-01	102.76%	6.11E+00	7.55E-02
Cm-245	3.91E-03	9.60E-04	5.59E-03	8.39E-02	1.02E-03	3.20E-05	94.04%	9.02E-04	5.26E-03
Cm-246	1.17E-01	2.88E-02	9.37E-02	0.00E+00	3.06E-02	9.45E-04	150.76%	4.34E-02	1.41E-01
Cs-137	1.00E+00	2.08E-01	2.36E-03	0.00E+00	0.00E+00	2.30E-04	32.54%	6.77E-02	7.69E-04
Ba-137m	9.46E-01	1.97E-01	3.66E-10	0.00E+00	0.00E+00	7.76E-04	32.54%	6.40E-02	1.19E-10
Sr-90	1.73E+01	3.56E+00	2.58E-02	0.00E+00	0.00E+00	4.12E-03	44.26%	1.57E+00	1.14E-02
Y-90	1.73E+01	3.56E+00	6.54E-06	0.00E+00	0.00E+00	1.97E-02	44.26%	1.57E+00	2.89E-06
Totals		1.47E+01	1.10E+00	1.25E-01	3.49E+00	2.41E-01			

	Value	(one Sigma)	
TRU Alpha Activity Concentration	4.44E+03	2.25E+03	nCi/g
TRU Alpha Activity	3.55E-01	1.80E-01	Ci
Total Pu-239 Equiv Activity	3.49E+00	3.62E+00	Ci
Total Pu-239 Fissile Gram Equiv	1.25E-01	7.85E-02	g
Total Decay Heat	2.41E-01	2.39E-01	W
Volume Activity	6.79E-02	3.97E-02	Ci/L

Originator **Chad Gerlock** (Print Name)

Signed Chad Gerlock Date 3/17/16

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Attachment 4 – Flammable Gas Analysis Form

FGA Attachments.xls Revision 4
SCO 1049 Add 4 Min. Chg. 06/17/2015
Win XP SP3/Win 7 SP1, Excel 2003/2007/2010

Waste Container ID: **ORRH00746**

BDR Number: **OR16FG11002**

Sampling Date: **3/16/2016**

CAS NUMBER	COMPOUND	Measured ppmv	Reporting Flag
1333-74-0	Hydrogen	439.34	
74-82-8	Methane	27.02	
67-56-1	Methanol	N/A	U
60-29-7	Ethyl Ether	N/A	U
75-35-4	1,1-Dichloroethylene	N/A	U
67-64-1	Acetone	N/A	U
75-34-3	1,1-Dichloroethane	N/A	U
156-59-2	cis-1,2-Dichloroethene	N/A	U
78-93-3	Methyl ethyl ketone	N/A	U
110-82-7	Cyclohexane	N/A	U
71-43-2	Benzene	N/A	U
107-06-2	1,2-Dichloroethane	N/A	U
71-36-3	1-Butanol	N/A	U
108-10-1	Methyl isobutyl ketone	N/A	U
108-88-3	Toluene	N/A	U
108-90-7	Chlorobenzene	N/A	U
100-41-4	Ethylbenzene	N/A	U
108-38-3/106-42-3	m- and p-Xylene	N/A	U
95-47-6	o-Xylene	N/A	U
108-67-8	1,3,5-Trimethylbenzene	N/A	U
95-63-6	1,2,4-Trimethylbenzene	N/A	U

CAS Number	IDENTIFIED TIC COMPOUND	Est. Amount ppmv
N/A	N/A	N/A
N/A	N/A	N/A
N/A	N/A	N/A
N/A	N/A	N/A
N/A	N/A	N/A
N/A	N/A	N/A
N/A	N/A	N/A
N/A	N/A	N/A

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Waste Isolation Pilot Plant
Container Data Report

Report Statistics

Report Version:	**2.5.4**
WDS Instance:	**prd05.wipp.carlsbad.nm.us**
Generated on:	**April 11, 2016 11:09 AM**
Generated by:	**KIRKES, CRETA**
Total Pages:	**7**

Selection Criteria

Container Number: **ORRH00746**

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Container: ORRH00746
Type: 39 - RH 55 gal TBO

Current Status

Extended Status:	APPROVED CERT IN PRESUB CERT CANISTER
Container Status:	CERTIFICATION DATA APPROVED
Certification Date:	04/01/2016
Waste Handling Code:	RH
Disposal Date:	

Current Location Site:	OR
Generator Site:	OR
Destination Site ID:	WI
Certification Program ID:	C7
Shipping Program ID:	C7
Overpack Container:	OR0093
Overpack Type:	REMOVABLE-LID 72-B CANISTER
Overpack Status:	PRESUBMITTAL TO CERTIFICATION

Neutron Dose Rate (mrem/hr):	71.3
Beta Gamma Dose Rate (mrem/hr):	1123.78
Total Dose Rate (mrem/hr):	1195.08

FGE (g):	1.25E-01
FGE Uncertainty (g):	7.847E-02
Gross Weight (kg):	121.00
Gross Weight Uncert (kg):	0.50
Decay Heat (W):	2.41E-01
Decay Heat Uncertainty (W):	2.386E-01

Certification Data Values

Waste Stream Profile Code:	OR-REDC-RH-HET
Waste Type Code:	MTRU
IDC Code:	NONE
Waste Matrix Code:	S5400
WAC Revision Number:	7.4
Fill Factor (%):	95.00
Waste Stream BIR ID:	OR-W211
Waste Stream MWIR ID:	NONE

TRU Alpha Activity (Ci):	3.551E-01
TRU Alpha Activity Uncertainty (Ci):	1.802E-01
TRU Alpha Activity Concentration (Ci/g):	4.444E-06
PU-239 Equivalent Activity (PE-Ci):	3.489E00
Alpha Surface Contamination (dpm/cm^2):	
Beta/Gamma Surface Contamination (dpm/cm^2):	

Transportation Data Values

Closure Date:	02/29/2016	Shipment Purpose:	DISPOSAL
Vent Date:	02/29/2016	Machine Compacted?	N
Process Knowledge?	Y	Liner Exists?	N
Waste Gen Date:		Liner Hole Size(mm):	
Content Code:	OR321M	Liner Lid Present?	
U-235 FEM (g):		Layers of Packaging	0
U-235 FEM Uncert (g):		Aqueous Material?	N

Be chemically/
mechanically bound:

Gas Generation Data Values

Measured FGGR (mol/s)	Measured TGRR (mol/s)	Truncated FGGR Test (Y/N)	Truncated FGGR Test Period (days)

Container: ORRH00746
Type: 39 - RH 55 gal TBO

Current Status

Extended Status: APPROVED CERT IN PRESUB CERT CANISTER
Container Status: CERTIFICATION DATA APPROVED
Certification Date: 04/01/2016
Waste Handling Code: RH
Disposal Date:

PCB Waste?	N
PCB Mass (kg):	
PCB Concentration (ppm):	
PCB Out of Service Date:	
Be Present?	Y
Be <= 1% by weight?	Y
Be mass <= 100kg?	Y
Separation OK?	
Packing Fraction (compaction level):	non-compacted

Filters

Filter Model Number	Filter Diffusivity (mol/s/ml)	Quantity	Install Date
NF019D	1.85E-05	1	02/29/2016

Certification Comments

Radionuclides

Radionuclide	Activity (Ci)	Activity Uncert (Ci)	Mass (g)	Mass Uncert (g)
AM-241	9.660E-02	1.074E-01	2.784E-02	3.096E-02
AM-243	2.870E-02	2.750E-02	1.437E-01	1.361E-01
BA-137M	1.968E-01	6.404E-02	3.658E-10	1.190E-10
CM-244	5.944E00	6.108E00	7.350E-02	7.467E-02
CM-245	9.597E-04	9.025E-04	5.592E-03	5.187E-03
CM-246	2.879E-02	4.340E-02	9.371E-02	1.395E-01
CS-137	2.080E-01	6.769E-02	2.364E-03	7.692E-04
PU-238	1.533E-01	1.522E-01	8.859E-03	8.798E-03
PU-239	2.314E-04	2.660E-04	3.679E-03	4.228E-03
PU-240	4.449E-02	4.368E-02	1.934E-01	1.899E-01
PU-241	8.872E-01	1.102E00	8.531E-03	1.060E-02
PU-242	2.041E-03	2.000E-03	5.141E-01	5.038E-01

COPY

Container: ORRH00746
Type: 39 - RH 55 gal TBO

Current Status

Extended Status: APPROVED CERT IN PRESUB CERT CANISTER
Container Status: CERTIFICATION DATA APPROVED
Certification Date: 04/01/2016
Waste Handling Code: RH
Disposal Date:

Radionuclides

Radionuclide	Activity (Ci)	Activity Uncert (Ci)	Mass (g)	Mass Uncert (g)
SR-90	3.556E00	1.574E00	2.576E-02	1.140E-02
U-233	.000E00	.000E00	.000E00	.000E00
U-234	.000E00	.000E00	.000E00	.000E00
U-235	.000E00	.000E00	.000E00	.000E00
U-238	.000E00	.000E00	.000E00	.000E00
Y-90	3.556E00	1.574E00	6.536E-06	2.893E-06

Samples

Sample ID	Sample Type Code	Sample Type Description	Sample Date	Layer Sampled
H-ORRH00746	HGHM-T	HEADSPACE GAS HYDROGEN AND METHANE	03/16/2016	0

Unique Samples

CAS Number	Analyte Description	Concentration (ppm)	Analysis Date	Analysis Method	Reporting Flags
1333-74-0	HYDROGEN	439.34	03/16/2016	16HG2	NA
74-82-8	METHANE	27.02	03/16/2016	16HG2	NA

Material Parameters

Material Parameter	Description	Weight (kg)
8	PLASTICS	79.90
13	STEEL CONTAINER MATERIALS	40.70

Container: ORRH00746
Type: 39 - RH 55 gal TBO

Current Status

Extended Status: APPROVED CERT IN PRESUB CERT CANISTER
Container Status: CERTIFICATION DATA APPROVED
Certification Date: 04/01/2016
Waste Handling Code: RH
Disposal Date:

Waste Weight:	79.90
Packaging Weight:	40.70
Total Material Weight:	120.60

Hazardous Codes

Hazardous Code	Description
D004	ARSENIC
D005	BARIUM
D006	CADMIUM
D007	CHROMIUM
D008	LEAD
D009	MERCURY
D010	SELENIUM
D011	SILVER
D019	CARBON TETRACHLORIDE
F002	SPENT HALOGENATED SOLVENTS
F005	SPENT NON-HALOGENATED SOLVENTS

Assay Methods

Assay Method	Description	Assay Date
16DTC1	DOSE-TO-CURIE	03/16/2016

Non-Destructive Examination (NDE)

NDE Method	Description	Examination Date

COPY

Container: ORRH00746
Type: 39 - RH 55 gal TBO

Current Status
Extended Status: APPROVED CERT IN PRESUB CERT CANISTER
Container Status: CERTIFICATION DATA APPROVED
Waste Handling Code: RH
Certification Date: 04/01/2016
Disposal Date:

Non-Destructive Examination (NDE)

NDE Method	Description	Examination Date
16RHVE1	VISUAL EXAMINATION	02/29/2016

Edit Limit Check Results

Evaluation Date: 04/01/2016 11:11:44 Overall Status: PASS

Evaluation Code	Status	Return Code	Detailed Description
DI_CERT_ALL	PASS		
DI_CERT_BE	PASS		
DI_CERT_CERT	PASS		
DI_CERT_CHARZ	PASS		
DI_CERT_ED	PASS		
DI_CERT_EPA	PASS		
DI_CERT_PCB	PASS		
DI_CERT_PERC	PASS		
DI_CERT_TRAMPAC	PASS		
DSA	PASS		
WAC	PASS		
WAP_CERT	PASS		

TRAMPAC Evaluation Results

Evaluation Date: Overall Status:

Evaluation Code	Status	Return Code	Detailed Description

Container: ORRH00746
Type: 39 - RH 55 gal TBO

Current Status

Extended Status: APPROVED CERT IN PRESUB CERT CANISTER
Container Status: CERTIFICATION DATA APPROVED
Certification Date: 04/01/2016
Waste Handling Code: RH
Disposal Date:

History

Event Date/Time	Container Number	Event Description	Reason
04/01/2016 11:11:47	ORRH00746	SUCCESSFUL SUBMISSION FOR CERT VIA THE WEB SERVICE	
04/01/2016 12:36:05	ORRH00746	APPROVED FOR CERT	

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DIVIDER

PAGE

NCR Verification from QA
ORNL RH Audit April 19-21, 2016

Container ID: ORRH00747

Container Status	Status Date	Status User
Ready	03/30/2016	Lot System
QA Ready	03/30/2016	Lot System
CO For Entry	03/30/2016	Helen Pettus
Entered	03/30/2016	Helen Pettus
CO For Validation	03/30/2016	Carolina Soaterna
Validated	03/30/2016	Carolina Soaterna
Sent To QA	03/31/2016	Creta Kirkes
QA Certified	03/31/2016	Laura Jones
CO For Certification	04/01/2016	Creta Kirkes
Certified	04/01/2016	Creta Kirkes
WDS Uploaded	04/01/2016	Creta Kirkes

CONTAINERID: ORRH00747

ORNL

AK DATA

Container ID	Container Type	AKA Matrix	WDS Status	AK Excluded	WSID	LOTID	LOT Excluded
ORRH00747			APPROVED_CERT	NO	OR-REDC-RH-HET	OR-REDC-RH-HET- Lot 35 (Shipping Lot 35 OR-REDC-RH-HET)	NONE

BDR DATA

BDRID	Type	Status	Generation Date
OR16FGI1002	HSG_TRANS	Complete	2016-03-16
ORNLRHVE16010	VE	Complete	2016-03-01
ORRHDTC16004	DTC	Complete	2016-03-21

NCR DATA

Container ID	NCRID	Status	Release Code
ORRH00747	NO DATA		

REJECT DATA

Container ID	BDRID	NCRID	NCR Status	Release Code	Actual Condition
ORRH00747	NO DATA				

IDC 2.13 SCO 1029 Addendum 49	Units	data	comments									
Shipper Site ID		C7	Location ID	Dest Program ID	Shipping Purpose	AK Report	AK Revision		ORRH00747			
Waste Stream Profile		OR-REDC-RH-HET	OR	WI	D	CCP-AK-ORNL-500	4					
Container Number		ORRH00747				Cur Ref AK Rev:	4					
Container Type		RH DRUM-55 TBO						U-235 FEM	U-235 FEM Uncert	FGGR Flag	FGGR Test Period	
WAC Rev #		7.4						NULL	NULL	NULL		
Cert Site		C7					Be mass<=100 k	Be <= 1%	Be Present	Aqueous Material	Compacted Wst	
Cert Date		04/01/2016					Y	Y	Y	N	N	
Waste Handling Code		RH										
Waste Type Code		MTRU	TRU, MTRU									
Waste Stream BIR ID		OR-W211										
Waste Stream MWIR ID		NONE										
Generator Site ID		OR										
IDC Code		NONE										
Matrix Code		S5400										
Trucon Code		OR321M										
Shipping Category			> 0.012 Watt-years									
Tru Alpha Act	Ci	2.49E-01		2.49E-01								
Tru Alpha Act Uncert	1sigma Ci	1.24E-01	4.97E-01	Tru Alpha Act + 2sigma (Ci)								
Tru Alpha Act Conc	nCi/g	4.40E+03						Drum Weight	40.7			
Pu239 Fiss Gm Eq	g	8.75E-02		8.67E-02				PP				
Pu239 Fiss Gm Eq Uncert	1sigma g	5.43E-02	1.96E-01	Pu239 Fiss Gm Eq + 2sigma (Ci)				CP				
Pu239 Eq Act	Ci	2.44E+00		2.44E+00				LP				
Decay Heat	watts	1.69E-01		1.71E-01				SL				
Decay Heat Uncert	1sigma watts	1.66E-01	3.35E-01	Decay Heat + 1sigma (watts)								
Layers of Packaging		0										
Fill Factor		100	percentage	Liner Lid Present	N							
Liner Type			1 = plastic drum liner									
Liner Punctured				Liner Hole Size								
PCB Conc		NULL		(mm)		PCB Waste	PCB Mass (kg)	Out of Service				
Closure Date		03/01/2016	Watt-years	Waste Gen Date								
Vent Date		03/01/2016	0.013401411	NULL								
Filter Install Date		03/01/2016			Filter Reduction Date							
Filter Model Number		NF019D			Reduced Filter Model							
Number of Filters Installed		1										
Aspiration Method ID		N										
Gas Gen Rate				<<Gas Gen Rate Calculated								
Hydrogen/Methane Gen Rate												
Gas Gen Comp Date				Waste (kg)	Packaging (kg)	Total (kg)						
Gross Weight	kg	97.2		56.5	40.7	97.2						
Gross Weight Uncert	1sigma kg	0.5										
Alpha Surf Cont	dpm/100 cm^2											
Beta/Gamma Surf Cont	dpm/100 cm^2											
Neutron Dose Rate	mrem/hr	71										
Beta/Gamma Dose Rate	mrem/hr	892										

Radionuclide		U-233	U-234	U-235	U-238	PU-238	PU-239	PU-240	PU-241	PU-242	AM-241
Activity	Ci	-1.00E+00	-1.00E+00	0.00E+00	-1.00E+00	1.07E-01	1.62E-04	3.12E-02	6.21E-01	1.43E-03	6.77E-02
Activity Uncert	1sigma Ci	-1.00E+00	-1.00E+00	0.00E+00	-1.00E+00	1.06E-01	1.85E-04	3.04E-02	7.69E-01	1.39E-03	7.49E-02
Mass	grams	-1.00E+00	-1.00E+00	0.00E+00	-1.00E+00	6.21E-03	2.58E-03	1.35E-01	5.98E-03	3.60E-01	1.95E-02
Mass Uncert	1sigma grams	-1.00E+00	-1.00E+00	0.00E+00	-1.00E+00	6.13E-03	2.95E-03	1.32E-01	7.40E-03	3.51E-01	2.16E-02

Radionuclide		AM-243	CM-244	CM-245	CM-246	CS-137	BA-137M	SR-90	Y-90
Activity	Ci	2.01E-02	4.16E+00	6.72E-04	2.02E-02	1.46E-01	1.38E-01	2.49E+00	2.49E+00
Activity Uncert	1sigma Ci	1.91E-02	4.26E+00	6.28E-04	3.03E-02	4.47E-02	4.23E-02	1.07E+00	1.07E+00
Mass	grams	1.01E-01	5.15E-02	3.92E-03	6.56E-02	1.66E-03	2.56E-10	1.80E-02	4.58E-06
Mass Uncert	1sigma grams	9.48E-02	5.20E-02	3.61E-03	9.75E-02	5.08E-04	7.87E-11	7.75E-03	1.97E-06

Waste Material Parameters		PW	
Wgt of Mat Parms	kg	56.5	
Radio Assay Method		16DTC1	PAN, FRAM, TGS, HENC
Data Package Number		ORRHDTC16004	
Assay Date		03/16/2016	
Charz Method ID		16RHVE1	RTRM, VISUAL
Data Package Number		ORNLRHVE16010	
Charz Method Date		03/01/2016	

Haz Codes		D005	D006	D007	D008	D009	D010	D011	D019	F002	F005
Haz Codes		D004									

Sample ID	Headspace Gas HM	ORRH00747
Sample Type		HGHM-T
Sample Type		HGVO-T
Layer No. Sampled		0
Date Sampled		03/16/2016
Method ID		16HG2
Data Package Number		OR16FG11002

Sample Site
C7

CAS #		1333-74-0	74-82-8
Analyte		Hydrogen	Methane
Concentration		290.51	6.85
Date Analyzed		03/16/2016	03/16/2016
D Detectable Flag			
U Detectable Flag			U
NA Detectable Flag		NA	

		Requirements Met?
Free liquids <1% by volume		YES
No non-rad. pyrophorics		YES
Chemical compatability		YES
No explosives		YES
No corrosives		YES
No pressurized containers		YES
No sealed Containers >4 liters		YES
Liner punctured/ filtered		YES
Flammable VOCs <500ppmv		YES
Container is in Approved Waste Stream Profile Form?	OR-REDC-RH-HET	YES
Can it be established through Process Knowledge that the concentration of flammable VOCs present in the headspace of the container is <= 500 ppm?		YES

V&V Initials	**Date**
HP/CS	3/30/2016

Creta Kirkes
CCP Certification Official

Date

Radiation & Contamination Survey Form

CM-REF-RP-306 Rev. 1, Radiation/Contamination Surveys

SURVEY NO: 16-SUR-00766

Instruments Used

Instrument Type	Serial Number	Cal Due Date	Alpha Eff.	Beta Eff.
LM 12-4 / LM 42-31	215368 / 215368	08/20/16	N/A	N/A
FHZ612	XC0761	10/2/16		

LOCATION / TYPE: RH DTC Drum Measurement

PURPOSE: Job Coverage

DATE/TIME: 03/16/16 13:20 RWP/ALARA: 16-TRU-009

Drum Barcode	Measurement Location	Gamma Bkg: 169 mR/hr			Neutron Bkg: <0.5 mrem/hr			Total Surface Dose Rate Gamma + Neutron (mrem/hr)
		Net Gamma @ 1m (mR/hr)	Correction Factor	Calculated Gamma Surface Dose Rate (mR/hr)	Net Neutron @ 1m* (mrem/hr)	Correction Factor	Calculated Neutron Surface Dose Rate (mrem/hr)	
ORRH00744	1	10.1	16.1	162.61	2	7.13	14.26	176.87
	2	12.2	16.1	196.42	2	7.13	14.26	210.68
	3	10.5	16.1	169.05	2	7.13	14.26	183.31
	4	12.9	16.1	207.69	1	7.13	7.13	214.82
ORRH00745	1	16.8	16.1	270.48	6	7.13	42.78	313.26
	2	14.8	16.1	238.28	2	7.13	14.26	252.54
	3	16.8	16.1	270.48	6	7.13	42.78	313.26
	4	15.7	16.1	252.77	2	7.13	14.26	267.03
ORRH00746	1	69.8	16.1	1123.78	10	7.13	71.3	1195.08
	2	66.2	16.1	1065.82	5	7.13	35.65	1101.47
	3	62.3	16.1	1003.03	10	7.13	71.3	1074.33
	4	59.2	16.1	953.12	8	7.13	57.04	1010.17
ORRH00747	1	48.8	16.1	785.68	10	7.13	71.3	856.98
	2	44.8	16.1	721.28	6	7.13	42.78	764.06
	3	47.3	16.1	761.53	4	7.13	28.52	790.05
	4	55.4	16.1	891.94	6	7.13	42.78	934.69

*Contact Shift Superintendent if neutron dose rate is great than 40 mrem/hr at 1 meter.

NOTES: Neutron and gamma measurements are taken at 180 degrees apart (eg. Gamma measurement at location 1 and neutron measurement at location 3 are taken simultaneously). Add calculated gamma measurement at position 1.2.3.4 to calculated neutron measurement at position 1.2.3.4 respectively to obtain total surface dose rate. The gamma and neutron 1 meter to surface calculation is based on T-RH-FW-C-RP-006.

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*On Contact (OC) or OC/30cm (#) Smear #LAS #Direct

UNITS: If performed, dose rates are in mR/hr γ and mrem/hr n. LAS in dpm/probe, smears and direct measurements in dpm/100 cm² (unless otherwise annotated). REMARKS: On contact and 1 meter neutron readings on containers performed using a LM 12-4 as read; all other neutron readings performed using a LM 12-4 and a 2X scaling factor.

RCT SIGNATURE: Jeff Bilyeu Jeff Bilyeu RCM SIGNATURE: Edward D Neil Date: 3.18.2016

The signature(s) on this sheet are that of the responsible technician(s) who certify that the data recorded represent the readings, measurements, and/or observations at the time indicated.

Attachment 1 – Visual Examination Data Form

Site ID: RH ORNL			
Examination Date: 3-1-16		Batch Number: ORNLRHVE16010	
Procedure #: CCP-TP-500		Revision #: 15	Video #: N/A
Recording Equipment Check: ☐SAT ☐UNSAT ☑N/A		Recording Start: N/A	Recording Stop: N/A
Inspection of Container to be loaded during VE: ☑SAT ☐UNSAT			
Indirect load Container ☑N/A		Final Output Container ☐ N/A	
Container ID Number:		Container ID Number: ORRH00747	
Container Type:		Container Type: 55 gallon drum	
Waste Matrix Code:		Waste Matrix Code: 55400	
Waste Stream:		Waste Stream: OR-REDC-RH-HET	
		Poly Rigid Liner: ☐Y ☑N Thickness: N/A	Poly Rigid Liner Lid: ☐ Y ☑N
		Poly Rigid Liner Vented or Hole Size: N/A	
Percent Fill:	Percent Organic Waste:	Percent Fill: 100%	Percent Organic Waste: 20%
Layers of Confinement:	Closure Method:	Layers of Confinement: 0	Closure Method: N/A
Comments (e.g., filter information, NCRs): Nuclfil-0190S FK-766 cask# X10C0402055			
Waste Description: metal filter components (IM) insulation (OIM) cardboard liner (C) super sack (P)			

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Attachment 1 – Visual Examination Data Form (continued)

Container ID Number ORRH00747

Prohibited Item(s) Summary	YES	NO
Does the container have observable liquid equal to or greater than 1 percent by volume of the outermost container at the time of RTR or VE?	☐	☑
Does the container have observable liquid more than 60 milliliters or 3 percent by volume, whichever is greater in an internal container?	☐	☑
Does the container have observable liquid with an EPA hazardous waste number (HWN) U134 assigned?	☐	☑
Does the container have observable liquid containing PCBs?	☐	☑
Is there an indication of non-radionuclide pyrophoric materials, such as elemental potassium?	☐	☑
Is there an indication of hazardous wastes not occurring as co-contaminants with TRU mixed wastes (non-mixed hazardous wastes)?	☐	☑
Is there an indication of wastes incompatible with backfill, seal and panel closures materials, container and packaging materials, shipping container materials, or other wastes (i.e., waste does **NOT** match Table of Allowable Materials for RH-TRU Waste in the RH-TRAMPAC)?	☐	☑
Is there an indication of wastes containing explosives or compressed gases?	☐	☑
Is there an indication of polychlorinated biphenyls (PCBs) not authorized under an EPA PCB waste disposal authorization?	☐	☑
Is there an indication of the waste exhibiting the characteristic of ignitability, corrosivity, or reactivity (EPA Hazardous Waste Numbers of D001, D002, or D003)?	☐	☑
Is the physical form of the waste inconsistent with the Waste Stream Description or the Waste Matrix Code?	☐	☑
RH 72B Criteria		
Were there Non-approved Closure Methods used on liner bags or inner bags greater than 4 liters?	☐	☑
Are there sealed containers GREATER than 4 liters or heat sealed bags **NOT** defined in the applicable TRUCON Code?	☐	☑
Are there indications of inadequate protection (blocked or braced) for heavy and/or sharp objects?	☐	☑
Is the waste consistent with the TRUCON Code?	☑	☐

Comments: N/A

Visual Examination Operator 1:

Print Name	Signature	Date
Anthony Harley		3-1-16

Visual Examination Operator 2:

Print Name	Signature	Date
Gilbert Gutierrez		3-1-16

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Attachment 2 – Container Data Sheet

BDR Number: ORRHDTC16004

Date:	3/16/16
Container No.:	ORRH00747
Probe Position:	55 gallon
Instrument No.:	023553
Probe No.:	XC0894
Measured Background Dose Rate (mR/hr):	0.194
Gross Weight (kg):	97.2
Dose Rate 1 (mR/hr):	48.8
Dose Rate 2 (mR/hr):	44.8
Dose Rate 3 (mR/hr):	47.3
Dose Rate 4 (mR/hr):	55.4
Highest measured dose rate is greater than three times the measured background.	(YES) NO

Chad Gerlock	Chad Gerlock	3/16/16
Printed Name	Signature	Date

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BDR #: ORRHDTC16004 Site ID: ORNL

Waste Container Dose-to-Curie Conversion Record

SCO 1000 ORNL DTC-Mark-HFIR.xlsx Version 7, Addendum 7 Windows 7 Microsoft Excel 2007& 2010 Minor Change 10/23/2015

Operating Procedure	CCP-TP-504 REV 17		
Date of Survey	3/16/2016		
Waste Stream Designation	OR-REDC-RH-HET		
Cask Number	X10C0402055		
Drum ID	ORRH00747		
Container Gross Weight	97.2 kg		
Estimate Fill Percentages	100 %		
Container Net Weight	56.5 kg		
Measured Container Dose Rate		Background	
Quadrant #1	48.8 mR/hr	0.194	mR/hr
Quadrant #2	44.8 mR/hr		
Quadrant #3	47.3 mR/hr		
Quadrant #4	55.4 mR/hr		
Average Dose Rate Minus Background	49 mR/hr		

Nuclide	Curie Scaling Factors	Activity (Ci)	Grams	FGE	PECi	Watts	Uncertainty	Uncertainty in Curies	Uncertainty in Grams
U-233	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00%	0.00E+00	0.00E+00
U-234	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00%	0.00E+00	0.00E+00
U-235	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00%	0.00E+00	0.00E+00
U-238	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00%	0.00E+00	0.00E+00
Pu-238	6.24E-01	1.07E-01	6.21E-03	7.01E-04	9.76E-02	3.56E-03	98.72%	1.06E-01	6.13E-03
Pu-239	9.43E-04	1.62E-04	2.58E-03	2.58E-03	1.62E-04	5.02E-06	114.43%	1.85E-04	2.95E-03
Pu-240	1.63E-01	3.12E-02	1.35E-01	3.05E-03	3.12E-02	9.70E-04	97.59%	3.04E-02	1.32E-01
Pu-241	5.11E+00	6.21E-01	5.98E-03	1.34E-02	1.22E-02	1.98E-05	123.78%	7.69E-01	7.40E-03
Pu-242	8.32E-03	1.43E-03	3.60E-01	2.70E-03	1.30E-03	4.21E-05	97.40%	1.39E-03	3.51E-01
Am-241	3.51E-01	6.77E-02	1.95E-02	3.65E-04	6.77E-02	2.26E-03	110.69%	7.49E-02	2.16E-02
Am-243	1.17E-01	2.01E-02	1.01E-01	1.30E-03	2.01E-02	6.48E-04	95.21%	1.91E-02	9.59E-02
Cm-244	3.19E+01	4.16E+00	5.15E-02	4.63E-03	2.19E+00	1.43E-01	102.19%	4.26E+00	5.26E-02
Cm-245	3.91E-03	6.72E-04	3.92E-03	5.88E-02	7.15E-04	2.24E-05	93.42%	6.28E-04	3.66E-03
Cm-246	1.17E-01	2.02E-02	6.56E-02	0.00E+00	2.15E-02	6.62E-04	150.37%	3.03E-02	9.87E-02
Cs-137	1.00E+00	1.46E-01	1.66E-03	0.00E+00	0.00E+00	1.61E-04	30.70%	4.47E-02	5.08E-04
Ba-137m	9.46E-01	1.38E-01	2.56E-10	0.00E+00	0.00E+00	5.43E-04	30.70%	4.23E-02	7.87E-11
Sr-90	1.73E+01	2.49E+00	1.80E-02	0.00E+00	0.00E+00	2.89E-03	42.93%	1.07E+00	7.75E-03
Y-90	1.73E+01	2.49E+00	4.58E-06	0.00E+00	0.00E+00	1.38E-02	42.93%	1.07E+00	1.97E-06
Totals		1.03E+01	7.71E-01	8.75E-02	2.44E+00	1.69E-01			

	Value	(one Sigma)	
TRU Alpha Activity Concentration	4.40E+03	2.20E+03	nCi/g
TRU Alpha Activity	2.49E-01	1.24E-01	Ci
Total Pu-239 Equiv Activity	2.44E+00	2.52E+00	Ci
Total Pu-239 Fissile Gram Equiv	8.75E-02	5.43E-02	g
Total Decay Heat	1.69E-01	1.66E-01	W
Volume Activity	4.75E-02	2.72E-02	Ci/L

Originator **Chad Gerlock** (Print Name)

Signed Chad Gerlock Date 3/17/16

COPY

Attachment 4 – Flammable Gas Analysis Form

FGA Attachments.xls Revision 4
SCO 1049 Add 4 Min. Chg. 06/17/2015
Win XP SP3/Win 7 SP1, Excel 2003/2007/2010

Waste Container ID: **ORRH00747**

BDR Number: **OR16FG11002**

Sampling Date: **3/16/2016**

CAS NUMBER	COMPOUND	Measured ppmv	Reporting Flag
1333-74-0	Hydrogen	290.51	
74-82-8	Methane	6.85	U
67-56-1	Methanol	N/A	U
60-29-7	Ethyl Ether	N/A	U
75-35-4	1,1-Dichloroethylene	N/A	U
67-64-1	Acetone	N/A	U
75-34-3	1,1-Dichloroethane	N/A	U
156-59-2	cis-1,2-Dichloroethene	N/A	U
78-93-3	Methyl ethyl ketone	N/A	U
110-82-7	Cyclohexane	N/A	U
71-43-2	Benzene	N/A	U
107-06-2	1,2-Dichloroethane	N/A	U
71-36-3	1-Butanol	N/A	U
108-10-1	Methyl isobutyl ketone	N/A	U
108-88-3	Toluene	N/A	U
108-90-7	Chlorobenzene	N/A	U
100-41-4	Ethylbenzene	N/A	U
108-38-3/106-42-3	m- and p-Xylene	N/A	U
95-47-6	o-Xylene	N/A	U
108-67-8	1,3,5-Trimethylbenzene	N/A	U
95-63-6	1,2,4-Trimethylbenzene	N/A	U

CAS Number	IDENTIFIED TIC COMPOUND	Est. Amount ppmv
N/A	N/A	N/A
N/A	N/A	N/A
N/A	N/A	N/A
N/A	N/A	N/A
N/A	N/A	N/A
N/A	N/A	N/A
N/A	N/A	N/A
N/A	N/A	N/A

COPY

Waste Isolation Pilot Plant
Container Data Report

Report Statistics

Report Version:	**2.5.4**
WDS Instance:	**prd05.wipp.carlsbad.nm.us**
Generated on:	**April 11, 2016 11:12 AM**
Generated by:	**KIRKES, CRETA**
Total Pages:	**7**

Selection Criteria

Container Number: **ORRH00747**

COPY

Container: ORRH00747
Type: 39 - RH 55 gal TBO

Current Status

Extended Status: APPROVED CERT IN PRESUB CERT CANISTER
Container Status: CERTIFICATION DATA APPROVED
Certification Date: 04/01/2016
Waste Handling Code: RH
Disposal Date:

Current Location Site: OR
Generator Site: OR
Destination Site ID: WI

Certification Program ID: C7
Shipping Program ID: C7

Overpack Container: OR0093
Overpack Type: REMOVABLE-LID 72-B CANISTER
Overpack Status: PRESUBMITTAL TO CERTIFICATION

Neutron Dose Rate (mrem/hr): 71.3
Beta Gamma Dose Rate (mrem/hr): 891.94
Total Dose Rate (mrem/hr): 963.24

FGE (g): 8.753E-02
FGE Uncertainty (g): 5.429E-02

Gross Weight (kg): 97.00
Gross Weight Uncert (kg): 0.50

Decay Heat (W): 1.688E-01
Decay Heat Uncertainty (W): 1.659E-01

Certification Data Values

Waste Stream Profile Code: OR-REDC-RH-HET
Waste Type Code: MTRU
IDC Code: NONE
Waste Matrix Code: S5400
WAC Revision Number: 7.4
Fill Factor (%): 100.00
Waste Stream BIR ID: OR-W211
Waste Stream MWIR ID: NONE

TRU Alpha Activity (Ci): 2.487E-01
TRU Alpha Activity Uncertainty (Ci): 1.243E-01
TRU Alpha Activity Concentration (Ci/g): 4.402E-06
PU-239 Equivalent Activity (PE-Ci): 2.444E00
Alpha Surface Contamination (dpm/cm^2):
Beta/Gamma Surface Contamination (dpm/cm^2):

Transportation Data Values

Closure Date: 03/01/2016
Vent Date: 03/01/2016
Process Knowledge? Y
Waste Gen Date:
Content Code: OR321M
U-235 FEM (g):
U-235 FEM Uncert (g):
Be chemically/ mechanically bound:

Shipment Purpose: DISPOSAL
Machine Compacted? N
Liner Exists? N
Liner Hole Size(mm):
Liner Lid Present?
Layers of Packaging 0
Aqueous Material? N

Gas Generation Data Values

Measured FGGR (mol/s)	Measured TGRR (mol/s)	Truncated FGGR Test (Y/N)	Truncated FGGR Test Period (days)

Container: ORRH00747
Type: 39 - RH 55 gal TBO

Current Status

Extended Status: APPROVED CERT IN PRESUB CERT CANISTER
Container Status: CERTIFICATION DATA APPROVED
Certification Date: 04/01/2016
Waste Handling Code: RH
Disposal Date:

PCB Waste? N
PCB Mass (kg):
PCB Concentration (ppm):
PCB Out of Service Date:
Be Present? Y
Be <= 1% by weight? Y
Be mass <= 100kg? Y
Separation OK?
Packing Fraction (compaction level): non-compacted

Filters

Filter Model Number	Filter Diffusivity (mol/s/ml)	Quantity	Install Date
NF019D	1.85E-05	1	03/01/2016

Certification Comments

Radionuclides

Radionuclide	Activity (Ci)	Activity Uncert (Ci)	Mass (g)	Mass Uncert (g)
AM-241	6.767E-02	7.491E-02	1.950E-02	2.159E-02
AM-243	2.011E-02	1.914E-02	1.007E-01	9.476E-02
BA-137M	1.378E-01	4.232E-02	2.563E-10	7.866E-11
CM-244	4.164E00	4.255E00	5.148E-02	5.202E-02
CM-245	6.722E-04	6.280E-04	3.917E-03	3.609E-03
CM-246	2.016E-02	3.032E-02	6.564E-02	9.750E-02
CS-137	1.457E-01	4.473E-02	1.656E-03	5.083E-04
PU-238	1.074E-01	1.060E-01	6.206E-03	6.126E-03
PU-239	1.621E-04	1.855E-04	2.577E-03	2.949E-03
PU-240	3.116E-02	3.041E-02	1.355E-01	1.322E-01
PU-241	6.215E-01	7.692E-01	5.976E-03	7.396E-03
PU-242	1.430E-03	1.392E-03	3.601E-01	3.507E-01

COPY

Container: ORRH00747
Type: 39 - RH 55 gal TBO

Current Status
Extended Status: APPROVED CERT IN PRESUB CERT CANISTER
Container Status: CERTIFICATION DATA APPROVED
Certification Date: 04/01/2016
Waste Handling Code: RH
Disposal Date:

Radionuclides

Radionuclide	Activity (Ci)	Activity Uncert (Ci)	Mass (g)	Mass Uncert (g)
SR-90	2.491E00	1.069E00	1.805E-02	7.747E-03
U-233	.000E00	.000E00	.000E00	.000E00
U-234	.000E00	.000E00	.000E00	.000E00
U-235	.000E00	.000E00	.000E00	.000E00
U-238	.000E00	.000E00	.000E00	.000E00
Y-90	2.491E00	1.069E00	4.578E-06	1.965E-06

Samples

Sample ID	Sample Type Code	Sample Type Description	Sample Date	Layer Sampled
H-ORRH00747	HGHM-T	HEADSPACE GAS HYDROGEN AND METHANE	03/16/2016	0

Unique Samples

CAS Number	Analyte Description	Concentration (ppm)	Analysis Date	Analysis Method	Reporting Flags
1333-74-0	HYDROGEN	290.51	03/16/2016	16HG2	NA
74-82-8	METHANE	6.85	03/16/2016	16HG2	U

Material Parameters

Material Parameter	Description	Weight (kg)
8	PLASTICS	56.50
13	STEEL CONTAINER MATERIALS	40.70

Container: ORRH00747
Type: 39 - RH 55 gal TBO

Current Status

Extended Status: APPROVED CERT IN PRESUB CERT CANISTER
Container Status: CERTIFICATION DATA APPROVED
Certification Date: 04/01/2016
Waste Handling Code: RH
Disposal Date:

Waste Weight:	56.50
Packaging Weight:	40.70
Total Material Weight:	97.20

Hazardous Codes

Hazardous Code	Description
D004	ARSENIC
D005	BARIUM
D006	CADMIUM
D007	CHROMIUM
D008	LEAD
D009	MERCURY
D010	SELENIUM
D011	SILVER
D019	CARBON TETRACHLORIDE
F002	SPENT HALOGENATED SOLVENTS
F005	SPENT NON-HALOGENATED SOLVENTS

Assay Methods

Assay Method	Description	Assay Date
16DTC1	DOSE-TO-CURIE	03/16/2016

Non-Destructive Examination (NDE)

NDE Method	Description	Examination Date

COPY

Container: ORRH00747
Type: 39 - RH 55 gal TBO

Current Status

Extended Status: APPROVED CERT IN PRESUB CERT CANISTER
Container Status: CERTIFICATION DATA APPROVED
Certification Date: 04/01/2016
Waste Handling Code: RH
Disposal Date:

Non-Destructive Examination (NDE)

NDE Method	Description	Examination Date
16RHVE1	VISUAL EXAMINATION	03/01/2016

Edit Limit Check Results

Evaluation Date: 04/01/2016 11:11:49 Overall Status: PASS

Evaluation Code	Status	Return Code	Detailed Description
DI_CERT_ALL	PASS		
DI_CERT_BE	PASS		
DI_CERT_CERT	PASS		
DI_CERT_CHARZ	PASS		
DI_CERT_ED	PASS		
DI_CERT_EPA	PASS		
DI_CERT_PCB	PASS		
DI_CERT_PERC	PASS		
DI_CERT_TRAMPAC	PASS		
DSA	PASS		
WAC	PASS		
WAP_CERT	PASS		

TRAMPAC Evaluation Results

Evaluation Date: Overall Status:

Evaluation Code	Status	Return Code	Detailed Description

Container: ORRH00747
Type: 39 - RH 55 gal TBO

Current Status

Extended Status: APPROVED CERT IN PRESUB CERT CANISTER
Container Status: CERTIFICATION DATA APPROVED
Certification Date: 04/01/2016
Waste Handling Code: RH
Disposal Date:

History

Event Date/Time	Container Number	Event Description	Reason
04/01/2016 11:11:52	ORRH00747	SUCCESSFUL SUBMISSION FOR CERT VIA THE WEB SERVICE	
04/01/2016 12:36:06	ORRH00747	APPROVED FOR CERT	

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DIVIDER

PAGE

NCR Verification from QA
ORNL RH Audit 19-21, 2016

Container ID: ORRH00748

Container Status	Status Date	Status User
Ready	03/30/2016	Lot System
QA Ready	03/30/2016	Lot System
CO For Entry	03/30/2016	Helen Pettus
Entered	03/30/2016	Helen Pettus
CO For Validation	03/30/2016	Carolina Soaterna
Validated	03/30/2016	Carolina Soaterna
Sent To QA	03/31/2016	Creta Kirkes
QA Certified	03/31/2016	Laura Jones
CO For Certification	04/01/2016	Creta Kirkes
Certified	04/01/2016	Creta Kirkes
WDS Uploaded	04/01/2016	Creta Kirkes

CONTAINERID: ORRH00748

ORNL

AK DATA

Container ID	Container Type	AKA Matrix	WDS Status	AK Excluded	WSID	LOTID	LOT Excluded
ORRH00748			APPROVED_CERT	NO	OR-REDC-RH-HET	OR-REDC-RH-HET- Lot 35 (Shipping Lot 35 OR-REDC-RH-HET)	NONE

BDR DATA

BDRID	Type	Status	Generation Date
OR16FGI1003	HSG_TRANS	Complete	2016-03-17
ORNLRHVE16010	VE	Complete	2016-03-01
ORRHDTC16004	DTC	Complete	2016-03-21

NCR DATA

Container ID	NCRID	Status	Release Code
ORRH00748	NO DATA		

REJECT DATA

Container ID	BDRID	NCRID	NCR Status	Release Code	Actual Condition
ORRH00748	NO DATA				

IDC 2.13 SCO 1029 Addendum 49	Units	data	comments									
Shipper Site ID		C7	Location ID	Dest Program ID	Shipping Purpose	AK Report	AK Revision		ORRH00748			
Waste Stream Profile		OR-REDC-RH-HET	OR	WI	D	CCP-AK-ORNL-500	4					
Container Number		ORRH00748				Cur Ref AK Rev:	4					
Container Type		RH DRUM-55 TBO						U-235 FEM	U-235 FEM Uncert	FGGR Flag	FGGR Test Period	
WAC Rev #		7.4						NULL	NULL	NULL		
Cert Site		C7					Be mass<=100 k	Be <= 1%	Be Present	Aqueous Material	Compacted Wst	
Cert Date		04/01/2016					Y	Y	Y	N	N	
Waste Handling Code		RH										
Waste Type Code		MTRU	TRU, MTRU									
Waste Stream BIR ID		OR-W211										
Waste Stream MWIR ID		NONE										
Generator Site ID		OR										
IDC Code		NONE										
Matrix Code		S5400										
Trucon Code		OR321M										
Shipping Category												
Tru Alpha Act	Ci	7.33E-02		7.33E-02								
Tru Alpha Act Uncert	1sigma Ci	3.68E-02	1.47E-01	Tru Alpha Act + 2sigma (Ci)								
Tru Alpha Act Conc	nCi/g	1.11E+03						Drum Weight	40.7			
Pu239 Fiss Gm Eq	g	2.58E-02		2.55E-02				PP				
Pu239 Fiss Gm Eq Uncert	1sigma g	1.61E-02	5.79E-02	Pu239 Fiss Gm Eq + 2sigma (Ci)				CP				
Pu239 Eq Act	Ci	7.20E-01		7.20E-01				LP				
Decay Heat	watts	4.97E-02		5.04E-02				SL				
Decay Heat Uncert	1sigma watts	4.90E-02	9.88E-02	Decay Heat + 1sigma (watts)								
Layers of Packaging		0										
Fill Factor		100	percentage	Liner Lid Present	N							
Liner Type			1 = plastic drum liner									
Liner Punctured				Liner Hole Size								
PCB Conc		NULL		(mm)		PCB Waste	PCB Mass (kg)	Out of Service				
Closure Date		03/01/2016	Watt-years	Waste Gen Date								
Vent Date		03/01/2016	0.003948819	NULL								
Filter Install Date		03/01/2016			Filter Reduction Date							
Filter Model Number		NF019D			Reduced Filter Model							
Number of Filters Installed		1										
Aspiration Method ID		N										
Gas Gen Rate				<<Gas Gen Rate Calculated								
Hydrogen/Methane Gen Rate												
Gas Gen Comp Date				Waste (kg)	Packaging (kg)	Total (kg)						
Gross Weight	kg	107		66.3	40.7	107						
Gross Weight Uncert	1sigma kg	0.5										
Alpha Surf Cont	dpm/100 cm^2											
Beta/Gamma Surf Cont	dpm/100 cm^2											
Neutron Dose Rate	mrem/hr	71										
Beta/Gamma Dose Rate	mrem/hr	250										

Radionuclide		U-233	U-234	U-235	U-238	PU-238	PU-239	PU-240	PU-241	PU-242	AM-241
Activity	Ci	-1.00E+00	-1.00E+00	0.00E+00	-1.00E+00	3.16E-02	4.78E-05	9.18E-03	1.83E-01	4.21E-04	1.99E-02
Activity Uncert	1sigma Ci	-1.00E+00	-1.00E+00	0.00E+00	-1.00E+00	3.13E-02	5.48E-05	8.98E-03	2.27E-01	4.11E-04	2.21E-02
Mass	grams	-1.00E+00	-1.00E+00	0.00E+00	-1.00E+00	1.83E-03	7.59E-04	3.99E-02	1.76E-03	1.06E-01	5.75E-03
Mass Uncert	1sigma grams	-1.00E+00	-1.00E+00	0.00E+00	-1.00E+00	1.81E-03	8.70E-04	3.91E-02	2.18E-03	1.04E-01	6.37E-03

Radionuclide		AM-243	CM-244	CM-245	CM-246	CS-137	BA-137M	SR-90	Y-90
Activity	Ci	5.92E-03	1.23E+00	1.98E-04	5.94E-03	4.29E-02	4.06E-02	7.34E-01	7.34E-01
Activity Uncert	1sigma Ci	5.65E-03	1.26E+00	1.86E-04	8.94E-03	1.35E-02	1.28E-02	3.19E-01	3.19E-01
Mass	grams	2.97E-02	1.52E-02	1.15E-03	1.93E-02	4.88E-04	7.55E-11	5.32E-03	1.35E-06
Mass Uncert	1sigma grams	2.80E-02	1.54E-02	1.07E-03	2.88E-02	1.53E-04	2.37E-11	2.31E-03	5.86E-07

Waste Material Parameters		PW	
Wgt of Mat Parms	kg	66.3	
Radio Assay Method		16DTC1	PAN, FRAM, TGS, HENC
Data Package Number		ORRHDTC16004	
Assay Date		03/17/2016	
Charz Method ID		16RHVE1	RTRM, VISUAL
Data Package Number		ORNLRHVE16010	
Charz Method Date		03/01/2016	

Haz Codes		D005	D006	D007	D008	D009	D010	D011	D019	F002	F005
Haz Codes		D004									

Sample ID	Headspace Gas HM	ORRH00748
Sample Type		HGHM-T
Sample Type		HGVO-T
Layer No. Sampled		0
Date Sampled		03/17/2016
Method ID		16HG2
Data Package Number		OR16FG11003

Sample Site
C7

CAS #		1333-74-0	74-82-8
Analyte		Hydrogen	Methane
Concentration		404.34	6.85
Date Analyzed		03/17/2016	03/17/2016
D Detectable Flag			
U Detectable Flag			U
NA Detectable Flag		NA	

		Requirements Met?
Free liquids <1% by volume		YES
No non-rad. pyrophorics		YES
Chemical compatability		YES
No explosives		YES
No corrosives		YES
No pressurized containers		YES
No sealed Containers >4 liters		YES
Liner punctured/ filtered		YES
Flammable VOCs <500ppmv		YES
Container is in Approved Waste Stream Profile Form?	OR-REDC-RH-HET	YES
Can it be established through Process Knowledge that the concentration of flammable VOCs present in the headspace of the container is <= 500 ppm?		YES

V&V Initials	Date
HP/CS	3/30/2016

Creta Kirkes
CCP Certification Official

Date

Radiation & Contamination Survey Form

CM-REF-RP-306 Rev. 1, Radiation/Contamination Surveys

SURVEY NO:	16-SUR-00768				PAGE | OF | PAGES
Instruments Used					
Instrument Type	Serial Number	Cal Due Date	Alpha Eff.	Beta Eff.	LOCATION / TYPE: RH DTC Drum Measurement
LM 12-4 / LM 42-31	215368 / 215368	08/20/16	N/A	N/A	
FHZ 612	XC0761	10/2/16			PURPOSE: Job Coverage
					DATE/TIME: 03/17/16 14:15 RWP/ALARA: 16-TRU-009

Drum Barcode	Measurement Location	Gamma Bkg: .191 mR/hr Net Gamma @ 1m (mR/hr)	Correction Factor	Calculated Gamma Surface Dose Rate (mR/hr)	Neutron Bkg: <0.5 mrem/hr Net Neutron @ 1m* (mrem/hr)	Correction Factor	Calculated Neutron Surface Dose Rate (mrem/hr)	Total Surface Dose Rate Gamma + Neutron (mrem/hr)
ORRH00748	1	13.2	16.1	212.52	6	7.13	35.65	248.17
	2	14.5	16.1	233.45	10	7.13	71.3	304.75
	3	15.5	16.1	249.55	6	7.13	35.65	292.33
	4	13.5	16.1	217.35	4	7.13	28.52	245.87
	1		16.1			7.13		
	2		16.1			7.13		
	3		16.1			7.13		
	4		16.1			7.13		
	1		16.1			7.13		
	2		16.1			7.13		
	3		16.1			7.13		
	4		16.1			7.13		
	1		16.1			7.13		
	2		16.1			7.13		
	3		16.1			7.13		
	4		16.1			7.13		

*Contact Shift Superintendent if neutron dose rate is great than 40 mrem/hr at 1 meter.

NOTES: Neutron and gamma measurements are taken at 180 degrees apart (eg. Gamma measurement at location 1 and neutron measurement at location 3 are taken simultaneously). Add calculated gamma measurement at position 1,2,3,4 to calculated neutron measurement at position 1,2,3,4 respectively to obtain total surface dose rate. The gamma and neutron 1 meter to surface calculation is based on T-RH-FW-C-RP-006.

*On Contact (OC) or $\frac{OC}{30cm}$ (#) Smear [#] LAS ⚠ Direct

UNITS: If performed, dose rates are in mR/hr γ and mrem/hr n. LAS in dpm/probe, smears and direct measurements in dpm/100 cm² (unless otherwise annotated). REMARKS: On contact and 1 meter neutron readings on containers performed using a LM 12-4 as read; all other neutron readings performed using a LM 12-4 and a 2X scaling factor.

RCT SIGNATURE: Jeff Bilyeu Jeff Bilyeu RCM SIGNATURE: Date: 3.18.2016

The signature(s) on this sheet are that of the responsible technician(s) who certify that the data recorded represent the readings, measurements, and/or observations at the time indicated.

COPY

Attachment 1 – Visual Examination Data Form

Site ID: RHORNL			
Examination Date: 3-1-16	Batch Number: ORNLRHVE16010		
Procedure #: CCP-TP-500	Revision #: 15	Video #: N/A	
Recording Equipment Check: ☐SAT ☐UNSAT ☑N/A	Recording Start: N/A	Recording Stop: N/A	
Inspection of Container to be loaded during VE: ☑SAT ☐UNSAT			

Indirect load Container ☑N/A	Final Output Container ☐ N/A
Container ID Number:	Container ID Number: ORRH00748
Container Type:	Container Type: 55 gallon drum
Waste Matrix Code:	Waste Matrix Code: S5400
Waste Stream:	Waste Stream: OR-REDC-RH-HET
	Poly Rigid Liner: ☐Y ☑N Thickness: N/A; Poly Rigid Liner Lid: ☐ Y ☑N
	Poly Rigid Liner Vented or Hole Size: N/A
Percent Fill: ; Percent Organic Waste:	Percent Fill: 100% Percent Organic Waste: 20%
Layers of Confinement: ; Closure Method:	Layers of Confinement: 0 ; Closure Method: N/A

Comments (e.g., filter information, NCRs):
Nucfil-019DS FK-750

cask # X10C040205S

Waste Description:

metal filter components (IM)
floor sweepings (IM) (OIM) (C)
filter media (C)
card board (C)
metal tools (IM)
wood (C)
insulation (OIM)

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Attachment 1 – Visual Examination Data Form (continued)

Container ID Number ORRH00748

Prohibited Item(s) Summary	YES	NO
Does the container have observable liquid equal to or greater than 1 percent by volume of the outermost container at the time of RTR or VE?	☐	☑
Does the container have observable liquid more than 60 milliliters or 3 percent by volume, whichever is greater in an internal container?	☐	☑
Does the container have observable liquid with an EPA hazardous waste number (HWN) U134 assigned?	☐	☑
Does the container have observable liquid containing PCBs?	☐	☑
Is there an indication of non-radionuclide pyrophoric materials, such as elemental potassium?	☐	☑
Is there an indication of hazardous wastes not occurring as co-contaminants with TRU mixed wastes (non-mixed hazardous wastes)?	☐	☑
Is there an indication of wastes incompatible with backfill, seal and panel closures materials, container and packaging materials, shipping container materials, or other wastes (i.e., waste does **NOT** match Table of Allowable Materials for RH-TRU Waste in the RH-TRAMPAC)?	☐	☑
Is there an indication of wastes containing explosives or compressed gases?	☐	☑
Is there an indication of polychlorinated biphenyls (PCBs) not authorized under an EPA PCB waste disposal authorization?	☐	☑
Is there an indication of the waste exhibiting the characteristic of ignitability, corrosivity, or reactivity (EPA Hazardous Waste Numbers of D001, D002, or D003)?	☐	☑
Is the physical form of the waste inconsistent with the Waste Stream Description or the Waste Matrix Code?	☐	☑
RH-72B Criteria		
Were there Non-approved Closure Methods used on liner bags or inner bags greater than 4 liters?	☐	☑
Are there sealed containers GREATER than 4 liters or heat sealed bags **NOT** defined in the applicable TRUCON Code?	☐	☑
Are there indications of inadequate protection (blocked or braced) for heavy and/or sharp objects?	☐	☑
Is the waste consistent with the TRUCON Code?	☑	☐

Comments:
N/A

Visual Examination Operator 1:

Print Name	Signature	Date
Anthony Harley		3-1-16

Visual Examination Operator 2:

Print Name	Signature	Date
Gilbert Gutierrez		3-1-16

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Attachment 2 – Container Data Sheet

BDR Number: ORRHDTC16004

Date:	3/17/16
Container No.:	ORRH00748
Probe Position:	55-gallon
Instrument No.:	023553
Probe No.:	XC0894
Measured Background Dose Rate (mR/hr):	0.191
Gross Weight (kg):	107.0
Dose Rate 1 (mR/hr):	13.2
Dose Rate 2 (mR/hr):	14.5
Dose Rate 3 (mR/hr):	15.5
Dose Rate 4 (mR/hr):	13.5
Highest measured dose rate is greater than three times the measured background.	(YES) NO

Chad Gerlock	Chad Gerlock	3/17/16
Printed Name	Signature	Date

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BDR #: ORRHDTC16004 Site ID: ORNL

Waste Container Dose-to-Curie Conversion Record

SCO 1000 ORNL DTC-Mark-HFIR.xlsx Version 7, Addendum 7 Windows 7 Microsoft Excel 2007& 2010 Minor Change 10/23/2015

Operating Procedure	CCP-TP-504 REV 17		
Date of Survey	3/17/2016		
Waste Stream Designation	OR-REDC-RH-HET		
Cask Number	X10C0402055		
Drum ID	ORRH00748		
Container Gross Weight	107	kg	
Estimate Fill Percentages	100	%	
Container Net Weight	66.3	kg	
Measured Container Dose Rate		Background	
Quadrant #1	13.2	mR/hr	0.191 mR/hr
Quadrant #2	14.5	mR/hr	
Quadrant #3	15.5	mR/hr	
Quadrant #4	13.5	mR/hr	
Average Dose Rate Minus Background	14	mR/hr	

Nuclide	Curie Scaling Factors	Activity (Ci)	Grams	FGE	PECi	Watts	Uncertainty	Uncertainty in Curies	Uncertainty in Grams
U-233	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00%	0.00E+00	0.00E+00
U-234	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00%	0.00E+00	0.00E+00
U-235	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00%	0.00E+00	0.00E+00
U-238	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00%	0.00E+00	0.00E+00
Pu-238	6.24E-01	3.16E-02	1.83E-03	2.07E-04	2.88E-02	1.05E-03	98.95%	3.13E-02	1.81E-03
Pu-239	9.43E-04	4.78E-05	7.59E-04	7.59E-04	4.78E-05	1.48E-06	114.63%	5.48E-05	8.70E-04
Pu-240	1.63E-01	9.18E-03	3.99E-02	8.98E-04	9.18E-03	2.86E-04	97.82%	8.98E-03	3.91E-02
Pu-241	5.11E+00	1.83E-01	1.76E-03	3.96E-03	3.59E-03	5.83E-06	123.96%	2.27E-01	2.18E-03
Pu-242	8.32E-03	4.21E-04	1.06E-01	7.96E-04	3.83E-04	1.24E-05	97.63%	4.11E-04	1.04E-01
Am-241	3.51E-01	1.99E-02	5.75E-03	1.07E-04	1.99E-02	6.67E-04	110.90%	2.21E-02	6.37E-03
Am-243	1.17E-01	5.92E-03	2.97E-02	3.83E-04	5.92E-03	1.91E-04	95.44%	5.65E-03	2.83E-02
Cm-244	3.19E+01	1.23E+00	1.52E-02	1.37E-03	6.46E-01	4.22E-02	102.41%	1.26E+00	1.55E-02
Cm-245	3.91E-03	1.98E-04	1.15E-03	1.73E-02	2.11E-04	6.60E-06	93.66%	1.86E-04	1.08E-03
Cm-246	1.17E-01	5.94E-03	1.93E-02	0.00E+00	6.32E-03	1.95E-04	150.52%	8.94E-03	2.91E-02
Cs-137	1.00E+00	4.29E-02	4.88E-04	0.00E+00	0.00E+00	4.75E-05	31.43%	1.35E-02	1.53E-04
Ba-137m	9.46E-01	4.06E-02	7.55E-11	0.00E+00	0.00E+00	1.60E-04	31.43%	1.28E-02	2.37E-11
Sr-90	1.73E+01	7.34E-01	5.32E-03	0.00E+00	0.00E+00	8.51E-04	43.45%	3.19E-01	2.31E-03
Y-90	1.73E+01	7.34E-01	1.35E-06	0.00E+00	0.00E+00	4.06E-03	43.45%	3.19E-01	5.86E-07
Totals		3.03E+00	2.27E-01	2.58E-02	7.20E-01	4.97E-02			

	Value	(one Sigma)	
TRU Alpha Activity Concentration	1.11E+03	5.56E+02	nCi/g
TRU Alpha Activity	7.33E-02	3.68E-02	Ci
Total Pu-239 Equiv Activity	7.20E-01	7.45E-01	Ci
Total Pu-239 Fissile Gram Equiv	2.58E-02	1.61E-02	g
Total Decay Heat	4.97E-02	4.90E-02	W
Volume Activity	1.40E-02	8.09E-03	Ci/L

Originator **Chad Gerlock** (Print Name)

Signed Chad Gerlock Date 3/17/16

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Attachment 4 – Flammable Gas Analysis Form

FGA Attachments.xls Revision 4
SCO 1049 Add 4 Min. Chg. 06/17/2015
Win XP SP3/Win 7 SP1, Excel 2003/2007/2010

Waste Container ID: **ORRH00748**

BDR Number: **OR16FG11003**

Sampling Date: **3/17/2016**

CAS NUMBER	COMPOUND	Measured ppmv	Reporting Flag
1333-74-0	Hydrogen	404.34	
74-82-8	Methane	6.85	U
67-56-1	Methanol	N/A	U
60-29-7	Ethyl Ether	N/A	U
75-35-4	1,1-Dichloroethylene	N/A	U
67-64-1	Acetone	N/A	U
75-34-3	1,1-Dichloroethane	N/A	U
156-59-2	cis-1,2-Dichloroethene	N/A	U
78-93-3	Methyl ethyl ketone	N/A	U
110-82-7	Cyclohexane	N/A	U
71-43-2	Benzene	N/A	U
107-06-2	1,2-Dichloroethane	N/A	U
71-36-3	1-Butanol	N/A	U
108-10-1	Methyl isobutyl ketone	N/A	U
108-88-3	Toluene	N/A	U
108-90-7	Chlorobenzene	N/A	U
100-41-4	Ethylbenzene	N/A	U
108-38-3/106-42-3	m- and p-Xylene	N/A	U
95-47-6	o-Xylene	N/A	U
108-67-8	1,3,5-Trimethylbenzene	N/A	U
95-63-6	1,2,4-Trimethylbenzene	N/A	U

CAS Number	IDENTIFIED TIC COMPOUND	Est. Amount ppmv
N/A	N/A	N/A
N/A	N/A	N/A
N/A	N/A	N/A
N/A	N/A	N/A
N/A	N/A	N/A
N/A	N/A	N/A
N/A	N/A	N/A
N/A	N/A	N/A

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Waste Isolation Pilot Plant
Container Data Report

Report Statistics

Report Version:	**2.5.4**
WDS Instance:	**prd05.wipp.carlsbad.nm.us**
Generated on:	**April 11, 2016 11:13 AM**
Generated by:	**KIRKES, CRETA**
Total Pages:	**7**

Selection Criteria

Container Number: **ORRH00748**

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Container: ORRH00748
Type: 39 - RH 55 gal TBO

Current Status
Extended Status: APPROVED CERT IN PRESUB CERT CANISTER
Container Status: CERTIFICATION DATA APPROVED
Certification Date: 04/01/2016
Waste Handling Code: RH
Disposal Date:

Current Location Site: OR
Generator Site: OR
Destination Site ID: WI

Certification Program ID: C7
Shipping Program ID: C7

Overpack Container: OR0093
Overpack Type: REMOVABLE-LID 72-B CANISTER
Overpack Status: PRESUBMITTAL TO CERTIFICATION

Neutron Dose Rate (mrem/hr): 71.3
Beta Gamma Dose Rate (mrem/hr): 249.55
Total Dose Rate (mrem/hr): 320.85

FGE (g): 2.579E-02
FGE Uncertainty (g): 1.607E-02

Gross Weight (kg): 107.00
Gross Weight Uncert (kg): 0.50

Decay Heat (W): 4.974E-02
Decay Heat Uncertainty (W): 4.903E-02

Certification Data Values

Waste Stream Profile Code: OR-REDC-RH-HET
Waste Type Code: MTRU
IDC Code: NONE
Waste Matrix Code: S5400
WAC Revision Number: 7.4
Fill Factor (%): 100.00
Waste Stream BIR ID: OR-W211
Waste Stream MWIR ID: NONE

TRU Alpha Activity (Ci): 7.33E-02
TRU Alpha Activity Uncertainty (Ci): 3.685E-02
TRU Alpha Activity Concentration (Ci/g): 1.106E-06
PU-239 Equivalent Activity (PE-Ci): 7.201E-01
Alpha Surface Contamination (dpm/cm^2):
Beta/Gamma Surface Contamination (dpm/cm^2):

Transportation Data Values

Closure Date: 03/01/2016
Vent Date: 03/01/2016
Process Knowledge? Y
Waste Gen Date:
Content Code: OR321M
U-235 FEM (g):
U-235 FEM Uncert (g):
Be chemically/ mechanically bound:

Shipment Purpose: DISPOSAL
Machine Compacted? N
Liner Exists? N
Liner Hole Size(mm):
Liner Lid Present?
Layers of Packaging 0
Aqueous Material? N

Gas Generation Data Values

Measured FGGR (mol/s)	Measured TGRR (mol/s)	Truncated FGGR Test (Y/N)	Truncated FGGR Test Period (days)

Container: ORRH00748
Type: 39 - RH 55 gal TBO

Current Status

Extended Status: APPROVED CERT IN PRESUB CERT CANISTER
Container Status: CERTIFICATION DATA APPROVED
Certification Date: 04/01/2016
Waste Handling Code: RH
Disposal Date:

PCB Waste? N
PCB Mass (kg):
PCB Concentration (ppm):
PCB Out of Service Date:
Be Present? Y
Be <= 1% by weight? Y
Be mass <= 100kg? Y
Separation OK?
Packing Fraction (compaction level): non-compacted

Filters

Filter Model Number	Filter Diffusivity (mol/s/ml)	Quantity	Install Date
NF019D	1.85E-05	1	03/01/2016

Certification Comments

Radionuclides

Radionuclide	Activity (Ci)	Activity Uncert (Ci)	Mass (g)	Mass Uncert (g)
AM-241	1.994E-02	2.211E-02	5.747E-03	6.373E-03
AM-243	5.925E-03	5.655E-03	2.967E-02	2.799E-02
BA-137M	4.061E-02	1.276E-02	7.551E-11	2.373E-11
CM-244	1.227E00	1.256E00	1.517E-02	1.536E-02
CM-245	1.981E-04	1.855E-04	1.154E-03	1.066E-03
CM-246	5.942E-03	8.944E-03	1.934E-02	2.876E-02
CS-137	4.293E-02	1.349E-02	4.879E-04	1.533E-04
PU-238	3.164E-02	3.130E-02	1.829E-03	1.809E-03
PU-239	4.776E-05	5.475E-05	7.594E-04	8.705E-04
PU-240	9.184E-03	8.984E-03	3.993E-02	3.906E-02
PU-241	1.831E-01	2.270E-01	1.761E-03	2.183E-03
PU-242	4.213E-04	4.113E-04	1.061E-01	1.036E-01

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Container: ORRH00748
Type: 39 - RH 55 gal TBO

Current Status

Extended Status: APPROVED CERT IN PRESUB CERT CANISTER
Container Status: CERTIFICATION DATA APPROVED
Certification Date: 04/01/2016
Waste Handling Code: RH
Disposal Date:

Radionuclides

Radionuclide	Activity (Ci)	Activity Uncert (Ci)	Mass (g)	Mass Uncert (g)
SR-90	7.339E-01	3.189E-01	5.318E-03	2.311E-03
U-233	.000E00	.000E00	.000E00	.000E00
U-234	.000E00	.000E00	.000E00	.000E00
U-235	.000E00	.000E00	.000E00	.000E00
U-238	.000E00	.000E00	.000E00	.000E00
Y-90	7.339E-01	3.189E-01	1.349E-06	5.861E-07

Samples

Sample ID	Sample Type Code	Sample Type Description	Sample Date	Layer Sampled
H-ORRH00748	HGHM-T	HEADSPACE GAS HYDROGEN AND METHANE	03/17/2016	0

Unique Samples

CAS Number	Analyte Description	Concentration (ppm)	Analysis Date	Analysis Method	Reporting Flags
1333-74-0	HYDROGEN	404.34	03/17/2016	16HG2	NA
74-82-8	METHANE	6.85	03/17/2016	16HG2	U

Material Parameters

Material Parameter	Description	Weight (kg)
8	PLASTICS	66.30
13	STEEL CONTAINER MATERIALS	40.70

Container: ORRH00748
Type: 39 - RH 55 gal TBO

Current Status

Extended Status: APPROVED CERT IN PRESUB CERT CANISTER
Container Status: CERTIFICATION DATA APPROVED
Certification Date: 04/01/2016
Waste Handling Code: RH
Disposal Date:

Waste Weight:	66.30
Packaging Weight:	40.70
Total Material Weight:	107.00

Hazardous Codes

Hazardous Code	Description
D004	ARSENIC
D005	BARIUM
D006	CADMIUM
D007	CHROMIUM
D008	LEAD
D009	MERCURY
D010	SELENIUM
D011	SILVER
D019	CARBON TETRACHLORIDE
F002	SPENT HALOGENATED SOLVENTS
F005	SPENT NON-HALOGENATED SOLVENTS

Assay Methods

Assay Method	Description	Assay Date
16DTC1	DOSE-TO-CURIE	03/17/2016

Non-Destructive Examination (NDE)

NDE Method	Description	Examination Date

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Container: ORRH00748
Type: 39 - RH 55 gal TBO

Current Status
Extended Status: APPROVED CERT IN PRESUB CERT CANISTER
Container Status: CERTIFICATION DATA APPROVED
Certification Date: 04/01/2016
Waste Handling Code: RH
Disposal Date:

Non-Destructive Examination (NDE)

NDE Method	Description	Examination Date
16RHVE1	VISUAL EXAMINATION	03/01/2016

Edit Limit Check Results
Evaluation Date: 04/01/2016 11:11:54 Overall Status: PASS

Evaluation Code	Status	Return Code	Detailed Description
DI_CERT_ALL	PASS		
DI_CERT_BE	PASS		
DI_CERT_CERT	PASS		
DI_CERT_CHARZ	PASS		
DI_CERT_ED	PASS		
DI_CERT_EPA	PASS		
DI_CERT_PCB	PASS		
DI_CERT_PERC	PASS		
DI_CERT_TRAMPAC	PASS		
DSA	PASS		
WAC	PASS		
WAP_CERT	PASS		

TRAMPAC Evaluation Results
Evaluation Date: Overall Status:

Evaluation Code	Status	Return Code	Detailed Description

Container: ORRH00748
Type: 39 - RH 55 gal TBO

Current Status

Extended Status: APPROVED CERT IN PRESUB CERT CANISTER
Container Status: CERTIFICATION DATA APPROVED
Certification Date: 04/01/2016
Waste Handling Code: RH
Disposal Date:

History

Event Date/Time	Container Number	Event Description	Reason
04/01/2016 11:11:56	ORRH00748	SUCCESSFUL SUBMISSION FOR CERT VIA THE WEB SERVICE	
04/01/2016 12:36:07	ORRH00748	APPROVED FOR CERT	

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Waste Isolation Pilot Plant RECORDS INVENTORY AND DISPOSITION SCHEDULE (RIDS)	1. ☐ DOE ☒ Contractor	2. Page 1 of 64

3. Organization Unit (Creating or Custodial Unit)	4. Date
NUCLEAR WASTE PARTNERSHIP (NWP)/CENTRAL CHARACTERIZATION PROJECT (CCP)/CONTACT HANDLED (CH) FOR ALL SITES 4021 NATIONAL PARKS HIGHWAY, GSA 212 CARLSBAD, NEW MEXICO 88220	06/29/2015

5. Signatures (of Appropriate Personnel)

Prepared By Sheila Pearcy	Date 7/30/15	Records Liaison Officer N/A	Date
Approved By Ed Gulbranson	Date 7/30/15	Records Officer Approval Michael Fox for	Date 07-30-15

6. Item No.	7. Filing Series Title, Description, Any Special Categories, Media Types, Filing Order, Inclusive Dates and Location:	8. Disposition Authority	9. Authorized Disposition Instructions	10. Transfer Instructions
1	**CCP TRAINING DOCUMENTATION FILES** Documentation pertaining to the training and qualification of CCP CH personnel.			

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Waste Isolation Pilot Plant RECORDS INVENTORY AND DISPOSITION SCHEDULE (RIDS)	1. ☐ DOE ☒ Contractor	2. Page 2 of 64

6. Item No.	7. Filing Series Title, Description, Any Special Categories, Media Types, Filing Order, Inclusive Dates and Location:	8. Disposition Authority	9. Authorized Disposition Instructions	10. Transfer Instructions
1(A)	CCP CH Employee Individual Training/Qualification Documentation Contractor employee individual folders that contain item 1.29.1.a records AND also contain: attendance/completion records of training courses or sessions that include subjects dealing with hazardous materials directly applicable to the employee's job or position. Documents the training and qualification and requalification of CCP CH personnel. May include but not limited to the following: appointment letters; qualification letters; correspondence; on-the-job records; completed exams; completed qualification cards; certificates of completion; test drum data sheets; training drum evaluation data sheets; resumes; and Waste Acceptance Plan briefings. May include Attachment 2, CCP Records Transmittal/Receiving Form(s). **PRIVACY ACT** **Quality Assurance (QA) Record/Nonpermanent/Validated by authorized signature and date.** Media Type: Hard Copy Filing Order: Alphabetical Inclusive Dates: 2000 to Present Location: CCP Records – Skeen Whitlock Building (SWB) and/or Waste Isolation Pilot Plant (WIPP) Records Archive (WRA)	ADM 1.29.1.b	Cut off at the time of separation or transfer of the employee. Screen out and destroy all item 1.29.1a.4 records. Transfer folders with remaining documents to the local Federal records center. Destroy 75 years after cutoff.	Retain in CCP Records until completion of the characterization process for each site and transfer to the WRA within one year for storage and retention or sooner if no longer needed in project files to support daily functions or audits.

Waste Isolation Pilot Plant RECORDS INVENTORY AND DISPOSITION SCHEDULE (RIDS)	1. ☐ DOE ☒ Contractor	2. Page 3 of 64

6. Item No.	7. Filing Series Title, Description, Any Special Categories, Media Types, Filing Order, Inclusive Dates and Location:	8. Disposition Authority	9. Authorized Disposition Instructions	10. Transfer Instructions
1(B)	Employee Individual Medical Examination Contractor employee individual folders that contain ONLY the following documents: results of medical examination (only pass/fail and restrictions); balance of results are to be retained in the medical file. Documentation pertaining to the eye examinations performed on the Nondestructive Examination (NDE), Helium Leak Detector, and Pressure Change Leak Testing personnel on an annual basis. May include Attachment 2, CCP Records Transmittal/Receiving Form(s). **EPIDEMIOLOGICAL** **PRIVACY ACT** **QA Record/Nonpermanent/Validated by authorized signature and date.** Media Type: Hard Copy Filing Order: Alphabetical Inclusive Dates: 2000 to Present Location: CCP Records – SWB and/or WRA	ADM 1.29.1a.4	Cut off at the time of separation or transfer of the employee. Screen out and destroy all item 1.29.1.a.4 records. Transfer folders with remaining documents to the local Federal Records Center. Destroy 4 years after cutoff.	Retain in CCP Records until completion of the characterization process for each site and transfer to the WRA within one year for storage and retention or sooner if no longer needed in project files to support daily functions or audits.

Waste Isolation Pilot Plant RECORDS INVENTORY AND DISPOSITION SCHEDULE (RIDS)	1. ☐ DOE ☒ Contractor	2. Page 4 of 64

6. Item No.	7. Filing Series Title, Description, Any Special Categories, Media Types, Filing Order, Inclusive Dates and Location:	8. Disposition Authority	9. Authorized Disposition Instructions	10. Transfer Instructions
1(C)	<u>CCP Test Drum Audio/Video Media of Test Drum Qualification</u> Contractor employee individual folders that contain item 1.29.1.a records AND also contain: attendance/completion records of training courses or sessions that include subjects dealing with hazardous materials directly applicable to the employee's job or position. Contains CCP audio/video media of qualification test performed by NDE personnel. This audio/video media of qualification test is performed by NDE personnel and is the second piece of the qualification. It supports the documentation captured on the supporting hard copy record(s). May include Attachment 2, CCP Records Transmittal/Receiving Form(s). **PRIVACY ACT** **QA Record/Nonpermanent/Validated by authorized signature and date.** Media Type: Audio/Video Tape or DVD (Primary and Backup) Filing Order: Alpha-Numeric Inclusive Dates: 2000 to Present Location: CCP Records - SWB and/or WRA	ADM 1.29.1.b	Cut off at the time of separation or transfer of the employee. Screen out and destroy all item 1.29.1.a.4 records. Transfer folders with remaining documents to the local Federal records center. Destroy 75 years after cutoff.	Retain in CCP Records until completion of the characterization process for each site and transfer to the WRA within one year for storage and retention or sooner if no longer needed in project files to support daily functions or audits.

Waste Isolation Pilot Plant RECORDS INVENTORY AND DISPOSITION SCHEDULE (RIDS)	1. ☐ DOE ☒ Contractor	2. Page 5 of 64

6. Item No.	7. Filing Series Title, Description, Any Special Categories, Media Types, Filing Order, Inclusive Dates and Location:	8. Disposition Authority	9. Authorized Disposition Instructions	10. Transfer Instructions
1(D)	CCP NDE Test Drum Inventories Documentation pertaining to the assembly of NDE test and training drums which are used to qualify radiography operators per CCP-PO-001, CCP Transuranic (TRU) Waste Characterization QA Project Plan (QAPjP) and CCP-QP-002, CCP Qualification and Training Plan. The drum assembly is representative of the Waste Matrix Codes for Waste Stream Profile Forms. CCP NDE Test Drum Inventory Sheet has the test drum identification (ID) number, date, summary category group, if it has a plastic liner and the contents of the drum. May include Attachment 2, CCP Records Transmittal/Receiving Form(s). **QA Record/Nonpermanent/Validated by authorized signature and date.** Media Type: Hard Copy Filing Order: Chronological Inclusive Dates: 2000 to Present Location: CCP Records - SWB and/or WRA	Disposition Authority Pending National Archives and Records Administration (NARA) Approval.	UNSCHEDULED -Do Not Destroy-	Retain in CCP Records until completion of the characterization process for each site and transfer to the WRA within one year for storage and retention or sooner if no longer needed in project files to support daily functions or audits.
1(E)	List of Qualified Individuals (LOQI) LOQI confirms and establishes, to the field personnel, who is to perform different areas of operations. It is updated each time there is a change to the qualifications of the project personnel. This record is no longer generated. See item 1(F). **QA Record/Nonpermanent/Validated by authorized signature and date.** Media Type: Hard Copy Filing Order: Chronological Inclusive Dates: January 2003 to September 2008 Location: CCP Records - SWB and/or WRA	Disposition Authority Pending NARA Approval.	UNSCHEDULED -Do not Destroy-	Retain in CCP Records until completion of the characterization process for each site and transfer to the WRA within one year for storage and retention or sooner if no longer needed in project files to support daily functions or audits.

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1(F)	LOQI LOQI confirms and establishes, to the field personnel, who is to perform different areas of operations. It is updated each time there is a change to the qualifications of the project personnel. Record is captured in the individual personnel's training files. Media Type: Electronic Filing Order: Chronological Inclusive Dates: September 2008 to Present Location: CCP Records - SWB and/or WRA	Nonrecord	Not applicable	Retain in CCP Record until completion of characterization process for each site or when no longer needed in project files to support daily functions. Screen and purge as needed.
2	**CCP QA SUMMARY REPORTING, ASSESSMENT/AUDIT, AND SURVEILLANCE DOCUMENTATION** QA documentation pertaining to the reporting, assessment/audit, and surveillance activities of the CCP CH QA program. Includes the identification, classification, control, and correction of conditions adverse to quality and nonconforming items, activities, and processes associated with the CCP CH – all sites.			

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6. Item No.	7. Filing Series Title, Description, Any Special Categories, Media Types, Filing Order, Inclusive Dates and Location:	8. Disposition Authority	9. Authorized Disposition Instructions	10. Transfer Instructions
2(A)	CCP CH Nonconformance Reports (NCRs) Audit and investigative case files and reports that pertain to environmental, health, and safety topics, cases or concerns but ARE NOT covered by items 22.1.a.1 or 22.2.a.1. NCRs are created for the CCP CH sites and document the process for identifying, documenting, controlling, evaluating, and dispositioning nonconforming items. May include Department of Energy (DOE)/Carlsbad Field Office (CBFO) notifications and supporting documentation such as copies of applicable procedures, etc. May include Attachment 2, CCP Records Transmittal/Receiving Form(s). **QA Record/Nonpermanent/Validated by authorized signature and date.** Media Type: Hard Copy Filing Order: Alpha-Numeric Inclusive Dates: 2000 to Present Location: CCP Records - SWB and/or WRA	ADM 22.4	Cut off upon completion of audit or investigation. Destroy when 75 years old.	Retain in CCP Records until completion of the characterization process for each site and transfer to the WRA within one year for storage and retention or sooner if no longer needed in project files to support daily functions or audits.
2(B)	NCR Log Reconciliation Report NCR Log Reconciliation Report documents and verifies that all NCR numbers at the end of each calendar year are reconciled against the Master Log and in the Nonconformance Report Module. Includes as attachment the information from NCR logs. May include Attachment 2, CCP Records Transmittal/Receiving Form(s). **QA Record/Nonpermanent/Validated by authorized signature and date.** Media Type: Hard Copy Filing Order: Chronological Inclusive Dates: 2004 to Present Location: CCP Records – SWB and/or WRA	Disposition Authority Pending NARA Approval.	UNSCHEDULED -Do Not Destroy-	Retain in CCP Records until completion of the characterization process for each site and transfer to the WRA within one year for storage and retention or sooner if no longer needed in project files to support daily functions or audits.

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6. Item No.	7. Filing Series Title, Description, Any Special Categories, Media Types, Filing Order, Inclusive Dates and Location:	8. Disposition Authority	9. Authorized Disposition Instructions	10. Transfer Instructions
2(C)	CCP CH Corrective Action Reports (CARs) Audit and investigative case files and reports that pertain to environmental, health, and safety topics, cases or concerns but ARE NOT covered by items 22.1.a.1 or 22.2.a.1. CCP RH CARs created for all CH sites and document the process for identifying, documenting, controlling, evaluating, dispositioning, and verifying completion of corrective actions for conditions adverse to quality related to failures, malfunctions, deficiencies, and technical inadequacies. May include but not limited to supporting documentation such as copies of applicable procedures and/or Deficiency Evaluation Form if applicable, as well as the CAR Logs. May also include Attachment 2, CCP Records Transmittal/Receiving Form(s). **QA Record/Nonpermanent/Validated by authorized signature and date.** Media Type: Hard Copy Filing Order: Alpha-Numeric Inclusive Dates: 2000 to 2013 Location: CCP Records - SWB and/or WRA	ADM 22.4	Cut off upon completion of audit or investigation. Destroy when 75 years old.	Retain in CCP Records until completion of the characterization process for each site and transfer to the WRA within one year for storage and retention or sooner if no longer needed in project files to support daily functions or audits.
2(D)	CCP CH Surveillance Program Documentation Audit and investigative case files and reports that pertain to environmental, health, and safety topics, cases or concerns but ARE NOT covered by items 22.1.a.1 or 22.2.a.1. Documentation pertaining to the planning, performing, documenting, and reporting independent surveillances of TRU CCP CH waste characterization activities. Includes but not limited to surveillance plan formats, surveillance reports, surveillance checklists and surveillance logs. May include Attachment 2, CCP Records Transmittal/Receiving Form(s). **QA Record/Nonpermanent/Validated by authorized signature and date.** Media Type: Hard Copy Filing Order: Alpha-Numeric Inclusive Dates: 2000 to Present Location: CCP Records - SWB and/or WRA	ADM 22.4	Cut off upon completion of audit or investigation. Destroy when 75 years old.	Retain in CCP Records until completion of the characterization process for each site and transfer to the WRA within one year for storage and retention or sooner if no longer needed in project files to support daily functions or audits.

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2(E)	QA Trend Reports Audit and investigative case files and reports that pertain to environmental, health, and safety topics, cases or concerns but ARE NOT covered by items 22.1.a.1 or 22.2.a.1. QA Trend Reports document trending and analyses of item characteristics and reliability, process implementation, and other quality-related information. It is used to identify items, services, activities, and processes that need improvements. **QA Record/Nonpermanent/Validated by authorized signature and date.** Media Type: Hard Copy Filing Order: Chronological Inclusive Dates: 2001 to Present Location: CCP Records - SWB and/or WRA	ADM 22.4	Cut off upon completion of audit or investigation. Destroy when 75 years old.	Retain in CCP Records until completion of the characterization process for each site and transfer to the WRA within one year for storage and retention or sooner if no longer needed in project files to support daily functions or audits.
3	**TEST PLAN/PROCEDURE DOCUMENTATION** Test plan/procedure documentation provides the method for test control of items considered to impact the quality of the characterization, certification, packaging, or transportation of waste for the CCP. The documents address requirements and responsibilities for testing activities performed to ensure items related to CCP activities meet established design, performance, and quality requirements. May include Attachment 2, CCP Records Transmittal/Receiving Form(s). **QA Record/Nonpermanent/Validated by authorized signature and date.** Media Type: Hard Copy Filing Order: Chronological Inclusive Dates: 2003 to Present Location: CCP Records - SWB and/or WRA	Disposition Authority Pending NARA Approval.	UNSCHEDULED -Do Not Destroy-	Retain in CCP Records until completion of the characterization process for each site and transfer to the WRA within one year for storage and retention or sooner if no longer needed in project files to support daily functions or audits.

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4	**CCP CH TRU SOFTWARE QA (SQA) DOCUMENTATION** Database system development records and documentation records which support the maintenance and operation of tracking systems. CCP CH TRU SQA documentation pertains to the development, procurement, maintenance, and use of computer software important to the waste characterization and certification for the CCP CH. Includes but not limited to the following documentation for: exempt software; commercial off the shelf (COTS) software; application within COTS; qualified supplier software; non-qualified supplier software; and CCP software. May include Attachment 2, CCP Records Transmittal/Receiving Form(s). **QA Record/Nonpermanent/Validated by authorized signature and date.** Media Type: Hard Copy Filing Order: Site and Alphabetical by Software Name Inclusive Dates: 2000 to Present Location: CCP Records – SWB and/or WRA	ENV 1.g.3.b	Destroy or delete upon authorized deletion of related system.	Retain in CCP Records until completion of the characterization process for each site and transfer to the WRA within one year for storage and retention or sooner if no longer needed in project files to support daily functions or audits.

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5	**CCP CH OPERATION LOGBOOKS** Logbooks/fieldbooks that document a chronological history which provides a summary of shift and daily activities related to program and functions. Logbooks may support calibration activities, problem resolution, sampling, monitoring, and reporting. Records may include, but are not limited to results, notes, drawings/sketches, and field information. Logbooks listing significant action, daily surveillances and maintenance activities occurring during normal operations of applicable facility. Logbooks, log sheets (data record sheets) which are used for CCP personnel to document technical work processes and that are obtained during gathering activities. May include Attachment 2, CCP Records Transmittal/Receiving Form(s). **QA Record/Nonpermanent/Validated by authorized signature and date.** Media Type: Hard Copy Filing Order: Alpha-Numeric Inclusive Dates: 2000 to Present Location: CCP Records - SWB and/or WRA	ENV 1.e.6	Destroy when 75 years old.	Retain in CCP Records until completion of the characterization process for each site and transfer to the WRA within one year for storage and retention or sooner if no longer needed in project files to support daily functions or audits.
6	**CCP CH NONDESTRUCTIVE ASSAY (NDA) DOCUMENTATION** NDA is a series of measurement techniques applied to nuclear fuel and nuclear weapons materials. The techniques measure radiation induced or emitted spontaneously from the nuclear material. Measurements that do not alter the physical or chemical state of the material are considered nondestructive.			

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6(A)	CCP CH NDA Batch Data Reports (BDRs) Records indicating type (classification) and degree of contamination date of disposal, method of disposal (burial, landfill, etc.), volume, and disposal location. Records may include engineering studies, reports of unusual problems encountered during removal or treatment. NDA BDRs pertain to a series of measurement techniques applied to nuclear fuel and nuclear weapons materials. The techniques measure radiation induced or emitted spontaneously from the nuclear material. The measurements are nondestructive material. The documentation in each BDR is from data generation level through the project level verification & validation (V&V) and includes Project Level Checklists. May include Attachment 2, CCP Records Transmittal/Receiving Form(s). **QA Record/Lifetime/Validated by authorized signature and date.** Media Type: Hard Copy Filing Order: Alpha-Numeric Inclusive Dates: 2000 to Present Location: CCP Records - SWB and/or WRA	ENV 6.b	Permanent. Cutoff 5 years after disposal. Transfer to NARA 25 years after cutoff.	Retain in CCP Records until completion of the characterization process for each site and transfer to the WRA within one year for storage and retention or sooner if no longer needed in project files to support daily functions or audits.
6(B)	CCP CH NDA – Analytical Raw Data Analytical raw data is generated during the NDA process on the systems software. Data is captured on CDs and a primary and back up CD is created. This includes the Radioassay Raw Data Sheet Information. May include Attachment 2, CCP Records Transmittal/Receiving Form(s). **QA Record/Nonpermanent/Validated by authorized signature and date.** Media Type: Electronic – CDs Filing Order: Alpha-Numeric Inclusive Dates: 2000 to Present Location: CCP Records - SWB and/or WRA	Disposition Authority Pending NARA Approval.	UNSCHEDULED -Do Not Destroy-	Retain in CCP Records until completion of the characterization process for each site and transfer to the WRA within one year for storage and retention or sooner if no longer needed in project files to support daily functions or audits.

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6(C)	NDA Total Measurement Uncertainty (TMU) Reports TMU Reports estimate the potential error in measurements taken by an assay system on a waste container within the waste stream. An NDA measurement of a waste container may deviate from the true value as a result of bias, random error, or a combination of the two. The TMU is composed of bias and random errors and is typically expressed as an interval extending below and above the measured value. TMU is used to determine whether the radioactivity of individual waste containers may exceed specific criteria. May include Attachment 2, CCP Records Transmittal/Receiving Form(s). **QA Record/Nonpermanent/Validated by authorized signature and date.** Media Type: Hard Copy Filing Order: Alpha-Numeric Inclusive Dates: 2000 to Present Location: CCP Records - SWB and/or WRA	Disposition Authority Pending NARA Approval.	UNSCHEDULED -Do Not Destroy-	Retain in CCP Records until completion of the characterization process for each site and transfer to the WRA within one year for storage and retention or sooner if no longer needed in project files to support daily functions or audits.
6(D)	NDA Calibration Verification and Calibration and Validation Reports NDA Calibration and Validation Reports document the results of qualification testing of the Mobile Assay System for all CH sites. New active and passive calibrations are described together with results of testing using uranium, californium and plutonium sources. May include Attachment 2, CCP Records Transmittal/Receiving Form(s). **QA Record/Nonpermanent/Validated by authorized signature and date.** Media Type: Hard Copy Filing Order: Alpha-Numeric Inclusive Dates 2000 to Present Location: CCP Records - SWB and/or WRA	Disposition Authority Pending NARA Approval.	UNSCHEDULED -Do Not Destroy-	Retain in CCP Records until completion of the characterization process for each site and transfer to the WRA within one year for storage and retention or sooner if no longer needed in project files to support daily functions or audits.

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6(E)	NDA Six-Month Interfering Matrix Reports Environmental administration records include program or project management records, reports, and records documenting protection and preservation of natural resources. Environmental, safety and health administrative program reports prepared, formulated, or consolidated in formally organized field office, contractor, or sub-contractor files that specify or document compliance, achievements, status, deliverables, progress or development of departments, programs, projects, organizations, etc.; that pertain to the mission or functions for which the field office, contractor, or subcontractor has primary oversight or responsibility; or that document opinions and decisions which set policy or precedent. Reports documenting waste management activities for required compliance reports, dumpster violations, dangerous waste reports, and decay heat reports. The Six Month Summary of Weekly Interfering Matrix Report documents the requirements of the CH TRU Waste Acceptance Criteria (WAC) for the WIPP. It demonstrates that over the past six-month period, the operating range of the assay system has been tested in each applicable surrogate waste matrix and the instrument performance has been acceptable. The report is done every six months. May include Attachment 2, CCP Records Transmittal/Receiving Form(s). **EPIDEMIOLOGICAL** **QA Record/Nonpermanent/Validated by authorized signature and date** Media Type: Hard Copy Filing Order: Alpha-Numeric Inclusive Dates: 2000 to Present Location: CCP Records - SWB and/or WRA	ENV 1.d.10.c	Destroy 5 years after final closure of facility.	Retain in CCP Records until completion of the characterization process for each site and transfer to the WRA within one year for storage and retention or sooner if no longer needed in project files to support daily functions or audits.

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6. Item No.	7. Filing Series Title, Description, Any Special Categories, Media Types, Filing Order, Inclusive Dates and Location:	8. Disposition Authority	9. Authorized Disposition Instructions	10. Transfer Instructions
6(F)	NDA Hardware and Software Settings Form(s) NDA Hardware and Software Settings Form is used to document the hardware and software settings for the Drum Waste Assay System. May include Attachment 2, CCP Records Transmittal/Receiving Form(s). **QA Record/Nonpermanent/Validated by authorized signature and date.** Media Type: Hard Copy Filing Order: Chronological Inclusive Dates: 2006 to Present Location: CCP Records - SWB and/or WRA	Disposition Authority Pending NARA Approval.	UNSCHEDULED -Do Not Destroy-	Retain in CCP Records until completion of the characterization process for each site and transfer to the WRA within one year for storage and retention or sooner if no longer needed in project files to support daily functions or audits.
6(G)	NDA Performance Demonstration Plan (PDP) Documentation Waste management reports document waste management activities including hazardous waste reports, hazardous substance reports, waste characterization reports and Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA)/Resource Conservation and Recovery Act (RCRA) unit reports. Documentation demonstrates the capability of each participating measurement facility to meet the data quality objectives stated in DOE/WIPP-02-3122, CH TRU WAC for the WIPP for assay of TRU waste. The PDP is used by the CBFO to assess and approve characterization services for TRU waste. This is an annual requirement. May include Attachment 2, CCP Records Transmittal/Receiving Form(s). **QA Record/Nonpermanent/Validated by authorized signature and date.** Media Type: Hard Copy Filing Order: Alpha-Numeric for Cycle Inclusive Dates : 2000 to Present Location: CCP Records - SWB and/or WRA	Disposition Authority Pending NARA Approval.	UNSCHEDULED -Do Not Destroy-	Retain in CCP Records until completion of the characterization process for each site and transfer to the WRA within one year for storage and retention or sooner if no longer needed in project files to support daily functions or audits.

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6(H)	Detector Dewar Fill Log Logbooks/fieldbooks that document a chronological history which provides a summary of shift and daily activities related to program and functions. Logbooks may support calibration activities, problem resolution, sampling, monitoring, and reporting. Records may include, but are not limited to results, notes, drawings/sketches, and field information. Operating logbooks listing significant action, daily surveillances and maintenance activities occurring during normal operations of applicable facility. Detector Dewar Fill Log is used to document each time the detector dewar is filled with liquid nitrogen as required. Fill date, initials of operator and comments if applicable are noted on the log. May include Attachment 2, CCP Records Transmittal/Receiving Form(s). **QA Record/Nonpermanent/Validated by authorized initials and date.** Media Type: Hard Copy Filing Order: Chronological Inclusive Dates: 2006 to Present Location: CCP Records - SWB and/or WRA	ENV 1.e.6	Destroy when 75 years old.	Retain in CCP Records until completion of the characterization process for each site and transfer to the WRA within one year for storage and retention or sooner if no longer needed in project files to support daily functions or audits.

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6. Item No.	7. Filing Series Title, Description, Any Special Categories, Media Types, Filing Order, Inclusive Dates and Location:	8. Disposition Authority	9. Authorized Disposition Instructions	10. Transfer Instructions
6(I)	Mobile Imaging Passive Action Neutron (IPAN)/Gamma Energy Assay (GEA) Maintenance Checklist Logbooks/fieldbooks that document a chronological history which provides a summary of shift and daily activities related to program and functions. Logbooks may support calibration activities, problem resolution, sampling, monitoring, and reporting. Records may include, but are not limited to results, notes, drawings/sketches, and field information. Operating logbooks listing significant action, daily surveillances and maintenance activities occurring during normal operations of applicable facility. Maintenance record CCP mobile IPAN/GEA Checklist is used to document weekly and/or monthly maintenance checks on the IPAN/GEA system which performs the NDA process. This record is no longer generated. May include Attachment 2, CCP Records Transmittal/Receiving Form(s). **QA Record/Nonpermanent/Validated by authorized signature and date.** Media Type: Hard Copy Filing Order: Equipment and Date Inclusive Dates: 2001 to 2006 Location: CCP Records - SWB and/or WRA	ENV 1.e.6	Destroy when 75 years old.	Retain in CCP Records until completion of the characterization process for each site and transfer to the WRA within one year for storage and retention or sooner if no longer needed in project files to support daily functions or audits.
7	**CCP CH NDE** NDE (Radiography) is a nondestructive qualitative and quantitative technique that involves x-ray scanning of waste containers to identify and verify waste container contents. NDE is used to examine every waste container to verify its physical form. It can detect prohibited items. NDE is also used to confirm the physical form of the waste matches its waste stream description.			

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7(A)	CCP CH NDE BDRs Records indicating type (classification) and degree of contamination, date of disposal, method of disposal (burial, landfill, etc.), volume, and disposal location. Records may include engineering studies, reports of unusual problems encountered during removal or treatment. CCP NDE BDRs are processed on the Real Time Radiography (RTR) systems. NDE (Radiography) is a nondestructive qualitative and quantitative technique that involves x-ray scanning of waste containers to identify and verify waste container contents. NDE is used to examine every waste container to verify its physical form. It can detect prohibited items. NDE is also used to confirm the physical form of the waste matches its waste stream description. BDRs may include but are not limited to the following: cover sheet, batch narrative, Independent Technical Review (ITR) Checklist, Independent Technical Supervisor (TS) Checklist, Radiography Data Sheet, Measurement Control Report, copies of NCR(s) if applicable and Site Project Manager (SPM) Checklists. May include Attachment 2, CCP Records Transmittal/Receiving Form(s). **QA Record/Lifetime/Validated by authorized signature and date.** Media Type: Hard Copy Filing Order: Alpha-Numeric Inclusive Dates: 2000 to Present Location: CCP Records - SWB and/or WRA	ENV 6.b	Permanent. Cutoff 5 years after disposal. Transfer to NARA 25 years after cutoff.	Retain in CCP Records until completion of the characterization process for each site and transfer to the WRA within one year for storage and retention or sooner if no longer needed in project files to support daily functions or audits.

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7(B)	Audio/Visual Media of the Radiography Scans Audio/Visual Media captured on DVDs while performing NDE of CH TRU waste containers using the RTR system. May include Attachment 2, CCP Records Transmittal/Receiving Form(s). **QA Record/Nonpermanent/Validated by authorized signature and date on supporting BDR.** Media Type: Audio/Visual VHS Tapes or DVDs Filing Order: Alpha-Numeric Inclusive Dates: 2001 to Present Location: CCP Records - SWB and/or WRA	Disposition Authority Pending NARA Approval.	UNSCHEDULED -Do Not Destroy-	Retain in CCP Records until completion of the characterization process for each site and transfer to the WRA within one year for storage and retention or sooner if no longer needed in project files to support daily functions or audits.
7(C)	CCP Radiography System Safety Checks CCP Radiography System Safety checks or Pre-Operational Checklists are completed during the actions for startup, daily operational safety checks, operations, and shutdown of RTR System used to perform RTR. May include Attachment 2, CCP Records Transmittal/Receiving Form(s). **QA Record/Nonpermanent/Validated by authorized signature and date.** Media Type: Hard Copy Filing Order: Chronological Inclusive Dates: 2001 to Present Location: CCP Records - SWB and/or WRA	Disposition Authority Pending NARA Approval.	UNSCHEDULED -Do Not Destroy-	Retain in CCP Records until completion of the characterization process for each site and transfer to the WRA within one year for storage and retention or sooner if no longer needed in project files to support daily functions or audits.

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7(D)	NDE Fast Scanning Documentation NDE fast scanning documentation screens candidate containers to determine if they qualify for the extensive formal certification process. Screening is defined as a preliminary check to determine if a drum contains obvious prohibited items such as free liquids. This process is not used to certify waste. Includes both the RTR Measurement Control Report and the RTR Drum Quick Screening Log Sheet. May include Attachment 2, CCP Records Transmittal/Receiving Form(s). Media Type: Hard Copy Filing Order: Chronological Inclusive Dates: 2001 to Present Location: CCP Records - SWB and/or WRA	Disposition Authority Pending NARA Approval.	UNSCHEDULED -Do Not Destroy-	Retain in CCP Records until completion of the characterization process for each site and transfer to the WRA within one year for storage and retention or sooner if no longer needed in project files to support daily functions or audits.
7(E)	RTR Batch Weight Records CCP RTR Batch Weight records document the drum numbers, gross weight, tare weight, net weight, and percent fill of each drum being processed in a BDR in the NDE operations. May include Attachment 2, CCP Records Transmittal/Receiving Form(s). **QA Record/Nonpermanent/Validated by authorized signature and date.** Media Type: Hard Copy Filing Order: Alpha-Numeric Inclusive Dates: 2002 to Present Location: CCP Records - SWB and/or WRA	Disposition Authority Pending NARA Approval.	UNSCHEDULED -Do Not Destroy-	Retain in CCP Records until completion of the characterization process for each site and transfer to the WRA within one year for storage and retention or sooner if no longer needed in project files to support daily functions or audits.

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7(F)	CCP CH NDE Quarterly Reports Environmental monitoring reports provided to identify the progress on the environmental monitoring plans or on other related subjects. NDE quarterly reports pertain to the quarterly review performed on randomly selected data completed through SPM review, within the last three months' time frame. The reports give information regarding the data generation level review, and V&V performed each quarter on a minimum of one randomly chosen waste container. The SPM uses this information to document the data generation level data review is being performed according to procedures. This includes the request and results correspondence. **QA Record/Lifetime/Validated by authorized signature and date on memorandum.** Media Type: Hard Copy Filing Order: Quarterly Report Number Inclusive Dates: 2001 to Present Location: CCP Records - SWB and/or WRA	ENV 1.d.8.a	Destroy when 75 years old. Cutoff when reports are superseded, obsolete, or canceled.	Retain in CCP Records until completion of the characterization process for each site and transfer to the WRA within one year for storage and retention or sooner if no longer needed in project files to support daily functions or audits.
8	**HEADSPACE GAS (HSG) BDRs** HSG BDRs are combined information derived from the HSG sampling process and preliminary sampling preparation activities, or from the HSG analytical process and post-analytical activities. Each BDR is for a batch of up to 20 HSG samples and may also include QA/Quality Control (QC) samples, analytical only.			
8(A)	CCP HSG BDRs – Online Records indicating type (classification) and degree of contamination, date of disposal, method of disposal (burial, landfill, etc.), volume, and disposal location. Records may include engineering studies, reports of unusual problems encountered during removal or treatment. CCP HSG sampling and analytical BDRs are derived from the HSG sampling or analytical processes and include preliminary sampling preparation activities (sampling only) or follow-up data processing activities for the online system. CCP HSG BDRs are for combined information of analytical data from the analysis of TRU-mixed waste for a batch of up to 20 HSG	ENV 6.b	Permanent. Cutoff 5 years after disposal. Transfer to NARA 25 years after cutoff.	Retain in CCP Records until completion of the characterization process for each site and transfer to the WRA within one year for storage and retention or sooner

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	or homogenous waste samples. These BDRs may include but are not limited to the following: cover page; table of contents; case narrative; Operator's Checklist; ITR Checklist; TS Checklist; Form 1A, Volatile Organic Analysis Data Sheet; Form 1A, Duplicate Volatile Organic Analysis Data Sheet; Form 1E, Volatile Organic Analysis Data Sheet Tentatively Identified Compounds (TIC); Form 3A, Online Control Sample (OCS) Accuracy Form; Form 3A, Duplicate OCS Accuracy Form; Form 3B, OCS/OCS Duplicate Precision Form; Form 3C, Sample/Sample Duplicate Precision Form; Form 4A, Volatile Organic Method Blank Summary; Form 5A, Volatile Instrument Performance Check Bromofluorobenzene; Form 6A, Volatile Organic Initial Calibration (ICAL) Data; Form 7A, Volatile Organic Continuing Calibration Check; Form 8A, Volatile Organic Internal Standard Report Area and Retention Time (RT) Summary; CCP HSG Drum Age Criteria Form; Temperature Log; Freezer Temperature Data Log; and SPM Project Level Checklists. No longer generating new online data. May include Attachment 2, CCP Records Transmittal/Receiving Form(s). **QA Record/Lifetime/Validated by authorized signature and date.** Media Type: Hard Copy Filing Order: Alpha-Numeric Inclusive Dates: 2001 to 2007 Location: CCP Records - SWB and/or WRA			if no longer needed in project files to support daily functions or audits.

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6. Item No.	7. Filing Series Title, Description, Any Special Categories, Media Types, Filing Order, Inclusive Dates and Location:	8. Disposition Authority	9. Authorized Disposition Instructions	10. Transfer Instructions
8(B)	CCP HSG ICAL Documentation ICAL documentation pertains to both gas analysis and solids analysis processes of analytical standards for series of different specified concentrations and is used to define the linearity and dynamic range of instruments. May include Attachment 2, CCP Records Transmittal/Receiving Form(s). **QA Record/Nonpermanent/Validated by authorized signature and date.** Media Type: Hard Copy Filing Order: Alpha-Numeric Inclusive Dates: 2000 to Present Location: CCP Records - SWB and/or WRA	Disposition Authority Pending NARA Approval.	UNSCHEDULED -Do Not Destroy-	Retain in CCP Records until completion of the characterization process for each site and transfer to the WRA within one year for storage and retention or sooner if no longer needed in project files to support daily functions or audits.
8(C)	CCP HSG Method Detection Limits (MDL) Documentation MDL documentation pertains to both gas analysis and solids analysis processes for data defined as the minimum concentration of a substance that can be measured and reported with 99% confidence that the value is above zero. May include Attachment 2, CCP Records Transmittal/Receiving Form(s). **QA Record/Nonpermanent/Validated by authorized signature and date.** Media Type: Hard Copy Filing Order: Alpha-Numeric Inclusive Dates: 2000 to Present Location: CCP Records - SWB and/or WRA	Disposition Authority Pending NARA Approval.	UNSCHEDULED -Do Not Destroy-	Retain in CCP Records until completion of the characterization process for each site and transfer to the WRA within one year for storage and retention or sooner if no longer needed in project files to support daily functions or audits.

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6. Item No.	7. Filing Series Title, Description, Any Special Categories, Media Types, Filing Order, Inclusive Dates and Location:	8. Disposition Authority	9. Authorized Disposition Instructions	10. Transfer Instructions
8(D)	CCP HSG Method Performance Documentation (MPD) These data packages consist of documentation generated during transport and receipt of field samples (e.g., chain of custody), sample movement in the laboratory, preparation for analysis, laboratory analyses output, raw and processed data, analytical results (analysis reports), reanalysis, QC sample results and instrument calibration data, plus a summary of final results for each batch. May include validation and/or verification documentation. CCP HSG MPD is an analytical method that demonstrates, through documented system and instrument tests and participation in the HSG instrument tests and HGS PDP, the analysis of blind samples. May include Attachment 2, CCP Records Transmittal/Receiving Form(s). **QA Record/Nonpermanent/Validated by authorized signature and date.** Media Type: Hard Copy Filing Order: Alpha-Numeric Inclusive Dates: 2000 to Present Location: CCP Records - SWB and/or WRA	ENV 5.c.1	Destroy in 75 years.	Retain in CCP Records until completion of the characterization process for each site and transfer to the WRA within one year for storage and retention or sooner if no longer needed in project files to support daily functions or audits.
8(E)	CCP Needle Blank Documentation These records consist of control records pertaining to work performed in analytical laboratories. Records include, but are not limited to Sample Receiving Logs, analysis requests, analytical assay records, and comparative analysis logs. Documentation pertains to the process of taking 10% of the needles and performing a check to assure cleanliness. May include Attachment 2, CCP Records Transmittal/Receiving Form(s). **QA Record/Nonpermanent/Validated by authorized signature and date.** Media Type: Hard Copy Filing Order: Chronological Inclusive Dates: 2004 to 2009 Location: CCP Records - SWB and/or WRA	ENV 5.d	Destroy when 10 years old.	Retain in CCP Records. Destroy when 10 years old. Screen and purge annually.

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6. Item No.	7. Filing Series Title, Description, Any Special Categories, Media Types, Filing Order, Inclusive Dates and Location:	8. Disposition Authority	9. Authorized Disposition Instructions	10. Transfer Instructions
8(F)	HSG – Analytical Raw Data Analytical raw data is generated during the HSG process on the online system software. Data captured on CDs with a primary and backup CD created. **QA Record/Nonpermanent/Validated by authorized signature/initial and date.** Media Type: CD Filing Order: Alpha-Numeric Inclusive Dates: 2000 to Present Location: CCP Records - SWB and/or WRA	Disposition Authority Pending NARA Approval.	UNSCHEDULED -Do Not Destroy-	Retain in CCP Records until completion of the characterization process for each site and transfer to the WRA within one year for storage and retention or sooner if no longer needed in project files to support daily functions or audits.
8(G)	Container Filter Change Out Forms Container Filter Change Out Forms are used to document when a filter is replaced on a characterization drum. It identifies the container number, filter install date, filter model number, filter manufacturer date, filter serial number, filter torque value, and calibration information of torque wrench used to perform replacement. Formerly entitled the Drum Filter Change Out Form. May include Attachment 2, CCP Records Transmittal/Receiving Form(s). **QA Record/Nonpermanent/Validated by authorized signature and date.** Media Type: Hard Copy Filing Order: Alpha-Numeric Inclusive Dates: 2000 to Present Location: CCP Records - SWB and/or WRA	Disposition Authority Pending NARA Approval.	UNSCHEDULED -Do Not Destroy-	Retain in CCP Records until completion of the characterization process for each site and transfer to the WRA within one year for storage and retention or sooner if no longer needed in project files to support daily functions or audits.

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6. Item No.	7. Filing Series Title, Description, Any Special Categories, Media Types, Filing Order, Inclusive Dates and Location:	8. Disposition Authority	9. Authorized Disposition Instructions	10. Transfer Instructions
8(H)	CCP CH HSG BDRs – Summa Sampling Records indicating type (classification) and degree of contamination, date of disposal, method of disposal (burial, landfill, etc.), volume, and disposal location. Records may include engineering studies, reports of unusual problems encountered during removal or treatment. CCP CH HSG – Summa BDRs are document the manual sampling of HSG in TRU waste containers. The sampling is done using a side port needle attached to a SUMMA® canister. After sampling, the canisters are sealed and prepared for shipment/transport to a laboratory for analysis. The BDR may include but is not limited to the following: cover sheet, table of contents, ITR Checklist, TS Review Checklist, Facility Quality Assurance Officer (FQAO) Review Checklist, 72-hour temperature equilibration plots, copies of NCRs if applicable, chain of custody/canister tag, Sample Drum Data Form, shipment request (or equivalent), and SPM Project Level Checklist. May include Attachment 2, CCP Records Transmittal/Receiving Form(s). **QA Record/Lifetime/Validated by authorized signature and date.** Media Type: Hard Copy Filing Order: Alpha-Numeric Inclusive Dates: 2004 to Present Location: CCP Records - SWB and/or WRA	ENV 6.b	Permanent. Cutoff 5 years after disposal. Transfer to NARA 25 years after cutoff.	Retain in CCP Records until completion of the characterization process for each site and transfer to the WRA within one year for storage and retention or sooner if no longer needed in project files to support daily functions or audits.

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6. Item No.	7. Filing Series Title, Description, Any Special Categories, Media Types, Filing Order, Inclusive Dates and Location:	8. Disposition Authority	9. Authorized Disposition Instructions	10. Transfer Instructions
8(l)	CCP CH Analysis of Gas Samples BDRs – Environmental Chemistry Laboratory (ECL) Records indicating type (classification) and degree of contamination, date of disposal, method of disposal (burial, landfill, etc.), volume, and disposal location. Records may include engineering studies, reports of unusual problems encountered during removal or treatment. CCP CH Analysis of Gas Samples BDRs are reports that document the analysis of gas samples of volatile organic compound (VOC) in HSG samples contained in SUMMA® canisters. May include but not limited to the following: Data Report cover page and table of contents, Sample Identification Table/Analysis Request Form, sample custody documents and sample tags, sample results, QA measurement results, calibration results, and Data Review Checklists and SPM Project Level Checklist. This includes BDRs for external sites such as Hanford and Advanced Mixed Waste TRU Program (AMWTP). May include Attachment 2, CCP Records Transmittal/Receiving Form(s). **QA Record/Lifetime/Validated by authorized signature and date.** Media Type: Hard Copy Filing Order: Alpha-Numeric Inclusive Dates: 2004 to Present Location: CCP Records - SWB and/or WRA	ENV 6.b	Permanent. Cutoff 5 years after disposal. Transfer to NARA 25 years after cutoff.	Retain in CCP Records until completion of the characterization process for each site and transfer to the WRA within one year for storage and retention or sooner if no longer needed in project files to support daily functions or audits.

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6. Item No.	7. Filing Series Title, Description, Any Special Categories, Media Types, Filing Order, Inclusive Dates and Location:	8. Disposition Authority	9. Authorized Disposition Instructions	10. Transfer Instructions
8(J)	CCP CH Analysis of Gas Samples BDRs – Raw Data Supporting Data Packages – ECL CCP CH Analysis of Gas Samples BDRs are raw data supporting data packages that document the analysis of gas samples of VOC HSG samples contained in SUMMA® canisters. These packages may contain but are not limited to the following: raw data/instrument printouts and copies of applicable pages of logbooks. This includes supporting documents to BDRs for external sites such as Hanford and AMWTP. May include Attachment 2, CCP Records Transmittal/Receiving Form(s). **QA Record/Nonpermanent/Validated by authorized signature and date.** Media Type: Hard Copy Filing Order: Alpha-Numeric Inclusive Dates: 2004 to Present Location: CCP Records - SWB and/or WRA	Disposition Authority Pending NARA Approval.	UNSCHEDULED -Do Not Destroy-	Retain in CCP Records until completion of the characterization process for each site and transfer to the WRA within one year for storage and retention or sooner if no longer needed in project files to support daily functions or audits.

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6. Item No.	7. Filing Series Title, Description, Any Special Categories, Media Types, Filing Order, Inclusive Dates and Location:	8. Disposition Authority	9. Authorized Disposition Instructions	10. Transfer Instructions
8(K)	CCP CH HSG Quarterly Reports Environmental monitoring reports provided to identify the progress on the environmental monitoring plans or on other related subjects. HSG quarterly reports pertain to the quarterly review performed on randomly selected data completed through SPM review, within the last three months' time frame. The reports give information regarding the repeat of data generation level review. V&V is performed each quarter on a minimum of one randomly chosen waste container. The SPM uses this information to document the data generation level data review is being performed according to procedures. This includes the request and results correspondence. **QA Record/Lifetime/Validated by authorized signature and date.** Media Type: Hard Copy Filing Order: Quarterly Report Number Inclusive Dates: 2001 to Present Location: CCP Records - SWB and/or WRA	ENV 1.d.8.a	Destroy when 75 years old. Cutoff when reports are superseded, obsolete, or canceled.	Retain in CCP Records until completion of the characterization process for each site and transfer to the WRA within one year for storage and retention or sooner if no longer needed in project files to support daily functions or audits.
8(L)	CCP CH HSG PDP Documentation Includes hazardous waste reports, hazardous substance reports, waste characterization reports, CERCLA/RCRA unit reports. Documentation demonstrates the capability of each participating measurement facility to meet the data quality objectives stated in DOE/WIPP-02-3122, CH TRU WAC for the WIPP for assay of TRU waste. The PDP is used by the CBFO to assess and approve characterization services for TRU waste. This is an annual requirement. May include Attachment 2, CCP Records Transmittal/Receiving Form(s). **QA Record/Nonpermanent/Validated by authorized signature and date.** Media Type: Hard Copy Filing Order: PDP Number and Process Inclusive Dates: 2000 to Present Location: CCP Records - SWB and/or WRA	Disposition Authority Pending NARA Approval.	UNSCHEDULED -Do Not Destroy-	Retain in CCP Records until completion of the characterization process for each site and transfer to the WRA within one year for storage and retention or sooner if no longer needed in project files to support daily functions or audits.

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6. Item No.	7. Filing Series Title, Description, Any Special Categories, Media Types, Filing Order, Inclusive Dates and Location:	8. Disposition Authority	9. Authorized Disposition Instructions	10. Transfer Instructions
8(M)	CCP CH HSG Random Sample Selection Memorandums HSG Random Sample Memorandums document the random selection for HSG sampling and analysis. It includes, at a minimum, a memorandum identifying the random selection with attached HSG Random Sample Selection Listing. **QA Record/Nonpermanent/Validated by authorized signature and date on memorandum.** Media Type: Hard Copy Filing Order: Chronological Inclusive Dates: 2001 to Present Location: CCP Records - SWB and/or WRA	Disposition Authority Pending NARA Approval.	UNSCHEDULED -Do Not Destroy-	Retain in CCP Records until completion of the characterization process for each site and transfer to the WRA within one year for storage and retention or sooner if no longer needed in project files to support daily functions or audits.
9	**FLAMMABLE GAS ANALYSIS (FGA) DOCUMENTATION** FGA documentation pertains to the process to establish the concentration of flammable gas/VOCs, hydrogen, and methane in a waste container intended for shipment.			

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6. Item No.	7. Filing Series Title, Description, Any Special Categories, Media Types, Filing Order, Inclusive Dates and Location:	8. Disposition Authority	9. Authorized Disposition Instructions	10. Transfer Instructions
9(A)	FGA BDRs Records indicating type (classification) and degree of contamination, date of disposal, method of disposal (burial, landfill, etc.), volume, and disposal location. Records may include engineering studies, reports of unusual problems encountered during removal or treatment. FGA BDRs are generated at all CH sites to establish the concentration of flammable gas (FG)/VOCs, hydrogen, and methane in a waste container intended for shipment. Procedure used is DOE/WIPP-06-3345. May include Attachment 2, CCP Records Transmittal/Receiving Form(s). **QA Record/Lifetime/Validated by authorized signature and date.** Media Type: Hard Copy Filing Order: Alpha-Numeric Inclusive Dates: 2005 to Present Location: CCP Records - SWB and/or WRA	ENV 6.b	Permanent. Cutoff 5 years after disposal. Transfer to NARA 25 years after cutoff.	Retain in CCP Records until completion of the characterization process for each site and transfer to the WRA within one year for storage and retention or sooner if no longer needed in project files to support daily functions or audits.
9(B)	CCP FGA ICAL Documentation CCP FGA ICAL documentation is an analysis of analytical standards for series of different specified concentrations and is used to define the linearity and dynamic range of the response of the mass spectrometer or electron capture detector to the target compounds. Procedure used is DOE/WIPP-06-3345. May include Attachment 2, CCP Records Transmittal/Receiving Form(s). **QA Record/Nonpermanent/Validated by authorized signature and date.** Media Type: Hard Copy Filing Order: Alpha-Numeric Inclusive Dates: 2005 to Present Location: CCP Records - SWB and/or WRA	Disposition Authority Pending NARA Approval.	UNSCHEDULED -Do Not Destroy-	Retain in CCP Records until completion of the characterization process for each site and transfer to the WRA within one year for storage and retention or sooner if no longer needed in project files to support daily functions or audits.

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9(C)	CCP FGA MDL Documentation CCP FGA MDL documentation pertains to and is defined as the minimum concentration of a substance that can be measured and reported with 99% confidence that the value is above zero. Procedure used is DOE/WIPP-06-3345. May include Attachment 2, CCP Records Transmittal/Receiving Form(s). **QA Record/Nonpermanent/Validated by authorized signature and date.** Media Type: Hard Copy Filing Order: Alpha-Numeric Inclusive Dates: 2005 to Present Location: CCP Records - SWB and/or WRA	Disposition Authority Pending NARA Approval.	UNSCHEDULED -Do Not Destroy-	Retain in CCP Records until completion of the characterization process for each site and transfer to the WRA within one year for storage and retention or sooner if no longer needed in project files to support daily functions or audits.
10	**SOLIDS SAMPLING BDRs** Documentation pertaining to the process of solids sampling which is the random sample collection and sample data collection.			

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10(A)	Solids Sampling BDRs Records indicating type (classification) and degree of contamination, date of disposal, method of disposal (burial, landfill, etc.), volume, and disposal location. Records may include engineering studies, reports of unusual problems encountered during removal or treatment. Documentation pertaining to the process of solids sampling which is the random sample collection and sample data collection. The BDR may include but is not limited to the following: Sample Tracking Form, Sample Chain of Custody Form, Sampling ITR Checklist, Sampling TS Review Checklist, Sampling FQAO Review Checklist, Sampling BDR – table of contents, Solids Sampling BDR – cover sheet, copy of CCP Waste Visual Examination (VE) Technique Data Form, copy of NCR(s) if applicable, Temperature Data Logger Sheets, Certification of Cleanliness for Sampling Equipment, and V&V Checklists. May include Attachment 2, CCP Records Transmittal/Receiving Form(s). **QA Record/Lifetime/Validated by authorized signature and date.** Media Type: Hard Copy Filing Order: Alpha-Numeric Inclusive Dates: 2004 to Present Location: CCP Records - SWB and/or WRA	ENV 6.b	Permanent. Cutoff 5 years after disposal. Transfer to NARA 25 years after cutoff.	Retain in CCP Records until completion of the characterization process for each site and transfer to the WRA within one year for storage and retention or sooner if no longer needed in project files to support daily functions or audits.

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6. Item No.	7. Filing Series Title, Description, Any Special Categories, Media Types, Filing Order, Inclusive Dates and Location:	8. Disposition Authority	9. Authorized Disposition Instructions	10. Transfer Instructions
10(B)	Solids Analysis BDRs These data packages consist of documentation generated during transport and receipt of field samples (e.g., chain of custody), sample movement in the laboratory, preparation for analysis, laboratory analyses output, raw and processed data, analytical results (analysis reports), reanalysis, QC sample results and instrument calibration data, plus a summary of final results for each batch. CCP CH Analysis of Solids Sample BDRs are reports that document the analysis of solids samples of VOC, non-halogenated volatile compounds (NHVOC), semi-volatile compounds (SVOC), and metals. May include but not limited to the following: data report, cover page, table of contents, sample custody documents, sample results, QC results, calibration results, Data Review Checklists and SPM Project Level Checklist. This includes BDRs for external sites. May include Attachment 2, CCP Records Transmittal/Receiving Form(s). **QA Record/Lifetime/Validated by authorized signature and date.** Media Type: Hard Copy Filing Order: Alpha-Numeric Inclusive Dates: 2004 to Present Location: CCP Records - SWB and/or WRA	ENV 5.c.1	Destroy in 75 years.	Retain in CCP Records until completion of the characterization process for each site and transfer to the WRA within one year for storage and retention or sooner if no longer needed in project files to support daily functions or audits.

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6. Item No.	7. Filing Series Title, Description, Any Special Categories, Media Types, Filing Order, Inclusive Dates and Location:	8. Disposition Authority	9. Authorized Disposition Instructions	10. Transfer Instructions
10(C)	<u>CCP Solids Analysis BDRs – Raw Data Supporting Data Package</u> CCP CH Solids Analysis BDRs raw data supporting data packages that document the analysis of VOC, NHVOC, SVOC and metals in solids analysis. These packages may contain but are not limited to the following: raw data/instrument printouts, copies of applicable pages of Digestion Record and copies of applicable pages of logbooks. This is supporting documents to all solids analysis BDRs for external sites such as Hanford and AMWTP. May include Attachment 2, CCP Records Transmittal/Receiving Form(s). **QA Record/Nonpermanent/Validated by authorized signature and date.** Media Type: Hard Copy Filing Order: Alpha-Numeric Inclusive Dates: 2004 to Present Location: CCP Records - SWB and/or WRA	Disposition Authority Pending NARA Approval.	UNSCHEDULED -Do Not Destroy-	Retain in CCP Records until completion of the characterization process for each site and transfer to the WRA within one year for storage and retention or sooner if no longer needed in project files to support daily functions or audits.
10(D)	<u>Solids Sampling Random Selection Memorandum</u> Solids Sampling Random Selection Memorandums document the random selection for solids sampling and analysis. It includes, at a minimum, a memorandum identifying the random selection with attached Solids Random Sample List/Waste Stream Container List. **QA Record/Nonpermanent/Validated by authorized signature and date.** Media Type: Hard Copy Filing Order: Chronological Inclusive Dates: 2004 to Present Location: CCP Records - SWB and/or WRA	Disposition Authority Pending NARA Approval.	UNSCHEDULED -Do Not Destroy-	Retain in CCP Records until completion of the characterization process for each site and transfer to the WRA within one year for storage and retention or sooner if no longer needed in project files to support daily functions or audits.

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10(E)	Instrument Detection Limit (IDL) Determination Files IDL determination files document the detection limits of the equipment. It is performed every six months. May include Attachment 2, CCP Records Transmittal/Receiving Form(s). **QA Record/Nonpermanent/Validated by authorized signature and date.** Media Type: Hard Copy Filing Order: Chronological Inclusive Dates: 2007 to Present Location: CCP Records - SWB and/or WRA	Disposition Authority Pending NARA Approval.	UNSCHEDULED -Do Not Destroy-	Retain in CCP Records until completion of the characterization process for each site and transfer to the WRA within one year for storage and retention or sooner if no longer needed in project files to support daily functions or audits.
10(F)	Interelement Interference Correction Factor (IECF) Determination Files IECF determination files document the Inductively Coupled Plasma wavelengths of the metal are used to determine the concentration of metals. Metals have several wavelengths and overlap/interfere with other metals; therefore a correction factor must be determined. May include Attachment 2, CCP Records Transmittal/Receiving Form(s). **QA Record/Nonpermanent/Validated by authorized signature and date.** Media Type: Hard Copy Filing Order: Chronological Inclusive Dates: 2007 to Present Location: CCP Records - SWB and/or WRA	Disposition Authority Pending NARA Approval.	UNSCHEDULED -Do Not Destroy-	Retain in CCP Records until completion of the characterization process for each site and transfer to the WRA within one year for storage and retention or sooner if no longer needed in project files to support daily functions or audits.

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10(G)	Documented Linear Range (DLR) Determination Files DLR determination files pertain to the concentration of the high calibration standard and are applicable only for a specific analyte, instrument, and set of operating conditions. A DLR may be used for up to six months after its determination date. May include Attachment 2, CCP Records Transmittal/Receiving Form(s). **QA Record/Nonpermanent/Validated by authorized signature and date.** Media Type: Hard Copy Filing Order: Chronological Inclusive Dates: 2007 to Present Location: CCP Records - SWB and/or WRA	Disposition Authority Pending NARA Approval.	UNSCHEDULED -Do Not Destroy-	Retain in CCP Records until completion of the characterization process for each site and transfer to the WRA within one year for storage and retention or sooner if no longer needed in project files to support daily functions or audits.
10(H)	Completed Chain of Custody Forms These data packages consist of documentation generated during transport and receipt of field samples (e.g., chain of custody), sample movement in the laboratory, preparation for analysis, laboratory analyses output, raw and processed data, analytical results (analysis reports), reanalysis, QC sample results, and instrument calibration data, plus a summary of final results for each batch. Completed Chain of Custody Forms document all transfers of sample custody from collection to disposal. The form contains at a minimum, the sample numbers, the date and times of transfers, and the signatures of the relinquishing and accepting parties. May include Attachment 2, CCP Records Transmittal/Receiving Form(s). **QA Record/Lifetime/Validated by authorized signature and date.** Media Type: Hard Copy Filing Order: Alpha-Numeric Inclusive Dates: 2007 to Present Location: CCP Records - SWB and/or WRA	ENV 5.c.1	Destroy in 75 years.	Retain in CCP Records until completion of the characterization process for each site and transfer to the WRA within one year for storage and retention or sooner if no longer needed in project files to support daily functions or audits.

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6. Item No.	7. Filing Series Title, Description, Any Special Categories, Media Types, Filing Order, Inclusive Dates and Location:	8. Disposition Authority	9. Authorized Disposition Instructions	10. Transfer Instructions
10(I)	Solids PDP Documentation Includes hazardous waste reports, hazardous substance reports, waste characterization reports, and CERCLA/RCRA unit reports. Documentation demonstrates the capability of each participating measurement facility to meet the data quality objectives stated in DOE/CBFO-95-1077, Performance Program Plan for RCRA Constituent Analysis of Solidified Waste. The PDP is used by the CBFO to assess and approve characterization services for TRU waste. This is an annual requirement May include Attachment 2, CCP Records Transmittal/Receiving Form(s). **QA Record/Nonpermanent/Validated by authorized signature and date.** Media Type: Hard Copy Filing Order: PDP Number and Process Inclusive Dates: 2004 to Present Location: CCP Records - SWB and/or WRA	Disposition Authority Pending NARA Approval.	UNSCHEDULED -Do Not Destroy-	Retain in CCP Records until completion of the characterization process for each site and transfer to the WRA within one year for storage and retention or sooner if no longer needed in project files to support daily functions or audits.
11	**PRECISION AND ACCURACY (P&A) DEMONSTRATION FILES** P&A demonstration files pertain to the demonstration of the method performance before analyzing any samples. May include Attachment 2, CCP Records Transmittal/Receiving Form(s). **QA Record/Nonpermanent/Validated by authorized signature and date.** Media Type: Hard Copy Filing Order: Chronological Inclusive Dates: 2004 to Present Location: CCP Records - SWB and/or WRA	Disposition Authority Pending NARA Approval.	UNSCHEDULED -Do Not Destroy-	Retain in CCP Records until completion of the characterization process for each site and transfer to the WRA within one year for storage and retention or sooner if no longer needed in project files to support daily functions or audits.

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6. Item No.	7. Filing Series Title, Description, Any Special Categories, Media Types, Filing Order, Inclusive Dates and Location:	8. Disposition Authority	9. Authorized Disposition Instructions	10. Transfer Instructions
12	**RT WINDOW DETERMINATION FILES** The RT window is crucial to the identification of target compounds. The window is determined by using +/- three times the standard deviation of the mean RT. May include Attachment 2, CCP Records Transmittal/Receiving Form(s). **QA Record/Nonpermanent/Validated by authorized signature and date.** Media Type: Hard Copy Filing Order: Alpha-Numeric Inclusive Dates: 2007 to Present Location: CCP Records - SWB and/or WRA	Disposition Authority Pending NARA Approval.	UNSCHEDULED -Do Not Destroy-	Retain in CCP Records until completion of the characterization process for each site and transfer to the WRA within one year for storage and retention or sooner if no longer needed in project files to support daily functions or audits.
13	**GAS GENERATION TESTING (GGT) DOCUMENTATION** Documentation on the GGT is used to collect off-gases generated from a waste drum, to analyze the Hydrogen/Methane (H_2/CH_4) generation rate, and the total gas generation of the drum.			

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6. Item No.	7. Filing Series Title, Description, Any Special Categories, Media Types, Filing Order, Inclusive Dates and Location:	8. Disposition Authority	9. Authorized Disposition Instructions	10. Transfer Instructions
13(A)	GGT BDRs Records indicating type (classification) and degree of contamination, date of disposal, method of disposal (burial, landfill, etc.), volume, and disposal location. Records may include engineering studies, reports of unusual problems encountered during removal or treatment. GGT BDRs are compiled to generate characterization data and data reviews on the GGT process of collecting off-gases generated from the waste drums being processed through the characterization process. Includes cover sheet, table of contents, case narrative, Continuing Calibration Verification Report, Sample Duplicate Report, Blank Report, Drum Data Sheets, Gas Generation Testing Program (GGTP), ITR Form, raw data, GGTP drum selection and batching, GGTP Isolation Checklist, copy of NCRs – if applicable, and the SPM Checklist Form. May include Attachment 2, CCP Records Transmittal/Receiving Form(s). **QA Record/Lifetime/Validated by authorized signature and date.** Media Type: Hard Copy Filing Order: Alpha-Numeric Inclusive Dates: 2005 to Present Location: CCP Records - SWB and/or WRA	ENV 6.b	Permanent. Cutoff 5 years after disposal. Transfer to NARA 25 years after cutoff.	Retain in CCP Records until completion of the characterization process for each site and transfer to the WRA within one year for storage and retention or sooner if no longer needed in project files to support daily functions or audits.

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6. Item No.	7. Filing Series Title, Description, Any Special Categories, Media Types, Filing Order, Inclusive Dates and Location:	8. Disposition Authority	9. Authorized Disposition Instructions	10. Transfer Instructions
13(B)	GGT Hydrogen ICAL GGT ICAL is documentation of analysis of analytical standards for series of different specified concentrations and is used to define the linearity and dynamic range of the response of the mass spectrometer or electron capture detector to the target compounds. Includes but not limited to the following: raw data printouts and Calibration Report. May include Attachment 2, CCP Records Transmittal/Receiving Form(s). **QA Record/Nonpermanent/Validated by authorized signature and date.** Media Type: Hard Copy Filing Order: Alpha-Numeric Inclusive Dates: 2005 to Present Location: CCP Records - SWB and/or WRA	Disposition Authority Pending NARA Approval.	UNSCHEDULED -Do Not Destroy-	Retain in CCP Records until completion of the characterization process for each site and transfer to the WRA within one year for storage and retention or sooner if no longer needed in project files to support daily functions or audits.
13(C)	GGT MDL Documentation GGT MDL is documentation that pertains to and is defined as the minimum concentration of a substance that can be measured and reported with 99% confidence that the value is above zero. Includes but is not limited to the following: raw data print outs and determination of MDLs, corresponding %R and %RSD form, Attachment 1. May include Attachment 2, CCP Records Transmittal/Receiving Form(s). **QA Record/Nonpermanent/Validated by authorized signature and date.** Media Type: Hard Copy Filing Order: Alpha-Numeric Inclusive Dates: 2005 to Present Location: CCP Records - SWB and/or WRA	Disposition Authority Pending NARA Approval.	UNSCHEDULED -Do Not Destroy-	Retain in CCP Records until completion of the characterization process for each site and transfer to the WRA within one year for storage and retention or sooner if no longer needed in project files to support daily functions or audits.

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6. Item No.	7. Filing Series Title, Description, Any Special Categories, Media Types, Filing Order, Inclusive Dates and Location:	8. Disposition Authority	9. Authorized Disposition Instructions	10. Transfer Instructions
13(D)	GGT CCP Unified Flammable Gas Test Procedure (UFGTP) Reports GGT CCP UFGTP Report documents whether a test category payload container demonstrates compliance with the FG/VOC limits. The long-term objective of the UFGTP is to improve waste shippability for specific populations of waste arriving at more realistic gas generation rates based on the results of measurement and testing. Includes the following: cover page, Long-Term Objective Population Identification Report or equivalent, Long-Term Objective Subpopulation Selection Report or equivalent, Long-Term Objective Subpopulation Data Compilation Report or equivalent, Long-Term Objective Subpopulation Data Evaluation Report or equivalent, and Long-Term Objective Summary Report. May include Attachment 2, CCP Records Transmittal/Receiving Form(s). **QA Record/Lifetime/Validated by authorized signature and date.** Media Type: Hard Copy Filing Order: Alpha-Numeric Inclusive Dates: 2005 to Present Location: CCP Records - SWB and/or WRA	Disposition Authority Pending NARA Approval.	UNSCHEDULED -Do Not Destroy-	Retain in CCP Records until completion of the characterization process for each site and transfer to the WRA within one year for storage and retention or sooner if no longer needed in project files to support daily functions or audits.
14	**VE BDRs** VE constitutes opening a container and physically examining its contents and verifying its physical form. VE is also used to confirm the physical form of the waste matches its waste stream description. Removal of prohibited items can be performed in this process.			

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6. Item No.	7. Filing Series Title, Description, Any Special Categories, Media Types, Filing Order, Inclusive Dates and Location:	8. Disposition Authority	9. Authorized Disposition Instructions	10. Transfer Instructions
14(A)	CCP CH VE BDRs Records indicating type (classification) and degree of contamination, date of disposal, method of disposal (burial, landfill, etc.), volume, and disposal location. Records may include engineering studies, reports of unusual problems encountered during removal or treatment. CCP CH VE BDRs is documentation regarding the process of opening a container and physically examining its contents and verifying its physical form. VE is also used to confirm the physical form of the waste matches its waste stream description. Removal of prohibited items can be performed in this process. May include Attachment 2, CCP Records Transmittal/Receiving Form(s). **QA Record/Lifetime/Validated by authorized signature and date.** Media Type: Hard Copy Filing Order: Alpha-Numeric Inclusive Dates: 2000 to Present Location: CCP Records - SWB and/or WRA	ENV 6.b	Permanent. Cutoff 5 years after disposal. Transfer to NARA 25 years after cutoff.	Retain in CCP Records until completion of the characterization process for each site and transfer to the WRA within one year for storage and retention or sooner if no longer needed in project files to support daily functions or audits.
14(B)	Audio/Visual Recording Tapes or DVDs of VE Audio/Visual recordings created while performing VE of CH TRU waste containers. These audio/visual recordings are matched to an associated VE BDR. May include Attachment 2, CCP Records Transmittal/Receiving Form(s). **QA Record/Nonpermanent/Validated by authorized signature and date on associated BDR.** Media Type: Audio/Visual Tapes and DVDs Filing Order: Alpha-Numeric Inclusive Dates: 2000 to Present Location: CCP Records - SWB and/or WRA	Disposition Authority Pending NARA Approval.	UNSCHEDULED -Do Not Destroy-	Retain in CCP Records until completion of the characterization process for each site and transfer to the WRA within one year for storage and retention or sooner if no longer needed in project files to support daily functions or audits.

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6. Item No.	7. Filing Series Title, Description, Any Special Categories, Media Types, Filing Order, Inclusive Dates and Location:	8. Disposition Authority	9. Authorized Disposition Instructions	10. Transfer Instructions
14(C)	Prohibited Items Removal Checklist Prohibited Items Removal Checklist is a form utilized to document the removal of prohibited items found in characterization drums. May include Attachment 2, CCP Records Transmittal/Receiving Form(s). **QA Record/Nonpermanent/Validated by authorized signature and date.** Media Type: Hard Copy Filing Order: Chronological Inclusive Dates: 2003 to Present Location: CCP Records - SWB and/or WRA	Disposition Authority Pending NARA Approval.	UNSCHEDULED -Do Not Destroy-	Retain in CCP Records until completion of the characterization process for each site and transfer to the WRA within one year for storage and retention or sooner if no longer needed in project files to support daily functions or audits.
14(D)	Remediation Data Forms Remediation Data Forms are used during the CCP standardized prohibited item remediation process performed in CCP-TP-036. This is a VE activity. May include Attachment 2, CCP Records Transmittal/Receiving Form(s). **QA Record/Nonpermanent/Validated by authorized signature and date.** Media Type: Hard Copy Filing Order: Alpha-Numeric Inclusive Dates: 2005 to 2008 Location: CCP Records - SWB and/or WRA	Disposition Authority Pending NARA Approval.	UNSCHEDULED -Do Not Destroy-	Retain in CCP Records until completion of the characterization process for each site and transfer to the WRA within one year for storage and retention or sooner if no longer needed in project files to support daily functions or audits.

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6. Item No.	7. Filing Series Title, Description, Any Special Categories, Media Types, Filing Order, Inclusive Dates and Location:	8. Disposition Authority	9. Authorized Disposition Instructions	10. Transfer Instructions
14(E)	CCP CH VE Quarterly Reports Environmental monitoring reports provided to identify the progress on the environmental monitoring plans or on other related subjects. VE quarterly reports pertain to the quarterly review performed on randomly selected data completed through SPM review, within the last three months. The reports give information regarding the repeat of data generation level review and V&V performed each quarter on a minimum of one randomly chosen waste container. The SPM uses this information to document the data generation level data review is being performed according to procedures. This includes the request and results correspondence. May include Attachment 2, CCP Records Transmittal/Receiving Form(s). **QA Record/Lifetime/Validated by authorized signature and date on memorandum.** Media Type: Hard Copy Filing Order: Quarterly Report Number Inclusive Dates: 2001 to Present Location: CCP Records - SWB and/or WRA	ENV 1.d.8.a	Destroy when 75 years old. Cutoff when reports are superseded, obsolete, or canceled.	Retain in CCP Records until completion of the characterization process for each site and transfer to the WRA within one year for storage and retention or sooner if no longer needed in project files to support daily functions or audits.
15	**CCP CH ACCEPTABLE KNOWLEDGE (AK) DOCUMENTATION** AK documentation supports the knowledge used for waste characterization, which is based on the materials and processes used to generate waste. AK includes information about the physical form of the waste, the base materials composing the waste (especially hazardous and radioactive materials) and the process that generated the waste. AK is used to define waste streams, assign summary categories, assign United States Environmental Protection Agency (EPA) hazardous waste numbers, estimate the weight fraction of cellulose, plastic, and rubber (CPR), and estimated isotopic ratios.			
15(A)	CCP CH AK Documentation Records indicating type (classification) and degree of contamination, date of disposal method of disposal (burial, landfill, etc.), volume, and disposal location. Records may include engineering studies, reports of unusual problems encountered during removal or treatment. AK documentation is compiled,	ENV 6.b	Permanent. Cutoff 5 years after disposal. Transfer to NARA 25 years	Retain in CCP Records until completion of the characterization process for each

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	reviewed, evaluated, confirmed and reported. It supports the related AK Summary Report. The following documentation may include but is not limited to: AK Documentation Checklist; Record of Communication; AK Source Document Summary - Attachment 3, may include attached CCP generated source documents and prior to 11/01/2010 included as attachment both the site generated and CCP generated source documents; AK Source Document Reference List; Hazardous Constituents Waste Form(s); Waste Form, Waste Material Parameters, Prohibited Items and Packaging Forms with Waste Material Parameter Evaluation Memorandum; Radionuclides Forms – may include NDA Memorandum; Waste Containers List, may have additional memorandums as addendums to Attachment 8; AK Re-evaluation Checklist; AK Source Document Discrepancy Resolution, includes AK Source Document Source Summary Forms as attachments; CCP Waste Stream Characterization Checklist; CCP TRU Waste Correlation and Surrogate Summary Form; and AK Sufficiency Determination Request, memorandum and SPM notifications (emails, letters, memorandums, etc.), as applicable. May include Attachment 2, CCP Records Transmittal/Receiving Form(s). **QA Record/Lifetime/Validated by authorized signature/initial and date.** Media Type: Hard Copy Filing Order: Site, and AK Report or AK Library and/or Waste Stream Inclusive Dates: 2006 to Present Location: CCP Records - SWB and/or WRA		after cutoff.	site and transfer to the WRA within one year for storage and retention or sooner if no longer needed in project files to support daily functions or audits.

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6. Item No.	7. Filing Series Title, Description, Any Special Categories, Media Types, Filing Order, Inclusive Dates and Location:	8. Disposition Authority	9. Authorized Disposition Instructions	10. Transfer Instructions
15(B)	AK Historical Source Documents Records indicating type (classification) and degree of contamination, date of disposal method of disposal (burial, landfill, etc.), volume, and disposal location. Records may include engineering studies, reports of unusual problems encountered during removal or treatment. AK historical source documents are external records that have been generated by the waste generating sites. Copies are collected and submitted to support the listing of AK source documents referenced in the correlating AK Summary Report. They may be categorized as follows: correspondence; documents; miscellaneous; procedures and published documents; discrepancy resolution; and unpublished documents. These records must be maintained in parallel to the correlating AK document summaries and CCP source documents. Media Type: Electronic - PDF files, databases, video Filing Order: Site, and AK Report or AK Library Inclusive Dates: November 2010 to Present Location: CCP Records - SWB and/or WRA	ENV 6.b	Permanent. Cutoff 5 years after disposal. Transfer to NARA 25 years after cutoff.	Transfer with related AK record set. Retain in CCP Records until completion of the characterization process for each site and transfer to the WRA within one year for storage and retention or sooner if no longer needed in project files to support daily functions or audits.

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6. Item No.	7. Filing Series Title, Description, Any Special Categories, Media Types, Filing Order, Inclusive Dates and Location:	8. Disposition Authority	9. Authorized Disposition Instructions	10. Transfer Instructions
15(C)	Reconciliation with Data Objective Reports Records indicating type (classification) and degree of contamination, date of disposal method of disposal (burial, landfill, etc.), volume, and disposal location. Records may include engineering studies, reports of unusual problems encountered during removal or treatment. Reconciliation with Data Objective Reports includes the Data Reconciliation and Reporting Routing Sheet, reconciliation with data objective, WIPP Waste Stream Profile, and Characterization Information Summary. May include Attachment 2, CCP Records Transmittal/Receiving Form(s). **QA Record/Lifetime/Validated by authorized signature and date.** Media Type: Hard Copy Filing Order: Site, and AK Report and Waste Stream Inclusive Dates: 2001 to Present Location: CCP Records - SWB and/or WRA	Disposition Authority Pending NARA Approval	UNSCHEDULED -Do Not Destroy-	Retain in CCP Records until completion of the characterization process for each site and transfer to the WRA within one year for storage and retention or sooner if no longer needed in project files to support daily functions or audits.
15(D)	CCP CH HSG Summary Data Report Records indicating type (classification) and degree of contamination, date of disposal method of disposal (burial, landfill, etc.), volume, and disposal location. Records may include engineering studies, reports of unusual problems encountered during removal or treatment. HSG Summary Data Report includes the correlation of container ID numbers to HSG Sample ID Number Form, UCL_{90} Evaluation Form, data evaluation narrative, waste stream lot TIC and SPM narrative. It may also include the Radiography/VE Comparison Report (with copy of trending chart) and miscertification rate calculations. **QA Record/Lifetime/Validated by authorized signature and date.** Media Type: Hard Copy Filing Order: Site, and AK Report and Waste Stream Inclusive Dates: 2001 to Present Location: CCP Records - SWB and/or WRA	Disposition Authority Pending NARA Approval	UNSCHEDULED -Do Not Destroy-	Retain in CCP Records until completion of the characterization process for each site and transfer to the WRA within one year for storage and retention or sooner if no longer needed in project files to support daily functions or audits.

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6. Item No.	7. Filing Series Title, Description, Any Special Categories, Media Types, Filing Order, Inclusive Dates and Location:	8. Disposition Authority	9. Authorized Disposition Instructions	10. Transfer Instructions
15(E)	Solids Summary Data Reports Records indicating type (classification) and degree of contamination, date of disposal method of disposal (burial, landfill, etc.), volume, and disposal location. Records may include engineering studies, reports of unusual problems encountered during removal or treatment. Solids Summary Data Reports include but are not limited to the inter-office correspondence, correlation of container ID numbers to solids sample ID numbers, CCP Totals Analysis VOC UCL_{90} Evaluation Form, CCP Totals Analysis SVOC, UCL_{90} Evaluation Form, CCP Totals Analysis Metals UCL_{90} Evaluation Form, CCP data evaluation narrative (VOC), CCP data evaluation narrative (SVOC), CCP data evaluation narrative (metals), waste stream lot TIC and SPM evaluation narrative. **QA Record/Lifetime/Validated by authorized signature and date.** Media Type: Hard Copy Filing Order: Site and Waste Stream Inclusive Dates: 2004 to Present Location: CCP Records - SWB and/or WRA	ENV 6.b	Permanent. Cutoff 5 years after disposal. Transfer to NARA 25 years after cutoff.	Retain in CCP Records until completion of the characterization process for each site and transfer to the WRA within one year for storage and retention or sooner if no longer needed in project files to support daily functions or audits.

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6. Item No.	7. Filing Series Title, Description, Any Special Categories, Media Types, Filing Order, Inclusive Dates and Location:	8. Disposition Authority	9. Authorized Disposition Instructions	10. Transfer Instructions
15(F)	Miscertification Rate Calculations Records indicating type (classification) and degree of contamination, date of disposal method of disposal (burial, landfill, etc.), volume, and disposal location. Records may include engineering studies, reports of unusual problems encountered during removal or treatment. Miscertification rate calculations documentation pertains to data from the VE used to determine the percentage of miscertified waste containers from radiographic examination. The miscertification rate is used to calculate the number of waste containers that shall be visually examined. The site-specific miscertification rate is applied to each summary category group. The site-specific miscertification rate is reassessed annually. **This is no longer performed in the program since the permit change of November 16, 2006.** **QA Record/Lifetime/Validated by authorized signature and date.** Media Type: Hard Copy Filing Order: Site and Waste Stream Inclusive Dates: 2001 to 2006 Location: CCP Records - SWB and/or WRA	ENV 6.b	Permanent. Cutoff 5 years after disposal. Transfer to NARA 25 years after cutoff.	Retain in CCP Records until completion of the characterization process for each site and transfer to the WRA within one year for storage and retention or sooner if no longer needed in project files to support daily functions or audits.

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6. Item No.	7. Filing Series Title, Description, Any Special Categories, Media Types, Filing Order, Inclusive Dates and Location:	8. Disposition Authority	9. Authorized Disposition Instructions	10. Transfer Instructions
15(G)	VE Random Selections Records indicating type (classification) and degree of contamination, date of disposal method of disposal (burial, landfill, etc.), volume, and disposal location. Records may include engineering studies, reports of unusual problems encountered during removal or treatment. VE random selection documentation pertains to a statistically selected portion of the certified waste containers that will be opened and visually examined as a QC check on the radiographic examination of waste containers. Data obtained from VE is used to verify the matrix parameter category, waste material parameter weights, and absence of prohibited items determined by radiography. Random selection is reassessed annually. **This is no longer performed in the program since the permit change of November 16, 2006.** **QA Record/Lifetime/Validated by authorized signature and date.** Media Type: Hard Copy Filing Order: Site and Waste Stream Inclusive Dates: 2001 to 2006 Location: CCP Records - SWB and/or WRA	ENV 6.b	Permanent. Cutoff 5 years after disposal. Transfer to NARA 25 years after cutoff.	Retain in CCP Records until completion of the characterization process for each site and transfer to the WRA within one year for storage and retention or sooner if no longer needed in project files to support daily functions or audits.

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6. Item No.	7. Filing Series Title, Description, Any Special Categories, Media Types, Filing Order, Inclusive Dates and Location:	8. Disposition Authority	9. Authorized Disposition Instructions	10. Transfer Instructions
15(H)	AK Summary Reports Hazardous waste reports, hazardous substance reports, waste characterization reports, and CERCLA/RCRA unit reports. AK Summary Reports support the knowledge used for waste characterization, which is based on the materials and processes used to generate a waste. AK reports include information about the physical form of the waste, the base materials composing the waste (especially hazardous and radioactive materials) and the process that generated the waste. AK reports define waste streams, assign summary categories, assign EPA hazardous waste numbers, estimate the weight fraction of CPR, and estimated isotopic ratios. May include but is not limited to the following record: final document; documentation that demonstrates approval by designated individuals; comments and comment resolution (attachments, Document Review Resolution [DRR], emails, letter, etc.); document revision requests (i.e., initial markup); and DOE/CBFO emails submitted within five days of project level review. **QA Record/Lifetime/Validated by authorized signature and date.** Media Type: Hard Copy Filing Order: Site and Waste Stream Inclusive Dates: 2000 to Present Location: CCP Records - SWB and/or WRA	ENV 1.d.10.a	Permanent. Cutoff when waste is disposed of. Transfer to NARA 25 years after cutoff.	Retain in CCP Records until completion of the characterization process for each site and transfer to the WRA within one year for storage and retention or sooner if no longer needed in project files to support daily functions or audits.

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6. Item No.	7. Filing Series Title, Description, Any Special Categories, Media Types, Filing Order, Inclusive Dates and Location:	8. Disposition Authority	9. Authorized Disposition Instructions	10. Transfer Instructions
15(I)	AK Accuracy Report Records indicating type (classification) and degree of contamination, date of disposal method of disposal (burial, landfill, etc.), volume, and disposal location. Records may include engineering studies, reports of unusual problems encountered during removal or treatment. AK Accuracy Reports document that AK accuracy is evaluated either on a lot or waste stream basis. The report documents the results of the evaluation for containers in a waste stream. It may include but is not limited to inter-office correspondence with attached CCP AK Accuracy Report and CCP correlation of container ID numbers to BDR numbers. May include Attachment 2, CCP Records Transmittal/Receiving Form(s). **QA Record/Lifetime/Validated by authorized signature and date.** Media Type: Hard Copy Filing Order: Site, and AK Report and Waste Stream Inclusive Dates: 2000 to Present Location: CCP Records - SWB and/or WRA	ENV 6.b	Permanent. Cutoff 5 years after disposal. Transfer to NARA 25 years after cutoff.	Retain in CCP Records until completion of the characterization process for each site and transfer to the WRA within one year for storage and retention or sooner if no longer needed in project files to support daily functions or audits.

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6. Item No.	7. Filing Series Title, Description, Any Special Categories, Media Types, Filing Order, Inclusive Dates and Location:	8. Disposition Authority	9. Authorized Disposition Instructions	10. Transfer Instructions
15(J)	CCP CH AK Container Tracking Spreadsheet Any electronic or manual system that tracks and produces records of wastes, from cradle to grave, from generator, storage or transported locations, including laboratory processing. Database and record systems which track wastes from creation through transportation, processing, storage; and reporting tracking records. AK Container Tracking Spreadsheet identifies the following minimum criterion for each container listed in the waste stream: container ID, waste stream ID, generation date, vent date, change reason, new closure date, new vent date, and container type. May include Attachment 2, CCP Records Transmittal/Receiving Form(s). **QA Record/Lifetime/Validated by authorized signature and date.** Media Type: Electronic Filing Order: N/A Inclusive Dates: 2000 to Present Location: CCP Records - SWB and/or WRA	ENV 1.g.3.a	Delete or destroy when related records are destroyed, or 75 years from creation, whichever occurs later.	Print out after completion of waste stream shipment to WIPP. Retain in CCP Records until completion of the characterization process for each site and transfer to the WRA within one year for storage and retention or sooner if no longer needed in project files to support daily functions or audits.
16	**CCP CH WASTE DATA SYSTEM (WDS) FORMERLY WIPP WASTE INFORMATION SYSTEM (WWIS) DOCUMENTATION** The WDS is an online database system used to document information pertaining to waste, including but not limited to waste container characterization and certification data, produce reports, record shipment configuration details, disposal locations and disposal dates.			

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16(A)	CCP CH WDS Documentation CCP CH WDS packages are created during the process of entering data into the WDS and reporting data on TRU waste. The WDS is a database system that requires input from waste generator sites for shipment of TRU waste payload containers and payload assemblies that are intended for disposal at WIPP. CCP represents the generator sites as the generator and provides input to WDS on behalf of generator sites. These CCP WDS packages contain, but are not limited to, spreadsheets, reports, and correspondence associated with data CCP submits to WDS electronically. **QA Record/Lifetime/Validated by authorized signature and date.** Media Type: Hard Copy Filing Order: Site and Batch Number Inclusive Dates: 2008 to Present Location: CCP Records - SWB and/or WRA	Disposition Authority Pending NARA Approval.	UNSCHEDULED -Do Not Destroy-	Retain in CCP Records until completion of the characterization process for each site and transfer to the WRA within one year for storage and retention or sooner if no longer needed in project files to support daily functions or audits.
16(B)	Overpack Loading Forms Documentation pertaining to 55 gallon drums that are overpacked in ten-drum overpack (TDOP)s and standard waste boxes. Forms include information such as container IDs, surface dose rates, and filter information. Data from these forms is required for data input into WDS. The forms are the TDOP Loading Form and the Standard Waste Boxes Loading Form. May include Attachment 2, CCP Records Transmittal/Receiving Form(s). **QA Record/Nonpermanent/Validated by authorized signature and date.** Media Type: Hard Copy Filing Order: Site and Batch Number Inclusive Dates: 2001 to Present Location: CCP Records - SWB and/or WRA	Disposition Authority Pending NARA Approval.	UNSCHEDULED -Do Not Destroy-	Retain in CCP Records until completion of the characterization process for each site and transfer to the WRA within one year for storage and retention or sooner if no longer needed in project files to support daily functions or audits.

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6. Item No.	7. Filing Series Title, Description, Any Special Categories, Media Types, Filing Order, Inclusive Dates and Location:	8. Disposition Authority	9. Authorized Disposition Instructions	10. Transfer Instructions
16(C)	Radiological Surveys Radiological surveys document levels of radiation and contamination conditions of the containers going through the characterization process for CCP CH. These are external records generated by the generator sites. May include Attachment 2, CCP Records Transmittal/Receiving Form(s). **QA Record/Lifetime/Validated by authorized signature and date.** Media Type: Hard Copy Filing Order: Drum or Rad Survey Number Inclusive Dates: 2006 to Present Location: CCP Records - SWB and/or WRA	Disposition Authority Pending NARA Approval.	UNSCHEDULED -Do Not Destroy-	Retain in CCP Records until completion of the characterization process for each site and transfer to the WRA within one year for storage and retention or sooner if no longer needed in project files to support daily functions or audits.
17	**CCP TRANSPORTATION DOCUMENTATION** TRU shipment records includes records prepared by the waste generator and other related documentation. Also includes CCP transportation packages created during the preparation and transport of drums for burial at the WIPP. May include but not limited to: payload container transportation certification document, uniform hazardous waste manifest, public burden statement, straight bill of lading short form, land disposal restriction exemption notification, dunnage certification statement, Container Integrity Checklist, and Varian Porta-Test Leak Detector Calibration Record or CCP-WCS Monthly Inventory Review Checklists. May include Attachment 2, CCP Records Transmittal/Receiving Form(s). **EPIDEMIOLOGICAL** **QA Record/Nonpermanent/Validated by authorized signature and date.** Media Type: Hard Copy Filing Order: Alpha-Numeric Inclusive Dates: 2008 to Present Location: CCP Records - SWB and/or WRA	ENV 2.d.4	Destroy after 5 years.	Retain in CCP Records until completion of the characterization process for each site and transfer to the WRA within one year for storage and retention or sooner if no longer needed in project files to support daily functions or audits.

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6. Item No.	7. Filing Series Title, Description, Any Special Categories, Media Types, Filing Order, Inclusive Dates and Location:	8. Disposition Authority	9. Authorized Disposition Instructions	10. Transfer Instructions
18	**CCP PROCEDURES, PLANS AND REPORTS** CCP procedures, plans, and reports document record packages may include but is not limited to the following record: final document; documentation that demonstrates approval by designated individuals; comments and comment resolution (attachments, DRR, emails, letter, etc.); document revision requests (i.e., initial markup) and DOE/CBFO emails submitted within five days of project level review. This line item is separate from AK Summary Reports. **QA Record/Nonpermanent/Validated by authorized signature and date for hard copy file and login and password of authorized personnel.** Media Type: Hard Copy/Electronic Filing Order: Alpha-Numeric Inclusive Dates: 2000 to Present Location: CCP Records - SWB and/or WRA	Disposition Authority Pending NARA Approval.	UNSCHEDULED -Do Not Destroy-	Retain in CCP Records until completion of the characterization process for each site and transfer to the WRA within one year for storage and retention or sooner if no longer needed in project files to support daily functions or audits.
19	**CONFIGURATION MANAGEMENT DOCUMENTATION FOR EQUIPMENT** Configuration management documentation for equipment pertains to the control and oversight of all CCP mobile characterization equipment (MCE) and transportation equipment.			

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19(A)	Measuring and Test Equipment (M&TE) Documentation M&TE pertains to documents that ensure equipment used for inspection and testing are properly controlled, calibrated, and maintained. This includes but is not limited to the following: Notice of Deficiency; Manufacturer's Certificate of Calibrations; calibration interval documentation – calibration interval/tolerance adjustments evaluation; exemptions/temporary extension evaluations; evaluations/impact studies with out-of-tolerance evaluations, as applicable; closing/exit calibrations; and pertinent emails as applicable. May include Attachment 2, CCP Records Transmittal/Receiving Form(s). **QA Record/Nonpermanent/Validated by authorized signature and date.** Media Type: Hard Copy Filing Order: Equipment Number and Date Inclusive Dates: 2000 to Present Location: CCP Records - SWB and/or WRA	Disposition Authority Pending NARA Approval.	UNSCHEDULED -Do Not Destroy-	Retain in CCP Records until completion of the characterization process for each site and transfer to the WRA within one year for storage and retention or sooner if no longer needed in project files to support daily functions or audits.
19(B)	EPA Tier 1 and Tier 2 Documentation Tier 1 and Tier 2 documentation pertains to the characterization change authorization of the EPA approved waste characterization processes for NDA and VE. Tier changes are documented by memorandum which is the notification of the required change to the waste characterization process. May include various documents. May include Attachment 2, CCP Records Transmittal/Receiving Form(s). **QA Record/Nonpermanent/Validated by appropriate authorized signature and date.** Media Type: Hard Copy Filing Order: Chronological Inclusive Dates: 2006 to Present Location: CCP Records - SWB and/or WRA	Disposition Authority Pending NARA Approval.	UNSCHEDULED -Do Not Destroy-	Retain in CCP Records until completion of the characterization process for each site and transfer to the WRA within one year for storage and retention or sooner if no longer needed in project files to support daily functions or audits.

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6. Item No.	7. Filing Series Title, Description, Any Special Categories, Media Types, Filing Order, Inclusive Dates and Location:	8. Disposition Authority	9. Authorized Disposition Instructions	10. Transfer Instructions
19(C)	Radioactive Sources Certificates of Compliance Radioactive Material Packing and Shipping Records. Shipping packaging records include the Certificates of Compliance. Certificates of Compliance for radioactive sources are used to calibrate the NDA systems or when performing a function where a source is required to be used in the process. May include Attachment 2, CCP Records Transmittal/Receiving Form(s). **EPIDEMIOLOGICAL** **QA Record/Nonpermanent/Validated by Manufacturer's signature and date.** Media Type: Hard Copy Filing Order: Equipment and Date Inclusive Dates: 2001 to Present Location: CCP Records - SWB and/or WRA	ADM 18.48	Destroy 5 years after Certificate of Compliance has terminated, unless information is received indicating that renewed use is definitely anticipated.	Retain in CCP Records until completion of the characterization process for each site and transfer to the WRA within one year for storage and retention or sooner if no longer needed in project files to support daily functions or audits.
20	**CCP CH PROCUREMENT RECORDS** Procurement records generated in the acquisition of goods and non-personnel services.			

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6. Item No.	7. Filing Series Title, Description, Any Special Categories, Media Types, Filing Order, Inclusive Dates and Location:	8. Disposition Authority	9. Authorized Disposition Instructions	10. Transfer Instructions
20(A)	CCP CH Procurement Documentation CCP procurement records that were generated in the acquisition of goods and non-personnel services for CH generator sites. Includes but not limited to the following: purchase requisitions/change notices; purchase orders/change notices; statements of work; specifications/drawings; qualified suppliers list and attachments; approval/variation requests, and copies of the QA Grading Level Determination Checklist. This is for Quality Level 1 and 2 procurement only. This is held by NWP until completion. **QA Record/Nonpermanent/Validated by authorized signature and date.** Media Type: Hard Copy Filing Order: Purchase Order Number Inclusive Dates: 2010 to Present Location: CCP Records - SWB and/or WRA and NWP Procurement	Disposition Authority Pending NARA Approval.	UNSCHEDULED -Do Not Destroy-	Retain in CCP Records until completion of the characterization process for each site and transfer to the WRA within one year for storage and retention or sooner if no longer needed in project files to support daily functions or audits.
20(B)	CCP CH Receipt Inspection Verification Sheets (RIVS) RIVS and supporting documentation (certificates of analysis/conformance/compliance, calibration certificates, etc.) pertaining to quality source and receipt activities in support of the CCP CH waste characterization mission. Formerly known as Source Receipt Inspection Verification Sheets (SRIVS).). May include Attachment 2, CCP Records Transmittal/Receiving Form(s). **QA Record/Nonpermanent/Validated by authorized signature and date.** Media Type: Hard Copy Filing Order: Alpha-Numeric by Purchase Order Inclusive Dates: 2002 to Present Location: CCP Records - SWB and/or WRA	Disposition Authority Pending NARA Approval.	UNSCHEDULED -Do Not Destroy-	Retain in CCP Records until completion of the characterization process for each site and transfer to the WRA within one year for storage and retention or sooner if no longer needed in project files to support daily functions or audits.

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6. Item No.	7. Filing Series Title, Description, Any Special Categories, Media Types, Filing Order, Inclusive Dates and Location:	8. Disposition Authority	9. Authorized Disposition Instructions	10. Transfer Instructions
21	**STANDING ORDERS FOR CH SITES** Documentation used by management to communicate short-term direction to operators and for the documented quarterly review of standing orders. Information such as special operations, data collection, plotting process parameters and other similar short-term matters may be included in standing orders. Standing orders are not used to deviate from procedures but supplement procedures until the procedure can be revised. Includes Standing Order Log. May include Attachment 2, CCP Records Transmittal/Receiving Form(s). **QA Record/Nonpermanent/Validated by authorized signature and date.** Media Type: Hard Copy Filing Order: Alpha-Numeric Inclusive Dates: 2000 to Present Location: CCP Records - SWB and/or WRA	Disposition Authority Pending NARA Approval.	UNSCHEDULED -Do Not Destroy-	Retain in CCP Records until completion of the characterization process for each site and transfer to the WRA within one year for storage and retention or sooner if no longer needed in project files to support daily functions or audits.
22	**CCP CH OPERATOR AIDS** Documentation used to provide information useful to operators in performing their duties and for semi-annual review to determine if operator aids are still necessary and current. Operator aids may be in many forms such as the latest revision pages out of procedures, handwritten notes, and information tags. Operator aids are viewed as a convenience to the operator, not administrative/technical requirements and/or direction. Operator aids assigned unique numbers may supplement approved procedures, but shall not be used in lieu of approved procedures. May include Attachment 2, CCP Records Transmittal/Receiving Form(s). **QA Record/Nonpermanent/Validated by authorized signature and date.** Media Type: Hard Copy Filing Order: Alpha-Numeric Inclusive Dates: 2000 to Present Location: CCP Records - SWB and/or WRA	Disposition Authority Pending NARA Approval.	UNSCHEDULED -Do Not Destroy-	Retain in CCP Records until completion of the characterization process for each site and transfer to the WRA within one year for storage and retention or sooner if no longer needed in project files to support daily functions or audits.

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6. Item No.	7. Filing Series Title, Description, Any Special Categories, Media Types, Filing Order, Inclusive Dates and Location:	8. Disposition Authority	9. Authorized Disposition Instructions	10. Transfer Instructions
23	**CONTAINER MANAGEMENT DOCUMENTATION** Container management documentation pertains to the CCP management control and tracking of TRU waste containers during the characterization process.			
23(A)	CCP Daily Container Management Forms Documentation which helps in the CCP management, control and tracking of TRU waste containers during the characterization process. Daily Container Management Forms pertain to the inspection of a TRU waste container to determine if the drum can be safety handled and whether repackaging will be required prior to CCP waste characterization or shipment. These forms may have different titles such as Container Inspection Reports, Container Integrity Reports and Daily Production Reports. May include Attachment 2, CCP Records Transmittal/Receiving Form(s). **QA Record/Nonpermanent/Validated by authorized signature and date.** Media Type: Hard Copy Filing Order: Chronological Inclusive Dates: 2000 to Present Location: CCP Records - SWB and/or WRA	Disposition Authority Pending NARA Approval.	UNSCHEDULED -Do Not Destroy-	Retain in CCP Records until completion of the characterization process for each site and transfer to the WRA within one year for storage and retention or sooner if no longer needed in project files to support daily functions or audits.
23(B)	CCP Scale Calibration Check and Container Weight Information Documentation used to perform a check on the scale used during handling of the drum to acquire the weight of each drum to be processed through the characterization process. Also captures the drums weight and who performed the task. May include Attachment 2, CCP Records Transmittal/Receiving Form(s). **QA Record/Nonpermanent/Validated by authorized signature and date.** Media Type: Hard Copy Filing Order: Chronological Inclusive Dates: 2001 to Present Location: CCP Records - SWB and/or WRA	Disposition Authority Pending NARA Approval.	UNSCHEDULED -Do Not Destroy-	Retain in CCP Records until completion of the characterization process for each site and transfer to the WRA within one year for storage and retention or sooner if no longer needed in project files to support daily functions or audits.

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6. Item No.	7. Filing Series Title, Description, Any Special Categories, Media Types, Filing Order, Inclusive Dates and Location:	8. Disposition Authority	9. Authorized Disposition Instructions	10. Transfer Instructions
23(C)	CCP Container Travelers Supporting documentation includes but is not limited to miscellaneous worksheets, recorder sheets, other data sheets, and correspondence from where applicable information has been transcribed or summarized in other documentation. CCP Container Travelers are a form that shows the management, control and tracking of waste containers during the characterization process. Form shows the container ID number, waste stream, weight, external temperature and the initials and dates of various NDE, NDA, HSG, VE and GGT personnel. May include Attachment 2, CCP Records Transmittal/Receiving Form(s). **EPIDEMIOLOGICAL** **QA Record/Nonpermanent/Validated by authorized signature and date.** Media Type: Hard Copy Filing Order: Alpha-Numeric Inclusive Dates: 2004 to Present Location: CCP Records - SWB and/or WRA	ENV 6.c	Destroy when 1 year old.	Retain in CCP Records until completion of the characterization process for each site and transfer to the WRA within one year for storage and retention or sooner if no longer needed in project files to support daily functions or audits.

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6. Item No.	7. Filing Series Title, Description, Any Special Categories, Media Types, Filing Order, Inclusive Dates and Location:	8. Disposition Authority	9. Authorized Disposition Instructions	10. Transfer Instructions
24	**WEEKLY CONDUCT OF OPERATIONS – WALK-DOWN CHECKLIST** Environmental administration records include program or project management records, reports, and records documenting protection and preservation of natural resources. Records associated with Safety and Health related documentation required by CERCLA/RCRA, other than CERCLA-funded cooperative agreements. Records which notify or support worker protection and safety including but not limited to safety incident, safety analysis, safety meetings, safety awards, and safety assessments. Weekly Conduct of Operations – Walk-Down Checklists are performed on a weekly basis to provide a walk-down of the equipment and area around the equipment. Documents general safety, housekeeping, procedures, radiological controls, and basic conduct of operations. May include Attachment 2, CCP Records Transmittal/Receiving Form(s). **EPIDEMIOLOGICAL** **QA Record/Nonpermanent/Validated by authorized signature and date.** Media Type: Hard Copy Filing Order: Chronological Inclusive Dates: February 2008 to Present Location: CCP Records - SWB and/or WRA	ENV 1.b.5.a	Destroy after 5 years.	Retain in CCP Records until completion of the characterization process for each site and transfer to the WRA within one year for storage and retention or sooner if no longer needed in project files to support daily functions or audits.

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3. Organization Unit (Creating or Custodial Unit)	4. Date
NUCLEAR WASTE PARTNERSHIP (NWP)/CENTRAL CHARACTERIZATION PROJECT (CCP)/REMOTE HANDLED (RH) FOR ALL SITES 4021 NATIONAL PARKS HIGHWAY, GSA 212 CARLSBAD, NEW MEXICO 88220	06/15/2015

5. Signatures (of Appropriate Personnel)

Sheila Pearcy	7-16-15		N/A		
Prepared By Sheila Pearcy CCP Records Manager	Date		Records Liaison Officer		Date
for	7.16.15			7/16/15	
Approved By Ed Gulbransen CCP Manager	Date		Records Officer Approval	Michael Fox	Date

6. Item No.	7. Filing Series Title, Description, Any Special Categories, Media Types, Filing Order, Inclusive Dates and Location:	8. Disposition Authority	9. Authorized Disposition Instructions	10. Transfer Instructions
1	**CCP RH TRAINING DOCUMENTATION FILES** Documentation pertaining to the training and qualification of CCP RH personnel.			

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6. Item No.	7. Filing Series Title, Description, Any Special Categories, Media Types, Filing Order, Inclusive Dates and Location:	8. Disposition Authority	9. Authorized Disposition Instructions	10. Transfer Instructions
1(A)	<u>CCP RH Employee Individual Training/Qualification Documentation</u> Contractor employee individual folders that contain item 1.29.1.a records AND also contain: attendance/completion records of training courses or sessions that include subjects dealing with hazardous materials directly applicable to the employee's job or position. Documents the training and qualification and re-qualification of CCP RH personnel. May include but not limited to the following: appointment letters; qualification letters; correspondence; on-the-job records; completed exams; completed qualification cards; certificates of completion; test drum data sheets; training drum evaluation data sheets; resumes; and Waste Acceptance Plan briefings. May include Attachment 2, CCP Records Transmittal/Receiving Form(s). **PRIVACY ACT** **Quality Assurance (QA) Record/Nonpermanent/Validated by authorized signature and date.** Media Type: Hard Copy Filing Order: Alphabetical Inclusive Dates: 2005 to Present Location: CCP Records – Skeen Whitlock Building (SWB) and/or Waste Isolation Pilot Plant (WIPP) Records Archive (WRA)	ADM 1.29.1.b	Cut off at the time of separation or transfer of the employee. Screen out and destroy all item 1.29.1.a.4 records. Transfer folders with remaining documents to the local Federal records center. Destroy 75 years after cutoff.	Retain in CCP Records until completion of the characterization process for each site and transfer to the WRA within one year for storage and retention or sooner if no longer needed in project files to support daily functions or audits.

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6. Item No.	7. Filing Series Title, Description, Any Special Categories, Media Types, Filing Order, Inclusive Dates and Location:	8. Disposition Authority	9. Authorized Disposition Instructions	10. Transfer Instructions
1(B)	Employee Individual Medical Examination Contractor employee individual training folders that contain ONLY the following documents: results of medical examinations (only pass/fail and restrictions); balance of results are to be retained in the medical file. Documentation pertaining to the eye examinations performed on the Nondestructive Examination (NDE), Helium Leak Detector, and Pressure Change Leak Testing personnel on an annual basis. May include Attachment 2, CCP Records Transmittal/Receiving Form(s). **EPIDEMIOLOGICAL** **PRIVACY ACT** **QA Record/Nonpermanent/Validated by authorized signature and date.** Media Type: Hard Copy Filing Order: Alphabetical Inclusive Dates: 2005 to Present Location: CCP Records – SWB and/or WRA	ADM 1.29.1.a.4	Cut off at the time of separation or transfer of the employee. Screen out and destroy all item 1.29.1.a.4 records. Transfer folders with remaining documents to the local Federal Records Center. Destroy 4 years after cutoff.	Retain in CCP Records until completion of the characterization process for each site and transfer to the WRA within one year for storage and retention or sooner if no longer needed in project files to support daily functions or audits.

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6. Item No.	7. Filing Series Title, Description, Any Special Categories, Media Types, Filing Order, Inclusive Dates and Location:	8. Disposition Authority	9. Authorized Disposition Instructions	10. Transfer Instructions
1(C)	CCP Test Drum Audio/Video Media of Test Drum Qualification Contractor employee individual folders that contain item 1.29.1.a records AND also contain: attendance/completion records of training courses or sessions that include subjects dealing with hazardous materials directly applicable to the employee's job or position. Contains CCP audio/video media of qualification test performed by NDE personnel. This audio/video media of qualification test is performed by NDE personnel and is the second piece of the qualification. It supports the documentation captured on the supporting hard copy record(s). May include Attachment 2, CCP Records Transmittal/Receiving Form(s). **PRIVACY ACT** **QA Record/Nonpermanent/Validated by authorized signature and date.** Media Type: Audio/Video Tape or DVD (Primary and Backup) Filing Order: Alpha-Numeric Inclusive Dates: 2005 to Present Location: CCP Records - SWB and/or WRA	ADM 1.29.1.b	Cut off at the time of separation or transfer of the employee. Screen out and destroy all item 1.29.1.a.4 records. Transfer folders with remaining documents to the local Federal records center. Destroy 75 years after cutoff.	Retain in CCP Records until completion of the characterization process for each site and transfer to the WRA within one year for storage and retention or sooner if no longer needed in project files to support daily functions or audits.

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6. Item No.	7. Filing Series Title, Description, Any Special Categories, Media Types, Filing Order, Inclusive Dates and Location:	8. Disposition Authority	9. Authorized Disposition Instructions	10. Transfer Instructions
1(D)	CCP NDE Test Drum Inventories Documentation pertaining to the assembly of NDE test and training drums which are used to qualify radiography operators per CCP-PO-001, CCP Transuranic (TRU) Waste Characterization QA Project Plan (QAPjP), and CCP-QP-002, CCP Qualification and Training Plan. The drum assembly is representative of the Waste Matrix Codes for Waste Stream Profile Forms. CCP NDE Test Drum Inventory Sheet has the test drum identification (ID) number, date, summary category group, if it has a plastic liner, and the contents of the drum. May include Attachment 2, CCP Records Transmittal/Receiving Form(s). **QA Record/Nonpermanent/Validated by authorized signature and date.** Media Type: Hard Copy Filing Order: Chronological Inclusive Dates: 2005 to Present Location: CCP Records - SWB and/or WRA	Disposition Authority Pending National Archives and Records Administration (NARA) Approval	UNSCHEDULED -Do Not Destroy-	Retain in CCP Records until completion of the characterization process for each site and transfer to the WRA within one year for storage and retention or sooner if no longer needed in project files to support daily functions or audits.
1(E)	List of Qualified Individuals (LOQI) LOQI confirms and establishes, to the field personnel, who is to perform different areas of operations. It is updated each time there is a change to the qualifications of the project personnel. This record is no longer generated. **QA Record/Nonpermanent/Validated by authorized signature and date.** Media Type: Hard Copy Filing Order: Chronological Inclusive Dates: 2002 to September 2008 Location: CCP Records - SWB and/or WRA	Disposition Authority Pending NARA Approval	UNSCHEDULED -Do Not Destroy-	Retain in CCP Records until completion of the characterization process for each site and transfer to the WRA within one year for storage and retention or sooner if no longer needed in project files to support daily functions or audits.

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6. Item No.	7. Filing Series Title, Description, Any Special Categories, Media Types, Filing Order, Inclusive Dates and Location:	8. Disposition Authority	9. Authorized Disposition Instructions	10. Transfer Instructions
1(F)	LOQI – Nonrecord LOQI confirms and establishes, to the field personnel, who is to perform different areas of operations. It is updated each time there is a change to the qualifications of the project personnel. Record is the captured in the individual personnel's qualification training files. Media Type: Hard Copy Filing Order: Chronological Inclusive Dates: September 2008 to Present Location: CCP Records - SWB and/or WRA	Nonrecord	Not Applicable	Retain in CCP Record until completion of characterization process for each site or when no longer needed in project files to support daily functions. Screen and purge as needed.
2	**CCP RH CORRECTIVE ACTION MANAGEMENT DOCUMENTATION** Documentation pertaining to the identification, classification, control, and correction of conditions adverse to quality and nonconforming items, activities, and processes associated with the CCP RH – all sites.			
2(A)	CCP RH Nonconformance Reports (NCRs) Audit and investigative case files and reports that pertain to environmental, health, and safety topics, cases or concerns, but ARE NOT covered by items 22.1.a.1 or 22.2.a.1. NCRs are created for the CCP RH sites and document the process for identifying, documenting, controlling, evaluating, and dispositioning nonconforming items. May include Department of Energy (DOE)/Carlsbad Field Office (CBFO) notifications and supporting documentation such as copies of applicable procedures, etc. May include Attachment 2, CCP Records Transmittal/Receiving Form(s). **QA Record/Nonpermanent/Validated by authorized signature and date.** Media Type: Hard Copy Filing Order: Alpha-Numeric Inclusive Dates: 2006 to Present Location: CCP Records - SWB and/or WRA	ADM 22.4	Cut off upon completion of audit or investigation. Destroy when 75 years old.	Retain in CCP Records until completion of the characterization process for each site and transfer to the WRA within one year for storage and retention or sooner if no longer needed in project files to support daily functions or audits.

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6. Item No.	7. Filing Series Title, Description, Any Special Categories, Media Types, Filing Order, Inclusive Dates and Location:	8. Disposition Authority	9. Authorized Disposition Instructions	10. Transfer Instructions
2(B)	NCR Log Reconciliation Report NCR Log Reconciliation Report documents and verifies that all NCR numbers at the end of each calendar year are reconciled against the Master Log and in the Nonconformance Report Module. Includes as attachment the information from NCR logs. May include Attachment 2, CCP Records Transmittal/Receiving Form(s). **QA Record/Nonpermanent/Validated by authorized signature and date.** Media Type: Hard Copy Filing Order: Chronological Inclusive Dates: 2005 to Present Location: CCP Records - SWB and/or WRA	Disposition Authority Pending NARA Approval	UNSCHEDULED -Do Not Destroy-	Retain in CCP Records until completion of the characterization process for each site and transfer to the WRA within one year for storage and retention or sooner if no longer needed in project files to support daily functions or audits.
2(C)	CCP RH Corrective Action Reports (CARs) Audit and investigative case files and reports that pertain to environmental, health, and safety topics, cases or concerns, but ARE NOT covered by items 22.1.a.1 or 22.2.a.1. CCP RH CARs are created for all RH sites and document the process for identifying, documenting, controlling, evaluating, dispositioning, and verifying completion of corrective actions for conditions adverse to quality related failures, malfunctions, deficiencies, and technical inadequacies. May include supporting documentation such as copies of applicable procedures and/or Deficiency Evaluation Form if applicable, Corrective Action Plan and DOE/CBFO notifications. May include Attachment 2, CCP Records Transmittal/Receiving Form(s). This record is no longer generated. **QA Record/Nonpermanent/Validated by authorized signature and date.** Media Type: Hard Copy Filing Order: Alpha-Numeric Inclusive Dates: 2006 to 2013 Location: CCP Records - SWB and/or WRA	ADM 22.4	Cut off upon completion of audit or investigation. Destroy when 75 years old.	Retain in CCP Records until completion of the characterization process for each site and transfer to the WRA within one year for storage and retention or sooner if no longer needed in project files to support daily functions or audits.

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6. Item No.	7. Filing Series Title, Description, Any Special Categories, Media Types, Filing Order, Inclusive Dates and Location:	8. Disposition Authority	9. Authorized Disposition Instructions	10. Transfer Instructions
2(D)	CCP RH CAR Log Indexes, lists, registers, and other finding aids used only to provide access to records authorized for destruction, EXCLUDING records containing abstracts or other information that can be used as an information source apart from the related records. CAR log is a document used to assign unique CAR numbers. It identifies the numbers assigned for both issued and voided CARs. The numbering system helps to identify the individual CAR number, facility and facility designee number, and the calendar year issued. This record is no longer generated. **QA Record/Nonpermanent/Validated by authorized signature and date.** Media Type: Hard Copy/Electronic Filing Order: Chronological Inclusive Dates: 2006 to 2013 Location: CCP Records - SWB and/or WRA	ADM 23.9	Destroy or delete with the related records.	Print out at the end of each calendar year. Retain in CCP Records until completion of the characterization process for each site and transfer to the WRA within one year for storage and retention or sooner if no longer needed in project files to support daily functions or audits.
2(E)	CCP RH Trend Reports Audit and investigative case files and reports that pertain to environmental, health, and safety topics, cases, or concerns, but ARE NOT covered by items 22.1.a.1 or 22.2.a.1. CCP RH Trend Reports are a review and evaluation of NCRs and CARs generated during the designated reporting period. Reports show negative trends such as quantities of NCRs or CARs generated by site, quantities and types of NCRs/CARs by process, identification of types of nonconformance by process, and programmatic noncompliance by trend codes. **QA Record/Nonpermanent/Validated by authorized signature and date.** Media Type: Hard Copy Filing Order: Chronological Inclusive Dates: 2006 to Present Location: CCP Records - SWB and/or WRA	ADM 22.4	Cut off upon completion of audit or investigation. Destroy when 75 years old.	Retain in CCP Records until completion of the characterization process for each site and transfer to the WRA within one year for storage and retention or sooner if no longer needed in project files to support daily functions or audits.

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6. Item No.	7. Filing Series Title, Description, Any Special Categories, Media Types, Filing Order, Inclusive Dates and Location:	8. Disposition Authority	9. Authorized Disposition Instructions	10. Transfer Instructions
3	**CCP RH OPERATION LOGBOOKS** Environmental administration records include program or project management records, reports, and records documenting protection and preservation of natural resources. Logbooks/fieldbooks that document a chronological history which provides a summary of shift and daily activities related to program and functions. Logbooks may support calibration activities, problem resolution, sampling, monitoring, and reporting. Records may include, but are not limited to results, notes, drawings/sketches, and field information. Logbooks listing significant action, daily surveillances and maintenance activities occurring during normal operations of applicable facility. Operational logbooks are used for CCP RH personnel to document technical work processes and daily activities during characterization activities. May include Attachment 2, CCP Records Transmittal/Receiving Form(s). **QA Record/Nonpermanent/Validated by authorized signature and date.** Media Type: Hard Copy Filing Order: Alpha-Numeric Inclusive Dates: 2006 to Present Location: CCP Records - SWB and/or WRA	ENV 1.e.6	Destroy when 75 years old.	Retain in CCP Records until completion of the characterization process for each site and transfer to the WRA within one year for storage and retention or sooner if no longer needed in project files to support daily functions or audits.
4	**CCP QA SUMMARY REPORTING, ASSESSMENT/AUDIT, AND SURVEILLANCE DOCUMENTATION** QA documentation pertaining to the reporting, assessment/audit, and surveillance activities of the CCP RH QA program.			

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6. Item No.	7. Filing Series Title, Description, Any Special Categories, Media Types, Filing Order, Inclusive Dates and Location:	8. Disposition Authority	9. Authorized Disposition Instructions	10. Transfer Instructions
4(A)	CCP RH Surveillance Program Documentation Audit and investigative case files and reports that pertain to environmental, health, and safety topics, cases, or concerns, but ARE NOT covered by items 22.1.a.1 or 22.2.a.1. Documentation pertaining to the planning, performing, documenting, and reporting independent surveillances of TRU CCP RH waste characterization activities. Includes surveillance plan formats, surveillance reports, and surveillance checklists. May include supporting documentation. May include Attachment 2, CCP Records Transmittal/Receiving Form(s). **QA Record/Nonpermanent/Validated by authorized signature and date.** Media Type: Hard Copy Filing Order: Alpha-Numeric Inclusive Dates: 2006 to Present Location: CCP Records - SWB and/or WRA	ADM 22.4	Cut off upon completion of audit or investigation. Destroy when 75 years old.	Retain in CCP Records until completion of the characterization process for each site and transfer to the WRA within one year for storage and retention or sooner if no longer needed in project files to support daily functions or audits.
4(B)	CCP RH Surveillance Log Indexes, lists, registers, and other finding aids used only to provide access to records authorized for destruction, EXCLUDING records containing abstracts or other information that can be used as an information source apart from the related records. CCP RH surveillance log is a document used to assign unique surveillance numbers. The numbering system helps to identify the individual surveillance number, facility and facility designee number, and the calendar year issued. **QA Record/Nonpermanent/Validated by authorized signature and date.** Media Type: Hard Copy/Electronic Filing Order: Chronological Inclusive Dates: 2006 to Present Location: CCP Records - SWB and/or WRA	ADM 23.9	Destroy or delete with the related records.	Print out at the end of each calendar year. Retain in CCP Records until completion of the characterization process for each site and transfer to the WRA within one year for storage and retention or sooner if no longer needed in project files to support daily functions or audits.

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6. Item No.	7. Filing Series Title, Description, Any Special Categories, Media Types, Filing Order, Inclusive Dates and Location:	8. Disposition Authority	9. Authorized Disposition Instructions	10. Transfer Instructions
5	**CCP RH TRU SOFTWARE QA (SQA) DOCUMENTATION** Database system development records and documentation records which support the maintenance and operation of tracking systems. CCP RH TRU SQA documentation pertains to the development, procurement, maintenance, and use of computer software important to the waste characterization and certification for the CCP RH. Includes but not limited to the following documentation for: exempt software, commercial off the shelf (COTS) software, application within COTS, qualified supplier software, non-qualified supplier software, CCP software. May include Attachment 2, CCP Records Transmittal/Receiving Form(s). **QA Record/Nonpermanent/Validated by authorized signature and date.** Media Type: Hard Copy Filing Order: Site and Alphabetical by Software Name Inclusive Dates: 2006 to Present Location: CCP Records – SWB and/or WRA	ENV 1.g.3.b	Destroy or delete upon authorized deletion of related system.	Retain in CCP Records until completion of the characterization process for each site and transfer to the WRA within one year for storage and retention or sooner if no longer needed in project files to support daily functions or audits.
6	**CCP RH VISUAL EXAMINATION (VE) BATCH DATA REPORTS (BDR)** VE constitutes opening a container and physically examining its contents and verifying its physical form. VE is also used to confirm the physical form of the waste matches its waste stream description. Removal of prohibited items can be performed in this process.			

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6. Item No.	7. Filing Series Title, Description, Any Special Categories, Media Types, Filing Order, Inclusive Dates and Location:	8. Disposition Authority	9. Authorized Disposition Instructions	10. Transfer Instructions
6(A)	CCP RH VE BDRs Records indicating type (classification) and degree of contamination, date of disposal, method of disposal (burial, landfill, etc.), volume, and disposal location. Records may include engineering studies, reports of unusual problems encountered during removal or treatment. CCP RH VE BDRs document the physical form of the waste and absence of prohibited items and are performed at the time the waste is actually being placed into the waste container or of video media. BDRs will include but not are limited to the following: VE Data Form(s), VE Independent Technical Reviewer (ITR) Checklist, VE Site Project Manager (SPM) Checklist, VE BDR cover sheet, VE BDR table of contents, and copy of NCR if applicable. May include Attachment 2, CCP Records Transmittal/Receiving Form(s). **QA Record/Lifetime/Validated by authorized signature and date.** Media Type: Hard Copy Filing Order: Alpha-Numeric Inclusive Dates: 2006 to Present Location: CCP Records - SWB and/or WRA	ENV 6.b	Permanent. Cutoff 5 years after disposal. Transfer to NARA 25 years after cutoff.	Retain in CCP Records until completion of the characterization process for each site and transfer to the WRA within one year for storage and retention or sooner if no longer needed in project files to support daily functions or audits.
6(B)	CCP RH Audio/Visual Recorded DVD for VE Audio/visual recorded DVDs are created for previously packaged waste. VE review is performed using this historical audio/visual media. May include Attachment 2, CCP Records Transmittal/Receiving Form(s). **QA Record/Nonpermanent/Validated by authorized signature and date.** Media Type: Audio/Visual DVDs/Hard Copy Filing Order: Alpha-Numeric Inclusive Dates: 2006 to Present Location: CCP Records - SWB and/or WRA	Disposition Authority Pending NARA Approval	UNSCHEDULED -Do Not Destroy-	Retain in CCP Records until completion of the characterization process for each site and transfer to the WRA within one year for storage and retention or sooner if no longer needed in project files to support daily functions or audits.

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6. Item No.	7. Filing Series Title, Description, Any Special Categories, Media Types, Filing Order, Inclusive Dates and Location:	8. Disposition Authority	9. Authorized Disposition Instructions	10. Transfer Instructions
6(C)	CCP RH VE Quarterly Reports Environmental monitoring reports provided to identify the progress on the environmental monitoring plans or on other related subjects. VE quarterly reports pertain to the quarterly review performed on randomly selected data completed through SPM review, within the last 3 months. The reports give information regarding the repeat of data generation level review and Verification and Validation V&V performed each quarter on a minimum of one randomly chosen waste container. The SPM uses this information to document the data generation level data review is being performed according to procedures. This includes the request and results correspondence. May include Attachment 2, CCP Records Transmittal/Receiving Form(s). **QA Record/Lifetime/Validated by authorized signature on memorandum.** Media Type: Hard Copy Filing Order: Chronological and Quarter Number Inclusive Dates: 2007 to Present Location: CCP Records - SWB and/or WRA	ENV 1.d.8.a	Destroy when 75 years old. Cutoff when reports are superseded, obsolete, or canceled.	Retain in CCP Records until completion of the characterization process for each site and transfer to the WRA within one year for storage and retention or sooner if no longer needed in project files to support daily functions or audits.
7	**CCP RH DOSE-TO-CURIE (DTC) DOCUMENTATION** DTC process is used to determine the total TRU activity concentrations and the individual isotopic activity in containers of RH TRU waste. Various calibrated probes are used to determine the gamma dose rate.			

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6. Item No.	7. Filing Series Title, Description, Any Special Categories, Media Types, Filing Order, Inclusive Dates and Location:	8. Disposition Authority	9. Authorized Disposition Instructions	10. Transfer Instructions
7(A)	CCP RH Waste DTC BDR Records indicating type (classification) and degree of contamination, date of disposal, method of disposal (burial, landfill, etc.), volume, and disposal location. Records may include engineering studies, reports of unusual problems encountered during removal or treatment. CCP RH Waste DTC BDRs are assembled data generated during the process and compiled to create a BDR package. The BDR includes the following: Measurement Control Report, Container Data Sheet(s), Waste Container DTC Conversion Record(s), cover sheet, table of contents, narrative summary, ITR Checklist, SPM Checklist and copy of NCRs if applicable. May include Attachment 2, CCP Records Transmittal/Receiving Form(s). **QA Record/Lifetime/Validated by authorized signature and date.** Media Type: Hard Copy Filing Order: Alpha-Numeric Inclusive Dates: 2006 to Present Location: CCP Records - SWB and/or WRA	ENV 6.b	Permanent. Cutoff 5 years after disposal. Transfer to NARA 25 years after cutoff.	Retain in CCP Records until completion of the characterization process for each site and transfer to the WRA within one year for storage and retention or sooner if no longer needed in project files to support daily functions or audits.
7(B)	CCP RH Waste Container DTC Conversion Record CCP RH Waste Container DTC Conversion Record is the electronic file created during the DTC process. May include Attachment 2, CCP Records Transmittal/Receiving Form(s). **QA Record/Nonpermanent/Validated by authorized signature and date on associated BDR.** Media Type: Electronic - CD/Hard Copy Filing Order: Alpha-Numeric Inclusive Dates: 2006 to Present Location: CCP Records - SWB and/or WRA	Disposition Authority Pending NARA Approval	UNSCHEDULED -Do Not Destroy-	Retain in CCP Records until completion of the characterization process for each site and transfer to the WRA within one year for storage and retention or sooner if no longer needed in project files to support daily functions or audits.

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6. Item No.	7. Filing Series Title, Description, Any Special Categories, Media Types, Filing Order, Inclusive Dates and Location:	8. Disposition Authority	9. Authorized Disposition Instructions	10. Transfer Instructions
8	**CCP RH SAMPLING AND ANALYSIS OF GAS SAMPLES BDRs** CCP RH Sampling and Analysis of Gas Samples BDRs document the analysis of gas samples of Volatile Organic Compounds (VOCs) in Headspace Gas (HSG) samples contained in SUMMA® canisters.			
8(A)	CCP RH Analysis of Gas Samples BDRs Records indicating type (classification) and degree of contamination, date of disposal, method of disposal (burial, landfill, etc.), volume, and disposal location. Records may include engineering studies, reports of unusual problems encountered during removal or treatment. CCP RH Analysis of Gas Samples BDRs document the analysis of gas samples of VOCs in HSG samples contained in SUMMA® canisters. May include but not limited to the following: Data Report cover page and table of contents, Sample Identification Table/Analysis Request Form, sample custody documents and sample tags, sample results, quality control (QC) measurement results, calibration results, Data Review Checklists and SPM Project Level Checklist. May include Attachment 2, CCP Records Transmittal/Receiving Form(s). **QA Record/Lifetime/Validated by authorized signature and date.** Media Type: Hard Copy Filing Order: Alpha-Numeric Inclusive Dates: 2006 to Present Location: CCP Records - SWB and/or WRA	ENV 6.b	Permanent. Cutoff 5 years after disposal. Transfer to NARA 25 years after cutoff.	Retain in CCP Records until completion of the characterization process for each site and transfer to the WRA within one year for storage and retention or sooner if no longer needed in project files to support daily functions or audits.

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6. Item No.	7. Filing Series Title, Description, Any Special Categories, Media Types, Filing Order, Inclusive Dates and Location:	8. Disposition Authority	9. Authorized Disposition Instructions	10. Transfer Instructions
8(B)	CCP RH HSG BDRs – Summa Sampling Records indicating type (classification) and degree of contamination, date of disposal, method of disposal (burial, landfill, etc.), volume, and disposal location. Records may include engineering studies, reports of unusual problems encountered during removal or treatment. CCP HSG – Summa BDRs are processed both at data generation level through Project Level V&V in the HSG-Summa Sampling process. May include but not limited to the following: cover sheet, table of contents, HSG ITR Checklist, HSG Technical Supervisor Review Checklist, HSG Facility QA Officer Review Checklist, 72-hour temperature equilibration plots, chain of custody/canister tag, Sample Drum Data Form, Shipment Request Form (or equivalent), and copy of NCR(s) if applicable. Also includes SPM Checklists. May include Attachment 2, CCP Records Transmittal/Receiving Form(s). **QA Record/Lifetime/Validated by authorized signature and date.** Media Type: Hard Copy Filing Order: Alpha-Numeric Inclusive Dates: March 2004 to Present Location: CCP Records - SWB and/or WRA	ENV 6.b	Permanent. Cutoff 5 years after disposal. Transfer to NARA 25 years after cutoff.	Retain in CCP Records until completion of the characterization process for each site and transfer to the WRA within one year for storage and retention or sooner if no longer needed in project files to support daily functions or audits.

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6. Item No.	7. Filing Series Title, Description, Any Special Categories, Media Types, Filing Order, Inclusive Dates and Location:	8. Disposition Authority	9. Authorized Disposition Instructions	10. Transfer Instructions
8(C)	CCP RH HSG Transportation BDRs Records indicating type (classification) and degree of contamination, date of disposal, method of disposal (burial, landfill, etc.), volume, and disposal location. Records may include engineering studies, reports of unusual problems encountered during removal or treatment. CCP RH HSG Transportation BDRs establish the concentration of flammable gas/VOCs, hydrogen, and methane in a waste container intended for shipment in TRU Package Transporter-II, (TRUPACT-II) or HalfPACT packaging. May include Attachment 2, CCP Records Transmittal/Receiving Form(s). **QA Record/Lifetime/Validated by authorized signature and date.** Media Type: Hard Copy Filing Order: Alpha-Numeric Inclusive Dates: 2006 to Present Location: CCP Records - SWB and/or WRA	ENV 6.b	Permanent. Cutoff 5 years after disposal. Transfer to NARA 25 years after cutoff.	Retain in CCP Records until completion of the characterization process for each site and transfer to the WRA within one year for storage and retention or sooner if no longer needed in project files to support daily functions or audits.
8(D)	CCP RH HSG Transportation Initial Calibration (ICAL) Report The ICAL Report implements the process to establish the concentration of flammable VOCs, hydrogen and methane in a waste container intended for shipment in TRUPACT-II or HalfPACT packaging. May include Attachment 2, CCP Records Transmittal/Receiving Form(s). **QA Record/Nonpermanent/Validated by authorized signature and date.** Media Type: Hard Copy Filing Order: Alpha-Numeric Inclusive Dates: 2006 to Present Location: CCP Records - SWB and/or WRA	Disposition Authority Pending NARA Approval	UNSCHEDULED -Do Not Destroy-	Retain in CCP Records until completion of the characterization process for each site and transfer to the WRA within one year for storage and retention or sooner if no longer needed in project files to support daily functions or audits.

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6. Item No.	7. Filing Series Title, Description, Any Special Categories, Media Types, Filing Order, Inclusive Dates and Location:	8. Disposition Authority	9. Authorized Disposition Instructions	10. Transfer Instructions
8(E)	CCP RH HSG Transportation Method Determination Level (MDL) Reports MDL Reports describe and implement the process to establish the concentration of flammable gas/VOCs, hydrogen, and methane in a waste container intended for shipment in TRUPACT-II or HalfPACT packaging. May include Attachment 2, CCP Records Transmittal/Receiving Form(s). **QA Record/Nonpermanent/Validated by authorized signature and date.** Media Type: Hard Copy Filing Order: Alpha-Numeric Inclusive Dates: 2006 to Present Location: CCP Records - SWB and/or WRA	Disposition Authority Pending NARA Approval	UNSCHEDULED -Do Not Destroy-	Retain in CCP Records until completion of the characterization process for each site and transfer to the WRA within one year for storage and retention or sooner if no longer needed in project files to support daily functions or audits.
8(F)	CCP RH HSG Random Sample Selection Memorandums HSG Random Selection Memorandums document the random selection for HSG sampling and analysis. It includes, at a minimum, a memorandum identifying the random selection with attached HSG Random Sample Selection Listing. **QA Record/Nonpermanent/Validated by authorized signature/initial and date.** Media Type: Hard Copy Filing Order: Chronological and Waste Stream Number Inclusive Dates: 2006 to Present Location: CCP Records - SWB and/or WRA	Disposition Authority Pending NARA Approval	UNSCHEDULED -Do Not Destroy-	Retain in CCP Records until completion of the characterization process for each site and transfer to the WRA within one year for storage and retention or sooner if no longer needed in project files to support daily functions or audits.

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6. Item No.	7. Filing Series Title, Description, Any Special Categories, Media Types, Filing Order, Inclusive Dates and Location:	8. Disposition Authority	9. Authorized Disposition Instructions	10. Transfer Instructions
8(G)	CCP RH HSG Quarterly Reports Environmental monitoring reports provided to identify the progress on the environmental monitoring plans or on other related subjects. HSG quarterly reports pertain to the quarterly review performed on HSG data. The reports give information regarding the repeat of data generation level review. V&V is performed each quarter on a minimum of one randomly chosen waste container. The SPM uses this information to document the data generation level data review is being performed according to procedures. This includes the request and results correspondence. **QA Record/Lifetime/Validated by authorized signature/initial and date.** Media Type: Hard Copy Filing Order: Chronological Inclusive Dates: 2006 to Present Location: CCP Records - SWB and/or WRA	ENV 1.d.8.a	Destroy when 75 years old. Cutoff when reports are superseded, obsolete, or canceled.	Retain in CCP Records until completion of the characterization process for each site and transfer to the WRA within one year for storage and retention or sooner if no longer needed in project files to support daily functions or audits.
9	**FIELD REFERENCE STANDARD (FRS) MEMORANDUM** FRS Memorandum is collected to assess the accuracy with which the sampling equipment collects the VOC into SUMMA® canisters. The FRS is collected and analyzed with the first sampling event at a newly certified site. The FRS shall contain a minimum of six analytes at concentrations within a range of 10 to 100 ppmv greater than the MDL for each compound. **QA Record/Lifetime/Validated by authorized signature/initial and date.** Media Type: Hard Copy Filing Order: Chronological Inclusive Dates: 2008 to Present Location: CCP Records - SWB and/or WRA	Disposition Authority Pending NARA Approval	UNSCHEDULED -Do Not Destroy-	Retain in CCP Records until completion of the characterization process for each site and transfer to the WRA within one year for storage and retention or sooner if no longer needed in project files to support daily functions or audits.
10	**SOLIDS SAMPLING BDRs** Documentation pertaining to the process of solids sampling which is the random sample collection and sample data collection.			

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6. Item No.	7. Filing Series Title, Description, Any Special Categories, Media Types, Filing Order, Inclusive Dates and Location:	8. Disposition Authority	9. Authorized Disposition Instructions	10. Transfer Instructions
10(A)	Solids Sampling BDRs Records indicating type (classification) and degree of contamination, date of disposal, method of disposal (burial, landfill, etc.), volume, and disposal location. Records may include engineering studies, reports of unusual problems encountered during removal or treatment. Documentation pertaining to the process of solids sampling which is the random sample collection and sample data collection. The BDR may include but is not limited to the following: Sample Tracking Form, Sample Chain of Custody Form, Sampling ITR Checklist, Sampling TS Review Checklist, Sampling Facility QA Officer Review Checklist, Sampling BDR – table of contents, Solids Sampling BDR - cover sheet, copy of CCP Waste VE Technique Data Form, copy of NCR(s) if applicable, Temperature Data Logger Sheets, Certification of Cleanliness for Sampling Equipment, and V&V Checklists. May include Attachment 2, CCP Records Transmittal/Receiving Form(s). **QA Record/Lifetime/Validated by authorized signature and date.** Media Type: Hard Copy Filing Order: Alpha-Numeric Inclusive Dates: 2008 to Present Location: CCP Records - SWB and/or WRA	ENV 6.b	Permanent. Cutoff 5 years after disposal. Transfer to NARA 25 years after cutoff.	Retain in CCP Records until completion of the characterization process for each site and transfer to the WRA within one year for storage and retention or sooner if no longer needed in project files to support daily functions or audits.
10(B)	Solids Analysis BDRs These data packages consist of documentation generated during transport and receipt of field samples (e.g., chain of custody), sample movement in the laboratory, preparation for analysis, laboratory analyses output, raw and processed data, analytical results (analysis reports), reanalysis, QC sample results, and instrument calibration data, plus a summary of final results for each batch. May include validation and/or verification documentation. Analytical laboratory data packages consisting of documentation generated during transport and receipt of field samples, sample movement in the laboratory, preparation for analysis, laboratory analyses output, raw and processed data, analytical results, reanalysis, QC sample results and instrument calibration data, plus a summary	ENV 5.c.1	Destroy in 75 years.	Retain in CCP Records until completion of the characterization process for each site and transfer to the WRA within one year for storage and retention or sooner if no longer needed in project files to

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	of final results for each batch. CCP RH Analysis of Solid Sample BDRs document the analysis of solid samples of VOC, non-halogenated volatile compounds (NHVOC), semi-volatile compounds (SVOC), metals, actinides, gamma, inductively-coupled plasma mass spectrometry, liquid scintillation counting, radiochemistry analysis, and radiostrontium. May include but not limited to the following: data report, cover page, table of contents, sample custody documents, sample results, QC results, calibration results, Data Review Checklists and SPM Project Level Checklist. May also include Attachment 2, CCP Records Transmittal/Receiving Form(s). **QA Record/Lifetime/Validated by authorized signature and date.** Media Type: Hard Copy Filing Order: Alpha-Numeric Inclusive Dates: 2008 to Present Location: CCP Records - SWB and/or WRA			support daily functions or audits.

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6. Item No.	7. Filing Series Title, Description, Any Special Categories, Media Types, Filing Order, Inclusive Dates and Location:	8. Disposition Authority	9. Authorized Disposition Instructions	10. Transfer Instructions
10(C)	CCP Solid Analysis BDRs – Raw Data Supporting Data Package These data packages consist of documentation generated during transport and receipt of field samples (e.g., chain of custody), sample movement in the laboratory, preparation for analysis, laboratory analyses output, raw and processed data, analytical results (analysis reports), reanalysis, QC sample results, and instrument calibration data, plus a summary of final results for each batch. May include validation and/or verification documentation. Analytical laboratory data packages consisting of documentation generated during transport and receipt of field samples, sample movement in the laboratory, preparation for analysis, laboratory analyses output, raw and processed data, analytical results, reanalysis, QC sample results and instrument calibration data, plus a summary of final results for each batch. CCP RH Solid Analysis BDRs raw data supporting data packages that document the analysis of VOC, NHVOC, SVOC and metals in solid analysis. These packages may contain but are not limited to the following: raw data/instrument printouts, copies of applicable pages of digestion record and copies of applicable pages of logbooks. May include Attachment 2, CCP Records Transmittal/Receiving Form(s). **QA Record/Nonpermanent/Validated by authorized signature and date.** Media Type: Hard Copy Filing Order: Alpha-Numeric Inclusive Dates: 2008 to Present Location: CCP Records - SWB and/or WRA	ENV 5.c.1	Destroy in 75 years.	Retain in CCP Records until completion of the characterization process for each site and transfer to the WRA within one year for storage and retention or sooner if no longer needed in project files to support daily functions or audits.

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6. Item No.	7. Filing Series Title, Description, Any Special Categories, Media Types, Filing Order, Inclusive Dates and Location:	8. Disposition Authority	9. Authorized Disposition Instructions	10. Transfer Instructions
10(D)	Solids Sampling Random Selection Memorandums Solids Sampling Random Selection Memorandums document the random selection for solids sampling and analysis. It includes, at a minimum, a memorandum identifying the random selection with attached Solids Random Sample List/Waste Stream Container List. **QA Record/Nonpermanent/Validated by authorized signature/initial and date.** Media Type: Hard Copy Filing Order: Chronological Inclusive Dates: 2006 to Present Location: CCP Records - SWB and/or WRA	Disposition Authority Pending NARA Approval	UNSCHEDULED -Do Not Destroy-	Retain in CCP Records until completion of the characterization process for each site and transfer to the WRA within one year for storage and retention or sooner if no longer needed in project files to support daily functions or audits.

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6. Item No.	7. Filing Series Title, Description, Any Special Categories, Media Types, Filing Order, Inclusive Dates and Location:	8. Disposition Authority	9. Authorized Disposition Instructions	10. Transfer Instructions
10(E)	Completed Chain-of-Custody Forms These data packages consist of documentation generated during transport and receipt of field samples (e.g., chain of custody), sample movement in the laboratory, preparation for analysis, laboratory analyses output, raw and processed data, analytical results (analysis reports), reanalysis, QC sample results, and instrument calibration data, plus a summary of final results for each batch. May include validation and/or verification documentation. These data packages consist of documentation generated during transport and receipt of field samples, sample movement in the laboratory, preparation for analysis, laboratory analyses output, raw and processed data, analytical results, reanalysis, QC sample results and instrument calibration data, plus a summary of final results for each batch. Completed Chain of Custody Forms document all transfers of sample custody from collection to disposal. The form contains at a minimum, the sample numbers, the date and times of transfers, and the signatures of the relinquishing and accepting parties. May include Attachment 2, CCP Records Transmittal/Receiving Form(s). **QA Record/Lifetime/Validated by authorized signature and date.** Media Type: Hard Copy Filing Order: Alpha-Numeric Inclusive Dates: 2008 to Present Location: CCP Records - SWB and/or WRA	ENV 5.c.1	Destroy in 75 years.	Retain in CCP Records until completion of the characterization process for each site and transfer to the WRA within one year for storage and retention or sooner if no longer needed in project files to support daily functions or audits.

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6. Item No.	7. Filing Series Title, Description, Any Special Categories, Media Types, Filing Order, Inclusive Dates and Location:	8. Disposition Authority	9. Authorized Disposition Instructions	10. Transfer Instructions
11	**CCP RH NONDESTRUCTIVE ASSAY (NDA) BATCH DATA REPORTS** Records indicating type (classification) and degree of contamination date of disposal, method of disposal (burial, landfill, etc.), volume, and disposal location. Records may include engineering studies, reports of unusual problems encountered during removal or treatment. NDA BDRs pertain to a series of measurement techniques applied to nuclear fuel and nuclear weapons materials. The techniques measure radiation induced or emitted spontaneously from the nuclear material. The measurements are nondestructive material. The documentation in each BDR is from data generation level through the project level V&V and includes Project Level Checklists. May include Attachment 2, CCP Records Transmittal/Receiving Form(s). **QA Record/Lifetime/Validated by authorized signature and date.** Media Type: Hard Copy Filing Order: Alpha-Numeric Inclusive Dates: 2008 to Present Location: CCP Records - SWB and/or WRA	ENV 6.b	Permanent. Cutoff 5 years after disposal. Transfer to NARA 25 years after cutoff.	Retain in CCP Records until completion of the characterization process for each site and transfer to the WRA within one year for storage and retention or sooner if no longer needed in project files to support daily functions or audits.
12	**CCP RH ACCEPTABLE KNOWLEDGE (AK) DOCUMENTATION** AK documentation supports the knowledge used for waste characterization, which is based on the materials and processes used to generate a waste. AK includes information about the physical form of the waste, the base materials composing the waste (especially hazardous and radioactive materials) and the process that generated the waste. AK is used to define waste streams, assign summary categories, assign United States Environmental Protection Agency (EPA) hazardous waste numbers, estimate the weight fraction of cellulose, plastic, and rubber (CPR), and estimated isotopic ratios.			
12(A)	CCP RH AK Documentation Records indicating type (classification) and degree of contamination, date of disposal, method of disposal (burial, landfill, etc.), volume, and disposal location. Records may include engineering studies, reports of unusual problems encountered during removal or treatment. AK documentation is compiled,	ENV 6.b	Permanent. Cutoff 5 years after disposal. Transfer to NARA 25 years	Retain in CCP Records until completion of the characterization process for each

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	reviewed, evaluated, confirmed and reported. It supports the related AK Summary Report. The following documentation may include but is not limited to: AK Documentation Checklist; Record of Communication; AK Source Document Summary - Attachments 3's- may include attached CCP generated source documents – prior to 11/01/2010 the Attachment 3's included as attachment both the site generated and CCP generated source documents; AK Source Document Reference List; Hazardous Constituents Waste Form(s); Waste Form, waste material parameters, Prohibited Items and Packaging Forms with waste material parameter evaluation memorandum; Radionuclides Forms – may include NDA Memorandum; Waste Containers List – may have additional memorandums as addendums to the Attachment 8; AK Re-evaluation Checklist; AK source document discrepancy resolution – includes AK Source Document Source Summary Forms as attachments; CCP Waste Stream Characterization Checklist; CCP TRU Waste Correlation and Surrogate Summary Form; AK Sufficiency Determination Request - memorandum and SPM notifications (emails, letters, memorandums, etc.), as applicable. May include Attachment 2, CCP Records Transmittal/Receiving Form(s). **QA Record/Lifetime/Validated by authorized signature/initial and date.** Media Type: Hard Copy Filing Order: By Site and AK Report or AK Library Inclusive Dates: 2006 to Present Location: CCP Records - SWB and/or WRA		after cutoff.	site and transfer to the WRA within one year for storage and retention or sooner if no longer needed in project files to support daily functions or audits.

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6. Item No.	7. Filing Series Title, Description, Any Special Categories, Media Types, Filing Order, Inclusive Dates and Location:	8. Disposition Authority	9. Authorized Disposition Instructions	10. Transfer Instructions
12(B)	AK Historical Source Documents Records indicating type (classification) and degree of contamination, date of disposal, method of disposal (burial, landfill, etc.), volume, and disposal location. Records may include engineering studies, reports of unusual problems encountered during removal or treatment. AK historical source documents are external records that have been generated by the waste generating sites. Copies are collected and submitted to support the listing of AK source documents referenced in the correlating AK Summary Report. They may be categorized as follows: correspondence; documents; miscellaneous; procedures and published documents; discrepancy resolution; and unpublished documents. These records must be maintained in parallel to the correlating AK document summaries and CCP source documents. Media Type: Electronic - PDF files, databases, video Filing Order: Site, AK Report or AK Library –Alpha-Numeric Inclusive Dates: 1957 to Present Location: CCP Records - SWB and/or WRA	ENV 6.b	Permanent. Cutoff 5 years after disposal. Transfer to NARA 25 years after cutoff.	Retain in CCP Records until completion of characterization process for each site or when no longer needed in project files to support daily functions or audits. Transfer with related AK Record Set. Transfer to the WRA within one year for storage and retention.

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6. Item No.	7. Filing Series Title, Description, Any Special Categories, Media Types, Filing Order, Inclusive Dates and Location:	8. Disposition Authority	9. Authorized Disposition Instructions	10. Transfer Instructions
12(C)	CCP RH AK Summary, Technical Reports and Plans Hazardous waste reports, hazardous substance reports, waste characterization reports, Comprehensive Environmental Response, Compensation, and Liability Act/Resource Conservation Recovery Act unit reports. CCP RH AK Summary Reports, technical reports and plans are documentation which supports the knowledge used for waste characterization, which is based on the materials and processes used to generate a waste. AK reports include information about the physical form of the waste, the base materials composing the waste (especially hazardous and radioactive materials) and the process that generated the waste. AK reports define waste streams, assign summary categories, assign EPA hazardous waste numbers, estimate the weight fraction of CPR, and estimated isotopic ratios. May include but is not limited to the following: documentation that demonstrates approval by designated individuals; comments and comment resolution (attachments, Document Review Resolution [DRR], emails, letter, etc.); document revision requests (i.e., initial markup) and DOE/CBFO emails submitted within five days of project level review. **QA Record/Lifetime/Validated by authorized signature and date.** Media Type: Hard Copy Filing Order: Alpha-Numeric Inclusive Dates: 2006 to Present Location: CCP Records - SWB and/or WRA	ENV 1.d.10.a	Permanent. Cutoff when waste is disposed of. Transfer to NARA 25 years after cutoff.	Retain in CCP Records until completion of the characterization process for each site and transfer to the WRA within one year for storage and retention or sooner if no longer needed in project files to support daily functions or audits.

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6. Item No.	7. Filing Series Title, Description, Any Special Categories, Media Types, Filing Order, Inclusive Dates and Location:	8. Disposition Authority	9. Authorized Disposition Instructions	10. Transfer Instructions
12(D)	AK Accuracy Report Records indicating type (classification) and degree of contamination, date of disposal, method of disposal (burial, landfill, etc.), volume, and disposal location. Records may include engineering studies, reports of unusual problems encountered during removal or treatment. AK Accuracy Reports document that AK accuracy is evaluated either on a lot or waste stream basis. The report documents the results of the evaluation for a container in a waste stream. It may include but is not limited to inter-office correspondence with attached CCP AK Accuracy Report and CCP correlation of containers ID numbers to BDR numbers. **QA Record/Lifetime/Validated by authorized signature and date.** Media Type: Hard Copy Filing Order: Site, AK Report and Waste Stream Inclusive Dates: 2006 to Present Location: CCP Records - SWB and/or WRA	ENV 6.b	Permanent. Cutoff 5 years after disposal. Transfer to NARA 25 years after cutoff.	Retain in CCP Records until completion of the characterization process for each site and transfer to the WRA within one year for storage and retention or sooner if no longer needed in project files to support daily functions or audits.

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6. Item No.	7. Filing Series Title, Description, Any Special Categories, Media Types, Filing Order, Inclusive Dates and Location:	8. Disposition Authority	9. Authorized Disposition Instructions	10. Transfer Instructions
12(E)	CCP RH AK QA Equivalency Demonstration Report Records indicating type (classification) and degree of contamination, date of disposal, method of disposal (burial, landfill, etc.), volume, and disposal location. Records may include engineering studies, reports of unusual problems encountered during removal or treatment. CCP AK QA Equivalency Demonstration Report is a document that shows the decision process, the criteria for qualifying data through this method, and the criteria used for qualifying the data to demonstrate QA equivalency. This report ensures RH TRU waste characterization information generated under a historic QA program complies with the applicable Data Quality Objectives (DQOs) and programmatic requirements specified in the RH TRU Waste Characterization Program Implementation Plan (WCPIP). This includes a procedures matrix providing a cross walk that identified the generator site plans and procedures that implement the applicable requirements of the QA Program Document. May include but is not limited to the following records: documentation that demonstrates approval by designated individuals; comments and comment resolution (attachments, DRR, emails, letter, etc.); document revision requests (i.e., initial markup); DOE/CBFO emails submitted within five days of project level review; and Attachment 2, CCP Records Transmittal/Receiving Form(s). **QA Record/Lifetime/Validated by authorized signature and date.** Media Type: Hard Copy Filing Order: Alpha-Numeric Inclusive Dates: 2007 to Present Location: CCP Records - SWB and/or WRA	ENV 6.b	Permanent. Cutoff 5 years after disposal. Transfer to NARA 25 years after cutoff.	Retain in CCP Records until completion of the characterization process for each site and transfer to the WRA within one year for storage and retention or sooner if no longer needed in project files to support daily functions or audits.

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6. Item No.	7. Filing Series Title, Description, Any Special Categories, Media Types, Filing Order, Inclusive Dates and Location:	8. Disposition Authority	9. Authorized Disposition Instructions	10. Transfer Instructions
12(F)	CCP RH AK Characterization Reconciliation Report (CRR) Records indicating type (classification) and degree of contamination, date of disposal, method of disposal (burial, landfill, etc.), volume, and disposal location. Records may include engineering studies, reports of unusual problems encountered during removal or treatment. CCP AK CRR provides the methodology for data reconciliation with the DQOs provided in the WCPIP, following data V&V by the SPM. The reconciliation is performed at the waste stream or waste stream lot level. It includes but is not limited to the following: RH CRR Container Data Work Sheet 1, RH CRR Container Data Sheet 2, RH CRR DQOs, RH CRR QA Objectives, RH CRR Cover Sheet, RH CRR Construction Sheet, RH CRR SPM/AKE Comment Sheet, and summary of radiological results by container. May include Attachment 2, CCP Records Transmittal/Receiving Form(s). **QA Record/Lifetime/Validated by authorized signature and date.** Media Type: Hard Copy Filing Order: Site, AK Summary Report and Lot Number Inclusive Dates: 2006 to Present Location: CCP Records - SWB and/or WRA	ENV 6.b	Permanent. Cutoff 5 years after disposal. Transfer to NARA 25 years after cutoff.	Retain in CCP Records until completion of the characterization process for each site and transfer to the WRA within one year for storage and retention or sooner if no longer needed in project files to support daily functions or audits.
12(G)	CCP RH Reconciliation with Data Objective Reports Reconciliation with Data Objective Reports includes the Data Reconciliation and Reporting Routing Sheet, reconciliation with data objective, WIPP waste stream profile, and characterization information summary. **QA Record/Lifetime/Validated by authorized signature and date.** Media Type: Hard Copy Filing Order: Site, AK Summary Report, Waste Stream Inclusive Dates: 2006 to Present Location: CCP Records - SWB and/or WRA	Disposition Authority Pending NARA Approval	UNSCHEDULED -Do Not Destroy-	Retain in CCP Records until completion of the characterization process for each site and transfer to the WRA within one year for storage and retention or sooner if no longer needed in project files to support daily functions or audits.

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6. Item No.	7. Filing Series Title, Description, Any Special Categories, Media Types, Filing Order, Inclusive Dates and Location:	8. Disposition Authority	9. Authorized Disposition Instructions	10. Transfer Instructions
12(H)	CCP RH HSG Summary Data Report HSG Summary Data Report includes the correlation of container ID numbers to the HSG Sample ID Number Form, UCL_{90} Evaluation Form, data evaluation narrative, waste steam lot tentatively identified compounds, and SPM narrative. It may also include the Radiography/VE Comparison Report (with copy of trending chart). **QA Record/Lifetime/Validated by authorized signature and date.** Media Type: Hard Copy Filing Order: Site, AK Summary Report, Waste Stream Inclusive Dates: 2006 to Present Location: CCP Records - SWB and/or WRA	Disposition Authority Pending NARA Approval	UNSCHEDULED -Do Not Destroy-	Retain in CCP Records until completion of the characterization process for each site and transfer to the WRA within one year for storage and retention or sooner if no longer needed in project files to support daily functions or audits.
12(I)	CCP RH AK Container Tracking Spreadsheet Any electronic or manual system that tracks and produces records of wastes, from cradle to grave, from generator, storage or transported locations, including laboratory processing. Database and record systems which track wastes from creation through transportation, processing, storage; and reporting tracking records. AK Container Tracking Spreadsheet identifies the following minimum criterion for each container listed in the waste stream: container ID, waste stream ID, generation date, vent date, change reason, new closure date, new vent date, container type. May include Attachment 2, CCP Records Transmittal/Receiving Form(s). **QA Record/Lifetime/Validated by authorized signature and date.** Media Type: Hard Copy/Electronic Filing Order: Site Inclusive Dates: 2006 to Present Location: CCP Records - SWB and/or WRA	ENV 1.g.3.a	Delete or destroy when related records are destroyed, or 75 years from creation, whichever occurs later.	Print out after completion of waste stream shipment to WIPP. Retain in CCP Records until completion of the characterization process for each site and transfer to the WRA within one year for storage and retention or sooner if no longer needed in project files to support daily functions or audits.

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6. Item No.	7. Filing Series Title, Description, Any Special Categories, Media Types, Filing Order, Inclusive Dates and Location:	8. Disposition Authority	9. Authorized Disposition Instructions	10. Transfer Instructions
12(J)	CCP RH Calculation Packages Records indicating type (classification) and degree of contamination, date of disposal, method of disposal (burial, landfill, etc.), volume, and disposal location. Records may include engineering studies, reports of unusual problems encountered during removal or treatment. CCP Calculation Packages document the calculation of the radiological characterization approach for specific waste container or waste stream. The calculations consist of ORIGEN runs, MCNP5 or Microshield modeling, uncertainty analysis, DTC correlation and modeling, and additional radionuclide reporting contributing to 95% of the radioactive hazard. The record includes an added checklist. May include Attachment 2, CCP Records Transmittal/Receiving Form(s) **QA Record/Lifetime/Validated by authorized signature and date.** Media Type: Hard Copy Filing Order: Alpha-Numeric Inclusive Dates: 2014 to Present Location: CCP Records - SWB and/or WRA	ENV 6.b	Permanent. Cutoff 5 years after disposal. Transfer to NARA 25 years after cutoff.	Retain in CCP Records until completion of the characterization process for each site and transfer to the WRA within one year for storage and retention or sooner if no longer needed in project files to support daily functions or audits.

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6. Item No.	7. Filing Series Title, Description, Any Special Categories, Media Types, Filing Order, Inclusive Dates and Location:	8. Disposition Authority	9. Authorized Disposition Instructions	10. Transfer Instructions
13	**CCP PROCEDURES, PLANS, AND REPORTS** CCP procedures, plans, and reports document record packages may include but are not limited to the following record: documentation that demonstrates approval by designated individuals; comments and comment resolution (attachments, DRR, emails, letter, etc.); document revision requests (i.e., initial markup); and DOE/CBFO emails submitted within five days of project level review. This line item is separate from AK Summary Reports and the AK QA Equivalency Demonstration Reports. **QA Record/Nonpermanent/Validated by authorized signature and date for hard copy file and login and password of authorized personnel.** Media Type: Hard Copy Filing Order: Alpha-Numeric - Procedure Numbers Inclusive Dates: 2006 to Present Location: CCP Records - SWB and/or WRA	Disposition Authority Pending NARA Approval	UNSCHEDULED -Do Not Destroy-	Retain in CCP Records until completion of the characterization process for each site and transfer to the WRA within one year for storage and retention or sooner if no longer needed in project files to support daily functions or audits.
14	**CCP RH PROCUREMENT RECORDS** Procurement records generated in the acquisition of goods and non-personnel services.			

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14(A)	CCP RH Procurement Documentation CCP procurement records that were generated in the acquisition of goods and non-personnel services for RH generator sites. Includes but not limited to the following: purchase requisitions/change notices; purchase orders/change notices; statements of work; specifications/drawings; qualified suppliers list and attachments; approval/variation requests, and copies of the QA Grading Level Determination Checklist. This is for Quality Level 1 and 2 procurements only. **QA Record/Nonpermanent/Validated by authorized signature and date.** Media Type: Hard Copy Filing Order: Purchase Order Number Inclusive Dates: 2006 to Present Location: CCP Records - SWB and/or WRA and NWP/Procurement	Disposition Authority Pending NARA Approval	UNSCHEDULED -Do Not Destroy-	Retain in CCP Records until completion of the characterization process for each site and transfer to the WRA within one year for storage and retention or sooner if no longer needed in project files to support daily functions or audits.
14(B)	CCP RH Receipt Inspection Verification Sheets (RIVS) RIVS and supporting documentation (certificates of analysis/conformance/compliance, calibration certificates, etc.) pertaining to quality source and receipt activities in support of the CCP RH waste characterization mission. Formerly known as Source Receipt Inspection Verification Sheets (SRIVS). May include Attachment 2, CCP Records Transmittal/Receiving Form(s). **QA Record/Nonpermanent/Validated by authorized signature and date.** Media Type: Hard Copy Filing Order: Alpha-Numeric by Purchase Order Inclusive Dates: 2006 to Present Location: CCP Records - SWB and/or WRA	Disposition Authority Pending NARA Approval	UNSCHEDULED -Do Not Destroy-	Retain in CCP Records until completion of the characterization process for each site and transfer to the WRA within one year for storage and retention or sooner if no longer needed in project files to support daily functions or audits.

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6. Item No.	7. Filing Series Title, Description, Any Special Categories, Media Types, Filing Order, Inclusive Dates and Location:	8. Disposition Authority	9. Authorized Disposition Instructions	10. Transfer Instructions
15	**STANDING ORDERS FOR RH SITES** Documentation used by management to communicate short-term direction to operators and for the documented quarterly review of standing orders. Information such as special operations, data collection, plotting process parameters and other similar short-term matters may be included in standing orders. Standing orders are not used to deviate from procedures but supplement procedures until the procedure can be revised. Includes Standing Order Log. May include Attachment 2, CCP Records Transmittal/Receiving Form(s). **QA Record/Nonpermanent/Validated by authorized initial/signature and date.** Media Type: Hard Copy Filing Order: Alpha-Numeric Inclusive Dates: 2006 to Present Location: CCP Records - SWB and/or WRA	Disposition Authority Pending NARA Approval	UNSCHEDULED -Do Not Destroy-	Retain in CCP Records until completion of the characterization process for each site and transfer to the WRA within one year for storage and retention or sooner if no longer needed in project files to support daily functions or audits.

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6. Item No.	7. Filing Series Title, Description, Any Special Categories, Media Types, Filing Order, Inclusive Dates and Location:	8. Disposition Authority	9. Authorized Disposition Instructions	10. Transfer Instructions
16	**CCP RH OPERATOR AIDS** Documentation used to provide information useful to operators in performing their duties and for semi-annual reviews to determine if operator aids are still necessary and current. Operator aids may be in many forms such as the latest revision of pages out of procedures, hand written notes, and information tags. Operator aids are viewed as a convenience to the operator, not administrative/technical requirements and/or direction. Operator aids assigned unique numbers may supplement approved procedures, but shall not be used in lieu of approved procedures. **QA Record/Nonpermanent/Validated by authorized initial/signature and date.** Media Type: Hard Copy Filing Order: Alpha-Numeric Inclusive Dates: 2006 to Present Location: CCP Records - SWB and/or WRA	Disposition Authority Pending NARA Approval	UNSCHEDULED -Do Not Destroy-	Retain in CCP Records until completion of the characterization process for each site and transfer to the WRA within one year for storage and retention or sooner if no longer needed in project files to support daily functions or audits.
17	**CCP RH WASTE DATA SYSTEM (WDS) FORMERLY WIPP WASTE INFORMATION SYSTEM (WWIS) AND TRANSPORTATION DOCUMENTATION** The WDS is an on-line database system used to document information pertaining to waste, including but not limited to waste container characterization and certification data, produce reports, record shipment configuration details, disposal locations, and disposal dates. Transportation documentation is the transportation packages created during the preparation and transport of drums for burial at the WIPP.			

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17(A)	CCP RH WDS Documentation The WDS is an on-line database system used to document information pertaining to the waste, including but not limited to waste container characterization and certification data, produce reports, record shipment configuration details, disposal locations, and disposal dates. A CCP RH WDS package is created during the process of entering data into the WDS and reporting data on TRU waste. The WDS is a database system that requires input from waste generator sites for shipment of TRU waste payload containers and payload assemblies intended for disposal at the WIPP. CCP represents all RH sites as the generator and provides input to WDS on behalf of all RH sites. CCP RH WDS packages contain, but are not limited to spreadsheets, reports, and correspondence associated with data CCP submits to WDS electronically. **QA Record/Lifetime/Validated by authorized initial/signature and date.** Media Type: Hard Copy Filing Order: Site and WDS Batch Number Inclusive Dates: 2006 to Present Location: CCP Records - SWB and/or WRA	Disposition Authority Pending NARA Approval	UNSCHEDULED -Do Not Destroy-	Retain in CCP Records until completion of the characterization process for each site and transfer to the WRA within one year for storage and retention or sooner if no longer needed in project files to support daily functions or audits.
17(B)	Radiological Surveys Radiological surveys document levels of radiation and contamination conditions of the containers going through the characterization process for CCP RH. These are external records generated by the generator sites. May include Attachment 2, CCP Records Transmittal/Receiving Form(s). **QA Record/Lifetime/Validated by authorized signature and date.** Media Type: Hard Copy Filing Order: Rad Survey Number Inclusive Dates: 2006 to Present Location: CCP Records - SWB and/or WRA	Disposition Authority Pending NARA Approval	UNSCHEDULED -Do Not Destroy-	Retain in CCP Records until completion of the characterization process for each site and transfer to the WRA within one year for storage and retention or sooner if no longer needed in project files to support daily functions or audits.

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17(C)	Removable Lid Canister (RLC) Loading Forms RLC Loading Forms are completed during the process of loading RH containers into the RLC for shipment in the RH-TRU-72-B Cask for the CCP. May include Attachment 2, CCP Records Transmittal/Receiving Form(s). **QA Record/Lifetime/Validated by authorized signature and date.** Media Type: Hard Copy Filing Order: Alpha-Numeric Canister Number Inclusive Dates: 2006 to Present Location: CCP Records - SWB and/or WRA	Disposition Authority Pending NARA Approval	UNSCHEDULED -Do Not Destroy-	Retain in CCP Records until completion of the characterization process for each site and transfer to the WRA within one year for storage and retention or sooner if no longer needed in project files to support daily functions or audits.
18	**TRANSPORTATION DOCUMENTATION** TRU shipment records includes records prepared by the waste generator and other related documentation. Also includes CCP RH transportation packages created during the preparation and transport of drums for burial at the WIPP. May include but not limited to: payload container transportation certification document, uniform hazardous waste manifest, public burden statement, straight bill of lading short form, land disposal restriction exemption notification, dunnage certification statement, Container Integrity Checklist and Leak Test Report. May include Attachment 2, CCP Records Transmittal/Receiving Form(s). **EPIDEMIOLOGICAL** **QA Record/Nonpermanent/Validated by authorized signature and date.** Media Type: Hard Copy Filing Order: Alpha-Numeric by Shipment Number Inclusive Dates: 2006 to Present Location: CCP Records - SWB and/or WRA	ENV 2.d.4	Destroy after 5 years.	Retain in CCP Records until completion of the characterization process for each site and transfer to the WRA within one year for storage and retention or sooner if no longer needed in project files to support daily functions or audits.

Waste Isolation Pilot Plant RECORDS INVENTORY AND DISPOSITION SCHEDULE (RIDS)	1. ☐DOE X Contractor	2. Page 40 of 41

6. Item No.	7. Filing Series Title, Description, Any Special Categories, Media Types, Filing Order, Inclusive Dates and Location:	8. Disposition Authority	9. Authorized Disposition Instructions	10. Transfer Instructions
19	**CONFIGURATION MANAGEMENT DOCUMENTATION FOR EQUIPMENT** Configuration Management documentation for equipment pertains to the control and oversight of CCP Mobile Characterization Equipment and transportation equipment.			
19(A)	Measuring and Test Equipment (M&TE) Documentation M&TE pertains to documents that ensure equipment used for inspection and testing are properly controlled, calibrated, and maintained. This includes but is not limited to the following: Notice of Deficiency; Manufacturer's Certificate of Calibrations; calibration interval documentation – calibration interval/tolerance adjustments evaluation; exemptions/temporary extension evaluations; evaluations/impact studies with out-of-tolerance evaluations, as applicable; closing/exit calibrations; and pertinent emails, as applicable. May include Attachment 2, CCP Records Transmittal/Receiving Form(s). **QA Record/Nonpermanent/Validated by authorized signature and date.** Media Type: Hard Copy Filing Order: Equipment and date Inclusive Dates: 2006 to Present Location: CCP Records - SWB and/or WRA	Disposition Authority Pending NARA Approval	UNSCHEDULED -Do Not Destroy-	Retain in CCP Records until completion of the characterization process for each site and transfer to the WRA within one year for storage and retention or sooner if no longer needed in project files to support daily functions or audits.

Waste Isolation Pilot Plant RECORDS INVENTORY AND DISPOSITION SCHEDULE (RIDS)	1. ☐DOE X Contractor	2. Page 41 of 41

6. Item No.	7. Filing Series Title, Description, Any Special Categories, Media Types, Filing Order, Inclusive Dates and Location:	8. Disposition Authority	9. Authorized Disposition Instructions	10. Transfer Instructions
19(B)	EPA Tier 1 and Tier 2 Documentation Tier 1 and Tier 2 documentation pertains to the characterization change authorization of the EPA approved waste characterization processes for NDA and VE. Tier changes are documented by memorandum which is the notification of the required change to the waste characterization process. May include various supporting documents. **QA Record/Nonpermanent/Validated by authorized signature and date.** Media Type: Hard Copy Filing Order: Chronological Inclusive Dates: 2006 to Present Location: CCP Records - SWB and/or WRA	Disposition Authority Pending NARA Approval	UNSCHEDULED -Do Not Destroy-	Retain in CCP Records until completion of the characterization process for each site and transfer to the WRA within one year for storage and retention or sooner if no longer needed in project files to support daily functions or audits.
20	**CONTAINER FILTER INSTALLATION FORMS AND DRUM INFORMATION SHEETS** Container Filter Installation Forms and Drum Information Sheets are generated and completed by the host site at Argonne National Laboratory – East. Container Filter Installation Forms provide container numbers, filter information, equipment serial number and calibration due date. The Drum Information Sheet provides drum numbers, radiation readings, filter information, lid information, and storage cask numbers. **QA Record/Lifetime/Validated by authorized signature and date.** Media Type: Hard Copy Filing Order: Chronological Inclusive Dates: 2007 to Present Location: CCP Records - SWB and/or WRA	Disposition Authority Pending NARA Approval	UNSCHEDULED -Do Not Destroy-	Retain in CCP Records until completion of the characterization process for each site and transfer to the WRA within one year for storage and retention or sooner if no longer needed in project files to support daily functions or audits.

GEN12

CCP - Oak Ridge National Labs (ORNL)
List of Qualified Individuals
4/19/2016 12:08 PM

	Name	Position	CCP Next Training Due Date	Host Site Next Training Due Date
VE	Gutierrez, Gilbert	Operator/ITR	07/2017	06/17/16
	Harley, Anthony	Operator/ITR NCR "K" Code Designee	09/2017	05/14/16
	Matheny, Derek	Operator/ITR **SME/OJT** **Expert**	04/2018	05/18/16
	Mojica, Tommy	Operator/ITR **SME/OJT** **Expert** NCR "K" Code Designee	07/2017	Cannot perform operations until site training is complete.
	Tilmon, Pat	Operator/ITR **SME/OJT** **Expert** NCR "K" Code Designee	03/2017	05/26/16

	Name	Position	CCP Next Training Due Date	Host Site Next Training Due Date
RTR	Elliott, Aaron	Operator/ITR **SME/OJT** NCR "K" Code Designee	Eye Exam – 12/2016 Requal – 10/2016 SNT-TC-1A – 01/19/2018 Training Cont. – **04/2016**	Cannot perform operations until site training is complete.
	Hasselstrom, Thad	Operator/ITR NCR "K" Code Designee	Eye Exam – 12/2016 Requal – 03/2017 SNT-TC-1A – 03/22/18 Training Cont. – 05/2016	Cannot perform operations until site training is complete.
	Lyles, Eric	Operator/ITR **SME/OJT** NCR "K" Code Designee	Eye Exam – 01/2017 Requal – 01/2018 SNT-TC-1A – **04/22/2016** Training Cont. – 07/2016	05/18/16
	Oney, Fred	Operator/ITR **SME/OJT** NCR "K" Code Designee	Eye Exam – 11/2016 Requal – 03/2018 SNT-TC-1A – 03/17/19 Training Cont. – 10/2016	05/17/16
	Simpson, Kenneth Dale	Operator/ITR **SME/OJT** NCR "K" Code Designee	Eye Exam – 12/2016 Requal – 03/2017 SNT-TC-1A – 02/19/19 Training Cont. – 05/2016	Cannot perform operations until site training is complete.

	Name	Position	CCP Next Training Due Date	Host Site Next Training Due Date
NDA IQ3	Anderson, Susan	Operator/ITR NCR "K" Code Designee	11/2017	05/19/16
	Ceo, Robert	Expert Analyst	N/A	N/A
	Crosby, Dan	Operator/ITR NCR "K" Code Designee	02/2018	05/07/16
	Gerlock, Chad	Operator/ITR **SME/OJT** NCR "K" Code Designee	11/2017	05/20/16
	Meyer, Kevin	Expert Analyst	N/A	N/A
	Morales, Bart	Expert Analyst	N/A	N/A
	Southworth, Tim	Expert Analyst	N/A	N/A
	Whitson, Ron	Operator/ITR **SME/OJT** NCR "K" Code Designee	10/2017	05/25/16

CCP - Oak Ridge National Labs (ORNL)
List of Qualified Individuals
4/19/2016 12:08 PM

	Name	Position	CCP Next Training Due Date	Host Site Next Training Due Date
MILCC	Anderson, Susan	Operator/ITR NCR "K" Code Designee	04/2016	05/19/16
	Ceo, Robert	Expert Analyst	N/A	N/A
	Crosby, Dan	Operator/ITR NCR "K" Code Designee	06/2016	05/07/16
	Gerlock Chad	Operator/ITR SME/OJT NCR "K" Code Designee	04/2016	05/20/16
	Meyer, Kevin	Expert Analyst	N/A	N/A
	Whitson, Ron	Operator/ITR SME/OJT NCR "K" Code Designee	04/2016	05/25/16

	Name	Position	CCP Next Training Due Date	Host Site Next Training Due Date
FGA	Byrd, Carmel	Operator/ITR	01/2018	05/17/16
	Harley, Anthony	Operator/ITR NCR "K" Code Designee	12/2017	05/14/16
	Matheny, Derek	Operator/ITR	09/2017	05/18/16
	Robinson, Jeremy	Operator/ITR SME/OJT	06/2016	05/18/16

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ORNL NDE Personnel Waste Streams Qualified List

4/19/2016 12:08 PM

		VE Expert	TWPC Process Bldg	OR-NFS-CH-HET-A	OR-NFS-CH-HOM-A	OR-NFS-CH-SOIL	OR-REDC-CH-HET	OR-RADP-CH-HET	OR-RF-CH-HET	OR-CHEM-CH-HET	OR-GENR-CH-HET	OR-NBL-CH-HET	OR-ISTP-CH-HET	OR-SWSA-CH-HET	OR-SWSA-CH-SOIL	OR-MRF-CH-HET	OR-PGDP-CH-HET	OR-PGDP-CH-HET-A
			AK-1			AK-2	AK-3	AK-4	AK-5	AK-6	AK-7	AK-8	AK-9		AK-10	AK-11		
RTR	Elliott, Aaron		X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	
	Hasselstrom, Thad		X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	
	Lyles, Eric		X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	
	Oney, Fred		X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	
	Simpson, Kenneth Dale		X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	
VE	Gutierrez, Gilbert		X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	
	Harley, Anthony		X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	
	Matheny, Derek	E	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	
	Mojica, Tommy	E	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	
	Tilmon, Pat	E	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	

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CCP - RH Program - ORNL
List of Qualified Individuals
4/5/2016 4:25 PM

	Name	Position	CCP Next Training Due Date	Host Site Next Training Due Date
VE	Gutierrez, Gilbert	Operator/ITR	11/2017	06/17/16
	Harley, Anthony	Operator/ITR (Includes Gravimetric) NCR "K" Code Designee	06/2017	05/14/16
	Matheny, Derek	Operator/ITR **SME/OJT** **Expert**	12/2017	05/18/16
	Mojica, Tommy	Operator/ITR (Includes Gravimetric) **SME/OJT** **Expert** NCR "K" Code Designee	06/2017	Cannot perform operations until site training is complete.
	Pattee, Spencer Troy	Operator/ITR (Includes Gravimetric) **SME/OJT** NCR "K" Code Designee	05/2017	Cannot perform operations until site training is complete.
	Root, Wes	Operator/ITR (Includes Gravimetric) **SME/OJT**	06/2017	Cannot perform operations until site training is complete.
	Tilmon, Pat	Operator/ITR **SME/OJT** **Expert** NCR "K" Code Designee	04/2017	05/26/16

	Name	Position	CCP Next Training Due Date	Host Site Next Training Due Date
Waste Sampling	Pattee, Spencer Troy	Operator/ITR **SME/OJT** NCR "K" Code Designee	12/2017	Cannot perform operations until site training is complete.
	Root, Wes	Operator/ITR **SME/OJT**	10/2016	Cannot perform operations until site training is complete.

	Name	Position	CCP Next Training Due Date	Host Site Next Training Due Date
DTC	Crosby, Dan	Operator/ITR NCR "K" Code Designee	12/2017	05/07/16
	Gerlock, Chad	Operator/ITR NCR "K" Code Designee	12/2017	05/20/16
	Shepley, Todd	Operator/ITR **SME/OJT** NCR "K" Code Designee	04/2017	Cannot perform operations until site training is complete.
	Whitson, Ron	Operator/ITR **SME/OJT** NCR "K" Code Designee	05/2016	05/25/16

	Name	Position	CCP Next Training Due Date	Host Site Next Training Due Date
FGA	Byrd, Carmel	Operator/ITR	01/2018	05/17/16
	Harley, Anthony	Operator/ITR NCR "K" Code Designee	12/2017	05/14/16
	Matheny, Derek	Operator/ITR	09/2017	05/18/16
	Robinson, Jeremy	Operator/ITR **SME/OJT**	06/2016	05/18/16

CCP - RH Program - ORNL
List of Qualified Individuals
4/5/2016 4:25 PM

	Name	Position	CCP Next Training Due Date	Host Site Next Training Due Date
ORNL Transportation Personnel	Blair, Steven	Canister Loading Operator	05/2017	05/26/16
	Brown, Jason	Canister Loading Operator	04/2017	05/18/16
	Clark, Larry	Canister Loading Operator	04/2017	05/18/16
	Cooper, Jason	Canister Loading Operator	05/2017	05/18/16
	Earling, David	Canister Loading Operator	05/2017	05/13/16
	Gaenslen, James	Canister Loading Operator	05/2017	05/14/16
	Hill, Terry	Canister Loading Operator	04/2017	05/13/16
	Howard Jr., Theodore	Canister Loading Operator	05/2017	05/21/16
	Iwamura, James	Canister Loading Operator	05/2017	05/26/16
	Lee, Jonathan	Canister Loading Operator	05/2017	05/17/16
	Lemons, Wayne	Canister Loading Operator	03/2018	05/13/16
	Metcalf, Jerid	Canister Loading Operator	04/2017	05/17/16
	White, Mike	Canister Loading Operator	04/2017	05/17/16
	Woods, Kevin	Canister Loading Operator	04/2017	05/13/16

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RH ORNL NDE Personnel Waste Streams Qualified List

4/5/2016 4:25 PM

		TWPC Process Bldg. BLDG 3525		OR-REDC-RH-HET	OR-RF-RH-HET
		VE	Expert	AK-500	AK-510
VE	Gutierrez, Gilbert			X	
	Harley, Anthony			X	
	Matheny, Derek	E		X	
	Mojica, Tommy	E		X	
	Pattee, Spencer				
	Root, Wes				
	Tilmon, Pat	E		X	

Central Characterization Project
Effective Date: 06/08/2011

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Acceptable Knowledge Expert (AKE) Qualification Card

Name: Jeff Harrison	Badge Number: [redacted]
Email Address: [redacted]	

Education / Experience	
Resume documenting education and experience on file with Central Characterization Project (CCP) Training.	Michele Billett 6/8/11 CCP Training — Date

Job Specific Training	
Qualification Limit	There is no qualification time limit for this position. It is a one-time only requirement. Upon completion of this qualification card, the Trainee is qualified to perform all Acceptable Knowledge Expert duties, including the development of acceptable knowledge reports. If necessary, additional training may be required by the CCP Lead Site Project Manager (SPM) or the CCP Manager Responsible for Training. Unsatisfactory performance will result in disqualification by the CCP Manager Responsible for Training. The candidate must successfully complete the entire CCP qualification card to re-establish qualification.
Requalification Requirements	Not required. See above statement.

Indoctrination	
WAP/QAPjP Briefing and Test. 12/3/2	Michele Billett 6/8/11 CCP Training — Date
	Initial/Indoctrination Reading: 1. NM4890139088, *Waste Isolation Pilot Plant Hazardous Waste Facility Permit* 2. DOE/WIPP-02-3122, *Transuranic Waste Acceptance Criteria for the Waste Isolation Pilot Plant* 3. DOE/WIPP 02-3214, *Remote-Handled TRU Waste Characterization Program Implementation Plan* 4. DOE/CBFO-94-1012, *U.S. Department of Energy Carlsbad Field Office Quality Assurance Program Document* 5. CCP-PO-001, *CCP Transuranic Waste Characterization Quality Assurance Project Plan* 6. CCP-PO-002, *CCP Transuranic Waste Certification Plan* 7. CCP-PO-003, *CCP Transuranic Authorized Methods for Payload Control (CCP CH-TRAMPAC)* 8. CCP-PO-505, *CCP Remote-Handled Transuranic Waste Authorized Methods for Payload Control (CCP RH-TRAMPAC)* 9. CCP-QP-004, *CCP Corrective Action Management* 10. CCP-QP-005, *CCP TRU Nonconforming Item Reporting and Control* 11. CCP-QP-006, *CCP Corrective Action Reporting and Control* 12. CCP-QP-008, *CCP Records Management* 13. CCP-QP-036, *CCP Qualification of Acceptable Knowledge for Remote-Handled Transuranic Waste Through a Quality Assurance Equivalency Demonstration*

Acceptable Knowledge Expert (AKE) Qualification Card

Name: Jeff Harrison	Badge Number: [redacted]
Email Address: [redacted]	

	14. CCP-TP-001, *CCP Project Level Data Validation and Verification* 15. CCP-TP-002, *CCP Reconciliation of DQOs and Reporting Characterization Data* 16. CCP-TP-005, *CCP Acceptable Knowledge Documentation* 17. CCP-TP-506, *CCP Preparation of the Remote-Handled Transuranic Waste Acceptable Knowledge Characterization Reconciliation Report*
I have read the listed initial/indoctrination reading and understand my responsibilities as applicable to the procedures above.	Jeffery L. Harrison 6/8/2011 Trainee Signature Date

Formal Training Requirements	
RCRA Training Documentation	Michelle Billett 6/20/11 CCP Training Date

Approvals	
I have completed formal training and received on-the-job training for this position. I fully understand my responsibilities as an AKE.	JEFFERY L. HARRISON Jeffery L. Harrison 6/8/11 Trainee *(printed name and signature)* Date
This individual has shown proficiency in the implementation of the requirements for the preparation of Acceptable Knowledge Summary Reports as required by CCP-TP-005.	Trey Greenwood 6/21/2011 AK Cognizant Manager *(printed name and signature)* Date
I have monitored the training of this individual and believe they are ready to perform the duties of an AKE. I approve this employee to perform the duties of an AKE.	LAURA NELSON Laura Nelson 6/22/2011 CCP Site Project Manager *(printed name and signature)* Date

Approved for Content & Format: **Trey Greenwood (Approval on File)** **06/08/2011**
Cognizant Engineer Date

Approved for Content: **Richard Kantrowitz (Approval on File)** **06/08/2011**
CCP Lead or Alternate SPM Date

Approved for Use: **A.J. Fisher (Approval on File)** **06/08/2011**
CCP Manager Responsible for Training Date

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Acceptable Knowledge Expert (AKE) Qualification Card

Name: Steve Schafer	Badge Number: [redacted]
Email Address: [redacted]	

Education / Experience

Resume documenting education and experience on file with Central Characterization Project (CCP) Training.	Michele Billett 6/8/11 CCP Training Date

Job Specific Training

Qualification Limit	There is no qualification time limit for this position. It is a one-time only requirement. Upon completion of this qualification card, the Trainee is qualified to perform all Acceptable Knowledge Expert duties, including the development of acceptable knowledge reports. If necessary, additional training may be required by the CCP Lead Site Project Manager (SPM) or the CCP Manager Responsible for Training. Unsatisfactory performance will result in disqualification by the CCP Manager Responsible for Training. The candidate must successfully complete the entire CCP qualification card to re-establish qualification.
Requalification Requirements	Not required. See above statement.

Indoctrination

WAP/QAPjP Briefing and Test. 10/3/03	Michele Billett 6/8/11 CCP Training Date

Initial/Indoctrination Reading:

1. NM4890139088, *Waste Isolation Pilot Plant Hazardous Waste Facility Permit*
2. DOE/WIPP-02-3122, *Transuranic Waste Acceptance Criteria for the Waste Isolation Pilot Plant*
3. DOE/WIPP 02-3214, *Remote-Handled TRU Waste Characterization Program Implementation Plan*
4. DOE/CBFO-94-1012, *U.S. Department of Energy Carlsbad Field Office Quality Assurance Program Document*
5. CCP-PO-001, *CCP Transuranic Waste Characterization Quality Assurance Project Plan*
6. CCP-PO-002, *CCP Transuranic Waste Certification Plan*
7. CCP-PO-003, *CCP Transuranic Authorized Methods for Payload Control (CCP CH-TRAMPAC)*
8. CCP-PO-505, *CCP Remote-Handled Transuranic Waste Authorized Methods for Payload Control (CCP RH-TRAMPAC)*
9. CCP-QP-004, *CCP Corrective Action Management*
10. CCP-QP-005, *CCP TRU Nonconforming Item Reporting and Control*
11. CCP-QP-006, *CCP Corrective Action Reporting and Control*
12. CCP-QP-008, *CCP Records Management*
13. CCP-QP-036, *CCP Qualification of Acceptable Knowledge for Remote-Handled Transuranic Waste Through a Quality Assurance Equivalency Demonstration*

Acceptable Knowledge Expert (AKE) Qualification Card

Name: Steve Schafer	**Badge Number:** [redacted]
Email Address: [redacted]	

	14. CCP-TP-001, *CCP Project Level Data Validation and Verification* 15. CCP-TP-002, *CCP Reconciliation of DQOs and Reporting Characterization Data* 16. CCP-TP-005, *CCP Acceptable Knowledge Documentation* 17. CCP-TP-506, *CCP Preparation of the Remote-Handled Transuranic Waste Acceptable Knowledge Characterization Reconciliation Report*
I have read the listed initial/indoctrination reading and understand my responsibilities as applicable to the procedures above.	Trainee Signature — Date: 6/8/2011

Formal Training Requirements	
RCRA Training Documentation	Michele Bullett — CCP Training — Date: 6/8/11

Approvals	
I have completed formal training and received on-the-job training for this position. I fully understand my responsibilities as an AKE.	STEVE SCHAFER — Trainee *(printed name and signature)* — Date: 6/8/2011
This individual has shown proficiency in the implementation of the requirements for the preparation of Acceptable Knowledge Summary Reports as required by CCP-TP-005.	Trey Greenwood — AK Cognizant Manager *(printed name and signature)* — Date: 6/16/11
I have monitored the training of this individual and believe they are ready to perform the duties of an AKE. I approve this employee to perform the duties of an AKE.	LAURA NELSON Laura Nelson — CCP Site Project Manager *(printed name and signature)* — Date: 6-16-11

Approved for Content & Format: **Trey Greenwood (Approval on File)** — Cognizant Engineer — **06/08/2011** — Date

Approved for Content: **Richard Kantrowitz (Approval on File)** — CCP Lead or Alternate SPM — **06/08/2011** — Date

Approved for Use: **A.J. Fisher (Approval on File)** — CCP Manager Responsible for Training — **06/08/2011** — Date

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Acceptable Knowledge Expert (AKE) Qualification Card

Name: Travis Smith	Badge Number: [redacted]
Email Address: [redacted]	

Education / Experience	
Resume documenting education and experience on file with Central Characterization Project (CCP) Training.	Michele Billett 6/9/11 CCP Training Date

Job Specific Training	
Qualification Limit	There is no qualification time limit for this position. It is a one-time only requirement. Upon completion of this qualification card, the Trainee is qualified to perform all Acceptable Knowledge Expert duties, including the development of acceptable knowledge reports. If necessary, additional training may be required by the CCP Lead Site Project Manager (SPM) or the CCP Manager Responsible for Training. Unsatisfactory performance will result in disqualification by the CCP Manager Responsible for Training. The candidate must successfully complete the entire CCP qualification card to re-establish qualification.
Requalification Requirements	Not required. See above statement.

Indoctrination	
WAP/QAPjP Briefing and Test.	Michele Billett 6/9/11 CCP Training Date

Initial/Indoctrination Reading:

1. NM4890139088, *Waste Isolation Pilot Plant Hazardous Waste Facility Permit*
2. DOE/WIPP-02-3122, *Transuranic Waste Acceptance Criteria for the Waste Isolation Pilot Plant*
3. DOE/WIPP 02-3214, *Remote-Handled TRU Waste Characterization Program Implementation Plan*
4. DOE/CBFO-94-1012, *U.S. Department of Energy Carlsbad Field Office Quality Assurance Program Document*
5. CCP-PO-001, *CCP Transuranic Waste Characterization Quality Assurance Project Plan*
6. CCP-PO-002, *CCP Transuranic Waste Certification Plan*
7. CCP-PO-003, *CCP Transuranic Authorized Methods for Payload Control (CCP CH-TRAMPAC)*
8. CCP-PO-505, *CCP Remote-Handled Transuranic Waste Authorized Methods for Payload Control (CCP RH-TRAMPAC)*
9. CCP-QP-004, *CCP Corrective Action Management*
10. CCP-QP-005, *CCP TRU Nonconforming Item Reporting and Control*
11. CCP-QP-006, *CCP Corrective Action Reporting and Control*
12. CCP-QP-008, *CCP Records Management*
13. CCP-QP-036, *CCP Qualification of Acceptable Knowledge for Remote-Handled Transuranic Waste Through a Quality Assurance Equivalency Demonstration*

Acceptable Knowledge Expert (AKE) Qualification Card

Name: Travis Smith	Badge Number: [redacted]
Email Address: [redacted]	

	14. CCP-TP-001, *CCP Project Level Data Validation and Verification* 15. CCP-TP-002, *CCP Reconciliation of DQOs and Reporting Characterization Data* 16. CCP-TP-005, *CCP Acceptable Knowledge Documentation* 17. CCP-TP-506, *CCP Preparation of the Remote-Handled Transuranic Waste Acceptable Knowledge Characterization Reconciliation Report*
I have read the listed initial/indoctrination reading and understand my responsibilities as applicable to the procedures above.	Trainee Signature — Date: 6/8/2011

Formal Training Requirements	
RCRA Training Documentation	Michele Billett — CCP Training — Date: 6/9/11

Approvals	
I have completed formal training and received on-the-job training for this position. I fully understand my responsibilities as an AKE.	TRAVIS SMITH — Trainee *(printed name and signature)* — Date: 6/8/2011
This individual has shown proficiency in the implementation of the requirements for the preparation of Acceptable Knowledge Summary Reports as required by CCP-TP-005.	Trey Greenwood — AK Cognizant Manager *(printed name and signature)* — Date: 6/16/11
I have monitored the training of this individual and believe they are ready to perform the duties of an AKE. I approve this employee to perform the duties of an AKE.	LAURA NELSON — CCP Site Project Manager *(printed name and signature)* — Date: 6-16-11

Approved for Content & Format: **Trey Greenwood (Approval on File)** — Cognizant Engineer — **06/08/2011** — Date

Approved for Content: **Richard Kantrowitz (Approval on File)** — CCP Lead or Alternate SPM — **06/08/2011** — Date

Approved for Use: **A.J. Fisher (Approval on File)** — CCP Manager Responsible for Training — **06/08/2011** — Date

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Remote Handled (RH)
Site Project Manager (SPM)
Qualification Card

Name: Barbara J. Broomfield

Education/Experience	
Resume documenting education and experience on file with Central Characterization Program (CCP) Training.	Michele Billett 4/29/15 CCP Training Date

Job Specific Training	
Qualification Limit	There is no qualification limit for this position. This qualification is a one-time-only requirement. Unsatisfactory performance will result in disqualification. If unsatisfactory performance is determined, the complete qualification card, including the On-the-Job Training (OJT) portions, must be completed to re-establish qualification.
Requalification Requirements	Not required. See above statement.

Indoctrination

Initial/Indoctrination Reading:

1. DOE/WIPP 02-3214, *Remote-Handled TRU Waste Characterization Program Implementation Plan (WCPIP)*
2. WP 15-GM1002, *Issues Management Processing of WIPP Forms*
3. CCP-CM-001, *CCP Equipment Change Authorization and Documentation*
4. CCP-HSP-014, *Health and Safety Program Implementation for CCP*
5. CCP-PO-001, *CCP Transuranic Waste Characterization Quality Assurance Project Plan*
6. CCP-PO-002, *CCP Transuranic Waste Certification Plan*
7. CCP-PO-005, *CCP Conduct of Operations*
8. CCP-PO-505, *CCP Remote-Handled Transuranic Waste Authorized Methods for Payload Control (CCP RH-TRAMPAC)*
9. CCP-QP-002, *CCP Training and Qualification Plan*
10. CCP-QP-005, *CCP TRU Nonconforming Item Reporting and Control*
11. CCP-QP-008, *CCP Records Management*
12. CCP-QP-010, *CCP Document Preparation, Approval, and Control*
13. CCP-QP-019, *CCP Quality Assurance Reporting to Management*
14. CCP-QP-022, *CCP Software Quality Assurance Plan*
15. CCP-QP-036, *CCP Qualification of Acceptable Knowledge for Remote-Handled Transuranic Waste Through a Quality Assurance Equivalency Demonstration*
16. CCP-QP-037, *CCP Calculations*
17. CCP-TP-001, *CCP Project Level Data Validation and Verification*
18. CCP-TP-002, *CCP Reconciliation of DQOs and Reporting Characterization Data*
19. CCP-TP-005, *CCP Acceptable Knowledge Documentation*
20. CCP-TP-053, *CCP Standard Real-Time Radiography (RTR) Inspection Procedure*
21. CCP-TP-163, *CCP Evaluation of Waste Packaging Records for Visual Examination of Records*
22. CCP-TP-500, *CCP Remote-Handled Waste Visual Examination*
23. CCP-TP-504, *CCP Dose-to-Curie Survey Procedure for Remote-Handled Transuranic Waste*

Remote Handled (RH)
Site Project Manager (SPM)
Qualification Card

Name: Barbara Broomfield

24. CCP-TP-506, *CCP Preparation of the Remote-Handled Transuranic Waste Acceptable Knowledge Characterization Reconciliation Report*
25. CCP-TP-508, *CCP RH Standard Real-Time Radiography Inspection Procedure*
26. CCP-TP-509, *CCP Remote-Handled Transuranic Container Tracking*
27. CCP-TP-511, *CCP Peer Review*
28. CCP-TP-512, *CCP Remote-Handled Waste Sampling*
29. CCP-TP-513, *CCP Procedure for Dimensional or Gravimetric Measurements for Radiological Characterization of Remote-Handled Transuranic Waste*
30. CCP-TP-514, *CCP Procedure for Radiological Calculation Package Submittal*
31. CCP-TP-530, *CCP RH TRU Waste Certification and WWIS/WDS Data Entry*

I have read the listed Initial/Indoctrination Reading and understand my responsibilities as applicable to the procedures above.	Trainee Signature	Date: 4/29/15

Additional Training Requirements

CCP-PO-001	1. WAP/QAPjP Briefing and Test	CCP Training	Date: 5/22/15
HAZ-ID-101	2. Hazardous Waste Identification Briefing and Test	CCP Training	Date: 5/22/15
CCP-VE-101	3. Visual Examination (VE) TRU Waste Characterization Briefing	CCP Training	Date: 5/22/15
CCP-RTR-101	4. Real-Time Radiography (RTR) TRU Waste Characterization Briefing.	CCP Training	Date: 5/22/15

Formal Training	OJT Knowledge Requirements	Subject Matter Expert (SME)/OJT Signature/Date
DOE/WIPP 02-3214	1. Define Environmental Protection Agency's (EPA) definition of VE of record. Provide an example.	4/29/15
	2. Explain how CCP-TP-500 satisfies the EPA and New Mexico Environmental Department (NMED) criteria.	4/29/15
	3. State the Data Quality Objectives (DQOs) for Dose-to-Curie (DTC), VE, and RTR.	4/29/15
	4. State the purpose of CCP-TP-506.	4/29/15

Remote Handled (RH)
Site Project Manager (SPM)
Qualification Card

Name: Barbara Broomfield

	23. State how to review a NCR.	RHK 5/18/15
	24. Explain how to verify corrective actions.	RHK 5/18/15
	25. Explain the difference between a final disposition of "Use As Is" and "Rework."	RHK 5/18/15
	26. Describe the process if a NCR generated at Project level is determined to be "reportable."	RHK 5/18/15
WP 15-GM1002	27. Describe the purpose of the WIPP Form process.	RHK 5/18/15
	28. State the person responsible for originating a WIPP Form.	RHK 5/18/15
	29. Describe how WIPP Forms are documented.	RHK 5/18/15
	30. Describe who has responsibility for processing WIPP Forms, approving Corrective Action Plans, and approving closure of WIPP Forms.	RHK 5/18/15
	31. Describe actions personnel may take when conditions adverse to quality are discovered.	RHK 5/18/15
CCP-QP-008	32. List the responsibilities of record generators.	RHK 5/18/15
	33. State the storage and control requirements for records.	RHK 5/18/15
	34. Explain the process and proper method to make corrections or revisions to records.	RHK 5/18/15
CCP-QP-010	35. State the importance of using approved documents.	RHK 5/18/15
	36. State when to verify a document revision.	RHK 5/18/15
CCP-PO-505	37. Discuss the differences in the transportation requirement for RH-TRU 72-B and CNS 10-160B versus the TRUPACT-II.	RHK 5/18/15
CCP-TP-001	38. State which characterization data requires SPM review and validation and verification.	RHK 5/18/15
	39. State the percentage of BDRs that must undergo SPM review.	RHK 5/18/15
	40. Explain when it is allowed to review BDRs with containers not on the AK Tracking Spreadsheet.	RHK 5/18/15

Remote Handled (RH)
Site Project Manager (SPM)
Qualification Card

Name: Barbara Broomfield

CCP-PO-001	5. State the regulator who governs hazardous waste.	RHK 4/29/15
	6. Define the term "prohibited item" and give five examples of prohibited items.	RHK 4/29/15
	7. Identify the document allowing WIPP to receive and store TRU-mixed waste.	RHK 4/29/15
	8. Identify and describe the three major methods used to characterize TRU waste.	RHK 4/29/15
	9. Name at least two (2) DQOs for Acceptable Knowledge (AK).	RHK 4/29/15
	10. State the five (5) QAOs.	RHK 4/29/15
	11. Define waste stream.	RHK 4/29/15
	12. Define waste matrix code.	RHK 4/29/15
	13. Describe the three (3) summary category groups.	RHK 4/29/15
CCP-PO-002	14. Define TRU waste.	RHK 4/29/15
	15. Define TRU-mixed waste.	RHK 4/29/15
	16. List the 10 radionuclides that must be reported.	RHK 4/29/15
	17. List the agency which governs radiological waste.	RHK 4/29/15
	18. State which type of radioactive waste is accepted at WIPP (limited by The Land Withdrawal Act, as stated in the WIPP WAC).	RHK 4/29/15
	19. State the maximum allowed curies per liter activity level (averaged over the volume of the canister).	RHK 4/29/15
	20. State if machine-compacted waste is allowed to ship to the Waste Isolation Pilot Plant (WIPP).	RHK 4/29/15
CCP-QP-005	21. State one major purpose for the nonconformance control program.	RHK 5/18/15
	22. Identify who can initiate a non-conformance report (NCR).	RHK 5/18/15

Remote Handled (RH)
Site Project Manager (SPM)
Qualification Card

Name: Barbara Broomfield

CCP-TP-002	41. State when an SPM must provide comments or justifications when completing an SPM checklist.	RHK 5/18/15
	42. Explain the differences between "editorial" changes and "data affecting" changes.	RHK 5/18/15
	43. State how the SPM documents the DGL data review, validation, and verification is being performed in accordance with applicable procedures.	RHK 5/18/15
	44. Discuss the components of a Characterization Information Summary (CIS).	RHK 5/28/15
	45. Discuss how to complete and prepare the Waste Stream Characterization Package.	RHK 5/28/15
	46. Explain how to verify the waste stream characterization meets the WAP requirements.	RHK 5/28/15
	47. Explain how to ensure the data generated meets the DQOs.	RHK 5/28/15
CCP-TP-005	48. Discuss how to resolve AK discrepancies	RHK 5/28/15
	49. Explain how to document the EPA Code modification to the Container Information Summary.	RHK 5/28/15
CCP-TP-506	50. Explain how to ensure data is within the established criteria and meets the applicable QAOs.	RHK 5/28/15
CCP-TP-511	51. State the peer review requirements.	RHK 5/28/15
CCP-TP-512	52. Discuss the QAOs for radiochemistry and ICP-MS batch data report (BDR).	RHK 5/28/15

Formal Training	OJT Practical Requirements	SME/OJT Signature/Date
CCP-QP-005	1. Generate a NCR.	RHK 5/27/15
CCP-TP-001	2. Verify the data generation level independent review have been performed.	RHK 5/27/15
	3. Verify the appropriate BDR checklists are complete.	RHK 5/27/15
	4. Verify the data is within the established criteria and meets the applicable QAO's.	RHK 5/27/15
	5. Prepare the Data Validation Summary.	RHK 5/27/15

Remote Handled (RH)
Site Project Manager (SPM)
Qualification Card

Name: Barbara Broomfield

CCP-TP-002	6. Demonstrate proficiency in review of the RH RTR BDRs.	RHK 5/27/15
	7. Demonstrate proficiency of characterization information summary reports.	RHK 5/27/15
	8. Compare the concentrations/limits of constituents associated with EPA Code.	RHK 5/27/15
	9. Compile the Container Information Summary Report.	RHK 5/27/15
	10. Ensure the data generated meets the DQOs.	RHK 5/27/15
CCP-TP-005	11. Document EPA Code modification to the Container Information Summary.	RHK 5/27/15
CCP-TP-500	12. Demonstrate proficiency in review of the RH VE BDRs.	RHK 5/27/15
CCP-TP-504	13. Demonstrate proficiency in the review of DTC BDR.	RHK 5/27/15
CCP-TP-506	14. Complete a Characterization Reconciliation Report (CRR).	RHK 5/27/15
CCP-TP-508	15. Demonstrate proficiency in review of the RH RTR BDRs.	RHK 5/27/15
	16. Demonstrate the verification of a container meeting the applicable content code limit.	RHK 5/27/15
CCP-TP-512	17. Demonstrate proficiency in the review of "Remote-Handled Waste Sample" BDR.	RHK 5/27/15
CCP-TP-513	18. Demonstrate proficiency in the review of Dimensional/Gravimetric BDR.	RHK 5/27/15
	19. Demonstrate proficiency in the review of Radiological Documentation Package.	RHK 5/27/15

Remote Handled (RH)
Site Project Manager (SPM)
Qualification Card

Name: Barbara Broomfield

Approvals	
I have completed formal training and received OJT for this position. I fully understand my responsibilities as a RH SPM.	Barbara Broomfield 5/28/15 Trainee *(printed name and signature)* Date
I have monitored the training of this individual and believe they are ready to perform the duties of a RH SPM. *(Validation by the SME/OJT instructor(s) involved in the training of this individual).*	Richard Kostelnik 5/28/15 SME/OJT Instructor *(printed name and signature)* Date
	N/A SME/OJT Instructor *(printed name and signature)* Date
I approve this employee to perform the duties of a RH SPM.	Irene Joo 6/4/15 SPM *(printed name and signature)* Date

Approved for Content & Format: **Irene Joo *(Approval on File)*** **10/27/2014**
SME/OJT Date

Approved for Content: **Charlie Turner *(Approval on File)*** **10/27/2014**
SPM Date

Approved for Applicability, Content, Format, & Use: **A.J. Fisher *(Approval on File)*** **10/27/2014**
Manager Responsible for Training Date

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Site Project Manager (SPM) Qualification Card

Name: Barbara Bloomfield CS 11/2/04	Badge #: [redacted]
The requirements of this document are the result of an evaluation as described in CCP-QP-002, *CCP Training and Qualification Plan.*	

Education / Experience

Trainee has been selected for this position based on his/her education, prior-experience, additional certifications, training, etc. as documented in the CCP Training Files.	CCP Program Manager 9/7/04 Date

Job Specific Training

Qualification Limit	There is no qualification limit for this position. This qualification is a one-time-only requirement. **Qualification is valid for the site(s) with completed addendum(s) attached with this card ONLY.** Trainee may qualify for additional sites as necessary by completing the appropriate addendum(s).	
Requalification Requirements	There are no requalification requirements for this position. If performance in this position is interrupted due to reassignment, then cognizant manager will determine if requalification is required at time position is resumed.	
Indoctrination	WAP/QAPjP Briefing 10/11/04	CCP Training 10/11/04 Date

Required Reading:

Note: Site-specific required reading will be completed on applicable addendum(s) for the site assigned (e.g. SPM-01A, *Savannah River Site*; SPM-01B, *Nevada Test Site;* etc.).

1. NM4890139088, *Waste Isolation Pilot Plant Hazardous Waste Facility Permit, Attachments B-B6*
2. DOE/WIPP-02-3122, *Contact-Handled Transuranic Waste Acceptance Criteria for the Waste Isolation Pilot Plant (Sections 3.0 and 4.0)*
3. DOE/CBFO-94-1012, *U.S. Department of Energy Carlsbad Field Office Quality Assurance Program Document*
4. DOE/CBFO-01-3107, *Performance Demonstration Program Management Plan*
5. DOE/CBFO-01-1005, *Performance Demonstration Program Plan for Nondestructive Assay of Drummed Wastses for the TRU Waste Characterization Program*
6. DOE/CAO-95-1076, *Performance Demonstration Program Plan for Analysis of Simulated Headspace Gases*
7. CCP-PO-001, *CCP Transuranic Waste Characterization Quality Assurance Project Plan*
8. CCP-PO-002, *CCP Transuranic Waste Certification Plan*
9. CCP-PO-003, *CCP TRUPACT-II Authorized Methods for Payload Control (TRAMPAC)*
10. CCP-PO-005, *CCP Conduct of Operations*
11. CCP-PO-008, *CCP Quality Assurance Administrative Program*
12. CCP-QP-002, *CCP Training and Qualification Plan*

Site Project Manager (SPM) Qualification Card

Name: Barbara Bloomfield r CB 11/2/04	Badge #: [redacted]

13. CCP-QP-004, *CCP Corrective Action Management*
14. CCP-QP-005, *CCP TRU Nonconforming Item Reporting and Control*
15. CCP-QP-006, *CCP Corrective Action Reporting and Control*
16. CCP-QP-008, *CCP Records Management*
17. CCP-QP-009, *CCP Work Control Process*
18. CCP-QP-010, *CCP Document Preparation, Approval and Control*
19. CCP-QP-011, *CCP Notebooks & Logbooks*
20. CCP-QP-015, *CCP Procurement*
21. CCP-QP-016, *CCP Control of Measuring, Testing, and Data Collection Equipment*
22. CCP-QP-018, *CCP Management Assessment*
23. CCP-QP-019, *CCP Quality Assurance Reporting to Management*
24. CCP-QP-021, *CCP Surveillance Program*
25. CCP-QP-022, *CCP TRU Software Quality Assurance*
26. CCP-QP-023, *CCP Handling, Storage, and Shipping*
27. CCP-QP-027, *CCP Test Control*
28. CCP-QP-028, *CCP Records Filing, Inventorying, Scheduling, and Dispositioning*
29. CCP-QP-030, *CCP Written Practice for the Qualification of CCP Helium Leak Detection Personnel*
30. CCP-TP-001, *CCP Project Level Data Validation and Verification*
31. CCP-TP-002, *CCP Reconciliation of DQOs and Reporting Characterization Data*
32. CCP-TP-003, *CCP Sampling Design andData Analysis for RCRA Characterization*
33. CCP-TP-005, *CCP Acceptable Knowledge Documentation*
34. CCP-TP-028, *CCP Radiographic Test and Training Drum Requirements*
35. CCP-TP-030, *CCP TRU Waste Certification and WWIS Data Entry*
36. CCP-TP-056, *CCP HSG Performance Demonstration Plan*
37. CCP-TP-058, *CCP NDA Performance Demonstration Plan*

I have read the listed required reading and understand my responsibilities as applicable to procedures above.	Trainee Signature 10/08/04 Date
Training has received site-specific addendum(s).	*11-1-04 CCP Training 11-1-04 Date

*Site-specific addendum for INEEL has not been developed. All applicable addendums will be completed as required. 11-1-04

Site Project Manager (SPM) Qualification Card

08/19/04

Name: Barbara Bloomfield		Badge #: [redacted]
Formal Training	Training Requirements	
	Training	Date Completed
	1. Hazardous Waste Code Assignments Briefing [1]	10/11/04
	2. NCR/CAR Briefing [1]	10/4/04
	CCP Training has received evidence of the completion of the formal training above.	CCP Training 11-1-04 Date
	On-the-Job Training Practical Requirements	SME/OJT Instructor Signature / Date
	1. Demonstrate proficiency in the review of Headspace Gas Batch Data Reports (BDR's).[2]	10/29/04
	2. Demonstrate proficiency in the review of Non-destructive Examination (NDE) BDR's.[2]	10/29/04
	3. Demonstrate proficiency in the review of Non-destructive Assay (NDA) BDR's.[2]	10/29/04
	4. Demonstrate proficiency in the review of Visual Examination (VE) BDR's.[2]	10/28/04
	5. Demonstrate proficiency in the review of Homogeneous Solids Sampling and Analysis.[3]	10/28/04

Site Project Manager (SPM) Qualification Card

Name: R CB 11/2/04 Barbara Bloomfield	Badge #: [redacted]
Approvals	
I have completed required reading and formal/informal training for my job position. I fully understand my responsibilities as an **Site Project Manager (SPM) for the site(s) with completed addendum(s) attached with this card.**	Trainee Signature 10/29/04 Date
I approve this employee to perform the duties of **Site Project Manager (SPM) for the site(s) with completed addendum(s) attached with this card.**	CCP Program Manager 11/02/04 Date
Each SME/OJT Instructor involved in the trainee validation of this OJT shall print and sign their name on the following blanks.	Printed Name SME / OJT Signature MARK PEARCY Mark Pearcy ADELA M. CANTU Adela M Cantu Printed Name SME / OJT Signature
This qualification card has been reviewed for completeness and signature verification by CCP Training.	CCP Training 11-2-04 Date

[1] Documentation in training file.
[2] Proficiency will be demonstrated after the completion of BDR reviews in each discipline under the supervision of a qualified SPM.
[3] Proficiency for Solids Sampling and Analysis will be demonstrated and documented on SPM-01a, Attachment 1 - On-the-Job Training (OJT) for Homogeneous Solids Sampling and Analysis.

Approved for format:	D. Freeze (Original Signature on File)	06/14/04
	CCP Training	Date
Approved for content:	S. Rose (Original Signature on File)	06/14/04
	CCP Site Project Manager	Date
Approved for use:	J. R. Stroble (Original Signature on File)	06/14/04
	Cognizant Manager	Date

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Remote Handled (RH)
Site Project Manager (SPM)
Qualification Card

Name: Richard (Rich) Kantrowitz

Email Address: [redacted]

Education/Experience	
Resume documenting education and experience on file with Central Characterization Project (CCP) Training.	Michele Bellett 10/26/12 CCP Training — Date

Job Specific Training	
Qualification Limit	There is no qualification limit for this position. This qualification is a one-time-only requirement. Upon completion of this core qualification card, the Trainee is qualified to perform Site Project Manager (SPM) duties for Remote Handled Waste. Additionally, once this qualification card is complete, the SPM will be qualified to perform SPM reviews of Headspace Gas (HSG) batch data reports, regardless of the radiological determination of the waste. Unsatisfactory performance will result in disqualification. If unsatisfactory performance is determined, the complete qualification card, including the on-the-job training (OJT) portions, must be completed to re-establish qualification.
Requalification Requirements	Not required. See above statement.

Indoctrination	
	Initial/Indoctrination Reading: 1. DOE/WIPP 02-3214, *Remote-Handled TRU Waste Characterization Program Implementation Plan (WCPIP)* 2. CCP-CM-001, *CCP Equipment Change Authorization and Documentation* 3. CCP-PO-001, *CCP Transuranic Waste Characterization Quality Assurance Project Plan* 4. CCP-PO-002, *CCP Transuranic Waste Certification Plan* 5. CCP-PO-008, *CCP Quality Assurance Interface with the WTS Quality Assurance Program* 6. CCP-PO-505, *CCP Remote-Handled Transuranic Waste Authorized Methods for Payload Control (CCP RH-TRAMPAC)* 7. CCP-QP-002, *CCP Training and Qualification Plan* 8. CCP-QP-004, *CCP Corrective Action Management* 9. CCP-QP-005, *CCP TRU Nonconforming Item Reporting and Control* 10. CCP-QP-006, *CCP Corrective Action Reporting and Control* 11. CCP-QP-008, *CCP Records Management* 12. CCP-QP-010, *CCP Document Preparation, Approval and Control* 13. CCP-QP-011, *CCP Laboratory Logbooks* 14. CCP-QP-015, *CCP Procurement* 15. CCP-QP-016, *CCP Control of Measuring and Testing Equipment* 16. CCP-QP-018, *CCP Management Assessment* 17. CCP-QP-022, *CCP Software Quality Assurance Plan*

Remote Handled (RH)
Site Project Manager (SPM)
Qualification Card

Name: Richard (Rich) Kantrowitz

Email Address: [redacted]

18. CCP-QP-023, *CCP Handling, Storage, and Shipping*
19. CCP-QP-027, *CCP Test Control*
20. CCP-QP-028, *CCP Records Filing, Inventorying, Scheduling, and Dispositioning*
21. CCP-QP-030, *CCP Written Practice for the Qualification of CCP Helium Leak Detection Personnel*
22. CCP-QP-036, *CCP Qualification of Acceptable Knowledge for Remote-Handled Transuranic Waste Through a Quality Assurance Equivalency Demonstration*
23. CCP-TP-001, *CCP Project Level Data Validation and Verification*
24. CCP-TP-002, *CCP Reconciliation of DQOs and Reporting Characterization Data*
25. CCP-TP-003, *CCP Data Analysis for S3000, S4000, and S5000 Characterization*
26. CCP-TP-005, *CCP Acceptable Knowledge Documentation*
27. CCP-TP-028, *CCP Radiographic Test and Training Drum Construction*
28. CCP-TP-053, *CCP Standard Real-Time Radiography (RTR) Inspection Procedure*
29. CCP-TP-056, *CCP HSG Performance Demonstration Plan*
30. CCP-TP-058, *CCP NDA Performance Demonstration Program*
31. CCP-TP-162, *CCP Random Selection of Containers for Solids and Headspace Gas Sampling and Analysis*
32. CCP-TP-163, *CCP Standard Waste Visual Examination*
33. CCP-TP-500, *CCP Remote-Handled Waste Visual Examination*
34. CCP-TP-504, *CCP Dose-to-Curie Survey Procedure for Remote-Handled Transuranic Waste*
35. CCP-TP-506, *CCP Preparation of the Remote-Handled Transuranic Waste Acceptable Knowledge Characterization Reconciliation Report*
36. CCP-TP-508, *CCP Standard Real-Time Radiography Inspection Procedure*
37. CCP-TP-509, *CCP Remote-Handled Transuranic Container Tracking*
38. CCP-TP-511, *CCP Peer Review*
39. CCP-TP-512, *CCP Remote-Handled Waste Sampling*
40. CCP-TP-513, *CCP Procedure for Dimensional or Gravimetric Measurements for Radiological Characterization of Remote-Handled Transuranic Waste*
41. CCP-TP-530, *CCP RH TRU Waste Certification and WWIS Data Entry*

I have read the listed initial/indoctrination reading and understand my responsibilities as applicable to the procedures above.

Trainee Signature — Date: 10/26/12

Remote Handled (RH)
Site Project Manager (SPM)
Qualification Card

Name: Richard (Rich) Kantrowitz

Email Address: [redacted]

Document	Additional Training Requirements	
CCP-PO-001	1. WAP/QAPjP Briefing and Test	Michele Billett 10/26/12 CCP Training Date
	2. Hazardous Waste Number Assignments Briefing and Test	Michele Billett 10/26/12 CCP Training Date
CCP-VE-101	3. Visual Examination (VE) TRU Waste Characterization Briefing	8-27-13 Michele Billett 10/26/12 CCP SPM Date
CCP-RTR-101	4. Real-Time Radiography TRU Waste Characterization Briefing.	8-27-13 Michele Billett 10/26/12 CCP SPM Date

Formal Training	OJT Knowledge Requirements	Subject Matter Expert (SME)/OJT Signature/Date
DOE/WIPP 02-3214	1. Define Environmental Protection Agency's (EPA) definition of Visual Examination (VE) of record. Provide an example.	Irene Pinta 6/14/12
	2. Explain how CCP-TP-500 satisfies the EPA and New Mexico Environmental Department (NMED) criteria.	Irene Pinta 6/14/12
	3. State the Data Quality Objectives (DQO) and Quality Assurance Objectives (QAO) for each characterization method (e.g., Dose-to-Curie, VE).	Irene Pinta 6/14/12
CCP-PO-001	4. State the purpose of CCP-TP-506.	Irene Pinta 6/14/12
	5. Define the term "prohibited item" and give two examples of prohibited items.	Irene Pinta 6/14/12
	6. Identify the document allowing WIPP to receive and store TRU-mixed waste.	Irene Pinta 6/14/12
	7. Identify and describe the four major methods used by CCP to characterize TRU waste.	Irene Pinta 6/14/12
	8. State three (3) instances when a nonconformance report (NCR) is required for Real-Time Radiography (RTR).	Irene Pinta 6/14/12

Remote Handled (RH)
Site Project Manager (SPM)
Qualification Card

Name: Richard (Rich) Kantrowitz

Email Address: [redacted]

	9. State when an NCR is written for VE.	Jane Doe 6/14/12
	10. State when an NCR is written for Headspace Gas (HSG) Sampling and Analysis.	Jane Doe 6/14/12
	11. State the difference between a "Z" qualifier and a "J" qualifier.	Jane Doe 6/14/12
	12. State when a "B" qualifier is used.	Jane Doe 6/14/12
	13. State when a replicate waste drum is run in RTR.	Jane Doe 6/14/12
CCP-PO-002	14. State which sites are authorized to ship PCB waste.	Jane Doe 6/14/12
	15. State the maximum allowed curies per liter activity level (averaged over the volume of the canister).	Jane Doe 6/14/12
	16. State if machine-compacted waste is allowed to ship to the Waste Isolation Pilot Plant (WIPP).	Jane Doe 6/14/12
CCP-QP-005	17. State one major purpose for the nonconformance control program.	Jane Doe 6/14/12
	18. Identify who can initiate an NCR.	Jane Doe 6/14/12
CCP-QP-008	19. List the responsibilities of record generators.	Jane Doe 6/14/12
	20. State the storage and control requirements for CCP records.	Jane Doe 6/14/12 6/14/12
	21. Explain the process and proper method to make corrections or revisions to CCP records.	Jane Doe 6/14/12
CCP-QP-010	22. State the importance of using approved documents.	Jane Doe 6/14/12
	23. State when to verify a document revision.	Jane Doe 6/14/12
CCP-PO-505	24. Discuss the differences in the transportation requirement for RH-TRU 72-B and CNS 10-160B versus the TRUPACT-II.	Jane Doe 6/14/12

Remote Handled (RH)
Site Project Manager (SPM)
Qualification Card

Name: Richard (Rich) Kantrowitz

Email Address: [redacted]

CCP-TP-511	25. State the peer review requirements.	6/14/12
CCP-TP-512	26. Discuss the QAOs for radiochemistry and ICP-MS batch data report (BDR).	6/14/12
CCP-TP-162	27. Discuss the components of statistical sampling.	6/14/12
	28. Discuss the components of solid and soil sampling and analysis.	6/14/12
CCP-QP-005 CCP-QP-006	29. Discuss the components of the NCR and CAR process.	6/14/12
Formal Training	**OJT Practical Requirements**	**SME/OJT Signature/Date**
CCP-TP-002	1. Demonstrate proficiency of characterization information summary reports.	10/23/12
CCP-TP-500	2. Demonstrate proficiency in review of the RH visual examination BDRs.	10/23/12
CCP-TP-504	3. Demonstrate proficiency in the review of 'Dose-to-Curie" BDR.	10/24/12 10/24/12
CCP-TP-506	4. Complete a Characterization Reconciliation Report (CRR).	10/24/12
CCP-TP-508	5. Demonstrate proficiency in review of the RH Real-time Radiography (RTR) BDRs.	10/24/12
	6. Demonstrate the verification of a container meeting the applicable content code limit.	10/24/12
CCP-TP-512	7. Demonstrate proficiency in the review of "Remote-Handled Waste Sample" BDR.	10/24/12
CCP-TP-513	8. Demonstrate proficiency in the review of Dimensional/Gravimetric Batch Data Report.	10/24/12
	9. Demonstrate proficiency in the review of Radiological Documentation Package.	10/24/12

Remote Handled (RH)
Site Project Manager (SPM)
Qualification Card

Name: Richard (Rich) Kantrowitz

Email Address: [redacted]

Approvals	
I have completed formal training and received OJT for this position. I fully understand my responsibilities as a RH SPM.	Richard Kantrowitz 10/26/12 Trainee *(printed name and signature)* Date
I have monitored the training of this individual and believe they are ready to perform the duties of a RH SPM. *(Validation by the SME/OJT instructor(s) involved in the training of this individual).*	Irene Quintana 10/24/12 SME/OJT Instructor *(printed name and signature)* Date
	Laura Nelson 10/24/12 SME/OJT Instructor *(printed name and signature)* Date
I approve this employee to perform the duties of a RH SPM.	Mark Pearcy 10/29/12 CCP Lead or Alternate SPM *(printed name and signature)* Date

Approved for Content & Format: **Irene Quintana (Approval on File)** **04/26/12**
SME/OJT Date

Approved for Content: **Mark Pearcy (Approval on File)** **04/26/12**
CCP Lead or Alternate SPM Date

Approved for Use: **A.J. Fisher (Approval on File)** **04/26/12**
CCP Manager Responsible for Training Date

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Contact Handled (CH)
Site Project Manager (SPM)
Qualification Card

Name: Rich Kantrowitz

Education/Experience	
Resume documenting education and experience on file with Central Characterization Program (CCP) Training.	Michele Billetts 2/5/15 CCP Training — Date

Job Specific Training	
Qualification Limit	There is no qualification limit for this position. This qualification is a one-time-only requirement. Unsatisfactory performance will result in disqualification. If unsatisfactory performance is determined, the complete qualification card, including the On-the-Job Training (OJT) portions, must be completed to re-establish qualification.
Requalification Requirements	Not required. See above statement.

Indoctrination

Initial/Indoctrination Reading:

1. WP 15-GM1002, *Issues Management Processing of WIPP Forms* .
2. CCP-CM-001, *CCP Equipment Change Authorization and Documentation*
3. CCP-HSP-014, *Health and Safety Program Implementation for CCP*
4. CCP-PO-001, *CCP Transuranic Waste Characterization Quality Assurance Project Plan*
5. CCP-PO-002, *CCP Transuranic Waste Certification Plan*
6. CCP-PO-003, *CCP Transuranic Authorized Methods for Payload Control (CCP CH-TRAMPAC)*
7. CCP-PO-005, *CCP Conduct of Operations*
8. CCP-PO-050, *CCP TRUPACT-III TRU Waste Authorized Methods for Payload Control (CCP TRUPACT-III TRAMPAC)*
9. CCP-QP-002, *CCP Training and Qualification Plan*
10. CCP-QP-005, *CCP TRU Nonconforming Item Reporting and Control*
11. CCP-QP-008, *CCP Records Management*
12. CCP-QP-010, *CCP Document Preparation, Approval, and Control*
13. CCP-QP-019, *CCP Quality Assurance Reporting to Management*
14. CCP-QP-022, *CCP Software Quality Assurance Plan*
15. CCP-TP-001, *CCP Project Level Data Validation and Verification*
16. CCP-TP-002, *CCP Reconciliation of DQOs and Reporting Characterization Data*
17. CCP-TP-005, *CCP Acceptable Knowledge Documentation*
18. CCP-TP-006, *CCP Visual Examination Technique for Idaho National Laboratory (INL) Newly Generated TRU Waste*
19. CCP-TP-030, *CCP CH TRU Waste Certification and WWIS/WDS Data Entry*
20. CCP-TP-035, *CCP Container Management*
21. CCP-TP-053, *CCP Standard Real-Time Radiography (RTR) Inspection Procedure*
22. CCP-TP-058, *CCP NDA Performance Demonstration Program*
23. CCP-TP-068, *CCP Standardized Container Management*

Contact Handled (CH)
Site Project Manager (SPM)
Qualification Card

Name: Rich Kantrowitz

24. CCP-TP-113, *CCP Standard Contact-Handled Waste Visual Examination*
25. CCP-TP-120, *CCP Container Management*
26. CCP-TP-138, *CCP Execution of Long-Term Objective for the Unified Flammable Gas Test Procedure*
27. CCP-TP-163, *CCP Evaluation of Waste Packaging Records for Visual Examination of Records*

I have read the listed Initial/Indoctrination Reading and understand my responsibilities as applicable to the procedures above.	Trainee	2/19/15 Date

Additional Training Requirements

CCP-PO-001	1. WAP/QAPjP Briefing and Test	CCP Training	02-05-15 Date
HAZ-ID-101	2. Hazardous Waste Identification (Self-Paced Module)	CCP Training	2/4/15 Date
CCP-VE-101	3. Visual Examination (VE) TRU Waste Characterization Briefing	CCP Training	2/4/15 Date
CCP-RTR-101	4. Real-Time Radiography (RTR) TRU Waste Characterization Briefing	CCP Training	2/3/15 Date

Formal Training	OJT Knowledge Requirements	Subject Matter Expert (SME)/OJT Signature/Date
CCP-PO-001	1. State the regulator who governs hazardous waste.	2/9/15
	2. Define the term "prohibited item" and give five examples of prohibited items.	2/9/15
	3. Identify the document allowing Waste Isolation Pilot Plant (WIPP) to receive and store TRU-mixed waste.	2/9/15
	4. Identify and describe the three major methods used to characterize TRU waste.	2/9/15
	5. State the Data Quality Objectives (DQOs) for VE/RTR.	2/9/15
	6. Name at least 2 DQOs for Acceptable Knowledge (AK).	2/9/15

Contact Handled (CH)
Site Project Manager (SPM)
Qualification Card

Name: Rich Kantrowitz

	7. State the five (5) Quality Assurance Objectives (QAOs).	2/16/15
	8. Define waste stream.	2/9/15
	9. Define waste matrix code.	2/9/15
	10. Describe the three (3) summary category groups.	2/9/15
CCP-PO-002	11. Define TRU waste.	2/9/15
	12. Define TRU-mixed waste.	2/9/15
	13. List the 10 radionuclides that must be reported.	2/9/15
	14. List the agency which governs radiological waste.	2/9/15
	15. State which document is the driver for non-destructive assay (NDA).	2/9/15
	16. State which type of radioactive waste is accepted at the WIPP (limited by The Land Withdrawal Act, as stated in the WIPP Waste Acceptance Criteria (WAC)).	2/9/15
CCP-QP-005	17. State one major purpose for the nonconformance control program.	2/9/15
	18. Identify who can initiate a non-conformance report (NCR).	2/9/15
	19. State how to review a NCR.	2/9/15
	20. Explain how to verify corrective actions.	2/9/15
	21. Explain the difference between a final disposition of 'Use As Is' and 'Rework.'	2/9/15
	22. Describe the process if an NCR generated at Project Level is determined to be "reportable."	2/9/15
WP 15-GM1002	23. Describe the purpose of the WIPP Form process.	2/9/15

Contact Handled (CH)
Site Project Manager (SPM)
Qualification Card

Name: Rich Kantrowitz

CCP-TP-001	24.	State the person responsible for originating a WIPP Form.	2/9/15
	25.	Describe how WIPP Forms are documented.	2/9/15
	26.	Describe who has responsibility for processing WIPP Forms, approving Corrective Action Plans, and approving closure of WIPP Forms.	2/9/15
	27.	Describe actions personnel may take when conditions adverse to quality are discovered.	2/9/15
	28.	State which characterization data requires SPM review and validation and verification.	2/9/15
	29.	Explain how to ensure data is within the established criteria and meets the applicable QAOs.	2/9/15
	30.	State the percentage of Batch Data Reports (BDRs) that must undergo SPM review.	2/9/15
	31.	Explain when it is allowed to review BDRs with containers not on the AK Tracking Spreadsheet.	2/9/15
	32.	State when an SPM must provide comments or justifications when completing an SPM checklist.	2/9/15
	33.	Explain the differences between "editorial" changes and "data affecting" changes.	2/9/15
	34.	State how the SPM documents the data generation level (DGL) data review, validation, and verification is being performed in accordance with applicable procedures.	2/9/15
CCP-TP-002	35.	Discuss the components of a Characterization Information Summary (CIS).	2/9/15
	36.	Discuss how to complete and prepare the Waste Stream Characterization Package.	2/9/15
	37.	Explain how to verify the waste stream characterization meets the WAP requirements.	2/9/15
	38.	Explain how to ensure the data generated meets the DQO's.	2/9/15
CCP-TP-005	39.	Define the term "acceptable knowledge" and state one use/purpose for acceptable knowledge.	2/9/15
	40.	Discuss how to resolve AK discrepancies.	2/9/15

Contact Handled (CH)
Site Project Manager (SPM)
Qualification Card

Name: Rich Kantrowitz

	41. Explain how to document the EPA Code modification to the Container Information Summary.	2/9/15
	42. State where acceptable knowledge information is documented.	2/9/15
	43. Discuss the AK sufficiency elements.	2/9/15
	44. State the purpose of the NDA Memo and who assists in its generation.	2/9/15
Formal Training	**OJT Practical Requirements**	**SME/OJT Signature/Date**
CCP-QP-005	1. Generate a NCR.	2-18-15
CCP-TP-001	2. Verify the data generation level independent review has been performed.	2/10/15
	3. Verify the appropriate BDR checklists are complete.	2/10/15
	4. Verify the data is within the established criteria and meets the applicable QAO's.	2/10/15
	5. Prepare the Data Validation Summary.	2/10/15
	6. Demonstrate proficiency in the review of RTR BDRs.[1]	2/10/15
	7. Demonstrate proficiency in the review of NDA BDRs.[1]	2/10/15
	8. Demonstrate proficiency in the review of VE BDRs.[1]	2/10/15
CCP-TP-002	9. Compile the Container Information Summary Report.	2/16/15
	10. Ensure the data generated meets the DQOs.	2/16/15
CCP-TP-005	11. Document EPA Code modification to the Container Information Summary.	2/16/15

[1] Proficiency will be demonstrated after the completion of BDR reviews in each discipline under the supervision of a qualified SPM SME.

Contact Handled (CH)
Site Project Manager (SPM)
Qualification Card

Name: Rich Kantrowitz

Approvals	
I have completed formal training and received OJT for this position. I fully understand my responsibilities as a CH SPM.	Richard Kantrowitz 2/19/15 Trainee *(printed name and signature)* Date
I have monitored the training of this individual and believe they are ready to perform the duties of a CH SPM. *(Validation by the SME/OJT instructor(s) involved in the training of this individual.)*	Barbara J. Broomfield 2/16/15 SME/OJT Instructor *(printed name and signature)* Date MIKE RAMIREZ 2-18-15 SME/OJT Instructor *(printed name and signature)* Date
I approve this employee to perform the duties of a CH SPM.	MIKE RAMIREZ 2-18-15 (19) MR 2-19-15 Barbara J. Broomfield 2/16/15 SPM *(printed name and signature)* Date

Approved for Content & Format:	**Richard Kantrowitz** ***(Approval on File)***	**09/17/2014**
	SME/OJT	Date
Approved for Content:	**Mike Ramirez** ***(Approval on File)***	**09/17/2014**
	SPM	Date
Approved for Applicability, Content, Format, & Use:	**A.J. Fisher** ***(Approval on File)***	**09/17/2014**
	Manager Responsible for Training	Date

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Remote Handled (RH) Site Project Manager (SPM) Qualification Card

Name: David Moody

Education/Experience	
Resume documenting education and experience on file with National TRU Program Certification (NTPC) Training.	NTPC Training — Date: 08-28-13

Job Specific Training	
Qualification Limit	There is no qualification limit for this position. This qualification is a one-time-only requirement. Upon completion of this core qualification card, the Trainee is qualified to perform Site Project Manager (SPM) duties for Remote Handled Waste. Unsatisfactory performance will result in disqualification. If unsatisfactory performance is determined, the complete qualification card, including the On-the-Job Training (OJT) portions, must be completed to re-establish qualification.
Requalification Requirements	Not required. See above statement.

Indoctrination

Initial/Indoctrination Reading:

1. ✓ DOE/WIPP 02-3214, *Remote-Handled TRU Waste Characterization Program Implementation Plan (WCPIP)*
2. ✓ CCP-CM-001, *CCP Equipment Change Authorization and Documentation*
3. CCP-HSP-01, *Health and Safety Program Implementation for CCIP*
4. ✓ CCP-PO-001, *CCP Transuranic Waste Characterization Quality Assurance Project Plan*
5. CCP-PO-002, *CCP Transuranic Waste Certification Plan*
6. CCP-PO-505, *CCP Remote-Handled Transuranic Waste Authorized Methods for Payload Control (CCP RH-TRAMPAC)*
7. CCP-QP-002, *CCP Training and Qualification Plan*
8. CCP-QP-005, *CCP TRU Nonconforming Item Reporting and Control*
9. CCP-QP-008, *CCP Records Management*
10. CCP-QP-010, *CCP Document Preparation, Approval, and Control*
11. ✓ CCP-QP-015, *CCP Procurement*
12. ✓ CCP-QP-016, *CCP Control of Measuring and Testing Equipment*
13. ✓ CCP-QP-018, *CCP Management Assessment*
14. ✓ CCP-QP-022, *CCP Software Quality Assurance Plan*
15. ✓ CCP-QP-023, *CCP Handling, Storage, and Shipping*
16. ✓ CCP-QP-027, *CCP Test Control*
17. ✓ CCP-QP-028, *CCP Records Filing, Inventorying, Scheduling, and Dispositioning*
18. ✓ CCP-QP-029, *CCP Corrective Action Management*
19. ✓ CCP-QP-036, *CCP Qualification of Acceptable Knowledge for Remote-Handled Transuranic Waste Through a Quality Assurance Equivalency Demonstration*
20. CCP-TP-001, *CCP Project Level Data Validation and Verification*
21. ✓ CCP-TP-002, *CCP Reconciliation of DQOs and Reporting Characterization Data*
22. ✓ CCP-TP-005, *CCP Acceptable Knowledge Documentation*

Remote Handled (RH) Site Project Manager (SPM) Qualification Card

Name: David Moody

23. ✓ CCP-TP-028, *CCP Radiographic Test Drum and Training Container Construction*
24. ✓ CCP-TP-053, *CCP Standard Real-Time Radiography (RTR) Inspection Procedure*
25. ✓ CCP-TP-058, *CCP NDA Performance Demonstration Program*
26. ✓ CCP-TP-163, *CCP Evaluation of Waste Packaging Records for Visual Examination of Records*
27. ✓ CCP-TP-500, *CCP Remote-Handled Waste Visual Examination*
28. ✓ CCP-TP-504, *CCP Dose-to-Curie Survey Procedure for Remote-Handled Transuranic Waste*
29. ✓ CCP-TP-506, *CCP Preparation of the Remote-Handled Transuranic Waste Acceptable Knowledge Characterization Reconciliation Report*
30. ✓ CCP-TP-508, *CCP RH Standard Real-Time Radiography Inspection Procedure*
31. ✓ CCP-TP-509, *CCP Remote-Handled Transuranic Container Tracking*
32. ✓ CCP-TP-511, *CCP Peer Review*
33. ✓ CCP-TP-512, *CCP Remote-Handled Waste Sampling*
34. ✓ CCP-TP-513, *CCP Procedure for Dimensional or Gravimetric Measurements for Radiological Characterization of Remote- Handled Transuranic Waste*
35. ✓ CCP-TP-514, *CCP Procedure for Radiological Calculation Package Submittal*
36. ✓ CCP-TP-530, *CCP RH TRU Waste Certification and WWIS/WDS Data Entry*

I have read the listed Initial/Indoctrination Reading and understand my responsibilities as applicable to the procedures above.	David W Moody Trainee Sigmature	13 Aug 13 Date

Additional Training Requirements

CCP-PO-001	1. WAP/QAPjP Briefing and Test	Cheryl Bruno NTIPC Training	08-28-13 Date
Haz-Waste-101	2. Hazardous Waste Number Assignments Briefing and Test	Cheryl Bruno NTIPC Training	08-28-13 Date
CCP-VE-101	3. Visual Examination (VE) TRU Waste Characterization Briefing	[signature] SPM	8/28/13 8/14/13 Date
CCP-RTR-101	4. Real-Time Radiography (RTR) TRU Waste Characterization Briefing.	[signature] SPM	8/28/13 8/14/13 Date

Remote Handled (RH)
Site Project Manager (SPM)
Qualification Card

Name: David Moody

Formal Training	OJT Knowledge Requirements	Subject Matter Expert (SME)/OJT Signature/Date
DOE/WIPP 02-3214	1. Define Environmental Protection Agency's (EPA) definition of VE of record. Provide an example..	Hanford West Valley Gene Joo 8/14/13
	2. Explain how CCP-TP-500 satisfies the EPA and New Mexico Environmental Department (NMED) critteria.	need pip & NMED Gene Joo 8/14/13
	3. State the Data Quality Objectives (DQOs) for Dose-to-Curie (DTC), VE, and RTR.	Gene Joo 8/14/13
	4. State the purpose of CCP-TP-506.	w SOQA Gene Joo 8/14/13
CCP-PO-001	5. State the regulator who governs hazardous waste:.	Gene Joo 8/14/13
	6. Define the term "prohibited item" and give five examples of prohibited items.	Gene Joo 8/14/13
	7. Identify the document allowing WIPP to receive and store TRU-mixed waste.	Gene Joo 8/14/13
	8. Identify and describe the three major methods used to characterize TRU waste.	Gene Joo 8/14/13
	9. Name at least two (2) DQOs for Acceptable Knowledge (AK).	Gene Joo 8/14/13
	10. State the five (5) QAOs.	Gene Joo 8/14/13
	11. Define waste stream.	Gene Joo 8/14/13
	12. Define waste matrix code.	Gene Joo 8/14/13
	13. Describe the three (3) summary category groups..	Gene Joo 8/14/13
CCP-PO-002	14. Define TRU waste.	Gene Joo 8/14/13
	15. Define TRU-mixed waste.	Gene Joo 8/14/13
	16. List the 10 radionuclides that must be reported.	Gene Joo 8/14/13
	17. List the agency which governs radiological waste.	Gene Joo 8/14/13

Remote Handled (RH)
Site Project Manager (SPM)
Qualification Card

Name: David Moody

	35. Explain the differences between "editorial" changes and "data affecting" changes.	8/14/13
	36. State how the SPM documents the DGL data review, validation, and verification is being performed in accordance with applicable procedures.	8/14/13
CCP-TP-002	37. Discuss the components of a Characterization Information Summary (CIS).	8/14/13
CCP-TP-511	38. State the peer review requirements.	8/14/13
CCP-TP-512	39. Discuss the QAOs for radiochemistry and ICP-MS batch data report (BDR).	8/14/13

Formal Training	OJT Practical Requirements	SME/OJT Signature/Date
CCP-TP-002	1. Demonstrate proficiency of characterization information summary reports.	Laura Nelson 8/14/13
CCP-TP-500	2. Demonstrate proficiency in review of the RH VE BDRs.	Laura Nelson 8/14/13
CCP-TP-504	3. Demonstrate proficiency in the review of DTC BDR.	Laura Nelson 8/14/13
CCP-TP-506	4. Complete a Characterization Reconciliation Report (CRR).	Laura Nelson 8/14/13
CCP-TP-508	5. Demonstrate proficiency in review of the RH RTR BDRs.	Laura Nelson 8/14/13
	6. Demonstrate the verification of a container meeting the applicable content code limit.	Laura Nelson 8/14/13
CCP-TP-512	7. Demonstrate proficiency in the review of "Remote-Handled Waste Sample" BDR.	Laura Nelson 8/14/13
CCP-TP-513	8. Demonstrate proficiency in the review of Dimensional/Gravimetric BDR.	Laura Nelson 8/14/13
	9. Demonstrate proficiency in the review of Radiological Documentation Package.	Laura Nelson 8/14/13

Remote Handled (RH)
Site Project Manager (SPM)
Qualification Card

Name: David Moody

Approvals	
I have completed formal training and received OJT for this position. I fully understand my responsibilities as a RH SPM.	David W. Moody 8.28.13 / David W. Moody 14 Aug 13 Trainee *(printed name and signature)* — Date
I have monitored the training of this individual and believe they are ready to perform the duties of a RH SPM. *(Validation by the SME/OJT instructor(s) involved in the training of this individual).*	Laura Nelson Laura Nelson 8/14/13 SME/OJT Instructor *(printed name and signature)* — Date
	Irene Joo Irene Joo 8/14/13 SME/OJT Instructor *(printed name and signature)* — Date
I approve this employee to perform the duties of a RH SPM.	Joshua Houghton 8/28/13 SPM *(printed name and signature)* — Date

Approved for Content & Format:	**Irene Joo *(Approval on File)***	**07/31/2013**
	SME/OJT	Date
Approved for Content:	**Richard Kanttrowitz *(Approval on File)***	**07/31/2013**
	SPM	Date
Approved for Applicability, Content, Format, & Use:	**A.J. Fisher *(Approval on File)***	**07/31/2013**
	Manager Responsible for Training	Date

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Contact Handled (CH)
Site Project Manager (SPM)
Qualification Card

Name: Dave Moody

Education/Experience	
Resume documenting education and experience on file with Central Characterization Program (CCP) Training.	Michele Billett 7/9/15 CCP Training Date

Job Specific Training	
Qualification Limit	There is no qualification limit for this position. This qualification is a one-time-only requirement. Unsatisfactory performance will result in disqualification. If unsatisfactory performance is determined, the complete qualification card, including the On-the-Job Training (OJT) portions, must be completed to re-establish qualification.
Requalification Requirements	Not required. See above statement.

Indoctrination

Initial/Indoctrination Reading:

1. WP 15-GM1002, *Issues Management Processing of WIPP Forms*
2. CCP-CM-001, *CCP Equipment Change Authorization and Documentation*
3. CCP-HSP-014, *Health and Safety Program Implementation for CCP*
4. CCP-PO-001, *CCP Transuranic Waste Characterization Quality Assurance Project Plan*
5. CCP-PO-002, *CCP Transuranic Waste Certification Plan*
6. CCP-PO-003, *CCP Transuranic Authorized Methods for Payload Control (CCP CH-TRAMPAC)*
7. CCP-PO-005, *CCP Conduct of Operations*
8. CCP-PO-050, *CCP TRUPACT-III TRU Waste Authorized Methods for Payload Control (CCP TRUPACT-III TRAMPAC)*
9. CCP-QP-002, *CCP Training and Qualification Plan*
10. CCP-QP-005, *CCP TRU Nonconforming Item Reporting and Control*
11. CCP-QP-008, *CCP Records Management*
12. CCP-QP-010, *CCP Document Preparation, Approval, and Control*
13. CCP-QP-019, *CCP Quality Assurance Reporting to Management*
14. CCP-QP-022, *CCP Software Quality Assurance Plan*
15. CCP-TP-001, *CCP Project Level Data Validation and Verification*
16. CCP-TP-002, *CCP Reconciliation of DQOs and Reporting Characterization Data*
17. CCP-TP-005, *CCP Acceptable Knowledge Documentation*
18. CCP-TP-006, *CCP Visual Examination Technique for Idaho National Laboratory (INL) Newly Generated TRU Waste*
19. CCP-TP-030, *CCP CH TRU Waste Certification and WWIS WDS Data Entry*
20. CCP-TP-035, *CCP Container Management*
21. CCP-TP-053, *CCP Standard Real-Time Radiography (RTR) Inspection Procedure*
22. CCP-TP-058, *CCP NDA Performance Demonstration Program*
23. CCP-TP-068, *CCP Standardized Container Management*

Contact Handled (CH)
Site Project Manager (SPM)
Qualification Card

Name: Dave Moody

24. CCP-TP-113, *CCP Standard Contact-Handled Waste Visual Examination*
25. CCP-TP-120, *CCP Container Management*
26. CCP-TP-138, *CCP Execution of Long-Term Objective for the Unified Flammable Gas Test Procedure*
27. CCP-TP-163, *CCP Evaluation of Waste Packaging Records for Visual Examination of Records*

I have read the listed Initial/Indoctrination Reading and understand my responsibilities as applicable to the procedures above.	Dave W Moody Trainee	28 May 2015 Date

Additional Training Requirements

CCP-PO-001	1.	WAP/QAPjP Briefing and Test	Michele Billett 7/9/15 CCP Training Date
HAZ-ID-101	2.	Hazardous Waste Identification (Self-Paced Module)	Michele Billett 7/9/15 CCP Training Date
CCP-VE-101	3.	Visual Examination (VE) TRU Waste Characterization Briefing	Michele Billett 7/9/15 CCP Training Date
CCP-RTR-101	4.	Real-Time Radiography (RTR) TRU Waste Characterization Briefing	Michele Billett 7/9/15 CCP Training Date

Formal Training		OJT Knowledge Requirements	Subject Matter Expert (SME)/OJT Signature/Date
CCP-PO-001	1.	State the regulator who governs hazardous waste.	5/28/15
	2.	Define the term "prohibited item" and give five examples of prohibited items.	5/28/15
	3.	Identify the document allowing Waste Isolation Pilot Plant (WIPP) to receive and store TRU-mixed waste.	5/28/15
	4.	Identify and describe the three major methods used to characterize TRU waste.	5/28/15
	5.	State the Data Quality Objectives (DQOs) for VE/RTR.	5/28/15
	6.	Name at least 2 DQOs for Acceptable Knowledge (AK).	5/28/15

Contact Handled (CH)
Site Project Manager (SPM)
Qualification Card

Name: Dave Moody

CCP-PO-002	7. State the five (5) Quality Assurance Objectives (QAOs).	RM KTA 5/28/15
	8. Define waste stream.	RM KTA 5/28/15
	9. Define waste matrix code.	RM KTA 5/28/15
	10. Describe the three (3) summary category groups.	RM KTA 5/28/15
	11. Define TRU waste.	RM KTA 5/28/15
	12. Define TRU-mixed waste.	RM KTA 5/28/15
	13. List the 10 radionuclides that must be reported.	RM KTA 5/28/15
	14. List the agency which governs radiological waste.	RM KTA 5/28/15
	15. State which document is the driver for non-destructive assay (NDA).	RM KTA 5/28/15
	16. State which type of radioactive waste is accepted at the WIPP (limited by The Land Withdrawal Act, as stated in the WIPP Waste Acceptance Criteria (WAC)).	RM KTA 5/28/15
CCP-QP-005	17. State one major purpose for the nonconformance control program.	RM KTA 5/28/15
	18. Identify who can initiate a non-conformance report (NCR).	RM KTA 5/28/15
	19. State how to review a NCR.	RM KTA 5/28/15
	20. Explain how to verify corrective actions.	RM KTA 5/28/15
	21. Explain the difference between a final disposition of 'Use As Is' and 'Rework.'	RM KTA 5/28/15
	22. Describe the process if an NCR generated at Project Level is determined to be "reportable."	RM KTA 5/28/15
WP 15-GM1002	23. Describe the purpose of the WIPP Form process.	RM KTA 5/28/15

Contact Handled (CH)
Site Project Manager (SPM)
Qualification Card

Name: Dave Moody

CCP-TP-001	24. State the person responsible for originating a WIPP Form.	5/28/15
	25. Describe how WIPP Forms are documented.	5/28/15
	26. Describe who has responsibility for processing WIPP Forms, approving Corrective Action Plans, and approving closure of WIPP Forms.	5/28/15
	27. Describe actions personnel may take when conditions adverse to quality are discovered.	5/28/15
	28. State which characterization data requires SPM review and validation and verification.	5/28/15
	29. Explain how to ensure data is within the established criteria and meets the applicable QAOs.	5/28/15
	30. State the percentage of Batch Data Reports (BDRs) that must undergo SPM review.	5/28/15
	31. Explain when it is allowed to review BDRs with containers not on the AK Tracking Spreadsheet.	5/28/15
	32. State when an SPM must provide comments or justifications when completing an SPM checklist.	5/28/15
	33. Explain the differences between "editorial" changes and "data affecting" changes.	5/28/15
CCP-TP-002	34. State how the SPM documents the data generation level (DGL) data review, validation, and verification is being performed in accordance with applicable procedures.	5/28/15
	35. Discuss the components of a Characterization Information Summary (CIS).	5/28/15
	36. Discuss how to complete and prepare the Waste Stream Characterization Package.	5/28/15
CCP-TP-005	37. Explain how to verify the waste stream characterization meets the WAP requirements.	5/28/15
	38. Explain how to ensure the data generated meets the DQO's.	5/28/15
	39. Define the term "acceptable knowledge" and state one use/purpose for acceptable knowledge.	5/28/15
	40. Discuss how to resolve AK discrepancies.	5/28/15

Contact Handled (CH)
Site Project Manager (SPM)
Qualification Card

Name: Dave Moody

	41. Explain how to document the EPA Code modification to the Container Information Summary.	RLM KTC 5/28/15
	42. State where acceptable knowledge information is documented.	RLM KTC 5/28/15
	43. Discuss the AK sufficiency elements.	RLM KTC 5/28/15
	44. State the purpose of the NDA Memo and who assists in its generation.	RLM KTC 5/28/15
Formal Training	**OJT Practical Requirements**	**SME/OJT Signature/Date**
CCP-QP-005	1. Generate a NCR.	RLM KTC 5/29/15
CCP-TP-001	2. Verify the data generation level independent review has been performed.	RLM KTC 5/29/15
	3. Verify the appropriate BDR checklists are complete.	RLM KTC 5/29/15
	4. Verify the data is within the established criteria and meets the applicable QAO's.	RLM KTC 5/29/15
	5. Prepare the Data Validation Summary.	RLM KTC 5/29/15
	6. Demonstrate proficiency in the review of RTR BDRs.[1]	RLM KTC 5/29/15
	7. Demonstrate proficiency in the review of NDA BDRs.[1]	RLM KTC 5/29/15
	8. Demonstrate proficiency in the review of VE BDRs.[1]	RLM KTC 5/29/15
CCP-TP-002	9. Compile the Container Information Summary Report.	RLM KTC 7/8/15
	10. Ensure the data generated meets the DQOs.	RLM KTC 7/8/15
CCP-TP-005	11. Document EPA Code modification to the Container Information Summary.	RLM KTC 7/8/15

[1] Proficiency will be demonstrated after the completion of BDR reviews in each discipline under the supervision of a qualified SPM SME.

Contact Handled (CH)
Site Project Manager (SPM)
Qualification Card

Name: Dave Moody

Approvals	
I have completed formal training and received OJT for this position. I fully understand my responsibilities as a CH SPM.	DAVID W MOODY Dave W Moody 8 July 15 Trainee *(printed name and signature)* Date
I have monitored the training of this individual and believe they are ready to perform the duties of a CH SPM. *(Validation by the SME OJT instructor(s) involved in the training of this individual.)*	Richard Kantrowitz 7/8/15 SME/OJT Instructor *(printed name and signature)* Date
	N/A SME/OJT Instructor *(printed name and signature)* Date
I approve this employee to perform the duties of a CH SPM.	MIKE RAMIREZ Mike Ramirez 7-9-2015 SPM *(printed name and signature)* Date

Approved for Content & Format: **Richard Kantrowitz *(Approval on File)*** **09/17/2014**
SME/OJT Date

Approved for Content: **Mike Ramirez *(Approval on File)*** **09/17/2014**
SPM Date

Approved for Applicability, Content, Format, & Use: **A.J. Fisher *(Approval on File)*** **09/17/2014**
Manager Responsible for Training Date

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Site Project Manager (SPM) Qualification Card

Name: Beverly Schrock	Badge Number: [redacted]
Email Address: [redacted]	

The requirements of this document are the result of an evaluation as described in CCP-QP-002, *CCP Training and Qualification Plan.*

Education / Experience

Trainee has been selected for this position based on their education, prior-experience, additional certifications, training, etc., as documented in the CCP training files.	Mark Pearcy Mark Pearcy CCP Program Manager	3/2/10 Date

Job Specific Training

Qualification Limit	There is no qualification limit for this position. This qualification is a one-time-only requirement. Upon completion of this core qualification card, the Trainee is qualified to perform SPM duties. Site specific qualification (i.e., BDR review) is valid for the site(s) with completed addenda. Unsatisfactory performance will result in disqualification. If unsatisfactory performance is determined, the qualification card and OJT process must be completed to re-establish qualification.
Requalification Requirements	Not required. See above statement.

Indoctrination

WAP/QAPjP Briefing and Test	Alyca Atwood CCP Training	3/8/10 Date
Hazardous Waste Code Assignments Briefing and Test	Alyca Atwood CCP Training	3/8/10 Date
Solid and Soils Sampling and Analysis for Site Project Managers (SPM) Briefing	Michael Valentine Site Project Manager	5/12/10 Date
NCR / CAR Briefing (Provided by CCP/QA Organization)	Christine Gomez CCP/QA Organization	3/10/10 Date
Statistical Sampling Briefing	Thomas Gallegos Site Project Manager	3/22/10 Date

Trainee started qualification prior to revision of checklist. Based on new Process defined in CCP-QP-002 addendum are no longer applicable and the trainee is a qualified SPM. Mike Ramirez 2-5-2014

Site Project Manager (SPM) Qualification Card

Name: Beverly Schrock	Badge Number: [redacted]
Email Address: [redacted]	

Contact-Handled Waste VE and RTR Training	Larry Porter Larry Porter Site Project Manager	5/7/10 Date
Incompatibles Determination Training Module	Michael Valentine Site Project Manager	5/7/2010 Date

Required Reading:

1. WP 08.NT.03, *Waste Stream Profile form*
2. CCP-CM-001, *CCP Equipment Change Authorization and Documentation*
3. CCP-PO-001, *CCP Transuranic Waste Characterization Quality Assurance Project Plan*
4. CCP-PO-002, *CCP Transuranic Waste Certification Plan*
5. CCP-PO-003, *CCP TRUPACT-II Authorized Methods for Payload Control (TRAMPAC)*
6. CCP-PO-005, *CCP Conduct of Operations*
7. CCP-PO-008, *CCP Quality Assurance Interface with the WTS Quality Assurance Program*
8. CCP-QP-002, *CCP Training and Qualification Plan*
9. CCP-QP-004, *CCP Corrective Action Management*
10. CCP-QP-005, *CCP TRU Nonconforming Item Reporting and Control*
11. CCP-QP-006, *CCP Corrective Action Reporting and Control*
12. CCP-QP-008, *CCP Records Management*
13. CCP-QP-010, *CCP Document Preparation, Approval and Control*
14. CCP-QP-011, *CCP Notebooks & Logbooks*
15. CCP-QP-015, *CCP Procurement*
16. CCP-QP-016, *CCP Control of Measuring, Testing, and Data Collection Equipment*
17. CCP-QP-018, *CCP Management Assessment*
18. CCP-QP-022, *CCP TRU Software Quality Assurance*
19. CCP-QP-023, *CCP Handling, Storage, and Shipping*
20. CCP-QP-027, *CCP Test Control*
21. CCP-QP-028, *CCP Records Filing, Inventory, Scheduling, and Dispositioning*
22. CCP-QP-030, *CCP Written Practice for the Qualification of CCP Helium Leak Detection*
23. CCP-TP-001, *CCP Project Level Data Validation and Verification*
24. CCP-TP-002, *CCP Reconciliation of DQOs and Reporting Characterization Data*
25. CCP-TP-003, *CCP Sampling Design and Data Analysis for RCRA Characterization*
26. CCP-TP-005, *CCP Acceptable Knowledge Documentation*
27. CCP-TP-028, *CCP Radiographic Test and Training Drum Requirements*
28. CCP-TP-030, *CCP TRU Waste Certification and WWIS Data Entry*
29. CCP-TP-056, *CCP HSG Performance Demonstration Plan*
30. CCP-TP-058, *CCP NDA Performance Demonstration Plan*
31. CCP-TP-160, *CCP Random Selection of Containers for Headspace Gas Sampling and Analysis*

Site Project Manager (SPM) Qualification Card

Name: Beverly Schrock	Badge Number: [redacted]
Email Address: [redacted]	

I have read the listed required reading and understand my responsibilities as applicable to the procedures above.	Beverly S. Schrock 5-7-10 Trainee Signature Date
CCP-PO-005 - Conduct of Operations Comprehensive Exam	Alyca Atwood 5/8/10 CCP Training Date

Formal Training	On-the-job Training Knowledge Requirements	SME Signature / Date
CCP-PO-001	1. Define the term "prohibited item" and give two examples of prohibited items.	Larry Porta 5/7/10
	2. Identify the document that permits WIPP to receive and store hazardous mixed TRU waste.	Larry Porta 5/7/10
	3. Identify the four major methods used by CCP to characterize TRU waste and briefly describe each method.	Larry Porta 5/7/10
	4. State three (3) instances when an NCR is required for non-destructive examination (NDE).	Larry Porta 5/7/10
	5. State when an NCR is written for visual examination (VE).	Larry Porta 5/7/10
	6. State when an NCR is written for headspace gas (HSG).	6/21/10
	7. State the difference between a "Z" qualifier and a "J" qualifier.	Adela M Canton 6/17/2010
	8. State when a "B" qualifier is used.	Adela M Canton 6/17/2010
	9. Describe the definition of VE of record according to New Mexico Environment Department (NMED). Provide an example.	6/21/10
	10. State when a duplicate waste drum is run.	6/21/10

* Individual forgot to date when completing attainment of qualification. BM 12/5/10

Site Project Manager (SPM)
Qualification Card

Name: Beverly Schrock **Badge Number:** [redacted]

Email Address: [redacted]

CCP-PO-002	11. State when an NCR is written for non-destructive assay (NDA).	6/21/10
	12. State which document is the driver for NDA.	6/21/10
	13. Describe the information to look for in an NDA control chart during V & V review of an NDA batch data report.	6/21/10
CCP-QP-005	14. State one major purpose for the nonconformance control program.	6/21/10
	15. Identify who can initiate a non-conformance report (NCR).	6/21/10
CCP-TP-005	16. Define the term "acceptable knowledge" and state one use/purpose for acceptable knowledge.	6/21/10
	17. State where acceptable knowledge information is documented.	6/21/10
	18. Discuss the AK sufficiency elements.	6/21/10
	On-the-job Training Practical Requirements	**SME Signature / Date**
CCP-TP-001	1. Demonstrate proficiency in the review of headspace gas batch data (BDR) reports.[2]	Adele M Canton 6/17/2010
	2. Demonstrate proficiency in the review of non-destructive examination (NDE) BDRs.[2]	Adele M Canton 6/17/2010
	3. Demonstrate proficiency in the review of non-destructive assay (NDA) BDRs.[2]	6/22/2010
	4. Demonstrate proficiency in the review of visual examination (VE) BDRs.[2]	Adele M Canton 6/17/2010
CCP-TP-002	5. Complete a Characterization Information Summary (CIS).	6/22/10

[2] Proficiency will be demonstrated after the completion of BDR reviews in each discipline under the supervision of a qualified SPM.

Site Project Manager (SPM) Qualification Card

Name: Beverly Schrock **Badge Number:** [redacted]

Email Address: [redacted]

Approvals	
I have completed formal training and received on-the-job training for this position. I fully understand my responsibilities as an SPM.	6-22-10 Beverly S. Schrock Beverly S Schrock Trainee *(printed name and signature)* Date
Validation by the SME/OJT instructor(s) involved in the training of this individual.	FGA, HSG, Totals (VOA, SVOC, Metals - detailed) RTR, VE. Adela M. Canto Adela M Canto 6/17/2010 SME/OJT Instructor *(printed name and signature)* Date Craig Simmons 6/22/2010 SME/OJT Instructor *(printed name and signature)* Date
I approve this employee to perform the duties of an SPM.	Richard Kantorowitz 6/22/10 CCP Site Project Manager *(printed name and signature)* Date Mark Pearcy Mark Pearcy 6/23/10 CCP Program Manager *(printed name and signature)* Date
This qualification card has been reviewed for completeness and signature verification by CCP Training.	Ryan Martin 6/23/10 CCP Training *(printed name and signature)* Date

Approved for Format: **Alyca Atwood** *(original signature on file)* 02-23-09
CCP Training Date

Approved for Content: **Craig Simmons** *(original signature on file)* 02-23-09
CCP Site Project Manager Date

Approved for Use: **R. A. Billett** *(original signature on file)* 02-23-09
CCP Program Manager Date

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Contact Handled (CH)
Site Project Manager (SPM)
Qualification Card

Name: Carolina Soaterna	Badge Number: [redacted]
Email Address: [redacted]	

Education/Experience	
Resume documenting education and experience on file with Central Characterization Project (CCP) Training.	5/31/11 CCP Training — Date

Job Specific Training	
Qualification Limit	There is no qualification limit for this position. This qualification is a one-time-only requirement. Upon completion of this core qualification card, the Trainee is qualified to perform Site Project Manager (SPM) duties for Contact Handled (CH) Waste. Unsatisfactory performance will result in disqualification. If unsatisfactory performance is determined, the qualification card and on-the-job training (OJT) process must be completed to re-establish qualification.
Requalification Requirements	Not required. See above statement.

Indoctrination

Initial/Indoctrination Reading:

1. CCP-CM-001, *CCP Equipment Change Authorization and Documentation*
2. CCP-PO-001, *CCP Transuranic Waste Characterization Quality Assurance Project Plan*
3. CCP-PO-002, *CCP Transuranic Waste Certification Plan*
4. CCP-PO-003, *CCP Transuranic Authorized Methods for Payload Control (CCP CH-TRAMPAC)*
5. CCP-PO-008, *CCP Quality Assurance Interface with the WTS Quality Assurance Program*
6. CCP-QP-002, *CCP Training and Qualification Plan*
7. CCP-QP-004, *CCP Corrective Action Management*
8. CCP-QP-005, *CCP TRU Nonconforming Item Reporting and Control*
9. CCP-QP-006, *CCP Corrective Action Reporting and Control*
10. CCP-QP-008, *CCP Records Management*
11. CCP-QP-010, *CCP Document Preparation, Approval, and Control*
12. CCP-QP-011, *CCP Laboratory Logbooks*
13. CCP-QP-014, *CCP Quality Assurance Trend Analysis and Reporting*
14. CCP-QP-015, *CCP Procurement*
15. CCP-QP-016, *CCP Control of Measuring and Testing Equipment*
16. CCP-QP-018, *CCP Management Assessment*
17. CCP-QP-019, *CCP Quality Assurance Reporting to Management*
18. CCP-QP-022, *CCP Software Quality Assurance Plan*
19. CCP-QP-027, *CCP Test Control*
20. CCP-QP-028, *CCP Records Filing, Inventorying, Scheduling, and Dispositioning*
21. CCP-TP-001, *CCP Project Level Data Validation and Verification*

Contact Handled (CH)
Site Project Manager (SPM)
Qualification Card

Name: Carolina Soaterna	Badge Number: [redacted]
Email Address: [redacted]	

	22. CCP-TP-002, *CCP Reconciliation of DQOs and Reporting Characterization Data* 23. CCP-TP-003, *CCP Data Analysis for S3000, S4000, and S5000 Characterization* 24. CCP-TP-005, *CCP Acceptable Knowledge Documentation* 25. CCP-TP-030, *CCP TRU Waste Certification and WWIS/WDS Data Entry* 26. CCP-TP-056, *CCP HSG Performance Demonstration Plan* 27. CCP-TP-058, *CCP NDA Performance Demonstration Program*
I have read the listed initial/indoctrination reading and understand my responsibilities as applicable to the procedures above.	Carolina Soaterna 5/31/11 Trainee Date

Document	Additional Training Requirements	
	1. WAP/QAPjP Briefing and Test 12/9/9	Michele Billett 5/31/11 CCP Training Date
	2. Hazardous Waste Identification Self-Paced Module 5/31/11	Michele Billett 5/31/11 CCP Training Date
	3. Visual Examination (VE) TRU Waste Characterization Briefing, CCP-VE-101	Michele Billett 5/31/11 CCP Training Date
	4. Real-Time Radiography TRU Waste Characterization Briefing, CCP-RTR-101	Michele Billett 5/31/11 CCP Training Date

Contact Handled (CH)
Site Project Manager (SPM)
Qualification Card

Name: Carolina Soaterna | **Badge Number:** [redacted]

Email Address: [redacted]

Formal Training	OJT Knowledge Requirements	Subject Matter Expert (SME) Signature/Date
CCP-PO-001	1. Define the term "prohibited item" and give five examples of prohibited items.	5/31/11
	2. Identify the document allowing WIPP to receive and store TRU-mixed waste.	5/31/11
	3. Identify and describe the four major methods used by CCP to characterize TRU waste.	5/31/11
	4. State three (3) instances when an NCR is required for Real-Time Radiography (RTR).	5/31/11
	5. State when an NCR is written for Visual Examination (VE).	5/31/11
	6. State when an NCR is written for Headspace Gas (HSG).	5/31/11
	7. State the difference between a "Z" qualifier and a "J" qualifier.	5/31/11
	8. State when a "B" qualifier is used.	5/31/11
	9. State when a replicate waste drum is run in RTR.	5/31/11
CCP-PO-002	10. State when an NCR is written for Non-Destructive Assay (NDA).	5/31/11
	11. State which document is the driver for NDA.	5/31/11
	12. Describe the information to look for in an NDA control chart during a V&V review of an NDA batch data report (BDR).	5/31/11

Contact Handled (CH)
Site Project Manager (SPM)
Qualification Card

Name: Carolina Soaterna **Badge Number:** [redacted]

Email Address: [redacted]

CCP-QP-005	13. State one major purpose for the nonconformance control program.	5/31/11
	14. Identify who can initiate a non-conformance report (NCR).	5/31/11
CCP-TP-005	15. Define the term "acceptable knowledge" and state one use/purpose for acceptable knowledge.	5/31/11
	16. State where acceptable knowledge information is documented.	5/31/11
	17. Discuss the AK sufficiency elements.	5/31/11
	18. Discuss the components of statistical sampling.	5/31/11
	19. Discuss the components of solids and soils sampling and analysis.	5/31/11
	20. Discuss the components of the NCR and CAR process.	5/31/11
Formal Training	**OJT Practical Requirements**	**SME Signature/Date**
CCP-TP-001	1. Demonstrate proficiency in the review of headspace gas batch data (BDR) reports.[1]	5/26/11
	2. Demonstrate proficiency in the review of non-destructive examination (NDE) BDRs.[1]	5/26/11
	3. Demonstrate proficiency in the review of non-destructive assay (NDA) BDRs.[1]	5/25/11
	4. Demonstrate proficiency in the review of visual examination (VE) BDRs.[1]	5/26/11
CCP-TP-002	5. Discuss the components of a Characterization Information Summary (CIS).	5/31/11

[1] Proficiency will be demonstrated after the completion of BDR reviews in each discipline under the supervision of a qualified SPM SME

Contact Handled (CH)
Site Project Manager (SPM)
Qualification Card

Name: Carolina Soaterna	Badge Number: [redacted]
Email Address: [redacted]	

Approvals	
I have completed formal training and received OJT for this position. I fully understand my responsibilities as a SPM.	Carolina Soaterna Carolina Soaterna 5/31/11 Trainee *(printed name and signature)* Date
I have monitored the training of this individual and believe they are ready to perform the duties of a SPM. *(Validation by the SME/OJT instructor(s) involved in the training of this individual).*	Adela M Cassetty David Wilkey 5/31/11 SME/OJT Instructor *(printed name and signature)* Date Richard Kantrowitz 5/31/11 SME/OJT Instructor *(printed name and signature)* Date
I approve this employee to perform the duties of a SPM.	Mark Pearcy Mark Pearcy 5/31/11 CCP Lead or Alternate SPM *(printed name and signature)* Date

Approved for Content & Format: Approval on file — 8/10/2010
SPM SME *(printed name and signature)* Date

Approved for Content: Approval on file — 8/10/2010
CCP Lead or Alternate SPM *(printed name and signature)* Date

Approved for Use: Approval on file — 8/10/2010
CCP Manager Responsible for Training *(printed name and signature)* Date

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Contact Handled (CH)
Site Project Manager (SPM)
Qualification Card

Name: Daniel Wade

Education/Experience	
Resume documenting education and experience on file with National TRU Program Certification (NTPC) Training.	Cheryl Kruger 10-23-13 NTPC Training Date

Job Specific Training	
Qualification Limit	There is no qualification limit for this position. This qualification is a one-time-only requirement. Upon completion of this core qualification card, the Trainee is qualified to perform Site Project Manager (SPM) duties for Contact Handled (CH) Waste. Unsatisfactory performance will result in disqualification. If unsatisfactory performance is determined, the complete qualification card, including the On-the-Job Training (OJT) portions, must be completed to re-establish qualification.
Requalification Requirements	Not required. See above statement.

Indoctrination

Initial/Indoctrination Reading:

1. WP 15-GM1002, *Issues Management Processing of WIPP Forms*
2. CCP-CM-001, *CCP Equipment Change Authorization and Documentation*
3. CCP-HSP-014, *Health and Safety Program Implementation for CCP*
4. CCP-PO-001, *CCP Transuranic Waste Characterization Quality Assurance Project Plan*
5. CCP-PO-002, *CCP Transuranic Waste Certification Plan*
6. CCP-PO-003, *CCP Transuranic Authorized Methods for Payload Control (CCP CH-TRAMPAC)*
7. CCP-PO-050, *CCP TRUPACT-III TRU Waste Authorized Methods for Payload Control (CCP TRUPACT-III TRAMPAC)*
8. CCP-QP-002, *CCP Training and Qualification Plan*
9. CCP-QP-005, *CCP TRU Nonconforming Item Reporting and Control*
10. CCP-QP-008, *CCP Records Management*
11. CCP-QP-010, *CCP Document Preparation, Approval, and Control*
12. CCP-QP-015, *CCP Procurement*
13. CCP-QP-016, *CCP Control of Measuring and Testing Equipment*
14. CCP-QP-018, *CCP Management Assessment*
15. CCP-QP-022, *CCP Software Quality Assurance Plan*
16. CCP-QP-023, *CCP Handling, Storage, and Shipping*
17. CCP-QP-027, *CCP Test Control*
18. CCP-QP-028, *CCP Records Filing, Inventorying, Scheduling, and Dispositioning*
19. CCP-TP-001, *CCP Project Level Data Validation and Verification*
20. CCP-TP-002, *CCP Reconciliation of DQOs and Reporting Characterization Data*
21. CCP-TP-005, *CCP Acceptable Knowledge Documentation*
22. CCP-TP-028, *CCP Radiographic Test Drum and Training Container Construction*
23. CCP-TP-030, *CCP CH TRU Waste Certification and WWIS/WDS Data Entry*

Contact Handled (CH)
Site Project Manager (SPM)
Qualification Card

Name: Daniel Wade

24. CCP-TP-053, *CCP Standard Real-Time Radiography (RTR) Inspection Procedure*
25. CCP-TP-058, *CCP NDA Performance Demonstration Program*
26. CCP-TP-113, *CCP Standard Contact-Handled Waste Visual Examination*

I have read the listed Initial/Indoctrination Reading and understand my responsibilities as applicable to the procedures above.	Daniel L Wade 10/21/13 Trainee Date

Additional Training Requirements

CCP-PO-001	1. WAP/QAPjP Briefing and Test	Michele Billett 10/21/13 NTPC Training Date
Haz-Waste-101	2. Hazardous Waste Identification (Self-Paced Module)	Cheryl Armijo 10-21-13 NTPC Training Date
CCP-VE-101	3. Visual Examination (VE) TRU Waste Characterization Briefing	Cheryl Armijo 10-09-13 NTPC Training Date
CCP-RTR-101	4. Real-Time Radiography (RTR) TRU Waste Characterization Briefing	Cheryl Armijo 10-09-13 NTPC Training Date

Formal Training	OJT Knowledge Requirements	Subject Matter Expert (SME)/OJT Signature/Date
CCP-PO-001	1. State the regulator who governs hazardous waste.	10/9/13
	2. Define the term "prohibited item" and give five examples of prohibited items.	10/9/13
	3. Identify the document allowing Waste Isolation Pilot Plant (WIPP) to receive and store TRU-mixed waste.	10/9/13
	4. Identify and describe the three major methods used to characterize TRU waste.	10/9/13
	5. State the Data Quality Objectives (DQOs) for VE/RTR.	10/9/13
	6. Name at least 2 DQOs for Acceptable Knowledge (AK).	10/9/13
	7. State the five (5) Quality Assurance Objectives (QAOs).	10/9/13

Contact Handled (CH)
Site Project Manager (SPM)
Qualification Card

Name: Daniel Wade

	8. Define waste stream.	10/9/13
	9. Define waste matrix code.	10/9/13
	10. Describe the three (3) summary category groups.	10/9/13
CCP-PO-002	11. Define TRU waste.	David W Moody 9 Oct 13
	12. Define TRU-mixed waste.	David W Moody 9 Oct 13
	13. List the 10 radionuclides that must be reported.	David W Moody 9 Oct 13
	14. List the agency which governs radiological waste.	David W Moody 9 Oct 13
	15. State which document is the driver for non-destructive assay (NDA).	David W Moody 9 Oct 13
	16. State which type of radioactive waste is accepted at the WIPP (limited by The Land Withdrawal Act, as stated in the WIPP Waste Acceptance Criteria (WAC)).	David W Moody 9 Oct 13
CCP-QP-005	17. State one major purpose for the nonconformance control program.	Mark Pearcy 10/22/2013
	18. Identify who can initiate a non-conformance report (NCR).	Mark Pearcy 10/22/2013
	19. Explain the difference between a final disposition of "Use As Is" and "Rework."	Mark Pearcy 10/22/2013
	20. Describe the process if an NCR generated at Project Level is determined to be "reportable."	Mark Pearcy 10/22/2013
WP 15-GM1002	21. Describe the purpose of the WIPP Form process.	Mark Pearcy 10/22/2013
	22. State the person responsible for originating a WIPP Form.	Mark Pearcy 10/22/2013
	23. Describe how WIPP Forms are documented.	Mark Pearcy 10/22/2013
	24. Describe who has responsibility for processing WIPP Forms, approving Corrective Action Plans, and approving closure of WIPP Forms.	Mark Pearcy 10/22/2013

Contact Handled (CH)
Site Project Manager (SPM)
Qualification Card

Name: Daniel Wade

CCP-TP-001	25. Describe actions personnel may take when conditions adverse to quality are discovered.	Mark Pearcy 10/22/2013
	26. State which characterization data requires SPM review and validation and verification.	Mark Pearcy 10/22/2013
	27. State the percentage of Batch Data Reports (BDRs) that must undergo SPM review.	10/23/13
	28. Explain when it is allowed to review BDRs with containers not on the AK Tracking Spreadsheet.	10/23/13
	29. State when an SPM must provide comments or justifications when completing an SPM checklist.	10/23/13
	30. Explain the differences between "editorial" changes and "data affecting" changes.	Mark Pearcy 10/22/2013
	31. State how the SPM documents the data generation level (DGL) data review, validation, and verification is being performed in accordance with applicable procedures.	10/23/13
CCP-TP-002	32. Discuss the components of a Characterization Information Summary (CIS).	10-14-13
CCP-TP-005	33. Define the term "acceptable knowledge" and state one use/purpose for acceptable knowledge.	10/23/13
	34. State where acceptable knowledge information is documented.	10/23/13
	35. Discuss the AK sufficiency elements.	10/23/13
	36. State the purpose of the NDA Memo and who assists in its generation.	Mark Pearcy 10/22/2013
Formal Training	**OJT Practical Requirements**	**SME/OJT Signature/Date**
CCP-TP-001	1. Demonstrate proficiency in the review of RTR BDRs.[1]	LA-HEARTR-13-0107 10/23/13
	2. Demonstrate proficiency in the review of NDA BDRs.[1]	SRLBC 1033 10/23/13
	3. Demonstrate proficiency in the review of VE BDRs.[1]	IN-ARP-VE-002818 10/23/13

[1] Proficiency will be demonstrated after the completion of BDR reviews in each discipline under the supervision of a qualified SPM-SME.

Contact Handled (CH)
Site Project Manager (SPM)
Qualification Card

Name: Daniel Wade

Approvals		
I have completed formal training and received OJT for this position. I fully understand my responsibilities as a CH SPM.	Daniel Wade Trainee *(printed name and signature)*	10/23/13 Date
I have monitored the training of this individual and believe they are ready to perform the duties of a CH SPM. *(Validation by the SME/OJT instructor(s) involved in the training of this individual.)*	David W Moody Jim Vernon SME/OJT Instructor *(printed name and signature)*	4 Oct 13 10/9/13 Date
	Richard Kantrowitz Mark Pearcy SME/OJT Instructor *(printed name and signature)*	10/23/13 10/22/2013 Date
I approve this employee to perform the duties of a CH SPM.	Mark Pearcy SPM *(printed name and signature)*	10/23/2013 Date

Approved for Content & Format: **Richard Kantrowitz** *(Approval on File)* **10/07/2013**
SME/OJT Date

Approved for Content: **Mark Pearcy** *(Approval on File)* **10/07/2013**
SPM Date

Approved for Applicability, Content, Format, & Use: **A.J. Fisher** *(Approval on File)* **10/07/2013**
Manager Responsible for Training Date

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Contact Handled (CH)
Site Project Manager (SPM)
Qualification Card

Name: Roger Whiteaker

Email Address: [redacted]

Education/Experience	
Resume documenting education and experience on file with Central Characterization Project (CCP) Training.	Michele Bizlett 4/9/12 CCP Training Date

Job Specific Training	
Qualification Limit	There is no qualification limit for this position. This qualification is a one-time-only requirement. Upon completion of this core qualification card, the Trainee is qualified to perform Site Project Manager (SPM) duties for Contact Handled (CH) Waste. Additionally, once this qualification card is complete, the SPM will be qualified to perform SPM reviews of Headspace Gas (HSG) batch data reports, regardless of the radiological determination of the waste. Unsatisfactory performance will result in disqualification. If unsatisfactory performance is determined, the complete qualification card, including the On-the-Job Training (OJT) portions, must be completed to re-establish qualification.
Requalification Requirements	Not required. See above statement.

Indoctrination

Initial/Indoctrination Reading:

1. CCP-CM-001, *CCP Equipment Change Authorization and Documentation*
2. CCP-PO-001, *CCP Transuranic Waste Characterization Quality Assurance Project Plan*
3. CCP-PO-002, *CCP Transuranic Waste Certification Plan*
4. CCP-PO-003, *CCP Transuranic Authorized Methods for Payload Control (CCP CH-TRAMPAC)*
5. CCP-PO-008, *CCP Quality Assurance Interface with the WTS Quality Assurance Program*
6. CCP-PO-050, *CCP TRUPACT-III TRU Waste Authorized Methods for Payload Control (CCP TRUPACT-III TRAMPAC)*
7. CCP-QP-002, *CCP Training and Qualification Plan*
8. CCP-QP-004, *CCP Corrective Action Management*
9. CCP-QP-005, *CCP TRU Nonconforming Item Reporting and Control*
10. CCP-QP-006, *CCP Corrective Action Reporting and Control*
11. CCP-QP-008, *CCP Records Management*
12. CCP-QP-010, *CCP Document Preparation, Approval, and Control*
13. CCP-QP-011, *CCP Laboratory Logbooks*
14. CCP-QP-014, *CCP Quality Assurance Trend Analysis and Reporting*
15. CCP-QP-015, *CCP Procurement*
16. CCP-QP-016, *CCP Control of Measuring and Testing Equipment*
17. CCP-QP-018, *CCP Management Assessment*
18. CCP-QP-019, *CCP Quality Assurance Reporting to Management*

Contact Handled (CH)
Site Project Manager (SPM)
Qualification Card

Name: Roger Whiteaker

Email Address: [redacted]

	19. CCP-QP-022, *CCP Software Quality Assurance Plan* 20. CCP-QP-027, *CCP Test Control* 21. CCP-QP-028, *CCP Records Filing, Inventorying, Scheduling, and Dispositioning* 22. CCP-TP-001, *CCP Project Level Data Validation and Verification* 23. CCP-TP-002, *CCP Reconciliation of DQOs and Reporting Characterization Data* 24. CCP-TP-003, *CCP Data Analysis for S3000, S4000, and S5000 Characterization* 25. CCP-TP-005, *CCP Acceptable Knowledge Documentation* 26. CCP-TP-030, *CCP CH TRU Waste Certification and WWIS/WDS Data Entry* 27. CCP-TP-056, *CCP HSG Performance Demonstration Plan* 28. CCP-TP-058, *CCP NDA Performance Demonstration Program*
I have read the listed initial/indoctrination reading and understand my responsibilities as applicable to the procedures above.	Roger Whiteaker 4/2/2012 Trainee Date

Document	Additional Training Requirements	
	1. WAP/QAPjP Briefing and Test	Michele Billetts 4/9/12 CCP Training Date
	2. Hazardous Waste Identification (Self-Paced Module)	Michele Billetts 4/4/12 CCP Training Date
	3. CCP-VE-101 - Visual Examination (VE) TRU Waste Characterization Briefing	Michele Billetts 4/9/12 CCP Training Date
	4. CCP-RTR-101 - Real-Time Radiography (RTR) TRU Waste Characterization Briefing	Michele Billetts 4/9/12 CCP Training Date

Formal Training	OJT Knowledge Requirements	Subject Matter Expert (SME)/OJT Signature/Date
CCP-PO-001	1. Define the term "prohibited item" and give five examples of prohibited items.	Adele Mantz 4/12/12
	2. Identify the document allowing WIPP to receive and store TRU-mixed waste.	Adele Mantz 4/12/12
	3. Identify and describe the four major methods used by CCP to characterize TRU waste.	Adele Mantz 4/12/12
	4. State three (3) instances when an NCR is required for Real-Time Radiography (RTR).	Adele Mantz 4/12/12

Contact Handled (CH)
Site Project Manager (SPM)
Qualification Card

Name: Roger Whiteaker

Email Address: [redacted]

	5. State when an NCR is written for Visual Examination (VE).	Adele M Canter 4/12/12
	6. State when an NCR is written for Headspace Gas (HSG).	Adele M Canter 4/12/12
	7. State the difference between a "Z" qualifier and a "J" qualifier.	Adele M Canter 4/12/12
	8. State when a "B" qualifier is used.	Adele M Canter 4/12/12
	9. State when a replicate waste drum is run in RTR.	Adele M Canter 4/12/12
CCP-PO-002	10. State when an NCR is written for Non-Destructive Assay (NDA).	4-23-12
	11. State which document is the driver for NDA.	4-23-12
	12. Describe the information to look for in an NDA control chart during a V&V review of an NDA batch data report (BDR).	4-23-12
CCP-QP-005	13. State one major purpose for the nonconformance control program.	4-23-12
	14. Identify who can initiate a non-conformance report (NCR).	Adele M Canter 4/12/12
CCP-TP-005	15. Define the term "acceptable knowledge" and state one use/purpose for acceptable knowledge.	4-23-12
	16. State where acceptable knowledge information is documented.	4-23-12
	17. Discuss the AK sufficiency elements.	4-23-12
	18. Discuss the components of statistical sampling.	5/3/12
	19. Discuss the components of solids and soils sampling and analysis.	5/3/12
	20. Discuss the components of the NCR and CAR process.	4-23-12

Contact Handled (CH)
Site Project Manager (SPM)
Qualification Card

Name: Roger Whiteaker

Email Address: [redacted]

Formal Training	OJT Practical Requirements	SME/OJT Signature/Date
CCP-TP-001	1. Demonstrate proficiency in the review of headspace gas batch data (BDR) reports.[1]	4/12/12
	2. Demonstrate proficiency in the review of non-destructive examination (NDE) BDRs.[1]	4/12/12
	3. Demonstrate proficiency in the review of non-destructive assay (NDA) BDRs.[1]	4-23-12
	4. Demonstrate proficiency in the review of visual examination (VE) BDRs.[1]	4/12/12
CCP-TP-002	5. Discuss the components of a Characterization Information Summary (CIS).	5/3/12

[1] Proficiency will be demonstrated after the completion of BDR reviews in each discipline under the supervision of a qualified SPM SME.

Contact Handled (CH) Site Project Manager (SPM) Qualification Card

Name: Roger Whiteaker

Email Address: [redacted]

Approvals	
I have completed formal training and received OJT for this position. I fully understand my responsibilities as a CH SPM.	Roger Whiteaker ROGER WHITEAKER 5/3/2012 Trainee *(printed name and signature)* Date
I have monitored the training of this individual and believe they are ready to perform the duties of a CH SPM. *(Validation by the SME/OJT instructor(s) involved in the training of this individual).*	Adela M Canty ADELA M. CANTY 5/3/12 SME/OJT Instructor *(printed name and signature)* Date Richard Kantrowitz 5/3/12 Jim Vernon 5-3-12 SME/OJT Instructor *(printed name and signature)* Date
I approve this employee to perform the duties of a CH SPM.	MARK PEARCY Mark Pearcy 5/3/12 CCP Lead or Alternate SPM *(printed name and signature)* Date

Approved for Content & Format: **Richard Kantrowitz (Approval on File)** **02/27/12**
SME/OJT Date

Approved for Content: **Mark Pearcy (Approval on File)** **02/27/12**
CCP Lead or Alternate SPM Date

Approved for Use: **A.J. Fisher (Approval on File)** **02/27/12**
CCP Manager Responsible for Training Date

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Contact Handled (CH)
Site Project Manager (SPM)
Qualification Card

Name: Rick Whiteley

Education/Experience	
Resume documenting education and experience on file with National TRU Program Certification (NTPC) Training.	Michele Billett 10/21/13 NTPC Training Date

Job Specific Training	
Qualification Limit	There is no qualification limit for this position. This qualification is a one-time-only requirement. Upon completion of this core qualification card, the Trainee is qualified to perform Site Project Manager (SPM) duties for Contact Handled (CH) Waste. Unsatisfactory performance will result in disqualification. If unsatisfactory performance is determined, the complete qualification card, including the On-the-Job Training (OJT) portions, must be completed to re-establish qualification.
Requalification Requirements	Not required. See above statement.

Indoctrination

Initial/Indoctrination Reading:

1. WP 15-GM1002, *Issues Management Processing of WIPP Forms*
2. CCP-CM-001, *CCP Equipment Change Authorization and Documentation*
3. CCP-HSP-014, *Health and Safety Program Implementation for CCP*
4. CCP-PO-001, *CCP Transuranic Waste Characterization Quality Assurance Project Plan*
5. CCP-PO-002, *CCP Transuranic Waste Certification Plan*
6. CCP-PO-003, *CCP Transuranic Authorized Methods for Payload Control (CCP CH-TRAMPAC)*
7. CCP-PO-050, *CCP TRUPACT-III TRU Waste Authorized Methods for Payload Control (CCP TRUPACT-III TRAMPAC)*
8. CCP-QP-002, *CCP Training and Qualification Plan*
9. CCP-QP-005, *CCP TRU Nonconforming Item Reporting and Control*
10. CCP-QP-008, *CCP Records Management*
11. CCP-QP-010, *CCP Document Preparation, Approval, and Control*
12. CCP-QP-015, *CCP Procurement*
13. CCP-QP-016, *CCP Control of Measuring and Testing Equipment*
14. CCP-QP-018, *CCP Management Assessment*
15. CCP-QP-022, *CCP Software Quality Assurance Plan*
16. CCP-QP-023, *CCP Handling, Storage, and Shipping*
17. CCP-QP-027, *CCP Test Control*
18. CCP-QP-028, *CCP Records Filing, Inventorying, Scheduling, and Dispositioning*
19. CCP-TP-001, *CCP Project Level Data Validation and Verification*
20. CCP-TP-002, *CCP Reconciliation of DQOs and Reporting Characterization Data*
21. CCP-TP-005, *CCP Acceptable Knowledge Documentation*
22. CCP-TP-028, *CCP Radiographic Test Drum and Training Container Construction*
23. CCP-TP-030, *CCP CH TRU Waste Certification and WWIS/WDS Data Entry*

Contact Handled (CH)
Site Project Manager (SPM)
Qualification Card

Name: Rick Whiteley

24. CCP-TP-053, *CCP Standard Real-Time Radiography (RTR) Inspection Procedure*	
25. CCP-TP-058, *CCP NDA Performance Demonstration Program*	
26. CCP-TP-113, *CCP Standard Contact-Handled Waste Visual Examination*	
I have read the listed Initial/Indoctrination Reading and understand my responsibilities as applicable to the procedures above.	Rick E Whiteley 10-16-13 Trainee Date

Additional Training Requirements

CCP-PO-001	1. WAP/QAPjP Briefing and Test	Michele Billett 10/21/13 NTPC Training Date
Haz-Waste-101	2. Hazardous Waste Identification (Self-Paced Module)	Cheryl E Alwin 10-21-13 NTPC Training Date
CCP-VE-101	3. Visual Examination (VE) TRU Waste Characterization Briefing	Michele Billett 10/17/13 NTPC Training Date
CCP-RTR-101	4. Real-Time Radiography (RTR) TRU Waste Characterization Briefing	Michele Billett 10/17/13 NTPC Training Date

Formal Training	OJT Knowledge Requirements	Subject Matter Expert (SME)/OJT Signature/Date
CCP-PO-001	1. State the regulator who governs hazardous waste.	10-17-13
	2. Define the term "prohibited item" and give five examples of prohibited items.	10-17-13
	3. Identify the document allowing Waste Isolation Pilot Plant (WIPP) to receive and store TRU-mixed waste.	10-17-13
	4. Identify and describe the three major methods used to characterize TRU waste.	10-17-13
	5. State the Data Quality Objectives (DQOs) for VE/RTR.	10-17-13
	6. Name at least 2 DQOs for Acceptable Knowledge (AK).	10-17-13
	7. State the five (5) Quality Assurance Objectives (QAOs).	10-17-13

Contact Handled (CH)
Site Project Manager (SPM)
Qualification Card

Name: Rick Whiteley

	8. Define waste stream.	10-17-13
	9. Define waste matrix code.	10-17-13
	10. Describe the three (3) summary category groups.	10-17-13
CCP-PO-002	11. Define TRU waste.	10/22/13
	12. Define TRU-mixed waste.	10/22/13
	13. List the 10 radionuclides that must be reported.	10/22/13
	14. List the agency which governs radiological waste.	10/22/13
	15. State which document is the driver for non-destructive assay (NDA).	10/22/13
	16. State which type of radioactive waste is accepted at the WIPP (limited by The Land Withdrawal Act, as stated in the WIPP Waste Acceptance Criteria (WAC)).	10/22/13
CCP-QP-005	17. State one major purpose for the nonconformance control program.	10/23/13
	18. Identify who can initiate a non-conformance report (NCR).	10/23/13
	19. Explain the difference between a final disposition of 'Use As Is' and 'Rework.'	10/23/13
	20. Describe the process if an NCR generated at Project Level is determined to be "reportable."	10/23/13
WP 15-GM1002	21. Describe the purpose of the WIPP Form process.	10/25/13
	22. State the person responsible for originating a WIPP Form.	10/25/13
	23. Describe how WIPP Forms are documented.	10/25/13
	24. Describe who has responsibility for processing WIPP Forms, approving Corrective Action Plans, and approving closure of WIPP Forms.	10/28/13

Contact Handled (CH)
Site Project Manager (SPM)
Qualification Card

Name: Rick Whiteley

CCP-TP-001	25. Describe actions personnel may take when conditions adverse to quality are discovered.	10-25-13
	26. State which characterization data requires SPM review and validation and verification.	10-25-13
	27. State the percentage of Batch Data Reports (BDRs) that must undergo SPM review.	10-25-13
	28. Explain when it is allowed to review BDRs with containers not on the AK Tracking Spreadsheet.	10-25-13
	29. State when an SPM must provide comments or justifications when completing an SPM checklist.	10-25-13
	30. Explain the differences between "editorial" changes and "data affecting" changes.	10-25-13
	31. State how the SPM documents the data generation level (DGL) data review, validation, and verification is being performed in accordance with applicable procedures.	10-25-13
CCP-TP-002	32. Discuss the components of a Characterization Information Summary (CIS).	10-23-13
CCP-TP-005	33. Define the term "acceptable knowledge" and state one use/purpose for acceptable knowledge.	10-25-13
	34. State where acceptable knowledge information is documented.	10-25-13
	35. Discuss the AK sufficiency elements.	10-25-13
	36. State the purpose of the NDA Memo and who assists in its generation.	10-25-13
Formal Training	**OJT Practical Requirements**	**SME/OJT Signature/Date**
CCP-TP-001	1. Demonstrate proficiency in the review of RTR BDRs.[1]	10/30/13
	2. Demonstrate proficiency in the review of NDA BDRs.[1]	10/28/13
	3. Demonstrate proficiency in the review of VE BDRs.[1]	10/29/13 Su 10/29/13 10/29/13

[1] Proficiency will be demonstrated after the completion of BDR reviews in each discipline under the supervision of a qualified SPM SME.

Contact Handled (CH)
Site Project Manager (SPM)
Qualification Card

Name: Rick Whiteley

Approvals	
I have completed formal training and received OJT for this position. I fully understand my responsibilities as a CH SPM.	Rick Whiteley 10-30-13 Trainee *(printed name and signature)* Date
I have monitored the training of this individual and believe they are ready to perform the duties of a CH SPM. *(Validation by the SME/OJT instructor(s) involved in the training of this individual.)*	Barbara Broomfield 10/30/13 SME/OJT Instructor *(printed name and signature)* Date Richard Kantrowitz 10/31/13 Jim Vernon 10-30-13 SME/OJT Instructor *(printed name and signature)* Date
I approve this employee to perform the duties of a CH SPM.	Mike Ramirez 10-31-13 SPM *(printed name and signature)* Date

Approved for Content & Format: **Richard Kantrowitz *(Approval on File)*** **10/07/2013**
SME/OJT Date

Approved for Content: **Mark Pearcy *(Approval on File)*** **10/07/2013**
SPM Date

Approved for Applicability, Content, Format, & Use: **A.J. Fisher *(Approval on File)*** **10/07/2013**
Manager Responsible for Training Date

Table C6-2 Acceptable Knowledge (AK) Checklist
ORNL/CCP Recertification Audit A-16-15
April 19 – 21, 2016

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Acceptable Knowledge (AK) Checklist[1]

	WAP Requirement[2] ORNL CCP Audit A-16-15 Table C6-2 Acceptable Knowledge (AK) Checklist[1]	Procedure Documented		Example of Implementation/ Objective Evidence, as applicable		Comment (e.g., any change in procedure since last audit, etc.)
		Location	Adequate? Y/N (Why)	Item Reviewed	Adequate? Y/N	
	GENERAL REQUIREMENTS					
134	Are the primary document(s) required in Permit Attachment C4 containing acceptable knowledge information available? (Section C4-2)	CCP-TP-002 S. 4.3-4.5 CCP-TP-005 S. 4.4	Y	CCP AK Summary Report for NFS CH TRU Waste Stored at ORNL, OR-NFS-CH-SOIL and OR-NFS-CH-HOM-A, CCP-AK-ORNL-001 R10 **(AK-1)** CCP AK Summary Report for ORNL REDC CH TRU Waste, OR-REDC-CH-HET, CCP-AK-ORNL-002 R4 **(AK-2)** CCP AK Summary Report for ORNL REDC RH TRU Waste, OR-REDC-RH-HET, CCP-AK-ORNL-500 R5 **(AK-3)** Q&MIS Approvals for AK Summaries for CCP-AK-ORNL-001 R10, CCP-AK-ORNL-002 R4, and CCP-AK-ORNL-500 R5 **(AK-4)** Draft Waste Stream Profile Form and attachments for Waste Stream OR-NFS-CH-SOIL **(AK-5)** Draft Waste Stream Profile Form and attachments for Waste Stream OR-NFS-CH-HOM-A **(AK-6)** Waste Stream Profile Form and attachments for Waste Stream OR-REDC-CH-HET **(AK-7)**	Y	During the week of April 19, 2016, the CTAC AK auditors participated in a recertification audit of the ORNL CCP TRU waste program for both CH and RH TRU waste. The AK records for 4 distinct TRU waste streams representing Summary Category Groups S3000 solids, S4000 soil/gravel, and S5000 debris for CH waste, and S5000 debris for RH waste were reviewed in light of the current WAP, WAC, TRAMPAC and WCPIP AK requirements. The four waste streams examined by AK auditors are CH S3000 OR-NFS-CH-HOM-A, CH S4000 OR-NFS-CH-SOIL, CH S5000 OR-REDC-CH-HET, and RH S5000 OR-REDC-RH-HET.

	WAP Requirement[2] ORNL CCP Audit A-16-15 Table C6-2 Acceptable Knowledge (AK) Checklist[1]	Procedure Documented		Example of Implementation/ Objective Evidence, as applicable		Comment (e.g., any change in procedure since last audit, etc.)
		Location	Adequate? Y/N (Why)	Item Reviewed	Adequate? Y/N	
				Waste Stream Profile Form and attachments for Waste Stream OR-REDC-RH-HET **(AK-8)**		
135	Has the generator developed a methodology whereby a logical sequence of acceptable knowledge information that progresses from general facility to more detailed waste-specific information can be acquired? (Section C4-2)	CCP-TP-005 S. 4.2 & 4.3	Y	CCP AK Summary Report for NFS CH TRU Waste Stored at ORNL, OR-NFS-CH-SOIL and OR-NFS-CH-HOM-A, CCP-AK-ORNL-001 R10 **(AK-1)** CCP AK Summary Report for ORNL REDC CH TRU Waste, OR-REDC-CH-HET, CCP-AK-ORNL-002 R4 **(AK-2)** CCP AK Summary Report for ORNL REDC RH TRU Waste, OR-REDC-RH-HET, CCP-AK-ORNL-500 R5 **(AK-3)** AK Source Document Summaries for waste stream OR-NFS-CH-SOIL **(AK-9)** AK Source Document Summaries for waste stream OR-NFS-CH-HOM-A **(AK-10)** AK Source Document Summaries for waste stream OR-REDC-CH-HET **(AK-11)** AK Source Document Summaries for waste stream OR-REDC-RH-HET **(AK-12)**	Y	

	WAP Requirement[2] ORNL CCP Audit A-16-15 Table C6-2 Acceptable Knowledge (AK) Checklist[1]	Procedure Documented		Example of Implementation/ Objective Evidence, as applicable		Comment (e.g., any change in procedure since last audit, etc.)
		Location	Adequate? Y/N (Why)	Item Reviewed	Adequate? Y/N	
136	Does the site have adequate procedures in place to ensure that the Acceptable Knowledge process is adequately implemented? Do these procedures facilitate the mandatory traceability analysis performed for each Summary Waste Category Group examined during the audit? (Section C4-2)	CCP-TP-005 S. 4.0	Y	CCP AK Summary Report for NFS CH TRU Waste Stored at ORNL, OR-NFS-CH-SOIL and OR-NFS-CH-HOM-A, CCP-AK-ORNL-001 R10 **(AK-1)** CCP AK Summary Report for ORNL REDC CH TRU Waste, OR-REDC-CH-HET, CCP-AK-ORNL-002 R4 **(AK-2)** CCP AK Summary Report for ORNL REDC RH TRU Waste, OR-REDC-RH-HET, CCP-AK-ORNL-500 R5 **(AK-3)** Q&MIS Approvals for AK Summaries for CCP-AK-ORNL-001 R10, CCP-AK-ORNL-002 R4, and CCP-AK-ORNL-500 R5 **(AK-4)** Draft Waste Stream Profile Form and attachments for Waste Stream OR-NFS-CH-SOIL **(AK-5)** Draft Waste Stream Profile Form and attachments for Waste Stream OR-NFS-CH-HOM-A **(AK-6)** Waste Stream Profile Form and attachments for Waste Stream OR-REDC-CH-HET **(AK-7)** Waste Stream Profile Form and attachments for Waste Stream OR-REDC-RH-HET **(AK-8)**	Y	A total of eight waste containers were selected for the WAP required traceability exercise from the four waste streams examined representing four distinct Summary Category Groups. The containers were the following, <u>OR-NFS-CH-SOIL</u> NFS0183A X10C1451639 <u>OR-NFS-CH-HOM-A</u> NFS0759B1 NFS0757A <u>OR-REDC-CH-HET</u> X10CSATN03210B X10CSATN03142A <u>OR-REDC-RH-HET</u> ORRH00718 ORRH00725

	WAP Requirement[2] ORNL CCP Audit A-16-15 Table C6-2 Acceptable Knowledge (AK) Checklist[1]	Procedure Documented		Example of Implementation/ Objective Evidence, as applicable		Comment (e.g., any change in procedure since last audit, etc.)
		Location	Adequate? Y/N (Why)	Item Reviewed	Adequate? Y/N	
				AK Source Document Summaries for waste stream OR-NFS-CH-SOIL **(AK-9)** AK Source Document Summaries for waste stream OR-NFS-CH-HOM-A **(AK-10)** AK Source Document Summaries for waste stream OR-REDC-CH-HET **(AK-11)** AK Source Document Summaries for waste stream OR-REDC-RH-HET **(AK-12)** <u>Traceability BDRs</u> ORNLRHVE15007 **(AK-31)** ORNLRHVE15012 **(AK-32)** OR-RTR7-0140 (**AK-33)** OR-RTR7-0102 **(AK-34)** OR-RTR7-0013 **(AK-35)** OR-RTR6-0636 **(AK-36)** OR-RTR7-0124 **(AK-37)** OR-RTR6-0581 **(AK-38)** IDC Screenshots for traceability containers **(AK-23)** AK CH and RH Tracking Spreadsheets for waste streams OR-NFS-CH-SOIL, OR-NFS-CH-HOM-A, OR-REDC-CH-HET, and OR-REDC-RH-HET **(AK-24)**		

	WAP Requirement[2] ORNL CCP Audit A-16-15 Table C6-2 Acceptable Knowledge (AK) Checklist[1]	Procedure Documented		Example of Implementation/ Objective Evidence, as applicable		Comment (e.g., any change in procedure since last audit, etc.)
		Location	Adequate? Y/N (Why)	Item Reviewed	Adequate? Y/N	
				Container Input Forms for traceability containers **(AK-25)** AK Att. 8 - Waste Containers List for waste streams OR-NFS-CH-SOIL, OR-NFS-CH-HOM-A, OR-REDC-CH-HET, and OR-REDC-RH-HET **(AK-17)** AK Att. 13 - Waste Stream Characterization Checklists and AK Data Reconciliation **(AK-30)**		
137	Does the generator site's TRU mixed waste management program information clearly define (or provide a methodology for defining) waste categorization schemes and terminology, provide a breakdown of the types and quantities of TRU mixed waste generated/stored at the site, and describe how waste is tracked and managed at the generator site (including historical and current operations? Do procedures ensure that waste streams are adequately identified? (Section C4-2a)	CCP-TP-005 S. 4.2.2 S. 4.2.4 S. 4.2.5 S. 4.4, 4.11 Att. 8 CCP-TP-001 S. 2.7 S. 4.1 S. 4.2	Y	CCP AK Summary Report for NFS CH TRU Waste Stored at ORNL, OR-NFS-CH-SOIL and OR-NFS-CH-HOM-A, CCP-AK-ORNL-001 R10 **(AK-1)** CCP AK Summary Report for ORNL REDC CH TRU Waste, OR-REDC-CH-HET, CCP-AK-ORNL-002 R4 **(AK-2)** CCP AK Summary Report for ORNL REDC RH TRU Waste, OR-REDC-RH-HET, CCP-AK-ORNL-500 R5 **(AK-3)** IDC Screenshots for traceability containers **(AK-23)** AK CH and RH Tracking Spreadsheets for waste streams OR-NFS-CH-SOIL, OR-NFS-CH-HOM-A, OR-REDC-CH-HET, and OR-REDC-RH-HET **(AK-24)**	Y	

	WAP Requirement[2] ORNL CCP Audit A-16-15 Table C6-2 Acceptable Knowledge (AK) Checklist[1]	Procedure Documented		Example of Implementation/ Objective Evidence, as applicable		Comment (e.g., any change in procedure since last audit, etc.)
		Location	Adequate? Y/N (Why)	Item Reviewed	Adequate? Y/N	
				AK Att. 8 - Waste Containers List for waste streams OR-NFS-CH-SOIL, OR-NFS-CH-HOM-A, OR-REDC-CH-HET, and OR-REDC-RH-HET **(AK-17)**		
138	Does site documentation procedures indicate that the site will document, justify, and consistently define waste streams and assign EPA hazardous waste numbers? (Section C4-2b)	CCP-TP-005 S. 4.4.16-4.4.21 Att. 5	Y	CCP AK Summary Report for NFS CH TRU Waste Stored at ORNL, OR-NFS-CH-SOIL and OR-NFS-CH-HOM-A, CCP-AK-ORNL-001 R10, S. 6.4.3, 7.4.3 & Table 7-5 **(AK-1)** CCP AK Summary Report for ORNL REDC CH TRU Waste, OR-REDC-CH-HET, CCP-AK-ORNL-002 R4, S. 5.4.3, Tables 5-7 & 5-8 **(AK-2)** CCP AK Summary Report for ORNL REDC RH TRU Waste, OR-REDC-RH-HET, CCP-AK-ORNL-500 R5, S. 5.4.2, Tables 5-2 & 5-3 **(AK-3)** AK Att. 5, Hazardous Constituents for waste streams OR-NFS-CH-SOIL, OR-NFS-CH-HOM-A, OR-REDC-CH-HET, and OR-REDC-RH-HET **(AK-15)**	Y	

	WAP Requirement[2] ORNL CCP Audit A-16-15 Table C6-2 Acceptable Knowledge (AK) Checklist[1]	Procedure Documented		Example of Implementation/ Objective Evidence, as applicable		Comment (e.g., any change in procedure since last audit, etc.)
		Location	Adequate? Y/N (Why)	Item Reviewed	Adequate? Y/N	
	REQUIRED AND ADDITIONAL INFORMATION					
140	Does the generator site document that the following must be included in the acceptable knowledge record: • Map of the site with the areas and facilities involved in TRU waste generation, treatment, and storage identified • Facility mission description as related to TRU waste generation and management (e.g., nuclear weapons research may involve metallurgy, radiochemistry, and nuclear physics operations that result in specific waste streams) • Description of the operations that generate TRU waste at the site (e.g., plutonium recovery, weapons design, or weapons fabrication) • Waste identification or categorization schemes used at the facility (e.g., item description codes, content codes) • Types and quantities of TRU mixed waste generated, including historical generation through future projections • Correlation of waste streams generated from the same building and process, as appropriate (e.g., sludge, combustibles, metals, and glass) • Waste certification procedures for retrievably stored and newly generated wastes to be sent to the WIPP facility (Section C4-2a)	**B1-7:** CCP-TP-005 S. 4.2.2 S. 4.4.5 Att. 1	Y	CCP-AK-ORNL-001 R10 **(AK-1)** CCP-AK-ORNL-002 R4 **(AK-2)** CCP-AK-ORNL-500 R5 **(AK-3)** Att. 1 – AK Documentation Checklist for waste streams OR-NFS-CH-SOIL, OR-NFS-CH-HOM-A, OR-REDC-CH-HET, and OR-REDC-RH-HET **(AK-13)** B1) S. 4.1, Figures 1-3, 6, & 7 **(AK-1)** S. 4.1, Figures 1-3 **(AK-2)** S. 4.1, Figures 1-3 **(AK-3)** B2) S. 4.2 **(AK-1)** S. 4.3 **(AK-2)** S. 4.3 **(AK-3)** B3) S. 4.4 **(AK-1)** S. 4.5 **(AK-2)** S. 4.7 **(AK-3)** B4) S. 4.5 **(AK-1)** S. 4.6 **(AK-2)** S. 4.6.3 **(AK-3)** B5) S. 4.6.1 **(AK-1)** S. 4.7.1 **(AK-2)** S. 4.6.1 **(AK-3)** B6) S. 4.6.2 **(AK-1)** S. 4.7.2 **(AK-2)** S. 4.6.2 **(AK-3)**	Y	

	WAP Requirement[2] ORNL CCP Audit A-16-15 Table C6-2 Acceptable Knowledge (AK) Checklist[1]	Procedure Documented		Example of Implementation/ Objective Evidence, as applicable		Comment (e.g., any change in procedure since last audit, etc.)
		Location	Adequate? Y/N (Why)	Item Reviewed	Adequate? Y/N	
				B7) S. 4.7 **(AK-1)** S. 4.8 **(AK-2)** S. 4.8 **(AK-3)**		
141	Does the generator site document that the following shall be collected for each waste stream: A. Area(s) and/or building(s) from which the waste stream was or is generated B. Waste stream volume and time period of generation (e.g., 100 standard waste boxes of retrievable stored waste generated from June 1977 through December 1977) C. Waste generating process described for each building (e.g., batch waste stream generated during decommissioning operations of glove boxes), including processes associated with U134 waste generation, if applicable. D. Documentation demonstrating how the site has historically managed the waste, including the historical regulatory status of the waste (i.e., TRU mixed versus TRU non-mined waste)	**A-F:** CCP-TP-005 S. 4.2.4 S. 4.2.9-4.2.19 S. 4.4.5 Att. 1 & 9	Y	CCP-AK-ORNL-001 R10 **(AK-1)** CCP-AK-ORNL-002 R4 **(AK-2)** CCP-AK-ORNL-500 R5 **(AK-3)** Att. 1 – AK Documentation Checklist for waste streams OR-NFS-CH-SOIL, OR-NFS-CH-HOM-A, OR-REDC-CH-HET, and OR-REDC-RH-HET **(AK-13)** A) S. 6.1 & 7.1 **(AK-1)** S. 5.1 **(AK-2)** S. 5.1 **(AK-3)** B) S. 6.2 & 7.2 **(AK-1)** S. 5.2 **(AK-2)** S. 5.2 **(AK-3)** C) S. 6.3 & 7.3 **(AK-1)** S. 5.3 **(AK-2)** S. 5.3 **(AK-3)** Att. 9 – Interface Waste Management Documents List for waste streams OR-REDC-CH-HET and OR-REDC-RH-HET **(AK-18)** D) S. 4.6.2 & 7.4.3 **(AK-1)** S. 5.4.3 **(AK-2)** S. 5.4.2 **(AK-3)**	Y	

	WAP Requirement[2] ORNL CCP Audit A-16-15 Table C6-2 Acceptable Knowledge (AK) Checklist[1]	Procedure Documented		Example of Implementation/ Objective Evidence, as applicable		Comment (e.g., any change in procedure since last audit, etc.)
		Location	Adequate? Y/N (Why)	Item Reviewed	Adequate? Y/N	
	E. Process flow diagrams (e.g., a diagram illustrating glove boxes from a specific building to a size reduction facility to a container storage area). In the case of research/development, analytical laboratory waste, or the similar processes where process flow diagrams cannot be created, a description of the waste generating processes, rather than a formal process flow diagram, may be included if this modification is justified and the justification is placed in the auditable record F. Material inputs or other information that identifies the chemical content of the waste stream and the physical waste form (e.g., glove box materials and chemical handled during glove box operations, events or processes that may have modified the chemical or physical properties of the waste stream after generation, data obtained through visual examination of newly generated waste that later undergoes radiography; information demonstrating neutralization of U134 [hydrofluoric acid] and waste compatibility. (Section C4-2b)			E) Figure 5 **(AK-1)** AK Source Document Summaries for OR-NFS-CH-HOM-A, P274 **(AK-10)** Figures 5-22 **(AK-2)** Figures 5-22 **(AK-3)** F) S. 6.4.1, 6.4.3, Table 7-1 S. 7.4.1, 7.4.3, Tables 7-1 & 7-5 **(AK-1)** S. 5.4.1, 5.4.3, Tables 5-1, 5-7 & 5-8 **(AK-2)** S. 5.4.1, 5.4.2, Tables 5-1, 5-2 & 5-3 **(AK-3)**		
142	Do site documents/procedures require that the facility will provide a summary to the Permittees that summarizes all information collected, including basis and rationale for all waste stream designations? Is an example of this summary available for audit review? If discrepant hazardous waste data exist in required information, do sites consider applying all hazardous waste numbers, but assess and evaluate the information to determine the appropriate hazardous waste number consistent with RCRA requirements? (Section C4-2b)	CCP-TP-005 S. 4.4 S. 4.9	Y	CCP AK Summary Report for NFS CH TRU Waste Stored at ORNL, OR-NFS-CH-SOIL and OR-NFS-CH-HOM-A, CCP-AK-ORNL-001 R10 **(AK-1)** CCP AK Summary Report for ORNL REDC CH TRU Waste, OR-REDC-CH-HET, CCP-AK-ORNL-002 R4 **(AK-2)** CCP AK Summary Report for ORNL REDC RH TRU Waste, OR-REDC-RH-HET, CCP-AK-ORNL-500 R5 **(AK-3)** AK Discrepancy Resolutions in the AK Record **(AK-19)**	Y	
143	Do site procedures indicate that if the required AK information is not available for a particular waste stream, that the waste stream will not be eligible for an AK Sufficiency Determination? (Section C4-2)	CCP-TP-005 S. 4.2 S. 4.4 S. 4.7 Att. 1	Y	Att. 1 – AK Documentation Checklist for waste streams OR-NFS-CH-SOIL, OR-NFS-CH-HOM-A, OR-REDC-CH-HET, and OR-REDC-RH-HET **(AK-13)**	Y	

	WAP Requirement[2] ORNL CCP Audit A-16-15 Table C6-2 Acceptable Knowledge (AK) Checklist[1]	Procedure Documented		Example of Implementation/ Objective Evidence, as applicable		Comment (e.g., any change in procedure since last audit, etc.)
		Location	Adequate? Y/N (Why)	Item Reviewed	Adequate? Y/N	
144	Have the following procedures been prepared?: A. Procedures for identifying and assigning the physical waste form of the waste B. Procedures for delineating waste streams and assigning Waste Matrix Codes C. Procedures for resolving inconsistencies in acceptable knowledge documentation D. Procedures for visual examination and/or radiography, if applicable E. For newly generated waste, procedures describing process controls used to ensure prohibited items (specified in the WAP, Permit Attachment C) are documented and managed F. Procedures to ensure radiography and visual examination include a list of prohibited items that the operator shall verify are not present in each container (e.g. liquid exceeding TSDF-WAC limits, corrosives, ignitables, reactives, and incompatible wastes) G. Procedures to document how changes to Waste Matrix Codes, waste stream assignment, and associated Environmental Protection Agency hazardous waste numbers based on material composition are documented for any waste H. Procedures that ensure the assignment of EPA hazardous waste numbers is appropriate, consistent with RCRA requirements, and adequately considers site historical waste management	**AK** **A.)** CCP-TP-005 S. 4.4.13 S. 4.4.14 **B.)** CCP-TP-005 S. 4.4.11 NOTE above & 4.4.12 **C.)** CCP-TP-005 S. 4.9 Att. 11 **E.)** CCP-TP-500 (ALL) **G.)** CCP-TP-005 S. 4.8, 4.9 Att. 10 & 11 **H.)** CCP-TP-005 S. 4.4.16-4.4.21 Att. 5 **I.)** CCP-TP-005 S. 4.4.30	Y	CCP-AK-ORNL-001 R10 **(AK-1)** CCP-AK-ORNL-002 R4 **(AK-2)** CCP-AK-ORNL-500 R5 **(AK-3)** A) S. 6.4.1, Table 6-1 & S. 7.4.1, Table 7-1 **(AK-1)** S. 5.4.1, Table 5-1 **(AK-2)** S. 5.4.1, Table 5-1 **(AK-3)** B) S. 2.2, 2.3, 6.4.1.1 & S. 7.4.1.1 **(AK-1)** S. 2.1 & 5.4.1.1 **(AK-2)** S. 2.0 & 5.4.1.1 **(AK-3)** C) AK Discrepancies Resolutions in the AK Record **(AK-19)** E) ORNLRHVE15007 **(AK-31)** ORNLRHVE15012 **(AK-32)** G) AK Discrepancy Resolutions in the AK Record **(AK-19)** AK Discrepancy Resolutions at Characterization and AK Reevaluations **(AK-20)** H) S. 6.4.3 & S. 7.4.3, Table 7-5 **(AK-1)** S. 5.4.3, Tables 5-7 & 5-8 **(AK-2)** S. 5.4.2, Tables 5-2 & 5-3 **(AK-3)**	Y	

	WAP Requirement[2] ORNL CCP Audit A-16-15 Table C6-2 Acceptable Knowledge (AK) Checklist[1]	Procedure Documented		Example of Implementation/ Objective Evidence, as applicable		Comment (e.g., any change in procedure since last audit, etc.)
		Location	Adequate? Y/N (Why)	Item Reviewed	Adequate? Y/N	
	I. Procedures for estimating waste material parameter weights (Section C4-2b)	**RTR** D, E, F, & I: CCP-TP-053 (ALL) **VE** D,E,F,& I: CCP-TP-113 (ALL)		AK Att. 5 - Hazardous Constituents for waste streams OR-NFS-CH-SOIL, OR-NFS-CH-HOM-A, OR-REDC-CH-HET, and OR-REDC-RH-HET **(AK-15)** I) S. 6.4.1.2, Table 6-1 & S. 7.4.1.2, Table 7-1 **(AK-1)** S. 5.4.1.2, Table 5-1 **(AK-2)** S. 5.4.1.2, Table 5-1 **(AK-3)** Memo attached to AK Att. 6 - Waste Form, Waste Material Parameters, Prohibited Items and Packaging for waste streams OR-NFS-CH-SOIL, OR-NFS-CH-HOM-A, OR-REDC-CH-HET, and OR-REDC-RH-HET **(AK-16)** RTR BDRs: OR-RTR6-0650 OR-RTR6-0654 OR-RTR6-0676 OR-RTR6-0688 OR-RTR6-0695 OR-RTR6-0706 OR-RTR6-0713 OR-RTR6-0723 OR-RTR7-0138 OR-RTR7-0148 **(RTR-1)** VE BDRs: ORNLRHVE15003 ORNLRHVE15016 ORNLRHVE16002		

	WAP Requirement[2] ORNL CCP Audit A-16-15 Table C6-2 Acceptable Knowledge (AK) Checklist[1]	Procedure Documented		Example of Implementation/ Objective Evidence, as applicable		Comment (e.g., any change in procedure since last audit, etc.)
		Location	Adequate? Y/N (Why)	Item Reviewed	Adequate? Y/N	
		CCP-TP-500 (ALL)		ORNLRHVE16009 ORNLRHVE16010 ORVECH0136 ORVECH0138 ORVECH0142 ORVECH0143 ORVECH0144 ORVECH0146 ORVECH0148 ORVECH0162 **(VE-1)**		
145	Does the generator provide procedures or written commitment to collect additional acceptable knowledge information, as available and as necessary to augment mandatory information? (Section C4-2c)	CCP-TP-005 S. 4.2.5 Att.1	Y	Att. 1 – AK Documentation Checklist for waste streams OR-NFS-CH-SOIL, OR-NFS-CH-HOM-A, OR-REDC-CH-HET, and OR-REDC-RH-HET **(AK-13)**	Y	
146	Does the generator site document that all additional specific, relevant information used in the acceptable knowledge process will be identified and its use explained? Is all necessary information assembled and has it been appropriately used? (Section C4-2c)	CCP-TP-005 S. 4.2.5 Att.1	Y	Att. 1 – AK Documentation Checklist for waste streams OR-NFS-CH-SOIL, OR-NFS-CH-HOM-A, OR-REDC-CH-HET, and OR-REDC-RH-HET **(AK-13)**	Y	
147	Does the generator site discrepancy analysis documentation (for acceptable knowledge additional and required documentation) indicate that if discrepancies are detected, the site may consider applying all hazardous waste numbers indicated in the required and additional information, but must assess and evaluate the information to determine the appropriate hazardous waste numbers consistent with RCRA requirements? (Section C4-2c)	CCP-TP-005 S. 4.9 Att. 11	Y	AK Discrepancies in the AK Record **(AK-19)**	Y	
	TRAINING					
148	Does the generator site have procedures to ensure that all personnel involved with acceptable knowledge waste characterization have the following training, and is this training documented? A. WIPP WAP in Permit Attachment C and the TSDF-WAC specified in this permit B. State and Federal RCRA regulations associated with solid and hazardous waste characterization	CCP-QP-002 S. 4.2.1 S. 4.3.1 S. 4.6 NOTE S. 4.8.1[A], [D], [E](b),(c),(d) and 4.7.2 CCP-TP-005 S. 4.14	Y	Acceptable Knowledge Expert (AKE) and Site Project Manager (SPM) Training files **(GEN-13)** AK Summary Report Operational Training (**AK-39)**	Y	

	WAP Requirement[2] ORNL CCP Audit A-16-15 Table C6-2 Acceptable Knowledge (AK) Checklist[1]	Procedure Documented		Example of Implementation/ Objective Evidence, as applicable		Comment (e.g., any change in procedure since last audit, etc.)
		Location	Adequate? Y/N (Why)	Item Reviewed	Adequate? Y/N	
	C. Discrepancy resolution and reporting D. Site-specific procedures associated with waste characterization using acceptable knowledge (Section C4-3a)					
	PROCEDURES					
149	Has the generator site developed the following procedures, and are these procedures technically sufficient? A. Sites must prepare and implement a written procedure outlining the specific methodology used to assemble acceptable knowledge records, including the origin of the documentation, how it will be used, and any limitations associated with the information (e.g., identify the purpose and scope of a study that included limited sampling and analysis data).	**A-D)** CCP-TP-005 S. 4.2 S. 4.3 S. 4.4 S. 4.9 S. 4.13 Att. 11 CCP-TP-001 S. 2.7 S. 4.1 S. 4.2	Y	A) CCP AK Summary Report for NFS CH TRU Waste Stored at ORNL, OR-NFS-CH-SOIL and OR-NFS-CH-HOM-A, CCP-AK-ORNL-001 R10 **(AK-1)** CCP AK Summary Report for ORNL REDC CH TRU Waste, OR-REDC-CH-HET, CCP-AK-ORNL-002 R4 **(AK-2)** CCP AK Summary Report for ORNL REDC RH TRU Waste, OR-REDC-RH-HET, CCP-AK-ORNL-500 R5 **(AK-3)** AK Source Document Summaries for waste stream OR-NFS-CH-SOIL **(AK-9)** AK Source Document Summaries for waste stream OR-NFS-CH-HOM-A **(AK-10)** AK Source Document Summaries for waste stream OR-REDC-CH-HET **(AK-11)** AK Source Document Summaries for waste	Y	

	WAP Requirement[2] ORNL CCP Audit A-16-15 Table C6-2 Acceptable Knowledge (AK) Checklist[1]	Procedure Documented		Example of Implementation/ Objective Evidence, as applicable		Comment (e.g., any change in procedure since last audit, etc.)
		Location	Adequate? Y/N (Why)	Item Reviewed	Adequate? Y/N	
	B. Sites must develop and implement a written procedure to compile the required acceptable knowledge record. C. Sites must develop and implement a written procedure that ensures unacceptable wastes (e.g., reactive, ignitable, corrosive) are identified and segregated from TRU mixed waste populations sent to WIPP.			stream OR-REDC-RH-HET **(AK-12)** Acceptable Knowledge Assessment for waste stream OR-NFS-CH-SOIL **(AK-22)** B) CCP AK Summary Report for NFS CH TRU Waste Stored at ORNL, OR-NFS-CH-SOIL and OR-NFS-CH-HOM-A, CCP-AK-ORNL-001 R10 **(AK-1)** CCP AK Summary Report for ORNL REDC CH TRU Waste, OR-REDC-CH-HET, CCP-AK-ORNL-002 R4 **(AK-2)** CCP AK Summary Report for ORNL REDC RH TRU Waste, OR-REDC-RH-HET, CCP-AK-ORNL-500 R5 **(AK-3)** C) NCRs for prohibited items **(AK-21)** Acceptable Knowledge Assessment for waste stream OR-NFS-CH-SOIL **(AK-22)** IDC database with “reject” field **(AK-23)** Container inspection reports **(AK-27)** “Hold” tag **(AK-26)**		

	WAP Requirement[2] ORNL CCP Audit A-16-15 Table C6-2 Acceptable Knowledge (AK) Checklist[1]	Procedure Documented		Example of Implementation/ Objective Evidence, as applicable		Comment (e.g., any change in procedure since last audit, etc.)
		Location	Adequate? Y/N (Why)	Item Reviewed	Adequate? Y/N	
	D. Sites must prepare and implement a written procedure to evaluate acceptable knowledge and resolve discrepancies. For example, if different sources of information indicate different hazardous wastes are present, then sites must include all sources of information in its records and may choose to either conservatively assign hazardous waste numbers, or assign only those numbers deemed appropriate and consistent with RCRA requirements. All information used to justify assignment of hazardous waste numbers must be placed in the auditable record. Further, the assignment of hazardous waste numbers shall be tracked in the auditable record to all required documentation.			ORNLRHVE15007 **(AK-31)** ORNLRHVE15012 **(AK-32)** AK Att. 6 - Waste Form, Waste Material Parameters, Prohibited Items and Packaging for waste streams OR-NFS-CH-SOIL, OR-NFS-CH-HOM-A, OR-REDC-CH-HET, and OR-REDC-RH-HET **(AK-16)** D) AK Discrepancy Resolutions in the AK Record **(AK-19)**		
149a	E. Sites must prepare and implement a written procedure to identify hazardous wastes and assign the appropriate hazardous waste numbers to each waste stream. The following are minimum baseline requirements/standards that site-specific procedures must include to ensure comparable and consistent characterization of hazardous waste: 1. Compile all of the required information in an auditable record. 2. Review the compiled information and delineate waste streams. Delineation of waste streams must comply with the WAP definition in Permit Attachment C, Section C-0a, and justify combining waste	**E.1 - E.6:** CCP-TP-005 S. 1.1 S. 4.2 S. 4.3 S. 4.4 S. 4.4.11 S. 4.4.16 S. 4.4.17 S. 4.4.30 S. 4.4.35 S. 4.4.38[D], [K], [L] & [M] S. 4.13 CCP-TP-500 (ALL)	Y	E.1) CCP AK Summary Report for NFS CH TRU Waste Stored at ORNL, OR-NFS-CH-SOIL and OR-NFS-CH-HOM-A, CCP-AK-ORNL-001 R10 **(AK-1)** CCP AK Summary Report for ORNL REDC CH TRU Waste, OR-REDC-CH-HET, CCP-AK-ORNL-002 R4 **(AK-2)** CCP AK Summary Report for ORNL REDC RH TRU Waste, OR-REDC-RH-HET, CCP-AK-ORNL-500 R5 **(AK-3)** E.2) CCP AK Summary Report for NFS CH TRU Waste	Y	

	WAP Requirement[2] ORNL CCP Audit A-16-15 Table C6-2 Acceptable Knowledge (AK) Checklist[1]	Procedure Documented		Example of Implementation/ Objective Evidence, as applicable		Comment (e.g., any change in procedure since last audit, etc.)
		Location	Adequate? Y/N (Why)	Item Reviewed	Adequate? Y/N	
	historically managed separately as TRU mixed and TRU non-mixed waste streams into a single waste stream. 3. Review the compiled information to determine if the waste stream is compliant with the TSDF-WAC			Stored at ORNL, OR-NFS-CH-SOIL and OR-NFS-CH-HOM-A, CCP-AK-ORNL-001 R10, S. 2.2 & 2.3 **(AK-1)** CCP AK Summary Report for ORNL REDC CH TRU Waste, OR-REDC-CH-HET, CCP-AK-ORNL-002 R4, S. 2.1 **(AK-2)** CCP AK Summary Report for ORNL REDC RH TRU Waste, OR-REDC-RH-HET, CCP-AK-ORNL-500 R5, S. 2.0 **(AK-3)** E.3) CCP AK Summary Report for NFS CH TRU Waste Stored at ORNL, OR-NFS-CH-SOIL and OR-NFS-CH-HOM-A, CCP-AK-ORNL-001 R10, S. 6.4.3.5, 6.4.3.6, 6.4.4, 7.4.3.5, 7.4.3.6, & 7.4.4 **(AK-1)** CCP AK Summary Report for ORNL REDC CH TRU Waste, OR-REDC-CH-HET, CCP-AK-ORNL-002 R4, S. 5.4.3.4, 5.4.3.5 & 5.4.4 **(AK-2)** CCP AK Summary Report for ORNL REDC RH TRU Waste, OR-REDC-RH-HET, CCP-AK-ORNL-500 R5, S. 5.4.2.3, 5.4.5 & 5.4.6 **(AK-3)** Acceptable Knowledge Assessment for waste stream OR-NFS-CH-SOIL **(AK-22)**		

	WAP Requirement[2] ORNL CCP Audit A-16-15 Table C6-2 Acceptable Knowledge (AK) Checklist[1]	Procedure Documented		Example of Implementation/ Objective Evidence, as applicable		Comment (e.g., any change in procedure since last audit, etc.)
		Location	Adequate? Y/N (Why)	Item Reviewed	Adequate? Y/N	
	4. Review the required information to determine if the waste is listed under 20.4.1.200 NMAC (incorporating 40 CFR 261), Subpart D. Assign all listed hazardous waste numbers, unless the site chooses to justify an alternative assignment and document the justification in the auditable record. 5. Review the required information to determine if the waste exhibits a hazardous characteristic or may contain hazardous constituents included in the toxicity characteristics specified in 20.4.1.200 NMAC (incorporating 40 CFR 261, Subpart C. If a toxicity characteristic contaminant is identified and is not included as a listed waste, sites may evaluate available data and assign the toxicity characteristic hazardous waste number consistent with RCRA requirements. All data examined to reach the hazardous waste number determination must be placed in the auditable record and must present a clear justification for the hazardous waste number analyses.			NCRs for prohibited items **(AK-21)** AK Att. 6 - Waste Form, Waste Material Parameters, Prohibited Items and Packaging for waste streams OR-NFS-CH-SOIL, OR-NFS-CH-HOM-A, OR-REDC-CH-HET, and OR-REDC-RH-HET **(AK-16)** ORNLRHVE15007 **(AK-31)** ORNLRHVE15012 **(AK-32)** E.4&5) CCP AK Summary Report for NFS CH TRU Waste Stored at ORNL, OR-NFS-CH-SOIL and OR-NFS-CH-HOM-A, CCP-AK-ORNL-001 R10, S. 6.4.3 & S. 7.4.3, Table 7-5 **(AK-1)** CCP AK Summary Report for ORNL REDC CH TRU Waste, OR-REDC-CH-HET, CCP-AK-ORNL-002 R4, S. 5.4.3, Tables 5-7 & 5-8 **(AK-2)** CCP AK Summary Report for ORNL REDC RH TRU Waste, OR-REDC-RH-HET, CCP-AK-ORNL-500 R5, S. 5.4.2, Tables 5-2 & 5-3 **(AK-3)** AK Att. 5 - Hazardous Constituents for waste streams OR-NFS-CH-		

	WAP Requirement[2] ORNL CCP Audit A-16-15 Table C6-2 Acceptable Knowledge (AK) Checklist[1]	Procedure Documented		Example of Implementation/ Objective Evidence, as applicable		Comment (e.g., any change in procedure since last audit, etc.)
		Location	Adequate? Y/N (Why)	Item Reviewed	Adequate? Y/N	
	6. Review the compiled information to provide an estimate of the material parameter weights for each container to be stored or disposed of at WIPP. For newly generated waste, procedures shall be developed and implemented to characterize hazardous waste using acceptable knowledge prior to packaging.			SOIL, OR-NFS-CH-HOM-A, OR-REDC-CH-HET, and OR-REDC-RH-HET **(AK-15)** E.6) CCP AK Summary Report for NFS CH TRU Waste Stored at ORNL, OR-NFS-CH-SOIL and OR-NFS-CH-HOM-A, CCP-AK-ORNL-001 R10, S. 6.4.1.2, Table 6-1 & S. 7.4.1.2, Table 7-1 **(AK-1)** CCP AK Summary Report for ORNL REDC CH TRU Waste, OR-REDC-CH-HET, CCP-AK-ORNL-002 R4, S. 5.4.1.2, Table 5-1 **(AK-2)** CCP AK Summary Report for ORNL REDC RH TRU Waste, OR-REDC-RH-HET, CCP-AK-ORNL-500 R5, S. 5.4.1.2, Table 5-1 **(AK-3)** Memo attached to AK Att. 6 - Waste Form, Waste Material Parameters, Prohibited Items and Packaging for waste streams OR-NFS-CH-SOIL, OR-NFS-CH-HOM-A, OR-REDC-CH-HET, and OR-REDC-RH-HET **(AK-16)**		
149b	F. Sites shall ensure that results of audits of the TRU mixed waste characterization programs at the site are available in the records.	**F.)** CCP-PO-001 S. C4-3f & C4-3b WP 13-QA.03 (ALL)	Y	F) CCP Internal Audits, Surveillances and Management Assessments **(AK-29)**	Y	

	WAP Requirement[2] ORNL CCP Audit A-16-15 Table C6-2 Acceptable Knowledge (AK) Checklist[1]	Procedure Documented		Example of Implementation/ Objective Evidence, as applicable		Comment (e.g., any change in procedure since last audit, etc.)
		Location	Adequate? Y/N (Why)	Item Reviewed	Adequate? Y/N	
	G. Sites shall identify all process controls (implemented to ensure that the waste contains no prohibited items and to control hazardous waste content and/or physical form) that have been applied to retrievably stored waste and/or may presently be applied to newly generated waste. Process controls are applied at the time of waste generation/packaging to control waste content, whereas any activities performed after waste generation/packaging to identify prohibited items, hazardous waste content, or physical form are waste characterization activities, not process controls. The AK record must contain specific process control and supporting documentation identifying when these process controls are used to control waste content. See Permit Attachment C, Section C-2 for programmatic requirements related to process controls. (Section C4-3b)	**G.)** CCP-TP-005 S. 4.2-4.4 S. 4.2.9-4.2.19 Att. 9		G) AK Source Document Summaries for waste stream OR-NFS-CH-SOIL, P1400 **(AK-9)** AK Source Document Summaries for waste stream OR-NFS-CH-HOM-A, P218 **(AK-10)** AK Source Document Summaries for waste stream OR-REDC-CH-HET, P598 **(AK-11)** AK Source Document Summaries for waste stream OR-REDC-RH-HET, P598 **(AK-12)** Att. 9 – Interface Waste Management Documents List for waste streams OR-REDC-CH-HET and OR-REDC-RH-HET **(AK-18)** ORNLRHVE15007 **(AK-31)** ORNLRHVE15012 **(AK-32)**		
150	Does the site have implemented procedures which comply with the following criteria to establish acceptable knowledge records: A. Acceptable knowledge information shall be compiled in an auditable record, including a road map for all applicable information.	**A-E:** CCP-TP-005 S. 3.3.13 S. 4.2 S. 4.3 S. 4.4 S. 4.10 S. 4.11 Att. 1,4 & 8 CCP-TP-001 S. 2.7	**A-E:** Y	A) CCP AK Summary Report for NFS CH TRU Waste Stored at ORNL, OR-NFS-CH-SOIL and OR-NFS-CH-HOM-A, CCP-AK-ORNL-001 R10 **(AK-1)** CCP AK Summary Report for ORNL REDC CH TRU Waste, OR-REDC-CH-HET, CCP-AK-ORNL-002 R4 **(AK-2)**	Y	

	WAP Requirement[2] ORNL CCP Audit A-16-15 Table C6-2 Acceptable Knowledge (AK) Checklist[1]	Procedure Documented		Example of Implementation/ Objective Evidence, as applicable		Comment (e.g., any change in procedure since last audit, etc.)
		Location	Adequate? Y/N (Why)	Item Reviewed	Adequate? Y/N	
	B. The overview of the facility and TRU mixed waste management operations in the context of the facility's mission shall be correlated to specific waste stream information. C. Correlations between waste streams, with regard to time of generation, waste generating processes, and site-specific facilities shall be clearly described. For newly generated wastes, the rate and quantity of waste to be generated shall be defined.			CCP AK Summary Report for ORNL REDC RH TRU Waste, OR-REDC-RH-HET, CCP-AK-ORNL-500 R5 **(AK-3)** Att. 1 – AK Documentation Checklist for waste streams OR-NFS-CH-SOIL, OR-NFS-CH-HOM-A, OR-REDC-CH-HET, and OR-REDC-RH-HET **(AK-13)** B) CCP AK Summary Report for NFS CH TRU Waste Stored at ORNL, OR-NFS-CH-SOIL and OR-NFS-CH-HOM-A, CCP-AK-ORNL-001 R10, S. 4.2, 4.6, 6.4, & 7.4 **(AK-1)** CCP AK Summary Report for ORNL REDC CH TRU Waste, OR-REDC-CH-HET, CCP-AK-ORNL-002 R4, S. 4.3, 4.7 & 5.4 **(AK-2)** CCP AK Summary Report for ORNL REDC RH TRU Waste, OR-REDC-RH-HET, CCP-AK-ORNL-500 R5, S. 4.3, 4.6 & 5.4 **(AK-3)** C) CCP AK Summary Report for NFS CH TRU Waste Stored at ORNL, OR-NFS-CH-SOIL and OR-NFS-CH-HOM-A, CCP-AK-ORNL-001 R10, S. 4.6.2, 4.4, 6.1, 6.2, 6.3, 7.1, 7.2 & 7.3 **(AK-1)**		

	WAP Requirement[2] ORNL CCP Audit A-16-15 Table C6-2 Acceptable Knowledge (AK) Checklist[1]	Procedure Documented		Example of Implementation/ Objective Evidence, as applicable		Comment (e.g., any change in procedure since last audit, etc.)
		Location	Adequate? Y/N (Why)	Item Reviewed	Adequate? Y/N	
	D. A reference list shall be provided that identifies documents, databases, Quality Assurance protocols, and other sources of information that support the acceptable knowledge information. E. Container inventories for TRU mixed waste in retrievable storage shall be delineated into waste streams by correlating the container identification to all of the required and additional AK information. (Section C4-3c)			CCP AK Summary Report for ORNL REDC CH TRU Waste, OR-REDC-CH-HET, CCP-AK-ORNL-002 R4, S. 4.7.2, 4.5, 5.1, 5.2 & 5.3 **(AK-2)** CCP AK Summary Report for ORNL REDC RH TRU Waste, OR-REDC-RH-HET, CCP-AK-ORNL-500 R5, S. 4.6.2, 4.7, 5.1, 5.2 & 5.3 **(AK-3)** D) Att. 4 – AK Source Document Information Checklist for waste streams OR-NFS-CH-SOIL, OR-NFS-CH-HOM-A, OR-REDC-CH-HET, and OR-REDC-RH-HET **(AK-14)** E) IDC Screenshots for traceability containers **(AK-23)** AK CH and RH Tracking Spreadsheets for waste streams OR-NFS-CH-SOIL, OR-NFS-CH-HOM-A, OR-REDC-CH-HET, and OR-REDC-RH-HET **(AK-24)** AK Att. 8 - Waste Containers List for waste streams OR-NFS-CH-SOIL, OR-NFS-CH-HOM-A, OR-REDC-CH-HET, and OR-REDC-RH-HET **(AK-17)**		

	WAP Requirement[2] ORNL CCP Audit A-16-15 Table C6-2 Acceptable Knowledge (AK) Checklist[1]	Procedure Documented		Example of Implementation/ Objective Evidence, as applicable		Comment (e.g., any change in procedure since last audit, etc.)
		Location	Adequate? Y/N (Why)	Item Reviewed	Adequate? Y/N	
151	If the generator site submitted an AK Sufficiency Determination Request for a specific waste stream, did the site provide all of the requisite information for which approval is sought? (Section C-0b)	CCP-TP-005 S. 4.7	Y	N/A	N/A	An AK Sufficiency Determination is not being sought for any ORNL waste streams at this time.
	RE-EVALUATING ACCEPTABLE KNOWLEDGE					
152	Does the generator site have written procedures for the augmentation of all acceptable knowledge information using testing. Testing consists of radiography and visual examination. Do site procedures indicate that the following testing will be conducted based upon the results of the Determination Request AKSD denied - 100% RTR or VE (Section C4-1, C-0b)	CCP-TP-005 S. 4.4 S. 4.5 S. 4.7	Y	CCP AK Summary Report for NFS CH TRU Waste Stored at ORNL, OR-NFS-CH-SOIL and OR-NFS-CH-HOM-A, CCP-AK-ORNL-001 R10 **(AK-1)** CCP AK Summary Report for ORNL REDC CH TRU Waste, OR-REDC-CH-HET, CCP-AK-ORNL-002 R4 **(AK-2)** CCP AK Summary Report for ORNL REDC RH TRU Waste, OR-REDC-RH-HET, CCP-AK-ORNL-500 R5 **(AK-3)** <u>BDRs</u> ORNLRHVE15007 **(AK-31)** ORNLRHVE15012 **(AK-32)** OR-RTR7-0140 (**AK-33)** OR-RTR7-0102 **(AK-34)** OR-RTR7-0013 **(AK-35)** OR-RTR6-0636 **(AK-36)** OR-RTR7-0124 **(AK-37)** OR-RTR6-0581 **(AK-38)**	Y	
155	Does the generator site have procedures for reevaluating acceptable knowledge if the results of the waste characterization indicate that the waste to be shipped does not match the approved waste stream or if the data from radiography or visual examination for waste streams without an AK Sufficiency Determination exhibit this discrepancy? Does this procedure describe how the waste is reassigned, acceptable knowledge reevaluation, and appropriate hazardous waste numbers are assigned? (Section C4-3e)	CCP-TP-005 S. 4.8 S. 4.9 Att. 10 & 11	Y	AK Discrepancy Resolutions at Characterization and AK Reevaluations **(AK-20)**	Y	

	WAP Requirement[2] ORNL CCP Audit A-16-15 Table C6-2 Acceptable Knowledge (AK) Checklist[1]	Procedure Documented		Example of Implementation/ Objective Evidence, as applicable		Comment (e.g., any change in procedure since last audit, etc.)
		Location	Adequate? Y/N (Why)	Item Reviewed	Adequate? Y/N	
156	Do site procedures indicate that debris wastes are assigned toxicity characteristic EPA numbers based on AK regardless of the quantity or concentration? (C4-3e)	CCP-TP-005 S. 4.4.17 Att. 5	Y	CCP AK Summary Report for ORNL REDC CH TRU Waste, OR-REDC-CH-HET, CCP-AK-ORNL-002 R4, S. 5.4.3.2, Tables 5-7 & 5-8 **(AK-2)** CCP AK Summary Report for ORNL REDC RH TRU Waste, OR-REDC-RH-HET, CCP-AK-ORNL-500 R5, S. 5.4.2.2, Tables 5-2 & 5-3 **(AK-3)** AK Att. 5 - Hazardous Constituents for waste streams OR-REDC-CH-HET and OR-REDC-RH-HET **(AK-15)**	Y	

	WAP Requirement[2] ORNL CCP Audit A-16-15 Table C6-2 Acceptable Knowledge (AK) Checklist[1]	Procedure Documented		Example of Implementation/ Objective Evidence, as applicable		Comment (e.g., any change in procedure since last audit, etc.)
		Location	Adequate? Y/N (Why)	Item Reviewed	Adequate? Y/N	
	CRITERIA FOR ASSEMBLING AN ACCEPTABLE KNOWLEDGE RECORD DELINEATING THE WASTE STREAM					
158	If wastes are reassigned to a different waste matrix code based on site visual examination or radiography or Permittee confirmation activities, does the generator site have written documentation to ensure that the following steps are followed: A. Review existing information based on the container identification number and document all differences in hazardous waste number assignments B. If differences exist in the hazardous waste numbers that were assigned, reassess and document all required acceptable knowledge information (Section C4-3b) associated with the new designation C. Reassess and document all testing data associated with the waste D. Verify and document that the reassigned waste matrix code was generated within the specified time period, area and buildings, waste generating process, and that the process material inputs are consistent with the waste material parameters identified during radiography or visual examination E. Record all changes to acceptable knowledge records F. If discrepancies exist in the acceptable knowledge information for the revised waste matrix code, document the segregation of the affected portion of the waste stream, and define the actions necessary to fully characterize the waste (Section C4-3e)	CCP-TP-005 S. 4.8 S. 4.9 Att. 10 & 11	Y	AK Discrepancy Resolutions at Characterization and AK Reevaluations **(AK-20)**	Y	
	DATA QUALITY REQUIREMENTS					
168	Are acceptable knowledge processes consistently applied among all generator sites, and does each generator site comply with the following data quality requirements for acceptable knowledge documentation: A. Precision - The qualitative determinations, such as compiling and assessing acceptable knowledge documentation, do not lend themselves to statistical evaluations of precision. However, the acceptable knowledge information will be addressed by the independent review of acceptable knowledge information during internal and external audits. B. Accuracy - The percentage of waste containers which require reassignment to a new waste matrix code and/or designation of different hazardous waste numbers based on testing data and discrepancies identified by the Permittees during waste confirmation will be reported as a measure of acceptable knowledge accuracy.	**A.)** CCP-PO-001 S. C4-3f WP 13-QA.03 (ALL) CCP-TP-005 S. 4.14 **B.)** CCP-TP-005 S. 4.6	Y Y	A) CCP Internal Audits, Surveillances and Management Assessments **(AK-29)** B) AK Accuracy Reports **(AK-28)**	Y Y	

	WAP Requirement[2] ORNL CCP Audit A-16-15 Table C6-2 Acceptable Knowledge (AK) Checklist[1]	Procedure Documented		Example of Implementation/ Objective Evidence, as applicable		Comment (e.g., any change in procedure since last audit, etc.)
		Location	Adequate? Y/N (Why)	Item Reviewed	Adequate? Y/N	
	C. Completeness - The acceptable knowledge record must contain 100 percent of the information (Permit Attachment C4-3). The usability of the acceptable knowledge information will be assessed for completeness during audits.	**C.)** CCP-TP-005 S. 4.0 Att. 1	Y	C) Att. 1 – AK Documentation Checklist for waste streams OR-NFS-CH-SOIL, OR-NFS-CH-HOM-A, OR-REDC-CH-HET, and OR-REDC-RH-HET **(AK-13)**	Y	
168a	D. Comparability - Comparability is ensured through sites meeting the training requirements and complying with the minimum standards outlined for procedures that are used to implement the acceptable knowledge process. All sites must assign hazardous waste numbers in accordance with Permit Attachment C4-4 and provide this information regarding its waste to other sites who store or generate a similar waste stream. E. Representativeness - Representativeness is a qualitative parameter that will be satisfied by ensuring that the process of obtaining, evaluating, and documenting acceptable knowledge information is performed in accordance with the minimum standards established in Permit Attachment C4. Sites also must assess and document the limitations of the acceptable knowledge information used to assign hazardous waste numbers (e.g., purpose and scope of information, date of publication, type and extent to which waste parameters are addressed). (Section C3-3)	**D.)** CCP-TP-005 S. 2.2 S. 4.0 S. 4.14 CCP-QP-002 S. 4.3.1 **E.)** CCP-TP-005 S. 2.2 S. 4.0 S. 4.14 CCP-QP-002 S. 4.3.1	Y	D) Acceptable Knowledge Expert (AKE) and Site Project Manager (SPM) Training files **(GEN-13)** AK Summary Report Operational Training (**AK-39)** E) Acceptable Knowledge Expert (AKE) and Site Project Manager (SPM) Training files **(GEN-13)** AK Source Document Summaries for waste stream OR-NFS-CH-SOIL, [need SD #] **(AK-9)** AK Source Document Summaries for waste stream OR-NFS-CH-HOM-A, P218 **(AK-10)** AK Source Document Summaries for waste stream OR-REDC-CH-HET, P1406 **(AK-11)** AK Summary Report Operational Training (**AK-39)**	Y	
169	Does the generator site address quality control by tracking its performance with regard to the use of acceptable knowledge by: 1) assessing the frequency of inconsistencies among information, and 2) documenting the results of waste discrepancies identified by the generator/storage site during waste characterization	CCP-TP-005 S. 4.6 S. 4.9 Att. 10 & 11	Y	AK Accuracy Reports **(AK-28)**	Y	

	WAP Requirement[2] ORNL CCP Audit A-16-15 Table C6-2 Acceptable Knowledge (AK) Checklist[1]	Procedure Documented		Example of Implementation/ Objective Evidence, as applicable		Comment (e.g., any change in procedure since last audit, etc.)
		Location	Adequate? Y/N (Why)	Item Reviewed	Adequate? Y/N	
	or the Permittees during waste confirmation using radiography, review of radiography audio/video recordings, or visual examination, or review of visual examination records. In addition, the acceptable knowledge process and waste stream documentation must be evaluated through internal assessments by generator/storage site quality assurance organizations. (Section C4-3e)	WP 13-QA.03 (ALL) CCP-PO-001 S. C4-3f		AK Discrepancy Resolutions in the AK Record **(AK-19)** AK Discrepancy Resolutions at Characterization and AK Reevaluations **(AK-20)** CCP Internal Audits, Surveillances and Management Assessments **(AK-29)**		

1. NMED expects a traceability analysis to be performed, the results of which should be presented on this checklist under the "Examples of Implementation" column. Further, the traceability analysis process and results should be discussed in the Final Audit Report.

2. The WAP requirements should be presented in documents, such as procedures. Each of the questions posed under WAP requirements are meant to determine whether procedures are in place or whether documents are evident which demonstrate that the specific WAP requirement is or can be met.

Controlled
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AK1

CCP-AK-ORNL-001

Central Characterization Program
Acceptable Knowledge Summary Report
For

Nuclear Fuel Services
Contact-Handled Transuranic Waste
Stored at Oak Ridge National Laboratory

Waste Streams:
OR-NFS-CH-HET-A
OR-NFS-CH-SOIL
OR-NFS-CH-HOM-A
OR-NFS-CH-HOM-B

REVISION 10

March 31, 2014

Mike Ramirez
Printed Name

APPROVED FOR USE

RECORD OF REVISION

Revision Number	Date Approved	Description of Revision
0	09/25/2007	Initial issue.
1	11/30/2007	1. Throughout: Added discussions related to early-1990s decommissioning waste, including Building 110 and associated underground storage tank. 2. Section 4.2: Added more detail to mission as it relates to Southwest Experimental Fast Oxide Reactor (SEFOR) and Savannah River Site (SRS) projects. 3. Section 4.2: Indicated that waste from U-233 facility in Building 234 is not included in this waste stream. 4. Section 4.4.1: Added new section with details of historical Mixed Oxide (MOX) production process operations. 5. Section 4.6: Included general discussion of transuranic (TRU) waste management. 6. Sections 4.6.1 & 5.2: Updated waste stream volumes and generation dates. 7. Section 5.4.2.2: Revised discussion on assay of waste from final decommissioning phase. 8. Tables 5-1 & 5-4: Updated waste material parameter and radiological percentages based on drum additions. 9. Sections 5.4.3 & 5.4.3.2: Added Environmental Protection Agency (EPA) hazardous waste number D006 (cadmium) and D011 (silver), and included more discussion on mercury. 10. Section 7.0: Added numerous new source documents.
2	06/25/2008	Added new soil waste stream OR-NFS-CH-SOIL (Sections 2.2 and 6.0). Made several changes in Section 4.0 and 9.0 associated with the soil.
3	08/11/2008	Added new TRUCON Code OR 111/211 for soil.

RECORD OF REVISION (Continued)

Revision Number	Date Approved	Description of Revision
4	05/26/2009	1. Small quantities of soil have been identified in several drums in debris waste stream OR-NFS-CH-HET. Soil waste stream OR-NFS-CH-SOIL is assigned EPA hazardous waste number F002 for tetrachloroethylene. For this reason, EPA hazardous waste number F002 is being added to the debris waste stream. The debris waste stream number is being changed to OR-NFS-CH-HET-A. 2. Added drums to waste streams OR-NFS-CH-HET and OR-NFS-CH-SOIL generated from repackaging of boxed waste into drums, including one box from excavation of the NFS burial ground. 3. Added discussion in Section 5.4.1.1 indicating drum NFS-0929 is <50 percent homogeneous solids. 4. Added discussion to Section 5.4.4 indicating drum NFS-0116 does not contain machine-compacted waste. 5. Made other minor editorial changes and correction.

RECORD OF REVISION (Continued)

Revision Number	Date Approved	Description of Revision
5	01/14/2010	1. Reduced HET-A waste stream volume by 5 drums that were mistakenly listed in both HET-A and SOIL. 2. Added "Subpart D" to Section 4.6.2 because HET-A is also F-listed. 3. Added a paragraph to Section 5.4.1.1 describing 5 drums that moved from SOIL to HET-A, and added rock to Section 5.4.1 as a result. 4. Added soil/gravel to Table 5-1 to account for drums containing soil, and added reference to the associated DR015. 5. Added more detail in Sections 5.4.3.1 and 6.4.3.1 describing the basis for the F002 assignment. 6. Added missing reference to end of the last paragraph in Section 5.4.3.2. 7. Added paragraph to Section 6.4.3.2 explaining why D006, D008, D009, and D011 do not apply to SOIL.
6	12/08/2010	1. Added new S3000 waste stream OR-NFS-CH-HOM-A. 2. Added reference to a future groundwater treatment sludge waste stream. 3. Revised discussion in Sections 5.3.1 and 6.3.1 on waste originating in Trench B of the radioactive burial ground. 4. Moved batteries from "iron-based metal" to "other metal," and deleted foam from "rubber" as it is already included in "plastic." 5. Moved NFS0929 from OR-NFS-CH-HET-A to OR-NFS-CH-HOM-A. 6. Added discussion on heat-sealed bags to Section 5.4.4. 7. Expanded packaging discussion in Sections 5.5, 5.5.2, and 6.5. 8. Added source documents to Section 10.0. 9. Made other minor editorial changes and corrections as necessary.

RECORD OF REVISION (Continued)

Revision Number	Date Approved	Description of Revision
7	05/10/2011	1. Added new groundwater treatment sludge waste stream OR-NFS-CH-HOM-B. 2. Added TRUPACT-II Content Code (TRUCON) OR 127 / OR 227 in Section 2.2 for soil, and revised Section 6.4.1.2 to indicate when this code is used. 3. Made major changes to Section 4.0 and 6.0 to describe additional Nuclear Fuel Services, Inc. (NFS) soil generation. 4. Changed the final decommissioning phase to the second decommissioning phase and redefined a new final decommissioning phase. 5. Made changes to address new *WIPP Hazardous Waste Facility Permit, Waste Analysis Plan* (WIPP-WAP) requirements. 6. Included discussion of concrete repackaging in Sections 5.3.2 and 5.5. 7. Included additional waste items in Section 5.4.1 based on repack forms, and split last bullet into inorganic matrix, organic matrix, and soil/gravel. 8. Added discussion of 1993 Wet Cell soil and concrete analysis in Sections 5.4.3 and 6.4.3. These data were previously missing. 9. Added discussion of high thorium in soils in Section 6.4.2.1. 10. Revised packaging configuration of OR-NFS-CH-HOM-A in Section 7.5. 11. Revised Section 9.0 to include new NFS container paperwork. 12. Added new and revised several existing source documents in Section 11.0. 13. Added new Figure 2c, 234 Excavation Facility Layout, and Figure 6, Groundwater Pretreatment System. 14. Made other editorial changes and corrections.

RECORD OF REVISION (Continued)

Revision Number	Date Approved	Description of Revision
8	12/12/2013	1. Made changes to be consistent with Attachment 12 of CCP-TP-005, *CCP Acceptable Knowledge Documentation*. 2. Incorporated Nuclear Waste Partnership (NWP) transition changes. 3. Added machine-compacted waste to waste stream OR-NFS-CH-HET-A, including further discussion of Building 110, the Decontamination and Volume Reduction Facility (DVRF), and Scientific Ecology Group (SEG). 4. Added source document P582 for polychlorinated biphenyls (PCB) decontamination at the Transuranic Waste Processing Center (TWPC) to Sections 5.3.2 and 11.0. 5. Made editorial changes, corrections, and clarifications.
9	02/06/2014	1. Deleted discussion of stainless steel band from Section 2.2. 2. Revised Section 4.3.2 to clarify that these waste streams do not contain spent nuclear fuel or high level waste. 3. Added description of Building 110 decommissioning to Section 4.4.2. 4. Changed 2012 to Fiscal Year 2018 in Section 6.3.1.3. 5. Revised Table 6-1 to include Inorganic Matrix and adjust other percentages. 6. Added bullet to Section 6.4.3 indicating NFS will be conducting further sampling and analysis. 7. Made other minor editorial corrections and changes.

RECORD OF REVISION (Continued)

Revision Number	Date Approved	Description of Revision
10	03/31/2014	1. Sections 2.2 and 6.5: Some drums may contain soil placed directly into a 90-mil liner with no polyethylene drum liner bag. 2. Section 5.4.1: For consistency with other ORNL AK reports, moved floor sweepings to Other Inorganic Material and electrical cord and shoe covers to Plastic, and added booties to Rubber. 3. Section 7.4.1: Added batteries to the waste stream description. 4. Section 11.0: Added DR037 and DR038.

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LIST OF ACRONYMS AND ABBREVIATIONS

AEC	U.S. Atomic Energy Comission
AK	acceptable knowledge
ATWIR	*Annual Transuranic Waste Inventory Report*
BBA	Box Breakdown Area
CAR	Corrective Action Report
CCP	Central Characterization Program
CFR	Code of Federal Regulations
CH	Contact-handled
Ci%	Curie percent
D_2O	Deuterium Oxide (heavy water)
DMS	Defense Material System
DOE	U.S. Department of Energy
DOT	U.S. Department of Transportation
DVRF	Decontamination and Volume Reduction Facility
EPA	U.S. Environmental Protection Agency
FGE	fissile gram equivalent
ft^3	cubic feet
GE	General Electric
GPS	groundwater pretreatment system
HDPE	high-density polyethylene
HEPA	High Efficiency Particulate Air
HLW	High-level waste
in.	inch
IPAN	Imaging Passive Active Neutron
kg	kilogram
mg/kg	milligrams per kilogram
mg/L	milligrams per liter
MOX	mixed oxide
mR/hr	millirem per hour
MSDS	Material Safety Data Sheet
nCi/g	nanocuries per gram
NDA	nondestructive assay
NFS	Nuclear Fuel Services, Inc.
NWPA	*Nuclear Waste Policy Act of 1982*
ORNL	Oak Ridge National Laboratory
ORNL-WAC	ORNL Waste Acceptance Criteria
PCBs	polychlorinated biphenyls
ppm	parts-per-million
PRQL	Program Required Quantitation Limit
PVC	polyvinyl chloride
QA	quality assurance
RBG	Radioactive Burial Ground
RCRA	Resource Conservation and Recovery Act
RTR	Real-Time Radiography

LIST OF ACRONYMS AND ABBREVIATIONS (Continued)

SEFOR	Southwest Experimental Fast Oxide Reactor
SEG	Scientific Ecology Group, Inc.
SGS	Segmented Gamma Scanner
SNF	Spent nuclear fuel
SRS	Savannah River Site
SWMU	Solid Waste Management Unit
TCLP	Toxicity Characteristic Leaching Procedure
TDEC	Tennessee Department of Environment and Conservation
TRU	transuranic
TRUCON	TRUPACT-II Content Code
TSCA	Toxic Substances Control Act
TWPC	Transuranic Waste Processing Center
UCL90	90 percent upper confidence limit
VAGAS	Versatile Automated Gamma Assay System
VE	visual examination
WEAF	Waste Examination and Assay Facility
WIPP	Waste Isolation Pilot Plant
WIPP-WAC	*Waste Isolation Pilot Plant Waste Acceptance Criteria*
WIPP-WAP	*Waste Isolation Pilot Plant Hazardous Waste Facility Permit, Waste Analysis Plan*
Wt%	Weight percent

1.0 EXECUTIVE SUMMARY

This acceptable knowledge (AK) Summary Report has been prepared for the Central Characterization Program (CCP) for contact-handled (CH) transuranic (TRU) waste generated at Nuclear Fuel Services, Inc. (NFS) in Erwin, Tennessee and stored at the Oak Ridge National Laboratory (ORNL) in Oak Ridge, Tennessee. A portion of the NFS waste inventory was sent to Scientific Ecology Group, Inc. (SEG) in Oak Ridge, Tennessee for compaction and then transferred to ORNL. As necessary, the NFS waste is repackaged at the Transuranic Waste Processing Center (TWPC) located in Building 7880 at ORNL. This report was prepared in accordance with CCP-TP-005, *CCP Acceptable Knowledge Documentation* (Reference 1) to implement the AK requirements of the *Waste Isolation Pilot Plant Hazardous Waste Facility Permit*, *Waste Analysis Plan,* (WIPP-WAP) (Reference 2) and DOE/WIPP-02-3122, *Transuranic Waste Acceptance Criteria for the Waste Isolation Pilot Plant* (WIPP-WAC) (Reference 5).

The WIPP-WAP AK requirements are addressed in CCP-PO-001, *CCP Transuranic Waste Characterization Quality Assurance Project Plan* (Reference 3). The WIPP-WAC AK requirements are addressed in CCP-PO-002, *CCP Transuranic Waste Certification Plan* (Reference 8). Additionally, this report provides the AK information required by CCP-PO-003, *CCP Transuranic Authorized Methods for Payload Control* (CCP CH-TRAMPAC) (Reference 16).

The CCP is tasked with certification of TRU waste for transportation to and disposal at the Waste Isolation Pilot Plant (WIPP). This report was developed in accordance with CCP-TP-005 (Reference 1) which describes how AK is collected, reviewed, and managed by the CCP. The CCP is responsible for collection, review, and management of AK documentation in accordance with CCP-TP-005 and reviews and approves this AK Summary Report. CCP maintains responsibility for this AK Summary Report and all CCP-TP-005 generated forms and records as quality assurance (QA) records. In addition, CCP maintains a copy of the "historical source documents" as non-QA records.

The waste described in this report was generated primarily by the decommissioning of Building 234 at NFS, but also includes waste from decommissioning of Building 110 (and associated underground storage tank) (References C099, P218, P248, P283, U054). In addition, a few drums were generated from excavation of the NFS Radioactive Burial Ground (RBG) (Reference M132).

This AK Summary Report, along with referenced supporting documents, provides a defensible and auditable record of AK for the designated waste streams from NFS decommissioning. The references and AK source documents used to prepare this report are listed in Sections 10.0 and 11.0. The source documents cited throughout this report are identified by alphanumeric designations corresponding to a unique Source Document Tracking Number (e.g., C001, I001, M001, P001, U001, DR001).

This AK Summary Report includes information relating to the mission and process operations in NFS Buildings 234 and 110 and SEG, and waste identification, characterization, and waste management practices. Information contained in this report was obtained from numerous sources, including facility safety basis documentation, historical document archives, generator and storage facility waste records and documents, and interviews with cognizant personnel.

This report and supporting source documentation provide the mandatory waste program and waste stream-specific information required by the WIPP-WAP (Reference 2).

2.0 WASTE STREAM IDENTIFICATION SUMMARY

Site Where TRU Waste Was Generated and Stored

Generation Location:
Nuclear Fuel Services, Inc.
1205 Banner Hill Road
Erwin, TN 37650
U.S. Environmental Protection Agency (EPA) ID TND003095635

Storage Location:
Oak Ridge National Laboratory (ORNL)
1 Bethel Valley Road
Oak Ridge, TN 37831
EPA ID TN1890090003

Facility Where TRU Waste Was Generated

TRU waste was generated primarily in Building 234 and the 234 Excavation Facility at NFS in Erwin, Tennessee. The 234 Excavation Facility is a secondary containment tent constructed in place of Building 234 after the building was demolished. Some waste was also generated in Building 110 including the removal of an underground storage tank associated with Building 110. A few drums were also generated from excavation of Trench B in the NFS RBG, the source of which was Buildings 234 or 110. A portion of the NFS waste inventory was sent to SEG in Oak Ridge, Tennessee for compaction (Refer to Section 4.1).

Facility Mission

The Building 234 facility at NFS performed fuel fabrication work under subcontracts to two U.S. Government contracts administered by the U.S. Atomic Energy Commission (AEC), and two smaller commercial contracts. The largest of the two government sponsored orders was to manufacture fuel rods for the Southwest Experimental Fast Oxide Reactor (SEFOR) in Arkansas. The other government sponsored order was from the U.S. Department of Energy (DOE) Savannah River Site (SRS). The majority of the plutonium processed by NFS resulted from the two U.S. Government contracts. The other plutonium processed at NFS supported commercial contracts for the Halden reactor and Consumers Power Company. Building 110 housed wet chemistry and spectrographic laboratories that provided analytical support to Building 234 (Refer to Section 4.2).

Waste Streams

2.1 Waste Stream OR-NFS-CH-HET-A

Summary Category Group: S5000

Waste Matrix Code Group: Heterogeneous Debris Waste

Waste Matrix Code: S5400, Heterogeneous Debris

TRUPACT-II Content Code (TRUCON): OR 125/225, SQ 154

Maximum Layers of Confinement: Maximum of Four (4)

Waste Stream Description: Waste stream OR-NFS-CH-HET-A is comprised primarily of numerous organic and inorganic debris waste items and generally consists of cellulosics, plastic, rubber, concrete, glass, and metal. Some drums in this waste stream contain machine-compacted waste. Some of the specific waste items include aluminum sheeting and tubing, angle iron, steel framing, metal fittings, hardware (e.g., bolts, nuts, screws), pipe, saw blades, sheet metal, copper tubing, inorganic absorbent, concrete, glassware, glass Raschig rings, rags, paper suits, tape, wipes, wood, plastic bags and sheeting, bottles, flex hose, hoods, strippable coating, tubing, rubber gaskets, rubber gloves, shoe covers, electric motors, electrical equipment (e.g., drills, saws, and vacuums), and High Efficiency Particulate Air (HEPA) filters. Small quantities of soil, floor sweepings, absorbed oil, and cemented aqueous solutions may also be present. A detailed list of items in this waste stream is provided in Section 5.4.1.

The two most prevalent radionuclides by mass in this waste stream are U-238 and Pu-239. The two most prevalent TRU radionuclides by mass in this waste stream are Pu-239 and Pu-240 (Refer to Section 5.4.2).

The EPA hazardous waste numbers assigned to this waste stream are F002, D006, D008, D009, and D011 (Refer to Section 5.4.3).

The only prohibited items identified in this waste stream were sealed containers greater than four liters and liquids. The few drums with sealed containers greater than four liters have already been repackaged where the lids were removed from the inner container so they are no longer sealed. Approximately 70 percent (41 of 58) of the initial drums of machine-compacted waste were found to contain detectable liquid. Polymer absorbent has been added to these drums. In addition, some of the waste processed through the TWPC may have a stainless-steel band wrapped around the twisted section of the liner bag, that was tightened with a banding tool, which is considered an unacceptable supplemental sealing device (Refer to Section 5.4.4).

Debris waste is packaged in 55-gallon drums fitted with approved filter vents that in some cases contain 90-mil rigid liner with or without a liner lid. Cardboard liners may also be present. A polyethylene drum liner bag was placed inside the drum or in the rigid liner. An absorbent pad was added between the bottom of the drum and the liner, and at the bottom of the liner. A polymer absorbent may have been added to the drum instead of an absorbent pad. Waste materials were placed directly into the rigid liner or the drum liner bag, or were first packaged in up to three plastic bags closed by the twist and tape method or by heat-sealing. Waste may have also been packaged in 2-liter plastic bottles and 5-gallon buckets. Large chunks of concrete were packaged in super sacks (not sealed) and loaded into drums. The polyethylene bag drum liner was twisted and taped closed. A stainless-steel band (unacceptable supplemental sealing device) or cable tie wrap may also have been wrapped around the twisted section and tightened using a banding tool with additional tape wrapped around the twisted section. A polyvinyl chloride (PVC) pipe insert with a half inch (in.) hole in the wall of the pipe may have been positioned between the drum lid and rigid liner lid at the center of the liner lid to help hold it in place (Refer to Section 5.5).

Waste stream OR-NFS-CH-HET-A meets the WIPP-WAP waste stream definition. The waste stream consists of waste materials that have common physical form, that contain similar hazardous constituents, and that are generated from a single process or activity. This waste stream consists of TRU-mixed heterogeneous debris waste generated during facility decommissioning operations at NFS (Refer to Section 4.6.2).

2.2 Waste Stream OR-NFS-CH-SOIL

Summary Category Group:	S4000
Waste Matrix Code Group:	Soils
Waste Matrix Code:	S4100, Soils
TRUCON:	OR 111/OR 211, OR 127/OR 227
Maximum Layers of Confinement:	Maximum of Two (2)

Waste Stream Description: Waste stream OR-NFS-CH-SOIL is comprised of soil mixed with absorbent (e.g., RADSORB, Encap®) with a RADPAD on top of the soil in some drums and packaged in a plastic drum liner bag inside a rigid liner. The absorbents used and the RADPAD are organic polymers (Refer to Section 6.4.1).

The two most prevalent radionuclides by mass in this waste stream are U-238 and Pu-239. The two most prevalent TRU radionuclides by mass in this waste stream are Pu-239 and Pu-240 (Refer to Section 6.4.2).

The EPA hazardous waste number assigned to this waste stream is F002 (Refer to Section 6.4.3).

No prohibited items have been identified in this waste stream, but the possibility exists for the formation of liquids in the drums (Refer to Section 6.4.4).

Soil waste is packaged in 55-gallon drums fitted with approved filter vents that in some cases contain a 90-mil rigid liner with or without a liner lid. Cardboard liners may also be present. One or two polyethylene drum liner bags were placed inside the drum, or one liner bag was placed inside the rigid liner. Some drums have the rigid liner inside the polyethylene drum liner bag. Some drums may contain soil placed directly into a 90-mil liner with no polyethylene drum liner bag. An absorbent pad was added between the bottom of the drum and the liner, and at the bottom of the liner. A polymer absorbent may have been added to the soil instead of an absorbent pad. The polyethylene bag drum liner was twisted and taped closed. A PVC pipe insert with a half inch hole in the wall of the pipe may have been positioned between the drum lid and rigid liner lid at the center of the liner lid to help hold it in place (Refer to Section 6.5).

Waste stream OR-NFS-CH-SOIL meets the WIPP-WAP waste stream definition. The waste stream consists of waste materials that have common physical form, that contain similar hazardous constituents, and that are generated from a single process or activity. This waste stream consists of TRU-mixed soil generated during facility decommissioning operations at NFS (Refer to Section 4.6.2).

2.3 Waste Stream OR-NFS-CH-HOM-A

Summary Category Group:	S3000
Waste Matrix Code Group:	Solidified Organics and Inorganics
Waste Matrix Code:	S3900, Other Homogeneous Solids
TRUCON:	OR 127/OR 227, SQ 154
Maximum Layers of Confinement:	Maximum of one (1)

Waste Stream Description: Waste stream OR-NFS-CH-HOM-A is comprised of respirable fines (high activity particulate from glovebox floor sweepings, filter media, etc.) immobilized with Portland cement and water in 2-liter high-density polyethylene (HDPE) bottles and aqueous liquids (e.g., Radiacwash decontamination solution) immobilized with RADSORB (organic polymer absorbent) in 2-liter HDPE bottles. There are also 2-liter HDPE bottles containing miscellaneous metal (e.g., sweepings, hardware) dispersed throughout a RADSORB absorbent matrix. Refer to Section 7.3.1 for a more detailed description of the process. Each bottle is packaged in two heat-sealed plastic bags. Depending on the level of radioactivity, the bottles were placed into a plastic or steel centering sleeve inside the 55-gallon drum or directly into the drum (Refer to Section 7.4.1).

The two most prevalent radionuclides by mass in this waste stream are U-238 and Pu-239. The two most prevalent TRU radionuclides by mass in this waste stream are Pu-239 and Pu-240 (Refer to Section 7.4.2).

EPA hazardous waste numbers assigned to this waste stream consist of D006 and D009 (Refer to Section 7.4.3).

The prohibited items identified in this waste stream include heat-sealed bags greater than four liters (fully expanded volume) and less than 390 square inches of surface area. There is also the potential for liquid in this waste stream (Refer to Section 7.4.4).

The 2-liter bottles of immobilized waste were capped and bagged out of the glovebox in two plastic bags (un-vented) which were heat-sealed. The bottles have been repackaged at the TWPC into a special packaging configuration consisting of two vertical cardboard tubes (diameters of 10.5-inches and 6-inches) in the center of a 55-gallon drum (with approved filter vent) and several vertical cardboard tubes around the outside. The drum is lined with a filtered 6-mil poly liner bag; rigid liners are not used. The heat-sealed plastic bags are first breached. Bottles are then placed only in the outer tubes (lower activity waste) or only in the center tube (higher activity waste). The cardboard tubes are considered packaging material, not waste. The polyethylene bag drum liner was twisted and taped closed. A cable tie wrap may have been wrapped around the twisted section and tightened using a banding tool with additional tape wrapped around the twisted section. Seven bottles were identified that require repackaging into 55-gallon drums containing standard 12-inch pipe overpack components due to the high surface dose rates of these bottles. The standard pipe overpack consists of a stainless steel pipe component (with a filter vent in the lid) centered in a 55-gallon drum using dunnage consisting of fiberboard and plywood spacers within a rigid polyethylene liner and lid with a vent hole (Refer to Section 7.5).

Waste stream OR-NFS-CH-HOM-A meets the WIPP-WAP waste stream definition. The waste stream consists of waste materials that have common physical form, that contain similar hazardous constituents, and that are generated from a single process or activity. This waste stream consists of TRU-mixed absorbed/solidified waste generated during facility decommissioning operations at NFS (Refer to Section 4.6.2).

2.4 Waste Stream OR-NFS-CH-HOM-B

Summary Category Group:	S3000
Waste Matrix Code Group:	Solidified Inorganics
Waste Matrix Code:	S3120, Inorganic Sludges
TRUCON:	OR 127/OR 227, SQ 154
Maximum Layers of Confinement:	Maximum of One (1)

Waste Stream Description: Waste stream OR-NFS-CH-HOM-B is comprised of an aqueous sludge produced from the treatment of groundwater. The sludge is pumped from the bottom of a tank directly into a lined 55-gallon drum, and an organic polymer absorbent is added and mixed into the sludge (Refer to Section 8.4.1).

The two most prevalent radionuclides by mass in this waste stream have not been determined. This section will be updated when this information becomes available (Refer to Section 8.4.2).

EPA hazardous waste numbers are not assigned to this waste stream. This is a nonhazardous waste stream (Refer to Section 8.4.3).

Prohibited items have not been identified in this waste stream (Refer to Section 8.4.4).

The groundwater treatment sludge is packaged into a 55-gallon drum with a filtered polyethylene liner bag and a 90-mil rigid liner inside the liner bag. Rigid liner lids are not used, and the drum has an approved filter vent. The sludge is loaded directly into the rigid liner along with a polymer absorbent. The liner bag is twisted, a plastic cable tie is wrapped around the twisted section and tightened, and tape is wrapped around the twisted section (Refer to Section 8.5).

Waste stream OR-NFS-CH-HOM-B meets the WIPP-WAP waste stream definition. The waste stream consists of waste materials that have common physical form, that contain similar hazardous constituents, and that are generated from a single process or activity. This waste stream consists of nonhazardous groundwater treatment sludge generated during facility decommissioning operations at NFS (Refer to Section 4.6.2).

3.0 ACCEPTABLE KNOWLEDGE DATA AND INFORMATION

TRU waste destined for disposal at the WIPP must be characterized prior to shipment. Development of knowledge of the waste materials and processes that generate and control the waste is required to provide a clear and convincing argument about the characteristics of the waste (Reference 2). The AK characterization documented herein complies with the AK requirements of the WIPP-WAP (Reference 2) and was developed in accordance with the applicable requirements of CCP-PO-001 (Reference 3) and CCP-TP-005 (Reference 1).

This waste was characterized using AK from a variety of sources, including operating procedures, work requests, waste management and packaging procedures, decommissioning plans and reports, waste packaging and shipping forms, site databases, previous waste characterization data (e.g., radiography), analytical data, and various correspondence.

The references and AK sources used to prepare this report are listed in Sections 10.0 and 11.0, respectively. The AK sources referenced within this report by alphanumeric designation (e.g., C001, I001, M001, P001, U001, DR001) correspond to the Source Document Tracking Number using the following convention:

- C – Correspondence
- I – Internal Procedures and Notes
- M – Miscellaneous data
- P – Published documents
- U – Unpublished documents
- DR – Discrepancy resolutions

The alphanumeric "I" designator (e.g., I001) was originally assigned to source documents (primarily internal procedures) collected by the TWPC operating contractor during the initial AK program conducted at ORNL (Reference U044). These documents have been assigned the same Source Document Tracking Numbers to maintain traceability to earlier reports; however, this designator has not been assigned during subsequent CCP AK collection and review operations.

A correlation between the CCP waste stream numbers in this AK Summary Report and the ORNL waste stream numbers in DOE/TRU-13-3425, *Annual Transuranic Waste Inventory Report – 2013* (ATWIR) (Reference 9) are presented in Table 3-1, Waste Stream Correlation.

Table 3-1. Waste Stream Correlation

ATWIR Waste Stream	CCP Waste Stream
OR-NFS-CH-HET	OR-NFS-CH-HET, OR-NFS-CH-HET-A [1]
OR-NFS-CH-SOIL	OR-NFS-CH-SOIL
OR-NFS-CH-HOM	OR-NFS-CH-HOM-A, OR-NFS-CH-HOM-B

1. OR-NFS-CH-HET is inactive and was replaced by OR-NFS-CH-HET-A (see below).

Previous revisions of this AK Summary Report include debris waste stream OR-NFS-CH-HET. A waste stream profile form was approved for this waste stream, and 112 drums were disposed of at the WIPP in October 2008. Waste stream OR-NFS-CH-SOIL was added at Revision 2. It was later determined that some of the debris drums contained small amounts of soil, and the hazardous waste characterization of the soil waste stream was inconsistent with the debris waste stream. A decision was made to discontinue the use of waste stream OR-NFS-CH-HET, and create new waste stream OR-NFS-CH-HET-A in Revision 4 that is characterized accordingly to account for the small amounts of soil (refer to Section 5.4.3.1 for specifics). AK and characterization data for the 112 shipped drums was reviewed to verify that they did not contain any soil. The remaining drums of debris waste that were not shipped were moved to new waste stream OR-NFS-CH-HET-A.

4.0 REQUIRED PROGRAM INFORMATION

This section provides the mandatory TRU waste program information required by the WIPP-WAP (Reference 2). This section provides descriptions of the facilities and operations associated with the generation of NFS TRU waste. Included are a brief description of the NFS and SEG sites and TRU waste generating facilities, a summary of the NFS mission, defense determination, and descriptions of historical and current operations associated with the generation of the waste streams.

4.1 Facility Location and Description

NFS is located in eastern Tennessee in the city of Erwin less than 10 miles from the western North Carolina border. The NFS waste originated primarily from decommissioning of Building 234. Building 234 contained a plutonium/uranium mixed oxide (MOX) fuel fabrication facility and a U-233 purification process facility. Decommissioning also included the cleanout of the Building 110 process laboratory and an underground waste tank. Building 234 is located in the northeast section of the NFS plant (References C099, P218, P248, P283, U038, U054). A map showing the location of NFS is included as Figure 1, Nuclear Fuel Services Inc., at the end of this report (Reference 10). A map and photograph showing the location of Buildings 234 and 110 are shown in Figure 2, Buildings 234 and 110 at Nuclear Fuel Services, Inc. and Figure 3, Photograph of Nuclear Fuel Services, Inc. (References M050, P248, P283).

Building 234 was comprised of three areas designated as Buildings 234A, 234B, and 234C. Building 234A was constructed in about 1962 and was used for uranium materials storage. In 1964, the MOX fuel fabrication line was installed for conversion, pellet fabrication, and scrap recovery processes. An annex was built on the south end of 234A in about 1965. The annex was used for an office, a utility room, showers, and change rooms. Buildings 234B and 234C were also added in about 1965. Building 234B, which was built on the west side of 234A, contained the U-233 purification process. Building 234C, which was added on the north end of 234A, was used to fabricate and inspect fuel rods. The MOX fuel fabrication facility operated until about 1973 (References C099, P248, P323).

Building 110 housed wet chemistry and spectrographic laboratories. This laboratory also operated until about 1973. Piping connected the laboratory drains to a small underground storage tank that was also included in the decommissioning of the facility (References C210, P283, P323, U043, U054).

In 1990, the Decontamination and Volume Reduction Facility (DVRF) was constructed in Building 234C. The DVRF was used during decommissioning operations and consisted of an external Perma-Con modular containment structure, airlock cell, decontamination cell with ultra-high pressure water jet, shear-baler for material compaction, five-station active-passive neutron assay system, data acquisition system electronics, HEPA filters, and a filtration and ion exchange system. The layout of the

DVRF is shown in Figure 4, Decontamination and Volume Reduction Facility (References P248, P300, P323, U052, U054).

Waste processed throughout the DVRF was sent to SEG from 1992 to 1994 for additional compaction using a 520-ton press. As shown in Figure 6, Oak Ridge National Laboratory and Scientific Ecology Group, the SEG Bear Creek Road facility is located only a couple of miles west of ORNL (References M003, M007, M052, M053, M213, M214, M215, P218, P273, P323).

Part of the NFS facility decommissioning included the remediation of the Solid Waste Management Units (SWMUs) in the northern portion of the NFS facility, including the RBG (SWMU 9). SWMU 9 included several burial trenches used for low-level waste disposal from 1966 until 1977. TRU waste was only generated from the remediation of Trench B in 2001 (References M003, M132, P1375).

Upon completion of decommissioning activities in the Building 234 interior, the building was demolished leaving behind only the concrete slab. In 2003, the 234 Excavation Facility was constructed in place of the former Building 234. This facility consists of a secondary containment tent and an inner primary containment structure with rooms for soil excavation, soil handling, groundwater treatment, and bag-out operations in addition to equipment and personnel airlocks. The facility is divided into four main compartments as illustrated in Figure 5, 234 Excavation Facility Layout (Reference P1373).

The NFS TRU waste described in this report is currently stored at ORNL. As shown in Figure 6, ORNL is located in eastern Tennessee approximately 8 miles southwest of the city of Oak Ridge (References M007, P014). ORNL is approximately 150 miles west of the NFS site. CH-TRU waste from NFS is currently stored in Buildings 7574, 7879, 7880, and 7883 (References M012, M013, P272). Figure 7, Transuranic Waste Processing Center and ORNL Solid Waste Storage Areas is a map denoting the locations of the TRU waste storage buildings (References P256, P272, P432).

The TWPC is located in Building 7880 within an approximate 5-acre area in the Melton Valley area of ORNL. Processing of CH-TRU waste is limited to characterization, sorting, segregation, size reduction and repackaging as required to produce waste suitable for disposal at WIPP (References P256, P432). The location of Building 7880 is shown in Figure 7 (References P256, P272, P432).

4.2 Facility Mission

The Building 234 facility performed MOX fuel fabrication work under subcontracts to two U.S. Government contracts administered by the AEC, and two smaller commercial contracts. The vast majority of the plutonium processed by NFS resulted from the two U.S. Government contracts. Other plutonium processed at NFS supported commercial contracts for the Halden Reactor and Consumers Power Company (References C099, C100).

The largest of the two government-sponsored orders was to manufacture fuel rods for the SEFOR, a test facility for liquid metal breeder reactor fuel located at the University of Arkansas. General Electric (GE) was contracted by the AEC to design, build, and operate the SEFOR, and GE contracted NFS to fabricate the fuel rods for the reactor. The plutonium utilized was supplied by the AEC. The other government sponsored order was from the DOE SRS. The fuel that NFS fabricated for DOE SRS was used in experiments that were part of a cooperative research and development program between the AEC and Atomic Energy of Canada Limited on deuterium oxide (D_2O)-moderated power reactors. These experiments were undertaken to determine the basic changes in lattice physics parameters that accompany plutonium buildup at high fuel burn-ups in natural uranium-fueled D_2O-moderated power reactors. The wet chemistry and spectrographic laboratories in Building 110 provided analytical support to Building 234. In early years, this lab also supported the Light Water Breeder Reactor Program (References C099, C100, C145, C210, P212, P273, P323, U038, U044).

A portion of Building 234 contained a U-233 purification facility. This area of the building was decommissioned in 1983, several years before decommissioning of the MOX facility began. Waste stream OR-NFS-CH-HET-A does not include debris from decommissioning of the U-233 facility, and waste stream OR-NFS-CH-SOIL does not include soil from directly beneath the U-233 facility. However, some of the soil in waste stream OR-NFS-CH-SOIL is contaminated with U-233. The source of the U-233 is likely contaminant migration since most of the soil is from an area beneath Building 234 that was adjacent to the U-233 facility (References C122, C210, I053, P248, P283).

4.3 Defense Waste, Spent Nuclear Fuel, and High-Level Waste

4.3.1 Defense Waste Assessment

The WIPP-WAC (Reference 5) requires generator sites to use AK to determine if the TRU waste streams to be disposed at WIPP meet the definition of TRU "defense" waste. Based on guidance from the DOE, a TRU waste is eligible for disposal at WIPP if it has been generated in whole or part by one of the atomic energy defense activities listed in section 10101(3) of the *Nuclear Waste Policy Act of 1982* (NWPA) (References 5, 6, and 7).

The two larger contracts described in Section 4.2 were placed pursuant to prime contracts with the AEC and were both national defense rated orders which were designated DO-E2 certified for national defense use under Defense Material System (DMS) Regulation 1. The established defense and commercial activities utilized the same process equipment so the source of contamination is indistinguishable. Therefore, the TRU wastes from decommissioning are linked primarily to defense nuclear materials production (References C099, C100, M021).

4.3.2 Spent Nuclear Fuel and High-Level Waste Assessment

Public Law 102-579, *The Waste Isolation Pilot Plant Land Withdrawal Act* (Reference 6) (as amended), bans the disposal of spent nuclear fuel (SNF) and high-level waste (HLW), as defined by the NWPA, at WIPP. According to the NWPA, SNF is "fuel that has been withdrawn from a nuclear reactor following irradiation, the constituent elements of which have not been separated by reprocessing." HLW is defined by the NWPA as "the highly radioactive material resulting from the reprocessing of spent nuclear fuel, including liquid waste produced directly in reprocessing and any solid material derived from such liquid waste that contains fission products in sufficient concentrations, and other highly radioactive material that the Commission, consistent with existing law, determines by rule requires permanent isolation." These requirements are also defined in DOE M 435.1-1, *Radioactive Waste Management Manual*, which is the mandatory requirements manual for implementing DOE O 435.1, *Radioactive Waste Management Manual* (References 6, 7, 17, I022, I023, I043).

The NFS facilities that generated this waste did not have a reactor or fuel reprocessing capabilities, and the waste does not contain irradiated fuel elements withdrawn from a reactor. The plutonium feed for the MOX fuel fabrication process was unirradiated material from the Hanford Site and Savannah River Site (References C099, C145, P273, U038). Therefore, the waste is not a SNF or HLW and is eligible for disposal at WIPP (References 6, 7).

4.4 Description of Waste Generating Operations

The Building 234 facility operated from 1965 to 1973. The process capabilities of the facility included dissolution of plutonium and uranium metals and oxides, co-precipitation of plutonium and uranium, wet or dry blending of MOX powders, pellet and rod fabrication, rod loading, and scrap recovery. Production operations in Building 234 ceased and were placed on standby in 1973. As described below, NFS TRU waste stored at ORNL is from decommissioning operations, not production (References C099, P248, P273).

4.4.1 Production Operations

Pellet Production

Solutions containing a mixture of plutonium nitrate and uranyl nitrate hexahydrate were transferred from the master mix tank to precipitation units. Plutonium and uranium were precipitated as ammonium diuranate and plutonium hydroxide, and ammonium hydroxide was used as a precipitant. During the Consumer Powers project, the feed solution contained plutonium nitrate only, and the plutonium was precipitated using oxalic acid, nitric acid, and hydrogen peroxide (References C145, P273).

Supernate was decanted from the ammonium diuranate or oxalate slurry and the remaining precipitate was filtered to remove liquids. Supernate/filtrate from the

ammonium diuranate or oxalate slurry was polished and stored in two glass columns. Filtrate from the column box was evaporated producing ammonium nitrate concentrate and ammonium hydroxide condensate. During SEFOR production, ammonium hydroxide condensate was used to wash ammonium diuranate cake. Wet ammonium diuranate or oxalate cake was dried in a furnace and then loaded in another furnace and heated in a nitrogen and hydrogen gas atmosphere. The resultant oxide solids (MOX or plutonium oxide) from the conversion furnace were passed through a twin shell blender. Sub-blended oxide was ball-milled, screened, and weighed. After weighing, oxide was packaged in two liter bottles and placed into storage (References C145, P273).

One cross-blend was performed per five days during SEFOR production; each cross-blend was comprised of five sub-blends. During the Consumer Powers project, plutonium oxide cross-blending was followed by the addition of uranium oxide solids. The mixture of plutonium oxide and uranium oxide was sub-blended and cross-blended. Blended oxide was granulated using an oscillating device and stainless-steel screen. Binder was added to cross-blends during granulation. Granulated oxide was transferred to a pellet press. Pellets were measured for density then loaded into the sintering furnace and heated in an atmosphere of hydrogen gas, nitrogen gas, carbon dioxide, and argon. The sintered pellets were then allowed to off-gas (References C145, P273).

Sintered pellets were machined to finished size using grinders. Recycled water from the pellet wash was used as coolant. Grinder sludge and damaged pellets were sent to scrap recovery. Machined pellets were cleaned with isopropyl alcohol or in an ultrasonic wash using distilled water and then air dried. Pellets were visually inspected and diametrically gauged. A percentage of pellets were sampled for destructive analyses and measured for density and dimensional attributes. Reject pellets and sample residues were sent to scrap recovery. Finished pellets were weighed and loaded in tubes that were capped and sent to rod assembly and fabrication stations (References C145, M008, P273).

Scrap Dissolution and Recovery

Oxide scrap was ball-milled to reduce particle size. Ball-milled oxide scrap was transferred to the dissolution station and heated with nitric acid in one of two dissolvers. Nitrate solutions were pumped from the dissolver to the evaporator (References C145, P273).

Non-combustible items containing recoverable material (e.g., bottles, plastics, screens, gloves, etc.) were unloaded from drums and passed to the scrap preparation station for manual cutting and shredding. Shredded materials were leached in a nitric acid bath to recover plutonium. Leachate was pumped to the evaporator and solids were bagged-out and packaged for disposal (References C145, P273).

Plutonium nitrate solutions were transferred from the evaporator to glass storage columns. Solutions were circulated, sampled, and pumped to the adjacent load-out

station. Plastic cylinders were placed in a holding rack and filled with solutions from the columns. Loaded cylinders were packaged for shipment (References C145, P273).

4.4.2 Decommissioning Operations

The Building 234 MOX facility and Building 110 analytical laboratory remained inactive from the time production operations ceased in 1973 until the initial phase of decommissioning started in the early 1990's. Between 1990 and 1993, process equipment, gloveboxes, piping, utilities, and ancillary materials were removed from Buildings 110 and 234, processed through the DVRF, and then sent to SEG from 1992 to 1994 for additional compaction. During this same time, the concrete floor was removed from the Building 234 Wet Chemistry Cell (also referred to as the Wet Cell) and soil was excavated from beneath the floor. The soil was blended with less contaminated soil to meet ORNL waste acceptance criteria (ORNL-WAC). Decommissioning of Building 110 also included the removal of Raschig rings from the Building 110 laboratory underground waste tank, and excavation of soil surrounding this tank (References C099, C210, M003, M052, P218, P248, P273, P306, P323, U055).

The second phase of Building 234 decommissioning began in about 2000 and included removing the remaining equipment and utilities, decontaminating the walls, floors, and other exposed surfaces, excavating contaminated soil, dismantling the building, and disposing of the waste. Essentially all processing equipment and interior furnishings were previously dispositioned with the exception of the DVRF. Plutonium remaining in the facility was in the form of residual contamination primarily contained in the block walls, concrete floors, the DVRF, and soil beneath areas of the building (References C099, P248). The second phase decommissioning also included the remediation of the RBG on the northern part of the NFS facility. The only TRU waste generated from the remediation of the RBG was the excavation of Trench B in 2001 (References M003, M132, P1375).

The final phase of decommissioning began in 2011 and will continue through Fiscal Year 2018 (Reference C230, M206). Additional soil is being excavated from the footprint of the former Building 234 Wet Cell as well as the footprint of the concrete slab and soil on which the excavator is currently located. During soil excavation, groundwater is pumped from the pit into a tank where it is treated to precipitate solids that are then mixed with absorbent (References P1373, P1399, P1400).

A more detailed description of the decommissioning waste generating activities is provided in Sections 5.3.1, 6.3.1, 7.3.1, and 8.3.1.

4.5 Waste Identification and Categorization

The NFS TRU wastes were categorized into two general classifications, CH-TRU and MOX waste. CH-TRU waste includes general glovebox waste, concrete, Raschig rings, equipment, machine-compacted waste, soil, immobilized liquids and fines, groundwater

treatment sludge, and other miscellaneous waste (References P218, P268, P323, P1373, U055). Waste segregation practices were as follows:

- Some of the material recovered during decommissioning is in the form of MOX fuel pellets and powder. This fuel material was packaged separate from other waste (Reference P218). The MOX fuel waste will be included in a separate AK report specifically for actinide oxide materials.

- Polyethylene bottles were used to collect higher activity waste. The contents of these bottles were heated if necessary to remove any moisture. The materials were screened to remove fines less than 200 microns, and the fines were solidified with cement and water in 2-liter HDPE bottles. There are also 2-liter HDPE bottles containing aqueous liquids immobilized with RADSORB (sodium polyacrylate polymer absorbent) and miscellaneous metal contained within the absorbent. The 2-liter HDPE bottles are packaged into 55-gallon drums separate from other types of waste (Reference P218). The immobilized liquids and fines waste is included in waste stream OR-NFS-CH-HOM-A.

- Contaminated soils were excavated, mixed with absorbent, and packaged into drums (References P218, P315, P1373, P1400). NFS also packaged soil in boxes which were repacked into drums at the TWPC (Reference M075). The soil waste is included in waste stream OR-NFS-CH-SOIL.

- During soil excavation, if groundwater is encountered, it is pumped from the pit into a tank where it is treated to precipitate solids which settle to the bottom of the tank. The settled solids are pumped from the bottom of the tank directly into 55-gallon drums, and a sodium polyacrylate polymer absorbent (e.g., Encap®) is mixed into the sludge (References P1373, P1399). The absorbed groundwater sludge is included in waste stream OR-NFS-CH-HOM-B.

- The bulk of the material removed during decommissioning was processed through the DVRF. Gloveboxes, piping, utilities, process equipment, and ancillary materials were decontaminated using ultra-high pressure water and then were loaded into a shear/baler where they were cut and compacted into blocks and placed into 40-gallon drums. The 40-gallon drums were sent to SEG in Oak Ridge, Tennessee where they were further compacted. Three compacted 40-gallon drum "pucks" were placed into a 55-gallon drum (Reference P218). The machine-compacted waste is included in waste stream OR-NFS-CH-HET-A.

- Not all of the debris waste was processed through the DVRF. Concrete, Raschig rings, glass, and other miscellaneous debris wastes (including dismantlement of the DVRF) were packaged into drums and boxes (References M003, M012, P323, U055). This waste is included in waste streams OR-NFS-CH-HET and OR-NFS-CH-HET-A.[1]

[1] As previously described in Section 3.0, the use of waste stream OR-NFS-CH-HET has been discontinued and has been replaced by waste stream OR-NFS-CH-HET-A.

4.6 TRU Waste Management

In April 1986, NFS secured a contract with the DOE Idaho Operations Office for acceptance and storage of TRU waste. Subsequently, the governor of Idaho banned out-of-state waste shipments before NFS wastes could be received. To honor its contract with NFS, the DOE proposed that the TRU waste (>100 nanocuries per gram [nCi/g]) be stored at ORNL. In late 1989, DOE and the State of Tennessee agreed to utilize the facilities at ORNL for the storage of the NFS waste, and the DOE contract was modified in April 1992 (References C099, C145, P218, U050, U052).

The NFS wastes were categorized into two general classifications, CH-TRU waste and MOX waste (fuel pellets and oxide powder). The CH-TRU waste and MOX waste were certified to ORNL-WAC developed specifically for receipt of the NFS waste. These criteria specified the acceptable chemical, physical, and radiological properties as well as packaging and documentation. ORNL then independently verified conformance to the applicable criteria for each waste package through a combination of program/procedure review, on-site observation of active waste processing, and direct measurement in the ORNL Waste Examination and Assay Facility (WEAF) (References P218, P267, P268, P269).

4.6.1 Types and Quantity of TRU Waste Generation

The waste streams described by this report are characterized as TRU mixed waste consistent with Resource Conservation and Recovery Act (RCRA) requirements. The specific containers in each waste stream are provided in the Waste Containers List which is maintained as a quality record as required by procedure CCP-TP-005 (Reference 1). The number of containers currently included in each waste stream is provided in Table 4-1, Waste Stream Volumes.

Table 4-1. Waste Stream Volumes

Waste Stream	Number of 55-Gallon Drums	Volume (m^3)
OR-NFS-CH-HET*	112	23.3
OR-NFS-CH-HET-A	733	152.46
OR-NFS-CH-SOIL	545	113.4
OR-NFS-CH-HOM-A	38	7.9
OR-NFS-CH-HOM-B	0**	0

* These 112 drums were shipped to WIPP in waste stream OR-NFS-CH-HET. Use of this waste stream has been discontinued. The remaining debris waste in waste stream OR-NFS-CH-HET has been moved to waste stream OR-NFS-CH-HET-A.

**This waste stream has not yet been shipped from NFS to ORNL. As the drums are shipped to ORNL, the container paperwork will be evaluated and the drums will be added to the waste stream as appropriate.

4.6.2 Correlation of Waste Streams Generated from the Same Building and Process

The WIPP-WAP defines a waste stream as waste materials that have common physical form, that contain similar hazardous constituents, and that are generated from a single process or activity. Four CH-TRU waste streams have been delineated for the NFS waste according to this definition. The waste streams are designated OR-NFS-CH-HET-A, heterogeneous debris waste; OR-NFS-CH-SOIL, contaminated soil; OR-NFS-CH-HOM-A immobilized liquids and fines; and OR-NFS-CH-HOM-B, groundwater treatment sludge. The basis and rationale for delineating these waste streams is as follows:

- The activity at NFS that generated all four waste streams was facility decommissioning (Refer to Section 4.4).
- Debris waste, soil waste, groundwater treatment sludge, and immobilized liquids and fines were packaged separately from one another (Refer to Section 4.5). However, containers included in the waste streams were not managed as single hazardous or non-hazardous waste streams. Therefore, these waste streams do not consist of containers historically segregated by the generator into separate mixed and non-mixed waste streams based on the hazardous constituent identified for specific containers.
- The debris waste (including the machine-compacted waste) was characterized by NFS as nonhazardous waste (References M003, M012, M198). However, review of waste item descriptions for the drums identified batteries and electronic equipment containing circuit boards which are common hazardous waste items. Also, RCRA-regulated metals and organics were identified in analytical data relevant to waste stream OR-NFS-CH-HET-A. Therefore, the debris waste is characterized as RCRA-hazardous waste under Title 40 of the Code of Federal Regulations (CFR), *Identification and Listing of Hazardous Waste* Part 261, Subpart C and Subpart D (refer to Section 5.4.3 for details on the specific hazardous constituents) (Reference 13).
- The soil waste was characterized by NFS as nonhazardous waste (References M003, M012, M198). However, limited analytical data for the soils identified trace amounts of tetrachloroethylene which is believed to have been used as a solvent. Therefore, waste stream OR-NFS-CH-SOIL is characterized as RCRA-hazardous waste under 40 CFR Part 261, Subpart D (Refer to Section 6.4.3 for additional details) (Reference 13).
- Analytical data from process line samples of sweepings material indicate a few samples above the regulatory level for some RCRA-hazardous metals; however, NFS characterized the immobilized liquids and fines waste as nonhazardous waste with the exception of one drum containing cadmium and mercury (References M003, M012, M198). Based on this information, waste stream OR-NFS-CH-HOM-A is characterized as RCRA-hazardous waste under 40 CFR Part 261, Subpart C (Refer to Section 7.4.3 for additional details).

- The groundwater treatment sludge has been preliminarily characterized by NFS as nonhazardous waste. The characterization of waste stream OR-NFS-CH-HOM-B will remain nonhazardous waste pending the review of sampling and analysis of the groundwater and groundwater treatment sludge. To date this waste stream has not been generated, and therefore, sampling and analysis has not been performed.

4.7 Waste Certification Procedures

In the CCP under which the subject waste stream will be certified for shipment to WIPP, CCP-TP-005 (Reference 1), directs compilation of AK. CCP certifies TRU waste under the program described in CCP-PO-002 (Reference 8).

5.0 REQUIRED WASTE STREAM INFORMATION: OR-NFS-CH-HET-A

This section presents the mandatory TRU waste stream specific information required by the WIPP-WAPP for waste stream OR-NFS-CH-HET-A (Reference 2). The area of generation, waste stream volume, period of generation, prohibited items, waste packaging, and the physical, chemical, and radiological composition of the waste stream are described.

5.1 Area and Building of Generation

Waste stream OR-NFS-CH-HET-A originated primarily from the initial and second phases of decommissioning of the Building 234 MOX fuel fabrication facility and the Building 110 analytical laboratory. This waste stream was also generated from the removal of the Building 110 laboratory underground waste tank (References C099, C210, M003, P248, U055). In addition, a few drums were generated from excavation of Trench B in the NFS RBG during the second phase of decommissioning (Reference M132).

5.2 Waste Stream Volume and Period of Generation

Waste stream OR-NFS-CH-HET-A includes 733 55-gallon drums, some of which are the result of size reduction and waste repackaging. The wastes from the initial phase of decommissioning were packaged at NFS from July 1993 to May 1994 (References M003, M012, M198). The wastes from the second phase of decommissioning were packaged at NFS from April 2001 to September 2003. Size reduction and repackaging at the TWPC (at ORNL) began in December 2005 and will continue (References M003, M012, M013, M016, M019, M075, M198). The specific container numbers are provided in the Waste Containers List which is maintained as a quality record as required by procedure CCP-TP-005 (Reference 1).

There were 131 55-gallon drums of machine-compacted debris waste in storage at ORNL. Review of the container paperwork identified three 40-gallon drum pucks in each of the 55-gallon drums with the exception of two 55-gallon drums that each contain two pucks (References M003, M012, M198). This waste has been repackaged into new 55-gallon drums with one puck per drum. Each puck is placed in the upright position in the drum so RTR can better penetrate the waste. Repackaging of these drums generated 391 55-gallon drums. This total is included in the waste stream volume in the previous paragraph (References M075, M216, P1409).

In addition, there are two B-25 boxes (X10C0506146 and X10C0506147) that will be repackaged into 55-gallon drums at the TWPC (Reference M003), at which time they will also be evaluated for possible inclusion in this waste stream. These boxes contain 55-gallon drums and were not directload. X10C0506146 contains three drums and X10C0506147 contains five drums. Assuming a one-to-one repack, repackaging of these two boxes will generate eight 55-gallon drums.

5.3 Waste Generating Activities

Waste stream OR-NFS-CH-HET-A originated from decommissioning of the Building 234 MOX fuel fabrication facility and the Building 110 analytical laboratory, and the removal of Raschig rings from the Building 110 laboratory underground waste tank. Building 234 production operations ceased in 1973. TRU waste stored at ORNL is not from production operations but from the decommissioning operations described below (References C099, C210, M003, P248, P273, U055). A portion of the NFS waste required size reduction and repackaging at the TWPC (References P256, P432).

5.3.1 Decommissioning

Between 1990 and 1993, process equipment, gloveboxes, piping, utilities, and ancillary materials were removed from Building 234 and Building 110 (References C099, P248). The bulk of the material was processed through the DVRF which involved high-pressure water decontamination, shearing, and compaction of the material. The compacted waste was then sent to SEG where it was further compacted and then shipped to ORNL (Reference P218). In general, non-combustible material was processed through the DVRF; however, material not amenable to decontamination and volume reduction was packaged directly for shipment to ORNL without processing through the DVRF (Reference P317). Figure 8, Equipment Decontamination and Volume Reduction, shows the steps for waste processed through the DVRF (Reference P273).

5.3.1.1 Waste Compaction Operations

Gloveboxes, equipment, exhaust systems, and utility and process lines and systems from Buildings 110 and 234 were sectioned and/or manually decontaminated as necessary prior to processing in the DVRF. During sectioning, a light coat of fixative (e.g., Crystalac or Aqualac [nonhazardous acrylic polymer]) was applied to the separation point if necessary (References M011, P301, P303, P319, P1371). Process lines with the potential to contain liquid and equipment such as pumps containing oil were drained before processing (References C210, M052, P1371).

Loose materials were removed from gloveboxes and process equipment and collected in HDPE bottles. The materials included dry powder sweepings, sludge, paint chips, metal chips and shavings, pellets, rust, wet cheesecloth used to wipe contaminated surfaces, highly contaminated items such as gasket or paper filter media, or other contaminated debris easily gathered into a small container. These bottles were used to concentrate the contamination removed from gloveboxes and equipment so the bulk of the waste could be packaged at lower activity concentrations (no more than 15 Pu-239 fissile gram equivalents [FGE] as described below). Therefore, these bottles contained relatively large amounts of activity (References C206, M054, P218, P274, P317).

The waste material collected in the HDPE bottles was passed through a screen and a 212 micron sieve. The particulate materials that passed through the sieve were immobilized in cement and are not included in this debris waste stream

(see Section 7.0). The materials that did not pass through the sieve, and that were sufficiently low in activity, were accumulated in HDPE bottles and packaged in 40-gallon drums for subsequent compaction at SEG (see below for additional details). Each 40-gallon drum contained no more than 15 Pu-239 FGE (References P218, P274, P300, P317).

With the loose materials having been removed, gloveboxes, process equipment, piping, and ventilation duct were introduced into the DVRF where an initial assay determined whether further decontamination was needed. If decontamination was required, items were disassembled or sectioned in the decontamination cell. Focusing on areas identified by the initial assay, manual cleaning methods (e.g., wiping with Radiacwash [contains citric acid and tetrasodium ethylenediamine triacetate]) were employed to decontaminate the items to the extent possible. If additional cleaning was needed, a high-pressure water jet (40,000 pounds per square inch maximum operating pressure) was used to remove the etched in and fixed contamination (References C210, M007, P218, P300, P1371). Glovebox gloves, seals, windows, and hardware were placed into 5-gallon buckets or old 55-gallon drums for compacting (Reference M054).

The decontaminated items, 5-gallon buckets, and 55-gallon drums were loaded into the shear/baler where they were cut and compacted into 16-inch square bales of varying thickness depending on the amount material fed into the loading hopper. Soft waste items, such as plastic sheet, protective clothing and supplied air hose, as well as plexiglass and hard plastic items were also incorporated into the predominantly metal matrix of the baled material. The shear/baler provided 377 tons of shear capacity and 180 tons of compaction force. A glovebox was attached to the outlet chute to provide an enclosure to seal the bales in plastic as they emerged from the shear/baler. The compacted bales were packaged into 40-gallon drums and sent to SEG for additional compaction (References C210, M007, P218, P300, P317, P1371, U052, U054). In some instances, 40-gallon drums contained a combination of compacted bales and HDPE bottles (Reference M052).

Routine DVRF maintenance activities included checking and repairing hydraulic fluid (Exxon Nuto 68 [heavy paraffinic petroleum distillate]) leaks in the high pressure water jet and shear/baler, lubricating shear/baler door actuator worm gears with Zeniplex Grease (mineral oil), lubricating shear/baler gate slides and loading hopper floor using Slip Plate Aerosol (graphite lubricant), and cleaning up hydraulic fluid, grease, dirt, and debris using cheesecloth. Keystone Penetrating Oil 2 (petroleum hydrocarbon) was used to free a piece of drum wedged in the shear (References C206, M011, P312). Each 40-gallon drum received at SEG for compaction was accompanied by the information required by the ORNL-WAC. Information verified by SEG for each 40-gallon drum prior to compaction included the following: TRU waste concentration exceeded 100 nCi/g and beta-gamma surface dose radiation level was less than 200 millirem per hour (mR/hr). In addition, FGE for each 40-gallon drum was reviewed to ensure the combined FGE for the final 55-gallon drum did not exceed 128 grams FGE. Once the order of processing had been determined, a 40-gallon drum was placed on a conveyor that fed the 520-ton TRU Press. The diameter of the 40-gallon drum was designed to fit

inside the die of the press. The TRU Press compacted the 40-gallon drum into a puck approximately one third of the original height. After the drum was compacted, it was coated with Crystalac fixative (acrylic polymer) and placed inside a 55-gallon drum. Three compacted 40-gallon drums were typically placed into each 55-gallon drum. A data package was developed for each 55-gallon drum that included FGE, Pu-239 equivalent activity, thermal power, activity for each radionuclide, neutron absorbers, physical description, chemical form, and iron content. The 55-gallon drums were then transferred to ORNL for storage (References M003, M007, M011, M066, P218, P273, P1413, P1414, P1415, P1416).

5.3.1.2 Non-compaction Waste Operations

Some materials were packaged directly for shipment to ORNL and not processed through the DVRF. The activities that generated the non-compacted debris waste in this waste stream included:

- Removal of the contaminated concrete floor and footers from the Building 234 Wet Chemistry Cell. Prior to removal, an aqueous-based fixative may have been applied to the floor. Fixatives included Crystalac CL-90 (contains an acrylic polymer, mixed glycol ethers, and isopropyl alcohol) and Aqualac III (contains an acrylic polymer and mixed glycol ethers) (References C210, M011, M052, P323).

- Removal of Raschig rings from process tanks in Building 234 and the underground tank that serviced the Building 110 laboratory. The Building 234 rings were visually clean, but the Building 110 rings were visibly contaminated with a sludge material and were cleaned in the DVRF to the extent possible (References C210, M052, U038, U055).

- Removal and packaging of miscellaneous wastes, including metal press parts and waste contaminated with asbestos (References C210, M003, M052, P304, P317).

The second phase of decommissioning of Building 234 began in about 2000. Essentially all processing equipment and interior furnishings were previously dispositioned in the 1990s with the exception of the DVRF. In addition to the DVRF, other plutonium remaining in the facility was in the form of residual contamination contained primarily in block walls and concrete floors (References C099, P248). The decommissioning activities that generated this waste stream included:

- Removal and size-reduction of contaminated piping, vacuum lines, and ductwork (References C119, C120, C129, I068).

- Cleaning of the DVRF shear/baler with Pipe X-Metal X (a nonhazardous water-soluble proprietary formulation containing small amounts of minerals and organics) (References C125, M011).

- Cleanout of DVRF gloveboxes, including the neutralization of acid solutions and cementation of the neutralized solution, and sweeping up material for placement into poly bottles (References C130, I061).

- Removal and dismantlement of the DVRF gloveboxes. The glovebox surfaces were sprayed with CC Fix (contains ammonia and 2-ethylhexyl acrylate). Saws were lubricated with Nozzle Dip (petrolatum) and Aqua Cut (solution containing ethylene glycol, isopropyl alcohol, and organic phosphate ester) cutting fluids (References C121, C127, C130, I061, M011).

- Cleanout, removal, and dismantlement of the DVRF Decon Cell Perma-Con Structure, including wiping down interior surfaces and spraying the surfaces with CC Fix (References C126, I056, I058, I059, M011).

- One box containing TRU soil and debris was generated from excavation of the NFS RBG during the second phase of decommissioning. NFS used the burial ground to dispose of their low-level waste from about 1966 to 1970. The burial ground was excavated between 2000 and 2004, and the low-level waste was shipped to Envirocare. The NFS container paperwork for this box indicates the waste was generated from RBG Trench B which indicates the Radioactive Burial Ground, and Trench B designates one of the burial pits. The excavated plutonium-contaminated debris originated in Buildings 110 or 234, and the soil itself originated from the trench. NFS determined that this box contained TRU waste. The chemical and radiological contamination of the Trench B area is similar to the Building 234 area (References C227, M003, M132, P1375).

NFS does not anticipate any TRU debris waste to result from the excavation process performed as part of the final phase of decommissioning which began in 2011, although the potential does exist (Reference C321). The Waste Container Packaging Form will indicate if the drum contains debris waste (Reference P1401). This section will be revised if any TRU waste is generated from this final decommissioning phase.

5.3.2 Transuranic Waste Processing Center

As necessary, drums containing CH-TRU waste are moved individually to the TWPC glovebox airlock. Once inside the glovebox airlock, the drum is moved to the drum tipper where the drum lid is removed and the drum contents are emptied into sorting trays. The waste articles are manually sorted and segregated via glove ports to remove prohibited items and repackaged at one of the four load-out stations along the glovebox. Prohibited items identified during repackaging of drums and boxes are removed from the waste stream or are remediated (References P251, P254, P255, P256). Secondary wastes created during waste processing, such as rubber glovebox gloves, tools, and damp rags from cleaning internal glovebox walls, are placed into the same TRU waste drums as the repackaged waste in this waste stream (References P252, P253). If polychlorinated biphenyls (PCBs) are encountered during waste processing, Big Orange-E (nonhazardous solvent containing d-Limonene) is used if necessary for

glovebox decontamination. PCB decontamination waste may be included in this waste stream (References M011, P582).

Boxes containing CH-TRU waste are moved into the box breakdown area (BBA) via airlocks. Within the BBA, the box lid is removed. The waste is inspected, removed, size reduced, and sorted manually within the BBA, and either packaged into new drums directly from the BBA or processed through the glovebox as described above. Drums containing large pieces of concrete were also processed in the BBA. The concrete required an additional enclosure to be used within the BBA for contamination control. CC Wet (an aqueous-based wetting agent containing glycerin, monosaccharide, a non-ionic surfactant, and a non-halogenated dye) and CC Fix (an aqueous-based fixative containing ammonia and 2-ethylhexyl acrylate) were applied to the concrete, the parent drum and liner were cut away to allow access to the concrete, and the concrete was transferred into super sacks that were loaded into new drums. A considerable amount of secondary waste was also generated during this activity. Drums containing machine-compacted waste are also repackaged in the BBA. Incoming 55-gallon drums are opened, and the compacted drum pucks (typically three pucks per drum) are removed. One puck is then placed upright in a new 55-gallon drum so that RTR can better penetrate the waste. If necessary, secondary waste (e.g., puck lifting device/sling, protective clothing) is placed around the puck to keep it in the upright position. A process flow diagram for the TWPC is shown in Figure 9, Transuranic Waste Processing Center CH Solid Waste Flow Diagram (References C622, M011, P251, P256, P432, P1409).

5.4 Type of Wastes Generated

This section describes the waste materials based on process inputs and outputs, waste matrix code assignment, waste material parameter weight estimates, radionuclide contaminants, and hazardous waste determinations for waste stream OR-NFS-CH-HET-A.

5.4.1 Materials Related to Physical Form

Waste stream OR-NFS-CH-HET-A is comprised primarily of numerous organic and inorganic debris waste items. Some of the drums contain un-compacted debris waste, and others contain compacted drum "pucks". Descriptions of the physical form of the waste are provided on the NFS TRU Waste Data Package form, NFS Radwaste Package Certification Record and NFS Drum Content Log (Reference M003). Waste item descriptions were also obtained from real-time radiography (RTR) conducted at the WEAF and RTR and visual examination (VE) performed at the TWPC. The TWPC RTR and VE is considered AK because it was performed prior to implementation of the CCP TRU waste certification program at ORNL (References M018, M019, M065, M068, M075, M216). Specific waste items present in this waste stream are as follows (References C206, C210, M003, M018, M019, M052, M076, M129, M130, M131, M133, P218, P273, P300, U054, U055):

- Aluminum metal items such as channel, ductwork, foil, glove portal inserts, ladders (cut up), pipe, plates, respirator filter cartridges, sheeting, spark arrestors, strips, and tubing

- Iron-based metal items including angle iron, banding, beams, bracing, cable, chain, clamps, conduit, containers, ductwork, filters, filter housing, fittings, flanges, framing, gauges, glovebox panels, hand tools, hardware (e.g., clips, bolts, hose clamps, nails, nuts, screws, springs, washers), lids, pipe, plate, rebar, rings, rods, saw blades, scrap/sheet metal (e.g., fume hoods, tanks), sleeves, strapping, wire, and wire mesh.

- Other metals such as batteries (e.g., AA), copper tubing, copper fittings, and copper wiring.

- Other inorganic materials including absorbent, asbestos, ceramic (e.g., balls from ball mill), charcoal filters, clay pipe, cinder and concrete block, concrete chunks, concrete chips and dust, filter media, fire brick (from furnace), floor sweepings, glass storage columns, glassware, Raschig rings (borosilicate glass rings 1.5-inches tall, 1.5-inches outside diameter, and 1-inch inside diameter) insulation, mirrors, and sheetrock.

- Cellulosic items such as absorbent pads, cardboard, cartons, cheesecloth, cloth, cork, cotton gauze, cotton glove liners, cotton wound filters, dollies, fabric, fiberboard, leather gloves, mop heads, padding, paint brushes and rollers, paper, rags, smears, suits, swipes, tape, towels, vacuum bags, wipes, and wood.

- Plastic items including bags, bottles, CC Strippable Decontamination Media (vinyl acrylic latex strippable coating), clips, containers, cord, ductwork, electrical cord, fiberglass, filters, fittings, flex hose, foam, Herculite® (industrial fabric), hoods, Kevlar® gloves, latex gloves, Lexan® glove ports, lids, liners, mesh, nylon belts and rope, plexiglass, pipe, sheeting, shoe covers, sprayers, strapping, suits, tape, ties, tile, and tubing. HDPE bottles were also used to collect miscellaneous waste items from glovebox cleanout. These bottles were packaged in 40-gallon drums for subsequent compaction at SEG. The bottles contained materials such as sweeping, paint chips, metal shavings, cheesecloth, gaskets, paper filer media, or other contaminated debris easily gathered into a small container.

- Rubber items such as booties, bungee cord, gaskets, gloves, hose, mats, o-rings, and wheels.

- Equipment including electrical devices containing circuit boards, electronic control panels, meter probes, halogen light fixtures, jacks, motors, metal press parts, power drills, pumps, reciprocating saws, and vacuums with HEPA filter and bag. Types of equipment processed through the DVRF included a ball mill, blower, cut-off machine, dumb waiter, furnace, grinder, oxide slugging press, pellet grinder, pellet press, pellet rod lathe, pump, twin-shell blender, and welder.

- Metal-framed HEPA filters and large wood-framed HEPA filters (cut up).
- Organic matrix (e.g., oil absorbed using Nochar [sodium polyacrylate polymer]).
- Inorganic matrix (e.g., liquids absorbed using Solid-A-Sorb [diatomaceous earth], cemented aqueous solutions). Sludge (dirt, rust, oxide, paint chips, metal hardware) from beneath the floor grating in the DVRF decontamination cell was cleaned out, allowed to dry out, and then packaged into HDPE bottles. The bottles were packaged in 40-gallon drums for compaction at SEG.
- Soil/gravel, including loose soil and rock and soil/rock samples.

5.4.1.1 Waste Matrix Code

As shown in the previous section, waste stream OR-NFS-CH-HET-A is comprised primarily of numerous organic and inorganic debris waste items and generally consists of cellulosics (e.g., paper, cloth, wood), plastic, rubber, concrete, glass, and metal. The waste matrix code was assigned to this waste stream based on the evaluation of AK information relating to the physical form of the waste recorded on waste disposal forms, RTR conducted at the WEAF, and RTR and VE performed at the TWPC. Based on these data, some drums contain only concrete, glass, metal, or plastic waste, but many contain a combination of organic and inorganic material types. Some drums in this waste stream also contain small amounts of homogeneous solids waste such as floor sweepings and absorbed or cemented liquids. However, individual drums contain less than 50 percent, by volume, of these materials (References M018, M019, M068).

There are five drums (NFS0821, NFS0839, NFS0840, NFS0927, and X10C0506069) that were identified on container paperwork as soil, but RTR has determined that they contain predominantly debris waste. RTR describes these drums as containing broken concrete, cinder block, clay pipe, reinforcement wire (i.e., rebar), rocks, scrap metal, absorbent, wire, a metal nut, nails, plastic bags, and plastic jars with soil and rock samples. The five drums have been added to waste stream OR-NFS-CH-HET-A (References DR010, DR022, DR023).

Accordingly, Waste Matrix Code S5400, Heterogeneous Debris, is applied to this waste stream. The definition of this Waste Matrix Code is provided in the DOE/LLW-217, *DOE Waste Treatability Group Guidance* (Reference 4). This category includes waste that is at least 50 percent, by volume, debris materials that do not meet the criteria for assignment as either an Inorganic Debris (S5100) or Organic Debris (S5300). This evaluation is documented in a memorandum (included with Attachment 6 completed per CCP-TP-005) (Reference 1).

5.4.1.2 Waste Material Parameters

The waste material parameter weight estimates for waste stream OR-NFS-CH-HET-A were derived from RTR conducted at the WEAF, RTR and VE performed at the TWPC, and other information including waste disposal forms as described in Section 5.4.1. The debris waste generated from the initial phase of decommissioning includes 131 drums which underwent RTR at the WEAF. The waste generated from the second phase of decommissioning includes 82 drums (57 of which have been repackaged) plus another 62 drums produced from repackaging of boxed waste. TWPC RTR data were evaluated for all 82 drums. In addition, VE data were evaluated for the 57 repackaged drums. VE data were also evaluated for the 62 drums from box repackaging. An analysis of the RTR and VE data was performed, the results of which are presented in Table 5-1, Waste Stream OR-NFS-CH-HET-A Waste Material Parameters (Reference DR015). This evaluation is documented in a memorandum (included with Attachment 6 completed per CCP-TP-005) (Reference 1).

Table 5-1. Waste Stream OR-NFS-CH-HET-A Waste Material Parameters

Waste Material Parameter	Weight Percent (Wt%)	Wt% Range
Aluminum-based Metals/Alloys	1.2%	0.0% – 96.6%
Iron-based Metasl/Alloys	13.6%	0.0% – 99.0%
Other Metals	1.1%	0.0% – 97.9%
Other Inorganic Materials	72.9%	0.0% –99.9%
Cellulosics	2.8%	0.0% – 99.1%
Plastics (waste materials)	7.7%	0.0% – 100%
Rubber	0.6%	0.0% – 84.6%
Organic Matrix	< 0.1%	0.0% – 4.3%
Inorganic Matrix	<0.1%	0.0% – 62.0%
Soils/Gravel	<0.1%	0.0% – 14.6%

* These Wt% estimates are based on data from both the discontinued waste stream OR-NFS-CH-HET as well as the new waste stream OR-NFS-CH-HET-A.

5.4.2 Radiological Characterization

The Building 234 facility performed MOX fuel fabrication work under subcontracts to two U.S. Government contracts administered by the AEC, and two smaller commercial contracts. The largest of the two government-sponsored orders was to manufacture fuel rods for the SEFOR. The other government work was sponsored by DOE SRS. The commercial contracts were for the Halden reactor and Consumers Power Company (References C099, C100, P273). Table 5-2, Mixed Oxide Fuels Processed at NFS, shows the amount of MOX fuel processed at NFS. The isotopic composition of the MOX fuel materials is provided in Table 5-3, Mass Isotopic Distribution of Mixed Oxide Fuels Processed at NFS (References C099, C100, C122, DR002, P212, P218, P268, P269, U016, U017).

Table 5-2. Mixed Oxide Fuels Processed at NFS

Material	%Pu	%U	Pu (kg)	U (kg)	Total (kg)
SEFOR	20%	80%	746	2,984	3,730.00
Consumers	2.27%	97.9%	47	2,027	2,070.48
SRS	0.31%	99.7%	16	5,064	5,079.37
Halden	2.5%	97.5%	3	117	120.00
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Table 5-3. Mass Isotopic Distribution of Mixed Oxide Fuels Processed at NFS

Isotope	SEFOR		Consumers		SRS		Halden	
Pu-238	0.01%	0.04%	0.01%	0.43%	--	--	0.01%	0.29%
Pu-239	18.13%	90.63%	1.73%	76.24%	0.29%	90.94%	2.00%	79.89%
Pu-240	1.67%	8.33%	0.37%	16.34%	0.02%	7.99%	0.36%	14.51%
Pu-241	0.10%	0.48%	0.07%	2.91%	0.003%	0.99%	0.06%	2.24%
Pu-242	0.01%	0.05%	0.03%	1.17%	0.0002%	0.08%	0.02%	0.83%
Am-241	0.09%	0.47%	0.06%	2.86%	--	--	0.06%	2.20%
Total	**20.0%**	**100%**	**2.27%**	**100%**	**0.31%**	**100%**	**2.5%**	**100%**
U-234	0.12%	0.15%	0.58%	0.59%	0.001%	0.001%	3.90%	4.00%
U-235	0.28%	0.35%	2.36%	2.41%	0.30%	0.30%	4.88%	5.01%
U-238	79.60%	99.50%	94.96%	97.00%	99.40%	99.69%	88.73%	91.01%
Total	**80.0%**	**100%**	**97.9%**	**100%**	**99.7%**	**100%**	**97.5%**	**100%**

NOTE: For each of these materials, column one represents the overall mass fractions of the MOX fuel, and column two provides the mass fractions of the plutonium and uranium separately.

5.4.2.1 Assay of Waste from Initial Phase of Decommissioning

TRU waste generated during the initial NFS decommissioning in the early-1990s was assayed using a nondestructive assay (NDA) system that consisted of five stations. Station 1 consisted of two passive neutron counters used for determining equipment hold-up prior to decontamination, Station 2 consisted of an active neutron chamber used to assess decontamination effectiveness, and Station 3 consisted of three passive neutron counters used for real-time monitoring of DVRF cell hold-up. These three stations were associated only with the machine-compacted waste. Station 4 consisted of a small size pulse active neutron differential die-away unit that was readily configured for both compacted bales and 55-gallon drums. Station 5 was a passive neutron coincidence counter for small packages (e.g., 5-gallon buckets and 2-liter bottles) containing relatively high TRU concentrations. This unit also included a hyper-pure germanium gamma-ray detector for establishing plutonium isotopics (References C210, M061, P218, P273, P300, P321, U054). Raschig rings (borosilicate glass) were put in 5-gallon buckets and assayed using passive neutron coincidence counting in Station 5 to measure Pu-240, but the remaining isotopes were calculated using isotopic mass fractions estimated by gamma spectroscopy of waste with higher TRU

concentrations such as glovebox sweepings (References C206, M052, M058, U055).

U-235 was assigned a mass value based on normalized intensity factor ratios from gamma spectroscopy. U-234 and U-238 mass values were assigned using scaling factors derived from uranium fuel isotopics (References M003, P218, P321). For uncompacted waste, U-235 values reported in NFS assay are less than 0.5 grams, and U-238 values are less than 50 grams. For machine-compacted waste, U-235 values reported in NFS assay average less than one gram but are as high as about 16 grams. U-238 values average over 100 grams and are as high as about 500 grams (References C202, M003, M198).

U-233 was not reported in NFS waste assay data for the uncompacted waste drums currently included in this waste stream. Part of Building 234 contained a U-233 purification facility; however, the equipment from this portion of the building was removed several years before decommissioning of the MOX facility began. The waste from the decommissioning of the U-233 facility is not included in this waste stream (References C210, P248, P283). The Building 110 laboratory handled U-233, and since a small percentage of the Raschig rings in this waste stream were from the Building 110 underground storage tank, U-233 may be present in trace quantities (References C210, U055). In addition, small quantities of U-233 were identified in samples of concrete from Building 234 (Reference C122). NFS waste assay data did report U-233 in several of the drums containing machine-compacted waste (0.275 grams was the maximum reported). The source of the U-233 would have been the Building 110 laboratory (References C210, M003, M198).

After receiving waste from NFS, the drums were re-assayed at the ORNL WEAF on a neutron assay system (References U017, U038). The Pu-240 mass measured by the ORNL neutron assay system was used with the same isotopic distribution used by NFS as a basis for ORNL comparisons. For this reason, even though there are differences in the isotope masses reported by the two assay systems, the calculated mass fractions will be the same (Reference M065). The assay data in the *eMWaste* database is from NFS assay (Reference M012).

5.4.2.2 Assay of Waste from Second Phase of Decommissioning

TRU waste generated during the second phase of decommissioning was assayed by NFS using the Versatile Automated Gamma Assay System (VAGAS). The VAGAS utilized four to six high efficiency germanium detectors to measure the contents of a 55-gallon drum (References I067, M003). After being shipped to ORNL, nearly all of this waste was re-assayed at the TWPC in 2006 using Imaging Passive Active Neutron (IPAN) and Segmented Gamma Scanner (SGS) systems. This assay is considered AK because it was performed prior to implementation of the CCP TRU waste certification program at ORNL (Reference M017).

There are several discrepancies between the NFS VAGAS data and the TWPC assay data, as well as discrepancies between TWPC assay data of the original drum and TWPC assay of the same waste after it was repackaged. The most notable is a drum

(X10C0506075) that NFS assay measured over one kilogram (kg) of U-238 and the initial TWPC assay measured just under a kg of U-238, but the TWPC assay of the same waste after it was repackaged into X10C0501409 did not report any uranium. Further review of the assay data for X10C0501409 indicates that the SGS assay was rejected due to two segments of the assay being too dense to accurately quantify the radionuclides in those segments, and the IPAN assay could not accurately quantify uranium due to significant gamma dead time. This may be due to re-configuration of the matrix during repackaging. Since neither the IPAN or SGS provided an acceptable measurement for X10C0501409, default isotopics were applied and uranium was not reported (Reference DR002).

The NFS VAGAS also measured U-235 (in the range of tenths of grams) and/or U-238 (in the range of hundreds of grams) in several other drums, but the TWPC assay did not detect any uranium in these drums. U-235 and U-238 have extremely long half-lives and as a result have low specific activity. The gamma ray emission rate is therefore very low, resulting in high detection limits and uncertainties for these isotopes when expressed in mass units. At the gram levels for U-238 and sub-gram levels for U-235, the self-attenuation of gamma rays can be significant. The U-238 has such a low gamma emission rate that the detection limits and uncertainties of hundreds of grams is not unexpected. In the same way the detection limits and uncertainties for U-235 is in tenths of grams is reasonable. Based on the detection limits for the isotopes, these discrepancies are not unexpected within the uncertainty of the measurements (Reference DR002).

Th-228 was also measured in several drums by the NFS VAGAS, but TWPC assay did not detect Th-228. NFS measured several grams of Th-232 in a drum, but TWPC assay did not detect Th-232 in any drum. It is possible that the reporting of thorium by the VAGAS may be due to spectral interference from background radiation, and it is assumed that Th-228 and Th-232 are not present in the waste stream (Reference DR002).

5.4.2.3 Radiological Characterization of Waste Stream OR-NFS-CH-HET-A

To determine isotopic ratios for waste stream OR-NFS-CH-HET-A as a whole, the total gram value for each individual radionuclide was divided by the total mass of all radioactive constituents in the waste stream and converted to a percentage. This result is listed as "Total Radionuclide Weight percent (Wt%)." To determine the radionuclide Wt% range for individual containers, the radiological mass in each container in the waste stream was summed. The mass of each individual radionuclide in a container was divided by the total radiological mass for that container and converted to a percentage. The minimum and maximum results are listed as "Radionuclide Wt% Range for Individual Containers." The same process was applied to determine "Total Radionuclide Curie percent (Ci%)" and "Radionuclide Ci% Range for Individual Containers."

As shown in Table 5-4, Waste Stream OR-NFS-CH-HET-A Radiological Characterization, U-238 is the most predominant radionuclide by mass, and Pu-239 is the second most predominant radionuclide by mass based on AK. However, the two most prevalent radionuclides by mass may turn out to be Pu-239 and Pu-240 because of the issues with nondestructive assay detecting U-238 (as described above). These percentages are based on the NFS assay data (for the early-1990s waste) and the most recent TWPC assay data (for the post-2000 waste). In addition, the radionuclide weight percent of individual radionuclides varies on a container-by-container basis. Because of this variability, some containers will not include the waste stream predominant radionuclides but may include other radionuclides expected in this waste. Radioassay data indicate that the TRU alpha activity concentration in each of the drums in this waste stream is more than 100 nCi/g (References M003, M017). The Wt% and Ci% estimates in Table 5-4 are based on data from both the discontinued waste stream OR-NFS-CH-HET as well as the new waste stream OR-NFS-CH-HET-A. The radiological evaluation for this waste stream is documented in the NDA Memorandum as required by CCP-TP-005 (Reference 1).

Table 5-4. Waste Stream OR-NFS-CH-HET-A Radiological Characterization

Isotope	Total Radionuclide Wt%[1]	Radionuclide Wt% Range for Individual Containers[2]	Total Radionuclide Ci%[3]	Radionuclide Ci% Range for Individual Containers[4]	Suspected Present (Yes/No)
WIPP Required Radionuclides					
Am-241	0.09%	Trace 2.53%[8]	3.15%	Trace 20.62%	Yes[6]
Pu-238	Trace[5]	0.00% - 0.11%[8]	1.20%	Trace 5.88%	Yes
Pu-239	12.40%	1.80% - 94.04%	8.00%	2.34% - 53.89%	Yes
Pu-240	1.79%	0.26% - 16.34%[8]	4.23%	2.20% - 27.32%	Yes
Pu-242	0.01%	0.00% - 1.17%[8]	Trace	Trace - Trace	Yes
U-233	Trace	0.00% - 0.25%	Trace	0.00% - 0.02%	Yes
U-234	3.88%	0.00% - 4.06%	0.25%	0.00% - 1.47%	Yes
U-238	81.07%	0.00% - 99.69%[8]	Trace	0.00% - Trace	Yes
Cs-137	Trace	0.00% - Trace	Trace	0.00% - Trace	Yes
Sr-90	Trace	0.00% - Trace	Trace	0.00% - Trace	Yes[7]
Additional Radionuclides					
Am-243	Trace	0.00% - Trace	Trace	0.00% - Trace	Yes
Np-237	Trace	0.00% - 0.05%	Trace	0.00% - Trace	Yes
Pu-241	0.08%	0.00% - 2.91%[8]	83.18%	Trace - 90.27%	Yes
U-235	0.66%	0.00% - 7.28%	Trace	0.00% - Trace	Yes

1. This listing indicates the total Wt% of each radionuclide over the entire waste stream.
2. This listing is the Wt% range of each radionuclide on a container-by-container basis. Some containers with "0" listed as the lower range, will not contain the specified radionuclide.
3. This listing indicates the total activity Ci% of each radionuclide over the entire waste stream.
4. This listing is the Ci% range of each radionuclide on a container-by-container basis.
5. "Trace" indicates <0.01 Wt% for that radionuclide.
6. Am-241 may be present in slightly larger percentages due to the further decay of Pu-241.
7. Sr-90 cannot be quantified by gamma spectroscopy. Its value is calculated based on measured Cs-137 values. A Sr-90/Cs-137 scaling factor of 1.0 is used to calculate Sr-90.
8. These Wt% ranges were expanded based on plutonium and uranium isotopic distribution data (see Table 5-3).

5.4.3 Chemical Content Identification – Hazardous Constituents

EPA hazardous waste numbers were assigned to waste stream OR-NFS-CH-HET-A in accordance with RCRA based on a review of available AK documentation to identify chemical usage and potentially hazardous materials that may have been introduced into the waste stream. Material Safety Data Sheet (MSDS) information has been compiled for commercial products used during decommissioning (Reference M011). This waste stream has been historically managed in accordance with ORNL waste management practices in compliance with the requirements imposed by the Tennessee Department of Environment and Conservation (TDEC). Documentation regarding how the site has historically managed the waste, including the historical regulatory status of the waste, is described above in Section 4.6.2. The EPA hazardous waste number assignments have been applied on a waste stream basis; individual containers may not contain all of the hazardous materials listed for the waste stream as a whole. Table 5-5, OR-NFS-CH-HET-A EPA Hazardous Waste Numbers, lists the EPA hazardous waste numbers assigned to waste stream OR-NFS-CH-HET-A.

Table 5-5. OR-NFS-CH-HET-A EPA Hazardous Waste Numbers

EPA Hazardous Waste Number	Constituent
D006	Cadmium
D008	Lead
D009	Mercury
D011	Silver
F002	Tetrachloroethylene

5.4.3.1 F-Listed Constituents

Waste stream OR-NFS-CH-HET-A is an F-listed hazardous waste because the debris wastes were mixed with hazardous wastes from non-specific sources as listed in 40 CFR Part 261, Subpart D (40 CFR 261.31) (Reference 13).

As part of MOX fuel production, blended oxide was granulated using an oscillating device and stainless-steel screen. Binder was added to cross-blends during granulation. One of the binders used was Oxylene M-6 which contained 81 percent methylene chloride and 19 percent trichlorotrifluoroethane, both of which are F002-listed solvents. Use of this binder does not constitute a listed hazardous waste because these constituents were used as reactants or ingredients in the formulation of a commercial product. The State of Tennessee concurred with this determination (References C142, P273). Therefore, waste stream OR-NFS-CH-HET-A is not an F002-listed waste due to methylene chloride and trichlorotrifluoroethane.

In 1993, 18 core samples were collected from the concrete footer on the east and west sides of the Wet Cell. These samples were composited into two samples. At the time of sampling, the Wet Cell floor had been removed and packaged. Several concrete

core samples were collected from the packaged concrete and composited into one sample. The three composite samples were analyzed for volatile organics by Toxicity Characteristic Leaching Procedure (TCLP). The only compound detected was trichloroethylene in very trace amounts (0.001 milligrams per liter [mg/L]) in the composite sample from the east wall footer (Reference P1402). A use for trichloroethylene has not been identified, and it is an anaerobic degradation product of tetrachloroethylene (Reference C227). Therefore, waste stream OR-NFS-CH-HET-A is not an F002-listed waste due to trichloroethylene. See below for additional discussion on tetrachloroethylene.

Several F-listed solvents were detected in TWPC headspace gas samples. The only constituents detected above the Program Required Quantitation Limit (PRQL) were methanol and toluene. Several samples contained methanol above the PRQL, but only one of 78 drums sampled contained toluene above the PRQL at 20 parts-per-million (ppm) (Reference M020). Methanol, an F003-listed solvent, was not identified as being used by NFS. F003-listed solvents are listed solely for ignitability, and this waste stream does not exhibit the characteristic of ignitability because the solvent is not in liquid form. Toluene, an F005-listed solvent, was a minor ingredient in Slip Plate Aerosol (graphite) that was used to lubricate the DVRF gate slides and loading hopper floor (References C206, M011, P312). Use of this lubricant does not constitute a listed hazardous waste because the toluene was an ingredient in the formulation of a commercial product. Therefore, waste stream OR-NFS-CH-HET-A is not an F003- or F005-listed waste.

Waste stream OR-NFS-CH-HET-A includes drums containing small amounts of soil. Building 234 is a single building divided into three sections built at different times; 234A, B, and C. The majority of the soil was excavated in approximately 1993 from below the Wet Chemistry Cell located within the Building 234A footprint. Analytical data for soil samples collected in 1993 from beneath the Wet Chemistry Cell prior to the initial 1993 excavation, which would best represent the soil from the first phase of decommissioning in this waste stream, had not been located until recently. No organic constituents were in the three soil samples. Soil from beneath the Wet Chemistry Cell was sampled in 2001 after the highly contaminated soil had already been removed. No organic constituents were detected in the 11 soil samples collected from beneath the Building 234 Wet Chemistry Cell, and no organics constituents were detected above the regulatory threshold in any of the seven soil samples from the area around the Building 110 underground waste tank (References I053, U043). The F-listed solvent tetrachloroethylene was detected in trace amounts (0.042 mg/L) in one of two composite soil samples that were collected in 1998 from beneath Building 234A (but not directly under the Wet Chemistry Cell) and adjacent to the building foundation (Reference C122). Tetrachloroethylene was not used in the Building 234 Wet Chemistry Cell or any other part of the MOX fuel production process, nor was it used in the decommissioning process. However, it may have been used historically for cleaning in Building 234C where NFS did the final welding of the fuel pins. None of the samples collected were from beneath Building 234C, but it is possible that tetrachloroethylene was present in the soil under Building 234A due to solvent migration. In addition, at one

time this solvent was used in a maintenance facility located elsewhere on the NFS site and has also been detected in groundwater samples up-gradient from Building 234. The source of the tetrachloroethylene in the groundwater may be from its use in off-site facilities and could also be the source of contamination for the sampled soil (Reference C309). To resolve the discrepancy between the nonhazardous characterization and the possibility that tetrachloroethylene may be present in the soil from past solvent use, EPA hazardous waste number F002 is applied to waste stream OR-NFS-CH-HET-A to account for the small amounts of soil. Even though the Wet Cell data from 1993 have been located, EPA hazardous waste number F002 will not be removed from the waste stream (Reference DR013).

5.4.3.2 Toxicity Characteristic Metals

Waste stream OR-NFS-CH-HET-A exhibits the characteristic of toxicity for metal compounds as defined in 40 CFR Part 261, Subpart C (40 CFR 261.24) (Reference 13). The following sources for metals have been identified:

- Review of physical form descriptions provided by NFS as well as RTR and VE data identified equipment containing circuit boards and batteries (References M003, M018, M019). The manufacturing of printed circuit boards involves dipping the boards in molten tin/lead solder (Reference C146). Electrical components are sometimes attached to the circuit board using solder containing lead and silver (Reference 12). Household dry-cell batteries contain mercury (Reference C147).

- Three samples of the Building 110 tank contents were collected and analyzed for metals by TCLP. Mercury was detected above regulatory limit in one of the samples (Reference U043).

- One composite paint sample was collected from the exterior of the shear/baler and analyzed for TCLP metals. Cadmium was detected at a concentration of 4.0 mg/L which is above the regulatory limit (Reference I052).

In addition, analytical data from six process line samples of sweepings material detected arsenic, barium, cadmium, chromium, lead, and silver.

- Arsenic was detected in five of six samples at concentrations of 0.13, 0.51, 0.62, 4.4, and 5.7 mg/L. Only one of these results is slightly above the regulatory level of 5.0 mg/L, and the 90 percent upper confidence limit (UCL90) of these six samples is below the regulatory level (References C205, M064, M235, P273, U043).

- Barium was detected in all six samples at 0.57, 1.4, 38, 124, 222, and 301 mg/L. Three of these are above the regulatory level of 100 mg/L, and the UCL90 of these six samples is above the regulatory level. However, the method blank contained 193 mg/L which is also above the regulatory level. The barium may have been introduced from one of the extraction columns used in the analysis which is a problem encountered periodically (References C205, M064, M235, P273, U043).

- Cadmium was reported in all six samples at 0.04, 0.15, 1.2, 1.3, 1.5, and 24 mg/L. Four of these are above the regulatory level of 1.0 mg/L. The 24 mg/L cadmium value was outside the expected distribution from the other sample points, and consequently, this area was re-sampled. A sample composite was made of three parts new sample to one part previous sample. The result of the composite sample was 6.27 mg/L. The UCL90 of these six samples is above the regulatory level (References C205, M064, M235, P273, U043).

- Chromium, lead, and silver were detected in all six samples but below the regulatory level of 5.0 mg/L. Mercury and selenium were not detected in any of the samples (References C205, M064, P273, U043).

Toxicity characteristic metals constituents were not identified in the MOX fuel production process (Reference P273). Products used during decommissioning did not contain toxicity characteristic metals constituents (Reference M011).

Two composite concrete samples from the footer on the east and west sides of the Wet Cell and a composite concrete sample from the Wet Cell floor were analyzed for metals by TCLP. No metals were detected in these samples (Reference P1402). Four concrete, three cinder block, three paint, and one floor tile composite samples were collected from Building 234 and analyzed for metals by the TCLP. No metals were detected above regulatory limits in any of the samples (Reference C122). Approximately 16 liters of fines were removed from the shear/baler prior to dismantlement. Three samples of fines were analyzed for metals by TCLP, and no metals were detected above regulatory limits (Reference I052).

The above information identifies the presence of arsenic, barium, cadmium, chromium, lead, mercury, and silver. The data indicate that while present, arsenic, barium, and chromium will be less than the regulatory level. However, there is a potential for cadmium, lead, mercury, and silver to be present above the regulatory level. Therefore, EPA hazardous waste numbers D006, D008, D009, and D011 are assigned to this waste stream (Reference DR001).

5.4.3.3 Toxicity Characteristic Organics

Waste stream OR-NFS-CH-HET-A does not meet the definition of toxicity for organic compounds as defined in 40 CFR Part 261, Subpart C (40 CFR 261.24) (Reference 13). Toxicity characteristic organic compounds were not identified in the MOX fuel production process (Reference P273). Products used during decommissioning did not contain toxicity characteristic organic compounds (Reference M011).

Two composite concrete samples from the footer on the east and west sides of the Wet Cell and a composite concrete sample from the Wet Cell floor were analyzed for volatile and semivolatile organics by TCLP. Trichloroethylene was detected at 0.001 mg/L which is well below the regulatory limit (Reference P1402). Four concrete, three cinder block, three paint, and one floor tile composite samples were collected from

Building 234 and analyzed for volatile organics, semivolatile organics, herbicides, and pesticides by TCLP. None of the organic constituents were detected above regulatory limits in any of the samples (Reference C122). About 16-liters of fines were removed from the shear/baler prior to dismantlement.

Three samples of fines were analyzed for volatile and semivolatile organics by TCLP, and no organics were detected above regulatory limits (Reference I052).

Three samples of the Building 110 tank contents were collected and analyzed for organics by TCLP. None of the organic constituents analyzed were detected above regulatory limits in any of the samples (References M064, U043).

5.4.3.4 U-, P- and K-Listed Wastes

Waste stream OR-NFS-CH-HET-A does not contain a discarded commercial chemical product, an off-specification commercial chemical product, or a container residue or spill residue thereof (40 CFR 261.33) (Reference 13). Based on the AK documentation reviewed, U- and P-listed compounds were not used during MOX production or facility decommissioning (References M011, P273). Therefore, U- and P-listed EPA hazardous waste numbers, including U134 (hydrofluoric acid), are not assigned to this waste stream.

Based on the AK documentation reviewed, beryllium powder was not used by NFS (Reference C210). Therefore, this waste stream is not a P015-listed waste, and beryllium will not be present in amounts greater than one percent by weight of the waste in each drum.

The material in waste stream OR-NFS-CH-HET-A is not a hazardous waste from any of the sources specified in 40 CFR 261.32 (Reference 13). Waste stream OR-NFS-CH-HET-A is therefore not assigned a K-listed hazardous waste number.

5.4.3.5 Ignitables, Corrosives, and Reactives

Ignitability

TRU waste generated at NFS was packaged in accordance with waste certification plans to meet ORNL-WAC developed specifically for NFS TRU waste. Efforts were made to minimize liquids in the waste, and any liquids encountered were immobilized (e.g., RADSORB, Waste Lock® 770 or Nochar sodium polyacrylate polymer absorbent) (References C125, C126, I059, M003, M011, P268, P269, P273, P317, P1116, P1416). Pyrophorics have not been identified in NFS TRU waste. Compressed gas cylinders, if identified, were rendered safe (References M003, M067, P268, P269, P273, P317, P1416).

The debris materials in waste stream OR-NFS-CH-HET-A do not meet the definition of ignitability as defined in 40 CFR 261.21 (Reference 13). The waste is not an oxidizer, and it is not capable of causing fire through friction, absorption of moisture, or

spontaneous chemical change. However, small quantities of liquids have been identified in a few drums. Prior to WIPP disposal, prohibited quantities of liquids will be removed or immobilized (see Section 5.4.4). Waste stream OR-NFS-CH-HET-A is therefore not ignitable (D001).

Corrosivity

TRU waste generated at NFS was packaged in accordance with waste certification plans to meet ORNL-WAC developed specifically for NFS TRU waste. Efforts were made to minimize liquids in the waste, and any liquids encountered were immobilized (e.g., RADSORB, Waste Lock® 770 or Nochar sodium polyacrylate polymer absorbent). Acidic liquids were neutralized prior to immobilization (References C125, C126, C130, I059, M003, M011, M067, P268, P269, P273, P317, P1116, P1416).

The debris materials in waste stream OR-NFS-CH-HET-A do not meet the definition of corrosivity as defined in 40 CFR 261.22 (Reference 13). However, small quantities of liquids have been identified in a few drums. Prior to WIPP disposal, prohibited quantities of liquids will be removed or immobilized (see Section 5.4.4). Waste stream OR-NFS-CH-HET-A is therefore not corrosive (D002).

Reactivity

TRU waste generated at NFS was packaged in accordance with waste certification plans to meet ORNL-WAC developed specifically for NFS TRU waste. Explosives, reactive metals, reactive cyanides, or reactive sulfides were not identified in the AK documentation reviewed (References M003, M067, P268, P269, P273, P317, P1416). NFS Radwaste Package Certification Records indicate that the waste is not readily capable of detonation, explosive decomposition, reaction at normal pressures and temperatures, or an explosive reaction with water (Reference M003).

The debris materials in waste stream OR-NFS-CH-HET-A do not meet the definition of reactivity as defined in 40 CFR 261.23 (Reference 13). The waste is stable, will not undergo violent chemical change, and will not detonate. The waste will not react violently with water, form potentially explosive mixtures with water, or generate toxic gases, vapors, or fumes when mixed with water. The waste does not contain reactive cyanide or sulfide compounds. There is no indication that the waste contains explosive materials, and it is not capable of detonation or explosive reaction. Waste stream OR-NFS-CH-HET-A is therefore not reactive (D003).

5.4.3.6 Polychlorinated Biphenyls

A portion of this waste stream contains PCBs greater than 50 ppm, and therefore, is regulated as a Toxic Substances Control Act (TSCA) waste under 40 CFR 761, *Polychlorinated Biphenyls [PCBs] Manufacturing, Processing, Distribution in Commerce, and Use Prohibitions* (Reference 14).

Four concrete, three cinder block, and one floor tile composite samples were collected from Building 234 and analyzed for total PCBs (Reference C122). One composite paint sample was collected from the exterior of the shear/baler and analyzed for total PCBs (Reference I052). Two samples of the Building 110 tank contents were collected and analyzed for PCBs. Also, gasket material from typical glovebox applications was analyzed for PCBs (References C205, M062, M063, M064, P273, U043). PCB compounds were not detected above 50 ppm in any of the above samples.

Routine DVRF maintenance activities included checking and repairing hydraulic fluid (Exxon Nuto 68 [heavy paraffinic petroleum distillate]) leaks in the high pressure water jet and shear/baler and lubricating shear/baler door actuator worm gears with Zeniplex Grease (mineral oil). Keystone Penetrating Oil 2 (petroleum hydrocarbon) was used to free a piece of drum wedged in the shear. These products do not contain PCBs (References C206, M011, P312).

Approximately 16-liters of fines were removed from the shear/baler prior to dismantlement. Three samples of fines were analyzed for total PCBs. Two of the fines samples contained the PCB compound Aroclor-1242 at 190 and 280 ppm (References C099, I052, U040). The PCB waste is packaged in drums inside box X10C0506146. This box is the only PCB waste identified but is not currently included in the waste stream and has not been processed at the TWPC.

5.4.4 Prohibited Items

For the waste generated in the early-1990s, RTR was conducted by ORNL in 1993 and 1994. Liquids and compressed gases were not observed in any of the uncompacted waste drums currently in this waste stream (Reference M065). However, liquids were discovered by RTR in drums of machine-compacted waste. Approximately 70 percent (41 of 58) of the initial drums received from SEG were found to contain detectable liquid even though no evidence of liquid was observed at SEG before, during, or after the compaction process or during loading of the 55-gallon drums. The most probable cause for the liquid was determined to be evaporation and condensation of residual moisture. These drums were returned to SEG where RADSORB (sodium polyacrylate polymer absorbent) was added to the drums inside the rigid liner and between the liner and the drum. A steel pipe was inserted down into the liner to deliver the RADSORB and may still be present in the drum. Subsequently, SEG began putting RADPAD absorbent pads (cellulosic laminate containing a sodium polyacrylate polymer) in the bottom of the drum and rigid liner (References C143, C144, C200, M053, M059, M060, M065, M067, P273, P316, P323, P1416, U038, U051, U057).

RTR conducted at the TWPC has identified prohibited items in only a few of the post-2000 decommissioning drums in this waste stream. The only prohibited items identified were sealed containers greater than four liters. These few drums have already been repackaged where the lids were removed from the inner container so they are no longer sealed. RTR also identified a few drums with liquid; however, the amount of liquid did not exceed WIPP-WAC limits (References M018, M019).

Some of the NFS waste processed at the TWPC may have a stainless-steel band wrapped around the twisted section of the liner bag that was tightened with a banding tool (Reference P253). This closure method is considered a supplemental sealing device that is unacceptable (References 11, P276).

The container paperwork for drum NFS-0116 describe this waste as Raschig rings. A decommissioning logbook says that this drum contains Raschig rings as well as a puck on top of the Raschig rings which could imply that the puck is machine-compacted waste. Review of historical RTR data indicates the drum contains mostly Raschig rings and the puck on top of the waste is a crushed 5-gallon bucket. Based on the RTR data, this drum does not contain machine-compacted waste and will be included in waste stream OR-NFS-CH-HET-A (References DR006, M003, M052, P218).

As described below in Section 5.5, general debris wastes from the initial phase of decommissioning may be packaged in heat-sealed bags. This consists of six drums (NFS0832, NFS0833, NFS0834, NFS0920, NFS0921, and NFS0922). The size of these bags is unknown so to ensure there are no prohibited heat-sealed bags, these drums will be repackaged to breach any heat-sealed bags that are present. Certified RTR and/or VE are performed by CCP to ensure the waste does not contain prohibited items in accordance with the WIPP-WAC and WIPP-WAP.

5.5 Waste Packaging

TRU waste generated during the initial phase of NFS decommissioning in the early 1990s is packaged in U.S. Department of Transportation (DOT) specification 17H or 17C drums. Each drum contains a 90-mil HDPE rigid liner with a liner lid, and the lid contains a ⅜-inch vent hole. A polyethylene drum liner bag was placed inside the rigid liner. A RADPAD absorbent pad (cellulosic laminate containing a sodium polyacrylate polymer) was added between the bottom of the drum and the liner, and at the bottom of the liner. Absorbent (e.g., RADSORB sodium polyacrylate polymer absorbent) may have been added to the drum instead of a RADPAD. Concrete and Raschig rings were placed directly into the drum liner bag. General debris wastes (e.g., asbestos, plastic, metal) were removed from the glovebox in two plastic bags and closed by the twist and tape method or by heat-sealing. When the drum was full of waste, the polyethylene bag drum liner was twisted and taped closed. A polyvinyl chloride (PVC) pipe insert with a half inch hole in the wall of the pipe may have been positioned between the drum lid and rigid liner lid at the center of the liner lid to help hold it in place (References C200, C210, M003, M011, M052, M068, P268, P269, P317, P320, U055).

Compacted bales exited the shear/baler into a glovebox where they were wrapped in 25-mil polyester-reinforced vinyl and sealed by folding the end of the bag over the end of the bale and taping. The bale was bagged out of the glovebox in 12-mil PVC through the bag-out shute. The bale was then placed into another 25-mil polyester-reinforced vinyl bag and heat-sealed. HDPE bottles containing miscellaneous waste were moved through the baler into the glovebox for packaging but were not compacted. Each bottle has the same three plastic layers as the compacted bales (References M054, P273,

P300). The compacted bales and HDPE bottles were packaged into 40-gallon Type A carbon steel drums and sent to SEG for additional compaction (References M003, P273). The compaction at SEG would have breached the plastic bags (Reference C210). Two to three 40-gallon compacted pucks were placed into a DOT specification 17H or 17C 55-gallon drum. Each 55-gallon drum contains a 90-mil HDPE rigid liner with a liner lid, and the lid contains a 3/8-inch vent hole. A RADPAD absorbent pad (cellulosic laminate containing a sodium polyacrylate polymer) was added between the bottom of the drum and the liner, and at the bottom of the liner (References M003, M059, P273, P1416). RADPADs were not used in the initial drums shipped to ORNL. Liquid was discovered in many of these drums, and they were sent back to SEG where RADSORB (sodium polyacrylate polymer absorbent) was added to the bottom of the drum and to the bottom of the rigid liner. A 29-inch long section of half inch diameter metal conduit was used to deliver the RADSORB powder. The conduit was then driven below the edge of the liner to provide clearance for placement of the liner lid (Reference M059).

TRU waste generated during the second phase of NFS decommissioning is packaged in DOT specification UN1A2/Y400/S 55-gallon drums (Reference M003). The majority of the drums are lined with a polyethylene bag drum liner, although a few of the drums also contain 90-mil HDPE liners with no liner lids (Reference M018). Prior to adding waste to the drum, NFS added absorbent (e.g., Waste Lock® 770 polymer absorbent) to the bottom of the drum liner (References C125, C126, I059, M011). Waste was packaged in plastic bags that were sealed with tape (plastic bags were not heat-sealed). Waste may have also been packaged in 2-liter plastic bottles and 5-gallon buckets (References I058, I061, M003). When the drum was full, the polyethylene bag drum liner was twisted and taped closed (Reference M018).

DOT specification 7A Type A 55-gallon drums are used for waste packaging (and repackaging) at the TWPC (References P256, P432). Drums were lined with a cardboard liner and a filtered 6-mil poly liner bag; rigid liners were not used (Reference M019). In the BBA, concrete pieces are removed from the parent drum and transferred into super sacks (not sealed) and loaded into drums (Reference C622). Compacted drum pucks are removed from the parent drum in the BBA, and one puck is placed into a new 55-gallon drum in an upright position (Reference P1409). When a drum was ready to be closed, the liner bag was twisted, and a stainless-steel band or cable tie wrap was wrapped around the twisted section and tightened using a banding tool. Additional tape was then wrapped around the twisted section (References P251, P252, P253, P254). Hydrogen diffusion rate testing of cable tie wraps indicates that they are an acceptable closure method. However, a stainless-steel band tightened with a banding tool is an unacceptable supplemental sealing device (References 11, P276).

5.5.1 Filter Vents

NFS TRU waste drums are fitted with approved filter vents (References C201, M003, P253).

5.5.2 Layers of Confinement

Drums of concrete and Raschig rings generated during the initial phase of NFS decommissioning in the early 1990s have one layer of confinement (drum liner bag) (References C210, M068, U055). General debris wastes generated during the initial phase of NFS decommissioning have up to three layers of confinement (two plastic bags and a drum liner bag) (Reference P320). TRU waste generated during the second phase of NFS decommissioning has between one and four layers of confinement (Reference M018). The TWPC typically limits containers to four layers of confinement, including a filtered drum liner bag (References M019, P254).

6.0 REQUIRED WASTE STREAM INFORMATION: OR-NFS-CH-SOIL

This section presents the mandatory AK for waste stream OR-NFS-CH-SOIL required by the WIPP-WAP (Reference 2). Attachment 1 for waste stream OR-NFS-CH-SOIL (created in accordance with procedure CCP-TP-005) provides a list of TRU waste stream information required to be developed as part of the AK record (Reference 1).

6.1 Area and Building of Generation

Waste stream OR-NFS-CH-SOIL is soil excavated from beneath the Building 234 Wet Chemistry Cell during the initial phase of decommissioning. A few drums of soil are from an area around the Building 110 laboratory underground waste tank (References C099, C210, M003, M052, P248, P273). A few drums were also generated from excavation of Trench B in the NFS RBG during the second phase of decommissioning (Reference M132). During the final phase of decommissioning, additional soil is being excavated from beneath the former Wet Cell. This activity is being conducted in the 234 Excavation Facility which is a secondary containment tent constructed in place of Building 234 after the building was demolished (References P1373, P1400).

6.2 Waste Stream Volume and Period of Generation

Waste stream OR-NFS-CH-SOIL includes 545 55-gallon drums generated from February 1993 and September 2005. The vast majority of the soil was originally packaged at NFS from February 1993 to October 1993. A few of these drums have 1994 closure dates because ORNL sent them to SEG to correct packaging problems (e.g., missing liner lids) and absorb residual liquids (References M003, M052). Some of the soil from the work done in 1993 remained in Building 234 and was not shipped to ORNL. This soil was packaged at NFS in 2001 and shipped to ORNL in 2005 (References C099, C210, M003).

There were also five HDPE High Integrity Containers (packaged in five B25 boxes) containing soil from the same excavation activity that were packaged at NFS in 2005. This soil has been repackaged into 55-gallon drums at the TWPC, and has been evaluated and included in this waste stream (References M003, M075, M128). Another B25 box (X10C0506154) containing soil and debris from RBG Trench B has been repackaged at the TWPC. This repackaging activity produced 25 drums of debris and five drums containing mostly soil (Reference M075). These five drums have been evaluated and included in this waste stream (References M003, M132).

The specific container numbers are provided in the Waste Containers List which is maintained as a quality record as required by procedure CCP-TP-005 (Reference 1).

NFS estimates approximately 4,300 55-gallon drums of soil to be generated during the final phase of decommissioning. NFS began shipping these drums to ORNL in December 2011 and will continue through Fiscal Year 2018 (References C230, M206, M217). Before adding these drums to the waste stream, the NFS Waste Container

Packaging Forms will be evaluated and the drum numbers and closure dates added to the Waste Containers List (References P1401).

6.3 Waste Generating Activities

Waste stream OR-NFS-CH-SOIL was generated as part of the decommissioning of Building 234 and the removal of the Building 110 laboratory underground waste tank. Production operations in Building 234 ceased in 1973. TRU waste stored at ORNL was generated from soil excavation and processing operations as described below (References C099, C210, P248, P273).

6.3.1 Soil Excavation and Processing

6.3.1.1 Initial Decommissioning Phase

The majority of the soil was generated in 1993 from excavating under the Building 234 Wet Chemistry Cell which was historically used for nitric acid dissolution and mixing of plutonium and depleted or low-enriched uranium (References I053, P323). The floor of the Wet Chemistry Cell was breached along a wall and sump providing a path for contamination to the sub-floor soils (Reference P218). Following removal of the Wet Chemistry Cell floor, excavation of soils revealed contamination concentrations exceeding 2 grams of material per pound of soil. The soil was excavated down to approximately 6 feet in areas adjacent to the west wall (Reference P323).

The excavated soils were placed on a conveyor and transferred from the Wet Chemistry Cell to a mixer in Area C of Building 234. The mixer blades were mounted on a central shaft and angled at 45 degrees for good mixing. Each blade had two components; the mixing/scraping portion at the end of the arm, and the cutting short blade at the halfway point on the arm. The blades were attached to the shaft in a rotating spiral so that when the end-gate was opened, the mix was forced out of the mixer. The mixer also included chopper blades which were high speed mixers. The chopper blades fit between the mixer blades as they scraped the walls of the mixer. At the end of the mixer, a slide gate was attached for dumping the contents after mixing was complete, and a chute was attached to the gate to allow the material to exit the mixer into a drum (References M052, P315). A RADPAD absorbent pad (cellulosic laminate containing a sodium polyacrylate polymer) was then placed on top of the soil (References M011, U058).

The purpose of soil mixing was to break up and homogenize the clay, add RADSORB (sodium polyacrylate polymer) absorbent powder to the soil to prevent the formation of liquid, and to blend soils with plutonium contamination that would otherwise exceed 128 grams Pu-239 FGE in compliance with ORNL-WAC (References C099, P218, P315, P323). The moisture content of the soils was also decreased due to the heat generated during the mixing process (Reference U055). To distinguish the soils requiring blending from soils that were TRU but with contamination that did not require blending, they were designated as "high plutonium density soils" and "TRU

contaminated soils." "High plutonium density soils" were loaded into 5-gallon containers, assayed, and staged for mixing. After dumping the specified 5-gallon containers of "high plutonium density soil" onto the conveyor in the Wet Chemistry Cell, a paper bag containing 10 pounds of RADSORB absorbent powder was placed onto the conveyor. The material was loaded onto the conveyor as it was moving. Additional soil to fill up a 55-gallon container was taken from "TRU contaminated soils." When all the material for the batch was loaded into the mixer, the conveyors were stopped and the mixing process started (References M011, P315, U055).

Building 110 Wet Chemistry and Spectographic Laboratories provided analytical support to Building 234. In early years, the labs in Building 110 also supported the Light Water Breeder Reactor program. Previous analysis identified relatively high levels of activity in the soil three feet below the surface at bore hole 22. Bore hole 22 was located two feet to the north of the concrete pad covering the Building 110 underground waste tank which was breached due to tank deterioration. Soil beneath the tank became contaminated with tank contents as discussed in Section 6.4. In 1991, soil in this area was excavated, dewatered, and packaged into 55-gallon drums in accordance with ORNL-WAC (References C210, P218, P306, P323).

6.3.1.2 Second Decommissioning Phase

One box containing soil and debris was generated from excavation of the NFS RBG during the second phase of decommissioning. NFS used the burial ground to dispose of their low-level waste from about 1966 to 1970. The entire burial ground, which was excavated between 2000 and 2004, was expected to generate only low-level waste to be shipped to Envirocare. The NFS container paperwork for this one box indicates the waste was generated in December 2001 from RBG Trench B which indicates the Radioactive Burial Ground, and Trench B designates one of the burial pits. The excavated plutonium-contaminated debris originated in Buildings 110 or 234, and the soil itself originated from the trench. NFS determined that this one box contained TRU waste. The chemical and radiological contamination of the Trench B area are similar to the Building 234 area (References C227, M003, M132, P1375).

6.3.1.3 Final Decommissioning Phase

The soil excavation process in the 234 Excavation Facility began in 2011 and is expected to be completed in Fiscal Year 2018 (References C230, M206). The process includes the excavation of soil, sample analysis screening, addition and mixing of absorbent, transport of soil within the primary containment, and final packaging of the processed soil (Reference P1400).

The total area requiring excavation has been divided into two separate excavation phases. The first phase of excavation consists of the footprint of the Wet Cell area. The second phase of excavation consists of the footprint of the concrete slab and soil on which the excavator is currently located. Prior to excavation, water or a mixture of Elmer's glue and water is applied to the soil when necessary to prevent airborne

contamination. Each soil batch, approximate dimensions of 11 feet wide, 14 feet long, and one foot deep, or 154 cubic feet (ft^3), is excavated and staged adjacent to the dig site. Between 700 and 800 pounds of a sodium polyacrylate polymer absorbent (e.g., Encap®, Waste Lock® 770, or Quik-Solid®) are added to each soil batch, and the excavator bucket is used to thoroughly mix the absorbent into the soil. A jackhammer or other appropriate equipment may be used to reduce rock size if the rocks are between six and ten inches. Rocks less than six inches are packaged without being size-reduced, and rocks greater than ten inches are not packaged (References C321, M011, P1370, P1400, P1401).

A sample is collected from each soil batch that has been conditioned with absorbent for liquid analysis using the paint filter test. The soil sample is placed into a fine mesh conical paint filter, and if liquid passes through and drops from the filter within five minutes, the soil is deemed to contain free liquids. If the paint filter test fails, approximately 50 pounds of additional absorbent are mixed in, and the paint filter test is repeated. Once the conditioned soil batch passes the paint filter test, another sample is collected from the batch and sent for NDA screening analysis. Twelve unlined 55-gallon drums are staged adjacent to the excavator, and four to eight inches of absorbent are added to the bottom of each empty drum. The excavator bucket is then used to fill each drum with the conditioned soil. If the NDA screening results indicate the sample is low-level waste, the soil is packaged in boxes. If the NDA screening results indicate the sample is 90 percent or greater of TRU limits, the drums of soil are transported inside the primary containment to a drum dumping station where the contents are emptied into lined 55-gallon drums. See Section 6.5 for additional details on the 55-gallon drum liners and closure methods (References P1372, P1400).

Soil excavation continues until the soil activity concentration reaches Class A limits (less than 10 nCi/g), bedrock refusal is encountered, or the excavator arm has reached full extension. When one of these criteria is reached for a given quadrant, sampling is conducted and verified (Reference P1400).

6.3.2 Transuranic Waste Processing Center

NFS soil drums may require repackaging at the TWPC if container integrity issues or prohibited items (e.g., liquid) are discovered. The boxes containing soil have been packaged into drums in the BBA (Reference M075). See Section 5.3.2. for additional details regarding TWPC glovebox and BBA operations.

6.4 Types of Wastes Generated

This section describes the waste materials based on process inputs and outputs, waste matrix code assignment, waste material parameter weight estimates, radionuclide contaminants, and hazardous waste determinations for waste stream OR-NFS-CH-SOIL.

6.4.1 Materials Related to Physical Form

Waste stream OR-NFS-CH-SOIL is comprised of soil, rock, and gravel mixed with absorbent. In addition to soil, rock, and gravel, this waste stream also contains some concrete pieces and concrete block, and iron-based metal (e.g., reinforcement wire, nuts, bolts, pipe, fittings, and scrap metal (References M075, M128). Building 234 was underlain by sandy clay ranging in thickness from a few feet up to approximately 30 feet and clay mixed with gravel and rock (Reference P248). The soil from the initial decommissioning phase was mixed with RADSORB absorbent powder. Each drum contains 10 pounds of RADSORB (References M011, P315). A RADPAD absorbent pad was placed on top of the soil (References M011, U058). During the mixing process, the texture of the soils was changed to a semi-course to fine sand consistency (Reference U055). The soil from the second decommissioning phase originated from the one box from RBG Trench B. At the TWPC, this soil was removed from the box and packaged into new drums with layers of Solid-A-Sorb (diatomaceous earth) absorbent (Reference M210). The soil from the final decommissioning phase was mixed with an organic polymer absorbent (e.g., Encap®) with each drum containing approximately 73 pounds of absorbent (References C321, M011, P1400, P1401).

6.4.1.1 Waste Matrix Code

As described in the previous section, waste stream OR-NFS-CH-SOIL is predominantly soil, rock, and gravel mixed with an organic polymer absorbent. Accordingly, Waste Matrix Code S4100, Soil, is applied to this waste stream. The definition of this Waste Matrix Code is provided in the *DOE Waste Treatability Group Guidance* (Reference 4). This category includes waste estimated to be greater than 95 percent by volume soil, including sand, silt, rock, and gravel, with rock and gravel volumes totaling less than 50 percent of the matrix. This evaluation is documented in a memorandum (included with Attachment 6 completed per CCP-TP-005) (Reference 1).

Drum X10C0506047 was identified by NFS as soil and initially included in waste stream OR-NFS-CH-SOIL (Reference M003). This drum underwent RTR on September 2, 2008 which identified plastic bags containing plastic jars with soil and rock samples. The drum was rejected by RTR because it contained greater than 50 percent by volume debris waste. A discrepancy resolution and AK re-evaluation were written to move this drum to waste stream OR-NFS-CH-HET-A (Reference DR010). This drum underwent RTR again on August 27, 2009 which confirmed the waste was primarily debris. During Audit A-10-08 conducted the week of February 9, 2010, Corrective Action Report (CAR) 10-017 was written which resulted in CCP re-reviewing RTR data for many drums. During this review, it was determined that X10C0506047 contained primarily soil, and a discrepancy resolution and AK re-evaluation were written to move this drum back to waste stream OR-NFS-CH-SOIL (Reference DR022).

Drum NFS0815 was identified by NFS as soil and initially included in waste stream OR-NFS-CH-SOIL (Reference M003). RTR was initially conducted on this drum on July 10, 2008 which identified greater than 50 percent soil along with chucks of concrete

and reinforcement wire. The RTR on this drum was re-reviewed as part of CAR 10-017 and was determined to contain primarily concrete. A discrepancy resolution and AK re-evaluation were written to move this drum to waste stream OR-NFS-CH-HET-A (Reference DR023). This drum underwent RTR again on June 9, 2010 and was rejected because it contained primarily soil. A discrepancy resolution and AK re-evaluation were written to move this drum back to waste stream OR-NFS-CH-SOIL (Reference DR026).

6.4.1.2 Waste Material Parameters

The waste material parameter weight estimates for waste stream OR-NFS-CH-SOIL were derived from information related to the soil excavation and mixing process as well as data from waste disposal forms.

- Each drum generated during the initial phase of decommissioning contains 10 pounds of RADSORB absorbent powder mixed with the soil and a RADPAD on top of the soil. The absorbent powder is an organic polymers which is considered "organic matrix," and the RADPAD is a cellulosic laminate containing an organic polymer which is considered "cellulosics." However, RTR may not be able to distinguish between the soil and the RADSORB and RADPADs. The soil/absorbent mixture is contained in a plastic drum liner bag that is considered part of the waste. These drums are shipped using TRUCON Code OR 111/OR 211 because they contain less than five Wt% organic polyer absorbent.

- The soil generated during the second decommissioning phase was removed from the original box and packaged into new drums with layers of Solid-A-Sorb (diatomaceous earth) absorbent. A half bag of absorbent (12.5 pounds) was added to the bottom of the empty drum. Soil was shoveled into a 5-gallon bucket and then dumped into the drum. Another half bag of absorbent was added and these steps were repeated until the drum was about 90 percent full. This equates to approximately 75 pounds of absorbent in each drum (Reference M210). The Solid-A-Sorb will absorb water from the soil and is considered "inorganic matrix;" however, RTR may not be able to distinguish between the soil and the absorbent. These drums are shipped using TRUCON Code OR 111/OR 211 because they contain inorganic absorbent.

- The soil generated during the final phase of decommissioning is excavated in batches of 154 ft^3 and mixed with 700 to 800 pounds of an organic polymer absorbent (750 pounds equals 20 ft^3). Assuming 50 gallons of waste is placed into the rigid liner, the mixture of soil and absorbent comprises 40 gallons with 11.5 percent by volume being absorbent (equivalent to about 23 pounds) plus an additional 10 gallons (about 50 pounds) of absorbent on top of the soil. The total weight of absorbent per drum is therefore approximately 73 pounds (References C321, P1400, P1402). Because the absorbents are organic polymers, they are considered "organic matrix;" however, RTR may not be able to distinguish between the soil and the absorbent. These drums are shipped using TRUCON Code

OR 127/OR 227 because they contain greater than five Wt% organic polymer absorbent.

This information combined with the weight of the waste from the waste disposal forms was used to estimate waste material parameter weight percentages as shown in Table 6-1, Waste Stream OR-NFS-CH-SOIL Waste Material Parameters. Based on certified RTR by CCP, the percentages in Table 6-1 have been revised. These percentages do not take into account the projected volume of soil to be generated during the final phase of decommissioning, but based on the average net weight of the soil from the initial decommissioning phase, the absorbent is expected to be between 10 and 15 Wt% per drum. This evaluation is documented in a memorandum (included with Attachment 6 completed per CCP-TP-005) (Reference 1).

Table 6-1. Waste Stream OR-NFS-CH-SOIL Waste Material Parameters

Waste Material Parameter	Wt%	Wt% Range
Aluminum-based Metals/Alloys	0%	0%
Iron-based Metasl/Alloys	<0.1%	0% – 1.3%
Other Metals	0%	0%
Other Inorganic Materials	<0.1%	0% – 23.2%
Cellulosics	<0.1%	0% – 0.3%
Plastics (waste materials)	0.2%	0% – 9.2%[2]
Rubber	0%	0%
Organic Matrix	2.0%	1.5% – 15.0%[3]
Inorganic Matrix	0.4%	0% - 26.4%
Soils/Gravel	97.3%	73.7% – 100%[1]

Notes:

1. Since RTR cannot distinguish the soil from the absorbent, and soil is the predominant waste material parameter, RTR will assign "Soils/Gravel" to the soil/absorbent mixture.
2. The 9.2% plastic is due to a single drum (X10C0506047) that has a reported net weight of only 74 pounds which is much lighter than most of the drums in this waste stream.
3. The Wt% range was expanded based on the amount of absorbent expected in soil from the final phase of decommissioning.

6.4.2 Radiological Characterization

The Building 234 facility performed MOX fuel fabrication work under subcontracts to two U.S. Government contracts administered by the AEC, and two smaller commercial contracts. The largest of the two government-sponsored orders was to manufacture fuel rods for the SEFOR. The other government work was sponsored by DOE SRS. The commercial contracts were for the Halden reactor and Consumers Power Company (References C099, C100, P273). Table 6-2, Mixed Oxide Fuels Processed at NFS, shows the amount of MOX fuel processed at NFS. The isotopic composition of the MOX fuel materials is provided in Table 6-3, Mass Isotopic Distribution of Mixed Oxide Fuels Processed at NFS (References C099, C100, C122, DR002, P212, P218, P268, P269, U016, U017).

Table 6-2. Mixed Oxide Fuels Processed at NFS

Material	%Pu	%U	Pu (kg)	U (kg)	Total (kg)
SEFOR	20%	80%	746	2,984	3,730.00
Consumers	2.27%	97.9%	47	2,027	2,070.48
SRS	0.31%	99.7%	16	5,064	5,079.37
Halden	2.5%	97.5%	3	117	120.00
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Table 6-3. Mass Isotopic Distribution of Mixed Oxide Fuels Processed at NFS

Isotope	SEFOR		Consumers		SRS		Halden	
Pu-238	0.01%	0.04%	0.01%	0.43%	--	--	0.01%	0.29%
Pu-239	18.13%	90.63%	1.73%	76.24%	0.29%	90.94%	2.00%	79.89%
Pu-240	1.67%	8.33%	0.37%	16.34%	0.02%	7.99%	0.36%	14.51%
Pu-241	0.10%	0.48%	0.07%	2.91%	0.003%	0.99%	0.06%	2.24%
Pu-242	0.01%	0.05%	0.03%	1.17%	0.0002%	0.08%	0.02%	0.83%
Am-241	0.09%	0.47%	0.06%	2.86%	--	--	0.06%	2.20%
Total	**20.0%**	**100%**	**2.27%**	**100%**	**0.31%**	**100%**	**2.5%**	**100%**
U-234	0.12%	0.15%	0.58%	0.59%	0.001%	0.001%	3.90%	4.00%
U-235	0.28%	0.35%	2.36%	2.41%	0.30%	0.30%	4.88%	5.01%
U-238	79.60%	99.50%	94.96%	97.00%	99.40%	99.69%	88.73%	91.01%
Total	**80.0%**	**100%**	**97.9%**	**100%**	**99.7%**	**100%**	**97.5%**	**100%**

NOTE: For each of these materials, column one represents the overall mass fractions of the MOX fuel, and column two provides the mass fractions of the plutonium and uranium separately.

6.4.2.1 NFS Assay of Soil

TRU waste generated during the initial NFS decommissioning in the early 1990s was assayed using a nondestructive assay system that consisted of five stations. Station 1 was used for determining equipment hold-up prior to decontamination, Station 2 was used to assess decontamination effectiveness, and Station 3 was used for real-time monitoring of DVRF cell hold-up. These three stations were associated only with compacted debris waste. Station 4 consisted of a small size pulse active neutron differential die-away unit that was readily configured for both compacted bales and 55-gallon drums. Station 5 was a passive neutron coincidence counter for small packages containing relatively high TRU concentrations. This unit also included a hyper-pure germanium gamma-ray detector for establishing plutonium isotopics (References C210, P300, P321, U054).

The highest contaminated soil was located near the northwest corner of the Building 234 Wet Chemistry Cell. This soil was initially packaged into 5-gallon containers and assayed in Station 5 to determine the plutonium content. The soil in the 5-gallon buckets was then batched with less contaminated soil and RADSORB

absorbent powder in the mixing process. After mixing, the soil was packaged in 55-gallon drums, and Station 4 was modified and calibrated to perform active/passive assay of a clay/soil matrix in 55-gallon drums. The Station 4 system was used by NFS to conduct assays on soils excavated from beneath Building 110 and Building 234 (References P218, P315, U055, U058).

Sampling and analysis of the soil under the Wet Chemistry Cell in Building 234 resulted in soils contaminated well above levels initially anticipated. Some soils were recovered in excess of one gram FGE per pound of soil. These levels of contamination required processing to blend the soil down to achieve less than 128 grams FGE in the final drum (Reference U058). NFS waste assay data indicates the largest total plutonium mass reported in a single soil drum is 57 grams and an average total plutonium mass of about 11 grams (Reference M012).

Relative to both Building 110 and Building 234 soil, U-235 was assigned a mass value based on normalized intensity factor ratios from gamma spectroscopy. U-234 and U-238 mass values were assigned using scaling factors derived from uranium fuel isotopics (References M003, P218, P321). The largest mass of U-234, U-235, and U-238 in a single soil drum reported by NFS assay is approximately 10 grams, 5 grams, and 190 grams, respectively (Reference M012).

U-233 was reported in NFS waste assay data for 36 soil drums (0.1 grams U-233 is the largest mass reported in a single soil drum) (References M003, M012). U-233 was also identified in samples of soil from several borehole locations throughout the interior and exterior of Building 234 (References C122, I053). One source for this radionuclide is the U-233 purification facility located in Building 234 (References C122, C210, I053, P248, P283). Another source for U-233 is from the removal of the Building 110 underground waste tank since the Building 110 laboratory also handled U-233 (References C210, U055).

After receiving waste from NFS, all the soil drums were re-assayed at the ORNL WEAF on a neutron assay system (References U017, U038). The Pu-240 mass measured by the ORNL neutron assay system was used with the same isotopic distribution used by NFS as a basis for ORNL comparisons. For this reason, even though there are differences in the isotope masses reported by the two assay systems, the calculated mass fractions will be the same (Reference M065). The assay data in the *eMWaste* database is from NFS assay (Reference M012).

TRU soil waste that remained in Building 234 and was packaged in 2001 was assayed by NFS using the VAGAS which utilized four to six high efficiency germanium detectors to measure the contents of a 55-gallon drum or box (References I067, M003). Nuclides reported by the VAGAS system in the soil waste include Th-228 and Th-232 (References M003, M012). As discussed in Section 5.4.2, the VAGAS system reported thorium in general debris waste from NFS (e.g., paper wipes, plastic bags, metal piping, and glassware) and indicates it may be due to spectral interference from background radiation. Unlike the debris waste, this waste stream is soil which is more likely to

contain natural thorium. This is consistent with alpha spectroscopy results for soil from the Building 234 Wet Chemistry Cell area (Reference I053). In addition, the U.S. Geological Survey identified high levels of thorium ranging from 200 ppm to over 2,000 ppm in soils just a few miles from the NFS site (Reference P1405).

Each drum of soil generated during the final phase of decommissioning is assayed by NFS using the VAGAS or a new gamma spectroscopy mobile counting system. The NDA system directly measures Am-241 and scales the plutonium isotopes using decay-corrected historical plutonium isotopics (References C321, I067, P1374, P1403).

6.4.2.2 Radiological Characterization of Waste Stream OR-NFS-CH-SOIL

To determine isotopic ratios for waste stream OR-NFS-CH-SOIL as a whole, the total gram value for each individual radionuclide was divided by the total mass of all radioactive constituents in the waste stream and converted to a percentage. This result is listed as "Total Radionuclide Wt%." To determine the radionuclide Wt% range for individual containers, the radiological mass in each container in the waste stream was summed. The mass of each individual radionuclide in a container was divided by the total radiological mass for that container and converted to a percentage. The minimum and maximum results are listed as "Radionuclide Wt% Range for Individual Containers." The same process was applied to determine "Total Radionuclide Ci%" and "Radionuclide Ci% Range for Individual Containers."

As shown in Table 6-4, Waste Stream OR-NFS-CH-SOIL Radiological Characterization, U-238 is the most predominant radionuclide by mass, and Pu-239 is the second most predominant radionuclide by mass based on AK. However, the two most prevalent radionuclides by mass may turn out to be Pu-239 and Pu-240 because of the issues with nondestructive assay detecting U-238 (see discussion in Section 5.4.2). These percentages are based on the NFS assay data from the soil generated during the first phase of decommissioning. In addition, the radionuclide weight percent of individual radionuclides varies on a container-by-container basis. Because of this variability, some containers will not include the waste stream predominant radionuclides but may include other radionuclides expected in this waste stream. Radioassay data indicate that the TRU alpha activity concentration in each of the drums evaluated in this waste stream is more than 100 nCi/g (References M003, M012). The radiological evaluation for this waste stream is documented in the NDA Memorandum as required by CCP-TP-005 (Reference 1).

Table 6-4 does not include any projected radionuclide quantities for the additional soil from the final phase of decommissioning but is expected to contain the same plutonium and uranium mass fractions as the other soil in this waste stream. The NFS Waste Container Packaging Forms will be reviewed, and the drums will be added to the waste stream as appropriate. This will include a review of radiological data for each drum which will be documented in a Waste Stream Container Evaluation Memorandum in accordance with CCP-TP-005. Table 6-4 will be revised if necessary as sufficient data become available (References P1401).

Table 6-4. Waste Stream OR-NFS-CH-SOIL Radiological Characterization

Isotope	Total Radionuclide Wt%[1]	Radionuclide Wt% Range for Individual Containers [2]	Total Radionuclide Ci% [3]	Radionuclide Ci% Range for Individual Containers [4]	Suspected Present (Yes/No)
WIPP Required Radionuclides					
Am-241	0.12%	0.00% - 2.86% [7]	4.79%	3.02% - 18.38%	Yes [6]
Pu-238	Trace [5]	0.00% - 0.43% [7]	1.23%	0.00% - 10.90%	Yes
Pu-239	19.17%	0.59% - 90.94% [7]	13.63%	5.10% - 52.93%	Yes
Pu-240	2.31%	0.06% - 16.34% [7]	6.02%	0.60% - 38.20%	Yes
Pu-242	0.01%	0.00% - 1.17% [7]	Trace	0.00% - Trace	Yes
U-233	Trace	0.00% - 0.18%	Trace	0.00% - 0.25%	Yes
U-234	3.84%	0.00% - 5.00%	0.27%	0.00% - 1.06%	Yes
U-238	73.42%	0.00% - 99.69% [7]	Trace	0.00% - 0.03%	Yes
Cs-137	Trace	0.00% - Trace	Trace	0.00% - Trace	Yes
Sr-90	Trace	0.00% - Trace	Trace	0.00% - Trace	Yes[8]
Additional Radionuclides					
Pu-241	0.06%	0.00% - 2.91% [7]	74.05%	23.56% - 86.96%	Yes
Tc-99	Trace	0.00% - 0.15%	Trace	0.00% - 0.07%	Yes
Th-228	Trace	0.00% - Trace	Trace	0.00% - Trace	Yes
Th-232	0.16%	0.00% - 22.23%	Trace	0.00% - Trace	Yes
U-232	Trace	0.00% - Trace	Trace	0.00% - Trace	Yes
U-235	0.90%	0.28% - 5.01% [7]	Trace	0.00% - Trace	Yes

1. This listing indicates the total Wt% of each radionuclide over the entire waste stream.
2. This listing is the Wt% range of each radionuclide on a container-by-container basis. Some containers with "0" listed as the lower range, will not contain the specified radionuclide.
3. This listing indicates the total activity Ci% of each radionuclide over the entire waste stream.
4. This listing is the Ci% range of each radionuclide on a container-by-container basis.
5. "Trace" indicates <0.01 Wt% for that radionuclide.
6. Am-241 may be present in slightly larger percentages due to the further decay of Pu-241.
7. These Wt% ranges were expanded based on plutonium and uranium isotopic distribution data (see Table 6-3).
8. Sr-90 cannot be quantified by gamma spectroscopy. Its value is calculated based on measured Cs-137 values. A Sr-90/Cs-137 scaling factor of 1.0 is used to calculate Sr-90.

6.4.3 Chemical Content Identification – Hazardous Constituents

Based on a review of available AK documentation identifying chemical usage and potentially hazardous materials that may have been introduced into the waste stream through waste generating operations as described in Section 4.4, MSDS information compiled for commercial products used during decommissioning, and sampling and analysis of the soil by NFS, waste stream OR-NFS-CH-SOIL is assigned EPA hazardous waste number F002 for tetrachloroethylene in accordance with RCRA (Reference M011). This waste stream has been historically managed in accordance

with ORNL waste management practices in compliance with the requirements imposed by the TDEC. Documentation regarding how the site has historically managed the waste, including the historical regulatory status of the waste, is described above in Section 4.6.2. The EPA hazardous waste number assignments have been applied on a waste stream basis; individual containers may not contain all of the hazardous materials listed for the waste stream as a whole.

Several sampling events have been conducted to characterize the soils beneath Building 234 and around the Building 110 underground waste tank. These sampling events are described below. The results of the analyses are summarized in the following sections.

- In 1993, the Wet Cell was divided into three areas and four soil samples were collected from each area. These 12 samples were composited for a total of three soil samples and analyzed for volatile organics, semivolatile organics, and metals by TCLP (Reference P1402).

- In 1998, several surface and subsurface soil samples were collected from areas beneath Building 234 (not the Wet Chemistry Cell). Surface samples represent the 0 to 6 inches depth interval. Subsurface samples represent depth intervals of 3 feet starting from 6 inches below the ground surface. Depth intervals were individually mixed and then aliquots were placed in appropriate containers for analysis. The soil samples were composited into two samples that were analyzed for volatile organics, semivolatile organics, herbicides, pesticides, and metals by TCLP as well as total PCBs, reactive cyanide, and reactive sulfide (Reference C122).

- In 2001, additional surface and subsurface sampling was conducted to further characterize the soil beneath the Building 234 Wet Chemistry Cell. Thirteen samples were analyzed for metals by TCLP and for reactive cyanide and sulfide. Eleven samples were analyzed for volatile organics, semivolatile organics, herbicides, and pesticides by TCLP as well as total PCBs (Reference I053).

- Two core samples were collected from the soil surrounding the Building 110 underground waste tank (one up-gradient and one down-gradient). The up-gradient core was divided into four segments for analysis, and the down-gradient core was divided into three segments for analysis. The samples were analyzed for volatile organics, semivolatile organics, herbicides, pesticides and metals by TCLP (Reference U043).

- Sampling and analysis of soil from the final phase of decommissioning is being conducted by NFS. These data will be evaluated once they become available (Reference P1372).

6.4.3.1 F-Listed Constituents

Waste stream OR-NFS-CH-SOIL is an F-listed hazardous waste because the soil was mixed with hazardous wastes from non-specific sources as listed in 40 CFR Part 261, Subpart D (40 CFR 261.31) (Reference 13).

NFS characterized the soil as nonhazardous waste, and ORNL has continued to manage the soil as nonhazardous waste. Products used during decommissioning did not contain listed solvents (Reference M011). As discussed in Section 5.4.3.1, the only listed solvents identified in the MOX fuel production process were methylene chloride and trichlorotrifluoroethane contained in a binder material; however, these solvents do not meet the definition of an F-listed waste (Reference P273). In addition, this binder material would not be a contaminant of the soil. Building 234 is a single building divided into three sections built at different times; 234A, B, and C. The majority of the soil in this waste stream was excavated in approximately 1993 from below the Wet Chemistry Cell located within the Building 234A footprint. Analytical data for samples collected in 1993 from beneath the Wet Chemistry Cell prior to the initial 1993 excavation, which best represent the soil from the initial phase of decommission in this waste stream, had not been located until recently. No organic constituents were detected in these three soil samples. Soil from beneath the Wet Chemistry Cell was sampled in 2001 after the highly contaminated soil had already been removed. No organic constituents were detected in the 11 soil samples collected from beneath the Building 234 Wet Chemistry Cell, and no organics constituents were detected above the regulatory threshold in any of the seven soil samples from the area around the Building 110 underground waste tank (References I053, U043). The F-listed solvent tetrachloroethylene was detected in trace amounts (0.042 mg/L) in one of two composite soil samples that were collected in 1998 from beneath Building 234A (but not directly under the Wet Chemistry Cell) and adjacent to the building foundation (Reference C122). Tetrachloroethylene was not used in the Building 234 Wet Chemistry Cell or any other part of the MOX fuel production process, nor was it used in the decommissioning process. However, it may have been used historically for cleaning in Building 234C where NFS did the final welding of the fuel pins. None of the samples collected were from beneath Building 234C, but it is possible that tetrachloroethylene was present in the soil under Building 234A due to solvent migration. In addition, at one time this solvent was used in a maintenance facility located elsewhere on the NFS site and has also been detected in groundwater samples up-gradient from Building 234. The source of the tetrachloroethylene in the groundwater may be from its use in off-site facilities and could also be the source of contamination for the sampled soil (Reference C309). To resolve the discrepancy between the nonhazardous characterization and the possibility that tetrachloroethylene may be present in the soil from past solvent use, EPA hazardous waste number F002 is applied to waste stream OR-NFS-CH-SOIL. Even though the Wet Cell data from 1993 have been located, EPA hazardous waste number F002 will not be removed from the waste stream (Reference DR013).

6.4.3.2 Toxicity Characteristic Metals

Waste stream OR-NFS-CH-SOIL does not exhibit the characteristic of toxicity for metal compounds as defined in 40 CFR Part 261, Subpart C (40 CFR 261.24) (Reference 13). Toxicity characteristic metals constituents were not identified in the MOX fuel production process (Reference P273). Products used during decommissioning did not contain toxicity characteristic metals constituents (Reference M011).

No metals were detected above the regulatory threshold in any of the seven soil samples from the area around the Building 110 underground waste tank (Reference U043). Barium was detected in small amounts (7.4 – 8.4 mg/L) in the three composite soil samples from beneath the Building 234 Wet Cell (Reference P1402). Barium was detected in trace amounts (0.492 mg/L) in one of the two composite soil samples from beneath Building 234. Barium was also detected in trace amounts (0.63 - 1.0 mg/L) in 10 of the 13 soil samples from beneath Building 234. These concentrations of barium are well below the regulatory threshold. No other regulated metals were detected in these samples (References C122, I053).

EPA hazardous waste numbers D006, D008, D009, and D011 are assigned to debris waste stream OR-NFS-CH-HET-A. The basis for these assignments to the debris waste stream, were evaluated to determine if they would be applicable to the soil waste stream. The sources for most of these metals in the debris waste stream are inherently hazardous waste items (e.g., batteries, circuit boards) which would not be contaminants of soil. Mercury was looked at as a possible soil contaminant. It has been determined that mercury if present would be below the regulatory level (Reference DR013).

6.4.3.3 Toxicity Characteristic Organics

Waste stream OR-NFS-CH-SOIL does not meet the definition of toxicity for organic compounds as defined in 40 CFR Part 261, Subpart C (40 CFR 261.24) (Reference 13).

Toxicity characteristic organic compounds were not identified in the MOX fuel production process (Reference P273). Products used during decommissioning did not contain toxicity characteristic organic compounds (Reference M011).

No organic constituents were detected in the three composite soil samples analyzed in 1993 or the 11 soil samples analyzed in 2001 from the beneath Building 234 Wet Chemistry Cell (References I053, P1402). No organics constituents were detected above the regulatory threshold in any of the seven soil samples from the area around the Building 110 underground waste tank (Reference U043). Tetrachloroethylene was detected in trace amounts (0.042 mg/L) in one of the two composite soil samples from beneath Building 234; however, this concentration is well below the regulatory threshold. In addition, the F-listed EPA hazardous waste number for tetrachloroethylene is assigned to this waste stream. Chloroform was also detected in one of the samples in trace amounts but was also found in the sample blank. No other organic constituents were detected in the two composite soil samples (Reference C122).

6.4.3.4 U-, P-, and K-Listed Wastes

Waste stream OR-NFS-CH-SOIL does not contain a discarded commercial chemical product, an off-specification commercial chemical product, or a container residue or spill residue thereof (40 CFR 261.33) (Reference 13). Based on the AK documentation reviewed, U- and P-listed compounds were not used during MOX production or facility decommissioning (References M011, P273). Therefore, U-and P-listed EPA hazardous waste numbers, including U134 (hydrofluoric acid), are not assigned to this waste stream.

Based on the AK documentation reviewed, beryllium powder was not used by NFS (Reference C210). Therefore, this waste stream is not a P015-listed waste, and beryllium will not be present in amounts greater than one percent by weight of the waste in each drum.

The material in waste stream OR-NFS-CH-SOIL is not a hazardous waste from any of the sources specified in 40 CFR 261.32 (Reference 13). Waste stream OR-NFS-CH-SOIL is therefore not assigned a K-listed hazardous waste number.

6.4.3.5 Ignitables, Corrosives, and Reactives

Ignitability

TRU waste generated at NFS was packaged in accordance with waste certification plans to meet ORNL-WAC developed specifically for NFS TRU waste. Efforts were made to prevent the formation of liquids in waste drums by mixing the soil with absorbent (e.g., RADSORB or Encap® polymer absorbent) (References M003, M011, P268, P273, P315, P317, P1400, P1401). Pyrophorics and compressed gases have not been identified in NFS TRU soil waste (References M003, M065, P268, P273, P317, P1400, P1401).

Soil does not meet the definition of ignitability as defined in 40 CFR 261.21 (Reference 13). The waste is not an oxidizer, and it is not capable of causing fire through friction, absorption of moisture, or spontaneous chemical change. Liquids have not been identified in soil drums; however, the possibility exists that liquids have formed in some drums while in storage. Prior to WIPP disposal, prohibited quantities of liquids will be removed or immobilized (see Section 6.4.4). Waste stream OR-NFS-CH-SOIL is therefore not ignitable (D001).

Corrosivity

TRU waste generated at NFS was packaged in accordance with waste certification plans to meet ORNL-WAC developed specifically for NFS TRU waste. Efforts were made to prevent the formation of liquids in waste drums by mixing the soil with absorbent (e.g., RADSORB or Encap® polymer absorbent) (References M003, M011, P268, P273, P315, P317, P1400, P1401).

Soil does not meet the definition of corrosivity as defined in 40 CFR 261.22 (Reference 13). Liquids have not been identified in soil drums; however, the possibility exists that liquids have formed in some drums while in storage. Prior to WIPP disposal, prohibited quantities of liquids will be removed or immobilized (see Section 6.4.4). Waste stream OR-NFS-CH-SOIL is therefore not corrosive (D002).

Reactivity

TRU waste generated at NFS was packaged in accordance with waste certification plans to meet ORNL-WAC developed specifically for NFS TRU waste. Explosives, reactive metals, reactive cyanides, or reactive sulfides were not identified in the AK documentation reviewed for either Building 234 or Building 110 (References M003, P268, P273, P317, P1400, P1401). NFS Radwaste Package Certification Records indicate that the waste is not readily capable of detonation, explosive decomposition, reaction at normal pressures and temperatures, or an explosive reaction with water (Reference M003).

Soil does not meet the definition of reactivity as defined in 40 CFR 261.23 (Reference 13). The waste is stable, will not undergo violent chemical change, and will not detonate. The waste will not react violently with water, form potentially explosive mixtures with water, or generate toxic gases, vapors, or fumes when mixed with water. There is no indication that the waste contains explosive materials, and it is not capable of detonation or explosive reaction. Two composite soil samples were collected from beneath Building 234 and analyzed for reactive cyanide and sulfide with only small amounts being measured (Reference C122). Thirteen surface soil samples were collected from beneath the Wet Chemistry Cell and were also analyzed for reactive cyanide and sulfide with no detections (Reference I053). NFS determined that the small amount of reactive cyanide and sulfide measured did not make this soil waste reactive. Waste stream OR-NFS-CH-SOIL is therefore not reactive (D003).

6.4.3.6 Polychlorinated Biphenyls

This waste stream does not contain PCBs greater than 50 ppm, and therefore, is not regulated as a TSCA waste under 40 CFR 761 (Reference 14).

Two composite soil samples were collected from beneath Building 234 and analyzed for total PCBs. Arochlor-1254 was detected in very trace amounts (0.014 milligrams per kilogram [mg/kg]) in one of the samples (Reference C122). Eleven surface soil samples were collected from beneath the Wet Chemistry Cell and were also analyzed for total PCBs. Arochlor-1254 was detected in very trace amounts in four of the samples (0.12 – 0.45 mg/kg) (Reference I053). Although the soil excavated from beneath Building 110 was not specifically analyzed for PCBs, two samples of the Building 110 tank contents were collected and analyzed for PCBs. PCBs were not detected above 50 ppm in any of the samples (Reference U043).

6.4.4 Prohibited Items

Prohibited items have not been identified in this waste stream. NFS conducted moisture content measurements of a select number of soil drums. The results of these tests indicated a moisture content between 13.5 percent and 21 percent (Reference U055). The soil mixing process included the addition of 10 pounds of RADSORB absorbent to each drum to prevent the formation of liquids (Reference P315). This quantity of RADSORB can absorb approximately 250 pounds of water from the soil which represents all water in 750 pounds of soils with 33 percent moisture content (Reference U058).

When the drums were received at ORNL, they underwent RTR which did not identify liquids in the majority of the drums but did discover liquid between the drum and rigid liner in one drum (NFS-0927). Drum NFS-0927 was sent to SEG where RADSORB was added to absorb the liquid (References C200, M003, M011, M065).

Due to the physical nature of this waste and the fact that many of these drums have been in storage at ORNL for nearly 15 years, it is possible that liquid may have formed in some drums. Certified RTR and/or VE are performed by CCP to ensure the waste does not contain prohibited items in accordance with the WIPP-WAC and WIPP-WAP.

6.5 Waste Packaging

TRU soil waste from the initial phase of decommissioning is packaged in DOT specification 17H, 17C, or UN1A2/Y400/S 55-gallon drums. Each drum contains a RADPAD absorbent pad on the bottom of the drum and a 90-mil HDPE rigid liner. A polyethylene drum liner bag was placed inside the rigid liner. When the polyethylene drum liner bag was full of soil, an absorbent pad was placed on top of the soil and then the bag was twisted and taped closed. The liner lid containing a ⅜-inch vent hole was snapped into place. Some drums may contain soil placed directly into a 90-mil liner with no polyethylene drum liner bag. Some drums may not have a 90-mil liner. A PVC pipe insert with a half inch hole in the wall of the pipe may have been positioned between the drum lid and liner lid at the center of the liner lid to help hold it in place (References C200, C210, DR038, M003, M011, M052, M065, P268, P315, P317, U058). The soil from the excavation of the Building 110 underground waste tank may be in two drum liner bags (Reference P306).

TRU soil waste from the final phase of decommissioning is packaged in DOT specification 7A Type A 55-gallon drums. Each drum contains a filtered polyethylene liner bag and a 90-mil rigid liner inside the liner bag. The soil and absorbent mixture is loaded directly into the rigid liner, and additional absorbent is on top of the waste. Rigid liner lids are not used. The liner bag is twisted, a plastic cable tie is wrapped around the twisted section and tightened, and tape is wrapped around the twisted section (References C321, P1400, P1401). Hydrogen diffusion rate testing of cable tie wraps indicates that they are an acceptable closure method (References 11, P276).

DOT specification 7A Type A 55-gallon drums are used for waste packaging (and repackaging) at the TWPC (References P256, P432). Drums are lined with a cardboard liner and a filtered 6-mil poly liner bag; rigid liners are not used. When a drum is ready to be closed, the liner bag is twisted, and a cable tie wrap is wrapped around the twisted section and tightened. Additional tape is then wrapped around the twisted section (References P251, P252, P253, P254). Hydrogen diffusion rate testing of cable tie wraps indicates that they are an acceptable closure method (References 11, P276).

6.5.1 Filter Vents

NFS TRU waste drums are fitted with approved filter vents (References C201, M003, P253, P315, P1401).

6.5.2 Layers of Confinement

The majority of the soil drums are expected to have one layer of confinement (drum liner bag). A few may include two layers of confinement (two drum liner bags) (References M003, M075, P1400, P1401).

7.0 REQUIRED WASTE STREAM INFORMATION: OR-NFS-CH-HOM-A

This section presents the mandatory AK for waste stream OR-NFS-CH-HOM-A required by the WIPP-WAP (Reference 2). Attachment 1 for waste stream OR-NFS-CH-HOM-A (created in accordance with procedure CCP-TP-005) provides a list of TRU waste stream information required to be developed as part of the AK record (Reference 1).

7.1 Area and Building of Generation

Waste stream OR-NFS-CH-HOM-A was generated in Buildings 110 and 234 at NFS. Only about five percent of the 2-liter HDPE bottles containing the immobilized liquids and fines waste originated in Building 110, although the specific drum numbers containing bottles from this building are not identifiable (References C099, M003, M052, M054, P273).

7.2 Waste Stream Volume and Period of Generation

Cleanout and decontamination of gloveboxes and equipment in Buildings 110 and 234 occurred in 1991 and 1992 (References C203, C210, M052, P317, P323). Liquids such as decontamination solutions, respirable fines, and other high activity residual materials were immobilized in approximately 250 2-liter HDPE bottles packaged into 38 55-gallon drums. The 2-liter bottles containing the immobilized waste were packaged into drums at NFS from July 1993 to March 1994 (References M003, M198).

There are three drums that contain 28 bottles in each drum configured in two layers of 14 bottles. Each layer contains four inner bottles surrounded by 10 outer bottles (References C203, M003, M126). RTR will not be able to penetrate the outer bottles to observe the inner bottles. These three drums will be repackaged into six drums into a cardboard tube configuration (as described in Section 7.5) to allow RTR to observe each of the bottles. Therefore, the volume of waste stream OR-NFS-CH-HOM-A will increase from 38 drums to 41 drums. In addition, during the repackaging of this waste stream, seven bottles were identified that will require repackaging into two to four 55-gallon drums containing standard pipe overpack components due to the high surface dose rates of these bottles. This will increase the volume of waste stream OR-NFS-CH-HOM-A to a maximum of 45 drums (References M003, M075, P1407).

The specific container numbers in waste stream OR-NFS-CH-HOM-A are provided in the Waste Containers List which is maintained as a quality record as required by procedure CCP-TP-005 (Reference 1).

7.3 Waste Generating Activities

Waste stream OR-NFS-CH-HOM-A was generated from the immobilization of liquids, fines, and other high activity residual materials collected and segregated during the decommissioning of Buildings 110 and 234. In the early-1990s when this waste was transferred from NFS to ORNL for storage, the ORNL WAC and WIPP-WAC required immobilization of respirable fines (References M007, P268, P269). NFS historical production operations (pellet production and scrap dissolution and recovery) are described in detail in Section 4.4.1. The immobilization process described below was performed in Building 234 (Reference P274). Repackaging of this waste stream is conducted at the TWPC as described below.

7.3.1 Segregation and Immobilization of Liquids, Fines, and Residual Materials at NFS

Gloveboxes, equipment, exhaust systems, and utility and process lines and systems from Buildings 110 and 234 were decontaminated as necessary prior to processing in the DVRF (References P303, P319, P1371). Loose materials were removed from gloveboxes and process equipment and accumulated in polyethylene bottles. The materials included dry powder sweepings, sludge, paint chips, metal chips and shavings, pellets, rust, wet cheesecloth used to wipe down contaminated surfaces, highly contaminated items such as gasket or paper filter media, or other contaminated debris easily gathered into a small container. These bottles were used to concentrate the contamination removed from gloveboxes and equipment so the bulk of the waste could be packaged at lower activity concentrations (no more than 15 Pu-239 FGE as described below). Therefore, these bottles contained relatively large amounts of activity (References C206, P218, P274, P317).

If the bottles did not contain MOX pellets or recoverable powder, the particulate waste was processed to remove respirable fines which were defined as those wastes which contain particulates with greater than one Wt% of the material less than 10 microns in diameter, or greater than 15 Wt% of the material less than 200 microns in diameter. The bottles of material were bagged into the segregation and immobilization station glovebox located in Building 234 Area C. If moisture was present, the contents of the bottles were emptied onto a screen to filter out large pieces. The particulate material that passed through the screen was dried on a hot plate until respirable fines were liberated. This material was emptied onto a 212 micron sieve screen over a collection pan. The sieve was covered and vibrated for about three minutes. The respirable fines that passed through the 212 micron sieve were emptied into 2-liter HDPE bottles. No more than 500 milliliters of fines were collected in a single bottle (References P218, P274, P300).

The bottles of respirable fines were bagged out of the glovebox and assayed. If the assay value was greater than 80 Pu-239 FGE, the contents of the bottles were separated into two bottles. Water and Portland cement were added to the 2-liter bottles of respirable fines and stirred to achieve a homogeneous mixture. The sieving described above was done for most of the bottles but was discontinued near the end of

the project and the residual materials collected in bottles were cemented. The bottles were tamped on the glovebox floor to help settle the cement and eliminate void space. The contents were allowed to cure (uncapped) for at least 24 hours. The immobilized waste was visually inspected for signs of residual liquid and set-up. According to procedure, about a half inch of absorbent was placed on top of the cement to absorb any liquid that could evolve and condense due to thermal cycling. However, previous RTR identified several inches of absorbent on top in some cases. The bottles were capped and bagged out of the glovebox in two un-vented plastic bags which were heat-sealed. The immobilized fines are included in waste stream OR-NFS-CH-HOM-A (References C200, C210, M003, M202, P218, P274).

With the loose materials having been removed, gloveboxes, process equipment, piping, and ventilation duct were introduced into the DVRF where an initial assay determined whether further decontamination was needed. If decontamination was required, items were disassembled or sectioned in the decontamination cell. Focusing on areas identified by the initial assay, manual cleaning methods (e.g., wiping with Radiacwash [contains citric acid and tetrasodium ethylenediamine triacetate]) were employed to decontaminate the items to the extent possible. If additional cleaning was needed, a high-pressure water jet was used to remove the etched in and fixed contamination. The decontaminated items were loaded into the shear/baler where they were cut and compacted. The compacted bales were packaged into 40-gallon drums and sent to SEG for further compaction. The compacted waste is not included in this homogeneous waste stream (References C210, P218, P300, P1371).

Water from the high-pressure water jet would not have been disposed of as TRU waste because it was recirculated through a series of filters and ion-exchange columns. However, Radiacwash decontamination solution generated during manual cleaning of gloveboxes and process equipment was solidified with Portland cement or other solidification media, such as RADSORB (sodium polyacrylate polymer absorbent), which was a common solidification media used by NFS. Liquid waste was packaged in sufficient absorbent material to absorb twice the volume of the liquid. The immobilized decontamination solution is included in waste stream OR-NFS-CH-HOM-A (References C210, M011, P273, P317).

In order to ensure a consistent and uniform geometry that was conducive to assay, 2-liter HDPE bottles of immobilized liquids or fines that exceeded 50 Pu-239 FGE were packaged into a centering sleeve in the middle of a 55-gallon drum. These drums contain only two or three bottles of waste. Bottles containing lower levels of activity were accumulated and packaged directly into a 55-gallon drum without the centering sleeve with less than 50 Pu-239 FGE (References C209, P218). These drums contain between 8 and 28 bottles of immobilized fines (References C203, M003, M051).

The residual materials that did not pass through the initial screening or the sieve described above, and that were sufficiently low in activity, were accumulated in 2-liter HDPE bottles and packaged in 40-gallon drums for subsequent compaction at SEG (the compacted waste is not included in this homogeneous waste stream). Each

40-gallon drum contained no more than 15 Pu-239 FGE. The remainder of the residual materials with more significant radionuclide loading were packaged in separate 55-gallon drums. NFS anticipated only minimal drums of this concentrated material would be generated (References P218, P300). An examination of the NFS inventory at ORNL from the initial phase of decommissioning did not identify any 55-gallon drums containing only bottles of residual material (Reference M198). RTR conducted in the early-1990s at the WEAF shows a couple of bottles of residual materials were packaged into 55-gallon drums along with bottles of immobilized fines or absorbent. However, the WEAF RTR identifies many of the 2-liter HDPE bottles in this waste stream contain what appears to be miscellaneous metal (e.g., sweepings, hardware, tools) mixed throughout a transparent resin matrix. The consistency and density of the resin matrix observed in the WEAF RTR is consistent with an organic polymer absorbent, such as RADSORB, which was a common absorbent used by NFS (References M126, M202). Although not specifically identified in NFS procedures, it is believed that RADSORB absorbent was mixed with the high activity residual materials (References P274, P317).

7.3.2 Transuranic Waste Processing Center in Oak Ridge

Waste stream OR-NFS-CH-HOM-A requires repackaging at the TWPC to breach prohibited heat-sealed bags and to reconfigure the drums by packaging the bottles into cardboard tubes so that they are more conducive to NDA and RTR. In addition, there are seven bottles that will be repackaged into 55-gallon drums containing standard pipe overpack components due to the high surface dose rates of these bottles. Section 7.5 provides additional detail on this packaging configuration. In addition, if prohibited quantities of liquid are discovered during repackaging, additional absorbent (e.g., Nochar sodium polyacrylate polymer absorbent) will be added to the bottles (References M075, P251, P252, P253, P254, P1116, P1407). See Section 5.3.2 for additional details regarding TWPC glovebox and BBA operations.

7.4 Types of Wastes Generated

This section describes the waste materials based on process inputs and outputs, waste matrix code assignment, waste material parameter weight estimates, radionuclide contaminants, and hazardous waste determinations for waste stream OR-NFS-CH-HOM-A.

7.4.1 Materials Related to Physical Form

Waste stream OR-NFS-CH-HOM-A is comprised of immobilized liquids, fines, and other high activity residual materials. Respirable fines were immobilized with Portland cement and water in 2-liter HDPE bottles, and dry absorbent was added to the top of the cured waste. Aqueous liquids were immobilized with RADSORB (organic polymer absorbent) in 2-liter HDPE bottles. Miscellaneous metals (e.g., sweepings, hardware) are contained throughout the RADSORB absorbent matrix. In addition, there are a couple of HDPE bottles containing very small quantities of scrap metal such as nuts and bolts with no absorbent (References C210, M003, M126, M202, P218, P274, P317).

Batteries (e.g., alkaline and nickel-cadmium) may also present in the HDPE bottles (Reference DR037).

Each 2-liter HDPE bottle was bagged out of the glovebox in one 12-mil PVC bag and one 25-mil nylon reinforced polyethylene bag (References C203, P218, P274, P320). Depending on the level of radioactivity, the bottles were placed into a plastic or steel centering sleeve inside the 55-gallon drum or directly into the drum (References M126, M202, P218). If the drum was not completely filled, NFS may have completed a layer of bottles with wrapped empty 2-liter bottles (Reference C203). A RADPAD absorbent pad (cellulosic laminate containing a sodium polyacrylate polymer) was placed in the bottom of the drum and the rigid liner. A polyethylene drum liner bag also may have been placed inside the rigid liner (References C200, M003, M011, P268, P317).

As described in Section 7.5, the bottles and plastic bags will be repackaged into a cardboard tube configuration or into standard pipe overpacks.

7.4.1.1 Waste Matrix Code

As described in the previous section, waste stream OR-NFS-CH-HOM-A includes a combination of respirable fines immobilized with Portland cement and water and liquid immobilized with RADSORB with miscellaneous metal contained within the RADSORB. Since this waste stream is a combination of inorganic and organic homogeneous solids, Waste Matrix Code S3900, Other Homogeneous Solids, is applied to this waste stream. The definition of this Waste Matrix Code is provided in the *DOE Waste Treatability Group Guidance* (Reference 4). This category includes waste that is consistent with the definition for the homogeneous solids (S3000) summary category, but does not meet the criteria specified for either of the inorganic homogeneous solids (S3100) or organic homogeneous solids (S3200) summary categories. This evaluation is documented in a memorandum (included with Attachment 6 completed per CCP-TP-005) (Reference 1).

The container paperwork for drum NFS0929 indicates the drum contains three 2-liter bottles. Based on an initial review of the WEAF RTR data, the drum appeared to contain homogeneous solids as well as debris waste, but the debris waste was greater than 50 percent, by volume. For this reason, this drum was included in waste stream OR-NFS-CH-HET-A (References DR006, M003, M068). However, a more thorough review of the WEAF RTR identified four bottles containing grouted fines, four bottles containing absorbent, and minor amounts of debris, which is consistent with other drums in this homogeneous solids waste stream (Reference M202). Therefore, NFS0929 is being moved to waste stream OR-NFS-CH-HOM-A (Reference DR030).

7.4.1.2 Waste Material Parameters

The waste material parameter weight estimates for waste stream OR-NFS-CH-HOM-A were derived from NFS container disposal paperwork, procedures, product information, and a review of previous WEAF RTR data. These estimates are presented in Table 7-1, Waste Stream OR-NFS-CH-HOM-A Waste Material Parameters.

NFS Form 28-001, TRU Waste Data Package, lists the gross weight and tare weight for each drum. The reported tare weights vary, and based on a review of the WEAF RTR data, it appears the tare weights include some of the inner packaging materials (e.g., rigid liner, centering sleeve). It is assumed that the 2-liter HDPE bottles and heat-sealed bags are not included in the tare weight (References M003, M126). According to product information, a Nalgene® 2-liter HDPE wide-mouth bottle weighs 200 grams. The weight of a typical bag-out bag provided in RTR procedure CCP-TP-053, *CCP Standard Real-Time Radiography (RTR) Inspection Procedure,* is 100 grams. Each HDPE bottle is contained in two plastic bag-out bags (References 15, C203, P274, P320). The plastic bags and 2-liter HDPE bottles are included in the table as "plastics (waste materials)." For the purpose of estimating waste material parameter weights, other packaging materials are not included in the calculation.

The weight of the immobilized waste was calculated by summing the weights of the HDPE bottles and plastic bags and subtracting this total from the net weight of each drum. The WEAF RTR was reviewed to determine the contents of each bottle and to estimate the volume utilization and the volume percentage of the different materials in each bottle (References M126, M202). These percentages were converted to actual volumes and then to weights based on an assumed density for the different waste materials (i.e., grouted fines, RADSORB organic polymer absorbent, and miscellaneous metals).

According to the NFS procedure for segregation and immobilization of particulate fines, the amount of fines in a 2-liter HDPE bottle varied, and the amount of cement and water mixed with the fines varied depending on the amount of fines (Reference P274). The density of the fines material is unknown so the density of the immobilized fines cannot be calculated. Instead, a density of 2.403 is assumed which is the density of concrete with gravel and of wet mortar.

Review of the WEAF RTR data by CCP identified numerous 2-liter HDPE bottles containing miscellaneous metals throughout a transparent resin matrix. The metals included scrap, sweepings, hardware (e.g., nuts, bolts, washers), and hand tools (e.g., screwdriver, wrench) (Reference M202). To calculate the iron-based metal/alloy weights for AK, a density of 7.85 was used. Based on a comparison of the net weights to the calculated waste material parameter weights, it appears that the volume of metals was overestimated by CCP in the review of the WEAF RTR. The metal volume percentages were adjusted so the net weights and calculated waste material parameter weights were more comparable. It is possible other residual debris materials (as described in Section 7.3.1) may be contained in the resin matrix but cannot be identified by RTR due to their lower densities.

The consistency and density of the resin matrix observed in the WEAF RTR is consistent with an organic polymer absorbent, such as RADSORB, which is a solid, granular, cross-linked homopolymer, and was a common absorbent used by NFS. RADSORB has an average density of 0.62 and can absorb up to 250 times its weight in water and up to 30 times its weight in aqueous solutions such as Radiacwash

decontamination solution (Reference M011). However, based on the net weights of the waste, it doesn't appear as if the bottles contain anywhere near that amount of liquid.

This evaluation is documented in a memorandum (included with Attachment 6 completed per CCP-TP-005) (Reference 1).

Table 7-1. Waste Stream OR-NFS-CH-HOM-A Waste Material Parameters

Waste Material Parameter	Wt%	Wt% Range
Aluminum-based Metals/Alloys	0%	0%
Iron-based Metals/Alloys	6.1%	0% – 57.3%
Other Metals	0%	0%
Other Inorganic Materials	0%	0%
Cellulosics	0%	0%
Plastics (waste materials)	12.2%	10.4% – 32.8%
Rubber	0%	0%
Organic Matrix	9.8%	2.5% – 50.1%
Inorganic Matrix	71.9%	0% – 85.6%
Soils/Gravel	0%	0%

7.4.2 Radiological Characterization

The Building 234 facility performed MOX fuel fabrication work under subcontracts to two U.S. Government contracts administered by the AEC, and two smaller commercial contracts. The largest of the two government-sponsored orders was to manufacture fuel rods for the SEFOR. The other government work was sponsored by DOE SRS. The commercial contracts were for the Halden reactor and Consumers Power Company (References C099, C100, P273). Table 7-2, Mixed Oxide Fuels Processed at NFS, shows the amount of MOX fuel processed at NFS. The isotopic composition of the MOX fuel materials is provided in Table 7-3, Mass Isotopic Distribution of Mixed Oxide Fuels Processed at NFS (References C099, C100, DR002, P212, P218, P268, P269, U016, U017).

Table 7-2. Mixed Oxide Fuels Processed at NFS

Material	%Pu	%U	Pu (kg)	U (kg)	Total (kg)
SEFOR	20%	80%	746	2,984	3,730.00
Consumers	2.27%	97.9%	47	2,027	2,070.48
SRS	0.31%	99.7%	16	5,064	5,079.37
Halden	2.5%	97.5%	3	117	120.00
---	---	---	**812**	**10,192**	**11,000**

Table 7-3. Mass Isotopic Distribution of Mixed Oxide Fuels Processed at NFS

Isotope	SEFOR		Consumers		SRS		Halden	
Pu-238	0.01%	0.04%	0.01%	0.43%	--	--	0.01%	0.29%
Pu-239	18.13%	90.63%	1.73%	76.24%	0.29%	90.94%	2.00%	79.89%
Pu-240	1.67%	8.33%	0.37%	16.34%	0.02%	7.99%	0.36%	14.51%
Pu-241	0.10%	0.48%	0.07%	2.91%	0.003%	0.99%	0.06%	2.24%
Pu-242	0.01%	0.05%	0.03%	1.17%	0.0002%	0.08%	0.02%	0.83%
Am-241	0.09%	0.47%	0.06%	2.86%	--	--	0.06%	2.20%
Total	**20.0%**	**100%**	**2.27%**	**100%**	**0.31%**	**100%**	**2.5%**	**100%**
U-234	0.12%	0.15%	0.58%	0.59%	0.001%	0.001%	3.90%	4.00%
U-235	0.28%	0.35%	2.36%	2.41%	0.30%	0.30%	4.88%	5.01%
U-238	79.60%	99.50%	94.96%	97.00%	99.40%	99.69%	88.73%	91.01%
Total	**80.0%**	**100%**	**97.9%**	**100%**	**99.7%**	**100%**	**97.5%**	**100%**

NOTE: For each of these materials, column one represents the overall mass fractions of the MOX fuel, and column two provides the mass fractions of the plutonium and uranium separately.

7.4.2.1 NFS Assay of Grouted Fines

TRU waste generated during the initial NFS decommissioning in the early 1990s was assayed using a nondestructive assay system that consisted of five stations. Station 1 was used for determining equipment hold-up prior to decontamination, Station 2 was used to assess decontamination effectiveness, and Station 3 was used for real-time monitoring of DVRF cell hold-up. These three stations were associated only with compacted waste. Station 4 consisted of a small size pulse active neutron differential die-away unit that was readily configured for both compacted bales and 55-gallon drums. Station 5 was a passive neutron coincidence counter for small packages, including 2-liter HDPE bottles, containing relatively high TRU concentrations and included a hyper-pure germanium gamma-ray detector for establishing plutonium isotopics (References M058, P218, P300, P321, U054).

NFS waste assay data indicates the largest Pu-239 mass reported in a single drum in this waste stream is 78 grams with an average Pu-239 mass of about 53 grams. Also, NFS waste assay data indicates the largest Am-241 activity reported in a single drum in this waste stream is about 5 curies with an average Am-241 activity of about 1.4 curies. These data are about 17 years old so the Am-241 activity will now be about 50 percent greater due to Pu-241 decay (References M003, M012, M198).

Relative to both Building 110 and Building 234 wastes, U-235 was assigned a mass value based on normalized intensity factor ratios from gamma spectroscopy. U-234 and U-238 mass values were assigned using scaling factors derived from uranium fuel isotopics (References M003, P218, P321). The largest mass of U-234, U-235, and U-238 in a single drum in this waste stream reported by NFS assay is approximately 76 grams, 7 grams, and 1.78 kg, respectively (References M012, M198).

U-233 was not reported in NFS waste assay data for any of the grouted fines drums (References M003, M012, M198). However, there is a potential for U-233 in this waste because five percent of the HDPE bottles originated from gloveboxes removed from the Building 110 laboratory which did handle U-233 (References C210, M054).

After receiving waste from NFS, all the drums in this waste stream were re-assayed at the ORNL WEAF on a neutron assay system (References U017, U038). The Pu-240 mass measured by the ORNL neutron assay system was used with the same isotopic distribution used by NFS as a basis for ORNL comparisons. For this reason, even though there are differences in the isotope masses reported by the two assay systems, the calculated mass fractions will be the same (Reference M065). The assay data in the *eMWaste* database is from NFS assay (References M012, M198).

7.4.2.2 Radiological Characterization of Waste Stream OR-NFS-CH-HOM-A

To determine isotopic ratios for waste stream OR-NFS-CH-HOM-A as a whole, the total gram value for each individual radionuclide was divided by the total mass of all radioactive constituents in the waste stream and converted to a percentage. This result is listed as "Total Radionuclide Wt%." To determine the radionuclide Wt% range for individual containers, the radiological mass in each container in the waste stream was summed. The mass of each individual radionuclide in a container was divided by the total radiological mass for that container and converted to a percentage. The minimum and maximum results are listed as "Radionuclide Wt% Range for Individual Containers." The same process was applied to determine "Total Radionuclide Ci%" and "Radionuclide Ci% Range for Individual Containers."

As shown in Table 7-4, Waste Stream OR-NFS-CH-HOM-A Radiological Characterization, U-238 is the most predominant radionuclide by mass, and Pu-239 is the second most predominant radionuclide by mass based on AK. The two most prevalent TRU radionuclides by mass are Pu-239 and Pu-240. These percentages are based on un-decayed NFS assay data. In addition, the radionuclide weight percent of individual radionuclides varies on a container-by-container basis. Because of this variability, some containers will not include the waste stream predominant radionuclides but may include other radionuclides expected in this waste stream. Radioassay data indicate that the TRU alpha activity concentration in each of the drums in this waste stream is more than 100 nCi/g (References M003, M012, M198). The radiological evaluation for this waste stream is documented in the NDA Memorandum as required by CCP-TP-005 (Reference 1).

Table 7-4. Waste Stream OR-NFS-CH-HOM-A Radiological Characterization

Isotope	Total Radionuclide Wt%[1]	Radionuclide Wt% Range for Individual Containers[2]	Total Radionuclide Ci%[3]	Radionuclide Ci% Range for Individual Containers[4]	Suspected Present (Yes/No)
WIPP Required Radionuclides					
Am-241	0.10%	0.01% - 2.86%[7]	2.58%	0.58% - 3.78%	Yes[6]
Pu-238	0.01%	Trace - 0.43%[7]	1.59%	0.55% - 22.66%	Yes
Pu-239	12.81%	3.53% - 90.94%[7]	6.20%	1.59% - 16.73%	Yes
Pu-240	1.94%	0.67% - 23.37%	3.44%	1.42% - 7.16%	Yes
Pu-242	0.02%	0.00% - 1.17%[7]	Trace[5]	Trace - Trace	Yes
U-233	Trace	0.00% - Trace	Trace	0.00% - Trace	Yes[9]
U-234	3.88%	0.00% - 4.00%[7]	0.19%	0.00% - 0.49%	Yes
U-238	80.74%	0.00% - 99.69%[7]	Trace	0.00% - Trace	Yes
Cs-137	Trace	0.00% - Trace	Trace	0.00% - Trace	Yes
Sr-90	Trace	0.00% - Trace	Trace	0.00% - Trace	Yes[8]
Additional Radionuclides					
Pu-241	0.11%	0.04% - 2.91%[7]	86.00%	65.35% - 94.70%	Yes[6]
U-235	0.40%	0.00% - 5.01%[7]	Trace	0.00% - Trace	Yes

1. This listing indicates the total Wt% of each radionuclide over the entire waste stream.
2. This listing is the Wt% range of each radionuclide on a container-by-container basis. Some containers with "0" listed as the lower range, will not contain the specified radionuclide.
3. This listing indicates the total activity Ci% of each radionuclide over the entire waste stream.
4. This listing is the Ci% range of each radionuclide on a container-by-container basis.
5. "Trace" indicates <0.01% for that radionuclide.
6. Am-241 may be present in slightly larger percentages, and Pu-241 in smaller percentages due to the decay of Pu-241.
7. These Wt% ranges were expanded based on plutonium and uranium isotopic distribution data (see Table 7-3).
8. Sr-90 cannot be quantified by gamma spectroscopy. Its value is calculated based on measured Cs-137 values. A Sr-90/Cs-137 scaling factor of 1.0 is used to calculate Sr-90.
9. U-233 was not reported in NFS waste assay data for any of the grouted fines drums; however, there is a potential for U-233 in this waste because some of the fines originated in the Building 110 laboratory which did handle U-233.

7.4.3 Chemical Content Identification – Hazardous Constituents

EPA hazardous waste numbers were assigned to waste stream OR-NFS-CH-HOM-A in accordance with RCRA based on a review of available AK documentation identifying chemical usage and potentially hazardous materials that may have been introduced into the waste stream through waste generating operations as described in Section 7.3, MSDS information compiled for commercial products used during decommissioning, and sampling and analysis of glovebox sweeping material by NFS. This waste stream has been historically managed in accordance with ORNL waste management practices in compliance with the requirements imposed by the TDEC. Documentation regarding how the site has historically managed the waste, including the historical regulatory status of the waste, is described above in Section 4.6.2. The EPA hazardous waste

number assignments have been applied on a waste stream basis; individual containers may not contain all of the hazardous materials listed for the waste stream as a whole. Table 7-5, OR-NFS-CH-HOM-A EPA Hazardous Waste Numbers, lists the assigned EPA hazardous waste numbers.

Table 7-5. OR-NFS-CH-HOM-A EPA Hazardous Waste Numbers

EPA Hazardous Waste Number	Constituent
D006	Cadmium
D009	Mercury

7.4.3.1 F-Listed Constituents

Waste stream OR-NFS-CH-HOM-A is not an F-listed hazardous waste because the grouted fines were not mixed with hazardous wastes from non-specific sources as listed in 40 CFR Part 261, Subpart D (40 CFR 261.31) (Reference 13).

Products used during decommissioning did not contain listed solvents (Reference M011). As discussed in Section 5.4.3.1, the only listed solvents identified in the MOX fuel production process were methylene chloride and trichlorotrifluoroethane contained in a binder material; however, these solvents do not meet the definition of an F-listed waste (References C142, P273).

Other NFS waste streams in the AK report have been assigned F002 for tetrachloroethylene contamination in the soil beneath Building 234. This solvent was not used during decommissioning or in the MOX fuel production process, and therefore will not be a contaminant in the immobilized liquids and fines waste. Therefore, F002 is not assigned to waste stream OR-NFS-CH-HOM-A.

7.4.3.2 Toxicity Characteristic Metals

Waste stream OR-NFS-CH-HOM-A exhibits the characteristic of toxicity for metal compounds as defined in 40 CFR Part 261, Subpart C (40 CFR 261.24) (Reference 13).

Toxicity characteristic metals constituents were not identified in the MOX fuel production process (Reference P273). Products used during decommissioning did not contain toxicity characteristic metals constituents (Reference M011). Analytical data from six process line samples of sweepings material identified a few samples above the regulatory level for arsenic, barium, and cadmium. Other sources for cadmium and mercury were also identified:

- Arsenic was detected in five of six samples at concentrations of 0.13, 0.51, 0.62, 4.4, and 5.7 mg/L. Only one of these results is above the regulatory level of 5.0 mg/L, and the UCL90 of these six samples is below the regulatory level (References C205, M064, M235, P273, U043).

- Barium was detected in all six samples at 0.57, 1.4, 38, 124, 222, and 301 mg/L. Three of these are above the regulatory level of 100 mg/L, and the UCL90 of these six samples is above the regulatory level. However, the method blank contained 193 mg/L which is also above the regulatory level. The barium may have been introduced from one of the extraction columns used in the analysis which is a problem encountered periodically (References C205, M064, M235, P273, U043).

- Cadmium was reported in all six samples at 0.04, 0.15, 1.2, 1.3, 1.5, and 24 mg/L. Four of these are above the regulatory level of 1.0 mg/L. The 24 mg/L cadmium value was outside the expected distribution from the other sample points, and consequently, this area was re-sampled. A sample composite was made of three parts new sample to one part previous sample. The result of the composite sample was 6.27 mg/L. The UCL90 of these six samples is above the regulatory level (References C205, M064, M235, P273, U043).

- Chromium, lead, and silver were detected in all six samples but below the regulatory level of 5.0 mg/L. Mercury and selenium were not detected in any of the samples (References C205, M064, P273, U043).

- A cadmium-coated wrench is located in one of the 2-liter HDPE bottles containing absorbent (References C210, U043).

- Waste was also generated from the cleanup of mercury from a regulator gauge located inside a glovebox. The liquid mercury was wiped up from the glovebox floor using cheesecloth. The mercury contaminated cleanup material, and other mercury contaminated waste from the floor of the glovebox (e.g., plexiglass and small metal items) were placed into 2-liter bottles and treated with a zinc amalgam (References C204, C210, M052).

Therefore, EPA hazardous waste numbers D006 (cadmium) and D009 (mercury) are assigned to waste stream OR-NFS-CH-HOM-A. However, EPA hazardous waste numbers D004, D005, D007, D008, D010, and D011 are not assigned to this waste stream (Reference DR031).

EPA hazardous waste numbers D008 (lead) and D011 (silver) are assigned to debris waste stream OR-NFS-CH-HET-A. The basis for these assignments to the debris waste stream were evaluated to determine if they would be applicable to the immobilized wastes. The source of lead and silver is from tin/lead solder and silver solder in circuit boards contained in electrical equipment. As described previously, this waste stream consists of grouted fines and absorbed liquids which would not contain tin/lead solder or silver solder. There are also miscellaneous metals in the waste such

as sweepings, scrap, hardware (nuts, bolts, etc.), and hand tools. Electrical equipment was not identified by RTR in this waste (Reference M202).

7.4.3.3 Toxicity Characteristic Organics

Waste stream OR-NFS-CH-HOM-A does not meet the definition of toxicity for organic compounds as defined in 40 CFR Part 261, Subpart C (40 CFR 261.24) (Reference 13). Toxicity characteristic organic compounds were not identified in the MOX fuel production process (Reference P273). Products used during decommissioning did not contain toxicity characteristic organic compounds (Reference M011). No organic constituents were detected in the process line samples of sweeping materials (Reference U043).

7.4.3.4 U-, P-, and K-Listed Wastes

Waste stream OR-NFS-CH-HOM-A does not contain a discarded commercial chemical product, an off-specification commercial chemical product, or a container residue or spill residue thereof (40 CFR 261.33) (Reference 13). Based on the AK documentation reviewed, U- and P-listed compounds were not used during MOX production or facility decommissioning (References M011, P273). Therefore, U-and P-listed EPA hazardous waste numbers, including U134 (hydrofluoric acid), are not assigned to this waste stream.

Based on the AK documentation reviewed, beryllium powder was not used by NFS (Reference C210). Therefore, this waste stream is not a P015-listed waste, and beryllium will not be present in amounts greater than one percent by weight of the waste in any drum.

The material in waste stream OR-NFS-CH-HOM-A is not a hazardous waste from any of the sources specified in 40 CFR 261.32 (Reference 13). Waste stream OR-NFS-CH-HOM-A is therefore not assigned a K-listed hazardous waste number.

7.4.3.5 Ignitables, Corrosives, and Reactives

Ignitability

The immobilized waste in this waste stream does not meet the definition of ignitability as defined in 40 CFR 261.21 (Reference 13). The waste is not an oxidizer, and it is not capable of causing fire through friction, absorption of moisture, or spontaneous chemical change. Respirable fines were immobilized with cement and water, and liquids were immobilized with RADSORB, so the possibility exists that liquids have formed in some drums while in storage. Prior to WIPP disposal, prohibited quantities of liquids will be removed or immobilized (see Section 7.4.4).

TRU waste generated at NFS was packaged in accordance with waste certification plans to meet ORNL-WAC developed specifically for NFS TRU waste. Efforts were

made to prevent the formation of liquids in bottles of immobilized fines by the addition of absorbent to the top of the cement (References C200, M003, P267, P268, P273, P274, P317). This waste will not be pyrophoric, and pyrophorics and compressed gases have not been identified in this waste stream (References M003, M065, P268, P273, P317). Waste stream OR-NFS-CH-HOM-A is therefore not ignitable (D001).

Corrosivity

The immobilized waste in this waste stream does not meet the definition of corrosivity as defined in 40 CFR 261.22 (Reference 13). Respirable fines were immobilized with cement and water, and liquids were immobilized with RADSORB, so the possibility exists that liquids have formed in some drums while in storage. Prior to WIPP disposal, prohibited quantities of liquids will be removed or immobilized (see Section 7.4.4). Waste stream OR-NFS-CH-HOM-A is therefore not corrosive (D002).

TRU waste generated at NFS was packaged in accordance with waste certification plans to meet ORNL-WAC developed specifically for NFS TRU waste. Efforts were made to prevent the formation of liquids in bottles of immobilized fines by the addition of absorbent to the top of the cement (References C200, M003, P267, P268, P273, P317).

Reactivity

The immobilized waste in this waste stream does not meet the definition of reactivity as defined in 40 CFR 261.23 (Reference 13). The waste is stable, will not undergo violent chemical change, and will not detonate. The waste will not react violently with water, form potentially explosive mixtures with water, or generate toxic gases, vapors, or fumes when mixed with water. There is no indication that the waste contains explosive materials, and it is not capable of detonation or explosive reaction. The waste does not contain reactive cyanide or sulfide compounds.

TRU waste generated at NFS was packaged in accordance with waste certification plans to meet ORNL-WAC developed specifically for NFS TRU waste. Explosives, reactive metals, reactive cyanides, or reactive sulfides were not identified in the AK documentation reviewed for either Building 234 or Building 110 (References M003, P267, P268, P273, P317). NFS Radwaste Package Certification Records indicate that the waste is not readily capable of detonation, explosive decomposition, reaction at normal pressures and temperatures, or an explosive reaction with water (Reference M003). Waste stream OR-NFS-CH-HOM-A is therefore not reactive (D003).

7.4.3.6 Polychlorinated Biphenyls

This waste stream does not contain PCBs greater than 50 ppm, and therefore, is not regulated as a TSCA waste under 40 CFR 761 (Reference 14). Analysis of process line samples of sweepings material indicate PCBs are well below 50 ppm (Reference C205, M064, P273, U043). RADSORB organic polymer absorbent was used to immobilize aqueous solutions only. Hydraulic fluids and oils were collected separately and sent to

SEG for incineration (References C210, P317).

7.4.4 Prohibited Items

The HDPE 2-liter bottles were removed from the glovebox in two unvented heat-sealed bags (References C203, P218, P274, P320). Based on a review of the WEAF RTR tapes, the heat-sealed bags may be greater than four liters (fully expanded volume), and the surface area may be less than 390 square inches (Reference M126). For this reason, every drum in this waste stream will be repackaged to breach all of the heat-sealed bags.

When the NFS waste was received at ORNL in the early-1990s, the drums underwent RTR which did not identify liquids in the majority of the drums but did discover liquid in one bottle inside drum NFS0480. Absorbent was added to the bottle. The drum number was then changed to NFS0865 (References C200, M003, M053, M065).

Certified RTR is performed by CCP to ensure the waste does not contain prohibited items in accordance with the WIPP-WAC and WIPP-WAP.

7.5 Waste Packaging

The 2-liter HDPE bottles of immobilized waste were capped and bagged out of the glovebox in two plastic bags (un-vented) which were heat-sealed. One of the bags is 12-mil PVC and one is 25-mil nylon reinforced polyethylene (References C203, P218, P274, P320).

The HDPE bottles were packaged in DOT specification 17H or 17C 55-gallon drums. The drums may contain a 90-mil HDPE rigid liner. A RADPAD absorbent pad may have been placed in the bottom of the drum and the rigid liner. A polyethylene drum liner bag also may have been placed inside the rigid liner. When the polyethylene drum liner bag was full, the bag was twisted and taped closed. The liner lid containing a ⅜-inch vent hole was snapped into place. Some drums have a PVC pipe insert with a half inch hole in the wall of the pipe positioned between the drum lid and liner lid at the center of the liner lid to help hold it in place (References C200, M003, M011, M052, M065, M126, P268, P317).

In order to ensure a consistent and uniform geometry that was conducive to assay, HDPE bottles that exceeded 50 Pu-239 FGE where packaged into a plastic or steel centering sleeve in the 55-gallon drum. HDPE bottles containing lower levels of activity were accumulated and packaged directly into a 55-gallon drum with less than 50 Pu-239 FGE with one or two layers of 14 bottles per layer. If there were less than 14 bottles in a layer, NFS may have completed the layer with wrapped empty 2-liter bottles. Also, a false lid may have been press fit down into the liner to help stabilize the bottles in the drum. Vermiculite was identified as a possible filler instead of using a false lid (References C203, C210, M051, M052, M067, M126, P218, P274).

DOT specification 7A Type A 55-gallon drums are used for waste repackaging at the TWPC (References P256, P432). Drums are lined with a filtered 6-mil poly liner bag; rigid liners are not used. When a drum is ready to be closed, the liner bag is twisted, and a cable tie wrap is wrapped around the twisted section and tightened. Additional tape is then wrapped around the twisted section (References P252, P253, P254). Hydrogen diffusion rate testing of cable tie wraps indicates that they are an acceptable closure method (References 11, P276).

A special packaging configuration is used at the TWPC to repackage the drums with 2-liter HDPE bottles loaded directly into the drum. This configuration will provide a more consistent and uniform geometry that will be conducive to assay and will allow RTR to examine all of the bottles. The configuration consists of two vertical cardboard tubes (diameters of 10.5-inches and 6-inches) in the center of the drum and several vertical cardboard tubes around the outside. The bottles of immobilized waste are placed in the outer tubes; the center tube may contain the plastic identification tag from the parent drum and a small amount of plastic from the daughter drum docking station. For example, a drum with 14 bottles will be configured with four tubes containing three bottles and one tube containing two bottles. The cardboard tubes are considered packaging material, not waste (Reference P1398).

For the drums that contain a plastic or steel centering sleeve with only two or three HDPE bottles, these drums are also repackaged at the TWPC into new drums with the same cardboard tube configuration, but in this case the two or three bottles are placed in the center tube (if each bottle in the drum has a surface dose rate less than 200 mR/hr) or an outer tube (if any one bottle in the drum has a surface dose rate greater than 200 mR/hr). The centering sleeve and the cardboard tubes are considered packaging material, not waste (Reference P1398). During the repackaging of this waste stream, seven bottles were identified that require repackaging into 55-gallon drums containing standard 12-inch pipe overpack components due to the high surface dose rates of these bottles. The standard pipe overpack consists of a pipe component centered in a DOT specification 7A Type A 55-gallon drum using dunnage consisting of fiberboard and plywood spacers within a rigid polyethylene liner. The pipe overpack component is a stainless steel cylindrical pipe with a bolted stainless steel lid sealed with an o-ring. The pipe component is approximately 12-inches in diameter, two feet long, and 0.25-inches thick. Each 55-gallon drum and pipe component is equipped with a manufacturer installed filter vent. Once the waste bottles and plastic bags (which have been breached) are placed into the pipe component, the pipe component lid is secured with bolts, the rigid liner lid (which includes a vent hole) is snapped into place, and the drum lid is installed (Reference P1407).

7.5.1 Filter Vents

TRU waste drums were fitted with approved filter vents by NFS at the time of generation (References C201, M003, P253). However, as described in Section 7.4.4, the drums contain prohibited heat-sealed bags and must be repackaged. The repackaged drums will be fitted with approved filter vents at the TWPC (References M075, P253).

7.5.2 Layers of Confinement

The HDPE bottles of immobilized waste were packaged in heat-sealed bags. As described in Section 7.4.4, these heat-sealed bags are prohibited and must be breached. The repackaged drums containing the cardboard tube configuration will have one layer of confinement (drum liner bag) (References M075, P254). The drums containing pipe overpack components will also have one layer of confinement (the filtered pipe component) (Reference P1407).

8.0 REQUIRED WASTE STREAM INFORMATION: OR-NFS-CH-HOM-B

This section presents the mandatory AK for waste stream OR-NFS-CH-HOM-B required by the WIPP-WAP (Reference 2). Attachment 1 for waste stream OR-NFS-CH-HOM-B (created in accordance with procedure CCP-TP-005) provides a list of TRU waste stream information required to be developed as part of the AK record (Reference 1).

8.1 Area of Building of Generation

Waste stream OR-NFS-CH-HOM-B, groundwater treatment sludge, is generated in the 234 Excavation Facility during the final phase of NFS decommissioning. This facility is a containment structure erected in place of Building 234 which was previously demolished. The 234 Excavation Facility contains compartmentalized structures for the excavation, handling, and packaging of plutonium contaminated soil from beneath the former Building 234 Wet Cell and equipment to treat groundwater removed from the excavation pit. As shown in Figure 5, sludge (solids separated from the contaminated groundwater) is generated in the water treatment area of the 234 Excavation Facility (References P1373, P1399).

8.2 Waste Stream Volume and Period of Generation

There are currently no drums in storage at ORNL in waste stream OR-NFS-CH-HOM-B. NFS estimates approximately 570 55-gallon drums of groundwater treatment sludge will be generated (Reference M206).

As the drums are shipped to ORNL, the NFS Waste Container Packaging Forms are evaluated and the drum numbers and closure dates are added to the Waste Containers List (References P1401). The Waste Containers List is maintained as a quality record as required by procedure CCP-TP-005 (Reference 1).

8.3 Waste Generating Activities

8.3.1 Groundwater Pretreatment at Nuclear Fuel Services

The 234 Excavation Facility operations excavate contaminated soil and pump groundwater into a treatment tank during soil excavation. The 234 Excavation Facility groundwater pretreatment system (GPS) processes the groundwater from the excavation area. Water is pumped from the excavation area to a process treatment tank in the water treatment compartment of the primary containment structure. During the liquid transfer from the excavation area, a series of filters may be used to pre-filter groundwater or they may be bypassed. Once the process tank has received the appropriate amount of water for treatment, the pump is stopped and chemicals (lime and flocculent) are prepared for the batch treatment of the groundwater. Lime (calcium hydroxide) is added to the groundwater treatment tank to precipitate metals and other dissolved chemicals from the water. As necessary, sodium hydroxide is added to adjust the pH. POLYFLOC AP125 (polymer flocculent) is then added to destabilize the

suspension of fine particles in solution which coagulate and settle out of solution. Once these treatment steps are complete, the treated water is transferred through filtration to a day tank. Water filtration involves bag filters or a combination of bag and cartridge filters. After the transfer is complete, a sample is collected and sent to the lab. Once the analyses are complete and verified to be within range, the water is transferred from the day tank to a large storage tank. The treated water is then transferred from the storage tank to the NFS Waste Water Treatment Facility (References C321, M011, P1372, P1399).

Settled solids (sludge) are pumped from the bottom of the treatment tank into a drum, and approximately 22 pounds of sodium polyacrylate polymer absorbent (i.e., Encap®, Waste-Lock 770, or Quik-Solid) are added to the top of the sludge. A pneumatic drill with an auger attachment is used to thoroughly mix the sludge and absorbent. A core sample is obtained from each drum, and the paint filter test is performed. The sludge sample is placed into a fine mesh conical paint filter, and if liquid passes through and drops from the filter within five minutes, the sludge is deemed to contain free liquids. If the paint filter test fails, 3.5 gallons of additional absorbent are mixed into the sludge with the auger and the paint filter test is repeated (References P1399, P1401). A diagram showing this process is provided in Figure 10, Groundwater Pretreatment System.

8.3.2 Transuranic Waste Processing Center in Oak Ridge

Waste stream OR-NFS-CH-HOM-B is packaged by NFS in accordance with the WIPP disposal requirements, and therefore, is not expected to be repackaged at the TWPC. However, this waste stream is sludge mixed with absorbent and will have a high moisture content. If RTR identifies prohibited quantities of liquids, the drums will be opened and absorbent (e.g., Nochar sodium polyacrylate polymer) will be added. Section 5.3.2 has additional details regarding the TWPC glovebox and BBA operations.

8.4 Types of Wastes Generated

This section describes the waste materials based on process inputs and outputs, waste matrix code assignment, waste material parameter weight estimates, radionuclide contaminants, and hazardous waste determinations for waste stream OR-NFS-CH-HOM-B.

8.4.1 Materials Related to Physical Form

Waste stream OR-NFS-CH-HOM-B is comprised of an aqueous sludge produced from the treatment of groundwater. The sludge is pumped from the bottom of a tank directly into a lined 55-gallon drum, and an organic polymer absorbent is added and mixed into the sludge (References P1399, P1401).

8.4.1.1 Waste Matrix Code

As described in the previous section, waste stream OR-NFS-CH-HOM-B is comprised of groundwater treatment sludge mixed with absorbent. Therefore, Waste Matrix Code S3120, Inorganic Sludges, is applied to this waste stream. The definition of this Waste Matrix Code is provided in the *DOE Waste Treatability Group Guidance* (Reference 4). This category includes waste that is at least 50 percent by volume inorganic sludges. The inorganic sludge may be mixed with stabilization agents.

8.4.1.2 Waste Material Parameters

As of the date Revision 7 of this AK Summary Report was issued, NFS has not begun shipping the sludge to ORNL. As shipments arrive, the NFS Waste Container Packaging Forms will be reviewed, and the drums will be added to the waste stream as appropriate. This will include a review of the waste material parameter data for each drum which will be documented in a Waste Stream Container Evaluation Memorandum in accordance with CCP-TP-005 (References P1401).

The waste material parameter weight estimates for waste stream OR-NFS-CH-HOM-B were derived from NFS waste packaging and operations procedures, waste container packaging forms, and discussions with NFS personnel. These estimates are presented in Table 8-1, Waste Stream OR-NFS-CH-HOM-B Waste Material Parameters. As described above, sludge is pumped from the bottom of the treatment tank into a drum, approximately 22 pounds of organic polymer absorbent (i.e., Encap®, Waste-Lock 770, or Quik-Solid) are added to the sludge, and the absorbent is thoroughly mixed into the sludge. After mixing, an additional three to four inches (approximately 25 pounds) of absorbent are added to the top of the waste (References C321, P1399, P1401).

A solidification testing report indicates that 13 pounds of sludge require one pound of absorbent (Reference P1404). If 22 pounds of absorbent are mixed into the sludge, the minimum sludge weight would be 286 pounds (13 x 22). Therefore, the total absorbent weight per drum will be approximately 47 pounds (22 + 25) or about 14 Wt% (47 / [286+47]). The actual weights will likely have some variation, so until sufficient container-specific data are available, the above data will be used to calculate the waste material parameter weight percentages. This waste material parameter evaluation is documented in a memorandum (included with Attachment 6 completed per CCP-TP-005) (Reference 1).

For the mixture of sludge and absorbent, RTR will not be able to distinguish between the two. The inorganic sludge will be the prevalent mass, and therefore, RTR will assign "Inorganic Matrix" to the mixture. The layer or absorbent added to the top of the waste should be identifiable by RTR and will be categorized as "Organic Matrix." The rigid liner and drum liner bag are considered packaging and therefore are not included in this evaluation.

Table 8-1. Waste Stream OR-NFS-CH-HOM-B Waste Material Parameters

Waste Material Parameter	Wt%	Wt% Range
Aluminum-based Metasl/Alloys	0%	0%
Iron-based Metals/Alloys	0%	0%
Other Metals	0%	0%
Other Inorganic Materials	0%	0%
Cellulosics	0%	0%
Plastics (waste materials)	0%	0%
Rubber	0%	0%
Organic Matrix	7.5%	To be determined
Inorganic Matrix	92.5%	To be determined
Soils/Gravel	0%	0%

8.4.2 Radiological Characterization

The Building 234 facility performed MOX fuel fabrication work under subcontracts to two U.S. Government contracts administered by the AEC, and two smaller commercial contracts. The largest of the two government-sponsored orders was to manufacture fuel rods for the SEFOR. The other government work was sponsored by DOE SRS. The commercial contracts were for the Halden reactor and Consumers Power Company (References C099, C100, P273). Table 8-2, Mixed Oxide Fuels Processed at NFS, shows the amount of MOX fuel processed at NFS. The isotopic composition of the MOX fuel materials is provided in Table 8-3, Mass Isotopic Distribution of Mixed Oxide Fuels Processed at NFS (References C099, C100, DR002, P212, P218, P268, P269, U016, U017).

Table 8-2. Mixed Oxide Fuels Processed at NFS

Material	%Pu	%U	Pu (kg)	U (kg)	Total (kg)
SEFOR	20%	80%	746	2,984	3,730.00
Consumers	2.27%	97.9%	47	2,027	2,070.48
SRS	0.31%	99.7%	16	5,064	5,079.37
Halden	2.5%	97.5%	3	117	120.00
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Table 8-3. Mass Isotopic Distribution of Mixed Oxide Fuels Processed at NFS

Isotope	SEFOR		Consumers		SRS		Halden	
Pu-238	0.01%	0.04%	0.01%	0.43%	--	--	0.01%	0.29%
Pu-239	18.13%	90.63%	1.73%	76.24%	0.29%	90.94%	2.00%	79.89%
Pu-240	1.67%	8.33%	0.37%	16.34%	0.02%	7.99%	0.36%	14.51%
Pu-241	0.10%	0.48%	0.07%	2.91%	0.003%	0.99%	0.06%	2.24%
Pu-242	0.01%	0.05%	0.03%	1.17%	0.0002%	0.08%	0.02%	0.83%
Am-241	0.09%	0.47%	0.06%	2.86%	--	--	0.06%	2.20%
Total	**20.0%**	**100%**	**2.27%**	**100%**	**0.31%**	**100%**	**2.5%**	**100%**
U-234	0.12%	0.15%	0.58%	0.59%	0.001%	0.001%	3.90%	4.00%
U-235	0.28%	0.35%	2.36%	2.41%	0.30%	0.30%	4.88%	5.01%
U-238	79.60%	99.50%	94.96%	97.00%	99.40%	99.69%	88.73%	91.01%
Total	**80.0%**	**100%**	**97.9%**	**100%**	**99.7%**	**100%**	**97.5%**	**100%**

NOTE: For each of these materials, column one represents the overall mass fractions of the MOX fuel, and column 2 provides the mass fractions of the plutonium and uranium separately.

There are two groundwater monitoring wells on the west side (down gradient) of the former Building 234. Over 200 samples have been collected from these wells over the last 15 years. Analyses conducted on these water samples included U-234, U-235, and U-238 and Pu-238 and Pu-239 (References P1375, U597). No more than six percent of the samples have calculated uranium mass fractions consistent with low-enriched uranium, and none of the samples are consistent with depleted uranium which was the primary uranium material processed in Building 234 (Reference M211). It may be that there are contributions from other facilities such as a scrap facility in the 200 Building Complex that recovered highly enriched uranium scrap (Reference C321). The Pu-239 to Pu-238 mass ratios compare somewhat favorably to the plutonium materials processed in Building 234; however, this comparison is less meaningful because Pu-238 is such a small contributor to the total plutonium (Reference M211).

One sample will be collected of the first batch of groundwater pumped from the excavation site to the treatment tank prior to treatment. This will be performed prior to any addition of treatment chemicals, therefore providing a representative sample of the groundwater that was pumped from the excavation site. The sample will be analyzed to confirm process knowledge of the constituents present in groundwater beneath the Building 234 area. The sample will be analyzed for technetium-99 and other radionuclides by gamma spectroscopy and alpha spectroscopy (Reference P1372). The results of these analyses will be provided once they become available.

8.4.2.1 NFS Assay of Groundwater Treatment Sludge

Each drum of groundwater treatment sludge is assayed by NFS using the VAGAS or a new gamma spectroscopy mobile counting system. The NDA system directly measures

Am-241 and scales the plutonium isotopes using decay-corrected historical plutonium isotopic (References C321, I067, P1374, P1403).

As of the date Revision 7 of this AK Summary Report was issued, NFS has not begun shipping the groundwater treatment sludge to ORNL. As shipments arrive, the NFS Waste Container Packaging Forms will be reviewed, and the drums will be added to the waste stream as appropriate (References P1401). This will include a review of radiological data for each drum which will be documented in a Waste Stream Container Evaluation Memorandum in accordance with CCP-TP-005. Once sufficient assay data are available, a table summarizing the weight and activity percentages will be included in this section. In addition, an NDA Memorandum will be developed to document the radiological evaluation for this waste stream as required by CCP-TP-005 (Reference 1).

8.4.3 Chemical Content Identification – Hazardous Constituents

NFS has characterized this groundwater treatment sludge as nonhazardous waste, and therefore, they did not assign EPA hazardous waste numbers to this waste. Based on a review of available AK documentation to identify chemical usage and potentially hazardous materials that may have been introduced into the waste stream, and MSDS information compiled for commercial products used during decommissioning, this waste stream will remain nonhazardous (Reference M011). Therefore, EPA hazardous waste numbers are not assigned to waste stream OR-NFS-CH-HOM-B in accordance with RCRA.

One sample of the first batch of groundwater pumped from the excavation site to the treatment tank prior to treatment will be collected. This will be performed prior to any addition of treatment chemicals, therefore providing a representative sample of the groundwater that was pumped from the excavation site. NFS will also collect one core sample from the first drum of groundwater treatment sludge. The groundwater and sludge samples will be analyzed for metals, volatile organic constituents, semivolatile organic constituents, and PCBs. The groundwater will also be analyzed for pH and flashpoint (Reference P1372).

8.4.3.1 F-Listed Constituents

Waste stream OR-NFS-CH-HOM-B is not an F-listed hazardous waste because the groundwater treatment sludge was not derived from the treatment of hazardous wastes from non-specific sources as listed in 40 CFR Part 261, Subpart D (40 CFR 261.31) (Reference 13).

Products used during decommissioning did not contain listed solvents (Reference M011). The only listed solvents identified in the MOX fuel production process were methylene chloride and trichlorotrifluoroethane contained in a binder material; however, these solvents do not meet the definition of an F-listed waste (References C142, P273).

The groundwater and groundwater treatment sludge will be sampled and analyzed for volatile organics (Reference P1372). Waste stream OR-NFS-CH-HOM-B will remain nonhazardous waste until these sampling results are available and can be evaluated. This section will be revised once these data are available.

8.4.3.2 Toxicity Characterisitic Metals

Waste stream OR-NFS-CH-HOM-B does not exhibit the characteristic of toxicity for metal compounds as defined in 40 CFR Part 261, Subpart C (40 CFR 261.24) (Reference 13).

Toxicity characteristic metal constituents were not identified in the MOX fuel production process (Reference P273). Products used during decommissioning did not contain toxicity characteristic metal constituents (Reference M011). The groundwater and groundwater treatment sludge will be sampled and analyzed for metals (Reference P1372). The results of the analysis will be included in this section when they are available.

8.4.3.3 Toxicity Characterisitic Organics

Waste stream OR-NFS-CH-HOM-B does not exhibit the characteristic of toxicity for organic compounds as defined in 40 CFR Part 261, Subpart C (40 CFR 261.24) (Reference 13).

Toxicity characteristic organic compounds were not identified in the MOX fuel production process (Reference P273). Products used during decommissioning did not contain toxicity characteristic organic compounds (Reference M011). The groundwater and groundwater treatment sludge will be sampled and analyzed for volatile and semivolatile organics (Reference P1372). The results of the analysis will be included in this section when they are available.

8.4.3.4 U-, P-, and K-Listed Wastes

Waste stream OR-NFS-CH-HOM-B does not contain a discarded commercial chemical product, an off-specification commercial chemical product, or a container residue or spill residue thereof (40 CFR 261.33) (Reference 13). Based on the AK documentation reviewed, U- and P-listed compounds were not used during MOX production or facility decommissioning (References M011, P273). Based on the AK documentation reviewed, beryllium was not used by NFS (Reference C210). Therefore, this waste stream is not a P015-listed waste, and beryllium will not be present in amounts greater than one percent by weight of the waste in each drum. Therefore, U-and P-listed EPA hazardous waste numbers, including U134 (hydrofluoric acid), are not assigned to this waste stream.

The material in waste stream OR-NFS-CH-HOM-B is not a hazardous waste from any of the sources specified in 40 CFR 261.32 (Reference 13). Waste stream OR-NFS-CH-HOM-B is therefore not assigned a K-listed hazardous waste number.

8.4.3.5 Ignitables, Corrosives, and Reactives

Ignitability

This waste stream does not meet the definition of ignitability as defined in 40 CFR 261.21 (Reference 13). The waste is sludge produced from treatment of groundwater which will not be ignitable. The waste is not capable of causing fire through friction, absorption of moisture, or spontaneous chemical change. The waste is not an ignitable compressed gas or an oxidizer (References P1399, P1401). Waste stream OR-NFS-CH-HOM-B is therefore not ignitable (D001).

Corrosivity

This waste stream does not meet the definition of corrosivity as defined in 40 CFR 261.22 (Reference 13). The waste is sludge produced from treatment of groundwater which will not be corrosive (References P1399, P1401). Waste stream OR-NFS-CH-HOM-B is therefore not corrosive (D002).

Reactivity

This waste stream does not meet the definition of reactivity as defined in 40 CFR 261.23 (Reference 13). The waste is sludge produced from treatment of groundwater. The waste is stable, will not undergo violent chemical change, and will not detonate. The waste will not react violently with water, form potentially explosive mixtures with water, or generate toxic gases, vapors, or fumes when mixed with water. The waste does not contain explosive materials, nor is it capable of detonation or explosive reaction. The waste does not contain reactive cyanide or sulfide compounds (References P1399, P1401). Waste stream OR-NFS-CH-HOM-B is therefore not reactive (D003).

8.4.3.6 Polychlorinated Biphenyls

This waste stream does not contain PCBs greater than 50 ppm, and therefore, is not regulated as a TSCA waste under 40 CFR 761 (Reference 14). The waste is sludge produced from treatment of groundwater, and therefore, is not expected to contain PCBs. The groundwater and groundwater treatment sludge will be sampled and analyzed for PCBs (Reference P1372). The results of the analysis will be included in this section when they are available.

8.4.4 Prohibited Items

An organic polymer absorbent is added to the sludge, and a pneumatic drill with an auger attachment is used to thoroughly mix the sludge and absorbent. A core sample is obtained from each drum, and the paint filter test is performed to ensure liquid does not drain from the sludge. If the paint filter test fails, additional absorbent is mixed into the sludge with the auger and the paint filter test is repeated (References P1399, P1401). Therefore, this waste stream is not expected to contain prohibited quantities of observable liquid. However, if RTR identifies prohibited quantities of liquids, the drums will be opened and absorbent (e.g., Nochar organic polymer) will be added.

Certified RTR is performed by CCP to ensure the waste does not contain prohibited items in accordance with the WIPP-WAC and WIPP-WAP.

8.5 Waste Packaging

The groundwater treatment sludge is packaged in DOT specification 7A Type A 55-gallon drums. Each drum contains a filtered polyethylene liner bag and a 90-mil rigid liner inside the liner bag. The sludge is loaded directly into the rigid liner, and absorbent is added to the sludge and thoroughly mixed into the sludge. Three to four inches of additional absorbent is added to the top of the waste. Rigid liner lids are not used. The liner bag is twisted, a plastic cable tie is wrapped around the twisted section and tightened, and tape is wrapped around the twisted section (References C321, P1399, P1401). Hydrogen diffusion rate testing of cable tie wraps indicates that they are an acceptable closure method (References 11, P276).

8.5.1 Filter Vents

NFS TRU waste drums are fitted with approved filter vents (Reference P1401).

8.5.2 Layers of Confinement

This waste has one layer of confinement which is the filtered polyethylene liner bag (Reference P1401).

9.0 CONTAINER SPECIFIC INFORMATION

For the decommissioning waste generated in the early-1990s during the initial decommissioning phase, several forms were filled out, including the NFS TRU Waste Data Package Form and the ORNL UCN-2822 form. For the waste generated during the second decommissioning phase, NFS completed a Radwaste Package Certification Record, a Drum Content Log, and a CH-TRU ORNL UCN-2109 form. For the waste generated during the final decommissioning phase, NFS completed a Waste Container Packaging Form. The types of information included on these forms is as follows:

NFS TRU Waste Data Package Form

- Container number
- Date packaged
- Gross and tare weights
- Physical description
- Iron content & Organic content
- Radiological data (e.g., FGE, plutonium equivalent curies)
- Hazardous constituents

ORNL Form UCN-2822

- Container number
- Origin of waste
- Brief description of waste (e.g., concrete)
- Date
- Container type

NFS Radwaste Package Certification Record

- Container number
- Generation location
- Container type
- Package date
- Waste description code (e.g., M = metals, P = plastics)
- Prohibited materials
- Hazardous waste listing

NFS Drum Content Log

- Item number
- Waste description (for each item in drum)
- Date

ORNL Form UCN-2109

- Container number
- Generator
- Waste description
- Origin date
- Prohibited items
- Radiological data

NFS Waste Container Packaging Form

- Container number
- Packaging date
- Container type
- Inner packaging configuration
- Drum weight
- Fill percentage
- Summary category group
- Waste description
- Waste material parameter weight percentages
- Radiological properties

In accordance with procedure CCP-TP-005 (Reference 1), a CCP Waste Containers List (Attachment 8 of the procedure) is completed and maintained as a quality record for waste tracking purposes. Information tracked includes container identification number, waste stream number, and the closure date for each container.

10.0 REFERENCES

1. CCP-TP-005, *CCP Acceptable Knowledge Documentation,* Carlsbad, New Mexico, Nuclear Waste Partnership, LLC.

2. *Waste Isolation Pilot Plant Hazardous Waste Facility Permit, Waste Analysis Plan*, New Mexico Environment Department, Santa Fe, New Mexico, Carlsbad, New Mexico, Nuclear Waste Partnership, LLC.

3. CCP-PO-001, *CCP Transuranic Waste Characterization Quality Assurance Project Plan,* Carlsbad, New Mexico, Nuclear Waste Partnership, LLC.

4. DOE/LLW-217, *DOE Waste Treatability Group Guidance*, Idaho Falls, Idaho, INEL-Lockheed Idaho Technologies

5. DOE/WIPP-02-3122, *Transuranic Waste Acceptance Criteria for the Waste Isolation Pilot Plant*, Carlsbad, New Mexico, U.S. Department of Energy

6. Public Law 102-579, *The Waste Isolation Pilot Plant Land Withdrawal Act,* October 30, 1992 as amended by Public Law 104-201, September 23, 1996

7. 42 U.S.C 10101, *Nuclear Waste Policy Act of 1982*

8. CCP-PO-002, *CCP Transuranic Waste Certification Plan,* Carlsbad, New Mexico, Nuclear Waste Partnership, LLC.

9. DOE/TRU-13-3425, *Annual Transuranic Waste Inventory Report – 2013*

10. Environmental Protection Agency EnviroMapper for Envirofacts, URL: http://134.67.99.122/enviro/emef.asp. Last updated on October 31, 2005. Retrieved August 28, 2007

11. *CH-TRU Payload Appendices*, Waste Isolation Pilot Plant

12. CCP-AK-ORNL-002, *Central Characterization Program Acceptable Knowledge Summary Report For Oak Ridge National Laboratory Radiochemical Engineering Development Center Contact-Handled Transuranic Waste, Waste Stream: OR-REDC-CH-HET*

13. 40 CFR Part 261, *Identification and Listing of Hazardous Waste*, U.S. EPA

14. 40 CFR Part 761, *Polychlorinated Biphenyls [PCBs] Manufacturing, Processing, Distribution in Commerce, and Use Prohibitions,* U.S. EPA

15. CCP-TP-053, *CCP Standard Real-Time Radiography (RTR) Inspection Procedure*, Carlsbad, New Mexico, Nuclear Waste Partnership, LLC.

16. CCP-PO-003, *CCP Transuranic Authorized Methods for Payload Control (CCP CH-TRAMPAC),* Carlsbad, New Mexico, Nuclear Waste Partnership, LLC.

17. DOE M 435.1-1, *Radioactive Waste Management Manual,* U.S. Department of Energy

11.0 AK SOURCE DOCUMENTS

Tracking Number	Title
C099	Letter to Harold Johnson, CBFO DOE re: KAPL-NFS Transuranic Waste Background Information
C100	Interview with Richard Booth and faxed defense and waste information for NFS, Erwin, TN TRU waste
C119	Removal of Contaminated Pipe, Building 234 Area B, Memo to Ron Mitchell, Letter of Authorization (LOA)
C120	Removal of Contaminated Piping, Building 234, Memo to Larry Burleson, Letter of Authorization (LAO)
C121	DVRF Bale Packaging Glovebox Removal, Memo to Ron Mitchell
C122	Building 234 Characterization Results, Memo to Heather Little
C125	Cleaning and Surveying the DVRF Shear Baler for PCBs, Memo to Building 234 Supervision
C126	Waste Packaging of the DVRF Decon Cell Perma-Con Structure, Memo to Richard A. Moore
C127	Size Reduction of the NDA Station 2 Glovebox In the DVRF Decontamination Cell, Memo to Ron Mitchell and Rick Leitner
C129	Size Reduction Process Ductwork within the Decontamination Cell, DVRF, Memo to Ron Mitchell and Rick Leitner
C130	Cleanout of DVRF Bale Packaging Glovebox, Memo to Ron Mitchell and Rick Leitner
C142	Legal Analysis regarding Solvent Binder Used to Make Fuel
C143	Memo to F. J. Schultz re: NFS Project Update from the WEAF
C144	Memo to Distribution re: Experience in Receipt and Inspection of Waste Shipments from Nuclear Fuel Services, Inc.
C145	Memo to Distribution re: Nuclear Fuel Services, In. (NFS) Background Information
C146	Paper from EPA website: Waste Minimization Assessment for a Manufacturer Producing Printed Circuit Boards
C147	Retrieved from EPA website: Consumer Product links for Mercury
C200	Internal Correspondence to M.W. Tull subject: On the Use of Rad-Sorb in NFS TRU-Waste Drums
C201	Letter to Mr. Bill Reynolds, EcoTek from Terry Wickland, Product Engineer regarding Seal for 16 gauge DOT 17H stainless steel drum lid
C202	Letter from Scott A. Toler to L.C.M. Roddeye regarding formal request for variance from Section 4.5.5 of the ORNL/NFS: NFS Waste Parameter Verification Program
C203	Letter to Martin Tull from Robert A. Hunt regarding a picture of the proposed method to "lab pack" bottles of immobilized respirable fines and residual materials

Tracking Number	Title
C204	Letter to Martin W. Tull, Martin Marietta Energy Systems, from Michael L. West, Nuclear Fuel Services, Inc. regarding response to his request for information relating to the discovery of mercury during the decommissioning of Station #15 in Building 234.
C205	Internal Correspondence to Distribution regarding Minutes of November 5, 1991 Meeting with NFS Regarding Process-Line Samples
C206	Numerous Faxes containing handwritten notes (oversight reports) from Paul O. Emerson re: such items as sampling the top of the underground tank, Pu Crew activities, equipment issues, processing of gloveboxes, and information on drums that were packaged.
C209	Internal Correspondence to F.J. Shultz from J.A. Chapman regarding NFS Project Accomplishments for Month of April 1992
C210	Interview re: NFS TRU Waste Shipped to Oak Ridge National Laboratory. Interviewees: Richard Booth, Richard Moore, Bob Hunt, Scott Toller, Marie Moore
C227	Interview with Scott Morie from NFS
C230	E-mail from Brian Oakley to Jeff Harrison, RE: NFS Schedule
C309	Record of Communication Subject: NFS Soil Sampling/Analysis Data Tetrachloroethylene Use
C321	Record of Communication. Subject: Soil and Groundwater Treatment Sludge to be Generated in 2011.
C622	Email from Don Coffey to Jeff Harrison RE: NFS BBA REPACKS NFS0385 A-H
DR001	Discrepancy Resolution re: OR-NFS-CH-HET EPA Hazardous Waste Numbers
DR002	Discrepancy Resolution for OR-NFS-CH-HET re: Radionuclides
DR006	Discrepancy Resolution re: Physical Form of NFS-0116 & NFS-0929
DR010	Discrepancy Resolution re: Incorrect Waste Stream Assignment of Soil Waste Containers
DR013	Discrepancy Resolution re: NFS Soil and Debris EPA Hazardous Waste Numbers
DR015	Discrepancy Resolution re: OR-NFS-CH-HET-A Heterogeneous Debris from NFS
DR022	Discrepancy Resolution re: OR-NFS-CH-SOIL and OR-NFS-CH-HET-A Waste Stream Designation
DR023	Discrepancy Resolution re: NFS0815 and X10C0506069
DR026	Discrepancy Resolution re: Reassignment of NFS815 to OR-NFS-CH-SOIL
DR030	Discrepancy Resolution re: Drum NFS0929
DR031	Discrepancy Resolution re: OR-NFS-CH-HOM-A EPA Hazardous Waste Number Assignment
DR037	Discrepency Resolution re: Drum NFS0788A

Tracking Number	Title
DR038	Discrepency Resolution re: Drum NFS0815
I022	DOE Order 435.1, Radioactive Waste Management
I023	Radioactive Waste Management Manual
I043	Implementation Guide for Use with DOE M 435.1-1
I052	Memorandum; Building 234 Shear Baler Characterization Samples
I053	KAPL-TN Waste Profile for NFS Building 234 Soil
I056	Removal of Building 234 Wet Cell Permacon Containment Enclosure
I058	Dismantlement of the West Wet Cell Wall in Building 234
I059	Waste Packaging of Wet Cell Wall in Building 234
I061	Size Reduction of the DVRS Glovebox
I067	Procedure for the Operation of the Versatile Automated Gamma Assay System (VAGAS)
I068	Size Reduction of 4-inch Diameter Duct Section in Area C
M003	ORNL UCN-2109 and UCN-2822 Forms for NFS TRU Waste and Related Paperwork for Waste Stored at ORNL (container paperwork)
M007	Internal Correspondence and the Environmental Assessment for the Receipt and Storage at ORNL, of Transuranic Waste, Mixed Transuranic Waste, and Mixed Oxide Waste from Nuclear Fuels and the Environmental Assessment for Disposition of Transuranic Waste
M008	Fax from John E. Kirkpatrick to Robert C. Mason on 01/16/1991 and the PuO2 + UO2 (mixed oxide) fuel production flow chart for Pellet Production, Rod/Assembly Fabrication, Scrap Dissolution/Recovery
M011	MSDS (Material Safety Data Sheets) for Products used at NFS
M012	EM Waste Database Query - Container Information; Waste Description; Isotopes
M013	EM Waste Database Query - NFS Box Daughter and Repack Drums: Container; Waste Description; Isotopes
M016	Incoming Container Travelers for NFS Waste - VE Data
M017	NFS NDA Data from Foster Wheeler (by container)
M018	NFS Radiography (NDE) Data from Foster Wheeler (by container)
M019	NFS VE Data from Foster Wheeler (by container)
M020	NFS HSG Data from Foster Wheeler (by container)

Tracking Number	Title
M021	Defense Determination Approval for ORNL/NFS-HD-001, Heterogeneous Debris - NFS
M050	Photos of the Site
M051	Fax from Bob Hunt from Martin Tull transmitting drawing for EcoTek - The Hunt 55 Gallon Poly. Insert
M052	Account Book No. S149 - DVRF Decommissioning and Volume Reduction Facility
M053	Letter from L.C.M. Roddye to R.L. Booth regarding Nuclear Fuel Services, Inc. - Contract DE-SCOT-86ID12630 - Closure of Nonconformance Reports NCR-X-94-WMRAD-0011, NCR-X-94-WMRAD-0012, NCR-X-94-WMRAD-0013, NCR-X-94-WMRAD-0014 AND NCR-X-94-WMRAD-0015
M054	Internal Correspondence to Distribution from D.W. Turner regarding Information Concerning NFS D&D Operations
M058	(Handwritten Document) Methods for: Measuring Activity in Baled Waste; Flowsheet for Immobilizing Fines; Assigning Values to Soil; Flowsheet for Packaging and Measuring Raschig Rings
M059	Memo transmitting NCR-X-WMRAD-0015 for Liquid in Liners
M060	Correction Actions to Prevent Recurrence of NCR-X-94-WMRAD-0011
M061	Internal Correspondence to Distribution from J.A. Chapman regarding An Evaluation of NFS Isotopic Estimates by Gamma-ray and Alpha-particle Spectroscopy
M062	NFS Data Set No. 2 PCB Reanalysis of Gasket and K1 Samples
M063	NFS Data Sheet No. 3 PCB Analysis of Fresh Gasket and Pall Filter Samples and Cadmium in Pall Filter TCLP Leachate
M064	Analysis Results for Process Line Samples from Nuclear Fuel Services, Inc. and NFS Sample Set No. 3
M065	WEAF Data for NFS Drums (by container); WEAF Waste Acceptance Report; NFS Storage Project (by container)
M066	Surveillance: Source Surveillance at Scientific Ecology Group, Oak Ridge, TN
M067	Surveillance: Source surveillance for Contact-Handled Transuranic and Mixed Oxide Wastes
M068	Review of WEAF RTR Video Tapes
M075	TWPC Contact Handled Waste Repackaging Data Forms for NFS Waste (container paperwork)
M076	Evaluations of Additional Containers for Waste Stream OR-NFS-CH-HET-A (drum additions)
M126	RTR Video Tapes and DVDs from the WEAF Facility for Oak Ridge Waste
M128	Evaluation of Additional Containers for Waste Stream OR-NFS-CH-SOIL, dated September 5, 2008

Tracking Number	Title
M129	Evaluation of Additional Containers for Waste Stream OR-NFS-CH-HET, dated 9/8/2008
M130	Evaluation of Additional Containers for Waste Stream OR-NFS-CH-HET, dated 09/15/2008
M131	Evaluation of Additional Containers for Waste Stream OR-NFS-CH-HET dated 11/30/2007
M132	Evaluation of Additional Containers for Waste Stream OR-NFS-CH-SOIL dated 9/24/2008
M133	Evaluation of Additional Containers for Waste Stream OR-NFS-CH-HET dated 09/24/2008
M198	eMWaste Query from ORNL Dated 08/30/2010
M202	Review of WEAF RTR Videos for NFS Immobilized Liquids and Fines
M206	Wet Cell Excavation TRU Waste Shipping Schedule
M207	NFS Waste Container Packaging Forms
M208	Evaluation of Drums for Waste Stream OR-NFS-CH-SOIL from NFS Final Decommissioning Phase
M209	Evaluation of Drums for Waste Stream OR-NFS-CH-HOM-B from NFS Final Decommissioning Phase
M210	TRU Project Waste Processing Facility Job Recipe. Subject: Soil-like Waste Remediation
M211	Evaluation of NFS Groundwater Data
M213	Duratek buys waste processing company
M214	EnergySolutions OKs deal to buy Duratek
M215	EnergySolutions Locations
M216	Evaluation of Additional Containers for Waste Stream OR-NFS-CH-HET-A
M217	eMWaste Database Query from ORNL Dated 01/03/2013
M235	Evaluation of Data from Source Document M064
P014	Inventory of ORNL Remedial Action Sites: 11. Research Laboratories
P212	Lattice Experiments with Simulated Burned-Up Fuel for D2O Power Reactors
P218	Oak Ridge National Laboratory/Nuclear Fuel Services, Inc. NFS Waste Parameter Verification Program
P248	Structural Assessment of Building 234 Prepared for NFS, 1205 Banner Hill Road, Erwin, TN 37650

Tracking Number	Title
P251	Box Breakdown Area Operations
P252	Glove Box Operations
P253	Drum Bag In/Bag Out and Glove Ports
P254	Contact Handled Waste Repackaging
P255	Contact handled Waste Acceptance Criteria
P256	TRU/Alpha Low Level Waste (LLW) Treatment Project Documented Safety Analysis
P267	Nuclear Fuel Services Waste Acceptance and Storage Procedure
P268	ORNL WAC for Contact Handled Transuranic and Mixed Oxide Wastes from Nuclear Fuel Services INC.
P269	ORNL Waste Acceptance Criteria for Transuranic Waste from the Nuclear Fuel Services, Inc.; ORNL WAC for Contact-Handled Transuranic and Mixed Oxide Wastes from Nuclear Fuel Services, Inc.
P272	Oak Ridge National Laboratory Waste Management Plan
P273	Nuclear Fuel Services, Inc., Waste Certification Plan for Transuranic Waste
P274	Segregation and Immobilization of Particulate Fines
P276	Determination of H2 Diffusion Rates through Various Closures on TRU Waste Bag-Out Bags
P283	Plutonium Facilities Decommissioning Project Plan Condition Addendum
P300	Operation of the Decontamination and Volume Reduction Facility
P301	Wet Cell
P303	Removal of Exhaust Systems
P304	Removal of Asbestos-Bearing Materials
P306	Excavation of 110 Lab Tank
P312	Maintenance for Plutonium Decommissioning
P315	Wet Cell Soil Excavation and Mixing
P316	Investigation of DOE-ORNL Nonconformance Reports for Building 234 Plutonium Shipments (Surface Contamination, Free Standing Liquids, Missing Liner Lid)
P317	Packaging for Shipment to Processing, Storage, or Burial
P319	Preparation of Gloveboxes for Decontamination in the DVRF

Tracking Number	Title
P320	Bag-Out and Glove Change
P321	Determination of Plutonium Isotopics for Building 110 and 234
P323	Status of Former Mixed Oxide Fuel Fabrication Facility
P432	TRU Waste Processing Center Document Safety Analysis
P582	PCB Decontamination
P1116	EnergX TRU Waste Processing Center Procedure: Absorbing Liquids
P1370	Evaluation of Techniques for Conditioning and Packaging Plutonium Contaminated Soil
P1371	Procedure for Removal and Decontamination of Utility and Process Lines and Systems
P1372	Building 234 Soil, Groundwater, and Groundwater Sludge Sampling and Analysis Plan (NFS)
P1373	Project Management Plan for Wet Cell Soil Excavation (NFS)
P1374	Characterization of Building 234 Waste (NFS)
P1375	North Site Characterization Report for Nuclear Fuel Services, Erwin, Tennessee
P1398	TRU Waste Processing Center, High Density Waste Item Repackaging
P1399	Operating Procedure for the 234 Excavation Facility Groundwater Pretreatment System
P1400	Operating Procedure for Soil Excavation, Processing and Packaging for the 234 Excavation Facility
P1401	Waste Packaging for WIPP Disposal
P1402	234 Wet Cell Characterization Summary
P1403	Operation of the ORTEC Mobile Counting System
P1404	Final Report: Solidification Testing for 234 Excavation Facility Decommissioning Project
P1405	Geochemical Survey of the Unaka Mountain Roadless Area, Unicoi County, Tennessee
P1407	TWPC Procedure - Pipe Overpack Container Operations
P1409	Attachment K: Compacted Drum Puck Standing Recipe, Job Recipe Number: OPSJR-STANDING-09
P1413	TRU Waste Compactor Operation
P1414	Radioactive Material Receipt
P1415	Radioactive Material Shipment to CNSI Barnwell, US Ecology Richland, and to Customer

Tracking Number	Title
P1416	TRU Waste Receipt and Shipment
U016	A Graphical Workbook for Estimating Important Quantities of NFS Radioactive Waste Constituents
U017	The Intercomparison of NDA Measurements on CH-TRU Waste Between Nuclear Fuel Services, Inc. and Oak Ridge National Laboratory
U038	ORNL TRU Waste Historical Survey; Volumes 1, 2, and 3—Origins and Characteristics of Remote-Handled Transuranic Wastes (Trabalka report) Plus Appendices
U040	NFS response to "Transuranic Waste Baseline Inventory Report Questionnaire"
U043	Final Report - Waste Characterization of Wastes Generated from D&D Activity; Buildings 110 and 234 on the NFS Site in Erwin, Tennessee
U044	Weston Report: Acceptable Knowledge Summary Report for Oak Ridge National Laboratory Contact-Handled TRU Debris Waste Facility Maintenance Operations
U050	Action Description Memorandum for Disposition of Transuranic Waste and Plutonium Scrap from Nuclear Fuel Services, Inc.
U051	Return of 55-Gallon Stainless Steel Drums for Addition of Radsorb
U052	Decommissioning Strategy in Today's Environments
U054	Decontamination and Decommissioning of a Plutonium Fabrication Facility
U055	Abstract, Calibration Schemes and Measurement Techniques
U057	An Interim Report on A Time-Series Analysis of the Events Leading up to the Detection of Free-Liquid in NFS Supercompacted Drums
U058	Oak Ridge National Laboratory/Nuclear Fuel Services Inc. NFS Waste Parameter Verification Program
U597	Building 234 Groundwater Design of Experiment (Groundwater Monitoring Data) (NFS)

Figure 1. Nuclear Fuel Services, Inc.

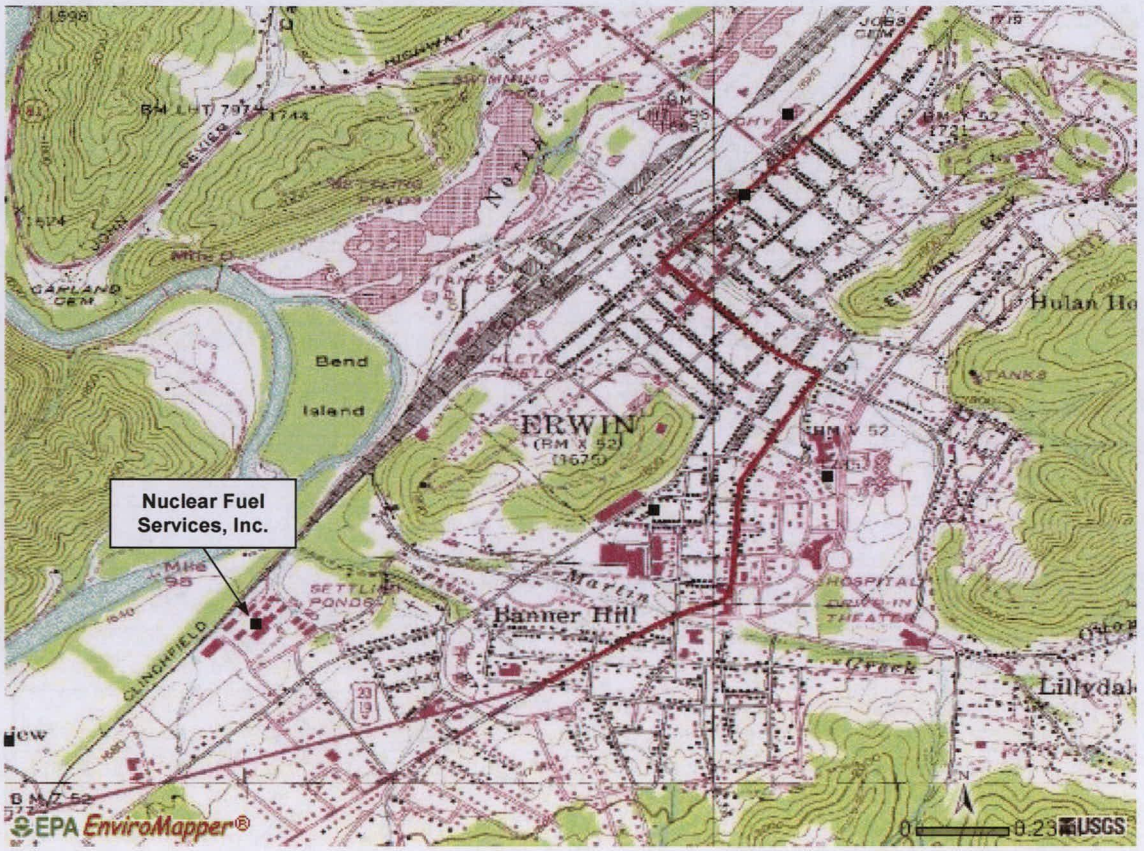


Figure 2. Buildings 234 and 110 at Nuclear Fuel Services, Inc.

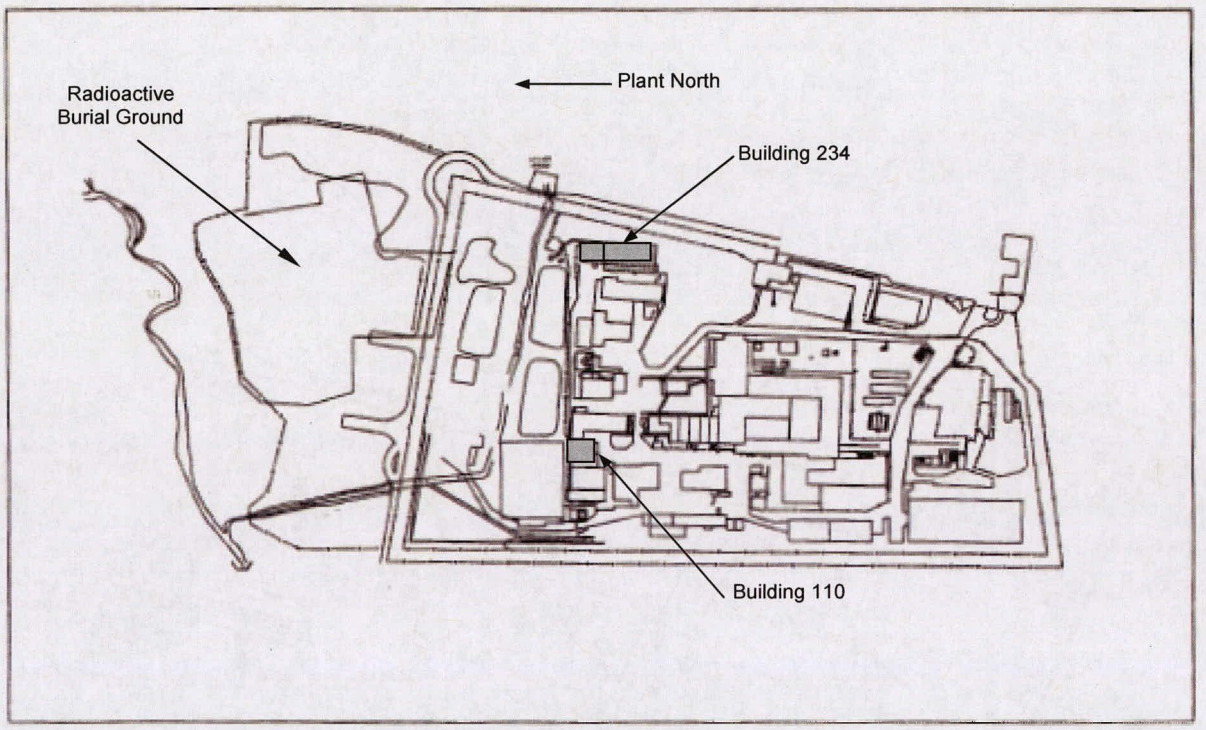


Figure 3. Photograph of Nuclear Fuel Services, Inc.

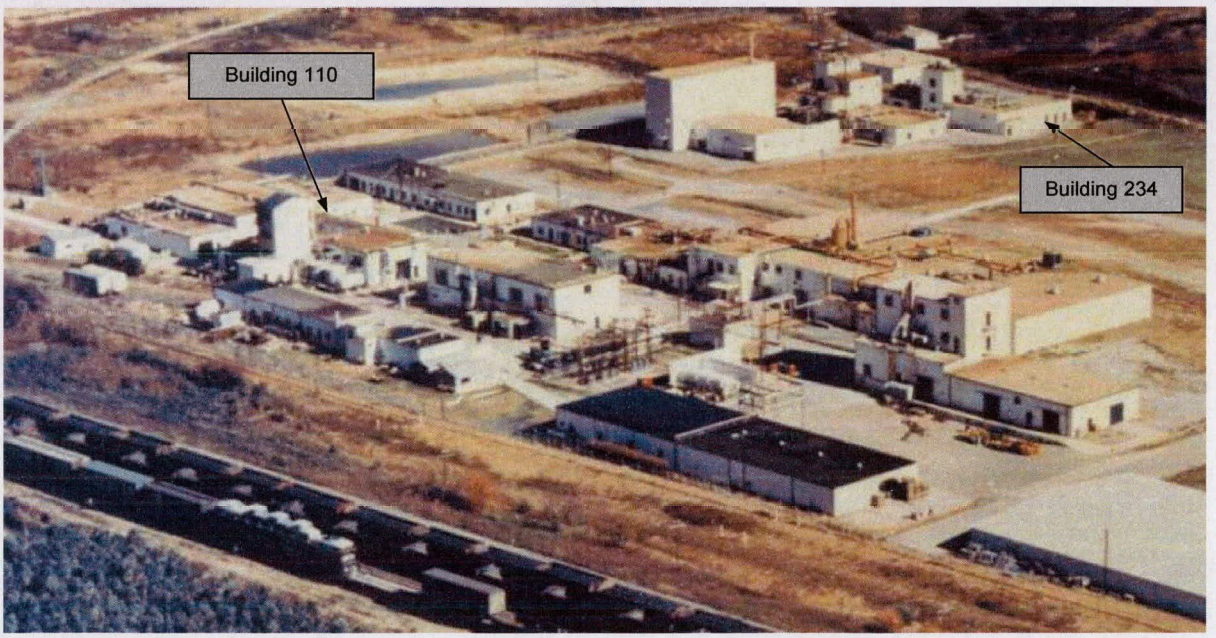


Figure 4. Decontamination and Volume Reduction Facility

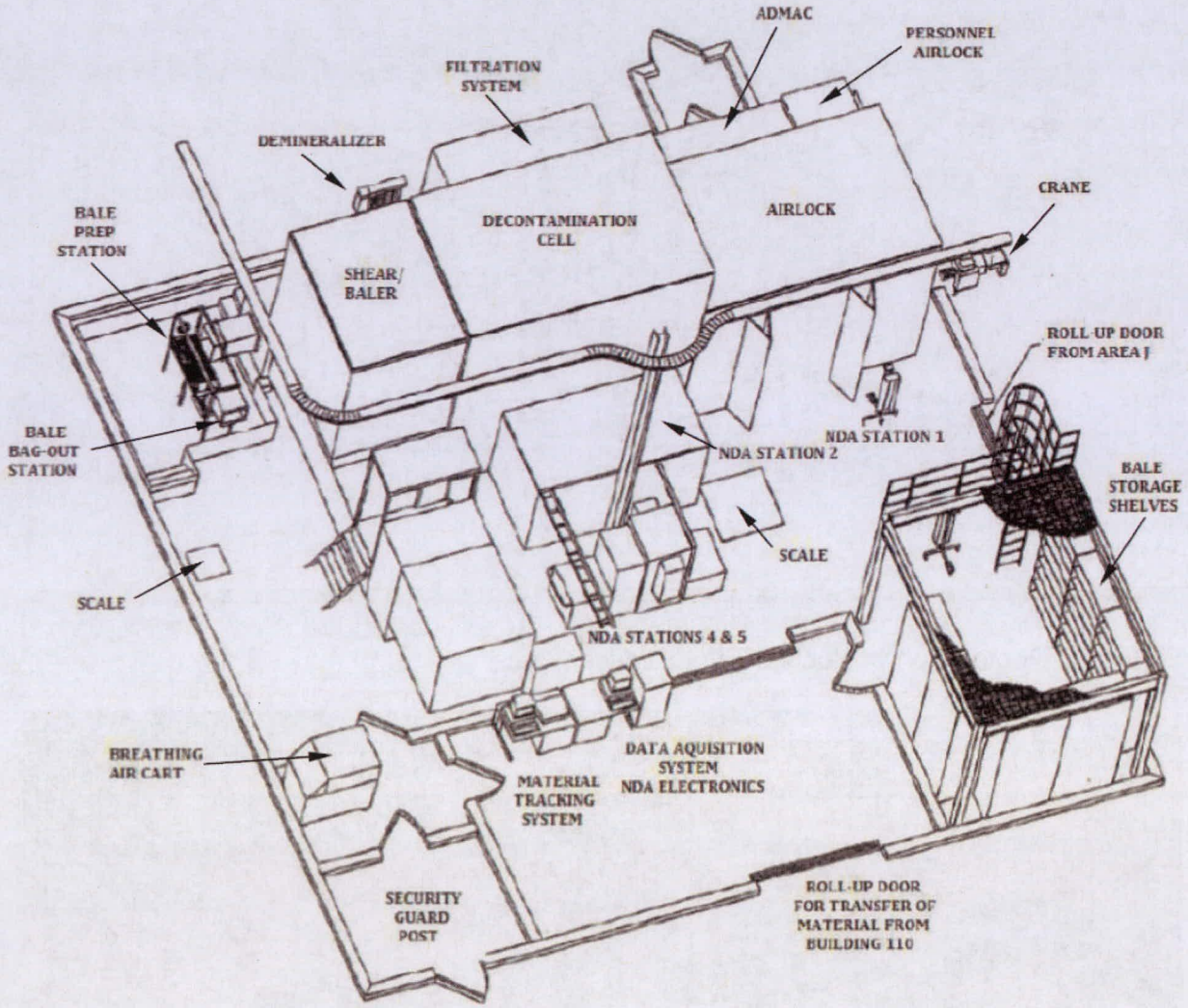


Figure 5. 234 Excavation Facility Layout

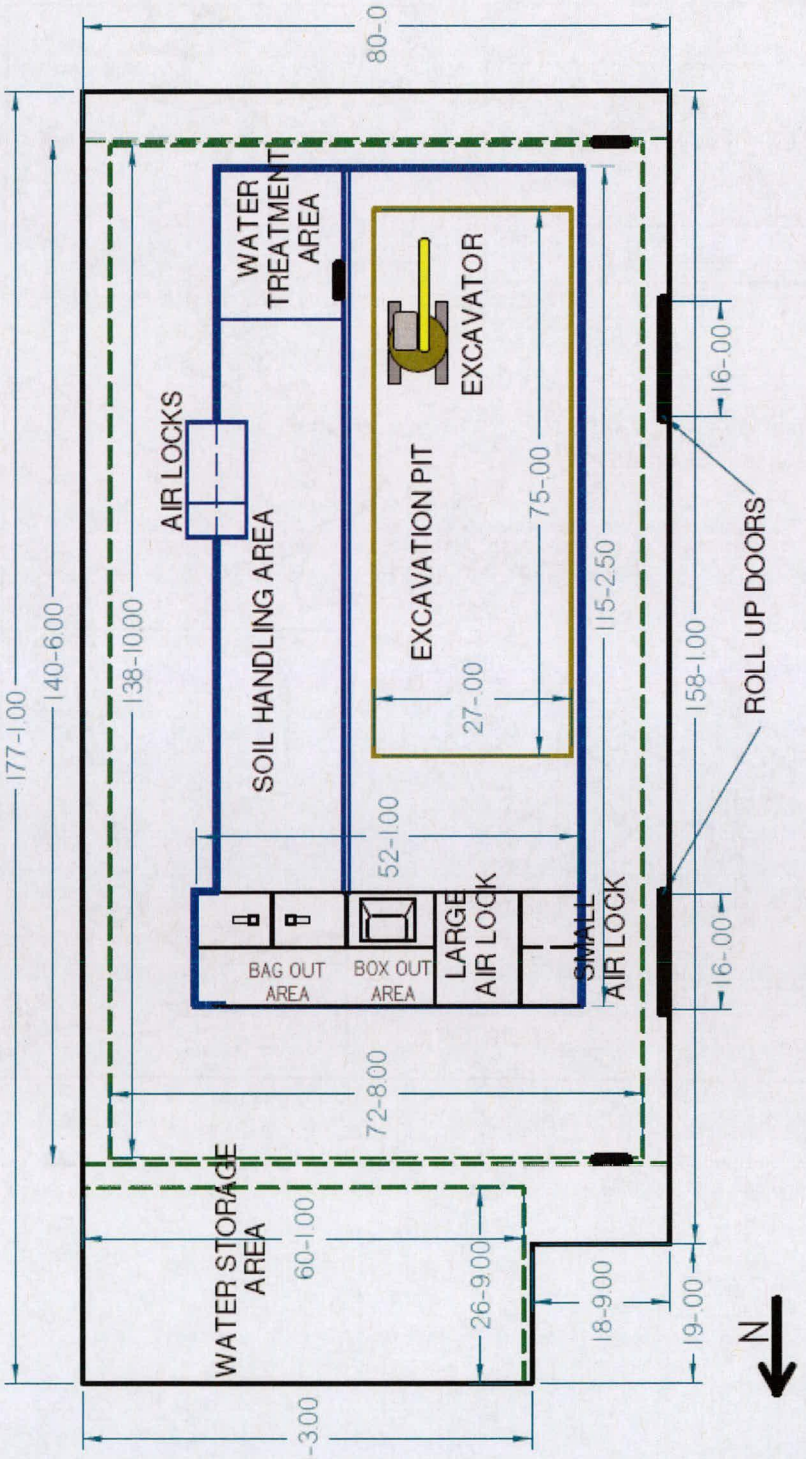


Figure 6. Oak Ridge National Laboratory and Scientific Ecology Group

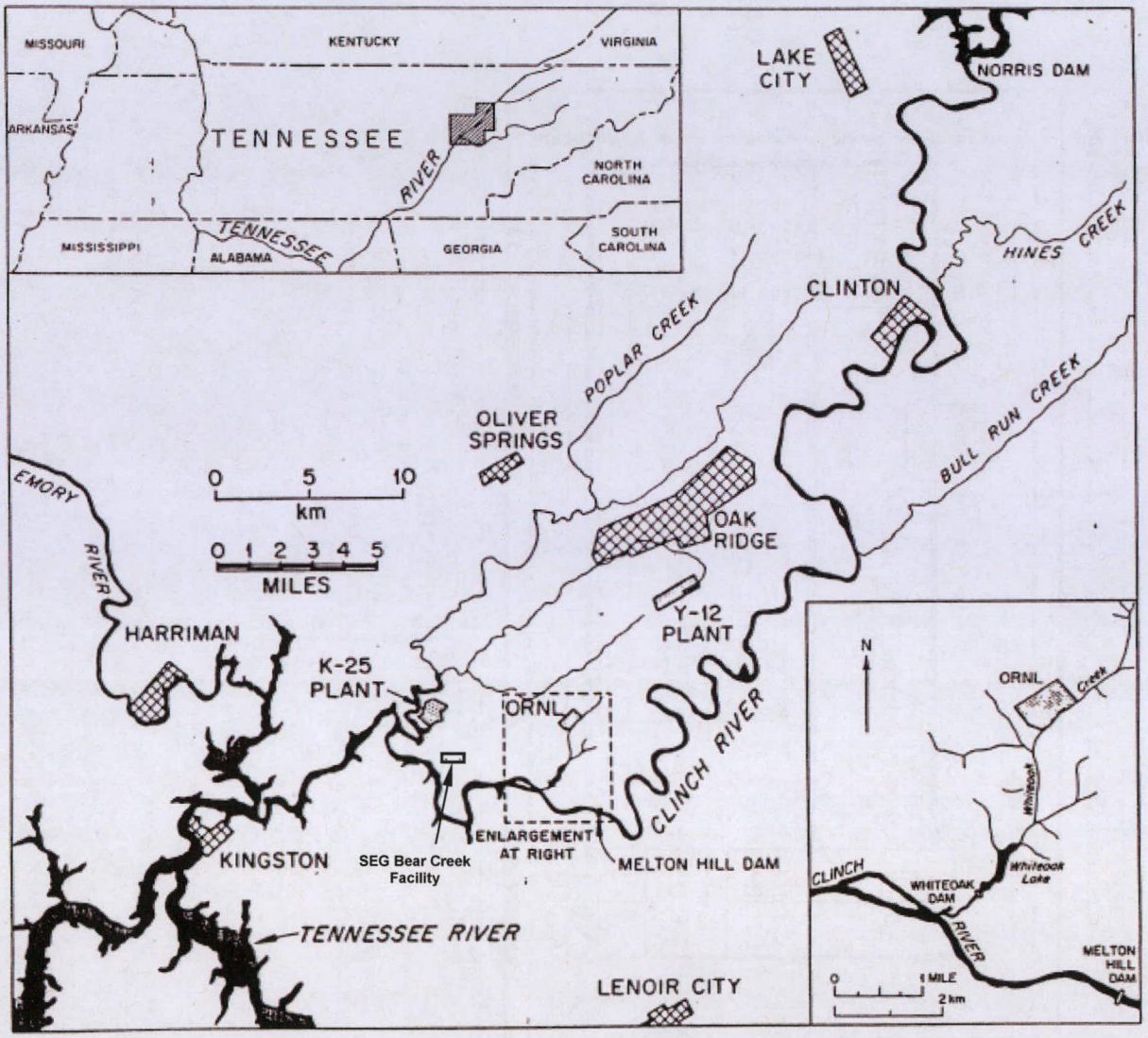


Figure 7. Transuranic Waste Processing Center and ORNL Solid Waste Storage Areas

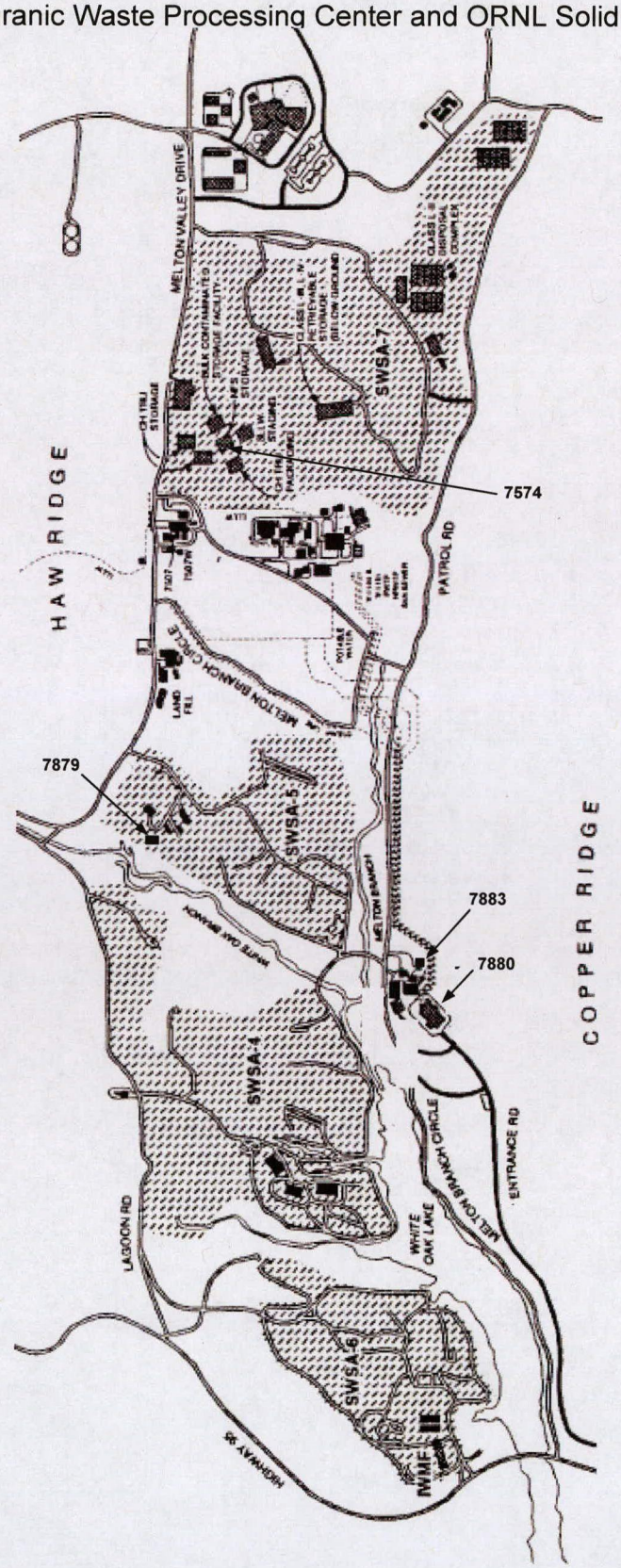


Figure 8. Equipment Decontamination and Volume Reduction

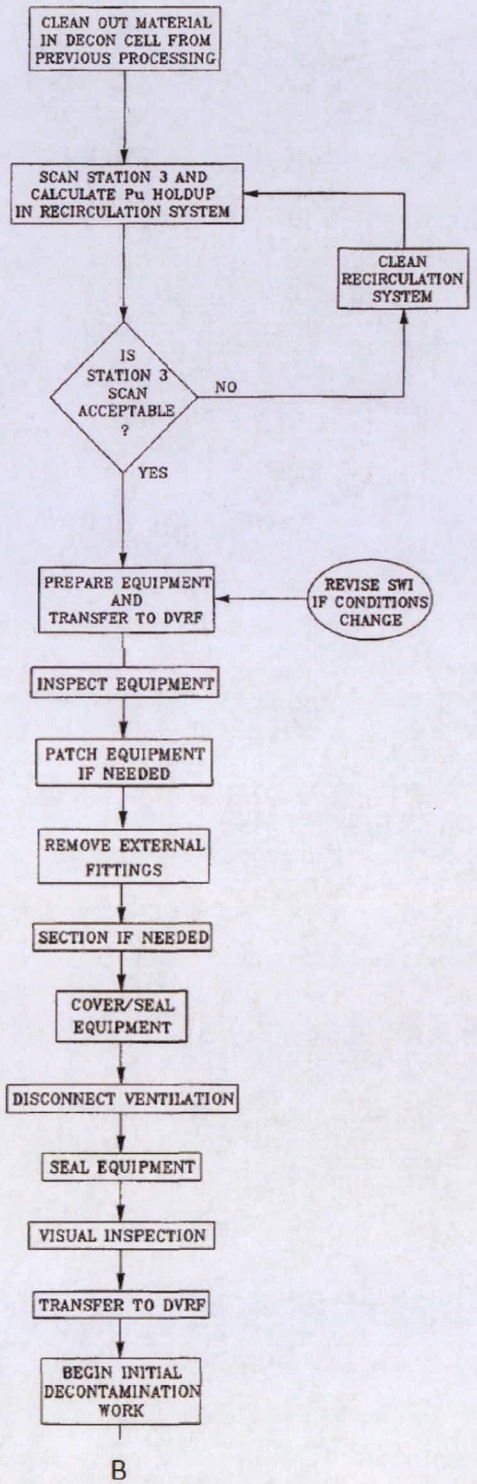


Figure 8. Equipment Decontamination and Volume Reduction (Continued)

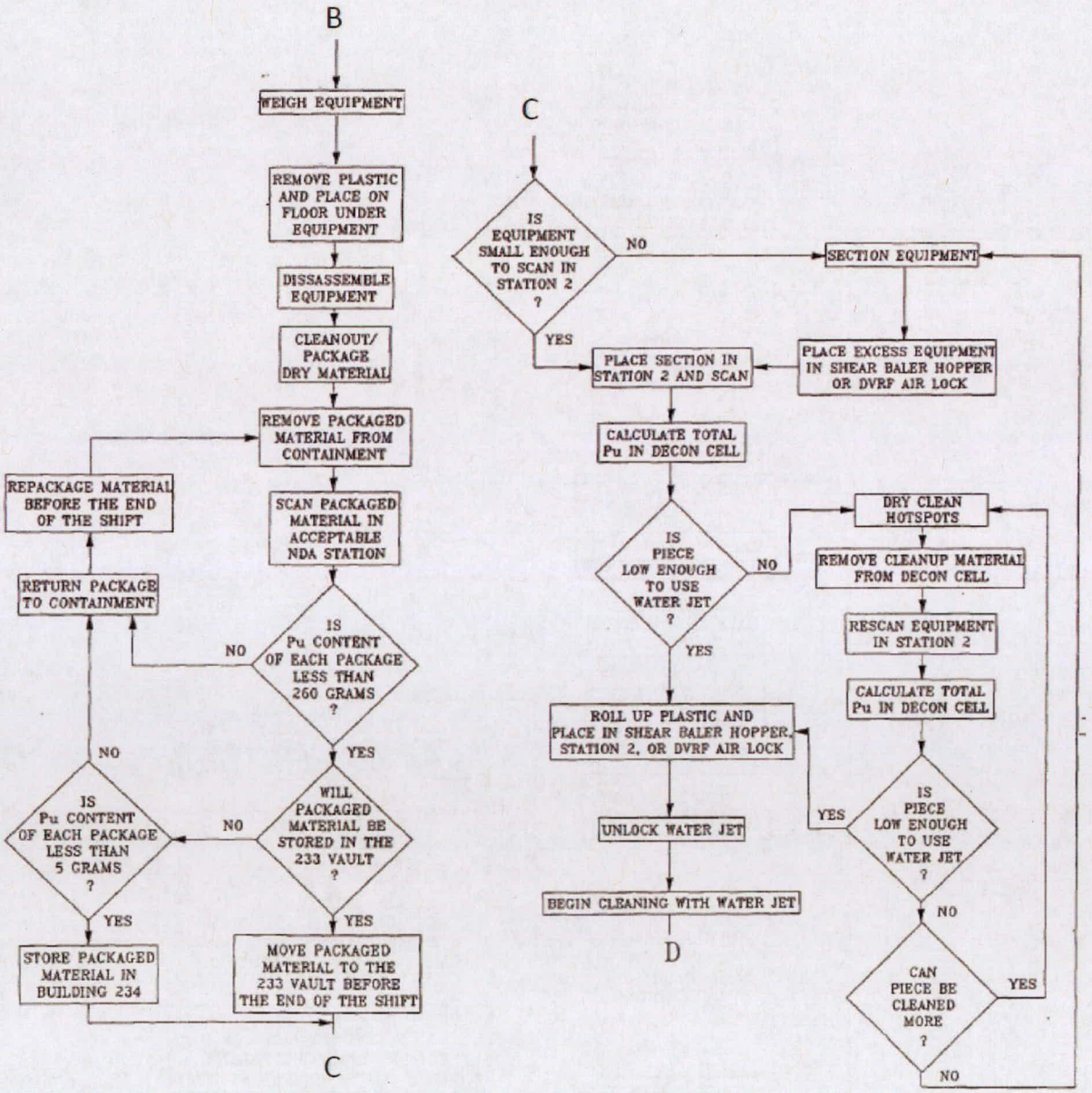


Figure 8. Equipment Decontamination and Volume Reduction (Continued)

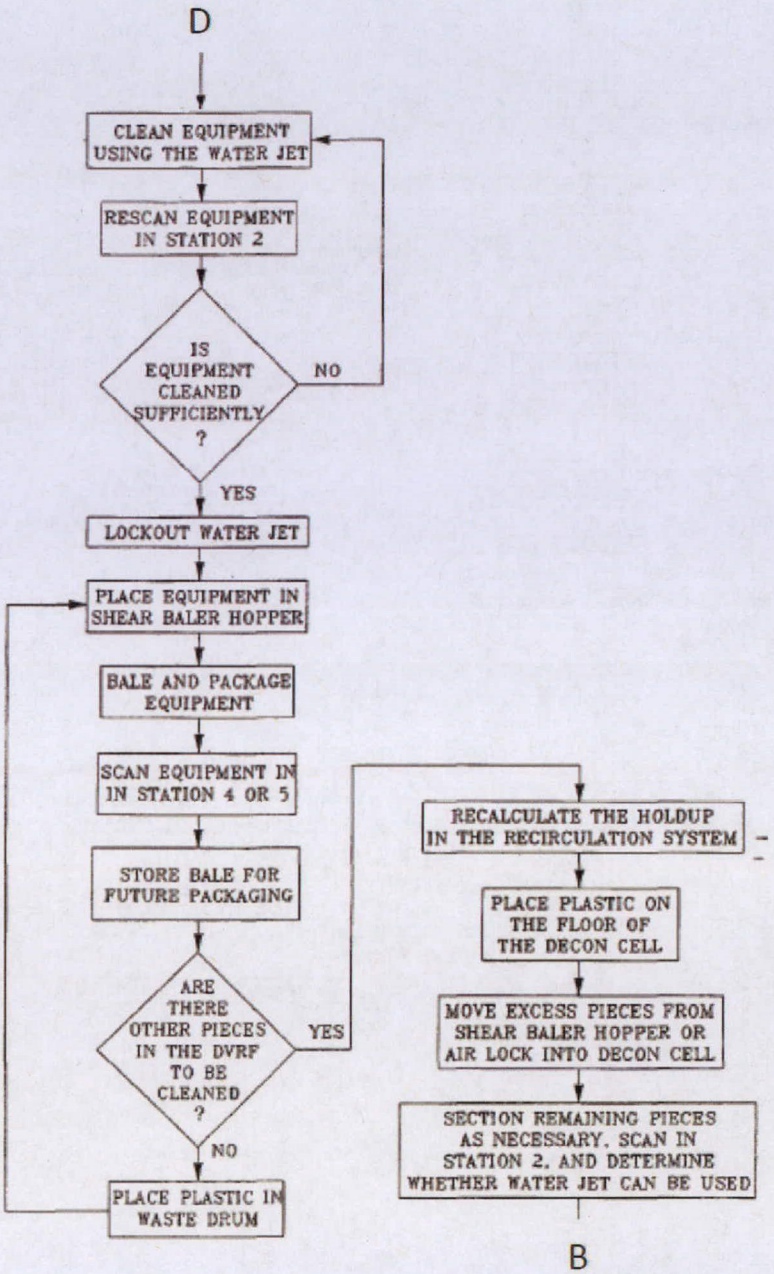


Figure 9. Transuranic Waste Processing Center CH Solid Waste Flow Diagram

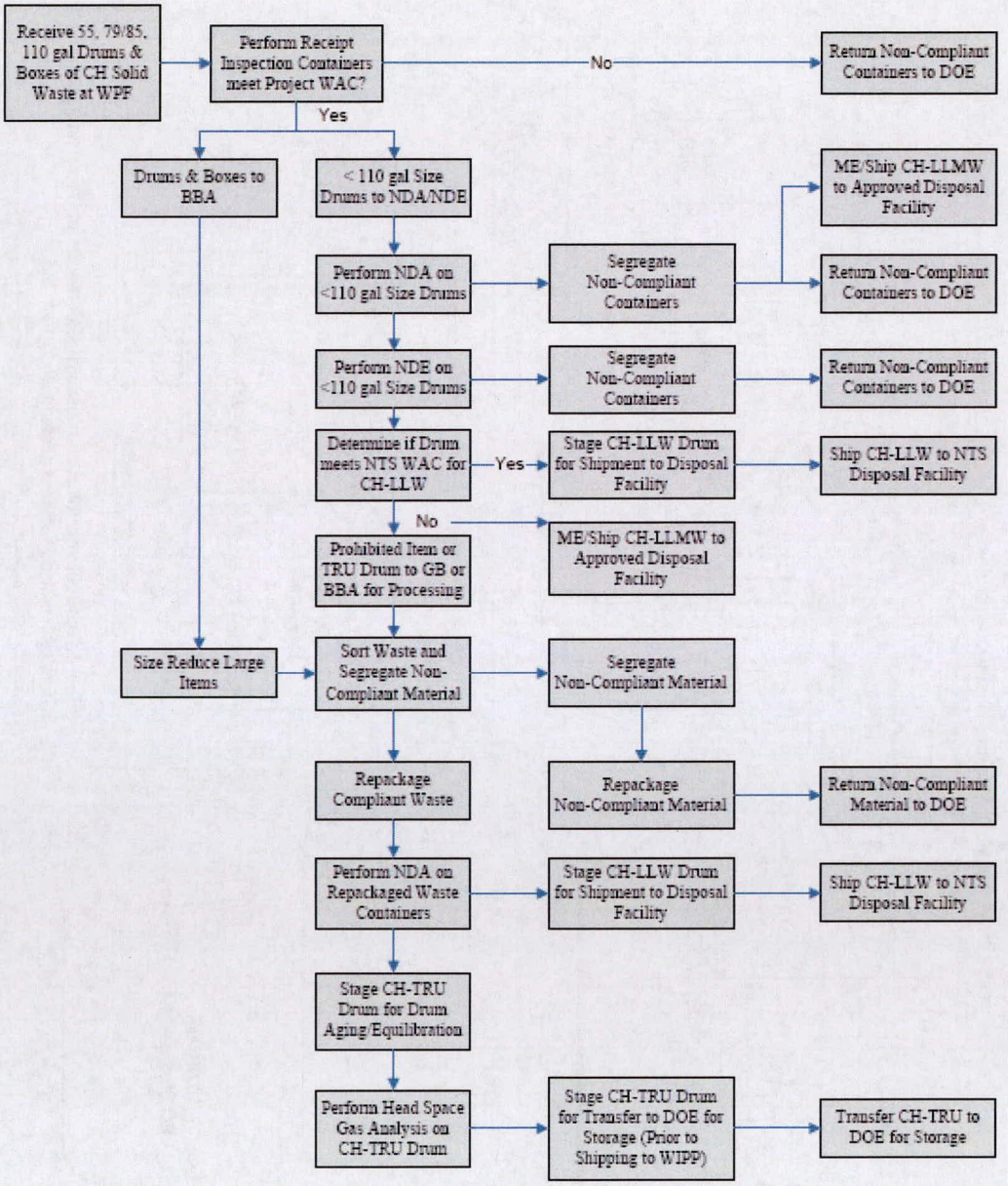
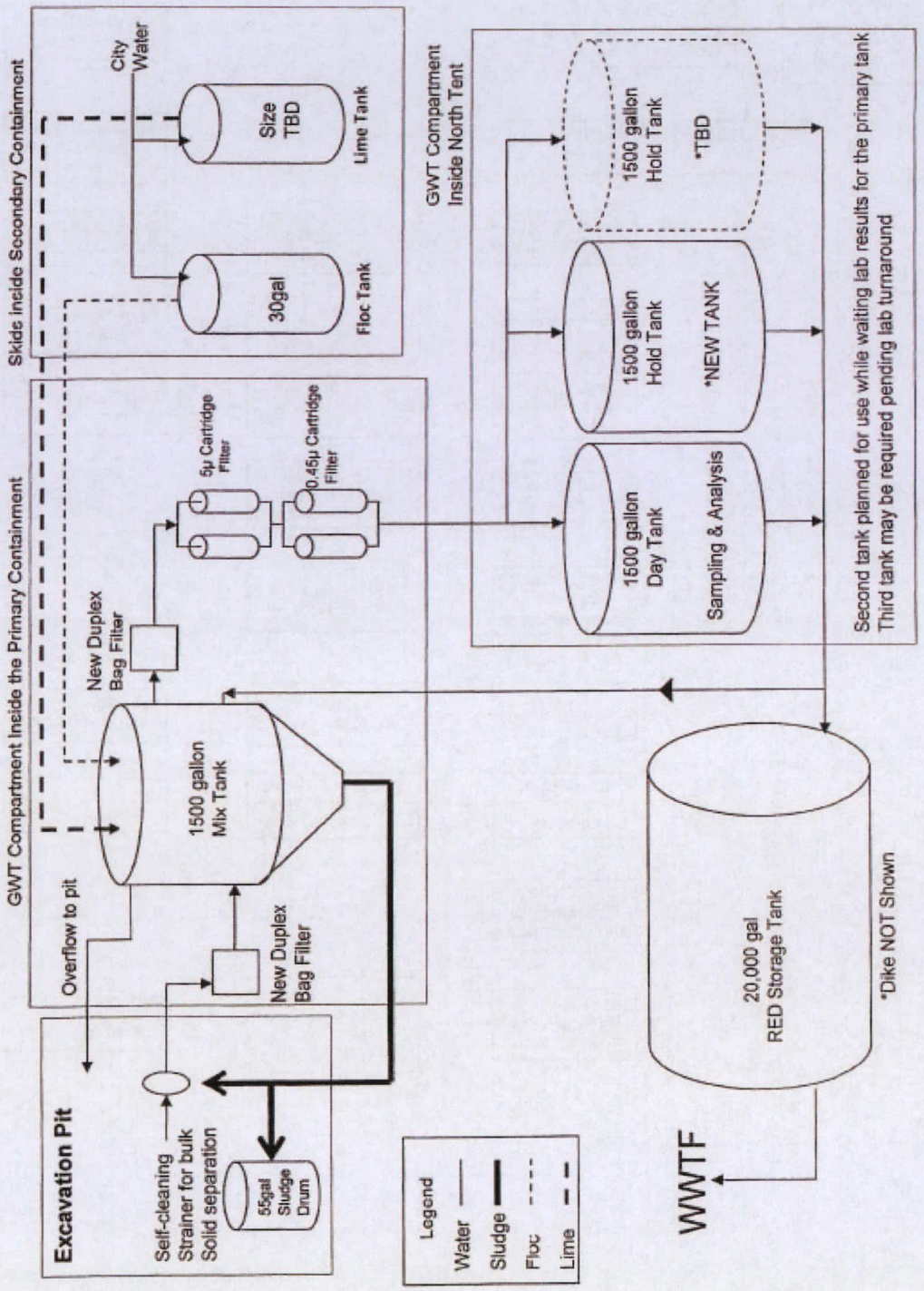


Figure 10. Groundwater Pretreatment System



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CCP-AK-ORNL-002

Central Characterization Program
Acceptable Knowledge Summary Report
For

Oak Ridge National Laboratory
Radiochemical Engineering Development Center
Contact-Handled Transuranic Waste

Waste Stream:
OR-REDC-CH-HET

REVISION 4

February 22, 2016

Mike Ramirez
Printed Name

APPROVED FOR USE

RECORD OF REVISION

Revision Number	Date Approved	Description of Revision
0	12/12/2007	Initial issue.
1	10/30/2008	Revised to incorporate Process Development Laboratory operations waste and contact-handled (CH) waste from the Transuranic Waste Processing Center (TWPC) cask repackaging operations. In addition to numerous minor technical changes, the waste material parameter estimates were included based on Real-Time Radiography (RTR) data, the Resource Conservation Recovery Act (RCRA) characterization was updated, and facility and equipment drawings were incorporated.
2	10/06/2010	Added process and chemical usage information for Rooms 110, 213, and 215. Removed discussion on Global Nuclear Energy Partnership (GNEP) as this activitiy never took place. Updated waste stream volume and time period of generation based on additional drums included in the waste stream. Updated Section 5.4.1 based on waste item descriptions on repack forms. Revised Table 5-4 to include revised distributions for Rooms 111 and 211. Added new Section 5.4.2.7 to discuss revised prevalent radionuclides based on an Acceptable Knowledge (AK) re-evaluation. Revised Table 5-8 to include chemicals used in Transuranic Waste Processing Center (TWPC) hot cell maintenance. Added a paragraph to Section 5.5 describing packaging configuration of drums from repackaging of casks in the TWPC hot cell. Updated Section 8.0 to include new and revised source documents. Made other editorial changes and minor corrections as necessary.

RECORD OF REVISION (Continued)

Revision Number	Date Approved	Description of Revision
3	04/29/2014	Revised to incorporate Nuclear Waste Partnership transition changes. Revised to incorporate changes required by the November 30, 2010 WIPP Permit renewal. Clarified in Section 4.4.2 that the waste is not spent nuclear fuel or high level waste. Added a new paragraph in Section 4.5.1.4. Updated the waste stream volumes to match the Attachment 8 dated 8/6/2010. Added discussions in Section 5.3.3 regarding polychlorinated biphenyl decontamination, the cask processing enclosure, and maintenance operations at the TWPC. Added several waste items in Section 5.4.1. Also split the homogeneous bullet into two bullets for Organic Matrix and Inorganic Matrix. For consistency with other AK reports , Section 5.4.1 was also revised to move shoe covers to Plastic. Added a discussion of historical waste management to Section 5.4.3. Deleted superscripts throughout Table 5-8 and deleted footnote. Added several new nonhazardous chemicals to Table 5-8. Added several new source documents to Section 8.0. Made other editorial changes.

RECORD OF REVISION (Continued)

Revision Number	Date Approved	Description of Revision
4	02/22/2016	Made changes to be consistent with Attachment 12 of CCP-TP-005, *CCP Acceptable Knowledge Documentation.* Revised waste stream description in Section 2.1 to align with Section 5.4.1. Revised description of Transuranic Waste Processing Center (TWPC) in Sections 4.1 and 5.3.3. Added discussion throughout regarding Global Nuclear Energy Partnership (GNEP), plutonium-beryllium source processing, and heat-source plutonium production. Added neptunium target fabrication to Section 4.5.2. Revised Section 4.5.4 to include current process development lab work. Updated waste stream volume and generation date range Sections 4.7.1 and 5.2. Revised waste stream volume projections in Section 5.2. Included alkaline, lithium, and nickel/cadmium batteries in Section 5.4.1. Footnoted Table 5-1, Waste Stream OR-REDC-CH-HET Waste Material Parameters to indicate the presence of inorganic matrix and organic matrix. Included current hot cell and Room 216 distribution in Table 5-2, ORNL Radionuclide Distributions in the REDC Hot Cell and Analytical Laboratory Waste. Added discussion of new process development lab distributions in Section 5.4.2.3. Updated Table 5-8, Waste Stream OR-REDC-CH-HET Material and Chemical Inputs to include additional chemicals. Revised Section 5.4.3.4 to better describe ignitables, corrosives, and reactives. Added new polychlorinated biphenyl (PCB) management to Section 5.4.3.5. Revised Sections 5.4.4 and 5.5 to describe new heat-sealed bag requirements. In Section 5.4.4, added lithium battery discussion, and removed discussion on prohibited PCB liquids as these are now absorbed as PCB remediation waste. In Section 5.5, added discussion of draw-string plastic bags, clarified that the rigid liners not used are plastic and lead, and described the use of pipe overpack containers. Revised drum filter vent discussion in Section 5.5.1. Added new references and source documents to Sections 7.0 and 8.0. Also, added TRUCON code OR 133/233. Made other editorial changes and corrections.

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LIST OF ACRONYMS AND ABBREVIATIONS

AK	Acceptable Knowledge
ATWIR	Annual Transuranic Waste Inventory Report
BAPL	Bettis Atomic Power Laboratory
BBA	Box Breakdown Area
CCP	Central Characterization Program
CETE	Coupled End-to-End
CFR	Code of Federal Regulations
CH	contact-handled
CHMB	Contact Handled Marshalling Building
CHSA	Contact Handled Staging Area
Ci	Curie
CPE	Cask Processing Enclosure
DOD	U. S. Department of Defense
DOE	U. S. Department of Energy
DOT	Department of Transportation
DTC	dose-to-curie
EPA	U. S. Environmental Protection Agency
GNEP	Global Nuclear Energy Partnership
HEPA	High Efficiency Particulate Air
HFIR	High Flux Isotope Reactor
HLW	High-level waste
HWNs	Hazardous Waste Numbers
LAA	Limited Access area
LANL	Los Alamos National Laboratory
LWR	Light Water Reactor
mR/hr	millirems per hour
MSDS	Material Safety Data Sheet
NASA	National Aeronautics and Space Administration
NDA	nondestructive assay
NWPA	*Nuclear Waste Policy Act of 1982*
ORNL	Oak Ridge National Laboratory
PB	Processing Building
PPE	personal protective equipment
PCB	polychlorinated biphenyl
POC	pipe overpack container
ppm	parts-per-million
Pu-Be	plutonium-beryllium
QA	quality assurance
RCRA	Resource Conservation and Recovery Act
RCW	Recirculating Cooling Water
R&D	research and development
RH	remote-handled

LIST OF ACRONYMS AND ABBREVIATIONS (CONTINUED)

RTR	real-time radiography
REDC	Radiochemical Engineering Development Center
SETF	Solvent Extraction Test Facility
SNF	Spent Nuclear Fuel
SRS	Savannah River Site
TA	Transfer Area
TDEC	Tennessee Department of Environment and Conservation
TMI-2	Three Mile Island 2
TRU	Transuranic
TRUCON	TRUPACT-II Content Code
TWPC	Transuranic Waste Processing Center
VE	visual examination
WIPP	Waste Isolation Pilot Plan
WIPP-WAC	*Transuranic Waste Acceptance Criteria for the Waste Isolation Pilot Plant*
WIPP-WAP	*Waste Isolation Pilot Plant Hazardous Waste Facility Permit, Waste Analysis Plan*
WSPS	Waste Stream Profile Sheet

1.0 EXECUTIVE SUMMARY

This Acceptable Knowledge (AK) Summary Report has been prepared for the Central Characterization Program (CCP) for contact-handled (CH) transuranic (TRU) waste generated and managed by the Oak Ridge National Laboratory (ORNL) in Oak Ridge, Tennessee. The waste described in this report was generated by the Radiochemical Engineering Development Center (REDC) located in Building 7920. As necessary, the waste is repackaged in the Processing Building (PB) (Building 7880) at the Transuranic Waste Processing Center (TWPC) located just south of the ORNL main site.

This report was prepared in accordance with CCP-TP-005, *CCP Acceptable Knowledge Documentation* (Reference 1), to implement the AK requirements of the *Waste Isolation Pilot Plant Waste Facility Permit, Waste Analysis Plan* (WIPP-WAP) (Reference 2); and DOE/WIPP-02-3122, *Transuranic Waste Acceptance Criteria for the Waste Isolation Pilot Plan* (WIPP-WAC) (Reference 5). The WIPP-WAP AK requirements are addressed in CCP-PO-001, *CCP Transuranic Waste Characterization Quality Assurance Project Plan* (Reference 3). The WIPP-WAC AK requirements are addressed in CCP-PO-002, *CCP Transuranic Waste Certification Plan* (Reference 8). Additionally, this report provides the AK information required by CCP-PO-003, *CCP Transuranic Authorized Methods for Payload Control* (CCP CH-TRAMPAC) (Reference 15).

The CCP is tasked with certification of TRU waste for transportation to and disposal at the Waste Isolation Pilot Plant (WIPP). This report was developed in accordance with CCP-TP-005 (Reference 1) and describes how AK is collected, reviewed, and managed by the CCP. The CCP is responsible for collection, review, and management of AK documentation in accordance with CCP-TP-005 and reviews and approves this AK Summary Report. CCP maintains responsibility for this AK Summary Report and all CCP-TP-005 generated forms and records as quality assurance (QA) records. In addition, CCP maintains a copy of the "historical source documents" as non-QA records.

Waste stream OR-REDC-CH-HET includes CH-TRU waste originating in the REDC hot cell facility, analytical chemistry laboratories, and process development laboratories. This AK Summary Report includes information relating to the facility's history, mission, process operations and waste identification, characterization, and waste management practices. Information contained in this report was obtained from numerous sources, including facility safety basis documentation, historical document archives, generator and storage facility waste records and documents, and interviews with cognizant personnel.

This AK Summary Report, along with referenced supporting documents, provides a defensible and auditable record of AK for the designated REDC waste streams. The references and AK source documents used to prepare this report are identified by alphanumeric designations (i.e., C001, I001, M001, P001, U001, and DR001) corresponding to a unique Source Document Tracking Number.

2.0 WASTE STREAM IDENTIFICATION SUMMARY

Site Where TRU Waste Was Generated and Stored

Generation and Storage Location:
Oak Ridge National Laboratory
1 Bethel Valley Road
Oak Ridge, TN 37831

Storage Location:
Transuranic Waste Processing Center
100 WIPP Road
Lenoir City, TN 37771

U. S. Environmental Protection Agency (EPA) Identification (ID) TN1890090003

Facility Where TRU Waste Was Generated

This waste was generated in Building 7920 which is part of the REDC located at the ORNL in Oak Ridge, Tennessee. Waste repackaging is performed in the PB (Building 7880) at the TWPC located just south of the ORNL main site.

Facility Mission

Since 1966, the primary mission of Building 7920 has been the fabrication of target rods containing plutonium (before or about 1970), americium and curium, and to separate and purify the heavy actinide isotopes including berkelium (Bk-249), californium (Cf-252), einsteinium (Es-253), and fermium (Fm-257) from the irradiated targets. Between 1979 and 1986, some uranium fuel cycle development work was performed in specially designed equipment in one of the Building 7920 hot cells. Since 1991, Building 7920 has also processed Mark-42 target assemblies. Fundamental research, chemical process development, and analytical chemistry are also performed in Building 7920 (refer to Section 4.3).

Waste Stream

2.1 Waste Stream OR-REDC-CH-HET, Heterogeneous Debris from the Radiological Engineering Development Center

Summary Category Group: S5000

Waste Matrix Code Group: Heterogeneous Debris Waste

Waste Matrix Code: S5400, Heterogeneous Debris

TRUPACT-II Content Code (TRUCON): OR 125/225, OR 133/233,

Maximum Layers of Confinement: Three

Waste Stream Description: Waste Stream OR-REDC-CH-HET is comprised primarily of organic and inorganic debris waste items and generally consists of cellulosics, plastic, rubber, glass, and metal. Some of the specific waste items include (see Table 5-8, Waste Stream OR-REDC-CH-HET Material and Chemical Inputs, for chemical information regarding specific products) (refer to Section 5.4.1):

- Aluminum-based metal items such as brackets, cans, covers, foil, manipulator parts, and sheeting
- Iron-based metal items including containers (e.g., buckets, cans, drums), filter housing, fittings, flanges, hand tools (e.g., files, hammers, knives, pipe cutters, scissors, screwdrivers, tweezers, wrenches), hardware (e.g., bolts, clips, nails, nuts, springs, washers), light bulb bases, pipe nipples, piping, planchets, plates, saw blades, scrap (e.g., angle iron, brackets, chips, discs, shavings, sheeting), sealed radiation sources, spray cans (punctured), steel wool, syringes, and valves
- Other metals such as batteries (e.g., alkaline, lithium, nickel/cadmium), brass (e.g., fittings, scale weights), copper (e.g, tubing, fittings, wire) and lead (e.g., bricks, pigs, plates, sheeting), nickel (e.g., crucibles, targets), and other items such as thermocouples
- Other inorganic materials including unirradiated actinide oxides/pellets, absorbents/adsorbents (e.g., Drierite, silica gel, Solid-a-sorb, vermiculite), asbestos (e.g., insulation), ceramics, charcoal (e.g., filters), concrete, drywall, fiberglass, filter media, fire blankets, floor sweepings, glassware (e.g, bottles), glass thermometers, glass windows, graphite, Hopcalite, insulation (may contain asbestos), leaded glass, light bulbs (incandescent mercury vapor), Met-L-X (fire extinguishing powder), mirrors, paint chips, and tile (may contain asbestos)

- Cellulosic items such as absorbent pads (e.g., WypAll X80 Wipers [cellulose/polypropylene blend]), cardboard, cheesecloth, cloth, cork, cotton, (e.g., gauze, glove liners, rope, swabs), labels, leather gloves, masking tape, mop heads, paper towels, rags, smears, vacuum bags, wipes, and wood (e.g., blocks, handles, rulers)

- Plastic items including bags, caps, containers (e.g., bottles, buckets), fittings, foam (e.g., ear plugs, head bands, knee pads), Herculite (industrial fabric), ion-exchange resin, labware (e.g., funnels, pipettes, vials), latex gloves, manipulator boots, markers, nylon (e.g., belts, rope), plexiglass, poly blocks, scouring pads, sheeting, shoe covers, sleeving, strippable coating (e.g., CC Fix, Stripcoat TLC Free), styrofoam, tape, ties, tips, tubing, Tyvek suits, and valves

- Rubber items such as aspirators, booties, bubble suits and hoods, gaskets, gloves, grommets, hose, o-rings, and stoppers

- Equipment and electrical devices including some containing circuit boards such as balance, electric motors, flashlights, furnaces, heating mantels, hotplates, micrometers, pumps, saws, and vacuum cleaners

- Wood-framed and metal-framed High Efficiency Particulate Air (HEPA) filters and roughing filters (filter media may contain asbestos)

- Organic matrix (e.g, grouted ion-exchange resin, dried epoxy, and liquids absorbed with an organic polymer such as Nochar N965 [refer to Table 5-8 for liquids and absorbents used in the process])

- Inorganic matrix (e.g., liquids absorbed with inorganic absorbents such as Solid-a-sorb or vermiculite, mercury absorbed with HG Absorb [refer to Table 5-8 for liquids and absorbents used in the process])

The two most prevalent radionuclides in this waste stream by activity, based on AK, are Cm-244 and Pu-241 (refer to Section 5.4.2).

The EPA hazardous waste numbers (HWNs) assigned to this waste stream are D004, D005, D006, D007, D008, D009, D010, D011, D019, F002, and F005 (refer to Section 5.4.3).

Prohibited items that may be present in this waste stream include liquids, un-punctured spray cans, internal payload container shielding (e.g., lead pigs), unvented heat-sealed bags with a surface area less than 390 square inches (if the bags are greater than four liters fully expanded), unapproved supplemental sealing devices (i.e., metal hose clamps) for plastic bags, and sealed containers greater than 4 liters (refer to Section 5.4.4).

In Building 7920, CH-TRU waste packages were placed into 55-gallon drums lined with a single poly drum liner bag that may or may not be sealed with tape. U.S. Department of Transportation (DOT) specification 7A Type A 55-gallon drums are used for waste packaging and repackaging at the TWPC. Drums are lined with a cardboard liner inside a filtered 6-mil poly liner bag sealed with tape and a plastic cable tie wrap. Some drums may also contain a polypropylene open top lifting sack fitted with standing lift loops. Waste materials with high surface dose rates or high radioactivity may be repackaged into a 55-gallon drum containing a standard pipe overpack container (POC). The standard POC consists of stainless steel cylindrical pipe with a bolted lid centered in a 55-gallon drum using dunnage consisting of fiberboard and/or plywood spacers within a rigid polyethylene liner (refer to Section 5.5).

Waste stream OR-REDC-CH-HET meets the WIPP-WAP waste stream definition. The waste stream consists of waste materials that have common physical form, that contain similar hazardous constituents, and that are generated from a single process or activity. This waste stream is comprised of TRU-mixed heterogeneous debris waste generated during production of the heavy actinide elements and those operations that support this activity (process development, analytical chemistry, and facility maintenance) (refer to Section 4.7.2).

3.0 ACCEPTABLE KNOWLEDGE DATA AND INFORMATION

TRU waste destined for disposal at the WIPP must be characterized prior to shipment. Development of knowledge of the waste materials and processes that generate and control the waste is required to provide a clear and convincing argument about the characteristics of the waste stream. The AK characterization documented herein complies with the requirements of the WIPP-WAP, WIPP-WAC, and CCP CH-TRAMPAC (References 2, 5, 15).

Waste stream OR-REDC-CH-HET was characterized using AK from a variety of sources, including laboratory logbooks, standard operating procedures, safety analysis reports, program plans, radiological data, waste packaging logs, container forms, inventory reports, and personnel interviews.

The references and AK sources used to prepare this report are listed in Sections 7.0 and 8.0. The AK sources cited throughout this report by alphanumeric designations (i.e, C001, I001, M001, P001, U001, and DR001) correspond to the Source Document Tracking Number using the following convention:

- C – Correspondence
- I – Internal Procedures and Notes
- M – Miscellaneous data
- P – Published documents and Procedures
- U – Unpublished documents
- DR – Discrepancy resolutions

The alphanumeric "I" designator (i.e., I001) was originally assigned to source documents (primarily internal procedures) collected by Weston Solutions, Inc. during the initial AK program conducted at ORNL. These documents have been assigned the same Source Document Tracking Numbers to maintain traceability to earlier reports; however, this designator has not been assigned during subsequent CCP AK collection and review operations.

4.0 REQUIRED PROGRAM INFORMATION

This section provides the mandatory TRU waste management program information required by the WIPP-WAP for waste stream OR-REDC-CH-HET (Reference 2). This section provides a description of the facility and operations associated with the generation of REDC TRU waste. Included is a description of Building 7920, summary of the mission, defense determination, and descriptions of operations associated with the generation of waste stream OR-REDC-CH-HET.

4.1 Facility Location

ORNL is located on the U.S. Department of Energy (DOE) Oak Ridge Reservation within the Bethel and Melton Valleys of Roane County, Tennessee, approximately six miles southwest of the city of Oak Ridge and about 23 miles west of downtown Knoxville. Building 7920 is located in the Melton Valley area of ORNL within the 7900 building area which includes the REDC (Buildings 7920 and 7930) and the High Flux Isotope Reactor (HFIR). Maps showing the locations of ORNL, the REDC, and Building 7920 are presented in Figure 1, Map of Oak Ridge National Laboratory, Figure 2, Map of Radiochemical Engineering Development Center, Transuranic Waste Processing Center, and Solid Waste Storage Areas, and Figure 4, Location of Building 7920 at the end of this report (References P014, P161, and P272).

CH-TRU waste generated in Building 7920 was previously stored or is currently stored in Buildings 7572, 7574, 7823, 7834, 7879, and 7883 which are also located in the Melton Valley area of ORNL (References M110, M244, and P272). A map denoting the locations of the TRU waste storage buildings is shown in Figure 2, Transuranic Waste Processing Center, and Solid Waste Storage Areas (Reference P272).

The TWPC is located within an approximate five-acre area in the Melton Valley area of ORNL. Processing of CH-TRU waste is conducted in the PB at the TWPC. Waste processing is limited to characterization, sorting, segregation, size reduction, and repackaging as required to produce waste suitable for disposal at the WIPP. Waste containers from the ORNL main site are transferred to the TWPC for unloading and storage in the Contact Handled Marshalling Building (CHMB), Contact Handled Staging Area (CHSA), or the Multi-Purpose Building. The PB and TWPC storage areas are shown in Figure 3, Site Layout for the Transuranic Waste Processing Center (References M244, M245, P256, P272, and P432).

4.2 Facility Description

Building 7920 contains a bank of hot cells, laboratories with gloveboxes and caves, and the support services and equipment for these facilities.

The bank of nine hot cells contains equipment for radiochemical processing and target fabrication activities. Each hot cell contains a cubicle which is a confinement enclosure

with a viewing window and master-slave manipulators. Tank pits housing process and storage tanks and piping are located behind and below the cubicles. The area above and behind the hot cell bank is a high-bay area known as the limited access area (LAA). Systems and equipment are located in the LAA for interfacing with the hot cells and for movement of materials and equipment in and out of the hot cells and cubicles and in and out of the building. The transfer area (TA), which is adjacent to Cubicle 9, contains the transfer cubicle, gloveboxes, and other equipment used for the addition and removal of small equipment and materials from the hot cell bank. The chemical make-up area (Room 213) is above the control room on the second floor and contains solution make-up and addition tanks and other service equipment and instrumentation for the hot cell operations. The decontamination glovebox room (Room 216) is on the second floor adjacent to the LAA. This room contains the decontamination glovebox, equipment repair glovebox, and liquid waste transfer boxes. Also on the second floor adjacent to the LAA is the recirculating cooling water (RCW) equipment room (Room 215) where process water is supplied to the closed-loop RCW system for use in cooling process equipment in the hot cells, cubicles, and other building areas (Reference P161).

The laboratory area contains three alpha laboratories (Rooms 109, 209, and 211) with gloveboxes for chemical development work and special projects. Another alpha laboratory (Room 111) contains two small hot cells, called shielded caves, that provide small chemical processing areas with sufficient shielding for final purification of various transuranium elements and for special projects. The laboratory area of the building also contains two analytical chemistry laboratories for radioactive samples (Rooms 108 and 208) and two analytical chemistry laboratories for non-radioactive samples (Rooms 110 and 210) (Reference P161). Rooms 110 and 210 do not generate TRU waste; however, one drum (X10C9313656) has a logsheet that identifies waste items from Rooms 110 and 111. Although Room 110 was supposed to be used for nonradioactive samples, logsheet entries for Room 110 waste in this particular drum show low radiation dose rates indicating this waste is radioactively contaminated. This is the only TRU waste drum from Building 7920 that identifies Room 110 as a generation location (References M005, and M155).

Floor plans for the first and second floors of Building 7920 are shown in Figure 5, Building 7920 First Floor and Figure 6, Building 7920 Second Floor. Figure 7, Building 7920 Hot Cell Bank, is a plan view of the hot cell bank, and Figure 8, Building 7920 Hot Cell Bank – Cubicle Cross Section, shows a cross section of a typical cell in Building 7920. A section through the shielded transfer carrier ("mule") and the transfer area cubicle is illustrated in Figure 9, Shielded Transfer Carrier (Mule) and Transfer Area Cubicle. Figure 10, Decontamination Glovebox, shows the decontamination glovebox. Figure 11, Process Development Laboratory – Room 111 Caves and Transfer Gloveboxes, is a plan view of Room 111 showing the shielded caves and transfer gloveboxes (References P161 and U011).

4.3 Facility Mission

Since 1966, the REDC has been the production, storage, and distribution center for the heavy-element research program of DOE, producing Bk-249, Cf-252, Es-253, and Fm-257. Target rods containing plutonium (before or about 1970), americium, and curium have been remotely fabricated in the Building 7920 hot cells, irradiated in the adjacent HFIR facility, and then processed in the Building 7920 hot cells for the separation and purification of the heavy actinide elements. The purified Bk-249, Es-253, and Fm-257 were packaged for shipment. The Cf-252 was subsequently fabricated into neutron sources (Reference P161).

Between 1979 and 1986, some uranium fuel cycle development work was performed in specially designed equipment in one of the Building 7920 hot cells known as the Solvent Extraction Test Facility (SETF). Solvent extraction flow sheets for processing irradiated fuels from commercial light water reactors and fast breeder reactors were developed and tested, and plutonium recovery schemes were demonstrated. This equipment is no longer used for its original purpose but remains in place and has been adapted and used for other processing and development activities related to the facility mission (References I044, P161, and U011).

Starting in 1991, the REDC processed Mark-42 target assemblies that were irradiated at the Savannah River Site (SRS). High-purity Am-243, Cm-244, and Pu-242 are separated and recovered in the Building 7920 hot cells for shipment to the Los Alamos National Laboratory (LANL). The Mark-42 Processing Program activities include many of the same operations steps that are used in transuranium element target processing which permits dual use of the same hot cell equipment (Reference P161).

From May 2007 until August 2010, the Global Nuclear Energy Partnership (GNEP) Coupled End-to-End (CETE) research, development, and demonstration project was performed. Previously known as the Advance Fuel Cycle Initiative, the mission of the GNEP project includes the development of advanced, proliferation-resistant fuel cycle technologies for application to current operating commercial reactors and next-generation reactors (References C174, C306, M251, M252, P952, and P982).

Starting in May 2011, plutonium-berllium (Pu-Be) neutron sources from Bettis Atomic Power Laboratory (BAPL) are undergoing radiochemical separation of the plutonium and beryllium to reduce the neutron emission to disposable limits. The REDC is one of the few facilities in the United States that can routinely perform radiochemical processing of high-activity materials (Reference P980).

Since 2013, heat-source plutonium (Pu-238) is being produced from irradiation of neptunium targets. The heat-source plutonium will ultimately be used in radioisotope thermoelectric generators to be used in satellites by the National Aeronautics and Space Administration (NASA) and for national security applications by the U.S. Department of Defense (DOD) (References C174, M265, M267, P981, and U132).

The four alpha laboratories are used for transuranium element product finishing operations and for fundamental research and chemical process development. Small-scale processes and operations similar in type or identical to those done in the hot cell may be performed in the gloveboxes and shielded caves. The analytical chemistry laboratories provide support for the REDC production, research, and development programs as well as environmental and waste management at ORNL. Two hot cell cubicles have been used to perform analyses that must be done without dilution on highly irradiated samples, and to make dilutions for subsequent analyses in the glovebox laboratories (References P161, and U011).

4.4 Defense Waste, Spent Nuclear Fuel, and High-Level Waste

4.4.1 Defense Waste Assessment

The WIPP-WAC (Reference 5) requires generator sites to use AK to determine if the TRU waste streams to be disposed at the WIPP meet the definition of TRU "defense" waste. Based on guidance from the DOE, a TRU waste is eligible for disposal at the WIPP if it has been generated in whole or part by one of the atomic energy defense activities listed in section 10101(3) of the *Nuclear Waste Policy Act of 1982* (NWPA) (References 5, 6, and 7).

The HFIR target campaigns that ultimately produce Cf-252 that is fabricated into neutron sources have been ongoing since inception of the REDC operations in 1966 and continue to generate waste today (References P161, U038, and U039). The Cf-252 neutron sources have many applications, several of which are related to defense activities. These include neutron radiography of weapons components and military aircraft, neutron counting of fissile material and transuranic waste, land mine detection, and in-field inspection and verification of chemical weapons and high explosives (References M023, P258, P281, and U038).

The SETF operations, consisting of nine campaigns conducted from 1979 to 1986, were research and development (R&D) activities supporting the DOE Breeder Reactor Program. The Mark-42 Processing Program, which began in 1991, supported the recovery of Pu-242, Am-243, and Cm-244 for use in other DOE and DOD programs. The HFIR target campaigns ran concurrently with the SETF and Mark-42 campaigns. Due to the similarity of contamination in the REDC hot cells from prior HFIR target campaigns, the waste generated from SETF and Mark-42 campaigns were not segregated from waste generated by the HFIR target campaigns (Reference I044).

GNEP seeks to bring about a significant, wide-scale use of nuclear energy and take actions now that would allow that vision to be achieved while decreasing the risk of nuclear weapons proliferation and effectively addressing the challenge of nuclear waste disposal. GNEP would advance the nonproliferation and national security interests of the U.S. by reinforcing U.S. nonproliferation policies, reducing the spread of enrichment

and reprocessing technologies abroad, and reducing or eliminating excess civilian plutonium stocks that have accumulated (Reference P952).

Pu-Be neutron sources from BAPL are undergoing radiochemical separation at REDC. BAPL is an R&D facility located in Pennsylvania which focuses mainly on the design and development of nuclear power for the U. S. Navy. The work at BAPL is part of the Naval Nuclear Propulsion Program which is a joint U. S. Navy-DOE program responsible for the research, design, construction, operation and maintenance of U.S. nuclear-powered warships (References 18 and P980).

Both the DOD and NASA have indicated they will have continuing requirements for Pu-238. In addition to radioisotope thermoelectric generators to be used in satellites by NASA, radioisotope power systems, which depend on Pu-238, are critical to DOD applications. In particular, these power systems have become more essential to vital defense programs since the terrorist attacks of September 11, 2001 (Reference P981).

These operations can be categorized into several of the defense activities listed in the NWPA, but the activity that best describes them is "defense nuclear materials production" because the Cf-252 was produced for neutron sources used for defense applications. The HFIR target campaigns that ultimately produce Cf-252 have been ongoing since inception of the REDC operations in 1966 and continue to generate waste today (References 5, 6, and 7).

4.4.2 Spent Nuclear Fuel and High-Level Waste Assessment

The Waste Isolation Pilot Plant Land Withdrawal Act (LWA) bans the disposal of spent nuclear fuel (SNF) and high-level waste (HLW), as defined by the NWPA, at WIPP. According to the NWPA, "spent nuclear fuel" is defined as "fuel that has been withdrawn from a nuclear reactor following irradiation, the constituent elements of which have not been separated by reprocessing." "HLW" is defined by the NWPA as "the highly radioactive material resulting from the reprocessing of SNF, including liquid waste produced directly in reprocessing and any solid material derived from such liquid waste that contains fission products in sufficient concentrations, and other highly radioactive material that the Commission, consistent with existing law, determines by rule requires permanent isolation." These requirements are also defined in DOE M 435.1-1, *Radioactive Waste Management Manual* which is the mandatory requirements manual for implementing DOE Order 435.1, *Radioactive Waste Management* (References 6, 7, I022, and I023).

The SNF and HLW requirements were reviewed by the ORNL operating contractor (Betchel Jacobs Company, LLC) and DOE-Oak Ridge Operations (References P569, U038, and U647). Based on this evaluation, it was determined that the waste generated from the processing of HFIR and Mark-42 targets processed in the REDC are not SNF. For this reason, the processing of these targets cannot result in the generation of HLW, because the wastes are not primarily or solely materials resulting from a first-cycle extraction system (or equivalent) used in reprocessing of SNF.

Additionally, the Light Water Reactor (LWR) and fast reactor test specimens processed during the SETF program involved the small-scale processing of these materials for development and recovery technologies, and not HLW from a reprocessing facility responsible for the separation of fissile elements and/or transuranium elements contained in SNF for the sole purpose of recovering desired materials. For these reasons, HLW requirements in DOE M 435.1-1 are not applicable to REDC, and these requirements were not included in the ORNL Implementation Plan for DOE Order 435.1 (Reference P569). Therefore, waste stream OR-REDC-CH-HET does not contain SNF or HLW (Reference DR009).

4.5 Description of Waste Generating Operations

The following sections provide an overview of the Building 7920 operations including chemical processing, target fabrication, analytical laboratory, and process development.

4.5.1 Chemical Processing

4.5.1.1 Transuranium Element Target Processing

Transuranium element target processing includes the dissolution of irradiated targets, the separation of the transuranium elements from miscellaneous impurities and fission products, and the separation of the transuranium elements from each other. This is accomplished using a variety of solvent extraction, precipitation, and ion-exchange process steps. The processing steps are arranged to separate the transplutonium elements as a group from fission products and gross impurities before partitioning and purifying the individual elements. Recovered americium and curium are purified and converted to oxide for remote fabrication of new targets. The general sequence of steps used to process transuranium element targets in the hot cells is shown in Figure 12, Transuranium Element Target Processing (References P161, P279, and U011).

After the berkelium, einsteinium, and fermium have been separated from most of the curium and californium in the hot cell cubicles, they are transferred to shielded caves or gloveboxes and purified further from radioactive and nonradioactive contaminants by additional cycles of ion-exchange. The purified products are then packaged for shipment. The californium is sorbed on cation-exchange resin and calcined to convert the californium to the oxysulfate for future use (References P279 and U011).

4.5.1.2 Solvent Extraction Test Facility

The SETF was in operation from 1979 to 1986 and involved the recovery of uranium and plutonium from irradiated commercial power reactor fuels. This was achieved by dissolution of irradiated fuel assembly sections, solvent extraction, ion-exchange, precipitation, and calcination process steps. The sequence of operating steps in the SETF campaigns is illustrated in Figure13, Solvent Extraction Test Facility Operations (Reference U011).

4.5.1.3 Mark-42 Processing

The Mark-42 program began operation in 1991 and includes the dissolution of irradiated segments (Mark 42 assemblies cut to 20-inch lengths); the separation of the transuranium elements from miscellaneous impurities, activation products, and fission products; and the separation of the transuranium elements from each other. This is accomplished using a variety of solvent extraction, precipitation, and ion-exchange process steps. The general sequence of steps used to process Mark-42 segments in the hot cells is shown in Figure14, Mark-42 Processing (Reference P161).

4.5.1.4 Global Nuclear Energy Partnership Coupled End-to-End Demonstration Project

The GNEP CETE Project began in May 2007 and was completed by August 2010. The spent fuel used during this project originated from the Dresden Nuclear Power Plant and the North Anna Nuclear Power Plant. The demonstration steps included voloxidation (heat treatment to release volatiles and declad the fuel), fuel dissolution, filtration, feed adjustment, four separate solvent extractions, and conversion of the solution to powder suitable for fuel pellet fabrication. The sequence of operating steps is illustrated in Figure 15, Coupled End-to-End Demonstration Of Advanced Fuel Cycles (References C174, C176, M251, M252, M253, M254, P952, P982, P983, P984, P985, and U568).

4.5.1.5 Processing of Plutonium-Beryllium Sources

BAPL was the custodian of sixteen Pu-238/Beryllium neutron sources. The sources were transferred to Building 7920 for radiochemical separation of the plutonium and beryllium to reduce the neutron emission to disposable limits. Processing of these sources in the hot cell began in May 2011. A hydraulic cutter is used to cut through and depressurize the source capsule, and the source capsule is cut open using a tubing cutter or a water-cooled rotary saw. It is expected that the material will be a metallic solid alloy or a pressed oxide powder; however, because the physical form is not positively known, processing plans have been prepared for both options. The processing of the sources includes dissolution, ion exchange, precipitation, filtration, and solution neutralization and solidification. Catalyzed electrolytic plutonium oxide dissolution (CEPOD) is also used if necessary. A process flow diagram is provided in Figure 16, Neutron Source Processing (References C174, P980, P1436, and P1437).

4.5.1.6 Pu-238 Supply Project

The purpose of the Pu-238 Supply Project is to develop and implement the technology necessary to reestablish the domestic capability to produce heat-source plutonium (Pu-238) in the United States using existing DOE infrastructure. Before Pu-238 can be produced, a series of irradiation and processing tests are being conducted to develop and validate the designs, procedures, process flow sheets, and specifications required during the production process. Production of Pu-238 involves several steps. The first is the fabrication of neptunium targets which is described in Section 4.5.2 followed by irradiation in the HFIR. About ten percent of the neptunium is converted to plutonium

during an irradiation while the remaining neptunium is reclaimed and recycled into targets. After irradiation of the targets, chemical processing of the targets is performed in the hot cells. Processing involves decladding, actinide and fission product dissolution, solvent extraction to separate the plutonium from the neptunium, purification of the plutonium by anion exchange, precipitation of the plutonium product, and oxygen-16 exchange. The plutonium product will be transported to LANL for eventual processing and encapsulation. A process flow diagram is provided in Figure 17, Pu-238 Supply Project (References C174, M270, and P1440).

4.5.1.7 Special Projects

The operations described above represent the primary chemical processing activities in the REDC; however, special separation projects were periodically performed in cells reserved for this purpose. These special separations (e.g., separating Cf-249 from decaying Bk-249, or purifying a sample for shipment to another site) were performed in laboratory-type equipment especially installed in the cell for each job. These procedures generally involved a small fraction of the amount of material handled in the main line (Reference P279).

One special project of note was research in support of the Three Mile Island 2 (TMI-2) Nuclear Power Station accident in late-1979. Tests were performed in the early-1980s in the REDC hot cell and laboratories for the development of chemical processes to decontaminate the high-activity-level water remaining in the TMI-2 reactor containment building and the reactor coolant system as well as ion-exchange resins from the TMI-2 submerged demineralizer system. The waste generated from this project was commingled with other REDC waste in two casks (X10CSATN02077 and X10CSATN02229). Because this waste was generated over 30 years ago, the radioactivity in the contaminated water is almost entirely Cs-137. And since the TMI-2 waste was commingled with other REDC waste, the activity contribution of the TMI-2 to this waste should be negligible (References M241, P098, P1427, and P1428).

4.5.2 Target Fabrication

Actinide oxide is incorporated into aluminum target rods for irradiation in the HFIR. The operations and inspections include pellet forming, weighing, measurement, calorimetry, thermal cleaning, target loading, welding, x-ray examination, helium leak tests, dimensional inspections, hydrostatic compression of the aluminum tube around the pellets, coolant shroud attachment, decontamination, and carrier loading for transfer to the HFIR. Generally, pellet forming operations with loose powders are performed in Cubicle 3, target tubes are assembled in Cubicle 2, and final assembly and inspection operations with sealed target rods are performed in Cubicle 1. Pellet and target tube fabrication and target assembly operations are illustrated in Figure 18, Pellet Fabrication, Figure 19, Target Tube Fabrication, and Figure 20, Target Assembly (Reference P279).

Neptunium targets are fabricated for irradiation in the HFIR for the production of heat-source plutonium which is primarily Pu-238. In gloveboxes in Room 109, neptunium nitrate is converted to oxide powder. The neptunium oxide is blended with aluminum powder and pressed into pellets. The pellets are heat treated and transferred to Building 7930 for loading into target capsules (References M005, M258, M265, and M267).

4.5.3 Analytical Laboratory

Cubicle 8 is used exclusively to collect and store samples from the hot cells, to perform analyses that must be made without dilutions on highly radioactive samples, and to make dilutions for analyses in the glovebox analytical chemistry laboratories. Cubicle 9 has also been used for analytical chemistry purposes. Sample preparation and analyses include pipetting, titration, dissolution, filtration, solvent extraction, and centrifugation. The operations performed inside the analytical laboratory gloveboxes are essentially the same as the analytical operations performed in the hot cells except that much smaller equipment and significantly smaller amounts of materials are used in the gloveboxes (References P161, P1441, P1442, and U011).

4.5.4 Process Development

The process development laboratories (Rooms 109, 209, 111, and 211) have been used for fundamental studies and process development of alpha-active materials. Much of the early work was concerned with the development of sol-gel processes and with process development for the isolation and purification of various alpha-active materials. Other fundamental research and process development work has included reprocessing of reactor fuels, conversion of recovered uranium and plutonium to forms suitable for use in fabrication of recycle reactor fuel elements, and development of waste separation processes. Other work has included radioisotope power source development, including fabrication of neptunium targets and production of heat-source plutonium. The chemical processes (e.g., voloxidation, dissolution, solvent extraction, ion-exchange, precipitation, filtration, centrifugation, calcination, and modified direct denitration) and physical processes (e.g., pellet pressing, encapsulation, welding) performed in the gloveboxes are much the same as the hot cells but with smaller equipment and smaller amounts of material (References M255, M256, M257, M258, M259, M260, M261, M262, M263, M264, M265, M267, P161, P279, and U011).

4.5.5 Maintenance Operations

The processing equipment in the cell bank was designed and built so that it can be maintained or replaced within the hot cell cubicles using remote techniques. Occasionally, large equipment items and equipment racks require maintenance that cannot be performed in the cubicles. These items are moved to the decontamination glovebox for cleaning and repair. As illustrated by Figure 6, Building 7920 Second Floor, Figure 8, and Figure 10, the decontamination glovebox is wheeled onto the top of the cell bank where the equipment is introduced into the glovebox from the equipment

transfer case (References P279 and U011). For maintenance operations in a tank pit, work may be performed directly in the pit in supplied air or may be done remotely from the top of the pit using long-handled tools (Reference U011).

The shielded caves and gloveboxes are also decontaminated and maintained. Alpha laboratory gloveboxes were constructed with standard carbon steel or stainless steel and have windows that are typically a polycarbonate type of plastic. The primary confinement in the shielded caves is provided by an internal alpha box with metal walls and floor and a viewing window similar to those of the alpha gloveboxes; however, it is surrounded by a concrete shield and operations are performed with manipulators. Gloveboxes and cave liners require removal and disposal on occasion. Loose items are removed before taking the box off line. Radioactive contamination on internal surfaces may be decontaminated using mild acid or alcohol, or may be fixed (e.g., spray painted) for contamination control (References M074, P161, and U403).

4.6 Waste Identification and Categorization

4.6.1 Physical Form

Waste generators completed a UCN-2109 form in which a waste description was recorded. The waste description indicates that wastes were not segregated by material type (e.g., plastic, metal, glass). Included with the UCN-2109 is a waste container log sheet which indicates that individual packages within a drum contain a mixture of material types. The predecessor to the UCN-2109 form was the UCN-2822. The UCN-2822 includes waste type codes and provides a brief waste description as well as the volume of combustible waste. The waste type codes include (Reference M005):

- BW – Biological Waste
- CE – Contaminated Equipment
- DD – Decontamination Debris
- DS – Dry Solids
- SS – Solidified Sludge
- NC – Not Classified

DS is the only waste type code assigned to the drums in this waste stream. The brief waste description on the UCN-2822 also shows that wastes were not segregated by material type. Included with the UCN-2822 is a data log sheet which provides a brief waste description and the volume percent combustible for each inner package. The volume of combustible waste recorded on the UCN-2822, and the volume percent combustible recorded on the log sheets indicate a wide range of combustible wastes (Reference M005). Burnable and non-burnable wastes, or combustible and non-combustible wastes, were to be segregated at one time, but review of the above forms and log sheets does not support this segregation (Reference U011).

4.6.2 Chemical Form

In approximately 1987, Building 7920 implemented a program for the identification and segregation of hazardous waste regulated by the Resource Conservation and Recovery Act (RCRA), Title 40 of the Code of Federal Regulations (CFR) Part 261, *Identification and Listing of Hazardous Waste* (References 11, P240, P263). Data log sheets for packaging TRU waste identified the presence or absence of hazardous materials. The UCN-2109 form also identified whether or not waste was RCRA-regulated (Reference M005).

Even with implementation of a RCRA program in 1987, the earliest generation date of waste assigned EPA hazardous waste numbers was in 1994. The EPA hazardous waste numbers assigned by generators are D003 (reactive lithium battery; see Section 5.4.4), D006 (cadmium), D008 (lead), D009 (mercury), and D011 (silver) based on the presence of batteries (nickel/cadmium and lithium), lead, incandescent light bulbs, mercury vapor light bulbs, and equipment containing solder with lead or silver. In addition, toxicity characteristic metal EPA HWNs including D004 (arsenic), D005 (barium), D007 (chromium), and D010 (selenium) were assigned by the generator to solid sample items that were disposed. There are several drums generated before 1987 and some after 1987 where the generator indicated no hazardous materials were present but have now been identified as suspect RCRA waste. These drums were identified as such based on a 2003 Tennessee Department of Environment and Conservation (TDEC) inspection in which TDEC pointed out numerous instances of waste in storage that had not been properly characterized. Much of the waste was suspected of containing incidental hazardous waste items and presumed to be RCRA hazardous. TDEC indicated this waste was to be managed onsite as RCRA hazardous waste "Pending Analysis for Hazardous Waste" (References M005, M110, and M244). In addition to the EPA HWNs listed above, several other RCRA hazardous materials have been identified in this waste stream (see Section 5.4.3).

Containers in this waste stream have been historically managed by the generator individually or in small populations for RCRA characterization purposes. Containers included in waste stream OR-REDC-CH-HET were not managed as a single hazardous or nonhazardous waste stream. Therefore, this waste stream does not consist of containers historically segregated by the generator into separate mixed and non-mixed waste streams based on the hazardous constituent identified for specific containers (References M110 and M244).

4.6.3 Radiological Form

Prior to 1999, each waste package was monitored for beta-gamma radiation and neutron radiation, and then the surface dose rate measurements were converted to activity values based on a defined conversion factor. This activity was assigned to the dominant nuclide in the package, typically Cm-244 and/or Cf-252 (References M005 and P240).

Beginning in 1999, an isotopic distribution was developed that included 30 different nuclides. This distribution was created using a combination of knowledge of the materials processed in the hot cells, smear sampling and analysis data, and MicroShield modeling. Similarly, distributions were created for waste generated in process development labs 109, 111, 209, and 211. Activity values were then assigned to each nuclide in the drum based on the surface dose rate of the inner package or drum (References M005, U041, U045, U129, U130, U131, U132, and U133). In December 2004, ORNL updated the radiological characterization of the waste generated before 1999 using the isotopic distribution and original surface dose rate measurement of the drum (References I044 and M005).

4.7 TRU Waste Management

4.7.1 Types and Quantity of TRU Waste Generated

The waste stream described by this report is characterized as TRU mixed waste under the RCRA. The specific containers in this waste stream are provided in the *Waste Containers List* which is maintained as a quality record as required by procedure CCP-TP-005 (Reference 1). The number of containers in the waste stream are provided in Table 4-1, Waste Stream Volumes.

Table 4-1. Waste Stream Volumes

Waste Stream	Number of 55-Gallon Drums*	Volume (m^3)
OR-REDC-CH-HET	4,064	845.3

*A few of the 55-gallon drums are currently stored in 79-gallon and 85-gallon overpacks.

4.7.2 Correlation of Waste Streams Generated from the Same Building and Process

The WIPP-WAP defines a waste stream as waste materials that have common physical form, that contain similar hazardous constituents, and that are generated from a single process or activity (Reference 5). One CH-TRU waste stream has been delineated for the Building 7920 waste according to this definition. DOE/TRU-14-3425, *Annual Transuranic Waste Inventory Report (ATWIR)* – 2014, identifies waste stream OR-REDC-CH-HET for this waste (Reference 9). The basis and rationale for delineating this waste stream is as follows:

- The activity in Building 7920 that generated this waste stream is production of the heavy actinide elements Bk-249, Cf-252, Es-253, and Fm-257, and those operations that support this activity (process development, analytical chemistry, and facility maintenance) (refer to Sections 4.5 and 5.3).

- The waste stream has common physical form in that it is comprised of a variety of organic and inorganic debris waste items. Wastes were not segregated by material type, and the volume percent combustible in each drum is highly variable (refer to Sections 4.6.1 and 5.4.1).

- The waste generator has characterized TRU waste from Building 7920 as either mixed waste regulated under RCRA, non-mixed waste (i.e., no RCRA-hazardous constituents), or suspect RCRA. Because of inaccuracies in waste characterization, the entire population of CH-TRU debris waste from Building 7920 is characterized as RCRA-hazardous waste under 40 CFR Part 261 (refer to Sections 4.6.2 and 5.4.3) (Reference 11).

The corresponding REDC remote-handled (RH) debris waste stream is described in CCP-AK-ORNL-500, *Central Characterization Program Acceptable Knowledge Summary Report For Oak Ridge National Laboratory Radiochemical Engineering Development Center Remote-Handled Transuranic Waste, Waste Stream: OR-REDC-RH-HET* (Reference 13).

4.8 Waste Certification Procedures

In the CCP under which the subject waste stream will be certified for shipment to WIPP, CCP-TP-005 (Reference 1), directs compilation of AK. CCP certifies TRU waste under the program described in CCP-PO-002.

5.0 REQUIRED WASTE STREAM INFORMATION: OR-REDC-CH-HET

This section presents the mandatory TRU waste stream specific information required by the WIPP-WAP for Waste Stream OR-REDC-CH-HET (Reference 2). The area of generation, waste stream volume, period of generation, prohibited items, waste packaging, and the physical, chemical, and radiological composition of the waste stream are described.

5.1 Area and Building of Generation

Waste stream OR-REDC-CH-HET originated in Building 7920. Areas within the building generating waste included in this waste stream are the TA (Room 118), the LAA (Room 120), the chemical make-up area (Room 213), the RCW equipment room (Room 215), and the decontamination glovebox room (Room 216) which are associated with the hot cell cubicle operations and waste transfers. Waste from the Building 7920 radioactive analytical chemistry laboratories (Rooms 108 and 208) and process development laboratories (Rooms 111, 211,109, and 209) is also included (References DR003, M005, M110, M244, and P161). In addition, one drum of TRU waste has a logsheet that identifies waste items from Room 111 as well as the nonradioactive analytical chemistry laboratory in Room 110 (References M005 and M155).

There are approximately 20 drums generated in Building 7920, but the specific room or area within the building is not identified. It is assumed this waste was generated in one of the areas identified in the previous paragraph (References M005 and M155).

5.2 Waste Stream Volume and Period of Generation

Waste stream OR-REDC-CH-HET includes 4,064 drums. Some of the waste was originally packaged in boxes or casks and has been repackaged into drums. The waste was originally generated from April 1972 to August 2014 (References M005 and M244). Repackaging of this waste stream at the TWPC to remove prohibited items began in December 2006 (Reference M073). The specific container numbers are provided in the Waste Containers List which is maintained as a quality record as required by procedure CCP-TP-005 (Reference 1).

Based on the volume of CH-TRU waste generated in Building 7920 over the last five years, it is assumed that this waste stream will be generated indefinitely at the rate of approximately 15 to 35 drums per year (Reference M244). Over a period of 28 years from 1978 to 2006, 22 boxes of CH-TRU waste were generated. Repackaging of these boxes produced 438 drums which is included in the above total (refer to the Waste Containers List). The generation rate of CH-TRU boxes is difficult to predict because it is not routine so it will be assumed CH-TRU drums from future box generation and repackaging will be generated at the rate of approximately 16 drums per year (438/28 = 15.6).

In addition to the 55-gallon drums of CH waste to be generated by ongoing operations in the REDC, many of the RH casks to be repackaged in the TWPC are expected to contain significant amounts of CH debris. There are 32 casks of RH-TRU waste from Building 7920 generated through 2014 that have not been repackaged at the TWPC. Based on the 226 casks that have already been repackaged, and the 2,044 daughter drums produced from repackaging of these casks included in the waste stream (refer to the AK Tracking Spreadsheet), an average of 9 drums of CH-TRU waste were produced from each cask (2,044/226 = 9.0). Therefore, approximately 288 drums of CH-TRU waste will be generated from repackaging these remaining 32 casks (32 x 9 = 288). In addition, in the last several years, between one and two casks per year have been generated. Assuming Building 7920 continues to generate two casks per year, and 9 CH-TRU drums are generated per cask, CH-TRU waste from cask repackaging will be generated at the rate of approximately 18 drums per year (References M244 and M245).

5.3 Waste Generating Activities

5.3.1 Hot Cell Cubicle Operations

Wastes are generated in the Building 7920 hot cell cubicles during the process operations and maintenance activities described in Section 4.5. The waste items are removed from the cubicles through connecting gloveboxes in the TA, LAA, decontamination glovebox room, or the equipment transfer case which attaches to the top of the hot cells (Reference P161).

In the hot cell cubicles, waste items are typically placed into small containers (e.g., plastic or metal buckets) and monitored for radiation. Depending on the type of waste and radiation level, the item is acid leached, water rinsed, and air dried before placement into the bucket. Some waste items are also cut up to fit into the buckets. To reduce the volume of waste, a low-temperature furnace in Cubicle 9 is used to melt small plastic items such as polyethylene bottles to consolidate them in a metal bucket. The cans of melted plastic may contain miscellaneous glass, metal, and cellulosic items in the plastic matrix or placed on top of the block added to the metal can after the melt process. Spent cation-exchange resins are calcined, leached with nitric acid, collected in a polyethylene bottle and melted in the furnace, then placed into a metal bucket. Spent anion-exchange resins are de-nitrated, rinsed, and fixed in a concrete grout mixture in a metal bucket. Unusable empty metal buckets are compacted in a crusher (References DR601, P161, P986, and P987).

The TA cubicle is connected to the cell bank by means of the intercell conveyor and to a standard glovebox by means of a rotary shielding block ("lazy susan"). Waste buckets are transferred from the hot cell cubicles through the inter-cell conveyor system (see Figures 7 and 8) to Cubicle 9 where the waste is characterized to assure that the waste forms in each bucket meet the waste acceptance criteria (e.g., no free liquid, compressed gases, etc.). The buckets are transferred by conveyor to the TA cubicle and monitored for beta-gamma and neutron radiation. Wastes are transferred out of the

TA cubicle via the lazy susan to the lazy susan glovebox or via the plastic bucket seal-out station and/or shielded transfer carrier ("mule"). Waste items are also transferred out of the lazy susan and standard gloveboxes using bag ports (see Figures 7 and 9). Buckets with low radiation levels are disposed in a drum for CH waste (References C311 and P161).

Several CH-TRU waste drums also originated from the LAA, the chemical make-up room (Room 213), the RCW equipment room (Room 215), and the decontamination glovebox room (Room 216) (References M005, P161, and U011).

- The LAA consists of a high bay area above and behind the hot cell bank. A pit below the floor of the LAA contains liquid waste collection tanks. A pipe tunnel below the floor of the LAA houses the vessel off-gas iodine retention system and scrubber pumps. HEPA filters for these systems system are also in pits below the LAA floor. LAA waste generating activities include general maintenance of equipment and systems, including tank and filter pits.

- The chemical make-up area contains service, supply, and control systems for the processes and equipment in the hot cells which include a standard chemical fume hood; solution makeup tanks; pressurized solution addition tanks; pumps, heaters, coolers, and accessories associated with several circulating water heat transfer systems; supply systems for in-cell tank accessories such as air spargers and steam jets; and the pressure differential pressure transmitters and air purge systems associated with liquid level, density, and pressure measurement instrumentation.

- Cooling and heating water within the hot cell bank is supplied by the RCW system. The RCW surge tank and pumps are located above the cell bank so that all lines inside the cells are under hydrostatic pressure at all times. Equipment cooled by the system includes all cell pit tanks, evaporator condensers, cubicle equipment heating and cooling loops, and other miscellaneous equipment.

- The decontamination glovebox room includes the decontamination and equipment repair gloveboxes used for maintenance, repair, and decontamination of hot cell equipment. Materials are transferred in and out of the gloveboxes using bagging ports. Large pieces of equipment are transferred in and out of the glovebox through the roof door using the equipment transfer case. Liquid wastes are transferred out of the gloveboxes through liquid waste lines.

Prior to 1976, all Building 7920 TRU solid wastes (CH and RH) were packaged into concrete casks. In March 1976, REDC packaged CH-TRU waste into a couple of 55-gallon drums as a trial run. Formal segregation of CH-TRU waste into drums began in late 1977. Most of the low dose rate waste generated prior to late 1977 was placed into concrete casks called "floor casks." The majority of the floor casks have 4.5-inch thick side walls because the lower activity materials typically required much less shielding than the 6- and 12-inch thick casks. This waste will contain significant amounts of lower dose rate waste (paper, glassware, personal protective equipment

(PPE), wipes, glovebox equipment, and HEPA filters) generated from the laboratory and support areas. The amount of these lower dose rate materials would have decreased significantly in RH casks loaded after the late 1977 time frame, which will contain greater volumes of waste from hot cell activities (References C600, M005, M110, P125, U038, and U501).

In addition to the concrete casks with 4.5-inch thick walls, waste from REDC operations has been loaded in casks providing additional shielding with 6- and 12-inch thick concrete walls. The external dimension for all three of these cylindrical casks is approximately 7.5 feet tall by 4.5 feet in diameter. The waste materials loaded into the casks are packaged in a variety of configurations utilizing the following packaging materials (References P125, P161, and U011):

- 1-gallon metal paint cans (some lead-lined)
- Polyethylene bags, liners, bottles, and draw-string bags
- Cardboard ice cream cartons
- 3.4-gallon polyethylene plastic buckets (sealed and unsealed)
- 2-gallon Bain-Marie polyethylene plastic containers
- 5-gallon metal lard cans
- 10-gallon rigid-cardboard fiber drum

Larger equipment, such as processing racks (2x3x6 feet), charcoal filter beds (24x24x24 inches), and Hopcalite organic filters traps (6x24x24 inches) are directly loaded into the casks. Processing racks used in the hot cells are replaced due to malfunctions, wear, change in process requirements, or upgrades. Typically, the racks have been packaged in several layers of polyethylene bags then placed directly into the concrete cask. Lead bricks have been used to balance the processing racks and will be found in the disposal casks (References C302 and P125).

Concrete casks of TRU waste are loaded in a solid waste loading station located in the LAA. Waste to be loaded into the cask from the transfer area is generally transferred to the loading station in sealed plastic buckets and unsealed plastic bags. Larger equipment is transferred to the loading station via the equipment transfer case for disposal. The incoming empty cask is prepared by placing a polyvinyl chloride plastic bag liner (0.01 inch) into the cask. Plywood expanders are placed inside the bag (a circular disk at the bottom and a circular ring at the top), and the bag is then secured to one of the waste station roof plugs. Two roof plugs are available for loading the waste packages. One is used when the waste is to be transferred using the equipment transfer case, the other is used when plastic buckets are loaded. After the cask is loaded, the plastic bag is collapsed and an electrically-driven turntable inside the waste station rotates the cask, twisting the top of the bag. The bag is then cut and sealed with a hot-knife sealer. The cask lid is then installed, sealed with roofing pitch, and secured using two steel tapes, attached around the outside of the cask. The cask lid may also be attached to the cask body by three anchor bolts aligned with holes drilled in the cask lid (References C302 and U011).

5.3.2 Glovebox Laboratory Operations

Wastes are generated in the Building 7920 glovebox laboratories during the process operations described in Section 4.5. Glovebox operations are performed using neoprene glovebox gloves which are periodically replaced. Glovebox equipment items and components require periodic decontamination, inspection, maintenance, and repair. Glovebox equipment may also require replacement, and glovebox interiors require regular decontamination. Glovebox waste transfers are accomplished using a plastic bag transfer technique through 6-inch and 12-inch diameter access ports. Some gloveboxes are also equipped with sphincter-valve devises in which materials are placed in cardboard ice-cream cartons (References P161 and U011).

5.3.3 Transuranic Waste Processing Center

As necessary, drums containing CH-TRU waste in storage are moved individually to the TWPC PB (Building 7880) glovebox airlock. Once inside the glovebox airlock, the drum is moved to the drum tipper where the lid is removed and the drum contents are emptied into sorting trays. The waste articles are manually sorted and segregated via glove ports to remove prohibited items and repackaged at load-out stations along the glovebox. Boxes or drums containing CH-TRU waste are moved into the box breakdown area (BBA) in the PB via airlocks. The waste is inspected, removed, size-reduced, and sorted manually within the BBA, and either packaged into new drums directly from the BBA or processed through the glovebox as described above. Prohibited items identified during repackaging of drums and boxes are removed from the waste stream or are remediated (References P251, P254, P255, P256, P588, P592, P597, P598, P599, P1116, and P1433).

The TWPC approach to processing RH-TRU solid wastes is similar to that used for CH solid wastes except that RH wastes are processed in the TWPC Hot Cell. RH concrete casks may contain RH-TRU, CH-TRU, and/or low-level waste. Waste suspected to be CH-TRU waste, is placed into a CH drum that is attached to the bottom of the TWPC Hot Cell, and no further visual examination (VE) of the item is required in the TWPC Hot Cell. Occasionally, waste initially repackaged in the TWPC Hot Cell as RH-TRU waste has a surface dose rate less than 200 millirems per hour (mR/hr) and the waste must be transferred to a different 55-gallon drum designated for CH waste that is positioned in the CH drum out station below the hot cell sorting table. The TWPC Cask Processing Enclosure (CPE) in the PB is designed as a processing area where concrete casks determined to contain CH waste can be processed in a manner similar to that of the BBA as described above. Prohibited items are not packaged into CH drums during cask repackaging. Secondary waste generated during repackaging operations in the TWPC Hot Cell and CPE may include liquids (refer to Table 5-8 for liquids used in the process) mixed with absorbent (approved absorbents listed below), mercury amalgamated with HG Absorb (spill cleanup kit containing zinc and citric acid), PPE, and other miscellaneous process materials and equipment generated during routine operations as well as maintenance operations (References 13, C160, M022, P125,

P254, P432, P583, P584, P590, P591, P598, P599, P1116, P1433, U038, U046, U125, and U126).

Glovebox, BBA, and CPE interiors are periodically wiped down using nonhazardous cleaners (e.g., rags dampened with Simple Green or Swiffer wet wipes). If polychlorinated biphenyls (PCBs) are encountered during waste processing, Big Orange-E (nonhazardous solvent containing d-Limonene) is used if necessary for decontamination. If inner containers are identified with liquids, they are absorbed with Nochar N965. Suspect PCB liquids are absorbed with the Nochar N910 Petro Bond. Environmental media (e.g., groundwater, moisture in soil) is abosorbed with Quik-Solid. Secondary wastes created during waste processing, including rubber glovebox gloves, tools, rags, and absorbed liquids, may be placed into TRU waste drums along with other waste from the waste stream being repackaged (References C173, M022, P252, P253, P254, P432, P582, P589, P590, P591, P592, P598, P1116, and P1433).

A diagram for processing CH-TRU waste at the TWPC is shown in Figure 21, Transuranic Waste Processing Center CH Solid Waste Flow Diagram. A diagram for processing RH-TRU waste at the TWPC is shown in Figure 22, Transuranic Waste Processing Center RH Solid Waste Flow Diagram (References P254, P432, and U046).

5.4 Type of Wastes Generated

This section describes the waste materials based on process inputs and outputs, waste matrix code assignment, waste material parameter weight estimates, radionuclide contaminants, and hazardous waste determinations for Waste Stream OR-REDC-CH-HET.

5.4.1 Materials Related to Physical Form

Waste Stream OR-REDC-CH-HET is comprised primarily of organic and inorganic debris waste items. Waste descriptions are provided on UCN-2109 and UCN-2822 forms and waste container log sheets. The waste includes cellulosics, plastic, rubber, metal, and glass (Reference M005). Typical waste items present in this waste stream are as follows (see Table 5-8 for chemical information regarding specific products) (References M005, M022, M072, M073, M074, M278, and P161):

- Aluminum-based metal items such as brackets, cans, covers, foil, manipulator parts, and sheeting
- Iron-based metal items including containers (e.g., buckets, cans, drums), filter housing, fittings, flanges, hand tools (e.g., files, hammers, knives, pipe cutters, scissors, screwdrivers, tweezers, wrenches), hardware (e.g., bolts, clips, nails, nuts, springs, washers), light bulb bases, pipe nipples, piping, planchets, plates, saw blades, scrap (e.g., angle iron, brackets, chips, discs, shavings, sheeting), sealed radiation sources, spray cans (punctured), steel wool, syringes, and valves

- Other metals such as batteries, (e.g., alkaline, lithium, nickel/cadmium), brass (e.g, fittings, scale weights), copper (e.g., tubing, fittings, wire) and lead (e.g., bricks, pigs, plates, sheeting), nickel (e.g., crucibles, targets), and other items such as thermocouples

- Other inorganic materials including unirradiated actinide oxides/pellets, absorbents/adsorbents (e.g., Drierite, silica gel, Solid-a-sorb, vermiculite), asbestos (e.g., insulation), ceramics, charcoal (e.g., filters), concrete, drywall, fiberglass, filter media, fire blankets, floor sweepings, glassware (e.g., bottles), glass thermometers, glass windows, graphite, Hopcalite, insulation (may contain asbestos), leaded glass, light bulbs (incandescent and mercury vapor), Met-L-X (fire extinguishing powder), mirrors, paint chips, and tile (may contain asbestos)

- Cellulosic items such as absorbent pads (e.g., WypAll X80 Wipers [cellulose/polypropylene blend]), cardboard, cheesecloth, cloth, cork, cotton, (e.g., gauze, glove liners, rope, swabs), labels, leather gloves, masking tape, mop heads, paper towels, rags, smears, vacuum bags, wipes, and wood (e.g., blocks, handles, rulers)

- Plastic items including bags, caps, containers (e.g., bottles, buckets), fittings, foam (e.g., ear plugs, head bands, knee pads), Herculite, (industrial fabric), ion-exchange resin, labware (e.g., funnels, pipettes, vials), latex gloves, manipulator boots, markers, nylon (e.g., belts, rope), plexiglass, poly blocks, scouring pads, sheeting, shoe covers, sleeving, strippable coating (e.g., CC Fix, Stripcoat TLC Free), styrofoam, tape, ties, tips, tubing, Tyvek suits, and valves

- Rubber items such as aspirators, booties, bubble suits and hoods, gaskets, gloves, grommets, hose, o-rings, and stoppers

- Equipment and electrical devices including some containing circuit boards such as balances, electric motors, flashlights, furnaces, heating mantels, hotplates, micrometers, pumps, saws, and vacuum cleaners

- Wood-framed and metal-framed HEPA filters and roughing filters (filter media may contain asbestos)

- Organic matrix (e.g., grouted ion-exchange resin, dried epoxy, and liquids absorbed with an organic polymer such as Nochar N965 [refer to Table 5-8 for liquids and absorbents used in the process])

- Inorganic matrix (e.g., liquids absorbed with an inorganic absorbent such as Solid-a-sorb or vermiculite, mercury absorbed with HG Absorb [refer to Table 5-8 for liquids and absorbents used in the process])

5.4.1.1 Waste Matrix Code

As shown in the previous section, Waste Stream OR-REDC-CH-HET is comprised primarily of numerous organic and inorganic debris waste items and generally consists of cellulosics (e.g., paper, cloth), plastic, rubber, glass, and metal. The waste matrix code was assigned to this waste stream based on the evaluation of AK information relating to the physical form of the waste recorded on UCN-2109 and UCN-2822 forms and container log sheets. The UCN-2109 records an estimate of the volume percent combustible which ranges from 0 to 100 with an average of about 62 percent for the drums in this waste stream. The UCN-2822 provides total volume and combustible volume in cubic feet. The calculated volume percent combustible ranges from 0 to 100 with an average of about 54 percent. The container log sheets provide an estimate of the volume percent combustible for each package in the drum. An average was calculated for each drum and an overall average for all of the drums with container log sheets. The calculated volume percent combustible ranges from 33 to 98 with an average of about 65 percent. A few drums may contain grouted ion-exchange resin, which is considered a homogeneous waste, but individual drums are expected to contain less than 50 percent, by volume, of this waste (Reference M005).

Due to the high degree of variability in the amount of combustible waste, Waste Matrix Code S5400, Heterogeneous Debris, is applied to this waste stream. The definition of this Waste Matrix Code is provided in the DOE/LLW-217, *DOE Waste Treatability Group Guidance* (Reference 4). This category includes waste that is at least 50 percent, by volume, debris materials that do not meet the criteria for assignment as either an Inorganic Debris (S5100) or Organic Debris (S5300). This evaluation is documented in the Waste Material Parameter Memorandum included with CCP-TP-005, Attachment 6 (Reference 1).

5.4.1.2 Waste Material Parameters

The waste material parameter weight estimates for Waste Stream OR-REDC-CH-HET were derived from CCP real-time radiography (RTR) data. RTR data were evaluated for 255 containers from Waste Stream OR-REDC-CH-HET generated from November 1977 to May 2005. It is assumed that the data for these 255 containers are representative of Waste Stream OR-REDC-CH-HET as a whole. One minor exception is that RTR had not identified any drums with organic matrix or inorganic matrix; however, as described above and footnoted in Table 5-1, Waste Stream OR-REDC-CH-HET Waste Material Parameters these waste material parameters are expected in small amounts. An analysis of the RTR data was performed, the results of which are presented in Table 5-1. This evaluation is documented in the Waste Material Parameter Memorandum included with CCP-TP-005, Attachment 6 (Reference 1).

Table 5-1. Waste Stream OR-REDC-CH-HET Waste Material Parameters

Waste Material Parameter	Weight Percent	Weight Percent Range
Iron-based Metal/Alloy	33.0%	0.0% – 98.8%
Aluminum-based Metal/Alloy	1.6%	0.0% – 21.2%
Other Metals/Alloy	0.9%	0.0% – 55.9%
Other Inorganic Materials	12.8%	0.0% – 80.3%
Cellulosics	4.9%	0.0% – 70.5%
Rubber	1.3%	0.0% – 52.2%
Plastics (waste materials)	45.5%	0.0% – 100%
Organic Matrix[1]	0%	0.0%
Inorganic Matrix[2]	0%	0.0%
Soil	<0.1%	0.0% – 3.4%

1. Although RTR did not identify organic matrix in this subset of drums, small amounts of organic matrix are expected to be present in the form of grouted ion-exchange resin, dried epoxy, and liquids absorbed with an organic polymer such as Nochar N910 or Nochar N965.
2. Although RTR did not identify inorganic matrix in this subset of drums, small amounts of inorganic matrix are expected to be present in the form of liquids absorbed with an inorganic absorbent such as Solid-a-sorb or vermiculite.

5.4.2 Radiological Characterization

As described in Section 4.0, the primary mission of the REDC Building 7920 facility is the recovery and purification of transplutonium elements from targets irradiated in the HFIR and Mark-42 targets from SRS. Transuranium element processing in Building 7920 includes dissolutions of irradiated targets, separation of the transuranium elements from miscellaneous impurities and fission products, and separation of the transuranium elements from each other (Reference P093). Based on the mainstream operation process, the REDC isotopic waste profile is expected to contain a similar type of actinides, fission, and activation products present in irradiated targets processed at REDC (Reference P093). Fundamental studies and process development of alpha-active materials conducted in the 7920 laboratories have also produced waste with unique radiological characteristics (References P093, P161, and U011).

Prior to 1999, each waste package was monitored for beta-gamma radiation and neutron radiation, and then the surface dose rate measurements were converted to activity values based on a defined conversion factor. This activity was assigned to the dominant nuclide in the package, typically Cm-244 and/or Cf-252 (References M005, M110, and P240). TRU radionuclides of plutonium and americium are known to be present in the waste, but records prepared by waste generators for waste generated prior to 1999 did not include reported values for these (Reference P058).

Beginning in 1999, an isotopic distribution was developed that included 30 different nuclides. This distribution was created using a combination of knowledge of the materials processed in the hot cells, smear sampling and analysis data, and MicroShield modeling. This isotopic distribution was applied by ORNL to waste

associated with the hot cell operations (i.e., waste from the TA, LAA, and Decon Room) as well as the analytical labs (Rooms 108 and 208) which were assumed to be dominated by hot cell material. Similarly, isotopic distributions were created for waste generated in process development labs 109, 111, and 211. Activity values were then assigned to each nuclide in the drum based on the surface dose rate of the inner package or drum. The radiological distribution has not been decay corrected for these values (References M005, M110, M244, U041, U045, U106, U107, U108, and U110). In December 2004, ORNL updated the radiological characterization of the waste generated before 1999 using the hot cell isotopic distribution and original surface dose rate measurement of the drum. The re-evaluation of pre-1999 waste included only hot cell and anlalytical laboratory CH waste packaged in drums and did not include RH waste, waste stored in casks, or waste generated from the process development labs (References I044, M005, M110, and M244).

5.4.2.1 REDC Hot Cell and Analytical Laboratories Radiological Characterization

On April 1, 1999, ORNL finalized and began implementation of the Waste Stream Profile Sheet (WSPS) 7920-HCAL-002 for the radiological characterization of waste generated at Building 7920 hot cell and analytical laboratories. The following information is a summary of the data flow used in development of the WSPS (Reference U045).

1. Twenty-eight in cell smears samples were collected and analyzed. The analysis reported 19 radionuclides; however, no beta nuclides were analyzed as part of the original analysis. The average data for the 19 nuclides was used for the development of the WSPS.

2. Two additional smears were taken and analyzed for the beta constituents, as well as selected alpha and gamma emitting nuclides. The Cm-244 values were used to scale the activities for the beta emitters to be included with the data from the 28 smears samples.

3. The Pu-241 content was estimated based on the concentration of Pu-241 in the MK-42 targets which had the highest Pu-241 content. The plutonium isotopic distribution was analyzed on the MK-42 targets by mass spectrometry.

4. Data for the curium and californium isotopic distribution was taken from the Master of Science Thesis, *"Characterization of ORNL Transuranic Waste from the Measurement of Fission and Activation Products"* prepared by L. K. Nguyen, May, 1997 (Reference P093). The curium and californium contributions were calculated using the Cm-244 and the Cf-252 reported in item number one above.

The isotopic distribution developed by WSPS 7920-HCAL-002 and the measured dose rates associated with waste packages were used to calculate and report the radiological content of hot cell and analytical laboratory waste included in Waste Stream OR-REDC-CH-HET between 1999 and 2002. Since 2002, ORNL has modified and

revised the radiological characterization of REDC hot cell and analytical laboratory CH waste several times. These modifications are documented in revisions of *WSPS 7920-HCAL-007* (Reference U041), Calculation *WSPS REDC-001* Revisions 0 through 9 (Reference U111), and *REDC Debris* Revisions 0 through 3 (Reference U127). Revisions have included, but are not limited to: new and revised Microshield calculations to add new waste package geometries and waste densities used in the dose-to-curie (DTC) calculations; utilization of isotopic data from hot cell process organic waste solutions to scale plutonium isotopes; and inclusion of four additional smear samples, which identified very low concentrations of uranium isotopes in the isotopic mix. A new distribution, 7920-216 *Glovebox Debris*, was developed in 2012 for the Room 216 decontamination glovebox debris which is associated with the hot cell operations. This calculation is based on the analytical results from smear samples collected from the Room 216 transfer glovebox and the *REDC Debris* hot cell radiological distribution which is representative of the debris generated in the Room 216 decontamination glovebox. Table 5-2, ORNL Radionuclide Distributions in the REDC Hot Cell and Analytical Laboratory Waste, shows the change in activity percentage of radionuclides from 1999 to 2013 as well as the activity percentage of radionluclides for the Room 216 decontamination debris (References M005, M073, U041, U045, U111, U127, and U128).

Table 5-2. ORNL Radionuclide Distributions in the REDC Hot Cell and Analytical Laboratory Waste

Nuclide	Average Activity Percentage 1999	Average Activity Percentage 2008	Average Activity Percentage 2013	Room 216 Activity Percentage
Co-60	0.017%	0.017%	0.064%	0.064%
Sr-89	N/A	N/A	0.110%	0.109%
Sr-90	15.516%	15.523%	11.710%	11.689%
Zr-95	0.226%	0.226%	0.170%	0.170%
Nb-95	0.214%	N/A	N/A	N/A
Ru-103	0.417%	0.418%	0.315%	0.314%
Ru-106	1.887%	1.888%	1.424%	1.421%
Ag-110m	0.031%	0.032%	0.024%	0.024%
Sb-125	0.111%	0.111%	0.083%	0.083%
Cs-134	0.160%	0.160%	0.121%	0.121%
Cs-137	2.098%	2.099%	3.951%	3.930%
Ce-141	0.888%	0.888%	0.670%	0.669%
Ce-144	0.286%	0.286%	0.216%	0.216%
Eu-152	0.061%	0.061%	0.046%	0.046%
Eu-154	0.303%	0.303%	1.733%	1.718%
Eu-155	0.219%	0.219%	1.116%	1.106%
Np-237	N/A	N/A	0.026%	0.025%
Np-239	0.080%	0.080%	N/A	N/A
Pu-238	0.424%	0.424%	0.872%	0.867%
Pu-239	0.207%	0.008%	0.493%	0.491%
Pu-240	N/A	0.364%	0.493%	0.491%
Pu-241	5.057%	5.059%	6.830%	6.794%
Pu-242	0.005%	0.005%	0.029%	0.029%
Pu-244	N/A	N/A	0.000%	0.025%
Am-241	0.564%	0.564%	10.557%	10.463%
Am-243	0.040%	0.040%	0.848%	0.841%
Cm-242	0.309%	0.309%	0.636%	0.632%
Cm-244	69.349%	69.383%	56.147%	55.845%
Cm-245	N/A	N/A	0.158%	0.156%
Cm-246	0.484%	0.484%	0.365%	0.365%
Cm-247	N/A	N/A	0.000%	0.271%
Cm-248	0.001%	0.001%	0.002%	0.237%
Cf-249	0.001%	0.001%	0.000%	0.000%
Cf-250	0.026%	0.026%	0.020%	0.020%
Cf-251	0.001%	0.000%	0.000%	0.000%
Cf-252	1.019%	1.020%	0.769%	0.768%
U-234	N/A	0.000%	0.000%	0.000%
U-235	N/A	0.000%	0.000%	0.000%
U-236	N/A	0.000%	0.000%	0.000%
U-238	N/A	0.000%	0.000%	0.000%
Total	**100.00%**	**100.00%**	**100.00%**	**100.00%**

5.4.2.2 Re-characterization of REDC Hot Cell and Analytical Laboratory Waste Generated Prior to 1999

During 2005, the radiological characterization of 7920 hot cell and analytical laboratory waste generated from 1977 until 1999 was re-evaluated based on REDC historical operational information, combined with characterization approach described in Section 5.4.2.1. The re-evaluation included only hot cell and analytical laboratory CH waste packaged in drums and did not include RH waste, waste stored in casks, or waste generated from the process development labs. The re-evaluation was used to reconcile, modify, and update the characterization of 645 CH-TRU waste drums contained in the Waste Information Tracking System. The re-characterization approach evaluated and developed radiological characteristics for three distinct timeframes based primarily on processing campaign timelines (References I044, M005, and M110):

- Timeframe 1: Prior to September 1, 1979; and between April 1, 1986 and April 30, 1991
- Timeframe 2: Between September 1, 1979 and March 31, 1986,
- Timeframe 3: Between May 1, 1991 and January 14, 1999.

The re-evaluation updated the radiological characterization of the target group of drums using one of the three isotopic distributions and original surface dose rate measurement of the drum. It should be noted that exact dates bounding the three timeframes above are not identical to the dates established by CCP in CCP-AK-ORNL-501, *Central Characterization Program Remote-Handled Transuranic Radiological Characterization Technical Report For Remote-Handled Transuranic Waste From Oak Ridge National Laboratory Radiochemical Engineering Development Center Waste Stream: OR-REDC-RH-HET* (Reference 14). Although it is unclear how ORNL established these dates, CCP established campaign dates based on the facility's collection of the first process samples associated with each campaign, and the dates used by CCP are expected to better represent the contamination expected on waste items generated during these timeframes. Table 5-3, Relative Activity of ORNL Radionuclide Distribution in REDC Hot Cell and Analytical Laboratory Waste for Three Timeframes Prior to 1999, shows the relative activity percentage of radionuclides identified by ORNL for the isotopic mix of the three timeframes (References I044, M005, and M110).

Table 5-3. Relative Activity of ORNL Radionuclide Distribution in REDC Hot Cell and Analytical Laboratory Waste for Three Timeframes Prior to 1999

Nuclide	Average Activity Percentage Timeframe 1	Average Activity Percentage Timeframe 2	Average Activity Percentage Timeframe 3
Co-60	N/A	N/A	0.017%
Sr-90	N/A	N/A	15.523%
Nb-95	5.22%	4.95%	N/A
Zr-95	5.38%	5.10%	0.226%
Ru-103	12.85%	12.17%	0.418%
Ru-106	23.61%	22.38%	1.888%
Ag-110m	0.42%	0.40%	0.031%
Sb-125	N/A	N/A	0.111%
Cs-134	1.25%	1.18%	0.160%
Cs-137	2.13%	2.02%	2.099%
Ce-141	7.95%	7.53%	0.888%
Ce-144	18.63%	17.65%	0.286%
Eu-152	N/A	0.00%	0.061%
Eu-154	N/A	0.00%	0.303%
Eu-155	N/A	0.00%	0.219%
Np-239	N/A	0.00%	0.080%
Pu-238	0.17%	0.16%	0.424%
Pu-239	0.01%	0.22%	0.008%
Pu-240	0.37%	0.35%	0.364%
Pu-241	0.44%	5.44%	5.059%
Pu-242	<0.001%	<0.001%	0.005%
Am-241	0.57%	0.54%	0.564%
Am-243	0.04%	0.04%	0.040%
Cm-242	0.07%	0.07%	0.309%
Cm-244	19.65%	18.62%	69.383%
Cm-246	0.14%	0.13%	0.484%
Cm-248	<0.001%	<0.001%	0.001%
Cf-249	<0.001%	0.00%	0.001%
Cf-250	0.03%	0.03%	0.026%
Cf-251	<0.001%	<0.001%	0.001%
Cf-252	1.07%	1.01%	1.020%
Total	**100.00%**	**100.00%**	**100.00%**

5.4.2.3 ORNL Radiological Characterization of 7920 Process Development Laboratories Waste

During 1999, ORNL developed radionuclide distributions and DTC calculations for waste generated from process development laboratory operations conducted in REDC rooms 109, 111, and 211. The approach generally mirrored the approach described in Section 5.4.2.1 above, except each WSPS included only one swipe sample or one composite sample collected within the area of interest. The distribution for Room 109

includes three revisions, dated 1999, 2002, and 2003, Rooms 111 and 211 include two revisions dated 1999 and 2005, and each revision was based on collection and radiochemical analysis of a single new swipe sample or single composite sample. The relative activity percentage of the radionuclides identified by ORNL for the process development laboratories is presented in Table 5-4, Radionuclides and Relative Activities for REDC Process Development Laboratories (References U105, U106, U107, U108, and U110).

ORNL did not re-evaluate process development laboratory waste generated prior to 1999. Consequently, waste container documentation and site database information for containers generated prior to 1999 in the process development laboratories included only the one or two predominant radionuclides determined by the generator at the time of generation, as described in Section 5.4.2 above. Additionally, source documents provide conflicting information regarding the appropriate distribution for waste originating from Room 209. Source document U110 asserts that the radioactive material used in Room 209 is primarily associated with 7920 cell bank, and the calculation WSPS REDC-001 (i.e., hot cell and analytical laboratory distribution), are typically used for waste disposal. Source document U110 also states that the distribution for the laboratories in Room 211 is used for Room 209 waste. However, no TRU waste had been generated from Room 209 since 1999, and therefore neither distribution has been assigned to any waste containers identified as originating from Room 209 (References M005, M110, U106, U109, and U110).

Two new distributions were developed for Room 109 in 2014; *REDC Np-237 Pellet Production* is applicable to three gloveboxes in Room 109, and 7920-109 *CETE Glovebox Debris* is applicable to three other gloveboxes in Room 109. Room 209 began generating waste again in 2008 under distributor *REDC Glovebox Smear Data Evaluation*, and then under distribution 7920-209 *Glovebox Debris* which was revised in 2011 and 2012. A new distribution, 7920-211 *Glovebox Debris*, was developed for Room 211 in 2009 and was revised in 2011 and 2012. Unlike the previous distributions for these rooms which were developed for each room as a whole, these new calculations include distributions for each glovebox. As the operations in these gloveboxes change, the distributions are revised (References U129, U130, U131, U132, and U133).

Table 5-4. Radionuclides and Relative Activities for REDC Process Development Laboratories

Nuclide	Average Activity Percentage Room 109 7/15/1999	Average Activity Percentage Room 109 10/9/2002	Average Activity Percentage Room 109 2/17/2003	Average Activity Percentage Room 111 7/1/1999	Average Activity Percentage Room 111 5/10/2005	Average Activity Percentage Room 211 7/15/1999	Average Activity Percentage Room 211 4/26/2005
Co-60	N/A	0.009%	0.024%	11.42%	N/A	N/A	N/A
Sr-90	N/A	1.108%	0.095%	N/A	N/A	N/A	N/A
Sb-125	N/A	0.725%	0.622%	N/A	N/A	N/A	N/A
Cs-137	N/A	0.072%	0.081%	N/A	N/A	N/A	N/A
Eu-154	N/A	0.011%	N/A	N/A	N/A	N/A	N/A
Eu-155	N/A	0.056%	N/A	N/A	N/A	N/A	N/A
Pa-233	2.26%	N/A	N/A	N/A	N/A	N/A	N/A
Np-237	8.46%	0.188%	N/A	N/A	N/A	N/A	N/A
Np-239	11.99%	0.111%	7.713%	0.98%	0.91%	N/A	N/A
Pu-238	6.63%	N/A	N/A	N/A	N/A	N/A	N/A
Pu-239	21.15%	0.051%	0.024%	N/A	N/A	N/A	N/A
Pu-240	N/A	2.421%	0.115%	N/A	N/A	N/A	N/A
Am-241	9.87%	0.546%	1.894%	0.48%	0.45%	0.0024%	0.0023%
Am-243	12.69%	0.128%	4.465%	0.79%	0.74%	0.0023%	0.0022%
Cm242	0.11%	N/A	N/A	0.14%	17.10%	0.0230%	2.95%
Cm-244	23.97%	93.766%	75.775%	30.94%	28.98%	5.1589%	5.01%
Cm-245	N/A	N/A	N/A	0.00%	0.001%	0.0129%	0.0125%
Cm-246	0.17%	0.655%	0.529%	0.22%	0.20%	0.0129%	0.0125%
Cm-248	0.11%	0.002%	0.001%	0.14%	0.001%	0.0228%	<0.0001%
Bk-249	N/A	N/A	0.000%	N/A	N/A	93.5051%	90.80%
Cf-249	2.61%	0.153%	8.660%	0.90%	0.85%	0.9565%	0.929%
Cf-250	N/A	N/A	N/A	1.17%	1.09%	0.0002%	0.0002%
Cf-251	N/A	N/A	N/A	0.01%	0.005%	<0.0001%	<0.0001%
Cf-252	N/A	N/A	N/A	45.22%	42.36%	0.0064%	0.0063%
Cf-253	N/A	N/A	N/A	N/A	0.14%	N/A	<0.0001%
Cf-254	N/A	N/A	N/A	N/A	0.04%	N/A	<0.0001%
Es-253	N/A	N/A	N/A	7.62%	7.13%	0.2902%	0.2820%
Es-254	N/A	N/A	N/A	N/A	N/A	0.0064%	0.0063%
Total	**100.00%**	**100.00%**	**100.00%**	**100.00%**	**100.00%**	**100.00%**	**100.00%**

5.4.2.4 Special Case Radionuclide Distributions

ORNL developed radionuclide distributions for activities that produced waste with unique isotopic distributions. For example, WSPS 7920-R211-2 (Reference U109) was developed specifically for a sample of Pu-238 material immobilized in 250 milliliters of grout in November 2000. Although no other WSPS documents have been identified that detail the radiological evaluation of special projects or waste, examination of the generator reported drum specific radionuclides shows several containers that do not match any of the radionuclide distributions presented above and are assumed to

originate from unique activities. These unique distributions skew the average generator reported radionuclides in waste stream OR-REDC-CH-HET, which is discussed further in Section 5.4.2.5 below (References M005, M110, and U109).

5.4.2.5 Generator Reported Radionuclides for Waste Stream OR-REDC-CH-HET

Site database information and/or container documentation has been reviewed for each parent container to compile a summary of generator reported radionuclide data (not decay-corrected) for waste stream OR-REDC-CH-HET, which is presented in Table 5-4. The data for some containers in Table 5-4 only include the one or two predominant radionuclides identified by the generator at the time of generation, as described in Section 5.4.2 above (Reference M005, M110, and M244).

To determine isotopic ratios for waste stream OR-REDC-CH-HET as a whole, the total gram value for each individual radionuclide was divided by the total mass of all radioactive constituents in the waste stream and converted to a percentage. This result is listed as "Total Nuclide Weight%." To determine the radionuclide weight percent range for individual containers, the radiological mass in each container in the waste stream was summed. The mass of each individual radionuclide in a container was divided by the total radiological mass for that container and converted to a percentage. The minimum and maximum results are listed as "Nuclide Weight% Range for Individual Drums." The same process was applied to determine "Total Nuclide Curie%" and "Nuclide Ci% Range for Individual Drums." As shown in Table 5-5, Waste Stream OR-REDC-CH-HET Radiological Characterization Cm-244 and Pu-241 are the two most prevalent radionuclides by activity at 60.72 and 6.55 percent, respectively. Sr-90 which had previously been identified as the second most prevalent radionuclide by activity is at 6.39 percent. The radiological evaluation for this waste stream is documented in the nondestructive assay (NDA) Memorandum included with CCP-TP-005, Attachment 7 (References 1, M110, and M244).

Table 5-5. Waste Stream OR-REDC-CH-HET Radiological Characterization

Nuclide	Total Nuclide Weight%[1,5]	Total Nuclide Curie (Ci)%[2,5]	Nuclide Weight% Range for Individual Drums[3,5]	Nuclide Ci% Range for Individual Drums[4,5]	Drums with Reported Nuclide	Expected Present (Yes/No)
WIPP-Required Radionuclides						
Am-241	Trace	0.64%	0% - 100%	0% - 48.17%	900	Yes
Pu-238	0.01%	4.60%	0% - 100%	0% - 13.74%	875	Yes
Pu-239	1.76%	2.27%	0% - 100%	0% - 88.06%	911	Yes
Pu-240	0.21%	1.01%	0% - 95.39%	0% - 0.62%	874	Yes
Pu-242	0.05%	Trace	0% - 23.78%	0% - 47.65%	864	Yes [6]
U-233	Trace	Trace	0% - 2.06%	0% - 87.77%	8	Yes
U-234	0.17%	0.02%	0% - 97.19%	0% - 48.17%	161	Yes [6]
U-238	78.81%	Trace	0% - 99.13%	0% - 0.02%	157	Yes
Cs-137	Trace	1.23%	0% - 69.86%	0% - 7.70%	876	Yes
Sr-90	Trace	6.39%	0% - 36.34%	0% - 7.70%	412	Yes [6]
Additional Radionuclides						
Ac-227	Trace	0.56%	0% - 4.09%	0% - 5.59%	28	Yes
Ag-110M	Trace	0.02%	0% - Trace	0% - 87.77%	786	Yes
Am-243	0.02%	0.07%	0% - 98.99%	0% - 7.72%	879	Yes
Ba-140	Trace	Trace	0% - Trace	0% - 4.17%	2	Yes
Bk-249	Trace	2.42%	0% - 11.24%	0% - 0.02%	20	Yes
Ce-141	Trace	0.48%	0% - Trace	0% - 55.99%	821	Yes
Ce-144	Trace	0.34%	0% - 0.21%	0% - 100%	804	Yes
Cf-249	Trace	0.11%	0% - 87.42%	0% - 100%	871	Yes
Cf-250	Trace	0.02%	0% - 0.19%	0% - 35.98%	833	Yes
Cf-251	Trace	Trace	0% - 0.06%	0% - 95.36%	832	Yes
Cf-252	Trace	4.59%	0% - 100%	0% - 11.20%	1085	Yes
Cf-253	Trace	Trace	0% - Trace	0% - 0.03%	44	Yes
Cf-254	Trace	Trace	0% - Trace	0% - Trace	44	Yes
Cm-242	Trace	0.24%	0% - 0.18%	0% - 13.74%	796	Yes
Cm-243	Trace	Trace	0% - 0.05%	0% - 88.06%	5	Yes
Cm-244	0.04%	**60.72%**	0% - 100%	0% - 0.62%	1271	Yes
Cm-245	Trace	Trace	0% - 14.80%	0% - 1.62%	111	Yes
Cm-246	0.03%	0.21%	0% - 28.72%	0% - 47.65%	862	Yes
Cm-247	0.34%	Trace	0% - 66.48%	0% - 83.63%	108	Yes
Cm-248	0.12%	0.01%	0% - 100%	0% - 89.27%	868	Yes
Co-57	Trace	Trace	0% - Trace	0% - 6.51%	1	Yes
Co-58	Trace	Trace	0% - Trace	0% - Trace	9	Yes
Co-60	Trace	Trace	0% - Trace	0% - Trace	386	Yes
Cs-134	Trace	0.08%	0% - 0.03%	0% - 0.52%	786	Yes

Table 5-5. Waste Stream OR-REDC-CH-HET Radiological Characterization (Continued)

Nuclide	Total Nuclide Weight%[1,5]	Total Nuclide Curie (Ci)%[2,5]	Nuclide Weight% Range for Individual Drums[3,5]	Nuclide Ci% Range for Individual Drums[4,5]	Drums with Reported Nuclide	Expected Present (Yes/No)
Es-253	Trace	0.03%	0% - Trace	0% - 98.83%	9	Yes
Es-254	Trace	Trace	0% - Trace	0% - Trace	7	Yes
Eu-152	Trace	0.04%	0% - 0.04%	0% - 0.19%	375	Yes
Eu-154	Trace	0.15%	0% - 0.02%	0% - 0.07%	405	Yes
Eu-155	Trace	0.11%	0% - 0.33%	0% - 5.76%	377	Yes
Gd-153	Trace	Trace	0% - Trace	0% - 5.59%	8	Yes
Ho-166M	Trace	Trace	0% - 0.07%	0% - 87.77%	7	Yes
I-131	Trace	Trace	0% - Trace	0% - 48.17%	5	Yes
Ir-192	Trace	Trace	0% - Trace	0% - 7.72%	2	Yes
K-40	0.74%	Trace	0% - 96.02%	0% - 4.17%	3	Yes
Mn-54	Trace	Trace	0% - Trace	0% - 0.02%	1	Yes
Na-22	Trace	Trace	0% - Trace	0% - 55.99%	10	Yes
Nb-95	Trace	0.07%	0% - Trace	0% - 100%	458	Yes
Ni-63	Trace	0.42%	0% - 1.62%	0% - 100%	24	Yes
Np-237	3.40%	0.05%	0% - 99.99%	0% - 35.98%	125	Yes
Np-239	Trace	0.07%	0% - Trace	0% - 95.36%	330	Yes
Pa-231	Trace	Trace	0% - 50.96%	0% - 11.20%	16	Yes
Po-209	Trace	Trace	0% - Trace	0% - 0.03%	1	Yes
Po-210	Trace	0.28%	0% - Trace	0% - Trace	7	Yes
Pu-241	Trace	**6.55%**	0% - 9.04%	0% - 1.62%	865	Yes
Pu-244	0.14%	Trace	0% - 30.74%	0% - 83.63%	114	Yes
Ra-226	Trace	Trace	0% - 0.03%	0% - 89.27%	1	Yes
Ru-103	Trace	0.32%	0% - 0.01%	0% - 6.51%	814	Yes
Ru-106	Trace	1.03%	0% - 0.25%	0% - Trace	787	Yes
Sb-125	Trace	0.05%	0% - Trace	0% - Trace	392	Yes
Sr-89	Trace	Trace	0% - Trace	0% - 0.52%	63	Yes
Tc-99	12.90%	4.52%	0% - 96.17%	0% - 98.83%	9	Yes
Te-123M	Trace	Trace	0% - 0.09%	0% - Trace	6	Yes
Th-227	Trace	Trace	0% - Trace	0% - 0.19%	28	Yes
Th-230	Trace	Trace	0% - Trace	0% - 0.07%	16	Yes
Th-232	0.68%	Trace	0% - 87.35%	0% - 5.76%	69	Yes
U-232	Trace	Trace	0% - Trace	0% - 5.59%	2	Yes
U-235	0.38%	Trace	0% - 60.84%	0% - 7.72%	157	Yes
U-236	0.19%	Trace	0% - 16.30%	0% - 4.17%	157	Yes
Zr-95	Trace	0.15%	0% - Trace	0% - 55.99%	788	Yes
	100%	**100%**			**1343**	

Table 5-5. Waste Stream OR-REDC-CH-HET Radiological Characterization (Continued)

1. This listing indicates the total weight percent of each radionuclide over the entire waste stream.
2. This listing indicates the total activity (Ci) percent of each radionuclide over the entire waste stream.
3. This listing is the weight percent range of each radionuclide on a container-by-container basis. Some containers with "0" listed as the lower range, will not contain the specified radionuclide.
4. This listing is the curie percent range of each radionuclide on a container-by-container basis.
5. "Trace" indicates <0.01 weight percent or activity percent for that radionuclide.
6. Pu-242, U-234, and Sr-90 cannot be accurately quantified by NDA. Quantification of these nuclides is described in the NDA Memorandum for this waste stream.

5.4.2.6 Use of Radionuclide Ratios

For waste containers where CCP direct measurement does not yield useable isotopic ratio information, AK may be used to supplement direct measurement data in accordance with the WIPP-WAC (Reference 5). Due to varied isotopic distributions associated with individual containers in this waste stream, no single isotopic ratio can be applied to this waste stream to supplement certified NDA measurements. The ratios that may be used are those based on the container specific area and time period of generation. The specific use and confirmation of AK related to WIPP-certified assay measurements of containers in this waste stream is documented in the NDA Memorandum (Reference 1). Additionally, although the two predominant radionuclides for the waste stream as a whole are Cm-244 and Pu-241 by activity, individual containers may vary significantly from the waste stream averages.

5.4.2.7 Re-evaluation of Prevalent Radionuclides

The initial radiological evaluation of this waste stream identified Cm-244 and Sr-90 as the two most prevalent radionuclides by activity based on generator reported data. However, CCP NDA data for Lots 1 through 17 (375 drums) indicated Cm-244 and Pu-241 as the two most prevalent nuclides by activity at 74.98 percent and 17.39 percent, respectively. Sr-90 activity is at 1.89 percent. A summary of the NDA data for these 375 drums is presented in Table 5-6, CCP NDA Data for OR-REDC-CH-HET Lots 1 through 17. As a result of this discrepancy, an AK re-evaluation was performed (Reference DR027). However, as shown above in Table 5-5, generator radionuclide data were recompiled for this waste stream because of the subsequent addition of containers to this waste stream which identified radionuclides not previously reported by AK. The recompiled data in Table 5-5 indicate Cm-244 and Pu-241 as the two most prevalent radionuclides which is consistent with CCP NDA data. Through Lot 68, CCP NDA data continues to identify Cm-244 and Pu-241 as the two most prevalent nuclides by activity.

CCP NDA has reported 35.9 Ci of Pu-241 in 45 of the 57 drums from the REDC process development labs assayed through Lot 17. AK only reported Pu-241 in 12 of the 410 process development lab drums in the waste stream. Pu-239 was also reported by AK in these 12 drums, but Pu-239 was also reported in another 32 process development

labs drums. It was typical for the generator to report the dominant nuclide in a drum, like Pu-239, and not report other nuclides present in smaller amounts. A default plutonium isotopic distribution was developed for the process development lab waste where Pu-239 is the dominant nuclide by mass (refer to the NDA Memorandum). Pu-241 is a small contributor by mass but a large contributor by activity in this isotopic distribution. Whether NDA was able to get measured plutonium isotopics or used the default isotopic distribution to scale other plutonium isotopes, this would result in much more Pu-241 being reported which appears to be the reason why Pu-241 is the second most prevalent nuclide by mass in this waste stream (Reference DR027).

Table 5-6. CCP NDA Data for OR-REDC-CH-HET Lots 1 through 17

Nuclide	Total Nuclide Curie%	Nuclide Ci% Range for Individual Drums	Drums with Reported Nuclide
WIPP Required Radionuclides			
Am-241	Trace	Trace – 99.35%	366
Pu-238	0.82%	Trace – 99.95%	369
Pu-239	1.62%	Trace – 98.30%	309
Pu-240	1.25%	Trace – 59.97%	364
Pu-242	0.02%	Trace – 10.03%	364
U-233	Trace	Trace – 0.63%	4
U-234	Trace	Trace – 0.24%	11
U-238	Trace	Trace – 0.57%	19
Cs-137	0.11%	Trace – 4.44%	352
Sr-90	1.89%	Trace – 76.47%	352
Additional Radionuclides			
Ac-227	Trace	Trace – 0.04%	4
Am-243	0.06%	Trace – 2.58%	356
Cm-244	**74.98%**	Trace – 99.22%	319
Cm-245	Trace	Trace – 0.18%	329
Cm-246	0.57%	Trace – 13.60%	318
Co-60	Trace	Trace – 0.12%	102
Cs-134	Trace	Trace – 0.09%	5
Cf-249	Trace	Trace – 97.90%	278
Eu-152	Trace	Trace – 0.04%	38
Eu-154	0.01%	Trace – 0.72%	163
Np-237	Trace	Trace – 0.25%	106
Pu-241	**17.39%**	Trace – 93.76%	363
Ra-226	Trace	Trace – 0.10%	26
Sb-125	Trace	Trace – 0.25%	35
Th-229	Trace	Trace – Trace	1
U-232	Trace	Trace – 0.66%	67
U-235	Trace	Trace – Trace	9
Total	**100.0%**		**375**

5.4.3 Chemical Content Identification – Hazardous Constituents

This section describes the characterization rationale for assignment of EPA HWNs to Waste Stream OR-REDC-CH-HET. This waste stream has been historically managed in accordance with ORNL waste management practices in compliance with the requirements imposed by the TDEC. Documentation regarding how the site has historically managed the waste, including the historical regulatory status of the waste, is described above in Section 4.6.2. The EPA HWN assignments have been applied on a waste stream basis; individual containers may not contain all of the hazardous materials listed for the waste stream as a whole. The EPA HWNs assigned to this waste stream are summarized in Table 5-7, Waste Stream OR-REDC-CH-HET Hazardous Waste Characterization Summary.

Table 5-7. Waste Stream OR-REDC-CH-HET Hazardous Waste Characterization Summary

EPA Hazardous Waste Number	Constituent
Toxicity Characteristic Metals	
D004	Arsenic
D005	Barium
D006	Cadmium
D007	Chromium
D008	Lead
D009	Mercury
D010	Selenium
D011	Silver
Toxicity Characteristic Organics	
D019	Carbon tetrachloride
F-Listed Organic Solvents	
F002	1,1,1-Trichloroethane
F002	1,1,2-Trichloroethane
F002	Trichloroethylene
F005	Benzene
F005	Toluene

To assign EPA HWNs, AK sources including, procedures, laboratory logbooks, personnel interviews, previous AK reports, container packaging and shipping documentation, and material safety data sheet (MSDS) information for commercial products noted in the AK record were reviewed to determine potential waste material inputs and possible chemical contaminants associated with the REDC operations. A comprehensive list of materials and chemicals identified during this assessment are

provided in Table 5-8, Waste Stream OR-REDC-CH-HET Material and Chemical Inputs. In accordance with RCRA, HWNs were assigned to all the containers in the stream for compounds used in and around the hot cells, due to the lack of analytical evidence quantifying the concentration of RCRA toxic contaminants in the waste matrix (References DR005, DR008, and DR602).

Table 5-8. Waste Stream OR-REDC-CH-HET Material and Chemical Inputs

Chemical/Material	Use/Description/Location	AK Source	EPA HWNs
1,1,1-trichloroethane	Component in Desicote rinsing aid.	U529	F002
1,1,2-trichloroethane	REDC organic chemical inventory.	C078, DR008	F002
1,10-phenanthroline	Iron spectrophotometric analysis reagent.	P282	NA
2,5-di-tert-butylhydroquinone (DBHQ)	Plutonium solvent extraction reagent.	C078, P145, U011	NA
2-ethylhexyl phenylphosphonic acid (Pharex)	Pharex solvent extraction reagent.	P136, P279	NA
2-ethylhexanol	Plutonium solvent extraction diluent.	C078, P136, P145, U011, U432, U533, U545	NA
2 – Methoxyethanol	Process development lab work.	M266	NA
2-Methyl lactic acid	REDC organic chemical inventory.	C078	NA
2-thenoyltrifluoroacetone (TTA)	Total plutonium, berkelium, and neptunium analytical chemistry extraction reagent.	P282	NA
Acetic acid	REDC organic chemical inventory.	C078, U011	NA
Acetohydroxamic acid (AHA)	Solvent extraction reducing/complexation.	P985	NA
Acetone	Equipment cleanout solvent (degreaser). Identified in laboratory logbooks. Analytical laboratory solvent. Process development lab solvent.	M255, M265, P161, P279, P282, U011, U437, U477, U489, U506, U529	NA
Acetonitrile	Study of solvents for actinide and lanthanide reductions.	P110	NA
Adogen 364	High purity tertiary amine dissolved in diethylbenzene for solvent extration.	C078, P136, M022, P282, U011	NA
Ajax All Purpose Cleaner (ammonia)	Decontamination detergent used on dampened wipes.	C148, M022, P263	NA
Alcohol (Formula 3A)	Cleanout of equipment (95% ethanol, 5% methanol).	M022, P282	NA
Aluminum chloride	REDC inorganic chemical inventory.	U011	NA
Aluminum powder (alumina)	Americium/curium fuel pellet component. Neptunium target component. Purifying diethylbenzene and kerosene.	M265, P161, P279, P1440, U011	NA
Aluminum nitrate	Neptunium solvent extraction reagent. Uranium alpha spectroscopy reagent. High pressure liquid chromatography separation reagent. Process development lab work.	M264, P282	NA
Ammonia	Reagent used to precipitate nickel and copper in ion-exchange product solutions.	P229, P279	NA
Ammonium acetate	Process development lab work.	M257	NA

Table 5-8. Waste Stream OR-REDC-CH-HET Material and Chemical Inputs (Continued)

Chemical/Material	Use/Description/Location	AK Source	EPA HWNs
Ammonium alpha-hydroxyisobutyrate (AHIB)	Chromatographic cation-exchange eluent. High pressure liquid chromatography separation reagent.	P136, P161, P279, P282, U011	NA
Ammonium hydroxide	Oxide precipitation reagent. Used to convert nitrated anion-exchange resins to the hydroxide form before drying. Neptunium solvent extraction reagent. Iron spectrophotometric analysis reagent. High pressure liquid chromatography separation reagent. Pu-Be neutron source processing. Process development lab work.	C078, M258, P136, P145, P161, P279, P282, P980, U011	NA
Ammonium nitrate	Cation-exchange reagent (wash). Process development lab work.	C078, M258, U011	NA
Ammonium persulfate	Oxization of americium.	P851, U011	NA
Ammonium thiocyanate	Uranium spectrophotometric analysis reagent.	P282	NA
Aqua regia (hydrochloric-nitric acid mixture)	Identified in laboratory logbooks.	U529	NA
Armor All Glass Cleaner (propylene glycol n-butyl ether, isopropanol)	TWPC hot cell maintenance.	M022, U125, U126	NA
Arsenic	Actinide and lanthanide hydride and metallide studies.	P114	D004
Ascorbic acid	Plutonium extraction reagent. Process development lab work.	P136, P980, U011	NA
Barium	Fission product contaminant of HFIR targets. Californium product solution impurity. Assigned by generator to REDC waste debris. Identified in laboratory logbooks.	M024, M100, P151, U011, U505	D005
Benzene	Testing of solvents for extraction of actinides.	DR602, P160, P164,	F005
Beryllium	Electroplating microgram quantities of transplutonium elements on beryllium foil targets and source plate. Sources. Process development lab work. Pu-Be neutron source processing.	M257, P223, P980	NA
Big Orange-E (d-Limonene)	Solvent used for PCB decontamination at the TWPC.	M022, P582	NA
Cadmium	Californium product solution impurity. D006 assigned by generator to REDC containers (flashlight batteries and electronic equipment). Identified in laboratory logbooks.	M005, P151, U529	D006
Calixarene-crown ether	Cesium extractant.	M254	NA

Table 5-8. Waste Stream OR-REDC-CH-HET Material and Chemical Inputs (Continued)

Chemical/Material	Use/Description/Location	AK Source	EPA HWNs
Carbon/activated charcoal	Organic chemical vapor filter media.	M001, P161, U011	NA
Carbon tetrachloride	Process development lab work. REDC organic chemical inventory.	C078, M256, M259, M263, U011	D019
Cerium nitrate	Identified in laboratory logbooks. Process development lab work.	M262, U435	NA
CC Fix (ammonia, 2-ethylhexyl acrylate)	Nonhazardous stabilization agent/fixative.	M022, M073, M155, U125, U126	NA
CC Wet (glycerin, monosaccharide, non-ionic surfactant, non-halogenaed yellow dye)	Nonhazardous stabilization agent/fixative.	M022, M073, M155, U125, U126	NA
Cement/concrete/grout	Ion-exchange resin immobilization. Pu-Be neutron source processing (Glenium 7700 admixture, Tercem 3000 blended cement).	M022, P241, P980, P1436	NA
Citric acid	REDC organic chemical inventory.	U011	NA
Chromium	Contaminant of aluminum target cladding and fuel matrix. Californium product solution impurity. Contaminant of Ni-63. Identified in laboratory logbooks.	P151, P161, P279, P801, U011, U529	D007
Cobalt chloride	Process development lab work.	M255	NA
Crown ether	Strontium extractant.	M254	NA
Cyanex 301 (bis-(2,4,4-trimethylpentyl)-dithiophosphinic acid)	Organic extractant being tested for group separation of the actinide and lanthanide elements.	P819	NA
Desiccant (e.g., Drierite [calcium sulfate], silica gel [silicon dioxide])	Purifying diethylbenzene and kerosene. Process development lab work.	C078, M073, M263, P279, P982, U011	NA
Diatomaceous earth	Process stream and liquid waste filtering media.	P161, P173, P229, P982	NA
Diethylbenzene (DEB)	Solvent extraction organic extractant.	C078, P136, P161, P279, U011	NA
Diethylene triaminepentaacetic acid (DTPA)	Strip and scrub solution in solvent extraction. REDC organic chemical inventory.	C078, P145, P984, U011,	NA
Di (2-ethylhexyl) phosphoric acid (HDEHP)	Solvent extraction organic extractant in decane diluent.	C078, P136, P145, P161, P279, P984, U011	NA
Diisopropylbenzene (DIPB)	REDC organic chemical inventory.	C078, U011	NA
Dimethylformamide	Study of solvents for actinide and lanthanide reductions.	P110	NA
Dioctylphthalate	HEPA filter testing.	P263, P279, U011	NA

Table 5-8. Waste Stream OR-REDC-CH-HET Material and Chemical Inputs (Continued)

Chemical/Material	Use/Description/Location	AK Source	EPA HWNs
Dodecane	Solvent extraction organic extractant.	P161, P984, P992, U011	NA
EDTA	REDC organic chemical inventory.	C078, U011	NA
Elmer's glue (polyvinyl acetate)/water mixture	Fixative for airborne contamination in the TWPC hot cell.	U124	NA
Ethanol	Analytical Laboratory equipment cleaning reagent. Component of Formula 3A alcohol (95%) used to cleanout equipment. *Decontamination and equipment repair solvent.* Process development lab solvent.	C078, M022, M255, M256, M257, M259, M260, M263, M265, M266, P161, P279, P282, U011	NA
Ethanol-hydrochloric acid mixture	Used as the eluent for some product finishing and special product ion-exchange operations.	P820, P826	NA
Ether (non-specific)	REDC organic chemical inventory. Identified in Building 7920 waste logbook.	U011, U501	NA
Ethylene glycol	REDC organic chemical inventory.	C078	NA
ExxonMobil Aromatic 150 (aromatic hydrocarbon)	Solvent extraction organic extractant.	M022, P161, P992	NA
ExxonMobil Isopar L (paraffinic hydrocarbon)	Solvent extraction organic extractant.	M022, M254	NA
ExxonMobil Exxsol D60 (paraffinic hydrocarbon)	Solvent extraction organic extractant.	M022, P161, P992	NA
Ferric chloride	REDC inorganic chemical inventory.	C078, U011	NA
Ferric nitrate	Total plutonium analytical chemistry extraction reagent.	C078, P282	NA
Ferrous ammonium sulfate	Iron spectrophotometric analysis reagent.	P282	NA
Ferrous chloride	Neptunium and plutonium solvent extraction reagent.	P136, P282	NA
Ferrous sulfamate	REDC inorganic chemical inventory (SETF reductant reagent). Process development lab work.	M264, P229, U011	NA
Ferrous sulfate	Determination of total reducing normality reagent.	C078, P282	NA
Formic acid	Used for actinide/lanthanide separation by extraction chromatography. Identified in laboratory logbooks.	P804, U477, U489	NA
Gadolinium nitrate	Identified in laboratory logbooks. Process development lab work.	M262, U435	NA
HG Absorb (zinc, citric acid)	Mercury cleanup kit used at the TWPC.	M022, M073, U046	NA
Hydrazine / hydrazine hydrate	SETF solvent extraction reduction agent. Process development lab work.	C078, M255, M256, M259, M264, P016, P173, P229,U011	NA

Table 5-8. Waste Stream OR-REDC-CH-HET Material and Chemical Inputs (Continued)

Chemical/Material	Use/Description/Location	AK Source	EPA HWNs
Hydrobromic acid	Identified in laboratory logbooks.	U506	NA
Hydrochloric acid	Solvent extraction aqueous solution. LiCl chromatographic anion-exchange solution. Curium and plutonium target dissolution. Process solution titration reagent. Pu-Be neutron source processing. Process development lab work.	C078, M255, M256, M257, M259, M260, M262, M263, M264, P136, P161, P279, P282, P980, U011	NA
Hydrofluoric acid	Target dissolution.	P136, P223, P279, P282, U011	NA
Hydrogen peroxide	SETF, Berkex, and Cleanex extraction reductant. Pu-Be neutron source processing.	C078, P173, P223, P279, P980, U011	NA
Hydroquinone	REDC organic chemical inventory.	C078, U011	NA
Hydroxylamine hydrochloride	REDC inorganic chemical inventory (SETF reagent). Total plutonium analytical chemistry extraction reagent. Neptunium solvent extraction reagent. Iron spectrophotometric analysis reagent.	C078, P136, P229, P282, U011	NA
Hydroxylamine nitrate	Solvent extraction reducing agent. REDC inorganic chemical inventory (SETF reagent).	P985, U011	NA
Hopcalite	Organic chemical vapor filter media oxidation catalyst (CuO_2-MnO_2).	M001, P263, U011	NA
Ion-exchange resins	Anion and cation exchange resins including Dowex and Ionac resins.	M022, P279, P282, U011	NA
Isopropanol	Electroplating solution for californium on platinum foils and disks. Process development lab solvent.	C078, M257, P021, P223	NA
Kerosene (Amsco)	Deodorized mineral spirits. Pharex solvent extraction diluent.	C078, P279, U011	NA
Lactic acid	Strip and scrub solution in solvent extraction.	P984	NA
Lead	Glovebox gloves and window. Fission product contaminant of HFIR targets. Californium product solution impurity. Lead shielding, lead pigs, bricks, shavings, electronic equipment (circuit boards), and solder. Identified in laboratory logbooks.	C148, M005, M110, P151, P279, U011, U038, U429, U477, U508, U529, U531, U537	D008
Lead-acid batteries	Contained in mule carrier lead-acid batteries.	P161	D008
Lead carbonate	Cleaning of soap film from internal surfaces of cell windows during window maintenance.	P020	D008
Lead oxide	Berkelium-Californium separation.	P114	D008

Table 5-8. Waste Stream OR-REDC-CH-HET Material and Chemical Inputs (Continued)

Chemical/Material	Use/Description/Location	AK Source	EPA HWNs
Lithium	Identified in laboratory logbooks. Lithium batteries.	M005, M244, P1438, U429	NA
Lithium chloride	Transcurium and Mark 42 LiCl chromatographic anion-exchange oxidant. Process solutions free acid and adogen titration reagent.	C078, P136, P145, P161, P223, P279, P282, U011	NA
Lithium hydride	Identified in laboratory logbooks.	U429	NA
Lithium hydroxide	Process solutions free acid and adogen titration reagent.	C078, P282, U011	NA
Lithium hypochlorite	Cleanex extraction oxidant.	U011	NA
Lithium nitrate	REDC inorganic chemical inventory.	U011	NA
Magnesium	Identified in laboratory logbooks.	U505, U506	NA
Mercuric nitrate	Radioiodine trap reagent.	C078, U011	D009
Mercury	Contained between the liners and shells of evaporator tanks. Mercury vapor lamps, electronic equipment, thermostats, and solder.	C148, M005, M110, P161, U038,	D009
Met-L-X (sodium chloride, Saran [vinylidene chloride acrylonitrile copolymer], magnesium aluminum silicate)	Fire extinguishing powder for Class D (combustible metal) fires.	M022, M073	NA
Methanol	Tramex extraction reagent. Ingredient in Formula 3A alcohol (5%) used to cleanout equipment. Identified in laboratory logbooks. Analytical laboratory solvent. Process development lab solvent.	C078, M022, M256, M257, M259, M266, P030, P136, P145, P161, P279, U011, U425	NA
Methyl isobutyl ketone	Neptunium solvent extraction reagent (organic phase). Uranium alpha spectroscopy reagent.	P282	NA
Mr. Clean (ethoxylated C9-11 alcohols)	Liquid cleaner used in ultrasonic cleaning of HFIR targets.	M022, P263	NA
Napthalene (deca hydro)	REDC organic chemical inventory.	C078	NA
N,N,N',N'-tetraoctyl diglycolamide (TODGA)	Process development lab work.	M257	NA
N-paraffin hydrocarbon (NPH)	Solvent extraction diluent.	C078, P161, P173, P229, P985, P992, U011	NA
Nickel chloride hexahydrate	REDC inorganic chemical inventory.	C078	NA

Table 5-8. Waste Stream OR-REDC-CH-HET Material and Chemical Inputs (Continued)

Chemical/Material	Use/Description/Location	AK Source	EPA HWNs
Nickelous nitrate	Process development lab work.	M255	NA
Nitric acid	Plutonium fuel and transcurium target dissolution. Solvent extraction aqueous solution. Plutonium and americium anion/cation-exchange feed solution and eluent. Dilute aqueous samples and cleaning counting plates for radiological analyses. Scrub, strip, and wash solution in solvent extraction. Pu-Be neutron source processing. Neptunium target dissolution. Process development lab work.	C078, M254, M255, M256, M257, M258, M259, M260, M261, M262, M263, M264, M265, M266, M270, P136, P145, P161, P229, P279, P282, P980, P982, P984, P985, P1440, U011	NA
Nitrous acid	Identified in laboratory logbooks.	U425	NA
Nochar Petro Bond N910 (thermoplastic elastomer)	Absorbtion of known or suspect PCB liquids.	M022, P592, P598, P993	NA
Nochar N965 Acid Bond and Petro Bond Blend (thermoplastic elastomer, co-polymer of acrylamide)	Solidifying agent for absorbing aqueous and organic liquids during waste repackaging.	M022, M073, P592, U046	NA
Octylphenyl-N,N-diisobutyl carbamoyl methylphosphine oxide (CMPO)	TRU element extraction.	P984	NA
Oxalic acid	TRU element extraction. Plutonium precipitation. REDC organic chemical inventory.	C078, M270, P984, P1440, U011	NA
Pentasodium diethylene-triamine pentaacetate	Decontamination solution detergent.	P279	NA
Perchloric acid	Indentified during repackaging and absorbed with Nochar N965.	M073, M155	NA
Phenolphthalein	Process solution titration end point indicator. Process development lab work.	M255, P282	NA
Phenoxy fluoro-alcohol	Modifier/solvating agent.	M254	NA
Potassium bromate	Berkelium extraction process oxidant.	P279, U011	NA
Potassium carbonate	In-tank americium and curium precipitation. Scrubbing system basic solution.	C078, P136, P145, P161, U011	NA
Potassium dichromate	Determination of total reducing normality reagent.	P282	D007
Potassium hydroxide	Scrubbing system basic solution.	C078, P161, U011	NA
Potassium iodide	Plutonium/Uranium anion-exchange reagent.	P282	NA
Potassium nitrate	REDC inorganic chemical inventory.	C078, U011	NA
Potassium oxalate	Process solution titration reagent.	P282	NA
Potassium permanganate	Neptunium solvent extraction reagent.	P282	NA

Table 5-8. Waste Stream OR-REDC-CH-HET Material and Chemical Inputs (Continued)

Chemical/Material	Use/Description/Location	AK Source	EPA HWNs
Praseodymium nitrate	Identified in laboratory logbooks.	U436	NA
Quik-Solid (sodium polyacrylate)	Absorbption of aqueous liquids with neutral pH.	M022, M005, M073, P1439	NA
Quintolubric 888-46 (mineral oil)	TWPC hot cell hydraulic system.	C160, U126	NA
Scouring powder	Used to decontaminate packages before shipment.	P263	NA
Samarium nitrate	Identified in laboratory logbooks. Process development lab work.	M262, U507, U529	NA
Selenium metal	Actinide and lanthanide hydride and metallide studies.	P114	D010
Silver	Photographic development solutions. Electronic equipment (circuit boards). Identified in laboratory logbooks. Pu-Be neutron source processing.	C078, C148, M005, M110, P980, U507	D011
Silver nitrate	REDC inorganic chemical inventory.	C078	D011
Silver zeolite	Trapping radioactive iodine. Process development lab work.	M263, P500	D011
Simple Green (nonhazardous)	TWPC containment enclosure decontamination.	C173, M022	NA
Soda lime	Process development lab work.	M263	NA
Sodium aluminate	Iodox process dissolver solution.	P500	NA
Sodium carbonate	Acid vapor scrubber solution. Process development lab work.	C078, M255, P161, U011	NA
Sodium bromate	Berkelium cation-exchange oxidant.	C078, P136, U011	NA
Sodium dichromate	Berkelium separation extraction reagent.	P282	D007
Sodium fluoride	Process development lab work.	M263	NA
Sodium hydroxide	Aluminum cladding target dissolution. Acid vapor scrubber and I-131 sorbent solutions. Decontamination and waste line flush solution. Neutralization of process solutions. Process solution titration reagent. Process development lab work. Pu-Be neutron source processing.	C078, M255, M258, M259, M264, P145, P161, P279, P282, P980, P991, P992, P1437, U011	NA
Sodium hypochlorite	Oxidation of iodine in caustic scrubber solution.	C078, P482	NA
Sodium meta bisulfite	REDC inorganic chemical inventory.	C078	NA
Sodium nitrate	Aluminum cladding target dissolution. Process development lab work.	C078, M255, P145, P161, P279, U011	NA

Table 5-8. Waste Stream OR-REDC-CH-HET Material and Chemical Inputs (Continued)

Chemical/Material	Use/Description/Location	AK Source	EPA HWNs
Sodium nitrite	Total plutonium analytical chemistry extraction reagent. Pu-Be neutron source processing. Plutonium extraction.	M270, P282, P980	NA
Sodium oxalate	Process solution titration reagent.	C078, P282	NA
Sodium tetraborate (borax)	REDC inorganic chemical inventory.	C078	NA
Sodium thiocyanate	Study of aqueous thiocyanate complexes of trivalent transplutonium actinides.	P114	N/A
Sodium perchlorate	Study of aqueous thiocyanate complexes of trivalent transplutonium actinides.	P114	NA
Sodium thiosulfate	Reagent for stabilization of iodine during aluminum jacket dissolution.	C078, U011	NA
Solid-a-sorb (diatomaceous earth)	Absorbption of aqueous liquids.	M022, M073, P590, P591, P592	NA
Stannous chloride	Tramex holding reductant reagent. Uranium spectrophotometric analysis reagent.	P136, P279, P282	NA
Stearic acid	Fuel pellet forming die lubricant.	M265, P161, U011	NA
Stripcoat TLC Free (polyvinyl butyral, polyisobutylene, polyisoprene, propylparaben)	TWPC hot cell maintenance.	M022, U125, U126	NA
Sulfamic acid	Identified in laboratory logbooks.	U432	NA
Sulfuric acid	Contained in mule carrier lead-acid batteries. Berkelium extraction reagent. Determination of total reducing normality reagent. Iron spectrophotometric analysis reagent. Process development lab work.	M255, P145, P161, P282	NA
Tartaric acid	Iron spectrophotometric analysis reagent.	P282	NA
Tellurium nitrate	Identified in laboratory logbooks.	U435, U506	NA
Terbium nitrate	Added to various feed solutions to enhance the precipitation of the actinides as oxalates. Identified in laboratory logbooks.	P820, U543	NA
Tetraethylammonium hydroxide	Precipitation of Technicium-99.	P787	NA
Thorium nitrate	REDC inorganic chemical inventory.	C078	NA
Trialkyl amine	Dissolved in diethylbenzed as an liquid ion-exchanger solution for solvent extraction operations.	P279	NA
Tributylphosphate	Solvent extraction organic phase solvent. Process development lab work.	C078, M255, M270, P173, P229, P984, P985, U011	NA

Table 5-8. Waste Stream OR-REDC-CH-HET Material and Chemical Inputs (Continued)

Chemical/Material	Use/Description/Location	AK Source	EPA HWNs
Trichloroethylene	Solvent extraction. Process development lab solvent.	C148, M257, P827, U011, U412, U478, U489	F002
Tri-n-octylamine	Inhibits impurity effects/improves stripping.	M254	NA
Toluene	Scintillation reagent solvent.	P223	F005
Ultima Gold (diisopropylnaphthalene, 2-ethylhexyl ester phosphoric acid)	Liquid scintillation cocktail.	M022, P282	NA
Vermiculite (magnesium, aluminum, iron silicate)	Used historically at REDC to absorb unspecified free liquids (historically generated waste is repackaged at the TWPC). Neutralized aqueous solutions from Pu-Be neutron source processing are solidified with cement and vermiculite.	P263, P590, P591, P592, P980	NA
Xylene	Dilute organic samples for analyses. Total plutonium, berkelium, and neptunium analytical chemistry extraction reagent. Identified in laboratory logbooks.	P161, P282, U011 U432, U482	NA
Zinc bromide	REDC inorganic chemical inventory.	C078, U011	NA
Zircaloy/zirconium	Contaminant from process tanks. Leached fuel cladding hulls from LWR (SETF) dissolution.	C078, P136, P161, P173, P229, P223, P279, U011	NA
Zirconium nitrate	Identified in laboratory logbooks.	U453	NA
Zirconium phosphate	Cation-exchange material.	P851	NA

5.4.3.1 F-Listed Constituents

Based on review of AK relative to REDC chemicals usage and chemical inventory information, waste stream OR-REDC-CH-HET contains or is mixed with F-listed hazardous wastes from non-specific sources listed in 40 CFR 261.31 (Reference 11). As shown in Tables 5-7 and 5-8, F002 and F005-listed solvents were used during REDC operations. F003 constituents, including acetone, methanol, methyl isobutyl ketone, and xylene are listed solely because these solvents are ignitable in the liquid form. The waste stream will not exhibit the characteristic of ignitability because it is not liquid; therefore, F003 is not assigned. Although F001-listed solvents were identified in the AK record (carbon tetrachloride and trichloroethylene), EPA has provided a regulatory clarification that the F001 listing is only appropriate when the listed solvents are used in a "large-scale" degreasing operation such as cold cleaning or vapor degreasing on an industrial scale (Reference 10). Large-scale degreasing operations were not conducted in the REDC, and therefore, EPA HWN F001 is not assigned to this waste stream. Waste stream OR-REDC-CH-HET is assigned F-listed EPA HWN F002 for 1,1,1-trichloroethane, 1,1,2-trichloroethane, and trichloroethylene and EPA HWN F005 for benzene, and toluene (References DR005, DR008, and DR602).

5.4.3.2 Toxicity Characteristic Constituents

Based on review of AK relative to chemicals used or present in the REDC and supporting analytical operations, Waste Stream OR-REDC-CH-HET is contaminated with toxicity characteristic compounds as defined in 40 CFR 261.24 (Reference 11). Where a constituent has been identified and there is no quantitative data available to demonstrate that the concentration of a constituent is below regulatory threshold levels, the applicable EPA HWN is applied to the waste stream in accordance with RCRA.

Debris waste from the REDC operations contain or is contaminated with toxicity characteristic metal compounds. Based on the references identified in Table 5-8, EPA HWNs D004, D005, D006, D007, D008, D009, D010, and D011 are assigned to waste stream OR-REDC-CH-HET (References DR005, DR008, and DR602).

The AK sources identified the use of organic toxicity characteristic compounds including benzene (HWN D018), carbon tetrachloride (HWN D019), and trichloroethylene (HWN D040). EPA HWNs F005 and F002 are assigned to the waste stream for F-listed solvents benzene (HWN F005) and trichloroethylene (HWN F002). Because the more specific F-listed EPA HWNs have been assigned for these compounds, assignment of the corresponding toxicity characteristic HWNs D018 and D040 is not necessary. Therefore only HWN D019 for carbon tetrachloride is assigned to waste stream OR-REDC-CH-HET (References DR005 and DR602).

5.4.3.3 U-, P-, and K- Listed Wastes

Review of the AK record did not identify any specific source or incident where the REDC waste was mixed with or contaminated with discarded commercial chemical product, an off-specification commercial chemical product, or a container residue or spill residue thereof. No listed chemicals were identified in the container-specific documentation for waste stream OR-REDC-CH-HET. The only specific source identified for beryllium was small foil targets and source plates electroplated with microgram quantities of transplutonium elements. Review of the available container documentation did not identify beryllium as a component of the waste in these containers. Therefore, if present, beryllium will be a minor contaminant, well below 1 weight percent in any given waste container. Additionally, since no beryllium powder will be present in the debris waste, P015 is not assigned to the waste stream. Hydrofluoric acid was used as a dissolution reagent; however, there is no indication that unused acids or other reagents, or spills of these reagents were disposed of in this waste stream. Therefore, U- and P-listed EPA HWNs, including U134, are not assigned to waste stream OR-REDC-CH-HET (References M005 and P223).

The material in waste stream OR-REDC-CH-HET is not a hazardous waste from any of the sources specified in 40 CFR 261.32 (Reference 11). Waste stream OR-REDC-CH-HET is therefore not assigned a K-listed HWN.

5.4.3.4 Ignitables, Corrosives, and Reactives

Ignitability

A solid waste exhibits the characteristic of ignitability as defined in 40 CFR 261.21 if it has any of the following properties: 1) It is a flammable liquid (flash point less than 60°C), 2) It is not a liquid and is capable, under standard temperature and pressure, of causing fire through friction, absorption of moisture, or spontaneous chemical change, 3) It is an ignitable compressed gas, or 4) It is an oxidizer (a substance such as a chlorate, permanganate, inorganic peroxide, or a nitrate, that yields oxygen readily to stimulate the combustion of organic matter (Reference 11).

The debris materials in this waste stream do not meet the definition of ignitability as defined in 40 CFR 261.21. Ignitable waste materials are prohibited in TRU waste in the REDC. As shown in Table 5-8, flammable liquids (e.g., acetone, diethylbenzene, methanol, xylene) and oxidizers (e.g., ammonium nitrate, hydrogen peroxide, lithium hypochlorite, sodium nitrate) are used in Building 7920. However, processing solutions containing potentially hazardous chemical reagents in their pure form are prepared outside of the processing area. The resulting process solutions are piped from the process area and are therefore not present in this waste stream. Also, any containers that held liquid are drained before disposal. If the liquid cannot be discharged down the drain (e.g., organic liquids such as oils and hazardous solvents), the liquid is collected in waste organic drums. Pyrophoric materials are not used in established glovebox and hot cell operations. Special notifications are made if pyrophoric materials are introduced into the REDC so that wastes of this type can be identified and excluded form CH-TRU waste containers. Compressed gas cylinders (e.g., spray cans) are emptied and punctured before inclusion in a waste container (References P161, P240, P241, P242, P244, P263, P279, P566, P917, P988, P989, P991, P1112, and U011).

To ensure the waste does not exhibit the characteristic of ignitability, prohibited quantities of liquids will be removed or immobilized, compressed gases (e.g., spray cans) will be removed or vented, and energetic materials (e.g., pyrophorics) will be removed and remediated at the TWPC prior to WIPP disposal (References P254, P587, P590, P591, P592, P598, P599, P1116, P1435, and P1438).

An energetic material is any material that may undergo a spontaneous energetic chemical reaction due to age, concentration, degradation, or oxidation potential when exposed to shock, friction, temperature change, air, or other initiating events. Field evaluations are performed at the TWPC by Energetic Material Subject Matter Experts when notified by operations personnel that materials have been discovered during repackaging operations that require evaluation for the presence of potentially energetic materials. The evaluation of the chemical and physical characteristics of the discovered items are documented on the *Field Evaluation of Potentially Energetic Materials* form (References P432, P587, and P1434).

Testing by the Nochar company has been done showing that Nochar N965 can be used to absorb concentrated acids, including nitric acid. Testing was also performed using a sample of Nochar containing concentrated nitric acid which shows the sample does not meet the RCRA definition of an oxidizer. In addition, any residue remaining in inner containers that held oxidizing solutions that have evaporated are considered empty, and therefore, are not hazardous because RCRA excludes residues of hazardous waste in empty containers (References 11 and C172).

Waste Stream OR-REDC-CH-HET is therefore not ignitable (HWN D001).

Corrosivity

A solid waste exhibits the characteristic of corrosivity as defined in 40 CFR 261.22 if it has any of the following properties: 1) It is aqueous and has a pH less than or equal to two or greater than or equal to 12.5, or 2) It is a liquid and corrodes steel at a rate greater than 0.25 inches per year (Reference 11).

The debris materials in this waste stream do not meet the definition of corrosivity as defined in 40 CFR 261.22. Corrosive waste materials are prohibited in TRU waste in the REDC. As shown in Table 5-8, corrosive liquids (e.g., nitric acid, hydrofluoric acid, ammonium hydroxide, sodium hydroxide) are used in Building 7920. However, processing solutions containing potentially hazardous chemical reagents in their pure form are prepared outside of the processing area. The resulting process solutions are piped from the process area and are therefore not present in this waste stream. Acidic solutions are neutralized using sodium hydroxide before discharging down the drain. Also, any containers that held liquid are drained before disposal (References P161, P240, P241, P242, P244, P263, P279, P566, P917, P988, P991, P1112, and U011).

To ensure the waste does not exhibit the characteristic of corrosivity, prohibited quantities of liquids will be removed or immobilized at the TWPC prior to WIPP disposal (References P254, P590, P591, P592, P598, P1116, and P1435). Testing by the Nochar company has been done showing that Nochar N965 can be used to absorb concentrated acids, including nitric acid (Reference C172). Waste stream OR-REDC-CH-HET is therefore not corrosive (HWN D002).

Reactivity

A solid waste exhibits the characteristic of reactivity as defined in 40 CFR 261.23 if it has any of the following properties: 1) It is normally unstable and readily undergoes violent change without detonating, 2) It reacts violently with water, 3) It forms potentially explosive mixtures with water, 4) When mixed with water, it generates toxic gases, vapors or fumes in a quantity sufficient to present a danger to human health or the environment, 5) It is a cyanide or sulfide bearing waste which, when exposed to pH conditions between two and 12.5, can generate toxic gases, vapors or fumes in a quantity sufficient to present a danger to human health or the environment, 6) It is capable of detonation or explosive reaction if it is subjected to a strong initiating source

or if heated under confinement, 7) It is readily capable of detonation or explosive decomposition or reaction at standard temperature and pressure, or 8) It is a forbidden explosive, or Class A or Class B explosive as defined in 49 CFR 173, *Shippers – General Requirements for Shipments and Packagings* (Reference 11 and 17).

The materials in this waste stream do not meet the definition of reactivity as defined in 40 CFR 261.23. Reactive waste materials are prohibited in TRU waste in the REDC. As shown in Table 5-8, reactive chemicals (e.g., hydrazine, hydrogen peroxide, lithium hydride) are used in Building 7920. However, processing solutions containing potentially hazardous chemical reagents in the pure form are prepared outside of the processing area. The resulting process solutions are piped from the process area and are therefore not present in this waste stream. Also, any containers that held liquid are drained before disposal. As shown in Table 5-8, reactive cyanide and sulfide compounds were not used at REDC. Compressed gas cylinders (e.g., spray cans) are emptied and punctured before inclusion in a waste container. Explosive materials are not used in REDC containment areas. Special notification are made if explosive materials are introduced into the REDC so that wastes of this type can be identified and excluded from CH-TRU waste containers. Aluminum powder, which is blended with actinide oxides for target fabrication, can be an explosion hazard if finely divided. The aluminum powder is carefully sized and the proper quantity is weighed outside the containment to minimize the likelihood of an explosion. Therefore, aluminum powder will not be present in TRU waste containers. The practice of washing traces of entrained extractant from aqueous solutions using a solvent that can be volatilized subsequently by stream distillation minimizes the possibility of a nitrated-organic reaction when the aqueous solutions are subsequently evaporated to small volumes. Additionally, preventative measures have been taken to prevent potential accidents associated with nitrated ion-exchange resins typically involving the removal of the resins from the column and conversion to the hydroxide form before disposal. Anion-exchange resins used with nitric acid are flushed from the column, rinsed with ammonium hydroxide to convert the resin to the hydroxide form, air dried, and grouted in metal cans. Spent cation-exchange resins are calcined to an oxysulfate ash, and the ashes are leached with nitric acid and dried prior to assimilation (and fixing) into melted polyethylene waste in a metal bucket (References P161, P240, P241, P242, P244, P263, P279, P566, P917, P987, P988, P989, P1112, and U011).

To ensure the waste does not exhibit the characteristic of reactivity, prohibited quantities of liquids will be removed or immobilized and energetic materials (e.g., explosives) will be removed or remediated at the TWPC prior to WIPP disposal (References P254, P587, P590, P591, P592, P598, P599, P1116, P1435, and P1438). An energetic material is any material that may undergo a spontaneous energetic chemical reaction due to age, concentration, degradation, or oxidation potential when exposed to shock, friction, temperature change, air, or other initiating events. Field evaluations are performed at the TWPC by Energetic Material Subject Matter Experts when notified by operations personnel that materials have been discovered during repackaging operations that require evaluation for the presence of potentially energetic

materials. The evaluation of the chemical and physical characteristics of the discovered items are documented on the *Field Evaluation of Potentially Energetic Materials* form. An example is a bottle containing perchloric acid. Visibility was limited while viewing the bottle, so the presence of crystallization or other indicators of shock sensitive materials could not be determined. Therefore, the bottle was handled assuming that it was potentially shock sensitive. The bottle lid was hydrated by submerging it in a water bath so that the lid could be safely removed. The liquid was then poured into plastic containers with Nochar N965 absorbent (1:8 volume ratio of liquid to absorbent) (References P254, P432, P587, P592, P1434, and P1438). Waste stream OR-REDC-CH-HET is therefore not reactive (HWN D003).

5.4.3.5 Polychlorinated Biphenyls

A portion of the containers in this waste stream may contain regulated levels of PCBs, and therefore, are regulated as Toxic Substance Control Act wastes under 40 CFR 761, *Polychlorinated Biphenyls (PCBs) Manufacturing, Processing, Distribution in Commerce, and Use Prohibitions* (Reference 16).

The final rule banning PCB manufacturing, processing, distribution in commerce, and use was promulgated in 1979 (www.epa.gov/pcb). As a result of these new regulations, ORNL began an effort to identify and track transformers and other large pieces of equipment containing PCBs (References P1100, P1101, P1102, P1103, P1104, P1105, P1106, P1107, P1108, P1109, and P1439). Large high and low voltage capacitors were not included in the inventory of PCB equipment until 1985 (Reference P1109). The only PCB equipment identified in Building 7920 was a 250-gallon non-PCB transformer (less than 50 parts-per-million [ppm] PCBs) which was first listed in the inventory in 1982 (Reference P1106). A 15-gallon x-ray transformer (less than 50 ppm PCBs) from Building 7920 was added to the inventory in 1991 (Reference P1104). Transformers and capacitors containing greater than 50 ppm PCBs were not identified in Building 7920.

Based on a review of the AK record, incandescent bulbs, mercury-vapor bulbs, and lighting fixtures (bases) were identified in container documentation, however items potentially containing PCB compounds were not specifically identified (capacitors, ballasts, etc.). No other potential sources for PCBs were identified in the AK record; however the ORNL waste management practices described in the AK record did not historically identify PCB materials as prohibited items for CH waste containers (References 3, 8, M005, M110, P240, and P263).

Based on discussions with ORNL personnel, there is the potential for some drums to contain equipment with small PCB capacitors and pumps containing PCB oil. The oil may or may not have been drained from the pumps. Examples of equipment containing small capacitors include fluorescent light ballasts and electric motors such as a vacuum pump motor. These items may be present in waste generated before 1979. There may not have been a concerted effort to inventory pumps or electrical equipment containing

small capacitors to determine if they contained PCBs so these items are potentially present in waste generated after 1979 (References C307 and C308).

The TWPC has been identifying PCBs during waste repackaging on the *Contact Handled Waste Repackaging Data Form* since December 2010. Beginning in June 2012, known or suspect PCB materials discovered during waste repackaging were segregated from the waste to the extent possible with the exception of PCB Bulk Product waste items. Since April 2014, the TWPC has been absorbing known and suspect PCB liquids with Nochar Petro Bond N910 and returning the absorbed PCB liquid to the repackaged daughter container (References M073, M268, P254, P592, P598, P993, and P1433).

Drums found to contain pumps (with or without oil), small capacitors contained in electric motors and light ballasts, or other potential PCB-containing items during RTR or VE will be managed in accordance with the CCP TRU Waste Certification Program (References 5 and 8).

5.4.4 Prohibited Items

According to TRU waste packaging procedures for Building 7920, liquids were removed from the waste or absorbed onto a solid such as vermiculite, and semi-liquid waste forms such as a sludge were immobilized (e.g., grouted). Procedures also required the emptying and puncturing of spray cans, and indicate pyrophorics and explosives were not used in established glovebox or hot cell operations. These materials have been prohibited by procedure since at least 1988 (References P240 and P263).

Since this waste stream dates back earlier than 1988, it is suspected that un-punctured spray cans may be present in some of the drums. It is unlikely that TRU waste from Building 7920 generated prior to 1988 contains process liquids because waste liquids were disposed into the process drain or intermediate level waste drains for treatment or storage (References P161, P279, and U011). However, small amounts of liquids (e.g., in spray cans) could be present. As indicated in Table 5-8, some drums in this waste stream may contain internal payload container shielding (e.g., lead pigs).

A review of UCN-2109 forms for waste generated since the mid-1990s indicate that prohibited items, including liquids, pyrophorics, explosives, and sealed container greater than 4 liters are not present (Reference M005). However, as described in Section 5.5 below, sealed containers greater than 4 liters will be present in waste generated before this date. Metal hose clamps may have been used as a supplemental sealing devise for plastic bags that were closed by the twist and tape method (Reference P905). This is not an acceptable closure method. Heat-sealing is the preferred closure method for waste bagged out of a glovebox (References P240, P263, P986, and P988). Unvented plastic waste bags heat-sealed on both ends may have a surface area less than 390 square inches which is prohibited if the bag is also greater than four liters fully expanded. Since it is not known which drums may contain unvented prohibited heat-sealed bags, all of the waste from Building 7920 generated before 2010 will be

repackaged (Reference C311). Since 2010, if the plastic bags are heat-sealed, the bag is less than four liters internal volume (fully expanded) or contains a WIPP-approved filter vent or has a minimum surface area of 390 square inches if the internal volume (fully expanded) is greater than four liters (References M005, P986, P987, and P988).

One container (X10C9307231) is identified as containing a lithium battery which ORNL assigned EPA hazardous waste number D003 (reactive). The lithium battery will be examined to determine the type and size battery and removed if determined to be reactive (References M005, M244, P254, and P1438).

Certified RTR and/or VE are performed by CCP to ensure the waste does not contain prohibited items in accordance with the WIPP-WAC and WIPP-WAP (Reference 2 and 5). Prohibited items are remediated or removed from the waste stream as necessary by TWPC personnel (References P254, P587, P598, P599, P1434, and P1435).

5.5 Waste Packaging

Several inner packaging configurations may be present, including plastic bags, small cardboard ice-cream cartons, one-gallon paint cans, 1.5-gallon metal cans, and 2- or 3-gallon plastic buckets (References C098, C103, C148, P093, P263, and P989). The 1.5-gallon metal cans were slip-lid cans. Tape was wrapped around the sealing surface of the lid, but the lid has a hole in it (References C148, P240). The plastic bucket lids were heat sealed until the late-1990s; however, a hole was punctured in the lid starting in the mid-1990s. Beginning in the late-1990s, the bucket lids were snapped in place, not heat-sealed (References C098, P161, and P240). The metal cans and plastic buckets that are not heat-sealed were placed in plastic bags and sealed with tape or into draw-string plastic bags. Hot cell waste items too large to fit into a waste bucket are loaded directly into draw-string plastic bags. The draw-string bags are then cinched tight and tied (References C148, P093, and P989). Waste placed into plastic bags may be heat-sealed or sealed with tape, but heat-sealing is the preferred method for waste removed from a glovebox. Since 2010, if the plastic bags are heat-sealed, the bag is less than four liters internal volume (fully expanded), contains WIPP-approved filter vent, or has a minimum surface area of 390 square inches if internal volume (fully expanded) is greater than four liters (References C311, P240, P263, P986, P987, P988, P989, and P990). The CH-TRU waste packages were placed into 55-gallon drums. The drums were lined with a single poly drum liner bag; lead and plastic rigid liners were not used. Drum liners may or may not be sealed with tape (References C148 and P263).

DOT specification 7A Type A 55-gallon drums are used for waste packaging and repackaging at the TWPC (Reference P256). Drums are lined with a cardboard liner inside a filtered 6-mil poly liner bag; lead and plastic rigid liners are not used (Reference M073). When a drum is ready to be closed, the liner bag is twisted, and a plastic cable tie wrap is wrapped around the twisted section and tightened using a banding tool. Additional tape is then wrapped around the twisted section (References P251, P252, P253, P254, P256, P432, P585, P586, and P589). Hydrogen

diffusion rate testing of cable tie wraps indicates that they are an acceptable closure method (References 12, P276).

Occasionally waste initially repackaged in the TWCP as RH waste will have a measured surface dose rate less than 200 mR/hr, and the waste must be transferred to a 55-gallon drum designated for CH-TRU waste. Waste anticipated to be RH-TRU waste is initially repackaged into 55-gallon drums lined with a polypropylene open top lifting sack fitted with standing lift loops. This polypropylene lifting sack may also include a cardboard form insert. The lifting sack facilitates moving the repackaged waste from the RH drum to a drum designated for CH waste. When waste is moved from an RH drum to a CH drum, the open top lifting sack and cardboard insert become part of the CH waste (Reference M170).

Waste materials identified during the repackaging of this waste stream with surface dose rates greater than 200 mR/hr or high radioactivity may be repackaged into 55-gallon drums containing standard POCs and shipped as CH-TRU waste as long as the payload container meets the surface dose rate and activity limits as required in the CH-TRAMPAC. The standard POC consists of a pipe component centered in a DOT specification 7A Type A 55-gallon drum using dunnage consisting of fiberboard and/or plywood spacers within a rigid polytheylene liner. The POC is stainless steel cylindrical pipe with a bolted stainless steel lid sealed with an O-ring and is equipped with a manufacturer installed filter vent. The pipe component lid is secured with bolts, the rigid liner lid (which includes a vent hole) is snapped into place, and the drum lid is installed (References 15 and P1430).

5.5.1 Drum Filter Vents

ORNL began installing filter vents in new drums in 1988 (Reference P241). For drums generated before 1988, filter vents were installed at ORNL prior to being transferred to the TWPC. Drums being repackaged at the TWPC will be vented at the time of repackaging (References M073 and P254). Regardless of whether the drum is repackaged, each container will be inspected by CCP for the presence of an approved filter vent.

5.5.2 Layers of Confinement

Based on the above packaging description, the maximum number of confinement layers is three. A review of UCN-2109 forms indicates that the maximum number of confinement layers is also three; however, most of the UCN-2109 forms indicate two layers and some with one layer (Reference M005). Repackaging data forms indicate either one or two layers of confinement (Reference M073).

6.0 CONTAINER SPECIFIC INFORMATION

The primary forms completed by ORNL waste generators were the UCN-2109 and UCN-2822. The UCN-2822 is the predecessor to the UCN-2109 which has been in use since about 1993. The UCN-2109 has changed several times since its inception (Reference M005). The types of information included on these forms is as follows:

Form UCN-2822

- Container number
- Generation date
- Origin of waste (building)
- Total volume and combustible volume (cubic feet)
- Weight
- Waste type code
- Container type
- Radiological data
- Waste description

Form UCN-2109

- Container number
- Origin date
- Origin facility (building)
- Origin room/area
- Container type
- Waste description
- Radiological data
- Prohibited items
- Heat-sealed bags
- Ion-exchange resins
- Beryllium
- Combustible material
- Layers of confinement
- Sealing method
- EPA hazardous waste numbers

In accordance with procedure CCP-TP-005 (Reference 1), a CCP Waste Containers List (Attachment 8 of the procedure) is completed and maintained as a quality record for waste tracking purposes. Information tracked includes container identification number, waste stream number, and the closure date for each container.

7.0 REFERENCES

1. CCP-TP-005, *CCP Acceptable Knowledge Documentation*, Carlsbad, New Mexico, Nuclear Waste Partnership LLC.

2. *Waste Isolation Pilot Plant Hazardous Waste Facility Permit, Waste Analysis Plan,* New Mexico Environment Department, Santa Fe, New Mexico

3. CCP-PO-001, *CCP Transuranic Waste Characterization Quality Assurance Project Plan*, Carlsbad, New Mexico, Nuclear Waste Partnership, LLC.

4. DOE/LLW-217, *DOE Waste Treatability Group Guidance*, Idaho Falls, Idaho, INEL-Lockheed Idaho Technologies

5. DOE/WIPP-02-3122, *Transuranic Waste Acceptance Criteria for the Waste Isolation Pilot Plant*, Carlsbad, New Mexico, U.S. Department of Energy Carlsbad Field Office

6. Public Law 102-579, *Waste Isolation Pilot Plant Land Withdrawal Act*, October 30, 1992 as amended by Public Law 104-201

7. 42 U.S.C 10101, *Nuclear Waste Policy Act of 1982*, U.S. Congress

8. CCP-PO-002, *CCP Transuranic Waste Certification Plan,* Carlsbad, New Mexico, Nuclear Waste Partnership, LLC.

9. DOE/TRU-14-3425, *Annual Transuranic Waste Inventory Report (ATWIR)* – 2014

10. McCoy and Associates, Inc. 2002. McCoy's RCRA *Unraveled.* Second Edition

11. 40 CFR Part 261, *Identification and Listing of Hazardous Waste*, U.S. EPA

12. *CH-TRU Payload Appendices*, Waste Isolation Pilot Plant, Carlsbad, New Mexico

13. CCP-AK-ORNL-500, *Central Characterization Program Acceptable Knowledge Summary Report For Oak Ridge National Laboratory Radiochemical Engineering Development Center Remote-Handled Transuranic Waste, Waste Stream: OR-REDC-RH-HET*

14. CCP-AK-ORNL-501, *Central Characterization Program Remote Handled Transuranic Radiological Characterization Technical Report For Remote-Handled Transuranic Waste From Oak Ridge National Laboratory Radiochemical Engineering Development Center, Waste Stream: OR-REDC-RH-HET*

15. CCP-PO-003, *CCP Transuranic Authorized Methods for Payload Control (*CCP CH-TRAMPAC), Carlsbad, New Mexico, Nuclear Waste Partnership, LLC.

16. 40 CFR, Part 761, *Polychlorinated Biphenyls (PCBs) Manufacturing, Processing, Distribution in Commerce, and Use Prohibitions*

17. 49 CFR, Part 173, *Shippers – General Requirements for Shipments and Packagings*

18. CCP-AK-BAPL-500, *Central Characterization Project Acceptable Knowledge Summary Report For Bettis Laboratory Remote-Handled Transuranic Debris Waste, Waste Stream: BT-T001*

8.0 AK SOURCE DOCUMENTS

Document Number	Title
C078	Memo to Bryan Roy transmitting Historical Survey – RCRA Information
C098	Interview with Wayne Evans: Waste management practices at REDC (Buildings 7920 and 7930)
C103	Memo to distribution re: Seal out buckets used at REDC
C148	Interviews of REDC Personnel
C160	E-mail from Kevin East to Don Coffey re: Hot Cell Clean Up Drums
C172	Miscellaneous Correspondence Regarding Testing of Nochar Absorbents
C173	Email Correspondence Regarding TWPC Glovebox Decon
C174	E-mail from Don Coffey, Subject: 7920 TRU Waste (REDC Timeline)
C176	E-mail from Don Coffey, Subject: 7920 TRU Waste (Dresden LWR fuel)
C302	ORNL Comments on CCP-AK-ORNL-500, Rev. 0, Draft D
C306	Email: re: Additional Info for Current Research Activities at REDC
C307	Interview of Walt Bond. Subject: Processes and Waste in Building 3508 at ORNL
C308	Interview of Jason Taylor ORNL-PCB Coordinator from 1997 – 2004 re: PCB Management at ORNL
C311	Interview of Don Coffey and Wayne Evans. Subject: Heat-Sealed Bags Used at REDC.
C600	Interviews with Don Coffey and Wayne Evans re: REDC RH Waste Cask Packaging Clarification and Swipe Sample Collection
DR003	Discrepancy Resolution, re: Generation Location Discrepancies
DR004	Discrepancy Resolution, re: Radiological Discrepancies
DR005	Discrepancy Resolution, re: EPA Hazardous Waste Number Discrepancies
DR008	Discrepancy Resolution, re: Follow-up on DR602 for EPA Hazardous Waste Number Discrepancies (REDC Waste)
DR009	Discrepancy Resolution, re: Waste Incidental to Reprocessing Determination
DR027	Discrepancy Resolution, re: AK Re-Evaluation for Two Most Prevalent Radionuclides
DR601	Discrepancy Resolution, re: Presence of Debris Items in Poly Blocks
DR602	Discrepancy Resolution, re: Follow-up on DR005 for EPA Hazardous Waste Number Discrepancies
I022	DOE Order 435.1, Radioactive Waste Management
I023	Radioactive Waste Management Manual
I044	Re-Evaluation of the Radiological Data for Legacy CH TRU Waste from REDC Building 7920

Document Number	Title
M001	Review by Charles Roberts of REDC Maintenance and Operational Log Books
M005	Container Paperwork and UNC-2109 Forms for ORNL Waste Drums for REDC CH Waste
M022	Collection of MSDS for REDC CH and RH Waste
M023	Defense Determination for REDC Heterogeneous Debris
M024	RH EM Waste Database Query
M072	Evaluation of Additional Drums for Waste Stream OR-REDC-CH-HET
M073	TWPC Contact Handled Waste Repackaging Data Forms for Building 7920 Waste
M074	UCN-2109 Forms and Related Container Paperwork for Building 7920 Waste Packaged in Boxes
M100	Container Paperwork for containers in Waste Stream OR-REDC-RH-HET (UCN-2109)
M110	EM Waste Database Query
M155	Evaluation of Additional Drums for Waste Stream OR-REDC-CH-HET
M170	Drawings and Specifications for Geotextile Drum Liners with Standing Lift Loops
M241	Information for containers X10CSATN02077 and X10CSATN02229
M244	UCOR TRU Database
M245	TWPC Database
M251	Global Nuclear Energy Partnership, GNEP And The Globalization Of Nuclear Energy
M252	Global Nuclear Energy Partnership, Research and Development Program
M253	Unreviewed Safety Question Determination (USQD) Change Package, Radiochemical Engineering Development Center (REDC) Building 7920, New Work Plan No. Voloxidation Campaign 1
M254	Unreviewed Safety Question Determination (USQD) Change Package, Radiochemical Engineering Development Center (REDC) Building 7920, Fission Product Extraction (FPEX) Process Solvent Extraction Development Studies
M255	Research Safety Summary, REDC Shielded Cave Operations
M256	Research Safety Summary, REDC Development Laboratory Operations – Lab 209
M257	Research Safety Summary, REDC Development Laboratory Operations – Lab 211
M258	Research Safety Summary, Building 7920 – General Use of Modified Direct Denitration and Powder Characterization Systems
M259	Research Safety Summary, Radioisotope Power Source Development
M260	Research Safety Summary, Processing of Ni-63
M261	Research Safety Summary, HKED Calibration Standard Sample Preparation
M262	Research Safety Summary, Laboratory 111 General Supporting Activities

Document Number	Title
M263	Research Safety Summary, Voloxidation Studies
M264	Research Safety Summary, Preparation of TRU Solutions for the Internal Gelation Process
M265	Research Safety Summary, Target Fabrication for the Pu-238 Project – Pellet Production
M266	Research Safety Summary, Anion Exchange Purification of Radionuclides by Acidified Alcohol Solution
M267	Waste Characterization Checklist (WCC), Debris from Np-237 Pellet Production
M268	Approval for the Storage and Processing of Liquid Polychlorinated Biphenyls Containing Transuranic Radionuclides; Cover Letter from G. Alan Farmer to Robert C. McKay
M270	The Plutonium-238 Supply Project, Presented to 18th Symposium on Separations Science Technology
M278	New Pig WypAll X80 Wipers used at the TWPC
P014	Inventory of ORNL Remedial Action Sites: 11. Research Laboratories
P016	Solvent Extraction Studies with High-Burnup Fast Flux Test Facility Fuel in the Solvent Extraction Test Facility
P020	Chemical Technology Division Annual Progress Report Period Ending March 31, 1979
P021	Chemical Technology Division Progress Report for the Period April 1, 1981 to March 31, 1983
P030	Chemical Technology Division Transuranium Processing Plant Semiannual Report of Production, Status, and Plans for Period Ending June 30, 1968
P058	Statistical Analysis of Radiochemical Measurements of TRU Radionuclides in REDC Waste
P093	Characterization of ORNL Transuranic Waste from the Measurement of Fission and Activation Products
P098	Chemical Technology Division Annual Progress Report, for the Period April 1, 1979 to March 31, 1981
P110	Chemical Technology Division Annual Progress Report for Period Ending March 31, 1972
P114	Chemical Technology Division Annual Progress Report for Period Ending March 31, 1971
P125	Remote-Handled Transuranic Solid Waste Characterization Study: Oak Ridge National Laboratory
P136	Chemical Technology Division Annual Progress Report for Period Ending May 31, 1967
P145	Chemical Technology Division Annual Progress Report for Period Ending May 31, 1970
P151	Chemical Technology Division Annual Progress Report for Period Ending May 31, 1973
P160	Chemical Technology Division Annual Progress Report; Period Ending March 31, 1977
P161	Safety Analysis Report Radiochemical Engineering Development Center Building 7920
P164	Chemical Technology Division Annual Progress Report; Period Ending March 31, 1976
P173	Solvent Extraction Studies of Coprocessing Flowsheets – Results from Campaigns 3 and 4 of the Solvent Extraction Test Facility (SETF)
P223	Chemical Technology Division Annual Progress Report for Period Ending May 31, 1969

Document Number	Title
P229	*Solvent Extraction Studies of Coprocessing Flowsheets – Results from Campaigns 1 and 2 of the Solvent* Extraction Test Facility (SETF)
P240	Certification, Packaging, and Disposition of Contact-Handled Transuranic (CH-TRU) Waste At the Radiochemical Engineering Development Center (REDC)
P241	Oak Ridge National Laboratory Contact-Handled Transuranic Waste Certification Program Plan
P242	Oak Ridge National Laboratory Contact-Handled Transuranic Waste Certification Program Plan
P244	Certification Document for Newly Generated Contact-Handled Transuranic Waste
P251	Box Breakdown Area Operations
P252	Glove Box Operations
P253	Drum Bag In/Bag Out and Glove Ports
P254	Contact-Handled Waste Repackaging
P255	Contact-Handled Waste Acceptance Criteria
P256	TRU/Alpha Low Level Waste (LLW) Treatment Project Documented Safety Analysis
P258	Production, Distribution, and Applications of Californium-252 Neutron Sources
P263	TRU Operating Manual and Supporting Documentation
P272	Oak Ridge National Laboratory Waste Management Plan
P276	Determination of H2 Diffusion Rates through Various Closures on TRU Waste Bag-Out Bags
P279	Safety Analysis for the Transuranium Processing Plant, Building 7920
P281	Californium-252: A Remarkable Versatile Radioisotope
P282	Gross Alpha Activity Measurements
P432	TRU Waste Processing Center Document Safety Analysis
P482	Summary of the Campaign During February 1969 to Process Six Irradiated HFIR Targets in the Transuranium Processing Plant
P500	Iodox Process Tests in a Transuranium Element Production Campaign
P566	ORNL Health Physics Manual
P569	Implementation Plan for U.S. Department of Energy Order 435.1, U.S. Department of Energy-Oak Ridge Operations, Oak Ridge, Tennessee
P582	PCB Decontamination
P583	Cask Processing Enclosure Operations
P584	Hot Cell Operations
P585	Remote Handled Drum In/Out Operations

Document Number	Title
P586	Cask Processing Enclosure Drum-In / Drum-Out
P587	Energetic Materials Management
P588	Box Breakdown Area Material Handling Recipes
P589	Glove Ports and Sleeve Transfers
P590	Liquids Handling in the Hot Cell
P591	Liquids Handling in the Cask Processing Enclosure
P592	Absorbing Liquids in the Glovebox and Box Breakdown Area
P597	Remote Handled Waste Acceptance Criteria
P598	Operations Prohibited Item Processing
P599	Non-Compliant Containers
P787	Conversion of NH499TcO4 to H99TcO4 & Synthesis of (C2H5) 4N99TcO4
P801	Removal of Chomium by Solvent Extraction
P804	Actinide Product Finishing/Special Projects Procedure: Actinide/Lanthanide Separation by Extraction Chromatography
P819	Actinide Product Finishing/Special Projects Procedure: Actinide/Lanthanide Separation Studies for the Advanced Fuel Cycle Initiative
P820	Actinide Product Finishing/Special Projects Procedure: Preparation of Chemical Reagents
P826	Actinide Product Finishing/Special Projects Procedure: Fission Product Removal by Alcoholic-HCl Ion Exchange
P827	Actinide Product Finishing/Special Projects Procedure: Organic Scrub of the Berkelium (Bk) Product from the Berkex Process
P851	Hot Cell Experimental Procedure
P905	Health Physics Procedure - Handling and Transfer of Radioactive Materials within the Laboratory and Guide for the Transfer of Materials Between Contaminated Enclosure Systems and Non-Contaminated Areas
P917	Procedure 5.1 - Segregation and Management of solid Radioactive Waste Materials and supporting Solid Waste Management Documentation
P952	Global Nuclear Energy Partnership Technology Development Plan
P980	Safety Basis Supplement for the Processing of Bettis PuBe Neutron Sources
P981	U.S. Department of Energy Office of Inspector General Office of Audit Services, Audit Report, Plutonium-238 Production
P982	The GNEP Coupled End-to-End (CETE) Research, Development, and Demonstration Project: Overview of the CETE Testbed Capabilities and Operations
P983	Plutonium and Neptunium Conversion Using Modified Direct Denitration
P984	Lab-Scale Demonstration of the UREX+1a Process Using Spent Fuel
P985	Development of the UREX+ Co-Decontamination Solvent Extraction Process

Document Number	Title
P986	Glove Box Operations
P987	Glove Box Operations
P988	CH-TRU Waste Handling at Building 7920
P989	RH-TRU Waste Handling in Building 7920 Cell Bank
P990	Bag-Out Procedure for the Transfer and Decontamination Facility
P991	Disposal of Waste Solutions
P992	[CLEANEX] Waste Organic Cleanout
P993	Transuranic Waste Processing Center, Risk-Based Disposal Approval Request for PCBs Contaminated with Radioisotopes at the TWPC
P1100	PCB Annual Report for Oak Ridge National Laboratory – 1986
P1101	PCB Annual Report for Oak Ridge National Laboratory – 1987
P1102	PCB Annual Report for ORNL – 1988
P1103	PCB Annual Report for Oak Ridge National Laboratory – January 1, 1989-February 5, 1990
P1104	PCB Annual Report for Oak Ridge National Laboratory – January 1, 1991-December 31, 1991
P1105	PCB Annual Report for Oak Ridge National Laboratory – February 6, 1990-December 31, 1990
P1106	PCB Annual Report for Oak Ridge National Laboratory – 1982
P1107	PCB Annual Report for Oak Ridge National Laboratory – 1983
P1108	PCB Annual Report for Oak Ridge National Laboratory – 1984
P1109	PCB Annual Report for Oak Ridge National Laboratory – 1985
P1112	Radioactive Solid Waste Operations Manual
P1116	EnergX TRU Waste Processing Center Procedure: Absorbing Liquids
P1427	Cleanup of TMI-2 Demineralizer Resins
P1428	Evaluation of the Submerged Demineralizer System (SDS) Flowsheet for Decontamination of High-Activity-Level Water at the Three Mile Island Unit 2 Nuclear Power System
P1430	Pipe Overpack Container Operations
P1433	Environmental Permits and Compliance
P1434	Energetic Material Program
P1435	Remote Handled Waste Container Selection Process
P1436	[PuBe Neutron Sources] Grouting Liquid Waste Solutions

Document Number	Title
P1437	[PuBe Neutron Sources] Neutralization of Liquid Waste Solutions
P1438	Identification of Potential Unanalyzed Materials
P1439	Standard Operating Procedure for Assisting Generators with Waste and Excess Materials
P1440	The Pu-238 Supply Project, Pacific Basin Nuclear Conference
P1441	Analytical Report for Destructive Analyses of MOX Spent Fuel Specimens
P1442	Mixed Oxide Fuel Prepared with Weapons-Derived Plutonium: Test Irradiations Summary and Preliminary LTA PIE Results
U011	Safety Analysis: Transuranium Processing Plant, Building 7920
U038	ORNL TRU Waste Historical Survey; Volumes 1, 2, and 3 - Origins and Characteristics of Remote-Handled Transuranic Wastes (Trabalka report) Plus Appendices
U039	Oak Ridge Reservation Transuranic Waste Acceptable Knowledge Summary Report for the Radiochemical Engineering Development Center: Newly Generated Contact-Handled Transuranic Waste from Isotope Production
U041	Waste Stream Profile Sheet for 7920-HCAL-007R1 and Supporting Documentation
U045	Waste Stream Profile Sheet for Building 7920, Hot Cells and Analytical Labs
U046	RH Debris Waste Process Flow Descriptions
U105	Waste Stream Profile Sheet for Building 7920, Room 211, Waste Stream 7920-R211-001
U106	Waste Stream Profile Sheet for Building 7920, Room 108, Waste Stream 7920-R108-001 and 7920-R109-001R1
U107	Waste Stream Profile Sheet for Building 7920, Room 111, ORNL Waste Stream 7920-R111-001, and Radiological Characterization of waste from Building 7920 - Room 111 "Shielded 7920-R111 Caves, A and B"
U108	Waste Stream Profile Sheet for Building 7920, Room 109, ORNL Waste Stream 7920-R109-002
U109	Waste Stream Profile Sheet for Building 7920, Room 211, ORNL Waste Stream 7920-R211-002
U110	Data Quality Objectives (DQO) Worksheet for Building 7920, Labs 209 and 211
U111	Radiological Characterization and Quantification of Waste under WSPS REDC-001 using Microshield
U124	Contamination Control Plan for Hot Cell (TWPC Hot Cell)
U125	Maintenance Work Control, Attachment C: Maintenance Work Order #CM-10-003
U126	Maintenance Work Control, Attachment C: Maintenance Work Order #CM-10-100
U127	Radiological Quantification of Debris Waste Generated at REDC from Hot Cell and Facility Operations
U128	Radiological Quantification of Waste Generated at Building 7920 Room 216 from Glovebox Operations
U129	Evaluation of Glovebox Radio-Chemical Analytical Smear Data used to Support REDC Waste Disposal
U130	Radiological Quantification of Waste Generated at Building 7920 Lab 209 from Glovebox Operations
U131	Radiological Quantification of Waste Generated at Building 7920 Lab 211 from Glovebox Operations

Document Number	Title
U132	Radiological Quantification of Waste Generated at REDC from Np-237 Pellet Production Operations
U133	Radiological Quantification of Waste Generated at Building 7920 Lab 109 from Operations Conducted in the CETE Gloveboxes
U403	Log Book: Cave A Liner Replacement Activities
U412	Logbook Reference 6R1 - Cf-252 Electrodeposition Processing - Initial CX, TEVA, and Final CX Purifications (REDC Bldg 7920)
U425	ORNL Technical Notebook No. A-106985-G - Milt Lloyd; Susan North
U429	Unclassified Notebook A-6271: Building 7920, O.K. Tallent
U432	O.K. Tallent Logbook A-106981-G Transferred to Milt Lloyd (Chem Tech Division, Building 7920), Dated 09/14/1994 (Solvent Extraction, etc.)
U435	ORNL Technical Notebook A-106991-G, Milt Lloyd, Building 7920 Chem Tech Division, Solvent Extraction
U436	Unclassified Notebook No. A-6227, Milt Lloyd, Building 7920 Chem Tech Division
U437	ORNL Technical Notebook No. A-106992-G, Milt Lloyd and Susan North Lewis, Building 7920
U453	ORNL Technical Notebook No. A106984-G, Milt Lloyd, Jeff Wade, O.K. Tallent, Chem Technology Division, Bldg 7920, Solvent Extraction
U477	ORNL Technical Notebook No. A-105094; Building 7920; REDC - Curtis Porter
U478	ORNL Technical Notebook No. A-102161; Chemical Technology / Finished Products / J. T. Wiggens
U482	TURF Logbook 16L4; Building 7930; M. E. Littleton
U489	Curtis Porter; Building 7920; Chemical Technology Division
U501	Logbook: G. A. West; C. E. Roberts; H. C. Thompson; 1/4/1972; Bldg 7920 Waste Logbook
U505	Lab Notebook: RE-2 - Analytical Chemistry Division – Charles Alexander - Building 7920
U506	Research & Technical Notebook No. Te-1 – Chemical Technology Division - Building 7920 - Charles (Chuck) Alexander - A-107733-G
U507	Research & Technical Notebook – Notebook No.(SM-1) A-107736-G - Building 7920, MS 6384 - Charles Alexander
U508	Lab Notebook 21/150/REC Building 7920 – Charles (Chuck) Alexander
U529	Technical Notebook – Charles Alexander, Building 7920.
U531	Logbook - Building 7920 – TRU Maintenance and Waste Disposal - 02/05/1979
U533	Logbook #9 - Building 7920 – 07/1968 thru 01/1969
U537	Logbook - Building 7920 - 11/1982 thru 08/1984 - Waste Logbook
U543	Logbook – Buildings 7920 and 7930 - 06/1985 thru 09/1986 - Waste Logbook
U545	Logbook – Building 7920 - 11/1967 thru 12/1974 - Building Maintenance
U568	*Coupled End-to-End Demonstration Project Task Sheets – Separations*

Document Number	Title
U647	Issue Paper: Does Oak Ridge Have High-Level Waste (HLW)?

Figure 1. Map of Oak Ridge National Laboratory

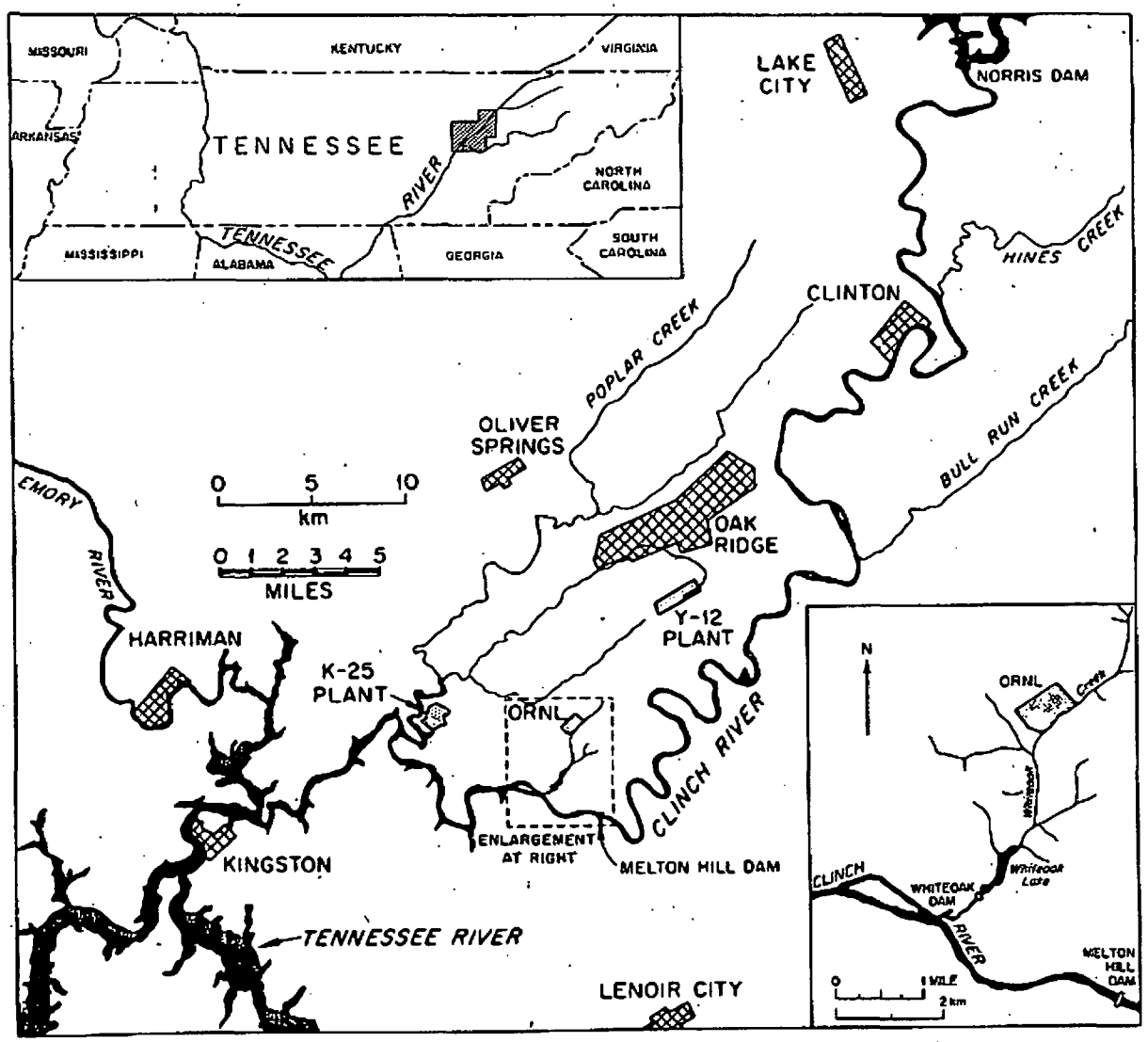


Figure 2. Map of Radiochemical Engineering Development Center, Transuranic Waste Processing Center, and Solid Waste Storage Areas

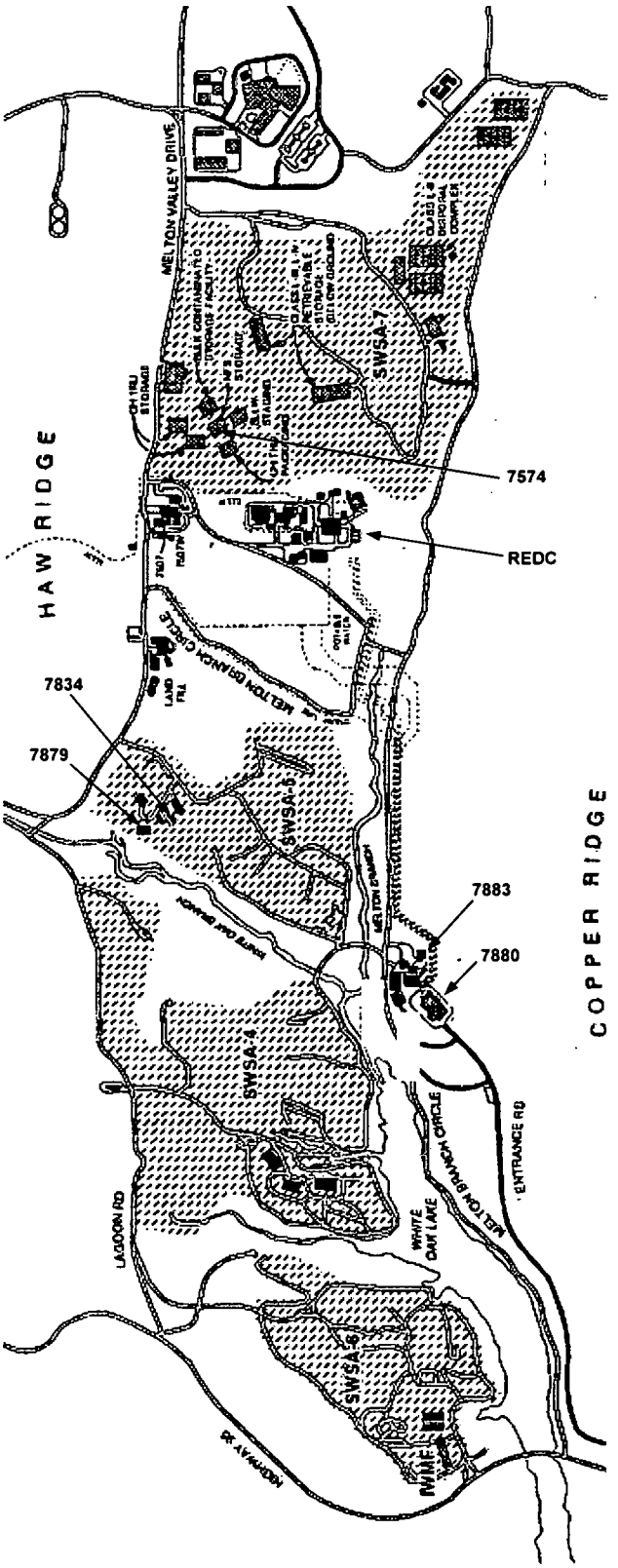


Figure 3. Site Layout for the Transuranic Waste Processing Center

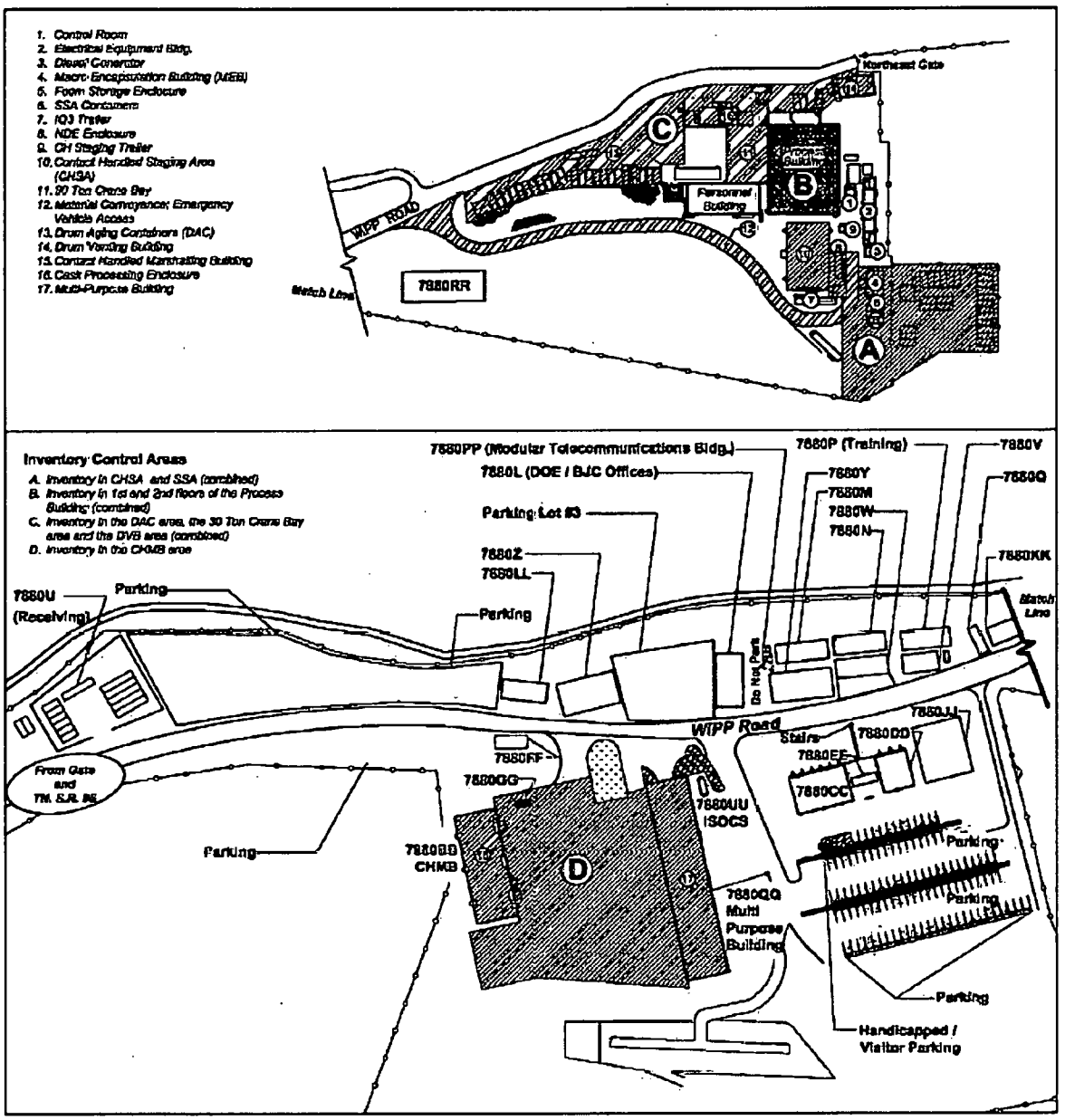


Figure 4. Location of Building 7920

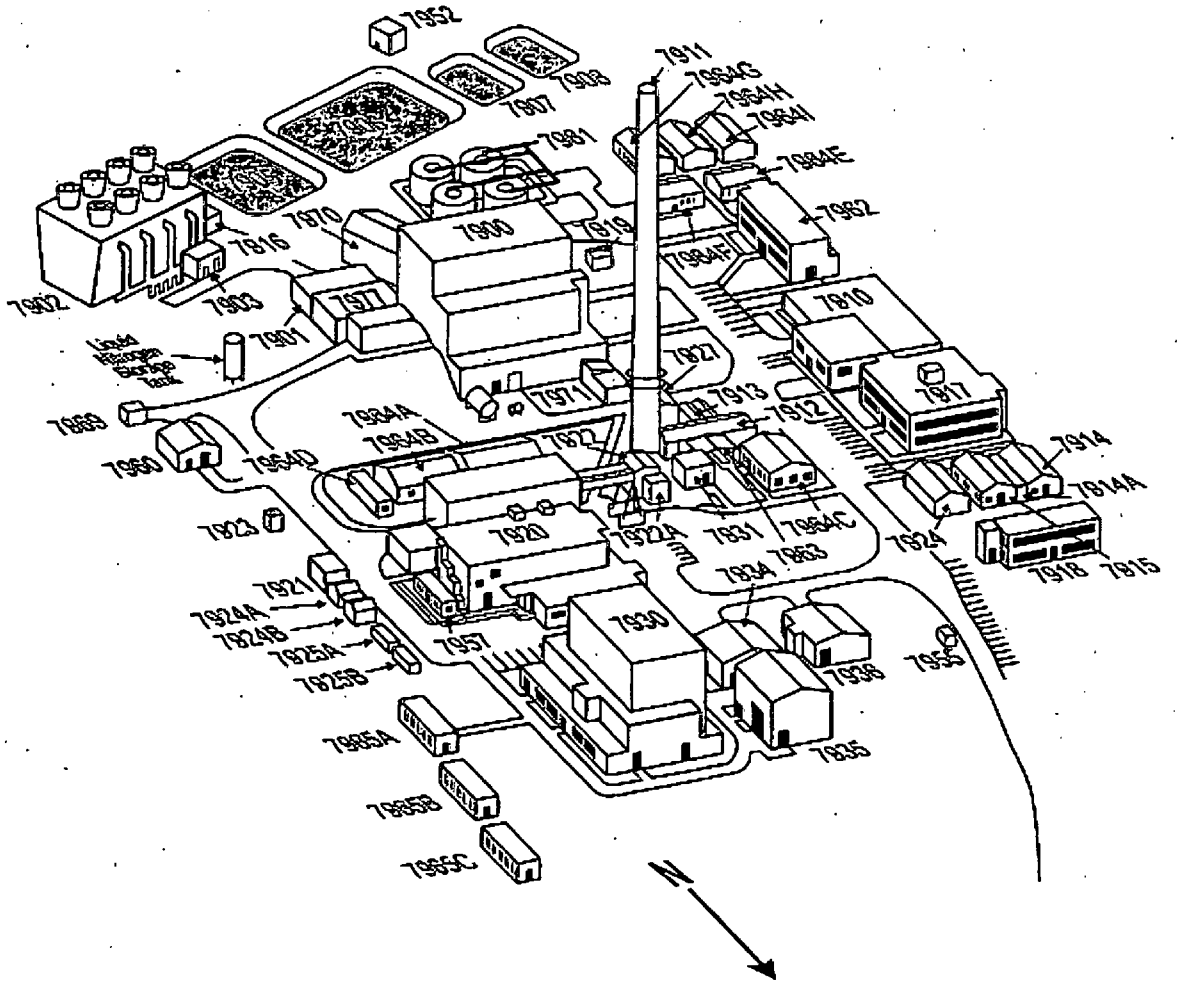


Figure 5. Building 7920 First Floor

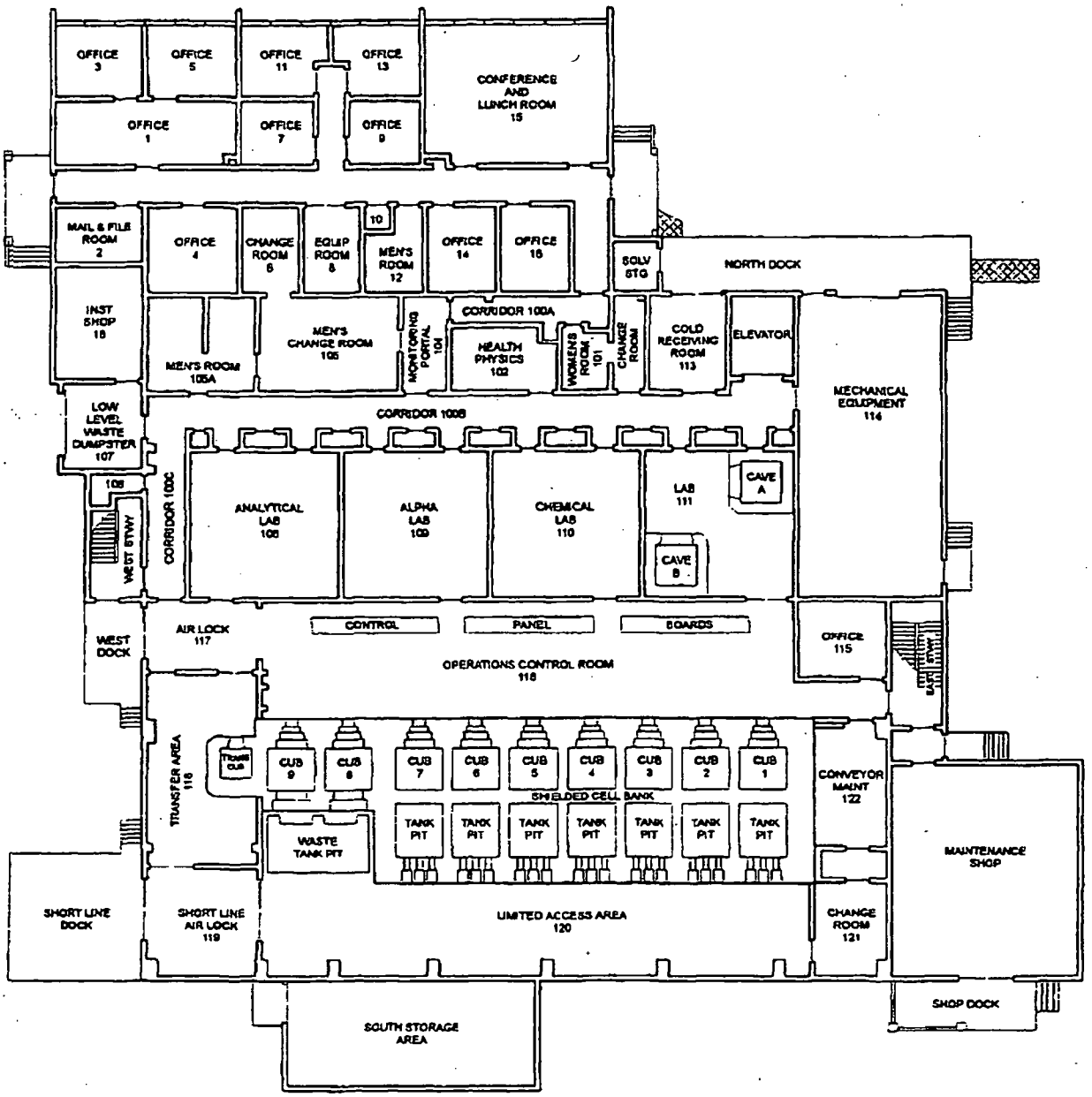


Figure 6. Building 7920 Second Floor

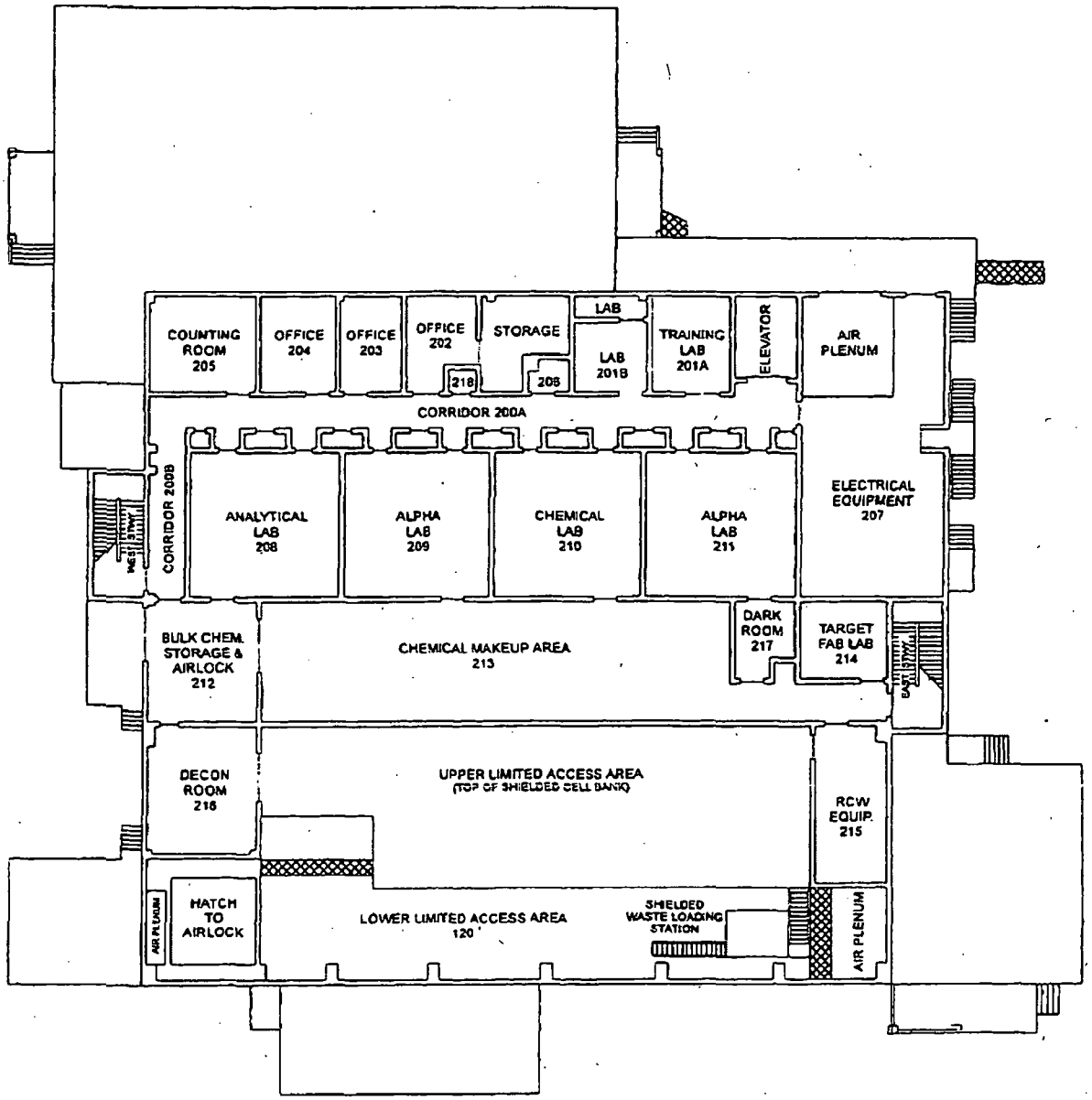


Figure 7. Building 7920 Hot Cell Bank

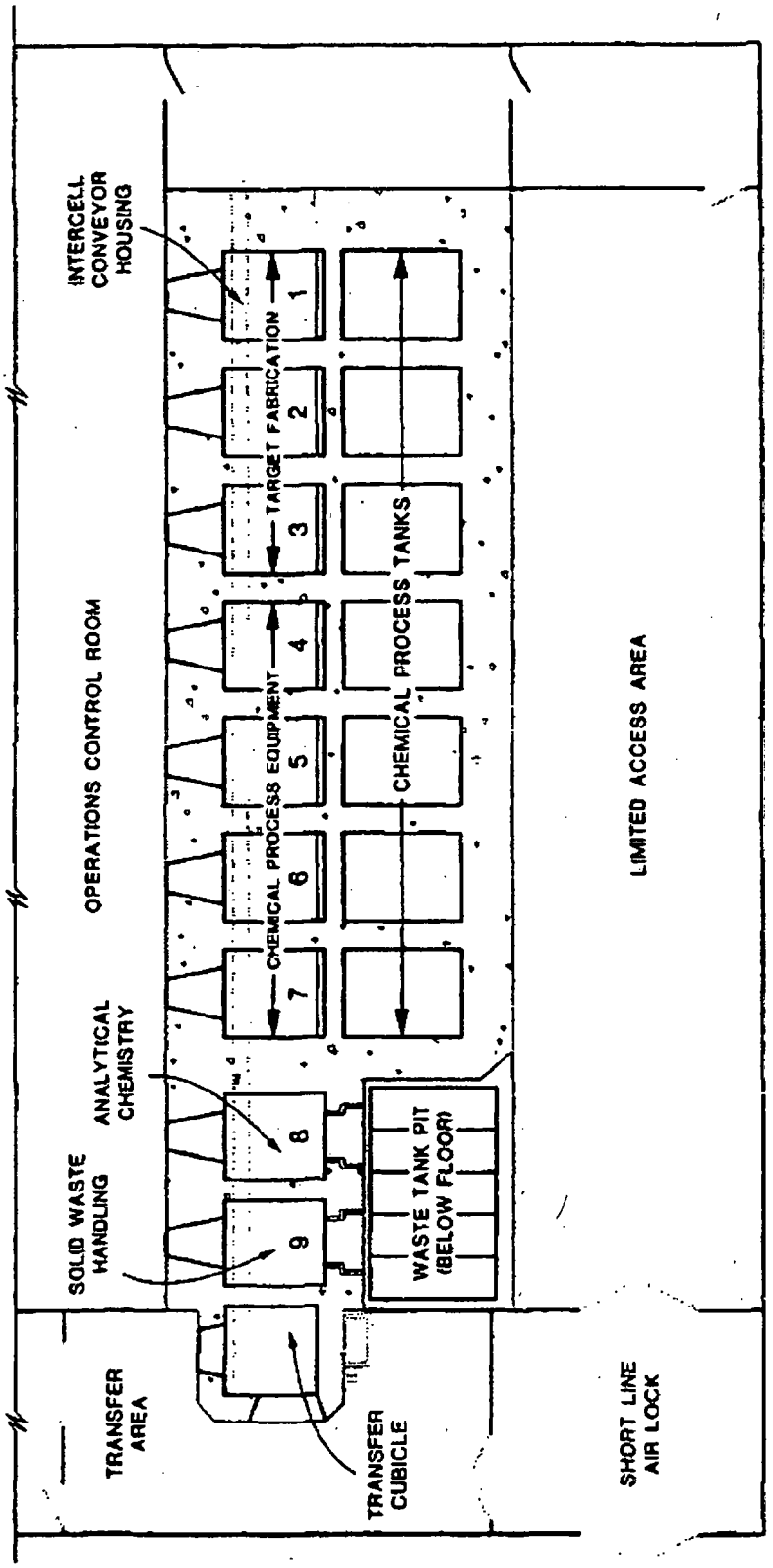


Figure 8. Building 7920 Hot Cell Bank – Cubicle Cross Section

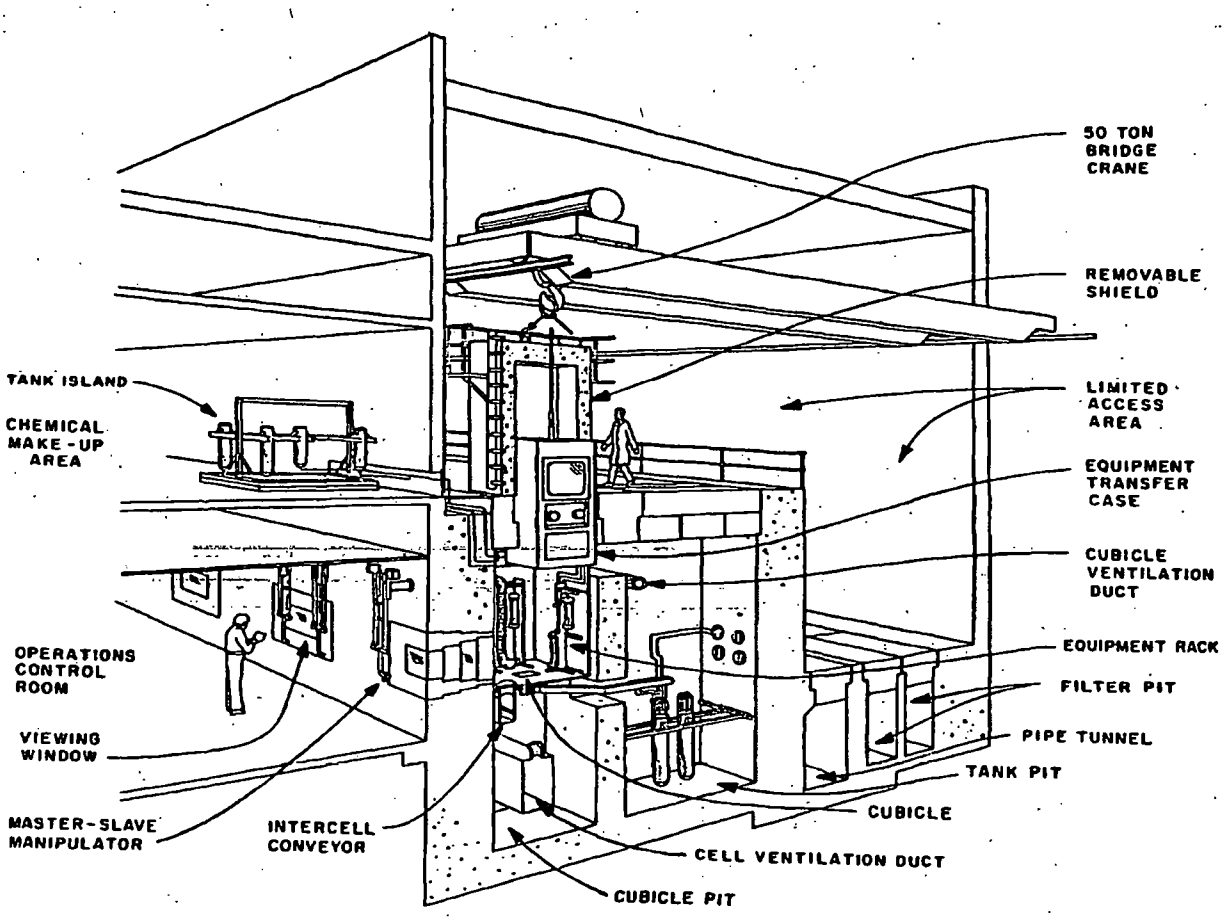


Figure 9. Sheilded Transfer Carrier (Mule) and Transfer Area Cubicle

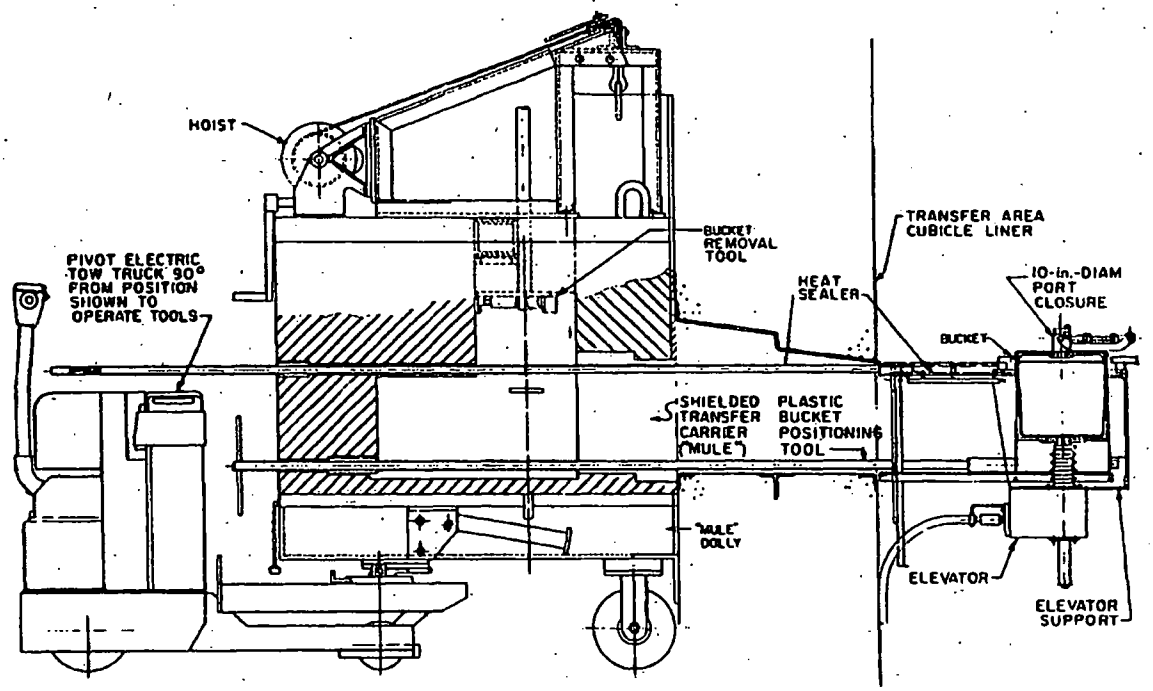


Figure 10. Decontamination Glovebox

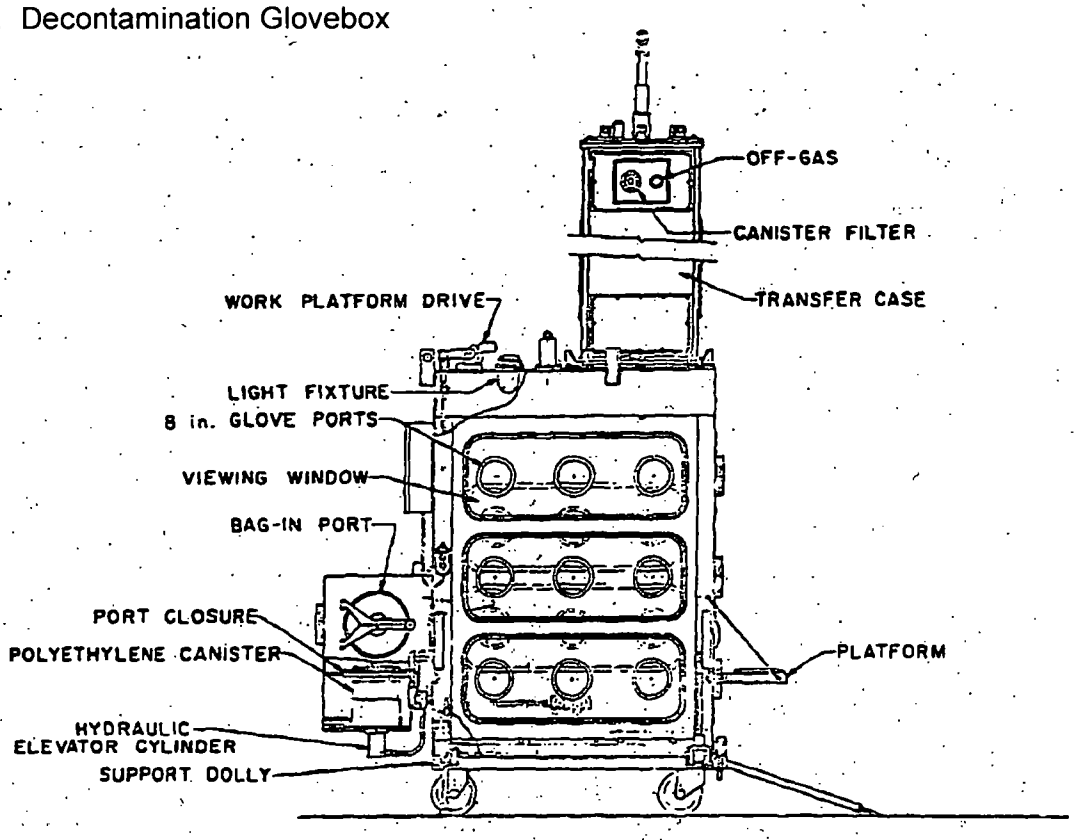


Figure 11. Process Development Laboratory – Room 111 Caves and Transfer Gloveboxes

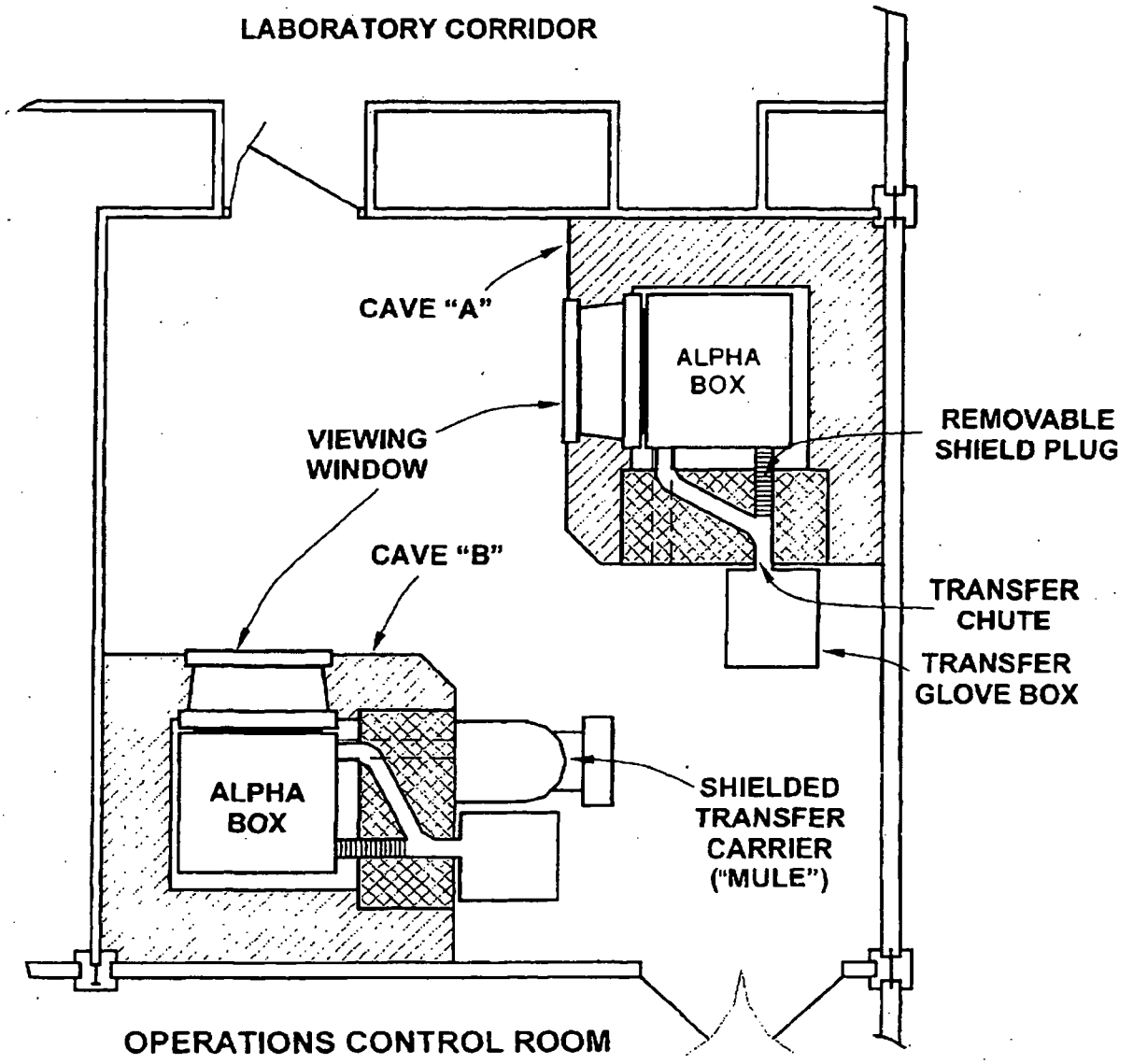


Figure 12. Transuranium Element Target Processing

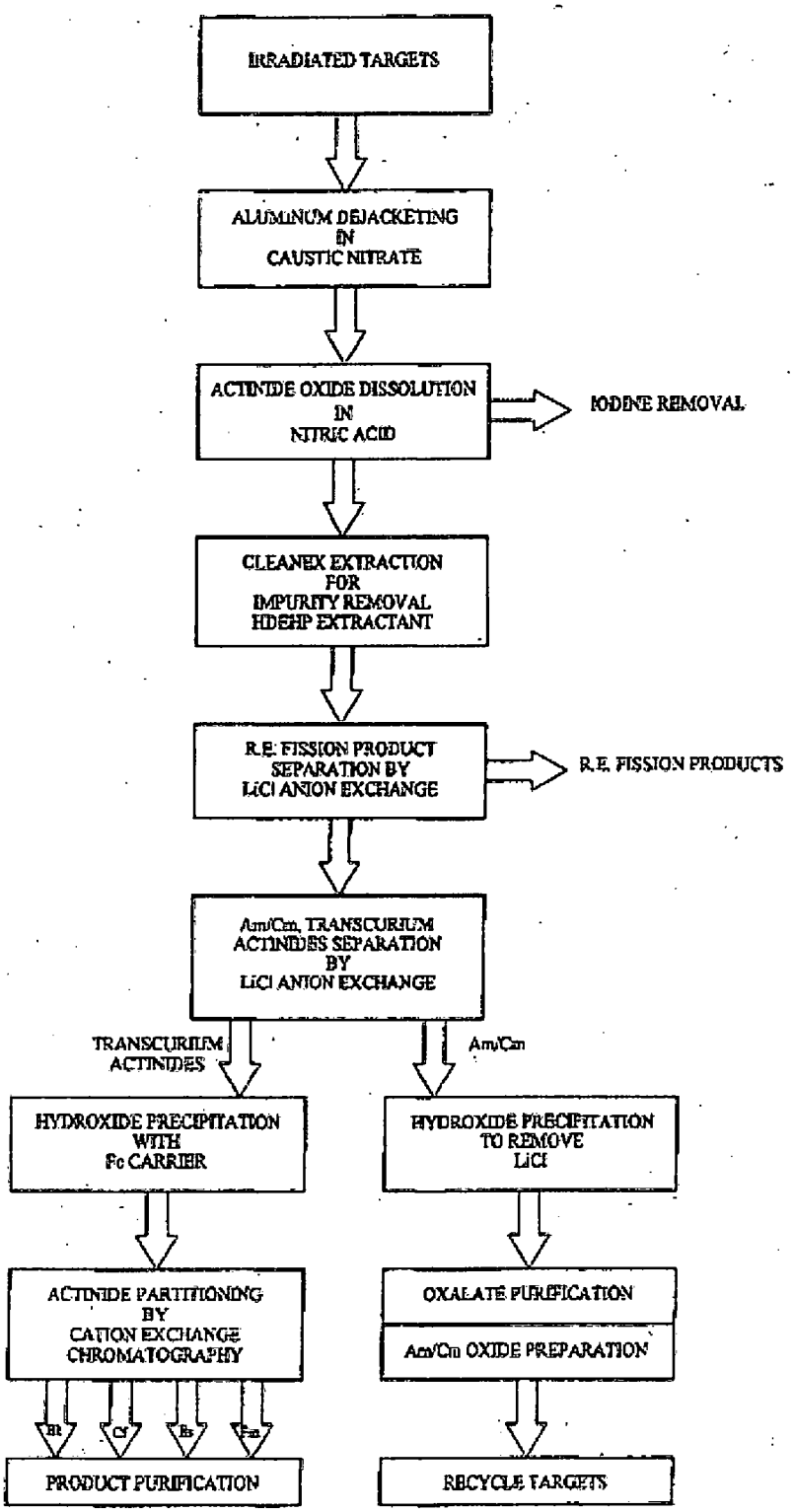


Figure 13. Solvent Extraction Test Facility Operations

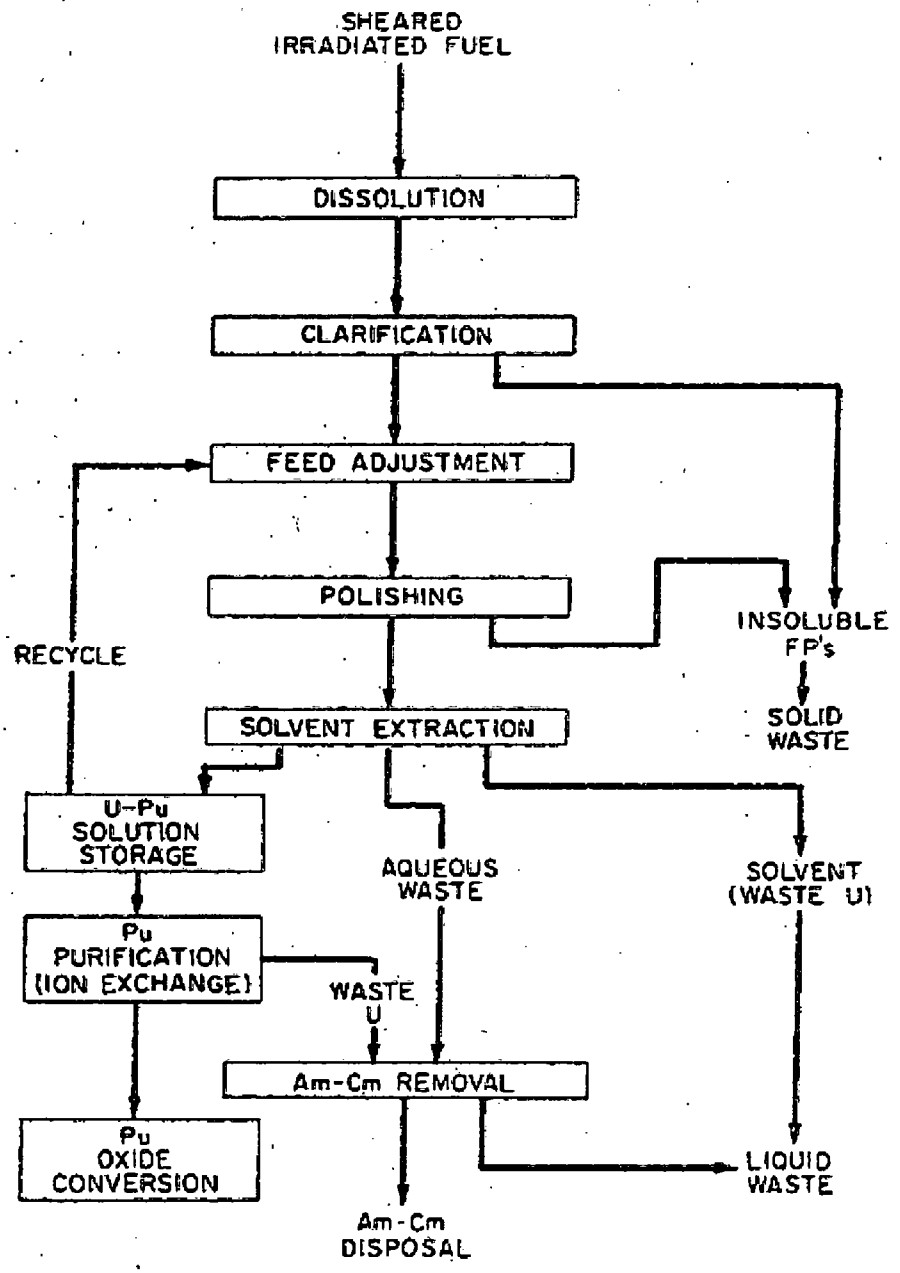


Figure 14. Mark-42 Processing

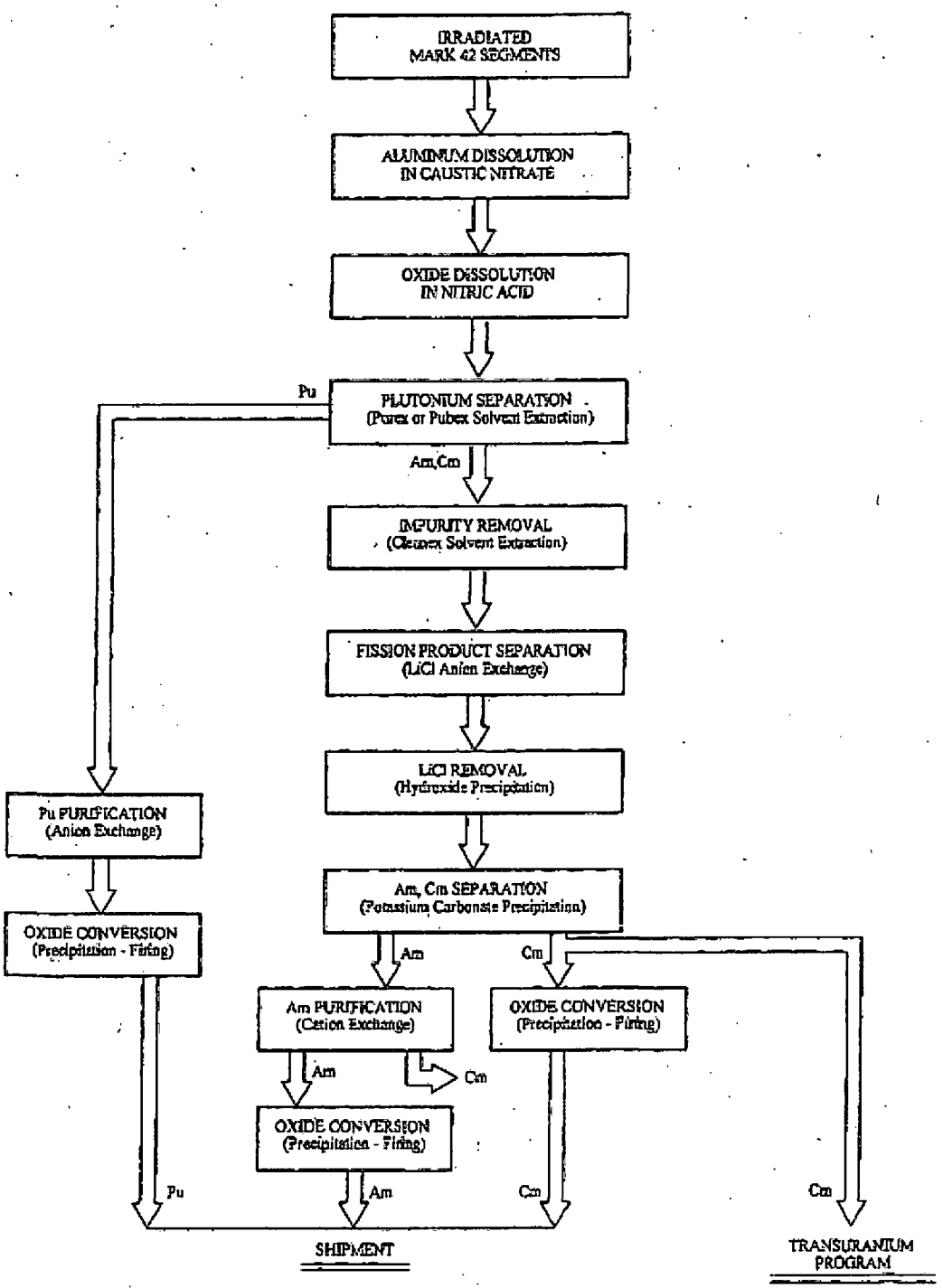


Figure 15. Coupled End-To-End Demonstration of Advanced Fuel Cycles

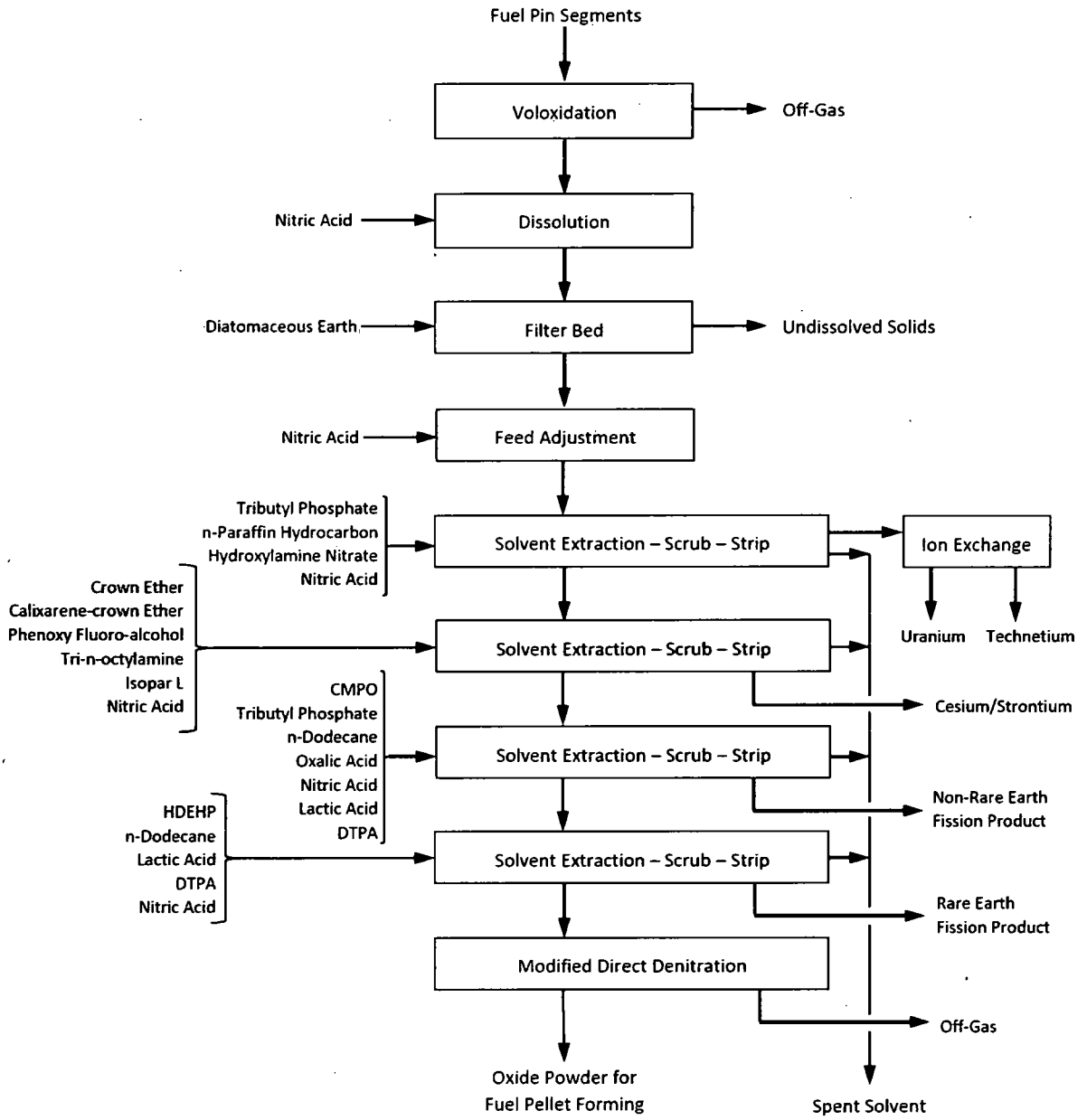


Figure 16. Neutron Source Processing

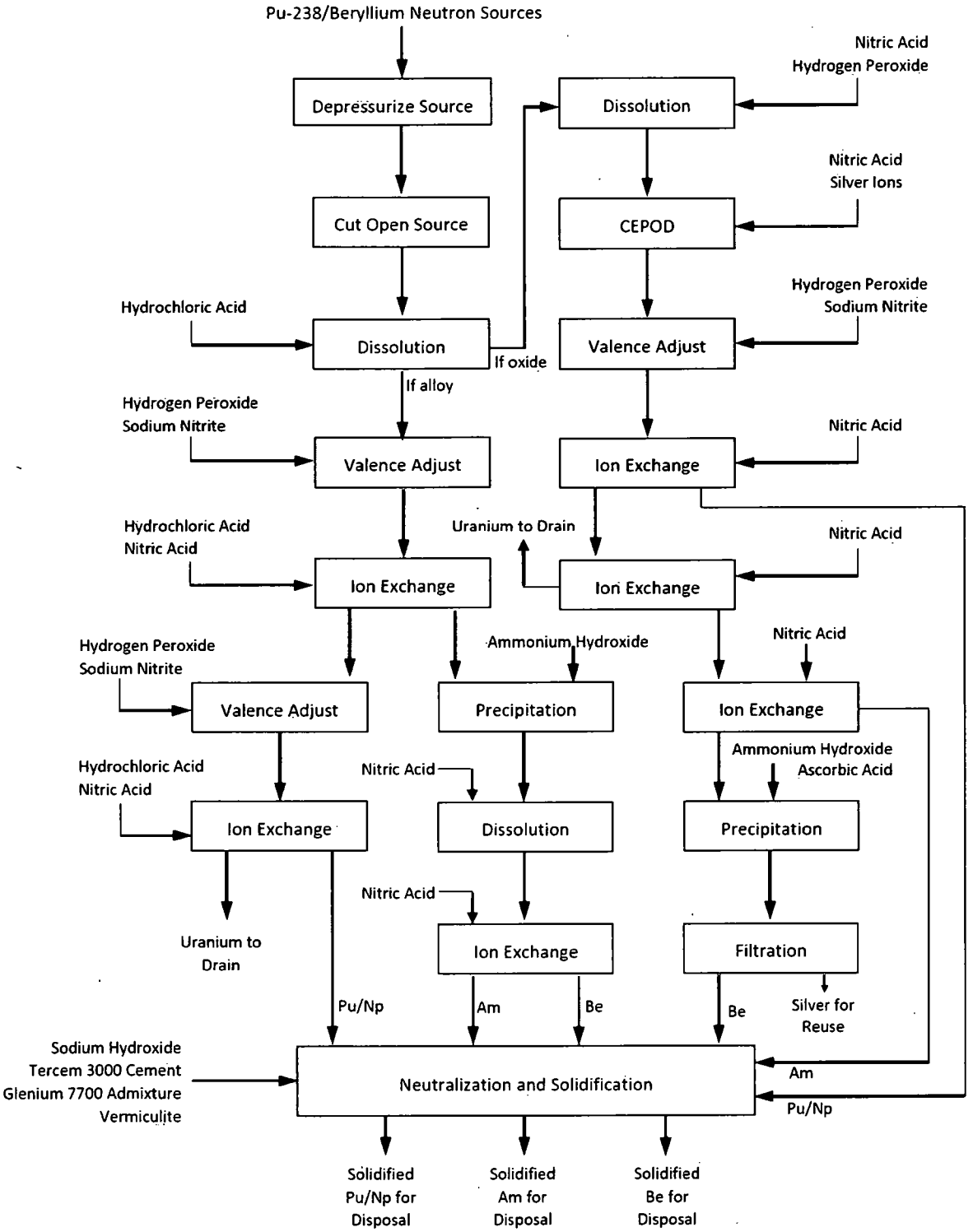


Figure 17. Pu-238 Supply Project

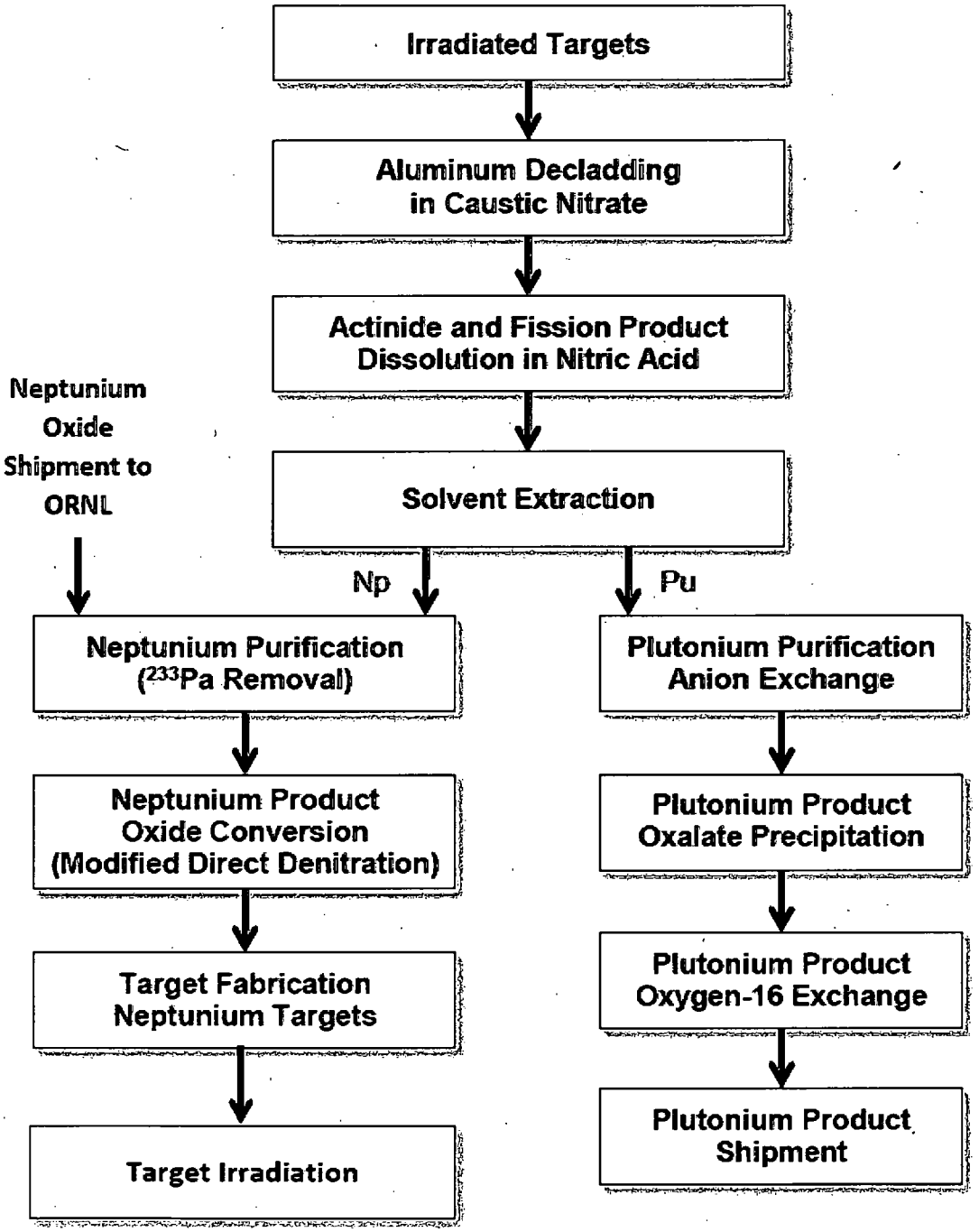


Figure 18. Pellet Fabrication

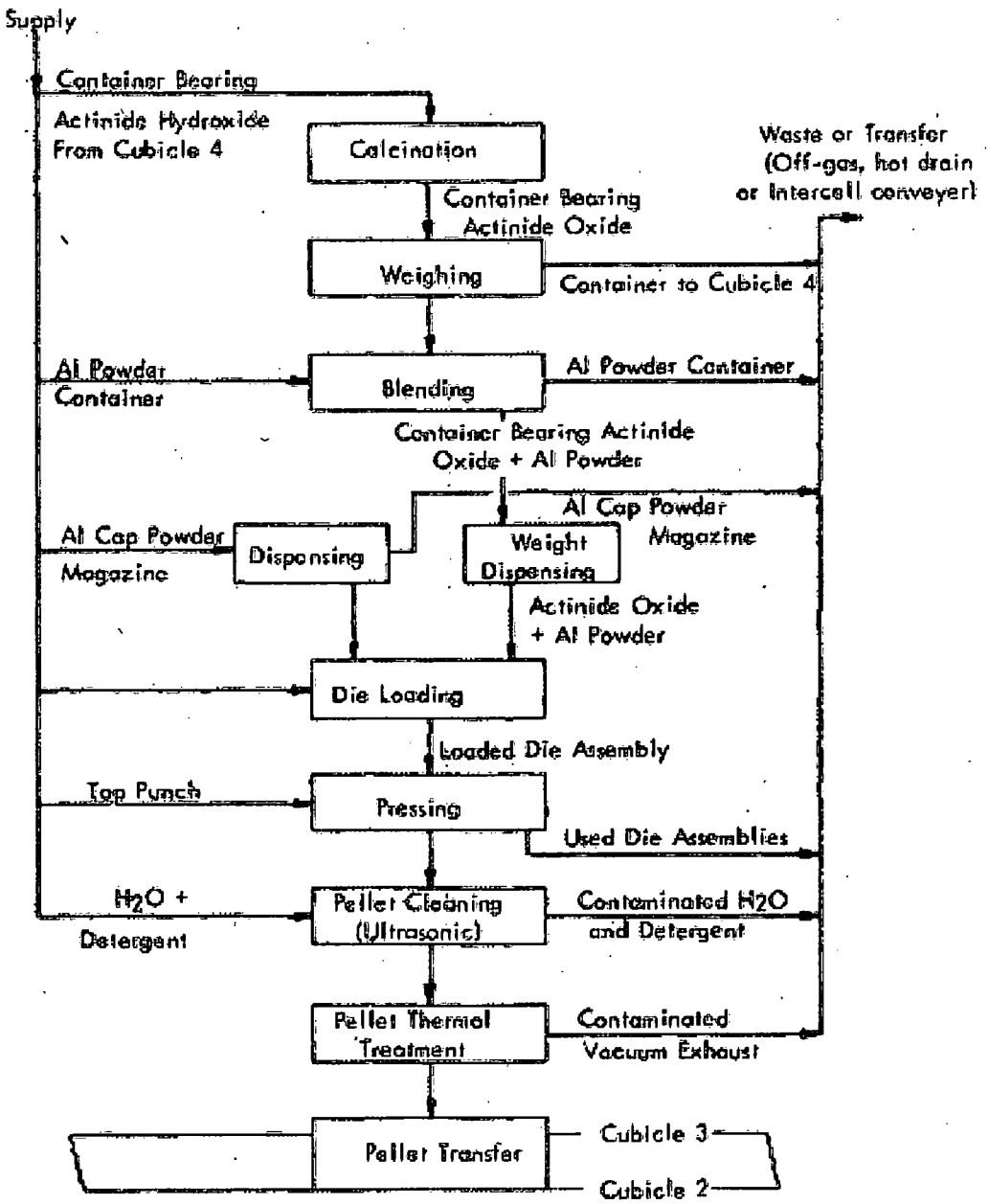


Figure 19. Target Tube Fabrication

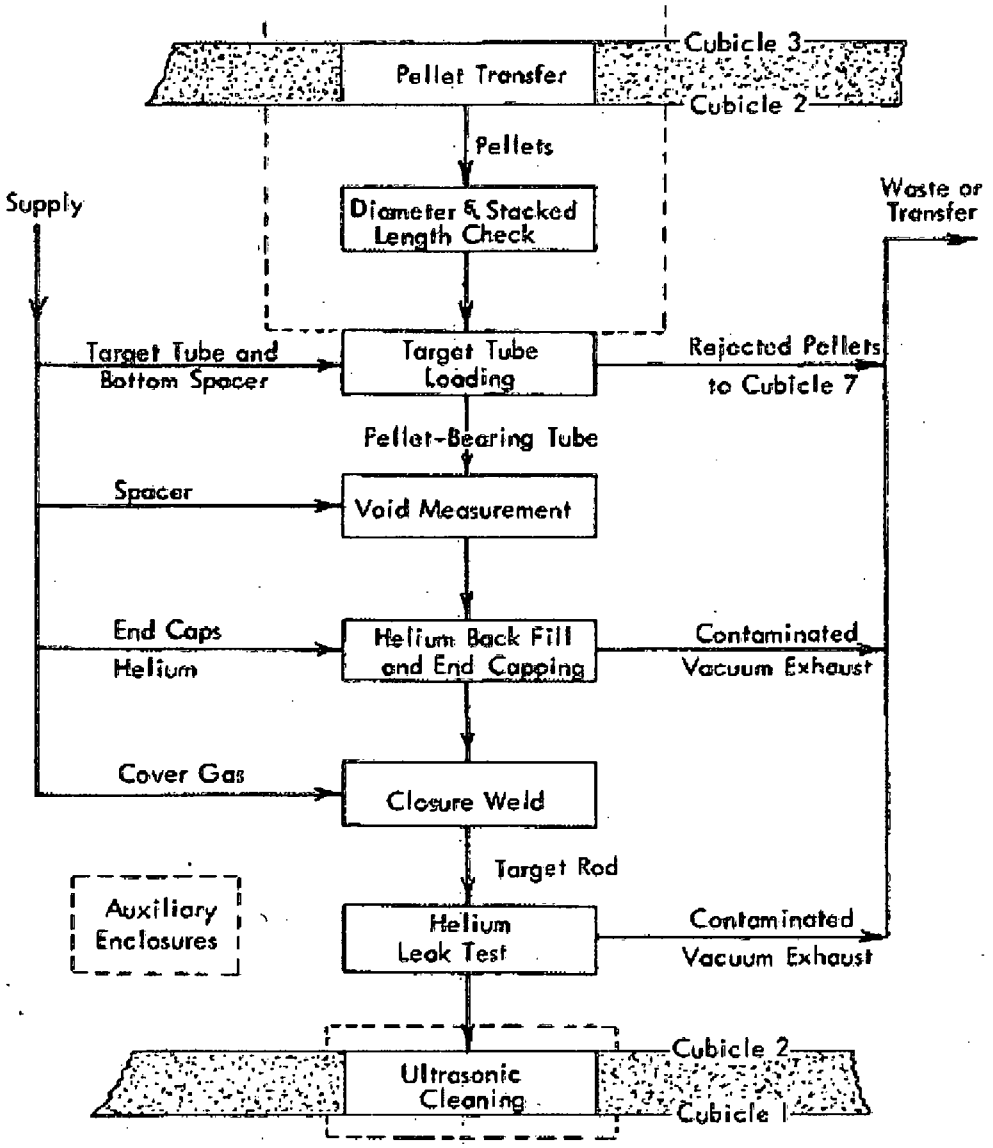


Figure 20. Target Assembly

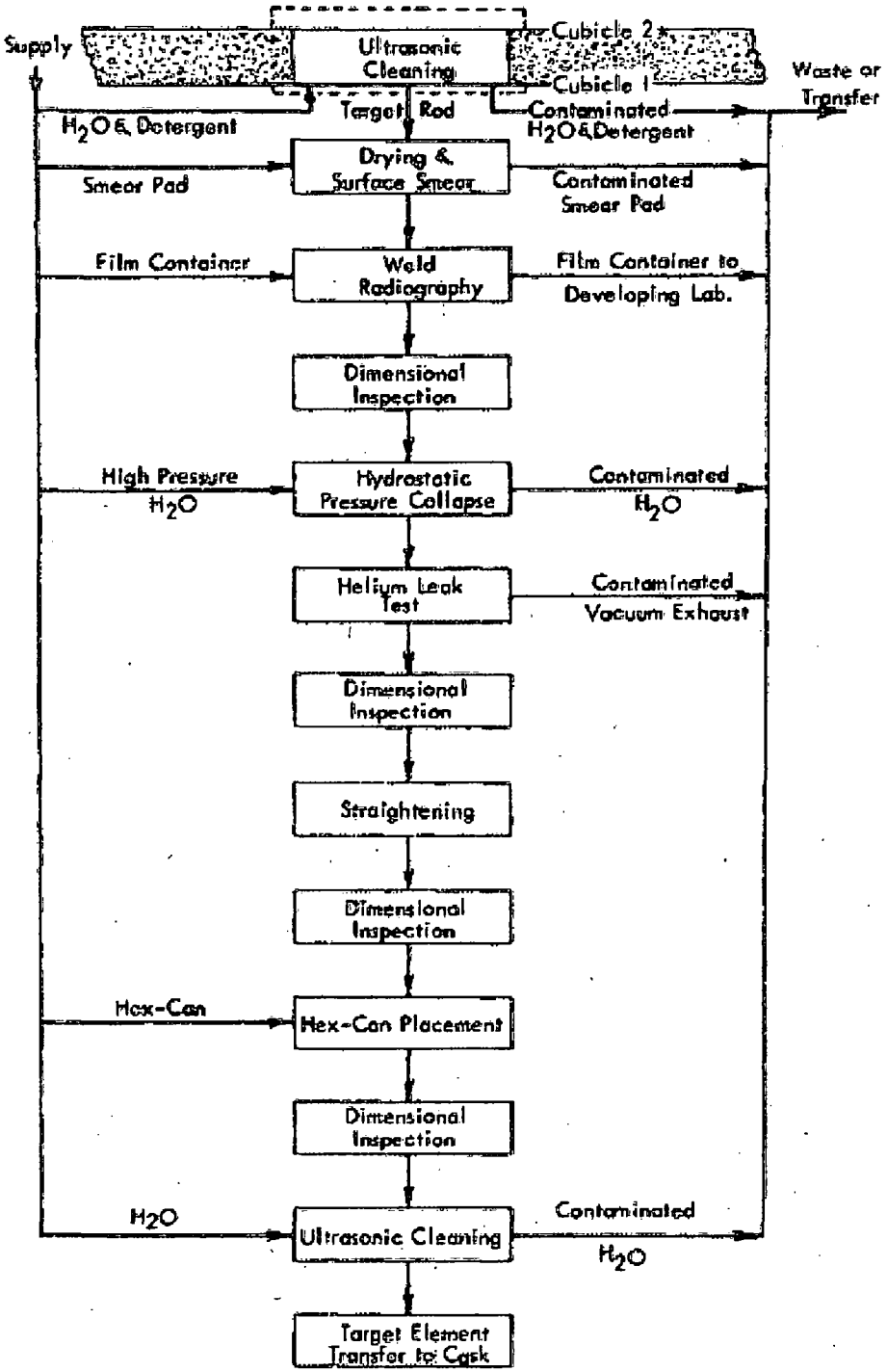


Figure 21. Transuranic Waste Processing Center CH Solid Waste Flow Diagram

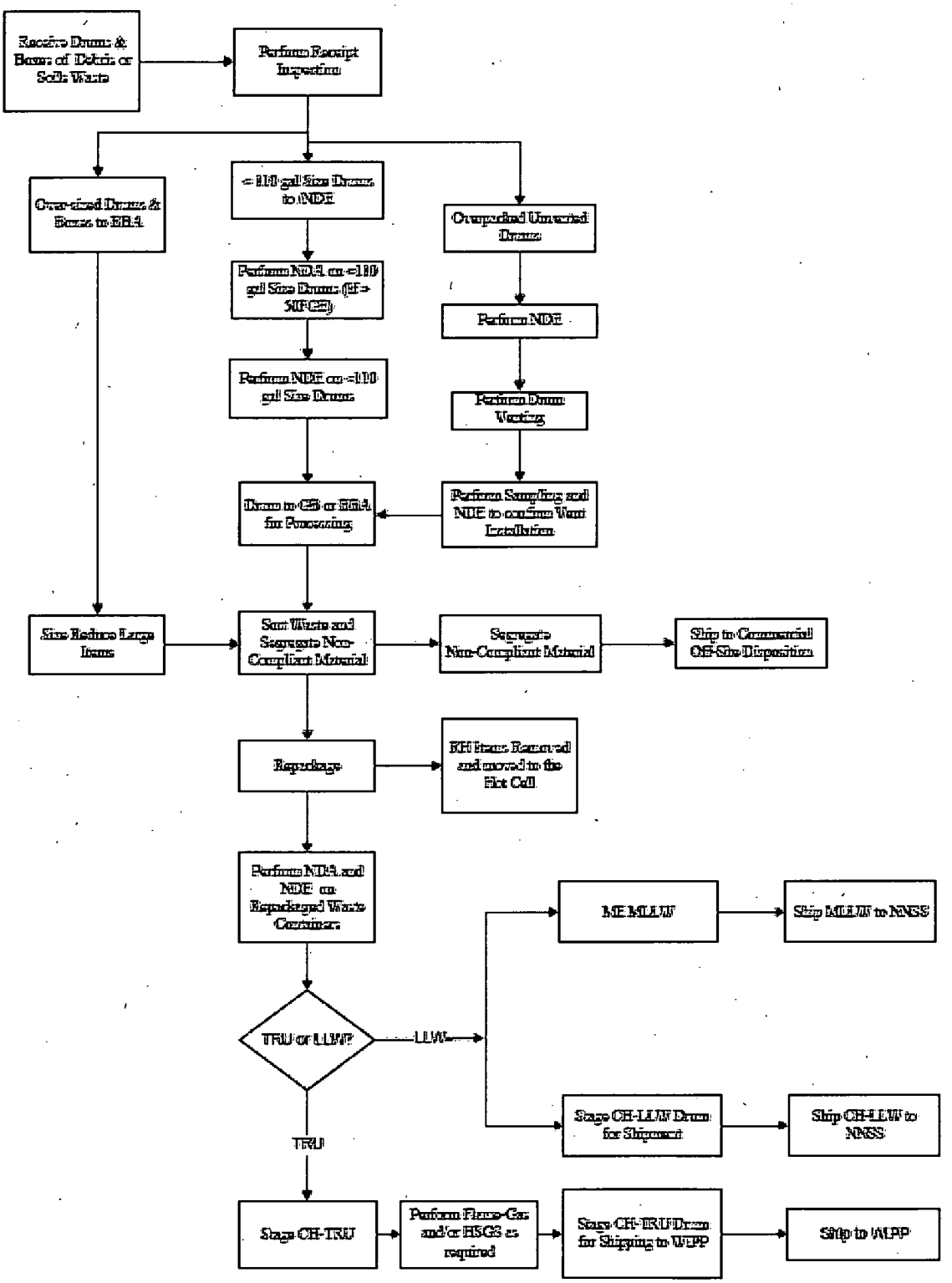
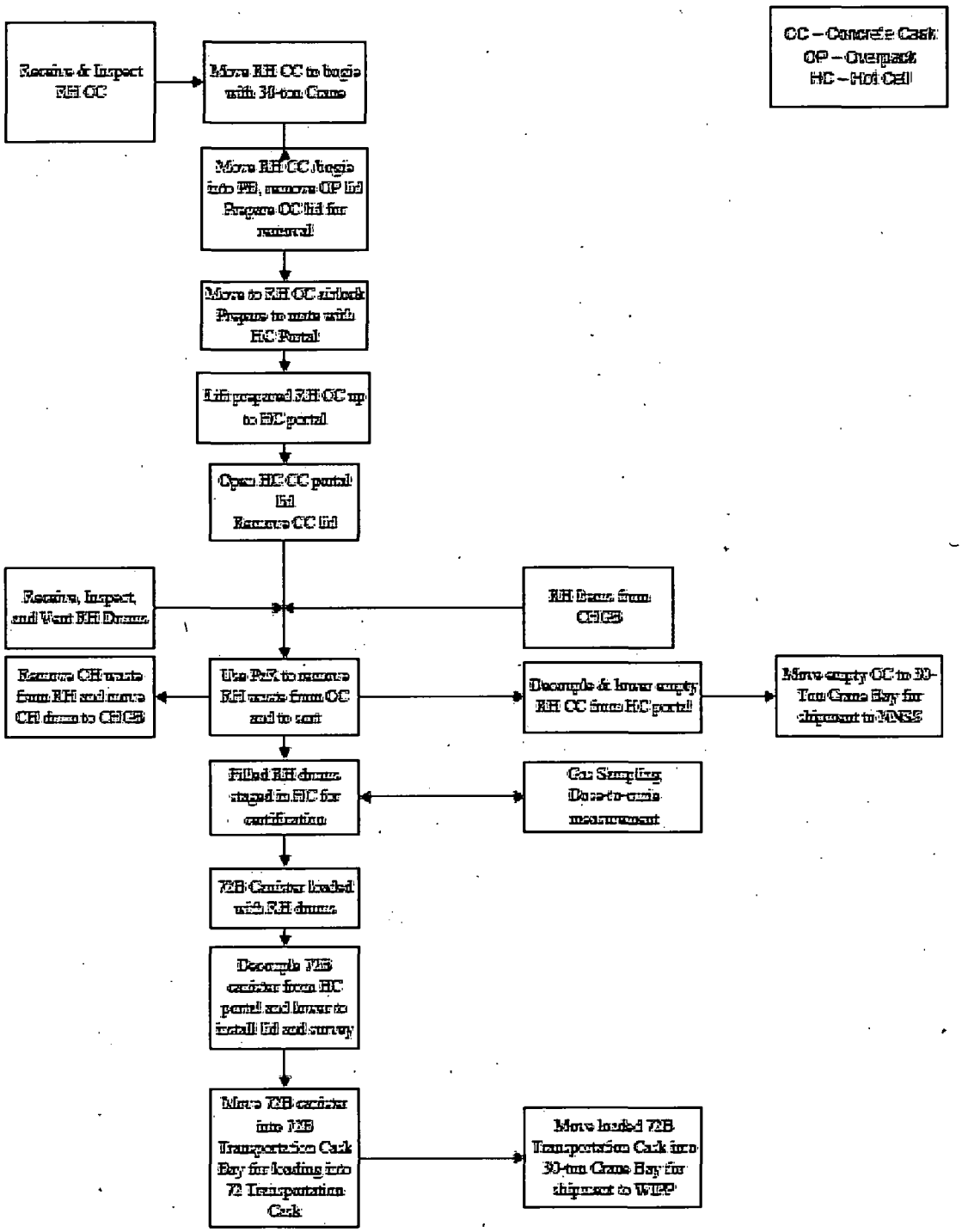


Figure 22. Transuranic Waste Processing Center RH Solid Waste Flow Diagram



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AK3

CCP-AK-ORNL-500

Central Characterization Program
Acceptable Knowledge Summary Report
For

Oak Ridge National Laboratory
Radiochemical Engineering Development Center
Remote-Handled Transuranic Waste

Waste Stream:
OR-REDC-RH-HET

REVISION 5

March 01, 2016

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Printed Name

APPROVED FOR USE

RECORD OF REVISION

Revision Number	Date Approved	Description of Revision
0	05/02/2008	Initial issue.
1	10/03/2008	Revised to address freeze file changes and recent discrepancy reports (DR008, DR009, DR600, DR601, and DR602) and address issues identified during Carlsbad Field Office (CBFO) Certification Audit A-08-12 (June 30 – July 2, 2008). Revised to remove Waste Incidental to Processing discussion in Section 5.4.5 (DR009). Expanded polychlorinated biphenyl (PCB) discussion in Section 5.4.4.
2	01/13/2011	Revised to address issues identified During U.S. Environmental Protection Agency (EPA) Tier 1 Inspection No. EPA-ORNL-CCP-RH-SETF-T1-09 (July 8, 2009), update packaging configurations, and address miscellaneous editorial changes. Revised to address permit modification changes in the November 30, 2010 WIPP-WAP.
3	01/08/2014	Revised to format the report consistently with Current revision of CCP-TP-005, *CCP Acceptable Knowledge Documentation*; to incorporate Nuclear Waste Partnership (NWP) transition changes; and incorporate freeze file changes submitted following Revision 2 (CBFO Recertification Audit A-1108) to address NMED observer suggestions.
4	02/06/2014	Revised to address issues identified during Carlsbad Field Office (CBFO) Recertification Audit A-14-03 (January 14 - 16, 2014) and the U.S. Environmental Protection Agency (EPA) Continued Compliance Inspection (February 4 – 6, 2014).

RECORD OF REVISION (CONTINUED)

Revision Number	Date Approved	Description of Revision
5	03/01/2016	Reorganized several sections to better align this report with CCP-AK-ORNL-002. Revised waste stream description in Section 2.1 and 5.4.1 to align with CCP-AK-ORNL-002. Revised description of Transuranic Waste Processing Center (TWPC) in Sections 4.1 and 5.3.3. Added discussion throughout regarding Global Nuclear Energy Partnership (GNEP), plutonium-beryllium source processing, and heat-source plutonium production. Added neptunium target fabrication to Section 4.7.2. Revised Section 4.7.4 to include current process development lab work. Updated waste stream volume and generation date range in Sections 4.6.1 and 5.2. Revised waste stream volume projections in Section 5.2. Included alkaline, lithium, and nickel/cadmium batteries in Section 5.4.1. Replaced waste material parameters (WMP) estimates to use contact-handled (CH) real-time radiography (RTR) data and added footnoted Table 5-1 to indicate the presence of inorganic matrix and organic matrix. Updated Table 5-3 to include additional chemicals. Revised Section 5.4.2.3 to better describe ignitables, corrosives, and reactives. Replaced Table 5-4 to present Oak Ridge National Laboratory (ORNL) radiological distributions over time. Added new polychlorinated biphenyl (PCB) management to Section 5.4.5. Revised Sections 5.4.6 and 5.5 to describe new heat-sealed bag requirements. In Section 5.4.6, added lithium battery discussion, and removed discussion on prohibited PCB liquids as these are now absorbed as PCB remediation waste. In Section 5.5, added discussion of draw-string plastic bags, clarified that the plastic and lead rigid liners are not used, and described the use of pipe overpack containers. Revised Section 7.0 to include additional container specific information. Added new references and source documents to Sections 8.0 and 9.0. Made other editorial changes and corrections.

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LIST OF ACRONYMS AND ABBREVIATIONS

AK	acceptable knowledge
ATWIR	*Annual Transuranic Waste Inventory Report*
BAPL	Bettis Atomic Power Laboratory
BBA	Box Breakdown Area
CBFO	Carlsbad Field Office
CCP	Central Characterization Program
CETE	Coupled End-to-End
CFR	Code of Federal Regulations
CH	contact-handled
CHMB	Contact Handled Marshalling Building
CHSA	Contact Handled Staging Area
CPE	Cask Processing Enclosure
DOD	U.S. Department of Defense
DOE	U.S. Department of Energy
DOT	U.S. Department of Transportation
DQO	Data Quality Objective
DTC	dose-to-curie
EPA	U.S. Environmental Protection Agency
FFTF	Fast Flux Test Facility
GNEP	Global Nuclear Energy Partnership
HEPA	High Efficiency Particulate Air
HFIR	High Flux Isotope Reactor
HLW	High-level waste
HWNs	Hazardous Waste Numbers
LAA	Limited Access Area
LANL	Los Alamos National Laboratory
LWA	Land Withdrawal Act
LWR	Light Water Reactor
m^3	cubic meters
MCNP	Monte Carlo Neutron-Particle
mR/hr	Millirems per hour
MSDS	Material Safety Data Sheet
NASA	National Aeronautics and Space Administration
NWPA	*Nuclear Waste Policy Act of 1982*
ORNL	Oak Ridge National Laboratory
PB	Processing Building
PCB	Polychlorinated biphenyl
POC	pipe overpack container
PPE	Personal Protective Equipment
ppm	parts per million
Pu-Be	plutonium-beryllium
QA	Quality Assurance

LIST OF ACRONYMS AND ABBREVIATIONS (CONTINUED)

QAO	Quality Assurance Objective
RCRA	Resource Conservation and Recovery Act
RCW	Recirculating Cooling Water
RH	remote-handled
RH TRUCON	RH TRU Waste Content Code
REDC	Radiochemical Engineering Development Center
RTR	real-time radiography
SETF	Solvent Extraction Test Facility
SNF	Spent Nuclear Fuel
SRS	Savannah River Site
TA	Transfer Area
TDEC	Tennessee Department of Energy and Conservation
TMI-2	Three Mile Island 2
TRU	transuranic
TRUCON	TRUPACT-II Content Code
TWPC	Transuranic Waste Processing Center
VE	visual examination
WCPIP	*Remote-Handled TRU Waste Characterization Program Implementation Plan*
WIPP	Waste Isolation Pilot Plant
WIPP-WAC	*Transuranic Waste Acceptance Criteria for the Waste Isolation Pilot Plant*
WIPP-WAP	*Waste Isolation Pilot Plant Hazardous Waste Facility Permit, Waste Analysis Plan*
WSPS	Waste Stream Profile Sheet

1.0 EXECUTIVE SUMMARY

This Acceptable Knowledge (AK) Summary Report has been prepared for the Central Characterization Program (CCP) for remote-handled (RH) transuranic (TRU) waste generated and managed by the Oak Ridge National Laboratory (ORNL) in Oak Ridge, Tennessee. The waste described in this report was generated by the Radiochemical Engineering Development Center (REDC) located in Building 7920. As necessary, the waste is repackaged in the Processing Building (PB) (Building 7880) at the Transuranic Waste Processing Center (TWPC) located just south of the ORNL main site.

This report was prepared in accordance with CCP-TP-005, *CCP Acceptable Knowledge Documentation* (Reference 3), to implement the AK requirements of DOE/WIPP-02-3214, *Remote-Handled TRU Waste Characterization Program Implementation Plan* (WCPIP) (Reference 1); *Waste Isolation Pilot Plant Hazardous Waste Facility Permit, Waste Analysis Plan,* (WIPP-WAP) (Reference 2); and DOE/WIPP-02-3122, *Transuranic Waste Acceptance Criteria for the Waste Isolation Pilot Plan* (WIPP-WAC)
(Reference 18).

The WIPP-WAP AK requirements are addressed in CCP-PO-001, *CCP Transuranic Waste Characterization Quality Assurance Project Plan* (Reference 5). The WIPP-WAC AK requirements are addressed in CCP-PO-002, *CCP Transuranic Waste Certification Plan* (Reference 15). Additional, this report provides the AK information required by CCP-PO-505, *CCP Remote-Handled Transuranic Waste Authorized Methods for Payload Control (CCP RH-TRAMPAC)* (Reference 19).

The CCP is tasked with certification of TRU waste for transportation to and disposal at the Waste Isolation Pilot Plant (WIPP). This report was developed in accordance with CCP-TP-005 (Reference 3), which describes how AK is collected, reviewed, and managed by the CCP. The CCP is responsible for collection, review, and management of AK documentation in accordance with CCP-TP-005, and reviews and approves this AK Summary Report. CCP maintains responsibility for this AK Summary Report and all CCP-TP-005 generated forms and records as quality assurance (QA) records. In addition, CCP maintains a copy of the "historical source documents" as non-QA records.

Waste stream OR-REDC-RH-HET includes RH TRU debris waste originating from the REDC hot cell facility target fabrication and processing, analytical chemistry, and process development activities. This debris is currently stored in concrete casks, boxes, and drums at ORNL. These storage containers are transferred, as necessary, to the TWPC hot cell in the Building 7880 for repackaging and certification. The corresponding contact-handled (CH) debris waste stream OR-REDC-CH-HET is described in CCP-AK-ORNL-002, *Central Characterization Program Acceptable Knowledge Summary Report for Oak Ridge National Laboratory Radiochemical Engineering Development Center Contact-Handled Transuranic Waste, Waste Stream OR-REDC-CH-HET* (Reference 12).

This AK Summary Report includes information relating to the mission and process operations of the REDC, waste identification and characterization, waste management, and TWPC repackaging. This report also includes information regarding the physical form, radiological characteristics, and chemical contaminants of the waste, as well as, prohibited items management.

This AK Summary Report, along with the referenced supporting documentation, provides a, defensible, and auditable record of the AK for an RH debris waste stream resulting from operations conducted in the REDC and repackaged in the TWPC. The references and AK sources used to prepare this report are listed in sections 8.0 and 9.0. The AK sources are referenced within this report by an alphanumeric designator (e.g., C001, DR001, I001, M001, P001, and U001), corresponding to a unique CCP Source Document Tracking Number for this waste stream. This report includes information relating to the facility's history, mission, process operations, and waste management practices. Information contained in this report was obtained from numerous sources, including facility safety basis documentation, historical document archives, generator and storage facility waste records and documents, interviews with cognizant personnel, and program/process documents (plans, procedures, etc.).

This report also compiles data relevant to the applicable U.S. Environmental Protection Agency (EPA) requirements and presents the documentation necessary to satisfy each WCPIP data quality objective (DQO) and quality assurance objective (QAO) for RH-TRU waste streams (Reference 1).

2.0 WASTE STREAM IDENTIFICATION SUMMARY

Site Where TRU Waste Was Generated and Stored

Generation and Storage Location:
Oak Ridge National Laboratory
1 Bethel Valley Road
Oak Ridge, TN 37831

Storage Location:
Transuranic Waste Processing Center
100 WIPP Road
Lenoir City, TN 37771

EPA Identification (ID) TN1890090003

Facility Where TRU Waste Was Generated

This waste was generated in Building 7920 which is part of the REDC located at the ORNL in Oak Ridge, Tennessee. Waste repackaging is performed in the PB (Building 7880) at the TWPC located just south of the ORNL main site.

Facility Mission

Since 1966, the primary mission of Building 7920 has been the fabrication of target rods containing plutonium, americium, and curium, and to separate and purify heavy actinide elements including Bk-249, Cf-252, Es-253, and Fm-257 isotopes from the irradiated targets. Between 1979 and 1986, some uranium fuel cycle development work was performed in specially designed equipment in one of the Building 7920 hot cells. Since 1991, Building 7920 has also processed Mark-42 target assemblies. Fundamental research, chemical process development, and analytical chemistry are also performed in Building 7920 (refer to section 4.3).

The TWPC serves as the primary ORNL processor of CH and RH wastes originating from containerized RH and CH waste inventories in storage at ORNL; ongoing and future ORNL demolition, decontamination, and remediation operations; future laboratory operations; and existing inventories or wastes received from other regional U.S. Department of Energy (DOE) sites. TRU waste inventories are transferred to the TWPC hot cell in the Building 7880 where RH waste streams are repackaged and certified for WIPP disposal (refer to section 4.3).

Waste Stream:	OR-REDC-RH-HET
Summary Category Group:	S5000
Waste Matrix Code Group:	Heterogeneous Debris Waste

Waste Matrix Code: S5400, Heterogeneous Debris

RH TRU Waste Content Code (RH TRUCON): OR 325, OR 321, OR 322

Waste Stream Description:

As described in section 5.4, waste stream OR-REDC-RH-HET is comprised primarily of repackaged organic and inorganic debris waste items. The waste includes cellulosics (paper), plastic, rubber, metal, and glass items. Some of the specific waste items include (see Table 5-3 for chemical information regarding specific products):

- Aluminum-based metal items such as brackets, cans, covers, foil, manipulator parts, and sheeting
- Iron-based metal items including containers (e.g., buckets, cans, drums), filter housing, fittings, flanges, hand tools (e.g., files, hammers, knives, pipe cutters, scissors, screwdrivers, tweezers, wrenches), hardware (e.g., bolts, clips, nails, nuts, springs, washers), light bulb bases, pipe nipples, piping, planchets, plates, saw blades, scrap (e.g., angle iron, brackets, chips, discs, shavings, sheeting), sealed radiation sources, spray cans (punctured), steel wool, syringes, and valves
- Other metals such as batteries (e.g., alkaline, lithium, nickel/cadmium), brass (e.g, fittings, scale weights), copper (e.g., tubing, fittings, wire) and lead (e.g., bricks, pigs, plates, sheeting), nickel (e.g., crucibles, targets), and other items such as thermocouples
- Other inorganic materials including unirradiated actinide oxides/pellets, absorbents/adsorbents (e.g., Drierite, silica gel, Solid-a-sorb, vermiculite), asbestos (e.g., insulation), ceramics, charcoal (e.g., filters), concrete, drywall, fiberglass, filter media, fire blankets, floor sweepings, glassware (e.g., bottles), glass thermometers, glass windows, graphite, Hopcalite, insulation (may contain asbestos), leaded glass, light bulbs (incandescent and mercury vapor), Met-L-X (fire extinguishing powder), mirrors, paint chips, and tile (may contain asbestos)
- Cellulosic items such as absorbent pads (e.g., Wypall X80 Wipers [cellulose/polypropylene blend]), cardboard, cheesecloth, cloth, cork, cotton, (e.g., gauze, glove liners, rope, swabs), labels, leather gloves, masking tape, mop heads, paper towels, rags, smears, vacuum bags, wipes, and wood (e.g., blocks, handles, rulers)
- Plastic items including bags, caps, containers (e.g., bottles, buckets), fittings, foam (e.g., ear plugs, head bands, knee pads), Herculite (industrial fabric), ion-exchange resin, labware (e.g., funnels, pipettes, vials), latex gloves, manipulator boots, markers, nylon (e.g., belts, rope), plexiglass, poly blocks, scouring pads, sheeting, shoe covers, sleeving, strippable coating (e.g., CC Fix, Stripcoat TLC Free), styrofoam, tape, ties, tips, tubing, Tyvek suits, and valves

- Rubber items such as aspirators, booties, bubble suits and hoods, gaskets, gloves, grommets, hose, o-rings, and stoppers
- Equipment and electrical devices including some containing circuit boards such as balances, electric motors, flashlights, furnaces, heating mantels, hotplates, micrometers, pumps, saws, and vacuum cleaners
- Wood-framed and metal-framed High Efficiency Particulate Air (HEPA) filters and roughing filters (filter media may contain asbestos).
- Organic matrix (e.g., grouted ion-exchange resin, dried epoxy, and liquids absorbed with an organic polymer such as Nochar N965 [refer to Table 5-3 for liquids and absorbents used in the process])
- Inorganic matrix (e.g., liquids absorbed with an inorganic absorbent such as Solid-a-sorb or vermiculite, mercury absorbed with HG Absorb [refer to Table 5-3 for liquids and absorbents used in the process])

The AK record identifies numerous packaging configurations utilizing plastic bags and liners, 1-gallon paint cans (some lead-lined), sealed and unsealed polyethylene buckets (2- to 5-gallon), 5-gallon lard cans, and 10-gallon rigid cardboard fiber drums. Secondary waste generated during repackaging operations in the TWPC hot cell may include solidified liquids, amalgamated mercury, personal protective equipment (PPE), and other miscellaneous process materials and equipment generated during routine operations of the hot cell. Although the waste stream, as a whole, is comprised of more than 50 percent heterogeneous debris, the casks are expected to contain a wide range of the waste material parameters. No individual repackaged drum of RH waste will contain greater than 50 percent homogeneous solids in this waste stream (e.g., solidified/absorbed liquids, grouted resins, graphite, and Hopcalite filter bed media).

This waste stream was determined to contain Resource Conservation and Recovery Act (RCRA)-regulated constituents and is assigned the following EPA Hazardous Waste Numbers (HWNs): D004, D005, D006, D007, D008, D009, D010, D011, D019, F002, and F005 (refer to Section 5.4.2).

Prohibited items that may be present in this waste stream include liquids, un-punctured spray cans, internal payload container shielding (e.g., lead pigs), unvented heat-sealed bags that are greater than four liters and have a surface area less than 390 square inches, unapproved supplemental sealing devices (i.e., metal hose clamps) for plastic bags, and sealed containers greater than 4 liters (refer to Section 5.4.6).

Certified visual examination (VE) is performed to ensure the waste does not contain prohibited items in accordance with the WCPIP and WIPP-WAP.

In Building 7920, waste packaged as CH-TRU may later be determined to be RH-TRU waste. These waste packages were placed into 55-gallon drums lined with a single poly drum liner bag that may or may not be sealed with tape. U.S. Department of Transportation (DOT) specification 7A Type A 55-gallon drums are used for waste packaging and repackaging at the TWPC. Drums are lined with a cardboard liner inside a filtered 6-mil poly liner bag sealed with tape and a plastic cable tie wrap. Some drums may also contain a polypropylene open top lifting sack fitted with standing lift loops. Waste materials with high surface dose rates or high radioactivity may be repackaged into a 55-gallon drum containing a standard pipe overpack container (POC). The standard POC consists of a stainless steel cylindrical pipe with a bolted lid centered in a 55-gallon drum using dunnage consisting of fiberboard and/or plywood spacers within a rigid polyethylene liner (refer to Section 5.5).

Building 7920 RH-TRU waste originally packaged in concrete casks will be repackaged in the TWPC hot cell into unlined, vented 55-, 30-, or 15-gallon drums (no layers of confinement in drums).

Waste stream OR-REDC-RH-HET meets the WIPP-WAP and the WCPIP waste stream definitions. The waste is similar in material, physical form, hazardous constituents, and radiological properties and generated from a single process or activity. This waste stream is comprised of TRU-mixed heterogeneous debris waste generated during production of the heavy actinide elements and those operations that support this activity (process development, analytical chemistry, and facility maintenance) (refer to Section 4.6.2).

3.0 ACCEPTABLE KNOWLEDGE DATA AND INFORMATION

TRU waste destined for disposal at the WIPP must be characterized prior to shipment. Development of knowledge of the waste materials and processes that generate and control the waste is required to provide a clear and convincing argument about the characteristics of each waste stream. The AK characterization documented herein complies with the requirements of the WIPP-WAP, WCPIP, WIPP-WAC, and CCP-RH-TRAMPAC (Reference 1, 2, 18, and 19), and was developed in accordance with CCP-TP-005 (Reference 3) and CCP-PO-001 (Reference 5). The WCPIP identifies waste characterization requirements and methods to satisfy requirements in:

- 40 Code of Federal Regulations (CFR) Part 191, *Environmental Radiation Protection Standards for Management and Disposal of Spent Nuclear Fuel, High-Level and Transuranic Radioactive Wastes* (Reference 6)
- 40 CFR Part 194, *Criteria for the Certification and Re-Certification of the Waste Isolation Pilot Plant's Compliance with the 40 CFR Part 191 Disposal Regulations* (Reference 7)
- *Criteria for the Certification and Re-Certification of the Waste Isolation Pilot Plant's Compliance with the 40 CFR Part 191 Disposal Regulations: Certification Decision* (Reference 8)
- Public Law 102-579, *The Waste Isolation Pilot Plant Land Withdrawal Act* (LWA) (Reference 9).

Waste stream OR-REDC-RH-HET was characterized using AK from a variety of sources, including laboratory logbooks, standard operating procedures, safety analysis reports, program plans, radiological data, waste packaging logs, container forms, inventory reports, and personnel interviews. The corresponding REDC CH debris waste stream (OR-REDC-CH-HET) is described in CCP-AK-ORNL-002 (Reference 12).

The references and AK sources used to prepare this report are listed in Sections 8.0 and 9.0, respectively. The AK sources referenced within this report by alphanumeric designations (e.g., C001, DR001, I001, M001, P001, and U001) correspond to the unique CCP Source Document Tracking Number using the following convention:

- C – Correspondence
- DR – Discrepancy resolutions
- I – Internal Procedures and Notes
- M – Miscellaneous data
- P – Published documents and procedures
- U – Unpublished documents

The alphanumeric "I" designator (i.e., I001) was originally assigned to source documents (primarily internal procedures) collected by Weston Solutions, Inc. during the

initial AK program conducted at ORNL. These documents have been assigned the same Source Document Tracking Numbers to maintain traceability to earlier reports; however, this designator has not been assigned during subsequent CCP AK collection and review operations.

4.0 PROGRAM INFORMATION

This section presents the mandatory TRU waste program information required by the WIPP-WAP and the WCPIP for waste stream OR-REDC-RH-HET (References 1 and 2). This section provides a description of the facility and operations associated with the generation of REDC RH-TRU waste. Included is a description of the location of the REDC facility. In addition, a description of the facility, summary of the mission, defense determination, and descriptions of the TWPC waste repacking operations associated with the generation of waste stream OR-REDC-RH-HET are provided.

4.1 Facility Location

ORNL is located on the DOE Oak Ridge Reservation within the Bethel and Melton Valleys of Roane County, Tennessee, approximately six miles southwest of the city of Oak Ridge and about 23 miles west of downtown Knoxville. Building 7920 is located in the Melton Valley area of ORNL within the 7900 building area which includes the REDC (Buildings 7920 and 7930) and the High Flux Isotope Reactor (HFIR). Maps showing the locations of ORNL, the REDC, and Building 7920 are presented in Figure 1, Map of Oak Ridge National Laboratory; Figure 2, Map of Radiochemical Engineering Development Center, Transuranic Waste Processing Center, and Solid Waste Storage Areas; and Figure 4, Location of Building 7920, at the end of this report (References P014, P161, and P272).

Prior to 1972, RH TRU waste generated at ORNL facilities was disposed in shallow land burial trenches. From 1972 on, the wastes were retrievably stored, initially in a series of 22 earthen trenches and later in engineered bunker-type facilities. RH TRU waste generated in Building 7920 is currently stored in large concrete casks, boxes, and 55-gallon drums in Buildings 7572, 7823, 7823B, 7823C, 7823D, 7823E, 7834, 7855, 7879, and 7883 which are also located in the Melton Valley area of ORNL. A map denoting the locations of the TRU waste storage buildings is shown in Figure 2. All of the concrete casks will be overpacked into carbon steel RH casks prior to processing in the TWPC (References M024, M100, P272, P953, U038, and U046).

The TWPC is located within an approximate five-acre area in the Melton Valley area of ORNL. RH storage containers are transferred to the PB at the TWPC where the waste items are extracted, inspected, and reduced in volume for repackaging and certification to produce waste suitable for disposal at WIPP. The location of TWPC is shown in Figure 2. The PB and TWPC storage areas are shown in Figure 3, Site Layout for the Transuranic Waste Processing Center (References M244, M245, P256, P272, P432, and U046).

4.2 Facility Description

Building 7920, constructed in the mid-1960s, is a two-level structure with a high bay area housing a heavily shielded, reinforced concrete hot cell bank, hot cell support area, laboratories with gloveboxes and caves, and an office wing (Reference P161).

The bank of nine hot cells contains equipment for radiochemical processing and target fabrication activities. Each hot cell contains a cubicle which is a confinement enclosure with a viewing window and master-slave manipulators. Tank pits housing process and storage tanks and piping are located behind and below the cubicles. The area above and behind the hot cell bank is a high-bay area known as the Limited Access Area (LAA). Systems and equipment are located in the LAA for interfacing with the hot cells and for movement of materials and equipment in and out of the hot cells and cubicles, and in and out of the building. The Transfer Area (TA), which is adjacent to Cubicle 9, contains the transfer cubicle, gloveboxes, and other equipment used for the addition and removal of small equipment and materials in the hot cell bank. The chemical make-up area (Room 213) is above the control room on the second floor and contains solution make-up and addition tanks, and other service equipment and instrumentation for the hot cell operations. The decontamination glovebox room (Room 216) is on the second floor adjacent to the LAA. This room contains the decontamination glovebox, equipment repair glovebox, and liquid waste transfer boxes. Also on the second floor adjacent to the LAA is the recirculating cooling water (RCW) equipment room (Room 215), where process water is supplied to the closed-loop RCW system for use in cooling process equipment in the hot cells, cubicles, and other building areas (Reference P161).

The laboratory area of Building 7920 contains three alpha laboratories (Rooms 109, 209, and 211) with gloveboxes for chemical development work and special projects. Another alpha laboratory (Room 111) contains two small hot cells, called shielded caves that provide small chemical processing areas with sufficient shielding for final purification of various transuranium elements and for special projects. The laboratory area of the building also contains two analytical chemistry laboratories for radioactive samples (Rooms 108 and 208) and two analytical chemistry laboratories for non-radioactive samples (Rooms 110 and 210) (Reference P161). Rooms 110 and 210 do not generate TRU waste; however, one drum (X10C9313656) has a logsheet that identifies waste items from Rooms 110 and 111. Although Room 110 was supposed to be used for nonradioactive samples, logsheet entries for Room 110 waste in this particular drum show low radiation dose rates indicating this waste is radioactively contaminated. This is the only TRU waste drum from Building 7920 that identifies Room 110 as a generation location (References M005 and M155).

Floor plans for the first and second floors of Building 7920 are shown in Figure 5, Building 7920 First Floor, and Figure 6, Building 7920 Second Floor. Figure 7, Building 7920 Hot Cell Bank, is a plan view of the hot cell bank, and Figure 8, Building 7920 Hot Cell Bank - Cubicle Cross Section, shows a cross section of a typical cell in Building 7920. A section through the shielded transfer carrier ("mule") and the transfer area cubicle is illustrated in Figure 9, Shielded Transfer Carrier (Mule) and Transfer Area Cubicle. Figure 10, Decontamination Glovebox, shows the decontamination glovebox. Figure 11, Process Development Laboratory – Room 111 Caves and Transfer Gloveboxes, is a plan view of Room 111 showing the shielded caves and transfer gloveboxes (References P161 and U011).

The TWPC, constructed in 2003, consists of a three-story reinforced concrete structure with internal concrete and steel shielding. RH waste repackaging is performed in the TWPC hot cell on the second floor of the facility. The facility is designed to receive the over-packed concrete RH casks, then remotely repackage the RH waste into 55-, 30-, or 15-gallon drums for shipment to WIPP (Reference U046).

4.3 Facility Mission

Since 1966, the REDC has been the production, storage, and distribution center for the heavy-element research program of DOE, producing Bk-249, Cf-252, Es-253, and Fm-257. Target rods containing americium and curium are remotely fabricated in the Building 7920 hot cells, irradiated in the adjacent HFIR facility, and then processed in the Building 7920 hot cells for the separation and purification of the heavy actinide elements. The purified Bk-249, Es-253, and Fm-257 are packaged for shipment. The Cf-252 has been subsequently fabricated into neutron sources (Reference P161).

Between 1979 and 1986, some uranium fuel cycle development work was performed in specially-designed equipment in one of the Building 7920 hot cells known as the Solvent Extraction Test Facility (SETF). Solvent extraction flow sheets for processing irradiated fuels from commercial light water reactors (LWRs) and fast breeder reactors were developed and tested, and plutonium recovery schemes were demonstrated. This equipment is no longer used for its original purpose but remains in place and has been adapted and used for other processing and development activities related to the facility mission (References I044, P161, and U011).

Starting in 1991, the REDC has processed Mark-42 target assemblies irradiated at the Savannah River Site (SRS). High-purity Am-243, Cm-244, and Pu-242 are separated and recovered in the Building 7920 hot cells for shipment to the Los Alamos National Laboratory (LANL). The Mark-42 Processing Program activities utilize many of the same processes used for the transuranium element targets, allowing for dual use of the same hot cell equipment (Reference P161).

From May 2007 until August 2010, the Global Nuclear Energy Partnership (GNEP) Coupled End-to-End (CETE) research, development, and demonstration project was performed. Previously known as the Advance Fuel Cycle Initiative, the mission of the GNEP project includes the development of advanced, proliferation-resistant fuel cycle technologies for application to current operating commercial reactors and next-generation reactors (References C174, C306, M251, M252, P952, and P982).

Starting in May 2011, plutonium-beryllium (Pu-Be) neutron sources from Bettis Atomic Power Laboratory (BAPL) have undergone radiochemical separation of the plutonium and beryllium to reduce the neutron emission to disposable limits. The REDC is one of the few facilities in the United States that can routinely perform radiochemical processing of high-activity materials (Reference P980).

Since 2013, heat-source plutonium (Pu-238) is being produced from irradiation of neptunium targets. The heat-source plutonium is ultimately used in radioisotope thermoelectric generators to be used in satellites by the National Aeronautics and Space Administration (NASA) and for national security applications by the U.S. Department of Defense (DOD) (References C174, M265, M267, P981, and U132).

The four alpha laboratories are used for transuranium element product finishing operations and for fundamental research and chemical process development. Small-scale process development and special project operations similar in type to those done in the processing areas may be performed in the gloveboxes and shielded caves. The analytical chemistry laboratories provide support for the REDC production, research, and development programs as well as environmental and waste management at ORNL. Two hot cell cubicles have been used to perform analyses that must be done without dilution on highly-irradiated samples, and to make dilutions for subsequent analyses in the glovebox laboratories (References P161 and U011).

The TWPC was designed with the capability and flexibility to serve as the primary ORNL processor of CH and RH wastes originating from (Reference U046):

- Containerized RH and CH waste inventories in storage at ORNL
- Ongoing and future ORNL demolition, decontamination, and remediation operations
- Future laboratory operations
- Existing inventories or wastes received from other regional DOE sites

4.4 Defense Waste Assessment

The WIPP-WAC (Reference 18) requires generator sites to use AK to document that TRU waste streams to be disposed of at WIPP meet the definition of TRU defense waste. TRU waste is eligible for disposal at the WIPP if it has been generated in whole or part by one of the atomic energy defense activities listed in Section 10101(3) of the *Nuclear Waste Policy Act of 1982* (NWPA) (Reference 10). In April 2006, the formal defense determination submitted by ORNL in April 2005 was approved by DOE Carlsbad Field Office (CBFO) for TRU waste originating from the operations in the REDC complex (including Building 7930). This determination concluded that the wastes generated by operations in the REDC are irretrievably commingled with materials generated, in part, by the following atomic energy defense activities (Reference M023):

- Naval reactors development
- Defense nuclear materials production
- Defense nuclear waste and material by-products management
- Defense research and development activities

Specifically, the HFIR target campaigns that ultimately produce Cf-252 that is fabricated into neutron sources have been ongoing since inception of the REDC operations in 1966 and continue to generate waste today (References P161, U038, and U039). The

Cf-252 neutron sources have many applications, several of which are related to defense activities. These include neutron radiography of weapons components and military aircraft, neutron counting of fissile material and transuranic waste, landmine detection, and in-field inspection and verification of chemical weapons and high explosives (References M023, P258, P281, and U038).

The SETF operations, consisting of nine campaigns conducted from 1979 to 1986, were research and development activities supporting the DOE Breeder Reactor Program. The Mark-42 Processing Program, which began in 1991, supported the recovery of Pu-242, Am-243, and Cm-244 for use in other DOE and DOD programs. The HFIR target campaigns ran concurrently with the SETF and Mark-42 campaigns. Due to the similarity of contamination in the REDC hot cells from prior HFIR target campaigns, the waste generated from SETF and Mark-42 campaigns have not been segregated from waste generated by the HFIR target campaigns (Reference I044).

GNEP seeks to bring about a significant, wide-scale use of nuclear energy and take actions now that would allow that vision to be achieved while decreasing the risk of nuclear weapons proliferation and effectively addressing the challenge of nuclear waste disposal. GNEP would advance the nonproliferation and national security interests of the U.S. by reinforcing U.S. nonproliferation policies, reducing the spread of enrichment and reprocessing technologies abroad, and reducing or eliminating excess civilian plutonium stocks that have accumulated (Reference P952).

Pu-Be neutron sources from BAPL have undergone radiochemical separation at REDC. BAPL is an R&D facility located in Pennsylvania which focuses mainly on the design and development of nuclear power for the U.S. Navy. The work at BAPL is part of the Naval Nuclear Propulsion Program which is a joint U.S. Navy-DOE program responsible for the research, design, construction, operation and maintenance of U.S. nuclear-powered warships (References 20 and P980).

Both the DOD and NASA have indicated they will have continuing requirements for Pu-238. In addition to radioisotope thermoelectric generators to be used in satellites by NASA, radioisotope power systems, which depend on Pu-238, are critical to DOD applications. In particular, these power systems have become more essential to vital Defense programs since the terrorist attacks of September 11, 2001 (Reference P981).

These operations can be categorized into several of the defense activities listed in the NWPA, but the activity that best describes them is "defense nuclear materials production" because the Cf-252 was produced for neutron sources used for defense applications. The HFIR target campaigns that ultimately produce Cf-252 have been ongoing since inception of the REDC operations in 1966 and continue to generate waste today (References 9, 10, and 18).

4.5 High-Level Waste and Spent Nuclear Fuel Assessment

The WIPP LWA bans the disposal of spent nuclear fuel (SNF) and high-level waste (HLW), as defined by the NWPA (Reference 10). According to the NWPA, "spent nuclear fuel" is defined as "fuel that has been withdrawn from a nuclear reactor following irradiation, the constituent elements of which have not been separated by reprocessing." "High-level waste" is defined by the NWPA as "the highly radioactive material resulting from the reprocessing of spent nuclear fuel, including liquid waste produced directly in reprocessing and any solid material derived from such liquid waste that contains fission products in sufficient concentrations, and other highly radioactive material that the Commission, consistent with existing law, determines by rule requires permanent isolation." These requirements are also defined in DOE M 435.1-1 which is the mandatory requirements manual for implementing DOE Order 435.1 (References I022 and I023).

The SNF and HLW requirements were reviewed by the ORNL operating contractor (Bechtel Jacobs Company, LLC) and DOE-Oak Ridge Operations (References P569, U038, and U647). Based on this evaluation it was determined that the waste generated from the processing of HFIR and Mark-42 targets processed in the REDC are not SNF. For this reason, the processing of these targets cannot result in the generation of HLW, because the wastes are not primarily or solely materials resulting from a first-cycle extraction system (or equivalent) used in reprocessing of SNF. Additionally, the LWR and fast reactor test specimens processed during the SETF program involved the small-scale processing of these materials for development of separation and recovery technologies, and not HLW from a reprocessing facility responsible for the separation of fissile elements and/or transuranium elements contained in SNF for the sole purpose of recovering desired materials. For these reasons, the HLW requirements defined in DOE M 435.1-1 are not applicable to the REDC and these requirements were not included in the ORNL Implementation Plan for DOE Order 435.1 (Reference P569). Therefore, waste stream OR-REDC-RH-HET does not contain SNF or HLW (Reference DR009).

4.6 RH TRU Waste Management

In approximately 1987, Building 7920 implemented a program for the identification and segregation of hazardous waste regulated by the RCRA, Title 40 CFR Part 261, *Identification and Listing of Hazardous Waste* (References 11, P240, and P263). Data log sheets for packaging TRU waste identified the presence or absence of hazardous materials. The UCN-2109 form also identified whether or not waste is RCRA-regulated (References M005 and M100).

Even with implementation of a RCRA program in 1987, the earliest generation date of waste assigned EPA HWNs is 1994. The EPA HWNs assigned by generators included D005 (barium), D006 (cadmium), D008 (lead), D009 (mercury), and D011 (silver) based on the presence of lead, incandescent light bulbs, mercury-vapor light bulbs, and equipment containing solder with lead or silver. A Tennessee Department of

Environment and Conservation (TDEC) inspection conducted in 2003 identified numerous instances where containers of waste in storage had not been properly characterized. There are several REDC CH drums generated before 1987 and some after 1987 where the generator indicated no hazardous materials were present but have now been identified as suspect RCRA waste. Much of the waste was suspected of containing incidental hazardous waste items and presumed to be RCRA hazardous (References 12, M005, M024, M100, M110, M120, and U038). In addition to the EPA HWNs listed above, several other RCRA hazardous materials have been identified in this waste stream (see section 5.4.2).

Prior to 1999, each waste package was monitored for beta-gamma radiation and neutron radiation, and then the surface dose rate measurements were converted to activity values based on a defined conversion factor. This activity was assigned to the dominant nuclide in the package, typically Cm-244 and/or Cf-252 (References M100 and P240).

Beginning in 1999, an isotopic distribution was developed that included 30 different nuclides. This distribution was created using a combination of knowledge of the materials processed in the hot cells, smear sampling and analysis data, and Monte Carlo Neutron-Particle (MCNP) code modeling data. Activity values are then assigned to each nuclide in the container based on the dose rate of the cask (References M024, M100, U045, and U049).

4.6.1 Types and Quantity of TRU Waste Generated

The waste stream described by this report is characterized as mixed waste under the RCRA. The specific containers in this waste stream are provided in the *Waste Containers List* which is maintained as a quality record as required by procedure CCP-TP-005 (Reference 3). The number of containers in the waste stream are provided in Table 4-1, Waste Stream Volumes. The estimated future generation of waste stream OR-REDC-RH-HET is 10 55-gallon drums per year. See Section 5.2 for additional information on waste stream projections.

Table 4-1. Waste Stream Volumes

Waste Stream	Number of 55-Gallon Drums*	Volume (m^3)
OR-REDC-RH-HET	255	53

*A few of the 55-gallon drums are currently stored in 79-gallon and 85-gallon overpacks.

4.6.2 Correlation of Waste Streams Generated from the Same Building and Process

Waste Stream OR-REDC-RH-HET meets the WIPP-WAP and the WCPIP waste stream definitions. The waste is similar in material, physical form, hazardous constituents, and radiological properties and generated from a single process or activity (References 1 and 2). One RH-TRU waste stream has been delineated for the Building 7920 waste

according to these definitions. DOE/TRU-14-3425 identifies waste stream OR-REDC-RH-HET for this waste (Reference 4). The basis and rationale for delineating this waste stream is as follows:

- The activity in Building 7920 that generated this waste stream is production of the heavy actinide elements Bk-249, Cf-252, Es-253, and Fm-257, and those operations that support this activity (process development, analytical chemistry, and facility maintenance) (refer to Sections 4.7 and 5.3).

- The waste stream has common physical form in that it is comprised of a variety of organic and inorganic debris waste items. Wastes were not segregated by material type, and the volume percent combustible in each drum is highly variable (refer to Sections 4.6.3 and 5.4.1).

- The waste generator has characterized TRU waste from Building 7920 as either mixed waste regulated under RCRA, non-mixed waste (i.e., no RCRA-hazardous constituents), or suspect RCRA. Because of inaccuracies in waste characterization, the entire population of RH-TRU debris waste from Building 7920 is characterized as RCRA-hazardous waste under 40 CFR Part 261 (refer to Sections 4.6.3 and 5.4.2) (Reference 11).

The corresponding REDC CH debris waste stream is described in CCP-AK-ORNL-002, (Reference 12).

4.6.3 Waste Stream Identification, Categorization, and Delineation

4.6.3.1 Physical Form

The REDC waste generators completed a UCN-2109 form in which a waste description is recorded for each container (i.e., casks, boxes, and drums). The brief waste descriptions indicate that wastes are not segregated by material type (e.g., plastic, metal, glass). Some UCN-2109 forms include a waste container log sheet which indicates that individual packages contain a mixture of material types. The predecessor to the UCN-2109 form is the UCN-2822. The UCN-2822 for the casks only provides a brief waste description (e.g., burnable or non-burnable waste). The UCN-2822 for the drums includes waste type codes and provides a brief waste description as well as the volume of combustible waste in the 55-gallon drums. The waste type codes include (Reference M100):

- BW – Biological Waste
- CE – Contaminated Equipment
- DD – Decontamination Debris
- DS – Dry Solids
- SS – Solidified Sludge
- NC – Not Classified

DS is the only waste type code assigned to the drums in this waste stream. The brief waste description on the UCN-2822 also shows that wastes were not segregated by material type. Included with the UCN-2822 is a data log sheet which provides a brief waste description and the volume percent combustible for each inner package (drums only). The volume of combustible waste recorded on the UCN-2822, and the volume percent combustible recorded on the log sheets indicate a wide range of combustible wastes. Burnable and non-burnable wastes, or combustible and non combustible wastes, were to be segregated at one time, but review of the above forms and log sheets does not support this segregation (References M005, M100, M120, and U011).

4.6.3.2 Chemical Form

In approximately 1987, Building 7920 implemented a program for the identification and segregation of hazardous waste regulated by the RCRA, Title 40 of the Code of Federal Regulations (CFR) Part 261 (References 11, P240, P263). Data log sheets for packaging TRU waste identified the presence or absence of hazardous materials. The UCN-2109 form also identified whether or not waste was RCRA-regulated (Reference M005).

Even with implementation of a RCRA program in 1987, the earliest generation date of waste-assigned EPA HWNs was in 1994. The EPA HWNs assigned by generators are D003 (reactive lithium battery; see Section 5.4.2.3), D006 (cadmium), D008 (lead), D009 (mercury), and D011 (silver) based on the presence of batteries (nickel/cadmium and lithium), lead, incandescent light bulbs, mercury vapor light bulbs, and equipment containing solder with lead or silver. In addition, toxicity characteristic metal EPA HWNs including D004 (arsenic), D005 (barium), D007 (chromium), and D010 (selenium) were assigned by the generator to solid sample items that were disposed. There are several drums generated before 1987 and some after 1987 where the generator indicated no hazardous materials were present but have now been identified as suspect RCRA waste. These drums were identified as such based on a 2003 TDEC inspection in which TDEC pointed out numerous instances of waste in storage that had not been properly characterized. Much of the waste was suspected of containing incidental hazardous waste items and presumed to be RCRA hazardous. TDEC indicated this waste was to be managed onsite as RCRA hazardous waste "Pending Analysis for Hazardous Waste" (References M005, M110, and M244). In addition to the EPA HWNs listed above, several other RCRA hazardous materials have been identified in this waste stream (see Section 5.4.2).

Containers in this waste stream have been historically managed by the generator individually or in small populations for RCRA characterization purposes. Containers included in waste stream OR-REDC-RH-HET were not managed as a single hazardous or nonhazardous waste stream. Therefore, this waste stream does not consist of containers historically segregated by the generator into separate mixed and non-mixed waste streams based on the hazardous constituent identified for specific containers (References M110 and M244).

4.6.3.3 Radiological Form

Prior to 1999, each waste package was monitored for beta-gamma radiation and neutron radiation, and then the surface dose rate measurements were converted to activity values based on a defined conversion factor. This activity was assigned to the dominant nuclide in the package, typically Cm-244 and/or Cf-252 (References M005, M100, and P240).

Beginning in 1999, an isotopic distribution was developed that included 30 different nuclides. This distribution was created using a combination of knowledge of the materials processed in the hot cells, smear sampling and analysis data, and MicroShield modeling. Similarly, distributions were created for waste generated in process development labs 109, 111, 209, and 211. Activity values were then assigned to each nuclide in the container based on the neutron dose rate and modeling. Refer to Section 5.4.4 for additional information regarding REDC radiological characterization (References M005, M100, U041, U045, U129, U130, U131, U132, and U133). In December 2004, ORNL updated the radiological characterization of the waste generated before 1999 using the isotopic distribution and original surface dose rate measurement of the drum (References I044 and M005).

4.7 Description of Waste Generating Process

The following sections provide an overview of the Building 7920 operations including chemical processing, target fabrication, analytical laboratory, and process development.

4.7.1 Chemical Processing

4.7.1.1 Transuranium Element Target Processing

Transuranium element target processing includes the dissolution of irradiated targets, the separation of the transuranium elements from miscellaneous impurities and fission products, and the separation of the transuranium elements from each other. This is accomplished using a variety of solvent extraction, precipitation, and ion-exchange process steps. The processing steps are arranged to separate the transplutonium elements as a group from fission products and gross impurities before partitioning and purifying the individual elements. Recovered americium and curium are purified and converted to oxide for remote fabrication of new targets. The general sequence of steps used to process transuranium element targets in the hot cells is shown in Figure 12, Transuranium Element Target Processing (References P161, P279, and U011).

After the berkelium, einsteinium, and fermium have been separated from most of the curium and californium in the hot cell cubicles, they are transferred to shielded caves or gloveboxes and purified further from radioactive and nonradioactive contaminants by additional cycles of ion-exchange. The purified products are then packaged for

shipment. The californium is sorbed on cation-exchange resin and calcined to convert the californium to the oxysulfate for future use (References P279 and U011).

4.7.1.2 Solvent Extraction Test Facility

The SETF was in operation from 1979 to 1986 and involved the recovery of uranium and plutonium from irradiated commercial power reactor fuels. This was achieved by dissolution of irradiated fuel assembly sections, solvent extraction, ion-exchange, precipitation, and calcination process steps. The sequence of operating steps in the SETF campaigns is illustrated in Figure 13, Solvent Extraction Test Facility Operations (Reference U011).

4.7.1.3 Mark-42 Processing

The Mark-42 program began operation in 1991 and includes the dissolution of irradiated segments (Mark 42 assemblies cut to 20-inch lengths); the separation of the transuranium elements from miscellaneous impurities, activation products, and fission products; and the separation of the transuranium elements from each other. This is accomplished using a variety of solvent extraction, precipitation, and ion-exchange process steps. The general sequence of steps used to process Mark-42 segments in the hot cells is shown in Figure 14, Mark-42 Processing (Reference P161).

4.7.1.4 Global Nuclear Energy Partnership Coupled End-to-End Demonstration Project

The GNEP CETE Project began in May 2007 and was completed by August 2010. The spent fuel used during this project originated from the Dresden Nuclear Power Plant and the North Anna Nuclear Power Plant. The demonstration steps included voloxidation (heat treatment to release volatiles and declad the fuel), fuel dissolution, filtration, feed adjustment, four separate solvent extractions, and conversion of the solution to powder suitable for fuel pellet fabrication. The sequence of operating steps is illustrated in Figure 15, Coupled End-to-End Demonstration Of Advanced Fuel Cycles (References C174, C176, M251, M252, M253, M254, P952, P982, P983, P984, P985, and U568).

4.7.1.5 Processing of Plutonium-Beryllium Sources

BAPL was the custodian of sixteen Pu-238/Beryllium neutron sources. The sources were transferred to Building 7920 for radiochemical separation of the plutonium and beryllium to reduce the neutron emission to disposable limits. Processing of these sources in the hot cell began in May 2011. A hydraulic cutter is used to cut through and depressurize the source capsule, and the source capsule is cut open using a tubing cutter or a water-cooled rotary saw. It is expected that the material will be a metallic solid alloy or a pressed oxide powder; however, because the physical form is not positively known, processing plans have been prepared for both options. The processing of the sources includes dissolution, ion exchange, precipitation, filtration,

and solution solidification. Catalyzed electrolytic plutonium oxide dissolution (CEPOD) is also used if necessary. A process flow diagram is provided in Figure 16, Neutron Source Processing (References C174 and P980).

4.7.1.6 Special Projects

The operations described above represent the primary chemical processing activities in the REDC; however, special separation projects were periodically performed in cells reserved for this purpose. These special separations (e.g., separating Cf-249 from decaying Bk-249, or purifying a sample for shipment to another site) were performed in laboratory-type equipment especially installed in the cell for each job. These procedures generally involved a small fraction of the amount of material handled in the main line (Reference P279).

One special project of note was research in support of the Three Mile Island 2 (TMI-2) Nuclear Power Station accident in late-1979. Tests were performed in the early-1980s in the REDC hot cell and laboratories for the development of chemical processes to decontaminate the high-activity-level water remaining in the TMI-2 reactor containment building and the reactor coolant system as well as ion-exchange resins from the TMI-2 submerged demineralizer system. The waste generated from this project was commingled with other REDC waste in two casks (X10CSATN02077 and X10CSATN02229). Because this waste was generated over 30 years ago, the radioactivity in the contaminated water is almost entirely Cs-137. And since the TMI-2 waste was commingled with other REDC waste, the activity contribution of the TMI-2 to this waste should be negligible (References M241, P098, P1427, and P1428).

4.7.2 Target Fabrication

Actinide oxide is incorporated into aluminum target rods for irradiation in the HFIR. The operations and inspections include pellet forming, weighing, measurement, calorimetry, thermal cleaning, target loading, welding, x-ray examination, helium leak tests, dimensional inspections, hydrostatic compression of the aluminum tube around the pellets, coolant shroud attachment, decontamination, and carrier loading for transfer to the HFIR. Generally, pellet forming operations with loose powders are performed in Cubicle 3, target tubes are assembled in Cubicle 2, and final assembly and inspection operations with sealed target rods are performed in Cubicle 1. Pellet and target tube fabrication and target assembly operations are illustrated in Figure 18, Pellet Fabrication, Figure 19, Target Tube Fabrication, and Figure 20, Target Assembly (Reference P279).

Neptunium targets are fabricated for irradiation in the HFIR for the production of heat-source plutonium which is primarily Pu-238. In gloveboxes in Room 109, neptunium nitrate is converted to oxide powder. The neptunium oxide is blended with aluminum powder and pressed into pellets. The pellets are heat treated and transferred to Building 7930 for loading into target capsules (References M005, M258, M265, and M267).

4.7.3 Analytical Laboratory

Cubicle 8 is used exclusively to collect and store samples from the hot cells, to perform analyses that must be made without dilutions on highly radioactive samples, and to make dilutions for analyses in the glovebox analytical chemistry laboratories. Cubicle 9 has also been used for analytical chemistry purposes. Sample preparation and analyses include pipetting, titration, dissolution, filtration, solvent extraction, and centrifugation. The operations performed inside the analytical laboratory gloveboxes are essentially the same as the analytical operations performed in the hot cells except that much smaller equipment and significantly smaller amounts of materials are used in the gloveboxes (References P161 P1441, P1442, and U011).

4.7.4 Process Development

The process development laboratories (Rooms 109, 209, 111, and 211) have been used for fundamental studies and process development of alpha-active materials. Much of the early work was concerned with the development of sol-gel processes and with process development for the isolation and purification of various alpha-active materials. Other fundamental research and process development work has included reprocessing of reactor fuels, conversion of recovered uranium and plutonium to forms suitable for use in fabrication of recycle reactor fuel elements, and development of waste separation processes. Other work has included radioisotope power source development, including fabrication of neptunium targets and production of heat-source plutonium. The chemical processes (e.g., voloxidation, dissolution, solvent extraction, ion-exchange, precipitation, filtration, centrifugation, calcination, and modified direct denitration) and physical processes (e.g., pellet pressing, encapsulation, welding) performed in the gloveboxes are much the same as the hot cells but with smaller equipment and smaller amounts of material (References M255, M256, M257, M258, M259, M260, M261, M262, M263, M264, M265, M267, P161, P279, and U011).

4.7.5 Pu-238 Supply Project

The purpose of the Pu-238 Supply Project is to develop and implement the technology necessary to reestablish the domestic capability to produce heat-source plutonium (Pu-238) in the United States using existing DOE infrastructure. Before Pu-238 can be produced, a series of irradiation and processing tests are being conducted to develop and validate the designs, procedures, process flow sheets, and specifications required during the production process. Production of Pu-238 involves several steps. The first is the fabrication of neptunium targets which is described in Section 4.7.2 followed by irradiation in the HFIR. About ten percent of the neptunium is converted to plutonium during an irradiation while the remaining neptunium is reclaimed and recycled into targets. After irradiation of the targets, chemical processing of the targets is performed in the hot cells. Processing involves decladding, actinide and fission product dissolution, solvent extraction to separate the plutonium from the neptunium, purification of the plutonium by anion exchange, precipitation of the plutonium product, and oxygen-16 exchange. The plutonium product will be transported to LANL for eventual

processing and encapsulation. A process flow diagram is provided in Figure 17, Pu-238 Supply Project (References C174, M270, and P1440).

4.7.6 Maintenance Operations

The processing equipment in the cell bank was designed and built so that it can be maintained or replaced within the hot cell cubicles using remote techniques. Occasionally, large equipment items and equipment racks require maintenance that cannot be performed in the cubicles. These items are moved to the decontamination glovebox for cleaning and repair. As illustrated by Figure 6, Figure 8, and Figure 10, the decontamination glovebox is wheeled onto the top of the cell bank where the equipment is introduced into the glovebox from the equipment transfer cask (References P279 and U011). For maintenance operations in a tank pit, work may be performed directly in the pit in supplied air or may be done remotely from the top of the pit using long-handled tools (Reference U011).

The shielded caves and gloveboxes are also decontaminated and maintained. Alpha laboratory gloveboxes were constructed with standard carbon steel or stainless steel and have windows that are typically a polycarbonate type of plastic. The primary confinement in the shielded caves is provided by an internal alpha box with metal walls and floor and a viewing window similar to those of the alpha gloveboxes; however, it is surrounded by a concrete shield and operations are performed with manipulators. Gloveboxes and cave liners require removal and disposal on occasion. Loose items are removed before taking the box off line. Radioactive contamination on internal surfaces may be decontaminated using mild acid or alcohol, or may be fixed (e.g., spray painted) for contamination control (References M074, P161, and U403).

4.8 Waste Certification Procedures

In the CCP program under which the subject waste stream will be certified for shipment to WIPP, CCP-TP-005 (Reference 3), directs compilation and confirmation of AK. CCP certifies TRU waste under the program described in CCP-PO-002 (Reference 15).

5.0 WASTE STREAM INFORMATION

This section presents the waste stream information required by the WIPP-WAP and the WCPIP for waste stream OR-REDC-RH-HET (References 1 and 2). The area of generation, waste stream volume, period of generation, waste packaging, and the physical, chemical, and radiological composition of the waste stream are described.

5.1 Area and Building of Generation

Waste stream OR-REDC-RH-HET originated in REDC Building 7920. Areas within the building generating waste included in this waste stream are the TA (Room 118), the LAA (Room 120), the chemical make-up area (Room 213), the RCW equipment room (Room 215), and the decontamination glovebox room (Room 216) which are associated with the hot cell cubicle operations and waste transfers. Waste from the Building 7920 analytical chemistry laboratories (Rooms 108 and 208) and process development laboratories (Rooms 111, 211, 109, and 209) are also included. It should be noted that insignificant amounts of debris waste from REDC Building 7930 Californium Product Finishing operations have been identified in the documentation in one cask. This waste consists of a single parcel of rags and wipes generated during the decontamination of a source in this area (References C600, DR003, DR600, M005, M024, M100, M120, M244, and P161).

REDC waste management practices have resulted in the mixing of waste materials within the storage containers, with limited segregation of these wastes based on the radiological and chemical properties. Solid wastes have not been segregated according to programmatic source during the waste accumulation and packaging operations conducted to date at the REDC. Most solid wastes from the REDC were, and continue to be, accumulated over a significant period of time, resulting in mixing of campaign wastes conducted during the period of accumulation (Reference U038). As containers of REDC debris waste are generated during repackaging in the TWPC, the container-specific documentation will be reviewed to assure that each container included in waste stream OR-REDC-RH-HET meets the WIPP-WAP and the WCPIP waste stream definitions (References 1, 2, C600, M100, M120, and U038).

5.2 Waste Stream Volume and Period of Generation

As of February 2015, waste stream OR-REDC-RH-HET includes 255 55-gallon drums generated from the repackaging of 24 concrete casks and 5 55-gallon drums, for a total existing volume of 53.0 cubic meters of repackaged waste. The waste stream also includes 14 concrete casks and 5 drums included in ORNL's RH inventory generated in the REDC Building 7920 through August 2014, awaiting repackaging at the TWPC. The waste stream described in this report is bounded by the timeframe April 1972 to August 2014. It should be noted that the initial inventory of REDC RH waste included 263 concrete casks. The majority of the waste in the original inventory of 263 casks has been determined to be, or is currently anticipated to be, CH-TRU waste or low level waste (References M005, M100, and M244). The specific container numbers for

containers included in waste stream OR-REDC-RH-HET are provided in the Waste Containers List which is maintained as a quality record as required by procedure CCP-TP-005.

Based on repackaging of historical concrete casks and based on the volume of RH-TRU waste generated in Building 7920 over the last five years, it is assumed that this waste stream will be generated indefinitely at the rate of approximately 10 55-gallon drums per year. This estimate assumes an average of 5 RH 55-gallon drums will be generated from the repackaging of each RH cask, and that 2 cask per year will be generated (References M100, M244, and M245).

5.3 Waste Generating Activities

5.3.1 Hot Cell Cubicle Operations

Wastes are generated in the Building 7920 hot cell cubicles during the process operations and maintenance activities described in Section 4.7. The waste items are removed from the cubicles through connecting gloveboxes in the TA, LAA, and decontamination glovebox room, or the equipment transfer case which attaches to the top of the hot cells (Reference P161).

In the hot cell cubicles, waste items are typically placed into small containers (e.g., plastic or metal buckets) and monitored for radiation. Depending on the type of waste and radiation level, the item is acid leached, water rinsed, and air dried before placement into the bucket. Some waste items are also cut up to fit into the buckets. To reduce the volume of waste, a low-temperature furnace in Cubicle 9 is used to melt small plastic items such as polyethylene bottles to consolidate them in a metal bucket. The cans of melted plastic may contain miscellaneous glass, metal, and cellulosic items in the plastic matrix or placed on top of the block added to the metal can after the melt process. Spent cation-exchange resins are calcined, leached with nitric acid, collected in a polyethylene bottle and melted in the furnace, then placed into a metal bucket. Spent anion-exchange resins are de-nitrated, rinsed, and fixed in a concrete grout mixture in a metal bucket. Unusable empty metal buckets are compacted in a crusher (References DR601, P161, P986, and P987).

The TA cubicle is connected to the cell bank by means of the intercell conveyor and to a standard glovebox by means of a rotary shielding block ("lazy susan"). Waste buckets are transferred from the hot cell cubicles through the inter-cell conveyor system (see Figures 7 and 8) to Cubicle 9 where the waste is characterized to assure that the waste forms in each bucket meet the waste acceptance criteria (e.g., no free liquid, compressed gases, etc.). The buckets are transferred by conveyor to the TA cubicle and monitored for beta-gamma and neutron radiation. Wastes are transferred out of the TA cubicle via the lazy susan to the lazy susan glovebox or via the plastic bucket seal-out station and/or shielded transfer carrier ("mule"). Waste items are also transferred out of the lazy susan and standard gloveboxes using bag ports (see

Figures 7 and 9). Buckets with low radiation levels are disposed in a drum for CH waste (References C311 and P161).

Several CH-TRU waste drums also originated from the LAA, the chemical make-up room (Room 213), the RCW equipment room (Room 215), and the decontamination glovebox room (Room 216). Some of these drums, originally packaged as CH-TRU wastes, may have measured dose rates above 200 mR/Hr. and included in this RH-TRU waste stream (References M005, P161, and U011).

- The LAA consists of a high bay area above and behind the hot cell bank. A pit below the floor of the LAA contains liquid waste collection tanks. A pipe tunnel below the floor of the LAA houses the vessel off-gas iodine retention system and scrubber pumps. HEPA filters for these systems system are also in pits below the LAA floor. LAA waste generating activities include general maintenance of equipment and systems, including tank and filter pits.

- The chemical make-up area contains service, supply, and control systems for the processes and equipment in the hot cells which include a standard chemical fume hood; solution makeup tanks; pressurized solution addition tanks; pumps, heaters, coolers, and accessories associated with several circulating water heat transfer systems; supply systems for in-cell tank accessories such as air spargers and steam jets; and the pressure differential pressure transmitters and air purge systems associated with liquid level, density, and pressure measurement instrumentation.

- Cooling and heating water within the hot cell bank is supplied by the RCW system. The RCW surge tank and pumps are located above the cell bank so that all lines inside the cells are under hydrostatic pressure at all times. Equipment cooled by the system includes all cell pit tanks, evaporator condensers, cubicle equipment heating and cooling loops, and other miscellaneous equipment.

- The decontamination glovebox room includes the decontamination and equipment repair gloveboxes used for maintenance, repair, and decontamination of hot cell equipment. Materials are transferred in and out of the gloveboxes using bagging ports. Large pieces of equipment are transferred in and out of the glovebox through the roof door using the equipment transfer case. Liquid wastes are transferred out of the gloveboxes through liquid waste lines.

Prior to 1976, all Building 7920 TRU solid wastes (CH and RH) were packaged into concrete casks. In March 1976, REDC packaged CH-TRU waste into a couple of 55-gallon drums as a trial run. Formal segregation of CH-TRU waste into drums began in late 1977. Most of the low dose rate waste generated prior to late 1977 was placed into concrete casks called "floor casks." The majority of the floor casks have 4.5-inch thick side walls because the lower activity materials typically required much less shielding than the 6- and 12-inch thick casks. This waste will contain significant amounts of lower dose rate waste (paper, glassware, PPE, wipes, glovebox equipment,

and HEPA filters) generated from the laboratory and support areas. The amount of these lower dose rate materials would have decreased significantly in RH casks loaded after the late 1977 time frame, which will contain greater volumes of waste from hot cell activities (References C600, M005, M110, P125, U038, and U501).

In addition to the concrete casks with 4.5-inch thick walls, waste from REDC operations has been loaded in casks providing additional shielding with 6- and 12-inch thick concrete walls. The external dimension for all three of these cylindrical casks is approximately 7.5 feet tall by 4.5 feet in diameter. The waste materials loaded into the casks are packaged in a variety of configurations utilizing the following packaging materials (References P125, P161, and U011):

- 1-gallon metal paint cans (some lead-lined)
- Polyethylene bags, liners, bottles, and draw-string bags
- Cardboard ice cream cartons
- 3.4-gallon polyethylene plastic buckets (sealed and unsealed)
- 2-gallon Bain-Marie polyethylene plastic containers
- 5-gallon metal lard cans
- 10-gallon rigid-cardboard fiber drum

Larger equipment, such as processing racks (2x3x6 feet), charcoal filter beds (24x24x24 inches), and Hopcalite organic filters traps (6x24x24 inches) are directly loaded into the casks. Processing racks used in the hot cells are replaced due to malfunctions, wear, change in process requirements, or upgrades. Typically, the racks have been packaged in several layers of polyethylene bags then placed directly into the concrete cask. Lead bricks have been used to balance the processing racks and will be found in the disposal casks (References C302 and P125).

Concrete casks of TRU waste are loaded in a solid waste loading station located in the LAA. Waste to be loaded into the cask from the transfer area is generally transferred to the loading station in sealed plastic buckets and unsealed plastic bags. Larger equipment is transferred to the loading station via the equipment transfer case for disposal. The incoming empty cask is prepared by placing a polyvinyl chloride plastic bag liner (0.01 inch) into the cask. Plywood expanders are placed inside the bag (a circular disk at the bottom and a circular ring at the top), and the bag is then secured to one of the waste station roof plugs. Two roof plugs are available for loading the waste packages. One is used when the waste is to be transferred using the equipment transfer case, the other is used when plastic buckets are loaded. After the cask is loaded, the plastic bag is collapsed and an electrically-driven turntable inside the waste station rotates the cask, twisting the top of the bag. The bag is then cut and sealed with a hot-knife sealer. The cask lid is then installed, sealed with roofing pitch, and secured using two steel tapes, attached around the outside of the cask. The cask lid may also be attached to the cask body by three anchor bolts aligned with holes drilled in the cask lid (References C302 and U011).

5.3.2 Glovebox Laboratory Operations

Wastes are generated in the Building 7920 glovebox laboratories during the process operations described in Section 4.7. Glovebox operations are performed using neoprene glovebox gloves which are periodically replaced. Glovebox equipment items and components require periodic decontamination, inspection, maintenance, and repair. Glovebox equipment may also require replacement, and glovebox interiors require regular decontamination. Glovebox waste transfers are accomplished using a plastic bag transfer technique through 6-inch and 12-inch diameter access ports. Some gloveboxes are also equipped with sphincter-valve devices in which materials are placed in cardboard ice-cream cartons (References P161 and U011).

5.3.3 Transuranic Waste Processing Center

As necessary, drums containing CH-TRU waste in storage are moved individually to the TWPC PB (Building 7880) glovebox airlock. Once inside the glovebox airlock, the drum is moved to the drum tipper where the lid is removed and the drum contents are emptied into sorting trays. The waste articles are manually sorted and segregated via glove ports to remove prohibited items and repackaged at load-out stations along the glovebox. Boxes or drums containing CH-TRU waste are moved into the box breakdown area (BBA) in the PB via airlocks. The waste is inspected, removed, size-reduced, and sorted manually within the BBA, and either packaged into new drums directly from the BBA or processed through the glovebox as described above. Prohibited items identified during repackaging of drums and boxes are removed from the waste stream or are remediated (References P251, P254, P255, P256, P588, P592, P597, P1116, and P1433).

The TWPC approach to processing RH-TRU solid wastes is similar to that used for CH solid wastes except that RH wastes are processed in the TWPC Hot Cell. RH concrete casks may contain RH-TRU, CH-TRU, and/or low-level waste. Waste suspected to be CH-TRU waste, is placed into a CH drum that is attached to the bottom of the TWPC Hot Cell, and no further VE of the item is required in the TWPC Hot Cell. Occassionally, waste initially repackaged in the TWPC Hot Cell as RH-TRU waste has a surface dose rate less than 200 millirems per hour (mR/hr) and the waste must be transferred to a different 55-gallon drum designated for CH waste that is positioned in the CH drum out station below the hot cell sorting table. The TWPC Cask Processing Enclosure (CPE) in the PB is designed as a processing area where concrete casks determined to contain CH waste can be processed in a manner similar to that of the BBA as described above. Prohibited items are not packaged into CH drums during cask repackaging. Secondary waste generated during repackaging operations in the TWPC Hot Cell and CPE may include liquids (refer to Table 5-3 for liquids used in the process) mixed with absorbent (approved absorbents listed below), mercury amalgamated with HG Absorb (spill cleanup kit containing zinc and citric acid), PPE, and other miscellaneous process materials and equipment generated during routine operations as well as maintenance operations (References 13, C160, M022, P125, P254, P432, P583, P584, P590, P591, P1116, P1433, U038, U046, U125, and U126).

Glovebox, BBA, and CPE interiors are periodically wiped down using nonhazardous cleaners (e.g., rags dampened with Simple Green or Swiffer wet wipes). If polychlorinated biphenyls (PCBs) are encountered during waste processing, Big Orange-E (nonhazardous solvent containing d-Limonene) is used if necessary for decontamination. If inner containers are identified with liquids, they are absorbed with Nochar N965. Suspect PCB liquids are absorbed with the Nochar N910 Petro Bond. Environmental media (e.g., groundwater, moisture in soil) is absorbed with Quik-Solid. Secondary wastes created during waste processing, including rubber glovebox gloves, tools, rags, and absorbed liquids, may be placed into TRU waste drums along with other waste from the waste stream being repackaged (References C173, M022, P252, P253, P254, P432, P582, P589, P590, P591, P592, P1116, and P1433).

A diagram for processing CH-TRU waste at the TWPC is shown in Figure 21, Transuranic Waste Processing Center CH Solid Waste Diagram. A diagram for processing RH-TRU waste at the TWPC is shown in Figure 22, Transuranic Waste Processing Center RH Solid Waste Flow Diagram (References P254, P432, and U046).

5.4 Type of Wastes Generated

This section describes the waste materials based on process inputs and outputs, waste matrix code assignment, waste material parameter weight estimates, radionuclide contaminants, and hazardous waste determinations for waste stream OR-REDC-RH-HET.

5.4.1 Materials Related to Physical Form

Waste stream OR-REDC-RH-HET is comprised primarily of organic and inorganic debris waste items. Waste descriptions are provided on UCN-2109 and UCN-2822 forms and waste container log sheets. The primary source for descriptions of TRU waste materials from the REDC were obtained from the waste container log sheets for the CH waste stream (OR-REDC-CH-HET) described in CCP AK Summary Report, CCP-AK-ORNL-002 (Reference 12). The waste includes cellulosics (paper), plastic, rubber, metal, and glass. Specific waste items present in the storage container inventory include the following (see Table 5-3 for chemical information regarding specific products) (References M005, M024, M072, M073, M074, M100, M278, P125, P161, and U011):

- Aluminum-based metal items such as brackets, cans, covers, foil, manipulator parts, and sheeting
- Iron-based metal items including containers (e.g., buckets, cans, drums), filter housing, fittings, flanges, hand tools (e.g., files, hammers, knives, pipe cutters, scissors, screwdrivers, tweezers, wrenches), hardware (e.g., bolts, clips, nails, nuts, springs, washers), light bulb bases, pipe nipples, piping, planchets, plates, saw blades, scrap (e.g., angle iron, brackets, chips, discs, shavings, sheeting), sealed radiation sources, spray cans (punctured), steel wool, syringes, and valves

- Other metals such as batteries (e.g., alkaline, lithium, nickel/cadmium), brass (e.g., fittings, scale weights), copper (e.g., tubing, fittings, wire) and lead (e.g., bricks, pigs, plates, sheeting), nickel (e.g., crucibles, targets), and other items such as thermocouples

- Other inorganic materials including unirradiated actinide oxides/pellets, absorbents/adsorbents (e.g., Drierite, silica gel, Solid-a-sorb, vermiculite), asbestos (e.g., insulation), ceramics, charcoal (e.g., filters), concrete, drywall, fiberglass, filter media, fire blankets, floor sweepings, glassware (e.g., bottles), glass thermometers, glass windows, graphite, Hopcalite, insulation (may contain asbestos), leaded glass, light bulbs (incandescent and mercury vapor), Met-L-X (fire extinguishing powder), mirrors, paint chips, and tile (may contain asbestos)

- Cellulosic items such as absorbent pads (e.g., Wypall X80 Wipers [cellulose/polypropylene blend]), cardboard, cheesecloth, cloth, cork, cotton, (e.g., gauze, glove liners, rope, swabs), labels, leather gloves, masking tape, mop heads, paper towels, rags, smears, vacuum bags, wipes, and wood (e.g., blocks, handles, rulers)

- Plastic items including bags, caps, containers (e.g., bottles, buckets), fittings, foam (e.g., ear plugs, head bands, knee pads), Herculite (industrial fabric), ion-exchange resin, labware (e.g., funnels, pipettes, vials), latex gloves, manipulator boots, markers, nylon (e.g., belts, rope), plexiglass, poly blocks, scouring pads, sheeting, shoe covers, sleeving, strippable coating (e.g., CC Fix, Stripcoat TLC Free), styrofoam, tape, ties, tips, tubing, Tyvek suits, and valves

- Rubber items such as aspirators, booties, bubble suits and hoods, gaskets, gloves, grommets, hose, o-rings, and stoppers

- Equipment and electrical devices including some containing circuit boards such as balances, electric motors, flashlights, furnaces, heating mantels, hotplates, micrometers, pump, saws, and vacuum cleaners

- Wood-framed and metal-framed HEPA filters and roughing filters (filter media may contain asbestos).

- Organic matrix (e.g., grouted ion-exchange resin, dried epoxy, and liquids absorbed with an organic polymer such as Nochar N965 [refer to Table 5-3, Waste Stream OR-REDC-RH-HET Material and Chemical Inputs, for liquids and absorbents used in the process])

- Inorganic matrix (e.g., liquids absorbed with an inorganic absorbent such as Solid-a-sorb or vermiculite, mercury absorbed with HG Absorb [refer to Table 5-3 for liquids and absorbents used in the process])

5.4.1.1 Waste Matrix Code

As discussed in the previous section, waste stream OR-REDC-RH-HET is comprised primarily of organic and inorganic debris waste items and generally consists of cellulosics (e.g., paper, cloth), plastic, rubber, glass, and metal. The waste matrix code was assigned to this waste stream based on the evaluation of AK information relating to the physical form of the waste recorded on UCN-2109 and UCN-2822 forms and container log sheets. This container documentation for the concrete casks contains limited information relating to the physical composition of the waste contained; typically only whether the waste is burnable or non-burnable (Reference M100).

For the CH inventory, the UCN-2109 records an estimate of the volume percent combustible which ranges from 0 to 100 percent with an average of 62. The UCN-2822 provides an estimate for total volume and combustible volume in cubic feet. The calculated volume percent range for combustibles on the UCN-2822 forms is 0 to 100 percent, averaging 54 percent. The container log sheets provide an estimate of the volume percent combustible for each package in CH drums. The calculated volume percent combustible range for combustibles in drums with container log sheets is 33 to 98 percent averaging 65 percent (Reference M005).

Due to the high degree of variability in the amount of combustible waste in the CH waste, Waste Matrix Code S5400, Heterogeneous Debris, is applied to the CH REDC waste stream. For this reason, S5400 is also applied to waste stream OR-REDC-RH-HET, assuming that the composition of the RH waste is comparable to the CH waste generated by the same operations. The definition of this Waste Matrix Code is provided in the DOE/LLW-217, *DOE Waste Treatability Group Guidance* (Reference 13). This category includes waste that is at least 50 percent, by volume, debris materials that do not meet the criteria for assignment as either an Inorganic Debris (S5100) or Organic Debris (S5300).

Although the waste stream, as a whole, is comprised of more than 50 percent heterogeneous debris, the casks will contain a wide range of the waste material parameters listed in section 5.4.1.2, except that no individual drum will contain greater than 50 percent homogeneous solids (e.g., solidified/absorbed liquids, grouted resins, graphite, and Hopcalite filter bed media).

5.4.1.2 Waste Material Parameters

The waste material parameter weight estimates for waste stream OR-REDC-RH-HET were derived from CCP Real-Time Radiography (RTR) data of the corresponding CH waste stream OR-REDC-CH-HET. RTR data were evaluated for 255 containers from waste stream OR-REDC-CH-HET generated from November 1977 to May 2005. It is assumed that the data for these 255 containers are representative of waste stream OR-REDC-CH-HET as a whole. One minor exception is that RTR has not identified any drums with organic matrix; however, as described above, only a few drums are expected to contain organic matrix (grouted ion-exchange resin). An analysis of the

RTR data was performed, the results of which are presented in Table 5-1, Waste Material Parameter Estimates for Waste Stream OR-REDC-RH-HET. This evaluation is documented in the Waste Material Parameter Memorandum included with CCP-TP-005, Attachment 6 (Reference 3).

Table 5-1. Waste Material Parameter Estimates for Waste Stream OR-REDC-RH-HET

Waste Material Parameter	Weight Percent	Weight Percent Range
Iron-based Metal/Alloy	33.0%	0.0% – 98.8%
Aluminum-based Metal/Alloy	1.6%	0.0% – 21.2%
Other Metals/Alloy	0.9%	0.0% – 55.9%
Other Inorganic Materials	12.8%	0.0% – 80.3%
Cellulosics	4.9%	0.0% – 70.5%
Rubber	1.3%	0.0% – 52.2%
Plastics (waste materials)	45.5%	0.0% – 100%
Organic Matrix [1]	0%	0.0%
Inorganic Matrix [2]	0%	0.0%
Soil	<0.1%	0.0% – 3.4%

1. Although RTR did not identify organic matrix in this subset of drums, small amounts of organic matrix are expected to be present in the form of grouted ion-exchange resin, dried epoxy, and liquids absorbed with an organic polymer such as Nochar N910 or Nochar N965.
2. Although RTR did not identify inorganic matrix in this subset of drums, small amounts of inorganic matrix are expected to be present in the form of liquids absorbed with an inorganic absorbent such as Solid-a-sorb or vermiculite.

5.4.2 Chemical Content Identification – Hazardous Constituents

This section describes the characterization rationale for assignment of EPA HWNs to waste stream OR-REDC-RH-HET. The EPA HWNs assigned to this waste stream are summarized in Table 5-2, Waste Stream OR-REDC-RH-HET Hazardous Waste Characterization Summary.

The REDC waste described in this report has been historically managed in accordance with ORNL waste management practices in compliance with the requirements imposed by the TDEC. As discussed in Section 4.6, the assignment of EPA HWNs to ORNL waste began in 1994. TDEC inspections conducted as late as 2003, identified containers had not been properly characterized. These containers were subsequently identified as "RCRA suspect" with no specific HWNs assigned to be managed onsite as RCRA hazardous waste "Pending Analysis for Hazardous Waste." Containers in this waste stream have been historically managed by the generator individually or in small populations for RCRA characterization purposes. Containers included in waste stream OR-REDC-RH-HET were not managed as a single hazardous or non-hazardous waste stream. Therefore, this waste stream does not consist of containers historically segregated by the generator into separate mixed and non-mixed waste streams based on the hazardous constituents identified for specific containers. Additional

documentation regarding how the site has historically managed the waste, including the historical assignment of EPA HWNs for the waste, is described above in Section 4.6.2. For this reason, the assignment of EPA HWNs to waste stream OR-REDC-RH-HET considered the HWNs assigned by the generators to REDC TRU waste, in addition the review of the AK record described below. The HWN assignments have been applied on a waste stream basis; individual containers may not contain all of the hazardous materials listed for the waste stream as a whole (References 12, M005, M024, M100, M110, M120, P1439, and U038).

Table 5-2. Waste Stream OR-REDC-RH-HET Hazardous Waste Characterization Summary

EPA Hazardous Waste Number	Constituent
Toxicity Characteristic Metals	
D004	Arsenic
D005	Barium
D006	Cadmium
D007	Chromium
D008	Lead
D009	Mercury
D010	Selenium
D011	Silver
Toxicity Characteristic Organics	
D019	Carbon tetrachloride
F-Listed Organic Solvents	
F002	1,1,1-Trichloroethane
F002	1,1,2-Trichloroethane
F002	Trichloroethylene
F005	Benzene
F005	Toluene

To assign EPA HWNs, AK sources including, procedures, laboratory logbooks, personnel interviews, previous AK reports, container packaging and shipping documentation, and material safety data sheet (MSDS) information for commercial products noted in the AK record were reviewed to determine potential waste material inputs and possible chemical contaminants associated with the Building 7920 REDC operations. A comprehensive list of materials and chemicals identified during this assessment are provided in Table 5-3. HWNs were assigned for compounds used in the hot cells, due to the lack of analytical evidence quantifying the concentration of RCRA toxic contaminants in the waste matrix (References DR005, DR008, and DR602).

Table 5-3. Waste Stream OR-REDC-RH-HET Material and Chemical Inputs

Chemical/Material	Use/Description/Location	AK Source	EPA HWNs
1,1,1-trichloroethane	Component in Desicote rinsing aid.	U529	F002
1,1,2-trichloroethane	REDC organic chemical inventory.	C078, DR008	F002
1,10-phenanthroline	Iron spectrophotometric analysis reagent.	P282	NA
2,5-di-tert-butylhydroquinone (DBHQ)	Plutonium solvent extraction reagent.	C078, P145, U011	NA
2-ethylhexyl phenylphosphonic acid (Pharex)	Pharex solvent extraction reagent.	P136, P279	NA
2-ethylhexanol	Plutonium solvent extraction diluent.	C078, P136, P145, U011, U432, U533, U545	NA
2- Methoxyethanol	Process development lab work.	M266	NA
2-methyl lactic acid	REDC organic chemical inventory.	C078	NA
2-thenoyltrifluoroacetone (TTA)	Total plutonium, berkelium, and neptunium analytical chemistry extraction reagent.	P282	NA
Acetic acid	REDC organic chemical inventory.	C078, U011	NA
Acetohydroxamic acid (AHA)	Solvent extraction reducing/complexation	P985	NA
Acetone	Equipment cleanout solvent (degreaser). Identified in laboratory logbooks. Analytical laboratory solvent. Process development lab solvent.	M255, M265, P161, P279, P282, U011, U437, U477, U489, U506, U529	NA
Acetonitrile	Study of solvents for actinide and lanthanide reductions.	P110	NA
Adogen 364	High purity tertiary amine dissolved in diethylbenzene for solvent extraction.	C078, M022, P136, P282, U011	NA
Ajax All Purpose Cleaner (ammonia)	Decontamination detergent used on dampened wipes.	C148, M022, P263	NA
Alcohol (Formula 3A)	Cleanout of equipment (95% ethanol, 5% methanol).	M022, P282	NA
Aluminum chloride	REDC inorganic chemical inventory.	U011	NA
Aluminum powder (alumina)	Americium/curium fuel pellet component. Neptunium target component. Purifying diethylbenzene and kerosene.	M265, P161, P279, P1440, U011	NA
Aluminum nitrate	Neptunium solvent extraction reagent. Uranium alpha spectroscopy reagent. High pressure liquid chromatography separation reagent. Process development lab work.	M264, P282	NA
Ammonia	Reagent used to precipitate nickel and copper in ion-exchange product solutions.	P229, P279	NA
Ammonium acetate	Process development lab work.	M257	NA
Ammonium alpha-hydroxyisobutyrate (AHIB)	Chromatographic cation-exchange eluent. High pressure liquid chromatography separation reagent.	P136, P161, P279, P282, U011	NA

Table 5-3. Waste Stream OR-REDC-RH-HET Material and Chemical Inputs (continued)

Chemical/Material	Use/Description/Location	AK Source	EPA HWNs
Ammonium hydroxide	Oxide precipitation reagent. Used to convert nitrated anion-exchange resins to the hydroxide form before drying. Neptunium solvent extraction reagent. Iron spectrophotometric analysis reagent. High pressure liquid chromatography separation reagent. Pu-Be neutron source processing. Process development lab work.	C078, M258, P136, P145, P161, P279, P282, P980, U011	NA
Ammonium nitrate	Cation-exchange reagent (wash). Process development lab work.	C078, U011	NA
Ammonium persulfate	Oxidation reagent for americium.	P851, U011	NA
Ammonium thiocyanate	Uranium spectrophotometric analysis reagent.	P282	NA
Aqua regia (hydrochloric-nitric acid mixture)	Identified in laboratory logbooks.	U529	NA
Armor All Glass Cleaner (propylene glycol n-butyl ether, isopropanol)	TWPC hot cell maintenance.	M022, U125	NA
Arsenic	Actinide and lanthanide hydride and metallide studies.	P114	D004
Ascorbic acid	Plutonium extraction reagent. Pu-Be neutron source processing.	P136, P980, U011	NA
Barium	Fission product contaminant of HFIR targets. Californium product solution impurity. Assigned by generator to REDC waste debris. Identified in laboratory logbooks.	M024, M100, P151, U011, U505	D005*
Benzene	Testing of solvents for extraction of actinides.	DR602, P160, P164	F005
Beryllium	Electroplating microgram quantities of transplutonium elements on beryllium foil targets and source plate. Sources. Process development lab work. Pu-Be neutron source processing.	M257, P223, P980	NA
Big Orange-E (d-Limonene)	Solvent used for PCB decontamination at the TWPC.	M022, P582	NA
Cadmium	Californium product solution impurity. D006 assigned by generator to REDC containers (flashlight batteries and electronic equipment). Identified in laboratory logbooks.	M005, M024, M100, P151, U483, U529	D006*
Calixarene-crown ether	Cesium extractant.	M254	NA
Carbon/activated charcoal	Organic chemical vapor filter media.	M001, P161, U011	NA
Carbon tetrachloride	REDC organic chemical inventory.	C078, U011	D019
Cement/concrete/grout	Ion exchange resin immobilization Pu-Be neutron source processing (Glenium 7700, Tercem 3000 cement).	M022, P241, P980, P1436	NA
Cerium nitrate	Identified in laboratory logbooks. Process development lab work.	M262, U435	NA

Table 5-3. Waste Stream OR-REDC-RH-HET Material and Chemical Inputs (continued)

Chemical/Material	Use/Description/Location	AK Source	EPA HWNs
CC Fix (ammonia 2-ethylhexyl acrylate)	Nonhazardous stabilization agent/fixative.	M022, M073, M155, U125, U126	NA
CC Wet (glycerin, monosaccharide, non-ionic surfactant, non-halogenated yellow dye)	Nonhazardous stabilization agent/fixative.	M022, M073, M155, U125, U126	NA
Citric acid	REDC organic chemical inventory.	U011	NA
Chromium	Contaminant of aluminum target cladding and fuel matrix. Californium product solution impurity. Contaminant of Ni-63. Identified in laboratory logbooks.	P151, P161, P279, P801, U011, U529	D007
Cobalt chloride	Process development lab work.	M255	NA
Crown ether	Strontium extractant.	M254	NA
Cyanex 301 (bis-(2,4,4-trimethylpentyl)-dithiophosphinic acid)	Organic extractant being tested for group separation of the actinide and lanthanide elements.	P819	NA
Desiccant (e.g., Drierite [calcium sulfate], silica gel [silicon dioxide])	Purifying diethylbenzene and kerosene. Process development lab work.	C078, M073, M263, P279, U011	NA
Diatomaceous earth	Process stream and liquid waste filtering media.	P161, P173, P229, P982	NA
Diethylbenzene (DEB)	Solvent extraction organic extractant.	C078, P136, P161, P279, U011	NA
Diethylene triaminepentaacetic acid (DTPA)	Strip and scrub solution in solvent extraction. REDC organic chemical inventory.	C078, P145, P984, U011,	NA
Di (2-ethylhexyl) phosphoric acid (HDEHP)	Solvent extraction organic extractant in decane diluent.	C078, P136, P145, P161, P279, P984, U011	NA
Diisopropylbenzene (DIPB)	REDC organic chemical inventory.	C078, U011	NA
Dimethylformamide	Study of solvents for actinide and lanthanide reductions.	P110	NA
Dioctylphthalate	Filter testing.	P263, P279, U011	NA
Dodecane	Solvent extraction organic extractant.	P161, P984, P992, U011	NA
EDTA	REDC organic chemical inventory.	C078, U011	NA
Elmer's glue (polyvinyl acetate)/water mixture	Fixative for airborne contamination in the TWPC hot cell.	U124	NA
Ethanol	Analytical Laboratory equipment cleaning reagent. Component of Formula 3A alcohol (95%) used to cleanout equipment. Decontamination and equipment repair solvent. Process development lab solvent.	C078, M022, M255, M256, M257, M259, M260, M263, M265, M266, P161, P279, P282, U011	NA
Ethanol-hydrochloric acid mixture	Used as the eluent for some product finishing and special product ion-exchange operations.	P820, P826	NA

Table 5-3. Waste Stream OR-REDC-RH-HET Material and Chemical Inputs (continued)

Chemical/Material	Use/Description/Location	AK Source	EPA HWNs
Ether (non-specific)	REDC organic chemical inventory. Identified in Building 7920 logbook.	U011, U501	NA
Ethylene glycol	REDC organic chemical inventory.	C078	NA
ExxonMobil Aromatic 150 (aromatic hydrocarbon)	Solvent extraction organic extractant.	M022, P161, P992	NA
ExxonMobil Isopar L (paraffinic hydrocarbon)	Solvent extraction organic extractant.	M022, M254	NA
ExxonMobil Exxsol D60 (paraffinic hydrocarbon)	Solvent extraction organic extractant.	M022, P161, P992	NA
Ferric chloride	REDC inorganic chemical inventory.	C078, U011	NA
Ferric nitrate	Total plutonium analytical chemistry extraction reagent.	C078, P282	NA
Ferrous ammonium sulfate	Iron spectrophotometric analysis reagent.	P282	NA
Ferrous chloride	Neptunium and plutonium solvent extraction reagent.	P136, P282	NA
Ferrous sulfamate	REDC inorganic chemical inventory (SETF reductant reagent). Process development lab work.	M264, P229, U011	NA
Ferrous sulfate	Determination of total reducing normality reagent.	C078, P282	NA
Formic acid	Used for actinide/lanthanide separation by extraction chromatography. Identified in laboratory logbooks.	P804, U477, U489	NA
Gadolinium nitrate	Identified in laboratory logbooks. Process development lab work.	M262, U435	NA
HG Absorb (zinc, citric acid)	Mercury cleanup kit used at the TWPC.	M022, M073, U046	NA
Hydrazine/hydrazine hydrate	SETF solvent extraction reduction agent. Process development lab work.	C078, M255, M256, M259, M264, P016, P173, P229, U011	NA
Hydrobromic acid	Identified in laboratory logbooks.	U506	NA
Hydrochloric acid	Solvent extraction aqueous solution. LiCl chromatographic anion-exchange solution. Curium and plutonium target dissolution. Process solution titration reagent. Pu-Be neutron source processing. Process development lab work.	C078, M255, M256, M257, M259, M260, M262, M263, M264, P136, P161, P279, P282, P980, U011	NA
Hydrofluoric acid	Target dissolution.	P136, P223, P279, P282, U011	NA
Hydrogen peroxide	SETF, Berkex, and Cleanex extraction reductant. Pu-Be neutron source processing.	C078, P173, P223, P279, P980, U011	NA
Hydroquinone	REDC organic chemical inventory.	C078, U011	NA

Table 5-3. Waste Stream OR-REDC-RH-HET Material and Chemical Inputs (continued)

Chemical/Material	Use/Description/Location	AK Source	EPA HWNs
Hydroxylamine hydrochloride	REDC inorganic chemical inventory (SETF reagent). Total plutonium analytical chemistry extraction reagent. Neptunium solvent extraction reagent. Iron spectrophotometric analysis reagent.	C078, P136, P229, P282, U011	NA
Hydroxylamine nitrate	Solvent extraction reducing agent. REDC inorganic chemical inventory (SETF reagent).	P985, U011	NA
Hopcalite	Organic chemical vapor filter media oxidation catalyst (CuO_2-MnO_2).	M001, P263, U011	NA
Ion exchange resins	Anion and cation exchange resins including Dowex and Ionac resins.	M022, P279, P282, U011	NA
Isopropanol	Electroplating solution for californium on platinum foils and disks. Process development lab solvent.	C078, M257, P021, P223	NA
Kerosene (Amsco)	Deodorized mineral spirits. Pharex solvent extraction diluent.	C078, P279, U011	NA
Lactic acid	Strip and scrub solution in solvent extraction.	P984	NA
Lead	Glovebox gloves and window. Fission product contaminant of HFIR targets. Californium product solution impurity. Lead shielding, lead pigs, bricks, shavings, electronic equipment (circuit boards), and solder. Identified in laboratory logbooks.	C148, C302, M005, M024, M100, P151, P272, P279, U011, U038, U429, U477, U508, U529, U531, U537	D008*
Lead-acid batteries	Contained in mule carrier lead-acid batteries.	P161	D008
Lead carbonate	Cleaning of soap film from internal surfaces of cell windows during window maintenance.	P020	D008
Lead oxide	Berkelium-Californium separation.	P114	D008
Lithium	Identified in laboratory logbooks. Lithium batteries.	M244, P1438, U429	NA
Lithium chloride	Transcurium and Mark-42 LiCl chromatographic anion-exchange oxidant. Process solutions free acid and adogen titration reagent.	C078, P136, P145, P161, P223, P279, P282, U011	NA
Lithium hydride	Identified in laboratory logbooks.	U429	NA
Lithium hydroxide	Process solutions free acid and adogen titration reagent.	C078, P282, U011	NA
Lithium hypochlorite	Cleanex extraction oxidant.	U011	NA
Lithium nitrate	REDC inorganic chemical inventory.	U011	NA
Magnesium	Identified in laboratory logbooks.	U505, U506	NA
Mercuric nitrate	Radioiodine trap reagent.	C078, U011	D009
Mercury	Contained between the liners and shells of evaporator tanks. Mercury vapor lamps, electronic equipment, thermostats, and solder.	C148, M005, M024, M100, P161, P272, U038	D009*

Table 5-3. Waste Stream OR-REDC-RH-HET Material and Chemical Inputs (continued)

Chemical/Material	Use/Description/Location	AK Source	EPA HWNs
Met-L-X (sodium chloride, Saran [vinylidene chloride acrylonitrile copolymer], magnesium aluminum silicate)	Fire extinguishing powder for Class D (combustible metal) fires.	M022, M073	NA
Methanol	Tramex extraction reagent. Ingredient in Formula 3A alcohol (5%) used to cleanout equipment. Identified in laboratory logbooks. Process development lab solvent.	C078, M022, M256, M257, M259, M266, P030, P136, P145, P161, P279, U011, U425	NA
Methyl isobutyl ketone	Neptunium solvent extraction reagent (organic phase). Uranium alpha spectroscopy reagent.	P282	NA
Mr. Clean (ethoxylated C9-11 alcohols)	Liquid cleaner used in ultrasonic cleaning of HFIR targets.	M022, P263	NA
Napthalene (deca hydro)	REDC organic chemical inventory.	C078	NA
N,N,N',N'-tetraoctyl diglycolamide (TODGA)	Process development lab work.	M257	NA
N-paraffin hydrocarbon (NPH)	SEFT solvent extraction diluent.	C078, P161, P173, P229, P985, P992, U011	NA
Nickel chloride hexahydrate	REDC inorganic chemical inventory.	C078	NA
Nickelous nitrate	Process development lab work.	M255	NA
Nitric acid	Plutonium fuel and transcurium target dissolution. Solvent extraction aqueous solution. Plutonium and americium anion/cation-exchange feed solution and eluent. Dilute aqueous samples and cleaning counting plates for radiological analyses. Scrub, strip, and wash solution in solvent extraction. Pu-Be neutron source processing. Neptunium target dissolution. Process development lab work.	C078, M254, M255, M256, M257, M258, M259, M260, M261, M262, M263, M264, M265, M266, M270, P136, P145, P161, P229, P279, P282, P980, P982, P984, P985, P1440, U011	NA
Nitrous acid	Identified in laboratory logbooks.	U425	NA
Nochar Petro Bond N910 (thermoplastic elastomer polymer)	Absorbtion of known or suspect PCB liquids.	M022,P592, P598, P993	NA
Nochar N965 Acid Bond and Petro Bond Blend (thermoplastic elastomer, co-polymer of acrylamide)	Solidifying agent for absorbing aqueous and organic liquids during waste repackaging.	M022, M073, P592, U046	NA
Oxalic acid	TRU element extraction. Plutonium precipitation. REDC organic chemical inventory.	C078, M270, P984, P1440, U011	NA

Table 5-3. Waste Stream OR-REDC-RH-HET Material and Chemical Inputs (continued)

Chemical/Material	Use/Description/Location	AK Source	EPA HWNs
Perchloric acid	Identified during repackaging and absorbed with Nochar N965.	M073, M155	NA
Pentasodium diethylene-triamine pentaacetate	Decontamination solution detergent.	P279	NA
Phenolphthalein	Process solution titration end point indicator. Process development lab work.	P255, P282	NA
Phenoxy fluoro-alcohol	Modifier/solvating agent.	M254	NA
Potassium bromate	Berkelium extraction process oxidant.	P279, U011	NA
Potassium carbonate	In-tank americium and curium precipitation. Scrubbing system basic solution.	C078, P136, P145, P161, U011	NA
Potassium dichromate	Determination of total reducing normality reagent.	P282	D007
Potassium hydroxide	Scrubbing system basic solution.	C078, P161, U011	NA
Potassium iodide	Plutonium/Uranium anion-exchange reagent.	P282	NA
Potassium nitrate	REDC inorganic chemical inventory.	C078, U011	NA
Potassium oxalate	Process solution titration reagent.	P282	NA
Potassium permanganate	Neptunium solvent extraction reagent.	P282	NA
Praseodymium nitrate	Identified in laboratory logbooks.	U436	NA
Quik-Solid (sodium polyacrylate)	Absorption of aqueous liquids with neutral pH.	M022, M005, M073, P1439	NA
Quintolubric 888-46 (mineral oil)	TWPC hot cell hydraulic system.	C160, U126	NA
Samarium nitrate	Identified in laboratory logbooks. Process development lab work.	M262, U507, U529	NA
Selenium metal	Actinide and lanthanide hydride and metallide studies.	P114	D010
Silver	Photographic development solutions. Electronic equipment (circuit boards). Identified in laboratory logbooks. Pu-Be neutron source processing.	C078, C148, M005, M100, M110, P980, U507	D011*
Silver nitrate	REDC inorganic chemical inventory.	C078	D011
Silver zeolite	Trapping radioactive iodine. Process development lab work.	M263, P500	D011
Simple Green (nonhazardous)	TWPC containment enclosure decontamination.	C173, M022	NA
Soda lime	Process development lab work.	M263	NA
Sodium aluminate	Iodox process dissolver solution.	P500	NA
Sodium carbonate	Acid vapor scrubber solution. Process development lab work.	C078, M255, P161, U011	NA
Sodium bromate	Berkelium cation-exchange oxidant.	C078, P136, U011	NA
Sodium dichromate	Berkelium separation extraction reagent.	P282	D007
Sodium fluoride	Process development lab work.	M263	NA

Table 5-3. Waste Stream OR-REDC-RH-HET Material and Chemical Inputs (continued)

Chemical/Material	Use/Description/Location	AK Source	EPA HWNs
Sodium hydroxide	Aluminum cladding target dissolution. Acid vapor scrubber and I-131 sorbent solutions. Decontamination and waste line flush solution. Neutralization of process solutions. Process solution titration reagent. Process development lab work. Pu-Be neutron source processing.	C078, M255, M258, M259, M264, P145, P161, P279, P282, P991, P992, P1437, U011	NA
Sodium hypochlorite	Oxidation of iodine in caustic scrubber solution.	C078, P482	NA
Sodium meta bisulfite	REDC inorganic chemical inventory.	C078	NA
Sodium nitrate	Aluminum cladding target dissolution. Process development lab work.	C078, M255, P145, P161, P279, U011	NA
Sodium nitrite	Total plutonium analytical chemistry extraction reagent. Pu-Be neutron source processing. Plutonium extraction.	M270, P282, P980	NA
Sodium oxalate	Process solution titration reagent.	C078, P282	NA
Sodium tetraborate (borax)	REDC inorganic chemical inventory.	C078	NA
Sodium thiocyanate	Study of aqueous thiocyanate complexes of trivalent transplutonium actinides.	P114	N/A
Solid-a-sorb (diatomaceous earth)	Absorption of aqueous liquids.	M022, M073, P590, P591, P592	NA
Sodium perchlorate	Study of aqueous thiocyanate complexes of trivalent transplutonium actinides.	P114	NA
Sodium thiosulfate	Reagent for stabilization of iodine during aluminum jacket dissolution.	C078, U011	NA
Stannous chloride	Tramex holding reductant reagent. Uranium spectrophotometric analysis reagent.	P136, P279, P282	NA
Stearic acid	Fuel pellet forming die lubricant.	M265, P161, U011	NA
Stripcoat TLC Free (polyvinyl butyral, polyisobutylene, polyisoprene, propylparaben)	TWPC hot cell maintenance.	M022, U125, U126	NA
Sulfamic acid	Identified in laboratory logbooks.	U432	NA
Sulfuric acid	Contained in mule carrier lead-acid batteries. Berkelium extraction reagent. Determination of total reducing normality reagent. Iron spectrophotometric analysis reagent. Process development lab work.	M255, P145, P161, P282	NA
Tartaric acid	Iron spectrophotometric analysis reagent.	P282	NA
Tellurium nitrate	Identified in laboratory logbooks.	U435, U506	NA
Terbium nitrate	Added to various feed solutions to enhance the precipitation of the actinides as oxalates. Identified in laboratory logbooks.	P820, U543	NA
Tetraethylammonium hydroxide	Precipitation of Technicium-99.	P787	NA
Thorium nitrate	REDC inorganic chemical inventory.	C078	NA

Table 5-3. Waste Stream OR-REDC-RH-HET Material and Chemical Inputs (continued)

Trialkyl amine	Dissolved in diethylbenzed as an liquid ion-exchanger solution for solvent extraction operations.	P279	NA
Tributylphosphate	Solvent extraction organic phase solvent. Process development lab work.	C078, M255, M270, P173, P229, P984, P985, U011	NA
Trichloroethylene	Solvent extraction. Process development lab solvent.	C148, M257, P827, U011, U412, U478, U489	F002
Tri-n-octylamine	Inhibits impurity effects/improves stripping.	M254	NA
Toluene	Scintillation reagent solvent.	P223	F005
Ultima Gold (diisopropylnaphthalene, 2-ethylhexyl ester phosphoric acid)	Liquid scintillation cocktail.	M022, P282	NA
Vermiculite (magnesium, aluminum, iron silicate)	Used historically at REDC to absorb unspecified free liquids (historically generated waste is repackaged at the TWPC). Neutralized aqueous solutions from Pu-Be neutron source processing are solidified with cement and vermiculite.	P263, P590, P591, P592, P980	NA
Xylene	Dilute organic samples for analyses. Total plutonium, berkelium, and neptunium analytical chemistry extraction reagent. Identified in laboratory logbooks.	P161, P282, U011, U432, U482	NA
Zinc bromide	REDC inorganic chemical inventory.	C078, U011	NA
Zircaloy/zirconium	Contaminant from process tanks. Leached fuel cladding hulls from LWR (SETF) dissolution.	C078, P136, P161, P173, P229, P223, P279, U011	NA
Zirconium nitrate	Identified in laboratory logbooks.	U453	NA
Zirconium phosphate	Cation-exchange material.	P851	NA

***EPA HWN historically assigned by ORNL generators.**

5.4.2.1 F-Listed Constituents

Based on review of AK relative to REDC chemicals usage and chemical inventory information, waste stream OR-REDC-RH-HET contains or is mixed with F-listed hazardous wastes from non-specific sources listed in 40 CFR 261.31 (Reference 11). As shown in Tables 5-2 and 5-3, F002 and F005-listed solvents have been used during REDC operations. F003 constituents, including acetone, methanol, methyl isobutyl ketone, and xylene are listed solely because these solvents are ignitable in the liquid form. The waste stream will not exhibit the characteristic of ignitability because it is not liquid; therefore, F003 is not assigned. Although F001-listed solvents were identified in the AK record (carbon tetrachloride and trichloroethylene), EPA has provided a regulatory clarification that the F001 listing is only appropriate when the listed solvents are used in a "large-scale" degreasing operation such as cold cleaning or vapor degreasing on an industrial scale (Reference 14). Large-scale degreasing operations have not been conducted in the REDC, and therefore, EPA HWN F001 is not assigned

to this waste stream. Waste stream OR-REDC-RH-HET is assigned F-listed EPA HWN F002 for 1,1,1-trichloroethane, 1,1,2-trichloroethane and trichloroethylene and EPA HWN F005 for benzene and toluene (References DR005, DR008, and DR602).

5.4.2.2 Toxicity Characteristic Constituents

Based on review of AK relative to chemicals used or present in the REDC and supporting analytical operations, waste stream OR-REDC-RH-HET is contaminated with toxicity characteristic compounds as defined in 40 CFR 261.24 (Reference 11). Where a constituent has been identified and there is no quantitative data available to demonstrate that the concentration of a constituent is below regulatory threshold levels, the applicable EPA HWN is applied to the waste stream.

Debris waste from the REDC operations contain or is contaminated with toxicity characteristic metal compounds. Based on the references identified in Table 5-3, EPA HWNs D004, D005, D006, D007, D008, D009, D010, and D011 are assigned to waste stream OR-REDC-RH-HET (References DR005, DR008, and DR602).

The AK sources identified the use of organic toxicity characteristic compounds including benzene (HWN D018), carbon tetrachloride (HWN D019), and trichloroethylene (HWN D040). EPA HWNs F005 and F002 are assigned to the waste stream for F-listed solvents benzene (HWN F005) and trichloroethylene (HWN F002). Because the more specific F-listed EPA HWNs have been assigned for these compounds, assignment of the corresponding toxicity characteristic HWNs D018 and D040 is not necessary. Therefore only HWN D019 for carbon tetrachloride is assigned to waste stream OR-REDC-RH-HET (References DR005 and DR602).

5.4.2.3 Ignitables, Corrosives, and Reactives

Ignitability

A solid waste exhibits the characteristic of ignitability as defined in 40 CFR 261.21 if it has any of the following properties: 1) It is a flammable liquid (flash point less than 60°C), 2) It is not a liquid and is capable, under standard temperature and pressure, of causing fire through friction, absorption of moisture, or spontaneous chemical change, 3) It is an ignitable compressed gas, or 4) It is an oxidizer (a substance such as a chlorate, permanganate, inorganic peroxide, or a nitrate, that yields oxygen readily to stimulate the combustion of organic matter (Reference 11).

The debris materials in this waste stream do not meet the definition of ignitability as defined in 40 CFR 261.21. Ignitable waste materials are prohibited in TRU waste in the REDC. As shown in Table 5-3, flammable liquids (e.g., acetone, diethylbenzene, methanol, xylene) and oxidizers (e.g., ammonium nitrate, hydrogen peroxide, lithium hypochlorite, sodium nitrate) are used in Building 7920. However, processing solutions containing potentially hazardous chemical reagents in their pure form are prepared outside of the processing area. The resulting process solutions are piped from the

process area and are therefore not present in this waste stream. Also, any containers that held liquid are drained before disposal. If the liquid cannot be discharged down the drain (e.g., organic liquids such as oils and hazardous solvents), the liquid is collected in waste organic containers, which are segregated and not included in TRU waste. Pyrophoric materials are not used in established glovebox and hot cell operations. Special notifications are made if pyrophoric materials are introduced into the REDC so that wastes of this type can be identified and excluded from RH-TRU waste containers. Compressed gas cylinders (e.g., spray cans) are emptied and punctured before inclusion in a waste container (References P161, P240, P241, P242, P244, P263, P279, P566, P917, P988, P989, P991, P1112, and U011).

To ensure the waste does not exhibit the characteristic of ignitability, prohibited quantities of liquids will be removed or immobilized, compressed gases (e.g., spray cans) will be removed or vented, and energetic materials (e.g., pyrophorics) will be removed or remediated at the TWPC prior to WIPP disposal (References P254, P256, P587, P590, P591, P592, P598, P599, P1116, P1435, and P1438).

An energetic material is any material that may undergo a spontaneous energetic chemical reaction due to age, concentration, degradation, or oxidation potential when exposed to shock, friction, temperature change, air, or other initiating events. Field evaluations are performed at the TWPC by Energetic Material Subject Matter Experts when notified by operations personnel that materials have been discovered during repackaging operations that require evaluation for the presence of potentially energetic materials. The evaluation of the chemical and physical characteristics of the discovered items are documented on the *Field Evaluation of Potentially Energetic Materials* form (References P432, P587, and P1434).

Testing by the Nochar company has been done showing that Nochar N965 can be used to absorb concentrated acids, including nitric acid. Testing was also performed using a sample of Nochar containing concentrated nitric acid which shows the sample does not meet the RCRA definition of an oxidizer or ignitable solid (Reference M022). In addition, any residue remaining in inner containers that held oxidizing solutions that have evaporated are considered empty, and therefore, are not hazardous because RCRA excludes residues of hazardous waste in empty containers (References 11 and C172). Waste stream OR-REDC-RH-HET is therefore not ignitable (HWN D001).

Corrosivity

A solid waste exhibits the characteristic of corrosivity as defined in 40 CFR 261.22 if it has any of the following properties: 1) It is aqueous and has a pH less than or equal to two or greater than or equal to 12.5, or 2) It is a liquid and corrodes steel at a rate greater than 0.25 inches per year (Reference 11).

The debris materials in this waste stream do not meet the definition of corrosivity as defined in 40 CFR 261.22 (Reference 11). Corrosive waste materials are prohibited in TRU waste in the REDC. As shown in Table 5-3, corrosive liquids (e.g., nitric acid,

hydrofluoric acid, ammonium hydroxide, sodium hydroxide) are used in Building 7920. However, processing solutions containing potentially hazardous chemical reagents in their pure form are prepared outside of the processing area. The resulting process solutions are piped from the process area and are therefore not present in this waste stream. Acidic solutions are neutralized using sodium hydroxide before discharging down the drain. Also, any containers that held liquid are drained before disposal (References P161, P240, P241, P242, P263, P279, P566, P917, P988, P989, P991, P1112, and U011).

To ensure the waste does not exhibit the characteristic of corrosivity, prohibited quantities of liquids will be removed or immobilized at the TWPC prior to WIPP disposal (References P254, P590, P591, P592, P598, P1116, and P1435). Testing by the Nochar company has been done showing that Nochar N965 can be used to absorb concentrated acids, including nitric acid (Reference C172). Waste stream OR-REDC-RH-HET is therefore not corrosive (HWN D002).

Reactivity

A solid waste exhibits the characteristic of reactivity as defined in 40 CFR 261.23 if it has any of the following properties: 1) It is normally unstable and readily undergoes violent change without detonating, 2) It reacts violently with water, 3) It forms potentially explosive mixtures with water, 4) When mixed with water, it generates toxic gases, vapors or fumes in a quantity sufficient to present a danger to human health or the environment, 5) It is a cyanide or sulfide bearing waste which, when exposed to pH conditions between two and 12.5, can generate toxic gases, vapors or fumes in a quantity sufficient to present a danger to human health or the environment, 6) It is capable of detonation or explosive reaction if it is subjected to a strong initiating source or if heated under confinement, 7) It is readily capable of detonation or explosive decomposition or reaction at standard temperature and pressure, or 8) It is a forbidden explosive, or Class A or Class B explosive as defined in 49 CFR, Part 173, *Shippers – General Requirements For Shipments And Packagings* (References 11 and 21).

The materials in this waste stream do not meet the definition of reactivity as defined in 40 CFR 261.23 (Reference 11). Reactive waste materials are prohibited in TRU waste in the REDC. As shown in Table 5-3, reactive chemicals (e.g., hydrazine, hydrogen peroxide, lithium hydride) are used in Building 7920. However, processing solutions containing potentially hazardous chemical reagents in the pure form are prepared outside of the processing area. The resulting process solutions are piped from the process area and are therefore not present in this waste stream. Also, any containers that held liquid are drained before disposal. As shown in Table 5-3, reactive cyanide and sulfide compounds were not used at REDC. Compressed gas cylinders (e.g., spray cans) are emptied and punctured before inclusion in a waste container. Explosive materials are not used in REDC containment areas. Special notifications are made if explosive materials are introduced into the REDC so that wastes of this type can be identified and excluded from RH-TRU waste containers. Aluminum powder, which is blended with actinide oxides for target fabrication, can be an explosion hazard if finely

divided. The aluminum powder is carefully sized and the proper quantity is weighed outside the containment to minimize the likelihood of an explosion. Therefore, aluminum powder will not be present in TRU waste containers. Additionally, preventative measures have been taken to prevent potential accidents associated with nitrated ion-exchange resins typically involving the removal of the resins from the column and conversion to the hydroxide form before disposal. Anion-exchange resins used with nitric acid are flushed from the column, rinsed with ammonium hydroxide to convert the resin to the hydroxide form, air dried, and grouted in metal cans. Spent cation-exchange resins are calcined to an oxysulfate ash, and the ashes are leached with nitric acid and dried prior to assimilation (and fixing) into melted polyethylene waste in a metal bucket (References P161, P240, P241, P242, P244, P263, P279, P566, P917, P987, P988, P989, P1112, and U011).

To ensure the waste does not exhibit the characteristic of reactivity, prohibited quantities of liquids will be removed or immobilized and energetic materials (e.g., explosives, lithium batteries) will be removed or remediated at the TWPC prior to WIPP disposal (References P254, P587, P590, P591, P592, P598, P599, P1116, P1435, P1438). An energetic material is any material that may undergo a spontaneous energetic chemical reaction due to age, concentration, degradation, or oxidation potential when exposed to shock, friction, temperature change, air, or other initiating events. Field evaluations are performed at the TWPC by Energetic Material Subject Matter Experts when notified by operations personnel that materials have been discovered during repackaging operations that require evaluation for the presence of potentially energetic materials. The evaluation of the chemical and physical characteristics of the discovered items are documented on the *Field Evaluation of Potentially Energetic Materials* form. An example is a bottle containing perchloric acid. Visibility was limited while viewing the bottle, so the presence of crystallization or other indicators of shock sensitive materials could not be determined. Therefore, the bottle was handled assuming that it was potentially shock sensitive. The bottle lid was hydrated by submerging it in a water bath so that the lid could be safely removed. The liquid was then poured into plastic containers with Nochar N965 absorbent (1:8 volume ratio of liquid to absorbent) (References P254, P432, P587, P592, P1438, and P1434). Waste stream OR-REDC-RH-HET is therefore not reactive (HWN D003).

5.4.2.4 P- and U-Listed Constituents

Review of the AK record did not identify any specific source or incident where the REDC waste was mixed with or contaminated with discarded commercial chemical product, an off-specification commercial chemical product, or a container residue or spill residue thereof. No listed chemicals were identified in the container-specific documentation for waste stream OR-REDC-RH-HET. The only specific source identified for beryllium is small foil targets and source plates electroplated with microgram quantities of transplutonium elements. Review of the available container documentation did not identify beryllium as a component of the waste in these containers. Therefore, if present, beryllium will be a minor contaminant, well below one weight percent in any given waste container. Additionally, since no beryllium powder is present in the debris

waste, P015 is not assigned to the waste stream. Hydrofluoric acid is used as a dissolution reagent; however, there is no indication that unused acids or other reagents, or spills of these reagents were disposed of in this waste stream. Therefore, U-and P-listed EPA HWNs, including U134, are not assigned to waste stream OR-REDC-RH-HET (References M005, M100, and P223).

5.4.2.5 K-Listed Constituents

Waste stream OR-REDC-RH-HET does not include any of the manufacturing process wastes from the specific industries or sources listed in 40 CFR 261.32 (Reference 11). Therefore, waste stream OR-REDC-RH-HET is not assigned a K-listed HWN.

5.4.3 CCP Radiological Characterization

The overall approach to the radiological characterization implemented by CCP for waste stream OR-REDC-RH-HET repackaged drums is a dose-to-curie (DTC) approach. The approach is documented in CCP-AK-ORNL-501, *Central Characterization Program Remote-Handled Transuranic Radiological Characterization Technical Report For Remote-Handled Transuranic Waste From Oak Ridge National Laboratory Radiochemical Engineering Development Center, Waste Stream: OR-REDC-RH-HET* (Reference 17). In this approach, the dose rate is measured for an individual waste container, and the Cs-137 concentration is determined from the dose rate. From the Cs-137 concentration, scaling factors developed from modeling of the contamination deposition on waste materials are used to derive the concentrations of the remainder of the radionuclides that are required to be reported.

The RH waste from the REDC hot cells currently included in CCP-AK-ORNL-501 was generated from April 1972 to February 2007. The waste generated prior to this date has already been disposed of. The radiological characterization of waste generated after February 2007 is currently in development, and will be presented in a revision of CCP-AK-ORNL-501.

In reviewing the radiological information and data collected for these processing campaigns conducted from April 1972 through May 2007, CCP determined that, although the processing equipment and waste-generating activities were essentially the same from campaign to campaign, there were potential differences in the radionuclide distributions on the waste because of the differences in the starting fuel and target materials processed in each campaign. It was concluded that three groupings of the campaigns would be appropriate for the purpose of developing scaling factors that would be used in the characterization of the waste. The three periods are identified as Pre-SETF, SETF, and Mark-42. The bases for groupings are the average inventory ratios of the actinides to Cs-137 and the relative distribution of the actinides. The first grouping includes 22 HFIR campaigns, conducted from April 1972 to November 1978, where curium purification, target fabrication, and transcurium recovery and purification were the principal activities (Reference 17).

The second grouping includes both SETF and HFIR campaigns that were conducted alternately over a 13-year period. This second grouping includes 11 HFIR campaigns, two americium and curium purification campaigns (Campaigns 57 and 58), and 10 SETF campaigns. With the addition of the LWR and Fast Flux Test Facility (FFTF) fuels from the SETF campaigns into the processing cells, significantly larger quantities of Cs-137 were introduced into the hot cells, which would have the affect of altering the scaling factors developed for the HFIR campaigns. In addition, the LWR and FFTF fuel introduced the uranium isotopes and different distributions and quantities of the plutonium isotopes, both of which would require different scaling factors from those developed for HFIR campaigns only. It is anticipated that waste originating from Campaigns 57 and 58 will have different scaling factors from the rest of the SETF period because these two campaigns were not HFIR processing campaigns, but rather purification campaigns of Am-Cm oxide slugs and Am slugs (Reference 17).
The third grouping included both Mark-42 and HFIR campaigns that were conducted alternately from November 1991 to February 2007. This third grouping includes five HFIR campaigns and 16 Mark-42 campaigns. As with the second grouping, the inclusion of the Mark-42 campaigns introduced even larger quantities of Cs-137 into the hot cells and altered the distributions of the actinides somewhat.

Although waste stream OR-REDC-RH-HET will be segregated into three or more populations for the purposes of implementing the DTC characterization approach, as containers of REDC debris waste are generated during repackaging in the TWPC, the container specific documentation will be reviewed to ensure that each container included in waste stream OR-REDC-RH-HET meets the WIPP-WAP and the WCPIP waste stream definitions (References 1, 2, M100, and U038).

5.4.4 Historical ORNL Radiological Characterization

This section summarizes the approach developed historically by ORNL to characterize RH-TRU waste generated at the REDC. This section does not represent the approach implemented by CCP. This section is presented only to provide background information related to data that may be found on historical waste generator records and waste storage records.

5.4.4.1 Radiological Characterization Prior to 1999

Prior to 1999, waste was monitored for beta-gamma radiation and neutron radiation. These dose rate measurements were converted to activity values based on a predetermined conversion factor. This activity was assigned to the dominant nuclide in the package, typically Cm-244 and/or Cf-252 (References M024, M100, M110, and P240). During 2006, the radionuclide inventory for overpacked casks from the trenches was revised to include an average decay correction of generator reported radionuclides (References M024 and M100). This decay correction adjusted the generator reported radionuclides, typically only Cm-244 and/or Cf-252. TRU radionuclides of plutonium and americium are known to be present in the waste, but records prepared by waste generators for waste generated prior to 1999 do not include information to demonstrate

whether the TRU concentration was less than or greater than 100 nanocuries per gram (Reference P058).

5.4.4.2 Radiological Characterization of CH Waste Generated After 1999

On April 1, 1999, ORNL finalized and began implementation of the Waste Stream Profile Sheet (WSPS) 7920-HCAL-002 for the radiological characterization of CH waste generated at Building 7920 Hot Cell and Analytical Laboratories. Although this WSPS is specific to CH waste, the isotopic distribution developed and documented in the WSPS was also utilized to assign isotopic values to RH waste generated after 1999 (refer to section 5.4.4.3). The following information is a summary of the data flow used in development of the isotopic distribution for WSPS 7920-HCAL-002 (Reference U045):

1. Twenty-eight in-cell smears samples were collected and analyzed. The analysis reported 19 radionuclides; however, no beta nuclides were analyzed as part of the original analysis. The average data for the 19 nuclides was used for the development of the WSPS.

2. Two additional smears were taken and analyzed for the beta constituents, as well as selected alpha and gamma emitting nuclides. The Cm-244 values were used to scale the activities for the beta emitters to be included with the data from the 28 smears samples.

3. The Pu-241 content was estimated based on the concentration of Pu-241 in the MK-42 targets which had the highest Pu-241 content. The plutonium isotopic distribution was analyzed on the MK-42 targets by mass spectrometry.

4. Data for the curium and californium isotopic distribution was taken from the Master of Science Thesis, *"Characterization of ORNL Transuranic Waste from the Measurement of Fission and Activation Products"* prepared by L. K. Nguyen, May, 1997 (Reference P093). The curium and californium contributions were calculated using the Cm-244 and the Cf-252 reported in item number one above.

5.4.4.3 Radiological Characterization of RH Waste Generated After 1999

On August 8, 1999, ORNL finalized WSPS 7920-HCAL-005 for the radiological characterization of RH waste in concrete casks generated at Building 7920 Hot Cell and Analytical Laboratories.

Initially, a study was performed to determine the neutron shielding characteristics of the goethite high density concrete cask using both field surveys and MCNP code modeling data. A 102 microgram Cf-252 source was used for the study. The field surveys were taken using a REM 500^{TM} neutron survey instrument manufactured by Far West Technologies Measurements. The measurements were compared to the modeling results from the MCNP code. The study is documented in a Master of Science Report,

"Neutron Shielding Effectiveness of Goethite High Density Concrete" prepared by Keith Waggoner, July 1999 (Reference U049).

A factor to convert the neutron dose rates at one meter from the wall of the RH-TRU waste cask to microgram quantities of Cf-252 was calculated. Two neutron dose rates are taken on opposite sides of the waste cask. The first dose rate at one meter is taken at the highest millirem/hour rate of the cask, and then the second dose rate is taken at a distance of one meter on the opposite side of the waste cask. The two dose rates are averaged to normalize the Cf-252 to the theoretical center of the waste cask. The average neutron dose rate is used to calculate the amount of Cf-252 inside the waste cask. The remaining radionuclides are calculated using the quantity of Cf-252 in the waste cask and the isotopic distribution documented in WSPS 7920-HCAL-002 (References M024, M100, U045, and U049).

5.4.4.4 Radiological Characterization of REDC Waste Generated After 2002

Since 2002, ORNL has modified and revised the radiological characterization of REDC hot cell and analytical laboratory waste several times. These modifications are documented in revisions of WSPS *7920-HCAL-007* (Reference U041), Calculation WSPS *REDC-001* Revisions 0 through 9 (Reference U111), and *REDC Debris* Revisions 0 through 3 (Reference U127). Revisions have included, but are not limited to: new and revised Microshield calculations to add new waste package geometries and waste densities used in the dose-to-curie calculations; utilization of isotopic data from hot cell process organic waste solutions to scale plutonium isotopes; and inclusion of four additional smear samples, which identified very low concentrations of uranium isotopes in the isotopic mix. A new distribution, *7920-216 Glovebox Debris*, was developed in 2012 for the Room 216 decontamination glovebox debris which is associated with the hot cell operations. This calculation is based on the analytical results from smear samples collected from the Room 216 transfer glovebox and the *REDC Debris* hot cell radiological distribution which is representative of the debris generated in the Room 216 decontamination glovebox. Table 5-4, ORNL Radionuclide Distributions in the REDC Hot Cell and Analytical Laboratory Waste, shows the change in activity percentage of radionuclides from 1999 to 2013 as well as the activity percentage of radionuclides for the Room 216 decontamination debris (References M005, M073, U041, U045, U111, U127, and U128).

Table 5-4. ORNL Radionuclide Distributions in the REDC Hot Cell and Analytical Laboratory Waste

Nuclide	Average Activity Percentage 1999	Average Activity Percentage 2008	Average Activity Percentage 2013	Room 216 Activity Percentage
Co-60	0.017%	0.017%	0.064%	0.064%
Sr-89	N/A	N/A	0.110%	0.109%
Sr-90	15.516%	15.523%	11.710%	11.689%
Zr-95	0.226%	0.226%	0.170%	0.170%
Nb-95	0.214%	N/A	N/A	N/A
Ru-103	0.417%	0.418%	0.315%	0.314%
Ru-106	1.887%	1.888%	1.424%	1.421%
Ag-110m	0.031%	0.032%	0.024%	0.024%
Sb-125	0.111%	0.111%	0.083%	0.083%
Cs-134	0.160%	0.160%	0.121%	0.121%
Cs-137	2.098%	2.099%	3.951%	3.930%
Ce-141	0.888%	0.888%	0.670%	0.669%
Ce-144	0.286%	0.286%	0.216%	0.216%
Eu-152	0.061%	0.061%	0.046%	0.046%
Eu-154	0.303%	0.303%	1.733%	1.718%
Eu-155	0.219%	0.219%	1.116%	1.106%
Np-237	N/A	N/A	0.026%	0.025%
Np-239	0.080%	0.080%	N/A	N/A
Pu-238	0.424%	0.424%	0.872%	0.867%
Pu-239	0.207%	0.008%	0.493%	0.491%
Pu-240	N/A	0.364%	0.493%	0.491%
Pu-241	5.057%	5.059%	6.830%	6.794%
Pu-242	0.005%	0.005%	0.029%	0.029%
Pu-244	N/A	N/A	0.000%	0.025%
Am-241	0.564%	0.564%	10.557%	10.463%
Am-243	0.040%	0.040%	0.848%	0.841%
Cm-242	0.309%	0.309%	0.636%	0.632%
Cm-244	69.349%	69.383%	56.147%	55.845%
Cm-245	N/A	N/A	0.158%	0.156%
Cm-246	0.484%	0.484%	0.365%	0.365%
Cm-247	N/A	N/A	0.000%	0.271%
Cm-248	0.001%	0.001%	0.002%	0.237%
Cf-249	0.001%	0.001%	0.000%	0.000%
Cf-250	0.026%	0.026%	0.020%	0.020%
Cf-251	0.001%	0.000%	0.000%	0.000%
Cf-252	1.019%	1.020%	0.769%	0.768%
U-234	N/A	0.000%	0.000%	0.000%
U-235	N/A	0.000%	0.000%	0.000%
U-236	N/A	0.000%	0.000%	0.000%
U-238	N/A	0.000%	0.000%	0.000%
Total	**100.00%**	**100.00%**	**100.00%**	**100.00%**

5.4.5 Polychlorinated Biphenyls

A portion of the containers in this waste stream may contain regulated levels of PCBs, and therefore, are regulated as Toxic Substance Control Act wastes under 40 CFR, Part 761, *Polychlorinated Biphenyls (PCBs) Manufacturing, Processing, Distribution in Commerce, And Use Prohibitions* (Reference 22).

The final rule banning polychlorinated biphenyls (PCB) manufacturing, processing, distribution in commerce, and use was promulgated in 1979 (www.epa.gov/pcb). As a result of these new regulations, ORNL began an effort to identify and track transformers and other large pieces of equipment containing PCBs (References P1100, P1101, P1102, P1103, P1104, P1105, P1106, P1107, P1108, P1109, and P1439). Large high and low voltage capacitors were not included in the inventory of PCB equipment until 1985 (Reference P1109). The only PCB equipment identified in Building 7920 was a 250-gallon non-PCB transformer (less than 50 ppm PCBs) which was first listed in the inventory in 1982 (Reference P1106). A 15-gallon x-ray transformer (less than 50 parts per million [ppm] PCBs) from Building 7920 was added to the inventory in 1991 (Reference P1104). Transformers and capacitors containing greater than 50 ppm PCBs were not identified in Building 7920 (Reference 8).

Based on a review of the AK record, incandescent bulbs, mercury-vapor bulbs, and lighting fixtures (bases) were identified in container documentation, however items potentially containing PCB compounds were not specifically identified (capacitors, ballasts, etc.). No other potential sources for PCBs were identified in the AK record; however, the ORNL waste management practices described in the AK record did not historically identify PCB materials as prohibited items for waste containers (References 5, 15, M005, M110, P240, and P263).

Based on discussions with ORNL personnel, there is the potential for some drums to contain equipment with small PCB capacitors and pumps containing PCB oil. The oil may or may not have been drained from the pumps. Examples of equipment containing small capacitors include fluorescent light ballasts and electric motors such as a vacuum pump motor. These items may be present in waste generated before 1979. There may not have been a concerted effort to inventory pumps or electrical equipment containing small capacitors to determine if they contained PCBs so these items are potentially present in waste generated after 1979 (References C307 and C308).

CCP identifies potential PCBs during waste repackaging in the TWPC hot cells. The TWPC has been identifying PCBs during waste repackaging on the *Contact-Handled Waste Repackaging Data Form* since December 2010. Since April 2014, the TWPC has been absorbing known and suspect PCB liquids in CH-TRU and RH-TRU waste with Nochar Petro Bond N910 and returning the absorbed PCB liquid to the repackaged daughter container (References M073, M268, P254, P592, P598, P993, and P1433).

Drums found to contain pumps (with or without oil), small capacitors contained in electric motors and light ballasts, or other potential PCB-containing items during RTR or VE will be managed in accordance with the WIPP-WAC (References 15 and 18).

5.4.6 Prohibited Items

According to TRU waste packaging procedures for Building 7920, liquids are removed from the waste or absorbed onto a solid such as vermiculite, and semi-liquid waste forms such as sludges and resins are immobilized (e.g., grouted). Procedures also required the emptying and puncturing of spray cans and indicate pyrophorics and explosives were not used in established glovebox or hot cell operations. These materials have been prohibited by procedure since at least 1988 (References P240 and P263).

Since this waste stream dates back earlier than 1988, it is suspected that un-punctured spray cans may be present in some of the storage containers. It is unlikely that TRU waste from Building 7920 generated prior to 1988 contains process liquids because waste liquids were disposed into the process drain or intermediate level waste drains for treatment or storage. However, small amounts of residual liquids are expected in internal containers (e.g., sample bottles and aerosol cans) (References P125, P161, P279, and U011).

A review of UCN-2109 forms for waste generated since the mid-1990s indicate that prohibited items, including liquids, pyrophorics, explosives, and sealed container greater than four liters are not present (References M005 and M100). However, as described in section 5.5 below, sealed containers greater than four liters will be present in waste generated before this time frame. Metal hose clamps may have been used as a supplemental sealing devise for plastic bags that were closed by the twist and tape method (Reference P905). This is not an acceptable closure method. Heat-sealing is the preferred closure method for waste bagged out of a glovebox (References P240, P263, P986, and P988). Unvented plastic waste bags heat-sealed on both ends may have a surface area less than 390 square inches which is prohibited if the bag is also greater than four liters fully expanded. Since it is not known which drums may contain unvented prohibited heat-sealed bags, all of the waste from Building 7920 generated before 2010 will be repackaged (Reference C311). Since 2010, if the plastic bags are heat-sealed, the bag is less than four liters internal volume (fully expanded) or contains a WIPP-approved filter vent or has a minimum surface area of 390 square inches if the internal volume (fully expanded) is greater than four liters (References M005, M100, P986, P987, P988, and P989).

One CH container (X10C9307231) is identified as containing a lithium battery which ORNL assigned EPA hazardous waste number D003 (reactive). The lithium battery will be examined to determine the type and size battery and removed if determined to be reactive (References M005, M244, P254, and P1438).

Certified VE is performed to ensure the waste does not contain prohibited items in accordance with the WCPIP and WIPP-WAP (References 1 and 2). Prohibited items are remediated or removed from the waste stream as necessary by TWPC personnel (References P254, P587, P598, P599, and P1435).

5.5 Waste Packaging

This section describes the packaging configuration for the current inventory of RH waste originating from the REDC. This waste will be repackaged in the TWCP and loaded into unlined, vented 55-gallon, 30-gallon, or 15-gallon drums (no layers of confinement in drums). As containers of REDC debris waste are generated during repackaging in the TWPC, the container-specific documentation will be reviewed to assure that each container included in waste stream OR-REDC-RH-HET meets the WIPP-WAP and the WCPIP waste stream definitions (References 1, 2, M100, and U038).

The initial REDC packages (casks and drum) may include several inner packaging configurations, including plastic bags, small cardboard ice-cream cartons, one-gallon paint cans, 1.5-gallon metal cans, and 2- or 3-gallon plastic buckets (References C098, C103, C148, P093, P263, and P989). The 1.5-gallon metal cans were slip-lid cans. Tape was wrapped around the sealing surface of the lid, but the lid has a hole in it (References C148 and P240). The plastic bucket lids were heat sealed until the late-1990s; however, a hole was punctured in the lid starting in the mid-1990s. Beginning in the late-1990s, the bucket lids were snapped in place, not heat-sealed (References C098, P161, and P240). The metal cans and plastic buckets that are not heat-sealed were placed in plastic bags and sealed with tape or into draw-string plastic bags. Hot cell waste items too large to fit into a waste bucket are loaded directly into draw-string plastic bags. The draw-string bags are then cinched tight and tied (References C148, P093, and P989). Waste placed into plastic bags may be heat-sealed or sealed with tape, but heat-sealing is the preferred method for waste removed from a glovebox. Since 2010, if the plastic bags are heat-sealed, the bag is less than four liters internal volume (fully expanded), contains a WIPP-approved filter vent, or has a minimum surface area of 390 square inches if the internal volume (fully expanded) is greater than four liters (References C311, P240, P263, P986, P987, P988, P989, and P990). The RH-TRU waste packages were placed into either 55-gallon drums or concrete casks. The drums were lined with a single poly drum liner bag; lead and plastic rigid liners were not used. Drum liners may or may not be sealed with tape (References C148, P263, P585, and P586).

Occasionally waste initially repackaged in the TWCP as RH waste will have measured surface dose rate less than 200 mR/hr, and the waste must be transferred to a 55-gallon drum designated for CH-TRU waste. Waste anticipated to be RH-TRU waste is initially repackaged into 55-gallon drums lined with an open top lifting sack fitted with standing lift loops. This polypropylene liner may also include a cardboard form insert. The polypropylene lifting sack facilitates moving the repackaged waste from the RH drum to a drum designated for CH waste. The open top polypropylene lifting sack and cardboard insert become part of the waste (Reference M170).

Waste materials identified during the repackaging of this waste stream with surface dose rates greater than 200 mR/hr or high radioactivity may be repackaged into 55-gallon drums containing standard POCs and shipped as CH-TRU waste as long as the payload container meets the surface dose rate and activity limits as required in the CH-TRAMPAC. The standard POC consists of a pipe component centered in a DOT specification 7A Type A 55-gallon drum using dunnage consisting of fiberboard and/or plywood spacers within a rigid polytheylene liner. The POC is stainless steel cylindrical pipe with a bolted stainless steel lid sealed with an O-ring and is equipped with a manufacturer installed filter vent. The pipe component lid is secured with bolts, the rigid liner lid (which includes a vent hole) is snapped into place, and the drum lid is installed (References 23 and P1430).

As described in Section 5.3, most of the waste generated prior to 1978 would have been placed into concrete casks called "floor casks." The majority of the floor casks have 4.5 inch thick side walls because the lower activity materials typically required much less shielding. In addition to the concrete casks with 4.5-inch thick walls, waste from REDC operations have been loaded in casks providing additional shielding with 6- and 12-inch thick concrete walls. The external dimension for all three of these cylindrical casks is approximately 7.5 feet tall by 4.5 feet in diameter. The waste materials loaded into the casks are packaged in a variety of configurations utilizing the following packaging materials (References P125, P161, U011, and U038):

- 1-gallon metal paint cans (some lead-lined)
- Polyethylene bags, liners, bottles, and draw-string bags
- Cardboard ice cream cartons
- 3.4-gallon polyethylene plastic buckets (sealed and unsealed)
- 2-gallon Bain-Marie polyethylene plastic containers
- 5-gallon metal lard cans
- 10-gallon rigid-cardboard fiber drum

In the hot cell cubicles, waste items are typically placed into small containers (e.g., plastic buckets or metal cans). Larger waste items are cut up to fit into the buckets. Larger equipment, such as processing racks, charcoal filter beds, and Hopcalite organic filters traps are directly loaded into the casks. Typically, the racks have been packaged in several layers of polyethylene bags then placed directly into the concrete cask (References M005, M100, C302, P125, and P161).

Concrete casks of TRU waste are loaded in a solid waste loading station located in the LAA. Waste to be loaded into the cask from the transfer area is generally transferred to the loading station in sealed plastic buckets and unsealed plastic bags. Larger equipment is transferred to the loading station via the equipment transfer case for disposal. The incoming empty cask is prepared by placing a polyvinyl chloride plastic bag liner (0.01 inch) into the cask. Plywood expanders are placed inside the bag (a circular disk at the bottom and a circular ring at the top), and the bag is then secured to one of the waste station roof plugs. Two roof plugs are available for loading the waste packages. One is used when the waste is to be transferred using the equipment

transfer case, the other is used when plastic buckets are loaded. After the cask is loaded, the plastic bag is collapsed and an electrically-driven turntable inside the waste station rotates the cask, twisting the top of the bag. The bag is then cut and sealed with a hot-knife sealer. The cask lid is then installed, sealed with roofing pitch, and secured using two steel tapes, attached around the outside of the cask. The cask lid may also be attached to the cask body by three anchor bolts aligned with holes drilled in the cask lid. All the concrete casks are overpacked into carbon steel RH cask prior to processing in the TWPC (References C302, U011, and U046).

6.0 QUALIFICATION OF AK INFORMATION

As stated in CCP-PO-002, (Reference 15), this AK Summary Report provides a description of the characterization of RH waste stream OR-REDC-RH-HET. CCP-AK-ORNL-502, *Central Characterization Program RH-TRU Certification Plan for 40 CFR Part 194 Compliance for ORNL REDC RH Waste, Waste Stream: OR-REDC-RH-HET* (Reference 16), describes how each DQO and QAO is met along with the rationale for selection of the AK qualification methods used. As required by the WCPIP (Reference 1), the description of waste stream OR-REDC-RH-HET is provided in sections 4.0 and 5.0. The description of the characterization approach is presented in CCP-AK-ORNL-502 (Reference 16).

Table 6-1, Waste Stream OR-REDC-RH-HET DQO Determination Summary, lists the DQOs to be addressed using AK associated with waste stream OR-REDC-RH-HET relating to the defense waste, radiological, and physical waste stream determinations.

Table 6-1. Waste Stream OR-REDC-RH-HET DQO Determination Summary

DQO Determinations	Summary of Characterization/Qualification Method	AK References/Sources
Defense, High Level Waste, and Spent Nuclear Fuel	As described in the defense waste justification in Section 4.4, a formal defense determination has been approved by CBFO for TRU waste originating from the operations in the REDC complex (including Building 7930). This determination concluded that the wastes generated by operations in the REDC are irretrievably commingled with materials from atomic energy defense activities associated with naval reactors development; nuclear materials production; nuclear waste and by-products management; and research and development activities. As described in Section 4.5, this waste stream does not contain spent nuclear fuel or high-level waste.	DR009, I022, I023, I044, M023, P258, P281, P569, P952, P980, P981, U038, U039, U647
TRU Waste	As described in the radiological characterization in Section 5.4.3, non-TRU radionuclides Cm-244 and Cf-252 were the only radionuclides reported by the waste generator for the majority waste containers, and no process has been implemented to quantify additional TRU radionuclides known to be present in those waste containers. Additionally, all, or nearly all of the existing inventory of waste currently categorized by the site as RH-TRU waste will be extracted from storage containers, visually inspected, and segregated based on the dose rate of incoming waste material at the time of repackaging. The final radiological characterization of resulting repackaged RH waste will be assessed as described in CCP-AK-ORNL-501 (Reference 17). **Characterization/Qualification Method**: Dose to Curie Method described in CCP-AK-ORNL-502 (Reference 16).	M024, M100, P058, P240, U038, U045, U049, U094 CCP-AK-ORNL-501 (Reference 17)
RH Waste	As described in the radiological characterization in Section 5.4.3, waste storage casks were monitored for beta-gamma radiation and neutron radiation, however, these measurements represent the dose rate external to the Goethite high density concrete storage casks and are not relevant to this DQO. Additionally, all, or nearly all of the existing inventory of waste currently categorized by the site as RH-TRU waste will be extracted from storage containers, visually inspected, and segregated based on the dose rate of incoming waste materials at the time of repackaging. The final radiological characterization of resulting repackaged RH waste will be assessed as described in CCP-AK-ORNL-501 (Reference 17). **Characterization/Qualification Method**: Dose rate measurement of each container as described in CCP-AK-ORNL-502 (Reference 16).	M024, M100, P058, P240, U038, U045, U049, U094 CCP-AK-ORNL-501 (Reference 17)
Activity	This DQO is specific to payload containers and will not be assessed until the final payload configuration has been established.	Not Assessed

Table 6-1. Waste Stream OR-REDC-RH-HET DQO Determination Summary (Continued)

DQO Determinations	Summary of Characterization/Qualification Method	AK References/Sources
WIPP 10 Required Radionuclides	As described in the radiological characterization in Section 5.4.3, Cm-244 and Cf-252 were the only radionuclides reported by the waste generator for the majority waste containers, and no process has been implemented to quantify additional radionuclides known to be present in those waste containers. Additionally, all, or nearly all of the existing inventory of waste currently categorized by the site as RH-TRU waste will be extracted from storage containers, visually inspected, and segregated based on the dose rate of incoming waste material at the time of repackaging. The final radiological characterization of resulting repackaged RH waste will be assessed as described in CCP-AK-ORNL-501 (Reference 17). **Characterization/Qualification Method**: Dose-to-Curie Method described in CCP-AK-ORNL-502 (Reference 16).	M024, M100, P058, P240, U038, U045, U049, U094 CCP-AK-ORNL-501 (Reference 17)
Physical Form	As described in Section 5.4.1, waste stream OR-REDC-RH-HET consists primarily of organic and inorganic debris meeting the WCPIP (Reference 1) definition for Summary Category Group S5000. **Characterization/Qualification Method**: 100% VE will be performed during repackaging to verify the physical form of the waste as discussed in CCP-AK-ORNL-502 (Reference 16).	M005, M024, M072, M073, M074, M100, P125, P161, U011 CCP-AK-ORNL-502 (Reference 16)
Liquids	Prohibited quantities of liquids will be immobilized or removed during the packaging of waste stream OR-REDC-RH-HET. **Characterization/Qualification Method**: 100% VE will be performed during repackaging to verify the absence of prohibited liquids as discussed in CCP-AK-ORNL-502 (Reference 16).	U046 CCP-AK-ORNL-502 (Reference 16)

7.0 CONTAINER SPECIFIC INFORMATION

The primary forms completed by ORNL waste generators were the UCN-2109 and UCN-2822. The UCN-2822 is the predecessor to the UCN-2109 which has been in use since about 1993. The UCN-2109 has changed several times since its inception (Reference M005). The types of information included on these forms is as follows:

Form UCN-2822

- Container number
- Generation date
- Origin of waste (building)
- Total volume and combustible volume (cubic feet)
- Weight
- Waste type code
- Container type
- Radiological data
- Waste description

Form UCN-2109

- Container number
- Origin date
- Origin facility (building)
- Origin room/area
- Container type
- Waste description
- Radiological data
- Prohibited items
- Heat-sealed bags
- Ion-exchange resins
- Beryllium
- Combustible material
- Layers of confinement
- Sealing method
- EPA hazardous waste numbers

In accordance with procedure CCP-TP-005 (Reference 3), a CCP Waste Containers List (Attachment 8 of the procedure) is completed and maintained as a quality record for waste tracking purposes. Information tracked includes container identification number, waste stream number, and the closure date for each container.

8.0 REFERENCE INFORMATION

1. DOE/WIPP-02-3214, *Remote-Handled TRU Waste Characterization Program Implementation Plan*, Carlsbad, New Mexico, U.S. DOE Carlsbad Field Office

2. *Waste Isolation Pilot Plant Hazardous Waste Facility Permit, Waste Analysis Plan,* NM4890139088-TSDF, Santa Fe, New Mexico, New Mexico Environment Department

3. CCP-TP-005, *CCP Acceptable Knowledge Documentation*, Carlsbad, New Mexico, Nuclear Waste Partnership, LLC.

4. DOE/TRU-14-3425, *Annual Transuranic Waste Inventory Report – 2014,* U.S. Department of Energy, Carlsbad Field Office

5. CCP-PO-001, *CCP Transuranic Waste Characterization Quality Assurance Project Plan*, Carlsbad, New Mexico, Nuclear Waste Partnership, LLC.

6. Title 40 CFR Part 191, *Environmental Radiation Protection Standards for Management and Disposal of Spent Nuclear Fuel, High-Level and Transuranic Radioactive Wastes*, Washington, D.C., U.S. EPA, December 20, 1993

7. Title 40 CFR Part 194, *Criteria for the Certification and Re-Certification of the Waste Isolation Pilot Plant's Compliance with the 40 CFR Part 191 Disposal Regulations*, Washington, D.C., U.S. EPA, February 9, 1996

8. *Criteria for the Certification and Re-Certification of the Waste Isolation Pilot Plant's Compliance with the 40 CFR Part 191 Disposal Regulations: Certification Decision*, Washington, D.C., U.S. EPA, May 18, 1998

9. Public Law 102-579, *The Waste Isolation Pilot Plant Land Withdrawal Act*, October 30, 1992 as amended by Public Law 104-201, September 23, 1996

10. 42 U.S.C. 10101, *Nuclear Waste Policy Act of 1982*, U.S. Congress

11. Title 40 CFR Part 261, *Identification and Listing of Hazardous Waste*, Washington, D.C., U.S. EPA, July 1, 2007

12. CCP-AK-ORNL-002, *Central Characterization Program Acceptable Knowledge Summary Report for Oak Ridge National Laboratory Radiochemical Engineering Development Center Contact-Handled Transuranic Waste, Waste Stream: OR-REDC-CH-HET,* Carlsbad, New Mexico, Nuclear Waste Partnership, LLC.

13. DOE/LLW-217, *DOE Waste Treatability Group Guidance*, Idaho Falls, Idaho, INEL-Lockheed Idaho Technologies

14. McCoy and Associates, Inc. 2002. *McCoy's RCRA Unraveled.* Second Edition

15. CCP-PO-002, *CCP Transuranic Waste Certification Plan*, Carlsbad, New Mexico, Nuclear Waste Partnership, LLC.

16. CCP-AK-ORNL-502, *Central Characterization Program RH-TRU Certification Plan for 40 CFR Part 194 Compliance for ORNL REDC RH Waste, Waste Stream: OR-REDC-RH-HET,* Carlsbad, New Mexico, Nuclear Waste Partnership, LLC.

17. CCP-AK-ORNL-501, *Central Characterization Program Remote-Handled Transuranic Radiological Characterization Technical Report For Remote-Handled Transuranic Waste From Oak Ridge National Laboratory Radiochemical Engineering Development Center, Waste Stream: OR-REDC-RH-HET,* Carlsbad, New Mexico, Nuclear Waste Partnership, LLC.

18. DOE/WIPP-02-3122, *Transuranic Waste Acceptance Criteria for the Waste Isolation Pilot Plant,* Carlsbad, New Mexico, U.S. DOE Carlsbad Field Office

19. CCP-PO-505, *CCP Remote-Handled Transuranic Waste Authorized Methods for Payload Control (CCP RH-TRAMPAC),* Carlsbad, New Mexico, Nuclear Waste Partnership, LLC.

20. CCP-AK-BAPL-500, *Central Characterization Project Acceptable Knowledge Summary Report For Bettis Laboratory Remote-Handled Transuranic Debris Waste, Waste Stream BT-T001.*

21. 49 CFR, Part 173, *Shippers – General Requirements For Shipments And Packagings*

22. 40 CFR, Part 761, *Polychlorinated Biphenyls (PCBs) Manufacturing, Processing, Distribution in Commerce, And Use Prohibitions*

23. CCP-PO-003, *CCP Transuranic Authorized Methods For Payload Control (CCP CH-TRAMPAC),* Carlsbad, New Mexico, Nuclear Waste Partnership, LLC.

9.0 AK SOURCE DOCUMENTS

Document Number	Title
C078	Memo to Bryan Roy transmitting Historical Survey – RCRA Information
C098	Interview with Wayne Evans: Waste management practices at REDC (Buildings 7920 and 7930)
C103	Memo to distribution Re: Seal out buckets used at REDC
C148	Interviews of REDC Personnel
C160	E-mail from Kevin East to Don Coffey Re: Hot Cell Clean Up Drums
C172	Miscellaneous Correspondence Regarding Testing of Nochar Absorbents
C173	Email Correspondence Regarding TWPC Glovebox Decon
C174	E-mail from Don Coffey, Subject: 7920 TRU Waste (REDC Timeline)
C176	E-mail from Don Coffey, Subject: 7920 TRU Waste (Dresden LWR fuel)
C302	ORNL Comments on CCP-AK-ORNL-500, Rev. 0, Draft D
C306	Email: Re: Additional Info for Current Research Activities at REDC
C307	Interview of Walt Bond - Subject: Processes and Waste in Building 3508 at ORNL
C308	Interview of Jason Taylor, ORNL-PCB Coordinator from 1977-2004, Re: PCB Management at ORNL
C311	Interview of Don Coffey and Wayne Evan - Subject: Heat-Sealed Bags Used at REDC
C600	Interviews with Don Coffey and Wayne Evans Re: REDC RH Waste Cask Packaging Clarification and Swipe Sample Collection
DR003	Discrepancy Resolution, Re: Generation Location Discrepancies
DR005	Discrepancy Resolution, Re: EPA Hazardous Waste Number Discrepancies
DR008	Discrepancy Resolution, Re: Follow-up on DR602 for EPA Hazardous Waste Number Discrepancies (REDC Waste)
DR009	Discrepancy Resolution, Re: Waste Incidental to Reprocessing Determination
DR600	Discrepancy Resolution, Re: Packaging Documentation Discrepancies for Cask X10C0601826
DR601	Discrepancy Resolution, Re: Presence of Debris items in Poly Blocks
DR602	Discrepancy Resolution, Re: Follow-up on DR005 for EPA Hazardous Waste Number Discrepancies
I022	DOE Order 435.1, Radioactive Waste Management
I023	Radioactive Waste Management Manual

Document Number	Title
I044	Re-Evaluation of the Radiological Data for Legacy CH-TRU Waste from REDC Building 7920
M001	Review by Charles Roberts of REDC Maintenance and Operational Log Books
M005	Container Paperwork and UNC-2109 Forms for ORNL Waste Drums for REDC CH Waste
M022	Collection of MSDS for REDC CH and RH Waste
M023	Defense Determination for REDC Heterogeneous Debris
M024	RH EM Waste Database Query
M072	Evaluation of Additional Drums for Waste Stream OR-REDC-CH-HET
M073	TWPC Contact Handled Waste Repackaging Data Forms for Building 7920 Waste
M074	UCN-2109 Forms and Related Container Paperwork for Building 7920 Waste Packaged in Boxes
M100	Container Paperwork for containers in Waste Stream OR-REDC-RH-HET (UCN-2109)
M110	EM Waste Database Query
M120	ORNL RH Cask Evaluation and Supplemental Packaging Documentation
M155	Evaluation of Additional Drums for Waste Stream OR-REDC-CH-HET
M170	Drawings and Specifications for Geotextile drum liners with standing lift loops
M241	Information for containers X10CSATN02077 and X10CSATN02229
M244	UCOR TRU Database
M245	TWPC Database
M251	Global Nuclear Energy Partnership, GNEP And The Globalization Of Nuclear Energy
M252	Global Nuclear Energy Partnership, Research and Development Program
M253	Unreviewed Safety Question Determination (USQD) Change Package, Radiochemical Engineering Development Center (REDC) Building 7920, New Work Plan No. Voloxidation Campaign 1
M254	Unreviewed Safety Question Determination (USQD) Change Package, Radiochemical Engineering Development Center (REDC) Building 7920, Fission Product Extraction (FPEX) Process Solvent Extraction Development Studies
M255	Research Safety Summary, REDC Shielded Cave Operations
M256	Research Safety Summary, REDC Development Laboratory Operations – Lab 209
M257	Research Safety Summary, REDC Development Laboratory Operations – Lab 211

Document Number	Title
M258	Research Safety Summary, Building 7920 – General Use of Modified Direct Denitration and Powder Characterization Systems
M259	Research Safety Summary, Radioisotope Power Source Development
M260	Research Safety Summary, Processing of Ni-63
M261	Research Safety Summary, HKED Calibration Standard Sample Preparation
M262	Research Safety Summary, Laboratory 111 General Supporting Activities
M263	Research Safety Summary, Voloxidation Studies
M264	Research Safety Summary, Preparation of TRU Solutions for the Internal Gelation Process
M265	Research Safety Summary, Target Fabrication for the Pu-238 Project – Pellet Production
M266	Research Safety Summary, Anion Exchange Purification of Radionuclides by Acidified Alcohol Solution
M267	Waste Characterization Checklist (WCC), Debris from Np-237 Pellet Production
M268	Approval for the Storage and Processing of Liquid Polychlorinated Biphenyls Containing Transuranic Radionuclides; Cover Letter from G. Alan Farmer to Robert C. McKay
M270	The Plutonium-238 Supply Project
M278	New Pig WypAll X80 Wipers used at the TWPC
P014	Inventory of ORNL Remedial Action Sites: 11. Research Laboratories
P016	Solvent Extraction Studies with High-Burnup Fast Flux Test Facility Fuel in the Solvent Extraction Test Facility
P020	Chemical Technology Division Annual Progress Report Period Ending March 31, 1979
P021	Chemical Technology Division Progress Report for the Period April 1, 1981 to March 31, 1983
P030	Chemical Technology Division Transuranium Processing Plant Semiannual Report of Production, Status, and Plans for Period Ending June 30, 1968
P058	Statistical Analysis of Radiochemical Measurements of TRU Radionuclides in REDC Waste
P093	Characterization of ORNL Transuranic Waste from the Measurement of Fission and Activation Products
P098	Chemical Technology Division Annual Progress Report for the Period April 1, 1979 to March 31, 1981
P110	Chemical Technology Division Annual Progress Report for Period Ending March 31, 1972
P113	Progress in Nuclear Energy, Series III, Process Chemistry, Volume 4; Section: 7.2 Processing Methods For The Recovery Of Transplutonium Elements
P114	Chemical Technology Division Annual Progress Report for Period Ending March 31, 1971

Document Number	Title
P125	Remote-Handled Transuranic Solid Waste Characterization Study: Oak Ridge National Laboratory
P136	Chemical Technology Division Annual Progress Report for Period Ending May 31, 1967
P145	Chemical Technology Division Annual Progress Report for Period Ending May 31, 1970
P151	Chemical Technology Division Annual Progress Report for Period Ending May 31, 1973
P160	Chemical Technology Division Annual Progress Report; Period Ending March 31, 1977
P161	Safety Analysis Report Radiochemical Engineering Development Center Building 7920
P164	Chemical Technology Division Annual Progress Report; Period Ending March 31, 1976
P173	Solvent Extraction Studies of Coprocessing Flowsheets – Results from Campaigns 3 and 4 of the Solvent Extraction Test Facility (SETF)
P223	Chemical Technology Division Annual Progress Report for Period Ending May 31, 1969
P229	Solvent Extraction Studies of Coprocessing Flowsheets – Results from Campaigns 1 and 2 of the Solvent Extraction Test Facility (SETF)
P240	Certification, Packaging and Disposition of Contact-Handled Transuranic (CH-TRU) Waste At the Radiochemical Engineering Development Center (REDC)
P241	Oak Ridge National Laboratory Contact-Handled Transuranic Waste Certification Program Plan
P242	Oak Ridge National Laboratory Contact-Handled Transuranic Waste Certification Program Plan
P244	Certification Document for Newly Generated Contact-Handled Transuranic Waste
P251	Box Breakdown Area Operations
P252	Glove Box Operations
P253	Drum Bag In/Bag Out and Glove Ports
P254	Contact-Handled Waste Repackaging
P255	Contact-Handled Waste Acceptance Criteria
P256	TRU/Alpha Low Level Waste (LLW) Treatment Project Documented Safety Analysis
P258	Production, Distribution, and Applications of Californium-252 Neutron Sources
P263	TRU Operating Manual and Supporting Documentation
P272	Oak Ridge National Laboratory Waste Management Plan
P279	Safety Analysis for the Transuranium Processing Plant, Building 7920
P281	Californium-252: A Remarkable Versatile Radioisotope

Document Number	Title
P282	Gross Alpha Activity Measurements
P432	TRU Waste Processing Center Document Safety Analysis
P482	Summary of the Campaign During February 1969 to Process Six Irradiated HFIR Targets in the Transuranium Processing Plant
P500	Iodox Process Tests in a Transuranium Element Production Campaign
P566	ORNL Health Physics Manual
P569	Implementation Plan for U.S. Department of Energy Order 435.1, U.S. Department of Energy – Oak Ridge Operations, Oak Ridge, Tennessee
P582	PCB Decontamination
P583	Cask Processing Enclosure Operations
P584	Hot Cell Operations
P585	Remote Handled Drum In/Out Operations
P586	Cask Processing Enclosure Drum-In / Drum-Out
P587	Energetic Materials Management
P588	Box Breakdown Area Material Handling Recipes
P589	Glove Ports and Sleeve Transfers
P590	Liquids Handling in the Hot Cell
P591	Liquids Handling in the Cask Processing Enclosure
P592	Absorbing Liquids in the Glovebox and Box Breakdown Area
P597	Remote Handled Waste Acceptance Criteria
P598	Operations Prohibited Item Processing
P599	Non-Compliant Containers
P787	Conversion of $NH_4{}^{99}TcO_4$ to $H99TcO_4$ & Synthesis of $(C_2H_5)_4N^{99}TcO_4$
P801	Removal of Chromium by Solvent Extraction
P804	Actinide Product Finishing/Special Projects Procedure: Actinide/Lanthanide Separation by Extraction Chromatography
P819	Actinide Product Finishing/Special Projects Procedure: Actinide/Lanthanide Separation Studies for the Advanced Fuel Cycle Initiative
P820	Actinide Product Finishing/Special Projects Procedure: Preparation of Chemical Reagents
P826	Actinide Product Finishing/Special Projects Procedure: Fission Product Removal by Alcoholic-HCl Ion Exchange

Document Number	Title
P827	Actinide Product Finishing/Special Projects Procedure: Organic Scrub of the Berkelium (Bk) Product from the Berkex Process
P851	Hot Cell Experimental Procedure
P905	Health Physics Procedure – Handling and Transfer of Radioactive Materials within the Laboratory and Guide for the Transfer of Materials Between Contaminated Enclosure Systems and Non-Contaminated Areas
P917	Procedure 5.1 – Segregation and Management of solid Radioactive Waste Materials and supporting Solid Waste Management Documentation
P952	Global Nuclear Energy Partnership Technology Development Plan
P953	Phased Construction Completion Report for the 22 Trench Waste Retrieval Project at ORNL
P980	Safety Basis Supplement for the Processing of Bettis PuBe Neutron Sources
P981	U.S. Department of Energy Office of Inspector General Office of Audit Services, Audit Report, Plutonium-238 Production
P982	The GNEP Coupled End-to-End (CETE) Research, Development, and Demonstration Project: Overview of the CETE Testbed Capabilities and Operations
P983	Plutonium and Neptunium Conversion Using Modified Direct Denitration
P984	Lab-Scale Demonstration of the UREX+1a Process Using Spent Fuel
P985	Development of the UREX+ Co-Decontamination Solvent Extraction Process
P986	Glove Box Operations
P987	Glove Box Operations
P988	CH-TRU Waste Handling at Building 7920
P989	RH-TRU Waste Handling in Building 7920 Cell Bank
P990	Bag-Out Procedure for the Transfer and Decontamination Facility
P991	Disposal of Waste Solutions
P992	[CLEANEX] Waste Organic Cleanout
P993	Transuranic Waste Processing Center, Risk-Based Disposal Approval Request for PCBs Contaminated with Radioisotopes at the TWPC
P1100	PCB Annual Report for Oak Ridge National Laboratory – 1986
P1101	PCB Annual Report for Oak Ridge National Laboratory – 1987
P1102	PCB Annual Report for ORNL – 1988
P1103	PCB Annual Report for Oak Ridge National Laboratory – January 1, 1989 – February 5, 1990
P1104	PCB Annual Report for Oak Ridge National Laboratory – January 1, 1991 – December 31, 1991

Document Number	Title
P1105	PCB Annual Report for Oak Ridge National Laboratory – February 6, 1990-December 31, 1990
P1106	PCB Annual Report for Oak Ridge National Laboratory – 1982
P1107	PCB Annual Report for Oak Ridge National Laboratory – 1983
P1108	PCB Annual Report for Oak Ridge National Laboratory – 1984
P1109	PCB Annual Report for Oak Ridge National Laboratory – 1985
P1112	Radioactive Solid Waste Operations Manual
P1116	EnergX TRU Waste Processing Center Procedure: Absorbing Liquids
P1427	Cleanup of TMI-2 Demineralizer Resins
P1428	Evaluation of the Submerged Demineralizer System (SDS) Flowsheet for Decontamination of High-Activity-Level Water at the Three Mile Island Unit 2 Nuclear Power System
P1430	Pipe Overpack Container Operations
P1433	Environmental Permits and Compliance
P1434	Energetic Materials Program
P1435	Remote Handled Waste Container Selection Process
P1436	[PuBe Neutron Sources] Grouting Liquid Waste Solutions
P1437	[PuBe Neutron Sources] Neutralization of Liquid Waste Solutions
P1438	Identification of Potential Unanalyzed Materials
P1439	Standard Operating Procedure for Assisting Generators with Waste and Excess Materials
P1440	The Plutonium-238 Supply Project
P1441	Analytical Report for Destructive Analyses of MOX Spent Fuel Specimens
P1442	Mixed Oxide Fuel Prepared with Weapons-Derived Plutonium: Test Irradiations Summary and Preliminary LTA PIE Results
U011	Safety Analysis: Transuranium Processing Plant, Building 7920
U038	ORNL TRU Waste Historical Survey; Volumes 1, 2, and 3—Origins and Characteristics of Remote-Handled Transuranic Wastes (Trabalka report) Plus Appendices
U039	Oak Ridge Reservation Transuranic Waste Acceptance Knowledge Summary Report for the Radiochemical Engineering Development Center: Newly Generated Contact-Handled Transuranic Waste from Isotope Production
U041	Waste Stream Profile Sheet for 7920-HCAL-007R1 and Supporting Documentation

Document Number	Title
U045	Waste Stream Profile Sheet for Building 7920, Hot Cells and Analytical Labs
U046	RH Debris Waste Process Flow Descriptions
U049	Waste Stream Profile Sheet for 7920-HCAL-005 and Supporting documentation
U094	Status Briefing: Radiological Characterization of REDC RH-TRU Waste at ORNL
U111	Radiological Characterization and Quantification of Waste under WSPS REDC-001 using Microshield
U124	Contamination Control Plan for Hot Cell (TWPC Hot Cell)
U125	Maintenance Work Control, Attachment C: Maintenance Work Order #CM-10-003
U126	Maintenance Work Control, Attachment C: Maintenance Work Order #CM-10-100
U127	Radiological Quantification of Debris Waste Generated at REDC from Hot Cell and Facility Operations
U128	Radiological Quantification of Waste Generated at Building 7920 Room 216 from Glovebox Operations
U129	Evaluation of Glovebox Radio-Chemical Analytical Smear Data used to Support REDC Waste Disposal
U130	Radiological Quantification of Waste Generated at Building 7920 Lab 209 from Glovebox Operations
U131	Radiological Quantification of Waste Generated at Building 7920 Lab 211 from Glovebox Operations
U132	Radiological Quantification of Waste Generated at REDC from Np-237 Pellet Production Operations
U133	Radiological Quantification of Waste Generated at Building 7920 Lab 109 from Operations Conducted in the CETE Gloveboxes
U403	Log Book: Cave A Liner Replacement Activities
U412	Logbook Reference 6R1 - Cf-252 Electrodeposition Processing - Initial CX, TEVA, and Final CX Purifications (REDC Bldg 7920)
U425	ORNL Technical Notebook No. A-106985-G - Milt Lloyd; Susan North
U429	Unclassified Notebook A-6271: Building 7920, O.K. Tallent
U432	O.K. Tallent Logbook A-106981-G; Transferred to Milt Lloyd, Chem Tech Division Building 7920, Dated 09/14/1994 (Solvent Extraction, etc.)
U435	ORNL Technical Notebook A-106991-G, Milt Lloyd, Building 7920 Chem Tech Division, Solvent Extraction
U436	Unclassified Notebook No. A-6227, Milt Lloyd, Building 7920 Chem Tech Division
U437	ORNL Technical Notebook No. A-106992-G, Milt Lloyd and Susan North Lewis, Building 7920
U453	ORNL Technical Notebook No. A106984-G, Milt Lloyd, Jeff Wade, O.K. Tallent, Chem Technology Division, Bldg 7920, Solvent Extraction
U477	ORNL Technical Notebook No. A-105094; Building 7920; REDC - Curtis Porter

Document Number	Title
U478	ORNL Technical Notebook No. A-102161; Chemical Technology / Finished Products / J. T. Wiggens
U482	TURF Logbook 16L4; Building 7930; M. E. Littleton
U483	ORNL Technical Logbook No. A-9372; C. E. McFarland; Building 3038
U489	Curtis Porter; Building 7920; Chemical Technology Division
U501	Logbook: G. A. West; C. E. Roberts; H. C. Thompson; 1/4/1972; Bldg 7920 Waste Logbook
U505	Lab Notebook No. RE-2 – Charles Alexander, Building 7920.
U506	Research & Technical Notebook No. Te-1 – Chemical Technology Division – Building 7920 – Charles (Chuck) Alexander - A- 107733-G
U507	Research & Technical Notebook No. (SM-1) A- 107736-G – Building 7920, MS 6384 – Charles Alexander
U508	Lab Notebook 21/150/REC – Building 7920 – Charles (Chuck) Alexander
U529	Technical Notebook – Charles Alexander, Building 7920
U531	Logbook – Building 7920 - TRU Maintenance and Waste Disposal - 02/05/1979
U533	Logbook #9 – Building 7920 - 07/1968 thru 01/1969
U537	Log book – Building 7920 - 11/1982 thru 08/1984 - Waste Logbook
U543	Logbook – Buildings 7920 and 7930 – 06/1985 thru 09/1986 – Waste Logbook
U545	Logbook – Building 7920 - 11/1967 thru 12/1974 – Building Maintenance
U568	Coupled End-to-End Demonstration Project Task Sheets - Separations
U647	Issue Paper: Does Oak Ridge Have High-Level Waste (HLW)?

Figure 1. Map of Oak Ridge National Laboratory

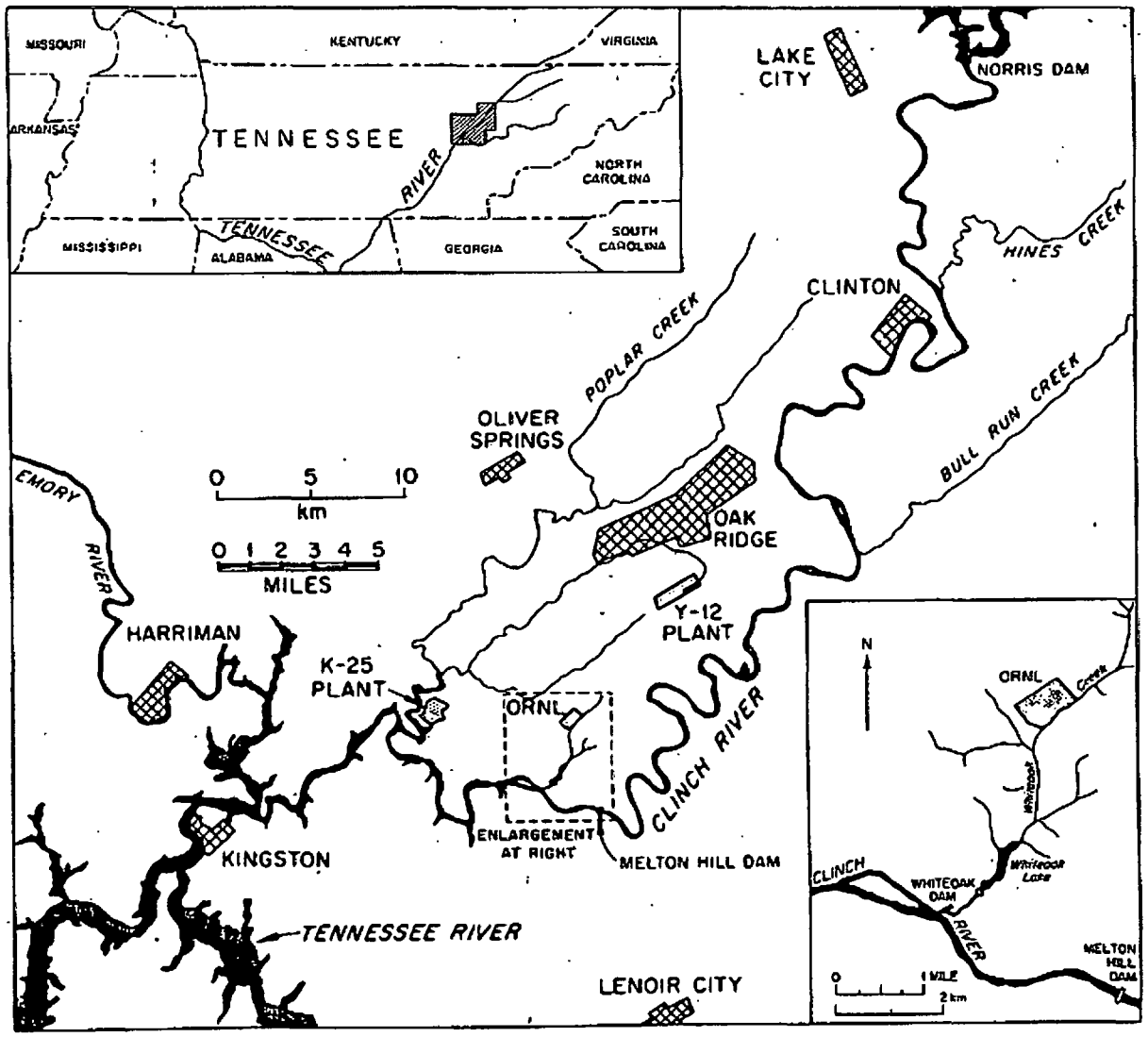


Figure 2. Map of Radiochemical Engineering Development Center, Transuranic Waste Processing Center, and Solid Waste Storage Areas

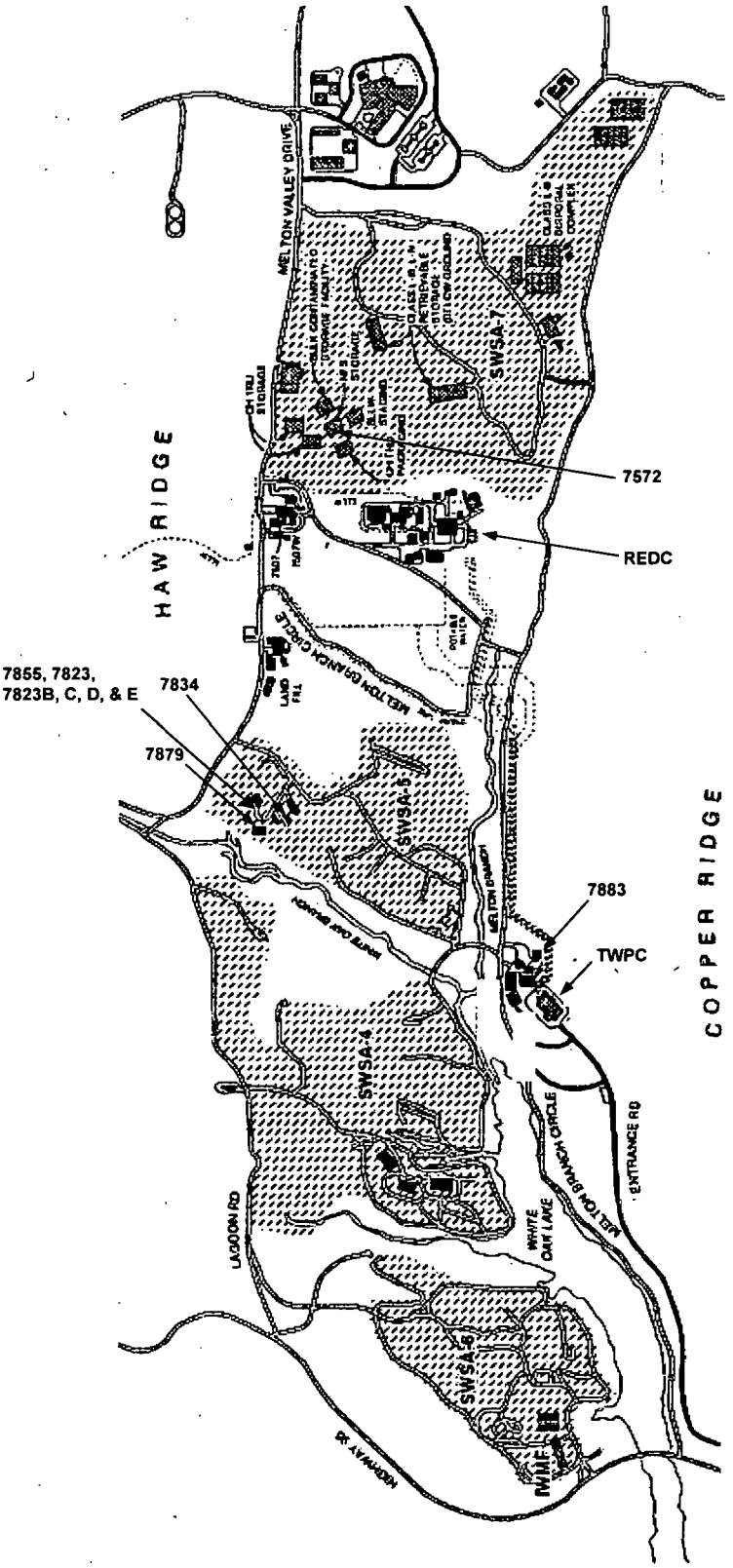


Figure 3. Site Layout for the Transuranic Waste Processing Center

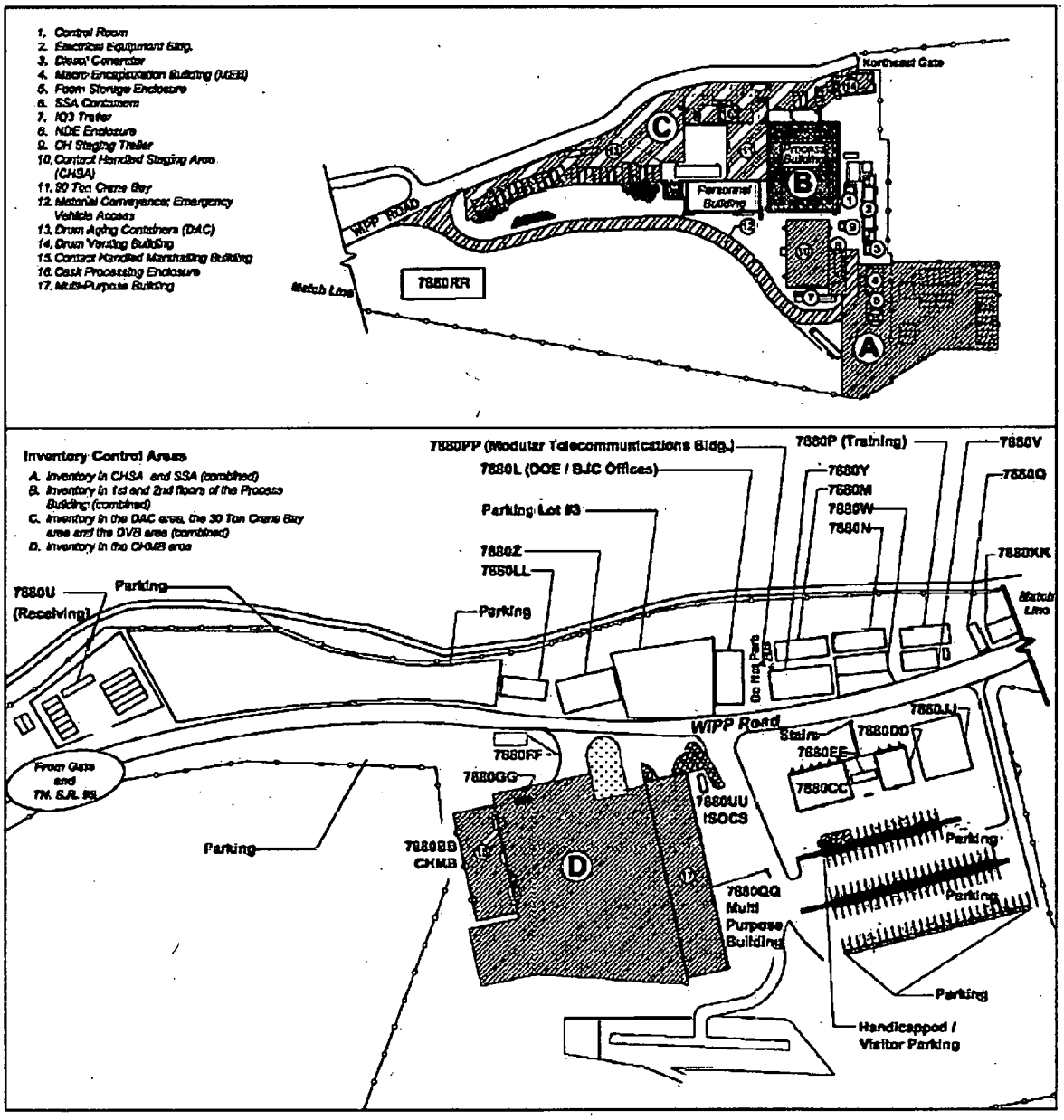


Figure 4. Location of Building 7920

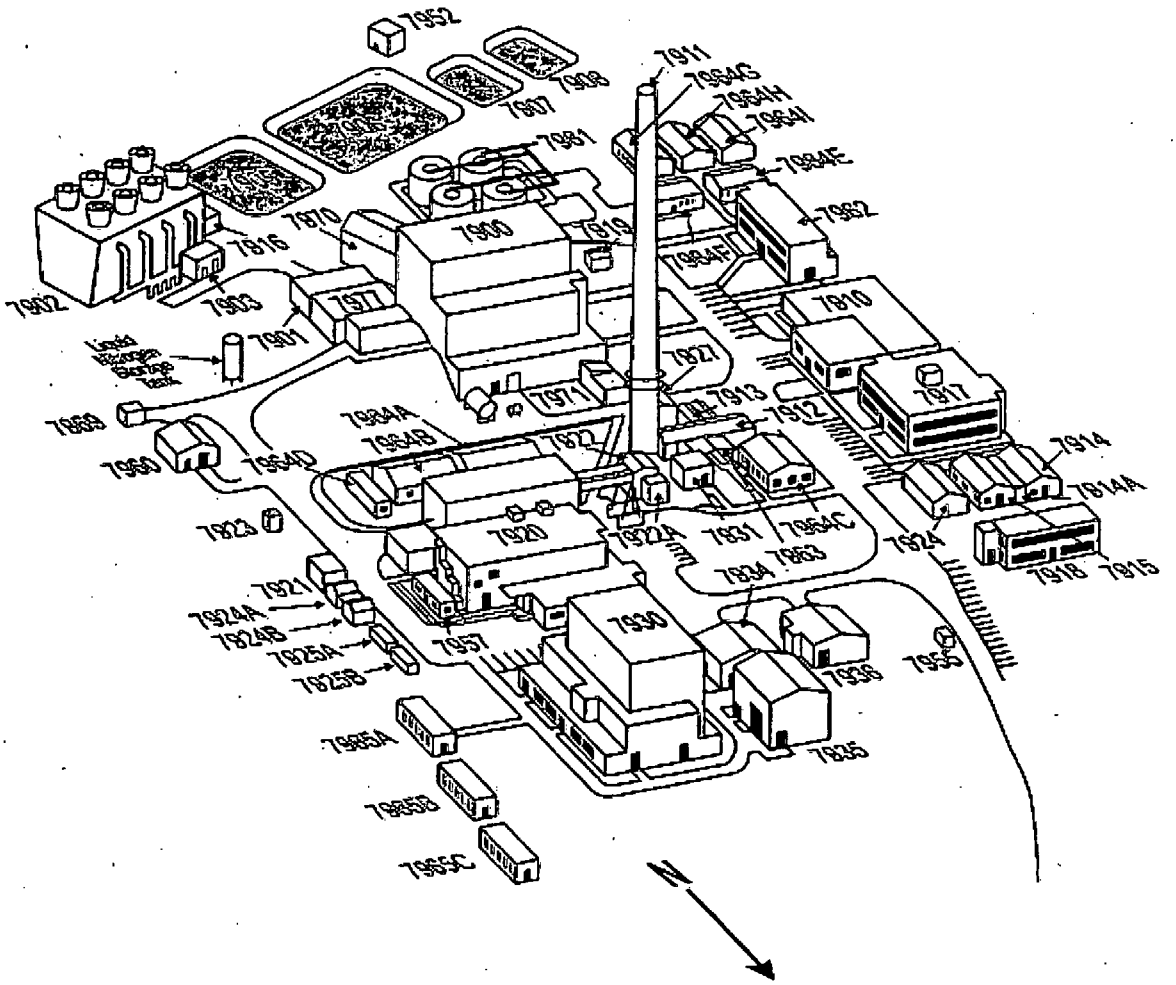


Figure 5. Building 7920 First Floor

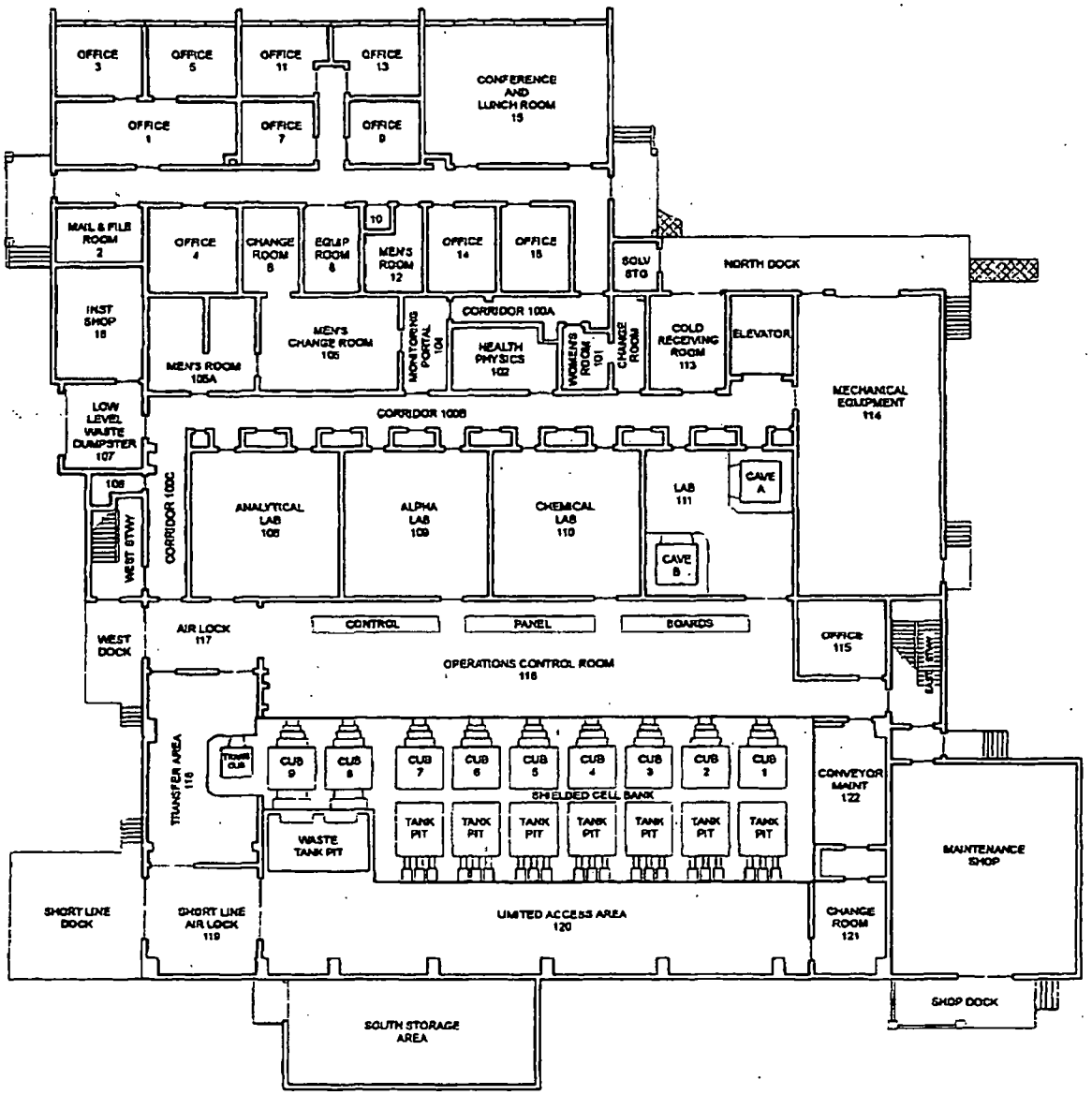


Figure 6. Building 7920 Second Floor

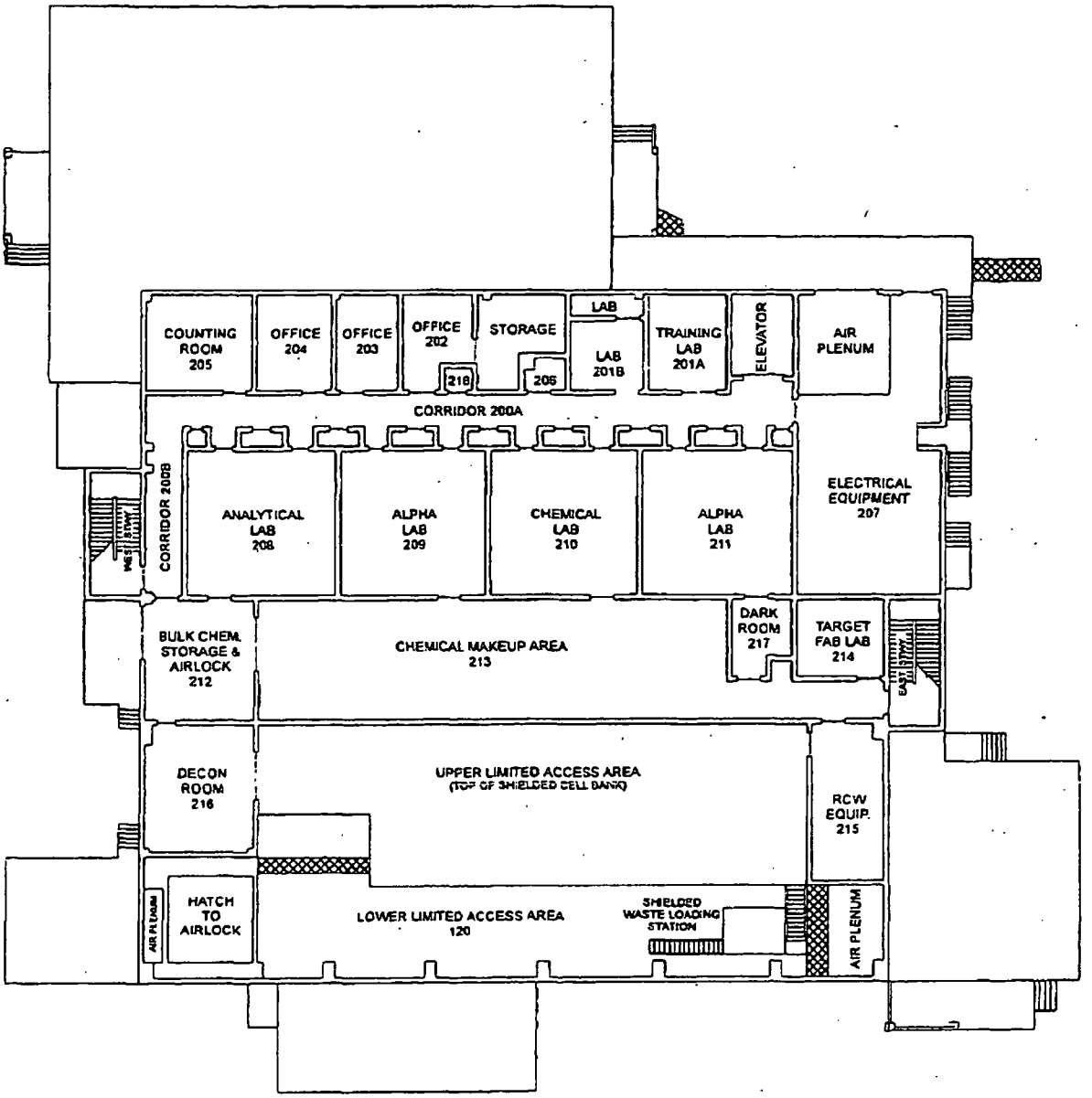


Figure 7. Building 7920 Hot Cell Bank

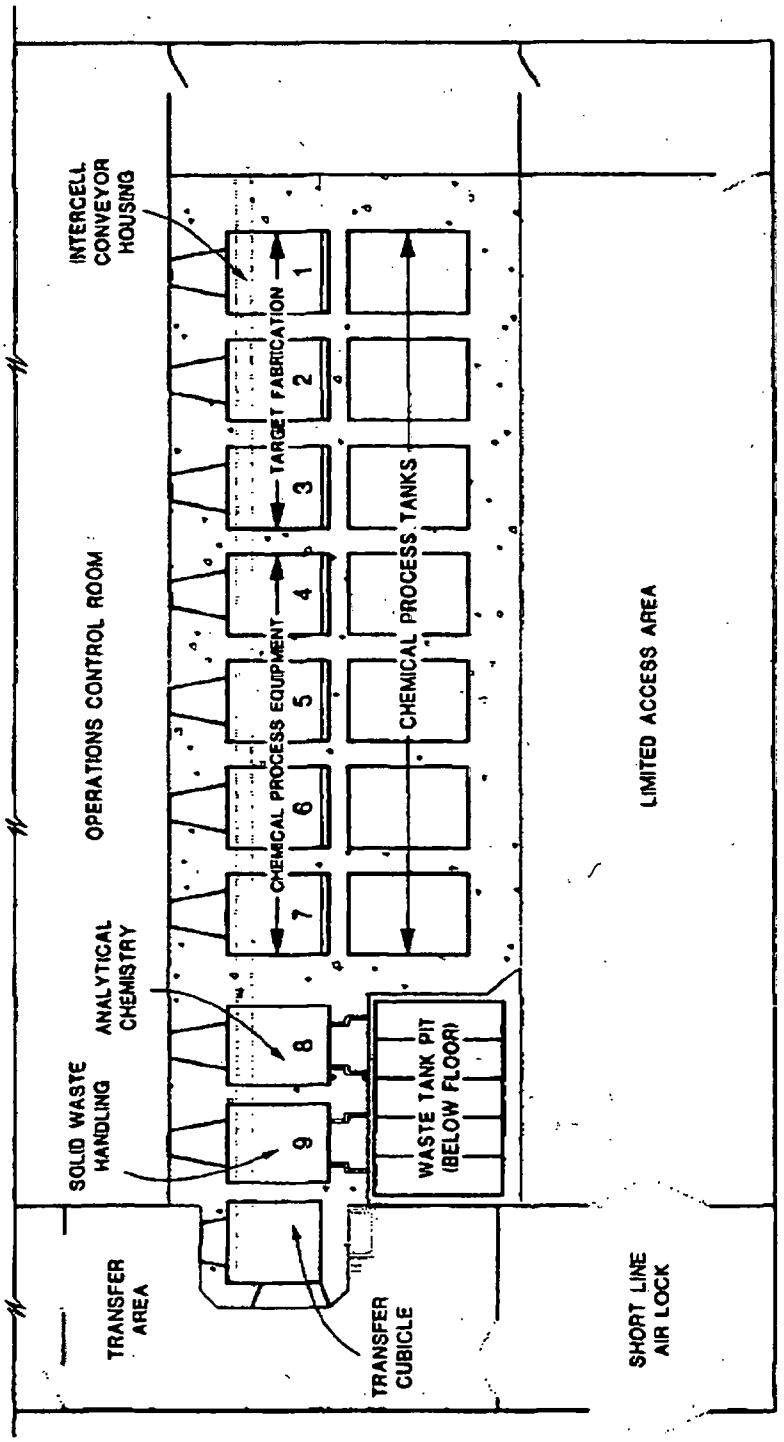


Figure 8. Building 7920 Hot Cell Bank - Cubicle Cross Section

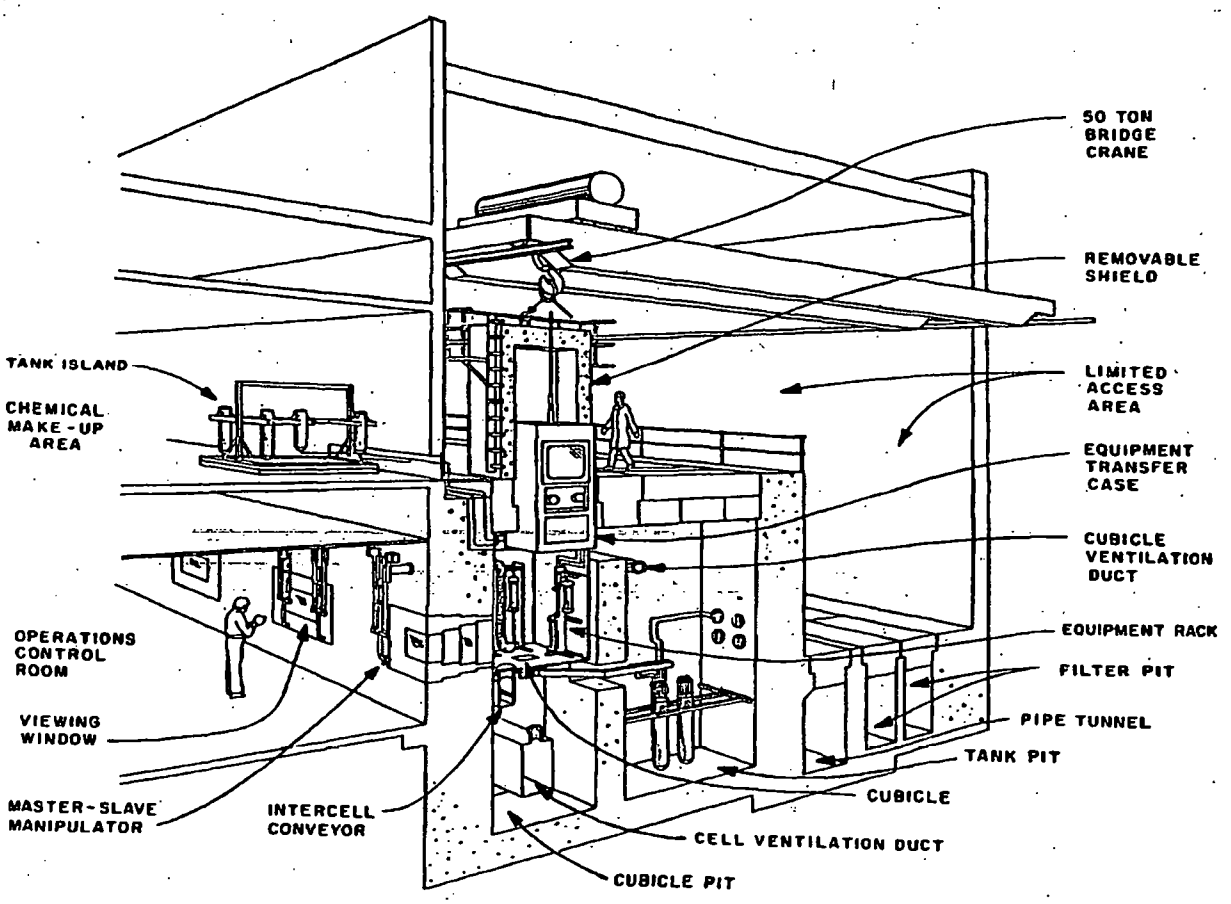


Figure 9. Shielded Transfer Carrier (Mule) and Transfer Area Cubicle

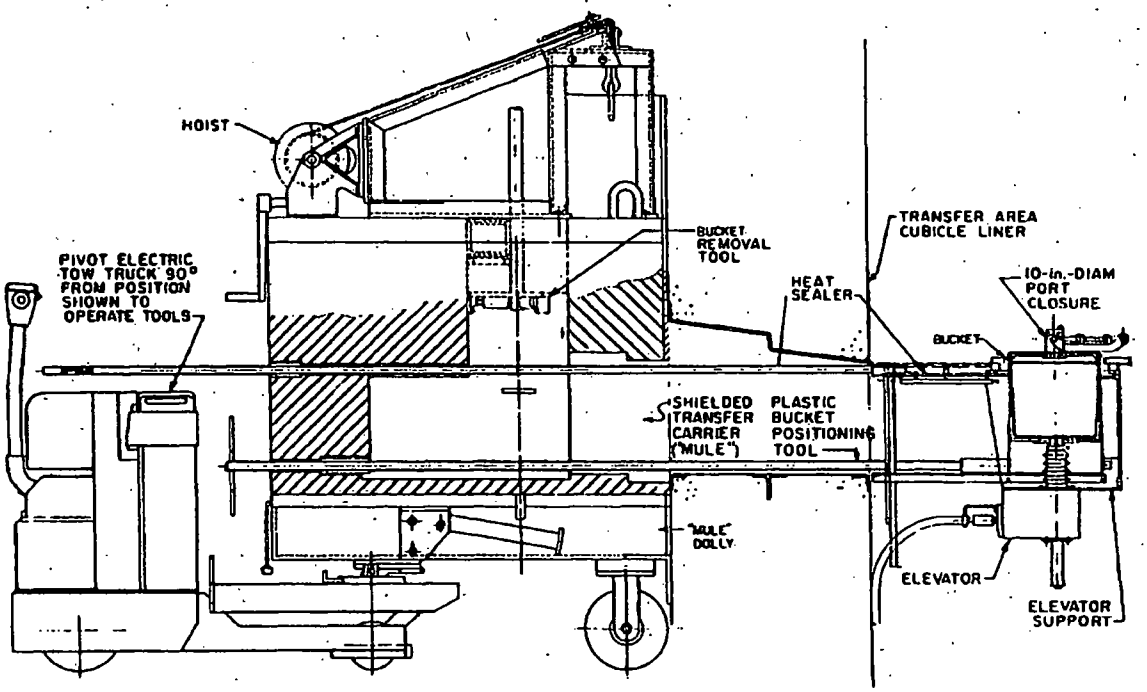


Figure 10. Decontamination Glovebox

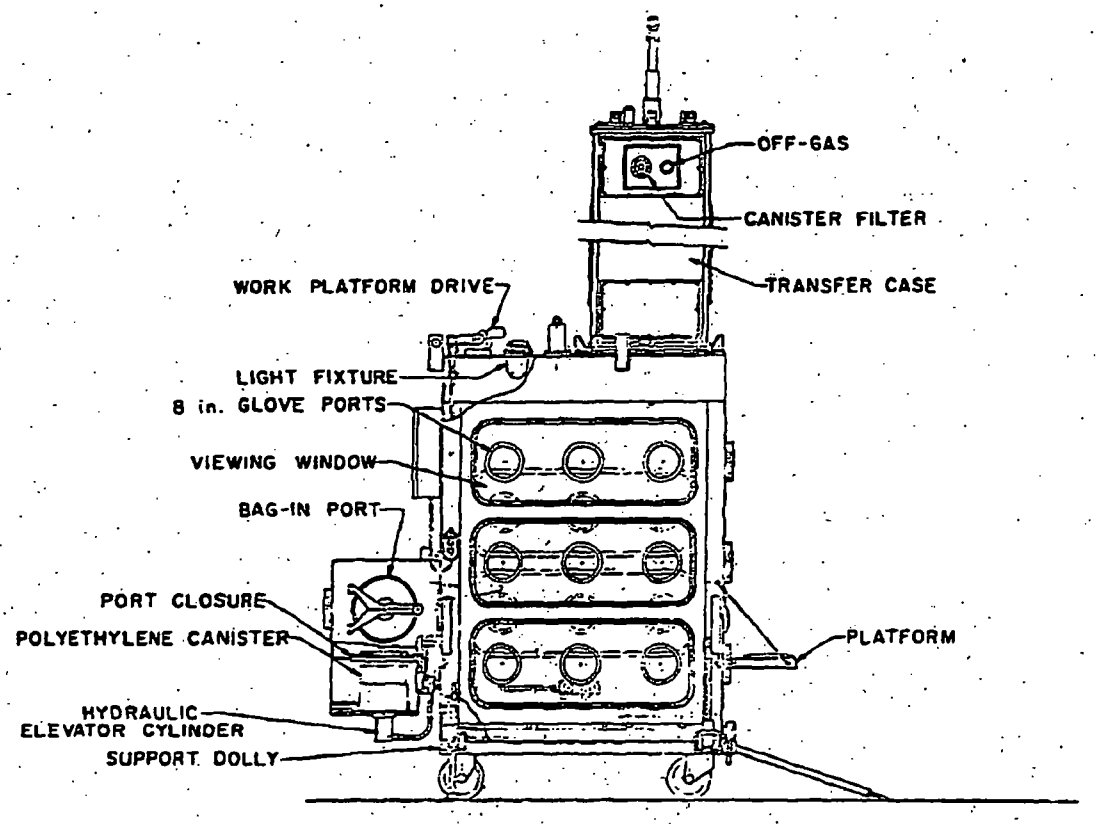


Figure 11. Process Development Laboratory - Room 111 Caves and Transfer Gloveboxes

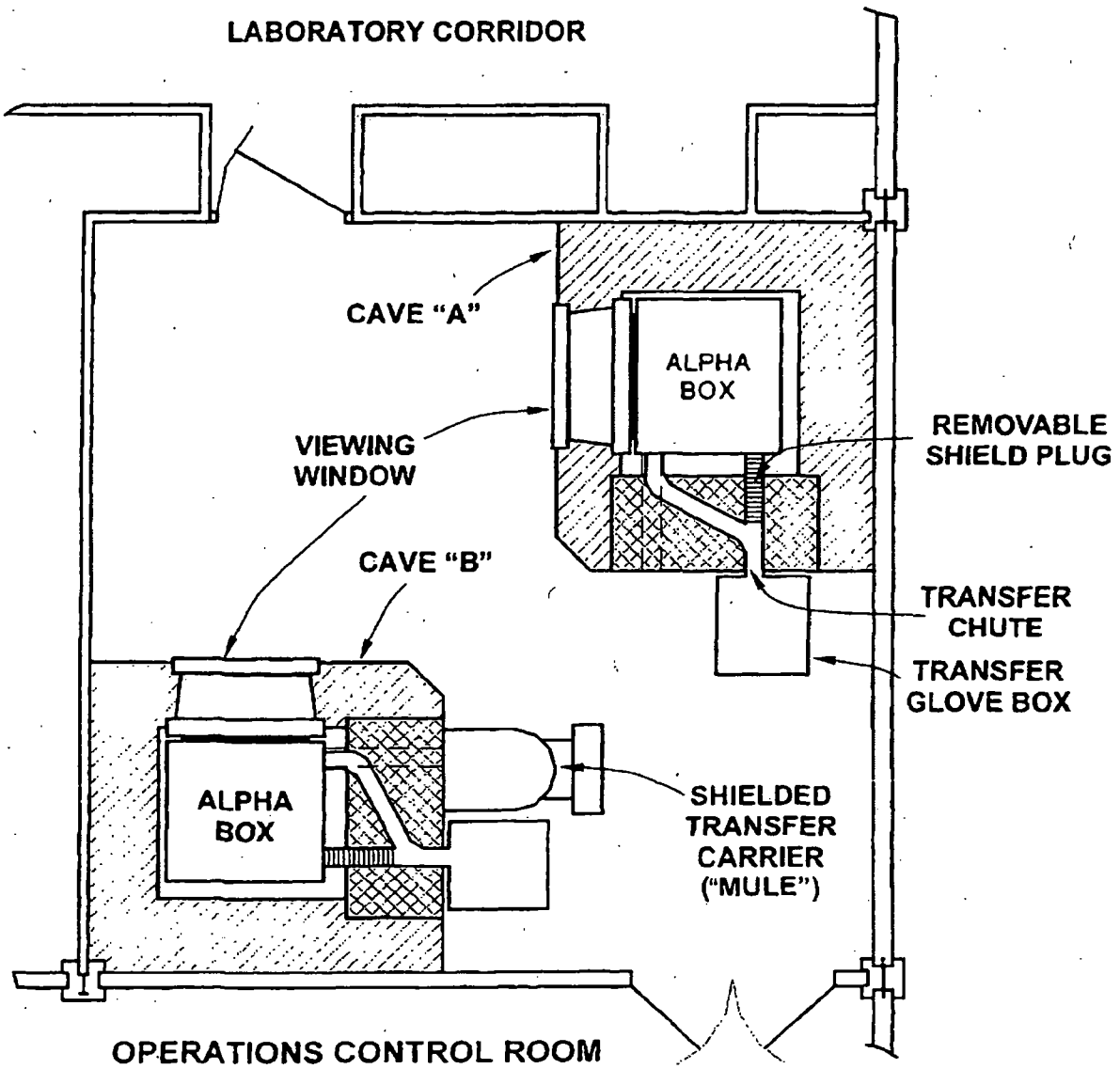


Figure 12. Transuranium Element Target Processing

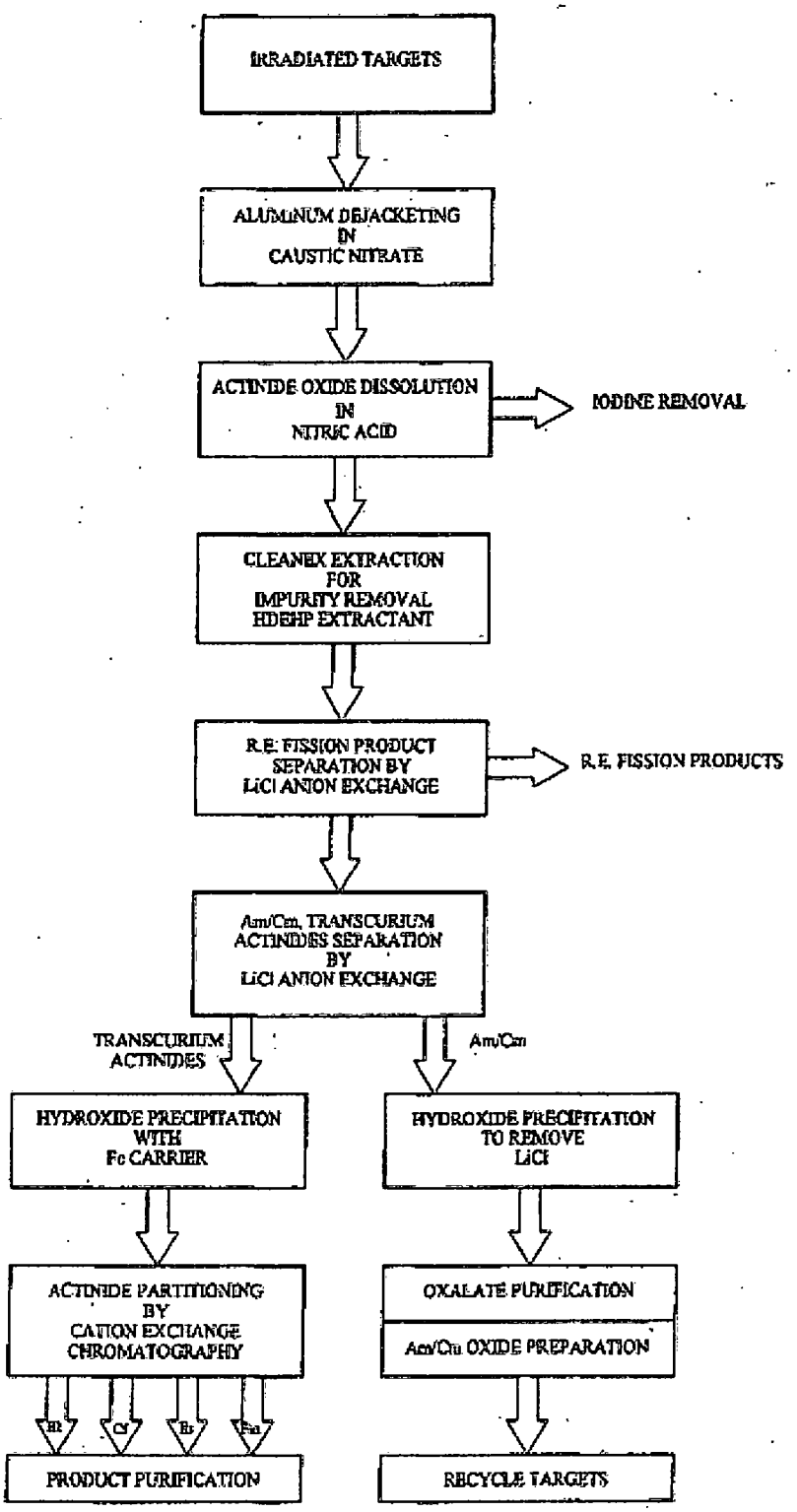


Figure 13. Solvent Extraction Test Facility Operations

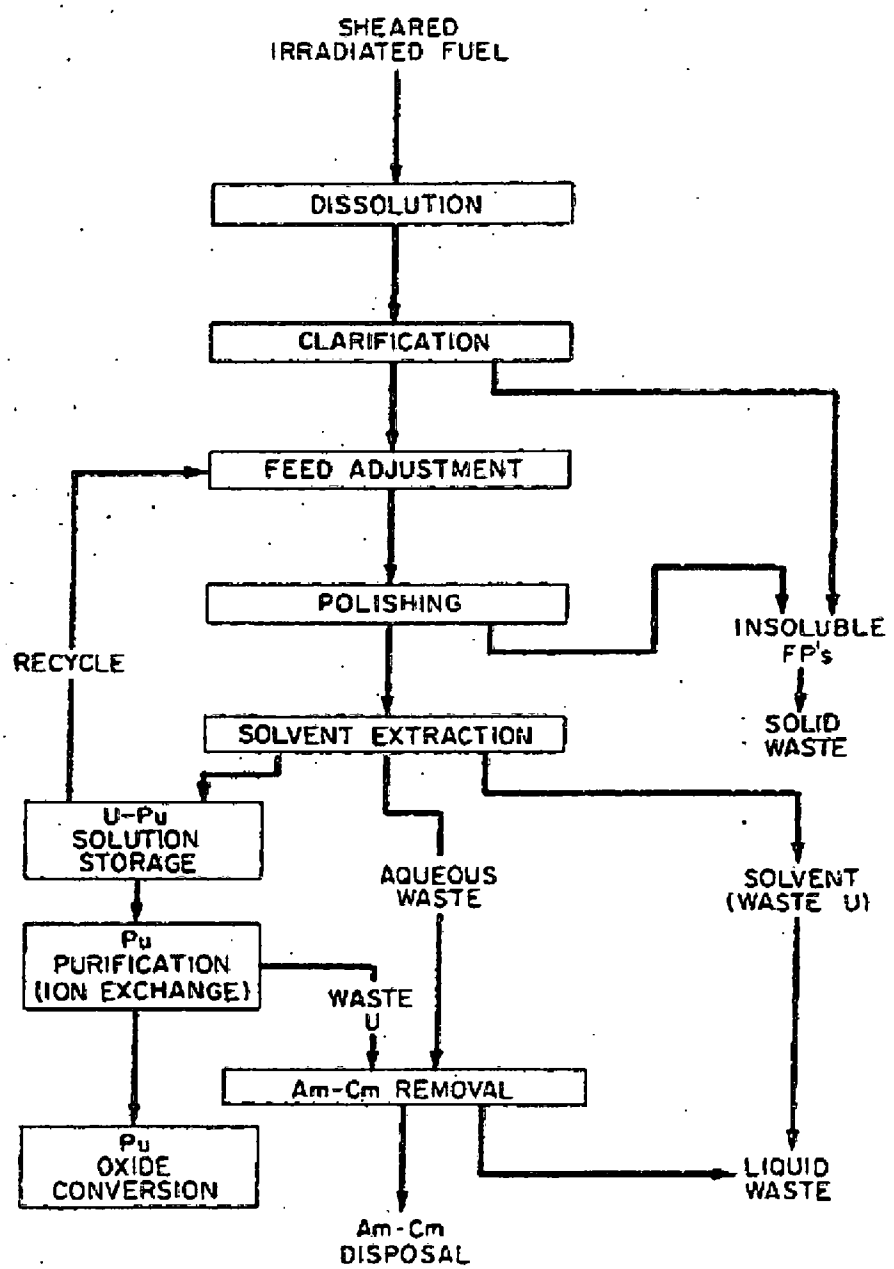


Figure 14. Mark-42 Processing

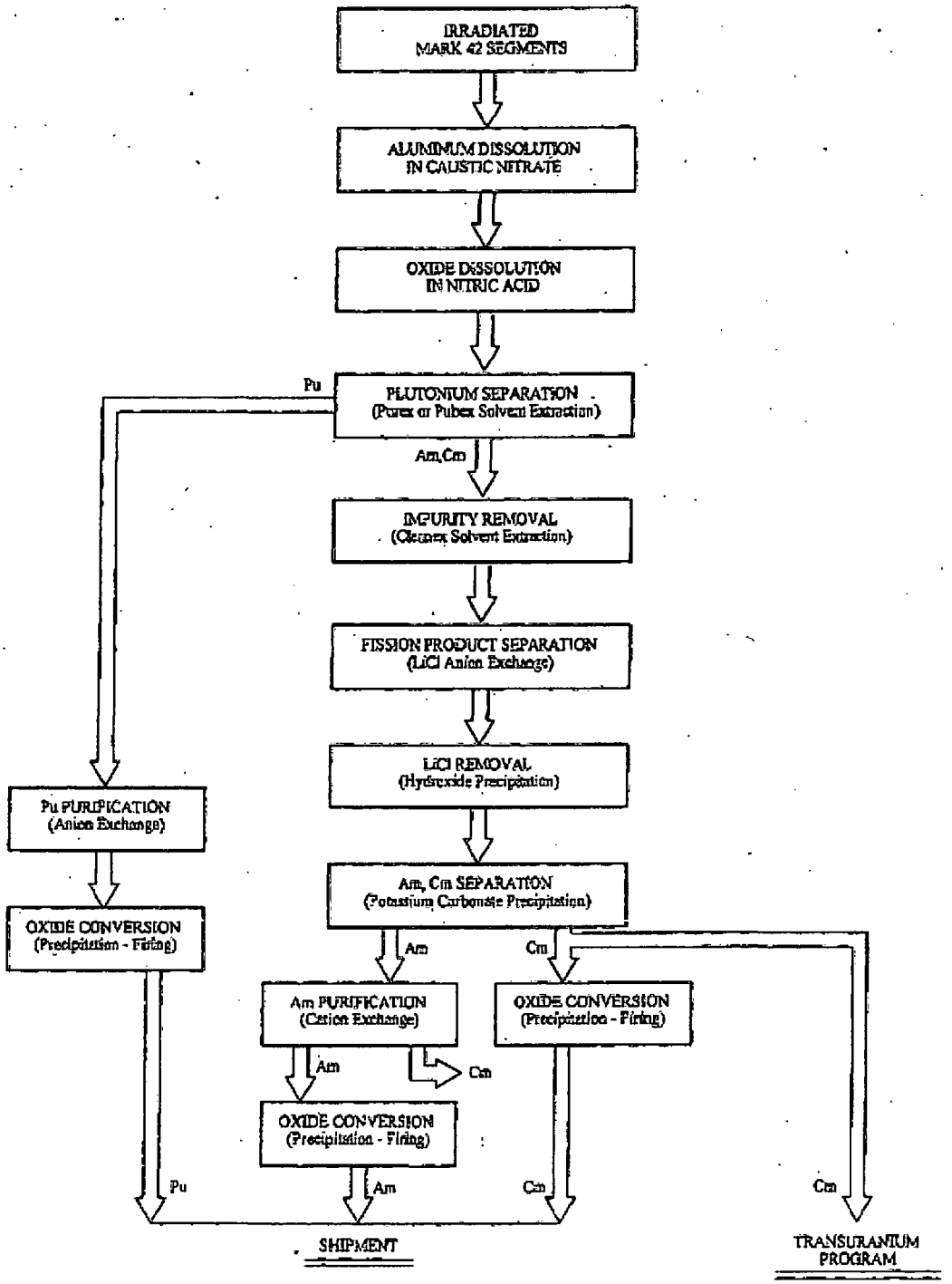


Figure 15. Coupled End-to-End Demonstration of Advanced Fuel Cycles

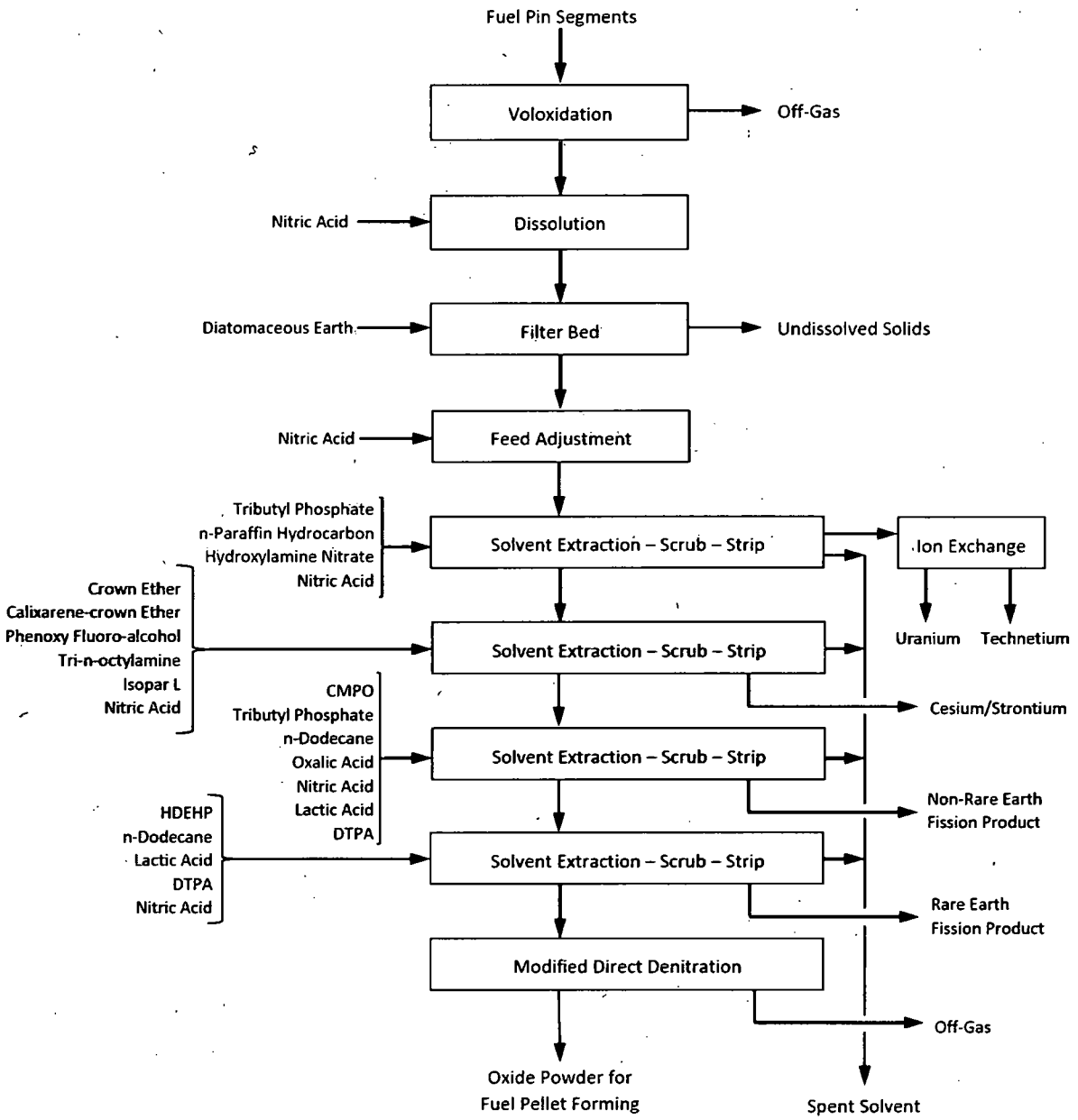


Figure 16. Neutron Source Processing

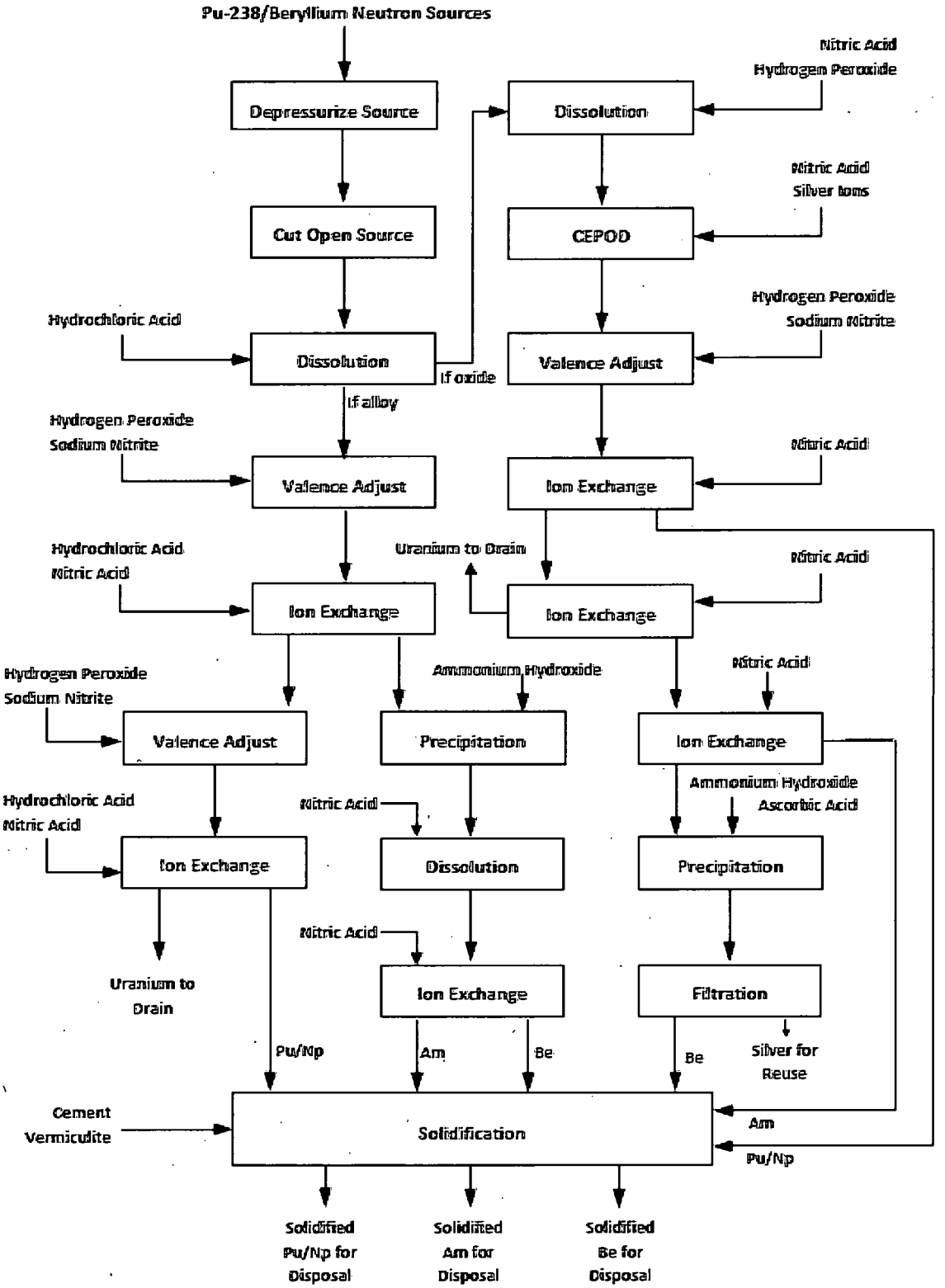


Figure 17. Pu-238 Supply Project

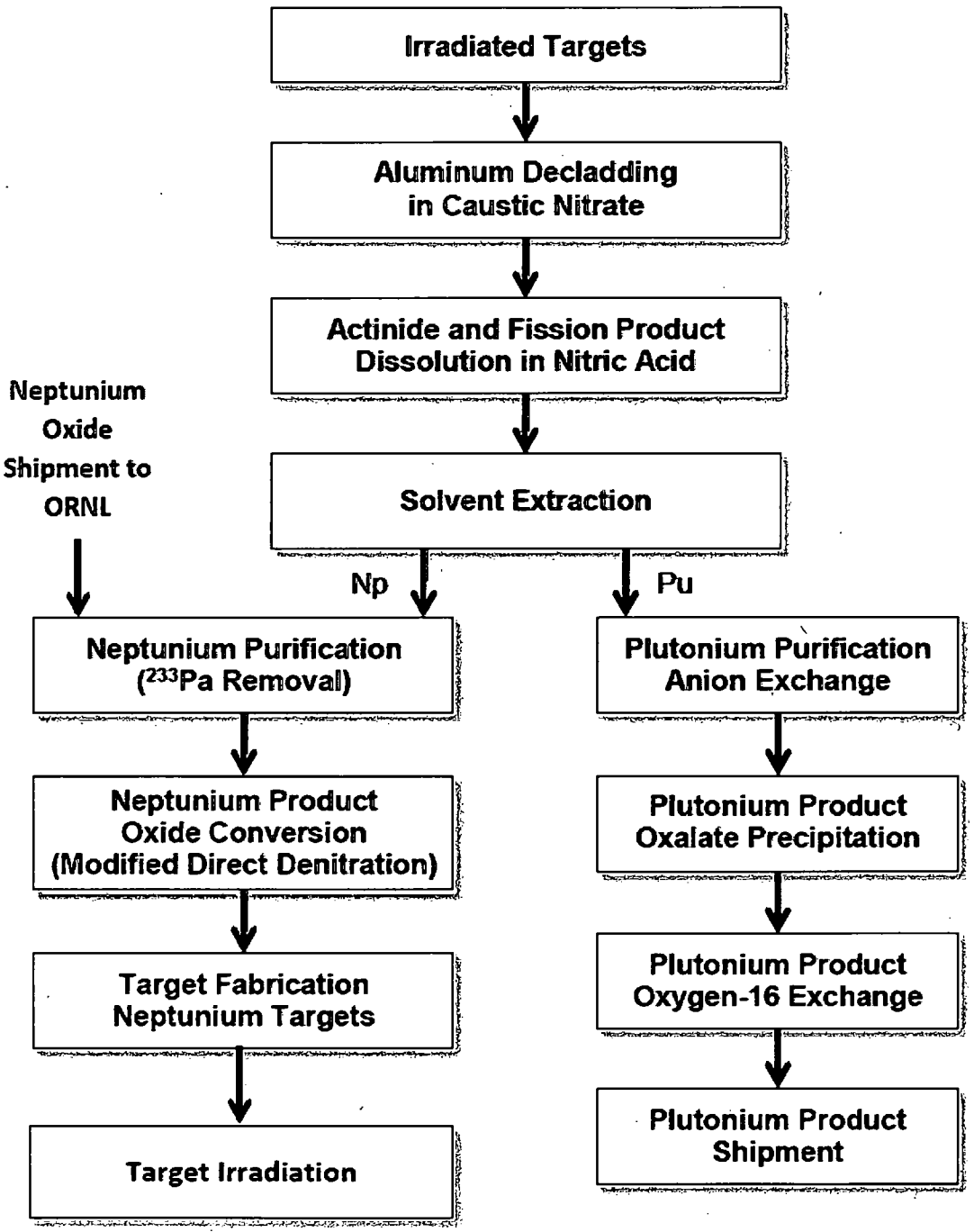


Figure 18. Pellet Fabrication

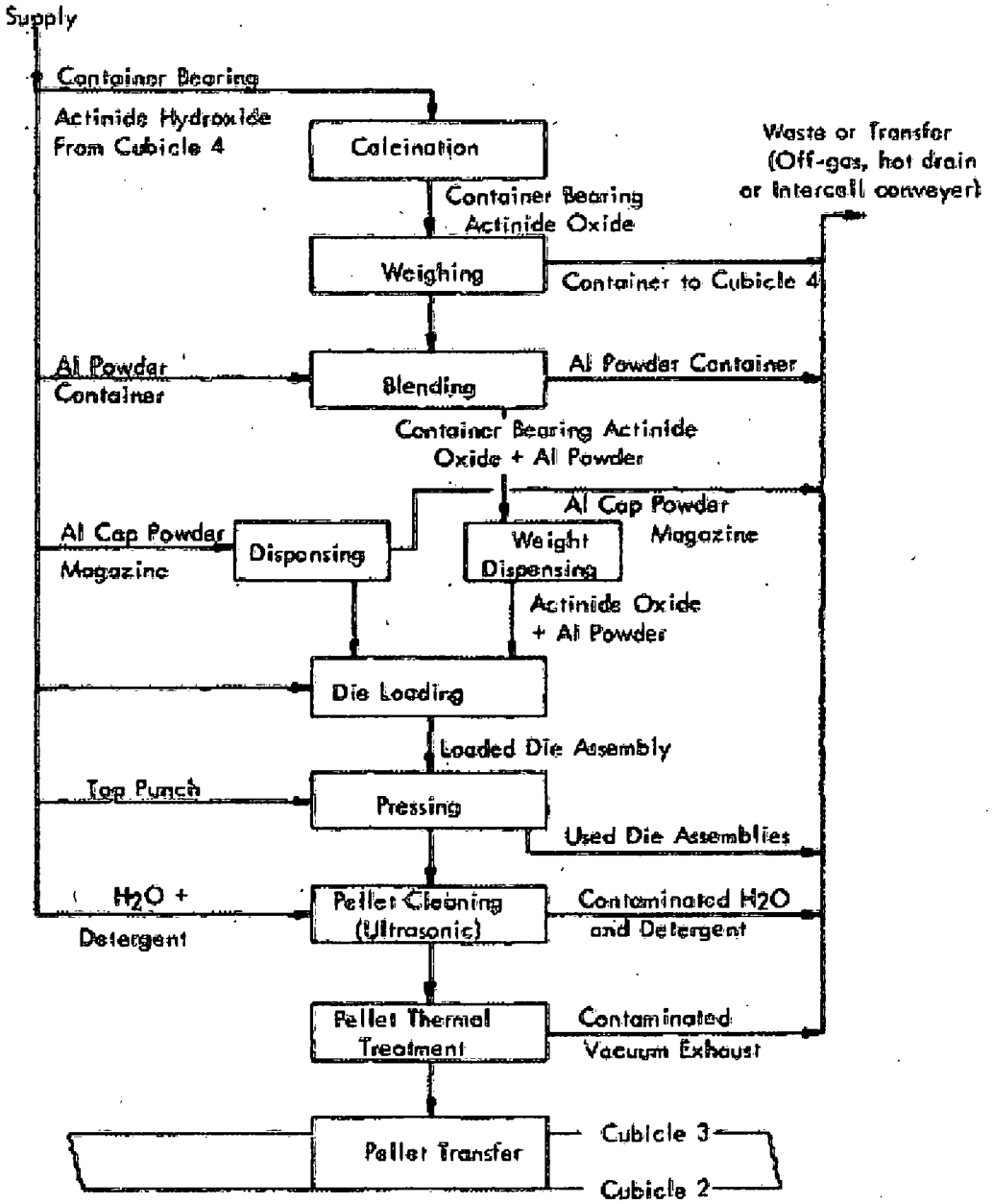


Figure 19. Target Tube Fabrication

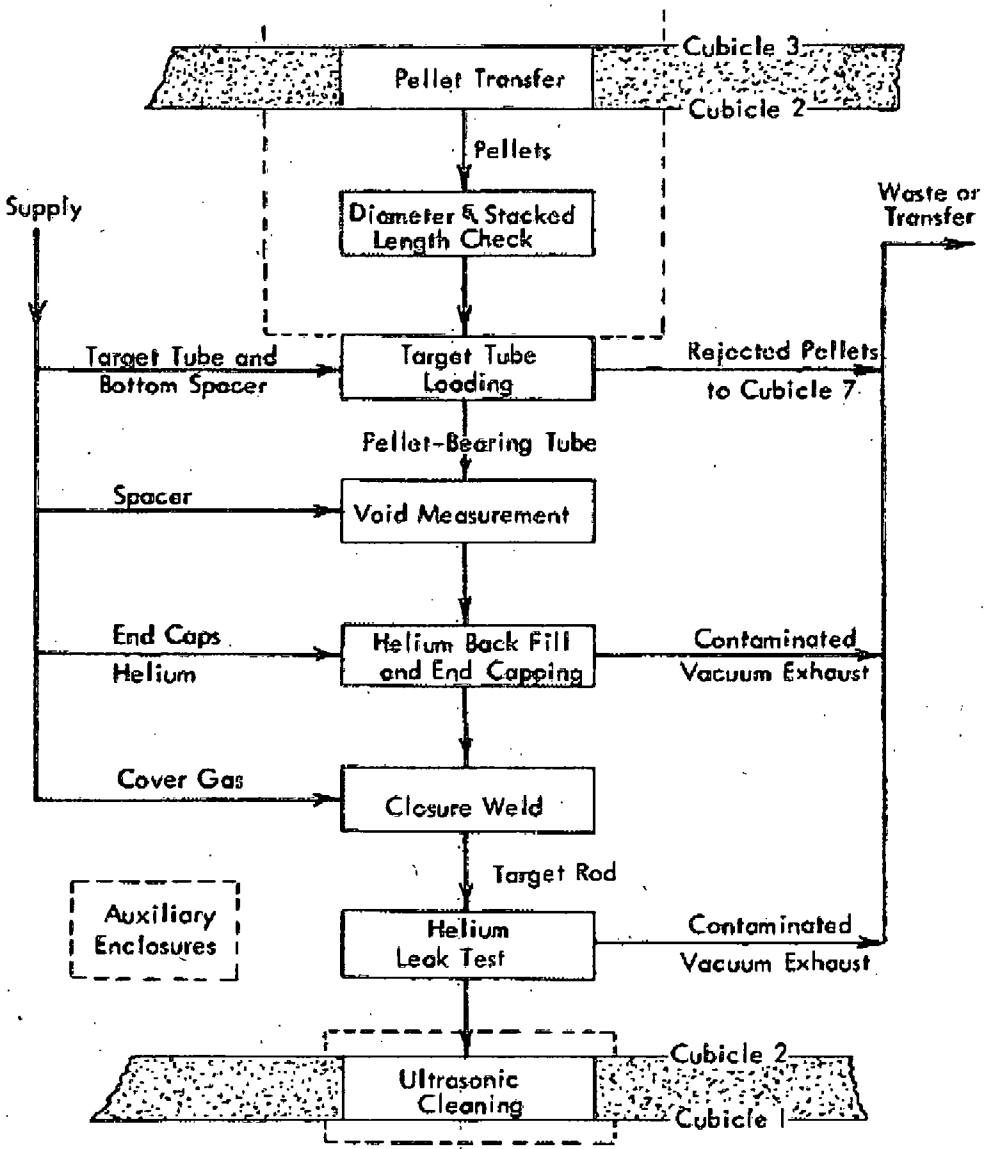


Figure 20. Target Assembly

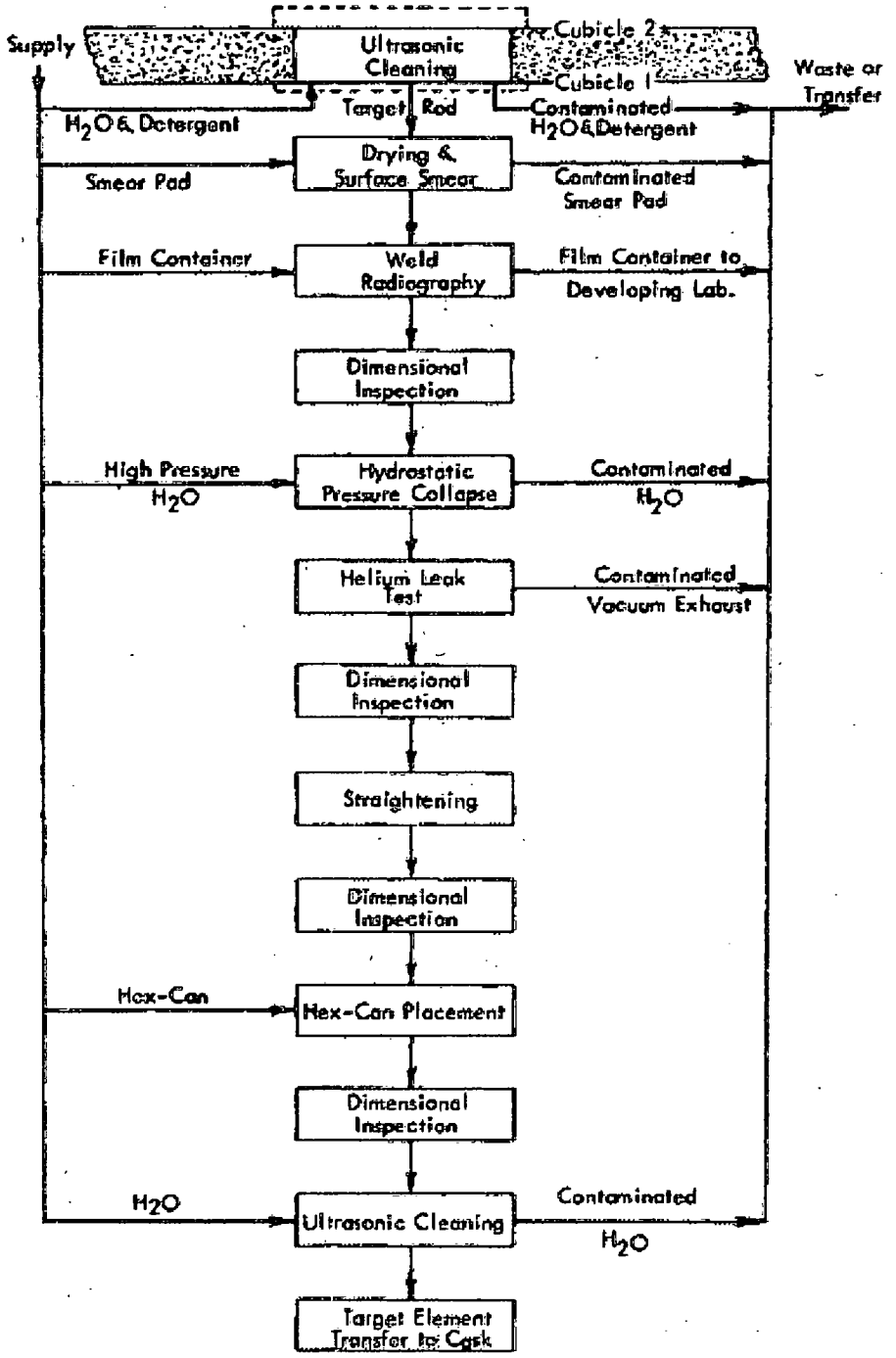


Figure 21. Transuranic Waste Processing Center CH Solid Waste Flow Diagram

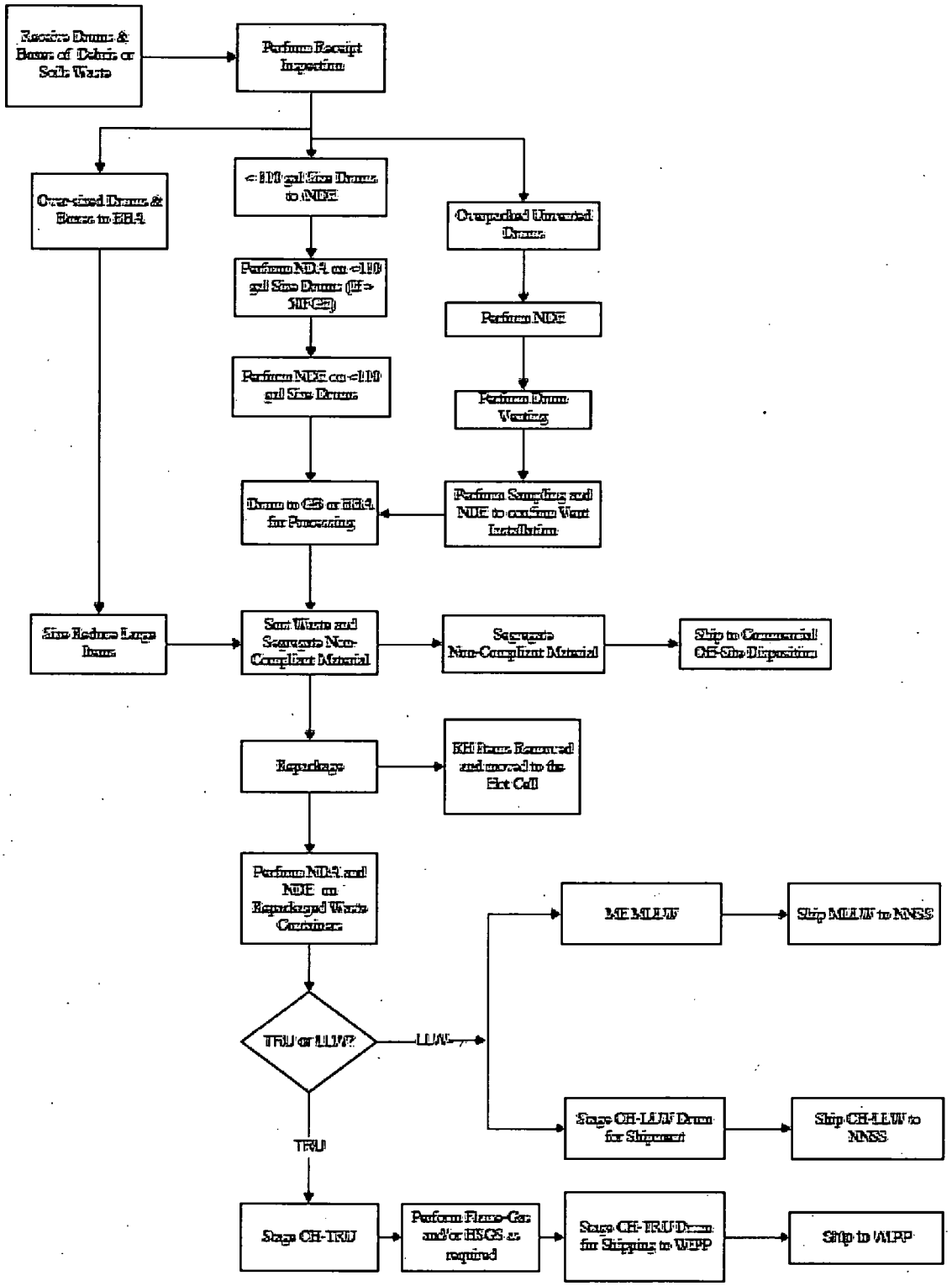
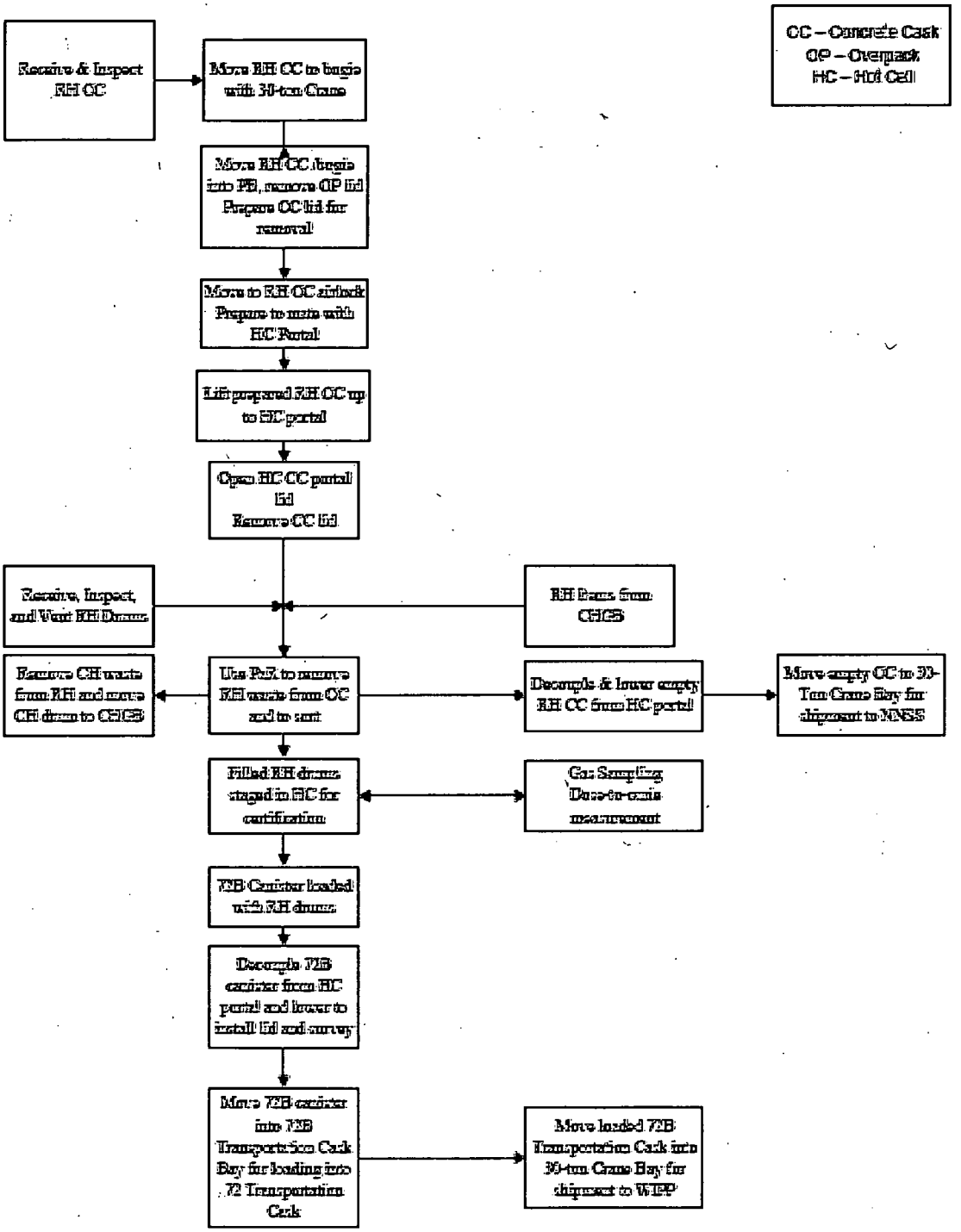
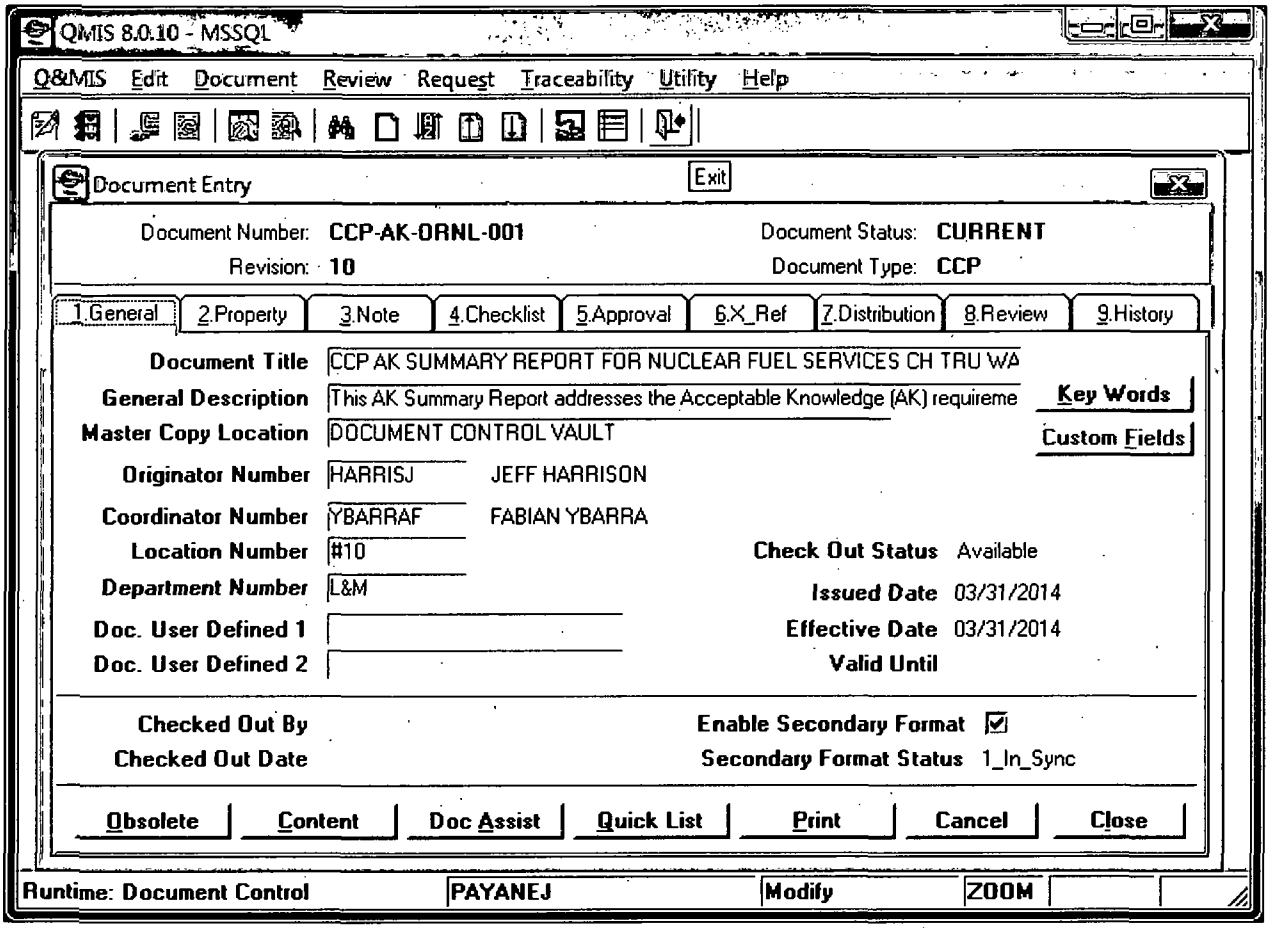


Figure 22. Transuranic Waste Processing Center RH Solid Waste Flow Diagram

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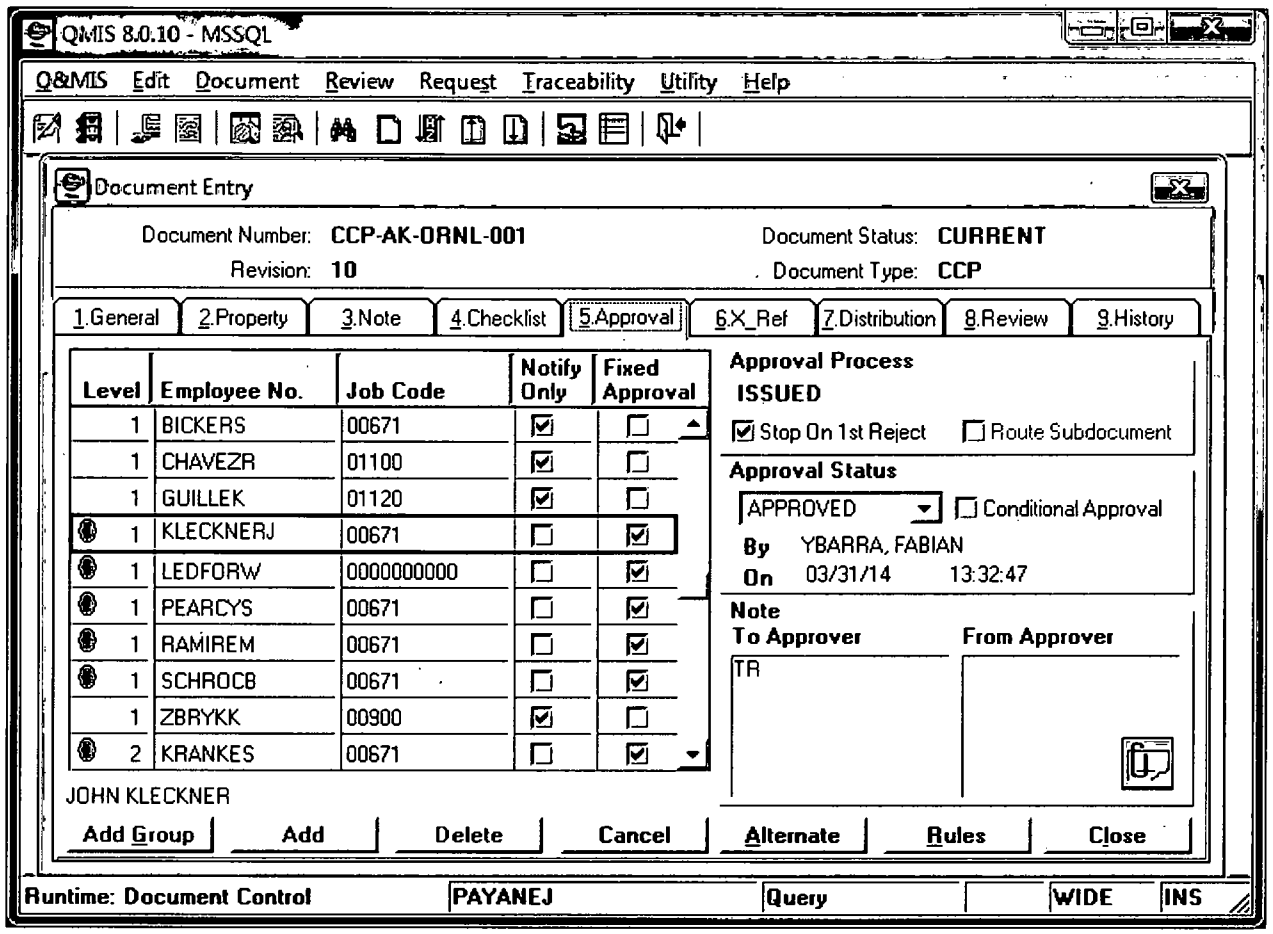
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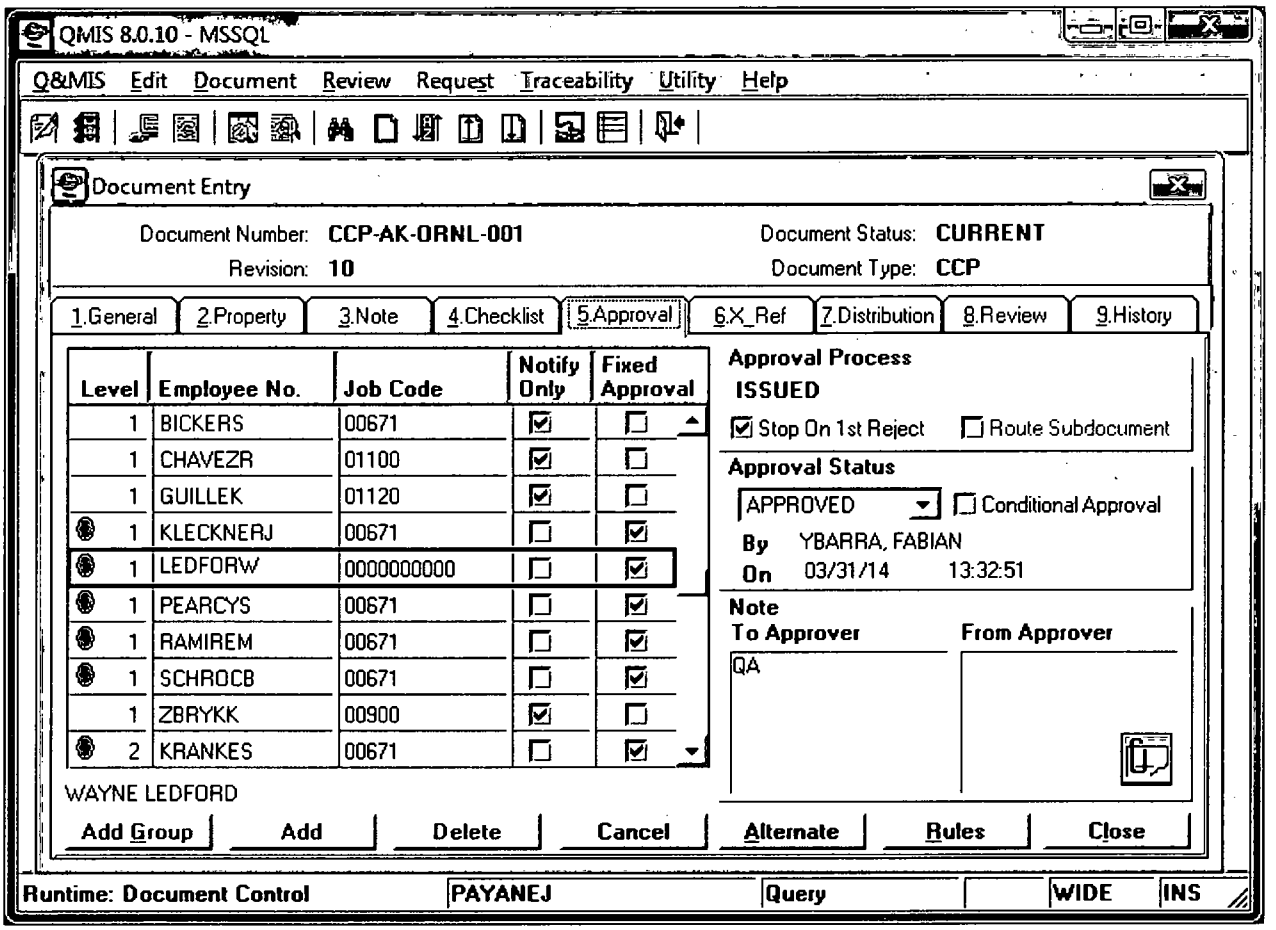
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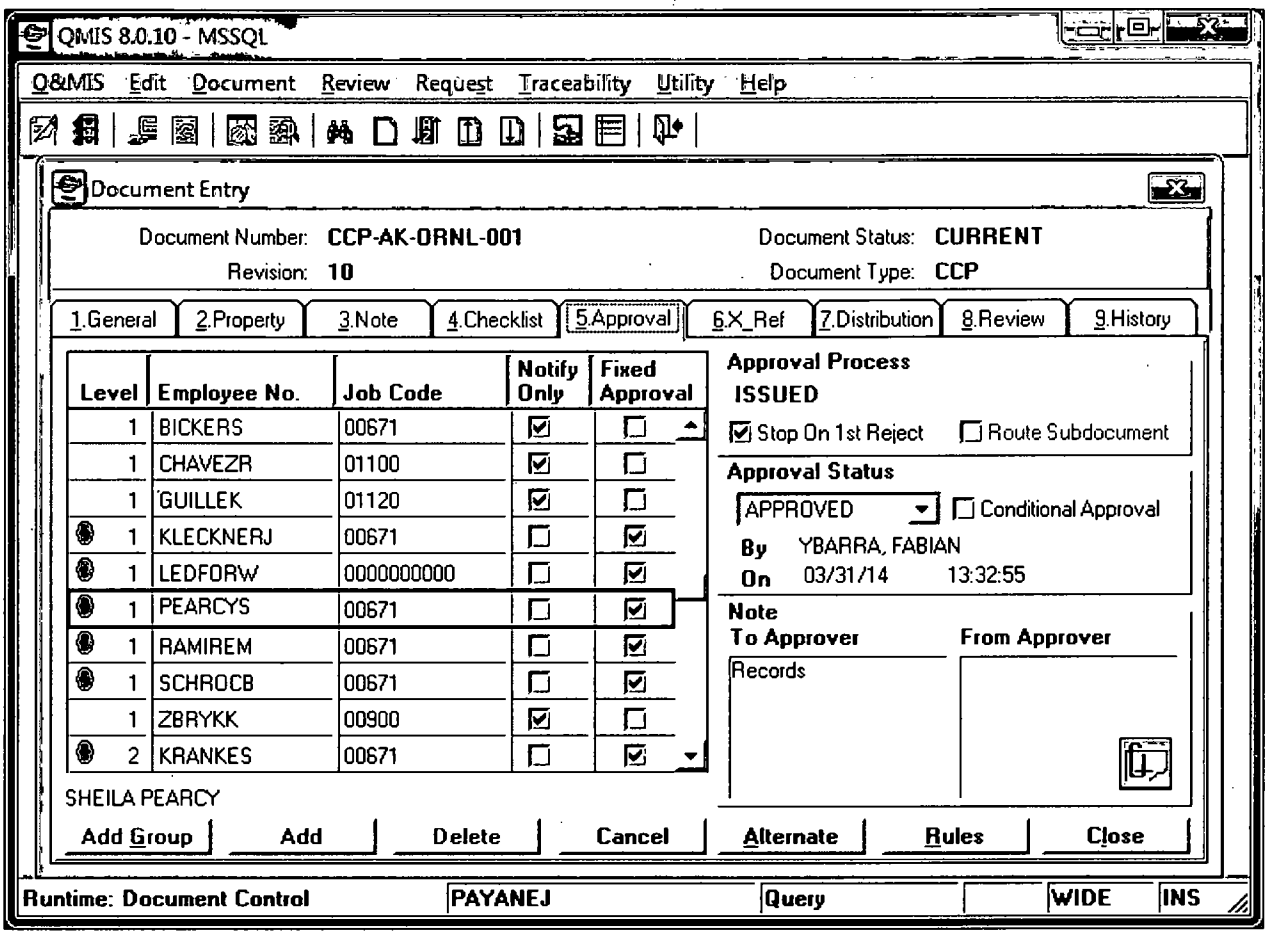
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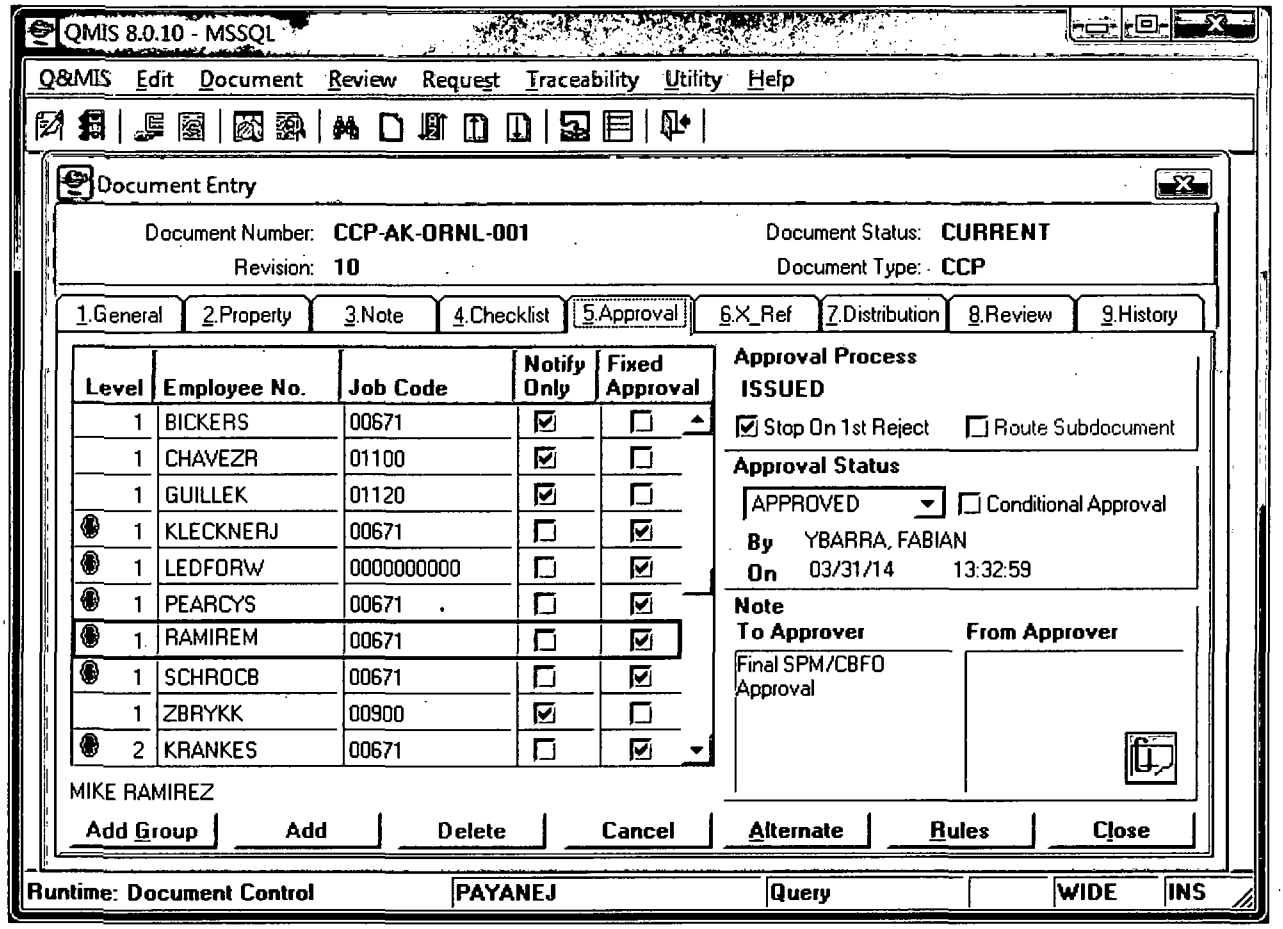
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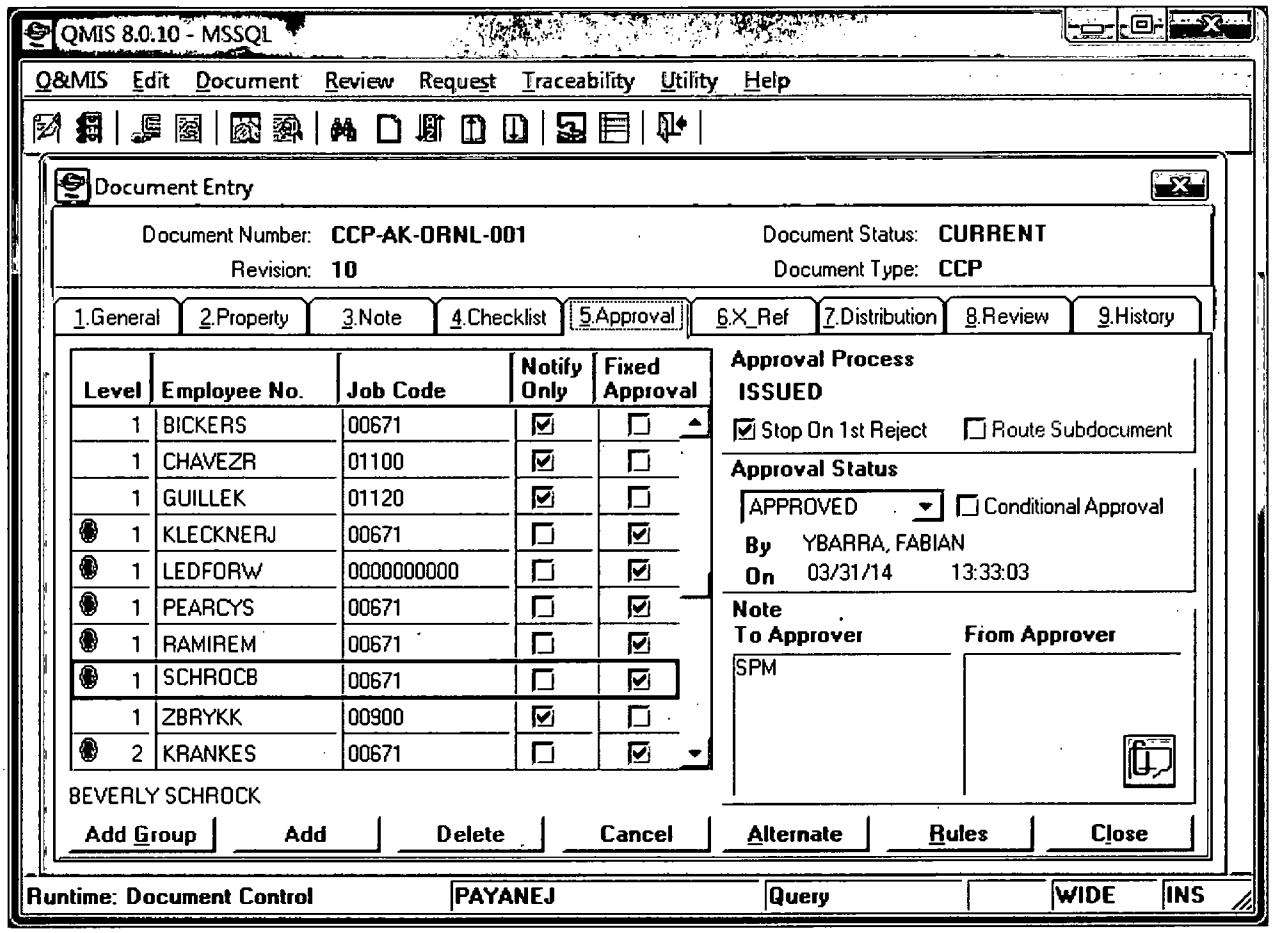
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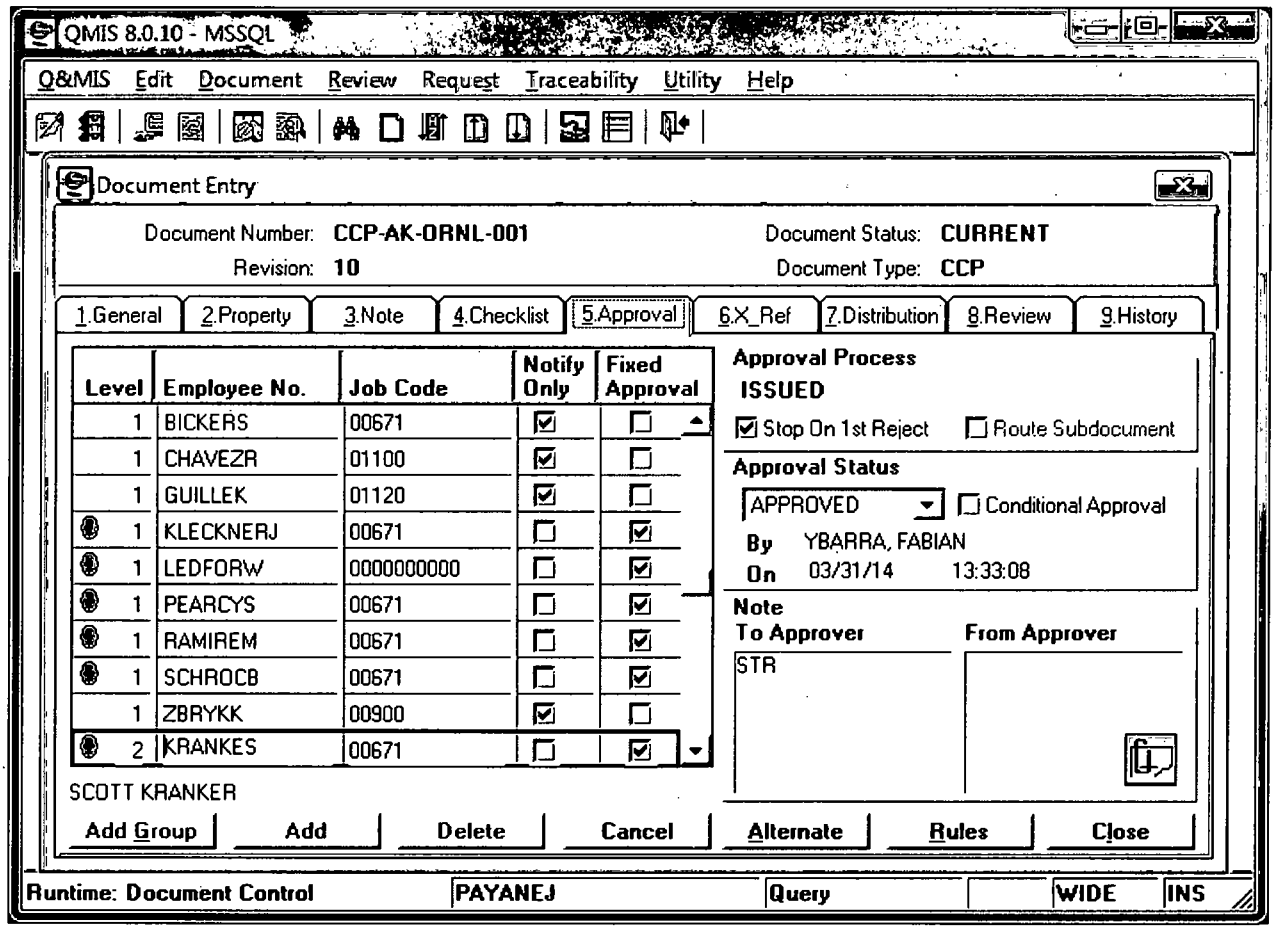
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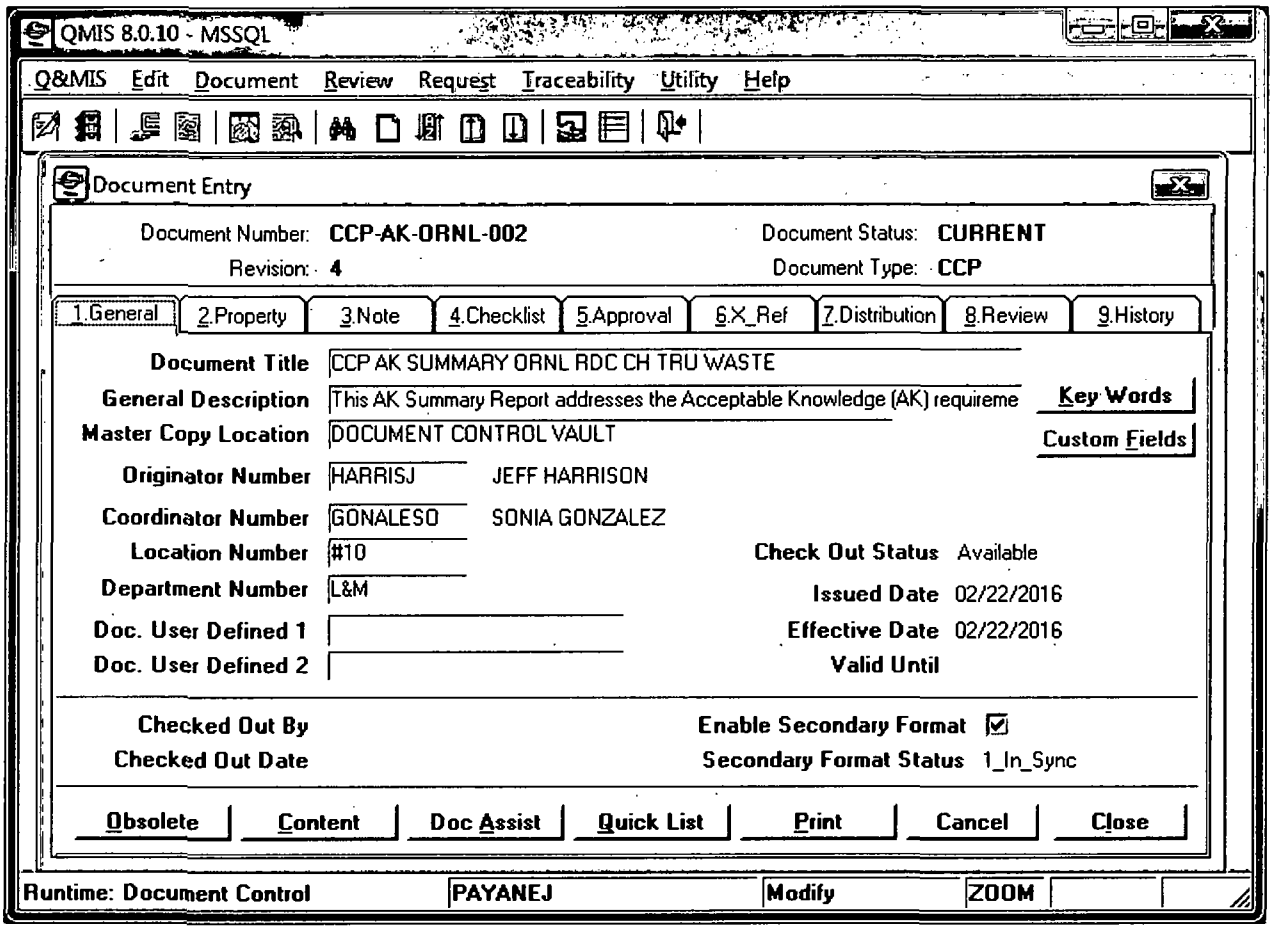
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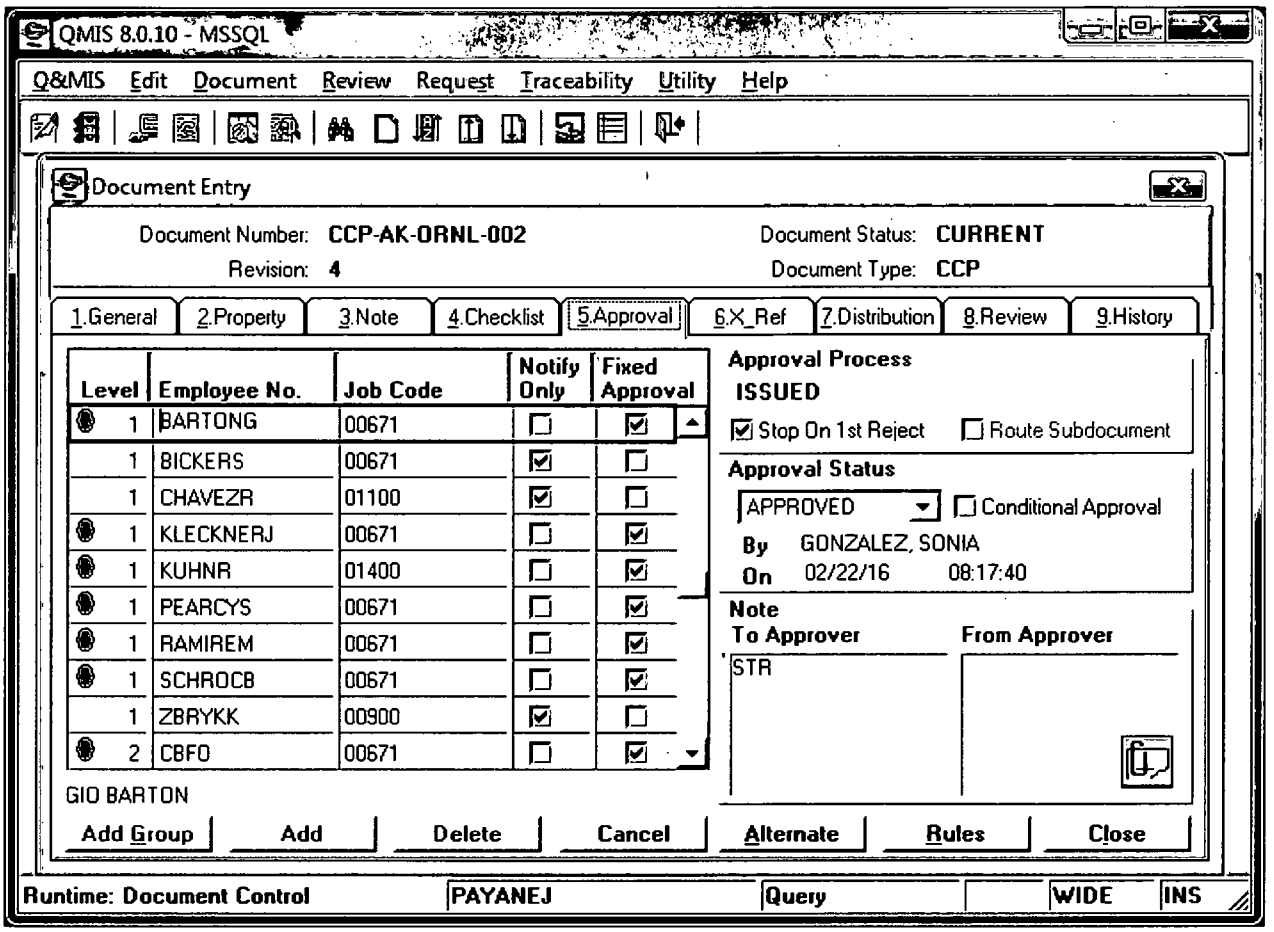
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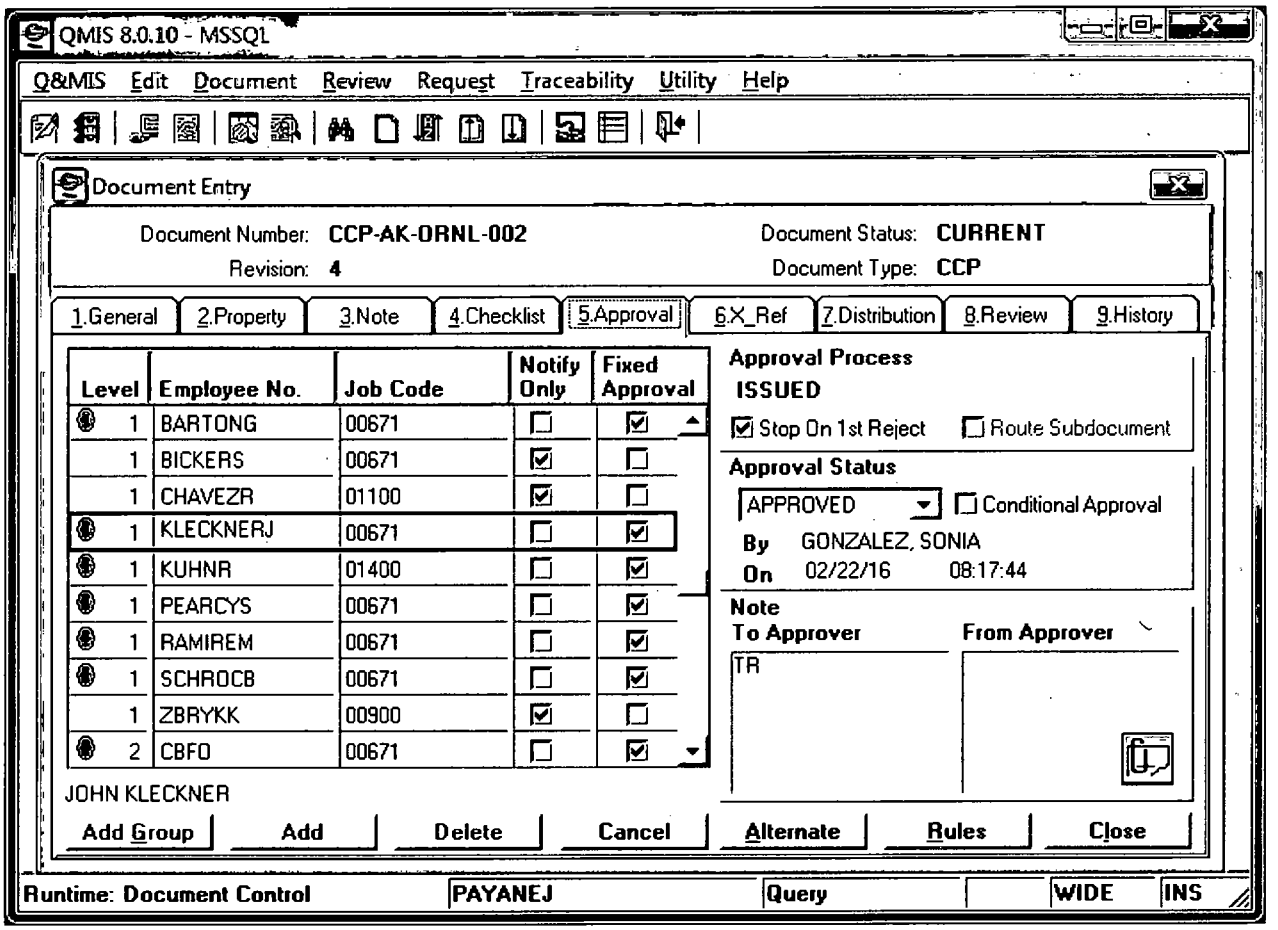
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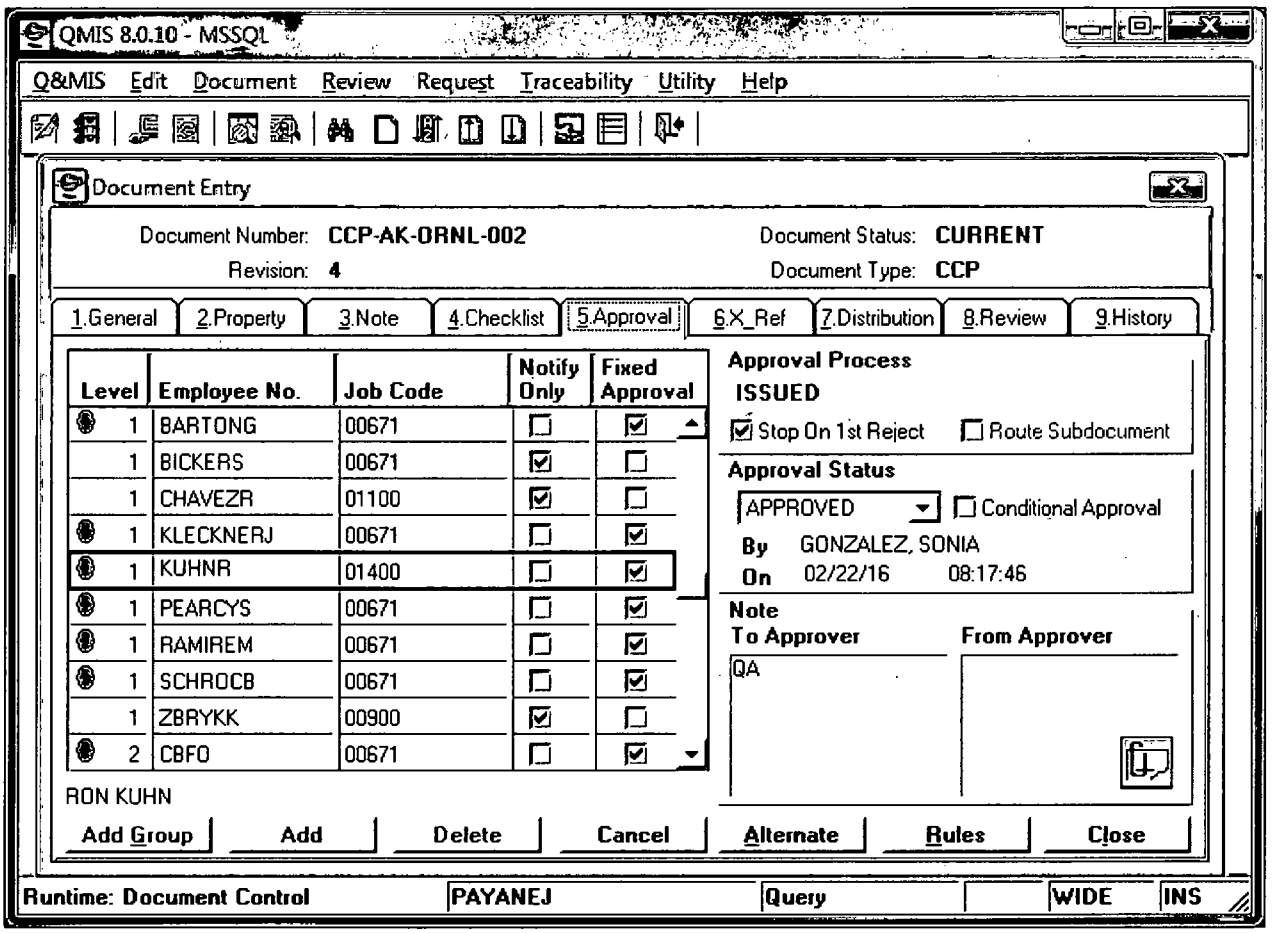
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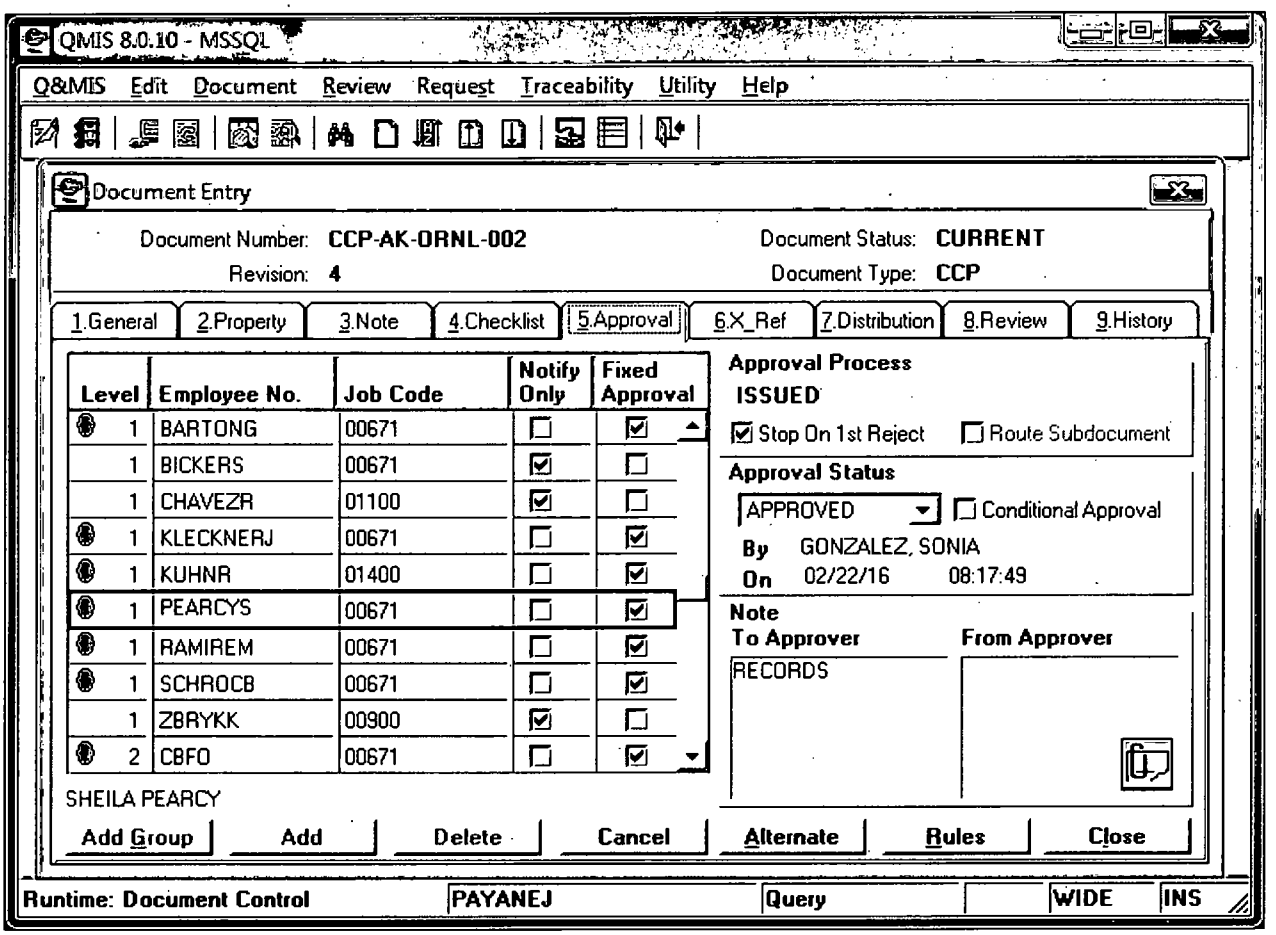
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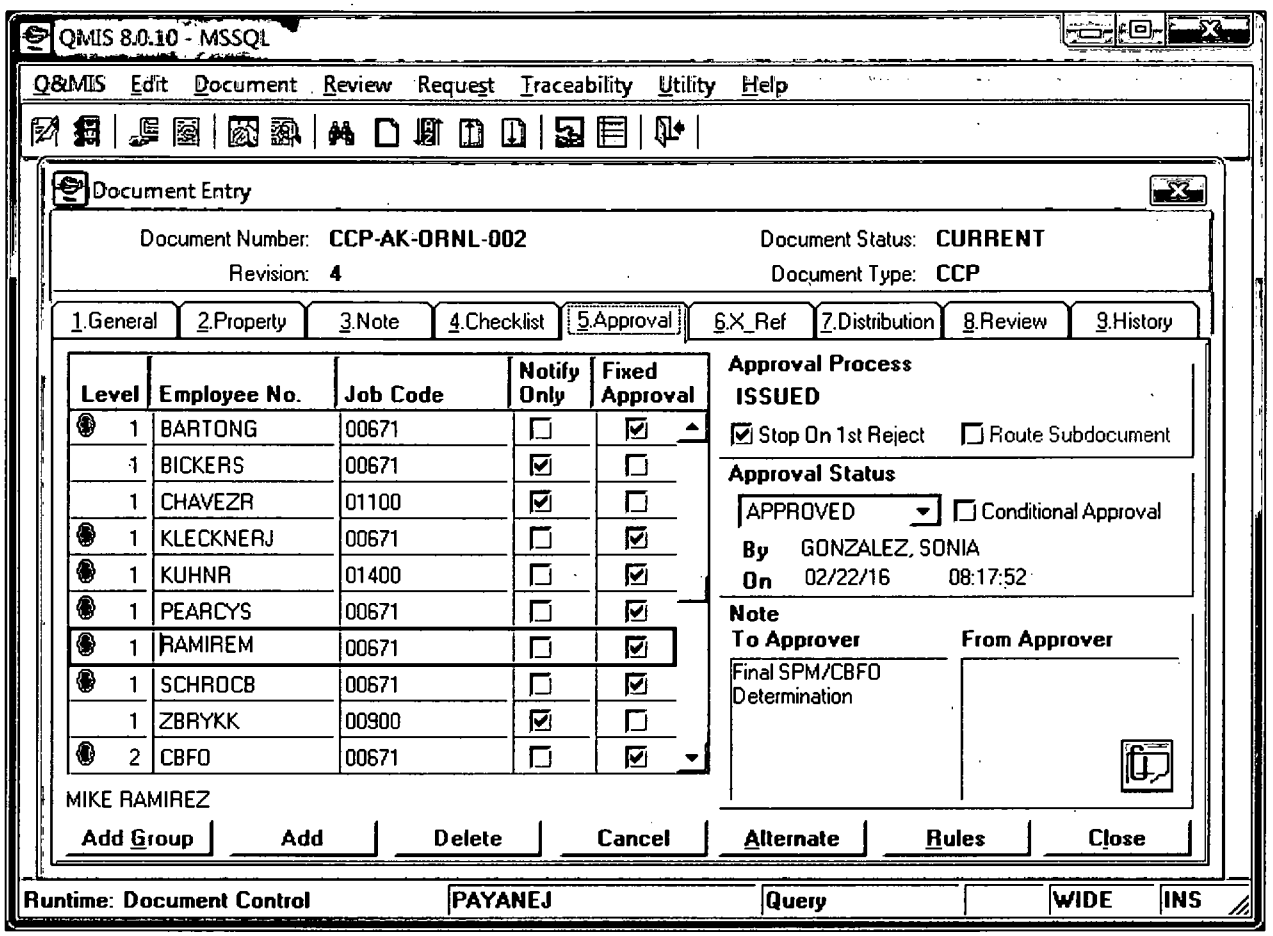
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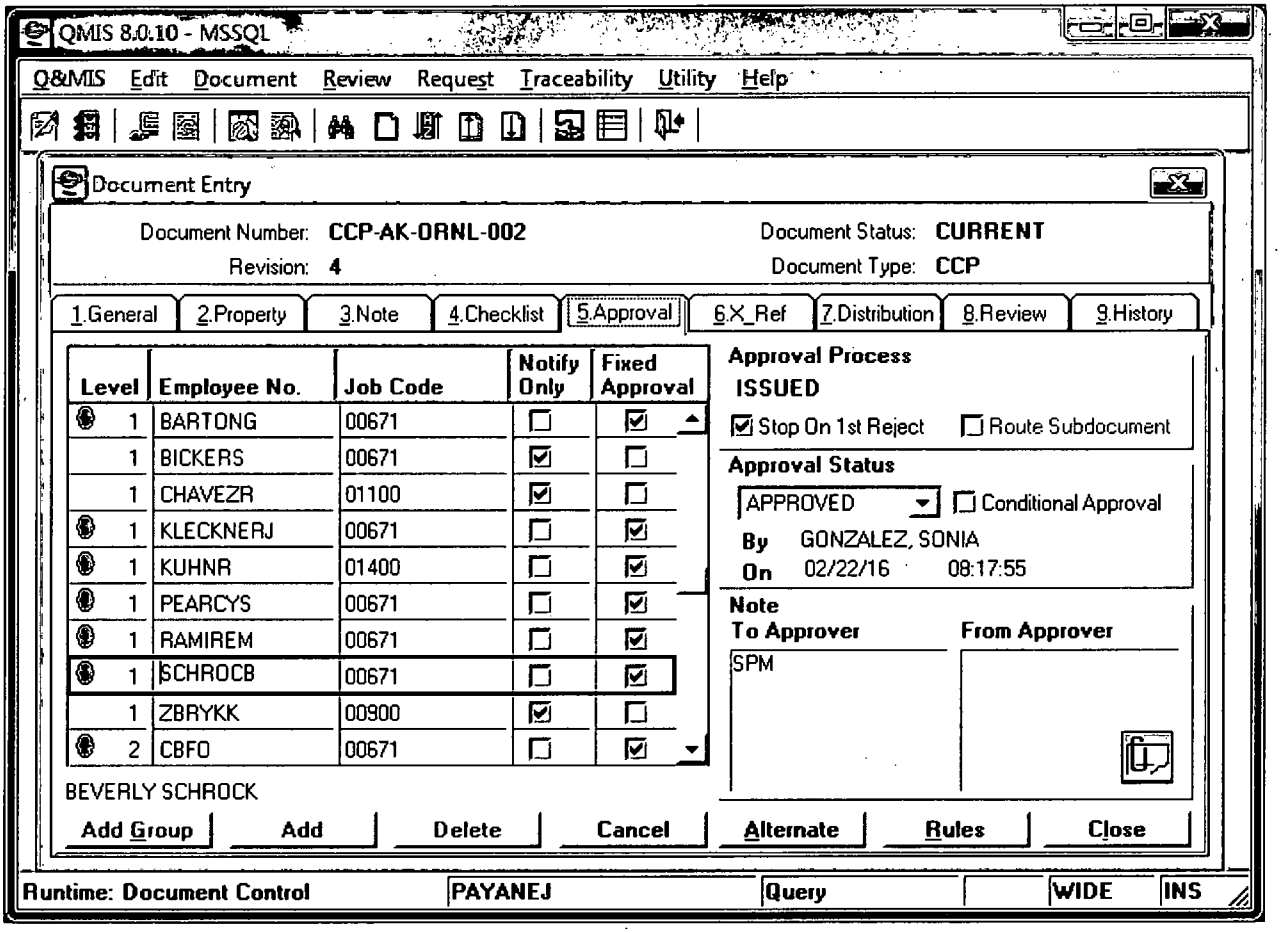
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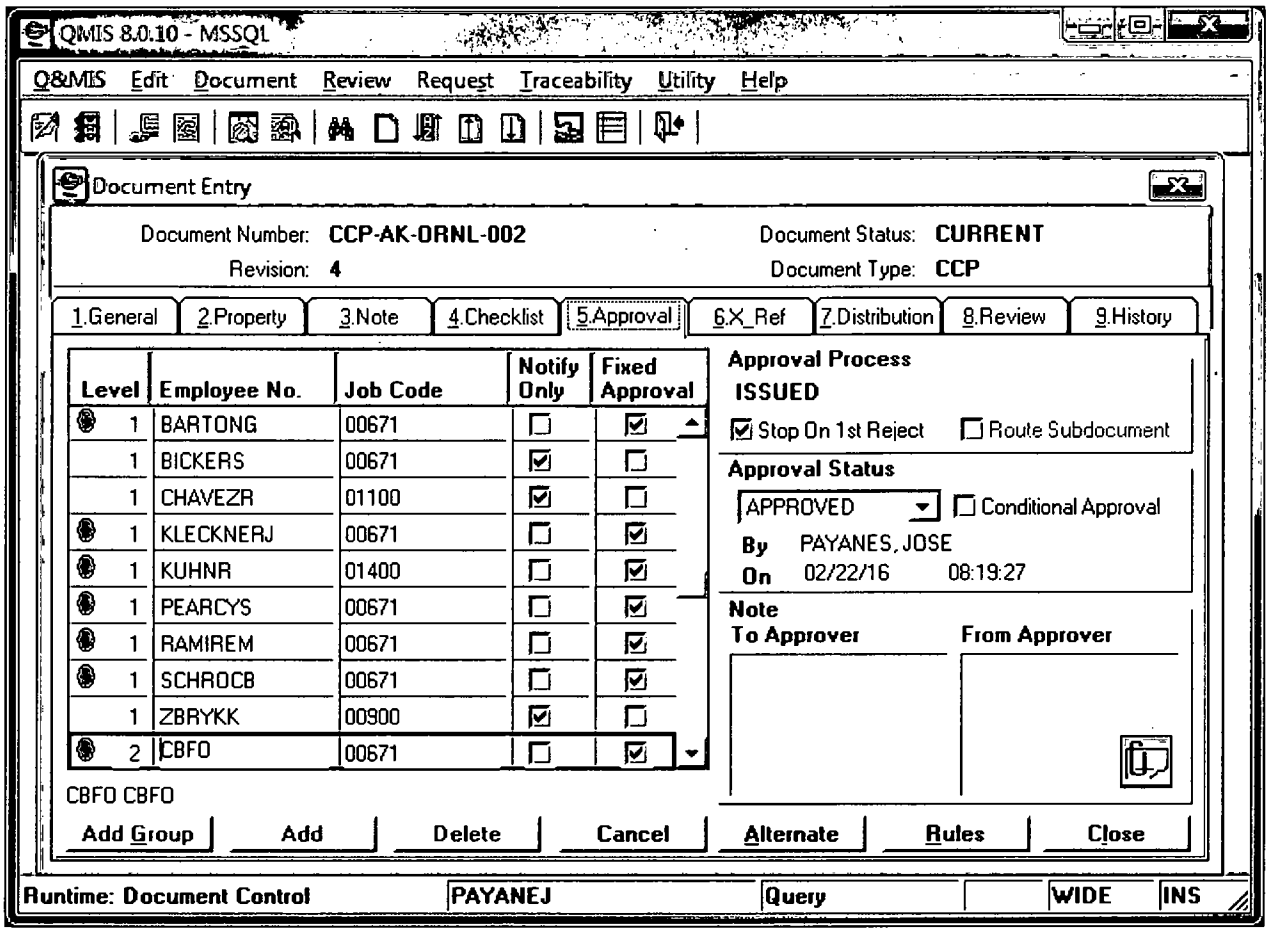
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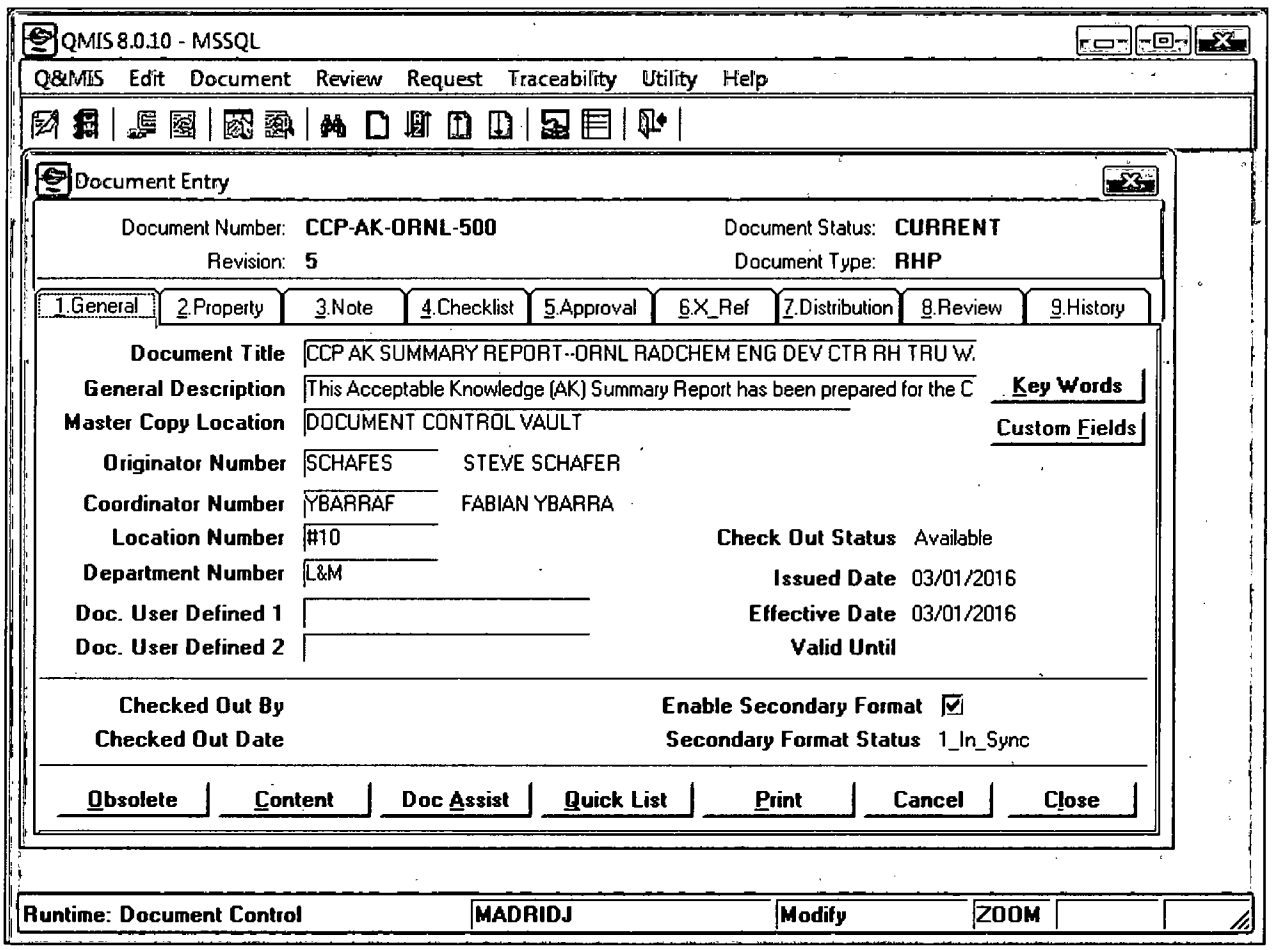
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STEVE SCHAFER
Coordinator Number
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Location Number
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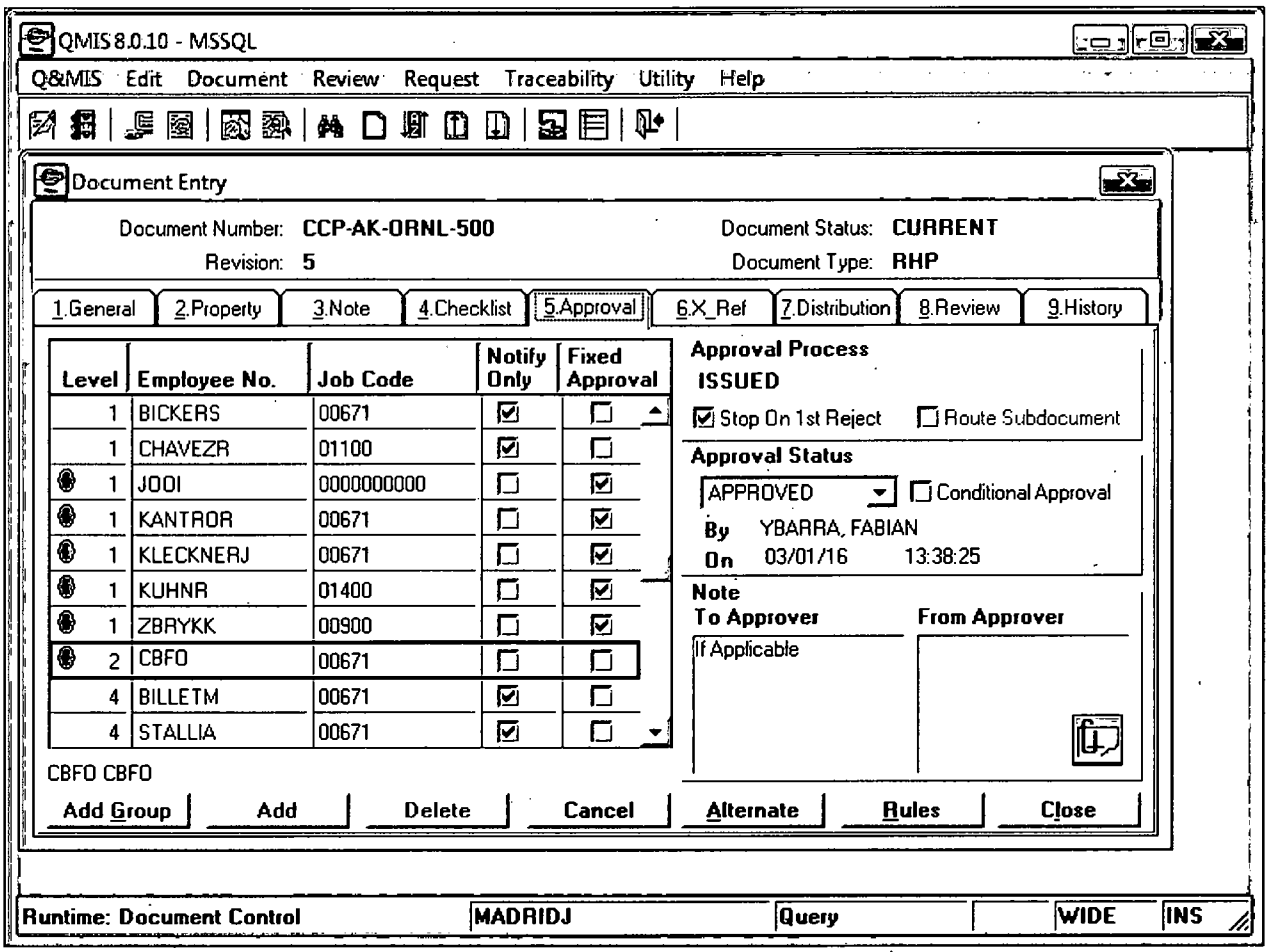
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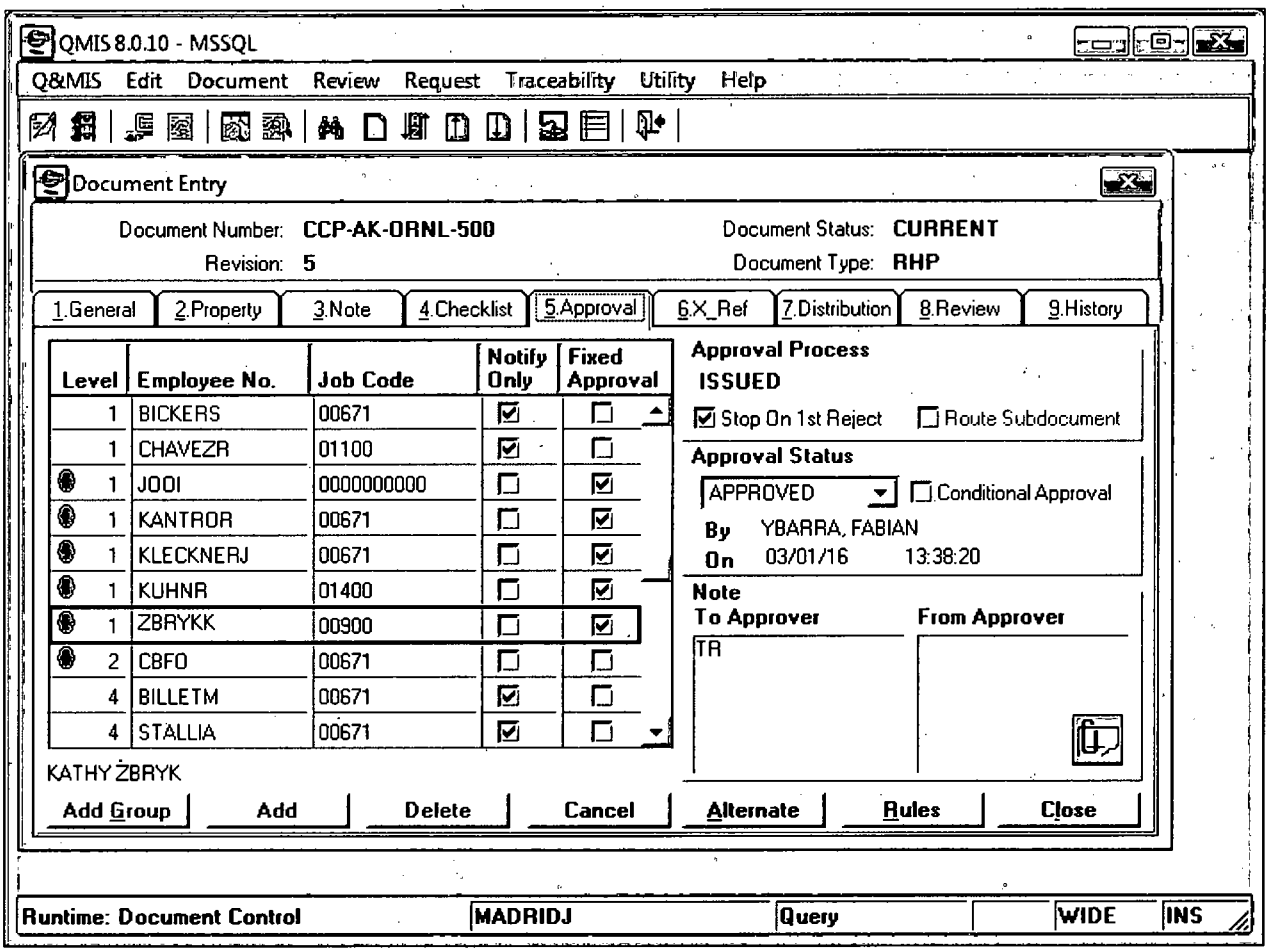
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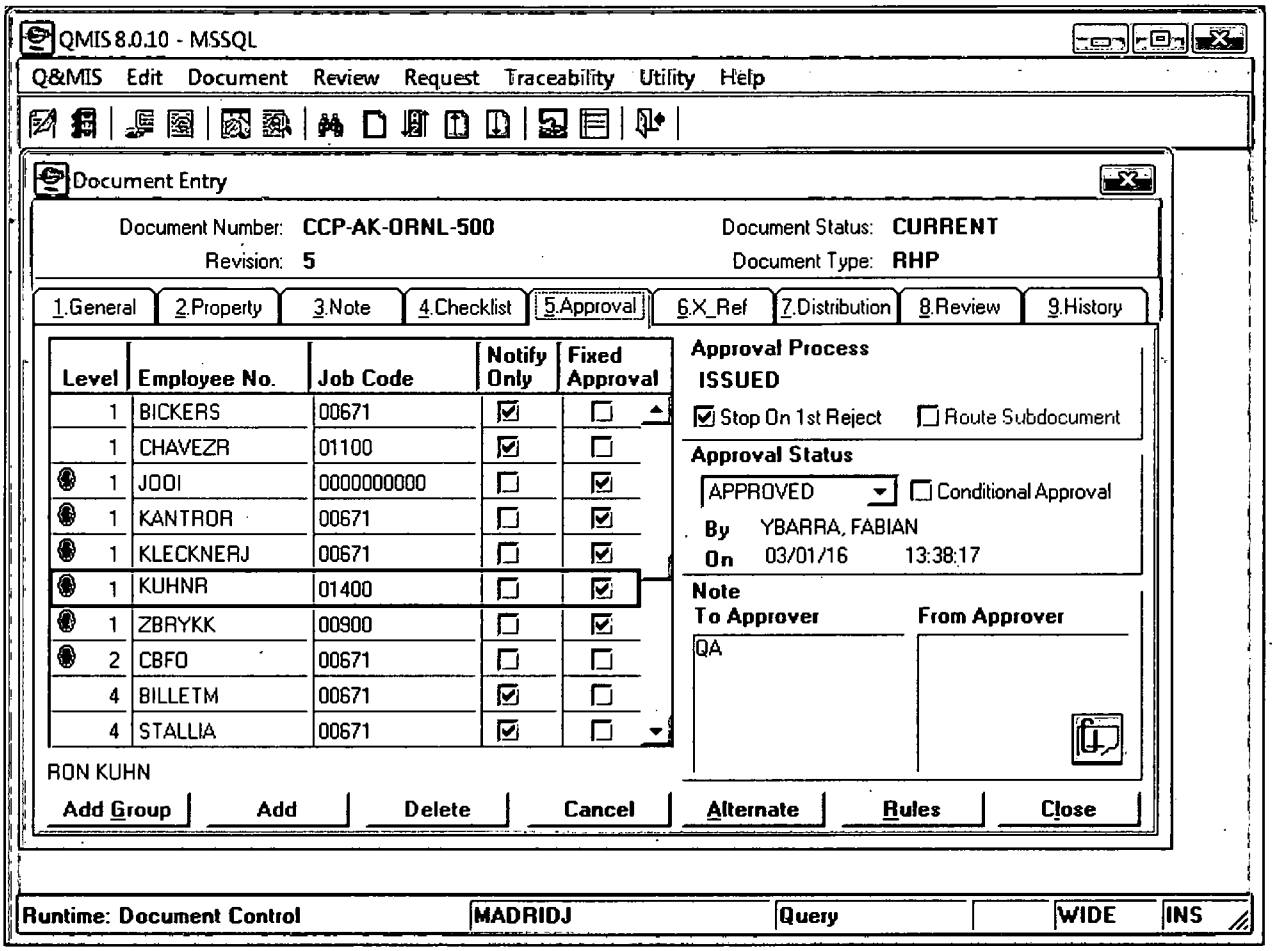
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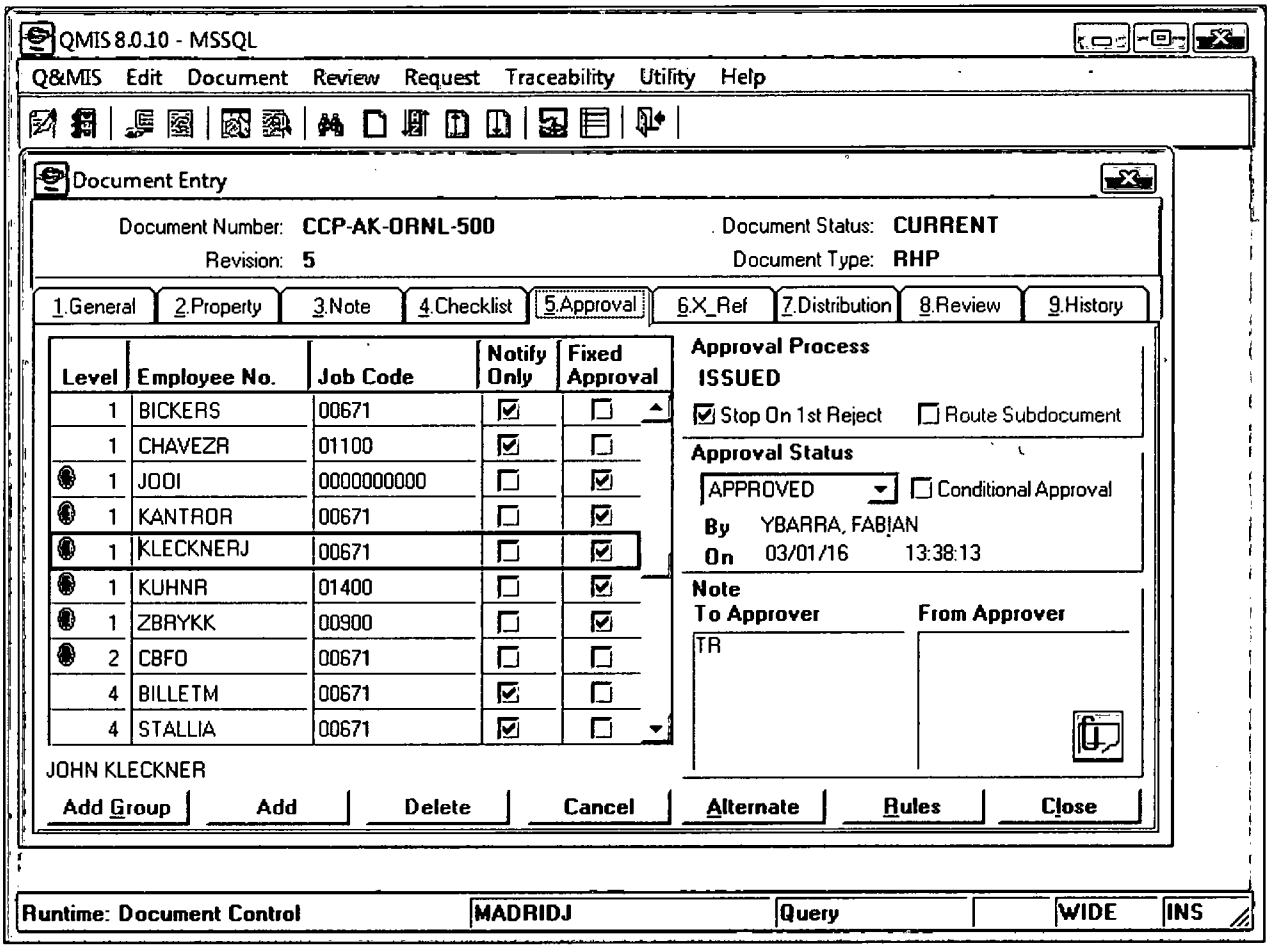
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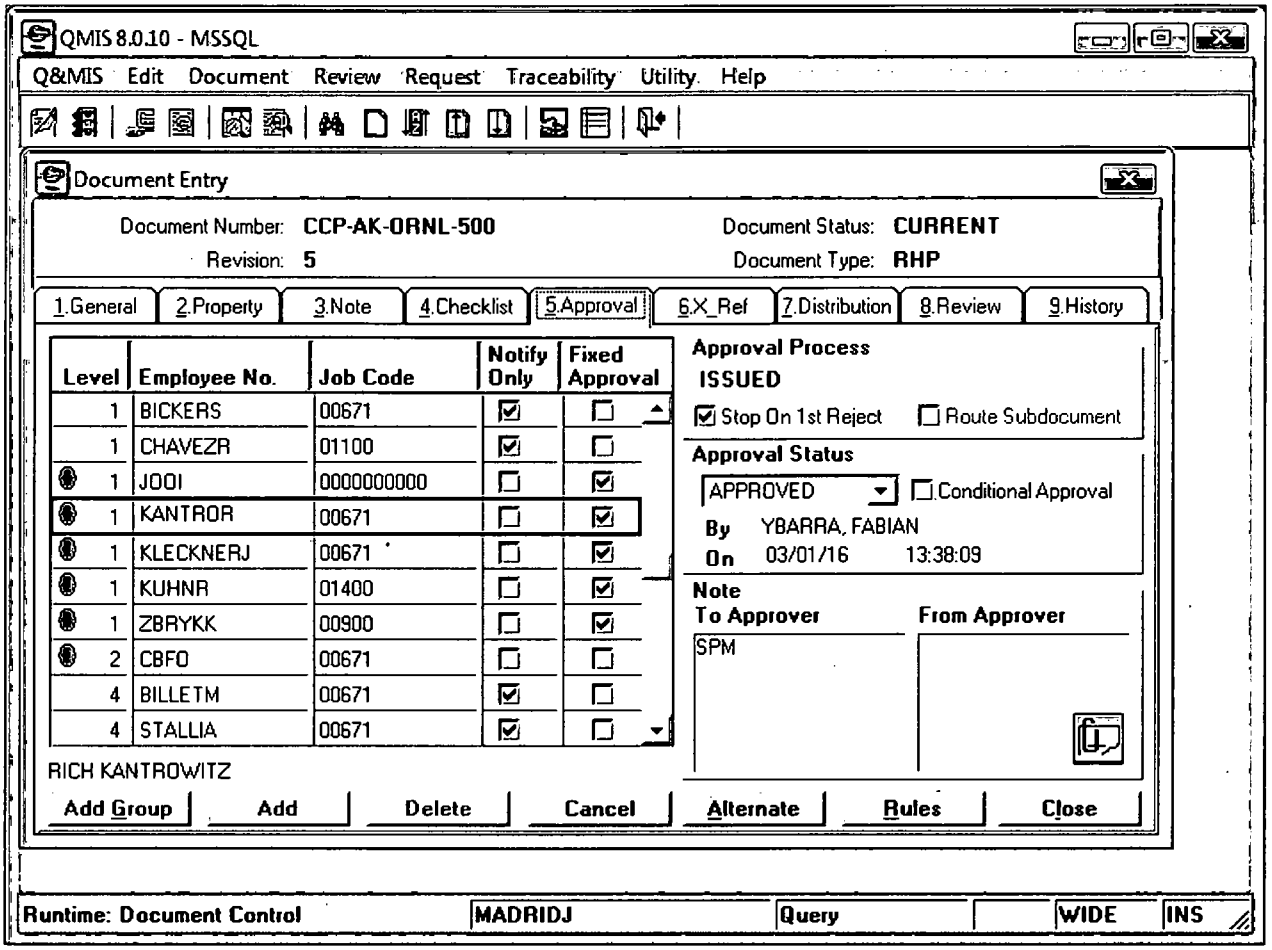
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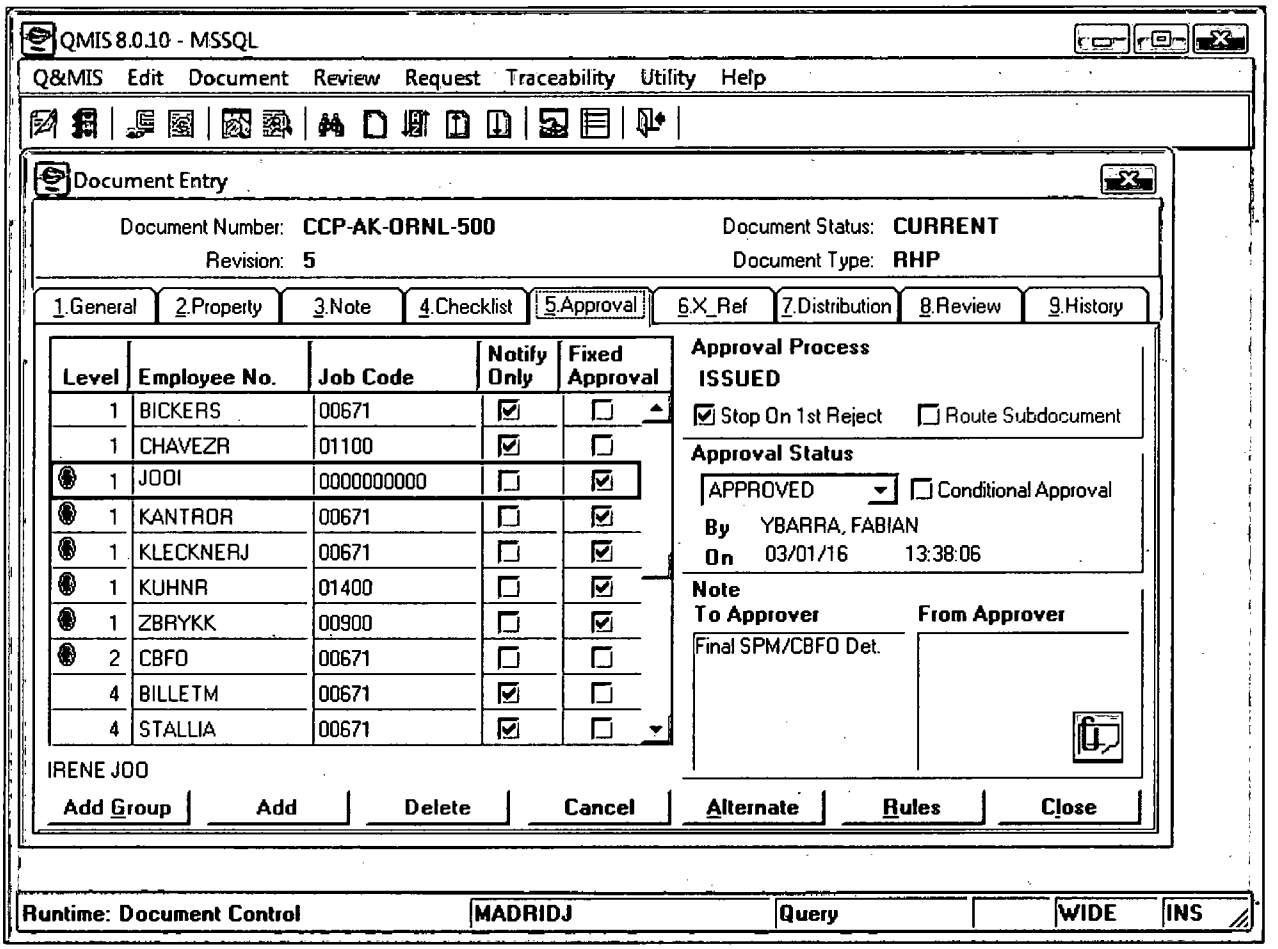
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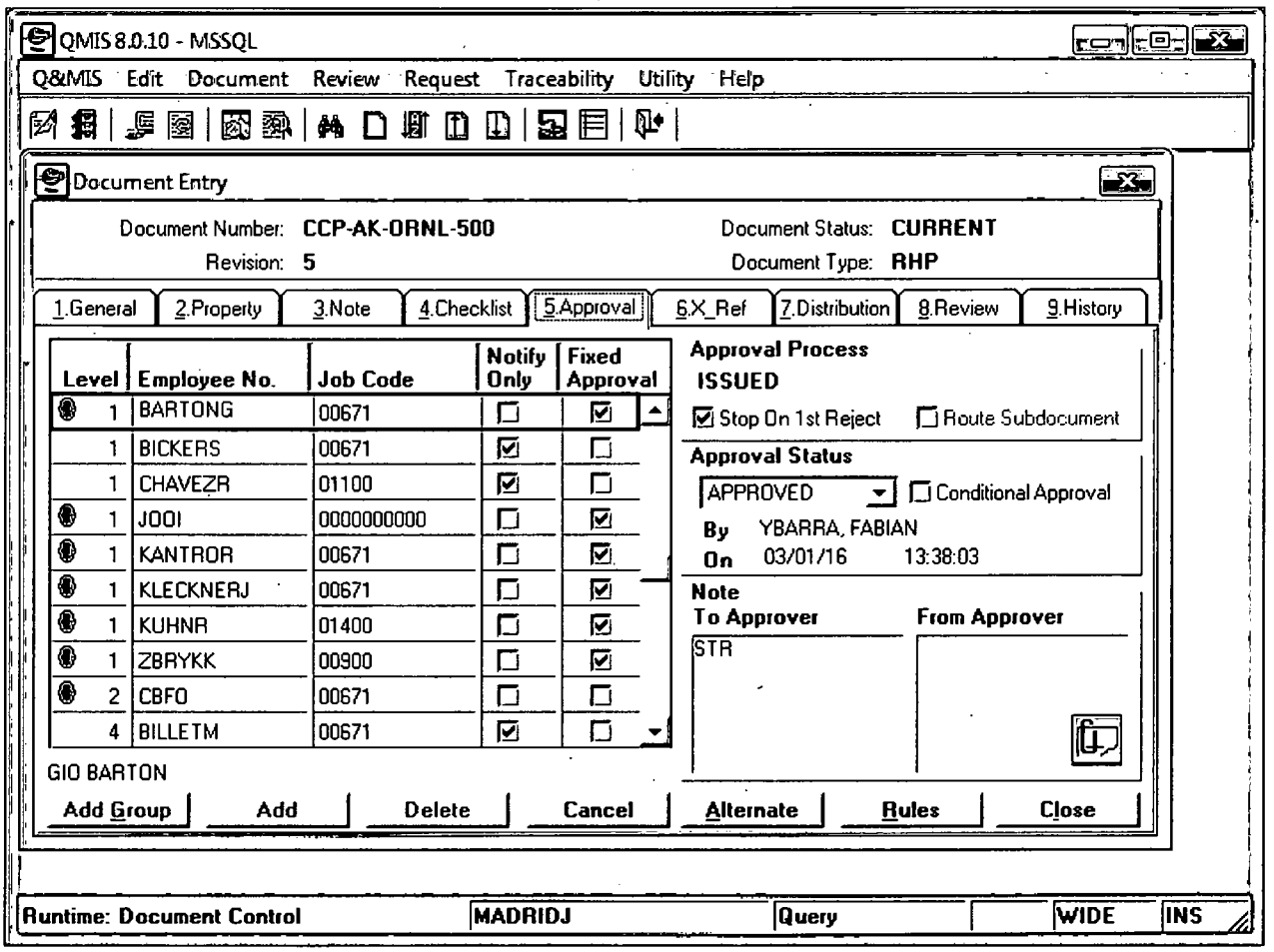
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Attachment 2 – CCP Waste Stream Profile Form

(1) Waste Stream Profile Number: OR-NFS-CH-SOIL, Revision 1							
(2) Generator site name: Oak Ridge National Laboratory						(3) Generator site EPA ID: TN1890090003	
(4) Technical contact: Beverly Schrock						(5) Technical contact phone number: 575-234-7444	
(6) Date of audit report approval by New Mexico Environment Department (NMED): March 10, 2014							
(7) Title, version number, and date of documents used for WIPP-WAP Certification: CCP-PO-001, CCP Transuranic Waste Characterization Quality Assurance Project Plan, Revision 21, May 31, 2013; CCP-PO-002, CCP Transuranic Waste Certification Plan, Revision 27, May 31, 2013; CCP-PO-024, CCP/INL Interface Document, Revision 15, March 30, 2015							
(8) Did your facility generate this waste?	YES		NO	X			
(9) If no, provide the name and EPA ID of the original generator: Nuclear Fuel Services, Inc. TND003095635							
Waste Stream Information							
(10) WIPP ID: OR-NFS-CH-SOIL						(11) Summary Category Group: S4000	
(12) Waste Matrix Code Group: Soils						(13) Waste Stream Name: Soil from Nuclear Fuel Services, Inc.	
(14) Description from the ATWIR: Waste consists of soils from NFS.							
(15) Defense TRU Waste:	YES	X	NO				
(16) Check One:	CH	X	RH				
(17) Number of SWBs: NA (17a) Number of SLB2: NA	(18) Number of Drums: 4,845 55-gallon drums					(19) Number of Canisters NA	
(20) Batch Data Report numbers supporting this waste stream characterization: See Characterization Information Summary (CIS) Correlation of Container Identification Numbers.							
(21) List applicable EPA Hazardous Waste Numbers: F002							
(22) Applicable TRUCON Content Numbers: OR111 / OR211, OR127 / OR227							
(23)**Acceptable Knowledge Information**							
(For the following, enter the supporting documentation used [i.e., references and dates])							
Required Program Information							
(23A) Map of site: CCP-AK-ORNL-001, Revision 10, March 31, 2014, Figures 1, 2, 6 and 7							
(23B) Facility mission description: CCP-AK-ORNL-001, Revision 10, March 31, 2014, Section 4.2							
(23C) Description of operations that generate waste: CCP-AK-ORNL-001, Revision 10, March 31, 2014, Section 4.4							
(23D) Waste identification/categorization schemes: CCP-AK-ORNL-001, Revision 10, March 31, 2014, Section 4.5							
(23E) Types and quantities of waste generated: CCP-AK-ORNL-001, Revision 10, March 31, 2014, Section 4.6.1							
(23F) Correlation of waste streams generated from the same building and process, as applicable: CCP-AK-ORNL-001, Revision 10, March 31, 2014, Section 4.6.2							
(24) Waste certification procedures: CCP-TP-030, Revision 34, February 2, 2015							
(25) Required Waste Stream Information							
(25A) Area(s) and building(s) from which the waste stream was generated: CCP-AK-ORNL-001, Revision 10, March 31, 2014, Section 6.1							
(25B) Waste stream volume and time period of generation: CCP-AK-ORNL-001, Revision 10, March 31, 2014, Section 6.2							
(25C) Waste generating process description for each building: CCP-AK-ORNL-001, Revision 10, March 31, 2014, Section 6.3							
(25D) Waste Process flow diagrams: CCP-AK-ORNL-001, Revision 10, March 31, 2014, Figure 9							

(25E) Material inputs or other information identifying chemical/radionuclide content and physical waste form: CCP-AK-ORNL-001, Revision 10, March 31, 2014, Section 6.4			
(25F) Waste Material Parameter Weight Estimates per unit of waste: See Table entitled "Waste Stream OR-NFS-CH-SOIL Waste Material Parameters" in Summation of Aspects of AK Summary Report: OR-NFS-CH-SOIL.			
(26) Which Defense Activity generated the waste:			
	Weapons activities including defense inertial confinement fusion		Naval reactors development
	Verification and control technology		Defense research and development
	Defense nuclear waste and materials by-products management	X	Defense nuclear materials production
	Defense nuclear materials security and safeguards and security investigations		
(27) Supplemental Documentation:			
(27A) Process design documents: NA			
(27B) Standard operating procedures: See C119, C120, C121, C122, C125, C126, C127, C129, C130, I056, I058, I059, I061, I067, I068, M210, P1370, P1371, P1372, P1400, P1401, P1403, P1407, P251, P252, P253, P254, P267, P273, P300, P303, P304, P306, P315, P582 and U044 in Summation of Aspects of AK Summary Report: OR-NFS-CH-SOIL, AK Source Documents			
(27C) Safety Analysis Reports: See P256 and P432 in Summation of Aspects of AK Summary Report: OR-NFS-CH-SOIL, AK Source Documents			
(27D) Waste packaging logs: See M003 and M052 in Summation of Aspects of AK Summary Report: OR-NFS-CH-SOIL, AK Source Documents			
(27E) Test plans/research project reports: See P1372, P1404 and P212 in Summation of Aspects of AK Summary Report: OR-NFS-CH-SOIL, AK Source Documents			
(27F) Site databases: See M012, M198 and M217 in Summation of Aspects of AK Summary Report: OR-NFS-CH-SOIL, AK Source Documents			
(27G) Information from site personnel: See C100, C206, C210, C227, C230, C309 and C321 in Summation of Aspects of AK Summary Report: OR-NFS-CH-SOIL, AK Source Documents			
(27H) Standard industry documents: See C146, C147, M011 and M210 in Summation of Aspects of AK Summary Report: OR-NFS-CH-SOIL, AK Source Documents			
(27I) Previous analytical data: See C122, C205, I052, I053, M017, M019, M020, M061, M062, M063, M064, M065, M068, M211, P1374, P1375, P1402, P1404, U043, U044 and U597 in Summation of Aspects of AK Summary Report: OR-NFS-CH-SOIL, AK Source Documents			
(27J) Material safety data sheets: See C200, C201, M011 and M210 in Summation of Aspects of AK Summary Report: OR-NFS-CH-SOIL, AK Source Documents			
(27K) Sampling and analysis data from comparable/surrogate Waste: See I052 and P1402 in Summation of Aspects of AK Summary Report: OR-NFS-CH-SOIL, AK Source Documents			
(27L) Laboratory notebooks: See M052 and U016 in Summation of Aspects of AK Summary Report: OR-NFS-CH-SOIL, AK Source Documents			
Confirmation Information			
For the following, when applicable, enter procedure title(s), number(s) and date(s)			
(28)	Radiography: CCP Standard Real-Time Radiography (RTR) Inspection Procedure, CCP-TP-053, Revision 15, September 11, 2014		
	Visual Examination: NA		

(29) Comments: For a list of the waste characterization procedures used and date of respective procedures see the list of procedures on the attached CIS.

This WSPF is being revised to add TRUCON Content Number OR127/OR227 since Inorganic Matrix is being added to the waste material parameters. The Organic Matrix waste material parameter range was increased to 15% based on the amount of organic polymer absorbent expected in soil from the final phase of decommissioning. OR111/OR211 is a Waste Type I which only allows up to 5 wt% organic/hydrogenous material in a payload container. OR127/OR227 is a Waste Type III which allows for more than 5 wt% organic/hydrogenous material in a payload container.

No additional hazardous waste numbers were added.

Reviewed by AK Expert: YES [X] **Date:** 8/5/2015

Reviewed by STR (if necessary): YES [X] N/A [ ] **Date:** 8/28/2015

Waste Stream Profile Form Certification:

I hereby certify that I have reviewed the information in this Waste Stream Profile Form, and it is complete and accurate to the best of my knowledge. I understand that this information will be made available to regulatory agencies and that there are significant penalties for submitting false information, including the possibility of fines and imprisonment for knowing violations.

BSSchrock	Beverly Schrock	8/31/2015
Signature of Site Project Manager	Printed Name	Date

CHARACTERIZATION INFORMATION SUMMARY

WSPF# OR-NFS-CH-SOIL Rev. 1

Lot 13

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CCP Characterization Information Summary Cover Page

Waste Stream # OR-NFS-CH-SOIL Lot #: 13

AK Expert Review: N/A Date: N/A

SPM Review: Roger Whiteaker Roger Whiteaker Date: 08/04/2015

SPM signature certifies that through Acceptable Knowledge testing and/or analysis that the waste identified in this summary is not corrosive, ignitable, reactive, or incompatible with the TSDF.

A summary of the Acceptable Knowledge regarding this waste stream containing specific information about the corrosivity, reactivity, and ignitability of the waste stream is included as an attachment to the Waste Stream Profile Form. By reference, that information is included in this lot.

List of procedures used:

Non Destructive Assay (NDA):

CCP-TP-048	Rev. 16	11/01/2013 Mobile IQ3 System Data Reviewing, Validating, and Reporting Procedure
CCP-TP-048	Rev. 15	03/24/2011 Mobile IQ3 System Data Reviewing, Validating, and Reporting Procedure
CCP-TP-048	Rev. 14	03/08/2010 Mobile IQ3 System Data Reviewing, Validating, and Reporting Procedure
CCP-TP-048	Rev. 13	10/12/2009 Mobile IQ3 System Data Reviewing, Validating, and Reporting Procedure
CCP-TP-048	Rev. 12	09/09/2009 Mobile IQ3 System Data Reviewing, Validating, and Reporting Procedure
CCP-TP-048	Rev. 11	02/19/2008 Mobile IQ3 System Data Reviewing, Validating, and Reporting Procedure
CCP-TP-048	Rev. 10	11/16/2006 Mobile IQ3 System Data Reviewing, Validating, and Reporting Procedure
CCP-TP-048	Rev. 9	11/03/2005 Mobile IQ3 System Data Reviewing, Validating, and Reporting Procedure
CCP-TP-048	Rev. 8	09/21/2005 Mobile IQ3 System Data Reviewing, Validating, and Reporting Procedure
CCP-TP-048	Rev. 7	03/14/2005 Mobile IQ3 System Data Reviewing, Validating, and Reporting Procedure
CCP-TP-048	Rev. 6	10/18/2004 Mobile IQ3 System Data Reviewing, Validating, and Reporting Procedure
CCP-TP-048	Rev. 5	06/08/2004 Mobile IQ3 System Data Reviewing, Validating, and Reporting Procedure
CCP-TP-048	Rev. 4	12/04/2003 Mobile IQ3 System Data Reviewing, Validating, and Reporting Procedure
CCP-TP-048	Rev. 3	09/03/2003 Mobile IQ3 System Data Reviewing, Validating, and Reporting Procedure
CCP-TP-048	Rev. 2	04/25/2003 Mobile IQ3 System Data Reviewing, Validating, and Reporting Procedure
CCP-TP-048	Rev. 1	03/21/2003 Mobile IQ3 System Data Reviewing, Validating, and Reporting Procedure
CCP-TP-048	Rev. 0	02/05/2003 Mobile IQ3 System Data Reviewing, Validating, and Reporting Procedure

Project Level Data Validation / DQO Reconciliation:

CCP-TP-001	Rev. 21	08/06/2013 CCP Project Level Data Validation and Verification
CCP-TP-001	Rev. 20	09/27/2012 CCP Project Level Data Validation and Verification
CCP-TP-001	Rev. 19	12/29/2010 CCP Project Level Data Validation and Verification
CCP-TP-001	Rev. 18	08/09/2010 CCP Project Level Data Validation and Verification
CCP-TP-001	Rev. 17	09/24/2007 CCP Project Level Data Validation and Verification
CCP-TP-001	Rev. 16	04/26/2007 CCP Project Level Data Validation and Verification
CCP-TP-001	Rev. 15	11/22/2006 CCP Project Level Data Validation and Verification
CCP-TP-001	Rev. 14	11/16/2006 CCP Project Level Data Validation and Verification
CCP-TP-001	Rev. 13	07/21/2006 CCP Project Level Data Validation and Verification
CCP-TP-001	Rev. 12	05/25/2006 CCP Project Level Data Validation and Verification
CCP-TP-001	Rev. 11	03/23/2005 CCP Project Level Data Validation and Verification

CCP-TP-002	Rev. 26	06/19/2013 CCP Reconciliation of DQOs and Reporting Characterization Data
CCP-TP-002	Rev. 25	02/11/2013 CCP Reconciliation of DQOs and Reporting Characterization Data
CCP-TP-002	Rev. 24	12/28/2011 CCP Reconciliation of DQOs and Reporting Characterization Data
CCP-TP-002	Rev. 23	12/29/2010 CCP Reconciliation of DQOs and Reporting Characterization Data
CCP-TP-002	Rev. 22	08/30/2010 CCP Reconciliation of DQOs and Reporting Characterization Data
CCP-TP-002	Rev. 21	08/04/2009 CCP Reconciliation of DQOs and Reporting Characterization Data
CCP-TP-002	Rev. 20	08/18/2008 CCP Reconciliation of DQOs and Reporting Characterization Data
CCP-TP-002	Rev. 19	12/22/2008 CCP Reconciliation of DQOs and Reporting Characterization Data
CCP-TP-002	Rev. 18	11/16/2008 CCP Reconciliation of DQOs and Reporting Characterization Data
CCP-TP-002	Rev. 17	10/10/2006 CCP Reconciliation of DQOs and Reporting Characterization Data
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CCP-TP-005	Rev. 26	08/12/2013 CCP Acceptable Knowledge Documentation
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CCP-TP-005	Rev. 15	03/31/2005 CCP Acceptable Knowledge Documentation

CCP-TP-030	Rev. 34	02/02/2015 CCP CH TRU Waste Certification and WWIS/WDS Data Entry
CCP-TP-030	Rev. 33	11/19/2013 CCP CH TRU Waste Certification and WWIS/WDS Data Entry
CCP-TP-030	Rev. 32	06/20/2013 CCP CH TRU Waste Certification and WWIS/WDS Data Entry
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CCP-TP-030	Rev. 29	04/26/2011 CCP CH TRU Waste Certification and WWIS/WDS Data Entry
CCP-TP-030	Rev. 28	05/12/2010 CCP CH TRU Waste Certification and WWIS/WDS Data Entry
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CCP-TP-030	Rev. 23	03/12/2008 CCP CH TRU Waste Certification and WWIS Data Entry
CCP-TP-030	Rev. 22	07/24/2007 CCP CH TRU Waste Certification and WWIS Data Entry
CCP-TP-030	Rev. 21	05/21/2007 CCP CH TRU Waste Certification and WWIS Data Entry
CCP-TP-030	Rev. 20	02/07/2007 CCP CH TRU Waste Certification and WWIS Data Entry
CCP-TP-030	Rev. 19	11/16/2006 CCP CH TRU Waste Certification and WWIS Data Entry
CCP-TP-030	Rev. 18	05/01/2006 CCP TRU Waste Certification and WWIS Data Entry
CCP-TP-030	Rev. 17	12/29/2005 CCP TRU Waste Certification and WWIS Data Entry
CCP-TP-030	Rev. 16	04/22/2005 CCP TRU Waste Certification and WWIS Data Entry

Radiography (RTR/NDE):

CCP-TP-053	Rev. 15	09/11/2014 CCP Standard Real-Time Radiography (RTR) Inspection Procedure
CCP-TP-053	Rev. 14	09/25/2013 CCP Standard Real-Time Radiography (RTR) Inspection Procedure
CCP-TP-053	Rev. 13	05/14/2013 CCP Standard Real-Time Radiography (RTR) Inspection Procedure
CCP-TP-053	Rev. 12	08/22/2012 CCP Standard Real-Time Radiography (RTR) Inspection Procedure
CCP-TP-053	Rev. 11	07/20/2011 CCP Standard Real-Time Radiography (RTR) Inspection Procedure
CCP-TP-053	Rev. 10	03/04/2011 CCP Standard Real-Time Radiography (RTR) Inspection Procedure
CCP-TP-053	Rev. 9	09/30/2010 CCP Standard Real-Time Radiography (RTR) Inspection Procedure
CCP-TP-053	Rev. 8	06/30/2010 CCP Standard Real-Time Radiography (RTR) Inspection Procedure
CCP-TP-053	Rev. 7	10/21/2009 CCP Standard Real-Time Radiography (RTR) Inspection Procedure
CCP-TP-053	Rev. 6	03/04/2008 CCP Standard Real-Time Radiography (RTR) Inspection Procedure
CCP-TP-053	Rev. 5	11/16/2006 CCP Standard Real-Time Radiography (RTR) Inspection Procedure
CCP-TP-053	Rev. 4	12/22/2005 CCP Standard Real-Time Radiography (RTR) Inspection Procedure
CCP-TP-053	Rev. 3	03/21/2005 CCP Standard Real-Time Radiography (RTR) Inspection Procedure
CCP-TP-053	Rev. 2	07/14/2004 CCP Standard Real-Time Radiography (RTR) Inspection Procedure

WAP Certification:

CCP-PO-001	Rev. 21	05/31/2013 CCP Transuranic Waste Characterization Quality Assurance Project Plan
CCP-PO-001	Rev. 20	06/16/2011 CCP Transuranic Waste Characterization Quality Assurance Project Plan
CCP-PO-001	Rev. 19	12/29/2010 CCP Transuranic Waste Characterization Quality Assurance Project Plan
CCP-PO-001	Rev. 18	06/30/2010 CCP Transuranic Waste Characterization Quality Assurance Project Plan
CCP-PO-001	Rev. 17	06/23/2009 CCP Transuranic Waste Characterization Quality Assurance Project Plan
CCP-PO-001	Rev. 16	10/31/2007 CCP Transuranic Waste Characterization Quality Assurance Project Plan
CCP-PO-001	Rev. 15	08/10/2007 CCP Transuranic Waste Characterization Quality Assurance Project Plan
CCP-PO-001	Rev. 14	03/28/2007 CCP Transuranic Waste Characterization Quality Assurance Project Plan
CCP-PO-001	Rev. 13	11/16/2006 CCP Transuranic Waste Characterization Quality Assurance Project Plan
CCP-PO-001	Rev. 12	03/22/2006 CCP Transuranic Waste Characterization Quality Assurance Project Plan
CCP-PO-001	Rev. 11	03/10/2005 CCP Transuranic Waste Characterization Quality Assurance Project Plan

CCP-PO-002	Rev. 27	05/31/2013 CCP Transuranic Waste Certification Plan
CCP-PO-002	Rev. 26	07/14/2011 CCP Transuranic Waste Certification Plan
CCP-PO-002	Rev. 25	12/29/2010 CCP Transuranic Waste Certification Plan
CCP-PO-002	Rev. 24	06/30/2010 CCP Transuranic Waste Certification Plan
CCP-PO-002	Rev. 23	04/07/2010 CCP Transuranic Waste Certification Plan
CCP-PO-002	Rev. 22	01/12/2010 CCP Transuranic Waste Certification Plan
CCP-PO-002	Rev. 21	01/26/2009 CCP Transuranic Waste Certification Plan
CCP-PO-002	Rev. 20	11/02/2007 CCP Transuranic Waste Certification Plan
CCP-PO-002	Rev. 19	05/22/2007 CCP Transuranic Waste Certification Plan
CCP-PO-002	Rev. 18	11/16/2006 CCP Transuranic Waste Certification Plan
CCP-PO-002	Rev. 17	11/16/2006 CCP Transuranic Waste Certification Plan
CCP-PO-002	Rev. 16	11/16/2006 CCP Transuranic Waste Certification Plan
CCP-PO-002	Rev. 15	03/22/2006 CCP Transuranic Waste Certification Plan
CCP-PO-002	Rev. 14	12/29/2005 CCP Transuranic Waste Certification Plan
CCP-PO-002	Rev. 13	05/09/2005 CCP Transuranic Waste Certification Plan

CCP-PO-003	Rev. 13	07/31/2013 Transuranic Authorized Methods for Payload Control (CCP CH-TRAMPC)
CCP-PO-003	Rev. 12	12/29/2010 Transuranic Authorized Methods for Payload Control (CCP CH-TRAMPC)
CCP-PO-003	Rev. 11	06/04/2009 Transuranic Authorized Methods for Payload Control (CCP CH-TRAMPC)
CCP-PO-003	Rev. 10	11/16/2006 Transuranic Authorized Methods for Payload Control (CCP CH-TRAMPC)
CCP-PO-003	Rev. 9	12/29/2005 Transuranic Authorized Methods for Payload Control (CCP CH-TRAMPC)
CCP-PO-003	Rev. 8	01/25/2005 Transuranic Authorized Methods for Payload Control (CCP CH-TRAMPC)
CCP-PO-003	Rev. 7	11/22/2004 Transuranic Authorized Methods for Payload Control (CCP CH-TRAMPC)
CCP-PO-003	Rev. 6	06/08/2004 Transuranic Authorized Methods for Payload Control (CCP CH-TRAMPC)
CCP-PO-003	Rev. 5	09/19/2003 Transuranic Authorized Methods for Payload Control (CCP CH-TRAMPC)
CCP-PO-003	Rev. 4	02/11/2003 Transuranic Authorized Methods for Payload Control (CCP CH-TRAMPC)
CCP-PO-003	Rev. 3	05/31/2002 Transuranic Authorized Methods for Payload Control (CCP CH-TRAMPC)

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CCP Correlation of Container Identification Numbers to Batch Data Report Numbers

Waste Stream: # OR-NFS-CH-SOIL Lot # 13

Container ID Number	Historical Container ID	NDA BDR	RTR BDR	VE BDR	Load/Manage Overpack Yes	Transportation Headspace Gas	
						FGA	GGT
X10C1351504	N/A	OR-IQ3-0451	OR-RTR6-0623	N/A	No	OR15FG8017	N/A
X10C1351505	N/A	OR-IQ3-0450	OR-RTR6-0623	N/A	No	OR15FG8017	N/A
X10C1351507	N/A	OR-IQ3-0451	OR-RTR6-0623	N/A	No	OR15FG8017	N/A
X10C1351508	N/A	OR-IQ3-0451	OR-RTR6-0623	N/A	No	OR15FG8017	N/A
X10C1351509	N/A	OR-IQ3-0450	OR-RTR6-0623	N/A	No	OR15FG8017	N/A

Roger Whiteaker — Signature of Site Project Manager
Roger Whiteaker — Printed Name
08/04/2015 — Date

CCP RTR/VE Summary of Prohibited Items and AK Confirmation

Waste Stream Number: OR-NFS-CH-SOIL Lot #: 13

Container Number	RTR Prohibited Items [a,b]	Visual Examination Prohibited Items [a,b]	Does the Physical Form of the Waste Match the Waste Stream Description as Determined by AK
See correlation of container ID numbers for list of remaining drum numbers in this Lot.	None of the containers in this lot had prohibited items identified during RTR.	VE was not used to certify any containers in this Lot.	The physical form of the waste matches the waste stream description as determined by AK.
a. See Batch Data Reports			
b. If AK has assigned U134 to this waste stream, then any liquids in these containers are prohibited items (not acceptable by the TSDF).			
Justification for the selection of RTR and/or VE: RTR was selected as the characterization method for this lot because the waste was previously packaged and RTR meets all the Data Quality Objectives for NDE for the waste.			

Site Project Manager Signature | Roger Whiteaker Printed Name | 08/04/2015 Date

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CCP Reconciliation with Data Quality Objectives

WSPF# OR-NFS-CH-SOIL Rev. 1 Lot # 13

Sampling Completeness

RTR/VE:

Number of Valid Samples: 5 Number of Total Samples Analyzed: 5

Percent Complete: 100 (QAO is 100%)

Radiological:

Number of Valid Samples: 5 Number of Total Samples Analyzed: 5

Percent Complete: 100 (QAO is 100%)

	Y/N/NA	Reconciliation Parameter
1	Y	Waste Matrix Code.
2	Y	Waste Material Parameter Weights.
3	Y	The TRU activity reported in the BDRs for each container demonstrates with a 95% probability that the container of waste contains TRU radioactive waste.
4	N	AK Sufficiency. Is there an approved AK sufficiency Determination for this waste stream?
5	N	The data demonstrates whether the waste stream exhibits a toxicity characteristic under Title 40 Code of Federal Regulations (CFR), Part 261, Identification and Listing of Hazardous Waste, Subpart C, Characteristics of Hazardous Waste.
6	Y	Does the waste stream contain listed waste found in 20.4.1.200 NMAC incorporating 40 CFR Part 261, Subpart D, Lists of Hazardous Wastes.
7	Y	Waste stream can be classified as hazardous or nonhazardous.
8	Y	The overall completeness, comparability, and representativeness QAOs were met for each of the analytical and testing procedures as specified in the WAP Sections C3-1 through C3-2 prior to submittal of a waste stream profile form for a waste steam or waste stream lot.

	Completeness	Comparability	Representativeness
Radiography	Y	Y	Y
VE	NA	NA	NA

Comments: None

Roger Whiteaker — Roger Whiteaker — 08/04/2015

Signature of Site Project Manager — Printed Name — Date

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SUMMATION OF ASPECTS OF AK SUMMARY REPORT: OR-NFS-CH-SOIL

Overview

Waste stream OR-NFS-CH-SOIL consists of Contact Handled (CH) transuranic (TRU) mixed soil waste generated at Nuclear Fuel Services, Inc. (NFS) in Erwin, Tennessee and stored at the Oak Ridge National Laboratory (ORNL) in Oak Ridge, Tennessee. The Building 234 facility performed plutonium/uranium mixed oxide (MOX) fuel fabrication work under subcontracts to two U.S. Government contracts administered by the Atomic Energy Commission (AEC), and two smaller commercial contracts. The largest of the two government sponsored orders was to manufacture fuel rods for the Southwest Experimental Fast Oxide Reactor (SEFOR) in Arkansas. The other government sponsored order was from the U.S. Department of Energy (DOE) Savannah River Site (SRS). The majority of the plutonium processed by NFS resulted from the two U.S. Government contracts. Other plutonium processed at NFS supported commercial contracts for the Halden Reactor and Consumers Power Company.

The two larger contracts were placed pursuant to prime contracts with the AEC and were both national defense rated orders which were designated DO-E2 certified for national defense use under Defense Material System (DMS) Regulation 1. The established defense and commercial activities utilized the same process equipment so the source of contamination is indistinguishable. Therefore, the TRU wastes from decommissioning are linked primarily to defense nuclear materials production.

This summation of the Acceptable Knowledge (AK) Summary Report includes information to support Waste Stream Profile Form number OR-NFS-CH-SOIL, Revision 1 for CH TRU soil from NFS. The primary source of information for this Summation is CCP-AK-ORNL-001, Central Characterization Program Acceptable Knowledge Summary Report For Nuclear Fuel Services Contact-Handled Transuranic Waste Stored at Oak Ridge National Laboratory, Waste Streams: OR-NFS-CH-HET-A, OR-NFS-CH-SOIL, OR-NFS-CH-HOM-A, OR-NFS-CH-HOM-B, Revision 10, March 31, 2014.

Waste Stream Identification Summary

Waste Stream Name:	Soil from Nuclear Fuel Services, Inc.
Waste Stream Number:	OR-NFS-CH-SOIL
Dates of Waste Generation:	February 1993 through September 2005
Waste Stream Volume – Current:	545 55-gallon drums
Waste Stream Volume – Projected:	4,300 55-gallon drums
Summary Category Group:	S4000
Waste Matrix Code Group:	Soils
Waste Matrix Code:	S4100, Soils
TRUPACT-II Content Code Numbers:	OR111 / OR211, OR127 / OR227
Annual Transuranic Waste Inventory Report (ATWIR) Identification Number:	OR-NFS-CH-SOIL

Waste Stream Description and Physical Form

Waste stream OR-NFS-CH-SOIL is comprised of soil, rock, and gravel mixed with absorbent. In addition to soil, rock, and gravel, this waste stream also contains some concrete pieces and concrete block, and iron-based metal (e.g., reinforcement wire, nuts, bolts, pipe, fittings, and scrap metal (References M075, M128). The soil from the initial decommissioning phase was mixed with RADSORB (sodium polyacrylate polymer) absorbent powder (References M011, P315). A RADPAD absorbent pad was placed on top of the soil (References M011, U058). The soil from the second decommissioning phase originated from the one box from Radioactive Burial Ground (RBG) Trench B. At the ORNL Transuranic Waste Processing Center (TWPC), this soil was removed from the box and packaged into new drums with layers of Solid-A-Sorb (diatomaceous earth) absorbent (Reference M210). The soil from the final decommissioning phase was mixed with an organic polymer absorbent (e.g., Encap) (References C321, M011, P1400, P1401).

Waste stream OR-NFS-CH-SOIL meets the WIPP-WAP waste stream definition. The waste stream consists of waste materials that have common physical form, that contain similar hazardous constituents, and that are generated from a single process or activity. This waste stream consists of TRU-mixed soil generated during facility decommissioning operations at NFS.

Point of Generation

Location

Waste stream OR-NFS-CH-SOIL was generated at NFS located in eastern Tennessee in the city of Erwin less than 10 miles from the western North Carolina border (References C099, P218, P248, P283, U038, U054).

Area and/or Buildings of Generation

Waste stream OR-NFS-CH-SOIL is soil excavated from beneath the Building 234 Wet Chemistry Cell during the initial phase of decommissioning. A few drums of soil are from an area around the Building 110 laboratory underground waste tank (References C099, C210, M003, M052, P248, P273). A few drums were also generated from excavation of Trench B in the NFS RBG during the second phase of decommissioning (Reference M132). During the final phase of decommissioning, additional soil is being excavated from beneath the former Wet Cell. This activity is being conducted in the 234 Excavation Facility which is a secondary containment tent constructed in place of Building 234 after the building was demolished (References P1373, P1400).

Generating Processes

Description of Waste Generating Processes

The Building 234 facility operated from 1965 to 1973. The process capabilities of the facility included dissolution of plutonium and uranium metals and oxides, co-precipitation of plutonium and uranium, wet or dry blending of MOX powders, pellet and rod fabrication, rod loading, and scrap recovery. Production operations in Building 234 ceased and were placed on standby in 1973 (References C099, P248, P273).

Production Operations

Pellet Production

Solutions containing a mixture of plutonium nitrate and uranyl nitrate hexahydrate were transferred from the master mix tank to precipitation units. Plutonium and uranium were precipitated as ammonium diuranate and plutonium hydroxide, and ammonium hydroxide was used as a precipitant. During the Consumer Powers project, the feed solution contained plutonium nitrate only, and the plutonium was precipitated using oxalic acid, nitric acid, and hydrogen peroxide (References C145, P273).

Supernate was decanted from the ammonium diuranate or oxalate slurry and the remaining precipitate was filtered to remove liquids. Supernate/filtrate from the ammonium diuranate or oxalate slurry was polished and stored in two glass columns. Filtrate from the column box was evaporated producing ammonium nitrate concentrate and ammonium hydroxide condensate. During SEFOR production, ammonium hydroxide condensate was used to wash ammonium diuranate cake. Wet ammonium diuranate or oxalate cake was dried in a furnace and then loaded in another furnace and heated in a nitrogen and hydrogen gas atmosphere. The resultant oxide solids (MOX or plutonium oxide) from the conversion furnace were passed through a twin shell blender. Sub-blended oxide was ball-milled, screened, and weighed. After weighing, oxide was packaged in two liter bottles and placed into storage (References C145, P273).

One cross-blend was performed per five days during SEFOR production; each cross-blend was comprised of five sub-blends. During the Consumer Powers project, plutonium oxide cross-blending was followed by the addition of uranium oxide solids. The mixture of plutonium oxide and uranium oxide was sub-blended and cross-blended. Blended oxide was granulated using an oscillating device and stainless-steel screen. Binder was added to cross-blends during granulation. Granulated oxide was transferred to a pellet press. Pellets were measured for density then loaded into the sintering furnace and heated in an atmosphere of hydrogen gas, nitrogen gas, carbon dioxide, and argon. The sintered pellets were then allowed to off-gas (References C145, P273).

Sintered pellets were machined to finished size using grinders. Recycled water from the pellet wash was used as coolant. Grinder sludge and damaged pellets were sent to scrap recovery. Machined pellets were cleaned with isopropyl alcohol or in an ultrasonic wash using distilled water and then air dried. Pellets were visually inspected and diametrically gauged. A percentage of pellets were sampled for destructive analyses and measured for density and dimensional attributes. Reject pellets and sample residues were sent to scrap recovery. Finished pellets were weighed and loaded in tubes that were capped and sent to rod assembly and fabrication stations (References C145, M008, P273).

Scrap Dissolution and Recovery

Oxide scrap was ball-milled to reduce particle size. Ball-milled oxide scrap was transferred to the dissolution station and heated with nitric acid in one of two dissolvers. Nitrate solutions were pumped from the dissolver to the evaporator (References C145, P273).

Non-combustible items containing recoverable material (e.g., bottles, plastics, screens, gloves, etc.) were unloaded from drums and passed to the scrap preparation station for manual cutting and shredding. Shredded materials were leached in a nitric acid bath to recover plutonium. Leachate was pumped to the evaporator and solids were bagged-out and packaged for disposal (References C145, P273).

Plutonium nitrate solutions were transferred from the evaporator to glass storage columns. Solutions were circulated, sampled, and pumped to the adjacent load-out station. Plastic cylinders were placed in a holding rack and filled with solutions from the columns. Loaded cylinders were packaged for shipment (References C145, P273).

Decommissioning Operations

Initial Decommissioning Phase

The majority of the soil was generated in 1993 from excavating under the Building 234 Wet Chemistry Cell which was historically used for nitric acid dissolution and mixing of plutonium and depleted or low-enriched uranium (References I053, P323). The floor of the Wet Chemistry Cell was breached along a wall and sump providing a path for contamination to the sub-floor soils (Reference P218). Following removal of the Wet Chemistry Cell floor, excavation of soils revealed contamination concentrations exceeding 2 grams of material per pound of soil. The soil was excavated down to approximately 6 feet in areas adjacent to the west wall (Reference P323).

The excavated soils were placed on a conveyor and transferred from the Wet Chemistry Cell to a mixer in Area C of Building 234. The mixer blades were mounted on a central shaft and angled at 45 degrees for good mixing. Each blade had two components; the mixing/scraping portion at the end of the arm, and the cutting short blade at the halfway point on the arm. The blades were attached to the shaft in a rotating spiral so that when the end-gate was opened, the mix was forced out of the mixer. The mixer also included chopper blades which were high speed mixers. The chopper blades fit between the mixer blades as they scraped the walls of the mixer. At the end of the mixer, a slide gate was attached for dumping the contents after mixing was complete, and a chute was attached to the gate to allow the material to exit the mixer into a drum (References M052, P315). A RADPAD absorbent pad (cellulosic laminate containing a sodium polyacrylate polymer) was then placed on top of the soil (References M011, U058).

The purpose of soil mixing was to break up and homogenize the clay, add RADSORB (sodium polyacrylate polymer) absorbent powder to the soil to prevent the formation of liquid, and to blend soils with plutonium contamination that would otherwise exceed 128 grams Pu-239 Fissile Gram Equivalents (FGE) in compliance with ORNL Waste Acceptance Criteria (WAC) (References C099, P218, P315, P323). The moisture content of the soils was also decreased due to the heat generated during the mixing process (Reference U055). To distinguish the soils requiring blending from soils that were TRU but with contamination that did not require blending, they were designated as "high plutonium density soils" and "TRU contaminated soils." "High plutonium density soils" were loaded into 5-gallon containers, assayed, and staged for mixing. After dumping the specified 5-gallon containers of "high plutonium density soil" onto the conveyor in the Wet Chemistry Cell, a paper bag containing 10 pounds of RADSORB absorbent powder was placed onto the conveyor. The material was loaded onto the conveyor as it was moving. Additional soil to fill up a 55-gallon container was taken from "TRU contaminated soils." When all the material for the batch was loaded into the mixer, the conveyors were stopped and the mixing process started (References M011, P315, U055).

Building 110 Wet Chemistry and Spectographic Laboratories provided analytical support to Building 234. In early years, the labs in Building 110 also supported the Light Water Breeder Reactor program. Previous analysis identified relatively high levels of activity in the soil three feet below the surface at bore hole 22. Bore hole 22 was located two feet to the north of the concrete pad covering the Building 110 underground waste tank which was breached due to tank deterioration. Soil beneath the tank became contaminated with tank contents. In 1991,

soil in this area was excavated, dewatered, and packaged into 55-gallon drums in accordance with ORNL-WAC (References C210, P218, P306, P323).

Second Decommissioning Phase

One box containing soil and debris was generated from excavation of the NFS RBG during the second phase of decommissioning. NFS used the burial ground to dispose of their low-level waste from about 1966 to 1970. The entire burial ground, which was excavated between 2000 and 2004, was expected to generate only low-level waste to be shipped to Envirocare. The NFS container paperwork for this one box indicates the waste was generated in December 2001 from RBG Trench B which indicates the Radioactive Burial Ground, and Trench B designates one of the burial pits. The excavated plutonium-contaminated debris originated in Buildings 110 or 234, and the soil itself originated from the trench. NFS determined that this one box contained TRU waste. The chemical and radiological contamination of the Trench B area are similar to the Building 234 area (References C227, M003, M132, P1375).

Final Decommissioning Phase

The soil excavation process in the 234 Excavation Facility began in 2011 and is expected to be completed in Fiscal Year 2018 (References C230, M206). The process includes the excavation of soil, sample analysis screening, addition and mixing of absorbent, transport of soil within the primary containment, and final packaging of the processed soil (Reference P1400).

The total area requiring excavation has been divided into two separate excavation phases. The first phase of excavation consists of the footprint of the Wet Cell area. The second phase of excavation consists of the footprint of the concrete slab and soil on which the excavator is currently located. Prior to excavation, water or a mixture of Elmer's glue and water is applied to the soil when necessary to prevent airborne contamination. Each soil batch, approximate dimensions of 11 feet wide, 14 feet long, and one foot deep, or 154 cubic feet (ft^3), is excavated and staged adjacent to the dig site. Between 700 and 800 pounds of a sodium polyacrylate polymer absorbent (e.g., Encap, Waste Lock 770, or Quik-Solid) are added to each soil batch, and the excavator bucket is used to thoroughly mix the absorbent into the soil. A jackhammer or other appropriate equipment may be used to reduce rock size if the rocks are between six and ten inches. Rocks less than six inches are packaged without being size-reduced, and rocks greater than ten inches are not packaged (References C321, M011, P1370, P1400, P1401).

A sample is collected from each soil batch that has been conditioned with absorbent for liquid analysis using the paint filter test. The soil sample is placed into a fine mesh conical paint filter, and if liquid passes through and drops from the filter within five minutes, the soil is deemed to contain free liquids. If the paint filter test fails, approximately 50 pounds of additional absorbent are mixed in, and the paint filter test is repeated. Once the conditioned soil batch passes the paint filter test, another sample is collected from the batch and sent for nondestructive assay (NDA) screening analysis. Twelve unlined 55-gallon drums are staged adjacent to the excavator, and four to eight inches of absorbent are added to the bottom of each empty drum. The excavator bucket is then used to fill each drum with the conditioned soil. If the NDA screening results indicate the sample is low-level waste, the soil is packaged in boxes. If the NDA screening results indicate the sample is 90 percent or greater of TRU limits, the drums of soil are transported inside the primary containment to a drum dumping station where the contents are emptied into lined 55-gallon drums (References P1372, P1400).

Soil excavation continues until the soil activity concentration reaches Class A limits (less than 10 nCi/g), bedrock refusal is encountered, or the excavator arm has reached full

extension. When one of these criteria is reached for a given quadrant, sampling is conducted (Reference P1400).

Transuranic Waste Processing Center

NFS soil drums may require repackaging at the TWPC if container integrity issues or prohibited items (e.g., liquid) are discovered. The boxes containing soil have been packaged into drums in the TWPC Box Breakdown Area (BBA) (Reference M075).

Waste Stream Material and Chemical Inputs

The following table identifies the Resource Conservation and Recovery Act (RCRA) constituents identified in this waste stream.

RCRA Constituents in Waste Stream OR-NFS-CH-SOIL

Chemical	Use/Source	EPA Hazardous Waste Number
Tetrachloroethylene	May be from cleaning in Building 234C where NFS did the final welding of the fuel pins. May be from its use in off-site facilities and could also be the source of contamination for the sampled soil. See additional discussion below.	F002

RCRA Determinations

Historical Waste Management

This waste stream has been historically managed in accordance with ORNL waste management practices in compliance with the requirements imposed by the Tennessee Department of Environment and Conservation (TDEC). The soil waste was characterized by NFS as nonhazardous waste (References M003, M012, M198). However, limited analytical data for the soils identified trace amounts of tetrachloroethylene which is believed to have been used as a solvent. Therefore, waste stream OR-NFS-CH-SOIL is characterized as an F-listed RCRA-hazardous waste as described below.

Hazardous Waste Determinations

Ignitability, Corrosivity, Reactivity

Ignitability

Waste stream OR-NFS-CH-SOIL does not meet the definition of ignitability as defined in 40 Code of Federal Regulations (CFR) 261.21 (Reference 13). Efforts were made to prevent the formation of liquids in waste drums by mixing the soil with absorbent (e.g., RADSORB or Encap polymer absorbent) (References M003, M011, P268, P273, P315, P317, P1400, P1401). Pyrophorics and compressed gases have not been identified in NFS TRU soil waste (References M003, M065, P268, P273, P317, P1400, P1401). The waste is not an oxidizer, and it is not capable of causing fire through friction, absorption of moisture, or spontaneous chemical change. Waste stream OR-NFS-CH-SOIL is therefore not ignitable (D001).

Corrosivity

Waste stream OR-NFS-CH-SOIL does not meet the definition of corrosivity as defined in 40 CFR 261.22 (Reference 13). Efforts were made to prevent the formation of liquids in waste drums by mixing the soil with absorbent (e.g., RADSORB or Encap polymer absorbent) (References M003, M011, P268, P273, P315, P317, P1400, P1401). Waste stream OR-NFS-CH-SOIL is therefore not corrosive (D002).

Reactivity

Waste stream OR-NFS-CH-SOIL does not meet the definition of reactivity as defined in 40 CFR 261.23 (Reference 13). Explosives, reactive metals, reactive cyanides, or reactive sulfides were not identified in the AK documentation reviewed for either Building 234 or Building 110 (References M003, P268, P273, P317, P1400, P1401). NFS Radwaste Package Certification Records indicate that the waste is not readily capable of detonation, explosive decomposition, reaction at normal pressures and temperatures, or an explosive reaction with water (Reference M003). The waste is stable, will not undergo violent chemical change, and will not detonate. The waste will not react violently with water, form potentially explosive mixtures with water, or generate toxic gases, vapors, or fumes when mixed with water. There is no indication that the waste contains explosive materials, and it is not capable of detonation or explosive reaction. Two composite soil samples were collected from beneath Building 234 and analyzed for reactive cyanide and sulfide with only small amounts being measured (Reference C122). Thirteen surface soil samples were collected from beneath the Wet Chemistry Cell and were also analyzed for reactive cyanide and sulfide with no detections (Reference I053). NFS determined that the small amount of reactive cyanide and sulfide measured did not make this soil waste reactive. Waste stream OR-NFS-CH-SOIL is therefore not reactive (D003).

The container in this waste stream will be evaluated in accordance with the Waste Isolation Pilot Plant Waste Analysis Plan (WIPP-WAP) using radiography prior to shipment to ensure the waste is not ignitable, corrosive, or reactive.

Toxicity Characteristic

Waste stream OR-NFS-CH-SOIL does not exhibit the characteristic of toxicity for metal compounds as defined in 40 CFR 261.24) (Reference 13). Toxicity characteristic metals constituents were not identified in the MOX fuel production process (Reference P273). Products used during decommissioning did not contain toxicity characteristic metals constituents (Reference M011). No metals were detected above the regulatory threshold in any of the seven soil samples from the area around the Building 110 underground waste tank (Reference U043). Barium was detected in small amounts (7.4 – 8.4 milligrams per liter [mg/L]) in the three composite soil samples from beneath the Building 234 Wet Cell (Reference P1402). Barium was detected in trace amounts (0.492 mg/L) in one of the two composite soil samples from beneath Building 234. Barium was also detected in trace amounts (0.63 - 1.0 mg/L) in 10 of the 13 soil samples from beneath Building 234. These concentrations of barium are well below the regulatory threshold. No other regulated metals were detected in these samples (References C122, I053).

EPA hazardous waste numbers D006, D008, D009, and D011 are assigned to debris waste stream OR-NFS-CH-HET-A. The basis for these assignments to the debris waste stream, were evaluated to determine if they would be applicable to the soil waste stream. The sources for most of these metals in the debris waste stream are inherently hazardous waste items (e.g., batteries, circuit boards) which would not be contaminants of soil. Mercury was looked at as a

possible soil contaminant. It has been determined that mercury if present would be below the regulatory level (Reference DR013).

Waste stream OR-NFS-CH-SOIL does not meet the definition of toxicity for organic compounds as defined in 40 CFR 261.24) (Reference 13). Toxicity characteristic organic compounds were not identified in the MOX fuel production process (Reference P273). Products used during decommissioning did not contain toxicity characteristic organic compounds (Reference M011). No organic constituents were detected in the three composite soil samples analyzed in 1993 or the 11 soil samples analyzed in 2001 from the beneath Building 234 Wet Chemistry Cell (References I053, P1402). No organics constituents were detected above the regulatory threshold in any of the seven soil samples from the area around the Building 110 underground waste tank (Reference U043). Tetrachloroethylene was detected in trace amounts (0.042 mg/L) in one of the two composite soil samples from beneath Building 234; however, this concentration is well below the regulatory threshold. In addition, the F-listed EPA hazardous waste number for tetrachloroethylene is assigned to this waste stream. Chloroform was also detected in one of the samples in trace amounts but was also found in the sample blank. No other organic constituents were detected in the two composite soil samples (Reference C122).

Listed Waste

F-Listed Waste

Waste stream OR-NFS-CH-SOIL is an F-listed hazardous waste because the soil was mixed with hazardous wastes from non-specific sources as listed in 40 CFR 261.31 (Reference 13).

The F-listed solvent tetrachloroethylene was detected in trace amounts (0.042 mg/L) in one of two composite soil samples that were collected in 1998 from beneath Building 234A and adjacent to the building foundation (Reference C122). Tetrachloroethylene was not used in the Building 234 Wet Chemistry Cell or any other part of the MOX fuel production process, nor was it used in the decommissioning process. However, it may have been used historically for cleaning in Building 234C where NFS did the final welding of the fuel pins. None of the samples collected were from beneath Building 234C, but it is possible that tetrachloroethylene was present in the soil under Building 234A due to solvent migration. In addition, at one time this solvent was used in a maintenance facility located elsewhere on the NFS site and has also been detected in groundwater samples up-gradient from Building 234. The source of the tetrachloroethylene in the groundwater may be from its use in off-site facilities and could also be the source of contamination for the sampled soil (Reference C309). To resolve the discrepancy between the nonhazardous characterization and the possibility that tetrachloroethylene may be present in the soil from past solvent use, EPA hazardous waste number F002 is applied to waste stream OR-NFS-CH-SOIL (Reference DR013).

K-Listed Waste

Waste stream OR-NFS-CH-SOIL does not include any of the manufacturing process wastes from the specific industries or sources listed in 40 CFR 261.32 (Reference 13).

P- and U-Listed Wastes

Waste stream OR-NFS-CH-SOIL does not contain a discarded commercial chemical product, an off-specification commercial chemical product, or a container residue or spill residue thereof, as defined in 40 CFR 261.33 (Reference 13). Based on the AK documentation reviewed, U- and P-listed compounds were not used during MOX production or facility decommissioning (References M011, P273). Based on the AK documentation reviewed, beryllium powder was

not used by NFS (Reference C210). Therefore, this waste stream is not a P015-listed waste, and beryllium will not be present in amounts greater than one percent by weight of the waste in each drum. Therefore, U-and P-listed EPA hazardous waste numbers, including U134 (hydrofluoric acid), are not assigned to this waste stream.

Polychlorinated Biphenyls (PCBs)

Waste stream OR-NFS-CH-SOIL does not contain PCBs, and therefore is not regulated as a Toxic Substances Control Act waste under 40 CFR 761 (Reference 14).

Two composite soil samples were collected from beneath Building 234 and analyzed for total PCBs. Arochlor-1254 was detected in very trace amounts (0.014 milligrams per kilogram [mg/kg]) in one of the samples (Reference C122). Eleven surface soil samples were collected from beneath the Wet Chemistry Cell and were also analyzed for total PCBs. Arochlor-1254 was detected in very trace amounts in four of the samples (0.12 – 0.45 mg/kg) (Reference I053). Although the soil excavated from beneath Building 110 was not specifically analyzed for PCBs, two samples of the Building 110 tank contents were collected and analyzed for PCBs. PCBs were not detected above 50 parts-per-million in any of the samples (Reference U043).

Prohibited Items

Prohibited items have not been identified in this waste stream. When the drums were received at ORNL, they underwent RTR which did not identify liquids in the majority of the drums but did discover liquid between the drum and rigid liner in one drum. RADSORB was added to this drum to absorb the liquid (References C200, M003, M011, M065).

Due to the physical nature of this waste and the fact that many of these drums have been in storage at ORNL for nearly 15 years, it is possible that liquid may have formed in some drums. Certified RTR is performed by CCP to ensure the waste does not contain prohibited items in accordance with the WIPP-WAC and WIPP-WAP.

Method for Determining Waste Material Parameters Weights per Unit of Waste

The waste material parameter weight estimates for waste stream OR-NFS-CH-SOIL were derived from information related to the soil excavation and mixing process as well as data from waste disposal forms.

- Each drum generated during the initial phase of decommissioning contains 10 pounds of RADSORB absorbent powder mixed with the soil and a RADPAD on top of the soil. The absorbent powder is an organic polymers which is considered "organic matrix," and the RADPAD is a cellulosic laminate containing an organic polymer which is considered "cellulosics." However, RTR may not be able to distinguish between the soil and the RADSORB and RADPADs. The soil/absorbent mixture is contained in a plastic drum liner bag that is considered part of the waste.

- The soil generated during the second decommissioning phase was removed from the original box and packaged into new drums with layers of Solid-A-Sorb (diatomaceous earth) absorbent. A half bag of absorbent (12.5 pounds) was added to the bottom of the empty drum. Soil was shoveled into a 5-gallon bucket and then dumped into the drum. Another half bag of absorbent was added and these steps were repeated until the drum was about 90 percent full. This equates to approximately 75 pounds of absorbent in each drum (Reference M210). The Solid-A-Sorb will absorb water from the soil and is considered

"inorganic matrix;" however, RTR may not be able to distinguish between the soil and the absorbent.

- The soil generated during the final phase of decommissioning is excavated in batches of 154 cubic feet (ft^3) and mixed with 700 to 800 pounds of an organic polymer absorbent (750 pounds equals 20 ft^3). Assuming 50 gallons of waste is placed into the rigid liner, the mixture of soil and absorbent comprises 40 gallons with 11.5 percent by volume being absorbent (equivalent to about 23 pounds) plus an additional 10 gallons (about 50 pounds) of absorbent on top of the soil. The total weight of absorbent per drum is therefore approximately 73 pounds (References C321, P1400, P1402). Because the absorbents are organic polymers, they are considered "organic matrix;" however, RTR may not be able to distinguish between the soil and the absorbent.

This information combined with the weight of the waste from the waste disposal forms was used to estimate waste material parameter weight percentages. Based on certified RTR by CCP, the percentages have been revised. These percentages do not take into account the projected volume of soil to be generated during the final phase of decommissioning, but based on the average net weight of the soil from the initial decommissioning phase, the absorbent is expected to be between 10 and 15 weight percent (Wt%) per drum.

Waste Stream OR-NFS-CH-SOIL Waste Material Parameters

Waste Material Parameter	Wt%	Wt% Range
Aluminum-based Metals/Alloys	0%	0%
Iron-based Metals/Alloys	<0.1%	0% – 1.3%
Other Metals	0%	0%
Other Inorganic Materials	<0.1%	0% – 23.2%
Cellulosics	<0.1%	0% – 0.3%
Plastics (waste materials)	0.2%	0% – 9.2% [2]
Rubber	0%	0%
Organic Matrix	2.0%	1.5% – 15.0% [3]
Inorganic Matrix	0.4%	0% – 26.4%
Soils/Gravel	97.3%	73.7% – 100% [1]

Notes:
1. Since RTR cannot distinguish the soil from the absorbent, and soil is the predominant waste material parameter, RTR will assign "Soils/Gravel" to the soil/absorbent mixture.
2. The 9.2% plastic is due to a single drum (X10C0506047) that has a reported net weight of only 74 pounds which is much lighter than most of the drums in this waste stream.
3. The Wt% range was expanded based on the amount of absorbent expected in soil from the final phase of decommissioning.

List of AK Sufficiency Determinations Requested for the Waste Stream

There are no AK sufficiency determination requests for this waste stream.

Transportation

This waste stream and its chemical constituents have been reviewed for consistency with listed TRUCON codes and they are consistent.

Beryllium

Beryllium will not be present in amounts greater than 1% by weight of the waste in each payload container.

Radionuclide Information

To determine isotopic ratios for waste stream OR-NFS-CH-SOIL as a whole, the total gram value for each individual radionuclide was divided by the total mass of all radioactive constituents in the waste stream and converted to a percentage. This result is listed as "Total Radionuclide Wt%." To determine the radionuclide Wt% range for individual containers, the radiological mass in each container in the waste stream was summed. The mass of each individual radionuclide in a container was divided by the total radiological mass for that container and converted to a percentage. The minimum and maximum results are listed as "Radionuclide Wt% Range for Individual Containers." The same process was applied to determine "Total Radionuclide Ci%" and "Radionuclide Ci% Range for Individual Containers."

As shown in the table below, U-238 is the most predominant radionuclide by mass, and Pu-239 is the second most predominant radionuclide by mass based on AK. However, the two most prevalent radionuclides by mass may turn out to be Pu-239 and Pu-240 because of the issues with nondestructive assay detecting U-238. U-238 has an extremely long half-life and as a result has a low specific activity. The gamma ray emission rate is therefore very low, resulting in high detection limits and uncertainties when expressed in mass units. At gram levels for U-238, the self-attenuation of gamma rays can be significant. The U-238 has such a low gamma emission rate that the detection limits and uncertainties of hundreds of grams is not unexpected (Reference DR002).

These percentages are based on the NFS assay data from the soil generated during the first phase of decommissioning. In addition, the radionuclide weight percent of individual radionuclides varies on a container-by-container basis. Because of this variability, some containers will not include the waste stream predominant radionuclides but may include other radionuclides expected in this waste stream (References M003, M012).

Waste Stream OR-NFS-CH-SOIL Radiological Characterization

Isotope	Total Radionuclide Wt%[1]	Radionuclide Wt% Range for Individual Containers [2]	Total Radionuclide Ci% [3]	Radionuclide Ci% Range for Individual Containers [4]	Suspected Present (Yes/No)
WIPP Required Radionuclides					
Am-241	0.12%	0.00% - 2.86% [7]	4.79%	3.02% - 18.38%	Yes [6]
Pu-238	Trace [5]	0.00% - 0.43% [7]	1.23%	0.00% - 10.90%	Yes
Pu-239	19.17%	0.59% - 90.94% [7]	13.63%	5.10% - 52.93%	Yes
Pu-240	2.31%	0.06% - 16.34% [7]	6.02%	0.60% - 38.20%	Yes
Pu-242	0.01%	0.00% - 1.17% [7]	Trace	0.00% - Trace	Yes
U-233	Trace	0.00% - 0.18%	Trace	0.00% - 0.25%	Yes
U-234	3.84%	0.00% - 5.00%	0.27%	0.00% - 1.06%	Yes
U-238	73.42%	0.00% - 99.69% [7]	Trace	0.00% - 0.03%	Yes
Cs-137	Trace	0.00% - Trace	Trace	0.00% - Trace	Yes
Sr-90	Trace	0.00% - Trace	Trace	0.00% - Trace	Yes [8]
Additional Radionuclides					
Pu-241	0.06%	0.00% - 2.91% [7]	74.05%	23.56% - 86.96%	Yes
Tc-99	Trace	0.00% - 0.15%	Trace	0.00% - 0.07%	Yes
Th-228	Trace	0.00% - Trace	Trace	0.00% - Trace	Yes
Th-232	0.16%	0.00% - 22.23%	Trace	0.00% - Trace	Yes
U-232	Trace	0.00% - Trace	Trace	0.00% - Trace	Yes
U-235	0.90%	0.28% - 5.01% [7]	Trace	0.00% - Trace	Yes

1. This listing indicates the total Wt% of each radionuclide over the entire waste stream.
2. This listing is the Wt% range of each radionuclide on a container-by-container basis. Some containers with "0" listed as the lower range, will not contain the specified radionuclide.
3. This listing indicates the total activity Ci% of each radionuclide over the entire waste stream.
4. This listing is the Ci% range of each radionuclide on a container-by-container basis.
5. "Trace" indicates <0.01 Wt% for that radionuclide.
6. Am-241 may be present in slightly larger percentages due to the further decay of Pu-241.
7. These Wt% ranges were expanded based on plutonium and uranium isotopic distribution data for mixed oxide fuels processed at NFS.
8. Sr-90 cannot be quantified by gamma spectroscopy. Its value is calculated based on measured Cs-137 values. A Sr-90/Cs-137 scaling factor of 1.0 is used to calculate Sr-90.

Payload management will not be utilized for this waste stream.

References

1. CCP-TP-005, *CCP Acceptable Knowledge Documentation*, Carlsbad, New Mexico, Nuclear Waste Partnership, LLC.

2. *Waste Isolation Pilot Plant Hazardous Waste Facility Permit, Waste Analysis Plan*, New Mexico Environment Department, Santa Fe, New Mexico

3. CCP-PO-001, *CCP Transuranic Waste Characterization Quality Assurance Project Plan*, Carlsbad, New Mexico, Nuclear Waste Partnership, LLC.

4. DOE *Waste Treatability Group Guidance,* Idaho Falls, Idaho, INEL-Lockheed Idaho Technologies Company, U.S. Department of Energy

5. DOE/WIPP-02-3122, *Transuranic Waste Acceptance Criteria for the Waste Isolation Pilot Plant*, Carlsbad, New Mexico, U.S. DOE, Carlsbad Field Office

6. Public Law 102-579, *The Waste Isolation Pilot Plant Land Withdrawal Act* (as amended)

7. 42 U.S.C. 10101 *Nuclear Waste Policy Act of 1982,* Washington, D.C., U.S. Congress

8. CCP-PO-002, *CCP Transuranic Waste Certification Plan,* Carlsbad, New Mexico, Nuclear Waste Partnership, LLC.

9. DOE/TRU-12-3425, Annual Transuranic Waste Inventory Report – 2012, U.S. Department Of Energy, Carlsbad Field Office

10. Environmental Protection Agency EnviroMapper for Envirofacts, URL: http://134.67.99.122/enviro/emef.asp. Last updated on October 31, 2005. Retrieved August 28, 2007.

11. *CH-TRU Payload Appendices*, Waste Isolation Pilot Plant

12. CCP-AK-ORNL-002, *Central Characterization Program Acceptable Knowledge Summary Report For Oak Ridge National Laboratory Radiochemical Engineering Development Center Contact-Handled Transuranic Waste, Waste Stream: OR-REDC-CH-HET*

13. 40 CFR Part 261, *Identification and Listing of Hazardous Waste,* U.S. EPA

14. 40 CFR Part 761, *Polychlorinated Biphenyls [PCBs] Manufacturing, Processing, Distribution in Commerce, and Use Prohibitions*, U.S. EPA

15. CCP-TP-053, *CCP Standard Real-Time Radiography (RTR) Inspection Procedure*, Carlsbad, New Mexico, Nuclear Waste Partnership, LLC.

16. CCP-PO-003, *CCP Transuranic Authorized Methods for Payload Control (CCP CH-TRAMPAC),* Carlsbad, New Mexico, Nuclear Waste Partnership, LLC.

17. DOE M 435.1-1, *Radioactive Waste Management Manual*, U.S. Department of Energy

AK Source Documents

Tracking Number	Title
C099	Letter to Harold Johnson, CBFO DOE re: KAPL-NFS Transuranic Waste Background Information
C100	Interview with Richard Booth and faxed defense and waste information for NFS, Erwin, TN TRU waste
C119	Removal of Contaminated Pipe, Building 234 Area B, Memo to Ron Mitchell, Letter of Authorization (LOA)
C120	Removal of Contaminated Piping, Building 234, Memo to Larry Burleson, Letter of Authorization (LAO)
C121	DVRF Bale Packaging Glovebox Removal, Memo to Ron Mitchell
C122	Building 234 Characterization Results, Memo to Heather Little
C125	Cleaning and Surveying the DVRF Shear Baler for PCBs, Memo to Building 234 Supervision
C126	Waste Packaging of the DVRF Decon Cell Perma-Con Structure, Memo to Richard A. Moore
C127	Size Reduction of the NDA Station 2 Glovebox In the DVRF Decontamination Cell, Memo to Ron Mitchell and Rick Leitner
C129	Size Reduction Process Ductwork within the Decontamination Cell, DVRF, Memo to Ron Mitchell and Rick Leitner
C130	Cleanout of DVRF Bale Packaging Glovebox, Memo to Ron Mitchell and Rick Leitner
C142	Legal Analysis regarding Solvent Binder Used to Make Fuel
C143	Memo to F. J. Schultz re: NFS Project Update from the WEAF
C144	Memo to Distribution re: Experience in Receipt and Inspection of Waste Shipments from Nuclear Fuel Services, Inc.
C145	Memo to Distribution re: Nuclear Fuel Services, In. (NFS) Background Information
C146	Paper from EPA website: Waste Minimization Assessment for a Manufacturer Producing Printed Circuit Boards
C147	Retrieved from EPA website: Consumer Product links for Mercury
C200	Internal Correspondence to M.W. Tull subject: On the Use of Rad-Sorb in NFS TRU-Waste Drums
C201	Letter to Mr. Bill Reynolds, EcoTek from Terry Wickland, Product Engineer regarding Seal for 16 gauge DOT 17H stainless steel drum lid
C202	Letter from Scott A. Toler to L.C.M. Roddeye regarding formal request for variance from Section 4.5.5 of the ORNL/NFS: NFS Waste Parameter Verification Program
C203	Letter to Martin Tull from Robert A. Hunt regarding a picture of the proposed method to "lab pack" bottles of immobilized respirable fines and residual materials
C204	Letter to Martin W. Tull, Martin Marietta Energy Systems, from Michael L. West, Nuclear Fuel Services, Inc. regarding response to his request for information relating to the discovery of mercury during the decommissioning of Station #15 in Building 234.
C205	Internal Correspondence to Distribution regarding Minutes of November 5, 1991 Meeting with NFS Regarding Process-Line Samples
C206	Numerous Faxes containing handwritten notes (oversight reports) from Paul O. Emerson re: such items as sampling the top of the underground tank, Pu Crew activities, equipment issues, processing of gloveboxes, and information on drums that were packaged.
C209	Internal Correspondence to F.J. Shultz from J.A. Chapman regarding NFS Project Accomplishments for Month of April 1992

Tracking Number	Title
C210	Interview re: NFS TRU Waste Shipped to Oak Ridge National Laboratory. Interviewees: Richard Booth, Richard Moore, Bob Hunt, Scott Toller, Marie Moore
C227	Interview with Scott Morie from NFS
C230	E-mail from Brian Oakley to Jeff Harrison, RE: NFS Schedule
C309	Record of Communication Subject: NFS Soil Sampling/Analysis Data Tetrachloroethylene Use
C321	Record of Communication. Subject: Soil and Groundwater Treatment Sludge to be Generated in 2011.
C622	Email from Don Coffey to Jeff Harrison RE: NFS BBA REPACKS NFS0385 A-H
DR001	Discrepancy Resolution re: OR-NFS-CH-HET EPA Hazardous Waste Numbers
DR002	Discrepancy Resolution for OR-NFS-CH-HET re: Radionuclides
DR006	Discrepancy Resolution re: Physical Form of NFS-0116 & NFS-0929
DR010	Discrepancy Resolution re: Incorrect Waste Stream Assignment of Soil Waste Containers
DR013	Discrepancy Resolution re: NFS Soil and Debris EPA Hazardous Waste Numbers
DR015	Discrepancy Resolution re: OR-NFS-CH-HET-A Heterogeneous Debris from NFS
DR022	Discrepancy Resolution re: OR-NFS-CH-SOIL and OR-NFS-CH-HET-A Waste Stream Designation
DR023	Discrepancy Resolution re: NFS0815 and X10C0506069
DR026	Discrepancy Resolution re: Reassignment of NFS815 to OR-NFS-CH-SOIL
DR030	Discrepancy Resolution re: Drum NFS0929
DR031	Discrepancy Resolution re: OR-NFS-CH-HOM-A EPA Hazardous Waste Number Assignment
DR037	Discrepancy Resolution re: Drum NFS0788A
DR038	Discrepancy Resolution re: Drum NFS0815
I022	DOE Order 435.1, Radioactive Waste Management
I023	Radioactive Waste Management Manual
I043	Implementation Guide for Use with DOE M 435.1-1
I052	Memorandum; Building 234 Shear Baler Characterization Samples
I053	KAPL-TN Waste Profile for NFS Building 234 Soil
I056	Removal of Building 234 Wet Cell Permacon Containment Enclosure
I058	Dismantlement of the West Wet Cell Wall in Building 234
I059	Waste Packaging of Wet Cell Wall in Building 234
I061	Size Reduction of the DVRS Glovebox
I067	Procedure for the Operation of the Versatile Automated Gamma Assay System (VAGAS)
I068	Size Reduction of 4-inch Diameter Duct Section in Area C
M003	ORNL UCN-2109 and UCN-2822 Forms for NFS TRU Waste and Related Paperwork for Waste Stored at ORNL (container paperwork)
M007	Internal Correspondence and the Environmental Assessment for the Receipt and Storage at ORNL, of Transuranic Waste, Mixed Transuranic Waste, and Mixed Oxide Waste from Nuclear Fuels and the Environmental Assessment for Disposition of Transuranic Waste
M008	Fax from John E. Kirkpatrick to Robert C. Mason on 01/16/1991 and the PuO2 + UO2 (mixed oxide) fuel production flow chart for Pellet Production, Rod/Assembly Fabrication, Scrap Dissolution/Recovery

Tracking Number	Title
M011	MSDS (Material Safety Data Sheets) for Products used at NFS
M012	EM Waste Database Query - Container Information; Waste Description; Isotopes
M013	EM Waste Database Query - NFS Box Daughter and Repack Drums: Container; Waste Description; Isotopes
M016	Incoming Container Travelers for NFS Waste - VE Data
M017	NFS NDA Data from Foster Wheeler (by container)
M018	NFS Radiography (NDE) Data from Foster Wheeler (by container)
M019	NFS VE Data from Foster Wheeler (by container)
M020	NFS HSG Data from Foster Wheeler (by container)
M021	Defense Determination Approval for ORNL/NFS-HD-001, Heterogeneous Debris - NFS
M050	Photos of the Site
M051	Fax from Bob Hunt from Martin Tull transmitting drawing for EcoTek - The Hunt 55 Gallon Poly. Insert
M052	Account Book No. S149 - DVRF Decommissioning and Volume Reduction Facility
M053	Letter from L.C.M. Roddye to R.L. Booth regarding Nuclear Fuel Services, Inc. - Contract DE-SCOT-86ID12630 - Closure of Nonconformance Reports NCR-X-94-WMRAD-0011, NCR-X-94-WMRAD-0012, NCR-X-94-WMRAD-0013, NCR-X-94-WMRAD-0014 AND NCR-X-94-WMRAD-0015
M054	Internal Correspondence to Distribution from D.W. Turner regarding Information Concerning NFS D&D Operations
M058	(Handwritten Document) Methods for: Measuring Activity in Baled Waste; Flowsheet for Immobilizing Fines; Assigning Values to Soil; Flowsheet for Packaging and Measuring Raschig Rings
M059	Memo transmitting NCR-X-WMRAD-0015 for Liquid in Liners
M060	Correction Actions to Prevent Recurrence of NCR-X-94-WMRAD-0011
M061	Internal Correspondence to Distribution from J.A. Chapman regarding An Evaluation of NFS Isotopic Estimates by Gamma-ray and Alpha-particle Spectroscopy
M062	NFS Data Set No. 2 PCB Reanalysis of Gasket and K1 Samples
M063	NFS Data Sheet No. 3 PCB Analysis of Fresh Gasket and Pall Filter Samples and Cadmium in Pall Filter TCLP Leachate
M064	Analysis Results for Process Line Samples from Nuclear Fuel Services, Inc. and NFS Sample Set No. 3
M065	WEAF Data for NFS Drums (by container); WEAF Waste Acceptance Report; NFS Storage Project (by container)
M066	Surveillance: Source Surveillance at Scientific Ecology Group, Oak Ridge, TN
M067	Surveillance: Source surveillance for Contact-Handled Transuranic and Mixed Oxide Wastes
M068	Review of WEAF RTR Video Tapes
M075	TWPC Contact Handled Waste Repackaging Data Forms for NFS Waste (container paperwork)
M076	Evaluations of Additional Containers for Waste Stream OR-NFS-CH-HET-A (drum additions)
M126	RTR Video Tapes and DVDs from the WEAF Facility for Oak Ridge Waste
M128	Evaluation of Additional Containers for Waste Stream OR-NFS-CH-SOIL, dated September 5, 2008
M129	Evaluation of Additional Containers for Waste Stream OR-NFS-CH-HET, dated 9/8/2008

Tracking Number	Title
M130	Evaluation of Additional Containers for Waste Stream OR-NFS-CH-HET, dated 09/15/2008
M131	Evaluation of Additional Containers for Waste Stream OR-NFS-CH-HET dated 11/30/2007
M132	Evaluation of Additional Containers for Waste Stream OR-NFS-CH-SOIL dated 9/24/2008
M133	Evaluation of Additional Containers for Waste Stream OR-NFS-CH-HET dated 09/24/2008
M198	eMWaste Query from ORNL Dated 08/30/2010
M202	Review of WEAF RTR Videos for NFS Immobilized Liquids and Fines
M206	Wet Cell Excavation TRU Waste Shipping Schedule
M207	NFS Waste Container Packaging Forms
M208	Evaluation of Drums for Waste Stream OR-NFS-CH-SOIL from NFS Final Decommissioning Phase
M209	Evaluation of Drums for Waste Stream OR-NFS-CH-HOM-B from NFS Final Decommissioning Phase
M210	TRU Project Waste Processing Facility Job Recipe. Subject: Soil-like Waste Remediation
M211	Evaluation of NFS Groundwater Data
M213	Duratek buys waste processing company
M214	EnergySolutions OKs deal to buy Duratek
M215	EnergySolutions Locations
M216	Evaluation of Additional Containers for Waste Stream OR-NFS-CH-HET-A
M217	eMWaste Database Query from ORNL Dated 01/03/2013
M235	Evaluation of Data from Source Document M064
P014	Inventory of ORNL Remedial Action Sites: 11. Research Laboratories
P212	Lattice Experiments with Simulated Burned-Up Fuel for D2O Power Reactors
P218	Oak Ridge National Laboratory/Nuclear Fuel Services, Inc. NFS Waste Parameter Verification Program
P248	Structural Assessment of Building 234 Prepared for NFS, 1205 Banner Hill Road, Erwin, TN 37650
P251	Box Breakdown Area Operations
P252	Glove Box Operations
P253	Drum Bag In/Bag Out and Glove Ports
P254	Contact Handled Waste Repackaging
P255	Contact handled Waste Acceptance Criteria
P256	TRU/Alpha Low Level Waste (LLW) Treatment Project Documented Safety Analysis
P267	Nuclear Fuel Services Waste Acceptance and Storage Procedure
P268	ORNL WAC for Contact Handled Transuranic and Mixed Oxide Wastes from Nuclear Fuel Services INC.
P269	ORNL Waste Acceptance Criteria for Transuranic Waste from the Nuclear Fuel Services, Inc.; ORNL WAC for Contact-Handled Transuranic and Mixed Oxide Wastes from Nuclear Fuel Services, Inc.
P272	Oak Ridge National Laboratory Waste Management Plan
P273	Nuclear Fuel Services, Inc., Waste Certification Plan for Transuranic Waste
P274	Segregation and Immobilization of Particulate Fines

Tracking Number	Title
P276	Determination of H2 Diffusion Rates through Various Closures on TRU Waste Bag-Out Bags
P283	Plutonium Facilities Decommissioning Project Plan Condition Addendum
P300	Operation of the Decontamination and Volume Reduction Facility
P301	Wet Cell
P303	Removal of Exhaust Systems
P304	Removal of Asbestos-Bearing Materials
P306	Excavation of 110 Lab Tank
P312	Maintenance for Plutonium Decommissioning
P315	Wet Cell Soil Excavation and Mixing
P316	Investigation of DOE-ORNL Nonconformance Reports for Building 234 Plutonium Shipments (Surface Contamination, Free Standing Liquids, Missing Liner Lid)
P317	Packaging for Shipment to Processing, Storage, or Burial
P319	Preparation of Gloveboxes for Decontamination in the DVRF
P320	Bag-Out and Glove Change
P321	Determination of Plutonium Isotopics for Building 110 and 234
P323	Status of Former Mixed Oxide Fuel Fabrication Facility
P432	TRU Waste Processing Center Document Safety Analysis
P582	PCB Decontamination
P1116	EnergX TRU Waste Processing Center Procedure: Absorbing Liquids
P1370	Evaluation of Techniques for Conditioning and Packaging Plutonium Contaminated Soil
P1371	Procedure for Removal and Decontamination of Utility and Process Lines and Systems
P1372	Building 234 Soil, Groundwater, and Groundwater Sludge Sampling and Analysis Plan (NFS)
P1373	Project Management Plan for Wet Cell Soil Excavation (NFS)
P1374	Characterization of Building 234 Waste (NFS)
P1375	North Site Characterization Report for Nuclear Fuel Services, Erwin, Tennessee
P1398	TRU Waste Processing Center, High Density Waste Item Repackaging
P1399	Operating Procedure for the 234 Excavation Facility Groundwater Pretreatment System
P1400	Operating Procedure for Soil Excavation, Processing and Packaging for the 234 Excavation Facility
P1401	Waste Packaging for WIPP Disposal
P1402	234 Wet Cell Characterization Summary
P1403	Operation of the ORTEC Mobile Counting System
P1404	Final Report: Solidification Testing for 234 Excavation Facility Decommissioning Project
P1405	Geochemical Survey of the Unaka Mountain Roadless Area, Unicoi County, Tennessee
P1407	TWPC Procedure - Pipe Overpack Container Operations
P1409	Attachment K: Compacted Drum Puck Standing Recipe, Job Recipe Number: OPSJR-STANDING-09
P1413	TRU Waste Compactor Operation
P1414	Radioactive Material Receipt
P1415	Radioactive Material Shipment to CNSI Barnwell, US Ecology Richland, and to Customer
P1416	TRU Waste Receipt and Shipment

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Tracking Number	Title
U016	A Graphical Workbook for Estimating Important Quantities of NFS Radioactive Waste Constituents
U017	The Intercomparison of NDA Measurements on CH-TRU Waste Between Nuclear Fuel Services, Inc. and Oak Ridge National Laboratory
U038	ORNL TRU Waste Historical Survey; Volumes 1, 2, and 3—Origins and Characteristics of Remote-Handled Transuranic Wastes (Trabalka report) Plus Appendices
U040	NFS response to "Transuranic Waste Baseline Inventory Report Questionnaire"
U043	Final Report - Waste Characterization of Wastes Generated from D&D Activity; Buildings 110 and 234 on the NFS Site in Erwin, Tennessee
U044	Weston Report: Acceptable Knowledge Summary Report for Oak Ridge National Laboratory Contact-Handled TRU Debris Waste Facility Maintenance Operations
U050	Action Description Memorandum for Disposition of Transuranic Waste and Plutonium Scrap from Nuclear Fuel Services, Inc.
U051	Return of 55-Gallon Stainless Steel Drums for Addition of Radsorb
U052	Decommissioning Strategy in Today's Environments
U054	Decontamination and Decommissioning of a Plutonium Fabrication Facility
U055	Abstract, Calibration Schemes and Measurement Techniques
U057	An Interim Report on A Time-Series Analysis of the Events Leading up to the Detection of Free-Liquid in NFS Supercompacted Drums
U058	Oak Ridge National Laboratory/Nuclear Fuel Services Inc. NFS Waste Parameter Verification Program
U597	Building 234 Groundwater Design of Experiment (Groundwater Monitoring Data) (NFS)

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Attachment 2 – CCP Waste Stream Profile Form

(1) Waste Stream Profile Number: OR-NFS-CH-HOM-A						
(2) Generator site name: Oak Ridge National Laboratory					(3) Generator site EPA ID: TN1890090003	
(4) Technical contact: Beverly Schrock					(5) Technical contact phone number: 575-234-7444	
(6) Date of audit report approval by New Mexico Environment Department (NMED): March 10, 2014						
(7) Title, version number, and date of documents used for WIPP-WAP Certification: CCP-PO-001, CCP Transuranic Waste Characterization Quality Assurance Project Plan, Revision 21, May 31, 2013; CCP-PO-002, CCP Transuranic Waste Certification Plan, Revision 27, May 31, 2013; CCP-PO-027, CCP/TRU Waste Processing Center/Oak Ridge National Laboratory Interface Document, Revision 5, October 2, 2013						
(8) Did your facility generate this waste?	YES		NO	X		
(9) If no, provide the name and EPA ID of the original generator: Nuclear Fuel Services, Inc; TND003095635						
Waste Stream Information						
(10) WIPP ID: OR-NFS-CH-HOM[1]					(11) Summary Category Group: S3000	
(12) Waste Matrix Code Group: Solidified Inorganics					(13) Waste Stream Name: Immobilized Liquids and Fines from NFS	
(14) Description from the ATWIR: Waste consists of homogeneous waste from NFS.						
(15) Defense TRU Waste:	YES	X	NO			
(16) Check One:	CH	X	RH			
(17) Number of SWBs NA (17a) Number of SLB2 NA	(18) Number of Drums Current - 38 55-gallon drums Projected – 7 55-gallon drums[2]				(19) Number of Canisters NA	
(20) Batch Data Report numbers supporting this waste stream characterization: See Characterization Information Summary for correlation of containers identification numbers to batch data report numbers						
(21) List applicable EPA Hazardous Waste Numbers: D006 and D009						
(22) Applicable TRUCON Content Numbers: OR127 / OR227, SQ154						
(23)**Acceptable Knowledge Information**						
(For the following, enter the supporting documentation used [i.e., references and dates])						
Required Program Information						
(23A) Map of site: CCP-AK-ORNL-001, Revision 10, March 31, 2014, Figures 1, 2 3, 6 and 7						
(23B) Facility mission description: CCP-AK-ORNL-001, Revision 10, March 31, 2014, Section 4.2						
(23C) Description of operations that generate waste: CCP-AK-ORNL-001, Revision 10, March 31, 2014, Section 4.4						
(23D) Waste identification/categorization schemes: CCP-AK-ORNL-001, Revision 10, March 31, 2014, Section 4.5						
(23E) Types and quantities of waste generated: CCP-AK-ORNL-001, Revision 10, March 31, 2014, Section 4.6.1						
(23F) Correlation of waste streams generated from the same building and process, as applicable: CCP-AK-ORNL-001, Revision 10, March 31, 2014, Section 4.6.2						
(24) Waste certification procedures: CCP-TP-030, Revision 33, November 19, 2013						
(25) Required Waste Stream Information						
(25A) Area(s) and building(s) from which the waste stream was generated: CCP-AK-ORNL-001, Revision 10, March 31, 2014, Section 7.1						

CCP RECORDS ORIGINAL
DATE REC'D 2/16/15 JV

(25B) Waste stream volume and time period of generation: CCP-AK-ORNL-001, Revision 10, March 31, 2014, Section 7.2			
(25C) Waste generating process description for each building: CCP-AK-ORNL-001, Revision 10, March 31, 2014, Section 7.3			
(25D) Waste Process flow diagrams: CCP-AK-ORNL-001, Revision 10, March 31, 2014, Figure 9			
(25E) Material inputs or other information identifying chemical/radionuclide content and physical waste form: CCP-AK-ORNL-001, Revision 10, March 31, 2014, Section 7.4			
(25F) Waste Material Parameter Weight Estimates per unit of waste See table entitled "Waste Material Parameter Estimates for OR-NFS-CH-HOM-A" in Summation of Aspects of AK Summary Report: OR-NFS-CH-HOM-A			
(26) Which Defense Activity generated the waste:			
	Weapons activities including defense inertial confinement fusion		Naval reactors development
	Verification and control technology		Defense research and development
	Defense nuclear waste and materials by-products management	X	Defense nuclear materials production
	Defense nuclear materials security and safeguards and security investigations		
(27) Supplemental Documentation:			
(27A) Process design documents: NA			
(27B) Standard operating procedures: See C119, C120, C121, C122, C125, C126, C127, C129, C130, I056, I058, I059, I061, I067, I068, M210, P1370, P1371, P1372, P1401, P1403, P1407, P248, P251, P252, P253, P254, P267, P273, P300, P303, P304, P306, P315, P320 and P582 in the Summary Report: OR-NFS-CH-HOM-A, AK Source Documents			
(27C) Safety Analysis Reports: in the Summary Report: See P248, P256 and P432 in OR-NFS-CH-HOM-A, AK Source Documents			
(27D) Waste packaging logs: See M003 and M052 in the Summary Report: OR-NFS-CH-HOM-A, AK Source Documents			
(27E) Test plans/research project reports: See C122, P1372, P1404, P212, U038 and U043 in the Summary Report: OR-NFS-CH-HOM-A, AK Source Documents			
(27F) Site databases: See M012, M013, M198 and M217 in the Summary Report: OR-NFS-CH-HOM-A, AK Source Documents			
(27G) Information from site personnel: See C100, C206, C210, C227, C309 and C321 in the Summary Report: OR-NFS-CH-HOM-A, AK Source Documents			
(27H) Standard industry documents: See C146, C147, M011 and M210 in the Summary Report: OR-NFS-CH-HOM-A, AK Source Documents			
(27I) Previous analytical data: See C122, C205, I052, I053, M013, M017, M019, M020, M061, M062, M063, M064, M065, M068, M198, M211, M217, M235, P1374, P1375, P1402, P1404, U038, U043, U044 and U597 in the Summary Report: OR-NFS-CH-HOM-A, AK Source Documents			
(27J) Material safety data sheets: See C200, C201, M011 and M210 in the Summary Report: OR-NFS-CH-HOM-A, AK Source Documents			
(27K) Sampling and analysis data from comparable/surrogate Waste: See I052 and P1402 in the Summary Report: OR-NFS-CH-HOM-A, AK Source Documents			
(27L) Laboratory notebooks: See M052 and U016 in the Summary Report: OR-NFS-CH-HOM-A, AK Source Documents			
Confirmation Information			
For the following, when applicable, enter procedure title(s), number(s) and date(s)			
(28)	Radiography: CCP Standard Real-Time Radiography (RTR) Inspection Procedure, CCP-TP-053, Revision 14, September 25, 2013		
	Visual Examination: N/A		

(29) Comments: For a list of the waste characterization procedures used and date of respective procedures see the list of procedures on the attached CIS.

Reviewed by AK Expert: YES [X] **Date:** 1/06/2015

Reviewed by STR (if necessary): YES [X] N/A [ ] **Date:** 1/15/2015

Waste Stream Profile Form Certification:

I hereby certify that I have reviewed the information in this Waste Stream Profile Form, and it is complete and accurate to the best of my knowledge. I understand that this information will be made available to regulatory agencies and that there are significant penalties for submitting false information, including the possibility of fines and imprisonment for knowing violations.

Signature of Site Project Manager	**Daniel Wade** Printed Name	**1/15/2015** Date

NOTE: (1) OR-NFS-CH-HOM-A is not listed in the Annual Transuranic Waste Inventory Report Identification Number; therefore OR-NFS-CH-HOM is used. OR-NFS-CH-HOM-A will be added to the next version of the ATWIR

(2) Projected containers due only to repackaging.

CHARACTERIZATION INFORMATION SUMMARY

WSPF# OR-NFS-CH-HOM-A (CCP-AK-ORNL-001)

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Lot 1

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CCP Characterization Information Summary Cover Page

Waste Stream #	OR-NFS-CH-HOM-A	Lot #:	1
AK Expert Review:	N/A	Date:	N/A
SPM Review:	Roger Whiteaker	Date:	12/04/2014

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SPM signature certifies that through Acceptable Knowledge testing and/or analysis that the waste identified in this summary is not corrosive, ignitable, reactive, or incompatible with the TSDF.

A summary of the Acceptable Knowledge regarding this waste stream containing specific information about the corrosivity, reactivity, and ignitability of the waste stream is included as an attachment to the Waste Stream Profile Form. By reference, that information is included in this lot.

List of procedures used:

Non Destructive Assay (NDA):

CCP-TP-048	Rev. 16	11/01/2013 Mobile IQ3 System Data Reviewing, Validating, and Reporting Procedure
CCP-TP-048	Rev. 15	03/24/2011 Mobile IQ3 System Data Reviewing, Validating, and Reporting Procedure
CCP-TP-048	Rev. 14	03/08/2010 Mobile IQ3 System Data Reviewing, Validating, and Reporting Procedure
CCP-TP-048	Rev. 13	10/12/2009 Mobile IQ3 System Data Reviewing, Validating, and Reporting Procedure
CCP-TP-048	Rev. 12	08/09/2009 Mobile IQ3 System Data Reviewing, Validating, and Reporting Procedure
CCP-TP-048	Rev. 11	02/19/2008 Mobile IQ3 System Data Reviewing, Validating, and Reporting Procedure
CCP-TP-048	Rev. 10	11/16/2006 Mobile IQ3 System Data Reviewing, Validating, and Reporting Procedure
CCP-TP-048	Rev. 9	11/03/2005 Mobile IQ3 System Data Reviewing, Validating, and Reporting Procedure
CCP-TP-048	Rev 8	09/21/2005 Mobile IQ3 System Data Reviewing, Validating, and Reporting Procedure
CCP-TP-048	Rev. 7	03/14/2005 Mobile IQ3 System Data Reviewing, Validating, and Reporting Procedure
CCP-TP-048	Rev. 6	10/18/2004 Mobile IQ3 System Data Reviewing, Validating, and Reporting Procedure
CCP-TP-048	Rev 5	06/08/2004 Mobile IQ3 System Data Reviewing, Validating, and Reporting Procedure
CCP-TP-048	Rev. 4	12/04/2003 Mobile IQ3 System Data Reviewing, Validating, and Reporting Procedure
CCP-TP-048	Rev. 3	09/03/2003 Mobile IQ3 System Data Reviewing, Validating, and Reporting Procedure
CCP-TP-048	Rev. 2	04/25/2003 Mobile IQ3 System Data Reviewing, Validating, and Reporting Procedure
CCP-TP-048	Rev. 1	03/21/2003 Mobile IQ3 System Data Reviewing, Validating, and Reporting Procedure
CCP-TP-048	Rev. 0	02/05/2003 Mobile IQ3 System Data Reviewing, Validating, and Reporting Procedure

Project Level Data Validation / DQO Reconciliation:

CCP-TP-001	Rev. 21	08/06/2013 CCP Project Level Data Validation and Verification
CCP-TP-001	Rev. 20	09/27/2012 CCP Project Level Data Validation and Verification
CCP-TP-001	Rev. 19	12/28/2010 CCP Project Level Data Validation and Verification
CCP-TP-001	Rev. 18	08/09/2010 CCP Project Level Data Validation and Verification
CCP-TP-001	Rev. 17	09/24/2007 CCP Project Level Data Validation and Verification
CCP-TP-001	Rev 16	04/26/2007 CCP Project Level Data Validation and Verification
CCP-TP-001	Rev. 15	11/22/2006 CCP Project Level Data Validation and Verification
CCP-TP-001	Rev. 14	11/16/2006 CCP Project Level Data Validation and Verification
CCP-TP-001	Rev. 13	07/21/2006 CCP Project Level Data Validation and Verification
CCP-TP-001	Rev. 12	05/25/2006 CCP Project Level Data Validation and Verification
CCP-TP-001	Rev. 11	03/23/2005 CCP Project Level Data Validation and Verification

CCP-TP-002	Rev. 26	06/19/2013 CCP Reconciliation of DQOs and Reporting Characterization Data
CCP-TP-002	Rev. 25	02/11/2013 CCP Reconciliation of DQOs and Reporting Characterization Data
CCP-TP-002	Rev 24	12/28/2011 CCP Reconciliation of DQOs and Reporting Characterization Data
CCP-TP-002	Rev. 23	12/29/2010 CCP Reconciliation of DQOs and Reporting Characterization Data
CCP-TP-002	Rev. 22	08/30/2010 CCP Reconciliation of DQOs and Reporting Characterization Data
CCP-TP-002	Rev. 21	08/04/2009 CCP Reconciliation of DQOs and Reporting Characterization Data
CCP-TP-002	Rev 20	08/18/2008 CCP Reconciliation of DQOs and Reporting Characterization Data
CCP-TP-002	Rev 19	12/22/2006 CCP Reconciliation of DQOs and Reporting Characterization Data
CCP-TP-002	Rev 18	11/16/2006 CCP Reconciliation of DQOs and Reporting Characterization Data
CCP-TP-002	Rev. 17	10/10/2006 CCP Reconciliation of DQOs and Reporting Characterization Data
CCP-TP-002	Rev. 16	06/06/2006 CCP Reconciliation of DQOs and Reporting Characterization Data
CCP-TP-002	Rev. 15	06/16/2005 CCP Reconciliation of DQOs and Reporting Characterization Data
CCP-TP-002	Rev. 14	03/29/2005 CCP Reconciliation of DQOs and Reporting Characterization Data

CCP-TP-005	Rev. 26	08/12/2013 CCP Acceptable Knowledge Documentation
CCP-TP-005	Rev. 25	06/19/2013 CCP Acceptable Knowledge Documentation
CCP-TP-005	Rev. 24	11/28/2011 CCP Acceptable Knowledge Documentation
CCP-TP-005	Rev. 23	06/30/2011 CCP Acceptable Knowledge Documentation
CCP-TP-005	Rev. 22	04/21/2011 CCP Acceptable Knowledge Documentation
CCP-TP-005	Rev. 21	12/29/2010 CCP Acceptable Knowledge Documentation
CCP-TP-005	Rev. 20	11/01/2010 CCP Acceptable Knowledge Documentation
CCP-TP-005	Rev. 19	07/06/2010 CCP Acceptable Knowledge Documentation
CCP-TP-005	Rev 18	11/16/2006 CCP Acceptable Knowledge Documentation

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CCP-TP-005	Rev. 17	06/05/2008 CCP Acceptable Knowledge Documentation
CCP-TP-005	Rev 16	02/27/2008 CCP Acceptable Knowledge Documentation
CCP-TP-005	Rev. 15	03/31/2005 CCP Acceptable Knowledge Documentation
CCP-TP-030	Rev. 33	11/19/2013 CCP CH TRU Waste Certification and WWIS/WDS Data Entry
CCP-TP-030	Rev. 32	06/20/2013 CCP CH TRU Waste Certification and WWIS/WDS Data Entry
CCP-TP-030	Rev. 31	11/19/2012 CCP CH TRU Waste Certification and WWIS/WDS Data Entry
CCP-TP-030	Rev. 30	05/21/2012 CCP CH TRU Waste Certification and WWIS/WDS Data Entry
CCP-TP-030	Rev 29	04/26/2011 CCP CH TRU Waste Certification and WWIS/WDS Data Entry
CCP-TP-030	Rev. 28	05/12/2010 CCP CH TRU Waste Certification and WWIS/WDS Data Entry
CCP-TP-030	Rev. 27	12/14/2009 CCP CH TRU Waste Certification and WWIS Data Entry
CCP-TP-030	Rev. 26	05/27/2009 CCP CH TRU Waste Certification and WWIS Data Entry
CCP-TP-030	Rev. 25	01/22/2009 CCP CH TRU Waste Certification and WWIS Data Entry
CCP-TP-030	Rev. 24	08/20/2008 CCP CH TRU Waste Certification and WWIS Data Entry
CCP-TP-030	Rev. 23	03/12/2008 CCP CH TRU Waste Certification and WWIS Data Entry
CCP-TP-030	Rev. 22	07/24/2007 CCP CH TRU Waste Certification and WWIS Data Entry
CCP-TP-030	Rev. 21	05/21/2007 CCP CH TRU Waste Certification and WWIS Data Entry
CCP-TP-030	Rev. 20	02/07/2007 CCP CH TRU Waste Certification and WWIS Data Entry
CCP-TP-030	Rev. 19	11/16/2006 CCP CH TRU Waste Certification and WWIS Data Entry
CCP-TP-030	Rev. 18	05/01/2006 CCP TRU Waste Certification and WWIS Data Entry
CCP-TP-030	Rev. 17	12/29/2005 CCP TRU Waste Certification and WWIS Data Entry
CCP-TP-030	Rev. 16	04/22/2005 CCP TRU Waste Certification and WWIS Data Entry

Radiography (RTR/NDE):

CCP-TP-053	Rev 15	09/11/2014 CCP Standard Real-Time Radiography (RTR) Inspection Procedure
CCP-TP-053	Rev. 14	09/25/2013 CCP Standard Real-Time Radiography (RTR) Inspection Procedure
CCP-TP-053	Rev 13	05/14/2013 CCP Standard Real-Time Radiography (RTR) Inspection Procedure
CCP-TP-053	Rev 12	08/22/2012 CCP Standard Real-Time Radiography (RTR) Inspection Procedure
CCP-TP-053	Rev 11	07/20/2011 CCP Standard Real-Time Radiography (RTR) Inspection Procedure
CCP-TP-053	Rev. 10	03/04/2011 CCP Standard Real-Time Radiography (RTR) Inspection Procedure
CCP-TP-053	Rev. 9	09/30/2010 CCP Standard Real-Time Radiography (RTR) Inspection Procedure
CCP-TP-053	Rev 8	06/30/2010 CCP Standard Real-Time Radiography (RTR) Inspection Procedure
CCP-TP-053	Rev. 7	10/21/2009 CCP Standard Real-Time Radiography (RTR) Inspection Procedure
CCP-TP-053	Rev. 6	03/04/2008 CCP Standard Real-Time Radiography (RTR) Inspection Procedure
CCP-TP-053	Rev. 5	11/16/2006 CCP Standard Real-Time Radiography (RTR) Inspection Procedure
CCP-TP-053	Rev. 4	12/22/2005 CCP Standard Real-Time Radiography (RTR) Inspection Procedure
CCP-TP-053	Rev. 3	03/21/2005 CCP Standard Real-Time Radiography (RTR) Inspection Procedure
CCP-TP-053	Rev. 2	07/14/2004 CCP Standard Real-Time Radiography (RTR) Inspection Procedure

WAP Certification:

CCP-PO-001	Rev. 21	05/31/2013 CCP Transuranic Waste Characterization Quality Assurance Project Plan
CCP-PO-001	Rev 20	08/16/2011 CCP Transuranic Waste Characterization Quality Assurance Project Plan
CCP-PO-001	Rev. 19	12/29/2010 CCP Transuranic Waste Characterization Quality Assurance Project Plan
CCP-PO-001	Rev 18	08/30/2010 CCP Transuranic Waste Characterization Quality Assurance Project Plan
CCP-PO-001	Rev. 17	08/23/2009 CCP Transuranic Waste Characterization Quality Assurance Project Plan
CCP-PO-001	Rev. 16	10/31/2007 CCP Transuranic Waste Characterization Quality Assurance Project Plan
CCP-PO-001	Rev. 15	08/10/2007 CCP Transuranic Waste Characterization Quality Assurance Project Plan
CCP-PO-001	Rev. 14	03/28/2007 CCP Transuranic Waste Characterization Quality Assurance Project Plan
CCP-PO-001	Rev. 13	11/16/2006 CCP Transuranic Waste Characterization Quality Assurance Project Plan
CCP-PO-001	Rev. 12	03/22/2006 CCP Transuranic Waste Characterization Quality Assurance Project Plan
CCP-PO-001	Rev. 11	03/10/2005 CCP Transuranic Waste Characterization Quality Assurance Project Plan
CCP-PO-002	Rev. 27	05/31/2013 CCP Transuranic Waste Certification Plan
CCP-PO-002	Rev. 26	07/14/2011 CCP Transuranic Waste Certification Plan
CCP-PO-002	Rev. 25	12/29/2010 CCP Transuranic Waste Certification Plan
CCP-PO-002	Rev. 24	06/30/2010 CCP Transuranic Waste Certification Plan
CCP-PO-002	Rev. 23	04/07/2010 CCP Transuranic Waste Certification Plan
CCP-PO-002	Rev. 22	01/12/2010 CCP Transuranic Waste Certification Plan
CCP-PO-002	Rev. 21	01/26/2009 CCP Transuranic Waste Certification Plan
CCP-PO-002	Rev. 20	11/02/2007 CCP Transuranic Waste Certification Plan
CCP-PO-002	Rev. 19	05/22/2007 CCP Transuranic Waste Certification Plan
CCP-PO-002	Rev. 18	11/16/2006 CCP Transuranic Waste Certification Plan
CCP-PO-002	Rev 17	11/16/2006 CCP Transuranic Waste Certification Plan
CCP-PO-002	Rev 16	11/16/2006 CCP Transuranic Waste Certification Plan
CCP-PO-002	Rev. 15	03/22/2006 CCP Transuranic Waste Certification Plan
CCP-PO-002	Rev. 14	12/29/2005 CCP Transuranic Waste Certification Plan
CCP-PO-002	Rev. 13	05/09/2005 CCP Transuranic Waste Certification Plan

CCP-PO-003	Rev. 13	07/31/2013 Transuranic Authorized Methods for Payload Control (CCP CH-TRAMPC)
CCP-PO-003	Rev. 12	12/29/2010 Transuranic Authorized Methods for Payload Control (CCP CH-TRAMPC)
CCP-PO-003	Rev. 11	06/04/2009 Transuranic Authorized Methods for Payload Control (CCP CH-TRAMPC)
CCP-PO-003	Rev. 10	11/18/2006 Transuranic Authorized Methods for Payload Control (CCP CH-TRAMPC)
CCP-PO-003	Rev. 9	12/29/2005 Transuranic Authorized Methods for Payload Control (CCP CH-TRAMPC)
CCP-PO-003	Rev. 8	01/25/2005 Transuranic Authorized Methods for Payload Control (CCP CH-TRAMPC)
CCP-PO-003	Rev. 7	11/22/2004 Transuranic Authorized Methods for Payload Control (CCP CH-TRAMPC)
CCP-PO-003	Rev. 6	06/08/2004 Transuranic Authorized Methods for Payload Control (CCP CH-TRAMPC)
CCP-PO-003	Rev. 5	08/19/2003 Transuranic Authorized Methods for Payload Control (CCP CH-TRAMPC)
CCP-PO-003	Rev. 4	02/11/2003 Transuranic Authorized Methods for Payload Control (CCP CH-TRAMPC)
CCP-PO-003	Rev. 3	05/31/2002 Transuranic Authorized Methods for Payload Control (CCP CH-TRAMPC)

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CCP Correlation of Container Identification Numbers to Batch Data Report Numbers

Waste Stream: # OR-NFS-CH-HOM-A Lot # 1

Container ID Number	Historical Container ID	NDA BDR	RTR BDR	VE BDR	Load/Manage Overpack Yes	Transportation Headspace Gas	
						FGA	GGT
NFS0149A	N/A	OR-MILCC2-0017	OR-RTR6-0437	N/A	No	OR14FG8060	N/A
NFS0478A	N/A	OR-IQ3-0224	OR-RTR6-0437	N/A	No	OR13FG4003	N/A
NFS0507B	N/A	OR-MILCC2-0017	OR-RTR6-0437	N/A	No	OR14FG8058	N/A
NFS0808A	N/A	OR-MILCC2-0017	OR-RTR6-0437	N/A	No	OR14FG4035	N/A
NFS0865A	N/A	OR-IQ3-0224	OR-RTR6-0437	N/A	No	OR14FG8023	N/A

Signature of Site Project Manager	Roger Whiteaker Printed Name	12/04/2014 Date

CCP RTR/VE Summary of Prohibited Items and AK Confirmation

Waste Stream Number: OR-NFS-CH-HOM-A Lot #: 1

Container Number	RTR Prohibited Items [a,b]	Visual Examination Prohibited Items [a,b]	Does the Physical Form of the Waste Match the Waste Stream Description as Determined by AK
See correlation of container ID numbers for list of remaining drum numbers in this Lot.	None of the containers in this lot had prohibited items identified during RTR.	VE was not used to certify any containers in this Lot.	The physical form of the waste matches the waste stream description as determined by AK.
a. See Batch Data Reports			
b. If AK has assigned U134 to this waste stream, then any liquids in these containers are prohibited items (not acceptable by the TSDF).			
Justification for the selection of RTR and/or VE: RTR was selected as the characterization method for this lot because the waste was previously packaged and RTR meets all the Data Quality Objectives for NDE for the waste.			

Site Project Manager Signature | Roger Whiteaker Printed Name | 12/04/2014 Date

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CCP Reconciliation with Data Quality Objectives

WSPF# OR-NFS-CH-HOM-A Lot # 1

Sampling Completeness

RTR/VE:

Number of Valid Samples: 5 Number of Total Samples Analyzed: 5

Percent Complete: 100 (QAO is 100%)

Radiological:

Number of Valid Samples: 5 Number of Total Samples Analyzed: 5

Percent Complete: 100 (QAO is 100%)

	Y/N/NA	Reconciliation Parameter
1	Y	Waste Matrix Code.
2	Y	Waste Material Parameter Weights.
3	Y	The TRU activity reported in the BDRs for each container demonstrates with a 95% probability that the container of waste contains TRU radioactive waste.
4	N	AK Sufficiency. Is there an approved AK sufficiency Determination for this waste stream?
5	Y	The data demonstrates whether the waste stream exhibits a toxicity characteristic under Title 40 Code of Federal Regulations (CFR), Part 261, Identification and Listing of Hazardous Waste, Subpart C, Characteristics of Hazardous Waste.
6	N	Does the waste stream contain listed waste found in 20.4.1.200 NMAC incorporating 40 CFR Part 261, Subpart D, Lists of Hazardous Wastes.
7	Y	Waste stream can be classified as hazardous or nonhazardous.
8	Y	The overall completeness, comparability, and representativeness QAOs were met for each of the analytical and testing procedures as specified in the WAP Sections C3-1 through C3-2 prior to submittal of a waste stream profile form for a waste steam or waste stream lot.

	Completeness	Comparability	Representativeness
Radiography	Y	Y	Y
VE	NA	NA	NA

Comments: None

Roger Whiteaker 05/06/2015

Signature of Site Project Manager Printed Name Date

SUMMATION OF ASPECTS OF AK SUMMARY REPORT: OR-NFS-CH-HOM-A

Overview

Waste stream OR-NFS-CH-HOM-A is contact-handled (CH) mixed immobilized liquids and fines generated at Nuclear Fuel Services, Inc. (NFS) in Erwin, Tennessee and stored at the Oak Ridge National Laboratory (ORNL) in Oak Ridge, Tennessee. Waste stream OR-NFS-CH-HOM-A was generated in Buildings 110 and 234 at NFS. Building 234 contained a plutonium/uranium mixed oxide (MOX) fuel fabrication facility that performed fuel fabrication work under subcontracts to two U.S. Government contracts administered by the U.S. Atomic Energy Commission (AEC), and two smaller commercial contracts. The largest of the two government sponsored orders was to manufacture fuel rods for the Southwest Experimental Fast Oxide Reactor (SEFOR) in Arkansas. The other government sponsored order was from the U.S. Department of Energy (DOE) Savannah River Site (SRS). The fuel that NFS fabricated for DOE SRS was used in experiments that were part of a cooperative research and development program between the AEC and Atomic Energy of Canada Limited on deuterium oxide-moderated power reactors. The majority of the plutonium processed by NFS resulted from the two U.S. Government contracts. The other plutonium processed at NFS supported commercial contracts for the Halden reactor and Consumers Power Company. Building 110 housed wet chemistry and spectrographic laboratories that provided analytical support to Building 234. The Building 234 MOX facility operated from 1965 to 1973. It remained inactive from the time production operations ceased in 1973 until the initial phase of decommissioning started in the early 1990's. Waste stream OR-NFS-CH-HOM-A is from decommissioning operations, not production operations.

The two larger contracts were placed pursuant to prime contracts with the AEC and were both national defense rated orders which were designated DO-E2 certified for national defense use under Defense Material System (DMS) Regulation 1. The established defense and commercial activities utilized the same process equipment so the source of contamination is indistinguishable. Therefore, waste stream OR-NFS-CH-HOM-A is linked to defense nuclear materials production.

This Summation of the AK Summary Report includes information to support Waste Stream Profile Form (WSPF) number OR-NFS-CH-HOM-A for mixed immobilized liquids and fines. The primary source of information for this Summation is CCP-AK-ORNL-001, *Central Characterization Program Acceptable Knowledge Summary Report For Nuclear Fuel Services Contact-Handled Transuranic Waste Stored at Oak Ridge National Laboratory, Waste Streams OR-NFS-CH-HET-A, OR-NFS-CH-SOIL, OR-NFS-CH-HOM-A, OR-NFS-CH-HOM-B,* Revision 10, March 31, 2014.

Waste Stream Identification Summary

Waste Stream Name:	Immobilized Liquids and Fines from NFS
Waste Stream Number:	OR-NFS-CH-HOM-A
Dates of Waste Generation:	July 1993 to March 1994
Waste Stream Volume – Current:	38 55-gallon drums
Waste Stream Volume – Projected:	7 55-gallon drums (due only to repackaging)

Summary Category Group:	S3000 – Homogeneous Solids
Waste Matrix Code Group:	Solidified Inorganics
Waste Matrix Code:	S3900
TRUCON Content Numbers:	OR 127 / OR 227, SQ 154
Annual Transuranic Waste Inventory Report (ATWIR) Identification Number:	OR-NFS-CH-HOM [1]

[1] Identification number OR-NFS-CH-HOM-A is not listed in the ATWIR; therefore OR-NFS-CH-HOM is used. OR-NFS-CH-HOM-A will be added to the next version of the ATWIR.

Waste Stream Description and Physical Form

Waste stream OR-NFS-CH-HOM-A is comprised of respirable fines (high activity particulate from glovebox floor sweepings, filter media, etc.) that have been immobilized with Portland cement and water in 2-liter high-density polyethylene (HDPE) bottles and aqueous liquids (e.g., Radiacwash decontamination solution) immobilized with RADSORB (organic polymer absorbent) in 2-liter HDPE bottles. There are also 2-liter HDPE bottles containing miscellaneous metal (e.g., sweepings, hardware) dispersed throughout a RADSORB absorbent matrix. This waste was generated during decommissioning of the MOX fuel production and laboratory support facilities in Buildings 110 and 234 (References C210, M003, M126, M202, P218, P274, P317).

Waste stream OR-NFS-CH-HOM-A meets the Waste Isolation Pilot Plant (WIPP) Waste Analysis Plan (WAP) waste stream definition. The waste stream consists of waste materials that have common physical form, that contain similar hazardous constituents, and that are generated from a single process or activity. This waste stream consists of TRU-mixed absorbed/solidified waste generated during facility decommissioning operations at NFS.

Point of Generation

Location

Waste stream OR-NFS-CH-HOM-A was generated at NFS. NFS is located in eastern Tennessee in the city of Erwin less than 10 miles from the western North Carolina border (References C099, P218, P248, P283, U038, U054).

Area and/or Buildings of Generation

Waste stream OR-NFS-CH-HOM-A was generated in Buildings 110 and 234 at NFS (References C099, M003, M052, M054, P273).

Generating Processes

Production Operations at NFS

Pellet Production (Building 234)

Solutions containing a mixture of plutonium nitrate and uranyl nitrate hexahydrate were transferred from the master mix tank to precipitation units. Plutonium and uranium were precipitated as ammonium diuranate and plutonium hydroxide, and ammonium hydroxide was used as a precipitant. During the Consumer Powers project, the feed solution contained plutonium nitrate only, and the plutonium was precipitated using oxalic acid, nitric acid, and hydrogen peroxide (References C145, P273).

Supernate was decanted from the ammonium diuranate or oxalate slurry and the remaining precipitate was filtered to remove liquids. Supernate/filtrate from the ammonium diuranate or oxalate slurry was polished and stored in two glass columns. Filtrate from the column box was evaporated producing ammonium nitrate concentrate and ammonium hydroxide condensate. During SEFOR production, ammonium hydroxide condensate was used to wash ammonium diuranate cake. Wet ammonium diuranate or oxalate cake was dried in a furnace and then loaded in another furnace and heated in a nitrogen and hydrogen gas atmosphere. The resultant oxide solids (MOX or plutonium oxide) from the conversion furnace were passed through a twin shell blender. Sub-blended oxide was ball-milled, screened, and weighed. After weighing, oxide was packaged in two liter bottles and placed into storage (References C145, P273).

One cross-blend was performed every five days during SEFOR production; each cross-blend was comprised of five sub-blends. During the Consumer Powers project, plutonium oxide cross-blending was followed by the addition of uranium oxide solids. The mixture of plutonium oxide and uranium oxide was sub-blended and cross-blended. Blended oxide was granulated using an oscillating device and stainless-steel screen. Binder was added to cross-blends during granulation. Granulated oxide was transferred to a pellet press. Pellets were measured for density then loaded into the sintering furnace and heated in an atmosphere of hydrogen gas, nitrogen gas, carbon dioxide, and argon. The sintered pellets were then allowed to off-gas (References C145, P273).

Sintered pellets were machined to finished size using grinders. Recycled water from the pellet wash was used as coolant. Grinder sludge and damaged pellets were sent to scrap recovery. Machined pellets were cleaned with isopropyl alcohol or in an ultrasonic wash using distilled water and then air dried. Pellets were visually inspected and diametrically gauged. A percentage of pellets were sampled for destructive analyses and measured for density and dimensional attributes. Reject pellets and sample residues were sent to scrap recovery. Finished pellets were weighed and loaded in tubes that were capped and sent to rod assembly and fabrication stations (References C145, M008, P273).

Scrap Dissolution and Recovery (Building 234)

Oxide scrap was ball-milled to reduce particle size. Ball-milled oxide scrap was transferred to the dissolution station and heated with nitric acid in one of two dissolvers. Nitrate solutions were pumped from the dissolver to the evaporator (References C145, P273).

Non-combustible items containing recoverable material (e.g., bottles, plastics, screens, gloves, etc.) were unloaded from drums and passed to the scrap preparation station for manual cutting and shredding. Shredded materials were leached in a nitric acid bath to recover plutonium. Leachate was pumped to the evaporator and solids were bagged-out and packaged for disposal (References C145, P273).

Plutonium nitrate solutions were transferred from the evaporator to glass storage columns. Solutions were circulated, sampled, and pumped to the adjacent load-out station. Plastic cylinders were placed in a holding rack and filled with solutions from the columns. Loaded cylinders were packaged for shipment (References C145, P273).

Analytical Laboratory Support (Building 110)

The wet chemistry and spectrographic laboratories in Building 110 provided analytical support to Building 234. In early years, this lab also supported the Light Water Breeder Reactor Program (References C210, P273, P283, P323, U054).

Segregation and Immobilization of Liquids, Fines, and Residual Materials at NFS

Waste stream OR-NFS-CH-HOM-A was generated from the immobilization of liquids, fines, and other high activity residual materials collected and segregated during the decommissioning of Buildings 110 and 234. In the early-1990s when this waste was transferred from NFS to ORNL for storage, the ORNL Waste Acceptance Criteria (WAC) and WIPP WAC required immobilization of respirable fines (References M007, P268, P269). The immobilization process described below was performed in Building 234 (Reference P274).

Gloveboxes, equipment, exhaust systems, and utility and process lines and systems from Buildings 110 and 234 were decontaminated as necessary prior to processing in the Decontamination and Volume Reduction Facility (DVRF) in Building 234 (References P303, P319, P1371). Loose materials were removed from gloveboxes and process equipment and accumulated in polyethylene bottles. The materials included dry powder sweepings, sludge, paint chips, metal chips and shavings, pellets, rust, wet cheesecloth used to wipe down contaminated surfaces, highly contaminated items such as gasket or paper filter media, or other contaminated debris easily gathered into a small container. These bottles were used to concentrate the contamination removed from gloveboxes and equipment so the bulk of the waste could be packaged at lower activity concentrations (no more than 15 Pu-239 fissile gram equivalent [FGE] as described below). Therefore, these bottles contained relatively large amounts of activity (References C206, P218, P274, P317).

If the bottles did not contain MOX pellets or recoverable powder, the particulate waste was processed to remove respirable fines which were defined as those wastes which contain particulates with greater than one weight percent (wt%) of the material less than 10 microns in diameter, or greater than 15 wt% of the material less than 200 microns in diameter. The bottles of material were bagged into the segregation and immobilization station glovebox located in Building 234 Area C. If moisture was present, the contents of the bottles were emptied onto a screen to filter out large pieces. The particulate material that passed through the screen was dried on a hot plate until respirable fines were liberated. This material was emptied onto a 212 micron sieve screen over a collection pan. The sieve was covered and vibrated for about three minutes. The respirable fines that passed through the 212 micron sieve were emptied into 2-liter HDPE bottles. No more than 500 milliliters of fines were collected in a single bottle (References P218, P274, P300).

The bottles of respirable fines were bagged out of the glovebox and assayed. If the assay value was greater than 80 Pu-239 FGE, the contents of the bottles were separated into two bottles. Water and Portland cement were added to the 2-liter bottles of respirable fines and stirred to achieve a homogeneous mixture. The sieving described above was done for most of the bottles but was discontinued near the end of the project and the residual materials collected in bottles were cemented. The bottles were tamped on the glovebox floor to help settle the cement and eliminate void space. The contents were allowed to cure (uncapped) for at least 24 hours. The immobilized waste was visually inspected for signs of residual liquid and set-up. According to procedure, about a half inch of absorbent was placed on top of the cement to absorb any liquid that could evolve and condense due to thermal cycling. However, previous RTR identified several inches of absorbent on top in some cases. The bottles were capped and bagged out of the glovebox in two un-vented plastic bags which were heat-sealed. The immobilized fines are included in waste stream OR-NFS-CH-HOM-A (References C200, C210, M003, M202, P218, P274).

With the loose materials having been removed, gloveboxes, process equipment, piping, and ventilation duct were introduced into the DVRF where an initial assay determined whether further decontamination was needed. If decontamination was required, items were disassembled or sectioned in the decontamination cell. Focusing on areas identified by the initial assay, manual cleaning methods (e.g., wiping with Radiacwash [contains citric acid and tetrasodium ethylenediamine triacetate]) were employed to decontaminate the items to the extent possible. If additional cleaning was needed, a high-pressure water jet was used to remove the etched in and fixed contamination. The decontaminated items were loaded into the shear/baler where they were cut and compacted. The compacted bales were packaged into 40-gallon drums and sent to Scientific Ecology Group, Inc. (SEG) for further compaction (The compacted waste is not included in waste stream OR-NFS-CH-HOM-A)(References C210, P218, P300, P1371).

Water from the high-pressure water jet would not have been disposed of as TRU waste because it was recirculated through a series of filters and ion-exchange columns. However, Radiacwash decontamination solution generated during manual cleaning of gloveboxes and process equipment was solidified with Portland cement or other solidification media, such as RADSORB (sodium polyacrylate polymer absorbent), which was a common solidification media used by NFS. Liquid waste was packaged in sufficient absorbent material to absorb twice the volume of the liquid. The immobilized decontamination solution is included in waste stream OR-NFS-CH-HOM-A (References C210, M011, P273, P317).

In order to ensure a consistent and uniform geometry that was conducive to assay, 2-liter HDPE bottles of immobilized liquids or fines that exceeded 50 Pu-239 FGE were packaged into a centering sleeve in the middle of a 55-gallon drum. These drums contained only two or three bottles of waste. Bottles containing lower levels of activity were accumulated and packaged directly into a 55-gallon drum without the centering sleeve with less than 50 Pu-239 FGE (References C209, P218). These drums contained between 8 and 28 bottles of immobilized fines (References C203, M003, M051).

The residual materials that did not pass through the initial screening or the sieve described above, and that were sufficiently low in activity, were accumulated in 2-liter HDPE bottles and packaged in 40-gallon drums for subsequent compaction at SEG (the compacted waste is not included in this homogeneous waste stream). Each 40-gallon drum contained no more than 15 Pu-239 FGE. The remainder of the residual materials with more significant radionuclide loading were packaged in separate 55-gallon drums. NFS anticipated only minimal drums of this

concentrated material would be generated (References P218, P300). An examination of the NFS inventory at ORNL from the initial phase of decommissioning did not identify any 55-gallon drums containing only bottles of residual material (Reference M198). RTR conducted in the early-1990s at the Waste Examination and Assay Facility (WEAF) at ORNL shows a couple of bottles of residual materials were packaged into 55-gallon drums along with bottles of immobilized fines or absorbent. However, the WEAF RTR identifies many of the 2-liter HDPE bottles in this waste stream contain what appears to be miscellaneous metal (e.g., sweepings, hardware, tools) mixed throughout a transparent resin matrix. The consistency and density of the resin matrix observed in the WEAF RTR is consistent with an organic polymer absorbent, such as RADSORB, which was a common absorbent used by NFS (References M126, M202). Although not specifically identified in NFS procedures, it is believed that RADSORB absorbent was mixed with the high activity residual materials (References P274, P317).

Waste Stream Material and Chemical Inputs

The following table identifies the Resource Conservation and Recovery Act (RCRA) toxicity characteristic constituents identified in this waste stream. This waste stream is not a listed waste. The use/source of these constituents is provided in the table below and in the hazardous waste determinations section.

Constituent	EPA Hazardous Waste Number	Use/Source
Cadmium	D006	Process line samples of sweepings material and a cadmium-coated wrench
Mercury	D009	Liquid mercury wiped up using cheesecloth and treated with a zinc amalgam

RCRA Determinations

Historical Waste Management

EPA hazardous waste numbers were assigned to waste stream OR-NFS-CH-HOM-A in accordance with RCRA based on a review of available AK documentation identifying chemical usage and potentially hazardous materials that may have been introduced into the waste stream through waste generating operations, MSDS information compiled for commercial products used during decommissioning, and sampling and analysis of glovebox sweeping material by NFS. This waste stream has been historically managed in accordance with ORNL waste management practices in compliance with the requirements imposed by the Tennessee Department of Environment and Conservation (TDEC). Analytical data from process line samples of sweepings material indicate a few samples above the regulatory level for some RCRA-hazardous metals (see the Toxicity Characteristic section below); however, NFS characterized this waste stream as nonhazardous waste with the exception of one drum containing cadmium and mercury.

Hazardous Waste Determinations

Ignitability, Corrosivity, Reactivity

The waste material in waste stream OR-NFS-CH-HOM-A does not meet the definition of ignitability as defined in 40 Code of Federal (CFR) 261.21. The waste is not an oxidizer, and it is not capable of causing fire through friction, absorption of moisture, or spontaneous chemical

change. Respirable fines were immobilized with cement and water, and liquids were immobilized with RADSORB, so the possibility exists that liquids have formed in some drums while in storage. Prior to WIPP disposal, prohibited quantities of liquids will be removed or immobilized. TRU waste generated at NFS was packaged in accordance with waste certification plans to meet ORNL-WAC developed specifically for NFS TRU waste. Efforts were made to prevent the formation of liquids in bottles of immobilized fines by the addition of absorbent to the top of the cement (References C200, M003, P267, P268, P273, P274, P317). This waste will not be pyrophoric, and pyrophorics and compressed gases have not been identified in this waste stream (References M003, M065, P268, P273, P317). The materials in this waste stream are, therefore, not ignitable D001 wastes.

The waste material in waste stream OR-NFS-CH-HOM-A is not liquid and does not contain unreactive corrosive chemicals; therefore, it does not meet the definition of corrosivity as defined in 40 CFR 261.22. Respirable fines were immobilized with cement and water, and liquids were immobilized with RADSORB, so the possibility exists that liquids have formed in some drums while in storage. Prior to WIPP disposal, prohibited quantities of liquids will be removed or immobilized. TRU waste generated at NFS was packaged in accordance with waste certification plans to meet ORNL-WAC developed specifically for NFS TRU waste. Efforts were made to prevent the formation of liquids in bottles of immobilized fines by the addition of absorbent to the top of the cement (References C200, M003, P267, P268, P273, P317). The materials in this waste stream are, therefore, not corrosive D002 wastes.

The waste material in waste stream OR-NFS-CH-HOM-A does not meet the definition of reactivity as defined in 40 CFR 261.23. The waste is stable, will not undergo violent chemical change, and will not detonate. The waste will not react violently with water, form potentially explosive mixtures with water, or generate toxic gases, vapors, or fumes when mixed with water. There is no indication that the waste contains explosive materials, and it is not capable of detonation or explosive reaction. The waste does not contain reactive cyanide or sulfide compounds. TRU waste generated at NFS was packaged in accordance with waste certification plans to meet ORNL-WAC developed specifically for NFS TRU waste. Explosives, reactive metals, reactive cyanides, or reactive sulfides were not identified in the AK documentation reviewed for either Building 234 or Building 110 (References M003, P267, P268, P273, P317). *NFS Radwaste Package Certification Records* indicate that the waste is not readily capable of detonation, explosive decomposition, reaction at normal pressures and temperatures, or an explosive reaction with water (Reference M003). The materials in this waste stream are, therefore, not reactive D003 wastes.

Toxicity Characteristic

Waste stream OR-NFS-CH-HOM-A exhibits the characteristic of toxicity for metal compounds as defined in 40 CFR 261.24.

Toxicity characteristic metals constituents were not identified in the MOX fuel production process (Reference P273). Products used during decommissioning did not contain toxicity characteristic metals constituents (Reference M011). Analytical data from six process line samples of sweepings material identified a few samples above the regulatory level for arsenic, barium, and cadmium. Other sources for cadmium and mercury were also identified.

- Arsenic was detected in five of six samples at concentrations of 0.13, 0.51, 0.62, 4.4, and 5.7 mg/L. Only one of these results is above the regulatory level of 5.0 mg/L, and the UCL90 of these six samples is below the regulatory level (References C205, M064,

M235, P273, U043). Therefore, EPA hazardous waste number D004 is not assigned to the waste stream.

- Barium was detected in all six samples at 0.57, 1.4, 38, 124, 222, and 301 mg/L. Three of these are above the regulatory level of 100 mg/L, and the UCL90 of these six samples is above the regulatory level. However, the method blank contained 193 mg/L which is also above the regulatory level. The barium may have been introduced from one of the extraction columns used in the analysis which is a problem encountered periodically (References C205, M064, M235, P273, U043). Therefore, EPA hazardous waste number D005 is not assigned to the waste stream.

- Cadmium was reported in all six samples at 0.04, 0.15, 1.2, 1.3, 1.5, and 24 mg/L. Four of these are above the regulatory level of 1.0 mg/L. The 24 mg/L cadmium value was outside the expected distribution from the other sample points, and consequently, this area was re-sampled. A sample composite was made of three parts new sample to one part previous sample. The result of the composite sample was 6.27 mg/L. The UCL90 of these six samples is above the regulatory level (References C205, M064, M235, P273, U043). Also, a cadmium-coated wrench is located in one of the 2-liter HDPE bottles containing absorbent (References C210, U043). Therefore, EPA hazardous waste number D006 is assigned to the waste stream.

- Chromium, lead, and silver were detected in all six samples but below the regulatory level of 5.0 mg/L. Selenium was not detected in any of the samples (References C205, M064, P273, U043). Therefore, EPA hazardous waste numbers D007, D008, D010, and D011 are not assigned to the waste stream.

- Mercury was not detected in any of the samples (References C205, M064, P273, U043). However, waste was also generated from the cleanup of mercury from a regulator gauge located inside a glovebox. The liquid mercury was wiped up from the glovebox floor using cheesecloth. The mercury contaminated cleanup material, and other mercury contaminated waste from the floor of the glovebox (e.g., plexiglass and small metal items) were placed into 2-liter bottles and treated with a zinc amalgam (References C204, C210, M052). Therefore, EPA hazardous waste number D009 is assigned to the waste stream.

Therefore, EPA hazardous waste numbers D006 (cadmium) and D009 (mercury) are assigned to waste stream OR-NFS-CH-HOM-A. However, EPA hazardous waste numbers D004, D005, D007, D008, D010, and D011 are not assigned to this waste stream (Reference DR031).

Waste stream OR-NFS-CH-HOM-A does not meet the definition of toxicity for organic compounds as defined in 40 CFR 261.24. Toxicity characteristic organic compounds were not identified in the MOX fuel production process (Reference P273). Products used during decommissioning did not contain toxicity characteristic organic compounds (Reference M011). No organic constituents were detected in the process line samples of sweeping materials (Reference U043).

Listed Waste

F-Listed Waste

Waste stream OR-NFS-CH-HOM-A is not an F-listed hazardous waste because the grouted fines were not mixed with hazardous wastes from non-specific sources as listed in 40 CFR 261.31.

Products used during decommissioning did not contain listed solvents (Reference M011). The only listed solvents identified in the MOX fuel production process were methylene chloride and trichlorotrifluoroethane contained in a binder material. As part of MOX fuel production, blended oxide was granulated using an oscillating device and stainless-steel screen. Binder was added to cross-blends during granulation. One of the binders used was Oxylene M-6 which contained 81 percent methylene chloride and 19 percent trichlorotrifluoroethane, both of which are F002-listed solvents. Use of this binder does not constitute a listed hazardous waste because these constituents were used as reactants or ingredients in the formulation of a commercial product. The TDEC concurred with this determination (References C142, P273).

NFS soil and debris waste containing small amounts of soil have been assigned F002 for tetrachloroethylene contamination in the soil beneath Building 234. This solvent was not used during decommissioning or in the MOX fuel production process, and therefore will not be a contaminant in the immobilized liquids and fines waste. Therefore, F002 is not assigned to waste stream OR-NFS-CH-HOM-A.

K-Listed Waste

The material in this waste stream is not hazardous from specific sources since it was not generated from any of the processes listed in 40 CFR 261.32.

P- and U-Listed Wastes

Waste stream OR-NFS-CH-HOM-A does not contain a discarded commercial chemical product, an off-specification commercial chemical product, or a container residue or spill residue thereof listed in 40 CFR 261.33. Based on the AK documentation reviewed, U- and P-listed compounds were not used during MOX production or facility decommissioning. Therefore, U- and P-listed EPA hazardous waste numbers, including U134 (hydrofluoric acid) and P015 (beryllium powder), are not assigned to this waste stream (References C210, M011, P273).

Polychlorinated Biphenyls (PCBs)

This waste stream does not contain PCBs greater than 50 ppm, and therefore, is not regulated as a TSCA waste under 40 CFR 761. Analysis of process line samples of sweepings material indicate PCBs are well below 50 ppm (Reference C205, M064, P273, U043). RADSORB organic polymer absorbent was used to immobilize aqueous solutions only. Hydraulic fluids and oils were collected separately and sent to SEG for incineration (References C210, P317).

Prohibited Items

The HDPE 2-liter bottles were removed from the glovebox in two unvented heat-sealed bags (References C203, P218, P274, P320). Based on a review of the WEAF RTR tapes, the heat-sealed bags may be greater than four liters (fully expanded volume), and the surface area may

be less than 390 square inches (Reference M126). For this reason, every drum in this waste stream will be repackaged to breach all of the heat-sealed bags.

When the NFS waste was received at ORNL in the early-1990s, the drums underwent RTR which did not identify liquids in the majority of the drums but did discover liquid in one bottle inside drum NFS0480. Absorbent was added to the bottle. The drum number was then changed to NFS0865 (References C200, M003, M053, M065).

Certified RTR is performed by CCP to ensure the waste does not contain prohibited items in accordance with the WIPP-WAC and WIPP-WAP.

Method for Determining Waste Material Parameters (WMPs) Weights per Unit of Waste

The waste material parameter weight estimates for waste stream OR-NFS-CH-HOM-A were derived from NFS container disposal paperwork, procedures, product information, and a review of previous WEAF RTR data.

NFS Form 28-001, TRU Waste Data Package, lists the gross weight and tare weight for each drum. The reported tare weights vary, and based on a review of the WEAF RTR data, it appears the tare weights include some inner packaging materials (e.g., rigid liner, centering sleeve). It is assumed that the 2-liter HDPE bottles and heat-sealed bags are not included in the tare weight (References M003, M126). According to product information, a Nalgene® 2-liter HDPE wide-mouth bottle weighs 200 grams. The weight of a typical bag-out bag provided in RTR procedure CCP-TP-053 is 100 grams. Each HDPE bottle is contained in two plastic bag-out bags (References 15, C203, P274, P320). The plastic bags and 2-liter HDPE bottles are included in the table as "plastics (waste materials)." For the purpose of estimating waste material parameter weights, other packaging materials are not included in the calculation.

The weight of the immobilized waste was calculated by summing the weights of the HDPE bottles and plastic bags and subtracting this total from the net weight of each drum. The WEAF RTR was reviewed to determine the contents of each bottle and to estimate the volume utilization and the volume percentage of the different materials in each bottle (References M126, M202). These percentages were converted to actual volumes and then to weights based on an assumed density for the different waste materials (i.e., grouted fines, RADSORB organic polymer absorbent, and miscellaneous metals).

According to the NFS procedure for segregation and immobilization of particulate fines, the amount of fines in a 2-liter HDPE bottle varied, and the amount of cement and water mixed with the fines varied depending on the amount of fines (Reference P274). The density of the fines material is unknown so the density of the immobilized fines cannot be calculated. Instead, a density of 2.403 is assumed which is the density of concrete with gravel and of wet mortar.

Review of the WEAF RTR data by CCP identified numerous 2-liter HDPE bottles containing miscellaneous metals throughout a transparent resin matrix. The metals included scrap, sweepings, hardware (e.g., nuts, bolts, washers), and hand tools (e.g., screwdriver, wrench) (Reference M202). To calculate the iron-based metal/alloy weights for AK, a density of 7.85 was used. Based on a comparison of the net weights to the calculated waste material parameter weights, it appears that the volume of metals was overestimated by CCP in the review of the WEAF RTR. The metal volume percentages were adjusted so the net weights and

calculated waste material parameter weights were more comparable. It is possible other residual debris materials may be contained in the resin matrix but cannot be identified by RTR due to their lower densities.

The consistency and density of the resin matrix observed in the WEAF RTR is consistent with an organic polymer absorbent, such as RADSORB, which is a solid, granular, cross-linked homopolymer, and was a common absorbent used by NFS. RADSORB has an average density of 0.62 and can absorb up to 250 times its weight in water and up to 30 times its weight in aqueous solutions such as Radiacwash decontamination solution (Reference M011). However, based on the net weights of the waste, it doesn't appear as if the bottles contain anywhere near that amount of liquid.

Waste Material Parameter Estimates for OR-NFS-CH-HOM-A

Waste Material Parameter	Weight Percent	Weight Percent Range
Iron-based Metals/Alloys	6.1%	0% - 57.3%
Aluminum-based Metals/Alloys	0%	0%
Other Metals	0%	0%
Other Inorganic Materials	0%	0%
Cellulosics	0%	0%
Rubber	0%	0%
Plastic (waste materials)	12.2%	10.4% - 32.8%
Organic Matrix	9.8%	2.5% - 50.1%
Inorganic Matrix	71.9%	0% - 85.6%
Soils/Gravel	0%	0%

List of AK Sufficiency Determinations Requested for the Waste Stream

No AK Sufficiency Determinations were requested for this waste stream.

Transportation

This waste stream and its chemical constituents have been reviewed for consistency with the listed TRUCON codes and they are consistent.

Beryllium

Based on the AK documentation reviewed, beryllium was not used by NFS (Reference C210). Therefore, beryllium will not be present in amounts greater than one percent by weight of the waste in any drum.

Radionuclide Information

To determine isotopic ratios for waste stream OR-NFS-CH-HOM-A as a whole, the total gram value for each individual radionuclide was divided by the total mass of all radioactive constituents in the waste stream and converted to a percentage. This result is listed as "Total Radionuclide Wt%." To determine the radionuclide Wt% range for individual containers, the radiological mass in each container in the waste stream was summed. The mass of each individual radionuclide in a container was divided by the total radiological mass for that

container and converted to a percentage. The minimum and maximum results are listed as "Radionuclide Wt% Range for Individual Containers." The same process was applied to determine "Total Radionuclide Ci%" and "Radionuclide Ci% Range for Individual Containers."

As shown in the Waste Stream OR-NFS-CH-HOM-A Radiological Characterization table, U-238 is the most predominant radionuclide by mass, and Pu-239 is the second most predominant radionuclide by mass based on AK. The radionuclide weight percent of individual radionuclides varies on a container-by-container basis. Because of this variability, some containers will not include the waste stream predominant radionuclides but may include other radionuclides expected in this waste stream. Payload management will not be utilized for this waste stream; however, radioassay data indicate that the TRU alpha activity concentration in each of the drums in this waste stream is more than 100 nCi/g (References M003, M012, M198).

Waste Stream OR-NFS-CH-HOM-A Radiological Characterization

Isotope	Total Radionuclide Wt%[1]	Radionuclide Wt% Range for Individual Containers[2]	Total Radionuclide Ci%[3]	Radionuclide Ci% Range for Individual Containers[4]	Suspected Present (Yes/No)
WIPP Required Radionuclides					
Am-241	0.10%	0.01% - 2.86%[7]	2.58%	0.58% - 3.78%	Yes[6]
Pu-238	0.01%	Trace - 0.43%[7]	1.59%	0.55% - 22.66%	Yes
Pu-239	12.81%	3.53% - 90.94%[7]	6.20%	1.59% - 16.73%	Yes
Pu-240	1.94%	0.67% - 23.37%	3.44%	1.42% - 7.16%	Yes
Pu-242	0.02%	0.00% - 1.17%[7]	Trace[5]	Trace - Trace	Yes
U-233	Trace	0.00% - Trace	Trace	0.00% - Trace	Yes[9]
U-234	3.88%	0.00% - 4.00%[7]	0.19%	0.00% - 0.49%	Yes
U-238	80.74%	0.00% - 99.69%[7]	Trace	0.00% - Trace	Yes
Cs-137	Trace	0.00% - Trace	Trace	0.00% - Trace	Yes
Sr-90	Trace	0.00% - Trace	Trace	0.00% - Trace	Yes[8]
Additional Radionuclides					
Pu-241	0.11%	0.04% - 2.91%[7]	86.00%	65.35% - 94.70%	Yes[6]
U-235	0.40%	0.00% - 5.01%[7]	Trace	0.00% - Trace	Yes

1. This listing indicates the total Wt% of each radionuclide over the entire waste stream.
2. This listing is the Wt% range of each radionuclide on a container-by-container basis. Some containers with "0" listed as the lower range, will not contain the specified radionuclide.
3. This listing indicates the total activity Ci% of each radionuclide over the entire waste stream.
4. This listing is the Ci% range of each radionuclide on a container-by-container basis.
5. "Trace" indicates <0.01% for that radionuclide.
6. Am-241 may be present in slightly larger percentages, and Pu-241 in smaller percentages due to the decay of Pu-241.
7. These Wt% ranges were expanded based on plutonium and uranium isotopic distribution data (see AKSR Table 7-3).
8. Sr-90 cannot be quantified by gamma spectroscopy. Its value is calculated based on measured Cs-137 values. A Sr-90/Cs-137 scaling factor of 1.0 is used to calculate Sr-90.
9. U-233 was not reported in NFS waste assay data for any of the grouted fines drums; however, there is a potential for U-233 in this waste because some of the fines originated in the Building 110 laboratory which did handle U-233.

Source Documents

Tracking Number	Title
C099	Letter to Harold Johnson, CBFO DOE re: KAPL-NFS Transuranic Waste Background Information
C100	Interview with Richard Booth and faxed defense and waste information for NFS; Erwin, TN TRU waste
C119	Removal of Contaminated Pipe, Building 234 Area B, Memo to Ron Mitchell, Letter of Authorization (LOA)
C120	Removal of Contaminated Piping, Building 234, Memo to Larry Burleson, Letter of Authorization (LOA)
C121	DVRF Bale Packaging Glovebox Removal, Memo to Ron Mitchell
C122	Building 234 Characterization Results, Memo to Heather Little
C125	Cleaning and Surveying the DVRF Shear Baler for PCBs, Memo to Building 234 Supervision
C126	Waste Packaging of the DVRF Decon Cell Perma-Con Structure, Memo to Richard A. Moore
C127	Size Reduction of the NDA Station 2 Glovebox In the DVRF Decontamination Cell, Memo to Ron Mitchell and Rick Leitner
C129	Size Reduction Process Ductwork within the Decontamination Cell, DVRF, Memo to Ron Mitchell and Rick Leitner
C130	Cleanout of DVRF Bale Packaging Glovebox, Memo to Ron Mitchell and Rick Leitner
C142	Legal Analysis regarding Solvent Binder Used to Make Fuel
C143	Memo to F. J. Schultz re: NFS Project Update from the WEAF
C144	Memo to Distribution re: Experience in Receipt and Inspection of Waste Shipments from Nuclear Fuel Services, Inc.
C145	Memo to Distribution re: Nuclear Fuel Services, In. (NFS) Background Information
C146	Paper from EPA website: Waste Minimization Assessment for a Manufacturer Producing Printed Circuit Boards
C147	Retrieved from EPA website: Consumer Product links for Mercury
C200	Internal Correspondence to M.W. Tull subject: On the Use of Rad-Sorb in NFS TRU-Waste Drums
C201	Letter to Mr. Bill Reynolds, EcoTek from Terry Wickland, Product Engineer regarding Seal for 16 gauge DOT 17H stainless steel drum lid
C202	Letter from Scott A. Toler to L.C.M. Roddeye regarding formal request for variance from Section 4.5.5 of the ORNL/NFS: NFS Waste Parameter Verification Program
C203	Letter to Martin Tull from Robert A. Hunt regarding a picture of the proposed method to "lab pack" bottles of immobilized respirable fines and residual materials
C204	Letter to Martin W. Tull, Martin Marietta Energy Systems, from Michael L. West, Nuclear Fuel Services, Inc. regarding response to his request for information relating to the discovery of mercury during the decommissioning of Station #15 in Building 234.
C205	Internal Correspondence to Distribution regarding Minutes of November 5, 1991 Meeting with NFS Regarding Process-Line Samples

Tracking Number	Title
C206	Numerous Faxes containing handwritten notes (oversight reports) from Paul O. Emerson re: such items as sampling the top of the underground tank, Pu Crew activities, equipment issues, processing of gloveboxes, and information on drums that were packaged.
C209	Internal Correspondence to F.J. Shultz from J.A. Chapman regarding NFS Project Accomplishments for Month of April 1992
C210	Interview re: NFS TRU Waste Shipped to Oak Ridge National Laboratory. Interviewees: Richard Booth, Richard Moore, Bob Hunt, Scott Toller, Marie Moore
C227	Interview with Scott Morie from NFS
C230	E-mail from Brian Oakley to Jeff Harrison, RE: NFS Schedule
C309	Record of Communication Subject: NFS Soil Sampling/Analysis Data Tetrachloroethylene Use
C321	Record of Communication. Subject: Soil and Groundwater Treatment Sludge to be Generated in 2011.
C622	Email from Don Coffey to Jeff Harrison RE: NFS BBA REPACKS NFS0385 A-H
DR001	Discrepancy Resolution re: OR-NFS-CH-HET EPA Hazardous Waste Numbers
DR002	Discrepancy Resolution for OR-NFS-CH-HET re: Radionuclides
DR006	Discrepancy Resolution re: Physical Form of NFS-0116 & NFS-0929
DR010	Discrepancy Resolution re: Incorrect Waste Stream Assignment of Soil Waste Containers
DR013	Discrepancy Resolution re: NFS Soil and Debris EPA Hazardous Waste Numbers
DR015	Discrepancy Resolution re: OR-NFS-CH-HET-A Heterogeneous Debris from NFS
DR022	Discrepancy Resolution re: OR-NFS-CH-SOIL and OR-NPS-CH-HET-A Waste Stream Designation
DR023	Discrepancy Resolution re: NFS0815 and X10C0506069
DR026	Discrepancy Resolution re: Reassignment of NFS815 to OR-NFS-CH-SOIL
DR030	Discrepancy Resolution re: Drum NFS0929
DR031	Discrepancy Resolution re: OR-NFS-CH-HOM-A EPA Hazardous Waste Number Assignment
DR037	Discrepancy Resolution re: Drum NFS0788A
DR038	Discrepancy Resolution re: Drum NFS0815
I022	DOE Order 435.1, Radioactive Waste Management
I023	Radioactive Waste Management Manual
I043	Implementation Guide for Use with DOE M 435.1-1
I052	Memorandum; Building 234 Shear Baler Characterization Samples
I053	KAPL-TN Waste Profile for NFS Building 234 Soil
I056	Removal of Building 234 Wet Cell Permacon Containment Enclosure
I058	Dismantlement of the West Wet Cell Wall in Building 234
I059	Waste Packaging of Wet Cell Wall in Building 234

Tracking Number	Title
I061	Size Reduction of the DVRS Glovebox
I067	Procedure for the Operation of the Versatile Automated Gamma Assay System (VAGAS)
I068	Size Reduction of 4-inch Diameter Duct Section in Area C
M003	ORNL UCN-2109 and UCN-2822 Forms for NFS TRU Waste and Related Paperwork for Waste Stored at ORNL (container paperwork)
M007	Internal Correspondence and the Environmental Assessment for the Receipt and Storage at ORNL, of Transuranic Waste, Mixed Transuranic Waste, and Mixed Oxide Waste from Nuclear Fuels and the Environmental Assessment for Disposition of Transuranic Waste
M008	Fax from John E. Kirkpatrick to Robert C. Mason on 01/16/1991 and the PuO2 + UO2 (mixed oxide) fuel production flow chart for Pellet Production, Rod/Assembly Fabrication, Scrap Dissolution/Recovery
M011	MSDS (Material Safety Data Sheets) for Products used at NFS
M012	EM Waste Database Query - Container Information; Waste Description; Isotopes
M013	EM Waste Database Query - NFS Box Daughter and Repack Drums: Container; Waste Description; Isotopes
M016	Incoming Container Travelers for NFS Waste - VE Data
M017	NFS NDA Data from Foster Wheeler (by container)
M018	NFS Radiography (NDE) Data from Foster Wheeler (by container)
M019	NFS VE Data from Foster Wheeler (by container)
M020	NFS HSG Data from Foster Wheeler (by container)
M021	Defense Determination Approval for ORNL/NFS-HD-001, Heterogeneous Debris - NFS
M050	Photos of the Site
M051	Fax from Bob Hunt from Martin Tull transmitting drawing for EcoTek - The Hunt 55 Gallon Poly. Insert
M052	Account Book No. S149 - DVRF Decommissioning and Volume Reduction Facility
M053	Letter from L.C.M. Roddye to R.L. Booth regarding Nuclear Fuel Services, Inc. - Contract DE-SCOT-86ID12630 - Closure of Nonconformance Reports NCR-X-94-WMRAD-0011, NCR-X-94-WMRAD-0012, NCR-X-94-WMRAD-0013, NCR-X-94-WMRAD-0014 AND NCR-X-94-WMRAD-0015
M054	Internal Correspondence to Distribution from D.W. Turner regarding Information Concerning NFS D&D Operations
M058	(Handwritten Document) Methods for: Measuring Activity in Baled Waste; Flowsheet for Immobilizing Fines; Assigning Values to Soil; Flowsheet for Packaging and Measuring Raschig Rings
M059	Memo transmitting NCR-X-WMRAD-0015 for Liquid in Liners
M060	Correction Actions to Prevent Recurrence of NCR-X-94-WMRAD-0011
M061	Internal Correspondence to Distribution from J.A. Chapman regarding An Evaluation of NFS Isotopic Estimates by Gamma-ray and Alpha-particle Spectroscopy
M062	NFS Data Set No. 2 PCB Reanalysis of Gasket and K1 Samples

Tracking Number	Title
M063	NFS Data Sheet No. 3 PCB Analysis of Fresh Gasket and Pall Filter Samples and Cadmium in Pall Filter TCLP Leachate
M064	Analysis Results for Process Line Samples from Nuclear Fuel Services, Inc. and NFS Sample Set No. 3
M065	WEAF Data for NFS Drums (by container); WEAF Waste Acceptance Report; NFS Storage Project (by container)
M066	Surveillance: Source Surveillance at Scientific Ecology Group, Oak Ridge, TN
M067	Surveillance: Source surveillance for Contact-Handled Transuranic and Mixed Oxide Wastes
M068	Review of WEAF RTR Video Tapes
M075	TWPC Contact Handled Waste Repackaging Data Forms for NFS Waste. (container paperwork)
M076	Evaluations of Additional Containers for Waste Stream OR-NFS-CH-HET-A (drum additions)
M126	RTR Video Tapes and DVDs from the WEAF Facility for Oak Ridge Waste
M128	Evaluation of Additional Containers for Waste Stream OR-NFS-CH-SOIL dated September 5, 2008
M129	Evaluation of Additional Containers for Waste Stream OR-NFS-CH-HET, dated 9/8/2008
M130	Evaluation of Additional Containers for Waste Stream OR-NFS-CH-HET dated 09/15/2008
M131	Evaluation of Additional Containers for Waste Stream OR-NFS-CH-HET dated 11/30/2007
M132	Evaluation of Additional Containers for Waste Stream OR-NFS-CH-SOIL dated 9/24/2008
M133	Evaluation of Additional Containers for Waste Stream OR-NFS-CH-HET dated 09/24/2008
M198	eMWaste Query from ORNL Dated 08/30/2010
M202	Review of WEAF RTR Videos for NFS Immobilized Liquids and Fines
M206	Wet Cell Excavation TRU Waste Shipping Schedule
M207	NFS Waste Container Packaging Forms
M208	Evaluation of Drums for Waste Stream OR-NFS-CH-SOIL from NFS Final Decommissioning Phase
M209	Evaluation of Drums for Waste Stream OR-NFS-CH-HOM-B from NFS Final Decommissioning Phase
M210	TRU Project Waste Processing Facility Job Recipe. Subject: Soil-like Waste Remediation
M211	Evaluation of NFS Groundwater Data
M213	Duratek buys waste processing company
M214	EnergySolutions OKs deal to buy Duratek
M215	EnergySolutions Locations

Tracking Number	Title
M216	Evaluation of Additional Containers for Waste Stream OR-NFS-CH-HET-A
M217	eMWaste Database Query from ORNL Dated 01/03/2013
M235	Evaluation of Data from Source Document M064
P014	Inventory of ORNL Remedial Action Sites: 11. Research Laboratories
P212	Lattice Experiments with Simulated Burned-Up Fuel for D2O Power Reactors
P218	Oak Ridge National Laboratory/Nuclear Fuel Services, Inc. NFS Waste Parameter Verification Program
P248	Structural Assessment of Building 234 Prepared for NFS, 1205 Banner Hill Road, Erwin, TN 37650
P251	Box Breakdown Area Operations
P252	Glove Box Operations
P253	Drum Bag In/Bag Out and Glove Ports
P254	Contact Handled Waste Repackaging
P255	Contact handled Waste Acceptance Criteria
P256	TRU/Alpha Low Level Waste (LLW) Treatment Project Documented Safety Analysis
P267	Nuclear Fuel Services Waste Acceptance and Storage Procedure
P268	ORNL WAC for Contact Handled Transuranic and Mixed Oxide Wastes from Nuclear Fuel Services INC.
P269	ORNL Waste Acceptance Criteria for Transuranic Waste from the Nuclear Fuel Services, Inc.; ORNL WAC for Contact-Handled Transuranic and Mixed Oxide Wastes from Nuclear Fuel Services, Inc.
P272	Oak Ridge National Laboratory Waste Management Plan
P273	Nuclear Fuel Services, Inc., Waste Certification Plan for Transuranic Waste
P274	Segregation and Immobilization of Particulate Fines
P276	Determination of H2 Diffusion Rates through Various Closures on TRU Waste Bag-Out Bags
P283	Plutonium Facilities Decommissioning Project Plan Condition Addendum
P300	Operation of the Decontamination and Volume Reduction Facility
P301	Wet Cell
P303	Removal of Exhaust Systems
P304	Removal of Asbestos-Bearing Materials
P306	Excavation of 110 Lab Tank
P312	Maintenance for Plutonium Decommissioning
P315	Wet Cell Soil Excavation and Mixing
P316	Investigation of DOE-ORNL Nonconformance Reports for Building 234 Plutonium Shipments (Surface Contamination, Free Standing Liquids, Missing Liner Lid)
P317	Packaging for Shipment to Processing, Storage, or Burial
P319	Preparation of Gloveboxes for Decontamination in the DVRF
P320	Bag-Out and Glove Change
P321	Determination of Plutonium Isotopics for Building 110 and 234
P323	Status of Former Mixed Oxide Fuel Fabrication Facility
P432	TRU Waste Processing Center Document Safety Analysis
P582	PCB Decontamination
P1116	EnergX TRU Waste Processing Center Procedure: Absorbing Liquids
P1370	Evaluation of Techniques for Conditioning and Packaging Plutonium Contaminated Soil
P1371	Procedure for Removal and Decontamination of Utility and Process Lines and Systems

Tracking Number	Title
P1372	Building 234 Soil, Groundwater, and Groundwater Sludge Sampling and Analysis Plan (NFS)
P1373	Project Management Plan for Wet Cell Soil Excavation (NFS)
P1374	Characterization of Building 234 Waste (NFS)
P1375	North Site Characterization Report for Nuclear Fuel Services, Erwin, Tennessee
P1398	TRU Waste Processing Center, High Density Waste Item Repackaging
P1399	Operating Procedure for the 234 Excavation Facility Groundwater Pretreatment System
P1400	Operating Procedure for Soil Excavation, Processing and Packaging for the 234 Excavation Facility
P1401	Waste Packaging for WIPP Disposal
P1402	234 Wet Cell Characterization Summary
P1403	Operation of the ORTEC Mobile Counting System
P1404	Final Report: Solidification Testing for 234 Excavation Facility Decommissioning Project
P1405	Geochemical Survey of the Unaka Mountain Roadless Area, Unicoi County, Tennessee
P1407	TWPC Procedure - Pipe Overpack Container Operations
P1409	Attachment K: Compacted Drum Puck Standing Recipe, Job Recipe Number: OPSJR-STANDING-09
P1413	TRU Waste Compactor Operation
P1414	Radioactive Material Receipt
P1415	Radioactive Material Shipment to CNSI Barnwell, US Ecology Richland, and to Customer
P1416	TRU Waste Receipt and Shipment
U016	A Graphical Workbook for Estimating Important Quantities of NFS Radioactive Waste Constituents
U017	The Intercomparison of NDA Measurements on CH-TRU Waste Between Nuclear Fuel Services, Inc. and Oak Ridge National Laboratory
U038	ORNL TRU Waste Historical Survey; Volumes 1, 2, and 3—Origins and Characteristics of Remote-Handled Transuranic Wastes (Trabalka report) Plus Appendices
U040	NFS response to "Transuranic Waste Baseline Inventory Report Questionnaire"
U043	Final Report - Waste Characterization of Wastes Generated from D&D Activity; Buildings 110 and 234 on the NFS Site in Erwin, Tennessee
U044	Weston Report: Acceptable Knowledge Summary Report for Oak Ridge National Laboratory Contact-Handled TRU Debris Waste Facility Maintenance Operations
U050	Action Description Memorandum for Disposition of Transuranic Waste and Plutonium Scrap from Nuclear Fuel Services, Inc.
U051	Return of 55-Gallon Stainless Steel Drums for Addition of Radsorb
U052	Decommissioning Strategy in Today's Environments
U054	Decontamination and Decommissioning of a Plutonium Fabrication Facility
U055	Abstract, Calibration Schemes and Measurement Techniques
U057	An Interim Report on A Time-Series Analysis of the Events Leading up to the Detection of Free-Liquid in NFS Supercompacted Drums
U058	Oak Ridge National Laboratory/Nuclear Fuel Services Inc. NFS Waste Parameter Verification Program
U597	Building 234 Groundwater Design of Experiment (Groundwater Monitoring Data) (NFS)

DIVIDER

PAGE

Stewart, Judith - CTAC

From: Schrock, Beverly - NWP
Sent: Tuesday, April 26, 2016 8:31 AM
To: Stewart, Judith - CTAC; Blauvelt, Richard
Subject: DQO Page out of the WSPF for OR-NFS-CH-HOM-A corrected
Attachments: OR-NFS-CH-HOM-A WSPF DRaft.pdf

Judith and Dick,

This page was corrected in May of 2015, but not loaded up to Dixon. Since there have been no movement on WSPF this "Draft" will be looked at closely before submitting.

If you have any questions, please let me know. Dick, I sent Jeff and Steve the info you shared with me yesterday.

Thank you,
Bev

Beverly S. Schrock
Site Project Manager
Central Characterization Program
Nuclear Waste Partnership, LLC
Contractor for the U.S. Department of Energy
(575) 234-7444
(575) 706-0809 Cell

CCP Reconciliation with Data Quality Objectives

WSPF# OR-NFS-CH-HOM-A Lot # 1

Sampling Completeness

RTR/VE:

Number of Valid Samples: 5 Number of Total Samples Analyzed: 5
Percent Complete: 100 (QAO is 100%)

Radiological:

Number of Valid Samples: 5 Number of Total Samples Analyzed: 5
Percent Complete: 100 (QAO is 100%)

	Y/N/NA	Reconciliation Parameter
1	Y	Waste Matrix Code.
2	Y	Waste Material Parameter Weights.
3	Y	The TRU activity reported in the BDRs for each container demonstrates with a 95% probability that the container of waste contains TRU radioactive waste.
4	N	AK Sufficiency. Is there an approved AK sufficiency Determination for this waste stream?
5	Y	The data demonstrates whether the waste stream exhibits a toxicity characteristic under Title 40 Code of Federal Regulations (CFR), Part 261, Identification and Listing of Hazardous Waste, Subpart C, Characteristics of Hazardous Waste.
6	N	Does the waste stream contain listed waste found in 20.4.1.200 NMAC incorporating 40 CFR Part 261, Subpart D, Lists of Hazardous Wastes.
7	Y	Waste stream can be classified as hazardous or nonhazardous.
8	Y	The overall completeness, comparability, and representativeness QAOs were met for each of the analytical and testing procedures as specified in the WAP Sections C3-1 through C3-2 prior to submittal of a waste stream profile form for a waste steam or waste stream lot.

	Completeness	Comparability	Representativeness
Radiography	Y	Y	Y
VE	NA	NA	NA

Comments: None

Roger Whiteaker 05/06/2015

Signature of Site Project Manager Printed Name Date

Washington
TRU Solutions LLC

CP:10:01017
UFC:5900.00

INTER-OFFICE CORRESPONDENCE

DATE: January 13, 2010

FROM: R. P. Kantrowitz R.P.K. LOCATION: Certification

TO: CCP Records Custodian GSA-212 LOCATION: Retrieval, Characterization & Transportation

SUBJECT: TRANSMITTAL OF OAK RIDGE NATIONAL LABORATORY WASTE STREAM PROFILE FORM FOR WASTE STREAM #OR-REDC-CH-HET

Please accept the attached Oak Ridge National Laboratory Waste Stream Profile Form to be placed in Records for Waste Stream #OR-REDC-CH-HET.

RPK:jmc

Attachment

cc: (without attachment)

M. Pearcy ED
W. Weyerman ED

ORIGINAL

Washington
TRU Solutions LLC

WRES:09:153
UFC:5822.00

April 21, 2009

Mr. D. H. Haar, Manager
Central Characterization Project
Washington TRU Solutions LLC
P. O. Box 2078
Carlsbad, NM 88221-2078

Subject: TRANSMITTAL OF APPROVED CENTRAL CHARACTERIZATION PROJECT WASTE STREAM PROFILE FORM NUMBER OR-REDC-CH-HET, HETEROGENEOUS DEBRIS FROM THE RADIOCHEMICAL ENGINEERING DEVELOPMENT CENTER

Dear Mr. Haar:

Washington TRU Solutions LLC, on behalf of the Permittees, has evaluated the Central Characterization Project (CCP) Waste Stream Profile Form (WSPF) Number OR-REDC-CH-HET, Heterogeneous Debris from the Radiochemical Engineering Development Center. We have concluded that the WSPF is complete and that the waste stream determination was made in accordance with applicable procedures and guidance.

The Permittees therefore approve the WSPF as submitted. Using the methods approved for CCP-ORNL, CCP- ORNL may enter the data into the certification and shipping modules of the WIPP Waste Information System.

If you have any questions, please contact me at (575) 234-7545.

Sincerely,

W. M. Wierzbicki, Manager
Regulatory Compliance

KSG:dg

Enclosure

cc:	C. Fesmire, CBFO	ED
	C. Gadbury, CBFO	ED
	D. Miehls, CBFO	ED
	M. Navarrete, CBFO	ED
	K. Watson, CBFO	ED
	P. Gilbert, LANL	ED
	S. Lott, LANL	ED
	G. Lyshik, LANL	ED
	CBFO, M&RC	
	WIPP Operating Record	459-09

Attachment 2 –CCP Waste Stream Profile Form

(1) Waste Stream Profile Number: OR-REDC-CH-HET							
(2) Generator site name: Oak Ridge National Laboratory					(4)Technical contact: Candice Weston		
(3) Generator site EPA ID: TN1890090003					(6) Technical contact phone number: 303-843-2305		
(5) Date of audit report approval by New Mexico Environment Department (NMED): 4/24/2008							
(7) Title, version number, and date of documents used for WAP Certification: CCP-PO-001, CCP Transuranic Waste Characterization Quality Assurance Project Plan, Revision 16, October 31, 2007. CCP-PO-002, CCP Transuranic Waste Certification Plan, Revision 21, January 26, 2009 CCP-PO-027 CCP/TRU Waste Processing Center/Oakridge National Laboratory Interface Document, Revision 0, October 2, 2007.							
(8) Did your facility generate this waste?	YES	X	NO				
(9) If no, provide the name and EPA ID of the original generator: NA							
Waste Stream Information[1]							
(10) WIPP ID: OR-W203[3]					(11) Summary Category Group: S5000		
(12) Waste Matrix Code Group: Heterogeneous Debris Waste					(13) Waste Stream Name: Heterogeneous debris from the Radiochemical Engineering Development Center		
(14) Description from the TWBIR: Hot cell debris waste.							
(15) Defense TRU Waste:	YES	X	NO				
(16) Check One:	CH	X	RH				
(17) Number of SWBs: N/A		(18) Number of Drums: 2,031 55-gallon			(19) Number of Canisters: N/A		
(20) Batch Data report numbers supporting this waste stream characterization: See Characterization Information Summary (CIS) Correlation of Container Identification Numbers to Batch Data Report Numbers							
(21) List applicable EPA Hazardous Waste Numbers:[2] D004, D005, D006, D007, D008, D009, D010, D011, D019, F002 and F005							
(22) Applicable TRUCON Content Numbers: OR 125, OR 225, SQ 154							
(23)**Acceptable Knowledge Information**[1]							
[For the following, enter the supporting documentation used (i.e., references and dates)]							
Required Program Information							
(23A) Map of site: CCP-AK-ORNL-002, Revision 1, October 30, 2008, Figures 1, 2,and 3							
(23B) Facility mission description: CCP-AK-ORNL-002, Revision 1, October 30, 2008, Section 4.3							
(23C) Description of operations that generate waste: CCP-AK-ORNL-002, Revision 1, October 30, 2008, Section 4.5							
(23D) Waste identification/categorization schemes: CCP-AK-ORNL-002, Revision 1, October 30, 2008, Section 4.6							
(23E) Types and quantities of waste generated: CCP-AK-ORNL-002, Revision 1, October 30, 2008, Section 4.7.1							
(23F) Correlation of waste streams generated from the same building and process, as applicable: CCP-AK-ORNL-002, Revision 1, October 30, 2008, Section 4.7.2							

(24) Waste certification procedures: CCP-TP-030, Revision 25, CCP CH TRU Waste Certification and WWIS Data Entry, January 22, 2009			
(25)Required Waste Stream Information			
(25A) Area(s) and building(s) from which the waste stream was generated: CCP-AK-ORNL-002, Revision 1, October 30, 2008, Section 5.1			
(25B) Waste stream volume and time period of generation: CCP-AK-ORNL-002, Revision 1, October 30, 2008, Section 5.2			
(25C) Waste generating process description for each building: CCP-AK-ORNL-002, Revision 1, October 30, 2008, Section 5.3			
(25D) Waste Process flow diagrams: CCP-AK-ORNL-002, Revision 1, October 30, 2008, Figures 4, 5, 6 7, 8, 9, and 10			
(25E) Material inputs or other information identifying chemical/radionuclide content and physical waste form: CCP-AK-ORNL-002, Revision 1, October 30, 2008, Sections 5.4.1 and 5.4.2			
(25F) Waste Material Parameter Weight Estimates per unit of waste: See Table 2 of the Summation of Aspects of AK Summary Report: OR-REDC-CH-HET			
(26) Which Defense Activity generated the waste: (check one)			
	Weapons activities including defense inertial confinement fusion		Naval Reactors development
	Verification and control technology		Defense research and development
	Defense nuclear waste and material by products management	X	Defense nuclear material production
	Defense nuclear waste and materials security and safeguards and security investigations		
(27)Supplemental Documentation			
(27A) Process design documents: See S1 AK#s on Attachment 1 to Summation of Aspects of AK Summary Report			
(27B) Standard operating procedures: See S2 AK#s on Attachment 1 to Summation of Aspects of AK Summary Report			
(27C) Safety Analysis Reports: See S3 AK#s on Attachment 1 to Summation of Aspects of AK Summary Report			
(27D) Waste packaging logs: NA			
(28E) Test plans/research project reports: See S5 AK#s on Attachment 1 to Summation of Aspects of AK Summary Report			
(27F) Site databases: NA			
(27G) Information from site personnel: See S7 AK#s on Attachment 1 to Summation of Aspects of AK Summary Report			
(27H) Standard industry documents: See S8 AK#s on Attachment 1 to Summation of Aspects of AK Summary Report			
(27I) Previous analytical data: See S9 AK#s on Attachment 1 to Summation of Aspects of AK Summary Report			
(27J) Material safety data sheets: See S10 AK#s on Attachment 1 to Summation of Aspects of AK Summary Report			
(27K) Sampling and analysis data from comparable/surrogate Waste: See S12 AK#s on Attachment 1 to Summation of Aspects of AK Summary Report			
(27L) Laboratory notebooks: See S11 AK#s on Attachment 1 to Summation of Aspects of AK Summary Report			
Confirmation Information[2]			
For the following, when applicable, enter procedure title(s), number(s) and date(s)			
(28)	Radiography: CCP-TP-053, Revision 6, March 4, 2008		
(29)	Visual Examination: CCP-TP-113, Revision 12, December 1, 2008		

(30)Comments:
For a list of the waste characterization procedures used and date of the respective procedures see the list of procedures on the attached CIS.

Reviewed by AK Expert: YES [X] **Date:** 04/20/09

Reviewed by STR (if necessary): YES [X] NA [ ] **Date:** 04/20/09

Waste Stream Profile Form Certification:

I hereby certify that I have reviewed the information in this Waste Stream Profile Form, and it is complete and accurate to the best of my knowledge. I understand that this information will be made available to regulatory agencies and that there are significant penalties for submitting false information, including the possibility of fines and imprisonment for knowing violations.

(31)	(32) Candice Weston	(33) 04/20/09
Signature of Site Project Manager	Printed Name	Date

NOTE: (1) Use back of sheet or continuation sheets, if required.
(2) If, radiography, visual examination were used to confirm EPA Hazardous Waste Numbers, attach signed Characterization Information Summary documenting this determination.
(3) TWBIR numbers OR-W201, OR-W202, and OR-W204 also apply.

CHARACTERIZATION INFORMATION SUMMARY

WSPF # OR-REDC-CH-HET

Lot 1

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CCP Characterization Information Summary Cover Page

Waste Stream #	OR-REOC-CH-HET	Lot #:	1
AK Expert Review:	N/A	Date:	N/A
SPM Review:	Richard Kantrowitz	Date:	4/20/2009

SPM signature certifies that through Acceptable Knowledge testing and/or analysis that the waste identified in this summary is not corrosive, ignitable, reactive, or incompatible with the TSDF.

A summary of the Acceptable Knowledge regarding this waste stream containing specific information about the corrosivity, reactivity, and ignitability of the waste stream is included as an attachment to the Waste Stream Profile Form. By reference, that information is included in this lot.

List of procedures used:

Radiography (RTR/NDE)

CCP-TP-053	Rev. 6	03/04/08	CCP Standard Real-Time Radiography (RTR) Inspection Procedure

Non Destructive Assay (NDA):

CCP-TP-166	Rev. 2	12/05/08	CCP Drum Waste Assay System Imaging Passive/Active Neutron Operations
CCP-TP-166	Rev. 1	06/19/08	CCP Drum Waste Assay System Imaging Passive/Active Neutron Operations
CCP-TP-166	Rev. 0	10/12/07	CCP Drum Waste Assay System Imaging Passive/Active Neutron Operations
CCP-TP-168	Rev. 2	12/02/08	CCP DWAS tPAN/SGS Data Generation Level Validation
CCP-TP-168	Rev. 1	11/17/08	CCP DWAS tPAN/SGS Data Generation Level Validation
CCP-TP-168	Rev. 0	10/18/07	CCP DWAS tPAN/SGS Data Generation Level Validation
CCP-TP-169	Rev. 1	06/19/08	CCP Operating the Mobile Segmented Gamma Scanner
CCP-TP-169	Rev. 0	10/12/07	CCP Operating the Mobile Segmented Gamma Scanner

Headspace Gas Sampling and Analysis (HSG):

CCP-TP-093	Rev. 13	03/19/07	CCP Sampling of TRU Waste Containers
CCP-TP-108	Rev. 6	07/12/07	CCP Headspace Gas Sampling Batch Data Report Preparation
CCP-TP-173	Rev. 0	05/03/07	CCP Analysis of Gas Samples for VOCs by GC/FID
CCP-TP-175	Rev. 0	05/02/07	CCP Analysis of Gas Samples for VOCs by GC/MS

Project Level Data Validation / DQO Reconciliation:

CCP-TP-001	Rev. 17	09/24/07	CCP Project Level Data Validation and Verification
CCP-TP-002	Rev. 20	08/18/08	CCP Reconciliation of DQOs and Reporting Characterization Data
CCP-TP-003	Rev. 16	10/02/07	CCP Data Analysis for S3000, S4000, and S5000 Characterization
CCP-TP-005	Rev. 18	11/16/06	CCP Acceptable Knowledge Documentation
CCP-TP-030	Rev. 25	01/22/09	CCP CH TRU Waste Certification and WWIS Data Entry
CCP-TP-030	Rev. 24	08/20/08	CCP CH TRU Waste Certification and WWIS Data Entry
CCP-TP-030	Rev. 23	03/12/08	CCP CH TRU Waste Certification and WWIS Data Entry
CCP-TP-030	Rev. 22	07/24/07	CCP CH TRU Waste Certification and WWIS Data Entry

WAP Certification:

CCP-PO-001	Rev. 16	10/31/07	CCP Transuranic Waste Characterization Quality Assurance Project Plan
CCP-PO-002	Rev. 21	01/26/09	CCP Transuranic Waste Certification Plan
CCP-PO-002	Rev. 20	11/02/07	CCP Transuranic Waste Certification Plan
CCP-PO-027	Rev. 0	10/02/07	CCP/TWPC/ORNL Interface Document

CCP Correlation of Container Identification Numbers to Batch Data Report Numbers

Waste Stream: # OR-REDC-CH-HET

Lot # 1

Container ID Number	NDA BDR	RTR BDR	VE BDR	Solids Sampling BDR	Solids Analytical BDR	Load Management/ Overpack Yes	Headspace Gas BDR			Transportation
							Sample	Analysis		
X10C0301192II	OR-DWAS-0175	OR-RTR6-0062	NA	NA	NA		ORHSGS090001	ECL090004M	ECL090004G	OR08FG4033
X10C0301192N	OR-DWAS-0085	OR-RTR6-0065	NA	NA	NA		ORHSGS090001	ECL090004M	ECL090004G	OR08FG4026
X10C0402064E	OR-DWAS-0174	OR-RTR6-0107	NA	NA	NA		ORHSGS090001	ECL090004M	ECL090004G	OR09FG4017
X10C0401650A	OR-DWAS-0137	OR-RTR6-0113	NA	NA	NA		ORHSGS090001	ECL090004M	ECL090004G	OR08FG4039
X10C0012923	OR-DWAS-0065	OR-RTR6-0057	NA	NA	NA		NA	NA	NA	OR08FG4011
X10C0301192B	OR-DWAS-0081	OR-RTR6-0069	NA	NA	NA		NA	NA	NA	OR08FG4038
X10C0301192E	OR-DWAS-0070	OR-RTR6-0064	NA	NA	NA		NA	NA	NA	OR08FG4046
X10C0301192H	OR-DWAS-0070	OR-RTR6-0063	NA	NA	NA		NA	NA	NA	OR08FG4046
X10C0301192I	OR-DWAS-0072	OR-RTR6-0064	NA	NA	NA		NA	NA	NA	OR08FG4046
X10C0301192J	OR-DWAS-0070	OR-RTR6-0064	NA	NA	NA		NA	NA	NA	OR08FG4046
** These containers were randomly selected for headspace gas sampling and analysis and are included to resolve EPA hazardous waste numbers. NDE and NDA BDR numbers for these six containers are included for information purposes only.										
**X10C0501811	NA	OR-RTR6-0141	NA	NA	NA		ORHSGS090001	ECL090004M	ECL090004G	NA
**X10C0301192U	OR-DWAS-0084	OR-RTR6-0065	NA	NA	NA		ORHSGS090001	ECL090004M	ECL090004G	NA
**X10C0402859E	NA	OR-RTR6-0097	NA	NA	NA		ORHSGS090001	ECL090004M	ECL090004G	NA
**X10C0402065J	OR-DWAS-0125	OR-RTR6-0108	NA	NA	NA		ORHSGS090001	ECL090004M	ECL090004G	NA
**X10C0402064D	OR-DWAS-0123	OR-RTR6-0107	NA	NA	NA		ORHSGS090001	ECL090004M	ECL090004G	NA
**X10C0501719	NA	OR-RTR6-0141	NA	NA	NA		ORHSGS090001	ECL090004M	ECL090004G	NA

Signature of Site Project Manager

Richard Kantrowitz
Printed Name

4/20/2009
Date

CCP Headspace Gas UCL_{90} Evaluation Form

WSPF #: OR-REDC-CH-HET **Waste Stream Headspace Gas Lot Number** 1 through 1

ANALYTE	Transform Data Used (No, Data-Log, SQRT, other)	# Samples above MDL (1)	# Samples	Maximum (ppmv)	Mean (ppmv)	SD (ppmv)	UCL_{90} (ppmv)	PRQL (ppmv)	Transformed PRQL (N/A or Value)	UCL_{90} > PRQL Yes	EPA Hazardous Waste Number
Benzene	No	1	10	0.13	0.06	0.04	0.08	10	N/A		
Bromoform	Log	0	10	-3.35	-4.55	0.64	-4.27	10	2.30		
Carbon Tetrachloride	Log	1	10	-2.30	-3.72	0.80	-3.37	10	2.30		
Chlorobenzene	Log	0	10	-2.25	-3.45	0.65	-3.16	10	2.30		
Chloroform	SQRT	1	10	0.35	0.20	0.08	0.24	10	3.16		
Cyclohexane[a]	Log	2	10	-0.87	-3.04	1.04	-2.59	10	2.30		
1,1-Dichloroethane	Log	0	10	-2.12	-3.32	0.65	-3.03	10	2.30		
1,2-Dichloroethane	Log	0	10	-1.97	-3.17	0.64	-2.89	10	2.30		
1,1-Dichloroethylene	Log	0	10	-2.21	-3.42	0.65	-3.14	10	2.30		
cis-1,2-Dichloroethylene	Log	0	10	-2.41	-3.63	0.65	-3.34	10	2.30		
trans 1,2-Dichloroethylene	Log	0	10	-2.16	-3.36	0.65	-3.08	10	2.30		
Ethyl benzene	Log	3	10	2.83	-2.64	2.12	-1.71	10	2.30		
Ethyl Ether	Log	0	10	-1.83	-3.03	0.65	-2.75	10	2.30		
Methylene chloride	SQRT	2	10	0.39	0.25	0.08	0.28	10	3.16		
1,1,2,2-Tetrachloroethane	Log	0	10	-2.35	-3.57	0.64	-3.29	10	2.30		
Tetrachloroethylene	Log	0	10	-2.47	-3.66	0.64	-3.38	10	2.30		
Toluene	SQRT	10	10	4.80	2.10	1.18	2.61	10	3.16		
1,1,1-Trichloroethane	Log	0	10	-2.53	-3.75	0.64	-3.46	10	2.30		
Trichloroethylene	Log	1	10	-2.04	-3.56	0.82	-3.20	10	2.30		
1,1,2-Trichloro-1,2,2-trifluoroethane	Log	0	10	-2.41	-3.59	0.64	-3.31	10	2.30		
1,2,4-Trimethylbenzene[a]	Log	0	10	-2.12	-3.32	0.65	-3.03	10	2.30		
1,3,5-Trimethylbenzene[a]	Log	0	10	-2.08	-3.29	0.64	-3.01	10	2.30		
m,p-Xylenes[b]	Log	5	10	3.64	-2.07	2.34	-1.05	10	2.30		
o-Xylene	Log	2	10	1.95	-2.65	1.79	-1.87	10	2.30		
Acetone	Log	10	10	4.04	1.20	1.22	1.74	100	4.61		
Butanol	Log	4	10	-0.42	-2.30	1.02	-1.85	100	4.61		
Methanol	No	7	10	180.00	90.75	64.18	118.82	100	N/A	Yes	(2)
Methyl ethyl ketone	Log	6	10	0.79	-1.99	1.10	-1.51	100	4.61		

CT5004

CCP Headspace Gas UCL_{90} Evaluation Form

WSPF #: OR-REDC-CH-HET **Waste Stream Headspace Gas Lot Number** 1 through 1

ANALYTE	Transform Data Used (No, Data-Log, SQRT, other)	# Samples above MDL (1)	# Samples	Maximum (ppmv)	Mean (ppmv)	SD (ppmv)	UCL_{90} (ppmv)	PRQL (ppmv)	Transformed PRQL (N/A or Value)	UCL_{90} > PRQL Yes	EPA Hazardous Waste Number
Methyl isobutyl ketone	Log	0	10	-2.04	-3.24	0.65	-2.96	100	4.61		
Chloromethane	Log	1	10	0.00	-2.38	1.05	-1.92	10	2.30		
Carbon Disulfide	Log	5	10	1.34	-1.85	1.69	-1.11	10	2.30		
1,2-Dichloropropane	Log	0	10	-2.35	-3.53	0.65	-3.25	10	2.30		
Trichlorofluoromethane	Log	0	10	-2.08	-3.30	0.65	-3.01	10	2.30		
Formaldehyde[c]	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Hydrazine[d]	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

[a] These compounds are from the TRAMPAC and are flammable VOCs that do not appear in the QAPjP or the WIPP WAP. These are not part of the target analyte list, but samples may be analyzed for these compounds.

[b] These xylene isomers cannot be resolved by the analytical methods employed in the program. m-Xylene and p-Xylene will be reported as "Total m-p-Xylene."

[c] Required only for homogenous solids and soil/gravel waste from Savannah River Site.

[d] Required only for homogenous solids and soil/gravel wast from Oak Ridge National Laboratory and Savannah River Site.

Comments:

(1) For analytes where there were no samples measured above the MDL value, 1/2 of the MDL value was used. (Per section B4 of the WAP, 1/2 of the MDL value is used in calculating the mean concentration.)

(2) EPA HWN F003 is not assigned to this waste stream for Methanol because the waste is not liquid and is therefore not ignitable. This is consistent with acceptable knowledge.

Signature of Site Project Manager

Richard Kantrowitz
Printed Name

4/20/2009
Date

CCP Headspace Gas Summary Data

Waste Stream Number OR-REDC-CH-HET Lot Number (s) 1

Tentatively Identified Compound	Maximum Observed Estimated Concentrations (ppmv)	# Samples Containing TIC	% Detected
None	N/A	N/A	N/A

Data Supports EPA Hazardous Waste Numbers Assigned by AK? ☑ Yes ☐ No

If no, describe the basis for assigning the EPA Hazardous Waste Codes:

SPM Signature [signature] Date 4/20/2009

CIS006

CCP RTR/VE Summary of Prohibited Items and AK Confirmation

Waste Stream Number: OR-REDC-CH-HET Lot(s)#: 1

Container Number	RTR Prohibited Items [a]	Visual Examination Prohibited Items [a]
See correlation of container ID numbers for list of remaining drum numbers in this Lot.	RTR Data confirm that none of the containers in this lot contain any prohibited items.	None of the containers in this lot were processed through VE.

a. See Batch Data Reports

Site Project Manager Signature | Richard Kantrowitz (Printed Name) | 4/20/2009 (Date)

CI5007

CCP Reconciliation with Data Quality Objectives

WSF# OR-REDC-CH-HET Lot # 1

Sampling Completeness

RTR:

Number of Valid Samples: 10 Number of Total Samples Analyzed: 10
Percent Complete: 100 (QAO is 100%)

NDA

Number of Valid Samples: 10 Number of Total Samples Analyzed: 10
Percent Complete: 100 (QAO is 100%)

HSG

Number of Valid Samples: 10 Number of Total Samples Collected: 10
Percent Complete: 100 (QAO is ≥90%)
Number of Valid Samples: 10 Number of Total Samples Analyzed: 10
Percent Complete: 100 (QAO is ≥90%)

Total VOC

Number of Valid Samples: NA Number of Total Samples Collected: NA
Percent Complete: NA (QAO is ≥90%)
Number of Valid Samples: NA Number of Total Samples Analyzed: NA
Percent Complete: NA (QAO is ≥90%)

Total SVOC

Number of Valid Samples: NA Number of Total Samples Collected: NA
Percent Complete: NA (QAO is ≥90%)
Number of Valid Samples: NA Number of Total Samples Analyzed: NA
Percent Complete: NA (QAO is ≥90%)

Total Metals

Number of Valid Samples: NA Number of Total Samples Collected: NA
Percent Complete: NA (QAO is ≥90%)
Number of Valid Samples: NA Number of Total Samples Analyzed: NA
Percent Complete: NA (QAO is ≥90%)

CIS008

CCP Reconciliation with Data Quality Objectives

WSF# OR-REDC-CH-HET Lot # 1

	Y/N/NA	Reconciliation Parameter
1	Y	Waste Matrix Code.
2	Y	Waste Material Parameter Weights.
3	Y	The waste matrix code identified is consistent with the type of sampling and analysis used to characterize the waste.
4	Y	The TRU activity reported in the BDRs for each container demonstrates with a 95% probability that the container of waste contains TRU radioactive waste.
5	N	AK Sufficiency. Is there an approved AK sufficiency Determination for this waste stream?
6	Y	Mean concentrations, UCL_{90} values for the mean concentration, standard deviations, and the number of samples collected for each VOC in the HSG of each container were calculated and compared with the program required quantitation limits, as reported in CCP-TP-003 Attachment 3, and additional Environmental Protection Agency (EPA) Hazardous Waste Numbers were assigned as required. Samples were randomly collected (when appropriate).
7a	NA	Mean concentrations, UCL_{90} values for the mean concentration, standard deviations, and the number of samples collected for solids VOCs were calculated and compared with the program required quantitation limits and regulatory thresholds, as reported in the Characterization Information Summary, CCP-TP-003 Attachment 4, and additional EPA Hazardous Waste Numbers were assigned as required. Samples were randomly collected.
7b	NA	Mean concentrations, UCL_{90} values for the mean concentration, standard deviations, and the number of samples collected for solids SVOCs were calculated and compared with the program required quantitation limits and regulatory thresholds, as reported in the Characterization Information Summary, CCP-TP-003 Attachment 5, and additional EPA Hazardous Waste Numbers were assigned as required. Samples were randomly collected.
7c	NA	Mean concentrations, (UCL_{90}) values for the mean concentration, standard deviations, and the number of samples collected for total metals were calculated and compared with the program required quantitation limits and regulatory thresholds, as reported in the Characterization Information Summary, CCP-TP-003 Attachment 6, and additional EPA Hazardous Waste Numbers were assigned as required. Samples were randomly collected.

CCP Reconciliation with Data Quality Objectives

WSF# OR-REDC-CH-HET Lot # 1

8	Y	The data demonstrates whether the waste stream exhibits a toxicity characteristic under Title 40 Code of Federal Regulations (CFR), Part 261, Identification and Listing of Hazardous Waste, Subpart C, Characteristics of Hazardous Waste.
9	Y	Does the waste stream contain listed waste found in 20.4.1.200 NMAC incorporating 40 CFR Part 261, Subpart D, Lists of Hazardous Wastes.
10	Y	Waste stream can be classified as hazardous or nonhazardous at the 90-percent confidence level.
11	Y	Appropriate packaging configuration and Drum Age Criteria (DAC) is applied and documented in the headspace gas sampling documentation, and the drum age met prior to sampling.
12	Y	TICs were appropriately identified and reported in accordance with the requirements of Section B3-1 of the QAPjP.
13	Y	The PRQLs for headspace gas VOCs were met for all analyses as evidenced by the analytical batch data reports.
14		The overall completeness, comparability, and representativeness QAOs were met for each of the analytical and testing procedures as specified in the WAP Sections B3-2 through B3-9 prior to submittal of a waste stream profile form for a waste steam or waste stream lot.

	Completeness	Comparability	Representativeness
Radiography	Y	Y	Y
VE	NA	NA	NA
Headspace Gas Analysis	Y	Y	Y
Solids Sampling	NA	NA	NA
Solids VOCs	NA	NA	NA
Solids SVOCs	NA	NA	NA
Solids Metals	NA	NA	NA

Comments: NONE

Signature of Site Project Manager | Richard Kantrowitz (Printed Name) | 4/20/2009 (Date)

SUMMATION OF ASPECTS OF AK SUMMARY REPORT: OR-REDC-CH-HET

Overview:

Waste Stream OR-REDC-CH-HET is Contact-Handled (CH) transuranic (TRU) mixed heterogeneous debris generated in the Radiochemical Engineering Development Center (REDC), Building 7920, at the Oak Ridge National Laboratory (ORNL) in Oak Ridge, Tennessee. The waste was generated from 1972 through present.

Since 1966, the REDC was the production, storage, and distribution center for the DOE heavy element research program, producing Bk-249, Cf-252, Es-253, and Fm-257. Target rods containing plutonium (before or about 1970), americium, and curium were remotely fabricated in the Building 7920 hot cells, irradiated in the High Flux Isotope Reactor (HFIR) facility, and then processed in the Building 7920 hot cells for the separation and purification of the heavy actinide elements. The purified Bk-249, Es-253, and Fm-257 were packaged for shipment whereas the Cf-252 was fabricated into neutron sources. Between 1979 and 1986, some uranium fuel cycle development work was performed in the Building 7920 Solvent Extraction Test Facility (SETF). Solvent extraction flow sheets for processing irradiated fuels from commercial light water reactors and fast breeder reactors were developed and tested, and plutonium recovery schemes were demonstrated. Since 1991, the REDC has processed Mark-42 target assemblies that were irradiated at the Savannah River Site (SRS). High-purity Am-243, Cm-244, and Pu-242 are separated and recovered in Building 7920 for shipment to the Los Alamos National Laboratory (LANL). The Mark-42 Processing Program activities include similar operations to those used in transuranium element target processing.

The Cf-252 neutron sources have applications which are defense related. Applications include neutron radiography of weapons components and military aircraft, neutron counting of fissile material and transuranic waste, land mine detection, and in-field inspection and identification of chemical weapons and high explosives. Other target campaigns ran concurrently with the Solvent Extraction Test Facility (SETF) and Mark-42 campaigns. Due to the similarity of contamination in the REDC from prior HFIR target campaigns, the waste generated from SETF and Mark-42 campaigns were not segregated from waste generated by the HFIR target campaigns. Therefore, the TRU wastes generated from the REDC, waste stream OR-REDC-CH-HET, is defense related waste generated from nuclear materials production.

This Summation of the AK Summary Report includes information to support Waste Stream Profile Form (WSPF) number OR-REDC-CH-HET for Contact Handled (CH) TRU debris. The primary source of information for this Summation is CCP-AK-ORNL-002, CCP Acceptable Knowledge Summary Report For: Oak Ridge National Laboratory Radiochemical Engineering Development Center Contact-Handled Transuranic Waste, Waste Stream: OR-REDC-CH-HET, Revision 1, October 30, 2008. CCP-AK-ORNL-002 includes information obtained from numerous sources, including facility safety basis documentation, historical document archives, generator and storage facility waste records and documents, program/processing documentation, and interviews with knowledgeable personnel.

Waste Stream Identification Summary:

Site Where TRU Waste Was Generated:	Oak Ridge National Laboratory
Waste Stream Name:	Heterogeneous Debris from the Radiochemical Engineering Development Center
Waste Stream Number:	OR-REDC-CH-HET

Dates of Waste Generation:	1972 to present
Summary Category Group:	S5000 – Debris Waste
Waste Matrix Code Group:	Heterogeneous Debris
Waste Matrix Code:	S5400
Waste Stream TWBIR Identification:	OR-W203[1]
Waste Stream Volume:	1,031 55-gallon drums (current) 1,000 55-gallon drums (projected)
RCRA EPA Hazardous Waste Numbers:	D004, D005, D006, D007, D008, D009, D010, D011, D019, F002 and F005
TRUCON Content Numbers:	OR 125, OR 225, SQ 154

Waste Stream Description and Physical Form:

Waste stream OR-REDC-CH-HET is comprised primarily of organic and inorganic debris and consists of cellulosics, plastic, rubber, glass, and metal. Examples of debris include aluminum foil, metal cans, hand tools, hardware (e.g., washers), light bulb bases, piping, planchets, plates, spray cans (punctured), lead, concrete, glass bottles, glass thermometers, light bulbs (incandescent and mercury vapor), absorbent pads, cloth, paper towels, personal protective equipment (e.g., shoe covers), rags, wipes, plastic bags, bottles, caps, latex gloves, manipulator boots, pipette tips, plastic sleeving, tape, tubing, rubber gloves and hose, equipment (e.g., electrical devices containing circuit boards and electric motors), grouted ion-exchange resin, HEPA and roughing filters and absorbent (e.g., vermiculite and Nochar, a proprietary polymer based absorbent).

This waste stream is assigned Waste Matrix Code S5400, Heterogeneous Debris. This category includes waste that is at least 50 percent, by volume, debris materials that do not meet the criteria for assignment as either an Inorganic Debris (S5100) or Organic Debris (S5300). The debris that comprises waste stream OR-REDC-CH-HET was generated from a single process or from an activity that is similar in material, physical form, and hazardous constituents and is therefore, a single waste stream.

Point of Generation - Area and Building of Generation

Waste stream OR-REDC-CH-HET was generated from Building 7920 at Oak Ridge National Laboratory in Oak Ridge, TN.

Generating Process

Waste stream OR-REDC-CH-HET was generated from the production of heavy actinide elements Bk-249, Cf-252, Es-253, and Fm-257 in Building 7920. Waste was generated in the Building 7920 hot cell cubicles during process operations and maintenance activities, and repackaging of waste from casks into drums. Following is a summary of those operations.

[1]TWBIR numbers OR-W201, OR-W202, and OR-W204 also apply.

Hot Cell Cubicle Operations

In the hot cell cubicles, waste was typically placed into small containers (e.g., plastic or metal buckets) and monitored for radiation. Depending on the size, type of waste and radiation level, the item was cut up, leached with nitric acid, rinsed with water, and air dried before placement into the small container. To reduce the volume of waste, a low-temperature furnace was used to melt small plastic items prior to consolidation in a metal bucket. Spent cation-exchange resins were calcined, leached with nitric acid, collected in a polyethylene bottle, melted, and placed into a metal bucket. Spent anion-exchange resins were de-nitrated, rinsed, and fixed in a concrete grout mixture in a metal bucket. The cans of melted plastic may contain glass, metal, and cellulosics in the plastic matrix or placed on top of the block added to the metal can after the melt process. Waste was then characterized to meet the waste acceptance criteria (e.g., no free liquid, compressed gases). The buckets were monitored for beta-gamma and neutron radiation.

As necessary, stored drums containing CH-TRU waste are manually sorted and segregated to remove prohibited items and repackaged. Glovebox internal walls are periodically wiped down using damp rags. Secondary wastes created during waste processing, such as rubber glovebox gloves and tools, are placed into TRU waste drums.

Production related operations that generated this waste stream include chemical processing, target fabrication, analytical laboratory activities, and process development.

Chemical Processing

The primary chemical processing activities conducted in the REDC are as follows.

Transuranium Element Target Processing

Transuranium element target processing includes the dissolution of irradiated targets, the separation of the transuranium elements from impurities and fission products, and the separation of the transuranium elements from each other. This is accomplished using solvent extraction, precipitation, and ion-exchange process steps. Recovered americium and curium are purified and converted to oxide for remote fabrication of new targets.

After the berkelium, einsteinium, and fermium have been separated from most of the curium and californium, they are transferred to shielded caves or gloveboxes and purified further from radioactive and nonradioactive contaminants by ion-exchange. The purified products are then packaged for shipment. The californium is sorbed on cation-exchange resin and calcined to convert the californium to the oxysulfate for future use.

Solvent Extraction Test Facility

The SETF recovered uranium and plutonium from irradiated commercial power reactor fuels. This was achieved by dissolution of irradiated fuel assembly sections, solvent extraction, ion-exchange, precipitation, and calcination steps.

Mark-42 Processing

The Mark-42 program operations include the dissolution of irradiated segments; the separation of the transuranium elements from impurities, activation products, fission products, and the separation of the transuranium elements from each other. This is accomplished using solvent extraction, precipitation, and ion-exchange steps.

Special Projects

Special separation projects, such as separating Cf-249 from decaying Bk-249, or purifying a sample for shipment to another site, were performed on a small amount of material handled in the main line.

Target Fabrication

Actinide oxide is incorporated into aluminum target rods for irradiation in the HFIR. The operations include pellet forming, weighing, measurement, calorimetry, thermal cleaning, target loading, welding, x-ray examination, helium leak tests, dimensional inspections, hydrostatic compression of the aluminum tube around the pellets, coolant shroud attachment, decontamination, and carrier loading for transfer to the HFIR.

Analytical Laboratory Activities

Sample preparation and analyses, as performed in the analytical laboratory, includes pipetting, titration, dissolution, filtration, solvent extraction, and centrifugation.

Process Development

The process development laboratories were used for studies and process development of alpha-active materials. Early work was concerned with the development of sol-gel processes and the isolation and purification of alpha-active materials. Other research and process development work included reprocessing of reactor fuels, conversion of recovered uranium and plutonium to forms suitable for use in fabrication of recycled reactor fuel elements, and development of waste separation processes.

Maintenance Operations

Processing equipment was designed and built so that it could be maintained or replaced within hot cell cubicles using remote techniques. Occasionally, large equipment items and equipment racks required maintenance that could not be performed in the cubicles. These items were moved to the decontamination glovebox for cleaning and repair. The decontamination glovebox was wheeled onto the top of the cell bank where the equipment was introduced into the glovebox. Tank pit maintenance operations were performed directly in the pit.

Glovebox operations were performed using neoprene glovebox gloves which were periodically replaced. Glovebox equipment items and components required periodic decontamination, inspection, maintenance, and repair. Glovebox equipment also required replacement, and glovebox interiors required regular decontamination.

Transuranic Waste Processing Center(TWPC)

Drums and boxes containing CH-TRU waste are moved to the TWPC (Building 7880) for sorting, segregation, size reduction, removal of prohibited items and repackaging as needed. Secondary waste created during waste processing, such as rubber glovebox gloves and tools, is placed into TRU waste drums.

Concrete casks are brought into the TWPC Hot Cell and the waste undergoes visual examination and repackaging. Remote-handled and contact-handled waste is segregated and packaged separately, and prohibited items are removed.

Table 1 identifies the toxicity characteristic (TC) and F-listed chemicals in waste stream OR-REDC-CH-HET.

Table 1 – Metals and organic TC and F-Listed Contaminants for Waste Stream OR-REDC-CH-HET

Constituent	CAS Number	EPA Hazardous Waste Numbers
Arsenic	7440-38-2	D004
Barium	7440-39-3	D005
Benzene	71-43-2	F005
Cadmium	7440-43-9	D006
Carbon tetrachloride	56-23-5	D019
Chromium	7440-47-3	D007
Lead	7439-92-1	D008
Mercury	7439-97-6	D009
Selenium	7782-49-2	D010
Silver	7440-22-4	D011
1,1,1-Trichloroethane	71-55-6	F002
1,1,2-Trichloroethane	79-00-5	F002
Trichloroethylene	79-01-6	F002
Toluene	108-88-3	F005

RCRA Determinations - Hazardous Waste Determinations

Waste generated in this waste stream does not qualify for any of the exclusions outlined in 40 CFR 260 or 261. Real-time radiography (RTR) or visual examination is used to verify that the waste stream is not a liquid waste and does not contain explosives, non-radioactive pyrophoric material, compressed gases or reactive waste. Therefore, this waste stream does not exhibit the characteristic for ignitability (D001), corrosivity (D002), or reactivity (D003).

Ignitability

The waste does not meet the definition of ignitability as defined in 40 CFR 261.21. The material is not a liquid, an ignitable compressed gas, or an oxidizer, and is not capable of causing fire through friction, absorption of moisture, or spontaneous chemical change. Potentially ignitable, corrosive, and reactive waste was prohibited during the packaging of the TRU waste in the REDC. Radiography and/or visual examination are performed to ensure the absence of compressed gases (e.g., un-punctured aerosol cans) and liquids. Therefore, this waste stream does not exhibit the characteristic of ignitability (D001).

Corrosivity

The waste does not meet the definition of corrosivity as defined in 40 CFR 261.22. The debris is not liquid and RTR and/or VE are performed to ensure liquids were not added to containers.

Chemicals such as acetic, citric, hydrofluoric, hydrochloric, oxalic and sulfuric acids; hydrazine and lithium hydroxide were used during dissolution, extraction, and titration processes or were identified on chemical inventories. Residual liquids identified during RTR or VE will be removed and/or immobilized (e.g. using Nochar). Therefore the characteristic of corrosivity (D002) does not apply to this waste stream.

Reactivity

The waste does not meet the definition of reactivity as defined in 40 CFR 261.23. The materials are stable and will not undergo violent chemical change. The materials will not react violently with water, form potentially explosive mixtures with water, or generate toxic gases, vapors, or fumes when mixed with water. The waste does not contain reactive cyanide or sulfide compounds. The materials are not capable of detonation or explosive reaction if subjected to a strong initiating source if heated under confinement. The materials are not readily capable of detonation or explosive decomposition or reaction at standard temperature and pressure (References P161 and U011).

Nitrated ion-exchange resins are rendered nonreactive through conversion to the hydroxide form before disposal. Anion-exchange resins used with nitric acid are flushed from the column, rinsed with ammonium hydroxide to convert the resin to the hydroxide form, air dried, and grouted in metal cans. Spent cation-exchange resins are calcined to an oxysulfate ash, and the ashes are leached with nitric acid and dried prior to assimilation (and fixing) into melted polyethylene waste in a metal bucket. As an additional measure to ensure the resins are nonreactive, prohibited quantities of liquids identified during RTR or VE will be removed and/or immobilized.

Therefore the characteristic of reactivity (D003) does not apply to this waste stream.

Toxicity Characteristic Metals

This waste stream exhibits the characteristic of toxicity per 40 CFR 261.24. The toxicity characteristic contaminants fall into two categories; metals and organics. The debris may contain toxicity characteristic metals and organics based on the following identified uses/sources. Where a constituent has been identified and there is no quantitative data available to demonstrate that the concentration of a constituent is below regulatory threshold, the applicable EPA HWN is conservatively applied to the waste stream in accordance with the CCP AK procedure CCP-TP-005.

Arsenic (D004) and selenium (D010) compounds were used for actinide and lanthanide hydride and metallide studies. Barium (D005), cadmium (D006), chromium (D007), and lead (D008) have been attributed to fission product contaminants, product solution impurities that contaminate the waste and target cladding. Cadmium is also attributed to flashlight batteries and electronic equipment. Lead is also attributed to shielding and electronic equipment. Mercury vapor lamps, electronic equipment, thermostats and solder are sources of mercury (D009). Silver (D011) is assigned due to photographic development solutions that contaminate the waste and circuit boards in the waste.

Based on AK, EPA HWNs D004, D005, D006, D007, D008, D009, D010, and D011 are assigned to waste stream OR-REDC-CH-HET (Reference DR005).

Toxicity Characteristic Organics

Waste stream OR-REDC-CH-HET meets the definition of toxicity for organic compounds as defined in 40 CFR 261.24. Toxicity characteristic organic compounds were identified in the REDC processes.

The AK identified the use of organic toxicity characteristic compounds including benzene (D018), carbon tetrachloride (HWN D019), and trichloroethylene (D040). EPA HWNs F005 and F002 are assigned to the waste stream for F-listed solvents benzene (F005) and trichloroethylene (F002). Because the more specific F-listed EPA HWNs have been assigned for these compounds, assignment of the corresponding toxicity characteristic HWNs D018 and D040 are not assigned. Therefore only D019 is conservatively assigned to waste stream OR-REDC-CH-HET for carbon tetrachloride (identified in the REDC inorganic chemical inventory) (References DR005, DR008, and DR602).

F-Listed Waste

Waste stream OR-REDC-CH-HET is an F-listed hazardous waste because the debris was mixed with or contains hazardous wastes from non-specific sources listed in 40 CFR 261.31.

F002 and F005-listed solvents were identified on REDC chemical inventories and are therefore conservatively assigned to the waste stream. Desicote is a rinsing aid that contains 1,1,1-trichloroethane; 1,1,2-trichloroethane was identified on the REDC organic chemical inventory and is conservatively identified as present in the waste. Benzene and trichloroethylene were used for solvent extraction. Toluene was identified as a constituent in liquid scintillation reagent and is assigned as a conservative measure. F003 constituents, including acetone, methanol, methyl isobutyl ketone, and xylene are listed solely because these solvents are ignitable in the liquid form. The waste stream will not exhibit the characteristic of ignitability because it is not liquid; therefore, F003 is not assigned. Although F001-listed solvents were identified in the AK record (carbon tetrachloride and trichloroethylene), no "large-scale" degreasing operation such as cold cleaning or vapor degreasing on an industrial scale was performed and F001 is not applied (References DR005, DR008, and DR602).

The following is a listing of the EPA HWNs and associated constituents assigned to waste stream OR-REDC-CH-HET.

(F002)
1,1,1-Trichloroethane, 1,1,2-trichloroethane, trichloroethylene

(F005)
Benzene, toluene

U, K, and P-Listed Chemicals

Waste stream OR-REDC-CH-HET does not contain a discarded commercial chemical product, an off-specification commercial chemical product, or a container residue or spill residue thereof (40 CFR 261.33). Based on the AK documentation reviewed, U- and P listed compounds were not used. Therefore, U-and P-listed EPA hazardous waste numbers are not assigned to this waste stream.

No U, K and P- listed chemicals were identified in the container-specific documentation for waste stream OR-REDC-CH-HET. Beryllium may be present in the waste as a contaminant of small foil targets and source plates electroplated with microgram quantities of trans-plutonium elements. Based on AK, no source for the pure, unused beryllium powder was identified. Therefore P015 is not assigned to this waste stream

Hydrofluoric acid was used as a dissolution reagent; however, there is no indication that unused acids or other reagents, or spills of these reagents were disposed of in this waste stream. (References M005 and P223).

The material in waste stream OR-REDC-CH-HET is not a hazardous waste from any of the sources specified in 40 CFR 261.32. Waste stream OR-REDC-CH-HET is therefore not assigned a K-listed HWN.

Headspace Gas/Volatile Organic Compound Information

Headspace gas sampling was performed on 10 randomly selected containers. The UCL_{90} values for one analyte (methanol) exceeded the PRQLs for headspace gas analysis. EPA HWN F003 is not assigned to this waste stream for methanol because this waste is not liquid and is therefore not ignitable. No TICs were identified in this lot. These data are consistent with AK. The specifics of this information are included in the attached Characterization Information Summary Report. No additional EPA hazardous waste numbers were assigned based on headspace gas analysis results.

Conclusion

The following EPA hazardous waste numbers are assigned to this waste stream: D004, D005, D006, D007, D008, D009, D010, D011, D019, F002 and F005.

Polychlorinated Biphenyls (PCBs)

Based on a review of the AK, incandescent bulbs, mercury-vapor bulbs, and lighting fixtures (bases) were identified in container documentation, however items potentially containing polychlorinated biphenyls (PCBs) were not identified (e.g., capacitors, ballasts). Based on discussions with ORNL personnel, some drums may contain equipment with small PCB capacitors and pumps containing PCB oil. Drums found to contain pumps (with or without oil), small capacitors contained in electric motors and light ballasts, or other potential PCB-containing items during RTR or VE will be managed in accordance with the PCB disposal requirements in the WIPP-WAC (References M005, M012, P240, and P263).

Prohibited Items

The absence of prohibited items is determined and documented through acceptable knowledge and characterization activities. Radiography or visual examination is performed on each container in this waste stream as a confirmation activity. The following items have been determined as not present in the waste:

- Liquids
- Non-radioactive pyrophoric materials
- Waste incompatible with backfill, seal and panel closure materials, container and packaging materials, or other wastes
- Explosives or compressed gases
- Waste with PCBs not authorized under an EPA PCB waste disposal authorization

- Waste exhibiting the characteristics of ignitability, corrosivity, or reactivity
- Non-mixed hazardous wastes
- Waste that has ever been managed as high-level waste and waste from tanks specified in Table B-8 of the WIPP Hazardous Waste Facility Permit, unless specifically approved through a Class 3 permit modification.
- Any waste container from a waste stream (or waste stream lot) which has not undergone either radiographic or visual examination of a statistically representative subpopulation of the waste stream in each shipment, as described in the WIPP Hazardous Waste Permit, Attachment B7.

Each container of waste is certified and shipped only after visual examination or RTR:

- Did not identify any prohibited items in the waste container, or
- All prohibited items found in a waste container by visual examination or RTR are identified and corrected (i.e., eliminated or removed) through the site non-conformance reporting system.

Method for Determining Waste Material Parameter Weights per Unit of Waste

The waste material parameter weight estimates for waste stream OR-REDC-CH-HET were derived from RTR data from 255 containers generated from 1977 through 2005 and are representative of the waste stream. An analysis of the RTR data was performed, the results of which are presented in Table 2.

Table 2. Waste Stream OR-REDC-CH-HET Waste Material Parameters

Waste Material Parameter	Weight Percent	Weight Percent Range
Aluminum-based Metals/Alloys	1.6 %	0.0% – 21.2 %
Iron-based Metals/Alloys	33.0 %	0.0% – 98.8 %
Other Metals	0.9 %	0.0% – 55.9 %
Other Inorganic Materials	12.8%	0.0% – 80.3%
Cellulosics	4.9 %	0.0% – 70.5 %
Plastics (waste materials)	45.5 %	0.0% – 100 %
Rubber	1.3 %	0.0% – 52.2 %
Organic Matrix [1]	0 %	0.0% – 0.0 %
Inorganic Matrix [1]	0 %	0.0% – 0.0 %
Soils/Gravel	<0.1%	0.0% – 3.4 %
Total Organic Waste Avg.	51.7 %	
Total Inorganic Waste Avg.	48.3 %	

[1] RTR of these 255 containers did not identify organic matrix or inorganic matrix; however, small amounts of these waste material parameters (e.g., grouted ion-exchange resin, vermiculite, and Nochar) are expected to be present in the waste stream.

List of AK Sufficiency Determinations

No AK Sufficiency Determinations were required for this waste stream.

Transportation

This waste stream and its chemical constituents have been reviewed for consistency with listed TRUCON codes and they are consistent.

Beryllium may be present as a contaminant in the waste but review of the available container documentation did not identify beryllium as a component of the waste. Therefore, if present, beryllium will be a minor contaminant and is below 1 weight percent in any given waste container.

The waste stream and chemical constituents will be reviewed for consistency with the applicable TRUCON Content Number prior to shipment.

Radionuclide Information

The two most prevalent radionuclides by mass in this waste stream are Pu-239 and Th-232. The isotopes expected to be present in the waste stream are listed in Table 3.

Table 3. Radionuclides in Waste Stream OR-REDC-CH-HET

WIPP Tracked Radionuclides	Other Radionuclides				
Am-241	Am-243	Ce-141	Es-253	Pu-241	U-236
Pu-238	Sb-125	Ce-144	Es-254	Po-209	Zr-95
Pu-239	Bk-249	Co-60	Eu-152	Ru-103	Ru-103
Pu-240	Cf-249	Cm-242	Eu-154	Ru-106	Ru-106
Pu-242	Cf-250	Cm-243	Eu-155	Ag-110m	
U-233	Cf-251	Cm-244	Ho-166m	Tc-99	
U-234	Cf-252	Cm-245	Nb-95	Te-123m	
U-238	Cf-253	Cm-246	Np-237	Th-232	
Cs-137	Cf-254	Cm-247	Np-239	U-232	
Sr-90	Cs-134	Cm-248	Ni-63	U-235	

Payload management will not be employed for Oak Ridge National Laboratory.

Attachment 1

AK SOURCE DOCUMENTS, SUPPLEMENTAL DOCUMENTATION

Tracking Number	AK #	Title	Document Number	Date
C026	S9	Memo to J. T. Hargrove re: Description of the Item 10PUPROD2	NA	10/9/1986
C027	S9	Memo to J. T. Hargrove re: Description of the Item 10PUPROD3	NA	10/9/1986
C033	S7	Email to Trabalka re: Source of Pu-238(?) from Lab 208 Cleanout in 7920 (mid – 1983)	NA	4/14/1999
C038	S5, S9	Memo to W. S. Aaron re: REDC Shipment No. 1418: ~ 1.55 g of 244Cm (MC-12304)	NA	3/23/1989
C044	S9	Memo to J. T. Hargrove re: Description of Item 10PUPROD1	NA	4/25/1986
C046	S5	Memo to J. A. Lenhard, DOE OR re: Materials Management Plan-ORNL	NA	6/13/1984
C078	S5	Memo to Bryan Roy transmitting Historical Survey – RCRA Information	NA	4/4/2005
C098	S7	Interview with Wayne Evans: Waste management practices at REDC (Buildings 7920 and 7930)	NA	5/9/2005
C148	S7	Interviews with REDC Personnel; Kenton Wilson, Fred Chattin, Wayne Evans, Chuck Alexander; Curtis Porter; Porter Bailey; Charles Roberts	NA	06/19/2007-06/21/2007
C151	S7	Internal Correspondence: Mixed Waste Drums ATN 3190 and ATN 2965	NA	2/6/1995
C153	S7	Email Releasing ORNL Container Paperwork. Subject: The Release of Generator Disposal Forms (2822 and 2109) Forms.	NA	4/2008 - 5/2008
C302	S7	ORNL Comments on CCP-AK-ORNL-500, Rev. 0, Draft D	NA	3/5/2008
C306	S7	Email from Don Coffey to Steve Schafer	NA	3/14/2008
C307	S7	Walt Bond Interview	NA	2/21/2008
C308	S7	Interview of Jason Taylor, ORNL-PCB Coordinator from 1997 - 2004 re: PCB Management at ORNL	NA	4/8/2008
C311	S7	Interview from Jeff Harrison with Don Coffey and Wayne Evans re: Heat-Sealed Bags Used at REDC	C311	8/11/2008
C312	S7, S13	Interview of Rob Peacher by Sheri Nance re: Explanation of ORNL Training and Qualifications Process	C312	9/8/2008
C600	S12	Interviews with Don Coffey and Wayne Evans re: REDC RH Waste Cask Packaging Clarification and Swipe Sample Collection	NA	6/4/2008
C607	S2	Internal Correspondence from L. C. Williams regarding Fifty-Five Gallon Drum Locking Ring Installation	NA	10/8/1986
DR005	NA	Discrepancy Resolution: EPA Hazardous Waste Number Discrepancies	NA	6/24/2008

Tracking Number	AK #	Title	Document Number	Date
DR008	NA	Discrepancy Resolution: Follow-up on DR602 for EPA Hazardous Waste Number Discrepancies	NA	Draft
DR602	NA	Discrepancy Resolution: Follow-up on DR005 for EPA Hazardous Waste	NA	7/2/2008
I044	S3, S9	Number Discrepancies	CAN-02MVSWSF-0014	4/14/2005
M001	S11	Review by Charles Roberts of REDC Maintenance and Operational Log Books	NA	1970-1980
M005	S4	Container Paperwork and UNC-2109 Forms for ORNL Waste Drums for REDC CH Waste	Various	Various
M010	NA			
M012	S6	EM Waste Database Query - Container Information; Waste Description; Isotopes	NA	8/9/2007
M022	S10	Collection of MSDS for REDC CH and RH waste	NA	Various
M024	S6, S9	RH EM Waste Database Query	NA	10/4/2007
M072	S9	Evaluation of Additional Drums for Waste Stream OR-REDC-CH-HET dated 5/20/08	NA	5/20/2008
M074	S9	UCN-2109 Forms and Related Container Paperwork for Building 7920 Waste Packaged in Boxes	NA	Various
M111	S11	H. Thompson Logbook, Bldg 7920 ATN Record; 3/17/1980 - 10/31/1984	NA	3/17/1980 - 10/31/1984
M610	S13	ORNL/NSTD/REDC CY-2003 Surveillance Plan and Schedule	NA	9/27/2002
M611	S13	Surveillance Plan, Checklist, and Report Form for the Module C Surveillance	REDC-QA-96-003	July 10-15 and Aug. 12 & 13
M612	S13	Radiochemical Engineering Development Center TRU Waste Quarterly Surveillance	NA	9/7/1995
M613	S13	Trend Analysis Status of On-Going Efforts	NA	1997, 1998, 1999
M614	S13	Chemical Technology Division Self-Assessment Program	ORNL/CF/161	Nov-97
M615	S13	Purchase Requisition for Class II. Type B2 Vertical Laminar Flow Biological Hood and Stand or Console	NA	7/26/1996
M616	S13	Nonconformance Report (NCR) for Hydraulic Rabbit Capsules	NRC-X-96-RR-087	9/20/1996
M617	S9, S13	Iron-Spectrophotometric Ortho Phenanthroline Method	NA	Undated
M618	S9, S13	MOU Between the Neutron Activation Analysis Facility and the ES&H Division	AC-MOU-102-0901	12/18/1992
M619	S9, S13	Determination of Total Reducing Normality	9 00720002	Undated
M620	S13	Organizational Charts	NA	Various
M621	S13	Oak Ridge National Laboratory Fabrication Department Test Report	X-379276	11/6/1997
M622	S13	Information Scheduling and Storage System (ISSS) Forms (RIDS)	NA	Undated

Tracking Number	AK #	Title	Document Number	Date
M625	S1, S2	SWSA 6/Phase II Committee Minutes of September 30, 1986, SWSA 6/Phase II Committee Meeting	NA	9/30/1986
P013	S5	Solvent Extraction Studies with Intermediate-Burnup fast Flux Test Facility Fuel in the Solvent Extraction Test Facility	ORNL/TM-9514	Apr-86
P021	S5	Chemical Technology Division Progress Report for the Period April 1, 1981 to March 31, 1983	ORNL-5933	Sep-83
P025	S5	Raman Spectra of Uranyl Ion and Its Hydrolysis Products in Aqueous HNO3	Volume 85, Pages 547-549	1981
P030	S5	Chemical Technology Division Transuranium Processing Plant Semiannual Report of Production, Status, and Plans for Period Ending June 30, 1968	ORNL-4376	Apr-69
P037	S5	Chemical Technology Division Annual Progress Report for Period Ending May 31, 1968	ORNL-4272	Sep-68
P043	S5	Oak Ridge National Laboratory, Institutional Plan, FY 1996 – FY 2001	ORNL/PPA-95/1	Dec-95
P059	S5	Transuranium Processing Plant Semiannual Report of Production, Status, and Plans for Period Ending June 30, 1973	ORNL-4921, UC-4-Chemistry	Mar-74
P077	S5	Transuranium Processing Plant Report of Production, Status, and Plans for Period October 1, 1978 to September 30, 1980	ORNL-5596	Aug-81
P079	S5	Transuranium Processing Plant Semiannual Report of Production, Status, and Plans for Period Ending December 31, 1972	ORNL-4884	Aug-73
P088	S5	Transuranium Processing Plant Semiannual Report of Production, Status, and Plans for Period Ending June 30, 1971	ORNL-4718	Dec-71
P093	S5	Characterization of ORNL Transuranic Waste from the Measurement of Fission and Activation Products	NA	May-97
P096	S5	Chemical Technology Division Annual Progress Report, Period Ending March 31, 1974	ORNL-4966	Aug-74
P096	S9	Chemical Technology Division Annual Progress Report, Period Ending March 31, 1974	ORNL-4966	Aug-74
P097	S5, S9	Chemical Technology Division Annual Progress Report, Period Ending March 31, 1978	ORNL-5383	3/31/1978
P098	S5, S9	Chemical Technology Division Annual Progress Report, for the Period April 1, 1979 to March 31, 1971	ORNL-5757	Nov-81
P099	S5	Chemistry Division Annual Progress Report, Period Ending November 1, 1975	ORNL-5111 UC-4 – Chemistry	Feb-76
P110	S5	Chemical Technology Division Annual Progress Report for Period Ending March 31, 1972	ORNL-4794	Aug-72

Tracking Number	AK #	Title	Document Number	Date
P113	S8	Progress in Nuclear Energy, Series III, Process Chemistry, Volume 4; Section: 7.2 Processing Methods For The Recovery Of Transplutonium Elements	NA	1970
P114	S5	Chemical Technology Division Annual Progress Report for Period Ending March 31, 1971	ORNL-4682	Jul-71
P118	S5, S9	Metals and Ceramics Division Annual Progress Report For Period Ending June 30, 1971	ORNL-4770	Sep-71
P121	S5	Solvent Extraction Studies of 10% TBP Flowsheets in the Solvent Extraction Test Facility Using Irradiated Fuel from the Fast Flux Test Facility	ORNL/TM-10266	Mar-88
P130	S5	Solvent Extraction Studies of Coprocessing Flowsheets – Results from Campaign 5 of the Solvent Extraction Test Facility (SETF)	ORNL/TM-8598	Nov-83
P146	S9	C-Tank Transfers; Transuranic Sludge Removal From the C-1, C-2, and W-23 Waste Storage Tanks at Oak Ridge National Laboratory. Oak Ridge, Tennessee	BJC/OR-279	May-99
P151	S5	Chemical Technology Division Annual Progress Report for Period Ending May 31, 1973	ORNL-4883, UC-10	Aug-73
P153	S5	Chemical Technology Division Annual Progress Report; Period Ending March 31, 1975	ORNL-5050, UC-10	Oct-75
P157	S5	Chemical Technology Division, Transuranium Processing Plant Report of Production, Status, and Plans for the Period January 1, 1978 – September 30, 1978	ORNL-5531	Jun-79
P160	S5	Chemical Technology Division Annual Progress Report; Period Ending March 31, 1977	ORNL-5295 UC-10	Oct-77
P185	S5, S9	Measurements of Fission and Activation Products for Oak Ridge National Laboratory Transuranic Waste Characterization	ORNL/TM-13292	Jun-97
P229	S5, S9	Solvent Extraction Studies of Coprocessing Flowsheets – Results from Campaigns 1 and 2 of the Solvent Extraction Test Facility (SETF)	ORNL/TM-7080, Dist. Category UC-86	Jul-82
P240	S2	Packaging and Disposition of Contact-Handled Transuranic Waste At the Radiochemical Engineering Development Center	REDC FO/WH 5100	01/26/1995; 07/15/1998
P241	S2	Oak Ridge National Laboratory Contact-Handled Transuranic Waste Certification Program Plan	ORNL/TM-10322/2	Aug-90
P242	S2, S11	Oak Ridge National Laboratory Contact-Handled Transuranic Waste Certification Program Plan	ORNL/TM-10322/R3	Jun-92
P244	S2	Certification Document for Newly Generated Contact-Handled Transuranic Waste	ORNL-5985/R1	May-84

Tracking Number	AK #	Title	Document Number	Date
P251	S2	Box Breakdown Area Operations	CH-P-OP-003	03/13/2007;10/11/2007; 7/29/2008
P252	S2	Glove Box Operations	CH-P-OP-004	03/13/2007; 10/11/2007; 7/29/2008
P253	S2	Drum Bag In/Bag Out and Glove Ports	CH-P-OP-011	05/02/2007; 1/15/2008,
P254	S2	Contact Handled Waste Repackaging (Rewritten)	CH-P-OP-013	4/30/2007;10/3/2007;2/22/2008
P256	S3	TRU/Alpha Low Level Waste (LLW) Treatment Project Documented Safety Analysis	T-CM-FW-R-AD-001	3/1/2007
P259	S9	Chemical Technology Division Segregation of Metals-Containing Wastewater by pH	ORNL/TM--11406	Oct-90
P263	S2	TRU Operating Manual and Supporting Documentation	NA	10/10/1980
P277	S5	Project Plan for the Evaluation of REDC Waste for TRU-Waste Radionuclides	ORNL/TM-13087	Sep-96
P279	S3	Safety Analysis for the Transuranium Processing Plant, Building 7920	ORNL-3954	Apr-68
P280	S5, S9	Summary of the Campaign During July 1968 to Process Fourteen Irradiated HFIR Targets in the Transuranium Processing Plant	ORNL-TM-2434	Dec-69
P282	S2	Chemical and Analytical Sciences Division Standard Analytical Methods Procedures	Various	2000-2001
P291	S2	Radioisotope Development Laboratory Building 3047 Hazards Report	ORNL-TM-946	5/24/1974
P324	S3	Technical Safety Requirements Irradiated Fuels Examination Laboratory Building 3525	ORNL/3525/TSR	8/1/2004
P325	S3	Oak Ridge National Laboratory Standardized Safety Analysis Report for Nonreactor Nuclear Facilities	ORNL/NNFD/SSAR	5/12/2004
P330	S3	Safety Analysis Report Irradiated Fuels Examination Laboratory / Building 3525	ORNL/3525/SAR	6/22/2006
P401	S13	Radioactive materials Analysis laboratory Quality Assurance Plan for the Characterization of Radioactive Waste	QAP-X-96-CASD/RML-001	Oct-97
P412	S11	Fabrication and Preirradiation Data for High Flux Isotope Reactor Prototype Target Rods	ORNL-TM-811	Jun-64
P415	S1, S2, S8	The HFIR Water Strainer	ORNL-TM-3460	Mar-72
P416	S5	Chemical Technologies Division Annual Progress Report For Period Ending May 31, 1965	ORNL-3830	Nov-65
P420	S3	Summaries of Chemical Technology Division Programs - FY 1978	ORNL/CF-77/400	9/10/1977
P423	S8	Proceedings of the Workshop on the Management of Radioactively Contaminated Soils, Knoxville, TN, November 10, 1988	ORNL/TM-11332	11/21/1989
P432	S3	TRU Waste Processing Center Document Safety Analysis	CM-R-AD-001	10/31/2007 12/20/2007

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P494	S5	Uranium and Plutonium Distribution Coefficients in the 6 vol % and 30 vol % TBP-NDD Systems	ORNL/TM-7493	Mar-81
P496	S5	The Reduction of Plutonium (VI) to Plutonium (IV) in Nitric Acid by Nitric Oxide or Nitrogen Dioxide Gases	ORNL/TM-6552	11/30/1978
P497	S1, S2, S5, S6	Separation of Americium; Curium, and Rare Earths from High-Level Wastes by Oxalate Precipitation: Experiments with Synthetic Waste Solutions	ORNL/TM-6445	1/16/1980
P498	S5	Radiochemical Procedures	ORNL/TM-6372	6/2/1978
P499	S2, S5, S6	Head-End Processing Studies with Mechanically Blended (U, Pu)O2 Reactor Fuels	ORNL/TM-6266	8/3/1978
P501	S5	Actinide Partitioning and Transmutation Program Progress Report for Period July 1 to September 30, 1977	ORNL/TM-6174	3/13/1978
P505	S5	Waste Metal Recovery By Solvent Extraction	ORNL-TM-4327	7/26/1973
P538	S3	Building 7920 Review: Follow-Up Information / Action Item Listing	NA	12/20/1990
P539	S2	Radioisotope Development Laboratory Building 3047 Hazards Report (Isotopes Development Center)	ORNL-TM-946	10/5/1964
P540	S8	Publications of the Radioactive Waste Disposal Section Health Physics Division	ORNL-TM-3301	Feb-71
P542	S3	Operational Safety Requirements Transuranium Processing Plant, Building 7920	ORNL/CF-81/242	12/24/1990
P551	S5	A Self-Replenishing Tritium Target for Neutron Generators	ORNL-TM-3397	Jun-72
P562	S5	Analytical Chemistry Division R&D Monthly Summaries - 1973	Various	1/1983 - 12/1973
P601	S9, S13	Operation of Nuclear Measurements Corporation Gas-Flow Proportional Counter	CASD-AM-TAL-0002	Aug. 1996, 3/27/2000
P602	S9, S13	Operation of the Tennelec LB-1000 Low Level Gas-Flow Proportional Counter	CASD-AM-TAL-0003	4/4/2000
P603	S9, S13	Operation of the Tennelec LB-4000 Low Level Gas-Flow Proportional Counter	CASD-AM-TAL-0004	4/4/2000
P604	S9, S13	Alpha Spectrometry with the Canberra Genie-ESP Data Acquisition System	CASD-AM-TAL-0005	5/8/2000
P605	S9, S13	Oak Ridge National Laboratory Chemical and Analytical Sciences Division Standard Analytical Method for Total Plutonium, 2-Thenoyltrifluoroacetone Extraction Method	CASD-AM-TAL-0006	5/24/2000
P606	S9, S13	Oak Ridge National Laboratory Chemical and Analytical Sciences Division Standard Analytical Method for Total Radioactive Strontium by Extraction Chromatography	CASD-AM-TAL-0008	6/29/2001
P607	S13	Gross Beta Activity Measurements	CASD-AM-TAL-0009	6/29/2001

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P608	S9, S13	Oak Ridge National Laboratory Chemical and Analytical Sciences Division Standard Analytical Method for Operation of Packard Model 2500TR Liquid Scintillation Counter	CASD-AM-TAL-0010	7/25/2001
P610	S9, S13	The Resin Method of Sample Preparation For Isotopic Analysis of Am, CM, and CF	40307	11/14/1987
P611	S9, S13	The Resin Bead Method of Sample Preparation for isotopic Analysis of Pu and U	40306	8/1/1979
P612	S9, S13	Gross Gamma, Scintillation Method	200365	NA
P613	S9, S13	Preparation of Carbonate Free LiCl Solution	100441	2/9/1988
P614	S13	Anion Exchange Separation of Uranium from Reactor Dissolver Solutions	100715	3/1/1985
P615	S13	Loading of Resin Beads for Isotopic Dilution Mass Spectrometric Analysis of Amercium-241	10936	12/7/1987
P616	S13	Determination of Total Solids in TPP Process Solution	1107	4/11/1988
P617	S13	Methrohm E536 Potentiograph-Potentiometric Titrations	3105	NA
P618	S9, S13	Operation of Remote Pipetting System ORNL Model Q-5780 (Process Methods) Method No. 1 003109	3109	NA
P619	S9, S13	Operation of Remote Titration System ORNL Model Q-5895	1003113	1/1/1985
P620	S9, S13	Operation of Spectronic 501 Spectrophotometer	3034	1/28/1988
P621	S9, S13	Gross Neutrons Determination	20953	3/29/1988
P622	S13	249-Berkelium Determination	31101	2/26/1988
P623	S13	Determination of Neptunium in Fission Product Mixtures	31534	11/25/1987
P624	S13	Determination of Uranium-232 and Uranium-233 by Alpha Spectroscopy	31926	12/30/1987
P625	S13	U-233 Hexone Extraction Method	123920	2/2/1988
P626	S13	Uranium, Spectrophotometric Ammonium Thiocyanate Method	219210	4/13/1988
P628	S13	Free Acid, Phenolphthalein End-Point	220025	2/2/1988
P629	S13	Free Acid and Hydrolyzable Ion Concentration Using the Remote Titration System, ORNL Model Q-5895	220034	5/9/1988
P630	S13	Free Acid and Adogen Determination in TRU Process Solutions	221011	2/25/1988
P631	S13	Determination of pH of Aqueous Solutions	230041	4/15/1988
P632	S13	Operating Procedure for Weighing and Dissolution Glovebox Line	NA	2/25/1988
P633	S9, S13	Oak Ridge National Laboratory Chemical and Analytical Sciences Division Standard Analytical Method for Gross Alpha Activity Measures	CASD-AM-TAL-0001	2/10/2000
P634	S9, S13	Measurements of Fluorescein and Rhodamine B by Fluorescence	1221025	1/28/1988

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P636	S9, S13	Operation and Calibration of the Canberra, Nuclear Data Genie-ESP Data Acquisition and Processing System	CSD-AM-RML-RA04	8/22/2005
P637	S13	Oak Ridge National Laboratory Chemical and Analytical Sciences Division Standard Operating Procedure for the Administration of Chemical and Analytical Sciences Division Procedures	CASD-OP-000-AD01	3/15/1994
P638	S13	Oak Ridge National Laboratory Standard Practice Procedure for ORNL Document Management	X-AD-9	2/28/1994
P639	S13	Oak Ridge National Laboratory Chemical and Analytical Sciences Division Chemical and Analytical Sciences Division Quality Assurance Plan	QAP-X-94-CASD-001	9/29/1995
P640	S13	Radioactive Materials Analytical Laboratory Quality Assurance Plan for the Characterization of Radioactive Waste	QAP-X-96-CASD/RML-001	05/10/1996, 9/1/2003
P641	S9, S13	Oak Ridge National Laboratory Chemical and Analytical Sciences Division Standard Operating Procedure for Handling of Samples and Decontamination of Ion Lenses in the 5505 TRU Laboratory	CASD-OP-TRL-RP01	7/16/1999
P642	S13	Oak Ridge National Laboratory Chemical and Analytical Sciences Division Standard Operating Procedure for Inorganic Mass Spectrometry Quality Assurance Plan	QAP-X-94-CASD/IMS-001	7/31/1996
P643	S13	Transuranium Analytical Laboratory QA Program	QA-AC-103-0201	11/11/1998, 7/20/1989
P644	S13	Oak Ridge National Laboratory Chemical and Analytical Sciences Division Standard Operating Procedure for Use of Radiochemical Glove Boxes in the Transuranium Research Laboratory	CASD-OP-TR-GB01	8/22/1995
P645	S13	Oak Ridge National Laboratory Analytical Chemistry Division Standard Operating Procedure for Configuration Control for the Radioactive Materials Analytical Laboratory, Building 2026	AC-OP-105-0308	8/23/1993
P646	S9, S13	Oak Ridge National Laboratory Analytical Chemistry Division Standard Operating Procedure for Sample Tracking for the Transuranium Analysis Laboratory	AC-OP-103-0805	3/23/1989
P647	S13	Oak Ridge National Laboratory Analytical Chemistry Division Standard Operating Procedure for Use and Handling of Chemicals for the Transuranium Analysis Laboratory	AC-OP-103-0808	3/23/1989, 9/22/1989
P648	S13	Oak Ridge National Laboratory Chemical and Analytical Sciences Division	AC-OP-103-0901	3/28/1994

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P649	S13	Oak Ridge National Laboratory Analytical Chemistry Division Standard Operating Procedure for Operation of Analytical Balances for the Transuranium Analysis Laboratory	AC-OP-103-1201	4/3/1989
P650	S13	Chain of Custody Sample Storage for the Transuranium Analysis Laboratory	AC-OP-103-1301	11/16/1988, 3/23/1989
P651	S13	Chain of Custody Sample Security for the Transuranium Analysis Laboratory	AC-OP-103-1302	3/23/1989
P652	S13	Neutron Activation Analysis Facility Training and Certification Program for Operators of the Pneumatic Tube Systems, PTS-1 and PTS-2	AC-OP-102-0207	12/1/1993
P655	S13	Quality Assurance Project Plan For Packaging of Transplutonium Elements and other Radioactive Products by the Radiochemical Engineering Development Center for Off-Site Transportation	QAP-X-88-CT-001	12/1/1988
P657	S13	Quality Assurance Plan for Modifications and Maintenance of Hot-Cell Support Systems and Adjunct Facilities at the REDC	QAP-X-88-CT-002	12/20/1989
P659	S13	Lockheed Martin Energy Research Corporation Oak Ridge National Laboratory Program Description for ORNL Job Hazard Evaluation	ORNL-SH-P29	9/10/1999
P660	S13	Waste Certification Program Plan	NA	3/30/2004
P662	S13	Duties and Responsibilities of the Sample Custodian for the Transuranium Analysis Laboratory	AC-OP-103-0801	3/28/1989
P663	S13	Data Review for the Transuranium Analysis Laboratory	AC-OP-103-0301	3/27/1989
P664	S13	Sample Chain-of-Custody for the Transuranium Analysis Laboratory	AC-OP-103-0804	9/22/1989
P665	S13	Quality Assurance Program Requirements for Projects Utilizing Hot-Cell Facilities	HC/QA-11560	4/12/1988
P666	S13	Oak Ridge National Laboratory Transuranic Waste Certification Program	ORNL/TM-10322	Jun-87
P667	S13	Quality Assurance Program Status Reporting	QA-L-1-100	10/15/1988
P668	S13	RMAL-ORNL Quality Assurance Project Plan for the TRU Waste Characterization Program	QAP-X-94/CASD/RML-002	6/1/1995
P669	S13	Preparation and Documentation of Radioactive Standards, Carriers, Inorganic and Organic Standard Solns	CASD-OP-RML-AD04	1/31/1995
P670	S13	Chemical and Analytical Sciences Division Training Plan for Nuclear Facilities	CASD-OP-000-TR02	7/1/1996
P671	S13	Sample Management in the Radioactive Materials Analytical Laboratory, (RMAL), Building 2026	CASD-OP-RML-AD02	3/31/1995
P672	S13	Work Policies and Practices, Radioactive Materials Analytical Laboratory (RMAL), Building 2026	CASD-OP-RML-AD01	2/15/1996

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P673	S13	The Analytical Chemistry Division Quality Control Program	QA-AC-000-0901	10/251990
P674	S13	Chemical and Analytical Sciences Division Training Program Plan	CASD-OP-000-TR01	6/1/1996
P675	S13	Office of Quality Programs and Inspection Quality Assurance Plan	QAP-X-96-QD-001	7/30/1996
P677	S13	High Radiation Level Analytical Laboratory (HRLAL) Facility QA Program	QA-AC-105-0201	8/20/1990
P678	S13	Radiochemical Technology Section Quality Assurance Plan	RTS/QA/17	7/23/1992
P679	S13	Chemical Technology Division Isotope Technology Section Quality Management Plan for the Radiochemical Engineering Development Center	REDC-QMP-1	Dec-96
P681	S13	QA Requirements for TRU Waste Certification Program	QA-L-20-100	Jan-87
P682	S13	Chemical Technology Division Self-Assessment Program Plan CY 1996-1998	ORNL/CF-96/2	Jan-96
P683	S13	Oak Ridge National Laboratory Organizational Charts and Document for Transferring Responsibilities to NNFD Beginning October 1, 2002	NA	Oct-02
P685	S13	Bagging Practices and Techniques for Standard Glovebox Operations	AC-OP-100-0910	Jun-90
P686	S13	Preparation and Documentation of Radioactive Standards and Carriers for the Transuranium Analysis Laboratory	AC-OP-103-0603	Mar-89
P687	S13	Quality Assurance Plan for Contact-Handled Transuranic Waste Certification and Operations	QAP-X-93-WMRA-056	Jul-93
P688	S13	Waste Examination and Assay Facility (WEAF) Operations	QAP-X-91-ESHC/WM-002	Jun-93
P689	S13	ORNL Quality Assurance Project Plan for the Transuranic Waste Characterization Program	WMRA-WMP-601	Dec-95
P690	S13	Quality Assurance Plan for Research and Development Activities within the Chemical Development Section of the Chemical Technology Division	QAP-X-88-CT-009	Jan-89
P692	S13	Quality Assurance Program Manual Analytical Chemistry Division	ORNL/M-806	10/1/1989
P693	S13	ORNL Self-Assessment Program	ORNL-QA-P03	12/20/2000
P694	S13	ORNL Issues Management Program	ORNL-QA-P04	9/29/2000
P695	S13	ORNL Nonconformance Control Procedure	ORNL-QA-P05	5/27/1998
P696	S13	Deviation Procedure	ORNL-QA-P06	DRAFT
P697	S13	List of All Comments on QA-P07 ORNL Lessons Learned Program	ORNL-QA-P07	4/27/1998
P698	S13	Control and Calibration of Measuring and Test Equipment at ORNL	x-GP-8	3/18/1994
P699	S13	ORNL Nonconformance Reporting	X-QA-9	5/20/1996

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P812	S2	Actinide Product Finishing / Special Projects Procedure: Fabrication and Testing of a Cf-252 Hemispherical Fission Chamber	PF-OP-15.0/R1	09/18/2001; 08/13/2001
P818	S2	Actinide Product Finishing/Special Projects Procedure: Fabrication and Testing of a Cf-252 Hemispherical Fission Chamber	PF-OP-15.0	08/13/2001 and 09/18/2001
P819	S2	Actinide Product Finishing/Special Projects Procedure: Actinide/Lanthanide Separation Studies for the Advanced Fuel Cycle Initiative	PF-OP-30.0	5/22/2003
P823	S2	Actinide Product Finishing/Special Projects Procedure: Actinide Separation by Pressurized Chromatographic Elution from Cation Exchange Resin in Cave B	PF-OP-4.0	10/9/2000
P824	S2	Actinide Product Finishing/Special Projects Procedure: Actinide/Lanthanide Separation by Chromatographic Elution from Cation Exchange Resin	PF-OP-6.0	10/14/1994
P850	S6	ORNL Computerized Hazardous Materials Tracking System	NA	May-85
P852	S2	Standard Procedures for Hot Cell Operations (Cleanex Procedures) for Bldg 7920	NA	8/1/1985
P853	S2	Hot Cell Procedure: Tank T-60: Clean Out of Organic Used in a Diluent Wash Stage	HC-OP-1010;1027; 1038	6/29/1989
P854	S2	Hot Cell Operating Procedure: Sampling of Actinide Oxide Product	HC-OP-930	2/15/1990
P855	S2, S3	Safety Standards	NA	1962 - 1968
P862	S3, S5	Problem Safety Summary for Building 3047, Isotope Circle - Decontamination of Cell D	CD-120	2/10/1989
P877	S8	Analytical Chemistry Division Employee Handbook	M-2791	Apr-93
P882	S3	Independent Review of Safety Systems (Document Reviewed: Safety Analysis TURF, Building 7930)	NA	Mar-91
P905	S2	Health Physics Procedure - Handling and Transfer of Radioactive Materials within the Laboratory and Guide for the Transfer of Materials Between Contaminated Enclosure Systems and Non-Contaminated Areas	Procedure 4.1	1/1/1976
P911	S5	Quarterly Progress Report for the Chemical and Energy Research Section of the Chemical Technology Division: July-September 1999	ORNL/TM-1999/304	Mar-01
P930	S10	Independent Review of Safety Analysis Documentation for Radiochemical Engineering Development Center - Building 7930 - Inspection Record package	NA	Mar-91

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P932	S3	Radioactive Operations Committee and Office of Operational Safety Review of the Radiochemical Engineering Development Center and the Radiochemical Processing Plant, December 12-15, 1988	NA	Dec-88
P1000	S13	Standard Practice Procedure for Records Management	X-AD-7	6/30/1993
P1001	S13	ORNL Office of Quality Services Procedure for Certification of Technical Lead Auditors	OQS-QA-P02	10/22/1998
P1002	S9, S13	Cleaning of Glassware	AC-OP-500-1201	10/25/1990
P1003	S13	Quality Assurance Plan for Operations in Hot Cells, Shielded Caves, Glove Boxes, and Related Support Areas at the Radiochemical Engineering Development Center	QAP-X-88-CT-003	3/28/1990
P1110	S5	Chemistry Division Annual Progress Report for Period Ending April 30, 1993	ORNL-6756	Aug-93
P1113	S6	Oak Ridge Tennessee Flora: Preliminary Alphabetic Inventory of Vascular Plants	ORNL-TM-1232	Feb-66
U011	S2, S9	Safety Analysis: Transuranium Processing Plant, Building 7920	ORNL/TM-7688	Dec-84
U038	S5, S9	ORNL TRU Waste Historical Survey; Volumes 1, 2, and 3—Origins and Characteristics of Remote-Handled Transuranic Wastes (Trabalka report) Plus Appendices	BJC/OR-395-V/1,2,3	Sep-01
U039	S5, S9	Oak Ridge Reservation Transuranic Waste Acceptable Knowledge Summary Report for the Radiochemical Engineering Development Center: Newly Generated Contact-Handled Transuranic Waste from Isotope Production	ORNL-CH-AK-TBD/RA	7/12/2002
U041	S9	Waste Stream Profile Sheet for 7920-HCAL-007 R1 and Supporting Documentation	7920-HCAL-007 R1	9/6/2002
U044	S2, S9	Weston Report: Acceptable Knowledge Summary Report for Oak Ridge National Laboratory Contact-Handled TRU Debris Waste Facility Maintenance Operations	Weston AK-ORNL-001	0524/2006; 06/19/2006
U045	S9, S12	Waste Stream Profile Sheet for Building 7920, Hot Cells and Analytical Labs	7920-HCAL-002	4/19/1999
U049	S9	Waste Stream Profile Sheet for 7920-HCAL-005 and Supporting documentation	7920-HCAL-005	8/18/1999
U105	S9	Waste Stream Profile Sheet for Building 7920, Room 11, Waste Stream 7920-R211-001	7920-R211-001	7/15/1999
U106	S9	Waste Stream Profile Sheet for Building 7920, Room 109, Waste Stream 7920-R109-001 and 7920-R109-001R1	7920-R109-001 and 7920-R109-001R1	9/25/02; 6/10/1999
U107	S9	Waste Stream Profile Sheet for Building 7920, Room 111, ORNL Waste Stream 7920-R111-001	7920-R111-001	7/1/1999
U110	S9	Data Quality Objectives (DQO) Worksheet for Building 7920, Labs 209 and 211	DQO # 08-004	7/15/2008

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U403	S11	Log Book: Cave A Liner Replacement Activities	NA	4/1999 - 1/2001
U412	S11	Logbook Reference 6R1 - Cf-252 Electrodeposition Processing - Initial CX, TEVA, and Final CX Purifications (REDC Bldg 7920)	Logbook 6R1	4/2003 - 9/2003
U420	S2, S4, S11	Research and Technical Notebook No. A-103608-G, Assigned to Curtis Porter, Process Development, REDC, Chemical Technology, Building 7920	A-103608-G	8/1989 - 7/2002
U422	S9	Waste Stream Profile Sheet for Waste Stream 7920-HCAL-002, Memo from D. E. Coffey to Memo to file regarding Waste Stream Profile Sheet (WSPS) 7920-HCAL-002 Data Description; Email from Chris D. Parks to D. E. Coffey regarding Pu-241 in REDC Waste	NA	4/15/1999; 04/01/1999; 12/16/1998
U423	S11	Unclassified Notebook A-6228 for M. H. Lloyd, Chem. Tech., Building 7920, Issued 12/10/1970	N/A	01/29/1971-09/22/1972
U424	S11	ORNL Technical Notebook No. A-106986-G, Assigned to Milt Lloyd, Chem Tech Division	A-106986-G	issued 9/15/1994 notes from 06/16/1980-09/16/1980
U425	S11	ORNL Technical Notebook No. A-106985-G - Milt Lloyd; Susan North	Logbook A-106985-G	issued 1/17/1990 notes from 01/17/1980-06/09/1980
U428	S11	Unclassified Notebook No. A-6272, Assigned to O. K. Tallent, Chem Tech Department, Building 7920, Issued 2/4/1971	A-6272	2/18/1971 - 6/21/1971
U429	S11	Unclassified Notebook A-6271: Building 7920, O.K. Tallent	A-6271	2/20/1973 - 5/20/1975
U432	S11	O.K. Tallent Logbook A-106981-G Transferred to Milt Lloyd (Chem Tech Division, Building 7920), Dated 09/14/1994 (Solvent Extraction, etc.)	A-106981-G	1/11/1978 - 4/24/1981
U434	S11	ORNL Technical Notebook No. A-106983-G, Milt Lloyd/McCosh, Solvent Extraction, Chemical Technology Div. Bldg 7920, Issued 09/14/1994	N/A	04/10/1961-08/14/1961
U435	S11	ORNL Technical Notebook A-106991-G, Milt Lloyd, Building 7920 Chem Tech Division, Solvent Extraction	A-106991-G	2/10/1976 - 9/22/1976
U436	S11	Unclassified Notebook No. A-6227, Milt Lloyd, Building 7920 Chem Tech Division	A-6227	4/11/1972 - 10/4/1974
U437	S11	ORNL Technical Notebook No. A-106992-G, Milt Lloyd and Susan North Lewis, Building 7920	Logbook A-106992-G	8/4/1977 - 9/29/1980
U438	S11	Unclassified Notebook No. A-6229, Milt Lloyd logbook, Building 7920 (REDC)	A-6229	4/19/1973 - 6/16/1975
U439	S11	ORNL Technical Notebook No. A-106981-G for Milt Lloyd and O.K. Tallent, Chem Technology Division, Building 7920	Logbook A-106981-G	1/11/1978 - 4-24-1981
U441	S11	ORNL Technical Notebook A-106988-G, Milt Lloyd, Chemical Technology Division, Building 7920	Logbook A-106988-G	2-23-1978 - 11-29-1978

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U442	S11	Unclassified notebook No, A-6307, R. A. Ward, Health Physics, Bldg 7920	A-6307	5-24-1971 - 11-2-1973
U443	S11	Unclassified Notebook No. A-6226, Milt Lloyd, Chem Tech, Bldg 7920	Logbook A-6226	1-15-1971 - 4-6-1972
U452	S11	Research and Technical Notebook: Building 7920 (MS 6384) No, A108099-G, Curtis Porter, Chem Technology Division (Isotope Technology)	A-108099-G	12/4/1996 - 1/7/1997
U453	S11	ORNL Technical Notebook No. A106984-G, Milt Lloyd, Jeff Wade, O.K. Tallent, Chem Technology Division, Bldg 7920, Solvent Extraction	Logbook A-106984-G	6/8/1977 - 4/18/1978
U468	S11	RTC Facility Logbook Misc/1988/0001; Buildings 7025; 3038E; 3038; 3033A; 3047 - J. M. Dailey (Isotopes)	Logbook Misc/1988/0001	1/4/1988 -12/18/1989
U477	S11	ORNL Technical Notebook No. A-105094; Building 7920; REDC - Curtis Porter	Logbook A-105094	11/19/1991 - 9/15/1995
U478	S11	ORNL Technical Notebook No. A-102161; Chemical Technology / Finished Products / J. T. Wiggens	Logbook A-102161	2/19/1986 - 11/6/1991
U479	S11	Logbook; TURF Project; H. C. Savage (Bldg 7930)	Logbook Un-numbered	1/27/1984 - 6/10/1985
U480	S2, S11	Logbook TURF (Bldg 7930) Operations Log #1; Pre-MSRE Fuel	Logbook TURF Log #1	8/3/1967 - 9/14/1967
U481	S11	Logbook REDC Building 7930 (TURF Facility); M. E. Littleton	Unnumbered	11/19/1990 - 9/22/1993
U482	S11	TURF Logbook 16L4; Building 7930; M. E. Littleton	Logbook: TURF 16L4	8/8/1988 - 11/16/1990
U483	S11	ORNL Technical Logbook No. A-9372; C. E. McFarland; Building 3038	Logbook A-9372; 3038/1980/0001	2/20/1980 - 12/30/1980
U484	S11	ORNL Technical Notebook No. A-105094; Assigned to C. E. Porter on 11/01/1991; ITS/REDC; Products Research and Development Projects	A-105094	11/19/1991 - 09/13/1993
U489	S11	Logbook #B000550, B000552, B000553, B000554, B000555; Curtis Porter; Building 7920; Chemical Technology Division	Logbook #B000550	3/22/1999
U493	S11	Logbook TURF (Bldg 7930) Building Log; 10/16/1973 - 12/17/1982	Logbook: TURF BLDG Log	10/16/1973 - 12/3/1982
U494	S11	Logbook: TURF (Bldg 7930) Logbook #12; 1/3/1983 - 8/21/1984	Logbook TURF #12	1/3/1983 - 8/21/1984
U495	S11	Logbook: TURF (Bldg 7930) E. B. Cagle 1987	Logbook: TURF - E. B. Cagle	1/2/1987 - 5/20/1988
U496	S11	Logbook: TURF (Bldg 7930) Logbook E. B. Cagle; May 10, 1985	Logbook E. B. Cagle	5/10/1985 - 12/31/1985
U497	S11	Logbook: Log #1; Building 7930; W. Bostic, W. Miller; R. Bowman, F. Brown (TURF Bldg)	Logbook Log #1 Bldg 7930	9/18/1967 - 1/15/1968

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U498	S11	Logbook: TURF (Bldg 7930) Logbook 14 L2; 8/22/1984 - 6/23/1985	Logbook: TURF Logbook 14	8/22/1984 - 6/23/1986
U499	S11	Logbook: TURF (Bldg 7930) Log #11; 1/1/1971 - 10/5/1973	Logbook: TURF Bldg Log #11	1/11/1971 - 6/21/1973
U500	S10, S11	Logbook: TURF (Bldg 7930) Logbook 15L3; M. E. Littleton; 6/24/1986 - 8/5/1988	Logbook: TURG Logbook 15L3	6/24/1986 - 8/5/1988
U501	S3, S9, S11	Logbook: G. A. West; C. E. Roberts; H. C. Thompson; 1/4/1972; Bldg 7920 Waste Logbook	Logbook: G. A. West; Issued 1/4/1972	1/2/1975 - 8/31/1976
U502	S11	Logbook: TRU Log (Maintenance & Waste); G. A. West; C. E. Roberts; H. C. Thompson; Bldg 7920	Logbook: TRU Log (Maint & Waste)	9/1/1976 - 11/30/1977
U503	S11	Logbook: TRU Maintenance & Waste Disposal; Building 7920; 12/1/1977 - 2/2/1979; West; Roberts; Thompson	Logbook: TURF Maintenance & Waste Disposal	12/1/1977 - 2/2/1979
U505	S9, S11	Lab Notebook: RE-2 - Analytical Chemistry Division - Charles Alexander - Building 7920	NA	11/1987 - 9/12/1988
U506	S11	Research & Technical Notebook No. Te-1 - Chemical Technology Division - Building 7920 - Charles (Chuck) Alexander - A-107733-G	A-107733-G	3/1/1996 - 12/12/1997
U507	S11	Research & Technical Notebook - Notebook No.(SM-1) A-107736-G - Building 7920, MS 6384 - Charles Alexander	A-107736-G	01/30/1997 - 02/25/1997
U508	S11	Lab Notebook 21/150/REC - Building 7920 - Charles (Chuck) Alexander	21/150/REC	4/25/1991 - 1/3/1992
U519	S11	Transuranium Bldg Log, Vol. 504, Logbook # A-8632, L. J. King, Chem Tech Division, Bldg 7920; 01/28/1979 - 02/05/1979	Logbook # A-8632	01/28/1979 - 02/05/1979
U528	S11	Technical Notebook - Chem Tech - Charles (Chuck Alexander) - Building 7920; 8/6/2003 - 8/1/2006	21/300/R; SL-AM241-SP-1	8/6/2003 - 8/1/2006; 08/01/2003
U529	S11	Technical Notebook - B000334 - Chem Tech- Charles (Chuck) Alexander - Building 7920; 12/11/1985 -7/29/1988	Logbook # B000334	12/11/1985 -7/29/1988
U530	S11	Logbook A-103674; REDC Mark 42 Process Development; Charles (Chuck) Alexander; Building 7920; issued to O'Kelley, G. D.	Logbook A-103674	10/13/1989
U531	S11	Logbook - Building 7920 - TRU Maintenance and Waste Disposal - 2/5/1979	NA	2/5/1979
U532	S11	Lob Book - Waste Transfer Area (LAA Area- Building 7920 - C.E. Roberts - 1977	NA	9/1977 - 3/1978
U533	S11	Logbook #9 - Building 7920 - 7/1968 - 1/1969	Logbook #9	7/1968 - 1/1969
U534	S11	Logbook - Building 7920 - 1/1992 thru 11/1993 -	NA	1/1992 - 11/1993

Tracking Number	AK #	Title	Document Number	Date
U535	S11	Logbook - Building 7920 - Process H20 Shutdown - 1979 thru 1984	NA	4/1979 - 2/1985
U536	S11	Logbook Building 7920 - 1/1989 thru 1/1990 - Waste Logbook	NA	1/1989 - 1/1990
U537	S11	Log Book Building 7920 - 11/1982 thru 8/1984 - Waste Logbook	NA	11/1982 - 8/1984
U538	S11	Logbook - Building 7920 - 1/1984 thru 6/1984 - Waste Logbook	NA	1/2/1984 - 6/8/1984
U539	S11	Logbook Building 7920 - 9/1981 thru 11/1982 - Waste Logbook; Marked Periodic Table	NA	9/1/1981 - 11/8/1982
U540	S11	Logbook Building 7920 - 6/1980 thru 8/1981 - Waste Logbook	NA	6/4/1980 - 8/31/1981
U541	S8, S11	Logbook - Building 7920 - 11/17/1969 thru 10/13/1972 - Waste Logbook	NA	11/1969 - 10/1972
U542	S11	Logbook Building 7920 - 1972 - Hot Cell Waste Logbook	NA	2/24/1972 - 1/10/1973
U543	S11	Logbook - Savage Maintenance LB - Buildings 7920, 7930, - 1985	NA	6/1985 - 9/1986
U544	S11	Logbook - Building 7920 - Bill Bryan - 12/1967 - 2/1972	NA	12/1/1967 - 2/17/1972
U545	S11	Logbook - Log of Building Maintenance, Building 7920: 11/1967 thru 12/31/1974	NA	11/3/1967 -12/31/1974
U546	S11	Logbook - Casks to SWSA - 1980 thru 1987 (Best Estimates from UCN-2822 and TRU Log Books) - Bldg 7920	NA	1980 - 1987
U601	S9	CCP Calculation Package: Sample Radionuclide Information Input Check	ORNL-RH-01	04/19/2008; 07/22/08
U602	S9	CCP Calculation Package: Sample Data Decay Correction	ORNL-RH-02	4/19/2008
U603	S9	CCP Calculation Package: Campaigns 69 and M5 Information Input Check	ORNL-RH-03	4/19/2008
U605	S9	CCP Calculation Package: Mark 42 Campaigns Inventory Information Input Check	ORNL-RH-05	4/19/2008
U606	S9	CCP Calculation Package: Radiological Inventories for SETF Campaigns	ORNL-RH-06	4/19/2008
U607	S9	CCP Calculation Package: Dose-to-Curie Derivation for Cs-137, Eu-152 and Eu-154	ORNL-RH-07	04/19/2008; 05/23/2008
U608	S9	CCP Calculation Package: Determination of Reportable Isotopes-Mark 42 Period	ORNL-RH-08	4/19/2008
U609	S9	CCP Calculation Package: Campaign Inventory Information Input Check	ORNL-RH-09	4/19/2008
U610	S9	CCP Calculation Package: Uncertainty Analysis	ORNL-RH-10	5/13/2008
U611	S9	CCP Calculation Package: DTC Spreadsheet for Mark 42 Time-Mark/HFIR	ORNL-RH-11	05/19/2008; 05/22/2008; 06/25/08
U612	S9	CCP Calculation Package: Development of Cs-137 Partition Factors	ORNL-RH-12	4/19/2008
U613	S9	CCP Calculation Package: MCNP5 Uncertainty Analysis	ORNL-RH-13	4/19/2008

Tracking Number	AK #	Title	Document Number	Date
U614	S9	CCP Calculation Package: Determination of Cm-242 Processed in Campaign 69	ORNL-RH-14	4/19/2008
U615	S9	CCP Calculation Package: Development of Campaigns 69 and M5 Inventories	ORNL-RH-15	4/19/2008
U616	S9	CCP Calculation Package: Direct Assay Information Input Check	ORNL-RH-16	5/13/2008
U617	S9	CCP Calculation Package: Direct Assay Data Analysis	ORNL-RH-17	5/13/2008
U618	S9	CCP Calculation Package: Scaling Factor Development for Mark 42 Time Period	ORNL-RH-18	4/19/2008
U619	S9	CCP Calculation Package: Scaling Factor Development for SETF Time Period	ORNL-RH-19	No date available.
U620	S9	CCP Calculation Package: Fission Product Contribution to Total Dose Rate	ORNL-RH-20	4/19/2008
U621	S9	CCP Calculation Package: Sample Scaling Factor Development	ORNL-RH-21	4/19/2008
U622	S9	CCP Calculation Package: SR-90/Cs-137 Scaling Factor Development	ORNL-RH-22	5/14/2008
U623	S9	CCP Calculation Package: DTC Spreadsheet for Mark 42 Time-HFIR/HFIR	ORNL-RH-23	05/19/2008; 05/22/2008; 06/25/2008
U626	S9	CCP Calculational Package for: Determination of Neutron Surface to 1-m Dose Ratio	ORNL-RH-26	5/23/2008
U627	S9	CCP Calculational Package for: Ratio Between Contact and One Meter Dose Rates	ORNL-RH-27	5/23/2008
U630	S13	Memo: Subject: Corrective Action for Plutonium Vulnerability Assessment Finding OR-7 (Resulting from Energy Systems Issue/Project Evaluation Matrix)	ID #10019668	2/17/1995
U631	S13	Corrective Action Reports for: Dispose of Unneeded Plutonium; Loss of Building 7920 Supply and Building Exhaust Ventilation; Replace Workers as required with trained, qualified, and experienced workers; Nuclear Criticality Safety Approval	NA	06/12/1995, 06/05/1995, 06/22/1995, 06/28/1995
U632	S13	Memo: Request for extension of calibration interval on two Snoopy Surveys	NA	3/15/1995
U633	S13	Internal Correspondence re: Closeout of CARS Items for Implementation Plan for 10CFR8730.120 Ref ID: I00221216	NA	5/23/1995
U634	s13	Memo: Subject: Comments from Second Review of HP Manual Procedures	NA	1/3/1995
U635	S13	Internal Correspondence re: Meeting with Waste Management and Remedial Action's Martin Tull	NA	10/28/1993, 12/02/1993
U636	S13	Self-Assessment for Conduct of Maintenance in the Radiochemical engineering Development Center (REDC)	0049284 REDC-DCC	7/21/1995, 03/14/1996

Tracking Number	AK #	Title	Document Number	Date
U637	S13	Solid low Level Waste (SLL) Certification Procedure, 8/2 Draft, for Radiochemical Engineering Development Center (REDC)	NA	8/12/1994
U638	S13	Contract D-AC05-96OR22464, Completion of Training Items to meet 5480.20A Criteria	NA	7/1/1996
U639	S13	Letter: Defense programs (DP) Support of Cf-252 Neutron Source Program	NA	5/20/1994
U640	S13	Response to Quality Assurance Questionnaire / Radiation Sources	NA	11/9/1994
U641	S13	Internal Correspondence re: CARS Item I0018302, RIDS for Radiochemical Engineering Development Center (REDC) Records and Internal; Biennial Review of REDC Quality Assurance Plans; and Authorization to Certify Waste	NA	02/13/1995, 05/19/1995, 09/08/1995
U642	S13	Various Internal Correspondence regarding Waste Acceptance Criteria for transuranic waste storage b/t REDC and WMRAD	NA	8/31/94; 11/13/95, 7/15/96,7/16/96
U643	S13	Memo: Subject: Comments on Sampling Plan for RH-TRU Waste from REDC	NA	3/15/1995
U644	S13	Memo re: Management Assessment Team for Ir-192 Production	NA	12/6/1996
U645	S13	Interoffice Memo: ORNL Records management review of Selected CTD Procedures	Read File 003021	12/5/1995

Alphanumeric Designations

C Correspondence
D Documents
DR Discrepancy Resolution
M Miscellaneous
P Procedures and Published Documents
U Unpublished Documents

AK Numbers

S1 Process Design Documents
S2 Standard Operating Procedure
S3 Safety Analysis Reports
S4 Waste Packaging Logs
S5 Test plans/research project reports
S6 Site databases
S7 Information from site personnel
S8 Standard industry documents
S9 Previous analytical data
S10 Material safety data sheets
S11 Laboratory Notebooks
S12 Comparable or surrogate sampling and analysis data
S13 Other

Washington
TRU Solutions LLC

CP:09:01234
UFC:5900.00

INTER-OFFICE CORRESPONDENCE

DATE: June 3, 2009

FROM: H. J. Neely

LOCATION: Special Operations and Remote-Handled Development

TO: CCP Records Custodian GSA-103

LOCATION: Retrieval, Characterization & Transportation

SUBJECT: TRANSMITTAL OF WASTE STREAM PROFILE FORM FOR OR-REDC-RH-HET, AT THE OAK RIDGE NATIONAL LABORATORY

Please accept the attached waste stream profile form for OR-REDC-RH-HET, to be placed in records for the Oak Ridge National Laboratory.

HJN:jmc

Attachment

cc: (without enclosure)
I. S. Quintana ED
M. Sensibaugh ED

Attachment 2 –CCP Waste Stream Profile Form

(1) Waste Stream Profile Number: OR-REDC-RH-HET					
(2) Generator site name: Oak Ridge National Laboratory			(4)Technical contact: Mike Sensibaugh		
(3) Generator site EPA ID: TN1890090003			(6) Technical contact phone number: 575-234-7122		
(5) Date of audit report approval by New Mexico Environment Department (NMED): September 9, 2008					
(7) Title, version number, and date of documents used for WAP Certification: CCP-PO-001, CCP Transuranic Waste Characterization Quality Assurance Project Plan, Rev. 16, October 31, 2007 CCP-PO-002, CCP Transuranic Waste Certification Plan, Rev. 21, January 26, 2009 CCP-PO-027 CCP/TRU Waste Processing Center/Oakridge National Laboratory Interface Document, Revision 0, October 2, 2007.					
(8) Did your facility generate this waste?	YES	X	NO		
(9) If no, provide the name and EPA ID of the original generator: NA					
Waste Stream Information[1]					
(10) WIPP ID: OR-W212[3]			(11) Summary Category Group: S5000		
(12) Waste Matrix Code Group: Heterogeneous Debris Waste			(13) Waste Stream Name: Remote Handled Heterogeneous Debris Waste from the Radiochemistry Engineering Development Center		
(14) Description from the TWBIR: Radionuclides from updated model. Mixed waste treated to LDR.					
(15) Defense TRU Waste:	YES	X	NO		
(16) Check One:	CH		RH	X	
(17) Number of SWBs: N/A	(18) Number of Drums: NA		(19) Number of Canisters: 691[4]		
(20) Batch Data report numbers supporting this waste stream characterization: See Characterization Information Summary (CIS) Correlation of Container Identification Numbers to Batch Data Report Numbers					
(21) List applicable EPA Hazardous Waste Numbers:[2] D004, D005, D006, D007, D008, D009, D010, D011, D019, F002, and F005					
(22) Applicable TRUCON Content Numbers: OR 325					
(23)**Acceptable Knowledge Information**[1]					
[For the following, enter the supporting documentation used (i.e., references and dates)]					
Required Program Information					
(23A) Map of site: CCP-AK-ORNL-500, Revision 1, October 3, 2008, Figures 1, 2, and 3					
(23B) Facility mission description: CCP-AK-ORNL-500, Revision 1, October 3, 2008, Section 4.1					
(23C) Description of operations that generate waste: CCP-AK-ORNL-500, Revision 1, October 3, 2008, Section 5.3					
(23D) Waste identification/categorization schemes: CCP-AK-ORNL-500, Revision 1, October 3, 2008, Section 4.2 and 5.4					
(23E) Types and quantities of waste generated: CCP-AK-ORNL-500, Revision 0, May 2, 2008, Section 4.2.1					
(23F) Correlation of waste streams generated from the same building and process, as applicable: CCP-AK-ORNL-500, Revision 1, October 3, 2008, Section 4.2.2					
(24) Waste certification procedures: CCP-TP-530, Rev. 7, CCP TRU Waste Certification and WWIS Data Entry, July 11, 2008					

(25)Required Waste Stream Information		
(25A) Area(s) and building(s) from which the waste stream was generated: CCP-AK-ORNL-500, Revision 1, October 3, 2008, Section 5.1		
(25B) Waste stream volume and time period of generation: CCP-AK-ORNL-500, Revision 1, October 3, 2008, Section 5.2		
(25C) Waste generating process description for each building: CCP-AK-ORNL-500, Revision 1, October 3, 2008, Section 5.3		
(25D) Waste Process flow diagrams: CCP-AK-ORNL-500, Revision 1, October 3, 2008, Figures 4, 5, 6, 7, 8 and 9		
(25E) Material inputs or other information identifying chemical/radionuclide content and physical waste form: CCP-AK-ORNL-500, Revision 1, October 3, 2008, Section 5.4		
(25F) Waste Material Parameter Weight Estimates per unit of waste: See Table 2 of the Summation of Aspects of AK Summary Report: OR-REDC-RH-HET		
(26) Which Defense Activity generated the waste: (check one)[5]		
	Weapons activities including defense inertial confinement fusion	Naval Reactors development
	Verification and control technology	Defense research and development
	Defense nuclear waste and material by products management	X Defense nuclear material production
	Defense nuclear waste and materials security and safeguards and security investigations	
(27)Supplemental Documentation		
(27A) Process design documents: See S1 AK#s on Attachment 1 to Summation of Aspects of AK Summary Report		
(27B) Standard operating procedures: See S2 AK#s on Attachment 1 to Summation of Aspects of AK Summary Report		
(27C) Safety Analysis Reports: See S3 AK#s on Attachment 1 to Summation of Aspects of AK Summary Report		
(27D) Waste packaging logs: NA		
(28E) Test plans/research project reports: See S5 AK#s on Attachment 1 to Summation of Aspects of AK Summary Report		
(27F) Site databases: NA		
(27G) Information from site personnel: See S7 AK#s on Attachment 1 to Summation of Aspects of AK Summary Report		
(27H) Standard industry documents: See S8 AK#s on Attachment 1 to Summation of Aspects of AK Summary Report		
(27I) Previous analytical data: See S9 AK#s on Attachment 1 to Summation of Aspects of AK Summary Report		
(27J) Material safety data sheets: See S10 AK#s on Attachment 1 to Summation of Aspects of AK Summary Report		
(27K) Sampling and analysis data from comparable/surrogate Waste: See S12 AK#s on Attachment 1 to Summation of Aspects of AK Summary Report		
(27L) Laboratory notebooks: See S11 AK#s on Attachment 1 to Summation of Aspects of AK Summary Report		
Confirmation Information[2]		
For the following, when applicable, enter procedure title(s), number(s) and date(s)		
(28)	Radiography: NA	
(29)	Visual Examination: CCP Remote-Handled Waste Visual Examination, CCP-TP-500, Revision 8, 7/24/2008	

(30)Comments:
For a list of the waste characterization procedures used and date of the respective procedures see the list of procedures on the attached CIS.

Reviewed by AK Expert: YES [X] **Date: 2/18/09**

Reviewed by STR (if necessary): YES [ ] NA [ ] **Date:**

Waste Stream Profile Form Certification:

I hereby certify that I have reviewed the information in this Waste Stream Profile Form, and it is complete and accurate to the best of my knowledge. I understand that this information will be made available to regulatory agencies and that there are significant penalties for submitting false information, including the possibility of fines and imprisonment for knowing violations.

(31)	(32)	(33)
Signature of Site Project Manager	Irene Quintana Printed Name	2/18/09 Date

NOTE:
(1) Use back of sheet or continuation sheets, if required.
(2) If, radiography, visual examination were used to confirm EPA Hazardous Waste Numbers, attach signed Characterization Information Summary documenting this determination.
(3) TWBIR numbers OR-W211 and OR-W214 also apply.
(4) Waste stream OR-REDC-RH-HET consists of casks, 55-gallon drums and a B-88 box that will be packaged into 2055 55-gallon drums and then into 685 canisters. Six additional canisters are projected for this waste stream.
(5) The following defense activities also resulted in generation of this waste: naval reactors development, defense nuclear waste and by-products management and defense research and development activities.

CHARACTERIZATION INFORMATION SUMMARY

WSPF # OR-REDC-RH-HET

Lot 1

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Reconciliation with Data Quality Objectives..... 008

CCP Characterization Information Summary Cover Page

Waste Stream # OR-REOC-RH-HET Sub-Lot #: 1

AK Expert Review: Kevin Peters Date: 2/18/2009

SPM Review: Hilari Nealy Date: 2/18/2009

SPM signature certifies that through Acceptable Knowledge testing and/or analysis that the waste identified in this summary is not corrosive, ignitable, reactive, or incompatible with the TSDF.

A summary of the Acceptable Knowledge regarding this waste stream containing specific information about the corrosivity, reactivity, and ignitability of the waste stream is included as an attachment to the Waste Stream Profile Form. By reference, that information is included in this lot.

List of procedures used:

Headspace Gas Sampling and Analysis (HSG):

CCP-TP-003	Rev. 13	03/19/07	CCP Sampling of TRU Waste Containers
CCP-TP-108	Rev. 6	07/12/07	CCP Headspace Gas Sampling Batch Data Report Preparation
CCP-TP-173	Rev. 0	05/03/07	CCP Analysis of Gas Samples for VOCs by GC/FID
CCP-TP-175	Rev. 0	05/02/07	CCP Analysis of Gas Samples for VOCs by GC/MS

Visual Examination (VE):

CCP-TP-500	Rev. 7	02/27/08	CCP Remote-Handled Waste Visual Examination
CCP-TP-500	Rev. 8	07/24/08	CCP Remote-Handled Waste Visual Examination

Project Level Data Validation / DQO Reconciliation:

CCP-TP-001	Rev. 17	09/24/07	CCP Project Level Data Validation and Verification
CCP-TP-002	Rev. 20	06/16/08	CCP Reconciliation of DQOs and Reporting Characterization Data
CCP-TP-003	Rev. 16	10/02/07	CCP Data Analysis for S3000, S4000, and S5000 Characterization
CCP-TP-005	Rev. 16	11/16/06	CCP Acceptable Knowledge Documentation

WAP Certification:

CCP-PO-001	Rev. 16	10/31/07	CCP Transuranic Waste Characterization Quality Assurance Project Plan

CCP Correlation of Container Identification Numbers to Batch Data Report Numbers

Waste Stream: # OR-REDC-RH-HET Sub-Lot # 1

Container ID Number	Historical Container ID	NDA BDR or Radiological Characterization BDR (CH only)	RTR BDR	VE BDR	Solids Sampling BDR	Solids Analytical BDR	Load Management/ Overpack Yes	Permit Required Headspace Gas BDR			
								Sample	Analysis		
ORRH00001	NA	NA	NA	RHORVE080005	NA	NA		ORHSGS08005	ECL08012M	ECL08012G	NA
ORRH00002	NA	NA	NA	RHORVE080005	NA	NA		ORHSGS08005	ECL08012M	ECL08012G	NA
ORRH00003	NA	NA	NA	RHORVE080005	NA	NA		ORHSGS08005	ECL08012M	ECL08012G	NA
ORRH00004	NA	NA	NA	RHORVE080002	NA	NA		ORHSGS08003	ECL08010M	ECL08010G	NA
ORRH00005*	NA	NA	NA	NA	NA	NA		ORHSGS08003	ECL08010M	ECL08010G	NA
ORRH00006	NA	NA	NA	RHORVE080002	NA	NA		ORHSGS08003	ECL08010M	ECL08010G	NA
ORRH00007*	NA	NA	NA	NA	NA	NA		ORHSGS08003	ECL08010M	ECL08010G	NA
ORRH00008*	NA	NA	NA	NA	NA	NA		ORHSGS08003	ECL08010M	ECL08010G	NA
ORRH00009*	NA	NA	NA	NA	NA	NA		ORHSGS08003	ECL08010M	ECL08010G	NA
ORRH00010*	NA	NA	NA	NA	NA	NA		ORHSGS08003	ECL08010M	ECL08010G	NA
ORRH00011	NA	NA	NA	RHORVE080004	NA	NA		NA	NA	NA	NA
ORRH00012	NA	NA	NA	RHORVE080004	NA	NA		NA	NA	NA	NA
ORRH00013	NA	NA	NA	RHORVE080005	NA	NA		ORHSGS08005	ECL08012M	ECL08012G	NA
ORRH00014	NA	NA	NA	RHORVE080006	NA	NA		NA	NA	NA	NA
ORRH00015	NA	NA	NA	RHORVE080006	NA	NA		NA	NA	NA	NA
ORRH00016	NA	NA	NA	RHORVE080006	NA	NA		NA	NA	NA	NA
ORRH00017	NA	NA	NA	RHORVE080006	NA	NA		NA	NA	NA	NA

* Container is included for the HSG Characterization Module for WWIS but are not certifiable

for Hillari J. Neely
Signature of Site Project Manager

Hillari J. Neely
Printed Name

2/19/2009
Date

CCP Headspace Gas UCL_{90} Evaluation Form

WSPF #: OR-REDC-RH-HET **Waste Stream Lot Number** 1 through 1

ANALYTE	Transform Data Used (No, Data-Log, SQRT, other)	# Samples above MDL (1)	# Samples	Maximum (ppmv)	Mean (ppmv)	SD (ppmv)	UCL_{90} (ppmv)	PRQL (ppmv)	Transformed PRQL (N/A or Value)	UCL_{90} > PRQL Yes	EPA Code
Benzene	SQRT	9	11	1.76	0.95	0.55	1.18	10	3.16		
Bromoform	SQRT	0	11	0.32	0.18	0.09	0.21	10	3.16		
Carbon tetrachloride	Log	0	11	-2.12	-3.60	0.96	-3.20	10	2.30		
Chlorobenzene	Log	0	11	-1.97	-3.43	0.97	-3.03	10	2.30		
Chloroform	SQRT	1	11	0.32	0.18	0.08	0.21	10	3.16		
Cyclohexane [a]	Log	0	11	-1.29	-2.77	0.97	-2.37	10	2.30		
1,1-Dichloroethane	SQRT	0	11	0.41	0.22	0.11	0.26	10	3.16		
1,2-Dichloroethane	Log	0	11	-1.97	-3.44	0.97	-3.04	10	2.30		
1,1-Dichloroethylene	SQRT	0	11	0.49	0.26	0.13	0.32	10	3.16		
cis-1,2-Dichloroethylene	Log	0	11	-1.83	-3.31	0.97	-2.90	10	2.30		
trans-1,2-Dichloroethylene	Log	0	11	-1.49	-2.96	0.97	-2.56	10	2.30		
Ethyl benzene	SQRT	0	11	0.39	0.21	0.10	0.25	10	3.16		
Ethyl ether	Log	0	11	-1.43	-2.89	0.97	-2.49	10	2.30		
Methylene chloride	No	3	11	0.27	0.11	0.08	0.15	10	N/A		
1,1,2,2-Tetrachloroethane	SQRT	0	11	0.51	0.28	0.13	0.33	10	3.16		
Tetrachloroethylene	SQRT	0	11	0.34	0.18	0.09	0.22	10	3.16		
Toluene	SQRT	5	11	0.61	0.37	0.18	0.45	10	3.16		
1,1,1-Trichloroethane	Log	0	11	-1.97	-3.46	0.97	-3.06	10	2.30		
Trichloroethylene	SQRT	0	11	0.32	0.17	0.08	0.21	10	3.16		
1,1,2-Trichloro-1,2,2-trifluoroethane	Log	0	11	-2.21	-3.66	0.97	-3.26	10	2.30		
1,2,4-Trimethylbenzene[a]	SQRT	0	11	0.41	0.22	0.11	0.26	10	3.16		
1,3,5-Trimethylbenzene[a]	SQRT	0	11	0.41	0.22	0.11	0.26	10	3.16		
m-Xylene[b]	Log	0	11	-1.80	-3.28	0.97	-2.88	10	2.30		
p-Xylene[b]	Log	0	11	-1.80	-3.28	0.97	-2.88	10	2.30		
o-Xylene	SQRT	0	11	0.36	0.19	0.09	0.23	10	3.16		
Acetone	SQRT	11	11	11.40	5.83	3.45	7.26	100	10.00		
1-Butanol	Log	10	11	2.25	-0.17	1.69	0.53	100	4.61		
Methanol	No	0	11	4.55	4.35	0.13	4.41	100	N/A		
Methyl ethyl ketone	SQRT	10	11	3.87	1.95	1.17	2.44	100	10.00		
Methyl isobutyl ketone	SQRT	9	11	1.52	0.82	0.48	1.02	100	10.00		

CCP Headspace Gas UCL_{90} Evaluation Form

WSPF #: OR-REDC-RH-HET **Waste Stream Lot Number** 1 through 1

ANALYTE	Transform Data Used (No, Data-Log, SQRT, other)	# Samples above MDL (1)	# Samples	Maximum (ppmv)	Mean (ppmv)	SD (ppmv)	UCL_{90} (ppmv)	PRQL (ppmv)	Transformed PRQL (N/A or Value)	UCL_{90} > PRQL Yes	EPA Code
Chloromethane[a]	SQRT	10	11	2.98	1.61	0.95	2.00	100	3.16		
Carbon Disulfide[a]	Log	1	11	-0.45	-3.03	1.25	-2.51	10	2.30		
1,2-Dichloropropane[a]	Log	0	11	-1.77	-3.23	0.96	-2.83	10	2.30		
Trichlorofluoromethane[c]	Log	0	11	-1.22	-2.69	0.97	-2.29	10	2.30		

[a] These compounds are from the TRAMPAC and or CH TRUCON Appendix B and are flammable VOCs that do not appear in the QAPjP or the WIPP WAP. These are not part of the target analyte list, but samples may be analyzed for these compounds.

[b] These xylene isomers cannot be resolved by the analytical methods employed in the program. m-Xylene and p-Xylene will be reported as "Total m-p-Xylene."

[c] Noted analytes are not required but are reported by the Environmental Chemistry Laboratory at Idaho and are included on the UCL90 for completeness.

Comments:

(1) For analytes where there were no samples measured above the MDL value, 1/2 of the MDL value was used. (Per section B4 of the WAP, 1/2 of the MDL value is used in calculating the mean concentration.)

for Hillari J. Neely — Signature of Site Project Manager

Hillari Neely — Printed Name

2/18/2009 — Date

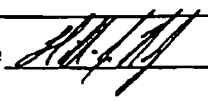
CCP Headspace Gas Summary Data

Waste Stream Number OR-REDC-RH-HET Sub-Lot Number (s) 1

Tentatively Identified Compound	Maximum Observed Estimated Concentrations (ppmv)	# Samples Containing TIC	% Detected
2-Methyl-1-propanol	3.10	1	9.09%

Data Supports EPA Hazardous Waste Numbers Assigned by AK? Yes ☑ No ☐

If no, describe the basis for assigning the EPA Hazardous Waste Codes:

SPM Signature  Date 2/18/2009

CCP RTR/VE Summary of Prohibited Items and AK Confirmation

Waste Stream Number: OR-REDC-RH-HET Sub-Lot(s)#: 1

Container Number	RTR Prohibited Items [a]	Visual Examination Prohibited Items [a]
See correlation of container ID numbers for list of remaining drum numbers in this Lot.	Radiography was not used to verify prohibited items.	None of the containers in this lot had prohibited items identified during Visual Examination.

a. See Batch Data Reports

b. If AK has assigned U134 to this waste stream, then any liquids in these containers are prohibited items (not acceptable by the TSDF).

Site Project Manager Signature	Hillari Neely	2/18/2009
	Printed Name	Date

CCP Reconcilliation with Data Quality Objectives

WSF# OR-REDC-RH-HET Lot # 1

Sampling Completeness

VE
Number of Valid Samples: 11 Number of Total Samples Analyzed: 11
Percent Complete: 100 (QAO is 100%)

RTR
Number of Valid Samples: NA Number of Total Samples Analyzed: NA
Percent Complete: NA (QAO is 100%)

HSG
Number of Valid Samples: 11 Number of Total Samples collected: 11
Percent Complete 100 (QAO is ≥90%)

Total VOC
Number of Valid Samples: NA Number of Total Samples collected: NA
Percent Complete: NA (QAO is ≥90%)
Number of Valid Samples: NA Number of Total Samples analyzed: NA
Percent Complete: NA (QAO is ≥90%)

Total SVOC
Number of Valid Samples: NA Number of Total Samples collected: NA
Percent Complete: NA (QAO is ≥90%)
Number of Valid Samples: NA Number of Total Samples analyzed: NA
Percent Complete: NA (QAO is ≥90%)

Total Metals
Number of Valid Samples: NA Number of Total Samples collected: NA
Percent Complete: NA (QAO is ≥90%)
Number of Valid Samples: NA Number of Total Samples analyzed: NA
Percent Complete: NA (QAO is ≥90%)

CCP Reconcilliation with Data Quality Objectives

WSF# OR-REDC-RH-HET Lot # 1

	Y/N/NA	Reconcilliation Parameter
1	Y	Waste Matrix Code.
2	Y	Waste Material Parameter Weights.
3	Y	The waste matrix code identified is consistent with the type of sampling and analysis used to characterize the waste.
4	Y	The TRU activity reported in the BDRs for each container demonstrates with a 95% probability that the container of waste contains TRU radioactive waste.
5	NA	AK Sufficiency. Is there an approved AK sufficiency Determination for this waste stream?
6	Y	Mean concentrations, UCL90 values for the mean concentration, standard deviations, and the number of samples collected for each VOC in the HSG of each container were calculated and compared with the program required quantitation limits, as reported in CCP TP 003, Attachment 3, and additional Environmental Protection Agency (EPA) Hazardous Waste Numbers were assigned as required. Samples were randomly collected (when appropriate).
7a	NA	Mean concentrations, UCL90 values for the mean concentration, standard deviations, and the number of samples collected for solids VOCs were calculated and compared with the program required quantitation limits and regulatory thresholds, as reported in the Characterization Information Summary, CCP-TP-003-Attachment 4, and additional EPA Hazardous Waste Numbers were assigned as required. Samples were randomly collected.
7b	NA	Mean concentrations, UCL90 values for the mean concentration, standard deviations, and the number of samples collected for solids SVOCs were calculated and compared with the program required quantitation limits and regulatory thresholds, as reported in the Characterization Information Summary, CCP TP 003 Attachment 5, and additional EPA Hazardous Waste Numbers were assigned as required. Samples were randomly collected.
7c	NA	Mean concentrations, (UCL90) values for the mean concentration, standard deviations, and the number of samples collected for total metals were calculated and compared with the program required quantitation limits and regulatory thresholds, as reported in the Characterization Information Summary, CCP TP 003 Attachment 6, and additional EPA Hazardous Waste Numbers were assigned as required. Samples were randomly collected.

CCP Reconcilliation with Data Quality Objectives

WSF# OR-REDC-RH-HET Lot # 1

8	Y	The data demonstrates whether the waste stream exhibits a toxicity characteristic under Title 40 Code of Federal Regulations (CFR), Part 261, Identification and Listing of Hazardous Waste, Subpart C, Characteristics of Hazardous Waste.
9	Y	Does the waste stream contain listed waste found in 20.4.1.200 NMAC incorporating 40 CFR Part 261, Subpart D, Lists of Hazardous Wastes.
10	Y	Waste stream can be classified as hazardous or nonhazardous at the 90-percent confidence level.
11	Y	Appropriate packaging configuration and Drum Age Criteria (DAC) is applied and documented in the headspace gas sampling documentation, and the drum age met prior to sampling.
12	Y	TICs were appropriately identified and reported in accordance with the requirements of Section B3-1 of the QAPjP.
13	Y	The PRQLs for headspace gas VOCs were met for all analyses as evidenced by the analytical batch data reports.
14		The overall completeness, comparability, and representativeness QAOs were met for each of the analytical and testing procedures as specified in CCP-PO-001 Sections B3-2 through B3-9 prior to submittal of a waste stream profile form for a waste steam or waste stream lot.

	Completeness	Comparability	Representativeness
Radiography	NA	NA	NA
VE	Y	Y	Y
Headspace Gas Analysis	Y	Y	Y
Solids Sampling	NA	NA	NA
Solids VOCs	NA	NA	NA
Solids SVOCs	NA	NA	NA
Solids Metals	NA	NA	NA

Comments. N/A

Signature of Site Project Manager | Hillari Neely (Printed Name) | 2/19/2009 (Date)

SUMMATION OF ASPECTS OF AK SUMMARY REPORT: OR-REDC-RH-HET

Overview:

Waste Stream OR-REDC-RH-HET is Remote-Handled (RH) Transuranic (TRU) heterogeneous debris generated in Building 7920 of the Radiochemical Engineering Development Center (REDC) and has subsequently been repackaged in Building 7880 of the Transuranic Waste Processing Center (TWPC) at the Oak Ridge National Laboratory (ORNL) in Oak Ridge, Tennessee. The waste was generated from 1972 to present. Waste Stream OR-REDC-RH-HET includes debris originating from target fabrication and processing, analytical chemistry, and process development activities. This debris is currently stored in storage containers such as concrete casks, boxes, and drums at the ORNL. These storage containers are transferred to the TWPC hot cell in the Building 7880 for repackaging and WIPP certification.

Since 1966, the REDC was the production, storage, and distribution center for the Department of Energy (DOE) heavy element research program, producing Berkelium (Bk)-249, Californium (Cf)-252, Einsteinium (Es)-253, and Fermium (Fm)-257. In approximately 1970, target rods containing plutonium, americium, and curium were remotely fabricated in the Building 7920 hot cells, irradiated in the High Flux Isotope Reactor (HFIR) facility, and then processed in the Building 7920 hot cells for the separation and purification of the heavy actinide elements. The purified Bk-249, Es-253, and Fm-257 were packaged for shipment whereas the Cf-252 was fabricated into neutron sources. Between 1979 and 1986, some uranium fuel cycle development work was performed in the Building 7920 Solvent Extraction Test Facility (SETF). Solvent extraction flow sheets for processing irradiated fuels from commercial light water reactors and fast breeder reactors were developed and tested, and plutonium recovery schemes were demonstrated. Since 1991, the REDC has processed Mark-42 target assemblies that were irradiated at the Savannah River Site (SRS). High-purity Americium (Am)-243, Curium (Cm)-244, and Plutonium (Pu)-242 are separated and recovered in Building 7920 for shipment to the Los Alamos National Laboratory (LANL).

The Cf-252 neutron sources are utilized for defense related applications that include neutron radiography of weapons components and military aircraft, neutron counting of fissile material and transuranic waste, land mine detection, and in-field inspection and identification of chemical weapons and high explosives. Special production of targets (referred to as campaigns) ran concurrently with the Solvent Extraction Test Facility (SETF) and Mark-42 campaigns. Due to the similarity in radiological contamination from HFIR target campaigns, the waste generated from SETF and Mark-42 campaigns were not segregated from waste generated by the HFIR target campaigns. Therefore, the TRU wastes generated from the REDC, waste stream OR-REDC-RH-HET, is defense related waste generated from nuclear materials production in addition to naval reactor development, and defense nuclear waste and by-products management.

This Summation of the AK Summary Report includes information to support Waste Stream Profile Form (WSPF) number OR-REDC-RH-HET for RH TRU debris. The primary source of information for this Summation is CCP-AK-ORNL-500, Central Characterization Project Acceptable Knowledge Summary Report For Oak Ridge National Laboratory Radiochemical Engineering Development Center Remote-Handled Transuranic Waste, Waste Stream: OR-REDC-RH-HET, Rev. 1, October 3, 2008. CCP-AK-ORNL-500 includes information obtained from numerous sources, including facility safety basis documentation, historical document archives, generator and storage facility waste records and documents, program/processing documentation, and interviews with knowledgeable personnel.

Waste Stream Identification Summary:

Site Where TRU Waste Was Generated:	Oak Ridge National Laboratory
Waste Stream Name:	Remote Handled Heterogeneous Debris Waste from the Radiochemistry Engineering Development Center
Waste Stream Number:	OR-REDC-RH-HET
Dates of Waste Generation:	1972 to present
Summary Category Group:	S5000 – Debris Waste
Waste Matrix Code Group:	Heterogeneous Debris Waste
Waste Matrix Code:	S5400, Heterogeneous Debris
Waste Stream TWBIR Identification:	OR-W212[1]
Waste Stream Volume:	685 canisters (current)[2] 6 canisters (projected)[3]
RCRA EPA Hazardous Waste Numbers:	D004, D005, D006, D007, D008, D009, D010, D011, D019, F002, and F005
TRUCON Content Numbers:	OR 325

Waste Stream Description and Physical Form:

Waste Stream OR-REDC-RH-HET is comprised primarily of repackaged organic and inorganic debris waste items. The waste includes cellulosics, plastic, rubber, metal, and glass items as follows: paper, cotton, cloth, and wood, including wipes, swabs, bags, towels, rags, protective clothing, gloves, rope, string, cardboard, brushes, blotter paper, and filter paper; polyethylene, polypropylene, polyvinyl chloride, Tygon tubing, nylon, Bakelite (methacrylate polymer plastic), and Plexiglass items, including sheeting, melted plastic, beads, blocks, tape, tubing, bags, fittings, buckets, bottles, caps, pans, discs, brushes, laboratory equipment (pipettes, syringes), circuit boards, gloves, manipulator boots; gaskets, rings, hose/tubing, squeegees, bulbs, stoppers, gloves, boots, leaded glovebox gloves, wire/cord/cable insulation; glass bottles, laboratory glassware, pipettes, columns, plates, thermometers, light bulbs (mercury and incandescent), mirrors, lenses, insulation, and broken glass; carbon steel, stainless steel, and iron. Non-ferrous materials include items made from aluminum, brass, copper, and lead. Metal waste items include cans, needles, tubes, valves, cable, wire, planchets, piping, tools (tongs, dies, punches, wrenches, knives, clamps, tweezers), foil,

[1] TWBIR numbers OR-W211 and OR-W214 also apply.
[2] Waste stream OR-REDC-RH-HET consists of casks, 55-gallon drums and a B-88 box that will be packaged into 2055 55-gallon drums and then into 685 canisters.
[3] Building 7920 REDC operations will generate approximately 3.4 m3 (two casks) of waste to be reprocessed in the TWPC with no projected end date. The projected waste stream volume includes one year of newly generated waste that will be packaged into canisters.

weights, blocks, plates, frames, columns, racks, shielding, sheeting, light fixtures, equipment (circuit boards, pumps, motors, balances, ultrasonic cleaners, hot plates, furnaces, centrifuges), hardware (nuts, bolts, brackets, washers), manipulator parts, and metal filter components.

Secondary waste generated during repackaging operations in the TWPC hot cell includes amalgamated mercury, water absorbed with Nochar (a proprietary nonhazardous polymer absorbent) and vermiculite, personal protective equipment (PPE), and equipment (tools and manipulator parts).

This waste stream is assigned Waste Matrix Code S5400, Heterogeneous Debris. This category includes waste that is at least 50 percent, by volume, debris materials that do not meet the criteria for assignment as either an Inorganic Debris (S5100) or Organic Debris (S5300). The debris that comprises waste stream OR-REDC-RH-HET was generated from a single process or from an activity that is similar in material, physical form, and hazardous constituents and is therefore, a single waste stream.

Point of Generation - Area and Building of Generation

This heterogeneous debris waste stream was generated in Building 7920 which is part of the REDC located at the ORNL in Oak Ridge, Tennessee. The waste is transferred to the TWPC hot cell in Building 7880 for repackaging and certification.

Generating Process

Building 7920 operations include chemical processing, target fabrication, analytical laboratory, and process development activities. These operations represent the chemical processing activities in the REDC; however, special separation projects, referred to as campaigns, were periodically performed. These special small scale separation campaigns (e.g., separating Cf-249 from decaying Bk-249 or purifying a sample for shipment to another site) were performed in the hot cell. Chemicals used in Building 7920 operations or that were identified as part of the REDC chemical inventory may contaminate this waste stream.

Chemical Processing

Transuranium element processing includes the dissolution of irradiated targets, the separation of the transuranium elements and the removal of impurities and fission products. This is accomplished using solvent extraction, precipitation, and ion-exchange. Recovered americium and curium are purified and converted to oxide for fabrication of new targets.

Berkelium, einsteinium, and fermium are separated from curium and californium and purified further by additional cycles of ion-exchange. The purified products are then packaged for shipment. The californium is sorbed on resin and calcined to convert the californium to the oxysulfate for future use.

The Solvent Extraction Test Facility (SETF) operated from 1979 through 1986 and recovered uranium and plutonium from irradiated commercial power reactor fuels. This was achieved by dissolution of irradiated fuel assembly sections, solvent extraction, ion-exchange, precipitation, and calcination.

The Mark-42 program began operation in 1991 and includes the dissolution of irradiated segments; the separation of the transuranium elements and removal of impurities, activation products, and fission products. This is accomplished using solvent extraction, precipitation, and ion-exchange process steps.

The Global Nuclear Energy Partnering (GNEP) program initiated in May 2007 involves the demonstration of isotopic separations technologies using fuel from the H.B. Robinson and Dresden LWR reactors.

The REDC supports small-scale experiments involving the separation of fission products such as tritium, C-14, iodine, krypton, and xenon from uranium fuel oxides followed by chemical extraction.

Hazardous chemicals used in these processes include: acids (2-ethylhexyl phenylphosphonic, ascorbic, citric, hydrochloric, hydrofluoric, nitric, and oxalic), bases (ammonium hydroxide, lithium hydroxide, potassium hydroxide, and sodium hydroxide), and solvents (1,1,2-trichloro ethane, acetone, benzene, hydrazine, methanol, methyl isobutyl ketone, trichloroethylene, toluene, and xylene).

Target Fabrication

Actinide oxide (americium and curium) is incorporated into aluminum target rods for irradiation in the High Flux Isotope Reactor (HFIR). The operations and inspections performed to incorporate the actinide oxide include pellet forming, weighing, measurement, calorimetry, thermal cleaning, target loading, welding, x-ray examination, helium leak tests, dimensional inspections, hydrostatic compression of the aluminum tube around the pellets, coolant shroud attachment, decontamination, and carrier loading for transfer to the HFIR.

Analytical Laboratory

Samples are collected and then stored in the analytical laboratory. Radiochemical analyses are performed on highly-radioactive samples in analytical chemistry gloveboxes. Sample preparation includes pipetting, titration, dissolution, filtration, solvent extraction, and centrifugation.

Hazardous chemicals used in these processes include: acids (ascorbic, citric, formic, hydrobromic, hydrochloric, hydrofluoric, nitric, nitrous, oxalic, selenic, sulfamic, and sulfuric), bases (ammonium hydroxide, lithium hydroxide, potassium hydroxide, sodium hydroxide, and tetraethylammonium hydroxide), and solvents (1,1,1-trichloroethane, acetone, benzene, hydrazine, methanol, methyl isobutyl ketone, trichloroethylene, toluene, and xylene).

Process Development

The process development alpha laboratories have been used for studies and process development of alpha-active materials. Early work focused on development of sol-gel processes (fuel pellet processes) and isolation and purification of alpha-active materials. Other research and process development work included reprocessing of reactor fuels, conversion of recovered uranium and plutonium for use in reactor fuel elements, and development of waste separation processes. The chemical processes (e.g., solvent extraction, ion-exchange, and precipitation) performed in process development are similar to those processes performed in the hot cells but on a smaller scale.

Maintenance Operations

The processing equipment in the hot cells was maintained or replaced within the hot cell cubicles using remote techniques. Occasionally, large equipment and equipment racks require maintenance that cannot be performed in the cubicles. These items are moved to the decontamination glovebox for cleaning (using acetone, and ethanol-methanol mixtures) and repaired. For maintenance operations in a tank pit, work may be performed directly in the pit or remotely from the top of the pit. Maintenance of the off-gas systems for the cells and the process tanks generate HEPA filters, charcoal and Hopcalite organic vapor trap filters (mixture of copper and manganese oxide used as a catalyst to convert carbon monoxide to carbon dioxide). Glovebox operations are performed using neoprene or leaded glovebox gloves which are periodically replaced. Glovebox equipment and components require periodic decontamination, inspection, maintenance, repair and replacement. Glovebox interiors require regular decontamination using pentasodium diethylene triamine pentaacetate, ethanol and Ajax.

Process Waste Handling

Glovebox waste transfers are accomplished using plastic bags and cardboard ice cream cartons. Large pieces of equipment are transferred through the roof door. Liquid waste is transferred out of the gloveboxes through liquid waste lines and is not part of the waste stream.

Prior to 1976, Building 7920 solid waste was managed as RH TRU waste, even though a significant portion of the inventory produced was CH-TRU waste. In March 1976, operations were initiated to segregate RH from CH-TRU waste but were not fully implemented until 1978. Most of the waste generated prior to 1978 was placed into concrete casks. This waste contains lower dose rate waste (paper, glassware, PPE, wipes, glovebox equipment, and HEPA filters) generated from the laboratory and support areas. The quantity of lower dose rate waste decreased significantly in RH casks loaded after 1978, which contain greater volumes of waste from hot cell activities.

In the hot cell cubicles, waste is placed into small containers (e.g., plastic buckets or metal cans) and monitored for radiation. Depending on the type of waste and radiation level, the item is leached using nitric acid, rinsed with water, and dried before placement into the bucket or can. Larger waste items are cut up to fit into the buckets. To reduce the volume of waste, a furnace is used to melt plastic items such as polyethylene bottles and to consolidate them in a metal bucket.

Spent cation-exchange resins are calcined, leached with nitric acid, collected in a polyethylene bottle and melted in the furnace, then placed into a metal bucket. Spent anion-exchange resins are de-nitrated, rinsed with water and grouted (using concrete) in a metal bucket. Empty metal buckets are crushed. Waste buckets are transferred from the hot cell cubicles for characterization. The buckets are also transferred for monitoring of beta-gamma and neutron radiation. Buckets that have low radiation levels are disposed as waste and are not part of this waste stream.

Larger equipment, such as processing racks, charcoal filter beds, and Hopcalite organic filters traps are directly loaded into the casks. Racks were packaged in polyethylene bags then placed into the concrete cask. Lead bricks were used to balance the processing racks and will be found in the disposal casks. The concrete casks of TRU waste are loaded in a solid waste loading station. The cask lid is installed, sealed with roofing pitch, and secured.

REDC waste has been generated with limited segregation based on the radiological and chemical properties. Solid waste from the REDC is accumulated over a long period of time,

resulting in mixing of campaigns of waste. As containers of REDC debris are generated during repackaging in the TWPC, the container-specific documentation is reviewed to ensure that each container included in waste stream OR-REDC-RH-HET meets the requirements identified in the WIPP-WAP and the WCPIP.

Table 1 identifies the RCRA toxicity characteristic constituents in this waste stream.

Table 1 – Metal and organic TC and F-Listed Contaminants for Waste Stream OR-REDC-RH-HET

Chemical	CAS Number	EPA Hazardous Waste Numbers
Arsenic	7440-38-2	D004
Barium	7440-39-3	D005
Benzene	71-43-2	F005
Cadmium	7440-43-9	D006
Carbon tetrachloride	56-23-5	D019
Chromium	7440-47-3	D007
Lead	7439-92-1	D008
Mercury	7439-97-6	D009
Selenium	7782-49-2	D010
Silver	7440-22-4	D011
Toluene	108-88-3	F005
1,1,1-Trichloroethane	71-55-6	F002
1,1,2-Trichloroethane	79-00-5	F002
Trichloroethylene	79-01-6	F002

RCRA Determinations - Hazardous Waste Determinations

Waste generated in this waste stream does not qualify for any of the exclusions outlined in 40 CFR 260 or 261. Visual examination is used to verify that the waste stream is not a liquid waste and does not contain explosives, non-radioactive pyrophoric material, compressed gasses or reactive waste. Therefore, this waste stream does not exhibit the characteristic for ignitability (D001), corrosivity (D002), or reactivity (D003).

Ignitability

The waste does not meet the definition of ignitability as defined in 40 CFR 261.21. The material is not a liquid, an ignitable compressed gas, or an oxidizer, and is not capable of causing fire through friction, absorption of moisture, or spontaneous chemical change. The waste does not meet the definition of a DOT oxidizer as defined in 49 CFR 173.

REDC process solutions and reagents (such as hydrazine) were not prepared in the gloveboxes and hot cells and were introduced into the closed loop process tanks. The resulting waste process solutions were piped out of the facility and are not included in the inventory of REDC waste for repackage (References P161, P241, P242, P263, P282, and U011). Acetone and ethanol-methanol mixtures were used for equipment degreasing in the REDC but are not present in liquid form.

Visual examination is performed to ensure the absence of compressed gases (e.g., un-punctured aerosol cans) and that liquids do not exceed the amount allowed by the WIPP-WAP. Any container identified with compressed gases, or liquids will be segregated from the waste stream during characterization and will not be eligible for disposal at WIPP until further characterization and/or processing is conducted. Therefore, this waste stream does not exhibit the characteristic of ignitability (D001).

Corrosivity

The waste does not meet the definition of corrosivity as defined in 40 CFR 261.22. The debris is not liquid and VE is performed to ensure liquids were not added to containers.

Chemicals such as acetic, citric, hydrofluoric, hydrochloric, oxalic and sulfuric acid; hydrazine and lithium hydroxide were used during dissolution, extraction, and titration processes or were identified on chemical inventories. Prohibited quantities of liquids identified during VE will be removed and/or immobilized using concrete grout, Nochar and vermiculite. Therefore the characteristic of corrosivity (D002) does not apply to this waste stream. (References P161, U011 and U046)

Reactivity

The waste does not meet the definition of reactivity as defined in 40 CFR 261.23. The materials are stable and will not undergo violent chemical change. The materials will not react violently with water, form potentially explosive mixtures with water, or generate toxic gases, vapors, or fumes when mixed with water. The waste does not contain reactive cyanide or sulfide compounds. The materials are not capable of detonation or explosive reaction if subjected to a strong initiating source if heated under confinement. The materials are not readily capable of detonation or explosive decomposition or reaction at standard temperature and pressure.

Hazardous chemical reagents may contaminate this waste stream. Preventative measures have been taken to ensure that nitrated ion-exchange resins are treated prior to disposal as follows. Anion-exchange resins used with nitric acid are flushed from the column, rinsed with ammonium hydroxide to convert the resin to the hydroxide form, air dried, and grouted in metal cans. Spent cation-exchange resins are calcined to an oxysulfate ash, and the ash is leached with nitric acid and dried prior to assimilation (and fixing) into melted polyethylene waste in a metal bucket. Prohibited quantities of liquids identified during VE are removed and/or immobilized during repackaging. Waste Stream OR-REDC-RH-HET is therefore not reactive (HWN D003) (References P161 and U011).

Toxicity Characteristic Metals

This waste stream exhibits the characteristic of toxicity per 40 CFR 261.24. The toxicity characteristic contaminants fall into two categories; metals and organics. The debris may contain toxicity characteristic metals based on the following identified uses/sources and is toxicity characteristic for organics. Where a constituent has been identified and there is no quantitative data available to demonstrate that the concentration of a constituent is below regulatory threshold levels, the applicable EPA HWN is conservatively applied to the waste stream in accordance with the CCP AK procedure CCP-TP-005.

Arsenic (D004) was used in actinide and lanthanide hydride and metallide studies. Barium (D005), cadmium (D006), chromium (D007), and lead (D008) have been attributed to fission product contaminants, product solution impurities (e.g. Berkelium-Californium separation, fission product contaminants) and target cladding. Cadmium is also attributed to flashlight batteries and electronic equipment. The presence of lead (D008) in this waste stream is attributed to lead shielding, gloves, batteries, electronic equipment and is a fission product contaminant of the HFIR targets. The presence of mercury (D009) in this waste stream is attributed to vapor lamps, electronic equipment, thermostats and solder. Selenium (D010) metal was identified on an REDC inorganic chemical inventory. Silver (D011) is assigned due to photographic development solutions and circuit boards in the waste. Based on AK, EPA HWNs D004, D005, D006, D007, D008, D009, D010, D011 are assigned to waste stream OR-REDC-CH-HET (Reference DR005 and DR602).

Toxicity Characteristic Organics

Waste stream OR-REDC-RH-HET does meet the definition of toxicity for organic compounds as defined in 40 CFR Part 261, Subpart C (40 CFR 261.24). Toxicity characteristic organic compounds were identified in the REDC processes. Where a constituent has been identified and there is no quantitative data available to demonstrate that the concentration is below regulatory threshold, the applicable EPA HWN is conservatively applied to the waste stream.

The AK identified the use of organic toxicity characteristic compounds including benzene (D018), carbon tetrachloride (HWN D019), and trichloroethylene (D040). EPA HWNs F005 and F002 are assigned to the waste stream for F-listed solvents benzene (F005) and trichloroethylene (F002). Because the more specific F-listed EPA HWNs have been assigned for these compounds, assignment of the corresponding toxicity characteristic HWNs D018 and D040 is not necessary. Therefore only D019 is conservatively assigned to waste stream OR-REDC-RH-HET for carbon tetrachloride (identified in the REDC inorganic chemical inventory). (Reference DR005 and DR602).

F-Listed Waste

Waste stream OR-REDC-RH-HET is an F-listed hazardous waste because the debris was mixed with or contains hazardous wastes from non-specific sources listed in 40 CFR Part 261, Subpart D (40 CFR 261.31).

F002 and F005-listed solvents were identified on REDC chemical inventories. Toluene (F005) was identified as a constituent in the liquid scintillation reagent Ultima Gold that was used in the laboratory. F003 constituents, including acetone, methanol, methyl isobutyl ketone, and xylene are listed solely because these solvents are ignitable. The waste stream will not exhibit the characteristic of ignitability because it is not liquid; therefore, F003 is not assigned. Although F001-listed solvents were identified in the AK record (carbon tetrachloride and trichloroethylene), no "large-scale" degreasing operation such as cold cleaning or vapor degreasing on an industrial scale was performed and F001 is not applied.

The following is a listing of the EPA HWNs and associated constituents assigned to waste stream OR-REDC-RH-HET.

(F002)
1,1,1-Trichloroethane, 1,1,2-trichloroethane, trichloroethylene

(F005)
Benzene and toluene

U, K, and P-Listed Chemicals

Waste stream OR-REDC-RH-HET does not contain a discarded commercial chemical product, an off-specification commercial chemical product, or a container residue or spill residue thereof (40 CFR 261.33). No U, K and P- listed chemicals were identified in the AK record for waste stream OR-REDC-RH-HET. The only sources identified for beryllium were small foil targets and source plates electroplated with microgram quantities of transplutonium elements. Review of the container documentation did not identify beryllium as a component of the waste in these containers. Therefore, if present, beryllium is a process contaminant. Since no beryllium powder will be present in the debris waste, P015 is not assigned to the waste stream.

Hydrofluoric acid (U134) was used as a dissolution reagent; however, there is no indication that unused acids or other reagents, or spills of these reagents were disposed of in this waste stream. Therefore, no U-and P-listed EPA HWNs are assigned to waste stream OR-REDC-RH-HET (References M005, M100 and P223).

The material in waste stream OR-REDC-RH-HET is not a hazardous waste from sources specified in 40 CFR 261.32. Waste stream OR-REDC-RH-HET is therefore not assigned a K-listed HWN.

Headspace Gas/Volatile Organic Compound Information

Headspace gas sampling was performed on 11 randomly selected containers. No UCL_{90} values exceeded the PRQLs for VOCs and SVOCs. One TIC (2-methyl-1-propanol) was identified but was not found in greater than 25% of the containers in this lot. These data are consistent with AK. The specifics of this information are included in the attached Characterization Information Summary Report. No EPA hazardous waste numbers were assigned based on headspace gas sampling analysis results.

Conclusion

The following EPA hazardous waste numbers are assigned to this waste stream: D004, D005, D006, D007, D008, D009, D010, D011, D019, F002 and F005.

Polychlorinated Biphenyls (PCBs)

Based on a review of the AK record, incandescent bulbs, mercury-vapor bulbs, vacuum pumps, and lighting fixtures (bases) were identified in the RH container documentation, however items potentially containing polychlorinated biphenyl (PCB) compounds were not specifically identified (capacitors, ballasts, etc.). No other potential sources for PCBs were identified in the AK record for this stream; however the ORNL waste management practices described in the AK record did not historically identify PCB materials as prohibited items or special management of these materials in the REDC. Additionally, interviews with ORNL waste management personnel have identified that vacuum pumps and capacitors containing PCB liquids could potentially be present in ORNL waste containers. If the waste is found to contain fluorescent light ballasts or other potential PCB-containing items during repackaging, these items will be managed in accordance with the PCB disposal requirements in the WIPP-WAC. (References C307, C308, M024, M100, P240, and P263).

Prohibited Items

The absence of prohibited items is determined and documented through acceptable knowledge and characterization activities. Visual examination is performed on each container in this waste stream as a confirmation activity. The following items have been determined as not present in the waste:

- Liquids
- Non-radioactive pyrophoric materials
- Waste incompatible with backfill, seal and panel closure materials, container and packaging materials, or other wastes
- Explosives or compressed gases
- Waste with PCBs not authorized under an EPA PCB waste disposal authorization
- Waste exhibiting the characteristics of ignitability, corrosivity, or reactivity
- Non-mixed hazardous wastes
- Waste that has ever been managed as high-level waste and waste from tanks specified in Table B-8 of the WIPP Hazardous Waste Facility Permit, unless specifically approved through a Class 3 permit modification.
- Any waste container from a waste stream (or waste stream lot) which has not undergone either radiographic or visual examination of a statistically representative subpopulation of the waste stream in each shipment, as described in the WIPP Hazardous Waste Facility Permit, Attachment B7.

Each container of waste is certified and shipped only after visual examination:

- Did not identify any prohibited items in the waste container, or
- All prohibited items found in a waste container by visual examination are identified and corrected (i.e., eliminated or removed) through the site non-conformance reporting system.

Method for Determining Waste Material Parameter Weights per Unit of Waste

The waste material parameter weight estimates for waste stream OR-REDC-RH-HET were derived from data located on site-specific waste disposal, transportation, and storage forms from 45 casks generated from 1991 through 2007. These containers are considered representative of the waste stream because the production operations that generated this waste

were consistent through the generation timeline. An analysis of the site-specific and VE data were performed, the results of which are presented in Table 2.

Table 2. Waste Stream OR-REDC-RH-HET Waste Material Parameters

Waste Material Parameter	Weight Percent	Weight Percent Range
Iron-based Metals/Alloys	59.13%	30.23% – 95.51%
Aluminum based Metals/Alloys	0.01%	0.0% – 0.64%
Other Metals	5.91%	0.0% – 52.38%
Other Inorganic Materials	16.78%	0.0% – 47.51%
Cellulosics	6.68%	0.0% – 18.03%
Plastics (waste materials)	8.62%	1.44% – 30.97%
Rubber	1.66%	0.0% – 11.9%
Organic Matrix	0.00%	0.0% – 0.0%
Inorganic Matrix	1.21%	0.0% – 7.93%
Soils/Gravel	0.00%	0.0% – 0.0%

List of AK Sufficiency Determinations

No AK Sufficiency Determinations apply to this waste stream.

Transportation

This waste stream and its chemical constituents have been reviewed for consistency with listed TRUCON codes and they are consistent. The waste stream and chemical constituents will be reviewed for consistency with the applicable TRUCON Content Number prior to shipment.

Radionuclide Information

The two most prevalent radionuclides by mass in this waste stream are Pu-239 and Cm-246. The isotopes expected to be present in the waste stream are listed in Table 3.

Table 3. Radionuclides in Waste Stream OR-REDC-RH-HET

WIPP Tracked Radionuclides	Additional Reported Radionuclides		
Am-241	Am-243	Cm-242	Ru-103
Pu-238	Ba-137m	Cm-244	Ru-106
Pu-239	Cf-249	Cm-246	Ag-110m
Pu-240	Cf-250	Cm-248	Sb-125
Pu-242	Cf-251	Eu-152	U-235
U-233 (Not expected)	Cf-252	Eu-154	U-236
U-234	Ce-141	Eu-155	Y-90
U-238	Ce-144	Nb-95	Zr-95
Cs-137	Cs-134	Np-239	
Sr-90	Co-60	Pu-241	

Payload management will not be employed for Oak Ridge National Laboratory.

Attachment 1

AK SOURCE DOCUMENTS, SUPPLEMENTAL DOCUMENTATION

Source Document Tracking Number	AK #	Title	Document Number	Date
C046	S5	Memo to J. A. Lenhard, DOE OR re: Materials Management Plan-ORNL	NA	06/13/1984
C307	NA	Interview of Walt Bond. Subject: Processes and Waste in Building 3508 at ORNL	NA	2/21/2008
C308	NA	Interview of Jason Taylor. Subject: PCB Management at ORNL.	NA	4/8/2008
DR005	NA	EPA Hazardous Waste Number Discrepancies	NA	06/24/08
DR602	NA	Discrepancy Resolution Follow-up on DR005 for EPA Hazardous Waste Number Discrepancy	NA	07/02/08
M005	NA	UCN-2109 Forms and Related Container Paperwork.	NA	Various
M024	S6, S9	RH EM Waste Database Query	NA	10/04/2007
P146	S9	C-Tank Transfers; Transuranic Sludge Removal From the C-1, C-2, and W-23 Waste Storage Tanks at Oak Ridge National Laboratory. Oak Ridge, Tennessee	BJC/OR-279	05/1999
P161	NA	Safety Analysis Report Radiochemical Engineering Development Center Building 7920	SAR/7920-CTD/0	3/14/2001
P223	NA	Chemical Technology Division Annual Progress Report for Period Ending 5/31/1969	ORNL-4422	Oct-69
P240	NA	Packaging and Disposition of Contact-Handled Transuranic Waste At the Radiochemical Engineering Development Center	REDC FO/WH 5100, Rev. 1 & 2	1/26/1995;7/15/1998
P241	NA	Oak Ridge National Laboratory Contact-Handled Transuranic Waste Certification Program Plan	ORNL/TM-10322/2, Rev. 2	8/1/1990

Source Document Tracking Number	AK #	Title	Document Number	Date
P242	NA	Oak Ridge National Laboratory Contact-Handled Transuranic Waste Certification Program Plan	ORNL/TM-10322/R3, Rev. 3	Jun-92
P263	NA	TRU Operating Manual and Supporting Documentation	NA	10/10/1980
P282	NA	Building 7920 Analytical Chemistry Procedures	Various	Various
P324	S3	Technical Safety Requirements Irradiated Fuels Examination Laboratory Building 3525	ORNL/3525/TSR	8/1/2004
P325	S3	Oak Ridge National Laboratory Standardized Safety Analysis Report for Nonreactor Nuclear Facilities	ORNL/NNFD/SSAR	5/12/2004
P330	S3	Safety Analysis Report Irradiated Fuels Examination Laboratory / Building 3525	ORNL/3525/SAR	6/22/2006
P401	S13	Radioactive materials Analysis laboratory Quality Assurance Plan for the Characterization of Radioactive Waste	QAP-X-96-CASD/RML-001	10/1997
P424	S5	Californium-252: A Remarkable Versatile Radioisotope	ORNL/TM-12706	10/10/1995
U011	NA	Safety Analysis: Transuranium Processing Plant, Building 7920	ORNL/TM-7688, Draft	Dec-84
U049	S9	Waste Stream Profile Sheet for 7920-HCAL-005 and Supporting documentation	7920-HCAL-005	08/18/1999
U601	S9	CCP Calculation Package: Sample Radionuclide Information Input Check	ORNL-RH-01	04/19/2008
U602	S9	CCP Calculation Package: Sample Data Decay Correction	ORNL-RH-02	04/19/2008
U603	S9	CCP Calculation Package: Campaigns 69 and M5 Information Input Check	ORNL-RH-03	04/19/2008
U605	S9	CCP Calculation Package: Mark 42 Campaigns Inventory Information Input Check	ORNL-RH-05	04/19/2008
Source Document Tracking	AK #	Title	Document Number	Date

Number				
U606	S9	CCP Calculation Package: Radiological Inventories for SETF Campaigns	ORNL-RH-06	04/19/2008
U607	S9	CCP Calculation Package: Dose-to-Curie Derivation for Cs-137, Eu-152 and Eu-154	ORNL-RH-07	04/19/2008; 05/23/2008
U608	S9	CCP Calculation Package: Determination of Reportable Isotopes-Mark 42 Period	ORNL-RH-08	04/19/2008
U609	S9	CCP Calculation Package: Campaign Inventory Information Input Check	ORNL-RH-09	04/19/2008
U610	S9	CCP Calculation Package: Uncertainty Analysis	ORNL-RH-10	05/13/2008
U611	S9	CCP Calculation Package: DTC Spreadsheet for Mark 42 Time-Mark/HFIR	ORNL-RH-11	05/22/2008
U612	S9	CCP Calculation Package: Development of Cs-137 Partition Factors	ORNL-RH-12	04/19/2008
U613	S9	CCP Calculation Package: MCNP5 Uncertainty Analysis	ORNL-RH-13	04/19/2008
U614	S9	CCP Calculation Package: Determination of Cm-242 Processed in Campaign 69	ORNL-RH-14	04/19/2008
U615	S9	CCP Calculation Package: Development of Campaigns 69 and M5 Inventories	ORNL-RH-15	04/19/2008
U616	S9	CCP Calculation Package: Direct Assay Information Input Check	ORNL-RH-16	05/13/2008
U617	S9	CCP Calculation Package: Direct Assay Data Analysis	ORNL-RH-17	05/13/2008
U618	S9	CCP Calculation Package: Scaling Factor Development for Mark 42 Time Period	ORNL-RH-18	04/19/2008
U620	S9	CCP Calculation Package: Fission Product Contribution to Total Dose Rate	ORNL-RH-20	04/19/2008
U621	S9	CCP Calculation Package: Sample Scaling Factor Development	ORNL-RH-21	04/19/2008
U622	S9	CCP Calculation Package: SR-90/Cs-137 Scaling Factor Development	ORNL-RH-22	05/14/2008
Source Document Tracking	AK #	Title	Document Number	Date

Number				
U623	S9	CCP Calculation Package: DTC Spreadsheet for Mark 42 Time-HFIR/HFIR	ORNL-RH-23	05/22/2008
U626	S9	CCP Calculation Package for: Determination of Neutron Surface to 1-m Dose Ratio	ORNL-RH-26	05/23/2008
U627	S9	CCP Calculation Package for: Ratio Between Contact and One Meter Dose Rates	ORNL-RH-27	05/23/2008

Alphanumeric Designations

C Correspondence
D Documents
DR Discrepancy Resolution
M Miscellaneous
P Procedures and Published Documents
U Unpublished Documents

AK Numbers

S1 Process Design Documents
S2 Standard Operating Procedure
S3 Safety Analysis Reports
S4 Waste Packaging Logs
S5 Test plans/research project reports
S6 Site databases
S7 Information from site personnel
S8 Standard industry documents
S9 Previous analytical data
S10 Material safety data sheets
S11 Laboratory Notebooks
S12 Comparable or surrogate sampling and analysis data
S13 Other

DIVIDER PAGE

NWP
Nuclear Waste Partnership LLC

A URS-led partnership with B&W and AREVA

CP:16:01076
UFC:5900.00

INTER-OFFICE CORRESPONDENCE

DATE: April 6, 2016

FROM: R. P. Kantrowitz LOCATION: Certification

TO: CCP Records Custodian GSA-212 LOCATION: Central Characterization Program

SUBJECT: TRANSMITTAL OF WASTE STREAM PROFILE FORM CHANGE NOTICE #1 FOR OAK RIDGE NATIONAL LABORATORY REMOTE-HANDLED WASTE STREAM OR-REDC-RH-HET (CCP-AK-ORNL-500)

Please accept the attached Waste Stream Profile Form Change Notice #1 for the Oak Ridge National Laboratory Remote-Handled Waste Stream OR-REDC-RH-HET (CCP-AK-ORNL-500).

RPK:rg

Attachment

cc: NWP
(without attachment)
I. Joo ED

CCP RECORDS ORIGINAL
DATE REC'D 4/13/2016

P.O. Box 2078 • Carlsbad, New Mexico USA 88221-2078
Phone: (575) 234-7200 • Fax: (575) 234-7083

Update for WIPP Operating Record (Change Notice #1)

Remote Handled Heterogeneous Debris Waste from the Radiochemistry Engineering Development Center

(OR-REDC-RH-HET)

Please add the following information to the WIPP operating record for Waste Stream Profile Form (WSPF) OR-REDC-RH-HET. This waste stream is Remote Handled Heterogeneous Debris Waste from the Radiochemistry Engineering Development Center and was approved by DOE/CBFO on February 20, 2009.

This WSPF is being revised. The WSPF components are bolded. The updates are:

1. **WSPF, Date of audit report approval by NMED**

   Update the audit approval date to include September 9, 2008, November 2, 2009 and August 12, 2010.

2. **WSPF, Title, version, number, and date of documents used for WAP certification**

   Update the following procedure revision numbers and approval dates:

   CCP-PO-001, CCP Transuranic Waste Characterization Quality Assurance Project Plan, Revision 19, December 29, 2010

   CCP-PO-002, CCP Transuranic Waste Certification Plan, Revision 25, December 29, 2010

   CCP-PO-027 CCP/TRU Waste Processing Center/Oakridge National Laboratory Interface Document, Revision 3, December 29, 2010

3. **WSPF, Waste Stream Information, Applicable TRUCON Content Codes**

   Update the list of applicable TRUCON Content Codes to include OR 321 and OR 322.

   The revised section will identify the following TRUCON Content Codes: OR 321, OR 322 and OR 325.

4. **WSPF, Required Program Information, Required Waste Stream Information, and Supplemental Documentation**

   Update reference CCP-AK-ORNL-500, revision 1, October 3, 2008 to CCP-AK-ORNL-500, revision 2, January 13, 2011.

5. **WSPF, Note (3)**

   Revise Note (3) as follows: TWBIR numbers OR-W211, OR-W214 and OR-REDC-RH-HET also apply.

6. **Summation of Aspects of AK Summary Report: OR-REDC-RH-HET, Overview**

Update reference CCP-AK-ORNL-500, revision 1, October 3, 2008 to CCP-AK-ORNL-500, revision 2, January 13, 2011

7. **Summation of Aspects of AK Summary Report: OR-REDC-RH-HET, Waste Stream Identification Summary, TRUCON Content Number (TRUCON):**

Update the list of applicable TRUCON Content Codes to include OR 321 and OR 322.

8. **Summation of Aspects of AK Summary Report: OR-REDC-RH-HET, Waste Stream TWBIR Identification, Footnote 1**

Revise Footnote 1 as follows: TWBIR numbers OR-W211, OR-W214 and OR-REDC-RH-HET also apply.

9. **Summation of Aspects of AK Summary Report: OR-REDC-RH-HET, RCRA Determinations - Hazardous Waste Determinations, new section entitled Hazardous Waste Management**

The REDC waste has been historically managed in accordance with ORNL waste management practices in compliance with the requirements required by the Tennessee Department of Environment and Conservation. The assignment of EPA HWNs to ORNL waste began in 1994. EPA inspections were conducted as late as 2003 and the containers were subsequently identified as "RCRA suspect" with no specific HWNs assigned. Therefore, the historical waste management was considered with respect to characterization of waste stream OR-REDC-RH-HET.

10. **Summation of Aspects of AK Summary Report: OR-REDC-RH-HET, new section entitled Justification for the Selection of Radiography or Visual Examination**

Visual examination (VE) has been used to characterize waste stream OR-REDC-RH-HET. Visual examination was selected as the characterization method because the waste containers were not previously packaged and VE is an acceptable characterization method for meeting all the Data Quality Objectives for NDE of waste stream OR-REDC-RH-HET.

Reason/justification for the change

The audit report approval date has been revised to reflect the most recent approval date.

Documents used for WAP certification have been revised to reflect the most recent revisions.

Reference to CCP-AK-ORNL-500, revision 1, October 23, 2008 is being updated to reflect the most current version, CCP-AK-ORNL-500, revision 2, January 13, 2011.

The approved TRUCON Content Codes are being added to support higher container wattage limits for waste stream OR-REDC-RH-HET. The TRUCON Content Codes were approved in October 2008.

The TWBIR number OR-REDC-RH-HET has been added to reflect the current ATWIR. Two new sections entitled Hazardous Waste Management and Justification for the Selection of Radiography or Visual Examination have been added to reflect current WIPP HWFP requirements.

11. EPA Hazardous Waste Number Assignment

The EPA Hazardous Waste Numbers assigned to the waste stream have not changed.

Update for the WIPP Operating Record (OR-REDC-RH-HET) certification:

I hereby certify that I have reviewed this Update for WIPP Operating Record, and it is complete and accurate to the best of my knowledge. I understand that this information will be made available to regulatory agencies and that there are significant penalties for submitting false information, including the possibility of fines and imprisonment for knowing violations.

Signature of Site Project Manager	Irene Quintana, SPM	5/4/11
	Printed Name and Title	Date

Attachment 3 - Acceptable Knowledge Source Document Summary

Site(s): Oak Ridge National Laboratory	Source Document Tracking Number: C210
Waste Stream Number(s): ORNL Non-specific Library Files (Applicable only when site library is not in use)	
Acceptable Knowledge Documentation Type: ☐ TRU Waste Management Program Information ☑ Waste Stream-Specific Information ☑ Additional Information	Category: ☑ Correspondence ☐ Discrepancy Resolution ☐ Internal Procedure ☐ Miscellaneous ☐ Published Document or Internal Procedure ☐ Unpublished Documents
Title or Description of Source Document [a]: Interview re: NFS TRU Waste Shipped to Oak Ridge National Laboratory. Interviewees: Richard Booth, Richard Moore, Bob Hunt, Scott Toller, Marie Moore	
Source Document Reference Information (author(s), document and revision number, date, publisher): J. Harrison; L. Watson, NA, NA, 09/12/2007, NA	

AK # [b]	Source Doc. Page #[c]	AK Information Summary
WS2, WS3, WS8, WS9, WS11, WS12, S7, S16	Throughout	Summary: A meeting was held at the Training Center at NFS in Erwin, TN primarily to discuss the TRU waste generated at NFS in the early-1990s and shipped to Oak Ridge National Laboratory (ORNL). The meeting was approximately 3 hours in length. CCP (Jeff Harrison) prepared a list of questions, and had a list of several specific documents that were requested. The responses to our questions are in bold italics. The NFS personnel interviewed were: Richard Booth At NFS from 1963 to present Phone: 423-743-1726 E-mail: rlbooth@nuclearfuelservices.com Richard Moore At NFS from 1989 to present Phone: 423-743-1174 E-mail: ramoore@nuclearfuelservices.com Bob Hunt At NFS from 1988 to 1994, and is now at ORNL (BJC/WDP) Phone: 865-241-1203 E-mail: huntra@bechteljacobs.org Scott Toller At NFS from 1989 to 1994, and is now at ORNL (BJC/WGS) Phone: 865-771-1658 E-mail: fourtolers@aol.com Marie Moore At NFS from 1986 to present Phone: 423-743-1737 E-mail: bmmoore@nuclearfuelservices.com Ms. Moore was only present at the meeting for a short time and had no input to the conversation. Others in attendance were:

NTPC RECORDS ORIGINAL
DATE REC'D 12/16/13

Attachment 3 - Acceptable Knowledge Source Document Summary (continued)

Site(s): Oak Ridge National Laboratory		Source Document Tracking Number: C210
AK # [b]	Source Doc. Page #[c]	AK Information Summary
		Bob Billett, WTS/CCP, 865-576-1564, bob.billett@truproject.com Fred Heacker, Energx, 865-574-2900, fred.heacker@truproject.com Don Coffey, Energx, 423-743-1737, don.coffey@truproject.com Drum-Specific Questions 1.□There are 80 drums described as concrete generated in 1993. •□We have conflicting information as to whether the concrete is in chunks or is chips/dust from scabbling operations. The net weights range from 320 to 690 lbs (576 lbs average). - The concrete should be in the form of chunks. Some scabbling was done in Building 110, but did not likely result in TRU waste. •□Where did the concrete originate and describe the generating process. - The concrete originated from Building 234 and was jack hammered from the Wet Cell floor and footers in 1993 and 1994. The contamination was the result of column overflow, primarily nitric acid (Pu nitrate and depleted Uranyl nitrate. Possibly an aqueous-based fixative was applied to the concrete – not sure. 2. There are 44 drums described as Raschig rings generated in 1993. • Are these borosilicate glass rings about 1-in. outside diameter and 2-in. long. - Yes • Are they from the tank associated with the high-pressure water decontamination unit that was part of the DVRF, or from the Building 110 underground tank, or something else? - Not from high-pressure water decontamination unit. - They are from the master mix tank in the Bldg. 234 Wet Cell (nitrate) and other nitrate tanks in Bldg. 234. No organics. - They are also from the Bldg. 110 tank that supported the two labs. The tank also contained liquids and sludge, possibly organics. These rings went through the DVRF, but still had some visible contamination. 3. There are 3 drums described as metal trash generated in mid-1992 that were not compacted. • The waste is relatively heavy at 558 to 709 lbs net. What is this metal, and why was is not compacted. - Could be equipment, such as pellet presses (hardened steel) or furnaces (inconel). Hydraulic fluid would have been removed and shipped to SEG for incineration. - The hydraulic fluid was sampled and analyzed for PCBs, and did not contain regulated levels of PCBs. 4. There are 3 drums described as asbestos waste, metal, and trash generated in April 1994 that were not compacted. • Describe how this waste was generated, and why was it not compacted. - Asbestos was not compacted. - Could be furnace insulation. 5. There are 131 drums of compacted waste. • Is it primarily gloveboxes and equipment that were compacted. - Yes • What types of equipment were disposed. Did it include items such as pumps, and was the oil drained. What was done with the oil. - Blenders, filter housings, ductwork. - Could include pumps which would have been drained of oil. 6. There are 512 drums of soil generated in 1993, and several more generated in the 2000s. • Where did the 1993 drums originate. - Mostly Bldg. 234 Wet Cell; maybe a little (~2 drums) of soil from 110 tank excavation • Where did the 2000s drums originate. - Same. This is 1993 waste that was shipped later. Not new generation. • Was dust suppressant applied to the soil during excavation, and what specifically was it. - No Waste Generating Location and Facility Mission 7. Did the decommissioning of Building 110 include just the Area C Wet Chemistry Lab and

Attachment 3 - Acceptable Knowledge Source Document Summary (continued)

Site(s): Oak Ridge National Laboratory		Source Document Tracking Number: C210
AK # [b]	Source Doc. Page #[c]	AK Information Summary
		associated underground tank and piping, or did it also include the Area D Spectrographic Lab? - Just Area C; gloveboxes/equipment & underground tank and piping 8. What was the mission of Building 110? Did it provide analytical support to just Building 234 or also to other site operations? - Just Bldg. 234 analytical support - Early years it supported Bldg. 234 as well as LWBR program Chemical Use and Liquid/Sludge Waste Generation and Management 9. What chemicals or commercial products were used for cleaning/decontamination? Did it include acids or oxidizers (e.g., hypochlorites, perchlorates, permanganates, peroxides)? - Radiac Wash (citrus-based decon. solution) - High-pressure water in DVRF - Acids or oxidizers not used. 10. Did decommissioning include draining of tanks and other vessels? If so, what TRU liquids were generated (e.g., acids, oils)? Was sludge removed from tanks? - Tanks were drained, but liquids were not disposed as TRU. 11. Were acids neutralized and what was the neutralizing agent used? - Acidic liquids from tanks were not neutralized. 12. How were liquids/sludges disposed (e.g., absorbed/solidified and placed in TRU waste containers, or transferred to a liquid waste treatment facility)? - Some were treated in on-site treatment facilities, some were sent to off-site treatment. 13. If liquids or sludges were absorbed/solidified, what material was used (e.g., diatomaceous earth, soda ash, Portland cement) and what were the liquids or sludges solidified in? - Possible that some contaminated aqueous liquids from decon operations were mixed with cement to solidify glovebox fines. - A few drums were rejected because of liquids. Radsorb, Radpads, or Aqualac was added to absorb the liquid. Solid Waste Generation and Management 14. Were any of the following disposed in TRU waste containers? • Batteries (e.g., alkaline, nickel-cadmium, lead-acid) • Cadmium shielding • Equipment containing circuit boards (contain lead solder) • Lead items (e.g., glass windows, gloves, shielding, tape, incandescent light bulbs) • Fluorescent light tubes or mercury vapor lamps • Mercury thermometers, manometers, switches, pumps - Bulbs/ballasts – low-level waste because not inside glovebox - Manometer removed from a glovebox – Hg amalgamated in one drum - There is one cadmium-plated wrench in the same drum with the amalgamated Hg. - Lead shielding and bricks were not TRU waste 15. A 1/31/1992 report entitled "Final Report Waste Characterization of Wastes Generated from D&D Activity in Buildings 110 and 234 on the NFS Site" indicates that one of the samples had higher than expected cadmium which was later attributed to the discovery of a cadmium-coated wrench. Were other cadmium-coated tools used, and were they disposed as TRU waste? - The wrench was marked as containing cadmium and was disposed in a TRU mixed waste drum along with the amalgamated mercury. They don't know of others like it, and if there were, they would have been handled in the same way. 16. Was beryllium used, will it be in TRU waste, and what forms of beryllium could be present (e.g., metal pieces, shavings/fines, debris with Be contamination)? Will the beryllium exceed 1% by weight in the waste container? - No beryllium 17. Were acid-contaminated wipes/rags generated, and were they rinsed with water and/or neutralized by adding caustic? - 1 to 3 Molar acid was used in production, and cleaning would have been done with more dilute acid like 0.5 Molar. - Was not neutralized, but there would not have been a lot of liquid used. 18. Were aerosol cans disposed in TRU waste? Were they empty? Punctured? - Aerosol cans were drained and punctured, but were not TRU waste.

Attachment 3 - Acceptable Knowledge Source Document Summary (continued)

Site(s): Oak Ridge National Laboratory		Source Document Tracking Number: C210
AK # [b]	Source Doc. Page #[c]	AK Information Summary
		19. Were water reactive materials used (e.g., calcium, sodium, potassium) and if so, how were they managed? - No water reactives 20. Were ion-exchange resins generated as TRU waste and if so, were the resins treated (e.g., washed with sodium sulfate solution and water) before disposal? How was resin packaged? - No IX resin in decommissioning waste. 21. Will any of the following PCB items be in TRU waste? • Fluorescent light ballasts - Outside glovebox, not TRU waste • Electrical transformers or capacitors - No • Absorbed oils from electrical, heat transfer, or hydraulic equipment - No; incinerated Radionuclides and Radioassay 22. Are the radionuclides in Building 110 waste expected to be the same as Building 234 waste? - Gloveboxes used for LWBR program are not in the waste sent to Oak Ridge. - Plutonium gloveboxes would have some combination of Bldg. 234 Pu. 23. U-233 was only reported in 32 drums of compacted waste and 19 drums of soil. Is this an indication that the 32 drums of compacted waste are from the U-233 purification facility in Building 234? Where are the 19 soil drums from? - U-233 gloveboxes in Bldg. 234 were removed earlier (~1983) and will not be in waste sent to Oak Ridge. - U-233 probably from Bldg. 110 equipment processed through the DVRF (compacted) and soil and tank/piping from the removal of the Bldg. 110 underground tank. 24. Which isotopes were actually measured by the passive/active neutron counter versus those that were scaled? - Active system quantified Pu-239 and others were scaled. - Passive system quantified Pu-240 and others were scaled. Waste Packaging For each of the waste types above: 25. Describe configuration of rigid liners and drum liners, including sealing methods and use of a filter vent or vent hole. - Black 90-mil HDPE liner, lid has 3/8-in. vent hole, lid not glued. 26. How was waste packaged (e.g., ice cream cartons, metal cans, plastic bags)? How many plastic bag layers could there be, including the drum liner bag? How were bags closed (e.g., twist/tape)? - Soil and concrete have 1 layer (twist/tape) and are not heat-sealed. - Raschig rings are most likely the same as soil and concrete. 27. Were plastic bags heat-sealed? Do heat-sealed bags contain a filter vent? What size of heat-sealed bags were used? - Plastic bags containing poly bottles of cemented fines were heat-sealed - Pucks from compactor were heat-sealed (but the 2nd compaction at SEG would have unsealed them) - Heat-sealed bags do not have filter vent 28. Will the drums contain sealed containers greater than 4 liters in size? What type of containers and how are they sealed? - No Other 29. A 1/31/1992 report entitled "Final Report Waste Characterization of Wastes Generated from D&D Activity in Buildings 110 and 234 on the NFS Site" discusses the analysis of six sweepings samples. One of the samples contains arsenic, three contain barium, and four contain cadmium above the RCRA regulatory threshold. Any ideas as to the source of these metals? - No 30. A 10/29/1992 report entitled "Oak Ridge National Laboratory/Nuclear Fuel Services, Inc. NFS Waste Parameter Verification Program" indicates that higher activity waste was collected in poly bottles and then passed through a 200 micron sieve. The fines <200 microns were cemented in poly bottles and packaged in their own drums separate from debris waste. Are the sweepings material described above what was cemented? - Yes

Attachment 3 - Acceptable Knowledge Source Document Summary (continued)

Site(s): Oak Ridge National Laboratory		Source Document Tracking Number: C210
AK # [b]	Source Doc. Page # [c]	AK Information Summary
		31. This same 10/29/1992 report says that material that did not pass through the sieve was packaged in poly bottle and baled/compacted with other debris waste. Were the materials that did not pass through the sieve debris items, or did they include larger particle sweepings as well? - Sieving was done for a period of time, but they stopped doing it and cemented all of it. Data Limitations: Information is based on memory of activities that occurred approximately 15 years ago.

Source Document Data Limitations (If any):

1. Information is based on memory of activities that occurred approximately 15 years ago.

Acceptable Knowlege Expert:

Trev Greenwood _____ Date: 11/14/2013

Print /Sign

[a] Provide description for non-titled information (i.e., container paperwork, MSDS sheets, etc)
[b] Obtain from Acceptable Knowledge Documentation Checklist
[c] For microfilm or microfiche, identify box, tape, reel number and location.

Attachment 2 – Record of Communication

Waste Stream Numbers: OR-NFS-CH-HET, Heterogeneous Debris OR-NFS-CH-HOM, Cemented Fines OR-NFS-CH-SOIL, Contaminated Soil	Corresponding Source Document #: **C210**	
Interviewer: Jeff Harrison, Lisa Watson	Date: 9/12/2007	Time: 1:00 EST
Interviewees: See below	Group/Organization: Job Title: See below	Phone: See below Email:
Subject: NFS TRU Waste Shipped to Oak Ridge National Laboratory		

Summary: A meeting was held at the Training Center at NFS in Erwin, TN primarily to discuss the TRU waste generated at NFS in the early-1990s and shipped to Oak Ridge National Laboratory (ORNL). The meeting was approximately 3 hours in length. CCP (Jeff Harrison) prepared a list of questions, and had a list of several specific documents that were requested. The responses to our questions are in bold italics. The NFS personnel interviewed were:

Richard Booth
At NFS from 1963 to present
Phone: 423-743-1726
E-mail: rlbooth@nuclearfuelservices.com

Richard Moore
At NFS from 1989 to present
Phone: 423-743-1174
E-mail: ramoore@nuclearfuelservices.com

Bob Hunt
At NFS from 1988 to 1994, and is now at ORNL (BJC/WDP)
Phone: 865-241-1203
E-mail: huntra@bechteljacobs.org

Scott Toller
At NFS from 1989 to 1994, and is now at ORNL (BJC/WGS)
Phone: 865-771-1658
E-mail: fourtolers@aol.com

Marie Moore
At NFS from 1986 to present
Phone: 423-743-1737
E-mail: bmmoore@nuclearfuelservices.com
Ms. Moore was only present at the meeting for a short time and had no input to the conversation.

Others in attendance were:

Bob Billett, WTS/CCP, 865-576-1564, bob.billett@truproject.com
Fred Heacker, Energx, 865-574-2900, fred.heacker@truproject.com
Don Coffey, Energx, 423-743-1737, don.coffey@truproject.com

NTPC RECORDS ORIGINAL
DATE REC'D 12/18/13

Drum-Specific Questions

1. There are 80 drums described as concrete generated in 1993.
   - We have conflicting information as to whether the concrete is in chunks or is chips/dust from scabbling operations. The net weights range from 320 to 690 lbs (576 lbs average).

   - The concrete should be in the form of chunks. Some scabbling was done in Building 110, but did not likely result in TRU waste.

   - Where did the concrete originate and describe the generating process.

   - The concrete originated from Building 234 and was jack hammered from the Wet Cell floor and footers in 1993 and 1994. The contamination was the result of column overflow, primarily nitric acid (Pu nitrate and depleted Uranyl nitrate. Possibly an aqueous-based fixative was applied to the concrete – not sure.

2. There are 44 drums described as Raschig rings generated in 1993.
   - Are these borosilicate glass rings about 1-in. outside diameter and 2-in. long. - ***Yes***
   - Are they from the tank associated with the high-pressure water decontamination unit that was part of the DVRF, or from the Building 110 underground tank, or something else?

   - Not from high-pressure water decontamination unit.

   - They are from the master mix tank in the Bldg. 234 Wet Cell (nitrate) and other nitrate tanks in Bldg. 234. No organics.

   - They are also from the Bldg. 110 tank that supported the two labs. The tank also contained liquids and sludge, possibly organics. These rings went through the DVRF, but still had some visible contamination.

3. There are 3 drums described as metal trash generated in mid-1992 that were not compacted.
   - The waste is relatively heavy at 558 to 709 lbs net. What is this metal, and why was is not compacted.

   - Could be equipment, such as pellet presses (hardened steel) or furnaces (Inconel). Hydraulic fluid would have been removed and shipped to SEG for incineration.

   - The hydraulic fluid was sampled and analyzed for PCBs, and did not contain regulated levels of PCBs.

4. There are 3 drums described as asbestos waste, metal, and trash generated in April 1994 that were not compacted.
   - Describe how this waste was generated, and why was it not compacted.

   - Asbestos was not compacted.

   - Could be furnace insulation.

5. There are 131 drums of compacted waste.
   - Is it primarily gloveboxes and equipment that were compacted. - ***Yes***
   - What types of equipment were disposed. Did it include items such as pumps, and was the oil drained. What was done with the oil.

   - Blenders, filter housings, ductwork.

- Could include pumps which would have been drained of oil.

6. There are 512 drums of soil generated in 1993, and several more generated in the 2000s.
   - Where did the 1993 drums originate.

   - Mostly Bldg. 234 Wet Cell; maybe a little (~2 drums) of soil from 110 tank excavation

   - Where did the 2000s drums originate.

   - Same. This is 1993 waste that was shipped later. Not new generation.

   - Was dust suppressant applied to the soil during excavation, and what specifically was it.

   - No

Waste Generating Location and Facility Mission

7. Did the decommissioning of Building 110 include just the Area C Wet Chemistry Lab and associated underground tank and piping, or did it also include the Area D Spectrographic Lab?

   - Just Area C; gloveboxes/equipment & underground tank and piping

8. What was the mission of Building 110? Did it provide analytical support to just Building 234 or also to other site operations?

   - Just Bldg. 234 analytical support

   - Early years it supported Bldg. 234 as well as LWBR program

Chemical Use and Liquid/Sludge Waste Generation and Management

9. What chemicals or commercial products were used for cleaning/decontamination? Did it include acids or oxidizers (e.g., hypochlorites, perchlorates, permanganates, peroxides)?

   - Radiac Wash (citrus-based decon. solution)

   - High-pressure water in DVRF

   - Acids or oxidizers not used.

10. Did decommissioning include draining of tanks and other vessels? If so, what TRU liquids were generated (e.g., acids, oils)? Was sludge removed from tanks?

    - Tanks were drained, but liquids were not disposed as TRU.

11. Were acids neutralized and what was the neutralizing agent used?

    - Acidic liquids from tanks were not neutralized.

12. How were liquids/sludges disposed (e.g., absorbed/solidified and placed in TRU waste containers, or transferred to a liquid waste treatment facility)?

    - Some were treated in on-site treatment facilities, some were sent to off-site treatment.

13. If liquids or sludges were absorbed/solidified, what material was used (e.g., diatomaceous earth, soda ash, Portland cement) and what were the liquids or sludges solidified in?

    - Possible that some contaminated aqueous liquids from decon operations were mixed with cement to solidify glovebox fines.

    - A few drums were rejected because of liquids. Radsorb, Radpads, or Aqualac was added to absorb the liquid.

Solid Waste Generation and Management

14. Were any of the following disposed in TRU waste containers?
    - Batteries (e.g., alkaline, nickel-cadmium, lead-acid)
    - Cadmium shielding
    - Equipment containing circuit boards (contain lead solder)
    - Lead items (e.g., glass windows, gloves, shielding, tape, incandescent light bulbs)
    - Fluorescent light tubes or mercury vapor lamps
    - Mercury thermometers, manometers, switches, pumps

    - Bulbs/ballasts – low-level waste because not inside glovebox

    - Manometer removed from a glovebox – Hg amalgamated in one drum

    - There is one cadmium-plated wrench in the same drum with the amalgamated Hg.

    - Lead shielding and bricks were not TRU waste

15. A 1/31/1992 report entitled "Final Report Waste Characterization of Wastes Generated from D&D Activity in Buildings 110 and 234 on the NFS Site" indicates that one of the samples had higher than expected cadmium which was later attributed to the discovery of a cadmium-coated wrench. Were other cadmium-coated tools used, and were they disposed as TRU waste?

    - The wrench was marked as containing cadmium and was disposed in a TRU mixed waste drum along with the amalgamated mercury. They don't know of others like it, and if there were, they would have been handled in the same way.

16. Was beryllium used, will it be in TRU waste, and what forms of beryllium could be present (e.g., metal pieces, shavings/fines, debris with Be contamination)? Will the beryllium exceed 1% by weight in the waste container? - ***No beryllium***

17. Were acid-contaminated wipes/rags generated, and were they rinsed with water and/or neutralized by adding caustic?

    - 1 to 3 Molar acid was used in production, and cleaning would have been done with more dilute acid like 0.5 Molar.

    - Was not neutralized, but there would not have been a lot of liquid used.

18. Were aerosol cans disposed in TRU waste? Were they empty? Punctured?

    - Aerosol cans were drained and punctured, but were not TRU waste.

19. Were water reactive materials used (e.g., calcium, sodium, potassium) and if so, how were they managed? - ***No water reactives***

20. Were ion-exchange resins generated as TRU waste and if so, were the resins treated (e.g., washed with sodium sulfate solution and water) before disposal? How was resin packaged?

    - No IX resin in decommissioning waste.

21. Will any of the following PCB items be in TRU waste?
    - Fluorescent light ballasts - ***Outside glovebox, not TRU waste***
    - Electrical transformers or capacitors - ***No***
    - Absorbed oils from electrical, heat transfer, or hydraulic equipment - ***No; incinerated***

Radionuclides and Radioassay

22. Are the radionuclides in Building 110 waste expected to be the same as Building 234 waste?

    - Gloveboxes used for LWBR program are not in the waste sent to Oak Ridge.

    - Plutonium gloveboxes would have some combination of Bldg. 234 Pu.

23. U-233 was only reported in 32 drums of compacted waste and 19 drums of soil. Is this an indication that the 32 drums of compacted waste are from the U-233 purification facility in Building 234? Where are the 19 soil drums from?

    - U-233 gloveboxes in Bldg. 234 were removed earlier (~1983) and will not be in waste sent to Oak Ridge.

    - U-233 probably from Bldg. 110 equipment processed through the DVRF (compacted) and soil and tank/piping from the removal of the Bldg. 110 underground tank.

24. Which isotopes were actually measured by the passive/active neutron counter versus those that were scaled?

    - Active system quantified Pu-239 and others were scaled.

    - Passive system quantified Pu-240 and others were scaled.

Waste Packaging

For each of the waste types above:

25. Describe configuration of rigid liners and drum liners, including sealing methods and use of a filter vent or vent hole.

    - Black 90-mil HDPE liner, lid has 3/8-in. vent hole, lid <u>not</u> glued.

26. How was waste packaged (e.g., ice cream cartons, metal cans, plastic bags)? How many plastic bag layers could there be, including the drum liner bag? How were bags closed (e.g., twist/tape)?

    - Soil and concrete have 1 layer (twist/tape) and are not heat-sealed.

    - Raschig rings are most likely the same as soil and concrete.

27. Were plastic bags heat-sealed? Do heat-sealed bags contain a filter vent? What size of heat-sealed bags were used?

    - Plastic bags containing poly bottles of cemented fines were heat-sealed

    - Pucks from compactor were heat-sealed (but the 2nd compaction at SEG would have unsealed them)

    - Heat-sealed bags do not have filter vent

28. Will the drums contain sealed containers greater than 4 liters in size? What type of containers and how are they sealed? - ***No***

Other

29. A 1/31/1992 report entitled "Final Report Waste Characterization of Wastes Generated from D&D Activity in Buildings 110 and 234 on the NFS Site" discusses the analysis of six sweepings samples. One of the samples contains arsenic, three contain barium, and four contain cadmium above the RCRA regulatory threshold. Any ideas as to the source of these metals? - ***No***

30. A 10/29/1992 report entitled "Oak Ridge National Laboratory/Nuclear Fuel Services, Inc. NFS Waste Parameter Verification Program" indicates that higher activity waste was collected in poly bottles and then passed through a 200 micron sieve. The fines <200 microns were cemented in poly bottles and packaged in their own drums separate from debris waste. Are the sweepings material described above what was cemented? - ***Yes***

31. This same 10/29/1992 report says that material that did not pass through the sieve was packaged in poly bottle and baled/compacted with other debris waste. Were the materials that did not pass through the sieve debris items, or did they include larger particle sweepings as well?

    - Sieving was done for a period of time, but they stopped doing it and cemented all of it.

Data Limitations:

Information is based on memory of activities that occurred approximately 15 years ago.

Acceptable Knowledge Expert: Lisa Watson [signature] Date: 11/21/07
Print / Sign

DIVIDER PAGE

Attachment 3 - Acceptable Knowledge Source Document Summary

Site(s): Oak Ridge National Laboratory	Source Document Tracking Number: C309
Waste Stream Number(s): ORNL Non-specific Library Files (Applicable only when site library is not in use)	
Acceptable Knowledge Documentation Type: ☐ TRU Waste Management Program Information ☑ Waste Stream-Specific Information ☑ Additional Information	Category: ☑ Correspondence ☐ Discrepancy Resolution ☐ Internal Procedure ☐ Miscellaneous ☐ Published Document or Internal Procedure ☐ Unpublished Documents
Title or Description of Source Document [a]: Record of Communication Subject: NFS Soil Sampling/Analysis Data Tetrachloroethylene Use	
Source Document Reference Information (author(s), document and revision number, date, publisher): Jeff Harrison, NA, Rev. NA, 06/04/2008, NA	

AK # [b]	Source Doc. Page # [c]	AK Information Summary
WS8, WS12, S7	Throughout	The soil was shipped to ORNL as non-mixed waste based on characterization done in accordance with the WIPP-WAC in place at the time (1993/1994). They are pretty sure it was based on TCLP analyses but are not positive. They will try and find the data. I told him my concern was with data from a 1998 sampling effort (AK Source Doc. C122) in which one composite soil sample contained trace amounts of tetrachloroethylene (PCE). The sample was not from under the Wet Cell but was from under other parts of Building 234. And without the Wet Cell data from the early-1990s (that they are going to look for), I was going to conservatively apply F002 due to the presence of PCE. We discussed data from a soil sampling effort in 2001 in which soil samples were collected from under the Building 234 Wet Chemistry Cell (AK Source Doc. I053). Even though this sampling effort was done well after the more contaminated soil had been removed from this area in the early-1990s, Richard believes that PCE would still show up in this soil because of its mobility. I also asked about PCE use at NFS. They said that PCE was not used in the Wet Cell process. They speculated that it could have been used historically for cleaning in 234C which is an area in the building where they used to do welding for the fuel pins, but this process had stopped before they worked at NFS. They said there was a maintenance facility on site that definitely used PCE for cleaning at one time, but it was not that close to Building 234. They also mentioned that PCE has been discovered in the groundwater up-gradient from Building 234. They don't know for sure where it is coming from but thought it may be from historic use in off-site facilities up-gradient from NFS.

Attachment 3 - Acceptable Knowledge Source Document Summary (continued)

Site(s): Oak Ridge National Laboratory	Source Document Tracking Number: C309
Source Document Data Limitations (if any): 1. None.	
Acceptable Knowlege Expert: Trey Greenwood Date: 11/14/2013 Print /Sign	
[a] Provide description for non-titled information (i.e., container paperwork, MSDS sheets, etc) [b] Obtain from Acceptable Knowledge Documentation Checklist [c] For microfilm or microfiche, identify box, tape, reel number and location.	

Attachment 2 – Record of Communication

Waste Stream Numbers: OR-NFS-CH-SOIL, Contaminated Soil	Corresponding Source Document #: **C309**	
Interviewer: Jeff Harrison	Date: 6/4/2008	Time: 12:30 EST
Interviewees: Richard Moore & Tom Holly	Group/Organization: Job Title:	Phone: 423-743-1174 Email:ramoore@nuclearfuelservices.com
Subject: NFS Soil Sampling/Analysis Data and Tetrachloroethylene Use		

Summary:

The soil was shipped to ORNL as non-mixed waste based on characterization done in accordance with the WIPP-WAC in place at the time (1993/1994). They are pretty sure it was based on TCLP analyses but are not positive. They will try and find the data.

I told him my concern was with data from a 1998 sampling effort (AK Source Doc. C122) in which one composite soil sample contained trace amounts of tetrachloroethylene (PCE). The sample was not from under the Wet Cell but was from under other parts of Building 234. And without the Wet Cell data from the early-1990s (that they are going to look for), I was going to conservatively apply F002 due to the presence of PCE.

We discussed data from a soil sampling effort in 2001 in which soil samples were collected from under the Building 234 Wet Chemistry Cell (AK Source Doc. I053). Even though this sampling effort was done well after the more contaminated soil had been removed from this area in the early-1990s, Richard believes that PCE would still show up in this soil because of its mobility.

I also asked about PCE use at NFS. They said that PCE was not used in the Wet Cell process. They speculated that it could have been used historically for cleaning in 234C which is an area in the building where they used to do welding for the fuel pins, but this process had stopped before they worked at NFS. They said there was a maintenance facility on site that definitely used PCE for cleaning at one time, but it was not that close to Building 234.

They also mentioned that PCE has been discovered in the groundwater up-gradient from Building 234. They don't know for sure where it is coming from but thought it may be from historic use in off-site facilities up-gradient from NFS.

Drum-Specific Questions

1. There are 80 drums described as concrete generated in 1993.
   - We have conflicting information as to whether the concrete is in chunks or is chips/dust from scabbling operations. The net weights range from 320 to 690 lbs (576 lbs average).

   - The concrete should be in the form of chunks. Some scabbling was done in Building 110, but did not likely result in TRU waste.

   - Where did the concrete originate and describe the generating process.

   - The concrete originated from Building 234 and was jack hammered from the Wet Cell floor and footers in 1993 and 1994. The contamination was the result of column overflow, primarily nitric acid (Pu nitrate and depleted Uranyl nitrate. Possibly an aqueous-based fixative was applied to the concrete – not sure.

2. There are 44 drums described as Raschig rings generated in 1993.
   - Are these borosilicate glass rings about 1-in. outside diameter and 2-in. long. - ***Yes***
   - Are they from the tank associated with the high-pressure water decontamination unit that was part of the DVRF, or from the Building 110 underground tank, or something else?

   - Not from high-pressure water decontamination unit.

   - They are from the master mix tank in the Bldg. 234 Wet Cell (nitrate) and other nitrate tanks in Bldg. 234. No organics.

   - They are also from the Bldg. 110 tank that supported the two labs. The tank also contained liquids and sludge, possibly organics. These rings went through the DVRF, but still had some visible contamination.

3. There are 3 drums described as metal trash generated in mid-1992 that were not compacted.
   - The waste is relatively heavy at 558 to 709 lbs net. What is this metal, and why was is not compacted.

   - Could be equipment, such as pellet presses (hardened steel) or furnaces (Inconel). Hydraulic fluid would have been removed and shipped to SEG for incineration.

   - The hydraulic fluid was sampled and analyzed for PCBs, and did not contain regulated levels of PCBs.

4. There are 3 drums described as asbestos waste, metal, and trash generated in April 1994 that were not compacted.
   - Describe how this waste was generated, and why was it not compacted.

   - Asbestos was not compacted.

   - Could be furnace insulation.

5. There are 131 drums of compacted waste.
   - Is it primarily gloveboxes and equipment that were compacted. - ***Yes***
   - What types of equipment were disposed. Did it include items such as pumps, and was the oil drained. What was done with the oil.

   - Blenders, filter housings, ductwork.

- Could include pumps which would have been drained of oil.

6. There are 512 drums of soil generated in 1993, and several more generated in the 2000s.
   - Where did the 1993 drums originate.

   - Mostly Bldg. 234 Wet Cell; maybe a little (~2 drums) of soil from 110 tank excavation

   - Where did the 2000s drums originate.

   - Same. This is 1993 waste that was shipped later. Not new generation.

   - Was dust suppressant applied to the soil during excavation, and what specifically was it.

   - No

Waste Generating Location and Facility Mission

7. Did the decommissioning of Building 110 include just the Area C Wet Chemistry Lab and associated underground tank and piping, or did it also include the Area D Spectrographic Lab?

   - Just Area C; gloveboxes/equipment & underground tank and piping

8. What was the mission of Building 110? Did it provide analytical support to just Building 234 or also to other site operations?

   - Just Bldg. 234 analytical support

   - Early years it supported Bldg. 234 as well as LWBR program

Chemical Use and Liquid/Sludge Waste Generation and Management

9. What chemicals or commercial products were used for cleaning/decontamination? Did it include acids or oxidizers (e.g., hypochlorites, perchlorates, permanganates, peroxides)?

   - Radiac Wash (citrus-based decon. solution)

   - High-pressure water in DVRF

   - Acids or oxidizers not used.

10. Did decommissioning include draining of tanks and other vessels? If so, what TRU liquids were generated (e.g., acids, oils)? Was sludge removed from tanks?

    - Tanks were drained, but liquids were not disposed as TRU.

11. Were acids neutralized and what was the neutralizing agent used?

    - Acidic liquids from tanks were not neutralized.

12. How were liquids/sludges disposed (e.g., absorbed/solidified and placed in TRU waste containers, or transferred to a liquid waste treatment facility)?

    - Some were treated in on-site treatment facilities, some were sent to off-site treatment.

13. If liquids or sludges were absorbed/solidified, what material was used (e.g., diatomaceous earth, soda ash, Portland cement) and what were the liquids or sludges solidified in?

    - Possible that some contaminated aqueous liquids from decon operations were mixed with cement to solidify glovebox fines.

    - A few drums were rejected because of liquids. Radsorb, Radpads, or Aqualac was added to absorb the liquid.

Solid Waste Generation and Management

14. Were any of the following disposed in TRU waste containers?
    - Batteries (e.g., alkaline, nickel-cadmium, lead-acid)
    - Cadmium shielding
    - Equipment containing circuit boards (contain lead solder)
    - Lead items (e.g., glass windows, gloves, shielding, tape, incandescent light bulbs)
    - Fluorescent light tubes or mercury vapor lamps
    - Mercury thermometers, manometers, switches, pumps

    - Bulbs/ballasts – low-level waste because not inside glovebox

    - Manometer removed from a glovebox – Hg amalgamated in one drum

    - There is one cadmium-plated wrench in the same drum with the amalgamated Hg.

    - Lead shielding and bricks were not TRU waste

15. A 1/31/1992 report entitled "Final Report Waste Characterization of Wastes Generated from D&D Activity in Buildings 110 and 234 on the NFS Site" indicates that one of the samples had higher than expected cadmium which was later attributed to the discovery of a cadmium-coated wrench. Were other cadmium-coated tools used, and were they disposed as TRU waste?

    - The wrench was marked as containing cadmium and was disposed in a TRU mixed waste drum along with the amalgamated mercury. They don't know of others like it, and if there were, they would have been handled in the same way.

16. Was beryllium used, will it be in TRU waste, and what forms of beryllium could be present (e.g., metal pieces, shavings/fines, debris with Be contamination)? Will the beryllium exceed 1% by weight in the waste container? ***- No beryllium***

17. Were acid-contaminated wipes/rags generated, and were they rinsed with water and/or neutralized by adding caustic?

    - 1 to 3 Molar acid was used in production, and cleaning would have been done with more dilute acid like 0.5 Molar.

    - Was not neutralized, but there would not have been a lot of liquid used.

18. Were aerosol cans disposed in TRU waste? Were they empty? Punctured?

    - Aerosol cans were drained and punctured, but were not TRU waste.

19. Were water reactive materials used (e.g., calcium, sodium, potassium) and if so, how were they managed? ***- No water reactives***

20. Were ion-exchange resins generated as TRU waste and if so, were the resins treated (e.g., washed with sodium sulfate solution and water) before disposal? How was resin packaged?

    - No IX resin in decommissioning waste.

21. Will any of the following PCB items be in TRU waste?
    - Fluorescent light ballasts ***- Outside glovebox, not TRU waste***
    - Electrical transformers or capacitors ***- No***
    - Absorbed oils from electrical, heat transfer, or hydraulic equipment ***- No; incinerated***

Radionuclides and Radioassay

22. Are the radionuclides in Building 110 waste expected to be the same as Building 234 waste?

    - Gloveboxes used for LWBR program are not in the waste sent to Oak Ridge.

    - Plutonium gloveboxes would have some combination of Bldg. 234 Pu.

23. U-233 was only reported in 32 drums of compacted waste and 19 drums of soil. Is this an indication that the 32 drums of compacted waste are from the U-233 purification facility in Building 234? Where are the 19 soil drums from?

    - U-233 gloveboxes in Bldg. 234 were removed earlier (~1983) and will not be in waste sent to Oak Ridge.

    - U-233 probably from Bldg. 110 equipment processed through the DVRF (compacted) and soil and tank/piping from the removal of the Bldg. 110 underground tank.

24. Which isotopes were actually measured by the passive/active neutron counter versus those that were scaled?

    - Active system quantified Pu-239 and others were scaled.

    - Passive system quantified Pu-240 and others were scaled.

Waste Packaging

For each of the waste types above:

25. Describe configuration of rigid liners and drum liners, including sealing methods and use of a filter vent or vent hole.

    - Black 90-mil HDPE liner, lid has 3/8-in. vent hole, lid <u>not</u> glued.

26. How was waste packaged (e.g., ice cream cartons, metal cans, plastic bags)? How many plastic bag layers could there be, including the drum liner bag? How were bags closed (e.g., twist/tape)?

    - Soil and concrete have 1 layer (twist/tape) and are not heat-sealed.

    - Raschig rings are most likely the same as soil and concrete.

27. Were plastic bags heat-sealed? Do heat-sealed bags contain a filter vent? What size of heat-sealed bags were used?

    - Plastic bags containing poly bottles of cemented fines were heat-sealed

    - Pucks from compactor were heat-sealed (but the 2nd compaction at SEG would have unsealed them)

    - Heat-sealed bags do not have filter vent

28. Will the drums contain sealed containers greater than 4 liters in size? What type of containers and how are they sealed? - ***No***

Other

29. A 1/31/1992 report entitled "Final Report Waste Characterization of Wastes Generated from D&D Activity in Buildings 110 and 234 on the NFS Site" discusses the analysis of six sweepings samples. One of the samples contains arsenic, three contain barium, and four contain cadmium above the RCRA regulatory threshold. Any ideas as to the source of these metals? - ***No***

30. A 10/29/1992 report entitled "Oak Ridge National Laboratory/Nuclear Fuel Services, Inc. NFS Waste Parameter Verification Program" indicates that higher activity waste was collected in poly bottles and then passed through a 200 micron sieve. The fines <200 microns were cemented in poly bottles and packaged in their own drums separate from debris waste. Are the sweepings material described above what was cemented? - ***Yes***

31. This same 10/29/1992 report says that material that did not pass through the sieve was packaged in poly bottle and baled/compacted with other debris waste. Were the materials that did not pass through the sieve debris items, or did they include larger particle sweepings as well?

    - ***Sieving was done for a period of time, but they stopped doing it and cemented all of it.***

Data Limitations:

Information is based on memory of activities that occurred approximately 15 years ago.

Acceptable Knowledge Expert: Lisa Watson Lisa Watson Date: 6/9/08
Print / Sign

DIVIDER PAGE

Attachment 3 - Acceptable Knowledge Source Document Summary

Site(s): Oak Ridge National Laboratory	Source Document Tracking Number: I053
Waste Stream Number(s): ORNL Non-specific Library Files (Applicable only when site library is not in use)	
Acceptable Knowledge Documentation Type: ☑ TRU Waste Management Program Information ☑ Waste Stream-Specific Information ☑ Additional Information	Category: ☐ Correspondence ☐ Discrepancy Resolution ☑ Internal Procedure ☐ Miscellaneous ☐ Published Document or Internal Procedure ☐ Unpublished Documents
Title or Description of Source Document [a]: KAPL-TN Waste Profile for NFS Building 234 Soil	
Source Document Reference Information (author(s), document and revision number, date, publisher): Joseph W. Pugh, 44G-03-1050, NA, 09/11/2003, NFS	

AK # [b]	Source Doc. Page #[c]	AK Information Summary
PR2, PR3, PR4, PR6, PR7, WS2, WS3, WS4, WS5, WS7, WS8, WS9, WS11, WS12, S9, S16	All	This waste profile was developed for soil planned for shipment to Hanford as low-level waste. In addition to the actual profile, the "Waste Certification Sampling Plan for Transuranic Waste from Nuclear Fuel Services, Inc. Erwin, Tennessee" is attached. On the waste profile, NFS projects a total of 7160 cubic feet of soil to be disposed as low-level waste at Hanford. NFS projects the following radionuclides to be present in the soil waste: Pu-238, Pu-239, Pu-240, Pu-241, Am-241, U-232, U-233, U-234, U-235, U-238, Tc-99, Th-228, Th-232, Th-234 in concentrations of 0 to 10E-01 Ci/m3. The waste is assumed to be nonmixed and non-regulated based on analyses included in the attached "Waste Certification Sampling Plan for Transuranic Waste from Nuclear Fuel Services, Inc. Erwin, Tennessee". Waste is to be packaged in 55-gal steel drums, B-25 boxes, or 'High Integrity Containers (HIC), using sorbents to prevent moisture buildup in the containers. In the attached "Waste Certification Sampling Plan for Transuranic Waste from Nuclear Fuel Services, Inc. Erwin, Tennessee" (the Plan), NFS describes the sampling approach used for residual TRU materials (i.e., sweepings) from gloveboxes comprising the pellet production line (Area C) and the scrap dissolution and recovery lines (Areas J and K). The Plan provides a production history of Building 234, including the sources of the fuel materials processed at that building. Plutonium process capabilities at NFS include: •□Dissolution of Pu •□Co-precipitation of Pu and U •□Wet or dry blending of mixed oxide powders •□Pellet production and inspection •□Rod loading •□Rod welding and inspection •□Scrap dissolution •□Lab services A floorplan of Building 234 is included and 14 functional or operational 'areas' are described. This section also includes a discussion of the activities conducted, equipment used, and reagents used in each area. Process flow diagrams are provided for each production area in Building 234.

NTPC RECORDS ORIGINAL
DATE REC'D 12/18/13

Attachment 3 - Acceptable Knowledge Source Document Summary (continued)

Site(s): Oak Ridge National Laboratory		Source Document Tracking Number: I053
AK # [b]	Source Doc. Page #[c]	AK Information Summary
		The Plan goes on to describe sampling locations and procedures, quality assurance, sample custody, transport, and health/safety requirements. Analytical results for the soil samples are also provided and include: radionuclides, TCLP VOCs, TCLP semi-VOCs, TCLP pesticides and herbicides, PCBs, TCLP metals, releasable H2S, releasable HCN, and pH. In general, all organic and inorganic analytical results were 'less than detection".

Source Document Data Limitations (if any):

1. The waste profile is for soil and is expected to be low-level waste for disposal at Hanford. However, the attached "Waste Certification Sampling Plan for Transuranic Waste from Nuclear Fuel Services, Inc. Erwin, Tennessee" provides excellent information on process operations and history at Building 234. Analytical results provide documentation of radiological and chemical contamination in the soil samples.

Acceptable Knowlege Expert:

Trey Greenwood Date: 11/14/2013

Print /Sign

[a] Provide description for non-titled information (i.e., container paperwork, MSDS sheets, etc)
[b] Obtain from Acceptable Knowledge Documentation Checklist
[c] For microfilm or microfiche, identify box, tape, reel number and location.

I053

PR2, PR3, PR4, PR6, PR7, WS2, WS3, WS4, WS5, WS7, WS8, WS9, WS11, WS12, S9, S16

Nuclear Fuel Services, Inc.
1205 Banner Hill Road
Erwin, TN 37650
(423) 743-9141
www.nuclearfuelservices.com

Mr. Gary Cox
Fluor Hanford
Waste Management Division
P.O. Box 1000
Richlands, WA 99352

44G-03-1050
WST-20
JWP-03-009

Subject: KAPL-TN Waste Profile for NFS Building 234 Soil

Dear Mr. Cox:

Enclosed for your review and approval, please find the KAPL-TN Waste Profile for NFS Building 234 Soil to be generated at Nuclear Fuel Services, Inc. located in Erwin, Tennessee. This profile is estimated to cover approximately 150 cubic meters of soil planned for shipment to the Hanford Low-level Burial Grounds during fiscal year 2004.

Four attachments are included with the Profile including historical information, a map, a characterization plan with laboratory results, and a report used to assist with radionuclide concentration reporting. Should you require additional information, please feel free to contact us.

The technical contact for this waste profile is Heather Little at (423) 743-9141 or hnlittle@nuclearfuelservice.com. Please contact her with any questions or requests for additional information.

Sincerely,
NUCLEAR FUEL SERVICES, INC.

Joseph W. Pugh

Joseph W. Pugh
NFS Transportation & Waste Manager

JWP/mag

Cc: D. Delwiche – SNR
D. Battiste – KAPL
J. Cummings – KAPL

ORIGINAL

Fluor Hanford Waste Profile Sheet

Profile Sheet Number (assigned by FH):

General Information

1. *Generator company:* KAPL-TN
2. *Address:* 1205 Banner Hill Road, Erwin, TN 37650
3. *Generator facility:* Nuclear Fuel Services, Inc. (NFS)
4. *Contact:* Joseph W. Pugh, NFS Transportation & Waste Manager; John Cummings, KAPL Waste Contact
5. *Phone:* (423) 743-9141; (518) 395-4882
6. *Waste stream name:* Building 234 Soil
   ☒ *New Profile Sheet* ☐ *Revised Profile Sheet. Previous Profile Sheet Number.*
7. *Waste generating process description. Describe the process that generated the waste stream identified by this profile sheet. Attach process flow charts and other available information if helpful in explaining the generating process.* Soil will be generated through the excavation under a former plutonium-uranium mixed oxide (MOX) fuel process building in operation from 1965 to 1973. The process (fully described in Attachment 1) included dissolution of plutonium and uranium metals and oxides, co-precipitation of plutonium and uranium, wet or dry blending of MOX powders, pellet and rod fabrication, rod loading, and scrap recovery. All process equipment and glove boxes used in the MOX process were removed during the first decommissioning phase (1990 -1992). The majority of the soil will be excavated under and around the wet cell (see Attachment 2 for location), which was used for nitric acid dissolution and mixing of plutonium and depleted or low-enriched uranium. The building will be demolished prior to initiating this excavation.

   Approximately 2,310 cubic feet of soil was removed within the wet cell walls during the previous decommissioning project, and there are fourteen high integrity containers that total 403 cubic feet to be disposed under this profile. The current generating process is projected to produce an additional 4,850 cubic feet of soil and rock with Class C concentrations.

8. *Waste management services requested:*
   ☒ *Disposal* ☐ *Storage* ☐ *Treatment; describe:*
   ☐ *Other; describe:*
9. *Estimated annual volume (m^3):*150
10. *Estimated frequency of shipments:* Every 2-4 weeks during and after excavation

Radiological Characterization

11. *Radiological process knowledge. Describe the source(s) of the radioactive material in this waste stream (i.e., the radiological processes that introduced the radioactive material into the waste stream).*
    The MOX fuel fabrication process in Areas A, C, J, K and the wet cell used plutonium along with depleted and low-enriched uranium. Also, there was a U-233 purification process in Areas B, I, L and 67, which was decommissioned in 1983, but may contribute to the radioactive material in the excavated soil.
12. *Radiological characterization methods. Describe the analysis and characterization methods used to determine the radionuclide inventory of the waste stream. Check all that apply.*
    ☐ *Radionuclide material accountability. Describe the accounting methods used to help establish the radionuclide inventory:*
    ☒ *Radiochemical analysis. Describe type and frequency of sampling and analysis:* Alpha spectroscopy and liquid scintillation were used to characterize this waste. The frequency of sampling and analysis is described in the attached Wet Cell Soil Characterization (Attachment 3).
    ☒ *Nondestructive assay. Describe type and frequency of assay performed:* Our nondestructive assay (NDA) system with high purity germanium detectors will provide shipment and burial values for each waste container.
    ☒ *Field measurement instruments. Describe the type of instruments and how they are used to help establish the radionuclide inventory:* A portable InSitu Object Counting System (ISOCS) may be used as a screening tool for initial segregation of waste. This tool is not used for final classification of the waste prior to packaging and/or shipping.
    ☒ *Scaling factors. Explain how the scaling factors were derived and how they are used:* Scaling factors will be used in conjunction with our NDA system prior to shipping waste for disposal. They are derived from extensive analysis of the NFS Building 234 process and characterization data (Attachment 4). The NFS NDA department will measure Americium-241, Thorium-228, Uranium-235 and Uranium-238 via gamma assay of the waste packages. The remainder of the reportable radionuclides are calculated from these measured isotopes.

☐ *Computer models. Describe the computer model used and how it is used to establish the radionuclide inventory:*
☐ *Other. Describe method:*

If several methods are checked above, briefly describe how the methods are used together to establish the radiological inventory of the waste stream. For complex or highly variable waste streams, explain the strategy used to meet the acceptable knowledge requirements of HNF-EP-0063.

The NDA method will measure four radionuclides for shipment and burial of the waste containers, and the remainder will be calculated via scaling factors which are determined by the radiochemical analyses completed for waste characterization.

13. *Radiological classification (check all that apply):*
☒ *Low-level waste* ☐ *Transuranic waste*
☒ *Category 1* ☒ *Category 3* ☐ *Exceeds Category 3*
☒ *Contains accountable nuclear material* ☐ *Classified waste*

14. *External dose rate:*
☐ *> 100 mrem/hr at 30 cm* ☐ *>200 mrem/hr at contact*
☒ *< 100 mrem/hr at 30 cm* ☒ *<200 mrem/hr at contact*

15. *Fissionable material (per container):*
☒ *Less than 1 FGE* ☒ *1-15 FGE* ☐ *> 15 FGE; list maximum:*
☒ *Contains enriched uranium; list the ^{235}U percent enrichment:* 5.0% was the maximum U-235 enrichment used in the MOX fuel process.

16. *Reportable radionuclides. List the radionuclides that could be reportable in the waste stream. Tab from last cell if additional lines are needed.*
☐ *If the isotopes present vary greatly from container to container, check this box and do not list isotopes and concentrations below.*

Isotope	*Concentration (Ci/m3); range or exact*	*Isotope*	*Concentration (Ci/m3); Range or exact*
Pu-238	0 - 1.0E-02	Th-234	0 - 3.2E-04
Pu-239	0 - 1.2E-01		
Pu-240	0 - 4.0E-02		
Pu-241	0 - 2.0E-01		
Am-241	0 - 4.0E-02		
U-232	0 - 5.6E-03		
U-233	0 - 5.1E-01		
U-234	0 - 1.1E-01		
U-235	0 - 5.0E-03		
U-238	0 - 3.2E-04		
Tc-99	0 - 1.7E-02		
Th-228	0 - 5.6E-03		
Th-232	0 - 5.2E-04		

Physical/Chemical Characterization

17. *Physical/Chemical process knowledge. Describe the process knowledge information used for physical/chemical characterization of this waste stream:*
☐ *Material Safety Data Sheets. Attach MSDSs used to designate this waste stream (Hanford Site users can list Hanford MSDS numbers below in lieu of providing MSDSs).*
☐ *Mass balance from process inputs. Describe how process inputs are controlled and recorded:*
☒ *Historical process and analytical data. Describe:* Reviewed process history and analytical data and have found no F-listed or regulated material. The characterization plan with laboratory analyses is attached (Attachment 3).
☐ *Inert debris characterized by inventory control. Check this box when the waste stream consists largely of inert debris items that are characterized by inventory control procedures and recorded on inventory sheets. Briefly list or describe inventory procedures:*
☐ *Other. Describe:*

☐ *Physical/chemical characterization varies. Check this box when the characterization strategy varies from container to container. Describe below the strategy used to meet the acceptable knowledge requirements of HNF-EP-0063.*

18. *Physical/chemical analysis. Describe the sampling and analysis performed to characterize this waste stream:*
☐ *No analysis performed*
☐ *Field screening performed. Describe the frequency and type of field screening performed:*
☒ *Laboratory analysis performed.*
Describe the sample source and sampling frequency and methods: The sample source and frequency are described in the Wet Cell Soil Characterization Workplan (Attachment 3).
List the analytical methods used. Attach representative analytical results. TCLP for metals, volatile organics, and semi-volatile organics, PCBs, reactive cyanide and sulfide analyses, and a solid corrosives (pH) analysis were conducted under the Wet Cell Soil Characterization Workplan. Laboratory analyses are attached with the characterization plan.

19. *Regulatory status. Check all boxes below that describe the regulatory status of the waste stream:*
☐ *Federally regulated (RCRA) hazardous waste (40 CFR 261). List all RCRA U, P, F, K or D waste codes that could apply to the waste stream; place waste codes that do not apply to all containers in parentheses:*
☐ *Washington State dangerous waste (WAC 173-303), excluding W001. List all Washington waste codes that apply; place waste codes that do not apply to all containers in parentheses:*
☐ *Washington State dangerous PCB waste (Waste code W001 of WAC 173-303): Describe PCB source and concentration:*
☐ *TSCA regulated PCB (40 CFR 761). Describe category of PCB (i.e. PCB waste, PCB bulk product waste, PCB remediation waste, PCB analytical waste, etc). Describe PCB source and concentration:*
☐ *Waste generated from cleanup activities conducted under CERCLA*
☒ *Waste is not regulated under any of the above regulations.*

20. *Federal land disposal restrictions. Check all boxes that apply:*
☒ *Waste stream is not subject to federal land disposal restrictions*
☐ *Waste stream requires treatment to meet land disposal restrictions of 40 CFR Part 268.*
If checked, provide the following information:
☐ *Wastewater* ☐ *Nonwastewater* ☐ *Hazardous debris*
☐ *Waste contains Underlying Hazardous Constituents (applicable UHCs must be included in Item 25)*
☐ *Waste stream meets some of the applicable land disposal restrictions of 40 CFR 268. Check this box if the waste has been treated to meet some federal land disposal restrictions or if it meets some federal land disposal restrictions as generated. If checked, describe the treatment performed and analytical data to support LDR determination:*
☐ *Waste stream meets all applicable land disposal restrictions of 40 CFR 268. Check this box if the waste has been treated to meet all federal land disposal restrictions or if it meets the land disposal restrictions as generated. If checked, describe the treatment performed and analytical data to support LDR determination:*

21. *Waste characteristics. Check any of the boxes for regulated characteristics (WAC 173-303-090) that apply to the waste stream:*
☐ *Flash point < 38°C* ☐ *Flash point 38°C - <60°C* ☐ *Flash point 60°C – 93.3°C*
☐ *Ignitable solid* ☐ *Oxidizer*
☐ *pH 2 or less* ☐ *pH 12.5 or greater*
☐ *Liquid that corrodes steel at a rate greater than or equal to 0.25 inches/year*
☐ *Reactive cyanide* ☐ *Reactive sulfide* ☐ *Water Reactive*
☐ *Explosive, unstable or pyrophoric* ☐ *Generates toxic gases, vapors or fumes*

22. *Physical state:*
☐ *Liquid* ☐ *Sludge* ☐ *Debris* ☒ Homogeneous solid
☐ *Other; describe:*

23. *Liquid form. If the waste stream contains liquid, check all that apply:*
☐ *Containerized liquid* ☐ *Sorbed liquid* ☐ *Stabilized liquid*

24. *Other contents: Check any of the following that are components of the waste stream:*
☐ *Animal carcasses* ☐ *Infectious waste* ☐ *Vegetation*
☐ *Chelating agents* ☐ *Organic liquids* ☐ *Asbestos waste*

25. *Waste composition. Describe the gross composition of the waste stream and all hazardous constituents that contribute to any waste codes or LDR treatment standards (see instructions). Tab from last cell if additional lines are needed.*

☐ *If the chemical composition of the waste varies greatly from container to container, check this box and do not list chemical components and concentrations below.*

CAS Number	*Chemical constituent or waste component*	*Weight percent (range or exact)*
	Soil	90
	Rock	10

Packaging

26. *Packaging used. Check the applicable boxes.*

- ☒ *Drum; describe size(s) and type:* 55-gallon steel drums
- ☒ *Metal box; describe size(s) and type:* B-25; 1.85 x 1.19 x 1.32 meters
- ☐ *Wood box; describe size(s) and type:*
- ☒ *High integrity container; describe size(s) and type:*
- ☐ *Other container; describe:* HDPE cylindrical HIC; 0.84 dia. x 1.44 ht. meters
- ☐ *Bulk waste*
- ☐ Vented; describe type of venting:
- ☐ Shielded; describe type of shielding:
- ☒ Sorbents; describe type and amount used: A Hanford approved sorbent will be used to prevent condensation/moisture build-up in each container.
- ☐ Radiologically stabilized in concrete or other stabilization agent; describe type and amount of material used and provide data to demonstrate waste meets stabilization criteria:

27. *Maximum container size:* 1.85 x 1.19 x 1.32 meters ; 2.55 cubic meters

28. *Maximum container gross weight:* 10,950 pounds (4,967 kgs)

29. *Describe any liners/protective coatings used to ensure that the container is compatible with the waste:*
Polystyrene foam liner inside HICs

Additional Information

30. *Comments:*

31. *Exception Request to HNF-EP-0063 criteria: Complete if needed*

a) Identify specific HNF-EP-0063 requirement for which an exception is desired:

b) Provide reason an exception is needed:

c) Describe any proposed alternative methods to meet the general intent of the requirement:

32. Attachments. List any attachments provided with this profile sheet:

33. Certification

I certify that, to the best of my knowledge, the information provided on this form and the attached documentation is a full and accurate description of the waste stream.

Name: Joseph W. Pugh *Date:* 9/11/03

Signature: Joseph W. Pugh

Waste Certification Sampling Plan
for
Transuranic Waste
from
Nuclear Fuel Services, Inc.
Erwin, Tennessee

Prepared by

EcoTek, Inc.
1219 Banner Hill Road
Erwin, Tennessee 37650

for

Nuclear Fuel Services, Inc.

June 7, 1991

RECORD OF REVISION

PAGE/SECTION	DESCRIPTION OF AND REASON FOR CHANGE
18 / 3.1	Changed last sentence in first paragraph to read "...will be segregated, collected, labeled, and retained to be evaluated...".
24 / 4.1	Changed third sentence to read "...collect up to 300 grams of sample to permit ORNL...".
28 / 6.1	Added "type of analyses requested" to chain-of-custody information.

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1.0 INTRODUCTION

This sampling plan was prepared for Nuclear Fuel Services, Inc. (NFS), of Erwin, Tennessee by its Contractor, EcoTek, Inc., Erwin, Tennessee to evaluate transuranic (TRU) materials in Building 234 at the Erwin facility. The plan is part of the Certification Plan required by Oak Ridge National Laboratory's (ORNL) Waste Acceptance Criteria (WAC) for TRU Waste from NFS (MMES 1991). TRU waste will be generated at NFS from the decommissioning of inactive plutonium production facilities in Building 234.

1.1 Purpose

The purpose of this plan is to provide methodology for sampling the plutonium-uranium mixed oxide (MOX) production line as required by ORNL WAC and DOE Order 5820.2A.

1.2 Scope

This plan addresses sampling design and procedures only; waste analyses, including adherence to analytical protocols for selected test methods, shall be the responsibility of ORNL. Materials to be sampled include:

(1) residual TRU waste materials (i.e., "sweepings") from gloveboxes comprising the pellet production line (Area "C"), and

(2) residual TRU waste materials (i.e., "sweepings") from gloveboxes comprising the scrap dissolution and recovery lines (Areas "J" and "K").

Area A was used for material loading and batch weighing of plutonium metal, plutonium oxide, or plutonium nitrate. Area B is a cell with limited entry via a totally enclosed tunnel suit. Activities in the cell were limited to nitric acid dissolution, master mix tank for the addition of depleted or low enriched uranium and miscellaneous storage vessels. The final product form of Area B is the initial product form for introduction into process group C1 (see section 2.3.1). In accordance with DOE 5820.2A Section II.3.(4).(a), sampling will not be performed in Areas A and B due to the increased potential for personnel radiation exposures.

1.3 Objectives

The objectives of this plan are as follows:

(1) evaluate and document the plutonium-uranium mixed oxide production process in Areas "C", "J", and "K" of Building 234 at NFS,

(2) develop a sampling design based on criteria of sample representativeness and sample availability, and

(3) provide a method for collecting samples in conformance with the ALARA principle and accepted quality assurance protocol.

1.4 Technical Approach

The technical approach for meeting the objectives of this sampling plan is outlined below.

(1) Evaluate the mixed oxide fuel production and scrap dissolution processes in Areas "C", "J", and "K" of Building 234 at NFS using the following sources of information:

- process and engineering knowledge,
- interviews and walkovers with facility personnel, and
- material balance flowsheets.

(2) Identify points where supplemental materials (e.g., binder) were introduced in the process.

(3) Identify points where non-process materials (e.g., equipment lubricants) may have mixed with residual TRU waste.

(4) Group process units (i.e., stations) according to:

- the type of process (e.g., pellet production; scrap recovery),
- points of process additions during production, and
- points where additions may have occurred in post-production years.

(5) Identify potential sampling locations within each process group.

(6) Select sampling points based on the following considerations:

- radiation hazard to personnel,
- availability of TRU waste sweepings, and
- accessibility of TRU waste sweepings.

(7) Develop a method for retrieving a representative sample from selected sampling points.

2.0 PROCESS EVALUATION

This process evaluation includes a synopsis of Building 234 production history, process capabilities, and process descriptions. Narratives are supplemented with process flow diagrams, station listings, and material balance summaries.

2.1 Production History

Building 234 plutonium production facilities were constructed in 1964 and 1965. Between 1965 and 1972, approximately 812 kilograms (kgs) of plutonium were processed. The largest job order covered the manufacture of 2,000 PuO_2-UO_2 (mixed oxide) fuel rods for the Southwest Experimental Fast Oxide Reactor (SEFOR). The SEFOR project comprised 92% (746 kgs) of plutonium introduced to the NFS-Erwin facility. Building 234 production facilities have been inactive since 1973. A list of job orders which utilized plutonium is provided below.

(1) Dupont-SROO/AEC (1965-1966); MOX Fuel Rods; 16 kg Pu

(2) GE-SEFOR/AEC (1967-1971); MOX Fuel Rods and Scrap Dissolution; 746 kg Pu

(3) Halden Fuel/NFS-RFD (1972); MOX Fuel Rods; 3 kg Pu

(4) Big Rock Point/Consumer Power/NFS/RFD (1972-1973); MOX Fuel Assemblies; 47 kg Pu

2.2 Process Capabilities

Plutonium process capabilities at NFS are listed below[1].

(1) Dissolution of plutonium metal and oxide[1]

(2) Co-precipitation of plutonium and uranium

(3) Wet or dry blending of mixed oxide powders

(4) Pellet production and inspection

(5) Rod loading

(6) Rod welding and inspection[2]

(7) Scrap dissolution (added during late 1960's)

(8) Laboratory services[1]

2.3 Process Description

Building 234 contains approximately 8,220 square feet of floor space. Facilities and equipment were located in the areas designated below. Equipment layout and area designations are shown in Figure 2-1.

- Area "A" - Batch Weigh and Scrap Prep
- Area "B" - Wet Cell
- Area "C" - Pellet Production
- Area "D" - Rod Assembly and Fabrication
- Area "E" - Laboratory
- Area "F" - Office

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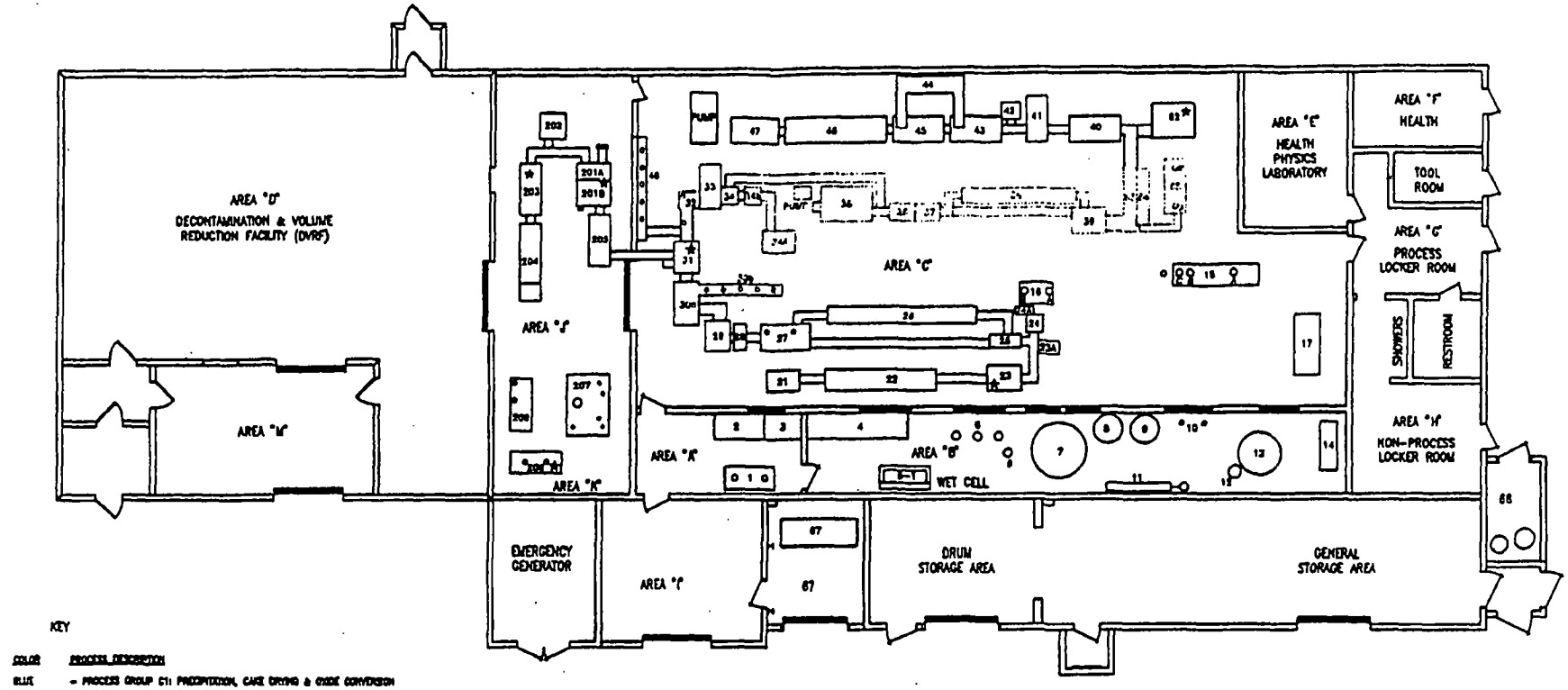
[1] Process not included in the scope of this plan.

[2] This process activity was conducted in Area "D" of Building 234. Area "D" was decommissioned in 1983 and now houses the decontamination and volume reduction facility (DVRF).



KEY

COLOR	PROCESS DESCRIPTION
BLUE	– PROCESS GROUP C1: PRECIPITATION, CAKE DRYING & OXIDE CONVERSION
ORANGE	– PROCESS GROUP C2: OXIDE BLENDING, PRESSING & SINTERING
MAGENTA	– PROCESS GROUP C3: PELLET GRINDING, INSPECTION & TUBE LOADING
BROWN	– PROCESS GROUP J1: OXIDE SCRAP RECOVERY LINE
CYAN	– PROCESS GROUP J2: LEACHABLE MATERIALS RECOVERY LINE
GREEN	– PROCESS GROUP K1: Pu NITRATE STORAGE & LOAD-OUT
★	– SAMPLE LOCATION

REV.	DATE	DESCRIPTION	BY	CHK'D	APPV.
B	5-16-91	ADDED SAMPLE LOCATION TO BOX 208	SJT		
A	4-11-91	ORIGINAL DRAWING	SJT	RAM	RAH

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ECOTEK, INC.
NFS PLUTONIUM PROJECT
ERWIN, TENNESSEE

NFS BUILDING 234 EQUIPMENT LAYOUT

SCALE	DRAWN BY	DESIGNED BY	DATE	JOB NO.	DRAWING NO.	SHEET NO.	REVISION
NTS	STEVEN J. TYLER		3-22-91	NFS-PLUT	NFNA009	1 OF 1	A

- Area "G" - Change Room
- Area "H" - Change Room
- Area "I" - Material Unloading
- Area "J" - Scrap Prep and Recovery
- Area "K" - Scrap Dissolution/Pu Nitrate Storage and Load-Out
- Area "M" - Air Lock
- Area 67 - Condensate Station
- Area 68 - Condensate Station

Primary production facilities in Building 234 were located in Areas "A", "B", "C", "D", "J", and "K". Equipment in the remaining areas is contained in glove boxes or in a single, limited-entry cell (Area "B" - Wet Cell). Descriptions of processes in Areas "C", "J", and "K" are provided in the following sections.

2.3.1 Area "C" - Pellet Production

For the purpose of this sampling plan, process units (i.e., stations) in Area "C" are grouped as follows:

- Process Group C1: Precipitation, Cake Drying, and Oxide Conversion
- Process Group C2: Oxide Blending, Pressing, and Sintering
- Process Group C3: Pellet Grinding, Inspection, and Tube Loading

2.3.1.1 Process Group C1: Precipitation, Cake Drying, and Oxide Conversion

Batch Co-Precipitation (Stations 15 and 17). During SROO and SEFOR production, solutions containing a mixture of plutonium nitrate and uranyl nitrate hexahydrate (UNH) were transferred from the master mix tank in Area "B" (the Wet Cell) to precipitation units in Area "C". Plutonium and uranium were precipitated as ammonium diuranate (ADU) and plutonium hydroxide. Ammonium hydroxide was used as a precipitant.

During the Big Rock Point/Consumer Power/NFS/RFD project (i.e., BRP/CON), the feed solution from Area "B" contained plutonium nitrate only; UNH was not a component. Plutonium was precipitated as "oxalate" using oxalic acid, nitric acid and hydrogen peroxide. A materials balance summary is provided below:

INPUT	PROCESS ADDITIONS	OUTPUT
Pu Nitrate-UNH	Ammonium Hydroxide	ADU Slurry
Solution (SEFOR)	Oxalic Acid	Oxalate Slurry
Pu Nitrate Solution (BRP/CON)	Nitric Acid	

Batch Filtration. Supernate was decanted from the ADU or oxalate slurry and the remaining precipitate was filtered to remove liquids. Filtered precipitate (wet cake) was transferred to the furnace loading box (Station 21); filtrate was transferred to glass storage columns at Station 16. A materials balance summary is provided below:

INPUT	PROCESS ADDITIONS	OUTPUT
ADU Slurry	None Identified	Wet Cake
Oxalate Slurry		Supernate
		Filtrate

Filtrate Storage (Station 16). Supernate/filtrate from the ADU or oxalate slurry was polished and stored in two glass columns at Station 16. Station 16 was also used for circulating and sampling filtrate. Filtrate from the column box was transferred to Area "B" and evaporated producing ammonium nitrate concentrate and ammonium hydroxide condensate. Concentrate from the evaporator tank was packaged for disposal. During SEFOR production, approximately 7 percent (16 liters/day) of ammonium hydroxide condensate was used to wash ADU cake; remaining condensate was packaged for disposal. A materials balance summary is provided below:

INPUT	PROCESS ADDITIONS	OUTPUT
Supernate and Filtrate	Condensate	Liquid Waste

Cake Drying (Station 22). Wet ADU or oxalate cake was dried in a furnace at temperatures to 600 °F. Stations 21 and 23 were used for loading and unloading the furnace. Dry cake was transferred to storage and tray loading boxes (Stations 24 and 25) in preparation for oxide conversion (i.e, calcining). A materials balance summary is provided below:

INPUT	PROCESS ADDITIONS	OUTPUT
Wet ADU or Oxalate Cake	None Identified	Dry ADU or Oxalate Cake

Oxide Reduction (Station 26). Dry ADU or oxalate cake was loaded in the oxide conversion furnace and heated to 1200 °F in a nitrogen and hydrogen gas atmosphere. Trays containing the resultant oxides were removed from the furnace and unloaded at Station 27. Empty trays were passed through a return box to the loading station. Oxide was transferred to the blending station (Station 29) via a dumb waiter (Station 28). A materials balance summary is provided below:

INPUT	PROCESS ADDITIONS	OUTPUT
Dry ADU or Oxalate Cake	Carbon Dioxide	Mixed Oxide (PuO_2-UO_2)
	Hydrogen Gas	Plutonium Oxide (PuO_2)
	Nitrogen Gas	Off-Gas (to scrubber)

Table 2-1
PROCESS GROUP C1 STATION LISTING

Station	Station #	Volume (in cubic)
Precipitation Boxes	15 and 17	334 ft^3 and 212 ft^3
Filtrate Column Box	16	91 ft^3
Furnace Loading Box	21	102 ft^3
Drying Furnace	22	90 ft^3
Furnace Unloading Box	23	175 ft^3
Storage Box and Tray Load	24 and 25	58 ft^3 and 38 ft^3
Oxide Conversion Furnace	26	141 ft^3
Tray Unload/Return Box	27	134 ft^3
Dumb Waiter	28	50 ft^3

2.3.1.2 Process Group C2: Oxide Blending, Pressing, and Sintering

Oxide Sub-Blending (Station 29). Oxide solids (MOX or PuO_2) from the conversion furnace were passed through a twin shell (v-shaped) blender at Station 29. One sub-blend was performed per day; each sub-blend was comprised of 16 daily ADU batches during SEFOR production. Total weight of mixed oxide per sub-blend was 23.4 kgs (4 kgs PuO_2). A materials balance summary is provided below:

INPUT	PROCESS ADDITIONS	OUTPUT
Oxide Solids (MOX or PuO_2)	None Identified	Blended Oxide (MOX or PuO_2 Sub-Blends)

Sub-Blend Loading and Storage (Stations 30A, 30B). Sub-blended oxide was ball-milled, screened, and weighed at Station 30A. After weighing, oxide was packaged in two liter bottles and loaded in one of five storage rockets at Station 30B. Five sub-blends, approximately 115 kgs of mixed oxide, were stored in 58 bottles (2 kgs MOX/bottle) at Station 30B during SEFOR production. A materials balance summary is provided below:

INPUT	PROCESS ADDITIONS	OUTPUT
Sub-blended Oxide (MOX or PuO_2)	None Identified	Sub-blended Oxide (MOX or PuO_2)

Oxide Cross-Blending. One cross-blend was performed per five days during SEFOR production; each cross-blend was comprised of five sub-blends. Total weight of mixed oxide per cross-blend was 115 kgs (20 kgs PuO_2). A materials balance summary is provided below:

INPUT	PROCESS ADDITIONS	OUTPUT
Sub-blended MOX	None Identified	Cross-blended MOX

During the BRP/CON project, plutonium oxide cross-blending was followed by the addition of uranium oxide (solids). The mixture of plutonium oxide and uranium oxide was sub-blended and cross-blended. A materials balance summary of the BRP/CON blending process is provided below:

INPUT	PROCESS ADDITIONS	OUTPUT
Sub-blended PuO_2	Uranium Oxide	Cross-blended MOX

Granulation (Station 31). Blended oxide was granulated using an oscillating device and stainless steel screen. Binder was added to cross-blends during granulation. Granulated oxide was packaged in two liter bottles and loaded in storage rockets at Station 48 prior to pelleting. A materials balance summary is provided below:

INPUT	PROCESS ADDITIONS	OUTPUT
Blended Oxide	Binder	Oxide Granules
		Oxide Scrap

Four types of binders were identified from material balance flowsheets:

TRADE NAME	CAS RN	CHEMICAL NAME
Sterotex	555-43-1	Hydrogenated Vegetable Oil
Carbowax	25322-68-3	Polyethylene Glycol (PEG)
PVA	009-002-895	Polyvinyl Alcohol (>95%)
Oxylene (M-6)	75-09-2	Methylene Chloride (81%)
	76-13-1	Trichlorotrifluoroethane (19%)

Use of the above binders in the production of plutonium fuel does not cause NFS TRU waste to be defined and regulated as hazardous waste (i.e., mixed waste) per 40 CFR Parts 260 to 270 for the following reasons:

(1) none of the binder constituents are listed as toxicity characteristic (TC) constituents in 40 CFR § 261.24, and

(2) binder constituents (i.e., methylene chloride and trichlorotrifluoroethane) are not listed hazardous wastes as they were used as a reactant or ingredient in the formulation of a commercial product.

The State of Tennessee Department of Conservation has concurred with this finding.

Pelleting (Stations 33, 34A, and 35). Granulated oxide was transferred through Station 32 to one of three pellet presses (Denison Multipresses) located at Stations 33, 34C, and 35. The presses were used in successive years, each replacing its predecessor following equipment failure. Pellet size, weight, and density varied depending on the manufacturing process. A materials balance summary is provided below:

INPUT	PROCESS ADDITIONS	OUTPUT
Oxide Granules	None Identified	Oxide Pellets
		Oxide Scrap

Pellet Sintering (Station 38). Pellets were measured for density and placed in molybdenum trays ("boats") at Stations 36 and 37. Trays were loaded in the sintering furnace and heated to a temperature of approximately 2900°F in an atmosphere of hydrogen gas, nitrogen gas, carbon dioxide, and argon. Cycle time was four to six hours. Trays were unloaded at Station 39; sintered pellets were passed to transfer, storage, and off-gas stations (Stations 63, 64, and 65). A materials balance summary is provided below:

INPUT	PROCESS ADDITIONS	OUTPUT
Oxide Pellets	Hydrogen Gas	Sintered Pellets
	Argon	Off-Gas (to scrubber)
	Carbon Dioxide	
	Nitrogen Gas	

Table 2-2 PROCESS GROUP C2 STATION LISTING		
Station	**Station #**	**Volume (in situ)**
Twin Shell Blender	29	232 ft^3
Oxide Loading Station	30A	141 ft^3
Storage Rockets	30B and 48	139 ft^3
Oxide Slugging Press	31	100 ft^3
Oxide Transfer Box	32	359 ft^3
Pellet Presses	33, 34A, and 35	263 ft^3, 115 ft^3, and 438 ft^3
Inspection and Tray Return	34A and 34B	11 ft^3 and 131 ft^3
Pellet Inspection and Tray Loading	36 and 37	83 ft^3
Sintering Furnace	38	153 ft^3
Unloading Box and Tray Return	39	83 ft^3

2.3.1.3 Process Group C3: Pellet Grinding, Inspection, and Tube Loading

Pellet Grinding (Stations 41 and 62). Sintered pellets were machined to finished size using grinders located at Stations 41 and 62. Station 62 contains a center-less grinder that replaced the belt grinder at Station 41. Recycled water from the pellet wash was used as coolant; lubricants were used in machinery but not on pellets. Grinding loss per pellet was approximately one to three percent; additional loss occurred from damage to pellets. Machined pellets were transferred to a drying and inspection station (Station 40). Grinder sludge and damaged pellets were sent to scrap recovery. A materials balance summary is provided below:

INPUT	PROCESS ADDITIONS	OUTPUT
Sintered Pellets	Cooling Water (recycled DI water from ultrasonic wash)	Machined Pellets
		Damaged Pellets
		Grinder Sludge

Pellet Washing and Drying (Station 43). Machined pellets were cleaned in an ultrasonic wash using distilled water. Washing was followed by air drying with heat lamps. Washed pellets were transferred to Stations 44 and 45 for inspection, sampling, and storage. A materials balance summary is provided below:

INPUT	PROCESS ADDITIONS	OUTPUT
Machined Pellets	DI Water	Washed Pellets

Pellet Inspection, Sampling and Storage (Stations 44 and 45). All pellets were visually inspected for cleanliness, chips, cracks, pits, etc. and diametrically gauged. A percentage of pellets were sampled for destructive analyses and measured for density and dimensional attributes. Reject pellets and sample residues were sent to scrap recovery. Pellets meeting quality control standards were transferred to Station 46 for stacking and weighing. A materials balance summary is provided below:

INPUT	PROCESS ADDITIONS	OUTPUT
Washed Pellets	None Identified	Finished Pellets
		Reject Pellets
		Sample Residue

Pellet Stacking, Weighing, and Loading (Stations 46 and 47). Finished pellets were stacked in assembly troughs, weighed, and loaded in tubes. Loaded tubes were capped and sent to rod assembly and fabrication stations in Area "D".

INPUT	PROCESS ADDITIONS	OUTPUT
Finished Pellets	None Identified	Loaded Tubes

Table 2-3 PROCESS GROUP C3 STATION LISTING		
Station	Station #	Volume (in situ)
Pellet Transfer and Storage	63 and 64	212 ft^3
Pellet Out-Gas Station	65	115 ft^3
Pellet Grinder	62	177 ft^3
Pellet Inspection	40	83 ft^3
Pellet Cut-off Station	41	144 ft^3
Density Check Station	42	29 ft^3
Pellet Wash Station	43	116 ft^3
Pellet Storage	44 and 45	62 ft^3 and 104 ft^3
Pellet Stacking and Rod Loading	46 and 47	188 ft^3 and 16 ft^3

2.3.2 Areas "J and "K" - Scrap Dissolution and Recovery

Recoverable scrap from the plutonium-uranium mixed oxide production line was unloaded from drums and sorted at Station 202 in Area "J". Oxide (solid) scrap and "leachable materials" (e.g., bottles, plastics, etc.) were segregated and processed separately. Solutions (either from leaching or dissolution) were transferred to the evaporator in Area "B". Impure plutonium nitrate solution from Area "B" was returned to Area "K" where it was stored, sampled, and loaded in 11 liter cylinders. For the purpose of this sampling plan, process units in Areas "J" and "K" have been grouped as follows:

- Process Group J1: Oxide Scrap Recovery Line
- Process Group J2: Leachable Materials Recovery Line
- Process Group K1: Pu Nitrate Storage and Load-Out

2.3.2.1 Process Group J1: Oxide Scrap Recovery Line

Oxide Preparation (Stations 201A and 201B). Oxide scrap from Station 202 was ball-milled to reduce particle size and transferred to loading and storage stations. Blended oxide scrap from Station 31 (granulation) in Area "C" could also be passed to Station 201 through a transfer chute.

INPUT	PROCESS ADDITIONS	OUTPUT
PuO_2 Solids	None Identified	Milled PuO_2-UO_2 Solid Scrap
PuO_2-UO_2 (Green) Solid Scrap		
Damaged/Rejected Pellets (Sintered)		
Grinder Sludge (Dry)		
Sample Residues (Dry)		

Oxide Loading and Storage (Stations 205 and 206). Ball-milled scrap from the oxide prep station was received at Station 205. Oxide scrap was packaged in two liter bottles and loaded in storage rockets.

INPUT	PROCESS ADDITIONS	OUTPUT
PuO_2-UO_2 Solid Scrap	None Identified	PuO_2-UO_2 Solid Scrap

Oxide Dissolution (Station 207). Oxide scrap (solid) was transferred from storage rockets in Area "J" to the dissolution station in Area "K". Oxide scrap was heated with nitric acid in one of two dissolvers in the 207 glovebox. Nitrate solutions were pumped from the dissolver to the evaporator in Area "B".

INPUT	PROCESS ADDITIONS	OUTPUT
PuO_2-UO_2 Solid Scrap	Nitric Acid	Impure Pu-U Nitrate Solution

2.3.2.2 Process Group J2: Leachable Materials Recovery Line

Scrap Preparation (Station 203). Non-combustible items containing recoverable material (e.g., bottles, plastics, screens, gloves, etc.) were unloaded from drums at Station 202 and passed to the scrap prep station. Scrap prep consisted of manual cutting and shredding. Shredded materials were transferred to the leaching station.

INPUT	PROCESS ADDITIONS	OUTPUT
Non-combustible Recoverable Materials (e.g., bottles, plastics, screens, gloves, etc.)	None Identified	Shredded Non-combustible Recoverable Materials

Leaching (Station 204). Shredded materials were leached in a nitric acid bath to recover plutonium. Nitric acid feed was pumped from storage cylinders located in a small glovebox beneath the prep station. Leachate was pumped to the evaporator in Area "B". Solids were bagged-out and packaged for disposal.

INPUT	PROCESS ADDITIONS	OUTPUT
Shredded Non-combustible Recoverable Materials	Nitric Acid	Leachate
		Solid Waste

NOTE: An acrylic fixative (Oakite Clear Coat) has been applied to the interior of Stations 202, 203, and 204. The Material Safety Data Sheet (MSDS) for Oakite does not identify any product ingredients listed as TC constituents.

2.3.2.3 Process Group K1: Pu Nitrate Storage and Load-Out

Pu Nitrate Storage (Station 208). Plutonium nitrate solutions were transferred from the evaporator in Area "B" to twin, 24 liter glass storage columns in Area "K". Solutions were circulated, sampled, and pumped to the adjacent load-out station.

INPUT	PROCESS ADDITIONS	OUTPUT
Pu-U Nitrate	None Identified	Pu-U Nitrate

Pu Nitrate Load-Out (Station 209). Plutonium nitrate solutions from Station 208 were received in two, 10 liter glass columns at the load-out station. Eleven liter, plastic cylinders were placed in a holding rack and filled with solutions from the columns. Loaded cylinders were removed from Station 209 and packaged for shipment.

INPUT	PROCESS ADDITIONS	OUTPUT
Pu-U Nitrate	None Identified	Pu-U Nitrate

Table 2-4
PROCESS GROUPS J1, J2, and K1 STATION LISTING

Station	Station #	Volume (in situ)
Oxide Prep Station	201A and 201B	206 ft^3
Oxide Loading Station	205	128 ft^3
Oxide Storage Rockets	206	62 ft^3
Oxide Dissolution Station	207	370 ft^3
Scrap Prep Station	203	177 ft^3
Leaching Station	204	193 ft^3
Pu Nitrate Storage	208	202 ft^3
Pu Nitrate Load-Out	209	212 ft^3

3.0 SAMPLING APPROACH

Information obtained from the process evaluation was used to develop a sampling approach that satisfies the purpose and objectives of this plan. The sampling approach is described in the sections that follow.

3.1 Sampling Design

Production units were grouped according to the type of process, points of process additions during production, and points where additions may have occurred in post-production years.

The rationale for groupings was as follows:

PROCESS GROUP	PROCESS OPERATIONS	RATIONALE
C1	Precip / Drying / Reduction	Initial Feed From Area "B"
C2	Blending / Pressing / Sintering	Process Addition: Binder
C3	Grinding / Washing / Loading	Potential Post-Production Addition: Equipment Lubricant
J1	Oxide Scrap Recovery	Discrete Process: Oxide Scrap Recovery
J2	Leachable Mat Recovery	Discrete Process: Non-combustible Scrap Recovery
K1	Pu Nitrate Storage and Load-out	Discrete Process: Pu Nitrate Handling

The purpose of grouping production units was to simplify the sampling process. Items such as lubricating and/or hydraulic fluids, lead shielding, etc. that could be encountered during decommissioning will be segregated, collected, labeled, and retained to be evaluated on a case-by-case basis.

This approach will minimize collecting and analyzing samples from each station and/or collecting aliquots from each station and compositing these for analyses.

3.2 Sampling Locations

Potential sampling locations within each process group were identified from interviews and walkovers with facility personnel. Sampling points were selected from potential locations based on radiological safety considerations, and the availability and accessibility of residual waste sweepings. Sampling points are listed below and are identified on the equipment layout drawing (Fig 2-1), and process flow diagrams (Figures 2-2 through 2-5).

PROCESS GROUP	PROCESS OPERATIONS	STATION
C1	Precip / Drying / Reduction	Station 23
C2	Blending / Pressing / Sintering	Station 31
C3	Grinding / Washing / Loading	Station 62
J1	Oxide Scrap Recovery	Station 201B
J2	Leachable Mat Recovery	Station 203
K1	Pu Nitrate Storage and Loadout	Station 208

Figure 2-2. Process Group C1 Flow Diagram

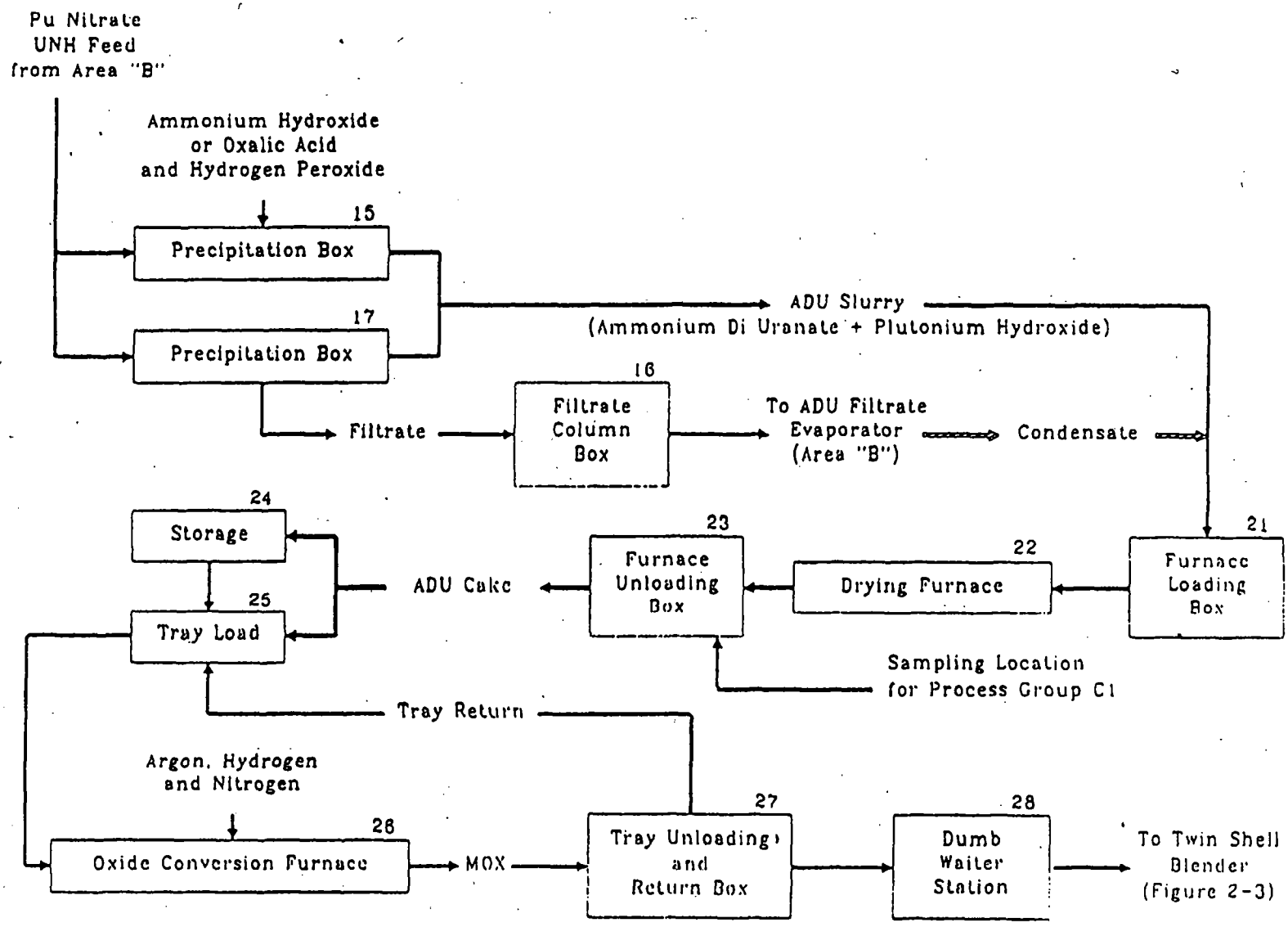


Figure 2-3. Process Group C2 Flow Diagram

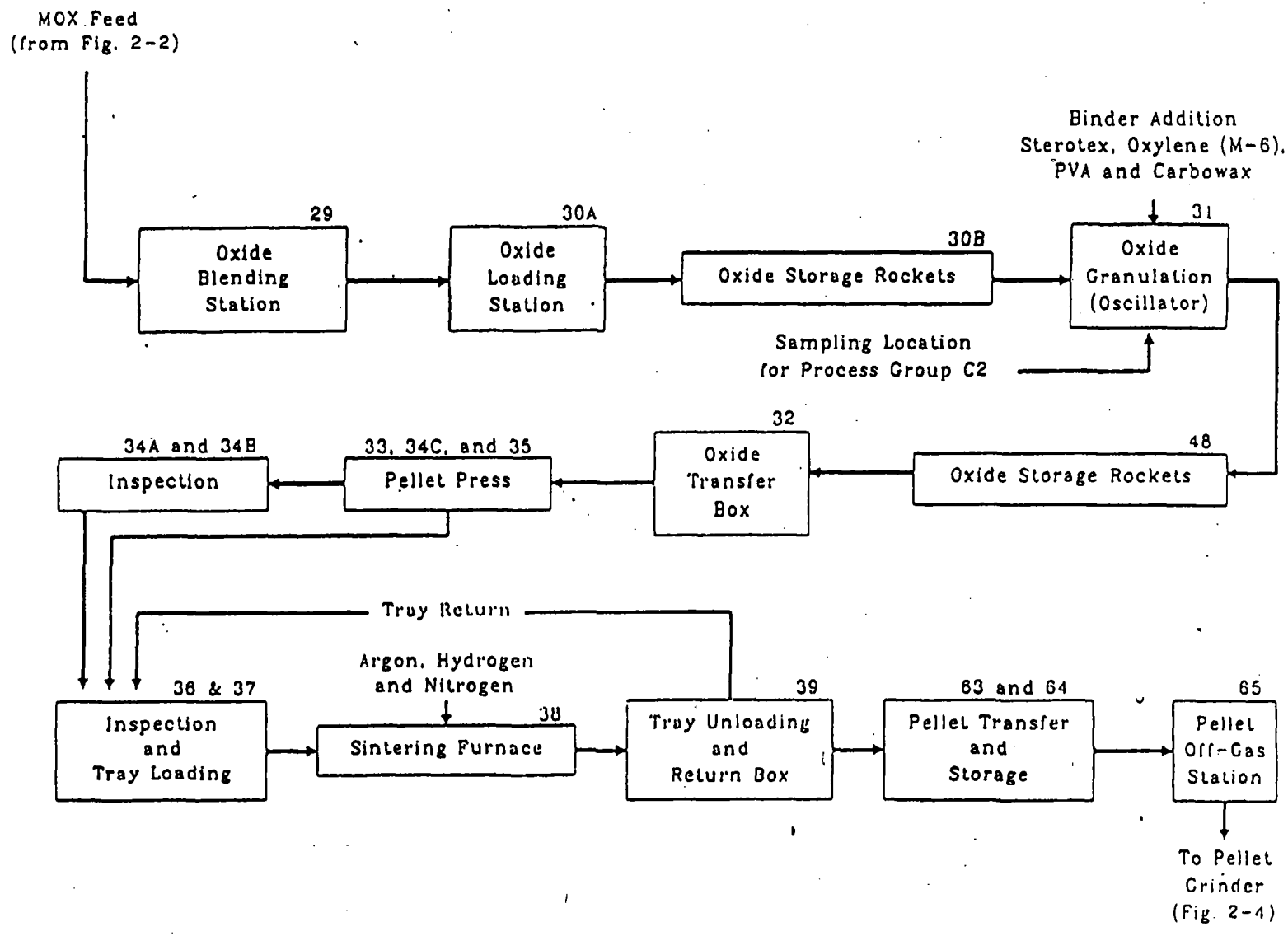


Figure 2-4. Process Group C3 Flow Diagram

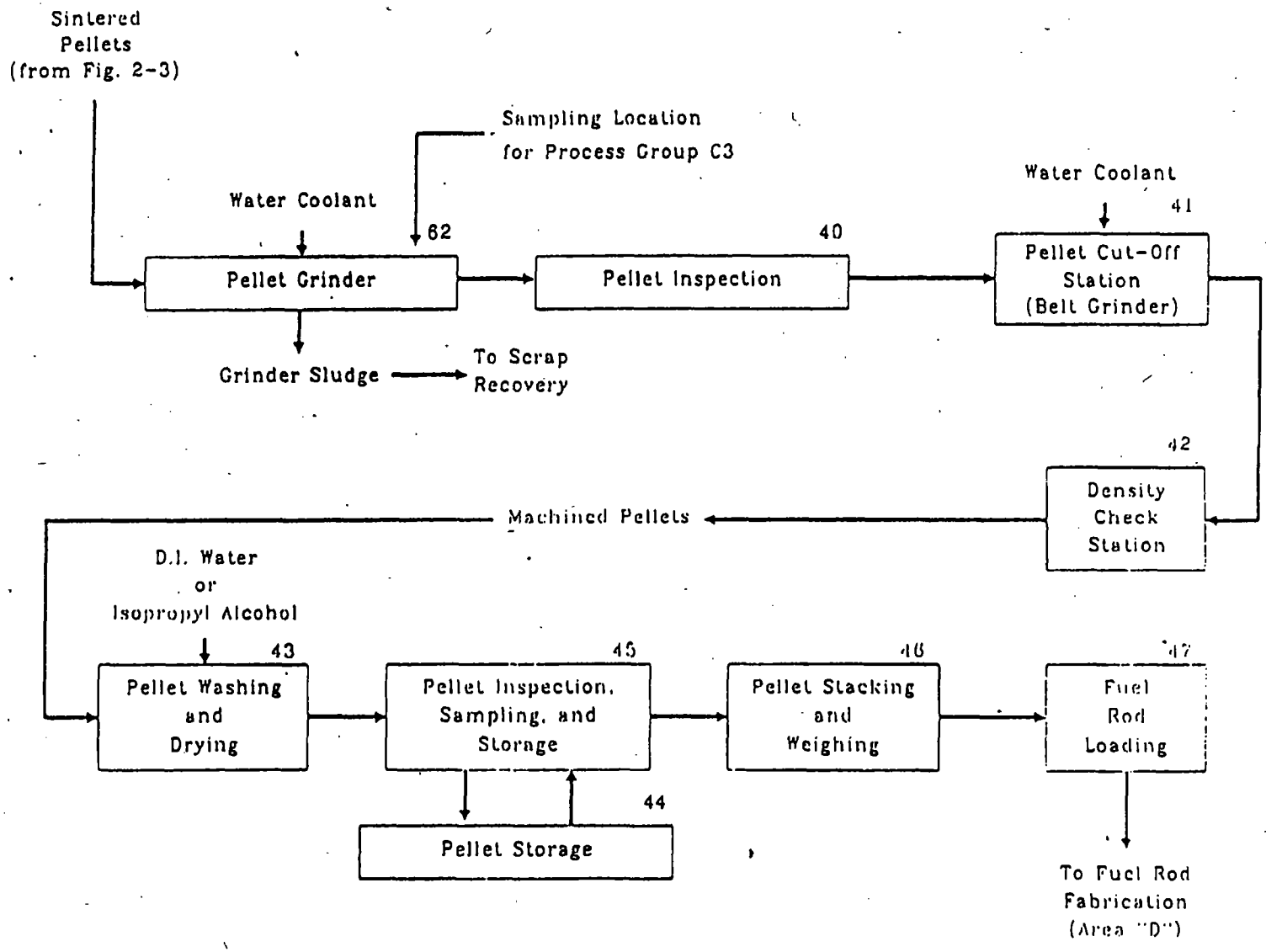


Figure 2-5. Process Groups J1 and J2 Flow Diagram

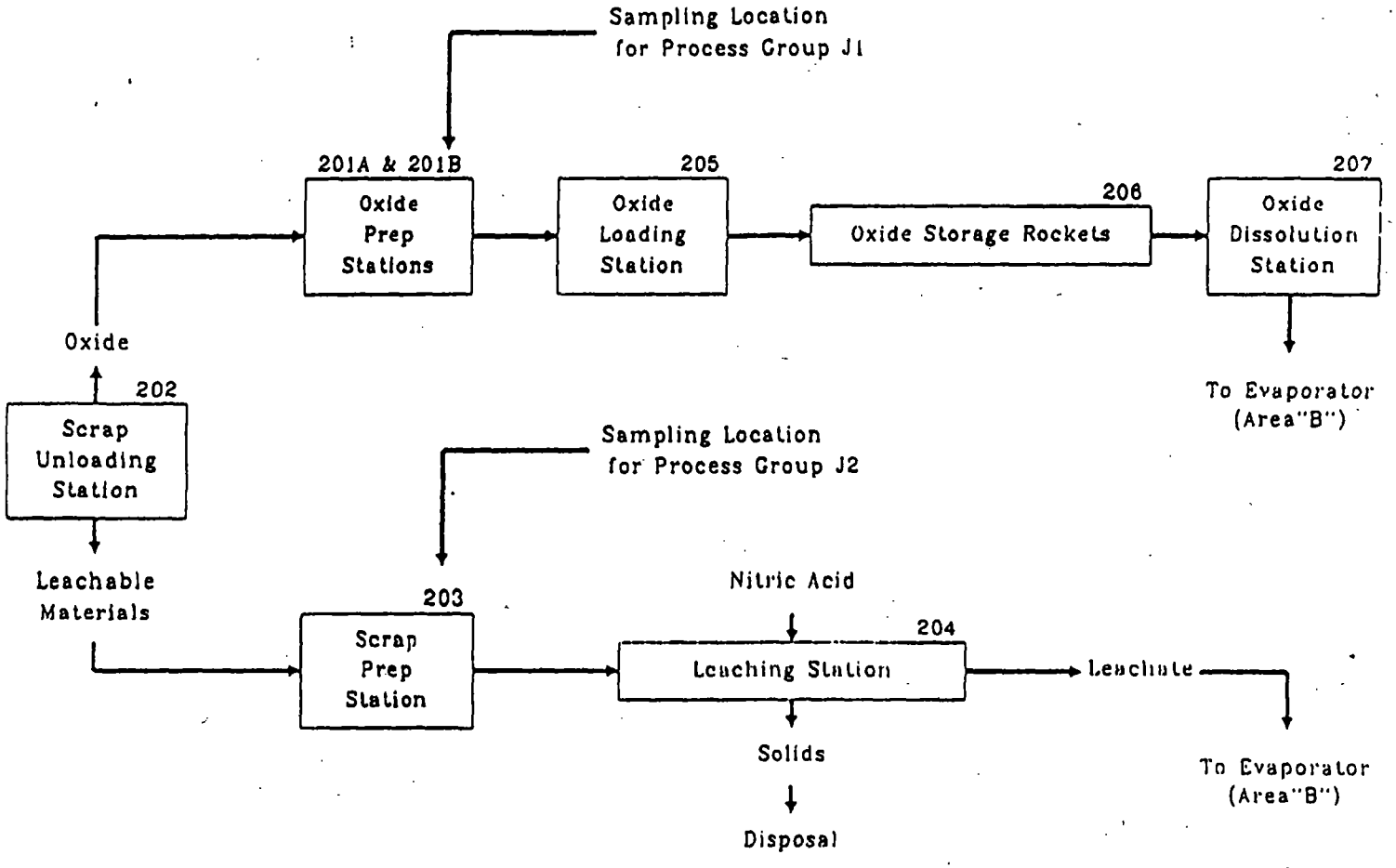
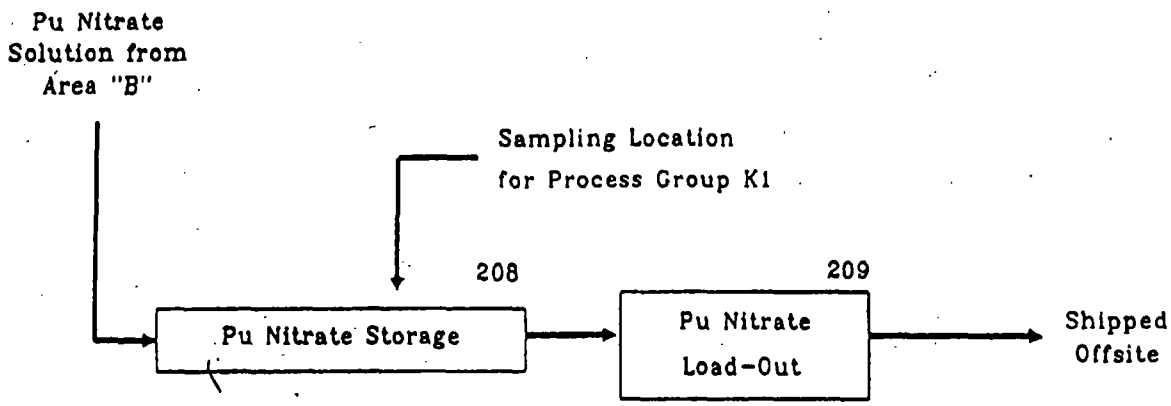


Figure 2-6 Process Group K1 Flow Diagram



3.3 Type of Samples

A listing of sample types (i.e., composite and/or grab) is provided below.

PROCESS GROUP	SAMPLING LOCATION	SAMPLE TYPE
C1	Station 27	Composite Sweepings from the Tray Unloading Box
C2	Station 31	Composite Sweepings from Beneath the Oscillator
C3	Station 62	Composite Sweepings from the Grinder Box
J1	Station 201B	Composite Sweepings from Stations 201A, 201B, and 205
J2	Station 203	Composite Sweepings from Stations 202, 203, and 204
K1	Station 208	Composite Sweepings from Beneath Pu Nitrate Storage Columns

Samples from Process Groups J1 and J2 will be taken from sweepings previously collected when gloveboxes comprising these groups were cleaned in 1989. Sweepings were placed in plastic bottles, labeled, and stored inside Stations 201B and 203.

3.4 Number of Samples

A total of six samples will be collected, one from each designated sampling location.

4.0 SAMPLING PROCEDURES

4.1 Sample Method

Each sample will have a minimum weight of 150 grams (g). Approximately 20 g of aliquot from each sample is required for isotopic analyses and 130 g for ORNL's chemical analyses. If additional sample material is readily available, collect up to 300 grams of sample to permit ORNL to split these samples for analysis. Record the amount of samples collected in the Remarks section of the Chain-of-Custody Record.

4.2 Sample Containers

Samples will be packaged in commercially purchased glassware cleaned to EPA specifications. Containers will be fitted with teflon-lined caps; caps may be sealed with tape.

4.3 Sample Labels

Sample containers will be labeled with the following information:

- project name and number,
- sample identification number,
- sampling location (area designation and station number),
- sampling date and time,
- list of analyses to be performed,
- grab or composite designation, and
- name of individual collecting the sample.

The individual collecting the sample will initial the label by his name.

4.4 Equipment Decontamination

Sampling equipment shall not be retrieved and reused between samples; therefore, the potential for cross-contaminating samples is not a concern.

4.5 Sample Preservation

NFS and ORNL have determined that sample integrity will be maintained if samples are stored and shipped at ambient temperatures. This determination was based on shipping distance, research data, and the fact that waste materials have been stored at ambient temperatures since 1973.

5.0 QUALITY ASSURANCE

5.1 Documentation

A bound logbook will be maintained to provide a record of sample collection and to document adherence to sampling protocol. The logbook should list sampling personnel and include a sample log, sampling locations, methods, pertinent observations, and a brief description of any difficulties encountered. The completed logbook will be placed in the project file.

All sample identification labels, field records, and chain-of custody records shall be recorded in waterproof, non-erasable ink. Transcription errors will be corrected by crossing a single line through the error and entering the correct information. Corrections will be initialed and dated.

5.2 Control Samples

ORNL shall provide NFS with a sample of analyte-free media (i.e., distilled, deionized water) to serve as a trip blank. The trip blank will not be opened and will be returned to ORNL with samples collected from the plutonium process facility. The trip blank shall be analyzed by ORNL for the same parameters as samples from the production line. The purpose of the trip blank is to document potential contamination (particularly from volatile organics) attributable to shipping and handling procedures.. Due to the nature of materials to be sampled, field duplicate samples will not be provided for analyses.

Matrix spikes, method blanks, surrogates, calibration standards, and other control samples should be used to document the analytical process per the requirements of applicable test methods.

5.3 Sample Holding Times

It shall be the responsibility of ORNL to ensure that all samples are analyzed within maximum holding times specified by the applicable test method.

6.0 SAMPLE CUSTODY AND TRANSPORT

6.1 Chain-of-Custody Procedure

A chain-of-custody record shall be maintained to document the possession of samples from the time they are obtained until relinquished to ORNL personnel. The record will consist of the following information transcribed on a form such as the example in Figure 6-1:

- project name and number,
- signature of sampler(s),
- sample identification number,
- sampling date and time,
- grab or composite designation,

EcoTek LSI
EcoTek Laboratory Services Incorporated

Chain-Of-Custody Record

SDG No.

Project Manager

Project Name/Location

Samplers

(Print) (Signature)

Comments

Sample ID	Collection Date	Collection Time	Comp or Grab	Sample Type	Sample Location	No Cont	Analyses Requested	Remarks

Relinquished By	Date	Received By	Relinquished By	Date	Received By
Print		Print	Print		Print
Signature	Time	Signature	Signature	Time	Signature
Relinquished By	Date	Received By	Relinquished By	Date	Received By
Print		Print	Print		Print
Signature	Time	Signature	Signature	Time	Signature

Rev 0 (7/00)

- sample type,
- sampling location (area designation and station number),
- number of containers per sample,
- remarks or comments,
- signature of the Plutonium Decommissioning Supervisor, and
- signatures of the person relinquishing the sample (beginning with the sampler), the person receiving the sample, and the date and time the transfer occurred.
- type of analyses requested

A chain-of-custody form (the original) shall accompany each shipping container transmitted to ORNL. The form may be placed in a plastic bag inside the shipping container or secured to the outside of the container. A copy of the form should be retained by the Plutonium Project Manager. The original chain-of-custody record shall be retained by ORNL with a signed copy returned to the Plutonium Project Manager after samples are received by ORNL. The chain-of-custody will be maintained in the project file.

Custody seals will be placed on shipping containers. Custody seals will be signed and dated.

6.2 Packaging/Shipping Procedure

Packaging shall be in accordance with NFS-DCM-PR-03, Packaging for Processing Shipment to Processing, Storage or Burial in approved shipping containers. Additionally, NFS shall supply ORNL with completed Form UCN-2471, NUCLEAR MATERIAL AUTHORIZATION for approval prior to actual shipment.

7.0 HEALTH AND SAFETY

Sampling shall be conducted in accordance with NFS-DCM-PR-04, "Health Physics Procedure for Plutonium Decommissioning" and all other applicable NFS Health and Safety procedures and requirements.

8.0 REFERENCES

Martin Marietta Energy Systems, Inc. January 21, 1991. Oak Ridge National Laboratory Waste Acceptance Criteria for Transuranic Waste from Nuclear Fuel Services, Inc.

Nuclear Fuel Services, Inc. December 21, 1964. Process Flowsheet for NFS PuO_2-UO_2 Oxide Production. Drawing No. 234A-282B.

Nuclear Fuel Services, Inc. February 17, 1966. Process Flowsheet for Mfg of PuO_2-UO_2 Pellets - SEFOR. Drawing No. 234A-275B.

Nuclear Fuel Services, Inc. May 25, 1966. Material Balance Flowsheet for SEFOR "Pellet" Manufacture. Drawing No. 234A-323C; Sheet No. 1 of 2.

Nuclear Fuel Services, Inc. May 25, 1966. Material Balance Flowsheet for SEFOR "Pellet" Manufacture. Drawing No. 234A-323C; Sheet No. 2 of 2.

Nuclear Fuel Services, Inc. September 28, 1966. Depleted UO_2 Pellet Production Flow Sheet - SEFOR. Drawing No. 234A-281B.

Nuclear Fuel Services, Inc. April 23, 1970. Flowsheet - Plutonium Oxides. Drawing No. 234A-277B.

Nuclear Fuel Services, Inc. June 22, 1971. Material Flow for PuO_2 Production from $Pu(NO_3)_4$. Drawing No. 234A-325B.

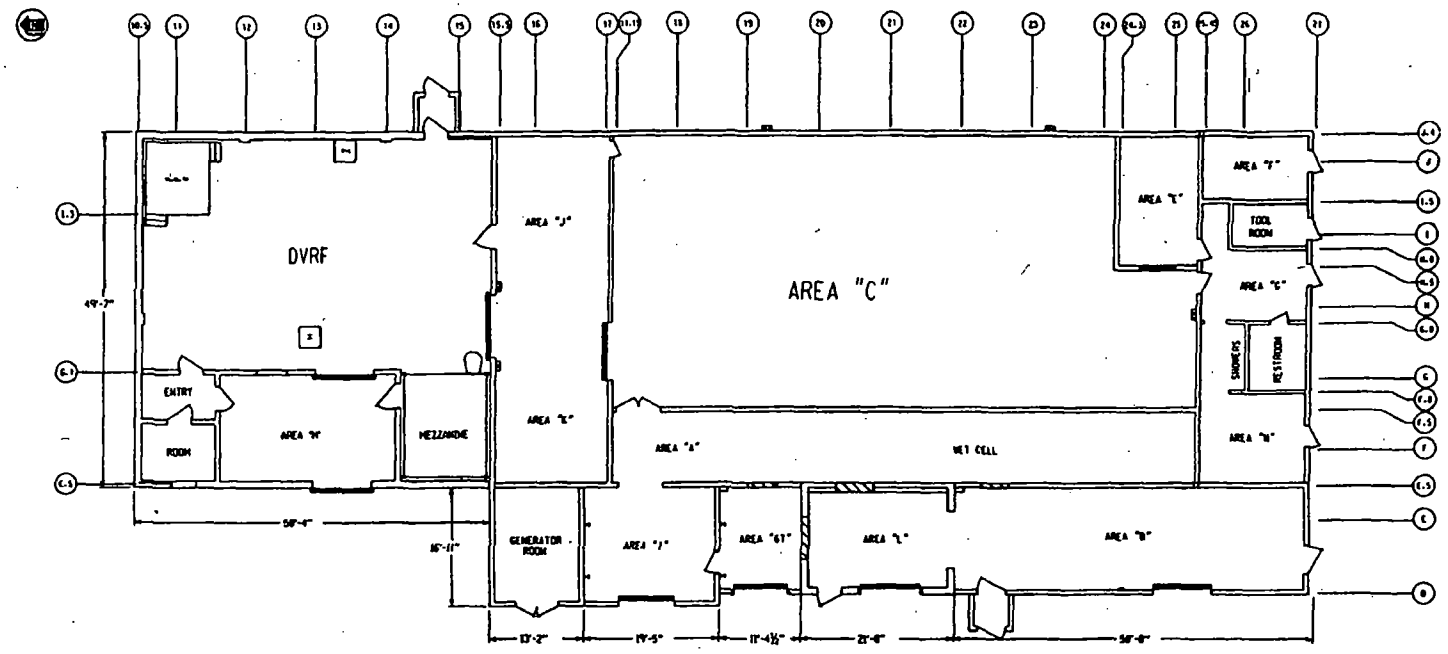
Nuclear Fuel Services, Inc. June 30, 1972. Detail Material Balance Flowsheet for Reclamation and Storage of Recoverable Scrap from Mixed Oxide Production Line; Drawing No. 234A-339D.

Nuclear Fuel Services, Inc. July 5, 1972. Material Balance Flowsheet for Mixed Oxide Production Line; Drawing No. 234A-338D; Sheet No. 1 of 3.

Nuclear Fuel Services, Inc. July 6, 1972. Material Balance Flowsheet for Mixed Oxide Production Line; Drawing No. 234A-338D; Sheet No. 2 of 3.

Nuclear Fuel Services, Inc. July 7, 1972. Material Balance Flowsheet for Mixed Oxide Production Line; Drawing No. 234A-338D; Sheet No. 3 of 3.

U. S. Environmental Protection Agency. 1986. Test Methods for Evaluating Solid Wastes, Physical/Chemical Methods. Office of Solid Waste and Emergency Response, Washington, D. C., SW-846, Third Edition.



FLOOR PLAN
AT ELEV.- 100 FT.

LEGEND

- COLUMN LINE
- ROLL-UP DOOR
- ENCLOSED OPENING
- CIRCULAR COLUMN
- REPAIRED OPENING
- DS - DOWNSPOUT
- LINTEL
- ENCLOSED OR OCCUPIED OPENING
- GLOVEBOX OPENING WITH PLEXIGLAS ENCLOSURE
- WINDOW

BY	DATE	REVISION	LET
		ORIGINAL ISSUE	—

NUCLEAR FUEL SERVICES, INC.

BUILDING 234
OVERALL FLOOR PLAN

DRAWING NO. 234-A0012-D

GPC-03-013
DCM-03-018
44T-03-0730

WET CELL SOIL CHARACTERIZATION

Background Information

Decommissioning of Building 234 will include excavation of soil beneath the building. Characterization of soil beneath Building 234, with the exception of the wet cell, was conducted in October 1998. Additional sampling is required to characterize soil beneath the wet cell. The primary purpose of characterization of the wet cell soil is to better estimate waste volumes and waste classifications for planning packaging and disposal of the soil.

Scope of Work

Objectives

- Define the extent of radiological contamination in soil beneath the wet cell.
- Identify and quantify nonradiological contaminants in wet cell soil.
- Provide radiological and nonradiological data required for the waste acceptance process at the U.S. DOE Hanford Site for Class C Waste.
- Accomplish the work in a safe and environmentally acceptable manner in accordance with NFS and regulatory requirements.

Strategy and Approach

Sampling is planned for December of 2001. Surface soil sampling will be performed during installation of the wet cell floor decking. Subsurface sampling will be conducted during and/or after installation of the floor decking. Sampling will be conducted in accordance with NFS-DC-103, "Soil, Sediment, and Waste Sampling, Sample Custody, and Shipping Procedure" and SWI-01-090, "Wet Cell Soil Sampling". Approximate soil sampling locations are shown on Figure 1. Approximately 36 (16 surface and 16 subsurface) grab soil samples will be collected from 16 locations. Surface sample locations were established using a systematic approach. One sample will be collected every 40 ft^2. Subsurface samples will collected from approximately 8 judgmental locations.

Surface and subsurface samples will be collected using a core sampler. Surface samples will be collected from 0 – 6 inches at 16 locations. Subsurface samples will be collected from 6 inches to auger refusal in 3-foot intervals. If it is impractical to sample a location due to some obstruction or an additional sample is needed, an alternative location will be chosen as close to the original location as possible.

GPC-03-013
DCM-03-018
44T-03-0730

Scope of Analysis

Soil samples will be analyzed for constituents required for the waste acceptance process at the U.S. DOE Hanford Site for Class C Waste. Soil samples will be analyzed by alpha spectroscopy for uranium and plutonium isotopics and Am-241, liquid scintillation for Pu-241and Tc-99. Nonradiological analyses to be performed include TCLP metals, TCLP organics, reactive cyanide, reactive sulfide, PCBs, pH, and percent moisture.

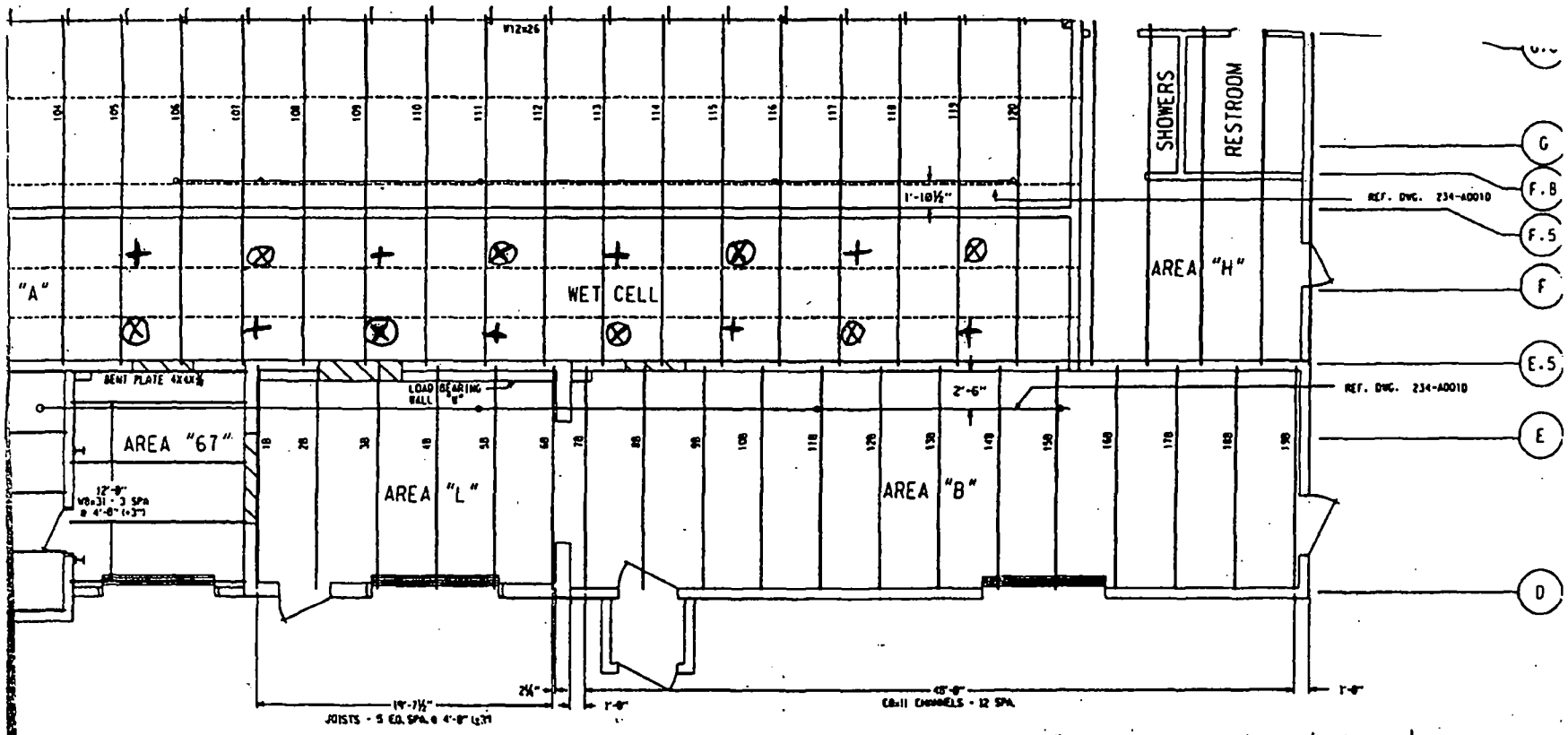
Approvals

Senior Project Manager

Waste Transportation Specialist

3/17/03
Environmental Safety Manager

Figure



⊗ Approximate Surface/Subsurface Sample Location

\+ Approximate Surface Sample Location

ROOF PLAN

		ADDED DIMENSIONS FOR ROOF BRACING IN AREA "B" AND "C"	B
MDK DB	01-13-00	ADDED ALL ROOF FRAMING	A
MDK DB	9-3-99	ORIGINAL ISSUE	—
BY	DATE	REVISION	LET

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TOLERANCE UNLESS SPECIFIED
FRACTIONAL ± 1/64"
ANGULAR ± 1/2°
DECIMAL
XX ± .01
XXX ± .001

NFS

NUCLEA

REVIEWED BY T.E. Blount
PROPOSED COMPLETION DATE:
DRAFTER
PROPOSED APPROVALS
REQ.

DRAFTER MD KEEVER
AS-BUILT APPROV
REQ.
DWG

Sample ID	Collection Date	Americium-241	Error	MDC	Plutonium-238	Error	MDC	Plutonium-239/240	Error	MDC	Plutonium-241	Error	MDC	Technetium-99	Error	MDC
234267	12/14/01	6.1E+03	2.2E+03	5.8E+02	1.1E+03	6.6E+02	5.0E+02	5.9E+03	2.2E+03	8.2E+02 J,U	3.4E+04	5.0E+04	8.1E+04	4.6E+00	1.5E+00	1.9E+00
234268	12/14/01	1.1E+04	3.8E+03	6.6E+02	2.7E+03	1.1E+03	1.5E+02	3.4E+04	1.0E+04	1.5E+02	7.1E+04	6.3E+04	6.1E+04	7.3E+00	1.8E+00	1.8E+00
234269	12/17/01 J	4.8E+04	1.4E+04	4.4E+02 J	8.8E+03	2.9E+03	5.8E+02	2.3E+05	6.7E+04	1.5E+02	4.3E+05	1.1E+05	6.6E+04	6.3E+03	1.1E+03	2.0E+00
234270	12/18/01	2.1E+04	6.7E+03	4.6E+02 J	1.9E+03	8.3E+02	1.4E+02	5.2E+04	1.5E+04	3.9E+02	9.7E+04	6.3E+04	6.7E+04	7.8E+00	1.9E+00	1.8E+00
234271	12/18/01	1.6E+04	5.3E+03	6.4E+02	1.8E+03	8.6E+02	5.1E+02	3.8E+04	1.1E+04	1.5E+02 J,U	6.1E+04	6.9E+04	6.7E+04	1.2E+01	2.5E+00	1.8E+00
234272	12/20/01	1.0E+05	3.0E+04	4.2E+01	1.1E+04	3.4E+03	5.8E+01	3.4E+05	9.8E+04	4.6E+01	5.3E+05	1.1E+05	6.0E+03	1.8E+03	3.1E+02	1.8E+00
234273	12/20/01	2.3E+05	6.7E+04	1.5E+01 J	2.6E+04	7.5E+03	4.2E+01	7.8E+05	2.3E+05	6.9E+01	1.2E+06	4.6E+05	5.3E+03	2.8E+03	5.0E+02	1.8E+00
234274	01/02/02 J	1.7E+05	4.8E+04	4.8E+01	2.3E+04	6.8E+03	8.3E+01	7.5E+05	2.2E+05	1.1E+02	1.4E+06	5.4E+05	5.2E+03	8.2E+03	1.5E+03	1.8E+00
234275	01/02/02	2.6E+05	7.5E+04	8.0E+01 J	3.1E+04	9.2E+03	4.7E+01	9.4E+05	2.7E+05	9.0E+01	1.4E+06	5.3E+05	6.6E+03	4.2E+03	7.5E+02	1.8E+00
234276	01/02/02	1.2E+05	3.5E+04	4.8E+01 J	1.5E+04	4.4E+03	4.3E+01	4.4E+05	1.3E+05	1.6E+01	6.7E+05	2.6E+05	7.8E+03	2.0E+03	3.6E+02	1.8E+00
234277	01/02/02	3.3E+05	9.7E+04	7.1E+01	4.5E+04	1.3E+04	5.5E+01	1.4E+06	3.9E+05	1.6E+01	1.8E+06	7.0E+05	6.6E+03	4.4E+03	7.8E+02	1.8E+00
234278	01/14/02	3.2E+05	9.3E+04	8.1E+01	2.9E+04	8.3E+03	5.0E+01	9.0E+05	2.6E+05	5.8E+01	1.2E+06	4.5E+05	4.5E+03	8.9E-01	4.7E-01	6.9E-01
234279	01/14/02	1.70E+05	5.10E+04	4.60E+01	1.9E+04	5.6E+03	4.8E+01	5.9E+05	1.7E+05	4.8E+01	8.7E+05	3.4E+05	4.8E+03 U	5.8E-01	4.4E-01	6.9E-01

Notes:
All samples were analyzed by O'Brien & Gere Laboratories, Inc. in Syracuse, NY.
U=result below MDC
J=estimated value

Sample ID	Collection Date	Uranium-233/234		Error	MDC		Uranium-235/236	Error	MDC		Uranium-238	Error	MDC		Thorium-228	Error	MDC		Thorium-230	Error	MDC		Thorium-232	Error	MDC	
234267	12/14/2001		3.8E+01	1.2E+01	6.1E-01		1.0E+00	6.5E-01	5.1E-01		1.5E+00	7.5E-01	4.1E-01	J	4.7E+00	1.9E+00	3.8E-01		4.9E+00	1.8E+00	7.3E-01	J	2.4E+00	1.0E+00	3.8E-01	
234268	12/14/2001		1.7E+01	5.5E+00	1.7E-01		6.9E-01	5.0E-01	2.1E-01		2.3E+00	1.0E+00	5.7E-01		4.6E+00	2.0E+00	1.5E-01		7.2E+00	2.5E+00	4.1E-01		4.0E+00	1.5E+00	1.5E-01	
234269	12/17/2001		3.8E+01	1.1E+01	1.5E-01	J,U	6.3E-01	5.7E-01	7.6E-01		3.9E+00	1.5E+00	4.2-01		4.1E+00	1.8E+00	1.2E-01	J	8.6E+00	2.8E+00	4.8E-01		3.1E+00	1.2E+00	1.5E-01	
234270	12/18/2001		5.2E+01	1.6E+01	4.5E-01		1.4E+00	7.8E-01	2.0E-01		6.0E+00	2.1E+00	1.7E-01		2.7E+00	1.7E+00	3.8E-01	J	8.0E+00	2.7E+00	1.4E-01		2.8E+00	1.1E+00	1.4E-01	
234271	12/18/2001		4.9E+01	1.5E+01	1.6E-01		1.2E+00	7.0E-01	2.0E-01		4.9E+00	1.8E+00	1.6E-01		5.3E+00	1.7E+00	6.8E-01		7.6E+00	2.6E+00	1.4E-01		4.4E+00	1.6E+00	3.8E-01	
234272	12/20/2001	J	6.4E+03	1.9E+03	4.6E+01	J	1.3E+03	4.1E+02	6.5E+01		9.3E+01	5.3E+01	3.6E+01		1.3E+03	4.2E+02	4.4E+01		3.6E+02	1.4E+02	5.7E+01	R	1.1E+02	6.0E+01	4.4E+01	
234273	12/20/2001	J	2.8E+02	1.2E+02	1.5E+01	J	9.1E+01	5.7E+01	1.9E+01	U	2.8E+01	3.5E+01	5.2E+01		1.4E+03	4.3E+02	5.2E+01		4.0E+02	1.5E+02	1.3E+01	R	1.6E+02	7.4E+01	1.3E+01	
234274	1/2/2002	J	2.4E+02	1.0E+02	1.4E+01	J	7.9E+01	5.1E+01	1.8E+01		4.3E+01	3.3E+01	1.4E+01		2.8E+03	8.5E+02	7.4E+01		7.8E+02	2.6E+02	1.3E+01	R	2.0E+02	8.6E+01	3.6E+01	
234275	1/2/2002	J	3.7E+02	1.4E+02	4.0E+01	J	9.5E+01	6.1E+01	5.0E+01		1.0E+02	5.7E+01	1.5E+01		1.1E+03	3.4E+02	4.3E+01		3.8E+02	1.4E+02	1.2E+01	R	9.6E+01	5.2E+01	3.4E+01	
234276	1/2/2002	J	3.5E+02	1.4E+02	1.5E+01	J	1.0E+02	6.0E+01	1.8E+01		3.8E+01	3.1E+01	1.5E+01		2.7E+03	8.1E+02	5.3E+01		5.7E+02	2.0E+02	1.3E+01	R	1.1E+02	5.8E+01	1.3E+01	
234277	1/2/2002	J	1.4E+04	4.2E+03	4.8E+01	J	2.5E+03	8.0E+02	2.2E+01		1.6E+02	8.1E+01	4.8E+01		2.8E+03	8.4E+02	4.8E+01		5.2E+02	1.8E+02	1.2E+01	R	1.3E+02	6.2E+01	1.2E+01	
234278	1/14/2002	J	3.90E+02	1.40E+02	1.40E+01	J	7.60E+01	4.90E+01	1.70E+01		1.1E+02	5.9E+01	1.4E+01		2.5E+02	9.5E+01	3.6E+01	R	4.2E+02	1.5E+02	1.3E+01		2.2E+02	9.3E+01	1.3E+01	
234279	1/14/2002	J	4.30E+02	1.60E+02	3.90E+01	J	9.80E+01	6.10E+01	4.80E+01	J	1.60E+01	1.90E+01	1.40E+01		2.4E+02	9.7E+01	4.6E+01	R	4.6E+02	1.7E+02	4.6E+01		2.6E+02	1.1E+02	4.6E+01	

Notes:
All samples were analyzed by O'Brien & Gere Laboratories, Inc. in Syracuse, NY.
U=result below MDC
J=estimated value
R= unusable

Wet Cell Surface Soil
Analytical Results for TCLP Volatiles (mg/L)

Sample ID	Collection Date	Vinyl Chloride		1,1-Dichloroethene		Chlorobenzene		1,2-Dichloroethane		Chloroform		Benzene		Trichloroethene		2-Butanone		Tetrachloroethene		Carbon Tetrachloride	
234267	12/14/2001	U	<.020	U	<0.010	U	<0.010	U	<0.010	U	<0.010	U	<0.010	U	<0.010	U	<0.040	U	<0.010	U	<0.010
234268	12/14/2001	U	<.020	U	<0.010	U	<0.010	U	<0.010	U	<0.010	U	<0.010	U	<0.010	U	<0.040	U	<0.010	U	<0.010
234269	12/17/2001	U	<.020	U	<0.010	U	<0.010	U	<0.010	U	<0.010	U	<0.010	U	<0.010	U	<0.040	U	<0.010	U	<0.010
234270	12/18/2001	U	<.020	U	<0.010	U	<0.010	U	<0.010	U	<0.010	U	<0.010	U	<0.010	U	<0.040	U	<0.010	U	<0.010
234271	12/18/2001	U	<.020	U	<0.010	U	<0.010	U	<0.010	U	<0.010	U	<0.010	U	<0.010	U	<0.040	U	<0.010	U	<0.010
234274	1/2/2002	U	<.020	U	<0.010	U	<0.010	U	<0.010	U	<0.010	U	<0.010	U	<0.010	U	<0.040	U	<0.010	U	<0.010
234275	1/2/2002	U	<.020	U	<0.010	U	<0.010	U	<0.010	U	<0.010	U	<0.010	U	<0.010	U	<0.040	U	<0.010	U	<0.010
234276	1/2/2002	U	<.020	U	<0.010	U	<0.010	U	<0.010	U	<0.010	U	<0.010	U	<0.010	U	<0.040	U	<0.010	U	<0.010
234277	1/2/2002	U	<.020	U	<0.010	U	<0.010	U	<0.010	U	<0.010	U	<0.010	U	<0.010	U	<0.040	U	<0.010	U	<0.010
234278	1/14/2002	U	<.020	U	<0.010	U	<0.010	U	<0.010	U	<0.010	U	<0.010	U	<0.010	U	<0.040	U	<0.010	U	<0.010
234279	1/14/2002	U	<.020	U	<0.010	U	<0.010	U	<0.010	U	<0.010	U	<0.010	U	<0.010	U	<0.040	U	<0.010	U	<0.010
TCLP Regulatory Limit		0.20		0.5		100.0		0.50		6.0		0.5		0.5		ND		0.5		0.5	

Notes:

U=Analyte undetected at reported level

ND=No Data Available

Analysis performed by O'Brien & Gere Laboratories in Syracuse, NY

Wet Cell Surface Soil
TCLP Semi-Volatile Results (mg/L)

Sample ID	Collection Date	Pyridine		1,4-Dichlorobenzene		2-Methylphenol		(3+4)-Methylphenol		Hexachloroethane		Nitrobenzene		Hexachlorobutadiene		2,4,6-Trichlorophenol		2,4,5 Trichlorophenol		2,4-Dinitrotoluene		Hexachlorobenzene		Pentachlorophenol	
234267	12/14/2001	U	<0.50	U	<0.10	U	<0.10	U	<0.10	U	<0.10	U	<0.10	U	<0.10	U	<0.10	U	<0.50	U	<0.10	U	<0.10	U	<0.50
234268	12/14/2001	U	<0.50	U	<0.10	U	<0.10	U	<0.10	U	<0.10	U	<0.10	U	<0.10	U	<0.10	U	<0.50	U	<0.10	U	<0.10	U	<0.50
234269	12/17/2001	U	<0.50	U	<0.10	U	<0.10	U	<0.10	U	<0.10	U	<0.10	U	<0.10	U	<0.10	U	<0.50	U	<0.10	U	<0.10	U	<0.50
234270	12/18/2001	U	<0.50	U	<0.10	U	<0.10	U	<0.10	U	<0.10	U	<0.10	U	<0.10	U	<0.10	U	<0.50	U	<0.10	U	<0.10	U	<0.50
234271	12/18/2001	U	<0.50	U	<0.10	U	<0.10	U	<0.10	U	<0.10	U	<0.10	U	<0.10	U	<0.10	U	<0.50	U	<0.10	U	<0.10	U	<0.50
234274	1/2/2002	U	<0.50	U	<0.10	U	<0.10	U	<0.10	U	<0.10	U	<0.10	U	<0.10	U	<0.10	U	<0.50	U	<0.10	U	<0.10	U	<0.50
234275	1/2/2002	U	<0.50	U	<0.10	U	<0.10	U	<0.10	U	<0.10	U	<0.10	U	<0.10	U	<0.10	U	<0.50	U	<0.10	U	<0.10	U	<0.50
234276	1/2/2002	U	<0.50	U	<0.10	U	<0.10	U	<0.10	U	<0.10	U	<0.10	U	<0.10	U	<0.10	U	<0.50	U	<0.10	U	<0.10	U	<0.50
234277	1/2/2002	U	<0.50	U	<0.10	U	<0.10	U	<0.10	U	<0.10	U	<0.10	U	<0.10	U	<0.10	U	<0.50	U	<0.10	U	<0.10	U	<0.50
234278	1/14/2002	U	<0.50	U	<0.10	U	<0.10		ND	U	<0.10	U	<0.10	U	<0.10	U	<0.10	U	<0.50	U	<0.10	U	<0.10	U	<0.50
234279	1/14/2002	U	<0.50	U	<0.10	U	<0.10		ND	U	<0.10	U	<0.10	U	<0.10	U	<0.10	U	<0.50	U	<0.10	U	<0.10	U	<0.50
TCLP Regulatory Limit		5		ND		ND		ND		3.0		2.0		0.5		2.0		400		0.13		0.13		100	

Notes:

U=Analyte undetected at reported level

ND=No Data Available

Analysis performed by O'Brien & Gere Laboratories in Syracuse, NY

Wet Cell Surface Soil

TCLP Pesticides and Herbicide Results (mg/L)

Sample ID	Collection Date	Lindane		Heptachlor		Heptachlor Epoxide		Endrin		Methoxychlor		Chlordane		Toxaphene		2,4-D		2,4,5-TP Silvex	
234267	12/14/2001	U	<0.00025	U	<0.00025	U	<0.00025	U	<0.00050	U	<0.00025	U	<0.00025	U	<0.00025	U	<0.1	U	<0.1
234268	12/14/2001	U	<0.00025	U	<0.00025	U	<0.00025	U	<0.00050	U	<0.00025	U	<0.00025	U	<0.00025	U	<0.1	U	<0.1
234269	12/17/2001	U	<0.00025	U	<0.00025	U	<0.00025	U	<0.00050	U	<0.00025	U	<0.00025	U	<0.00025	U	<0.1	U	<0.1
234270	12/18/2001	U	<0.00025	U	<0.00025	U	<0.00025	U	<0.00050	U	<0.00025	U	<0.00025	U	<0.00025	U	<0.1	U	<0.1
234271	12/18/2001	U	<0.00025	U	<0.00025	U	<0.00025	U	<0.00050	U	<0.00025	U	<0.00025	U	<0.00025	U	<0.1	U	<0.1
234274	1/2/2002	U	<0.00025	U	<0.00025	U	<0.00025	U	<0.00050	U	<0.00025	U	<0.00025	U	<0.00025	U	<0.1	U	<0.1
234275	1/2/2002	U	<0.00025	U	<0.00025	U	<0.00025	U	<0.00050	U	<0.00025	U	<0.00025	U	<0.00025	U	<0.1	U	<0.1
234276	1/2/2002	U	<0.00025	U	<0.00025	U	<0.00025	U	<0.00050	U	<0.00025	U	<0.00025	U	<0.00025	U	<0.1	U	<0.1
234277	1/2/2002	U	<0.00025	U	<0.00025	U	<0.00025	U	<0.00050	U	<0.00025	U	<0.00025	U	<0.00025	U	<0.1	U	<0.1
234278	1/14/2002	U	<0.00025	U	<0.00025	U	<0.00025	U	<0.00050	U	<0.00025	U	<0.00025	U	<0.00025	U	<0.1	U	<0.1
234279	1/14/2002	U	<0.00025	U	<0.00025	U	<0.00025	U	<0.00050	U	<0.00025	U	<0.00025	U	<0.00025	U	<0.1	U	<0.1
Regulatory Limit			ND		ND		0.008		0.2		10.0		0.03		0.5		10.0		1.0

Notes:

U=Analyte undetected at reported level
ND=No Data Available
Analysis performed by O'Brien and Gere Laboratories, Inc. in Syracuse, NY

Wet Cell Surface Soil
Analytical Results for PCBs (mg/kg)

Sample ID	Collection Date	PCB-1016		PCB-1221		PCB-1232		PCB-1242		PCB-1248		PCB-1254		PCB-1260	
234267	12/14/2001	U	<0.58	U	<0.58	U	<0.58	U	<0.58	U	<0.58	U	<0.58	U	<0.58
234268	12/14/2001	U	<0.58	U	<0.58	U	<0.58	U	<0.58	U	<0.58	U	<0.58	U	<0.58
234269	12/17/2001	U	<0.57	U	<0.57	U	<0.57	U	<0.57	U	<0.57	U	<0.57	U	<0.57
234270	12/18/2001	U	<0.62	U	<0.62	U	<0.62	U	<0.62	U	<0.62	U	<0.62	U	<0.62
234271	12/18/2001	U	<0.62	U	<0.62	U	<0.62	U	<0.62	U	<0.62	U	<0.62	U	<0.62
234274	1/2/2002	U	<0.57	U	<0.57	U	<0.57	U	<0.57	U	<0.57	U	<0.57	U	<0.57
234275	1/2/2002	U	<0.55	U	<0.55	U	<0.55	U	<0.55	U	<0.55	J	0.27	U	<0.55
234276	1/2/2002	U	<0.57	U	<0.57	U	<0.57	U	<0.57	U	<0.57	U	<0.57	U	<0.57
234277	1/2/2002	U	<0.56	U	<0.56	U	<0.56	U	<0.56	U	<0.56	J	0.12	U	<0.56
234278	1/14/2002	U	<0.62	U	<0.62	U	<0.62	U	<0.62	U	<0.62	J	0.34	U	<0.62
234279	1/14/2002	U	<0.74	U	<0.74	U	<0.74	U	<0.74	U	<0.74	J	0.45	U	<0.74
TCLP Regulatory Limit			50		50		50		50		50		50		50

Notes:

U=Analyte undected at the reported level

J=Reported value is estimated

Analysis performed by O'Brien and Gere Laboratories, Inc. in Syracuse, NY

Wet Cell Surface Soil
Analytical Results for TCLP Metals (mg/L)

Sample ID	Collection Date	Arsenic		Barium		Cadmium		Chromium		Lead		Mercury		Selenium		Silver	
234267	12/14/2001	U	<0.5		0.69	U	<0.1	U	<0.5	U	<0.5	U	<0.0004	U	<0.1	U	<0.5
234268	12/14/2001	U	<0.5	U	<0.50	U	<0.1	U	<0.5	U	<0.5	U	<0.0004	U	<0.1	U	<0.5
234269	12/17/2001	U	<0.5	U	<0.50	U	<0.1	U	<0.5	U	<0.5	U	<0.0004	U	<0.1	U	<0.5
234270	12/18/2001	U	<0.5		0.69	U	<0.1	U	<0.5	U	<0.5	U	<0.0004	U	<0.1	U	<0.5
234271	12/18/2001	U	<0.5		0.70	U	<0.1	U	<0.5	U	<0.5	U	<0.0004	U	<0.1	U	<0.5
234272	12/20/2001	U	<0.5		0.74	U	<0.1	U	<0.5	U	<0.5	U	<0.0004	U	<0.1	U	<0.5
234273	12/20/2001	U	<0.5		0.70	U	<0.1	U	<0.5	U	<0.5	U	<0.0004	U	<0.1	U	<0.5
234274	1/2/2002	U	<0.5		0.86	U	<0.1	U	<0.5	U	<0.5	U	<0.0004	U	<0.1	U	<0.5
234275	1/2/2002	U	<0.5		1.00	U	<0.1	U	<0.5	U	<0.5	U	<0.0004	U	<0.1	U	<0.5
234276	1/2/2002	U	<0.5		0.63	U	<0.1	U	<0.5	U	<0.5	U	<0.0004	U	<0.1	U	<0.5
234277	1/2/2002	U	<0.5		0.88	U	<0.1	U	<0.5	U	<0.5	U	<0.0004	U	<0.1	U	<0.5
234278	1/14/2002	U	<0.5		0.96	U	<0.1	U	<0.5	U	<0.5	U	<0.0004	U	<0.1	U	<0.5
234279	1/14/2002	U	<0.5	U	<0.50	U	<0.1	U	<0.5	U	<0.5	U	<0.0004	U	<0.1	U	<0.5
TCLP Regulatory Limit			5.0		100.0		1.0		5.0		5.0		0.2		1.0		5.0

Notes:

U= Analyte undetected at reported level.

Analysis performed by O'Brien and Gere Laboratories, Inc. in Syracuse, NY

Wet Cell Surface Soil
Analytical Results for Wet Chemistry

Sample ID	Collection Date		Total Releasable H_2S (mg/kg)		Total Releasable HCN		pH		Total Solids
234267	12/14/2001	U	<50	U	<25	HJ	7.0		86.5
234268	12/14/2001	U	<50	U	<25	HJ	6.5		85.8
234269	12/17/2001	U	<50	U	<25	HJ	8.5		88.1
234270	12/18/2001	U	<100	U	<50	HJ	7.8		80.8
234271	12/18/2001	U	<50	U	<25	HJ	7.5		81.0
234272	12/20/2001	U	<50	U	<25	HJ	6.5		87.8
234273	12/20/2001	U	<50	U	<25	HJ	7.3		88.4
234274	1/2/2002	U	<50	U	<25	HJ	7.8		87.6
234275	1/2/2002	U	<50	U	<25	HJ	7.6		91.3
234276	1/2/2002	U	<50	U	<25	HJ	7.5		87.6
234277	1/2/2002	U	<50	U	<25	HJ	7.8		88.9
234278	1/14/2002	U	<50	U	<25	HJ	8.00		80.4
234279	1/14/2002	U	<50	U	<25	HJ	7.90		67.4
EPA Action Limit			500 mg H_2S/kg waste		250 mHCN/kg waste		<2 or >12.5		

Notes:

U=Analyte undetected at reported level.

HJ=Holding time exceeded; value is estimated.

Analysis performed by O'Brien and Gere Laboratories, Inc. in Syracuse, NY

DIVIDER PAGE ONLY

Not part of page count

Attachment 2 - CCP Records Transmittal/Receiving Form

CCP Central Records / Records Custodian, 4021 National Parks Highway - MS: GSA 203, Carlsbad, New Mexico 88220

Telephone Number: 505-234-7523

Fax Number: 505-234-7014

☒ Original Record
☐ Fax Record
☐ E-mail Record

Attn:	Sheila Pearcy	From:	Lisa Price-Watson
Ship to:	CCP Central Records/ CCP Records Custodian	Site:	Oak Ridge National Laboratory
	4021 National Parks Highway - MS GSA 203, Carlsbad, NM 88220	Company:	Los Alamos National Laboratory
		Telephone Number:	575-628-8946
Telephone Number:	505-234-7523	Date Sent:	05/30/2008

Document Number	Title/Description	Record Date	Total Pages
I053	Attachment 3 - Acceptable Knowledge Source Document Summary for CCP ORNL AK 1 KAPL-TN waste Profile for NFS Building 284 Soil JAN 7.24.08	5/30/2008	2
NA	NA	NA	NA

Comments:
Supercede previous Attachment 3.

Acceptance/Rejection Signature and Date

Records Accepted	☒ Signature	JANDÉ NAJAR (Printed Name)	7.24.08 (Date)
Records Rejected	☐ Signature	Printed Name	Date

Reason for Rejection:

Re-submittal:	Signature	Printed Name	Date

HWC
2-15-10

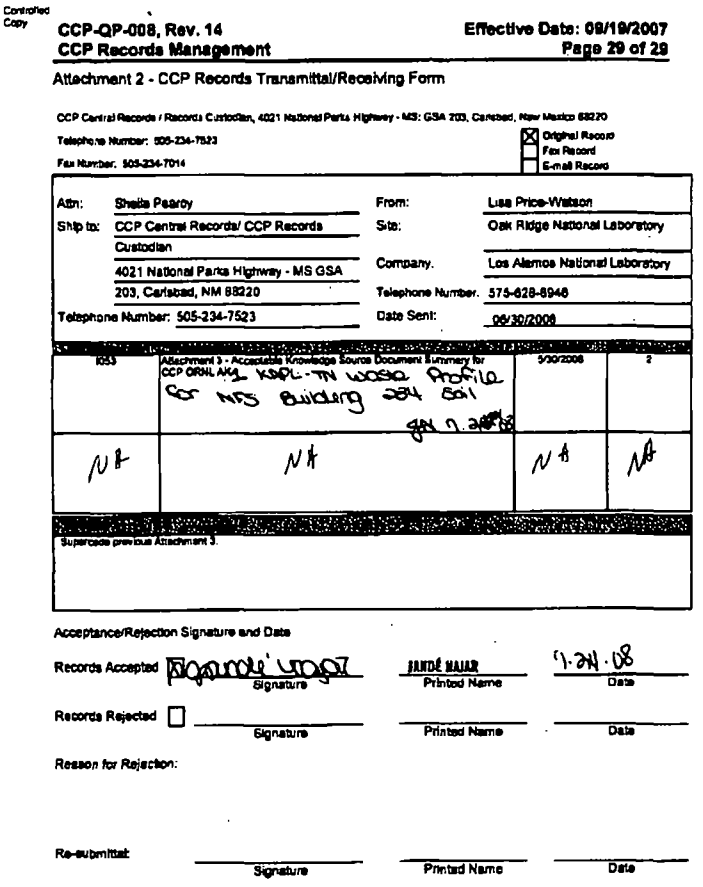
HP LaserJet ***M2727nf MFP***

Fax Confirmation Report

HP LASERJET FAX

Jul-30-2008 10:27AM

Job	Date	Time	Type	Identification	Duration	Pages	Result
4017	7/30/2008	10:27:22AM	Send	96283238	0:27	1	OK



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CCP-QP-008, Rev. 14 **Effective Date: 09/19/2007**
CCP Records Management **Page 29 of 29**

Attachment 2 - CCP Records Transmittal/Receiving Form

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Telephone Number: 505-234-7523
Fax Number: 505-234-7014

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☐ Fax Record
☐ E-mail Record

Attn:	Sheila Pearcy	From:	Lisa Price-Watson
Ship to:	CCP Central Records/ CCP Records Custodian	Site:	Oak Ridge National Laboratory
	4021 National Parks Highway - MS GSA 203, Carlsbad, NM 88220	Company:	Los Alamos National Laboratory
Telephone Number:	505-234-7523	Telephone Number:	575-628-8946
		Date Sent:	06/30/2008

1053	Attachment 3 - Acceptable Knowledge Source Document Summary for CCP ORNL Area: KSPL-TN waste Profile for MES Building 284 Soil	6/30/2008	2
NA	NA	NA	NA

Supersede previous Attachment 3.

Acceptance/Rejection Signature and Date

Records Accepted ☒ Signature — BRENÉ MAJAR Printed Name — 7.24.08 Date

Records Rejected ☐ Signature — Printed Name — Date

Reason for Rejection:

Re-submittal: Signature — Printed Name — Date

Attachment 2 - CCP Records Transmittal/Receiving Form

CCP Central Records / Records Custodian, 4021 National Parks Highway - MS: GSA 203, Carlsbad, New Mexico 88220

Telephone Number: 505-234-7523

Fax Number: 505-234-7014

☒ Original Record
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Attn:	Sheila Pearcy	From:	Jeff Harrison
Ship to:	CCP Central Records/ CCP Records Custodian	Site:	Oak Ridge National Laboratory
	4021 National Parks Highway - MS GSA 203, Carlsbad, NM 88220	Company:	Technical Specialists, LLC
		Telephone Number:	720-977-7042
Telephone Number:	505-234-7523	Date Sent:	12/21/07

Document Number	Title/Description	Record Date	Total Pages
I053	Attachment 3 - Acceptable Knowledge Source Document Summary for CCP ORNL AK	11/30/2007	2
I053	44G-03-1050 - KAPL-TN Waste Profile for NFS Building 234 Soil	09/11/2003	54

Comments:

~~None~~ Superced Duplicate Source Document
HWC 2-15-10

HWC 2-15-10

Acceptance/Rejection Signature and Date

Records Accepted ☒	Signature	JANDÉ NAJAR (Printed Name)	12.29.09 (Date)
Records Rejected ☐	Signature	Printed Name	Date

Reason for Rejection:

Re-submittal:

Signature	Printed Name	Date

HWC
2-15-10

P. 01

TRANSACTION REPORT

DEC-27-2007 THU 10:21 AM

FOR: CCP RECORDS 15052347014

SEND DATE START	RECEIVER	TX TIME	PAGES	TYPE	NOTE	M#	DP
DEC-27 10:20 AM	LANL CARLSBAD	17″	1	FAX TX	OK	142	

TOTAL : 17S PAGES: 1

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Attn:	Sheila Pearcy	From:	Jeff Harrison
Ship to:	CCP Central Records/ CCP Records Custodian	Site:	Oak Ridge National Laboratory
	4021 National Parks Highway - MS GSA 203, Carlsbad, NM 88220	Company:	Technical Specialists, LLC
		Telephone Number:	720-977-7042
Telephone Number:	505-234-7523	Date Sent:	12/21/07

1053	Attachment 3 - Acceptable Knowledge Source Document Summary for CCP ORNL AK	11/30/2007	2
1053	44G-03-1050 - KAPL-TN Waste Profile for NFS Building 234 Soil	09/11/2003	54

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Fax Number: 505-234-7014

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☐ E-mail Record

Attn:	Sheila Pearcy	From:	Amy Johns
Ship to:	CCP Central Records/ CCP Records Custodian	Site:	Oak Ridge National Laboratory
	4021 National Parks Highway - MS GSA 203, Carlsbad, NM 88220	Company:	Technical Specialists, LLC
		Telephone Number:	505-302-8669
Telephone Number:	505-234-7523	Date Sent:	12/13/07

Document Number	Title/Description	Record Date	Total Pages
1053	Attachment 3 - Acceptable Knowledge Source Document Summary for CCP ORNL AK	12/13/2007	2
	44G-03-1050 - KAPL-TN Waste Profile for NFS Building 234 Soil	09/11/2003	54

Comments

None

Acceptance/Rejection Signature and Date

Records Accepted	☒	Gayla White (Signature)	GAYLA WHITE (Printed Name)	12-14-07 (Date)
Records Rejected	☐	(Signature)	(Printed Name)	(Date)

Reason for Rejection:

Re-submittal:

(Signature)	(Printed Name)	(Date)

GWC
2-15-08

TRANSACTION REPORT

P.01

DEC-14-2007 FRI 09:43 AM

FOR: CCP RECORDS 15052347014

SEND DATE START	RECEIVER	TX TIME	PAGES	TYPE	NOTE	M#	DP
DEC-14 09:43 AM	LANL CARLSBAD	16"	1	FAX TX	OK	687	

TOTAL : 16S PAGES: 1

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Telephone Number: 505-234-7523

Fax Number: 505-234-7014

☒ Original Record
☐ Fax Record
☐ E-mail Record

Attn:	Sheila Pearcy	From:	Amy Johns
Ship to:	CCP Central Records/ CCP Records Custodian 4021 National Parks Highway - MS GSA 203, Carlsbad, NM 88220	Site:	Oak Ridge National Laboratory
		Company:	Technical Specialists, LLC
		Telephone Number:	505-302-8669
Telephone Number:	505-234-7523	Date Sent:	12/13/07

Document Number	Title/Description	Record Date	Total Pages
1053	Attachment 3 - Acceptable Knowledge Source Document Summary for CCP ORNL AK	12/13/2007	2
	44G-03-1050 - KAPL-TN Waste Profile for NFS Building 234 Soil	09/11/2003	54

DIVIDER PAGE

Attachment 3 - Acceptable Knowledge Source Document Summary

Site(s): Oak Ridge National Laboratory	Source Document Tracking Number: P306
Waste Stream Number(s): ORNL Non-specific Library Files (Applicable only when site library is not in use)	
Acceptable Knowledge Documentation Type: ☑ TRU Waste Management Program Information ☑ Waste Stream-Specific Information ☑ Additional Information	Category: ☐ Correspondence ☐ Discrepancy Resolution ☐ Internal Procedure ☐ Miscellaneous ☑ Published Document or Internal Procedure ☐ Unpublished Documents
Title or Description of Source Document [a]: Excavation of 110 Lab Tank	
Source Document Reference Information (author(s), document and revision number, date, publisher): NA, DCM-17, Rev. 1, 02/11/1991, NA	

AK # [b]	Source Doc. Page # [c]	AK Information Summary
PR7, PR8, WS2, S2	Throughout	Excavation of 110 Lab Tank Procedure - The purpose of this procedure is to describe the steps to be used to excavate the lab tank and surrounding soil located behind Building 110.

Source Document Data Limitations (if any):

1. None.

Acceptable Knowlege Expert:

Travis Smith /Sign Date: 11/18/2013
Print

[a] Provide description for non-titled information (i.e., container paperwork, MSDS sheets, etc)
[b] Obtain from Acceptable Knowledge Documentation Checklist
[c] For microfilm or microfiche, identify box, tape, reel number and location.

NTPC RECORDS ORIGINAL
DATE REC'D 12/27/13

P306

NFS

DOCUMENT TITLE PAGE	NAME: / COPY #:

TITLE: EXCAVATION OF 110 LAB TANK

PAGE 1 OF 13

28T-91-004
UNIQUE ID #

SYS-50-27
SUBJECT/FILE CODE

CROSS REFERENCE

CROSS REFERENCE

DECOMMISSIONING
CONTROLLING DEPT.

DCM-17
PROCEDURE/SECTION #

1
REVISION #

2/11/91
EFFECTIVE DATE

0
SUPERSEDES

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APPROVED: | REVIEW DATE:

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Material Control & Acct. Dir.

Production Director

Plant Engineering Director

Quality & Process Control Dir.

Security Director

Nuclear Safety Supv. 1/21/91

Health Physics Coordinator

Decomm. Project Dir - Pu Project

EcoTek Project Mgr. -Pu

Nuclear Fuel Services, Inc.
205 Banner Hill Rd.
Erwin, TN 37650

RECORD OF REVISIONS

PAGE / PARAGRAPH	DESCRIPTION OF AND REASON FOR CHANGE
6 / 5.3.1	Removed requirement for a burial box and added requirement for double poly-lined drums.
6 / 5.3.3	Replaced "an eight foot (8') cube" with "a 13'x13'x8' high" inner containment.
6 / 5.3.6	Revised procedure for taking a soil sample.
10 / 6.2	Added sentence defining "release".
11 / 9	Added Industrial Safety section.

EXCAVATION OF 110 LAB TANK

1. PURPOSE

The purpose of this procedure is to describe the steps to be used to excavate the lab tank and surrounding soil located behind Building 110.

2. REFERENCES/DEFINITIONS

2.1. REFERENCES

2.1.1. NFS's Radioactive Materials License SNM-124, issued by the NRC

2.1.2. "Guidelines for Decontamination of Facilities and Equipment Prior to Release for Unrestricted Use or Termination of Licenses for Byproduct, Source, or Special Nuclear Material," USNRC, Division of Fuel Cycle and Material Safety, July, 1982

2.1.3. Procedure NFS-DCM-PR-04, "Safety Procedure for Plutonium Decommissioning"

2.1.4. Procedure NFS-DCM-PR-03, "Packaging for Shipment to Processing, Storage or Burial"

2.2. DEFINITIONS

2.2.1. ALARA - As Low As Reasonably Achievable

2.2.2. CFR - Code of Federal Regulations

2.2.3. cm - centimeter

2.2.4. cpm - counts per minute

2.2.5. dpm - disintegrations per minute

2.2.6. gm - gram

2.2.7. nCi - nanocurie

2.2.8. NFS - Nuclear Fuel Services
2.2.9. NRC - Nuclear Regulatory Commission
2.2.10. RWP - Radiation Work Permit
2.2.11. ml - milliliter
2.2.12. SWI - Specific Work Instruction

3. HEALTH AND SAFETY

3.1. Work shall be performed in accordance with all NFS General Health and Safety Procedures and reference 2.1.3.

3.2. Respiratory protection and protective clothing shall be worn as prescribed in the RWP.

4. PREREQUISITES

4.1. The NRC shall be notified at least 30 days before work is to begin. A copy of this procedure shall be transmitted with the notification.

4.2. An RWP shall be issued by the Health Physics Coordinator for work conducted in accordance with this procedure.

4.3. Employees performing work under this procedure shall have read and signed the applicable RWP.

4.4. Employees performing work under this procedure shall have received training on this procedure and on reference 2.1.4. Training shall be documented.

4.5. Radiation measuring instruments shall have up-to-date calibrations.

4.6. A Radiation Monitor shall be in attendance during these operations.

4.7. Containment has been erected around the lab tank for excavation. The containment is flame retardant clear plastic framed with metal tubing. The containment is attached to the back of Building 110. An eight foot (8') roll-up door has been installed to move drums into Building 110 from the containment. A step-off pad shall be established at the entrance to this door. Negative pressure relative to ambient shall be maintained inside the containment by tapping into the existing ventilation system behind Building 110. The ventilation system is more than adequate since one of the two blowers remain idle at all times.

5. INSTRUCTIONS

5.1. An analysis report provided by TMA Eberline dated February 24, 1987 indicates that levels of activity in excess of 3,500 pCi/gram of dry soil exist three (3) feet below the surface at bore hole 22. Bore hole 22 was located two (2) feet to the north of the concrete pad covering the lab tank. A potential for airborne contamination exists during the excavation activities. Soil, equipment and clothing will be treated as contaminated, unless verified otherwise, in accordance with reference 2.1.4.

CAUTION: ***RESPIRATORY PROTECTION IS REQUIRED WHEN A POTENTIAL FOR AIRBORNE CONTAMINATION EXISTS.***

5.2. Based on preliminary investigation, the top of the lab tank is approximately eighteen inches (18") below the surface. The lab tank is a drum oriented vertically in the ground

and contains borated Raschig rings. The drum is probably carbon steel of 55 gallon capacity.

5.3. PHASE I - PREPARATION FOR REMOVAL OF THE LAB TANK

5.3.1. Stage ten double poly-lined 55-gallon drums inside the containment.

5.3.2. Lay out a circle of six and one half (6½) feet radius from the center of the concrete lab tank cover.

5.3.3. Erect a 13'x13'x8' high inner containment constructed of 2'x4's and flame retardant clear plastic over the lab tank. If lighting is inadequate in the inner containment, string temporary lighting from inside Building 110.

5.3.4. Establish a step-off pad at the entrance to the inner-containment.

5.3.5. Using sledges, mattocks and shovels, remove the concrete cover over the lab tank in as few pieces as possible. Survey the concrete. Record the results and the surface area (ft^2). Place the concrete in the burial box or drum. The Decommissioning Supervisor shall maintain a record of all survey results and packaging documentation.

5.3.6. Take a three-inch (3") diameter core sample of the soil located over the center of the lab tank (adjacent to the lab tank vent line). The sample shall be taken to the top of the lab tank or a maximum of eighteen inches (18"). Extra caution should be taken to maintain the integrity of the sample. Provide the sample to the Project Health Physicist for analysis. The sample of the soil shall then be sent off-site

for analysis of isotopic plutonium and uranium and hazardous constituents.

5.3.7. Where the concrete pad was located, dig straight down approximately twelve to eighteen inches (12"-18") until the top of the tank is reached. Remove all the soil over the tank and place it in 55-gallon drums.

5.3.8. As close as possible to the side of the tank, bore a 6" diameter hole downward using a manual post hole digger until the structural integrity of the tank can be determined. Observe the structural integrity of the tank. The removed soil shall be placed in 55 gallon drums lined with two 55 gallon poly liners.

5.3.9. After assessment is made on the structural integrity of the tank, a specific approach can be chosen to remove the tank. If the tank appears to be intact, see Section 5.4. If deterioration of the tank is detected, see Section 5.5.

5.4. REMOVAL OF INTACT TANK

5.4.1. Remove the vent line from the top of the tank. Obtain a sample of the material inside the tank as directed by the Project Health Physicist. This sample shall be analyzed for concentration of radionuclides for nuclear safety evaluation. A replicate sample shall be taken in a 500 ml bottle and given to the Project Engineer to be sent off-site for analysis of isotopic plutonium and uranium and hazardous constituents.

5.4.2. At a five and one-half foot (5½') radius from the center of the tank, dig around the tank to a depth of two feet (2') at a 45° angle of repose. Then dig straight down around the tank at a three and one-half foot (3½') radius from the center of the tank until the bottom of the tank is reached (approximately 24"). Place the soil in 55 gallon drums lined with two 55 gallon poly liners. If standing water is encountered, inform the EcoTek Project Engineer who will issue an SWI for the removal of the remaining soil and the tank.

5.4.3. If once uncovered a final determination is made that the tank is completely intact, carefully lift the tank out of the hole. Place the tank in an overpack (stainless or HDPE), assay in DVRF, and store in Building 310 while awaiting results of analysis described in Sections 5.3.7 and 5.4.1. If partial deterioration has occurred, inform the EcoTek Project Engineer, who will issue an SWI for the removal of the tank.

5.5. REMOVAL OF DETERIORATED TANK

5.5.1. If deterioration of the tank has occurred and the top of the tank is intact, obtain a sample of the material inside the tank per Step 5.4.1. If the top of the tank is not intact, consult the Project Health Physicist for instructions on obtaining a sample.

5.5.2. At a six foot (6') radius from the center of the tank, dig to a depth of two feet (2') at a 45°

angle of repose, leaving a minimum of six inches (6") of soil surrounding the tank intact. Then dig straight down at a four foot (4') radius from the center of the tank, leaving the six inches (6") of soil surrounding the tank intact, to approximately six inches (6") below the bottom of the tank. Place removed soil in 55 gallon drums lined with two 55 gallon poly liners.

5.5.3. Using a thin 4' x 8' metal sheet and 2'x4's, carefully band the soil/tank with metal strapping around the sides of the tank.

5.5.4. Slip four metal lifting devices under the tank at points approximately 90° apart (see Figure 1).

5.5.5. Lifting on the four devices, gently raise the tank from the pit and place it on a reinforced plastic sheet inside the containment.

5.6. FINAL INSTRUCTIONS FOR REMOVAL OF LAB TANK

5.6.1. When it is necessary to leave the hole open for an extended period of time (in excess of one shift), cover the opening with a flame retardant plastic sheet. Place stakes in the ground around the circumference of the opening with yellow plastic "CAUTION" tape attached.

5.6.2. The drums of soil removed under this procedure will be sampled and sealed as directed by the Decommissioning Supervisor and placed inside Building 110.

5.6.3. A separate procedure, NFS-DCM-PR-16, Soil Sampling, will be issued to cover the removal of

the remaining soil until acceptable levels are achieved.

5.6.4. **No backfilling of the hole will be done without permission of the NFS Decommissioning Director.** An SWI will be issued to cover backfilling procedures.

5.6.5. In the event that standing water is encountered during excavation of the lab tank, a sample of this water shall be taken and analyzed. Based on the data obtained for this sample, proper protective clothing (i.e. hip waders) will be evaluated by the Project Health Physicist. Based on this evaluation, an SWI will be written for the removal of the tank by the EcoTek Project Engineer.

6. ACCEPTANCE CRITERIA

6.1. Drums and equipment shall meet the criteria for release as delineated in Reference 2.1.3.

6.2. Limits shall be established for the release of the area at less than 100 nCi/gm (this is release from transuranic content as defined by WIPP/DOE-069 and not unrestricted release).

7. RECORDS

7.1. A record of the radiation and contamination surveys shall be maintained indefinitely.

7.2. Instrument calibration records shall be maintained indefinitely.

7.3. All archived records will be kept at NFS Document Control.

7.4. The Decommissioning Supervisor is responsible for collecting and reviewing all records. He shall maintain a copy of all survey and packaging records until project completion.

8. ENVIRONMENTAL CONDITIONS EVALUATION

During Phase I operations, the following evaluations, at a minimum, for environmental conditions shall be completed prior to the beginning of the Phase II.

8.1. An evaluation of the groundwater levels and groundwater infiltration rates shall be performed. Details for this evaluation shall be covered in a separate SWI. This data will be used for prescribing protective clothing requirements for Phase II.

8.2. A groundwater monitoring program shall be instituted for monitoring the immediate area of the excavation area prior to beginning Phase II. Details for this program shall be covered in a separate SWI.

8.3. A hydrogeological evaluation of the immediate area shall be performed to determine groundwater flow patterns. Details for this evaluation shall be covered in a separate SWI.

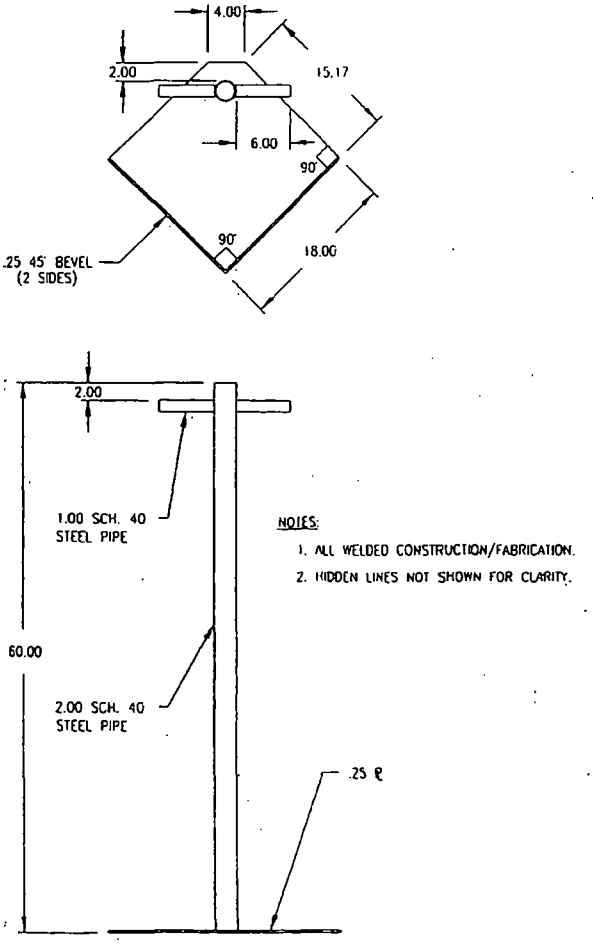
9. INDUSTRIAL SAFETY

9.1. The walls of the excavation will be sloped a minimum of 53 degrees per OSHA 2202, Construction Industry Standards, to guard against moving ground or cave-in.

9.2. Excavation materials shall be effectively stored and retained at least two feet (2') or more from the edge of the excavation.

9.3. Daily inspections of the excavation site shall be made by the EcoTek Project Engineer. If evidence of possible cave-ins or slides is apparent, all work in the excavation shall cease until the necessary precautions have been taken to safeguard the employees.

Figure 1
DETERIORATED TANK LIFTING DEVICE



DIVIDER PAGE

Attachment 3 - Acceptable Knowledge Source Document Summary

Site(s): Oak Ridge National Laboratory	Source Document Tracking Number: P315
Waste Stream Number(s): ORNL Non-specific Library Files (Applicable only when site library is not in use)	
Acceptable Knowledge Documentation Type: ☑ TRU Waste Management Program Information ☑ Waste Stream-Specific Information ☑ Additional Information	Category: ☐ Correspondence ☐ Discrepancy Resolution ☐ Internal Procedure ☐ Miscellaneous ☑ Published Document or Internal Procedure ☐ Unpublished Documents
Title or Description of Source Document [a]: Wet Cell Soil Excavation and Mixing	
Source Document Reference Information (author(s), document and revision number, date, publisher): NA, DCM-61, Rev. 0, 07/05/1993, NA	

AK # [b]	Source Doc. Page #[c]	AK Information Summary
PR7, PR8, WS2, s2, S16	Throughout	Wet Cell Soil Excavation and Mixing The purpose of this procedure is to provide guidance to excavate, process and package radioactive contaminated soil from Building 234. Figure 1 (pg. 8) - Soil Mixing Equipment Layout

Source Document Data Limitations (if any):

1. None.

Acceptable Knowlege Expert:

Travis Smith / [signature] Date: 11/18/2013
Print /Sign

[a] Provide description for non-titled information (i.e., container paperwork, MSDS sheets, etc)
[b] Obtain from Acceptable Knowledge Documentation Checklist
[c] For microfilm or microfiche, identify box, tape, reel number and location.

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P315

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DOCUMENT TITLE PAGE

NAME:
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WET CELL SOIL EXCAVATION AND MIXING

PAGE 1 OF 16

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UNIQUE ID #

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CROSS REFERENCE

DECOMMISSIONING
CONTROLLING DEPT.

DCM-61
PROCEDURE/SECTION #

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REVISION #

7/05/93
EFFECTIVE DATE

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Security Director

Nuclear Safety Supervisor 7/2/93

Health Physics Coordinator

Decommissioning Project Director - Plutonium

EcoTek Project Manager - Plutonium

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ORIGINAL

RECORD OF REVISIONS

PAGE/PARAGRAPH	DESCRIPTION OF AND REASON FOR CHANGE
	This is a new procedure.

WET CELL SOIL EXCAVATION AND MIXING

1 PURPOSE

The purpose of this procedure is to provide guidance to excavate, process and package radioactive contaminated soil from Building 234.

2 REFERENCES/DEFINITIONS

2.1 REFERENCES

2.1.1 NFS' Radioactive Materials License, SNM-124, issued by the NRC

2.1.2 NFS General Health and Safety Procedures

2.1.3 Procedure DCM-03, "Packaging for Shipment to Processing, Storage, or Burial"

2.1.4 Procedure DCM-04, "Health Physics for Plutonium Decommissioning"

2.1.5 Procedure DCM-06, "Bag-out and Glove Change"

2.1.6 Procedure DCM-08, Section XI, "Five Station NDA System"

2.1.7 Procedure NFS-HS-GH-36, "Lockout/Tagout Procedure"

2.2 DEFINITIONS

2.2.1 ALARA - As Low As Reasonably Achievable

2.2.2 CFR - Code of Federal Regulations

2.2.3 OSHA - Occupational Safety and Health Administration

2.2.4 NFS - Nuclear Fuel Services

2.2.5 NRC - Nuclear Regulatory Commission

2.2.6 RWP - Radiation Work Permit

2.2.7 SNM - Special Nuclear Material

2.2.8 TRU - Transuranic Waste Materials (> 100 nCi/g) in accordance with DOE 5820.2 and DOE 5480.1

2.2.9 Ci - curie (unit of activity equal to 3.7E10 disintegrations per second)

2.2.10 mCi - millicurie (10^{-3} Ci)

2.2.11 μCi - microcurie (10^{-6} Ci)

2.2.12 nCi - nanocurie (10^{-9} Ci)

2.2.13 cpm - counts per minute

2.2.14 dpm - disintegrations per minute

2.2.15 g - gram

2.2.16 Primary Containment - Primary containment means enclosures which have air pressures that are negative to secondary containment. Some examples are "tents", "greenhouses", gloveboxes, and the Decon Cell.

2.2.17 Secondary Containment - Secondary containment, in this case, means the building or enclosure which has air pressure negative to the outside atmospheric air pressure.

2.2.18 SWI - Specific Work Instruction

2.2.19 *Competent person* means one who is capable of identifying existing and predictable hazards in the surroundings, or working conditions which are unsanitary, hazardous, or dangerous to employees, and who has authorization to take prompt corrective measures to eliminate them.

3 HEALTH AND SAFETY

3.1 Work shall be performed in accordance with References 2.1.2 and 2.1.4. Other procedures that may be applicable to a particular task will be referenced in an SWI.

3.2 Personnel shall wear protective clothing as prescribed in an RWP, issued by the Health Physics Coordinator.

3.3 Employees performing work under this procedure shall have been trained on this procedure. They shall read and sign applicable SWI's and RWP's.

3.4 Air sampling requirements shall be specified by the HP Coordinator in the RWP.

3.5 Maintenance on the mixer or conveyors requiring access to mechanical drives, moving blades or electrical components shall be performed under the requirements of reference 2.1.7.

4 PREREQUISITES

4.1 Proper equipment and supplies shall be available for the performance of the steps in this procedure. Proper equipment and supplies may include, but are not limited to, the following:

- Previously assayed 5-gallon containers
- plastic bags (5-gallon)
- radiation monitoring equipment
- 55-gallon drums and liners
- Radsorb powder and Radpads absorbent materials
- shoring
- shovels and picks

4.2 The building ventilation shall be in operation.

4.3 There shall be negative pressure on the Wet Cell.

4.4 There shall be negative pressure on Secondary Containment(s).

5 PREPARATION

5.1 The existing door from Area A to the Wet Cell will be used for ingress and egress into the Wet Cell. A wood frame double airlock has been constructed at the opening to minimize the spread of contamination upon entry and exit of the Wet Cell.

5.2 At the entrance to the airlock and at the entrance to the Wet Cell, tape down two layers of butcher paper. Stage extra shoe covers and latex gloves at each entrance.

5.3 Initial entries into the Wet Cell will require the use of supplied air suits. This requirement may be re-evaluated by the NFS Health Physics Coordinator, and, at his recommendation, may be changed. This change will be noted on the applicable RWP.

5.4 Prior to entry into the wet cell, personnel will be dressed in protective clothing per the applicable RWP.

6 INSTRUCTIONS

6.1 The Decommissioning Supervisor may issue instructions to correct abnormal or upset conditions. These must comply with the provisions of the nuclear safety procedure and with the RWP, if applicable. The special instructions shall not conflict with other Health and Safety Procedures and must consider acceptable

health physics practices. Instructions which affect the security systems require approval by the Security Director. Instructions which affect the accountability systems require the Material Manager's approval. These instructions will be documented in the Supervisor's log book. The Supervisor shall inform the EcoTek Plutonium Project Manager and/or NFS Decommissioning Project Director of the condition and actions taken as soon as possible following stabilization of the condition.

6.2 EXCAVATION

6.2.1 Upon completion of preparation, soil will be manually excavated with shovels and picks in the wet cell. Other equipment may be prescribed in areas providing greater access (Area B, Area A, and Area 67).

6.2.2 Excavation past four feet in depth requires the placement of shoring using supplied OSHA approved shoring system. After shoring is placed, excavation may continue to two feet below the bottom of the shoring. When the excavation is two feet below the bottom of the shoring, the shoring must be lowered to the bottom of the excavation. All shoring installation, moving and removal must be completed from outside the excavation.

NOTE: EXCAVATION WILL NOT CONTINUE BEYOND FOUR FEET IN DEPTH WITHOUT SHORING.

6.2.3 Excavation past four feet requires an access ladder to be located in the excavation which requires no more than 25 feet of lateral movement to reach.

6.2.4 No employee shall be permitted underneath loads handled by lifting or digging equipment.

6.2.5 Water will be controlled/prevented by the use of a pump and filter system. *Equipment must be operational prior to excavation when water is present.*

NOTE: EMPLOYEES SHALL NOT WORK IN EXCAVATIONS IN WHICH THERE IS ACCUMULATED WATER.

6.2.6 Employees shall be protected from excavated or other materials or equipment that could pose a hazard by falling or rolling into the excavations. Protection shall be provided by placing and keeping such materials or equipment at least 2 feet from the edge of the excavation.

NOTE: FAILURE TO KEEP EXCAVATED MATERIALS AND OTHER EQUIPMENT 2 FEET AWAY FROM THE EXCAVATION COULD RESULT IN INJURIES TO OPERATORS.

6.2.7 Operators in the Wet Cell are to be continuously alert for evidence of situations that could result in possible cave-ins, indications of failure of protection systems, hazardous atmospheres, or other hazardous conditions. Training on this procedure shall cover such situations so that operators are competent to recognize and take corrective action.

6.3 EQUIPMENT DESCRIPTION

Soil mixing equipment layout in Area C of Building 234 is shown in figure 1.

6.3.1 Conveyors

6.3.1.1 One 24" by 15' conveyor will move material from the wet cell to a 24" by 25' conveyor. The 25' conveyor will move the material to the mixer. The conveyors are open troughing conveyors with stationary stands, lag head pulleys, wing type tail pulleys, 150 PIW Goodyear belts, with belt wipers. The 15' conveyor has a 3 HP electric motor. The 25' conveyor has a 5 HP motor and a loading hopper.

6.3.1.2 The conveyors are controlled by the operator using on/off buttons on the control panel to start and stop the motors. Both conveyors

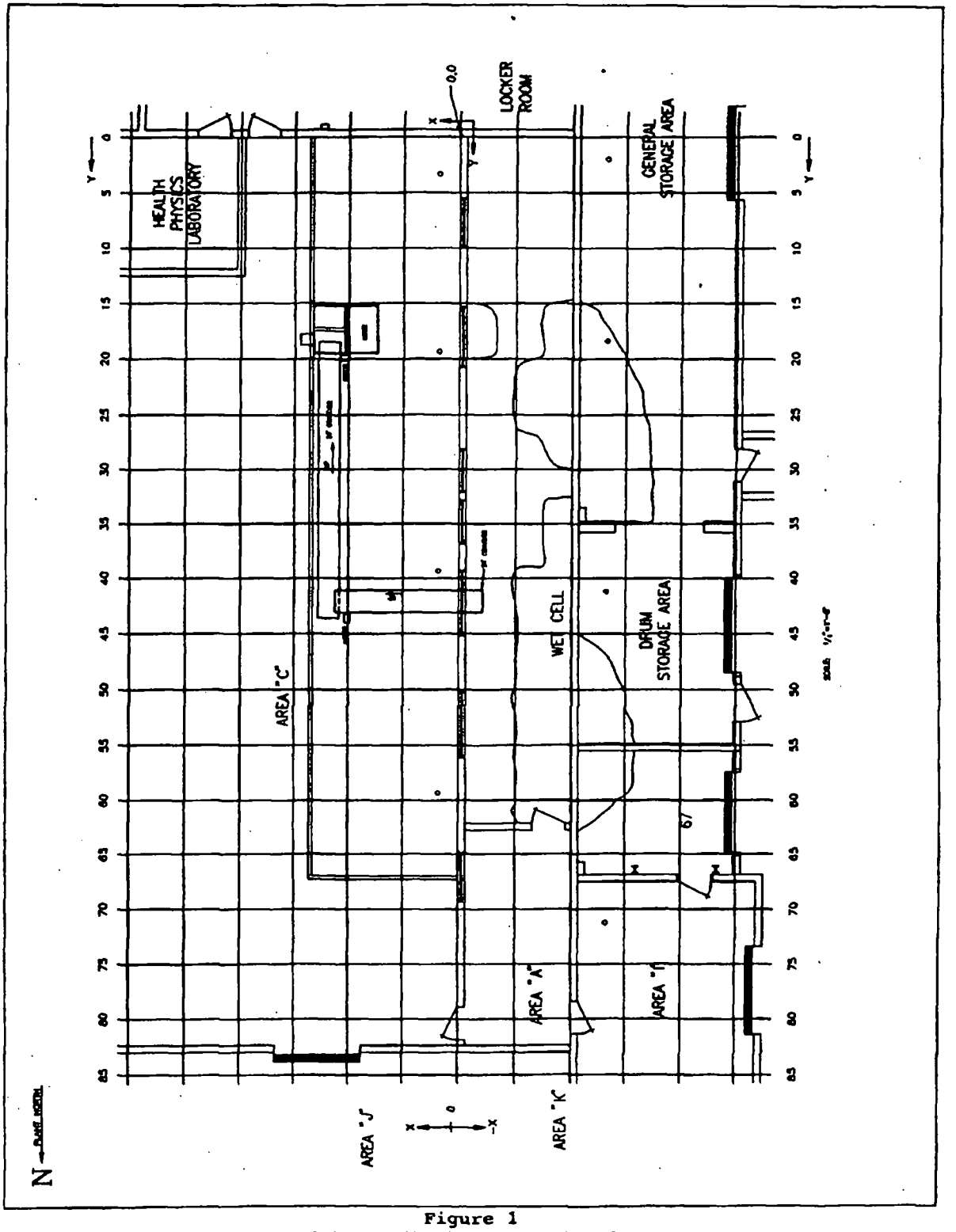


Figure 1
SOIL MIXING EQUIPMENT LAYOUT

are operated simultaneously by the same controller. There is an emergency shut off device located at the loading end of the 15' conveyor which stops the complete system, including the mixer.

6.3.2 Mixer and Discharge Gate

6.3.2.1 The mixer is located in containment in Area C. The shell of the mixer is 3/8-inch thick mill steel and has 45 cubic feet of volume. The blades are mounted on a central shaft. The blades are angled at 45° to plow through the mix and move it in a "figure 8" pattern for good mixing. Each blade has two components, the mixing/scraping portion at the end of the arm, and the cutting short blade at the halfway point on the arm. The blades are attached to the shaft in a rotating spiral so that when the endgate is opened, the mix is forced out of the mixer.

6.3.2.2 Chopper blades are high speed mixers attached to the bottom of the mixer. The chopper blades fit between the mixer blades as they scrape the walls of the mixer. This gives the mixer two independent mixing systems; one at a slow speed of 50 RPM, and one at a high speed of 3400 RPM. The choppers are driven by 15 HP electric motors that are controlled by the operator. The choppers and the mixers are run independently. They are controlled by an on/off switch on the control panel.

NOTE: THE HIGH SPEED CHOPPER MOTORS SHOULD NOT BE LEFT ON CONTINUOUSLY TO AVOID OVER-HEATING OF BLADES. OPERATION SHOULD BE LIMITED TO APPROXIMATELY 4 MINUTES PER BATCH.

6.3.2.3 The mixer drive is made up of an electric motor and heavy duty gear reducer. These drive units are attached directly to the mixer shaft and blades. The ends of the shaft are sealed with garlock packing and teflon seal rings.

6.3.2.4 The mixer is controlled by the operator using the forward/off/reverse button on the control panel to start the motor.

6.3.2.5 At the end of the mixer, a slide gate is attached for dumping the contents after mixing is complete. This discharge gate is a stainless steel slide gate, opening and closing as a pneumatic cylinder goes up and down. A limit switch is connected to an indicator light on the central panel to show the operator that the discharge gate is fully closed. This is necessary to keep the material inside the mixer during mixing.

6.3.2.6 The operator controls the discharge gate by pushing the joystick forward to open and releasing the joystick to close the gate. The joystick is spring loaded to close when released.

6.3.2.7 Attached to the gate is a chute to allow all of the mixed material to exit the mixer into a drum. The end of this chute is configured as a bag-out port.

6.3.3 Load Cells

The mixer is mounted on four load cells. These load cells are under each leg of the mixer and transmit a signal to the digital display near the control console that gives the weight of the material being added to the mixer.

6.3.4 Central Control Console

The control panel contains a fwd/off/rev switch for the mixer, on/off push buttons for the chopper motors and conveyor motors and an emergency shut off device for the complete system. It is mounted on a stand near the discharge of the mixer.

6.3.5 Containment and Drum Load Out

Containment for the mixing operation is located in Area C. The containment is constructed of 2x4 framing with 25 mil nylon reinforced polyethylene lining on the inside walls. An outer layer of 8 mil PVC sheet provides double containment. The floor is covered with 25 mil plastic and commercial grade linoleum. The ceiling is lined with 8 mil PVC. A clear plastic "window" is installed in the containment to permit the console operator to view the equipment operation.

6.3.6 The drum load out area is appended to the side of the main containment. The chute from the mixer penetrates the containment in the drum load out area and terminates as a vertical bag-out port. The elevation of the bag-out port permits a drum on a dolly to be rolled underneath with 6 inches clearance. The clearance allows an operator room to use a "horsetail" closure on the bag by rotating the drum on the dolly.

6.4 MIXER LOADING

6.4.1 The purpose of soil mixing is three-fold: (1) To break up and homogenize the clay; (2) to add absorbent powder to the soil to meet the no free liquid waste acceptance criteria, and; (3) to blend off soils with contaminant density that would otherwise exceed package limits of 128 grams $^{239}Pu_{FGE}$.

6.4.2 For purposes of convention to distinguish the soils requiring blending from soils that are TRU, but with contaminant density that does not require blending, the former will be called "high Pu density soils", and the latter will be called "TRU contaminated soils".

6.4.3 Mixing of soil will be done on a batch basis. Each batch will consist of soil and absorbent powder. Absorbent powder will be added at the rate of 10 pounds per packaged drum.

6.4.4 High Pu density soils have been excavated, loaded into 5-gallon containers, assayed, and staged for mixing. 5-gallon containers of high Pu density soil will be pre-selected by project management for mixing so that final package limits will not be exceeded. An administrative control limit is established at 80 grams $^{239}Pu_{FGE}$ per drum to reduce the potential of exceeding the 128 gram limit as evaluated by the receiver.

6.4.5 It has been evaluated from soil characterization data that a 55-gallon drum of TRU contaminated soil will contribute less than 20 grams $^{239}Pu_{FGE}$. Therefore, no more than 60 grams of high density Pu soil will be assigned to any batch.

6.4.6 Attachment (1), Soil Mixing Worksheet (the Worksheet), will be used to control the batch "recipe". A sequential lot number will be assigned to each batch. Decommissioning supervisors will maintain an active file of

Worksheets. Project staff will enter the NFS unique identification numbers of the 5-gallon containers selected for mixing and the associated assay values. Operators will locate the specified containers and initial on the Worksheet. These containers will then be introduced into the Wet Cell for loading into the mixer.

6.4.7 Operators will record date and approximate time of the mixing on the worksheet.

6.4.8 After dumping the specified 5-gallon containers of high Pu density soil onto the conveyor in the Wet Cell, a paper bag containing 10 pounds of absorbent powder will be placed onto the conveyor.

6.4.9 The material is loaded onto the conveyor as it is moving. The operators inside the containment can communicate to the console operator to start and stop the conveyor as necessary.

NOTE: EMERGENCY SHUT OFF DEVICES LOCATED AT THE CONVEYOR LOADING AREA AND THE CONTROL PANEL WILL SECURE POWER TO ALL EQUIPMENT IN CASE OF AN UPSET CONDITION.

6.4.10 Additional soil to fill up a 55-gallon container will be taken from TRU contaminated soils. Test results indicate that the 55-gallon drum holds about 450 pounds. Control of total weight of the batch is maintained by the operator at the Central Control Panel, who can stop the conveyor when the desired weight of material has been loaded into the mixer.

6.4.11 When all the material for the batch has been loaded into the mixer, the conveyors are stopped and the mixing process begun. Enter the lot weight on the worksheet.

6.5 MIXING

6.5.1 Start mixer rotation in the forward direction.

6.5.2 After approximately three (3) minutes, start the chopper motors.

6.5.3 After approximately five (5) minutes, reverse the mixer rotation.

6.5.4 After approximately seven (7) minutes, stop the chopper motors.

6.5.5 After approximately ten (10) minutes, shift the mixer rotation to forward.

6.5.6 After approximately fifteen (15) minutes, stop the mixer.

6.6 CONTAINER LOADING

6.6.1 Containers for loading mixed soils should be prepared before starting the mixing operation:

6.6.1.1 Use stainless steel DOT 17-C or 17-H 55-gallon drums.

6.6.1.2 Insert a RADPAD absorbent pad into the bottom of the drum.

6.6.1.3 Insert a 90-mil polyethylene rigid liner into the drum.

6.6.1.4 Fit a NUCFIL HEPA filter into the bung on lid of the drum (see reference 2.1.3 for torque requirements).

6.6.1.5 Stage the 90-mil liner lid and the drum lid with the drum for closure after loading.

6.6.2 Place the container for loading on a round drum dolly.

6.6.3 Position the container under the mixer outlet chute and insert the bagout bag into the drum. Ensure that there is sufficient bagout bag material on the chute to permit a horsetail closure.

6.6.4 Open the slide gate on the mixer. When the gate is open, start the mixer in the forward direction. The mixer will discharge the soil through the outlet chute and into the bagout bag.

6.6.5 Monitor the load cells to determine when the appropriate amount of soil has been discharged from the mixer into the container. This amount may vary depending on the density of the soil, but will not exceed 700 pounds so that the package gross weight cannot exceed 800 pounds.

6.6.6 When the appropriate amount of material has been discharged from the mixer, or the mixer is empty, close the slide gate. The mixer is empty when the scale display is at or near 0.

6.6.7 Use a horsetail closure to seal the bagout bag per reference 2.1.5. The drum dolly can be rotated in place to facilitate making the horsetail.

6.6.8 Mark the side of the container with the lot and container number from the worksheet.

6.7 PACKAGING AND TRANSFER

Requirements of reference 2.1.3 must be met for the final package. This reference addresses drum closure, labeling, assaying, surveying, and documentation requirements. In order to meet the throughput requirements for this operation, these steps must be completed expeditiously following drum loading. Portable instrumentation is available in the area to provide rapid turn around for surveying for transferrable contamination. The information required for shipping and disposal of the drums will be entered into the MTS and NFS on-line computer and documents generated on a continuous basis. Supervisors will coordinate with Building 310 clerks to ensure smooth and timely transfer of drums.

7 NUCLEAR SAFETY

7.1 Nuclear Safety will be controlled by process batch controls using the Worksheet. The nuclear safety limit for the process is less than 200 grams $^{239}Pu_{FGE}$ in the mixer and in any 55-gallon container.

8 RADIOLOGICAL SAFETY

8.1 Prior to removal of any material from secondary containment, surface contamination shall be removed or sealed in accordance with Reference 2.1.2.

8.2 Reference 2.1.4 specifies radiation control monitoring and action limits.

9 ENVIRONMENTAL SAFETY

9.1 Environmental protection surveillance and monitoring are addressed in Reference 2.1.4.

10 ACCEPTANCE CRITERIA

10.1 All final packages must meet the requirements of DOE-ORNL Waste Acceptance Criteria.

11 WASTE DISPOSITION

11.1 All waste generated during decommissioning shall be disposed of in accordance with reference 2.1.3. Particular disposal instructions not covered by this procedure shall be addressed in the SWI.

12 RECORDS

12.1 All archived records will be kept in accordance with NFS Document Control Procedure NFS-RM-006, "Uniform File Classification System File Outline".

ATTACHMENT 1

Soil Mixing Worksheet

Lot Number: _____

Date: _____

Approx. time: _____

5-Gal. Pail #	5-Gal. Pail Assay Value (passive mass)	Bags of Radsorb	Container #	Container Content Weight	Operator Initials
Total					

Project Staff assigning 5-gallon containers for lot:

(print) _____, (sign) _____, Date: _____

Review:

_____ _____

Supervisor Signature Date

DIVIDER PAGE

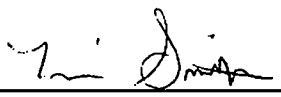
Attachment 3 - Acceptable Knowledge Source Document Summary

Site(s): Oak Ridge National Laboratory	Source Document Tracking Number: P1400
Waste Stream Number(s): ORNL Non-specific Library Files (Applicable only when site library is not in use)	
Acceptable Knowledge Documentation Type: ☑ TRU Waste Management Program Information ☑ Waste Stream-Specific Information ☑ Additional Information	Category: ☐ Correspondence ☐ Discrepancy Resolution ☑ Internal Procedure ☐ Miscellaneous ☐ Published Document or Internal Procedure ☐ Unpublished Documents
Title or Description of Source Document [a]: Operating Procedure for Soil Excavation, Processing and Packaging for the 234 Excavation Facility	
Source Document Reference Information (author(s), document and revision number, date, publisher): Mark Wetherill, NFS-DC-133, Revs. 0 and 1, 05/17/2010 - 09/03/2010, N/A	

AK # [b]	Source Doc. Page # [c]	AK Information Summary
PR8, WS5, S2, S9, S16	Throughout	This procedure provides the instructions to safely excavate, process, and package transuranic (TRU) waste in compliance with the Contact-Handled Transuranic Waste Packaging Instructions and low-level waste (LL W) in compliance with the Nevada Test Site (NTS) waste acceptance criteria (WAC). System mock up testing will be performed with non-radiologically contaminated soil to establish the most effective processing sequence. Revision 0 of this procedure will be used to perform system mock up testing. Normal operations shall not be conducted with Revision 0 of this procedure. This procedure will be revised to incorporate lessons learned and red-line changes from system mock up testing prior to operations. Red line changes will be tracked using Attachment #6 of this procedure and must be approved by the responsible Senior Project Manager and Industrial Safety representative. This procedure covers excavation of soil, absorbent addition, soil testing, soil transport, and final packaging of excavated soil from the 234 Excavation Facility. Standby and shutdown conditions, non-routine processing and operations are also provided. Letters Of Authorization (L.O.A.s) or Specific Work Instructions (SWIs) may be written to supplement this Standard Operating Procedure (SOP) and to address any situation not covered within this document. The SOP will not require a revision for LOAs and SWIs. Sign-off of LOAs will consist of the same approval level as this SOP and SWIs must be approved by the Nuclear Safety Engineer, Process Engineer, Senior Project Manager, and Health Physicist. Revision 1 was issued 09/03/2010 to incorporate a title change, changes to Sections 3, 4, 6, 9, to delete Attachment 6, and to revise Attachments 3 and 4

NTPC RECORDS ORIGINAL
DATE REC'D 12/18/13

Attachment 3 - Acceptable Knowledge Source Document Summary (continued)

Site(s): Oak Ridge National Laboratory	Source Document Tracking Number: P1400
Source Document Data Limitations (if any): 1. Best available copy	
Acceptable Knowlege Expert: Travis Smith /  Date: 11/20/2013 Print /Sign	
[a] Provide description for non-titled information (i.e., container paperwork, MSDS sheets, etc) [b] Obtain from Acceptable Knowledge Documentation Checklist [c] For microfilm or microfiche, identify box, tape, reel number and location.	

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▪ www.nuclearfuelservices.com

20G-10-0052
GEN
WRH-10-065
August 30, 2010

Mr. Don Coffey
TRU Project
Building 7880Y
100 WIPP Road
Lenoir City, TN 37771

SUBJECT: Approval for Limited Use of NFS Proprietary Information

Dear Mr. Coffey:

In accordance with your recent request and similar offerings by Nuclear Fuel Services, Inc. (NFS) on previous dates, you are hereby granted certain approvals to the Transuranic Waste Process Center (TWPC) Acceptable Knowledge (AK) team related to the following NFS documents which are being transmitted herewith. The enclosed documents are:

1) *Building 234 Soil, Groundwater, and Groundwater Sludge Sampling and Analysis Plan*; NFS-DC-135, March 15, 2010.

2) *Operating Procedure for the Operation of the 234 Excavation Facility Groundwater Pretreatment System*; NFS-DC-130, Revision 0, June 8, 2010.

3) *Operating Procedure for Soil Excavation, Treatment, and Packaging for the 234 Excavation Facility*; NFS-DC-133, Revision 0, May 17, 2010.

4) *Waste Packaging for WIPP Disposal*; SOP 335, Section L, Revision 0, August 1, 2010.

5) *234 Wet Cell Characterization Summary, Nuclear Fuel Services, Inc. Erwin, TN*; Reference: 44T-09-0056, May 2010.

6) *Radiological Characterization Onsite Waste Burial Areas, Nuclear Fuel Services, Inc. Erwin, TN*; Reference: 84N-87-0405, Gov-01-55-04, Final Report September 1987.

7) *Radiological Survey of the Nuclear Fuel Services, Inc. Erwin Plant Burial Site Draft Report*; Reference: NRC-02-80-034, January 1983.

These documents may be copied or shared with other USDOE and USEPA personnel, State of New Mexico agencies, and DOE contractors solely and exclusively in connection with the final disposal of transuranic (TRU) waste which originated at NFS and is now stored at Oak Ridge.

Although the documents may be used for the purpose stated above, they are not to be released for general publication or for public access via printed or electronic media, or otherwise.

Your cooperation with these restrictions regarding use and release is requested. Please advise me if you have any further questions on this matter.

Sincerely,

William R. Hull
Director, Corporate Services
Nuclear Fuel Services, Inc.

cc: D. Boss, NFS
M. Wetherill, NFS

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NFS-DC-133

Name: _____

Copy# _____

TITLE:

OPERATING PROCEDURE FOR SOIL EXCAVATION, TREATMENT AND PACKAGING FOR THE 234 EXCAVATION FACILITY

This document may not be copied without approval of the:

DECOMMISSIONING DEPARTMENT

UNIQUE ID#

44T-10-0094

NOTE: Knowingly or willfully falsifying or concealing a material fact on this form, or making false, fictitious, or fraudulent statements or representations herein could constitute a felony punishable under Federal Statutes.

SUBJECT/FILE CODE

SYS-50-30

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CROSS REFERENCE

Prepared by: Mark Wetherell

Review Date:

CONTROLLING DEPT.
Decommissioning

APPROVAL:

4/29/10
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T&WM MANAGER

John J. Kennon 4/28/10
PROJECT ENGINEERING MANAGER

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4/28/10
FUEL PRODUCTION DIRECTOR

Natalie Kenno/KOW 4-28-10
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04/27/10
LICENSING & COMPLIANCE DIRECTOR / SSRC CHAIRMAN

R. Shackelford/RPD 1/27/2010
SAFETY DIRECTOR

4/29/10
WASTE PROGRAMS MANAGER

REVISION #
0

EFFECTIVE DATE
5-17-10

SUPERCEDES

ECR #
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RECORD OF REVISIONS

Change Section	Description
N/A	This is a new procedure

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COMMITMENT LOG

Revision Number	Section containing Commitment	Commitment (include PIRCS reference)
N/A	This is a new procedure	

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1.0 PURPOSE

This procedure provides the instructions to safely excavate, process, and package transuranic (TRU) waste in compliance with the Contact-Handled Transuranic Waste Packaging Instructions and low-level waste (LLW) in compliance with the Nevada Test Site (NTS) waste acceptance criteria (WAC). System mock up testing will be performed with non-radiologically contaminated soil to establish the most effective processing sequence. Revision 0 of this procedure will be used to perform system mock up testing. Normal operations shall not be conducted with Revision 0 of this procedure. This procedure will be revised to incorporate lessons learned and red-line changes from system mock up testing prior to operations. Red line changes will be tracked using Attachment #6 of this procedure and must be approved by the responsible Senior Project Manager and Industrial Safety representative.

2.0 SCOPE

This procedure covers excavation of soil, absorbent addition, soil testing, soil transport, and final packaging of excavated soil from the 234 Excavation Facility. Standby and shutdown conditions, non-routine processing and operations are also provided. Letters Of Authorization (L.O.A.s) or Specific Work Instructions (SWIs) may be written to supplement this Standard Operating Procedure (SOP) and to address any situation not covered within this document. The SOP will not require a revision for LOAs and SWIs. Sign-off of LOAs will consist of the same approval level as this SOP and SWIs must be approved by the Nuclear Safety Engineer, Process Engineer, Senior Project Manager, and Health Physicist.

3.0 GENERAL INFORMATION

3.1 Safety Related Equipment

There is no Safety Related Equipment (SRE) associated with the 234 Excavation Facility.

3.2 Safety Hazards and Precautions

3.2.1 Industrial Safety

General Information

1) All injuries must be reported in accordance with NFS-GH-04.
2) HEU Material Handlers will check equipment and tools prior to their use.
    a. Only equipment with properly operating controls and safety devices shall be used in accordance with NFS-GH-37 (PIT procedure and inspections).

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b. The manufacturer's safety devices on the equipment must be present, not altered, and in good working order when in use.

3) A Hot Work Permit is required in accordance with NFS-GH-25 for all welding, spark producing activities or in the presence of open flames.

4) Combustibles will be minimized in accordance with NFS-GH-62.

5) Hand and power tools will be used in accordance with NFS-GH-67.

6) Ladders will be used in accordance with NFS-GH-05.

7) Employees working in confined spaces shall be trained and shall perform the work in accordance with NFS-GH-30.

3.2.2 Personal Protective Equipment (PPE) shall be used in accordance with NFS-GH-19 and will be worn as described in the following sections.

1) Safety toe shoes shall be worn in controlled areas at all times and when performing all work in accordance with NFS-OS-001.

2) Hearing protection shall be worn for high noise activities such as jack hammering or shearing. The headsets used for radio communication can also be used for hearing protection.

3) NOTE: Safety Work Permits (SWPs) may require additional protective clothing.

4) HEU Material Handlers loading debris by hand will wear cut-resistant gloves or equivalent.

5) Personnel will properly dispose of used PPE and practice good housekeeping in accordance with NFS-OS-001, maintaining the step off pad free of all obstacles and allowing for unimpeded emergency egress of personnel.

3.2.3 Vehicle and Equipment Use

1) Training and Inspection shall be conducted in accordance with NFS-GH-37.

2) Vehicle Operations

a. All decommissioning personnel who operate vehicles or equipment will follow all manufacturer operations manual instructions.

b. Spotters will be used during use of the excavator, Drum Hauler, electric and air pallets, when the view of the HEU Material Handler is impaired, or at the discretion of the supervisor. Pay attention to the following:

- Buildings and power lines
- Primary containment wall boundaries
- Low clearances
- Pedestrians
- Excavation edges

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- All other hazards associated with vehicle/heavy equipment movement.

3) HEU Material Handlers shall operate vehicle and heavy equipment in accordance with NFS-GH-37.
4) The company speed limit is 9 miles per hour. Adhere to the posted speed limits. Situations can occur (carrying heavy loads, creating excessive dust, operating in areas of pedestrians) which may require a slower rate of speed.
5) All accidents and near misses must be reported to Decommissioning Supervisor, Decommissioning Manager, Industrial Safety, the Plant Superintendant, and to the Security Operations Supervisor (SOS) and in accordance with NFS-GH-04.

3.2.4 Excavation and Trenching

1) All excavation activities shall be performed in accordance with NFS-GH-59.
2) A competent person for excavation, trenching and shoring will be present during excavation activities. His/her duties shall be performed in accordance with OSHA requirements for this work.
3) Underground work permits shall be obtained prior to initial excavation activities in accordance with SOP 392. A copy of this permit will be posted in the Supervisors office or in the work area.
4) Employees shall not walk between the safety railing and the excavation.

3.2.5 Chemical Safety, Storage, Disposal and Use

1) All chemicals shall be stored in approved cabinets when not in use.
2) Flammable chemicals must be stored in flammable storage cabinets when not in use.
3) All chemical containers must be labeled in accordance with NFS-GH-68.
4) Wear the appropriate PPE before using and handling chemicals.
5) Eyewash stations are available inside the 234 Excavation Facility if needed.
6) Follow the precautions in the Material Safety Data Sheets (MSDSs) located in 234 Excavation Facility for handling solutions and chemicals within the 234 Excavation Facility.
7) A face shield with safety glasses or goggles, apron and gloves are worn as directed by Industrial Safety when handling corrosive chemicals outside of containment.

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NOTE: If no sleeves are attached to the chemical resistant apron, sleeve protectors are additionally required.

8) Collection and disposal of used oil, fuels, antifreeze, and other liquids must be handled in the following manner:
    a) Used oil collected from equipment oil changes, pumps or equipment will be placed in a 55-gallon closed head (bung hole) drum and labeled as "Used Oil."
    b) Use separate containers for used antifreeze, fuels and all other liquids. Antifreeze, water or any other liquid must not be mixed with waste oil.
    c) The name of the contents and appropriate warning labels shall be identified on the container.
    d) Lock the lid opening or place drum in a secured location to control the contents being added to the container. Initial and record the date in the Waste Oil Log (See SOP 335, Sec. G).
    e) When the drum or container is full, complete the Request for Waste Determination in accordance with NFS-GH-38 and submit it to Environmental Safety. Further handling and sampling will be provided by Environmental Safety.
    f) The drums or containers will be held for off-site recycling or disposal at the direction of Environmental Safety and Transportation & Waste Management (T&WM).
    g) Lids and/or bung openings on containers must always be tightly secured unless adding contents to a container.

3.2.6 Miscellaneous Safety Items

1) Tools, ladders, safety equipment, extension cords, etc. must be stored in appropriate areas. These items will not be left in walking areas where they can become tripping hazards.
2) Material Handling and lifting activities will include the following:
    a) Wear protective gloves.
    b) Use lifting equipment for the purpose it was designed.
    c) Use proper lifting techniques for manual lifting (such as keeping your back straight and lifting with your legs).
    d) Use equipment to lift when possible.
    e) Check travel path of moved load prior to moving the load.
    f) Secure loads by using tie-down straps when using a forklift.
3) Through training and pre-job briefings, personnel will familiarize themselves with the physical characteristics of the site including:
    a) Emergency equipment.

b) The nearest emergency and site area access and egress.

c) Access to co-workers, equipment and vehicles.

d) Communications equipment at the site.

e) Areas of known or suspected contamination.

3.2.7 Environmental Safety

1) Potentially hazardous waste shall be managed in accordance with NFS-GH-38.

2) All spills of oil, chemicals, excavation water and radioactive material must be reported to the Decommissioning Manager and Environmental Safety immediately in accordance with NFS-GH-35 and/or NFS-HS-E-05.

3) Wet down or use fixatives for dry soils in controlled areas when necessary to prevent airborne contamination from spreading into clean areas as directed by the Supervisor. The work area shall be maintained such that dust is kept to a minimum.

3.2.8 Supervisors shall conduct a pre-job briefing with the HEU Material Handlers prior to conducting daily operations.

3.2.9 Radios shall be used to facilitate communication for workers inside the excavator or primary containment and support staff outside the primary containment.

1) Radios shall be placed on the charger at the end of each shift.

2) Batteries inside the headset shall be changed a minimum of once a quarter to ensure proper headset functionality.

3) Radio checks shall be performed prior to entry to ensure proper functionality.

4) Batteries shall be placed in a labeled "Universal Waste Used Batteries." Non-contaminated batteries shall not be disposed of in common trash containers or as radiologically contaminated waste. Non-contaminated batteries will be collected in accordance with SOP 335 G, current revision. When the container is full, complete a Request for Waste Determination form in accordance with NFS-GH-38 and submit it to Environmental Safety.

3.2.10 Safety glasses or goggles and safety shoes shall be worn at all times during waste packaging unless instructed otherwise by area Health Physics or Radiation Technicians. All operations personnel shall wear work gloves when handling materials or equipment.

3.2.11 Survey release limits for plutonium are 20 dpm/100 cm^2 smearable and 100 dpm/100 cm^2 for direct.

3.3 Nuclear Criticality Safety Requirements

Nuclear Criticality Safety (NCS) Analyses are addressed in the memo titled "Nuclear Safety Controls on Operations in Building 234." The only NCS

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requirement is to report all fissile loadings to Nuclear Criticality Safety.

3.4 Supplemental

3.4.1 General Overview of PU Soil Excavation

The PU soil excavation process includes the excavation of soil, addition and mixing of absorbent material, transport of soil within the primary containment, and final packaging of processed soil in the 234 Excavation Facility. Soil will be excavated using the Komatsu excavator and staged adjacent to the dig site. The soil batch will be mixed with absorbent to dry the soil. The mixed soil batch will then be transported inside the primary containment for final packaging in either a burial box or a 55-gallon drum, depending on analytical results of the soil batch. Groundwater will be addressed and processed in accordance with NFS-DC-130. In the event that a breach of containment, to include small holes in walls, is discovered, HEU Material Handlers shall notify area Supervisor and HP for further guidance.

It is imperative to maintain a clean working environment. All areas need to be kept free of debris, trash, and dust on a daily basis in accordance with NFS-OPS-001 Conduct of Operations.

3.4.2 Sampling, Analysis, and Protocols

Sampling will be conducted in accordance with NFS-DC-135, Building 234 Soil, Groundwater, and Groundwater Sludge Sampling and Analysis Plan.

3.4.3 Packaging of Contaminated Trash

Trash will be collected inside one of two trash collection bins located inside the personnel airlock on the north side of the primary containment. The bags of trash will be removed and double-bagged prior to disposal inside a burial box. The bags of trash shall not be compressed without approval from area HP to remove excess air and void space due to radiological airborne issues. The burial box will be radiologically characterized prior to shipment to NTS. HEU Material Handlers shall minimize the generation of waste as much as possible and shall not take unnecessary equipment inside the primary containment until the equipment is needed.

4.0 DEFINITIONS

4.1 Class A Waste – Waste classified as having < 10 nCi/g

4.2 Class C Waste – Waste classified as having 10 to < 100 nCi/g

4.3 Competent Person – The person responsible for determining the safety requirements for trench and excavation work to maintain compliance with 29 CFR 1926, Subpart P as described in NFS-GH-59. This person must be capable of identifying the hazards that are present and take action to diminish them.

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4.4 Controlled Area – A site area where uncontained radioactive material is present, such that contamination levels are likely to be encountered in excess of acceptable levels for unrestricted use.

4.5 Debris - Man made items such as long handled tools, used personal protective equipment, ladders, air hose, and other items encountered during excavation that is packaged and loaded in greater than 50% of the burial box or 55-gallon drum volume.

4.6 Decontamination - The act of removing radioactive materials (contamination) from the surface of an object to an acceptable level.

4.7 Emergency – An unplanned event characterized by sufficient risk to require immediate action to avoid or mitigate an abruptly deteriorating situation.

4.8 Enrichment – The %, by weight, of U-235 in uranium.

4.9 Excavation - Any man made cut, cavity, trench, or depression in an earth surface, formed by earth removal.

4.10 Fire Watch – Employee who watches for fires and fire hazards in areas where hot work is being performed. This employee must be fire extinguisher trained.

4.11 Hazardous Waste – Any material (solid, liquid or gas) that can potentially cause serious harm to employees or the environment if it is not properly used, stored, transported or managed.

4.12 HEU - High Enriched Uranium.

4.13 HP - Health Physicist.

4.14 IDLH – Immediately Dangerous to Life and Health.

4.15 Intermodal Container - A 19-23 cubic yard metal container (approximately 7 ft. wide x 18 ft. long x 5 ft. high) designed to be moved on a trailer chassis or railcar.

4.16 Letter of Authorization (LOA) – A written document that authorizes temporary additional instructions or minor changes to a procedure and contains all actions required for the changes.

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4.17 LEU - Low Enriched Uranium.

4.18 LLW – Low Level Waste, classified as having < 100 nCi/g, which can be either Class A or Class C waste depending on the concentration.

4.19 NDA - Non Destructive Assay - Analyzing for radionuclides by detecting the gamma rays emitted from the material.

4.20 NTS – Nevada Test Site.

4.21 NTS-WAC – Nevada Test Site Waste Acceptance Criteria.

4.22 NUMAC – Nuclear Material Accounting and Control.

4.23 PAPR – A powered air purifying respirator.

4.24 PIRCS - Problem Identification, Resolution and Correction System. A computer program designed to document and track various safety issues and corrective actions taken to resolve them.

4.25 PPE – Personal Protective Equipment.

4.26 Pu – Plutonium.

4.27 Restricted area – The area of the site encompassed by a physical barrier, such as a chain link fence or yellow line to which access is generally controlled.

4.28 RT – Radiation Technician.

4.29 Safety Work Permit (SWP) – A permit designed to provide guidance on performing work that is not routine. The permit protects workers from hazards by addressing radiological and industrial safety issues.

4.30 SNM - Special Nuclear Material.

4.31 Soil Batch – Soil removed from an approximate one-foot lift from one quadrant.

4.32 Special Work Instruction (SWI) – A procedural document used to identify step-by-step actions or requirements, including sketches, drawings and data documentation and reporting, to control and guide actual work.

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4.33 Super Sack - A woven polypropylene bag used to contain soil, waste and/or debris. Typical size is 48" x 48" x 72" and containing approximately 90 cubic feet of material.

4.34 TCLP - Toxicity Characteristics Leaching Procedure. An analysis used to determine if a waste is characteristically hazardous.

4.35 TRU – Transuranic Waste classified as having ≥ 100 nCi/g.

4.36 Utility – Any water, sewer, electrical, or communication line.

4.37 VAGAS – Versatile Automated Gamma Assay System. A special group of detectors set up to measure the radiological characteristics of a container for shipping purposes.

4.38 Waste Materials - Bulk discarded material other than soil or debris uncovered during excavation.

4.39 Waste Pocket – Debris or hazardous waste that has been discarded in a concentrated manner or location (e.g. group of drums), having been previously covered over with soil.

4.40 WIPP – Waste Isolation Pilot Plant.

4.41 WWTF - Waste Water Treatment Facility.

5.0 RESPONSIBILITIES

All personnel are responsible for adhering to the requirements of this and all procedures that apply to work performed within the scope of this SOP.

A Health Physicist is a specially trained person, who is responsible for radiological data interpretation, and generation of SWPs.

NDA Personnel are responsible for providing radiological data on environmental samples.

Process Engineering are responsible for reviewing run sheets, maintaining area processes, and resolving technical issues.

Senior Project Managers are accountable for overall project implementation, including project schedule and budget.

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Transportation and Waste Management Personnel are responsible for preparing the shipping papers and tracking the shipments. Audio/video packaging requirements will be captured in accordance with SOP 335-L.

HEU Material Handlers sample, excavate, monitor and package all waste materials and debris and are responsible for adhering to all procedures, SWPs and work instructions.

Decommissioning Operations Specialist is responsible for preparation of work requests, ordering of supplies, and resolution of issues to facilitate operations.

Decommissioning Operations Manager is responsible for all operations activities, the Daily Stand-Up meeting, and Daily Ops Briefing if work occurs on multiple shifts.

Decommissioning Supervisors are responsible for all HEU Material Handler activities performed in the Decommissioning Group. They are responsible for compliance of SWP work. They shall maintain a logbook and document the following as needed:

- All work (soil condition, absorbent added or needed, soil batches excavated, waste containers loaded, staged, moved, water pumped, areas excavated, etc.)
- HuP implementation
- All SWP work initiated and terminated
- SWP pre-job briefings
- Employee safety concerns
- All accidents and injuries
- All unusual events
- Shift staffing including absences
- RT shift coverage and shortages

Radiation Technicians (RT) are responsible for performing release surveys and shipping surveys, as well as all regulatory required routine surveys and specific job coverage surveys.

The Environmental Specialist, Scientist or designee oversees sampling and environmental aspects of excavation. The Environmental Specialist also specifies which attributes shall be analyzed for waste verification.

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6.0 SYSTEM PREPARATION

6.1 Disconnect Drum Haulers from respective charging stations and ensure the battery is fully charged as indicated by the green indicator light.

6.2 Ensure the air compressor is turned on prior to using the air pallet by checking the display on the south side of the compressor.

6.3 Disconnect electric pallet jack from the charging station prior to use.

6.4 Ensure placement of herculite or other Health Physics approved floor covering is secured with tape in drum loading areas and north equipment airlock prior to conducting airlock operations.

6.5 Replace or re-tape floor coverings that are damaged or show excessive signs of wear.

6.6 Soil sampling and associated analysis is addressed in the Building 234 Soil, Groundwater, and Groundwater Sludge Sampling and Analysis Plan. NFS-approved SWIs will be used to provide specific instructions for sample collection and handling.

6.7 Burial Box Preparation

1) Transport an empty burial box inspected and approved by Transportation and Waste Management with lid attached inside the 234 Excavation Facility.

NOTE: Ensure the lid is secured on the empty burial box prior to transport outside during rain or snow to prevent water collection inside the box.

2) Remove the lid from the empty burial box.

CAUTION: The lid weighs approximately 200 pounds. Use proper lifting techniques when removing the lid.

3) Raise the height of the burial box using the electric pallet jack.
4) Install the burial box i-beam extensions by sliding the extensions over the ends of the outer i-beams.

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CAUTION: Do not place any part of the body underneath the i-beams on the bottom of the burial box during installation.

5) Lower the height of the burial box until the box is stationary on the ground.
6) Place a super sack inside the empty burial box and remove excess void space between the sack and the burial box.
7) Place super sack flaps on the outside of the burial box and ensure hoisting straps are accessible.
8) Wrap the exterior of the burial box, including super sack flaps, with plastic wrap.

6.8 Drum Preparation

1) Obtain an inspected and T&WM-approved empty 55-gallon drum, which is indicated by two labels "Container Approved for NTS Disposal" and "Container Approved for WIPP Disposal, " with lid, drum ring, and bolt and transfer the empty drum into the 234 Excavation Facility.

NOTE: Ensure the lid is placed on the empty drum prior to transport outside during rain or snow to prevent water collection inside the drum.

2) Remove the lid from the empty 55-gallon drum if present.
3) Obtain a clean transfer bag equipped with a filter and rigid 90-mil liner and transfer into the 234 Excavation Facility.
4) Place a clean transfer bag inside the empty 55-gallon drum and remove excess void space between the bag and the drum.
5) Position excess clean transfer bag on the outside of the empty 55-gallon drum. Excess bag should cover the entire outside of the empty 55-gallon drum at a minimum.
6) When loading soil and gravel, place the rigid 90-mil liner inside the 55-gallon drum such that the clean transfer bag resides between the empty 55-gallon drum and the 90-mil liner. Do not use a rigid 90-mil liner when packaging or repackaging debris.

NOTE: Area Process Engineering may approve placement of the 90-mil liner inside the clean transfer bag followed by placement of the bagged 90-mil liner into the 55-gallon drum in lieu of Steps 4 through 6.

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7) Determine the tare weight of the configured 55-gallon drum to include the 90-mil liner, clean transfer bag, lid, ring, and bolt. This step is only required once and only needs to be conducted again if the drum configuration changes.

> **NOTE:** Ensure that Steps 2 through 6 are monitored by the camera system in accordance with SOP 335-L where applicable.

6.9 Bag Out Preparation

1) Place the assembled 55-gallon drum on the drum cart carousel.

> **NOTE:** Inspect drum cart and carousel prior to use to ensure proper functionality.

2) Position the drum cart inside the drum packaging station specified by supervision and engage the cart brake.

> **NOTE:** Handheld barcode scanners may be utilized to capture bar codes on video recording prior to placement of the drum cart inside the drum packaging station as applicable in SOP 335 L.

> **NOTE:** The drum cart may be raised during waste loading if specified by area Process Engineer.

3) Close the drum packaging station door and lower the top enclosure sashes to the lowest position.
4) If present, position the existing elastic band, Velcro strap, or Process Engineer approved equivalent off of the existing bag stub from the previous drum bag out.
5) Lower the existing bag stub from above the top bagging ring to a position in between the upper and lower bagging rings.
6) Position the new clean transfer bag above the top bagging ring such that the new bag completely encloses the old bag stub.
7) Position the elastic band, Velcro strap, or Process Engineer approved equivalent off of the drum port in between the bungee cord of the clean transfer bag and the top bagging ring.
8) Use the excess of the clean transfer bag to grab the bottom of the existing bag stub, and pull the stub off of the drum port into the bottom of the empty drum.

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9) Place excess bag around the outside diameter of the empty drum and secure to the side of the drum using a strap.
10) Raise the top enclosure sashes and secure in the closed position.
11) Visually ensure that all openings to the enclosure are closed and secure and bag integrity is maintained.

6.10 CO Monitor Bump Test

1) The RT, with assistance from the HEU Material handler, will inspect CO monitor and remove any debris or dirt present on the bump test cup.
2) HEU Material Handler will affix the bump test cup to the CO monitor sensor inside the primary containment.
3) RT will partially open the regulator and attach the regulator to the bump test gas bottle.
4) RT will attach the tubing to test fitting and open the isolation valve.
5) RT will open the containment isolation valve.
6) RT will open the regulator valve and allow valve to stabilize.
7) HEU Material Handler will communicate the bump test reading to the RT for the respective CO monitors.
8) RT will record bump test information on Attachment#1.
9) RT will close the regulator isolation valve and immediately close the containment isolation valve.
10) Proceed to the next CO monitor and repeat steps 1 – 9 until remaining bump testing has been completed.
11) If the bump check indicates failure for any of the CO monitors, calibration can be performed on the failed monitor or a new monitor with successful calibration can replace the failed monitor.

6.11 CO Monitor Alarm

1) If one or more CO monitors reach $\geq$ 35 ppm to $\leq$ 50 ppm, proceed with the following steps:
    a. Position the excavator and all other processing equipment inside the primary containment to a safe shut down position.
    b. Turn the excavator engine off.
    c. Monitor each of the five CO monitors and allow building ventilation to remove excess carbon monoxide build-up.
    d. Proceed with routine operations once all CO monitors indicate carbon monoxide levels of $\leq$ 25 ppm.

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2)If one or more CO monitors reach > 50 ppm, proceed with the following steps:

a. Position the excavator and all other processing equipment inside the primary containment to a safe shut down position.
b. Turn the excavator engine off.
c. Safely exit the primary containment.
d. Monitor each of the five CO monitors from outside the primary containment and allow building ventilation to remove excess carbon monoxide build-up.
e. Proceed with routine operations once all CO monitors indicate carbon monoxide levels of 25 ppm.

3)If CO monitors alarm, HEU Material Handlers shall notify Supervisor or Process Engineer for system inspection.

7.0 DEBRIS ABOVE WET CELL CAP

Debris currently resides above the wet cell cap from previous Building 234 activities. This debris must be removed prior to removal of the wet cell cap. This work scope will be captured in an approved Specific Work Instructions (SWI).

8.0 WET CELL CAP

The wet cell cap consists of fiberglass decking and beams with ethylene propylene diene monomer (EPDM) rubber on top of the decking. This cap and a portion of adjacent concrete must be removed prior to soil excavation. This work scope will be captured in an approved SWI.

9.0 SOIL EXCAVATION

The total area requiring excavation has been divided into two separate excavation phases. The first phase of excavation consists of the footprint of the wet cell area. The second phase of excavation consists of the footprint of the concrete slab and soil on which the excavator is currently located.

Two different waste classifications will be encountered during operations. These consist of low-level waste (Class A and Class C) and transuranic waste (TRU). Each waste classification has a specific set of requirements that must be met in order to ensure packaging compliance with the respective disposal facility.

9.1 Wet Cell Excavation

Soil processing consists of three phases. The first phase focuses on handling debris

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that may be present on the top surface of the quadrant selected for excavation. The second phase focuses on soil excavation, sample analysis screening, and absorbent addition. The final phase focuses on the packaging method that will be used and is based on analytical screening results obtained. A soil batch is identified as a batch with approximate dimensions of 11 feet wide by 14 feet long by 1 foot deep.

The first phase of excavation consists of the footprint of the wet cell area. This footprint has been divided into a total of 7 quadrants. The approximate dimensions of each quadrant are 11 feet wide by 14 feet long. Soil will be excavated at approximate 1 foot depth increments, thus comprising a soil treatment batch of approximately 154 ft^3.

Each quadrant will be excavated until soil activity concentration reaches Class A (< 10 nCi/g) limits, bedrock refusal is encountered, or the excavator arm has reached full extension. When one of the three criteria listed above is reached for a given quadrant, sampling will be conducted and verified. The quadrant will then be backfilled with a flowable-fill low-strength concrete. Backfill will be addressed in an approved SWI. Sampling will be conducted in accordance with NFS-DC-135.

HEU Material Handlers shall complete Attachment #4 "Use every time check list for packaging CH-TRU Soil and Gravel" for each container of transuranic waste that is packaged. This form will be attached to the respective drum upon packaging.

9.2 Soil Excavation

1) Use the excavator to level the top surface of the adjacent quadrant for soil staging.
2) Use the excavator to excavate a soil batch of approximately 11 feet wide by 14 feet long by 1 foot deep.
3) Stage the excavated soil batch on the top surface of the adjacent quadrant using the excavator.
4) Add the amount of an approved absorbent specified by Area Process Engineer or Supervision to the excavator bucket.
5) Use the excavator to deliver absorbent to the soil batch.
6) Use the excavator to thoroughly mix the absorbent and soil batch.
7) Collect one grab sample and one duplicate and place in 2 sample jars from the mixed soil batch using the excavator bucket for paint filter testing. Ensure that the Hydraulic Activation Control Lever is disengaged prior to the HEU Material Handler approaching the bucket for sample collection.
8) Transport the sample jars from the excavation site to the paint filter test assembly for paint filter testing.

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9) Perform paint filter testing in accordance with Attachment #2 of this procedure and document sample number and paint filter test results in a sample log book. These results will also be recorded on the Waste Container Packaging Form in accordance with SOP 335-L.

10) If paint filter test results indicate the treated soil batch fails the paint filter test, then repeat Steps 4 through 9 using approximately 50 pounds of additional absorbent until paint filter test results indicate the treated soil batch passes paint filter testing.

11) Prepare one 500 ml poly sample jar with a latex glove to sleeve or other suitable radiological contamination control methods specified by area HP or RT.

12) Collect one sample in accordance with NFS-DC-103, current revision, and place in one 500 mL sample jar from the mixed soil batch using the excavator bucket for non-destructive assay (NDA) analysis.

13) Transport the sample jar from the excavation site to the north personnel airlock door and remove jar sleeving as specified by area HP or RT.

14) Perform decontamination on the 1 sample jar.

15) Sample will require surveys prior to release from the radiologically controlled area and shall be transported to the NDA lab for NDA analysis as specified by area HP or RT.

16) Supervisors will document sample number and analytical results in a sample log book.

17) Sample will require surveys prior to release from the radiologically controlled area and shall be transported to the NDA lab for NDA analysis as specified by area HP or RT.

18) Stage approximately 12 empty stainless steel drums adjacent to the excavator.

19) Fill the bottom of each of the 12 drums with 4 – 8 inches of absorbent using the absorbent transfer bucket as specified by area Process Engineering.

20) Use the excavator to fill each of the 12 drums with the treated soil batch.

NOTE: An aluminum portable hopper is available inside the primary containment to assist loading treated soil into stainless steel drums if needed to minimize spillage. The excavator is equipped with an arm-mounted camera and monitor system, which should be used by the excavator operator to ensure the drum is not over-filled.

21) Ensure that the soil in the drum is approximately level with the top surface of the drum.

22) Proceed to Section 9.2.1 for NDA analytical screening results that indicate the treated soil batch is low level waste.

23) Proceed with Section 9.2.2 for NDA analytical screening results that indicate the treated soil batch is 90% or greater of the transuranic limits.

NOTE: The limits listed in 9.2, Steps 21 and 22 can be adjusted by area Process Engineering based on operations experience.

24) Rocks will be processed according to the following:

a. A jack hammer or other appropriate equipment may be used to reduce rock size.

b. Rock which are less than 6" in diameter are considered soil and will be processed as such.

c. Rock over 6" and less than 10" in diameter will be considered debris. The hopper on the Lexan enclosures cannot accept rock greater than 10" in diameter.

NOTE: Do not mix the contents of two different batches into the same stainless steel drum inside the primary containment. Soil remaining in a quantity smaller than a 55-gallon drum shall be mixed with the next batch that is excavated.

9.2.1 Soil Packaging Method for Low Level Waste

1) Use electric pallet jack in accordance with manufacturer's recommendations to retrieve an empty T&WM-approved burial box from the burial box staging area.

2) Transport burial box from the staging area to the inside of the north side equipment airlock.

3) Use the air pallet in accordance with the manufacture's recommendations to transfer the burial box from the inside of the equipment airlock to the inside of the primary containment.

NOTE: Herculite or equivalent plastic floor covering should be placed on the metal floor inside the primary containment prior to burial box staging to minimize the potential for radiological contamination on the bottom of the burial box.

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4) Shut off the air to the air pallet and let residual air bleed off completely.
5) Remove the air pallet from underneath the burial box and return it to the inside of the equipment airlock.
6) Close the door separating the inside of the primary containment from the inside of the equipment airlock.
7) Use Drum Hauler to transport a stainless steel drum filled approximately half full with an approved absorbent specified by Area Process Engineer or Supervisor and transport the drum to the empty burial box.
8) Use Drum Hauler to raise the top of the stainless steel drum to approximately 24 inches above the opening of the empty burial box.
9) Use Drum Hauler to rotate the stainless steel drum to transfer the contents from the drum into the burial box. Contents may be leveled using hand tools if needed.
10) Use Drum Hauler to transport a stainless steel drum containing treated soil from the stainless steel drum staging area adjacent to the excavator and transport the drum to the empty burial box.
    a. NOTE: Personnel shall remain 5 feet clear of materials or equipment when lifted above floor level.
11) Use Drum Hauler to raise the stainless steel drum to approximately 24 inches above the opening of the empty burial box.
12) Use Drum Hauler to rotate the stainless steel drum to transfer the contents from the drum into the burial box.
13) Repeat steps 10 through 12 until the burial box is a minimum of 80% full (approximately 9 inches of void space from the top of the box).
14) Use shovels, rakes, or other suitable methods to level the contents inside the burial box after the addition of each drum.
15) Don a clean pair of outer gloves and cut the plastic wrap off of the burial box and place removed plastic inside the burial box.
16) Close the super sack per the manufacturer's instructions.
17) HEU Material Handlers inside the equipment airlock will open the door separating the inside of the primary containment from the inside of the equipment airlock.
18) Engage compressed air for the air pallet until the air bladders are fully inflated.
19) Position the air pallet underneath the full burial box.
20) Transport the full burial box to the inside of the equipment airlock.
21) Close the door separating the inside of the primary containment from the inside of the equipment airlock.

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22) Perform lid closure of the full burial box in accordance with Attachment #3.

9.2.2 Soil Packaging Method for Transuranic Waste

1) Ensure that the 55-gallon drum is in place on the drum bagout station in accordance with Section 6.9 of this procedure.
2) Use Drum Hauler to transport a stainless steel drum containing treated soil from the stainless steel drum staging area adjacent to the excavator to one of four drum dumping stations.
3) Stage stainless steel drum on the drum roller conveyor.
4) Use the drum roller conveyor to position the stainless steel drum on the base of the drum dumper.
5) Secure the yellow drum clamps to the top of the stainless steel drum.
6) Drum dumping operations will be controlled by personnel outside the primary containment in accordance with Section 9.2.3 of this procedure.

> **NOTE:** Personnel inside the primary containment may need to stand on the upper platform behind the fixed handrail during drum dumping operations to use long handled tools to facilitate dumping or inspection of wastes during the transfer.

> **CAUTION:** Operations personnel inside the primary containment shall stand clear of the drum dumpers when the yellow beacons are signaling drum dumping operations.

7) Operations personnel will remove the empty stainless steel drums from the drum dumpers and stage the empty drums back in the stainless steel drum staging area adjacent to the excavator.

9.2.3 Bag Out Operation

1) Visually verify through the Lexan wall that the yellow drum clamps on the drum dumper are securing the drum inside the primary containment.
2) Push and hold the hand controller for the respective drum dumper to raise the stainless steel drum until the waste contents have been completely transferred. The camera system may be utilized for verification of transfer.

> **NOTE:** Operations personnel may disengage the hand controller for drum dumping to facilitate inspection of waste as needed in accordance with SOP 335-L.

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3) Push and hold the hand controller to lower the empty stainless steel drum after the waste has been transferred.
4) Visually inspect the clean transfer bag and verify the bag integrity was not compromised during waste transfer.
5) Ensure the entire contents of the stainless steel drum were transferred through the use of camera system and/or radio communications.

> **NOTE:** If the bag integrity has been compromised during waste transfer, stop bag out operations and contact area supervisor. Area supervision will notify radiological safety for further instructions.

6) If the bag integrity was not compromised during waste transfer, lower the top enclosure sashes.
7) Remove the strap securing the excess bag from the drum.
8) Rotate the drum on the drum carousel until a "horsetail" with an approximate length of 8 to 10 inches is formed.
9) Ensure that the bag filter is located between the top of the drum and the bottom of the "horsetail ."
10) Place and tighten one ziptie at each end of the "horsetail."
11) Use tape approved by Process Engineer to cover the "horsetail."
12) Prepare two sections of tape or vinyl "dots" to be utilized to cover exposed ends after "horsetail" is cut.
13) Use ratcheting PVC cutter to cut the center of the "horsetail."
14) Place the two previously prepared pieces of tape over the exposed ends.
15) Contact area Radiation Technician to perform necessary survey as directed by the area Health Physicist.
16) Decontamination of the drum and/or the lexan enclosure will be performed as directed by area Radiation Technicians based on survey results.
17) Open the drum packaging station door and release the drum cart brake.
18) Transport the drum cart to the outside of the enclosure and close drum packaging station door.
19) Place the lid on the top of the drum and secure lid with drum ring and bolt.
20) Torque bolt to 55 to 60 ft-lbs and ensure drum ring ends do not contact using tools specified by Area Process Engineer or Supervisor.
21) Install tamper indicating device.

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NOTE: Ensure that steps 18 through 21 are monitored by the camera system in accordance with SOP 335-L where applicable. All requirements of SOP 335-L shall be met during bag-out operations.

22) Ensure the lid and drum ring are properly seated on the drum.
23) RTs perform off site shipping survey.
24) Use Drum Hauler to place drum on the scale located inside 234 Excavation Facility and weigh the drum.
25) Record the drum weight on burial certification
26) Ensure the calibration on the scale is current.
27) NuMAC transactions for this container will be performed in accordance with Attachment #5 of this procedure.
28) Use Drum Hauler to stage the drum for future NDA analysis.

10.0 SYSTEM SHUT DOWN

10.1 Communications radios shall be placed on chargers at the end of each shift.
10.2 Drum Haulers shall be staged and connected to their respective charging stations at the end of each shift.
10.3 The excavator shall be placed in a safe shut down with the entrance to the cab facing the west wall of the primary containment at the end of each shift.
10.4 The air compressor shall be turned off at the end of each shift.

11.0 NON ROUTINE OPERATIONS AND PROCESS UPSETS

11.1 Abnormal Operations Responses

Abnormal operations responses will be addressed in NFS-DC-136, "Emergency Preparedness and Adverse Condition Procedure for the 234 Facility."

ATTACHMENT #1 – CO MONITOR BUMP CHECK DOCUMENTATION FORM

Date	Station Number	Time	Result (Pass/Fail)	Monitor Calibration Date

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ATTACHMENT #2 – EPA PAINT FILTER TEST METHOD

METHOD 9095B
PAINT FILTER LIQUIDS TEST

1.0 SCOPE AND APPLICATION

1.1 This method is used to determine the presence of free liquids in a representative sample of waste.

1.2 The method is used to determine compliance with 40 CFR 264.314 and 265.314.

2.0 SUMMARY OF METHOD

2.1 A predetermined amount of material is placed in a paint filter. If any portion of the material passes through and drops from the filter within the 5-min test period, the material is deemed to contain free liquids.

3.0 INTERFERENCES

3.1 Filter media were observed to separate from the filter cone on exposure to alkaline materials. This development causes no problem if the sample is not disturbed.

3.2 Temperature can affect the test results if the test is performed below the freezing point of any liquid in the sample. Tests must be performed above the freezing point and can, but are not required to, exceed room temperature of 25° C.

4.0 APPARATUS AND MATERIALS

4.1 Conical paint filter -- Mesh number 60 +/- 5% (fine meshed size). Available at local paint stores such as Sherwin-Williams and Glidden.

4.2 Glass funnel -- If the paint filter, with the waste, cannot sustain its weight on the ring stand, then a fluted glass funnel or glass funnel with a mouth large enough to allow at least 1 in. of the filter mesh to protrude should be used to support the filter. The funnel should be fluted or have a large open mouth in order to support the paint filter yet not interfere with the movement, to the graduated cylinder, of the liquid that passes through the filter mesh.

4.3 Ring stand and ring, or tripod.

4.4 Graduated cylinder or beaker -- 100-mL.

5.0 REAGENTS

5.1 None.

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6.0 SAMPLE COLLECTION, PRESERVATION, AND HANDLING

A 100-mL or 100-g representative sample is required for the test. If it is not possible to obtain a sample of 100 mL or 100 g that is sufficiently representative of the waste, the analyst may use larger size samples in multiples of 100 mL or 100 g, i.e., 200, 300, 400 mL or g. However, when larger samples are used, analysts shall divide the sample into 100-mL or 100-g portions and test each portion separately. If any portion contains free liquids, the entire sample is considered to have free liquids. If the sample is measured volumetrically, then it should lack major air spaces or voids.

7.0 PROCEDURE

7.1 Assemble test apparatus as shown in Figure 1.

7.2 Place sample in the filter. A funnel may be used to provide support for the paint filter. If the sample is of such light bulk density that it overflows the filter, then the sides of the filter can be extended upward by taping filter paper to the inside of the filter and above the mesh. Settling the sample into the paint filter may be facilitated by lightly tapping the side of the filter as it is being filled.

7.3 In order to assure uniformity and standardization of the test, material such as sorbent pads or pillows which do not conform to the shape of the paint filter should be cut into small pieces and poured into the filter. Sample size reduction may be accomplished by cutting the sorbent material with scissors, shears, a knife, or other such device so as to preserve as much of the original integrity of the sorbent fabric as possible. Sorbents enclosed in a fabric should be mixed with the resultant fabric pieces. The particles to be tested should be reduced smaller than 1 cm (i.e., should be capable of passing through a 9.5 mm (0.375 inch) standard sieve). Grinding sorbent materials should be avoided as this may destroy the integrity of the sorbent and produce many "fine particles" which would normally not be present.

7.4 For brittle materials larger than 1 cm that do not conform to the filter, light crushing to reduce oversize particles is acceptable if it is not practical to cut the material. Materials such as clay, silica gel, and some polymers may fall into this category.

7.5 Allow sample to drain for 5 min into the graduated cylinder.

7.6 If any portion of the test material collects in the graduated cylinder in the 5-min period, then the material is deemed to contain free liquids for purposes of 40 CFR 264.314 and 265.314.

8.0 QUALITY CONTROL

8.1 Duplicate samples should be analyzed on a routine basis as specified by area Process Engineer.

9.0 METHOD PERFORMANCE

9.1 No data provided.

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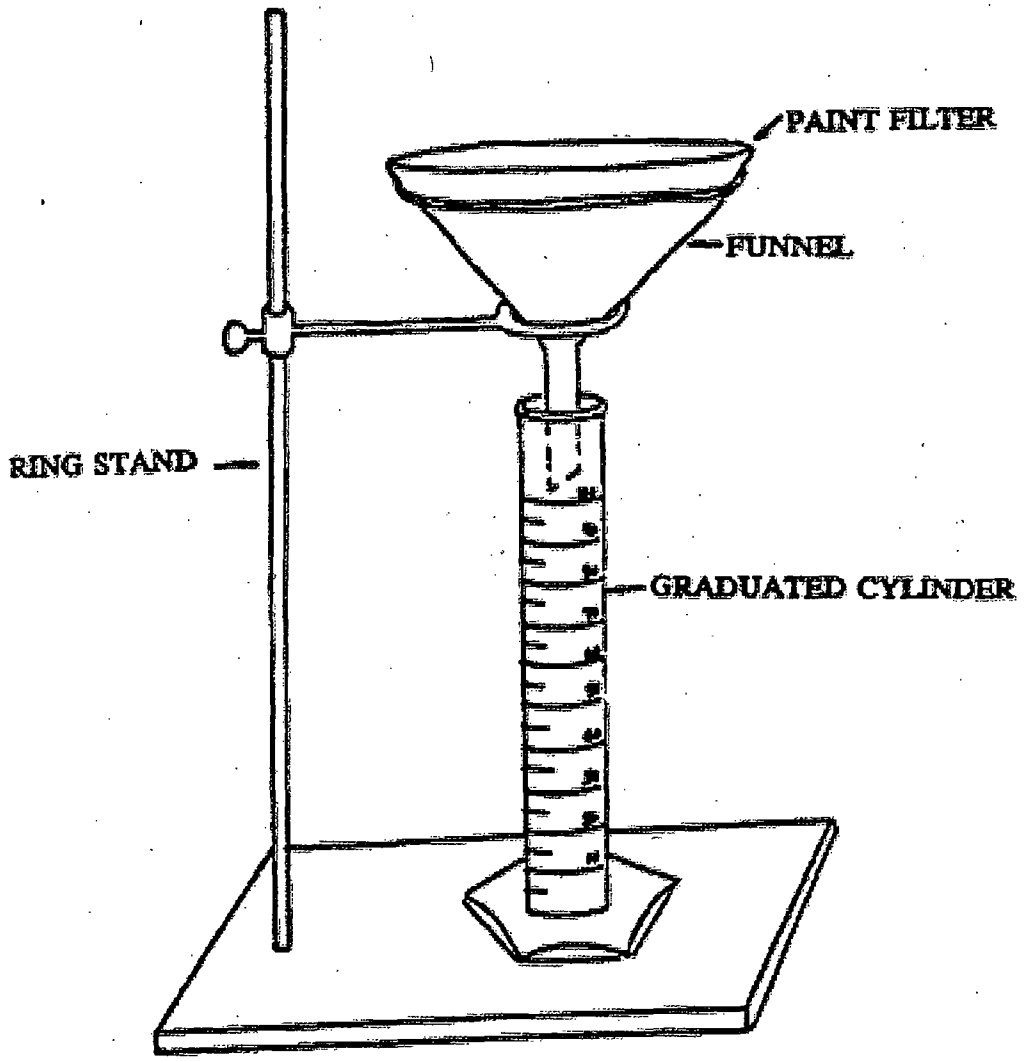
10.0 REFERENCES

10.1 None provided.

FIGURE 1
PAINT FILTER TEST APPARATUS
METHOD 9095B



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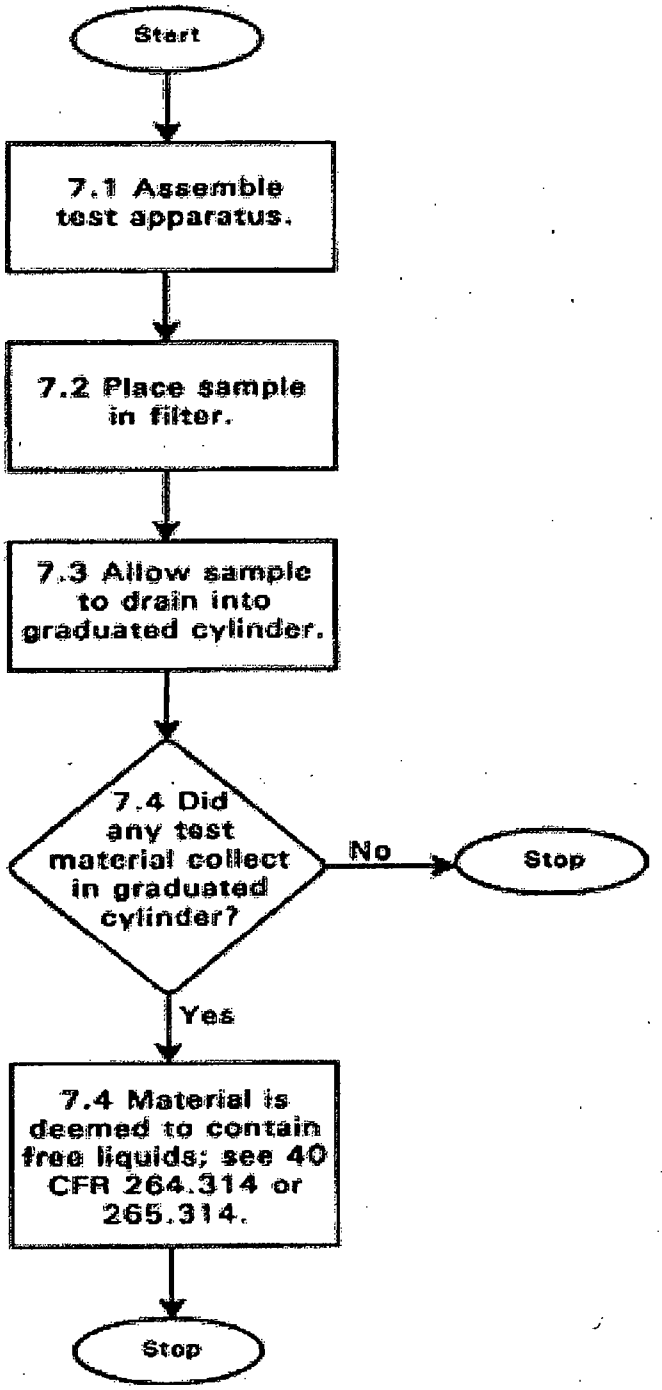
METHOD 9095B
PAINT FILTER LIQUIDS TEST



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ATTACHMENT #3 – BURIAL BOX LID CLOSURE INSTRUCTIONS

1.0 PURPOSE:

The purpose of this attachment is to provide documented instructions for closure of the Blue Burial Boxes per manufacturer's instructions.

2.0 INSTRUCTIONS:

The T&WM or Decommissioning HEU material handlers will perform the closure of the Blue Burial Boxes.

CAUTION: Be alert to all pinch points while performing this process. Never place part of your body beneath suspended load.

2.1 Prepare Blue Burial Boxes by:

2.1.1 Verify the lid gasket is firmly sealed to the bottom of the lid and has not been damaged or dislocated. If gasket is not installed, install gasket on bottom side of lid per Waste Management Specialist instructions.

2.1.2 Verify gasket seating area on the rim of the box is clean and free of debris.

2.1.3 Place lid on Burial Box.

2.2 Install bolts and washers as follows:

2.2.1 If the nut is serrated, place bolt with single flat washer through container and lid followed by another flat washer and serrated nut.

2.2.2 If the nut is non-serrated, place bolt with single flat washer through container and lid followed by another flat washer and lock washer then the non-serrated nut.

2.3 Tighten each bolt until snug.

2.4 Torque each bolt using a calibrated torque wrench per the sequence pattern shown in Attachment I to 15 ft. lbs.

2.5 Re-torque each bolt using a calibrated torque wrench to 30 ft. lbs. Attachment I sequence is not required.

2.6 Gasket compression is now complete.

2.7 After container card is printed write the following in the "Remarks" section: **"Lid torqued to 30 ft. lbs." Then initial and date.** Only one person's initials are required.

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ATTACHMENT #3 – BURIAL BOX LID CLOSURE INSTRUCTIONS
ATTACHMENT I

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ATTACHMENT #4 - USE EVERY TIME CHECK LIST FOR PACKAGING CH-TRU SOIL AND GRAVEL

1) Video record all 55-gallon drum loading with an audio narration per Section 22 of SOP-335-L. ☐ Yes ☐ No
2) DOE exception received for the audio / video WIPP requirements ☐ Yes ☐ No
3) Document a written record of waste packaging on the WCPF, WBIF, and RPCR, place in a 1-gallon liner and attach to top of drum. Provide T&WM Specialist with a copy of the attachments. ☐ Yes ☐ No
4) Package TRU waste into a 55-gallon drum using as few closed plastic bag layers as possible, but no more than two closed plastic bag layers. ☐ Yes ☐ No
5) Ensure that the outer bag consists of a WIPP approved filter bag. ☐ Yes ☐ No
6) If inner bags are used, please obtain approval from the T&WM Specialist and ensure the inner bag is either vented or open. ☐ Yes ☐ No
7) Each bag, if closed, shall be closed by the twist-and-tape method (horse-tail) and equipped with a filter per DOE Memo, "Contact-Handled Transuranic Waste Packaging Instructions "Rev. 0 final 9-30-08[1], Section 7.1. ☐ Yes ☐ No
8) Waste packages shall be loaded to ensure that the interior volume is as efficiently loaded as practical to minimize void space. ☐ Yes ☐ No
9) Document the unique container identification number on the WCPF and RPCR. ☐ Yes ☐ No
10) Document on the WCPF and RPCR a description of each item of waste placed into the receiving container including estimated weight percent composition of each waste constituents: ☐ Yes ☐ No
11) When waste is treated (i.e. absorbent added) for any reason prior to packaging, document the waste form, treatment method, absorbent used, solidification agent, and product name and manufacturer of all materials added on the WCPF and the RPCR: ☐ Yes ☐ No ☐N/A
12) Complete the WCPF per the instructions in Section 32 of SOP-335-L. ☐ Yes ☐ No
13) Complete the RPCR per the instructions in SOP 335 A. ☐ Yes ☐ No
14) Prior to packaging, determine that each batch of Soil and Gravel does not contain free liquid using EPA Publication SW-846 "Test Methods for Evaluating Solid Waste, Physical/Chemical Methods", Method 9095B (Paint Filter Liquids Test). ☐ Yes ☐ No
15) When liquid is determined to be present, add approved absorbent in a quantity sufficient to absorb all liquid. ☐ Yes ☐ No ☐N/A
16) Following mixing with absorbent and prior to packaging, determine that the batch of waste no longer contains free liquid by repeating the Method 9095B Paint Filter Liquids Test. ☐ Yes ☐ No ☐N/A
17) If liquid is determined to be present, add additional approved absorbent until the Soil and Gravel is determined not to contain free liquid using the Method 9095B Paint Filter Liquids Test. ☐ Yes ☐ No ☐N/A
18) Document the result of the Method 9095B Paint Filter Liquids Test performed on the WCPF and RPCR. ☐ Yes ☐ No

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Packer Date Packer Date Supervisor Date

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ATTACHMENT #5 – NuMAC TRANSACTION

Perform a "Remove Material From Process" and "Apply a Seal" transaction in NUMAC. Use the following process information:

Process Group:	Facility Decommissioning/Cleanup
Process:	Pu Decommissioning/Cleanup
Process Step:	Pu Decommissioning/Cleanup
I/O Stream:	I/O Stream-Pu Soil/Gravel or Debris
	I/O Stream-Pu Homogenous Solids
	I/O Stream-Pu PPE
	I/O Stream-Pu D&D Organics (oils, coolants, etc.)

I/O Stream	**Batch Mask**
I/O Stream-Pu Soil/Gravel or Debris	QUAD-##-##
I/O Stream-Pu Homogenous Solids	QUAD-##
I/O Stream-Pu PPE	Julian date
I/O Stream-Pu D&D Organics	Julian date

Material Descriptions
Pu Debris Drum
Pu Soil & Gravel Drum
Pu Homogenous Solids Drum
Pu Debris Box
Pu Soil & Gravel Box
Pu Organics Drum

Note: Quadrant identification will be handled by quadrant number and lift depth. For example, soil removed from quadrant 2 at 4 foot depth will be shown as QUAD-02-04.

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ATTACHMENT #6 – RED LINE DOCUMENT CHANGE FORM

Date	Procedure Section	Comments	Sr. Project Manager Approval	Industrial Safety Approval

Attachment 3 - Acceptable Knowledge Source Document Summary

Site(s): Oak Ridge National Laboratory	Source Document Tracking Number: C099
Waste Stream Number(s): ORNL Non-specific Library Files (Applicable only when site library is not in use)	
Acceptable Knowledge Documentation Type: ☑ TRU Waste Management Program Information ☑ Waste Stream-Specific Information ☐ Additional Information	Category: ☑ Correspondence ☐ Discrepancy Resolution ☐ Internal Procedure ☐ Miscellaneous ☐ Published Document or Internal Procedure ☐ Unpublished Documents
Title or Description of Source Document [a]: Letter to Harold Johnson, CBFO DOE re: KAPL-NFS Transuranic Waste Background Information	
Source Document Reference Information (author(s), document and revision number, date, publisher): Delwiche, D. A., NA, NA, 05/03/2005, DOE, Schenectady Naval Reactors Office	

AK # [b]	Source Doc. Page # [c]	AK Information Summary
PR1, PR2, PR3, PR4, PR6, PR7, WS1, WS2, WS3, WS4, WS5, WS7, WS9, WS10, WS11, WS12	ALL	This correspondence contained information regarding the generation of waste at Nuclear Fuel Services, Inc., Erwin, TN. It included a description of the building, what processes generated the waste, and the defense program associated with the operations in the building. It also included background information on the waste, and historical information about the plant. Production history, contract information, decommissioning activities, waste disposal options, and a summary description of building 234 including a building map, are discussed. The TRU wastes can be specifically linked to carrying out defense nuclear materials production, defense nuclear waste and by-products management, and defense research and development. Concerning the waste remaining at NFS: There are two drums of PCB contaminated waste. Waste items include concrete, metal, PPE, Plexiglas, plastic, HEPA filters, piping ductwork glass, cloth, paper, rubber, and small hand tools. Waste is packaged in 55-gallon stainless steel drums, B25 boxes and high-density polyethylene high integrity containers. There will be additional D&D waste generated - contaminated soil and concrete debris. Page 4 Predominant TRU isotopes are Pu-238, Pu-239, Pu-240, Pu-241, and Am-241 with an average TRU activity of ~860 nCi/gm.

NTPC RECORDS ORIGINAL
DATE REC'D 12/18/13

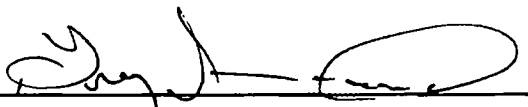
Attachment 3 - Acceptable Knowledge Source Document Summary (continued)

Site(s): Oak Ridge National Laboratory	Source Document Tracking Number: C099

Source Document Data Limitations (if any):

1. Attachments B and C (contracts) are not included with the document.
2. No specific information on individual waste containers.

Acceptable Knowlege Expert:

Trey Greenwood  Date: 11/14/2013

Print /Sign

[a] Provide description for non-titled information (i.e., container paperwork, MSDS sheets, etc)
[b] Obtain from Acceptable Knowledge Documentation Checklist
[c] For microfilm or microfiche, identify box, tape, reel number and location.

Department of Energy
Schenectady Naval Reactors Office
Post Office Box 1069
Schenectady, New York 12301-1069

COPY

Dave/Bev: F.Y.I. & inventory
Roger

REC&SD:DAD05-17

MAY 0 3 2005

Mr. Harold Johnson
U.S. Department of Energy
Carlsbad Field Office
P.O. Box 3090
4021 National Parks Highway
Carlsbad, NM 88221

Subject: **KAPL-NFS TRANSURANIC WASTE BACKGROUND INFORMATION**

Dear Mr. Johnson:

Recent small quantity generator site (SQS) conference calls have discussed the status of defense determinations, including the preparation of defense determinations for TRU waste streams at the Oak Ridge National Laboratory (ORNL). I have enclosed background information that may be relevant for an ORNL TRU waste stream.

Nuclear Fuel Services, Inc. (NFS), located in Erwin, Tennessee, generated TRU waste from the decommissioning of a former Mixed Oxide (MOX) Fuel Fabrication Facility (Building 234). TRU waste generated during the first phase of the decommissioning of the facility was shipped to ORNL in the early 1990s. TRU waste generated during the second phase of decommissioning (building removal) is currently in storage at NFS. Additional TRU waste from the removal of contaminated soils under this facility is expected to be generated in the future (final phase). NFS produces nuclear fuel materials for use in the Naval Nuclear Propulsion Program. Naval Reactors is financially responsible for decommissioning of retired NFS facilities, including the second and final phase of the MOX facility decommissioning. The Knolls Atomic Power Laboratory (KAPL), under contract to Naval Reactors, works with NFS and Naval Reactors on facility decommissioning and related issues. The TRU waste from the second and final phase of the Building 234 decommissioning is designated as KAPL-NFS waste.

In support of the building demolition and final phases of the Building 234 decommissioning project, the attached background information discussing government-sponsored orders covering the production period of Building 234 is applicable. Since the TRU waste from NFS at ORNL has NFS Building 234 as its origin, this information may be of use in supplementing ORNL's defense determination.

UNIQUE #	DOE UFC	DATE REC'VD	ADDRESSEES
0501987	1100.00	MAY 09 2005	H. Johnson R. Nelson

C-099

 MAY 0 3 2005

I appreciate the opportunity to provide this information to you and hope it will be useful. Please call me at (518) 395-4543 if you have any questions.

Sincerely,

D. A. Delwiche
Radiological/Environmental
Control and Safety Division

Enclosure:
As Stated

cc: R. Nelson, CBFO
G. Riner, ORO
D. M. Battiste, KAPL
R. Moore, NFS

Background Information on KAPL-NFS Transuranic Waste

Summary: Nuclear Fuel Services (NFS) in Erwin, Tenessee is decommissioning Building 234, a former plutonium-uranium Mixed Oxide (MOX) Fuel Fabrication facility that operated from 1965 to 1973. Included in the decommissioning is a waste tank (removed from beneath the building 110C laboratory) contaminated with Building 234 MOX facility laboratory waste.

The Building 234 facility performed fuel fabrication work under subcontracts to two U.S. Government contracts administered by the USAEC, and two smaller commercial contracts. The first two contracts, producing 94% of the fuel produced by the MOX facility, were placed pursuant to prime contracts with the U.S. Atomic Energy Commission (the predecessor to the DOE) and were both National Defense Rated Orders which are rated and allotted DO-E-2 and "Certified for National Defense Use under DMS [Defense Material System] Regulation 1". The waste generated from Building 234 decommissioning and associated contaminated soil remediation is TRU waste (referred to as KAPL-NFS TRU waste) from general facility contamination resulting from accepted contamination control practices during the manufacturing process operations. The established defense (94%) and remaining (6%) activities utilized the same process equipment so the source of contamination is indistinguishable.

The process at NFS, that was the original source of the TRU in the waste being generated, was MOX fuel production performed for the most part (94% of generated material) under national defense orders. The contamination from the defense contracted production is indistinguishable from, and therefore can not be segregated from, the small amount of "other" contributed contamination, and even if possible the segregation would not normally be performed as provided in DOE guidance.

Discussion: Nuclear Fuel Services, located in Erwin, Tennessee, is currently decommissioning inactive facilities under contract to Naval Reactors. NFS is decommissioning a former Mixed Oxide (MOX) Fuel Fabrication Facility (Building 234) located in Erwin, Tennessee. The MOX facility was operated from 1965 to 1973 under license to the USAEC. Process capabilities included dissolution of plutonium and uranium metals and oxides, co-precipitation of plutonium and uranium, wet or dry blending of MOX powders, pellet and rod fabrication, rod loading and scrap recovery. The facility performed fuel fabrication work under subcontracts to two U.S. Government contracts administered by the USAEC, and two smaller commercial contracts (six percent of the material processed). The facility remained inactive until decommissioning started in the early 1990's.

The following table gives a brief description of the contracts:

Customer	Pu (kgs)	USAEC Contract	Purchase Order	NFS Sales Order	Approx Dates
Dupont-AEC (SROO)	16	AT(07-2)-1	Dupont PO: AX-2640	3163	1965-66
GE-AEC (SEFOR)	746	AT(04-3)-647	GE PO: 205-58226-NG	256A	1967-71
Halden Fuel-NFS	3	NA	. . .	945E	1972
Consumer Power-NFS	47	NA	. . .	1021F	1972-73

Approximately 213 M^3 of TRU waste will be generated as a result of decommissioning the MOX Fuel Fabrication Facility. The waste is low level, Contact Handled TRU waste and is not expected to be RCRA hazardous. However, the waste includes two drums of PCB contaminated waste (maximum 280 PPM). The waste is primarily non-hazardous soil and debris consisting of concrete, metal, PPE, Plexiglas, plastic, HEPA filters, piping ductwork, glass, cloth, paper, rubber and small hand tools. The predominant TRU isotopes are Pu-238, Pu-239, Pu-240, Pu-241, and Am-241 with an average TRU activity of ~860 nCi/gm (expected maximum of ~12,100 nCi/gm). Approximately 80 M^3 of Transuranic waste has been generated and is available for preparation for offsite shipment. The waste is currently packaged in 55-gallon carbon steel drums, 55-gallon stainless steel drums, B25 boxes and high-density polyethylene (HDPE) high integrity containers (HICs). The need for some repackaging of waste into approved containers is anticipated prior to shipment offsite. The remaining waste (contaminated soil and concrete debris) is yet to be generated.

Reviewing the purchase orders Dupont and GE had placed with NFS, it is noted that they were placed pursuant to their prime contracts with the U.S. Atomic Energy Commission. It is also noted that both these contracts were National Defense Rated Orders. They were both rated and allotted DO-E-2 and state they were "Certified for National Defense Use under DMS Regulation 1". DMS is the Defense Material System. The current priorities and allocations system is discussed in Subpart 11.6 of the Federal Acquisition Regulation (FAR) which states rated orders are placed by a "Delegate Agency" under the Defense Priorities and Allocations System (DPAS) in support of authorized national defense programs (15 CFR 700). "Authorized programs" are defined as those approved by FEMA for support under the Defense Production Act of 1950, as amended, to promote the national defense. A review of the Department of Defense Priorities and Allocations Manual of 1961 with changes 1 – 9 (1967) shows that the intent and application of the rating system, in effect when the purchase orders were placed with NFS, was consistent with that of today.

The TRU wastes can be specifically linked to carrying out defense nuclear materials production, defense nuclear waste and by-products management, and defense research and development:

- The majority (94%) of the radioactive material was provided under defense contract from the USAEC.
- The process that generated the waste was the manufacture of MOX fuel.
- The facility became contaminated by the MOX fuel process. Contracts for the first 94% of the MOX fuel produced are rated orders (DO-E-2) and certified for national defense use under DMS Regulation 1.

July 1998

Production History and Waste Disposal Considerations Relative to Decommissioning the Mixed Oxide Fuel Fabrication Facility at Nuclear Fuel Services, Inc. Erwin, Tennessee

Introduction

Nuclear Fuel Services, Inc. (NFS) is preparing to complete the decommissioning of the former Mixed Oxide Fuel Fabrication Facility (Building 234) in Erwin, Tennessee. Decommissioning will include removing remaining equipment and utilities, excavating contaminated soil, demolishing the building, and disposing of the waste. Essentially all processing equipment and interior furnishings have been previously dispositioned with the exception of the Decontamination and Volume Reduction System (DVRS). Planning and preparations for the remaining work began in 1998 and are anticipated to continue through 1999. Decommissioning is expected begin in the year 2000.

Waste disposal is projected to be the most significant direct cost in decommissioning Building 234. This cost can be reduced if the waste is disposed at the Nevada Test Site (NTS). The acceptability of Building 234 waste at the NTS is not known; however, a disposal site must be identified to define decommissioning budget plans, schedules, and elements of the technical work scope.

U. S. Department of Energy (DOE) authorization from the Office of Waste Management (EM-30) and the Nevada Operations Office (DOE-NV) is needed to disposition waste at the NTS. It is proposed that the Schenectady Naval Reactors Office of the DOE (SNR) enter into discussions with these and other appropriate parties to determine if authorization can be granted for disposal of the plutonium-bearing waste from NFS. NFS will support and assist this effort as requested by NR/SNR. This paper is intended to provide information needed to initiate DOE consideration of this matter.

Production History

The plutonium-uranium mixed oxide (MOX) fuel process in Building 234 (Attachment A) was operated by NFS from 1965 to 1973 under license to the U. S. Atomic Energy Commission (USAEC), predecessor to the DOE and the Nuclear Regulatory Commission (NRC). Process capabilities included dissolution of plutonium and uranium metals and oxides, co-precipitation of plutonium and uranium, wet or dry blending of MOX powders, pellet and rod fabrication, rod loading, and scrap recovery.

Ninety-four Percent of Plutonium Supported USAEC Contracts

NFS processed approximately 812 kilograms (kgs) of plutonium between 1965 and 1972. Ninety-four percent (762 kgs) of the plutonium processed by NFS resulted from two U. S. Government contracts administered by the USAEC. The remaining six percent (50 kgs) of plutonium processed at NFS supported commercial contracts for the Halden reactor and Consumers Power Co. in 1972 and 1973.

The largest of the two government sponsored orders was to manufacture about 2,000 fuel rods for the Southwest Experimental Fast Oxide Reactor (SEFOR) in Arkansas. The General Electric Company (GE) was contracted by the USAEC to design, build, and operate the SEFOR to measure the Doppler effect for fast neutron breeder reactors. GE contracted NFS to fabricate the fuel rods for the reactor. The plutonium utilized was supplied by the USAEC. This contract accounted for about 92 percent (746 kgs) of the plutonium introduced to Building 234. The other government sponsored order was from E. I. du Pont de Nemours & Company (Du Pont) at Savannah River for 1,556 aluminum clad MOX fuel rods. Copies of the GE and Du Pont contracts with NFS are attached (Attachments B and C).

Facility Placed in Standby in 1973

MOX production at NFS ceased and the plutonium facilities were placed in standby in 1973. NFS MOX fuel contracts are summarized in Table 1.

Table 1. MOX Fuel Contracts

Customer	Pu (kgs)	USAEC Contract	Purchase Order	NFS Sales Order	Approx Dates
Dupont-AEC (SROO)	16	AT(07-2)-1	Dupont PO: AX-2640	3163	1965-66
GE-AEC (SEFOR)	746	AT(04-3)-647	GE PO: 205-58226-NG	256A	1967-71
Halden Fuel-NFS	3	NA	. . .	945E	1972
Consumer Power-NFS	47	NA	. . .	1021F	1972-73

Decommissioning Actions

In April 1986 NFS secured a contract with the DOE Idaho Operations Office (DOE-ID) for acceptance, storage, and eventual disposal of transuranic waste (>100 nanocuries/gram). Transuranic (TRU) waste from NFS would be stored at the Idaho National Engineering Laboratory (INEL) Radioactive Waste Management Complex for later disposal at the Waste Isolation Pilot Plant (WIPP). Similar contracts were executed by DOE-ID with Babcock and Wilcox, Inc. (B&W) and the Monsanto Chemical Company, Inc. (Monsanto). All of these contracts were on a "full cost recovery basis" by the government.

Subsequently, the governor of Idaho banned out-of-state waste shipments to INEL before NFS wastes could be received.

DOE Contract Modification for TRU Waste Storage at ORNL Signed April 1992

To honor its contract with NFS, the DOE proposed that the TRU waste be stored at the Oak Ridge National Laboratory (ORNL) instead of INEL. NFS obtained the concurrence and support of the State of Tennessee in this move and the DOE contract was modified in April 1992.

The NRC approved the NFS Plutonium Facilities Decommissioning Project Plan and Condition Addendum in June 1989. Process equipment, gloveboxes, utilities, and ancillary materials were removed from Building 234 and processed through the DVRS from September 1990 through September 1992. Class A waste (<10 nCi/g) was shipped directly to the Barnwell, S. C. disposal site operated by Chem-Nuclear Systems, L. L. C., (CNS). Class C waste (10-100 nCi/g) was shipped to Scientific Ecology Group, Inc. (SEG) in Oak Ridge for additional compaction and stabilization prior to disposal at Barnwell. TRU waste (debris) was shipped to SEG for additional compaction prior to interim storage at ORNL under the DOE/NFS contract. This waste will be disposed at the WIPP.

Additionally, during 1993 approximately 2,300 ft^3 of soil were excavated from the Building 234 Wet Cell. The soil was blended with less contaminated soil to meet ORNL waste acceptance criteria for the maximum permissible fissile content of waste packages (128 ^{239}Pu fissile gram equivalents). This resulted in 4,275 ft^3 of soil containing about 6.1 kgs of plutonium. The soil was classified as TRU waste and shipped directly to ORNL for interim storage prior to disposal at the WIPP.

Waste Disposal Projections to Complete D&D

Projections of waste volumes and classifications to complete the decommissioning of Building 234 are very preliminary. The estimates discussed here are from the *NFS Near Term Decommissioning Management Plan* (NTDMP), January 1998.

Approximately 80,000 ft^3 of waste are expected to be generated from the future decommissioning of Building 234. About 75 percent of the waste is projected to be Class C, 15 percent Class A, and 10 percent TRU. About 1,700 ft^3 of soil with TRU levels of contamination are estimated to remain beneath the Wet Cell and 475 ft^3 of TRU waste (soil) is stored in Building 234. Approximately 60 percent (48,000 ft^3) of the total waste volume is expected to be soil or "soil-like" waste and about 40 percent (32,000 ft^3) debris.

The cost for disposal of Building 234 decommissioning waste was estimated at roughly $50 million in the NTDMP. Unit prices of $480/ ft³ and $528/ ft³ were assumed for disposal of Class A and Class C waste respectively at Barnwell. A unit price of $1,056/ ft³ was assumed for TRU disposal at the WIPP, the only domestic TRU waste disposal site.

About 90 percent of the waste from Building 234 decommissioning (all Class A and Class C) should be acceptable at the NTS if disposal is authorized and preliminary projections are correct. If access to the NTS is not possible, a minimum of about 75 percent of the decommissioning waste (all Class C) will likely require disposal at Barnwell.

CNS Proposed 25 Year Funding Plan for Barnwell in July 1998

Future disposal costs at Barnwell are uncertain. CNS distributed a plan to customers in July 1998 that describes a funding proposal to continue operating the site over the next 25 years (Attachment D). The plan proposes that CNS enter into agreements ("Qualified Contracts") with customers ("Users") to reserve disposal capacity for a term of 25 years. The agreements will allow CNS to satisfy financial commitments to the State. NFS has not yet evaluated the potential impact of this plan on Building 234 decommissioning cost estimates, but it appears that disposal charges may exceed those included in the NTDMP.

Work is in-progress by NFS to revise the preliminary waste projections for decommissioning Building 234, but a sound estimating basis will not be available until the facility is adequately characterized. Characterization is expected to be completed by the end of 1998. Preliminary waste projections are shown in Table 3.

Table 3. Building 234 Preliminary Waste Projections

Waste Type	Debris Volume (ft^3)	Soil Volume (ft^3)	Total Volume (ft^3)
Class A	10,874	1,550	12,424
Class C	14,317	44,384	58,701
TRU	6,978	2,175[1]	9,153
Total	32,169	48,109	80,278

Source: NFS Near Term Decommissioning Management Plan, NFS, January 1998.
[1]Includes 475 ft^3 of TRU waste in storage (containerized soil) and the 1,700 ft^3 TRU soil estimate provided in the Near Term Decommissioning Management Plan.

NTS Disposal Considerations

Authorization for NTS acceptance of plutonium bearing waste from NFS appears to depend on the distinction between Federal and State responsibilities as defined in the *Low-Level Radioactive Waste Policy Amendments Act of 1985* (the Act). The Act exempts from State responsibility wastes owned or generated by the DOE. DOE Order 5820.2A, *Radioactive Waste Management*, defines DOE waste as "Radioactive waste generated by activities of the Department (or its predecessors), waste for which the Department is responsible under law or contract, or other waste for which the Department is responsible."

The plutonium processed at NFS was almost exclusively the result of Federal procurement actions by the DOE's predecessor, the USAEC. All of the plutonium processed by NFS was supplied by the USAEC. Possible additional support for the position that the government owned the plutonium processed by NFS is contained in the contract between NFS and Du Pont, the USAEC's prime management and operations contractor at the Savannah River Plant (Attachment C). That contract, in Section F.4, states, "Title to all special nuclear material and source material furnished to or received by the vendor subject to this purchase order shall at all times be and remain in the Government."

Summary

A reasonable basis exists for authorizing the NTS to accept plutonium bearing waste from NFS. Given this, the NTS disposal option should be pursued due to the potential for significant cost savings to the NR Program. Concurrently, NFS must characterize the facility and improve projections of decommissioning waste types and volumes. Also, decommissioning planning efforts must be directed at waste minimization. NFS is prepared to assist NR/SNR as needed to gain acceptance to the NTS.

Attachments

Attachment A. Summary Description of Building 234 at NFS, Erwin, Tennessee

Attachment B. GE PO No. 205-58226-NG for SEFOR Fuel to Support USAEC Contract AT (04-3)-647

Attachment C. Du Pont PO No. AX-2640 for MOX Fuel to Support USAEC Contract AT (07-2)-1

Attachment D. Chem-Nuclear Systems, L.L.C., Transaction Summary; Proposed Agreement to Establish S. C. Trust Fund, July 10, 1998

Attachment A

Summary Description of Building 234
at NFS, Erwin, Tennessee

Production History and Waste Disposal Considerations Relative to
Decommissioning the Mixed Oxide Fuel Fabrication Facility at
Nuclear Fuel Services, Inc., Erwin, Tennessee

July 1998

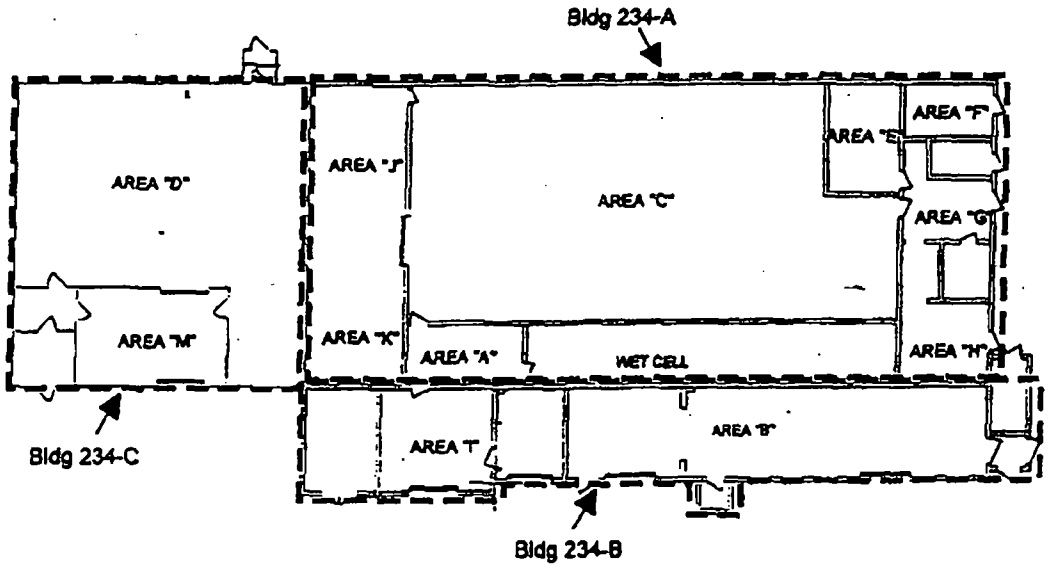
Summary Description of Building 234 at NFS, Erwin, Tennessee

Building 234 is located in the northeast section of the NFS plant adjacent to the High Enriched Uranium Recovery Facility. The building housed the equipment and processes for converting plutonium feed materials to oxides and fabricating fuel pellets and fuel rods. The building is constructed primarily of concrete block and encloses an area of about 10,000 square feet (ft^2). Floors are concrete and the composite and rubber membrane roofs are supported by metal trusses.

The facility is comprised of three areas designated as Buildings 234A, 234B, and 234C. Building 234A was constructed in 1962 or 1963 and contained the conversion, pellet fabrication, and scrap recovery processes. The dimensions of this structure are 100 ft by 50 ft (5,000 ft^2) with 14 ft walls. A 16 ft by 50 ft (800 ft^2) annex was built on the south end of Building 234A in about 1965. The annex was used for an office, a utility room, showers, and change rooms.

Buildings 234B and 234C were also added to Building 234A in 1964/1965. Building 234B was built on the west side of 234A and varies from 14 to 16 ft wide by 116 ft long (1688 ft^2). This facility contained the ^{233}U purification process. Building 234C is a 50 ft by 50 ft (2500 ft^2) high bay (24 ft walls) addition to the north end of 234A. Building 234C was used to fabricate and inspect fuel rods. It now contains the Decontamination and Volume Reduction Facility (DVRF) used during the previous decommissioning project.

←**Plant North**



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Attachment 3 - Acceptable Knowledge Source Document Summary

Waste Stream Number(s): ORFWENC-003

Site(s): Oak Ridge National Laboratory	**Source Document Tracking Number:** C145
Acceptable Knowledge Documentation Type: ☑ TRU Waste Management Program Information ☑ Waste Stream-Specific Information ☐ Supporting Information	**Category:** ☑ C - Correspondence ☐ D - Discrepancy Resolution ☐ I - Internal Procedure or Note ☐ M - Miscellaneous ☐ P - Published Document or Controlled Databas ☐ U - Unpublished Documents

Title of Source Document: Memo to Distribution re: Nuclear Fuel Services, In. (NFS) Background Information

Source Document Reference Information (author(s), document and revision number, date, publisher): D. W. Turner, NA, NA, 02/07/1992, NA

AK # [a]	Source Doc. Page #[b]	AK Information Summary
PR1, PR2, PR4, PR6, PR7, WS2, WS4, WS7, WS8, WS9, WS11, WS12	Throughout	This is a memo transmitting NFS background information. Original agreements were for the NFS waste to be transported to INL; however the state of Idaho banned the acceptance of any waste generated out of state. In 1989, DOE and Tennessee agreed to utilize facilities at ORNL. The waste that was to be received at ORNL is from the D&D of the mixed oxide (MOX, a blend of U and Pu oxides) fuel fabrication facility operated at NFS. 2 unused support labs at the Erwin site will also be D&D'd. Activities will generate several types of waste including LLW and TRU. Approximately 5500 ft2 of CH TRU is expected to be generated. Only the CH TRU waste was to be sent to ORNL. Bldg 234 was set up for the AEC. The facility operated during the years of 1965 through 1973. Table 1 lists a breakdown of NFS activities during this time. Form 1965 to 1966, NFS operated for SRO and DuPont under a federal program producing MOX fuel rods. From 1967 - 1971, NFS operated a project for Southwest Experimental Fast Oxide Reactor (SEFOR), GE, and the AEC manufacturing MOX fuel rods and scrap dissolution. During 1972, NFS operated under private contract for Halden Fuel and NFS-RFD producing MOX fuel rods. NFS produced MOX fuel assemblies from 1972 - 1973 under contract with Big Rock Point (consumer Power). After 1973, NFS ceased MOX operations. The balance of the NFS site continues to fabricate U fuel for DOE. Bldg 234 were constructed in 1967 and 1965. Figure 1 reflects the building's layout and the location of all areas. Primary production facilities in 234 were located in Areas a, B, C, D, J, and K. Majority of the waste will be composed of the facilities' 136 gloveboxes and the process equipment. The remainder of the waste will consist of various other sources including disposal by the use of an ultra-high pressure water jetting system; volume reduction in a high capacity shear/baler; and material control accountability utilizing a five station active-passive neutron NDA system. Attachment 1 is an NFS Chronology of Events

ORIGINAL

Attachment 3 - Acceptable Knowledge Source Document Summary (continued)

Site(s): Oak Ridge National Laboratory		Source Document Tracking Number: C145
AK # [a]	**Source Doc. Page # [b]**	**AK Information Summary**
		Attachment 2 is the NFS bldg 234 equipment layout Appendix A - Area is was the Batch Weigh and Scrap Prep and Area B container in the Wet Cell. Rod assembly and fabrication area was Area D. Area C (pellet production) has numerous stations broken down and combined 3 process groups - precipitation, cake drying, and oxide conversion. During SEFOR production, solutions containing a mixture of Up nitrate and U nitrate hexahydrate (UNH) were transferred from the master mix tank in Area B to precipitation units in Area C. Pu and U were precipitated as ammonium diuranate (ADU) and Pu hydroxide ammonium hydroxide was used as a precipitant. Blended oxide was granulated using a oscillating device and stainless steel screen in Station 31. Binder was added to cross-blends during granulation. Granulated oxide was packaged in 2 liter bottles and loaded in storage rockets at Station 48 prior to pelleting. The use of binders in the production of Pu fuel does not cause NFS TRU waste to be defined and regulated as hazardous waste because: 1 - None of the binder constitutents are listed as toxicity characteristic constituents 2 - Binder constituents (methylene chloride and trichlorotrifluoroethane) are not listed hazardous wastes as they were used as a reactant of ingredient in the formulation of a commercial product. The State of Tennessee Department of Conservation has concurred with this finding.

Source Document Data Limitations (if any):

1. Highlights in the document make some portions of this document illegible.

Acceptable Knowlege Expert:

Lisa Price-Watson _____ Date: 09/05/2007
Print /Sign

[a] Obtain from Acceptable Knowledge Documentation Checklist
[b] For microfilm or microfiche, identify box, tape, reel number and location.

ORIGINAL

C145

Schultz

MARTIN MARIETTA

Internal Correspondence

MARTIN MARIETTA ENERGY SYSTEMS, INC.

BACKGROUND INFO.

No

February 7, 1992

Distribution

Nuclear Fuel Services, Inc. (NFS) Background Information

Attached is a copy of the draft NFS Background Information. The NFS Background Information was written to highlight the history and processes involved with the NFS Storage Project. Please review and provide any comments or additional information to Mary Beth Roberts (6-6171) or myself by Wednesday, February 12, 1992. Also, please advise as to how useful this information will be.

D. W. Turner, 3042, MS-6060 (6-2017)

Distribution:
P. O. Emerson
D. F. Hall
R. C. Mason
B. D. Patton
C. E. Pepper
M. W. Tull

Attachment

D R A F T NFS Background Information

Overview

In April 1986, Nuclear Fuel Services, Inc. (NFS) entered into an agreement (DE-SC07-86ID12630) with the Department of Energy (DOE) - Idaho Operations Office. The agreement is to send the contact-handled transuranic (CH TRU) waste from the decontamination and decommissioning (D&D) of the nuclear fuel fabrication facility operated by NFS in Erwin, Tennessee to facilities at the Idaho National Engineering Laboratory near Idaho Falls, Idaho, for storage and ultimate disposal in unidentified future DOE facilities. However, a decision made by the Governor of Idaho to ban the acceptance of any waste generated out-of-state has impacted the DOE-NFS agreement. Representatives from the State of Tennessee, with the support of the Nuclear Regulatory Commission, suggested that the DOE consider utilizing facilities on the Oak Ridge Reservation (ORR) for the storage of the NFS wastes as a replacement for the facilities in Idaho. The DOE Headquarters (HQ) has accepted this suggestion and directed DOE Field Office - Oak Ridge (DOE-OR) to prepare facilities for the acceptance of this waste for storage.

In late 1989, DOE and the State of Tennessee agreed to utilize the facilities at the Oak Ridge National Laboratory (ORNL) for the storage of the NFS waste from Erwin, Tennessee. Since this time, DOE, ORNL, and NFS have closely worked together in the planning and preparation of the NFS Storage Project as is recorded in Attachment 1, NFS Storage Project Chronology of Events. The waste to be received at ORNL is from the D&D of the [redacted]X, a blend of [redacted] and [redacted]) fuel fabrication facility operated by NFS. Two unused support laboratories at the Erwin site will also undergo the D&D activities. The D&D activities will generate several types of waste including low level waste (LLW) and transuranic (TRU). Approximately [redacted] of contact-handled ([redacted] (>100 nCi/gm) is expected to be generated as a result of the D&D

$6.8\ ft^3/drum = 800\ drums$

activities. Only the CH TRU waste will be sent to ORNL, the LLW will be sent to a commercial LLW disposal facility (Barwell, SC).

The MOX processing line in Building 234 (Attachment 2) at the NFS facility in Erwin, Tennessee was set up for the Atomic Energy Commission (AEC). This facility operated during the years of [redacted] in [redacted] runs processing approximately [redacted] of plutonium and Table 1 lists the breakdown of NFS activities during this time. From 1965 to 1966, NFS operated for Savannah River Operations (SRO) and DuPont under a federal program producing [redacted] fuel rods. The NFS facility operated on another federal program from 1967 - 1971 on a project for Southwest Experimental Fast Oxide Reactor ([redacted]), GE, and the AEC manufacturing MOX fuel rods and scrap dissolution. During 1972, NFS operated under private contract for [redacted] Fuel and NFS-RFD producing MOX fuel rods. NFS produced MOX fuel assemblies from 1972 - 1973 under contract with Big Rock Point ([redacted]). After 1973, NFS ceased MOX operations, although the balance of the NFS site in Erwin continues to fabricate uranium fuel for DOE.

Building 234 production facilities were constructed in 1964 and 1965, and contain approximately 8,220 ft^2 of floor space. The building's facilities and equipment were located in designated areas. Figure 1 reflects the building's layout and the location of these areas. Primary production facilities in Building 234 were located in Areas A, B, C, D, J, and K. Equipment in the remaining areas is contained in glove boxes or in a single, limited-entry cell. Appendix A discusses each area and the processes within each area.

D&D Activities

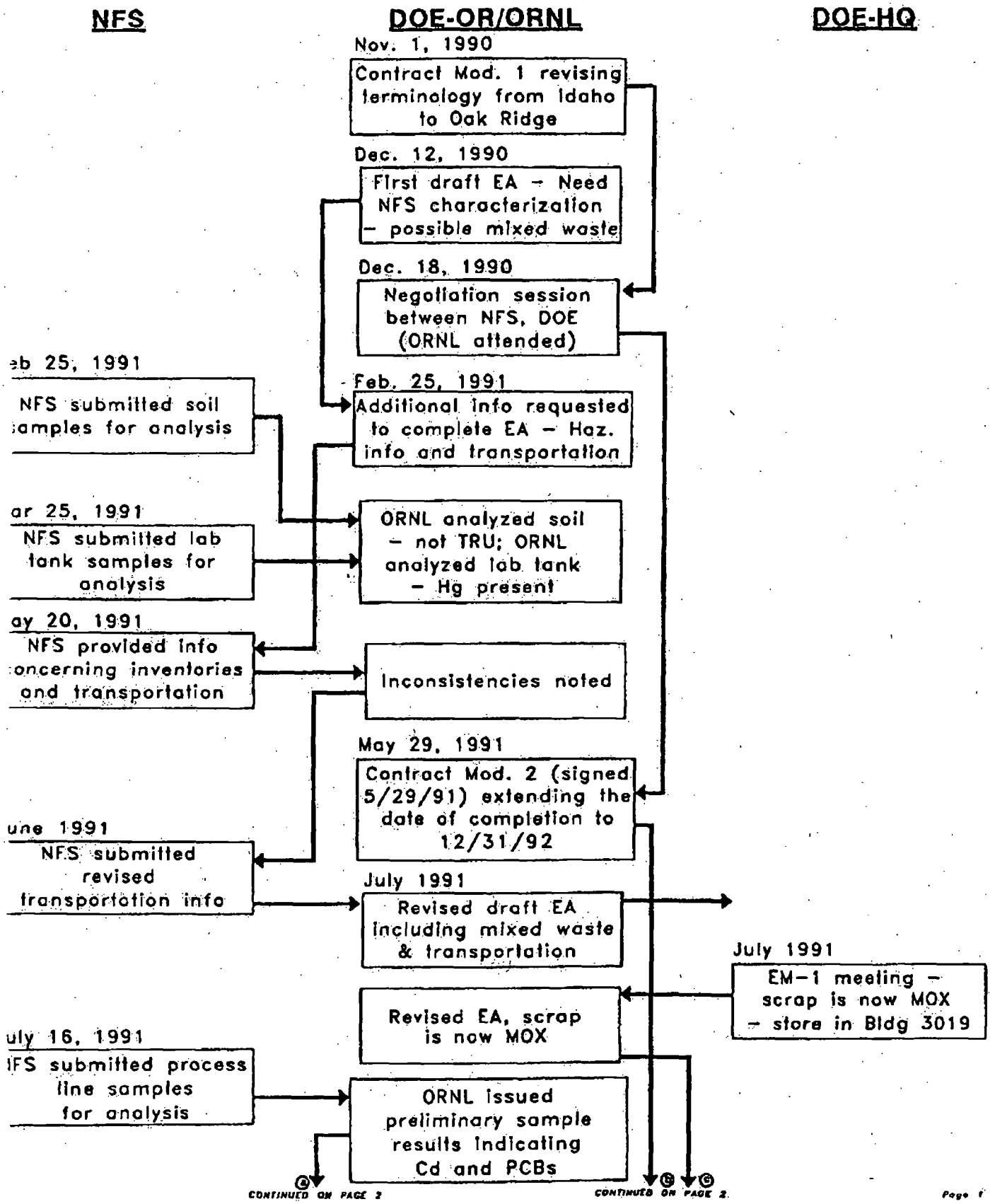
Majority of the waste will be composed of the facilities' 136 gloveboxes and the process equipment contained therein. The remainder of the waste will consist of various other sources including disposal

by the use of an ultra-high pressure water jetting system; volume reduction in a high capacity shear/baler; and material control accountability utilizing a five station active-passive neutron non-destructive assay (NDA) system.

The scheduled objective of the NFS D&D plan is to remove all of the waste from NFS by December 1992. Additional NFS goals of the D&D plan are to restore the facilities to allow "unrestricted use, to operate in a safe and environmentally acceptable manner, to minimize the volume of the waste shipments, to keep the TRU waste volume [redacted] to reach these goals in the most cost effective manner, and to keep exposures As Low As Reasonably Achievable (ALARA).

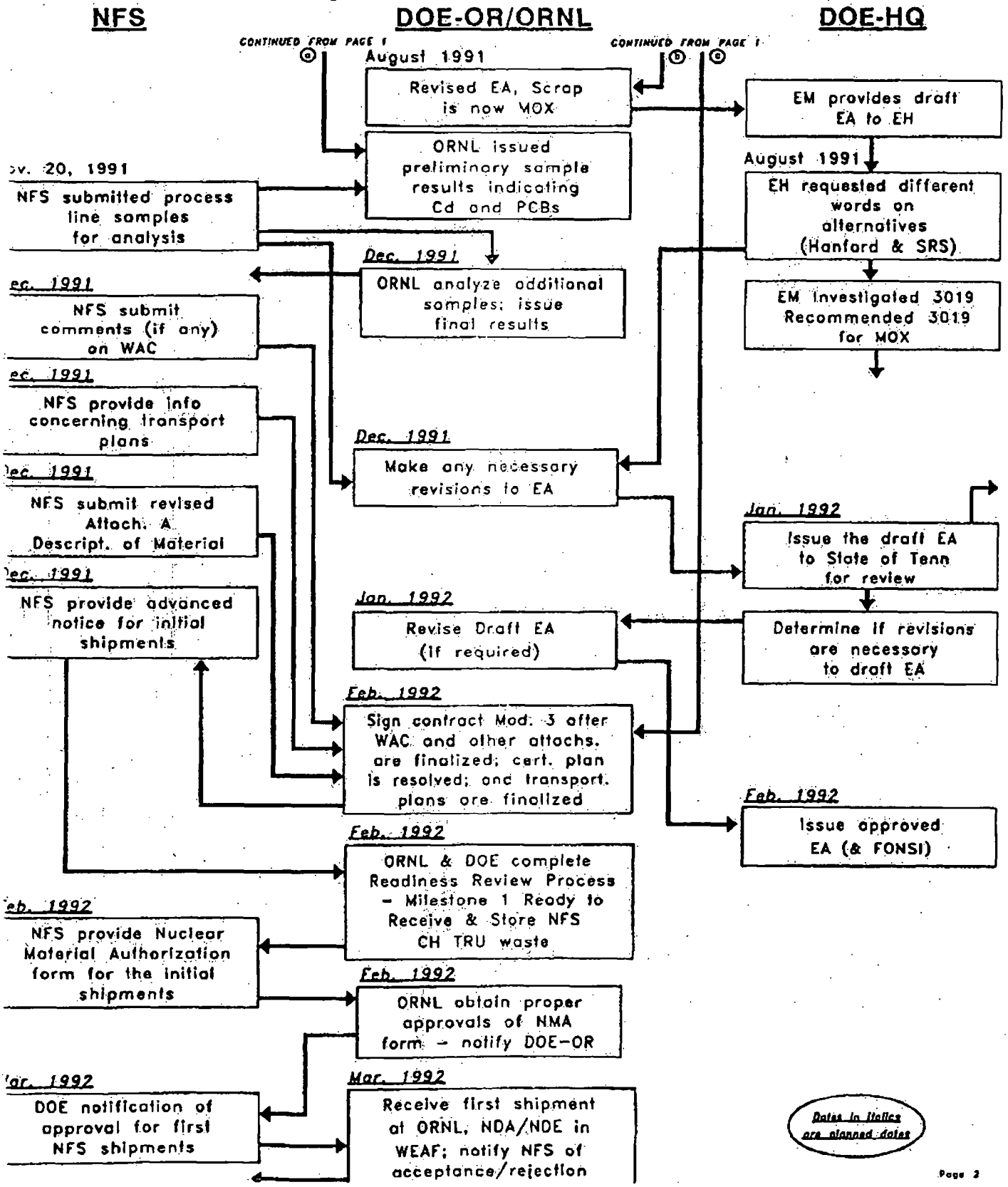
Attachment 1

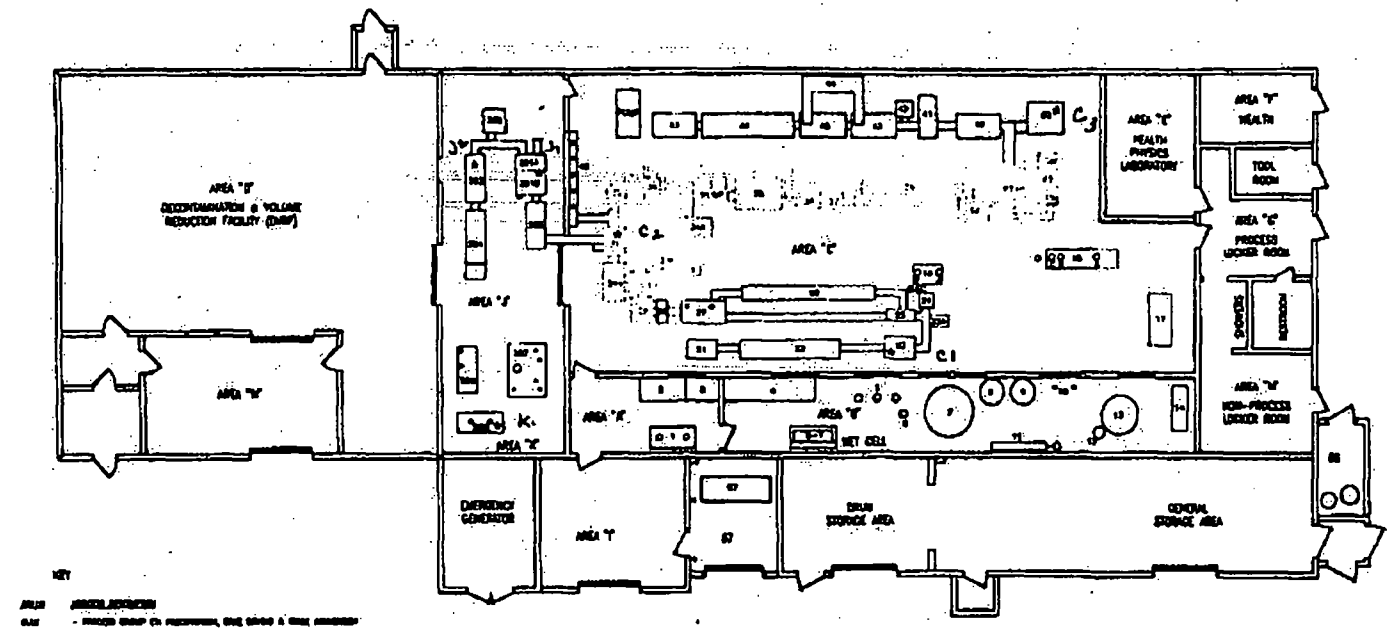
NFS Chronology of Events



Attachment 1 - Continued

Activities to be Completed Before Initial Shipment of NFS CH TRU Waste





KEY

B	5-16-91	ADDED SAMPLE LOCATION TO BOX 208	SJT	BDB		
A	4-11-91	ORIGINAL DRAWING	SJT	RAM	RAH	
REV.	DATE	DESCRIPTION	BY	CHK'D	APPV.	

EcoTek | NFS

ECOTEK, INC.
NFS PLUTONIUM PROJECT
ERWIN, TENNESSEE

NFS BUILDING 234 EQUIPMENT LAYOUT

SCALE	DRAWN BY	DESIGNED BY	DATE	JOB NO.	DRAWING NO.	SHEET NO.	REVISION
NTS	STEVEN J. TYLER		3-22-91	NFS-PLUT	NFMA009	1 OF 1	A

Attachment 2

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3/3/92

CONCLUSIONS:

(1) U:Pu is 80:20 92% of time

(2) ^{235}U enrichments are so low that it doesn't matter (in absolute qty) what ratio of U:Pu is used → ^{235}U is negligible.

(3) ^{238}U is not a constituent of a fge.

PLUTONIUM SOURCES

NFS S.O.	Date	Project/Customer	Product	Original Kg-Pu	Mixture	%U	%Pu	Uranium Enrichment
3163	1965-1966	DuPont/SRO (DuPont P.O. AX-2640) (AEC: AT/07/-2/1)	MOX Fuel Rods	16 (2%)	Uranium	99.7	~0.315	Depleted
2[illegible]	1967-1971	SEFOR/GE/BBC (GE P.O. 205-58226-NG) (AEC: AT/04-3/-647)	MOX Fuel Rods and scrap dissolution	746 (92%)	Uranium	80.0	20.00	Depleted
		Sub-Total Government Program:		762 (94%)				
945-E	1972	Halden/NFS-RFD (35% of Pu from NPR Fuel)	MOX Fuel Rods	3 (.4%)	Uranium	98.5 to 97.5	1.5 to 2.5	Depleted and 1.0% to 5.0%
1021-F	1972-1973	Big Rock Point (CBRI) (Consumers)/NFS-RFD	MOX Fuel assemblies	47 (6%)	Uranium	97.83	Avg. 2.27	Avg. 2.41%
		Sub-Total NFS Programs:		50(6%)				
		Total		812 (100%)				

∴ will have large mass loading of ^{238}U optimum attenuator of the source, the source.

128 fge ^{239}Pu = 711 g U → 0.6 g ^{235}U → 710.4 g ^{238}U

ASSUMES WELL MIXED

Weighted average (Pu) of final products:

			U:Pu
SEFOR =	746/812	= 0.92	0.74 ÷ 0.18
BIG ROCK =	47/812	= 0.06	0.059 − 0.001
WV =	16/812	= 0.02	0.002 − 6.3E-5
Halden =	3/812	= 0.004	5.9E-3 − 6.0E-5

82% − 18%

Enrichment (upper limit)	weighted
.0025 DU	1.8E-3
.024	1.4E-3
.0025 DU	5.0E-6
.05	1.9E-4

Σ = 8.5E-4 = 0.0085 % ~ natural

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APPENDIX A

Process Description

Area A is the Batch Weigh and Scrap Prep and Area B contains the Wet Cell. The Rod Assembly and Fabrication area has been designated as Area D (Attachment 3). Area C, which involved the Pellet Production, contains numerous stations which have been broken down and combined three Process Groups. Process Group C1 the processes of Precipitation, Cake Drying, and Oxide Conversion. Batch Co-Precipitation includes Stations 15 and 17 (Attachment 4). During SROO and SEFOR production, solutions containing a mixture of plutonium nitrate and uranium nitrate hexahydrate (UNH) were transferred from the master mix tank in Area B (the Wet Cell) to precipitation units in Area C as reflected in Attachment 5. Plutonium and uranium were precipitated (Attachment 6) as ammonium diuranate (ADU) and plutonium hydroxide ammonium hydroxide was used as a precipitant. In addition, during the Big Rock Point/Consumer/NFS/RFD project, the feed solution from Area B contained plutonium nitrate only; UNH was not a component. Plutonium was precipitated as "oxalate" using oxalic acid, nitric acid and hydrogen peroxide.

In the Batch Filtration, which is located in Process Group C1, supernate was decanted from the ADU or oxalate slurry and the remaining precipitate was filtered to remove liquids. Filtered precipitate (wet cake) was transferred to the furnace loading box (Station 21). Filtrate was transferred to glass storage columns at Station 16 (Filtrate Storage). Supernate/filtrate from the ADU or oxalate slurry was polished and stored in two glass columns at Station 16 shown in Attachment 7. Station 16 as transferred to Area B and evaporated producing ammonium nitrate concentrate and ammonium hydroxide condensate. Concentrate from the evaporator tank and packaged for disposal. During SEFOR production, used to was ADU cake; remaining condensate was packaged for disposal.

Cake Drying is located in Station 22. Wet ADU or oxalate cake was dried in a furnace at temperatures to 600 °F. Stations 21 and 23 in Attachment 8 were used for loading and unloading the furnace. Dry cake was transferred to storage and tray loading boxes (Stations 24 and 25) in preparation for oxide conversion (i.e., calcining) as shown in Attachment 9.

Station 26 in Process Group C1 involves Oxide Reduction. Dry ADU or oxalate cake was loaded in the oxide conversion furnace (Attachment 10) and heated to 1200 °F in a nitrogen and hydrogen gas atmosphere. Trays containing the resultant oxides were removed from the furnace and unloaded at Station 27 (Attachment 11). Empty trays were passed through a return box to the loading station. Oxide was transferred to the blending station (Station 29) via dumb waiter (Station 28).

Process Group C2 performed the processes of Oxide Blending, Pressing, and Sintering. Oxide solids (MOX or PuO_2) from the conversion furnace were passed through a twin shell (v-shaped) blender at Station 29 in the Oxide Sub-Blending process. One sub-blend was performed per day; each sub-blend was comprised of 16 daily ADU batches during SEFOR production. Total weight of mixed oxide per sub-blend was 23.4 kgs (4 kgs PuO_2).

Sub-Blend Loading and Storage were processed in Stations 30A and 30B. Sub-blending oxide was ball-milled, screened, and weighed in Station 20A. After weighing, oxide was packaged in two liter bottles and loaded in one of five storage rockets at Station 30B (Attachment 12). Five sub-blends, approximately 115 kgs of mixed oxide, were stored in 58 bottles (2kgs MOX/bottle) at Station 30B during SEFOR production.

One cross-blending of oxide was performed per five days during SEFOR production in PG C2. Each cross-blend was comprised of five sub-blends. Total weight of mixed oxide per cross-blend was 115

kgs (20 kgs PuO_2). During the BRP/CON project, plutonium oxide cross-blending was followed by the addition of uranium oxide (solids). The mixture of plutonium oxide and uranium oxide was sub-blended and cross-blended.

Blended oxide was granulated using an oscillating device and stainless steel screen in Station 31. Binder was added to cross-blends during granulation. Granulated oxide was packaged in two liter bottles and loaded in storage rockets at Station 48 (Attachment 13) prior to pelleting.

The use of binders in the production of plutonium fuel does not cause NFS TRU waste to be defined and regulated as hazardous waste per 40 CFR Parts 260 to 270 for the following reasons: 1) none of the binder constituents are listed as toxicity characteristic (TC) constituents in 40 CFR paragraph 261.24, and 2) binder constituents (i.e., methylene chloride and trichlorotrifluoroethane) are not listed hazardous wastes as they were used as a reactant of ingredient in the formulation of a commercial product. The State of Tennessee Department of Conservation has concurred with this finding.

Granulated oxide was transferred through Station 32 to one of three pellet presses (Denison Multipresses) located at Stations 33, 34C, and 35. The presses, shown in Attachment 16, were used in successive years, each replacing its predecessor following equipment failure. Pellet size, weight, and density varied depending on the manufacturing process.

Pellets were measured for density and placed in molybdenum trays ("boats") at Stations 36 and 37. Trays were loaded in the sintering furnace and heated to temperature of approximately 2900° F in an atmosphere of hydrogen gas, nitrogen gas, carbon dioxide, and argon. Cycle time was four to six hours. Trays were unloaded at Station 39 (Attachment 17); sintered pellets were passed to transfer, storage, and off-gas stations (Station 63, 64, and 65 in Area C).

Process Group C3 is comprised of the processes of Pellet Grinding, Inspection, and Tube Loading. Sintering pellets were machined to finished size using grinders located at Stations 41 and 62. Station 62 contains a center-less grinder that replaced the belt grinder at Station 41. Recycled water from the pellet wash was used as coolant; lubricants were used in machinery but not on pellets. Grinding loss per pellet was approximately one to three percent. Additional loss occurred from damage to pellets. Machined pellets were transferred to a drying and inspection station (Station 40) as reflected in Attachment 18. Grinder sludge and damaged pellets were sent to scrap recovery.

Machined pellets were cleaned in an ultrasonic wash using distilled water. Washing was followed by air drying with heat lamps. Washed pellets were transferred to Stations 44 and 45 for inspection, sampling, and storage. All pellets were visually inspected for cleanliness, chips, cracks, pits, etc. and diametrically gauged. A percentage of pellets were sampled for destructive analyses and measured for density and dimensional attributes. Reject pellets and sample residues were sent to scrap recovery. Pellets meeting quality control standards were transferred to Station 46. In Stations 46 and 47 the finished pellets were stacked in assembly troughs, weighed, and loaded in tubes (Attachment 19). Loaded tubes were capped and sent to rod assembly and fabrication stations in Area D.

Recoverable scrap from the plutonium-uranium mixed oxide production line was unloaded from drums and sorted at Station 202 in Area J. Oxide (solid) scrap and "leachable materials" (e.g., bottles plastics, etc.) were segregated and processed separately. Solutions (either leaching or dissolution) were transferred to the evaporator in Area B. Impure plutonium nitrate solution from Area B was returned to Area K where it was stored, sampled, and loaded in 11 liter cylinders. Areas J and K have been broken down and divided into process groups.

Process Group J1 contains the process of Oxide Scrap Recovery Line. Oxide scrap from Station 202

was ball-milled to reduce particle size in Stations 201A and 201B (Oxide Preparation) and transferred to loading and storage stations. Blended oxide scrap from Station 31 (granulation) in Area C could also be passed to Station 201 through a transfer chute. Ball-milled scrap from the oxide prep station was received at Station 205. Oxide scrap was packaged in two liter bottles and loaded in storage rockets. Oxide scrap (solid) was transferred from storage rockets in Area J to the dissolution station in Area K. Oxide scrap was heated with nitric acid in one of two dissolvers in the 207 glovebox, as shown in Attachment 20.

Process Group J2 involves the Leachable Material Recovery Line. Non-combustible items containing recoverable material (e.g., bottles, plastics, screens, gloves, etc.) were unloaded from drums at Station 202 and passed to the Scrap Preparation station (Station 203). Scrap prep consisted of manual cutting and shredding. Shredded materials were transferred to the leaching station. Shredded materials were leached in Station 204 in nitric acid bath to recover plutonium. Nitric acid feed was pumped from storage cylinders located in a small glovebox beneath the prep station. Leachate was pumped to the evaporator in Area B. Solids were bagged-out and packaged for disposal.

Process Group K1 consists of the Pu Nitrate Storage and Load-Out processes. Plutonium nitrate solutions were transferred form the evaporator in Area B to twin, 24 liter glass storage columns in Station 208 of Area K (Attachment 21). Solutions were circulated, sampled, pumped to the adjacent load-out station. Plutonium nitrate solutions from Station 208 were received in two, 10 liter glass columns at the load-out station (Station 209), reflected in Attachment 22. Eleven liter, plastic cylinders were placed in a holding rack and filled with solutions from the columns. Loaded cylinders were removed from Station 209 and packaged for shipment.

Attachment 2 - CCP Records Transmittal/Receiving Form

CCP Central Records / Records Custodian, 4021 National Parks Highway - MS: GSA 203, Carlsbad, New Mexico 88220

Telephone Number: 505-234-7523, 505-234-7233, 505-234-7617

Fax Number: 505-234-7014

☒ Original Record
☐ Fax Record
☐ E-mail Record

Attn:	Sheila Pearcy	From:	Lisa Price-Watson
Ship to:	CCP Central Records/ CCP Records Custodian	Site:	Oak Ridge National Laboratory, CCP-AK-ORNL-001
	4021 National Parks Highway - MS GSA 203, Carlsbad, NM 88220	Company:	Los Alamos National Laboratory
		Telephone Number:	505-628-8946
Telephone Number:	505-234-7523	Date Sent:	06/06/2007

Document Number	Title/Description	Record Date	Total Pages
C145	Attachment 3 - Acceptable Knowledge Source Document Summary for CCP-AK-ORNL-001	9/5/2007	2
	Memo to Distribution re: Nuclear Fuel Services, In. (NFS) Background Information	02/07/1992	13

Comments

None

Acceptance/Rejection Signature and Date

Records Accepted ☑ Signature: Sonia Gonzalez — Printed Name: SONIA GONZALEZ — Date: 9-10-07

Records Rejected ☐ Signature: _____ — Printed Name: _____ — Date: _____

Reason for Rejection:

Re-submittal: Signature: _____ — Printed Name: _____ — Date: _____

P.01

TRANSACTION REPORT

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FOR: CCP RECORDS 15052347014

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DATE	START	RECEIVER	TX TIME	PAGES	TYPE	NOTE	M#	DP
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☐ E-mail Record

Attn:	Sheila Pearcy	From:	Lisa Price-Watson
Ship to:	CCP Central Records/ CCP Records Custodian 4021 National Parks Highway - MS GSA 203, Carlsbad, NM 88220	Site:	Oak Ridge National Laboratory, CCP-AK-ORNL-001
		Company:	Los Alamos National Laboratory
Telephone Number:	505-234-7523	Telephone Number:	505-628-8946
		Date Sent:	06/06/2007

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C145	Attachment 3 - Acceptable Knowledge Source Document Summary for CCP-AK-ORNL-001	9/5/2007	2
	Memo to Distribution re: Nuclear Fuel Services, In. (NFS) Background Information	02/07/1992	13

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Attachment 3 - Acceptable Knowledge Source Document Summary

Site(s): Oak Ridge National Laboratory	Source Document Tracking Number: C203
Waste Stream Number(s): ORNL Non-specific Library Files (Applicable only when site library is not in use)	
Acceptable Knowledge Documentation Type: ☐ TRU Waste Management Program Information ☐ Waste Stream-Specific Information ☑ Additional Information	Category: ☑ Correspondence ☐ Discrepancy Resolution ☐ Internal Procedure ☐ Miscellaneous ☐ Published Document or Internal Procedure ☐ Unpublished Documents
Title or Description of Source Document [a]: Letter to Martin Tull from Robert A. Hunt regarding a picture of the proposed method to "lab pack" bottles of immobilized respirable fines and residual materials	
Source Document Reference Information (author(s), document and revision number, date, publisher): Robert A. Hunt, Ecotek, Inc., NA, Rev. NA, 03/23/1993, NA	

AK # [b]	Source Doc. Page # [c]	AK Information Summary
S16	Throughout	Letter to Martin Tull from Robert A. Hunt regarding a picture of the proposed method to "lab pack" bottles of immobilized respirable fines and residual materials. The photo shows one layer of 14 bottles in the bottom of a poly-lined 55-gallon drum. "We can place three (3) layers in a drum for a total of 42 bottles. The bottles are 2-liter Nalgene high density polyethylene, heat sealed in one layer of 12-mil polyvinyl chloride and one layer of 25-mil nylon reinforced polyethylene. This should provide adequate protection for the material contained in the bottles. The packaging configuration prevents excessive jostling of the bottles without using a vermiculite filler. If we get into the position where we cannot completely fill a drum, we will complete a layer with wrapped empty 2-liter bottles. If this leaves us below three full layers we will press fit a false lid into the liner."

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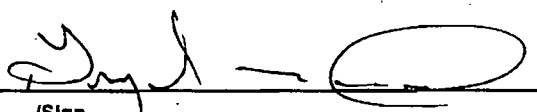
DATE REC'D 12/18/13

Attachment 3 - Acceptable Knowledge Source Document Summary (continued)

Site(s): Oak Ridge National Laboratory	Source Document Tracking Number: C203
Source Document Data Limitations (if any): 1. None.	
Acceptable Knowlege Expert: Trey Greenwood  Date: 11/14/2013 Print /Sign	

[a] Provide description for non-titled information (i.e., container paperwork, MSDS sheets, etc)
[b] Obtain from Acceptable Knowledge Documentation Checklist
[c] For microfilm or microfiche, identify box, tape, reel number and location.

C203

EcoTek

MAR 24 1993

P.O. Box 369
219 Banner Hill Road
Erwin, Tennessee 37650
(615) 743-6186

March 23, 1993

Mr. Martin Tull
Martin Marietta Energy Systems
Building 1054B M/S 6404
Bethel Valley Road
Oak Ridge, Tennessee 37831

Dear Martin;

Please find enclosed a picture of our proposed method to "lab pack" bottles of immobilized respirable fines and residual material. In consonance with the Waste Parameter Verification Program, we will keep material packed with this method below 50 grams (^{239}Pu FGE) per drum. The photo shows one layer of 14 bottles in the bottom of a poly-lined 55-gallon drum. We can place three (3) layers in a drum for a total of 42 bottles. The bottles are 2-liter Nalgene® high density polyethylene, heat sealed in one layer of 12-mil polyvinyl chloride and one layer of 25-mil nylon reinforced polyethylene. This should provide adequate protection for the material contained in the bottles. The packaging configuration prevents excessive jostling of the bottles without using a vermiculite filler. If we get into a position where we cannot completely fill a drum, we will complete a layer with wrapped empty 2-liter bottles. If this leaves us below three full layers we will press fit a false lid into the liner.

I would greatly appreciate your expeditious review of this methodology. If you have any questions, please do not hesitate to call me at (615) 743-1800.

Sincerely yours,

ECOTEK, INC.

Robert A. Hunt
Project Manager

MODE=TRANSMISSION START=MAR-24 17:02 END=MAR-24 17:03
FILE NO.= 297

NO.	COM	ABBR.NO.	STATION NAME/ TELEPHONE NO.	PAGES	PRG.NO.	PROGRAM NAME
01	OK		67954	002/002		

-WASTE MIN.,PLAN.,& CERT. -

********** -615 241 2843 - ***** - 615 241 2843- **********

EcoTek

MAR 24 1993

P.O. Box 369
219 Banner Hill Road
Erwin, Tennessee 37650
(615) 743-6186

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Sincerely yours,

ECOTEK, INC.

Robert A. Hunt
Project Manager

$\frac{2.27 \times 10^{5}}{7.47 \times 10^{4}} = 3.04$ rem

279 2/10

DIVIDER PAGE

Attachment 3 - Acceptable Knowledge Source Document Summary

Site(s): Oak Ridge National Laboratory	Source Document Tracking Number: C205
Waste Stream Number(s): ORNL Non-specific Library Files (Applicable only when site library is not in use)	
Acceptable Knowledge Documentation Type: ☑ TRU Waste Management Program Information ☑ Waste Stream-Specific Information ☑ Additional Information	Category: ☑ Correspondence ☐ Discrepancy Resolution ☐ Internal Procedure ☐ Miscellaneous ☐ Published Document or Internal Procedure ☐ Unpublished Documents
Title or Description of Source Document [a]: Internal Correspondence to Distribtuion regarding Minutes of November 5, 1991 Meeting with NFS Regarding Process-Line Samples	
Source Document Reference Information (author(s), document and revision number, date, publisher): Martin W. Tull, NA, Rev. NA, 11/11/1991, NA	

AK # [b]	Source Doc. Page #[c]	AK Information Summary
PR7, WS2, WS12, S9	Throughout	Internal Correspondence to Distribution regarding Minutes of November 5, 1991 Meeting with NFS Regarding Process-Line Samples. The meeting agenda included the following areas of discussion: A. Discussion of Analyses 1. What parameters were analyzed 2. What protocols were employed 3. What technical difficulties/problems were encountered during execution of the protocols 4. What deviations were required from protocol and what were the justifications B. Discussion of Results 1. Review of resulting data from analyzed parameters 2. Interpretation of data 3. Impact on waste characterization C. Discussion of Next Action(s) 1. What options are available 2. What constraints on available options do identified problems create 3. What remaining options appear appropriate

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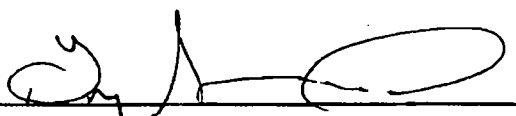
DATE REC'D 12/18/13

Attachment 3 - Acceptable Knowledge Source Document Summary (continued)

Site(s): Oak Ridge National Laboratory	Source Document Tracking Number: C205
Source Document Data Limitations (if any): 1. None.	
Acceptable Knowlege Expert: Trey Greenwood  Date: 11/14/2013 Print /Sign	
[a] Provide description for non-titled information (i.e., container paperwork, MSDS sheets, etc) [b] Obtain from Acceptable Knowledge Documentation Checklist [c] For microfilm or microfiche, identify box, tape, reel number and location.	

C205

MARTIN MARIETTA

Internal Correspondence

MARTIN MARIETTA ENERGY SYSTEMS, INC.

November 11, 1991

Distribution

Minutes of November 5, 1991 Meeting With NFS Regarding Process-Line Samples

On Tuesday, November 5, 1991 representatives of ORNL (Analytical Chemistry Division and Office of Waste Management and Remedial Action), DOE-OR, NFS and one of its subsidiaries (LSI Labs) met to review and discuss the analytical results from the samples collected from the Building 234 processing line. These samples had been collected to establish the waste stream characteristics for waste generated by the decommissioning of this facility.

The meeting agenda included the following areas of discussion:

A. Discussion of Analyses

1. What parameters were analyzed
2. What protocols were employed
3. What technical difficulties/problems were encountered during execution of the protocols
4. What deviations were required from protocol and what were the justifications

B. Discussion of Results

1. Review of resulting data from analyzed parameters
2. Interpretation of data
3. Impact on waste characterization

C. Discussion of Next Action(s)

1. What options are available
2. What constraints on available options do identified problems create
3. What remaining options appear appropriate

The discussion of these issues covered approximately two hours and were thoroughly explored by all parties. A consensus was reached regarding remaining work to be done. The following action plan was adopted:

TCLP Metals

All metals parameters, with the exception of Cd, are below any applicable regulatory threshold. Ba was reported at high levels, however, the trip blank was also high. ACD personnel indicated that the Ba could have been introduced from one of the extraction columns used in the analysis. This problem is routinely encountered from time-to-time. The Cd issue is a real concern. It was agreed that of particular interest was the value reported from the K1 sample point (24ppm). Other Cd values reported

at the remaining five sample points displayed a high degree of variation (variability from highest, K1, to lowest spanned three orders of magnitude). Verification of the K1 value was determined to be necessary. Another analysis of that sample point will be run and additional sample will be collected from K1. The results of this verification will constitute the final data on this waste characteristic. It was agreed by all parties that the corresponding results would define the waste characteristic for Cd and no further analysis would be performed.

PCBs

During the analysis for PCBs, seven PCB species have been positively identified. The concentrations have been determined at < 50ppm, but the associated uncertainties are fairly large. Additionally, several of the reported values are actually < values or reported detection limits. Utilizing the methodology presented in SW-846, these results would yield concentrations below the 50ppm regulatory threshold, but it was deemed prudent to make one more attempt to narrow the uncertainty window if possible. Consequently, this work will proceed coincidently with the TCLP Cd analysis. As with the Cd work, this will constitute the final analytical work on PCBs.

These actions were discussed to be performed within the next two weeks, however, the need to obtain additional sample and several other constraints will make the achievement of this goal most unlikely. Early December would seem to be the earliest that the work would be completed.

A list of attendees is attached.

Martin W. Tull, 3047, MS-6023 (6-5225) - RC

Enclosure

Distribution:
H. L. Adair
J. L. Botts
W. H. Griest
R. C. Mason
L. E. McNeese
T. F. Scanlan
L. E. Stratton
D. W. Turner

ATTENDEES
NOVEMBER 5, 1991 MMES/NFS/DOE MEETING
PROCESS-LINE SAMPLE RESULTS

ORNL

J. L. Botts - ACD
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M. L. West - NFS

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Attachment 3 - Acceptable Knowledge Source Document Summary

Site(s): Oak Ridge National Laboratory	Source Document Tracking Number: C210
Waste Stream Number(s): ORNL Non-specific Library Files (Applicable only when site library is not in use)	
Acceptable Knowledge Documentation Type: ☐ TRU Waste Management Program Information ☑ Waste Stream-Specific Information ☑ Additional Information	Category: ☑ Correspondence ☐ Discrepancy Resolution ☐ Internal Procedure ☐ Miscellaneous ☐ Published Document or Internal Procedure ☐ Unpublished Documents
Title or Description of Source Document [a]: Interview re: NFS TRU Waste Shipped to Oak Ridge National Laboratory. Interviewees: Richard Booth, Richard Moore, Bob Hunt, Scott Toller, Marie Moore	
Source Document Reference Information (author(s), document and revision number, date, publisher): J. Harrison; L. Watson, NA, NA, 09/12/2007, NA	

AK # [b]	Source Doc. Page #[c]	AK Information Summary
WS2, WS3, WS8, WS9, WS11, WS12, S7, S16	Throughout	Summary: A meeting was held at the Training Center at NFS in Erwin, TN primarily to discuss the TRU waste generated at NFS in the early-1990s and shipped to Oak Ridge National Laboratory (ORNL). The meeting was approximately 3 hours in length. CCP (Jeff Harrison) prepared a list of questions, and had a list of several specific documents that were requested. The responses to our questions are in bold italics. The NFS personnel interviewed were: Richard Booth At NFS from 1963 to present Phone: 423-743-1726 E-mail: rlbooth@nuclearfuelservices.com Richard Moore At NFS from 1989 to present Phone: 423-743-1174 E-mail: ramoore@nuclearfuelservices.com Bob Hunt At NFS from 1988 to 1994, and is now at ORNL (BJC/WDP) Phone: 865-241-1203 E-mail: huntra@bechteljacobs.org Scott Toller At NFS from 1989 to 1994, and is now at ORNL (BJC/WGS) Phone: 865-771-1658 E-mail: fourtolers@aol.com Marie Moore At NFS from 1986 to present Phone: 423-743-1737 E-mail: bmmoore@nuclearfuelservices.com Ms. Moore was only present at the meeting for a short time and had no input to the conversation. Others in attendance were:

NTPC RECORDS ORIGINAL
DATE REC'D 12/16/13

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Site(s): Oak Ridge National Laboratory		Source Document Tracking Number: C210
AK # [b]	Source Doc. Page #[c]	AK Information Summary
		Bob Billett, WTS/CCP, 865-576-1564, bob.billett@truproject.com Fred Heacker, Energx, 865-574-2900, fred.heacker@truproject.com Don Coffey, Energx, 423-743-1737, don.coffey@truproject.com Drum-Specific Questions 1.□There are 80 drums described as concrete generated in 1993. •□We have conflicting information as to whether the concrete is in chunks or is chips/dust from scabbling operations. The net weights range from 320 to 690 lbs (576 lbs average). - The concrete should be in the form of chunks. Some scabbling was done in Building 110, but did not likely result in TRU waste. •□Where did the concrete originate and describe the generating process. - The concrete originated from Building 234 and was jack hammered from the Wet Cell floor and footers in 1993 and 1994. The contamination was the result of column overflow, primarily nitric acid (Pu nitrate and depleted Uranyl nitrate. Possibly an aqueous-based fixative was applied to the concrete – not sure. 2. There are 44 drums described as Raschig rings generated in 1993. • Are these borosilicate glass rings about 1-in. outside diameter and 2-in. long. - Yes • Are they from the tank associated with the high-pressure water decontamination unit that was part of the DVRF, or from the Building 110 underground tank, or something else? - Not from high-pressure water decontamination unit. - They are from the master mix tank in the Bldg. 234 Wet Cell (nitrate) and other nitrate tanks in Bldg. 234. No organics. - They are also from the Bldg. 110 tank that supported the two labs. The tank also contained liquids and sludge, possibly organics. These rings went through the DVRF, but still had some visible contamination. 3. There are 3 drums described as metal trash generated in mid-1992 that were not compacted. • The waste is relatively heavy at 558 to 709 lbs net. What is this metal, and why was is not compacted. - Could be equipment, such as pellet presses (hardened steel) or furnaces (inconel). Hydraulic fluid would have been removed and shipped to SEG for incineration. - The hydraulic fluid was sampled and analyzed for PCBs, and did not contain regulated levels of PCBs. 4. There are 3 drums described as asbestos waste, metal, and trash generated in April 1994 that were not compacted. • Describe how this waste was generated, and why was it not compacted. - Asbestos was not compacted. - Could be furnace insulation. 5. There are 131 drums of compacted waste. • Is it primarily gloveboxes and equipment that were compacted. - Yes • What types of equipment were disposed. Did it include items such as pumps, and was the oil drained. What was done with the oil. - Blenders, filter housings, ductwork. - Could include pumps which would have been drained of oil. 6. There are 512 drums of soil generated in 1993, and several more generated in the 2000s. • Where did the 1993 drums originate. - Mostly Bldg. 234 Wet Cell; maybe a little (~2 drums) of soil from 110 tank excavation • Where did the 2000s drums originate. - Same. This is 1993 waste that was shipped later. Not new generation. • Was dust suppressant applied to the soil during excavation, and what specifically was it. - No Waste Generating Location and Facility Mission 7. Did the decommissioning of Building 110 include just the Area C Wet Chemistry Lab and

Attachment 3 - Acceptable Knowledge Source Document Summary (continued)

Site(s): Oak Ridge National Laboratory		Source Document Tracking Number: C210
AK # [b]	Source Doc. Page #[c]	AK Information Summary
		associated underground tank and piping, or did it also include the Area D Spectrographic Lab? - Just Area C; gloveboxes/equipment & underground tank and piping 8. What was the mission of Building 110? Did it provide analytical support to just Building 234 or also to other site operations? - Just Bldg. 234 analytical support - Early years it supported Bldg. 234 as well as LWBR program Chemical Use and Liquid/Sludge Waste Generation and Management 9. What chemicals or commercial products were used for cleaning/decontamination? Did it include acids or oxidizers (e.g., hypochlorites, perchlorates, permanganates, peroxides)? - Radiac Wash (citrus-based decon. solution) - High-pressure water in DVRF - Acids or oxidizers not used. 10. Did decommissioning include draining of tanks and other vessels? If so, what TRU liquids were generated (e.g., acids, oils)? Was sludge removed from tanks? - Tanks were drained, but liquids were not disposed as TRU. 11. Were acids neutralized and what was the neutralizing agent used? - Acidic liquids from tanks were not neutralized. 12. How were liquids/sludges disposed (e.g., absorbed/solidified and placed in TRU waste containers, or transferred to a liquid waste treatment facility)? - Some were treated in on-site treatment facilities, some were sent to off-site treatment. 13. If liquids or sludges were absorbed/solidified, what material was used (e.g., diatomaceous earth, soda ash, Portland cement) and what were the liquids or sludges solidified in? - Possible that some contaminated aqueous liquids from decon operations were mixed with cement to solidify glovebox fines. - A few drums were rejected because of liquids. Radsorb, Radpads, or Aqualac was added to absorb the liquid. Solid Waste Generation and Management 14. Were any of the following disposed in TRU waste containers? • Batteries (e.g., alkaline, nickel-cadmium, lead-acid) • Cadmium shielding • Equipment containing circuit boards (contain lead solder) • Lead items (e.g., glass windows, gloves, shielding, tape, incandescent light bulbs) • Fluorescent light tubes or mercury vapor lamps • Mercury thermometers, manometers, switches, pumps - Bulbs/ballasts – low-level waste because not inside glovebox - Manometer removed from a glovebox – Hg amalgamated in one drum ! - There is one cadmium-plated wrench in the same drum with the amalgamated Hg. - Lead shielding and bricks were not TRU waste 15. A 1/31/1992 report entitled "Final Report Waste Characterization of Wastes Generated from D&D Activity in Buildings 110 and 234 on the NFS Site" indicates that one of the samples had higher than expected cadmium which was later attributed to the discovery of a cadmium-coated wrench. Were other cadmium-coated tools used, and were they disposed as TRU waste? - The wrench was marked as containing cadmium and was disposed in a TRU mixed waste drum along with the amalgamated mercury. They don't know of others like it, and if there were, they would have been handled in the same way. 16. Was beryllium used, will it be in TRU waste, and what forms of beryllium could be present (e.g., metal pieces, shavings/fines, debris-with Be contamination)? Will the beryllium exceed 1% by weight in the waste container? - No beryllium 17. Were acid-contaminated wipes/rags generated, and were they rinsed with water and/or neutralized by adding caustic? - 1 to 3 Molar acid was used in production, and cleaning would have been done with more dilute acid like 0.5 Molar. - Was not neutralized, but there would not have been a lot of liquid used. 18. Were aerosol cans disposed in TRU waste? Were they empty? Punctured? - Aerosol cans were drained and punctured, but were not TRU waste.

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Site(s): Oak Ridge National Laboratory		Source Document Tracking Number: C210
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		19. Were water reactive materials used (e.g., calcium, sodium, potassium) and if so, how were they managed? - No water reactives 20. Were ion-exchange resins generated as TRU waste and if so, were the resins treated (e.g., washed with sodium sulfate solution and water) before disposal? How was resin packaged? - No IX resin in decommissioning waste. 21. Will any of the following PCB items be in TRU waste? • Fluorescent light ballasts - Outside glovebox, not TRU waste • Electrical transformers or capacitors - No • Absorbed oils from electrical, heat transfer, or hydraulic equipment - No; incinerated Radionuclides and Radioassay 22. Are the radionuclides in Building 110 waste expected to be the same as Building 234 waste? - Gloveboxes used for LWBR program are not in the waste sent to Oak Ridge. - Plutonium gloveboxes would have some combination of Bldg. 234 Pu. 23. U-233 was only reported in 32 drums of compacted waste and 19 drums of soil. Is this an indication that the 32 drums of compacted waste are from the U-233 purification facility in Building 234? Where are the 19 soil drums from? - U-233 gloveboxes in Bldg. 234 were removed earlier (~1983) and will not be in waste sent to Oak Ridge. - U-233 probably from Bldg. 110 equipment processed through the DVRF (compacted) and soil and tank/piping from the removal of the Bldg. 110 underground tank. 24. Which isotopes were actually measured by the passive/active neutron counter versus those that were scaled? - Active system quantified Pu-239 and others were scaled. - Passive system quantified Pu-240 and others were scaled. Waste Packaging For each of the waste types above: 25. Describe configuration of rigid liners and drum liners, including sealing methods and use of a filter vent or vent hole. - Black 90-mil HDPE liner, lid has 3/8-in. vent hole, lid not glued. 26. How was waste packaged (e.g., ice cream cartons, metal cans, plastic bags)? How many plastic bag layers could there be, including the drum liner bag? How were bags closed (e.g., twist/tape)? - Soil and concrete have 1 layer (twist/tape) and are not heat-sealed. - Raschig rings are most likely the same as soil and concrete. 27. Were plastic bags heat-sealed? Do heat-sealed bags contain a filter vent? What size of heat-sealed bags were used? - Plastic bags containing poly bottles of cemented fines were heat-sealed - Pucks from compactor were heat-sealed (but the 2nd compaction at SEG would have unsealed them) - Heat-sealed bags do not have filter vent 28. Will the drums contain sealed containers greater than 4 liters in size? What type of containers and how are they sealed? - No Other 29. A 1/31/1992 report entitled "Final Report Waste Characterization of Wastes Generated from D&D Activity in Buildings 110 and 234 on the NFS Site" discusses the analysis of six sweepings samples. One of the samples contains arsenic, three contain barium, and four contain cadmium above the RCRA regulatory threshold. Any ideas as to the source of these metals? - No 30. A 10/29/1992 report entitled "Oak Ridge National Laboratory/Nuclear Fuel Services, Inc. NFS Waste Parameter Verification Program" indicates that higher activity waste was collected in poly bottles and then passed through a 200 micron sieve. The fines <200 microns were cemented in poly bottles and packaged in their own drums separate from debris waste. Are the sweepings material described above what was cemented? - Yes

Attachment 3 - Acceptable Knowledge Source Document Summary (continued)

Site(s): Oak Ridge National Laboratory		Source Document Tracking Number: C210
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		31. This same 10/29/1992 report says that material that did not pass through the sieve was packaged in poly bottle and baled/compacted with other debris waste. Were the materials that did not pass through the sieve debris items, or did they include larger particle sweepings as well? - Sieving was done for a period of time, but they stopped doing it and cemented all of it. Data Limitations: Information is based on memory of activities that occurred approximately 15 years ago.

Source Document Data Limitations (if any):

1. Information is based on memory of activities that occurred approximately 15 years ago.

Acceptable Knowlege Expert:

Trev Greenwood _____ Date: 11/14/2013

Print /Sign

[a] Provide description for non-titled information (i.e., container paperwork, MSDS sheets, etc)
[b] Obtain from Acceptable Knowledge Documentation Checklist
[c] For microfilm or microfiche, identify box, tape, reel number and location.

Attachment 2 – Record of Communication

Waste Stream Numbers: OR-NFS-CH-HET, Heterogeneous Debris OR-NFS-CH-HOM, Cemented Fines OR-NFS-CH-SOIL, Contaminated Soil	Corresponding Source Document #: **C210**	
Interviewer: Jeff Harrison, Lisa Watson	Date: 9/12/2007	Time: 1:00 EST
Interviewees: See below	Group/Organization: Job Title: See below	Phone: See below Email:
Subject: NFS TRU Waste Shipped to Oak Ridge National Laboratory		

Summary: A meeting was held at the Training Center at NFS in Erwin, TN primarily to discuss the TRU waste generated at NFS in the early-1990s and shipped to Oak Ridge National Laboratory (ORNL). The meeting was approximately 3 hours in length. CCP (Jeff Harrison) prepared a list of questions, and had a list of several specific documents that were requested. The responses to our questions are in bold italics. The NFS personnel interviewed were:

Richard Booth
At NFS from 1963 to present
Phone: 423-743-1726
E-mail: rlbooth@nuclearfuelservices.com

Richard Moore
At NFS from 1989 to present
Phone: 423-743-1174
E-mail: ramoore@nuclearfuelservices.com

Bob Hunt
At NFS from 1988 to 1994, and is now at ORNL (BJC/WDP)
Phone: 865-241-1203
E-mail: huntra@bechteljacobs.org

Scott Toller
At NFS from 1989 to 1994, and is now at ORNL (BJC/WGS)
Phone: 865-771-1658
E-mail: fourtolers@aol.com

Marie Moore
At NFS from 1986 to present
Phone: 423-743-1737
E-mail: bmmoore@nuclearfuelservices.com
Ms. Moore was only present at the meeting for a short time and had no input to the conversation.

Others in attendance were:

Bob Billett, WTS/CCP, 865-576-1564, bob.billett@truproject.com
Fred Heacker, Energx, 865-574-2900, fred.heacker@truproject.com
Don Coffey, Energx, 423-743-1737, don.coffey@truproject.com

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Drum-Specific Questions

1. There are 80 drums described as concrete generated in 1993.
   - We have conflicting information as to whether the concrete is in chunks or is chips/dust from scabbling operations. The net weights range from 320 to 690 lbs (576 lbs average).

   - The concrete should be in the form of chunks. Some scabbling was done in Building 110, but did not likely result in TRU waste.

   - Where did the concrete originate and describe the generating process.

   - The concrete originated from Building 234 and was jack hammered from the Wet Cell floor and footers in 1993 and 1994. The contamination was the result of column overflow, primarily nitric acid (Pu nitrate and depleted Uranyl nitrate. Possibly an aqueous-based fixative was applied to the concrete – not sure.

2. There are 44 drums described as Raschig rings generated in 1993.
   - Are these borosilicate glass rings about 1-in. outside diameter and 2-in. long. - ***Yes***
   - Are they from the tank associated with the high-pressure water decontamination unit that was part of the DVRF, or from the Building 110 underground tank, or something else?

   - Not from high-pressure water decontamination unit.

   - They are from the master mix tank in the Bldg. 234 Wet Cell (nitrate) and other nitrate tanks in Bldg. 234. No organics.

   - They are also from the Bldg. 110 tank that supported the two labs. The tank also contained liquids and sludge, possibly organics. These rings went through the DVRF, but still had some visible contamination.

3. There are 3 drums described as metal trash generated in mid-1992 that were not compacted.
   - The waste is relatively heavy at 558 to 709 lbs net. What is this metal, and why was is not compacted.

   - Could be equipment, such as pellet presses (hardened steel) or furnaces (Inconel). Hydraulic fluid would have been removed and shipped to SEG for incineration.

   - The hydraulic fluid was sampled and analyzed for PCBs, and did not contain regulated levels of PCBs.

4. There are 3 drums described as asbestos waste, metal, and trash generated in April 1994 that were not compacted.
   - Describe how this waste was generated, and why was it not compacted.

   - Asbestos was not compacted.

   - Could be furnace insulation.

5. There are 131 drums of compacted waste.
   - Is it primarily gloveboxes and equipment that were compacted. - ***Yes***
   - What types of equipment were disposed. Did it include items such as pumps, and was the oil drained. What was done with the oil.

   - Blenders, filter housings, ductwork.

- Could include pumps which would have been drained of oil.

6. There are 512 drums of soil generated in 1993, and several more generated in the 2000s.
   - Where did the 1993 drums originate.

   - Mostly Bldg. 234 Wet Cell; maybe a little (~2 drums) of soil from 110 tank excavation

   - Where did the 2000s drums originate.

   - Same. This is 1993 waste that was shipped later. Not new generation.

   - Was dust suppressant applied to the soil during excavation, and what specifically was it.

   - No

Waste Generating Location and Facility Mission

7. Did the decommissioning of Building 110 include just the Area C Wet Chemistry Lab and associated underground tank and piping, or did it also include the Area D Spectrographic Lab?

   - Just Area C; gloveboxes/equipment & underground tank and piping

8. What was the mission of Building 110? Did it provide analytical support to just Building 234 or also to other site operations?

   - Just Bldg. 234 analytical support

   - Early years it supported Bldg. 234 as well as LWBR program

Chemical Use and Liquid/Sludge Waste Generation and Management

9. What chemicals or commercial products were used for cleaning/decontamination? Did it include acids or oxidizers (e.g., hypochlorites, perchlorates, permanganates, peroxides)?

   - Radiac Wash (citrus-based decon. solution)

   - High-pressure water in DVRF

   - Acids or oxidizers not used.

10. Did decommissioning include draining of tanks and other vessels? If so, what TRU liquids were generated (e.g., acids, oils)? Was sludge removed from tanks?

    - Tanks were drained, but liquids were not disposed as TRU.

11. Were acids neutralized and what was the neutralizing agent used?

    - Acidic liquids from tanks were not neutralized.

12. How were liquids/sludges disposed (e.g., absorbed/solidified and placed in TRU waste containers, or transferred to a liquid waste treatment facility)?

    - Some were treated in on-site treatment facilities, some were sent to off-site treatment.

13. If liquids or sludges were absorbed/solidified, what material was used (e.g., diatomaceous earth, soda ash, Portland cement) and what were the liquids or sludges solidified in?

    - Possible that some contaminated aqueous liquids from decon operations were mixed with cement to solidify glovebox fines.

    - A few drums were rejected because of liquids. Radsorb, Radpads, or Aqualac was added to absorb the liquid.

Solid Waste Generation and Management

14. Were any of the following disposed in TRU waste containers?
    - Batteries (e.g., alkaline, nickel-cadmium, lead-acid)
    - Cadmium shielding
    - Equipment containing circuit boards (contain lead solder)
    - Lead items (e.g., glass windows, gloves, shielding, tape, incandescent light bulbs)
    - Fluorescent light tubes or mercury vapor lamps
    - Mercury thermometers, manometers, switches, pumps

    - Bulbs/ballasts – low-level waste because not inside glovebox

    - Manometer removed from a glovebox – Hg amalgamated in one drum

    - There is one cadmium-plated wrench in the same drum with the amalgamated Hg.

    - Lead shielding and bricks were not TRU waste

15. A 1/31/1992 report entitled "Final Report Waste Characterization of Wastes Generated from D&D Activity in Buildings 110 and 234 on the NFS Site" indicates that one of the samples had higher than expected cadmium which was later attributed to the discovery of a cadmium-coated wrench. Were other cadmium-coated tools used, and were they disposed as TRU waste?

    - The wrench was marked as containing cadmium and was disposed in a TRU mixed waste drum along with the amalgamated mercury. They don't know of others like it, and if there were, they would have been handled in the same way.

16. Was beryllium used, will it be in TRU waste, and what forms of beryllium could be present (e.g., metal pieces, shavings/fines, debris with Be contamination)? Will the beryllium exceed 1% by weight in the waste container? - ***No beryllium***

17. Were acid-contaminated wipes/rags generated, and were they rinsed with water and/or neutralized by adding caustic?

    - 1 to 3 Molar acid was used in production, and cleaning would have been done with more dilute acid like 0.5 Molar.

    - Was not neutralized, but there would not have been a lot of liquid used.

18. Were aerosol cans disposed in TRU waste? Were they empty? Punctured?

    - Aerosol cans were drained and punctured, but were not TRU waste.

19. Were water reactive materials used (e.g., calcium, sodium, potassium) and if so, how were they managed? - ***No water reactives***

20. Were ion-exchange resins generated as TRU waste and if so, were the resins treated (e.g., washed with sodium sulfate solution and water) before disposal? How was resin packaged?

    - No IX resin in decommissioning waste.

21. Will any of the following PCB items be in TRU waste?
    - Fluorescent light ballasts - ***Outside glovebox, not TRU waste***
    - Electrical transformers or capacitors - ***No***
    - Absorbed oils from electrical, heat transfer, or hydraulic equipment - ***No; Incinerated***

Radionuclides and Radioassay

22. Are the radionuclides in Building 110 waste expected to be the same as Building 234 waste?

    - Gloveboxes used for LWBR program are not in the waste sent to Oak Ridge.

    - Plutonium gloveboxes would have some combination of Bldg. 234 Pu.

23. U-233 was only reported in 32 drums of compacted waste and 19 drums of soil. Is this an indication that the 32 drums of compacted waste are from the U-233 purification facility in Building 234? Where are the 19 soil drums from?

    - U-233 gloveboxes in Bldg. 234 were removed earlier (~1983) and will not be in waste sent to Oak Ridge.

    - U-233 probably from Bldg. 110 equipment processed through the DVRF (compacted) and soil and tank/piping from the removal of the Bldg. 110 underground tank.

24. Which isotopes were actually measured by the passive/active neutron counter versus those that were scaled?

    - Active system quantified Pu-239 and others were scaled.

    - Passive system quantified Pu-240 and others were scaled.

Waste Packaging

For each of the waste types above:

25. Describe configuration of rigid liners and drum liners, including sealing methods and use of a filter vent or vent hole.

    - Black 90-mil HDPE liner, lid has 3/8-in. vent hole, lid not glued.

26. How was waste packaged (e.g., ice cream cartons, metal cans, plastic bags)? How many plastic bag layers could there be, including the drum liner bag? How were bags closed (e.g., twist/tape)?

    - Soil and concrete have 1 layer (twist/tape) and are not heat-sealed.

    - Raschig rings are most likely the same as soil and concrete.

27. Were plastic bags heat-sealed? Do heat-sealed bags contain a filter vent? What size of heat-sealed bags were used?

    - Plastic bags containing poly bottles of cemented fines were heat-sealed

    - Pucks from compactor were heat-sealed (but the 2nd compaction at SEG would have unsealed them)

    - Heat-sealed bags do not have filter vent

28. Will the drums contain sealed containers greater than 4 liters in size? What type of containers and how are they sealed? - ***No***

Other

29. A 1/31/1992 report entitled "Final Report Waste Characterization of Wastes Generated from D&D Activity in Buildings 110 and 234 on the NFS Site" discusses the analysis of six sweepings samples. One of the samples contains arsenic, three contain barium, and four contain cadmium above the RCRA regulatory threshold. Any ideas as to the source of these metals? - ***No***

30. A 10/29/1992 report entitled "Oak Ridge National Laboratory/Nuclear Fuel Services, Inc. NFS Waste Parameter Verification Program" indicates that higher activity waste was collected in poly bottles and then passed through a 200 micron sieve. The fines <200 microns were cemented in poly bottles and packaged in their own drums separate from debris waste. Are the sweepings material described above what was cemented? - ***Yes***

31. This same 10/29/1992 report says that material that did not pass through the sieve was packaged in poly bottle and baled/compacted with other debris waste. Were the materials that did not pass through the sieve debris items, or did they include larger particle sweepings as well?

    - Sieving was done for a period of time, but they stopped doing it and cemented all of it.

Data Limitations:

Information is based on memory of activities that occurred approximately 15 years ago.

Acceptable Knowledge Expert: Lisa Watson [signature] Date: 11/21/07
Print / Sign

DIVIDER PAGE

Attachment 3 - Acceptable Knowledge Source Document Summary

Site(s): Oak Ridge National Laboratory	Source Document Tracking Number: M011
Waste Stream Number(s): ORNL Non-specific Library Files (Applicable only when site library is not in use)	
Acceptable Knowledge Documentation Type: ☐ TRU Waste Management Program Information ☑ Waste Stream-Specific Information ☑ Additional Information	Category: ☐ Correspondence ☐ Discrepancy Resolution ☐ Internal Procedure ☑ Miscellaneous ☐ Published Document or Internal Procedure ☐ Unpublished Documents
Title or Description of Source Document [a]: MSDS (Material Safety Data Sheets) for Products used at NFS	
Source Document Reference Information (author(s), document and revision number, date, publisher): Various, NA, NA, Various, Various	

AK # [b]	Source Doc. Page # [c]	AK Information Summary
WS8, WS12, S8, S10	Throughout	This source documents contains MSDS sheets for chemicals found in the NFS waste. Nozzle Gel (USP Petrolatum, Anthraquinone Blue Dye) Tapmatic Dual Action Aquacut Cutting Fluid (Amine Salt of Organic Phosphate Ester, Ethylene Glycol, Isopropyl Alcohol) CC Fix Media (Ammonia, 2-Ethylhexyl Acrylate) CC Strippable Decon Media (Vinyl Acetate) Pipe X-Metal X (proprietary formulation which contains small amounts of minerals and organics) WYK Safety Sorbent (Amorphous Silica, Amorphous-Diatomaceous Earth) Waste Lock 770 (Sodium Polyacrylate) WYK Oil Absorbent Pads (Melt Blown & Airlaid Polypropylene) Nochar (N965) - An updated revision of the MSDS is included. Crystalac (Isopropanol, Mixed Glycol Ether, Acrylic Polymer, Intert and Mixed Pigment) Aqualac III (Water, Acrylic Polymer, Mixed Glycol Ethers) Radpad (Superabsorbent Polymer) Anti-corrosion Radpads (A proprietary blend of superabsorbent polymers and amine salts) Radsorb (Sodium Polyacrylate Homopolymer) Radpad Rolls (Superabsorbent Polymer) CC Wet (Distilled Water, Glycerin, Monosaccharide, Non-ionic Surfactant, Hon-halogenated Yellow Dye) Encap 107 (Sodium Polyacrylate) Polyfloc AP125 Quik-Solid (Sodium Polyacrylate, Water, Acrylic Acid)

CCP RECORDS ORIGINAL
DATE REC'D 2/16/2015

Attachment 3 - Acceptable Knowledge Source Document Summary (continued)

Site(s): Oak Ridge National Laboratory Source Document Tracking Number: M011

AK # [b]	Source Doc. Page # [c]	AK Information Summary
		Radiacwash (Citric Acid, Octylphenol condensed with 8-10 Moles Ethylene Oxide, Triton X100 Tetrasodium Ethylenediamine Triacetate, BENZYLDIMETHYL.(.2-.(.2-.(.P-(1,1,3,3-TETRAMETHYLBUTYL)PHENOXY.).ETHOXY.).ETHYL.).AMMONIUM CHLORIDE, HYAMINE 1622 Solid-A-Sorb (Diatomaceous Earth, Calcined, Crystalline Silica, Ctystalline Silica) Big Orange-E (D-Limonene, Nonylphenoxy Poly(Ethyleneoxy) Ethanol) Exxon Nuto H-68 (Petroleum, Hydrotreated Heavy Paraffinic) Keystone Penetrating Oil 2 (Petroleum Based Lubricating Oil, Aliphatic Hydrocarbons) Slip Plate Graphite Lube (Graphite, Silica, Crystalline Quartz, Toluene, Acetone, Naphtha, Petroleum Distillate Blend Heptane Methylcyclohexane, Propane) Zeniplex Grease (Mineral Oils, Organic Barium Salt) Simple Green (2-butoxyethanol, ethoxylated alcohol, tetrapotassium pyrophosphate, sodium citrate) Swiffer Wet (No Hazardous Ingredients listed) Nochar N910 (Thermoplastic Elastomer Polymer)

Source Document Data Limitations (if any):

1. Relevant only to NFS waste.

Acceptable Knowlege Expert:

Travis Smith / Date: 02/13/2015
Print /Sign

[a] Provide description for non-titled information (i.e., container paperwork, MSDS sheets, etc)
[b] Obtain from Acceptable Knowledge Documentation Checklist
[c] For microfilm or microfiche, identify box, tape, reel number and location.

M011

MATERIAL SAFETY DATA SHEET
May be used to comply with
OSHA's Hazard Communication
Standard,29CFR 1910.2100.

U.S. DEPARTMENT OF LABOR
Occupational Safety and
Health Administration
(Non-Mandatory Form)

006-NOZZLE GEL

KCI, INC
3710 N. DAVIDSON STREET
CHARLOTTE,N.C. 28205

CHEMTREC(24-HOUR)800-424-9300
INFORMATION 704-372-8435
DATE PREPARED: JANUARY 14, 2004

SECTION II-HAZARDOUS INGREDIENTS/IDENTITY INFORMATION

Hazardous components	OSHA PEL	ACGIH TLV	%(optional)
None	N/A	N/A	

The ingredients in this product are not listed in 29 CFR 1910 Subpart 2 nor do they appear in "Threshold Limit Values for Chemical Substances in the work environment adopted by ACGIH for 1985-86." They are also not reportable under Section 313 of Title III of SARA

SECTION III-PHYSICAL/CHEMICAL CHARACTERISTICS

Boiling Point: NDA	Specific Gravity(H2O=1).815-.880
Vapor Pressure: NDA	Melting Point: 100.4-140 F
Vapor Density: NDA	Evaporation Rate: NDA (BUTYL=1)

Solubility in Water: NIL
Appearance and Odor: Opaque, no odor
Volatile(by weight %): 0 at 25C.

SECTION IV-FIRE AND EXPLOSION HAZARD DATA

Flash Point(Method Used)	Flammable Limits	LEL	UEL
Greater than 390F(astm D-92)	NDA	NDA	NDA

Extinguishign Media: Carbon dioxide,dry chemical or foam.
Special Firefighting Procedures: Pressure-demand,self-contained protection should be provided. Water spray is an unsuitable extinguishing agent.

Unusual Fire and Explosion Hazards: NONE

SECTION V-REACTIVITY DATA

Stability Unstable: Conditions to Avoid
NONE

Stable :X

Incompatibility(Materials to Avoid)
N/A

Hazardous Decomposition or Byproducts
N/A

Hazardous Polymerization: Conditions to Avoid
May Occur: N/A

Will Not Occur: X

SECTION VI-HEALTH HAZARD DATA

Route(s)of Entry: Inhalation: NO Skin: NO Ingestion: NO

Health Hazards(Acute and Chronic)

Acute-None

Chronic-None

Carcinogenicity: No NTP N/A IARC Monographs N/A OSHA N/A

Signs and Symptoms of Exposure: NDA

Emergency First Aid Procedures: Eyes:flush eyes with water for 15 minutes. Skin:wash with soap & water. Inhalation : remove to fresh air. Call physician. Ingestion: drink water.

SECTION VII-PRECAUTIONS FOR SAFE HANDLING AND USE

Steps to Be Taken in Case Material Is Released or Spilled:	Shut off leak and dike up large spills. After cooling and solidification, scrape and/or shovel up material. Finally, clean area with an oil absorbent material.
Waste Disposal Method:	Dispose of in accordance with local, state, and federal regulations.
Precautions to Be Taken in Handling and Storing:	Store away from flame, heat(250F) maximum. Also keep away from strong oxidizing agents.
Other Precautions:	None

SECTION VIII-CONTROL MEASURES

Respiratory Protection(Specify type)
None required.

Ventilation: Local Exhaust-N/A Special-N/A

Mechanical- N/A Other-N/A

Protective Gloves- Impervious when molten. Eye Protection-Wear a face shield if product is molten

Other Protective Clothing: When molten ,wear coveralls.

Work/Hygienic Practices: NDA

NEW JERSEY RIGHT TO KNOW INFORMATION(HAZARDOUS & NON-HAZARDOUS)

USP PETROLATUM	CAS# 8009-03-8	99.5%
ANTHRAQUINONE BLUE DYE	CAS#14233-37-5	.5%

PERCENT VOLATILES: NIL
VOC'S: NONE

HAZARD RATINGS
FIRE-1
REACTIVITY-0
TOXICITY-0
SPECIAL-NONE

LPS LABORATORIES INC -- TAPMATIC DUAL ACTION AQUACUT CUTTING FLUID, 0

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MSDS Safety Information

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FSC: 6850
MSDS Date: 03/01/1993
MSDS Num: BXRGK
LIIN: 00N022182
Product ID: TAPMATIC DUAL ACTION AQUACUT CUTTING FLUID, 01216
MFN: 02
Responsible Party
Cage: 66724
Name: LPS LABORATORIES INC
Address: 4647 HUGH HOWELL RD
City: TUCKER GA 30085-5052
Info Phone Number: 404-934-7800
Emergency Phone Number: 800-424-9300 (CHEMTREC)
Published: Y

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Contractor Summary

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Cage: 66724
Name: LPS LABORATORIES, INC.
Address: 4647 HUGH HOWELL ROAD
City: TUCKER GA 30085-5052
Phone: 404-934-7800

==========

Ingredients

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Name: AMINE SALT OF ORGANIC PHOSPHATE ESTER
% Wt: 2-4
OSHA PEL: N/K (FP N)
ACGIH TLV: N/K (FP N)

Cas: 107-21-1
RTECS #: KW2975000
Name: ETHYLENE GLYCOL; (ETHYLENE GLYCOL; 1,2ETHANEDIOL) (SARA 313) (CERCLA)
% Wt: 4-6
OSHA PEL: N/K (FP N)
ACGIH TLV: 50 PPM, VAPOR, C
EPA Rpt Qty: 1 LB
DOT Rpt Qty: 1 LB

Cas: 67-63-0
RTECS #: NT8050000
Name: ISOPROPYL ALCOHOL; (ISOPROPYL ALCOHOL; ISOPROPANOL) (SARA 313)
% Wt: 1-3
OSHA PEL: 400 PPM
ACGIH TLV: 400 PPM; 500 STEL

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Health Hazards Data

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LD50 LC50 Mixture: NONE SPECIFIED BY MANUFACTURER.
Route Of Entry Inds - Inhalation: YES
Skin: YES
Ingestion: NO

Carcinogenicity Inds - NTP: NO
IARC: NO
OSHA: NO
Effects of Exposure: INHALATION: HEADACHE, DIZZINESS AND NAUSEA. EYES: LIQUID WILL CAUSE TEMPORARY IRRITATION. SKIN: REPEATED OR PROLONGED CONTACT MAY CAUSE DRYING OF SKIN. INGESTION: NOT A LIKELY ROUTE OF EXPOSURE. INGES TION OF ETHYLENE GLYCOL MAY RESULT IN DEPRESSION FOLLOWED BY RESPIRATORY AND CARDIAC FAILURE.
Explanation Of Carcinogenicity: NOT RELEVANT
Signs And Symptions Of Overexposure: SEE HEALTH HAZARDS.
Medical Cond Aggravated By Exposure: NONE KNOWN.
First Aid: INHAL: MOVE TO FRESH AIR AND PROVIDE OXYGEN IF BREATHING IS DIFFICULT. EYES: FLUSH EYES WITH PLENTY OF WATER FOR AT LEAST 15 MINUTES. IF IRRITATION PERSISTS, CONTACT MD. SKIN: WASH WITH SOAP AND WATER ; APPLY MEDICATED SKIN CREAM. INGEST: GIVE TWO GLASSES OF WATER AND INDUCE VOMITING IMMEDIATELY BY TOUCHING FINGER TO BACK OF THROAT. NEVER GIVE ANYTHING BY MOUTH TO AN UNCONSCIOUS PERSON.

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Handling and Disposal

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Spill Release Procedures: REMOVE LEAKING CONTAINER AND CONTAIN SPILL. SOAK OR MOP UP WITH ABSORBENT MATERIAL AND DISCARD.
Neutralizing Agent: NONE SPECIFIED BY MANUFACTURER.
Waste Disposal Methods: DISPOSE OF IN ACCORDANCE WITH LOCAL, STATE AND FEDERAL REGULATIONS.
Handling And Storage Precautions: PRODUCT SHOULD BE STORED ABOVE 20F AND BELOW 120F. KEEP CONTAINERS CLOSED WHEN NOT IN USE.
Other Precautions: NONE SPECIFIED BY MANUFACTURER.

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Fire and Explosion Hazard Information

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Flash Point Text: NONFLAMMABLE
Extinguishing Media: MEDIA SUITABLE FOR SURROUNDING FIRE (FP N).
Fire Fighting Procedures: USE NIOSH/MSHA APPROVED SCBA AND FULL PROTECTIVE EQUIPMENT (FP N).
Unusual Fire/Explosion Hazard: NONE.

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Control Measures

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Respiratory Protection: NONE REQUIRED IF GOOD VENTILATION IS MAINTAINED. USE NIOSH/MSHA APPROVED RESPIRATOR APPROPRIATE FOR EXPOSURE OF CONCERN (FP N).
Ventilation: LOCAL EXHAUST IS USUALLY ADEQUATE.
Protective Gloves: IMPERVIOUS GLOVES (FP N).
Eye Protection: ANSI APPRVD CHEM WORKERS GOGGLES (FP N).
Work Hygienic Practices: WASH HANDS W/SOAP & WATER AFTER USE &/OR BEFORE BREAKS, LUNCH & AT END OF WORK PERIODS. REMOVE CONTAMINATED (SUPDAT)
Supplemental Safety and Health: HYGIENE PRACT: CLOTHING & LAUNDER BEFORE REUSE.

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Physical/Chemical Properties

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B.P. Text: 200F,93C
Vapor Pres: 18 @ 100F
Vapor Density: APPROX 0.6

Spec Gravity: 1.0 (H*2O=1)
Evaporation Rate & Reference: 1 (H*2O=1)
Solubility in Water: 100%
Appearance and Odor: CLEAR, AMBER LIQUID WITH CINNAMON ODOR.

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Reactivity Data

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Stability Indicator: YES
Stability Condition To Avoid: NONE.
Materials To Avoid: MAGNESIUM AND STRONG OXIDIZING AGENTS.
Hazardous Decomposition Products: CARBON MONOXIDE UPON THERMAL DECOMPOSITION.
Hazardous Polymerization Indicator: NO
Conditions To Avoid Polymerization: NOT RELEVANT

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Toxicological Information

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Ecological Information

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MSDS Transport Information

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Regulatory Information

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Other Information

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HAZCOM Label

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Product ID: TAPMATIC DUAL ACTION AQUACUT CUTTING FLUID, 01216
Cage: 66724
Company Name: LPS LABORATORIES, INC.
Street: 4647 HUGH HOWELL ROAD
City: TUCKER GA
Zipcode: 30085-5052
Health Emergency Phone: 800-424-9300 (CHEMTREC)
Label Required IND: Y
Date Of Label Review: 04/18/1995
Status Code: C
Label Date: 04/18/1995
Origination Code: G
Eye Protection IND: YES
Skin Protection IND: YES
Signal Word: WARNING
Respiratory Protection IND: YES
Health Hazard: Moderate
Contact Hazard: Slight
Fire Hazard: None
Reactivity Hazard: None
Hazard And Precautions: DO NOT INGEST. ACUTE: INHALATION: HEADACHE, DIZZINESS AND NAUSEA. EYES: LIQUID WILL CAUSE TEMPORARY IRRITATION. SKIN: REPEATED OR PROLONGED CONTACT MAY CAUSE DRYING OF SKIN. INGESTION: INGESTION OF ETHYLENE GLYCOL MAY RESULT IN DEPRESSION FOLLOWED BY RESPIRATORY AND CARDIAC FAILURE.

CHRONIC: NONE LISTED BY MANUFACTURER.

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MATERIAL SAFETY DATA SHEET

Trade Name: CC Fix Media

Section I – General Information:

Item Name: CC Fixative Media
Product Code: SC4521/Blue
Manufactured by: InstaCote, INC.
160 C Lavoy Rd.
Erie, MI 48133
Date MSDS Prepared: May 23, 2001
Last Review Date: May 23, 2001
MSDS Preparer's Name: Charles J. Smith Chemist/ M.S.
Product Description: Vinyl Latex/Modified Poly Acrylate Coating
CAS Name and Number: None, Mixture
D.O.T. Hazard Classification and Shipping Name: None
NFPA Ratings: Hazard: 0 Health: 0 Fire: 0 Reactivity: 0
Scale 3 = extreme, 2 = high, 1 = moderate, 0 = insignificant

Section II – Ingredient/Identity Information:

Proprietary (Y/N): Y

Ingredient	Composition:	CAS #	Exposure Limits (TWA)
Ammonia	<0.04%	7664-41-7	35 ppm STEL ACGIH 35 mg/m^3 TWA8 OSHA
2-Ethylhexyl Acrylate	<0.01%	103-11-7	5 ppm TWA8 UCC

Section III – Physical/Chemical Properties:

Appearance:	Blue Liquid	Color:	Blue
State:	Liquid	pH:	7.3
Specific Gravity:	1.10	Viscosity:	250 cP@72≤F
Vapor Pressure:	18 mm Hg, 20°C	Odor:	Pleasant

Vapor Density: 0.6 (Air=1)
Water Solubility: Completely
Evaporation Rate: 0.8 (Butyl Acetate=1)

Section IV – Fire and Explosion Hazard Data:

Flash Point: N/A Flammable Limits: Upper – N/A
Lower: - N/A

Extinguishing Media: As for surrounding fire. This product is a very low fire hazard. This product is a water-based material and while it may not burn, it can splatter and froth. Do not spray water into hot material; use water fog to cool surrounding fire.

Section V – Reactivity Data:

Stability (Y/N) Y
Conditions to Avoid: **Do not allow freezing.**
Materials to Avoid: Strong Acids or Strong Alkalis
Hazardous Decomposition Products: Oxides of Carbon

Section VI – Health Hazard Data:

Primary Routes of Exposure: Skin Contact, Ingestion and Inhalation

Skin Contact: Prolonged and repeated skin contact may cause irritation.

Ingestion: Ingestion of product will cause irritation of the mouth, pharynx, esophagus and stomach.

Inhalation: Breathing atomized vapors may cause headaches, nausea, irritation of the nose, throat and lungs.

Section VII – Emergency First Aid:

Eye Contact: Flush eyes with a large amount of water for at least 15 minutes. Consult a physician if irritation persists.

Skin Contact: Wash area with soap and water.

Ingestion: No special precautions

Inhalation: Move individual to fresh air. Consult a physician if irritation persists or breathing becomes labored.

Section VIII – Precautions for Safe Handling, Storage and Use:

Personal Protective Equipment for Routine Use:

Respiratory Protection: Respirators are not routinely required when using this product indoors or outdoors. In any case when excessive mist and atomization of product occurs such as pressurized air spraying, use NIOSH/MSHA approved full or half face respirator with dust cartridge.

Gloves: Gloves are not normally required for routine use. If an individual is known to have skin susceptible to irritation by other chemicals, this individual should wear butyl or nitrile type gloves.

Eye Protection: Safety goggles or glasses with side shields should always be worn.

Other: Applicator should wear a Tyvek suit or coveralls.

Work Practices: Do not eat, drink or smoke while applying this product. Wash hands immediately upon leaving the work site. Treat this product with caution as you would any other chemical.

Spill/Release Procedures: Large spills can be vacuumed. Small spills can be treated with absorbent clay, earth, sand or other material, shoveled into a DOT approved container and disposed of according to all local, state and Federal regulations.

Waste Disposal Procedure: Coagulate the waste material by addition of sand, clay or other earth material. Allow to dry if time permits. Coagulated solids may be incinerated in accordance with local, state and federal regulations.

Storage and Handling: Store product in a dry environment.. Protect product from extremes in temperatures, **Do Not Freeze.**

Other Health Hazard Precautions: None

Complete

MATERIAL SAFETY DATA SHEET

Trade Name: CC Strippable Decon Media

Section I – General Information:

Item Name: CC Strippable Decontamination Media
Product Code: SC901/Clear
Manufactured by: InstaCote, INC.
160 C Lavoy Rd.
Erie, MI 48133
Date MSDS Prepared: August 4, 1998
Last Review Date: March 3, 2001
MSDS Preparer's Name: Charles J. Smith Chemist/ M.S.

Product Description: Vinyl Acrylic Latex Strippable Coating
CAS Name and Number: None, Mixture
D.O.T. Hazard Classification and Shipping Name: None
NFPA Ratings: Hazard: 0 Health: 0 Fire: 0 Reactivity: 0
Scale 3 = extreme, 2 = high, 1 = moderate, 0 = insignificant

Section II – Ingredient/Identity Information:

Proprietary (Y/N): Y

Ingredient	Composition:	CAS #	Exposure Limits (TWA)
Vinyl Acetate	0.07%	108-05-4	ACGIH- 10 ppm TWA 8 hr. 15 ppm STEL OSHA- 10 ppm TWA 8 hr. UCC- 5 ppm

Section III – Physical/Chemical Properties:

Appearance: Off white thick milky fluid
State: Liquid pH: 6.5-8.0
Specific Gravity: 1.0 – 1.2 Viscosity: NA
Vapor Pressure: 1.4 mm Hg Vapor Density: same as water
Water Dispersible: Completely Odor: Pleasant
Boiling Point: 212 °F Melting Point: 27 °F
Evaporation Rate: Equiv. To water

Section IV – Fire and Explosion Hazard Data:

Flash Point:	Will not flash ignite
Lower Explosion Limit:	No low level explosion limit
Upper Explosion Limit:	No upper level explosion limit
Extinguishing Media/Methods:	Use dry chemical, CO_2,AFFF(foam), or water.
Special Fire Fighting Precautions:	None known
Unusual Fire/Explosion Hazards:	None known

Section V – Reactivity Data:

Stability (Y/N) Y
Conditions to Avoid: Do not allow freezing.
Materials to Avoid: None known
Hazardous Decomposition Products: Oxides of carbon

Section VI – Health Hazard Data:

Primary Routes of Exposure: Inhalation (Y/N): Y
Skin (Y/N): Y
Ingestion (Y/N) Y

Contact Eye/Skin Hazard: Eye Contact may cause smarting and redness, skin contact has extremely low to no toxic effects in humans.

Acute Overexposure Symptoms: No evidence of adverse effects available.
Chronic Overexposure Symptoms: None known.
Carcinogenicity Data: None
IARC Monographs on Carcinogenic Evaluation: None
Emergency First Aid:

Eye Contact: Flush eyes with a large amount of water for at least 15 minutes. Consult a physician if irritation persists.
Skin Contact: Wash area with soap and water.
Ingestion: No harmful effects expected.
Inhalation: Move individual to fresh air. Consult a physician if irritation persists or breath becomes labored.

Section VII – Precautions for Safe Handling, Storage and Use:

Personal Protective Equipment for Routine Use:

Respiratory Protection: Respirators are not required when using this product outdoors. In any case when excessive mist might be periodically created in poorly ventilated areas, use NIOSH/MSHA approved respirator.

Gloves: Gloves are not normally required for routine use. If an individual is known to have skin susceptible to irritation by other chemicals, this individual should wear butyl or nitrile type gloves.

Eye Protection: Safety goggles or glasses with side shields should always be worn.

Other: Applicator should wear a Tyvek suit or coveralls.

Work Practices: Treat this product with caution as you would any other chemical.

Spill/Release Procedures: Large spills can be vacuumed up. Small spills can be treated with absorbent clay, earth sand or other material, shoveled into a DOT approved container and disposed of according to all local, state and Federal regulations.

Waste Disposal Procedure: Coagulate the waste material by step additions of ferric chloride and lime. Remove the clear supernatant and flush to a chemical sewer. Coagulated solids maybe incinerated in accordance with local, state and Federal regulations.

Storage and Handling: Store product in a dry environment. Protect product from extremes in temperatures, **Do Not Freeze.** Keep the container closed when not in use.

Other Health Hazard Precautions: None

Section VIII – Regulatory Information

Federal EPA, Status on Substance List: The concentration levels are maximum or ceiling levels (weight%) to be used for calculations for

regulations. Trade Secrets are identified by "TS". Comprehensive Material Environmental Response Compensation, and Liability Act of 1980 (CERCLA) requires notification of the National Response Center release of quantities of Hazardous Substances equal to/or greater than the reportable quantities (RQs) in 40 CFR 302.4
Components present in this product at levels which could require reporting under this statute are: **None**

Superfund Amendments and Reauthorization Act of 1986 (SARA) Title III requires emergency planning based on Threshold Planning Quantities (TPQs) and release reporting based on Reportable Quantities (RQs) in 40 CFR 355 (used for SARA, subsections; 302,304,311 and 312). Components present in this product at a level which could require reporting under this statute are: **None**

Toxic Substance Control Act (TSCA) Statue: The ingredients of this product are on the TSCA inventory.

Other Regulatory Information: EPA Hazard Categories: **None**
DOT Hazardous Shipping Classification:
Not Classified

End

Pipe X-Metal X

(Catalog # RP-102)

I Product: PIPE X-METAL X

Description: Clear Liquid Manufacturer: **Chemical Solutions Int'l. Corp.** **P.O. Box 891185** **Houston, TX 77289-1185**	Date Prepared: September 2003. Emergency Telephone No. **(281) 992-3031** **(800) 424-4804** E-mail: jimarnold@chemicalsolutionsintl.com Home Page: www.chemicalsolutionsintl.com

II Health Hazard Data:

Health Hazards (Acute & Chronic)
EYES: May cause disconfort.
SKIN: Concentrate will dry out and chap sensitive
skin as would detergent.
INHALATION of fumes may upset stomach.

SIGNS AND SYMPTOMS OF EXPOSURE:
EYES:Tearing, redness, blurred vision.
SKIN: Dryness, redness, chapping.

FIRST AID:
EYES: Flush 15 minutes with water.
SKIN:Wash with soap and water.
INHALATION: Move to fresh air.
Apply artificial respiration if breathing has stopped.
INGESTION: Do not induce vomiting. If any
irritation persists, seek medical attention.

III Precautions for Safe Handling & Use:

If material is spilled, remove leaking package to safe area. Flush with water.
Disposal: Any approved method for

V Hazardous Ingredients:

PIPE X-METAL X is a proprietary formulation
which contains small amounts of minerals and organics.
This product should be handled accordingly.
Complies with OSHA 29 CFR XVIII-1910.1200 Section (I) "Trade Secrets"
Contains no hazardous components under current OSHA definitions.

VI Special Protection & Precautions:

Hygienic Practices: Wash after each shift.
Remove and wash contaminated clothing before re-used.
Work Practices: Wear goggles or face shield.
Rubber gloves.
Other Protective Clothing: Long sleeved shirt buttoned at neck. is desirable. Rubber boots.

VII Reactivity Data:

Stable under normal use and storage conditions.
Incompatible with strong oxidizing agents.
Hazardous decomposition or byproducts - oxides of carbon.

VIII Fire & Explosion Data:

dilute cleaner. Surfactants are highly biodegradable. **IV Physical Data:** pH.....10.5 Solubility in water..... 100% Boiling Point..... 212°F Vapor Pressure/Density..... Same as water Evaporation Rate (Butyl Acetate=1).....<1 Appearance & Odor: Clear liquid with medium viscosity and cleaner odor. Specific Gravity.....1.06	Flash Point/Method Used..... None/COC. **IX Control Measures:** Respiratory Protection: Not Necessary. Ventilation: Local Exhaust/Desirable. Mechanical/Reccomended in congested areas. (Complies with OSHA 174, Sep. 1985.)

HMIS CODE: Health 1 **Flammability 0** **Reactivity 0** **Personal Protection B**

"To the best of our knowledge the information contained in this MSDS is accurate. However, neither Chemical Solutions Int'l. Corp. nor any of its affiliates makes any warranty expressed or implied, or accepts any liability in connection with this information or its use."

UPRIGHT INC -- WYK SAFETY SORBENT -- 7930-00F032769

========== Product Identification ==========

Product ID:WYK SAFETY SORBENT
MSDS Date:03/01/1992
FSC:7930
NIIN:00F032769
MSDS Number: BTBFM
=== Responsible Party ===
Company Name:UPRIGHT INC
Address:2640 CREVE COEUR DR
City:ST LOUIS
State:MO
ZIP:63144
Country:US
Info Phone Num:800-248-7007
Emergency Phone Num:314-961-3711
CAGE:0BJ55
=== *Contractor Identification* ===
Company Name:UPRIGHT INC
Address:2640 CREVE COEUR DR
Box:City:ST LOUIS
State:MO
ZIP:63144
Country:US
Phone:800-248-7007
CAGE:0BJ55

========== Composition/Information on Ingredients ==========

Ingred Name:AMORPHOUS SILICA, AMORPHOUS-DIATOMACEOUS EARTH (NO FREE SILICA)
CAS:61790-53-2
RTECS #:HL8600000
Other REC Limits:20 MCCPF (MSHA)
ACGIH TLV:10 MG/CUM DUST

========== Hazards Identification ==========

Routes of Entry: Inhalation:NO Skin:NO Ingestion:NO
Reports of Carcinogenicity:NTP:NO IARC:NO OSHA:NO
Health Hazards Acute and Chronic:MATERIAL IS NON-TOXIC.
Explanation of Carcinogenicity:NONE

========== First Aid Measures ==========

First Aid:INHALATION: REMOVE TO FRESH AIR. EYES: FLUSH W/WATER. OBTAIN MEDICAL ATTENTION IN ALL CASES.

========== Accidental Release Measures ==========

Spill Release Procedures:VACUUM OR SWEEP.

========== Exposure Controls/Personal Protection ==========

Work Hygienic Practices:MAINTAIN GOOD HOUSEKEEPING PROCEDURES REGARDING

DUST.
Supplemental Safety and Health
AMORPHOUS MINERAL SICICATE (NO FREE SILICA). ALL ELEMENTS ARE CHEMICALLY AND PHYSICALLY BOUND.

========== Physical/Chemical Properties ==========

Spec Gravity:2.2-2.4
Appearance and Odor:LIGHT GREY SHADES W/NO ODOR.

========== Stability and Reactivity Data ==========

Stability Indicator/Materials to Avoid:YES
DON'T USE W/HYDROFLUORIC ACID

========== Disposal Considerations ==========

Waste Disposal Methods:MATERIAL ITSELF IS NON-HAZARDOUS & MAY BE DISPOSED OF IN ANY LANDFILL AS DEFINED BY RCRA (40 CFR PART 261), AFTER ABSORPTION OF HAZARDOUS OR TOXIC LIQUID, FOLLOW LOCAL, STATE OR FEDERAL REGULATION FOR PROPER DISPOSAL METHODS.

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M² Polymer Technologies, Inc.
P.O. Box 365
West Dundee, IL 60118
P: 847/836-1393
F: 847/836-6483

MATERIAL SAFETY DATA SHEET: May be used to comply with OSHA's Hazard Communication Standard, 29 CFR 1910.1200. Standard must be consulted for specific requirements.

PRODUCT NAME: **Waste Lock® 770**

SECTION I SUPPLIER'S INFORMATION

M² Polymer Technologies, Inc.
P.O. Box 365
West Dundee, IL 60118

Telephone Number for Information: 847/836-1393
Last Update : January 10, 2003

SECTION II HAZARDOUS INGREDIENTS/IDENTITY INFORMATION

Hazardous Components (Specific Chemical Identity; Common Name(s))	OSHA PEL	ACGIH TLV	% (optional)
1. *Sodium Polyacrylate, Crosslinked* CAS Number: 09003-04-7	NE	NE	
2. Post Treatment (Trade Secret)	NE	NE	

Other Limits
Recommended
Recommended Exposure --
Guideline for Respirable Particulate 0.05mg/m^3
(For Particles < 10 µm)

SARA Section 313 Reportable Toxic Chemicals: NONE

NFPA/HMIS: Health - 2, Fire - 1 Reactivity - 0, Specific Hazard - None

Dot Class: Not Regulated

SECTION III PHYSICAL/CHEMICAL CHARACTERISTICS

Boiling Point	- Solid	Bulk Density (Apparent - g/cc)	0.5-0.7
Vapor Pressure (mm Hg.)	- LT 10	Melting Point	Greater than 390° F
Vapor Density (AIR = 1)	- Nil	Evaporation Rate (Butyl Acetate = 1)	Less than 1
Water Solubility	- Insoluble		
Appearance and Odor	- White granular powder		

SECTION IV FIRE AND EXPLOSION HAZARD DATA

Flash Point (Method Used) - NONE
Flammable Limits - Not Available LEL: 0.0325 UEL: NE
Extinguishing Media - Water, CO_2 and dry chemical extinguishants.
Unusual Fire and Explosion Hazards - Extremely slippery conditions if spilled product comes in contact with water.

SECTION V REACTIVITY DATA

Stability	Unstable Stable	- X	Conditions to Avoid- None Known
Incompatibility (Materials to Avoid)	- *None known*		
Hazardous Decomposition or By-products	- None known		
Hazardous Polymerization	- May Not Occur	- X	Conditions to Avoid - None Known

SECTION VI HEALTH HAZARD DATA

Route(s) of Entry: Inhalation? Yes Skin? Yes Ingestion? Yes

Health Hazards (Acute and Chronic) - Contact with eyes, skin or clothing may cause irritation.

Acute (short term) inhalation of dust may cause mild irritation of upper respiratory tract (nose and throat) and lungs.

Chronic (long-term) inhalation exposure to rats for a lifetime (two years) using a sodium polyacrylate that had been micronized to a respirable particle size (<10 µm) produced non-specific inflammation and chronic lung injury at 0.2 mg/m² and 0.8 mg/m². AT 0.8 mg/m², tumors were seen in some animals. In the absence of chronic inflammation, tumors are not expected. There were no adverse effects of any kind at 0.05 mg/m².

Sodium polyacrylate had no effect in mutagenicity tests.

Carcinogenicity: NTP? No IARC Monographs? No OSHA Regulated? No

Signs and Symptoms of Exposure -Reddening, drying of affected area with possible itching, burning or other discomfort. *Irritation of the upper respiratory tract.*

Medical Conditions
Generally Aggravated by Exposure - Existing respiratory and allergic conditions.

Emergency and First Aid Procedures -
Flush eyes with large quantity of water.
Wash skin with soap and water.
If inhaled, move to fresh air.
Consult physician regarding any continued discomfort.

SECTION VII PRECAUTIONS FOR SAFE HANDLING AND USE

Steps to be taken in Case Material is Released or Spilled: Collect material. Avoid generating airborne dust. Avoid contact with water, as extremely slippery conditions will result.
Residuals are to be flushed thoroughly with water to the drain for normal wastewater treatment.

Waste Disposal Method: Dispose of in accordance with local, Federal, and State regulations. Non-hazardous waste material suitable for approved solid waste landfill.

Precautions to be taken in Handling and Storing: Handle as an eye irritant. Store in a cool, dry place. Do not ingest. Avoid breathing powder. Avoid skin and eye contact.

Other Precautions: Dusty conditions may irritate eyes and respiratory system. Slippery when wet.

SECTION VIII CONTROL MEASURES

Respiratory Protection (Specify Type) - Where dusty conditions are created, use a suitable, nuisance-type mask.

Ventilation - Local Exhaust Ensure removal of airborne particles.
- Mechanical (General) - Recommended. Other - Not required.
Protective Gloves - Recommended. Eye Protection - Safety goggles
Other Protective Clothing or Equipment - None
Work/Hygienic Practices - Wash thoroughly after handling.

MATERIAL SAFETY DATA SHEET

SUPPLIER **WYK SORBENTS, LLC**
ADDRESS: **10715 KAHLMEYER DRIVE**
ST. LOUIS, MO 63132

EMERGENCY: **(800) 248-7007**
PHONE: **(314) 426-3336**
FAX: **(314) 426-0145**

SECTION I - MATERIAL IDENTIFICATION

CHEMICAL NAME & SYNONYMS:
Melt Blown & Airlaid Polypropylene

TRADE NAME & SYNONYMS:
WYK® Oil Absorbent Pads, Rolls, Booms, Socks, Pillows, & Particulate.
All **700 Series** Stock Numbers

CHEMICAL FAMILY: Polyolefin / Hydrocarbon

SECTION II - INGREDIENTS AND HAZARDS

This product is **NOT** hazardous as defined by CFR 1910.1200

SECTION III - PHYSICAL DATA

Boiling point at 1 atm, deg. F:	N/A	**Specific gravity (H2O = 1):**	0.9 – 0.95
Vapor pressure at (mm HG.):	N/A	**Evap. Rate:**	N/A
Vapor density (Air = 1):	N/A	**Volatiles, % by Volume:**	N/A
Water Solubility:	N/A	**Melting Point:**	<325 °F

Appearance & Odor: Blue or White / Odorless

SECTION IV - FIRE AND EXPLOSION DATA

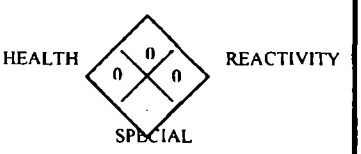
Flash Point: >600 °F **Autoignition Temp:** >575 °F

Flammability Limits In Air: LOWER = None / UPPER = None

Extinguishing media: Water spray, dry chemical / carbon dioxide

N.F.P.A. HAZARD INFORMATION LABEL

Hazard Code
4 = Extreme
3 = High
2 = Moderate
1 = Slight
0 = Negligible



Special fire fighting procedures: Wear self-contained breathing apparatus and protective clothing as required.

Unusual fire and explosion hazards: Carbon Monoxide formation and irritating smoke are possible under oxygen-lean conditions

SECTION V - HEALTH HAZARD INFORMATION

TLV: N/A

This product is not considered a carcinogen

Summary of risks: N/A
Medical conditions, which may be aggravated by contact: N/A
Target organs: N/A
Primary entry route (s): N/A
Acute effects: N/A
Chronic effect (s): N/A

SECTION V: - HEALTH HAZARD INFORMATION - Continued

EFFECTS OF OVEREXPOSURE

FIRST AID:

Eye contact: N/A

Skin Contact: N/A

Inhalation: N/A

Ingestion: N/A

SECTION VI - REACTIVITY DATA

Stability: Material is stable. Hazardous polymerization will not occur. Temperatures over 480 °F may cause degradation.

Chemical Incompatibility (Materials to Avoid): N/A

Hazardous Decomposition Products: Carbon Dioxide / Carbon Monoxide

SECTION VII - SPILL LEAK, AND DISPOSAL PROCEDURE

Spills, leaks: (steps to be taken: Maintain good housekeeping procedures

Waste Disposal Method: Observe all Federal, State, and Local laws concerning health and environment.

SECTION VIII - SPECIAL PROTECTION INFORMATION

Personal protective equipment:		**Work Place Consideration:**	
Goggles:	Normally not required	**Ventilation:**	N/A
Gloves:	Normally not required	**Safety Station:**	N/A
Respirator:	Normally not required	**Contaminated Equipment:**	N/A
Other:	Consideration should be given to the nature of the liquids to be absorbed.		

SECTION IX - SPECIAL PRECAUTIONS AND COMMENTS

Storage & Handling Information: Keep Dry, avoid long term storage in sunlight

Engineering Controls: N/A

Other Precautions: N/A

Judgments as to the suitability of information herein for purchaser's purposes are Necessarily purchaser's responsibility. Therefore, although reasonable care has been Taken in the preparation of such information, WYK Sorbents, LLC. extends no warranties, Makes no representations and assumes no responsibility as to accuracy or suitability of such information for application to purchaser's intended purposes or for the Consequences of its use.

Signed _____

Jim Dunn, Managing Partner

Date: 12/29/2005 MSDS: #700-4

MATERIAL SAFETY DATA SHEET
May be used to comply with OSHA's Hazard Communication Standard, 29 CFR 1910.1200. Standard must be consulted for specific requirements.

U.S. DEPARTMENT OF LABOR
Occupational Safety and Health Administration
(Non-Mandatory Form)
Form Approved
OMB No. 1218-0072

IDENTITY (As used on label and list)
N965 (N) TRADE SECRET

Note: Blank spaces are not permitted. If any item is not applicable, or no information is available, the space must be marked to indicate that.

Section I

Manufacturer's Name
NOCHAR, INC.

Emergency Telephone Number
(317) 613-3046

Address *(Number, Street, City, State and ZIP Code)*
8650 COMMERCE PARK PLACE SUITE K
INDIANAPOLIS, INDIANA 46268

Telephone Number for information
FAX: (317) 613-3052

Date Prepared
OCTOBER 2004

Signature of Preparer ***(optional)***

Section II - Hazardous Ingredients/Identity Information

Hazardous Components (Specific Chemical Identity: Common Name(s))	OSHA PEL	ACGIH TLV	Other Limits Recommended	% (optional)
NONE				

Section III - Physical/Chemical Characteristics

Boiling Point	316 F to 351 F	**Specific Gravity (H_2O = 1)**	.80
Vapor Pressure (mm Hg.)	N/A	**Melting Point**	N/A
Vapor Density (AIR = 1)	>1	**Evaporation Rate (Butyl Acetate = 1)**	N/A
Solubility in Water	INSOLUBLE	**Appearance and Odor**	Solid, Generally in Powder Form, Essentially Odorless

Section IV - Fire and Explosion Hazard Data

Flash Point (Method Used) N/A **Flammable Limits** N/A **LEL** **UEL**

Extinguishing Media FOAM- DRY CHEMICAL CARBON DIOXIDE

Special Fire Fighting Procedures AVOID WATER WHICH SWELLS PRODUCT.

Unusual Fire and Explosion Hazards N/A

Section V - Reactivity Data

Stability	**Unstable**		**Conditions to Avoid**
	Stable	X	EXTREME HEAT, (420 F) OPEN FLAME
Incompatibility (Materials to Avoid)			MATERIAL WILL SWELL WITH WATER
Hazardous Decomposition or Byproducts			MAY PRODUCE: HYDROGEN CYANIDE (Hydrocyanic Acid) NITROGEN OXIDES, CARBON OXIDES
Hazardous	**May Occur**		**Conditions to Avoid**
Polymerization	**Will Not Occur**	X	

Section VI - Health Hazard Data

Route(s) of Entry: **Inhalation** X **Skin** X **Ingestion** X

Health Hazards ***(Acute and Chronic)***

INHALATION: REMOVE TO FRESH AIR, IF NOT BREATHING, GIVE ARTIFCIAL RESPIRATION. EYES: FLUSH WITH WATER FOR 15 MIN. CALL PHYSICIAN. SKIN: WASH EXPOSED AREA WITH SOAP AND WATER. CALL PHYSICIAN. INGESTON: DO NOT INDUCE VOMITING. CALL PHYSICIAN

Carcinogenicity: N/A **NTP?** **IARC Monographs?** **OSHA Regulated?**

Signs and Symptoms of Exposure

AVOID PROLONGED OR FREQUENT CONTACT WHEN HANDLING MATERIAL. DO NOT INHALE DUST. AVOID SKIN AND EYE CONTACT.

Medical Conditions - Generally Aggravated by Exposure

Emergency and First Aid Procedures

Section VII - Precautions for Safe Handling and Use

Steps to Be Taken in Case Material is Released or Spilled

RECOVER SOLID WITH BROOM, SHOVEL OR VACUUM. AVOID GENERATING DUST CLOUDS.
PUT RECOVERED MATERIAL IN CONTAINERS FOR RECLAMATION OR DISPOSAL.

Waste Disposal Method

FOLLOW FEDERAL, STATE AND LOCAL REGULATIONS. WHEN USED AS ABSORBENT,
FOLLOW REGULATIONS FOR ABSORBED MATERIAL.

Precautions to Be Taken in Handling and Storing

IMPERVIOUS GLOVES, CHEMICAL GOGGLES.

Other Precautions

Section VIII - Control Measures

Respiratory Protection (Specify Type) DUST RESPIRATOR FOR FINE PRODUCT

Ventilation	**Local Exhaust**	NO SPECIAL REQUIREMENT	**Special**	N/A
	Mechanical (General)	IF POSSIBLE	**Other**	N/A
Protective Gloves	IMPERVIOUS GLOVES		**Eye Protection**	SAFETY GLASSES OR GOGGLES
Other Protective Clothing or Equipment	NOT NECESSARY			
Work/Hygienic Practice	NORMAL HYGIENE PRACTICES SHOULD BE FOLLOWED; WASH HANDS, ETC. AFTER HANDLING.			

DISCLAIMER: *The information contained herein is based on the data available to us and is believed to be correct. However, the manufacturer makes no warranty, expressed or implied regarding the accuracy of this data or the results to be obtained from the use thereof, and assumes no responsibility for injury from the use of the product described herein. The manufacturer assumes no liability for incidental, consequential or direct damage of any manner or kind, regardless of cause, including negligence.*

NFPA RATINGS

HEALTH 0

FLAMMABILITY 1

REACTIVITY 1

MATERIAL SAFETY DATA SHEET

Becker Labs
Rt. 2 Box 119-B
Mountain City, TN. 37683

Product Name: CRYSTALAC - CL-90, CL-60, CL-30, CL-SS CL-CC, CL-UC, Series Coatings
Product Code No:
Page 1
Issue Date: 1-3-92

MANUFACTURER	Transportation Emergencies:
Becker Labs Rt. 2 Box 119-B Mountain City, TN. 37683 CONTACT FOR FURTHER INFORMATION: MSDS COORDINATOR Phone 615-727-6425	NON-FLAMMABLE PAINT CLASS 55 D.O.T NON REGULATED ITEM # 149980 Sub 6 Health Emergencies: NON-TOXIC LATEX PAINT

PRODUCT IDENTIFICATION

PRODUCT NAME: CRYSTALAC (Waterborne Finishes)

CHEMICAL FAMILY: Mixture

DOT PROPER SHIPPING NAME: NON-FLAMMABLE PAINT

ID NUMBER: ITEM # 149980 sub 6

DOT HAZARD CLASSIFICATION: NOT REGULATED

SECTION I - COMPONENTS	PERCENT	EXPOSURE LIMIT	UNITS	AGENCY	TYPE
HAZARDOUS COMPONENTS:	AS IDENTIFIED PER 29 CFR 1910.1200				
ISOPROPANOL CAS # 67-63-0	4.0	400 500	TVL TVL	ppm ppm	TWA STEL ACGIH
		HMIS HEALTH HAZARD RATING = 1			
OTHER COMPONENTS:					
MIXED GLYCOL ETHER CAS # PROPRIETARY	4.2	NOT ESTABLISHED			
ACRYLIC POLYMER CAS #: PROPRIETARY	28-32	NOT ESTABLISHED			
PIGMENT, MIXED, INERT CAS #: PROPRIETARY	0-10	NOT ESTABLISHED			

THIS PRODUCT CONTAINS THE FOLLOWING CHEMICALS SUBJECT TO THE REPORTING REQUIREMENTS OF SARA 313 AND 40 CFR 372: CAS# WEIGHT %

- - N O N E - -

NOTE: CONTAINS LESS THAN 0.5% RESIDUAL MONOMERS (LESS THAN 0.1% RESIDUAL ACRYLATE MONOMERS PRESENT).

SECTION II - EMERGENCY AND FIRST AID PROCEDURES

EYE CONTACT:

IF IRRITATION OR REDNESS DEVELOPS, MOVE VICTIM AWAY FROM EXPOSURE AND INTO FRESH AIR. FLUSH EYES WITH CLEAN WATER. IF SYMPTOMS PERSIST, SEEK MEDICAL ATTENTION.

SECTION IV - SPECIAL PROTECTION INFORMATION

PROTECTIVE GLOVES:

THE USE OF GLOVES IMPERMEABLE TO THE SPECIFIC MATERIAL HANDLED IS ADVISED TO PREVENT SKIN CONTACT AND POSSIBLE IRRITATION.

EYE PROTECTION:

APPROVED EYE PROTECTION TO SAFEGUARD AGAINST POTENTIAL EYE CONTACT, IRRITATION OR INJURY IS RECOMMENDED.

OTHER PROTECTIVE EQUIPMENT:

IT IS SUGGESTED THAT A SOURCE OF CLEAN WATER BE AVAILABLE IN THE WORK AREA FOR FLUSHING EYES AND SKIN. IMPERVIOUS CLOTHING SHOULD BE WORN AS NEEDED.

SECTION V - REACTIVITY DATA

STABILITY:

STABLE

CONDITIONS TO AVOID (STABILITY):

NOT NOTED

INCOMPATIBILITY (MATERIALS TO AVOID):

NO HAZARDOUS REACTIONS ARE EXPECTED TO OCCUR UNDER NORMAL INDUSTRIAL CONDITIONS.

HAZARDOUS DECOMPOSITION PRODUCTS:

COMBUSTION MAY YIELD CARBON MONOXIDE AND/OR CARBON DIOXIDE AND TRACES OF MONOMER.

HAZARDOUS POLYMERIZATION:

WILL NOT OCCUR

POLYMERIZATION CONDITIONS TO AVOID:

NOT NOTED

SECTION VI - SPILL AND LEAK PROCEDURES ***HIGHWAY OR RAILWAY SPILLS***

PRECAUTIONS IN CASE OF RELEASE OR SPILL:

FLUSH SPILLED MATERIAL INTO SUITABLE RETAINING AREAS OR CONTAINERS WITH LARGE QUANTITIES OF WATER. SMALL SPILLS: SPILLED MATERIAL MAY BE ABSORBED INTO AN APPROPRIATE ABSORBANT. PREVENT SPILLED LIQUID FROM ENTERING SEWERS, STORM DRAINS, OTHER UNAUTHORIZED TREATMENT/DRAINAGE SYSTEMS AND NATURAL WATERWAYS. NOTIFY APPROPRIATE STATE/LOCAL AGENCIES.

REPORTABLE QUANTITY:

NOT NOTED

WASTE DISPOSAL METHOD:

DISPOSE OF PRODUCT IN ACCORDANCE WITH LOCAL, COUNTY, STATE, AND FEDERAL REGULATIONS.

FAX TO ECOTEK
615-743-6995
3/16/92

MATERIAL SAFETY DATA SHEET

Becker Labs
Rt. 2 Box 119-B
Mountain City, TN. 37683

Product Name: AQUALAC III
Product Code No: 80-9AM 16-13A-3

Issue Date: 5-30-91

MANUFACTURER

Becker Labs
Rt. 2 Box 119-B
Mountain City, TN. 37683

CONTACT FOR FURTHER INFORMATION:
MSDS COORDINATOR Phone 615-727-6425

Transportation Emergencies:

Health Emergencies:

PRODUCT IDENTIFICATION

PRODUCT NAME: AQUALAC III

CHEMICAL FAMILY: Waterborne Furniture Coating

DOT PROPER SHIPPING NAME: N/A

ID NUMBER: NONE

DOT HAZARD CLASSIFICATION: NOT REGULATED

SECTION I - COMPONENTS	PERCENT	EXPOSURE LIMIT	UNITS	AGENCY	TYPE

HAZARDOUS COMPONENTS

NO HAZARDOUS COMPONENTS IDENTIFIED AS PER 29 CFR 1910.1200.

OTHER COMPONENTS

WATER CAS #: 7732-18-5	58-62	NOT ESTABLISHED			
ACRYLIC POLYMER CAS #: PROPRIETARY	30-32	NOT ESTABLISHED			
MIXED GLYCOL ETHERS CAS #: PROPRIETARY	6-8	NOT ESTABLISHED			

THIS PRODUCT CONTAINS THE FOLLOWING CHEMICALS SUBJECT TO THE REPORTING REQUIREMENTS OF SARA 313 AND 40 CFR 372: CAS NUMBER WEIGHT %

--NONE--

NOTE: CONTAINS LESS THAN 0.5% RESIDUAL MONOMERS (LESS THAN 0.1% RESIDUAL ACRYLATE MONOMERS PRESENT).

SECTION II - EMERGENCY AND FIRST AID PROCEDURES

EYE CONTACT:

IF IRRITATION OR REDNESS DEVELOPS, MOVE VICTIM AWAY FROM EXPOSURE AND INTO FRESH AIR. FLUSH EYES WITH CLEAN WATER. IF SYMPTOMS PERSIST, SEEK MEDICAL ATTENTION.

Becker Labs

SECTION II - EMERGENCY AND FIRST AID PROCEDURES

SKIN CONTACT:

FIRST AID IS NOT NORMALLY REQUIRED. HOWEVER, IT IS GOOD PRACTICE TO WASH ANY CHEMICAL FROM THE SKIN.

INHALATION (BREATHING):

IF RESPIRATORY SYMPTOMS DEVELOP, MOVE VICTIM AWAY FROM SOURCE OF EXPOSURE AND INTO FRESH AIR. IF SYMPTOMS PERSIST, SEEK MEDICAL ATTENTION. IF VICTIM IS NOT BREATHING, IMMEDIATELY BEGIN ARTIFICIAL RESPIRATION. IF BREATHING DIFFICULTIES DEVELOP, OXYGEN SHOULD BE ADMINISTERED BY QUALIFIED PERSONNEL. SEEK IMMEDIATE MEDICAL ATTENTION.

INGESTION (SWALLOWING):

NO FIRST AID IS NORMALLY REQUIRED; HOWEVER, IF SWALLOWED, AND SYMPTOMS DEVELOP, SEEK MEDICAL ATTENTION.

SECTION III - HEALTH HAZARDS/ROUTES OF ENTRY

EYE CONTACT:

THIS MATERIAL MAY CAUSE EYE IRRITATION. DIRECT CONTACT WITH THE LIQUID OR EXPOSURE TO VAPORS OR AEROSOLS MAY CAUSE STINGING, TEARING AND REDNESS.

SKIN CONTACT:

THIS MATERIAL IS NOT EXPECTED TO BE A SKIN IRRITANT. HOWEVER, IF ALLOWED TO REMAIN ON THE SKIN WITHOUT BEING RINSED OFF WITH WATER, A THIN FILM MAY FORM. REMOVAL OF THIS FILM MAY RESULT IN SLIGHT IRRITATION DEPENDENT ON THE METHOD OF REMOVAL. SKIN ABSORPTION OF THIS MATERIAL IS UNLIKELY.

INHALATION (BREATHING):

BREATHING HIGH CONCENTRATIONS OF VAPORS OR AEROSOLS OF THIS MATERIAL MAY CAUSE NAUSEA AND IRRITATION OF THE NOSE, THROAT AND RESPIRATORY TRACT. RESPIRATORY SYMPTOMS ASSOCIATED WITH PRE-EXISTING LUNG DISORDERS (E.G., ASTHMA-LIKE CONDITIONS) MAY BE AGGRAVATED BY EXPOSURE TO THIS MATERIAL.

INGESTION (SWALLOWING):

WHILE THIS MATERIAL HAS A LOW DEGREE OF TOXICITY, INGESTION OF EXCESSIVE QUANTITIES MAY CAUSE IRRITATION OF THE DIGESTIVE TRACT.

COMMENTS:

THIS MATERIAL HAS NOT BEEN IDENTIFIED AS A CARCINOGEN BY NTP, IARC OR OSHA. TOTAL RESIDUAL MONOMER CONTENT DOES NOT EXCEED 0.5%. ANY INDIVIDUAL COMPONENT THAT MAY POSE A CANCER HAZARD IS PRESENT AT LESS THAN 0.1%. USE OF THIS PRODUCT MAY, IN SOME CIRCUMSTANCES, GENERATE THE SAME HAZARDS ASSOCIATED WITH THE BASE MONOMERS. THE USER SHOULD EVALUATE HIS USE OF THE PRODUCT TO DETERMINE IF HAZARDS FROM RESIDUAL MONOMERS EXIST.

SECTION IV - SPECIAL PROTECTION INFORMATION

VENTILATION:

IF CURRENT VENTILATION PRACTICES ARE NOT ADEQUATE TO MINIMIZE EXPOSURE, ADDITIONAL VENTILATION OR EXHAUST SYSTEMS MAY BE REQUIRED.

RESPIRATORY PROTECTION:

RESPIRATORY PROTECTION MAY BE NECESSARY TO MINIMIZE EXPOSURE TO VAPORS OR AEROSOLS. DEPENDING ON THE NATURE AND CONCENTRATION OF THE AIRBORNE MATERIAL, USE A RESPIRATOR OR GAS MASK WITH APPROPRIATE FILTERS, CARTRIDGES AND CANNISTERS (NIOSH APPROVED, IF AVAILABLE) OR SUPPLIED AIR EQUIPMENT.

Becker Labs

Product Name: AQUALAC III
Product Code No: 80-9AM 16-13A-3

Issue Date: 5-30-91

SECTION IV - SPECIAL PROTECTION INFORMATION

PROTECTIVE GLOVES:

THE USE OF GLOVES IMPERMEABLE TO THE SPECIFIC MATERIAL HANDLED IS ADVISED TO PREVENT SKIN CONTACT AND POSSIBLE IRRITATION.

EYE PROTECTION:

APPROVED EYE PROTECTION TO SAFEGUARD AGAINST POTENTIAL EYE CONTACT, IRRITATION OR INJURY IS RECOMMENDED.

OTHER PROTECTIVE EQUIPMENT:

IT IS SUGGESTED THAT A SOURCE OF CLEAN WATER BE AVAILABLE IN THE WORK AREA FOR FLUSHING EYES AND SKIN. IMPERVIOUS CLOTHING SHOULD BE WORN AS NEEDED.

SECTION V - REACTIVITY DATA

STABILITY:

STABLE

CONDITIONS TO AVOID (STABILITY):

NOT NOTED

INCOMPATIBILITY (MATERIALS TO AVOID):

NO HAZARDOUS REACTIONS ARE EXPECTED TO OCCUR UNDER NORMAL INDUSTRIAL CONDITIONS.

HAZARDOUS DECOMPOSITION PRODUCTS:

COMBUSTION MAY YIELD CARBON MONOXIDE AND/OR CARBON DIOXIDE AND TRACES OF MONOMER.

HAZARDOUS POLYMERIZATION:

WILL NOT OCCUR

POLYMERIZATION CONDITIONS TO AVOID:

NOT NOTED

SECTION VI - SPILL AND LEAK PROCEDURES ***HIGHWAY OR RAILWAY SPILLS***

Not Noted

PRECAUTIONS IN CASE OF RELEASE OR SPILL:

FLUSH SPILLED MATERIAL INTO SUITABLE RETAINING AREAS OR CONTAINERS WITH LARGE QUANTITIES OF WATER. SMALL SPILLS: SPILLED MATERIAL MAY BE ABSORBED INTO AN APPROPRIATE ABSORBANT. PREVENT SPILLED LIQUID FROM ENTERING SEWERS, STORM DRAINS, OTHER UNAUTHORIZED TREATMENT/DRAINAGE SYSTEMS AND NATURAL WATERWAYS. NOTIFY APPROPRIATE STATE/LOCAL AGENCIES.

REPORTABLE QUANTITY:

NOT NOTED

WASTE DISPOSAL METHOD:

DISPOSE OF PRODUCT IN ACCORDANCE WITH LOCAL, COUNTY, STATE, AND FEDERAL REGULATIONS.

Becker Labs

Product Name: AQUALAC III
Product Code No: 80-9AM 16-13A-3

Issue Date: 5-30-91

SECTION VII - STORAGE AND SPECIAL PRECAUTIONS

HANDLING AND STORAGE PRECAUTIONS:

KEEP CONTAINERS COOL AND DRY. USE AND STORE THIS PRODUCT WITH ADEQUATE VENTILATION (SEE SECTION IV). KEEP PRODUCT CONTAINERS CLOSED WHEN NOT IN USE. AVOID SUBJECTING THIS PRODUCT TO EXTREME TEMPERATURE VARIATIONS AND FREEZING. SHOCKING EMULSIONS WITH LARGE QUANTITIES OF CHEMICALS OR EXTREME SHEAR MAY CAUSE COAGULATION. CAREFUL HANDLING PRACTICES SHOULD BE EXERCISED AND UNNECESSARY EXPOSURE AVOIDED. DO NOT WEAR SATURATED CLOTHING OR SHOES.

SECTION VIII - FIRE AND EXPLOSION HAZARD DATA

			HAZARD RANKING
NFPA HAZARD CLASS	HEALTH HAZARD:	1	0 - LEAST
	FLAMMABILITY:	0	1 - SLIGHT
	REACTIVITY:	0	2 - MODERATE
	OTHER:		3 - HIGH
			4 - EXTREME

EXTINGUISHING MEDIA:

FOR DRIED SOLIDS, USE WATER, FOAM, CO2 OR DRY CHEMICAL FIRE FIGHTING APPARATUS.

FIRE & EXPLOSION HAZARDS:

CLOSED CONTAINERS EXPOSED TO EXTREME HEAT MAY RUPTURE DUE TO PRESSURE BUILD UP.

FIRE FIGHTING PROCEDURES:

WATER SPRAY MAY BE USEFUL IN MINIMIZING VAPORS AND COOLING CONTAINERS EXPOSED TO HEAT AND FLAME.

SECTION IX - PHYSICAL DATA

APPROX BOILING POINT	(AIR = 1) VAPOR DENSITY	(N-BUTYL ACETATE = 1) EVAPORATION RATE	% VOLATILE
212F / 100C	<1	EQUAL TO WATER	68-70
% SOLUBILITY IN WATER	**SPECIFIC GRAVITY**	**APPROX. BULK DENSITY (lb/gal)**	
DILUTABLE	1.02	8.5	
VAPOR PRESSURE	**VOC (Less Water)**		
NOT NOTED	< 2 lb. per Gal.		
APPEARANCE		**ODOR**	
MILKY WHITE LIQUID		FAINT ESTER.	

SECTION X - PRECAUTIONARY LABEL/WARNING

NONE

SECTION XI - DOCUMENTARY INFORMATION

ISSUE DATE: 5-30-91 PRODUCT CODE NO. 80-9AM 16-13A-3

PREV. DATE: none PREV. PROD. CODE NO.

MSDS NO: S-14 PREV. MSDS NO: none

Becker Labs

Product Name: AQUALAC III
Product Code No: 80-9AM 16-13A-3
Issue Date: 5-30-91

SECTION X - PRECAUTIONARY LABEL/WARNING

NONE

SECTION XI - DOCUMENTARY INFORMATION

ISSUE DATE: 5-30-91 PRODUCT CODE NO. 80-9AM 16-13A-3

PREV. DATE: none PREV. PROD. CODE NO. none

MSDS NO: s-14 PREV. MSDS NO: none

DISCLAIMER OF EXPRESSED AND IMPLIED WARRANTIES

The information in this document is believed to be correct as of the date issued. HOWEVER, NO WARRANTY OF MERCHANTABILITY, FITNESS FOR ANY PARTICULAR PURPOSE, OR ANY OTHER WARRANTY IS EXPRESSED OR IS TO BE IMPLIED REGARDING THE ACCURACY OR COMPLETENESS OF THIS INFORMATION, THE RESULTS TO BE OBTAINED FROM THE USE OF THIS INFORMATION OR THE PRODUCT, THE SAFETY OF THIS PRODUCT, OR THE HAZARDS RELATED TO ITS USE. This information and product are furnished on the condition that the person receiving them shall make his own determination as to the suitability of the product for his particular purpose and on the condition that he assume the risk of his use thereof.

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MATERIAL SAFETY DATA SHEET

RADPAD

SECTION 1 - IDENTIFICATION

MANUFACTURER'S NAME	ENVIRONMENTAL SCIENTIFIC, INC.
ADDRESS	P.O. Box 13486 Research Triangle Park, NC 27709
EMERGENCY PHONE NUMBER	FOR TRANSPORTATION EMERGENCY Call 919-941-0847 Ingestion or skin contact call ENVIRONMENTAL SCIENTIFIC 919-941-0847
PHONE NUMBER	919-941-0847
EFFECTIVE DATE	2-11-93
CHEMICAL FAMILY	Superabsorbent polymer
TRADE NAME	RADPAD
DOT CLASSIFICATION	Not applicable
DOT HAZARD CLASS	NOT APPLICABLE

SECTION 2 - HAZARDOUS INGREDIENTS

Product does not contain hazardous ingredients

OSHA, TWA, and ACGIH TWA: Not regulated

SECTION 3 - PHYSICAL DATA

VOLATILITY (%)	None
SOLUBILITY	Insoluble, but swellable in aqueous fluids.
APPEARANCE	White cellulosic laminate containing a superabsorbent polymer.
ODOR	None

SECTION 4 - FIRE AND EXPLOSION HAZARD DATA

FLASH POINT	Not applicable
FLAMMABLE LIMITS	Not applicable
EXTINGUISH MEDIA	Water
FIRE HAZARD	None

SECTION 5 - TOXICITY AND FIRST AID

CARCINOGENICITY	None
OSHA REGULATED?	No
ACUTE ORAL & DERMAL	Nontoxic
EYE SENSITIVITY	Temporary eye irritant
SKIN SENSITIVITY	None
FIRST AID	Flush eyes with water. If irritation persists, obtain medical assistance.

SECTION 6 - REACTIVITY DATA

STABILITY	Stable
INCOMPATIBLE MATERIALS	Strong oxidizing agents
DECOMPOSITION HAZARD	None
HAZARDOUS POLYMERIZATION	Will not occur.

SECTION 7 - SPILL AND DISPOSAL

In the event of a spill or need to dispose of unwanted material, place in an approved solid waste disposal area in accordance with existing environmental regulations.

CAUTION: The material becomes slippery if flushed or in contact with water.

SECTION 8 - HANDLING AND STORAGE

RESPIRATORY PROTECTION	Use mask appropriate for your operation to protect from any dust and respiratory particles.
PROTECTIVE CLOTHING	None
EYE PROTECTION	Safety glasses are always advised, but normally not needed.
HYGIENE PRACTICES	Good housekeeping
STORAGE	Keep material in a dry location and sealed to minimize water absorption before use.

SECTION 9 - REGULATORY INFORMATION

TSCA	Laminate: Not applicable
FDA	None
PROP 65	Not regulated

MATERIAL SAFETY DATA SHEET

ANTI-CORROSION RADPAD

SECTION 1 - IDENTIFICATION

MANUFACTURER'S NAME:	ENVIRONMENTAL SCIENTIFIC, INC.
ADDRESS:	P.O. Box 13486 Research Triangle Park, NC 27709
EMERGENCY PHONE NUMBER:	FOR TRANSPORTATION EMERGENCY Call 919-941-0847 Ingestion or skin contact call ENVIRONMENTAL SCIENTIFIC 919-941-0847
PHONE NUMBER:	919-941-0847
EFFECTIVE DATE:	2/11/93
CHEMICAL FAMILY:	A proprietary blend of superabsorbent polymers and amine salts.
TRADE NAME:	ANTI-CORROSION RADPAD
DOT CLASSIFICATION:	Not applicable
DOT HAZARD CLASS:	NOT APPLICABLE

SECTION 2 - INGREDIENTS

Product does not contain hazardous ingredients

Carcinogenic? OSHA: no NTP: no IARC: no

SECTION 3 - PHYSICAL DATA

VOLATILITY (%):	None.
SOLUBILITY:	Insoluble, but swellable in aqueous fluids.
APPEARANCE:	White cellulosic laminate containing a blend of superabsorbent polymer and amine salts.
ODOR:	Slight amine.
EVAPORATION RATE (amine salts):	Nil.
VAPOR PRESSURE (amine salts):	0.0001 mm Hg (20°C).

SECTION 4 - FIRE AND EXPLOSION HAZARD DATA

FLASH POINT:	Not applicable
FLAMMABLE LIMITS:	LEL: Not applicable UEL: Not applicable
EXTINGUISH MEDIA"	Water, carbon dioxide or other dry chemical firefighting agents.
UNUSUAL FIRE & EXPLOSION HAZARDS:	None
SPECIAL FIREFIGHTING PROCEDURES:	If involved in a fire, firefighters should wear self-contained breathing apparatus.

SECTION 5 - HEALTH HAZARD DATA

MEDICAL CONDITIONS PRONE TO AGGRAVATION BY EXPOSURE:	None known.
CARCINOGENICITY:	None
OSHA REGULATED:	No
ACUTE ORAL & DERMAL:	Nontoxic
EYE SENSITIVITYY:	Temporary eye irritant
SKIN SENSITIVITY:	None

SECTION 6 - REACTIVITY DATA

STABILITY	Stable
INCOMPATIBLE MATERIALS	Strong oxidizing agents
DECOMPOSITION HAZARD	None
HAZARDOUS POLYMERIZATION	Will not occur.

SECTION 7 - SPILL AND DISPOSAL

In the event of a spill or need to dispose of unwanted material, place in an approved solid waste disposal area in accordance with existing environmental regulations.

CAUTION: The material becomes slippery if flushed or in contact with water.

SECTION 8 - HANDLING AND STORAGE

RESPIRATORY PROTECTION	Use mask appropriate for your operation to protect from any dust and respriatory particles.
PROTECTIVE CLOTHING	None
EYE PROTECTION	Safety glasses are always advised, but normally not needed.
HYGIENE PRACTICES	Good housekeeping
STORAGE	Keep material in a dry location and sealed to minimize water absorption before use.

SECTION 9 - REGULATORY INFORMATION

TSCA	Laminate: Not applicable
FDA	None
PROP 65	Not regulated

MATERIAL SAFETY DATA SHEET

RADSORB

SECTION 1 - IDENTIFICATION

MANUFACTURER'S NAME	ENVIRONMENTAL SCIENTIFIC, INC.
ADDRESS	5400 SOUTH MIAMI BLVD. MORRISVILLE, NC 27560
EMERGENCY PHONE NUMBER	FOR TRANSPORTATION EMERGENCY Call 919-941-0847 Ingestion or skin contact call ENVIRONMENTAL SCIENTIFIC 919/941-0847
PHONE NUMBER	919-941-0847
EFFECTIVE DATE	1-22-93
CHEMICAL FAMILY	Sodium polyacrylate homopolymer
TRADE NAME	RADSORB
DOT CLASSIFICATION	Not applicable
DOT HAZARD CLASS	NOT APPLICABLE

SECTION 2 - HAZARDOUS INGREDIENTS

HAZARDOUS COMPONENTS	HAZARDOUS %	TLV (Units)
None	0.0%	None

SECTION 3 - PHYSICAL DATA

VOLATILITY (%)	None	
SOLUBILITY IN WATER	Insoluble, but swellable in aqueous fluids.	
pH VALUE	7.5+/-0.3 (20°C gel)	
SPECIFIC GRAVITY	0.83	ASTM D-1298
PHYSICAL FORM	White granular	
PARTICLE SIZE	100-300 microns	
MOISTURE CONTENT	5%+/-2% DIN 53723	
BULK DENSITY	620+/-40 g/l	

SECTION 4 - FIRE AND EXPLOSION HAZARD DATA

FLASH POINT	Not applicable
EXTINGUISH MEDIA	Water, CO_2, foam, dry powder.
UNUSUAL FIRE AND FIRE HAZARD	None

SECTION 5 - HEALTH EFFECTS INFORMATION

SKIN CONTACT:	Prolonged contact with skin may lead to slight irritation due to the somewhat abrasive powder.
EYE CONTACT	May cause slight irritation and swelling of mucous membrane.
INHALATION:	May cause irritation to the respiratory tract and lungs.
FIRST AID:	SKIN CONTACT: Wash with soap and water. EYE CONTACT: Rinse with plenty of water for at least 15 minutes. If ill effects occur, seek medical attention.

INHALATION: Remove to fresh air. If discomfort continues, seek medical attention.
INGESTION: If ill effects occur, seek medical attention.

SECTION 6 - TOXICOLOGICAL INFORMATION

ACUTE ORAL TOXICITY (ALBINO RATS): LD50 = Greater than 5,000 mg/kg.

COMMENTS: Administered as a 5% gel in 0.9% NaCl solution.

ACUTE DERMAL TOXICITY (ALBINO RATS): LD50 = Greater than 2,000 mg/kg.

COMMENTS: Administered as a 5% gel in a 0.9% NaCl solution, applied to shom skin of rats.

SUBACUTE INHALATION STUDY: A 14 day inhalation test with Fischer-344 rats of 0.05, 0.1 and 1.0 mg/cubic meter showed no effects at the level of 1.0 mg/cubic meter or lower. Sacrifice after 1 to 40 days exposure showed non-specific reversible inflammatory response, a typical pattern for chemicals of this class.

SUBCHRONIC SKIN COMPATIBILITY 10 Female mice were treated dermally thrice per week with 0.05 ml of a 7.5% w/v RADSORB gel in 0,9% NaCl solution on the shom skin for 8 weeks (24 overall applications). Body weight development was normal; no defects or adverse effects to skin were observed.

HUMAN REPEAT INSULT PATCH TEST (HRIPT): No evidence of sensitizing potential when using a patch of 29% RADSORB N in a cellulose matrix on 12 humans.

EYE IRRITATION: Application of 0.1 g of dry powder RADSORB into the conjunctival sac of the eyes of rabbits caused slight erythema, slight opaqueness of the cornea, and a slight swelling of the mucous membrane (primary irritation index = 26 out of possible 110 points). A watery gel of RADSORB exerts no reaction on rabbit eyes.

SENSITIZATION: Maximization test according to Magusson & Kilgman: 20 guinea pigs were treated intradermally with a 1.0% extraction solution of RADSORB and dermally with 7.5% w/v gel in a 0.9% NaCl solution. No erythema or edema were observed. A sensitization potential is not considered likely. A human sensitization test, performed in 119 adults yielded no evidence of sensitization.

MUTAGENICITY: Ames test using strains TA98, TA100, TA1535 and TA1538 both with and without S-9. The concentration ranged from 5-500 micrograms/plate. No evidence of mutagenic activity. Zytogenic investigations of oral doses given to rats (0.14-1.43 g/kg) exhibited no chromosome damaging effects. Mouse lymphoma assay with L51784 cells using the thymidinkinase locus led to no mutagenic activity when 186-2475 mg/ml without S-9 and 44-588 mg/ml with S-9 were applied. Unscheduled DNA Synthesis UDS) in rat hepatocytes was not activated with concentrations from 6.7-6.77 mg/ml.

CELL TOXICITY: The ciliate Test, according to Professors Graef & Erlangen, with water extracts of RADSORB showed a significant effect only at the concentration of 368 mg/ml carbon content. No effects were observed with extracts of 23-183 mg/ml carbon.

SECTION 7 - REACTIVITY INFORMATION

INCOMPATIBILITY: None known
THERMAL DECOMPOSITION PRODUCTS: In the event of combustion CO, CO_2. NOx may be formed. Do not breathe smoke or fumes, Wear suitable protective equipment.

SECTION 8 - PERSONAL PROTECTION EQUIPMENT

RESPIRATORY PROTECTION: Respiratory protection not normally needed. If significant dusting occurs, wear a NIOSH approved or equivalent dust respirator.

For large spills, entry into large tanks, vessels or enclosed small spaces with inadequate ventilation, a pressure-demand, self-contained breathing apparatus is recommended.

VENTILATION: If significant dusting occurs, local exhaust ventilation is recommended.

PROTECTIVE EQUIPMENT: No special precautions. Avoid eye and skin contact, and inhalation of dust.

If clothing is contaminated, remove clothing and thoroughly wash the affected area. Launder contaminated clothing before reuse.

SECTION 9 - SPILL AND DISPOSAL

SPILL CONTROL AND RECOVERY:

SOLID SPILLS: Sweep or vacuum up and reclaim into recovery or salvage drums for disposal. Wear the protective equipment specified in Section 8. Refer to CERCLA in Section 12.

DISPOSAL: If this product becomes a waste, it does not meet the criteria of a hazardous waste as defined under the Resource Conservation and Recovery Act (RCRA) 40 CFR 261, since it does not have the characteristics of Subpart C, nor is it listed under Subpart D.

As a non-hazardous solid waste, it can be disposed of in a sanitary landfill in accordance with local, state and federal regulations.

SECTION 10 - ENVIRONMENTAL INFORMATION

If released into the environment, see CERCLA in Section 12.

ACUTE FISH TOXICITY: LC_{50} approximately 1000 mg extractable (golden orfs, 96 hours) substances as carbon/liter. (OECD Method No. 203).

ACUTE BACTERIAL TOXICITY: EC_{50} = 630 mg extractable substances as (pseudomonas putida) carbon/liter. DEVL 8). From structural considerations and the physical/chemical properties, RADSORB is considered to be non-toxic to terrestrial and aquatic life.

SECTION 11 - TRANSPORTATION INFORMATION

DOT PROPER SHIPPING NAME/HAZARD CODE - PRODUCT IS NOT REGULATED DURING TRANSPORTATION

SECTION 12 - REGULATORY INFORMATION

This product does not contain ingredients (at a level of 1% or greater) on the List of Toxic Chemicals.

FEDERAL WATER POLLUTION CONTROL ACT, CLEAN WATER ACT, 40 CFR 401.15/formerly Sec. 307, 40 CFR 116/formerly Sec. 311:
None of the ingredients are specifically listed.

CLEAN AIR ACT, 40 CFR 60, SECTION 111, 40 CFR 61, SECTION 112:
This product does not contain ingredients covered by the Clean Air Act.

STATE REGULATIONS:

CALIFORNIA PROPOSITION 65:
None of the chemicals on the current Proposition 65 list are known to be present in this product.

MICHIGAN CRITICAL MATERIALS:
This product does not contain ingredients listed on the Michigan Critical Materials Register.

STATE RIGHT TO KNOW LAWS: The following ingredient(s) are disclosed for compliance with State Right to Know Laws:

Sodium polyacrylate homopolymer	Trade Secret

SECTION 13 - USER'S RESPONSIBILITY

This product material safety data sheet provides health and safety information. The product is to be used in applications consistent with our product literature. Individuals handling this product should be informed of the recommended safety precautions and should have access to this information. For any other uses, exposures should be evaluated so that appropriate handling practices and training programs can be established to ensure safe workplace operations. Please consult your ESI sales representative for further information.

SECTION 14 - BIBLIOGRAPHY

ANNUAL REPORT ON CARCINOGENS, U.S. Department of Health and Human Services, Public Health Service, PB 33-135855, 1983.

CASARETT AND DOULL'S TOXICOLOGY, THE BASIC SCIENCE OF POISONS, Doull, J., Klaassen, C.D., and Admur, M.O., eds., Macmillian Publishing Company, Inc., N.Y., 2nd. edition, 1980.

CHEMICAL HAZARDS OF THE WORKPLACE, Proctor, N.H., and Hughes, J.P., eds., J.P. Lipincott Company, N.Y., 1981.

DANGEROUS PROPERTIES OF INDUSTRIAL MATERIALS, Sax, n. Irving, ed., Van Nostrand Reinhold Company, N.Y., 6th edition, 1984

IARC MONOGRAPHS ON THE EVALUATION OF THE CARCINOGENIC RISK OF CHEMICALS TO MAN, Geneva: World Health Organization, International Agency for Research on Cancer, 1972-1977.

PATTY'S INDUSTRIAL HYGIENE AND TOXICOLOGY, Clayton, G.D., Clayton, F.E., eds., John Wiley and Sons, N.Y., 3rd edition, Vol. 2 A-C, 1981.

REGISTRY OF TOXIC EFFECTS ON CHEMICAL SUBSTANCES, U.S. Department of Health and Human Services, Public Health Service, Center for Disease Control, National Institute for Occupational Safety and Health, 1983 supplement of 1981-1982 edition, Vol. 1-3, OH, 1984.

Title 29 Code of Federal Regulations Part 1910, Subpart Z, Toxic and Hazardous Substances, Occupational Safety and Health Administration (OSHA).

THRESHOLD LIMIT VALUES FOR CHEMICAL SUBSTANCES AND PHYSICAL AGENTS IN THE WORKROOM ENVIRONMENT WITH INTENDED CHANGES, American Conference of Government Industrial Hygienists, OH.

SECTION 15 - STORAGE

STORAGE	Keep material in a dry location and sealed to minimize water absorption before use.

MATERIAL SAFETY DATA SHEET

RADPAD ROLLS

SECTION 1 - IDENTIFICATION

MANUFACTURER'S NAME	ENVIRONMENTAL SCIENTIFIC, INC.
ADDRESS	P.O. Box 13486 Research Triangle Park, NC 27709
EMERGENCY PHONE NUMBER	FOR TRANSPORTATION EMERGENCY Call 919-941-0741 Ingestion or skin contact call ENVIRONMENTAL SCIENTIFIC 919-941-0847
PHONE NUMBER	919-941-0847
EFFECTIVE DATE	2/11/93
CHEMICAL FAMILY	Superabsorbent polymer
TRADE NAME	RADPAD ROLLS
DOT CLASSIFICATION	Not applicable
DOT HAZARD CLASS	NOT APPLICABLE

SECTION 2 - HAZARDOUS INGREDIENTS

Product does not contain hazardous ingredients

OSHA, TWA, and ACGIH TWA: Not regulated

SECTION 3 - PHYSICAL DATA

VOLATILITY (%)	None
SOLUBILITY	Insoluble, but swellable in aqueous fluids.
APPEARANCE	White cellulosic laminate containing a superabsorbent polymer.
ODOR	None

SECTION 4 - FIRE AND EXPLOSION HAZARD DATA

FLASH POINT	Not applicable
FLAMMABLE LIMITS	Not applicable
EXTINGUISH MEDIA	Water
FIRE HAZARD	None

SECTION 5 - TOXICITY AND FIRST AID

CARCINOGENICITY	None
OSHA REGULATED?	No
ACUTE ORAL & DERMAL	Nontoxic
EYE SENSITIVITY	Temporary eye irritant
SKIN SENSITIVITY	None

FIRST AID	Flush eyes with water. If irritation persists, obtain medical assistance.

SECTION 6 - REACTIVITY DATA

STABILITY	Stable
INCOMPATIBLE MATERIALS	Strong oxidizing agents
DECOMPOSITION HAZARD	None
HAZARDOUS POLYMERIZATION	Will not occur.

SECTION 7 - SPILL AND DISPOSAL

In the event of a spill or need to dispose of unwanted material, place in an approved solid waste disposal area in accordance with existing environmental regulations.

CAUTION: The material becomes slippery if flushed or in contact with water.

SECTION 8 - HANDLING AND STORAGE

RESPIRATORY PROTECTION	Use mask appropriate for your operation to protect from any dust and respiratory particles.
PROTECTIVE CLOTHING	None
EYE PROTECTION	Safety glasses are always advised, but normally not needed.
HYGIENE PRACTICES	Good housekeeping
STORAGE	Keep material in a dry location and sealed to minimize water absorption before use.

SECTION 9 - REGULATORY INFORMATION

TSCA	Laminate: Not applicable
FDA	None
PROP 65	Not regulated

MATERIAL SAFETY DATA SHEET

Trade Name: CC Wet

Section I – General Information:

Item Name: CC Wet

Manufactured by: InstaCote, INC.
160 C Lavoy Rd.
Erie, MI 48133
Phone (734) 847-5260
Fax (743) 847-9008
Emergency Phone (800) 359-2783

Date MSDS Prepared: February 19, 2001
Last Review Date: October 12, 2006
MSDS Preparer's Name: Thomas J. Nachtman
Product Description: Water Base Anti-dusting Media
Multiple Parts (Yes/No) No
Description of Related Comp. NA

Section II – Ingredient/Identity Information:

This product is considered to be non-hazardous under OSHA Hazard Communication Standard 29.CFR 1910.1200

Ingredient	CAS #
Distilled Water	7732-18-5
Glycerin	56-81-5
Monosaccharide	57-50-1
Non-ionic Surfactant	151-21-3
Non-halogenated yellow dye	6358-69-6, 19125-99-6

HMIS Codes
Health 1 Fire 1 Reactivity 1 Special None
Scale 4 = extreme, 3 = high, 2 = moderate, 1 = insignificant

Section III – Physical/Chemical Properties:

Appearance: Amber Liquid	pH: 8.5
Specific Gravity: 1.05	Viscosity: 31 cps.
Vapor Density: > than air	Evaporation Rate <Ether
Coating V.O.C.: 0.00 lbs./gal	MaterialV.O.C.:0.0 lbs./gal
Coating V.O.C.: 0.0g/l	Material V.O.C.: 0g/l
Water Solubility: 100%	Odor: None
Boiling Point: 214°F	

Section IV – Fire and Explosion Hazard Data:

Flash Point: Water Base, NA
Flammable Limits: Upper – N/A Lower: - N/A
Extinguishing Media: As for surrounding fire. This product is a very low fire hazard. This product is a water-based material and while it may not burn, it can splatter and froth. Do not spray water into hot material, use water fog to cool surrounding fire.

Section V – Reactivity Data:

Stability (Y/N) Y
Conditions to Avoid: None Known
Materials to Avoid: None Known
Hazardous Decomposition Products: Carbon-monoxide,-dioxide

Section VI – Health Hazard Data:

Primary Routes of Exposure: Skin & Eye Contact, Ingestion and Inhalation

Skin & Eye Contact: Prolonged and repeated skin contact may cause irritation and burns.

Ingestion: Ingesting large volumes of product may cause CNS depression.

Inhalation: Extended periods of breathing atomized vapors may cause CNS depression.

Section VII – Emergency First Aid:

Eye Contact: Flush eyes with a large amount of water for at least 15 minutes. Consult a physician if irritation persists.

Skin Contact: Wash area with soap and water.

Ingestion: Do not induce vomiting. Get immediate medical attention.

Inhalation: Move individual to fresh air. Consult a physician if irritation persist or breath becomes labored.

Section VIII – Precautions for Safe Handling, Storage and Use:

Personal Protective Equipment for Routine Use:

Respiratory Protection: Respirators are not routinely required when using this product indoors or outdoors. In any case when excessive mist and atomization of product occurs such as high pressure air spraying, use NIOSH/MSHA approved full or half face respirator with dust cartridge.

Gloves: Gloves are not normally required for routine use. If an individual is known to have skin susceptible to irritation by other chemicals, this individual should wear butyl or nitrile type gloves.

Eye Protection: Safety goggles or glasses with side shields should always be worn.

Work Practices: Do not eat drink or smoke while applying this product. Wash hands immediately upon leaving the work site. Treat this product caution as you would any other chemical.

Spill/Release Procedures: Large spills can be vacuumed up. Small spills can be treated with absorbent clay, earth sand or other material, shoveled into a DOT approved container and disposed of according to all local, state and Federal regulations.

Waste Disposal Procedure: Incinerated or dispose of in accordance with local, state and Federal regulations.

Storage and Handling: Store product in a dry environment. Protect product from extremes in temperatures.

Other Health Hazard Precautions: None

MATERIAL SAFETY DATA SHEET

SECTION 1 – CHEMICAL PRODUCT AND COMPANY IDENTIFICATION

PRODUCT NAME: ***ENCAP 107*** EFFECTIVE DATE: 23 January 2006

CHEMICAL FAMILY: Polyacrylate salt

CHEMICAL NAME: Sodium polyacrylate

COMPANY IDENTIFICATION:
B2K Technologies
PO Box 324
Johnson City, TN 37605

EMERGENCY TELEPHONE: 423-676-2171

SECTION 2 – COMPOSITION / INFORMATION ON INGREDIENTS

CAS #	Component	Percent	OSHA HAZARD
9003-04-7	Sodium Polyacrylate		
Not Available	Post Treated – Trade Secret		

Component Information / Information on Non-Hazardous Components

The components of this product are not regulated as hazardous under 29 CFR and 49 CFR. However, the manufacturer recognizes the potential for respiratory tract irritation as a result of inhalation of this material as a respirable dust. See Sections 8, 11, 14, and 15 for further regulatory information.

SECTION 3 – HAZARDS IDENTIFICATION

Emergency Overview

Sodium polyacrylate is a white, granular, odorless polymer that yields a gel-like material with the addition of water. It is insoluble in water and causes extremely slippery conditions when wet. Although not regulated as a hazardous material, the respirable dust is potential respiratory tract irritant. The manufacturer recommends an eight-hour exposure limit of 0.05 mg/m^3.

Potential Health Effects: Eyes

Dust may cause burning, drying, itching, and other discomfort, resulting in reddening of the eyes.

Potential Health Effects: Skin

Exposure to the dust, such as in manufacturing, may aggravate existing skin conditions due to drying effect.

Potential Health Effects: Ingestion

Although not a likely route of entry, tests have shown that polyacrylate absorbents are non-toxic if ingested. However, as in any instance of non-food consumption, seek medical attention in the event of any adverse symptoms.

Potential Health Effects: Inhalation

Exposure to respirable dust may cause respiratory tract and lung irritation and may aggravate existing respiratory conditions.

HMIS Ratings: Health: 1 Fire: 0 Reactivity: 0

Hazard Scale: 0 = Minimal 1 = Slight 2 = Moderate 3 = Serious 4 = Severe * = Chronic Hazard

SECTION 4 –FIRST AID MEASURES

First Aid: Eyes
Immediately flush with plenty of water. Remove particles remaining under the eyelids. Get medical attention if irritation persists.
First Aid: Skin
Remove polyacrylate absorbent dust from skin using soap and water.
First Aid: Ingestion
Non-toxic by ingestion. However, if adverse symptoms appear, seek medical attention.
First Aid: Inhalation
If inhaled, move to source of fresh air. Seek medical attention if symptoms persist.

SECTION 5 – FIRE-FIGHTING MEASURES

General Fire Hazards
No recognized fire hazards associated with the finished product.
Fire and Explosive Properties

Flammability Classification:	None	
Flash Point	NA	Flash Point Method
Flammable Limits - Upper	NE	
Lower	NE	

Hazardous Combustion Products
None known.
Extinguishing Media
Dry chemical, foam, carbon dioxide, and water fog. Extremely slippery conditions are created if spilled product comes in contact with water.
Fire Fighting Instructions
Firefighters should wear full protective clothing including self-contained breathing apparatus.

NFPA Ratings: Health: 1 Fire: 0 Reactivity: 0
Hazard Scale: 0 = Minimal 1 = Slight 2 = Moderate 3 = Serious 4 = Severe * = Chronic Hazard

SECTION 6 – ACCIDENTAL RELEASE MEASURES

Containment Procedures
Sweep or vacuum material when possible and shovel into a waste container.

Clean up procedures
Use caution after contact of product with water, as extremely slippery conditions will result. Residuals maybe flushed with water into the drain for normal wastewater treatment. This is a non-hazardous waste suitable for disposal in an approved solid waste landfill.

Evacuation Procedures
None required.

Special Procedures
Avoid respirable dust inhalation during clean up. Wear appropriate respirator.

SECTION 7 – HANDLING AND STORAGE

Handling

Handle as an eye and respiratory tract irritant.

Storage

Store in a dry, closed container.

SECTION 8 – EXPOSURE CONTROL / PERSONAL PROTECTION

Exposure Guidelines

A: General Product Information

This product is not regulated as a hazardous material. However, the manufacturer recognizes the potential for respiratory tract irritation and recommends an eight-hour exposure limit of 0.05 mg/m^3.

B: Component Exposure Limits

No information available.

Engineering Controls

Provide local exhaust ventilation to maintain worker exposure to less than 0.05 mg/m^3 over an eight-hour period.

PERSONAL PROTECTIVE EQUIPMENT

Personal Protective Equipments: Eyes/Face

Wear safety glasses with side shields or goggles.

Personal Protective Equipments: Skin

Use impervious gloves when handling the product in the manufacturing environment.

Personal Protective Equipments: Respiratory

Wear respirator with a high efficiency filter is particulate concentration in the work area exceeds 0.05 mg/m^3 over an eight hour time period.

Personal Protective Equipments: General

Obey reasonable safety precautions and practice good housekeeping. Wash thoroughly after handling.

SECTION 9 – PHYSICAL AND CHEMICAL PROPERTIES

Appearance/Odor	White Granular Powder, no odor
pH	5.5 – 6.5 (1% in water)
Specific Gravity (Bulk Density)	0.4 – 0.7 g/ml
Vapor Pressure	< 10 mm Hg
Vapor Density	NE
Melting Point	> 390 °F
Freezing Point	NA
Boiling Point	NA
Solubility in Water	Insoluble
Evaporation Rate (%)	< 1.0

SECTION 10– STABILITY AND REACTIVITY

Chemical Stability
This material is chemically stable under normal and anticipated storage and handling conditions.
Chemical Stability: Conditions to Avoid
None
Incompatibility
None
Hazardous Decomposition Products
Decomposition above 200 °C
Hazardous Polymerization
Will not occur.

SECTION 11 – TOXICOLOGICAL INFORMATION

Acute and Chronic Toxicity
A: General Product Information:

Acute oral toxicity:	LD_{50} rat Dose: > 5000 mg/kg Method: Limit Test
Acute dermal toxicity:	LD_{50} rat Dose: > 2000 mg/kg Method: Limit Test
Skin irritation:	Rabbit Method: OECD Nr. 404 Very slight irritant
Eye irritation:	Rabbit Method: OECD Nr. 405 Very slight irritant
Sensitization:	Guinea pig Method: OECD Nr. 406 Result: 0/20 No sensitization

B: Acute Toxicity – LD_{50}/LC_{50}
Sodium polyacrylate (9003-04-7)
LD_{50}: Oral LD50 Rat: > 40g/kg

Carcinogenicity:
Component Carcinogenicity
No information is available.
Chronic Toxicity
Chronic inhalation exposure to rates for a lifetime (two years) using sodium polyacrylate that had been micronized to a respirable particle size (less than 10 microns) produced non-specific inflammation and chronic lung injury at 0.2 mg/m³ and 0.8 mg/m³. Also, at 0.8 mg/m³, tumors were seen in some test animals. In the absence of chronic inflammation, tumors are not expected. There were no adverse effects detected at 0.05 mg/m³.
Mutagenicity
Sodium polyacrylate had no effect in mutagenicity tests.

SECTION 12 – ECOLOGICAL INFORMATION

Ecotoxicity

A: General Product Information

Composted polyacrylate absorbents are non-toxic to aquatic or terrestrial organisms at predicted exposure levels.

B: Component Analysis – Ecotoxicity – Aquatic Toxicity

No information available.

Environmental Fate

Polyacrylate absorbents are relatively inert in aerobic and anaerobic conditions. They are immobile in landfills and soil systems (> 90% retention), with the mobile fraction showing biodegradability. They are also compatible with incineration of municipal solid waste. Incidental down-the-drain disposal of small quantities of polyacrylic absorbents will not affect the performance of wastewater treatment systems.

SECTION 13 – DISPOSAL CONSIDERATIONS

US EPA Waste Number & Descriptions

A: General Product Information

This product is a non-hazardous waste material suitable for approved sold waste landfills.

B: Component Waste Numbers

No EPA Waste Numbers are applicable for this product's components.

Disposal Instructions

Dispose of in accordance with Local, State, and Federal Regulations.

SECTION 14 – TRANSPORTATION INFORMATION

International Transportation Regulations

This product is not transport regulated.

SECTION 15 –REGULATORY INFORMATION

US Federal Regulations

A: General Product Information

This product is not federally regulated as a hazardous material.

B: Clean Air Act

No information is available.

C: Component Analysis

No information available.

D: Food and Drug Administration

No information available.

State Regulations

A: General Product Information

This product is not regulated by any state as a hazardous material.

B. Component Analysis – State

None of this product's components are listed on the state lists from CA, FL, MA, NJ, or PA.

SECTION 15 –REGULATORY INFORMATION, continued

Component Analysis – Inventory

Component	CAS #	TSCA	CAN	EEC
Sodium Polyacrylate	9003-04-7	Yes	DSL	No

SECTION 16 – OTHER INFORMATION

Revision Information:
Revision Date: N/A
Supercedes Revision Dated: N/A

Reason for Revision: N/A

Key: N/A – Not Applicable NE – Not Established

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GE
Water & Process Technologies

Material Safety Data Sheet

Issue Date: 08-AUG-2008
Supercedes: 08-AUG-2008

POLYFLOC AP125

1 Identification

Identification of substance or preparation
POLYFLOC AP125

Product Application Area
Flocculant

Company/Undertaking Identification
GE Betz, Inc.
4636 Somerton Road
Trevose, PA 19053
T 215 355-3300, F 215 953 5524

Emergency Telephone
(800) 877-1940

Prepared by Product Stewardship Group: T 215-355-3300 Prepared on: 08-AUG-2008

2 Hazard(s) identification

****

EMERGENCY OVERVIEW

CAUTION

Non-hazardous to skin. Potential eye irritant due to mechanical action only. Dusts may cause irritation to the upper respiratory tract.

DOT hazard is not applicable
Odor: None; Appearance: Off-White, Powder

Fire fighters should wear positive pressure self-contained breathing apparatus(full face-piece type). Proper fire-extinguishing media: dry chemical, carbon dioxide, foam or water

****

POTENTIAL HEALTH EFFECTS

ACUTE SKIN EFFECTS:
Non-hazardous to skin.

ACUTE EYE EFFECTS:
Potential eye irritant due to mechanical action only.

ACUTE RESPIRATORY EFFECTS:
Primary route of exposure;Dusts may cause irritation to the upper respiratory tract.

INGESTION EFFECTS:
No evidence of adverse effects from available information.

TARGET ORGANS:
No evidence of potential chronic effects.

MEDICAL CONDITIONS AGGRAVATED:
Not known.

SYMPTOMS OF EXPOSURE:
Nuisance dust.

3 Composition / information on ingredients

Information for specific product ingredients as required by the U.S. OSHA HAZARD COMMUNICATION STANDARD is listed. Refer to additional sections of this MSDS for our assessment of the potential hazards of this formulation.

HAZARDOUS INGREDIENTS:

This product is not hazardous as defined by OSHA regulations.

No component is considered to be a carcinogen by the National Toxicology Program, the International Agency for Research on Cancer, or the Occupational Safety and Health Administration at OSHA thresholds for carcinogens.

4 First-aid measures

SKIN CONTACT:
Wash thoroughly with soap and water. Remove contaminated clothing. Get medical attention if irritation develops or persists.

EYE CONTACT:
Remove contact lenses. Hold eyelids apart. Immediately flush eyes with plenty of low-pressure water for at least 15 minutes. Get medical attention if irritation persists after flushing.

INHALATION:
If nasal, throat or lung irritation develops - remove to fresh air and get medical attention.

INGESTION:
Do not feed anything by mouth to an unconscious or convulsive victim. Do not induce vomiting. Immediately contact physician. Dilute contents of stomach using 2-8 fluid ounces (60-240 mL) of milk or water.

NOTES TO PHYSICIANS:
No special instructions

5 Fire-fighting measures

FIRE FIGHTING INSTRUCTIONS:
Fire fighters should wear positive pressure self-contained breathing apparatus (full face-piece type).
EXTINGUISHING MEDIA:
dry chemical, carbon dioxide, foam or water
HAZARDOUS DECOMPOSITION PRODUCTS:
oxides of carbon and nitrogen
FLASH POINT:
> 200F > 93C P-M(CC)

6 Accidental release measures

PROTECTION AND SPILL CONTAINMENT:
Ventilate area. Use specified protective equipment. Sweep up and remove. Minimize dust generation.
DISPOSAL INSTRUCTIONS:
Water contaminated with this product may be sent to a sanitary sewer treatment facility, in accordance with any local agreement, a permitted waste treatment facility or discharged under a permit. Product as is - Incinerate or land dispose in an approved landfill.

7 Handling and storage

HANDLING:
Normal chemical handling.
STORAGE:
Keep containers closed when not in use. Keep dry. Store away from oxidizers.

8 Exposure controls / personal protection

EXPOSURE LIMITS

This product is not hazardous as defined by OSHA regulations.

ENGINEERING CONTROLS:
adequate ventilation
PERSONAL PROTECTIVE EQUIPMENT:
Use protective equipment in accordance with 29CFR 1910 Subpart I
RESPIRATORY PROTECTION:
A RESPIRATORY PROTECTION PROGRAM THAT MEETS OSHA'S 29 CFR 1910.134 AND ANSI Z88.2 REQUIREMENTS MUST BE FOLLOWED WHENEVER WORKPLACE CONDITIONS WARRANT A RESPIRATOR'S USE.
USE AIR PURIFYING RESPIRATORS WITHIN USE LIMITATIONS ASSOCIATED WITH THE EQUIPMENT OR ELSE USE SUPPLIED AIR-RESPIRATORS.
If air-purifying respirator use is appropriate, use any of the following particulate respirators: N95, N99, N100, R95, R99, R100, P95, P99 or P100.
SKIN PROTECTION:
rubber, butyl, viton or neoprene gloves -- Wash off after each use. Replace as necessary.
EYE PROTECTION:
safety glasses

9 Physical and chemical properties

Density	40.000 lb/cu.	Vapor Pressure (mmHG)	< 0.1
Freeze Point (F)	NA	Vapor Density (air=1)	< 1.00
Freeze Point (C)	NA		
Viscosity(cps 70F,21C)	NA	% Solubility (water)	1.0

Odor		None
Appearance		Off-White
Physical State		Powder
Flash Point	P-M(CC)	> 200F > 93C
pH 0.5% Sol. (approx.)		7.0
Evaporation Rate (Ether=1)		< 1.00
Percent VOC:		0.0

NA = not applicable ND = not determined

10 Stability and reactivity

STABILITY:
Stable under normal storage conditions.
HAZARDOUS POLYMERIZATION:
Will not occur.
INCOMPATIBILITIES:
May react with strong oxidizers.
DECOMPOSITION PRODUCTS:
oxides of carbon and nitrogen

11 Toxicological information

Oral LD50 RAT:	>2,000 mg/kg
Dermal LD50 RABBIT:	>2,000 mg/kg

NOTE - Estimated value

12 Ecological information

AQUATIC TOXICOLOGY

Bluegill Sunfish 96 Hour Static Screen
0% Mortality= 300 mg/L
Ceriodaphnia 7 Day Chronic Bioassay
No Effect Level= 10 mg/L
Daphnia magna 48 Hour Static Acute Bioassay
LC50= 2975; No Effect Level= 315 mg/L
Fathead Minnow 96 Hour Static Acute Bioassay
LC50= 810; 5% Mortality= 315 mg/L
Rainbow Trout 72 Hour Static Screen
0% Mortality= 100 mg/L

BIODEGRADATION

BOD-28 (mg/g): 24
BOD-5 (mg/g): 2
COD (mg/g): 400
TOC (mg/g): 240

13 Disposal considerations

If this undiluted product is discarded as a waste, the US RCRA hazardous waste identification number is :
Not applicable.

Please be advised; however, that state and local requirements for waste disposal may be more restrictive or otherwise different from federal regulations. Consult state and local regulations regarding the proper disposal of this material.

14 Transport information

DOT HAZARD: Not Applicable
PROPER SHIPPING NAME:

DOT EMERGENCY RESPONSE GUIDE #: Not applicable
Note: Some containers may be DOT exempt, please check BOL for exact container classification

15 Regulatory information

TSCA:
All components of this product are included on or are in compliance with the U.S. TSCA regulations.

CERCLA AND/OR SARA REPORTABLE QUANTITY (RQ):
No regulated constituent present at OSHA thresholds

FOOD AND DRUG ADMINISTRATION:
21 CFR 176.110 (acrylamide - acrylic acid resins)
All ingredients comprising this product are authorized by FDA for the manufacture of paper and paperboard that may contact aqueous and fatty foods as per 21 CFR 176.170(a) (4).

NSF Registered and/or meets USDA (according to 1998 Guidelines):
Registration number: Not Registered
L1

SARA SECTION 312 HAZARD CLASS:
Product is non-hazardous under Section 311/312

SARA SECTION 302 CHEMICALS:
No regulated constituent present at OSHA thresholds

SARA SECTION 313 CHEMICALS:
No regulated constituent present at OSHA thresholds

CALIFORNIA REGULATORY INFORMATION

CALIFORNIA SAFE DRINKING WATER AND TOXIC ENFORCEMENT ACT (PROPOSITION 65):
No regulated constituents present

MICHIGAN REGULATORY INFORMATION

No regulated constituent present at OSHA thresholds

16 Other information

HMIS vII		CODE TRANSLATION
Health	1	Slight Hazard
Fire	1	Slight Hazard
Reactivity	0	Minimal Hazard

Special	NONE	No special Hazard
(1) Protective Equipment	A	Safety Glasses

(1) refer to section 8 of MSDS for additional protective equipment recommendations.

CHANGE LOG

	EFFECTIVE DATE	REVISIONS TO SECTION:	SUPERCEDES
MSDS status:	12-FEB-1997		** NEW **
	23-JUL-1997	15	12-FEB-1997
	01-JUN-1999	15	23-JUL-1997
	12-SEP-2000	4	01-JUN-1999
	19-MAR-2008	4,5,6,8,10	12-SEP-2000
	08-AUG-2008	2,3,4,5,6,8,10	19-MAR-2008

Quik-Solid MSDS

Quik-Solid®

Section 1: Manufacturer Information

CETCO
1350 West Shure Drive
Arlington Heights, IL 60004
847-392-5800

Section 2: Physical/Chemical Characteristics

Boiling Point - Not Applicable
Bulk Density (Apparent - g/cc) - 0.5-0.7
Vapor Pressure (mm Hg.) - Not Applicable
Melting point - Not Applicable
Vapor Density (AIR = 1) - Not Applicable
Evaporation Rate (Butyl Acetate = 1) - Not Applicable
Appearance - Off White, Odorless.

Section 3: Hazardous Ingredients/Identity Information

Hazardous Components: OSHA PEL ACGIH TLV
Other Components:
Recommended Exposure Limit (dust) 0.05mg/m3
Guideline for Respirable Particulate
Product Identification
Chemical Name CAS No. %
Sodium Polyacrylate, lightly crosslinked CAS#-076774-25-9
Water CAS#-7732-18-5
Acrylic Acid N/A CAS#-79-10-7
NFPA/HMIS: Health-1 Reactivity-0 Fire-1 Specific Hazard-See 4
DOT Class: Not Regulated

Section 4: Fire & Explosion Hazard Data

Flash Point (Method Used): Not available
Flammable Limits: Not available LEL UEL
Extinguishing Media: As with any fire, wear positive pressure, self-contained breathing apparatus in any closed space when fighting fire.
Special Fire Fighting Procedures: Not applicable
Unusual Fire and Explosion Hazards: Becomes slippery when wet. Under certain confined conditions, a fine dust of this material in air may cause a dust explosion if ignited.

Section 5: Reactivity Data

Stability: Stable **Incompatibility:** Strong oxidizers
Hazardous Decomposition or Byproducts: Thermal decomposition releases CO, CO2, Hydrocarbons
Hazardous Polymerization: Will not occur
Conditions to Avoid: None Known

Section 6: Health Hazard Data (applies to unused product)

Route (s) of Entry: Inhalation, ingestion, open wounds, eyes.
Health Hazards: Contact with eyes, skin or clothing may cause irritation. Care must be taken to minimize exposure and prevent workplace inhalation of respirable dust. Respiratory protection is required for exposures above the recommended level of respirable dust. A similar product, ground very finely, produced an inflammatory tissue response in the lungs in a lifetime exposure inhalation experiment with animals. According to the EPA "Hazard Categories" under sections 311 and 312 of SARA Title III, this product is considered to meet the applicable definitions of: A delayed health hazard.
Carcinogenicity: None known
IARC Monographs: No
OSHA Regulated: No
Signs/Symptoms of Exposure: Slight irritant effects
Medical Conditions Aggravated by Exposure: None known.
Emergency and First Aid Procedures:
Eyes: Flush with large quantity of water, consult physician.
Skin: Wash with soap and water.
Inhalation: Remove to fresh air, consult physician.

Section 7: Control Measures

Respiratory Protection: Use NIOSH or MSHA with high efficiency filter for particulate levels above 0.05mg/m3.
Ventilation: Local Exhaust – as appropriate
Mechanical (General) - as appropriate

Special/Other – none
Protective Gloves: Impervious/rubber
Eye Protection: Safety goggles as recommended
Other Protective Clothing or Equipment: If needed.
Work Hygienic Practices: Use good housekeeping practices.

Section: 8 Precautions for Safe Handling & Use

Steps to be taken in case material is released or spilled: Vacuum (using HEPA filter equipped system) if possible to avoid generating airborne dust. Avoid breathing dust. Wear an approved respirator. Exercise caution when adding water, product will become slippery when wet.
Waste Disposal Method: Dispose of in accordance with federal, state and local regulations.
Precautions to be taken in handling & storing: Store in a cool, dry place. Avoid breathing powder. Avoid skin and eye contact.
Other Precautions: Protective eye wear should be worn where dust levels are high enough to cause irritation. Slippery when wet.

Section 9: Supplemental Information
Prepared 10/1/98

DISCLAIMER: The information herein has been compiled from sources believed to be reliable and is accurate to the best of our knowledge. However, CETCO cannot give any guarantees regarding information from other sources, and expressly does not make any warranties, nor assumes any liability, for its use.

ATOMIC PRODUCTS CORP -- RADIACWASH -- 6850-00-127-4531

========== Product Identification ==========

Product ID:RADIACWASH
MSDS Date:02/22/1988
FSC:6850
NIIN:00-127-4531
Status Code:A
MSDS Number: CLJRB
=== Responsible Party ===
Company Name:ATOMIC PRODUCTS CORP
Address:49 NATCON DRIVE
City:SHIRLEY
State:NY
ZIP:11967
Country:US
Info Phone Num:516-924-9000
Emergency Phone Num:516-924-9000
Preparer's Name:W. S. GILMAN
CAGE:TO365
=== Contractor Identification ===
Company Name:ATOMIC PRODUCTS CORP
Address:49 NATCON DRIVE
Box:City:SHIRLEY
State:NY
ZIP:11967
Country:US
Phone:516-924-9000
CAGE:TO365
Company Name:BIODEX MEDICAL SYSTEMS INC
Address:20 RAMSAY RD BROOKHAVEN R AND D PLZ
Box:702
City:SHIRLEY
State:NY
ZIP:11967
Country:US
Phone:516-924-9000
CAGE:13308

========== Composition/Information on Ingredients ==========

Ingred Name:CITRIC ACID

CAS:77-92-9
RTECS #:GE7350000

Ingred Name:OCTYLPHENOL CONDENSED WITH 8-10 MOLES ETHYLENE OXIDE, TRITON X100
CAS:9036-19-5
RTECS #:MD0907600

Ingred Name:TETRASODIUM ETHYLENEDIAMINE TRIACETATE
CAS:64-02-8
RTECS #:AH5075000

Ingred Name:BENZYLDIMETHYL.(.2-.(.2-.(.P-(1,1,3,3-TETRAMETHYLBUTYL)PHENOXY.).ETHOXY.).ETHYL.).AMMONIUM CHLORIDE, HYAMINE 1622
CAS:121-54-0
RTECS #:BO7175000

========== Hazards Identification ==========

LD50 LC50 Mixture:ORAL, LD50= > 800 MG/KG
Routes of Entry: Inhalation:NO Skin:YES Ingestion:YES
Reports of Carcinogenicity:NTP:NO IARC:NO OSHA:NO
Health Hazards Acute and Chronic:PROLONGED CONTACT OF PRODUCT WITH SKIN MAY CAUSE IRRITATION, POSSIBLE ALLERGIC REACTION.
Explanation of Carcinogenicity:NTP: NONE. IARC: NONE. OSHA: NONE.
Effects of Overexposure:REPEATED CONTACT WITH SKIN MAY CAUSE DRYING OF SKIN WITH MODERATE IRRITATION. SOME ALLERGIC PROPERTIES EXPERIENCED.
Medical Cond Aggravated by Exposure:PRE-EXISTING EYE, SKIN AND RESPIRATORY DISORDERS MAY BE AGGRAVATED BY EXPOSURE TO PRODUCT.

========== First Aid Measures ==========

First Aid:INHALATION: REMOVE TO FRESH AIR. EYE: FLUSH WITH WATER FOR AT LEAST 15 MINUTES. SKIN: WASH THOROUGHLY WITH SOAP AND WATER. INGESTION: DRINK PLENTY OF WATER, CALL PHYSICIAN.

========== Fire Fighting Measures ==========

Flash Point:>101.1C, 214.F
Lower Limits:NA
Upper Limits:NA

Extinguishing Media:DRY POWDER, FOAM, CARBON DIOXIDE
Fire Fighting Procedures:FIRE FIGHTERS SHOULD WEAR SELF CONTAINED BREATHING APPARATUS
Unusual Fire/Explosion Hazard:DECOMPOSITION PRODUCTS MAY BE TOXIC

========== Accidental Release Measures ==========

Spill Release Procedures:SOAK UP MATERIAL WITH ABSORBENT MATERIALS AND PLACE IN TIGHT CONTAINER.
Neutralizing Agent:NO DATA PROVIDED BY MANUFACTURER

========== Handling and Storage ==========

Handling and Storage Precautions:STORE IN CLOSED CONTAINERS AWAY FROM HEAT.
Other Precautions:NONE

========== Exposure Controls/Personal Protection ==========

Respiratory Protection:WEAR NIOSH APPROVED RESPIRATOR IF REQUIRED
Ventilation:LOCAL EXHAUST: IN OPEN AREAS. MECHANICAL (GENERAL): IN CONFINED AREAS.
Protective Gloves:IMPERVIOUS GLOVES
Eye Protection:GOGGLES
Other Protective Equipment:BARRIER CREAMS, ARPONS, OVERALLS TO AVOID CONTACT
Work Hygienic Practices:OBSERVE CONDITIONS OF GOOD INDUSTRIAL HYGIENE - NO EATING, SMOKING OR DRINKING.
Supplemental Safety and Health
NO DATA PROVIDED BY MANUFACTURER

========== Physical/Chemical Properties ==========

HCC:N1
Boiling Pt:=100.C, 212.F
Melt/Freeze Pt:=.3C, 32.5F
M.P/F.P Text:FREEZING POINT
Vapor Pres:NA
Vapor Density:NA
Spec Gravity:1.052 (H2O=1)
Evaporation Rate & Reference:1.2 (WATER=1)
Solubility in Water:INFINITE (COMPLETELY MISC
Appearance and Odor:BLUISH TRANSPARENT LIQUID - SLIGHTLY PUNGENT ODOR

========== Stability and Reactivity Data ==========

Stability Indicator/Materials to Avoid:YES
METALLIC SURFACES FOR PROLONGED TIME PERIODS (PH 5)
Stability Condition to Avoid:METAL NITRATES
Hazardous Decomposition Products:NO DATA PROVIDED BY MANUFACTURER
Conditions to Avoid Polymerization:WILL NOT OCCUR

========== Toxicological Information ==========

Toxicological Information:NO DATA PROVIDED BY MANUFACTURER

========== Ecological Information ==========

Ecological:NO DATA PROVIDED BY MANUFACTURER

========== Disposal Considerations ==========

Waste Disposal Methods:PLACE IN APPROPRIATE DISPOSAL FACILITY IN COMPLIANCE WITH FEDERAL, STATE AND LOCAL REGULATIONS

========== MSDS Transport Information ==========

Transport Information:NO DATA PROVIDED BY MANUFACTURER

========== Regulatory Information ==========

SARA Title III Information:NO DATA PROVIDED BY MANUFACTURER
Federal Regulatory Information:NO DATA PROVIDED BY MANUFACTURER
State Regulatory Information:NO DATA PROVIDED BY MANUFACTURER

========== Other Information ==========

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MATERIAL SAFETY DATA SHEET

EAGLE – PICHER MINERALS, INC.

DATE ISSUED: November 18, 1985	DATE REVISED: July 1, 2001	REVISION NO: 8

SECTION I: MATERIAL IDENTIFICATION AND USE

MATERIAL NAME: Solid-A-Sorb I and Solid-A-Sorb II

MANUFACTURER'S NAME: Eagle-Picher Minerals, Inc.

STREET ADDRESS: 9785 Gateway Drive, Suite 1000

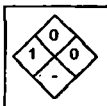
CITY: Reno STATE: Nevada ZIP: 89511

EMERGENCY TELEPHONE NO: (775) 824-7600 CHEMICAL FORMULA: SiO2

CHEMICAL NAME: Diatomaceous Earth, Calcined TRADE NAME: Solid-A-Sorb

CHEMICAL FAMILY: Silica MATERIAL USE: Industrial Absorbent

NFPA



4-Extreme
3-High
2-Moderate
1-Slight
0-Insignificant

HMIS

*	Health
0	Flammability
0	Reactivity
E	Protective Equipment

* REFER TO DATA ON MSDS

SECTION II: HAZARDOUS INGREDIENTS OF MATERIAL

INGREDIENT IDENTIFICATION	APPROXIMATE CONCENTRATION %	C.A.S. NUMBERS	OSHA PEL [ACGIH TLV]	LD50/ /LC 50 SPECIES AND ROUTE
Diatomaceous Earth, Calcined	100%	91053-39-3	See below	Not available
Crystalline Silica (Cristobalite)	< 1%	14464-46-1	0.05 mg/m3 [0.05 mg/m3]	Not available
Crystalline Silica (Quartz)	< 1%	14808-60-7	0.10 mg/m3 [0.10 mg/m3]	Not available

For sampling silica dusts refer to NIOSH Analytical Method 7500 or OSHA method ID 142

SECTION III: PHYSICAL DATA FOR MATERIAL

PHYSICAL STATE:	ODOR AND APPEARANCE:		SPECIFIC GRAVITY:	BOILING POINT:
Solid	Odorless, granular product, buff to off-white		2.2	Not Applicable
VAPOR PRESSURE (MM):	VAPOR DENSITY:	pH:	SOLUBILITY/WATER:	FREEZING POINT:
Not Applicable	Not applicable	7 (10% Slurry)	< 2%	Not Applicable

SECTION IV – FIRE AND EXPLOSION HAZARD OF MATERIAL

FLAMMABILITY: YES NO X IF YES, UNDER WHICH CONDITIONS

MEANS OF EXTINCTION:	SPECIAL PROCEDURES:
Not Applicable	Not Applicable

SECTION V – HEALTH HAZARDS

SUMMARY: Calcined diatomaceous earth (Kieselguhr) contains crystalline silica which is a known cause of silicosis, a progressive, sometimes fatal lung disease. In a 1997 monograph (Volume 68, "Silica, Some Silicates, Coal Dust and Para-Aramid Fibrils"), the International Agency of Research on Cancer (IARC) has classified "inhaled crystalline silica from occupational sources" in Group 1 as a substance "carcinogenic to humans." In making the overall evaluation, the IARC Working Group noted that carcinogenicity in humans was not detected in all industrial circumstances studied. Although the recent IARC determination was, in part, based on a 1992 study of diatomite workers, a 1996 follow up which was issued by the University of Washington and Tulane University was not available to the Working Group. The follow up study reported a Standardized Mortality Ration (SMR) of 2.01 for non-malignant respiratory disease (NMRD) and a SMR of 1.29 for lung cancer when compared to national and regional populations. This is a reduction of the levels reported in the 1992 report (SMR=2.59 for NMRD and SMR=1.43 for lung cancer.)

As noted in the 1992 study, relatively intense exposures to crystalline silica that occurred before the 1950s were probably the most important contributors in the excesses in NMRD and lung cancer. The 1996 report continues to support the conclusion that recent improvements in dust control in the industry appear to have abated any excess risk in silicosis or lung cancer in today's work environment. In 1997 a radiographic study was published by Tulane University researchers that reported X-ray opacities of the post-1950 hires that were "...consistent with the prevalences observed in many unexposed populations." These findings appear to be consistent with, and supportive, of current occupational exposure limits for cristobalite. A more detailed report discussing the IARC classification and the diatomite worker studies is available upon request.

MEDICAL CONDITIONS AGGRAVATED BY EXPOSURE

Pre-existing diseases of the upper respiratory tract and lung such as bronchitis, emphysema, and asthma

IMPORTANT HEALTH HAZARD DATA CONTINUES ON THE SECOND PAGE (BACK)

PAGE 2	MATERIAL NAME / IDENTIFIER: Solid-A-Sorb I and Solid-A-Sorb II

SECTION V – HEALTH HAZARDS CONT'D

ROUTE OF ENTRY: Inhalation (Chronic)	TARGET ORGANS: Lungs

EFFECTS OF ACUTE EXPOSURE TO PRODUCT: Upper respiratory irritant – May cause coughing or throat irritation.

EFFECTS OF CHRONIC EXPOSURE TO PRODUCT:

Inhalation of crystalline silica dust in excess of the Threshold Limit Value (TLV) recommended by the American Conference of Governmental Industrial Hygienists (ACGIH) or in excess of the Permissible Exposure Limit (PEL) established by OSHA over an extended number of years may cause silicosis, a progressive sometimes fatal lung disease. Although silicosis is a non-cancerous lung disease, a 1992 study conducted by the University of Washington on certain diatomite workers, and a 1996 follow-up to this study indicates that exposure to high concentrations of crystalline silica for many years may increase the potential risk of developing lung cancer. The 1996 follow-up study continues to support the findings of the 1992 study in that for those workers hired since 1960, no increase in lung cancer mortality risk was found. Consequently, maintenance of crystalline silica dust concentrations at or below levels specified by occupational standards setting agencies will minimize, if not eliminate, any potential excess risk of NMRD or lung cancer.

IARC - "Inhaled crystalline silica from occupational sources" – Group 1 – Carcinogenic to humans
NTP - "Silica, crystalline (respirable)" – "known to be a human carcinogen"
OSHA - Has not classified crystalline silica as a carcinogen.

SECTION VI – REACTIVITY DATA

CHEMICAL STABILITY: YES X NO	INCOMPATIBILITY TO OTHER SUBSTANCES YES X NO IF YES, WHICH ONES? Hydrofluoric Acid, Hydrogenated vegetable oils Products containing Silica may react violently with Hydrofluoric Acid
REACTIVITY AND UNDER WHAT CONDITIONS: Not Applicable	HAZARDOUS DECOMPOSITION PRODUCTS: Not Applicable

SECTION VII – PRECAUTIONS FOR SAFE HANDLING AND USE

PERSONAL PROTECTIVE EQUIPMENT:

Respirators fitted with filters certified to standard 42CFR84 under series N95 should be worn when dust is present. If the dust concentration is less than ten (10) times the Permissible Exposure Limit (PEL) use a quarter or half-mask respirator with a N95 dust filter or a single use dust mask rated N95. If dust concentration is greater than ten (10) times and less than fifty (50) times the PEL, a full-face piece respirator fitted with replaceable N95 filters is recommended. If dust concentration is greater than fifty (50) and less than two hundred (200) times the PEL use a power air-purifying (positive pressure) respirator with a replaceable N95 filter. If dust concentration is greater than two hundred (200) times the PEL use a type C, supplied air respirator (continuous flow, positive pressure), with full face piece, hood or helmet.

GLOVES: Not normally necessary	RESPIRATORY: Note Above	EYE: Goggles to protect from dust
FOOTWEAR: Not necessary	CLOTHING: Not normally necessary	

ENGINEERING CONTROLS (E.G. VENTILATION, ENCLOSED PROCESS): Local – Control within recommended TLV/PEL. Refer to ACGIH publication "Industrial Ventilation" or similar publications for design of ventilation systems.

LEAK AND SPILL PROCEDURE: Vacuum clean spillage, wet sweep or wash away. Avoid creating dust.

WASTE DISPOSAL: Non-Biodegradable. Use solid waste disposal common to landfill type operations or in slurry to sumps. Not considered a hazardous waste under RCRA (40CFR Part 261).

HANDLING PROCEDURES: Avoid creating dust. Repair or properly dispose of broken bags.

STORAGE REQUIREMENTS: Store in a dry place to maintain product quality.

SPECIAL SHIPPING INSTRUCTIONS: None

SECTION VIII – FIRST AID MEASURES

SKIN: Not absorbed by the skin. May cause dryness. Use moisture renewing lotions if dryness occurs.

EYE: May cause irritation or inflammation. Wash with generous quantities of water. Consult physician if irritation persists.

INHALATION: Acute inhalation can cause dryness of the nasal passages and congestion of the upper respiratory tract. Remove to fresh air.

INGESTION: Short-term exposure not considered harmful. Drink generous amounts of water to reduce bulk and drying effects.

SECTION IX – PREPARATION DATE OF M.S.D.S.

PREPARED BY: Patrick T. Flynn, Jr.	TITLE: Director - Government Affairs
PHONE NUMBER: (775) 824-7650	DATE: July 1, 2001

Material Safety Data Sheet

Zep, Inc.
1310 Seaboard Industrial Blvd.
Atlanta, GA 30318
1-877-I-BUY-ZEP (428-9937)
www.zep.com

Section 1. Chemical Product and Company Identification

Product name BIG ORANGE-E

Product use Industrial Solvent Degreaser

Product code 0485

Date of issue 09/02/09 **Supersedes** 05/18/07

Emergency Telephone Numbers

For MSDS Information:
Compliance Services 1-877-I-BUY-ZEP (428-9937)

For Medical Emergency
(877) 541-2016 Toll Free - All Calls Recorded

For Transportation Emergency
CHEMTREC: (800) 424-9300 - All Calls Recorded
In the District of Columbia (202) 483-7616

Printing date: 09/02/09

Prepared By
Compliance Services
1420 Seaboard Industrial Blvd.
Atlanta, GA 30318

Section 2. Hazards Identification

Emergency overview

*Hazard Determination System (HDS): Health, Flammability, Reactivity

1 2 0

WARNING !

COMBUSTIBLE LIQUID AND VAPOR. CAUSES EYE IRRITATION.
MAY CAUSE ALLERGIC SKIN REACTION.

NOTE: MSDS data pertains to the product as delivered in the original shipping container(s). Risk of adverse effects are lessened by following all prescribed safety precautions, including the use of proper personal protective equipment.

Acute Effects **Routes of Entry** Dermal contact. Eye contact. Inhalation.

Eyes Causes eye irritation. Inflammation of the eye is characterized by redness, watering and itching.

Skin May cause skin irritation. May cause skin sensitization. May cause allergic reactions in certain individuals. Skin inflammation is characterized by itching, scaling, or reddening.

Inhalation Avoid breathing vapors, spray or mists. Over-exposure by inhalation may cause respiratory irritation.

Ingestion May be harmful if swallowed. Aspiration hazard if swallowed. Can enter lungs and cause damage.

Chronic effects Prolonged or repeated contact may dry skin and cause irritation.

Carcinogenicity
Ingredients: Not listed as carcinogen by OSHA, NTP or IARC.

Product/ingredient name	ACGIH	IARC	EPA	NIOSH	NTP	OSHA
None.						

Additional Information: See Toxicological Information (Section 11)

Section 3. Composition/Information on Ingredients

Name of Hazardous Ingredients	CAS number	% by Weight
PROPRIETARY, BIODEGRADABLE, HIGH-FLASH SOLVENT	Proprietary	40 - 50
D-LIMONENE; orange distillate; citrus terpene; cyclohexene, 1-methyl-4-(1-methylethenyl)-, (R)-	5989-27-5	30 - 40
NONYLPHENOXY POLY(ETHYLENEOXY) ETHANOL - npe; poly(oxy-1,2-ethanediyl) alpha-(nonylphenyl)-omega-hydroxy	9016-45-9	1 - 10

Section 4. First Aid Measures

Eye Contact Immediately flush eyes with plenty of water, occasionally lifting the upper and lower eyelids. Check for and remove any contact lenses. Continue to rinse for at least 10 minutes. Get medical attention immediately.

Skin Contact Flush affected skin with plenty of water. Remove contaminated clothing and shoes. Continue to rinse for at least 10 minutes. Wash clothing before reuse. Get medical attention if irritation develops.

Inhalation Move exposed person to fresh air. If irritation persists, get medical attention.

Ingestion If swallowed, do not induce vomiting unless directed to do so by medical personnel. If vomiting occurs, the head should be kept low so that vomit does not enter the lungs. Never give anything by mouth to an unconscious person. Get medical attention immediately.

Section 5. Fire Fighting Measures

National Fire Protection Association (U.S.A.)

Flash Point Closed cup: 64.4°C (148°F) [Tagliabue.]

Flammable Limits Not determined.

Flammability COMBUSTIBLE.

Fire hazard COMBUSTIBLE LIQUID AND VAPOR. Keep away from heat, sparks and flame. Rags, steel wool or other wastes soaked with product may spontaneously catch fire if improperly discarded. Immediately after use, place rags, steel wool or other waste in a sealed, water-filled metal container.

Fire-Fighting Procedures Use dry chemical, CO_2, water spray (fog) or foam. Fire-fighters should wear appropriate protective equipment. Do not release runoff from fire to sewers or waterways.

Section 6. Accidental Release Measures

Spill Clean up Eliminate all ignition sources. Put on appropriate personal protective equipment (see section 8). Dilute with water and mop up if water-soluble or absorb with an inert dry material and place in an appropriate waste disposal container. Dispose of via a licensed waste disposal contractor.

Section 7. Handling and Storage

Handling Put on appropriate personal protective equipment (see section 8). Store and use away from heat, sparks, open flame or any other ignition source. Avoid contact with eyes, skin and clothing. Avoid breathing vapors, spray or mists. Use only with adequate ventilation. Do not ingest. Observe label precautions. Wash thoroughly after handling. Empty containers retain product residue and can be hazardous. Do not reuse container.

Storage Keep away from heat and direct sunlight. Avoid all possible sources of ignition (spark or flame). Keep container in a cool, well-ventilated area. Keep container tightly closed and sealed until ready for use. Keep away from food, drink and animal feeding stuffs. Keep out of the reach of children.

Section 8. Exposure Controls/Personal Protection

Product name | **Exposure limits**

No exposure limit value known.

Personal Protective Equipment (PPE)

Eyes Safety glasses.

Body For prolonged or repeated handling, use gloves. Recommended: Neoprene gloves. Nitrile gloves. Rubber gloves.

Respiratory Use with adequate ventilation. Provide exhaust ventilation or other engineering controls to keep the airborne concentrations of vapors below their respective occupational exposure limits.

Section 9. Physical and Chemical Properties

Physical State Liquid.

pH 7.0 - 8.0

Boiling Point 170°C (338°F)

Specific Gravity 0.81

Solubility Emulsifies in water.

Color Clear. Orange.

Odor Citrus [Strong]

Vapor Pressure 0.13 kPa (1 mm Hg)

Vapor Density Not available.

Evaporation Rate Not available.

VOC (Consumer) 36.9% 2.48 (lb/gal) 298 (g/l).

Section 10. Stability and Reactivity

Stability and Reactivity The product is stable.

Incompatibility Combustible materials should be stored away from extreme heat and away from strong oxidizing agents. Incompatible with some strong acids. Reactive with acidic clay (i.e. clay absorbent).

Hazardous Polymerization Will not occur.

Hazardous Decomposition Products carbon oxides

Section 11. Toxicological Information

Acute Toxicity

Product/ingredient name	Result	Species	Dose	Exposure
Nonylphenoxypoly(Ethyleneoxy)Ethano	LD50 Dermal	Rabbit	2000 mg/kg	-
	LD50 Oral	Rat	3310 mg/kg	-

Section 12. Ecological Information

Environmental Effects Not available.

Aquatic Ecotoxicity

Not available.

Section 13. Disposal Considerations

Waste Information

Waste must be disposed of in accordance with federal, state and local environmental control regulations. Consult your local or regional authorities for additional information.

Waste Stream Classification: - [Non-hazardous waste]

Section 14. Transport Information

Regulatory information	UN number	Proper shipping name	Classes	PG*	Label
DOT Classification	Not applicable.	Not a DOT controlled material (United States).			

NOTE: DOT classification applies to most package sizes. For specific container size classifications or for size exceptions, refer to the Bill of Lading with your shipment.

PG* : Packing group

Section 15. Regulatory Information

U.S. Federal Regulations

SARA 313 toxic chemical notification and release reporting:

No products were found.

Clean Water Act (CWA) 307: No products were found.

Clean Water Act (CWA) 311: No products were found.

Clean Air Act (CAA) 112 regulated toxic substances: No products were found.

All Components of this product are listed or exempt from listing on TSCA Inventory.

State Regulations

California Prop 65 No products were found.

Section 16. Other Information

To the best of our knowledge, the information contained herein is accurate. However, neither the above named supplier nor any of its subsidiaries assumes any liability whatsoever for the accuracy or completeness of the information contained herein.
Final determination of suitability of any material is the sole responsibility of the user. All materials may present unknown hazards and should be used with caution. Although certain hazards are described herein, we cannot guarantee that these are the only hazards that exist.

**NOTE: Hazard Determination System (HDS) ratings are based on a 0-4 rating scale, with 0 representing minimal hazards or risks, and 4 representing significant hazards or risks. Although these ratings are not required on MSDSs under 29 CFR 1910.1200, the preparer may choose to provide them. HDS ratings are to be used with a fully implemented program to relay the meanings of this scale.*

MSDS# 000982

EXXON COMPANY, U.S.A.
A DIVISION OF EXXON CORPORATION

DATE ISSUED: 11/13/92
SUPERSEDES DATE: 12/02/91

MATERIAL SAFETY DATA SHEET

EXXON COMPANY, U.S.A. P.O. BOX 2180 HOUSTON, TX 77252-2180

A. IDENTIFICATION AND EMERGENCY INFORMATION

PRODUCT NAME
NUTO H 68

PRODUCT CODE
363015 - 01337

PRODUCT CATEGORY
Petroleum Lubricating Oil

PRODUCT APPEARANCE AND ODOR
Clear liquid, yellow color
Mild, bland petroleum odor

MEDICAL EMERGENCY TELEPHONE NUMBER
(713) 656-3424

B. COMPONENTS AND HAZARD INFORMATION

COMPONENTS	CAS NO. OF COMPONENTS	APPROXIMATE CONCENTRATION
Distillates (petroleum), hydrotreated heavy paraffinic	64742-54-7	Greater than 99%
or	or	
Distillates (petroleum), solvent-dewaxed heavy paraffinic	64742-65-0	
Proprietary additives	Mixture	Less than 1%

All components of this product are listed on the U.S. TSCA inventory.

See Section E for Health and Hazard Information.

See Section H for additional Environmental Information.

HAZARDOUS MATERIALS IDENTIFICATION SYSTEM (HMIS)

Health	Flammability	Reactivity	BASIS
1	1	0	Recommended by Exxon

EXPOSURE LIMIT FOR TOTAL PRODUCT
5 mg/m3 for oil mist (aerosol) for an 8-hour workday

BASIS
OSHA Regulation 29 CFR 1910.1000 and recommended by the American Conference of Governmental Industrial Hygienists (ACGIH). ACGIH states that the air is to be sampled by a method that does not collect vapor; in addition, it lists a 10 mg/m3 STEL.

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C. PRIMARY ROUTES OF ENTRY AND EMERGENCY AND FIRST AID PROCEDURES

EYE CONTACT
If splashed into the eyes, flush with clear water for 15 minutes or until irritation subsides. If irritation persists, call a physician.

SKIN
In case of skin contact, remove any contaminated clothing and wash skin with soap and water. Launder or dry-clean clothing before reuse. If product is injected into or under the skin, or into any part of the body, regardless of the appearance of the wound or its size, the individual

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should be evaluated immediately by a physician as a surgical emergency. Even though initial symptoms from high pressure injection may be minimal or absent, early surgical treatment within the first few hours may significantly reduce the ultimate extent of injury.

INHALATION
Vapor pressure is very low. Vapor inhalation under ambient conditions is normally not a problem. If overcome by vapor from hot product, immediately remove from exposure and call a physician. If breathing is irregular or has stopped, start resuscitation; administer oxygen, if available. If overexposed to oil mist, remove from further exposure until excessive oil mist condition subsides.

INGESTION
If ingested, DO NOT induce vomiting; call a physician immediately.

D. FIRE AND EXPLOSION HAZARD INFORMATION

FLASH POINT (MINIMUM)
220°C (428°F)
ASTM D 92, Cleveland Open Cup

AUTOIGNITION TEMPERATURE
Greater than 260°C (500°F)

NATIONAL FIRE PROTECTION ASSOCIATION (NFPA) - HAZARD IDENTIFICATION

Health	Flammability	Reactivity	BASIS
1	1	0	Recommended by Exxon

HANDLING PRECAUTIONS
Use product with caution around heat, sparks, pilot lights, static electricity, and open flame.

FLAMMABLE OR EXPLOSIVE LIMITS (APPROXIMATE PERCENT BY VOLUME IN AIR)
Estimated values: Lower Flammable Limit 0.9% Upper Flammable Limit 7%

EXTINGUISHING MEDIA AND FIRE FIGHTING PROCEDURES
Foam, water spray (fog), dry chemical, carbon dioxide and vaporizing liquid type extinguishing agents may all be suitable for extinguishing fires involving this type of product, depending on size or potential size of fire and circumstances related to the situation. Plan fire protection and response strategy through consultation with local fire protection authorities or appropriate specialists.

The following procedures for this type of product are based on the recommendations in the National Fire Protection Association's "Fire Protection Guide on Hazardous Materials", Eighth Edition (1984):

Use water spray, dry chemical, foam or carbon dioxide to extinguish the fire. Use water to keep fire-exposed containers cool. If a leak or spill has not ignited, use water spray to disperse the vapors and to provide protection for men attempting to stop a leak. Water spray may be used to flush spills away from exposures. Minimize breathing of gases, vapor, fumes or decomposition products. Use supplied-air breathing equipment for enclosed or confined spaces or as otherwise needed.

DECOMPOSITION PRODUCTS UNDER FIRE CONDITIONS
Fumes, smoke, carbon monoxide, sulfur oxides, aldehydes and other decomposition products, in the case of incomplete combustion.

"EMPTY" CONTAINER WARNING
"Empty" containers retain residue (liquid and/or vapor) and can be dangerous. DO NOT PRESSURIZE, CUT, WELD, BRAZE, SOLDER, DRILL, GRIND OR EXPOSE SUCH CONTAINERS TO HEAT, FLAME, SPARKS, STATIC ELECTRICITY, OR OTHER SOURCES OF IGNITION; THEY MAY EXPLODE AND CAUSE INJURY OR DEATH. Do not attempt to clean since residue is difficult to remove. "Empty" drums should be completely drained, properly bunged and promptly returned to a drum reconditioner. All other containers should be disposed of in an environmentally safe manner and in accordance with governmental regulations. For work on tanks refer to Occupational Safety and Health Administration regulations, ANSI Z49.1, and other governmental and industrial references pertaining to cleaning, repairing, welding, or other contemplated operations.

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E. HEALTH AND HAZARD INFORMATION

VARIABILITY AMONG INDIVIDUALS
Health studies have shown that many petroleum hydrocarbons and synthetic lubricants pose potential human health risks which may vary from person to person. As a precaution, exposure to liquids, vapors, mists or fumes should be minimized.

EFFECTS OF OVEREXPOSURE (Signs and symptoms of exposure)
Prolonged or repeated skin contact may cause skin irritation.

NATURE OF HAZARD AND TOXICITY INFORMATION
In accordance with the current OSHA Hazard Communication Standard criteria, this product does not require a cancer hazard warning. This is because the product is formulated from base stocks which are severely hydrotreated, severely solvent extracted, and/or processed by mild hydrotreatment and extraction. Alternatively, it may consist of components not otherwise affected by IARC criteria, such as atmospheric distillates or synthetically derived materials, and as such is not characterized by current IARC classification criteria.

Prolonged or repeated skin contact with this product tends to remove skin oils, possibly leading to irritation and dermatitis; however, based on human experience and available toxicological data, this product is judged to be neither a "corrosive" nor an "irritant" by OSHA criteria.

Product contacting the eyes may cause eye irritation.

Product has a low order of acute oral and dermal toxicity, but minute amounts aspirated into the lungs during ingestion or vomiting may cause mild to severe pulmonary injury and possibly death.

This product is judged to have an acute oral LD50 (rat) greater than 5 g/kg of body weight, and an acute dermal LD50 (rabbit) greater than 3.16 g/kg of body weight.

PRE-EXISTING MEDICAL CONDITIONS WHICH MAY BE AGGRAVATED BY EXPOSURE
None Recognized

F. PHYSICAL DATA

The following data are approximate or typical values and should not be used for precise design purposes.

BOILING RANGE
IBP Approximately 293°C (560°F)
by ASTM D 2887

SPECIFIC GRAVITY (15.6 C/15.6 C)
0.88

MOLECULAR WEIGHT
Not determined

pH
Essentially neutral

POUR, CONGEALING OR MELTING POINT
-27°C (-17°F)
Pour Point by ASTM D 97

VISCOSITY
66 cSt @ 40°C

VAPOR PRESSURE
Less than 0.01 mm Hg @ 20°C

VAPOR DENSITY (AIR = 1)
Greater than 5

PERCENT VOLATILE BY VOLUME
Negligible from open container in 4 hours @ 38°C (100°F)

EVAPORATION RATE @ 1 ATM. AND 25 C (77 F) (n-BUTYL ACETATE = 1)
Less than 0.01

SOLUBILITY IN WATER @ 1 ATM. AND 25 C (77 F)
Negligible: less than 0.1%

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G. REACTIVITY

This product is stable and will not react violently with water. Hazardous polymerization will not occur. Avoid contact with strong oxidants such as liquid chlorine, concentrated oxygen, sodium hypochlorite, calcium hypochlorite, etc., as this presents a serious explosion hazard.

H. ENVIRONMENTAL INFORMATION

STEPS TO BE TAKEN IN CASE MATERIAL IS RELEASED OR SPILLED
Recover free product. Add sand, earth or other suitable absorbent to spill area. Minimize breathing vapors. Minimize skin contact. Open all windows and doors. Keep product out of sewers and watercourses by diking or impounding. Advise authorities if product has entered or may enter sewers, watercourses, or extensive land areas.
Assure conformity with applicable governmental regulations.

THE FOLLOWING INFORMATION MAY BE USEFUL IN COMPLYING WITH VARIOUS STATE AND FEDERAL LAWS AND REGULATIONS UNDER VARIOUS ENVIRONMENTAL STATUTES:

REPORTABLE QUANTITY (RQ), EPA REGULATION 40 CFR 302 (CERCLA Section 102)
No RQ for product or any constituent greater than 1% or 0.1% (carcinogen).

THRESHOLD PLANNING QUANTITY (TPQ), EPA REGULATION 40 CFR 355 (SARA Sections 301-304)
No TPQ for product or any constituent greater than 1% or 0.1% (carcinogen).

TOXIC CHEMICAL RELEASE REPORTING, EPA REGULATION 40 CFR 372 (SARA Section 313)
No toxic chemical is present greater than 1% or 0.1% (carcinogen).

HAZARDOUS CHEMICAL REPORTING, EPA REGULATION 40 CFR 370 (SARA Sections 311-312)

EPA HAZARD CLASSIFICATION CODE:	Acute Hazard	Chronic Hazard	Fire Hazard	Pressure Hazard	Reactive Hazard	Not Applicable
						XXX

I. PROTECTION AND PRECAUTIONS

VENTILATION
Use local exhaust to capture vapor, mists or fumes, if necessary. Provide ventilation sufficient to prevent exceeding recommended exposure limit or buildup of explosive concentrations of vapor in air. No smoking, flame or other ignition sources.

RESPIRATORY PROTECTION
Use supplied-air respiratory protection in confined or enclosed spaces, if needed.

PROTECTIVE GLOVES
Use chemical-resistant gloves, if needed, to avoid prolonged or repeated skin contact.

EYE PROTECTION
Use splash goggles or face shield when eye contact may occur.

OTHER PROTECTIVE EQUIPMENT
Use chemical-resistant apron or other impervious clothing, if needed, to avoid contaminating regular clothing, which could result in prolonged or repeated skin contact.

WORK PRACTICES / ENGINEERING CONTROLS
Keep containers closed when not in use. Do not store near heat, sparks, flame or strong oxidants.

In order to prevent fire or explosion hazards, use appropriate equipment.

Information on electrical equipment appropriate for use with this product may be found in the latest edition of the National Electrical Code (NFPA-70). This document is available from the National Fire Protection Association, Batterymarch Park, Quincy, Massachusetts 02269.

PERSONAL HYGIENE
Minimize breathing vapor, mist or fumes. Avoid prolonged or repeated contact with skin. Remove contaminated clothing; launder or dry-clean before re-use. Remove contaminated shoes

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and thoroughly clean before re-use; discard if oil-soaked. Cleanse skin thoroughly after contact, before breaks and meals, and at end of work period. Product is readily removed from skin by waterless hand cleaners followed by washing thoroughly with soap and water.

J. TRANSPORTATION AND OSHA RELATED LABEL INFORMATION

TRANSPORTATION INCIDENT INFORMATION
For further information relative to spills resulting from transportation incidents, refer to latest Department of Transportation Emergency Response Guidebook for Hazardous Materials Incidents, DOT P 5800.3.

DOT IDENTIFICATION NUMBER
Not applicable

OSHA REQUIRED LABEL INFORMATION
In compliance with hazard and right-to-know requirements, the following OSHA Hazard Warnings should be found on a label, bill of lading or invoice accompanying this shipment.

(OSHA Hazard Warnings not applicable for this product; therefore, no OSHA warnings would appear on the label.)

Note: Product label will contain additional non-OSHA related information.

The information and recommendations contained herein are, to the best of Exxon's knowledge and belief, accurate and reliable as of the date issued. Exxon does not warrant or guarantee their accuracy or reliability, and Exxon shall not be liable for any loss or damage arising out of the use thereof.

The information and recommendations are offered for the user's consideration and examination, and it is the user's responsibility to satisfy itself that they are suitable and complete for its particular use. If buyer repackages this product, legal counsel should be consulted to insure proper health, safety and other necessary information is included on the container.

The Environmental Information included under Section H hereof as well as the Hazardous Materials Identification System (HMIS) and National Fire Protection Association (NFPA) ratings have been included by Exxon Company, U.S.A. in order to provide additional health and hazard classification information. The ratings recommended are based upon the criteria supplied by the developers of these rating systems, together with Exxon's interpretation of the available data.

FOR ADDITIONAL INFORMATION ON HEALTH EFFECTS CONTACT:
DIRECTOR OF INDUSTRIAL HYGIENE
EXXON COMPANY, U.S.A.
KELLOGG TOWER, ROOM 550
P. O. BOX 2180
HOUSTON, TX 77252-2180
(713) 656-2443

FOR OTHER PRODUCT INFORMATION CONTACT:
MANAGER, MARKETING TECHNICAL SERVICES
EXXON COMPANY, U.S.A.
ROOM 2355
P. O. BOX 2180
HOUSTON, TX 77252-2180
(713) 656-5949

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MATERIAL SAFETY DATA SHEET
FOR PENETRATING OIL 2

Keystone Lubricants Division
Total Fina Elf Lubricants USA, Inc.
5 N. Stiles Street, Linden NJ 07036

REVISION DATE
04-NOV-02

DATE ISSUED
06-JAN-03

IDENTIFICATION AND EMERGENCY INFORMATION

PRODUCT NAME:
PENETRATING OIL 2

PRODUCT #:
200136

CHEMICAL NAME:
N/A - Mixture

CAS #'S:
Mixture

PRODUCT APPEARANCE AND ODOR:
Amber liquid, perfumed odor

CHEMICAL FAMILY:
Petroleum hydrocarbon

SYNONYMS:
General purpose penetrating oil

EMERGENCY TELEPHONE:
1-908-862-9300

COMPONENTS AND HAZARD INFORMATION

COMPONENTS:	W/W	HAZARD DATA (TLV, LD50, LC50, ETC.):
Petroleum based lubricating oil CAS No. 64742-58-1		5 mg/m3 ACGIH/OSHA TWA
Aliphatic hydrocarbons CAS Nos. 64742-47-8 8052-41-3		100 ppm ACGIH TWA

HAZARDOUS MATERIALS IDENTIFICATION SYSTEM (HMIS):

Health	Flammability	Reactivity
2	2	0

TRANSPORTATION INFORMATION

TRANSPORTATION INCIDENT INFORMATION:
DOT PROPER SHIPPING NAME:
Combustible Liquid (Petroleum distillate) NA 1993 PG III
DOT HAZARD CLASS: Combustible Liquid
DOT IDENTIFICATION NUMBER: NA 1993
NAME: COMBUSTIBLE LIQUID, N.O.S.

EMERGENCY FIRST AID

EYE CONTACT:
If splashed into the eyes, flush with clear water for 15 minutes or until irritation subsides. If irritation persists, call a physician.

SKIN CONTACT:
In case of skin contact, remove contaminated clothing and wash skin thoroughly with soap and water.

INHALATION:
If overcome by vapor, remove from exposure and call a physician immediately.

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EMERGENCY FIRST AID

If breathing is irregular or has stopped, start resuscitation, administer oxygen, if available.
INGESTION:
If ingested, DO NOT induce vomiting; call a physician immediately.
Possible aspiration hazard.

FIRE AND EXPLOSION HAZARD INFORMATION

FLASH POINT (MINIMUM)
COMBUSTIBLE - Per DOT 49 CFR 173.115
104'F
ASTM D 56, Tag Closed Cup

AUTOIGNITION TEMPERATURE
Approximately 254°C (490°F)
ASTM D 2155

NATIONAL FIRE PROTECTION ASSOCIATION (NFPA) - HAZARD IDENTIFICATION

Health	Flammability	Reactivity
2	2	0

HANDLING PRECAUTIONS
Keep product away from heat, sparks, pilot lights, static electricity, and open flame.

FLAMMABLE OR EXPLOSIVE LIMITS (APPROXIMATE PERCENT BY VOLUME IN AIR)
Estimated values: Lower Flammable Limit N/E Upper Flammable Limit N/E

EXTINGUISHING MEDIA AND FIRE FIGHTING PROCEDURES
Foam, water spray (fog), dry chemical, carbon dioxide and vaporizing liquid type extinguishing agents may all be suitable for extinguishing fires involving this type of product, depending on size or potential size of fire and circumstances related to the situation. Plan fire protection and response strategy through consultation with local fire protection authorities or appropriate specialists. Water may be ineffective, but water
should be used to keep fire-exposed containers cool. If a leak or spill has ignited, use water spray to disperse the vapors and to protect men attempting to stop a leak. Water spray may be used to flush spills away from exposures. Minimize breathing gases, vapor, fumes or decomposition products. Use supplied-air breathing equipment for enclosed or confined spaces or as otherwise needed.

Note: The inclusion of the phrase "water may be ineffective" is to indicate that although water can be used to cool and protect exposed material, water may not extinguish the fire unless used under favorable conditions by experienced fire fighters trained in fighting all types of flammable liquid fires.

DECOMPOSITION PRODUCTS UNDER FIRE CONDITIONS
Fumes, smoke, carbon monoxide, aldehydes and other decomposition products, in the case of incomplete combustion.

"EMPTY" CONTAINER WARNING
"Empty" containers retain residue (liquid and/or vapor) and can be dangerous. DO NOT PRESSURIZE, CUT, WELD, BRAZE, SOLDER, DRILL, GRIND OR EXPOSE SUCH CONTAINERS TO HEAT, FLAME, SPARKS OR OTHER SOURCES OF IGNITION; THEY MAY EXPLODE AND CAUSE INJURY OR DEATH. Do not attempt to clean since residue is difficult to remove. "Empty" drums should be completely drained, properly bunged and

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FIRE AND EXPLOSION HAZARD INFORMATION

promptly returned to a drum reconditioner. All other containers should be disposed of in an environmentally safe manner and in accordance with governmental regulations.

HEALTH AND HAZARD INFORMATION

VARIABILITY AMONG INDIVIDUALS:
Health studies have shown that many petroleum hydrocarbons and synthetic lubricants pose potential human health risks which may vary from person to person. As a precaution, exposure to liquids, vapors, mists or fumes should be minimized.

POTENTIAL HEALTH EFFECTS

EYE CONTACT: May cause slight eye irritation.

SKIN CONTACT: Occasional brief contact with the liquid will not result in significant irritation unless evaporation is impeded. May aggravate an existing dermatitis condition. Prolonged or repeated contact tends to remove skin oils possibly leading to irritation and dermatitis.

INHALATION: High vapor/aerosol concentrations (greater than approximately 1000 ppm) are irritating to the eyes and respiratory tract, may cause headaches, dizziness, anesthesia, drowsiness, unconsciousness, and other central nervous system effects, including death. Low order of toxicity.

INGESTION: Small amounts of this product aspirated into the respiratory system during ingestion or vomiting may cause mild to severe pulmonary injury, possibly progressing to death. Minimal toxicity.

PHYSICAL DATA

The following data are approximate or typical values and should not be used for precise design purposes.

BOILING RANGE:
Approximately 152-202°C (305-396°F)

SPECIFIC GRAVITY (15.6°C/15.6°C):
Approximately 0.79

MOLECULAR WEIGHT:
n/e

pH:
Essentially neutral

VAPOR PRESSURE:
Less than 10 mm Hg @ 25°C
ASTM D 2879

VAPOR DENSITY (AIR = 1):
Approximately 4.8

PERCENT VOLATILE BY VOLUME:
Approximately 20 @ 1 ATM. AND 25°C (77°F)

EVAPORATION RATE @ 1 ATM. AND 25°C (77°F):
(n-BUTYL ACETATE = 1)

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PHYSICAL DATA

POUR, CONGEALING OR MELTING POINT:
Less than -18°C (0°F)
Pour Point by ASTM D 97
VISCOSITY:
0.95 cP @ 25°C ASTM D 445

0.1
SOLUBILITY IN WATER @ 1 ATM. AND 25°C (77°F):
Negligible; less than 0.1%

REACTIVITY

This product is stable and will NOT react violently with water. Hazardous polymerization will not occur. Avoid contact with strong oxidants such as liquid chlorine, concentrated oxygen, sodium hypochlorite or calcium hypochlorite, etc., as this represents a serious explosion hazard.

DECOMPOSITION PRODUCTS UNDER FIRE CONDITIONS:
Fumes, smoke, carbon monoxide, oxides of sulfur, and other decomposition products, in case of incomplete combustion.

CONDITIONS TO AVOID:
Open flames.

TOXICITY

ORAL (Acute)	N/E
DERMAL (Acute)	N/E
EYE	N/E
INHALATION (Acute)	N/E
CHRONIC, SUBCHRONIC, ETC.	N/E

Medical Conditions Aggravated by Exposure: Unknown

This product does NOT contain any ingredients identified as carcinogenic by IARC, NTP, or OSHA.

SARA Section 313 Status: This material is not known to contain any chemicals on the SARA Section 313 list at a concentration greater than 1.0 percent or carcinogenic chemical on that list at a concentration greater than 0.1 percent.

SPILL OR LEAK PROCEDURES

STEPS TO BE TAKEN IN CASE MATERIAL IS RELEASED OR SPILLED:
Keep product out of sewers and watercourses by diking or impounding. Absorb with sand or inert material. Sweep or scoop up and remove. Prevent spread of spill. Advise authorities if product has entered or may enter sewers, watercourses or extensive land areas. Assure conformity with local regulations.

WASTE DISPOSAL METHOD: (Consult federal, state, or local authorities for

Keystone Lubricants Division
Total Fina Elf Lubricants USA, Inc.
5 N. Stiles Street, Linden NJ 07036

REVISION DATE
04-NOV-02

DATE ISSUED
06-JAN-03

SPILL OR LEAK PROCEDURES

proper disposal procedures.)
Assure conformity with applicable disposal regulations. Dispose of absorbed material at an approved waste site or facility.

PROTECTION AND PRECAUTIONS

VENTILATION: (Always maintain below permissible exposure limits.)
Use local exhaust to capture vapor, mist or fumes, if necessary.
Provide ventilation sufficient to prevent exceeding recommended exposure limit or buildup of explosive concentrations of vapor in air.

RESPIRATORY PROTECTION: (Use only NIOSH approved equipment.)
Normally not needed at ambient temperatures. Use supplied air respiratory protection in confined or enclosed spaces, if needed. Use filter, dust, fume, or mist respirator type under misting conditions. Use can or cartridge; gas or vapor respirator type under conditions exceeding TWA standard.

PROTECTIVE GLOVES:
Use chemical-resistant gloves, if needed, to avoid prolonged or repeated skin contact.

EYE PROTECTION:
Use splash goggles or face shield when eye contact may occur.

OTHER PROTECTIVE EQUIPMENT:
Use chemical-resistant apron or other impervious clothing, if needed, to avoid contaminating regular clothing which could result in prolonged or repeated skin contact.

WORK PRACTICES/ENGINEERING CONTROLS:
Keep containers closed when not in use. Do not handle near heat, sparks, flame, or strong oxidants.

PERSONAL HYGIENE:
Minimize breathing vapor, mist, or fumes. Avoid prolonged or repeated contact with skin. Remove contaminated clothing; launder or dry-clean before reuse. Remove contaminated shoes and thoroughly clean before reuse; discard if oil-soaked. Cleanse skin thoroughly after contact, before breaks and meals, and at end of work period. Product is readily removed from skin by waterless hand cleaners followed by washing thoroughly with soap and water.

PREPARED BY: Luke McHale REGULATORY MANAGER

THE ABOVE INFORMATION IS ACCURATE TO THE BEST OF OUR KNOWLEDGE. HOWEVER, SINCE DATA, SAFETY STANDARDS, AND GOVERNMENT REGULATIONS ARE SUBJECT TO CHANGE AND THE CONDITIONS OF HANDLING AND USE, OR MISUSE BEYOND OUR CONTROL, SELLER MAKES NO WARRANTY, EITHER EXPRESS OR IMPLIED, WITH RESPECT TO THE COMPLETENESS OR CONTINUING ACCURACY OF THE INFORMATION CONTAINED HEREIN AND DISCLAIMS ALL LIABILITY FOR RELIANCE

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5 N. Stiles Street, Linden NJ 07036

REVISION DATE
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THEREON. USER SHOULD SATISFY HIMSELF THAT HE HAS ALL CURRENT DATA RELEVANT TO HIS PARTICULAR USE.

M011

MATERIAL SAFETY DATA SHEET
May be used to comply with
OSHA's Hazard Communication
Standard,29CFR 1910.2100.

U.S. DEPARTMENT OF LABOR
Occupational Safety and
Health Administration
(Non-Mandatory Form)

006-NOZZLE GEL

KCI, INC
3710 N. DAVIDSON STREET
CHARLOTTE,N.C. 28205

CHEMTREC(24-HOUR)800-424-9300
INFORMATION 704-372-8435
DATE PREPARED: JANUARY 14, 2004

SECTION II-HAZARDOUS INGREDIENTS/IDENTITY INFORMATION

Hazardous components	OSHA PEL	ACGIH TLV	%(optional)
None	N/A	N/A	

The ingredients in this product are not listed in 29 CFR 1910 Subpart 2 nor do they appear in "Threshold Limit Values for Chemical Substances in the work environment adopted by ACGIH for 1985-86." They are also not reportable under Section 313 of Title III of SARA

SECTION III-PHYSICAL/CHEMICAL CHARACTERISTICS

Boiling Point: NDA	Specific Gravity(H2O=1).815-.880
Vapor Pressure: NDA	Melting Point: 100.4-140 F
Vapor Density: NDA	Evaporation Rate: NDA (BUTYL=1)

Solubility in Water: NIL
Appearance and Odor: Opaque, no odor
Volatile(by weight %): 0 at 25C.

SECTION IV-FIRE AND EXPLOSION HAZARD DATA

Flash Point(Method Used)	Flammable Limits	LEL	UEL
Greater than 390F(astm D-92)	NDA	NDA	NDA

Extinguishign Media: Carbon dioxide,dry chemical or foam.
Special Firefighting Procedures: Pressure-demand,self-contained protection should be provided. Water spray is an unsuitable extinguishing agent.

Unusual Fire and Explosion Hazards: NONE

SECTION V-REACTIVITY DATA

Stability		Conditions to Avoid
	Unstable:	NONE
	Stable :X	

Incompatibility(Materials to Avoid)
N/A

Hazardous Decomposition or Byproducts
N/A

Hazardous Polymerization:	Conditions to Avoid
May Occur:	N/A
Will Not Occur: X	

SECTION VI-HEALTH HAZARD DATA

Route(s)of Entry: Inhalation: NO Skin: NO Ingestion: NO

Health Hazards(Acute and Chronic)

Acute-None

Chronic-None

Carcinogenicity: No NTP N/A IARC Monographs N/A OSHA N/A

Signs and Symptoms of Exposure: NDA

Emergency First Aid Procedures: Eyes:flush eyes with water for 15 minutes. Skin:wash with soap & water. Inhalation : remove to fresh air. Call physician. Ingestion: drink water.

SECTION VII-PRECAUTIONS FOR SAFE HANDLING AND USE

Steps to Be Taken in Case Material Is Released or Spilled: Shut off leak and dike up large spills. After cooling and solidification, scrape and/or shovel up material. Finally, clean area with an oil absorbent material.

Waste Disposal Method: Dispose of in accordance with local, state, and federal regulations.

Precautions to Be Taken in Handling and Storing: Store away from flame, heat(250F) maximum. Also keep away from strong oxidizing agents.

Other Precautions: None

SECTION VIII-CONTROL MEASURES

Respiratory Protection(Specify type)
None required.

Ventilation: Local Exhaust-N/A Special-N/A

Mechanical- N/A Other-N/A

Protective Gloves- Impervious when molten. Eye Protection-Wear a face shield if product is molten

Other Protective Clothing: When molten ,wear coveralls.

Work/Hygienic Practices: NDA

NEW JERSEY RIGHT TO KNOW INFORMATION(HAZARDOUS & NON-HAZARDOUS)

USP PETROLATUM	CAS# 8009-03-8	99.5%
ANTHRAQUINONE BLUE DYE	CAS#14233-37-5	.5%

PERCENT VOLATILES: NIL
VOC'S: NONE

HAZARD RATINGS
FIRE-1
REACTIVITY-0
TOXICITY-0
SPECIAL-NONE

LPS LABORATORIES INC -- TAPMATIC DUAL ACTION AQUACUT CUTTING FLUID, 0

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MSDS Safety Information

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FSC: 6850
MSDS Date: 03/01/1993
MSDS Num: BXRGK
LIIN: 00N022182
Product ID: TAPMATIC DUAL ACTION AQUACUT CUTTING FLUID, 01216
MFN: 02
Responsible Party
Cage: 66724
Name: LPS LABORATORIES INC
Address: 4647 HUGH HOWELL RD
City: TUCKER GA 30085-5052
Info Phone Number: 404-934-7800
Emergency Phone Number: 800-424-9300 (CHEMTREC)
Published: Y

==========

Contractor Summary

==========

Cage: 66724
Name: LPS LABORATORIES, INC.
Address: 4647 HUGH HOWELL ROAD
City: TUCKER GA 30085-5052
Phone: 404-934-7800

==========

Ingredients

==========

Name: AMINE SALT OF ORGANIC PHOSPHATE ESTER
% Wt: 2-4
OSHA PEL: N/K (FP N)
ACGIH TLV: N/K (FP N)

Cas: 107-21-1
RTECS #: KW2975000
Name: ETHYLENE GLYCOL; (ETHYLENE GLYCOL; 1,2ETHANEDIOL) (SARA 313) (CERCLA)
% Wt: 4-6
OSHA PEL: N/K (FP N)
ACGIH TLV: 50 PPM, VAPOR, C
EPA Rpt Qty: 1 LB
DOT Rpt Qty: 1 LB

Cas: 67-63-0
RTECS #: NT8050000
Name: ISOPROPYL ALCOHOL; (ISOPROPYL ALCOHOL; ISOPROPANOL) (SARA 313)
% Wt: 1-3
OSHA PEL: 400 PPM
ACGIH TLV: 400 PPM; 500 STEL

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Health Hazards Data

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LD50 LC50 Mixture: NONE SPECIFIED BY MANUFACTURER.
Route Of Entry Inds - Inhalation: YES
Skin: YES
Ingestion: NO

Carcinogenicity Inds - NTP: NO
IARC: NO
OSHA: NO
Effects of Exposure: INHALATION: HEADACHE, DIZZINESS AND NAUSEA. EYES: LIQUID WILL CAUSE TEMPORARY IRRITATION. SKIN: REPEATED OR PROLONGED CONTACT MAY CAUSE DRYING OF SKIN. INGESTION: NOT A LIKELY ROUTE OF EXPOSURE. INGES TION OF ETHYLENE GLYCOL MAY RESULT IN DEPRESSION FOLLOWED BY RESPIRATORY AND CARDIAC FAILURE.
Explanation Of Carcinogenicity: NOT RELEVANT
Signs And Symptions Of Overexposure: SEE HEALTH HAZARDS.
Medical Cond Aggravated By Exposure: NONE KNOWN.
First Aid: INHAL: MOVE TO FRESH AIR AND PROVIDE OXYGEN IF BREATHING IS DIFFICULT. EYES: FLUSH EYES WITH PLENTY OF WATER FOR AT LEAST 15 MINUTES. IF IRRITATION PERSISTS, CONTACT MD. SKIN: WASH WITH SOAP AND WATER ; APPLY MEDICATED SKIN CREAM. INGEST: GIVE TWO GLASSES OF WATER AND INDUCE VOMITING IMMEDIATELY BY TOUCHING FINGER TO BACK OF THROAT. NEVER GIVE ANYTHING BY MOUTH TO AN UNCONSCIOUS PERSON.

==========

Handling and Disposal

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Spill Release Procedures: REMOVE LEAKING CONTAINER AND CONTAIN SPILL. SOAK OR MOP UP WITH ABSORBENT MATERIAL AND DISCARD.
Neutralizing Agent: NONE SPECIFIED BY MANUFACTURER.
Waste Disposal Methods: DISPOSE OF IN ACCORDANCE WITH LOCAL, STATE AND FEDERAL REGULATIONS.
Handling And Storage Precautions: PRODUCT SHOULD BE STORED ABOVE 20F AND BELOW 120F. KEEP CONTAINERS CLOSED WHEN NOT IN USE.
Other Precautions: NONE SPECIFIED BY MANUFACTURER.

==========

Fire and Explosion Hazard Information

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Flash Point Text: NONFLAMMABLE
Extinguishing Media: MEDIA SUITABLE FOR SURROUNDING FIRE (FP N).
Fire Fighting Procedures: USE NIOSH/MSHA APPROVED SCBA AND FULL PROTECTIVE EQUIPMENT (FP N).
Unusual Fire/Explosion Hazard: NONE.

==========

Control Measures

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Respiratory Protection: NONE REQUIRED IF GOOD VENTILATION IS MAINTAINED. USE NIOSH/MSHA APPROVED RESPIRATOR APPROPRIATE FOR EXPOSURE OF CONCERN (FP N).
Ventilation: LOCAL EXHAUST IS USUALLY ADEQUATE.
Protective Gloves: IMPERVIOUS GLOVES (FP N).
Eye Protection: ANSI APPRVD CHEM WORKERS GOGGLES (FP N).
Work Hygienic Practices: WASH HANDS W/SOAP & WATER AFTER USE &/OR BEFORE BREAKS, LUNCH & AT END OF WORK PERIODS. REMOVE CONTAMINATED (SUPDAT)
Supplemental Safety and Health: HYGIENE PRACT: CLOTHING & LAUNDER BEFORE REUSE.

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Physical/Chemical Properties

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B.P. Text: 200F,93C
Vapor Pres: 18 @ 100F
Vapor Density: APPROX 0.6

Spec Gravity: 1.0 (H*2O=1)
Evaporation Rate & Reference: 1 (H*2O=1)
Solubility in Water: 100%
Appearance and Odor: CLEAR, AMBER LIQUID WITH CINNAMON ODOR.

Reactivity Data

Stability Indicator: YES
Stability Condition To Avoid: NONE.
Materials To Avoid: MAGNESIUM AND STRONG OXIDIZING AGENTS.
Hazardous Decomposition Products: CARBON MONOXIDE UPON THERMAL DECOMPOSITION.
Hazardous Polymerization Indicator: NO
Conditions To Avoid Polymerization: NOT RELEVANT

Toxicological Information

Ecological Information

MSDS Transport Information

Regulatory Information

Other Information

HAZCOM Label

Product ID: TAPMATIC DUAL ACTION AQUACUT CUTTING FLUID, 01216
Cage: 66724
Company Name: LPS LABORATORIES, INC.
Street: 4647 HUGH HOWELL ROAD
City: TUCKER GA
Zipcode: 30085-5052
Health Emergency Phone: 800-424-9300 (CHEMTREC)
Label Required IND: Y
Date Of Label Review: 04/18/1995
Status Code: C
Label Date: 04/18/1995
Origination Code: G
Eye Protection IND: YES
Skin Protection IND: YES
Signal Word: WARNING
Respiratory Protection IND: YES
Health Hazard: Moderate
Contact Hazard: Slight
Fire Hazard: None
Reactivity Hazard: None
Hazard And Precautions: DO NOT INGEST. ACUTE: INHALATION: HEADACHE, DIZZINESS AND NAUSEA. EYES: LIQUID WILL CAUSE TEMPORARY IRRITATION. SKIN: REPEATED OR PROLONGED CONTACT MAY CAUSE DRYING OF SKIN. INGESTION: INGESTION OF ETHYLENE GLYCOL MAY RESULT IN DEPRESSION FOLLOWED BY RESPIRATORY AND CARDIAC FAILURE.

CHRONIC: NONE LISTED BY MANUFACTURER.

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Disclaimer (provided with this information by the compiling agencies): This information is formulated for use by elements of the Department of Defense. The United States of America in no manner whatsoever expressly or implied warrants, states, or intends said information to have any application, use or viability by or to any person or persons outside the Department of Defense nor any person or persons contracting with any instrumentality of the United States of America and disclaims all liability for such use. Any person utilizing this instruction who is not a military or civilian employee of the United States of America should seek competent professional advice to verify and assume responsibility for the suitability of this information to their particular situation regardless of similarity to a corresponding Department of Defense or other government situation.

MATERIAL SAFETY DATA SHEET

Trade Name: CC Fix Media

Section I – General Information:

Item Name: CC Fixative Media
Product Code: SC4521/Blue
Manufactured by: InstaCote, INC.
160 C Lavoy Rd.
Erie, MI 48133
Date MSDS Prepared: May 23, 2001
Last Review Date: May 23, 2001
MSDS Preparer's Name: Charles J. Smith Chemist/ M.S.
Product Description: Vinyl Latex/Modified Poly Acrylate Coating
CAS Name and Number: None, Mixture
D.O.T. Hazard Classification and Shipping Name: None
NFPA Ratings: Hazard: 0 Health: 0 Fire: 0 Reactivity: 0
Scale 3 = extreme, 2 = high, 1 = moderate, 0 = insignificant

Section II – Ingredient/Identity Information:

Proprietary (Y/N): Y

Ingredient	Composition:	CAS #	Exposure Limits (TWA)
Ammonia	<0.04%	7664-41-7	35 ppm STEL ACGIH 35 mg/m^3 TWA8 OSHA
2-Ethylhexyl Acrylate	<0.01%	103-11-7	5 ppm TWA8 UCC

Section III – Physical/Chemical Properties:

Appearance:	Blue Liquid	Color:	Blue
State:	Liquid	pH:	7.3
Specific Gravity:	1.10	Viscosity:	250 cP@72≤F
Vapor Pressure:	18 mm Hg, 20°C	Odor:	Pleasant

Vapor Density: 0.6 (Air=1)
Water Solubility: Completely
Evaporation Rate: 0.8 (Butyl Acetate=1)

Section IV – Fire and Explosion Hazard Data:

Flash Point: N/A Flammable Limits: Upper – N/A
Lower: - N/A

Extinguishing Media: As for surrounding fire. This product is a very low fire hazard. This product is a water-based material and while it may not burn, it can splatter and froth. Do not spray water into hot material; use water fog to cool surrounding fire.

Section V – Reactivity Data:

Stability (Y/N) Y
Conditions to Avoid: **Do not allow freezing**.
Materials to Avoid: Strong Acids or Strong Alkalis
Hazardous Decomposition Products: Oxides of Carbon

Section VI – Health Hazard Data:

Primary Routes of Exposure: Skin Contact, Ingestion and Inhalation

Skin Contact: Prolonged and repeated skin contact may cause irritation.

Ingestion: Ingestion of product will cause irritation of the mouth, pharynx, esophagus and stomach.

Inhalation: Breathing atomized vapors may cause headaches, nausea, irritation of the nose, throat and lungs.

Section VII – Emergency First Aid:

Eye Contact: Flush eyes with a large amount of water for at least 15 minutes. Consult a physician if irritation persists.

Skin Contact: Wash area with soap and water.

Ingestion: No special precautions

Inhalation: Move individual to fresh air. Consult a physician if irritation persists or breathing becomes labored.

Section VIII – Precautions for Safe Handling, Storage and Use:

Personal Protective Equipment for Routine Use:

Respiratory Protection: Respirators are not routinely required when using this product indoors or outdoors. In any case when excessive mist and atomization of product occurs such as pressurized air spraying, use NIOSH/MSHA approved full or half face respirator with dust cartridge.

Gloves: Gloves are not normally required for routine use. If an individual is known to have skin susceptible to irritation by other chemicals, this individual should wear butyl or nitrile type gloves.

Eye Protection: Safety goggles or glasses with side shields should always be worn.

Other: Applicator should wear a Tyvek suit or coveralls.

Work Practices: Do not eat, drink or smoke while applying this product. Wash hands immediately upon leaving the work site. Treat this product with caution as you would any other chemical.

Spill/Release Procedures: Large spills can be vacuumed. Small spills can be treated with absorbent clay, earth, sand or other material, shoveled into a DOT approved container and disposed of according to all local, state and Federal regulations.

Waste Disposal Procedure: Coagulate the waste material by addition of sand, clay or other earth material. Allow to dry if time permits. Coagulated solids may be incinerated in accordance with local, state and federal regulations.

Storage and Handling: Store product in a dry environment.. Protect product from extremes in temperatures, **Do Not Freeze.**

Other Health Hazard Precautions: None

Complete

MATERIAL SAFETY DATA SHEET

Trade Name: CC Strippable Decon Media

Section I – General Information:

Item Name: CC Strippable Decontamination Media
Product Code: SC901/Clear
Manufactured by: InstaCote, INC.
160 C Lavoy Rd.
Erie, MI 48133
Date MSDS Prepared: August 4, 1998
Last Review Date: March 3, 2001
MSDS Preparer's Name: Charles J. Smith Chemist/ M.S.

Product Description: Vinyl Acrylic Latex Strippable Coating
CAS Name and Number: None, Mixture
D.O.T. Hazard Classification and Shipping Name: None
NFPA Ratings: Hazard: 0 Health: 0 Fire: 0 Reactivity: 0
Scale 3 = extreme, 2 = high, 1 = moderate, 0 = insignificant

Section II – Ingredient/Identity Information:

Proprietary (Y/N): Y

Ingredient	Composition:	CAS #	Exposure Limits (TWA)
Vinyl Acetate	0.07%	108-05-4	ACGIH- 10 ppm TWA 8 hr. 15 ppm STEL OSHA- 10 ppm TWA 8 hr. UCC- 5 ppm

Section III – Physical/Chemical Properties:

Appearance:	Off white thick milky fluid		
State:	Liquid	pH:	6.5-8.0
Specific Gravity:	1.0 – 1.2	Viscosity:	NA
Vapor Pressure:	1.4 mm Hg	Vapor Density:	same as water
Water Dispersible:	Completely	Odor:	Pleasant
Boiling Point:	212 °F	Melting Point:	27 °F
Evaporation Rate:	Equiv. To water		

Section IV – Fire and Explosion Hazard Data:

Flash Point:	Will not flash ignite
Lower Explosion Limit:	No low level explosion limit
Upper Explosion Limit:	No upper level explosion limit
Extinguishing Media/Methods:	Use dry chemical, CO_2,AFFF(foam), or water.
Special Fire Fighting Precautions:	None known
Unusual Fire/Explosion Hazards:	None known

Section V – Reactivity Data:

Stability (Y/N) Y
Conditions to Avoid: Do not allow freezing.
Materials to Avoid: None known
Hazardous Decomposition Products: Oxides of carbon

Section VI – Health Hazard Data:

Primary Routes of Exposure: Inhalation (Y/N): Y
Skin (Y/N): Y
Ingestion (Y/N) Y

Contact Eye/Skin Hazard: Eye Contact may cause smarting and redness, skin contact has extremely low to no toxic effects in humans.

Acute Overexposure Symptoms: No evidence of adverse effects available.
Chronic Overexposure Symptoms: None known.
Carcinogenicity Data: None
IARC Monographs on Carcinogenic Evaluation: None
Emergency First Aid:

Eye Contact: Flush eyes with a large amount of water for at least 15 minutes. Consult a physician if irritation persists.
Skin Contact: Wash area with soap and water.
Ingestion: No harmful effects expected.
Inhalation: Move individual to fresh air. Consult a physician if irritation persists or breath becomes labored.

Section VII – Precautions for Safe Handling, Storage and Use:

Personal Protective Equipment for Routine Use:

Respiratory Protection: Respirators are not required when using this product outdoors. In any case when excessive mist might be periodically created in poorly ventilated areas, use NIOSH/MSHA approved respirator.

Gloves: Gloves are not normally required for routine use. If an individual is known to have skin susceptible to irritation by other chemicals, this individual should wear butyl or nitrile type gloves.

Eye Protection: Safety goggles or glasses with side shields should always be worn.

Other: Applicator should wear a Tyvek suit or coveralls.

Work Practices: Treat this product with caution as you would any other chemical.

Spill/Release Procedures: Large spills can be vacuumed up. Small spills can be treated with absorbent clay, earth sand or other material, shoveled into a DOT approved container and disposed of according to all local, state and Federal regulations.

Waste Disposal Procedure: Coagulate the waste material by step additions of ferric chloride and lime. Remove the clear supernatant and flush to a chemical sewer. Coagulated solids maybe incinerated in accordance with local, state and Federal regulations.

Storage and Handling: Store product in a dry environment. Protect product from extremes in temperatures, **Do Not Freeze.** Keep the container closed when not in use.

Other Health Hazard Precautions: None

Section VIII – Regulatory Information

Federal EPA, Status on Substance List: The concentration levels are maximum or ceiling levels (weight%) to be used for calculations for

regulations. Trade Secrets are identified by "TS". Comprehensive Material Environmental Response Compensation, and Liability Act of 1980 (CERCLA) requires notification of the National Response Center release of quantities of Hazardous Substances equal to/or greater than the reportable quantities (RQs) in 40 CFR 302.4
Components present in this product at levels which could require reporting under this statute are: **None**

Superfund Amendments and Reauthorization Act of 1986 (SARA) Title III requires emergency planning based on Threshold Planning Quantities (TPQs) and release reporting based on Reportable Quantities (RQs) in 40 CFR 355 (used for SARA, subsections; 302;304,311 and 312). Components present in this product at a level which could require reporting under this statute are: **None**

Toxic Substance Control Act (TSCA) Statue: The ingredients of this product are on the TSCA inventory.

Other Regulatory Information: EPA Hazard Categories: **None**
DOT Hazardous Shipping Classification:
Not Classified

End

Pipe X-Metal X

(Catalog # RP-102)

I Product: PIPE X-METAL X

Description: Clear Liquid Manufacturer: **Chemical Solutions Int'l. Corp.** **P.O. Box 891185** **Houston, TX 77289-1185**	Date Prepared: September 2003. Emergency Telephone No. **(281) 992-3031** **(800) 424-4804** E-mail: jimarnold@chemicalsolutionsintl.com Home Page: www.chemicalsolutionsintl.com

II Health Hazard Data:

Health Hazards (Acute & Chronic)
EYES: May cause disconfort.
SKIN: Concentrate will dry out and chap sensitive
skin as would detergent.
INHALATION of fumes may upset stomach.

SIGNS AND SYMPTOMS OF EXPOSURE:
EYES:Tearing, redness, blurred vision.
SKIN: Dryness, redness, chapping.

FIRST AID:
EYES: Flush 15 minutes with water.
SKIN:Wash with soap and water.
INHALATION: Move to fresh air.
Apply artificial respiration if breathing has stopped.
INGESTION: Do not induce vomiting. If any
irritation persists, seek medical attention.

III Precautions for Safe Handling & Use:

If material is spilled, remove leaking package to safe area. Flush with water.
Disposal: Any approved method for

V Hazardous Ingredients:

PIPE X-METAL X is a proprietary formulation
which contains small amounts of minerals and organics.
This product should be handled accordingly.
Complies with OSHA 29 CFR XVIII-1910.1200 Section (I) "Trade Secrets"
Contains no hazardous components under current OSHA definitions.

VI Special Protection & Precautions:

Hygienic Practices: Wash after each shift.
Remove and wash contaminated clothing before re-used.
Work Practices: Wear goggles or face shield.
Rubber gloves.
Other Protective Clothing: Long sleeved shirt buttoned at neck. is desirable. Rubber boots.

VII Reactivity Data:

Stable under normal use and storage conditions.
Incompatible with strong oxidizing agents.
Hazardous decomposition or byproducts - oxides of carbon.

VIII Fire & Explosion Data:

dilute cleaner. Surfactants are highly biodegradable. **IV Physical Data:** pH.....10.5 Solubility in water..... 100% Boiling Point..... 212°F Vapor Pressure/Density..... Same as water Evaporation Rate (Butyl Acetate=1).....<1 Appearance & Odor: Clear liquid with medium viscosity and cleaner odor. Specific Gravity.....1.06	Flash Point/Method Used..... None/COC. **IX Control Measures:** Respiratory Protection: Not Necessary. Ventilation: Local Exhaust/Desirable. Mechanical/Reccomended in congested areas. (Complies with OSHA 174, Sep. 1985.)

HMIS CODE: Health 1 **Flammability 0** **Reactivity 0** **Personal Protection B**

"To the best of our knowledge the information contained in this MSDS is accurate. However, neither Chemical Solutions Int'l. Corp. nor any of its affiliates makes any warranty expressed or implied, or accepts any liability in connection with this information or its use."

UPRIGHT INC -- WYK SAFETY SORBENT -- 7930-00F032769

========== Product Identification ==========

Product ID:WYK SAFETY SORBENT
MSDS Date:03/01/1992
FSC:7930
NIIN:00F032769
MSDS Number: BTBFM
=== Responsible Party ===
Company Name:UPRIGHT INC
Address:2640 CREVE COEUR DR
City:ST LOUIS
State:MO
ZIP:63144
Country:US
Info Phone Num:800-248-7007
Emergency Phone Num:314-961-3711
CAGE:0BJ55
=== Contractor Identification ===
Company Name:UPRIGHT INC
Address:2640 CREVE COEUR DR
Box:City:ST LOUIS
State:MO
ZIP:63144
Country:US
Phone:800-248-7007
CAGE:0BJ55

========== Composition/Information on Ingredients ==========

Ingred Name:AMORPHOUS SILICA, AMORPHOUS-DIATOMACEOUS EARTH (NO FREE SILICA)
CAS:61790-53-2
RTECS #:HL8600000
Other REC Limits:20 MCCPF (MSHA)
ACGIH TLV:10 MG/CUM DUST

========== Hazards Identification ==========

Routes of Entry: Inhalation:NO Skin:NO Ingestion:NO
Reports of Carcinogenicity:NTP:NO IARC:NO OSHA:NO
Health Hazards Acute and Chronic:MATERIAL IS NON-TOXIC.
Explanation of Carcinogenicity:NONE

========== First Aid Measures ==========

First Aid:INHALATION: REMOVE TO FRESH AIR. EYES: FLUSH W/WATER. OBTAIN MEDICAL ATTENTION IN ALL CASES.

========== Accidental Release Measures ==========

Spill Release Procedures:VACUUM OR SWEEP.

========== Exposure Controls/Personal Protection ==========

Work Hygienic Practices:MAINTAIN GOOD HOUSEKEEPING PROCEDURES REGARDING

DUST.
Supplemental Safety and Health
AMORPHOUS MINERAL SICICATE (NO FREE SILICA). ALL ELEMENTS ARE CHEMICALLY AND PHYSICALLY BOUND.

========== Physical/Chemical Properties ==========

Spec Gravity:2.2-2.4
Appearance and Odor:LIGHT GREY SHADES W/NO ODOR.

========== Stability and Reactivity Data ==========

Stability Indicator/Materials to Avoid:YES
DON'T USE W/HYDROFLUORIC ACID

========== Disposal Considerations ==========

Waste Disposal Methods:MATERIAL ITSELF IS NON-HAZARDOUS & MAY BE DISPOSED OF IN ANY LANDFILL AS DEFINED BY RCRA (40 CFR PART 261), AFTER ABSORPTION OF HAZARDOUS OR TOXIC LIQUID, FOLLOW LOCAL, STATE OR FEDERAL REGULATION FOR PROPER DISPOSAL METHODS.

Disclaimer (provided with this information by the compiling agencies): This information is formulated for use by elements of the Department of Defense. The United States of America in no manner whatsoever, expressly or implied, warrants this information to be accurate and disclaims all liability for its use. Any person utilizing this document should seek competent professional advice to verify and assume responsibility for the suitability of this information to their particular situation.

M² Polymer Technologies, Inc.
P.O. Box 365
West Dundee, IL 60118
P: 847/836-1393
F: 847/836-6483

MATERIAL SAFETY DATA SHEET: May be used to comply with OSHA's Hazard Communication Standard, 29 CFR 1910.1200. Standard must be consulted for specific requirements.

PRODUCT NAME: **Waste Lock® 770**

SECTION I SUPPLIER'S INFORMATION

M² Polymer Technologies, Inc.
P.O. Box 365
West Dundee, IL 60118

Telephone Number for Information: .847/836-1393
Last Update : January 10, 2003

SECTION II HAZARDOUS INGREDIENTS/IDENTITY INFORMATION

Hazardous Components (Specific Chemical Identity; Common Name(s))	OSHA PEL	ACGIH TLV	% (optional)
1. *Sodium Polyacrylate, Crosslinked* CAS Number: 09003-04-7	NE	NE	
2. Post Treatment (Trade Secret)	NE	NE	

Other Limits
Recommended
Recommended Exposure --
Guideline for Respirable Particulate 0.05mg/m^3
(For Particles < 10 µm)

SARA Section 313 Reportable Toxic Chemicals: NONE

NFPA/HMIS: Health - 2, Fire - 1 Reactivity - 0, Specific Hazard - None

Dot Class: Not Regulated

SECTION III PHYSICAL/CHEMICAL CHARACTERISTICS

Boiling Point	- Solid	Bulk Density (Apparent - g/cc)	0.5-0.7
Vapor Pressure (mm Hg.)	- LT 10	Melting Point	Greater than 390° F
Vapor Density (AIR = 1)	- Nil	Evaporation Rate (Butyl Acetate = 1)	Less than 1
Water Solubility	- Insoluble		
Appearance and Odor	- White granular powder		

SECTION IV FIRE AND EXPLOSION HAZARD DATA

Flash Point (Method Used) - NONE
Flammable Limits - Not Available LEL: 0.0325 UEL: NE
Extinguishing Media - Water, CO_2 and dry chemical extinguishants.
Unusual Fire and Explosion Hazards - Extremely slippery conditions if spilled product comes in contact with water.

SECTION V REACTIVITY DATA

Stability	Unstable		Conditions to Avoid- None Known
	Stable	- X	
Incompatibility (Materials to Avoid)	- None known		
Hazardous Decomposition or By-products	- None known		
Hazardous Polymerization	- May Not Occur	- X	Conditions to Avoid - None Known

SECTION VI HEALTH HAZARD DATA

Route(s) of Entry: Inhalation? Yes Skin? Yes Ingestion? Yes

Health Hazards (Acute and Chronic) - Contact with eyes, skin or clothing may cause irritation.

Acute (short term) inhalation of dust may cause mild irritation of upper respiratory tract (nose and throat) and lungs.

Chronic (long-term) inhalation exposure to rats for a lifetime (two years) using a sodium polyacrylate that had been micronized to a respirable particle size (<10 µm) produced non-specific inflammation and chronic lung injury at 0.2 mg/m² and 0.8 mg/m². AT 0.8 mg/m², tumors were seen in some animals. In the absence of chronic inflammation, tumors are not expected. There were no adverse effects of any kind at 0.05 mg/m².

Sodium polyacrylate had no effect in mutagenicity tests.

Carcinogenicity: NTP? No IARC Monographs? No OSHA Regulated? No

Signs and Symptoms of Exposure -Reddening, drying of affected area with possible itching, burning or other discomfort. *Irritation of the upper respiratory tract.*

Medical Conditions
Generally Aggravated by Exposure - Existing respiratory and allergic conditions.

Emergency and First Aid Procedures -
Flush eyes with large quantity of water.
Wash skin with soap and water.
If inhaled, move to fresh air.
Consult physician regarding any continued discomfort.

SECTION VII PRECAUTIONS FOR SAFE HANDLING AND USE

Steps to be taken in Case Material is Released or Spilled: Collect material. Avoid generating airborne dust. Avoid contact with water, as extremely slippery conditions will result.
Residuals are to be flushed thoroughly with water to the drain for normal wastewater treatment.

Waste Disposal Method: Dispose of in accordance with local, Federal, and State regulations. Non-hazardous waste material suitable for approved solid waste landfill.

Precautions to be taken in Handling and Storing: Handle as an eye irritant. Store in a cool, dry place. Do not ingest. Avoid breathing powder. Avoid skin and eye contact.

Other Precautions: Dusty conditions may irritate eyes and respiratory system. Slippery when wet.

SECTION VIII CONTROL MEASURES

Respiratory Protection (Specify Type) - Where dusty conditions are created, use a suitable, nuisance-type mask.

Ventilation - Local Exhaust Ensure removal of airborne particles.
- Mechanical (General) - Recommended. Other - Not required.
Protective Gloves - Recommended. Eye Protection - Safety goggles
Other Protective Clothing or Equipment - None
Work/Hygienic Practices - Wash thoroughly after handling.

MATERIAL SAFETY DATA SHEET

SUPPLIER **WYK SORBENTS, LLC**
ADDRESS: **10715 KAHLMEYER DRIVE**
ST. LOUIS, MO 63132

EMERGENCY: **(800) 248-7007**
PHONE: **(314) 426-3336**
FAX: **(314) 426-0145**

SECTION I - MATERIAL IDENTIFICATION

CHEMICAL NAME & SYNONYMS:
Melt Blown & Airlaid Polypropylene

TRADE NAME & SYNONYMS:
WYK® Oil Absorbent Pads, Rolls, Booms, Socks, Pillows, & Particulate.
All **700 Series** Stock Numbers

CHEMICAL FAMILY: Polyolefin / Hydrocarbon

SECTION II - INGREDIENTS AND HAZARDS

This product is **NOT** hazardous as defined by CFR 1910.1200

SECTION III - PHYSICAL DATA

Boiling point at 1 atm, deg. F: N/A
Vapor pressure at (mm HG.): N/A
Vapor density (Air = 1): N/A
Water Solubility: N/A

Specific gravity (H2O = 1): 0.9 – 0.95
Evap. Rate: N/A
Volatiles, % by Volume: N/A
Melting Point: <325 °F

Appearance & Odor: Blue or White / Odorless

SECTION IV - FIRE AND EXPLOSION DATA

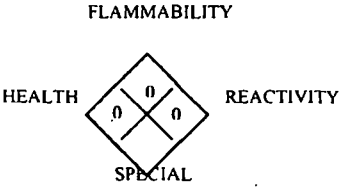
Flash Point: >600 °F **Autoignition Temp:** >575 °F

Flammability Limits In Air: LOWER = None / UPPER = None

Extinguishing media: Water spray, dry chemical / carbon dioxide

N.F.P.A. HAZARD INFORMATION LABEL

Hazard Code
4 = Extreme
3 = High
2 = Moderate
1 = Slight
0 = Negligible



Special fire fighting procedures: Wear self-contained breathing apparatus and protective clothing as required.

Unusual fire and explosion hazards: Carbon Monoxide formation and irritating smoke are possible under oxygen-lean conditions

SECTION V - HEALTH HAZARD INFORMATION

TLV: N/A

This product is not considered a carcinogen

Summary of risks: N/A
Medical conditions, which may be aggravated by contact: N/A
Target organs: N/A
Primary entry route (s): N/A
Acute effects: N/A
Chronic effect (s): N/A

SECTION V: - HEALTH HAZARD INFORMATION - Continued

EFFECTS OF OVEREXPOSURE

FIRST AID:

Eye contact: N/A

Skin Contact: N/A

Inhalation: N/A

Ingestion: N/A

SECTION VI - REACTIVITY DATA

Stability: Material is stable. Hazardous polymerization will not occur. Temperatures over 480 °F may cause degradation.

Chemical Incompatibility (Materials to Avoid): N/A

Hazardous Decomposition Products: Carbon Dioxide / Carbon Monoxide

SECTION VII - SPILL LEAK, AND DISPOSAL PROCEDURE

Spills, leaks: (steps to be taken: Maintain good housekeeping procedures

Waste Disposal Method: Observe all Federal, State, and Local laws concerning health and environment.

SECTION VIII - SPECIAL PROTECTION INFORMATION

Personal protective equipment:		**Work Place Consideration:**	
Goggles:	Normally not required	**Ventilation:**	N/A
Gloves:	Normally not required	**Safety Station:**	N/A
Respirator:	Normally not required	**Contaminated Equipment:**	N/A
Other:	Consideration should be given to the nature of the liquids to be absorbed.		

SECTION IX - SPECIAL PRECAUTIONS AND COMMENTS

Storage & Handling Information: Keep Dry, avoid long term storage in sunlight

Engineering Controls: N/A

Other Precautions: N/A

Judgments as to the suitability of information herein for purchaser's purposes are Necessarily purchaser's responsibility. Therefore, although reasonable care has been Taken in the preparation of such information, WYK Sorbents, LLC. extends no warranties, Makes no representations and assumes no responsibility as to accuracy or suitability of such information for application to purchaser's intended purposes or for the Consequences of its use.

Signed _____

Jim Dunn, Managing Partner

Date: 12/29/2005 MSDS: #700-4

MATERIAL SAFETY DATA SHEET
May be used to comply with OSHA's Hazard Communication Standard, 29 CFR 1910.1200. Standard must be consulted for specific requirements.

U.S. DEPARTMENT OF LABOR
Occupational Safety and Health Administration
(Non-Mandatory Form)
Form Approved
OMB No. 1218-0072

IDENTITY (As used on label and list)
N965 (N) TRADE SECRET

Note: Blank spaces are not permitted. If any item is not applicable, or no information is available, the space must be marked to indicate that.

Section I

Manufacturer's Name
NOCHAR, INC.

Emergency Telephone Number
(317) 613-3046

Address *(Number, Street, City, State and ZIP Code)*
8650 COMMERCE PARK PLACE SUITE K
INDIANAPOLIS, INDIANA 46268

Telephone Number for information
FAX: (317) 613-3052

Date Prepared
OCTOBER 2004

Signature of Preparer ***(optional)***

Section II - Hazardous Ingredients/Identity Information

Hazardous Components (Specific Chemical Identity: Common Name(s))	OSHA PEL	ACGIH TLV	Other Limits Recommended	% (optional)
NONE				

Section III - Physical/Chemical Characteristics

Boiling Point	316 F to 351 F	**Specific Gravity (H_2O = 1)**	.80
Vapor Pressure (mm Hg.)	N/A	**Melting Point**	N/A
Vapor Density (AIR = 1)	>1	**Evaporation Rate (Butyl Acetate = 1)**	N/A
Solubility in Water	INSOLUBLE	**Appearance and Odor**	Solid, Generally in Powder Form, Essentially Odorless

Section IV - Fire and Explosion Hazard Data

Flash Point (Method Used) N/A **Flammable Limits** N/A **LEL** **UEL**

Extinguishing Media FOAM- DRY CHEMICAL CARBON DIOXIDE

Special Fire Fighting Procedures AVOID WATER WHICH SWELLS PRODUCT.

Unusual Fire and Explosion Hazards N/A

Section V - Reactivity Data

Stability	**Unstable**		**Conditions to Avoid**
	Stable	X	EXTREME HEAT, (420 F) OPEN FLAME
Incompatibility (Materials to Avoid)			MATERIAL WILL SWELL WITH WATER
Hazardous Decomposition or Byproducts			MAY PRODUCE: HYDROGEN CYANIDE (Hydrocyanic Acid) NITROGEN OXIDES, CARBON OXIDES
Hazardous Polymerization	**May Occur**		**Conditions to Avoid**
	Will Not Occur	X	

Section VI - Health Hazard Data

Route(s) of Entry: **Inhalation** X **Skin** X **Ingestion** X

Health Hazards ***(Acute and Chronic)***

INHALATION: REMOVE TO FRESH AIR, IF NOT BREATHING, GIVE ARTIFCIAL RESPIRATION. EYES: FLUSH WITH WATER FOR 15 MIN. CALL PHYSICIAN. SKIN: WASH EXPOSED AREA WITH SOAP AND WATER. CALL PHYSICIAN. INGESTON: DO NOT INDUCE VOMITING. CALL PHYSICIAN

Carcinogenicity: N/A **NTP?** **IARC Monographs?** **OSHA Regulated?**

Signs and Symptoms of Exposure

AVOID PROLONGED OR FREQUENT CONTACT WHEN HANDLING MATERIAL. DO NOT INHALE DUST. AVOID SKIN AND EYE CONTACT.

Medical Conditions - Generally Aggravated by Exposure

Emergency and First Aid Procedures

Section VII - Precautions for Safe Handling and Use

Steps to Be Taken in Case Material is Released or Spilled

RECOVER SOLID WITH BROOM, SHOVEL OR VACUUM. AVOID GENERATING DUST CLOUDS.

PUT RECOVERED MATERIAL IN CONTAINERS FOR RECLAMATION OR DISPOSAL.

Waste Disposal Method

FOLLOW FEDERAL, STATE AND LOCAL REGULATIONS. WHEN USED AS ABSORBENT,

FOLLOW REGULATIONS FOR ABSORBED MATERIAL.

Precautions to Be Taken in Handling and Storing

IMPERVIOUS GLOVES, CHEMICAL GOGGLES.

Other Precautions

Section VIII - Control Measures

Respiratory Protection (Specify Type)	DUST RESPIRATOR FOR FINE PRODUCT

Ventilation	**Local Exhaust**	NO SPECIAL REQUIREMENT	**Special**	N/A
	Mechanical (General)	IF POSSIBLE	**Other**	N/A
Protective Gloves	IMPERVIOUS GLOVES		**Eye Protection**	SAFETY GLASSES OR GOGGLES
Other Protective Clothing or Equipment	NOT NECESSARY			
Work/Hygienic Practice	NORMAL HYGIENE PRACTICES SHOULD BE FOLLOWED; WASH HANDS, ETC. AFTER HANDLING.			

DISCLAIMER: *The information contained herein is based on the data available to us and is believed to be correct. However, the manufacturer makes no warranty, expressed or implied regarding the accuracy of this data or the results to be obtained from the use thereof, and assumes no responsibility for injury from the use of the product described herein. The manufacturer assumes no liability for incidental, consequential or direct damage of any manner or kind, regardless of cause, including negligence.*

NFPA RATINGS

HEALTH 0

FLAMMABILITY 1

REACTIVITY 1

MATERIAL SAFETY DATA SHEET

Becker Labs
Rt. 2 Box 119-B
Mountain City, TN. 37683

Product Name: CRYSTALAC - CL-90 CL-60, CL-30, CL-SS CL-CC, CL-UC, Series Coatings
Product Code No:
Page 1
Issue Date: 1-3-92

MANUFACTURER

Becker Labs
Rt. 2 Box 119-B
Mountain City, TN. 37683

CONTACT FOR FURTHER INFORMATION:
MSDS COORDINATOR Phone 615-727-6425

Transportation Emergencies:
NON-FLAMMABLE PAINT CLASS 55
D.O.T NON REGULATED
ITEM # 149980 Sub 6

Health Emergencies:

NON-TOXIC LATEX PAINT

PRODUCT IDENTIFICATION

PRODUCT NAME: CRYSTALAC (Waterborne Finishes)

CHEMICAL FAMILY: Mixture

DOT PROPER SHIPPING NAME: NON-FLAMMABLE PAINT

ID NUMBER: ITEM # 149980 sub 6

DOT HAZARD CLASSIFICATION: NOT REGULATED

SECTION I - COMPONENTS	PERCENT	EXPOSURE LIMIT	UNITS	AGENCY	TYPE
HAZARDOUS COMPONENTS:	AS IDENTIFIED PER 29 CFR 1910.1200				
ISOPROPANOL CAS # 67-63-0	4.0	400 500	TVL TVL	ppm ppm	TWA STEL ACGIH
		HMIS HEALTH HAZARD RATING = 1			
OTHER COMPONENTS:					
MIXED GLYCOL ETHER CAS # PROPRIETARY	4.2	NOT ESTABLISHED			
ACRYLIC POLYMER CAS #: PROPRIETARY	28-32	NOT ESTABLISHED			
PIGMENT, MIXED, INERT CAS #: PROPRIETARY	0-10	NOT ESTABLISHED			

THIS PRODUCT CONTAINS THE FOLLOWING CHEMICALS SUBJECT TO THE REPORTING REQUIREMENTS OF SARA 313 AND 40 CFR 372: CAS# WEIGHT %

- - N O N E - -

NOTE: CONTAINS LESS THAN 0.5% RESIDUAL MONOMERS (LESS THAN 0.1% RESIDUAL ACRYLATE MONOMERS PRESENT).

SECTION II - EMERGENCY AND FIRST AID PROCEDURES

EYE CONTACT:

IF IRRITATION OR REDNESS DEVELOPS, MOVE VICTIM AWAY FROM EXPOSURE AND INTO FRESH AIR. FLUSH EYES WITH CLEAN WATER. IF SYMPTOMS PERSIST, SEEK MEDICAL ATTENTION.

SECTION IV - SPECIAL PROTECTION INFORMATION

PROTECTIVE GLOVES:

THE USE OF GLOVES IMPERMEABLE TO THE SPECIFIC MATERIAL HANDLED IS ADVISED TO PREVENT SKIN CONTACT AND POSSIBLE IRRITATION.

EYE PROTECTION:

APPROVED EYE PROTECTION TO SAFEGUARD AGAINST POTENTIAL EYE CONTACT, IRRITATION OR INJURY IS RECOMMENDED.

OTHER PROTECTIVE EQUIPMENT:

IT IS SUGGESTED THAT A SOURCE OF CLEAN WATER BE AVAILABLE IN THE WORK AREA FOR FLUSHING EYES AND SKIN. IMPERVIOUS CLOTHING SHOULD BE WORN AS NEEDED.

SECTION V - REACTIVITY DATA

STABILITY:

STABLE

CONDITIONS TO AVOID (STABILITY):

NOT NOTED

INCOMPATIBILITY (MATERIALS TO AVOID):

NO HAZARDOUS REACTIONS ARE EXPECTED TO OCCUR UNDER NORMAL INDUSTRIAL CONDITIONS.

HAZARDOUS DECOMPOSITION PRODUCTS:

COMBUSTION MAY YIELD CARBON MONOXIDE AND/OR CARBON DIOXIDE AND TRACES OF MONOMER.

HAZARDOUS POLYMERIZATION:

WILL NOT OCCUR

POLYMERIZATION CONDITIONS TO AVOID:

NOT NOTED

SECTION VI - SPILL AND LEAK PROCEDURES ***HIGHWAY OR RAILWAY SPILLS***

PRECAUTIONS IN CASE OF RELEASE OR SPILL:

FLUSH SPILLED MATERIAL INTO SUITABLE RETAINING AREAS OR CONTAINERS WITH LARGE QUANTITIES OF WATER. SMALL SPILLS: SPILLED MATERIAL MAY BE ABSORBED INTO AN APPROPRIATE ABSORBANT. PREVENT SPILLED LIQUID FROM ENTERING SEWERS, STORM DRAINS, OTHER UNAUTHORIZED TREATMENT/DRAINAGE SYSTEMS AND NATURAL WATERWAYS. NOTIFY APPROPRIATE STATE/LOCAL AGENCIES.

REPORTABLE QUANTITY:

NOT NOTED

WASTE DISPOSAL METHOD:

DISPOSE OF PRODUCT IN ACCORDANCE WITH LOCAL, COUNTY, STATE, AND FEDERAL REGULATIONS.

FAX TO ECOTEK
615-743-6995
3/16/92

MATERIAL SAFETY DATA SHEET

Becker Labs
Rt. 2 Box 119-B
Mountain City, TN. 37683

Product Name: AQUALAC III
Product Code No: 80-9AM 16-13A-3

Issue Date: 5-30-91

MANUFACTURER

Becker Labs
Rt. 2 Box 119-B
Mountain City, TN. 37683

CONTACT FOR FURTHER INFORMATION:
MSDS COORDINATOR Phone 615-727-6425

Transportation Emergencies:

Health Emergencies:

PRODUCT IDENTIFICATION

PRODUCT NAME: AQUALAC III

CHEMICAL FAMILY: Waterborne Furniture Coating

DOT PROPER SHIPPING NAME: N/A

ID NUMBER: NONE

DOT HAZARD CLASSIFICATION: NOT REGULATED

SECTION I - COMPONENTS	PERCENT	EXPOSURE LIMIT	UNITS	AGENCY	TYPE
HAZARDOUS COMPONENTS					
NO HAZARDOUS COMPONENTS IDENTIFIED AS PER 29 CFR 1910.1200.					
OTHER COMPONENTS					
WATER CAS #: 7732-18-5	58-62	NOT ESTABLISHED			
ACRYLIC POLYMER CAS #: PROPRIETARY	30-32	NOT ESTABLISHED			
MIXED GLYCOL ETHERS CAS #: PROPRIETARY	6-8	NOT ESTABLISHED			

THIS PRODUCT CONTAINS THE FOLLOWING CHEMICALS SUBJECT TO THE REPORTING REQUIREMENTS OF SARA 313 AND 40 CFR 372: CAS NUMBER WEIGHT %

--NONE--

NOTE: CONTAINS LESS THAN 0.5% RESIDUAL MONOMERS (LESS THAN 0.1% RESIDUAL ACRYLATE MONOMERS PRESENT).

SECTION II - EMERGENCY AND FIRST AID PROCEDURES

EYE CONTACT:

IF IRRITATION OR REDNESS DEVELOPS, MOVE VICTIM AWAY FROM EXPOSURE AND INTO FRESH AIR. FLUSH EYES WITH CLEAN WATER. IF SYMPTOMS PERSIST, SEEK MEDICAL ATTENTION.

SECTION II - EMERGENCY AND FIRST AID PROCEDURES

SKIN CONTACT:

FIRST AID IS NOT NORMALLY REQUIRED. HOWEVER, IT IS GOOD PRACTICE TO WASH ANY CHEMICAL FROM THE SKIN.

INHALATION (BREATHING):

IF RESPIRATORY SYMPTOMS DEVELOP, MOVE VICTIM AWAY FROM SOURCE OF EXPOSURE AND INTO FRESH AIR. IF SYMPTOMS PERSIST, SEEK MEDICAL ATTENTION. IF VICTIM IS NOT BREATHING, IMMEDIATELY BEGIN ARTIFICIAL RESPIRATION. IF BREATHING DIFFICULTIES DEVELOP, OXYGEN SHOULD BE ADMINISTERED BY QUALIFIED PERSONNEL. SEEK IMMEDIATE MEDICAL ATTENTION.

INGESTION (SWALLOWING):

NO FIRST AID IS NORMALLY REQUIRED; HOWEVER, IF SWALLOWED, AND SYMPTOMS DEVELOP, SEEK MEDICAL ATTENTION.

SECTION III - HEALTH HAZARDS/ROUTES OF ENTRY

EYE CONTACT:

THIS MATERIAL MAY CAUSE EYE IRRITATION. DIRECT CONTACT WITH THE LIQUID OR EXPOSURE TO VAPORS OR AEROSOLS MAY CAUSE STINGING, TEARING AND REDNESS.

SKIN CONTACT:

THIS MATERIAL IS NOT EXPECTED TO BE A SKIN IRRITANT. HOWEVER, IF ALLOWED TO REMAIN ON THE SKIN WITHOUT BEING RINSED OFF WITH WATER, A THIN FILM MAY FORM. REMOVAL OF THIS FILM MAY RESULT IN SLIGHT IRRITATION DEPENDENT ON THE METHOD OF REMOVAL. SKIN ABSORPTION OF THIS MATERIAL IS UNLIKELY.

INHALATION (BREATHING):

BREATHING HIGH CONCENTRATIONS OF VAPORS OR AEROSOLS OF THIS MATERIAL MAY CAUSE NAUSEA AND IRRITATION OF THE NOSE, THROAT AND RESPIRATORY TRACT. RESPIRATORY SYMPTOMS ASSOCIATED WITH PRE-EXISTING LUNG DISORDERS (E.G., ASTHMA-LIKE CONDITIONS) MAY BE AGGRAVATED BY EXPOSURE TO THIS MATERIAL.

INGESTION (SWALLOWING):

WHILE THIS MATERIAL HAS A LOW DEGREE OF TOXICITY, INGESTION OF EXCESSIVE QUANTITIES MAY CAUSE IRRITATION OF THE DIGESTIVE TRACT.

COMMENTS:

THIS MATERIAL HAS NOT BEEN IDENTIFIED AS A CARCINOGEN BY NTP, IARC OR OSHA. TOTAL RESIDUAL MONOMER CONTENT DOES NOT EXCEED 0.5%. ANY INDIVIDUAL COMPONENT THAT MAY POSE A CANCER HAZARD IS PRESENT AT LESS THAN 0.1%. USE OF THIS PRODUCT MAY, IN SOME CIRCUMSTANCES, GENERATE THE SAME HAZARDS ASSOCIATED WITH THE BASE MONOMERS. THE USER SHOULD EVALUATE HIS USE OF THE PRODUCT TO DETERMINE IF HAZARDS FROM RESIDUAL MONOMERS EXIST.

SECTION IV - SPECIAL PROTECTION INFORMATION

VENTILATION:

IF CURRENT VENTILATION PRACTICES ARE NOT ADEQUATE TO MINIMIZE EXPOSURE, ADDITIONAL VENTILATION OR EXHAUST SYSTEMS MAY BE REQUIRED.

RESPIRATORY PROTECTION:

RESPIRATORY PROTECTION MAY BE NECESSARY TO MINIMIZE EXPOSURE TO VAPORS OR AEROSOLS. DEPENDING ON THE NATURE AND CONCENTRATION OF THE AIRBORNE MATERIAL, USE A RESPIRATOR OR GAS MASK WITH APPROPRIATE FILTERS, CARTRIDGES AND CANNISTERS (NIOSH APPROVED, IF AVAILABLE) OR SUPPLIED AIR EQUIPMENT.

Becker Labs

Product Name: AQUALAC III
Product Code No: 80-9AM 16-13A-3

Issue Date: 5-30-91

SECTION IV - SPECIAL PROTECTION INFORMATION

PROTECTIVE GLOVES:

THE USE OF GLOVES IMPERMEABLE TO THE SPECIFIC MATERIAL HANDLED IS ADVISED TO PREVENT SKIN CONTACT AND POSSIBLE IRRITATION.

EYE PROTECTION:

APPROVED EYE PROTECTION TO SAFEGUARD AGAINST POTENTIAL EYE CONTACT, IRRITATION OR INJURY IS RECOMMENDED.

OTHER PROTECTIVE EQUIPMENT:

IT IS SUGGESTED THAT A SOURCE OF CLEAN WATER BE AVAILABLE IN THE WORK AREA FOR FLUSHING EYES AND SKIN. IMPERVIOUS CLOTHING SHOULD BE WORN AS NEEDED.

SECTION V - REACTIVITY DATA

STABILITY:

STABLE

CONDITIONS TO AVOID (STABILITY):

NOT NOTED

INCOMPATIBILITY (MATERIALS TO AVOID):

NO HAZARDOUS REACTIONS ARE EXPECTED TO OCCUR UNDER NORMAL INDUSTRIAL CONDITIONS.

HAZARDOUS DECOMPOSITION PRODUCTS:

COMBUSTION MAY YIELD CARBON MONOXIDE AND/OR CARBON DIOXIDE AND TRACES OF MONOMER.

HAZARDOUS POLYMERIZATION:

WILL NOT OCCUR

POLYMERIZATION CONDITIONS TO AVOID:

NOT NOTED

SECTION VI - SPILL AND LEAK PROCEDURES ***HIGHWAY OR RAILWAY SPILLS***

Not Noted

PRECAUTIONS IN CASE OF RELEASE OR SPILL:

FLUSH SPILLED MATERIAL INTO SUITABLE RETAINING AREAS OR CONTAINERS WITH LARGE QUANTITIES OF WATER. SMALL SPILLS: SPILLED MATERIAL MAY BE ABSORBED INTO AN APPROPRIATE ABSORBANT. PREVENT SPILLED LIQUID FROM ENTERING SEWERS, STORM DRAINS, OTHER UNAUTHORIZED TREATMENT/DRAINAGE SYSTEMS AND NATURAL WATERWAYS. NOTIFY APPROPRIATE STATE/LOCAL AGENCIES.

REPORTABLE QUANTITY:

NOT NOTED

WASTE DISPOSAL METHOD:

DISPOSE OF PRODUCT IN ACCORDANCE WITH LOCAL, COUNTY, STATE, AND FEDERAL REGULATIONS.

Becker Labs

Product Name: AQUALAC III
Product Code No: 80-9AM 16-13A-3

Issue Date: 5-30-91

SECTION VII - STORAGE AND SPECIAL PRECAUTIONS

HANDLING AND STORAGE PRECAUTIONS:

KEEP CONTAINERS COOL AND DRY. USE AND STORE THIS PRODUCT WITH ADEQUATE VENTILATION (SEE SECTION IV). KEEP PRODUCT CONTAINERS CLOSED WHEN NOT IN USE. AVOID SUBJECTING THIS PRODUCT TO EXTREME TEMPERATURE VARIATIONS AND FREEZING. SHOCKING EMULSIONS WITH LARGE QUANTITIES OF CHEMICALS OR EXTREME SHEAR MAY CAUSE COAGULATION. CAREFUL HANDLING PRACTICES SHOULD BE EXERCISED AND UNNECESSARY EXPOSURE AVOIDED. DO NOT WEAR SATURATED CLOTHING OR SHOES.

SECTION VIII - FIRE AND EXPLOSION HAZARD DATA

NFPA HAZARD CLASS		
	HEALTH HAZARD:	1
	FLAMMABILITY:	0
	REACTIVITY:	0
	OTHER:	

HAZARD RANKING
0 - LEAST
1 - SLIGHT
2 - MODERATE
3 - HIGH
4 - EXTREME

EXTINGUISHING MEDIA:

FOR DRIED SOLIDS, USE WATER, FOAM, CO2 OR DRY CHEMICAL FIRE FIGHTING APPARATUS.

FIRE & EXPLOSION HAZARDS:

CLOSED CONTAINERS EXPOSED TO EXTREME HEAT MAY RUPTURE DUE TO PRESSURE BUILD UP.

FIRE FIGHTING PROCEDURES:

WATER SPRAY MAY BE USEFUL IN MINIMIZING VAPORS AND COOLING CONTAINERS EXPOSED TO HEAT AND FLAME.

SECTION IX - PHYSICAL DATA

APPROX BOILING POINT	(AIR = 1) VAPOR DENSITY	(N-BUTYL ACETATE = 1) EVAPORATION RATE	% VOLATILE
212F / 100C	<1	EQUAL TO WATER	68-70
% SOLUBILITY IN WATER	**SPECIFIC GRAVITY**	**APPROX. BULK DENSITY (lb/gal)**	
DILUTABLE	1.02	8.5	
VAPOR PRESSURE	**VOC (Less Water)**		
NOT NOTED	< 2 lb. per Gal.		
APPEARANCE		**ODOR**	
MILKY WHITE LIQUID		FAINT ESTER	

SECTION X - PRECAUTIONARY LABEL/WARNING

NONE

SECTION XI - DOCUMENTARY INFORMATION

ISSUE DATE: 5-30-91 PRODUCT CODE NO. 80-9AM 16-13A-3
PREV. DATE: none PREV. PROD. CODE NO.
MSDS NO: S-14 PREV. MSDS NO: none

Becker Labs

Product Name: AQUALAC III
Product Code No: 80-9AM 16-13A-3
Issue Date: 5-30-91

SECTION X - PRECAUTIONARY LABEL/WARNING

NONE

SECTION XI - DOCUMENTARY INFORMATION

ISSUE DATE: 5-30-91 PRODUCT CODE NO. 80-9AM 16-13A-3

PREV. DATE: none PREV. PROD. CODE NO. none

MSDS NO: s-14 PREV. MSDS NO: none

DISCLAIMER OF EXPRESSED AND IMPLIED WARRANTIES

The information in this document is believed to be correct as of the date issued. HOWEVER, NO WARRANTY OF MERCHANTABILITY, FITNESS FOR ANY PARTICULAR PURPOSE, OR ANY OTHER WARRANTY IS EXPRESSED OR IS TO BE IMPLIED REGARDING THE ACCURACY OR COMPLETENESS OF THIS INFORMATION, THE RESULTS TO BE OBTAINED FROM THE USE OF THIS INFORMATION OR THE PRODUCT, THE SAFETY OF THIS PRODUCT, OR THE HAZARDS RELATED TO ITS USE. This information and product are furnished on the condition that the person receiving them shall make his own determination as to the suitability of the product for his particular purpose and on the condition that he assume the risk of his use thereof.

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MATERIAL SAFETY DATA SHEET

RADPAD

SECTION 1 - IDENTIFICATION

MANUFACTURER'S NAME	ENVIRONMENTAL SCIENTIFIC, INC.
ADDRESS	P.O. Box 13486 Research Triangle Park, NC 27709
EMERGENCY PHONE NUMBER	FOR TRANSPORTATION EMERGENCY Call 919-941-0847 Ingestion or skin contact call ENVIRONMENTAL SCIENTIFIC 919-941-0847
PHONE NUMBER	919-941-0847
EFFECTIVE DATE	2-11-93
CHEMICAL FAMILY	Superabsorbent polymer
TRADE NAME	RADPAD
DOT CLASSIFICATION	Not applicable
DOT HAZARD CLASS	NOT APPLICABLE

SECTION 2 - HAZARDOUS INGREDIENTS

Product does not contain hazardous ingredients

OSHA, TWA, and ACGIH TWA: Not regulated

SECTION 3 - PHYSICAL DATA

VOLATILITY (%)	None
SOLUBILITY	Insoluble, but swellable in aqueous fluids.
APPEARANCE	White cellulosic laminate containing a superabsorbent polymer.
ODOR	None

SECTION 4 - FIRE AND EXPLOSION HAZARD DATA

FLASH POINT	Not applicable
FLAMMABLE LIMITS	Not applicable
EXTINGUISH MEDIA	Water
FIRE HAZARD	None

SECTION 5 - TOXICITY AND FIRST AID

CARCINOGENICITY	None
OSHA REGULATED?	No
ACUTE ORAL & DERMAL	Nontoxic
EYE SENSITIVITY	Temporary eye irritant
SKIN SENSITIVITY	None
FIRST AID	Flush eyes with water. If irritation persists, obtain medical assistance.

SECTION 6 - REACTIVITY DATA

STABILITY	Stable
INCOMPATIBLE MATERIALS	Strong oxidizing agents
DECOMPOSITION HAZARD	None
HAZARDOUS POLYMERIZATION	Will not occur.

SECTION 7 - SPILL AND DISPOSAL

In the event of a spill or need to dispose of unwanted material. place in an approved solid waste disposal area in accordance with existing environmental regulations.

CAUTION: The material becomes slippery if flushed or in contact with water.

SECTION 8 - HANDLING AND STORAGE

RESPIRATORY PROTECTION	Use mask appropriate for your operation to protect from any dust and respiratory particles.
PROTECTIVE CLOTHING	None
EYE PROTECTION	Safety glasses are always advised, but normally not needed.
HYGIENE PRACTICES	Good housekeeping
STORAGE	Keep material in a dry location and sealed to minimize water absorption before use.

SECTION 9 - REGULATORY INFORMATION

TSCA	Laminate: Not applicable
FDA	None
PROP 65	Not regulated

MATERIAL SAFETY DATA SHEET

ANTI-CORROSION RADPAD

SECTION 1 - IDENTIFICATION

MANUFACTURER'S NAME:	ENVIRONMENTAL SCIENTIFIC, INC.
ADDRESS:	P.O. Box 13486 Research Triangle Park, NC 27709
EMERGENCY PHONE NUMBER:	FOR TRANSPORTATION EMERGENCY Call 919-941-0847 Ingestion or skin contact call ENVIRONMENTAL SCIENTIFIC 919-941-0847
PHONE NUMBER:	919-941-0847
EFFECTIVE DATE:	2/11/93
CHEMICAL FAMILY:	A proprietary blend of superabsorbent polymers and amine salts.
TRADE NAME:	ANTI-CORROSION RADPAD
DOT CLASSIFICATION:	Not applicable
DOT HAZARD CLASS:	NOT APPLICABLE

SECTION 2 - INGREDIENTS

Product does not contain hazardous ingredients

Carcinogenic? OSHA: no NTP: no IARC: no

SECTION 3 - PHYSICAL DATA

VOLATILITY (%):	None.
SOLUBILITY:	Insoluble, but swellable in aqueous fluids.
APPEARANCE:	White cellulosic laminate containing a blend of superabsorbent polymer and amine salts.
ODOR:	Slight amine.
EVAPORATION RATE (amine salts):	Nil.
VAPOR PRESSURE (amine salts):	0.0001 mm Hg (20°C).

SECTION 4 - FIRE AND EXPLOSION HAZARD DATA

FLASH POINT:	Not applicable
FLAMMABLE LIMITS:	LEL: Not applicable UEL: Not applicable
EXTINGUISH MEDIA"	Water, carbon dioxide or other dry chemical firefighting agents.
UNUSUAL FIRE & EXPLOSION HAZARDS:	None
SPECIAL FIREFIGHTING PROCEDURES:	If involved in a fire, firefighters should wear self-contained breathing apparatus.

SECTION 5 - HEALTH HAZARD DATA

MEDICAL CONDITIONS PRONE TO AGGRAVATION BY EXPOSURE:	None known.
CARCINOGENICITY:	None
OSHA REGULATED:	No
ACUTE ORAL & DERMAL:	Nontoxic
EYE SENSITIVITYY:	Temporary eye irritant
SKIN SENSITIVITY:	None

SECTION 6 - REACTIVITY DATA

STABILITY	Stable
INCOMPATIBLE MATERIALS	Strong oxidizing agents
DECOMPOSITION HAZARD	None
HAZARDOUS POLYMERIZATION	Will not occur.

SECTION 7 - SPILL AND DISPOSAL

In the event of a spill or need to dispose of unwanted material, place in an approved solid waste disposal area in accordance with existing environmental regulations.

CAUTION: The material becomes slippery if flushed or in contact with water.

SECTION 8 - HANDLING AND STORAGE

RESPIRATORY PROTECTION	Use mask appropriate for your operation to protect from any dust and respriatory particles.
PROTECTIVE CLOTHING	None
EYE PROTECTION	Safety glasses are always advised, but normally not needed.
HYGIENE PRACTICES	Good housekeeping
STORAGE	Keep material in a dry location and sealed to minimize water absorption before use.

SECTION 9 - REGULATORY INFORMATION

TSCA	Laminate: Not applicable
FDA	None
PROP 65	Not regulated

MATERIAL SAFETY DATA SHEET

RADSORB

SECTION 1 - IDENTIFICATION

MANUFACTURER'S NAME	ENVIRONMENTAL SCIENTIFIC, INC.
ADDRESS	5400 SOUTH MIAMI BLVD. MORRISVILLE, NC 27560
EMERGENCY PHONE NUMBER	FOR TRANSPORTATION EMERGENCY Call 919-941-0847 Ingestion or skin contact call ENVIRONMENTAL SCIENTIFIC 919/941-0847
PHONE NUMBER	919-941-0847
EFFECTIVE DATE	1-22-93
CHEMICAL FAMILY	Sodium polyacrylate homopolymer
TRADE NAME	RADSORB
DOT CLASSIFICATION	Not applicable
DOT HAZARD CLASS	NOT APPLICABLE

SECTION 2 - HAZARDOUS INGREDIENTS

HAZARDOUS COMPONENTS	HAZARDOUS %	TLV (Units)
None	0.0%	None

SECTION 3 - PHYSICAL DATA

VOLATILITY (%)	None	
SOLUBILITY IN WATER	Insoluble, but swellable in aqueous fluids.	
pH VALUE	7.5+/-0.3 (20°C gel)	
SPECIFIC GRAVITY	0.83	ASTM D-1298
PHYSICAL FORM	White granular	
PARTICLE SIZE	100-300 microns	
MOISTURE CONTENT	5%+/-2% DIN 53723	
BULK DENSITY	620+/-40 g/l	

SECTION 4 - FIRE AND EXPLOSION HAZARD DATA

FLASH POINT	Not applicable
EXTINGUISH MEDIA	Water, CO_2, foam, dry powder.
UNUSUAL FIRE AND FIRE HAZARD	None

SECTION 5 - HEALTH EFFECTS INFORMATION

SKIN CONTACT:	Prolonged contact with skin may lead to slight irritation due to the somewhat abrasive powder.
EYE CONTACT	May cause slight irritation and swelling of mucous membrane.
INHALATION:	May cause irritation to the respiratory tract and lungs.
FIRST AID:	SKIN CONTACT: Wash with soap and water. EYE CONTACT: Rinse with plenty of water for at least 15 minutes. If ill effects occur, seek medical attention.

INHALATION: Remove to fresh air. If discomfort continues, seek medical attention.
INGESTION: If ill effects occur, seek medical attention.

SECTION 6 - TOXICOLOGICAL INFORMATION

ACUTE ORAL TOXICITY (ALBINO RATS): LD50 = Greater than 5,000 mg/kg.

COMMENTS: Administered as a 5% gel in 0.9% NaCl solution.

ACUTE DERMAL TOXICITY (ALBINO RATS): LD50 = Greater than 2,000 mg/kg.

COMMENTS: Administered as a 5% gel in a 0.9% NaCl solution, applied to shom skin of rats.

SUBACUTE INHALATION STUDY: A 14 day inhalation test with Fischer-344 rats of 0.05, 0.1 and 1.0 mg/cubic meter showed no effects at the level of 1.0 mg/cubic meter or lower. Sacrifice after 1 to 40 days exposure showed non-specific reversible inflammatory response, a typical pattern for chemicals of this class.

SUBCHRONIC SKIN COMPATIBILITY 10 Female mice were treated dermally thrice per week with 0.05 ml of a 7.5% w/v RADSORB gel in 0,9% NaCl solution on the shom skin for 8 weeks (24 overall applications). Body weight development was normal; no defects or adverse effects to skin were observed.

HUMAN REPEAT INSULT PATCH TEST (HRIPT): No evidence of sensitizing potential when using a patch of 29% RADSORB N in a cellulose matrix on 12 humans.

EYE IRRITATION: Application of 0.1 g of dry powder RADSORB into the conjunctival sac of the eyes of rabbits caused slight erythema, slight opaqueness of the cornea, and a slight swelling of the mucous membrane (primary irritation index = 26 out of possible 110 points). A watery gel of RADSORB exerts no reaction on rabbit eyes.

SENSITIZATION: Maximization test according to Magusson & Kilgman: 20 guinea pigs were treated intradermally with a 1.0% extraction solution of RADSORB and dermally with 7.5% w/v gel in a 0.9% NaCl solution. No erythema or edema were observed. A sensitization potential is not considered likely. A human sensitization test, performed in 119 adults yielded no evidence of sensitization.

MUTAGENICITY: Ames test using strains TA98, TA100, TA1535 and TA1538 both with and without S-9. The concentration ranged from 5-500 micrograms/plate. No evidence of mutagenic activity. Zytogenic investigations of oral doses given to rats (0.14-1.43 g/kg) exhibited no chromosome damaging effects. Mouse lymphoma assay with L51784 cells using the thymidinkinase locus led to no mutagenic activity when 186-2475 mg/ml without S-9 and 44-588 mg/ml with S-9 were applied. Unscheduled DNA Synthesis UDS) in rat hepatocytes was not activated with concentrations from 6.7-6.77 mg/ml.

CELL TOXICITY: The ciliate Test, according to Professors Graef & Erlangen, with water extracts of RADSORB showed a significant effect only at the concentration of 368 mg/ml carbon content. No effects were observed with extracts of 23-183 mg/ml carbon.

SECTION 7 - REACTIVITY INFORMATION

INCOMPATIBILITY: None known
THERMAL DECOMPOSITION PRODUCTS: In the event of combustion CO, CO_2. NOx may be formed. Do not breathe smoke or fumes, Wear suitable protective equipment.

SECTION 8 - PERSONAL PROTECTION EQUIPMENT

RESPIRATORY PROTECTION: Respiratory protection not normally needed. If significant dusting occurs, wear a NIOSH approved or equivalent dust respirator.

For large spills, entry into large tanks, vessels or enclosed small spaces with inadequate ventilation, a pressure-demand, self-contained breathing apparatus is recommended.

VENTILATION: If significant dusting occurs, local exhaust ventilation is recommended.

PROTECTIVE EQUIPMENT: No special precautions. Avoid eye and skin contact, and inhalation of dust.

If clothing is contaminated, remove clothing and thoroughly wash the affected area. Launder contaminated clothing before reuse.

SECTION 9 - SPILL AND DISPOSAL

SPILL CONTROL AND RECOVERY:

SOLID SPILLS: Sweep or vacuum up and reclaim into recovery or salvage drums for disposal. Wear the protective equipment specified in Section 8. Refer to CERCLA in Section 12.

DISPOSAL: If this product becomes a waste, it does not meet the criteria of a hazardous waste as defined under the Resource Conservation and Recovery Act (RCRA) 40 CFR 261, since it does not have the characteristics of Subpart C, nor is it listed under Subpart D.

As a non-hazardous solid waste, it can be disposed of in a sanitary landfill in accordance with local, state and federal regulations.

SECTION 10 - ENVIRONMENTAL INFORMATION

If released into the environment, see CERCLA in Section 12.

ACUTE FISH TOXICITY: LC_{50} approximately 1000 mg extractable (golden orfs, 96 hours) substances as carbon/liter. (OECD Method No. 203).

ACUTE BACTERIAL TOXICITY: EC_{50} = 630 mg extractable substances as (pseudomonas putida) carbon/liter. DEVL 8). From structural considerations and the physical/chemical properties, RADSORB is considered to be non-toxic to terrestrial and aquatic life.

SECTION 11 - TRANSPORTATION INFORMATION

DOT PROPER SHIPPING NAME/HAZARD CODE - PRODUCT IS NOT REGULATED DURING TRANSPORTATION

SECTION 12 - REGULATORY INFORMATION

This product does not contain ingredients (at a level of 1% or greater) on the List of Toxic Chemicals.

FEDERAL WATER POLLUTION CONTROL ACT, CLEAN WATER ACT, 40 CFR 401.15/formerly Sec. 307, 40 CFR 116/formerly Sec. 311:
None of the ingredients are specifically listed.

CLEAN AIR ACT. 40 CFR 60, SECTION 111, 40 CFR 61, SECTION 112:
This product does not contain ingredients covered by the Clean Air Act.

STATE REGULATIONS:

CALIFORNIA PROPOSITION 65:
None of the chemicals on the current Proposition 65 list are known to be present in this product.

MICHIGAN CRITICAL MATERIALS:
This product does not contain ingredients listed on the Michigan Critical Materials Register.

STATE RIGHT TO KNOW LAWS: The following ingredient(s) are disclosed for compliance with State Right to Know Laws:

Sodium polyacrylate homopolymer	Trade Secret

SECTION 13 - USER'S RESPONSIBILITY

This product material safety data sheet provides health and safety information. The product is to be used in applications consistent with our product literature. Individuals handling this product should be informed of the recommended safety precautions and should have access to this information. For any other uses, exposures should be evaluated so that appropriate handling practices and training programs can be established to ensure safe workplace operations. Please consult your ESI sales representative for further information.

SECTION 14 - BIBLIOGRAPHY

ANNUAL REPORT ON CARCINOGENS, U.S. Department of Health and Human Services, Public Health Service, PB 33-135855, 1983.

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CHEMICAL HAZARDS OF THE WORKPLACE, Proctor, N.H., and Hughes, J.P., eds., J.P. Lipincott Company, N.Y., 1981.

DANGEROUS PROPERTIES OF INDUSTRIAL MATERIALS, Sax, n. Irving, ed., Van Nostrand Reinhold Company, N.Y., 6th edition, 1984

IARC MONOGRAPHS ON THE EVALUATION OF THE CARCINOGENIC RISK OF CHEMICALS TO MAN, Geneva: World Health Organization, International Agency for Research on Cancer, 1972-1977.

PATTY'S INDUSTRIAL HYGIENE AND TOXICOLOGY, Clayton, G.D., Clayton, F.E., eds., John Wiley and Sons, N.Y., 3rd edition, Vol. 2 A-C, 1981.

REGISTRY OF TOXIC EFFECTS ON CHEMICAL SUBSTANCES, U.S. Department of Health and Human Services, Public Health Service, Center for Disease Control, National Institute for Occupational Safety and Health, 1983 supplement of 1981-1982 edition, Vol. 1-3, OH, 1984.

Title 29 Code of Federal Regulations Part 1910, Subpart Z, Toxic and Hazardous Substances, Occupational Safety and Health Administration (OSHA).

THRESHOLD LIMIT VALUES FOR CHEMICAL SUBSTANCES AND PHYSICAL AGENTS IN THE WORKROOM ENVIRONMENT WITH INTENDED CHANGES, American Conference of Government Industrial Hygienists, OH.

SECTION 15 - STORAGE

STORAGE	Keep material in a dry location and sealed to minimize water absorption before use.

MATERIAL SAFETY DATA SHEET

RADPAD ROLLS

SECTION 1 - IDENTIFICATION

MANUFACTURER'S NAME	ENVIRONMENTAL SCIENTIFIC, INC.
ADDRESS	P.O. Box 13486 Research Triangle Park, NC 27709
EMERGENCY PHONE NUMBER	FOR TRANSPORTATION EMERGENCY Call 919-941-0741 Ingestion or skin contact call ENVIRONMENTAL SCIENTIFIC 919-941-0847
PHONE NUMBER	919-941-0847
EFFECTIVE DATE	2/11/93
CHEMICAL FAMILY	Superabsorbent polymer
TRADE NAME	RADPAD ROLLS
DOT CLASSIFICATION	Not applicable
DOT HAZARD CLASS	NOT APPLICABLE

SECTION 2 - HAZARDOUS INGREDIENTS

Product does not contain hazardous ingredients

OSHA, TWA, and ACGIH TWA: Not regulated

SECTION 3 - PHYSICAL DATA

VOLATILITY (%)	None
SOLUBILITY	Insoluble, but swellable in aqueous fluids.
APPEARANCE	White cellulosic laminate containing a superabsorbent polymer.
ODOR	None

SECTION 4 - FIRE AND EXPLOSION HAZARD DATA

FLASH POINT	Not applicable
FLAMMABLE LIMITS	Not applicable
EXTINGUISH MEDIA	Water
FIRE HAZARD	None

SECTION 5 - TOXICITY AND FIRST AID

CARCINOGENICITY	None
OSHA REGULATED?	No
ACUTE ORAL & DERMAL	Nontoxic
EYE SENSITIVITY	Temporary eye irritant
SKIN SENSITIVITY	None
FIRST AID	Flush eyes with water. If irritation persists, obtain medical assistance.

SECTION 6 - REACTIVITY DATA

STABILITY	Stable
INCOMPATIBLE MATERIALS	Strong oxidizing agents
DECOMPOSITION HAZARD	None
HAZARDOUS POLYMERIZATION	Will not occur.

SECTION 7 - SPILL AND DISPOSAL

In the event of a spill or need to dispose of unwanted material, place in an approved solid waste disposal area in accordance with existing environmental regulations.

CAUTION: The material becomes slippery if flushed or in contact with water.

SECTION 8 - HANDLING AND STORAGE

RESPIRATORY PROTECTION	Use mask appropriate for your operation to protect from any dust and respiratory particles.
PROTECTIVE CLOTHING	None
EYE PROTECTION	Safety glasses are always advised, but normally not needed.
HYGIENE PRACTICES	Good housekeeping
STORAGE	Keep material in a dry location and sealed to minimize water absorption before use.

SECTION 9 - REGULATORY INFORMATION

TSCA	Laminate: Not applicable
FDA	None
PROP 65	Not regulated

MATERIAL SAFETY DATA SHEET

Trade Name: CC Wet

Section I – General Information:

Item Name: CC Wet

Manufactured by: InstaCote, INC.
160 C Lavoy Rd.
Erie, MI 48133
Phone (734) 847-5260
Fax (743) 847-9008
Emergency Phone (800) 359-2783

Date MSDS Prepared: February 19, 2001
Last Review Date: October 12, 2006
MSDS Preparer's Name: Thomas J. Nachtman
Product Description: Water Base Anti-dusting Media
Multiple Parts (Yes/No) No
Description of Related Comp. NA

Section II – Ingredient/Identity Information:

This product is considered to be non-hazardous under OSHA Hazard Communication Standard 29.CFR 1910.1200

Ingredient	CAS #
Distilled Water	7732-18-5
Glycerin	56-81-5
Monosaccharide	57-50-1
Non-ionic Surfactant	151-21-3
Non-halogenated yellow dye	6358-69-6, 19125-99-6

HMIS Codes
Health 1 Fire 1 Reactivity 1 Special None
Scale 4 = extreme, 3 = high, 2 = moderate, 1 = insignificant

Section III – Physical/Chemical Properties:

Appearance: Amber Liquid	pH: 8.5
Specific Gravity: 1.05	Viscosity: 31 cps.
Vapor Density: > than air	Evaporation Rate <Ether
Coating V.O.C.: 0.00 lbs./gal	MaterialV.O.C.:0.0 lbs./gal
Coating V.O.C.: 0.0g/l	Material V.O.C.: 0g/l
Water Solubility: 100%	Odor: None
Boiling Point: 214°F	

Section IV – Fire and Explosion Hazard Data:

Flash Point: Water Base, NA
Flammable Limits: Upper – N/A Lower: - N/A
Extinguishing Media: As for surrounding fire. This product is a very low fire hazard. This product is a water-based material and while it may not burn, it can splatter and froth. Do not spray water into hot material, use water fog to cool surrounding fire.

Section V – Reactivity Data:

Stability (Y/N) Y
Conditions to Avoid: None Known
Materials to Avoid: None Known
Hazardous Decomposition Products: Carbon-monoxide,-dioxide

Section VI – Health Hazard Data:

Primary Routes of Exposure: Skin & Eye Contact, Ingestion and Inhalation

Skin & Eye Contact: Prolonged and repeated skin contact may cause irritation and burns.

Ingestion: Ingesting large volumes of product may cause CNS depression.

Inhalation: Extended periods of breathing atomized vapors may cause CNS depression.

Section VII – Emergency First Aid:

Eye Contact: Flush eyes with a large amount of water for at least 15 minutes. Consult a physician if irritation persists.

Skin Contact: Wash area with soap and water.

Ingestion: Do not induce vomiting. Get immediate medical attention.

Inhalation: Move individual to fresh air. Consult a physician if irritation persist or breath becomes labored.

Section VIII – Precautions for Safe Handling, Storage and Use:

Personal Protective Equipment for Routine Use:

Respiratory Protection: Respirators are not routinely required when using this product indoors or outdoors. In any case when excessive mist and atomization of product occurs such as high pressure air spraying, use NIOSH/MSHA approved full or half face respirator with dust cartridge.

Gloves: Gloves are not normally required for routine use. If an individual is known to have skin susceptible to irritation by other chemicals, this individual should wear butyl or nitrile type gloves.

Eye Protection: Safety goggles or glasses with side shields should always be worn.

Work Practices: Do not eat drink or smoke while applying this product. Wash hands immediately upon leaving the work site. Treat this product caution as you would any other chemical.

Spill/Release Procedures: Large spills can be vacuumed up. Small spills can be treated with absorbent clay, earth sand or other material, shoveled into a DOT approved container and disposed of according to all local, state and Federal regulations.

Waste Disposal Procedure: Incinerated or dispose of in accordance with local, state and Federal regulations.

Storage and Handling: Store product in a dry environment. Protect product from extremes in temperatures.

Other Health Hazard Precautions: None

MATERIAL SAFETY DATA SHEET

SECTION 1 – CHEMICAL PRODUCT AND COMPANY IDENTIFICATION

PRODUCT NAME: ***ENCAP 107*** EFFECTIVE DATE: 23 January 2006

CHEMICAL FAMILY: Polyacrylate salt

CHEMICAL NAME: Sodium polyacrylate

COMPANY IDENTIFICATION:
B2K Technologies
PO Box 324
Johnson City, TN 37605

EMERGENCY TELEPHONE: 423-676-2171

SECTION 2 – COMPOSITION / INFORMATION ON INGREDIENTS

CAS #	Component	Percent	OSHA HAZARD
9003-04-7	Sodium Polyacrylate		
Not Available	Post Treated – Trade Secret		

Component Information / Information on Non-Hazardous Components

The components of this product are not regulated as hazardous under 29 CFR and 49 CFR. However, the manufacturer recognizes the potential for respiratory tract irritation as a result of inhalation of this material as a respirable dust. See Sections 8, 11, 14, and 15 for further regulatory information.

SECTION 3 – HAZARDS IDENTIFICATION

Emergency Overview

Sodium polyacrylate is a white, granular, odorless polymer that yields a gel-like material with the addition of water. It is insoluble in water and causes extremely slippery conditions when wet. Although not regulated as a hazardous material, the respirable dust is potential respiratory tract irritant. The manufacturer recommends an eight-hour exposure limit of 0.05 mg/m^3.

Potential Health Effects: Eyes

Dust may cause burning, drying, itching, and other discomfort, resulting in reddening of the eyes.

Potential Health Effects: Skin

Exposure to the dust, such as in manufacturing, may aggravate existing skin conditions due to drying effect.

Potential Health Effects: Ingestion

Although not a likely route of entry, tests have shown that polyacrylate absorbents are non-toxic if ingested. However, as in any instance of non-food consumption, seek medical attention in the event of any adverse symptoms.

Potential Health Effects: Inhalation

Exposure to respirable dust may cause respiratory tract and lung irritation and may aggravate existing respiratory conditions.

HMIS Ratings: Health: 1 Fire: 0 Reactivity: 0

Hazard Scale: 0 = Minimal 1 = Slight 2 = Moderate 3 = Serious 4 = Severe * = Chronic Hazard

SECTION 4 –FIRST AID MEASURES

First Aid: Eyes
Immediately flush with plenty of water. Remove particles remaining under the eyelids. Get medical attention if irritation persists.
First Aid: Skin
Remove polyacrylate absorbent dust from skin using soap and water.
First Aid: Ingestion
Non-toxic by ingestion. However, if adverse symptoms appear, seek medical attention.
First Aid: Inhalation
If inhaled, move to source of fresh air. Seek medical attention if symptoms persist.

SECTION 5 – FIRE-FIGHTING MEASURES

General Fire Hazards
No recognized fire hazards associated with the finished product.
Fire and Explosive Properties

Flammability Classification:	None	
Flash Point	NA	Flash Point Method
Flammable Limits - Upper	NE	
Lower	NE	

Hazardous Combustion Products
None known.
Extinguishing Media
Dry chemical, foam, carbon dioxide, and water fog. Extremely slippery conditions are created if spilled product comes in contact with water.
Fire Fighting Instructions
Firefighters should wear full protective clothing including self-contained breathing apparatus.

NFPA Ratings: Health: 1 Fire: 0 Reactivity: 0
Hazard Scale: 0 = Minimal 1 = Slight 2 = Moderate 3 = Serious 4 = Severe * = Chronic Hazard

SECTION 6 – ACCIDENTAL RELEASE MEASURES

Containment Procedures
Sweep or vacuum material when possible and shovel into a waste container.

Clean up procedures
Use caution after contact of product with water, as extremely slippery conditions will result. Residuals maybe flushed with water into the drain for normal wastewater treatment. This is a non-hazardous waste suitable for disposal in an approved solid waste landfill.

Evacuation Procedures
None required.

Special Procedures
Avoid respirable dust inhalation during clean up. Wear appropriate respirator.

SECTION 7 – HANDLING AND STORAGE

Handling

Handle as an eye and respiratory tract irritant.

Storage

Store in a dry, closed container.

SECTION 8 – EXPOSURE CONTROL / PERSONAL PROTECTION

Exposure Guidelines

A: General Product Information

This product is not regulated as a hazardous material. However, the manufacturer recognizes the potential for respiratory tract irritation and recommends an eight-hour exposure limit of 0.05 mg/m^3.

B: Component Exposure Limits

No information available.

Engineering Controls

Provide local exhaust ventilation to maintain worker exposure to less than 0.05 mg/m^3 over an eight-hour period.

PERSONAL PROTECTIVE EQUIPMENT

Personal Protective Equipments: Eyes/Face

Wear safety glasses with side shields or goggles.

Personal Protective Equipments: Skin

Use impervious gloves when handling the product in the manufacturing environment.

Personal Protective Equipments: Respiratory

Wear respirator with a high efficiency filter is particulate concentration in the work area exceeds 0.05 mg/m^3 over an eight hour time period.

Personal Protective Equipments: General

Obey reasonable safety precautions and practice good housekeeping. Wash thoroughly after handling.

SECTION 9 – PHYSICAL AND CHEMICAL PROPERTIES

Appearance/Odor	White Granular Powder, no odor
pH	5.5 – 6.5 (1% in water)
Specific Gravity (Bulk Density)	0.4 – 0.7 g/ml
Vapor Pressure	< 10 mm Hg
Vapor Density	NE
Melting Point	> 390 °F
Freezing Point	NA
Boiling Point	NA
Solubility in Water	Insoluble
Evaporation Rate (%)	< 1.0

SECTION 10– STABILITY AND REACTIVITY

Chemical Stability
This material is chemically stable under normal and anticipated storage and handling conditions.
Chemical Stability: Conditions to Avoid
None
Incompatibility
None
Hazardous Decomposition Products
Decomposition above 200 °C
Hazardous Polymerization
Will not occur.

SECTION 11 – TOXICOLOGICAL INFORMATION

Acute and Chronic Toxicity
A: General Product Information:

Acute oral toxicity:	LD_{50} rat Dose: > 5000 mg/kg Method: Limit Test
Acute dermal toxicity:	LD_{50} rat Dose: > 2000 mg/kg Method: Limit Test
Skin irritation:	Rabbit Method: OECD Nr. 404 Very slight irritant
Eye irritation:	Rabbit Method: OECD Nr. 405 Very slight irritant
Sensitization:	Guinea pig Method: OECD Nr. 406 Result: 0/20 No sensitization

B: Acute Toxicity – LD_{50}/LC_{50}
Sodium polyacrylate (9003-04-7)
LD_{50}: Oral LD50 Rat: > 40g/kg

Carcinogenicity:
Component Carcinogenicity
No information is available.
Chronic Toxicity
Chronic inhalation exposure to rates for a lifetime (two years) using sodium polyacrylate that had been micronized to a respirable particle size (less than 10 microns) produced non-specific inflammation and chronic lung injury at 0.2 mg/m³ and 0.8 mg/m³. Also, at 0.8 mg/m³, tumors were seen in some test animals. In the absence of chronic inflammation, tumors are not expected. There were no adverse effects detected at 0.05 mg/m³.
Mutagenicity
Sodium polyacrylate had no effect in mutagenicity tests.

SECTION 12 – ECOLOGICAL INFORMATION

Ecotoxicity

A: General Product Information

Composted polyacrylate absorbents are non-toxic to aquatic or terrestrial organisms at predicted exposure levels.

B: Component Analysis – Ecotoxicity – Aquatic Toxicity

No information available.

Environmental Fate

Polyacrylate absorbents are relatively inert in aerobic and anaerobic conditions. They are immobile in landfills and soil systems (> 90% retention), with the mobile fraction showing biodegradability. They are also compatible with incineration of municipal solid waste. Incidental down-the-drain disposal of small quantities of polyacrylic absorbents will not affect the performance of wastewater treatment systems.

SECTION 13 – DISPOSAL CONSIDERATIONS

US EPA Waste Number & Descriptions

A: General Product Information

This product is a non-hazardous waste material suitable for approved sold waste landfills.

B: Component Waste Numbers

No EPA Waste Numbers are applicable for this product's components.

Disposal Instructions

Dispose of in accordance with Local, State, and Federal Regulations.

SECTION 14 – TRANSPORTATION INFORMATION

International Transportation Regulations

This product is not transport regulated.

SECTION 15 –REGULATORY INFORMATION

US Federal Regulations

A: General Product Information

This product is not federally regulated as a hazardous material.

B: Clean Air Act

No information is available.

C: Component Analysis

No information available.

D: Food and Drug Administration

No information available.

State Regulations

A: General Product Information

This product is not regulated by any state as a hazardous material.

B. Component Analysis – State

None of this product's components are listed on the state lists from CA, FL, MA, NJ, or PA.

SECTION 15 –REGULATORY INFORMATION, continued

Component Analysis – Inventory

Component	CAS #	TSCA	CAN	EEC
Sodium Polyacrylate	9003-04-7	Yes	DSL	No

SECTION 16 – OTHER INFORMATION

Revision Information:
Revision Date: N/A
Supercedes Revision Dated: N/A

Reason for Revision: N/A

Key: N/A – Not Applicable NE – Not Established

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GE
Water & Process Technologies

Material Safety Data Sheet

Issue Date: 08-AUG-2008
Supercedes: 08-AUG-2008

POLYFLOC AP125

1 Identification

Identification of substance or preparation
POLYFLOC AP125

Product Application Area
Flocculant

Company/Undertaking Identification
GE Betz, Inc.
4636 Somerton Road
Trevose, PA 19053
T 215 355-3300, F 215 953 5524

Emergency Telephone
(800) 877-1940

Prepared by Product Stewardship Group: T 215-355-3300 Prepared on: 08-AUG-2008

2 Hazard(s) identification

****

EMERGENCY OVERVIEW

CAUTION

Non-hazardous to skin. Potential eye irritant due to mechanical action only. Dusts may cause irritation to the upper respiratory tract.

DOT hazard is not applicable
Odor: None; Appearance: Off-White, Powder

Fire fighters should wear positive pressure self-contained breathing apparatus(full face-piece type). Proper fire-extinguishing media: dry chemical, carbon dioxide, foam or water

****

POTENTIAL HEALTH EFFECTS

ACUTE SKIN EFFECTS:
Non-hazardous to skin.

ACUTE EYE EFFECTS:
Potential eye irritant due to mechanical action only.

ACUTE RESPIRATORY EFFECTS:
Primary route of exposure;Dusts may cause irritation to the upper respiratory tract.

INGESTION EFFECTS:
No evidence of adverse effects from available information.

TARGET ORGANS:
No evidence of potential chronic effects.

MEDICAL CONDITIONS AGGRAVATED:
Not known.

SYMPTOMS OF EXPOSURE:
Nuisance dust.

3 Composition / information on ingredients

Information for specific product ingredients as required by the U.S. OSHA HAZARD COMMUNICATION STANDARD is listed. Refer to additional sections of this MSDS for our assessment of the potential hazards of this formulation.

HAZARDOUS INGREDIENTS:

This product is not hazardous as defined by OSHA regulations.

No component is considered to be a carcinogen by the National Toxicology Program, the International Agency for Research on Cancer, or the Occupational Safety and Health Administration at OSHA thresholds for carcinogens.

4 First-aid measures

SKIN CONTACT:
Wash thoroughly with soap and water. Remove contaminated clothing. Get medical attention if irritation develops or persists.

EYE CONTACT:
Remove contact lenses. Hold eyelids apart. Immediately flush eyes with plenty of low-pressure water for at least 15 minutes. Get medical attention if irritation persists after flushing.

INHALATION:
If nasal, throat or lung irritation develops - remove to fresh air and get medical attention.

INGESTION:
Do not feed anything by mouth to an unconscious or convulsive victim. Do not induce vomiting. Immediately contact physician. Dilute contents of stomach using 2-8 fluid ounces (60-240 mL) of milk or water.

NOTES TO PHYSICIANS:
No special instructions

5 Fire-fighting measures

FIRE FIGHTING INSTRUCTIONS:
Fire fighters should wear positive pressure self-contained breathing apparatus (full face-piece type).
EXTINGUISHING MEDIA:
dry chemical, carbon dioxide, foam or water
HAZARDOUS DECOMPOSITION PRODUCTS:
oxides of carbon and nitrogen
FLASH POINT:
> 200F > 93C P-M(CC)

6 Accidental release measures

PROTECTION AND SPILL CONTAINMENT:
Ventilate area. Use specified protective equipment. Sweep up and remove. Minimize dust generation.
DISPOSAL INSTRUCTIONS:
Water contaminated with this product may be sent to a sanitary sewer treatment facility,in accordance with any local agreement,a permitted waste treatment facility or discharged under a permit. Product as is - Incinerate or land dispose in an approved landfill.

7 Handling and storage

HANDLING:
Normal chemical handling.
STORAGE:
Keep containers closed when not in use. Keep dry. Store away from oxidizers.

8 Exposure controls / personal protection

EXPOSURE LIMITS

This product is not hazardous as defined by OSHA regulations.

ENGINEERING CONTROLS:
adequate ventilation
PERSONAL PROTECTIVE EQUIPMENT:
Use protective equipment in accordance with 29CFR 1910 Subpart I
RESPIRATORY PROTECTION:
A RESPIRATORY PROTECTION PROGRAM THAT MEETS OSHA'S 29 CFR 1910.134 AND ANSI Z88.2 REQUIREMENTS MUST BE FOLLOWED WHENEVER WORKPLACE CONDITIONS WARRANT A RESPIRATOR'S USE.
USE AIR PURIFYING RESPIRATORS WITHIN USE LIMITATIONS ASSOCIATED WITH THE EQUIPMENT OR ELSE USE SUPPLIED AIR-RESPIRATORS.
If air-purifying respirator use is appropriate, use any of the following particulate respirators: N95, N99, N100, R95, R99, R100, P95, P99 or P100.
SKIN PROTECTION:
rubber, butyl, viton or neoprene gloves -- Wash off after each use. Replace as necessary.
EYE PROTECTION:
safety glasses

9 Physical and chemical properties

Density	40.000 lb/cu.	Vapor Pressure (mmHG)	< 0.1
Freeze Point (F)	NA	Vapor Density (air=1)	< 1.00
Freeze Point (C)	NA		
Viscosity(cps 70F,21C)	NA	% Solubility (water)	1.0

Odor	None
Appearance	Off-White
Physical State	Powder
Flash Point P-M(CC)	> 200F > 93C
pH 0.5% Sol. (approx.)	7.0
Evaporation Rate (Ether=1)	< 1.00
Percent VOC:	0.0

NA = not applicable ND = not determined

10 Stability and reactivity

STABILITY:
Stable under normal storage conditions.
HAZARDOUS POLYMERIZATION:
Will not occur.
INCOMPATIBILITIES:
May react with strong oxidizers.
DECOMPOSITION PRODUCTS:
oxides of carbon and nitrogen

11 Toxicological information

Oral LD50 RAT:	>2,000 mg/kg
Dermal LD50 RABBIT:	>2,000 mg/kg

NOTE - Estimated value

12 Ecological information

AQUATIC TOXICOLOGY

Bluegill Sunfish 96 Hour Static Screen
0% Mortality= 300 mg/L
Ceriodaphnia 7 Day Chronic Bioassay
No Effect Level= 10 mg/L
Daphnia magna 48 Hour Static Acute Bioassay
LC50= 2975; No Effect Level= 315 mg/L
Fathead Minnow 96 Hour Static Acute Bioassay
LC50= 810; 5% Mortality= 315 mg/L
Rainbow Trout 72 Hour Static Screen
0% Mortality= 100 mg/L

BIODEGRADATION

BOD-28 (mg/g): 24
BOD-5 (mg/g): 2
COD (mg/g): 400
TOC (mg/g): 240

13 Disposal considerations

If this undiluted product is discarded as a waste, the US RCRA hazardous waste identification number is :
Not applicable.

Please be advised; however, that state and local requirements for waste disposal may be more restrictive or otherwise different from federal regulations. Consult state and local regulations regarding the proper disposal of this material.

14 Transport information

DOT HAZARD: Not Applicable
PROPER SHIPPING NAME:

DOT EMERGENCY RESPONSE GUIDE #: Not applicable
Note: Some containers may be DOT exempt, please check BOL for exact container classification

15 Regulatory information

TSCA:
All components of this product are included on or are in compliance with the U.S. TSCA regulations.

CERCLA AND/OR SARA REPORTABLE QUANTITY (RQ):
No regulated constituent present at OSHA thresholds

FOOD AND DRUG ADMINISTRATION:
21 CFR 176.110 (acrylamide - acrylic acid resins)
All ingredients comprising this product are authorized by FDA for the manufacture of paper and paperboard that may contact aqueous and fatty foods as per 21 CFR 176.170(a) (4).

NSF Registered and/or meets USDA (according to 1998 Guidelines):
Registration number: Not Registered
L1

SARA SECTION 312 HAZARD CLASS:
Product is non-hazardous under Section 311/312

SARA SECTION 302 CHEMICALS:
No regulated constituent present at OSHA thresholds

SARA SECTION 313 CHEMICALS:
No regulated constituent present at OSHA thresholds

CALIFORNIA REGULATORY INFORMATION

CALIFORNIA SAFE DRINKING WATER AND TOXIC ENFORCEMENT ACT (PROPOSITION 65):
No regulated constituents present

MICHIGAN REGULATORY INFORMATION

No regulated constituent present at OSHA thresholds

16 Other information

HMIS vII		CODE TRANSLATION
Health	1	Slight Hazard
Fire	1	Slight Hazard
Reactivity	0	Minimal Hazard

Special	NONE	No special Hazard
(1) Protective Equipment	A	Safety Glasses

(1) refer to section 8 of MSDS for additional protective equipment recommendations.

CHANGE LOG

	EFFECTIVE DATE	REVISIONS TO SECTION:	SUPERCEDES
MSDS status:	12-FEB-1997		** NEW **
	23-JUL-1997	15	12-FEB-1997
	01-JUN-1999	15	23-JUL-1997
	12-SEP-2000	4	01-JUN-1999
	19-MAR-2008	4,5,6,8,10	12-SEP-2000
	08-AUG-2008	2,3,4,5,6,8,10	19-MAR-2008

Quik-Solid MSDS

Quik-Solid®

Section 1: Manufacturer Information

CETCO
1350 West Shure Drive
Arlington Heights, IL 60004
847-392-5800

Section 2: Physical/Chemical Characteristics

Boiling Point - Not Applicable
Bulk Density (Apparent - g/cc) - 0.5-0.7
Vapor Pressure (mm Hg.) - Not Applicable
Melting point - Not Applicable
Vapor Density (AIR = 1) - Not Applicable
Evaporation Rate (Butyl Acetate = 1) - Not Applicable
Appearance - Off White, Odorless.

Section 3: Hazardous Ingredients/Identity Information

Hazardous Components: OSHA PEL ACGIH TLV
Other Components:
Recommended Exposure Limit (dust) 0.05mg/m3
Guideline for Respirable Particulate
Product Identification
Chemical Name CAS No. %
Sodium Polyacrylate, lightly crosslinked CAS#-076774-25-9
Water CAS#-7732-18-5
Acrylic Acid N/A CAS#-79-10-7
NFPA/HMIS: Health-1 Reactivity-0 Fire-1 Specific Hazard-See 4
DOT Class: Not Regulated

Section 4: Fire & Explosion Hazard Data

Flash Point (Method Used): Not available
Flammable Limits: Not available LEL UEL
Extinguishing Media: As with any fire, wear positive pressure, self-contained breathing apparatus in any closed space when fighting fire.
Special Fire Fighting Procedures: Not applicable
Unusual Fire and Explosion Hazards: Becomes slippery when wet. Under certain confined conditions, a fine dust of this material in air may cause a dust explosion if ignited.

Section 5: Reactivity Data

Stability: Stable **Incompatibility:** Strong oxidizers
Hazardous Decomposition or Byproducts: Thermal decomposition releases CO, CO2, Hydrocarbons
Hazardous Polymerization: Will not occur
Conditions to Avoid: None Known

Section 6: Health Hazard Data (applies to unused product)

Route (s) of Entry: Inhalation, ingestion, open wounds, eyes.
Health Hazards: Contact with eyes, skin or clothing may cause irritation. Care must be taken to minimize exposure and prevent workplace inhalation of respirable dust. Respiratory protection is required for exposures above the recommended level of respirable dust. A similar product, ground very finely, produced an inflammatory tissue response in the lungs in a lifetime exposure inhalation experiment with animals. According to the EPA "Hazard Categories" under sections 311 and 312 of SARA Title III, this product is considered to meet the applicable definitions of: A delayed health hazard.
Carcinogenicity: None known
IARC Monographs: No
OSHA Regulated: No
Signs/Symptoms of Exposure: Slight irritant effects
Medical Conditions Aggravated by Exposure: None known.
Emergency and First Aid Procedures:
Eyes: Flush with large quantity of water, consult physician.
Skin: Wash with soap and water.
Inhalation: Remove to fresh air, consult physician.

Section 7: Control Measures

Respiratory Protection: Use NIOSH or MSHA with high efficiency filter for particulate levels above 0.05mg/m3.
Ventilation: Local Exhaust – as appropriate
Mechanical (General) - as appropriate

Special/Other – none
Protective Gloves: Impervious/rubber
Eye Protection: Safety goggles as recommended
Other Protective Clothing or Equipment: If needed.
Work Hygienic Practices: Use good housekeeping practices.

Section: 8 Precautions for Safe Handling & Use

Steps to be taken in case material is released or spilled: Vacuum (using HEPA filter equipped system) if possible to avoid generating airborne dust. Avoid breathing dust. Wear an approved respirator. Exercise caution when adding water, product will become slippery when wet.
Waste Disposal Method: Dispose of in accordance with federal, state and local regulations.
Precautions to be taken in handling & storing: Store in a cool, dry place. Avoid breathing powder. Avoid skin and eye contact.
Other Precautions: Protective eye wear should be worn where dust levels are high enough to cause irritation. Slippery when wet.

Section 9: Supplemental Information
Prepared 10/1/98

DISCLAIMER: The information herein has been compiled from sources believed to be reliable and is accurate to the best of our knowledge. However, CETCO cannot give any guarantees regarding information from other sources, and expressly does not make any warranties, nor assumes any liability, for its use.

ATOMIC PRODUCTS CORP -- RADIACWASH -- 6850-00-127-4531

========== Product Identification ==========

Product ID:RADIACWASH
MSDS Date:02/22/1988
FSC:6850
NIIN:00-127-4531
Status Code:A
MSDS Number: CLJRB
=== Responsible Party ===
Company Name:ATOMIC PRODUCTS CORP
Address:49 NATCON DRIVE
City:SHIRLEY
State:NY
ZIP:11967
Country:US
Info Phone Num:516-924-9000
Emergency Phone Num:516-924-9000
Preparer's Name:W. S. GILMAN
CAGE:TO365
=== Contractor Identification ===
Company Name:ATOMIC PRODUCTS CORP
Address:49 NATCON DRIVE
Box:City:SHIRLEY
State:NY
ZIP:11967
Country:US
Phone:516-924-9000
CAGE:TO365
Company Name:BIODEX MEDICAL SYSTEMS INC
Address:20 RAMSAY RD BROOKHAVEN R AND D PLZ
Box:702
City:SHIRLEY
State:NY
ZIP:11967
Country:US
Phone:516-924-9000
CAGE:13308

========== Composition/Information on Ingredients ==========

Ingred Name:CITRIC ACID

CAS:77-92-9
RTECS #:GE7350000

Ingred Name:OCTYLPHENOL CONDENSED WITH 8-10 MOLES ETHYLENE OXIDE, TRITON X100
CAS:9036-19-5
RTECS #:MD0907600

Ingred Name:TETRASODIUM ETHYLENEDIAMINE TRIACETATE
CAS:64-02-8
RTECS #:AH5075000

Ingred Name:BENZYLDIMETHYL.(.2-.(.2-.(.P-(1,1,3,3-TETRAMETHYLBUTYL)PHENOXY.).ETHOXY.).ETHYL.).AMMONIUM CHLORIDE, HYAMINE 1622
CAS:121-54-0
RTECS #:BO7175000

========== Hazards Identification ==========

LD50 LC50 Mixture:ORAL, LD50= > 800 MG/KG
Routes of Entry: Inhalation:NO Skin:YES Ingestion:YES
Reports of Carcinogenicity:NTP:NO IARC:NO OSHA:NO
Health Hazards Acute and Chronic:PROLONGED CONTACT OF PRODUCT WITH SKIN MAY CAUSE IRRITATION, POSSIBLE ALLERGIC REACTION.
Explanation of Carcinogenicity:NTP: NONE. IARC: NONE. OSHA: NONE.
Effects of Overexposure:REPEATED CONTACT WITH SKIN MAY CAUSE DRYING OF SKIN WITH MODERATE IRRITATION. SOME ALLERGIC PROPERTIES EXPERIENCED.
Medical Cond Aggravated by Exposure:PRE-EXISTING EYE, SKIN AND RESPIRATORY DISORDERS MAY BE AGGRAVATED BY EXPOSURE TO PRODUCT.

========== First Aid Measures ==========

First Aid:INHALATION: REMOVE TO FRESH AIR. EYE: FLUSH WITH WATER FOR AT LEAST 15 MINUTES. SKIN: WASH THOROUGHLY WITH SOAP AND WATER. INGESTION: DRINK PLENTY OF WATER, CALL PHYSICIAN.

========== Fire Fighting Measures ==========

Flash Point:>101.1C, 214.F
Lower Limits:NA
Upper Limits:NA

Extinguishing Media:DRY POWDER, FOAM, CARBON DIOXIDE
Fire Fighting Procedures:FIRE FIGHTERS SHOULD WEAR SELF CONTAINED BREATHING APPARATUS
Unusual Fire/Explosion Hazard:DECOMPOSITION PRODUCTS MAY BE TOXIC

========== Accidental Release Measures ==========

Spill Release Procedures:SOAK UP MATERIAL WITH ABSORBENT MATERIALS AND PLACE IN TIGHT CONTAINER.
Neutralizing Agent:NO DATA PROVIDED BY MANUFACTURER

========== Handling and Storage ==========

Handling and Storage Precautions:STORE IN CLOSED CONTAINERS AWAY FROM HEAT.
Other Precautions:NONE

========== Exposure Controls/Personal Protection ==========

Respiratory Protection:WEAR NIOSH APPROVED RESPIRATOR IF REQUIRED
Ventilation:LOCAL EXHAUST: IN OPEN AREAS. MECHANICAL (GENERAL): IN CONFINED AREAS.
Protective Gloves:IMPERVIOUS GLOVES
Eye Protection:GOGGLES
Other Protective Equipment:BARRIER CREAMS, ARPONS, OVERALLS TO AVOID CONTACT
Work Hygienic Practices:OBSERVE CONDITIONS OF GOOD INDUSTRIAL HYGIENE - NO EATING, SMOKING OR DRINKING.
Supplemental Safety and Health
NO DATA PROVIDED BY MANUFACTURER

========== Physical/Chemical Properties ==========

HCC:N1
Boiling Pt:=100.C, 212.F
Melt/Freeze Pt:=.3C, 32.5F
M.P/F.P Text:FREEZING POINT
Vapor Pres:NA
Vapor Density:NA
Spec Gravity:1.052 (H2O=1)
Evaporation Rate & Reference:1.2 (WATER=1)
Solubility in Water:INFINITE (COMPLETELY MISC
Appearance and Odor:BLUISH TRANSPARENT LIQUID - SLIGHTLY PUNGENT ODOR

========== Stability and Reactivity Data ==========

Stability Indicator/Materials to Avoid:YES
METALLIC SURFACES FOR PROLONGED TIME PERIODS (PH 5)
Stability Condition to Avoid:METAL NITRATES
Hazardous Decomposition Products:NO DATA PROVIDED BY MANUFACTURER
Conditions to Avoid Polymerization:WILL NOT OCCUR

========== Toxicological Information ==========

Toxicological Information:NO DATA PROVIDED BY MANUFACTURER

========== Ecological Information ==========

Ecological:NO DATA PROVIDED BY MANUFACTURER

========== Disposal Considerations ==========

Waste Disposal Methods:PLACE IN APPROPRIATE DISPOSAL FACILITY IN COMPLIANCE WITH FEDERAL, STATE AND LOCAL REGULATIONS

========== MSDS Transport Information ==========

Transport Information:NO DATA PROVIDED BY MANUFACTURER

========== Regulatory Information ==========

SARA Title III Information:NO DATA PROVIDED BY MANUFACTURER
Federal Regulatory Information:NO DATA PROVIDED BY MANUFACTURER
State Regulatory Information:NO DATA PROVIDED BY MANUFACTURER

========== Other Information ==========

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MATERIAL SAFETY DATA SHEET

EAGLE – PICHER MINERALS, INC.

DATE ISSUED: November 18, 1985	DATE REVISED: July 1, 2001	REVISION NO: 8

SECTION I: MATERIAL IDENTIFICATION AND USE

MATERIAL NAME: Solid-A-Sorb I and Solid-A-Sorb ii	
MANUFACTURER'S NAME: Eagle-Picher Minerals, Inc.	
STREET ADDRESS: 9785 Gateway Drive, Suite 1000	
CITY: Reno STATE: Nevada ZIP: 89511	
EMERGENCY TELEPHONE NO: (775) 824-7600	CHEMICAL FORMULA: SiO2
CHEMICAL NAME: Diatomaceous Earth, Calcined	TRADE NAME: Solid-A-Sorb
CHEMICAL FAMILY: Silica	MATERIAL USE: Industrial Absorbent

NFPA: 0 / 1 / 0 / - (4-Extreme, 3-High, 2-Moderate, 1-Slight, 0-Insignificant)

HMIS: * Health; 0 Flammability; 0 Reactivity; E Protective Equipment; * REFER TO DATA ON MSDS

SECTION II: HAZARDOUS INGREDIENTS OF MATERIAL

INGREDIENT IDENTIFICATION	APPROXIMATE CONCENTRATION %	C.A.S. NUMBERS	OSHA PEL [ACGIH TLV]	LD50/ /LC 50 SPECIES AND ROUTE
Diatomaceous Earth, Calcined	100%	91053-39-3	See below	Not available
Crystalline Silica (Cristobalite)	< 1%	14464-46-1	0.05 mg/m3 [0.05 mg/m3]	Not available
Crystalline Silica (Quartz)	< 1%	14808-60-7	0.10 mg/m3 [0.10 mg/m3]	Not available

For sampling silica dusts refer to NIOSH Analytical Method 7500 or OSHA method ID 142

SECTION III: PHYSICAL DATA FOR MATERIAL

PHYSICAL STATE:	ODOR AND APPEARANCE:		SPECIFIC GRAVITY:	BOILING POINT:
Solid	Odorless, granular product, buff to off-white		2.2	Not Applicable
VAPOR PRESSURE (MM):	VAPOR DENSITY:	pH:	SOLUBILITY/WATER:	FREEZING POINT:
Not Applicable	Not applicable	7 (10% Slurry)	< 2%	Not Applicable

SECTION IV – FIRE AND EXPLOSION HAZARD OF MATERIAL

FLAMMABILITY: YES NO X IF YES, UNDER WHICH CONDITIONS

MEANS OF EXTINCTION:	SPECIAL PROCEDURES:
Not Applicable	Not Applicable

SECTION V – HEALTH HAZARDS

SUMMARY: Calcined diatomaceous earth (Kieselguhr) contains crystalline silica which is a known cause of silicosis, a progressive, sometimes fatal lung disease. In a 1997 monograph (Volume 68, "Silica, Some Silicates, Coal Dust and Para-Aramid Fibrils"), the International Agency of Research on Cancer (IARC) has classified "inhaled crystalline silica from occupational sources" in Group 1 as a substance "carcinogenic to humans." In making the overall evaluation, the IARC Working Group noted that carcinogenicity in humans was not detected in all industrial circumstances studied. Although the recent IARC determination was, in part, based on a 1992 study of diatomite workers, a 1996 follow up which was issued by the University of Washington and Tulane University was not available to the Working Group. The follow up study reported a Standardized Mortality Ration (SMR) of 2.01 for non-malignant respiratory disease (NMRD) and a SMR of 1.29 for lung cancer when compared to national and regional populations. This is a reduction of the levels reported in the 1992 report (SMR=2.59 for NMRD and SMR=1.43 for lung cancer.)

As noted in the 1992 study, relatively intense exposures to crystalline silica that occurred before the 1950s were probably the most important contributors in the excesses in NMRD and lung cancer. The 1996 report continues to support the conclusion that recent improvements in dust control in the industry appear to have abated any excess risk in silicosis or lung cancer in today's work environment. In 1997 a radiographic study was published by Tulane University researchers that reported X-ray opacities of the post-1950 hires that were "...consistent with the prevalences observed in many unexposed populations." These findings appear to be consistent with, and supportive, of current occupational exposure limits for cristobalite. A more detailed report discussing the IARC classification and the diatomite worker studies is available upon request.

MEDICAL CONDITIONS AGGRAVATED BY EXPOSURE

Pre-existing diseases of the upper respiratory tract and lung such as bronchitis, emphysema, and asthma

IMPORTANT HEALTH HAZARD DATA CONTINUES ON THE SECOND PAGE (BACK)

PAGE 2	MATERIAL NAME / IDENTIFIER: Solid-A-Sorb I and Solid-A-Sorb II

SECTION V – HEALTH HAZARDS CONT'D

ROUTE OF ENTRY: Inhalation (Chronic)	TARGET ORGANS: Lungs

EFFECTS OF ACUTE EXPOSURE TO PRODUCT: Upper respiratory irritant – May cause coughing or throat irritation.

EFFECTS OF CHRONIC EXPOSURE TO PRODUCT:

Inhalation of crystalline silica dust in excess of the Threshold Limit Value (TLV) recommended by the American Conference of Governmental Industrial Hygienists (ACGIH) or in excess of the Permissible Exposure Limit (PEL) established by OSHA over an extended number of years may cause silicosis, a progressive sometimes fatal lung disease. Although silicosis is a non-cancerous lung disease, a 1992 study conducted by the University of Washington on certain diatomite workers, and a 1996 follow-up to this study indicates that exposure to high concentrations of crystalline silica for many years may increase the potential risk of developing lung cancer. The 1996 follow-up study continues to support the findings of the 1992 study in that for those workers hired since 1960, no increase in lung cancer mortality risk was found. Consequently, maintenance of crystalline silica dust concentrations at or below levels specified by occupational standards setting agencies will minimize, if not eliminate, any potential excess risk of NMRD or lung cancer.

IARC - "Inhaled crystalline silica from occupational sources" – Group 1 – Carcinogenic to humans
NTP - "Silica, crystalline (respirable)" – "known to be a human carcinogen"
OSHA - Has not classified crystalline silica as a carcinogen

SECTION VI – REACTIVITY DATA

CHEMICAL STABILITY: YES X NO	INCOMPATIBILITY TO OTHER SUBSTANCES YES X NO IF YES, WHICH ONES? Hydrofluoric Acid, Hydrogenated vegetable oils Products containing Silica may react violently with Hydrofluoric Acid
REACTIVITY AND UNDER WHAT CONDITIONS: Not Applicable	HAZARDOUS DECOMPOSITION PRODUCTS: Not Applicable

SECTION VII – PRECAUTIONS FOR SAFE HANDLING AND USE

PERSONAL PROTECTIVE EQUIPMENT:

Respirators fitted with filters certified to standard 42CFR84 under series N95 should be worn when dust is present. If the dust concentration is less than ten (10) times the Permissible Exposure Limit (PEL) use a quarter or half-mask respirator with a N95 dust filter or a single use dust mask rated N95. If dust concentration is greater than ten (10) times and less than fifty (50) times the PEL, a full-face piece respirator fitted with replaceable N95 filters is recommended. If dust concentration is greater than fifty (50) and less than two hundred (200) times the PEL use a power air-purifying (positive pressure) respirator with a replaceable N95 filter. If dust concentration is greater than two hundred (200) times the PEL use a type C, supplied air respirator (continuous flow, positive pressure), with full face piece, hood or helmet.

GLOVES: Not normally necessary	RESPIRATORY: Note Above	EYE: Goggles to protect from dust
FOOTWEAR: Not necessary	CLOTHING: Not normally necessary	

ENGINEERING CONTROLS (E.G. VENTILATION, ENCLOSED PROCESS): Local – Control within recommended TLV/PEL. Refer to ACGIH publication "Industrial Ventilation" or similar publications for design of ventilation systems.

LEAK AND SPILL PROCEDURE: Vacuum clean spillage, wet sweep or wash away. Avoid creating dust.

WASTE DISPOSAL: Non-Biodegradable. Use solid waste disposal common to landfill type operations or in slurry to sumps. Not considered a hazardous waste under RCRA (40CFR Part 261).

HANDLING PROCEDURES: Avoid creating dust. Repair or properly dispose of broken bags.

STORAGE REQUIREMENTS: Store in a dry place to maintain product quality.

SPECIAL SHIPPING INSTRUCTIONS: None

SECTION VIII – FIRST AID MEASURES

SKIN: Not absorbed by the skin. May cause dryness. Use moisture renewing lotions if dryness occurs.

EYE: May cause irritation or inflammation. Wash with generous quantities of water. Consult physician if irritation persists.

INHALATION: Acute inhalation can cause dryness of the nasal passages and congestion of the upper respiratory tract. Remove to fresh air.

INGESTION: Short-term exposure not considered harmful. Drink generous amounts of water to reduce bulk and drying effects.

SECTION IX – PREPARATION DATE OF M.S.D.S.

PREPARED BY: Patrick T. Flynn, Jr.	TITLE: Director - Government Affairs
PHONE NUMBER: (775) 824-7650	DATE: July 1, 2001

SUPERIOR GRAPHITE

1. Chemical Product and Company Identification

Chemical Name: SLIP Plate Aerosol
Manufacturer: Superior Graphite
Address: 10 S. Riverside Plaza
Chicago IL 60606
Information Number: (312) 559-2999

2. Composition/Information on Ingredients

Hazardous Components	CAS#	OSHA PEL	ACGIH TLV	Other Limits	%
Graphite, Natural (as respirable dust)	7782-42-5	2.5 mg/m3	2.0 mg/m3	None	<10
Silica, Crystalline Quartz (as respirable dust)	14808-60-7	0.1 mg/m3	0.025 mg/m3	None	<0.1
Toluene	108-88-3	100 ppm	20 ppm	None	2.4%.
Acetone	67-64-1	1000 ppm	500 ppm	750 STEL	<45
VM&P Naphtha	6474249-0	300 ppm	247 ppm	None	5-15
Petroleum Distillate Blend	Blend			None	5-15
Heptane		400 ppm	400 ppm		
Methylcyclohexane		400 ppm	400 ppm		
Propane	74-98-6	1000 ppm	1000 ppm	None	<25

Notes:
Toluene is subject to the reporting requirements of section 313 of Sara Title III and of 40 CFR 372.Tests performed on natural graphite have shown respirable quartz dust levels ranging from 0% to 5%.

3. Hazards Identification

Route (s) of Entry:	Inhalation	Skin	Ingestion
	Yes	Yes	Yes

Health Hazards (acute and chronic): Eyes, skin and respiratory system irritant. Narcotic in high concentrations. Severe overexposure may cause damage to the blood. Reports have associated repeated and prolonged occupational exposure to solvents with permanent brain and nervous system and other internal organ damage.

Carcinogenicity:	NTP	IARC Monographs	OSHA Regulated
	Yes	Yes	No

Notes:
Silica as quartz; animal sufficient evidence, human sufficient evidence.

Signs and Symptoms of Exposure:
Inhalation: Respiratory irritation, dizziness, headache, nausea, fatigue, drowsiness, impaired coordination, central nervous system depression or heart arrhythmia.
Skin: Contact may dry the skin prolonged contact may cause irritation. Can not be easily absorbed through the skin. Solvent action can dry and defat the skin causing skin to crack, leading to dermatitis.
Eyes: Liquid or vapor can cause moderate to severe irritation.
Ingestion: Not a likely route of exposure.

Medical Conditions Generally Aggravated by Exposure: Liver and kidney disease, anemia, coronary disease or rhythm disorders of the heart.

4. First Aid Measures

Eyes: Flush thoroughly with water for 15 minutes. Get medical attention.
Skin: Wash exposed skin with soap and water. If irritation persists get medical attention. Launder severely contaminated clothing before reuse.
Ingestion: Do not induce vomiting. Get medical attention.
Inhalation: Remove to fresh air. Administer oxygen if needed. Apply artificial respiration if breathing has stopped. Get medical attention.

5. Fire Fighting Measures

Flash Point: (method)	Flammable Limits:	LEL:	UEL:
N/A		N/D	N/D

Extinguishing Media: Foam, carbon dioxide, dry chemical or water spray (fog).
Special Fire Fighting Procedures: Wear a NIOSH approved self contained breathing apparatus to fight a fire involving this material. Water spray may be ineffective. Water may be used to cool containers to prevent pressure build-up and explosion when exposed to extreme heat. If water is used, fog nozzles are preferred.
Unusual Fire and Explosion Hazards: Closed containers may explode from internal pressure build-up when exposed to extreme heat and discharge contents. Vapor accumulation can flash or explode if ignited. Overexposure to decomposition products may cause a health hazard. Symptoms may not be immediately apparent. Obtain medical attention.

NFPA Hazard Rating:

Health	Flammability	Reactivity
2	**4**	**0**

NFPA Notes:

6. Accidental Release Measures

Spill/Leak Procedures: Avoid breathing vapors. Ventilate area, remove all sources of ignition. Clean up area with

absorbent material and place in closed containers for disposal.

Dispose of in accordance with local, state and federal regulaitons.

7. Handling and Storage

Handling and Storage Precautions: Store and use in cool, dry, well-ventilated areas. Do not store above 120 F. Do not puncture or incinerate (burn) cans. Do not stick a pin, nail or any other sharp object into opening on top of can. Do not spray in eyes. Do not take internally. See product label for additional information. Small pressurized containers of flammable products may be stored in areas suitable for ordinary combustibles with respect to construction, drainage, control of ignition sources and ventilation except that they should not be stored in basements.
Work/Hygienic Practices: Follow good hygienic practice for solvent borne products. Use adequate ventilation. Wash hands and face after handling this product.

8. Exposure Controls/Personal Protection

Respiratory Protection (specify type): Use NIOSH/MSHA approved mask for chemical products if ACGIH, OSHA and/or TWA limits will be exceeded.

Local Exhaust	Mechanical (general)	Special	Other
Required	Required	None	None

Eye/Face Protection: Goggles, safety glasses or face shield. Eye wash station should be available.
Skin Protection: Chemical resistant gloves. Safety shower should be available.

9. Physical/Chemical Characteristics

Physical State:Liquid	Boiling Point:N/A
Appearance:Aerosol	Melting Point:N/A
Odor:Solvent	Vapor Pressure (mm Hg):N/A
Specific Gravity (H_2O=1):N/A	Vapor Density (air=1):N/A
Water Solubility:Slight	Evaporation Rate: N/A (Butyl Acetate = 1)

10. Stability and Reactivity

Stability: Material is stable.
Incompatibility (materials to avoid): Strong oxidizing agents, acids and alkalis.
Hazardous Decomposition Products: On burning, may release carbon dioxide and carbon monoxide.
Hazardous Polymerization: Will not occur.

11. Transportation Information

(VIA TRUCK)
Consumer Commodity, ORM-D (No flammable label needed)
(Box must be marked "Consumer Commodity, ORM-D")

(VIA AIR)

Aerosols, flammable (Class 2 Flammable Gas label)
Class 2.1 No Pkg. Group UN1950
Box must be marked "Aerosol, flammable, UN1950, LTD. QTY."
(Cover "Consumer Commodity, ORM-D" on pre-printed box)

(VIA OCEAN)
Aerosol (No flammable label needed)
Class 2 No Pkg. Group UN1950
Box must be marked "Aerosol, UN1950"
(Cover "Consumer Commodity ORM-D" on pre-printed box)

12. Other Information

Disclaimer: The information contained herein is based on data available. However, no warranty is expressed or implied regarding the accuracy of the data or the results obtained from the use thereof. Because the information contained herein may be applied under conditions beyond our control, we assume no responsibility for its use.

All components of this product are on the TSCA inventory.

Unk. = Unknown
N/A = Not applicable
Nav = Not available
N/D = Not determined
N/E = Not established
Prop. = Proprietary

Warning. This product contains chemicals known to the State of California to cause cancer and birth defects or other reproductive harm.

Prepared: Date 08/15/91
Revised: Date 01/28/2013

MATERIAL SAFETY DATA SHEET

"ESSENTIALLY SIMILAR" TO OSHA FORM 20

FORM 4040 (Rev. 9-90)

000001519

I. PRODUCT IDENTIFICATION

Pennwalt Product Name	Pennwalt Code No.
Zeniplex® 1 Grease	CS 2406

Chemical Name and Molecular Formula:

Emergency Phone — Business: (215) 225-7473 Other:

CAS No.(s):

MSDS # 01519

Synonyms: Grease

Chemical Family: Lubricant

II. HAZARDOUS INGREDIENTS

MATERIALS OR COMPONENTS	% w/w	HAZARD DATA (TLV, LD50, LC50, etc.)
Mineral Oils	85.0	TLV 5mg/m^3 (mist)
Organic Barium Salt (As BA)	< .5	TLV 0.5 mg/m^3

2060910781

III. SHIPPING INFORMATION

Petroleum Lubricant; Grease; O/T Axle Grease

IV. PHYSICAL PROPERTIES

Boiling Point/Range	Melting Point	Pour point	Molecular Weight (Calculated)
°C NA °F	°C ND. °F	°C -10 °F	Mixture

Specific Gravity (H_2O=1)	Vapor Pressure (mm Hg)	Vapor Density (Air=1)
ND @ / °C	@ °C °F	

Solubility in H_2O	% Volatiles by Volume	Evaporation Rate	Appearance and Odor
N.1	N.1	N.1 ☐ Ether = 1 ☐ Water = 1 ☐ Butylacetat = 1	Clear, Dark Amber Grease

Other:

V. FIRE AND EXPLOSION DATA

Flash Point	Test Method	Flammable Limits	Autoignition Temperature/Fire Point
°C 420 °F	COC	Lower % Upper %	°C

EXTINGUISHING MEDIA

☐ Water-spray ☒ Water-fog ☐ Water stream ☒ CO_2 ☒ Dry chemical ☐ Alcohol foam ☒ Foam ☐ Earth or sand

SPECIAL FIRE FIGHTING PROCEDURES

☐ Do not enter building ☐ Allow fire to burn ☒ Water may cause frothing ☐ Do not use water

UNUSUAL FIRE AND EXPLOSION HAZARDS

☐ Dust explosion hazard ☐ Sensitive to shock ☐ Contamination ☐ Temperature ☐ Other (specify):

VI. REACTIVITY DATA

STABILITY

☒ Stable ☐ Unstable

CONDITIONS CONTRIBUTING TO INSTABILITY

☐ Thermal decomposition ☐ Photo degradation ☐ Polymerization ☐ Contamination

INCOMPATIBILITY - Avoid contact with

☐ Strong acids ☐ Strong alkalis ☒ Strong oxidizers ☐ Other (specify):

HAZARDOUS DECOMPOSITION PRODUCTS - THERMAL AND OTHER (list)

Thermal - Oxides of Carbon

CONDITIONS TO AVOID

☐ Heat ☐ Open flames ☐ Sparks ☐ Ignition sources ☐ Other (specify):

VII. SPILL OR LEAK

STEPS TO BE TAKEN IF MATERIAL IS RELEASED OR SPILLED

☐ Flush with water ☒ Absorb with sand or inert material ☐ Neutralize ☐ Sweep or scoop up and remove ☐ Keep upwind. Evacuate enclosed spaces. ☐ Prevent spread of spill ☐ Dispose of immediately ☐ Other (specify):

WASTE DISPOSAL METHOD - *Consult federal, state, or local authorities for proper disposal procedures.*

CONTINUED ON

http://legacy.library.ucsf.edu/tid/rlg93c00/pdf

MSDS# 01579-2

Dermal (acute)

Eye

Inhalation (acute)

Chronic, Subchronic, etc.

HEALTH HAZARD INFORMATION

Effects of Exposure

PERMISSIBLE EXPOSURE LIMIT (Specify if TLV/TWA or Ceiling [c])

ACGIH 19___ | OSHA 19___ | Other:

IRRITATION
- Skin: ☐ Severe ☐ Moderate
- Eye: ☐ Severe ☐ Moderate ☒ Mild (transient)

CORROSIVITY
- Skin ☐ 4 hrs. (DOT) ☐ 24 hrs. (CPSC)
- Eye ☐ May cause blindness

SENSITIZATION: ☐ Skin ☐ Respiratory ☐ Allergen

INHALATION EFFECTS: ☐ Narcotic effect ☐ Cyanosis ☐ Asphyxiant

LUNG EFFECTS (Specify):

OTHER (Specify):
☐ Repeated contact-skin detatter ☐ Other (Specify):

Emergency First Aid

INGESTION: ☐ Induce vomiting ☒ Do NOT induce vomiting ☒ Give plenty of water ☒ Get medical attention ☐ Other (specify):

DERMAL: ☒ Flush with soap and water ☐ Get medical attention ☐ Contaminated clothing - remove & launder ☐ Contaminated shoes - destroy ☐ Other (specify):

EYE CONTACT: ☒ Flush with plenty of water for at least 15 minutes ☒ Get medical attention ☒ Other (specify): Hold eyelids open while flu

INHALATION: ☒ Remove to fresh air ☐ If not breathing, give artificial respiration ☐ Give oxygen ☐ Get medical attention ☐ Other (specify):

SPECIAL PROTECTION INFORMATION

VENTILATION REQUIREMENTS — *Always maintain exposure below permissible exposure limits*

☐ Consult an industrial hygienist or environmental health specialist ☒ Local exhaust ☐ Use with adequate ventilation ☐ Check for air contaminant and oxygen deficiency

☐ Other (specify):

EYE: ☐ Face shield ☒ Safety glasses ☐ Goggles

HAND (GLOVE TYPE): ☐ Polyvinyl chloride ☒ Neoprene ☒ Butyl rubber ☐ Natural rubber ☐ Polyvinyl alcohol ☐ Polyethylene ☐ Other (specify):

RESPIRATOR TYPE - *Use only NIOSH / MESA approved equipment*

☐ Self-contained ☐ Supplied air ☐ Can or cartridge gas or vapor ☒ Filter - dust, fume, mist ☐ Other (specify):

OTHER PROTECTIVE EQUIPMENT

☐ Rubber boots ☐ Apron ☐ Other (specify):

20609 10782

SPECIAL PRECAUTIONS

PRECAUTIONARY LABELING

☒ Wash thoroughly after handling ☒ Do not get in eyes, on skin or clothing ☐ Do not breathe dust, vapor, mist, gas ☐ Keep container closed ☐ Keep away from heat, sparks, and open flames ☐ Store in tight closed conta

☐ Do not store near combustibles ☐ Keep from contact with clothing and other combustible materials ☐ Empty container may contain hazardous residues ☐ Use explosion proof equipment ☐ Other (specify):

Other handling and storage conditions

Minimum contact with this and all chemicals is recommended as a good general policy to follow.

Prepared by	Date	Address	Phone
George Arbocus	1/01/84	21st & Lippencott Sts	225-7472

PLEASE READ "The above information is accurate to the best of our knowledge. However, since data, safety standards, and government regulations are subject to change and the conditions of handling and use, or misuse are beyond our control, Pennwalt MAKES NO WARRANTY, EITHER EXPRESS OR IMPLIED, AS TO THE COMPLETENESS OR CONTINUING ACCURACY OF THE INFORMATION CONTAINED HEREIN and assumes no responsibility in connection therewith. It is the user's obligation to investigate and obtain all current data relevant to the particular use or uses contemplated by him."

http://legacy.library.ucsf.edu/tid/rlg93c00/pdf

1. IDENTIFICATION OF THE SUBSTANCE/PREPERATION AND THE COMPANY

Product Name: N910
Company: Nochar, Inc.
8650 Commerce Park Place
Suite K
Indianapolis, IN 46268

Telephone: 317-613-3046
Telefax: 317-613-3052
E-mail: nochar@nochar.com

Emergency Information: 765-938-3333

Product Use: Solidification of hazardous and non-hazardous hydrocarbon liquids

2. COMPOSITION/INFORMATION ON INGREDIENTS

Identification of the Preparation: Thermoplastic Elastomer Polymer

3. HAZARDS IDENTIFICATION

Human Health Hazards: None
Environmental Hazards: None
Safety Hazards: Electrostatic charges may be generated during handling. Risk of self-ignition of bulk product above certain temperatures (Refer to Section 10) dust explosion could occur.

Special Notes: These components are synthetic rubber compounds, which are essentially nontoxic. Material is non-irritating. If polymer dusts are generated, they could scratch the eyes and cause minor irritation to the respiratory tract.

4. FIRST AID MEASURES

Inhalation: If dust is inhaled, obtain medical attention.
Skin Contact: Wash off immediately with soap and plenty of water. In case of persistent skin irritation, consult a physician.
Eye Contact: Rinse thoroughly with plenty of water, also under the eyelids. In case of persistent eye irritation consult a physician.
Ingestion: None.
Advice to Physician: Treat symptoms.

5. FIRE-FIGHTING MEASURES

NFPA 704 Hazard Class: Health: 0 Flammability: 1 Instability: 0
Unsuitable Extinguishing Media: Water in spray may disperse fire.
Extinguishing Media: Foam, water spray or fog. Dry chemical powder, carbon dioxide, sand or earth may be used for small fires only.
Specific Hazards: Not flammable but will burn. Combustion products may include carbon monoxide and carbon dioxide.
Special Protective Equipment for Firefighters: Full protective clothing and self contained breathing apparatus.

6. ACCIDENTAL RELEASE MEASURES

Personal Precautions: Avoid generating dust.

Environmental Precautions: None.

Methods for Cleaning Up: Clean up promptly by scoop or vacuum. Keep in suitable, closed containers for disposal as required by local, state, federal, international or country specific regulations.

7. HANDLING AND STORAGE

Safe Handling Advice: Avoid generation of dust. Take precautionary measures against static discharges, earth/ground all equipment. Do not breathe dust. Use local exhaust over processing area. When processing N910 products, maintain a fire watch if the material reaches 225 deg. C (536 deg. F)
Storage: Keep in a dry, cool place. Avoid storage under pressure or at elevated temperatures to minimize particulate clustering.
Storage Temperature: Ambient
Product Transfer: Take precautionary measures against static discharge. Earth/Ground all equipment.

8. EXPOSURE CONTROLS / PERSONAL PROTECTION

Engineering Measures: Use local exhaust ventilation.
Nuisance Dust TLV: TWA (8 h) 10 mg/m^3 if dust is generated.
Personal Protective Equipment:

Respiratory Protection: In case of insufficient ventilation wear suitable respiratory equipment.
Hand Protection: Cloth gloves are recommended.
Eye Protection: Safety glasses with side shields. Do not wear contact lenses where this product is used.
Skin and Body Protection: No special protective clothing required.

9. PHYSICAL AND CHEMICAL PROPERIES

Form: Solid

Color: White

Odor: Essentially odorless

Flash Point: None

Specific Gravity: ≤ 1

Auto Ignition Temperature: Does not ignite.

Bulk Density (for solids): Typical 300-400 kg/m³ at 20 Deg. C

Loose Density: Approximately 18 lbs per cu.ft.

Water Solubility: Insoluble

10. STABILITY AND REACTIVITY

Stability: Stable under ambient conditions.

Materials to Avoid: Oxidizing agents may cause exothermic reactions.

Hazardous Decomposition Products: Thermal decomposition may produce Carbon oxides (COx)

11. TOXICOLOGICAL INFORMATION

Acute Toxicity

Oral: Expected to be of low toxicity. LD50≥ 2000 mg/kg.
Dermal: Expected to be of low toxicity. LD50≥ 2000 mg/kg.
Inhalation: The product is not expected to be toxic by inhalation.

Irritation

Skin: Not expected to be irritating.
Eyes: Not expected to be irritating.
Sensitization: Not sensitizing
Mutagenicity: No data available, but not expected. This product is not classified by the following: The International Agency for Research on Cancer (IARC), The National Toxicology Program (NTP) or The American Conference of Governmental Industrial Hygienists (ACGIH).

12. ECOLOGICAL INFORMATION

Mobility: Floats on water. Remains on surface of soil.

Aquatic Toxicity

Toxicity to Fish: Expected to be non toxic. LC/EC/IC 50 ≥ 1000 mg/l.
Toxicity to Invertebrates: Expected to be non toxic. LC/EC/IC 50 ≥ 1000 mg/l.
Toxicity to Algae: Expected to be non toxic. LC/EC/IC 50 ≥ 1000 mg/l.
Toxicity to Bacteria: Expected to be non toxic. LC/EC/IC 50 ≥ 1000 mg/l.
Sewage Treatment: Expected to be non toxic. LC/EC/IC 50 ≥ 1000 mg/l.

13. DISPOSAL CONSIDERATIONS

Waste from Residues / Unused Products: In accordance with Federal, State, local and national regulations.

Contaminated Packaging: Can be land filled or incinerated, when in compliance with local regulations.

14. TRANSPORT INFORMATION

Not classified as dangerous in the meaning of transport regulations. **DOT, IMDG/IMO, ICAO/IATA. UN, IMO, ADR/RID, ICAO CODE**

Harmonized Tariff System (HTS): 3901.90

Export Administration Regulations: Does not require a license EAR 99

15. REGULATORY INFORMATION

This product is not classified as dangerous and need not to be labeled according to EC-DIRECTIVES as amended.

International Inventories:

European Union (EINECS/ELINCS); All components of this product are either listed on the inventory or are exempt from listing.
USA (TSCA): All components of this product are either listed on the inventory or are exempt from listing.
Canada (DSL): All components of this product are either listed on the inventory or are exempt from listing.
Australia (AICS): All components of this product are either listed on the inventory or are exempt from listing.
CHINA (IECSC): All components of this product are either listed on the inventory or are exempt from listing.
JAPAN (IENCS): All components of this product are either listed on the inventory or are exempt from listing.

KOREA (KECI): All components of this product are either listed on the inventory or are exempt from listing.
NEW ZEALAND (NZIOC): All components of this product are either listed on the inventory or are exempt from listing.

This document is compliant with the Globally Harmonized System (GHS) for the classification, labeling, and packaging (CLP) of substances and mixtures.

EU Reach Article 29 (Requirements for Safety Data Sheets) and Japan Ministry of Economy, Trade, and Industry (METI), Ministry of Health, Labor, and Welfare (MHLW) and Ministry of the Environment (MOE).

EU Regulation (EC) 1907/2006 REACH: Polymers are exempted from registration and evaluation. Therefore Nochar Products are exempted by regulation. Annex V exempts from registration additives used in our polymers as antioxidants, defoaming agents, stabilizers, etc.,
EU Directive 94/62/EC Hazardous Waste: Not regulated
EU Directive 94/62/EC as amended by **2004/12/EC (Packaging and packaging waste):** Not regulated, The product meets the requirement for the total amount of cadmium, chromium, lead and mercury to be less than 100 parts per million.
EU Directive 2000/53/EC as amended in **2002 (End of life vehicle):** Not regulated
EU Directive 2037/2000 Ozone Depleters (Class I or II) as defined in Montreal Protocol: Not regulated
UNITED STATES: FEDURAL REGULATIONS
Toxic Substances Control Act (TSCA) Section 4,5(a)(2), (e),(f), 6,7 or 12(b): Not regulated
Clean Air Act Amendments Section 602 (Class I or II) Ozone Depleters: Not regulated
Clean Air Act Section 111 Volatile Organic Compounds (VOC): Not regulated
Clean Air Act 112 Hazardous Air Pollutants (HAP): Not regulated
Clean Water Act Section 307 Priority Pollutants: Not regulated
UNITED STATES: STATES REGULATIONS
Right-to-Know Laws (Massachusetts, New Jersey, New York State, Pennsylvania): Not regulated
Coalition of Northeastern Governors (CONEG): Not regulated. The product meets the requirement for the total amount of cadmium, chromium, lead and mercury to be less than 100 parts per million.

16. OTHER INFORMATION:

This information contained herein is based on the data available to us and is believed to be correct. However, the manufacturer makes no warranty, expressed or implied regarding the accuracy of this data or the results to be obtained from the use thereof, and assumes no responsibility for injury from the use of the product described herein. The manufacturer assumes no liability for incidental, consequential or direct damage of any manner or kind, regardless of cause, including negligence.

MATERIAL SAFETY DATA SHEET (SDS)
NOCHAR'S N965 TRADE SECRET

1. IDENTIFICATION OF THE SUBSTANCE/PREPERATION AND THE COMPANY

Product name N965

Company:
Nochar, Inc.
8650 Commerce Park Place
Suite K
Indianapolis, IN 46268

Telephone: 317-613-3046
Telefax: 317-613-3052
E-mail: nochar@nochar.com

Emergency Information: 765-938-3333

Product Use: Solidification of Hazardous and non Hazardous Liquids

2. COMPOSITION/INFORMATION ON INGREDIENTS

Identification of the Preparation: Thermoplastic Elastomer, Co- Polymer of Acrylamide

3. HAZARDS IDENTIFICATION

Human Health Hazards: None
Environmental Hazards: None
Safety Hazards: Electrostatic charges ma be generated during handling. Risk of self-ignition of bulk product above certain temperatures (Refer to section 10) dust explosion could occur.

Special Notes: These components are synthetic rubber compounds, which are essentially nontoxic. Material is non-irritating. If polymer dusts are generated, they could scratch the eyes and cause minor irritation to the respiratory tract. Product swells in water

4. FIRST AID MEASURES

Inhalation: If dust is inhaled, obtain medical attention.
Skin Contact: Wash off immediately with soap and plenty of water. In case of persistent skin irritation, consult a physician.
Eye Contact: Rinse thoroughly with plenty of water, also under the eyelids. In case of persistent eye irritation consult a physician.
Ingestion: None. The product is not considered toxic based on studies on laboratory animals.
Advice to Physician: Treat symptoms.

5. FIRE-FIGHTING MEASURES

NFPA 704 Hazard Class:
Health 0, Flammability: 1 Instability: 0
Unsuitable Extinguishing Media: Water in spray may disperse fire.
Extinguishing Media: Foam, water spray or fog. Dry chemical powder, carbon dioxide, sand or earth may be used for small fires only.
Specific Hazards: Not flammable but will burn. Combustion products may include carbon monoxide and carbon dioxide.
Special Protective Equipment for Firefighters: Full protective clothing and self contained breathing apparatus.
Precautions: The product when wet renders surfaces extremely slippery. The product swells in water.

6. ACCIDENTAL RELEASE MEASURES

Personal Precautions: Avoid generating dust.

Environmental Precautions: None

Methods for Cleaning Up: Clean up promptly by scoop or vacuum, Keep in suitable, closed containers for disposal as required by local, state, federal, international or country specific regulations.

7. HANDLING AND STORAGE

Safe Handling Advice: Avoid generation of dust. Take precautionary measures against static discharges, earth/ground all equipment. Do not breathe dust. Use local exhaust over processing area. When processing N965 products, maintain a fire watch if the material reaches 225 deg, C (437deg. F)
Storage: Keep in a dry, cool place (0 - 35° C). Avoid storage under pressure or at elevated temperatures to minimize particulate clustering.
Storage Temperature. Ambient
Product Transfer: Take precautionary measures against static discharge. Earth/Ground all equipment.

8. EXPOSURE CONTROLS / PERSONAL PROTECTION

Engineering Measures: Use local exhaust ventilation.
Nuisance Dust TLV: TWA (8 h) 10 mg/m³ if dust is generated.
Personal Protective Equipment:
Respiratory Protection: In case of insufficient ventilation wear suitable respiratory equipment.
Hand Protection: Cloth gloves are recommended.

Eye Protection: Safety glasses with side shields. Do not wear contact lenses where this product is used.
Skin and Body Protection: No special protective clothing required.
Hygiene Measures: Wash hands before breaks and at end of workday. Handle in accordance with good industrial hygiene and safety practice.

9. PHYSICAL AND CHEMICAL PROPERIES

Form: Granular solid

Color: White

Odor: Essentially odorless

Flash Point: None

Specific Gravity: ≤ 1 (.91)

Auto Ignition Temperature: Does not ignite.

Loose Density: Approximately 21 lbs per cu.ft.

Water Solubility: Insoluble

10. STABILITY AND REACTIVITY

Stability: Stable under ambient conditions.

Materials to Avoid: Oxidizing agents may cause exothermic reactions. Product swells with water.

Hazardous Decomposition Products: Thermal decomposition may produce hydrogen cyanide (hydrocyanic acid), nitrogen oxides (NOx), Carbon oxides (COx)

11. TOXICOLOGICAL INFORMATION

Acute Toxicity

Oral: Expected to be of low toxicity. LD50≥ 2000 mg/kg.
Dermal: Expected to be of low toxicity. LD50≥ 2000 mg/kg.
Inhalation: The product is not expected to be toxic by inhalation.

Irritation

Skin: Not expected to be irritating.
Eyes: Not expected to be irritating.

Sensitization: Not sensitizing
Repeated Dose Toxicity: Repeated exposure does not cause toxic effects.
Mutagenicity: No data available, but not expected. This product is not classified by the following: The International Agency for Research on Cancer (IARC), The National Toxicology Program (NTP) or The American Conference of Governmental Industrial Hygienists (ACGIH).

12. ECOLOGICAL INFORMATION

Mobility: Floats on water. Remains on surface of soil.
Persistence/Degradability: Not expected to be inherently biodegradable.
Aquatic Toxicity
Toxicity to Fish: Expected to be non toxic. LC/EC/IC 50 $\geq$ 1000 mg/l.
Toxicity to Invertebrates: Expected to be non toxic. LC/EC/IC 50 $\geq$ 1000 mg/l.
Toxicity to Algae: Expected to be non toxic. LC/EC/IC 50 $\geq$ 1000 mg/l.
Toxicity to Bacteria: Expected to be non toxic. LC/EC/IC 50 $\geq$ 1000 mg/l.
Sewage Treatment: Expected to be non toxic. LC/EC/IC 50 $\geq$ 1000 mg/l.

13. DISPOSAL CONSIDERATIONS

Waste from Residues / Unused Products: In accordance with Federal, State, local and national regulations.

Contaminated Packaging: Can be land filled or incinerated, when in compliance with local regulations

14. TRANSPORT INFORMATION

.Not classified as dangerous in the meaning of transport regulations. **DOT, IMDG/IMO, ICAO/IATA. UN, IMO, ADR/RID, ICAO CODE**

Harmonized Tariff System (HTS): 4002.19

Export Administration Regulations: Does not require a license EAR 99

15 REGULATORY INFORMATION

This product is not classified as dangerous and need not to be labeled according to EC-DIRECTIVES as amended.

International Inventories:

European Union (EINECS/ELINCS); Existing polymer according to the definition in the 7th Amendment to Directive 67/548/EEC/ All starting materials and additives are listed in EINECS.

USA (TSCA): Complies with all applicable rules and orders under TSCA.

16. OTHER INFORMATION:

Further Information.

This MSDS was prepared in accordance with the following:

Council Directive 92/32/EEC of 30 April 1992 amending for the seventh time Directive 67/548/EEC on the approximation of the laws, regulations and administrative provisions relating to the classification, packaging and labeling of dangerous substances and all subsequent adaptations to technical progress.

Directive 1999/45/EC of the European Parliament and of the Council of 31 May 1999 concerning the approximation of the laws, regulations and administrative provisions of the Member States relating to the classification, packaging and labeling of dangerous preparations.

Commission Directive 2001/58/EC of 27 July 2001 amending for the second time Directive 91/155/EEC defining and laying down the detailed arrangements for the system of specific information relating to dangerous preparations in implementation of Article 14 of European Parliament and Council Directive 1999/45/EC and relating to dangerous substances in implementation of Article 27 of Council Directive 67/548/EEC and relating to dangerous substances in implementation of Article 27 of Council Directive 67/548/EEC (Safety Data Sheets).

ISO 11014-1: Material Safety Data Sheet for Chemical Products.

This information contained herein is based on the data available to us and is believed to be correct. However, the manufacturer makes no warranty, expressed or implied regarding the accuracy of this data or the results to be obtained from the use thereof, and assumes no responsibility for injury from the use of the product described herein. The manufacturer assumes no liability for incidental, consequential or direct damage of any manner or kind, regardless of cause, including negligence.

Material Safety Data Sheet: **Simple Green® All-Purpose Cleaner and Simple Green® Scrubbing Pad**
Version No. 13005-12B Date of Issue: February 2012 *ANSI-Z400.1-2003 Format*

Section 1: PRODUCT & COMPANY IDENTIFICATION

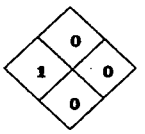
Product Name: Simple Green® All-Purpose Cleaner
Additional Names: Simple Green® Concentrated Cleaner Degreaser Deodorizer
Simple Green® Scrubbing Pad (Fluid in pad only)

Manufacturer's Part Number: **Please refer to page 4*

Company: Sunshine Makers, Inc.
15922 Pacific Coast Highway
Huntington Beach, CA 92649 USA
Telephone: 800-228-0709 • 562-795-6000 Fax: 562-592-3830
Emergency Phone: Chem-Tel 24-Hour Emergency Service: 800-255-3924

Section 2: HAZARDS IDENTIFICATION

Emergency Overview: **CAUTION. Irritant. This is a Green colored liquid with a sassafras added odor. Scrubbing pad is a green fibrous rectangle infused with Simple Green Cleaner.**



NFPA/HMIS Rating:
Health = 1 = slight
Fire, Reactivity, and Special = 0 = minimal

Potential Health Effects

Eye Contact: Mildly irritating.
Skin Contact: No adverse effects expected under typical use conditions. Prolonged exposure may cause dryness. Chemically sensitive individuals may experience mild irritation.
Ingestion: May cause stomach or intestinal irritation if swallowed.
Inhalation: No adverse effects expected under typical use conditions. Adequate ventilation should be present for prolonged usage in small enclosed areas.

Section 3: COMPOSITION/INFORMATION ON INGREDIENTS

Ingredient	CAS Number	Percent Range
Water	7732-18-5	≥ 78%
2-butoxyethanol	111-76-2	≤ 5%
Ethoxylated Alcohol	68439-46-3	≤ 5%
Tetrapotassium Pyrophosphate	7320-34-5	≤ 5%
Sodium Citrate	68-04-2	≤ 5%
Fragrance	Proprietary Mixture	≤ 1%
Colorant	Proprietary Mixture	≤ 1%

Section 4: FIRST AID MEASURES

If Inhaled: If adverse effect occurs, move to fresh air.
If on skin: If adverse effect occurs, rinse skin with water.
If in eyes: Flush with plenty of water. After 5 minutes of flushing, remove contact lenses, if present. Continue flushing for at least 10 more minutes. If irritation persists seek medical attention.
If ingested: Drink plenty of water to dilute.

Section 5: FIRE FIGHTING MEASURES

This formula is stable, non-flammable, and will not burn. No special procedures necessary

Flammability: Non-flammable
Flash Point: Non-flammable

Suitable Extinguishing Media: Use Dry chemical, CO2, water spray or "alcohol" foam.
Extinguishing Media to Avoid High volume jet water.
Special Exposure Hazards: In event of fire created carbon oxides, oxides of phosphorus may be formed.
Special Protective Equipment: Wear positive pressure self-contained breathing apparatus; Wear full protective clothing.

Section 6: ACCIDENTAL RELEASE MEASURES

Personal Precautions: See section 8 – personal protection.

Environmental Precautions: Do not allow into open waterways and ground water systems.

Method for Clean Up: Dilute with water and rinse into sanitary sewer system or soak up with inert absorbent material.

Section 7: HANDLING AND STORAGE

Handling: Keep container tightly closed. Ensure adequate ventilation. Keep out of reach of children.

Storage: Keep in cool dry area.

Section 8: EXPOSURE CONTROLS / PERSONAL PROTECTION

Exposure Limit Values:	OSHA PEL	ACGIH TLV
2-butoxyethanol	TWA 50 ppm (240 mg/m^3)	20 ppm (97 mg/m^3)
Tetrapotassium Pyrophosphate		5 mg/m^3

Exposure Controls:
Eye Contact: Use protective glasses if splashing or spray-back is likely.
Respiratory: Use in well ventilated areas.
Skin Contact: Prolonged exposure or dermal sensitive individuals should use protective gloves.

Section 9: PHYSICAL AND CHEMICAL PROPERTIES

Appearance:	Green Liquid	**Vapor Pressure:**		18 mmHg @20°C; 23.5 mmHg @26°C
Odor:	Added Sassafras odor	**Density:**		8.5 lb/gal;
Specific Gravity:	1.010 ± 0.010	**Water Solubility:**		100%
pH:	9.5 ± 0.5	**VOC composite Partial Pressure:**		TBD
Boiling Point:	~210°F (98 °C)	**VOC:**	CARB Method 310	3.8%
Freezing Point:	~ 32°F (0 °C)		SCAQMD Method 313	2.8%
Nutrient Content:	Phosphorous: 0.28% Chloride: ~110 ppm	Sulfur: ~180 ppm Fluorine: ~90 ppm		

Section 10: STABILITY AND REACTIVITY

Stability:	Stable
Materials to Avoid:	None known
Hazardous Decomposition Products:	Normal products of combustion - CO, CO2; Oxides of Phosphorous may occur.

Section 11: TOXICOLOGICAL INFORMATION

Acute Toxicity: Oral LD_{50} (rat) > 5 g/kg body weight
Dermal LD_{50} (rabbit) > 5 g/kg body weight
Toxicity calculated from ingredients using OECD SERIES ON TESTING AND ASSESSMENT Number 33

Carcinogens: No ingredients are listed by OSHA, IARC, or NTP as known or suspected carcinogens.

Section 12: ECOLOGICAL INFORMATION

Hazard to wild mammals:	Low, based on toxicology profile
Hazard to avian species:	Low, based on toxicology profile
Hazard to aquatic organisms:	Low, based on toxicology profile
Chemical Fate Information:	Readily Biodegradable per OECD 301D, Closed Bottle Test

Section 13: DISPOSAL CONSIDERATIONS

Appropriate Method for Disposal:

Unused Product:	*Dilute with water to use concentration and dispose by sanitary sewer.
Used Product:	*This product can enter into clarifiers and oil/water separators. Used product may be hazardous depending on the cleaning application and resulting contaminants.
Empty Containers:	*Triple-rinse with water and offer for recycling if available in your area. Otherwise, dispose as non-hazardous waste.

*Dispose of used or unused product, and empty containers in accordance with the local, State, Provincial, and Federal regulations for your location. Never dispose of used degreasing rinsates into lakes, streams, and open bodies of water or storm drains.

Section 14: TRANSPORT INFORMATION

U.S. Department of Transportation (DOT) / Canadian TDG: Not Regulated

IMO / IDMG:	Not classified as Dangerous
ICAO/ IATA:	Not classified as Dangerous
ADR/RID:	Not classified as Dangerous

U.N. Number	Not Required	Proper Shipping Name:	Detergent Solution
Hazard Class:	Non-Hazardous	Marine Pollutant:	No

Section 15: REGULATORY INFORMATION

All components are listed on: EINECS, TSCA, DSL and AICS Inventory.
No components listed under: Clean Air Act Section 112; Clean Water Act 307 & 311

SARA Title III: 2-butoxyethanol is subject to the reporting requirements of Section 313 of Title III of the Superfund Amendments and Reauthorization Act of 1986 as Category N230 – Certain Glycol Ethers.

RCRA Status: Not a hazardous waste CERCLA Status: No components listed

State Right To Know Lists

2-butoxyethanol Illinois, Massachusetts, New Jersey, Pennsylvania, Rhode Island

WHMIS Classification – Category D, subcategory 2B, eye irritant

Name	Toxic Substances List – Schedule 1 – CEPA (Canadian Environmental Protection Act)	NPRI Inventory
2-butoxyethanol	Yes	No

This product has been classified according to the hazard criteria of the CPR and the MSDS contains all the information required by Canada's Controlled Products Regulation.

Section 16: OTHER INFORMATION

Questions about the information found on this MSDS should be directed to:
SUNSHINE MAKERS, INC. – TECHNICAL DEPARTMENT
15922 Pacific Coast Hwy. Huntington Beach, CA 92649
Phone: 800/228-0709 [8am-5pm Pacific time, Mon-Fri] *Fax:* 562/592-3830 *Email:* infoweb@simplegreen.com

CAGE CODE 1Z575
GSA/FSS - CONTRACT NO. GS-07F-0065J
Scrubbing Pad GSA/BPA - CONTRACT NO. GS-07F-BSIMP
National Stock Numbers & Industrial Part Numbers:

	Part Number	NSN	Size
Simple Green	13012	7930-01-342-5315	24 oz spray (12/case)
	13005	7930-01-306-8369	1 Gallon (6/case)
	13006	7930-01-342-5316	5 Gallon
	13016	7930-01-342-5317	15 Gallon
	13008	7930-01-342-4145	55 Gallon
	13103	N/A	2oz samples
	13225	N/A	2.5 Gallon
	13275	N/A	275 Gallon tote
	48049	N/A	1 Gallon Conc. w/ 32oz dilution
Scrubbing Pad	10224	7930-01-346-9148	Each (24/case)

Retail Numbers:

Part Number	Size
13002	16 oz Trigger (12/case)
13005	1 Gallon (6/case)
13013	24 oz Trigger (12/case)
13014	67 oz / 2 L (6/case)
13033	32 oz Trigger (12/case)
80007	Tier display holding 13005 (36/Tier)

part number is for both industrial and retail

****International Part Numbers May Differ.**

DISCLAIMER: The information provided with this MSDS is furnished in good faith and without warranty of any kind. Personnel handling this material must make independent determinations of the suitability and completeness of information from all sources to assure proper use and disposal of this material and the safety and health of employees and customers. Sunshine Makers, Inc. assumes no additional liability or responsibility resulting from the use of, or reliance on this information.

The Procter & Gamble Company
P&G Household Care
Fabric & Home Care Innovation Center
5299 Spring Grove Avenue
Cincinnati, OH 45217-1087

MATERIAL SAFETY DATA SHEET

MSDS #: RQ0814307 Issue Date: 09/2011
Supersedes: RQ0810303 Issue Date: 07/2008

SECTION I - PRODUCT IDENTIFICATION

Identity: **Liquid Floor Cleaner on Pre-moistened Cloth** **Finished Product**
Brands: **Swiffer Wet (Open Window, Citrus & Light, Lavender Vanilla & Comfort)**

P&G Telephone Number: 1-800-214-8734or call Local Poison Control Center or your physician.
Emergency (24 hour) Telephone Number: CHEMTREC 1-800-424-9300 U.S. and Canada, or 1-703-527-3887 - for calls originating elsewhere.

SECTION II - HAZARDS IDENTIFICATION

Potential Health Hazards (Acute and Chronic): (See Section 11 for more information)
Ingestion: This product is expected to have a low order of toxicity. Oral ingestion may result in gastrointestinal irritation with transient nausea, vomiting or diarrhea.
Eye Contact: This product may be slightly irritating to eyes. Exposure to eyes may cause transient superficial effects similar to those produced by mild soap.
Skin Contact: This product may be slightly irritating to skin. Use on irritated or extremely dry skin may aggravate the existing condition.
Inhalation: This product is expected to have a low order of toxicity.
Signs and Symptoms of Exposure:
Ingestion: Ingestion of moistened sheet by a young child or household pet may lead to impaction of the gastrointestinal tract. A physician or veterinarian should be consulted.
Eye Contact: No irritation expected.
Skin Contact: No irritation expected.
Inhalation: N/A
Medical Conditions Generally Known to be Aggravated by Exposure: N/A
Potential Environmental Effects: (See Section 12 for more information)

SECTION III - COMPOSITION AND INGREDIENTS

Hazardous Ingredients as defined by OSHA, 29 CFR 1910.1200. and/or WHMIS under the HPA:

Chemical Name	Common Name	CAS No.	Composition Range	LD50/LC50
None				

SECTION IV – FIRST AID INFORMATION

First Aid Procedures:

Ingestion: Dilute ingested product with fluids (water or milk). If gastric irritation or other signs of toxicity develop, consult a physician and treat symptomatically

Eye Contact: Hold eyelids open and flush thoroughly with water. If irritation persists, consult a physician.

Skin Contact: Rinse affected area thoroughly with water. Apply a cold compress to relieve the symptoms of irritation. If irritation persists, consult a physician.

Inhalation: Move to an open area away from the site of exposure. If respiratory irritation is present, consult a physician and treat symptomatically.

Note to Physician: (if applicable) Treat symptomatically

Other: Consumer product package has the following precautionary statement: AVOID ACCIDENTS: KEEP OUT OF REACH OF CHILDREN AND PETS TO AVOID ACCIDENTAL INGESTION. In case of eye contact or prolonged exposure to skin, flush with water to reduce irritation. If irritation persists, call a physician. Avoid exerting excessive pressure on mop pole as breakage may occur.

SECTION V - FIRE FIGHTING INFORMATION

Flash Point (Method Used): N/K

Flammable Properties:
Upper Flammable Limit: N/A
Lower Flammable Limit: N/A

Explosive Limits: **UEL:** N/A **LEL:** N/A

Auto-ignition Temperature: N/K

Hazardous Combustion Products: N/K

Explosion Data (Sensitivity to Mechanical Impact): N/A
Explosion Data (Sensitivity to Static Discharge): N/A

Extinguishing Media:
Suitable: CO_2, water, foam or dry chemical may be used.
Unsuitable: N/K

Protection of Firefighters:
Specific Hazards Arising from the Material: Hazardous gases/vapors produced in fire are: aldehydes, ethanol, methanol, acetic acid, acetone, paraffin, and carbon monoxide.
Protective Equipment and Precautions for Firefighters: No unusual precautions necessary. Normal firefighting gear.

SECTION VI - ACCIDENTAL RELEASE MEASURES

Personal Precautions: None
Environmental Precautions: DISPOSAL IS TO BE PERFORMED IN COMPLIANCE WITH ALL FEDERAL, STATE/PROVINCIAL AND LOCAL REGULATIONS. Non-biodegradable. The sheets and/or dusters are compatible with all available solid waste disposal technologies.
Methods for Containment: N/A
Methods for Cleanup: N/A
Other Information: (if applicable) Dry product may be landfilled if permitted by local regulations. Discard empty container in trash.

SECTION VII – HANDLING AND STORAGE

Precautions To Be Taken in Handling: Store in a cool and dry area.
Precautions To Be Taken in Storage: None known.

SECTION VIII - EXPOSURE CONTROLS / PERSONAL PROTECTION

Exposure Guidelines: No special precautions for normal household use.
Engineering Controls: None required.
Personal Protective Equipment (PPE): None required with normal consumer use
Eye/Face Protection: None required with normal consumer use
Skin Protection: None required with normal consumer use
Respiratory Protection: None required with normal consumer use

SECTION IX - PHYSICAL AND CHEMICAL PROPERTIES

Appearance (color, physical form, shape): White/bluish-white in color; pre-moistened cloth.

Flash Point (Method Used): N/A

Reserve Alkalinity: N/A

Odor Threshold: N/A

Solubility in Water: (20°C) Insoluble

Physical State: Solid

Decomposition Temperature: N/A

Vapor Pressure (mm Hg): N/A

Evaporation Rate (nBuOAc=1): N/A

Vapor Density (Air=1): N/A

Specific Gravity (H2O=1): N/A

Boiling Point: 100°C

Melting/Freezing Point: N/A

Partition Coefficient (n-octanol/water): N/A

pH (specify % solution): N/A

Volatile Organic Compound (VOC): Not Applicable – Product not regulated for VOC content at State or Federal level.

SECTION X - STABILITY AND REACTIVITY

Chemical Stability: Stable
Conditions to Avoid: Open flame
Incompatible Materials: None Known
Hazardous Decomposition Products: None known
Possibility of Hazardous Reactions: None known

SECTION XI - TOXICOLOGICAL INFORMATION

Chronic Effects: Swiffer Wet Cloths are non-toxic
Target Organs: No target organs reported.
Carcinogenicity: This finished consumer product is not carcinogenic.
NTP: No
IARC: No
OSHA: No

SECTION XII - ECOLOGICAL INFORMATION

Containers as well as used and unused sheets are compatible with municipal solid waste system and they will not pose a hazard to the environment when the waste is properly handled.

SECTION XIII - DISPOSAL CONSIDERATIONS

Waste Disposal Method: DISPOSAL IS TO BE PERFORMED IN COMPLIANCE WITH FEDERAL, STATE/PROVINCIAL AND LOCAL REGULATIONS.

Non-Household Setting (US Federal): Products covered by this MSDS, in their original form, when disposed as waste, are considered non hazardous waste according to Federal RCRA regulations (40 CFR 261). Disposal should be in accordance with local, state and federal regulations.

Household Use: The sheets and dusters are compatible with all available solid waste technologies. Consumers may dispose with normal household waste.

SECTION XIV - TRANSPORT INFORMATION

Ground Transport (US DOT): Not regulated

Air Transport (IATA): Not regulated

Marine/Water Transport (IMDG): Not regulated

SECTION XV - REGULATORY INFORMATION

United States

All intentionally-added components of this product are listed on the US TSCA Inventory.
EPA Registration Number: Not Applicable

SARA 313/302/304/311/312 chemicals: None

California: This product Noen does not require warning labeling under California Proposition 65.
California Registration Number: None

State Right-to-Know and CERCLA:
The following ingredients present in the finished product are listed on state right-to-know lists or state worker exposure lists

Ingredient	CAS #	Level	CERCLA RQ	State IL	MA	NJ	PA	RI
None								

Canada

All ingredients are CEPA approved for import to Canada by Procter & Gamble. This product has been classified in accordance with the hazard criteria of the Canadian Controlled Products Regulations (CPR) and this MSDS contains all information required by the Controlled Products Regulations.

SECTION XVI - OTHER INFORMATION

Perfumes contained within the products covered by this MSDS comply with appropriate IFRA guidance.

P&G Hazard Rating:	Health:	1	4=EXTREME
	Flammability:	1	3=HIGH
	Reactivity:	0	2=MODERATE
			1=SLIGHT
			0=NOT SIGNIFICANT

*N/A. - Not Applicable *N/K. - Not Known

Data supplied is for use only in connection with occupational safety and health.

DISCLAIMER: This MSDS is intended to provide a brief summary of our knowledge and guidance regarding the use of this material. The information contained here has been compiled from sources considered by Procter & Gamble to be dependable and is accurate to the best of the Company's knowledge. It is not meant to be an all-inclusive document on worldwide hazard communication regulations.

This information is offered in good faith. Each user of this material needs to evaluate the conditions of use and design the appropriate protective mechanisms to prevent employee exposures, property damage or release to the environment. Procter & Gamble assumed no responsibility for injury to the recipient or third persons, or for any damage to any property resulting from misuse of the product.

DIVIDER PAGE

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7/16/14

Attachment 3 - Acceptable Knowledge Source Document Summary

Site(s): Oak Ridge National Laboratory	Source Document Tracking Number: P218
Waste Stream Number(s): ORNL Non-specific Library Files (Applicable only when site library is not in use)	
Acceptable Knowledge Documentation Type: ☑ TRU Waste Management Program Information ☑ Waste Stream-Specific Information ☑ Additional Information	Category: ☐ Correspondence ☐ Discrepancy Resolution ☐ Internal Procedure ☐ Miscellaneous ☑ Published Document or Internal Procedure ☐ Unpublished Documents
Title or Description of Source Document [a]: Oak Ridge National Laboratory/Nuclear Fuel Services, Inc. NFS Waste Parameter Verification Program	
Source Document Reference Information (author(s), document and revision number, date, publisher): Martin Marietta Energy Systems, Inc., NA, NA, 10/29/1992, Waste Management and Remedial Action Division/ORNL/Martin Marietta Energy Systems, Inc.	

AK # [b]	Source Doc. Page # [c]	AK Information Summary
PR2, PR3, PR4, PR6, PR7, PR8, WS1, WS2, WS3, WS4, WS5, WS6, WS7, WS9, WS11, S16	1-3, 6, 12, 19, 21-22, 25-26, App. B	This document outlines the waste generating processes, areas, and characterization of TRU waste at Nuclear Fuel Services in preparation for sending this material to ORNL. Doe agreed to take possession of approximately 5500 ft3 (750 drums) of CH-TRU waste that was to be generated at NFS as part of a D&D campaign. There is also an estimated 150 containers (275 ml) of MOX waste to be generated from these activities. The CH-TRU waste includes general glovebox, equipment, and other miscellaneous waste that will be certified against an ORNL WAC developed for this project. MOX waste (mixed PuO2 and UO2) will be segregated from the CH-TRU and also certified against the ORNL WAC. A process flow diagram for the waste generating and certification activities is shown in Appendix B. CH-TRU waste will be generated at NFS Building 110, a process lab. MOX waste will be generated at NFS Building 234, a MOX fuel fabrication facility. A floorplan for Building 234 is shown on p. 19. Waste will be 1) 40-gallon drums supercompacted at SEG and placed into 55-gallon drums, 2) material grouted and placed inside 2-liter bottles, and 3) MOX waste packaged in 275 ml cans. CH-TRU waste will be shredded and pressed into 40-gal "bales". This waste is primarily metallic (pipes, ducts, equipment), but there is some soft material such as plastic, PPE, Plexiglas and hard plastic items. Waste placed in 2-liter bottles is comprised of dry powder sweepings, wet cheesecloth, filter media or other contaminated debris that fits into a small container. Materials are solidified and placed into bottles and then placed into 2 heat-sealed bags. After sealing, the bottles are placed into a 55-gal drum for shipment to ORNL. MOX waste (fuel pellets, mixed oxide powder) will be calcined and packaged into pressure resistive cans, which will then be sealed inside produce cans, and then placed into a 55-gallon drum. There will also be soils contaminated with TRU elements, however, it is unclear if this will be TRU waste. Isotopic information applied to all wastes will be derived from the material to be grouted in plastic bottles. A detailed discussion of the NDA determination for the wastes is provided. Isotopes mentioned: U-234, U-235, U-238, Pu-238, Pu-239, Pu-240, Pu-241, Pu-242, and Am-241.

CCP RECORDS ORIGINAL
DATE REC'D 10/22/2014
EPT

TD 7/16/14

Attachment 3 - Acceptable Knowledge Source Document Summary (continued)

Site(s): Oak Ridge National Laboratory			Source Document Tracking Number: P218
AK # [b]	Source Doc. Page # [c]	AK Information Summary	
Source Document Data Limitations (if any): 1. None.			
Acceptable Knowlege Expert: Travis Smith / [signature] Date: 07/16/2014 Print /Sign			

[a] Provide description for non-titled information (i.e., container paperwork, MSDS sheets, etc)
[b] Obtain from Acceptable Knowledge Documentation Checklist
[c] For microfilm or microfiche, identify box, tape, reel number and location.

P-218

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OAK RIDGE
NATIONAL
LABORATORY

MARTIN MARIETTA

OAK RIDGE NATIONAL LABORATORY/ NUCLEAR FUEL SERVICES, INC. NFS WASTE PARAMETER VERIFICATION PROGRAM

OCTOBER 29, 1992

prepared by
MARTIN MARIETTA ENERGY SYSTEMS, INC.
Post Office Box 2008
Oak Ridge, Tennessee 37831
for the
U. S. DEPARTMENT OF ENERGY
Under Contract No. DE-AC05-84OR21400

MANAGED BY
MARTIN MARIETTA ENERGY SYSTEMS, INC.
FOR THE UNITED STATES
DEPARTMENT OF ENERGY

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OAK RIDGE NATIONAL LABORATORY
WASTE MANAGEMENT AND REMEDIAL ACTION DIVISION

NFS Waste Parameter Verification Program for Contact-Handled and Mixed-Oxide Transuranic Wastes from Nuclear Fuel Services, Inc.

Approved by: _____ Date: 10/29/92
ORNL Certification Program

Approved by: _____ Date: 10-29-92
Waste Examination and Assay Facility

Approved by: _____ Date: 10-29-92
Nuclear Fuel Services, Inc.

Approved by: _____ Date: 10-30-92
Operational Readiness Team

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9.0 APPENDIX C, NONCONFORMANCE REPORT FORM

1.0 INTRODUCTION

In April 1986, the U.S. Department of Energy (DOE) entered into an agreement with Nuclear Fuel Services, Inc. (NFS) of Erwin, Tennessee to take possession of approximately 5,500 ft^3 of contact-handled transuranic (CH-TRU) and mixed-oxide (MOX) wastes from two process buildings at its Erwin site. These wastes have been generated during the decontamination and decommissioning (D&D) of an inactive Nuclear Regulatory Commission (NRC) licensed MOX fuel fabrication facility. As part of these D&D activities, NFS is expected to generate up to 750 drums (55-gallon size) of CH-TRU waste and up to 150 containers (approximately 275 ml) of MOX waste. The total quantity of plutonium from all activities included in the waste streams could approach 30 kg.

1.1 NFS Project Background

The original contractual agreement between DOE and NFS (DE-SC07-86ID12630) cited the Idaho National Engineering Laboratory (INEL) near Idaho Falls, Idaho as the receiving site for storage and later disposition of the NFS waste. Discussions between the State of Idaho and DOE, however, resulted in Idaho taking a position which prohibited the shipment of out-of-state generated waste to INEL. Representatives of the State of Tennessee suggested that DOE consider utilizing the facilities on the Oak Ridge Reservation for the storage of this material in lieu of the Idaho site. DOE Headquarters (DOE-HQ) accepted that recommendation, with support from the NRC, and the DOE Field Office Oak Ridge (OR) has in turn selected the Oak Ridge National Laboratory (ORNL) as the alternate site for storage of the NFS generated waste.

1.2 Certification Program Requirements

The NFS wastes have been categorized into two general classifications, CH-TRU and MOX. CH-TRU waste will include the general glovebox, equipment and other miscellaneous waste contaminated with TRU isotopes in concentrations greater than 100 nCi/gm. Packaged out of the D&D operations at the NFS site, CH-TRU waste will be certified against the waste acceptance criteria (WAC) for CH-TRU waste specified in Part II "Contact-Handled Transuranic Waste Acceptance Criteria" of WMRA-WMPC-106 "Oak Ridge National Laboratory Waste Acceptance Criteria for Transuranic Waste from Nuclear Fuel Services, Inc."

As a consequence of part of the D&D effort at NFS, mixed plutonium oxide (PuO_2) and uranium oxide (UO_2), i.e. MOX, waste will be generated, segregated from the CH-TRU, packaged and certified against the criteria specified in Part III "Mixed Oxide Waste Acceptance Criteria" of WMRA-WMPC-106.

The certification of both of these waste streams will be required to meet the additional requirements set forth in Parts I "General Requirements" and IV "Certification Requirements" of WMRA-WMPC-106.

2.0 SCOPE

The verification program described in this document is intended to provide the approach and methodology for independent verification, by ORNL, that the NFS certification of the waste packages subject to the provisions of contract no. DE-SC05-86ID12630 is bounded by the applicable criteria of WMRA-WMPC-106.

The use of this document for any other purpose is outside the intended scope.

3.0 PURPOSE

The purpose of this plan is to document the activities and methodology utilized to enable ORNL to perform an independent verification of the certification provided by NFS that each waste package, CH-TRU and MOX, conform to the parameter requirements specified for each waste stream in WMRA-WMPC-106.

3.1 Verification Program Objective

The objective of the program is very straight-forward, to ensure that all waste packages are properly characterized, packaged and documented such that the applicable WAC can be certified against.

3.2 Relationship to Certification Program Requirements

The certification program at ORNL developed criteria which specified the acceptable chemical, physical and radiological properties, as well as packaging and documentation. The specific criteria and technical rationale are presented in WMRA-WMPC-106.

ORNL will independently verify NFS's conformance to the applicable criteria for each package through a combination of the following:

1-Program/procedure review
2-On-site observation of active waste processing
3-Direct measurement

4.0 WASTE STREAM CHARACTERISTICS

The waste stream characteristics presented here focus on the waste streams as received by ORNL and processed through the Waste Examination and Assay Facility (WEAF) after packaging and certification by NFS. A thorough discussion of the D&D activity and the gross waste stream characteristics resulting from that activity are presented in DCM-03-05, Revision 0, "Nuclear Fuel Services, Inc. Waste Certification Plan for Transuranic Waste," dated February 1992, or current revision.

4.1 Overview of the NFS Wastes

NFS wastes to be received by ORNL were generated by D&D activity at primarily two locations within the NFS site. One of these locations consisted of a clean-out of Building 110, a process laboratory, which included an outside, underground 55-gallon tank and surrounding soil. The second location, Building 234, consisted of a clean-out of this facility which had been a mixed-oxide, fuel fabrication process line. The detailed characterization of these wastes was presented in a January 31, 1992, report titled "Final Report Waste Characterization of Wastes Generated from D&D Activity in Buildings 110 and 234 on the NFS Site, Erwin, Tennessee."

Contaminated soil, concrete and debris to be removed from under the wet-cell area in Building 234 are yet to be characterized.

Waste material arriving at ORNL will appear as "bales", packaged at NFS as: (1) 40-gallon drums, processed through Scientific Ecology Group (SEG) and super compacted into 55-gallon drums; (2) 2-liter plastic bottles, grouted per an NFS procedure (DCM-58 "Segregation and Immobilization of Particulate Fines"); (3) MOX waste packaged in specified 275 ml "cans" (described in Part III, WMRA-WMPC-106).

4.2 Compacted Solids

4.2.1 Description

During D & D activity at NFS, the bulk of the material removed is processed through the Decontamination and Volume Reduction Facility (DVRF). Gloveboxes, furnace shells, presses, ventilation duct work, process equipment, etc. are individually sealed off from the process line and transported to a large, rigid containment for ultra-high pressure water decontamination. After decontamination, the equipment is loaded into a high capacity shear/baler. The shear/baler, capable of compacting scrapped automobiles, cuts and bales the material into 16 inch square blocks of variable thickness, nominally 4 to 10 inches, depending on the amount of material fed into the loading hopper. This process eliminates inefficient and risky manual cleaning and sectioning techniques.

Incorporated into the predominantly metal matrix of the baled material are soft waste items, such as plastic sheet, protective clothing and supplied air hose, as well as plexiglass and hard plastic items.

Typically four (4) of these bales are packed into a 40-gallon drum. The diameter of the 40-gallon drum is designed to fit inside the die of the TRU Press, a 520 ton press located at Scientific Ecology Group, Inc. (SEG) in Oak Ridge, Tennessee. The TRU Press compacts the 40-gallon drum into "disks" approximately 1/3 of the original height at a diameter that will fit loosely inside a 55-gallon drum. With three (3) 40-gallon drums fitting into a 55-gallon drum, ORNL will receive 55-gallon drums containing approximately 650 pounds of baled and TRU Pressed waste material.

4.2.2 Assay Methodology

Individual bales are assayed in NDA Station 4 at NFS. Station 4 is an active neutron interrogation system designed and calibrated primarily to assay the metal matrix bales in the 16 inch square geometry. Station 4 can be reconfigured to assay 55-gallon drums with less efficiency and accuracy.

NDA Station 4 reports a fissile signal, active mass and activity (concentration) of the waste being interrogated. Figure 1 is an example of an "Identifying Data Report" produced from a Station 4 interrogation.

The fissile signal is obtained by a count of prompt fission neutrons generated during a neutron count gate following an active neutron pulse. The fissile signal reported is directly proportional to the number of neutrons counted. The relationship is:

The relationship between fissile signal and actively measured (fissile) mass has been established using secondary uranium metal standards. The standards were verified with Los Alamos National Laboratory's HSE-7 active assay system and have been intercompared with 40 fabricated plutonium standards at ORNL ("Quinby Standards").[1]

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[1] CALDWELL, J. T., *Five Station NDA System Calibration Procedure*, Los Alamos, NM: Pajarito Scientific Corporation, June 26, 1990.

Identifying Data Report

Station Name:	Final Drum and Package Station
Facility taking data:	NFS/EcoTek System
Operator:	R CAMPBELL
Primary Identification:	1X6 D38 STD
Secondary Identification:	Medium
Content Code:	No Content Code
Container weight (lb):	30.0
Run number in data base:	1
Date of Assay:	Fri Jun 12 06:17:17 1992
Name of data base:	061292
Edited(?):	n

Isotopic Content:
31.0% Pu-239/Tot-Fis

Raw Data--Station 4-- Final Drum and Package Station

Signal Gate Delay:	700000
Signal Gate Length:	4000000
Background Gate Delay:	9000000
Background Gate Length:	10000000
Number of Pulses:	9000

Detector	Early Gate	Late Gate
Flux Mon	41990	12
Totals	1322	63
Left	595	28
Right	727	35

Processed Data--Station 4-- Final Drum and Package Station

Fissile Signal:	0.030887 +/-	0.000869
Active Mass:	0.7069 +/-	0.0200 grams Pu (equivalent)
Activity:	2863.8652 +/-	81.0030 nCi/g

Figure 1

NDA STATION 4
IDENTIFYING DATA REPORT

$$\text{Fissile Signal} = \frac{[\text{Prompt Fission Neutrons} - (0.4 \times \text{Background Neutrons})]}{[\text{FM}_{\text{Prompt Gate}} - (0.4 \times \text{FM}_{\text{Bkg Gate}})]}$$

Where,

FM = Neutron Flux Monitor Reading

0.4 = Ratio of the prompt neutron count gate to the background neuton count gate

Active mass is defined as the mass of ^{233}U, ^{235}U, ^{238}Pu, ^{239}Pu and ^{241}Pu (total fissile material - predominantly ^{235}U and ^{239}Pu), and is reported as "grams Pu (equivalent)". The relationship of active mass to fissile signal is:

$$\text{Grams Pu (equivalent)} = \text{Calibration Constant} \times \{\text{Fissile Signal} - (0.00006 + 0.0000031 \times \text{Weight [lbs]})\}$$

Station 4 Calibration Constant was derived by measuring the response of the uranium metal standards placed at various positions within the active neutron interrogation chamber in a "typical" metal matrix. The ¼" x ¼" x 1" uranium standard, containing 0.0387 grams ^{235}U as determined by Los Alamos National Laboratory mass spectrometry, was used for determining the Calibration Constant.

The response of the ^{235}U in the standard is correlated to the response of ^{239}Pu. Thermal fission prompt neutrons measured by differential die-away systems per gram of fissile material are proportional to the prompt neutrons liberated per fission, times the thermal neutron fission cross-section for the material:

$$\frac{\text{fissile signal}}{\text{gram}} \propto (\bar{\nu}_p)(\sigma_F), \text{ where,}$$

$\bar{\nu}_p$ = induced thermal fission multiplicity

σ_F = thermal neutron fission cross-section

For ^{235}U and ^{239}Pu:

	^{235}U	^{239}Pu
$\bar{\nu}_p$	2.41	2.88
σ_F	580	742

The ratio of fissile signal per gram of ^{235}U to fissile signal per gram of ^{239}Pu is:

$$\frac{\text{Fissile signal } ^{235}U}{\text{Fissile signal } ^{239}Pu} = \frac{(\bar{\nu}_{p_{^{235}U}})(\sigma_{F_{^{235}U}})}{(\bar{\nu}_{p_{^{239}Pu}})(\sigma_{F_{^{239}Pu}})}$$

$$= 0.65$$

(two-thirds provides a good approximation)

Therefore, the equivalent mass of ^{239}Pu in the ¼" x ¼" x 1" uranium metal sample with 0.0387 grams of fissile ^{235}U is:

$$\left(\frac{2}{3}\right) \times (0.0387\, g_{^{235}U}) = 0.0258 g_{^{239}Pu}$$

The fissile signal from the uranium metal source can now be correlated to the equivalent ^{239}Pu mass. This Calibration Constant for fissile signal to equivalent ^{239}Pu mass is dependent on the positioning of the detector packages in Station 4. Three categories of "generic" geometry corresponding to three detector package positions are identified for Calibration Constants.

Geometry	Calibration Constant
Large	27.9
Medium	23.0
Small	19.1

Later measurements indicated thermal flux absorption resulting from the chlorine content of the PVC used to wrap bales. The Calibration Constant was changed from 20.2 to 23.0 in the 6-21-90 version of "Decon" software system to correct for this matrix effect.[2]

An additional correction is applied for the source dependent active background, $6.0 \times 10^{-5} + 0.31 \times 10^{-5}$ x weight [lbs]. This was empirically determined using uncontaminated waste bales of typical composition.[3]

4.2.3 Isotopic Evaluation

Determination of the constituent radioisotopes present in the NFS waste material is made by evaluation of gamma spectra. Observation and recording of gamma spectra from metal matrix bales is not practical due to low count rates. Optimum spectral measurements result when count rates exceed 30,000 net counts per hour in the 413.7 keV (^{239}Pu) peak. Count rates that approach this value are available from bottles of concentrated waste material such as sweepings and bulk material recovered from gloveboxes and equipment. This material is representative of the uniform contamination present on the glovebox from which metal matrix bales are made. Therefore, the isotopic information derived from the bottles is assigned to compacted metal matrix bales associated with the glovebox. Bottles are selected from each glovebox processed based on amount of material present in the bottle (generally greater than one gram will provide sufficient count rate). If more than one bottle meets the selection criteria the most accessible bottle from storage is chosen.

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[2] Ibid.

[3] CALDWELL, J. T., *PSC NFS Calibration Book*, entry dated March 23, 1990, Los Alamos, NM: Pajarito Scientific Corporation.

Isotopic information is used in isolating the contribution of ^{239}Pu to the fissile signal used in Station 4 to report active mass. ^{239}Pu isotope is selected as the basis for evaluation because of its dominance in contribution to fissile signal from the NFS material. The ratio of ^{239}Pu to total fissile signal (active mass) is established using ratios of normalized intensity factors (NIF) from gamma spectroscopy. In isolating the signal due to ^{239}Pu, the contribution of the fissile isotopes are weighted proportionately to the prompt neutrons liberated per fission as previously discussed:

	$\bar{\nu}_p$ Induced Thermal Fission Multiplicity	σ_F Thermal Neutron Fission Cross Section	$\frac{(\bar{\nu}_{p_i})(\sigma_{F_i})}{(\bar{\nu}_{p_{^{239}Pu}})(\sigma_{F_{^{239}Pu}})}$
^{239}Pu	2.88	742	1
^{233}U	2.4	530	0.59
^{235}U	2.41	580	0.65
^{238}Pu	2.9	17	0.02
^{241}Pu	2.8	1010	1.32

The calculation for the contribution of ^{239}Pu to the fissile signal is:

$$\frac{^{239}Pu}{\text{Total Fissile (signal)}} = \frac{^{239}Pu}{(0.59 \times {}^{233}U) + (0.65 \times {}^{235}U) + (0.02 \times {}^{238}Pu) + {}^{239}Pu + (1.32 \times {}^{241}Pu)}$$

Two simplifying assumptions are made: (1) ^{238}Pu and ^{241}Pu make up less than 0.1% of the isotopic mix by weight and are considered negligible, which is a conservative assumption (i.e., tends to overestimate ^{239}Pu) and; (2) Two-thirds provides a close approximation for the relative contribution of the uranium isotopes to the fissile signal. Therefore,

$$\frac{^{239}Pu}{\text{Total Fissile (signal)}} = \frac{^{239}Pu}{\left(\frac{2}{3}\right) \times ({}^{233}U + {}^{235}U) + {}^{239}Pu}$$

Multiplying the reported active mass by the ^{239}Pu-to-total fissile ratio provides the mass of ^{239}Pu in grams. After determining the mass of ^{239}Pu in the material, ^{235}U, ^{241}Pu and ^{241}Am are assigned mass values based directly on NIF ratios from gamma spectroscopy. ^{240}Pu is determined indirectly using an empirical relationship with the ^{241}Pu ratio to ^{239}Pu.[4] The mass of the remaining isotopes are estimated in relation to ^{239}Pu on the basis of process knowledge. A detailed description of these determinations follows.

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[4] CALDWELL, J. T., Pajarito Scientific Corp. memorandum, *Sludge Sample Data Analysis*, facsimile transmission March 19, 1991.

The following isotopes are determined by NIF ratio to ^{239}Pu, using gamma spectroscopy:

Isotope	Energy	^{239}Pu Energy
^{235}U	185.7 keV	203.5 keV
^{241}Pu	208.0 keV	203.5 keV
^{241}Am	125.3 keV	129.3 keV

The gamma lines presented are close in energy to accommodate simplifying assumptions of common detector efficiencies and sample attenuation effects. The energies chosen to determine ^{235}U are separated by 17.8 keV (8.7%). The difference in detector efficiency of a coaxial germanium detector between these two energy lines is typically less than 6.0%.[5] Considering that self-attenuation counters the efficiency effect in this region, the effect is considered negligible.

To proceed from this point requires assumptions based on process knowledge of fuel mixes on record. A calculated value, *% ^{240}Pu effective*, is used to evaluate the waste material and to make a comparison of the waste material with fuel mixes of record. This value has a larger significance for NDA Station 5, Passive Neutron Coincidence Counter and will be discussed in section 4.3.3. It is calculated by the equation:

$$\%\ ^{240}Pu\ effective = 6.42 + 359.9\left[\frac{^{241}Am}{^{239}Pu} + \frac{^{241}Pu}{^{239}Pu}\right]$$

Isotopic ratios in this equation are based on NIFs of the following energies:

Isotope	Energy	^{239}Pu Energy
^{241}Am	125.3 keV	129.3 keV
^{241}Pu	208.0 keV	203.5 keV

% ^{240}Pu effective is determined from the sum of ^{241}Pu and ^{241}Am in ratio to ^{239}Pu. This correlation accounts for fuel batches that may have had different reactor histories and different "ages" since removal from reactor, since $T_{\frac{1}{2}}$ ($^{241}Pu \rightarrow {}^{241}Am$) is relatively short, approximately 14 years.

For each sample of material evaluated, calculate *% ^{240}Pu effective* based on gamma-spectroscopy measurements. Compare the calculated value for the material to the *% ^{240}Pu effective* calculated for isotopic information on the fuel mixes of record (percentages to the nearest hundredth):

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[5] REILLY, DON, et. al., *Passive Nondestructive Assay of Nuclear Materials*, page 155, Washington DC: U.S. Nuclear Regulatory Commission, Office of Nuclear Regulatory Research, March 1991.

Fuel	^{234}U	^{235}U	^{238}U	U	^{238}Pu	^{239}Pu	^{240}Pu	^{241}Pu[6]	^{242}Pu	^{241}Am	Pu	% ^{240}Pu effective
SEFOR	0.12	0.28	79.60	80.00	0.01	18.11	1.66	0.03	0.01	0.18	20.00	10.58
W. Valley	3.90	4.88	88.73	97.50	0.00	2.14	0.29	0.01	0.00	0.05	2.50	17.07
Halden	3.90	4.88	88.73	97.50	0.01	2.00	0.36	0.02	0.01	0.11	2.50	28.62
Con. Pwr.	0.58	2.36	94.80	97.73	0.01	1.73	0.37	0.02	0.02	0.12	2.27	36.59

Fuel	^{233}U	^{234}U	^{235}U	^{238}U	U	^{238}Pu	^{239}Pu	^{240}Pu	^{241}Pu	^{242}Pu	^{241}Am	Pu	% ^{240}Pu effective
Bldg. 110	0.17	3.90	0.29	86.56	90.92	0.00	7.51	1.39	0.08	0.00	0.10	8.98	14.89

Using the *% ^{240}Pu effective* as the basis, interpolate between fuel mixes of record to determine % ^{239}Pu of the sample:

$$\%^{239}Pu_{sample} = \%^{239}Pu_i - \frac{\%^{240}Pu\ eff_{sample} - \%^{240}Pu\ eff_i}{\%^{240}Pu\ eff_j - \%^{240}Pu\ eff_i}$$

where i and j refer to the fuel mixes with *%^{240}Pu effective* below and above *%^{240}Pu effective* for the sample, respectively.

The nominal value for the closest fuel mix of record is assigned for ^{238}Pu and ^{242}Pu. As shown in the following table, these isotopes represent small percentages and have little or no impact on fissile equivalence:

Isotope	L_{239}/L_i	Maximum Percentage in Any Fuel Mix
^{238}Pu	0.15	0.01%
^{242}Pu	0.0	0.02%
^{234}U	0.0	3.90%

For ^{234}U, the maximum percentage in any fuel mix of record, 3.9%, will be assigned for all cases. Of the uranium isotopes, that percentage not assigned to ^{234}U and ^{235}U is assigned to ^{238}U. In the calculation for thermal effects of decay, ^{234}U exceeds ^{238}U in watts per gram by a factor of 14,000. Therefore, assigning the maximum expected value provides conservatism for this calculation. Other characteristics determined by isotopic constituents (fissile gram equivalence and ^{239}Pu gram equivalence) are not sensitive to assignment of ^{234}U relative to ^{238}U.

[6] Values for ^{241}Pu and ^{241}Am have been decay corrected to 01 June 1992.

Percentage of ^{240}Pu of plutonium ($\%_{Pu}{}^{240}Pu$) is calculated from gamma spectroscopy data using a regression developed from original isotopic data (decay corrected to March 1991):

$$\%_{Pu}{}^{240}Pu = e^{\left[4.25 + 0.33 \times \ln\left(\frac{^{241}Pu}{^{239}Pu}\right)\right]}$$

Fuel Mix	$\frac{^{241}Pu}{^{239}Pu}$	$\%_{Pu}{}^{240}Pu$	$e^{\left[4.25 + 0.33 \ln\left(\frac{^{241}Pu}{^{239}Pu}\right)\right]}$
SEFOR	0.00168	8.31	8.33
W. Valley	0.00429	11.49	11.40
Halden Fuel	0.00895	14.42	14.57
Consumer Power	0.01218	16.22	16.15

A graph of the data is presented in Figure 2.

The isotopic ratio in the equation is determined using the following energies:

^{241}Pu Energy	^{239}Pu Energy
208.0 keV	203.5 keV
267.5 keV	344.7 keV

Using $\%_{Pu}{}^{240}Pu$ determine the percentage of ^{240}Pu in the total mixed oxide isotopes, uranium and plutonium ($\%_{mixed\ oxide}{}^{240}Pu$):

$$\%_{mixed\ oxide}{}^{240}Pu = (\%_{Pu}{}^{240}Pu) \times \frac{(\%_{\text{mixed oxide}}{}^{238}Pu + \%_{\text{mixed oxide}}{}^{239}Pu + \%_{\text{mixed oxide}}{}^{241}Pu + \%_{\text{mixed}}}{1 - (\%_{Pu}{}^{240}Pu)}$$

Sum the individual percentages of plutonium isotopes to determine total percent plutonium of the mix. The remaining percentage is assigned to uranium. Assign any residual uranium to ^{238}U:

$$\%\ ^{238}U = \%\ U - \%\ ^{234}U - \%\ ^{235}U$$

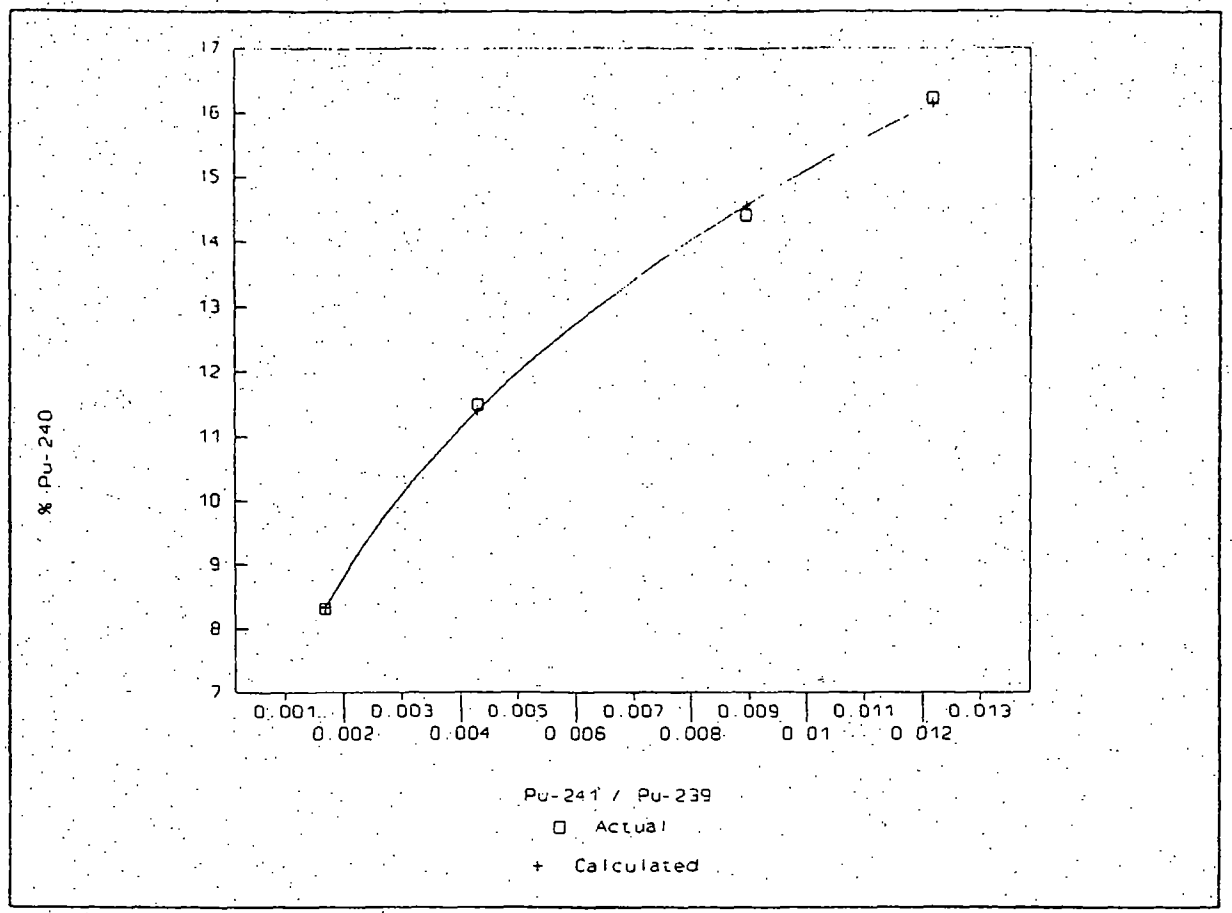

Figure 2

DETERMINATION OF $\%^{240}Pu$

In summary, the following table indicates that the isotopes of primary concern are determined directly by gamma spectroscopy and active neutron interrogation. The remaining isotopes are calculated from process knowledge.

Isotope	L_{239}/L_i	Method of Determination
^{234}U		Assigned maximum value from process knowledge of feed material.
^{235}U	0.64	Direct gamma spectroscopy ratio to ^{239}Pu.
^{238}U		Residual material not otherwise assigned.
^{238}Pu	0.15	Assigned nominal value from process knowledge of feed material.
^{239}Pu	1.00	Active neutron interrogation and gamma spectroscopy ratios.
^{240}Pu	0.03	Regression analysis of gamma spectroscopy ratios.
^{241}Pu	2.25	Direct gamma spectroscopy ratio to ^{239}Pu.
^{242}Pu	0.03	Assigned nominal value from process knowledge of feed material.
^{241}Am	0.03	Direct gamma spectroscopy ratio to ^{239}Pu.

Figures 3 through 5 present flow charts of the assay and isotopic assignment process.

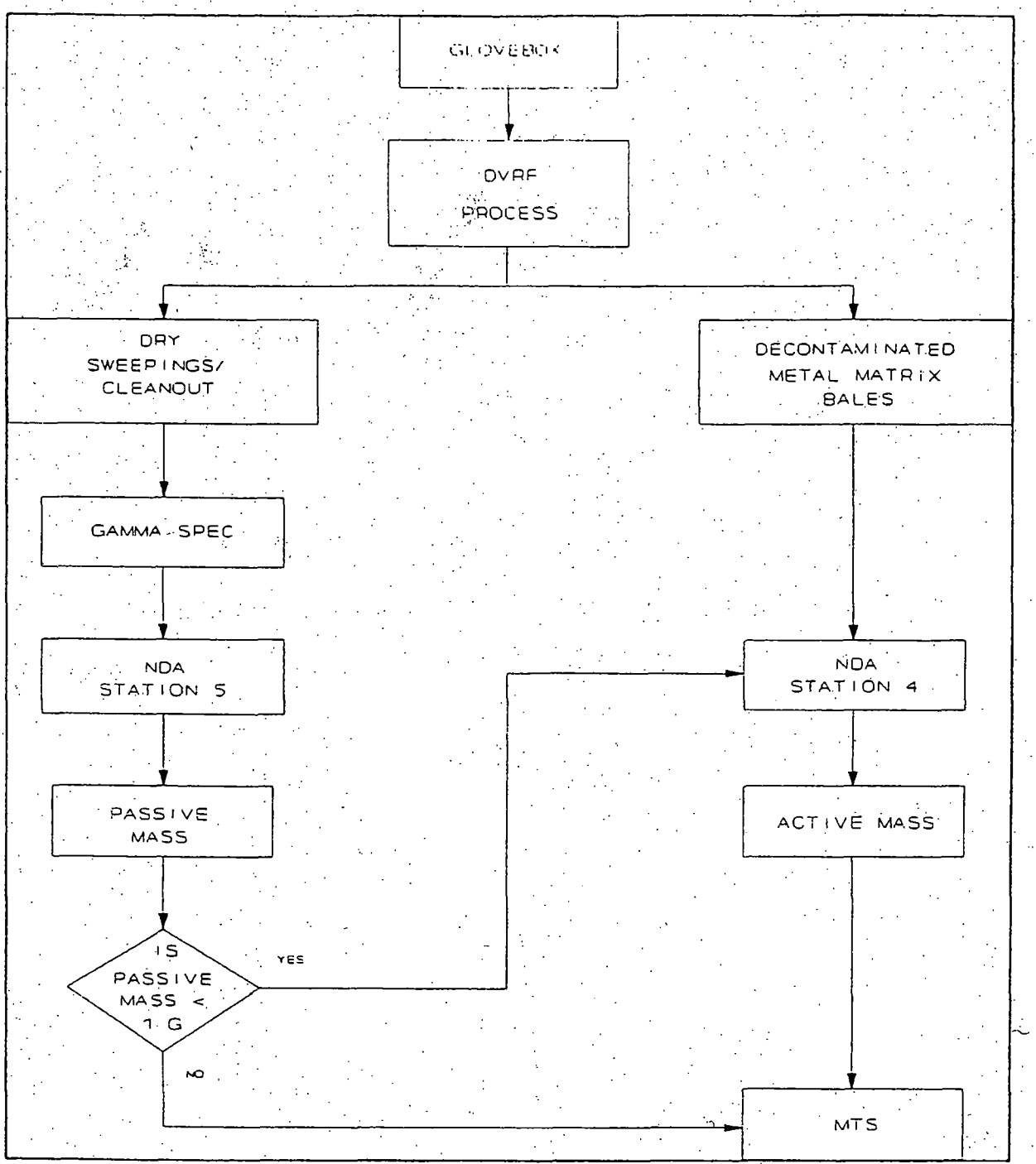

Figure 3

ASSAY FLOW DIAGRAM

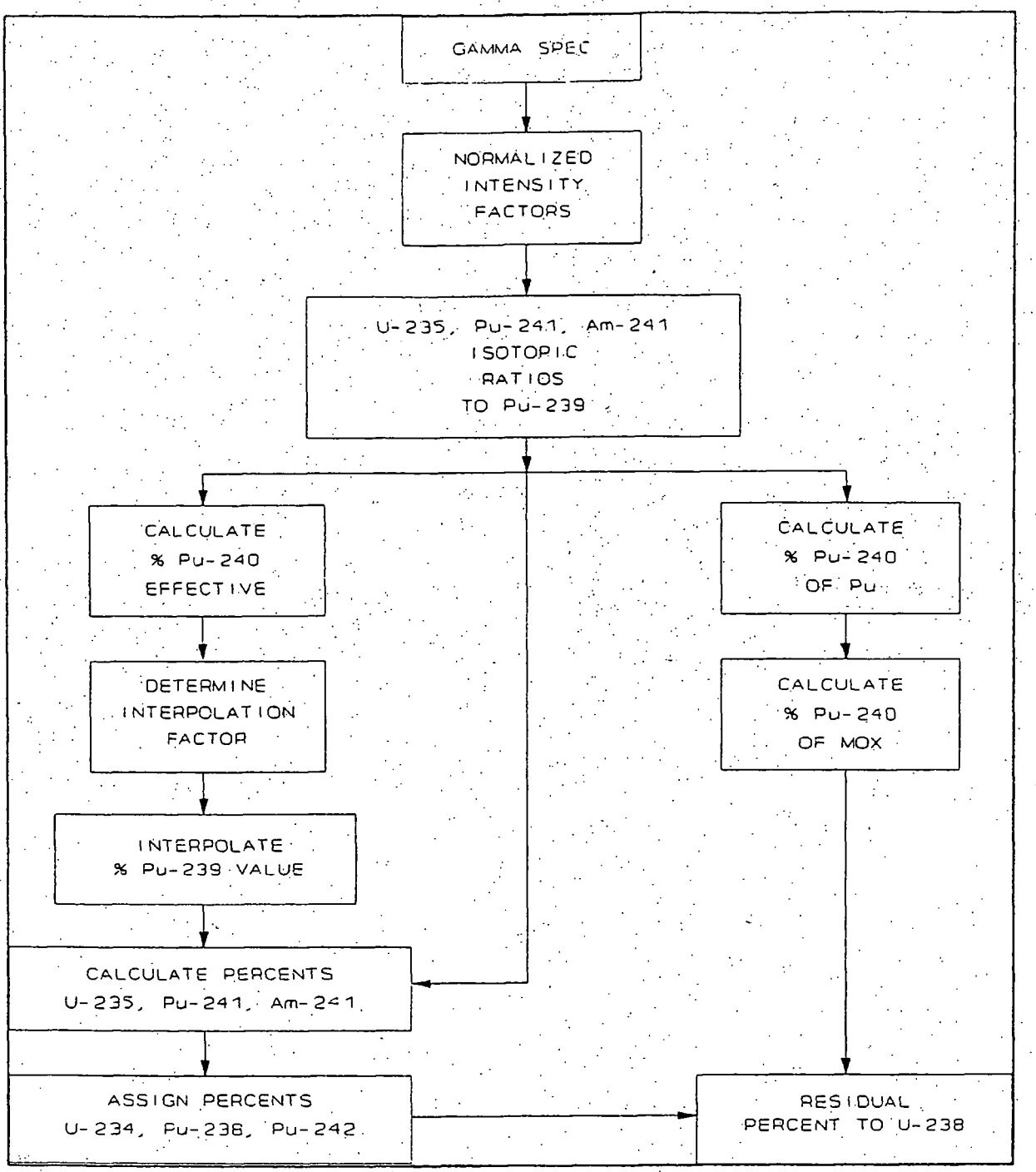

Figure 4

ISOTOPIC DETERMINATION FLOW DIAGRAM

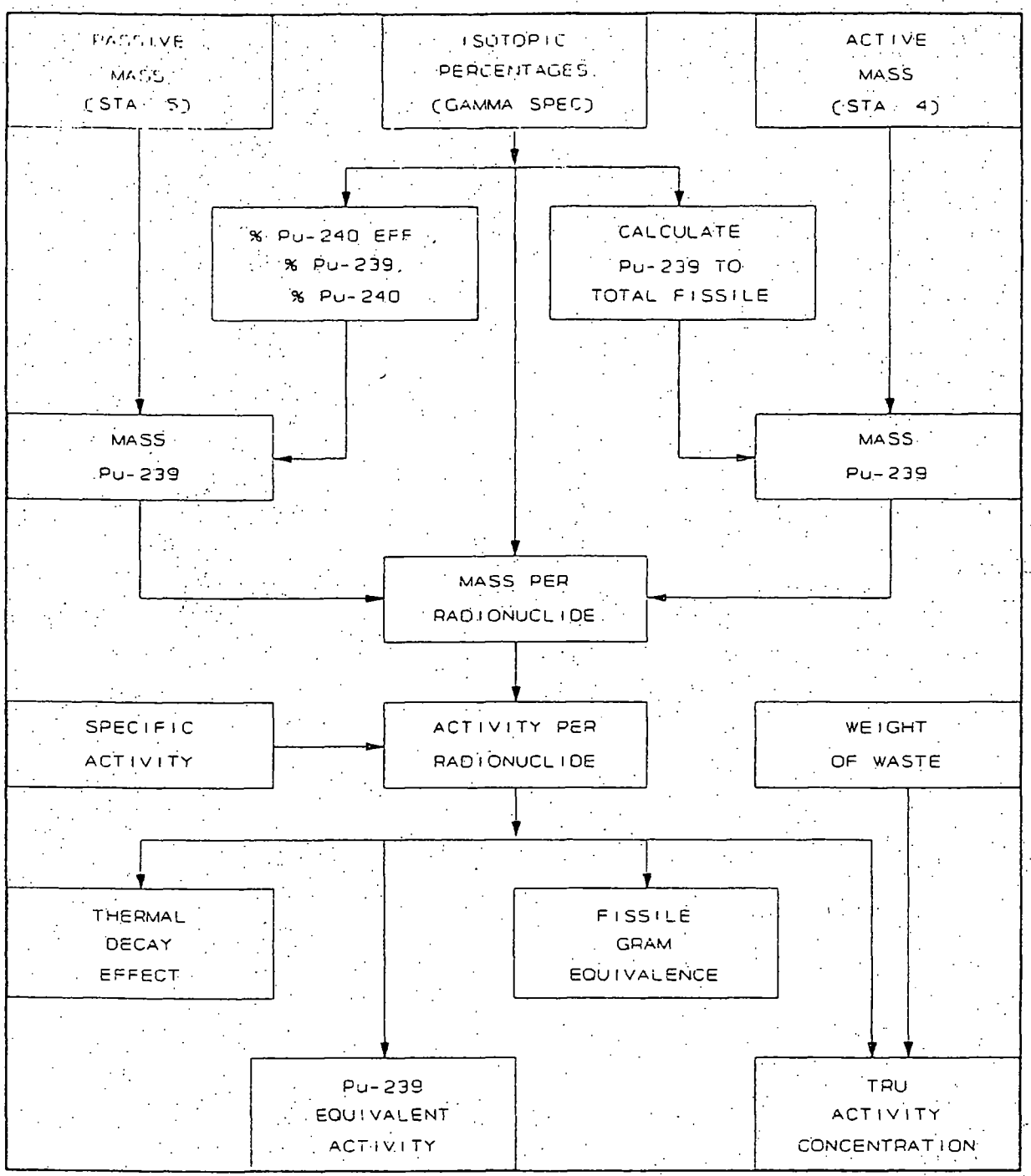

Figure 5

MATERIAL TRACKING SYSTEM CALCULATION FLOW DIAGRAM

As an endnote to this section, earlier data collected from gamma spectroscopy did not include evaluation of the 125.3 keV ^{241}Am peak or the 129.3 keV ^{239}Pu peak. As an alternative to the calculation presented for *% ^{240}Pu effective*, a correlation with % ^{240}Pu of plutonium was developed using 26 data points.[7] The equation

$$\%\ ^{240}Pu\ effective = 3.495\ \exp\ (0.0924 \times \%\ ^{240}\text{Pu of total Pu})$$

has a coefficient of determination of 0.991. A graph of the data appears in Figure 6.

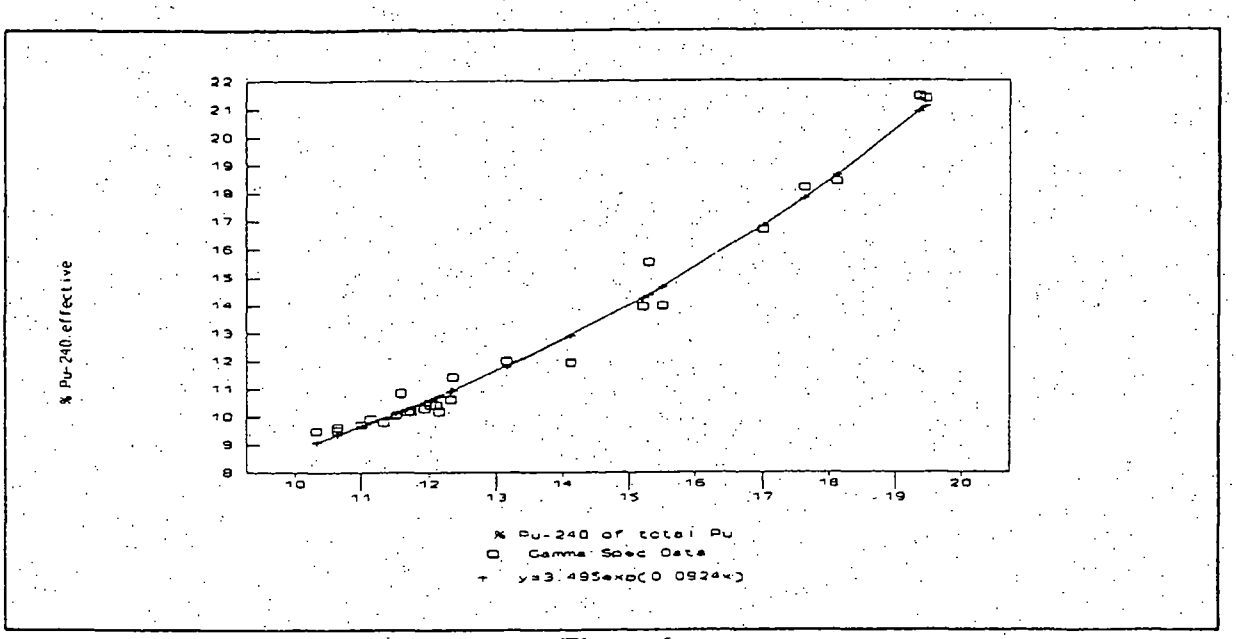

Figure 6
%^{240}Pu OF TOTAL Pu vs. %^{240}Pu EFFECTIVE

4.2.4 Maximum and Nominal Values

The results of the evaluation of representative material from gloveboxes are presented in tables on the next two pages. A map of the fuel processing area is provided in Figure 7.

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[7] Data points represent the first of the gamma spectroscopy information taken which included collecting the 125.3 keV ^{241}Am and 129.3 keV ^{239}Pu spectral lines, permitting the calculation of *%^{240}Pu effective*, specifically bales 1623, 4460, 4503, 4530, 4558, 4583, 4629, 4661, 4783, 4826, 4941, 4943, 4944, 4945, 4953, 4963, 4964, 4966, 4967, 4968, 5020, 5023, 5024, 5025, 5026, and 5026 (replicate).

BATCH	BALE	AREA	STA.	Percent of Fuel Mix of Record Based on $\%^{240}Pu$ Effective				^{234}U	^{235}U	^{238}U	Total U	^{238}Pu	^{239}Pu	^{240}Pu	^{241}Pu	^{241}Am	^{242}Pu	Pu + Am
								L_{239}/L_1 =	0.64			0.15	1	0.03	2.25	0.03		
				SEFOR	West Valley	Halden	Consumer Power	(Nominal Value)	(Gamma Ratio)	(Residual Uranium)	(Residual Mix)	(Nominal Value)	(later-pointed)	(Gamma Ratio)	(Gamma Ratio)	(Gamma Ratio)	(Nominal Value)	(Sum)
141	4100	67	67	90%				3.90	0.54	73.10	77.54	0.01	19.73	2.52	0.07	0.12	0.01	22.46
118	3297	A	1			74%		3.90	0.01	93.35	97.26	0.01	2.03	0.59	0.06	0.05	0.01	2.74
114	3133	A	2	75%				3.90	0.24	71.01	75.16	0.01	22.16	2.51	0.08	0.07	0.01	24.84
115	3198	A	3	126%				3.90	0.76	78.95	83.62	0.01	13.93	2.21	0.10	0.13	0.01	16.38
139	4041	C	15	100%				3.90	0.20	75.09	79.19	0.01	18.11	2.48	0.09	0.12	0.01	20.81
110	2907	C	16	113%				3.90	0.51	77.08	81.49	0.01	15.96	2.32	0.09	0.13	0.01	18.51
125	3649	C	17	105%				3.90	2.77	73.24	79.91	0.01	17.38	2.47	0.09	0.13	0.01	20.09
89	2072	C	21	104%				3.90	0.25	75.77	79.91	0.01	17.40	2.46	0.09	0.12	0.01	20.09
85	1929	C	21-TR	127%				3.90	0.21	79.54	83.65	0.01	13.79	2.31	0.10	0.12	0.01	16.35
100	2573	C	22	117%				3.90	0.46	77.73	82.08	0.01	15.44	2.24	0.09	0.13	0.01	17.92
97	2501	C	23	137%				3.90	1.07	80.64	85.61	0.01	12.13	2.02	0.10	0.12	0.01	14.39
96	2410	C	24/25	108%				3.90	0.07	76.56	80.52	0.01	16.81	2.43	0.10	0.12	0.01	19.48
93	2228	C	26		86%			3.90	0.10	89.68	93.68	0.00	5.17	1.01	0.07	0.07	0.00	6.32
84	1900	C	26A/27	142%				3.90	0.20	82.36	86.45	0.01	11.33	1.98	0.10	0.12	0.01	13.55
74	1656	C	29/30		69%			3.90	0.94	84.31	89.15	0.00	9.03	1.62	0.09	0.11	0.00	10.85
86	2001	C	31/32	136%				3.90	0.85	80.66	85.41	0.01	12.31	2.04	0.10	0.12	0.01	14.59
184	5064	C	33	83%				3.90	0.49	72.13	76.53	0.01	20.86	2.42	0.04	0.13	0.01	23.47
106	2749	C	34	89%				3.90	0.60	72.95	77.45	0.01	19.90	2.45	0.07	0.12	0.01	22.55
120	3483	C	34A		105%			3.90	0.06	93.37	97.33	0.00	2.14	0.46	0.03	0.04	0.00	2.67
121	3491	C	34B	109%				3.90	0.51	76.28	80.70	0.01	16.66	2.41	0.10	0.12	0.01	19.30
195	5390	C	35	89%				3.90	0.71	72.71	77.32	0.01	19.91	2.56	0.08	0.11	0.01	22.68
108	2811	C	36/37	128%				3.90	1.58	78.22	83.71	0.01	13.64	2.41	0.11	0.11	0.01	16.29
116	3263	C	38		78%			3.90	2.46	85.18	91.54	0.00	6.95	1.33	0.08	0.09	0.00	8.46
107	2770	C	39			117%		3.90	1.29	92.12	97.31	0.01	1.94	0.60	0.08	0.05	0.01	2.69

BATCH	BALE	AREA	STA.	Percent of Fuel Mix of Record Based on %^{240}Pu Effective				^{234}U	^{235}U	^{238}U	Total U	^{238}Pu	^{239}Pu	^{240}Pu	^{241}Pu	^{241}Am	^{242}Pu	Pu + Am
								$L_{239}/L_1 \rightarrow$	0.64			0.15	1	0.03	2.25	0.03		
				SEFOR	West Valley	Halden	Consumer Power	(Nominal Value)	(Gamma Ratio)	(Residual Uranium)	(Residual Mix)	(Nominal Value)	(Inter-polated)	(Gamma Ratio)	(Gamma Ratio)	(Gamma Ratio)	(Nominal Value)	(Sum)
95	2359	C	40	125%				3.90	0.30	79.26	83.45	0.01	14.10	2.21	0.09	0.14	0.01	16.55
94	2285	C	41	85%				3.90	0.13	72.93	76.96	0.01	20.55	2.30	0.07	0.11	0.01	23.04
92	2193	C	42/43	87%				3.90	0.24	72.91	77.05	0.01	20.21	2.54	0.07	0.11	0.01	22.95
91	2169	C	44		140%			3.90	0.87	92.53	97.30	0.00	2.10	0.51	0.04	0.04	0.00	2.70
87	2029	C	46/47	103%				3.90	0.39	75.24	79.54	0.01	17.71	2.53	0.09	0.12	0.01	20.46
76	1701	C	48		72%			3.90	1.46	84.46	89.82	0.00	8.43	1.56	0.09	0.10	0.00	10.18
111	2926	C	62	105%				3.90	0.62	75.50	80.02	0.01	17.30	2.45	0.11	0.11	0.01	19.98
104	2672	C	63/64	140%				3.90	1.36	80.89	86.15	0.01	11.73	1.88	0.10	0.12	0.01	13.85
105	2737	C	65	136%				3.90	1.56	79.78	85.24	0.01	12.33	2.19	0.11	0.11	0.01	14.76
166	4661	CELL	11	90%				3.90	0.17	73.50	77.57	0.01	19.74	2.49	0.07	0.12	0.01	22.43
164	4583	CELL	4	83%				3.90	0.02	72.70	76.62	0.01	20.78	2.40	0.07	0.10	0.01	23.38
162	4503	CELL	6	94%				3.90	0.13	73.98	78.01	0.01	19.12	2.66	0.09	0.11	0.01	21.99
178	4953	CELL	8	92%				3.90	0.19	73.78	77.86	0.01	19.39	2.54	0.09	0.11	0.01	22.14
160	4460	CELL	S-1	89%				3.90	0.30	73.21	77.42	0.01	19.82	2.56	0.08	0.11	0.01	22.58
AREA J	S 201	J	201			119%		3.90	0.70	92.70	97.30	0.01	1.93	0.62	0.06	0.07	0.01	2.70
60	1055	J	202				129%	3.90	1.51	92.18	97.59	0.01	1.65	0.58	0.08	0.07	0.02	2.41
61	1090	J	203			125%		3.90	0.95	92.50	97.34	0.01	1.91	0.59	0.06	0.07	0.01	2.66
AREA J	S 204	J	204	123%				3.90	1.11	78.02	83.03	0.01	14.47	2.26	0.10	0.13	0.01	16.97
57	958	J	205			79%		3.90	0.24	93.13	97.27	0.01	2.02	0.57	0.05	0.06	0.01	2.73
56	929	J	TRAN	127%				3.90	0.15	79.69	83.74	0.01	13.82	2.20	0.09	0.13	0.01	16.26
AREA K	S 207	K	207	88%				3.90	0.05	73.28	77.23	0.01	20.04	2.53	0.08	0.11	0.01	22.77
68	1623	K	208		65%			3.90	1.16	83.13	88.19	0.00	9.82	1.78	0.11	0.10	0.00	11.81
67	1307	K	209	99%				3.90	0.78	74.45	79.13	0.01	18.21	2.44	0.08	0.12	0.01	20.87

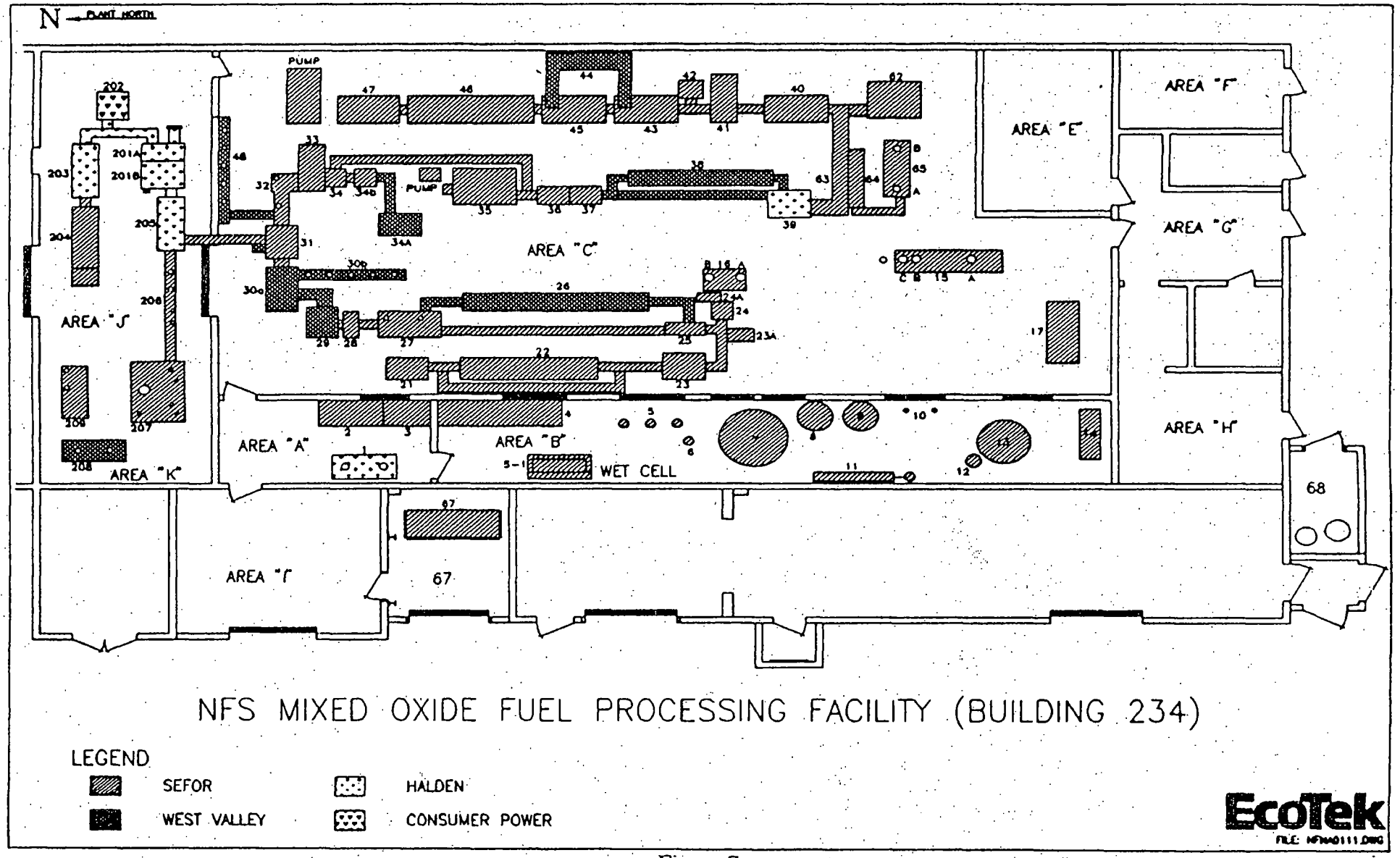
N
PLANT NORTH
PUMP
AREA "C"
AREA "E"
AREA "F"
AREA "G"
AREA "H"
AREA "J"
AREA "K"
AREA "A"
AREA "B"
AREA "I"
WET CELL
67
68
NFS MIXED OXIDE FUEL PROCESSING FACILITY (BUILDING 234)
LEGEND
SEFOR
WEST VALLEY
HALDEN
CONSUMER POWER
EcoTek

Figure 7

Of notable interest in the isotopic information provided in the tables is the variability of ^{235}U that is independent of the fuel mix of record. For the SEFOR fuel, depleted uranium (typically 0.22% ^{235}U) was used. In the test reactor fuels processed later, varying enrichments of ^{235}U were used. It can be assumed that some blending of fuel types contributes to the variability.

Where duplicate samples were analyzed from one station, the more conservative isotopic weight distribution (i.e., larger percentage of ^{239}Pu) was chosen. For gloveboxes without sufficient sample material recovered, the most conservative isotopic mix in contiguous stations has been chosen to represent the bales from that glovebox. The following table lists the stations without recovered samples and the mix chosen to represent the glovebox. These represent less than 15% of the gloveboxes in Building 234.

Station Number	Area	Representative Station	Closest Fuel Mix of Record
5, 7, 9, 10, 12, 13, 14	Wet Cell	4	SEFOR (20.78 % ^{239}Pu)
28	C	26A/27	SEFOR (11.33 % ^{239}Pu)
45	C	42/43	SEFOR (20.21 % ^{239}Pu)

Of the 1,236 CH-TRU bales produced to date, the average Pu^{239} fissile gram equivalent (^{239}Pu FGE) per bale is 0.26 grams, with maximum of 6.31.

4.2.5 Verification

Verification of waste against Waste Acceptance Criteria limits will be made using the upper limit of the 95% confidence interval of the reported values. Uncertainty associated with Station 4 active mass measurements include 20% geometry and matrix error, 10% isotopic evaluation error, 10% systematic error and the specific error due to counting statistics for each assay. The total uncertainty for the measurement is determined by calculating the square root of the sum of the square of each component. Propagation of uncertainty to calculated values is based on the percentage of uncertainty in the active mass measurement.

40-gallon drums containing bales of CH-TRU will be monitored to ensure that the contents do not exceed 15 grams (^{239}Pu FGE). Typically the contents will be much lower. The worst case scenario will result in no more than 45 grams (^{239}Pu FGE) in the final 55-gallon drum delivered to DOE-ORNL for storage.

Verification of the final 55-gallon drum at DOE-ORNL will require:

- Item count
- Tamper-indicating device integrity
- Gross weight agreement within $\pm$ 5%
- Completed documentation
- Passive neutron assay, Health Physics survey and Real-Time Radiography to verify compliance with WAC (i.e. < 128 ^{239}Pu FGE)

Item count will be completed within 10 working days. Final verification will be completed within 90 days of receipt. Differences will be resolved within 30 days of discovery by joint investigation of NFS, DOE-ORNL and DOE-ORO.

4.3 2-Liter Bottles

4.3.1 Description

During D & D activities, some material is accumulated in 0.5, 1, or 2-liter bottles. Typically this material is dry powder sweepings of residue from gloveboxes; pellets; wet cheesecloth used to wipe down contaminated surfaces; highly contaminated items such as gasket or paper filter media, or; other contaminated debris easily gathered into a small container. These bottles are used to concentrate the contamination that is removed from glovebox and equipment surfaces so that the bulk of the waste can be packaged at lower activity concentrations. Therefore, these bottles tend to contain relatively large amounts of activity.

These bottles are assayed to ensure that no more than fifteen grams are stored in any container in the process facility. Bottles containing more than 15 grams are required to be stored in a secured area. All bottles are maintained in a critically safe geometry throughout the operation and no more than 100 grams are allowed to be accumulated in any one container. Each bottle is treated as a "bale" for material tracking purposes. Each bottle is double wrapped in heat sealed plastic.

The bottles that do not contain pellets or recoverable powder are processed to remove any respirable fines less than 200 microns in diameter. The contents of each bottle is emptied into a pan and heated to remove any moisture. The material is then placed in a three stage sieve on a vibration plate. Fines less than 200 microns are removed and segregated into a 0.5-liter bottle. The residual material is returned to the bottle from which it came and is bagged out for assay. The fines from multiple bottles are accumulated in one 0.5-liter bottle until enough are collected to solidify in a portland cement matrix in a 2-liter bottle.

After assaying, the bottles of fines are solidified and packaged into a centering sleeve in the middle of a 55-gallon drum for shipment to ORNL. The bottles of residual material are accumulated into 40-gallon drums and processed through the SEG TRU Press. Bottles containing pellets or recoverable powders are treated as a separate waste stream covered under a later section on mixed-oxide waste (MOX).

4.3.2 Assay Methodology

All bottles of material containing less than 1 gram (^{239}Pu FGE) are assayed in Station 4 as described above in the section covering compacted solids. All bottles containing 1 gram (^{239}Pu FGE) or more are assayed in NDA Station 5, Passive Neutron Coincidence Counter. Station 5 measures coincident neutrons from spontaneous fission of neutron emitting isotopes, primarily ^{240}Pu in the NFS material. Station 5 consists of two (2) banks of four (4) ^{3}He detector tubes on adjustable slide rails, spaced ten inches apart on either side of a turntable.

Calibration of Station 5 is provided by use of a standardized ^{252}Cf source which has been intercompared with two (2) Los Alamos National Laboratory neutron sources and ORNL source number ORNL-4.3-240. Designated Cf-083, this source contained the equivalent of 133 grams of plutonium having a 10% ^{240}Pu isotopic content as of the reference date of June 1, 1989. With the ten inch detector package spacing and the sample positioned in the center, a calibration constant was derived[8]:

$$\text{Passive Mass} = 1.56 \times (\text{Net Coincidence Signal [cps]})$$

The calibration constant is based on the assumption that the material contains the nominal 10.0% ^{240}Pu. The passive mass is corrected to account for the actual contribution of ^{240}Pu and the contribution of ^{238}Pu and ^{242}Pu to the total spontaneous fission neutrons. The term *% ^{240}Pu effective* is used to define this correction. The relative contributions to the spontaneous fission neutrons are[9]:

$$\%\ ^{240}Pu\ effective = \%\ ^{240}Pu + 2.52 \times \%\ ^{238}Pu + 1.68 \times \%\ ^{242}Pu$$

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[8] Op. Cit., CALDWELL, *Five Station NDA System Calibration Procedures.*

[9] HOOTON, BRIAN, *A Review of Plutonium Measurement by Passive Neutron Coincidence Counting.* United Kingdom: ESARDA, July 1991.

In order to determine % ^{240}Pu *effective* accurately and conveniently using gamma spectroscopy evaluation, a relationship based on mass spectrometry of nine batches of material covering a range from 6.09 to 52.20 % ^{240}Pu *effective* has been derived[10]:

$$\%\ ^{240}Pu\ effective = 6.42 + 359.9\left[\frac{^{241}Pu + {}^{241}Am}{^{239}Pu}\right]$$

4.3.3 Isotopic Evaluation

Provided passive mass from Station 5 assay and normalized intensity factors from gamma spectroscopy, mass of ^{239}Pu in grams is calculated by:

$$\text{grams } ^{239}Pu = \frac{(\text{Passive Mass} \times 10\,\%) \times \left(\frac{\%\ ^{240}Pu}{\%\ ^{240}Pu\ effective}\right)}{\left(\frac{\%\ ^{240}Pu}{\%\ ^{239}Pu}\right)}$$

The weight percent ratio of ^{240}Pu to ^{239}Pu is determined from gamma spec ratios[11]:

$$\frac{\%\ ^{240}Pu}{\%\ ^{239}Pu} = 0.0681 + 4.131 \times \left(\frac{^{241}Am + {}^{241}Pu}{^{239}Pu}\right)$$

Using this empirical relationship and the equation presented in section 4.2.3,

$$\%_{Pu}\ ^{240}Pu = e^{\left[4.25 - 0.33 \times \ln\left(\frac{^{241}Pu}{^{239}Pu}\right)\right]},$$

the mass of ^{239}Pu is determined directly from the Station 5 assay and gamma spectroscopy. Having established the mass of ^{239}Pu, all other isotopes can be determined using the methodology discussed in section 4.2.3. All bottles, both fines and residual material, will be evaluated by gamma spectroscopy to determine and apply unique weight percents to each bottle. Isotopic weight percents for bottles that contain insufficient radioactive material to provide reasonable gamma count rates as defined in section 4.2.3 are assigned using material from the same or similar process origin.

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[10] CALDWELL, J. T., *Determination of Plutonium Isotopics for Buildings 110 and 234*, Los Alamos, NM: Pajarito Scientific Corporation, April 28, 1992.

[11] Ibid.

4.3.4 Verification

Verification of waste against Waste Acceptance Criteria limits will be made using the upper limit of the 95% confidence interval of the reported values. Uncertainty associated with Station 5 passive mass measurements include 10% geometry and matrix error, 10% isotopic evaluation error, 10% systematic error and the specific error due to counting statistics for each assay. The total uncertainty for the measurement is determined by calculating the square root of the sum of the square of each component. Propagation of uncertainty to calculated values is based on the percentage of uncertainty in the passive mass measurement.

a. Residual Material

The bottles of material that have been screened and assayed to date have been very low in radionuclide loading, for both the fines and the residual material. It is probable, however, that significant loading will be achieved in one stream or the other at some time during the process.

The residual material that is sufficiently low in activity will be controlled so that packaging in 40-gallon drums will not exceed 15 grams (^{239}Pu FGE). Therefore, the worst case scenario will result in no more than 45 grams (^{239}Pu FGE) in the final 55-gallon drum delivered to DOE-ORNL for storage.

The remainder of the residual material with significant loading of radionuclides will be concentrated and packaged separately in drums not to exceed waste acceptance criteria in the final package. Concentrating material in this way will enhance the capability of verification with passive neutron assay and gamma spectroscopy. It is anticipated that minimal drums of this concentrated material will be generated.

Verification of the final 55-gallon drum at DOE-ORNL will require:

- Item count
- Tamper-indicating device integrity
- Gross weight agreement within $\pm$ 5%
- Completed documentation
- Passive neutron assay, Health Physics survey and Real-Time Radiography to verify compliance with WAC

Item count will be completed within 10 working days. Final verification will be completed within 90 days of receipt. Differences will be resolved within 30 days of discovery by joint investigation of NFS, DOE-ORNL and DOE-ORO.

Note that with the stream of residual material constrained to 15 grams (^{239}Pu FGE) per 40-gallon drum, mixing with CH-TRU bales to minimize void space is an option that will not impede verification.

b. Immobilized Fines

In order to ensure a consistent and uniform geometry that is conducive to assay, bottles of immobilized fines that exceed 50 grams (^{239}Pu FGE) when packed into the final 55-gallon drum (four bottles), will be "bird-caged" in a sleeve in the center of the 55-gallon drum. Bottles of immobilized fines containing low levels of activity may be accumulated and "lab-packed" into a 55-gallon drum with less than 50 grams (^{239}Pu FGE). None of the immobilized material will be subject to TRU Press compaction.

Verification of the final 55-gallon drum of immobilized fines at DOE-ORNL will require:

- Item count
- Tamper-indicating device integrity
- Gross weight agreement within $\pm$ 5%
- Completed documentation
- Passive neutron assay, Health Physics survey and Real-Time Radiography to verify compliance with WAC

Item count will be completed within 10 working days. Final verification will be completed within 90 days of receipt. Differences will be resolved within 30 days of discovery by joint investigation of NFS, DOE-ORNL and DOE-ORO.

4.4 Mixed-Oxide Waste

4.4.1 Description

Some of the material recovered during the D & D activity is in the form of fuel pellets and mixed oxide powder. This material will be calcined and packaged into small pressure resistive cans. The cans will be sealed inside of produce cans. Two (2) of these assemblies will be loaded into a 55-gallon 6-M Type B shipping container.

4.4.2 Assay Methodology

Mixed oxide pellets and powders will be assayed in Station 5 using the methodology discussed in section 4.3.2.

4.4.3 Isotopic Evaluation

Calculational techniques for isotopic evaluation are the same as discussed in section 4.3.3.

4.4.4 Maximum and Nominal Values

The upper limit of MOX waste established by the waste acceptance criteria is 215 grams ^{239}Pu inhalation dose equivalents packaged in each of two inner cans and 520 grams ^{239}Pu fissile gram equivalents packaged in the final 6-M Type B package.

4.4.5 Verification

Verification of waste against Waste Acceptance Criteria limits will be made using the upper limit of the 95% confidence interval of the reported values. Uncertainty associated with Station 5 passive mass measurements include 10% geometry and matrix error, 10% isotopic evaluation error, 10% systematic error and the specific error due to counting statistics for each assay. The total uncertainty for the measurement is determined by calculating the square root of the sum of the square of each component. Propagation of uncertainty to calculated values is based on the percentage of uncertainty in the passive mass measurement.

Verification of the final 55-gallon 6-M package at DOE-ORNL will require:

- Item count
- Tamper-indicating device integrity
- Gross weight agreement within $\pm$ 5%
- Completed documentation
- Passive neutron assay, Health Physics survey and Real-Time Radiography to determine compliance with WAC limits

Item count will be completed within 10 working days. Final verification will be completed within 90 days of receipt. Differences will be resolved within 30 days of discovery by joint investigation of NFS, DOE-ORNL and DOE-ORO.

4.5 Soils

4.5.1 Description

Soils contiguous to a breached underground lab tank are contaminated with transuranic levels of activity. The soils have been excavated, dewatered and packaged in accordance with the waste acceptance criteria. Additionally, the floor of the Wet Chemistry Cell is breached along a wall and sump, providing a path for contamination to the sub-floor soils. These soils may potentially be contaminated to transuranic levels.

During the excavation, dewatering and packaging, the soils are extensively mixed and are homogeneous throughout the final package.

4.5.2 Assay Methodology

0.5-liter samples of soils are recovered in Marinelli beakers and assayed using gamma spectroscopy and active neutron interrogation, NDA Station 4. One soil sample from each of seven (7) drums of soil from the lab tank excavation have been taken. The assay methodology will be the same as described for bales. The activity per gram of sample will be applied to the mass of the soil in the corresponding drum.

A representative sampling will be taken from the Wet Chemistry Cell sub-floor soils. Sampling for assignment of activity to the mass of soil exceeding transuranic levels will be determined by the relative homogeneity of the pre-excavation soil samples.

4.5.3 Isotopic Evaluation

Assignment of isotopic weight percents will be by the same protocol as described for metal matrix bales, section 4.2.3.

4.5.4 Nominal and Maximum Values

The soils retrieved from around the lab tank contain much less than 10 grams (^{239}Pu FGE) per 55-gallon volume. It is anticipated that the soils beneath the Wet Chemistry Cell will, at worst, not exceed 50 grams (^{239}Pu FGE) per 55-gallon drum.

4.5.5 Verification

Verification of waste against Waste Acceptance Criteria limits will be made using the upper limit of the 95% confidence interval of the reported values. Uncertainty associated with Station 4 active mass measurements include 20% geometry and matrix error, 10% isotopic evaluation error, 10% systematic error and the specific error due to counting statistics for each assay. The total uncertainty for the measurement is determined by calculating the square root of the sum of the square of each component. Propagation of uncertainty to calculated values is based on the percentage of uncertainty in the active mass measurement.

55-gallon drums containing soils will be monitored to ensure that the contents do not exceed 45 grams (^{239}Pu FGE). Typically the contents will be much lower.

Verification of the final 55-gallon drum at DOE-ORNL will require:

- Item count
- Tamper-indicating device integrity
- Gross weight agreement within $\pm$ 5%

- Completed documentation
- Passive neutron assay, Health Physics survey and Real-Time Radiography to verify WAC compliance

Item count will be completed within 10 working days. Final verification will be completed within 90 days of receipt. Differences will be resolved within 30 days of discovery by joint investigation of NFS, DOE-ORNL and DOE-ORO.

5.0 VERIFICATION METHODS

Various methods will be employed to verify waste package compliance with the requirements of the applicable WAC. These methods include technical review of generator waste characterization, packaging and certification practice, technical review of applicable NFS and SEG procedures, on-site observation of active waste generation, processing, characterization and certification activity, non-destructive assay and examination, health physics surveys and waste package documentation review.

5.1 General Requirements - WMRA-WMPC-106, Part I

CORRELATION OF VERIFICATION METHOD TO WAC CRITERION	
Criterion	Verification Method
Notification Requirements	Technical Review, On-Site Observation
Certification Plan	Technical Review, Procedures & Plan
Shipment & Receipt	Technical Review, On-Site Observation

5.2 CH-TRU Waste Acceptance Criteria - WMRA-WMPC-106, Part II

CORRELATION OF VERIFICATION METHOD TO WAC CRITERION	
Criterion	Verification Method
Waste Container	Visual Inspection, Technical Review
Immobilization	Technical Procedure Review, On-Site Observation, Real-Time Radiography
Liquid Wastes	Real-Time-Radiography
Pyrophoric Materials	Technical Review, On-Site Observation
Explosives and Compressed Gases	Technical Review, On-Site Observation, Real-Time-Radiography

Radioactive Mixed Waste	Technical Review, On-Site Observation
Activity Concentration of Waste	Non-Destructive Assay, On-Site Observation, Technical Review
Waste Package Weight	Calibrated Scale
Fissile Gram-Equivalent	Non-Destructive Assay, On-Site Observation, Technical Review
^{239}Pu Equivalent Activity	Non-Destructive Assay, On-Site Observation, Technical Review
Surface Dose Rate	Health Physics Survey, On-Site Observation
Surface Contamination (Removable)	Health Physics Survey, On-Site Observation
Thermal Power	Non-Destructive Assay, On-Site Observation
Gas Generation	Technical Review, On-Site Observation
Labeling	Technical Review, Receipt Inspection
Data Package	Technical Review, On-Site Observation

5.3 MOX Waste Acceptance Criteria, WMRA-WMPC-106, Part III

CORRELATION OF VERIFICATION METHOD TO WAC CRITERION	
Criterion	Verification Method
Type and Form of Material	Technical Review, On-Site Observation
Pretreatment	Technical Review, On-Site Observation
Sampling and Testing	Technical Review, On-Site Observation
Packaging	Receipt Inspection, On-Site Observation
NDA Measurements of Loaded Packages	Non-Destructive Assay, On-Site Observation, Technical Review
Data Package	Technical Review, On-Site Observation

5.4 Certification Requirements, WMRA-WMPC-106, Part IV

CORRELATION OF VERIFICATION METHOD TO WAC CRITERION	
Criterion	Verification Method
Documentation of Process	Technical Review
Documentation of Calculational Methods	Technical Review
Documentation of Operational Procedures	Technical Review
External Dose Rate and Surface Contamination Measurements	Technical Review
Waste Physical Description	Technical Review, On-Site Observation
Homogeneity of Radionuclide Distribution	Non-Destructive Assay & Examination
Qualitative and Quantitative Radionuclide Information	Technical Review, Non-Destructive Assay
Data Quality	Technical Review
Neutron Assay Requirements	On-Site Observation
Gamma Spectroscopy Requirements	On-Site Observation
Characterization of Mixed Waste	Technical Review, On-Site Observation
Verification of Pretreatment	On-Site Observation
Verification of Chemical Form and Moisture Content	Technical Review, On-Site Observation
Measurement Statistics	Technical Review
Forms	Technical Review
Compacted Waste Packages	Technical Review, On-Site Observation, Real-Time-Radiography

6.0 DIFFERENCE RESOLUTION

The mission of the verification program is to independently verify that NFS waste packages do not exceed any acceptance criterion against which they were certified. It is not the intent of this program to correlate exactly to each and every NFS measurement. Consequently, a difference will arise in cases where the independent ORNL verification indicates that a criterion has been exceeded. As stated earlier, such differences will be resolved within 30 days via a technical evaluation jointly between ORNL and NFS. In cases where no clear technical reason for a difference can be ascertained, the ORNL value for the criterion in question will become the accepted value. In all cases where the outcome of the joint

investigation concludes with the waste package out of compliance with one or more waste acceptance criterion, the responsibility for correction of the nonconformance will reside with the generator (NFS). A package, thus out of compliance, will not be accepted by the Laboratory Certification Official (LCO) and will either be returned to NFS, or NFS will make arrangements acceptable to ORNL to remediate the waste package on site. All waste packages returned to NFS will, following corrective action, be considered a "new" waste package and subjected to the full verification protocol for acceptance. ORNL will issue a Nonconformance Report (NCR) on any waste package which fails certification verification and resolution of the NCR will require both mitigation of the specific nonconformance and identification, by the generator, of corrective action taken to prevent a reoccurrence of the nonconformance. A failed waste package may not be resubmitted until the NCR response has been submitted, reviewed and approved by the ORNL LCO.

6.1 Waste Acceptance Criteria Interpretation

The Laboratory Certification Official (LCO) for the NFS waste stream is the Department Head, Waste Minimization, Planning and Certification Department or his designee. The interpretation of all waste acceptance criteria and final determination that a waste package has or has not satisfied the requirements of WMRA-WMPC-106, or current revision of the waste acceptance criteria will reside with the LCO.

APPENDIX A

NFS WASTE CERTIFICATION AND CONFIRMATORY MEASUREMENTS

BY

WASTE EXAMINATION ASSAY FACILITY

ABSTRACT

Oak Ridge National Laboratory (ORNL) will receive CH-TRU waste and MOX waste from Nuclear Fuel Services Inc. (NFS) of Erwin Tennessee. CH-TRU waste is contact handled transuranic waste. MOX waste is mixed oxide waste, primarily mixed plutonium-oxide (PUO_2) and uranium oxide (UO_2). Before the waste can be officially received by ORNL, it must be certified against waste acceptance criteria (WAC).[1] Certification will require a measurement of radionuclide content for each waste package. To meet the WAC objectives, nondestructive examination and assay will be performed at ORNL's Waste Examination and Assay Facility (WEAF). WEAF will verify the waste by confirming that:

- TRU activity concentration is greater than 100 nCi/g [1] *(Part II, sec. 7)*;
- gross weight of the waste package is less than 800 lb [1] *(Part II, sec. 8)*;
- reported ^{239}Pu fissile gram equivalent is less than 128 g [1] *(Part II, sec. 9)*;
- corresponding ^{235}U-equivalent mass is less than 200 g; [2]
- reported ^{239}Pu equivalent activity is less than 1000 Ci [1] *(Part II, sec. 10)*;
- thermal power density is reported when it is above 0.1 W per cubic foot [1] *(Part II, sec. 13)*;
- sum of the radionuclide masses is less than 215 g, ^{239}Pu-IDE, ^{239}Pu-Inhalation Dose Equivalents for MOX waste [1] *(Part III, sec. 4)*; and
- nonconformance items are excluded from the waste package.

This document provides the mathematical expressions and values of applicable coefficients for calculating the quantities used for certifying NFS waste. Certification criteria presented here are dependent on the successful measurement of each radionuclide; hence, the methods presented here assume that an estimate for the activity, and associated error, of each radionuclide is available for each waste package. WAC methods are covered by section in the following order: TRU activity concentration *($nCi\ g^{-1}$)*; ^{239}Pu fissile gram equivalent *(g)* and corresponding ^{235}U-equivalent mass *(g)*; ^{239}Pu equivalent activity *(Ci)*; thermal power density *($W\ ft^{-3}$)*; and inhalation dose equivalent *(g)*.

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[1] *Oak Ridge National Laboratory Waste Acceptance Criteria for Contact-Handled Transuranic and Mixed Oxide Wastes from Nuclear Fuel Services*. WMRA-WMPC-106. September 15, 1992 (DRAFT).

[2] *Radioactive Solid Waste Disposal at SWSA-6*. Oak Ridge National Laboratory. WM-WMCO-203. July 1, 1991. Note: ^{235}U-equivalent mass applies only for compliance of internal ORNL requirements; it is NOT a requirement of the waste acceptance criteria described here.

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A.1 INTRODUCTION TO CALCULATIONAL METHODS

The methods for calculating various waste acceptance quantities are straightforward. The concepts in each case are nearly identical---to index a radionuclide mixture to some benchmark-equivalent quantity for controlling an identified safety parameter, e.g. criticality, or absorbed dose. Each certification calculation presented here requires that the mass or activity of each applicable radionuclide in the waste package be known. A "weighted" average of the masses then constitute a waste acceptance criteria calculation, where the "weights" are coefficients indexed to appropriate control parameters.

Table 1.1 shown below is a summary of the waste acceptance criteria discussed in this document. It shows the criteria, limit, purpose, applicable waste type and radionuclides, and the independent variables. The index i refers to the ith radionuclide, m_i is mass, SA_i is specific activity, M is mass of the waste matrix, L is subcritical mass limit, A is activity, WF is weighting factor, H is the 50-yr. committed effective dose equivalent per unit intake, and SP is specific power.

Table 1.1 *Summary for Calculating Waste Acceptance Criteria Quantities*

WAC Parameter	Limit	Purpose	Waste Type	Radionuclides	Indep. Var.
TRU activity concentration [1]	> 100 nCi/g	Assures TRU definition is met	CH-TRU, MOX	^{233}U ^{236}Pu ^{239}Pu ^{240}Pu ^{242}Pu ^{241}Am	m_i, SA_i, M
^{239}Pu-fissile gram equivalent [1]	< 128 g	Controls against accidental criticality	CH-TRU, MOX	^{233}U ^{235}U ^{238}Pu ^{239}Pu ^{240}Pu ^{241}Pu ^{242}Pu ^{241}Am	m_i, L_{Pu239}, L_i
^{235}U-equivalent mass [2] Note: not a WAC	< 200 g	Controls against accidental criticality	CH-TRU, MOX	^{233}U ^{235}U ^{238}Pu ^{239}Pu ^{240}Pu ^{241}Pu ^{242}Pu ^{241}Am	m_i, L_{U235}, L_i
^{239}Pu-equivalent activity [1]	< 1000 Ci	Limits potential radiation dose from inhalation	CH-TRU, MOX	^{233}U ^{234}U ^{235}U ^{236}U ^{238}U ^{238}Pu ^{239}Pu ^{240}Pu ^{241}Pu ^{242}Pu ^{241}Am	A_i, WF_i, H_i
Thermal power density [1]	< 0.1 W/ft^3	Limits heat & gas generation by est. a limit for reporting	CH-TRU, MOX	^{233}U ^{234}U ^{235}U ^{236}U ^{238}U ^{238}Pu ^{239}Pu ^{240}Pu ^{241}Pu ^{242}Pu ^{241}Am	m_i, SP_i
Inhalation dose equivalent [1]	< 215 g ^{239}Pu-equivalent	Basis for meeting Bldg. 3019 FSAR /USQD: limits radiation dose from inhalation	MOX only	^{233}U ^{234}U ^{235}U ^{238}U ^{238}Pu ^{239}Pu ^{240}Pu ^{241}Pu ^{242}Pu ^{241}Am	m_i, SA_i, H_i

The table in attachment I provides a summary of important isotopes in the NFS waste stream and the corresponding coefficients for calculating TRU activity concentration, fissile gram equivalents, ^{239}Pu equivalent activity, and thermal power density. Quantities listed in the table include specific activity, the ratios of criticality limits for calculating fissile gram equivalents, the ratios of committed effective dose equivalents per unit intake for calculating ^{239}Pu equivalent activity, and specific power data for calculating thermal power density.

A.2 TRU ACTIVITY CONCENTRATION

Definition

Transuranic activity concentration is a quantity expressed in nanocuries per gram of package mass (nCi g^{-1}). Transuranic waste is solid, radioactive waste comprised of radionuclides with atomic number greater than 92, a half life greater than 20 years, alpha-emitting and possessing a total TRU-activity concentration of the waste matrix greater than 100 nCi g^{-1}.

Applicable Waste Stream and Radionuclides

- Applies to CH-TRU and MOX waste.
- Applies to 6 isotopes of this waste stream: ^{233}U, ^{238}Pu, ^{239}Pu, ^{240}Pu, ^{242}Pu, and ^{241}Am.

Waste Acceptance Limit

TRU waste classification requires that the applicable isotopes be present in each waste package with a combined activity concentration greater than 100 nCi g^{-1} (ref. 1, Part II, §7.). The mass of the waste matrix is to be included in the denominator of the expression.

Mathematical Expression

TRU activity concentration is calculated by the following relationship:

$$TRU\ Act.\ Conc. = \frac{\left[\sum_{i=1}^{n} m_i \times SA_i\right]}{M} \qquad (nCi/g\ of\ waste) \qquad (1)$$

where:
m_i = *mass of radionuclide, i* (g)
SA_i = *Specific Activity of radionuclide, i* (nCi/g *of radionuclide*)
M = *Mass of the waste matrix* (g)

Values for specific activity (SA_i) are presented for each TRU-nuclide in table 2.1 below. Specific activity was calculated with half-life data taken from reference 3.

Table 2.1 *Specific Activity of TRU Radionuclides*

Isotope, i	^{233}U	^{238}Pu	^{239}Pu	^{240}Pu	^{242}Pu	^{241}Am
SA_i *(nCi* g^{-1}*)*	9.44e+06	1.71e+10	6.20e+07	2.27e+08	3.94e+06	3.43e+09

If the radioactivity of each isotope is calculated rather than the mass, the calculation is simplified by summing the activities (nCi) for each of the applicable isotopes and dividing by the mass of the waste matrix (g). In this case no conversion from mass to activity is necessary in the numerator of equation 1.

A.3 ^{239}Pu-FISSILE GRAM EQUIVALENT

Definition

^{239}Pu-fissile gram equivalent is a quantity expressed in gram (g). It will be abbreviated as $^{239}Pu_{fge}$ (or Pu-239_{fge}). This quantity scales the mass of a mixture of fissile and fissionable isotopes into a value that can be indexed to the criticality properties of a single nuclide---^{239}Pu, subject to simplified assumptions on very specific constraints of geometry, chemical form, TRU-isotopics, moderator/reflector characteristics, and whether single or multiple parameter limits are applied. Fissile and/or fissionable isotopes are not necessarily TRU.

Applicable Waste Stream and Radionuclides

- Applies to CH-TRU and MOX waste.
- Applies to 8 isotopes of this waste stream: ^{233}U, ^{235}U, ^{238}Pu, ^{239}Pu, ^{240}Pu, ^{241}Pu, ^{242}Pu, and ^{241}Am.

Waste Acceptance Limit

Section 9 of part II, reference 1 requires that the $^{239}Pu_{fge}$ not exceed 128 g for any single waste package.

Mathematical Expression

Pu-239 fissile gram equivalent is calculated by the following expression:

$$Pu\text{-}239_{fge} = \sum_{i=1}^{n} m_i \left[\frac{L_{239}}{L_i} \right] \quad (g) \qquad (2)$$

where:
m_i = *mass of radionuclide, i* (g)
L_{239} = *subcritical mass limit for Pu-239* * (g)
L_i = *subcritical mass limit for radionuclide, i* * (g)

**Note: subcritical mass limit is defined for specific physical conditions. The convention for selecting the appropriate critical conditions is outlined in the WIPP/WAC, reference 4.*

Ratios of subcritical mass limits of ^{239}Pu to nuclide i are presented for each applicable radionuclide in table 3.1 below. The ratios of L_{Pu239}/L_i apply to equation 2. Ratios were calculated from subcritical mass limits presented in references 5 and 6.

Table 3.1 *^{239}Pu Subcritical Mass Ratios for Applicable Radionuclides*

Isotope, i	^{233}U	^{235}U	^{238}Pu	^{239}Pu	^{240}Pu	^{241}Pu	^{242}Pu	^{241}Am
L_{Pu239}/L_i	0.90	0.64	0.15	1.00	0.03	2.25	0.03	0.03

A.4 ^{235}U-EQUIVALENT MASS

Definition

^{235}U-equivalent mass is a quantity expressed in gram (g). This quantity scales the mass of a mixture of fissile and fissionable isotopes into a value that can be indexed to the criticality properties of a single nuclide---^{235}U, subject to simplified assumptions on very specific constraints of geometry, chemical form, TRU-isotopics, moderator/reflector characteristics, and whether single or multiple parameter limits are applied. The concept is similar to that introduced in section 2.0 for plutonium; the only difference here is that the criticality limits were developed by the ORNL criticality safety group, under which case no storage arrangement restrictions are imposed. ^{235}U-equivalent mass is not a waste acceptance criteria, but its determination is required to demonstrate compliance with ORNL internal requirements.

Applicable Waste Stream and Radionuclides

- Applies to CH-TRU and MOX waste.
- Applies to 8 isotopes of this waste stream: ^{233}U, ^{235}U, ^{238}Pu, ^{239}Pu, ^{240}Pu, ^{241}Pu, ^{242}Pu, and ^{241}Am.

Waste Acceptance Limit

ORNL document titled "*Radioactive Solid Waste Disposal at SWSA-6*," WM-WMCO-203, reference 2 requires that the ^{235}U-equivalent mass not exceed 200 g for any single waste package.

Mathematical Expression

U-235-equivalent mass is calculated by the following expression:

$$U\text{-}235\ eq.\ mass = \sum_{i=1}^{n} m_i \left[\frac{L_{235}}{L_i} \right] \quad (g) \qquad (3)$$

where:

m_i = *mass of radionuclide, i* (g)

L_{235} = *subcritical mass limit for U-235* * (g)

L_i = *subcritical mass limit for radionuclide, i* * (g)

Ratios of subcritical mass limits of ^{235}U to nuclide i are presented for each applicable radionuclide in table 4.1 below. The second row shows the ratios with respect to ^{239}Pu, while the third row shows the ratios with respect to ^{235}U. The ratios of L_{Pu239}/L_i apply to equation 2, while the ratios of L_{U235}/L_i apply to equation 3 for calculating ^{235}U-equivalent mass. With the exception of ^{240}Pu and ^{242}Pu, ratios were taken from reference 7. The most restrictive limit for ^{240}Pu was taken from reference 5; the same conservative limit was assumed for ^{242}Pu.

Table 4.1 *^{235}U Subcritical Mass Ratios for Applicable Radionuclides*

Isotope, i	^{233}U	^{235}U	^{238}Pu	^{239}Pu	^{240}Pu	^{241}Pu	^{242}Pu	^{241}Am
L_{U235}/L_i	1.40	1.00	0.23	1.56	0.05	3.50	0.05	0.04

A.5 ^{239}Pu EQUIVALENT ACTIVITY

Definition

^{239}Pu-equivalent activity is a quantity expressed in curies (Ci). It will be abbreviated as $^{239}Pu_{eq}$ (or Pu-239_{eq}). It represents a normalizing scheme, indexed to the ^{239}Pu 50-year committed effective whole body dose equivalent (H), assuming 1.0-micron size respirable particles and a pulmonary clearance class of W (10-100 days).

Applicable Waste Stream and Radionuclides

- Applies to CH-TRU and MOX waste.
- Applies to all major isotopes: ^{233}U, ^{234}U, ^{235}U, ^{236}U, ^{238}U, ^{238}Pu, ^{239}Pu, ^{240}Pu, ^{241}Pu, ^{242}Pu, ^{241}Am.

Waste Acceptance Limit

Section 10 of part II, ref. 1 requires that the $^{239}Pu_{eq}$ not exceed 1000 Ci for any single waste package.

Mathematical Expression

^{239}Pu-equivalent activity is calculated by the following expression:

$$Pu\text{-}239_{eq} = \sum_{i=1}^{n} \frac{A_i}{WF_i} \qquad (Ci) \tag{4}$$

where: A_i = *Activity of radionuclide, i* (*Ci*)
WF_i = *Weighting Factor of radionuclide, i*

The Weighting Factor is given by the following ratio:

$$WF_i = \frac{H_{Pu\text{-}239}}{H_i} \tag{5}$$

where: $H_{Pu\text{-}239}$ = *committed eff. whole body dose eq. per μCi, Pu-239*
H_i = *committed eff. whole body dose eq. per μCi, nuclide i*

The weighting factors (WF) are presented for each nuclide in table 5.1 below. Weighting factors were calculated from dose conversion factors presented in reference 8. The interpretation of the WF's is, for example, to say that ^{239}Pu is 51 times more hazardous than ^{241}Pu under the conditions applied to the definition.

Table 5.1 *Weighting Factors for Calculating ^{239}Pu-equivalent Activity*

Isotope, i	^{233}U	^{234}U	^{235}U	^{236}U	^{238}U	^{238}Pu	^{239}Pu	^{240}Pu	^{241}Pu	^{242}Pu	^{241}Am
WF_i	3.9	3.9	4.3	3.9	4.3	1.1	1.0	1.0	51.0	1.0	1.0

A.6 THERMAL POWER DENSITY

Definition

Thermal power density is a quantity expressed in watts per cubic foot (W/ft^3) of waste. It represents the heat generation rate from spontaneous transmutation of radionuclides in the waste per unit volume of waste.

Applicable Waste Stream and Radionuclides

- Applies to CH-TRU and MOX waste.
- Applies to all major isotopes: ^{233}U, ^{234}U, ^{235}U, ^{236}U, ^{238}U, ^{238}Pu, ^{239}Pu, ^{240}Pu, ^{241}Pu, ^{242}Pu, ^{241}Am.

Waste Acceptance Limit

Section 13 of part II, reference 1 requires that the thermal power density be reported when it exceeds 0.1 W/ft^3 for any single waste package.

Mathematical Expression

Thermal power density is calculated by the following expression:

$$\textit{Thermal power density} = \frac{\left[\sum_{i=1}^{n} m_i \times SP_i\right]}{7.5\ ft^3\ \{per\ 55\text{-}gal\ drum\}} \qquad (W/ft^3) \qquad (6)$$

where: m_i = *mass of radionuclide, i* (g)
SP_i = *specific power of radionuclide, i* (W/g)

Specific power (W/g) for each radionuclide is given in table 6.1 below. Specific power is a function of specific activity and the isotopic Q-value (MeV/dis). Specific activity data was taken from reference 3, while Q-values were taken from reference 9.

Table 6.1 *Specific Power of Applicable Radionuclides*

Isotope, i	^{233}U	^{234}U	^{235}U	^{236}U	^{238}U	^{238}Pu	^{239}Pu	^{240}Pu	^{241}Pu	^{242}Pu	^{241}Am
SP_i *(W/g)*	2.8e-4	1.7e-4	5.9e-8	1.7e-6	8.4e-9	5.8e-1	1.9e-3	7.1e-3	1.2e-2	1.2e-4	1.2e-1

A.7 INHALATION DOSE EQUIVALENT

Definition

The Inhalation Dose Equivalent (IDE) is a quantity expressed in gram (g). Unlike the other WAC quantities, IDE only applies to MOX waste, destined for storage in the Radiochemical Development Facility (RDF), building 3019, Oak Ridge National Laboratory. IDE was introduced in reference 10 in response to DOE Order 5480.21, Unreviewed Safety Question, to demonstrate that the process of storing MOX waste at RDF will comply with the Final Safety Analysis Report (FSAR) of the Radiochemical Processing Plant (ref. 11), provided that adjustments for the MOX radionuclide speciation are made. IDE was introduced because the existing RDF FSAR addresses glove box failures using only uranium as the material being processed---thus the contribution of plutonium isotopes from the NFS MOX waste had to be considered. IDE, like ^{239}Pu equivalent activity, scales the radionuclide mixture to an index of the 50-year committed effective whole body dose equivalent. The difference is that IDE indexes to the resulting allowable dose, as defended in the FSAR, based on a specified isotopic makeup of uranium (mostly ^{233}U), whereas ^{239}Pu equivalent activity indexes to the "equivalent" dose from ^{239}Pu.

"The IDE calculation (1) determines the equivalent quantity of ^{239}Pu that would result in the same accident consequences as analyzed in the failure of the glovebox from an earthquake (FSAR Table 5.1, item 3), and (2) determines conversion factors to convert the quantities of non-^{239}Pu isotopes in the MOX to equivalent quantities of ^{239}Pu." (ref. 10)

A few points regarding the differences between IDE and ^{239}Pu equivalent activity are:

(1) IDE applies only to MOX waste; $^{239}Pu_{eq}$ applies to CH-TRU and MOX waste;

(2) IDE references a different set of dose conversion factors than $^{239}Pu_{eq}$. IDE uses reference 12; $^{239}Pu_{eq}$ uses reference 8.;

(3) the IDE unit is mass and the independent variable is mass, whereas the $^{239}Pu_{eq}$ unit is activity and the independent variable is activity;

(4) the conditions and assumptions under which IDE is calculated is entirely different from those of $^{239}Pu_{eq}$; and

(5) the WAC limit is applied in a different manner. On the one hand, $^{239}Pu_{eq}$ is determined from equation 4; the WAC is met as long as the quantity for the entire package is less than 1000 Ci. On the other hand, IDE is the calculation of the upper acceptance limit for a specific mixture in a single MOX can. The upper limit is tagged to the upper limit for pure ^{239}Pu---215 g per MOX can (875 g per glove box---4 MOX cans per glovebox).

Therefore, certification for IDE is quite different. For any single MOX can the IDE upper limit is calculated using equation 8 below. Then the radionuclide masses for that single can are simply added. If the sum of the masses is less than the IDE, the IDE criterion is satisfied.

Applicable Waste Stream and Radionuclides

- Applies only to MOX waste.
- Applies to most major isotopes: ^{233}U, ^{234}U, ^{235}U, ^{238}U, ^{238}Pu, ^{239}Pu, ^{240}Pu, ^{241}Pu, ^{242}Pu, ^{241}Am.

Waste Acceptance Limit

Section 1 of reference 4 requires that no single container, i.e. MOX can, shall contain more than 215 grams inhalation dose equivalent ^{239}Pu. Special requirement 3 of section 5.0 of that reference describes the methodology.

Mathematical Expression

IDE is calculated by the following expression:

$$IDE = \frac{SA_{239} * H_{239} * 215 * \sum_{i=1}^{n} m_i}{\left[\sum_{i=1}^{n} m_i SA_i H_i\right]} \quad (g) \qquad (7)$$

where:

SA_{239} = *Specific Activity of Pu-239* ($\mu Ci/g$)
H_{239} = *50-yr committed eff. dose eq. for Pu-239 per μCi intake*
215 = *upper storage limit for pure Pu-239* (g)
m_i = *mass of radionuclide, i* (g)
SA_i = *Specific Activity of radionuclide, i* ($\mu Ci/g$)
H_i = *50-yr committed eff. dose eq., nuclide,i* ($rem/\mu Ci$)

By substitution, equation 7 reduces to:

$$IDE = \frac{6.88 * 10^9 \sum_{i=1}^{n} m_i}{\left[\sum_{i=1}^{n} m_i SA_i H_i\right]} \quad (g) \qquad (8)$$

Multiples of the specific activity and the 50-year committed effective whole body dose equivalents are given in table 7.1 below. These values make up the coefficients of the denominator in equations 7 and 8. SA_i is calculated from reference 3; H_i was taken from reference 8.

Table 7.1 $SA_i * H_i$ *of Applicable Radionuclides*

Isotope, i	^{233}U	^{234}U	^{235}U	^{238}U	^{238}Pu	^{239}Pu	^{240}Pu	^{241}Pu	^{242}Pu	^{241}Am
$SA_i * H_i$ *(rem/g)*	1.2e+6	7.9e+5	2.6e+2	4.0e+1	7.9e+9	3.2e+7	1.2e+8	1.0e+9	1.9e+6	1.7e+9

Demonstrating that the IDE Acceptance Criterion is Satisfied

Equation 8 and the coefficients listed in table 7.1 are used to calculate the upper IDE limit for a single MOX can. A single MOX can meets the IDE acceptance criterion when the following inequality is satisfied:

$$\sum_{i=1}^{n} m_i < IDE \quad (g) \qquad (9)$$

A.8 REFERENCES

1. WMRA-WMPC-106. *Oak Ridge National Laboratory Waste Acceptance Criteria for Contact-Handled Transuranic and Mixed Oxide Wastes from Nuclear Fuel Services.* Oak Ridge National Laboratory, Martin Marietta Energy Systems. September 15, 1992 (Draft).

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ATTACHMENT I

SUMMARY TABLE OF COEFFICIENTS USED IN THE WASTE CERTIFICATION CALCULATIONS

ISOTOPES OF THE NFS WASTE STREAM

(Coefficients used for calculating TRU-activity, U- and Pu-fissile equivalents, and specific power)

Nuclide	Half-life	Physical Data				Fissile gram equivalent			Pu-239 equiv. activity			Specific Power		
		SA	SA	Spont. fiss.	multiplicity	sub-crit	L(35)/L(i)	L(39)/L(i)	Lung	H	WF(i) + + +	Energy Output		Power
	(y) *	*(Ci/g)*	*(dps/g)*	*(n/s/g)* **	*nu* **	mass limit	+	+ +	Class	*(rem/uCi)*	*H(39)/H(i)*	*(Mev/dis)*	*(MeV/s/g)*	*(W/g)*
U-233	1.59e+05	9.44e-03	3.49e+08	8.60e-04	1.76	500	1.40	0.90	Y	130	3.9	4.909	1.71e+09	2.75e-04
U-234	2.46e+05	6.08e-03	2.25e+08	5.02e-03	1.81				Y	130	3.9	4.769	1.07e+09	1.72e-04
U-235	7.04e+08	2.12e-06	7.83e+04	2.99e-04	1.86	700	1	0.64	Y	120	4.3	4.677	3.66e+05	5.87e-08
U-236	2.34e+07	6.34e-05	2.34e+06	5.49e-03	1.91				Y	130	3.9	4.500	1.05e+07	1.69e-06
U-238	4.47e+09	3.31e-07	1.22e+04	1.36e-02	2.01				Y	120	4.3	4.267	5.22e+04	8.36e-09
Pu-238	8.77e+01	1.71e+01	6.34e+11	2590	2.21	3000	0.23	0.15	W	460	1.1	5.679	3.60e+12	5.76e-01
Pu-239	2.41e+04	6.20e-02	2.30e+09	0.02	2.16	450	1.56	1.00	W	510	1.0	5.243	1.20e+10	1.93e-03
Pu-240	6.56e+03	2.27e-01	8.40e+09	1020	2.16	15000	0.05	0.03	W	510	1.0	5.255	4.41e+10	7.07e-03
Pu-241	1.44e+01	1.03e+02	3.83e+12	0.05	2.25	200	3.50	2.25	W	10	51.0	0.02	7.65e+10	1.23e-02
Pu-242	3.75e+05	3.94e-03	1.46e+08	1720	2.15		0.05	0.03	W	490	1.0	4.98	7.26e+08	1.16e-04
Am-241	4.33e+02	3.43e+00	1.27e+11	1.18	3.22	16000	0.04	0.03	W	530	1.0	5.638	7.15e+11	1.15e-01

Shaded blocks indicate non-TRU material

\+ Ratio of the U235 subcritical mass limit to that of the ith nuclide. (Used for calculating U-235 fissile gram equivalent---ORNL internal)

\+ + Ratio of the Pu239 subcritical mass limit to that of the ith nuclide. (Used for calculating Pu-239 fissile gram equivalent)

\+ + + WF(i) is the weighting factor, defined as the ratio of comitted effective dose equivalent of Pu239 to that of the ith nuclide (For example, Pu-239 is 51 times more hazardous than Pu-241, per unit intake)

REFERENCES

* Half-life/Specific Activity: Chart of the Nuclides, 14th ed., April 1988

** Spontaneous fission: Passive Nondestructive Assay of Nuclear Materials, NUREG/CR-5550, Table 11-1

** Spontaneous fiss. multiplicity: Passive Nondestructive Assay of Nuclear Materials, NUREG/CR-5550, Table 11-1

Fissile Gram Equivalent: *Subcritical mass limits from* ANSI/ANS-8.1, sec 5.2 (U233, U235, Pu239); ANSI/ANS-8.1 (all other isotopes)
Also refer to RP-2.4, WM-WMCO-203, IL92_1.JAC, IL92_4.JAC, and Chapman's Graphical Workbook on NFS Waste

Pu-239 Equivalent Activity: WIPP/DOE-176, Rev. 1, Estimates of Internal Dose Equivalent from Inhalation and Ingestion of Selected Radionuclides. Don Dunning.

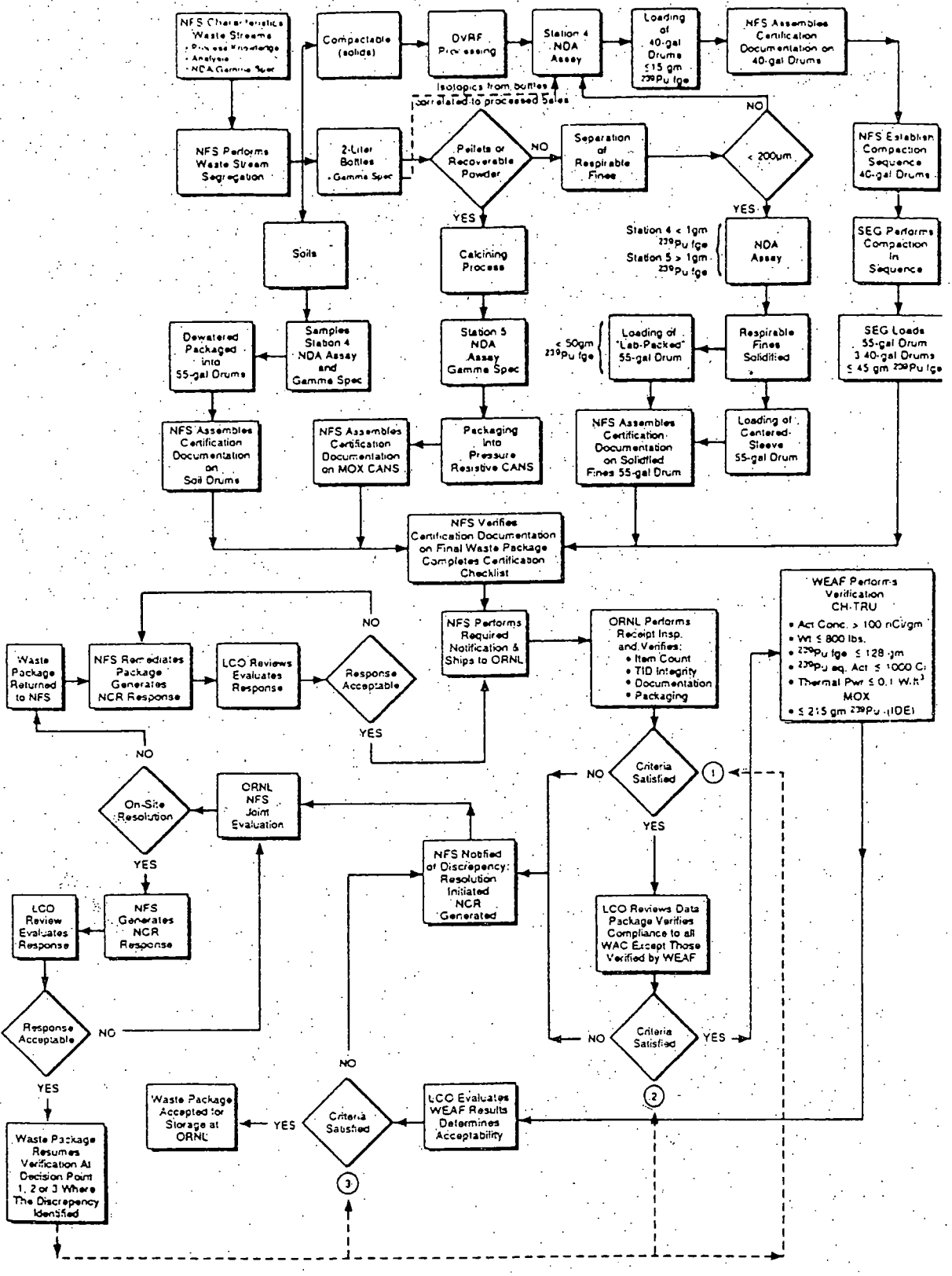
Specific Power: NUREG/CR-5550; and Waste Certification Plan for TRU Waste (Appendix C), NFS, DCM-03-05, Feb. 1992;
Q-values taken from "Energetics, Atomic and Nuclear Structure Radioactivity," Ken Skrable, Univ. of Lowell, 1988.

APPENDIX B

NFS GENERATION/CERTIFICATION PROCESS FLOW

APPENDIX B

NFS WASTE GENERATION/CERTIFICATION PROCESS FLOW



APPENDIX C

NONCONFORMANCE REPORT FORM

NONCONFORMANCE REPORT (NCR)

MARTIN MARIETTA

Sheet ____ of ____

This form should be completed when one or more distinct, describable and measurable properties or characteristics of an item (hardware or software) do not conform to documented technical requirements

1. NONCONFORMANCE REPORT NO.: NCR-

2. OCCURRENCE DATE	3. ORIGINATOR	4. PLANT/ORGANIZATION	5. DIVISION	6. ADDRESS	7. PHONE NUMBER

8. PURCHASE ORDER/WORK ORDER OR CONTRACT/ STORES NO.	9. ITEM NO.	10. REC. REPORT NO.	11. DWG/SPEC/DOC. NO.	12. REV. NO.	13. QTY REC'D. OR PRODUCED	14. QTY. NONCONFORM.

15. DESCRIPTION

15A. SPECIFIED REQUIREMENT(S)	15B. NONCONFORMANCE(S)

16A. NONCONFORMANCE DISPOSITION	16B. REMEDIAL ACTION(S) AND JUSTIFICATION
☐ ACCEPT; USE-AS-IS ☐ REWORK (TO SPEC.) ☐ REPAIR (TO USABLE COND.) ☐ RETURN TO VENDOR / SHOP ☐ REJECT/SCRAP	

17. DISPOSITION APPROVALS

17A. ENGINEER/REQUISITIONER	DATE	17B. CUSTOMER/USER	DATE	17C. QA SPECIALIST	17D. DATE

17E. REMEDIAL ACTION COMPLETED BY (NAME)	DATE

18. CORRECTIVE ACTION(S) TO PREVENT RECURRENCE

18A. ACTION	18B. TECHNICAL OR SYSTEM	18C. RESPONSIBILITY	18D. SCHEDULED COMPLETION DATE

19. CORRECTIVE ACTION APPROVALS

19A. ENGINEER/REQUISITIONER	DATE	19B. RESPONSIBLE MGR. OR BUYER	DATE	19C. QA SPECIALIST	19D. DATE

20. COST/SCHEDULE DELAY SUMMARY

COST ITEM	TOTAL
- COST OF REPAIR/REWORK - the cost of correcting failed and defective items to make them fit for intended use.	
- COST OF REPLACEMENT - the cost of procuring and installing a fit substitute for failed and defective items.	
- COST OF DELAY - the cost occurring as a result of delays caused by the nonconformance.	
- COST OF REDESIGN - the cost of re-, sing, deviating, eliminating or approving the design of items due to nonconformance.	
- COST OF CONSEQUENTIAL DAMAGE - the cost of actual, nominal, tangible, or intangible damage.	
- REIMBURSABLE CREDIT - actual dollar amount credited or reimbursed for the nonconformance.	
20A. TOTAL COST IMPACT	

WAS SCHEDULE IMPACTED? ☐ YES ☐ NO 20B. SCHEDULE DELAY (DAYS) ____

ENERGY SYSTEMS QUALITY INFORMATION SYSTEM ATTRIBUTES

21. NCR TITLE ____ 23. OTHER APPLICABLE QIRS, UQRS, OR NCRS: ____

22. REF. QER NO. ____

24. ☐ HARDWARE ☐ SOFTWARE	25. ITEM	26. DEFECT

27. QUALITY INDICATOR CATEGORY	28. JOB/PROJECT NO.

29. SOURCE OF SUPPLY ☐ VENDOR ☐ SUBCONTRACTOR ☐ AE ☐ MMESI
ACTIVITY TYPE ☐ FABRICATION ☐ DEVELOPMENT ☐ CONSTRUCT. ☐ SERVICE
30. NAME OF VENDOR /SHOP/ORG/CONTRACTOR/AE

31. KEYWORD	32. PRIMARY PROBLEM CAUSE CATEGORY:	33. PROBLEM DISCIPLINE CATEGORY:
	☐☐	☐☐

DIVIDER PAGE

Attachment 3 - Acceptable Knowledge Source Document Summary

Waste Stream Number(s): ORFWENC-003

Site(s): Oak Ridge National Laboratory	**Source Document Tracking Number:** P267
Acceptable Knowledge Documentation Type: ☐ TRU Waste Management Program Information ☐ Waste Stream-Specific Information ☑ Supporting Information	**Category:** ☐ C - Correspondence ☐ D - Discrepancy Resolution ☑ I - Internal Procedure or Note ☐ M - Miscellaneous ☐ P - Published Document or Controlled Databas ☐ U - Unpublished Documents

Title of Source Document: Nuclear Fuel Services Waste Acceptance and Storage Procedure

Source Document Reference Information (author(s), document and revision number, date, publisher): NA, WM-SWO-501.18, Revisions 0, 1, 03/05/1991; 07/12/1991, NA

AK # [a]	Source Doc. Page # [b]	AK Information Summary
S2, S16	All	The purpose of this document is to provide the instructions for the Radioactive Solid Waste Operations (RSWO) group to accept, inspect, and store transuranic (TRU) radioactive waste generated offsite by the Nuclear Fuel Services Inc. This document provides instructions for the Radioactive Solid Waste Operations (RSWO) group to accept, inspect and store transuranic (TRU) radioactive solid waste generated offsite by Nuclear Fuel Services Inc (NFS). The procedure provides instruction on completion of TRU waste documentation forms and proper packaging of containers.

Source Document Data Limitations (if any):

1. This document is stamped "Historical Copy Obsolete".

Acceptable Knowlege Expert:

Lisa Price-Watson _____ Date: 09/05/2007
Print /Sign

[a] Obtain from Acceptable Knowledge Documentation Checklist
[b] For microfilm or microfiche, identify box, tape, reel number and location.

ORIGINAL

P267

RECORD COPY

CONTROLLED COPY NUMBER 8

OFFICE OF
WASTE MANAGEMENT
and
REMEDIAL ACTIONS

PROCEDURE	1 Page of 12
Number WM-SWO-501.18	
Revision No. 1	
Issue Date July 12, 1991	
SUPERCEDES ISSUE 05 March 1991, WM-SWO-501.18	

SECTION(S)
WASTE MANAGEMENT SECTION

TITLE NUCLEAR FUEL SERVICES WASTE ACCEPTANCE AND STORAGE PROCEDURE

Approved by	Date	Approved By	Date
J. E. Van Cleve Jr	7/12/91	D. L. Adams	7/12/91

1. Purpose

The purpose of this procedure is to provide the instructions for the Radioactive Solid Waste Operations (RSWO) group to accept, inspect, and store transuranic (TRU) radioactive solid waste generated offsite by Nuclear Fuel Services, Inc. (NFS).

2. Scope

This procedure applies to the acceptance and storage operations of NFS contact-handled (CH) TRU radioactive solid waste at SWSA-5. This procedure provides the RSWO personnel the instructions to (1) ensure the TRU waste documentation forms have been properly completed, (2) ensure the container has been packaged properly, and (3) store the containers at ORNL. The acceptance of the waste package by the RSWO group does not certify the waste meets the ORNL or WIPP waste acceptance criteria. Waste acceptance criteria certification is performed by NFS, the ORNL TRU LCO, and further testing performed by Waste Examination and Assay Facility (WEAF) personnel, and is not within the scope of this procedure. Instructions for other groups (Transportation, Radiation Protection, WEAF operations, etc.) are contained in their respective operating procedure/documents.

3. References

1. WM-WMCO-202, *ORNL Waste Acceptance Criteria for TRU Waste from NFS*
2. WM-SWO-501.2, *CH TRU Waste Acceptance and Storage Procedure*
3. WM-SWO-501, *Radioactive Solid Waste Operations Manual*
4. *ORNL Health Physics Procedure Manual*

HISTORICAL COPY
OBSOLETE DMC

4. Materials, Equipment, or Supplies

1. Form TX-5352, Data Log Sheet for Packaging TRU Waste
2. Form TX-5352A, Data Log Sheet for Packaging TRU Mixed Waste
3. Form UCN-2822, Request for Storage or Disposal of Radioactive Solid Waste or Special Materials
4. Form UCN-2785, Radiation Hazard Tag
5. Form UCN-5917, Request for Nuclear Safety Review

5. Definitions and Acronyms

NOTE

The definitions are derived from DOE Order 5820.2A, Radioactive Waste Management, unless otherwise referenced.

5.1 Definitions

Fissile Waste Material. Solid waste which contains the isotopes ^{233}U, ^{235}U, ^{238}Pu, ^{239}Pu, ^{241}Pu, and/or the elements neptunium, americium, curium, berkelium, and californium (procedure 2.4 of ref. 4).

Hazardous Waste. Those wastes that are designated hazardous by EPA regulations (40 CFR 261).

Package. The outside container together with its radioactive contents as presented for transfer and disposal/storage.

Radioactive Waste. Material that contains radionuclides regulated under the Atomic Energy Act of 1954, as amended, and of negligible value considering costs of recovery.

Storage. Retrievable retention of waste pending disposal.

Solid Waste Storage Area (SWSA). The disposal site, including the land, structures, facilities, and equipment used for the storage and/or disposal of radioactive waste.

Transuranic (TRU) Waste. Waste contaminated with alpha-emitting transuranium radionuclides of atomic number greater than 92, half-lives exceeding 20 years, and concentrations greater than 100 nCi/g. Uranium-233, ^{244}Cm, and ^{252}Cf shall be handled as TRU waste. There are two types of TRU waste:

1. Contact-Handled — The radiation dose (beta/gamma and neutrons) at contact with the outer surface of the unshielded waste package does not exceed 200 mrem/h.

2. Remote-Handled — The radiation dose (beta/gamma and neutrons) at contact with the outer surface of the unshielded waste package exceeds 200 mrem/h.

Waste Container. A receptacle for waste, including any liner or shielding material that is intended to accompany the waste in disposal.

5.2 Acronyms

ALARA — As Low As Reasonably Achievable
ATN — Accountability Transfer Number
CH — Contact-handled
CFR — Code of Federal Regulations
DMC — Document Management Center
GCO — Generator Certification Officer
HP — Health Physics

LCO	—	Laboratory Certification Officer
LLW	—	Low-Level Waste
NDA	—	Nondestructive Assay
NDE	—	Nondestructive Examination
NFS	—	Nuclear Fuel Services, Inc.
NSR	—	Nuclear Safety Review
ORNL	—	Oak Ridge National Laboratory
RCO	—	Radiation Control Officer
RCRA	—	Resource Conservation and Recovery Act
RH	—	Remote-handled
SWO	—	Solid Waste Operations
SWIMS	—	Solid Waste Information Management System
SWSA	—	Solid Waste Storage Area
RSWO	—	Radioactive Solid Waste Operations
TID	—	Tamper Indicating Device
TOM	—	Transportation Operations Management
TRU	—	Transuranic
WAC	—	Waste Acceptance Criteria
WEAF	—	Waste Examination and Assay Facility
WIPP	—	Waste Isolation Pilot Plant

6. Responsibilities

6.1 NFS (Waste Generator)

1. Identifies the radioactive solid waste that is classified as TRU waste and segregates it from other wastes that are generated.

2. Properly packages the TRU waste in accordance with the Waste Acceptance Criteria (WAC) and completes all necessary documentation in accordance with the requirements of ref. 1.

3. Certifies the TRU waste has been identified, classified, and packaged according to the ORNL waste acceptance criteria, ref. 1.

4. Completes and approves all TRU waste documentation prior to shipment to ORNL for storage.

6.2 Radioactive Solid Waste Operations Group

1. Reviews the waste package documentation to ensure required forms are completed.

2. Inspects the containers to verify the package meets the acceptance and storage requirements.

3. Supervises the unloading of the transfer vehicle and the handling and storage of the containers.

4. Operates the storage facilities and performs required scheduled inspections.

5. Completes all required waste documentation and forwards the information to the Documentation Management Center (DMC) for entry into the Solid Waste Information Management System (SWIMS) data base.

6.3 Finance and Materials Division

1. Provides technical support for receiving the inbound radioactive waste shipments.

2. Provides Materials Department support for initial inspection of the waste shipment and for execution of receiving documents.

3. Makes arrangements with Health Physics to survey the inbound shipment.

4. Provides Transportation Operations Management (TOM) support for overseeing the transportation regulatory and operations activities.

5. Notifies the RSWO group upon arrival of a NFS shipment.

6.4 Radiation Protection

1. Provides trained personnel to monitor and survey the waste packages and monitor waste handling and storage operations.

6.5 Waste Examination and Assay Facility

1. Performs NDA/NDE inspections on the waste drums and completes the applicable inspection sections on form UCN-2822A and forwards the original forms to the DMC.

2. Requests the SWSA foreman transfer the drums to long-term storage.

6.6 Document Management Center

1. Receives the completed forms and enters the data into the SWIMS data base.

2. Maintains the SWIMS data base and generates reports as required.

3. Maintains the original hard copy of the forms in permanent storage.

7. Procedure

CAUTION

a. Waste operations shall be performed so that radiation exposures are reduced or maintained as low as reasonably achievable (ALARA) by observing radiation areas and warning signs, using distance and shielding to maintain low working dose rates, minimizing exposure time, and following approved operating procedures.

b. All personnel who perform work in accordance with this procedure shall be trained as applicable to perform their duties in a safe, efficient, and correct manner as required in ref. 3.

7.1 RSWO Notification of the Waste Shipment

NOTE

The NFS shipment shall be processed through Receiving in the 7000 area upon arrival at ORNL. When the RSWO group is notified that a waste shipment has arrived, either the RSWO supervisor or the technicians go to the 7000 area and perform the following operations:

1. Verify the TOMS has reviewed the waste shipment and documentation for completeness and accuracy.

2. Review the Data Package to verify forms UCN-2822 and TX-5352, Data Log Sheet for Packaging TRU Waste, are provided.

NOTE

If the NFS TRU waste also contains hazardous waste, form TX-5352A, Data Log Sheet for Packaging TRU Mixed Waste, is also required in addition to forms UCN-2822 and TX-5352.

3. Verify the quantity of drums match the reported quantity on the paperwork.

4. Request the driver to transfer the shipment to SWSA-5.

7.2 Drum Unloading and Inspection

NOTE

If an unacceptable item is discovered during the inspection, notify the RSWO supervisor prior to any corrective actions.

1. Inspect the waste drum and documentation as listed below. Complete the Check Sheet for NFS Drum Receipt, as shown in Appendix 1, as the verifications are performed and the drums are being removed from the shipping vehicle.

2. Request HP to survey each drum and attach a Radiation Hazard Tag, form UCN-2785. The container surface dose rate should be ≤200 mrem/h and the exterior of the container should be free of transferrable contamination by being:

   <20 dpm/100 cm^2 alpha and
   <200 dpm/100 cm^2 beta-gamma.

3. Verify a bar code sticker with the NFS number has been placed on the drum in two locations. Verify the number has been recorded on form UCN-2822. For waste being shipped from Scientific Ecology Group (SEG), install the NFS bar code sticker on the drum and record on form UCN-2822.

4. Review the TRU log sheet, form TX-5352, to ensure it has been properly completed. Verify columns 1 through 8 are filled out completely and signatures have been entered in columns 10 and 11.

NOTE

The log sheet and the instructions for its completion are shown in Appendix 2 of ref. 2.

5. Verify that NFS personnel have signed at the bottom of the log-in sheet for the GCO.

6. Check column 9. If "yes" is indicated that the drum contains hazardous materials, the hazardous waste materials shall be identified and quantified on the supplemental log sheet, form TX-5352A, Data Log Sheet for Packaging TRU Mixed Waste. The form must be completed and attached to the data package for the container.

7. If form TX-5352A is required, review the TRU log sheet for mixed waste, form TX-5352A, to ensure it has been properly completed. Verify columns 1 through 7 are filled out completely, and columns 8 and 9 have been signed by qualified individuals. A list of qualified NFS personnel shall be provided by NFS.

NOTE

The log sheet and instructions for its completion are shown in Appendix 3 of ref. 2.

8. If hazardous wastes are in the waste container, verify that a hazardous material waste label has been placed on the drum. See example in Appendix 2.

9. Review form UCN-2822 to ensure it has been properly completed. Verify each section of the form has been filled in. The instructions for completing and checking the form are contained in ref. 3.

10. Enter the Isotope Control (IC) number for the shipment onto each UCN-2822 form in the shipment. The IC number is given to NFS by ORNL Materials Accountability prior to each shipment. The number is recorded on the shipping documentation by NFS.

11. Review form UCN-2822 to check the quantity of the isotopes in the container. If the quantity of fissile material exceeds 100 g of ^{235}U equivalent (or 64 g of ^{239}Pu), verify the generator has labeled the container with a fissile material sign or with fissile material tape as defined in HP procedure 2.4 of ref. 4. Also, verify the drum does not contain more than 200 g of ^{235}U equivalent (128 g for ^{239}Pu). If the fissile quantity exceeds 200 g equivalent, the approval of the Criticality Committee is required prior to waste storage, approval is requested by the RSWO group using form UCN-5917, Request for Nuclear Safety Review. The Criticality Committee or Criticality Safety Officer shall be consulted on the proper method of temporary storage until a Nuclear Safety Review (NSR) is approved.

12. Verify that a tamper indicating device (TID) has been attached to the drum and is intact.

13. Visually check each drum for damage and verify the drum is closed such that there will be no leakage of radioactive material from the package during storage.

14. Check the bolt ring to verify that it has been installed properly.

15. Using a calibrated torque wrench, verify the closure bolt is torqued to 45 ft-lb (±5 ft-lb) and the jam nut is located on the outside of the bolt ring.

16. Verify the drum is stainless steel and a nuc-filter vent has been installed in the drum lid.

17. Complete the check sheet and sign and date at the bottom of the form.

NOTE

If a drum does not meet the requirements listed above and those on the check sheet, notify the RSWO supervisor. Unacceptable drums shall require special handling prior to storage.

18. After the forms have been reviewed and the waste containers inspected, the RSWO supervisor or technician shall sign form UCN-2822 and the log-in sheet.

7.3 Drum Storage and WEAF Inspection

NOTE

a. All NFS drums shall be inspected at the Waste Examination and Assay Facility (WEAF), Bldg. 7824, prior to being placed in long-term storage. Prior to WEAF inspection, the drums may be staged either at the WEAF or in Bldg. 7879.

b. Waste drums *shall not* remain at the WEAF overnight. Drums shall be transferred to Bldg. 7879 for overnight storage.

c. The log-in sheet and form UCN-2822 pertaining to the NFS waste are reviewed by the WEAF personnel by comparing them with the NDA/NDE results.

d. Depending upon the results of the NDA/NDE, waste drums are either accepted and placed in TRU storage or rejected and identified for disposition. If the drum contains less than the TRU limits (<100 nCi/g) it is not accepted for storage. R1

e. The WEAF personnel complete the applicable inspection sections on form UCN-2822A and forward the original forms to data management personnel for entry into the SWIMS data base. Copies of the original forms are maintained at WEAF.

f. After the drums have been inspected at the WEAF, WEAF personnel request the SWSA foreman to transfer the drums to long-term storage.

CAUTION

Building 7879 is equipped with door locks and intrusion alarm devices on all doors. Prior to entering the building, the door alarms shall be deactivated.

1. Prior to entering Bldg. 7879 the door alarms must be deactivated by calling Security Headquaters at 4-6646 and telling them entry into Bldg. 7879 is going to be made and request the alarms to be deactivated.

NOTE

Repeated entry and exit into the building may be made without calling Security Headquaters.

2. Bldg. 7879 shall not be left unattended while open. When entry is no longer required (at the end of the day at a minimum), notify Security Headquaters at 4-6646 to reactivate the intrusion alarms. R1

3. Transfer the drums between Bldgs. 7879 and 7824 using a fork lift or a truck. If the fork lift is used for transfer, the drum(s) shall be placed on a pallet or single drums may be transferred using the fork lift drum handling tool. Multiple drums shall be banded together on a pallet. Drums placed on a truck shall be securely tied down.

4. During drum movement into the building, perform the Daily Inspection Logsheets as required in procedure WM-SWO-501.17, TRU/RCRA Waste Storage Facility Operation Procedure.

5. Perform storage building operations in accordance with procedure WM-SWO-501.17, TRU/RCRA Waste Storage Facility Operation Procedure.

6. Place four drums on a pallet so the NFS bar code and hazardous waste label (if applicable) is seen. Band the drums onto the pallet and install a tamper indicating device around the bands holding the drums on the pallet.

NOTE

When placing drums on pallets, banding with TIDs are required only on drums that have been processed through the WEAF facility and are being placed in long-term storage. Drums temporarily staged in the building do not require banding and TIDs.

7. Place the pallet of drums in the designated storage area of Bldg. 7879. Record the exact position of the palletized drums on the Building 7879 Drum Location Log Book.

NOTE

As much as possible, drums containing hazardous material shall be stored in separate areas of the building from those drums not containing hazardous material.

8. Place the pallets in rows and provide a minimum of 28 in. of aisle space between the rows of pallets.

9. Stack the pallets three high.

10. Request HP to establish or replace radiation zones signs, barriers, and ropes to warn personnel and minimize exposure; and to identify and define the radiation control zones as required by procedure 2.7 of ref. 4.

11. After the drums have been placed in the building, remove all motorized equipment from within the building. No motorized equipment shall remain within Bldg. 7879 other than when work is in progress.

12. The SWSA foreman shall complete form UCN-2822B (pink sheet), indicating the new location of the drum, retain a copy of the form, and forward the original to the DMC for entry into the SWIMS data base.

NOTE

Routine daily and weekly, RCRA required, inspections shall be performed as required in procedure WM-SWO-501.17, TRU/RCRA Waste Storage Facility Operation Procedure.

13. Also, perform a monthly inspection of all NFS drums. Verify location of the drums, inventory and piece count, and verify integrity of the tamper indicating devices on each drum. Complete the Monthly Inspection Log Sheet as shown in Appendix 3.

8. Appendixes

1. Check Sheet for NFS Drum Receipt
2. Hazardous Waste Label
3. Monthly Inspection Log Sheet for NFS TRU Waste Storage

TITLE NUCLEAR FUEL SERVICES WASTE ACCEPTANCE AND STORAGE PROCEDURE

Appendix 1

CHECK SHEET for NFS DRUM RECEIPT

	SIGNATURE
1. HP has surveyed drum and attached a Radiation Tag.	_____
2. Bar code sticker installed in two locations on the drum.	_____
3. Form TX-5352 (Data Log Sheet for Packaging TRU Waste) completed.	_____
4. Form TX-5352A (Data Log Sheet for Packaging TRU Mixed Waste) completed.	_____
5. Hazardous Waste label on drum, if required.	_____
6. Form UCN-2822 completed.	_____
7. IC number recorded on form UCN-2822.	_____
8. Total fissile material in waste drum. _____ grams	_____
9. TID attached to drum.	_____
10. Visual check on drum for physical damage.	_____
11. Bolt ring installed properly and bolt torqued to 45 ft-lb.	_____
12. Nuc-filter installed in drum lid.	_____
13. Drum acceptable for storage.	_____

Appendix 2

HAZARDOUS MATERIAL WASTE LABEL

HAZARDOUS WASTE

FEDERAL LAW PROHIBITS IMPROPER DISPOSAL

IF FOUND, CONTACT THE NEAREST POLICE, OR PUBLIC SAFETY AUTHORITY, OR THE U.S. ENVIRONMENTAL PROTECTION AGENCY

GENERATOR INFORMATION:

NAME U.S. DOE-OAK RIDGE NATIONAL LABORATORY

ADDRESS P.O. BOX 2008 PHONE _____

CITY OAK RIDGE STATE TN ZIP 37831-6058

EPA ID NO. / MANIFEST DOCUMENT NO. TN1890090003 / _____

ACCUMULATION START DATE _____ EPA WASTE NO. _____

_____

_____

_____

D.O.T. PROPER SHIPPING NAME AND UN OR NA NO. WITH PREFIX

HANDLE WITH CARE!

STYLE WM6P

Printed by LABELMASTER, Div. of AMERICAN LABELMARK CO., CHICAGO, IL 60648 (800) 621-5808

TITLE NUCLEAR FUEL SERVICES WASTE ACCEPTANCE AND STORAGE PROCEDURE

Appendix 3

MONTHLY INSPECTION LOGSHEET FOR NFS TRU WASTE STORAGE

INSPECTOR: _____

DATE: _____

TIME: _____

DRUM NUMBER	LOCATION OF DRUM	TID IN PLACE

RECORD COPY

OFFICIAL COPY

CONTROLLED COPY

WASTE MANAGEMENT and REMEDIAL ACTIONS

PROCEDURE	1 Page of 12
Number WM-SWO-501.18	
Revision No. 0	
Issue Date 05 March 1991	
SUPERCEDES ISSUE N/A	

SECTION(S)
WASTE MANAGEMENT SECTION

TITLE NUCLEAR FUEL SERVICES WASTE ACCEPTANCE AND STORAGE PROCEDURE

Approved by	Date	Approved By	Date
J. E. Van Cleve	3/5/91	W. L. Offutt	03/05/91

1. Purpose

The purpose of this procedure is to provide the instructions for the Radioactive Solid Waste Operations (RSWO) group to accept, inspect, and store transuranic (TRU) radioactive solid waste generated offsite by Nuclear Fuel Services, Inc. (NFS).

HISTORICAL COPY OBSOLETE

2. Scope

This procedure applies to the acceptance and storage operations of NFS contact-handled (CH) TRU radioactive solid waste at SWSA-5. This procedure provides the RSWO personnel the instructions to (1) ensure the TRU waste documentation forms have been properly completed, (2) ensure the container has been packaged properly, and (3) store the containers at ORNL. The acceptance of the waste package by the RSWO group does not certify the waste meets the ORNL or WIPP waste acceptance criteria. Waste acceptance criteria certification is performed by NFS, the ORNL TRU LCO, and further testing performed by Waste Examination and Assay Facility (WEAF) personnel, and is not within the scope of this procedure. Instructions for other groups (Transportation, Radiation Protection, WEAF operations, etc.) are contained in their respective operating procedure/documents.

3. References

1. WM-WMCO-202, *ORNL Waste Acceptance Criteria for TRU Waste from NFS, Inc.*
2. WM-SWO-501.2, *CH TRU Waste Acceptance and Storage Procedure*
3. WM-SWO-501, *Radioactive Solid Waste Operations Manual*
4. *ORNL Health Physics Procedure Manual*

4. Materials, Equipment, or Supplies

1. Form TX-5352, Data Log Sheet for Packaging TRU Waste
2. Form TX-5352A, Data Log Sheet for Packaging TRU Mixed Waste
3. Form UCN-2822, Request for Storage or Disposal of Radioactive Solid Waste or Special Materials
4. Form UCN-2785, Radiation Hazard Tag
5. Form UCN-5917, Request for Nuclear Safety Review

TITLE NUCLEAR FUEL SERVICES WASTE ACCEPTANCE AND STORAGE PROCEDURE

5. Definitions and Acronyms

NOTE

The definitions are derived from DOE Order 5820.2A, Radioactive Waste Management, unless otherwise referenced.

5.1 Definitions

Fissile Waste Material. Solid waste which contains the isotopes ^{233}U, ^{235}U, ^{238}Pu, ^{239}Pu, ^{241}Pu, and/or the elements neptunium, americium, curium, berkelium, and californium (procedure 2.4 of ref. 4).

Hazardous Waste. Those wastes that are designated hazardous by EPA regulations (40 CFR 261).

Package. The outside container together with its radioactive contents as presented for transfer and disposal/storage.

Radioactive Waste. Material that contains radionuclides regulated under the Atomic Energy Act of 1954, as amended, and of negligible value considering costs of recovery.

Storage. Retrievable retention of waste pending disposal.

Solid Waste Storage Area (SWSA). The disposal site, including the land, structures, facilities, and equipment used for the storage and/or disposal of radioactive waste.

Transuranic (TRU) Waste. Waste contaminated with alpha-emitting transuranium radionuclides of atomic number greater than 92, half-lives exceeding 20 years, and concentrations greater than 100 nCi/g. Uranium-233, ^{244}Cm, and ^{252}Cf shall be handled as TRU waste. There are two types of TRU waste:

1. Contact-Handled — The radiation dose (beta/gamma and neutrons) at contact with the outer surface of the unshielded waste package does not exceed 200 mrem/h.

2. Remote-Handled — The radiation dose (beta/gamma and neutrons) at contact with the outer surface of the unshielded waste package exceeds 200 mrem/h.

Waste Container. A receptacle for waste, including any liner or shielding material that is intended to accompany the waste in disposal.

5.2 Acronyms

ALARA	—	As Low As Reasonably Achievable
ATN	—	Accountability Transfer Number
CH	—	Contact-handled
CFR	—	Code of Federal Regulations
DMC	—	Document Management Center
GCO	—	Generator Certification Officer
HP	—	Health Physics

LCO	—	Laboratory Certification Officer
LLW	—	Low-Level Waste
NDA	—	Nondestructive Assay
NDE	—	Nondestructive Examination
NFS	—	Nuclear Fuel Services, Inc.
NSR	—	National Safety Review
ORNL	—	Oak Ridge National Laboratory
RCO	—	Radiation Control Officer
RCRA	—	Resource Conservation and Recovery Act
RH	—	Remote-handled
SWO	—	Solid Waste Operations
SWIMS	—	Solid Waste Information Management System
SWSA	—	Solid Waste Storage Area
RSWO	—	Radioactive Solid Waste Operations
TID	—	Tamper Indicating Device
TOMS	—	Transportation Operations Management Section
TRU	—	Transuranic
WAC	—	Waste Acceptance Criteria
WEAF	—	Waste Examination and Assay Facility
WIPP	—	Waste Isolation Pilot Plant

6. Responsibilities

6.1 NFS (Waste Generator)

1. Identifies the radioactive solid waste that is classified as TRU waste and segregates it from other wastes that are generated.

2. Properly packages the TRU waste in accordance with the Waste Acceptance Criteria (WAC) and completes all necessary documentation in accordance with the requirements of ref. 1.

3. Certifies the TRU waste has been identified, classified, and packaged according to the ORNL waste acceptance criteria, ref. 1.

4. Completes and approves all TRU waste documentation prior to shipment to ORNL for storage.

6.2 Radioactive Solid Waste Operations Group

1. Reviews the waste package documentation to ensure required forms are completed.

2. Inspects the containers to verify the package meets the acceptance and storage requirements.

3. Supervises the unloading of the transfer vehicle and the handling and storage of the containers.

4. Operates the storage facilities and performs required scheduled inspections.

5. Completes all required waste documentation and forwards the information to the Documentation Management Center (DMC) for entry into the Solid Waste Information Management System (SWIMS) data base.

6.3 Finance and Materials Division

1. Provides technical support for receiving the inbound radioactive waste shipments.

2. Provides Materials Department support for initial inspection of the waste shipment and for execution of receiving documents.

3. Makes arrangements with Health Physics to survey the inbound shipment.

4. Provides Transportation Operations Management Section (TOMS) support for overseeing the transportation regulatory and operations activities.

5. Notifies the RSWO group upon arrival of a NFS shipment.

6.4 Radiation Protection

1. Provides trained personnel to monitor and survey the waste packages and monitor waste handling and storage operations.

6.5 Waste Examination and Assay Facility

1. Performs NDA/NDE inspections on the waste drums and completes the applicable inspection sections on form UCN-2822A and forwards the original forms to the DMC.

2. Requests the SWSA foreman transfer the drums to long-term storage.

6.6 Document Management Center

1. Receives the completed forms and enters the data into the SWIMS data base.

2. Maintains the SWIMS data base and generates reports as required.

3. Maintains the original hard copy of the forms in permanent storage.

TITLE NUCLEAR FUEL SERVICES WASTE ACCEPTANCE AND STORAGE PROCEDURE

7. Procedure

CAUTION

a. Waste operations shall be performed so that radiation exposures are reduced or maintained as low as reasonably achievable (ALARA) by observing radiation areas and warning signs, using distance and shielding to maintain low working dose rates, minimizing exposure time, and following approved operating procedures.

b. All personnel who perform work in accordance with this procedure shall be trained as applicable to perform their duties in a safe, efficient, and correct manner as required in ref. 3.

7.1 RSWO Notification of the Waste Shipment

NOTE

The NFS shipment shall be processed through Receiving in the 7000 area upon arrival at ORNL. When the RSWO group is notified that a waste shipment has arrived, either the RSWO supervisor or the technicians go to the 7000 area and perform the following operations:

1. Verify the TOMS has reviewed the waste shipment and documentation for completeness and accuracy.

2. Review the Data Package to verify forms UCN-2822 and TX-5352, Data Log Sheet for Packaging TRU Waste, are provided.

NOTE

If the NFS TRU waste also contains hazardous waste, form TX-5352A, Data Log Sheet for Packaging TRU Mixed Waste, is also required in addition to forms UCN-2822 and TX-5352.

3. Verify the quantity of drums match the reported quantity on the paperwork.

4. Request the driver to transfer the shipment to SWSA-5.

7.2 Drum Unloading and Inspection

NOTE

If an unacceptable item is discovered during the inspection, notify the RSWO supervisor prior to any corrective actions.

1. Inspect the waste drum and documentation as listed below. Complete the Check Sheet for NFS Drum Receipt, as shown in Appendix 1, as the verifications are performed and the drums are being removed from the shipping vehicle.

2. Request HP to survey each drum and attach a Radiation Hazard Tag, form UCN-2785. The container surface dose rate should be ≤200 mrem/h and the exterior of the container should be free of transferrable contamination by being:

   <20 dpm/100 cm^2 alpha and
   <200 dpm/100 cm^2 beta-gamma.

3. Verify a bar code sticker with the NFS number has been placed on the drum in two locations. Verify the number has been recorded on form UCN-2822. For waste being shipped from SEG, install the NFS bar code sticker on the drum and record on form UCN-2822.

4. Review the TRU log sheet, form TX-5352, to ensure it has been properly completed. Verify columns 1 through 8 are filled out completely and signatures have been entered in columns 10 and 11.

NOTE

The log sheet and the instructions for its completion are shown in Appendix 2 of ref. 2.

5. Verify that NFS personnel have signed at the bottom of the log-in sheet for the GCO.

6. Check column 9. If "yes" is indicated that the drum contains hazardous materials, the hazardous waste materials shall be identified and quantified on the supplemental log sheet, form TX-5352A, Data Log Sheet for Packaging TRU Mixed Waste. The form must be completed and attached to the data package for the container.

7. If form TX-5352A is required, review the TRU log sheet for mixed waste, form TX-5352A, to ensure it has been properly completed. Verify columns 1 through 7 are filled out completely, and columns 8 and 9 have been signed by qualified individuals. A list of qualified NFS personnel shall be provided by NFS.

NOTE

The log sheet and instructions for its completion are shown in Appendix 3 of ref. 2.

8. If hazardous wastes are in the waste container, verify that a hazardous material waste label has been placed on the drum. See example in Appendix 2.

9. Review form UCN-2822 to ensure it has been properly completed. Verify each section of the form has been filled in. The instructions for completing and checking the form are contained in ref. 3.

10. Enter the Isotope Control (IC) number for the shipment onto each UCN-2822 form in the shipment. The IC number is given to NFS by ORNL Materials Accountability prior to each shipment. The number is recorded on the shipping documentation by NFS.

11. Review form UCN-2822 to check the quantity of the isotopes in the container. If the quantity of fissile material exceeds 100 g of ^{235}U equivalent (or 64 g of ^{239}Pu), verify the generator has labeled the container with a fissile material sign or with fissile material tape as defined in HP procedure 2.4 of ref. 4. Also, verify the drum does not contain more than 200 g of ^{235}U equivalent (128 g for ^{239}Pu). If the fissile quantity exceeds 200 g equivalent, the approval of the Criticality Committee is required prior to waste storage, approval is requested by the RSWO group using form UCN-5917, Request for Nuclear Safety Review. The Criticality Committee or Criticality Safety Officer shall be consulted on the proper method of temporary storage until a Nuclear Safety Review (NSR) is approved.

12. Verify that a tamper indicating device (TID) has been attached to the drum and is intact.

13. Visually check each drum for damage and verify the drum is closed such that there will be no leakage of radioactive material from the package during storage.

14. Check the bolt ring to verify that it has been installed properly.

15. Using a calibrated torque wrench, verify the closure bolt is torqued to 45 ft-lb (±5 ft-lb) and the jam nut is located on the outside of the bolt ring.

16. Verify the drum is stainless steel and a nuc-filter vent has been installed in the drum lid.

17. Complete the check sheet and sign and date at the bottom of the form.

NOTE

If a drum does not meet the requirements listed above and those on the check sheet, notify the RSWO supervisor. Unacceptable drums shall require special handling prior to storage.

18. After the forms have been reviewed and the waste containers inspected, the RSWO supervisor or technician shall sign form UCN-2822 and the log-in sheet.

7.3 Drum Storage and WEAF Inspection

NOTE

a. All NFS drums shall be inspected at the Waste Examination and Assay Facility (WEAF), Bldg. 7824, prior to being placed in long-term storage. Prior to WEAF inspection, the drums may be staged either at the WEAF or in Bldg. 7879.

b. Waste drums *shall not* remain at the WEAF overnight. Drums shall be transferred to Bldg. 7879 for overnight storage.

c. The log-in sheet and form UCN-2822 pertaining to the NFS waste are reviewed by the WEAF personnel by comparing them with the NDA/NDE results.

d. Depending upon the results of the NDA/NDE, waste drums are either (1) accepted and placed in TRU storage; (2) rejected and identified for disposition; or (3) if the drum contains less than the TRU limits (<100 nCi/g) and does not contain hazardous material, it is identified and stored separately for possible future disposal.

e. The WEAF personnel complete the applicable inspection sections on form UCN-2822A and forward the original forms to data management personnel for entry into the SWIMS data base. Copies of the original forms are maintained at WEAF.

f. After the drums have been inspected at the WEAF, WEAF personnel request the SWSA foreman to transfer the drums to long-term storage.

1. The SWSA foreman shall arrange for the transfer of the drums to Bldg. 7879 for storage.

CAUTION

Building 7879 is equipped with door locks and intrusion alarm devices on all doors. Prior to entering the building, verify the door alarms are deactivated.

2. During drum movement into the building, perform the Daily Inspection Logsheets as required in procedure WM-SWO-501.17, TRU/RCRA Waste Storage Facility Operation Procedure.

3. Perform storage building operations in accordance with procedure WM-SWO-501.17, TRU/RCRA Waste Storage Facility Operation Procedure.

4. Place four drums on a pallet so the NFS bar code and hazardous waste label (if applicable) is seen. Band the drums onto the pallet and install a tamper indicating device around the bands holding the drums on the pallet.

NOTE

When placing drums on pallets, banding with TIDs are required only on drums that have been processed through the WEAF facility and are being placed in long-term storage. Drums temporarily staged in the building do not require banding and TIDs.

5. Place the pallet of drums in the designated storage area of Bldg. 7879. Record the exact position of the palletized drums on the Building 7879 Drum Location Log Book.

NOTE

As much as possible, drums containing hazardous material shall be stored in separate areas of the building from those drums not containing hazardous material.

6. Arrange the pallets so there is a minimum of 28 in. of aisle space between the pallets.

7. Stack the pallets three high.

8. Request HP to establish or replace radiation zones signs, barriers, and ropes to warn personnel and minimize exposure; and to identify and define the radiation control zones as required by procedure 2.7 of ref. 4.

9. After the drums have been placed in the building, remove all motorized equipment from within the building. No motorized equipment shall remain within Bldg. 7879 other than when work is in progress.

10. The SWSA foreman shall complete form UCN-2822B (pink sheet), indicating the new location of the drum, retain a copy of the form, and forward the original to the DMC for entry into the SWIMS data base.

NOTE

Routine daily and weekly, RCRA required, inspections shall be performed as required in procedure WM-SWO-501.17, TRU/RCRA Waste Storage Facility Operation Procedure.

11. Also, perform a monthly inspection of all NFS drums. Verify location of the drums, inventory and piece count, and verify integrity of the tamper indicating devices on each drum. Complete the Monthly Inspection Log Sheet as shown in Appendix 3.

8. Appendixes

1. Check Sheet for NFS Drum Receipt
2. Hazardous Waste Label
3. Monthly Inspection Log Sheet for NFS TRU Waste Storage

TITLE NUCLEAR FUEL SERVICES WASTE ACCEPTANCE AND STORAGE PROCEDURE

Appendix 1

CHECK SHEET for NFS DRUM RECEIPT

	SIGNATURE
1. HP has surveyed drum and attached a Radiation Tag.	_____
2. Bar code sticker installed in two locations on the drum.	_____
3. Form TX-5352 (Data Log Sheet for Packaging TRU Waste) completed.	_____
4. Form TX-5352A (Data Log Sheet for Packaging TRU Mixed Waste) completed.	_____
5. Hazardous Waste label on drum, if required.	_____
6. Form UCN-2822 completed.	_____
7. IC number recorded on form UCN-2822.	_____
8. Total fissile material in waste drum. _____ grams	_____
9. TID attached to drum.	_____
10. Visual check on drum for physical damage.	_____
11. Bolt ring installed properly and bolt torqued to 45 ft-lb.	_____
12. Nuc-filter installed in drum lid.	_____
13. Drum acceptable for storage.	_____

Appendix 2

HAZARDOUS MATERIAL WASTE LABEL

HAZARDOUS WASTE

FEDERAL LAW PROHIBITS IMPROPER DISPOSAL

IF FOUND, CONTACT THE NEAREST POLICE, OR PUBLIC SAFETY AUTHORITY, OR THE U.S. ENVIRONMENTAL PROTECTION AGENCY

GENERATOR INFORMATION:

NAME U.S. DOE-OAK RIDGE NATIONAL LABORATORY

ADDRESS P.O. BOX 2008 PHONE

CITY OAK RIDGE STATE TN ZIP 37831-6058

EPA ID NO. / MANIFEST DOCUMENT NO. TN1890090003 /

ACCUMULATION START DATE EPA WASTE NO.

D.O.T. PROPER SHIPPING NAME AND UN OR NA NO. WITH PREFIX

HANDLE WITH CARE!

STYLE WM6P

Printed by LABELMASTER, Div. of AMERICAN LABELMARK CO., CHICAGO, IL 60646 (800) 621-5808

Appendix 3

MONTHLY INSPECTION LOGSHEET FOR NFS TRU WASTE STORAGE

INSPECTOR: _____

DATE: _____

TIME: _____

DRUM NUMBER	LOCATION OF DRUM	TID IN PLACE

Attachment 2 - CCP Records Transmittal/Receiving Form

CCP Central Records / Records Custodian, 4021 National Parks Highway - MS: GSA 203, Carlsbad, New Mexico 88220

Telephone Number: 505-234-7523, 505-234-7233, 505-234-7617

Fax Number: 505-234-7014

☒ Original Record
☐ Fax Record
☐ E-mail Record

Attn:	Sheila Pearcy	From:	Lisa Price-Watson
Ship to:	CCP Central Records/ CCP Records Custodian	Site:	Oak Ridge National Laboratory, CCP-AK-ORNL-001
	4021 National Parks Highway - MS GSA 203, Carlsbad, NM 88220	Company:	Los Alamos National Laboratory
		Telephone Number:	505-628-8946
Telephone Number:	505-234-7523	Date Sent:	06/06/2007

Document Number	Title/Description	Record Date	Total Pages
P267	Attachment 3 - Acceptable Knowledge Source Document Summary for CCP-AK-ORNL-001	9/5/2007	1
	Nuclear Fuel Services Waste Acceptance and Storage Procedure	03/05/1991; 07/12/1991	24

Comments

None

Acceptance/Rejection Signature and Date

Records Accepted ☑ Sonia Gonzalez (Signature) SONIA GONZALEZ (Printed Name) 9-10-07 (Date)

Records Rejected ☐ _____ (Signature) _____ (Printed Name) _____ (Date)

Reason for Rejection:

Re-submittal: _____ (Signature) _____ (Printed Name) _____ (Date)

P.01

TRANSACTION REPORT

SEP-10-2007 MON 01:39 PM

FOR: CCP RECORDS 15052347014

SEND

DATE	START	RECEIVER	TX TIME	PAGES	TYPE	NOTE	M#	DP
SEP-10	01:38 PM	LANL CARLSBAD	16"	1	FAX TX	OK	994	

TOTAL : 16S PAGES: 1

Controlled Copy

Attachment 2 - CCP Records Transmittal/Receiving Form

CCP Central Records / Records Custodian, 4021 National Parks Highway - MS: GSA 203, Carlsbad, New Mexico 88220

Telephone Number: 505-234-7523, 505-234-7233, 505-234-7617

Fax Number: 505-234-7014

☒ Original Record
☐ Fax Record
☐ E-mail Record

Attn:	Sheila Pearcy	From:	Lisa Price-Watson
Ship to:	CCP Central Records/ CCP Records Custodian	Site:	Oak Ridge National Laboratory, CCP-AK-ORNL-001
	4021 National Parks Highway - MS GSA 203, Carlsbad, NM 88220	Company:	Los Alamos National Laboratory
		Telephone Number:	505-628-8946
Telephone Number:	505-234-7523	Date Sent:	06/06/2007

Document Number	Title/Description	Record Date	Total Pages
P267	Attachment 3 - Acceptable Knowledge Source Document Summary for CCP-AK-ORNL-001	9/5/2007	1
	Nuclear Fuel Services Waste Acceptance and Storage Procedure	03/05/1991; 07/12/1991	24

DIVIDER PAGE

Attachment 3 - Acceptable Knowledge Source Document Summary

Site(s): Oak Ridge National Laboratory	Source Document Tracking Number: P274
Waste Stream Number(s): ORNL Non-specific Library Files (Applicable only when site library is not in use)	
Acceptable Knowledge Documentation Type: ☑ TRU Waste Management Program Information ☑ Waste Stream-Specific Information ☑ Additional Information	Category: ☐ Correspondence ☐ Discrepancy Resolution ☐ Internal Procedure ☐ Miscellaneous ☑ Published Document or Internal Procedure ☐ Unpublished Documents
Title or Description of Source Document [a] : Segregation and Immobilization of Particulate Fines	
Source Document Reference Information (author(s), document and revision number, date, publisher): NFS, Decommissioning Department, DCM-58, Various, Various	

AK # [b]	Source Doc. Page # [c]	AK Information Summary
PR6, WS2, WS3, WS4, WS8, WS9, WS11, S16	Throughout	This procedure addresses the segregation and immobilization of particulate fines. For the Plutonium Facilities Decommissioning Project. Materials such as floor sweepings, paint chips, filter media, and rust are generated from various cleanup activities. These materials have been collected in 1 liter and 2 linter poly bottles and assayed to determine Pu-239 fge of each container. The bottles are presently being stored in bldg 234 and in bldg 233 vault, and are being tracked in the MTS. These bottles of particulate waste will be processed to remove respirable fines. The 1 and 2 liter bottles are put in the glovebox. Each bottle is opened and empties onto a sieve screen. The large pieces of waste are separated and shaken to remove any loose particulate material. The larger pieces are placed in 2 liter bottles for removal from the glovebox. These are sent to the DVRF for processing. The fines are placed into a poly measuring cup and into 2 liter bottles. These are bagged out and assayed, and stored in Bldg 234 Area C until ready for immobilization. The fines are cemented with cement and water. Revision 3 revisions: 8.3 changed to read - Mix the correct ratio of fines, cement and water, according to step 8.2. 8.4 changed to read - Stir the wet mixture with the spatula for approximately 30 seconds or until homogeneity of the mixture exists. 8.8 changed to read - after the cement slurry cures for twenty-four (24) hours, visually inspect the bottle for signs of residual liquid and set-up. Place a small amount of moisture absorbent material (approximately 1/2 inch thick) on the top of the cement to absorb any liquid that may evolve and condense due to thermal cycling.

NTPC RECORDS ORIGINAL
DATE REC'D 12/27/13

Attachment 3 - Acceptable Knowledge Source Document Summary (continued)

Site(s): Oak Ridge National Laboratory	Source Document Tracking Number: P274

Source Document Data Limitations (if any):

1. Does not address placement of the 1 and 2 liter bottles.
2. Revision 0 of this procedure has no effective date.
3. Revision 3 of this procedure has "Revision 2" as well as the incorrect effective date on pages 2 through 10.

Acceptable Knowlege Expert:

Travis Smith _____ Date: 11/18/2013
Print /Sign

[a] Provide description for non-titled information (i.e., container paperwork, MSDS sheets, etc)
[b] Obtain from Acceptable Knowledge Documentation Checklist
[c] For microfilm or microfiche, identify box, tape, reel number and location.

P274

NFS

DOCUMENT TITLE PAGE

NAME:
COPY #:

TITLE:
SEGREGATION AND IMMOBILIZATION OF PARTICULATE FINES

PAGE 1 OF ____

28T-93-049
UNIQUE ID #

SYS-50-27
SUBJECT/FILE CODE

DCM-58
CROSS REFERENCE

CROSS REFERENCE

DECOMMISSIONING
CONTROLLING DEPT.

DCM-58
PROCEDURE/SECTION #

3
REVISION #

02/09/93
EFFECTIVE DATE

Rev. 2
SUPERSEDES

QUAL. TRNG. | | VERS | ____

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APPROVED:

REVIEW DATE:

Safety Director

Material Control & Accountability Dir.

Production Director

Plant Engineering Director

Quality & Process Control Director

Security Director

Nuclear Safety Supervisor

Health Physics Coordinator

Decommissioning Project Director - Plutonium

EcoTek Project Manager - Plutonium

Nuclear Fuel Services, Inc.
205 Banner Hill Rd.
Erwin, TN 37650

RECORD OF REVISIONS

PAGE/PARAGRAPH		DESCRIPTION OF AND REASON FOR CHANGE
8/8.3	Change to Read:	Mix the correct ratio of fines, cement and water, according to Step 8.2.
8/8.4	Change to Read:	Stir the wet mixture with the spatula for approximately 30 seconds or until homogeneity of the mixture exists.
8/8.8	Change to Read:	After the cement slurry cures for twenty-four (24) hours, visually inspect the bottle for signs of residual liquid and set-up. Place a small amount of moisture absorbent material (approximately 1/2 inch thick) on the top of the cement to absorb any liquid that may evolve and condense due to thermal cycling.

SEGREGATION AND IMMOBILIZATION OF PARTICULATE FINES

1 GENERAL

1.1 This procedure provides instruction for the segregation and solidification of particulate waste for the Plutonium Facilities Decommissioning Project. Materials such as floor sweepings, paint chips, filter media, and rust are generated from various clean-up activities. These materials have been collected in 1-liter and 2-liter polyethylene bottles and assayed in NDA Station 4 or NDA Station 5 to determine the ^{239}Pu fissile gram equivalent of each container. The bottles are presently being stored in Building 234 and in Building 233 (vault), and are being tracked in the MTS. These bottles of particulate waste will be processed to remove respirable fines. Respirable fines are defined as those wastes which contain particulates with greater than one (1) weight percent of the material less than ten (10) microns in diameter, or greater than fifteen (15) weight percent of the material less than two hundred (200) microns in diameter. The respirable fines will be removed from the waste through a process in which the particulates are screened through a 212 micron sieve. The screened fines will be collected in 2-liter or smaller polyethylene bottles. This work will be performed in the segregation and immobilization station, Building 234, Area C.

2 REFERENCES

2.1 NFS General Health and Safety Procedures

2.2 DCM-04, Health Physics for Plutonium Decommissioning

2.3 DCM-06, Bag-out and Glove Change

2.4 DCM-08, DVRF Operations

3 HEALTH AND SAFETY

3.1 Work shall be performed in accordance with NFS general Safety procedures and procedure DCM-04, Health Physics Procedure for Plutonium Decommissioning.

3.2 Respiratory protection and protective clothing shall be worn as prescribed by the RWP.

4 RADIOLOGICAL SAFETY

4.1 A minimum of 0.5" water gauge vacuum will be maintained in the process glovebox. The glovebox will be connected to the Building 234, stack #27, vacuum header. The inlet air to the glovebox will be HEPA filtered and the exhaust air from the glovebox will be double HEPA filtered prior to discharge.

4.2 A continuous air monitor (CAM) will be operational in Area C at all times during operation of the process.

5 NUCLEAR SAFETY

5.1 All materials to be introduced into the process glovebox have previously been assayed in NDA Station 4 or NDA Station 5 to determine ^{239}Pu fissile gram equivalent. Using these values, a maximum of 200 grams ^{239}Pu fissile gram equivalents will be in the system at any one time.

6 PREREQUISITES

6.1 Employees performing work under this procedure will receive training on this procedure. Training will be documented.

6.2 Proper equipment and supplies shall be available for the performance of the steps in this procedure. Proper equipment and supplies include, but is not limited to, the following:

212 micron sieve
sieve lid
sieve collection pan
2000 ml poly measuring cup

1000 ml poly graduated cylinder
stainless steel spatula
poly funnel
small hand brush
poly scoop
vibration table
drying pan
industrial bench scale
12 mil plastic sheet or bunge bag
utility knife
radiation monitoring equipment
55-gallon or 40-gallon drum
hot plate

6.3 The building ventilation shall be in operation.

6.4 An RWP shall be issued by the Health Physics Coordinator for work conducted in accordance with this procedure.

6.5 Radiation measuring instruments utilized during this procedure shall have up-to-date calibration stickers.

6.6 A Radiation Monitor shall be in attendance while introducing or removing materials from the glovebox.

7 SEGREGATION

7.1 Select a batch of 2-liter and/or 1-liter polyethylene bottles of waste materials to be segregated and solidified. A batch will be limited to a maximum of 200 grams ^{239}Pu fissile gram equivalents. Log each bottle number (the bottle's MTS bale number) and ^{239}Pu fissile gram equivalent on the Segregation of Respirable Fines Data Sheet (Figure 1). Delete each original bale number from the MTS. Each Segregation of Respirable Fines Data Sheet will not be used for more than one batch.

7.2 Bag in the batch of 1-liter and 2-liter bottles into the process glovebox.

7.3 Open each bottle and observe the moisture content of the material. Residual moisture may be present due to condensation during storage. If no moisture is present, proceed to Step 7.8.

7.4 A 440 volt hot plate, with temperature indicator and regulator has been installed in the glovebox. A stainless steel drying pan will be used to segregate and dry the materials.

7.5 Place the 24 x 48 inch screen on the drying pan and pour the contents of the 2-liter bottles on the screen. Carefully sort the materials, removing pieces too large to fall through the screen. Remove cheesecloth and other combustible materials, vigorously shake these items over the screen, place these materials in 2-liter bottles to be removed from the glovebox.

7.6 With all combustible material removed from drying box, turn the hot plate on, adjust the regulator to 350 $\pm$ 10 degrees. The material must be dried in the pan until respirable fines are liberated. Stir the contents of the pan intermittently to allow for quicker drying.

Caution: *Do not leave the hot plate unattended during drying operation.*

Caution: *A digital temperature indicating device with an alarm set point has been installed on the hot plate. Do not touch the heated surface while red strobe is flashing.*

7.7 The material must be dried on the pan until respirable fines are liberated such that they can pass through a 212 micron sieve. Stir the contents of the pan intermittently to allow for quicker drying.

NOTE: *Allow material to cool 45 minutes prior to placing in 2-liter bottle.*

7.8 Place the sieve screen onto the sieve collection pan. Empty the contents of each bottle, or of the drying pan, into the sieve screen.

7.9 Carefully separate the larger pieces of waste and place the larger pieces in a 2-liter bottle(s) for removal from the glovebox.

7.10 Once the larger pieces have been segregated, cover the sieve and vibrate for approximately one (1) minute. Remove the lid and stir the contents, replace the lid, and vibrate the contents an additional two (2) minutes.

7.11 Remove the sieve from the collection pan and pour the remaining material from the sieve screen into the 2-liter bottle containing the larger pieces of

waste removed in Step 7.8. Replace the sieve on the collection pan and clean the screen with a small hand brush.

7.12 Repeat the sieving process for all bottles in the batch.

7.13 Once the batch has been screened, sweep the floor of the glovebox to collect any particulate that has escaped the sieve and settled on the floor. Place the sweepings on the sieve screen to separate any fines.

7.14 Remove the sieve from the collection pan and empty the contents of the sieve into the 2-liter bottle containing the non-sieved pieces. Bag-out the 2-liter bottle(s) and transfer to the DVRF for processing.

7.15 Empty the contents of the collection pan into the poly measuring cup. If contents are greater than a 500 ml volume, separate into 2-liter bottles so that no single bottle contains greater than 500 ml. Remeasure volume(s) if necessary and document this volume(s) on the Immobilization of Respirable Fines Data Sheet(s) (Figure 2).

7.16 Bag-out the bottle(s) containing the respirable fines and assay in NDA Station 5. If the assay value is less than or equal to 80 ^{239}Pu fissile gram equivalents, proceed to Step 7.17.

7.17 If the assay value of a bottle is greater than 80 ^{239}Pu fissile gram equivalents, bag the bottle into the glovebox. Separate the material into 2-liter bottles so that no single bottle should contain greater than 80 ^{239}Pu fissile gram equivalents. New Immobilization of Respirable Fines Data Sheets shall be used for each bottle. Repeat Step 7.15.

7.18 Enter the gram value into the MTS and assign a bale number to the bottle.

7.19 Store the assayed bottle in the storage racks located in Building 234 Area C.

8 IMMOBILIZATION

8.1 When the cumulative gram and volume totals on Figure 2 reach, but do not exceed, either 80 grams ^{239}Pu fissile gram equivalents or a fines volume of 500 ml, bag the stored bottle(s) into the process glove box for immobilization. If more than one bottle is to be immobilized, combine the bottles into a single 2-

liter bottle. Bag the 2-liter bottle out of the glovebox and assay in NDA Station 5. Enter the gram value into the MTS and assign a bale number to the bottle. Bag the assayed 2-liter bottle into the glovebox.

Caution: *Segregation operations are not authorized during immobilization.*

8.2 Use the following concrete mix-to-fines ratio for solidification:

Fines	Cement	Water
250 ml or less	750 ml	250 ml
250 ml to 500 ml	1,250 ml	375 ml

8.3 Mix the correct ratio of fines, cement and water, according to Step 8.2.

8.4 Stir the wet mixture with the spatula for approximately 30 seconds or until homogeneity of the mixture exists.

8.5 Tamp the bottle on the floor of the glovebox several times to assist the settling of the cement and elimination of void spaces.

8.6 Sweep the floor of the glovebox to collect any particulate that was spilled. Place the sweepings into the 2-liter bottle and re-stir until homogeneity exists.

8.7 Set the uncapped 2-liter bottle aside in the glovebox to allow hardening for at least twenty-four (24) hours.

8.8 After the cement slurry cures for twenty-four (24) hours, visually inspect the bottle for signs of residual liquid and set-up. Place a small amount of moisture absorbent material (approximately 1/2 inch thick) on the top of the cement to absorb any liquid that may evolve and condense due to thermal cycling.

8.9 Cap and bag-out the immobilized 2-liter bottle from the process glovebox and place in an approved storage area.

8.10 Bag-out the empty 2-liter bottle and transfer to the DVRF for processing.

Figure 1

SEGREGATION OF RESPIRABLE FINES DATA SHEET

	MTS Bale Number	Gram Value	Cumulative Gram Value*
1			
2			
3			
4			
5			
6			
7			
8			
9			
10			
11			
12			
13			
14			
15			
16			
17			
18			

**Not to exceed 200 grams ^{239}Pu equivalent.*

Remarks:	Operator: _____
	Supervisor: _____
	Date: _____

Figure 2

IMMOBILIZATION OF RESPIRABLE FINES DATA SHEET

	MTS Bale Number	Gram Value	Cumulative Gram Value	Volume (ml)	Cumulative Volume (ml)
1					
2					
3					
4					
5					
6					
7					
8					
9					
10					
11					
12					
13					
14					
15					
16					

Final Bale #	Gram Value	Volume

Remarks:	Operator: _____
	Supervisor: _____
	Date: _____

DIVIDER PAGE ONLY

Not part of page count

P274

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NFS

DOCUMENT TITLE PAGE	NAME: / COPY #:

TITLE: SEGREGATION AND IMMOBILIZATION OF PARTICULATE FINES

This document may not be copied without approval of the

DECOMMISSIONING DEPARTMENT

NOTE: Knowingly or willfully falsifying or concealing a material fact on this form, or making false, fictitious, or fraudulent statements or representations herein could constitute a felony punishable under Federal Statutes.

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PAGE 1 OF ____	
28T-92-030	UNIQUE ID #
SYS-50-27	SUBJECT/FILE CODE
DCM-58	CROSS REFERENCE
	CROSS REFERENCE
DECOMMISSIONING	CONTROLLING DEPT.
DCM-58	PROCEDURE/SECTION #
0	REVISION #
	EFFECTIVE DATE
	SUPERSEDES
QUAL. TRNG.	VERS

APPROVED: _____ REVIEW DATE:

Safety Director	Material Control & Accountability Dir.
Production Director	Plant Engineering Director
Quality & Process Control Director	Security Director
Nuclear Safety Supervisor 9/14/92	Health Physics Coordinator
Decommissioning Project Director - Plutonium	EcoTek Project Manager - Plutonium

Nuclear Fuel Services, Inc.
205 Banner Hill Rd.
Erwin, TN 37650

(1) 80 gram 239Pu equivalent value - is this an NFS Administrative limit? Yes - based upon a 25-30% uncertainty and?
(2) Cement mix - is it Portland, mixed according to Brunk Tech Postal? - yes.
25-30 liter container?

RECORD OF REVISIONS

PAGE/PARAGRAPH	DESCRIPTION OF AND REASON FOR CHANGE
	This is a new procedure.

SEGREGATION AND IMMOBILIZATION OF PARTICULATE FINES

1 GENERAL

1.1 This procedure provides instruction for the segregation and solidification of particulate waste for the Plutonium Facilities Decommissioning Project. Materials such as floor sweepings, paint chips, filter media, and rust are generated from various clean-up activities. These materials have been collected in 1-liter and 2-liter polyethylene bottles and assayed in NDA Station 4 or NDA Station 5 to determine the ^{239}Pu fissile gram equivalent of each container. The bottles are presently being stored in Building 234 and in Building 233 (vault), and are being tracked in the MTS. These bottles of particulate waste will be processed to remove respirable fines. Respirable fines are defined as those wastes which contain particulates with greater than one (1) weight percent of the material less than ten (10) microns in diameter, or greater than fifteen (15) weight percent of the material less than two hundred (200) microns in diameter. The respirable fines will be removed from the waste through a process in which the particulates are screened through a 212 micron sieve. The screened fines will be collected in 2-liter or smaller polyethylene bottles. This work will be performed in Building 234, Area C.

2 REFERENCES

2.1 NFS General Health and Safety Procedures

2.2 DCM-04, Health Physics for Plutonium Decommissioning

2.3 DCM-06, Bag-out and Glove Change

2.4 DCM-08, DVRF Operations

3 HEALTH AND SAFETY

3.1 Work shall be performed in accordance with NFS general Safety procedures and procedure DCM-04, Health Physics Procedure for Plutonium Decommissioning.

3.2 Respiratory protection and protective clothing shall be worn as prescribed by the RWP.

4 RADIOLOGICAL SAFETY

4.1 A minimum of 0.5" water gauge vacuum will be maintained in the process glovebox. The glovebox will be connected to the Building 234, stack #224, vacuum header. The inlet air to the glovebox will be HEPA filtered and the exhaust air from the glovebox will be double HEPA filtered prior to discharge.

4.2 A continuous air monitor (CAM) will be operational in Area C at all times during operation of the process.

5 NUCLEAR SAFETY

5.1 All materials to be introduced into the process glovebox have previously been assayed in NDA Station 4 or NDA Station 5 to determine ^{239}Pu fissile gram equivalent. Using these values, a maximum of 200 grams ^{239}Pu fissile gram equivalents will be in the system at any one time.

6 PREREQUISITES

6.1 Employees performing work under this procedure will receive training on this procedure. Training will be documented.

6.2 Proper equipment and supplies shall be available for the performance of the steps in this procedure. Proper equipment and supplies include, but is not limited to, the following:

212 micron sieve
sieve lid
sieve collection pan
2000 ml poly measuring cup
1000 ml poly graduated cylinder
stainless steel spatula
poly funnel
small hand brush
poly scoop
vibration table

industrial bench scale
12 mil plastic sheet or bunge bag
utility knife
radiation monitoring equipment
55-gallon or 40-gallon drum

6.3 The building ventilation shall be in operation.

6.4 An RWP shall be issued by the Health Physics Coordinator for work conducted in accordance with this procedure.

6.5 Radiation measuring instruments utilized during this procedure shall have up-to-date calibration stickers.

6.6 A Radiation Monitor shall be in attendance during these operations.

7 SEGREGATION

7.1 Select a batch of 2-liter and/or 1-liter polyethylene bottles of waste materials to be segregated and solidified. A batch will be limited to a maximum of 200 grams ^{239}Pu fissile gram equivalents. Log each bottle number (the bottle's MTS bale number) and ^{239}Pu fissile gram equivalent on the Segregation of Respirable Fines Data Sheet (Figure 1). Delete each original bale number from the MTS. Each Segregation of Respirable Fines Data Sheet will not be used for more than one batch.

7.2 Bag in the batch of 1-liter and 2-liter bottles into the process glovebox.

7.3 Place the sieve screen onto the sieve collection pan. Individually open each bottle and empty its contents into the sieve screen.

7.4 Carefully separate the larger pieces of waste (i.e. cheesecloth, gasket material, filter media, etc.). Vigorously shake each piece as it is removed over the sieve screen, in order to remove any loose particulate. Place the larger pieces in a 2-liter bottle(s) for removal from the glovebox.

7.5 Once the larger pieces have been segregated, cover the sieve and vibrate for approximately one (1) minute. Remove the lid and stir the contents, replace the lid, and vibrate the contents an additional two (2) minutes.

how determined

Negative pressure differential across seive?

7.6 Remove the sieve from the collection pan and pour the remaining material from the sieve screen into the 2-liter bottle containing the larger pieces of waste removed in Step 7.4. Replace the sieve on the collection pan and clean the screen with a small hand brush.

7.7 Repeat the sieving process for all bottles in the batch.

7.8 Once the batch has been screened, sweep the floor of the glovebox to collect any particulate that has escaped the sieve and settled on the floor. Place the sweepings on the sieve screen to separate any fines.

7.9 Remove the sieve from the collection pan and empty the contents of the sieve into the 2-liter bottle containing the non-sieved pieces. Bag-out the 2-liter bottle(s) and transfer to the DVRF for processing.

7.10 Empty the contents of the collection pan into the poly measuring cup. If contents are greater than a 500 ml volume, separate into 2-liter bottles so that no single bottle contains greater than 500 ml. Remeasure volume(s) if necessary and document this volume(s) on the Immobilization of Respirable Fines Data Sheet(s) (Figure 2).

Q_1 → 7.11 Bag-out the bottle(s) containing the respirable fines and assay in NDA Station 5. If the assay value is less than or equal to 80 ^{239}Pu fissile gram equivalents, proceed to Step 7.13.

How chosen?

7.12 If the assay value of a bottle is greater than 80 ^{239}Pu fissile gram equivalents, bag the bottle into the glovebox. Separate the material into 2-liter bottles so that no single bottle should contain greater than 80 ^{239}Pu fissile gram equivalents. New Immobilization of Respirable Fines Data Sheets shall be used for each bottle. Repeat Step 7.11.

7.13 Enter the gram value into the MTS and assign a bale number to the bottle.

7.14 Store the assayed bottle in the storage racks located in Building 234 Area C.

8 IMMOBILIZATION

8.1 When the cumulative gram and volume totals on Figure 2 reach, but do not exceed, either 80 grams ^{239}Pu fissile gram equivalents or a fines volume of 500

ml, bag the stored bottle(s) into the process glove box for immobilization. If more than one bottle is to be immobilized, combine the bottles into a single 2-liter bottle. Bag the 2-liter bottle out of the glovebox and assay in NDA Station 5. Enter the gram value into the MTS and assign a bale number to the bottle. Bag the assayed 2-liter bottle into the glovebox.

Caution: *Segregation operations are not authorized during immobilization.*

8.2 Use the following concrete mix-to-fines ratio for solidification:

Portland ? Yes, Per M.W. West telecon 6-8-92 From Branch Technical Position ?

Fines	Cement	Water
250 ml or less	750 ml	250 ml
250 ml to 500 ml	1,250 ml	375 ml

8.3 Pre-mix the correct amount of cement and water, according to Step 8.2, in a 2-liter bottle outside of the process glovebox. Immediately bag the bottle into the glovebox.

8.4 Pour the fines into the wet cement and mix with the spatula for 30 seconds or until homogeneity of the mixture exists.

8.5 Tamp the bottle on the floor of the glovebox several times to assist the settling of the cement and elimination of void spaces.

8.6 Sweep the floor of the glovebox to collect any particulate that was spilled. Place the sweepings into the 2-liter bottle and re-stir until homogeneity exists.

8.7 Set the uncapped 2-liter bottle aside in the glovebox to allow hardening for at least twenty-four (24) hours.

8.8 After the cement slurry cures for twenty-four (24) hours, visually inspect the bottle for signs of residual liquid and proper set-up. Place a small amount of vermiculite (approximately 1/2 inch thick) on top of the cement to absorb any liquid that may evolve and condense due to thermal cycling.

8.9 Cap and bag-out the immobilized 2-liter bottle from the process glovebox and place in an approved storage area.

8.10 Bag-out the empty 2-liter bottle and transfer to the DVRF for processing.

Figure 1

SEGREGATION OF RESPIRABLE FINES DATA SHEET

	MTS Bale Number	Gram Value	Cumulative Gram Value*
1			
2			
3			
4			
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18			

**Not to exceed 200 grams ^{239}Pu equivalent.*

Remarks:	Operator: _____
	Supervisor: _____
	Date: _____

Figure 2

IMMOBILIZATION OF RESPIRABLE FINES DATA SHEET

	MTS Bale Number	Gram Value	Cumulative Gram Value	Volume (ml)	Cumulative Volume (ml)
1					
2					
3					
4					
5					
6					
7					
8					
9					
10					
11					
12					
13					
14					
15					
16					

Final Bale #	Gram Value	Volume

Remarks:	Operator: _____
	Supervisor: _____
	Date: _____

DIVIDER PAGE

Attachment 3 - Acceptable Knowledge Source Document Summary

Site(s): Oak Ridge National Laboratory	Source Document Tracking Number: U043
Waste Stream Number(s): ORNL Non-specific Library Files (Applicable only when site library is not in use)	
Acceptable Knowledge Documentation Type: ☑ TRU Waste Management Program Information ☑ Waste Stream-Specific Information ☑ Additional Information	Category: ☐ Correspondence ☐ Discrepancy Resolution ☐ Internal Procedure ☐ Miscellaneous ☐ Published Document or Internal Procedure ☑ Unpublished Documents
Title or Description of Source Document [a]: Final Report - Waste Characterization of Wastes Generated from D&D Activity; Buildings 110 and 234 on the NFS Site in Erwin, Tennessee	
Source Document Reference Information (author(s), document and revision number, date, publisher): M. W. Tull, Martin Marietta, NA, NA, 01/31/1992, NA	

AK # [b]	Source Doc. Page # [c]	AK Information Summary
PR4, PR6, PR7, WS2, WS3, WS4, WS8, WS9, WS11, WS12, S5, S9	Throughout	This report summarizes the analytical results form analyses performed on samples submitted by the NFS associated with wastes to be generated from D&D of bigs 110 and 234. these samples were taken to characterize wastes from a lab tank and surrounding soil which were part of the bldg 110 activity, and samples were also taken at 6 pre-determined locations along the process line in the bldg 234 MOX fuel fabrication facility. The nature of the waste composition, particularly the nonhomogeneity and the rad content presented several challenges to the performance of characterization analysis in accordance with SW-846 methodologies. Page 8 Bldg 234 Mixed oxide fuel production process line The D&D of this facility will be the source of the majority of the potential 550 ft3 of waste to be stored at ORNL. Sample locations were as follows: Pt C1 - Precipitation, cake drying, and oxide conversion Pt C2 - Oxide blending, pressing, and sintering Pt C3 - Pellet grinding, inspection, and tube loading Pt J1 - Oxide scrap recovery line Pt J2 - Leachable materials recovery line Pt K1 - Pu nitrate storage and load out Additionally, gasket material from typical glovebox applications were analyzed for PCBs. Pg 9 - provides to tables. One for MOX process line radionuclides and metals, and one for PCBs. TCLP showed Barium, cadmium, arsenic. Radionuclides found were Pu-238, Pu-239, Am-241, Pu-240 in all samples. K1 and the gaskets showed PCBs (Aroclor 1248, 1254, and 1260). A Cd-coated wrench was found in one of the samples and they expected this to be an isolated

NTPC RECORDS ORIGINAL
DATE REC'D 12/27/13

Attachment 3 - Acceptable Knowledge Source Document Summary (continued)

Site(s): Oak Ridge National Laboratory		Source Document Tracking Number: U043
AK # [b]	Source Doc. Page # [c]	AK Information Summary
		situation causing Cd levels to be above the regulatory thresholds for this sample. PCBs were detected at values well below the regulatory threshold.

Source Document Data Limitations (if any):

1. None.

Acceptable Knowlege Expert:

Travis Smith _____ Date: 11/18/2013

Print /Sign

[a] Provide description for non-titled information (i.e., container paperwork, MSDS sheets, etc)
[b] Obtain from Acceptable Knowledge Documentation Checklist
[c] For microfilm or microfiche, identify box, tape, reel number and location.

U043

MARTIN MARIETTA

Internal Correspondence

MARTIN MARIETTA ENERGY SYSTEMS, INC.

January 31, 1992

D.W. Turner

Final Report on the Characterization of Wastes From NFS

Attached is the final report on the characterization of the waste stream comming from the NFS, Erwin site in fullfillment of the contract between DOE and NFS.

The report contains results from both the previous analysis of soil and laboratory tank, as well as the results from the process line analysis for completeness.

If you have any questions, please let me know.

Martin W. Tull

M.W. Tull, Bldg 3047, MS-6023 (6-5225) - RC

FINAL REPORT
WASTE CHARACTERIZATION
of
WASTES GENERATED from D&D ACTIVITY
in
BUILDINGS 110 and 234 on the NFS SITE
ERWIN, TENNESSEE

January 31, 1992

Prepared by
MARTIN MARIETTA ENERGY SYSTEMS,INC.
P.O. Box 2008
Oak Ridge, Tennessee 37831-6023
for the
U.S. DEPARTMENT OF ENERGY
Under Contract No. DE-AC05-84OR21400

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Polychlorinated Biphenyls

BUILDING 234 MIXED OXIDE FUEL PRODUCTION PROCESS LINE

Radionuclides and Metals

Polychlorinated Biphenyls

Organic Analyses

DATA ANALYSIS

FINAL REPORT
WASTE CHARACTERIZATION
of
WASTES GENERATED from D&D ACTIVITY
in
BUILDINGS 110 and 234 on the NFS SITE
ERWIN, TENNESSEE

INTRODUCTION

This report summarizes the analytical results from analyses performed on samples submitted by the Nuclear Fuel Services Company, Erwin, Tennessee (NFS) associated with wastes to be generated from the decommissioning and decontamination of buildings 110 and 234 on the Erwin site and destined for storage at the Oak Ridge National Laboratory (ORNL). These samples were taken to characterize wastes from a laboratory tank and surrounding soil which were part of the building 110 activity, equipment in building 110 and samples were also taken at six (6) pre-determined locations along the process line in the building 234, mixed-oxide, fuel fabrication facility.

Although results from the laboratory tank and soils analyses have been reported previously, they are repeated here for the sake of completeness in the final characterization report.

These results are to be utilized by NFS to perform a hazardous waste determination as prescribed by 40CFR262.11. ORNL, which is not the generator of the wastes, has provided the analytical results, consulted with NFS on interpretation of the data, but has deferred the final determination to NFS, who as the actual generator, is required by regulation to perform the determination.

This report concludes the activities commited to , by ORNL and the Department of Energy (DOE), to provide supporting analytical services for waste characterization.

The nature of the waste composition, particularly the nonhomogeneity and the radionuclide content presented several challenges to the performance of characterization analysis in accordance with typical SW-846 methodologies. In some instances, typical protocols could not be followed. The sample consitiuents were highly complex which caused some re-analysis of certain parameters to become necessary. These difficulties required a significantly longer period of time to resolve and consequently the completion of the characterization effort could not be completed as expeditiously as had been thought originally.

A considerable amount of data on these samples has been generated and the result is that the NFS samples have been charactrized as completely as practical. A sufficient amount of information has been collected to enable both NFS and ORNL to clearly understand the content and character of the samples and the associated waste stream.

SOIL CORE SAMPLES

The soil surrounding the laboratory tank outside the Bldg. 110 area at the NFS site was sampled by taking 2 soil cores approximately 4 inches in diameter, one sample was taken in a location determined to be up-gradient from the tank at a distance from the tank of 15.6 feet, and the second sample was taken in a location approximately 4.6 feet from the tank and in a down-gradient position relative to the tank. The up-gradient core was 67.5 inches in total length and the down-gradient core was 56 inches in total length.

UP-GRADIENT
SOIL CORE SCHEMATIC

TOP BOTTOM

UP-GRADIENT SOIL CORE DATA RADIONUCLIDES and METALS				
SEGMENT NO. (LENGTH)	GROSS ALPHA (BQ/GM)	GROSS BETA (BQ/GM)	PRINCIPLE RADIOISOTOPES (% ABUNDANCE)	TCLP*
1 (19")	8.4	11.9	N/A	< RT
2 (17.5")	5.0	3.6	N/A	< RT
3 (12")	93	18	U^{233} (100)	< RT
4 (16")	120	24	U^{233} (93), Pu^{239} (6.1) Pu^{238} (0.9)	< RT

* < RT indicates that all characteristically toxic parameters were less than the regulatory threshold specified in 40CFR261.

DOWN-GRADIENT
SOIL CORE SCHEMATIC

TOP BOTTOM

DOWN-GRADIENT SOIL CORE DATA RADIONUCLIDES and METALS				
SEGMENT NO. (LENGTH)	GROSS ALPHA (BQ/GM)	GROSS BETA (BQ/GM)	PRINCIPLE RADIOISOTOPES (% ABUNDANCE)	TCLP
1 (18")	390	69	U^{233} (92), Pu^{239} (5.6) Pu^{238} (2.4) Am^{241} {1.28± 0.52 Bq/Gm}	< RT
2 (18")	900	110	U^{233} (87), Pu^{239} (6.9) Pu^{238} (6.1) Am^{241} {0.46±0.17 Bq/Gm}	< RT
3 (20")	16	19.1	N/A	< RT

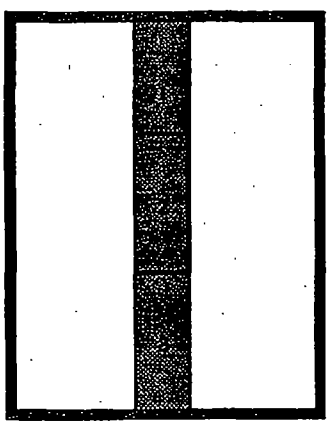
LABORATORY TANK CONTENTS

The laboratory tank which was sampled for these analyses was approximately 55 gallons in volume and was sampled by taking a core through the center along the vertical axis of the tank. That core was then sectioned into 3 segments and submitted for analysis. Each core segment was approximately 11 inches in length and approximately 1 inch in diameter.

LABORATORY TANK CONTENT RADIONUCLIDES and METALS				
CORE SECTION (LENGTH)	GROSS ALPHA (BQ/GM)	GROSS BETA (BQ/GM)	PRINCIPLE RADIOISOTOPES (BQ/GM)	TCLP* (uGM/GM)
TOP (11")	1.12E5 ±0.01E5	1.86E5 ±0.01E5	Pu^{238}/Am^{241} 1.14E5 ±0.06E5 Pu^{239}/Pu^{240} 7.02E3 ±0.4E3	< RT
MIDDLE (11")	8.10E4 ±0.02E4	1.21E5 ±0.01E5	Pu^{238}/Am^{241} 7.67E4 ±0.4E4 Pu^{239}/Pu^{240} 3.53E3 ±0.2E3	Hg 0.2±0.07
BOTTOM (11")	9.24E4 ±0.02E4	1.48E5 ±0.01E5	Pu^{238}/Am^{241} 1.04E5 ±0.05E5 Pu^{239}/Pu^{240} 4.8E3 ±0.2E3	< RT

* TCLP data reflect only those samples where parameters were reported in excess of the regulatory threshold.

LABORATORY TANK SCHEMATIC



Laboratory tank contained approximately 55 gallons in volume, and was buried approximately 18 inches below grade. The center column represents the core sample with segments 1, 2, and 3 corresponding to the top, middle, and bottom segments respectively as reported in the above table.

With regard to the Hg contamination indicated in the middle tank sample, the results were treated according to the methodology presented in Chapter Nine of SW-846. That statistical analysis resulted in a value for the upper limit of the confidence interval (CI_{ul}) of 0.193 uGm/Gm, which is < the 0.20 uGm/Gm value of the regulatory thtreshold. As a result, in accordance with SW-846, the Hg is not present at hazardous levels as defined by 40CFR261 in these samples.

ORGANIC ANALYSES

Both the soil core and laboratory tank samples were analyzed for the following consitiuents:

1,1 - Dichloroethylene
1,2 - Dichloroethene
1,4 - Dichlorobenzene
2,4,5 -TP (Silvex)
2,4,5 -Trichlorophenol
2,4,6 -Trichlorophenol
2,4, -D
2,4 - Dinitrotoluene
Benzene
Carbon Tetrachloride
Chlordane
Chlorobenzene
Chloroform
Cresol
Endrin
Heptachlor
Heptachlor epoxide
Hexachlorethane
Hexachlorobenzene
Hexachlorobutadiene
Lindane
Methoxychlor
Methyl ethyl ketone
Nitrobenzene
Pentachlorophenol
Pyridine
Tetrachloroethylene
Toxaphene
Trichloroethylene
Vinyl chloride
m-Cresol
o-Cresol
p-Cresol

No values above the regulatory thresholds were identified for any of the parameters in any of the samples of either soils or laboratory tank content.

POLYCHLORINATED BIPHENYLS

Polychlorinated Biphenyls (PCBs) were analyzed for after the first round of samples reported above. An insufficient amount of sample remained for a PCB analysis of the top tank core segment. Consequently, results for only the middle and bottom segments is reported.

POLYCHLORINATED BIPHENYLS	
Segment	Concentration (PPM)
Middle segment	3.14
Bottom Segment	1.43*

* The value reported (1.43 ppm) is below the quantitation limit (2.0 ppm) and represents an estimated value. It means that the parameter was detected, at some level below the quantitation limit.

BUILDING 234 MIXED OXIDE FUEL PRODUCTION PROCESS LINE

Building 234 on the NFS site was the location of the mixed oxide fuel fabrication process line. The decommissioning and decontamination of this facility will be the source of the majority of the potential 5500 ft^3 of waste to be stored at ORNL. The sample results reported below were from samples collected at six (6) locations along the process line. The sampling locations and process descriptions are detailed in NFS document 29G-91-001 "Waste Certification Sampling Plan for Transuranic Waste from Nuclear Fuel Services, Inc. Erwin, Tennessee" dated June 7, 1991.

The sample locations were determined by process grouping such that like process activity and subsequent waste constituents would be consistent. The sample groups were :

Sample Point C1 - Precipitation, Cake Drying, and Oxide Conversion

Sample Point C2 - Oxide Blending, Pressing, and Sintering

Sample Point C3 - Pellet Grinding, Inspection, and Tube Loading

Sample Point J1 - Oxide Scrap Recovery Line

Sample Point J2 - Leachable Materials Recovery Line

Sample Point K1 - Pu Nitrate Storage and Load-Out

Additionally, gasket material from typical glovebox applications were analyzed for PCBs.

BUILDING 234 MIXED OXIDE PROCESS LINE RADIONUCLIDES and METALS				
Sample Point	Gross Alpha Bq/Gm	Gross Beta Bq/Gm	Principle Radioisotopes (% Abundance)	TCLP* (uGm/Gm)
C1	1.32E8 ± 0.01E8	2.00E7 ± 0.03E7	$^{238}Pu/^{241}Am$ (63.3) $^{239}Pu/^{240}Pu$ (36.7)	Ba 124± 1 Cd 1.2±0.03
C2	5.35E7 ± 0.04E7	6.98E6 ± 0.1E6	$^{238}Pu/^{241}Am$ (63.4) $^{239}Pu/^{240}Pu$ (36.6)	As 5.7±1.1 Ba 222±1
C3	3.28E8 ± 0.02E8	4.32E7 ± 0.07E7	$^{238}Pu/^{241}Am$ (44.6) $^{239}Pu/^{240}Pu$ (55.4)	Ba 301±3
J1	5.54E7 ± 0.03E7	7.68E6 ± 0.08E6	$^{238}Pu/^{241}Am$ (65.8) $^{239}Pu/^{240}Pu$ (34.2)	Cd 1.5±0.04
J2	1.28 E7 ± 0.01E7	1.98E6 ± 0.04E6	$^{238}Pu/^{241}Am$ (64.5) $^{239}Pu/^{240}Pu$ (35.5)	Cd 1.3±0/04
K1	1.52E7 ± 0.02E7	1.35E6 ± 0.05E6	$^{238}Pu/^{241}Am$ (N/A) $^{239}Pu/^{240}Pu$ (24)	Cd 24±0.4

* Only parameters for metals which exceeded the regulatory threshold (RT) were presented.
The Cd value obtained from the K1 sample location was outside the expected distribution from the other sample points. Consequently, this area was re-sampled. A sample composite was made of three (3) parts new sample to one (1) part previous K1 sample. The results were 6.27 ±0.12 uGm/Gm which confirmed the earlier value.

POLYCHLORINATED BIPHENYLS CONCENTRATION OF AROCLOR (PPM)*							
Sample Location	Aroclor 1016	Aroclor 1221	Aroclor 1232	Aroclor 1242	Aroclor 1248	Aroclor 1254	Aroclor 1260
C1							
C2							
C3							
J1							
J2							
K1**						6.0	12.0
Gasket**					4.0		

* Only analytical values greater than the quantitation limit (2.0 ppm) are reported.
** Reported values for the K1 and Gasket samples are the re-analyzed values due to interferences and technical difficulties encountered in the first analysis.

ORGANIC ANALYSES

The mixed oxide fuel fabrication process line samples were analyzed for the following constituents:

1,1 - Dichloroethylene
1,2 - Dichloroethene
1,4 - Dichlorobenzene
2,4,5 -TP (Silvex)
2,4,5 -Trichlorophenol
2,4,6 -Trichlorophenol
2,4, -D
2,4 - Dinitrotoluene
Benzene
Carbon Tetrachloride
Chlordane
Chlorobenzene
Chloroform
Cresol
Endrin
Heptachlor
Heptachlor epoxide
Hexachlorethane
Hexachlorobenzene
Hexachlorobutadiene
Lindane
Methoxychlor
Methyl ethyl ketone
Nitrobenzene
Pentachlorophenol
Pyridine
Tetrachloroethylene
Toxaphene
Trichloroethylene
Vinyl chloride
m-Cresol
o-Cresol
p-Cresol

No values above the regulatory thresholds were identified for any of the parameters in any of the samples of either soils or laboratory tank content.

DATA ANALYSIS

The results of the samples analyzed from the NFS laboratory tank, the adjacent soil, the gasket material and the mixed oxide fuel fabrication process line yield the following conclusions regarding the characterization of the waste stream material:

1. The soil does not meet the 100 nCi/Gm (3700 Bq/Gm) criterion to be classified as transuranic (TRU) waste.

2. The laboratory tank contents are definitely TRU waste, but are not mixed wastes. The middle tank segment did reveal elevated levels of Hg, however, when the reported values for this parameter were subjected to SW-846 prescribed statistical treatment the resulting value for the upper limit of the confidence interval was below the regulatory threshold. The process line samples are also definitely TRU waste and the container(s) from which the initial K1 sample was obtained should be considered RCRA mixed due to Cd levels. The re-analysis of the K1 area confirmed the value obtained from the first sample and further confirmed that the second sample was not contaminated with excessive Cd levels. The discovery of a Cd-coated wrench in the first sample lent additional evidence to the fact that both the specific sample value was valid and that an isolated situation appeared to be the cause for Cd levels significantly greater than those seen in the other samples. Additionally, no listed hazardous materials, as defined by 40CFR261, Sub-parts C&D were detected.

3. Organic analysis did not identify the presence of any constituents at concentrations of regulatory concern.

4. Polyclchlorinated Biphenyls (PCBs) were detected at values well below the regulatory threshold. Although no regulatory issue is presented at the PCB levels reported, it should be noted that the PCB values reported will yield a value for the upper limit of the confidence interval which is > the MMES administrative limit on PCBs of 2 ppm.

The data presented in this report include all re-analysis that was performed as a result of technical difficulties encountered in the analytical work and comprises the final report on the characterization of the NFS waste stream destined for ORNL.

Attachment 3 - Acceptable Knowledge Source Document Summary

Site(s): Oak Ridge National Laboratory	**Source Document Tracking Number:** C172
Waste Stream Number(s): ORNL Non-specific Library Files (Applicable only when site library is not in use)	
Acceptable Knowledge Documentation Type: ☑ TRU Waste Management Program Information ☑ Waste Stream-Specific Information ☑ Additional Information	**Category:** ☑ Correspondence ☐ Discrepancy Resolution ☐ Internal Procedure ☐ Miscellaneous ☐ Published Document or Internal Procedure ☐ Unpublished Documents
Title or Description of Source Document [a]: Miscellaneous Correspondence Regarding Testing of Nochar Absorbents	
Source Document Reference Information (author(s), document and revision number, date, publisher): Various, N/A, N/A, Various, N/A	

AK # [b]	Source Doc. Page # [c]	AK Information Summary
PR8, WS8, WS9, S5, S8	Throughout	Memo from Dennis Campbell (Senior Vice President, Nochar, Inc.) to Chris Thompson (EnergX, Inc.) dated 01/15/2008: In 2007, Nochar, Inc. performed a series of tests with various blends of Acid Bond and Petro Bond to determine a safe way to treat unknown liquids. The first series of tests were performed for SRS F-Canyon Repack Project. In January of 2007 N965 was used at 4:1 (N965 to liquid) for the safe treatment of unknown liquids. In August 2007, a series of incompatible solid tests for the Transuranic Waste Processing Center (TWPC) were performed. The purpose of these tests was to determine if the solidified waste forms produced from the treatment of two incompatible liquids could be commingled without any adverse reactions. Two phases of testing were performed, which concluded that two solids produced from the solidification of two incompatible liquids could be co-mingled with no adverse reactions, once the solids had fully cured. Under phase-one testing, an extremely aggressive approach was used to demonstrate the ability of our polymers to produce a chemically inert solid waste form. Under this phase, concentrated acid and bases were used and solidified with Acid Bond at a weight ratio of 1:1, Acid Bond to liquid. Under these extreme conditions, the solid forms remain reactive until they fully cured. This test determined that a 24-hour cure period resulted in chemically inert solids and that the solids (produced from the solidification of two incompatible liquids) could be commingled, even thoroughly mixed, without any reaction what so ever. Under phase-two testing, the test was refined to be more reflective of the actual TWPC production process to determine a minimum cure time for the TWPC. Under this phase, N965 was used at the recommended weight ratio of 4:1, N965 to liquid (which is equivalent to a volume ratio of 8:1, N965 to liquid) and found that a two hour cure time was a sufficient amount of time to render an inert waste form. Testing results and paperwork is included as an attachment to this memo. General Observations of the Solid Oxidizer Screening Tests: *Hanford U-Plant has a tank containing approximately 190 gallons of spent nitric acid that is* RH TRU waste. Hanford wanted to minimize exposure by minimizing the number of steps to remove, treat, and package the waste. The U-Plant tank liquid waste was designated as an ignitable liquid and was designated as a RCRA D001 Ignitable Waste. This test was done to determine if the solidifying of an oxidizing liquid, such as nitric acid, with Acid Bond render a non-oxidizing solid waste form. Nochar Inc. performed a series of tests using concentrated nitric acid and solidified the pure concentrated nitric acid at two different weight ratios, 1:1 and 0.5:1 - liquid to Acid Bond. In both cases the resulting waste forms were successfully solidified. Nochar Inc. then subjected the sample of solidified nitric acid to an extreme version of EPA Method 1030

CCP RECORDS ORIGINAL
DATE REC'D 2/16/16

Attachment 3 - Acceptable Knowledge Source Document Summary (continued)

Site(s): Oak Ridge National Laboratory		Source Document Tracking Number: C172
AK # [b]	Source Doc. Page # [c]	AK Information Summary
		screening, using a hand-held butane torch that produced a flame temperature of over 2000 degrees Fahrenheit. The sample did not burn or react violently. It was determined that the Nochar Acid Bond would render a non-oxidizing solid, without any additional pre- or post-treatment. Photos and the test procedures are provided in the document. Letter from Dennis Campbell, Senior Vice President of Nochar, Inc., re: Compatability: It was presented in the letter that Nochar N965 has been tested and utilized in the field at SRS for the solidification of percholoric acid, with no negative reaction. N965 contains N960 Acid Bond, which is designed to bond and solidify all acid solutions for long term burial. N965 was designed to solidify all types of liquids which did not have proper content characterization. Letter from Dennis Campbell, Senior Vice President of Nochar, Inc. to Chris Thompson of EnergX, dated 08/19/2008: The letter is a response to an inquiry as to whether or not simply pouring a liquid into a bottle containing the N965 polymer blend, capping the bottle, and mixing by shaking in lieu of mixing the liquid into the polymer with a stir stick is sufficient to adsorb all the liquid, assuming that the TWPC will implement the recommended 4:1 ratio (by weight) of N965 to liquid. This will not cause a lot of off-gassing that would cause the bottle to over-pressure and burst. The only exception to the off-gassing that had been identified by Nochar was when mixing with unspent, fresh, concentrated nitric acid. Nochar suggested that when treating concentrated acids, loosen the cap for about 10 minutes to relieve any off-gasses produced. Nochar also recommended a curing period of 2 hours before allowing the solidified waste to come into contact with other solidified waste. Letter from Dennis Campbell, Senior Vice President of Nochar, Inc., to Chris Thompson, Facilities Director of EnergX, dated 12/20/2007, re: Technical Safety Report Support Information: This letter and associated attachments were provided to support two statements that were included in TWPC's TSR for the deployment of the liquid treatment process: The absorbent material prevents the volatilization of flammable liquids by chemically binding the liquids. The absorbent material is compatible with the expected waste streams to be treated. Nochar confirmed that both statements are true, and to substantiate the statements the following information was provided with the letter: Flash point tests of solidified diesel fuel. Flash point tests of solidified toluene. Flash point tests of the glove box liner with solidified gasoline and diesel fuel. VOC head space has tests. An overview of the polymer technology, which provides a general discussion on the polymers and how they work, was also provided. Letter from W. D. Bostick, Technical Manager for MCL, Inc., to F. K. Heacker and M. McCauley for TWPC, dated 05/28/2008, re: Determination of Nochar N965 Polymer Blend Efficiency to Treat Organic Solvents to Meet the RCRA Requirements for Land Disposal Restrictions: The ability of Nochar N965 polymeric elastomer sorbent blend to retain select volatile organic solvents was evaluated based on the gas vapor headspace concentration. A table summarizing

Attachment 3 - Acceptable Knowledge Source Document Summary (continued)

Site(s): Oak Ridge National Laboratory **Source Document Tracking Number:** C172

AK # [b]	Source Doc. Page # [c]	AK Information Summary
		the test results is provided in Table 1 of this letter. The Nochar product appears very adequate for purposes of liquid spill control, but it does not appear to significantly alter the vapor pressure for the sorbed solvent at higher surrogate waste loading. Solvents used in this study include the following: Carbon Tetrachloride Methanol Methyl Ethyl Ketone Trichloroethylene Toluene Xylenes Results summarized in Table 2 indicate that the volatile solvents loaded on Nochar are readily extracted by alcohol lixivants. The headspace analysis and TCA determination indicate that hazardous volatile organic constituents solidified on Nochar 965 elastomer blend retain the potential to volatalize into the atmosphere or leach into the environment. The Nochar product is found to be satisfactory for its original intended purpose, to solidify organic liquid for long-term storage or for transport to a licensed facility that can destroy the hazardous organic constituent by incineration. Memo from Dennis Campbell, Senior Vice President of Nochar, Inc., re: Certificate of Conformance for Non-Biodegradable Product: This document is to certify that Nochar's N965 solidification polymer blend is non-biodegradable according to EPA guidelines and 40CFR265.314 (F). N965 is manufactured using two non-biodegradable polymers which are designed to solidify both aqueous and organic waste into a solid form. These base polymers which make up N965 have undergone substantial testing including non-biodegradable, throughout the U.S. Department of Energy.

Source Document Data Limitations (if any):

1. None.

Acceptable Knowlege Expert:

Travis Smith / Date: 02/15/2016

Print /Sign

[a] Provide description for non-titled information (i.e., container paperwork, MSDS sheets, etc)
[b] Obtain from Acceptable Knowledge Documentation Checklist
[c] For microfilm or microfiche, identify box, tape, reel number and location.

nochar, inc.

8650 Commerce Park Place, Suite K
Indianapolis In. 46268

January 15, 2008

EnergX , Inc.
100 WIPP Road
Lenoir City, TN 37771

Attn: Chris Thompson

Chris,

Over the past year Nochar, Incorporated, performed a series of tests with various blends of Acid Bond and Petro Bond to determine a safe way to treat unknown liquids. The first series of tests were performed for the Savannah River Site's F-Canyon Repack Project back in January, 2007. This round of testing found that a blend of Acid Bond and Petro Bond, designated as N965, used at a conservative weight ratio of 4:1, N965 to liquid, (which equates to a 8:1 volume ratio) was robust enough to allow for the safe treatment of unknown liquids.

In August 2007, we ran a series of incompatible solid tests for the Transuranic Waste Processing Center (TWPC). The purpose of these tests was to determine if the solidified waste forms produced from the treatment of two incompatible liquids could be commingled without any adverse reactions. Two phases of testing were performed, which concluded that two solids produced from the solidification of two incompatible liquids could be co-mingled with no adverse reactions, once the solids had fully cured. Under phase-one testing we used an extremely aggressive approach to demonstrate the ability of our polymers to produce a chemically inert solid waste form. Under this phase we used concentrated acid and bases and solidified them with Acid Bond at a weight ratio of 1:1, Acid Bond to liquid. We found that under these extreme conditions that the solid forms remain reactive until they fully cured. Under this test we determined that a 24-hour cure period resulted in chemically inert solids and that the solids (produced from the solidification of two incompatible liquids) could be commingle, even thoroughly mixed, without any reaction what so ever.

Under phase-two testing we refined the test to be more reflective of the actual TWPC production process to determine a minimum cure time for the TWPC. Under this phase we used N965 at the recommended weight ratio of 4:1, N965 to liquid

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(which is equivalent to a volume ratio of 8:1, N965 to liquid) and found that a two-hour cure time was a sufficient amount of time to render an inert waste form.

Generally speaking, the premise we were testing to for the TWPC, particularly under phase-two, was to determine if two solids produced from the solidification of two incompatible liquids would be safe if **accidentally commingled**. Even though we actively mixed the two cured solid waste forms (produced from the solidification of two incompatible liquids) after two hours under phase-two testing and did not observe any reaction, we would not recommend that active mixing of waste forms be performed as a standard practice after two hours. If active mixing of treated waste forms is operationally desirable, to be perfectly safe, we would recommend that the TWPC impose a 24-hour cure period prior to any active mixing. Please note, that this is a conservative recommendation which is based on our observations and evaluations of the results from the phase-one test.

For your convenience we have attached copies of both the SRS F-Canyon test and Incompatible Liquids Tests reports. If you have any additional questions, or would like to discuss additional testing please give me a call.

Kind regards,

Signature on file

Dennis Campbell
Senior Vice president

Enclosures: *Bench Tests Conducted for "F" Canyon Repack Project, January 5, 2007* and *Incompatible Liquid Tests, August 2007*

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Attachment 1

Bench Tests Conducted for "F" Canyon Repack Project
January 5, 2007

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Bench Tests Conducted
For
"F" Canyon Repack Project

January 5, 2007

1.0 Objective: To enhance the project's efficiency the SRS TRU Repack Project would like to utilize a single absorbent to immobilize unknown liquids encountered during the repackaging process. Currently the SRS TRU Repack Project uses a field screening process to determine if the unknown liquid is an aqueous or organic based liquid. Based on the results of the screening process the Project then determines which Nochar absorbent to use. In those cases where acidic solutions are encountered the current process requires a pH adjustment pre-treatment step to occur prior to immobilization. Although the screening and immobilization process has been very successful, the Project would like to streamline the process by eliminating the screening process and simply using one absorbent to treat all liquids. The objective of this test is to confirm the effectiveness of the recommended ratio of waste to the N965 blend, which was derived from a series of earlier tests.

2.0 Background: To address this challenge Nochar performed a number of preliminary studies to determine the right blend and ratios. Once determined the blend was then subjected to a series of worst-case scenario testing (concentrated nitric acid, organic, and mixtures) to determine the best waste to agent loading ratio. Original screening tests performed by Nochar Inc. had shown that a 0.25 to 1 (1 to 4) ratio by weight of waste to N965 by weight was successful in solidifying a worst-case waste liquid without any pretreatment.

The present protocol for the F-Canyon Repack Project calls for a 1 to 1 ratio of acid bond for concentrated acids. To achieve a 1 to 1 ratio for acids using the N965 blend, a weight-to-weight ratio of 0.4 parts acid to 1 part polymer would be required. However, since one of the priorities of this proposal is to eliminate the step of raising the pH of an acid to 5 or above, a 0.25 to 1 ratio was agreed upon.

The testing that was performed under this test plan was performed as a confirmatory test of the recommend ratio of 0.25:1 by weight of waste to bonding agent. The testing protocols were developed with support from the SRS subject matter expert.

3.0 Scope: Testing was conducted at Nochar's Facility on three different simulants, which were designed to represent possible conditions in the "F" Canyon Repack Project. Three separate tests were conducted on each of the three simulant cocktails. All tests (total of nine) utilized a **.25 to 1 ratio** (.25 parts waste to 1 part polymer blend at a weight-to- weight ratio). 1 liter of liquid simulant was used in each of the nine bench tests. The polymer blend developed for this project is Nochar's **N965**, which is a proprietary blend of aqueous and elastomeric polymers designed to solidify oily waste, acids, bases and aqueous liquid waste in a one step process. This new process should dramatically reduce the testing needed for each waste container as is required under the current protocols at SRS.

3.0 Testing

Per suggestions by the SRS subject matter expert, these confirmation tests were replicated three times for each surrogate waste type. All tests were performed at a ratio of 0.25:1 by weight of waste to the N965 polymer agent. Three surrogate waste types were tested which represented a conservative range of waste types that might be encountered by the project. The testing was performed on 1-liter samples, which was as manageable amount of liquid that could be treated in the glove-box environment.

3.1 Testing supplies: 4 gallon high density polyethylene containers, beaker glasses, weight scale, thermometers, stainless steel mixing rod, stand and ring clamps, labels, rubber gloves, lab coat, safety glasses, face mask, (3) 1 liter samples of 100% industrial grade vacuum pump oil. (3) 1 liter samples of

blended vacuum pump oil (60%) and tap water (40%) mixed in a high speed blender for one hour to create an emulsion. (3) 1 liter samples of nitric acid (lab grade/ 65% concentrate).

3.2 Test Protocol: Three (3) tests were conducted at 0.25 to ratio on each simulant by pouring 1 liter (~2.2 lbs) of liquid into the 4 gallon HD poly pail containing 8.8lbs. of N965 polymer blend. The mixture was stirred as the liquid was being added with a stainless steel mixing rod. Test #3 protocol (for 100% vacuum oil) was changed by adding all the liquid to the polymer before stirring. This was performed to determine if a non-mixing approach was viable. Due to clumping, this method was not acceptable.

In each test the materials were mixed by hand with the stainless steel rod for one minute minimum. Temperature readings were taken on test # 1 of the oil sample mix and test #3 of the nitric acid test (results reported below). Upon completion of each test, the samples were allowed to sit for 24 hours without being sealed. After 24 hours the samples were sealed and placed in climate controlled storage for long term observation (minimum of 2 weeks).

3.3 Waste Processing
The following sections describe the process used to develop the surrogate waste forms. The SRS subject matter expert identified the waste simulants used.

3.3.1 100% Vacuum Pump Oil and N965 at a 0.25:1 Bonding Ratio

Start Date: 12/14/06

Test #1: 1 liter of vacuum pump oil was added into the 4-gallon poly pail containing 8.8 lbs. of N965 polymer blend. The mixture was stirred with a stainless steel rod for 1 minute and 45 seconds to ensure that all of the oil was blended into the polymer. A digital thermometer was used to measure any heat reaction as the process began and again after solidification had been completed.

Beginning temperature = 18.0 C

Temperature after 10 minutes = 18.0 C

Test # 2: 100% vacuum pump oil blended with N965. The test duplicated the same procedure as test # 1.

Test # 3: As referenced in the test protocol section, the polymer was placed in the 4 gallon poly container before adding 1 liter of vacuum pump oil. All the oil was poured onto the polymer. The mixture was then stirred for 1 minute and 45 seconds.

3.3.2 Vacuum Oil and Water Blended at 60/40 Ratio and N965 at a 0.25 to 1 Bonding Ratio

Start Date: 12/14/06

Test # 1: Vacuum pump oil and water emulsion were added to the 4 gallon poly pail containing 8.8 lbs. of N965. The mixture was stirred as the liquid was being added with the stainless steel rod for 1 minute and 45 seconds to ensure that the liquid and polymers were completely engaged.

Test # 2: Exact duplication of test # 1

Test #3: Exact duplication of test #1 and #2

3.3.3 Nitric Acid (HN03) 65% Concentrate Blended with N965 at a0.25 to1 Bonding Ratio

Start Date: 12/14/06

Test #1: Nitric Acid was slowly poured into the 4 gallon poly pail containing 8.8 lbs. of N965 polymer blend. The mixture was stirred as the acid was being poured for 1 minute and 45 seconds. A digital thermometer was utilized to take temperature readings at the beginning of the blending process.

Beginning temperature = 18.0 C and proceeded upward to 36.8 C by the end of the blending process.

Temperature reading after 10 minutes = 36.2 C

At the end of the two week period all three samples were at ambient temperature.

Test # 2: Exact duplication of test #1 except that no temperature readings were taken for this test.

Test # 3: Exact duplication of test #2

3.4 Results/Observations

3.4.1 100% Vacuum pump oil and N965

Test Duration: 2 weeks
All three tests were observed upon completion of the solidification and compared to the final observation after two weeks. None of the samples showed any change in color or appearance. All samples were checked for any evidence of free liquids, by placing samples from each of the three containers onto blue test paper. None of the samples showed any liquid release (see attached photos SRS Oil & SRS Oil 2).

3.4.2 Vacuum oil and water blended at 60/40 ratio (oil to water)

Test Duration: 2 weeks
All three tests were observed upon completion of the solidification and compared to the final observation after two weeks. None of the samples showed any change in color or appearance. All samples were checked for any evidence of free liquids, by placing samples from each of the three containers onto blue test paper. None of the samples showed any liquid release (see attached photos SRS Oil & Water and SRS Oil H2O).

3.4.3 Nitric acid (HN03) 65% concentrate

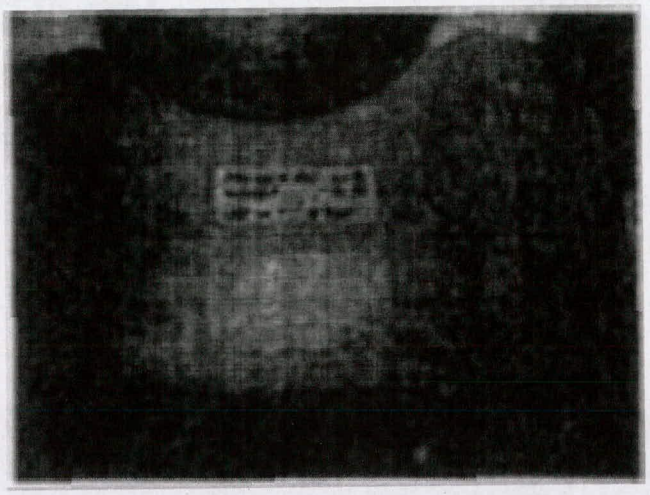
Test Duration: 2 weeks
All three samples were visually observed after solidification was completed and each sample had a normal appearance. After the two-week period the samples were checked again for any signs of degradation. No degradation was observed.

Samples from each of the three tests were placed on blue test paper to check for presence of free liquids. None of the samples showed any liquid release (see attached photos SRS Nitric & SRS Nitric 2).

3.4.4 Comments: It should be noted that these tests were conducted by Nochar at its manufacturing facility and were conducted according to agreed upon procedures by Nochar management and personnel at Savannah River Site. These tests were conducted through Nochar's best efforts, but do not represent any verification by any third party or certified laboratory.

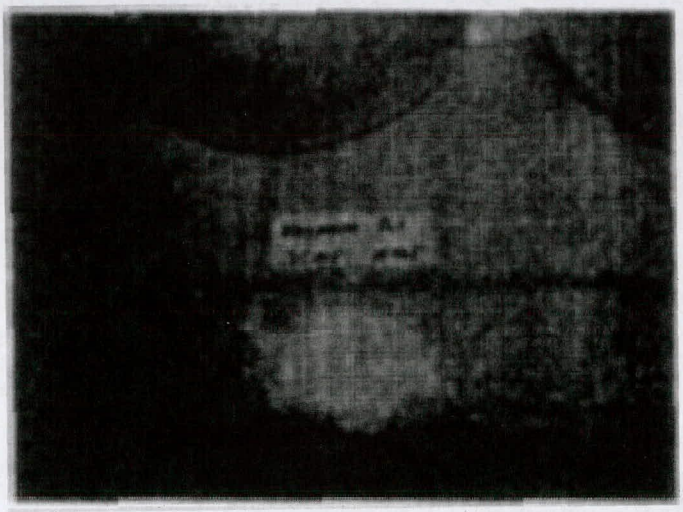
Photos

Vacuum pump oil (60%) & Water (40%) & N965 (0.25:1)



Photos

Vacuum Pump Oil & N965 (0.25:1)



Testing conducted by: Daniel Gehlhausen

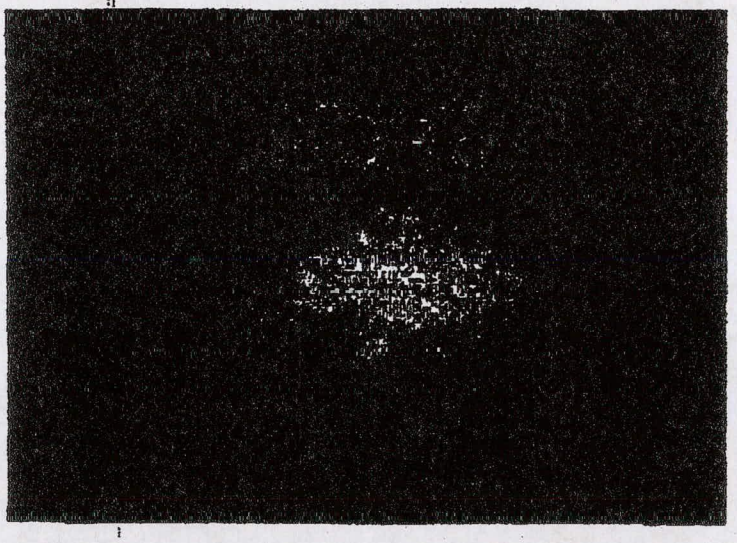
Verified by: Dennis Campbell

Report Date: January 5, 2007

3.4 Conclusion: To eliminate the project's requirement to screen and possibly pre-treat unknown liquids encountered during the repackaging process the use of the N965 at a conservative ratio of 0.25:1 by weight is proposed.

SRS Concurrence: _____ Date: 1/29/07

Photos
Concentrated Nitric Acid & N965 (0.25:1)



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Attachment 2

Incompatible Liquid Tests,
August 2007

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Incompatible Liquid Tests
August 2007

Several DOE sites are using the N965 blend to treat unknown liquids. In some cases, the project is concerned about the possibility of an adverse reaction if two solidified waste forms that resulted from the treatment of chemically incompatible liquids were to come into contact. To date, no specific tests have been performed to determine if the treatment of two incompatible liquids with the Nochar polymers would render compatible solids.

1) Scope
To determine if the use of the Nochar absorbent polymers used to treat two incompatible liquids will result in compatible solids.

2) Background
Nochar, Inc. (Nochar) has two basic high tech polymers specifically formulated to immobilize aqueous-based liquids (Acid Bond) and organic-based liquids (Petro Bond). Acid Bond was formulated to solidify the full range of aqueous based liquids, from acids to bases (pH 0 to 14). Petro Bond was formulated to solidify organic based liquids ranging from oils to solvents. When used in concert, the blended polymers can solidify and immobilize a vast array of mixtures of organic hydrocarbons, aqueous, acids, bases and sludges.

Sorbent is a general term used to represent adsorption or absorption properties of a material. The term *ab*sorption is the taking up of a substance into or throughout a material by physical or chemical means, i.e., a strong, essentially irreversible bonding, vs. *ad*sorption, a process by which molecules are taken up on the surface of a solid by chemical or physical action, i.e. a physical bonding from which adsorbed materials can be more readily removed, e.g., by vacuum and/or heating. Unlike most commercial sorbing products, such as vermiculite (adsorbent), the Nochar polymers are considered absorbents, which result in a more robust waste form.

As an absorbent, it is believed that once the liquids have been fully sorbed into the polymer matrix that two incompatible liquids will no longer be physically available to react with one another. Unlike the standard adsorbent, such as kitty litter, where the liquids are superficially adhered to the surface of the adsorbent material and are readily available to interact with the surrounding environment, the Nochar polymer essentially isolate the liquids from the environment, thus eliminating the ability of the liquids to react with one another.

3) Initial Testing
The initial tests involved the solidification of two incompatible liquids, such as an acid and a base, and then the placement of the resulting solids together to determine if the solids are compatible or not.

Compatibility will be determined by visual observation. To be conservative, instead of using the N965 blend, which is a blend of Acid Bond and Petro Bond (~60/40) designed to absorb unknown liquids (Nochar Inc. test report, *Bench Tests Conducted for "F" Canyon Repack Project*, Jan. 5, 2007), it was decided to test straight Acid Bond using acid and basic solutions as the reactants. Since acid/base reactions are easily observed no instrumentation was needed for this test. Instead, simple visual verification was used to determine if a reaction had occurred. The liquid to Acid Bond ratio used in these tests represents nearly a 40% higher liquid to polymer ratio than of the N965 blend, thus this testing is truly conservative.

Several tests were performed. Each test is described below.

Test #1
Solidified Concentrated Nitric acid (pH 0) with solidified simulated Hanford Tank liquid ((pH 14) see attachment for a general description of similant)).

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a) Sample Development
Reactant A - 500 ml sample was developed in a beaker by mixing concentrated Nitric acid with Acid Bond at a 1:1 weight ratio.

Reactant B - 500 ml sample was developed in a beaker by mixing simulated Hanford Tank liquid with Acid Bond at a 1:1 weight ratio.

b) Test
After 15 minutes of cure time reactant A was placed into a HDPE bucket and Reactant B was placed directly on top of Reactant A. No mixing was preformed.

c) Observations
No immediate reactions were observed. After a few minutes small amounts of steam were observed coming off the waste forms. Small amounts of steam were observed for approximately two (2) hours. After 2 hours no additional signs of reaction were observed.

Test #2
Solidified Muratic acid (~37% HCl (pH 2)) with solidified sodium carbonate solution (pH 8-9)

a) Sample Development
Reactant C - 500 ml sample was developed in a beaker by mixing muratic acid with Acid Bond at a 1:1 weight ratio.
Reactant D - 500 ml sample was developed in a beaker by mixing the sodium carbonate solution with Acid Bond at a 1:1 weight ratio.

b) Test
After 15 minutes of cure time reactant C was placed into a HDPE bucket and Reactant D was placed directly on top of Reactant C. No mixing was preformed.

c) Observations
No immediate reactions were observed. After a few minutes small amounts of steam were observed coming off the waste forms. Small amounts of steam were observed for approximately forty-five (45) minutes. After 45 minutes no additional signs of reaction were observed.

Test # 3
Previously set-up samples of Solidified Concentrated Nitric acid (pH 0) with solidified simulated Hanford Tank liquid ((pH 14) see attachment for a general description of similant)). These samples were part of the original demonstration testing done to determine the proper ratios to use for these types of waste. These samples were previously developed and have been stored in a sealed container for at least six (6) months.

a) Sample Development
Reactant E – was previously developed by mixing concentrated Nitric acid mix with Acid Bond at a 1:1 weight ratio. Reactant E was stored in a sealed container for approximately six months.
Reactant F – previously developed by mixing simulated Hanford Tank liquid with Acid Bond at a 1:1 weight ratio. Reactant F was stored in a sealed container for approximately 12 months.

b) Test
Approximately 500 ml of Reactant E was placed into a HDPE bucket and approximately 500 ml of Reactant F was placed directly on top of Reactant A. No mixing was preformed initially.

c) Observations
No reactions were observed at all. After about an hour no reactions were observed so the samples were mixed together to promote more intimate contact between the two reactants. No observed reactions were observed during the initial mixing or after an hour

Test # 4
Previously set-up samples of Solidified Concentrated Nitric acid (pH 0) with simulated Hanford Tank liquid (pH 14). The solidified nitric acid sample was previously developed and was stored in a sealed container for about six months. The Hanford liquid was the same liquid that was used in test #1.

a) Sample Development
Reactant G – was previously developed by mixing concentrated Nitric acid mix with Acid Bond at a 1:1 weight ratio.

Reactant H - was un-solidified simulated Hanford tank liquid

b) Test
Approximately 500 ml of Reactant H liquid was placed into dish and approximately 500 ml of Reactant G was placed directly into Reactant H. Approximately 40% of the solid sample was submerged into the liquid. No mixing was preformed.

c) Observations
No reactions were observed at all. After about 2 minutes the solid was removed from the liquid. This method was used to prevent the solid from absorbing all of the liquid.

4) Conclusion from Initial Testing
The generation of steam under tests #1 and #2 conditions is an indicator that a reaction did occur when the two solids came into contact with each other. Even though the reaction was not violent it is still an indicator that either some amount of the incompatible liquids were still available to react or that the actual solids were actually reacting with one another. Conversely, the lack of any indication of reaction in test #3 indicates that the incompatible liquids were no longer available to react and that the solids themselves are not incompatible.

As previously discussed, the Nochar polymers essentially encapsulates the liquids and once encapsulated the liquids are no longer available to react, which appeared to be the case under test #3. This was further demonstrated under test #4 where one of the reactants was in an actual liquid form. The fact that tests #1 and #2 did show signs of a reaction (in the form of steam generation) is a clear indicator that the two reactants were still available even though no free liquid was observed after 15 minutes of cure time. It is believed that the reaction occurred simply because the polymer had not yet fully absorbed all the liquid and, as such, some of the liquid was superficially available to react with the other liquid.

It appears that the key to rendering chemically inert solids has to do with cure time, 15 minutes is not enough for the polymer to totally absorb all the liquid. It is assumed that even though all the free liquid appears to be sorbed, that after 15 minutes all the liquid has not yet been totally encapsulated, thus available to react. Conversely, six months appears to be long enough. Further tests were performed to narrow the cure time down to something more practical for a production process.

5) Follow-On Testing
Tests #1 and #2 were repeated, but the two solidified forms were allowed to cure for 24 hours before they were interacted.

Test #5
Solidified Concentrated Nitric acid (pH 0) with solidified simulated Hanford Tank liquid (pH 14).

a) Sample Development
Reactant A2 - 500 ml sample was developed in a beaker by mixing concentrated Nitric acid with Acid Bond at a 1:1 weight ratio.
Reactant B2 - 500 ml sample was developed in a beaker by mixing simulated Hanford Tank liquid with Acid Bond at a 1:1 weight ratio.

b) Test
After 24 hours of cure time reactant A2 was placed into a HDPE bucket and Reactant B2 was placed directly on top of Reactant A2. No mixing was preformed.

c) Observations
No immediate reactions were observed. No reactions were observed after 10 minutes. No reaction was observed after an hour and the test was terminated.

Test #6
Solidified Muratic acid (~37% HCl (pH 2)) with solidified sodium carbonate solution (pH 8-9)

a) Sample Development
Reactant C2 - 500 ml sample was developed in a beaker by mixing muratic acid with Acid Bond at a 1:1 weight ratio.
Reactant D2 - 500 ml sample was developed in a beaker by mixing the sodium carbonate solution with Acid Bond at a 1:1 weight ratio.

b) Test
After 24 hours of cure time reactant C2 was placed into a HDPE bucket and Reactant D2 was placed directly on top of Reactant C2. No mixing was preformed.

c) Observations
No immediate reactions were observed. No reactions were observed after 10 minutes. No reaction was observed after an hour and the test was terminated.

6) Final Conclusion
Solidified liquids that are fully cured are chemically inert and can come into contact with other cured waste forms without any adverse reactions occurring. Based on the testing performed under this test plan, 24 hours was shown to be a sufficient curing period. Therefore, it is recommended that the solidified waste forms produced from the solidification of potentially incompatible liquids, using the Nochar polymer absorbents, not be directly commingled for at least 24 hours. To reduce this time additional testing would be required.

Please Note - Key to the finding of this test plan is the use of proper waste to polymer ratios. The ratios used under this test plan were evaluated and deemed to be sufficient to bind the liquids indefinitely (Nochar, Inc. test report, *Bench Test Conducted for Hanford U-Plant*, Feb. 19, 2007, & Nochar, Inc. Test report, *Hanford Tank Proof of Principal Tests*, March 25, 2002).

7) Comments: It should be noted that these tests were conducted by Nochar at its manufacturing facility and were conducted according to agreed upon procedures by Nochar management based on general discussions with EnergX, LLC technical representative. These tests were conducted through Nochar's best efforts, but do not represent any verification by any third party or certified laboratory.

Testing conducted by: Daniel Gehlhausen

Verified by: Dennis Campbell

Report Date: August 10, 2007

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Attachment 1
Recipe for Hanford Tank Surrogate

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AN-105 Supernate Simulant at 5 Molar Na
Prepared by Savannah River Technology Center
Target Composition

Species	Formula	Moles/Liter	Formula Wt, gm	mg/L
Acetate	$CH_3CO_2^{-1}$	0.0164	59.04462	968
Aluminate	$Al(OH)4^{-1}$	0.688	95.011	65,368
Ammonium	NH_4^{-1}	0.0031	18.038	56
Borate	BO_3^{-3}	0.0022	58.808	129
Cadmium	Cd^{+2}	0.000014	112.41	2
Calcium	Ca^{+2}	0.00047	40.08	19
Cesium	Cs^{+1}	0.00001	132.9054	1
Carbonate	CO_3^{-2}	0.098	60	5,880
Chloride	Cl^{-1}	0.12	35.453	4,254
Chromate	CrO_4^{-2}	0.012	115.994	1,392
Fluoride	F^{-1}	0.0047	18.998	89
Formate	HCO_2^{-1}	0.03	45.0177	1,351
Glycolate	$CH_2OHCO_2^{-1}$	0.0072	75.042	540
Hydroxide	OH^{-1}	1.6	17.007	27,211
Lead	Pb^{+2}	0.00012	207.2	25
Magnesium	Mg^{+2}	0.0001	24.305	2
Molybdate	MoO_3^{-2}	0.0004	143.938	58
Nitrate	NO_3^{-1}	1.24	62	76,880
Nitrite	NO_2^{-1}	1.13	46.006	51,987
Oxalate	$C_2O_4^{-2}$	0.0032	88.0196	282
Phosphate	PO_4^{-3}	0.0028	94.97136	266
Potassium	K^{+1}	0.0896	39.0983	3,503
Silicate	SiO_3^{-2}	0.0035	76.084	266
Sodium	Na^{+1}	4.99	22.98977	114,719
Sulfate	SO_4^{-2}	0.0038	96.0576	365
Zinc	Zn^{+2}	0.00007	65.38	5

Incompatible Liquid Tests – Phase II
August 2007

At the request of the Tru Waste Processing Center (TWPC) additional testing was performed to determine the minimum cure time required before the two solidified incompatible liquids can be commingled without causing any type reaction.

1) Scope of Phase II Testing
To determine minimum cure time required to render chemically inert, compatible solids derived from the solidification of two incompatible liquids.

2) Background
Earlier tests had shown that a fully cured waste form was essentially rendered chemically inert. This was demonstrated by commingling the two solid test samples that were derived from the treatment of two incompatible liquids after a 24-hour period. The initial test had also shown that a 15 minute cure period was not long enough to render a fully chemically inert waste form, and as such a small reaction could occur if the two solids were commingled. Operationally a 24-hour hold period could negatively impact the production schedule, so additional testing was requested to minimum cure time.

3) Phase II Testing
Tests involved the solidification of two incompatible liquids, concentrated nitric acid (pH 0) and the simulated Hanford Tank liquid (pH 14), and then the placement of the resulting solids together to determine if the solids are compatible or not.

This series of tests was designed to more accurately represent the anticipated production conditions. This was accomplished by using the Nochar N965 polymer blend to solidify the two test liquids at the recommended 4:1 by weight polymer to liquid ratio.

Testing was performed by preparing a large sample (~16 ounces) of each reactant and the commingling sub-samples on an hourly basis until no reaction was observed. Since acid/base reactions are easily observed no instrumentation was needed for this test. Instead, simple visual verification was used to determine if a reaction had occurred.

Sample Development
Reactant A, was developed by mixing 4 lbs. of the N965 blend with 1 lb. of concentrated Nitric acid - 4:1 by weight ratio.

Reactant B, was developed by mixing 4 lbs. of. the N965 blend with 1 lb. of simulated Hanford Tank liquid - 4:1 by weight ratio.

Test #1
After 1 hour of cure time approximately one pint of reactant A was placed into a HDPE bucket and approximately a pint of Reactant B was placed directly on top of Reactant A.

Observations
No immediate or obvious reaction occurred. However, after very close inspection, a small amount of steam was observed coming off the waste forms. This lasted for approximately five minutes.

Test #2
After 2 hours of cure time approximately one pint of reactant A was placed into a HDPE bucket and approximately a pint of Reactant B was placed directly on top of Reactant A.

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Observations
Even under very close inspection no reaction was observed. After approximately five (5) minutes the two test-samples were actively mixed together and carefully inspected, and still no reaction was observed.

Test # 3
After 3 hours of cure time approximately one pint of reactant A was placed into a HDPE bucket and approximately a pint of Reactant B was placed directly on top of Reactant A.

Observations
Even under very close inspection no reaction was observed. After approximately five (5) minutes the two-test samples were actively mixed together and carefully inspected, and still no reaction was observed.

Testing was terminated after the third test.

4) Conclusion from Phase II Testing
The slight generation of steam under tests #1 conditions was an indicator that a reaction did occur when the two solids were commingled. Even though the reaction was barely visible it was still an indicator that the solids were not totally cured and that a slight amount of the incompatible liquids were still available to react. Conversely, the total lack of any indication of reaction, even when actively mixed together, in test #2 and #3 indicated that the solids had totally cured and the incompatible liquids were no longer available to react and that the solids themselves are not incompatible.

Based on the general observations of the Phase II testing it can be concluded that when using the N965 blend at a 4:1 weight ratio of polymer to liquid, a two hour cure time is sufficient to produce a chemically inert solid form that can be commingled with other cured waste forms.

5) Comments: It should be noted that these tests were conducted by Nochar at its manufacturing facility and were conducted according to agreed upon procedures by Nochar management based on general discussions with EnergX, LLC technical representative. These tests were conducted through Nochar's best efforts, but do not represent any verification by any third party or certified laboratory.

Testing conducted by: Daniel Gehlhausen

Verified by: Dennis Campbell

Report Date: August 27, 2007

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General Observations of the Solid Oxidizer Screening Tests

March 2007

Background

Hanford U-Plant has a tank containing ~190 gallons of spent nitric acid with a pH of 0 to 1. It is estimated that the 190 gallons of spent acid contains roughly 1660 fissile gram equivalent and a dose rate up to 190 Rem, which makes this an RH TRU waste. It is assumed that the final treated waste form will be packaged to meet the WIPP RH TRU transportation and disposal criteria.

For ALARA reasons, Hanford would like to minimize exposure by minimizing the number of steps required to remove, treat, and package the waste. Conceptually, the utilization of Nochar Acid Bond™ polymer absorbent would allow the waste to be solidified without any pretreatment, such as neutralization.

Issue

The U-Plant tank liquid waste is currently designated as an ignitable liquid primarily due to the oxidizing nature of nitric acid and as such the waste is currently designated as a RCRA D001, Ignitable waste. WIPP prohibits the shipment and disposal of Ignitable waste.

Recent tests performed by Nochar Inc. in conjunction with SRS have shown that that concentrated nitric acid can be solidified with Nochar Acid Bond without any pretreatment, such as dilution or neutralization. Since nitric acid is considered a strong oxidizer the question has be raised as to whether or not the resulting solidified waste form would be considered a solid oxidizer. If it is, then the waste cannot be sent to WIPP until the waste form has been rendered as a non-oxidizing solid.

Therefore, the question is: Will solidifying an oxidizing liquid, such as nitric acid, with Acid Bond render a non-oxidizing solid waste form?

Regulation/Requirement

The Environmental Protections Agency (EPA) in 40 CFR 261.21 defines the ***characteristic of ignitability (D001)*** as having any of four designated properties. Of these four properties, one pertains to *ignitable liquids* using a specific EPA-approved method for flash point, one pertains to *oxidizers* as defined in 49 CFR 173.115(a), and one pertains to *ignitable compressed gas* as defined in 49 CFR 173.127. The other property, ***ignitable solids*** is described as the following: ***"It is not a liquid and is capable, under standard temperature and pressure, of causing fire through friction, absorption of moisture or spontaneous chemical changes and, when ignited, burns so vigorously and persistently that it creates a hazard."***

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Since the definition of "ignitable solids" is somewhat subjective, the EPA recognizes the SW-846 method 1030, *Ignitability of Solids*, as a quantitative method that can be use to determine whether a solid does or does not exhibit the characteristic of ignitability.

Method 1030 provides for two tests, a screening test and the more quantitative burning rate test. The following excerpt from SW-46 method 1030 provides a general description of the tests and the actions required.

> 2.0 SUMMARY OF METHOD
> 2.1 In a preliminary test, the test material is formed into an unbroken strip or powder train 250 mm in length. An ignition source is applied to one end of the test material to determine whether combustion will propagate along 200 mm of the strip within a specified time period. Materials that propagate burning along a 200 mm strip within the specified time period are then subjected to a burning rate test. Materials that do not ignite or propagate combustion as described above do not require further testing. In the burning rate test, the burning time is measured over a distance of 100 mm and the rate of burning is determined. The test method described here is based on the test procedure adopted by the Department of Transportation from the United Nations regulations for the international transportation of dangerous goods and is contained in Appendix E to Part 173 of 49 CFR.

Section 7.1 of Method 1030 describes how to perform preliminary screening:

> 7.1 Preliminary Screening Test
> 7.1.1 The preliminary ignitability test is conducted on all waste materials. On a clean, impervious ceramic tile (Section 4.1), clearly mark a 250 mm long test path. Make another mark at exactly 200 mm from the start of the sample path.
>
> 7.1.2 Prepare the test material in its "as received" form by forming an unbroken strip or powder train of sample 250 mm long by 20 mm wide by 10 mm high on the ceramic tile. Use the mold to form the material as in 7.2.3 if appropriate.
>
> 7.1.3 Place the ceramic tile with the loaded sample in a fume hood about 20 cm (~8 inches) from the front of the hood and in an area of laminar airflow. Position the sample perpendicular to the airflow. (See Figure 2) The airflow across the perpendicular axis of the sample should sufficient to prevent fumes from escaping into the laboratory and should not be varied during the test. The air velocity should be approximately 0.7 meters/second. Measure the air velocity by an anemometer.
>
> 7.1.4 Light the Bunsen burner and adjust the height of the flame (6.5 to 7.5 cm) by adjusting the propane gas and air flows. Measure the temperature of the flame (tip of the flame) by a thermocouple. The temperature of the flame must be at least 1000°C.

7.1.5 Apply the tip of the flame to one end of the sample strip. The test period will depend on the sample matrix as follows:

7.1.6 If the waste is non-metallic, hold the flame tip on the sample strip until the sample ignites or for a maximum of 2 minutes. If combustion occurs, begin timing with a stopwatch and note whether the combustion propagates up to the 200 mm mark within the 2 minute test period.

7.1.7 If the waste is a metal or metal-alloy powder, hold the flame tip on the sample strip until the sample ignites or for a maximum of 5 minutes. If combustion occurs, begin timing with a stop watch and note whether the combustion propagates up to the 200 mm mark within the 20 minute test period.

7.1.8 If the waste does not ignite and propagate combustion either by burning with open flame or by smoldering along 200 mm of sample strip within the 2 minute test period (or 20 minute test period for metal powders), the waste is not considered flammable and no further testing is required. If the waste propagates burning of 200 mm of the test strip within the 2 minute test period (20 minute test period for metals), the material must be evaluated by the burning rate test (Section 7.2).

Discussion

To conservatively demonstrate the ability of Acid Bond to solidify the U-Plant liquid Nochar Inc. performed a series of tests using concentrated nitric acid (see *Bench Test Conducted For Hanford U-Plant*, February 19, 2007). Nochar Inc. took samples of pure concentrated nitric acid, without dilution or neutralization, and mixed it with Acid Bond at two different weight ratios, 1:1 and 0.5:1 – liquid to Acid Bond. In both cases the resulting waste forms were successfully solidified - see photos 1 and 2

To address the question as to whether or not the simple solidification of an oxidizing liquid, such as concentrated nitric acid, with Acid Bond would render a non-oxidizing solid it was decided to subject a sample of the solidified nitric acid to an extreme version of the EPA Method 1030 screening.

A conservative screening test was performed by Nochar Inc. using a of sample of the solidified nitric acid, which had been in storage for over two months. The sample was placed on to a non-combustible surface and subjected to a flame for the requisite two minutes. However, instead of using the prescribed Bunsen burner the Nochar test operator used a hand-held butane torch that produced a flame temperature of over 2000°F. It believed that if the sample passed this extreme test then it would definitely pass the standard test.

The sample was subjected to the flame for two minutes without any ignition - See video clip and photos 3-6. After two minutes the flame was removed. The edges of the sample

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were charred, but no burning or smoldering was observed. Since the sample did not burn or react violently no additional testing was deemed as being necessary.

Conclusion

Based on the observations made from the screening test one can conclude that the simple immobilization of an oxidizing liquid with the Nochar Acid Bond will render a non-oxidizing solid. Applying this premise to the U-Plant liquid waste (utilizing the general information provided regarding waste) it is believed that the resulting waste form generated from the solidification of that waste using Acid Bond will render a non-oxidizing solid, without any additional pre- or post-treatment.

This finding is consistent with the observations and designations of other sites, such as Rocky Flats. Rocky Flats' D&D Projects utilized significant quantities of the cerium nitrate solutions for the decontaminating of tanks and glove boxes. Cerium Nitrate solutions are a high aggressive oxidizers. The spent cerium nitrate solutions were collect and solidified with Nochar Acid Bond, without pretreatment. The resulting waste forms and packages were evaluated by TRU Program and found to be WIPP acceptable.

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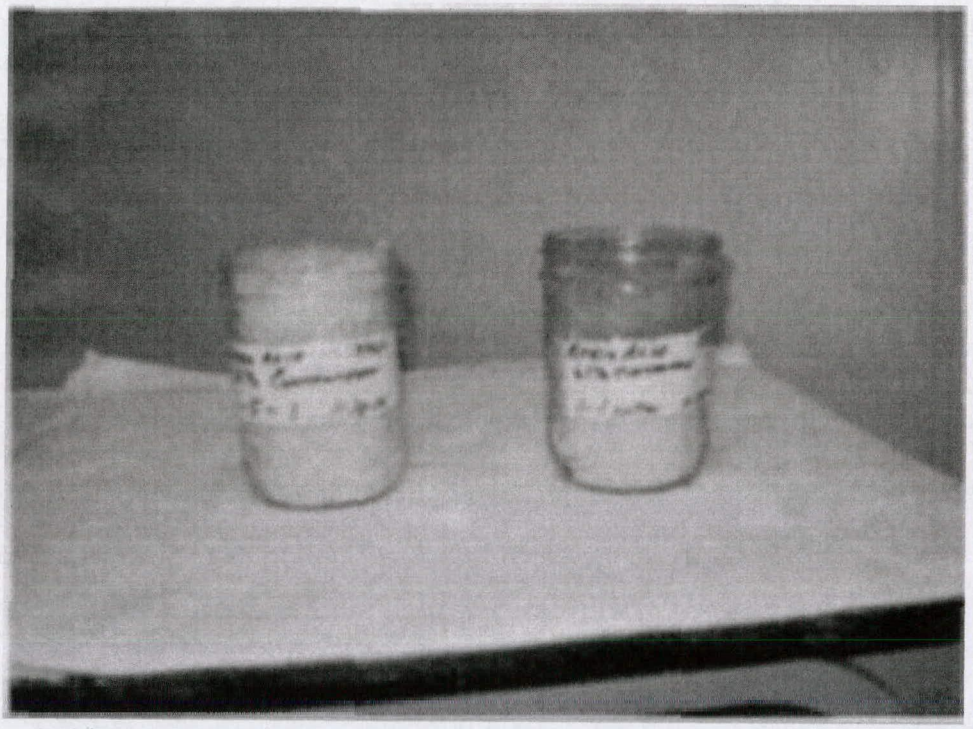
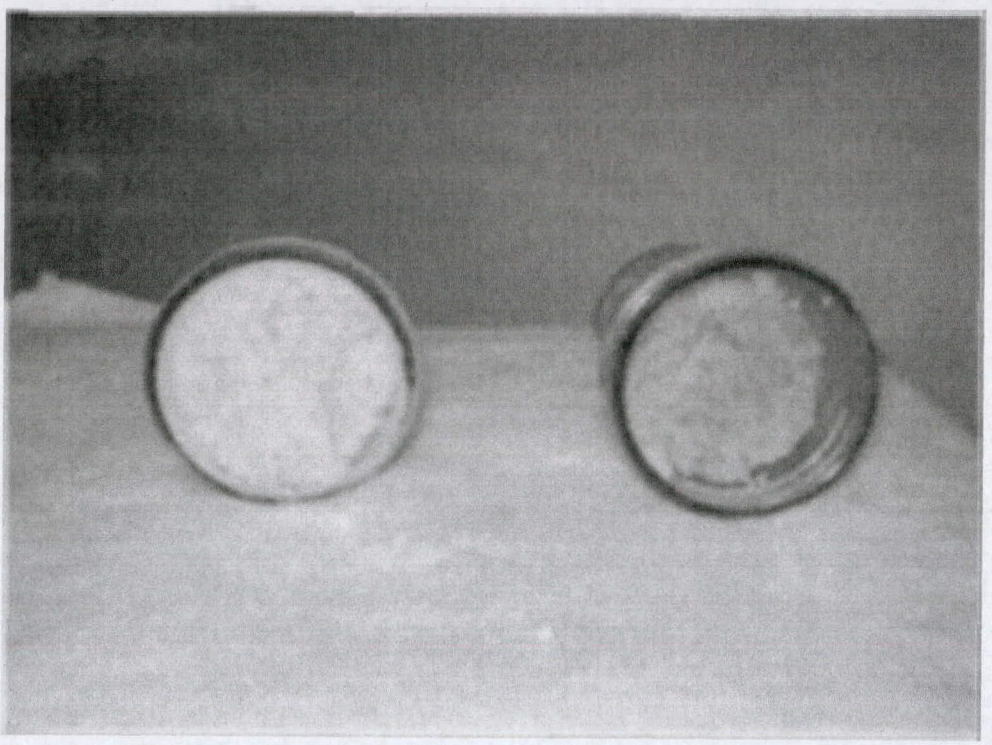
Photos 1 & 2 – Nitric Acid solidified with Acid Bond





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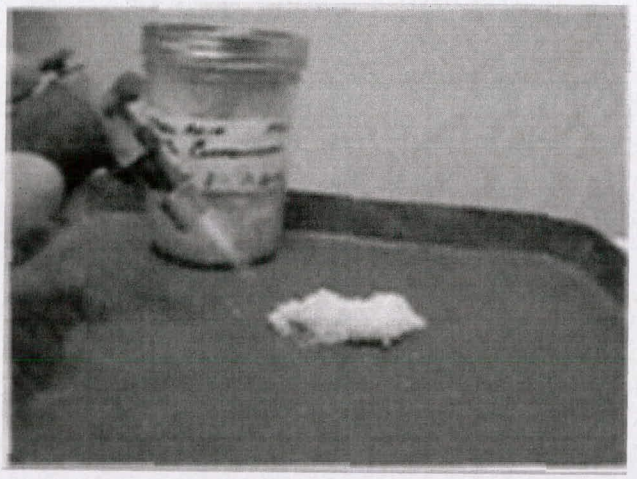
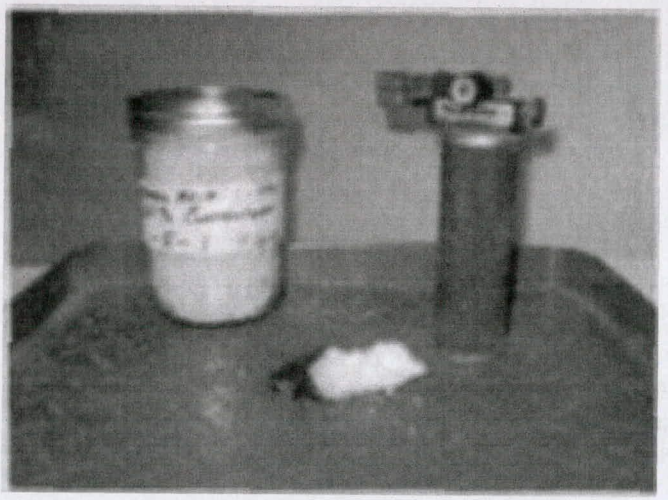
Photos 3, 4, 5 & 6 - Burn Tests





Bench Test Conducted
For
Hanford U-Plant

February 19, 2007

1.0 Purpose
Hanford U-Plant has a tank containing ~190 gallons of spent nitric acid with a pH of 0 to 1. It is estimated the at the 190 gallons of spent acid contains roughly 1660 fissile gram equivalent and a dose rate up to 190 REM, which makes this an RH TRU waste. It is assumed the final treated waste form will be packaged to meet the WIPP RH TRU transportation and disposal criteria.

For ALARA reasons, Hanford would like to minimize exposure by minimizing the number of steps required to remove, treat, and package the waste. Conceptually, the utilization of Nochar Acid Bond would allow the waste to be solidified without any pretreatment, such as neutralization. The purpose of this test was to demonstrate the ability and durability of Acid Bond to solidify. It is known that Acid Bond if used at the wrong ratios can release liquid over time, typically seen after two weeks. Thus, it is imperative to test and verify the right conditions.

2.0 Scope:
To conservatively simulate the U-Plant treatment to determine a conservative waste to Acid Bond ratio that will result in a final waste form that will meet the WIPP/WAC.

Acid Bond has been tested and used throughout the DOE Complex on a variety of wastes and conditions, including the stabilization of the highly aggressive (oxidizer) spent cerium nitrate decontamination solution. Utilizing this knowledge base Nochar has determined two conservative ratios of waste to Acid Bond to test. To be even more conservative Nochar will perform the test using concentrated acid versus a spent acid.

3.0 Test:
Two conservative ratios where chosen to test for this demonstration, a 0.5 to 1 by weight and a 1 to 1 by weight.

3.1 – Concentrated Nitric to Acid Bond at a 0.5 to 1 by weight ratio
Date: 11/28/06
Sample #1 (.5 to 1 by weight)
- Added 92gms of Nitric acid (65%) to184 gms of N960 Acid Bond into a 475 ml beaker.
- Mixed for ~30 seconds with a stir stick.
- Placed beaker in temporary storage.

3.2 - **Concentrated Nitric to Acid Bond at a 1 to 1 by weight ratio**
Sample #2 (1 to 1 by weight)
- Added 184 gms of Nitric acid (65%) to 184 gms of N960 Acid Bond into a 475 ml beaker .
- Mixed for ~30 seconds with a stir stick.
- Placed beaker in temporary storage.

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4.0 Results/Observations:
After two weeks the samples were removed from storage and examined. After examination the samples were place back into storage for an additional eight (8) weeks.

4.1 **Two Weeks**:
As of 12/12/06, both test samples remain in excellent condition. The test is considered successful. See attached photos.

4.2 **Two and a Half Months**:
As of 2/19/07, both test samples remain in excellent condition with no release of any liquids. The 1:1 samples has shown some discoloration, but with no signs of degradation. Both samples have a rubbery like texture and are a very durable, hard to tear apart. The test is considered very successful. See attached photos.

5.0 Conclusion:
Based on past experiences and the results of this test the utilization of a 1:1 by weight ratio of waste to Acid Bond (N960) will produce an acceptable waste form.

Past radiological dose studies have shown that the polymerized waste forms do not degrade over time when exposed to high levels of radiation. As such, the results of this should not be any different with radiological wastes. However, to be extra conservative a 0.5:1 weight ratio of waste to Acid Bond should be considered.

6.0 Comments: It should be noted that these tests were conducted by Nochar at its manufacturing facility and were conducted according to agreed upon procedures by Nochar management based on general discussions with Hanford technical representative. These tests were conducted through Nochar's best efforts, but do not represent any verification by any third party or certified laboratory.

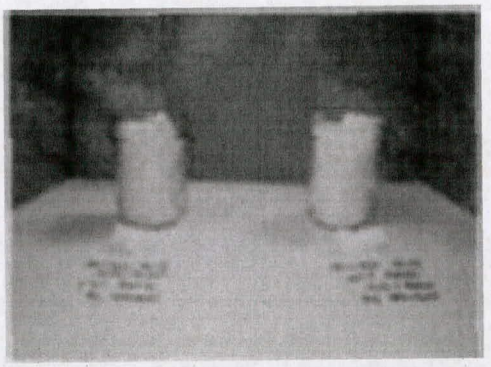
Testing conducted by: Daniel Gehlhausen

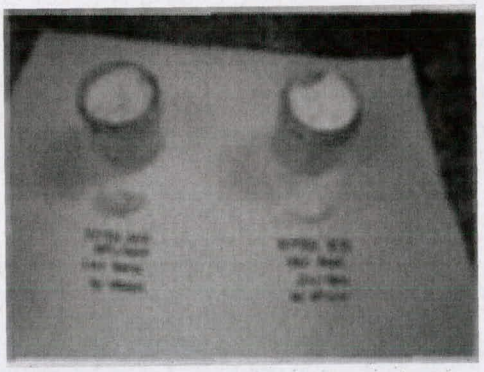
Verified by: Dennis Campbell

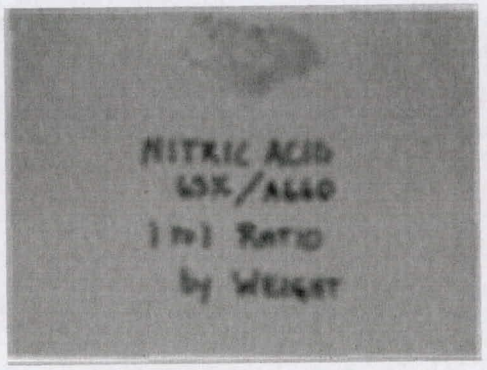
Report Date: February 19, 2007

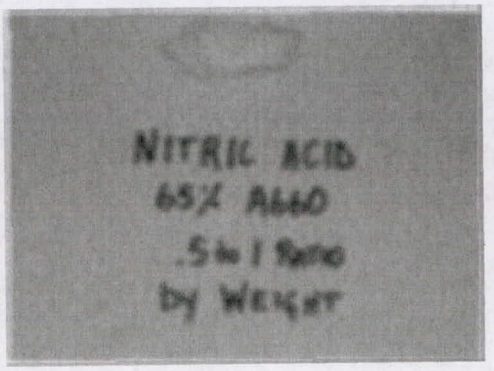
nochar inc.
8650 Commerce Park Place Suite K
Indianapolis In. 46268

Solidified Nitric Acid Sample after 2 weeks



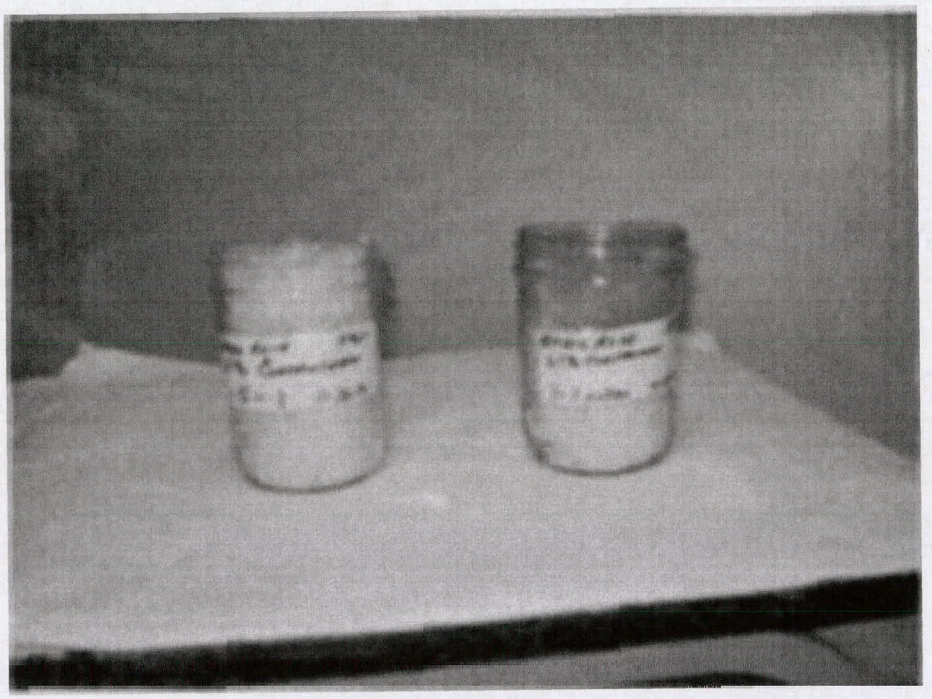


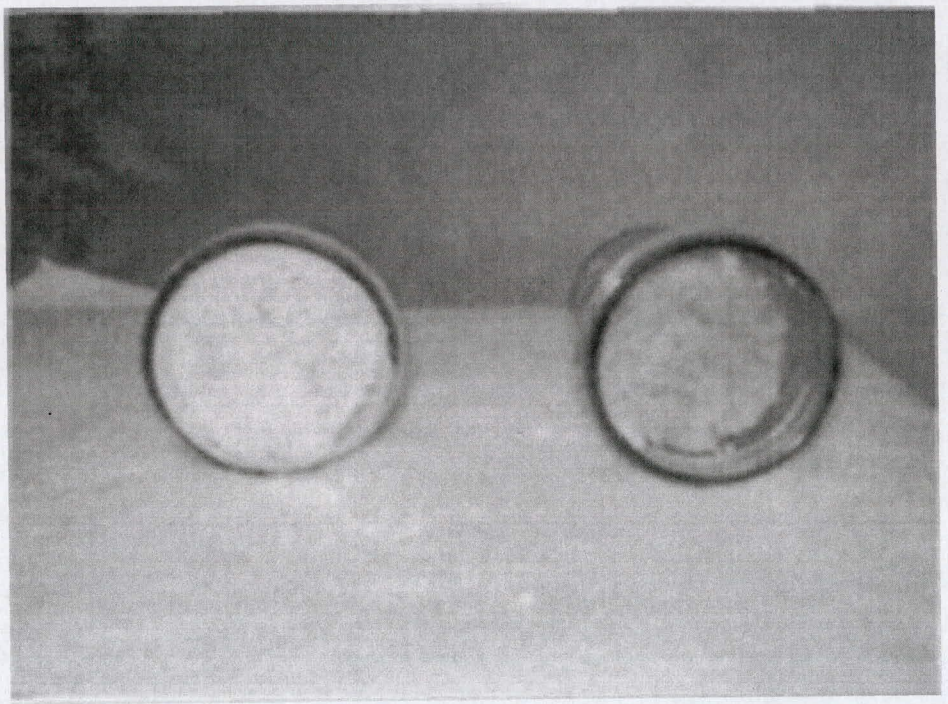




nochar inc.
8650 Commerce Park Place Suite K
Indianapolis In. 46268

Solidified Nitric Acid Samples after 2 ½ months





nochar inc.
8650 Commerce Park Place Suite K
Indianapolis In. 46268

nochar, inc.

8650 Commerce Park Place, Suite K
Indianapolis, IN 46268

COMPATABILITY

Nochar's N965 has been tested and utilized in the field at Savanah River Site for the solidification of **percholoric acid,** with no negative reaction. N965 contains N960 acid bond which is designed to bond and solidify all acid solutions for long term burial. N965 was designed to solidify all types of liquids which did not have proper content characterization.

N960 Acid bond by itself is recommended for the solidification of acids and bases. However as stated above, N965 will work for this application as referenced in applications at SRS.

Dennis Campbell
Senior Vice President
Nochar, Inc.

Phone: 317-613-3046 Fax: 317-613-3052 e-mail nochar@nochar.com web: nochar.com

nochar inc.

8650 Commerce Park Place Suite K
Indianapolis In. 46268

EnergX
100 WIPP Road
Lenoir City, TN 37771
Attn: Chris Thompson
8/19/08

Dear Mr. Thompson,

In response to your inquiry as to whether or not simply pouring a liquid into a bottle containing the N965 polymer blend, capping the bottle, and mixing by shaking in lieu of mixing the liquid into the polymer with a stir stick is sufficient enough to adsorb all the liquid, our response is yes – this is assuming that the TWPC will be implementing the recommended 8:1 by volume (4:1 by weight) ratio of N965 to liquid.

With the main objective of your process being to sorb all the free liquid, the fact that mixing by shaking will not form an evenly distributed or homogenous looking waste form is not a concern. If a homogenous looking waste form is desirable then we would recommend that a more aggressive mixing approach be taken. With the conservative sorbent to liquid ratio recommended there is more than an adequate amount of sorbent in the blend to sorb all the liquid without having to distribute the liquid evenly thought out the sorbent material.

In regards to keeping the cap on after shaking, we do not see any issue with that either. Since our polymers are essentially chemically inert there should not be any chemical interaction that would cause a lot of off-gassing that would cause the bottle to over-pressurize and burst. The only exception to this rule that we have encountered is when we have done some extremely aggressive test conditions of mixing the N965 blend with unspent, fresh, concentrated nitric acid. Under this condition we did see a slight, temporary rise in temperature and some slight off-gassing. The temperature and the slight off-gassing that diminished after about ten minutes (see report). If you treat concentrated acids, we would recommend that after the initial shaking you loosen the cap, to release any off-gasses that may be coming off for about 10 minutes. If it is undesirable to have a loosen lid on the container for 10 minutes, then visually inspect the container for any signs of pressurization. If there are any signs of pressurization, then slightly open the bottle to release the pressure.

We still recommend a curing period of 2 hours before allowing the solidified waste to come into contact with other solidified waste.

If you have any further questions regarding this matter or require any additional information, please let me know.

Dennis Campbell
Senior Vice President
Nochar, Inc.

nochar inc.

8650 Commerce Park Place Suite K
Indianapolis In. 46268

December 20, 2007

Chris Thompson
Facilities Director
EnergX
100 Wipp Road
Lenoir, TN 37771

Ref: Technical Safety Report (TSR) support information

Dear Chris,

This note and the associated attachments are being provided to you to support the following two statements that were included in TWPC's TSR for the deployment of the liquid treatment process.

- The absorbent material prevents the volatilization of flammable liquids by chemically binding the liquids.
- The absorbent material is compatible with the expected waste streams to be treated.

Both statements are true. To help substantiate the first statement regarding the Nochar polymers' ability to solidify flammable liquids and suppress VOC gases I have attached the following information.

Flash point tests of solidified diesel fuel
Flash point tests of solidified toluene
Flash point tests of the glove box liner with solidified gasoline and diesel fuel
Voc head space gas tests

As you are aware, Nochar polymers have been used throughout the D.O.E. complex to solidify TRU waste. In most of these applications VOC head space and hydrogen head space testing has been conducted. Nochar has demonstrated in these applications, its ability to limit gas vapor generation in solidified waste.

In regards to the compatibility of the polymers to the expected waste streams to be treated, the polymers are essentially chemically inert materials and we have not found them to be incompatible with any waste streams yet.

For your information we have also attached an overview of the polymer technology, which provides a general discussion on the polymers and how they work.

I hope this letter and the supporting documentation will answer any questions concerning this issue.

If you have any additional questions or require any further information please let me know.

Kind regards,

Dennis Campbell
Senior Vice President
Nochar, Inc.

phone: 317-613-3046 Fax: 317-613-3052 e-mail nochar@in.net web: nochar.com

Data Analysis Technologies, Inc.
7715 Corporate Boulevard
Plain City, OH 43064

Sample Analysis Certificate

Nochar, Inc.
8650 Commerce Park Place
Suite K
Indianapolis, IN 46268

Date:	1/2/02
Project ID:	0901008
Sample Date:	NA
Date Received:	9/5/01
Analyzed By:	Sub-contract
Date Analyzed:	12/28/01

Attn: Dennis Campbell
Project #: NA

Ultimate Analysis

See appended Sub-Contract Data Summary Table

Reviewed and approved for release by: _____ Date: 1/2/02
President

KB:csh

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U.S. Mail: P.O. Box 51610 • Knoxville, TN 37950-1610
Other Carriers: 2323 Sycamore Drive • Knoxville, TN 37921-1750
Tel: 865/546-1335 • Fax: 865/546-7209 • Internet: www.galbraith.com • e-mail: labinfo@galbraith.com

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Other Carriers: 2323 Sycamore Drive • Knoxville, TN 37921-1750
Tel: 865/546-1335 • Fax: 865/546-7209 • Internet: www.galbraith.com • e-mail: labinfo@galbraith.com

IT Corporation
304 Directors Drive
Knoxville, Tennessee 37923
Tel: 865.690.3211
Fax: 865.694.9573

A Member of The IT Group

September 13, 2001

Mr. Ward Brunkow

Re: Headspace Analysis of Nochar Solidified Diesel Fuel

Dear Mr. Brunkow:

On September 4, 2001 the Technology Applications Laboratory (TAL) received two Nochar solidified diesel fuel samples, each in sealed one gallon metal paint cans. The samples were logged into the laboratory sample tracking system and assigned laboratory sample numbers. The samples were labeled with the following:

Solidified Diesel Fuel with a cap of Polymer (TAL# 3461)
Solidified Diesel Fuel with a cap of Granular Activated Carbon, GAC, (830 mesh) (TAL# 3462)

After logging in the samples they were maintained at room temperature (22°C) pending analysis. The samples were analyzed for flammable headspace gases at room temperature using a MSA Watchman™ Multigas Monitor. The monitor is a constant sampling and readout device, which measures the flammable gases in the headspace in terms of percent of the lower-explosive-limit (%LEL).

The monitor was calibrated for %LEL readings using pentane , which has an LEL of 1.5 percent and the calibration was verified using a gas standard containing 1.45 percent methane, which has an LEL of 5 percent. The samples were analyzed following the procedure described in your fax dated September 4, 2001 (copy is attached).

The sample containers were in good condition and the lids were tightly sealed on both cans with the seals intact. The monitor was used to sniff the outside of the sample containers around the lid seals to check for detectable leaks. No readings were noted around the can seals different from ambient gas sampling indicating that there were no leaks detected.

The headspace of each sample was analyzed on September 12, 2001. The analysis was performed by drilling a 7/16 inch diameter hole in the can lid and immediately inserting the ¼ inch diameter by 30 inch length MSA monitor sampling tube into the can headspace, being careful not to insert the tube into the sample cap layer. The headspace readings were monitored for 10 minutes. Instrument readings generally equilibrated

IT CORPORATION
A Member of The IT Group

within 20-30 seconds. There was some drift towards ambient gas readings with time as the headspace was diluted due to the inflow of ambient air from the headspace sampling, which was withdrawn at a rate of 1.7 liters per minute (L/min.).

The solidified diesel sample with a cap of polymer (TAL# 3461) gave LEL readings, which peaked at 7 percent within 20-30 seconds and remained steady before dropping to 6 percent near the 10 minute sampling mark. The solidified diesel sample with a cap of GAC (TAL# 3462) showed a constant %LEL reading of 0 for 10 minutes. Headspace results are summarized below.

Sample	%LEL (as pentane)
3461 (polymer cap)	7
3462 (GAC cap)	0

IT appreciates the opportunity to work with you on this project and if you have any questions about the results, you may contact me at 865-694-7360 (or by e-mail at droot@theitgroup.com).

Very truly yours,

Duane K. Root, Ph.D.
Sr. Technical Consultant
Technology Applications Group
IT Corporation

Data Analysis Technologies, Inc.
7715 Corporate Boulevard
Plain City, OH 43064

Sample Analysis Certificate

Nochar, Inc.
8650 Commerce Park Place
Suite K
Indianapolis, IN 46268

Date:	1/2/02
Project ID:	0901008
Sample Date:	NA
Date Received:	9/5/01
Analyzed By:	Sub-contract
Date Analyzed:	12/28/01

Attn: Dennis Campbell
Project #: NA

Ultimate Analysis

See appended Sub-Contract Data Summary Table

Reviewed and approved for release by: _____ Date: 1/2/02
President

Galbraith Laboratories, Inc.

Accuracy with Speed – Since 1950

LABORATORY REPORT

Ron Mitchum
DAT, Inc.

Report Date: 12/28/01
Lab I.D.: L-7179-80

TECHNICAL INFORMATION:

*Quality Assurance data indicates that we cannot be confident in the analysis of your sample below the level indicated. If lower quantitation limits are required, other procedures may be applicable. Please contact a member of our technical staff for a complete description of our alternate testing capabilities.

KB:csh

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Tel: 865/546-1335 • Fax: 865/546-7209 • Internet: www.galbraith.com • e-mail: labinfo@galbraith.com

Galbraith Laboratories, Inc.

Accuracy with Speed – Since 1950

LABORATORY REPORT

Ron Mitchum
DAT, Inc.
7715 Corporate Blvd
Plain City, OH 43064

Report Date: 12/28/01

Fax Number: 614-873-0810

SAMPLE ID	LAB ID	ANALYSIS	AS RECEIVED		
		ULTIMATE ANALYSIS:			
0901008-1	L-7179	Loss on Drying @ 110°C	14.12		%
		Carbon	38.09		%
		Hydrogen	6.57		%
		Nitrogen	10.19		%
		Sulfur	<0.05	*	%
		Chlorine	419		ppm
		Ash	13.48		%
		Oxygen (by difference)	31.63		%
0901008-2	L-7180	Loss on Drying @ 110°C	5.64		%
		Carbon	84.34		%
		Hydrogen	12.21		%
		Nitrogen	<0.5	*	%
		Sulfur	<0.05	*	%
		Chlorine	168		ppm
		Ash	2.50		%
		Oxygen (by difference)	0.93		%

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NOCHAR

3176133852

12/19/2007 15:42

SERIAL Nº 21150

DAT

Data/Analysis Technologies, Inc.

"Analytical Laboratories and Consultants"

ANALYSIS REQUEST AND CHAIN OF CUSTODY RECORD

7715 CORPORATE BLVD.
PLAIN CITY, OHIO 43064
614-873-6710 800-733-8644
FAX 614-873-0810

PROJECT REFERENCE	PROJECT NO.	P.O. NUMBER	MATRIX TYPE	REQUIRED ANALYSIS	PAGE	OF
PROJECT LOC. (State)	SAMPLER(S) NAME	PHONE 317-613-3046				
		FAX 317-613-3052				
CLIENT NAME: Nochar Inc	CLIENT PROJECT MANAGER: Dennis Campbell					
CLIENT ADDRESS (CITY, STATE, ZIP): 8105 Commerce Park Place, Suite K Indianapolis, IN 462268						

☐ STANDARD REPORT DELIVERY
☐ EXPEDITED REPORT DELIVERY (SURCHARGE)

SAMPLE DATE	SAMPLE TIME	DAT NO.	SAMPLE IDENTIFICATION	PRESERVATIVE	NUMBER OF CONTAINERS SUBMITTED	DATE DUE / REMARKS
			N960/AM60	X		
			N990	X		

% Carbon, Hydrogen, Moisture

RELINQUISHED BY (SIGNATURE)	DATE	TIME	RELINQUISHED BY (SIGNATURE)	DATE	TIME	RELINQUISHED BY (SIGNATURE)	DATE	TIME
RECEIVED BY (SIGNATURE)	DATE	TIME	RECEIVED BY (SIGNATURE)	DATE	TIME	RECEIVED BY (SIGNATURE) Jennifer M Arnau	DATE 9/5/07	TIME 1300

LABORATORY USE ONLY

RECEIVED FOR LABORATORY BY (SIGNATURE)	DATE	TIME	CUSTODY SEAL? ☐ YES ☐ NO	LABORATORY REMARKS:

AVATLABS INC
3125 Madison, S.E. • Grand Rapids, MI 49548 • (616) 241-6070

February 25, 1993

TO: Nochar Inc.
12333 N. Meridian St.
Suite 215
Indianapolis, IN 46290

RE: Results of Flash point analysis on sample A610; Sample received 2-24-93

The results are as follows:

Sample A610 & Diesel Fuel @ 10/1, had a flash point at 80° Celcius which is 176° Fahrenheit.

Analysis is in accordance with A.S.T.M. Method D93 79.

Analysis Submitted By:

Job #: 8278

Thomas J. Krueger
Environmental Laboratory Services

Approved: TW

ENVIRONMENTAL LABORATORY SERVICES

- CERTIFICATE OF ANALYSIS -

Report Date: *05-Dec-07*

Client ID: NOCHAR_INC

Nochar, Inc.
8650 Commerce Park
Suite K
Indianapolis, Indiana 46268
Attn: Dennis Campbell
Phone: (317) 613-3046
FAX: (317) 613-3052

Our Lab # 07014080-001	**Your Sample ID:** Diesel Sample
Your Project #	**Collection Date:** 11/30/07
Your Project Name: Flashpoint Testing	**Collected By:** Client
Sample Type: Solid	**Receipt Date:** 12/03/07 12:00

Flashpoint by PMCC

Analytical Method	Prep Method	Prep Date	By
SW846 1010			

Parameter	Result	Units	Qual	Quant. Limit	CAS #	Analysis Date	By
Flashpoint by PMCC	>160	°F				12/4/07	[illegible]

12/5/07

Lab Manager — Date

ESC Laboratories
5927 WEST 71ST STREET
INDIANAPOLIS, INDIANA 46278
PHONE (317) 290-1471
FAX (317) 290-1670

ESG Laboratories

5927 West 71st Street • Indianapolis, IN 46278
Phone (317) 290-1471 • Fax (317)290-1670

CHAIN OF CUSTODY RECORD

PAGE 11

Client Name:	ESG Work Order #:
Nochar, Inc.	0704080 1
Project Name:	Project No:
Flash Point	
Sampler(s) Signature:	

Sample No./Lab ID	Date	Time	Matrix	Sample Description	Total Number of Containers	Filtered (Y or N)	Preserv. Code	Analyses: Flashpoint	Comments
	11/30			Diesel	1		X		Separate Report
	11/30			Gasoline	1		-Y		

Comments:
(317) 1013-3046
Dennis Campbell
8650 Commerce Pl Dr
Suite K
Lafayette, IN 47905
Bill Customer
EW

NOCHAR

3176133852

TRANSFER/CUSTODY RECORD

	Date/Time
Relinquished By: Dennis Campbell	11/30/07 12/3/07 (12:30) 4:00pm
Received By: DJ Bellamy	
Relinquished By:	Date/Time
Received By:	
Relinquished By:	Date/Time
Received By:	

15:42

12/19/2007

SAMPLE CONDITION UPON RECEIPT

Sample Temp:	°C
Received on Ice:	Y / N
Samples Intact:	Y / N
Adequate Volume:	Y / N
Appropriate Containers:	Y / N
Appropriate Preservative:	Y / N
Within Hold Time:	Y / N
Head Space Absent:	Y / N / NA

SAMPLE COMMENTS

Please note if sample(s) suspected to be hazardous, corrosive, or requires special handling for any reason.

SAMPLE PH (IF APPLICABLE)

4.00 _____ 7.00 _____ 10.00 _____

TURNAROUND REQUIRED

Normal _____ Rush _____
Requested Date: _____

PRESERVATIVE KEY

N = HNO_3 / Nitric Acid
S = H_2SO_4 / Sulfuric Acid
H = HCl / Hydrochloric Acid
U = Unpreserved, Cooled to 4°C
OH = NaOH / Sodium Hydroxide
SO = $Na_2S_2O_3$ / Sodium Thiosulfate

- CERTIFICATE OF ANALYSIS -

Report Date: *11-Dec-07*

Client ID: NOCHAR_INC

Nochar, Inc.
8650 Commerce Park
Suite K
Indianapolis, Indiana 46268
Attn: Donna Campbell
Phone: (317) 613-3046
FAX: (317) 613-3052

Our Lab # 07014358-001	Your Sample ID: Gasolene Sample
Your Project #	Collection Date: 12/06/07 14:00
Your Project Name: Flashpoint Test	Collected By: Client
Sample Type: Solid	Receipt Date: 12/07/07 09:43

Flashpoint by PMCC — Analytical Method: SW846 1010 — Prep Method — Prep Date — By

Parameter	Result	Units	Qual	Quant Limit	CAS #	Analysis Date	By
Flashpoint by PMCC	>160	°F				12/11/07	nmason

12/11/07

Lab Manager — Date

ESG Laboratories
6927 WEST 71ST STREET
INDIANAPOLIS, INDIANA 46278
PHONE (317) 290-1471
FAX (317) 290-1870

ESG Laboratories
5927 West 71st Street • Indianapolis, IN 46278
Phone (317) 290-1471 • Fax (317)290-1670

CHAIN OF CUSTODY RECORD

Client Name: Nochar
ESG Work Order #: N0U14337
Project Name: Flashpoint Test
Project No:
Sampler(s) Signature: [signature]

Total Number of Containers

Filtered (Y or N)
Preserv. Code
Analyses: Flashpoint

							Total Number of Containers	Flashpoint									Comments
	12/6	14:00			x	Gasolene	1	x									

Relinquished By:	Date/Time
[signature]	12/7/07
Received By: [signature]	9:43
Relinquished By:	Date/Time
Received By:	
Relinquished By:	Date/Time
Received By:	

Sample Temp: ______ °C
Received on Ice: Y / N
Samples Intact: Y / N
Adequate Volume: Y / N
Appropriate Containers: Y / N
Appropriate Preservative: Y / N
Within Hold Time: Y / N
Head Space Absent: Y / N / NA

Please note if sample(s) suspected to be hazardous, corrosive, or requires special handling for any reason.

4.00 ______ 7.00 ______ 10.00 ______

Normal ______ Rush ______
Requested Due Date: ______

N = HNO_3 / Nitric Acid
S = H_2SO_4 / Sulfuric Acid
H = HCl / Hydrochloric Acid
C = Unpreserved, Chilled to 4°C
OH = NaOH / Sodium Hydroxide
SO = $Na_2S_2O_3$ / Sodium Thiosulfate

AVTLABS INC
3125 Madison, S.E. • Grand Rapids, MI 49548 • (616) 241-6070

February 25, 1993

TO: Nochar Inc.
12333 N. Meridian St.
Suite 215
Indianapolis, IN 46290

RE: Results of Flash point analysis on sample A610; Sample received 2-24-93

The results are as follows:

Sample A610 & Toluene @ 10/1, had a flash point at 100° Celcius which is 212° Fahrenheit.

Analysis is in accordance with A.S.T.M. Method 093 79.

Analysis Submitted By:

Job #: 8278

Thomas J. Krueger
Environmental Laboratory Services

Approved: TJK

ENVIRONMENTAL LABORATORY SERVICES

nochar

Polymer Solidification

Nochar, Inc., a leader in the polymer waste solidification industry, has been manufacturing and marketing high tech polymers since 1991.

Nochar, Inc. (Nochar) has two basic high tech polymers specifically formulated to immobilize aqueous-based liquids (Acid Bond) and organic-based liquids (Petro Bond). Acid Bond was formulated to solidify the full range of aqueous based liquids, from acids to bases (pH 0 to 14). PetroBond was formulated to solidify organic based liquids ranging from oils to solvents. The Nochar polymers are the only polymeric sorbents in the nuclear market that can immobilize such a large range of liquids without some type of pre-treatment, such as neutralization. When used in concert, blended polymers can solidify and immobilize a vast array of mixtures of organic hydrocarbons, aqueous, acids, bases and sludges. The final waste forms meet or exceed all disposal requirements.

Nochar polymer solidified hazardous waste forms have been shipped and buried in Class I and Class II landfills throughout the United States. The Nochar polymers are certified incinerable and produce only .02% ash. Solidified wastes produced from the treatment of a large variety of hazardous waste liquids and sludges have met the RCRA Land Disposal Restriction (LDR) Treatment Standards.

In 1997, the Nochar polymers were introduced into the nuclear waste industry, including the Department of Energy, as an alternative methodology for the treatment of problematic liquid waste streams. Nuclear wastes treated with the Nochar polymers have been successfully transported and disposed of at both private sector disposal sites, such as EnviroCare, and DOE owned disposal sites, such as the Waste Isolation Pilot Plant (WIPP) and the Nevada Test Site (NTS). Organic/Aqueous solidified waste has also been subjected to gamma radiation as high as 270,000,000 rad (Cobalt 60 source).

Polymer Technology

Sorbent is a general term used to represent adsorption or absorption properties of a material. The term *ab*sorption is the taking up of a substance into or throughout a material by physical or chemical means, i.e., a strong, essentially irreversible bonding, vs. *ad*sorption, a process by which molecules are taken up on the surface of a solid by chemical or physical action, i.e. a physical bonding from which adsorbed materials can be more readily removed, e.g., by vacuum and/or heating. Unlike most commercial sorbing products, such as vermiculite (adsorbent), the Nochar polymers are considered absorbents, which result in a more robust waste form.

PetroBond (A610/N910)

Petrobond is a thermoplastic rubber with an elastomeric block in the center and thermoplastic (polystyrene) blocks on each end, which allows the absorption or bonding of the organic compounds with the polymer.

Nochar's organic polymer is a 3rd generation elastomer, which is a macromolecule formed by the union of (5) or more monomers. The polymers undergo a co polymerization process using the Natta/Ziegler method. Organic waste is solidified by first wicking the liquid into the polymer granule. As the waste travels through the polymer strands, the styrene tips swell, thus trapping the waste into the polymer matrix. As the micro pours collapse around the entrapped liquid, a solid non-leaching waste form results.

The speed and density of solidification depends on the volatile nature of the waste stream. As an example, #2 diesel fuel will bond immediately forming a solid rubber mass in under a minute. Mineral oil, which is commonly used as a vacuum pump lubricant, will take several hours to complete a bond and will be more of a rubbery oatmeal consistency. Once the solidification process is complete and the polymerized waste is allowed to cure the solidified waste exhibits extreme durability.

8650 Commerce Park Place, Suite K,
Indianapolis, IN 46268

www.nochar.com *(317) 613-3046* *nochar@in.net*

nochar

Acid Bond (A660/N960)

Acid Bond is a copolymer of potassium polyacrylate and acrylamide, which are cross-linked to create absorption sites. Due to linking polymers of very high molecular weight, Acid Bond is insoluble in water and is capable of absorbing up to 300 times its weight.

The combination of cross-linking polyacrylate and acrylamide has created a stronger bond for aqueous materials than using acrylates alone. Standard polyacrylates are the most commonly used polymers in such markets as baby diapers and soil enhancers. These polyacrylates will release water over time, which is a desirable characteristic for these applications. In contrast, the combination of cross-linking acrylamide with acrylates creates a polymer chain of much higher long-term water retention rates. This cross-linking is an absolute requirement for hazardous and radioactive waste management treatment and disposal applications.

Testing

Waste forms produced by the treatment of liquid wastes (surrogate and actual waste) with the Nochar polymers have been subjected to extensive testing to determine acceptability and durability. Testing has been performed domestically and internationally.

Testing throughout the DOE Complex has consistently shown the durability of Nochar bonded liquid waste forms. After extensive testing at the former plutonium production facility at Rocky Flats, both Acid Bond and Petro Bond, and various mixtures of the two, became the baseline solidification product for all TRU liquid wastes. These waste forms were eventually transported and disposed of at the Waste Isolation Pilot Plant (WIPP) - the nations only burial site for transuranic waste (over 10,000 year half-life). The Nochar polymers have been tested and used at other DOE sites including: Mound, Savannah River Site, Hanford, Portsmith, Paducah, Lawrence Livermore National Laboratory, Idaho National Laboratory, Los Alamos National Laboratory, and Oak Ridge National Laboratory.

International testing of the Nochar polymers has been performed at the Whiteshell Laboratory in Canada, at the Sellafield and Barkley facilities in Great Britain, and at the Klophin Radium Institute in Russia. Additionally, testing has been successfully performed in; France, Japan, Brazil, South Africa, Australia, and China. Solidification projects are on going in Romania and Slovenia.

High radiation durability testing of the polymers and surrogate waste forms has been performed both domestically and internationally. These include testing at the Klophin Radium Institute in St. Petersburg, Russia and Purdue University. The Klophin Institute subjected Acid Bond/Petro Bond blend to 270,000,000 rad with no liquid release. At Purdue University, four different aqueous waste streams, including nitric acid and a 14.2 ph waste, were solidified with Nochar's Acid Bond. The tests conducted in 2004 at Purdue's School of Nuclear Engineering, utilized a Gamma Cell 220 irradiator, with Cobalt 60 as the source. The rad field was generating 1.29 K-rad /min. At the conclusion of the test, the samples had been subjected to 75,000,000 rad with no significant degradation of the waste form or any release of liquids.

The following is a partial listing of tests that have been conducted on the immobilized waste forms:

Radiation Exposure Testing

Radiation testing – Cobalt 60 source
90 mega-rad (Savannah River Site)
75 mega-rad (Purdue University)
70 mega-rad (China Atomic)
270 mega-rad (Klophin Radium Institute, Russia)

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Leach Testing
TCLP
Iodine 129 Leaching

Waste Form Testing
Freeze/Thaw
Ultra Violet Accelerated Aging
Compression
Paint Filter - free liquid
Liquid Release
Hydrogen gas-generation at 142 degrees Fahrenheit
Elevated temperature – up to 500 degrees Fahrenheit
Volatile Organic Carbon gas release
Vibration
Incineration/Percent Ash
Percent Carbon – for criticality evaluations

Many of the above tests have been duplicated numerous times within the D.O.E. complex. The successful application of polymers for the solidification and immobilization of radioactive waste has been and continues to be a major success throughout the nuclear industry.

Deployments

The following Table highlights various Sites that have utilized Nochar polymers to immobilize problematic waste streams:

Site	Waste	LLW or TRU	Disposal Site	Polymer
Oak Ridge National Lab.	Tritium Oils	LLW	NTS	Petro Bond
Sandia National Lab.	Tritium Oils	LLW	NTS	Blend
Argonne National Lab -East	Oil/Solvents	LLW	NTS	Blend
Pacific Northwest National Lab.	Cutting Oils/water	LLW	On-Site	Blend
Lawrence Livermore National Lab.	Tritium Oils	LLW	NTS	Petro Bond
Los Alamos National Lab.	Spent Acids	TRU	WIPP	Acid Bond
Mound	Tritium Oil	LLW	NTS	Petro Bond
Mound	Scintillation Fluids	LLW	EnvioCare	Blend
Rocky Flats	Oil/Solvents	TRU	WIPP	Blend
Rocky Flats	Spent Acids	TRU	WIPP	Acid Bond
Rocky Flats	Sludges	TRU	WIPP	Acid Bond
Rocky Flats	Sludges	LLW	NTS	Acid Bond
Savannah River Site	Unknowns	TRU	WIPP	Blends
Whiteshell	Oils/water	LLW	On-Site	Blend

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DATE: May 28, 2008

TO: F.K. Heacker
M. McCauley
TRU Waste Processing Center

FROM: W.D. Bostick, Technical Manager for MCLinc
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Determination of Nochar N965 Polymer Blend Efficiency to Treat Organic Solvents to Meet the RCRA Requirements for Land Disposal Restrictions.

(Rev. 1)

MCLinc Project ENX002038

Under EnergX Scope of Work, PO # 061331, work release GGS0001

Summary

The ability of Nochar N965™ polymeric elastomer sorbent blend to retain select volatile organic solvents was evaluated based on the gas vapor headspace concentration, as referenced to the gas chromatographic instrument response for an aliquot of the referenced solvent with no sorbent added. The equilibration temperature was (~ 104° F), modestly above ambient, to simulate a temperature that could easily occur in a sealed waste package during storage or transport. If the solvent is selectively held in solid solution or strongly chemisorbed within the sorbent phase, i.e., if it has been successfully stabilized (or "fixed") within the surrogate waste form, then the equilibrium headspace partial pressure of solvent should be substantially less than that observed under the same conditions for the compound with no sorbent added. This analytical approach is analogous to the determination of trace VOCs in soil matrix by the purge-and-trap technique, such as EPA SW-846 Method 5035 for volatile organics.

The expectation for selective retention of VOC vapor by the sorbent was not realized, especially for the relatively polar solvents methyl ethyl ketone (MEK), xylene and trichloroethylene (TCE), suggesting that the RCRA toxicity characteristic of ignitability and the industrial hygiene concerns for inhalation hazard would not have been significantly ameliorated. Results were more promising for the more hydrophilic solvent methanol, which evidenced a reduction in vapor pressure by nearly 80% at the recommended treatment dosage of 8 volumes of Nochar to 1 volume of liquid (i.e., solvent loading ~11 %, by volume).

Table 1 is a summary of test results. Organic liquid was loaded on ~ 8-mL (2.88-g) aliquots of Nochar at dosages of 0.7-mL (nominal "70%" of recommended dosage value), 1.0-mL (nominal "100%" of recommended dosage value), and 1.3-mL (nominal "130%" of recommended dosage value).

Table 1. GC/FID response ratio of each sample to the neat organic material (Head space analysis after equilibration at 104° F).

Organic	~ 70% Recommended Loading (Solvent ~8 Vol%)	~ 100% Recommended Loading (Solvent ~11 Vol%)	~ 130% Recommended Loading (Solvent ~14 Vol%)
Methanol	5%	22%	80%
Methyl Ethyl Ketone	92%	>99%	88%
Xylene	97%	>99%	>99%
Toluene	9%	8%	82%
Carbon Tetrachloride	66%	65%	69%
Trichloroethylene	68%	80%	>99%

* Percentages are response in treated sample compared to response to neat sample regarded as 100% or maximum achievable with no Nochar.

The tendency for organic-laden Nochar to off-gas at relatively modest temperatures has also been noted by Bickford et al. (2006); see notes in Appendix I (Nochar – Annotated Bibliography).

It was noted that the Nochar product did appear to adequately address the free liquid issue, with no free liquid observed even at ~ 130% of the recommended solvent loading. Thus, it is expected that the solidified solvent would pass the less rigorous paint filter test (SW-846 method 9095A) for free liquids (gravimetric drain of liquid from medium), although Joyce et al. (2004) suggest that the compressible Nochar surrogate waste forms may not necessarily perform well against the more rigorous liquid release test (EPA Method 9096), in which moderate pressure (50 psi, to simulate the effect of overburden) is applied to the surrogate waste form to exude weakly held free liquid. A previous trial using non-hazardous mineral oil as the surrogate organic liquid (Bostick, 2008) demonstrated that apparent free liquid containment by Nochar was achieved at a surrogate waste loading $\geq$ 50% (by volume) or $\geq$ 29% (by mass).

The Nochar product appears very adequate for purposes of liquid spill control, but it does not appear to significantly alter the vapor pressure for the sorbed solvent at higher surrogate waste loading. For most of the solvents tested, this suggests physical sorption or very weak chemisorption, as the sorbed liquid readily permeates through the medium as a vapor into the headspace.

After headspace vapor analysis, small aliquots of solvent-laden solids (at 100% of the recommended waste loading) were extracted for "Total Constituent Analysis" (Table 2). The data indicate that volatile solvent constituent in the surrogate waste form was readily extracted by organic lixivant. These computed recovery values assume that the VOC is evenly distributed on the bulk surrogate waste form, which may not necessarily be the case for the rapidly-sorbed liquids, depending on the effective mixing efficiency (Langton, 2001).

Table 2. Extraction of Surrogate Waste Form at "100%" of Recommended Loading *

Solvent System in Surrogate Waste Form	Extraction Lixivant **	TCA Mean Result (mg/kg)	Recovery of Solvent Added to Surrogate Waste Form			
			Aliquot A	Aliquot B	Mean	RPD ***
Carbon Tetrachloride	Methanol	434,000	124%	117%	121%	6%
Methanol	Isopropanol	230,000	118%	94%	106%	23%
Methyl Ethyl Ketone (2-butanone)	Methanol	166,000	69%	76%	73%	10%
Trichloroethylene	Methanol	286,000	86%	83%	85%	4%
Toluene	Methanol	269,000	121%	107%	114%	12%
Xylenes (mixed isomers)	Methanol	221,000	86%	100%	93%	15%

* Recommended surrogate waste loading is 1-mL of VOC to 8-mL of N965 solid.

** 20-mL of lixivant is contacted with ~ 0.2-g of solidified surrogate waste form.

*** RPD = Relative Percent Difference (a measure of reproducibility for duplicate analyses) = 100%*(Difference between measurements)/(Mean of measurements)

A comparison of the VOC surrogate waste form Total Constituent Analysis results, as estimated by solvent extraction (Table 2), to the corresponding Land Disposal Restriction permissible nonwastewater limits (40 CFR 268.40) indicates that the fully-laden surrogate waste form (solvent at 100% of the recommended surrogate waste loading on Nochar N965) would not satisfy EPA expectations for a stabilized product for compliant land disposal. For example, the surrogate waste form prepared using xylene was formulated to contain the hazardous constituent at ~ 237,000 mg/kg;[1] by TCA (Table 2), it was determined to contain ~ 221,000 mg/kg (as extractable constituent), but the LDR nonwastewater criterion for xylene (mixed isomers) is only 30 mg/kg.[2]

[1] See Table 7, Sample 1076-7-2 (as-prepared)

[2] See Table 4

Experimental

Estimate of material mass

Mass measurements were made with use of a Mettler AE160 balance, SN B81487, calibrated and serviced 8/2007. Accuracy was verified with use of Permas Laboratory weight set SN A330 (meets Class S specifications of NIST), as described by the procedure MCL-7756, Appendix V.

Estimate of sorbent volume

The Nochar N965 elastomer product, provided by the client, is a fluffy, compressible material. The uncompressed bulk density was estimated by placing an aliquot of material into a tared 100-mL volumetric cylinder. The cylinder with sample was gently tamped on the lab bench 50 times, and then the net weight and volume of settled material was recorded to compute a bulk estimate of ~ 0.36 g/cm^3. Thus, a target mass aliquot of ~ 2.88-g of N965 material represents a nominal volume of 8-mL.

Estimate of liquid volumes

A VWR pipette, adjustable from 0.5-mL to 5.0-mL, is used to dispense liquids. It was calibrated against de-ionized water, DIW, (density 0.9974 g/cm^3 at 23 C; Dean, 1992) at nominal settings of 0.7, 1.0, and 1.3-mL; see Table 3.

Table 3. Pipette Volumes (assessed vs. DIW)

Nominal Volume Setting (mL)	Calibrated Volume Delivered (mL)
0.70	0.704 (± 0.002)*
1.00	1.001 (± 0.004)
1.30	1.293 (± 0.007)

* Error estimate is ± 1 standard deviation of the mean)

Some of the organic liquids drained differently than did water (due to density and viscosity differences), so the actual amount of solvent dispensed is recorded both as mass and as estimated volume.

Surrogate waste loading

Surrogate waste loading on N965 sorbent is estimated as the percentage of solvent as a fraction of the total (solvent plus N965), by weight and by estimated volume.

Prescribed benchmark waste loading ("100%" of vendor-recommended loading) is 8 parts Nochar 965 to 1 part waste liquid, by volume (or ~ 11 Vol%).[3] For a "typical" hydrocarbon oil, with density ~ 0.8 g/cm^3, this would correspond to a benchmark mass

[3] As cited in EnergX Scope of Work, Blanket Order release #001, provided to MCLinc, April 2008.

loading ~ 22 Wt%. In contrast, Ryz et al. (2002) evaluated similar Nochar elastomer products, and report an "optimum" loading for most of the waste types tested as ~ 4:1 (oil to polymer), by mass (or ~ 80 Wt%). Langton (2002) evaluated Nochar products at 50% and 66% waste loading, by weight. Bostick (2008) evaluated Nochar N965 vs. mineral oil (density ~ 0.906 g/cm^3, and found no evidence of free liquid at loadings up to ~ 50 Wt%, after material had "cured" for > 1-d.

Organic liquid was loaded on ~ 8-mL (2.88-g) aliquots of Nochar at dosages of 0.7-mL (nominal "70%" of recommended value), 1.0-mL (nominal "100%" of recommended value), and 1.3-mL (nominal "130%" of recommended value).

Preparation of surrogate waste product specimens in Fluoropolymer/Silicone Septum vials

Specimens were prepared in sealable containers (VWR Trace Clean™ 40-mL clear borosilicate vials with 0.125-in fluoropolymer resin/silicone septa liners; Cat. No. 15900-022; meets or exceeds EPA Level 1 standards for volatiles). Solvent was first added to the tared container,[4] the container was then sealed and the net solvent mass was recorded. The container was then briefly opened to allow a pre-weighed aliquot of Nochar N965 to be added, with rapid physical stirring provided by use of a small stainless steel spatula.[5] As soon as the liquid and solid phases were apparently well-mixed, the vial was again capped and weighed. Transfer of the pre-weighed aliquot of N965 to the sample vial averaged (99.0 ± 0.5)%, by mass, with only a small residual clinging to the transfer vessel. The contents of the sealed container were then vigorously shaken or tumbled for additional several minutes, in an attempt to further ensure that test material was as evenly distributed on the substrate as possible. Loaded sorbent was allowed to "cure" by setting at ambient temperature for a minimum of 2-d before testing (to allow diffusion of sorbed solvent into the pores of the substrate).

All "cured" specimens appeared to have successfully controlled the free liquid attribute; however, the Nochar formed more or less cohesive "clumps" with solvents such as xylene and toluene (Fig. 1). Note that the nominal "100%" loading for xylene in Fig. 1 evidences a small amount of (apparently) unreacted sorbent below the clumped solvent-laden material. The noncompacted bulk volume for liquids absorbed on solids for all solvent series, at ~ 100% of recommended loading, generally fell within the range ~ 125% to ~ 175% of the sum of the nominal volume of reagents added, representing some bulk phase volumetric expansion ("fluffing") due to phase mixing efforts. Bickford et al. (2006) reported a volumetric expansion of ~ 70% for PUREX simulant when mixed with Nochar products in sample tests with 22-L of liquid; they state that "extra volume is necessary in Nochar sample containers if the samples are mixed and stored in the same container because of the vigorous mixing needed to obtain a well mixed surrogate waste form."

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[4] Joyce et al. (2004) reported that "best" results were obtained by the addition of sorbent to the liquid waste.
[5] Langton et al. (2001) observed that, with use of the similar product Nochar A-610™, rapid and vigorous mixing is required, especially at higher waste loadings, to assure even distribution of waste within the waste form. Otherwise, rapid sorption results in regions with and without waste component, which may adversely affect waste form performance. Joyce et al. (2004) and Bickford et al. (2006) also emphasize the importance of effective mixing, which is a challenge to achieve in large-scale applications.

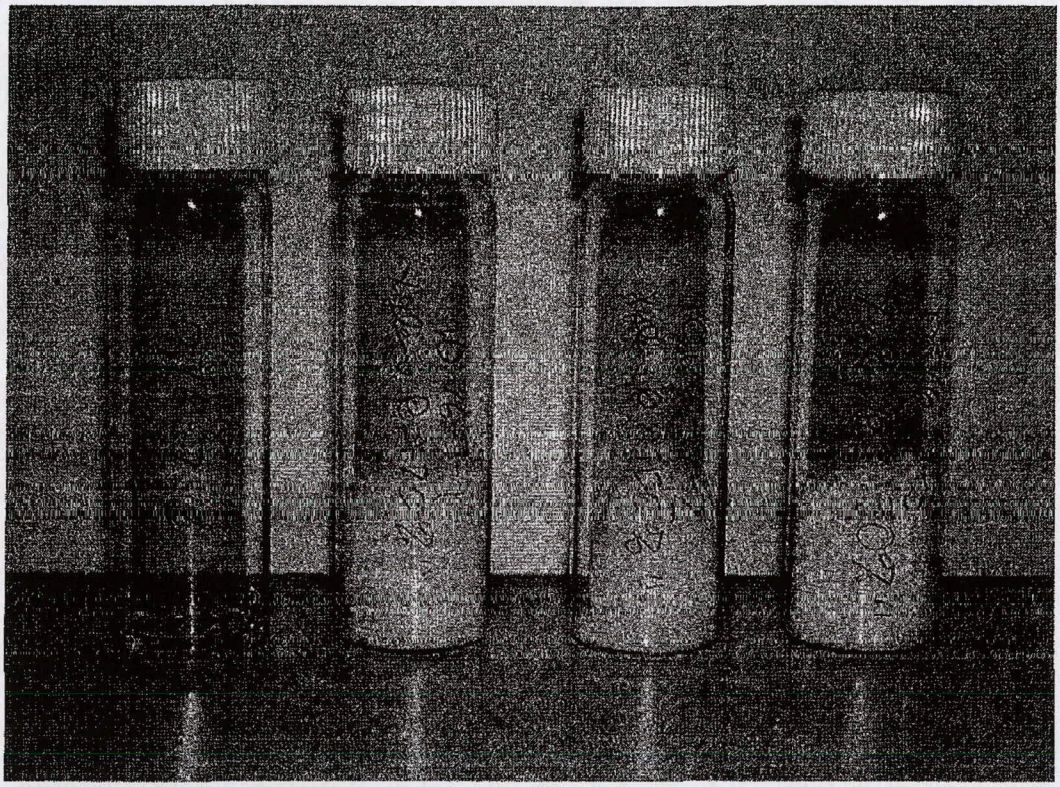

Figure 1. Test Series 1076-7 (xylene): 1-mL of neat solvent is shown at left, and solvent at various surrogate waste loadings on Nochar N965 sorbent is shown in the other vials (i.e., 1-mL xylene on ~ 8-mL Nochar represents "100%" of recommended loading).

Estimate of Volatile Organic Component Retention

As indicated in Table 4 (data compiled from information contained in representative solvent Material Safety Data Sheets), the volatility (high vapor pressure) attribute of the solvent controls many of the regulatory and the occupation safety aspects of the material (such as flammability, potential explosivity, personnel exposure, etc.).

In this initial qualification screening, sample in 40-mL volatile organic analysis (VOA) vial with septum seal cap is equilibrated in a water bath maintained at 40° C (104° F). The selected temperature is slightly elevated over ambient, so as to represent an elevated temperature that the surrogate waste form could easily experience during material storage or transport. The concern is that unacceptable concentration of hazardous material could accumulate in the headspace for containerized treated waste.

A small sample (10-μL) of headspace gas in the thermally-equilibrated vial is sampled with a gas syringe and directly injected into a gas chromatographic (GC) system (HP5890 chromatograph with flame ionization detection). The GC injector temperature is 210 C,

and the flame detector temperature is 310° C. The separation column is Retek RTX502.2 (60-m x 0.53-mm I.D., with 3-μm stationary phase coating). The thermal elution program is set at an initial temperature of 40° C (held for 4-min), then the temperature is ramped at 15° C per minute to 150° C. The precision of the direct injection analytical procedure at the very high analyte concentrations found in the vapor headspace was rather inconsistent, with variance on the order of ± 50% at the high concentration range. This likely indicates that the equilibrium vapor concentration in the headspace (even with only 10-μL sampled from a 40-mL vial) is beyond the linear response range of the FID detector. However, this method (even if regarded as semi-quantitative) clearly demonstrates very high solvent vapor pressure over the surrogate waste form solid phase.

The GC response for the headspace vapor composition for solvent material on sorbent is compared to that of an aliquot of the neat solvent (no sorbent added), to determine whether any significant selective material retention has occurred (as evidenced by a substantial reduction in the concentration of volatile component in the container headspace, relative to that determined for the neat solvent). EPA Land Disposal Restriction (LDR)[6] requires that hazardous wastes undergo fundamental physical or chemical changes so that they pose less of a threat to groundwater. A substantial reduction in the environmental availability of the hazardous VOC, or a reduction in the attributes that cause the material to have toxicity characteristic, is required to satisfy U.S. EPA expectations that a hazardous constituent has indeed been stabilized vs. possible impermissible dilution by the selected treatment. [7]

The analytical approach selected (direct headspace analysis) is analogous to the determination of trace VOC in soil matrix by purge-and-trap techniques, such as EPA SW-846 Method 5035 for volatile organics. Since the hazardous constituent source terms in this series of tests do not represent trace levels, it was not deemed necessary to use the purge and trap method in order to concentrate the total constituent before analysis.

As an example, the LDR treatment standard criterion for toluene (nonwastewater) is 10 mg/kg, whereas the benchmark loading on Nochar (11 % solvent, by volume) represents ~ 236,000 mg/kg of this contaminant. At 104° F, the vapor pressure of neat toluene (vapor over free liquid) is ~ 59 torr (or ~ 7 %, by volume, in the headspace of a closed system, such as in the septa vial or a sealed waste container). Such a high concentration in the vapor phase would saturate detector response in the purge and trap analytical technique, if it was used to estimate the total constituent analysis.

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[6] 40 CFR § 268.40

[7] Draft Interpretative Memorandum on Stabilization of Organic-Bearing Hazardous Wastes to Comply with RCRA Land Disposal Restrictions
U.S.EPA (Sep-2001) http://www.epa.gov/epaoswer/hazwaste/ldr/version7.pdf

Analysis as "Total Constituent"

After the estimation of volatile component in the sample vial headspace (described above), duplicate aliquots of the solvent-laden solid sorbent were extracted with organic lixivant (see Table 2). In the extraction step, 20-mL of lixivant is added to ~ 0.2-g of solid phase. The phases are manually shaken for ~ 30-sec, and then allowed to set quiescently for at least 2-h before sampling the solution phase for analysis. Analysis was by GC-FID, analogous to the procedure used for headspace analysis except that 1-μL of solution phase is injected. Percent recovery is based on the computed value for solvent extracted referenced to the as-prepared nominal mass-based surrogate waste form loading.

As an example, the as-prepared mass loading of toluene for specimen 1076-8-2 (sorbent at "100%" of recommended loading) was 23.66-Wt%.[8] The median computed value for toluene as extracted from small aliquots of the solidified specimen with use of methanol was 26.9-Wt% (based on solidified sample mass), for an apparent recovery of 114%.

[8] See data, Table 8.

Table 4. Select Properties of Solvents Evaluated in this Study

Solvent	CAS No.	Density (g/cc at 20°C)	Water Solubility (wt%)	Nonwastewater LDR Criterion (mg/kg)[9]	Boiling Point	Flash Point	Explosivity Limits (in air, by volume)	OSHA PEL (TWA)
Carbon Tetrachloride (EPA HW D019)	56-23-5	1.59	"insoluble"	6.0	76° C	NA	NA	10 ppm
Methanol	67-56-1	0.79	miscible	(5.6 mg/L TCLP)	64.5° C	12°C (54°F) CC	LEL: 6%; UEL: 36%	200 ppm
Methyl Ethyl Ketone (2-butanone) (EPA HW D035)	78-93-3	0.80	29%	36	80° C	-9°C (16°F) CC	LEL: 1.4%; UEL: 11.4%	200 ppm
Trichloroethylene (EPA HW D040)	79-01-6	1.46	"insoluble"	6.0	87° C	NA	LEL: 8%; UEL: 12.5%	200 ppm
Toluene	108-88-3	0.87	0.05% @ 20 C	10	111° C	7°C (45°F) CC	LEL: 1.1%; UEL: 7.1%	200 ppm
Xylenes (mixed isomers)	1330-20-7	0.87	"insoluble"	30	137-140° C	29°C (84°F) CC	LEL: 1.0%; UEL: 7.0%	100 ppm

NA: Not applicable
PEL: Occupational (OSHA) Permissible Exposure Limit (in air)
TWA: Time-weighted average (8-h occupational exposure limit)
Ppm: parts per million, by volume
CC: closed cup flammability test procedure
LEL: lower explosivity limit
UEL: upper explosivity limit
(Data compiled from solvent Material Safety Data Sheets)

[9] http://www.epa.gov/epaoswer/hazwaste/ldr/268_40.pdf

Results

Series 1076-5: Trichloroethylene (TCE), FW 131.39 (EPA HW D040)

The reagent evaluated is Mallinckrodt PN 8600, lot 8600T47582. The estimated density of the material used (as dispensed with use of a calibrated pipette) is ~ 1.447 g/cm^3. Mass and volumetric parameters for the specimens tested are presented in Table 5. The table also summarizes the relative GC-FID headspace concentration at 40° C (relative to neat solvent as 100%). Data from Table 2 indicates that ~ 85% of TCE in Sample 1076-5-2 is extractable by methanol.

Table 5. Test Specimens: Trichloroethylene on NoChar N965

Sample ID	N965		TCE		Surrogate Waste Loading		Relative Vapor Pressure at 40°C
	g	mL (est.)	g	mL	wt%	vol%	
1076-5-0	NA	NA	1.4000	1.001	≡100%	≡100%	≡100%
1076-5-1	2.8449	7.90	1.0109	0.704	26.22%	8.18%	68%
1076-5-2	2.8697	7.97	1.4491	1.001	33.55%	11.16%	80%
1076-5-3	2.8404	7.89	1.8799	1.293	39.83%	14.08%	~ 100%

The temperature dependence of the vapor pressure of neat TCE (data from Dean, 1992) is presented in Fig. 2 in Clausius-Clapeyon format. The estimated vapor pressure of TCE at the 40° C (313.15 K) media equilibration temperature is estimated to be ~ 138 torr (~ 0.16 atm. in a closed system).

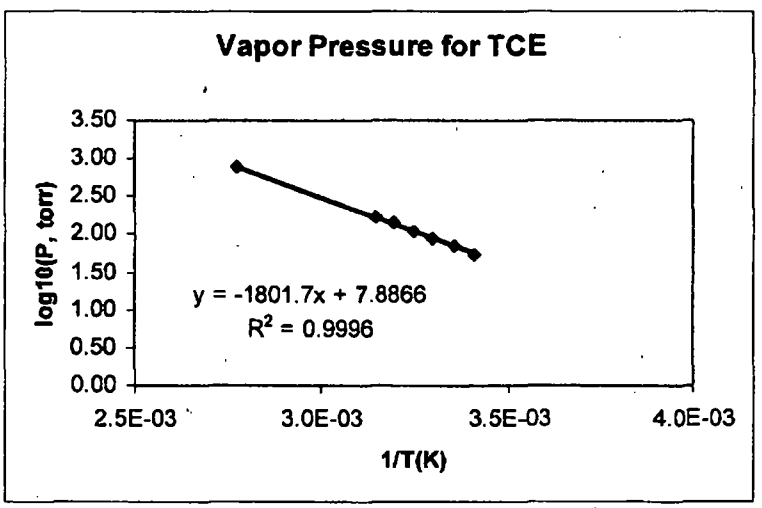

Figure 2. Temperature dependence of the vapor pressure of TCE.

Series 1076-6: Methyl Ethyl Ketone (2-Butanone), FW 72.11 (EPA HW D035)

The reagent evaluated is Fisher Scientific Product M-209, Lot # 851624. The estimated density of the material used (as dispensed with use of a calibrated pipette) is ~ 0.823 g/cm^3. Mass and volumetric parameters for the specimens tested are presented in Table 6. The table also summarizes the relative GC-FID headspace concentration at 40° C (relative to neat solvent as 100%). Data from Table 2 indicates that ~ 93% of MEK in Sample 1076-6-2 is extractable by methanol.

Table 6. Preparation of Test Specimens: Methyl Ethyl Ketone on NoChar N965

Sample ID	N965		MEK		Surrogate Waste Loading		Relative Vapor Pressure at 40° C
	g	mL	g		W%	V%	
1076-6-0	NA	NA	0.8345	≡100%	100%	100%	≡100%
1076-6-1	2.8597	7.94	0.5831	0.704	16.94%	8.15%	92%
1076-6-2	2.8465	7.91	0.8397	1.001	22.78%	11.24%	~ 100%
1076-6-3	2.8415	7.89	1.0923	1.293	27.77%	14.08%	88%

The temperature dependence of the vapor pressure of neat MEK (data from Dean, 1992) is presented in Fig. 3 in Clausius-Clapeyon format. The estimated vapor pressure of MEK at the 40° C (313.15 K) media equilibration temperature is estimated to be ~ 177 torr (~ 0.20 atm. in a closed system). At the flash point of MEK (11° C), the estimated vapor pressure is ~ 45 torr.

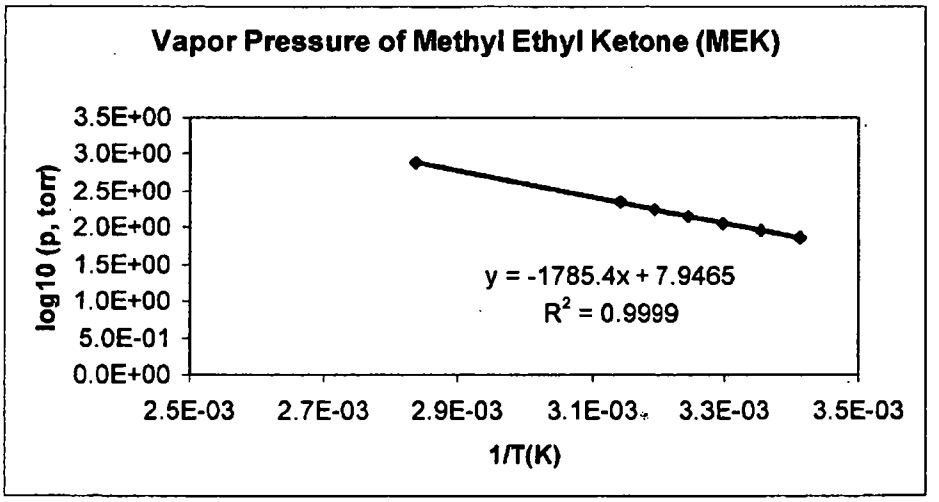

Figure 3. Temperature dependence of the vapor pressure of MEK.

Series 1076-7: Xylenes, FW 106.17

The product evaluated was from Baker & Adamson, Code 2415, ACS Reagent Grade. Boiling point range 137-140 C. The estimated density of the material used (as dispensed with use of a calibrated pipette) is ~ 0.878 g/cm^3. Mass and volumetric parameters for the specimens tested are presented in Table 7. The table also summarizes the relative GC-FID headspace concentration at 40° C (relative to neat solvent as 100%). Data from Table 2 indicates that ~ 93% of xylene in Sample 1076-7-2 is extractable by methanol.

Table 7. Preparation of Test Specimens: Xylene on NoChar N965

Sample ID	N965		Xylene		Surrogate Waste Loading		Relative Vapor Pressure at 40 C
	g	mL	g	mL	Wt%	Vol%	
1076-7-0			0.8558	1.001	≡100%	≡100%	≡100%
1076-7-1	2.8750	7.99	0.6223	0.704	17.79%	8.11%	97%
1076-7-2	2.8763	7.99	0.8950	1.001	23.73%	11.13%	>99%
1076-7-3	2.8415	7.89	1.1399	1.293	28.63%	14.08%	>99%

Images of the small-scale surrogate waste forms are illustrated in Fig. 1.

The temperature dependence of the vapor pressure of neat xylene (data from Dean, 1992) is presented in Fig. 4 in Clausius-Clapeyon format. The estimated vapor pressure of MEK at the 40° C (313.15 K) media equilibration temperature is estimated to be ~ 59 torr (~ 0.07 atm. in a closed system). At the flash point of xylene (23° C), the estimated vapor pressure is ~ 26 torr.

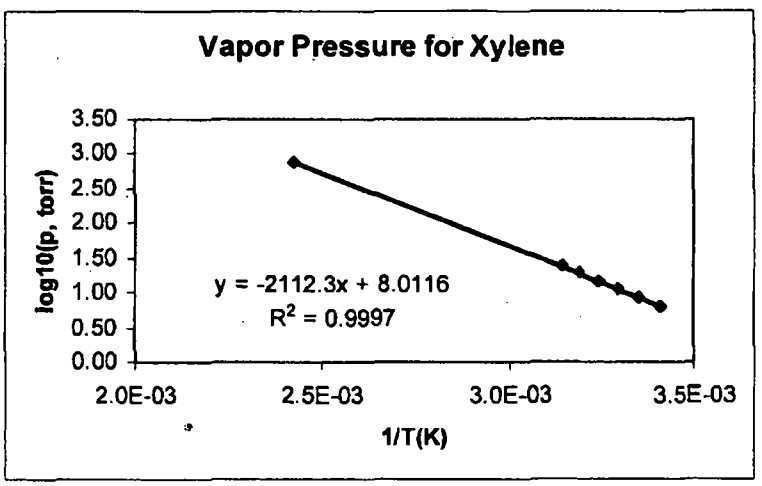

Figure 4. Temperature dependence of the vapor pressure of m-xylene.

Series 1076-8: Toluene, FW 92.14

The material tested was EM Science PN TX0735-5. The estimated density of the material used (as dispensed with use of a calibrated pipette) is ~ 0.881 g/cm^3. Mass and volumetric parameters for the specimens tested are presented in Table 8. The table also summarizes the relative GC-FID headspace concentration at 40° C (relative to neat solvent as 100%). Data from Table 2 indicates that ~ 114% of toluene in Sample 1076-8-2 is extractable by methanol.

Table 8. Test Specimens: Toluene on NoChar N965

Sample ID	N965		Toluene		Surrogate Wash Loading		Relative Vapor Pressure at 40 C
	g	mL	g	mL	Wt%	Vol%	
1076-8-0	NA	NA	0.8706	1.001	≡100%	≡100%	≡100%
1076-8-1	2.8706	7.97	0.6138	0.704	17.62%	8.12%	9%
1076-8-2	2.8699	7.97	0.8895	1.001	23.66%	11.16%	8%
1076-8-3	2.8789	8.00	1.1588	1.293	28.70%	13.92%	82%

The temperature dependence of the vapor pressure of neat toluene (data from Dean, 1992) is presented in Fig. 5 in Clausius-Clapeyon format. The estimated vapor pressure of toluene at the 40° C (313.15 K) media equilibration temperature is estimated to be ~ 59 torr (~ 0.07 atm. in a closed system). At the flash point of toluene (4° C), the estimated vapor pressure is ~ 8.6 torr.

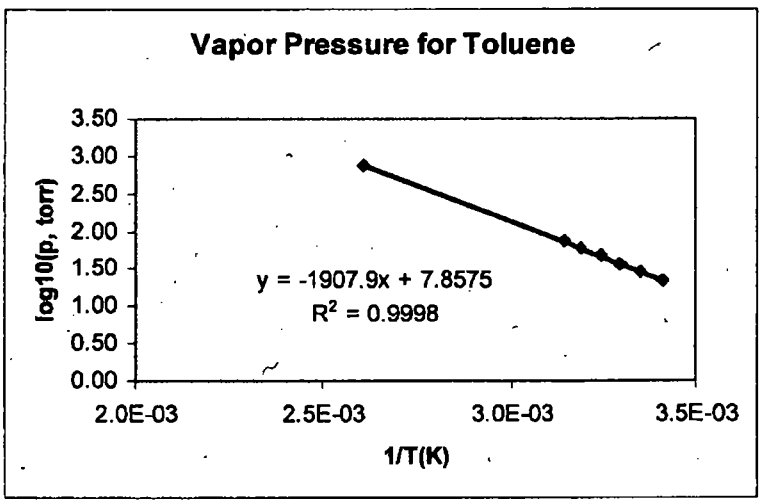

Figure 5. Temperature dependence of the vapor pressure of toluene.

Series 1076-9: Methyl Alcohol (Methanol), FW 32.04

The material tested was Fisher PN A453-500. The estimated density of the material used (as dispensed with use of a calibrated pipette) is ~ 0.792 g/cm^3. Mass and volumetric parameters for the specimens tested are presented in Table 9. The table also summarizes the relative GC-FID headspace concentration at 40° C (relative to neat solvent as 100%). Data from Table 2 indicates that ~ 106% of methanol in Sample 1076-9-2 is extractable by isopropanol solvent.

Table 9. Test Specimens: Methanol on NoChar N965

Sample ID	N965		Methanol		Surrogate Waste Loading		Relative Vapor Pressure at 40 C
	g	mL	g	mL	Wt%	Vol%	
1076-9-0	NA	NA	0.7859	1.001	≡100%	≡100%	≡100%
1076-9-1	2.8835	8.01	0.5632	0.704	16.44%	8.14%	4.5%
1076-9-2	2.8837	8.01	0.7829	1.001	21.59%	11.25%	22%
1076-9-3	2.8823	8.01	1.0355	1.293	26.58%	14.00%	80%

The temperature dependence of the vapor pressure of neat methanol (data from Dean, 1992) is presented in Fig. 6 in Clausius-Clapeyon format. The estimated vapor pressure of methanol at the 40° C (313.15 K) media equilibration temperature is estimated to be ~ 263 torr (~ 0.30 atm. in closed system). At the flash point of methanol (12° C), the estimated vapor pressure is ~ 61 torr.

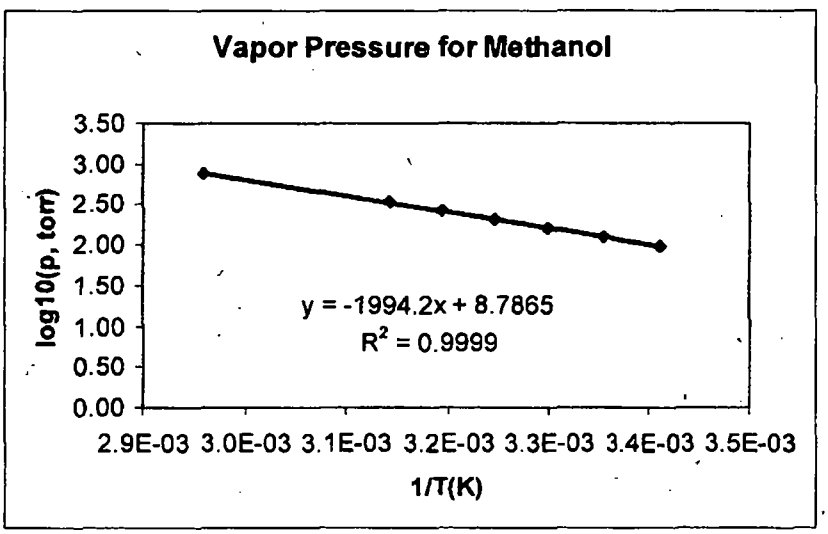

Figure 6. Temperature dependence of the vapor pressure of methanol.

Series 1076-11: Carbon Tetrachloride, FW 153.82 (EPA HW D019)

The material tested was Sigma-Aldrich PN 289116-100mL, Batch 00451PH. The estimated density of the material used (as dispensed with use of a calibrated pipette) is ~ 1.58 g/cm^3. Mass and volumetric parameters for the specimens tested are presented in Table 10. The table also summarizes the relative GC-FID headspace concentration at 40° C (relative to neat solvent as 100%). Data from Table 2 indicates that ~ 121% of carbon tetrachloride in Sample 1076-11-2 is extractable by methanol.

Table 10. Preparation of Test Specimens: Carbon Tetrachloride on NoChar N965

Sample ID	N965		Carbon Tetrachloride		Surrogate Waste Loading		Relative Vapor Pressure at 40 °C
	g	mL	g	mL	Wt%	Vol%	
1076-11-0	NA	NA	1.5721	1.001	≡100%	≡100%	≡100%
1076-11-1	2.8454	7.90	1.1104	0.704	28.07%	8.18%	66%
1076-11-2	2.8389	7.89	1.5997	1.001	36.04%	11.26%	65%
1076-11-3	2.8439	7.90	2.0442	1.293	41.82%	14.07%	69%

The temperature dependence of the vapor pressure of neat CCl_4 (data from Dean, 1992) is presented in Fig. 7 in Clausius-Clapeyon format. The estimated vapor pressure of methanol at the 40° C (313.15 K) media equilibration temperature is estimated to be ~ 214 torr (~ 0.25 atm. in a closed system).

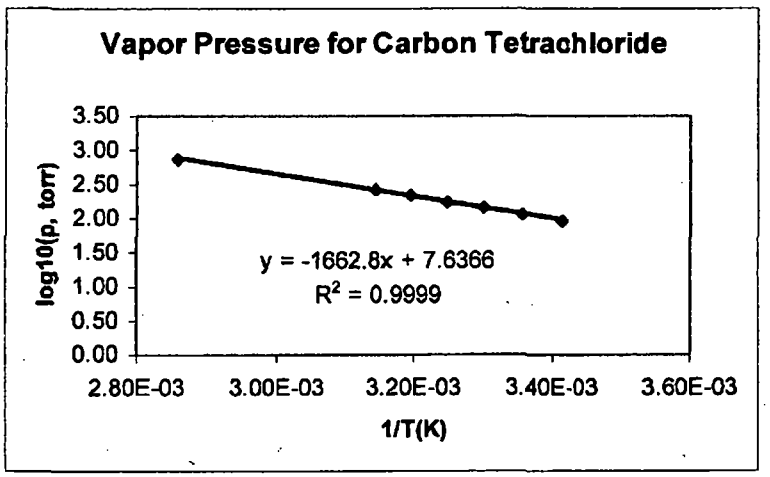

Figure 7. Temperature dependence of the vapor pressure of carbon tetrachloride.

Discussion

As noted by Conner (1995), organic stabilization or immobilization has been shown in numerous studies to be capable of considerably reducing the mobility of organic constituents. Previously, the projected effectiveness for the use of additives such as activated carbon and organically modified clays in stabilization systems was based on the TCLP test method. In effect, the TCLP is a measure of the partition coefficient of the waste between aqueous extractant and the solid surrogate waste form phases, and many hydrophobic solvents performed relatively well by TCLP when the solid phase was itself relatively hydrophobic.

However, with the advent of the Total Constituent Analysis (TCA) test method, many such additives are often not very effective by this criterion. For example, activated carbon (a surface-active medium) appeared successful for treatment of VOCs as assessed by the TCLP but appeared relatively ineffective by TCA, whereas microporous sorbent media, such as rubber or elastomer particulate, or organoclays, can often achieve a good measure of immobilization as determined by the TCA. TCA is generally done by means of extraction with aggressive organic solvents that are presumed to dissolve out all of the organic contaminant from the raw solid-phase matrix.

In this study, we used the vapor pressure of select VOCs, in addition to TCA, as indexes as to whether significant modification of hazardous properties had been achieved. Immobilization is generally appropriate only for material containing inorganics, semi-volatile and/or non-volatile organics. The EPA in guidance documents considers a significant reduction (e.g., by 90+ %) in the concentration of constituent of interest, assessed by TCA, to be a figure of merit for successful waste stabilization. Percentage reduction in leachability or volatility (vapor pressure) is perhaps more useful and less confusing when comparing one additive versus another, with reference to the untreated waste. The soil standards mandate reduction of hazardous constituents by 90 percent, capped at 10 times the UTS (40 CFR §268.49). This means that if a 90 percent reduction of a particular constituent would bring the constituent concentration to below 10 times the UTS level, treatment need only achieve the 10 times UTS level.

The data summary presented in Table 1 and the discussion presented in the text suggest that the selected hazardous VOCs loaded on to Nochar N965 at the recommended dosage ("100%" of recommended loading) generally exhibit vapor pressure values that exceed 10% of the corresponding value for the neat (untreated liquid) solvent, and that the vapor pressure over the surrogate waste form will generally be greater than that required to ignite the surrogatewaste.

Appendix I presents an annotated bibliography for some other published investigations assessing the ability of Nochar polymers to contain organic liquids. Most of these investigations only evaluated the ability of the sorbent to control free liquid; they generally did not evaluate other RCRA criteria such as control of flash point or performance vs. TCLP extraction. An exception is the report by Langton (2002), who did perform TCLP for authentic PUREX solidified by select sorbents (including Nochar

products); the waste forms did pass the TCLP but no assessment was made for the ability of the waste form to affect solvent volatility, flash point or the performance vs. the more rigorous Total Constituent Analysis test (generally performed by extraction with a strong organic lixivant). Joyce et al. (2004) did evaluate solidified simulated PUREX against the U.S. Department of Transportation (DOT) ignitability criterion (based upon flame propagation rate), but did not evaluate the material against the EPA ignitability criterion (based upon material flash point, which is related to vapor phase concentration). Moreover, Joyce et al. (2004) did note that some Nochar solidified samples tested did ignite during the DOT testing.

Our headspace analysis was performed at 104° F, at which temperature a significant proportion of volatile solvent from the surrogate waste form partitions to the headspace. Joyce et al. (2004) report that during hot weather [e.g., $\geq$ 100° F], some Nochar samples appeared to lose stability and certain areas of the sample surrogate waste forms became a viscous syrup. Such phenomena may have affected the release of solvent to the headspace in our testing.

Mellinger et al. (2004) has recommended use of Nochar Acid Bond,[10] a polyacrylic water sorbent, for solidification of wet CH-TRU sand filter sludge for disposal at WIPP. The authors note that TRU wastes to be transported in the TRUPACT-II are restricted so that no flammable mixtures can occur in any layer of confinement during shipping. Specifically, flammable VOCs are restricted to < 500 ppm in the payload container headspace.

As stated previously, Total Constituent Analysis (TCA) is generally done by means of extraction with aggressive organic solvents that are presumed to dissolve out all of the organic contaminant from the raw solid-phase matrix. Results summarized in Table 2 indicate that the volatile solvents loaded on Nochar are readily extracted by alcohol lixivants, with apparent material balance recoveries of ~ 75 – 120% of the amounts added to the original surrogate waste form. These computed recovery values assume that the VOC is evenly distributed on the surrogate waste form, which may not necessarily be the case for the rapidly-sorbed liquids, depending on the effective mixing efficiency (Langton et al., 2001).

EPA Land Disposal Restriction (LDR) requires that hazardous wastes undergo fundamental physical or chemical changes so that they pose less of a threat to groundwater. Collectively, the headspace analysis and TCA determination indicate that hazardous volatile organic constituents solidified on Nochar N965 elastomer blend retain the potential to volatilize into the atmosphere or leach into the environment.

The Nochar product is found to be satisfactory for its original intended purpose, to solidify organic liquid for long-term storage or for transport to a licensed facility that can subsequently destroy the hazardous organic constituent by incineration.

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[10] According to vendor-supplied info, the N965 product is ~ 60% Acid Bond® (a polyacrylic sorbent for water) and ~ 40% Petrobond® (a butadiene-acrylate polymeric sorbent for organic liquids).

References

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Joyce, H.O.; Bickford, J.L.; Whitworth, C.G.; Battleson, D.M.; LeFever, J.; Holmes-Burns, H. (2004), "Sorbent Testing for Solidification of Organic Plutonium/Uranium Extraction Waste," WM-4156, WM'04 Conference.

Langton, C.A.; Iversen, G.M.; Fondeur, F.; Creech, G.D.; Oji, L.N.; Cozzi, A.D. (2001), "PUREX Waste Solidification (U)," Savannah River Site report WSRC-TR-00526, Revision 1.

Langton, C.A. (2002), "Purex Organic Waste Solidification," Report WSRC-TR-2002-00570

Mellinger, G.B.; Delegard, C.H.; Schmidt, A.J.; Sevigny, G.J. (2004), "Evaluation and Recommendation of Surrogate waste form and Packaging for Disposition of the K East Basin North Loadout Pit Sludge," Report PNNL-14741

MCL-7756, Appendix V, "Operational Aid for Balance Checks."

Ryz, M.A.; Brunkow, W.G.; Govers, R.; Campbell, D.; Krause, D. (2002), "Demonstration Solidification Tests Conducted on Radioactively Contaminated Organic Liquids at the AECL Whiteshell Laboratories," WM'02 Conference, Tucson, AZ.

APPENDIX I.

NOCHAR – Annotated Bibliography

A number of papers have been published comparing Nochar to clay-based sorbents, etc., for solidification of organic or mixed-phase liquids (e.g., solidification of tritiated waste oils, surrogate spent PUREX waste, etc.). Most of the observations were semi-quantitative evaluations of product consistency and liquid control; **NOTE:** most of these comparisons only evaluated the ability of the sorbents to control free liquid and the assessment of volumetric increases after treatment; they generally did not evaluate other RCRA criteria such as control of flash point or performance vs. TCLP extraction. One exception is the report by Langton (2002), who did perform TCLP for authentic PUREX solidified by select sorbents (including Nochar products); the surrogate waste forms did pass the TCLP but no assessment was made for the ability of the surrogate waste form to affect solvent volatility, flash point or the performance vs. the more rigorous Total Constituent Analysis test (extraction with a strong organic lixivant). This sampling of report summaries are arranged in chronological order.

Nochar Petrobond® Absorbent Polymer Tritiated Oil Solidification. Innovative Technology Summary Report, Report DOE/EM-0598 (2001) (http://www.osti.gov/bridge/product.biblio.jsp?osti_id=793546)
NOCHAR is a high technology polymer solidifying agent that can provide a simple and effective disposal method for tritiated oil. The NOCHAR agent will absorb oil with no mixing or required mixing equipment, and with a combination or 'formula' of high tech polymers can be specifically designed to address the characteristics of waste oil as it exists at a given site. The NOCHAR Petro Bond product can be effectively used for free liquid control in storage, transport, and disposal of radioactive and RCRA defined waste oils. Petro Bond Polymer Crystals are non-toxic, non-biodegradable and incinerable to less than 0.02% ash with an absorbent capacity of up to 15:1 (oil to solidification agent ratio by weight).

Blauvelt, D.; Krause, D.; Shoemaker, H.; Johnson, J. (2002), "The Mound Plant Tritium D&D Large Scale Demonstration and Deployment Project. Demonstrating and Deploying Technologies to Enhance the Exit Program," WM '01 Conference, Tucson, AZ.
http://www.wmsym.org/Abstracts/2001/10B/10B-29.pdf
This paper will examine some of the more than 70 technologies that the Mound Tritium Decommissioning and Decontamination (D&D) LSDDP has considered for demonstration. In August of 1999, the Mound LSDDP conducted a demonstration using Nochar Petro Bond polymer oil absorbent. The intent of the demonstration was to compare the Nochar Petro Bond polymer agent against the baseline options for disposal which are incineration, long term storage for decay and use of existing organic solidification agents. The innovative technology that has been demonstrated in the LSDDP at Mound is a high technology polymer solidifying agent offered by the Nochar Corporation of Indianapolis, Indiana. The Nochar agent will absorb oil with no mixing or required mixing equipment, and with a combination or "formula" of high tech polymers can be specifically designed to address the characteristics of waste oil as it exists on a

given site. The Nochar Petro Bond product can be effectively used for free liquid control in storage, transport, and disposal of radioactive and RCRA defined waste oils. Petro Bond polymer crystals have been found to be non-toxic, non-biodegradable and incinerable to less than 0.02%ash with an absorbent capacity of up to 15:1 (oil to solidification agent ratio by weight).The Nochar agent formed an acceptable solidified mass with waste oils. The Toxicity Characteristics Leaching Procedure (TCLP) values were found to be several magnitudes below burial site limits on specific metals. The product proved very easy to use and required no agitation or mixing, thus facilitating safety & ALARA.

Langton, C.A.; Iversen, G.M.; Fondeur, F.; Creech, G.D.; Oji, L.N.; Cozzi, A.D. (2001), "PUREX Waste Solidification (U)," Savannah River Site report WSRC-TR-00526, Revision 1 (http://sti.srs.gov/fulltext/tr2001526r1/tr2001526r1.pdf), 100pp
Six sorbents (four organic polymers and two clay products) were comprehensively tested for solidification of simulated and authentic PUREX organic waste. The Nochar products evaluated were Nochar A-610™ (bulk density ~ 0.24 g/cc), and Nochar A-650™ (bulk density ~ 0.38 g/cc); the products appear to be similar chemically, but the A-650 contains calcium carbonate filler. The A-610 product sorbs organic waste very rapidly, requiring vigorous mixing to achieve an even distribution of waste within the surrogate waste form. The butadiene (rubber) component of the A-650 product is degraded by components in the PUREX mixture, and it was thus eliminated from further consideration.

Brunkow, W.G.; Campbell, D.; Rivera, M. (2002), "Solidification tests conducted on transuranic mixed oil waste (TRUM) at the Rocky flats Environmental Technology Site (RFETS)," WM '02 Conference, Tucson, AZ
(www.wmsym.org/Abstracts/2002/Proceedings/6a/443.pdf)
The authors evaluated Nochar Petrobond® for solidification of TRUM, for acceptability by the Waste Isolation Pilot plant (WIPP). The Nochar product bonds organic liquid into a soft, sponge rubber-like material. It has an absorbent capacity of up to 15:1 (ratio of oil to agent by weight, using PertoBond®) and up to 85:1 (ratio of water to agent using AcidBond®).[11] TCLP analysis of Nochar solidified oil "shows effective results in almost every application to date." (Samples were submitted for TCLP, and "easily met (LDRs) for sequestering heavy metals as mandated by burial sites such as Nevada Test Site (NTS)"). Three TRUM waste streams were identified for further testing: (1) methanol-based waste; (2) mixed organic waste; and (3) contaminated used pump oil. Cold tests with Petrobond and diesel fuel showed reduction in vapor as evidenced by a reduction in the LEL.

Brunkow, W.G.; Govers, R.; Pietsch, C.; Kelley, D.; Krause, D. (2002), "The Nochar® Technology Deployment Program, Providing a Proven Method Worldwide for Waste Solidification and Stabilization," WM '02 Conference, Tucson, AZ
http://www.wmsym.org/Abstracts/2002/Proceedings/11/444.pdf

[11] Acid Bond® is a polyacrylic sorbent for water; Petrobond® is a butadiene-acrylate polymeric sorbent for organic liquids.

In August of 1999, the U.S. Department of Energy Miamisburg Environmental Management Project (DOE-MEMP) Office and BWXT of Ohio, Inc. (BWXTO) conducted an EM-50 demonstration utilizing PetroBond® polymer oil absorbent. The intent of the demonstration was to compare this innovative technology with the baseline options for disposal, which include incineration, long term storage for decay, and existing organic agents. High technology polymers are an answer to present day needs that will allow immediate burial site disposal, above ground depository use for "safe store" applications, and stabilization and immobilization plans for safe transport or incineration at a later date. These tests resulted in the successful stabilization and shipment of tritiated mixed waste oil (from the DOE Mound Site) with approval given by (NTS) as an authorized solidification product based on highly successful TLCP test results.

Langton, C.A. (2002), "Purex Organic Waste Solidification," Report WSRC-TR-2002-00570 (http://sti.srs.gov/fulltext/tr2002570/tr2002570.pdf)
The objectives of this study were to evaluate solidification/stabilization as an alternative treatment technology for the organic phase of the SRS spent PUREX waste using simulated waste, and to evaluate surrogate waste forms prepared with actual spent organic PUREX waste for regulatory classification. Six sorbents (four organic polymers and two clay products) were tested for solidification of simulated and authentic PUREX organic waste.

Notes:
Spent authentic PUREX waste consists of two immiscible phases, a lower density organic liquid, and an aqueous phase.
The proportioning of waste to sorbent was conducted on a weight rather than volumetric basis because weights were more accurate and unambiguous for laboratory work. This is especially the case for compressible elastomer sorbent materials, where estimation of volumes is dependent upon packing. Sorbents were evaluated at 50% and 66% waste loading, by weight. Sorbent was added to waste, with mixing.
The materials tested were Imbiber Beads™, Imbiber beads NG™, Nochar A-610™ (bulk density ~ 0.24 g/cc), and Nochar A650 (bulk density ~ 0.38 g/cc), and Petroset II. Nochar A610 had a rapid absorbency and requires rapid mixing to distribute the organic waste evenly throughout the surrogate waste form. The Nochar A650 sorbent was subsequently eliminated from consideration because it reacts with the organic components in the PUREX and undergoes physical and chemical changes upon aging (i.e., the polymer is plasticized by the PUREX waste, probably due to the tributylphosphate component).
Given that the authentic organic PUREX waste is classified as characteristically hazardous (contains traces of toxic metals, plus benzene and TCE), in order to exit RCRA regulation the potential for additional Underlying Hazardous Constituents (UHC) must also be evaluated. All solidified authentic PUREX samples (at 66 wt% loading) passed the TCLP criteria, and can be considered for disposal as low-level radioactive waste. [Total Constituent Analysis for organics was not evaluated in this report as the LDR criterion, just the performance vs. TCLP. With the TCLP, one is effectively measuring a partition of contaminant between the aqueous phase and the hydrophobic elastomer].

Ryz, M.A.; Brunkow, W.G.; Govers, R.; Campbell, D.; Krause, D. (2002),

"Demonstration Solidification Tests Conducted on Radioactively Contaminated Organic Liquids at the AECL Whiteshell Laboratories," WM'02 Conference, Tucson, AZ. (http://www.wmsym.org/Abstracts/2002/Proceedings/11/44.pdf)

ABSTRACT

The AECL, Whiteshell Laboratory (WL) near Pinawa Manitoba, Canada, was established in the early 1960's to carry out AECL research and development activities for higher temperature versions of the CANDU® reactor. The initial focus of the research program was the Whiteshell Reactor-1 (WR-1) Organic Cooled Reactor (OCR) that began operation in 1965. The OCR program was discontinued in the early 1970's in favor of the successful heavy-water-cooled CANDU system. WR-1 continued to operate until 1985 in support of AECL nuclear research programs.

A consequence of the Federal government's recent program review process was AECL's business decision to discontinue research programs and operations at the Whiteshell Laboratories and to consolidate its' activities at the Chalk River Laboratories. As a result, AECL received government concurrence in 1998 to proceed to plan actions to achieve closure of WL. The planning actions now in progress address the need to safely and effectively transition the WL site from an operational state, in support of AECL's business, to a shutdown and decommissioned state that meets the regulatory requirements for a licensed nuclear site. The decommissioning program that will be required at WL is unique within AECL and Canada since it will need to address the entire research site rather than individual facilities declared redundant.

Accordingly, the site nuclear facilities are being systematically placed in a safe shutdown state and planning for the decommissioning work to place the facilities in a secure monitoring and surveillance state is in progress. One aspect of the shutdown activities is to deal with the legacy of radioactively contaminated organic liquid wastes. Use of a polymer powder to solidify these organic wastes was identified as one possibility for improved interim storage of this material pending final disposition.

Notes:

Nochar PetroBond® was evaluated for the solidification of radioactively contaminated organic waste mixtures; these mixtures had activities above allowable limits for destruction by incineration. In similar evaluation in the U.S. for oily waste from the DOE Mound Site after solidification by Nochar, the final product received Nevada Test Site approval for land disposal.

The PetroBond® elastomer product is claimed to have an absorbent capacity of up to 15:1 (ratio of oil to agent, by weight) and up to 85:1 (ratio of water to agent) with minimal volume increase. It has been tested up to 40 MRad gamma with limited evidence of radiological degradation.

In the reported testing, three different Nochar polymers (A-610, A-660, and N-990) were used at surrogate waste loadings up to 10:1 (organic liquid to polymer, by weight); "optimum" loading for most of the waste types tested was ~ 4:1 (oil to polymer), by mass (80 wt% waste).

The authors added organic to the elastomer, with minimal stirring. After 24-h solidification "cure," the solid mass was tested for free liquid (paint filter test); only two of the specimens failed this criterion, and these specimens also contained water phase. Addition of conventional water sorbent solved this problem [but see Bickford et al., 2006].

Joyce, H.O.; Bickford, J.L.; Whitworth, C.G.; Battleson, D.M.; LeFever, J.; Holmes-Burns, H. (2004), "Sorbent Testing for Solidification of Organic Plutonium/Uranium Extraction Waste," WM-4156, WM'04 Conference.
http://www.wmsym.org/abstracts/2004/pdfs/4156.pdf

Operational criteria included: sorbent capacity; sorption rate; sorbent handling; and mixing requirements. Final surrogate wasteform evaluation properties included: leachability; ignitability; thermal stability; long-term stability; and volumetric expansion. Authentic PUREX waste contains n-parafins and tributyphosphate (TBP), in addition to aromatic hydrocarbons and amine compounds; simplified surrogate is a mixture of TBP (17.6-wt%) and kerosene (82.4-wt%). The Nochar product evaluated was A610 Petrobond. "Best" results for all sorbents were for addition of sorbent to the liquid waste. "Nochar when added to Purex [surrogate] with mixing resulted in a rubbery mixture. The unmixed Nochar samples had three distinct phases: (1) viscous liquid in the bottom of the bucket, (2) a rubbery mixture in the center, and (3) excess sorbent on top. During hot weather [100 °F], some Nochar samples appeared to lose stability and certain areas of the sample surrogate waste forms became a viscous syrup." The LRT (liquid release test) may not be the best test for determining the presence of free liquids for the polymer samples, which had very little structural strength." [Nochar failed the LRT]. Ignitability was assessed by DOT (not RCRA) requirements; by DOT, samples with burn rates < 2.2 mm/s are considered non-ignitable (SW-846 Method 1030 *Ignitability of Solids*). Stabilized wastes passed the DOT criterion (flame propagation rate), although some samples tested did ignite (kerosene has a flash point ~ 38-110 °C, depending upon grade). [DOT Ignitability Criterion and RCRA Ignitability Toxicity Criterion are not equivalent]. Rapid mixing is required to achieve a homogeneous product with use of Nochar.

Mellinger, G.B.; Delegard, C.H.; Schmidt, A.J.; Sevigny, G.J. (2004), "Evaluation and Recommendation of Surrogate waste form and Packaging for Disposition of the K East Basin North Loadout Pit Sludge," Report PNNL-14741
http://www.pnl.gov/main/publications/external/technical_reports/PNNL-14741.pdf

PNNL recommends use of Nochar Acid Bond, a polyacrylic water sorbent, for solidification of wet CH-TRU sand filter sludge for disposal at WIPP.
(Text, p. 2.5) TRU wastes to be transported in the TRUPACT-II are restricted so that no flammable mixtures can occur in any layer of confinement during shipping. Specifically, flammable VOCs are restricted to < 500 ppm in the payload container headspace. [The KE-NLOP waste has minimal VOCs]

Joyce, H.O.; Bickford, J.L.; Whitworth, C.G.; Battleson, D.M.; Holmes-Burns, H. (2005), *Environmental Engineering Science*, **22**(2): 251-263.
The U.S. Department of Energy (DOE) is evaluating various sorbents to solidify the organic fraction of plutonium/uranium extraction (PUREX) process waste at the Savannah River Site (SRS). The purpose of the solidification is to provide a cost-effective alternative to incineration of the waste. Incineration at the Consolidated Incinerator Facility (CIF) at SRS is currently identified as the treatment technology for PUREX waste. However, the CIF is not in operation at this time; therefore, SRS is

interested in pursuing alternatives to incineration for treatment of this waste. The DOE Western Environmental Technology Office (WETO) in Butte, MT, was designated as the facility for conducting the sorbent testing and evaluation for organic PUREX waste surrogate. In concert with the Transuranic Waste Accelerated Shipment program, MSE Technology Applications, Inc. (MSE) also of Butte, MT, tested and evaluated sorbents with the capability of solidifying organic PUREX waste. A surrogate organic PUREX waste recipe was used, and sorbents were tested and evaluated. This paper presents experimental results evaluating four sorbent materials: Imbiber Beads IMB230301-R™, Nochar A610 Petrobond™, Petroset II™, and Petroset II Granular™ (Petroset II-G™). Previous work at SRS indicated that these products could solidify organic PUREX waste on a bench scale. Evaluation criteria included sorbent handling, sorbent capacity, sorption rate, sorbent composition, sorbent dust production potential, final surrogate waste form physical properties, volumetric expansion, mixing requirements, and sorbent cost.

Pokhitonov, Y.; Kolobov, E.; Orlov, A.; Kelley, D.; Pietsch, C. (2005), "Innovative Technology for Radwaste Treatment for New Applications," WM '05 Conference, Tucson, AZ
http://www.wmsym.org/abstracts/pdfs/5123.pdf
Polymers used in the experiments are manufactured by Nochar, Inc. Nochar polymers have been applied extensively to solidify various waste streams in the U.S. and international nuclear sectors. The polymers have wide ranging capability and have been thoroughly tested for leaching, stability (75-90 million rad, gamma, cobalt source), compression and many other tests conducted by the U.S. DOE. Radwaste compositions treated by Nochar include LLW-HLW tritiated oil, TRU acid and TRU oil, TBP-purex, extremely high alkaline (14.2 pH) and aqueous compositions, and various complex extractants that include heavy metals, solvents, scintillation fluid, etc.
For nitric acid, there was no mixing of solution and polymer (presumably, AcidBond).

Bickford, J.L.; Joyce, H.O.; Holmes-Burns, H. (2006), "Sorbent Testing for Solidification of Organic Plutonium/Uranium Extraction Waste – Phase IV, WM'06 Conference, Tucson, AZ
http://www.wmsym.org/abstracts/2006/pdfs/6456.pdf
This paper compared two clay-based products and two organic polymers (including Nochar A610 Petrobond™ and Nochar 660 Acid Bond™) for S/S of oily waste. Final surrogate waste form evaluation properties included: ignitability; thermal stability; off-gas generation; leachability tests and volumetric expansion. [But only control of free liquid and volumetric expansion is evaluated in this report]. The simplified surrogate tested contained > 80% kerosene (Flash point ~ 38-110 °C, depending upon grade).
Nochar Petrobond quickly forms thick rubbery mass ("like cool honey"); in order to achieve acceptable liquid release test results, the sample must be mixed thoroughly, which can be problematic. "Optimum" waste loading was 1:3 (sorbent to surrogate), by mass.
For surrogate waste that also contained water (5-10%), they first added Aquaset™ (granular clay product manufactured by Fluid Tech, Inc). "Water phase seems to have a negative effect on the Nochar sorbent." The paint filter test (PFT – SW-846 Method 9095A) was used to determine the absence or presence of drainable free liquid. Liquid Release Test (LRT) criterion for the NTS WAC is 0.5% (v/v).

"To date, instability of the Nochar samples when subjected to high temperatures and/or sunlight and the increased apparent offgas generation for all samples at higher temperatures were the only long-term stability issues noted."

nochar, inc.

8650 Commerce Park Place, Suite K
Indianapolis In. 46268

Certificate of Conformance
For
Non-biodegradable Product

This document is to certify that Nochar's N965 solidification polymer blend is non-biodegradable according to EPA guidelines and 40CFR 265.314 (F).

N965 is manufactured using two non-biodegradable polymers which are designed to solidify both aqueous and organic waste into a solid form.

These base polymers which make up N965' have undergone substantial testing including non-biodegradable, throughout the U.S. Dept. of Energy.

N965 materials provided to EnergX at 100 Wipp Road in Lenoir City TN, meet the requirements as stated above.

Dennis Campbell

Senior Vice President
Nochar, Inc.

Phone: 317-613-3046 Fax: 317-613-3052 e-mail nochar@nochar.com web: nochar.com

DIVIDER PAGE

Attachment 3 - Acceptable Knowledge Source Document Summary

Waste Stream Number(s): OR-REDC-RH-HET

Site(s): Oak Ridge National Laboratory	**Source Document Tracking Number:** C307
Acceptable Knowledge Documentation Type: ☑ TRU Waste Management Program Information ☑ Waste Stream-Specific Information ☑ Supporting Information	**Category:** ☑ Correspondence ☐ Discrepancy Resolution ☐ Internal Procedure or Note ☐ Miscellaneous ☐ Published Document or Controlled Database ☐ Unpublished Documents

Title of Source Document: Walt Bond Interview

Source Document Reference Information (author(s), document and revision number, date, publisher): Lisa Watson, NA, NA, 2/21/2008, NA

AK # [a]	Source Doc. Page # [b]	AK Information Summary
PR7, WS2, WS8, WS9, WS11, WS12, S7	All	This interview of Walt Bond, PhD was conducted at ORNL. Dr. Bond provided information on the experiments that were conducted in Building 3508 and indicated that some of the same type work was conducted in Building 7920. Isotopes: Pu, Am, Cm, Np, and some fission products. Chemicals: Nitric Acid, TBP, 2-ethyl hexanol, normal parafin hydro carbons, di-2-ethylhexlphosphoric acid, diethybenzeneamine, lithium chloride, aluminum nitrate, nitric acid, hydrochloric acid, sodium hydroxide, oxalic acid, lactic acid, glycolic acid, hydroxybuyric, chromic acid. (No cyanide or sulfide compounds were used.) Dr/ Bond also described the types of debris waste that was generated - these items are listed in the interview.

Source Document Data Limitations (if any):

1. None

Acceptable Knowlege Expert:

Elizabeth H. Lickliter Elizabeth H. Lickliter Date: 6/11/2008
Print /Sign

[a] Obtain from Acceptable Knowledge Documentation Checklist
[b] For microfilm or microfiche, identify box, tape, reel number and location.

Attachment 2 – Record of Communication

Waste Stream Numbers: Bldg 3508		Corresponding Source Document #: C307
Interviewer: Lisa Watson (575) 706-3134	Date: 02/21/2008	Time: 10:00 am
Interviewees: Dr. Walt Bond	**Group/Organization:** **Job Title:** ORNL, Chemical Technology Division	Phone: 865-588-1132 Email: LemonAda225@cs.com
Subject: Processes and Waste in Bldg 3508 at ORNL		

Dr. Bond started working at the ORNL in about 1957 and worked in 3508 in the Sol-Gel program until Building 3508 shut down in around 1988 or 1989. Dr. Bond retired for ORNL in September, 1997.

W. Bond was in charge of work activities from about 1985 until the cessation of radiochemical work and radiochemical decontamination in the building in about1991. Before 1991, extensive experimental on the development of separations of the actinide elements was carried out with Rex Leuze in charge of the work from about 1956 until 1985. Other Personnel involved in the work over the years was Milton Lloyd, Russ Baybarz, David Campbell, Fred Kappleman, John Cooper, Bruce Hannaford, Frank Scheitlin, Horace Friedman, Marvin Shanks, Mike Osborne, George Davis, and Ronald Hickey.

Bldg 3508:

Building 3508 was primarily an alpha glovebox facility for experimental work involving actinide elements. It also had a shielded Hot-Cell to do work where penetrating radiation was an issue.

High level waste was used for reprocessing:
- Developed processes for recovering Pu and U from fast reactor fuel
- Stripped away actinides from high level fuel for reuse

Work in Bldg 3508 consisted mostly of alpha and development work such as:
- separating the plutoniums
- fuel processing and waste treatment
- solvent exchange processes

Modifications were made to the mixed oxide process. Modified conditions to get cleaner extractions. There was some work on the portioning of the waste. They stripped the Cm and Am off so they could send the fuel back to the reactor, but this work was never done and the isotopes were returned the isotopes to storage

Marvin Shanks was the person in charge. 3508 did general chemical separations; ion exchange separations, and precipitation separations. A lot of the same work that was done in Bldg 7920 was also done in Bldg 3508. Some of the work that was carried out from 1985 – 1992 included experimental studies of:

- Development of solvent extraction processes for recovery of U and Pu from fast reactor fuels
- Development of solvent extraction processes for separation of actinides from rare earth elements. This work paralleled similar work at the TRU facility (Building 7920).
- Methods for decontaminating HEPA filter waste from Pu and other actinides.
- Development of separations processes for removal of actnides from high level wastes generated in recovering fuel ales from spent nuclear reactor fuels. No actual high level waste

was used. Simulated wastes using only tracer levels of actinides and fission products to measure the efficiency of separations were employed.
- Contol of Neptunium valence in spent fuel reprocessing. Only few mg were used in these studies.

Work carried out from the late 1950's – 1980 included experiments studies of:

- methods for recovery of transplutonium elements from curium targets irradiated in the ORNL High Flux Isotope reactor and also the subsequent recycle of unburned Cm to new targets. This work was closely coupled with work at 7920
- Developmentof Sol-Gel processes for preparing Plutonium and Curium oxides.
-
- (can you give some examples of the work that was common between the 2 buildings?). There was a Final Safety Analysis Report written in about the 1980s.

From 1985 forward, waste containers went through RTR and they will probably not have any liquids.

Radionuclides:

You will find Pu, Am, Cm, Np, and some fission products.

Small quantities of Cm from the early separations in the hot cell will be present in the waste resulting from work done in the mid to late 1980s to the early 1990s.

Chemicals:

No cyanide or sulfide compounds were used.

Nitric acid was used to make up all chemical solutions. Solvents used were TBP as an extractant as well as small amounts of all kinds of organic and inorganic compounds. Organic compounds were used in very small quantities. 2-ethyl hexanol, normal parrafin hydro carbons (C12 to C16 in chain length), di-2-ethylhexylphosphoric acid, diethylbenzeneamine extractants (long chained ,e.g.octyl and lauryl amines), lithium chloride, aluminum nitrate, nitric acid, hydrochloric acid, sodium hydroxide, oxalic acid, lactic acid, glycolic acid, and hydroxybutyric acid. Chromic acid was used in the early years.

It is possible that chromic acid may have been used in the early years.

Small quantities of amino-based solvents were used

Any liquid wastes were disposed down the drains – you will not find liquids in the waste.

There were no pyrophoirics or water reactive materials used.

There was some work done with ion and anion exchange resins. There were highly salted solutions of Pu and Uranium.

Dr. Bond was not sure whether the resins were neutralized before they were packaged as waste. There was an incident where a small test column blew up. Gasses had generated in the column and they burped out. There were only about 1-10 ccs of resins in the columns that were used. There were 1 or 2 experiments that separated Cm in the hot cell that used columns containing about 100 ccs of resins.

Dr. Bond explained that there will likely be small amounts of ion exchange resins in the waste, and they were likely not neutralized.

Dr. Bond indicated that there will likely be PCBs in the waste from pumps and small transformers. The pumps may or may not have been drained of the oil. Dr. Bond felt that it was possible that a few items containing PCBs were overlooked in the circa 1979 timeframe banning, such as electronic equipment that incorporated small transformers.

Dr. Bond indicated that the radioactivity of the waste was probably calculated by using dose-rate measurements. He also indicated that the basis for the measurements would likely be found in Kappelmann's logbooks. Kappelmann was the building manager at the time.

Dr. Bond indicated that waste was likely bagged out into poly bags that probably would have been heat-sealed.

Dr. Bond would expect that there may be unpunctured aerosol cans in the waste.

The types of debris waste that can be expected to be found in the 3508 waste is:

- cheesecloth
- lab equipment
- glassware
- crucibles
- small electric heaters
- hot plates
- circulating baths
- all kinds of batteries, including mercury batteries
- lead shielding
- circuit boards
- lead-lined gloves
- heat lamps with infrared contacts (no fluorescent lamps, these would be outside the gloveboxes)
- Mercury thermometers, manometers, and switches
- Lab-scale instruments

Beryllium was never used.

Data Limitations:

Acceptable Knowledge Expert: Lisa Watson / [signature] Date: 5/6/08
Print / Sign

ORNL - RH

C307

3

Attachment 2 - CCP Records Transmittal/Receiving Form

CCP Central Records / Records Custodian, 4021 National Parks Highway - MS: GSA 203, Carlsbad, New Mexico 88220

Telephone Number: 505-234-7523

Fax Number: 505-234-7014

☒ Original Record
☐ Fax Record
☐ E-mail Record

Attn:	Sheila Pearcy	From:	Elizabeth Lickliter
Ship to:	CCP Central Records/ CCP Records Custodian	Site:	Oak Ridge National Laboratory
	4021 National Parks Highway - MS GSA 203, Carlsbad, NM 88220	Company:	Technical Specialists
		Telephone Number:	575-302-3266
Telephone Number:	505-234-7523	Date Sent:	6/12/2008

Document Number	Title/Description	Record Date	Total Pages
C307	*Attachment 3 - Acceptable Knowledge Source Document Summary for CCP ORNL AK RH 1*	6/11/2008	1
	Walt Bond Interview	2/21/2008	3

Comments

None

Acceptance/Rejection Signature and Date

Records Accepted ☒	Signature: Tami L. Parker	Printed Name: TAMI PARKER	Date: 6/12/08
Records Rejected ☐	Signature:	Printed Name:	Date:

Reason for Rejection:

Re-submittal:

Signature	Printed Name	Date

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Jun-12-2008 4:07PM

Job	Date	Time	Type	Identification	Duration	Pages	Result
412	6/12/2008	4:07:03PM	Send	96283238	0:26	1	OK

Controlled Copy

CCP-QP-008, Rev. 14 **Effective Date: 09/19/2007**
CCP Records Management **Page 29 of 29**

Attachment 2 - CCP Records Transmittal/Receiving Form

CCP Central Records / Records Custodian, 4021 National Parks Highway - MS: GSA 203, Carlsbad, New Mexico 88220
Telephone Number: 505-234-7523
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☒ Original Record
☐ Fax Record
☐ E-mail Record

Attn:	Sheila Pearcy	From:	Elizabeth Lickliter
Ship to:	CCP Central Records/ CCP Records Custodian	Site:	Oak Ridge National Laboratory
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Telephone Number:	505-234-7523	Date Sent:	6/12/2008

C307	Attachment 3 - Acceptable Knowledge Source Document Summary for CCP ORNL AK AH 1	6/11/2008	1
	Walt Bond Interview	2/21/2008	3

None

Acceptance/Rejection Signature and Date

Records Accepted ☒ Signature: Tami L. Parker — Printed Name: TAMI PARKER — Date: 6/12/08

Records Rejected ☐ Signature _____ — Printed Name _____ — Date _____

Reason for Rejection:

Re-submittal: Signature _____ — Printed Name _____ — Date _____

DIVIDER PAGE

Attachment 3 - Acceptable Knowledge Source Document Summary

Site(s): Oak Ridge National Laboratory	**Source Document Tracking Number:** M022
Waste Stream Number(s): ORNL Non-specific Library Files (Applicable only when site library is not in use)	
Acceptable Knowledge Documentation Type: ☐ TRU Waste Management Program Information ☑ Waste Stream-Specific Information ☑ Additional Information	**Category:** ☐ Correspondence ☐ Discrepancy Resolution ☐ Internal Procedure ☑ Miscellaneous ☐ Published Document or Internal Procedure ☐ *Unpublished Documents*
Title or Description of Source Document [a]: Collection of MSDS for REDC CH and RH Waste	
Source Document Reference Information (author(s), document and revision number, date, publisher): **Various, NA, NA, Various, Various**	

AK # [b]	Source Doc. Page # [c]	AK Information Summary
WS8, WS12, S8, S10	Throughout	This document is a compilation of MSDS forms that pertain to both CH and RH waste for REDC. These include: Ion Exchange Resin Petroleum Ether Aqua Regia AG 50W-X4 50-100 100-200 200-400 H+ Resin Dowex 50WX8, 100-200 Mesh, H Cation Exchange Resin Desicote Rinsing Aid Dowex HCR-W2 (H) Cation Exchange Resin Nitric Acid Ultrex II Ceresin Wax (White) Lithobraze 925 and Lithoobraze 720 (BT) Mercury Magnet A610 (Trade Secret) A660 (N) (Trade Secret) Ajax All Purpose Cleaner w/Ammonia Ajax Scouring Cleaner Mr Clean Liquid Cleaner Ultima Gold / 2*5 L Alchol SDA 3A Adogen 364 Quik-Solid Cyanex 301 Cyanex 923 (not MSDS, but a technical paper) Diphenyl dithiophosphonic acid Nochar N965 (Also includes an updated MSDS revision.) Armor All Auto Glass Cleaner - 22 oz size Stripcoat TLC Free Alvania Grease 2 Mobilegrease 28 Mobilux EP 2 Mobil Vactra Oil No. 4 XO Rust Anti-Rust Enamel Quintolubric 888-46 CC Wet CC Fix Drierite Big Orange-E Adogen 364 Exxon Aromatic 150 Exxon Isopar L

CCP RECORDS ORIGINAL
DATE REC'D 2/16/2015
TPF

Attachment 3 - Acceptable Knowledge Source Document Summary (continued)

Site(s): Oak Ridge National Laboratory Source Document Tracking Number: M022

AK # [b]	Source Doc. Page # [c]	AK Information Summary
		Exxsol D60 HG Absorb Nochar N910 Simple Green Solid-A-Sorb Swiffer Wet

Source Document Data Limitations (if any):

1. None.

Acceptable Knowlege Expert:

Travis Smith / Date: 02/13/2015
Print /Sign

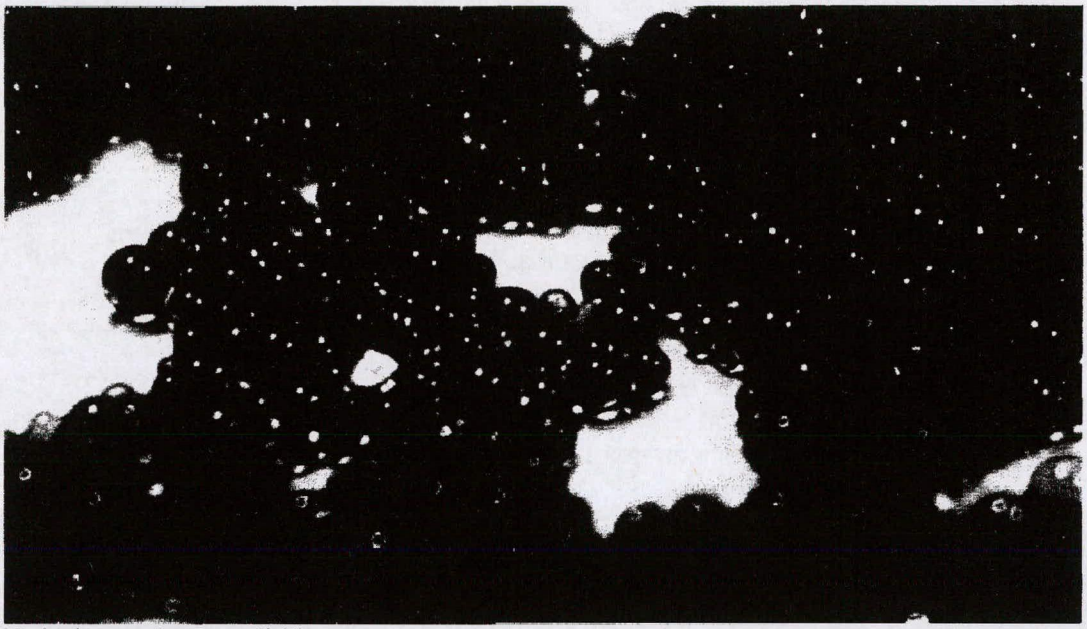
[a] Provide description for non-titled information (i.e., container paperwork, MSDS sheets, etc)
[b] Obtain from Acceptable Knowledge Documentation Checklist
[c] For microfilm or microfiche, identify box, tape, reel number and location.

M022

Image:Ion exchange resin.jpeg

From Wikipedia, the free encyclopedia

- Image
- File history
- File links



No higher resolution available.
Ion_exchange_resin.jpeg (561 × 323 pixels, file size: 75 KB, MIME type: image/jpeg)

Summary

Ion Exchange resin nodules, photographed by Adam Smith

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File

	Date/Time	User	Dimensions	size	Comment
current	11:14, 30 October 2005	Bugman (Talk | contribs)	561×323	75 KB	(Ion Exchange resin nodules, photographed by Adam Smith)

- Search for duplicate files
- Edit this file using an external application

  See the setup instructions for more information.

File links

The following pages on the English Wikipedia link to this file (pages on other projects are not listed):

- Ion exchange resin

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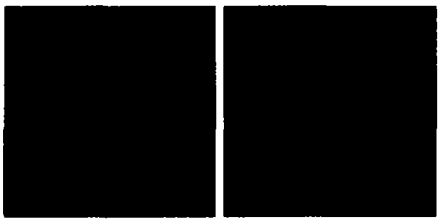
Safety data for petroleum ether



Click here for data on petroleum ether in student-friendly format, from the HSci project

Glossary of terms on this data sheet.

The information on this web page is provided to help you to work safely, but it is intended to be an overview of hazards, not a replacement for a full Material Safety Data Sheet (MSDS). MSDS forms can be downloaded from the web sites of many chemical suppliers.

General

Synonyms: amsco H-J, Amsco H-SB, Benzin B70, benzoline, hi-flash naphtha, hydrotreated naphtha, rubber solvent, super vmp, pet ether, ligroine, petroleum spirits, petroleum naptha, benzin, petroleum benzine, petroleum spirit x-y C (in which x-y denotes the range over which the material boils)
Molecular formula: varies. Typically samples contain predominantly n-pentane and hexane, with small amounts of methylpentane, cyclopentane, dimethylbutane and other short chain hydrocarbons.
CAS No: 8032-32-4
EC No: 232-453-7
EU number: 649-263-00-9

Physical data

Appearance: colourless liquid with hydrocarbon odour
Melting point: varies with formulation, typically near -70 C
Boiling point: varies with formulation, typically ca. 35 - 60 C
Specific gravity: varies with formulation, typically ca. 0.64
Vapour pressure:
Flash point: typically ca. -46 C
Explosion limits: typically ca. 1% - 8%
Autoignition temperature: ca. 245 C

Water solubility: negligible

Stability

Stable. Extremely flammable. Avoid strong oxidizing agents, all sources of ignition. As a consequence of its low flashpoint, mixtures of this material with air may ignite upon contact with hot surfaces - a naked flame is not required.

Toxicology

Since the formulation of this product varies from one supplier to another, the hazards associated with the liquid cannot be defined exactly without a knowledge of the composition. Some formulations are believed to act largely as irritants, but may present little further hazard; others may contain components that could be carcinogenic in humans. Treat as harmful by inhalation, ingestion or by skin contact. If the composition is unknown, assume that the product is toxic if inhaled. Inhalation may cause headache, nausea or vomitting. Prolonged or repeated skin contact may cause dermatitis. Typical TLV 1350 mg/m3 (300 ppm)

Toxicity data
(The meaning of any abbreviations which appear in this section is given here.)
IHL-HMN LCLO 3pph/5m
IVN-MAN LDLO 27000 mg kg^{-1}
ORL-RAT LD50 > 5000 mg kg^{-1}
SKN-RBT LD50 > 3000 mg kg^{-1}

Risk phrases
(The meaning of any risk phrases which appear in this section is given here.)
R11 R20 R21 R22 R45 R65.

Transport information

(The meaning of any UN hazard codes which appear in this section is given here.)
UN No 1268. Hazard class 3.0 Transport category 2. Packing group II.

Personal protection

Safety glasses. Use efficient ventilation. Remove all sources of ignition, including hot plates, from the working area.

Safety phrases

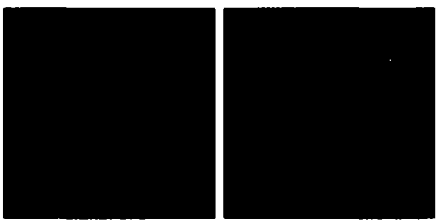
(The meaning of any safety phrases which appear in this section is given here.)
S45 S53.

[Return to Physical & Theoretical Chemistry Lab. Safety home page.]

This information was last updated on December 5, 2006. Although we have tried to make it as accurate and useful as possible, we can take no responsibility for its use or misuse.

Note also that the information on the PTCL Safety web site, where this page was hosted, has been copied onto many other sites, often without permission. If you have any doubts about the veracity of the information that you are viewing, or have any queries, please check the URL that your web browser displays for this page. If the URL **begins** "http://msds.chem.ox.ac.uk/" the page is maintained by the Safety Officer in Physical Chemistry at Oxford University. If not, this page is a copy made by some other person and we have no responsibility for it.

Safety data for aqua regia



Glossary of terms on this data sheet.

The information on this web page is provided to help you to work safely, but it is intended to be an overview of hazards, not a replacement for a full Material Safety Data Sheet (MSDS). MSDS forms can be downloaded from the web sites of many chemical suppliers.

General

Synonyms: nitrohydrochloric acid (a mixture of concentrated hydrochloric acid and concentrated nitric acid.)
Molecular formula: $HCl + HNO_3$

CAS No: 8007-56-5
EINECS No:

Physical data

Appearance: red, yellow or gold fuming liquid
Melting point:
Boiling point:
Vapour density:
Vapour pressure:
Density (g cm^{-3}):
Flash point:
Explosion limits:
Autoignition temperature:

Stability

Pressure will develop in sealed bottles. Incompatible with (and may react violently with) a wide variety of materials, including metals, oxidising agents, reducing agents, combustible materials.

Toxicology

Highly toxic. Extremely corrosive. May be fatal if swallowed or inhaled. Causes severe burns in contact with skin. Causes severe eye damage on contact. Serious respiratory irritant.

Risk phrases
(The meaning of any risk phrases which appear in this section is given here.)
R21 R26 R28 R34 R41.

Transport information

Personal protection

Safety glasses, gloves, good ventilation. Do not use before a risk assessment has been prepared.

[Return to Physical & Theoretical Chemistry Lab. Safety home page.]

This information was last updated on February 18, 2005. We have tried to make it as accurate and useful as possible, but can take no responsibility for its use, misuse, or accuracy. We have not verified this information, and cannot guarantee that it is up-to-date.

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Material Safety Data Sheet

Printing date 07/18/2001 Reviewed on 07/17/2001

1 Identification of substance:

- **Product details:**
- **Trade name: AG 50W-X4 50-100 100-200 200-400 H+ resin**
- **Catalog or product number:** 1421341, 1421351, 1421331, 1421331-001
- **Manufacturer/Supplier:**
  Bio-Rad Laboratories, Life Science Research
  2000 Alfred Nobel Drive
  Hercules, California 94547 1(510)741-1000
- **Information department:** Technical services, customer support.
- **Emergency information:**
  1(800)424-9300 Use only in the event of a CHEMICAL EMERGENCY involving a SPILL, LEAK, FIRE, EXPLOSION or ACCIDENT.
  510-741-1000

2 Composition/Information on components:

- **Chemical characterization:**
  CAS No. Description:
  69011-20-7 Polystyrene-divinylbenzene sulfonic acid resin
- **Identification number(s):**
- **EU Number:** 585-580-01-X

3 Hazards identification

- **Information pertaining to particular dangers for man and environment**
  R 16 Explosive when mixed with oxidizing substances.
- **NFPA ratings (scale 0-4)**
  Health = 2
  Fire = 0
  Reactivity = 0

4 First aid measures

- **After inhalation**
  Supply fresh air; consult doctor in case of complaints.
- **After skin contact** Generally the product does not irritate the skin.

- **After eye contact**
  Rinse opened eye for several minutes under running water.
- **After swallowing** Induce vomiting and call for medical help.

5 Fire fighting measures

- **Suitable extinguishing agents**
  CO_2, extinguishing powder or water spray. Fight larger fires with water spray or alcohol resistant foam.
- **Protective equipment:** No special measures required.

6 Accidental release measures

- **Person-related safety precautions:** Not required
- **Measures for environmental protection:** No special measures required.
- **Measures for cleaning/collecting:** Pick up mechanically.

7 Handling and storage

- **Handling**
- **Information for safe handling:**
  No special measures required.
  Prevent formation of dust.
  No special precautions are necessary if used correctly.
- **Information about protection against explosions and fires:**
  No special measures required.

- **Storage**
- **Requirements to be met by storerooms and receptacles:**
  No special requirements.
- **Information about storage in one common storage facility:** Not required.
- **Further information about storage conditions:** None.
- **Storage class**
- **Class according to regulation on flammable liquids:** Void

8 Exposure controls and personal protection

- **Additional information about design of technical systems:**
  No further data; see item 7.

Components with limit values that require monitoring at the workplace:
Not required.

- **Additional information:**
  The lists that were valid during the creation were used as basis.

- **Personal protective equipment**
- **General protective and hygienic measures**

Wash hands before breaks and at the end of work.

- **Breathing equipment:**
  In case of brief exposure or low pollution use respiratory filter device. In case of intensive or longer exposure use respiratory protective device that is independent of circulating air.
- **Protection of hands:**
  Protective gloves.
  Synthetic gloves
- **Eye protection:** Not required.

9 Physical and chemical properties:

- **Form:** particulate
- **Color:** Amber colored
- **Odor:** Odorless

	Value/Range	Unit	Method
Change in condition			
Melting point/Melting range:	undetermined		
Boiling point/Boiling range:	undetermined		
Flash point:	Not applicable		
Flammability (solid, gaseous)	Product is not flammable.		

- **Danger of explosion:**
  Explosive when mixed with oxidizing substances.

Density:	Not determined	
Solubility in / Miscibility with		
Water:	Insoluble	
Organic solvents:	0.0	%
Solids content:	100.0	%

10 Stability and reactivity

- **Thermal decomposition / conditions to be avoided:**
  No decomposition if used according to specifications.
- **Dangerous reactions** Reacts with strong oxidizing agents
- **Dangerous products of decomposition:**
  No dangerous decomposition products known

11 Toxicological information

- **Acute toxicity:**
  LD/LC50 values for hazardous components per OSHA criteria:

Oral: LD50: 124 mg/kg (rat)
Dermal: LD50: 400 mg/kg (rat)
- **Primary irritant effect:**
- **on the skin:** No irritant effect.
- **on the eye:** No irritant effect.
- **Sensitization:** No sensitizing effects known.

12 Ecological information:

- **General notes:** Not known to be hazardous to water.

13 Disposal considerations

- **Product:**
- **Recommendation**
Must not be disposed of together with household garbage. Do not allow product to reach sewage system.
Hand over to hazardous waste disposers.

- **Uncleaned packagings:**
- **Recommendation:**
Disposal must be made according to official regulations.

14 Transport information

- **Land transport ADR/RID (cross-border)**
- **ADR/RID class:** -

- **Maritime transport IMDG:**
- **Marine pollutant:** No

15 Regulations

- **SARA (Superfund Amendents and Reauthorization Act of 1986 - USA)**

Section 302/304 (40CFR355.30 / 40CFR355.40):

Substance not listed.
- **California Proposition 65:**
Chemicals known to cause cancer:

Substance is not listed.
Chemicals known to cause reproductive toxicity:

Substance is not listed.

- **Markings according to EU guidelines:**
The product has been classified and marked in accordance with EU Directives / Ordinance on Hazardous Materials

- **Risk phrases**: 16 Explosive when mixed with oxidizing substances.

- **Safety phrases**:
  24/25 Avoid contact with skin and eyes.
  50 Do not mix with ... .

- **National regulations**

- **Classification according to VbF**: Void

- **16 Other information**:

  This information is based on our present knowledge. However, this shall not constitute a guarantee for any specific product features and shall not establish a legally valid contractual relationship.

- **Department issuing MSDS**: Environmental Health and Safety.
- **Contact**:
  Life Science Group, Environmental Health and Safety, 2000 Alfred Nobel Drive, Hercules, California, 94547: 1(510) 741-1000

  Diagnostic Group, Juliet Carrara, 4000 Alfred Nobel Drive, Hercules, California, 94547: 1(510) 724-7000

MSDS Number: **I6364** * * * * * *Effective Date: **02/16/06** * * * * * Supercedes: **05/08/03***

MSDS Material Safety Data Sheet

From: Mallinckrodt Baker, Inc.
222 Red School Lane
Phillipsburg, NJ 08865

J.T.Baker®

24 Hour Emergency Telephone: 908-859-2151
CHEMTREC: 1-800-424-9300
National Response in Canada
CANUTEC: 613-996-6666
Outside U.S. And Canada
Chemtrec: 703-527-3887

NOTE: CHEMTREC, CANUTEC and National Response Center emergency numbers to be used only in the event of chemical emergencies involving a spill, leak, fire, exposure or accident involving chemicals.

All non-emergency questions should be directed to Customer Service (1-800-582-2537) for assistance.

DOWEX® 50WX8, 100-200 Mesh, H Cation Exchange Resin

1. Product Identification

Synonyms: Benzene, diethenyl-, polymer with ethenylbenzene and ethenylethylbenzene, sulfonated; Styrene sulfonic acid
CAS No.: 69011-20-7
Molecular Weight: Not applicable.
Chemical Formula: (C10H12.C10H10.C8H8)x
Product Codes: 1905

2. Composition/Information on Ingredients

Ingredient	CAS No	Percent	Hazardous
Cation Exchange Polymer	69011-20-7	57 - 62%	Yes
Water	7732-18-5	38 - 43%	No

3. Hazards Identification

Emergency Overview

CAUTION! MAY CAUSE IRRITATION TO SKIN AND EYES.

J.T. Baker SAF-T-DATA(tm) Ratings (Provided here for your convenience)

Health Rating: 0 - None
Flammability Rating: 1 - Slight
Reactivity Rating: 0 - None
Contact Rating: 1 - Slight
Lab Protective Equip: GOGGLES; LAB COAT
Storage Color Code: Orange (General Storage)

Potential Health Effects

Inhalation:
Not expected to be a health hazard.
Ingestion:
Large oral doses may cause irritation to the gastrointestinal tract. Extremely large oral dosages may produce gastrointestinal disturbances. The effects would be those of bulking, mainly discomfort and possible nausea or osmotic imbalance due to the exchange of ions. A possibly hazardous condition might occur if the ingested resin was previously loaded with a toxic anion which could be released in the stomach.
Skin Contact:
May cause mild irritation and redness. Product has a tendency to cling to skin due to static charge. Care must be exercised to remove all product from skin.
Eye Contact:
May cause mild irritation, possible reddening.
Chronic Exposure:
No adverse health effects expected.
Aggravation of Pre-existing Conditions:
No adverse health effects expected.

---

4. First Aid Measures

Inhalation:
Not expected to require first aid measures. Remove to fresh air. Get medical attention for any breathing difficulty.
Ingestion:
If large amounts were swallowed, give water to drink and get medical advice.
Skin Contact:
In case of contact, immediately wash skin with plenty of soap and water for at least 15 minutes. Get medical attention if irritation develops.
Eye Contact:
Immediately flush eyes with plenty of water for at least 15 minutes, lifting upper and lower eyelids occasionally. Get medical attention if irritation persists.

5. Fire Fighting Measures

Fire:
Not considered to be a fire hazard.
Explosion:
Not considered to be an explosion hazard. Nitric acid and other strong oxidizing agents can cause explosive-type reactions when mixed with ion exchange resins. Proper design of equipment to prevent build up of pressure is necessary if use of an oxidizing agent such as nitric acid is contemplated.
Fire Extinguishing Media:
Dry chemical, foam, water or carbon dioxide.
Special Information:
In the event of a fire, wear full protective clothing and NIOSH-approved self-contained breathing apparatus with full facepiece operated in the pressure demand or other positive pressure mode.

6. Accidental Release Measures

Caution! Floor and other surfaces may be slippery. Ventilate area of leak or spill. Wear appropriate personal protective equipment as specified in Section 8. Spills: Pick up and place in a suitable container for reclamation or disposal, using a method that does not generate dust.

7. Handling and Storage

Keep in a tightly closed container, stored in a cool, dry, ventilated area. Protect against physical damage. Protect from freezing. Avoid prolonged storage above 50C. Isolate from incompatible substances. Containers of this material may be hazardous when empty since they retain product residues (dust, solids); observe all warnings and precautions listed for the product.

8. Exposure Controls/Personal Protection

Airborne Exposure Limits:
None established.
Ventilation System:
Not expected to require any special ventilation.
Personal Respirators (NIOSH Approved):
Not expected to require personal respirator usage.
Skin Protection:

Wear protective gloves and clean body-covering clothing.
Eye Protection:
Use chemical safety goggles. Maintain eye wash fountain and quick-drench facilities in work area.

9. Physical and Chemical Properties

Appearance:
Light yellow to amber beads.
Odor:
Odorless.
Solubility:
Insoluble in water.
Specific Gravity:
0.80
pH:
No information found.
% Volatiles by volume @ 21C (70F):
ca. 40 For water.
Boiling Point:
No information found.
Melting Point:
No information found.
Vapor Density (Air=1):
0.62 For water.
Vapor Pressure (mm Hg):
17 @ 20C (68F) For water.
Evaporation Rate (BuAc=1):
No information found.

10. Stability and Reactivity

Stability:
Stable under ordinary conditions of use and storage. Do not pack column with dry ion exchange resins. Dry beads expand when wet; this expansion can cause a glass column to shatter.
Hazardous Decomposition Products:
Amines, ammonia, divinylbenzene, and oxides of carbon, nitrogen and sulfur.
Hazardous Polymerization:
Will not occur.
Incompatibilities:
Nitric acid and similar strongly oxidizing liquids.
Conditions to Avoid:
Heat and incompatibles.

11. Toxicological Information

No LD50/LC50 information found relating to normal routes of occupational exposure.

--------\Cancer Lists\----------

Ingredient	---NTP Carcinogen--- Known	Anticipated	IARC Category
Cation Exchange Polymer (69011-20-7)	No	No	None
Water (7732-18-5)	No	No	None

12. Ecological Information

Environmental Fate:
No information found.
Environmental Toxicity:
No information found.

13. Disposal Considerations

Whatever cannot be saved for recovery or recycling should be managed in an appropriate and approved waste disposal facility. Processing, use or contamination of this product may change the waste management options. State and local disposal regulations may differ from federal disposal regulations. Dispose of container and unused contents in accordance with federal, state and local requirements.

14. Transport Information

Not regulated.

15. Regulatory Information

--------\Chemical Inventory Status - Part 1\----------

Ingredient	TSCA	EC	Japan	Australia
Cation Exchange Polymer (69011-20-7)	Yes	No	No	Yes
Water (7732-18-5)	Yes	Yes	Yes	Yes

--------\Chemical Inventory Status - Part 2\----------

--Canada--

Ingredient	Korea	DSL	NDSL	Phil.
Cation Exchange Polymer (69011-20-7)	Yes	Yes	No	Yes
Water (7732-18-5)	Yes	Yes	No	Yes

\--------Federal, State & International Regulations - Part 1\----------

Ingredient	-SARA 302- RQ	TPQ	------SARA 313------ List	Chemical Catg.
Cation Exchange Polymer (69011-20-7)	No	No	No	No
Water (7732-18-5)	No	No	No	No

\--------Federal, State & International Regulations - Part 2\----------

Ingredient	CERCLA	-RCRA- 261.33	-TSCA- 8(d)
Cation Exchange Polymer (69011-20-7)	No	No	No
Water (7732-18-5)	No	No	No

Chemical Weapons Convention: No TSCA 12(b): No CDTA: No
SARA 311/312: Acute: No Chronic: No Fire: No Pressure: No
Reactivity: No (Mixture / Solid)

Australian Hazchem Code: None allocated.
Poison Schedule: None allocated.
WHMIS:
This MSDS has been prepared according to the hazard criteria of the Controlled Products Regulations (CPR) and the MSDS contains all of the information required by the CPR.

---

16. Other Information

NFPA Ratings: Health: **0** Flammability: **1** Reactivity: **0**
Label Hazard Warning:
CAUTION! MAY CAUSE IRRITATION TO SKIN AND EYES.
Label Precautions:
Avoid contact with eyes, skin and clothing.
Wash thoroughly after handling.
Keep container closed.
Label First Aid:
In case of contact, immediately flush eyes or skin with plenty of water for at least 15 minutes. Get medical attention if irritation develops or persists.
Product Use:
Laboratory Reagent.
Revision Information:
No Changes.
Disclaimer:
****

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Prepared by: Environmental Health & Safety
Phone Number: (314) 654-1600 (U.S.A.)

B E C K M A N

MATERIAL SAFETY DATA SHEET

PRODUCT: DESICOTE RINSING AID
PART NO.: 18772.

SECTION I - GENERAL

Manufacturer: Beckman Instruments, Inc.
Telephone No.: (714) 773-6962
Address: 2500 Harbor Blvd., Fullerton, CA 92634

Chemical Name and Synonyms: METHYL CHLOROFORM, SILICONE
Trade Name and Synonyms: DESICOTE RINSING AID
Chemical Family: ORGANIC SOLVENT SOLUTION
Formula: CCL3 CH3

SECTION II - HAZARDOUS INGREDIENTS

METHYL CHLOROFORM, 1,1,1, TRICHLOROETHANE	CAS 71-55-6	99%
SILICONE COMPOUND		<1%

SECTION III - PHYSICAL DATA

Boiling Point (Deg.C): 74.1C.
Vapor Pressure (mmHg): 100 @20C
Vapor Density (Air=1): 4.55
Specific Gravity (H2O=1): 1.3
% Volatile by Volume: 99+
Evaporation Rate (H2O=1): 5
Solubility in Water: <0.01%
Appearance and Odor: CLEAR SOLUTION, CHLOROFORM-LIKE ODOR
Others: NONE

SECTION IV - FIRE AND EXPLOSION HAZARD DATA

Flammable Limits(%): LEL:8 UEL:10.5

Flash Point (Method Used): NOT FLAMMABLE
Extinguishing Media: WILL IGNITE IN THE PRESENCE OF HIGH ENERGY SOURCE SUCH AS ELECTRIC ARC.
Special Fire-Fighting Procedures: REMOVE IGNITION SOURCE, WATER FOG, CO2, DRY CHEMICAL, OR FOAM EXTINGUISHER.
Unusual Fire & Explosion Hazards: TOXIC AND CORROSIVE IGNITION

CONTINUED ON NEXT PAGE

PRODUCT: DESICOTE RINSING AID

PRODUCTS

SECTION V - HEALTH HAZARD DATA

Threshold Limit Value: 350 PPM
Effects of Overexposure: ANESTHETIC PROPERTIES WHEN INHALED. DEFATS SKIN OR TISSUE. EYE CONTACT CAN CAUSE PAIN OR IRRITATION. 1,1,1, TRICHLOROETHANE IS CONSIDERED LOW IN TOXICITY AMONG HYDROCARBONS.
Emergency and First Aid Procedures: EYES-FLUSH WITH WATER, SKIN-WASH WITH SOAP AND WATER, INHALATION-REMOVE TO FRESH AIR , INGESTION-GET MEDICAL ASSISTANCE, PHYSICIAN-AVOID USING SYMPATHOMIMETIC AMINES IN TREATMENT

SECTION VI - REACTIVITY DATA

Stability: STABLE, AVOID STRONG CAUSTIC
Incompatibility (Materials To Avoid): STRONG CAUSTIC SUCH AS SODIUM HYDROXIDE
Hazardous Decomposition Products: PHOSGENE AND HYDROGEN CHLORIDE
Hazardous Polymerization: WILL NOT OCCUR

SECTION VII - SPILL OR LEAK PROCEDURE

Steps To Be Taken In Case Material Is Released Or Spilled: WIPE OR MOP SPILL WITH ABSORBENT MATERIAL USING RUBBER GLOVES. EVAPORATE OUTDOORS OR IN EXHAUST HOOD. DO NOT DUMP IN SEWER OR ONTO GROUND.
EPA HAZARDOUS WASTE U 226.
Waste Disposal Method: EVAPORATE SMALL QUANTITIES IN EXHAUST HOOD.

SECTION VIII - SPECIAL PROTECTION INFORMATION

Respiratory Protection: N/A
Ventilation: N/A
Protective Gloves: RUBBER GLOVES
Eye Protection: SAFETY GLASSES OR GOGGLES
Other Protective Equipment: NONE

CONTINUED ON NEXT PAGE

PRODUCT: DESICOTE RINSING AID

SECTION IX - SPECIAL PRECAUTIONS

Precautions To Be Taken In Handling And Storage: NONE
Other Precautions: NONE

Administrative Reference: 0001-SID-3441
Date of Last Revision: FEBRUARY 1, 1993
MSDS Ver. 6.3, CTS/RE

NOTICE: WHILE BECKMAN INSTRUMENTS, INC. BELIEVES THE INFORMATION CONTAINED HEREIN IS VALID AND ACCURATE, BECKMAN MAKES NO WARRANTY OR REPRESENTATION AS TO ITS VALIDITY, ACCURACY, OR CURRENCY. BECKMAN SHALL NOT BE LIABLE OR OTHERWISE RESPONSIBLE IN ANY WAY FOR USE OF EITHER THIS INFORMATION OR THE MATERIAL TO WHICH IT APPLIES. DISPOSAL OF HAZARDOUS MATERIAL MAY BE SUBJECT TO FEDERAL, STATE OR LOCAL LAWS OR REGULATIONS.

MERCK
eurolab

SAFETY DATA SHEET

1. Identification of the substance/preparation and of the company/undertaking

Identification of the product

Catalogue No: 55038 ID No.: 5503800

Product name: **Dowex® HCR-W2 (H) cation exchange resin**

Manufacturer/supplier identification

Company: Merck Eurolab Ltd, Merck House, Poole, Dorset, BH15 1TD, England
Telephone : 01202 669700 Telefax : 01202 665599

Emergency telephone No.: 01202 669700

2. Composition/information on ingredients

Chemical characterization

Polymeric resin

Product name: Dowex ion exchange resins

CAS number: 69011-20-7 EC-No.:

3. Hazards identification

Irritating to eyes.

4. First aid measures

Eye contact: Irrigate thoroughly with water. If discomfort persists obtain medical attention.

Inhalation: Remove from exposure.

Skin contact: Wash off thoroughly with soap and water.

Ingestion: Wash out mouth thoroughly with water. In severe cases obtain medical attention.

5. Fire-fighting measures

Special risks:

Combustible.
May evolve toxic fumes in fire.

Suitable extinguishing media:

Water spray, foam, dry powder or carbon dioxide

6. Accidental release measures

Wear appropriate protective clothing.
Carefully sweep up and dispose of in accordance with local regulations.
For large spillages liquids should be contained with sand or earth and both liquids and solids transferred to salvage containers. Any residues should be treated as for small spillages.

7. Handling and storage

Handling:

Change contaminated clothing. Wash hands after working with substance.

Storage:

Store at room temperature (15 to 25°C recommended). Keep well closed and protected from direct sunlight and moisture.

8. Exposure controls/personal protection

As appropriate to the situation and the quantity handled.
Respirator: Not applicable
Ventilation: Not applicable
Gloves: Rubber or plastic
Eye Protection: Goggles or face-shield
Other Precautions: Plastic apron, sleeves, boots - if handling large quantities

9. Physical and chemical properties

Form:	fine granules
Colour:	beige to brownish
Odour:	odourless

Melting temperature	No data
Solubility in water	Immiscible or insoluble
Flash point	Not applicable
Explosion limits: lower:	No data
Auto-ignition temperature	427°C

10. Stability and reactivity

Stable.

Substances to be avoided
strong oxidizing agents.
The possibility of reaction with other substances cannot be excluded.

11. Toxicological information

Hazardous properties are relatively improbable.
After skin contact: Irritation.
After eye contact: Irritation.
The product should be handled with the care usual when dealing with chemicals.

Further data

No data

No evidence of carcinogenic properties. No evidence of mutagenic or teratogenic effects.

12. Ecological information

No environmental hazard is anticipated provided that the material is handled and disposed of with due care and attention.

13. Disposal considerations

Can be safely disposed of as ordinary refuse.

14. Transport information

UN-No.: Not subject to transport regulations.	IMDG class:
IMO:	Packaging group:

IATA: Packaging group:
Correct technical name:
ADR/RID:

15. Regulatory information

Labelling according to EC directives

Symbol: Xi Irritant.

R-phrases: R36
Irritating to eyes.

S-phrases: S26
In case of contact with eyes, rinse immediately with plenty of water and seek medical advice.

EC-No.:

Local Regulations

Within the UK, the use of this material must be assessed under the Control of Substances Hazardous to Health (COSHH) regulations.

UK Exposure Limits: None assigned

16. Other information

Reason for alteration: Changes in Section : 15
Revised.
Supersedes edition of: 14/06/95

Date of issue: 27/08/98
Date of print: 02/10/01

MSDS Number: **N3661** * * * * * *Effective Date: **01/19/06** * * * * * Supercedes: **04/13/05***

MSDS Material Safety Data Sheet

From: Mallinckrodt Baker, Inc.
222 Red School Lane
Phillipsburg, NJ 08865

J.T.Baker®

24 Hour Emergency Telephone: 908-859-2151
CHEMTREC: 1-800-424-9300
National Response in Canada
CANUTEC: 613-996-6666
Outside U.S. And Canada
Chemtrec: 703-527-3887

NOTE: CHEMTREC, CANUTEC and National Response Center emergency numbers to be used only in the event of chemical emergencies involving a spill, leak, fire, exposure or accident involving chemicals.

All non-emergency questions should be directed to Customer Service (1-800-582-2537) for assistance.

NITRIC ACID ULTREX II

1. Product Identification

Synonyms: Aqua Fortis; Azotic Acid
CAS No.: 7697-37-2
Molecular Weight: 63.00
Chemical Formula: HNO3
Product Codes: 6901

2. Composition/Information on Ingredients

Ingredient	CAS No	Percent	Hazardous
Nitric Acid	7697-37-2	65 - 70%	Yes
Water	7732-18-5	29 - 35%	No

3. Hazards Identification

Emergency Overview

POISON! DANGER! STRONG OXIDIZER. CONTACT WITH OTHER

MATERIAL MAY CAUSE FIRE. CORROSIVE. LIQUID AND MIST CAUSE SEVERE BURNS TO ALL BODY TISSUE. MAY BE FATAL IF SWALLOWED OR INHALED. INHALATION MAY CAUSE LUNG AND TOOTH DAMAGE.

SAF-T-DATA(tm) Ratings (Provided here for your convenience)

Health Rating: 4 - Extreme (Poison)
Flammability Rating: 0 - None
Reactivity Rating: 3 - Severe (Oxidizer)
Contact Rating: 4 - Extreme (Corrosive)
Lab Protective Equip: GOGGLES & SHIELD; LAB COAT & APRON; VENT HOOD; PROPER GLOVES
Storage Color Code: White (Corrosive)

Potential Health Effects

Nitric acid is extremely hazardous; it is corrosive, reactive, an oxidizer, and a poison.

Inhalation:
Corrosive! Inhalation of vapors can cause breathing difficulties and lead to pneumonia and pulmonary edema, which may be fatal. Other symptoms may include coughing, choking, and irritation of the nose, throat, and respiratory tract.
Ingestion:
Corrosive! Swallowing nitric acid can cause immediate pain and burns of the mouth, throat, esophagus and gastrointestinal tract.
Skin Contact:
Corrosive! Can cause redness, pain, and severe skin burns. Concentrated solutions cause deep ulcers and stain skin a yellow or yellow-brown color.
Eye Contact:
Corrosive! Vapors are irritating and may cause damage to the eyes. Contact may cause severe burns and permanent eye damage.
Chronic Exposure:
Long-term exposure to concentrated vapors may cause erosion of teeth and lung damage. Long-term exposures seldom occur due to the corrosive properties of the acid.
Aggravation of Pre-existing Conditions:
Persons with pre-existing skin disorders, eye disease, or cardiopulmonary diseases may be more susceptible to the effects of this substance.

---

4. First Aid Measures

Immediate first aid treatment reduces the health effects of this substance.
Inhalation:
Remove to fresh air. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Call a physician.
Ingestion:
DO NOT INDUCE VOMITING! Give large quantities of water or milk if available. Never

give anything by mouth to an unconscious person. Get medical attention immediately.
Skin Contact:
In case of contact, immediately flush skin with plenty of water for at least 15 minutes while removing contaminated clothing and shoes. Wash clothing before reuse. Thoroughly clean shoes before reuse. Get medical attention immediately.
Eye Contact:
Immediately flush eyes with plenty of water for at least 15 minutes, lifting lower and upper eyelids occasionally. Get medical attention immediately.

5. Fire Fighting Measures

Fire:
Not combustible, but substance is a strong oxidizer and its heat of reaction with reducing agents or combustibles may cause ignition. Can react with metals to release flammable hydrogen gas.
Explosion:
Reacts explosively with combustible organic or readily oxidizable materials such as: alcohols, turpentine, charcoal, organic refuse, metal powder, hydrogen sulfide, etc. Reacts with most metals to release hydrogen gas which can form explosive mixtures with air.
Fire Extinguishing Media:
Water spray may be used to keep fire exposed containers cool. Do not get water inside container.
Special Information:
Increases the flammability of combustible, organic and readily oxidizable materials. In the event of a fire, wear full protective clothing and NIOSH-approved self-contained breathing apparatus with full facepiece operated in the pressure demand or other positive pressure mode.

6. Accidental Release Measures

Ventilate area of leak or spill. Wear appropriate personal protective equipment as specified in Section 8. Isolate hazard area. Keep unnecessary and unprotected personnel from entering. Contain and recover liquid when possible. Neutralize with alkaline material (soda ash, lime), then absorb with an inert material (e. g., vermiculite, dry sand, earth), and place in a chemical waste container. Do not use combustible materials, such as saw dust. Do not flush to sewer! US Regulations (CERCLA) require reporting spills and releases to soil, water and air in excess of reportable quantities. The toll free number for the US Coast Guard National Response Center is (800) 424-8802.

J. T. Baker NEUTRASORB® or TEAM® 'Low Na+' acid neutralizers are recommended for spills of this product.

7. Handling and Storage

Store in a cool, dry, ventilated storage area with acid resistant floors and good drainage. Protect from physical damage. Keep out of direct sunlight and away from heat, water, and incompatible materials. Do not wash out container and use it for other purposes. When diluting, the acid should always be added slowly to water and in small amounts. Never use hot water and never add water to the acid. Water added to acid can cause uncontrolled boiling and splashing. Containers of this material may be hazardous when empty since they retain product residues (vapors, liquid); observe all warnings and precautions listed for the product.

8. Exposure Controls/Personal Protection

Airborne Exposure Limits:
-OSHA Permissible Exposure Limit (PEL):
2 ppm (TWA), 4 ppm (STEL)
-ACGIH Threshold Limit Value (TLV):
2 ppm (TWA); 4 ppm (STEL)

Ventilation System:
A system of local and/or general exhaust is recommended to keep employee exposures below the Airborne Exposure Limits. Local exhaust ventilation is generally preferred because it can control the emissions of the contaminant at its source, preventing dispersion of it into the general work area. Please refer to the ACGIH document, *Industrial Ventilation, A Manual of Recommended Practices*, most recent edition, for details.
Personal Respirators (NIOSH Approved):
If the exposure limit is exceeded, wear a supplied air, full-facepiece respirator, airlined hood, or full-facepiece self-contained breathing apparatus. Nitric acid is an oxidizer and should not come in contact with cartridges and canisters that contain oxidizable materials, such as activated charcoal. Canister-type respirators using sorbents are ineffective.
Skin Protection:
Wear impervious protective clothing, including boots, gloves, lab coat, apron or coveralls, as appropriate, to prevent skin contact.
Eye Protection:
Use chemical safety goggles and/or a full face shield where splashing is possible. Maintain eye wash fountain and quick-drench facilities in work area.

9. Physical and Chemical Properties

Appearance:
Colorless to yellowish liquid.
Odor:
Suffocating, acrid.
Solubility:
Infinitely soluble.

Specific Gravity:
1.41
pH:
1.0 (0.1M solution)
% Volatiles by volume @ 21C (70F):
100 (as water and acid)
Boiling Point:
122C (252F)
Melting Point:
-42C (-44F)
Vapor Density (Air=1):
2-3
Vapor Pressure (mm Hg):
48 @ 20C (68F)
Evaporation Rate (BuAc=1):
No information found.

---

10. Stability and Reactivity

Stability:
Stable under ordinary conditions of use and storage. Containers may burst when heated.
Hazardous Decomposition Products:
When heated to decomposition, emits toxic nitrogen oxides fumes and hydrogen nitrate. Will react with water or steam to produce heat and toxic and corrosive fumes.
Hazardous Polymerization:
Will not occur.
Incompatibilities:
A dangerously powerful oxidizing agent, concentrated nitric acid is incompatible with most substances, especially strong bases, metallic powders, carbides, hydrogen sulfide, turpentine, and combustible organics.
Conditions to Avoid:
Light and heat.

---

11. Toxicological Information

Nitric acid: Inhalation rat LC50: 244 ppm (NO2)/30M; Investigated as a mutagen, reproductive effector. Oral (human) LDLo: 430 mg/kg.

--------\Cancer Lists\----------

Ingredient	---NTP Carcinogen--- Known	Anticipated	IARC Category
Nitric Acid (7697-37-2)	No	No	None
Water (7732-18-5)	No	No	None

---

12. Ecological Information

Environmental Fate:
No information found.
Environmental Toxicity:
No information found.

---

13. Disposal Considerations

Whatever cannot be saved for recovery or recycling should be managed in an appropriate and approved waste facility. Although not a listed RCRA hazardous waste, this material may exhibit one or more characteristics of a hazardous waste and require appropriate analysis to determine specific disposal requirements. Processing, use or contamination of this product may change the waste management options. State and local disposal regulations may differ from federal disposal regulations. Dispose of container and unused contents in accordance with federal, state and local requirements.

---

14. Transport Information

Domestic (Land, D.O.T.)

Proper Shipping Name: NITRIC ACID (WITH NOT MORE THAN 70% NITRIC ACID)

Hazard Class: 8
UN/NA: UN2031
Packing Group: II
Information reported for product/size: 2L

International (Water, I.M.O.)

Proper Shipping Name: NITRIC ACID (WITH NOT MORE THAN 70% NITRIC ACID)

Hazard Class: 8
UN/NA: UN2031
Packing Group: II
Information reported for product/size: 2L

---

15. Regulatory Information

--------\Chemical Inventory Status - Part 1\---------------------------------

Ingredient	TSCA	EC	Japan	Australia
Nitric Acid (7697-37-2)	Yes	Yes	Yes	Yes

Water (7732-18-5)	Yes	Yes	Yes	Yes

--------\Chemical Inventory Status - Part 2\----------

Ingredient	Korea	--Canada-- DSL	NDSL	Phil.
Nitric Acid (7697-37-2)	Yes	Yes	No	Yes
Water (7732-18-5)	Yes	Yes	No	Yes

--------\Federal, State & International Regulations - Part 1\----------

Ingredient	-SARA 302- RQ	TPQ	------SARA 313------ List	Chemical Catg.
Nitric Acid (7697-37-2)	1000	1000	Yes	No
Water (7732-18-5)	No	No	No	No

--------\Federal, State & International Regulations - Part 2\----------

Ingredient	CERCLA	-RCRA- 261.33	-TSCA- 8(d)
Nitric Acid (7697-37-2)	1000	No	No
Water (7732-18-5)	No	No	No

Chemical Weapons Convention: No TSCA 12(b): No CDTA: No
SARA 311/312: Acute: Yes Chronic: Yes Fire: Yes Pressure: No
Reactivity: No (Mixture / Liquid)

Australian Hazchem Code: 2PE
Poison Schedule: S6
WHMIS:
This MSDS has been prepared according to the hazard criteria of the Controlled Products Regulations (CPR) and the MSDS contains all of the information required by the CPR.

---

16. Other Information

NFPA Ratings: Health: **4** Flammability: **0** Reactivity: **0** Other: **Oxidizer**
Label Hazard Warning:
POISON! DANGER! STRONG OXIDIZER. CONTACT WITH OTHER MATERIAL MAY CAUSE FIRE. CORROSIVE. LIQUID AND MIST CAUSE SEVERE BURNS TO ALL BODY TISSUE. MAY BE FATAL IF SWALLOWED OR INHALED. INHALATION MAY CAUSE LUNG AND TOOTH DAMAGE.
Label Precautions:
Do not get in eyes, on skin, or on clothing.
Do not breathe vapor or mist.
Use only with adequate ventilation.
Wash thoroughly after handling.
Keep from contact with clothing and other combustible materials.
Do not store near combustible materials.
Store in a tightly closed container.

Remove and wash contaminated clothing promptly.

Label First Aid:

In case of contact, immediately flush eyes or skin with plenty of water for at least 15 minutes while removing contaminated clothing and shoes. Wash clothing before reuse. If swallowed, DO NOT INDUCE VOMITING. Give large quantities of water. Never give anything by mouth to an unconscious person. If inhaled, remove to fresh air. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. In all cases get medical attention immediately.

Product Use:

Laboratory Reagent.

Revision Information:

MSDS Section(s) changed since last revision of document include: 14, 16.

Disclaimer:

****

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****

Prepared by: Environmental Health & Safety
Phone Number: (314) 654-1600 (U.S.A.)

Material Safety Data Sheet

Science Stuff, Inc.
1104 Newport Ave
Austin, TX 78753

Phone (512) 837-6020
Chemtrec 800-424-9300
24 Hour Emergency Assistance

Section 1 Identification

Product Number:	C1470
Product Name:	Ceresin Wax (White) Pieces
Trade/Chemical Synonyms	
Formula:	N/A
RTECS:	NONE
C.A.S	CAS# 8001-75-0

Health:	0
Flammability	1
Reactivity	0

Hazard Rating:
Least Slight Moderate High Extreme
0 1 2 3 4
NA = Not Applicable NE = Not Established

Section 2 Component Mixture

Sara 313	Component	CAS Number	%	Dim	Exposure Limits:
☐	Ceresin Wax (White)	CAS# 8001-75-0	100%	W/W	

Section 3 Hazard Identification (Also see section 11)

Keep away from heat and ignition sources. Harmful if swallowed. Avoid breathing vapors. Use with adequate ventilation. Avoid contact with eyes, skin, and clothes. Wash thoroughly after handling. Keep container closed.

Section 4 First Aid Measures

Keep away from heat and ignition sources. Harmful if swallowed. Avoid breathing vapors. Use with adequate ventilation. Avoid contact with eyes, skin, and clothes. Wash thoroughly after handling. Keep container closed.

FIRST AID: SKIN: Wash exposed area with soap and water. If irritation persists, seek medical attention.

EYES: Wash eyes with plenty of water for at least 15 minutes, lifting lids occasionally. Seek Medical Aid. INHALATION: Remove to fresh air. If not breathing, give artificial respiration. If breathing is difficult, give oxygen

INGESTION: Give several glasses of milk or water. Vomiting may occur spontaneously, but DO NOT INDUCE! Never give anything by mouth to an unconscious person.

Section 5 Fire Fighting Measures

Section 6 Accidental Release Measures

Sweep up and place in suitable (fiberboard) containers for reclamation or later disposal.

Section 7 Handling and Storage

Store in a cool dry place. Do not get in eyes, on skin, or on clothing. Wash thoroughly after handling

Section 8 Exposure Controls & Personal Protection

Respiratory Protection:If material Is heated, use a NIOSH approved Respir

Ventilation: Mechanical: ☐ Local Exhaust: ☑

Hand Protection: Wear appropriate gloves to prevent skin exposure.

Eye Protection: Safety Glasses w/ Side Shields

Other Protective Equipment: Wear appropriate clothing to prevent skin exposure

Section 9 Physical and Chemical Properties

Melting Point:	130/198 F	Specific Gravity	~0.880 - 0.935
Boiling Point:	Information not available	Percent Volatile by Volume:	0
Vapor Pressure:	Not applicable	Evaporation Rate:	not applicable
Vapor Density:	Not applicable	Evaporation Standard:	
Solubility in Water:	not soluble	Auto ignition Temperature:	Not applicable
Appearance and Odor:	White waxy substance, odorless	Lower Flamm. Limit in Air:	Not applicable
Flash Point:	Information not available	Upper Flamm. Limit in Air:	Not applicable

Section 10 Stability and Reactivity Information

Stability: Stable Conditions to Avoid: None known

Materials to Avoid:
May react with strong oxidizing agents

Hazardous Decomposition Products:

Fire Extinguisher Type:	dry Chemical, foam or Carbon Dioxide
Fire/Explosion Hazards:	dense smoke may be generated while burning. Carbon monoxide, carbon dioxide and other oxides may be generated as products of combustion.
Fire Fighting Procedure:	Wear self-contained breathing apparatus and protective clothing to prevent contact with skin and clothing.

Oxides of Carbon
Hazardous Polymerization:Will Not Occur
Condition to Avoid:None known

Section 11 Additional Information

This material is not considered hazardous. Handle using established laboratory procedures. Use Care if material is heated. Wear gloves and Respirator if material is heated.

DOT Classification: Not Regulated

DOT regulations may change from time to time. Please consult the most recent version of the relevant regulations.

Revision No:0 Date Entered: 9/1/2006 Approved by: WPF

The information contained herein is believed to be accurate and is offered in good faith for the user's consideration and investigation. No warranty is expressed or implied regarding the completeness or accuracy of this information, whether originating from Science Stuff, Inc. or from an alternate source. Users of this material should satisfy themselves by independent investigation of current scientific and medical information that this material may be safely handled.

LucasMilhaupt
A Handy & Harman Company
Join with the Best!

5656 S. Pennsylvania Avenue
Cudahy, WI 53110

Telephone: (414) 769-6000
FAX: (414) 769-1093
www.lucasmilhaupt.com

LITHOBRAZE® 925 and LITHOBRAZE® 720 (BT)

NOMINAL COMPOSITION

	LITHOBRAZE 925	LITHOBRAZE 720 (BT)
Silver	92.5% ± 0.5%	71.65% ± 0.5%
Copper	Balance	Balance
Lithium	0.20% + 0.10% - 0.05%	0.35% + 0.15% - 0.10%
Total Other Elements	0.15% max.	0.15% max.

PHYSICAL PROPERTIES

Color	Silver-White	Silver-White
Solidus (Melting Point) approx.	1400°F (760°C)	1400°F (760°C)
Liquidus (Flow Point) approx.	1635°F (890°C)	1400°F (760°C)
Specific Gravity	10.11	9.67
Density (Troy oz./cu.in.)	5.33	5.09
Electrical Conductivity (% IACS)	55.2*	50.8**
Electrical Resistivity (Microhm-cm)	3.12*	3.39*

* Measured on 0.030" diameter annealed wire with 0.22% lithium.
** Measured on 0.032" diameter annealed wire with 0.19% lithium.

USES

The principal use to date of Lithobraze 925 has been the brazing of honeycomb panel sections. It can be used for general purpose furnace brazing of stainless steels where flux must be avoided.

Lithobraze 720 is a good general purpose, low temperature filler metal of high fluidity for fluxless furnace brazing of stainless steels when used in dry hydrogen or inert atmospheres.

BRAZING CHARACTERISTICS

Lithobraze 925 is lithium modified sterling silver, designed primarily for fluxless furnace brazing of stainless steels. This alloy has been widely used for brazing honeycomb airframe structures made of precipitation hardening stainless steels such as 17-7PH, PH15-7Mo and AM350.

The use of Lithobraze 925 permits taking advantage of the maximum panel strength afforded by free node flow. This alloy is not suitable for torch brazing in air but must be used in a hydrogen or inert atmosphere of low dew point (-70°F/-55°C or drier). Argon is the most commonly used inert gas.

Lithobraze 720 (BT) is lithium modified Braze 720 (BT). Braze 720 is the eutectic composition in the silver-copper system (72% Ag, 28% Cu). The lithium content facilitates the wetting of stainless and refractory metals when used in a hydrogen or inert atmosphere of low dew point (-70°F/-55°C or drier).

The use of endogas or exogas atmospheres, or standard fluxes, is not recommended since they react with the lithium and interfere with bonding. A minimum brazing temperature of 50°F(10°C) above the flow point is suggested for atmosphere furnace brazing. These alloys are particularly adaptable to brazing thin sections of stainless steels because solution of the base metal by the filler metal is negligible.

PROPERTIES OF BRAZED JOINTS

Joints brazed with Lithobraze 925 and Lithobraze 720 have been used for applications where operating temperatures were intermittently as high as 900°F (480°C). When continuous elevated temperature exposure to oxidizing conditions is to be expected (1000 hours or more), the maximum operating temperature should be reduced to 500°F(260°C). Joints made on heat resistant alloys with these filler metals are much more resistant to interface corrosion than flux brazed joints. Final acceptance should be based on tests made under the anticipated service conditions.

SPECIFICATIONS

The principal use to date of Lithobraze 925 has been the brazing of honeycomb panel sections. It can be used for general purpose furnace brazing of stainless steels where flux must be avoided.

Lithobraze 720 is a good general purpose, low temperature filler metal of high fluidity for fluxless furnace brazing of stainless steels when used in dry hydrogen or inert atmospheres.

AVAILABLE FORMS

Sheet, wire, powder, paste, and preforms to specification.

WARRANTY CLAUSE

Lucas-Milhaupt, Inc believes the information contained herein to be reliable. However, the technical information is given by Lucas-Milhaupt, Inc. without charge and the user shall employ such information at its own discretion and risk. Lucas-Milhaupt, Inc. assumes no responsibility for results obtained or damaged incurred from the use of such information in whole or in part.

ORNL MSDS
M022 - ORNL

Material Data Safety Sheet

Manufacturer: OMNI/ajax
Address: 49 Pocono Forest
Gouldsboro, PA? 18424
Phone# 570-848-4186??? Fax# 570-848-4187

Product Name: Mercury Magnet
MSDS#: N/A
CAS#: See below
Date Prepared: June 10, 2003
Prepared by: MAC

Material Identification and Information:

Copper, CAS# 7440-50-8; Zinc, CAS# 7440-66-6; Iron, CAS# 7439-89-6; Sulfamic Acid, CAS# 5329-14-6

Physical and Chemical Characteristics:

Boiling Point: N/A
Vapor Pressure: N/A
Vapor Density: N/A
Solubility in water: 6%
Appearance and Odor: Mixed gray & bronze powder; no odor

Specific Gravity: 3.10
Melting Point: N/A
Evaporation Rate: 0
Water Reactive: Some Hydrogen may release

Fire and Explosion Hazard:

Flash Point: N/A
Auto-Ignition Temperature: N/A
Unusual Fire and Explosion Hazards: None
Special Fire Fighting Procedures: None

Extinguisher Medium: Water
Flammability Limits in Air: N/A

Reactivity Hazard Data:

Stable, Conditions to avoid: Contact with strong alkalis, acids, chlorine, cyanide compounds, hypochlorites. May release SO2, SO3, and NH3.
Hazardous Decomposition Products: Zinc vapor. Exposure to high temperatures may generate hazardous fumes.

Health Hazard Data:

Primary Route: Inhalation, Skin Contact. Health Hazards: Irritant of skin and eyes. Stomach upset. Chronic: None. Eye Contact: Flush with water. Skin Contact: Flush with water. Ingestion: Give universal antidote. Inhalation: Remove to fresh air.

Control and Protective Measures:

Use NIOSH respirator. Goggles and gloves. Other protective clothing as required in HazMat use. Wash hands after using.

Safe Handling and Leak Procedures:

Spills: Clean up using SorbaSet S Solidifier/Neutralizer
Waste Disposal: Call 800.309.9908 (Lamp Recyclers of LA), 610.838.7034 (Bethlehem Apparatus) for amalgam
recycling.????? ??

NFPA Rating: Health: 1,Flammability: 0; Reactivity: 2

Nochar

MATERIAL SAFETY DATA SHEET

May be used to comply with OSHA's Hazard Communication Standard, 29 CFR 1910.1200. Standard must be consulted for specific requirements.

U.S. DEPARTMENT OF LABOR
Occupational Safety and Health Administration
(Non-Mandatory Form)
Form Approved
OMB No. 1218-0072

IDENTITY (As used on label and list)
A610 TRADE SECRET

Note: Blank spaces are not permitted. If any item is not applicable, or no information is available, the space must be marked to indicate that

Section I

Manufacturer's Name
NOCHAR, INC.

Emergency Telephone Number
(317) 613-3046

Address *(Number, Street, City, State and ZIP Code)*
8650 COMMERCE PARK PLACE SUITE K
INDIANAPOLIS, INDIANA 46268

Telephone Number for information
FAX: (317) 613-3052

Date Prepared
January 2004

Signature of Preparer ***(optional)***

Section II - Hazardous Ingredients/Identity Information

Hazardous Components (Specific Chemical Identity; Common Name(s))	OSHA PEL	ACGIH TLV	Other Limits Recommended	% (optional)
NONE				

Section III - Physical/Chemical Characteristics

Boiling Point	N/A	**Specific Gravity (H_2O = 1)**	.91
Vapor Pressure (mm Hg.)	N/A	**Melting Point**	N/A
Vapor Density (AIR = 1)	N/A	**Evaporation Rate (Butyl Acetate = 1)**	N/A
Solubility in Water	NEGLIGIBLE	**Appearance and Odor**	Solid, Generally in Powder Form, Essentially Odorless

Section IV - Fire and Explosion Hazard Data

Flash Point (Method Used)	N/A	**Flammable Limits**	N/A	**LEL**	N/A	**UEL**	N/A
Extinguishing Media	WATER FOG, FOAM, DRY CHEMICAL, CO_2						
Special Fire Fighting Procedures	SEE SECTION VII AND SECTION VIII.						
Unusual Fire and Explosion Hazards	NONE KNOWN						

Section V - Reactivity Data

Stability	**Unstable**		**Conditions to Avoid**
	Stable	X	EXTREME HEAT, OPEN FLAME
Incompatibility (Materials to Avoid)			STRONG OXIDIZERS
Hazardous Decomposition or Byproducts			CO, CO_2 MAY PRODUCE ACROLEIN, ACIDS, KETONES, ALDEHYDES. TREAT COMBUSTION PRODUCTS AS TOXIC.
Hazardous	**May Occur**		**Conditions to Avoid**
Polymerization	**Will Not Occur**	X	

Section VI - Health Hazard Data

Route(s) of Entry:	**Inhalation**	X	**Skin?**	**Ingestion**	X		

Health Hazards ***(Acute and Chronic)***

AVAILABLE DATA AND EXPERIENCE SHOW POTENTIAL FOR SLIGHT IRRITATION TO EYES, SLIGHT ORAL TOXICITY.

Carcinogenicity:	N/A	**NTP?**	**IARC Monographs?**	**OSHA Regulated?**

Signs and Symptoms of Exposure

PRODUCT MAY BE SLIGHTLY IRRITATING TO EYES. ORAL TOXICITY IS LOW. THERMAL DECOMPOSITION MAY PRODUCE TOXIC, IRRITATING GASES OR FUMES. (SEE HAZARDOUS DECOMPOSITION OR BYPRODUCTS)

Medical Conditions - Generally Aggravated by Exposure

PREEXISTING EYE, SKIN & RESPIRATORY DISORDERS MAY BE AGGRAVATED BY PRODUCT.

Emergency and First Aid Procedures

EYE CONTACT: FLUSH EYES WITH WATER. IF IRRITATION OCCURS, CONSULT PHYSICIAN.

BURNS: TREAT AS FOR ORDINARY BURNS.

Section VII - Precautions for Safe Handling and Use

Steps to Be Taken in Case Material is Released or Spilled

RECOVER SOLID WITH BROOM, SHOVEL OR VACUUM. AVOID GENERATING DUST CLOUDS. PUT RECOVERED MATERIAL IN CONTAINERS FOR RECLAMATION OR DISPOSAL.

Waste Disposal Method

FOLLOW FEDERAL, STATE AND LOCAL REGULATIONS. WHEN USED AS ABSORBENT, FOLLOW REGULATIONS FOR ABSORBED MATERIAL.

Precautions to Be Taken in Handling and Storing

PRODUCT CAN ACCUMULATE STATIC CHARGES WHEN HANDLED.

Other Precautions

AVOID BREATHING VAPORS FROM HEATED PRODUCT.

Section VIII - Control Measures

Respiratory Protection (Specify Type)		NORMALLY NOT REQUIRED. USE NIOSH APPROVED SCBA IF PRODUCT IS HEATED OR INVOLVED IN FIRE.		
Ventilation	**Local Exhaust**	NO SPECIAL REQUIREMENT	**Special**	N/A
	Mechanical (General)	NO SPECIAL REQUIREMENT	**Other**	N/A
Protective Gloves	NOT REQUIRED	**Eye Protection**	SAFETY GLASSES OR GOGGLES	
Other Protective Clothing or Equipment	NONE REQUIRED			
Work/Hygienic Practice	NORMAL HYGIENE PRACTICES SHOULD BE FOLLOWED; WASH HANDS, ETC. AFTER HANDLING.			

DISCLAIMER: *The information contained herein is based on the data available to us and is believed to be correct. However, the manufacturer makes no warranty, expressed or implied regarding the accuracy of this data or the results to be obtained from the use thereof, and assumes no responsibility for injury from the use of the product described herein. The manufacturer assumes no liability for incidental, consequential or direct damage of any manner or kind, regardless of cause, including negligence.*

NFPA RATINGS

HEALTH 0

FLAMMABILITY 1

REACTIVITY 0

No char

MATERIAL SAFETY DATA SHEET

May be used to comply with OSHA's Hazard Communication Standard, 29 CFR 1910.1200. Standard must be consulted for specific requirements.

U.S. DEPARTMENT OF LABOR
Occupational Safety and Health Administration
(Non-Mandatory Form)
Form Approved
OMB No. 1218-0072

IDENTITY (As used on label and list)
A660 (N) TRADE SECRET

Note: Blank spaces are not permitted. If any item is not applicable, or no information is available, the space must be marked to indicate that.

Section I

Manufacturer's Name
NOCHAR, INC.

Emergency Telephone Number
(317) 613-3046

Address *(Number, Street, City, State and ZIP Code)*
8650 COMMERCE PARK PLACE SUITE K
INDIANAPOLIS, INDIANA 46268

Telephone Number for information
FAX: (317) 613-3052

Date Prepared
OCTOBER 2003

Signature of Preparer *(optional)*

Section II - Hazardous Ingredients/Identity Information

Hazardous Components (Specific Chemical Identity; Common Name(s))	OSHA PEL	ACGIH TLV	Other Limits Recommended	% (optional)
NONE				

Section III - Physical/Chemical Characteristics

Boiling Point	NONE	**Specific Gravity (H_2O = 1)**	.80
Vapor Pressure (mm Hg.)	NONE	**Melting Point**	N/A
Vapor Density (AIR = 1)	N/A	**Evaporation Rate (Butyl Acetate = 1)**	N/A
Solubility in Water	INSOLUBLE	**Appearance and Odor**	Solid, Generally in Powder Form, Essentially Odorless

Section IV - Fire and Explosion Hazard Data

Flash Point (Method Used)	N/A	**Flammable Limits**	N/A	**LEL**	**UEL**
Extinguishing Media	FOAM- DRY CHEMICAL CARBON DIOXIDE				
Special Fire Fighting Procedures	AVOID WATER WHICH SWELLS PRODUCT.				
Unusual Fire and Explosion Hazards	NONE KNOWN				

Section V - Reactivity Data

Stability	**Unstable**		**Conditions to Avoid**
	Stable	X	EXTREME HEAT, (420 F) OPEN FLAME
Incompatibility (Materials to Avoid)			MATERIAL WILL SWELL WITH WATER
Hazardous Decomposition or Byproducts			CO, CO2 MAY PRODUCE ACROLEIN, ACIDS, KETONES. ALDEHYDES. TREAT COMBUSTION PRODUCTS AS TOXICS.
Hazardous Polymerization	**May Occur**		**Conditions to Avoid**
	Will Not Occur	X	

Section VI - Health Hazard Data

Route(s) of Entry:	**Inhalation**	X	**Skin**	X	**Ingestion**	X	

Health Hazards *(Acute and Chronic)*

INHALATION: REMOVE TO FRESH AIR, IF NOT BREATHING, GIVE ARTIFFICIAL RESPIRATION. *EYES*: FLUSH WITH WATER FOR 15 MIN. CALL PHYSICIAN. *SKIN*: WASH EXPOSED AREA WASH WITH SOAP AND WATER. CALL PHYSICIAN. *INGESTION*: DO NOT INDUCE VOMITING. CALL PHYSICIAN.

Carcinogenicity:	N/A	**NTP?**	**IARC Monographs?**	**OSHA Regulated?**

Signs and Symptoms of Exposure

PRODUCT MAY BE SLIGHTLY IRRITATING TO EYES. ORAL TOXICITY IS LOW. THERMAL DECOMPOSITION MAY PRODUCE TOXIC, IRRITATING GASES OR FUMES (SEE HAZARDOUS DECOMPOSITION OR BYPRODUCTS)

Medical Conditions - Generally Aggravated by Exposure

PREEXISTING EYE, SKIN & RESPIRATORY DISORDERS MAY BE AGGRAVATED BY PRODUCT.

Emergency and First Aid Procedures

EYE CONTACT: FLUSH EYES WITH WATER. IF IRRTATION OCCURS, CONSULT PHYSICIAN.

BURNS: TREAT AS FOR ORDINARY BURNS.

Section VII - Precautions for Safe Handling and Use

Steps to Be Taken in Case Material is Released or Spilled

RECOVER SOLID WITH BROOM, SHOVEL OR VACUUM. AVOID GENERATING DUST CLOUDS.

PUT RECOVERED MATERIAL IN CONTAINERS FOR RECLAMATION OR DISPOSAL.

Waste Disposal Method

FOLLOW FEDERAL, STATE AND LOCAL REGULATIONS. WHEN USED AS ABSORBENT,

FOLLOW REGULATIONS FOR ABSORBED MATERIAL.

Precautions to Be Taken in Handling and Storing

IMPERVIOUS GLOVES, CHEMICAL GOGGLES.

Other Precautions

Section VIII - Control Measures

Respiratory Protection (Specify Type) DUST RESPIRATOR FOR FINE PRODUCT

Ventilation	**Local Exhaust**	NO SPECIAL REQUIREMENT		**Special**	N/A
	Mechanical (General)	IF POSSIBLE	**Other**	N/A	
Protective Gloves	IMPERVIOUS GLOVES		**Eye Protection**	SAFETY GLASSES OR GOGGLES	
Other Protective Clothing or Equipment	NOT NECESSARY				
Work/Hygienic Practice	NORMAL HYGIENE PRACTICES SHOULD BE FOLLOWED; WASH HANDS, ETC. AFTER HANDLING.				

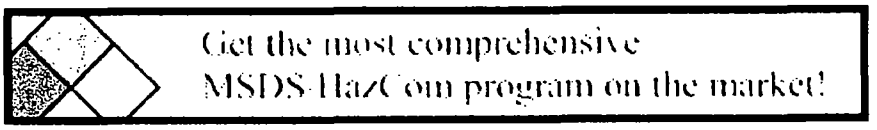
DISCLAIMER: *The information contained herein is based on the data available to us and is believed to be correct. However, the manufacturer makes no warranty, expressed or implied regarding the accuracy of this data or the results to be obtained from the use thereof, and assumes no responsibility for injury from the use of the product described herein. The manufacturer assumes no liability for incidental, consequential or direct damage of any manner or kind, regardless of cause, including negligence.*

NFPA RATINGS

HEALTH 0

FLAMMABILITY 1

REACTIVITY 1



Material Safety Data Sheet

SECTION I - Material Identity
SECTION II - Manufacturer's Information
SECTION III - Physical/Chemical Characteristics
SECTION IV - Fire and Explosion Hazard Data
SECTION V - Reactivity Data
SECTION VI - Health Hazard Data
SECTION VII - Precautions for Safe Handling and Use
SECTION VIII - Control Measures
SECTION IX - Label Data
SECTION X - Transportation Data
SECTION XI - Site Specific/Reporting Information
SECTION XII - Ingredients/Identity Information

SECTION I - Material Identity

Item Name	
Part Number/Trade Name	AJAX ALL PURPOSE CLEANER W/ AMMONIA
National Stock Number	7930P04949
CAGE Code	0M5F7
Part Number Indicator	A
MSDS Number	193546
HAZ Code	B

SECTION II - Manufacturer's Information

Manufacturer Name	COLGATE-PALMOLIVE
Street	191 E HANOVER AVE
City	MORRISTOWN
State	NJ
Country	US
Zip Code	07962
Emergency Phone	412-692-5596 (COLLECT)
Information Phone	800-432-8226

MSDS Preparer's Information

Date MSDS Prepared/Revised	01JAN98
Active Indicator	Y

Alternate Vendors

SECTION III - Physical/Chemical Characteristics

Appearance/Odor	LIQUID, WHITE, AMMONIA ODOR
Specific Gravity	1.16
Solubility in Water	COMPLETE
Chemical pH	10.7
Container Type	R
Container Pressure Code	1
Temperature Code	4
Product State Code	L

SECTION IV - Fire and Explosion Hazard Data

Flash Point	200
Flash Point Method	UNK
Extinguishing Media	WATER SPRAY, ALL-PURPOSE DRY CHEMICAL
Special Fire Fighting Procedures	SCBA & PROTECTIVE CLOTHING SHOULD BE WORN WHEN FIGHTING CHEMICAL FIRES. USE WATER SPRAY TO KEEP FIRE-EXPOSED CONTAINERS COOL

SECTION V - Reactivity Data

Stability	YES
Materials to Avoid	AVOID CONTACT W/ CHLORINE, ACIDS & STRONG OXIDIZING AGENTS. DO NOT MIX W/ BLEACH OR BLEACH PRODUCTS
Hazardous Decomposition Products	MAY PRODUCE IRRITATING AND/OR TOXIC FUMES UPON THERMAL DECOMPOSITION
Hazardous Polymerization	NO
Polymerization Conditions to Avoid	WILL NOT OCCUR

SECTION VI - Health Hazard Data

Route of Entry: Skin	U
Route of Entry: Ingestion	U
Route of Entry: Inhalation	U
Health Hazards - Acute and Chronic	{EYE} IRRITANT UPON DIRECT CONTACT {SKIN} MAY CAUSE IRRITATION UPON PROLONGED CONTACT {INHALE} OVEREXPOSURE MAY CAUSE RESPIRATORY TRACT IRRITATION {INGEST} MAY BE HARMFUL IF SWALLOWED IN LARGE AMOUNTS
Emergency/First Aid Procedures	{EYE} FLUSH W/ LARGE AMOUNTS OF WARM WATER FOR 15 MIN. {SKIN} FLUSH EXPOSED AREA W/ LARGE AMOUNTS OF WATER {INHALE} REMOVE TO FRESH AIR {INGEST} DRINK 1-2 GLASSES OF WATER. DO NOT INDUCE VOMITING. GET MED. ATTN IMMEDIATELY

SECTION VII - Precautions for Safe Handling and Use

Steps if Material Released/Spilled	COVER W/ INERT, ABSORBENT MATERIAL & REMOVE TO DISPOSAL CONTAINER. AREA MAY BE SLIPPERY, FLUSH W/ PLENTY OF WATER
Waste Disposal Method	MUST BE IN COMPLIANCE W/ LOCAL, STATE & FED LAWS & REGS. DO NOT DUMP INTO SEWERS, ANY BODY OF WATER OR ONTO THE GROUND
Handling and Storage Precautions	STORE IN A TIGHTLY CLOSED CONTAINER IN A COOL, DRY, WELL-VENTILATED AREA

SECTION VIII - Control Measures

Respiratory Protection	NOT REQUIRED
Protective Gloves	RUBBER GLOVES RECOMMENDED
Eye Protection	GOGGLES RECOMMENDED
Supplemental Health/Safety Data	AVOID CONTACT W/ SKIN & EYES

SECTION IX - Label Data

Protect Eye	NO
Protect Skin	NO
Protect Respiratory	NO
Chronic Indicator	UNKNOWN
Contact Code	UNKNOWN
Fire Code	UNKNOWN
Health Code	UNKNOWN
React Code	UNKNOWN

SECTION X - Transportation Data

SECTION XI - Site Specific/Reporting Information

Volatile Organic Compounds (P/G)	0
Volatile Organic Compounds (G/L)	0

SECTION XII - Ingredients/Identity Information

Ingredient #	01
Ingredient Name	NO INGREDIENTS LISTED ON MSDS
CAS Number	1005
Percent	1

Household Products Database

National Institutes of Health
National Library of Medicine
Specialized Information Services

Brand Information

Brand Name:	Ajax Scouring Cleanser
Form:	powder
Product Category:	Home inside >> Bathroom & Kitchen >> multipurpose cleaner Home inside >> Cleaner >> multipurpose
Customer Service No.:	800-221-4607
Date Entered:	1996-08-21
Related Items:	Products with similar usage in this database

Manufacturer

Manufacturer:	Colgate Palmolive Co.
Address:	300 Park Avenue
City:	New York
State:	NY
Zip Code:	10022
Telephone Number:	212-310-2000
Fax Number:	212-310-3243
Toll Free Number:	800-221-4607
Date Info Verified:	2007-02-07
Related Items:	Products by this manufacturer

Health Effects

Search TOXNET
Enter text or highlight term...

The following information (Health Effects, Handling/Disposal, and Ingredients) is taken from the product label and/or the Material Safety Data Sheet (MSDS) prepared by the manufacturer. The National Library of Medicine does not evaluate information from the product label or the Material Safety Data Sheet.

Acute Health Effects:	From MSDS Inhalation: No hazards under normal conditions of use. Prolonged inhalation by unorthodox use (non-wetted) or abuse (sniffing) may affect respiratory function in some individuals. Skin Contact: May cause skin irritation on prolong contact. Eye Contact: Causes eye irritation on direct contact. Ingestion: May cause nausea, vomiting and diarrhea
Chronic Health Effects:	MSDS states "This product contains fine particulates which, under conditions of unorthodox use, may affect respiratory function in some individuals. These particles may aggravate asthma, bronchitis, and other lung conditions. (For a further discussion of potential health effects of the chemical ingredients listed on the label or mentioned as hazardous under 'Ingredients' in this database file, consult the accompanying chemical database file.)
Carcinogenicity:	The manufacturer's Material Safety Data Sheet (MSDS) states that "IARC found sufficient evidence to classify silica as a carcinogen in animals. However, the evidence in humans is limited. It is anticipated to be a carcinogen by NTP."
Health Rating:	2
Flammability Rating:	0
Reactivity Rating:	0
HMIS Rating Scale:	0 = Minimal; 1 = Slight; 2 = Moderate; 3 = Serious; 4 = Severe N = No information provided by manufacturer, * = Chronic Health Hazard

MSDS Date: 1996-08-2

Handling/Disposal

Handling: MSDS: Keep out of reach of children. Avoid inhalation of the dust: use in a well ventilated area on welted surface. Avoid contact with acids. Low levels of chlorine gas could be released when powder is exposed to flames. Keep container sealed to avoid absorption of moisture from the air and possible loss of bleaching function. Not recommended for use on silver fabrics, painted surfaces, rubber or soft plastic.

Disposal: MSDS: Small (household) amounts may be disposed of in an approved land disposal facility

Ingredients from MSDS/Label

Chemical	CAS No / Unique ID	Percent
Sodium carbonate	000497-19-8	2
Quartz	014808-60-7	1.02
Sodium dodecylbenzenesulfonate	025155-30-0	1.7

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Last updated: April 23, 2007

Household Products Database

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Brand Information

Brand Name:	Mr Clean Liquid Cleaner
Form:	liquid
Product Category:	Home inside >> Bathroom >> cleaner Home inside >> Kitchen >> cleaner Home inside >> Cleaner >> multipurpose Home inside >> Cleaner >> kitchen
Customer Service No.:	800-262-1637
Date Entered:	2001-05-30
Related Items:	Products with similar usage in this database

Manufacturer

Manufacturer:	Procter & Gamble Co
Address:	P.O. Box 599
City:	Cincinnati
State:	OH
Zip Code:	45201
Telephone Number:	513-983-1100
Fax Number:	513-562-4500
Toll Free Number:	800-543-7270
Date Info Verified:	2007-02-07
Related Items:	Products by this manufacturer

Health Effects

Search TOXNET
Enter text or highlight term...

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Acute Health Effects: From MSDS:
Health Hazards (Acute and Chronic):
Ingestion: Harmful if swallowed.
Eye Contact: Mild eye irritant.
Inhalation: N/A
Skin: Mild skin irritant.

Signs and Symptoms of Exposure:
Ingestion: Oral ingestion may result in transient nervous system effects (ataxia and muscle weakness) and/or gastrointestinal irritation with nausea, vomiting, or diarrhea. This product contains alcohol ethoxylates. Large ingestions (>2 ml/kg) may also cause symptoms of alcohol-like intoxication, incoordination, drowsiness, inarticulateness or ataxia. Alcohol ethoxylates may contribute to central nervous system symptoms.
Eye Contact: Instillation into the eye may result in transient superficial effects similar to those produced by mild toilet soaps and detergents.
Skin: Use on irritated or extremely dry skin may aggravate the existing condition.
Inhalation: N/A

Chronic Health Effects: MSDS: *Chronic health hazards same as acute hazards.*

Carcinogenicity: The manufacturer's Material Safety Data Sheet (MSDS) does not address the subject of carcinogenicity.

First Aid: MSDS. WARNING: KEEP OUT OF REACH OF CHILDREN. HARMFUL IF

SWALLOWED. EYE IRRITANT. If swallowed, drink a glassful of water and call a physician. In case of contact with eyes, rinse thoroughly with water.

Emergency and First Aid Procedures.
Ingestion: Dilute with fluids and call a physician.
Eye Contact: Flush thoroughly with water.
Skin: Wash exposed area with soap and water and discontinue use. Remove contaminated clothing.
Inhalation: Remove to fresh air.

Health Rating:
Flammability Rating: 0
Reactivity Rating: 0
HMIS Rating Scale: 0 = Minimal; 1 = Slight; 2 = Moderate; 3 = Serious; 4 = Severe;
N = No information provided by manufacturer; * = Chronic Health Hazard
MSDS Date: 1999-11-01

Handling/Disposal

Handling: MSDS: Precautions To Be Taken in Handling and Storing: Store in cool, dry, well ventilated area.

Disposal: MSDS: DISPOSAL IS TO BE PERFORMED IN COMPLIANCE WITH ALL FEDERAL, STATE AND LOCAL REGULATIONS
Do not landfill. Small (household) quantities may be disposed of via sewer with large quantities of water. Incineration is preferred where permitted.

Ingredients from MSDS/Label

Chemical	CAS No / Unique ID	Percent
Fragrance(s)/perfume(s)	000000-00-1	
Surfactant(s) (unspecified)	000000-00-4	0.1-1
Water	007732-18-5	
C9-11 Pareth-3	068439-46-3	0.1-1
Colorant/Pigment/Dye(s)	999999-49-5	
Quality control agent(s)	999999-49-6	

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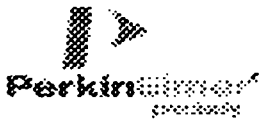

Creation Date: 12-01-2003
Revision Date: 03-20-2007

Material Safety Data Sheet

1. Chemical Product and Company Identification

Material Name	**ULTIMA GOLD / 2*5 L**
Version #	02
Item #	6013329
Identification Of The Company/Undertaking	PerkinElmer Life and Analytical Sciences 710 Bridgeport Avenue Shelton, CT 06484 Technical Support 800-762-4000
Emergency Telephone Number	CHEMTREC 800-424-9300 Emergency Phone 800-762-4000

2. Composition / Information on Ingredients

Hazardous component(s)	CAS #	Percent	PEL	TLV
TRIETHYL PHOSPHATE	78-40-0	1 - 2.5		
Non-hazardous component(s)	**CAS #**	**Percent**		
P-BIS(O-METHYLSTYRYL)BENZENE	13280-61-0	1 - 2.5		
SODIUM DIOCTYL SULFOSUCCINATE	577-11-7	1 - 2.5		
ETHYLENE OXIDE-NONYLPHENOL POLYMER	9016-45-9	10 - 20		
2,5-DIPHENYLOXAZOLE	92-71-7	1 - 2.5		
DIISOPROPYLNAPHTHALENE	38640-62-9	60 - 80		
PHOSPHORIC ACID, 2-ETHYLHEXYL ESTER, COMPOUND WITH 2,2'-IMINOBIS[ETHANOL]	73070-48-1	10 - 20		

3. Hazards Identification

Potential Short Term Health Effects

Skin

Not expected to be a primary skin irritant.

Eyes

Contact will irritate or burn eyes.

Inhalation

May cause irritation of respiratory tract.

Ingestion

Do not ingest. May be harmful if swallowed.

HMIS RATINGS

Health: 2
Flammability: 1
Physical hazard: 0
Personal protection: B

NFPA RATINGS	Health: 2 Flammability: 1 Instability: 0

4. First Aid Measures

General advice

If you feel unwell, seek medical advice (show the label where possible).

First Aid

Skin contact

If skin irritation persists, call a physician. Wash off immediately with soap and plenty of water removing all contaminated clothes and shoes. Rinse with water.

Eye contact

Flush eyes with water as a precaution. Rinse thoroughly with plenty of water for at least 15 minutes and consult a physician.

Inhalation

Move to fresh air. Oxygen or artificial respiration if needed.

Ingestion

If swallowed, seek medical advice immediately and show this container or label. If a person vomits when lying on his back, place him in the recovery position. If ingestion of a large amount does occur, seek medical attention. Have victim rinse mouth thoroughly with water.

5. Fire Fighting Measures

Suitable extinguishing media

Use extinguishing measures that are appropriate to local circumstances and the surrounding environment.

Small Fires: Dry chemical, CO2, water spray or regular foam.

Large Fires: Water spray, fog or regular foam.

Specific methods

Standard procedure for chemical fires.

6. Accidental Release Measures

Personal precautions

Use personal protective equipment. Keep people away from and upwind of spill/leak.

Environmental precautions

Prevent further leakage or spillage if safe to do so.

Methods for cleaning up

Soak up with inert absorbent material. Shovel into suitable container for disposal. Use a non-combustible material like vermiculite, sand or earth to soak up the product and place into a container for later disposal. Never return spills in original containers for re-use.

Containment Procedures

Stop the flow of material, if this is without risk. Prevent entry into waterways, sewers, basements or confined areas. Dike the spilled material, where this is possible. This material is a water pollutant and should be prevented from contaminating soil or from entering sewage and drainage systems and bodies of water.

7. Handling and Storage

Handling

Keep away from heat and sources of ignition. Handle and open container with care.

Storage

Use care in handling/storage.

8. Exposure Controls / Personal Protection

Exposure Limit Values

Exposure Controls

Engineering measures to reduce exposure

Provide adequate ventilation.

Hygiene measures

Handle in accordance with good industrial hygiene and safety practice.

Respiratory protection

In the case of respirable dust and/or fumes, use self-contained breathing apparatus. Wear a positive-pressure supplied-air respirator. No personal respiratory protective equipment normally required.

Hand protection

gloves

Eye protection

Avoid contact with eyes.

9. Physical & Chemical Properties

General Information

Form

Liquid.

Color

colorless

Odor

characteristic

Important health, safety and environmental information

Boiling Point 554 °F (290 °C)

10. Chemical Stability & Reactivity Information

Stability

No hazards to be especially mentioned.

Incompatibility

None known.

Further information

Stable at normal conditions

11. Toxicological Information

Acute Toxicity

NIOSH - Selected LD50s and LC50s

TRIETHYL PHOSPHATE	78-40-0	Oral LD50 Rat: 1311 mg/kg; Oral LD50 Mouse: 1500 mg/kg

Further information

This product has no known adverse effect on human health.

12. Ecological Information

Ecological Information

This material is not expected to be harmful to aquatic life.

Other adverse effects

Ecological injuries are not known or expected under normal use.

13. Disposal Considerations

Disposal Instructions

In accordance with local and national regulations. Dispose in accordance with all applicable regulations.

14. Transportation Information

US DOT

Other Information

Not classified as dangerous in the meaning of transport regulations.

15. Regulatory Information

US Federal Regulations

All components are on the U.S. EPA TSCA Inventory List.

OSHA Process Safety Standard: This material is not known to be hazardous by the OSHA Highly Hazardous Process Safety Standard, 29 CFR 1910.119.

CERCLA/SARA Hazardous Substances - Not applicable.

State Regulations

This product does not contain a chemical known to the State of California to cause cancer, birth defects or other reproductive harm.

16. Other Information

Disclaimer

The information provided in this Material Safety Data Sheet is based on our present knowledge, and believed to be correct at the date of publication. However, no representation is made concerning its accuracy and completeness. It is intended as guidance only, and is not to be considered a warranty or quality specification. All materials may present unknown hazards, and should be used with caution. Although certain hazards are described, we cannot guarantee that these are the only hazards which exist. PerkinElmer Life and Analytical Sciences shall not be held liable for any damage resulting from handling or from contact with the product.

Alcohol SDA 3A

1. CHEMICAL PRODUCT AND COMPANY IDENTIFICATION

PRODUCT NAME: SDA 3A Anhydrous

OTHER/GENERIC NAMES: Ethyl Alcohol SDA-3A, Denatured Alcohol

PRODUCT USE: Solvent

MANUFACTURER: Honeywell, Burdick & Jackson
1953 South Harvey Street
Muskegon, MI 49442

FOR MORE INFORMATION CALL:
(Monday-Friday, 8:00am-5:00pm)
1-800-368-0050

IN CASE OF EMERGENCY CALL:
(24 Hours/Day, 7 Days/Week)
1-800-707-4555 or Chemtrec 1-800-424-9300

2. COMPOSITION/INFORMATION ON INGREDIENTS

INGREDIENT NAME	CAS NUMBER	WEIGHT %
Ethyl Alcohol	64-17-5	95
Methanol	67-56-1	5

Trace impurities and additional material names not listed above may also appear in Section 15 toward the end of the MSDS. These materials may be listed for local "Right-To-Know" compliance and for other reasons.

3. HAZARDS IDENTIFICATION

EMERGENCY OVERVIEW: Extremely flammable liquid and vapor. Clear colorless liquid. Mildly toxic by inhalation, ingestion and skin contact. Cannot be made non-poisonous.

POTENTIAL HEALTH HAZARDS

SKIN: Irritant. May cause dermatitis through defatting of the skin.

EYES: Irritant. Redness and itching may result from exposure to vapors or liquid.

INHALATION: Can cause headache, drowsiness, intoxication, visual impairment, blindness, coma and death.

INGESTION: Can cause gastrointestinal disorder, central nervous system depression, headache, drowsiness, intoxication, visual impairment, blindness, coma and death

DELAYED EFFECTS: Prolonged or repeated exposure can result in alcoholism, cyanosis, respiratory failure and liver damage.

Ingredients found on one of the OSHA designated carcinogen lists are listed below.

INGREDIENT NAME	NTP STATUS	IARC STATUS	OSHA LIST
No ingredients listed in this section			

4. FIRST AID MEASURES

SKIN: Immediately flush thoroughly for at least 15 minutes. Wash affected skin with soap and water. Remove contaminated clothing and shoes.

EYES: Immediately rinse with copious amounts of water for at least 15 minutes. Get emergency medical assistance immediately.

INHALATION: Immediately remove to fresh air. If not breathing, administer mouth-to-mouth rescue breathing. If there is no pulse, administer cardiopulmonary resuscitation (CPR). Contact physician immediately.

INGESTION: Contact physician immediately. Never induce vomiting or give anything by mouth to a victim unconscious or having convulsions.

ADVICE TO PHYSICIAN: In case of ingestion or massive inhalation, observe victim as an inpatient because slow metabolism causes a latent period of 24 hours between exposure and acidosis and blindness.

5. FIRE FIGHTING MEASURES *Fire and Explosion Hazard Data is for ethyl alcohol only.*

FLAMMABLE PROPERTIES

FLASH POINT:	59°F, 15° C
FLASH POINT METHOD:	(Tag closed cup)
AUTOIGNITION TEMPERATURE:	363° C
UPPER FLAME LIMIT (volume % in air):	19.0
LOWER FLAME LIMIT (volume % in air):	3.3
FLAME PROPAGATION RATE (solids):	Not Applicable
OSHA FLAMMABILITY CLASS:	IB

EXTINGUISHING MEDIA:
Alcohol foam, carbon dioxide or dry chemical.

UNUSUAL FIRE AND EXPLOSION HAZARDS:

Incomplete combustion can generate carbon monoxide. May burn with an invisible flame. Under some circumstances can corrode certain metals, including aluminum and zinc, and generate hydrogen gas.

SPECIAL FIRE FIGHTING PRECAUTIONS/INSTRUCTIONS:

Wear full protective clothing and self-contained breathing apparatus.
Heat will build pressure an may rupture closed storage containers.
Keep fire-exposed containers cool with water spray.

6. ACCIDENTAL RELEASE MEASURES

IN CASE OF SPILL OR OTHER RELEASE: (Always wear recommended personal protective equipment.)

Eliminate sources of ignition. Isolate the spill area. Stop leak in a safe and practical manner. (If leak cannot be stopped easily and safely, advise trained emergency response personnel of the situation.) Using inert material (such as ground corncobs) dike the spilled solvent to prevent it from running into drains or waterways.

Spills and releases may have to be reported to Federal and/or local authorities. See Section 15 regarding reporting requirements.

7. HANDLING AND STORAGE

NORMAL HANDLING: (Always wear recommended personal protective equipment.)

STORAGE RECOMMENDATIONS:

This material should be protected from temperature extremes and direct sunlight. Proper storage of this material must be determined based on other materials stored and their hazards and potential chemical incompatibility. In general, this material should be stored in an acceptably protected and secure flammable liquid storage room.

8. EXPOSURE CONTROLS/PERSONAL PROTECTION

ENGINEERING CONTROLS:

Provide general or local exhaust ventilation systems to maintain airborne concentrations below permissible TLV levels. Local exhaust ventilation is preferred because it prevents contaminant dispersion into the work area by controlling it at its source.

PERSONAL PROTECTIVE EQUIPMENT

SKIN PROTECTION:

Where liquid contact is possible impervious coveralls are recommended. To minimize the possibility in other handling and storage operations, wear appropriate PPE to include chemical resistant gloves, boots and apron.

EYE PROTECTION:
Safety glasses are considered minimum protection. Goggles or face shield may be necessary depending on quantity of material and conditions of use.

RESPIRATORY PROTECTION:
Seek professional advice prior to respirator selection and use. Follow OSHA respirator regulations (*29 CFR 1910.134*) and, if necessary, wear a MSHA/NIOSH-approved respirator. For emergency or non-routine operations (cleaning spills, reactor vessels, or storage tanks), wear an SCBA. Warning! Air-purifying respirators do not protect workers in oxygen-deficient atmospheres.

ADDITIONAL RECOMMENDATIONS:
This material should be used in close proximity to eyewash station and safety shower. Use appropriate personal hygiene after handling this material. Do not smoke in the vicinity of flammable materials.

EXPOSURE GUIDELINES

INGREDIENT NAME	ACGIH TLV	OSHA PEL	OTHER LIMIT
Ethyl Alcohol	1000 ppm	1000 ppm	none
Methyl Alcohol	200 ppm (skin)	200 ppm	250 ppm (STEL)

* = Limit established by Honeywell International, Inc.
** = Workplace Environmental Exposure Level (AIHA).
*** = Biological Exposure Index (ACGIH).

OTHER EXPOSURE LIMITS FOR POTENTIAL DECOMPOSITION PRODUCTS:
None

9. PHYSICAL AND CHEMICAL PROPERTIES *Physical and Chemical Data is for ethyl alcohol only.*

APPEARANCE:	Clear, colorless
PHYSICAL STATE:	Liquid
MOLECULAR WEIGHT:	Mixture
CHEMICAL FORMULA:	Government formula SD-3A
ODOR:	Fragant odor
SPECIFIC GRAVITY (water = 1.0):	@ 20° C 0.78
SOLUBILITY IN WATER (weight %):	@ 20° C complete
pH:	Not Applicable
BOILING POINT:	175° F, 78° C
MELTING POINT:	<-114° C
VAPOR PRESSURE: at 20° C:	45 mm Hg
VAPOR DENSITY (air = 1.0):	1.59
EVAPORATION RATE:	3.2 **COMPARED TO:** Butyl Acetate = 1

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Adogen 364 information

Solvent extraction in nuclear technology

James D. Navratil

Rockwell International, Rocky Flats Plant, P.O. Box 464, Golden, CO 80401, U.S.A.

Abstract - Some aspects of solvent extraction chemistry in the field of nuclear technology are briefly reviewed. Applications of solvent extraction in actinide recovery and purification, radionuclide production, and reactor materials preparation are summarized. The need for new, more selective, solvent extraction reagents is presented via examples of recent work with bifunctional organophosphorus reagents applied to the removal of actinides from acidic radioactive waste solutions.

INTRODUCTION

Liquid-liquid solvent extraction technology is used in numerous industrial processes such as petroleum and petrochemical processing, organic chemical and pharmaceutical production, food and fuel industries, effluent treatment, and hydrometallurgy (ref.1). Although solvent extraction technology had its beginning more than 100 years ago, it owes a significant amount of its present prominence as a separation technique to its successful applications in the field of nuclear technology, when demands for simple separation processes for many elements, previously considered only laboratory curiosities, arose. The use of thorium, uranium, plutonium and other actinides in the nuclear energy programs and interest in metals such as hafnium-free zirconium as a reactor construction material and bismuth, gallium and indium as heat transfer media have led to the rapid development of many solvent extraction processes that display selectivity, simplicity and speed.

This paper briefly reviews the various liquid-liquid solvent extraction reagents used in several nuclear technological areas, such as purification of reactor materials, radionuclide production, and the recovery and purification of thorium, uranium, and plutonium. New reagents, especially bifunctional organophosphorus compounds for actinide removal from acidic nuclear waste solutions will be discussed with a call for better, more selective, and less expensive reagents for use in the field.

APPLICATIONS

Reactor materials

Materials employed in reactor technology along with some of the successful solvent extraction reagents used for their separation are summarized in Table 1. Of the processes connected with the elements listed none have more challenged the nuclear chemist and engineer than those of zirconium and hafnium separation and production. Each element is always associated with the other and their chemistry is very similar. Among the extractants used for the successful separation of the two elements are tributyl phosphate (ref. 10,11), thenoyltrifluoroacetone (ref. 12) and tri-n-octylamine (ref. 13), while the addition of thiocyanate to the aqueous phase extends the range of applicable solvents to methyl-iso-butyl ketone (ref. 14), diethyl ether, n-butanol, cyclohexanone, n-butyl acetate, pentyl acetate, methyl propyl ketone, and ethyl-iso-propyl ketone (ref. 15). The solvents commonly used in industrial processes involve methyl-iso-butyl ketone and tributyl phosphate. They have the advantage of high separation factors.

Radionuclide production

A large number of radionuclides are finding ever-increasing usage in agriculture, industry, medicine and science (ref. 17), and are artificially produced by means of a nuclear reactor or a particle accelerator. When transmutation reactions are employed or interfering secondary reactions occur, chemical separations must be employed to obtain pure forms of the radionuclide. Numerous examples exist in the literature of the use of solvent extraction in the laboratory scale preparation of purified radionuclides. Some of the reagents used are briefly summarized in Table 2.

TABLE 1. Some solvent extractants used for producing reactor materials

Reactor Material	Solvent Extractant	Reference
Bismuth	Diethyldithiocarbamate	(2)
Lead	Methyl-iso-propyl ketone	(3)
	Diethyldithiocarbamate-dithizone	(4)
Rare earths	Tributyl phosphate	(5)
	Butyl alcohol/thiocyanates	(6)
Tantalum/ niobium	(a) Hexone; (b) Di-iso-propyl ketone	(7,8)
	Octylarsinic acid	(9)
	Tributyl phosphate	(1)
Zirconium/ hafnium	Tributyl phosphate	(10,11)
	Thenoyltrifluoroacetone	(12)
	Tri-n-octylamine	(13)
	Methyl-iso-butyl ketone/thiocyanate	(14)
	Diethyl ether/thiocyanate	(15)
	Primene JMT (a long-chain primary chain)	(16)

TABLE 2. Some solvent extractants used for producing radionuclides.

Radionuclide	Solvent Extractant	Reference
Calcium-45	Thenoyltrifluoro-acetone in benzene	(18)
Cobalt-58	Tributyl phosphate	(19)
	Tributyl phosphate	(20)
	Methyl-iso-butyl ketone/1-phenyl-3-methyl-4-capryl-pyrazolone-5	(21)
Copper-64	Dithizone in CCl_4	(22)
Gold-198	Ethyl acetate	(23)
Iron-59	Isopropyl ether	(24)
Potassium-42	Tributyl phosphate	(25)

Solvent extraction plays a key role in the Transuranium Processing Plant operated in conjunction with the High Flux Isotope Reactor at Oak Ridge National Laboratory to produce large quantities of the transuranium elements for use as heat and power sources and for distribution to researchers (ref. 26). Plutonium is recovered from dissolved irradiated targets by solvent extraction with bis-(2-ethylhexyl)-phosphoric acid. The remaining transplutonium elements are then decontaminated from fission products by countercurrent solvent extraction with a high purity tertiary amine, Adogen 364, in diethylbenzene. Americium and curium are partitioned from the transcurium elements by a LiCl-based anion exchange process for small-scale processes but extraction with di-(2-ethylhexyl)phosphoric acid in Amsco 125-82 diluent is preferred for large-scale production. Subsequent Am-Cm separation and berkelium and californium isolation are achieved by precipitation, solvent extraction and chromatographic anion exhange processes respectively.

Uranium recovery from ores and other sources

The major stages in the conventional processes for the milling of uranium ores include leaching of uranium by acid or alkaline solutions, concentration and purification by solvent extraction or ion exchange, and precipitation. Solvent extraction has displaced many of the initial ion exchange processes for the concentration and purification of uranium from acid leaching processes. While it is primarily used with clarified acid solutions, considerable development work has been done on alkaline solutions and on solvent-in-pulp applications. The two types of solvent employed are tertiary amines (Alamine 336) and alkylphosphoric acids (di-(2-ethylhexyl)phosphoric acid) (ref. 27,28). Generally, amine solvents have superseded the alkylphosphoric acids because of their selectivity, although the latter are preferred when vanadium is present in the feed stream.

The fertilizer industry produces large quantities of wet process phosphoric acid solution containing 0.1-0.2 g/l of uranium, which represent a large potential source of uranium. A two-cycle process was developed for the recovery of uranium from these phosphoric acid solutions by extraction with di-(2-ethylhexyl)phosphoric acid plus trioctylphosphine oxide in an aliphatic diluent (ref. 29). Later studies simplified the solution chemistry of the process by replacing the first extraction cycle with the commercial solvent mixture, mono and dioctylphenylphosphoric acid (octylphenylacidphosphate) (ref. 30).

Spent nuclear fuel processing

As is shown above, tributyl phosphate has found applications in many hydrometallurgical processes and is the extractant of choice in spent nuclear fuel processing. All major plants for reprocessing spent nuclear fuel employ tributyl phosphate to separate uranium and plutonium from fission products, as well as to purify the separated plutonium and uranium (ref. 31). Tributyl phosphate is also used to reprocess spent thorium containing nuclear fuels, and to separate the actinide-lanthanide fraction from reprocessing wastes.

Solvent extractants used prior to TBP included methylisobutylketone and dibutyl carbitol and many other reagents, such as alkylphosphonates, phenylphosphonates and tertiary amines, have been proposed as replacements for tributyl phosphate in the reprocessing of spent nuclear fuels (ref. 31). Thus far, the reagents investigated do not have a significant advantage over the following attractive properties of tributyl phosphate: 1) suitable extracting power, 2) good decontamination of fission products, 3) good density, viscosity, flash-point, etc., and 4) reasonable stability.

NEW SOLVENT EXTRACTANTS

The literature abounds with articles on new extractants (re. 1,31-35). While many of the reagents are only of academic interest, several types of extractants show promise in improving actinide separation and recovery, improved recovery of uranium from its ores and other low-grade sources and promise of alternate methods for radionuclide production.

Table 3 shows some of the newer extractants that are currently being studied and their possible applications.

TABLE 3. Some new extractants and possible applications.

Extractant	Application	Reference
Carbamoylmethylphosphonates	Actinide recovery/purification	(32-39)
Carbamoylmethylphosphine oxides	Actinide recovery/purification	(39)
Sulphoxides	Actinide separation	(40,41)
Crown ethers	Pb(II), Sr(II) separation	(42)
Arsine oxides	Actinide separation	(35)
Macrobicycles	Na,K,Cs separation	(43)

In the last decade there has been much interest in the potential application of the neutral bifunctional organophosphorus compounds, carbamoylmethylphosphonates(CMP) and carbamoylmethylphosphine oxides(CMPO), to remove trivalent actinides and lanthanides from strong nitric acid solutions, a property which distinguishes them from monofunctional organophosphorus compounds (ref. 33-39). The Arbuzov rearrangement

$$(GO)_3P + (G')_2NCO(CH_2)X \text{ — } (GO)_2P(O)(CH_2)C(O)N(G')_2 + GX \qquad (1)$$

has been used to prepare (in 40 to 60% yield) carbamoylphosphonates (ref. 33). Kim et al. (ref. 44) have discovered a phase transfer-catalyzed Michaelis-Becker reaction which is not plagued by the side reactions typical of conventional Arbuzov synthesis which seriously limit yields and purities of crude products.

Two general methods for preparing phosphine oxides have been reported (ref. 45):

$$2(G_2)P(O)MgX + X(CH_2)_nX \rightarrow (G)_2P(O)(CH_2)_n(P)O(G)_2 + 2MgX_2 \qquad (2)$$

$$2G_2POCl + (CH_2)_{n\geq 4}(MgX)_2 \rightarrow (G)_2P(O)(CH_2)_{n\geq 4}(O)P(G)_2 + MgCl_2 + MgX_2 \qquad (3)$$

Compounds which are solids at room temperature, such as phosphine oxides, can be readily purified by repeated recrystallizations, whereas with crude carbamoylphosphonates several methods have been used (ref. 33). Vacuum distillation (0.001 torr, 110 degrees C), high pressure liquid chromatography, and salt precipitation methods have been very successful in purifying carbamoylmethylphosphonates, with the latter method being preferred.

Most recently, Horwitz and coworkers (ref. 39) have evaluated a number of neutral bifunctional organophosphorus extractants containing the $P(O)(CH_2)_nC(O)N$ moiety for their ability to extract americium from nitric acid and their selectivity for americium over iron and selected fission products. Compounds containing alkoxy, alkyl, and aryl substituents were evaluated. The most efficient and selective americium extractants contain a single carbon bridging group, one or two phenyl groups attached to the phosphorus atom and isobutyl groups attached to the amide nitrogen. Fig. 1 summarizes the properties affected by substituents on the carbamoyl-phosphoryl moiety.

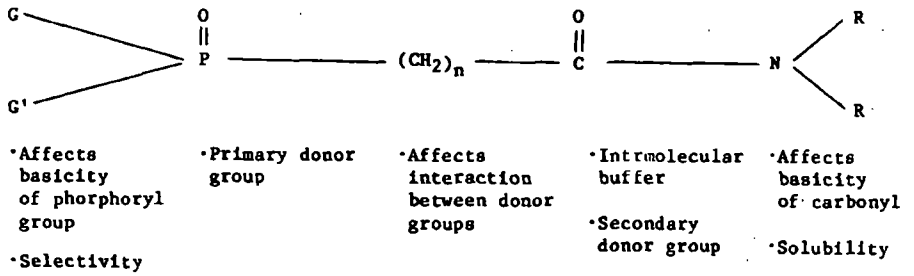

Fig. 1. Effect of substituents on the properties of the carbamoylphosphoryl moiety.

CONCLUSION

Solvent extraction technology plays a vital role in actinide recovery and purification, radionuclide production, the preparation of reactor materials, and other aspects of the nuclear field. There are challenging research areas for the separations chemist and synthetic organic chemist to work together to improve solvent extraction processes and develop energy saving process technology. One major area alluded to in this paper is through the preparation and testing of new reagents which have a far greater selectivity for the solute species, better overall recovery, improved physical properties, less toxicity, and lower costs.

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Quik Solid

Quik-Solid® is a solid, granular cross-linked polyacrylate Advanced Superabsorbent Polymer that rapidly absorbs and retains large volumes of aqueous solutions. The absorptive properties of Quik-Solid® are ideally suited for the absorption and solidification of radioactive and other types of waste waters.

Quik-Solid National Stock Numbers & Part Numbers

Product features:

Reduces Waste Disposal Costs – expands in volume by less than 1%
Non-Biodegradable Polymer (per 40 CFR 264.314 (e)(ii)).
Freeze-Thaw Tested: will not release liquids after freezing and subsequent heating to160° F
Not release trapped Ionic contaminants if solute evaporation occurs.
Passes Paint Filter Test (EPA 9095).
Approved for use at Hanford and other licensed facilities
SEG Certified Incinerable Material with a heat value of 5560 BTU/lbs.
Strong Ion exchange capability allows for heavy metals to be bound and wastes to pass TCLP.

Typical Absorptive Properties:

Free Swell in D.I. Water 250-350 XIn
1% AIC I22-26 X
Free Swell in 1% NaC l43-52 X
In 6N NaOH 23-29 X
Free Swell in 2% NaCl 34-41 X
In 8N NaOH 22-28 X
Free Swell in 10% NaCl 19-23 X
In 6N NaOH + 2% NaCl 22-28 X
Free Swell in 1% CaCl 220-24 X
In 10% Bleach + 1% NaCl 39-47 X

Liquid Release Test (EPA 9096)
(Deionized Water Retention After 10 Minutes)

Passes with 25 x weight at 20 psi
Passes with 15 x weight at 50 psi

Radiation Testing on Dry Polymer:

Cobalt60 Rad Testing	**Absorbency In Deionized Water**	**Absorbency in 0.9% NaCl**	**Gel Volume in 0.9% NaCl**
0 megarads	250-300 X	50-60 X	33-41 X
5 megarads	120-140 X	34-42 X	n.d.
25 megarads	78-92 X	28-34 X	15-19 X
50 megarads	68-83 X	27-33 X	15-19 X
100 megarads	n.d.	n.d.	14-18 X
150 megarads	n.d.	n.d.	12-16 X

Quik Solid MSDS

Quik Solid®

Section 1: Manufacturer Information

CETCO
1350 West Shure Drive
Arlington Heights, IL 60004
847-392-5800

Section 2: Physical/Chemical Characteristics

Boiling Point - Not Applicable
Bulk Density (Apparent - g/cc) - 0.5-0.7
Vapor Pressure (mm Hg.) - Not Applicable
Melting point - Not Applicable
Vapor Density (AIR = 1) - Not Applicable
Evaporation Rate (Butyl Acetate = 1) - Not Applicable
Appearance - Off White, Odorless.

Section 3: Hazardous Ingredients/Identity Information

Hazardous Components: OSHA PEL ACGIH TLV
Other Components:
Recommended Exposure Limit (dust) 0.05mg/m3
Guideline for Respirable Particulate
Product Identification
Chemical Name CAS No. %
Sodium Polyacrylate, lightly crosslinked CAS#-076774-25-9
Water CAS#-7732-18-5
Acrylic Acid N/A CAS#-79-10-7
NFPA/HMIS: Health-1 Reactivity-0 Fire-1 Specific Hazard-See 4
DOT Class: Not Regulated

Section 4: Fire & Explosion Hazard Data

Flash Point (Method Used): Not available
Flammable Limits: Not available LEL UEL
Extinguishing Media: As with any fire, wear positive pressure, self-contained breathing apparatus in any closed space when fighting fire.
Special Fire Fighting Procedures: Not applicable
Unusual Fire and Explosion Hazards: Becomes slippery when wet. Under certain confined conditions, a fine dust of this material in air may cause a dust explosion if ignited.

Section 5: Reactivity Data

Stability: Stable **Incompatibility:** Strong oxidizers
Hazardous Decomposition or Byproducts: Thermal decomposition releases CO, CO2, Hydrocarbons
Hazardous Polymerization: Will not occur
Conditions to Avoid: None Known

Section 6: Health Hazard Data (applies to unused product)

Route (s) of Entry: Inhalation, ingestion, open wounds, eyes.
Health Hazards: Contact with eyes, skin or clothing may cause irritation. Care must be taken to minimize exposure and prevent workplace inhalation of respirable dust. Respiratory protection is required for exposures above the recommended level of respirable dust. A similar product, ground very finely, produced an inflammatory tissue response in the lungs in a lifetime exposure inhalation experiment with animals. According to the EPA "Hazard Categories" under sections 311 and 312 of SARA Title III, this product is considered to meet the applicable definitions of: A delayed health hazard.
Carcinogenicity: None known
IARC Monographs: No
OSHA Regulated: No
Signs/Symptoms of Exposure: Slight irritant effects
Medical Conditions Aggravated by Exposure: None known.
Emergency and First Aid Procedures:
Eyes: Flush with large quantity of water, consult physician.
Skin: Wash with soap and water.
Inhalation: Remove to fresh air, consult physician.

Section 7: Control Measures

Respiratory Protection: Use NIOSH or MSHA with high efficiency filter for particulate levels above 0.05mg/m3.

Ventilation: Local Exhaust – as appropriate
Mechanical (General) - as appropriate
Special/Other – none
Protective Gloves: Impervious/rubber
Eye Protection: Safety goggles as recommended
Other Protective Clothing or Equipment: If needed.
Work Hygienic Practices: Use good housekeeping practices.

Section: 8 Precautions for Safe Handling & Use

Steps to be taken in case material is released or spilled: Vacuum (using HEPA filter equipped system) if possible to avoid generating airborne dust. Avoid breathing dust. Wear an approved respirator. Exercise caution when adding water, product will become slippery when wet.
Waste Disposal Method: Dispose of in accordance with federal, state and local regulations.
Precautions to be taken in handling & storing: Store in a cool, dry place. Avoid breathing powder. Avoid skin and eye contact.
Other Precautions: Protective eye wear should be worn where dust levels are high enough to cause irritation. Slippery when wet.

Section 9: Supplemental Information
Prepared 10/1/98

DISCLAIMER: The information herein has been compiled from sources believed to be reliable and is accurate to the best of our knowledge. However, CETCO cannot give any guarantees regarding information from other sources, and expressly does not make any warranties, nor assumes any liability, for its use.

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CYTEC

MSDS: 0013279
Print Date: 03/12/2009
Revision Date: 03/12/2009

MATERIAL SAFETY DATA SHEET

1. CHEMICAL PRODUCT AND COMPANY IDENTIFICATION

Product Name:	**CYANEX® 301 GN Extractant**
Synonyms:	Bis(2,4,4-trimethylpentyl)dithiophosphinic acid
Chemical Family:	Dialkyldithiophosphinic acid
Molecular Formula:	C16H35PS2
Molecular Weight:	322

CYTEC INDUSTRIES INC., FIVE GARRET MOUNTAIN PLAZA, WEST PATERSON, NEW JERSEY 07424, USA
For Product Information call 1-800/652-6013. Outside the USA and Canada call 1-973/357-3193.

EMERGENCY PHONE (24 hours/day) - For emergency involving spill, leak, fire, exposure or accident call:
Asia Pacific Region:
Australia - +61-3-9663-2130 or 1800-033-111
China (PRC) - +86(0)532-8388-9090 (NRCC)
New Guinea - +61-3-9663-2130
New Zealand - +61-3-9663-2130 or 0800-734-607
All Others - +65-633-44-177 (CareChem24 Singapore)
Canada: 1-905-356-8310 (Cytec Welland, Canada plant)
Europe/Africa/Middle East: +44-(0)208-762-8322 (CareChem24 UK)
Latin America:
Brazil - 0800 0111 767 (SOS Cotec)
Chile - +56-2-247-3600 (CITUC QUIMICO)
All Others - +52-376-73 74122 (Cytec Atequiza, Mexico plant)
USA: +1-703-527-3887 or 1-800-424-9300 (CHEMTREC)

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2. COMPOSITION/INFORMATION ON INGREDIENTS

OSHA REGULATED COMPONENTS

Component / CAS No.	% (w/w)	OSHA (PEL):	ACGIH (TLV):	Carcinogen
Di(2,4,4-trimethylpentyl) dithiophosphinic acid 107667-02-7	68 - 72	Not established	Not established	-
Di(2,4,4-trimethyl-pentyl) monothio-phosphinic acid 132767-86-3	1 - 2	Not established	Not established	-
Petroleum distillate hydrotreated light 64742-47-8	18 - 22	500 ppm 1200 mg/m^3 (Supplier) 165 ppm (Supplier)	Not established	-

3. HAZARDS IDENTIFICATION

EMERGENCY OVERVIEW

APPEARANCE AND ODOR:

Color:	green
Appearance:	viscous liquid
Odor:	hydrogen sulfide

STATEMENTS OF HAZARD:

DANGER! CAUSES BURNS OF EYES AND SKIN
HARMFUL IF INHALED
Hydrogen sulfide may accumulate in vapor spaces of containers

POTENTIAL HEALTH EFFECTS

EFFECTS OF EXPOSURE:
The estimated acute oral (rat) LD50, acute dermal (rabbit) LD50 and 4-hour inhalation (rat) LC50 values for this material are >800 mg/kg, >2,000 mg/kg and >0.6 mg/L mg/l, respectively. Direct contact with this material may cause severe eye and skin irritation. Overexposure to vapor may cause respiratory tract irritation and central nervous system depression. Refer to Section 11 for toxicology information on the regulated components of this product.

---

4. FIRST AID MEASURES

Ingestion:
If swallowed, call a physician immediately. Only induce vomiting at the instruction of a physician. Never give anything by mouth to an unconscious person.

Skin Contact:
Remove contaminated clothing and shoes without delay. Wear impermeable gloves. Wash immediately with plenty of water and soap. Pay particular attention to skin crevices, nail folds, etc. Do not reuse contaminated clothing without laundering. Do not reuse contaminated leatherware. Obtain medical attention.

Eye Contact:
Rinse immediately with plenty of water for at least 15 minutes. Obtain medical attention immediately.

Inhalation:
Remove to fresh air. If breathing is difficult, give oxygen. Apply artificial respiration if patient is not breathing. Obtain medical attention immediately.

---

5. FIRE-FIGHTING MEASURES

Suitable Extinguishing Media:
Use water spray, carbon dioxide or dry chemical.

Protective Equipment:
Firefighters, and others exposed, wear self-contained breathing apparatus. Wear full firefighting protective clothing. See MSDS Section 8 (Exposure Controls/Personal Protection).

Special Hazards:
Keep containers cool by spraying with water if exposed to fire.

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6. ACCIDENTAL RELEASE MEASURES

6. ACCIDENTAL RELEASE MEASURES

Personal precautions:
Where exposure level is known, wear approved respirator suitable for level of exposure. Where exposure level is not known, wear approved, positive pressure, self-contained respirator. In addition to the protective clothing/equipment in Section 8 (Exposure Controls/Personal Protection), wear impermeable boots.

Methods For Cleaning Up:
Cover spills with some inert absorbent material; sweep up and place in a waste disposal container. Flush spill area with water.

Environmental Precautions:
Use appropriate containment to avoid environmental contamination.

---

7. HANDLING AND STORAGE

HANDLING

Precautionary Measures: Do not get in eyes, on skin or on clothing. Avoid breathing vapor. Keep container closed. Use with adequate ventilation. Wash thoroughly after handling.

Special Handling Statements: Hydrogen sulfide maybe emitted from heated material and may accumulate in the vapor spaces of containers or other confined spaces. Hydrogen sulfide has a strong rotten-egg odor, however, some people are unable to smell the gas and exposure will deaden the sense of smell. Therefore, odor is an unreliable indicator of exposure. Overexposure to hydrogen sulfide gas may cause severe eye or respiratory tract irritation, rapid development of coma and respiratory failure. Low levels of hydrogen sulfide may cause headache, dizziness, staggering gait, neurological damage and gastritis.

STORAGE
None

Storage Temperature: Store at -10 - 15 °C 14 - 59 °F
Reason: Quality.

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8. EXPOSURE CONTROLS/PERSONAL PROTECTION

Engineering Measures:
Utilize a closed system process where feasible. Where this material is not used in a closed system, good enclosure and local exhaust ventilation should be provided to control exposure.

Respiratory Protection:
Where exposures are below the established exposure limit, no respiratory protection is required. Where exposures exceed the established exposure limit, use respiratory protection recommended for the material and level of exposure.

Eye Protection:
Prevent eye and skin contact. Provide eye wash fountain and safety shower in close proximity to points of potential exposure. Wear eye/face protection such as chemical splash proof goggles or face shield.

Skin Protection:
Prevent contamination of skin or clothing when removing protective equipment. Wear impermeable gloves and suitable protective clothing.

Additional Advice:
Food, beverages, and tobacco products should not be carried, stored, or consumed where this material is in use. Before eating, drinking, or smoking, wash face and hands thoroughly with soap and water.

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9. PHYSICAL AND CHEMICAL PROPERTIES

9. PHYSICAL AND CHEMICAL PROPERTIES

Color:	green
Appearance:	viscous liquid
Odor:	hydrogen sulfide
Boiling Point:	Not available
Melting Point:	Not applicable
Vapor Pressure:	Not available
Specific Gravity/Density:	0.91
Vapor Density:	Not available
Percent Volatile (% by wt.):	20
pH:	Not applicable
Saturation In Air (% By Vol.):	Not available
Evaporation Rate:	Not available
Solubility In Water:	negligible
Volatile Organic Content:	Not available
Flash Point:	114 °C 237.2 °F Setaflash Closed Cup
Flammable Limits (% By Vol):	Not available
Autoignition Temperature:	Not available
Decomposition Temperature:	Not available
Partition coefficient (n-octanol/water):	Not available
Odor Threshold:	Not available

10. STABILITY AND REACTIVITY

Stability:	Stable
Conditions To Avoid:	Avoid contact with air or other oxidizing agents. Avoid excessive heat.
Polymerization:	Will not occur
Conditions To Avoid:	None known
Materials To Avoid:	Strong oxidizing agents. Excessive heat
Hazardous Decomposition Products:	oxides of phosphorus oxides of sulfur (includes sulfur di and tri oxides) Carbon monoxide Carbon dioxide hydrogen sulfide (H2S)

11. TOXICOLOGICAL INFORMATION

Toxicological information for the product is found under Section 3. HAZARDS IDENTIFICATION.
Toxicological information on the regulated components of this product is as follows:

Di(2,4,4-trimethylpentyl) dithiophosphinic acid has estimated oral (rat) and dermal (rabbit) LD50 values of 700 mg/kg and greater than 2000 mg/kg, respectively. The acute 4 hour inhalation LC50 is estimated to be 0.4 mg/L. Direct contact with di(2,4,4-trimethylpentyl) dithiophosphinic acid can cause severe eye and skin irritation.

Di(2,4,4-trimethylpentyl) monothiophosphinic acid has acute oral (rat) and dermal (rabbit) LD50 values of 1150 mg/kg and greater than 2000 mg/kg, respectively. Direct contact with this material caused severe skin and moderate eye irritation when tested in rabbits. When tested in guinea pigs, this material caused allergic skin reactions. No mutagenic activity was seen when this material was tested in the Ames Salmonella assay.

11. TOXICOLOGICAL INFORMATION

Petroleum distillates, hydrotreated light (CAS# 64742-47-8) has acute oral (rat) and dermal (rabbit) LD50 values of >5 g/kg and >3.16 g/kg, respectively. Prolonged or repeated skin contact tends to remove skin oils, possibly leading to irritation and dermatitis. Direct contact may cause eye irritation. Overexposure to high vapor concentrations, >~700 ppm, are irritating to the eyes and respiratory tract and may cause headaches, dizziness, drowsiness, and other central nervous system effects, including death. Aspiration of minute amounts during ingestion or vomiting may cause mild to severe pulmonary injury and possibly death. In a 90-day oral gavage (rats) study at 100, 500, or 1000 mg/kg, no treatment-related mortalities were observed. There were no significant changes in body weights or food consumption in any dose groups. Increased liver weights were observed in male and female rats a 500 and 1000 mg/kg. Increased kidney weights were observed only in male rats at 500 and 1000 mg/kg. Testes weights were significantly elevated in male rats at 1000 mg/kg. Kidney effects, indicative of light hydrocarbon nephropathy, occured in male rat kidneys at all dose levels. Histological findings of hepatocellular hypertrophy were seeen in the livers of male rats at 1000 mg/kg and in female rats at 500 and 1000 mg/kg. All treatment-related effects were reversible within the 4-week recovery period. Observed kidney effects (including light hydrocarbon nephropathy and increased kidney weight) are a unique response by male rats to chronic hydrocarbon exposure, which th U.S. EPA has declared `not relevant to humans`. High-dose liver effects (including hepatocellular hypertrophy, or enlarged liver cells) are a direct consequence of the sustained high-fat `hydrocarbon diet`. The No Observed Adverse Effect Level (NOAEL) for this study was 1000 mg/kg.

---

12. ECOLOGICAL INFORMATION

Toxic to aquatic organisms, may cause long-term adverse effects in the aquatic environment.
All ecological information provided was conducted on a structurally similar product.

ALGAE TEST RESULTS

Test: Growth Inhibition (OECD 201)
Duration: 72 hr
Species: Green Algae (Selenastrum capricornutum)
>10 - < 100 mg/l EbC50
>10 - < 100 mg/l ErC50

FISH TEST RESULTS

Test: Acute toxicity, freshwater (OECD 203)
Duration: 96 hr.
Species: Rainbow Trout (Oncorhyncus mykiss)
>1 - < 10 mg/l LC50

INVERTEBRATE TEST RESULTS

Test: Acute Immobilization (OECD 202)
Duration: 48 hr
Species: Water Flea (Daphnia magna)
>10 - < 100 mg/l EC50

DEGRADATION

Test: Closed Bottle (OECD 301D)

12. ECOLOGICAL INFORMATION

Duration: 28 day **Procedure:** Ready biodegradability
< 70 %

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13. DISPOSAL CONSIDERATIONS

The information on RCRA waste classification and disposal methodology provided below applies only to the product, as supplied. If the material has been altered or contaminated, or it has exceeded its recommended shelf life, the guidance may be inapplicable. Hazardous waste classification under federal regulations (40 CFR Part 261 et seq) is dependent upon whether a material is a RCRA 'listed hazardous waste'or has any of the four RCRA 'hazardous waste characteristics.'Refer to 40 CFR Part 261.33 to determine if a given material to be disposed of is a RCRA 'listed hazardous waste'; information contained in Section 15 of this MSDS is not intended to indicate if the product is a 'listed hazardous waste.'RCRA Hazardous Waste Characteristics: There are four characteristics defined in 40 CFR Section 261.21-61.24: Ignitability, Corrosivity, Reactivity, and Toxicity. To determine Ignitability, see Section 9 of this MSDS (flash point). For Corrosivity, see Sections 9 and 14 (pH and DOT corrosivity). For Reactivity, see Section 10 (incompatible materials). For Toxicity, see Section 2 (composition). Federal regulations are subject to change. State and local requirements, which may differ from or be more stringent than the federal regulations, may also apply to the classification of the material if it is to be disposed. The Company encourages the recycle, recovery and reuse of materials, where permitted, as an alternate to disposal as a waste. The Company recommends that organic materials classified as RCRA hazardous wastes be disposed of by thermal treatment or incineration at EPA approved facilities. The Company has provided the foregoing for information only; the person generating the waste is responsible for determining the waste classification and disposal method.

---

14. TRANSPORT INFORMATION

This section provides basic shipping classification information. Refer to appropriate transportation regulations for specific requirements.

US DOT

Proper Shipping Name: Corrosive liquid, toxic, n.o.s.
Hazard Class: 8
Subsidiary Class: 6.1
Packing Group: III
UN/ID Number: UN2922
Transport Label Required: Corrosive
Toxic
Marine Pollutant
Technical Name (N.O.S.): Di(2,4,4-trimethylpentyl)dithiophosphinic acid
Hazardous Substances:
Not applicable
Comments: Marine Pollutants - DOT requirements specific to Marine Pollutants do not apply to non-bulk packagings transported by motor vehicles, rail cars or aircraft.

TRANSPORT CANADA

Proper Shipping Name: Corrosive liquid, toxic, n.o.s.
Hazard Class: 8
Subsidiary Class: 6.1
Packing Group: III
UN Number: UN2922
Transport Label Required: Corrosive
Toxic
Marine Pollutant
Technical Name (N.O.S.): Contains Di(2,4,4-trimethylpentyl)dithiophosphinic acid

ICAO / IATA

Proper Shipping Name: Corrosive liquid, toxic, n.o.s.
Hazard Class: 8
Subsidiary Class: 6.1
Packing Group: III
UN Number: UN2922
Transport Label Required: Corrosive
Toxic
Packing Instructions/Maximum Net Quantity Per Package:
Passenger Aircraft: 818; 5 L
Cargo Aircraft: 820; 60 L
Technical Name (N.O.S.): Contains Di(2,4,4-trimethylpentyl)dithiophosphinic acid

IMO

Proper Shipping Name: Corrosive liquid, toxic, n.o.s.
Hazard Class: 8
Subsidiary Class: 6.1
UN Number: UN2922
Packing Group: III
Transport Label Required: Corrosive
Toxic
Marine Pollutant
Technical Name (N.O.S.): Contains Di(2,4,4-trimethylpentyl)dithiophosphinic acid

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15. REGULATORY INFORMATION

Inventory Information

United States (USA): All components of this product are NOT included on the Toxic Substance Control Act (TSCA) Inventory. The chemical, physical, and toxicological properties of this material have not been fully investigated. Its handling or use may be hazardous, and it must be used under the supervision of technically qualified individuals. Materials not included on the TSCA Inventory may only be used for research and development (R&D) purposes or in other TSCA exempt activities.
This product contains a chemical substance that is subject to export notification under Section 12 (b) of the Toxic Substances Control Act, 15 U. S. C. 2601 et. seq. (This requirement applies to exports from the United States only.)

Canada: All components of this product are included on the Domestic Substances List (DSL) or are not required to be listed on the DSL.

European Union (EU): All components of this product are included in the European Inventory of Existing Chemical Substances (EINECS), or are not required to be listed on EINECS, or have been notified according to Council Directive 67/548/EEC and its amendments.

Australia: One or more components of this product have NOT yet been included in the Australian Inventory of Chemical Substances (AICS) or assessed by NICNAS.

China: All components of this product are included on the Chinese inventory or are not required to be listed on the Chinese inventory.

Japan: All components of this product are NOT included on the Japanese (ENCS) inventory.

Korea: All components of this product are NOT included on the Korean (ECL) inventory.

Philippines: All components of this product are included on the Philippine (PICCS) inventory or are not required to be listed on the Philippine inventory.

OTHER ENVIRONMENTAL INFORMATION

The following components of this product may be subject to reporting requirements pursuant to Section 313 of CERCLA (40 CFR 372), Section 12(b) of TSCA, or may be subject to release reporting requirements (40 CFR 307, 40 CFR 311, etc.) See Section 13 for information on waste classification and waste disposal of this product.

Component / CAS No.	%	TPQ (lbs)	RQ(lbs)	S313	TSCA 12B
Di(2,4,4-trimethyl-pentyl) monothio-phosphinic acid 132767-86-3	1 - 2	None	0	No	Yes

PRODUCT HAZARD CLASSIFICATION UNDER SECTION 311 OF SARA

- Acute

16. OTHER INFORMATION

NFPA Hazard Rating (National Fire Protection Association)

Health: 3 - Materials that, under emergency conditions, can cause serious or permanent injury.

Fire: 1 - Materials that must be preheated before ignition can occur.

Instability: 0 - Materials that in themselves are normally stable, even under fire exposure conditions.

Reasons For Issue:

Revised Section 3
Revised Section 7
Revised Section 10

Randy Deskin, Ph.D., DABT +1-973-357-3100

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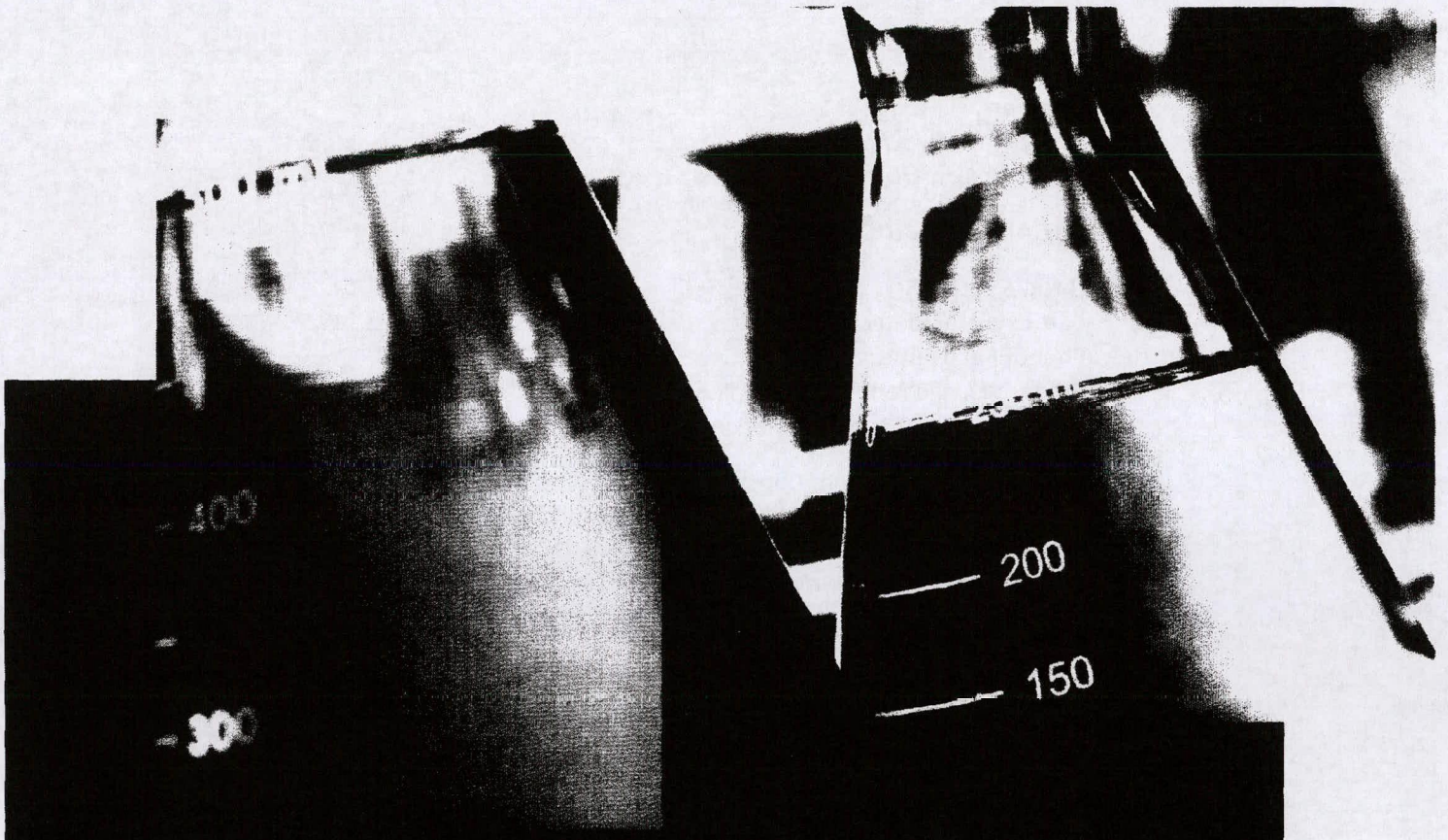
CYTEC



CYANEX® 923 Extractant

Solvent Extraction Reagent

- Recovery of uranium from wet process phosphoric acid
- Cesium recovery
- Recovery of rhenium
- Acetic acid recovery from effluent streams
- Phenol extraction

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Introduction 3

CYANEX® 923 extractant is a liquid phosphine oxide which has potential applications in the solvent extraction recovery of both organic and inorganic solutes from aqueous solution, e.g. carboxylic acids from effluent streams and the removal of arsenic impurities from copper electrolytes.

The major advantage of CYANEX 923 extractant over similar extraction reagents, e.g. TOPO (trioctylphosphine oxide), is that it is completely miscible with all common hydrocarbon diluents even at low ambient temperatures. The major benefit of high solubility lies in the ability to prepare concentrated, stable solvents which can recover solutes (e.g. acetic acid) that are normally only weakly extracted by this type of reagent.

Composition

CYANEX 923 extractant is a mixture of four trialkyl-phosphine oxides as follows:

$R_3P(O)$ $R_2R'P(O)$ $RR'_2P(O)$ $R'_3P(0)$

Where R = $[CH_3(CH_2)_7]$ - normal octyl

R'= $[CH_3(CH_2)_5]$ - normal hexyl

Average Molecular Weight = 348 (approximately)

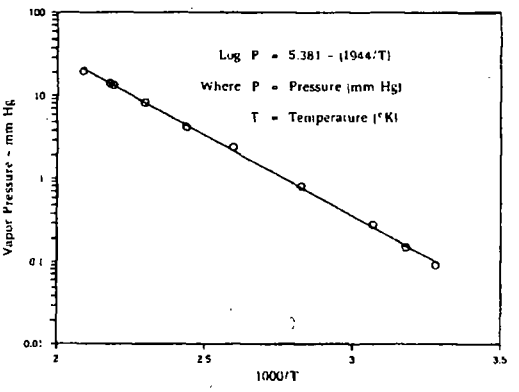
Typical Properties

Trialkylphosphine oxides	:	93%
Appearance	:	Colorless mobile liquid
Specific Gravity	:	0.88 at 25°C
Freezing Point	:	-5 to 0°C
Viscosity	:	40.0 centipoise at 25°C
	:	13.7 centipoise at 50°C
Flashpoint (Closed Cup Setaflash)	:	182°C
Autoignition Temperature	:	281°C
Vapor Pressure*	:	0.09 mm. Hg at 31°C
Boiling Point	:	310°C at 50 mm Hg
Solubility in Water	:	> 10 mg/l
CYANEX 923 extractant	:	8 w/o

Surface Tension	@ 25°C	9.0 dynes/cm
	@ 100°C	7.5 dynes/cm
	@ 150°C	5.2 dynes/cm
Viscosity Kinematic	@ 25°C	51.6 cSt
	@ 50°C	18.9 cSt
	@ 100°C	4.2 cSt
Specific Heat	@ 25°C	0.45 cal/gm/°C
	@ 50°C	0.47 cal/gm/°C
	@ 100°C	0.51 Cal/gm/°C
Thermal Conductivity	@ 25°C	0.000302 cal/cm/sec/°C
	@ 120°C	0.000288 cal/cm/sec/°C
	@ 200°C	0.000274 cal/cm/sec/°C

** Shown as function of temperature in Figure 1*

FIG. 1 — EFFECT OF TEMPERATURE ON VAPOR PRESSURE



4 Introduction

Suitability of Construction Materials

Samples of the following plastics and rubbers (in the form of tubing) were immersed for 200 hours at 50°C in glass vessels containing CYANEX 923 extractant.

The results are summarized below:

Material	Remarks
Butyl Rubber	Unsuitable. Rapid swelling and softening.
Teflon Fluorocarbon Film*	Suitable. No detectable effect.
Polypropylene	Suitable. No detectable effect.
Natural & Black Latex Rubber	Unsuitable. Complete dissolution in less than 192 hours.
PVC (Laboratory Grade)	Short-term suitability. Loss of plasticity in less than 192 hours.
PVC (Solvent Grade)	Suitable. Only a slight increase in dimension observed.
Red Gum Rubber	Unsuitable: Rapid swelling and softening.
Viton Fluoroelastometer*	Suitable. No detectable effect.
Silicone	Unsuitable. Disintegrated after 56 hours.

Samples of the following metals in the form of coupons (approximate dimensions 50 mm x 20 mm. x 3 mm) were immersed for 1000 hours at 50°C in glass vessels containing CYANEX 923 extractant. The following observations were made.

Metal	Remarks
Mild Steel	No detectable corrosion.
Stainless Steel (316)	No detectable corrosion.
Stainless Steel (304)	No detectable corrosion.
Aluminum	No detectable corrosion.

**Product of E.I. DuPont* de Nemours & Co.

ORGANIC SOLUTES

Carboxylic Acid Recovery

Processes in petrochemical plants, wood pulping mills, and other chemical facilities often generate aqueous effluent streams containing carboxylic acids; particularly acetic acid. Typically, these acids are present in concentrations between 1 and 50 g/l.

A solvent extraction plant to recover acetic acid from an effluent stream has been operated successfully by Lenzing A.G. in Austria since 1983. Briefly, the process involves extracting acetic acid with a solvent containing TOPO and stripping the loaded solvent by distillation.

The advantage of using CYANEX 923 extractant in this application, as opposed to TOPO, lies in the ability to prepare a concentrated, low freezing point solvent.

This leads to lower staging requirements in extraction and virtually eliminates the problem of plant freeze-up during periods when the ambient temperature is low.

The potential for CYANEX 923 extractant in this application is illustrated by the acetic acid extraction isotherms shown in Figure 2. The isotherms were plotted from the data in Table 1.

FIG. 2 – ACETIC ACID EXTRACTION ISOTHERMS

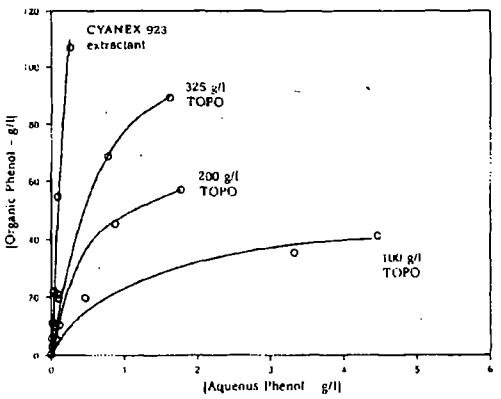


TABLE 1
Acetic Acid Recovery

Solvents	:	CYANEX 923 extractant undiluted) 150 g/l and 400 g/L TOPO in DPA diluent*
Aqueous	:	10 g/l acetic acid (approx.)
Temperature	:	50°C
Contact Time	:	5 minutes

Equilibrium Acetic Acid Concentration (g/l)

	150 g/l TOPO		400 g/l TOPO		CYANEX 923 extractant	
A/O	Org.	Aq.	Org.	Aq.	Org.	Aq.
10	-	-	-	-	27.7	6.84
5	-	-	-	-	22.0	5.22
2	5.60	7.20	8.40	5.80	13.0	3.11
1	5.30	4.70	7.50	2.50	7.87	1.74
0.5	3.43	3.15	4.48	1.05	4.41	0.80
0.2	1.77	1.15	1.92	0.40	-	-
0.1	0.95	0.55	9.95	0.20	-	-

** DPA, a high boiling (330-379oC) diphenylalkene diluent, is a product of Conoco Chemicals Co. (a division of Conoco).*

Phenol Recovery

Phenols, like carboxylic acids, are a common component of many aqueous effluents, e.g. waste streams produced during coal liquefaction, coal gasification (steel manufacture), and in the petrochemical industry.

Again, the potential benefit of recovering phenol by solvent extraction with CYANEX 923 extractant is the ability to construct plants with minimal staging requirements. Since phenol is strongly extracted by phosphine oxides, the advantages of CYANEX 923 extractant vs. TOPO are less marked than in the case of the more weakly extracted acetic acid. The major factor in choosing between the two in phenol systems will obviously depend upon the concentration of phenol in the effluent.

Phenol extractions isotherms are shown in Figure 3 and were plotted using the batch, shake-out data given in Table 2. Composition of the aqueous solution was chosen to approximate a real effluent. As with carboxylic acids, stripping is achieved by distillation.

Estimates indicate significant savings in capital and operating costs vs. the conventional Phenosolvan process.

6 Potential Applications

FIG. 3 — PHENOL EXTRACTION ISOTHERMS

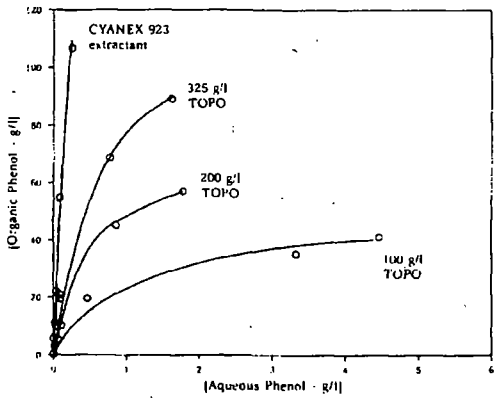


TABLE 2
Phenol Recovery

Solvents	:	CYANEX 923 extractant (undiluted) 100, 200 and 325 g/l TOPO in Nalkylene 500 diluent*
Aqueous	:	10 g/l phenol (approx.) and 30 g/l Na_2SO_4. Initial pH = 5 (approx.)
Temperature	:	50°C
Contact Time	:	5 minutes

Equilibrium Phenol Concentration (g/l)

	100 g/l		200 g/l		325 g/l		CYANEX 923 extractant	
A/O	Org.	Aq.	Org.	Aq.	Org.	Aq.	Org.	Aq.
10	-	-	-	-	88.8	1.65	107.2	0.28
7	40.0	4.48	56.6	1.79	68.2	0.79	-	-
5	34.3	3.34	45.0	0.87	-	-	54.6	0.089
2	19.4	0.47	19.6	0.10	20.9	0.08	21.0	0.028
1	10.1	0.10	9.84	0.04	10.5	0.04	11.0	0.013
0.5	5.07	0.05	4.93	0.02	5.25	0.03	5.50	0.005
0.25	2.54	0.02	2.46	0.01	2.63	0.02	2.75	0.002**

* *Nalkylene 500, a linear alkyl benzene diluent, is a product of Conoco Chemicals Co. (a division of Conoco.)*
** *Detection limit of the analytical method.*

Ethanol Extraction

CYANEX 923 extractant exhibits a separation factor in ethanol/water solutions near the maximum useful limit for recovery from continuous fermentation broths, typically containing 5% ethanol. Higher values do not further reduce extractor size or energy required in the downstream distillation. This is illustrated in Figure 4 where separation factors for CYANEX 923 extractant and for other candidate extractants are shown in relation to the upper and lower limits. Extraction coefficients, and their effect on extractor size, are also plotted in Figure 4. The coefficient for CYANEX 923 extractant is well into the flat part of the curve. This excess capacity can be exchanged for increased separation factor, if needed, by dilution with inert diluents.

The principle advantage of CYANEX 923 extractant lies in its very low solubility in water. This obviates or minimizes extra processing of raffinate that would be required by more soluble extractants. The solubilities in water of CYANEX 923 extractant and of other candidate ethanol extractants are compared in Table 3.

FIG. 4 — ETHANOL EXTRACTION

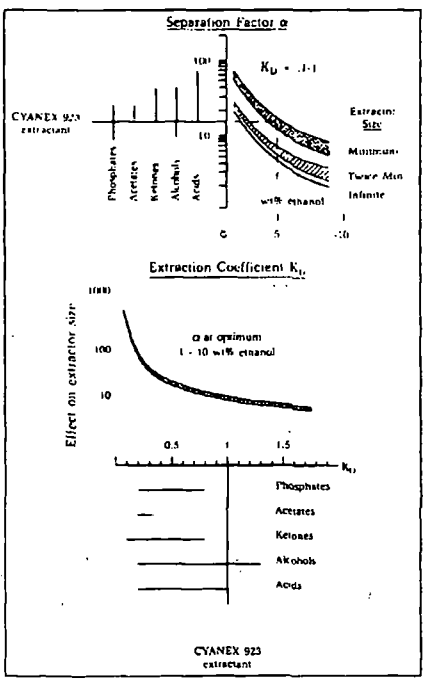


TABLE 3
Solubility in Water, WT%

	Exptl[1]	UNIFAC[4]
CYANEX 923 extractant	0.001[2]	
Phosphates		
Tri-n-Butyl	0.042[3]	
Acetates		
n-Butyl	0.64	
i-Butyl	0.85	
Ketones		
Methyl Isobutyl	1.9	
Diisobutyl	0.083	
Isophorone		0.19
Alcohols		
3-Phenyl-1-Propanol		0.15
2-Ethyl-1-Butanol		0.88
3-Methyl-3-Pentanol	4.3	
4-Methyl-2-Pentanol	1.6	
3-Ethyl-3-Pentanol	1.7	
2,4-Dimethyl-3-Pentanol	0.7	
1-Octanol	0.051	
2,2-Dimethyl-3-Octanol		0.017
3,7-Dimethyl-3-Octanol		0.017
1-Nonanol	0.013	
1-Decanol	0.0037	
4-Decanol		0.016
1-Dodecanol	0.00023	
1-Tridecanol		0.00072
Acids		
2-Ethyl-4-Methyl Pentanoic		0.24
n-Hexanoic	1.1	
2-Ethyl Hexanoic		0.24
n-Octanoic		0.24
Neodecanoic		0.032

(1) J.M. Sorenson and W. Arlt, "Liquid-Liquid Equilibrium Data Collection," DECHEMA, Vol. V, Part 1 (1979)
(2) This work
(3) W.N. Schulz and J.P. Navratil, "Science and Technology of Tributyl Phosphate," CRC Press (1982)
(4) A. Fredenslund, et. al., "Group-Contribution Estimation of Activity Coefficients in Nonideal Liquid Mixtures," AICHE Journal 21, No. 6, (1975), pp. 1086-1099.

INORGANIC SOLUTES

Impurity Removal from Copper Electrolytes

Briefly, the advantages of removing arsenic, antimony and bismuth impurities from copper electrolytes by so vent extraction rather than conventional processes consist of improvements in current efficiency, the quality of electrolytic copper, and in the productivity of the tankhouse. Minimizing the formation of arsine gas is also an important consideration.

Data on the extraction of arsenic, antimony and bismuth from a synthetic, nickeliferous copper electrolyte are given in Table 4. The corresponding arsenic and antimony extraction isotherms are shown in Figure 5. McCabe-Thiele interpolations indicated a reduction in the electrolyte arsenic concentration from 6 g/l to 1 g/l in two theoretical stages at O/A = 4. Under these conditions, the data indicated quantitative extraction of bismuth, 30-40% extraction of the antimony and a solvent loaded to 10-20 g/l H_2SO_4. High selectivity against copper and nickel extraction was observed. Copper loading in the solvents varied from 3 to 5 mg/l while no nickel extraction was observed.

Scrubbing sulfuric acid from the loaded solvent was readily achieved with water. The data in Table 5 and Figure 6 implied essentially quantitative removal in 3 theoretical stages at O/A=8 to produce a scrub liquor containing 130 g/l H_2SO_4 for recycle. The feasibility of a selective metal/acid scrub was also indicated.

Water proved to be an effective strip feed at a lower O/A ratio as shown by the data in Table 6 and the arsenic stripping isotherm plotted in Figure 7

Interpolations from the isotherm showed complete arsenic stripping in 5 stages at O/A = 2. Quantitative antimony stripping was estimated under these conditions while approximately 0.07 g/l bismuth remained loaded on the solvent.

Solubility losses of the extractant in this system varied from 1 mg/l in the electrolyte to 10 mg/l in the strip liquor.

8 Potential Applications

TABLE 4
Arsenic, Antimony and Bismuth Extraction Isotherms

Solvent	:	50 v/o CYANEX 923 extractant in Exxsol D-80 diluent*
Aqueous	:	31.3 g/l Cu, 8.4 g/l Ni (as sulfates), 7.30 g/l As, 0.35 g/l Sb, 1.10 g/l Bi, 167.4 g/l H_2SO_4
Contact Time	:	5 minutes
Temperature	:	50°C

Equilibrium Metal Concentration (g/l)

	Arsenic		Antimony	
O/A	Organic	Aqueous	Organic	Aqueous
1	1.60	5.70	0.15	0.20
2	1.43	4.45	0.08	0.20
5	1.04	2.10	0.03	0.22
10	0.63	1.03	0.01	0.24

Bismuth quantitatively extracted at all O/A ratios

TABLE 5
Sulfuric Acid Scrubbing Using Water

Solvent	:	50 v/o CYANEX 923 extractant in Exxsol D-80 diluent; loaded to 16.4 g/l H_2SO_4 and 1.90 g/l As, 0.14 g/l Sb and 1.10 g/l Bi
Scrub Feed	:	Distilled Water
Contact Time	:	5 minutes
Temperature	:	50°C

Equilibrium H_2SO_4 Concentration

O/A	Organic	Aqueous
0.5	0	9.1
1	0	17.4
5	0.7	78.4
10	5.4	110.0
20	9.9	130.2

* *A product of Exxon Co., U. S. A.*

TABLE 6
Arsenic, Antimony and Bismuth Stripping Isotherms

Solvent	:	50 v/o CYANEX 923 extractant in Exxsol D-80 diluent; loaded to 1.38 g/l As, 0.061 g/l Sb. 0.19 g/l Bi
Strip Feed	:	Distilled Water
Contact Time	:	5 minutes
Temperature	:	50°C

Equilibrium Metal Concentration g/l

	As		Sb		Bi	
O/A	Organic	Aqueous	Organic	Aqueous	Organic	Aqueous
0.5	0	0.71	0	0.033	0.01	0.09
1	0.28	1.10	0	0.061	0.02	0.17
2	0.53	1.71	0	0.14	0.08	0.22
5	0.89	2.45	0.009	0.26	0.14	0.26
10	1.08	3.05	0.029	0.32	-	-

FIG. 5 — ARSENIC AND ANTIMONY EXTRACTION ISOTHERMS

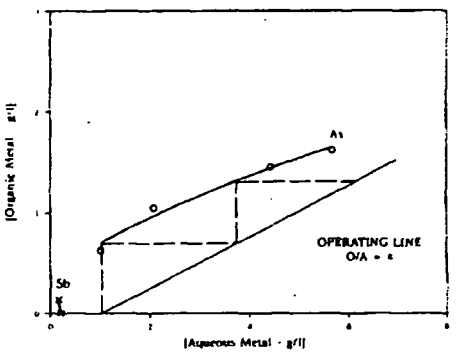


FIG. 6 – SULFURIC ACID SCRUBBING

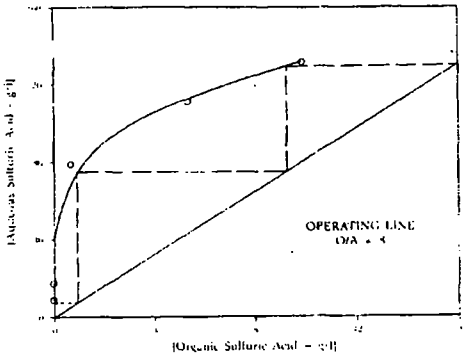
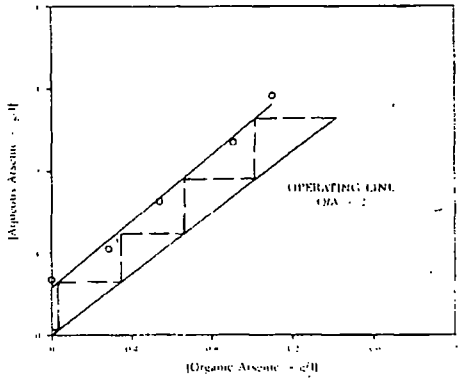


FIG. 7 – ARSENIC STRIPPING ISOTHERM



Uranium Extraction From Wet Process Phosphoric Acid

The conventional process for recovering uranium from wet process phosphoric acid involves extraction with a synergic mixture of D2EHPA and TOPO. CYANEX 923 extractant is a potential substitute for TOPO in this process and offers a materials handling advantage in that it is a liquid, while TOPO is a solid at normal temperatures (melting point approximately 50°C) and must be melted for ready removal from its container.

The feasibility of using CYANEX 923 extractant in this application is illustrated by the results of shake-out tests which are presented in Table 7 and Figure 8.

TABLE 7
Uranium Recovery from Wet-Process Phosphoric Acid Using Synergic Mixtures of Phosphine Oxides and D2EHPA

Solvent	:	All 0.5M D2EHPA in Ashland 140 diluent*. Varying in Phosphine Oxide concentration from 0 to 0.3M.
Aqueous	:	Florida WPPA 0.118 g/l U, oxidized with H_2O_2 to + 370 mV (vs.SCE).
A/O	:	1
Temperature	:	40°C
Contact Time	:	10 minutes

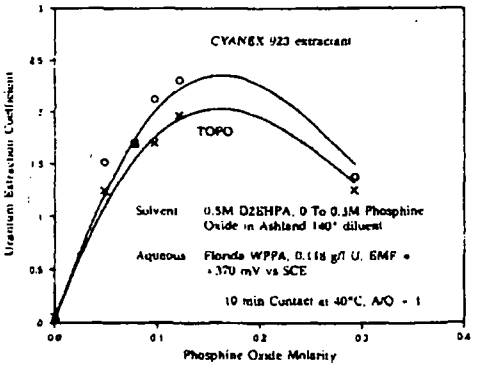
Uranium Extraction Coefficient $\left(E_A^O\right)$

Phosphine Oxide Molarity	TOPO	CYANEX 923 Extractant
0	0.08	0.05
0.05	1.26	1.54
0.08	1.73	1.72
0.10	1.73	2.16
0.125	2.00	2.34
0.3	1.26	1.39

$$E_A^O = \frac{\text{Uranium Concentration In Solvent}}{\text{Uranium Concentration In Aqueous}} = \text{At Equilibrium}$$

**Ashland 140, an aliphatic diluent, is a product of Ashland Chemical Co.*

FIG. 8 – EFFECT OF PHOSPHINE OXIDE MOLARITY ON URANIUM EXTRACTION FROM WPPA



10 Potential Applications

Niobium - Tantalum Separation

Niobium - tantalum separation is normally effected using MIBK. The disadvantage here is the high aqueous solubility of the ketone (approximately 20 g/l) and the consequent need to treat the raffinate for recovery of the extractant. Recent work' has shown that TOPO has utility in niobium - tantalum separation and is reported to produce higher purity niobium oxide than MIBK.

The advantage of using CYANEX 923 extractant in place of TOPO is again related to its liquid state and higher organic solubility.

A strong diluent effect was observed in preliminary experiments on niobium extraction. This is illustrated by the results of extraction isotherms given in Table 8 and plotted in Figure 9. Aromatic 150* proved to be the superior diluent in comparison to both Aromatic 100* and Exxsol D-80.

The process for niobium - tantalum separation, as with MIBK and TOPO, consists of extracting both metals followed by a selective strip; first of niobium and then of tantalum. This is illustrated in Table 9 and Figure 10 where selective stripping of niobium. from a niobium - tantalum loaded solvent was observed using a strip feed containing 0. 1 N NH_4OH and 1 % NH_4F. Tantalum was subsequently stripped using a more basic strip feed of 0.4 N NH_4OH and 4% NH_4F.

**A product of Exxon Co.. U.S.A.*

TABLE 8

The Effect of Diluent Type on Niobium Extraction

Solvent	:	277 g/l (0.8M) CYANEX 923 extractant in the appropriate diluent.
Diluents	:	Exxsol D-80, Aromatic 100 and Aromatic 150
Aqueous	:	88.5 or 91.4 g/l Nb, 4N HF, 8N H_2SO_4
Temperature	:	24°C
Contact Time	:	5 minutes

Equilibrium Nb Concentration (g/l)

	EXXSOL D-80		Aromatic 100		Aromatic 150	
O/A	Organic	Aqueous	Organic	Aqueous	Organic	Aqueous
2	43.8	66.6	38.7	72.0	61.3	60.7
1	36.6	51.9	39.7	51.7	61.9	29.5
0.5	36.6	15.3	36.5	18.5	44.8	1.86
0.3	-	-	-	-	27.2	0.73
0.2	17.4	1.53	18.2	0.30	18.2	0.56
	8.84	0.07	9.12	0.13	9.13	0.05

FIG. 9 – EFFECT OF DILUENT TYPE ON NIOBIUM EXTRACTION

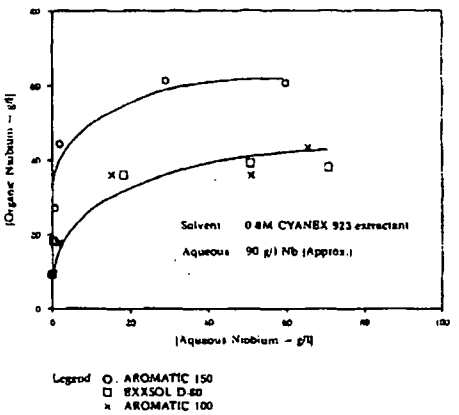


TABLE 9
Niobium Stripping From a Solvent Containing Niobium and Tantalum

Solvent	:	277 g/l (0.8M) CYANEX 923 extractant in Aromatic 150 diluent. Loaded to 22.4 g/l Nb and 3.61 g/l Ta.
Strip Feed	:	0.1N NH_4OH, 1% NH_4F
Contact Time	:	5 minutes
Temperature	:	24°C

Equilibrium Nb Concentration g/l		
A/0	Organic	Aqueous
5	0	4.66
2	0	11.6
1	0	22.7
0.05	3.30	38.2
0.2	10.9	57.3
0.1	14.8	75.6

TABLE 10
Tantalum Stripping Isotherm

Solvent	:	277 g/l (0.8M) CYANEX 923 extractant in Aromatic 150 diluent. Loaded to 6.78 g/l Ta.
Strip Feed	:	0.4N NH_4OH, 4% NH_4F
Contact Time	:	5 minutes
Temperature	:	24°C

Equilibrium Ta Concentration g/l		
O/A	Organic	Aqueous
2	0	3.39
1	0.61	5.93
0.5	0.74	11.6
0.2	2.66	19.4
0.1	4.71	18.3

FIG. 10 – NIOBIUM STRIPPING ISOTHERM

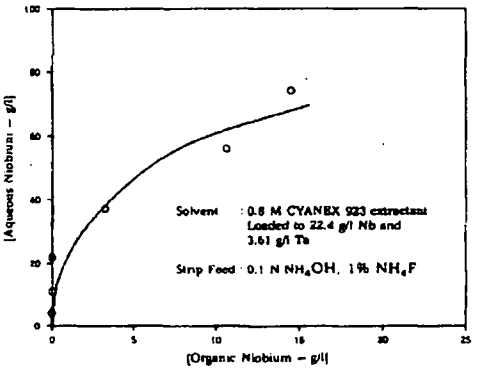
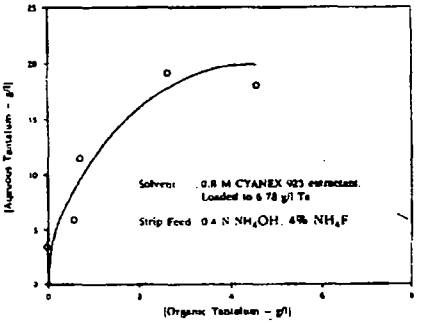


FIG. 11 – TANTALUM STRIPPING ISOTHERM



[1] *R. Hahn and H. Retelsdorf. Production of Pure Niobium Using a New Extraction Process for Niobic Oxide and Optimal Reduction Processes. Erzmetal, 37, (9), 444-448 (1984).*

12 Potential Applications

Cadmium Removal from Phosphoric Acid

Cadmium sometimes occurs as an undesirable impurity in phosphoric and other acids. The data given in Table 11 illustrate the ability of CYANEX 923 to readily reduce the concentration of cadmium from 10 mg/l to below a target of 2 mg/l; the specification in this particular application. McCabe-Thiele interpolations from the isotherm (Figure 12) indicate minimal staging requirements and that cadmium can be reduced from 10 mg/l to < 2 mg/l in two theoretical stages at A/0 = 4.

Cadmium, as well as co-extracted acids, are efficiently stripped from the loaded solvent with water as shown by the data in Table 12. The stripping isotherm (Figure 13) again indicates minimal staging requirements.

TABLE 11
Extraction of Cadmium from HCl/H_3PO_4 Using 2.5 v/o CYANEX 923

Solvent	:	2.5 v/o CYANEX 923 in Exxsol D-80
Aqueous	:	10.2 mg/l Cd^{2+}, 100 g/l HCl, 133 g/l H_3PO_4
Phase Contact	:	10 mins at 40°C

Equilibrium Concentration

	Cd(mg/l)		HCl (g/l)		H_3PO_4 (g/l)	
A/O	Organic	Aqueous	Organic	Aqueous	Organic	Aqueous
0.25	2.46	0.36	0.6	97.6	0.75	130
0.5	4.85	0.51	1.3	97.4	0.5	132
1	9.37	0.83	2.5	97.5	1	132
2	17.6	1.40	2.4	98.8	2	132
5	40.6	2.08	6.0	98.8	5	132

FIG. 12 - CADMIUM EXTRACTION ISOTHERM: 2.5 v/o CYANEX 923

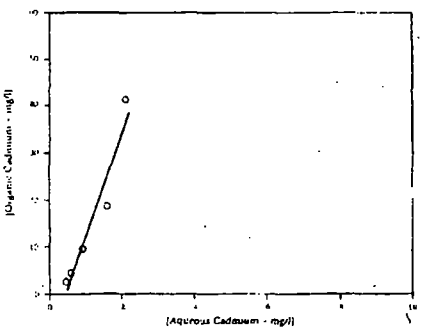


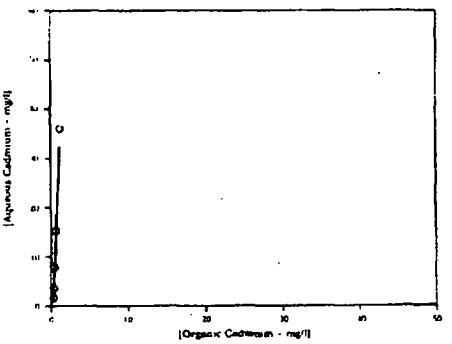
TABLE 12
Cadmium Stripping from 2.5 v/o CYANEX 923

Solvent	:	2.5 v/o CYANEX 923 in Exxsol D-80 loaded to 8.05 mg/l Cd, 1.3 g/l HCl, 1.2 g/l H_3PO_4
Strip Feed	:	Water
Phase Contact	:	10 mins at 40°C

Equilibrium Concentration

	Cd(mg/l)		HCl (g/l)		H_3PO_4 (g/l)	
A/O	Organic	Aqueous	Organic	Aqueous	Organic	Aqueous
5	0.15	1.58	0	0.2	0	0.3
2	0.15	3.95	0	0.6	0	0.7
1	0.40	7.65	0	01.0	0	1.3
0.5	0.50	15.1	0	2.2	0	2.5
0.2	0.79	36.3	0	5.4	0	6.4

FIG. 13 - CADMIUM STRIPPING ISOTHERM: 2.5 v/o CYANEX 923



ANALYSIS IN ORGANIC SOLVENTS

As described, the gas chromatographic procedure is suitable for analyzing solvents containing approximately 120 g/l CYANEX 923 extractant. Other concentrations may be determined by diluting the solvent appropriately or adjusting the composition of the standard solution.

CYANEX 923 extractant is a mixture containing four major components, as follows: Trihexylphosphine oxide (1), dihexylmonooctyl- phosphine oxide (2), dioctylmonohexyl-phosphine oxide (3) and trioctylphosphine oxide (4).

The method is based upon the fact that, within the limits of experimental error, the response factors for components 1, 2 and 3 are the same as for 4 and that 4 (TOPO) is readily available and may be easily purified to AR grade.

Reagents

1. Didecylphthalate (AR grade - internal standard)
2. TOPO (purified - see note 1)
3. Process diluent (e.g. Escaid* 110 diluent)

Calibration

1. Accurately weigh 1g (± 1 mg) of pure TOPO and 2g (± 0. 1 g) of didecylphthalate into a 50 ml volumetric flask. Dissolve and make up to volume with the process diluent.
2. Analyze the above standard solution as described under "Gas Chromatographic Conditions" to determine the relative response factor of TOPO vs. didecylphthalate.

Procedure

1. Centrifuge the solvent to be analyzed or filter through PS paper" to remove entrained aqueous or suspended solids.
2. Accurately weigh 2g (±0.1g) of didecylphthalate into a 50 ml volumetric flask and pipette 25 ml of the clarified solvent into the same flask. Make up to volume with the process diluent.
3. Determine the relative response factor of each component of CYANEX 923 extractant vs. that of the internal standard as described under "Gas Chromatographic Conditions".

* *A product of Exxon Co., U.S.A.*
** *Phase separation paper available from Whatman, Inc., Clifton, NJ*

Calculations

Total Concentration of Trialkylphosphine Oxides (g/l)

$$\sum \left[\frac{R_{4S}}{R_{na}} \right] \times 2 \times C_{4S}$$

Where R_{4S} = Relative response factor for TOPO in the standard solution
R_{na} = Relative response factor for the nth component in the analyte solution.
C_{4S} = Concentration of TOPO in the standard solution (g/l)

Gas Chromatographic Conditions

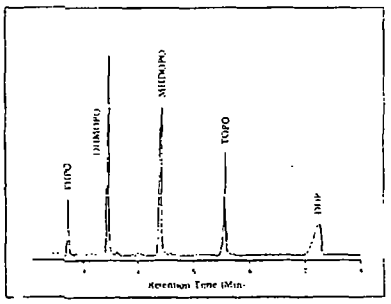
Instrument	:	Perkin Elmer Sigma 115 or equivalent
Column	:	30 in x 0.32 mm fused silica capillary column coated with 0.25 µm of DB1
Detector	:	FID
Carrier Gas	:	Helium at 18 psig
Vent Flow	:	100 ml/min
Column Flow	:	4.3 ml/min
Split Ratio	:	23/1
Temperatures °C		
Detector	:	340
Injection Port	:	340
Column	:	220 to 330 at 10°C/min
Sample Injection Volume	:	0.1 µl
Peak Areas	:	Determined by electronic integration

Notes

1. A chromatogram of commercial CYANEX 923 extractant is shown in Figure 1A.
2. Pure TOPO (>99.5%) can be obtained by recrystallizing commercial grade TOPO from hexane (three recrystallizations are necessary).
3. Megabore columns may be used as an alternative to capillary columns. A thermal conductivity detector may also be used in place of an FID.
4. The method is based upon a single point determination. If required, a calibration curve can be constructed by varying the concentration of TOPO in the standard solution while maintaining a constant concentration of the internal standard.
5. This method has not been validated.

14 Analytical Methods

FIG. 2A – CHROMATOGRAM OF CYANEX 923 EXTRACTANT CONTAINING DIDECYLPHTHALATE (DDP) AS AN INTERNAL STANDARD



ANALYSIS IN AQUEOUS SOLUTION

The aqueous solubility of each component of CYANEX 923 extractant will normally be <2 mg/l. The method is based on analysis of the aqueous sample by gas chromatography. The response factors of the four active components are equal within the limits of experimental error.

Reagents

1. Tetrahydrofuran (THF). "Baker Analyzed Reagent, 100%."
2. TOPO (purified - see note 1.)

Calibration

1. Prepare a stock solution by accurately weighing (± 1 mg) approximately 0.5 g of TOPO into a 50 ml volumetric flask. Dilute to 50 ml with THF and dissolve the TOPO.
2. Dilute aliquots of the stock solution with distilled water to prepare standard solutions containing 2, 5, 10 and 30 mg/l of TOPO.
3. Analyze the solutions as described under "Gas Chromatographic Conditions.

Procedure

1. Filter the aqueous solution to remove entrained organic
2. Inject 3µl of the analyte solution and analyze as described under "Gas Chromatographic Conditions."

Calculation

1. *Response Factor for TOPO (R) =

$$\frac{\text{Conc. of TOPO in Standard (mg/l)}}{\text{Area of TOPO Standard Peak}}$$

2. Concentration of Component in Aqueous (mg/l) = Area of Component Peak (analyte) x R

*Response factor for the standard closest in concentration to the sample.

Gas Chromatographic Conditions

Instrument	:	Hewlett Packard 5730A or equivalent
Column	:	2 ft x 1/4 inch x 2 mm ID glass Column packed with 9% OV-17 and 12% SP2401 on 80/100 mesh Supelcoport
Detector	:	FID
Carrier Gas	:	Helium at 57 psi (Flowrate 40 ml/minute)
Temperatures °C		
FID	:	300
Injection Port	:	250
Column	:	230 (Isothermal)
Sample Injection Volume	:	3 µl

Notes

1. Pure TOPO can be obtained by recrystallizing commercial grade TOPO from hexane. (Three recrystallizations are necessary).
2. Retention time for TOPO is approximately 12 minutes.
3. Detection limit approximately 2 mg/l.
4. This method has not been validated.

DETERMINATION OF WATER

The method is based on distilling water from CYANEX 923 extractant in the form of an azeotrope with toluene. On contacting a condenser, the water and toluene separate and fall into a graduated trap. The volume of the distillate is then measured.

Apparatus

1. 500 ml round-bottomed, short-necked glass flask with a 40/50 ground glass fitting.
2. Water-cooled condenser. Cold-finger type.
3. Dean and Stark type trap. 10 ml capacity graduated in 0.1 ml divisions with a 40/50 ground glass fitting.
4. Heating mantle controlled by a rheostat.

Reagents

1. AR grade toluene (water-free)

Procedure

1. Weigh 50 g of the sample (± 0.5 g) into the 500 ml flask.
2. Add approximately 200 ml of toluene to the flask and assemble the apparatus.
3. Heat the contents of the flask to boiling and allow to reflux for 30 to 60 minutes or until the volume of water in the trap is constant.
4. Read the volume of water in the trap at room temperature.

Calculation

$$\% \text{ Water} = \frac{\text{Volume of Water in Trap (ml)}}{\text{Sample weight (g)}} \times 100$$

Notes

1. This method has not been validated.
2. Karl-Fisher titration is not recommended.

Technical Papers and Patents 15

Technical Papers (listed chronologically)

1. **A Liquid Phosphine Oxide; Solvent Extraction of Phenol, Acetic Acid and Ethanol**
   Watson, E.K.; et.al.
   Solvent Extr. Ion Exch., 6, No. 2, Pages 207-20; (1988)

2. **Solvent Extraction Separation of Niobium and Tantalum at MHO**
   Haesebroek, G.; et.al.
   Process Metall., 7B, Pages 1115-20; (1992)

3. **Simulation of Countercurrent Multistage Extraction Process for Recovery of Titanium**
   Kagaku Kogaku Ronbunshu, 19, No. 2.
   Pages 214-19; (1993)

4. **Computer Modelling of Countercurrent Multistage Extraction for Titanium (IV) - Sulfuric Acid - CYANEX 923 System**
   Technal. Rep. Kansai Univ., 35, Pages 59-67; (1993)

5. **Phenol Recovery with SLM using CYANEX 923**
   Garea, A.; et.al.
   Chem. Eng. Commer., 120, Pages 85-97; (1993)

6. **Computer Modelling of Countercurrent Multistage Extraction for Ti(4 +) – H_2SO_4 CYANEX 923 System**
   Int. Conf. Process. Mater. Prob.
   Pages 521-4, Ed. Henein, H. Pub.
   Miner. Met. Mater. Soc., Warrendale PA; (1993)

7. **Gold (I) Extraction Equilibrium in Cyanide Media by the Synergic Mixture of Primene 81R-CYANEX 923**
   Coravaca, C.
   Hydrometallurgy, 35, No. 1, Pages 27-40; (1994)

8. **The Phosphine Oxides CYANEX 923 and CYANEX 923 as Extractants for Gold (I) Cyanide Aqueous Solutions**
   Alquacil, F.J.; et.al.
   Hydrometallurgy, 16, No. 3, Pages 369-84; (1994)

Patents (listed chronologically)

1. **Liquid Phosphine Oxide Systems for Solvent Extraction**
   Robertson, A.J. and Rickelton, W.A.
   European Pat. Appl. EP 132700 A1 (1985)

2. **Procede de Separation des Terres Rares par Extraction Liquide-Liquide**
   Dellaye, T.; et.al.
   European Pat. Appl. 0284504 (1988)

3. **Recovery of Uranium from Wet Process Phosphoric Acid Using Asymetrical Phosphine Oxides**
   Rickelton, W.A.
   U.S. Patent 4778663 (1988)

4. **Process for Solvent Extraction Using Phosphine Oxide Mixtures**
   Rickelton, W.A. and Robertson, A.J.
   U.S. Patent 4909939 (1990)

5. **Recovery of Indium from Acidic Solutions by Solvent Extraction Using Trialkylphosphine Oxide**
   Rickelton, W.A.
   Canadian Pat. Appl. CA 2077601 (1994)

6. **Method for Recovering Carboxylic Acids from Aqueous Solutions**
   Gentry, J.C.; et.al.
   U.S. Patent 5399751 (1995)

As of July 26, 1995

16 Health and Safety

The oral and dermal toxicity of CYANEX 923 extractant is low. CYANEX 923 extractant produces mild eye irritation and severe skin irritation upon contact. Repeated dermal exposure for 28 consecutive days produced severe skin irritation, but no systemic toxicity. CYANEX 923 extractant did not produce dermal sensitization in guinea pigs after repeated dermal exposure. This product did not produce mutations in bacteria nor did it produce chromosomal effects in the mouse micronucleus or human lymphocyte aberration assays. CYANEX 923 extractant is highly toxic to fish and invertebrates and great care should be exercised to avoid environmental exposure.

• Email: custinfo@cytec.com Worldwide Contact Info: www.cytec.com US Toll Free 800-652-6013 Tel 973-357-3193 •

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Material Safety Data Sheet

acc. to OSHA and ANSI

Printing date 11/10/2008 Reviewed on 11/10/2008

1 Identification of substance:

Product details:

Product name: Diphenyldithiophosphonic acid

Stock number: 17758

Manufacturer/Supplier:
Alfa Aesar, A Johnson Matthey Company
Johnson Matthey Catalog Company, Inc.
30 Bond Street
Ward Hill, MA 01835-8099
Emergency Phone: (978) 521-6300
CHEMTREC: (800) 424-9300
Web Site: www.alfa.com

Information Department: Health, Safety and Environmental Department
Emergency information:
During normal hours the Health, Safety and Environmental Department.
After normal hours call Chemtrec at (800) 424-9300.

2 Composition/Data on components:

Chemical characterization:
Description: (CAS#)
Diphenyldithiophosphonic acid (CAS# 1015-38-9), 100%

3 Hazards identification

Hazard description:

Xi Irritant

Information pertaining to particular dangers for man and environment
R 36/38 Irritating to eyes and skin.
Classification system
HMIS ratings (scale 0-4)
(Hazardous Materials Identification System)

HEALTH	2
FIRE	1
REACTIVITY	1

Health (acute effects) = 2
Flammability = 1
Reactivity = 1

4 First aid measures

After inhalation
Supply fresh air. If required, provide artificial respiration. Keep patient warm.
Seek immediate medical advice.
After skin contact
Immediately wash with water and soap and rinse thoroughly.
Seek immediate medical advice.
After eye contact
Rinse opened eye for several minutes under running water. Then consult a doctor.
After swallowing Seek immediate medical advice.

(Contd. on page 2)

Material Safety Data Sheet
acc. to OSHA and ANSI

Printing date 11/10/2008 Reviewed on 11/10/2008

Product name: Diphenyldithiophosphonic acid

(Contd. of page 1)

5 Fire fighting measures

Suitable extinguishing agents
Carbon dioxide, extinguishing powder or water spray. Fight larger fires with water spray or alcohol resistant foam.
Special hazards caused by the material, its products of combustion or resulting gases:
In case of fire, the following can be released:
Carbon monoxide (CO)
Sulfur dioxide (SO2)
Phosphorus oxides
Protective equipment:
Wear self-contained respirator.
Wear fully protective impervious suit.

6 Accidental release measures

Person-related safety precautions:
Wear protective equipment. Keep unprotected persons away.
Ensure adequate ventilation
Measures for environmental protection:
Do not allow material to be released to the environment without proper governmental permits.
Measures for cleaning/collecting: Pick up mechanically.
Additional information:
See Section 7 for information on safe handling
See Section 8 for information on personal protection equipment.
See Section 13 for disposal information.

7 Handling and storage

Handling
Information for safe handling:
Keep container tightly sealed.
Store in cool, dry place in tightly closed containers.
Ensure good ventilation at the workplace.
Information about protection against explosions and fires:
No special measures required.

Storage
Requirements to be met by storerooms and receptacles:
No special requirements.
Information about storage in one common storage facility:
Do not store together with oxidizing and acidic materials.
Further information about storage conditions:
Keep container tightly sealed.
Store in cool, dry conditions in well sealed containers.

8 Exposure controls and personal protection

Additional information about design of technical systems:
Properly operating chemical fume hood designed for hazardous chemicals and having an average face velocity of at least 100 feet per minute.

Components with limit values that require monitoring at the workplace:
Not required.

(Contd. on page 3)

Material Safety Data Sheet
acc. to OSHA and ANSI

Printing date 11/10/2008 Reviewed on 11/10/2008

Product name: Diphenyldithiophosphonic acid

(Contd. of page 2)

Additional information: No data

Personal protective equipment
General protective and hygienic measures
The usual precautionary measures for handling chemicals should be followed.
Keep away from foodstuffs, beverages and feed.
Remove all soiled and contaminated clothing immediately.
Wash hands before breaks and at the end of work.
Avoid contact with the eyes and skin.
Breathing equipment:
Use suitable respirator when high concentrations are present.
Protection of hands: Impervious gloves
Eye protection: Safety glasses
Body protection: Protective work clothing.

9 Physical and chemical properties:

General Information	
Form:	Crystalline
Odor:	Not determined
Change in condition	
Melting point/Melting range:	55-56°C (131-133°F)
Boiling point/Boiling range:	Not determined
Sublimation temperature / start:	Not determined
Flash point:	Not applicable
Ignition temperature:	Not determined
Decomposition temperature:	Not determined
Danger of explosion:	Product does not present an explosion hazard.
Explosion limits:	
Lower:	Not determined
Upper:	Not determined
Vapor pressure:	Not determined
Density:	Not determined

10 Stability and reactivity

Thermal decomposition / conditions to be avoided:
Decomposition will not occur if used and stored according to specifications.
Materials to be avoided:
Acids
Oxidizing agents
Dangerous reactions No dangerous reactions known
Dangerous products of decomposition:
Carbon monoxide and carbon dioxide
Sulfur oxides (SOx)

(Contd. on page 4)

Material Safety Data Sheet
acc. to OSHA and ANSI

Printing date 11/10/2008 Reviewed on 11/10/2008

Product name: Diphenyldithiophosphonic acid

(Contd. of page 3)

Nitrogen oxides (NOx)

11 Toxicological information

Acute toxicity:
Primary irritant effect:
on the skin: Irritant to skin and mucous membranes.
on the eye: Irritating effect.
Sensitization: No sensitizing effects known.
Subacute to chronic toxicity:
Organic phosphorus compounds exhibit a wide range of toxicity. Most are skin and eye irritants with the more volatile also being respiratory irritants. Those exhibiting substantial water reactivity will have stronger irritating properties and may be corrosive enough to cause severe burns. Some organic phosphorus compounds are cholinesterase inhibitors. Symptoms associated with these include muscle twitching, convulsions, flaccid paralysis, coma, respiratory failure. They can be highly paralytic.
Additional toxicological information:
To the best of our knowledge the acute and chronic toxicity of this substance is not fully known.
No classification data on carcinogenic properties of this material is available from the EPA, IARC, NTP, OSHA or ACGIH.

12 Ecological information:

General notes:
Do not allow undiluted product or large quantities of it to reach ground water, water course or sewage system.
Do not allow material to be released to the environment without proper governmental permits.

13 Disposal considerations

Product:
Recommendation
Consult state, local or national regulations to ensure proper disposal.

Uncleaned packagings:
Recommendation: Disposal must be made according to official regulations.

14 Transport information

Not a hazardous material for transportation.

DOT regulations:
Hazard class: None

Land transport ADR/RID (cross-border)
ADR/RID class: None

Maritime transport IMDG:
IMDG Class: None

(Contd. on page 5)

Material Safety Data Sheet
acc. to OSHA and ANSI

Printing date 11/10/2008 Reviewed on 11/10/2008

Product name: Diphenyldithiophosphonic acid

(Contd. of page 4)

Air transport ICAO-TI and IATA-DGR:
ICAO/IATA Class: None

Transport/Additional information:
Not dangerous according to the above specifications.

15 Regulations

Product related hazard informations:

Hazard symbols:
Xi Irritant

Risk phrases:
36/38 Irritating to eyes and skin.

Safety phrases:
26 In case of contact with eyes, rinse immediately with plenty of water and seek medical advice.

National regulations
This product is not listed in the U.S. Environmental Protection Agency Toxic Substances Control Act Chemical Substance Inventory. Use of this product is restricted to research and development only.
Some or all of the components of this product are not listed on the Canadian Domestic Substances List (DSL) or the Canadian Non-Domestic Substances List (NDSL).

Information about limitation of use:
For use only by technically qualified individuals.

16 Other information:
Employers should use this information only as a supplement to other information gathered by them, and should make independent judgement of suitability of this information to ensure proper use and protect the health and safety of employees. This information is furnished without warranty, and any use of the product not in conformance with this Material Safety Data Sheet, or in combination with any other product or process, is the responsibility of the user.

Department issuing MSDS: Health, Safety and Environmental Department.
Contact: Paul V. Connolly

MATERIAL SAFETY DATA SHEET
May be used to comply with OSHA's Hazard Communication Standard, 29 CFR 1910.1200. Standard must be consulted for specific requirements.

U.S. DEPARTMENT OF LABOR
Occupational Safety and Health Administration
(Non-Mandatory Form)
Form Approved
OMB No. 1218-0072

IDENTITY (As used on label and list)
N965 (N) TRADE SECRET

Note: Blank spaces are not permitted. If any item is not applicable, or no information is available, the space must be marked to indicate that.

Section I

Manufacturer's Name
NOCHAR, INC.

Emergency Telephone Number
(317) 613-3046

Address *(Number, Street, City, State and ZIP Code)*
8650 COMMERCE PARK PLACE SUITE K
INDIANAPOLIS, INDIANA 46268

Telephone Number for information
FAX: (317) 613-3052

Date Prepared
OCTOBER 2004

Signature of Preparer ***(optional)***

Section II - Hazardous Ingredients/Identity Information

Hazardous Components (Specific Chemical Identity: Common Name(s))	OSHA PEL	ACGIH TLV	Other Limits Recommended	% (optional)
NONE				

Section III - Physical/Chemical Characteristics

Boiling Point	316 F to 351 F	**Specific Gravity (H_2O = 1)**	.80
Vapor Pressure (mm Hg.)	N/A	**Melting Point**	N/A
Vapor Density (AIR = 1)	>1	**Evaporation Rate (Butyl Acetate = 1)**	N/A
Solubility in Water	INSOLUBLE	**Appearance and Odor**	Solid, Generally in Powder Form, Essentially Odorless

Section IV - Fire and Explosion Hazard Data

Flash Point (Method Used) N/A **Flammable Limits** N/A **LEL** **UEL**

Extinguishing Media FOAM- DRY CHEMICAL CARBON DIOXIDE

Special Fire Fighting Procedures AVOID WATER WHICH SWELLS PRODUCT.

Unusual Fire and Explosion Hazards N/A

Section V - Reactivity Data

Stability	**Unstable**		**Conditions to Avoid**
	Stable	X	EXTREME HEAT, (420 F) OPEN FLAME
Incompatibility (Materials to Avoid)			MATERIAL WILL SWELL WITH WATER
Hazardous Decomposition or Byproducts			MAY PRODUCE: HYDROGEN CYANIDE (Hydrocyanic Acid) NITROGEN OXIDES, CARBON OXIDES
Hazardous Polymerization	**May Occur**		**Conditions to Avoid**
	Will Not Occur	X	

Section VI - Health Hazard Data

Route(s) of Entry: **Inhalation** X **Skin** X **Ingestion** X

Health Hazards ***(Acute and Chronic)***

INHALATION: REMOVE TO FRESH AIR, IF NOT BREATHING, GIVE ARTIFCIAL RESPIRATION. EYES: FLUSH WITH WATER FOR 15 MIN. CALL PHYSICIAN. SKIN: WASH EXPOSED AREA WITH SOAP AND WATER. CALL PHYSICIAN. INGESTON: DO NOT INDUCE VOMITING. CALL PHYSICIAN

Carcinogenicity: N/A **NTP?** **IARC Monographs?** **OSHA Regulated?**

Signs and Symptoms of Exposure

AVOID PROLONGED OR FREQUENT CONTACT WHEN HANDLING MATERIAL. DO NOT INHALE DUST. AVOID SKIN AND EYE CONTACT.

Medical Conditions - Generally Aggravated by Exposure

Emergency and First Aid Procedures

Section VII - Precautions for Safe Handling and Use

Steps to Be Taken in Case Material is Released or Spilled

RECOVER SOLID WITH BROOM, SHOVEL OR VACUUM. AVOID GENERATING DUST CLOUDS.
PUT RECOVERED MATERIAL IN CONTAINERS FOR RECLAMATION OR DISPOSAL.

Waste Disposal Method

FOLLOW FEDERAL, STATE AND LOCAL REGULATIONS. WHEN USED AS ABSORBENT,
FOLLOW REGULATIONS FOR ABSORBED MATERIAL.

Precautions to Be Taken In Handling and Storing

IMPERVIOUS GLOVES, CHEMICAL GOGGLES.

Other Precautions

Section VIII - Control Measures

Respiratory Protection (Specify Type)	DUST RESPIRATOR FOR FINE PRODUCT

Ventilation	**Local Exhaust**	NO SPECIAL REQUIREMENT	**Special**	N/A
	Mechanical (General)	IF POSSIBLE	**Other**	N/A
Protective Gloves	IMPERVIOUS GLOVES		**Eye Protection**	SAFETY GLASSES OR GOGGLES
Other Protective Clothing or Equipment	NOT NECESSARY			
Work/Hygienic Practice	NORMAL HYGIENE PRACTICES SHOULD BE FOLLOWED; WASH HANDS, ETC. AFTER HANDLING.			

DISCLAIMER: *The information contained herein is based on the data available to us and is believed to be correct. However, the manufacturer makes no warranty, expressed or implied regarding the accuracy of this data or the results to be obtained from the use thereof, and assumes no responsibility for injury from the use of the product described herein. The manufacturer assumes no liability for incidental, consequential or direct damage of any manner or kind, regardless of cause, including negligence.*

NFPA RATINGS

HEALTH 0

FLAMMABILITY 1

REACTIVITY 1

DIVIDER PAGE ONLY

Not part of page count

POSTED

Attachment C: Chemical Product Review and Approval Checklist

Section 1				
Chemical Requestor				
Chemical Requested	Armor All Auto Glass Cleaner - 22 oz. size			
Manufacturer	The Clorox Company			
Requistioner Name	Gabe Brannon			
Quantity Requested	10 bottles	Date Requested: 1-12-2010	Date Required: 1-12-2010	
Forward to Health and Safety (HS) Manager				
Section 2				
Health and Safety				
This chemical is approved/denied for order. If denied, provide reason(s).			☑ Approved	☐ Denied
Hazardous Chemical Controls Required (Barcode Required)?			☑ Yes	☐ No
HS Handling Requirements			☑ Yes	☐ No
Respiratory Protection	☐ Yes	☑ No	Ventilation	☑ Yes ☐ No
			Use w/ adequate ventilation.	
Gloves	☐ Yes	☑ No	Eye Protection	☑ Yes ☐ No
Other If yes, list below	☑ Yes	☐ No	Special Training If yes, list below	☐ Yes ☑ No
Known or Suspected Human Carcinogen	☐ Yes	☑ No		
Avoid skin & eye contact. Wash hands after use. Avoid inhalation of mist, vapor.				
Special Storage Requirements			☑ Yes	☐ No
Flammable Cabinet	☐ Yes	☑ No	Avoid Heat >120°F	☑ Yes ☐ No
Avoid Acids	☐ Yes	☑ No	Avoid Bases	☐ Yes ☑ No
Other If yes, list below	☑ Yes	☐ No	Freeze Protection Needed	☑ Yes ☐ No
Keep containers tightly closed in storage; product that has undergone partial or complete evaporation may be combustible.				
Samuel E. Bru HSM Approval			12 Jan 10 Date	
Forward to EPM				

Attachment C: Chemical Product Review and Approval Checklist

Section 3		
Environmental Programs and Permitting		
This chemical is approved/denied for order. If denied, provide reason(s).	☑ Approved	☐ Denied
Hazardous Chemical Controls Required (Barcode Required)?	☑ Yes	☐ No
EPM Requirements	☑ Yes	☐ No
Use Requirements per section 2		
Storage Requirements per section 2		
Disposal Requirements Empty containers disposed as sanitary waste		
Chemical has been added to Chemical Inventory Database?	☑ Yes	☐ No
Unique Item ID IT 00483		
Thomas B. Barton	1/13/2010	
EPM Signature (or designee)	Date	
Forward to Requistioner.		
Section 4		
Facility Management		
Special TWPC Requirements	☑ Yes	☐ No
SEE SECT 2 REQUIREMENTS		
[signature]	1/13/10	
Director of Facility Management Signature	Date	
Forward to EPM.		

Armor All Products Company
1221 Broadway
Oakland, CA 94612
Tel. (510) 271-7000

Material Safety Data Sheet

I Product:	ARMOR ALL AUTO GLASS CLEANER
Description:	CLEAR LIQUID

Other Designations	Manufacturer	Emergency Telephone Nos.
Window Cleaner	Armor All Products Company 1221 Broadway Oakland, CA 94612	For Medical Emergencies call: (800) 446-1014 For Transportation Emergencies Chemtrec (800) 424-9300

II Health Hazard Data

Eye contact may result in temporary conjunctival redness. Ingestion of large amounts may cause indigestion. Under normal consumer use and conditions, the likelihood of adverse health effects is low.

No medical conditions are known to be aggravated by exposure to this product.

FIRST AID:
EYE CONTACT: Remove contact lenses. Flush eyes thoroughly with plenty of water for 15 minutes. If irritation occurs, get medical attention.

SKIN CONTACT: Wash area with soap and water. If irritation occurs, get medical attention.

INGESTION: Drink a glassful of water. Get medical attention.

INHALATION: If breathing problems occur, remove to fresh air.

III Hazardous Ingredients

Ingredients	Concentration	Worker Exposure Limit
Propylene glycol n-butyl ether CAS# 5131-66-8	1- 5%	Not established
Isopropanol CAS #67-63-0	1- 5%	200 ppm/400 ppm[1] 400 ppm[2]

[1]TLV-TWA- Threshold Limit Value-Time Weighted Average.
STEL- Short Term Exposure Limit
[2]PEL- OHSA Permissible Exposure Limit

None of the ingredients in this product are on the IARC, NTP or OSHA carcinogen list.

IV Special Protection and Precautions

Hygienic Practices: Wear safety glasses. Wash hands with soap and water after use.

Engineering Controls: Use general ventilation to minimize exposure to vapor or mists.

Work Practices: Avoid eye and skin contact and inhalation of vapor or mist.

V Transportation and Regulatory Data

DOT/IATA/IMO: Not restricted

TSCA Status: All ingredients in this product are listed on the TSCA inventory.

EPA - SARA Title III/CERCLA:
This product is not reportable under Sections 311/312 or 313; and contains no chemicals which are regulated under Section 304/CERCLA.

VI Spill Procedures/Waste Disposal

Spill Procedures: Absorb and containerize. Wash residual down to sanitary sewer. Contact the sanitary treatment facility in advance to assure ability to process washed down material. For spills of multiple products, responders should evaluate the MSDS's of the products for incompatibility with this product.

Waste Disposal: Dispose of in accordance with all applicable federal, state and local regulations.

VII Reactivity Data

Stable under normal use and conditions.

VIII Fire and Explosion Data

Fire Extinguishing Agents: Water, water fog, dry chemical, foam or carbon dioxide (CO_2).

If product has undergone partial or complete evaporation, may be combustible.

IX Physical Data

Boiling Point	212°F/100°C
Flashpoint (Hezog Closed Cup)	147° F
Specific Gravity (H_2O	1.00 @ 25° C
Solubility in Water	Easily soluble
pH	9 - 11

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DATA SUPPLIED IS FOR USE ONLY IN CONNECTION WITH OCCUPATIONAL SAFETY AND HEALTH
DATE PREPARED 8/07

Attachment C: Chemical Product Review and Approval Checklist

Section 1					
Warehouse Supervisor					
Chemical Requested	Stripcoat TLC Free				
Manufacturer	Sanchem, Inc.				
Requistioner Name	Kevin D. East (product is already on-site) 2-18-08				
Quantity Requested	1 gal.	Date Requested: 2-18-08		Date Required: 2-25-08	
Forward to Health and Safety (HS) Manager					
Section 2					
Health and Safety					
This chemical is approved/denied for order. If denied, provide reason(s).			☒ Approved	☐ Denied	
Hazardous Chemical Controls Required (Barcode Required)?			☒ Yes	☐ No	
If yes, identified any Special TWPC Requirements below.					
If yes Facility Management Director is required for additional approval of chemical at the TWPC.					
Special Handling Requirements			☒ Yes	☐ No	
Respiratory Protection	☐ Yes	☒ No	Ventilation	☒ Yes	☐ No
			use with adequate general or local exhaust		
Gloves vinyl, latex, or butyl/rubber	☒ Yes	☐ No	Eye Protection	☒ Yes	☐ No
Other If yes, list below	☒ Yes	☐ No	Special Training If yes, list below	☐ Yes	☒ No
Minimize skin contact. Wash hands after use, before eating/drinking/smoking.					
Special Storage Requirements			☒ Yes	☐ No	
Flammable Cabinet	☐ Yes	☒ No	Avoid Heat >120°F	☐ Yes	☒ No
Avoid Acids	☒ Yes	☐ No	Avoid Bases	☐ Yes	☒ No
Other If yes, list below	☐ Yes	☒ No	Freeze Protection Needed	☒ Yes	☐ No

Attachment C: Chemical Product Review and Approval Checklist

Samuel E. Bu	19 Feb 08
HS Manager Approval	Date
Forward to Environmental Programs and Permitting Director	
Section 3	
Environmental Programs and Permitting	
This chemical is approved/denied for order. If denied, provide reason(s).	☑ Approved ☐ Denied
Hazardous Chemical Controls Required (Barcode Required)? If yes, identified as Special TWPC Requirements below. If yes Facility Management Director is required for additional approval of chemical at the TWPC.	☑ Yes ☐ No
Special TWPC Requirements	☑ Yes ☐ No
Special Use Requirements - PER MSDS	
Special Storage Requirements - PER MSDS	
Disposal Requirements - EMPTY CONTAINER - SANITARY TRASH	
Chemical has been added to Chemical Inventory Database?	☑ Yes ☐ No
Unique Item ID IT00372	
[signature]	2/20/08
EPP Director Signature	Date

Attachment C: Chemical Product Review and Approval Checklist

Forward to Requistioner.	
Section 4	
Facility Management	
Special TWPC Requirements	☐ Yes ☐ No
for C. Thompson	1-11-08
Facility Management Director Signature	Date
Forward to EPP Director.	

Material Safety Data Sheet
STRIPCOAT TLC FREE

Section I - Manufacturer Information

Sanchem, Inc.
1600 S. Canal Street
Chicago, IL 60616

Emergency Telephone Number: 800-621-1603
Telephone Number for Information: 800-225-0385
Revision Date: .....October, 2003

Section II - Hazardous Ingredients/Identity Information

Hazardous Components (Specific Chemical Identity; Common Names(s)):
OSHA PEL ACGIH TLV Other Recommended Limits

No TLV has been established for any component of this product.

	CAS Number
Acrylic Copolymer	9003-01-4
Water	7732-18-5
Poly (Vinyl Butyral)	63148-65-2
Poly (Isobulylene)	9003-27-4
Keysperse Yellow A-52 Liquid	6358-31-2
Poly (Isoprene)	104389-31-3
Propyl Paraben	94-13-3

Section III - Physical/Chemical Characteristics

HMIS Health Rating 0 .....Flammability 0 .....Reactivity 1

Boiling Point: .....212°F
Specific Gravity (H^2O = 1): 0.95
Vapor Pressure (mm Hg.): .....Same as Water
pH: 9.5
Melting Point: .....32°F
Vapor Density (Air = 1): .....Same as Water
Evaporation Rate (Butyl Acetate = 1): .....Same as Water
Solubility in Water: .....Forms dispersion in water
Appearance and Odor: .....Yellow liquid

Section IV - Fire and Explosion Hazard Data

Flash point, auto-ignition temperature, upper and lower explosive limits:
Not determined (aqueous system).

Extinguishing media:
Dried product will burn. Use alcohol type or all-purpose foam for large fires. Use CO_2 or dry chemical media for small fires.

Special fire fighting procedures:
Breathing apparatus when fighting fires in enclosed areas.

Unusual fire and explosion hazards:
Product will not burn but may spatter if temperature exceeds boiling point of water. Dried solids can burn, giving off oxides of carbon and other potentially dangerous combustion by-products.

Section V - Reactivity Data

Stability: ..... Stable
Conditions to Avoid: ..... None Known
Incompatibility (Materials to Avoid): ..... Strong acids
Hazardous Decomposition or By-products: ..... None known
Hazardous Polymerization: ..... Will Not Occur

Section VI - Health Hazard Data

Route(s) of Entry:
Inhalation: ..... No
Skin: ..... Yes
Ingestion: ..... Yes

Health Hazards (Acute and Chronic): ..... None known

Carcinogenicity:
NTP: ..... No
IARC Monographs: ..... No
OSHA Regulated: ..... No

Signs of Symptoms of Exposure: ..... May cause minor skin irritation
Medical Conditions Generally Aggravated by Exposure: .... None known
Emergency and First Aid Procedures: ..... Wash with soap and water

Section VII - Precautions for Safe Handling and Use

Steps to be taken in Case Material is Released or Spilled:
Absorb with strong-absorbing material and scoop up. Store in sealed drums.

Waste Disposal Method: ..... Sanitary land-fill
Precautions to be taken in Handling and Storing: ..... DO NOT FREEZE
Other Precautions: ..... None

Section VIII - Control Measures

Respiratory Protection (Specify Type):
Where required use N10SH/MSHA approved respiratory protection in compliance with OSHA regulations (i.e. 29 CFR 1910.134 et al).

Ventilation:

Local Exhaust: ..... Required
Mechanical (General): ..... Required
Special: ..... Not Applicable
Other: ..... Not Applicable

Protective Gloves: ..... Vinyl or rubber
Eye Protection: ..... Goggles
Other Protective Clothing or Equipment: ..... Optional
Work/Hygienic Practices: ..... Wash hands before eating

DIVIDER PAGE ONLY

Not part of page count

MATERIAL SAFETY DATA SHEET
Review Date: 12/06/2005

SECTION 1 PRODUCT AND COMPANY IDENTIFICATION

PRODUCT: ALVANIA® Grease 2

MSDS NUMBER: 56110E - 11
PRODUCT CODE(S): 71012, 7101202120, 7101202400, 7101235203

MANUFACTURER ADDRESS:
SOPUS Products, P.O. Box 4427, Houston, TX. 77210-4427

TELEPHONE NUMBERS
Spill Information: (877) 242-7400
Health Information: (877) 504-9351
MSDS Assistance Number: (877) 276-7285

SECTION 2 PRODUCT/INGREDIENTS

CAS#	CONCENTRATION	INGREDIENTS
Lubricating Grease Mixture	65 - 89.99 %weight	Highly refined petroleum oils
8001-78-3	5 - 29.99 %weight	Hydrogenated castor oil
Mixture	1 - 4.99 %weight	Lithium grease thickener
Mixture	1 - 4.99 %weight	Additives (containes Sodium Nitrite)

SECTION 3 HAZARDS IDENTIFICATION

EMERGENCY OVERVIEW
Appearance & Odor: Amber semi-solid. Hydrocarbon odor.
Health Hazards: No known immediate health hazards. High-pressure injection under the skin may cause serious damage.
Physical Hazards: No known physical hazards.
NFPA Rating (Health, Fire, Reactivity): 0, 1, 0
Hazard Rating: Least - 0 Slight - 1 Moderate - 2 High - 3 Extreme - 4

Inhalation:
Inhalation of vapors (generated at high temperatures only) or oil mist may cause mild irritation of the nose, throat, and respiratory tract.

Eye Irritation:
May be irritating to the eyes causing a burning sensation, redness, swelling and/or blurred vision.

Skin Contact:
May be irritating to the skin causing a burning sensation, redness and/or swelling. Release of the material during high-pressure applications may result in injection under the skin causing possible extensive tissue damage which is difficult to heal. Other adverse effects not expected from brief skin contact.

Ingestion:
Generally considered to have a low order of acute oral toxicity.

Signs and Symptoms:
Irritation as noted above. Local necrosis is evidenced by delayed onset of pain and tissue damage a few hours following injection.

Aggravated Medical Conditions:
Pre-existing eye, skin and respiratory disorders may be aggravated by exposure to this product.

For additional health information, refer to section 11.

SECTION 4 FIRST AID MEASURES

Inhalation:
If the victim has difficulty breathing or tightness of the chest, is dizzy, vomiting or unresponsive, give 100% oxygen with rescue breathing or CPR as required and transport to the nearest medical facility.

Skin:
Remove contaminated clothing and shoes and wipe excess from skin. Flush skin with water, then wash with soap and water. If irritation occurs, get medical attention. Do not reuse clothing until cleaned. Wipe off excess material from exposed area. If material is injected under the skin, transport to the nearest medical facility for additional treatment. If redness, swelling, pain and/or blisters occur, transport to the nearest medical facility for additional treatment.

Eye:
Flush eyes with large amounts of water for at least 15 minutes. If redness, burning, blurred vision or swelling persist, transport to nearest medical facility for additional treatment.

Ingestion:
Do not induce vomiting. In general, no treatment is necessary unless large quantities of product are ingested. However, get medical attention. Have victim rinse mouth out with water, then drink sips of water to remove taste from mouth. If vomiting occurs spontaneously, keep head below hips to prevent aspiration.

Note to Physician:
In general, emesis induction is unnecessary in high viscosity, low volatility products such as oils and greases.

SECTION 5 FIRE FIGHTING MEASURES

Flash Point [Method]: >400 °F/>204.44 °C [Pensky-Martens Closed Cup]

Extinguishing Media:
Use water fog, foam, dry chemical or carbon dioxide (CO2) to extinguish flames.

Fire Fighting Instructions:
Do not enter confined fire space without full bunker gear (helmet with face shield, bunker coats, gloves and rubber boots), including a positive pressure,

NIOSH approved, self-contained breathing apparatus. This material is non-flammable.

Unusual Fire Hazards:
Material may ignite when preheated.

SECTION 6 ACCIDENTAL RELEASE MEASURES

Protective Measures:
May burn although not readily ignitable.

Spill Management:
Scoop up excess grease. Clean area with appropriate cleaner.

Reporting:
U.S. regulations require reporting releases of this material to the environment which exceed the reportable quantity to the National Response Center at (800)424-8802.
CERCLA: Product is covered by EPA's Comprehensive Environmental Response, Compensation and Liability Act (CERCLA) petroleum exclusion. Releases to air, land, or water are not reportable under CERCLA (Superfund).

CWA: This product is an oil as defined under Section 311 of EPA's Clean Water Act (CWA). Spills into or leading to surface waters that cause a sheen must be reported to the National Response Center, 1-800-424-8802.

SECTION 7 HANDLING AND STORAGE

Precautionary Measures:
Avoid heat, open flames, including pilot lights, and strong oxidizing agents. Use explosion-proof ventilation to prevent vapor accumulation. Ground all handling equipment to prevent sparking. Avoid contact with eyes, skin and clothing. Wash thoroughly after handling.

Handling:
Wash with soap and water before eating, drinking, smoking, applying cosmetics, or using toilet. Launder contaminated clothing before reuse. Properly dispose of contaminated leather articles such as shoes or belts that cannot be decontaminated. Contaminated leather articles including shoes cannot be decontaminated and should be destroyed to prevent reuse.

Storage:
Do not store in open or unlabeled containers. Store in a cool, dry place with adequate ventilation. Keep away from open flames and high temperatures.

Container Warnings:
Keep containers closed when not in use. Containers, even those that have been emptied, can contain explosive vapors. Do not cut, drill, grind, weld or perform similar operations on or near containers.

SECTION 8 EXPOSURE CONTROLS/PERSONAL PROTECTION

Li-Hydroxystearate	ACGIH TLV	TWA: 10 mg/m3
Oil mist, mineral	ACGIH TLV	TWA: 5 mg/m3 STEL: 10 mg/m3
Oil mist, mineral	OSHA PEL	TWA: 5 mg/m3

EXPOSURE CONTROLS
Adequate ventilation to control airborne concentrations.

PERSONAL PROTECTION
Personal protective equipment (PPE) selections vary based on potential exposure conditions such as handling practices, concentration and ventilation. Information on the selection of eye, skin and respiratory protection for use with this material is provided below.

Eye Protection:
Chemical Goggles, or Safety glasses with side shields

Skin Protection:
Use protective clothing which is chemically resistant to this material. Selection of protective clothing depends on potential exposure conditions and may include gloves, boots, suits and other items. The selection(s) should take into account such factors as job task, type of exposure and durability requirements.

Published literature, test data and/or glove and clothing manufacturers indicate the best protection is provided by:
Neoprene, or Nitrile Rubber
Respiratory Protection:
If engineering controls do not maintain airborne concentrations to a level which is adequate to protect worker health, an approved respirator must be worn. Respirator selection, use and maintenance should be in accordance with the requirements of the OSHA Respiratory Protection Standard, 29 CFR 1910.134.

Types of respirator(s) to be considered in the selection process include:
For Vapors: Air Purifying, R or P style prefilter & organic cartridge, NIOSH approved respirator. Self-contained breathing apparatus for use in environments with unknown concentrations or emergency situations.

SECTION 9 PHYSICAL AND CHEMICAL PROPERTIES

Appearance & Odor: Amber semi-solid. Hydrocarbon odor.
Substance Chemical Family: Lubricants
Appearance: Amber semi-solid.

Drop Point: > 350 °F

Flash Point: > 400 °F [Pensky-Martens Closed Cup]

Solubility (in Water): Insoluble

Specific Gravity: > 1.07

SECTION 10 REACTIVITY AND STABILITY

Stability:
Material is stable under normal conditions.

Conditions to Avoid:
Avoid heat and open flames.

Materials to Avoid:
Avoid contact with strong oxidizing agents.

Hazardous Decomposition Products:

Thermal decomposition products are highly dependent on combustion conditions. A complex mixture of airborne solids, liquids and gases will evolve when this material undergoes pyrolysis or combustion. Carbon Monoxide, Carbon Dioxideand other unidentified organic compounds may be formed upon combustion.

SECTION 11 TOXICOLOGICAL INFORMATION

Acute Toxicity
Dermal LD50 >2 g/kg(Rabbit) OSHA: Non-Toxic Based on components(s)
Oral LD50 >5 g/kg(Rat) OSHA: Non-Toxic Based on components(s)
Carcinogenicity Classification
Lubricating Grease
NTP: No IARC: No ACGIH: No OSHA: No

SECTION 12 ECOLOGICAL INFORMATION

Environmental Impact Summary:
There is no ecological data available for this product. However, this product is an oil. It is persistent and does not readily biodegrade. However, it does not bioaccumulate.

SECTION 13 DISPOSAL CONSIDERATIONS

RCRA Information:

Under RCRA, it is the responsibility of the user of the material to determine, at the time of the disposal, whether the material meets RCRA criteria for hazardous waste. This is because material uses, transformations, mixtures, processes, etc. may affect the classification. Refer to the latest EPA, state and local regulations regarding proper disposal.

SECTION 14 TRANSPORT INFORMATION

US Department of Transportation Classification
This material is not subject to DOT regulations under 49 CFR Parts 171-180.

Oil: This product is an oil under 49CFR (DOT) Part 130. If shipped by rail or highway in a tank with a capacity of 3500 gallons or more, it is subject to these requirements. Mixtures or solutions containing 10% or more of this product may also be subject to this rule.

International Air Transport Association
Not regulated under IATA rules.

International Maritime Organization Classification
Not regulated under International Maritime Organization rules.

SECTION 15 REGULATORY INFORMATION

FEDERAL REGULATORY STATUS

OSHA Classification:
Product is hazardous according to the OSHA Hazard Communication Standard, 29 CFR 1910.1200.

Comprehensive Environmental Release, Compensation & Liability Act (CERCLA):
sodium nitrite RQ 100 lbs Reportable Spill => 6993 lbs or 839 gal

Ozone Depleting Substances (40 CFR 82 Clean Air Act):
This material does not contain nor was it directly manufactured with any Class I or Class II ozone depleting substances.

Superfund Amendment & Reauthorization Act (SARA) Title III:
There are no components in this product on the SARA 302 list.

SARA Hazard Categories (311/312):
Immediate Health:YES Delayed Health:NO Fire:NO Pressure:NO Reactivity:NO

SARA Toxic Release Inventory (TRI) (313):
There are no components in this product on the SARA 313 list.

Toxic Substances Control Act (TSCA) Status:
All component(s) of this material is(are) listed on the EPA/TSCA Inventory of Chemical Substances.

Other Chemical Inventories:
Component(s) of this material is (are) listed on the Australian AICS, Canadian DSL, Chinese Inventory, European EINECS, Korean Inventory, Philippines PICCS,

State Regulation
This material is not regulated by California Prop 65, New Jersey Right-to-Know Chemical List or Pennsylvania Right-To-Know Chemical List. However for details on your regulation requirements you should contact the appropriate agency in your state.

SECTION 16 OTHER INFORMATION

Revision#: 11
Review Date: 12/06/2005

Revision Date: 12/06/2005
Revisions since last change (discussion): This Material Safety Data Sheet has changed because Equiva Services LLC has implemented new software to generate the sheet. There will be slight differences in the hazard and precautionary language as we incorporate the guidance contained in the ANSI MSDS standard (ANSI Z400.1-1998). There are no significant changes to the health, safety or precautionary messages. We encourage you to take the opportunity to reread the sheet and review the information contained.

SECTION 17 LABEL INFORMATION

READ AND UNDERSTAND MATERIAL SAFETY DATA SHEET BEFORE HANDLING OR DISPOSING OF PRODUCT. THIS LABEL COMPLIES WITH THE REQUIREMENTS OF THE OSHA HAZARD COMMUNICATION STANDARD (29 CFR 1910.1200) FOR USE IN THE WORKPLACE. THIS LABEL IS NOT INTENDED TO BE USED WITH PACKAGING INTENDED FOR SALE TO CONSUMERS AND MAY NOT CONFORM WITH THE REQUIREMENTS OF THE CONSUMER PRODUCT SAFETY ACT OR OTHER RELATED REGULATORY REQUIREMENTS.

PRODUCT CODE(S): 71012, 7101202120, 7101202400, 7101235203

ALVANIA® Grease 2

CAUTION!

MAY CAUSE SKIN AND EYE IRRITATION. PROLONGED OR REPEATED SKIN CONTACT MAY CAUSE OIL ACNE OR DERMATITIS. HIGH-PRESSURE INJECTION UNDER SKIN MAY CAUSE SERIOUS DAMAGE.

Precautionary Measures:
Avoid prolonged or repeated contact with eyes, skin and clothing. Avoid breathing of vapors, fumes, or mist. Use only with adequate ventilation. Wash thoroughly after handling.

FIRST AID
Inhalation: If the victim has difficulty breathing or tightness of the chest, is dizzy, vomiting or unresponsive, give 100% oxygen with rescue breathing or CPR as required and transport to the nearest medical facility.
Skin Contact: Wipe off excess material from exposed area. Remove contaminated clothing and shoes and wipe excess from skin. Flush skin with water, then wash with soap and water. If irritation occurs, get medical attention. Do not reuse clothing until cleaned. If material is injected under the skin, transport to the nearest medical facility for additional treatment. If redness, swelling, pain and/or blisters occur, transport to the nearest medical facility for additional treatment.
Eye Contact: Flush eyes with large amounts of water for at least 15 minutes. If redness, burning, blurred vision or swelling persist, transport to nearest medical facility for additional treatment.
Ingestion: Do not induce vomiting. In general, no treatment is necessary unless large quantities of product are ingested. However, get medical attention. If vomiting occurs spontaneously, keep head below hips to prevent aspiration. Have victim rinse mouth out with water, then drink sips of water to remove taste from mouth.

FIRE

In case of fire, Use water fog, 'alcohol foam', dry chemical or carbon dioxide (CO2) to extinguish flames. Do not use a direct stream of water.
SPILL OR LEAK
Scoop up excess grease. Clean area with appropriate cleaner.

CONTAINS: Highly refined petroleum oils, Mixture; Hydrogenated castor oil, 8001-78-3; Lithium grease thickener, Mixture; Additives (containes Sodium Nitrite), Mixture

NFPA Rating (Health, Fire, Reactivity): 0, 1, 0

TRANSPORTATION

US Department of Transportation Classification
This material is not subject to DOT regulations under 49 CFR Parts 171-180.

Oil: This product is an oil under 49CFR (DOT) Part 130. If shipped by rail or highway in a tank with a capacity of 3500 gallons or more, it is subject to these requirements. Mixtures or solutions containing 10% or more of this product may also be subject to this rule.

CAUTION: Misuse of empty containers can be hazardous. Empty containers can be hazardous if used to store toxic, flammable, or reactive materials. Cutting or welding of empty containers might cause fire, explosion or toxic fumes from residues. Do not pressurize or expose to open flames or heat. Keep container closed and drum bungs in place.

Name and Address
SOPUS Products
P.O. Box 4427
Houston, TX 77210-4427

ADMINISTRATIVE INFORMATION
MANUFACTURER ADDRESS: SOPUS Products, P.O. Box 4427, Houston, TX. 77210-4427

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44532-11973-100R-12/06/2005

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MATERIAL SAFETY DATA SHEET

SECTION 1 PRODUCT AND COMPANY IDENTIFICATION

PRODUCT

Product Name: **MOBILGREASE 28**
Product Description: Synthetic Base Stocks and Additives
Product Code: 970934
Intended Use: Grease

COMPANY IDENTIFICATION

Supplier:	**EXXON MOBIL CORPORATION** 3225 GALLOWS RD. FAIRFAX, VA. 22037 USA
24 Hour Health Emergency	609-737-4411
Transportation Emergency Phone	800-424-9300
ExxonMobil Transportation No.	281-834-3296
MSDS Requests	713-613-3661
Product Technical Information	800-662-4525, 800-947-9147
MSDS Internet Address	http://www.exxon.com, http://www.mobil.com

SECTION 2 COMPOSITION / INFORMATION ON INGREDIENTS

Reportable Hazardous Substance(s) or Complex Substance(s)

Name	CAS#	Concentration*
PENTAERYTHRITOL	115-77-5	1 - 5%
SODIUM NITRITE	7632-00-0	0.1 - 1%

* All concentrations are percent by weight unless material is a gas. Gas concentrations are in percent by volume.

SECTION 3 HAZARDS IDENTIFICATION

This material is not considered to be hazardous according to regulatory guidelines (see (M)SDS Section 15).

POTENTIAL HEALTH EFFECTS

Low order of toxicity. Excessive exposure may result in eye, skin, or respiratory irritation. High-pressure injection under skin may cause serious damage.

ENVIRONMENTAL HAZARDS

Harmful to aquatic organisms, may cause long-term adverse effects in the aquatic environment.

NFPA Hazard ID:	Health:	0	Flammability:	1	Reactivity: 0
HMIS Hazard ID:	Health:	0	Flammability:	1	Reactivity: 0

NOTE: This material should not be used for any other purpose than the intended use in Section 1 without expert advice. Health studies have shown that chemical exposure may cause potential human health risks which may vary from person to person.

SECTION 4 FIRST AID MEASURES

INHALATION

Under normal conditions of intended use, this material is not expected to be an inhalation hazard.

SKIN CONTACT

Wash contact areas with soap and water. If product is injected into or under the skin, or into any part of the body, regardless of the appearance of the wound or its size, the individual should be evaluated immediately by a physician as a surgical emergency. Even though initial symptoms from high pressure injection may be minimal or absent, early surgical treatment within the first few hours may significantly reduce the ultimate extent of injury.

EYE CONTACT

Flush thoroughly with water. If irritation occurs, get medical assistance.

INGESTION

First aid is normally not required. Seek medical attention if discomfort occurs.

SECTION 5 FIRE FIGHTING MEASURES

EXTINGUISHING MEDIA

Appropriate Extinguishing Media: Use water fog, foam, dry chemical or carbon dioxide (CO2) to extinguish flames.

Inappropriate Extinguishing Media: Straight Streams of Water

FIRE FIGHTING

Fire Fighting Instructions: Evacuate area. Prevent runoff from fire control or dilution from entering streams, sewers, or drinking water supply. Firefighters should use standard protective equipment and in enclosed spaces, self-contained breathing apparatus (SCBA). Use water spray to cool fire exposed surfaces and to protect personnel.

Hazardous Combustion Products: Sulfur oxides, Aldehydes, Smoke, Fume, Incomplete combustion products, Oxides of carbon

FLAMMABILITY PROPERTIES

Flash Point [Method]: 232C (450F) [EST. FOR OIL, ASTM D-92 (COC)]
Flammable Limits (Approximate volume % in air): LEL: N/D UEL: N/D
Autoignition Temperature: N/D

SECTION 6 ACCIDENTAL RELEASE MEASURES

NOTIFICATION PROCEDURES

In the event of a spill or accidental release, notify relevant authorities in accordance with all applicable regulations. U.S. regulations require reporting releases of this material to the environment which exceed the reportable quantity or oil spills which could reach any waterway including intermittent dry creeks. The National Response Center can be reached at (800)424-8802.

SPILL MANAGEMENT

Land Spill: Allow spilled material to solidify and scrape up with shovels into a suitable container for recycle or disposal. Scrape up spilled material with shovels into a suitable container for recycle or disposal.

Water Spill: Stop leak if you can do it without risk. Confine the spill immediately with booms. Skim from surface.

Water spill and land spill recommendations are based on the most likely spill scenario for this material; however, geographic conditions, wind, temperature, (and in the case of a water spill) wave and current direction and speed may greatly influence the appropriate action to be taken. For this reason, local experts should be consulted. Note: Local regulations may prescribe or limit action to be taken.

ENVIRONMENTAL PRECAUTIONS

Prevent entry into waterways, sewers, basements or confined areas.

SECTION 7: HANDLING AND STORAGE

HANDLING

Prevent small spills and leakage to avoid slip hazard.

Static Accumulator: This material is not a static accumulator.

STORAGE

Do not store in open or unlabelled containers.

SECTION 8: EXPOSURE CONTROLS/PERSONAL PROTECTION

EXPOSURE LIMIT VALUES

Exposure limits/standards (Note: Exposure limits are not additive)

Source	Form	Limit / Standard			Note	Source
PENTAERYTHRITOL	Respirable fraction.	TWA	5 mg/m3		N/A	OSHA Z1
PENTAERYTHRITOL	Total dust.	TWA	15 mg/m3		N/A	OSHA Z1
PENTAERYTHRITOL		TWA	10 mg/m3		N/A	ACGIH

NOTE: Limits/standards shown for guidance only. Follow applicable regulations.

ENGINEERING CONTROLS

The level of protection and types of controls necessary will vary depending upon potential exposure conditions.
Control measures to consider:

No special requirements under ordinary conditions of use and with adequate ventilation.

PERSONAL PROTECTION

Personal protective equipment selections vary based on potential exposure conditions such as applications, handling practices, concentration and ventilation. Information on the selection of protective equipment for use with this material, as provided below, is based upon intended, normal usage.

Respiratory Protection: If engineering controls do not maintain airborne contaminant concentrations at a level which is adequate to protect worker health, an approved respirator may be appropriate. Respirator selection, use, and maintenance must be in accordance with regulatory requirements, if applicable. Types of respirators to be considered for this material include:

No protection is ordinarily required under normal conditions of use and with adequate ventilation.

For high airborne concentrations, use an approved supplied-air respirator, operated in positive pressure mode. Supplied air respirators with an escape bottle may be appropriate when oxygen levels are inadequate, gas/vapor warning properties are poor, or if air purifying filter capacity/rating may be exceeded.

Hand Protection: Any specific glove information provided is based on published literature and glove manufacturer data. Work conditions can greatly effect glove durability; inspect and replace worn or damaged gloves. The types of gloves to be considered for this material include:

No protection is ordinarily required under normal conditions of use.

Eye Protection: If contact is likely, safety glasses with side shields are recommended.

Skin and Body Protection: Any specific clothing information provided is based on published literature or manufacturer data. The types of clothing to be considered for this material include:

No skin protection is ordinarily required under normal conditions of use. In accordance with good industrial hygiene practices, precautions should be taken to avoid skin contact.

Specific Hygiene Measures: Always observe good personal hygiene measures, such as washing after handling the material and before eating, drinking, and/or smoking. Routinely wash work clothing and protective equipment to remove contaminants. Discard contaminated clothing and footwear that cannot be cleaned. Practice good housekeeping.

ENVIRONMENTAL CONTROLS

See Sections 6, 7, 12, 13.

SECTION 9 PHYSICAL AND CHEMICAL PROPERTIES

Typical physical and chemical properties are given below. Consult the Supplier in Section 1 for additional data.

GENERAL INFORMATION

Physical State: Solid
Form: Semi-fluid
Color: Red
Odor: Characteristic
Odor Threshold: N/D

IMPORTANT HEALTH, SAFETY, AND ENVIRONMENTAL INFORMATION

Relative Density (at 15 C): 0.946
Flash Point [Method]: 232C (450F) [EST. FOR OIL, ASTM D-92 (COC)]

Flammable Limits (Approximate volume % in air): LEL: N/D UEL: N/D
Autoignition Temperature: N/D
Boiling Point / Range: > 316C (600F)
Vapor Density (Air = 1): N/D
Vapor Pressure: < 0.013 kPa (0.1 mm Hg) at 20 C
Evaporation Rate (n-butyl acetate = 1): N/D
pH: N/A
Log Pow (n-Octanol/Water Partition Coefficient): > 3.5
Solubility in Water: Negligible
Viscosity: 28 cSt (28 mm2/sec) at 40 C | 5.2 cSt (5.2 mm2/sec) at 100C
Oxidizing Properties: See Sections 3, 15, 16.

OTHER INFORMATION
Freezing Point: N/D
Melting Point: N/D

NOTE: Most physical properties above are for the oil component in the material.

SECTION 10 STABILITY AND REACTIVITY

STABILITY: Material is stable under normal conditions.

CONDITIONS TO AVOID: Excessive heat. High energy sources of ignition.

MATERIALS TO AVOID: Strong oxidizers

HAZARDOUS DECOMPOSITION PRODUCTS: Material does not decompose at ambient temperatures.

HAZARDOUS POLYMERIZATION: Will not occur.

SECTION 11 TOXICOLOGICAL INFORMATION

ACUTE TOXICITY

Route of Exposure	Conclusion / Remarks
Inhalation	
Toxicity (Rat): LC50 > 5000 mg/m3	Minimally Toxic. Based on assessment of the components.
Irritation: No end point data.	Negligible hazard at ambient/normal handling temperatures. Based on assessment of the components.
Ingestion	
Toxicity (Rat): LD50 > 2000 mg/kg	Minimally Toxic. Based on test data for structurally similar materials.
Skin	
Toxicity (Rabbit): LD50 > 2000 mg/kg	Minimally Toxic. Based on test data for structurally similar materials.
Irritation (Rabbit): Data available.	Negligible irritation to skin at ambient temperatures. Based on assessment of the components.
Eye	
Irritation (Rabbit): Data available.	May cause mild, short-lasting discomfort to eyes. Based on assessment of the components.

CHRONIC/OTHER EFFECTS

Contains:

Synthetic base oils: Not expected to cause significant health effects under conditions of normal use, based on laboratory studies with the same or similar materials. Not mutagenic or genotoxic. Not sensitizing in test animals and humans.

Phenyl-alpha-naphthylamine (PAN): Undiluted PAN is a skin sensitizer. Human testing with lubricants containing 1.0% PAN caused no reactions indicative of sensitization.

Additional information is available by request.

The following ingredients are cited on the lists below: None.

–REGULATORY LISTS SEARCHED–

1 = NTP CARC	3 = IARC 1	5 = IARC 2B
2 = NTP SUS	4 = IARC 2A	6 = OSHA CARC

SECTION 12 ECOLOGICAL INFORMATION

The information given is based on data available for the material, the components of the material, and similar materials.

ECOTOXICITY

Material -- Expected to be harmful to aquatic organisms. May cause long-term adverse effects in the aquatic environment.

MOBILITY

Base oil component -- Low solubility and floats and is expected to migrate from water to the land. Expected to partition to sediment and wastewater solids.

PERSISTENCE AND DEGRADABILITY

Biodegradation:

Base oil component -- Expected to be inherently biodegradable

BIOACCUMULATION POTENTIAL

Base oil component -- Has the potential to bioaccumulate, however metabolism or physical properties may reduce the bioconcentration or limit bioavailability.

SECTION 13 DISPOSAL CONSIDERATIONS

Disposal recommendations based on material as supplied. Disposal must be in accordance with current applicable laws and regulations, and material characteristics at time of disposal.

DISPOSAL RECOMMENDATIONS

Suitable routes of disposal are supervised incineration, preferentially with energy recovery, or appropriate recycling methods in accordance with applicable regulations and material characteristics at the time of disposal.

REGULATORY DISPOSAL INFORMATION

RCRA Information: The unused product, in our opinion, is not specifically listed by the EPA as a hazardous waste (40 CFR, Part 261D), nor is it formulated to contain materials which are listed as hazardous wastes. It does not exhibit the hazardous characteristics of ignitability, corrositivity or reactivity and is not formulated with contaminants as determined by the Toxicity Characteristic Leaching Procedure (TCLP). However, used product may be regulated.

Empty Container Warning PRECAUTIONARY LABEL TEXT: Empty containers may retain residue and can be dangerous. DO NOT PRESSURIZE, CUT, WELD, BRAZE, SOLDER, DRILL, GRIND OR EXPOSE SUCH CONTAINERS TO HEAT, FLAME, SPARKS, STATIC ELECTRICITY, OR OTHER SOURCES OF IGNITION; THEY MAY EXPLODE AND CAUSE INJURY OR DEATH. Do not attempt to refill or clean container since residue is difficult to remove. Empty drums should be completely drained, properly bunged and promptly returned to a drum reconditioner. All containers should be disposed of in an environmentally safe manner and in accordance with governmental regulations.

SECTION 14 TRANSPORT INFORMATION

LAND (DOT) : Not Regulated for Land Transport

LAND (TDG) : Not Regulated for Land Transport

SEA (IMDG) : Not Regulated for Sea Transport according to IMDG-Code

AIR (IATA) : Not Regulated for Air Transport

SECTION 15 REGULATORY INFORMATION

OSHA HAZARD COMMUNICATION STANDARD: When used for its intended purposes, this material is not classified as hazardous in accordance with OSHA 29 CFR 1910.1200.

NATIONAL CHEMICAL INVENTORY LISTING: AICS, IECSC, DSL, EINECS, TSCA

EPCRA: This material contains no extremely hazardous substances.

SARA (311/312) REPORTABLE HAZARD CATEGORIES: None.

SARA (313) TOXIC RELEASE INVENTORY: This material contains no chemicals subject to the supplier notification requirements of the SARA 313 Toxic Release Program.

The Following Ingredients are Cited on the Lists Below:*

Chemical Name	CAS Number	List Citations
DIPHENYLAMINE	122-39-4	5, 9
PENTAERYTHRITOL	115-77-5	1, 4, 13, 16, 19

--REGULATORY LISTS SEARCHED--

1 = ACGIH ALL 6 = TSCA 5a2 11 = CA P65 REPRO 16 = MN RTK

2 = ACGIH A1	7 = TSCA 5e	12 = CA RTK	17 = NJ RTK
3 = ACGIH A2	8 = TSCA 6	13 = IL RTK	18 = PA RTK
4 = OSHA Z	9 = TSCA 12b	14 = LA RTK	19 = RI RTK
5 = TSCA 4	10 = CA P65 CARC	15 = MI 293	

Code key: CARC=Carcinogen; REPRO=Reproductive

* EPA recently added new chemical substances to its TSCA Section 4 test rules. Please contact the supplier to confirm whether the ingredients in this product currently appear on a TSCA 4 or TSCA 12b list.

SECTION 16 OTHER INFORMATION

N/D = Not determined, N/A = Not applicable

THIS SAFETY DATA SHEET CONTAINS THE FOLLOWING REVISIONS:
Revision Changes:
Section 13: Disposal Considerations - Disposal Recommendations was modified.
Section 13: Regulatory Disposal Information was modified.
Section 09: Boiling Point C(F) was modified.
Section 09: Vapor Pressure was modified.
Section 11: Inhalation Lethality Test Data was modified.
Section 05: Hazardous Combustion Products was modified.
Section 06: Accidental Release - Spill Management - Land was modified.
Section 06: Accidental Release - Spill Management - Water was modified.
Section 09: Relative Density - Header was modified.
Section 09: Flash Point C(F) was modified.
Section 09: Viscosity was modified.
Section 09: Viscosity was modified.
Section 02: Component table was modified.
Section 15: National Chemical Inventory Listing was modified.
Section 08: Exposure Limits Table was modified.
Section 08: Exposure Limit Values - Header was modified.
Section 16: Global Disclaimer was added.
Section 16: Disclaimer was deleted.
Section 13: RCRA Information Header was deleted.
Section 13: RCRA TCLP was deleted.
Section 13: RCRA TCLP was deleted.

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641274-00 MOBILUX EP 2
MATERIAL SAFETY DATA BULLETIN

1. PRODUCT AND COMPANY IDENTIFICATION

PRODUCT NAME: MOBILUX EP 2
SUPPLIER: EXXONMOBIL CORPORATION
3225 GALLOWS RD.
FAIRFAX, VA 22037
24 - Hour Health and Safety Emergency (call collect): 609-737-4411
24 - Hour Transportation Emergency:
CHEMTREC: 800-424-9300 202-483-7616
LUBES AND FUELS: 281-834-3296
Product and Technical Information:
Lubricants and Specialties: 800-662-4525 800-443-9966
Fuels Products: 800-947-9147
MSDS Fax on Demand: 613-228-1467
MSDS Internet Website: http://emmsds.ihssolutions.com/

2. COMPOSITION/INFORMATION ON INGREDIENTS

CHEMICAL NAMES AND SYNONYMS: SEVERE TREAT MIN. OILS & ADDITIVES
GLOBALLY REPORTABLE MSDS INGREDIENTS:

Substance Name	Approx. Wt%
ZINC DIALKYL DITHIOPHOSPHATE (68457-79-4)	1-5
HYDROXYALKYL LONG-CHAIN ALKENYL IMIDAZOLINE (27136-73-8)	<1

See Section 8 for exposure limits (if applicable).

3. HAZARDS IDENTIFICATION

Under normal conditions of use, this product is not considered hazardous according to regulatory guidelines (See section 15).
EMERGENCY OVERVIEW: Brown Grease. DOT ERG No. : NA
POTENTIAL HEALTH EFFECTS: Under normal conditions of intended use, this product does not pose a risk to health. Excessive exposure may result in eye, skin or respiratory irritation.
POTENTIAL ENVIRONMENTAL EFFECTS: Harmful to aquatic organisms, may cause long-term adverse effects in the aquatic environment.
For further health effects/toxicological data, see Section 11.

4. FIRST AID MEASURES

EYE CONTACT: Flush thoroughly with water. If irritation occurs, call a physician.
SKIN CONTACT: Wash contact areas with soap and water. Remove and

clean oil soaked clothing daily and wash affected area.
INJECTION INJURY WARNING: If product is injected into or under the skin, or into any part of the body, regardless of the appearance of the wound or its size, the individual should be evaluated immediately by a physician as a surgical emergency. Even though initial symptoms from high pressure injection may be minimal or absent, early surgical treatment within the first few hours may significantly reduce the ultimate extent of injury.
INHALATION: Remove from further exposure. If respiratory irritation, dizziness, nausea, or unconsciousness occurs, seek immediate medical assistance. If breathing has stopped, assist ventilation with mechanical device or use mouth-to-mouth resuscitation.
INGESTION: Not expected to be a problem. Seek medical attention if discomfort occurs. Do not induce vomiting.

5. FIRE-FIGHTING MEASURES

EXTINGUISHING MEDIA: Carbon dioxide, foam, dry chemical and water fog.
SPECIAL FIRE FIGHTING PROCEDURES: Water or foam may cause frothing. Use water to keep fire exposed containers cool. Water spray may be used to flush spills away from exposure. Prevent runoff from fire control or dilution from entering streams, sewers, or drinking water supply.
SPECIAL PROTECTIVE EQUIPMENT: For fires in enclosed areas, fire fighters must use self-contained breathing apparatus.
UNUSUAL FIRE AND EXPLOSION HAZARDS: None.
COMBUSTION PRODUCTS: Fumes, smoke, carbon monoxide, sulfur oxides, aldehydes and other decomposition products, in the case of incomplete combustion.
Flash Point C(F): > 204(400) (ESTIMATED FOR OIL, ASTM D-92 (COC)).
Flammable Limits (approx.% vol.in air) - LEL: NE, UEL: NE
NFPA HAZARD ID: Health: 0, Flammability: 1, Reactivity: 0

6. ACCIDENTAL RELEASE MEASURES

NOTIFICATION PROCEDURES: Report spills/releases as required to appropriate authorities. U.S. Coast Guard and EPA regulations require immediate reporting of spills/releases that could reach any waterway including intermittent dry creeks. Report spill/release to Coast Guard National Response Center toll free number (800)424-8802. In case of accident or road spill notify CHEMTREC (800) 424-9300.
PROCEDURES IF MATERIAL IS RELEASED OR SPILLED:
LAND SPILL: Shut off source taking normal safety precautions. Take measures to minimize the effects on ground water. Recover by pumping or contain spilled material with sand or other suitable absorbent and remove mechanically into containers. If necessary, dispose of adsorbed residues as directed in Section 13.
WATER SPILL: Confine the spill immediately with booms. Warn other ships in the vicinity. Notify port and other relevant authorities. Remove from the surface by skimming or with suitable absorbents. If permitted by regulatory authorities the use of suitable dispersants should be considered where recommended in local oil spill procedures.

ENVIRONMENTAL PRECAUTIONS: Prevent material from entering sewers, water sources or low lying areas; advise the relevant authorities if it has, or if it contaminates soil/vegetation.
PERSONAL PRECAUTIONS: See Section 8

7. HANDLING AND STORAGE

HANDLING: High pressure injection under the skin may occur due to the rupture of pressurized lines. Always seek medical attention. No special precautions are necessary beyond normal good hygiene practices. See Section 8 for additional personal protection advice when handling this product.
STORAGE: Keep containers closed when not in use. Do not store in open or unlabelled containers. Store away from strong oxidizing agents and combustible materials. Do not store near heat, sparks, flame or strong oxidants.
SPECIAL PRECAUTIONS: Prevent small spills and leakages to avoid slip hazard.
EMPTY CONTAINER WARNING: Empty containers retain residue (liquid and/or vapor) and can be dangerous. DO NOT PRESSURIZE, CUT, WELD, BRAZE, SOLDER, DRILL, GRIND OR EXPOSE SUCH CONTAINERS TO HEAT, FLAME, SPARKS, STATIC ELECTRICITY, OR OTHER SOURCES OF IGNITION; THEY MAY EXPLODE AND CAUSE INJURY OR DEATH. Do not attempt to refill or clean container since residue is difficult to remove. Empty drums should be completely drained, properly bunged and promptly returned to a drum reconditioner. All containers should be disposed of in an environmentally safe manner and in accordance with governmental regulations.

8. EXPOSURE CONTROLS/PERSONAL PROTECTION

OCCUPATIONAL EXPOSURE LIMITS:
This product does not contain any components which have recognized exposure limits.
VENTILATION: Use adequate ventilation.
RESPIRATORY PROTECTION: No special requirements under ordinary conditions of use and with adequate ventilation.
EYE PROTECTION: Generally eye contact is unlikely with this type material. If eye contact is likely, safety glasses with side shields or chemical type goggles should be worn.
SKIN PROTECTION: If prolonged or repeated skin contact is likely, oil impervious gloves should be worn. Good personal hygiene practices should always be followed.

9. PHYSICAL AND CHEMICAL PROPERTIES

Typical physical properties are given below. Consult Product Data Sheet for specific details.
APPEARANCE: Grease
COLOR: Brown
ODOR: Mild
ODOR THRESHOLD-ppm: NE
pH: NA

BOILING POINT C(F): > 316(600)
DROP POINT C(F): > 180(356)
FLASH POINT C(F): > 204(400) (ESTIMATED FOR OIL, ASTM D-92 (COC))
FLAMMABILITY (solids): NE
AUTO FLAMMABILITY C(F): NA
EXPLOSIVE PROPERTIES: NA
OXIDIZING PROPERTIES: NA
VAPOR PRESSURE-mmHg 20 C: < 0.1
VAPOR DENSITY: NE
EVAPORATION RATE: NE
RELATIVE DENSITY, 15/4 C: 0.922
SOLUBILITY IN WATER: Negligible
PARTITION COEFFICIENT: > 3.5
VISCOSITY AT 40 C, cSt: 160.0
VISCOSITY AT 100 C, cSt: > 16.0
POUR POINT C(F): NA
FREEZING POINT C(F): NE
VOLATILE ORGANIC COMPOUND: NE
NOTE: MOST PHYSICAL PROPERTIES FOR OIL COMPONENT.
DMSO EXTRACT, IP-346 (WT.%): <3, for mineral oil only
NA=NOT APPLICABLE NE=NOT ESTABLISHED D=DECOMPOSES
FOR FURTHER TECHNICAL INFORMATION, CONTACT YOUR MARKETING REPRESENTATIVE

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10. STABILITY AND REACTIVITY

STABILITY (THERMAL, LIGHT, ETC.): Stable.
CONDITIONS TO AVOID: Extreme heat and high energy sources of ignition.
INCOMPATIBILITY (MATERIALS TO AVOID): Strong oxidizers.
HAZARDOUS DECOMPOSITION PRODUCTS: Product does not decompose at ambient temperatures.
HAZARDOUS POLYMERIZATION: Will not occur.

---

11. TOXICOLOGICAL DATA

---ACUTE TOXICOLOGY---
ORAL TOXICITY (RATS): Practically non-toxic (LD50: greater than 2000 mg/kg). ---Based on testing of similar products and/or the components.
DERMAL TOXICITY (RABBITS): Practically non-toxic (LD50: greater than 2000 mg/kg). ---Based on testing of similar products and/or the components.
INHALATION TOXICITY (RATS): Practically non-toxic (LC50: greater than 5 mg/l). ---Based on testing of similar products and/or the components.
EYE IRRITATION (RABBITS): Practically non-irritating. (Draize score: greater than 6 but 15 or less). ---Based on testing of similar products and/or the components.
SKIN IRRITATION (RABBITS): Practically non-irritating. (Primary Irritation Index: greater than 0.5 but less than 3). ---Based on testing of similar products and/or the components.
OTHER ACUTE TOXICITY DATA: Although an acute inhalation study was not performed with this product, a variety of mineral oils and synthetic base oils, such as those in this product have been tested. These samples had virtually no effect other than a

nonspecific inflammatory response in the lung to the aerosolized mineral oil. The presence of additives in other tested formulations (in approximately the same amounts as in the present formulation) did not alter the observed effects.

---SUBCHRONIC TOXICOLOGY (SUMMARY)---

No significant adverse effects were found in studies using repeated dermal applications of similar formulations to the skin of laboratory animals for 13 weeks at doses significantly higher than those expected during normal industrial exposure. The animals were evaluated extensively for effects of exposure (hematology, serum chemistry, urinalysis, organ weights, microscopic examination of tissues etc.).

---REPRODUCTIVE TOXICOLOGY (SUMMARY)---

No teratogenic effects would be expected from dermal exposure, based on laboratory developmental toxicity studies of major components in this formulation and/or materials of similar composition.

---CHRONIC TOXICOLOGY (SUMMARY)---

Repeated and/or prolonged exposure may cause irritation to the skin, eyes or respiratory tract. For mineral base oils: Base oils in this product are severely solvent refined and/or severely hydrotreated. Chronic mouse skin painting studies of severely treated oils showed no evidence of carcinogenic effects. These results are confirmed on a continuing basis using various screening methods such as Modified Ames Test, IP-346, and/or other analytical methods. For synthetic base oils: The base oils in this product have been tested in the Ames assay and other tests of mutagenicity with negative results. These base oils are not expected to be carcinogenic with chronic dermal exposures.

---SENSITIZATION (SUMMARY)---

Not expected to be sensitizing based on tests of this product, components, or similar products.

---

12. ECOLOGICAL INFORMATION

ENVIRONMENTAL FATE AND EFFECTS:

This environmental assessment was conducted using information on the individual components as no test data was available for this specific formulation.

ECOTOXICITY: This product is expected to be harmful to aquatic organisms. May cause long-term adverse effects in the aquatic environment.

MOBILITY: Not established.

PERSISTENCE AND DEGRADABILITY: This product is expected to be inherently biodegradable, as the principal components have been shown to degrade at slow to moderate rates.

BIOACCUMULATIVE POTENTIAL: Not established.

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13. DISPOSAL CONSIDERATIONS

WASTE DISPOSAL: Product is suitable for burning in an enclosed, controlled burner for fuel value. Such burning may be limited pursuant to the Resource Conservation and Recovery Act. In addition, the product is suitable for processing by an approved recycling facility or can be disposed of at an appropriate

government waste disposal facility. Use of these methods is subject to user compliance with applicable laws and regulations and consideration of product characteristics at time of disposal.

RCRA INFORMATION: The unused product, in our opinion, is not specifically listed by the EPA as a hazardous waste (40 CFR, Part 261D), nor is it formulated to contain materials which are listed hazardous wastes. It does not exhibit the hazardous characteristics of ignitability, corrosivity, or reactivity. The unused product is not formulated with substances covered by the Toxicity Characteristic Leaching Procedure (TCLP). However, used product may be regulated.

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14. TRANSPORT INFORMATION

USA DOT: NOT REGULATED BY USA DOT.
RID/ADR: NOT REGULATED BY RID/ADR.
IMO: NOT REGULATED BY IMO.
IATA: NOT REGULATED BY IATA.

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15. REGULATORY INFORMATION

US OSHA HAZARD COMMUNICATION STANDARD: When used for its intended purposes, this product is not classified as hazardous in accordance with OSHA 29 CFR 1910.1200.

EU Labeling: Product is dangerous as defined by the European Union Dangerous Substances/Preparations Directives.

Symbol: Not applicable.

Risk Phrase(s): R52/53.
Harmful to aquatic organisms, may cause long-term adverse effects in the aquatic environment.

Safety Phrase(s): Not applicable.

Governmental Inventory Status: All components comply with TSCA, EINECS/ELINCS and AICS.

U.S. Superfund Amendments and Reauthorization Act (SARA) Title III:
This product contains no "EXTREMELY HAZARDOUS SUBSTANCES".
SARA (311/312) REPORTABLE HAZARD CATEGORIES: None.
This product contains the following SARA (313) Toxic Release Chemicals:

CHEMICAL NAME	CAS NUMBER	CONC.
ZINC DIALKYL DITHIOPHOSPHATE	68457-79-4	1.4%

The following product ingredients are cited on the lists below:

CHEMICAL NAME	CAS NUMBER	LIST CITATIONS
LITHIUM HYDROXIDE (0.05%)	1310-65-2	22
TRICRESYL PHOSPHATE (>0.01%)	1330-78-5	22
ZINC (ELEMENTAL ANALYSIS) (0.17%)	7440-66-6	22
LITHIUM-SOAP THICKENER (6.14%)	7620-77-1	22
ZINC DIALKYL DITHIOPHOSPHATE (1.36%)	68457-79-4	18, 20, 21, 22, 24, 25
FATTY ACIDS, C16-22, LITHIUM SALTS (0.76%)	68783-36-8	22

--- REGULATORY LISTS SEARCHED ---
1=ACGIH ALL 6=IARC 1 11=TSCA 4 16=CA P65 CARC 21=LA RTK

2=ACGIH A1 7=IARC 2A 12=TSCA 5a2 17=CA P65 REPRO 22=MI 293
3=ACGIH A2 8=IARC 2B 13=TSCA 5e 18=CA RTK 23=MN RTK
4=NTP CARC 9=OSHA CARC 14=TSCA 6 19=FL RTK 24=NJ RTK
5=NTP SUS 10=OSHA Z 15=TSCA 12b 20=IL RTK 25=PA RTK
26=RI RTK
Code key: CARC=Carcinogen; SUS=Suspected Carcinogen; REPRO=Reproductive

---

16. OTHER INFORMATION

USE: AUTOMOTIVE GREASE
NOTE: PRODUCTS OF EXXON MOBIL CORPORATION AND ITS AFFILIATED COMPANIES ARE NOT FORMULATED TO CONTAIN PCBS.
Health studies have shown that many hydrocarbons pose potential human health risks which may vary from person to person. Information provided on this MSDS reflects intended use. This product should not be used for other applications. In any case, the following advice should be considered:
INDUSTRIAL LABEL
Under normal conditions of intended use, this product does not pose a risk to health. Excessive exposure may result in eye, skin or respiratory irritation. Always observe good hygiene measures. First Aid: Wash skin with soap and water. Flush eyes with water. If overcome by fumes or vapor, remove to fresh air. If ingested do not induce vomiting. If symptoms persist seek medical assistance. Read and understand the MSDS before using this product.
****
For Internal Use Only: MHC: 1* 1* 1* 1* 1*, MPPEC: A, TRN: 641274-00, ELIS: 400381, CMCS97: 970717, REQ: US - MARKETING, SAFE USE: L
EHS Approval Date: 27FEB2003
****

****
Legally required information is given in accordance with applicable Information given herein is offered in good faith as accurate, but without guarantee. Conditions of use and suitability of the product for particular uses are beyond our control; all risks of use of the product are therefore assumed by the user and WE EXPRESSLY DISCLAIM ALL WARRANTIES OF EVERY KIND AND NATURE, INCLUDING WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE IN RESPECT TO THE USE OR SUITABILITY OF THE PRODUCT. Nothing is intended as a recommendation for uses which infringe valid patents or as extending any license under valid patents. Appropiate warnings and safe handling procedures should be providedto handlers and users. Use or re-transmission of the information contained herein in any other format than the format as presented is strictly prohibited. Mobil neither represents nor warrants that the format, content or product formulas contained in this document comply with the laws of any other country except the United States of America.
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MATERIAL SAFETY DATA SHEET

SECTION 1 PRODUCT AND COMPANY IDENTIFICATION

PRODUCT

Product Name: MOBIL VACTRA OIL NO. 4
Product Description: Base Oil and Additives
Product Code: 201560901025, 600510-00, 970855
Intended Use: Lubricant

COMPANY IDENTIFICATION

Supplier: **EXXON MOBIL CORPORATION**
3225 GALLOWS RD.
FAIRFAX, VA. 22037 USA

24 Hour Health Emergency	609-737-4411
Transportation Emergency Phone	800-424-9300
ExxonMobil Transportation No.	281-834-3296
MSDS Requests	713-613-3661
Product Technical Information	800-662-4525, 800-947-9147
MSDS Internet Address	http://www.exxon.com, http://www.mobil.com

SECTION 2 COMPOSITION / INFORMATION ON INGREDIENTS

No Reportable Hazardous Substance(s) or Complex Substance(s).

SECTION 3 HAZARDS IDENTIFICATION

This material is not considered to be hazardous according to regulatory guidelines (see (M)SDS Section 15).

POTENTIAL HEALTH EFFECTS

Low order of toxicity. Excessive exposure may result in eye, skin, or respiratory irritation. High-pressure injection under skin may cause serious damage.

NFPA Hazard ID:	Health: 0	Flammability: 1	Reactivity: 0
HMIS Hazard ID:	Health: 0	Flammability: 1	Reactivity: 0

NOTE: This material should not be used for any other purpose than the intended use in Section 1 without expert advice. Health studies have shown that chemical exposure may cause potential human health risks which may vary from person to person.

SECTION 4 FIRST AID MEASURES

INHALATION

Remove from further exposure. For those providing assistance, avoid exposure to yourself or others. Use adequate respiratory protection. If respiratory irritation, dizziness, nausea, or unconsciousness occurs, seek immediate medical assistance. If breathing has stopped, assist ventilation with a mechanical device or use

mouth-to-mouth resuscitation.

SKIN CONTACT

Wash contact areas with soap and water. If product is injected into or under the skin, or into any part of the body, regardless of the appearance of the wound or its size, the individual should be evaluated immediately by a physician as a surgical emergency. Even though initial symptoms from high pressure injection may be minimal or absent, early surgical treatment within the first few hours may significantly reduce the ultimate extent of injury.

EYE CONTACT

Flush thoroughly with water. If irritation occurs, get medical assistance.

INGESTION

First aid is normally not required. Seek medical attention if discomfort occurs.

SECTION 5 FIRE FIGHTING MEASURES

EXTINGUISHING MEDIA

Appropriate Extinguishing Media: Use water fog, foam, dry chemical or carbon dioxide (CO2) to extinguish flames.

Inappropriate Extinguishing Media: Straight Streams of Water

FIRE FIGHTING

Fire Fighting Instructions: Evacuate area. Prevent runoff from fire control or dilution from entering streams, sewers, or drinking water supply. Firefighters should use standard protective equipment and in enclosed spaces, self-contained breathing apparatus (SCBA). Use water spray to cool fire exposed surfaces and to protect personnel.

Hazardous Combustion Products: Smoke, Fume, Sulfur oxides, Aldehydes, Oxides of carbon, Incomplete combustion products

FLAMMABILITY PROPERTIES

Flash Point [Method]: >210C (410F) [ASTM D-92]
Flammable Limits (Approximate volume % in air): LEL: 0.9 UEL: 7.0
Autoignition Temperature: N/D

SECTION 6 ACCIDENTAL RELEASE MEASURES

NOTIFICATION PROCEDURES

In the event of a spill or accidental release, notify relevant authorities in accordance with all applicable regulations. In the event of a spill or accidental release, notify relevant authorities in accordance with all applicable regulations. US regulations require reporting releases of this material to the environment which exceed the applicable reportable quantity or oil spills which could reach any waterway including intermittent dry creeks. The National Response Center can be reached at (800)424-8802.

SPILL MANAGEMENT

Land Spill: Stop leak if you can do it without risk. Recover by pumping or with suitable absorbent.

Water Spill: Stop leak if you can do it without risk. Confine the spill immediately with booms. Warn other shipping. Remove from the surface by skimming or with suitable absorbents. Seek the advice of a specialist before using dispersants.

Water spill and land spill recommendations are based on the most likely spill scenario for this material; however, geographic conditions, wind, temperature, (and in the case of a water spill) wave and current direction and speed may greatly influence the appropriate action to be taken. For this reason, local experts should be consulted. Note: Local regulations may prescribe or limit action to be taken.

ENVIRONMENTAL PRECAUTIONS

Large Spills: Dike far ahead of liquid spill for later recovery and disposal. Prevent entry into waterways, sewers, basements or confined areas.

SECTION 7 HANDLING AND STORAGE

HANDLING

Prevent small spills and leakage to avoid slip hazard.

Static Accumulator: This material is a static accumulator.

STORAGE

Do not store in open or unlabelled containers.

SECTION 8 EXPOSURE CONTROLS / PERSONAL PROTECTION

Exposure limits/standards for materials that can be formed when handling this product: When mists / aerosols can occur, the following are recommended: 5 mg/m³ - ACGIH TLV, 10 mg/m³ - ACGIH STEL, 5 mg/m³ - OSHA PEL.

NOTE: Limits/standards shown for guidance only. Follow applicable regulations.

ENGINEERING CONTROLS

The level of protection and types of controls necessary will vary depending upon potential exposure conditions. Control measures to consider:

No special requirements under ordinary conditions of use and with adequate ventilation.

PERSONAL PROTECTION

Personal protective equipment selections vary based on potential exposure conditions such as applications, handling practices, concentration and ventilation. Information on the selection of protective equipment for use with this material, as provided below, is based upon intended, normal usage.

Respiratory Protection: If engineering controls do not maintain airborne contaminant concentrations at a level which is adequate to protect worker health, an approved respirator may be appropriate. Respirator

selection, use, and maintenance must be in accordance with regulatory requirements, if applicable. Types of respirators to be considered for this material include:

No special requirements under ordinary conditions of use and with adequate ventilation.

For high airborne concentrations, use an approved supplied-air respirator, operated in positive pressure mode. Supplied air respirators with an escape bottle may be appropriate when oxygen levels are inadequate, gas/vapor warning properties are poor, or if air purifying filter capacity/rating may be exceeded.

Hand Protection: Any specific glove information provided is based on published literature and glove manufacturer data. Work conditions can greatly affect glove durability; inspect and replace worn or damaged gloves. The types of gloves to be considered for this material include:

No protection is ordinarily required under normal conditions of use.

Eye Protection: If contact is likely, safety glasses with side shields are recommended.

Skin and Body Protection: Any specific clothing information provided is based on published literature or manufacturer data. The types of clothing to be considered for this material include:

No skin protection is ordinarily required under normal conditions of use. In accordance with good industrial hygiene practices, precautions should be taken to avoid skin contact.

Specific Hygiene Measures: Always observe good personal hygiene measures, such as washing after handling the material and before eating, drinking, and/or smoking. Routinely wash work clothing and protective equipment to remove contaminants. Discard contaminated clothing and footwear that cannot be cleaned. Practice good housekeeping.

ENVIRONMENTAL CONTROLS

See Sections 6, 7, 12, 13.

SECTION 9 PHYSICAL AND CHEMICAL PROPERTIES

Typical physical and chemical properties are given below. Consult the Supplier in Section 1 for additional data.

GENERAL INFORMATION

Physical State: Liquid
Color: Amber
Odor: Characteristic
Odor Threshold: N/D

IMPORTANT HEALTH, SAFETY, AND ENVIRONMENTAL INFORMATION

Relative Density (at 15 C): 0.892
Flash Point [Method]: >210C (410F) [ASTM D-92]
Flammable Limits (Approximate volume % in air): LEL: 0.9 UEL: 7.0
Autoignition Temperature: N/D
Boiling Point / Range: > 316C (600F)
Vapor Density (Air = 1): > 2 at 101 kPa
Vapor Pressure: < 0.013 kPa (0.1 mm Hg) at 20 C
Evaporation Rate (n-butyl acetate = 1): N/D
pH: N/A
Log Pow (n-Octanol/Water Partition Coefficient): > 3.5
Solubility in Water: Negligible

Viscosity: 219.5 cSt (219.5 mm2/sec) at 40 C | 18.3 cSt (18.3 mm2/sec) at 100C
Oxidizing Properties: See Sections 3, 15, 16.

OTHER INFORMATION

Freezing Point: N/D
Melting Point: N/A
Pour Point: -3°C (27°F)
DMSO Extract (mineral oil only), IP-346: < 3 %wt

SECTION 10 STABILITY AND REACTIVITY

STABILITY: Material is stable under normal conditions.

CONDITIONS TO AVOID: Excessive heat. High energy sources of ignition.

MATERIALS TO AVOID: Strong oxidizers

HAZARDOUS DECOMPOSITION PRODUCTS: Material does not decompose at ambient temperatures.

HAZARDOUS POLYMERIZATION: Will not occur.

SECTION 11 TOXICOLOGICAL INFORMATION

ACUTE TOXICITY

Route of Exposure	Conclusion / Remarks
Inhalation	
Toxicity (Rat): LC50 > 5000 mg/m3	Minimally Toxic. Based on test data for structurally similar materials.
Irritation: No end point data.	Negligible hazard at ambient/normal handling temperatures. Based on assessment of the components.
Ingestion	
Toxicity (Rat): LD50 > 2000 mg/kg	Minimally Toxic. Based on test data for structurally similar materials.
Skin	
Toxicity (Rabbit): LD50 > 2000 mg/kg	Minimally Toxic. Based on test data for structurally similar materials.
Irritation (Rabbit): Data available.	Negligible irritation to skin at ambient temperatures. Based on test data for structurally similar materials.
Eye	
Irritation (Rabbit): Data available.	May cause mild, short-lasting discomfort to eyes. Based on test data for structurally similar materials.

CHRONIC/OTHER EFFECTS

Contains:

Base oil severely refined: Not carcinogenic in animal studies. Representative material passes IP-346, Modified Ames test, and/or other screening tests. Dermal and inhalation studies showed minimal effects; lung non-specific infiltration of immune cells, oil deposition and minimal granuloma formation. Not sensitizing in test animals.

Additional information is available by request.

The following ingredients are cited on the lists below: None.

--REGULATORY LISTS SEARCHED--

1 = NTP CARC	3 = IARC 1	5 = IARC 2B
2 = NTP SUS	4 = IARC 2A	6 = OSHA CARC

SECTION 12 ECOLOGICAL INFORMATION

The information given is based on data available for the material, the components of the material, and similar materials.

ECOTOXICITY

Material -- Not expected to be harmful to aquatic organisms.

MOBILITY

Base oil component -- Low solubility and floats and is expected to migrate from water to the land. Expected to partition to sediment and wastewater solids.

PERSISTENCE AND DEGRADABILITY

Biodegradation:

Base oil component -- Expected to be inherently biodegradable

BIOACCUMULATION POTENTIAL

Base oil component -- Has the potential to bioaccumulate, however metabolism or physical properties may reduce the bioconcentration or limit bioavailability.

SECTION 13 DISPOSAL CONSIDERATIONS

Disposal recommendations based on material as supplied. Disposal must be in accordance with current applicable laws and regulations, and material characteristics at time of disposal.

DISPOSAL RECOMMENDATIONS

Product is suitable for burning in an enclosed controlled burner for fuel value or disposal by supervised incineration at very high temperatures to prevent formation of undesirable combustion products.

REGULATORY DISPOSAL INFORMATION

RCRA Information: The unused product, in our opinion, is not specifically listed by the EPA as a hazardous waste (40 CFR, Part 261D), nor is it formulated to contain materials which are listed as hazardous wastes. It does not exhibit the hazardous characteristics of ignitability, corrosivity or reactivity and is not formulated with contaminants as determined by the Toxicity Characteristic Leaching Procedure (TCLP). However, used product may be regulated.

Empty Container Warning Empty Container Warning (where applicable): Empty containers may contain residue and can be dangerous. Do not attempt to refill or clean containers without proper instructions. Empty drums should be completely drained and safely stored until appropriately reconditioned or disposed. Empty containers should be taken for recycling, recovery, or disposal through suitably qualified or licensed contractor and in accordance with

governmental regulations. DO NOT PRESSURISE, CUT, WELD, BRAZE, SOLDER, DRILL, GRIND, OR EXPOSE SUCH CONTAINERS TO HEAT, FLAME, SPARKS, STATIC ELECTRICITY, OR OTHER SOURCES OF IGNITION. THEY MAY EXPLODE AND CAUSE INJURY OR DEATH.

SECTION 14 TRANSPORT INFORMATION

LAND (DOT) : Not Regulated for Land Transport

LAND (TDG) : Not Regulated for Land Transport

SEA (IMDG) : Not Regulated for Sea Transport according to IMDG-Code

AIR (IATA) : Not Regulated for Air Transport

SECTION 15 REGULATORY INFORMATION

OSHA HAZARD COMMUNICATION STANDARD: When used for its intended purposes, this material is not classified as hazardous in accordance with OSHA 29 CFR 1910.1200.

NATIONAL CHEMICAL INVENTORY LISTING: AICS, DSL, EINECS, ENCS, KECI, PICCS, TSCA

EPCRA: This material contains no extremely hazardous substances.

SARA (311/312) REPORTABLE HAZARD CATEGORIES: None.

SARA (313) TOXIC RELEASE INVENTORY: This material contains no chemicals subject to the supplier notification requirements of the SARA 313 Toxic Release Program.

The Following Ingredients are Cited on the Lists Below: None.

--REGULATORY LISTS SEARCHED--

1 = ACGIH ALL	6 = TSCA 5a2	11 = CA P65 REPRO	16 = MN RTK
2 = ACGIH A1	7 = TSCA 5e	12 = CA RTK	17 = NJ RTK
3 = ACGIH A2	8 = TSCA 6	13 = IL RTK	18 = PA RTK
4 = OSHA Z	9 = TSCA 12b	14 = LA RTK	19 = RI RTK
5 = TSCA 4	10 = CA P65 CARC	15 = MI 293	

Code key: CARC=Carcinogen; REPRO=Reproductive

SECTION 16 OTHER INFORMATION

N/D = Not determined, N/A = Not applicable

THIS SAFETY DATA SHEET CONTAINS THE FOLLOWING REVISIONS:
No revision information is available.

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Material Safety Data Sheet

MANUFACTURER:
GPM
201 Jandus Road
Cary, IL 60013

EMERGENCY TELEPHONE NUMBER: (866)257-3981
TECHNICAL INFORMATION: (847)639-5383
HMIS: H [1] F [2] R [0]
DATE: November 23, 2009
SUPERSEDES: November 12, 2009

SECTION 1- PRODUCT IDENTIFICATION

PRODUCT CODE: XO-1, 2, 4, 6, 7, 8, 11, 15, 18, 20, 23, 25, 26, 27, 31, 39, 41, D, N, P, T
PRODUCT NAME: XO-Rust Anti-Rust Enamel
PRODUCT CLASS: Rust Preventative

SECTION 2 - HAZARDOUS INGREDIENTS

INGREDIENT	CAS NUMBER	WT.%	OCCUPATIONAL EXPOSURE LIMITS TLV	PEL	VAPOR PRESSURE mmHg@20°C
Mineral Spirits	8052-41-3	23-42	100ppm	100ppm	2.6
Carbon Black(1)	1333-86-4	.1-3	3.5mg/m^3	3.5mg/m^3	17.0
Hydrous Calcium Magnesium Silicate(2)	14807-96-6	5-8	2mg/m^3	2mg/m^3	NA
(S)Ethyl Benzene	100-41-4	.05-1.5	100 ppm	100 ppm	12.0
Yellow Iron Oxide (3)	51274-00-1	1-9	5mg/m^3	5mg/m^3	NA
Red Iron Oxide (4)	1309-37-1	1-4	5mg/m^3	5mg/m^3	NA
(S)Cobalt Carboxylate	mixture	0.05-0.25	NA	NA	NA
(S)Calcium Barium Phosphosilicate	66402-68-4	.6-3	10mg/m^3	15mg/m^3	NA
(S)Co Neodecanoate (5)	27253-31-2	0.10-0.25	NA	NA	NA
(S)Xylene	1330-20-7	0.6-2	100 ppm	100 ppm	14.0
Crystalline Silica Quartz (6)	14808-60-7	0.1-0.2	.05 mg/m^3	.1 mg/m^3	NA
Naphtha (7)	64742-48-9	0.8-3	NE	NE	5.2

(S) - This ingredient is subject to the reporting requirements of Section 313 SARA Title III.
(1) - In XO-2, 11, 15, 18, 20 only; (2) - In XO-18 only, (3) – XO-7, 11, 20, 26 only. (4) – In XO-6, 20 only. (5) – In XO-2,6,8,18, 39, 41 only. (6) In XO-18 only. (7) – In XO-2, 25, D, N, T only. NA - Not applicable. NE - Not established.

SECTION 3 - PHYSICAL DATA

VAPOR DENSITY: [X] HEAVIER [ ] LIGHTER THAN AIR
BOILING RANGE: 300-380°F
EVAPORATION RATE: [ ] FASTER [X] SLOWER THAN ETHER
44-55 % VOLATILE VOLUME
APPEARANCE/ODOR: Thick liquid/aliphatic
DENSITY: 7.6-11.2 Wt(lbs)/Gal
VOLATILE ORGANIC COMPOUND(VOC) < 400 gm/l 3.3 lbs/gal

SECTION 4 - FIRE AND EXPLOSION HAZARD DATA

FLAMMABILITY CLASSIFICATION: OSHA Class II
DOT Combustible Liquid
FLASH POINT: 105°F LEL: 0.9

EXTINGUISHING MEDIA:
[X] FOAM [ ] ALCOHOL FOAM [X] CO_2 [X] DRY CHEMICAL [X] WATER FOG [ ] OTHER
UNUSUAL FIRE AND EXPLOSION HAZARDS: Closed containers may explode when exposed to extreme heat. Isolate from heat, sparks and open flame.
SPECIAL FIRE FIGHTING PROCEDURES: Use a self-contained breathing apparatus with full face mask in a positive pressure demand mode. Treat as a volatile liquid fire. Water spray may be ineffective. If water spray is used, fog nozzles are preferable. Water may be used to cool sealed containers to prevent pressure build-up and possible explosion or auto-ignition when exposed to the heat of a fire.
HAZARDOUS DECOMPOSITION PRODUCTS: Carbon monoxide, carbon dioxide and unidentified organic compounds.

SECTION 5 - HEALTH HAZARD DATA

EFFECTS OF OVEREXPOSURE:

INHALATION: Exposure to large amounts of vapors, mists or sanding dusts may cause moderate irritation to the lungs, nose, and throat. May also cause dizziness, nausea or fatigue. Vapors or spray mists may be irritating to eyes, nose or throat. Prolonged overexposure may cause coughing, shortness of breath, dizziness, and intoxication. This product contains crystalline silica (cs), which is considered a hazard by inhalation.

SKIN CONTACT: Exposure may cause mild irritation. Prolonged exposure may cause drying and cracking.

EYE CONTACT: Causes irritation, including redness, stinging and watering.

INGESTION: Moderately toxic in large amounts. Could cause drowsiness, nausea or headache.

CARCINOGENICITY: This product contains carbon black, cobalt/cobalt compounds, crystalline silica and ethyl benzene (see section 2). Carbon black, ethyl benzene, cobalt and cobalt compounds have been classified by IARC (not NTP or OSHA) as possible carcinogens for humans (2B) from lab animal studies. Crystalline silica has been classified by IARC and NTP as a carcinogen for humans (Group 1) from lab animal studies.

MEDICAL CONDITIONS PRONE TO AGGRAVATION BY EXPOSURE: Preexisting skin, eye and respiratory disorders may be aggravated by exposure to this product.

PRIMARY ROUTE(S) OF ENTRY: [X] DERMAL [X] INHALATION [ ] INGESTION

EMERGENCY AND FIRST AID PROCEDURES:

INHALATION: Remove to fresh air. Use artificial respiration if necessary. Seek medical attention.

SKIN CONTACT: Remove contaminated clothing. Wash affected area with soap and water. Wash clothing before reuse.

EYE CONTACT: Immediately flush eyes with large amounts of water. If symptoms persist, seek medical attention.

INGESTION: Give 1 or 2 glasses of water to dilute. Do not induce vomiting. Get medical attention immediately.

SECTION 6 - REACTIVITY DATA

STABILITY: Stable HAZARDOUS POLYMERIZATION: Will not occur

INCOMPATIBILITY (Materials to avoid): Avoid contact with strong oxidizing agents.

SECTION 7 - SPILL OR LEAK PROCEDURES

STEPS TO BE TAKEN IN CASE MATERIAL IS RELEASED OR SPILLED: Eliminate all ignition sources. Contain spill, absorb liquid with clay, sand or floor absorbent. Prevent run-off to sewers, streams or other bodies of water.

WASTE DISPOSAL METHOD: Observe all federal, state and local regulations regarding proper disposal.

SECTION 8 - SAFE HANDLING AND USE INFORMATION

RESPIRATORY PROTECTION: NIOSH/MSHA jointly approved air purifying respirator if TLV limits are exceeded. Approved mechanical filter to remove solid airborne particles of overspray during application.

VENTILATION: Provide sufficient mechanical (general and/or local exhaust) ventilation to maintain exposure below TLV.

PROTECTIVE CLOTHING: Wear safety glasses with side shields to prevent eye contact. Contact lenses should not be worn. Use solvent resistant gloves to avoid prolonged contact.

OTHER PROTECTIVE EQUIPMENT: Eyewash fountains and safety showers in the event of an accident.

HYGIENIC PRACTICES: Wash hands thoroughly after use, and before eating, drinking or smoking.

SECTION 9 - SPECIAL PRECAUTIONS

PRECAUTIONS TO BE TAKEN IN HANDLING AND STORING: Keep out of reach of children. Keep liquid and vapor away from heat, sparks, and open flame. Close container after each use. Store in a cool dry area.

OTHER PRECAUTIONS: CAUTION: Reports have associated repeated and prolonged occupational exposure to solvents with permanent brain and nervous system damage. Intentional misuse by deliberately concentrating and inhaling contents may be harmful or fatal.

WARNING: This product contains chemicals known to the state of California to cause cancer and birth defects or other reproductive harm.

The information contained in this MSDS is based on information and data provided by the supplier of the raw material used in the manufacture of this product. Although GPM believes such information and data to be reliable, GPM makes no warranty, expressed or implied, regarding the accuracy and completeness of such information and data.

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MATERIAL SAFETY DATA SHEET

Trade Name: CC Fix

Section I – General Information:

Item Name: CC Fix
Product Code: SC4521/Blue
Manufactured by: InstaCote, INC.
160 C Lavoy Rd.
Erie, MI 48133
Date MSDS Prepared: May 23, 2001
Last Review Date: October 12, 2006
MSDS Preparer's Name: Thomas J. Nachtman
Product Description: Vinyl Latex/Modified Poly Acrylate Coating
CAS Name and Number: None, Mixture
D.O.T. Hazard Classification and Shipping Name: None
NFPA Ratings: Hazard: 0 Health: 0 Fire: 0 Reactivity: 0
Scale 3 = extreme, 2 = high, 1 = moderate, 0 = insignificant

Section II – Ingredient/Identity Information:

Proprietary (Y/N): Y

Ingredient	Composition:	CAS #	Exposure Limits (TWA)
Ammonia	<0.04%	7664-41-7	35 ppm STEL ACGIH 35 mg/m^3 TWA8 OSHA
2-Ethylhexyl Acrylate	<0.01%	103-11-7	5 ppm TWA8 UCC

Section III – Physical/Chemical Properties:

Appearance:	Blue Liquid	Color:	Blue
State:	Liquid	pH:	7.3
Specific Gravity:	1.10	Viscosity:	250 cP@72°F
Vapor Pressure:	18 mm Hg, 20°C	Odor:	Pleasant

Vapor Density: 0.6 (Air=1)
Water Solubility: Completely
Evaporation Rate: 0.8 (Butyl Acetate=1)

Section IV – Fire and Explosion Hazard Data:

Flash Point: N/A Flammable Limits: Upper – N/A
Lower: - N/A

Extinguishing Media: As for surrounding fire. This product is a very low fire hazard. This product is a water-based material and while it may not burn, it can splatter and froth. Do not spray water into hot material; use water fog to cool surrounding fire.

Section V – Reactivity Data:

Stability (Y/N) Y
Conditions to Avoid: **Do not allow freezing**.
Materials to Avoid: Strong Acids or Strong Alkalis
Hazardous Decomposition Products: Oxides of Carbon

Section VI – Health Hazard Data:

Primary Routes of Exposure: Skin Contact, Ingestion and Inhalation

Skin Contact: Prolonged and repeated skin contact may cause irritation.

Ingestion: Ingestion of product will cause irritation of the mouth, pharynx, esophagus and stomach.

Inhalation: Breathing atomized vapors may cause headaches, nausea, irritation of the nose, throat and lungs.

Section VII – Emergency First Aid:

Eye Contact: Flush eyes with a large amount of water for at least 15 minutes. Consult a physician if irritation persists.

Skin Contact: Wash area with soap and water.

Ingestion: No special precautions

Inhalation: Move individual to fresh air. Consult a physician if irritation persists or breathing becomes labored.

Section VIII – Precautions for Safe Handling, Storage and Use:

Personal Protective Equipment for Routine Use:

Respiratory Protection: Respirators are not routinely required when using this product indoors or outdoors. In any case when excessive mist and atomization of product occurs such as pressurized air spraying, use NIOSH/MSHA approved full or half face respirator with dust cartridge.

Gloves: Gloves are not normally required for routine use. If an individual is known to have skin susceptible to irritation by other chemicals, this individual should wear butyl or nitrile type gloves.

Eye Protection: Safety goggles or glasses with side shields should always be worn.

Other: Applicator should wear a Tyvek suit or coveralls.

Work Practices: Do not eat, drink or smoke while applying this product. Wash hands immediately upon leaving the work site. Treat this product with caution as you would any other chemical.

Spill/Release Procedures: Large spills can be vacuumed. Small spills can be treated with absorbent clay, earth, sand or other material, shoveled into a DOT approved container and disposed of according to all local, state and Federal regulations.

Waste Disposal Procedure: Coagulate the waste material by addition of sand, clay or other earth material. Allow to dry if time permits. Coagulated solids may be incinerated in accordance with local, state and federal regulations.

Storage and Handling: Store product in a dry environment.. Protect product from extremes in temperatures, **Do Not Freeze.**

Other Health Hazard Precautions: None

END

MATERIAL SAFETY DATA SHEET

Trade Name: CC Wet

Section I – General Information:

Item Name: CC Wet

Manufactured by: InstaCote, INC.
160 C Lavoy Rd.
Erie, MI 48133
Phone (734) 847-5260
Fax (743) 847-9008
Emergency Phone (800) 359-2783

Date MSDS Prepared: February 19, 2001
Last Review Date: October 12, 2006
MSDS Preparer's Name: Thomas J. Nachtman
Product Description: Water Base Anti-dusting Media
Multiple Parts (Yes/No) No
Description of Related Comp. NA

Section II – Ingredient/Identity Information:

This product is considered to be non-hazardous under OSHA Hazard Communication Standard 29.CFR 1910.1200

Ingredient	CAS #
Distilled Water	7732-18-5
Glycerin	56-81-5
Monosaccharide	57-50-1
Non-ionic Surfactant	151-21-3
Non-halogenated yellow dye	6358-69-6, 19125-99-6

HMIS Codes
Health 1 Fire 1 Reactivity 1 Special None
Scale 4 = extreme, 3 = high, 2 = moderate, 1 = insignificant

Section III – Physical/Chemical Properties:

Appearance: Amber Liquid	pH: 8.5
Specific Gravity: 1.05	Viscosity: 31 cps.
Vapor Density: > than air	Evaporation Rate <Ether
Coating V.O.C.: 0.00 lbs./gal	MaterialV.O.C.:0.0 lbs./gal
Coating V.O.C.: 0.0g/l	Material V.O.C.: 0g/l
Water Solubility: 100%	Odor: None
Boiling Point: 214°F	

Section IV – Fire and Explosion Hazard Data:

Flash Point: Water Base, NA
Flammable Limits: Upper – N/A Lower: - N/A
Extinguishing Media: As for surrounding fire. This product is a very low fire hazard. This product is a water-based material and while it may not burn, it can splatter and froth. Do not spray water into hot material, use water fog to cool surrounding fire.

Section V – Reactivity Data:

Stability (Y/N) Y
Conditions to Avoid: None Known
Materials to Avoid: None Known
Hazardous Decomposition Products: Carbon-monoxide,-dioxide

Section VI – Health Hazard Data:

Primary Routes of Exposure: Skin & Eye Contact, Ingestion and Inhalation

Skin & Eye Contact: Prolonged and repeated skin contact may cause irritation and burns.

Ingestion: Ingesting large volumes of product may cause CNS depression.

Inhalation: Extended periods of breathing atomized vapors may cause CNS depression.

Section VII – Emergency First Aid:

Eye Contact: Flush eyes with a large amount of water for at least 15 minutes. Consult a physician if irritation persists.

Skin Contact: Wash area with soap and water.

Ingestion: Do not induce vomiting. Get immediate medical attention.

Inhalation: Move individual to fresh air. Consult a physician if irritation persist or breath becomes labored.

Section VIII – Precautions for Safe Handling, Storage and Use:

Personal Protective Equipment for Routine Use:

Respiratory Protection: Respirators are not routinely required when using this product indoors or outdoors. In any case when excessive mist and atomization of product occurs such as high pressure air spraying, use NIOSH/MSHA approved full or half face respirator with dust cartridge.

Gloves: Gloves are not normally required for routine use. If an individual is known to have skin susceptible to irritation by other chemicals, this individual should wear butyl or nitrile type gloves.

Eye Protection: Safety goggles or glasses with side shields should always be worn.

Work Practices: Do not eat drink or smoke while applying this product. Wash hands immediately upon leaving the work site. Treat this product caution as you would any other chemical.

Spill/Release Procedures: Large spills can be vacuumed up. Small spills can be treated with absorbent clay, earth sand or other material, shoveled into a DOT approved container and disposed of according to all local, state and Federal regulations.

Waste Disposal Procedure: Incinerated or dispose of in accordance with local, state and Federal regulations.

Storage and Handling: Store product in a dry environment. Protect product from extremes in temperatures.

Other Health Hazard Precautions: None

135618
DOD Hazardous Materials Information System

DoD 6050.5-L

AS OF July 1998

FSC: 4210
NIIN: 005809191
Manufacturer's CAGE: 03670
Part No. Indicator: A
Part Number/Trade Name: MET-L-X DRY POWDER EXTINGUISHING AGENT,METLX 50,
9320

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General Information

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Item Name: DRY CHEMICAL,FIRE EXTINGUISHER
Company's Name: ANSUL FIRE PROTECTION, WORMALD U.S.INC.
Company's Street: ONE STANTON STREET
Company's P. O. Box:
Company's City: MARINETTE
Company's State: WI
Company's Country: US
Company's Zip Code: 54143-2542
Company's Emerg Ph #: 715-735-7411/800-424-9300(CHEMTRAC)
Company's Info Ph #: 715-735-7411
Distributor/Vendor # 1:
Distributor/Vendor # 1 Cage:
Distributor/Vendor # 2:
Distributor/Vendor # 2 Cage:
Distributor/Vendor # 3:
Distributor/Vendor # 3 Cage:
Distributor/Vendor # 4:
Distributor/Vendor # 4 Cage:
Safety Data Action Code:
Safety Focal Point: D
Record No. For Safety Entry: 001
Tot Safety Entries This Stk#: 001
Status: SE
Date MSDS Prepared: 05NOV93
Safety Data Review Date: 17JUN94
Supply Item Manager: AX
MSDS Preparer's Name:
Preparer's Company:
Preparer's St Or P. O. Box:
Preparer's City:

Preparer's State:
Preparer's Zip Code:
Other MSDS Number:
MSDS Serial Number: BTKRD
Specification Number: NONE
Spec Type, Grade, Class: NONE
Hazard Characteristic Code: N1
Unit Of Issue: EA
Unit Of Issue Container Qty: UNKNOWN
Type Of Container: UNKNOWN

Report for NIIN: 005809191

Net Unit Weight: UNKNOWN
NRC/State License Number: NOT APPLICABLE
Net Explosive Weight:
Net Propellant Weight-Ammo: N/R
Coast Guard Ammunition Code:

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Ingredients/Identity Information

==========

Proprietary: YES
Ingredient: PROPRIETARY
Ingredient Sequence Number: 01
Percent:
Ingredient Action Code:
Ingredient Focal Point: D
NIOSH (RTECS) Number:
CAS Number:
OSHA PEL:
ACGIH TLV:
Other Recommended Limit:

Proprietary: YES
Ingredient: PROPRIETARY
Ingredient Sequence Number: 02
Percent:
Ingredient Action Code:
Ingredient Focal Point: D
NIOSH (RTECS) Number:
CAS Number:
OSHA PEL:
ACGIH TLV:
Other Recommended Limit:

Proprietary: YES

Ingredient: PROPRIETARY
Ingredient Sequence Number: 03
Percent:
Ingredient Action Code:
Ingredient Focal Point: D
NIOSH (RTECS) Number:
CAS Number:
OSHA PEL:
ACGIH TLV:
Other Recommended Limit:

Proprietary: YES
Ingredient: PROPRIETARY
Ingredient Sequence Number: 04
Percent:
Ingredient Action Code:
Ingredient Focal Point: D
NIOSH (RTECS) Number:
CAS Number:
OSHA PEL:

Report for NIIN: 005809191

ACGIH TLV:
Other Recommended Limit:

Physical/Chemical Characteristics

Appearance And Odor: WHITE COLORED POWDER, NO CHARACTERISTIC ODOR
Boiling Point: N/R
Melting Point: UNKNOWN
Vapor Pressure (MM Hg/70 F): N/R
Vapor Density (Air=1): N/R
Specific Gravity: UNKNOWN
Decomposition Temperature: UNKNOWN
Evaporation Rate And Ref: NOT APPLICABLE
Solubility In Water: SLIGHT
Percent Volatiles By Volume: N/R
Viscosity: NOT APPLICABE
pH: N/K
Radioactivity:
Form (Radioactive Matl):
Magnetism (Milligauss): N/P
Corrosion Rate (IPY): UNKNOWN
Autoignition Temperature: N/R

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Fire and Explosion Hazard Data

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Flash Point: NOT APPLICABLE
Flash Point Method: N/P
Lower Explosive Limit: N/R
Upper Explosive Limit: N/R
Extinguishing Media: THIS IS AN EXTINGUISHING AGENT.
Special Fire Fighting Proc: NONE
Unusual Fire And Expl Hazrds: NONE

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Reactivity Data

==========

Stability: YES
Cond To Avoid (Stability): EXCESSIVE HEAT
Materials To Avoid: BRF3, LI
Hazardous Decomp Products: POSSIBLY TRACES OF HYDROCHLORIC ACID
Hazardous Poly Occur: NO
Conditions To Avoid (Poly): NONE

==========

Health Hazard Data

==========

LD50-LC50 Mixture: UNKNOWN
Route Of Entry - Inhalation: YES
Route Of Entry - Skin: NO
Route Of Entry - Ingestion: NO
Health Haz Acute And Chronic: TARGET ORGANS:RESPIRATORY SYSTEM. ACUTE- EYE
OR SKIN CONTACT MAY CAUSE MILD IRRITATION. INHALATION IS NOT EXPECTED TO
CAUSE ANY HARM WITH NORMAL USE. INGESTION OF LARGE AMOUNTS CAN CAUSE
IRRITATION OF THE STOMACH. CHRONIC- UNKNOWN.
Carcinogenicity - NTP: NO

Report for NIIN: 005809191

Carcinogenicity - IARC: NO
Carcinogenicity - OSHA: NO
Explanation Carcinogenicity: NONE
Signs/Symptoms Of Overexp: NONE EXPECTED WITH SINGLE EXPOSURE.
Med Cond Aggravated By Exp: UNKNOWN
Emergency/First Aid Proc: GET MEDICAL ATTENTION IF SYMPTOMS PERSIST.
EYES:FLUSH WITH WATER FOR 15 MINUTES. HOLD EYELIDS OPEN. SKIN:WASH WIT

H
SOAP AND WATER. INHALATION:REMOVE TO FRESH AIR. INGESTION:IF CONSCIOUS
,
DRINK LARGE AMOUNT OF WATER AND INDUCE VOMITING. SEEK MEDICAL HELP.

Precautions for Safe Handling and Use

Steps If Matl Released/Spill: SWEEP UP.
Neutralizing Agent: NOT APPLICABLE
Waste Disposal Method: DISPOSE IN COMPLIANCE WITH LOCAL, STATE AND FED
ERAL
REGULATIONS.
Precautions-Handling/Storing: SHOULD BE STORED IN ORIGINAL CONTAINER O
R
ANSUL FIRE EXTINGUISHER.
Other Precautions: DO NOT MIX AENTS.

Control Measures

Respiratory Protection: NONE REQUIRED.
Ventilation: MECHANICAL (GENERAL) RECOMMENDED
Protective Gloves: NONE NEEDED.
Eye Protection: GOGGLES RECOMMENDED
Other Protective Equipment: EYE WASH FOUNTAIN. IF IRRITATION OCCURS, L
ONG
SLEEVES AND IMPERVIOUS GLOVES SHOULD BE WORN.
Work Hygienic Practices: WASH HANDS AFTER HANDLING.
Suppl. Safety & Health Data:

Transportation Data

Transportation Action Code:
Transportation Focal Point: D
Trans Data Review Date: 94168
DOT PSN Code: ZZZ
DOT Symbol: N/R
DOT Proper Shipping Name: NOT REGULATED BY THIS MODE OF TRANSPORTATION
DOT Class: N/R
DOT ID Number: N/R
DOT Pack Group: N/R
DOT Label: N/R
DOT/DoD Exemption Number:

IMO PSN Code: ZZZ
IMO Proper Shipping Name: NOT REGULATED FOR THIS MODE OF TRANSPORTATIO
N
IMO Regulations Page Number: N/R
IMO UN Number: N/R
IMO UN Class: N/R
IMO Subsidiary Risk Label: N/R
IATA PSN Code: ZZZ
IATA UN ID Number: N/R
IATA Proper Shipping Name: NOT REGULATED BY THIS MODE OF TRANSPORTATIO
N

Report for NIIN: 005809191

IATA UN Class: N/R
IATA Subsidiary Risk Class: N/R
IATA Label: N/R
AFI PSN Code: ZZZ
AFI Symbols:
AFI Prop. Shipping Name: NOT REGULATED BY THIS MODE OF TRANSPORTATION
AFI Class: N/R
AFI ID Number: N/R
AFI Pack Group: N/R
AFI Label: N/R
AFI Special Prov:
AFI Basic Pac Ref:
MMAC Code:
N.O.S. Shipping Name:
Additional Trans Data: THIS IS A DRY CHEMICAL USED IN FIRE EXTINGUISHE
RS.

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Disposal Data

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Disposal Data Action Code:
Disposal Data Focal Point:
Disposal Data Review Date:
Rec # For This Disp Entry:
Tot Disp Entries Per NSN:
Landfill Ban Item:
Disposal Supplemental Data:
1st EPA Haz Wst Code New:
1st EPA Haz Wst Name New:
1st EPA Haz Wst Char New:
1st EPA Acute Hazard New:
2nd EPA Haz Wst Code New:
2nd EPA Haz Wst Name New:

2nd EPA Haz Wst Char New:
2nd EPA Acute Hazard New:
3rd EPA Haz Wst Code New:
3rd EPA Haz Wst Name New:
3rd EPA Haz Wst Char New:
3rd EPA Acute Hazard New:

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Label Data

==========

Label Required: YES
Technical Review Date: 17JUN94
Label Date:
MFR Label Number: NOT APPLICABLE
Label Status: F
Common Name: MET-L-X DRY POWDER EXTINGUISHING AGENT,METLX 50, 9320
Chronic Hazard: N/P
Signal Word: CAUTION!
Acute Health Hazard-None:
Acute Health Hazard-Slight: X
Acute Health Hazard-Moderate:
Acute Health Hazard-Severe:

Report for NIIN: 005809191

Contact Hazard-None:
Contact Hazard-Slight: X
Contact Hazard-Moderate:
Contact Hazard-Severe:
Fire Hazard-None: X
Fire Hazard-Slight:
Fire Hazard-Moderate:
Fire Hazard-Severe:
Reactivity Hazard-None: X
Reactivity Hazard-Slight:
Reactivity Hazard-Moderate:
Reactivity Hazard-Severe:
Special Hazard Precautions: TARGET ORGANS:RESPIRATORY SYSTEM. ACUTE- EYE
OR SKIN CONTACT MAY CAUSE MILD IRRITATION. INHALATION IS NOT EXPECTED TO
CAUSE ANY HARM WITH NORMAL USE. INGESTION OF LARGE AMOUNTS CAN CAUSE
IRRITATION OF THE STOMACH. CHRONIC- UNKNOWN. SHOULD BE STORED IN ORIGINAL
CONTAINER OR ANSUL FIRE EXTINGUISHER. FIRST AID- GET MEDICAL ATTENTION IF

SYMPTOMS PERSIST. EYES:FLUSH WITH WATER FOR 15 MINUTES. HOLD EYELIDS O
PEN.
SKIN:WASH WITH SOAP AND WATER. INHALATION:REMOVE TO FRESH AIR. INGESTI
ON:IF
CONSCIOUS, DRINK LARGE AMOUNT OF WATER AND INDUCE VOMITING. SEEK MEDIC
AL
HELP.
Protect Eye:
Protect Skin:
Protect Respiratory:
Label Name: ANSUL FIRE PROTECTION, WORMALD U.S.INC.
Label Street: ONE STANTON STREET
Label P.O. Box:
Label City: MARINETTE
Label State: WI
Label Zip Code: 54143-2542
Label Country: US
Label Emergency Number: 715-735-7411/800-424-9300(CHEMTRAC)
Year Procured:

W.A.HAMMOND DRIERITE CO. -- DRIERITE -- 6810-00D000097

========== Product Identification ==========

Product ID:DRIERITE
MSDS Date:01/01/1985
FSC:6810
NIIN:00D000097
MSDS Number: BBCGM
=== Responsible Party ===
Company Name:W.A.HAMMOND DRIERITE CO.
Emergency Phone Num:513-376-2927
CAGE:70000
=== Contractor Identification ===
Company Name:W.A.HAMMOND DRIERITE CO.
Address:138 DAYTON AVE.
Box:460
City:XENIA
State:OH
ZIP:45385-2830
Country:US
Phone:937-376-2927
CAGE:70000

========== Composition/Information on Ingredients ==========

Ingred Name:PLASTER OF PARIS (CALCIUM SULFATE DIHYDRATE)
CAS:10101-41-4
RTECS #:EW4150000
Fraction by Wt: 100%.
OSHA PEL:15 MG/M3 TDUST
ACGIH TLV:10 MG/M3 TDUST; 9293

========== Accidental Release Measures ==========

Spill Release Procedures:NONE

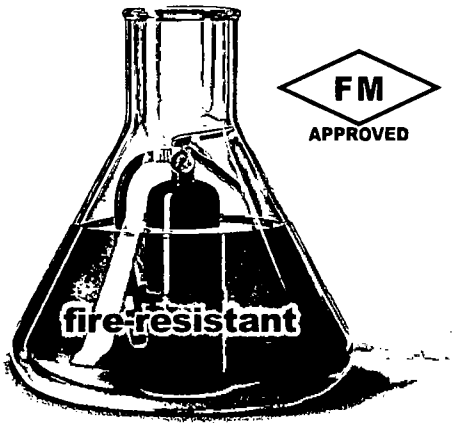
========== Handling and Storage ==========

Handling and Storage Precautions:NONE

========== Exposure Controls/Personal Protection ==========

QUINTOLUBRIC® 888-46

Fire Resistant Hydraulic Fluid



APPLICATIONS

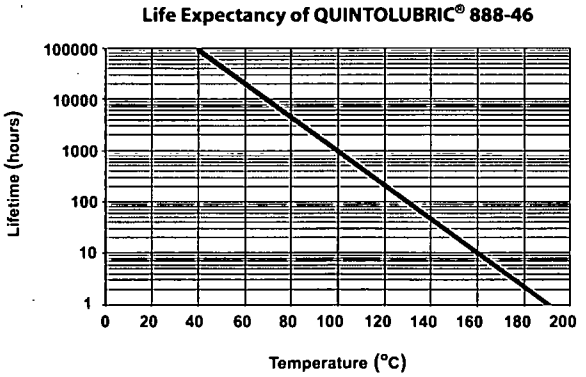
QUINTOLUBRIC® 888-46 was designed to replace anti-wear, mineral oil-based hydraulic fluids used in applications where fire hazards exist. QUINTOLUBRIC® 888-46 can also be used in environmentally sensitive hydraulic applications without compromising the overall hydraulic system operations. This fluid does not contain water, mineral oil, or phosphate ester, and is based on high-quality, synthetic, organic esters and carefully selected additives to achieve excellent hydraulic fluid performance. QUINTOLUBRIC® 888-46 offers the lubrication level of premium, anti-wear hydraulic oils, and can be used with hydraulic components from all major manufacturers.

BENEFITS

- Fire-resistant
  - High ignition temperature and low heat release
  - Properties that limit the spread of fire
  - Excellent shear stability
  - Approved by Factory Mutual Approvals
- Non-toxic / non-toxic to aquatic life
- Non-irritating
- Fully biodegradable
- Simple waste treatment

PERFORMANCE

Properly maintained QUINTOLUBRIC® 888-46 has a useful life comparable to that of mineral oil fluids. Specific fluid lifetime depends primarily on temperature as shown in the graph.



TYPICAL PROPERTIES

PROPERTIES (Test Method)	888-46 (014113)
Appearance	Yellow to amber fluid
Kinematic Viscosity (ASTM D 445) **At 0°C** **At 20°C** **At 40°C** **At 100°C**	 349 mm² /s or cSt 116 mm² /s or cSt 49.7 mm² /s or cSt 9.7 mm² /s or cSt
Viscosity Index (ASTM D 2270)	185
Density at 15°C (ASTM D 1298)	0.92 g/cm3
Acid Number (ASTM D 974)	2.0 mg KOH/g
Pour Point (ASTM D 97)	< -20°C (< -4°F)
Foam Test at 25°C (ASTM D 892) Sequence I	50-0 ml-ml
Corrosion Protection ISO 4404-2 ASTM D 665 A ASTM D 130	 Pass Pass 1a
Flash Point (ASTM D 92)	300°C (572°F)
Fire Point (ASTM D 92)	360°C (680°F)
Auto Ignition Temperature (DIN 51794)	>400°C (>752°F)
Air Release (ASTM D 3427)	7 min.
Fire Resistance (FM Approvals)	Approved
Pump Test (ASTM D 2882)	<5 mg wear
Gear Lubrication (DIN 51354-2)	>12 FZG load stage
Water Separability (ASTM D 1401)	41-39-0 (30) ml-ml-ml (min.)

Quaker

Respiratory Protection:NONE
Ventilation:NONE
Protective Gloves:NONE
Other Protective Equipment:NONE
Supplemental Safety and Health
ITEM IS ALSO SUPPLIED IN 10-20 MESH,200 MESH,6,4 MESH.

========== Physical/Chemical Properties ==========

HCC:N1
Spec Gravity:1.0.
Evaporation Rate & Reference:0
Solubility in Water:0.24HMS/LI.
Appearance and Odor:WHITE GRANULAR SOLID-NO ODOR.
Percent Volatiles by Volume:0

========== Stability and Reactivity Data ==========

Stability Indicator/Materials to Avoid:YES

========== Disposal Considerations ==========

Waste Disposal Methods:DISCARD WITH DRY WASTE.

Disclaimer (provided with this information by the compiling agencies): This information is formulated for use by elements of the Department of Defense. The United States of America in no manner whatsoever, expressly or implied, warrants this information to be accurate and disclaims all liability for its use. Any person utilizing this document should seek competent professional advice to verify and assume responsibility for the suitability of this information to their particular situation.

QUINTOLUBRIC® 888-46
Fire Resistant Hydraulic Fluid

COMPATIBILITY

The following chart contains our recommendations regarding the use of QUINTOLUBRIC® 888-46 with commonly used elastomers. The elastomer applications listed are "Static," which refers to trapped nonmoving seals such as O-rings in valve sub-plates and rigid, low pressure hose connections; "Mild-Dynamic," whose applications include accumulator bladders and hose linings where the hoses are exposed to high pressure and light flexing; and "Dynamic," which refers to cylinder rod seals, pump shaft seals and constantly flexing hydraulic hose.

Elastomers

ISO 1629	DESCRIPTION	STATIC	MILD DYNAMIC	DYNAMIC
NBR	Medium to high nitrile rubber (Buna N, >30% acrylonitrile)	C	C	C
FPM	Fluoroelastomer (Viton®)	C	C	C
CR	Neoprene	S	S	S
IIR	Butyl rubber	S	N	N
EPDM	Ethylene propylene rubber	N	N	N
AU	Polyurethane	C	C	C
PTFE	Teflon®	C	C	C

C = Compatible
S = Satisfactory for short term use, but replacement with a completely compatible elastomer is recommended at the earliest convenience.
N = Not Compatible

Metals

QUINTOLUBRIC® 888-46 is compatible with iron and steel alloys and most nonferrous metals and their alloys. It is not compatible with lead, cadmium, zinc, and alloys containing high levels of these metals. Suitable substitutes for these materials are available and should be used.

Paints and Coatings

QUINTOLUBRIC® 888-46 is compatible with multi-component epoxy coatings. It is not compatible with zinc-based coatings. Specific coating and application recommendations can be obtained from coating manufacturers or directly from Quaker Chemical.

Fluids

QUINTOLUBRIC® 888-46 is compatible and miscible with nearly all mineral oil and polyolester-type hydraulic fluids and with some, but not all, phosphate esters. It is not miscible or compatible with water-containing fluids. For conversion recommendations, please contact Quaker.

ENGINEERING DATA

PROPERTIES	METHOD	QUINTOLUBRIC® 888-46
Specific Heat at 20°C	ASTM D 2766	2.06 kJ/kg °C .49 Btu/lb °F
Coefficient of Thermal Expansion at 20°C	ASTM D 1903	6 X 10^{-4} per °C
Vapor Pressure At 20°C At 66°C	ASTM 02551	3.2 X 10^{-6} mmHg 7.5 X10^{-6} mm Hg
Bulk Modulus at 20°C At 210 bar At 3,000 psi		1.87 X 10^{5} N/cm² 266,900 psi
Thermal Conductivity at 19°C	ASTM D 2717	0.167 J/sec/m/°C
Dielectric Breakdown Voltage	ASTM D 877	30 kV

*Country-specific MSDS are available.

Quaker

quintolubric.com
quakerchem.com

Material Safety Data Sheet

Print date: 04/02/2007 *Version: 3* *Revision date: 04/02/2007*

1. COMPANY AND PRODUCT IDENTIFICATION

Product name: QUINTOLUBRIC® 888-46
Product code: 014113-04

Supplier:
Quaker Chemical Corporation
Quaker Park One
901 Hector Street
Conshohocken, PA 19428
610-832-4000
E-mail: she@quakerchem.com

Emergency telephone number:
* 24 HOUR TRANSPORTATION:
**CHEMTREC: 1-800-424-9300
703-527-3887 (Call collect outside of US)
* 24 HOUR EMERGENCY HEALTH & SAFETY:
**QUAKER CHEMICAL CORPORATION: (800) 523-7010(Within US only)
Outside of US call (703) 527-3887

2. COMPOSITION/INFORMATION ON INGREDIENTS

HAZARDOUS COMPONENTS

This product does not contain any hazardous ingredients as defined under 29 CFR 1910.1200.

3. HAZARDS IDENTIFICATION

Emergency Overview
Mild eye irritation.
May cause skin irritation and/or dermatitis.
May cause irritation of respiratory tract.
May be harmful if swallowed.

Signal word:	CAUTION
Principle routes of exposure:	Eyes, skin and inhalation.
Eye contact:	May cause slight irritation.
Skin contact:	Substance may cause slight skin irritation.
Inhalation:	Vapors and/or aerosols which may be formed at elevated temperatures may be irritating to eyes and respiratory tract.
Ingestion:	Ingestion may cause gastrointestinal irritation, nausea, vomiting and diarrhoea.
Physico-chemical properties:	No hazards resulting from material as supplied.

4. FIRST AID MEASURES

General advice:	If symptoms persist, call a physician. INJECTION INJURY WARNING: If product is injected into or under the skin, or into any part of the body, regardless of the appearance of the wound or its size, the individual should be evaluated immediately by a physician as a surgical emergency. Even though initial symptoms from high pressure injection may be minimal or absent, early surgical treatment within the first few hours may significantly reduce the ultimate extent of the injury.
Eye contact:	Rinse immediately with plenty of water, also under the eyelids, for at least 15 minutes. If symptoms persist, call a physician.
Skin contact:	Wash off immediately with soap and plenty of water. If skin irritation persists, call a physician.
Ingestion:	If swallowed, seek medical advice immediately and show this container or label. Never give anything by mouth to an unconscious person.
Inhalation:	Move to fresh air in case of accidental inhalation of vapors. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Consult a physician.
Notes to physician:	Treat symptomatically.
Medical condition aggravated by exposure:	Dermatitis.

5. FIRE-FIGHTING MEASURES

Flash Point (°C): 288 **Flash point (°F):** 550 **Flash Point Method:** COC

Flammable limits in air - upper (%): Not determined **Flammable limits in air - lower (%):** Not determined

Suitable extinguishing media:	Use dry chemical, CO2, water spray or 'alcohol' foam.
Unusual hazards:	None known
Special protective equipment for fire-fighters:	As in any fire, wear self-contained breathing apparatus pressure-demand, MSHA/NIOSH (approved or equivalent) and full protective gear.
Specific methods:	Water mist may be used to cool closed containers.

6. ACCIDENTAL RELEASE MEASURES

Personal precautions:	Ensure adequate ventilation. Use personal protective equipment. Avoid contact with skin, eyes and clothing.
Environmental precautions:	Do not flush into surface water or sanitary sewer system.
Methods for cleaning up:	Soak up with inert absorbent material (e.g. sand, silica gel, acid binder, universal binder, sawdust).

7. HANDLING AND STORAGE

Handling

Technical measures/precautions:	Provide sufficient air exchange and/or exhaust in work rooms.
Safe handling advice:	In case of insufficient ventilation, wear suitable respiratory equipment.

Storage

Technical measures/storage conditions:	Store at room temperature in the original container
Incompatible products:	No special restrictions on storage with other products
Safe storage temperature:	40-100 ° F
Shelf life:	12 months and re-evaluate

8 EXPOSURE CONTROLS /PERSONAL PROTECTION

Engineering measures:	Ensure adequate ventilation.

Personal Protective Equipment

General:	Eye Wash and Safety Shower
Respiratory protection:	If engineering controls do not maintain airborne concentrations to a level which is adequate to protect worker health, a NIOSH/MSHA certified respirator with organic vapor/P100 filter should be worn.
Hand protection:	Neoprene gloves
Skin and body protection:	Long sleeved clothing
Eye protection:	Safety glasses with side-shields.
Hygiene measures:	Avoid contact with skin, eyes and clothing.

9 PHYSICAL AND CHEMICAL PROPERTIES

Physical state:	Liquid
Color:	Clear Amber
Odour:	Mild
Vapour pressure:	Not determined
Vapour density:	Not determined
VOC Content Product (lb/gal)	0.012 (EPA Method 24)
Solubility:	Insoluble
Evaporation rate:	Not determined
pH:	Not applicable
Flash Point (°C):	288
Flash point (°F):	550
Decomposition temperature:	Not determined
Auto-ignition temperature:	Not determined
Density @ 15.5 ° C (g/cc) :	0.92
Bulk density @ 60 ° F (lb/gal):	7.68
Partition coefficient (n-octanol/water, log Pow):	Not determined

9. PHYSICAL AND CHEMICAL PROPERTIES

Explosive properties:

- **upper limit:** No data available
- **lower limit:** No data available

10. STABILITY AND REACTIVITY

Stability:

Stable under recommended storage conditions.

Conditions to avoid:

None known

Materials to avoid:

Strong oxidising agents

Hazardous decomposition products:

Nitrogen oxides (nox), Oxides of phosphorus, Carbon oxides, Sulphur oxides

Polymerization:

Not applicable

11. TOXICOLOGICAL INFORMATION

No toxicological information is available on the product. Data obtained on components are summarized below.

12. ECOLOGICAL INFORMATION

Persistence and degradability:	No information available
Mobility:	No data available
Bioaccumulation:	No data available
Ecotoxicity effects:	No data available
Aquatic toxicity:	Not Determined

13. DISPOSAL CONSIDERATIONS

Waste from residues/unused products:	Waste disposal must be in accordance with appropriate Federal, State, and local regulations. This product, if unaltered by use, may be disposed of by treatment at a permitted facility or as advised by your local hazardous waste regulatory authority.
Contaminated packaging:	Do not re-use empty containers
Methods for cleaning up:	Take up mechanically and collect in suitable container for disposal.

14 TRANSPORT INFORMATION

U. S. DEPARTMENT OF TRANSPORTATION:

Proper shipping name: Not Regulated

TDG (CANADA):

Proper shipping name: Not Regulated

IMDG/IMO:

Proper shipping name: Not Regulated

IATA/ICAO:

Proper shipping name: Not Regulated

15 REGULATORY INFORMATION

CLASSIFICATION AND LABELING

OSHA Hazard Communication Standard: This product is considered non-hazardous under the OSHA Hazard Communication Standard.

Canada - WHMIS Classification Information: This product has been classified according to the hazard criteria of the CPR and the MSDS contains all the information required by the CPR.

Product Classification: None Required

Product Classification Graphic(s):

Component Classification Data:

Canadian National Pollution Inventory Data:

U.S. REGULATIONS:

Factory Mutual Approval: FM Approval Standard Class # 6930
Project Identifier 0Y0HS.AF
Approval Date: 05/18/2006

SARA (311, 312) hazard class: This product possesses the following SARA Hazard Categories:

Immediate Health (Acute):	No
Delayed Health (Chronic):	No
Flammability:	No
Pressure:	No
Reactivity:	No

RCRA Status Not Regulated

STATE REGULATIONS (RTK):

California Proposition 65 Status:	No components are listed

INVENTORY STATUS:

United States TSCA - Sect. 8(b) Inventory:	This product complies with TSCA
Canada DSL Inventory List -	DSL Compliance has not been determined
Canada DSL/NDSL Inventory List	All components except one are on the DSL Inventory List. The remaining ingredient is listed on the NDSL Inventory List.
EC EINECS/ELINCS/NLP list:	Compliance has not been determined

16. OTHER INFORMATION

Sources of key data used to compile the data sheet:	Material safety data sheets of the ingredients.
Prepared by:	Quaker Chemical Corporation -Safety, Health and Environmental Affairs Group - US
Reason for revision:	This data sheet contains changes from the previous version in section(s) 15

HMIS classification:	**NFPA rating:**
Health: 1	**Health:** 1
Flammability: 1	**Flammability:** 1
Reactivity: 0	**Reactivity:** 0
Personal Protection: B	**Special:** NA

* Indicates possible chronic heath effect

Personal protection recommendations should be reviewed by purchasers. Workplace conditions are important factors in specifying adequate protection.

Disclaimer

This product's safety information is provided to assist our customers in assessing compliance with safety/health/environmental regulations. The information contained herein is based on data available to us and is believed to be accurate. However, no warranty of merchantability, fitness for any use, or any other warranty is expressed or implied regarding the accuracy of this data, the results to be obtained from the use thereof, or the hazards connected with the use of the product. Since the use of this product is within the exclusive control of the user, it is the user's obligation to determine the conditions for safe use of the product. Such conditions should comply with all regulations concerning the product. Quaker Chemical Corporation ("Quaker") assumes no liability for any injury or damage, direct or consequential, resulting from the use of this product unless such injury or damage is attributable to the gross negligence of Quaker.

End of Safety Data Sheet

Material Safety Data Sheet

Zep, Inc.
1310 Seaboard Industrial Blvd.
Atlanta, GA 30318
1-877-I-BUY-ZEP (428-9937)
www.zep.com

Section 1. Chemical Product and Company Identification

Product name BIG ORANGE-E

Product use Industrial Solvent Degreaser

Product code 0485

Date of issue 09/02/09 **Supersedes** 05/18/07

Emergency Telephone Numbers

For MSDS Information:
Compliance Services 1-877-I-BUY-ZEP (428-9937)

For Medical Emergency
(877) 541-2016 Toll Free - All Calls Recorded

For Transportation Emergency
CHEMTREC: (800) 424-9300 - All Calls Recorded
In the District of Columbia (202) 483-7616

Printing date: 09/02/09

Prepared By
Compliance Services
1420 Seaboard Industrial Blvd.
Atlanta, GA 30318

Section 2. Hazards Identification

Emergency overview

*Hazard Determination System (HDS): Health, Flammability, Reactivity

WARNING !

COMBUSTIBLE LIQUID AND VAPOR. CAUSES EYE IRRITATION.
MAY CAUSE ALLERGIC SKIN REACTION.

NOTE: MSDS data pertains to the product as delivered in the original shipping container(s). Risk of adverse effects are lessened by following all prescribed safety precautions, including the use of proper personal protective equipment.

Acute Effects **Routes of Entry** Dermal contact. Eye contact. Inhalation.

Eyes Causes eye irritation. Inflammation of the eye is characterized by redness, watering and itching.

Skin May cause skin irritation. May cause skin sensitization. May cause allergic reactions in certain individuals. Skin inflammation is characterized by itching, scaling, or reddening.

Inhalation Avoid breathing vapors, spray or mists. Over-exposure by inhalation may cause respiratory irritation.

Ingestion May be harmful if swallowed. Aspiration hazard if swallowed. Can enter lungs and cause damage.

Chronic effects Prolonged or repeated contact may dry skin and cause irritation.

Carcinogenicity
Ingredients: Not listed as carcinogen by OSHA, NTP or IARC.

Product/ingredient name	ACGIH	IARC	EPA	NIOSH	NTP	OSHA
None.						

Additional Information: See Toxicological Information (Section 11)

Section 3. Composition/Information on Ingredients

Name of Hazardous Ingredients	CAS number	% by Weight
PROPRIETARY, BIODEGRADABLE, HIGH-FLASH SOLVENT	Proprietary	40 - 50
D-LIMONENE; orange distillate; citrus terpene; cyclohexene, 1-methyl-4-(1-methylethenyl)-, (R)-	5989-27-5	30 - 40
NONYLPHENOXY POLY(ETHYLENEOXY) ETHANOL - npe; poly(oxy-1,2-ethanediyl) alpha-(nonylphenyl)-omega-hydroxy	9016-45-9	1 - 10

Section 4. First Aid Measures

Eye Contact Immediately flush eyes with plenty of water, occasionally lifting the upper and lower eyelids. Check for and remove any contact lenses. Continue to rinse for at least 10 minutes. Get medical attention immediately.

Skin Contact Flush affected skin with plenty of water. Remove contaminated clothing and shoes. Continue to rinse for at least 10 minutes. Wash clothing before reuse. Get medical attention if irritation develops.

Inhalation Move exposed person to fresh air. If irritation persists, get medical attention.

Ingestion If swallowed, do not induce vomiting unless directed to do so by medical personnel. If vomiting occurs, the head should be kept low so that vomit does not enter the lungs. Never give anything by mouth to an unconscious person. Get medical attention immediately.

Section 5. Fire Fighting Measures

National Fire Protection Association (U.S.A.)

Flash Point Closed cup: 64.4°C (148°F) [Tagliabue.]

Flammable Limits Not determined.

Flammability COMBUSTIBLE.

Fire hazard COMBUSTIBLE LIQUID AND VAPOR. Keep away from heat, sparks and flame. Rags, steel wool or other wastes soaked with product may spontaneously catch fire if improperly discarded. Immediately after use, place rags, steel wool or other waste in a sealed, water-filled metal container.

Fire-Fighting Procedures Use dry chemical, CO_2, water spray (fog) or foam. Fire-fighters should wear appropriate protective equipment. Do not release runoff from fire to sewers or waterways.

Section 6. Accidental Release Measures

Spill Clean up Eliminate all ignition sources. Put on appropriate personal protective equipment (see section 8). Dilute with water and mop up if water-soluble or absorb with an inert dry material and place in an appropriate waste disposal container. Dispose of via a licensed waste disposal contractor.

Section 7. Handling and Storage

Handling Put on appropriate personal protective equipment (see section 8). Store and use away from heat, sparks, open flame or any other ignition source. Avoid contact with eyes, skin and clothing. Avoid breathing vapors, spray or mists. Use only with adequate ventilation. Do not ingest. Observe label precautions. Wash thoroughly after handling. Empty containers retain product residue and can be hazardous. Do not reuse container.

Storage Keep away from heat and direct sunlight. Avoid all possible sources of ignition (spark or flame). Keep container in a cool, well-ventilated area. Keep container tightly closed and sealed until ready for use. Keep away from food, drink and animal feeding stuffs. Keep out of the reach of children.

Section 8. Exposure Controls/Personal Protection

Product name **Exposure limits**

No exposure limit value known.

Personal Protective Equipment (PPE)

Eyes Safety glasses.

Body For prolonged or repeated handling, use gloves. Recommended: Neoprene gloves. Nitrile gloves. Rubber gloves.

Respiratory Use with adequate ventilation. Provide exhaust ventilation or other engineering controls to keep the airborne concentrations of vapors below their respective occupational exposure limits.

Section 9. Physical and Chemical Properties

Physical State Liquid.

pH 7.0 - 8.0

Boiling Point 170°C (338°F)

Specific Gravity 0.81

Solubility Emulsifies in water.

Color Clear. Orange.

Odor Citrus [Strong]

Vapor Pressure 0.13 kPa (1 mm Hg)

Vapor Density Not available.

Evaporation Rate Not available.

VOC (Consumer) 36.9% 2.48 (lb/gal) 298 (g/l).

Section 10. Stability and Reactivity

Stability and Reactivity The product is stable.

Incompatibility Combustible materials should be stored away from extreme heat and away from strong oxidizing agents. Incompatible with some strong acids. Reactive with acidic clay (i.e. clay absorbent).

Hazardous Polymerization Will not occur.

Hazardous Decomposition Products carbon oxides

Section 11. Toxicological Information

Acute Toxicity

Product/ingredient name	Result	Species	Dose	Exposure
Nonylphenoxypoly(Ethyleneoxy)Ethano	LD50 Dermal	Rabbit	2000 mg/kg	-
	LD50 Oral	Rat	3310 mg/kg	-

Section 12. Ecological Information

Environmental Effects Not available.

Aquatic Ecotoxicity

Not available.

Section 13. Disposal Considerations

Waste Information

Waste must be disposed of in accordance with federal, state and local environmental control regulations. Consult your local or regional authorities for additional information.

Waste Stream Classification: - [Non-hazardous waste]

Section 14. Transport Information

Regulatory information	UN number	Proper shipping name	Classes	PG*	Label
DOT Classification	Not applicable.	Not a DOT controlled material (United States).			

NOTE: DOT classification applies to most package sizes. For specific container size classifications or for size exceptions, refer to the Bill of Lading with your shipment.

PG* : Packing group

Section 15. Regulatory Information

U.S. Federal Regulations

SARA 313 toxic chemical notification and release reporting:

No products were found.

Clean Water Act (CWA) 307: No products were found.

Clean Water Act (CWA) 311: No products were found.

Clean Air Act (CAA) 112 regulated toxic substances: No products were found.

All Components of this product are listed or exempt from listing on TSCA Inventory.

State Regulations

California Prop 65 No products were found.

Section 16. Other Information

To the best of our knowledge, the information contained herein is accurate. However, neither the above named supplier nor any of its subsidiaries assumes any liability whatsoever for the accuracy or completeness of the information contained herein.
Final determination of suitability of any material is the sole responsibility of the user. All materials may present unknown hazards and should be used with caution. Although certain hazards are described herein, we cannot guarantee that these are the only hazards that exist.

**NOTE: Hazard Determination System (HDS) ratings are based on a 0-4 rating scale, with 0 representing minimal hazards or risks, and 4 representing significant hazards or risks. Although these ratings are not required on MSDSs under 29 CFR 1910.1200, the preparer may choose to provide them. HDS ratings are to be used with a fully implemented program to relay the meanings of this scale.*

Click http://www.guidechem.com/cas-688/68814-95-9.html for suppliers of this product

Amines,tri-C8-10-alkyl (cas 68814-95-9) MSDS

MSDS : Amines, tri-C(sub 8-10)-alkyl-
CAS : 68814-95-9
SYNONYMS : * Adogen 364
* Alamine 336
* Alamine 336S
* Azamine T 810
* 336S

Catalog of Chemical Suppliers, Buyers, Custom Synthesis Companies And Equipment Manufacturers
[Amines, tri-C(sub 8-10)-alkyl- 68814-95-9]

*** CHEMICAL IDENTIFICATION ***

RTECS NUMBER : BF2814500
CHEMICAL NAME : Amines, tri-C(sub 8-10)-alkyl-
CAS REGISTRY NUMBER : 68814-95-9
OTHER CAS REGISTRY NOS. : 51142-05-3
LAST UPDATED : 199701
DATA ITEMS CITED : 3
SYNONYMS/TRADE NAMES :
* Adogen 364
* Alamine 336
* Alamine 336S
* Azamine T 810
* 336S

*** HEALTH HAZARD DATA ***

** ACUTE TOXICITY DATA **

TYPE OF TEST : LD50 - Lethal dose, 50 percent kill
ROUTE OF EXPOSURE : Oral
SPECIES OBSERVED : Rodent - rat
DOSE/DURATION : 5600 mg/kg
TOXIC EFFECTS :
Details of toxic effects not reported other than lethal dose value
REFERENCE :
HYDRDA Hydrometallurgy. (Elsevier Science Pub. B.V., POB 211, 1000 AE
Amsterdam, Netherlands) V.1- 1975- Volume(issue)/page/year: 3,201,1978

TYPE OF TEST : LD50 - Lethal dose, 50 percent kill
ROUTE OF EXPOSURE : Intraperitoneal
SPECIES OBSERVED : Rodent - rat
DOSE/DURATION : 1 gm/kg
TOXIC EFFECTS :
Behavioral - convulsions or effect on seizure threshold
Behavioral - muscle contraction or spasticity
REFERENCE :
HYDRDA Hydrometallurgy. (Elsevier Science Pub. B.V., POB 211, 1000 AE
Amsterdam, Netherlands) V.1- 1975- Volume(issue)/page/year: 3,201,1978

*** STATUS IN U.S. ***

EPA TSCA Section 8(b) CHEMICAL INVENTORY

*** END OF RECORD ***

Product Safety Summary

Aromatic 150 Fluid

ExxonMobil Chemical

(Solvesso™ 150 Fluid)

This Product Safety Summary document is a high-level summary intended to provide the general public with an overview of product safety information on this chemical substance. It is not intended to provide emergency response, medical or treatment information, or to provide a discussion of all safety and health information. This document is not intended to replace the (Material) Safety Data Sheet. Warnings and handling precautions provided below are not intended to replace or supersede manufacturers' instructions and warning for their consumer products which may contain this chemical substance.

1. Chemical Identity

CAS No.	Chemical Name:	Abbreviation:
64742-94-5	Solvent Naphtha (Petroleum), Heavy Aromatic	A150, S150

Other Names:
- High Flash Aromatic Naphtha, Type II
- Heavy Aromatic Solvent Naphtha
- Hydrocarbons, C10 aromatics, >1% naphthalene

2. Product Uses

Aromatic 150 is a liquid solvent used in many industrial applications such as fuel additives, paints and coatings, pesticide formulations, industrial cleaning, and process fluids.

3. Physical / Chemical Properties

Aromatic 150 is a combustible material in both the liquid and vapor forms, has a relatively high vapor pressure, and should be handled only with adequate ventilation and in areas without any ignition source present (e.g. no open flames, static electricity sources, or unprotected light switches). It is composed primarily of C10-12 alkyl benzenes.

The flash point for Aromatic 150 is approximately 151°F /66°C.

4. Health Information

Aromatic 150 Fluid is generally recognized to have low acute and chronic toxicity if ingested and/or breathed. Vapor concentrations above the exposure limit of 19 parts per million (ppm) in the air can cause eye and lung irritation and may cause headaches, dizziness, drowsiness or CNS depression. Prolonged or repeated skin contact in an occupational setting may result in irritation and in these situations, the use of chemical resistant gloves is recommended. This product is not regarded as a mutagen or carcinogen, and there is low concern reproductive or developmental effects.

5. Additional Hazard Information

If accidentally swallowed, small amounts of liquid may be aspirated into the lungs during ingestion or from vomiting, this may cause severe lung inflammation and lung edema (an accumulation of fluid in the lungs). This is a medical emergency which must be immediately and properly treated.

Aromatic 150 may contain naphthalene (~5-10 wt %). Naphthalene has caused cancer in laboratory animal studies, but the relevance of the findings to humans is uncertain. Exposure to high concentrations of naphthalene may cause destruction of red blood cells, anemia, and cataracts.

Product Safety Summary

Aromatic 150 Fluid

(Solvesso™ 150 Fluid)

ExxonMobil Chemical

6. Food Contact Regulated Uses

This product is not claimed as compliant for food contact uses.

7. Environmental Information

Aromatic 150, if accidentally spilled in the environment, is potentially a threat to the environment due to its moderate toxicity to aquatic organisms (e.g. fish and invertebrates). Aromatic 150 biodegrades at a rapid rate and will not persist in the environment. Because of its low solubility in water and volatility (tendency to move from water to air) chronic aquatic toxicity is not expected, however a significant spill may cause long-term adverse effects in the aquatic environment. Aromatic 150 is a volatile organic compound (VOC) and is rapidly degraded in air, water, and soil. Considerable measures are taken to prevent its release to the atmosphere and minimize any exposure to the environment from manufacturing and use activities.

8. Exposure Potential

- **Workplace exposure** – This refers to potential exposure in a manufacturing facility or through evaporation in various industrial applications. Generally, exposure of workers in manufacturing facilities is relatively low because the process, storage and handling operations are enclosed. The ExxonMobil recommended occupational exposure limit value is 17 parts per million (ppm) per 8-hour work day.
- **Consumer use of products containing Aromatic 150** –Exposure could occur through the use of paints or coatings that contain this product. The best way to prevent exposure to vapors is to work in well-ventilated areas, wear chemical resistant gloves, and follow good personal hygiene practices.
- **Environmental releases** – As a chemical manufacturer, we are committed to operating in an environmentally responsible manner everywhere we do business. Our efforts are guided by in-depth scientific understanding of the environmental impact of our operations, as well as by the social and economic needs of the communities in which we operate. Industrial spills or releases are rare; however a spill may pose a significant flammability issue. Our operational improvement targets and plans are based on driving incidents with real environmental impact to zero and delivering superior environmental performance.

9. Manufacture of Product

- **Capacity** – Based on publicly available information in 2005, global production for Heavy Aromatic Naphtha-type products such as Aromatic 150 exceeded 450 thousand metric tons (1 billion pounds).
- **Process** – Aromatic 150 is produced from distillation of aromatic streams derived from crude oil. Processes and equipment for manufacture, transfer and storage are continuous and enclosed.

10. Risk Management

- **Workplace Risk Management** – When using this substance or products which contain this substance, make sure that there is adequate ventilation. Always use appropriate chemical resistant gloves to protect your hands and skin and always wear eye protection such as chemical goggles. Do not eat, drink, or smoke where this substance is handled, processed, or stored. Wash hands and skin following contact. If this substance gets into your eyes, rinse eyes thoroughly for at least 15 minutes with tap water and seek medical attention. Please refer to the (Material) Safety Data Sheet.
- **Consumer Risk Management** - This chemical is not sold directly to the public for general consumer uses. If exposure should occur, it is expected to be infrequent and of short duration. Always follow

manufacturers' instructions, warnings and handling precautions when using their products. The best way to minimize exposure to vapors is to work in well-ventilated areas.

11. Regulatory Information

Regulations may exist that govern the manufacture, sale, transportation, use and/or disposal of this product and may vary by city, state, country or geographic region. Additional helpful information may be found by consulting the relevant ExxonMobil (Material) Safety Data Sheet at:

http://www.msds.exxonmobil.com

13. Conclusion Statement

Aromatic 150 . . .

- is a widely used industrial, paint, and agricultural solvent.
- is low in toxicity; however, it may cause lung damage if swallowed.
- does not cause adverse health or environmental effects at levels typically found in the workplace or environment.
- is combustible with a high vapor pressure; use only with good ventilation; avoid all ignition sources.

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Product Safety Summary

ExxonMobil Chemical

ISOPAR™ L FLUID

This Product Safety Summary document is a high-level summary intended to provide the general public with an overview of product safety information on this chemical substance. It is not intended to provide emergency response, medical or treatment information, or to provide a discussion of all safety and health information. This document is not intended to replace the (Material) Safety Data Sheet. Warnings and handling precautions provided below are not intended to replace or supersede manufacturers' instructions and warning for their consumer products which may contain this chemical substance.

1. Chemical Identity

Isopar™ L Fluid is characterized as a synthetic isoparaffinic hydrocarbon solvent produced from petroleum-based raw materials which are treated with hydrogen in the presence of a catalyst to produce a product that contains very low levels of aromatic hydrocarbons and is essentially odorless and colorless.

For EU only; EC No.:	Chemical Name:
920-901-0	Hydrocarbons, C11-C13, isoalkanes, < 2% aromatics

CAS No.:	Chemical Name:
64742-48-9	Distillates (petroleum), Hydrotreated light

2. Product Uses

Isopar L Fluid is a liquid solvent used in paints and coatings, consumer products, printing inks, and agricultural chemical applications. It is not sold directly to the public for general consumer uses; however this product may be an ingredient in consumer and commercial applications such as paints, cleaning agents, and as functional fluids in other consumer products.

3. Physical / Chemical Properties

Isopar L Fluid is a combustible material, has a relatively high vapor pressure, and should be handled only with adequate ventilation and in areas where ignition sources have been removed (e.g. open flames, static electricity sources, unprotected light switches). The flash point is ~144°F /62°C.

4. Health Information

Isopar L Fluid is generally recognized to have low acute and chronic toxicity. Vapor or aerosol concentrations above the exposure limit of 171 parts per million (ppm) in the air can cause eye and lung irritation and may cause headaches, dizziness or drowsiness. Prolonged or repeated skin contact in an occupational setting may result in irritation and in these situations, the use of chemical resistant gloves is recommended This product is not regarded as a mutagen or carcinogen, and there is low concern for reproductive, developmental, or nervous system toxic effects.

5. Additional Hazard Information

If accidentally swallowed, small amounts of liquid may be aspirated into the lungs during ingestion or from vomiting, this may cause severe lung inflammation and lung edema (an accumulation of fluid in the lungs). This is a medical emergency which must be immediately and properly treated. Do not induce vomiting.

Product Safety Summary

ExxonMobil Chemical

ISOPAR™ L FLUID

6. Food Contact Regulated Uses

Appropriate manufacturing and distribution practices are employed to ensure the quality of this product when offered for use in indirect food contact applications.

7. Environmental Information

Isopar L Fluid biodegrades at a moderate rate and will not persist in the environment. It is not expected to cause short-term toxicity to fish or other aquatic organisms. Because of its low solubility in water and volatility (tendency to move from water to air) chronic aquatic toxicity is not expected. It is a volatile organic compound (VOC) and is rapidly degraded in air. Considerable measures are taken to prevent its release to the atmosphere and minimize any exposure to the environment from manufacturing and use activities.

8. Exposure Potential

- **Workplace exposure** – This refers to potential exposure in a manufacturing facility or through evaporation in various industrial applications. Generally, exposure of personnel in manufacturing facilities is relatively low because the process, storage and handling operations are enclosed. The ExxonMobil recommended occupational exposure limit (OEL) is 171 ppm per an 8-hour work day.
- **Consumer use of products containing Isopar L Fluid** – If exposure should occur, it is likely to be infrequent and of short duration depending on the products used and the conditions under which they are used. Exposure could occur through the use of commercial paints, bug sprays or waterless hand cleaner formulations that contain this product. The best way to prevent exposure to vapors is to work in well-ventilated areas, wear chemical resistant gloves, and follow good personal hygiene practices.
- **Environmental releases** – As a chemical manufacturer, we are committed to operating in an environmentally responsible manner everywhere we do business. Our efforts are guided by in-depth scientific understanding of the environmental impact of our operations, as well as by the social and economic needs of the communities in which we operate. Industrial spills or releases are rare; however a spill may pose a significant flammability issue. Our operational improvement targets and plans are based on driving incidents with real environmental impact to zero and delivering superior environmental performance.

9. Manufacture of Product

- **Capacity** – Publicly available sources report total U.S. production capacity for this type of solvent product exceeded 1 billion pounds in 2005 (450 kT).
- **Process** – Isopar L Fluid is produced from petroleum-based raw materials which are treated with hydrogen in the presence of a catalyst to produce a low odor solvent.

10. Risk Management

- **Workplace Risk Management** – When using this product, make sure that there is adequate ventilation. Always use chemical resistant gloves to protect your hands and skin and always wear eye protection such as chemical goggles. Do not eat, drink, or smoke where chemicals are handled, processed, or stored. Wash hands and skin following contact. If this product gets into your eyes, rinse eyes thoroughly for at least 15 minutes with tap water and seek medical attention. Please refer to the (Material) Safety Data Sheet.

Product Safety Summary

ISOPAR™ L FLUID

- **Consumer Risk Management** - This chemical is not sold directly to the public for general consumer uses. If exposure should occur, it is expected to be infrequent and of short duration. Always follow manufacturers' instructions, warnings and handling precautions when using their products. The best way to minimize exposure to vapors is to work in well-ventilated areas.

11. Regulatory Information

Regulations may exist that govern the manufacture, sale, transportation, use and/or disposal of this chemical and may vary by city, state, country or geographic region. Additional helpful information may be found by consulting the relevant ExxonMobil (Material) Safety Data Sheet at:

- http://www.msds.exxonmobil.com

12. Conclusion Statements

Isopar L Fluid ...

- is a widely used industrial solvent, and may be an ingredient in consumer products.
- is low in toxicity; however it may cause lung damage if swallowed.
- does not cause adverse health or environmental effects at levels typically found in the workplace or environment.
- is combustible; use only with good ventilation; avoid all ignition sources.

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Product Safety Summary

ExxonMobil Chemical

EXXSOL ™ D60 FLUID

This Product Safety Summary document is a high-level summary intended to provide the general public with an overview of product safety information on this chemical substance. It is not intended to provide emergency response, medical or treatment information, or to provide a discussion of all safety and health information. This document is not intended to replace the Material Safety Data Sheet. Warnings and handling precautions provided below are not intended to replace or supersede manufacturers' instructions and warning for their consumer products which may contain this chemical substance.

1. Chemical Identity

Exxsol™ D60 Fluid is produced from petroleum-based raw materials which are treated with hydrogen in the presence of a catalyst to produce a low odor, low aromatic hydrocarbon solvent. The major components include normal paraffins, isoparaffins, and cycloparaffins.

CAS No.: 64742-47-8 **Chemical Name:** Distillates (petroleum), hydrotreated light

CAS No.: 64742-48-9 **Chemical Name:** Hydrocarbons, C10-C13, n-alkanes, isoalkanes, cyclics, <2% aromatics

2. Product Uses

Exxsol D60 Fluid is a solvent used in industrial and professional applications such as manufacturing process solvent, metal working, and coatings. It is not sold directly to the public for general consumer uses. This product may be an ingredient in consumer and commercial applications which may include:

- Metal working solvents
- Architectural, construction and traffic marking coatings

3. Physical / Chemical Properties

Exxsol D60 Fluid is a combustible material and should be handled only with adequate ventilation and in areas without any ignition source present (e.g. no open flames, static electricity sources, or unprotected light switches).

The flash point for this product is approximately 143°F / 62°C.

4. Health Information

Exxsol D60 Fluid is generally recognized to have low acute and chronic toxicity. Vapor or aerosol concentrations above the exposure limit of 184 parts per million (ppm) in the air can cause eye and lung irritation and may cause headaches, dizziness or drowsiness. Prolonged or repeated skin contact in an occupational setting may result in irritation and in these situations, the use of chemical resistant gloves is recommended. Exxsol D60 Fluid is not regarded as a mutagen or carcinogen, and there is low concern for reproductive, developmental, or nervous system toxic effects.

5. Additional Hazard Information

If accidentally swallowed, small amounts of liquid may be aspirated into the lungs during ingestion or from vomiting which may cause severe lung inflammation and lung edema (an accumulation of fluid in the lungs). This is a medical emergency which must be immediately and properly treated. Do not induce vomiting.

Product Safety Summary

ExxonMobil Chemical

EXXSOL ™ D60 FLUID

6. Food Contact Regulated Uses

Appropriate manufacturing and distribution practices are employed to ensure the quality of Exxsol D60 Fluid offered for use in indirect food contact applications.

7. Environmental Information

Exxsol D60 Fluid biodegrades at a rapid rate and will not persist in the environment. It is not expected to cause short-term toxicity to fish or other aquatic organisms. Because of its low solubility in water and volatility (tendency to move from water to air) chronic aquatic toxicity is not expected. Exxsol D60 Fluid is a volatile organic compound (VOC) and is rapidly degraded in air. Considerable measures are taken to prevent its release to the atmosphere and minimize any exposure to the environment from manufacturing and use activities.

8. Exposure Potential

- **Workplace exposure** – This refers to potential exposure in a manufacturing facility or through evaporation in various industrial applications. Generally, exposure of personnel in manufacturing facilities is relatively low because the process, storage and handling operations are enclosed. The ExxonMobil recommended occupational exposure limit (OEL) is 184 ppm per 8-hour work day.
- **Consumer use of products containing Exxsol D60 Fluid** – If exposure should occur, it is likely to be infrequent and of short duration depending on the products used and the conditions under which they are used. Exposure could occur through the use of commercial metal working solvents or coatings formulations that contain this product. The best way to prevent exposure to vapors is to work in well-ventilated areas, wear chemical resistant gloves, and follow good personal hygiene practices.
- **Environmental releases** – As a chemical manufacturer, we are committed to operating in an environmentally responsible manner everywhere we do business. Our efforts are guided by in-depth scientific understanding of the environmental impact of our operations, as well as by the social and economic needs of the communities in which we operate. Industrial spills or releases are rare; however a spill may pose a significant flammability issue. Our operational improvement targets and plans are based on driving incidents with real environmental impact to zero and delivering superior environmental performance.

9. Manufacture of Product

- **Capacity** – Publicly available sources report total global production capacity for this type of solvent product exceeded 1 billion pounds in 2005 (450 kT).
- **Process** – Exxsol D60 Fluid is produced from petroleum-based raw materials which are treated with hydrogen in the presence of a catalyst to produce a low odor solvent.

Product Safety Summary

ExxonMobil Chemical

EXXSOL ™ D60 FLUID

10. Risk Management

- **Workplace Risk Management** – When using this product, make sure that there is adequate ventilation. Always use chemical resistant gloves to protect your hands and skin and always wear eye protection such as chemical goggles. Do not eat, drink, or smoke where chemicals are handled, processed, or stored. Wash hands and skin following contact. If this product gets into your eyes, rinse eyes thoroughly for at least 15 minutes with tap water and seek medical attention. Please refer to the Safety Data Sheet.
- **Consumer Risk Management** - This chemical is not sold directly to the public for general consumer uses. If exposure should occur, it is expected to be infrequent and of short duration. Always follow manufacturers' instructions, warnings and handling precautions when using their products. The best way to minimize exposure to vapors is to work in well-ventilated areas.

11. Regulatory Information

Regulations may exist that govern the manufacture, sale, transportation, use and/or disposal of this chemical and may vary by city, state, country or geographic region. Additional helpful information may be found by consulting the relevant ExxonMobil Safety Data Sheet at:

- http://www.msds.exxonmobil.com/psims/psims.aspx?brand=xomcc

12. Conclusion Statements

- Exxsol D60 Fluid is a widely used industrial solvent, and may be an ingredient in consumer products.
- Exxsol D60 Fluid is low in toxicity; however it may cause lung damage if swallowed.
- Exxsol D60 Fluid does not cause adverse health or environmental effects at levels typically found in the workplace or environment.
- Exxsol D60 Fluid is combustible; use only with good ventilation; avoid all ignition sources.

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LAB SAFETY SUPPLY (FORMERLY SC -- HG ABSORB

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MSDS Safety Information

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FSC: 9330
NIIN: 01-381-8030
MSDS Date: 01/01/1996
MSDS Num: CBSPB
Product ID: HG ABSORB
MFN: 01
Responsible Party
Cage: 6M644
Name: LAB SAFETY SUPPLY INC (FORMERLY SCIENCE RELATED)
Address: 401 SOUTH WRIGHT RD
Box: 1368
City: JANESVILLE WI 53547-1368
Info Phone Number: 800-356-0783
Emergency Phone Number: 800-356-0783
Review Ind: Y
Published: Y

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Contractor Summary

==========

Cage: 8P044
Name: LAB SAFETY SUPPLY INC (608-754-2345)
Address: UNKNOWN
Box: UNKNOW
City: UNKNOWN NK 00000
Phone: UNKNOWN
Cage: 6M644
Name: LAB SAFETY SUPPLY INC (FORMERLY SCIENCE RELATED)
Address: 401 S WRIGHT RD
Box: 1368
City: JANESVILLE WI 53547-1368
Phone: 608-757-4737

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Item Description Information

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Item Manager: S9I
Item Name: CLEANUP KIT,MERCURY
Specification Number: NONE
Type/Grade/Class: NONE
Unit of Issue: EA
UI Container Qty: 0
Type of Container: KIT

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Ingredients

==========
Cas: 7440-66-6
RTECS #: ZG8600000
Name: ZINC (SARA 313) (CERCLA)
% Wt: 94-96
Other REC Limits: NONE RECOMMENDED
OSHA PEL: NOT ESTABLISHED
ACGIH TLV: NOT ESTABLISHED
EPA Rpt Qty: 1000 LBS
DOT Rpt Qty: 1000 LBS

Cas: 77-92-9
RTECS #: GE7350000
Name: CITRIC ACID
% Wt: UNKNOWN
Other REC Limits: NONE RECOMMENDED
OSHA PEL: NOT ESTABLISHED
ACGIH TLV: NOT ESTABLISHED
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Health Hazards Data
==========
LD50 LC50 Mixture: PRODUCT'S LD50 (ORAL RAT) WAS NOT STATED
Route Of Entry Inds - Inhalation: YES
Skin: NO
Ingestion: NO
Effects of Exposure: *TARGET-ORGANS:RESPIRATORY SYSTEM.* ACUTE-IRRITATION TO EYES, NOSE, THROAT, METALLIC TASTE IN MOUTH, FLU LIKE SYMPTOMS. CHRONIC-CHROMOSOMAL ANOMALIES IN LEUCOCYTES REPORTED, ARTHRITIC LAMENESS & INFLA MATION OF G/I TRACT REPORTED IN ANIMAL STUDIES.
Explanation Of Carcinogenicity: MFR GAVE THE ABOVE LISTINGS ON THE MSDS BUT NO OTHER COMMENTS ABOUT CARCINOGENICITY WERE RECORDED.
Signs And Symptions Of Overexposure: IRRITATIONOF NOSE, THROAT & EYES.
First Aid: EYE:FLUSH W/PLENTY OF WATER FOR 15 MIN. SKIN:FLUSH W/PLENTY OF WATER. INHALED:REMOVE TO FRESH AIR & GET IMMEDIATE MEDICAL ATTENTION. INGESTED:DILUTE W/PLENTY OF WATER & GET IMMEDIATE MEDICAL ATTENTION .
==========
Handling and Disposal
==========
Spill Release Procedures: SWEEP UP MATERIAL & PLACE IN WASTE DISPOSAL CONTAINER.
Neutralizing Agent: MFR GAVE NO INFORMATION OF MSDS.
Waste Disposal Methods: MERCURY FREE MATERIAL MAY BE CONTAINERIZED & DISPOSED OF IN A LICENSED LANDFILL. DISPOSE OF MERCURY CONTAINING MATERIAL I/A/W FEDERAL, STATE & LOCAL REGULATIONS FOR HAZARDOUS WASTE.
Handling And Storage Precautions: STORE IN COOL, DRY PLACE AWAY FROM INCOMPATIBLE MATERIALS.
==========
Fire and Explosion Hazard Information

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Extinguishing Media: CARBON DIOXIDE OR DRY CHEMICAL. DO NOT USE WATER. WATER WILL REACT VIOLENTLY W/MOLTEN MATERIAL.
Unusual Fire/Explosion Hazard: ZINC DUST MIXED W/SULFUR DUST MAY EXPLODE.
==========
Control Measures
==========
Respiratory Protection: USE NUISANCE DUST MASK AT DUST LEVELS OVER 15 MG/M3. 3M 9908 OR EQUIVALENT MAY BE DESIRABLE FOR MERCURY CLEANUP PROCEDURES.
Ventilation: USE MECHANICAL (GENERAL) VENTILATION
Protective Gloves: POLYETHYLENE, RUBBER OR PVC
Eye Protection: SAFETY GLASSES RECOMMENDED
Other Protective Equipment: NONE REQUIRED UNDER NORMAL USE.
Work Hygienic Practices: WASH HANDS AFTER USE.
Supplemental Safety and Health: NONE
==========
Physical/Chemical Properties
==========
HCC: N1
NRC/State LIC No: NONE
Decomp Text: UNKNOWN
Spec Gravity: 2.35 GM/CM3
Viscosity: UNKNOWN
Solubility in Water: MODERATE
Appearance and Odor: GRAY GRANULAR SOLID
Corrosion Rate: UNKNOWN
==========
Reactivity Data
==========
Stability Indicator: YES
Stability Condition To Avoid: MFR GAVE NO INFORMATION OF MSDS.
Materials To Avoid: OXIDIZING AGENTS, ACIDS, BASES, HALOGENS, REDUCING AGENTS, AMINES, CHLORINATED SOLVENTS & SULFUR.
Hazardous Decomposition Products: MAY RELEASE CARBON MONOXIDE, CARBON DIOXIDE
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Toxicological Information
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Ecological Information
==========
==========
MSDS Transport Information
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==========
Regulatory Information
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==========
Other Information

==========
==========
Transportation Information
==========
Responsible Party Cage: 6M644
Trans ID NO: 132099
Product ID: HG ABSORB
MSDS Prepared Date: 01/01/1996
Review Date: 09/17/1996
MFN: 1
Tech Entry NOS Shipping Nm: NONE
Net Unit Weight: UNKNOWN
Multiple KIT Number: 0
Review IND: Y
Unit Of Issue: EA
Container QTY: 0
Type Of Container: KIT
Additional Data: TIR DESCRIBES KIT AS CONTAINING 500 GM OF ABSORBENT.
==========
Detail DOT Information
==========
DOT PSN Code: ZZZ
DOT Proper Shipping Name: NOT REGULATED BY THIS MODE OF TRANSPORTATION
==========
Detail IMO Information
==========
IMO PSN Code: ZZZ
IMO Proper Shipping Name: NOT REGULATED FOR THIS MODE OF TRANSPORTATION
==========
Detail IATA Information
==========
IATA PSN Code: ZZZ
IATA Proper Shipping Name: NOT REGULATED BY THIS MODE OF TRANSPORTATION
==========
Detail AFI Information
==========
AFI PSN Code: ZZZ
AFI Proper Shipping Name: NOT REGULATED BY THIS MODE OF TRANSPORTATION
==========
HAZCOM Label
==========
Product ID: HG ABSORB
Cage: 6M644
Company Name: LAB SAFETY SUPPLY INC (FORMERLY SCIENCE RELATED)
Street: 401 S WRIGHT RD
PO Box: 1368
City: JANESVILLE WI
Zipcode: 53547-1368

Health Emergency Phone: 800-356-0783
Label Required IND: Y
Date Of Label Review: 09/17/1996
Status Code: C
MFG Label NO: NONE
Label Date: 09/17/1996
Origination Code: F
Eye Protection IND: YES
Skin Protection IND: YES
Signal Word: CAUTION
Respiratory Protection IND: YES
Health Hazard: Slight
Contact Hazard: Slight
Fire Hazard: None
Reactivity Hazard: Slight
Hazard And Precautions: *TARGET-ORGANS:RESPIRATORY SYSTEM.* ACUTE-IRRITATION TO EYES, NOSE, THROAT, METALLIC TASTE IN MOUTH, FLU LIKE SYMPTOMS. CHRONIC-CHROMOSOMAL ANOMALIES IN LEUCOCYTES REPORTED, ARTHRITIC LAMENESS & INFLA MATION OF G/I TRACT REPORTED IN ANIMAL STUDIES. STORE IN COOL, DRY PLACE AWAY FROM INCOMPATIBLE MATERIALS.

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1. IDENTIFICATION OF THE SUBSTANCE/PREPERATION AND THE COMPANY

Product Name: N910
Company: Nochar, Inc.
8650 Commerce Park Place
Suite K
Indianapolis, IN 46268

Telephone: 317-613-3046
Telefax: 317-613-3052
E-mail: nochar@nochar.com

Emergency Information: 765-938-3333

Product Use: Solidification of hazardous and non-hazardous hydrocarbon liquids

2. COMPOSITION/INFORMATION ON INGREDIENTS

Identification of the Preparation: Thermoplastic Elastomer Polymer

3. HAZARDS IDENTIFICATION

Human Health Hazards: None
Environmental Hazards: None
Safety Hazards: Electrostatic charges may be generated during handling. Risk of self-ignition of bulk product above certain temperatures (Refer to Section 10) dust explosion could occur.

Special Notes: These components are synthetic rubber compounds, which are essentially nontoxic. Material is non-irritating. If polymer dusts are generated, they could scratch the eyes and cause minor irritation to the respiratory tract.

4. FIRST AID MEASURES

Inhalation: If dust is inhaled, obtain medical attention.
Skin Contact: Wash off immediately with soap and plenty of water. In case of persistent skin irritation, consult a physician.
Eye Contact: Rinse thoroughly with plenty of water, also under the eyelids. In case of persistent eye irritation consult a physician.
Ingestion: None.
Advice to Physician: Treat symptoms.

5. FIRE-FIGHTING MEASURES

NFPA 704 Hazard Class: Health: 0 Flammability: 1 Instability: 0
Unsuitable Extinguishing Media: Water in spray may disperse fire.
Extinguishing Media: Foam, water spray or fog. Dry chemical powder, carbon dioxide, sand or earth may be used for small fires only.
Specific Hazards: Not flammable but will burn. Combustion products may include carbon monoxide and carbon dioxide.
Special Protective Equipment for Firefighters: Full protective clothing and self contained breathing apparatus.

6. ACCIDENTAL RELEASE MEASURES

Personal Precautions: Avoid generating dust.

Environmental Precautions: None.

Methods for Cleaning Up: Clean up promptly by scoop or vacuum. Keep in suitable, closed containers for disposal as required by local, state, federal, international or country specific regulations.

7. HANDLING AND STORAGE

Safe Handling Advice: Avoid generation of dust. Take precautionary measures against static discharges, earth/ground all equipment. Do not breathe dust. Use local exhaust over processing area. When processing N910 products, maintain a fire watch if the material reaches 225 deg, C (536 deg. F)
Storage: Keep in a dry, cool place. Avoid storage under pressure or at elevated temperatures to minimize particulate clustering.
Storage Temperature. Ambient
Product Transfer: Take precautionary measures against static discharge. Earth/Ground all equipment.

8. EXPOSURE CONTROLS / PERSONAL PROTECTION

Engineering Measures: Use local exhaust ventilation.
Nuisance Dust TLV: TWA (8 h) 10 mg/m^3 if dust is generated.
Personal Protective Equipment:

Respiratory Protection: In case of insufficient ventilation wear suitable respiratory equipment.
Hand Protection: Cloth gloves are recommended.
Eye Protection: Safety glasses with side shields. Do not wear contact lenses where this product is used.
Skin and Body Protection: No special protective clothing required.

9. PHYSICAL AND CHEMICAL PROPERIES

Form: Solid

Color: White

Odor: Essentially odorless

Flash Point: None

Specific Gravity: ≤ 1

Auto Ignition Temperature: Does not ignite.

Bulk Density (for solids): Typical 300-400 kg/m³ at 20 Deg. C

Loose Density: Approximately 18 lbs per cu.ft.

Water Solubility: Insoluble

10. STABILITY AND REACTIVITY

Stability: Stable under ambient conditions.

Materials to Avoid: Oxidizing agents may cause exothermic reactions.

Hazardous Decomposition Products: Thermal decomposition may produce Carbon oxides (COx)

11. TOXICOLOGICAL INFORMATION

Acute Toxicity

Oral: Expected to be of low toxicity. LD50≥ 2000 mg/kg.
Dermal: Expected to be of low toxicity. LD50≥ 2000 mg/kg.
Inhalation: The product is not expected to be toxic by inhalation.

Irritation

Skin: Not expected to be irritating.
Eyes: Not expected to be irritating.
Sensitization: Not sensitizing
Mutagenicity: No data available, but not expected. This product is not classified by the following: The International Agency for Research on Cancer (IARC), The National Toxicology Program (NTP) or The American Conference of Governmental Industrial Hygienists (ACGIH).

12. ECOLOGICAL INFORMATION

Mobility: Floats on water. Remains on surface of soil.

Aquatic Toxicity

Toxicity to Fish: Expected to be non toxic. LC/EC/IC 50 ≥ 1000 mg/l.
Toxicity to Invertebrates: Expected to be non toxic. LC/EC/IC 50 ≥ 1000 mg/l.
Toxicity to Algae: Expected to be non toxic. LC/EC/IC 50 ≥ 1000 mg/l.
Toxicity to Bacteria: Expected to be non toxic. LC/EC/IC 50 ≥ 1000 mg/l.
Sewage Treatment: Expected to be non toxic. LC/EC/IC 50 ≥ 1000 mg/l.

13. DISPOSAL CONSIDERATIONS

Waste from Residues / Unused Products: In accordance with Federal, State, local and national regulations.

Contaminated Packaging: Can be land filled or incinerated, when in compliance with local regulations.

14. TRANSPORT INFORMATION

Not classified as dangerous in the meaning of transport regulations. **DOT, IMDG/IMO, ICAO/IATA. UN, IMO, ADR/RID, ICAO CODE**

Harmonized Tariff System (HTS): 3901.90

Export Administration Regulations: Does not require a license EAR 99

15. REGULATORY INFORMATION

This product is not classified as dangerous and need not to be labeled according to EC-DIRECTIVES as amended.

International Inventories:

European Union (EINECS/ELINCS); All components of this product are either listed on the inventory or are exempt from listing.
USA (TSCA): All components of this product are either listed on the inventory or are exempt from listing.
Canada (DSL): All components of this product are either listed on the inventory or are exempt from listing.
Australia (AICS): All components of this product are either listed on the inventory or are exempt from listing.
CHINA (IECSC): All components of this product are either listed on the inventory or are exempt from listing.
JAPAN (IENCS): All components of this product are either listed on the inventory or are exempt from listing.

KOREA (KECI): All components of this product are either listed on the inventory or are exempt from listing.
NEW ZEALAND (NZIOC): All components of this product are either listed on the inventory or are exempt from listing.

This document is compliant with the Globally Harmonized System (GHS) for the classification, labeling, and packaging (CLP) of substances and mixtures.

EU Reach Article 29 (Requirements for Safety Data Sheets) and Japan Ministry of Economy, Trade, and Industry (METI), Ministry of Health, Labor, and Welfare (MHLW) and Ministry of the Environment (MOE).

EU Regulation (EC) 1907/2006 REACH: Polymers are exempted from registration and evaluation. Therefore Nochar Products are exempted by regulation. Annex V exempts from registration additives used in our polymers as antioxidants, defoaming agents, stabilizers, etc.,
EU Directive 94/62/EC Hazardous Waste: Not regulated
EU Directive 94/62/EC as amended by 2004/12/EC (Packaging and packaging waste): Not regulated, The product meets the requirement for the total amount of cadmium, chromium, lead and mercury to be less than 100 parts per million.
EU Directive 2000/53/EC as amended in 2002 (End of life vehicle): Not regulated
EU Directive 2037/2000 Ozone Depleters (Class I or II) as defined in Montreal Protocol: Not regulated
UNITED STATES: FEDURAL REGULATIONS
Toxic Substances Control Act (TSCA) Section 4,5(a)(2), (e),(f), 6,7 or 12(b): Not regulated
Clean Air Act Amendments Section 602 (Class I or II) Ozone Depleters: Not regulated
Clean Air Act Section 111 Volatile Organic Compounds (VOC): Not regulated
Clean Air Act 112 Hazardous Air Pollutants (HAP): Not regulated
Clean Water Act Section 307 Priority Pollutants: Not regulated
UNITED STATES: STATES REGULATIONS
Right-to-Know Laws (Massachusetts, New Jersey, New York State, Pennsylvania): Not regulated
Coalition of Northeastern Governors (CONEG): Not regulated. The product meets the requirement for the total amount of cadmium, chromium, lead and mercury to be less than 100 parts per million.

16. OTHER INFORMATION:

This information contained herein is based on the data available to us and is believed to be correct. However, the manufacturer makes no warranty, expressed or implied regarding the accuracy of this data or the results to be obtained from the use thereof, and assumes no responsibility for injury from the use of the product described herein. The manufacturer assumes no liability for incidental, consequential or direct damage of any manner or kind, regardless of cause, including negligence.

1. IDENTIFICATION OF THE SUBSTANCE/PREPERATION AND THE COMPANY

Product name **N965**

Company: Nochar, Inc.
8650 Commerce Park Place
Suite K
Indianapolis, IN 46268

Telephone: 317-613-3046
Telefax: 317-613-3052
E-mail: nochar@nochar.com

Emergency Information: 765-938-3333

Product Use: Solidification of Hazardous and non Hazardous Liquids

2. COMPOSITION/INFORMATION ON INGREDIENTS

Identification of the Preparation: Thermoplastic Elastomer, Co- Polymer of Acrylamide

3. HAZARDS IDENTIFICATION

Human Health Hazards: None
Environmental Hazards: None
Safety Hazards: Electrostatic charges ma be generated during handling. Risk of self-ignition of bulk product above certain temperatures (Refer to section 10) dust explosion could occur.

Special Notes: These components are synthetic rubber compounds, which are essentially nontoxic. Material is non-irritating. If polymer dusts are generated, they could scratch the eyes and cause minor irritation to the respiratory tract. Product swells in water

4. FIRST AID MEASURES

Inhalation: If dust is inhaled, obtain medical attention.
Skin Contact: Wash off immediately with soap and plenty of water. In case of persistent skin irritation, consult a physician.
Eye Contact: Rinse thoroughly with plenty of water, also under the eyelids. In case of persistent eye irritation consult a physician.
Ingestion: None. The product is not considered toxic based on studies on laboratory animals.
Advice to Physician: Treat symptoms.

5. FIRE-FIGHTING MEASURES

NFPA 704 Hazard Class:
Health 0, Flammability: 1 Instability: 0
Unsuitable Extinguishing Media: Water in spray may disperse fire.
Extinguishing Media: Foam, water spray or fog. Dry chemical powder, carbon dioxide, sand or earth may be used for small fires only.
Specific Hazards: Not flammable but will burn. Combustion products may include carbon monoxide and carbon dioxide.
Special Protective Equipment for Firefighters: Full protective clothing and self contained breathing apparatus.
Precautions: The product when wet renders surfaces extremely slippery. The product swells in water.

6. ACCIDENTAL RELEASE MEASURES

Personal Precautions: Avoid generating dust.

Environmental Precautions: None

Methods for Cleaning Up: Clean up promptly by scoop or vacuum, Keep in suitable, closed containers for disposal as required by local, state, federal, international or country specific regulations.

7. HANDLING AND STORAGE

Safe Handling Advice: Avoid generation of dust. Take precautionary measures against static discharges, earth/ground all equipment. Do not breathe dust. Use local exhaust over processing area. When processing N965 products, maintain a fire watch if the material reaches 225 deg, C (437deg. F)
Storage: Keep in a dry, cool place (0 - 35° C). Avoid storage under pressure or at elevated temperatures to minimize particulate clustering.
Storage Temperature. Ambient
Product Transfer: Take precautionary measures against static discharge. Earth/Ground all equipment.

8. EXPOSURE CONTROLS / PERSONAL PROTECTION

Engineering Measures: Use local exhaust ventilation.
Nuisance Dust TLV: TWA (8 h) 10 mg/m^3 if dust is generated.
Personal Protective Equipment:
Respiratory Protection: In case of insufficient ventilation wear suitable respiratory equipment.
Hand Protection: Cloth gloves are recommended.

Eye Protection: Safety glasses with side shields. Do not wear contact lenses where this product is used.
Skin and Body Protection: No special protective clothing required.
Hygiene Measures: Wash hands before breaks and at end of workday. Handle in accordance with good industrial hygiene and safety practice.

9. PHYSICAL AND CHEMICAL PROPERIES

Form: Granular solid

Color: White

Odor: Essentially odorless

Flash Point: None

Specific Gravity: ≤ 1 (.91)

Auto Ignition Temperature: Does not ignite.

Loose Density: Approximately 21 lbs per cu.ft.

Water Solubility: Insoluble

10. STABILITY AND REACTIVITY

Stability: Stable under ambient conditions.

Materials to Avoid: Oxidizing agents may cause exothermic reactions. Product swells with water.

Hazardous Decomposition Products: Thermal decomposition may produce hydrogen cyanide (hydrocyanic acid), nitrogen oxides (NOx), Carbon oxides (COx)

11. TOXICOLOGICAL INFORMATION

Acute Toxicity

Oral: Expected to be of low toxicity. LD50≥ 2000 mg/kg.
Dermal: Expected to be of low toxicity. LD50≥ 2000 mg/kg.
Inhalation: The product is not expected to be toxic by inhalation.

Irritation

Skin: Not expected to be irritating.
Eyes: Not expected to be irritating.

Sensitization: Not sensitizing
Repeated Dose Toxicity: Repeated exposure does not cause toxic effects.
Mutagenicity: No data available, but not expected. This product is not classified by the following: The International Agency for Research on Cancer (IARC), The National Toxicology Program (NTP) or The American Conference of Governmental Industrial Hygienists (ACGIH).

12. ECOLOGICAL INFORMATION

Mobility: Floats on water. Remains on surface of soil.
Persistence/Degradability: Not expected to be inherently biodegradable.
Aquatic Toxicity
Toxicity to Fish: Expected to be non toxic. LC/EC/IC 50 ≥ 1000 mg/l.
Toxicity to Invertebrates: Expected to be non toxic. LC/EC/IC 50 ≥ 1000 mg/l.
Toxicity to Algae: Expected to be non toxic. LC/EC/IC 50 ≥ 1000 mg/l.
Toxicity to Bacteria: Expected to be non toxic. LC/EC/IC 50 ≥ 1000 mg/l.
Sewage Treatment: Expected to be non toxic. LC/EC/IC 50 ≥ 1000 mg/l.

13. DISPOSAL CONSIDERATIONS

Waste from Residues / Unused Products: In accordance with Federal, State, local and national regulations.

Contaminated Packaging: Can be land filled or incinerated, when in compliance with local regulations

14. TRANSPORT INFORMATION

.Not classified as dangerous in the meaning of transport regulations. **DOT, IMDG/IMO, ICAO/IATA. UN, IMO, ADR/RID, ICAO CODE**

Harmonized Tariff System (HTS): 4002.19

Export Administration Regulations: Does not require a license EAR 99

15 REGULATORY INFORMATION

This product is not classified as dangerous and need not to be labeled according to EC-DIRECTIVES as amended.

International Inventories:

European Union (EINECS/ELINCS); Existing polymer according to the definition in the 7th Amendment to Directive 67/548/EEC/ All starting materials and additives are listed in EINECS.

USA (TSCA): Complies with all applicable rules and orders under TSCA.

16. OTHER INFORMATION:

Further Information.

This MSDS was prepared in accordance with the following:

Council Directive 92/32/EEC of 30 April 1992 amending for the seventh time Directive 67/548/EEC on the approximation of the laws, regulations and administrative provisions relating to the classification, packaging and labeling of dangerous substances and all subsequent adaptations to technical progress.

Directive 1999/45/EC of the European Parliament and of the Council of 31 May 1999 concerning the approximation of the laws, regulations and administrative provisions of the Member States relating to the classification, packaging and labeling of dangerous preparations.

Commission Directive 2001/58/EC of 27 July 2001 amending for the second time Directive 91/155/EEC defining and laying down the detailed arrangements for the system of specific information relating to dangerous preparations in implementation of Article 14 of European Parliament and Council Directive 1999/45/EC and relating to dangerous substances in implementation of Article 27 of Council Directive 67/548/EEC and relating to dangerous substances in implementation of Article 27 of Council Directive 67/548/EEC (Safety Data Sheets).

ISO 11014-1: Material Safety Data Sheet for Chemical Products.

This information contained herein is based on the data available to us and is believed to be correct. However, the manufacturer makes no warranty, expressed or implied regarding the accuracy of this data or the results to be obtained from the use thereof, and assumes no responsibility for injury from the use of the product described herein. The manufacturer assumes no liability for incidental, consequential or direct damage of any manner or kind, regardless of cause, including negligence.

Material Safety Data Sheet: **Simple Green® All-Purpose Cleaner and Simple Green® Scrubbing Pad**

Version No. 13005-12B Date of Issue: February 2012 *ANSI-Z400.1-2003 Format*

Section 1: PRODUCT & COMPANY IDENTIFICATION

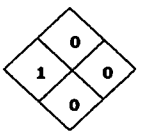
Product Name: Simple Green® All-Purpose Cleaner
Additional Names: Simple Green® Concentrated Cleaner Degreaser Deodorizer
Simple Green® Scrubbing Pad (Fluid in pad only)

Manufacturer's Part Number: **Please refer to page 4*

Company: Sunshine Makers, Inc.
15922 Pacific Coast Highway
Huntington Beach, CA 92649 USA
Telephone: 800-228-0709 • 562-795-6000 Fax: 562-592-3830
Emergency Phone: Chem-Tel 24-Hour Emergency Service: 800-255-3924

Section 2: HAZARDS IDENTIFICATION

Emergency Overview: **CAUTION. Irritant. This is a Green colored liquid with a sassafras added odor. Scrubbing pad is a green fibrous rectangle infused with Simple Green Cleaner.**



NFPA/HMIS Rating:
Health = 1 = slight
Fire, Reactivity, and Special = 0 = minimal

Potential Health Effects

Eye Contact: Mildly irritating.
Skin Contact: No adverse effects expected under typical use conditions. Prolonged exposure may cause dryness. Chemically sensitive individuals may experience mild irritation.
Ingestion: May cause stomach or intestinal irritation if swallowed.
Inhalation: No adverse effects expected under typical use conditions. Adequate ventilation should be present for prolonged usage in small enclosed areas.

Section 3: COMPOSITION/INFORMATION ON INGREDIENTS

Ingredient	CAS Number	Percent Range
Water	7732-18-5	≥ 78%
2-butoxyethanol	111-76-2	≤ 5%
Ethoxylated Alcohol	68439-46-3	≤ 5%
Tetrapotassium Pyrophosphate	7320-34-5	≤ 5%
Sodium Citrate	68-04-2	≤ 5%
Fragrance	Proprietary Mixture	≤ 1%
Colorant	Proprietary Mixture	≤ 1%

Section 4: FIRST AID MEASURES

If Inhaled: If adverse effect occurs, move to fresh air.
If on skin: If adverse effect occurs, rinse skin with water.
If in eyes: Flush with plenty of water. After 5 minutes of flushing, remove contact lenses, if present. Continue flushing for at least 10 more minutes. If irritation persists seek medical attention.
If ingested: Drink plenty of water to dilute.

Section 5: FIRE FIGHTING MEASURES

This formula is stable, non-flammable, and will not burn. No special procedures necessary

Flammability: Non-flammable
Flash Point: Non-flammable

Suitable Extinguishing Media: Use Dry chemical, CO2, water spray or "alcohol" foam.
Extinguishing Media to Avoid High volume jet water.
Special Exposure Hazards: In event of fire created carbon oxides, oxides of phosphorus may be formed.
Special Protective Equipment: Wear positive pressure self-contained breathing apparatus; Wear full protective clothing.

Section 6: ACCIDENTAL RELEASE MEASURES

Personal Precautions: See section 8 – personal protection.

Environmental Precautions: Do not allow into open waterways and ground water systems.

Method for Clean Up: Dilute with water and rinse into sanitary sewer system or soak up with inert absorbent material.

Section 7: HANDLING AND STORAGE

Handling: Keep container tightly closed. Ensure adequate ventilation. Keep out of reach of children.

Storage: Keep in cool dry area.

Section 8: EXPOSURE CONTROLS / PERSONAL PROTECTION

Exposure Limit Values:	OSHA PEL	ACGIH TLV
2-butoxyethanol	TWA 50 ppm (240 mg/m^3)	20 ppm (97 mg/m^3)
Tetrapotassium Pyrophosphate		5 mg/m^3

Exposure Controls:
Eye Contact: Use protective glasses if splashing or spray-back is likely.
Respiratory: Use in well ventilated areas.
Skin Contact: Prolonged exposure or dermal sensitive individuals should use protective gloves.

Section 9: PHYSICAL AND CHEMICAL PROPERTIES

Appearance:	Green Liquid	**Vapor Pressure:**	18 mmHg @20°C; 23.5 mmHg @26°C	
Odor:	Added Sassafras odor	**Density:**	8.5 lb/gal;	
Specific Gravity:	1.010 ± 0.010	**Water Solubility:**	100%	
pH:	9.5 ± 0.5	**VOC composite Partial Pressure:**		TBD
Boiling Point:	~210°F (98 °C)	**VOC:**	CARB Method 310	3.8%
Freezing Point:	~ 32°F (0 °C)		SCAQMD Method 313	2.8%
Nutrient Content:	Phosphorous: 0.28% Chloride: ~110 ppm	Sulfur: ~180 ppm Fluorine: ~90 ppm		

Section 10: STABILITY AND REACTIVITY

Stability:	Stable
Materials to Avoid:	None known
Hazardous Decomposition Products:	Normal products of combustion - CO, CO2; Oxides of Phosphorous may occur.

Section 11: TOXICOLOGICAL INFORMATION

Acute Toxicity: Oral LD_{50} (rat) > 5 g/kg body weight
Dermal LD_{50} (rabbit) > 5 g/kg body weight
Toxicity calculated from ingredients using OECD SERIES ON TESTING AND ASSESSMENT Number 33

Carcinogens: No ingredients are listed by OSHA, IARC, or NTP as known or suspected carcinogens.

Section 12: ECOLOGICAL INFORMATION

Hazard to wild mammals:	Low, based on toxicology profile
Hazard to avian species:	Low, based on toxicology profile
Hazard to aquatic organisms:	Low, based on toxicology profile
Chemical Fate Information:	Readily Biodegradable per OECD 301D, Closed Bottle Test

Section 13: DISPOSAL CONSIDERATIONS

Appropriate Method for Disposal:

Unused Product:	*Dilute with water to use concentration and dispose by sanitary sewer.
Used Product:	*This product can enter into clarifiers and oil/water separators. Used product may be hazardous depending on the cleaning application and resulting contaminants.
Empty Containers:	*Triple-rinse with water and offer for recycling if available in your area. Otherwise, dispose as non-hazardous waste.

*Dispose of used or unused product, and empty containers in accordance with the local, State, Provincial, and Federal regulations for your location. Never dispose of used degreasing rinsates into lakes, streams, and open bodies of water or storm drains.

Section 14: TRANSPORT INFORMATION

U.S. Department of Transportation (DOT) / Canadian TDG: Not Regulated
IMO / IDMG: Not classified as Dangerous
ICAO/ IATA: Not classified as Dangerous
ADR/RID: Not classified as Dangerous

U.N. Number	Not Required	Proper Shipping Name:	Detergent Solution
Hazard Class:	Non-Hazardous	Marine Pollutant:	No

Section 15: REGULATORY INFORMATION

All components are listed on: EINECS, TSCA, DSL and AICS Inventory.
No components listed under: Clean Air Act Section 112; Clean Water Act 307 & 311

SARA Title III: 2-butoxyethanol is subject to the reporting requirements of Section 313 of Title III of the Superfund Amendments and Reauthorization Act of 1986 as Category N230 – Certain Glycol Ethers.

RCRA Status: Not a hazardous waste CERCLA Status: No components listed

State Right To Know Lists

2-butoxyethanol Illinois, Massachusetts, New Jersey, Pennsylvania, Rhode Island

WHMIS Classification – Category D, subcategory 2B, eye irritant

Name	Toxic Substances List – Schedule 1 – CEPA (Canadian Environmental Protection Act)	NPRI Inventory
2-butoxyethanol	Yes	No

This product has been classified according to the hazard criteria of the CPR and the MSDS contains all the information required by Canada's Controlled Products Regulation.

Section 16: OTHER INFORMATION

Questions about the information found on this MSDS should be directed to:
SUNSHINE MAKERS, INC. – TECHNICAL DEPARTMENT
15922 Pacific Coast Hwy. Huntington Beach, CA 92649
Phone: 800/228-0709 [8am-5pm Pacific time, Mon-Fri] *Fax:* 562/592-3830 *Email:* infoweb@simplegreen.com

CAGE CODE 1Z575
GSA/FSS - CONTRACT NO. GS-07F-0065J
Scrubbing Pad GSA/BPA - CONTRACT NO. GS-07F-BSIMP
National Stock Numbers & Industrial Part Numbers:

	Part Number	NSN	Size
Simple Green	13012	7930-01-342-5315	24 oz spray (12/case)
	13005	7930-01-306-8369	1 Gallon (6/case)
	13006	7930-01-342-5316	5 Gallon
	13016	7930-01-342-5317	15 Gallon
	13008	7930-01-342-4145	55 Gallon
	13103	N/A	2oz samples
	13225	N/A	2.5 Gallon
	13275	N/A	275 Gallon tote
	48049	N/A	1 Gallon Conc. w/ 32oz dilution
Scrubbing Pad	10224	7930-01-346-9148	Each (24/case)

Retail Numbers:

Part Number	Size
13002	16 oz Trigger (12/case)
13005	1 Gallon (6/case)
13013	24 oz Trigger (12/case)
13014	67 oz / 2 L (6/case)
13033	32 oz Trigger (12/case)
80007	Tier display holding 13005 (36/Tier)

part number is for both industrial and retail
****International Part Numbers May Differ.**

DISCLAIMER: The information provided with this MSDS is furnished in good faith and without warranty of any kind. Personnel handling this material must make independent determinations of the suitability and completeness of information from all sources to assure proper use and disposal of this material and the safety and health of employees and customers. Sunshine Makers, Inc. assumes no additional liability or responsibility resulting from the use of, or reliance on this information.

MATERIAL SAFETY DATA SHEET

EAGLE – PICHER MINERALS, INC.

DATE ISSUED: November 18, 1985	DATE REVISED: July 1, 2001	REVISION NO: 8

SECTION I: MATERIAL IDENTIFICATION AND USE

MATERIAL NAME: Solid-A-Sorb I and Solid-A-Sorb ii

MANUFACTURER'S NAME: Eagle-Picher Minerals, Inc.

STREET ADDRESS: 9785 Gateway Drive, Suite 1000

CITY: Reno STATE: Nevada ZIP: 89511

EMERGENCY TELEPHONE NO: (775) 824-7600 CHEMICAL FORMULA: SiO2

CHEMICAL NAME: Diatomaceous Earth, Calcined TRADE NAME: Solid-A-Sorb

CHEMICAL FAMILY: Silica MATERIAL USE: Industrial Absorbent

NFPA: 0 / 1 / 0 / -

4-Extreme
3-High
2-Moderate
1-Slight
0-Insignificant

HMIS

*	Health
0	Flammability
0	Reactivity
E	Protective Equipment

* REFER TO DATA ON MSDS

SECTION II: HAZARDOUS INGREDIENTS OF MATERIAL

INGREDIENT IDENTIFICATION	APPROXIMATE CONCENTRATION %	C.A.S. NUMBERS	OSHA PEL [ACGIH TLV]	LD50/ /LC 50 SPECIES AND ROUTE
Diatomaceous Earth, Calcined	100%	91053-39-3	See below	Not available
Crystalline Silica (Cristobalite)	< 1%	14464-46-1	0.05 mg/m3 [0.05 mg/m3]	Not available
Crystalline Silica (Quartz)	< 1%	14808-60-7	0.10 mg/m3 [0.10 mg/m3]	Not available

For sampling silica dusts refer to NIOSH Analytical Method 7500 or OSHA method ID 142

SECTION III: PHYSICAL DATA FOR MATERIAL

PHYSICAL STATE:	ODOR AND APPEARANCE:		SPECIFIC GRAVITY:	BOILING POINT:
Solid	Odorless, granular product, buff to off-white		2.2	Not Applicable
VAPOR PRESSURE (MM):	VAPOR DENSITY:	pH:	SOLUBILITY/WATER:	FREEZING POINT:
Not Applicable	Not applicable	7 (10% Slurry)	< 2%	Not Applicable

SECTION IV – FIRE AND EXPLOSION HAZARD OF MATERIAL

FLAMMABILITY: YES NO X IF YES, UNDER WHICH CONDITIONS

MEANS OF EXTINCTION: Not Applicable

SPECIAL PROCEDURES: Not Applicable

SECTION V – HEALTH HAZARDS

SUMMARY: Calcined diatomaceous earth (Kieselguhr) contains crystalline silica which is a known cause of silicosis, a progressive, sometimes fatal lung disease. In a 1997 monograph (Volume 68, "Silica, Some Silicates, Coal Dust and Para-Aramid Fibrils"), the International Agency of Research on Cancer (IARC) has classified "inhaled crystalline silica from occupational sources" in Group 1 as a substance "carcinogenic to humans." In making the overall evaluation, the IARC Working Group noted that carcinogenicity in humans was not detected in all industrial circumstances studied. Although the recent IARC determination was, in part, based on a 1992 study of diatomite workers, a 1996 follow up which was issued by the University of Washington and Tulane University was not available to the Working Group. The follow up study reported a Standardized Mortality Ration (SMR) of 2.01 for non-malignant respiratory disease (NMRD) and a SMR of 1.29 for lung cancer when compared to national and regional populations. This is a reduction of the levels reported in the 1992 report (SMR=2.59 for NMRD and SMR=1.43 for lung cancer.)

As noted in the 1992 study, relatively intense exposures to crystalline silica that occurred before the 1950s were probably the most important contributors in the excesses in NMRD and lung cancer. The 1996 report continues to support the conclusion that recent improvements in dust control in the industry appear to have abated any excess risk in silicosis or lung cancer in today's work environment. In 1997 a radiographic study was published by Tulane University researchers that reported X-ray opacities of the post-1950 hires that were "...consistent with the prevalences observed in many unexposed populations." These findings appear to be consistent with, and supportive, of current occupational exposure limits for cristobalite. A more detailed report discussing the IARC classification and the diatomite worker studies is available upon request.

MEDICAL CONDITIONS AGGRAVATED BY EXPOSURE

Pre-existing diseases of the upper respiratory tract and lung such as bronchitis, emphysema, and asthma

IMPORTANT HEALTH HAZARD DATA CONTINUES ON THE SECOND PAGE (BACK)

PAGE 2	MATERIAL NAME / IDENTIFIER: Solid-A-Sorb I and Solid-A-Sorb II

SECTION V – HEALTH HAZARDS CONT'D

ROUTE OF ENTRY: Inhalation (Chronic)	TARGET ORGANS: Lungs

EFFECTS OF ACUTE EXPOSURE TO PRODUCT: Upper respiratory irritant – May cause coughing or throat irritation.

EFFECTS OF CHRONIC EXPOSURE TO PRODUCT:

Inhalation of crystalline silica dust in excess of the Threshold Limit Value (TLV) recommended by the American Conference of Governmental Industrial Hygienists (ACGIH) or in excess of the Permissible Exposure Limit (PEL) established by OSHA over an extended number of years may cause silicosis, a progressive sometimes fatal lung disease. Although silicosis is a non-cancerous lung disease, a 1992 study conducted by the University of Washington on certain diatomite workers, and a 1996 follow-up to this study indicates that exposure to high concentrations of crystalline silica for many years may increase the potential risk of developing lung cancer. The 1996 follow-up study continues to support the findings of the 1992 study in that for those workers hired since 1960, no increase in lung cancer mortality risk was found. Consequently, maintenance of crystalline silica dust concentrations at or below levels specified by occupational standards setting agencies will minimize, if not eliminate, any potential excess risk of NMRD or lung cancer.

IARC - "Inhaled crystalline silica from occupational sources" – Group 1 – Carcinogenic to humans
NTP - "Silica, crystalline (respirable)" – "known to be a human carcinogen"
OSHA - Has not classified crystalline silica as a carcinogen

SECTION VI – REACTIVITY DATA

CHEMICAL STABILITY: YES X NO	INCOMPATIBILITY TO OTHER SUBSTANCES YES X NO IF YES, WHICH ONES? Hydrofluoric Acid, Hydrogenated vegetable oils Products containing Silica may react violently with Hydrofluoric Acid
REACTIVITY AND UNDER WHAT CONDITIONS: Not Applicable	HAZARDOUS DECOMPOSITION PRODUCTS: Not Applicable

SECTION VII – PRECAUTIONS FOR SAFE HANDLING AND USE

PERSONAL PROTECTIVE EQUIPMENT:

Respirators fitted with filters certified to standard 42CFR84 under series N95 should be worn when dust is present. If the dust concentration is less than ten (10) times the Permissible Exposure Limit (PEL) use a quarter or half-mask respirator with a N95 dust filter or a single use dust mask rated N95. If dust concentration is greater than ten (10) times and less than fifty (50) times the PEL, a full-face piece respirator fitted with replaceable N95 filters is recommended. If dust concentration is greater than fifty (50) and less than two hundred (200) times the PEL use a power air-purifying (positive pressure) respirator with a replaceable N95 filter. If dust concentration is greater than two hundred (200) times the PEL use a type C, supplied air respirator (continuous flow, positive pressure), with full face piece, hood or helmet.

GLOVES: Not normally necessary	RESPIRATORY: Note Above	EYE: Goggles to protect from dust
FOOTWEAR: Not necessary	CLOTHING: Not normally necessary	

ENGINEERING CONTROLS (E.G. VENTILATION, ENCLOSED PROCESS): Local – Control within recommended TLV/PEL. Refer to ACGIH publication "Industrial Ventilation" or similar publications for design of ventilation systems.

LEAK AND SPILL PROCEDURE: Vacuum clean spillage, wet sweep or wash away. Avoid creating dust.

WASTE DISPOSAL: Non-Biodegradable. Use solid waste disposal common to landfill type operations or in slurry to sumps. Not considered a hazardous waste under RCRA (40CFR Part 261).

HANDLING PROCEDURES: Avoid creating dust. Repair or properly dispose of broken bags.

STORAGE REQUIREMENTS: Store in a dry place to maintain product quality.

SPECIAL SHIPPING INSTRUCTIONS: None

SECTION VIII – FIRST AID MEASURES

SKIN: Not absorbed by the skin. May cause dryness. Use moisture renewing lotions if dryness occurs.

EYE: May cause irritation or inflammation. Wash with generous quantities of water. Consult physician if irritation persists.

INHALATION: Acute inhalation can cause dryness of the nasal passages and congestion of the upper respiratory tract. Remove to fresh air.

INGESTION: Short-term exposure not considered harmful. Drink generous amounts of water to reduce bulk and drying effects.

SECTION IX – PREPARATION DATE OF M.S.D.S.

PREPARED BY: Patrick T. Flynn, Jr.	TITLE: Director - Government Affairs
PHONE NUMBER: (775) 824-7650	DATE: July 1, 2001

The Procter & Gamble Company
P&G Household Care
Fabric & Home Care Innovation Center
5299 Spring Grove Avenue
Cincinnati, OH 45217-1087

MATERIAL SAFETY DATA SHEET

MSDS #: RQ0814307 Issue Date: 09/2011
Supersedes: RQ0810303 Issue Date: 07/2008

SECTION I - PRODUCT IDENTIFICATION

Identity: Liquid Floor Cleaner on Pre-moistened Cloth Finished Product
Brands: Swiffer Wet (Open Window, Citrus & Light, Lavender Vanilla & Comfort)

P&G Telephone Number: 1-800-214-8734or call Local Poison Control Center or your physician.
Emergency (24 hour) Telephone Number: CHEMTREC 1-800-424-9300 U.S. and Canada, or 1-703-527-3887 - for calls originating elsewhere.

SECTION II - HAZARDS IDENTIFICATION

Potential Health Hazards (Acute and Chronic): (See Section 11 for more information)
Ingestion: This product is expected to have a low order of toxicity. Oral ingestion may result in gastrointestinal irritation with transient nausea, vomiting or diarrhea.
Eye Contact: This product may be slightly irritating to eyes. Exposure to eyes may cause transient superficial effects similar to those produced by mild soap.
Skin Contact: This product may be slightly irritating to skin. Use on irritated or extremely dry skin may aggravate the existing condition.
Inhalation: This product is expected to have a low order of toxicity.
Signs and Symptoms of Exposure:
Ingestion: Ingestion of moistened sheet by a young child or household pet may lead to impaction of the gastrointestinal tract. A physician or veterinarian should be consulted.
Eye Contact: No irritation expected.
Skin Contact: No irritation expected.
Inhalation: N/A
Medical Conditions Generally Known to be Aggravated by Exposure: N/A
Potential Environmental Effects: (See Section 12 for more information)

SECTION III - COMPOSITION AND INGREDIENTS

Hazardous Ingredients as defined by OSHA, 29 CFR 1910.1200. and/or WHMIS under the HPA:

Chemical Name	Common Name	CAS No.	Composition Range	LD50/LC50
None				

SECTION IV – FIRST AID INFORMATION

First Aid Procedures:

Ingestion: Dilute ingested product with fluids (water or milk). If gastric irritation or other signs of toxicity develop, consult a physician and treat symptomatically

Eye Contact: Hold eyelids open and flush thoroughly with water. If irritation persists, consult a physician.

Skin Contact: Rinse affected area thoroughly with water. Apply a cold compress to relieve the symptoms of irritation. If irritation persists, consult a physician.

Inhalation: Move to an open area away from the site of exposure. If respiratory irritation is present, consult a physician and treat symptomatically.

Note to Physician: (if applicable) Treat symptomatically

Other: Consumer product package has the following precautionary statement: AVOID ACCIDENTS: KEEP OUT OF REACH OF CHILDREN AND PETS TO AVOID ACCIDENTAL INGESTION. In case of eye contact or prolonged exposure to skin, flush with water to reduce irritation. If irritation persists, call a physician. Avoid exerting excessive pressure on mop pole as breakage may occur.

SECTION V - FIRE FIGHTING INFORMATION

Flash Point (Method Used): N/K

Flammable Properties:
Upper Flammable Limit: N/A
Lower Flammable Limit: N/A

Explosive Limits: **UEL:** N/A **LEL:** N/A

Auto-ignition Temperature: N/K

Hazardous Combustion Products: N/K

Explosion Data (Sensitivity to Mechanical Impact): N/A
Explosion Data (Sensitivity to Static Discharge): N/A

Extinguishing Media:
Suitable: CO_2, water, foam or dry chemical may be used.
Unsuitable: N/K

Protection of Firefighters:
Specific Hazards Arising from the Material: Hazardous gases/vapors produced in fire are: aldehydes, ethanol, methanol, acetic acid, acetone, paraffin, and carbon monoxide.
Protective Equipment and Precautions for Firefighters: No unusual precautions necessary. Normal firefighting gear.

SECTION VI - ACCIDENTAL RELEASE MEASURES

Personal Precautions: None
Environmental Precautions: DISPOSAL IS TO BE PERFORMED IN COMPLIANCE WITH ALL FEDERAL, STATE/PROVINCIAL AND LOCAL REGULATIONS. Non-biodegradable. The sheets and/or dusters are compatible with all available solid waste disposal technologies.
Methods for Containment: N/A
Methods for Cleanup: N/A
Other Information: (if applicable) Dry product may be landfilled if permitted by local regulations. Discard empty container in trash.

SECTION VII – HANDLING AND STORAGE

Precautions To Be Taken in Handling: Store in a cool and dry area.
Precautions To Be Taken in Storage: None known.

SECTION VIII - EXPOSURE CONTROLS / PERSONAL PROTECTION

Exposure Guidelines: No special precautions for normal household use.
Engineering Controls: None required.
Personal Protective Equipment (PPE): None required with normal consumer use
Eye/Face Protection: None required with normal consumer use
Skin Protection: None required with normal consumer use
Respiratory Protection: None required with normal consumer use

SECTION IX - PHYSICAL AND CHEMICAL PROPERTIES

Appearance (color, physical form, shape): White/bluish-white in color; pre-moistened cloth.

Flash Point (Method Used): N/A

Reserve Alkalinity: N/A

Odor Threshold: N/A

Solubility in Water: (20°C) Insoluble

Physical State: Solid

Decomposition Temperature: N/A

Vapor Pressure (mm Hg): N/A

Evaporation Rate (nBuOAc=1): N/A

Vapor Density (Air=1): N/A

Specific Gravity (H2O=1): N/A

Boiling Point: 100°C

Melting/Freezing Point: N/A

Partition Coefficient (n-octanol/water): N/A

pH (specify % solution): N/A

Volatile Organic Compound (VOC): Not Applicable – Product not regulated for VOC content at State or Federal level.

SECTION X - STABILITY AND REACTIVITY

Chemical Stability: Stable
Conditions to Avoid: Open flame
Incompatible Materials: None Known
Hazardous Decomposition Products: None known
Possibility of Hazardous Reactions: None known

SECTION XI - TOXICOLOGICAL INFORMATION

Chronic Effects: Swiffer Wet Cloths are non-toxic
Target Organs: No target organs reported.
Carcinogenicity: This finished consumer product is not carcinogenic.
NTP: No
IARC: No
OSHA: No

SECTION XII - ECOLOGICAL INFORMATION

Containers as well as used and unused sheets are compatible with municipal solid waste system and they will not pose a hazard to the environment when the waste is properly handled.

SECTION XIII - DISPOSAL CONSIDERATIONS

Waste Disposal Method: DISPOSAL IS TO BE PERFORMED IN COMPLIANCE WITH FEDERAL, STATE/PROVINCIAL AND LOCAL REGULATIONS.

Non-Household Setting (US Federal): Products covered by this MSDS, in their original form, when disposed as waste, are considered non hazardous waste according to Federal RCRA regulations (40 CFR 261). Disposal should be in accordance with local, state and federal regulations.

Household Use: The sheets and dusters are compatible with all available solid waste technologies. Consumers may dispose with normal household waste.

SECTION XIV - TRANSPORT INFORMATION

Ground Transport (US DOT): Not regulated

Air Transport (IATA): Not regulated

Marine/Water Transport (IMDG): Not regulated

SECTION XV - REGULATORY INFORMATION

United States

All intentionally-added components of this product are listed on the US TSCA Inventory.
EPA Registration Number: Not Applicable

SARA 313/302/304/311/312 chemicals: None

California: This product Noen does not require warning labeling under California Proposition 65.
California Registration Number: None

State Right-to-Know and CERCLA:
The following ingredients present in the finished product are listed on state right-to-know lists or state worker exposure lists

Ingredient	CAS #	Level	CERCLA RQ	State IL	MA	NJ	PA	RI
None								

Canada

All ingredients are CEPA approved for import to Canada by Procter & Gamble. This product has been classified in accordance with the hazard criteria of the Canadian Controlled Products Regulations (CPR) and this MSDS contains all information required by the Controlled Products Regulations.

SECTION XVI - OTHER INFORMATION

Perfumes contained within the products covered by this MSDS comply with appropriate IFRA guidance.

P&G Hazard Rating:	Health:	1	4=EXTREME
	Flammability:	1	3=HIGH
	Reactivity:	0	2=MODERATE
			1=SLIGHT
			0=NOT SIGNIFICANT

*N/A. - Not Applicable *N/K. - Not Known

Data supplied is for use only in connection with occupational safety and health.

DISCLAIMER: This MSDS is intended to provide a brief summary of our knowledge and guidance regarding the use of this material. The information contained here has been compiled from sources considered by Procter & Gamble to be dependable and is accurate to the best of the Company's knowledge. It is not meant to be an all-inclusive document on worldwide hazard communication regulations.

This information is offered in good faith. Each user of this material needs to evaluate the conditions of use and design the appropriate protective mechanisms to prevent employee exposures, property damage or release to the environment. Procter & Gamble assumed no responsibility for injury to the recipient or third persons, or for any damage to any property resulting from misuse of the product.

Material Safety Data Sheet

Section 1: PRODUCT AND COMPANY INFORMATION

Product Name(s): Lafarge Blended Cement (cement)

Product Identifiers: MaxCem®, SF™ Cement, Silica Fume Cement, TerraCem™, Tercem 3000™, Terraflow Cement, PozzMod Plus™, , FortiPave®, FortiMax™, LowDense™ Lightweight Well Cement, Type IS, IP, IT, GUb, HEb, MSb, HSb, MHb, LHb, GULb, MSLb, MHLb, HELb, HSLb.

Manufacturer:
Lafarge North America Inc.
12018 Sunrise Valley Drive, Suite 500
Reston, VA 20191

Information Telephone Number:
703-480-3600 (9am to 5pm EST)
Emergency Telephone Number:
1-800-451-8346 (3E Hotline)

Product Use: Cement is used as a binder in concrete and mortars that are widely used in construction. Cement is distributed in bags, totes and bulk shipment.

Note: This MSDS covers many types of Cement. Individual composition of hazardous constituents will vary between types of Cement.

Section 2: COMPOSITION/INFORMATION ON INGREDIENTS

Component	Percent (By Weight)	CAS Number	OSHA PEL -TWA (mg/m^3)	ACGIH TLV-TWA (mg/m^3)	LD_{50} (mouse, intraperitoneal)	LC_{50}
Portland Cement*	5-95	65997-15-1	15 (T); 5 (R)	1 (R)	NA	NA
Calcium Carbonate* (Limestone)	0-20	1317-65-3	15 (T); 5 (R)	3 (R); 10 (T)	NA	NA
Calcium Sulfate* (Gypsum)	1-10	13397-24-5	15 (T); 5 (R)	10 (T)	NA	NA
Silica Fume (Amorphous Silica)	0-10	69012-64-2	NA	3 (R); 10 (T)	NA	NA
Crystalline Silica	0-10	14808-60-7	[(10) / (%SiO_2+2)] (R); [(30) / (%SiO_2+2)] (T)	0.025 (R)	NA	NA
Portland Cement Kiln Dust	0-10	68475-76-3	NA	NA	NA	NA
Fly Ash	0-40	68131-74-8	NA	NA	NA	NA
Slag	0-95	65996-69-2	NA	NA	NA	NA
Metakaolin	0-20	1332-58-7	NA	NA	NA	NA

Note: Exposure limits for components noted with an * contain no asbestos and <1% crystalline silica

Cement is made from materials mined from the earth and is processed using energy provided by fuels. Trace amounts of chemicals may be detected during chemical analysis. For example, cement may contain trace amounts of titanium oxide, potassium and sodium sulfate compounds, chromium compounds, nickel compounds, arsenic compounds and other trace compounds.

Section 3: HAZARD IDENTIFICATION

WARNING

Corrosive - Causes severe burns.
Toxic - Harmful by inhalation.
(Contains crystalline silica)

Use proper engineering controls, work practices, and personal protective equipment to prevent exposure to wet or dry product.

Read MSDS for details.

Respiratory Protection

Eye Protection

Waterproof Gloves

Waterproof Boots

Section 3: HAZARD IDENTIFICATION (continued)

Emergency Overview: Cement is a solid, grey, odorless powder. It is not combustible or explosive. A single, short-term exposure to the dry powder presents little or no hazard. Exposure of sufficient duration to wet cement, or to dry cement on moist areas of the body, can cause serious, potentially irreversible tissue (skin, eye, respiratory tract) damage due to chemical (caustic) burns, including third degree burns.

Potential Health Effects:

Eye Contact: Airborne dust may cause immediate or delayed irritation or inflammation. Eye contact with large amounts of dry powder or with wet cement can cause moderate eye irritation, chemical burns and blindness. Eye exposures require immediate first aid and medical attention to prevent significant damage to the eye.

Skin Contact: Cement may cause dry skin, discomfort, irritation, severe burns, and dermatitis.

Burns: Exposure of sufficient duration to wet cement, or to dry cement on moist areas of the body, can cause serious, potentially irreversible damage to skin, eye, respiratory and digestive tracts due to chemical (caustic) burns, including third degree burns. A skin exposure may be hazardous even if there is no pain or discomfort.

Dermatitis: Cement is capable of causing dermatitis by irritation and allergy. Skin affected by dermatitis may include symptoms such as, redness, itching, rash, scaling, and cracking.

Irritant dermatitis is caused by the physical properties of cement including alkalinity and abrasion.

Allergic contact dermatitis is caused by sensitization to hexavalent chromium (chromate) present in cement. The reaction can range from a mild rash to severe skin ulcers. Persons already sensitized may react to the first contact with cement. Others may develop allergic dermatitis after years of repeated contact with cement.

Inhalation (acute): Breathing dust may cause nose, throat or lung irritation, including choking, depending on the degree of exposure. Inhalation of high levels of dust can cause chemical burns to the nose, throat and lungs.

Inhalation (chronic): Risk of injury depends on duration and level of exposure.

Silicosis: This product contains crystalline silica. Prolonged or repeated inhalation of respirable crystalline silica from this product can cause silicosis, a seriously disabling and fatal lung disease. See Note to Physicians in Section 4 for further information.

Carcinogenicity: Cement is not listed as a carcinogen by IARC or NTP; however, cement contains trace amounts of crystalline silica and hexavalent chromium which are classified by IARC and NTP as known human carcinogens.

Autoimmune Disease: Some studies show that exposure to respirable crystalline silica (without silicosis) or that the disease silicosis may be associated with the increased incidence of several autoimmune disorders such as scleroderma (thickening of the skin), systemic lupus erythematosus, rheumatoid arthritis and diseases affecting the kidneys.

Tuberculosis: Silicosis increases the risk of tuberculosis.

Renal Disease: Some studies show an increased incidence of chronic kidney disease and end-stage renal disease in workers exposed to respirable crystalline silica.

Section 3: HAZARD IDENTIFICATION (continued)

Ingestion: Do not ingest cement. Although ingestion of small quantities of cement is not known to be harmful, large quantities can cause chemical burns in the mouth, throat, stomach, and digestive tract.

Medical Conditions Aggravated by Exposure: Individuals with lung disease (e.g. bronchitis, emphysema, COPD, pulmonary disease) or sensitivity to hexavalent chromium can be aggravated by exposure.

Section 4: FIRST AID MEASURES

Eye Contact: Rinse eyes thoroughly with water for at least 15 minutes, including under lids, to remove all particles. Seek medical attention for abrasions and burns.

Skin Contact: Wash with cool water and a pH neutral soap or a mild skin detergent. Seek medical attention for rash, burns, irritation, dermatitis, and prolonged unprotected exposures to wet cement, cement mixtures or liquids from wet cement.

Inhalation: Move person to fresh air. Seek medical attention for discomfort or if coughing or other symptoms do not subside.

Ingestion: Do not induce vomiting. If conscious, have person drink plenty of water. Seek medical attention or contact poison control center immediately.

Note to Physician: The three types of silicosis include:

- Simple chronic silicosis – which results from long-term exposure (more than 20 years) to low amounts of respirable crystalline silica. Nodules of chronic inflammation and scarring provoked by the respirable crystalline silica form in the lungs and chest lymph nodes. This disease may feature breathlessness and may resemble chronic obstructive pulmonary disease (COPD).
- Accelerated silicosis – occurs after exposure to larger amounts of respirable crystalline silica over a shorter period of time (5-15 years). Inflammation, scarring, and symptoms progress faster in accelerated silicosis than in simple silicosis.
- Acute silicosis – results from short-term exposure to very large amounts of respirable crystalline silica. The lungs become very inflamed and may fill with fluid, causing severe shortness of breath and low blood oxygen levels.

Progressive massive fibrosis may occur in simple or accelerated silicosis, but is more common in the accelerated form. Progressive massive fibrosis results from severe scarring and leads to the destruction of normal lung structures.

Section 5: FIREFIGHTING MEASURES

Flashpoint & Method: Non-combustible

General Hazard: Avoid breathing dust. Wet cement is caustic.

Extinguishing Media: Use extinguishing media appropriate for surrounding fire.

Firefighting Equipment: Cement poses no fire-related hazard. A SCBA is recommended to limit exposures to combustion products when fighting any fire.

Combustion Products: None.

Section 6: ACCIDENTAL RELEASE MEASURES

General: Place spilled material into a container. Avoid actions that cause the cement to become airborne. Avoid inhalation of cement and contact with skin. Wear appropriate protective equipment as described in Section 8. Scrape wet cement and place in container. Allow material to dry or solidify before disposal. Do not wash cement down sewage and drainage systems or into bodies of water (e.g. streams).

Waste Disposal Method: Dispose of cement according to Federal, State, Provincial and Local regulations.

Section 7: HANDLING AND STORAGE

General: Keep bulk and bagged cement dry until used. When slag or slag containing materials are kept wet for long periods of time, the leachate may be discolored and have a sulfurous odor. When this liquid is exposed to oxygen, elemental sulfur may precipitate out leaving a solution of calcium thiosulfate.

Stack bagged material in a secure manner to prevent falling. Bagged cement is heavy and poses risks such as sprains and strains to the back, arms, shoulders and legs during lifting and mixing. Handle with care and use appropriate control measures.

Engulfment hazard. To prevent burial or suffocation, do not enter a confined space, such as a silo, bin, bulk truck, or other storage container or vessel that stores or contains cement. Cement can buildup or adhere to the walls of a confined space. The cement can release, collapse or fall unexpectedly.

Properly ground all pneumatic conveyance systems. The potential exists for static build-up and static discharge when moving cement powders through a plastic, non-conductive, or non-grounded pneumatic conveyance system. The static discharge may result in damage to equipment and injury to workers.

Usage: Cutting, crushing or grinding hardened cement, concrete or other crystalline silica-bearing materials will release respirable crystalline silica. Use all appropriate measures of dust control or suppression, and Personal Protective Equipment (PPE) described in Section 8 below.

Housekeeping: Avoid actions that cause the cement to become airborne during clean-up such as dry sweeping or using compressed air. Use HEPA vacuum or thoroughly wet with water to clean-up dust. Use PPE described in Section 8 below.

Storage Temperature: Unlimited. **Storage Pressure:** Unlimited.

Clothing: Promptly remove and launder clothing that is dusty or wet with cement. Thoroughly wash skin after exposure to dust or wet cement.

Section 8: EXPOSURE CONTROLS AND PERSONAL PROTECTION

Engineering Controls: Use local exhaust or general dilution ventilation or other suppression methods to maintain dust levels below exposure limits.

Personal Protective Equipment (PPE):

Respiratory Protection: Under ordinary conditions no respiratory protection is required. Wear a NIOSH approved respirator that is properly fitted and is in good condition when exposed to dust above exposure limits.

Eye Protection: Wear ANSI approved glasses or safety goggles when handling dust or wet cement to prevent contact with eyes. Wearing contact lenses when using cement, under dusty conditions, is not recommended.

Section 8: EXPOSURE CONTROLS AND PERSONAL PROTECTION (continued)

Skin Protection: Wear gloves, boot covers and protective clothing impervious to water to prevent skin contact. Do not rely on barrier creams, in place of impervious gloves. Remove clothing and protective equipment that becomes saturated with wet cement and immediately wash exposed areas.

Section 9: PHYSICAL AND CHEMICAL PROPERTIES

Physical State:	Solid (powder).	**Evaporation Rate:**	NA.
Appearance:	Gray or white powder.	**pH (in water):**	12 – 13
Odor:	None.	**Boiling Point:**	>1000° C
Vapor Pressure:	NA.	**Freezing Point:**	None, solid.
Vapor Density:	NA.	**Viscosity:**	None, solid.
Specific Gravity:	3-3.2	**Solubility in Water:**	Slightly (0.1 - 1.0%)

Section 10: STABILITY AND REACTIVITY

Stability: Stable. Keep dry until use. Avoid contact with incompatible materials.

Incompatibility: Wet cement is alkaline and is incompatible with acids, ammonium salts and aluminum metal. Cement dissolves in hydrofluoric acid, producing corrosive silicon tetrafluoride gas. Cement reacts with water to form silicates and calcium hydroxide. Silicates react with powerful oxidizers such as fluorine, boron trifluoride, chlorine trifluoride, manganese trifluoride, and oxygen difluoride.

Hazardous Polymerization: None. **Hazardous Decomposition:** None.

Section 11 and 12: TOXICOLOGICAL AND ECOLOGICAL INFORMATION

For questions regarding toxicological and ecological information refer to contact information in Section 1.

Section 13: DISPOSAL CONSIDERATIONS

Dispose of waste and containers in compliance with applicable Federal, State, Provincial and Local regulations.

Section 14: TRANSPORT INFORMATION

This product is not classified as a Hazardous Material under U.S. DOT or Canadian TDG regulations.

Section 15: REGULATORY INFORMATION

OSHA/MSHA Hazard Communication: This product is considered by OSHA/MSHA to be a hazardous chemical and should be included in the employer's hazard communication program.

CERCLA/SUPERFUND: This product is not listed as a CERCLA hazardous substance.

EPCRA SARA Title III: This product has been reviewed according to the EPA Hazard Categories promulgated under Sections 311 and 312 of the Superfund Amendment and Reauthorization Act of 1986 and is considered a hazardous chemical and a delayed health hazard.

EPRCA SARA Section 313: This product contains none of the substances subject to the reporting requirements of Section 313 of Title III of the Superfund Amendments and Reauthorization Act of 1986 and 40 CFR Part 372.

Section 15: REGULATORY INFORMATION (continued)

RCRA: If discarded in its purchased form, this product would not be a hazardous waste either by listing or characteristic. However, under RCRA, it is the responsibility of the product user to determine at the time of disposal, whether a material containing the product or derived from the product should be classified as a hazardous waste.

TSCA: Blended cement and crystalline silica are exempt from reporting under the inventory update rule.

California Proposition 65: Crystalline silica (airborne particulates of respirable size) and Chromium (hexavalent compounds) are substances known by the State of California to cause cancer.

WHMIS/DSL: Products containing crystalline silica and calcium carbonate are classified as D2A, E and are subject to WHMIS requirements.

Section 16: OTHER INFORMATION

Abbreviations:

>	Greater than	NA	Not Applicable
ACGIH	American Conference of Governmental Industrial Hygienists	NFPA	National Fire Protection Association
CAS No	Chemical Abstract Service number	NIOSH	National Institute for Occupational Safety and Health
CERCLA	Comprehensive Environmental Response, Compensation and Liability Act	NTP	National Toxicology Program
		OSHA	Occupational Safety and Health Administration
CFR	Code for Federal Regulations	PEL	Permissible Exposure Limit
CL	Ceiling Limit	pH	Negative log of hydrogen ion
DOT	U.S. Department of Transportation	PPE	Personal Protective Equipment
EST	Eastern Standard Time	R	Respirable Particulate
HEPA	High-Efficiency Particulate Air	RCRA	Resource Conservation and Recovery Act
HMIS	Hazardous Materials Identification System	SARA	Superfund Amendments and Reauthorization Act
IARC	International Agency for Research on Cancer	T	Total Particulate
		TDG	Transportation of Dangerous Goods
LC_{50}	Lethal Concentration	TLV	Threshold Limit Value
LD_{50}	Lethal Dose	TWA	Time Weighted Average (8 hour)
mg/m^3	Milligrams per cubic meter	WHMIS	Workplace Hazardous Materials Information System
MSHA	Mine Safety and Health Administration		

This MSDS (Sections 1-16) was revised on August 1, 2011.

An electronic version of this MSDS is available at: www.lafarge-na.com under the Sustainability section.

Lafarge North America Inc. (LNA) believes the information contained herein is accurate; however, LNA makes no guarantees with respect to such accuracy and assumes no liability in connection with the use of the information contained herein which is not intended to be and should not be construed as legal advice or as insuring compliance with any federal, state or local laws or regulations. Any party using this product should review all such laws, rules, or regulations prior to use, including but not limited to US and Canada Federal, Provincial and State regulations.

NO WARRANTY IS MADE, EXPRESS OR IMPLIED, OF MERCHANTABILITY, FITNESS FOR A PARTICULAR PURPOSE, OR OTHERWISE.

Material Safety Data Sheet

BASF
The Chemical Company

GLENIUM 7700

Version 1.2 04/23/2007

1. PRODUCT AND COMPANY INFORMATION

Company	:	**BASF Construction Chemicals. LLC** BASF Admixtures, Inc. 23700 Chagrin Blvd BEACHWOOD, OH 44122
Telephone	:	216-839-7500
Emergency telephone number	:	BASF ER HOTLINE: 800-832-4357 CHEMTREC: 800-424-9300 CHEMTREC (Outside Continental US): 703-527-3887
Product name	:	GLENIUM 7700
MSDS ID No.	:	11896
TSCA Inventory	:	All components of this product are included, or are exempt from inclusion, in the EPA Toxic Substances Control Act (TSCA) Chemical Substance Inventory.
Canadian DSL	:	This product contains material not included on the Canadian Domestic Substance List (DSL).
Product Use Description	:	Admixture

2. HAZARDOUS INGREDIENTS

Does not contain hazardous chemicals as defined by 29 CFR 1910.1200 and WHMIS.

3. HAZARDS IDENTIFICATION

HMIS® Rating	HEALTH	FLAMMABILITY	PHYSICAL HAZARD
	1	1	0

WHMIS Class	:	D2B
Primary Routes of Entry	:	Eye contact Skin contact

Effects of Overexposure

Inhalation	:	Can cause slight irritation.
Skin	:	Can cause slight irritation.
Eyes	:	Can cause slight irritation.
Ingestion	:	Can cause slight irritation.
Chronic exposure	:	No known information available.

4. FIRST AID MEASURES

Eye contact	:	Flush eyes with water, lifting upper and lower lids occasionally for 15 minutes. Seek medical attention.
Skin contact	:	Remove contaminated clothing. Wash thoroughly with soap and water. If irritation persists seek medical attention. Wash contaminated clothing before reuse.
Ingestion	:	Do not induce vomiting without medical advice. If conscious, drink plenty of water. If a person feels unwell or symptoms of skin irritation appear, consult a physician. If a person vomits, place him/her in the recovery position. Never give anything by mouth to an unconscious person.
Inhalation	:	Remove victim from exposure. If difficulty with breathing, administer oxygen. If breathing has stopped administer artificial respiration, preferably mouth-to-mouth. Seek immediate medical attention.

5. FIRE-FIGHTING MEASURES

Flash point	:	Not combustible.
Autoignition temperature	:	not applicable
Lower explosion limit	:	not applicable
Upper explosion limit	:	not applicable
Suitable extinguishing media	:	Use extinguishing agent suitable for type of surrounding fire.
Fire and Explosion Hazards	:	Containers can build up pressure if exposed to heat (fire). Cool closed containers exposed to fire with water spray.
Special Fire-fighting Procedures	:	As in any fire, wear pressure demand self-contained breathing apparatus (NIOSH approved or equivalent) and full protective gear.

6. ACCIDENTAL RELEASE MEASURES

Methods for cleaning up	:	Wear appropriate protective equipment (refer to section 8). Take action to eliminate source of leak; prevent from entry into open streams or sewers; contain spill by diking; vacuum up liquid or use absorbent media; remove to storage for disposal and rinse residual stain with water.

7. HANDLING AND STORAGE

Handling	:	Keep out of reach of children. For personal protection see section 8.
Storage	:	Keep tightly closed.

8. EXPOSURE CONTROLS / PERSONAL PROTECTION

Eye protection	:	Wear as appropriate: safety glasses with side-shields goggles face-shield
Hand protection	:	Wear as appropriate: impervious gloves
Body Protection	:	Wear as appropriate: impervious clothing preventive skin protection
Respiratory protection	:	In case of insufficient ventilation wear suitable respiratory equipment. When workers are facing concentrations above the exposure limit they must use NIOSH approved respirators.
Hygienic Practices	:	Avoid contact with skin, eyes and clothing. Ensure adequate ventilation, especially in confined areas. Wash hands before breaks and at the end of workday. When using, do not eat, drink or smoke. Handle in accordance with good industrial hygiene and safety practice.
Engineering Controls	:	Local exhaust ventilation can be necessary to control any air contaminants to within their TLVs during the use of this product.

9. PHYSICAL AND CHEMICAL PROPERTIES

Color	:	purple-brown
Physical State	:	liquid
Odor	:	mild
pH	:	5
Odor Threshold	:	No information available.
Vapor Pressure	:	No information available.
Vapor Density	:	No information available.
Boiling point/range	:	No information available.
Freeze Point	:	No information available.
Water solubility	:	dispersible
Specific Gravity	:	1.064
Viscosity	:	Approx.235 cps
Evaporation rate	:	No information available.
Partition coefficient (n-octanol/water)	:	No information available.

VOC Concentration as applied (less water and exempt solvents) : 0 g/l

10. STABILITY AND REACTIVITY

Stability : Stable under recommended storage conditions.

Conditions to avoid : Prolonged exposure to high temperatures

Hazardous polymerization : Will not occur under normal conditions.

11. TOXICOLOGICAL INFORMATION

Acute inhalation toxicity

	Type	Value	Species	Exposure time
Product	LC50	no data available		

Acute oral toxicity

	Type	Value	Species
Product	LD50 (Oral)	no data available	

Acute dermal toxicity

	Type	Value	Species
Product	LD50 (Dermal)	no data available	

12. ECOLOGICAL INFORMATION

Ecotoxicological Information : There is no data available for this product.

13. DISPOSAL CONSIDERATIONS

Recommendations: Use excess product in an alternate beneficial application. Handle disposal of waste material in manner which complies with local, state, province and federal regulation.

14. TRANSPORT INFORMATION

DOT : Proper shipping name Not regulated

15. REGULATORY INFORMATION

SARA 311/312 (RTK)
This product has been reviewed according to the EPA 'Hazard Categories' promulgated under Sections 311 and 312 of the Superfund Amendments and Reauthorization Act of 1986 (SARA Title III) and is considered, under applicable definitions, to meet the following categories:

not applicable

SARA 313
This product contains the following substances subject to the reporting requirements of Section 313 of Title III of the Superfund Amendments and Reauthorization Act of 1986 and 40 CFR Part 372:

This product contains no chemicals subject to the SARA 313 supplier notification requirements.

CERCLA
CERCLA section 103(a) specifically requires the person in charge of a vessel or facility to report immediately to the National Response Center (NRC) a release of a hazardous substance whose amount equals or exceeds the assigned RQ. The following hazardous substances are contained in this product.

RQ	CAS No.	Chemical Name

No CERCLA chemicals exist in this product above reportable concentrations.

TSCA Section 12(b) Export Notification
This product contains the following chemical substances subject to the reporting requirements of TSCA 12(b) if exported from the United States:

CAS No.	Chemical Name

There are no TSCA 12(b) Chemicals in this product.

California Proposition 65
The chemical(s) noted below and contained in this product, are known to the state of California to cause cancer, birth defects or other reproductive harm. Unless otherwise specified in Section 2 of this MSDS, these chemicals are present at < 0.1%:

CAS No.	Chemical Name
75-21-8	ETHYLENE OXIDE
123-91-1	DIOXANE

16. OTHER INFORMATION

Legend : N.E. - Not Established
TLV - Threshold Limit Value
STEL - Short Term Exposure Limit
PEL - Permissible Exposure Limit
CEIL - Ceiling

Prepared By : Environment, Health and Safety Department

BASF
The Chemical Company

GLENIUM 7700

Version 1.2 04/23/2007

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End of MSDS.

DIVIDER PAGE

Attachment 3 - Acceptable Knowledge Source Document Summary

Site(s): Oak Ridge National Laboratory	Source Document Tracking Number: M278

Waste Stream Number(s): ORNL Non-specific Library Files
(Applicable only when site library is not in use)

Acceptable Knowledge Documentation Type:	Category:
☐ TRU Waste Management Program Information	☐ Correspondence
☑ Waste Stream-Specific Information	☐ Discrepancy Resolution
☑ Additional Information	☐ Internal Procedure
	☑ Miscellaneous
	☐ Published Document or Internal Procedure
	☐ Unpublished Documents

Title or Description of Source Document [a]: New Pig WypAll X80 Wipers used at the TWPC

Source Document Reference Information (author(s), document and revision number, date, publisher): NA, NA, NA, NA, New Pig Corporation

AK # [b]	Source Doc. Page # [c]	AK Information Summary
WS9, S8	Throughout	SD is an informational advertisement for WypAll X80 Wipers. The advertisement describes the wipes as a roll of red wipes made of polypropylene/cellulose blend. Attached to the advertisement is a TWPC procedure with the instructions involving the wipes highlighted. The procedure is Cask Processing Enclosure (CPE) Operations, OAHA-12-009, Rev. 13, and is dated 07/31/2014. The procedure discusses the weight of the rolls of wipes (12 pounds), and directs the operator to carry the roll and install on a material rack.

Source Document Data Limitations (if any):

1. None.

Acceptable Knowlege Expert:

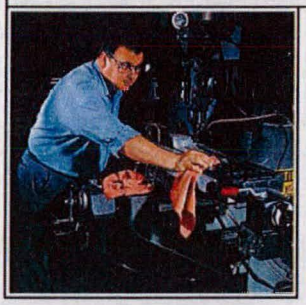
Travis Smith /Sign Date: 07/07/2015
Print

[a] Provide description for non-titled information (i.e., container paperwork, MSDS sheets, etc)
[b] Obtain from Acceptable Knowledge Documentation Checklist
[c] For microfilm or microfiche, identify box, tape, reel number and location.

CCP RECORDS ORIGINAL
DATE REC'D 8/7/15 mc

WypAll® X80 Wipers

#WIP41055 - Jumbo Roll • 12.5" x 13.4" • 475 wipers



They work just like rental shop rags - except clean and reliable every time! Good for small tasks throughout the day.

- 	
- Unlike rental shop towels, these wipers are fresh and clean every time - no contaminants, snags or rough edges 	
- Reusable for small jobs and designed for durability - they withstand solvents as well as shop towels do 	
- Embossed hexagon design adds extra texture to remove grime 	
- Add a dispenser cart or rack (sold separately) for convenient dispensing
- Economical jumbo rolls dispense easily and offer a lower cost per wiper for high-volume use
- Low-lint construction won't shed, pill or leave behind unwanted fibers when wiping parts
- Binder-free construction withstands solvents, degreasers and cleaning agents
- Want to try out a new wiper? Your satisfaction is always guaranteed with the PIG Promise... try a case risk-free!

Pricing (based on quantity)

1-2	3-6	7+
$92.05	$88.85	$81.35

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WIP41055 Specifications

Style:	Jumbo Roll
Color:	Red
Dimensions:	12.5" W x 13.4" L
Dispenser:	No Dispenser Box
Strength Rating:	PR Rating 80
Sold as:	475 wipers per roll
Weight:	14 lbs.
# per Pallet:	72
Composition:	Polypropylene/cellulose blend
UNSPSC:	47131502

Technical Information

Warnings & Restrictions:
There are no known warnings and restrictions for this product.

Technical Documents:
(Available at newpig.com)
Product Data Sheet (PDS)

WIP41055 Metric Equivalent

Dimensions:	31.8cm W x 34cm L
Weight:	6.4 kg

WIP41055 Accessories

You might like...		Item Number
	Jumbo Roll Dispenser	WIP80595
	WypAll® Jumbo Wall-Mount Wiper Dispenser	WIP80579

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Attachment B: Activity Hazard Analysis

AHA Number: OAHA-12-009	Rev. 13
Activity: Cask Processing Enclosure (CPE) Operations	
AHA Implementation Date: 7/31/14	
AHA Type: ☒ Standing ☐ Task-Specific	

Performed by (SME):	R. Johnson, K. East	Date:	07-31-14
Performed by (Safety Rep):	D. Smith	Date:	07-31-14
HSM Approval:	[signature]	Date:	31Jul14
RCM Approval (if required):	[signature]	Date:	7/31/14
Functional Manager Approval:	[signature]	Date:	7/31/14
Design Manager Approval:	J. G. WAGNER [signature]	Date:	7/31/14
Director of Ops Approval:	R. A. HUNT [signature]	Date:	7/31/14

AHA Number:	OAHA-12-009	Rev. 13
Activity:	Cask Processing Enclosure (CPE) Operations	
TASK	**POTENTIAL HAZARDS**	**CONTROL MEASURES** (Include references and specify equipment inspection and/or training requirements.)

General CPE tasks	Cuts, Punctures; hand injuries	• Leather lineman's glove or Hex-armor over-glove (HOG) required for waste/debris handling
		• Alternative Sharpmasters II or Hex-armor 9000 Series allowed in lieu of HOG or leather lineman's gloves for tasks NOT involving direct waste/debris handling
		• ONLY the listed tasks are exempt from the use of cut/puncture resistant gloves:
		  • Pulling and tearing tape
		  • Twisting and taping horsetail
		  • Manipulating RCT instruments controls
		  • Placing masslin on masslin mops
		  • Changing air sampling media
		  • Opening new rad bags
		  • Donning/doffing booties
		  • Disassemble/Assemble sump pump
		  • Operate crane controller

		• Inspect surfaces and areas where you may grab or put your hands, watching for sharp or pointed objects to the extent possible • Blunt, remove, disassemble or pad items with pointed or sharp edges where practical, prior to removing or handling

AHA Number:	OAHA-12-009	Rev. 13
Activity:	Cask Processing Enclosure (CPE) Operations	
TASK	POTENTIAL HAZARDS	CONTROL MEASURES (Include references and specify equipment inspection and/or training requirements.)
Add absorbent into the annulus between the cask body and Overpack	Particulate (Quick Solid or approved equivalent absorbent)	• Pour absorbent material slowly • Use HEPA vacuum inside annulus to minimize airborne dust
Handle and Transfer Casks, Over Pack and Over Pack Lid	Personnel Pinch Point, Caught-In, or Struck-By Injury Obstructed line of site	• Perform CPE operations in accordance with applicable procedures • Ensure travel path is clear and maintain eye contact of path during travel; personnel keep clear of travel path • Establish spotters as needed to assist guiding the container transfer • Activate E-stops as necessary to prevent personnel injury or equipment damage • CPE cask bogie equipped with alarms, lights, and E-stop, and also functions as "dead man" switch
	Failure of Slings, Hoists or other rigging. Load Instability	• Use crane/hoist equipment in accordance with CM-REF-IS-025, Hoisting and Rigging, and CM-REF-IS-040, Pre-Engineered Production Lifts • Monitor north travel of crane to ensure no impact between sling and OAL roof slot • Do not place body or any body part (i.e., arm, hand, leg, or foot) under a suspended load
General Work in CPE Area	Personnel Pinch Point Struck By/Against Caught On/Between Injury	• Use caution when opening/closing rollup or bi-fold doors, position body to avoid struck by, struck against, caught on, or caught between hazards • Use tools in accordance with CM-P-IS-039, Hand and Portable Power Tools. Use appropriate tools to remove lid locks or fasteners.
	Release of Contamination to Clean Areas (inhalation exposure to unprotected personnel)	• CPE maintained under negative pressure • Conduct CPE operations in accordance with approved procedures
	Personnel Slip, Trip and Fall Injury	• Maintain CPE floor and working areas free from excess debris, tools, and waste material to the extent possible • Always maintain firm footing and look before you step
	Hearing damage or loss from noise sources (PA ventilation, operating power tools)	• Wear hearing protection when in PA and in the vicinity of operating power tools
	Personnel Injury by Contact with Hazardous Energy (electric, mechanic, hydraulic, compressed air, pneumatic) Rotating machinery (fans, blowers)	• Access to or maintenance on CPE equipment performed in accordance with CM-UET-IS-019, Lockout/Tagout, using a separate AHA • Exhaust and Supply Fans, Blowers properly guarding by design

AHA Number:	OAHA-12-009	Rev. 13
Activity:	Cask Processing Enclosure (CPE) Operations	
TASK	POTENTIAL HAZARDS	CONTROL MEASURES (Include references and specify equipment inspection and/or training requirements.)
General Work in CPE Area (continued)	Falls from Elevated Work	• Use ladders in accordance with CM-P-IS-041, Ladder Safety • Utilize Safety Chains and Fall Barriers integral to the platform and stair assembly in accordance with CM-P-IS-024, Fall Protection
	Inadvertent Loss of Air to Personnel in Air Supplied Bubble Suits	• Operate the Continuous Flow Breathing Air Purifier system in accordance with RH-UET-OP-106, CPE Continuous Flow Breathing Air Purifier • Monitor air supply hose routing to prevent kinking or tangles • Do not step on, or place waste items or tools on air supply hoses • Prior to securing the BAS, verify all personnel have exited the CPE
	Lack of Communication	• Communicate with use of radio and visual hand signals
	Heat stress illness	• H&S Technicians perform heat stress monitoring in accordance CM-I-IH-400, Heat Stress Monitoring • Optional cool vests available for use
CLET Operation	Drum Discovered in Cask (Unvented) Hydrogen Gas Accumulation	• Do not stand or place body parts in the lid ejection path • UNVENTED drums shall not be opened in the CPE
	Hazardous or Flammable Atmospheres inside Cask	• Perform gas sampling for oxygen, carbon monoxide, or LEL levels
	Free liquids in RH casks are considered infiltration of groundwater and not flammable or combustible liquids	• Verify hose connection secured appropriately • Operate liquid transfer pump in accordance with approved procedure • Collect ground water in approved, vented containers. Ensure appropriate spill pallets are used • Monitor liquid level during pumping • Liquid handling system equipped with alarms, lights, and E-stop • Stage a sufficient amount of absorbent pads, spill kit, or other available material to clean-up, barricade, or divert inadvertent spill
Cask Tilter Operation	Personnel Pinch Point, Struck By/Against, Caught On/Between Injury Rotating, Moving Parts Obstructed line of sight Falling objects Load instability	• Stay clear during rotation of cask tilter • Keep hands clear • Stay clear of east side as cask is tilted to the west direction and returned to vertical • Activate E-stops as necessary to prevent personnel injury or equipment damage • Access under tilter prohibited
	Electric Shock, Electrocution, Arc Flash	• Open and close the breaker in accordance with UT-REF-OP-511, Electrical Equipment Operation

AHA Number:	OAHA-12-009	Rev. 13
Activity:	Cask Processing Enclosure (CPE) Operations	
TASK	POTENTIAL HAZARDS	CONTROL MEASURES (Include references and specify equipment inspection and/or training requirements.)
Processing Waste	Personnel Injury from Ergonomics/Overexertion, leaning over work table and loading CH drums at load out port, and activities associated with pulling waste from cask with long handled tool	• Adjust table height to reduce ergonomic stress • Use mechanical handling equipment in accordance with CM-P-IS-016, Materials Handling • Use proper body positioning and support to minimize potential back or muscle injury from excessive strain when pushing/pulling containers • Prior to lifting, evaluate ease of handling of large waste items. Use 2-person lift as needed for heavy, large, or awkward items. Manual lift of CPE items that exceed ACGIH TLV – Quick Solid 50 lb bags, 6 ft herculite roll, 85 & 55 gallon rad bag rolls, and empty 55 gal drums • Manual lift of CPE items that DO NOT exceed ACGIH TLV - No char, dry red rags roll, 3 ft herculite roll, air conditioner reservoir, PPE bag, secondary waste bag, fire blankets, box of cask sleeves, box of cask shower caps, box of drum liners, box of bolts for cask closure, and box of cask vent plugs, evaluated - do not exceed ACGIH TLV • Use long handled tool as appropriate to retrieve waste from cask • Rotate workers assignments to avoid repetitive lifting/excessive strain
	Personnel Pinch Point, Puncture, Cut, and Abrasion Injury	• Make attempt to inspect surfaces and area where you may grab or put your hands, watching for sharp or pointed objects to the extent possible • Blunt, remove, disassemble or pad items with pointed or sharp edges where practical, prior to removing or handling • Do not handle broken glass directly with gloves to the extent possible. Use a broom or vacuum or other indirect handling method • Do not break any glass, to the extent possible • Clear the sorting table, disposition waste, and clean sorting trays at the end of each jump to the extent practical • Empty the sorting trays into impenetrable containers such as pail, bucket or fiber box • Use impenetrable transfer container (pail, bucket or fiber box) to transfer waste to drum out • Use sieves or colanders to strain small items from the residual absorbent • Limit the size of the transfer container and/or use a drum caster dolly for a larger container • Manage the amount of waste on the sorting table to optimize sorting - don't overload the sorting table • Ensure prompt notification of potential pinch, puncture, cut, or abrasion injury and determination of the cause

AHA Number:	OAHA-12-009	Rev. 13
Activity:	Cask Processing Enclosure (CPE) Operations	
TASK	POTENTIAL HAZARDS	CONTROL MEASURES (Include references and specify equipment inspection and/or training requirements.)
Processing Waste (cont.)	Injury or Illness due to Chemical Use (no char, simple green, fixative, hair spray)	• Store, use, and dispose of chemicals in accordance with Attachment C of C CM-P-EN-003, Chemical Management, and CM-P-IS-004, Hazard Communication • Review MSDS(s)
Size Reducing Using Hand Tools or Power Tools	Personnel Cut, Abrasion, or Puncture Injuries due to Improper Use of Hand Tools or Power Tools	• Use tools in accordance with CM-P-IS-039, Hand and Portable Power Tools
	Inadvertent Loss of Air to Personnel in Air Supplied Bubble Suits	• Monitor air supply hose routing to prevent inadvertent hose cutting or damage
Opening Paint Cans	Personal Injury or suit tear due to lid striking worker	• Place can on side and pierce bottom with an aluminum (non-sparking) can opener • Once bottom is pierced place paint can on side • Direct lid away from personnel in the birdcage • Place flexible protective material (plastic netting) over can • Remove lid using non-sparking tool
Spark or Flame Producing Activities	Burn Injury or Property Damage due to Fire	• Cutting, open flame, grinding, or other spark-producing activities are performed in accordance with CM-REF-IS-021, Hot Work. Use of cutting tools that result in an unintended spark(s) is not considered Hot Work • Inspect fire blankets prior to use. Small holes or tears are acceptable if waste is not visible through the fire blanket. It is acceptable to overlap or fold fire blankets to achieve adequate coverage
Handling of Suspect -Asbestos-Containing Material -Pressurized or Sealed Inner Containers - PCB Containing Waste - Biological Substances	Exposure to asbestos-containing materials, pressure hazards, unknown chemicals or excess contamination inside secondary waste containers, PCB containing waste, Biological Hazards	• Segregate, notify, and process suspect material waste in accordance with CH-REF-OP-044, Operations Prohibited Item Processing
Handling of Unidentified or Hazardous Substances	Illness or Injury due to Chemical Hazards	• If large quantities of unidentified liquids or substances, or if crystallized residues are encountered, STOP, warn others and, notify the Floor Supervisor and SS • Attempt to positively identify liquids or substances found • Treat unidentified liquids or substances as potentially ignitable, corrosive, or reactive (i.e., do NOT mix) • Do not open containers with unidentified powders • Containers of powders may be opened if approved by the AKE based on applicable process knowledge • Treat small quantities of liquids in accordance with RH-REF-OP-102, Liquids Handling in the CPE

AHA Number:	OAHA-12-009	Rev. 13
Activity:	Cask Processing Enclosure (CPE) Operations	
TASK	POTENTIAL HAZARDS	CONTROL MEASURES (Include references and specify equipment inspection and/or training requirements.)

Handling of Explosive, Pyrophoric, or Oxidizing Substances	Burn Injury or Property Damage due to Fire	• Maintain container of Metal-X or equivalent fire extinguishing agent in CPE
		• If explosive, pyrophoric, or oxidizing substances are encountered:
		  • Stop waste processing activities in the CPE
		  • Warn others in the area
		  • Cover material with fire blanket
		  • Consult with the HSM, EPM, Fire Protection Engineer, and Safety Authorization Basis Manager as needed before re-initiating work
		• In case of fire in the CPE, use fire extinguisher in the CPE (one located in each room) or Metal-X agent as applicable, and activate fire alarm and follow emergency training and procedures

CPE Drum In/Drum Out or glove change out	Pinch Point, Caught-In, or Struck-By Injury	• Perform drum in/drum out and glove change activities in accordance with applicable procedure
	Back Injury due to Excessive Stress/Strain	• Handle materials in accordance with CM-P-IS-016, Materials Handling
	Hearing Damage or Loss	• Wear hearing protection when in the vicinity of operating power tools
	Personnel Cut, Abrasion, or Puncture Injuries due to Improper Use of Hand Tools	• Use tools in accordance with CM-P-IS-039, Hand and Portable Power Tools
Change filters	Elevated Work	• Use scaffolding in accordance with CM-P-IS-023, Scaffolding • Wear fall protection PPE when working at heights greater than 4 ft above floor level not guarded. See CM-P-IS-024, Fall Protection
	Chemical hazards	• Review MSDS for filter adhesives and lubricants • Store, use, and dispose of chemicals in accordance with Attachment C of CM-P-EN-003, Chemical Management, and CM-P-IS-004, Hazard Communications
	Injuries associated with hand tools	• Use tools in accordance with CM-P-IS-039, Hand and Portable Power Tools
Operate Continuous Flow Breathing Air Purifier system	Compressed gases	• Operate in accordance with RH-UET-OP-106, CPE Continuous Flow Breathing Air Purifier • Handle compressed gases in accordance with CM-REF-IS-005, Compressed Gases

AHA Number:	OAHA-12-009	Rev. 13
Activity:	Cask Processing Enclosure (CPE) Operations	
TASK	POTENTIAL HAZARDS	CONTROL MEASURES (Include references and specify equipment inspection and/or training requirements.)
Perform Surveys, Decontaminate and Apply Coating to Contaminated Cask	Work on Suspended Loads	• Maintain load as low as practical to perform the task • Use long handled tools to obtain smears and survey data as necessary • Use long handled tools to perform decontamination techniques (i.e., scraping, sanding, wiping, grinding, painting) as necessary • Use long handled tools with magnets or tag lines to stabilize the load as directed by the Lift Supervisor
	Chemical exposure (2-part epoxy coating) (IT00156-R2)	• Use roller or paint brush for coating application • For Behr gray paint, avoid direct skin, eye, or clothing contact, wash after use. Avoid inhaling vapor or mist. Ventilation must be sufficient to control vapors • Store, use, and dispose of chemicals in accordance with Attachment C of CM-P-EN-003, Chemical Management, and CM-P-IS-004, Hazard Communication • Review MSDS(s)

Attachment C: Hazards Screening for Activity Hazards Analysis Checklist
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AHA Number:	OAHA-12-009	**Rev:**	13	**Date:**	7/31/14
Work Activity:	CPE Operations	**Initial Analysis** ☐		**Update** ☒	
Personnel Conducting Screening: D. Smith, M. Smith, J. Coffey, R. Johnson					
SME: J. Coffey, R. Johnson					

The following checklists include various factors that are considered when developing or revising an AHA. These are guidelines for assisting in accomplishing a comprehensive evaluation of potential hazards that might affect an activity. The factors included in the checklists are of a general nature, and are not necessarily all-inclusive. Knowledgeable workers and SMEs consider each activity for any additional, specific associated hazards, and note these in the "Notes" sections of this Attachment.

Hazard Types Does the work activity being analyzed involve potential for any of the following? If Yes, the potential hazard should be addressed in the Attachment B, AHA, or in the notes section of this form.	**Check if applicable**
Temperature Extremes (hot or cold stress) 29 CFR 1910.132, ACGIH TLV 2005, CM-I-IH-400 and CM-I-IH-402	☒
Biological Hazards (living organisms, potentially infectious wastes/items, sewage, etc.) Bloodborne Pathogens (bacteria, virus) 29 CFR 1910.1030, CM-P-IS-013 Insects, Poisonous Plants and Wildlife	☐ ☐
Chemical/Toxic or Hazardous Substances/Waste Exposure (corrosives, reactive materials, toxics, flammables, compressed gases) Flammable/Combustible Liquids 29 CFR 1910.106, 29 CFR 1926.152, NFPA 30 Potential for Static Electric Discharge Present during transfer Hazard Com/MSDS/Labeling 29 CFR 1910.1200, CM-P-IS-004, CM-P-EN-003 Asbestos 29 CFR 1910.1001, CM-A-IH-004 Beryllium 10 CFR 850, CM-A-IH-002 Lead 29 CFR 1910.1025, CM-A-IH-001 Cadmium 29 CFR 1910.1027, CM-A-IH-001 Carcinogen 29 CFR 1910.1200, CM-A-IH-001	☒ ☐ ☒ ☒ ☒ ☐ ☐ ☐

Comments: Local exhaust ventilation in use. UNVENTED drums not be opened in the CPE. Casks are sampled using portable detector as the lid is initially raised to ensure the container headspace does not contain a hazardous atmosphere. Gas sample evaluation includes oxygen, carbon monoxide, or LEL levels using an approved gas analyzer. **Identity/Estimated Quantity/Direct Contact/Applicator/Duration of Use:** No-char 10 lb bags placed into plastic container storage, scooped into trays, use varies up to 6 bags/day; Quick Solid, 50 lb bags placed into plastic container, use ~10 lbs/cask/week added to annulus of cask and overpack slowly and HEPA vacuum used to minimize dust; No-char and Quick solid are handled wearing gloves; Hair spray use with spray bottle no direct contact ~1 bottle/2 days; Fixative is Elmer Glue diluted with water solution use with garden sprayer no direct contact ~ ½ gal/cask/week; Gray 2-part epoxycoating (1T00156-R2)use for coating casks per Radcon, use varies ~1 qt; Behr paint, avoid direct skin or eye contact, wash after use; contact IH for other than short duration use. Wear neoprene, butyl rubber or nitrile gloves. Petrobond 7lb. bags.

Attachment C: Hazards Screening for Activity Hazards Analysis Checklist (Page 2 of 6)

Hazard Type	Check if applicable
Noise Exposure 29 CFR 1910.95, 29 CFR 1926.52, CM-P-IS-026 Noise Source: Ventilation and Portable Power Tools and Equipment **Continuous Noise > 106 dBA**	☒ ☐
Confined Space 29 CFR 1910.146, CM-REF-IS-022 Not a Permit Required Space Permit Required Space - Cask – however No entry during CPE operations	☐ ☒
Ergonomics (repetitive exertions, rapid motions, high forces, contact stresses, extreme postures, vibration, and/or low temperatures) ACGIH TLVs 2005, CM-P-IS-016	☒
Overexertion/Manual Lifting and Handling Operations (manual handling of too heavy or large an object) ACGIH TLVs 2005, CM-P-IS-016 Lifting greater than 40lbs knee to shoulder? Lifting greater than 20lbs below the knee or above the shoulder? Lift requires an awkward posture (extended arms, twisting or etc.)? (Note: If any of the above are applicable, H&S will perform actions below) ACGIH TLV Lifting Pre-Screen acceptable? NIOSH RWL and LI Calculation acceptable?	 ☒ ☒ ☒ ☐ ☐
Material Handling/Storage (labeled, stable and secure against collapse, free from accumulated materials, sufficient safe clearance, safe load limits for floors; material falling from height, roll, shift, or cave-in) Handling Materials 29 CFR 1910.176, CM-P-IS-016 General Requirements for Storage 29 CFR 1926.250	 ☒ ☐
Hand/Portable Tools 29 CFR 1910 Subpart P, 29 CFR 1926, Subpart I, CM-P-IS-039 Vacuum, Fasten, Punch, Cut, Drill, Grind, Sand, Compressors, Sprayers, Weeder, Chainsaw, Other? Gas powered "Chop Saw" required to cut pavement may be necessary. Non-spark tool required - required when opening Cask	 ☒ ☒
Moving Parts of Machinery and Equipment (guarding, condition, pinch, nip points) Machinery and Machine Guarding 29 CFR 1910.212	☒
Contact With or By (being touched or touching something that can cause injury/damage) **Struck Against or By** (running into or forcefully hitting another object or by another object)	☒
Caught In, On, or Between (a body part/whole body becoming trapped in an opening or enclosure or being caught by a projection, moving or stationary object or pinch point)	☒
Hot Surfaces	☐
Welding, Cutting, or Other "Hot Work" Welding/Cutting/Brazing 29 CFR 1910 Part Q; Welding and Cutting 29 CFR 1926 Part J Stainless Steel (Hexavalent Chromium 29 CFR 1910.1026 , CM-A-IH-001, CM-REF-MT-015) Ventilation 29 CFR 1910.94, 29 CFR 1926.57Hot work CM-REF-IS-021 Compressed Gases 29 CFR 1910.101, 29 CFR 1910.253, CM-REF-IS-005 Exposure duration	☐ ☐ ☐ ☐

Comments: Adjust CPE sorting table height to reduce ergonomic stress. Use proper body positioning working. Container lift/hoist/tilt equipment and safe material handling technique use for container and waste handling. Two personnel to manually move heavy, large, or awkward items. CPE lifting task evaluation as follows:

- receive Quick Solid bags from stores - carry 8 bags one at a time approximately 30 ft. to storage position outside CPE, (1-2 times per week) – weight =50 lbs
- Lift Quick Solid bag - lift one bag to pour into cask annulus. (1 bag per cask) – weight =50 lbs
- Dry red rags roll - carry roll approximately 25 ft. and install on material rack. (1-2 times per week) – weight =12 lbs
- Herculite roll (6 ft.) - carry herculite roll approximately 20 ft. and install on material rack or stage on crane bay. (1 time per 2 weeks) – weight =56 lbs

- Herculite roll (6 ft.) – carry roll one wrap around cask to install contamination covering (2 times per cask) – weight =56 lbs
- Herculite roll (3 ft.) – carry herculite roll approximately 20 ft. and install on material rack or stage on crane bay. (1 time per 2 weeks) – weight =15 lbs
- 55 Gallon rad bag roll - carry bag roll approximately 20 ft. and install on material rack. (2 times per week) – weight =45 lbs
- 85 Gallon rad bag roll - carry bag roll approximately 20 ft. and install on material rack. (1 time per 2 weeks) – weight =56 lbs
- Empty air conditioners at CPE (empty reservoir) – lift air conditioner approximately 18 in. and place on step stool to empty reservoir. (2 time per week) – weight = 42 lbs
- Empty full PPE bag from trash can storage container – lift bag and carry to laundry storage. (1 time per 2 weeks) = approx. 20 lbs
- Lift 55 gallon drum – lift drum approximately 12 in. and place onto drum lift cart. (2-4 times per day) – weight =70 lbs
- Full secondary waste bag – lift secondary waste bag out of trash can and carry to crane bay. (3 times per week) – weight approx. 20 lbs
- Fire blankets (4x4, 6x6, 6x9 etc...) - carry fire blanket approximately 30 ft. from PD1-33 to CPE personnel air locks. (1 time per month) – weight =5 lbs (4x4; 9 lbs (6x6); 26 lbs (12x9)
- Fire blankets (4x4, 6x6, 6x9 ect...) – carry fire blanket approximately 25 ft. from personnel air lock into CPE. (1 time per month) – weight =5 lbs (4x4; 9 lbs (6x6); 26 lbs (12x9)
- Box of cask sleeves – carry from crane bay door approximately 40 ft. to storage cabinet on east side of RM 192. (1 time per week) – weight =24 lbs
- Box of Cask shower caps – carry from crane bay door approximately 40 ft. to storage cabinet on east side of RM 192. (1 time per week) – weight =20 lbs
- Box of 55 Gallon Drum Liners - carry from crane bay door approximately 40 ft. to storage cabinet on east side of RM 192. (1 time per week) – weight =25 lbs
- Box of bolts for cask closure (½-13 SS Hex Bolt, 1 ½" long ASTM A193 GR. B8) - carry from crane bay door approximately 35 ft. to storage cabinet on south side of crane bay. (1 time per month) – weight approx. 30 lb. for a typical 10" cube box
- Box of cask vent plugs (8UNC x 1 ½" Lg. Hex Bolt ASTM A-193 GR. B8, SS with WW/ 1/8" TK. X 1 ½" diameter neoprene gasket) - carry from crane bay door approximately 35 ft. to storage cabinet on south side of crane bay. (1 time per month) – weight approx. 20 lb. fpr a typical 8" cube box

TLV lifting guide –

	Horizontal Zone		
Vertical Zone	Close <12 in.	Intermediate 12 – 24 in.	Extended >24 – 31 in.
High 3 in. below to 12 in. above shoulder	35 – ☐	15 – ☐	0 – ☐
Chest knuckle to 3 in. below shoulder	70 – ☐	35 – ☐	20 – ☐
Low middle shin to knuckle	40 – ☐	30 – ☐	15 – ☐
Floor 0 in. to middle shin	30 – ☐	0 – ☐	0 – ☐

Hand and power tools use for open/close container, process waste, downsize items. Prior to opening paint can with appropriate pry tool, vent bottom of can with non-sparking tool to relieve internal pressure buildup, place paint can on side, direct lid away from personnel in birdcage, and place flexible protective material (example plastic netting) over can. Blunt, remove, disassemble or pad items with pointed or sharp edges where practical, prior to removing or handling; Use of cutting tools that result in an unintended spark(s) is not considered Hot Work NOTE: sump pump assembly/disassembly and crane controller operator activity requires fine dexterity.

Attachment C: Hazards Screening for Activity Hazards Analysis Checklist
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Hazard Type	Check if applicable
Hoisting and Rigging and other Overhead Lifts (potential for others working above or below the work area)	
Overhead/Gantry Cranes 29 CFR 1910.179	☒
Slings 29 CFR 1910.184	☒
Hoisting and Rigging DOE 1090-2007, 29 CFR 1910.179, CM-REF-IS-025, CM-REF-IS-040	☒
Lifting Gear/Equipment ASME B30.20, ASME BTH-1-2005	☒
Working On or Near Electrical Equipment/Components	
Electrical Work CM-REF-MT-008	☐
Control of Hazardous Energy 29 CFR 1910.147, / DOE O 422.1, CM-UET-IS-019	☒
Administrative Lock Required CM-P-IS-014	☐
Pneumatic, Hydraulic, Pressure Systems (steam, boilers and pipes, compressed air or gases, hydraulic equipment, valves, etc.)	
Control of Hazardous Energy 29 CFR 1910.147, DOE O 422.1, CM-UET-IS-019	☒
Administrative Lock Required CM-P-IS-014	☐
Compressed Gases 29 CFR 1910.101, 29 CFR 1910.253, CM-REF-IS-005	☒
Operation of Motorized Equipment	
Light Vehicles CM-P-IS-001	☐
Industrial Trucks 29 CFR 1910.178, CM-P-IS-012	☒
Mobile/Heavy Equipment 29 CFR 1910.178, CM-P-IS-002	☒
Walking/Working Surfaces/Aisles/Passageways (clean, dry orderly and sanitary conditions and in good repair, routes free of debris, adequately lighted and marked))	
Walking-Working Surfaces 29 CFR 1910.22	☐
Means of Egress 29 CFR 1910.37	☐
Elevated Work and other Fall Hazards (potential for fall to same or lower level - tripping or slipping on something resulting in a fall, falling over an open edge or off an elevated surface)	
Fall Protection 29 CFR 1926 Subpart M, CM-P-IS-024Manlift 29 CFR 1910.68, CM-P-IS-002	☒
Walking and Working Surfaces 29 CFR 1910 Subpart D	☒
Ladders 29 CR 1926 Subpart X, CM-P-IS-041	☒
Scaffolds 29 CFR 1910.28, 29 CFR 1926.451, CM-P-IS-023	☒
Stairs 29 CFR 1910.24	☐

Comments: Hoisting and rigging is required for CPE activities. Use of 30-Ton crane to move cask/overpack, 3-ton hoist for CLET operations, 10-ton hoist for moving cask/overpack to cask tilter and back to cask bogie; ½-ton Jib hoist; and 1-ton hoist for processing. Cranes and hoists have electric remote or electric cord controllers where personnel maintain a safe distance from load (overhead hazard). Also, 30-ton crane lift area is posted during lifts limiting access. Operator energizing and deenergizing cask tilter breaker.

Continuous Flow Breathing Air Purifier system uses compressed gas cylinders; Ladder, Mobile Ladder, and Elevated Platform access CPE waste operation; Scaffold use for filter change

Attachment C: Hazards Screening for Activity Hazards Analysis Checklist (Page 5 of 6)

Hazard Type	Check if applicable
Isolated/Remote Work Areas (employee working alone or work in area away from normal working areas)	☐
Excavation (man-made depression or trench) Requirements for Protective Systems 29 CFR 1926.651, CM-P-MT-900	☐
Unauthorized/Unqualified Personnel Access Safety Color Coding for Physical Hazards 29 CFR 1926.144 Accident Prevention Signs and Tags 29 CFR1910.145, 29 CFR 1926.200, DOE O 422.1, CM-P-IS-014	☐ ☒
High Hazard Emergency Responses Warnings Systems and Instructions 29 CFR 1910.38, 29 CFR 1910.120 Eye Wash/Safety Shower 29 CFR 1910.151 Medical Services/First Aid 29 CFR 1910.151, 29 CFR 1926. 50 Emergency Rescue Equipment 29 CFR 1910. 120	☒ ☐ ☐ ☐
Visibility (poor lighting, obstructed line of sight) Illumination 29 CFR 1910.120, 29 CFR 1926.56 Wall/Ceiling/Floor Penetration	☐ ☐
Lasers 29 CFR 1910.133, ANSI Z136.1-2000, CM-P-IS-028	☒
Environmental Release or Spill Chemical Release or Spill, Waste Disposal or Storage	☐
Inadequate Sanitation (adequate drinking water, washing and toilet facilities, clean and dry conditions, waste in proper containers) General Environmental Controls 29 CFR 1910.141 Sanitation 29 CFR 1926.51	☐ ☐
Comments: Posted area during CPE hoisting and rigging operation in 30-ton crane bay. CPE hoisting and rigging overhead hazards eliminated by use of remote pendants and by administrative controls, maintaining distance and limiting access. BAS warning light for operational emergency; Use of bar code scanners	

Attachment C: Hazards Screening for Activity Hazards Analysis Checklist (Page 6 of 6)

CM-P-IS-017, Personal Protective Equipment	Check if applicable
Hearing 29 CFR 1910.95, CM-P-IS-026 (posted area, near vicinity of noise source ≥85 dBA)	☒
Type: ear plugs or muffs	
Head 29 CFR 1910.135	☐
Safety Glasses 29 CFR 1910.133	☒
Safety Goggles 29 CFR 1910.133	☐
Faceshield 29 CFR 1910.133	☐
Safety Shoes/Boots 29 CFR 1910.136, CM-Y-HR-003, Code of Conduct	☒
Chemical-Resistant glove	☒
Type: AntiC and Nitrile (waste processing) Neoprene, Nitrile, or Butyl rubber (coating)	
Material handling glove	☒
Insulated glove	☐
Cut-resistant glove	☒
Chaps 29 CFR 1910.132, CM-P-IS-017	☐
High Visibility Vests ANSI/ISEA 107-2004, ANSI/ISEA 207-2006, 29 CFR 1926. 201	☐
Respiratory Protection 29 CFR 1910.134, ANSI Z88.2-1992, CM-P-IS-027	☒
Electrical Work, CM-REF-MT-008	☐
Welding/Hotwork Protective PPE ANSI Z49.1, AWS F2.2, CM-REF-IS-021, CM-REF-MT-015	☐

Comments: Leather lineman's glove or Hex-armor over-glove (HOG) required for waste/debris handling. Alternative Sharpmasters II or Hex-armor 9000 Series allowed in lieu of HOG or leather lineman's gloves for tasks NOT involving direct waste/debris handling. ONLY the listed tasks are exempt from the use of cut/puncture resistant gloves: 1) Pulling and tearing tape 2) Twisting and taping horsetail 3) Manipulating RCT instruments controls 4) Placing masslin on masslin mops 5) Changing air sampling media 6) Opening new rad bags 7) Donning/doffing booties 8) Disassemble/Assemble sump pump and 9) Operate crane controller

CPE hoisting and rigging overhead hazards eliminated by use of remote pendants and by administrative controls, maintaining distance and limiting access, no hardhat or high visibility vests required.

Other Sources of Information on Potential Hazards

Information Type	Check if applicable
Related AHAs List: OAHA-05-010, Drum Handling; OAHA-02-001, Operations General	☒
Related Procedures/Work Instructions (other than listed in Hazard Screening Form) List: RH-A-OP-011, Remote Handled Waste Container Selection Process, RH-R-AD-007, Remote Handled Concrete Cask Selection for Cask Processing Enclosure Processing, RH-REF-OP-104, Cask Processing Enclosure Drum-In / Drum-Out, RH-REF-OP-112, Cask Processing Enclosure Ventilation Differential Pressure Requirements, RH-UET-OP-105, Cask Processing Enclosure Liquids Handling System	☐
Equipment Operation and/or Safety Manuals List: T-RH-80097-M-EE-002, CPE Cask Bogie Adjustable Frequency Drive Manual and Catalog, T-CM-FW-D-IC-148, Sht 01 – 03, Cask Processing Area Bogie Control	☐
Lessons Learned List: LLI-2012-12-001, Failure to follow procedure CH-UET-OP-003 R0, Box Breakdown Operations verbatim; Near Miss Puncture Wound 20140527 CPE	☐

DIVIDER PAGE

Attachment 3 - Acceptable Knowledge Source Document Summary

Site(s): Oak Ridge National Laboratory	Source Document Tracking Number: P254
Waste Stream Number(s): ORNL Non-specific Library Files (Applicable only when site library is not in use)	
Acceptable Knowledge Documentation Type: ☑ TRU Waste Management Program Information ☐ Waste Stream-Specific Information ☑ Additional Information	Category: ☐ Correspondence ☐ Discrepancy Resolution ☐ Internal Procedure ☐ Miscellaneous ☑ Published Document or Internal Procedure ☐ Unpublished Documents
Title or Description of Source Document [a] : Contact Handled Waste Repackaging	
Source Document Reference Information (author(s), document and revision number, date, publisher): NA, CH-REF-OP-013 (Changed from CH-P-OP-013), Rev. PCN 9-1 (Older Versions Included), 06/19/2015, TWPC	

AK # [b]	Source Doc. Page #[c]	AK Information Summary
PR8, S2, S16	All	This procedure provides instructions for examining, segregating or processing specific materials or items, and documenting waste related data during packaging or re-packaging Contact Handled (CH) solid waste material from the U.S. Department of Energy (DOE) Oak Ridge National Laboratory at the TRU Waste Processing Center (TWPC). This procedure is used to document repackaging of waste into drums and boxes, and for direct loading of unpackaged waste into macro-encapsulation containers. The guidance herein ensures that final waste packages destined for transport to, and disposal at, the Waste Isolation Pilot Plant (WIPP) or at the Nevada National Security Site (NNSS) comply with applicable Waste Acceptance Criteria (WAC) and Waste Analysis Plan. Instruction is provided on how to document the waste contents for characterization of newly generated or repackaged CH waste. The CH waste repackaging process is used to verify the physical waste form, confirm the Waste Stream Description and Resource Conservation and Recovery Act (RCRA) characterization provided by Acceptable Knowledge (AK) or Process Knowledge (PK), and confirm that no Prohibited Items (PIs) are present. Nochar, Solidasorb, kitty litter, and vermiculite are listed (pp. 13 of 42 of Revision PCN 9-1) as absorbent materials that COULD BE found in the drums when they are opened. Specific chemicals and compounds called out in the procedure are as follows: • NoChar (pp. 16 of 42) T CH-FW-P-OP-013 was superseded by CH-P-OP-013 and renamed, but the revision number did not start back at zero. The major difference between T CH-FW-P-OP-013 and CH-P-OP-013 is the former estimated waste material parameter (WMP) weights. Document T-CH-FW-P-OP-013: Revision 5 (Date on the Approved Signature is 11/17/2005, but no Implementation Date is provided): Revision 5 is the first revision that bounds the population of unshipped containers (01/20/2006). Prior revisions were not provided, so for the purposes of this summary, Revision 5 is the "initial issue," and changes to the document from Revision 4 could not be determined. VE Technique Data Form:

CCP RECORDS ORIGINAL
DATE REC'D 2/9/16

Attachment 3 - Acceptable Knowledge Source Document Summary (continued)

Site(s): Oak Ridge National Laboratory		Source Document Tracking Number: P254
AK # [b]	Source Doc. Page #[c]	AK Information Summary
		• Initiate a VE Technique Data Form, Attachment F of this procedure for each waste container to be filled. • If items or materials identified as non-compliant in T-CH-FW-X-AD-001, CH Waste Acceptance Criteria, are found, stop work in the immediate area and notify the WOL. • If deemed safe to handle by the WOL, segregate non-compliant items or materials and process in accordance with T-CH-FW-P-OP-022, Non-Compliant Containers. • Segregate prohibited items identified in the WPP Prohibited Items table, Attachment B of this procedure, and process in accordance with T-CH-FW-P-OP-022, Non-Compliant Containers. • Breach inner waste packages if the contents cannot be clearly identified, the packaging is heat sealed, or if they consist of more than 3 layers of confinement. • Estimate and record the weight percentage of each WMP found in the item. • Document "NO" or "YES", to indicate if the physical waste form is consistent with the assigned Waste Stream Description, Waste Matrix Code, and RCRA characterization • Attachment B is a list of WIPP prohibited items that must be segregated from compliant waste, including: • liquid waste (more than 1 inch of liquid in bottom of container and total residual liquid in any payload container may not exceed 1% volume of that container) • non-radionuclide pyrophoric materials, such as elemental potassium • incompatible wastes (wastes that are incompatible with backfill, seal and panel closure materials, container and packaging materials, shipping container materials, and/or other wastes) • explosives • compressed gases/pressurized containers (e.g., aerosol cans) • ignitables, corrosives, and reactives. Document CH-REF-OP-013: CH-P-OP-013 superseded T CH-FW-P-OP-013 and was renamed, but the revision numbers were not reset. Revision 6 (Dated 05/02/2007): Waste Repackaging: • Initiate an Attachment D, Contact Handled Waste Repackaging Data Form, for each waste container to be filled. Revision 7 (Dated 10/03/2007): • The Waste Package Certifier verifies that the Waste Stream Identification, Summary Category Codes, and Waste Matrix Code are consistent with these assigned to the original parent container. Revision 8 (Dated 02/22/2008): No substantive changes made in this revision related to TRU waste management.

Attachment 3 - Acceptable Knowledge Source Document Summary (continued)

Site(s): Oak Ridge National Laboratory		Source Document Tracking Number: P254
AK # [b]	Source Doc. Page #[c]	AK Information Summary
		Revision 9 (Dated 03/23/2009): No substantive changes made in this revision related to TRU waste management. Revision 10 (Dated 07/22/2009): • Containers repackaged in the BBA may contain both heterogeneous debris and soil resulting in waste material which does not match the documented waste stream description for the parent container. If material types can be reasonably separated into different drums, then keep the different types separated. • Check the "No" box on the "Contact handled Waste Repackaging Form" if the daughter drum contains >50% of waste that does not match the parent containers waste stream description (matrix). Revision 11 (Dated 02/16/2010): • Waste Containers previously packaged as Remote Handled (RH) waste that fail to meet the Waste Isolation Pilot Plant Waste Acceptance Criteria as RH waste are repackaged as CH waste. Applicable portions of the CCP RH Visual Examination documentation are transcribed to the Attachment D, CH Waste Repackaging Data Form. Revision 12 (Dated 05/24/2010): • If items or materials identified as non-compliant in CH-X-AD-001, Contact Handled Waste Acceptance Criteria, are found, stop work in the immediate area and notify the Duty WOL. If deemed safe to handle by the Duty WOL, segregate non-compliant items or materials and process in accordance with CH-P-OP-045, Non-Compliant Containers (see Reference P599 in the ORNL Site Library). • When the PI is approved for processing, review any special processing instructions detailed in the applicable Attachment B, Operations Prohibited Item Processing (OPIP) of CH-P-OP-044, Operations Prohibited Item Processing (see Reference P598 in the ORNL Site Library), and resume processing activities as directed by the Duty WOL. Revision 13 (Dated 12/07/2010): • If necessary to co-mingle waste from two or more parent drums into the same daughter drum in the GB, notify the AKE for approval to co-mingle waste in a daughter drum. Processing Prohibited Items: • Segregate the PI(s) into a separate tray or area away from other compliant waste, and clearly label as appropriate while waiting for dispositioning. • Complete an Attachment F, PI Characterization form, indicating a PI description, characterization instructions, and related regulatory requirements as applicable. • Once the OPIP report or WNCR and Attachment F, PI Characterization form has been reviewed and approved, process PIs in accordance with the approved OPIP report and Attachment F, PI Characterization form or as directed by Duty WOL. Processing Liquids or Wetted Waste:

Attachment 3 - Acceptable Knowledge Source Document Summary (continued)

Site(s): Oak Ridge National Laboratory		Source Document Tracking Number: P254
AK # [b]	Source Doc. Page #[c]	AK Information Summary
		• Absorbent materials such as Nochar, Solid-a-sorb, kitty litter, or vermiculite which are found in a container are assumed to have been used to absorb unknown or flammable liquids and shall be considered a wetted waste. Absorbent materials (absorbed liquids) in containers which are transferred from the HC are also considered a wetted waste. • If non-PCB free liquid, containerized liquid, or absorbed liquid (wetted waste) is discovered, treat the waste in accordance with CH-I-OP-013, Absorbing Liquids in the Glove Box and Box Breakdown Area (see Reference P1116 in the ORNL Site Library). Processing Non-Compliant or Potentially Incompatible Materials: • Prohibited quantities of liquids and other items or materials identified as NC in CH-X-AD-001, Contact Handled Waste Acceptance Criteria or potentially incompatible waste, may be discovered during processing in the GB or BBA. The Duty WOL is responsible to determine if NC or potentially incompatible waste is safe to handle. These materials are segregated for disposition and possible return to the Department of Energy – Oak Ridge. • If NC or potentially incompatible material is found, stop work and notify the Duty WOL. Refer to CH-P-OP-045, Non-Compliant Containers (see Reference 599 in the ORNL Site Library) for guidance on dispositioning and handling of NC material. Initiate an OPIP report in accordance with CH-P-OP-044, Prohibited Items Processing, or a WNCR in accordance with CH-P-AD-044, Waste Corrective Action and Non-Conformances, as applicable. Process waste as directed by the applicable OPIP or WNCR or as directed by the Floor Supervisor or Duty WOL. Processing Capped Pipe Nipples/2R Type Containers: • Capped pipe nipples or 2R type containers discovered in waste containers may have been used as small strong-tight sealable containers and may conceal high hazard waste items or materials. Concealed materials may present additional uncontrolled hazards to the worker. • If the capped/sealed pipe nipple or 2R type container is confirmed to not contain liquids or other PI, segregate the item into a designated hold area within the GB or BBA and reintroduce the item into a non-CH visual examination waste drum being repackaged from the same waste stream that the item came from. • If the capped/sealed pipe nipple or 2R type container is identified to contain liquids or other PI, transfer the container containing the capped/sealed pipe nipple or 2R type container to Room 231 of the PB and place on hold for alternate or later processing. • Initiate an OPIP report in accordance with CH-P-OP-044, Prohibited Items Processing, or a WNCR in accordance with CH-P-AD-044, Waste Corrective Action and Non-Conformances, as applicable. Process the capped/sealed pipe nipple or 2R type container as directed by the applicable OPIP or WNCR or as directed by the Floor Supervisor or Duty WOL. Processing Polychlorinated Biphenyl (PCB) Waste: • If, during repackaging, PCB materials (solid or liquid) are discovered in parent containers not previously designated as containing PCBs, notify the AKE, RII, and Waste Management personnel.

Attachment 3 - Acceptable Knowledge Source Document Summary (continued)

Site(s): Oak Ridge National Laboratory		Source Document Tracking Number: P254
AK # [b]	Source Doc. Page #[c]	AK Information Summary

- If, during repackaging, uncontainerized PCB liquid wastes (known or suspect) are discovered, minimize spread of liquids and isolate PCB contaminated waste, containers or equipment.
- Absorb the liquid wastes in accordance with CH-I-OP-013, Absorbing Liquids in the Glove Box and Box Breakdown Area.

Processing Potentially Pressurized Container (PPC):

- Potentially pressurized containers including aerosol cans are segregated and containerized for processing at off-site facilities.
- Initiate an OPIP report in accordance with CH-P-OP-044, Prohibited Items Processing, or a WNCR in accordance with CH-P-AD-044, Waste Corrective Action and Non-Conformances, as applicable.
- Initiate Attachment T, Aerosol Can Management, in accordance with CM-P-RP-309, Environmental Permits – Inspections/Monitoring and Reporting.
- Document a detailed description of the item on the applicable waste repackaging data form for the collection container, including size, content, and type of container.
- Items or materials which are potentially incompatible are packaged separately as applicable.

Revision 14 (Dated 06/09/2011):

Processing Liquids or Wetted Waste:

- Absorbent materials (absorbed liquids) in containers which are transferred from the HC are also considered a wetted material. Waste material which has been exposed to or saturated with groundwater in RH casks is considered a saturated waste and is processed in the HC or CPE only.
- If non-PCB free liquid, containerized liquid, absorbed liquid (wetted material), or groundwater saturated waste (saturated waste) is discovered, treat the waste in accordance with CH-I-OP-013, Absorbing Liquids in the Glovebox and Box Breakdown Area, if working in the GB or BBA, or RH-P-OP-014, Liquids Handling in the Hot Cell, if working in the HC.

Processing Polychlorinated Biphenyl (PCB) Waste:

- Absorb the uncontainerized liquid wastes in accordance with either CH-I-OP-013, Absorbing Liquids in the Glove Box and Box Breakdown Area, if working in the GB or BBA, or RH-P-OP-014, Liquids Handling in the Hot Cell, if working in the HC.

Definitions:

- Residual Liquids –Residual liquids (i.e., liquid droplets found on the inside of the containers or bags, heels of liquids, etc.) are not considered liquids or wetted materials.

Revision 15 (Dated 03/27/2012):

Document is a single title page stating that CH-P-OP-013 has been superseded by CH-REF-OP-013.

Attachment 3 - Acceptable Knowledge Source Document Summary (continued)

Site(s): Oak Ridge National Laboratory		Source Document Tracking Number: P254
AK # [b]	Source Doc. Page #[c]	AK Information Summary

CH-REF-OP-013 superseded CH-P-OP-013 and the revision number was reset to 0.

Revision 0 (Dated 03/27/2012):

Processing Liquids or Wetted Waste:

- If non-PCB free liquid, containerized liquid, absorbed liquid (wetted material), or groundwater saturated waste (saturated waste) is discovered, initiate an OPIP report in accordance with CH-REF-OP-044, Operations Prohibited Items Processing.

Processing Polychlorinated Biphenyl (PCB) Waste:

- If, during repackaging, PCB materials (solid or liquid) are discovered, initiate an OPIP report in accordance with CH-REF-OP-044, Operations Prohibited Items Processing.
- Absorb the uncontainerized liquid wastes in accordance with either CH-REF-OP-014, Absorbing Liquids in the Glovebox and Box Breakdown Area, if working in the GB or BBA, or RH-REF-OP-014, Liquids Handling in the Hot Cell, if working in the HC, or RH-REF-OP-102, Liquids Handling in the Cask Processing Enclosure.

Processing Batteries (new section):

- Document a detailed description of the battery on the associated Attachment D, Contact Handled Repackaging Data Form, including size (e.g., 9-volt, D, etc.) and type (e.g., alkaline, nickel-cadmium, lithium, etc.).
- If the battery type cannot be determined OR a lithium battery (any size) is discovered, then contact the AKE and RII personnel for assistance.
- Process the battery per the recommended disposition path as instructed on the applicable Attachment F, Unapproved PI Characterization form.

Definitions:

- Wetted Material - Absorbent materials such as Solid-a-sorb, kitty litter, vermiculite, mop heads, or absorbent pads, which are found in a container are assumed to have been used to absorb unknown or flammable liquids.
- Saturated Waste – Any waste in contact with groundwater within a RH cask.

Revision 1 (Dated 05/31/2012):

Processing Prohibited Items:

- Document PI characterization and recommended disposition path as applicable on the Attachment F, Uncharacterized Waste Guidance form as applicable.

Processing Capped Pipe Nipples/2R Type Containers:

- Document PI characterization and recommended disposition path as applicable on the Attachment F, Uncharacterized Waste Guidance form as applicable.

Processing Polychlorinated Biphenyl (PCB) Waste:

- Ensure processing guidance and labeling requirements are documented on

Attachment 3 - Acceptable Knowledge Source Document Summary (continued)

Site(s): Oak Ridge National Laboratory		Source Document Tracking Number: P254
AK # [b]	Source Doc. Page #[c]	AK Information Summary

the applicable Attachment F, Uncharacterized Waste Guidance form.

Processing Batteries:

- Process the battery per the recommended disposition path as instructed on the applicable Attachment F, Uncharacterized Waste Guidance form.

Processing Potentially Energetic Material (new section):

- Potentially Energetic Material include materials which may have reactive, shock sensitive, explosive, or pyrophoric characteristics.
- If potentially energetic material is found, stop work in the affected process area and notify the Floor Supervisor and the DWOL.
- Notify the Energetic Material Subject Matter Expert to review the potentially energetic material.
  - The Energetic Material Subject Matter Expert reviews available waste documentation to determine if a material is energetic and provides guidance for the safe handling and recommended disposition path of energetic material. The Energetic Materials Subject Matter Expert documents safe handling guidance and recommended disposition path for energetic material on Attachment B, Field Evaluation of Potentially Energetic Materials Form, of CM-REF-WP-016, Energetic Materials Management (see Reference P587 in the ORNL Site Library). A separate procedure may be developed specifically for processing the energetic material.
- IF the material is determined to be energetic material, THEN initiate a WNCR in accordance with CH-P-AD-044, Waste Corrective Action and Nonconformance's.
- Process the energetic material as guided by the associated; procedure developed to process the specific energetic material, Attachment B, Field Evaluation of Potentially Energetic Materials Form, of CM-REF-WP-016, Energetic Materials Management, or WNCR.

Revision 2 (Dated 10/11/2012):

No substantive changes made in this revision related to TRU waste management.

Revision 3 (Dated 02/25/2013):

No substantive changes made in this revision related to TRU waste management.

Revision 4 (Dated 05/06/2013):

Processing Polychlorinated Biphenyl (PCB) Waste:

- Absorb the uncontainerized liquid wastes with Nochar or equivalent.

Revision 5 (Dated 08/27/2013):

Add steps to process waste items greater than 200 mR/hr in the GB, BBA, or CPE; added clarification for suspect ACM determination hold points.

Revision 6 (Dated 02/03/2014):

Added Attachment J, High Dose Drum Data, to document gamma on contact, gamma behind drum lid, neutron at glove port, and shielded gamma behind ¼- inch

Attachment 3 - Acceptable Knowledge Source Document Summary (continued)

Site(s): Oak Ridge National Laboratory		Source Document Tracking Number: P254
AK # [b]	Source Doc. Page #[c]	AK Information Summary

steel plate.

Revision 7 (Dated 06/25/2014):

No substantive changes made in this revision related to TRU waste management.

Revision 8 (Dated 03/26/2015):

No substantive changes made in this revision related to TRU waste management.

Revision 9 (Dated 06/17/2015):

Waste Processing and Repackaging:

- If the container has an assigned OPIP, process in accordance with CH-REF-OP-044, Operations Prohibited Item Processing (see Reference P598 in the ORNL Site Library).
- If the container has an assigned WNCR, process in accordance with CH-P-AD-044, Waste Corrective Action and Nonconformance's.

Revision PCN 9-1 (Dated 06/19/2015):

No substantive changes made in this revision related to TRU waste management.

Procedure Verification: Verification/walk down of CH-REF-OP-013 was conducted on 9/30/15 by Jeff Harrison with Kevin East, Process Superintendent.

- Mr. East indicated the waste operators do not process prohibited or potentially prohibited items without input from supervision including liquids. If they encounter anything they do not recognize, the AKE is called in to evaluate the material and an Attachment F is completed.
- If a battery was encountered prior to adding the section for battery processing (03/27/2012), the AKE was called in to determine the type of battery unless it was positively identified as an alkaline battery in which case they would process it as normal waste without input from the AKE.
- If absorbent (e.g., kitty litter) was identified in legacy waste prior to adding the section for processing wetted material (12/07/2010), they would not have processed the wetted material by adding Nochar.
- Mr. East agreed that Section 5.8.2.2 should be revised to specifically identify Nochar N910 Petro Bond for PCB liquids or refer to liquids handling procedure CH-REF-OP-014.

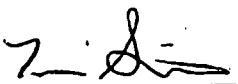
Attachment 3 - Acceptable Knowledge Source Document Summary (continued)

Site(s): Oak Ridge National Laboratory	Source Document Tracking Number: P254

Source Document Data Limitations (if any):

1. The document number was changed to CH-REF-OP-013 when management of the facility switched to EnergX.
2. This procedure is worked concurrenty with CH-P-OP-003, and CH-P-OP-004.

Acceptable Knowlege Expert:

Travis Smith /  Date: 01/20/2016

Print /Sign

[a] Provide description for non-titled information (i.e., container paperwork, MSDS sheets, etc)
[b] Obtain from Acceptable Knowledge Documentation Checklist
[c] For microfilm or microfiche, identify box, tape, reel number and location.

PCN #	AFFECTED PAGES
PCN 9-1	1, 5, 6, 15

Contact Handled Waste Repackaging

REFERENCE

Implementation Date: 6/17/15

~~Wastren Advantage, Inc.~~
~~TRU Project Controlled Distribution~~
~~Issued To:~~ #1265 ~~Date:~~ ~~09/09/2015~~
10/01/2015

PCN 9-1 Kevin D. Eaton
PROCESS SUPERINTENDENT
06/19/2015 cka pentelecon

WASTREN ADVANTAGE, INC.
TRU PROJECT CONTROLLED DISTRIBUTION
345
ISSUED TO: CH Rm DATE: 6/9/15
6/19/15

APPROVAL:

Tim Hallman
Operations Manager

6/8/15
Date

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Revision Summary

Revision	Change Summary
0	Initial issue – Supersedes CH-P-OP-013
1	Implement requirements for Energetic Materials in DSA/TSR Rev 25
2	Rewritten to clarify sequences related to Macro-Encapsulation in the BBA
3	Reduce notification requirements for some PIs; Update titles and formatting
4	Add signature block for EPM approval to Attachment F
5	Add steps to process waste items greater than 200 mr/hr in the GB, BBA, or CPE; added clarification for suspect ACM determination hold points
6	Rewritten
7	Revised to better align with other procedures
8	Rewritten
9	Added steps to process in accordance with an assigned OPIP/WNCR

Current Revision Specific Changes

Location	Description	Reason
5.2	Added steps	To process in accordance with an assigned OPIP/WNCR

1.0 INTRODUCTION

1.1 Purpose

This procedure provides instructions for examining, segregating or processing specific materials or items, and documenting waste related data during packaging or re-packaging Contact Handled (CH) solid waste material from the U.S. Department of Energy (DOE) Oak Ridge National Laboratory at the TRU Waste Processing Center (TWPC). This procedure is used to document repackaging of waste into drums and boxes, and for direct loading of unpackaged waste into macro-encapsulation containers. The guidance herein ensures that final waste packages destined for transport to, and disposal at, the Waste Isolation Pilot Plant (WIPP) or at the Nevada National Security Site (NNSS) comply with applicable Waste Acceptance Criteria (WAC) and Waste Analysis Plan.

1.2 Scope

Instruction is provided on how to document the waste contents for characterization of newly generated or repackaged CH waste. The CH waste repackaging process is used to verify the physical waste form, confirm the Waste Stream Description and Resource Conservation and Recovery Act (RCRA) characterization provided by Acceptable Knowledge (AK) or Process Knowledge (PK), and confirm that no Prohibited Items (PIs) are present.

1.3 Document Use

This document has been evaluated by the Document Use Review Team and has been determined to be a **REFERENCE** procedure.

REFERENCE procedures are not required to be in-hand or present for the user to actively reference during actual performance of action steps, however they may be open and referenced during the work performance based on personnel knowledge and skill level. If work is suspended due to inadequacy of procedure, then a page change notice or revision of the procedure is initiated.

2.0 PRECAUTIONS AND LIMITATIONS

2.1 Safety

- This procedure provides direction for handling hazardous and radioactive material containers.

2.2 Technical Safety Requirements

- None

2.3 Nuclear Criticality Safety Evaluation

- None

3.0 RESPONSIBILITIES

3.1 Personnel Assignments

The following personnel are responsible for performing the activities described in this procedure and for training to this procedure prior to accomplishing the activities described herein. These TWPC personnel may designate alternate personnel to assist in carrying out their responsibilities as specified in this procedure.

PW 9-1 ADPSS 6-18-15 DSK-DMG 6-18-15

3.1.1 ~~Operations Manager (OM)~~ PROCESS SUPERINTENDENT (PS) DK 6-18-15

- approves this procedure

3.1.2 Waste Management Personnel

- provides AK, PK, and other applicable waste stream specific information to Operations personnel

3.1.3 Waste Certification Official (WCO)

- provides waste characterization and certification support and guidance to Operations personnel
- reviews and provides dispositions on Operations Prohibited Item Processing (OPIP) reports and Waste Nonconformance Reports (WNCR)
- ensures work performed in accordance with this procedure complies with applicable waste acceptance criteria and quality objectives

3.1.4 Acceptable Knowledge Expert (AKE)

- provides RCRA, Polychlorinated Biphenyl (PCB), and Asbestos Containing Material (ACM) specific information and guidance to Operations personnel
- provides AK support and guidance to Operations personnel
- reviews, characterizes, and dispositions unapproved PI

3.1.5 Shift Superintendent (SS)

- authorizes work activities

3.1.6 Floor Supervisor

- supervises and directs waste processing activities at the Cask Processing Enclosure (CPE), Glovebox (GB), Box Breakdown Area (BBA), or Hot Cell (HC)
- reviews special processing instructions on PIs approved for processing
- reviews travelers for completion
- supervises activities in the field to ensure activities are completed in accordance with this procedure

3.1.7 Waste Operator

- performs CH waste repackaging activities as the Waste Repackaging Operator and Waste Repackaging Data Form Reviewer in accordance with this procedure
- signs OPIP "Performed by" when completed

3.1.8 Waste Package Verifier (WPV)

- performs activities in accordance with this procedure
- verifies satisfactory remediation as prescribed on the OPIP for closure
- signs the OPIP "verified by" for closure

3.1.9 Environmental Programs Manager (EPM)

- provides RCRA, PCB, and ACM specific information and guidance to Operations personnel
- reviews, characterizes, and recommends disposition path for unapproved PI as needed

3.1.10 Data Entry Personnel

- reviews travelers for completion/closure
- reviews and closes out OPIP/WNCRs

3.1.11 Energetic Material Subject Matter Expert

- reviews available waste documentation for potentially energetic material
- provides guidance for the safe handling and recommended disposition path of potentially energetic material

3.2 Document Maintenance

The ~~OM~~ PS DLC 6-18-15 is designated the document owner and is responsible for updating this document. Approval authority rests with the ~~OM~~ PS DLC 6-18-15. Submit suggestions for revisions or improvement to the ~~OM~~ PS DLC 6-18-15 utilizing Attachment E, New Document and Revision Request Form, of CM-P-AD-061, Document Preparation, Review and Approval.

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4.0 PREREQUISITES

- None

NOTE: Section 5.0 is divided into multiple subsections. Steps within those subsections are followed in the sequence written unless stated otherwise. Operations personnel may enter specific subsections as needed to start a new work activity or resume work activities (e.g., directed by other procedures, after shift turnover, returning from the weekend, holiday, etc.), only after applicable safety precautions and prerequisites are verified to be satisfied or implemented.

5.0 PROCEDURE

NOTE 1: Waste Container Information for previously repackaged containers is to be traced to the original parent container using authorized source documentation. This documentation is available in and should be verified only in the AKPKS database.

NOTE 2: Waste Containers previously packaged in the HC as Remote Handled (RH) waste that fail to meet the WIPP WAC as RH waste are repackaged as CH waste. If available, applicable portions of the RH Visual Examination documentation and traveler may be transcribed to the Attachment D, Contact Handled Waste Repackaging Data Form and placed in the applicable CH container traveler for information verification by Data Entry personnel. A separate folder is initiated for the RH traveler and forwarded to Waste Management personnel. Waste items from RH Casks may also be individually surveyed and directly repackaged as CH Waste. This waste is not considered to be previously repackaged as RH waste.

5.1 Contact Handled Waste Repackaging Data Form

5.1.1 Make a copy of the updated Container AK Detail for the Source Container and, if necessary, a copy of the Container AK Detail for the Original Parent Container for inclusion in the applicable Waste Container Traveler.

5.1.2 IF repackaging waste in the HC,
AND the waste was previously packaged as RH waste,
THEN transcribe the following information from Attachment 1, Visual Examination Data Form, of CCP-TP-500, Remote Handled Waste Visual Examination, to the Attachment D, Contact Handled Waste Repackaging Data Form:

- Percent Fill
- Waste Description (it is not necessary to transcribe the Central Characterization Project (CCP) Waste Material Parameter Codes)

NOTE: Certain items may be "not applicable" if preparing or processing waste into a box or macro-encapsulation container. For example, boxes do not utilize bag liners, therefore thickness of liner bag and bag liner description are Not Applicable. Forms may be annotated as N/A accordingly, when applicable.

5.1.3 Record the following information in Section 1, General Information, of the Attachment D, Contact Handled Waste Repackaging Data Form:

- Examination Start Date
- Container Number
- Container Type (e.g., DOT 7A, Type A, 55-gallon drum)
- Thickness of the bag liner
- Bag Liner Description (check all that apply)
- Waste Stream Identification Number (if more than one record "various")

5.1.3.1 IF not "Previously Repackaged as RH Waste," THEN check NO.

5.1.3.2 IF "Previously Repackaged as RH Waste," THEN check YES.

5.1.4 Record the container number and examination date in Sections 2 and 3 of the Attachment D, Contact Handled Waste Repackaging Data Form.

5.1.5 Document the source Container Number (container that waste material was retrieved from) and associated waste stream number in Section 1 of the Attachment D, Contact Handled Waste Repackaging Data Form, for the container that waste will be deposited into.

5.1.6 IF repackaging a previously repackaged container (i.e., grand-daughter), THEN document the original parent container number and associated waste stream in Section 1 of the Attachment D, Contact Handled Waste Repackaging Data Form.

NOTE 1: Subsections 5.3 through 5.13 are referred to and performed concurrently as needed during the performance of Subsection 5.2 to process specific items as they are discovered during waste processing.

NOTE 2: Steps in this subsection are performed in any order as items or conditions are encountered and concurrently with waste processing activities detailed in CH-UET-OP-003, Box Breakdown Area Operations, CH-UET-OP-004, Glovebox Operations, or RH-UET-OP-002, Hot Cell Operations.

5.2 Waste Processing and Repackaging

5.2.1 IF the container has an assigned OPIP,
THEN process in accordance with CH-REF-OP-044, Operations Prohibited Item Processing.

5.2.2 IF the container has an assigned WNCR,
THEN process in accordance with CH-P-AD-044, Waste Corrective Action and Nonconformances.

5.2.3 Ensure the container number and examination date is recorded in Section 2 of the Attachment D, Contact Handled Waste Repackaging Data Form.

5.2.4 IF any of the following conditions apply:

- The contents cannot be clearly identified,

OR

- The packaging is heat sealed,

OR

- The packaging consists of more than 3 layers of confinement,

THEN breach inner waste packages.

NOTE 1: Source container numbers are documented to maintain clear traceability of waste from incoming containers to waste containers destined for final disposal.

NOTE 2: If waste was previously packaged as RH waste in the HC, the Source Container is the RH Container Identification Number that the waste is transferred from.

5.2.5 IF repackaging PIs into containers in the BBA or at the GB, CPE or HC CH drum out portal,
THEN document the source Container Number (container that waste material was retrieved from) and associated waste stream number in Section 1 of the Attachment D, Contact Handled Waste Repackaging Data Form, for the container that waste will be deposited into.

NOTE: If waste was previously packaged as RH waste in the HC, the Original Parent Container is the RH Concrete Cask Identification Number(s) that the RH Container was generated from.

5.2.6 IF repackaging PIs from a previously repackaged container (i.e., grand-daughter),
THEN document the original parent container number and associated waste stream in Section 1 of the Attachment D, Contact Handled Waste Repackaging Data Form.

5.2.7 IF repackaging large component waste into a box,
THEN request Radiological Engineering to determine if material is acceptable to be containerized.

5.2.8 IF size reducing hazardous waste to fit into outgoing container,
THEN initiate Attachment R, Size Reduction Inspection Log Sheet, of CM-P-EN-013, Environmental Permits and Compliance.

5.2.9 If safe to do so, ensure sharp or heavy objects are blocked, braced, or packaged as necessary to provide puncture protection for the waste container.

5.2.10 Document the applicable data in Section 2, Waste Package Data, of the Attachment D, Contact Handled Waste Repackaging Data Form, for each waste item:

- Item Number (in sequential order)
- Waste Item Description (provide a detailed description of the item or contents of the waste package, and as applicable, details pertaining to the processing or remediation of PIs, including any discrepancies or variances in the identification of PIs, or in the final disposition of PIs)

5.2.11 IF documenting drum puck data in Section 2, Waste Package Data, of the Attachment D, Contact Handled Waste Repackaging Data Form, THEN select the drum puck material type (i.e., carbon or stainless steel) and include the size and container number of the puck drum in the description.

NOTE: Some waste streams contain waste containers which are also from different time periods or for other reasons, may be required to be maintained segregated during waste repackaging. Approval is required from the AKE prior to co-mingling waste from multiple containers into a single container. Waste from different waste streams cannot be co-mingled.

5.2.12 IF necessary to co-mingle waste from two or more parent containers into the same daughter drum,
THEN notify the AKE for approval to co-mingle waste in a daughter drum and document approval from AKE in Section 3, Comments, of Attachment D, Contact Handled Waste Repackaging Data Form.

5.2.13 Place compliant waste items and material into approved daughter waste container(s).

5.2.14 IF processing waste from a CH drum or box,
THEN record the container identification number for the daughter waste container in which waste is deposited into on the applicable attachment:

- Attachment F, Incoming Container Traveler File Cover Sheet, from CH-UET-OP-001, Receipt of Contact Handled Solid Waste,

OR

- Attachment D, Waste Container Traveler File Coversheet, of CH-REF-OP-011, Drum Bag In / Bag Out, for previously repackaged containers.

5.2.15 IF waste processing is completed for the waste container or if directed to close out the container by the Floor Supervisor,
THEN sign and date the bottom of the applicable, completed Section 2 Waste Package Data Form.

5.2.16 IF the current Section 2 Waste Package Data sheet is filled,

OR

- waste processing is stopped for the day and is to be resumed on another day,

OR

- the Waste Repackaging Operator documenting the waste repackaging is to be replaced,

THEN sign and date the bottom of the applicable completed Section 2 Waste Package Data sheet.

5.2.17 IF waste processing is to be resumed,
THEN go to Step 5.2.3 and obtain a new Section 2, Waste Package Data sheet.

NOTE: Waste streams cannot be mixed, however, different matrices within a waste stream may be mixed.

5.3 Processing Multiple Waste Matrices

5.3.1 IF multiple waste matrices (e.g., soils and debris) are encountered,
THEN perform the following:

5.3.1.1 Notify the Floor Supervisor and the Process Superintendent.

5.3.1.2 Contact the WCO, Waste Management personnel, and AKE for guidance on processing multiple waste matrices.

NOTE: Low Level Waste Project PIs are listed in Attachment E, MLLW/LLW Prohibited Items. Waste Isolation Pilot Plant PIs are listed in Attachment B, WIPP Prohibited Items.

5.4 Processing Previously Unidentified Prohibited Items

5.4.1 IF a PI not previously identified is discovered,
THEN contact the Floor Supervisor or SS.

NOTE: PIs may be placed in an empty tray, labeled and staged in a specific area within the GB/BBA/HC/CPE, or placed into a specific container designated to receive PIs. PIs which are sleeved out or transferred out of the GB/BBA/HC/CPE, may be placed in intermediate containers such as bags, bottles, or paint cans, however, the PI and intermediate containers must be staged in a minimum 55 gallon drum or .21 m^3 container.

5.4.1.1 Segregate the PI(s), by waste stream, into a separate tray or area away from other compliant waste, and clearly label as appropriate while waiting for dispositioning (station, originating drum container identification number, etc.).

NOTE 1: Processing of remaining compliant waste for the container may continue while performing the following steps.

NOTE 2: Some PIs are identified in following sections with standard instructions for processing. Remaining PIs may be processed as directed in the applicable approved OPIP or WNCR, and the remainder of this subsection.

5.4.2 IF the PI is discovered during repackaging and the identified PI is discussed in Subsections 5.5 through 5.13,
THEN go to the applicable subsection to continue processing the PI.

5.4.3 IF the PI is discovered during repackaging and the identified PI is not approved or discussed in Subsections 5.5 through 5.13,
THEN perform the following:

5.4.3.1 Contact the EPM and the AKE to characterize and provide a disposition path for the PI.

NOTE: The EPM and the AKE document PI characterization and recommended disposition path as applicable on the Attachment F, Uncharacterized Waste Guidance.

5.4.3.2 Document PI characterization and recommended disposition path on Attachment F, Uncharacterized Waste Guidance, as applicable.

5.4.3.3 Contact Waste Management or Data Entry personnel to initiate an OPIP in accordance with CH-REF-OP-044, Operations Prohibited Item Processing, or WNCR in accordance with CH-P-AD-044, Waste Corrective Action and Nonconformances, as applicable.

5.4.4 Once the OPIP report or WNCR has been reviewed and approved, process PIs in accordance with the approved OPIP report or WNCR or as directed by Floor Supervisor or SS.

5.4.4.1 Sign Attachment F, Uncharacterized Waste Guidance, indicating the PI was processed per the recommended disposition.

NOTE: Absorbent materials such as Nochar, Quick Solid, Solidasorb, kitty litter, vermiculite, or other approved absorbents which are found in a container are assumed to have been used to absorb unknown or flammable liquids and shall be considered a wetted material and are typically processed similar to residual liquid waste. Absorbent materials (absorbed liquids) in containers which are transferred from the HC are also considered a wetted material. Waste material which has been exposed to or saturated with groundwater is considered a saturated waste. Wetted materials and saturated wastes are required to be processed in accordance with the following steps and requirements.

5.5 Processing Liquids or Wetted Material

5.5.1 IF discovered liquids are suspect PCB liquids,
THEN refer to Subsection 5.8.

NOTE: Container grounding or bonding requirements do not apply when transferring small quantities (≤ 1 liter) of flammable liquids (or liquids considered to be flammable) to small processing containers for processing in accordance with CH-REF-OP-014, Absorbing Liquids in the Glovebox and Box Breakdown Area, or RH-REF-OP-014, Liquids Handling in the Hot Cell, or RH-REF-OP-102, Liquids Handling in the Cask Processing Enclosure.

5.5.2 IF non-PCB free liquid, containerized liquid, absorbed liquid (wetted material), or groundwater saturated waste (saturated waste) is discovered, THEN perform the following:

5.5.2.1 Notify Waste Management or Data Entry personnel to initiate an OPIP report in accordance with CH-REF-OP-044, Operations Prohibited Items Processing, or WNCR in accordance with CH-P-AD-044, Waste Corrective Action and Nonconformances.

5.5.2.2 When approved, process the liquid, wetted, or saturated waste per the applicable OPIP or WNCR.

NOTE: Items or materials identified as non-compliant in CH-X-AD-001, Contact Handled Waste Acceptance Criteria, or potentially incompatible waste, may be discovered during processing in the GB, BBA, HC, or CPE. The SS is responsible to determine if non-compliant or potentially incompatible waste is safe to handle. These materials are segregated for disposition and possible return to the DOE - Oak Ridge.

5.6 Processing Non-Compliant or Potentially Incompatible Materials

5.6.1 Stop work and notify the Floor Supervisor and the SS.

5.6.2 Refer to CH-REF-OP-045, Non-Compliant Containers, for guidance on dispositioning and handling of non-compliant material.

5.6.3 When approved, process waste as directed by the WNCR.

NOTE: Capped pipe nipples, capsules, or 2R type containers discovered in waste containers may have been used as small strong-tight sealable containers and may conceal high hazard waste items or materials. Concealed materials may present additional uncontrolled hazards to the worker.

5.7 Processing Capped Pipe Nipples/Capsules/2R Type Containers

NOTE: Processing of remaining compliant waste for the container may continue while performing the following steps in this section.

5.7.1 IF capped pipe nipples, capsules, or 2R type containers are discovered in the GB, BBA, or CPE,
THEN perform the following:

5.7.1.1 Request Radiological Control Technicians (RCTs) to obtain dose rates of the capped/sealed pipe nipple or 2R type container and document on a survey form.

5.7.1.2 IF > 200 mr/hr through drum lid,
THEN go to Subsection 5.11.

5.7.1.3 IF < 200 mr/hr through drum lid,
THEN attempt to remove the cap(s) using hands only.

5.7.2 IF the cap(s) are removable by hand (i.e., loose or not sealed),
THEN verify no prohibited items are concealed within.

5.7.2.1 IF no prohibited items are concealed within,
THEN log on Attachment D, Contact Handled Waste Repackaging Data Form (e.g., no prohibited items within, empty), reinstall the lid and process the item as typical waste material.

5.7.3 IF the cap(s) are NOT removable by hand (i.e., sealed),
THEN segregate the item into a designated hold area within the GB, BBA, or CPE.

NOTE: Processing of remaining compliant waste for the container may continue while performing the following steps in this section.

5.7.3.1 If available, review Real-Time Radiography (RTR) documentation for the parent container to determine if the capped/sealed pipe nipple, capsule, or 2R type container is impenetrable to RTR or is identified to contain liquids or other PI.

5.7.3.2 IF the capped/sealed pipe nipple, capsule, or 2R type container is confirmed to not contain liquids or other PI,
THEN re-introduce the item into a daughter waste drum being repackaged from the same waste stream that the item came from.

5.7.3.3 IF the capped/sealed pipe nipple, capsule, or 2R type container is confirmed to contain liquids or other PIs,
THEN segregate the item into a designated hold area within the GB, BBA, HC, or CPE.

NOTE: The AKE reviews RTR documentation, if available, and documents PI characterization and recommended disposition path as applicable on the Attachment F, Uncharacterized Waste Guidance.

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5.7.3.3.1 Contact the SS, ~~OM~~, Director of Operations, Waste Management personnel, and AKE of the hold disposition. DS DK 6-18-15

5.7.3.3.2 Notify Waste Management or Data Entry personnel to initiate an OPIP report in accordance with CH-REF-OP-044, Operations Prohibited Items Processing, or a WNCR in accordance with CH-P-AD-044, Waste Corrective Action and Nonconformances for the identified PI.

5.7.3.3.3 The AKE documents PI characterization and recommended disposition path as applicable on the Attachment F, Uncharacterized Waste Guidance.

5.7.3.3.4 When approved, process the capped/sealed pipe nipple, capsule, or 2R type container and internal PI as directed by the applicable OPIP, WNCR, or Attachment F, Uncharacterized Waste Guidance.

5.7.3.3.5 IF the PI was processed in accordance with recommended disposition path on an Attachment F, Uncharacterized Waste Guidance,
THEN sign the applicable Attachment F, Uncharacterized Waste Guidance, indicating the PI was processed per the recommended disposition.

5.7.4 IF capped pipe nipples, capsules, or 2R type containers are discovered in the HC,
THEN remove the cap(s).

5.7.5 Ensure the pipe nipple, capsule, or 2R type container is not shielded or obstructed by potentially impenetrable material (steel or lead blocks).

NOTE 1: Daughter containers generated from parent containers designated as containing PCB waste are labeled as PCB waste containers. Waste Management may direct Operations to remove PCB labels after subsequent reviews or characterization of these containers. Labels shall include the out-of-service date in permanent marker. The Hazardous Waste Accumulation Start Date should be used as out-of-service date unless otherwise specified.

NOTE 2: PCB PIs are listed in Attachment G, PCB Prohibited Items. PCB Bulk Product examples are listed in Attachment H, PCB Waste Acceptable for Disposal. PCB Bulk Product items are acceptable for disposal.

5.8 Processing Polychlorinated Biphenyl Waste

5.8.1 IF during repackaging, PCB (known or suspect) materials, containerized PCB liquids or an item that potentially contains PCB liquids (i.e., gearbox, vacuum pump, etc.), are discovered in parent containers,
THEN perform the following:

5.8.1.1 Do not open the PCB container or absorb the containerized PCB liquids.

NOTE: The EPM and the AKE document PI characterization and recommended disposition path as applicable on the Attachment F, Uncharacterized Waste Guidance.

5.8.1.2 Notify the Floor Supervisor, AKE, EPM, and Waste Management personnel.

5.8.1.3 Notify Waste Management or Data Entry personnel to initiate an OPIP in accordance with CH-REF-OP-044, Operations Prohibited Item Processing, or WNCR in accordance with CH-P-AD-044, Waste Corrective Action and Nonconformances.

5.8.1.4 Document processing guidance and labeling requirements on Attachment F, Uncharacterized Waste Guidance.

5.8.1.5 When approved, process the PCB waste per the OPIP or WNCR.

5.8.1.6 Sign the Attachment F, Uncharacterized Waste Guidance, indicating the PI was processed per recommended disposition.

5.8.2 IF during repackaging, uncontainerized PCB liquid wastes (known or suspect) are discovered,
THEN perform the following:

5.8.2.1 Minimize spread of liquids and isolate potential PCB contaminated waste, containers or equipment.

5.8.2.2 Absorb the uncontainerized liquid wastes with Nochar or equivalent.

NOTE: The EPM and the AKE document PI characterization and recommended disposition path on Attachment F, Uncharacterized Waste Guidance.

5.8.2.3 Stop waste processing in the area, and notify the AKE, EPM, or Waste Management personnel for assistance in determining spread of PCB contamination and labeling requirements.

5.8.2.4 Document determination of PCB contamination spread and labeling requirements on Attachment F, Uncharacterized Waste Guidance.

NOTE: PCB contamination of the process area is remediated in accordance with CH-REF-OP-027, PCB Decontamination, for the GB and BBA.

5.8.2.5 IF the process area was contaminated and remediated,
THEN segregate and package decontamination materials as PCB waste in accordance with Attachment F, Uncharacterized Waste Guidance.

5.8.2.5.1 Document details of PCB contaminated material on Attachment D, Contact Handled Waste Repackaging Data Form.

5.8.2.6 Sign Attachment F, Uncharacterized Waste Guidance, indicating the PI was processed per recommended disposition.

NOTE: Potentially pressurized containers are segregated and containerized for processing at off-site facilities. These items may be placed into containers at a GB, BBA, or CPE Drum Out port, or sleeved out of the GB/BBA or CPE or HC for transfer to an appropriate container in Room 231 of the Process Building.

5.9 Processing Potentially Pressurized Container

5.9.1 IF a potentially pressurized container is discovered,
THEN inspect the container for being potentially pressurized (hole can be seen).

5.9.2 IF the container is not potentially pressurized,
THEN make it easily identifiable to Nondestructive Examination that it is not pressurized (e.g., cut in half, object inserted through hole)
AND document using appropriate descriptive narrative with words such as "not pressurized, cut in half, object inserted through hole etc..." in Section 2 of Attachment D, Contact Handled Waste Repackaging Data Form.

5.9.3 IF the container is potentially pressurized (no holes visible),
THEN notify Floor Supervisor of the potentially pressurized container.

5.9.3.1 Notify Waste Management or Data Entry personnel to initiate an OPIP in accordance with CH-REF-OP-044, Operations Prohibited Item Processing, or WNCR in accordance with CH-P-AD-044, Waste Corrective Action and Nonconformances.

5.9.3.2 Process the potentially pressurized container per the OPIP or WNCR.

NOTE 1: During waste processing, material identified as suspect ACM may be encountered. Waste Management will make a determination of whether or not the material is "Regulated ACM." ACM identified as "Regulated" must be processed in accordance with the NNSS WAC to ensure disposal site acceptance if the waste is later determined to be low level. The following guidelines are to be followed anytime suspect ACM is encountered.

NOTE 2: Non-regulated ACM is processed as normal CH Waste.

NOTE 3: Size reduction activities require ACM to be managed as Regulated Asbestos Waste.

NOTE 4: Waste Management and the EPM document PI ACM determination and recommended disposition path on Attachment F, Uncharacterized Waste Guidance.

5.10 Processing Asbestos Containing Material Waste

5.10.1 IF processing suspect ACM,
THEN perform the following:

5.10.1.1 Notify the Floor Supervisor
AND do not disturb the suspect ACM.

5.10.1.2 Notify AKE, EPM, and Waste Management personnel.

5.10.1.3 Document the ACM determination on Attachment F, Uncharacterized Waste Guidance.

5.10.1.4 IF deemed regulated ACM,
THEN notify Waste Management or Data Entry personnel to initiate an OPIP in accordance with CH-REF-OP-044, Operations Prohibited Item Processing, or WNCR in accordance with CH-P-AD-044, Waste Corrective Action and Nonconformances.

5.10.1.4.1 When approved, process the ACM per the OPIP or WNCR.

5.10.1.4.2 When ACM processing is complete, perform wipe down of the work area as directed by supervision.

5.10.2 Sign Attachment F, Uncharacterized Waste Guidance, indicating the ACM was processed per recommended disposition.

5.10.3 Place an ACM label on the Container Traveler for the container that the ACM was repackaged into.

NOTE 1: This subsection does not apply to RH Waste processing in the HC.

NOTE 2: During waste processing in the GB, BBA or CPE, waste items may be discovered with contact dose rates of greater than 200 mr/hr. These items may result in failing CH waste packaging criteria.

5.11 Processing Waste Items Greater than 200mr/hr in the GB, BBA or CPE

5.11.1 IF a waste item is discovered to have contact dose rates of greater than 200mr/hr,
THEN request RCTs to document survey results.

5.11.2 IF loading waste directly into a macro-box,
THEN perform the following:

5.11.2.1 Place the high dose item as close as reasonably achievable to the center of the box.

5.11.2.2 Block and brace the item with the remaining compliant waste or foam.

5.11.2.3 Proceed to Step 5.11.6.

5.11.3 Request RCTs to survey the high dose item against a drum lid or section of drum material (or other panel representative of drum material).

5.11.4 IF the total dose rate on the opposite side of the lid or panel exceeds 200mr/hr at any point on the lid or panel surface,
THEN document survey results on Attachment J, High Dose Drum Data.

5.11.4.1 Proceed to Substep 5.11.7.3.

5.11.5 IF the total dose rate of the container does not exceed 200mr/hr at any point on the lid or panel surface,
THEN place the high dose item as close as reasonably achievable to the side of the container.

5.11.6 Request RCTs to survey the container to determine if the total dose rate of the container exceeds 200mr/hr at any point on the container surface and document survey results.

5.11.7 IF the total dose rate of the container exceeds 200mr/hr at any point on the container surface,
THEN perform the following:

5.11.7.1 Pull the high dose rate item out of the container and segregate the item into a designated hold area within the GB, BBA or CPE.

5.11.7.2 Contact the Floor Supervisor and the SS of the high dose rate item hold disposition.

5.11.7.3 Request RCT to survey the item using ¼" stainless steel shielding AND document survey results on Attachment J, High Dose Drum Data.

5.11.7.4 Notify AKE to document recommended disposition path on Attachment F, Uncharacterized Waste Guidance.

5.11.7.5 Notify Waste Management or Data Entry personnel to initiate a WNCR in accordance with CH-P-AD-044, Waste Corrective Action and Nonconformances.

5.11.7.6 Process the high dose item as directed by the WNCR or as directed by the recommended disposition path on Attachment F, Uncharacterized Waste Guidance.

5.12 Processing Batteries

5.12.1 IF the battery type cannot be determined
OR a lithium battery (any size) is discovered,
THEN perform the following:

5.12.1.1 Contact the AKE and EPM for assistance.

NOTE: The AKE or EPM document PI characterization and recommended disposition path as applicable on the Attachment F, Uncharacterized Waste Guidance.

5.12.1.2 Document the battery determination and recommended disposition path on Attachment F, Uncharacterized Waste Guidance.

5.12.1.3 Process the battery per the recommended disposition path as instructed on Attachment F, Uncharacterized Waste Guidance.

5.12.1.4 Sign Attachment F, Uncharacterized Waste Guidance, indicating the battery was processed per recommended disposition.

5.12.2 Document a detailed description of the battery on Attachment D, Contact Handled Waste Repackaging Data Form, including quantity, size (e.g., 9-volt or D or C or A or AA or AAA, etc.), and type (e.g., alkaline, nickel-cadmium, lithium, etc.).

NOTE: Potentially Energetic Material include materials which may have reactive, shock sensitive, explosive, or pyrophoric characteristics.

5.13 Processing Potentially Energetic Material

5.13.1 IF potentially energetic material is found,
THEN stop work in the affected process area and notify the Floor Supervisor and the SS.

5.13.1.1 Notify the Energetic Material Subject Matter Expert to review the potentially energetic material.

NOTE: The Energetic Material Subject Matter Expert reviews available waste documentation to determine if a material is energetic and provides guidance for the safe handling and recommended disposition path of energetic material. The Energetic Materials Subject Matter Expert documents safe handling guidance and recommended disposition path for energetic material on Attachment B, Field Evaluation of Potentially Energetic Materials Form, of CM-P-WP-016, Energetic Materials Management. A separate procedure may be developed specifically for processing the energetic material.

5.13.1.2 IF the material is determined to be not-energetic material,
THEN process the material as normal waste.

5.13.1.3 IF the material is determined to be energetic material,
THEN perform the following:

5.13.1.3.1 Notify Waste Management or Data Entry personnel to initiate a WNCR in accordance with CH-P-AD-044, Waste Corrective Action and Nonconformances.

5.13.1.3.2 Process the energetic material in accordance with the Attachment B, Field Evaluation of Potentially Energetic Materials Form, of CM-P-WP-016, Energetic Materials Management, or WNCR.

NOTE: Parent Container Close Out for RH casks is performed in accordance with RH-UET-OP-002, Hot Cell Operations.

5.14 Parent Container Close Out

5.14.1 IF the waste container has been emptied,
THEN visually inspect the remaining container internal surfaces for loose or excess residue and wipe out container internals, if necessary, to ensure residual material quantity is less than one of the following:

- If container is less than or equal to 119 gallons in size, quantity of residuals is less than or equal to 1 in. or 3% of container volume (non-liquid).
- If container is greater than 119 gallons in size, quantity residuals is less than 0.3% of container volume (boxes and casks).

5.14.1.1 IF there are questions regarding RCRA empty determination, THEN contact the EPM to verify container is RCRA empty.

5.14.1.2 Document verification that container is RCRA empty:

- on page 2 of Attachment F, Incoming Container Traveler File Cover Sheet, of CH-UET-OP-001, Receipt of Contact Handled Solid Waste,

OR

- in the Comments section on Attachment D, Waste Container Traveler File Cover Sheet, of CH-REF-OP-011, Drum Bag In / Bag Out, for previously repackaged containers.

NOTE 1: For containers with inner liners - If a box, cask or drum containing PCB waste has an inner liner, the box, cask, or drum is not a PCB container and requires no further action.

NOTE 2: For containers without inner liners - If a box, cask or drum has segregated PCB waste (i.e., individually bagged, closed paint can, etc.), the container is not a PCB container and requires no further action.

NOTE 3: Drums designated as PCB containers cannot be compacted and should be overpacked.

5.14.2 IF an unlined box or drum contained unsegregated PCB waste, THEN contact EPM and Waste Management personnel to make a PCB container determination.

5.14.2.1.1 Document the PCB container determination on:

- Attachment D, Contact Handled Waste Repackaging Data Form, for the overpack container the container is deposited into

OR

- the applicable Incoming Container Traveler Cover Sheet, if the empty container is to be removed from the BBA intact.

5.14.2.1.2 IF containers are determined not to be PCB containers, THEN remove or deface existing PCB labels on the container and traveler.

NOTE: An "MT" designator in the container identification number implies a RCRA Empty designation.

5.14.2.2 Notify the Inventory Coordinator that the parent container is RCRA empty.

NOTE: Empty containers may be removed from the BBA intact or size reduced for disposal as waste. Transfer or size reducing of the empty container may be performed at any time as directed by the Floor Supervisor.

5.14.3 IF directed by the Floor Supervisor to remove an empty container from the BBA,
THEN perform the following:

5.14.3.1 Ensure characterization surveys are performed on the empty container.

5.14.3.2 Transfer the container from the BBA in accordance with CH-UET-OP-003, Box Breakdown Area Operations.

5.14.4 Notify the Inventory Coordinator of the closed out container number and the container number(s) that the waste was deposited into.

5.14.5 Forward the Container Traveler File to the Floor Supervisor for final review and distribution.

NOTE 1: The Floor Supervisor is responsible to complete a review of the Container Traveler File to ensure that all required documents are included in the file (including objective evidence of the original parent and waste stream number), that applicable documents are completed thoroughly and accurately, and to forward the completed Container Traveler File to Data Entry personnel.

NOTE 2: Subsection 5.15 may be performed before, during, or after drum out activities in accordance with Subsection 5.16.

5.15 Daughter Container Close Out

5.15.1 WHEN the waste container is FULL,
OR the waste container is selected to be closed out,
THEN document the data listed below for the Output Waste Container in Section 1 of Attachment D, Contact Handled Waste Repackaging Data Form:

NOTE: Containers repackaged in the BBA may contain both heterogeneous debris (Matrix Code S5400) and soil (Matrix Code S4100) resulting in waste material which does not match the documented waste stream description for the parent container. The "NO" box is checked on Attachment D, Contact Handled Waste Repackaging Data Form, if the daughter drum contains > 50% of waste that does not match the parent containers waste stream description (matrix).

5.15.1.1 Document "NO" or "YES," to indicate if the physical waste form is consistent with the assigned Waste Stream Description and RCRA characterization.

5.15.1.2 IF "NO" is checked,
THEN initiate a Nonconformance Report in accordance with CH-P-AD-044, Waste Corrective Action and Nonconformances.

5.15.1.3 Document "NO" or "YES," to indicate if sharp or heavy objects are blocked, braced, or packaged to provide puncture protection for the waste container.

NOTE 1: The Volume Utilization Percentage (or container fill level) (VUP) of the container is based on the highest level of the bulk of the waste. Items (e.g., pipe, scrap angle, plastic bags) which protrude above the bulk of the waste are NOT to be included in the VUP determination. The VUP is to be documented in five-percent increments (e.g., 35%, 40%, 45%). Maximum fill VUP is targeted.

NOTE 2: Certain items may be "not applicable" if preparing or processing waste into a box or macro-encapsulation container. For example, boxes do not utilize bag liners, therefore thickness of liner bag and bag liner description are not applicable. Forms may be annotated as N/A accordingly, when applicable.

5.15.1.4 Estimate and document the VUP.

5.15.1.5 Document the number of Container Liners used (may be N/A).

5.15.1.6 Document the closure method for the container liner (may be N/A).

5.15.1.7 Document the number of Inner Bags (may be N/A).

5.15.1.8 Document "NO" or "YES," to verify that no inner packages are heat sealed (may be N/A).

5.15.1.9 Document the Layers of Confinement (number of layers) (may be N/A).

5.15.1.10 Document the following from Attachment B, Waste Container Traveler, of CH-REF-OP-011, Drum Bag In/Bag Out:

- Filter torque wrench serial number
- Calibration due date
- Filter model number
- Serial number
- Torque value

5.15.2 Number the individual data page(s) in the upper right hand corner of each Section 2 Waste Package Data sheet used for a container and indicate the total number of data pages used.

NOTE: Final comments should include any information of prohibited items remediation/disposition (e.g., only residual liquid found added no-char, "prohibited item" sleeved out and placed in PI drum).

5.15.3 Ensure the examination date and final comments realized during waste examination and re-packaging are documented in Section 3 of the Attachment D, Contact Handled Waste Repackaging Data Form.

5.15.4 IF waste is processed per an associated OPIP,
THEN record the OPIP Number and describe any deviances, if any, in Section 3 of Attachment D, Contact Handled Waste Repackaging Data Form.

5.15.5 IF waste is processed per an associated WNCR,
THEN record the WNCR Number and describe any deviances, if any, in Section 3 of Attachment D, Contact Handled Waste Repackaging Data Form.

NOTE 1: The WPV verifies completion of remediation of PI and closes out the OPIP by signing and dating Attachment B, Operations Prohibited Item Processing (OPIP), of CH-REF-OP-044, Operations Prohibited Item Processing.

NOTE 2: The WPV performs the following step.

5.15.6 IF remediation of the PI is verified complete,
THEN sign and date Attachment B, Operations Prohibited Item Processing (OPIP), of CH-REF-OP-044, Operations Prohibited Item Processing.

5.15.7 IF any PIs were dispositioned,
THEN notify the Inventory Coordinator of final packaging of PIs.

NOTE 1: A container may be moved to a BBA airlock or out of the BBA to complete closure at any time during this closeout procedure, in accordance with CH-UET-OP-003, Box Breakdown Area Operations. This subsection does not apply to macro-boxes.

NOTE 2: Containers may be designated for removal at the discretion of the Floor Supervisor, as needed to accommodate waste processing criteria and schedules.

5.16 Filled Container Removal

5.16.1 IF a waste container has been filled,
OR is otherwise designated for removal from a GB Drum Out Port,
THEN refer to CH-REF-OP-011, Drum Bag In / Bag Out, to change out waste containers.

5.16.2 If a waste container has been filled,
OR is otherwise designated for removal from the BBA via airlocks,
THEN refer to CH-REF-OP-011, Drum Bag In / Bag Out.

5.16.3 IF a waste container has been filled,
OR is otherwise designated for removal from the HC,
THEN refer to RH-REF-OP-003, Remote Handled Drum In/Out Operations, to change out waste containers.

5.16.4 IF a waste container has been filled,
OR is otherwise designated for removal from a CPE Drum Out Port,
THEN refer to RH-REF-OP-104, Cask Processing Enclosure Drum In / Drum Out, to change out waste containers.

NOTE 1: The signatures of the Waste Repackaging Operator and Contact Handled Waste Repackaging Data Form Reviewer indicate that the physical waste processing is complete and documented as required.

NOTE 2: Approval of the Attachment D, Contact Handled Waste Repackaging Data Forms, may be completed after the drum is staged in Room 231 of the Process Building.

5.17 Approval

NOTE: The Waste Repackaging Operator performs the following step.

5.17.1 Print name, sign and date in Section 4, of the Attachment D, Contact Handled Waste Repackaging Data Form, to annotate that the Waste Repackaging process has been completed.

5.17.2 Forward the Attachment D, Contact Handled Waste Repackaging Data Form, to a Waste Repackaging Data Form Reviewer.

5.17.2.1 Review the Attachment D, Contact Handled Waste Repackaging Data Form, set for completeness and accuracy.

5.17.2.2 IF any discrepancies are found,
THEN return the Attachment D, Contact Handled Waste Repackaging Data Form to the applicable Waste Repackaging Operator for review and correction.

5.17.2.3 Print name, sign and date to annotate that the Attachment D, Contact Handled Waste Repackaging Data Form review has been completed.

5.17.3 Forward the Waste Container Traveler to the WPV.

NOTE: The WPV verifies that the Waste Stream Identification is consistent as assigned to the original parent container and that objective evidence is included in the Waste Container Traveler.

5.17.3.1 Print, sign, and date to annotate Attachment D, Contact Handled Waste Repackaging Data Form, that the Waste Stream Identification Number review has been completed.

5.17.4 Ensure the completed Attachment D, Contact Handled Waste Repackaging Data Form, is in the Waste Container Traveler Folder for the applicable container.

5.17.5 Forward the Waste or Macro-Encapsulation Container Traveler File folder to the Floor Supervisor.

6.0 RECORDS

Records are identified, classified, and maintained in accordance with CM-P-AD-049, Records Management, and CM-X-AD-026, Records Inventory and Disposition Schedule.

6.1 Record Numbering

Record	Record Naming Convention
Att. D	No specific code. File with Waste Container Traveler.
Att. F	UWG-########## where UWG = Record Code; ########## = Waste Container Number (e.g., UWG-0402967G)
Att. J	No specific code. File with Attachment F.

6.2 Records Inventory and Disposition Schedule

Records generated from this document are:

Record	Retention Period	Class	Record Type	Disposition Location	File Index Loc.	Media Type	OUO	Vital		Other File Loc.
								L&F	EO	
Attachment D, Contact Handled Waste Repackaging Data Form	LOP+30	Record	COMFOR	7880W-DCRM	18.4	EP	N/A	N/A	N/A	N/A
Attachment F, Uncharacterized Waste Guidance	LOP+30	Record	COMFOR	7880V	17.2	EP	N/A	N/A	N/A	18.4
Attachment J, High Dose Drum Data	LOP+30	Record	COMFOR	7880V	17.2	EP	N/A	N/A	N/A	Att. F, 18.4

COMFOR – Completed Form **EO** – Emergency Operating **EP** – Electronic and Paper **L&F** – Legal & Financial
LOP+30 – Life of Project + 30 years **OUO** – Official Use Only

7.0 ATTACHMENTS

Attachment A: Acronyms/Abbreviations, Definitions, References, and Reviewer Selection for Major Revisions

Attachment B: WIPP Prohibited Items

Attachment C: Layers of Confinement

Attachment D: Contact Handled Waste Repackaging Data Form

Attachment E: MLLW/LLW Prohibited Items

Attachment F: Uncharacterized Waste Guidance

Attachment G: PCB Prohibited Items

Attachment H: PCB Waste Acceptable for Disposal

Attachment I: Intentionally Left Blank

Attachment J: High Dose Drum Data

Attachment A: Acronyms/Abbreviations, Definitions, References, and Reviewer Selection for Major Revisions

Acronyms/Abbreviations

ACM – Asbestos Containing Material

AK – Acceptable Knowledge

AKE – Acceptable Knowledge Expert

BBA – Box Breakdown Area

CCP – Central Characterization Project

CH – Contact Handled

CPE – Cask Processing Enclosure

DOE – Department of Energy

EPM – Environmental Programs Manager

GB – Glovebox

HC – Hot Cell

NNSS – Nevada National Security Site

OM – Operations Manager

OPIP – Operations Prohibited Item Processing

PCB – Polychlorinated Biphenyl

PI – Prohibited Item

PK – Process Knowledge

RCRA – Resource Conservation and Recovery Act

RCT – Radiological Control Technician

RH – Remote Handled

RTR – Real Time Radiography

SS – Shift Superintendent

TRU – Transuranic

TWPC – TRU Waste Processing Center

VUP – Volume Utilization Percentage

WAC – Waste Acceptance Criteria

WCO – Waste Certification Official

WIPP – Waste Isolation Pilot Plant

WNCR – Waste Nonconformance Report

WPV – Waste Package Verifier

Attachment A: Acronyms/Abbreviations, Definitions, References, and Reviewer Selection for Major Revisions

Definitions

Disturb – Crush, crumble, pulverize, drill, grind, buff, cut, saw, strike, or break the materials down making fiber release likely.

Residual Liquids – Residual liquids (i.e., liquid droplets found on the inside of the containers or bags, heels of liquids, etc.) are not considered liquids or wetted materials.

Wetted Material – Absorbent materials such as Solidasorb, kitty litter, vermiculite, mop heads, or absorbent pads, which are found in a container are assumed to have been used to absorb unknown or flammable liquids.

Saturated Waste – Any waste in contact with groundwater.

Calibration Due Date – The date recorded on a tool or scale's sticker/label which indicates the date the tool or scale is NO longer in calibration.

Developmental References

DOE/NV-325, Nevada National Security Site Waste Acceptance Criteria

DOE/WIPP-02-3122, Contact-Handled Transuranic Waste Acceptance Criteria for the Waste Isolation Pilot Plant

CM-R-AD-001, Documented Safety Analysis

CM-X-AD-022, Technical Safety Requirements

Cross References

CCP-TP-500, Remote Handled Waste Visual Examination

CH-P-AD-044, Waste Corrective Action and Nonconformances

CH-REF-OP-011, Drum Bag In / Bag Out

CH-REF-OP-014, Absorbing Liquids in the Glovebox and Box Breakdown Area

CH-REF-OP-027, PCB Decontamination

CH-REF-OP-044, Operations Prohibited Items Processing

CH-REF-OP-045, Non-Compliant Containers

CH-UET-OP-001, Receipt of Contact Handled Solid Waste

CH-UET-OP-003, Box Breakdown Area Operations

CH-UET-OP-004, Glovebox Operations

CH-X-AD-001, Contact Handled Waste Acceptance Criteria

CM-P-EN-013, Environmental Permits and Compliance

CM-P-WP-016, Energetic Materials Management

RH-REF-OP-014, Liquids Handling in the Hot Cell

RH-REF-OP-102, Liquids Handling in the Cask Processing Enclosure

Attachment A: Acronyms/Abbreviations, Definitions, References, and Reviewer Selection for Major Revisions

Cross References
RH-REF-OP-104, Cask Processing Enclosure Drum In / Drum Out
RH-UET-OP-002, Hot Cell Operations
RH-REF-OP-003, Remote Handled Drum In/Out Operations

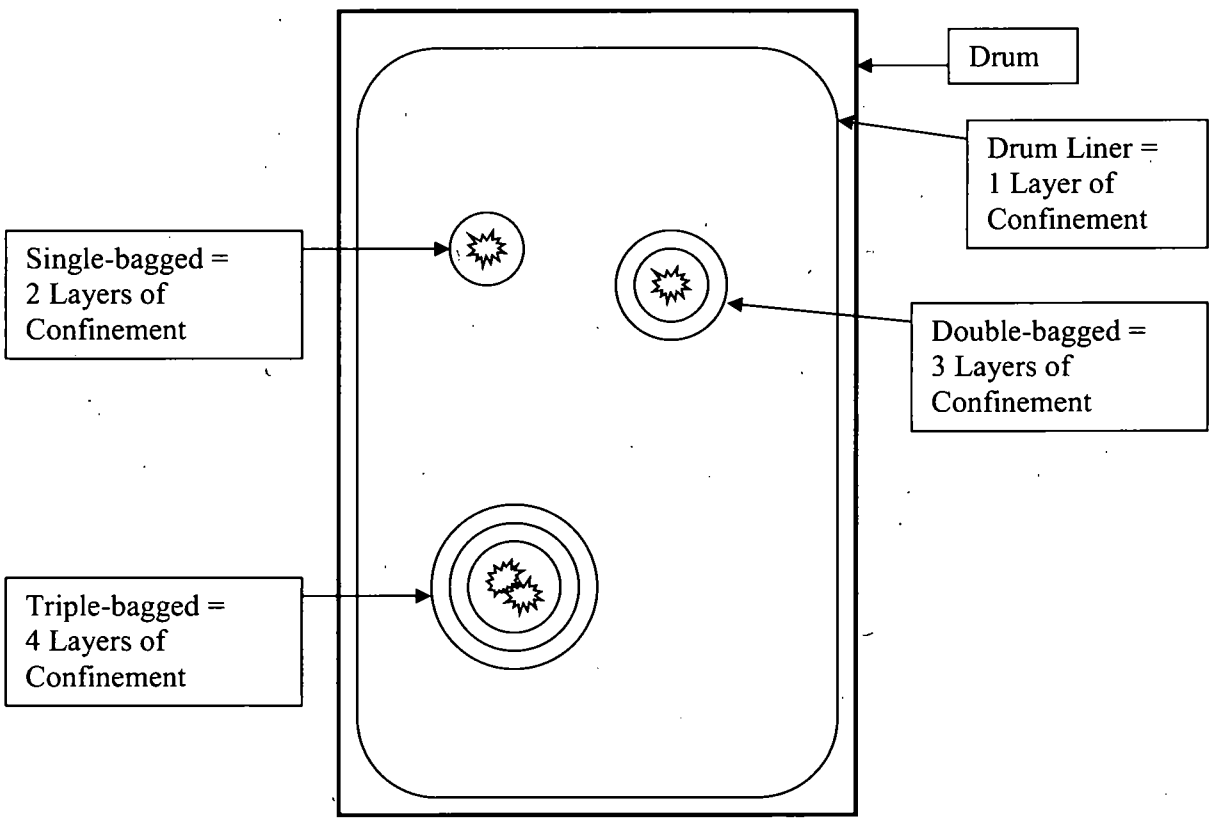
Reviewer Selection for Major Revisions	
Required	**Optional**
Operations Manager	Director of Operations
Peer Review Specialist	Environmental Programs Manager
CH Process Superintendent	Quality Assurance Manager
	Safety Authorization Basis Manager
	Radiological Control Manager
	Health and Safety Manager
	Waste Certification Official
	Nuclear Criticality Safety Manager
	Acceptable Knowledge Expert
	Facility Manager
	Shift Superintendent

Attachment B: WIPP Prohibited Items

LIST OF PROHIBITED ITEMS (PIs)
Liquid Wastes - (more than 1 inch or 2.5 centimeters of liquid in the bottom of the container and total residual liquid in any payload container (e.g., 55 gallon drum or standard waste box) may not exceed one percent volume of that container.)
Payload containers with U134 Waste shall contain no detectable liquid.
Non-radionuclide pyrophoric materials, such as elemental potassium
Non-mixed hazardous waste
Incompatible wastes - (Wastes that are incompatible with backfill, seal and panel closure materials, container and packaging materials, shipping container materials, and/or other wastes.)
Explosives
Compressed Gases/Pressurized containers (e.g., aerosol cans)
Wastes with Polychlorinated Biphenyls (PCBs) not authorized under an EPA PCB waste disposal authorization
Ignitables
Corrosives
Reactive waste
Sealed containers greater than 4 liters
Heat Sealed Bags (unvented) greater than 4 liters
Not readily identified material or items by real-time radiography (impenetrable)

Attachment C: Layers of Confinement

The TWPC typically limits containers to 4 layers of confinement, including a filtered drum liner. Inner packages may be single - double - or triple - bagged only. Inner packages typically are breached if closed by heat seal. Drum liner closure is accomplished using the twist and tape method. See diagram below.



Attachment D: Contact Handled Waste Repackaging Data Form

Page 1 of 3

Section 1: General Information

Examination Start Date: _____ **Repackaged as RH Waste** ☐ Yes ☐ No

Container Number: _____

Container Type: _____ **Thickness of Bag Liner:** _____ mil

Bag Liner Description: ☐ Non-Rigid ☐ Filtered Vent ☐ Poly
☐ Rigid ☐ Non-vented ☐ Other: _____

Waste Stream Identification #: _____

Physical waste form matches the assigned Waste Stream Description and RCRA characterization?
☐ NO ☐ YES

New Waste Stream Identification Number if assigned _____

Are sharp or heavy objects are blocked, braced, or packaged to provide puncture protection for the waste container? ☐ NO ☐ YES

Volume Utilization Percentage: _____ %

Number of Container Liners used: _____

Closure Method for Container Liner: _____

Number of Inner Bags: _____

Verified no inner packages are heat sealed? ☐ NO ☐ YES ☐ N/A

Number for Layers of Confinement: _____

Container Filter Data

Filter Torque Wrench **Filter Model No.** _____

Serial/ID No. _____ **Serial No.** _____

Calibration Due Date: _____ **Torque Value** _____

Drum Enclosure Data

Lid Ring Bolt Torque Wrench: _____ **Calibration Due Date:** _____

Manufacturer's Closure spec: _____

Source Container #:	Waste Stream #:	Original Parent Container #:	Waste Stream #:

Attachment D: Contact Handled Waste Repackaging Data Form

Page 2 of 3

Section 2: Waste Package Data			Data Page of
Container Number:		Examination Date:	
Item #	If Drum Puck, SS or CS	Waste Item Description	

Waste Repackaging Operator:			
	Print Name	Signature	Date

Attachment D: Contact Handled Waste Repackaging Data Form
Page 3 of 3

Section 3: Comments			
Container Number:		**Examination Date:**	
Waste repackaged in accordance with OPIP#			
Waste repackaged in accordance with WNCR#			
PCB Bulk Product Characterization:			

Section 4: Approvals		
Signature below signifies that waste in this container has been examined and documented as required.		
Waste Repackaging Operator:		
Print Name	Signature	Date
Waste Repackaging Data Form Reviewer:		
Print Name	Signature	Date
Signature below signifies that the Waste Stream Identification Number has been verified to be consistent with the original parent container and that objective evidence of the Waste Stream Identification Number is included in the applicable Waste Container Traveler.		
Waste Package Verifier:		
Print Name	Signature	Date

*File with Waste Container Traveler.

Attachment E: MLLW/LLW Prohibited Items

Page 1 of 2

Included is a comprehensive list of PIs derived from the Nevada National Security Site (NNSS) Waste Acceptance Criteria (WAC) and TRU Waste Processing Center (TWPC) Process Knowledge (PK) documents that lists items that might exist within the potential Mixed Low Level Waste (MLLW)/Low Level Waste (LLW) that is being evaluated for disposal at NNSS. The combination of these items is referred to as TWPC LLW Prohibited Items. These items, identified by the Real-Time Radiography (RTR) or visual inspection during waste repackaging are prohibited from disposal at NNSS or required additional processing or treatment prior to disposal.

The TWPC LLW PIs that can be characterized as individual discrete items that are readily identified by RTR for removal from MLLW/LLW Evaluation Program.

Non-conclusive RTR results or inability to qualify an item as not prohibited will result in the item being removed from LLW Evaluation Program.

TWPC LLW PIs include but are not limited to the following:

- Transuranic Waste – greater than 100 nCi/gm.
- Mercury – liquid form, such as switches, and thermometers (incidental or residual quantities of mercury absorbed with a mercury spill kit are exempt).
- Free Liquids:
  - LLW – free liquids shall be converted into a form that contains as little free-standing and noncorrosive liquid as is reasonably achievable. The free liquid shall not exceed 1 percent of the volume of the waste when the waste is in a disposal container; or 0.5 percent of the waste volume processed to a solidified form.
  - MLLW – free liquids shall be absorbed, stabilized, or otherwise removed from the waste. Containerized free liquids such as ampules, small articles that contain free liquids required for the article to function (e.g., batteries or capacitors), are acceptable.
- Particulates – waste that is known to be in a fine particulate form or in a form that could mechanically or chemically be transformed to a particulate during handling and interim storage must be immobilized or placed in secure packaging as defined by NNSS WAC.
- Gases – small sealed containers or cylinders within the waste matrix, aerosol cans which cannot be readily identified as empty and non-pressurized (i.e., punctured)
- Etiologic Agents – pathogens, infectious or other disease-causing
- Chelating Agents – ion exchange resin, zeolites, etc., greater than 1% by volume
- Polychlorinated Biphenyl(s) (PCBs) – See Attachment G, PCB Prohibited Items (only TSCA regulated PCBs as bulk product waste are acceptable).

Attachment E: MLLW/LLW Prohibited Items

Page 2 of 2

- Explosives – items capable of detonation or explosive decomposition or reaction
- Pyrophoric(s) – items capable of self ignition or flammability
- Sealed Sources – All sealed sources are prohibited (additional characterization and classification is required for disposal)
- Animal carcasses – animal carcasses or remains
- Beryllium Waste – elemental Beryllium, insoluble Beryllium compounds, Beryllium powder, or alloy
- Classified Waste – classified waste which requires protection from visual observation

Attachment F: Uncharacterized Waste Guidance

Record No: UWG-_____
(Container Number)

Initiation Date:
Parent Container ID#:
PI or daughter Container ID#, if applicable:
PI Description:
PI Characterization:
PI Regulatory Requirements:
PI Processing or Recommended Disposition Path:

Environmental Programs Personnel		
	Print / Sign Name	Date
AKE		
	Print / Sign Name	Date
Waste Operator **(PI processed per recommended disposition path)**		
	Print / Sign Name	Date
EPM		
	Print / Sign Name	Date

Original to Document Control.
Copy to associated WNCR or OPIP, if applicable.
Copy to Waste Container Traveler.

Attachment G: PCB Prohibited Items

PCB Articles (may contain liquids)	
1	Capacitors
2	Electric motors
3	Electric motors with capacitors
4	Pumps
5	Gear boxes
6	Pumps with gear boxes
7	Vacuum pumps
8	Piping associated with electric motor pumps or gear boxes
9	Transformers
PCB Liquids	
1	Oil/lubricants or grease in containers
2	Oil/lubricants or grease contained in PCB articles
3	Oil/lubricants or grease leaking from PCB articles

Attachment H: PCB Waste Acceptable for Disposal

PCB Bulk Product Waste (non liquid)	
1	Gaskets
2	Light ballasts
3	Paint
4	Painted surfaces
5	Plastic insulation from wiring (generator identified as PCB containing)

Attachment I: Intentionally Left Blank

Attachment J: High Dose Drum Data

Shift: _____ Name: _____ Date: _____

Barcode	Item Description	Gamma on contact	Gamma behind drum lid	Neutron at glove port or on contact	Shielded dose Gamma ¼" ss plate	Comments

Distribution: Original to AKE.
Keep with Attachment F, Uncharacterized Waste Guidance.
Copy to associated WNCR or OPIP, if applicable.
Copy to Waste Container Traveler.

DIVIDER PAGE

Attachment 3 - Acceptable Knowledge Source Document Summary

Site(s): Oak Ridge National Laboratory	Source Document Tracking Number: P255
Waste Stream Number(s): ORNL Non-specific Library Files (Applicable only when site library is not in use)	
Acceptable Knowledge Documentation Type: ☑ TRU Waste Management Program Information ☐ Waste Stream-Specific Information ☐ Additional Information	Category: ☐ Correspondence ☐ Discrepancy Resolution ☑ Internal Procedure ☐ Miscellaneous ☐ Published Document or Internal Procedure ☐ Unpublished Documents
Title or Description of Source Document [a] : Contact Handled Waste Acceptance Criteria	
Source Document Reference Information (author(s), document and revision number, date, publisher): NA, CH-X-AD-001, Rev. 26 (Older Versions Included), 06/15/2015, TWPC	

AK # [b]	Source Doc. Page #[c]	AK Information Summary
PR8	Throughout	This document established the Transuranic (TRU) Waste Processing Center (TWPC) Waste Acceptance Criteria (WAC) for the acceptance of Contact Handled (CH) waste at the TWPC for characterization and processing. The TWPC accepts radioactive wastes, that once fully characterized by the TWPC meets one of the following definitions: Contact Handled Waste - CH waste is less than 200mR/hr contact dose rate. Low Level Waste (LLW) - LLW contains at least a regulatory threshold concentration of radioactivity and is not classified as high-level waste, TRU waste or spent nuclear fuel or by product material. Test specimens of fissionable material irradiated for research and development only, and not for the production of power or plutonium may be classified as LLW provided the concentration of TRU is less than or equal to 100 nCi/g. Mixed Low Level Waste (MLLW) - MLLW is LLW that contains hazardous constituents as defined by the RCRA. All RCRA Hazardous Codes are acceptable for processing at TWPC. Transuranic (TRU) Waste - TRU waste contains more than 100 nCi of alpha-emitting TRU isotopes per gram of waste, with half-lives greater than 20 years, except for (1) high-level radioactive waste, (2) waste that the Secretary has determined, with the concurrence of the Administrator, does not need the degree of isolation required by the disposal regulations, or (3) waste that the Nuclear Regulatory Commission (NRC) has approved for disposal on a case-by-case basis in accordance with 10 CFR Part 61. Mixed Transuranic Waste - Mixed TRU waste is TRU waste that is also a hazardous waste as defined by the Hazardous Waste Act and 20.4.1.200 NMAC (incorporating 40 CFR § 261.3). All RCRA hazardous waste codes are acceptable for processing at TWPC. Section 6 discusses the Waste Acceptance Criteria, which includes discussions on the following: Radioactive Material Content Dose Limits Size/Volume of Waste Containers

CCP RECORDS ORIGINAL
DATE REC'D 2/9/16 mr

Attachment 3 - Acceptable Knowledge Source Document Summary (continued)

Site(s): Oak Ridge National Laboratory		Source Document Tracking Number: P255
AK # [b]	Source Doc. Page #[c]	AK Information Summary
		Loose Surface Contamination Waste Matrix Adequate AK/PK Waste Container Identification Waste Container Integrity Vented Containers Hazardous Wastes *Some or all of the following techniques are used to confirm that WAC are satisfied for individual* waste containers: Weighing Non-Destructive Assay Non-Destructive Examination Headspace Gas Sampling Waste containers or waste articles discovered to be non-compliant with this WAC shall be segregated from the waste stream as appropriate to maintain worker and public safety. The non-compliant condition shall be reported to DOE and Tennessee Department of Environment and Conservation, as appropriate. Disposition of non-compliant wastes shall be completed as promptly and safely as the DSA and permits require and may include return transfer to UCOR. There are no specific chemicals or compounds called out in the procedure. The original document number was T-CH-FW-X-AD-001, and was changed to CH-X-AD-001. The revision numbers for the document were not reset to zero, but continued with the numerical progression. T-CH-FW-X-AD-001: Revision 2 (Date on Approved Signature is 11/04/2005, but no Implementation Date is provided): Revision 2 is the first revision that bounds the population of unshipped containers (01/20/2006). Prior revisions were not included, so for the purposes of this summary, Revision 2 is the "initial issue," and changes to the document from Revision 1 could not be determined. Free Liquids: • No containerized/confined free liquids Non-compliant Hazardous Wastes: • Cadmium (D006), lead (D008), mercury (D009), and silver (D011) are the RCRA toxic characteristic metals acceptable for receipt and characterization at the Project. Other characteristic wastes or listed RCRA wastes are not acceptable. • Incoming containers shall not contain regulated concentrations of polychlorinated biphenyl (PCB) or other Toxic Substances Control Act of 1976 (TSCA)-regulated materials (e.g., ≥ 50 ppm PCBs and asbestos). • Incoming waste shall not be known to contain dangerous constituents such as explosives, pyrophorics, pressurized gases, etiologic agents, biological waste, or beryllium. Revision 3 (Dated 05/11/2006): Waste containers are authorized onto the Project for the purposes of verifying

Attachment 3 - Acceptable Knowledge Source Document Summary (continued)

Site(s): Oak Ridge National Laboratory		Source Document Tracking Number: P255
AK # [b]	Source Doc. Page #[c]	AK Information Summary
		Acceptable and Process Knowledge (AK/PK), characterization, packaging or repackaging. Accordingly, certain conditions or characteristics of the waste may not be known prior to receipt of wastes at the Project. Initial waste receipt and/or the conduct of other preliminary characterizations shall not be construed as unqualified acceptance of the waste or portions thereof. The Project reserves the right, in accordance with its contract, Memoranda of Understanding, permits, and approved DSA, to segregate and/or return to the DOE wastes determined at any point in the process to exhibit non-compliant characteristics. Incoming waste containers shall be identifiable as part of a waste stream for which adequate Acceptable Knowledge has been accumulated, reviewed, and summarized by the Project. Non-compliant Hazardous Wastes: • Characteristic and listed RCRA wastes other than F001, F002, F004, F005, D004, D005, D006, D007, D008, D009, D010, D011, and D022 are not acceptable and will not be authorized onto the Project. Revision 4 (Dated 06/22/2006): No substantive changes made in this revision related to TRU waste management. Revision 5 (Dated 10/19/2006): Free Liquids: • No containerized/confined free liquids greater than 1 percent of container volume are allowed for processing at the TWPC. CH-X-AD-001: Revision 6 (Date on Signature Approval is 09/19/2007, but no Implementation Date is provided): No substantive changes made in this revision related to TRU waste management. Revision 7 (Dated 10/11/2007): No substantive changes made in this revision related to TRU waste management. Revision PCN 7-1 (Dated 01/14/2008): Added D019 to list of acceptable RCRA codes. Revision 8 (Date on Approved Signature is 12/06/2007, but the Implementation Date is not provided): • All RCRA Hazardous Codes allowed. • Revised to remove the prohibition of allowing processing containers at TWPC with >1% liquids. Revision 9 (Dated 02/14/2008): Incoming waste containers shall be identifiable as part of a waste stream for which adequate AK/PK has been accumulated, reviewed, and summarized. Revision 10 (Dated 03/18/2008):

Attachment 3 - Acceptable Knowledge Source Document Summary (continued)

Site(s): Oak Ridge National Laboratory		Source Document Tracking Number: P255
AK # [b]	Source Doc. Page #[c]	AK Information Summary
		No substantive changes made in this revision related to TRU waste management. Revision 11 (Dated 05/12/2008): If the container is not on an approved AK/PK list, the containers may be approved on a case by case basis by the Acceptable Knowledge Expert/Process Knowledge Expert using generator documents, such as 2109 forms or other equivalent documents. Revise to allow for acceptance of soils. Revision 12 (Dated 12/08/2008): Revised to remove the prohibition of allowing processing containers at TWPC with pressurized gases. Revision 13 (Dated 05/08/2009): No substantive changes made in this revision related to TRU waste management. Revision 14 (Dated 10/15/2009): Revised to remove the prohibition of allowing processing containers at TWPC with regulated asbestos. Revision 15 (Dated 06/29/2010): No substantive changes made in this revision related to TRU waste management. Revision 16 (Dated 10/14/2010): Revise to allow for acceptance of homogenous solids. Revision 17 (Dated 04/27/2011): No substantive changes made in this revision related to TRU waste management. Revision 18 (Dated 08/09/2011): • Revised to remove the prohibition of allowing processing containers at TWPC with PCBs and asbestos. • Added beryllium exception for acceptance of sealed sources containing beryllium. Revision 19 (Dated 10/20/2011): No substantive changes made in this revision related to TRU waste management. Revision 20 (Dated 12/22/2011): No substantive changes made in this revision related to TRU waste management. Revision 21 (Dated 08/02/2012): No substantive changes made in this revision related to TRU waste management. Revision 22 (Dated 11/08/2012):

Attachment 3 - Acceptable Knowledge Source Document Summary (continued)

Site(s): Oak Ridge National Laboratory		Source Document Tracking Number: P255
AK # [b]	Source Doc. Page #[c]	AK Information Summary

No substantive changes made in this revision related to TRU waste management.

Revision 23 (Dated 04/22/2013):

No substantive changes made in this revision related to TRU waste management.

Revision 24 (Dated 07/22/2013):

No substantive changes made in this revision related to TRU waste management.

Revision 25 (Dated 08/29/2013):

No substantive changes made in this revision related to TRU waste management.

Revision PCN 25-1 (Dated 08/13/2014):

Handwritten change in Section 6.3: "Drums must have acceptable internal packaging configurations. Packaging configurations as described in CM-X-AD-053, Table 1, are not acceptable."

Handwritten change in Attachment A: Added the following reference: CM-X-AD-053, JCO for the PISA Involving a Potential DDT Hazard in 6M/2R Packaging.

Revision 26 (Dated 06/15/2015):

Revised to reference new limits established in DSA/TSR Rev 31. "Incoming waste containers shall not exceed 278 PE-Ci individually." The limit was changed from 309 PE-Ci.

Added reference to SAC 5.5.39.

This revision does not include any relevant changes to waste management from the previous revision.

Procedure verification/walk down was conducted by Jeff Harrison with Aaron Clements, Waste Acceptance/Transfer Lead, on 09/24/2015. Mr. Clements said generator data are compiled for evaluation against the WAC, and a checklist is completed. The procedure that implements this checklist completion is CH-REF-WP-001. Once accepted, containers are transferred from UCOR to the TWPC.

Attachment 3 - Acceptable Knowledge Source Document Summary (continued)

Site(s): Oak Ridge National Laboratory	Source Document Tracking Number: P255
Source Document Data Limitations (if any): 1. None.	
Acceptable Knowlege Expert: Travis Smith Date: 01/20/2016 Print /Sign	
[a] Provide description for non-titled information (i.e., container paperwork, MSDS sheets, etc) [b] Obtain from Acceptable Knowledge Documentation Checklist [c] For microfilm or microfiche, identify box, tape, reel number and location.	

Contact Handled Waste Acceptance Criteria

Implementation Date: 6/15/15

APPROVAL:

Fred Heacker
Director of Waste Management

Bi Dalley for

5/20/15
Date

~~Wastren Advantage, Inc.~~
~~TRU Project Controlled Distribution~~
Issued To: ~~#1264~~ Date: ~~09/09/2015~~

TD
9/24/2015

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Revision Summary

Revision	Change Summary
0 5	Initial Issue
6	Implement Criticality program.
7	Corrective Actions from IVR
8	Implement DSA/TSR Rev 15 changes
9	CH Clarifications to coincide with new RH WAC
10	Procedure updated to reflect corrections on PE Ci limit and removal of lid restraint requirement for overpack drums.
11	Document revised to allow for case by case acceptance of waste containers that are not on an approved AK/PK list and also to allow for waste containers that are classified as soil.
12	Revised to remove the prohibition of pressurized gases at TWPC.
13	Update for incoming previously processed drums
14	Revised to remove prohibition of regulated asbestos.
15	Revision to WAC required for DVS start-up and DSA/TSR Rev 19 and 20
16	Revise to allow for acceptance of homogenous solids
17	Update to be compliant with TSR/DSA Rev 22
18	Revised for updates and clarification on acceptance of PCBs, asbestos, and beryllium
19	Revised to add flexibility in accepting waste boxes that are outside of the Maximum Dimension requirements
20	Revised to remove wording from Section 7.5
21	Revised to add the ability to receive newly generated drums
22	Revise to allow overpacks that exceed 130 PE-Ci; to clarify receiving unvented drums; upped administrative dose
23	Revised to update the box size maximum dimensions
24	Revised to remove verbiage that allows for the use of drum lid restraints for receipt of unvented drums
25	Revised to remove permit number; editorial updates
26	Revised to reference new limits established in DSA/TSR Rev 31

Current Revision Specific Changes

Location	Description	Reason
6.1	Changed 309 to 278	DSA/TSR Rev 31
6.3	Added reference to SAC 5.5.39	DSA/TSR Rev 31

1.0 INTRODUCTION

1.1 Purpose

This document establishes the TRU Waste Processing Center (TWPC) Waste Acceptance Criteria (WAC) for the acceptance of Contact Handled (CH) waste (hereinafter, waste) at the TWPC for characterization and processing.

By establishing and implementing this WAC the TWPC:

- ensures the safe and compliant processing of contracted waste materials in accordance with the applicable permits and authorizations
- protects TWPC personnel, co-located workers, and the environment from chemical and radiological hazards associated with the contracted waste in compliance with applicable federal, state, and local laws and regulations

Subject to the terms and conditions of the contract, the TWPC accepts waste material for processing that meets this WAC. The WAC has been developed to capture the requirements of the TWPC permits, Documented Safety Analysis (DSA) and other requirements as determined applicable.

The TWPC revises the WAC as determined appropriate to reflect changes to the contract, additional or alternate administrative controls, temporary physical controls, or other appropriate actions to ensure a safe and regulatory-compliant handling of the waste.

NOTE: This document is not used to determine acceptability of waste or waste packages for shipment to the Waste Isolation Pilot Plant (WIPP) or Nevada National Security Site.

The CH WAC applies to the CH waste stream described in the current U.S. Department of Energy (DOE) Contract governing waste processing activities at the TWPC. The portion of these wastes that are Resource Conservation and Recovery Act (RCRA) wastes are stored by the TWPC in accordance with the facility Hazardous Waste Management Permit. The gaseous effluents from these wastes are permitted to be released to the environment by the facility Air Operating Permit.

2.0 DOCUMENT MAINTENANCE

The Director of Waste Management (DWM) is designated the document owner and is responsible for updating this document. Approval authority rests with the DWM. Submit suggestions for revisions or improvement to the DWM utilizing Attachment E, New Document and Revision Request Form, of CM-P-AD-061, Document Preparation, Review, and Approval.

3.0 GENERAL ACCEPTANCE

Waste containers are authorized onto the TWPC for the purposes of confirming Acceptable Knowledge (AK)/Process Knowledge (PK), characterization, treatment, packaging, or repackaging. Accordingly, certain conditions or characteristics of the waste may not be known prior to receipt of wastes at the TWPC. Initial waste receipt and/or the conduct of other preliminary characterizations shall not be construed as unqualified acceptance of the waste or portions thereof. The TWPC reserves the right, in accordance with its contract, Memoranda of Understanding, permits, and approved DSA, to segregate and/or return to URS | CH2M Oak Ridge LLC (UCOR) wastes determined at

any point in the process to exhibit non-compliant characteristics. This is particularly the case for the wastes packaged in boxes or in numerous layers of confinement in drums. The constituents therein may only be revealed or determined by Non-Destructive Examination, and successive disassembly and dissection during Repackaging.

4.0 WASTE TYPES

The TWPC accepts radioactive wastes, that once fully characterized by the TWPC meets one of the following definitions:

4.1 Contact Handled Waste

CH waste is less than 200mR/hr contact dose rate.

4.2 Low Level Waste (LLW)

LLW contains at least a regulatory threshold concentration of radioactivity and is not classified as high-level waste, TRU waste or spent nuclear fuel or by product material. Test specimens of fissionable material irradiated for research and development only, and not for the production of power or plutonium may be classified as LLW provided the concentration of TRU is less than or equal to 100 nCi/g.

4.3 Mixed Low Level Waste (MLLW)

MLLW is LLW that contains hazardous constituents as defined by the RCRA. All RCRA Hazardous Codes are acceptable for processing at TWPC.

4.4 Transuranic (TRU) Waste

TRU waste contains more than 100 nCi of alpha-emitting TRU isotopes per gram of waste, with half-lives greater than 20 years, except for (1), high-level radioactive waste, (2), waste that the Secretary has determined, with the concurrence of the Administrator, does not need the degree of isolation required by the disposal regulations, or (3), waste that the Nuclear Regulatory Commission (NRC) has approved for disposal on a case-by-case basis in accordance with 10 CFR Part 61.

4.5 Mixed Transuranic Waste

Mixed TRU waste is TRU waste that is also a hazardous waste as defined by the Hazardous Waste Act and 20.4.1.200 NMAC (incorporating 40 CFR § 261.3). All RCRA hazardous waste codes are acceptable for processing at TWPC.

5.0 NOTIFICATIONS

5.1 Waste Transfers

The transfer of waste (i.e., delivery of waste containers to the TWPC site) is controlled by approved TWPC procedures using transfer authorization forms submitted by the TWPC to the designated UCOR Representative. This authorization form serves as a formal request to UCOR for container transfer. When completed by UCOR and approved by the TWPC, it serves to notify the TWPC of incoming transfers. Transfers may be cancelled or suspended due to severe weather, mutual agreement between the parties, other transfer route concerns, or inventory limits at the TWPC.

5.2 Packaging Changes

The contract references identify several characteristics of individual waste containers to be received (e.g., weight, volume, dimensions, etc.). Significant discrepancies identified during receipt inspection and initial processing shall be formally recorded by the TWPC and reflected during update of the waste stream AK report. However, if overpacking or other packaging changes are made prior to transfer, or discrepancies from the contract description are observed by the point of contact (POC) prior to transfer, these changes should be brought to the attention of TWPC management prior to the transfer to the TWPC of the affected containers (with as much advance notice as possible). Containers that are delivered to the TWPC without prior approval are returned to UCOR if they cannot be accepted.

No formal pre-approval for packaging changes is required, assuming the changes are bounded by the contract documents.

The following information shall be communicated via the transfer authorization form, as applicable:

- date and time of intended transfer
- descriptions of atypical configurations for package loading
- extra packaging applied to original waste containers at the time of loading

5.3 Transfer Paperwork

5.3.1 Per the Hazardous Waste (RCRA) regulations and TWPC, no further manifesting of the waste transferred is expected.

5.3.2 The POC will provide a record of the transferred inventory that lists the individual unique numbers of the containers in each transfer.

6.0 WASTE ACCEPTANCE CRITERIA

6.1 Radioactive Material Content

Waste accepted by the TWPC is limited by the DSA such that criticality concerns are not credible.

Each container is evaluated based on best available generator and/or AK/PK information to ensure that the individual container Pu-239 Fissile Gram Equivalent (FGE) values (as calculated in accordance with CH-UET-OP-014, Waste and Activity Inventory Control) are within the limits established in the DSA.

Incoming waste containers shall not exceed 278 PE-Ci individually.

Incoming waste containers shall not exceed 200 FGE (Pu-239) individually.

6.2 Dose Limits

The TWPC administratively limits contact dose rates for individual waste containers acceptable for receipt and characterization to < 200 mR/hr contact (higher dose rates may be case-approved by the TWPC).

6.3 Size/Volume of Waste Containers

Unacceptable Drum Sizes and Configurations

Drums must have acceptable internal packaging configurations. Legacy DOT 6M/2R packaging configurations and (due to similar size and geometry) legacy "birdcage"-type packaging configurations are not acceptable. Reference SAC 5.5.39, DDT WASTE Drum Receipt, from CM-X-AD-022, Technical Safety Requirements.

Acceptable Drum Sizes and Configurations (nominal gallon)

Standard Drums

55, 79, 85, and 110 gallon

Overpack Drums

Acceptable overpack configurations may utilize drums that range in size from 5 gallon to 110 gallon (e.g. 5, 8, 10, 16, 30, 55, 79, 85, or 110 gallon); however, the outermost container must be a 55 gallon drum or greater.

NOTE: Incoming waste boxes that exceed the maximum dimensions may be reviewed and approved for acceptance to the TWPC on a case by case basis by the Operations Manager, or designee, and the Design Engineering Manager, or designee. Documentation of approval is attached to Attachment B, Contact Handled Waste Acceptability Review Checklist of CH-REF-WP-001, Contact Handled Waste Container Selection Process.

Box sizes (max. dimensions)

10 ft x 6 ft x 8 ft
(L x W x H)

NOTE: Incoming waste boxes that do not meet minimum volumes below may be reviewed and approved for acceptance to the TWPC on a case by case basis by Nuclear Criticality Safety. Documentation of approval is attached to Attachment B, Contact Handled Waste Acceptability Review Checklist of CH-REF-WP-001, Contact Handled Waste Container Selection Process.

Box sizes (min. volume)

Standard B12 waste box or equivalent OR
21 cubic foot in volume

OR

Boxes less than 21cubic foot in volume, which are exempt from the TWPC Nuclear Criticality Safety Program as verified by the Nuclear Criticality Safety Engineer.

6.4 Loose Surface Contamination (exterior surface of container)

Beta Gamma

$< 1{,}000$ dpm/100 cm^2

Alpha

≤ 20 dpm/100 cm^2

6.5 Waste Matrix

Wastes shall be classified as:

- soils
- debris
- homogenous solids

6.6 Adequate Acceptable Knowledge or Process Knowledge

Incoming waste containers shall be identifiable as part of a waste stream for which adequate AK/PK has been accumulated, reviewed, and summarized. Wastes shall be of defense-origin as defined by the DOE-ORO.

If the container is not on an approved AK/PK list, the containers may be approved on a case by case basis by the Acceptable Knowledge Expert/Process Knowledge Expert using generator documents, such as 2109 forms or other equivalent documents.

6.7 Waste Container Identification

Incoming waste containers shall exhibit a unique container identification number.

6.8 Waste Container Integrity

Wastes shall be packaged in securely lidded metal boxes and drums. Incoming containers shall demonstrate the integrity defined in the DSA, which is verified by inspecting each container upon receipt using the following general criteria:

- no denting, deformation, breaches, creasing, cracking, or gouging that might reasonably compromise container integrity, expose the internal contents, or affect the closure of the container
- no significant rusting or a readily observable loss of metal due to oxidation (e.g., flaking, bubbling, pitting, or perforation) that causes perforation of the container
- no bulging or distortion indicative of over pressurization
- closure devices properly installed and secure

6.9 Vented Containers

Incoming drums shall be equipped with a securely installed DRUM FILTER-VENT with headspace gas sample results that do not exceed 32,000 ppm hydrogen equivalent content and 6,000 ppm total volatile organic compounds unless they are overpacked within a metal box, concrete cask, or larger vented metal drum.

In some cases, incoming drums were previously repackaged at the TWPC to meet the WIPP WAC and returned to UCOR for temporary storage. These drums were properly vented with an approved filter during repack operations at the TWPC. When these previously processed drums are requested for transfer back to the TWPC, headspace gas sample results are not required for acceptance. T-CH-FW-C-WP-001, Maximum Plutonium Equivalent Curies for Drum with One Filter Vent, verifies that drums with less than 80 PE-Ci and a filter with minimum diffusivity of 1.85e-5 moles/sec-mole fraction are adequate assuming the drums were repackaged to meet the WIPP WAC.

Incoming drums may also be "newly generated" drums that have been placed in temporary UCOR storage. These drums were properly vented with an approved filter vent at the time of generation and were packaged to meet the WIPP WAC without the need for repackaging at the TWPC. When these drums are requested for transfer to the TWPC, headspace gas sample results are not required for acceptance, as justified in T-CH-FW-C-WP-001, Maximum Plutonium Equivalent Curies for Drums with One Filter Vent, so long as they were accepted into storage in compliance with the UCOR Master Profile TRU-CH-7, Rev 0. In conjunction with the Master Profile, acceptance into UCOR storage may have been achieved under variances V11-002, VR12-005, VR12-008, and/or VR12-014. Drums that were accepted into storage under other approved variances may be acceptable without headspace gas sample results pending review of the variance to verify that the variance does not impact the gas generation calculations in T-CH-FW-C-WP-001. If a drum was accepted into UCOR storage without utilizing the aforementioned Master Profile and approved variances, headspace gas sample results shall be provided in order to verify hydrogen and volatile organic compound limits are not exceeded.

External shipping containers or overpacked containers, which are welded closed or fitted with a tight sealing closure device, are considered unvented containers. Containers (boxes) which are not fitted with tight sealing closure devices and incorporate metal to metal sealing surfaces or are fitted with closure gaskets are considered self-venting containers, and are not required to be mechanically vented.

6.10 Hazardous Wastes

All RCRA Hazardous Codes are allowed at the TWPC.

Polychlorinated Biphenyl (PCB) wastes and asbestos are acceptable for processing at the TWPC, but must be managed in accordance with regulatory and TWPC site requirements.

NOTE: Incoming waste suspected to contain very low incidental concentrations of beryllium may be approved for acceptance to the TWPC on a case by case basis by Health and Safety (HS). The Health and Safety Manager, or designee, reviews available information and waste processing description to determine applicability of 10 CFR 850 requirements in accordance with CM-A-IH-002, Beryllium Awareness and Chronic Beryllium Disease Prevention. Documentation of approval is attached to Attachment B, Contact Handled Waste Acceptability Review Checklist of CH-REF-WP-001, Contact Handled Waste Container Selection Process.

Additionally, incoming waste containers shall not be known to contain:

- dangerous constituents such as explosives, pyrophorics, etiologic agents, or biological waste,
- beryllium (Exception: Waste containing very low incidental concentrations of beryllium that are approved by HS or Sealed Sources containing beryllium are allowable.)
- classified materials

7.0 WASTE ACCEPTANCE

Acceptance of waste is accomplished in accordance with approved TWPC procedures. The first steps for acceptance of transferred wastes are accomplished through the waste container request and authorization process. Transferred waste containers are verified as being consistent with the request for transfer document upon receipt of the conveyance. The unique container numbers are verified, as the waste is off-loaded. Waste packaging integrity, dose rates, surface contamination levels, sizes, venting, and hazardous waste labeling of the waste containers are verified at various points in the receipt process.

Some or all of the following techniques are used to confirm that WAC are satisfied for individual waste containers:

- Weighing
- Non-Destructive Assay
- Non-Destructive Examination
- Headspace Gas Sampling

8.0 NON-COMPLIANT WASTE

Waste containers or waste articles discovered to be non-compliant with this WAC shall be segregated from the waste stream as appropriate to maintain worker and public safety. The non-compliant condition shall be reported to DOE and Tennessee Department of Environment and Conservation, as appropriate. Disposition of non-compliant wastes shall be completed as promptly and safely as the DSA and permits require and may include return transfer to UCOR.

9.0 RECORDS

Records are identified, classified, and maintained in accordance with CM-P-AD-049, Records Management, and CM-X-AD-026, Records Inventory and Disposition Schedule.

9.1 Record Numbering

None

9.2 Records Inventory and Disposition Schedule

There are no records generated by this document.

10.0 ATTACHMENTS

Attachment A: Acronyms/Abbreviations, Definitions, References, and Reviewer Selection for Major Revisions

Attachment A: Acronyms/Abbreviations, Definitions, References, and Reviewer Selection for Major Revisions

Acronyms

AK – Acceptable Knowledge

CH – Contact Handled

DOE – U.S. Department of Energy

DSA – Documented Safety Analysis

DWM – Director of Waste Management

FGE – Fissile Gram Equivalent

LLW – Low Level Waste

MLLW – Mixed Low Level Waste

ORO – Oak Ridge Office

PCB – polychlorinated biphenyl

PK – Process Knowledge

POC – Point of Contact (for waste transfers)

RCRA – Resource Conservation and Recovery Act

TRU – Transuranic

TWPC – TRU Waste Processing Center

UCOR - URS | CH2M Oak Ridge LLC

WAC – Waste Acceptance Criteria

WIPP – Waste Isolation Pilot Plant

Definitions

None

Developmental References

Air Operating Permit Number #063331P ()

CM-R-AD-001, Documented Safety Analysis

Contact Handled Transuranic Waste Acceptance Criteria for Waste Isolation Pilot Plant, DOE/WIPP-02-3122 (TWPC-339965)

DOE Facility CH-TRU Inventory, Revision 1, March 18, 1998 (TWPC-18219)

Nevada National Security Site, Waste Acceptance Criteria, DOE/NV-325 (TWPC-336448)

T-CH-FW-C-WP-001, Maximum Plutonium Equivalent Curies

T-CH-FW-C-WP-001, Maximum Plutonium Equivalent Curies for Drum with One NFT-019DS Filter Vent

Attachment A: Acronyms/Abbreviations, Definitions, References, and Reviewer Selection for Major Revisions

Developmental References

TNHW-145, Hazardous Waste Management Permit, State of Tennessee Department of Environment and Conservation, Division of Solid Waste Management (15.1.4-RCRA)

TRU Waste Baseline Inventory Report for Oak Ridge, Revision 3, June 14, 1996 (TWPC-18112)

UCOR Master Profile, TRU-CH-7-R0 (TWPC-271246)

UCOR Variance V11-002 (TWPC-271242)

UCOR Variance VR12-005 (TWPC-271243)

UCOR Variance VR12-008 (TWPC-271244)

UCOR Variance VR12-014 (TWPC-271245)

T-CM-457-R-HP-003, WSMS-NCSE-TWPC-001, Waste Container Storage at TWPC

Cross References

CH-REF-WP-001, Contact Handled Waste Container Selection Process

CH-UET-OP-014, Waste and Activity Inventory Control

CM-A-AD-017, Nuclear Criticality Safety Program

CM-X-AD-022, Technical Safety Requirements

Reviewer Selection for Major Revisions

Required	Optional
Director of Waste Management	Analytical Manager
General Manager	Safety Authorization Basis Manager
Director of Operations	Quality Assurance Manager
Operations Manager	Environmental Programs Manager
Facility Manager	
Director of Safety Health, and Quality	
AK/PK Expert	
Feedstock & Disposition Manager	
Waste Acceptance/Transfer Lead	
Waste Certification Official	
Health and Safety Manager	
Nuclear Criticality Safety Manager	

DIVIDER PAGE

Attachment 3 - Acceptable Knowledge Source Document Summary

Site(s): Oak Ridge National Laboratory	**Source Document Tracking Number:** P587
Waste Stream Number(s): ORNL Non-specific Library Files (Applicable only when site library is not in use)	
Acceptable Knowledge Documentation Type: ☑ TRU Waste Management Program Information ☐ Waste Stream-Specific Information ☑ Additional Information	**Category:** ☐ Correspondence ☐ Discrepancy Resolution ☑ Internal Procedure ☐ Miscellaneous ☐ Published Document or Internal Procedure ☐ Unpublished Documents
Title or Description of Source Document [a]: Energetic Materials Management	
Source Document Reference Information (author(s), document and revision number, date, publisher): **NA, CM-P-WP-016, Rev. 2 (Older Versions Included), 06/22/2015, TWPC**	

AK #	Source Doc. Page # [b]	AK Information Summary
PR8, S2	Throughout	This procedure identifies the responsibilities and describes the process for managing energetic or potentially energetic materials at the TRU Waste Processing Center (TWPC), and implements the program requirements described in CM-A-WP-004, Energetic Materials Program. For the purposes of this procedure, an energetic or potentially energetic material is any material that may undergo a spontaneous energetic chemical reaction due to age, concentration, degradation, or oxidation potential when exposed to shock, friction, temperature change, air, moisture, or other initiating events. The procedure is as follows: Energetic Materials Field Evaluations Additional Evaluation of Potentially Energetic Materials Revision 1 (Dated 05/22/2014): Updated to current titles (DWOL to SS) throughout the document. Revision 2 (Dated 06/22/2015): Updated to current titles (OM to PS and DRII to EPM) throughout the document. This revision does not include any relevant changes to waste management from the previous revision. Procedure verification/walk down was conducted on 09/25/15 by Jeff Harrison with Don Coffey, Level 1 Energetic Materials Subject Matter Expert. • Don said, per CH-REF-OP-013 (Reference P254), operations personnel repackaging the waste are told to notify supervision if they don't recognize something. Don then comes to the Processing Building to evaluate the material. If it is determined to be an energetic material or has that potential, Attachment B, Field Evaluation of Potentially Energetic Materials, is completed. If Don's evaluation (or a Level 2 SME evaluation) determines the material is not energetic, Attachment B is not used. Depending on what the material is, they may complete Attachment F, Uncharacterized Waste Guidance, from CH-REF-OP-013 (Reference P254) or Attachment B, Operations Prohibited Item Processing (OPIP), from CH-REF-OP-045 (Reference P599), or maybe no

CCP RECORDS ORIGINAL
DATE REC'D 3/16/2016 JY

Attachment 3 - Acceptable Knowledge Source Document Summary (continued)

Site(s): Oak Ridge National Laboratory		Source Document Tracking Number: P587
AK #	Source Doc. Page #[b]	AK Information Summary
		form at all. • *Prior to implementation of the energetic materials program, operations* personnel repackaging the waste were told to notify supervision if they didn't recognize something. Don then evaluated the material. If it was determined to be an energetic material or had that potential, the material was managed as a prohibited item and set aside for future processing or sent to Perma-Fix for off-site treatment.

Source Document Data Limitations (if any):

1. None.

Acceptable Knowlege Expert:

Travis Smith / [signature] Date: 03/16/2016
Print /Sign

[a] Provide description for non-titled information (i.e., container paperwork, MSDS sheets, etc)
[b] For microfilm or microfiche, identify box, tape, reel number and location.

Energetic Materials Management

Implementation Date: 6/22/2015

APPROVAL:

Fred Heacker F. K. Heacker 06/19/2015
Director of Waste Management Date

~~Wastren Advantage, Inc.~~
~~TRU Project Controlled Distribution~~
~~Issued To:~~ ~~#1265~~ ~~Date: 09/09/2015~~

YD
09/29/2015

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Attachment B: Field Evaluation of Potentially Energetic Materials Form 12

Revision Summary

Revision	Change Summary
0	Initial issue
1	Updated to current titles (DWOL to SS)
2	Updated to current titles (OM to PS and DRII to EPM)

Current Revision Specific Changes

Location	Description	Reason
Global	Changed OM to PS and DRII to EPM	Update

1.0 INTRODUCTION

1.1 Purpose

This procedure identifies the responsibilities and describes the process for managing energetic or potentially energetic materials at the TRU Waste Processing Center (TWPC), and implements the program requirements described in CM-A-WP-004, Energetic Materials Program. The process described in this procedure implements the administrative control of Safety Management Program 5.6.8.1, Hazardous Material Protection, in CM-X-AD-022, Technical Safety Requirements.

1.2 Scope

This procedure describes the process by which energetic or potentially energetic materials are evaluated and managed at the TWPC. For the purposes of this procedure, an energetic or potentially energetic material is any material that may undergo a spontaneous energetic chemical reaction due to age, concentration, degradation, or oxidation potential when exposed to shock, friction, temperature change, air, moisture, or other initiating events.

1.3 Document Use

This document has been evaluated by the Document Use Review Team and has been determined to be a management control procedure.

Management control procedures are not required to be in-hand or present for the user to actively reference during actual performance of action steps; however, they may be open and referenced during the work performance based on personnel knowledge and skill level.

2.0 PRECAUTIONS AND LIMITATIONS

2.1 Safety

- Only trained/qualified personnel handle waste items in waste processing areas.

2.2 Technical Safety Requirements

- SMP 5.6.8.1, Hazardous Material Protection

3.0 RESPONSIBILITIES

3.1 Personnel Assignments

The following personnel are responsible for performing the activities described in this procedure and for training to this procedure prior to accomplishing the activities described herein. These TWPC personnel may assign subordinates to assist in carrying out their responsibilities as specified in this procedure.

3.1.1 Director of Waste Management (DWM)

- approves this procedure
- manages the Energetic Chemicals Program with the support of Energetic Materials Subject Matter Experts (SMEs)

3.1.2 Level 1 Energetic Materials Subject Matter Expert (SME)

- performs field evaluations when potentially energetic materials are discovered during repackaging operations
- determines whether sufficient information is available to identify whether energetic or potentially energetic materials may be present based on their detailed knowledge of chemicals, chemical hazards, and process knowledge
- consults with Level 2 Energetic Materials SMEs as needed during the field evaluation process to assist with the evaluation of discovered materials or to answer specific questions related to the physical characteristics of the discovered material

3.1.3 Level 2 Energetic Materials Subject Matter Expert (SME)

- consults with Level 1 Energetic Materials SMEs to support field evaluations of whether energetic or potentially energetic materials are present
- assists in establishing appropriate methods for the safe handling and processing of energetic or potentially energetic materials in conjunction with input from the DWM, Process Superintendent, Safety Authorization Basis Manager (SABM), Environmental Programs Manager (EPM), and the Level 1 Energetic Materials SME

3.1.4 Shift Superintendent (SS)

- informs appropriate management and personnel when notified that energetic or potentially energetic materials have been discovered

3.1.5 Safety Authorization Basis Manager (SABM)

- determines whether the discovery of energetic or potentially energetic materials represents a condition for entry into the Unreviewed Safety Question process

3.1.6 Environmental Programs Manager (EPM)

- determines environmental regulatory requirements for operations including any notifications and permit modifications that may be required

3.2 Document Maintenance

The DWM is designated the document owner and is responsible for updating this document. Approval authority rests with the DWM. Submit suggestions for revisions or improvement to the DWM utilizing Attachment E, New Document and Revision Request Form, of CM-P-AD-061, Document Preparation, Review and Approval.

4.0 PREREQUISITES

- Notify SS before beginning task.

NOTE 1: Operating procedures, Activity Hazards Assessments, and worker training address the initial identification of potentially energetic materials by operators, the appropriate actions for suspending related activities, and the notification of onsite Level 1 Energetic Material SMEs to support repackaging operations.

NOTE 2: Multiple resources may be used to evaluate the chemical and physical hazards of discovered hazards. Resources may include (but are not limited to):

- Sak's Dangerous Properties of Industrial Materials
- Hazardous Chemicals Desk Reference
- Hawley's Condensed Chemical Dictionary
- Material Safety Data Sheets (MSDSs)
- Acceptable Knowledge/Process Knowledge (AK/PK) Reports

NOTE 3: Subsections of 5.0 and the steps within those subsections may be performed in any order as needed to accommodate current processing activities. Multiple process areas may be worked concurrently in the same subsection or different subsections within this procedure. Personnel may enter specific subsections as needed to start a new work activity or resume work activities.

NOTE 4: Energetic Materials SMEs perform the following steps, unless otherwise noted.

5.0 PROCEDURE

NOTE 1: Field evaluations are performed by Level 1 Energetic Material SMEs when notified by operations personnel that materials have been discovered during repackaging operations that require evaluation for the presence of potentially energetic materials.

NOTE 2: Level 2 Energetic Material SMEs may be consulted during the field evaluation process to assist with the evaluation of discovered materials or to answer specific questions related to the physical characteristics and hazards of the discovered material.

5.1 Energetic Materials Field Evaluations

5.1.1 Inspect and identify the chemical and physical characteristics of the discovered items

- Container type (original packaging, secondary container, sealed capsules/bottles/high integrity containers, transparent/translucent)
- Labels or writing present
- Physical composition (pure chemical compounds, solutions/dilutions, or hygroscopic materials)
- Physical form (cloudy solution, crystalline structures)

5.1.2 IF the material is in a sealed capsule/bottle that is a high integrity container,
THEN perform Step 5.2 for additional evaluation of the material.

5.1.3 IF the material is in an original or secondary container with a legible label,
THEN evaluate the chemical hazards of the identified constituents.

5.1.3.1 IF the evaluation of the chemical hazards determines that the material is potentially energetic,
THEN perform Step 5.2 for additional evaluation of the material.

5.1.3.2 IF the evaluation of the chemical hazards determines that the material is not potentially energetic,
THEN notify the Waste Operations Floor Supervisor and the SS that that the material is safe to handle and may be dispositioned using standard operating procedures following the requirements of CH-REF-OP-013, Contact Handled Waste Repackaging, as required.

5.1.4 IF the material is in an original or secondary container with no labeling or the labeling is illegible,
THEN evaluate the physical properties of the materials for indications that the material may potentially be energetic.

5.1.4.1 IF the material is a cloudy solution or there are indications that crystallized residues are present,
THEN perform Step 5.2 for additional evaluation of the material.

5.1.4.2 IF there are no physical indications that the material may be potentially energetic,
THEN notify the Waste Operations Floor Supervisor and the SS that that the material is safe to handle and may be dispositioned using standard operating procedures following the requirements of CH-REF-OP-013, Contact Handled Waste Repackaging, as required.

5.2 Additional Evaluation of Potentially Energetic Materials

5.2.1 Record the chemical and physical characteristics of the discovered items on Attachment B, Field Evaluation of Potentially Energetic Materials.

5.2.2 Evaluate the chemical and physical hazards of the discovered items and record on Attachment B, Field Evaluation of Potentially Energetic Materials.

NOTE: Level 2 Energetic Material SMEs may be consulted as needed during the evaluation process.

5.2.3 Determine whether the discovered items are energetic or potentially energetic materials and record on Attachment B: Field Evaluation of Potentially Energetic Materials.

5.2.3.1 IF the material is identified as an energetic or potentially energetic material,
THEN contact a Level 2 Energetic Material SME for additional evaluation/special instructions and record on Attachment B: Field Evaluation of Potentially Energetic Materials.
AND notify the following personnel that an energetic or potentially energetic material has been identified:

- SS
- DWM
- SABM
- PS
- EP

5.2.4 Determine whether special disposition instructions are required for the discovered items and record on Attachment B, Field Evaluation of Potentially Energetic Materials.

5.2.4.1 IF special disposition instructions are NOT required,
THEN notify the Waste Operations Floor Supervisor and the SS that the material is safe to handle and may be dispositioned using standard operating procedures following the requirements of CH-REF-OP-013, Contact Handled Waste Repackaging, as required.

5.2.4.2 IF special disposition instructions are required,
THEN notify the Waste Operations Floor Supervisor and the SS that special work instructions/work package is required for disposition and document following the requirements of CH-REF-OP-013, as required.

5.2.4.3 File Attachment B, Field Evaluation of Potentially Energetic Materials, in the applicable Waste Container Traveler File.

6.0 RECORDS

Records are identified, classified, and maintained in accordance with CM-P-AD-049, Records Management, and CM-X-AD-026, Records Inventory and Disposition Schedule.

6.1 Record Numbering

Not Applicable

6.2 Records Inventory and Disposition Schedule

Records generated from this procedure are:

Record	Retention Period	Class	Record Type	Disposition Location	File Index Loc.	Media Type	OUO	Vital		Other File Loc.
								L&F	EO	
Attachment B: Field Evaluation of Potentially Energetic Materials	LOP+30	Record	COMFOR	7880W	18.4	EP	N/A	N/A	N/A	N/A

COMFOR – Completed Form **EO** – Emergency Operating **EP** – Electronic and Paper **L&F** – Legal & Financial
LOP – Life of Project **OUO** – Official Use Only

7.0 ATTACHMENTS

Attachment A: Acronyms/Abbreviations, Definitions, References, and Reviewer Selection for Major Revisions

Attachment B: Field Evaluation of Potentially Energetic Materials

Attachment A: Acronyms/Abbreviations, Definitions, References, and Reviewer Selection for Major Revisions

Acronyms/Abbreviations

AK – Acceptable Knowledge

MSDS – Material Safety Data Sheet

PK – Process Knowledge

SMP – Specific Management Program

SME – Subject Matter Expert

SS – Shift Superintendent

TRU – Transuranic

TWPC – TRU Waste Processing Center

Definitions

Energetic or Potentially Energetic Material — Any material that may undergo a spontaneous energetic chemical reaction due to age, concentration, degradation, or oxidation potential when exposed to shock, friction, temperature change, air, moisture, or other initiating events.

Developmental References

None

Cross References

CH-REF-OP-013, Contact Handled Waste Repackaging

CM-A-WP-004, Energetic Materials Program

CM-P-AD-049, Records Management

CM-P-AD-061, Document Preparation, Review, and Approval

CM-X-AD-022, Technical Safety Requirements

CM-X-AD-026, Records Inventory and Disposition Schedule

Sak's Dangerous Properties of Industrial Materials

Hazardous Chemicals Desk Reference

Hawley's Condensed Chemical Dictionary

Attachment A: Acronyms/Abbreviations, Definitions, References, and Reviewer Selection for Major Revisions

Reviewer Selection for Major Revisions	
Required	**Optional**
AK/PK Characterization Support Lead	Director of Operations
Director of Waste Management	Environmental Programs Manager
Facility Manager	Radiological Control Manager
Health and Safety Manager	
Nuclear Safety Analyst	
Process Superintendent	
Safety Authorization Basis Manager	
Senior Environmental Specialist	

Attachment B: Field Evaluation of Potentially Energetic Materials Form

Page 1 of 2

Container ID _____ Date _____

Level 1 Energetic Materials SME: _____

General Description of Discovered Items: _____

Packaging Description:	**YES**	**NO**
Manufacturer's/original package	☐	☐
Secondary container	☐	☐
Sealed high integrity capsule/container	☐	☐

Description of Labeling _____

Transparent or translucent package (glass/plastic)	☐	☐
Labels present	☐	☐

Description of Labeling _____

Chemical Constituents Identified: _____

Physical Composition: _____

(pure chemical, solution/dilution, hygroscopic, etc.) _____

Physical Form:			
	Cloudy solution?	☐	☐
	Crystalline structures visible?	☐	☐

Comments: _____

Attachment B: Field Evaluation of Potentially Energetic Materials Form

Page 2 of 2

	YES	NO
Level 2 Energetic Materials SME Consulted?	☐	☐

SME Contacted: _____ Date: _____

Comments: _____

_____

_____

_____

Energetic or Potentially Energetic Materials Identified?	☐	☐

Description: _____

_____

_____

Chemical or Physical Hazards Identified?

Shock Sensitive or Potentially Shock Sensitive	☐	☐
Air/Water Reactive	☐	☐
Other Reactive Material Hazard	☐	☐

Comments: _____

_____

_____

Disposition Instructions:

Disposition waste using standard operating procedures	☐	☐
Special work instructions/work package required for disposition	☐	☐

Comments: _____

_____

_____

Distribution: Original to applicable Waste Container Traveler File.

DIVIDER PAGE

Attachment 3 - Acceptable Knowledge Source Document Summary

Site(s): Oak Ridge National Laboratory	Source Document Tracking Number: P592
Waste Stream Number(s): ORNL Non-specific Library Files (Applicable only when site library is not in use)	
Acceptable Knowledge Documentation Type: ☑ TRU Waste Management Program Information ☐ Waste Stream-Specific Information ☑ Additional Information	Category: ☐ Correspondence ☐ Discrepancy Resolution ☑ Internal Procedure ☐ Miscellaneous ☐ Published Document or Internal Procedure ☐ Unpublished Documents
Title or Description of Source Document [a]: Absorbing Liquids in the Glovebox and Box Breakdown Area	
Source Document Reference Information (author(s), document and revision number, date, publisher): NA, CH-REF-OP-014, Rev. PCN 5-1 (Older Versions Included), 08/27/2015, TWPC	

AK # [b]	Source Doc. Page #[c]	AK Information Summary
PR8, S2	Throughout	This document provides general instruction for absorbing residual/non-residual liquids found during processing of Contact Handled waste in the Glovebox (GB) and/or Box Breakdown Area (BBA) at the TWPC. CH-REF-OP-014 supersedes CH-I-OP-013 (see Reference P1116 in the ORNL Site Library). CH-REF-OP-014 is limited to liquids processing in the GB and BBA. Separate procedures were created for processing liquids in the hot cell (see Reference P590 in the ORNL Site Library) and cask processing enclosure (see Reference P591 in the ORNL Site Library). Chemicals and compounds called out in the procedure: • Quick-Solid QS-44 (pp. 16 of 17 of Revision 5) • Solid-A-Sorb (pp. 16 of 17 of Revision 5) • NoChar N965 (pp. 16 of 17 of Revision 5) • Liquibond (pp. 16 of 17 of Revision 5) • NoChar N910 (pp. 16 of 17 of Revision 5) • Petrobond (pp. 16 of 17 of Revision 5) • Hg Absorb (pp. 16 of 17 of Revision 5) • PIG Mercury Absorbent Powder (pp. 16 of 17 of Revision 5) Revision 0 (Dated 03/27/2012): Record the approximate volume of liquids/mercury absorbed or solidified in the applicable Attachment D, Contact Handled Waste Repackaging Data Form, of CH-REF-OP-013, Contact Handled Waste Repackaging (see Reference P254 in the ORNL Site Library). Wetted Material: • If residual liquids are observed within or coming from the wetted material, record the approximate volume of liquids absorbed or solidified on Attachment D, Contact Handled Waste Repackaging Data Form, of CH-REF-OP-013, Contact Handled Waste Repackaging. • Absorbent materials such as Solid-a-sorb, kitty litter, vermiculite, mop heads, or absorbent pads which are found in a container are assumed to have been used to absorb unknown or flammable liquids and shall be considered a wetted material. Wetted material may appear dry or wet, or may be observed to contain or release residual liquids when handled.

CCP RECORDS ORIGINAL
DATE REC'D 2/9/16 mre

Attachment 3 - Acceptable Knowledge Source Document Summary (continued)

Site(s): Oak Ridge National Laboratory		Source Document Tracking Number: P592
AK # [b]	Source Doc. Page #[c]	AK Information Summary
		• Pour approved absorbent material into a sealable container at an estimated volume ratio of 1:8 liquid to absorbent. • Transfer wetted material into the sealable container leaving a void space at the top for additional absorbent material. • Pour approved absorbent material to fill the sealable container, and close the sealable container. • Transfer the sealable container(s) to the appropriate outgoing waste container. • Waste must be placed into an outgoing container of same waste stream. Revision 1 (Dated 12/10/2013): No substantive changes made in this revision related to TRU waste management. Revision 2 (Dated 07/07/2014): Processing Environmental Media Liquids in Drums: • Transfer liquid to the intermediate container. • Once the source container has been emptied of liquid and waste, absorb incidental quantities of liquid in the container using an absorbent liner pad or approved absorbent material. • If liquid was spilled or dropped on the BBA floor, the container or vacuum, wipe up or absorb the liquid with an absorbent liner pad or approved absorbent material. • Transfer wetted absorbent liner pad(s) or approved absorbent material to the appropriate outgoing waste container. • If saturated waste is encountered, then ensure the waste is placed in a secondary containment pan and apply absorbent material until no liquid remains. • Document that residual liquids were absorbed or solidified in Attachment P, Saturated Waste Treatment, of CM-P-EN-013, Environmental Permits and Compliance. Revision 3 (Dated 10/21/2014): Added new Attachment C with a list of approved absorbents and their uses: • Quik-Solid QS-44 or Solid-A-Sorb is used for environmental media in drums, groundwater in casks, and saturated waste. • NoChar N965 Liquibond is used for unknown containerized liquids/non-residual liquids/residual liquids/wetted materials. • NoChar N910 Petrobond is used for PCB contaminated oils. Revision 4 (Dated 02/04/2015): • Revised Attachment C to include mercury spill kits for Residual or incidental droplets of mercury.

Attachment 3 - Acceptable Knowledge Source Document Summary (continued)

Site(s): Oak Ridge National Laboratory		Source Document Tracking Number: P592
AK # [b]	Source Doc. Page #[c]	AK Information Summary
		• Added Attachment D, Liquid Volume Conversion Chart as an aid tooperator. Revision 5 (Dated 06/15/2015): Revised Attachment C to indicate: • NoChar N965 can also be used to absorb environmental media in drums, groundwater in casks, and saturated waste • Specified Hg Absorb and PIG Mercury Absorbent Powder for residual or incidental droplets of mercury. Revision PCN 5-1 (Dated 08/27/2015): No substantive changes made in this revision related to TRU waste management. Verification/walk down of CH-REF-OP-014 was conducted on 9/30/15 by Jeff Harrison with Kevin East, Process Superintendent." Mr. Harrison asked Mr. East about the absorbent pads referred to in this procedure. He said they have been using the same thing for many years. They use the pink pads and red wipes made by New PIG. He also asked Mr. East how the waste operators know which absorbent to use (even though the approved absorbents and their use is specified in Attachment C). He said the waste operators do not process liquids without guidance from the AKE.

Source Document Data Limitations (if any):

1. Procedure is specific to TWPC.

Acceptable Knowlege Expert:

Travis Smith / [signature] Date: 01/20/2016

Print /Sign

[a] Provide description for non-titled information (i.e., container paperwork, MSDS sheets, etc)
[b] Obtain from Acceptable Knowledge Documentation Checklist
[c] For microfilm or microfiche, identify box, tape, reel number and location.

PCN #	Affected Pgs
PCN 5-1	Pgs 8-9

Absorbing Liquids in the Glovebox and Box Breakdown Area

REFERENCE

Implementation Date: 6/15/15

~~Wastren Advantage, Inc.~~
~~TRU Project Controlled Distribution~~
~~Issued To: #1265 Date: 09/09/2015~~

7B 10/01/2015
8/27/15 CB

WASTREN ADVANTAGE, INC.
TRU PROJECT CONTROLLED DISTRIBUTION
#345 Control Room
ISSUED 6/15/15

PCN 5-1 Kevin D. Ea 8-27-15

APPROVAL:

Tim Hallman
Operations Manager

5/18/15
Date

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Revision Summary

Revision	Change Summary
0	Initial issue (supersedes CH-I-OP-013)
1	Revised to update procedure
2	Added new subsection to allow processing of free liquids in drums
3	Added Attachment C, TWPC Approved Absorbents
4	Incorporate Operator Aid 12-001 as Attachment D
5	Revised Attachment C; Implements DSA/TSR Rev 31

Current Revision Specific Changes

Location	Description	Reason
2.2	Updated Technical Safety Requirements	DSA/TSR Rev 31
Att. A	Removed definitions	Not applicable
Att. C	Updated absorbent	Att. C

1.0 INTRODUCTION

1.1 Purpose

This document provides general instruction for absorbing residual/non-residual liquids found during processing of Contact Handled waste in the Glovebox (GB) and/or Box Breakdown Area (BBA) at the TRU Waste Processing Center (TWPC).

1.2 Scope

This procedure applies to the processing of liquids in the GB and BBA only.

1.3 Document Use

This document has been evaluated by the Document Use Review Team and has been determined to be a **REFERENCE** procedure.

REFERENCE procedures are not required to be in-hand or present for the user to actively reference during actual performance of action steps, however, they may be open and referenced during the work performance based on personnel knowledge and skill level. If work is suspended due to inadequacy of procedure, then a page change notice or revision of the procedure is initiated.

2.0 PRECAUTIONS AND LIMITATIONS

2.1 Safety

- This document provides direction for handling hazardous and radioactive material containers.
- Containers of liquids up to 1 liter in size shall only be opened and remediated one-at-a-time in the GB or BBA, to avoid mixing of potentially incompatible substances. Volumes of non-residual liquids greater than 1-liter in size must be divided into 1-liter or smaller batches for processing. Liquids processing rate not to exceed 50 gallons per day.
- Liquids must be remediated utilizing a stainless steel or approved plastic secondary containment pan or bucket.

2.2 Technical Safety Requirements

- DF 6.8, Sealable Container

2.3 Nuclear Criticality Safety Evaluation

- None

3.0 RESPONSIBILITIES

3.1 Personnel Assignments

The following personnel are responsible for performing the activities described in this procedure and for training to this procedure prior to accomplishing the activities described herein. These TWPC personnel may designate alternate personnel to assist in carrying out their responsibilities as specified in this procedure.

3.1.1 Operations Manager (OM)

- ensures individuals working to this document have received Resource Conservation and Recovery Act (RCRA) training on liquids treatment
- approves this document

3.1.2 Shift Superintendent

- authorizes work activities

3.1.3 Floor Supervisor

- ensures activities are completed in accordance with this document

3.1.4 Waste Operator

- performs activities in accordance with this document
- completes RCRA inspection logsheet documenting treatment

3.1.5 Environmental Programs Manager

- ensures that environmental regulatory requirements are clearly addressed in the applicable documents and training associated with this activity

3.2 Document Maintenance

The OM is designated the document owner and is responsible for updating this document. Approval authority rests with the OM. Submit suggestions for revisions or improvement to the OM utilizing Attachment E, New Document and Revision Request Form, of CM-P-AD-061, Document Preparation, Review and Approval.

4.0 PREREQUISITES

- Ensure tools and supplies as shown in Attachment B, Recommended Tool List, are available as required.
- Select and stage the appropriate absorbent for the waste liquids identified to be absorbed from Attachment C, TWPC Approved Absorbents.
- Inspect sealable containers to ensure no visible holes or penetrations are present.

NOTE 1: Operations personnel perform the following steps, unless otherwise noted.

NOTE 2: Section 5.0 is divided into multiple subsections. Steps within those subsections are followed in the sequence written unless stated otherwise. Operations personnel may enter specific subsections as needed to start a new work activity or resume work activities (e.g., directed by other procedures, after shift turnover, returning from the weekend, holiday, etc.), only after applicable safety precautions and prerequisites are verified to be satisfied or implemented.

5.0 PROCEDURE

NOTE 1: Attachment C, TWPC Approved Absorbents, provides a list of approved absorbents.

NOTE 2: Attachment D, Liquid Volume Conversion Chart, may be referenced for estimating volumes of liquid.

5.1 Preparing for Liquid Absorption

5.1.1 Place an absorbent liner pad or other absorbent material into a stainless or approved plastic secondary containment pan or bucket.

5.1.2 Position secondary containment pan in a stable location away from other waste material.

NOTE: Typically, absorbent materials are designed to absorb unknown liquid at a ratio of 1:8 volume ratio of liquid to absorbent.

5.1.3 Estimate the volume of liquid to be absorbed and place an appropriate volume of approved absorbent material into an appropriately sized container.

5.1.4 Place the pre-measured container of approved absorbent material in or near the secondary containment pan.

5.1.5 IF the quantity of liquid is greater than 1 liter,
THEN prepare multiple containers or batches to process the liquid in batches no more than 1 liter in size.

5.2 Processing Non-Residual Liquids

5.2.1 Initiate Attachment O, Miscellaneous Treatment Inspection Log Sheet, of CM-P-EN-013, Environmental Permits and Compliance.

NOTE: Waste drums or boxes may contain smaller containers (i.e., bottles, jars, buckets, tubes, ampules) or bags with non-residual liquids inside. Containers with liquids shall only be opened and remediated one-at-a-time. Non-residual liquids found in the waste drum or box (free or uncontainerized liquids) are transferred in small batches (< 1 liter) into sealable containers for processing.

5.2.2 Place container(s) or bag(s) with liquids into the secondary containment pan.

5.2.3 Open the container or cut open the inner bag as needed to access any liquid.

5.2.4 IF more than 1 liter of liquid is present in the drum, box, container or bag, THEN pour, pump, or transfer no more than 1 liter of liquid into a pre-measured bag or sealable container of approved absorbent material.

5.2.4.1 Shake or, using a stir stick or spatula tool, ensure liquid is thoroughly mixed into the absorbent for at least 1 minute.

5.2.4.2 Allow container to sit for a minimum of 5 minutes.

5.2.4.3 Inspect bag or sealable container for liquids.

5.2.4.4 IF liquids are observed,
THEN add additional approved absorbent material at an estimated volume ratio of 1:8 liquid to absorbent, and repeat Steps 5.2.4.1 - 5.2.4.3.

5.2.5 IF 1 liter or less liquid is present in the drum, box, container or bag, THEN transfer the liquid into a pre-measured bag or sealable container of approved absorbent material
OR pour approved absorbent material into the drum, box, container or bag at an estimated volume ratio of 1:8 liquid to absorbent.

NOTE: To ensure contact, operators may use tools such as stir sticks, spatula, paint cans, etc., or "massage" the bag.

5.2.5.1 Shake or, using a stir stick or spatula tool, ensure liquid is thoroughly mixed into the absorbent for at least 1 minute.

5.2.5.2 IF liquid is in a bag,
THEN shake or massage the bag to ensure that the absorbent is in contact with the liquid.

5.2.5.3 IF liquid is absorbed in paint can or other container,
THEN shake or agitate the container as needed until liquid is well absorbed.

5.2.5.4 Allow waste to sit for a minimum of 5 minutes.

5.2.5.5 Inspect the drum, box, container or bag for liquids.

5.2.5.6 IF liquids are observed,
THEN add additional approved absorbent material at an estimated volume ratio of 1:8 liquid to absorbent and repeat Steps 5.2.5.1 - 5.2.5.5.

5.2.6 IF liquid was absorbed in a non-sealable container,
THEN transfer the absorbed liquid into a sealable container and close the sealable container.

5.2.6.1 Wipe the non-sealable container clean to ensure no residual absorbed liquid material remains.

PCN 5-1 Bm-FS-8/27/15 MSS-FS/SME 8/27/15 MWF-SS-8.27.15

NOTE 1: Waste must be placed into a designated ~~Prohibited Item (PI)~~ container of same waste stream. Bm 8/27/15

NOTE 2: Batches of liquids processed from different containers (i.e., potentially incompatible liquids) must be allowed to cure prior to transferring the waste into final waste packages to prevent hazardous reactions if inadvertently mixed.

5.2.7 IF the processed batch of liquid is to be transferred into a waste container which contains previously processed liquids which are potentially incompatible,
THEN allow the batch to cure for at least one hour.

NOTE: Additional batches of liquid may be processed while waiting for potentially incompatible batches to cure.

PCN 5-1 Bm-FS-8/27/15 MSS-FS/SME-8/27/15 MWF-SS 8/27/15

~~5.2.8 IF no liquids are observed OR when batches have cured for at least one hour, THEN transfer the waste to the appropriate designated PI waste package.~~ Bm 8/27/15

5.2.8 ~~5.2.9~~ Bm 8/27/15 Record the approximate volume of liquids absorbed or solidified in the applicable Attachment D, Contact Handled Waste Repackaging Data Form, of CH-REF-OP-013, Contact Handled Waste Repackaging.

5.2.8.1 ~~5.2.9.1~~ Bm 8/27/15 IF the volume of liquids found and processed is not consistent with the volume of liquids reported in associated Radiography Reports (where applicable),
THEN note the discrepancy in the applicable Attachment D, Contact Handled Waste Repackaging Data Form, of CH-REF-OP-013, Contact Handled Waste Repackaging

5.2.9 ~~5.2.10~~ Bm 8/27/15 Complete Attachment O, Miscellaneous Treatment Inspection Log Sheet, of CM-P-EN-013, Environmental Permits and Compliance.

5.2.10 ~~5.2.11~~ Bm 8/27/15 IF liquids are spilled onto the secondary containment pan absorbent liner pad or material,
THEN place the absorbent liner pad or material into a sealable container.

5.2.10.1 ~~5.2.11.1~~ Bm 8/27/15 Allow the absorbent liner pad or material to sit for a minimum of five minutes.

5.2.10.2 ~~5.2.11.2~~ Bm 8/27/15 Inspect the sealable container for liquids.

5.2.10.3 ~~5.2.11.3~~ Bm 8/27/15 IF liquids are observed,
THEN add additional approved absorbent material at an estimated volume ratio of 1:8 liquid to absorbent and repeat Steps 5.2.11.1 - 5.2.11.2.

5.2.11 ~~5.2.12~~ Bm 8/27/15 IF no liquids are observed,
THEN transfer the secondary containment pan absorbent liner pad or material in the sealable container to an outgoing waste package per the applicable Attachment B, Operations Prohibited Item Processing (OPIP), of CH-REF-OP-044, Operations Prohibited Item Processing.

PCN 5-1 Bm-FS-8/27/15 5/12/18-2 MSS

5.2.12 ~~5.2.13~~ Wipe the secondary containment pan clean to ensure no residual absorbed liquid material remains. Bm 8/27/15

5.3 Absorbing Residual Liquids

NOTE: Waste drums or boxes may contain smaller containers (i.e., bottles, jars, buckets, tubes, ampules) or bags with residual liquids inside. Residual liquids may also be found in the waste drum or box.

5.3.1 IF residual liquid is present in the drum, box, container, or bag,
THEN pour approved absorbent material into the drum, box, container or bag at an estimated volume ratio of 1:8 liquid to absorbent.

NOTE: To ensure contact, operators may use tools such as stir sticks, spatula, etc.

5.3.2 Shake or, using a stir stick or spatula tool, ensure liquid is thoroughly mixed into the absorbent for at least 1 minute.

5.3.3 IF liquid is in a bag,
THEN shake or massage the bag to ensure that the absorbent is in contact with the liquid.

5.3.4 IF liquid is absorbed in paint can or other container,
THEN shake or agitate the container as needed until liquid is well absorbed.

5.3.5 Allow waste to sit for a minimum of 5 minutes.

5.3.6 Inspect drum, box, container or bag for liquids.

5.3.7 IF liquids are observed,
THEN add additional approved absorbent material at an estimated volume ratio of 1:8 liquid to absorbent and repeat Steps 5.3.2 - 5.3.4.

5.3.8 IF absorbent material was used to absorb residual liquids in a box or drum,
THEN transfer absorbent material from the drum or box into a container or bag(s).

5.3.8.1 Wipe the drum or box clean to ensure no residual absorbed liquid material remains.

NOTE: Waste must be placed into an outgoing container of same waste stream.

5.3.9 Transfer the container or bag(s) to the appropriate outgoing waste container.

5.3.10 Document that residual liquids were absorbed or solidified in the applicable Attachment D, Contact Handled Waste Repackaging Data Form, of CH-REF-OP-013, Contact Handled Waste Repackaging.

5.4 Absorbing Residual and/or Incidental Mercury in Drum or Box

5.4.1 IF mercury containing devices and discrete containers with mercury are found in the drum or box,
THEN segregate and repackage the item as mercury waste.

5.4.1.1 Record a description of the item or approximate volume of mercury in the applicable waste container documentation.

5.4.1.2 Ensure the waste container with the mercury waste is identified and labeled with the appropriate waste code.

5.4.2 IF residual or incidental droplets of mercury are present in the drum or box,
THEN absorb the droplets using compounds from a mercury spill kit in accordance with the applicable vendor instruction for the mercury spill kit.

5.4.2.1 Transfer the waste material to the appropriate waste container per the applicable Attachment B, Operations Prohibited Item Processing (OPIP), of CH-REF-OP-044, Operations Prohibited Item Processing.

5.4.2.2 Record the approximate volume of mercury absorbed in the applicable Attachment D, Contact Handled Waste Repackaging Data Form, of CH-REF-OP-013, Contact Handled Waste Repackaging (i.e., droplets of mercury absorbed).

5.5 Wetted Material

NOTE: Absorbent materials such as Solidasorb, kitty litter, vermiculite, mop heads, or absorbent pads which are found in a container are assumed to have been used to absorb unknown or flammable liquids and shall be considered a wetted material. Wetted material may appear dry or wet, or may be observed to contain or release residual liquids when handled.

5.5.1 IF residual liquids are observed within or coming from the wetted material,
THEN record the approximate volume of liquids absorbed or solidified on Attachment D, Contact Handled Waste Repackaging Data Form, of CH-REF-OP-013, Contact Handled Waste Repackaging.

5.5.1.1 Pour approved absorbent material into a sealable container at an estimated volume ratio of 1:8 liquid to absorbent.

5.5.2 Transfer wetted material into the sealable container leaving a void space at the top for additional absorbent material.

5.5.3 Pour approved absorbent material to fill the sealable container.

5.5.4 Close the sealable container.

NOTE: Waste must be placed into an outgoing container of same waste stream.

5.5.5 Transfer the sealable container(s) to the appropriate outgoing waste container.

5.6 Processing Environmental Media Liquids in Drums

5.6.1 Ensure the container is placed on absorbent pads on the BBA floor.

5.6.2 Ensure a vacuum and hose assembly is installed to an appropriate intermediate container (e.g., 55 gal drum, 30 gal drum, or other suitable container inside the BBA).

5.6.3 Transfer liquid to the intermediate container.

NOTE: Incidental liquid in the source container may be wiped or absorbed at any time during or after processing of waste from the container.

5.6.4 Once the source container has been emptied of liquid and waste, absorb incidental quantities of liquid in the container using an absorbent liner pad or approved absorbent material.

5.6.5 IF liquid was spilled or dropped on the BBA floor, the container or vacuum,
THEN wipe up or absorb the liquid with an absorbent liner pad or approved absorbent material.

5.6.5.1 Transfer wetted absorbent liner pad(s) or approved absorbent material to the appropriate outgoing waste container.

5.6.6 IF saturated waste is encountered,
THEN perform the following:

5.6.6.1 Initiate Attachment P, Saturated Waste Treatment, of CM-P-EN-013, Environmental Permits and Compliance.

5.6.6.2 Ensure the waste is placed in a secondary containment pan AND apply absorbent material until no liquid remains.

5.6.6.3 Document that residual liquids were absorbed or solidified in Attachment P, Saturated Waste Treatment, of CM-P-EN-013, Environmental Permits and Compliance.

6.0 RECORDS

Records are identified, classified, and maintained in accordance with CM-P-AD-049, Records Management, and CM-X-AD-026, Records Inventory and Disposition Schedule.

6.1 Record Numbering

None

6.2 Records Inventory and Disposition Schedule

None

7.0 ATTACHMENTS

Attachment A: Acronyms/Abbreviations, Definitions, References, and Reviewer Selection for Major Revisions

Attachment B: Recommended Tool List

Attachment C: TWPC Approved Absorbents

Attachment D: Liquid Volume Conversion Chart

Attachment A: Acronyms/Abbreviations, Definitions, References, and Reviewer Selection for Major Revisions

Acronyms/Abbreviations

BBA – Box Breakdown Area

GB – Glovebox

OM – Operations Manager

PI – Prohibited Item

RCRA – Resource Conservation and Recovery Act

TRU – Transuranic

TWPC – TRU Waste Processing Center

Definitions

Environmental Media - Liquids introduced into waste containers during the conditions described in CH-R-WP-002, Environmental Media in Retrieved Containers from the Legacy Transuranic Waste Inventory.

Non-Residual Liquids - Pumpable, pourable, transferable, containerized or uncontainerized liquid.

PROCESS AREA - A footprint or space in the facility that may consist of a room, several rooms, a floor, or the whole facility that is involved with a particular operation or procedure.

Residual Liquids - Residual liquids (i.e., non-pourable, non-pumpable liquids or liquid droplets found on the inside of the containers or bags, heels of liquids, etc.) are not considered liquids or wetted materials.

Saturated Waste - Any waste in contact with environmental media or groundwater within a waste container.

SEALABLE CONTAINER - Sealable containers are containers having the following characteristics:

- Sealable Containers shall have a closure mechanism.
- Sealable Containers and its associated closure mechanism shall be non-metallic.
- Sealable Containers shall have no visible holes or penetrations.
- Sealable Containers shall have a minimum thickness of 5-mil or greater.

Wetted Material - Absorbent materials such as Solidasorb, kitty litter, vermiculite, mop heads, or absorbent pads, which are found in a container are assumed to have been used to absorb unknown or flammable liquids.

Attachment A: Acronyms/Abbreviations, Definitions, References, and Reviewer Selection for Major Revisions

Developmental References

Risk-Based Disposal Approval Request for PCBs Contaminated with Radioisotopes at the TWPC, March 1, 2011

LL-A-OP-010, Mixed Low Level Waste Profile

OAHA-02-001, Operations General

OAHA-05-005, Box Breakdown Area Operations

OAHA-05-006, Glove Box Operations

T-CM-478-R-PR-004, Nochar 1/7/08 Letter Verifying TWPC Work Procedures

TNHW-145, Hazardous Waste Permit

Cross References

CH-REF-OP-013, Contact Handled Waste Repackaging

CH-REF-OP-044, Operations Prohibited Item Processing

CH-R-WP-002, Environmental Media in Retrieved Containers from the Legacy Transuranic Waste Inventory

CM-P-EN-013, Environmental Permits and Compliance

Reviewer Selection for Major Revisions

Required	Optional
Operations Manager	Environmental Programs Manager
Peer Review Specialist	Quality Assurance Manager
CH Process Superintendent	Safety Authorization Basis Manager
Facility Manager	Radiological Control Manager
	Health and Safety Manager
	Shift Superintendent
	Waste Certification Official

Attachment B: Recommended Tool List

This list is intended as a general guide of various tools and supplies that may be used in the processing of residual liquids. Tools and supplies may include but are not limited to the following:

- impervious gloves
- various sized recloseable plastic bags (zip-lock, etc.)
- wooden or plastic stir sticks, spatulas, etc.
- absorbent pads (pan liners)
- clean rags or paper towels
- approved absorbent material
- paint can
- pump, aspirator or similar
- sealable containers

Attachment C: TWPC Approved Absorbents

ADDITIVE	USAGE
Quick-Solid QS-44 OR Solid-A-Sorb	Environmental media in drums, Groundwater in casks and saturated waste
NoChar N965 Liquibond	Unknown containerized liquids/non-residual liquids/residual liquids/wetted materials, Environmental media in drums, Groundwater in casks and saturated waste
NoChar N910 Petrobond	PCB contaminated oils
Hg Absorb, PIG Mercury Absorbent Powder	Residual or incidental droplets of Mercury

Attachment D: Liquid Volume Conversion Chart

1 teaspoon		1/3 tablespoon	5 ml, 5cc	
1 tablespoon	1/2 fluid ounce	3 teaspoons	15 ml, 15 cc	
2 tablespoons	1 fluid ounce	1/8 cup, 6 teaspoons	30 ml, 30 cc	
1/4 cup	2 fluid ounces	4 tablespoons	59 ml	
1/3 cup	2-2/3 fluid ounces	5 tablespoons + 1 teaspoon	79 ml	
1/2 cup	4 fluid ounces	8 tablespoons	118 ml	
2/3 cup	5-1/3 fluid ounces	10 tablespoons + 2 teaspoons	158 ml	
3/4 cup	6 fluid ounces	12 tablespoons	177 ml	
7/8 cup	7 fluid ounces	14 tablespoons	207 ml	
1 cup / 1/2 pint	8 fluid ounces	16 tablespoons	237 ml	
2 cups / 1 pint	16 fluid ounces	32 tablespoons	473 ml	
4 cups / 2 pints	32 fluid ounces	1 quart	946 ml	0.25 gallon
8 cups / 4 pints	64 fluid ounces	2 quarts	1893 ml	0.5 gallon
8 pints	128 fluid ounces	4 quarts	3785 ml	1 gallon
1 gallon	128 fluid ounces	3.785 liters	3785 ml	1 gallon
100 ml	3 fluid ounces	0.11 quarts / 0.4 cup	0.1 liter	0.03 gallon
250 ml	8.5 fluid ounces	0.26 quarts / 1.06 cup	0.25 liter	0.07 gallon
500 ml	17 fluid ounces	0.53 quarts / 2.11 cup	1/2 liter	0.13 gallon
1 liter	34 fluid ounces	1.057 quarts	1000 ml	0.26 gallon
2 liter	68 fluid ounces	2.11 quarts	2000 ml	0.53 gallon
3 liters	101 fluid ounces	3.17 quarts	3000 ml	0.79 gallon
3.785 liters	128 fluid ounces	4 quarts	3785 ml	1 gallon

DIVIDER PAGE

Attachment 3 - Acceptable Knowledge Source Document Summary

Site(s): Oak Ridge National Laboratory	Source Document Tracking Number: P598
Waste Stream Number(s): ORNL Non-specific Library Files (Applicable only when site library is not in use)	
Acceptable Knowledge Documentation Type: ☑ TRU Waste Management Program Information ☑ Waste Stream-Specific Information ☑ Additional Information	Category: ☐ Correspondence ☐ Discrepancy Resolution ☑ Internal Procedure ☐ Miscellaneous ☐ Published Document or Internal Procedure ☐ Unpublished Documents
Title or Description of Source Document [a] : Operations Prohibited Item Processing	
Source Document Reference Information (author(s), document and revision number, date, publisher): NA, CH-REF-OP-044, Rev. 4 (Older Versions Included), 07/24/2014, TWPC	

AK # [b]	Source Doc. Page #[c]	AK Information Summary
PR8, WS9, S2	Throughout	This procedure provides instructions for the identification, handling, remediation, and disposition of Prohibited Items (PIs). PIs may also be returned to the U.S. Department of Energy (DOE) Oak Ridge National Laboratory or shipped offsite for alternative treatment. This procedure also provides instruction for remediation tasks that are repetitive and have established predetermined directions for Operations Prohibited Item Processing (OPIP). Resource Conservation and Recovery Act (RCRA) wastes and Toxic Substances Control Act (TSCA) wastes which meet specific TRU Waste Processing Center (TWPC) waste profile requirements and Nevada National Security Site (NNSS) Waste Acceptance Criteria are packaged for disposal at NNSS. Specific RCRA and TSCA wastes which are not packaged for disposal at NNSS may be acceptable at the Waste Isolation Pilot Plant (WIPP). These items are identified and segregated during processing to ensure proper handling and disposal in accordance with TWPC procedures. Items or materials that do not meet acceptance requirements specified in DOE/WIPP-02-3122, Transuranic Waste Acceptance Criteria for the Waste Isolation Pilot Plant, are considered PIs. These items or materials are identified and segregated for evaluation, on-site remediation, off-site treatment, or possible return transfer to DOE. The procedure discusses chemicals, such as mercury, that if found, follow the steps provided. The procedure states in several places that an approved absorbent is to be used, but the specific absorbent is not called out. Specific chemicals/compounds called out in the procedure are as follows: • NoChar N910 Petrobond - Only approved absorbent for the absorption, stabilization, or solidification of containerized PCB liquids, and is to be used in a 8:1 ratio of absorbent to liquid by volume. (pp. 29 of 30 in Revision 4) CH-P-OP-044 supersedes CH-P-OP-022, and CH-P-OP-044 was superseded by CH-REF-OP-044. CH-P-OP-044: Revision 0 (Dated 05/24/2010): Items or materials that have established predetermined direction for remediation in accordance with attached Table 1, Prohibited Item Remediation Directions, may be remediated accordingly and documented in accordance with Attachment B,

CCP RECORDS ORIGINAL
DATE REC'D 2/9/16

Attachment 3 - Acceptable Knowledge Source Document Summary (continued)

Site(s): Oak Ridge National Laboratory		Source Document Tracking Number: P598
AK # [b]	Source Doc. Page #[c]	AK Information Summary
		Operations Prohibited Item Processing (OPIP). All other materials refer to CH-REF-OP-045, Non-Compliant Containers (see Reference P599 in the ORNL Site Library). PIs may be found in waste containers received at the TWPC. WIPP PIs are remediated prior to packaging for disposal at WIPP. WIPP PIs are listed in Attachment B, WIPP Prohibited Items, of CH-P-OP-013, Contact Handled Waste Repackaging (see Reference P254 in the ORNL Site Library). Table 1, Prohibited Item Remediation Directions: • Liquids • Absorb liquids in accordance with CH-I-OP-013, Absorbing Liquids in the Glove Box and Box Breakdown Area. • Make clear notes on the Attachment D, Contact Handled Waste Repacking Data Form • Complete Attachment O, Miscellaneous Treatment Inspection Items, of CM-P-RP-309, Environmental Permits – Inspections/Monitoring and Reporting. • Residual or incidental Mercury • Absorb the droplets using compounds from a mercury spill kit in accordance with the applicable vendor instruction for mercury spill kit. • Return the material to the appropriate waste container. • Record the approximate volume of mercury absorbed in the applicable waste container documentation (i.e., droplets of mercury absorbed). • Potentially Pressurized Containers (PPC) • If pressurized, label the PPC with assigned number, have the RCT perform SCO survey, and bag out item. • Have EPP personnel fill out Attachment T, Aerosol Can Management of CM-P-RP-309, Environmental Permits Inspections-Monitoring. • Place in approved designated labeled container. Revision 1 (Dated 05/27/2010): No substantive changes were made related to TRU waste management. Revision 2 (Dated 06/09/2011): • Liquids • Created categories for residual and non-residual liquids. • Both categories are absorbed; however, non-residual liquids require an Attachment O from CM-P-RP-309, and residual liquids do not require an Attachment O. • Containerized PCB Liquids • AKE, RII, or WCO/AWCO evaluates the Containerized PCB Liquid wastes (known and suspect) and documents the PCB item description, characterization, extent of contamination, and regulatory requirements on Attachment B, Operations Prohibited Item Processing (OPIP). • Operations ensures segregated Containerized PCB Liquid wastes are placed into daughter drums containing only waste from one AK/PK Waste Stream. • Daughter drums with consolidated PCB Liquid wastes (known and suspect) will undergo NDA and will be dispositioned at Perma-Fix for treatment and disposal. Revision 3 (Dated 03/27/2012):

Attachment 3 - Acceptable Knowledge Source Document Summary (continued)

Site(s): Oak Ridge National Laboratory		Source Document Tracking Number: P598
AK # [b]	Source Doc. Page #[c]	AK Information Summary
		Document is just the title page stating that the procedure has been superseded by CH-REF-OP-044 and the revision number was reset to zero. CH-REF-OP-044: Revision 0 (Dated 03/27/2012): Table 1, Prohibited Item Remediation Directions: • Liquids/Saturated Waste/Wetted Waste • Absorb in accordance with CH-REF-OP-014, Absorbing Liquids in the Glovebox and Box Breakdown Area (see Reference P592 in the ORNL Site Library), RH-REF-OP-014, Liquids Handling in the Hot Cell (see Reference P590 in the ORNL Site Library), or RH-REF-OP-102, Liquids Handling in the Cask Processing Enclosure (see Reference P591 in the ORNL Site Library). • Place absorbed liquids/waste into a daughter drum (non-PI) with parent waste or from a matching waste stream. • Make clear notes on the Attachment D, Contact Handled Waste Repacking Data Form, of CH-REF-OP-013, Contact Handled Waste Repackaging (see Reference P254 in ORNL Site Library). • Complete Attachment O, Miscellaneous Treatment Inspection Log Sheet, or Attachment P, Saturated Waste Treatment, from CM-P-RP-309, Environmental Permits – Inspections/ Monitoring and Reporting (see Reference P1433 in the ORNL Site Library). • Containerized PCB Liquids • This table applies to containers of PCB liquids or waste articles which contain potential PCB liquids (such as gearboxes, vacuum pumps, etc). • Do not open the PCB container or waste articles, or absorb the PCB liquids. • Segregate the PCB liquids container or waste articles from other compliant waste. • AKE, RII, or WCO/AWCO evaluates the containerized PCB Liquid wastes (known and suspect) and documents the PCB item description, characterization, extent of contamination, and regulatory requirements on the applicable Attachment F, Unapproved PI Characterization form, from CH-REF-OP-013, Contact Handled Waste Repackaging (see Reference P254 in the ORNL Site Library). • PI drums with consolidated PCB Liquid wastes (known and suspect) will undergo NDA and will be dispositioned for off-site treatment and disposal. Revision 1 (Dated 09/10/2013): • Added reference to CPE • Changed title of Attachment F of CH-REF-OP-013 to "Uncharacterized Waste Guidance" Revision 2 (Dated 11/20/2013): • Revised to include requirements for CCP VE of drums containing materials (such as lead) impenetrable by RTR. Revision 3 (Dated 07/14/2014): Revised Table 1A to add 1.A.11, which applies to environmental media liquids and saturated waste (waste which has absorbed known environmental media liquids from BBA). • Process the environmental media liquids in accordance with CH-REF-OP-014,

Attachment 3 - Acceptable Knowledge Source Document Summary (continued)

Site(s): Oak Ridge National Laboratory		Source Document Tracking Number: P598
AK # [b]	Source Doc. Page #[c]	AK Information Summary
		Absorbing Liquids in the Glovebox and Box Breakdown Area. • Initiate/fill out an Attachment P, Saturated Waste Treatment, of CM-P-EN-013, Environmental Permits and Compliance, for each drum receiving absorbed liquid waste. Revision 4 (Dated 07/24/2014): Revised Table 1A to add 1.H.2. 1.H.2 applies to containers of PCB liquids or PCB articles which contain potential PCB liquids (such as electric motors, gearboxes, vacuum pumps, etc.). • Segregate the PCB liquids container or PCB articles from other compliant waste. • AKE and RII or designee evaluates the containerized PCB liquid wastes (known and suspect) and documents the PCB item description, characterization, extent of contamination, and regulatory requirements on the applicable Attachment F, Uncharacterized Waste Guidance, from CH-REF-OP-013, Contact Handled Waste Repackaging (see Reference P254 in the ORNL Site Library). • NoChar N910 PETROBOND is the only approved absorbent for the absorption, stabilization or solidification of containerized PCB liquid and is to be used in a 8:1 ratio absorbent to liquid by volume. • Fill out Attachment Q, PCB Liquid Treatment Inspection Log Sheet, from CM-P-EN-013, Environmental Permits and Compliance (see Reference P1433 in the ORNL Site Library). • Place PCB articles and waste into outgoing daughter waste container. Place absorbed/treated PCB liquid on top of the waste in the outgoing container. • Decon work area in accordance with CH-REF-OP-027, PCB Decontamination (see Reference P582 in the ORNL Site Library), if any spilled outside of bag or treatment pan and place in an outgoing daughter waste container. • Make good notes on Attachment D, Contact Handled Waste Repackaging Data Form, of CH-REF-OP-013, Contact Handled Waste Repackaging (see Reference P254 in the ORNL Site Library). Procedure verification/walk down was conducted on 09/24/2015 by Jeff Harrison with Mike Snipes, Alternate Waste Certification Official.

Attachment 3 - Acceptable Knowledge Source Document Summary (continued)

Site(s): Oak Ridge National Laboratory	Source Document Tracking Number: P598
Source Document Data Limitations (if any): 1. None.	
Acceptable Knowlege Expert: Travis Smith Date: 01/20/2016 Print /Sign	
[a] Provide description for non-titled information (i.e., container paperwork, MSDS sheets, etc) [b] Obtain from Acceptable Knowledge Documentation Checklist [c] For microfilm or microfiche, identify box, tape, reel number and location.	

Operations Prohibited Item Processing

REFERENCE

Implementation Date: 9/10/13

APPROVAL:

Tim Hallman
Operations Manager

9/5/13
Date

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Revision Summary

Revision	Change Summary
0	Initial issue
1	Added reference to CPE

Current Revision Specific Changes		
Location	**Description**	**Reason**
Tables	Added reference to CPE; added out-of-service date	
Global	Changed title of Attachment F of CH-REF-OP-013	

1.0 INTRODUCTION

1.1 Purpose

This procedure provides instructions for the identification, handling, remediation, and disposition of Prohibited Items (PIs). PIs may also be returned to the U.S. Department of Energy (DOE) Oak Ridge National Laboratory or shipped offsite for alternative treatment. This procedure also provides instruction for remediation tasks that are repetitive and have established predetermined directions for Operations Prohibited Item Processing (OPIP).

1.2 Scope

Resource Conservation and Recovery Act (RCRA) wastes and Toxic Substances Control Act (TSCA) wastes which meet specific TRU Waste Processing Center (TWPC) waste profile requirements and Nevada National Security Site (NNSS) Waste Acceptance Criteria are packaged for disposal at NNSS. Specific RCRA and TSCA wastes which are not packaged for disposal at NNSS may be acceptable at the Waste Isolation Pilot Plant (WIPP). These items are identified and segregated during processing to ensure proper handling and disposal in accordance with TWPC procedures.

Items or materials that do not meet acceptance requirements specified in DOE/NV-325, Nevada National Security Site Waste Acceptance Criteria, are considered PIs. These items or materials are identified and segregated for evaluation, on-site remediation, off-site treatment, or possible return transfer to DOE.

Items or materials that do not meet acceptance requirements specified in DOE/WIPP-02-3122, Transuranic Waste Acceptance Criteria for the Waste Isolation Pilot Plant, are considered PIs. These items or materials are identified and segregated for evaluation, on-site remediation, off-site treatment, or possible return transfer to DOE.

Items or materials that have established predetermined direction for remediation in accordance with attached Table 1, Prohibited Item Remediation Directions, may be remediated accordingly and documented in accordance with Attachment B, Operations Prohibited Item Processing (OPIP). All other materials refer to CH-P-OP-045, Non-Compliant Containers.

1.3 Document Use

This document has been evaluated by the Document Use Review Team and has been determined to be a **REFERENCE** procedure.

REFERENCE procedures are not required to be in-hand or present for the user to actively reference during actual performance of action steps, however they may be open and referenced during the work performance based on personnel knowledge and skill level. If work is suspended due to inadequacy of procedure, then a page change notice or revision of the procedure is initiated.

2.0 PRECAUTIONS AND LIMITATIONS

2.1 Safety

- Observe as low as reasonably achievable exposure techniques at all times.
- For waste or containers where safe handling is in question, personnel shall not handle the containers or items until appropriate reviews are completed and processes are evaluated.
- When dispositioning PIs, the handling process considers the following, at a minimum, to ensure that containers/items are handled safely:
  - applicable Activity Hazards Analyses and controls
  - type of PI
  - personal protective equipment
  - packaging configuration
  - storage location
  - methods of handling and transport, including equipment used

2.2 Technical Safety Requirements

- None

3.0 RESPONSIBILITIES

3.1 Personnel Assignments

Training to the document is at the discretion of the Functional Manager in coordination with the document owner. The following personnel are responsible for performing the activities described in this document. These TWPC personnel may designate alternate personnel to assist in carrying out their responsibilities as specified in this document.

3.1.1 Operations Manager (OM)

- approves this procedure

3.1.2 Waste Certification Official (WCO)

- concurs with Table 1 direction for remediation
- reviews and signs completed Attachment B, Operations Prohibited Item Processing (OPIP)
- evaluates PIs and potential polychlorinated biphenyls (PCB) and/or RCRA materials to ensure proper waste characterization and documentation

3.1.3 Environmental Programs Manager (EPM)

- ensures management options are compliant with regulatory and permit conditions
- concurs with Table 1 direction for remediation
- evaluates PIs and potential PCB and/or RCRA materials to ensure proper waste characterization and documentation

3.1.4 Safety Authorization Basis Manager

- concurs with Table 1 direction for remediation

3.1.5 Fire Protection Engineer

- concurs with Table 1 direction for remediation

3.1.6 Health and Safety Manager

- concurs with Table 1 direction for remediation

3.1.7 Radiological Control Manager

- concurs with Table 1 direction for remediation

3.1.8 Inventory Coordinator

- plans and authorizes movement of waste containers
- maintains and updates waste container and activity inventory tracking mechanisms
- performs activities in accordance with this procedure

3.1.9 Alternate Waste Certification Official (AWCO), or Designee

- performs activities in accordance with the procedure
- initiates and reviews completed OPIP
- forwards OPIPs to Operations for processing

3.1.10 Data Entry Personnel

- perform activities in accordance with the procedure
- initiate and review completed OPIP
- forward OPIPs to Operations for processing

3.1.11 Regulatory Interface and Integration (RII) Personnel

- ensure management options are compliant with regulatory and permit conditions
- evaluate PIs and potential PCB and/or RCRA materials to ensure proper waste characterization and documentation

3.1.12 Acceptable Knowledge Expert (AKE)

- evaluates PIs and potential PCB and/or RCRA materials to ensure proper waste characterization and documentation
- reviews and signs completed OPIPs

3.1.13 Waste Operators

- process waste in accordance with OPIPs
- sign for completion of processing per OPIPs

3.1.14 Waste Package Verifier

- reviews and signs completed OPIPs

3.2 Document Maintenance

The OM is designated the document owner and is responsible for updating this document. Approval authority rests with the OM. Submit suggestions for revisions or improvement to the OM utilizing Attachment E, New Document and Revision Request Form, of CM-P-AD-061, Document Preparation, Review and Approval.

4.0 PREREQUISITES

- None

NOTE 1: Waste Management personnel perform the following steps, unless otherwise directed.

NOTE 2: Waste Nonconformance Reports (WNCRs) are initiated in accordance with CH-P-AD-044, Waste Corrective Actions and Nonconformances.

NOTE 3: Incoming Waste Containers transferred to the TWPC are surveyed and inspected to verify that the containers meet pertinent requirements for acceptance, as specified in CH-X-AD-001, Contact Handled Waste Acceptance Criteria; or RH-X-AD-001, Remote Handled Waste Acceptance Criteria. These surveys and inspections are performed in accordance with CH-UET-OP-001, Receipt of Contact Handled Solid Waste, or RH-UET-OP-001, Remote Handled Debris Waste Receipt. Authorized containers are individually unloaded from the transfer conveyance for visual inspections and surveys.

5.0 PROCEDURE

NOTE 1: Low Level Waste (LLW) PIs are listed in Attachment E, Project LLW Prohibited Items, of CH-REF-OP-013, Contact Handled Waste Repackaging. WIPP PIs are listed in Attachment B, WIPP Prohibited Items, of CH-REF-OP-013, Contact Handled Waste Repackaging.

NOTE 2: PIs may be found in waste containers received at the TWPC. NNSS PIs are remediated prior to being packaged for disposal as LLW. WIPP PIs are remediated prior to packaging for disposal at WIPP.

5.1 Prohibited Items (PI) Discovered During Nondestructive Examination (NDE)

5.1.1 Review Real-Time Radiography (RTR) report to determine if the PI(s) or PCB items can be remediated via an OPIP.

NOTE: The AWCO, or designee, performs Steps 5.1.2 and 5.1.3.

5.1.2 IF yes,
THEN initiate an OPIP per Subsection 5.3.

5.1.3 IF no,
THEN initiate a WNCR in accordance with CH-P-AD-044, Waste Corrective Action and Nonconformances.

NOTE: NNSS or WIPP PIs may also be discovered during repackaging of the waste contents. These items are segregated and removed from the process area, dispositioned, and either packaged for return to DOE, processed to create an acceptable waste form for disposal, or packaged for off-site remediation.

5.2 Prohibited Item(s) (PIs) Discovered During Processing

NOTE: When notified of a PI by Operations, the AWCO, or designee, determines if the PI can be remediated via an OPIP.

5.2.1 Review the specific PI to determine if the PI can be remediated via an OPIP.

5.2.2 IF yes,
THEN initiate an OPIP per Subsection 5.3..

5.2.3 IF no,
THEN initiate a WNCR in accordance with CH-P-AD-044, Waste Corrective Action and Nonconformances.

NOTE 1: The AWCO, or designee performs the following subsection.

NOTE 2: OPIPs are initiated in the Issues Tracking System utilizing an electronic version of Attachment B, Operations Prohibited Item Processing (OPIP). OPIPs are tracked and maintained according to CM-P-AD-048, Issues Management.

5.3 Initiating Operations Prohibited Item Processing (OPIP)

5.3.1 Go to the Home Page in Issues Tracking System.

5.3.2 Go to drop down list in Create a New Issue.

5.3.3 Select OPIP.

5.3.4 The OPIP number will generate automatically.

5.3.5 Enter Title/Brief Description.

5.3.6 Select responsible person.

5.3.7 Select projected closure date (normally 90 days out).

5.3.8 Enter container number.

5.3.9 Enter PI Description.

5.3.10 Enter PI Location. (Enter N/A if not known.)

5.3.11 Review PI and select appropriate remediation.

5.3.12 Create an Operations Prohibited Item Processing (OPIP) Folder.

5.3.12.1 Ensure OPIP folders contain the following (may be verified in any order):

- drum number and OPIP number written on the front
- a copy of the OPIP
- a copy of the RTR (description of prohibited item)
- a copy of Attachment G, PE-Ci and FGE Conversion Worksheet, of CH-UET-OP-014, Waste and Activity Inventory Control (evidence to confirm <50 FGE)

NOTE: The AWCO or designee performs the following subsection.

5.4 Revising an Existing Operations Prohibited Item Processing (OPIP)

5.4.1 Go to Issues Tracking Database.

5.4.2 Select the "**OPIP**" button.

5.4.3 Go to the appropriate OPIP number.

5.4.4 Click on "**supersede**" option.

NOTE: The following items will be duplicated into the next revision of the OPIP #: Title/Brief Description, Container Numbers, PI Description, and PI Location #.

5.4.5 Click on "**Create New Issue**" option.

5.4.6 Click on the "**Edit/Submit**" button.

5.5 Inspecting Parent Container Traveler for Latest Revision

5.5.1 Ensure the parent container traveler contains, at a minimum, the items listed on Attachment F, Incoming Container Traveler File Cover Sheet, of CH-UET-OP-001, Receipt of Contact Handled Solid Waste.

- IF the parent container is a repack,
  THEN it should contain Attachment D, Waste Container Traveler File Cover Sheet, and Attachment B, Waste Container Traveler, of CH-REF-OP-011, Drum Bag In/Bag Out. Ensure items listed on cover sheet and objective evidence of Parent Container Waste Stream are in the traveler.

5.5.2 Mate Parent Container Traveler to OPIP Traveler.

NOTE: Operations personnel remediate PIs as indicated in the OPIP. Operations personnel sign for completion and verification of remediated PIs on the applicable OPIP in accordance with CH-REF-OP-013, Contact Handled Waste Repackaging.

5.5.3 Forward the OPIP Traveler to Operations for processing.

NOTE: The AWCO or designee performs the following subsection.

5.6 Closing Operations Prohibited Item Processing (OPIP)

5.6.1 Receive Parent, Daughter Travelers, and OPIP from Operations personnel for Box Breakdown Area (BBA), Contact Handled Glovebox (CHGB), Hot Cell, and Cask Processing Enclosure (CPE) repackaging.

5.6.2 Mate Parent Traveler to Daughter Traveler(s) as applicable. (This will help ensure where, when, what and why container was repackaged, also helps determine if it is a drum repack, box-daughter, or Remote Handled (RH) cask-daughter.)

5.6.3 Close the Incoming Parent Traveler.

- Ensure thorough completion of incoming Attachment F, Incoming Container Traveler File Cover Sheet, of CH-UET-OP-001, Receipt of Contact Handled Solid Waste.
- Ensure it is the latest revision (check InTruNet Document Center CH-UET-OP-001).

- Ensure Cover Sheet is initialed, signed, dated, description of repack, and what is listed on the Cover Sheet is the minimum of what is in the traveler. (What is in the traveler is signed, dated, lined out, etc. If old revision is blank throw it out.) List any extra information.
- Forward Traveler and completed OPIP folder to WCO.

5.6.4 Close the Repack Parent Traveler.

- Review repack (Attachment D, Waste Container Traveler Cover Sheet, and Attachment B, Waste Container Traveler, of CH-REF-OP-011, Drum Bag In / Bag Out).
- Ensure forms are the latest revisions (check InTruNet Document Center CH-REF-OP-011, Drum Bag In / Bag Out).
- Ensure Cover Sheet and Waste Container Traveler are initialed, signed, and dated. Description of repack and what is listed on the Cover Sheet (Container Weight form is N/A if not there) is the minimum of what is in the traveler. (What is in the traveler is signed, dated, lined out, etc. Throw out old revision if it is blank.) List any extra information.
- Forward Traveler to WCO for review.

5.6.5 Close the Daughter Travelers.

- Ensure Traveler has the latest revision Attachment D, Waste Container Traveler Cover Sheet, and Attachment B, Waste Container Traveler, of CH-REF-OP-011, Drum Bag In / Bag Out. (Check InTruNet Document Center.)
- Review Contact Handled (CH) Waste Repackaging for latest revision (check InTruNet Document Center CH-REF-OP-013); correct parent container number; Waste Stream matches parent, < 3 layers of confinement; waste item description; and note referring to OPIP (e.g., non-residual found or not).
- Scan CH Waste Repackaging Data Form and any applicable Attachment F, Uncharacterized Waste Guidance, of CH-REF-OP-013, Contact Handled Waste Repackaging, title as Container number with suffix (e.g., X10C0000000A or X10C0000000A1).
- Make a copy of CH Waste Repackaging Data Form (if repackaged with an OPIP).
- E-Mail scanned CH Waste Repackaging Data Forms to designated person.
- File the folder until the container is placed on the Acceptable Knowledge (AK) document.
- When container is placed on the AK, forward applicable Traveler(s) to designated location.

- Leave Travelers in designated location until Nondestructive Assay (NDA) data report is returned. Travelers will then be grouped by data report.

5.6.6 Close the OPIP.

NOTE: All revisions to an OPIP Attachment B, Operations Prohibited Item Processing (OPIP), are to be retained in the traveler.

- Verify OPIP is on the latest revision (check InTruNet Document Center CH-REF-OP-044, Operations Prohibited Item Processing).
  - If not, then initiate a revision to the OPIP assigned number in Issues Tracking per Subsection 5.4.
- Review OPIP Title/Brief description, container number, PI Description, PI Location (may be N/A), PI Remediation (box checked).
- Review to ensure OPIP folder contains a copy of the following:
  - Prohibited Item Remediation Directions, Table 1 of CH-REF-OP-044 (if remediation directions are not on the OPIP),
  - Attachment D, Contact Handled Waste Repackaging Data Form, of CH-REF-OP-013, Contact Handled Waste Repackaging,
  - Attachment F, Uncharacterized Waste Guidance, of CH-REF-OP-013, Contact Handled Waste Repackaging,
  - Attachment G, PE-Ci and FGE Conversion Worksheet, of CH-UET-OP-014, Waste and Activity Inventory Control,
  - Attachment P, Saturated Waste Treatment, of CM-P-EN-013, Environmental Permits and Compliance,
  - RTR Container Quick Screening Log sheet (other RTR Data Sheets are acceptable),
  - Review CH Waste Repackaging Data Form note to determine if liquid was residual and absorbed; or if it was non-residual and treated.
  - Drum venting paperwork and vent verification, if container was an overpack.

NOTE: If liquid was treated then Attachment O, Miscellaneous Treatment Inspection Log Sheet, of CM-P-EN-013, Environmental Permits and Compliance, is applicable.

- Ensure Attachment O, Miscellaneous Treatment Inspection Log Sheet, of CM-P-EN-013, Environmental Permits and Compliance, has been signed and dated.

- Record the OPIP number at the bottom of each page in the OPIP traveler.

NOTE: Comments may be added in Issues Tracking when closing OPIP.

5.6.7 Go to Issues Tracking Database.

5.6.8 Select OPIP.

5.6.9 Search OPIP to be closed.

NOTE: If the operator who signed the "Performed by" block is not in the drop-down menu, the signature must be over-signed by an operator on the drop-down list.

5.6.10 Ensure the Attachment B, Operations Prohibited Item Processing (OPIP), is signed by an approved Waste Operator.

5.6.11 Select the operator from the "Performed by" drop down list who signed the "Performed by" block on the hardcopy of the OPIP.

5.6.12 Enter the "Performed by" date.

NOTE: If the Waste Package Verifier (WPV) who signed the "Verified by" block is not in the drop-down menu, the signature must be over-signed by a WPV on the drop-down list.

5.6.13 Ensure the Attachment B, Operations Prohibited Item Processing (OPIP), is signed by an approved WPV.

5.6.14 Select the WPV from the "Verified by" drop down list who signed the "Verified by" block on the hardcopy of the OPIP.

5.6.15 Enter the "Verified by" date.

5.6.16 Forward the OPIP Traveler to the AKE for review.

5.6.17 Forward the OPIP Traveler to the WCO for review.

6.0 RECORDS

Records are identified, classified, and maintained in accordance with CM-P-AD-049, Records Management, and CM-X-AD-026, Records Inventory and Disposition Schedule.

6.1 Record Numbering

Record	Record Naming Convention
Att. B	OPIP-YYYY-###-R#, where OPIP = record code; YYYY = Year; ### = number sequence; R# = revision number

6.2 Records Inventory and Disposition Schedule

Records generated from this document are:

Record	Retention Period	Class	Record Type	Disposition Location	File Index Loc.	Media Type	OUO	Vital		Other File Loc.
								L&F	EO	
Attachment B, Operations Prohibited Item Processing (OPIP)	LOP+30	Record	COMFOR	7880V	17.2	EP	N/A	N/A	N/A	N/A

COMFOR – Completed Form **EO** – Emergency Operating **EP** – Electronic and Paper **L&F** – Legal & Financial
LOP+30 – Life of Project + 30 years **OUO** – Official Use Only

7.0 ATTACHMENTS

Attachment A: Acronyms/Abbreviations, Definitions, References, and Reviewer Selection for Major Revisions

Attachment B: Operations Prohibited Item Processing (OPIP)

Table 1, Prohibited Item Remediation Directions

Table 1A, Liquids

Table 1B, > 4 Liter Sealed Container(s)

Table 1C, Residual Mercury

Table 1D, Impenetrable Material (e.g., lead)

Table 1E, TRU Alpha <100 nCi/g

Table 1F, Potentially Pressurized Containers (PPC)

Table 1G, PCB Items (Non-Liquid)

Table 1H, Containerized PCB Liquids

Table 1I, Regulated Asbestos Containing Materials (ACM)

Attachment A: Acronyms/Abbreviations, Definitions, References, and Reviewer Selection for Major Revisions

Acronyms/Abbreviations

ACM – Asbestos Containing Material

AK – Acceptable Knowledge

AKE – Acceptable Knowledge Expert

AWCO – Alternate Waste Certification Official

BBA – Box Breakdown Area

CH – Contact Handled

CHGB – Contact Handled Glovebox

CPE – Cask Processing Enclosure

DOE – U.S. Department of Energy

EPM – Environmental Programs Manager

GB – Glovebox

LLW – Low Level Waste

MLLW – Mixed Low Level Waste

NDA – Nondestructive Assay

NDE – Nondestructive Examination

NNSS – Nevada National Security Site

OM – Operations Manager

OPIP – Operations Prohibited Item Processing

PCB – polychlorinated biphenyls

PI – Prohibited Item

PPC – Potentially Pressurized Containers

RCRA – Resource Conservation and Recovery Act

RH – Remote Handled

RII – Regulatory Interface and Integration

RTR – Real-Time Radiography

TRU – Transuranic

TSCA – Toxic Substances Control Act

TWPC – TRU Waste Processing Center

WCO – Waste Certification Official

WICS – Waste Inventory Control System

Attachment A: Acronyms/Abbreviations, Definitions, References, and Reviewer Selection for Major Revisions

Acronyms/Abbreviations

WIPP – Waste Isolation Pilot Plant

WNCR – Waste Nonconformance Report

WPV – Waste Package Verifier

Definitions

In-Process – A container is considered "in-process" once it is accepted for receipt. In-process containers may be staged in a staging area awaiting active processing, actively processed by Non-Destructive Assay or Examination, opened for sorting within a processing area, staged in an aging area, or actively processed by Head Space Gas Analysis. A container is no longer "in-process" when it is staged for final packaging or shipment.

Discovery – If, after acceptance of a waste container, a condition, item, or material is found to not meet TWPC Waste Acceptance Criteria that was not clearly identified or implied by the original waste generator documentation prior to receipt of the waste container, it is considered a "discovery" condition.

Prohibited Items (PI) – Items or materials that do not meet acceptance requirements specified in DOE/NV-325, Nevada National Security Site Waste Acceptance Criteria, or that are identified in DOE/WIPP-02-3122 Transuranic Waste Acceptance Criteria for the Waste Isolation Pilot Plant, are considered PI. These items or materials are identified and segregated for evaluation, on-site remediation, off-site treatment, or possible return transfer to DOE.

Operations Prohibited Item Processing (OPIP) – Proven and approved predetermined direction for remediation of listed items in Table 1.

Designee – For the purposes of this procedure, typically the AWCO or Data Entry Personnel.

Developmental References

DOE/NV-325, Nevada National Security Site Waste Acceptance Criteria

DOE/WIPP 02-3122, Transuranic Waste Acceptance Criteria for the Waste Isolation Pilot Plant

CH-P-OP-045, Non-Compliant Containers

CH-UET-OP-002, Contact Handled Staging Area Operations

CH-UET-OP-003, Box Breakdown Area Operations

CH-UET-OP-004, Glovebox Operations

CH-X-AD-001, Contact Handled Waste Acceptance Criteria

CM-R-AD-001, Documented Safety Analysis

LL-P-OP-001, Mixed Low Level Waste / Low Level Waste Tracking

RH-X-AD-001, Remote Handled Waste Acceptance Criteria

Attachment A: Acronyms/Abbreviations, Definitions, References, and Reviewer Selection for Major Revisions

Cross References
TNHW-145, Tennessee Hazardous Waste Permit
057077P, Operating Air Permit
CH-I-OP-016, Waste Inventory Control System Data Entry
CH-REF-OP-027, PCB Decontamination
CH-P-AD-044, Waste Corrective Action and Nonconformances
CH-REF-OP-011, Drum Bag In / Bag Out
CH-REF-OP-013, Contact Handled Waste Repackaging
CH-REF-OP-014, Absorbing Liquids in the Glovebox and Box Breakdown Area
CH-REF-OP-046, Glove Ports and Sleeve Transfers
CH-UET-OP-001, Receipt of Contact Handled Solid Waste
CH-UET-OP-014, Waste and Activity Inventory Control
CM-P-AD-048, Issues Management
CM-P-EN-013, Environmental Permits and Compliance
CM-REF-RP-402, Radiological Characterization Using Surface Contaminated Object Surveys
RH-UET-OP-001, Remote Handled Debris Waste Receipt
RH-REF-OP-014, Liquids Handling in the Hot Cell
RH-REF-OP-102, Liquids Handling in the Cask Processing Enclosure

Reviewer Selection for Major Revisions	
Required	**Optional**
Operations Manager	Director of Regulatory Interface and Integration
Quality Assurance Manager	Environmental Programs Manager
Peer Review Specialists	Safety Authorization Basis Manager
Waste Certification Official	Radiological Control Manager
	Health and Safety Manager
	Facility Manager

Attachment B: Operations Prohibited Item Processing (OPIP)

No:	Revision No:

I. Origination

Title/Brief Description:

Container #(s):

PI Description/Characterization:

PI Location:

PI Remediation #

☐ 1.A.1	☐ 1.B.1	☐ 1.D.1	☐ 1.G.1
☐ 1.A.2	☐ 1.B.2	☐ 1.D.2	☐ 1.G.2
☐ 1.A.3	☐ 1.B.3	☐ 1.D.3	☐ 1.H.1
☐ 1.A.4	☐ 1.C.1	☐ 1.D.4	☐ 1.I.1
☐ 1.A.5	☐ 1.C.2	☐ 1.E.1	
☐ 1.A.6	☐ 1.C.3	☐ 1.F.1	
☐ 1.A.7			
☐ 1.A.8			
☐ 1.A.9			
☐ 1.A.10			

PI Remediation Description(s):

Comments:

II. Completion/Verification

Remediation Performed by:

Waste Operator	Signature	Date

Verified by:

Waste Package Verifier	Signature	Date

AKPKS updated/verified:

Acceptable Knowledge Expert	Signature	Date

Review:

WCO/designee	Print	Sign	Date

Table 1: Prohibited Item Remediation Directions

Table 1A: Liquids

Remediation #	Waste Type	Remediation Direction
1.A.1	TRU (Residual or Non-Residual Liquids)	Drum has been determined to be TRU. Absorb liquids in accordance with CH-REF-OP-014, Absorbing Liquids in the Glovebox and Box Breakdown Area. Residual Liquids - Place absorbed residual liquids into a daughter drum (non-PI) with parent waste or from a matching waste stream. Make clear notes on the Attachment D, Contact Handled Waste Repacking Data Form, of CH-REF-OP-013, Contact Handled Waste Repackaging. Non-Residual Liquids - Place absorbed non-residual liquids into a daughter drum (non-PI) with parent waste or from a matching waste stream. Make clear notes on the Attachment D, Contact Handled Waste Repacking Data Form, of CH-REF-OP-013, Contact Handled Waste Repackaging, and complete Attachment O, Miscellaneous Treatment Inspection Log Sheet, of CM-P-EN-013, Environmental Permits and Compliance.
1.A.2	LLW (Residual or Non-Residual Liquids)	Drum has been determined to be LLW. Absorb liquids in accordance with CH-REF-OP-014, Absorbing Liquids in the Glovebox and Box Breakdown Area. The remediated waste must meet the requirements of Section 3.1.5, Free Liquids, of DOE/NV-325, Nevada National Security Site Waste Acceptance Criteria; "Liquid waste and waste containing free liquids must be converted into a form that contains as little free-standing and noncorrosive liquids as is reasonably achievable." Residual Liquids - Place absorbed residual liquids into a daughter drum (non-PI) with parent waste or from a matching waste stream. Make clear notes on the Attachment D, Contact Handled Waste Repacking Data Form, of CH-REF-OP-013, Contact Handled Waste Repackaging. Non-Residual Liquids - Place absorbed non-residual liquids into a daughter drum (non-PI) with parent waste or from a matching waste stream. Make clear notes on the Attachment D, Contact Handled Waste Repacking Data Form, of CH-REF-OP-013, Contact Handled Waste Repackaging.
1.A.3	MLLW/ Unknown (Non-Residual Liquids)	Absorb non-residual liquids in accordance with CH-REF-OP-014, Absorbing Liquids in the Glovebox and Box Breakdown Area. Segregate and place absorbed non-residual liquids into designated PI drums from a matching waste stream. Make clear notes on the Attachment D, Contact Handled Waste Repacking Data Form, of CH-REF-OP-013, Contact Handled Waste Repackaging, and complete Attachment O, Miscellaneous Treatment Inspection Log Sheet, of CM-P-EN-013, Environmental Permits and Compliance. The segregated drums of absorbed non-residual liquids will be shipped to an approved off-site vendor for treatment.
1.A.4	MLLW/ Unknown (Residual Liquids)	Absorb residual liquids in accordance with CH-REF-OP-014, Absorbing Liquids in the Glovebox and Box Breakdown Area. Place absorbed residual liquids in a daughter (non-PI) container with parent waste or from a matching waste stream. Make clear notes on the Attachment D, Contact Handled Waste Repacking Data Form, of CH-REF-OP-013, Contact Handled Waste Repackaging.

Table 1A: Liquids

Remediation #	Waste Type	Remediation Direction
1.A.5	Containerized, Non-Residual, Non-Groundwater Liquids from Hot Cell	Absorb and package in accordance with RH-REF-OP-014, Liquids Handling in the Hot Cell. If repackaging as CH waste, label as non-residual, non-groundwater absorbed liquids for retrieval and place in top of CH daughter drum. Make clear notes on Attachment D, Contact Handled Waste Repacking Data Form, of CH-REF-OP-013, Contact Handled Waste Repackaging, and complete Attachment O, Miscellaneous Treatment Inspection Log Sheet, of CM-P-EN-013, Environmental Permits and Compliance. If repackaging as RH waste, place in non-PI RH daughter container.
1.A.6	TRU/ LLW/ MLLW/ Unknown (Wetted Waste – waste which has absorbed unknown liquids)	Absorb any free liquids in Wetted Waste in accordance with CH-REF-OP-014, Absorbing Liquids in the Glovebox and Box Breakdown Area. Place processed wetted waste in a daughter (non-PI) container with parent waste or from a matching waste stream. Make clear notes on the Attachment D, Contact Handled Waste Repacking Data Form, of CH-REF-OP-013, Contact Handled Waste Repackaging.
1.A.7	Saturated Waste – waste which has absorbed known Groundwater Liquids from Hot Cell	Process the groundwater/intrusion water in accordance with RH-REF-OP-014, Liquids Handling in the Hot Cell, and initiate/fill out an Attachment P, Saturated Waste Treatment, of CM-P-EN-013, Environmental Permits and Compliance, for each drum receiving absorbed liquid waste. Make clear notes on Attachment D, Contact Handled Waste Repackaging Data Form, of CH-REF-OP-013, Contact Handled Waste Repackaging, as to which drums received saturated waste and which drums did not.
1.A.8	Containerized, Non-Residual, Non-Groundwater Liquids from CPE	Absorb and package in accordance with RH-REF-OP-102, Liquids Handling in the Cask Processing Enclosure. Segregate and place absorbed non-residual liquids into designated PI drums from a matching waste stream. Make clear notes on Attachment D, Contact Handled Waste Repacking Data Form, of CH-REF-OP-013, Contact Handled Waste Repackaging, and complete Attachment O, Miscellaneous Treatment Inspection Log Sheet, of CM-P-EN-013, Environmental Permits and Compliance. If repackaging as RH waste, place in non-PI RH daughter container.
1.A.9	Unknown (Wetted Waste – waste which has absorbed unknown liquids) from Hot Cell or CPE	Absorb any free liquids in Wetted Waste in accordance with RH-REF-OP-014, Liquids Handling in the Hot Cell, or RH-REF-OP-102, Liquids Handling in the Cask Processing Enclosure. Place processed wetted waste in a daughter (non-PI) container with parent waste or from a matching waste stream. Make clear notes on the Attachment D, Contact Handled Waste Repacking Data Form, of CH-REF-OP-013, Contact Handled Waste Repackaging.

Table 1A: Liquids

Remediation #	Waste Type	Remediation Direction
1.A.10	Saturated Waste – waste which has absorbed known Groundwater Liquids from CPE	Process the groundwater/intrusion water in accordance with RH-REF-OP-102, Liquids Handling in the Cask Processing Enclosure, and initiate/fill out an Attachment P, Saturated Waste Treatment, of CM-P-EN-013, Environmental Permits and Compliance, for each drum receiving absorbed liquid waste.

Table 1B: > 4 Liter Sealed Container(s)

Remediation #	Waste Type	Remediation Direction
1.B.1	TRU/ Unknown	Perform repacking in accordance with CH-REF-OP-013, Contact Handled Waste Repackaging. Open the > 4 liter sealed container, ensuring the container opening is easily identifiable by NDE. Ensure no other PI is found inside. Note details of container opening on the Attachment D, Contact Handled Waste Repacking Data Form, of CH-REF-OP-013, Contact Handled Waste Repackaging.
1.B.2	MLLW/ LLW	Sealed containers are not specifically prohibited for NNSS disposal in accordance with DOE/NV-325, Nevada National Security Site Waste Acceptance Criteria. Review the RTR image to verify that no other prohibited items are concealed within the sealed container. If unable to confirm, remove the sealed container, inspect the interior to ensure no other PI are found inside. If found, remove PI and remediate appropriately. The open container may be returned to the original waste container.
1.B.3	TRU/ MLLW/ Unknown Discovered during Repacking	If > 4 liter sealed containers are discovered in the BBA, CHGB, Hot Cell, or CPE, perform repacking in accordance with CH-REF-OP-013, Contact Handled Waste Repackaging. Open the > 4 liter sealed container, ensuring the container opening is easily identifiable by an RTR Operator. Ensure no other PI is found inside. Note details of container opening on Attachment D, Contact Handled Waste Repacking Data Form, of CH-REF-OP-013, Contact Handled Waste Repackaging.

Table 1C: Mercury

Remediation #	Waste Type	Remediation Direction
1.C.1	MLLW/ Unknown	**Mercury Containing Devices or discrete containers:** Perform repackaging in accordance with CH-REF-OP-013, Contact Handled Waste Repackaging. If mercury containing devices and discrete containers with mercury are found, segregate and place in a Mercury designated PI container from same waste stream for off-site treatment. Record a description of the item or approximate volume of mercury in the applicable waste container documentation. Prior to drum-out/bag-out of discrete item, contact AKE and EPM or designee for direction on assignment of the EPA Waste Code. Ensure the waste container with the mercury waste is identified in Waste Inventory Control System (WICS) with the appropriate Mercury waste code.
1.C.2	TRU	**Mercury Containing Devices:** If mercury containing devices are found, record a description of the item and approximate volume of mercury in the applicable waste container documentation. Place item in waste container. Ensure the waste container with the mercury waste is identified in WICS with the appropriate Mercury waste code. **Discrete containers for mercury:** If discrete containers with mercury are found, segregate from compliant waste and repackage in a designated PI container for off-site treatment. Record the approximate volume of mercury in the applicable waste container documentation. Prior to drum-out/bag-out of discrete item contact AKE and EPM or designee for direction on assignment of the EPA Waste Code. Ensure the waste container with the mercury waste is identified in WICS with the appropriate Mercury waste code.
1.C.3	TRU, MLLW/ Unknown	**Residual or incidental mercury:** Perform repackaging and remove the mercury for remediation. Absorb the droplets using compounds from a mercury spill kit in accordance with the applicable vendor instruction for mercury spill kit. Return the material to a daughter/non-PI waste container. Record the approximate volume of mercury absorbed in the applicable waste container documentation (i.e., droplets of mercury absorbed). Contact AKE and EPM or designee for direction on assignment of the EPA Waste Code. Ensure the waste container with the mercury waste is identified in WICS with the appropriate Mercury waste code.

Table 1D: Impenetrable Material (Including Lead)

Remediation #	Waste Type	Remediation Direction
1.D.1	TRU/ Unknown	If the impenetrable object/area is an item, perform a documented SCO survey (if applicable) on the impenetrable object(s). Segregate the item from compliant waste and sleeve out impenetrable object(s). Transfer into a designated impenetrable object (PI) waste container from same waste stream. Make clear notes, including a detailed description of the item, on Attachment D, Contact Handled Waste Repacking Data Form, of CH-REF-OP-013, Contact Handled Waste Repackaging.
1.D.2	MLLW	Perform repackaging in accordance with CH-REF-OP-013, Contact Handled Waste Repackaging, ensuring no PIs are concealed by the impenetrable material. Lead which does not conceal a PI may remain in the original waste container and is macro-encapsulated to meet land disposal restriction.
1.D.3	LLW	Perform repackaging in accordance with CH-REF-OP-013, Contact Handled Waste Repackaging, ensuring no PIs are concealed by the impenetrable material. Lead may be used as shielding for high activity waste items; however, PIs shall not be concealed within the lead shielding. Contact Radiological Engineering to perform dose rate calculations for the waste item. Contact the WCO for further specific processing instructions.
1.D.4	Repacked MLLW	Determined to be MLLW/LLW, no prohibited items identified via Repackaging Data Form.

Table 1E: TRU Alpha <100 nCi/g

Remediation #	Waste Type	Remediation Direction
1.E.1	LLW/ MLLW	Review RTR Data Sheets to ensure no NNSS PIs are identified. If no PIs are identified, forward to WCO for acceptance in to the LLW Program.

Table 1F: Potentially Pressurized Containers (PPC)

Remediation #	Waste Type	Remediation Direction
1.F.1	Unknown/ LLW/ MLLW/ TRU	Segregate PPC from compliant waste. Ensure the PPC is labeled with assigned PI number (refer to CH-I-OP-016, Waste Inventory Control System Data Entry, and CH-UET-OP-014, Waste and Activity Inventory Control). If the container is un-marked and the contents cannot be determined, contact RII personnel for disposition guidance. Have RCT perform SCO survey in accordance with CM-REF-RP-402, Radiological Characterization Using Surface Contaminated Object Surveys. Bag out PPC from the GB, BBA, Hot Cell or CPE in accordance with the applicable procedure. Record the assigned PI identification number on the bag sleeve using label, a permanent marker, or other suitable method. **NOTE:** Items or materials which are potentially incompatible are packaged separately as applicable. Items or materials which are known to be compatible may be packaged together. Items may be packaged with approved absorbent padding at the discretion of the SS. Place the PPC in approved designated labeled container. Ensure the collection container is labeled with Hazardous Waste labels as appropriate. Make detailed notes on the Parent Container Traveler and Attachment D, Contact Handled Waste Repacking Data Form, of CH-REF-OP-013, Contact Handled Waste Repackaging, including size, content, and type of container. Place a signed copy of attachment(s) from CH-REF-OP-013, Contact Handled Waste Repackaging, in the Container Traveler.

Table 1G: PCB Articles (Non-Liquid)

Remediation #	Waste Type	Remediation Direction
1.G.1	TRU	No action required for TRU waste.
1.G.2	LLW/ MLLW Unknown	**NOTE**: This table applies to co-packaged waste, liner, parent container, or waste handling equipment that is or may be contaminated by PCB liquids. Contact AKE, RII, and Waste Management personnel for PCB contamination determination and/or processing guidance. AKE, RII, or WCO/AWCO evaluates the PCB (Non-Liquid) wastes (known or suspect) and documents the PCB item description, characterization, extent of contamination, and regulatory requirements on the applicable Attachment F, Uncharacterized Waste Guidance, from CH-REF-OP-013, Contact Handled Waste Repackaging. Ensure PCB (Non-Liquid) wastes are segregated and placed into PI drums containing only waste from same Waste Stream, or as directed on the applicable Attachment B, Operations Prohibited Item Processing (OPIP). Clean PCB contamination in accordance with CH-REF-OP-027, PCB Decontamination, as necessary. **NOTE:** The Hazardous Waste Accumulation Start Date should be used as out-of-service date, unless otherwise specified. Ensure all daughter drums and travelers generated from PCB containing parent containers are labeled as PCB waste, including out-of-service date written in permanent marker. Sign Attachment F, Uncharacterized Waste Guidance, of CH-REF-OP-013, Contact Handled Waste Repackaging, to indicate completion of PCB waste processing per recommended disposition. Make detailed notes on the Parent Container Traveler and Attachment D, Contact Handled Waste Repacking Data Form, of CH-REF-OP-013, Contact Handled Waste Repackaging, including size, content, and type of container. Daughter drums with consolidated PCB (non-liquid) wastes (known and suspect) will undergo NDA and will be dispositioned for off-site treatment and/or disposal.

Table 1H: Containerized PCB Liquids

Remediation #	Waste Type	Remediation Direction
1.H.1	TRU/ LLW/ MLLW/ Unknown	**NOTE**: This table applies to containers of PCB liquids or waste articles which contain potential PCB liquids (such as gearboxes, vacuum pumps, etc). Do not open the PCB container or waste articles, or absorb the PCB liquids. Segregate the PCB liquids container or waste articles from other compliant waste. AKE, RII, or WCO/AWCO evaluates the containerized PCB Liquid wastes (known and suspect) and documents the PCB item description, characterization, extent of contamination, and regulatory requirements on the applicable Attachment F, Uncharacterized Waste Guidance, from CH-REF-OP-013, Contact Handled Waste Repackaging. **NOTE**: Drums shall be rated for liquids by DOT regulations. Consult with Transportation Manager to ensure proper packaging. Ensure segregated containerized PCB Liquid wastes or waste articles are placed into PI drums containing only waste from the same AK/PK Waste Stream. Clean PCB contamination in accordance with CH-REF-OP-027, PCB Decontamination, as necessary. **NOTE:** The Hazardous Waste Accumulation Start Date should be used as out-of-service date, unless otherwise specified. Ensure all daughter drums generated from PCB containing parent containers are labeled as PCB waste, including out-of-service date written in permanent marker. Make detailed notes on the Parent Container Traveler and Attachment D, Contact Handled Waste Repacking Data Form, of CH-REF-OP-013, Contact Handled Waste Repackaging, including size, content, and type of container. Sign Attachment F, Uncharacterized Waste Guidance, of CH-REF-OP-013, Contact Handled Waste Repackaging, to indicate completion of PCB waste processing per recommended disposition. PI drums with consolidated PCB Liquid wastes (known and suspect) will undergo NDA and will be dispositioned for off-site treatment and disposal. If parent container is determined to be free of PCB contamination by visual examination during repackaging, AKE uses Attachment D, Contact Handled Waste Repackaging Data Form, or Attachment F, Uncharacterized Waste Guidance, of CH-REF-OP-013, Contact Handled Waste Repackaging, as a basis to remove PCB information in the AK/PK database.

Table 1I: Regulated Asbestos Containing Material

Remediation #	Waste Type	Remediation Direction
1.I.1	Unknown	Notify Health and Safety/Industrial Hygiene for Industrial Hygiene sampling assessment. Waste Management personnel document ACM characterization and recommended disposition as applicable on the Attachment F, Uncharacterized Waste Guidance, of CH-REF-OP-013, Contact Handled Waste Repackaging. Wet the ACM with appropriate fixative. Cut and size as necessary while minimizing the spread of asbestos contamination. Pad or protect sharp edges or corners of the ACM to prevent damage to the drum liner during handling, shipping, and disposal. Package the ACM into a plastic bag (the drum liner is sufficient) which is not less than 6 mil in thickness. Add adsorbent to ensure compliance with free-liquids criteria. **NOTE**: Container labeling may be delayed until after the container has been bagged out and removed from the GB or BBA Drum Out Port, or from the Hot Cell or CPE CH Drum Out Portal. Label the container with a label that contains one of the following: • Caution Contains Asbestos Fibers. Avoid Opening or Breaking Container. Breathing Asbestos is Hazardous to Your Health. • Caution Contains Asbestos Fibers. Avoid Creating Dust. May Cause Serious Bodily Harm. • Danger Contains Asbestos Fibers. Avoid Creating Dust. Cancer and Lung Disease Hazard. Document the ACM on the applicable Attachment D, Contact Handled Waste Repackaging Data Form. Sign Attachment F, Uncharacterized Waste Guidance, of CH-REF-OP-013, Contact Handled Waste Repackaging, to indicate completion of ACM processing per recommended disposition. Notify the Inventory Coordinator or Data Entry personnel to update WICS as applicable. Drums with ACM wastes (known and suspect) will undergo NDA and will be dispositioned for off-site treatment and disposal.

Operations Prohibited Item Processing

REFERENCE

Implementation Date: 7/24/14

APPROVAL:

Tim Hallman
Operations Manager

Date 7/22/14

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Revision Summary

Revision	Change Summary
0	Initial issue
1	Added reference to CPE
2	Revised to include requirements for CCP
3	Revised Table 1A to add 1.A.11
4	Revised Table 1A to add 1.H.2

Current Revision Specific Changes		
Location	**Description**	**Reason**
Table 1A	Revised to add 1.H.2	

1.0 INTRODUCTION

1.1 Purpose

This procedure provides instructions for the identification, handling, remediation, and disposition of Prohibited Items (PIs). PIs may also be returned to the U.S. Department of Energy (DOE) Oak Ridge National Laboratory or shipped offsite for alternative treatment. This procedure also provides instruction for remediation tasks that are repetitive and have established predetermined directions for Operations Prohibited Item Processing (OPIP).

1.2 Scope

Resource Conservation and Recovery Act (RCRA) wastes and Toxic Substances Control Act (TSCA) wastes which meet specific TRU Waste Processing Center (TWPC) waste profile requirements and Nevada National Security Site (NNSS) Waste Acceptance Criteria are packaged for disposal at NNSS. Specific RCRA and TSCA wastes which are not packaged for disposal at NNSS may be acceptable at the Waste Isolation Pilot Plant (WIPP). These items are identified and segregated during processing to ensure proper handling and disposal in accordance with TWPC procedures.

Items or materials that do not meet acceptance requirements specified in DOE/NV-325, Nevada National Security Site Waste Acceptance Criteria, are considered PIs. These items or materials are identified and segregated for evaluation, on-site remediation, off-site treatment, or possible return transfer to DOE.

Items or materials that do not meet acceptance requirements specified in DOE/WIPP-02-3122, Transuranic Waste Acceptance Criteria for the Waste Isolation Pilot Plant, are considered PIs. These items or materials are identified and segregated for evaluation, on-site remediation, off-site treatment, or possible return transfer to DOE.

Items or materials that have established predetermined direction for remediation in accordance with attached Table 1, Prohibited Item Remediation Directions, may be remediated accordingly and documented in accordance with Attachment B, Operations Prohibited Item Processing (OPIP). All other materials refer to CH-REF-OP-045, Non-Compliant Containers.

1.3 Document Use

This document has been evaluated by the Document Use Review Team and has been determined to be a **REFERENCE** procedure.

REFERENCE procedures are not required to be in-hand or present for the user to actively reference during actual performance of action steps, however they may be open and referenced during the work performance based on personnel knowledge and skill level. If work is suspended due to inadequacy of procedure, then a page change notice or revision of the procedure is initiated.

2.0 PRECAUTIONS AND LIMITATIONS

2.1 Safety

- Observe as low as reasonably achievable exposure techniques at all times.
- For waste or containers where safe handling is in question, personnel shall not handle the containers or items until appropriate reviews are completed and processes are evaluated.
- When dispositioning PIs, the handling process considers the following, at a minimum, to ensure that containers/items are handled safely:
  - applicable Activity Hazards Analyses and controls
  - type of PI
  - personal protective equipment
  - packaging configuration
  - storage location
  - methods of handling and transport, including equipment used

2.2 Technical Safety Requirements

- None

2.3 Nuclear Criticality Safety Evaluation

- None

3.0 RESPONSIBILITIES

3.1 Personnel Assignments

The following personnel are responsible for performing the activities described in this document and for training to this document prior to accomplishing the activities described herein. These TWPC personnel may delegate alternate personnel to assist in carrying out their responsibilities.

3.1.1 Operations Manager (OM)

- approves this procedure

3.1.2 Waste Certification Official (WCO)

- concurs with Table 1 direction for remediation
- reviews and signs completed Attachment B, Operations Prohibited Item Processing (OPIP)
- evaluates PIs and potential polychlorinated biphenyls (PCB) and/or RCRA materials to ensure proper waste characterization and documentation

3.1.3 Environmental Programs Manager (EPM)

- ensures management options are compliant with regulatory and permit conditions
- concurs with Table 1 direction for remediation
- evaluates PIs and potential PCB and/or RCRA materials to ensure proper waste characterization and documentation

3.1.4 Safety Authorization Basis Manager

- concurs with Table 1 direction for remediation

3.1.5 Fire Protection Engineer

- concurs with Table 1 direction for remediation

3.1.6 Health and Safety Manager

- concurs with Table 1 direction for remediation

3.1.7 Radiological Control Manager

- concurs with Table 1 direction for remediation

3.1.8 Inventory Coordinator

- plans and authorizes movement of waste containers
- maintains and updates waste container and activity inventory tracking mechanisms
- performs activities in accordance with this procedure

3.1.9 Alternate Waste Certification Official (AWCO), or Designee

- performs activities in accordance with the procedure
- initiates and reviews completed OPIP
- forwards OPIPs to Operations for processing

3.1.10 Data Entry Personnel

- perform activities in accordance with the procedure
- initiate and review completed OPIP
- forward OPIPs to Operations for processing

3.1.11 Regulatory Interface and Integration (RII) Personnel

- ensure management options are compliant with regulatory and permit conditions
- evaluate PIs and potential PCB and/or RCRA materials to ensure proper waste characterization and documentation

3.1.12 Acceptable Knowledge Expert (AKE)

- evaluates PIs and potential PCB and/or RCRA materials to ensure proper waste characterization and documentation
- reviews and signs completed OPIPs

3.1.13 Waste Operators

- process waste in accordance with OPIPs
- sign for completion of processing per OPIPs

3.1.14 Waste Package Verifier

- reviews and signs completed OPIPs

3.2 Document Maintenance

The OM is designated the document owner and is responsible for updating this document. Approval authority rests with the OM. Submit suggestions for revisions or improvement to the OM utilizing Attachment E, New Document and Revision Request Form, of CM-P-AD-061, Document Preparation, Review and Approval.

4.0 PREREQUISITES

- None

NOTE 1: Waste Management personnel perform the following steps, unless otherwise noted.

NOTE 2: Waste Nonconformance Reports (WNCRs) are initiated in accordance with CH-P-AD-044, Waste Corrective Actions and Nonconformances.

NOTE 3: Incoming Waste Containers transferred to the TWPC are surveyed and inspected to verify that the containers meet pertinent requirements for acceptance, as specified in CH-X-AD-001, Contact Handled Waste Acceptance Criteria; or RH-X-AD-001, Remote Handled Waste Acceptance Criteria. These surveys and inspections are performed in accordance with CH-UET-OP-001, Receipt of Contact Handled Solid Waste, or RH-UET-OP-001, Remote Handled Debris Waste Receipt. Authorized containers are individually unloaded from the transfer conveyance for visual inspections and surveys.

5.0 PROCEDURE

NOTE 1: Low Level Waste (LLW) PIs are listed in Attachment E, Project LLW Prohibited Items, of CH-REF-OP-013, Contact Handled Waste Repackaging. WIPP PIs are listed in Attachment B, WIPP Prohibited Items, of CH-REF-OP-013, Contact Handled Waste Repackaging.

NOTE 2: PIs may be found in waste containers received at the TWPC. NNSS PIs are remediated prior to being packaged for disposal as LLW. WIPP PIs are remediated prior to packaging for disposal at WIPP.

5.1 Prohibited Items (PI) Discovered During Nondestructive Examination (NDE)

5.1.1 Review Real-Time Radiography (RTR) report to determine if the PI(s) or PCB items can be remediated via an OPIP.

NOTE: The AWCO or designee performs Steps 5.1.2 and 5.1.3.

5.1.2 IF yes,
THEN initiate an OPIP per Subsection 5.3.

5.1.3 IF no,
THEN initiate a WNCR in accordance with CH-P-AD-044, Waste Corrective Action and Nonconformances.

NOTE: NNSS or WIPP PIs may also be discovered during repackaging of the waste contents. These items are segregated and removed from the process area, dispositioned, and either packaged for return to DOE, processed to create an acceptable waste form for disposal, or packaged for off-site remediation.

5.2 Prohibited Item(s) (PIs) Discovered During Processing

NOTE: When notified of a PI by Operations, the AWCO or designee determines if the PI can be remediated via an OPIP.

5.2.1 Review the specific PI to determine if the PI can be remediated via an OPIP.

5.2.2 IF yes,
THEN initiate an OPIP per Subsection 5.3.

5.2.3 IF no,
THEN initiate a WNCR in accordance with CH-P-AD-044, Waste Corrective Action and Nonconformances.

NOTE 1: The AWCO or designee performs the following subsection.

NOTE 2: OPIPs are initiated in the Issues Tracking System utilizing an electronic version of Attachment B, Operations Prohibited Item Processing (OPIP). OPIPs are tracked and maintained according to CM-P-AD-048, Issues Management.

5.3 Initiating Operations Prohibited Item Processing (OPIP)

5.3.1 Go to Manage Issues to open the Issues Tracking System.

5.3.2 Go to drop down list in Create a New Issue.

5.3.3 Select OPIP.

5.3.4 The OPIP number will generate automatically.

5.3.5 Enter Title/Brief Description.

5.3.6 Select responsible person.

5.3.7 Select projected closure date (normally 90 days out).

5.3.8 Enter container number.

5.3.9 Enter PI Description.

5.3.10 Enter PI Location. (Enter N/A if not known.)

5.3.11 Review PI and select appropriate remediation.

5.3.12 Create an Operations Prohibited Item Processing (OPIP) Folder.

5.3.12.1 Ensure OPIP folders contain the following (may be verified in any order):

- drum number and OPIP number written on the front
- a copy of the OPIP
- a copy of the RTR (description of prohibited item)
- a copy of Attachment G, PE-Ci and FGE Conversion Worksheet, of CH-UET-OP-014, Waste and Activity Inventory Control (evidence to confirm <50 FGE)

NOTE: The AWCO or designee performs the following subsection.

5.4 Revising an Existing Operations Prohibited Item Processing (OPIP)

5.4.1 Go to Issues Tracking Database.

5.4.2 Select the "**OPIP**" button.

5.4.3 Go to the appropriate OPIP number.

5.4.4 Click on "**supersede**" option.

NOTE: The following items will be duplicated into the next revision of the OPIP #: Title/Brief Description, Container Numbers, PI Description, and PI Location #.

5.4.5 Click on "**Create New Issue**" option.

5.4.6 Click on the "**Edit/Submit**" button.

5.5 Inspecting Parent Container Traveler for Latest Revision

5.5.1 Ensure the parent container traveler contains, at a minimum:

- the items listed on Attachment F, Incoming Container Traveler File Cover Sheet, of CH-UET-OP-001, Receipt of Contact Handled Solid Waste
- Attachment C, Waste Package Verifier Checklist, of CH-REF-OP-011, Drum Bag In / Bag Out
- Attachment D, Contact Handled Waste Repackaging Data Form, of CH-REF-OP-013, Contact Handled Waste Repackaging

5.5.2 IF the parent container is a repack,
THEN it should contain:

- Attachment D, Waste Container Traveler File Cover Sheet
- Attachment B, Waste Container Traveler, of CH-REF-OP-011, Drum Bag In/Bag Out
- objective evidence of Parent Container Waste Stream

5.5.3 Mate Parent Container Traveler to OPIP Traveler.

NOTE: Operations personnel remediate PIs as indicated in the OPIP. Operations personnel sign for completion and verification of remediated PIs on the applicable OPIP in accordance with CH-REF-OP-013, Contact Handled Waste Repackaging.

5.5.4 Forward the OPIP Traveler to Operations for processing.

NOTE: The AWCO or designee performs the following subsection.

5.6 Closing Operations Prohibited Item Processing (OPIP)

5.6.1 Receive Parent, Daughter Travelers, and OPIP from Operations personnel for Box Breakdown Area (BBA), Contact Handled Glovebox (CHGB), Hot Cell, and Cask Processing Enclosure (CPE) repackaging.

5.6.2 Mate Parent Traveler to Daughter Traveler(s) as applicable. (This will help ensure where, when, what and why container was repackaged, also helps determine if it is a drum repack, box-daughter, or Remote Handled (RH) cask-daughter.)

5.6.3 Close the Incoming Parent Traveler.

- Ensure thorough completion of incoming Attachment F, Incoming Container Traveler File Cover Sheet, of CH-UET-OP-001, Receipt of Contact Handled Solid Waste.
- Ensure it is the latest revision (check InTruNet Document Center CH-UET-OP-001).
- Ensure Cover Sheet is initialed, signed, dated, description of repack, and what is listed on the Cover Sheet is the minimum of what is in the traveler. (What is in the traveler is signed, dated, lined out, etc. If old revision is blank throw it out.) List any extra information.
- Forward Traveler and completed OPIP folder to WCO.

5.6.4 Close the Repack Parent Traveler.

- Review repack (Attachment D, Waste Container Traveler Cover Sheet, and Attachment B, Waste Container Traveler, of CH-REF-OP-011, Drum Bag In / Bag Out).
- Ensure forms are the latest revisions (check InTruNet Document Center CH-REF-OP-011, Drum Bag In / Bag Out).
- Ensure Cover Sheet and Waste Container Traveler are initialed, signed, and dated. Description of repack and what is listed on the Cover Sheet (Container Weight form is N/A if not there) is the minimum of what is in the traveler. (What is in the traveler is signed, dated, lined out, etc. Throw out old revision if it is blank.) List any extra information.
- Forward Traveler to AWCO, upon request.
- Forward Traveler to WCO for review.

5.6.5 Close the Daughter Travelers.

- Ensure Traveler has the latest revision Attachment D, Waste Container Traveler Cover Sheet, and Attachment B, Waste Container Traveler, of CH-REF-OP-011, Drum Bag In / Bag Out. (Check InTruNet Document Center.)
- Review Contact Handled (CH) Waste Repackaging for latest revision (check InTruNet Document Center CH-REF-OP-013); correct parent container number; Waste Stream matches parent, < 3 layers of confinement; waste item description; and note referring to OPIP (e.g., non-residual found or not).
- Scan CH Waste Repackaging Data Form and any applicable Attachment F, Uncharacterized Waste Guidance, of CH-REF-OP-013, Contact Handled Waste Repackaging, title as Container number with suffix (e.g., X10C0000000A or X10C0000000A1).

- Make a copy of CH Waste Repackaging Data Form (if repackaged with an OPIP).
- E-Mail scanned CH Waste Repackaging Data Forms to AKE, Waste Certification personnel, and other designated personnel, as applicable.
- File the folder until the container is placed on the Acceptable Knowledge (AK) document.
- Leave Travelers in designated location until Nondestructive Assay (NDA) data report is returned. Travelers will then be grouped by data report.

5.6.6 Close the OPIP.

NOTE: All revisions to an OPIP Attachment B, Operations Prohibited Item Processing (OPIP), are to be retained in the traveler.

- Verify OPIP is on the latest revision (check InTruNet Document Center CH-REF-OP-044, Operations Prohibited Item Processing).
  - If not, then initiate a revision to the OPIP assigned number in Issues Tracking per Subsection 5.4.
- Review OPIP Title/Brief description, container number, PI Description, PI Location (may be N/A), PI Remediation (box checked).
- Review to ensure OPIP folder contains a copy of the following, as applicable:
  - Prohibited Item Remediation Directions, Table 1 of CH-REF-OP-044 (if remediation directions are not on the OPIP),
  - Attachment D, Contact Handled Waste Repackaging Data Form, of CH-REF-OP-013, Contact Handled Waste Repackaging,
  - Attachment F, Uncharacterized Waste Guidance, of CH-REF-OP-013, Contact Handled Waste Repackaging,
  - Attachment G, PE-Ci and FGE Conversion Worksheet, of CH-UET-OP-014, Waste and Activity Inventory Control,
  - Attachment P, Saturated Waste Treatment, of CM-P-EN-013, Environmental Permits and Compliance,
  - RTR Container Quick Screening Log sheet (other RTR Data Sheets are acceptable),
  - Review CH Waste Repackaging Data Form note to determine if liquid was residual and absorbed; or if it was non-residual and treated.
  - Drum venting paperwork and vent verification, if container was an overpack.

NOTE: If liquid was treated then Attachment O, Miscellaneous Treatment Inspection Log Sheet, of CM-P-EN-013, Environmental Permits and Compliance, is applicable.

- Ensure Attachment O, Miscellaneous Treatment Inspection Log Sheet, of CM-P-EN-013, Environmental Permits and Compliance, has been signed and dated.

- Record the OPIP number at the bottom of each page in the OPIP traveler.

NOTE: Comments may be added in Issues Tracking when closing OPIP.

5.6.7 Go to Issues Tracking Database in Manage Issues.

5.6.8 Select OPIP.

5.6.9 Search OPIP to be closed.

NOTE: If the operator who signed the "Performed by" block is not in the drop-down menu, the signature must be over-signed by an operator on the drop-down list.

5.6.10 Ensure the Attachment B, Operations Prohibited Item Processing (OPIP), is signed by an approved Waste Operator by selecting "Completion/Verification."

5.6.11 Select the operator from the "Performed by" drop down list who signed the "Performed by" block on the hardcopy of the OPIP.

5.6.12 Enter the "Performed by" date.

NOTE: If the Waste Package Verifier (WPV) who signed the "Verified by" block is not in the drop-down menu, the signature must be over-signed by a WPV on the drop-down list.

5.6.13 Ensure the Attachment B, Operations Prohibited Item Processing (OPIP), is signed by an approved WPV.

5.6.14 Select the WPV from the "Verified by" drop down list who signed the "Verified by" block on the hardcopy of the OPIP.

5.6.15 Enter the "Verified by" date.

5.6.16 Forward the OPIP Traveler to the AWCO for review.

5.6.17 Forward the OPIP Traveler to the AKE for review.

5.6.18 Forward the OPIP Traveler to the WCO for review.

6.0 RECORDS

Records are identified, classified, and maintained in accordance with CM-P-AD-049, Records Management, and CM-X-AD-026, Records Inventory and Disposition Schedule.

6.1 Record Numbering

Record	Record Naming Convention
Att. B	OPIP-YYYY-###-R#, where OPIP = record code; YYYY = Year; ### = number sequence; R# = revision number

6.2 Records Inventory and Disposition Schedule

Records generated from this document are:

Record	Retention Period	Class	Record Type	Disposition Location	File Index Loc.	Media Type	OUO	Vital		Other File Loc.
								L&F	EO	
Attachment B, Operations Prohibited Item Processing (OPIP)	LOP+30	Record	COMFOR	7880V	17.2	EP	N/A	N/A	N/A	N/A

COMFOR – Completed Form **EO** – Emergency Operating **EP** – Electronic and Paper **L&F** – Legal & Financial
LOP+30 – Life of Project + 30 years **OUO** – Official Use Only

7.0 ATTACHMENTS

Attachment A: Acronyms/Abbreviations, Definitions, References, and Reviewer Selection for Major Revisions

Attachment B: Operations Prohibited Item Processing (OPIP)

Table 1: Prohibited Item Remediation Directions

Table 1A, Liquids

Table 1B, > 4 Liter Sealed Container(s)

Table 1C, Residual Mercury

Table 1D, Impenetrable Material (e.g., lead)

Table 1E, TRU Alpha <100 nCi/g

Table 1F, Potentially Pressurized Containers (PPC)

Table 1G, PCB Items (Non-Liquid)

Table 1H, Containerized PCB Liquids

Table 1I, Regulated Asbestos Containing Materials (ACM)

Attachment A: Acronyms/Abbreviations, Definitions, References, and Reviewer Selection for Major Revisions

Acronyms/Abbreviations

ACM – Asbestos Containing Material

AK – Acceptable Knowledge

AKE – Acceptable Knowledge Expert

AWCO – Alternate Waste Certification Official

BBA – Box Breakdown Area

CH – Contact Handled

CHGB – Contact Handled Glovebox

CPE – Cask Processing Enclosure

DOE – U.S. Department of Energy

EPM – Environmental Programs Manager

GB – Glovebox

LLW – Low Level Waste

MLLW – Mixed Low Level Waste

NDA – Nondestructive Assay

NDE – Nondestructive Examination

NNSS – Nevada National Security Site

OM – Operations Manager

OPIP – Operations Prohibited Item Processing

PCB – polychlorinated biphenyls

PI – Prohibited Item

PPC – Potentially Pressurized Containers

RCRA – Resource Conservation and Recovery Act

RH – Remote Handled

RII – Regulatory Interface and Integration

RTR – Real-Time Radiography

TRU – Transuranic

TSCA – Toxic Substances Control Act

TWPC – TRU Waste Processing Center

WCO – Waste Certification Official

WICS – Waste Inventory Control System

Attachment A: Acronyms/Abbreviations, Definitions, References, and Reviewer Selection for Major Revisions

Acronyms/Abbreviations

WIPP – Waste Isolation Pilot Plant

WNCR – Waste Nonconformance Report

WPV – Waste Package Verifier

Definitions

Designee – For the purposes of this procedure, typically the AWCO or Data Entry Personnel.

Discovery – If, after acceptance of a waste container, a condition, item, or material is found to not meet TWPC Waste Acceptance Criteria that was not clearly identified or implied by the original waste generator documentation prior to receipt of the waste container, it is considered a "discovery" condition.

Environmental Media – Liquids introduced into waste containers during the conditions described in CH-R-WP-002, Environmental Media in Retrieved Containers from the Legacy Transuranic Waste Inventory.

In-Process – A container is considered "in-process" once it is accepted for receipt. In-process containers may be staged in a staging area awaiting active processing, actively processed by Non-Destructive Assay or Examination, opened for sorting within a processing area, staged in an aging area, or actively processed by Head Space Gas Analysis. A container is no longer "in-process" when it is staged for final packaging or shipment.

Operations Prohibited Item Processing (OPIP) – Proven and approved predetermined direction for remediation of listed items in Table 1.

Prohibited Items (PI) – Items or materials that do not meet acceptance requirements specified in DOE/NV-325, Nevada National Security Site Waste Acceptance Criteria, or that are identified in DOE/WIPP-02-3122 Transuranic Waste Acceptance Criteria for the Waste Isolation Pilot Plant, are considered PI. These items or materials are identified and segregated for evaluation, on-site remediation, off-site treatment, or possible return transfer to DOE.

Developmental References

DOE/NV-325, Nevada National Security Site Waste Acceptance Criteria

DOE/WIPP 02-3122, Transuranic Waste Acceptance Criteria for the Waste Isolation Pilot Plant

CH-REF-OP-045, Non-Compliant Containers

CH-UET-OP-002, Contact Handled Staging Area Operations

CH-UET-OP-003, Box Breakdown Area Operations

CH-UET-OP-004, Glovebox Operations

CH-X-AD-001, Contact Handled Waste Acceptance Criteria

CM-R-AD-001, Documented Safety Analysis

RH-X-AD-001, Remote Handled Waste Acceptance Criteria

Attachment A: Acronyms/Abbreviations, Definitions, References, and Reviewer Selection for Major Revisions

Cross References

TNHW-145, Tennessee Hazardous Waste Permit

057077P, Operating Air Permit

CH-P-AD-044, Waste Corrective Action and Nonconformances

CH-REF-OP-011, Drum Bag In / Bag Out

CH-REF-OP-013, Contact Handled Waste Repackaging

CH-REF-OP-014, Absorbing Liquids in the Glovebox and Box Breakdown Area

CH-REF-OP-016, Waste Inventory Control System Data Entry

CH-REF-OP-027, PCB Decontamination

CH-REF-OP-046, Glove Ports and Sleeve Transfers

CH-UET-OP-001, Receipt of Contact Handled Solid Waste

CH-UET-OP-014, Waste and Activity Inventory Control

CM-P-AD-048, Issues Management

CM-P-EN-013, Environmental Permits and Compliance

CM-REF-RP-402, Radiological Characterization Using Surface Contaminated Object Surveys

RH-UET-OP-001, Remote Handled Debris Waste Receipt

RH-REF-OP-014, Liquids Handling in the Hot Cell

RH-REF-OP-102, Liquids Handling in the Cask Processing Enclosure

Reviewer Selection for Major Revisions

Required	Optional
Operations Manager	Director of Regulatory Interface and Integration
Peer Review Specialists	Environmental Programs Manager
Waste Certification Official	Quality Assurance Manager
	Safety Authorization Basis Manager
	Radiological Control Manager
	Health and Safety Manager
	Facility Manager
	Fire Protection Engineer
	Inventory Coordinator
	Acceptable Knowledge Expert

Attachment B: Operations Prohibited Item Processing (OPIP)

No:	Revision No:

I. Origination

Title/Brief Description:

Container #(s):

PI Description/Characterization:

PI Location:

PI Remediation #

☐ 1.A.1	☐ 1.B.1	☐ 1.D.1	☐ 1.G.1
☐ 1.A.2	☐ 1.B.2	☐ 1.D.2	☐ 1.G.2
☐ 1.A.3	☐ 1.B.3	☐ 1.D.3	☐ 1.H.1
☐ 1.A.4	☐ 1.C.1	☐ 1.D.4	☐ 1.H.2
☐ 1.A.5	☐ 1.C.2	☐ 1.E.1	☐ 1.I.1
☐ 1.A.6	☐ 1.C.3	☐ 1.F.1	
☐ 1.A.7			
☐ 1.A.8			
☐ 1.A.9			
☐ 1.A.10			
☐ 1.A.11			

PI Remediation Description(s):

Comments:

II. Completion/Verification

Remediation Performed by:

Waste Operator	Signature	Date

Verified by:

Waste Package Verifier	Signature	Date

AKPKS updated/verified:

Acceptable Knowledge Expert	Signature	Date

Review:

WCO/designee	Print	Sign	Date

Table 1: Prohibited Item Remediation Directions

Table 1A: Liquids

Remediation #	Waste Type	Remediation Direction
1.A.1	TRU (Residual or Non-Residual Liquids)	Drum has been determined to be TRU. Absorb liquids in accordance with CH-REF-OP-014, Absorbing Liquids in the Glovebox and Box Breakdown Area. Residual Liquids - Place absorbed residual liquids into a daughter drum (non-PI) with parent waste or from a matching waste stream. Make clear notes on the Attachment D, Contact Handled Waste Repacking Data Form, of CH-REF-OP-013, Contact Handled Waste Repackaging. Non-Residual Liquids - Place absorbed non-residual liquids into a daughter drum (non-PI) with parent waste or from a matching waste stream. Make clear notes on the Attachment D, Contact Handled Waste Repacking Data Form, of CH-REF-OP-013, Contact Handled Waste Repackaging, and complete Attachment O, Miscellaneous Treatment Inspection Log Sheet, of CM-P-EN-013, Environmental Permits and Compliance.
1.A.2	LLW (Residual or Non-Residual Liquids)	Drum has been determined to be LLW. Absorb liquids in accordance with CH-REF-OP-014, Absorbing Liquids in the Glovebox and Box Breakdown Area. The remediated waste must meet the requirements of Section 3.1.5, Free Liquids, of DOE/NV-325, Nevada National Security Site Waste Acceptance Criteria; "Liquid waste and waste containing free liquids must be converted into a form that contains as little free-standing and noncorrosive liquids as is reasonably achievable." Residual Liquids - Place absorbed residual liquids into a daughter drum (non-PI) with parent waste or from a matching waste stream. Make clear notes on the Attachment D, Contact Handled Waste Repacking Data Form, of CH-REF-OP-013, Contact Handled Waste Repackaging. Non-Residual Liquids - Place absorbed non-residual liquids into a daughter drum (non-PI) with parent waste or from a matching waste stream. Make clear notes on the Attachment D, Contact Handled Waste Repacking Data Form, of CH-REF-OP-013, Contact Handled Waste Repackaging.
1.A.3	MLLW/ Unknown (Non-Residual Liquids)	Absorb non-residual liquids in accordance with CH-REF-OP-014, Absorbing Liquids in the Glovebox and Box Breakdown Area. Segregate and place absorbed non-residual liquids into designated PI drums from a matching waste stream. Make clear notes on the Attachment D, Contact Handled Waste Repacking Data Form, of CH-REF-OP-013, Contact Handled Waste Repackaging, and complete Attachment O, Miscellaneous Treatment Inspection Log Sheet, of CM-P-EN-013, Environmental Permits and Compliance. The segregated drums of absorbed non-residual liquids will be shipped to an approved off-site vendor for treatment.
1.A.4	MLLW/ Unknown (Residual Liquids)	Absorb residual liquids in accordance with CH-REF-OP-014, Absorbing Liquids in the Glovebox and Box Breakdown Area. Place absorbed residual liquids in a daughter (non-PI) container with parent waste or from a matching waste stream. Make clear notes on the Attachment D, Contact Handled Waste Repacking Data Form, of CH-REF-OP-013, Contact Handled Waste Repackaging.

Table 1A: Liquids

Remediation #	Waste Type	Remediation Direction
1.A.5	Containerized, Non-Residual, Non-Groundwater Liquids from Hot Cell	Absorb and package in accordance with RH-REF-OP-014, Liquids Handling in the Hot Cell. If repackaging as CH waste, label as non-residual, non-groundwater absorbed liquids for retrieval and place in top of CH daughter drum. Make clear notes on Attachment D, Contact Handled Waste Repacking Data Form, of CH-REF-OP-013, Contact Handled Waste Repackaging, and complete Attachment O, Miscellaneous Treatment Inspection Log Sheet, of CM-P-EN-013, Environmental Permits and Compliance. If repackaging as RH waste, place in non-PI RH daughter container.
1.A.6	TRU/ LLW/ MLLW/ Unknown (Wetted Waste – waste which has absorbed unknown liquids)	Absorb any free liquids in Wetted Waste in accordance with CH-REF-OP-014, Absorbing Liquids in the Glovebox and Box Breakdown Area. Place processed wetted waste in a daughter (non-PI) container with parent waste or from a matching waste stream. Make clear notes on the Attachment D, Contact Handled Waste Repacking Data Form, of CH-REF-OP-013, Contact Handled Waste Repackaging.
1.A.7	Saturated Waste – waste which has absorbed known Groundwater Liquids from Hot Cell	Process the groundwater/intrusion water in accordance with RH-REF-OP-014, Liquids Handling in the Hot Cell, and initiate/fill out an Attachment P, Saturated Waste Treatment, of CM-P-EN-013, Environmental Permits and Compliance, for each drum receiving absorbed liquid waste. Make clear notes on Attachment D, Contact Handled Waste Repackaging Data Form, of CH-REF-OP-013, Contact Handled Waste Repackaging, as to which drums received saturated waste and which drums did not.
1.A.8	Containerized, Non-Residual, Non-Groundwater Liquids from CPE	Absorb and package in accordance with RH-REF-OP-102, Liquids Handling in the Cask Processing Enclosure. Segregate and place absorbed non-residual liquids into designated PI drums from a matching waste stream. Make clear notes on Attachment D, Contact Handled Waste Repacking Data Form, of CH-REF-OP-013, Contact Handled Waste Repackaging, and complete Attachment O, Miscellaneous Treatment Inspection Log Sheet, of CM-P-EN-013, Environmental Permits and Compliance. If repackaging as RH waste, place in non-PI RH daughter container.
1.A.9	Unknown (Wetted Waste – waste which has absorbed unknown liquids) from Hot Cell or CPE	Absorb any free liquids in Wetted Waste in accordance with RH-REF-OP-014, Liquids Handling in the Hot Cell, or RH-REF-OP-102, Liquids Handling in the Cask Processing Enclosure. Place processed wetted waste in a daughter (non-PI) container with parent waste or from a matching waste stream. Make clear notes on the Attachment D, Contact Handled Waste Repacking Data Form, of CH-REF-OP-013, Contact Handled Waste Repackaging.

Table 1A: Liquids

Remediation #	Waste Type	Remediation Direction
1.A.10	Saturated Waste – waste which has absorbed known Groundwater Liquids from CPE	Process the groundwater/intrusion water in accordance with RH-REF-OP-102, Liquids Handling in the Cask Processing Enclosure, and initiate/fill out an Attachment P, Saturated Waste Treatment, of CM-P-EN-013, Environmental Permits and Compliance, for each drum receiving absorbed liquid waste.
1.A.11	Environmental Media Liquids and Saturated Waste – waste which has absorbed known Environmental Media Liquids from BBA	Process the environmental media liquids in accordance with CH-REF-OP-014, Absorbing Liquids in the Glovebox and Box Breakdown Area, and initiate/fill out an Attachment P, Saturated Waste Treatment, of CM-P-EN-013, Environmental Permits and Compliance, for each drum receiving absorbed liquid waste.

Table 1B: > 4 Liter Sealed Container(s)

Remediation #	Waste Type	Remediation Direction
1.B.1	TRU/ Unknown	Perform repacking in accordance with CH-REF-OP-013, Contact Handled Waste Repackaging. Open the > 4 liter sealed container, ensuring the container opening is easily identifiable by NDE. Ensure no other PI is found inside. Note details of container opening on the Attachment D, Contact Handled Waste Repacking Data Form, of CH-REF-OP-013, Contact Handled Waste Repackaging.
1.B.2	MLLW/ LLW	Sealed containers are not specifically prohibited for NNSS disposal in accordance with DOE/NV-325, Nevada National Security Site Waste Acceptance Criteria. Review the RTR image to verify that no other prohibited items are concealed within the sealed container. If unable to confirm, remove the sealed container, inspect the interior to ensure no other PI are found inside. If found, remove PI and remediate appropriately. The open container may be returned to the original waste container.
1.B.3	TRU/ MLLW/ Unknown Discovered during Repacking	If > 4 liter sealed containers are discovered in the BBA, CHGB, Hot Cell, or CPE, perform repacking in accordance with CH-REF-OP-013, Contact Handled Waste Repackaging. Open the > 4 liter sealed container, ensuring the container opening is easily identifiable by an RTR Operator. Ensure no other PI is found inside. Note details of container opening on Attachment D, Contact Handled Waste Repacking Data Form, of CH-REF-OP-013, Contact Handled Waste Repackaging.

Table 1C: Mercury

Remediation #	Waste Type	Remediation Direction
1.C.1	MLLW/ Unknown	**Mercury Containing Devices or discrete containers:** Perform repackaging in accordance with CH-REF-OP-013, Contact Handled Waste Repackaging. If mercury containing devices and discrete containers with mercury are found, segregate and place in a Mercury designated PI container from same waste stream for off-site treatment. Record a description of the item or approximate volume of mercury in the applicable waste container documentation. Prior to drum-out/bag-out of discrete item, contact AKE and EPM or designee for direction on assignment of the EPA Waste Code. Ensure the waste container with the mercury waste is identified in Waste Inventory Control System (WICS) with the appropriate Mercury waste code.
1.C.2	TRU	**Mercury Containing Devices:** If mercury containing devices are found, record a description of the item and approximate volume of mercury in the applicable waste container documentation. Place item in waste container. Ensure the waste container with the mercury waste is identified in WICS with the appropriate Mercury waste code. **Discrete containers for mercury:** If discrete containers with mercury are found, segregate from compliant waste and repackage in a designated PI container for off-site treatment. Record the approximate volume of mercury in the applicable waste container documentation. Prior to drum-out/bag-out of discrete item contact AKE and EPM or designee for direction on assignment of the EPA Waste Code. Ensure the waste container with the mercury waste is identified in WICS with the appropriate Mercury waste code.
1.C.3	TRU, MLLW/ Unknown	**Residual or incidental mercury:** Perform repackaging and remove the mercury for remediation. Absorb the droplets using compounds from a mercury spill kit in accordance with the applicable vendor instruction for mercury spill kit. Return the material to a daughter/non-PI waste container. Record the approximate volume of mercury absorbed in the applicable waste container documentation (i.e., droplets of mercury absorbed). Contact AKE and EPM or designee for direction on assignment of the EPA Waste Code. Ensure the waste container with the mercury waste is identified in WICS with the appropriate Mercury waste code.

Table 1D: Impenetrable Material (Including Lead)

Remediation #	Waste Type	Remediation Direction
1.D.1	TRU	Take drum which has been determined to be TRU, and perform waste repackaging. Perform visual examination in accordance with CCP-TP-113, CCP Standard Contact-Handled Waste Visual Examination. Perform visual examination ensuring no PIs are concealed by the impenetrable material. Lead may be returned to the original waste container.
1.D.2	MLLW	Perform repackaging in accordance with CH-REF-OP-013, Contact Handled Waste Repackaging, ensuring no PIs are concealed by the impenetrable material. Lead which does not conceal a PI may remain in the original waste container and is macro-encapsulated to meet land disposal restriction.
1.D.3	LLW	Perform repackaging in accordance with CH-REF-OP-013, Contact Handled Waste Repackaging, ensuring no PIs are concealed by the impenetrable material. Lead may be used as shielding for high activity waste items; however, PIs shall not be concealed within the lead shielding. Contact Radiological Engineering to perform dose rate calculations for the waste item. Contact the WCO for further specific processing instructions.
1.D.4	Unknown	If the impenetrable object/area is an item, perform a documented SCO survey (if applicable) on the impenetrable object(s). Segregate the item from compliant waste and sleeve out impenetrable object(s). Transfer into a designated impenetrable object (PI) waste container from same waste stream. Make clear notes, including a detailed description of the item, on Attachment D, Contact Handled Waste Repacking Data Form, of CH-REF-OP-013, Contact Handled Waste Repackaging.

Table 1E: TRU Alpha <100 nCi/g

Remediation #	Waste Type	Remediation Direction
1.E.1	LLW/ MLLW	Review RTR Data Sheets to ensure no NNSS PIs are identified. If no PIs are identified, forward to WCO for acceptance in to the LLW Program.

Table 1F: Potentially Pressurized Containers (PPC)

Remediation #	Waste Type	Remediation Direction
1.F.1	Unknown/ LLW/ MLLW/ TRU	Segregate PPC from compliant waste. Ensure the PPC is labeled with assigned PI number (refer to CH-REF-OP-016, Waste Inventory Control System Data Entry, and CH-UET-OP-014, Waste and Activity Inventory Control). If the container is un-marked and the contents cannot be determined, contact RII personnel for disposition guidance. Have RCT perform SCO survey in accordance with CM-REF-RP-402, Radiological Characterization Using Surface Contaminated Object Surveys. Bag out PPC from the GB, BBA, Hot Cell or CPE in accordance with the applicable procedure. Record the assigned PI identification number on the bag sleeve using label, a permanent marker, or other suitable method. **NOTE:** Items or materials which are potentially incompatible are packaged separately as applicable. Items or materials which are known to be compatible may be packaged together. Items may be packaged with approved absorbent padding at the discretion of the SS. Place the PPC in approved designated labeled container. Ensure the collection container is labeled with Hazardous Waste labels as appropriate. Make detailed notes on the Parent Container Traveler and Attachment D, Contact Handled Waste Repacking Data Form, of CH-REF-OP-013, Contact Handled Waste Repackaging, including size, content, and type of container. Place a signed copy of attachment(s) from CH-REF-OP-013, Contact Handled Waste Repackaging, in the Container Traveler.

Table 1G: PCB Articles (Non-Liquid)

Remediation #	Waste Type	Remediation Direction
1.G.1	TRU	No action required for TRU waste.
1.G.2	LLW/ MLLW Unknown	**NOTE**: This table applies to co-packaged waste, liner, parent container, or waste handling equipment that is or may be contaminated by PCB liquids. Contact AKE, RII, and Waste Management personnel for PCB contamination determination and/or processing guidance. AKE, RII, or WCO/AWCO evaluates the PCB (Non-Liquid) wastes (known or suspect) and documents the PCB item description, characterization, extent of contamination, and regulatory requirements on the applicable Attachment F, Uncharacterized Waste Guidance, from CH-REF-OP-013, Contact Handled Waste Repackaging. Ensure PCB (Non-Liquid) wastes are segregated and placed into PI drums containing only waste from same Waste Stream, or as directed on the applicable Attachment B, Operations Prohibited Item Processing (OPIP). Clean PCB contamination in accordance with CH-REF-OP-027, PCB Decontamination, as necessary. **NOTE:** The Hazardous Waste Accumulation Start Date should be used as out-of-service date, unless otherwise specified. Ensure all daughter drums and travelers generated from PCB containing parent containers are labeled as PCB waste, including out-of-service date written in permanent marker. Sign Attachment F, Uncharacterized Waste Guidance, of CH-REF-OP-013, Contact Handled Waste Repackaging, to indicate completion of PCB waste processing per recommended disposition. Make detailed notes on the Parent Container Traveler and Attachment D, Contact Handled Waste Repacking Data Form, of CH-REF-OP-013, Contact Handled Waste Repackaging, including size, content, and type of container. Daughter drums with consolidated PCB (non-liquid) wastes (known and suspect) will undergo NDA and will be dispositioned for off-site treatment and/or disposal.

Table 1H: Containerized PCB Liquids

Remediation #	Waste Type	Remediation Direction
1.H.1	LLW/ MLLW/ Unknown	**NOTE**: This table applies to containers of PCB liquids or waste articles which contain potential PCB liquids (such as gearboxes, vacuum pumps, etc). Do not open the PCB container or waste articles, or absorb the PCB liquids. Segregate the PCB liquids container or waste articles from other compliant waste. AKE, RII, or WCO/AWCO evaluates the containerized PCB Liquid wastes (known and suspect) and documents the PCB item description, characterization, extent of contamination, and regulatory requirements on the applicable Attachment F, Uncharacterized Waste Guidance, from CH-REF-OP-013, Contact Handled Waste Repackaging. **NOTE**: Drums shall be rated for liquids by DOT regulations. Consult with Transportation Manager to ensure proper packaging. Ensure segregated containerized PCB Liquid wastes or waste articles are placed into PI drums containing only waste from the same AK/PK Waste Stream. Clean PCB contamination in accordance with CH-REF-OP-027, PCB Decontamination, as necessary. **NOTE:** The Hazardous Waste Accumulation Start Date should be used as out-of-service date, unless otherwise specified. Ensure all daughter drums generated from PCB containing parent containers are labeled as PCB waste, including out-of-service date written in permanent marker. Make detailed notes on the Parent Container Traveler and Attachment D, Contact Handled Waste Repacking Data Form, of CH-REF-OP-013, Contact Handled Waste Repackaging, including size, content, and type of container. Sign Attachment F, Uncharacterized Waste Guidance, of CH-REF-OP-013, Contact Handled Waste Repackaging, to indicate completion of PCB waste processing per recommended disposition. PI drums with consolidated PCB Liquid wastes (known and suspect) will undergo NDA and will be dispositioned for off-site treatment and disposal. If parent container is determined to be free of PCB contamination by visual examination during repackaging, AKE uses Attachment D, Contact Handled Waste Repackaging Data Form, or Attachment F, Uncharacterized Waste Guidance, of CH-REF-OP-013, Contact Handled Waste Repackaging, as a basis to remove PCB information in the AK/PK database.

Table 1H: Containerized PCB Liquids

Remediation #	Waste Type	Remediation Direction
1.H.2	TRU/ Suspect TRU	**NOTE**: This table applies to containers of PCB liquids or PCB articles which contain potential PCB liquids (such as electric motors, gearboxes, vacuum pumps, etc.). Segregate the PCB liquids container or PCB articles from other compliant waste. AKE and RII or designee evaluates the containerized PCB liquid wastes (known and suspect) and documents the PCB item description, characterization, extent of contamination, and regulatory requirements on the applicable Attachment F, Uncharacterized Waste Guidance, from CH-REF-OP-013, Contact Handled Waste Repackaging. **NOTE**: NoChar N910 PETROBOND is the only approved absorbent for the absorption, stabilization or solidification of containerized PCB liquid and is to be used in a 8:1 ratio absorbent to liquid by volume. **Articles containing known/suspect PCB liquid:** • Minimizing the spread of PCB contamination, drain known/suspect PCB liquid to a container and lid container. • Fill cavity of known/suspect PCB article with NoChar N910 PETROBOND to capture any residual liquid. • Absorb any liquid spilled with NoChar N910 PETROBOND. • Determine if there is sufficient capacity in the container to treat the volume of PCB liquid present at the 8:1 ratio. If not, divide the liquid into additional containers as needed to allow the treatment. • Remove lid from lidded container and absorb PCB liquid at an 8:1 ratio absorbent to liquid with NoChar N910 PETROBOND. Fill out Attachment Q, PCB Liquid Treatment Inspection Log Sheet, from CM-P-EN-013, Environmental Permits and Compliance. **Disposition:** • Place PCB articles and waste into outgoing daughter waste container. • Place absorbed/treated PCB liquid on top of the waste in the outgoing container. • Decon work area in accordance with CH-REF-OP-027, PCB Decontamination, if any spilled outside of bag or treatment pan and place in an outgoing daughter waste container. • Make good notes on Attachment D, Contact Handled Waste Repackaging Data Form, of CH-REF-OP-013, Contact Handled Waste Repackaging. • Ensure daughter container and traveler are labeled as PCB with an out of service date written in permanent marker.

Table 1I: Regulated Asbestos Containing Material

Remediation #	Waste Type	Remediation Direction
1.I.1	Unknown	Notify Health and Safety/Industrial Hygiene for Industrial Hygiene sampling assessment. Waste Management personnel document ACM characterization and recommended disposition as applicable on the Attachment F, Uncharacterized Waste Guidance, of CH-REF-OP-013, Contact Handled Waste Repackaging. Wet the ACM with appropriate fixative. Cut and size as necessary while minimizing the spread of asbestos contamination. Pad or protect sharp edges or corners of the ACM to prevent damage to the drum liner during handling, shipping, and disposal. Package the ACM into a plastic bag (the drum liner is sufficient) which is not less than 6 mil in thickness. Add adsorbent to ensure compliance with free-liquids criteria. **NOTE**: Container labeling may be delayed until after the container has been bagged out and removed from the GB or BBA Drum Out Port, or from the Hot Cell or CPE CH Drum Out Portal. Label the container with a label that contains one of the following: • Caution Contains Asbestos Fibers. Avoid Opening or Breaking Container. Breathing Asbestos is Hazardous to Your Health. • Caution Contains Asbestos Fibers. Avoid Creating Dust. May Cause Serious Bodily Harm. • Danger Contains Asbestos Fibers. Avoid Creating Dust. Cancer and Lung Disease Hazard. Document the ACM on the applicable Attachment D, Contact Handled Waste Repackaging Data Form. Sign Attachment F, Uncharacterized Waste Guidance, of CH-REF-OP-013, Contact Handled Waste Repackaging, to indicate completion of ACM processing per recommended disposition. Notify the Inventory Coordinator or Data Entry personnel to update WICS as applicable. Drums with ACM wastes (known and suspect) will undergo NDA and will be dispositioned for off-site treatment and disposal.

DIVIDER PAGE

Attachment 3 - Acceptable Knowledge Source Document Summary

Site(s): Oak Ridge National Laboratory	Source Document Tracking Number: P599
Waste Stream Number(s): ORNL Non-specific Library Files (Applicable only when site library is not in use)	
Acceptable Knowledge Documentation Type: ☑ TRU Waste Management Program Information ☐ Waste Stream-Specific Information ☑ Additional Information	Category: ☐ Correspondence ☐ Discrepancy Resolution ☑ Internal Procedure ☐ Miscellaneous ☐ Published Document or Internal Procedure ☐ Unpublished Documents
Title or Description of Source Document [a]: Non-Compliant Containers	
Source Document Reference Information (author(s), document and revision number, date, publisher): NA, CH-REF-OP-045, Rev. 1 (Older Versions Included), 06/23/2015, TWPC	

AK # [b]	Source Doc. Page #[c]	AK Information Summary
PR8, S2	Throughout	This procedure provides instructions for the identification, handling, dispositioning, and, if required, return of non-compliant solid waste containers and prohibited items to the Department of Energy (DOE) Oak Ridge National Laboratory. This procedure also provides instructions for dispositioning waste found to not conform to waste stream descriptions in current Acceptable Knowledge (AK) documentation. Containers that do not meet acceptance requirements specified in T-CH-FW-X-AD-001, Contact Handled (CH) Waste Acceptance Criteria (WAC), for the Transuranic (TRU) Alpha Waste Treatment Project, are considered non-compliant and are not processed at the Waste Processing Facility (WPF). Non-compliant containers or materials are segregated for a return transfer to DOE. Items or materials which are found to not conform to the waste stream description or RCRA characterization for the waste stream it is associated with is considered to be non-compliant waste in accordance with the WIPP Waste Analysis Plan. These items or materials are segregated as AK Discrepancies at the WPF until the AK discrepancy is dispositioned and resolved. No specific chemicals or compounds were called out in the procedure. T-CH-FW-P-OP-022 was superseded by CH-P-OP-022. CH-P-OP-022 was superseded by CH-REF-OP-045, and the revision numbers were reset to zero. T-CH-FW-P-OP-022: Revision 3 is the first revision that bounds the population of unshipped containers (01/20/2006). Prior revisions were not provided, so for the purposes of this summary, Revision 3 is the "initial issue," and changes to the document from Revision 2 could not be determined. Revision 3 (Dated 01/03/2006): Non-Compliant Containers Found Prior to Acceptance: • IF non-compliant conditions are identified prior to acceptance of the waste, stop work in the immediate area. • Evaluate the nature of the non-compliance, as well as overall processing conditions to determine if the container may be safely segregated to allow

CCP RECORDS ORIGINAL
DATE REC'D 2/9/16

Attachment 3 - Acceptable Knowledge Source Document Summary (continued)

Site(s): Oak Ridge National Laboratory		Source Document Tracking Number: P599
AK # [b]	Source Doc. Page #[c]	AK Information Summary
		continued unloading of compliant containers. • If a non-compliant container is still on or in the transfer conveyance and is deemed NOT safe for handling by the WOL; initiate a Non-Compliant Waste Disposition form. Non-Compliant Containers Found After Acceptance: • Evaluate the nature of the identified unsafe condition, as well as overall processing conditions to determine if the container may be safely removed from the process area. • IF non-compliant conditions such as those listed below exist or are developing, stop work in the immediate area and notify the WOL: • container is externally contaminated • container is leaking internal contents • container appears pressurized (e.g., bulging) • nondestructive examination reveals non-compliant item or material in the waste container (discovery) • If a non-compliant container is deemed NOT safe for handling by the WOL, segregate the non-compliant container by moving other compliant containers away from the NC container to establish a safety separation distance (nominally a minimum 3 ft.), and initiate a Non-Compliant Waste Disposition form, Attachment B • Distribution of Attachment B: Original to Incoming Container Traveler, copy to WCO, SPM. Non-Compliant Waste Found During Processing in the Glove Box (GB) or Box Breakdown Area (BBA): • If non-compliant items or material is discovered or suspected, stop work in the immediate area and notify the WOL. • If the waste is deemed NOT safe for handling by the WOL; stop work in the immediate area, or as directed by the WOL. • If the waste is deemed safe for handling by the WOL; segregate the non-compliant waste away from compliant waste as directed by the WOL. Prohibited Items: • NTS or WIPP prohibited items may also be discovered during visual examination of the waste contents. These items are segregated and removed from the process area as soon as possible, dispositioned, and either packaged for return to DOE, or processed to create an acceptable waste form for disposal. • Complete a Prohibited Item Disposition form, Attachment C of this procedure, detailing a description of each prohibited item. Submit the Prohibited Item Disposition form to the OM and WCO for review and dispositioning. • Distribution of Attachment C: Original to Incoming Container Traveler, copy to WCO, SPM. • Determine if the waste item or material is acceptable for processing at the WPF using Non-Compliant Waste Handling Guidelines found in Attachment D of this procedure. • If the waste item or material is determined to be not acceptable for processing at the WPF, disposition the waste as non-compliant and initiate

Attachment 3 - Acceptable Knowledge Source Document Summary (continued)

Site(s): Oak Ridge National Laboratory		Source Document Tracking Number: P599
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		a Non-Compliant Waste Disposition form. • If the waste item or material is determined to be acceptable for processing at the WPF, document the applicable details in Section 2 of the Non-Compliant Waste Disposition form. Acceptable Knowledge Discrepancies: • Segregate and label the item or material found which does not conform to the waste stream description for the associated waste stream to ensure the waste is not packaged with other compliant waste. • Initiate an AK Discrepancy Disposition form, Attachment E of this procedure, for each item or material found which does not conform to the waste stream description for the associated waste stream in Section 1 of the Non-Compliant Waste Disposition form. • Distribution of Attachment E: Original to Incoming Container Traveler, copy to WCO, SPM. Revision 4 (Dated 04/26/2006): • Attachment B, Non-Compliant Waste Disposition, is the mechanism the site uses to satisfy the site safety basis and ensures the non-compliant container is safe to handle. • WNCRs are initiated in accordance with T-CH-FW-P-AD-044, Waste Corrective Actions and Nonconformance's. • Section 6.4 provides the direction when a WNCR is initiated for non-compliant containers. • Section 6.5 provides the direction when a WNCR is initiated for prohibited items. T-CH-FW-P-OP-022 was superseded by CH-P-OP-022, but the revision numbers were not reset, but continued with the previous numeration. CH-P-OP-022: Revision 5 (Dated 02/15/2007): Deleted the following attachments: • Attachment B, Non-Compliant Waste Disposition • Attachment C, Prohibited Item Disposition • Attachment E, AK Discrepancy Disposition [These forms are no longer needed as the information is contained in the WNCR.] Revision 6 (Dated 03/20/2008): Items or materials that have established predetermined direction for remediation in accordance with attached Table 1 may be remediated accordingly and documented in accordance with Attachment C, Prohibited Item Processing (PIP) Report. Prohibited Items: • Evaluate the PI, as well as overall processing conditions, to determine if the

Attachment 3 - Acceptable Knowledge Source Document Summary (continued)

Site(s): Oak Ridge National Laboratory		Source Document Tracking Number: P599
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		waste container may be safely handled. Remediate in accordance with Table 1, if applicable. • Initiate an Attachment B, Prohibited Item Processing Report, and remediate in accordance with Table 1 or generate a WNCR in accordance with CH-P-AD-044, Waste Corrective Action and Nonconformance's for items which do not have a pre-determined remediation direction. • Table 1A, Liquids: • Absorb liquids in accordance with CH-I-OP-013, Absorbing Liquids. • Repackage in accordance with CH-P-OP-013, Contact Handled Waste Repackaging. • Complete Attachment O, RCRA Treatment Log Sheet, of CM-P-RP-309, Environmental Permits (incidental liquids are also absorbed but do not require an Attachment O). • Table 1C, Residual Mercury: • Absorb the droplets using compounds from a mercury spill kit in accordance with the applicable vendor instruction for mercury spill kit. • Return the material to the appropriate waste container. • Record the approximate volume of mercury absorbed in the applicable waste container documentation (i.e., droplets of mercury absorbed). Revision 7 (Dated 09/08/2008): Added hot cell to scope of this procedure. Revision 8 (Dated 04/08/2009): • Table 1A, Liquids: • Added a statement to make clear notes on the Attachment D, Contact Handled Waste Repacking Data Form (from CH-P-OP-013, Contact Handled Waste Repackaging). Revision 9 (Dated 05/04/2010): No substantive changes made in this revision related to TRU waste management. Revision 10 (Dated 05/24/2010): Document is just the title page stating that the procedure has been superseded by CH-P-OP-044, Operations Prohibited Item Processing (see Reference P598 in the ORNL Site Library), and CH-P-OP-045, Non-Compliant Containers. CH-P-OP-045 superseded CH-P-OP-022, and the revision numbers were reset to zero. CH-P-OP-045: This procedure provides instructions for the identification, handling, remediation, and dispositioning of Non-Compliant (NC) containers. NC containers may be returned to the U.S. Department of Energy (DOE) Oak Ridge National Laboratory or shipped offsite for alternative treatment. This procedure also provides instructions for handling NC waste and potentially incompatible waste. Containers that do not meet acceptance requirements specified in CH-X-AD-001, Contact Handled Waste Acceptance Criteria (see Reference P255 in the ORNL Site Library), or RH-X-AD-001, Remote Handled Waste Acceptance Criteria (see Reference P597 in the ORNL Site Library), for the TRU Waste Processing Center (TWPC), are considered NC and are not processed at the TWPC. NC containers or materials are segregated and dispositioned for safe

Attachment 3 - Acceptable Knowledge Source Document Summary (continued)

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handling with regard to the TWPC safety basis for a return transfer to DOE. A Waste Nonconformance Report (WNCR) is initiated to disposition the waste with regard to the Waste Isolation Pilot Plant Waste Analysis.

Items or materials which are found to not conform to the waste stream description are considered to be NC waste. These items or materials are segregated as Acceptable Knowledge (AK) discrepancies at the TWPC until the AK/Process Knowledge discrepancy is resolved.

Revision 0 (Dated 05/24/2010):

The prohibited items section, prohibited item tables, and Attachment B: Prohibited Item Processing Report, were removed from CH-P-OP-022 and included in new procedure CH-P-OP-044 (see Reference P598 in the ORNL Site Library).

Revision 1 (Dated 09/10/2013):

The document is just the title page stating that CH-P-OP-045 is superseded by CH-REF-OP-045, and the revision numbers were reset to zero.

CH-REF-OP-045:

Revision 0 (Dated 09/10/2013):

Added Cask Processing Enclosure to scope of the procedure.

Revision 1 (Dated 06/23/2015):

This revision does not include any relevant changes to waste management from the previous revision.

Procedure verification/walk down was conducted on 09/24/2015 by Jeff Harrison with Mike Snipes, Alternate Waste Certification Official. Mr. Snipes said this procedure is not used much anymore because typically all containers are accepted from UCOR for processing at the TWPC, and any known or discovered non-conforming or potentially incompatible materials are processed either through the OPIP or WNCR process. However, the TWPC can still reject and return drums to UCOR when needed if they discover something that they don't know how to deal with at that particular time.

Attachment 3 - Acceptable Knowledge Source Document Summary (continued)

Site(s): Oak Ridge National Laboratory	Source Document Tracking Number: P599
Source Document Data Limitations (if any): 1. None.	
Acceptable Knowlege Expert: Travis Smith / [signature] Date: 01/20/2016 Print /Sign	
[a] Provide description for non-titled information (i.e., container paperwork, MSDS sheets, etc) [b] Obtain from Acceptable Knowledge Documentation Checklist [c] For microfilm or microfiche, identify box, tape, reel number and location.	

Non-Compliant Containers

REFERENCE

Implementation Date: June 23. 2015

APPROVAL:

Kevin East
Process Superintendent

6/22/2015
Date

~~Wastren Advantage, Inc.~~
~~TRU Project Controlled Distribution~~
~~Issued To:~~ #1265 ~~Date:~~ ~~09/09/2015~~

09/25/2015

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Revision Summary

Revision	Change Summary
0	Initial issue – Supersedes CH-P-OP-045
1	Revised to update titles to align with current organization

Current Revision Specific Changes		
Location	**Description**	**Reason**
Global	Update titles to align with current organization	Update

1.0 INTRODUCTION

1.1 Purpose

This procedure provides instructions for the identification, handling, remediation, and dispositioning of Non-Compliant (NC) containers. NC containers may be returned to the U.S. Department of Energy (DOE) Oak Ridge National Laboratory or shipped offsite for alternative treatment. This procedure also provides instructions for handling NC waste and potentially incompatible waste.

1.2 Scope

Containers that do not meet acceptance requirements specified in CH-X-AD-001, Contact Handled Waste Acceptance Criteria, or RH-X-AD-001, Remote Handled Waste Acceptance Criteria, for the TRU Waste Processing Center (TWPC), are considered NC and are not processed at the TWPC. NC containers or materials are segregated and dispositioned for safe handling with regard to the TWPC safety basis for a return transfer to DOE. A Waste Nonconformance Report (WNCR) is initiated to disposition the waste with regard to the Waste Isolation Pilot Plant Waste Analysis.

Items or materials which are found to not conform to the waste stream description are considered to be NC waste. These items or materials are segregated as Acceptable Knowledge (AK) discrepancies at the TWPC until the AK/Process Knowledge discrepancy is resolved.

1.3 Document Use

This document has been evaluated by the Document Use Review Team and has been determined to be a **REFERENCE** procedure.

REFERENCE procedures are not required to be in-hand or present for the user to actively reference during actual performance of action steps, however they may be open and referenced during the work performance based on personnel knowledge and skill level. If work is suspended due to inadequacy of procedure, then a page change notice or revision of the procedure is initiated.

2.0 PRECAUTIONS AND LIMITATIONS

2.1 Safety

- The Floor Supervisor will determine if NC waste is safe to handle. Personnel should not handle waste that could represent a safety hazard without further review and evaluation, including, but not limited to items that:
  - are bulging
  - are radioactively contaminated in excess of applicable Radiological Work Permit limits
  - are leaking
  - have significant integrity issues
  - contain or present unknown crystalline compounds

- For waste or containers where safe handling is in question, personnel shall not handle the containers or items until appropriate reviews are completed and processes are evaluated.
- When dispositioning NC containers, the handling process should consider the following, as a minimum, to ensure that containers/items are handled safely:
  - applicable Activity Hazards Analyses and controls
  - type of non-compliance/hazard
  - personal protective equipment
  - packaging configuration
  - storage location
  - methods of handling and transport, including equipment used

2.2 Technical Safety Requirements

- None

3.0 RESPONSIBILITIES

3.1 Personnel Assignments

Training to the document is at the discretion of the Functional Manager in coordination with the document owner. The following personnel are responsible for performing the activities described in this document. These TWPC personnel may designate alternate personnel to assist in carrying out their responsibilities as specified in this document.

3.1.1 Process Superintendent (PS)

- approves this procedure
- reviews container documentation to determine acceptability of waste containers
- assists in development of instructions for handling NC containers, NC waste, and potentially incompatible waste

3.1.2 Waste Certification Official (WCO)

- reviews container documentation to determine acceptability of waste containers
- assists in development of instructions for handling NC containers, NC waste, and potentially incompatible waste

3.1.3 Environmental Programs Manager (EPM)

- notifies applicable State authorities, if necessary, of intended processing or handling of NC containers

- reviews NC container documentation to determine further reporting requirements
- ensures management options are compliant with regulatory and permit conditions
- assists in development of instructions for handling NC containers, NC waste, and potentially incompatible waste

3.1.4 Shift Superintendent (SS)

- authorizes work activities

3.1.5 Floor Supervisor

- ensures activities are completed in accordance with this procedure
- determines if it is safe to handle NC waste, potentially incompatible waste, or if a suspension of waste handling activities is required

3.1.6 Waste Operator

- performs activities in accordance with this procedure

3.1.7 Health and Safety Manager (HSM)

- assists in development of instructions for handling NC waste, and potentially incompatible waste

3.1.8 Alternate Waste Certification Official

- performs activities in accordance with this procedure
- initiates WNCR in accordance with CH-P-AD-044, Waste Corrective Actions and Nonconformances

3.1.9 Transportation Manager

- reviews containerized waste to ensure compliance with U.S. Department of Transportation waste packaging requirements
- directs the packaging of NC containers for return to DOE or off-site

3.1.10 Acceptable Knowledge Expert (AKE)

- determines if the potential NC item is, or could be, considered within the current AK
- provides additional information if available
- assists in development of instructions for handling NC waste, and potentially incompatible waste

3.2 Document Maintenance

The PS is designated the document owner and is responsible for updating this document. Approval authority rests with the PS. Submit suggestions for revisions or improvement to the PS utilizing Attachment E, New Document and Revision Request Form, of CM-P-AD-061, Document Preparation, Review and Approval.

4.0 PREREQUISITES

- None

NOTE 1: Operations personnel perform the following steps, unless otherwise noted.

NOTE 2: Section 5.0 is divided into multiple subsections. Steps within those subsections are followed in the sequence written unless stated otherwise. Operations personnel may enter specific subsections as needed to start a new work activity or resume work activities (e.g., directed by other procedures, after shift turnover, returning from the weekend, holiday, etc.), only after applicable safety precautions and prerequisites are verified to be satisfied or implemented.

5.0 PROCEDURE

NOTE 1: NC conditions may be discovered during the initial inspection and surveys, unloading, individual container inspection, and movement of waste containers.

NOTE 2: Incoming waste containers transferred to the TWPC are surveyed and inspected to verify that the containers meet pertinent requirements for acceptance, as specified in CH-X-AD-001, Contact Handled Waste Acceptance Criteria, or RH-X-AD-001, Remote Handled Waste Acceptance Criteria. These surveys and inspections are performed in accordance with CH-UET-OP-001, Receipt of Contact Handled Solid Waste, or RH-UET-OP-001, Remote Handled Debris Waste Receipt. Authorized containers are individually unloaded from the transfer conveyance for visual inspections and surveys.

5.1 Non-Compliant Containers Found Prior to Acceptance

5.1.1 IF NC conditions are identified prior to acceptance of the waste, THEN stop work in the immediate area.

NOTE: The Floor Supervisor or Inventory Coordinator is responsible to determine if NC waste is safe to handle or to continue receiving activities. A safety separation distance (nominally a minimum 3 ft) must be established between compliant containers and the NC container by moving other compliant containers away from the NC container.

WARNING: IF CONTAINER APPEARS PRESSURIZED (I.E., BULGING) THEN THE FLOOR SUPERVISOR OR INVENTORY COORDINATOR WILL DEEM THE CONTAINER NOT SAFE FOR HANDLING.

5.1.2 Evaluate the nature of the non-compliance, as well as overall processing conditions to determine if the container may be safely segregated to allow continued unloading of compliant containers.

5.1.3 IF the container is not labeled with a unique identification,
THEN assign a unique identification number (typical format is current date/military time: mmddyy/tttt)
AND attach a label including the assigned number to the container for the purpose of identifying and tracking the NC container.

5.1.4 IF a NC container is still on or in the transfer conveyance and is deemed NOT safe for handling by the Floor Supervisor or Inventory Coordinator, THEN perform the following:

5.1.4.1 Exit the transfer conveyance.

5.1.4.2 Close and secure the conveyance access doors, if so equipped.

5.1.4.3 Notify the Director of Operations (DO), PS, SS, EPM, Safety Authorization Basis Manager (SABM), and WCO of the NC container condition.

NOTE 1: A waste container is a design feature. Any condition that may challenge the credited features in the TSR is evaluated by the Nonconformance Report (NCR) process.

NOTE 2: The Floor Supervisor or Inventory Coordinator performs the following step.

5.1.4.4 Compare the credited features in the TSR with the container in question. Initiate an NCR in accordance with CM-P-AD-041, Nonconformance Control, if applicable.

5.1.4.5 Initiate a WNCR in accordance with CH-P-AD-044, Waste Corrective Action and Nonconformances.

5.1.5 IF a NC container is unloaded from the transfer conveyance and is deemed NOT safe for handling by the Floor Supervisor or Inventory Coordinator, THEN perform the following:

5.1.5.1 Establish a safety separation distance (nominally a minimum 3 ft) between compliant containers and the NC container by moving other compliant containers away from the NC container.

5.1.5.2 Establish a roped boundary, or equivalent, with warning signs or labels around the NC container as appropriate.

5.1.5.3 Stop work in the immediate area.

5.1.5.4 Notify the DO, PS, SS, EPM, SABM, and WCO of the NC container condition.

NOTE 1: A waste container is a design feature. Any condition that may challenge the credited features in the TSR is evaluated by the NCR process.

NOTE 2: The Floor Supervisor or Inventory Coordinator performs the following step.

5.1.5.5 Compare the credited features in the TSR with the container in question. Initiate an NCR in accordance with CM-P-AD-041, Nonconformance Control, if applicable.

5.1.5.6 Initiate a WNCR in accordance CH-P-AD-044, Waste Corrective Action and Nonconformances.

5.1.5.7 IF continued work activities may be safely resumed around the separation or boundary zone of the NC container, THEN resume normal activities per Step 5.1.6.

5.1.6 IF a NC container is deemed safe for handling by the Floor Supervisor or Inventory Coordinator, THEN perform the following:

5.1.6.1 Attach a NON-COMPLIANT CONTAINER label on the NC container.

5.1.6.2 Stage the NC container in a temporary hold area within the Process Building and separated from other WASTE by a minimum of 3 ft, as directed by the Floor Supervisor or Inventory Coordinator.

NOTE: The remainder of Subsection 5.1 may be performed concurrently or in any order.

5.1.6.3 IF container integrity issues exist,
THEN perform one of the following:

- place in overpack
- IF deemed unsafe to overpack,
  THEN contact Regulatory Interface and Integration personnel for further direction

5.1.6.4 Continue receiving acceptable containers in accordance with CH-UET-OP-001, Receipt of Contact Handled Solid Waste, as directed by the Floor Supervisor or Inventory Coordinator.

5.2 Non-Compliant Containers Found After Acceptance

NOTE: Waste Containers, which have been accepted and received, and are considered to be "in-process," are inspected during handling to verify that the containers meet pertinent requirements for processing, as specified in CH-X-AD-001, Contact Handled Waste Acceptance Criteria, or RH-X-AD-001, Remote Handled Waste Acceptance Criteria. If unsafe conditions develop, or normal processing activities indicate that it is unsafe to handle or continue processing an unopened container, the container may be rejected from further processing.

5.2.1 IF unsafe conditions develop, or normal processing activities indicate that it is unsafe to handle or continue processing an unopened container (discovery),
THEN contact the Floor Supervisor or Inventory Coordinator for further guidance.

NOTE: The Floor Supervisor or Inventory Coordinator is responsible to evaluate the container(s) to determine if the container(s) may be handled safely to allow continued processing activities.

5.2.2 Evaluate the nature of the identified unsafe condition, as well as overall processing conditions to determine if the container may be safely removed from the process area.

5.2.3 IF NC conditions such as those listed below exist or are developing,
THEN stop work in the immediate area
AND notify the Floor Supervisor and SS:

- container is externally contaminated
- container is leaking internal contents
- container appears pressurized (e.g., bulging)
- nondestructive examination reveals NC item or material in the waste container (discovery)

NOTE: The Floor Supervisor or Inventory Coordinator is responsible to determine if NC waste is safe to handle.

WARNING: IF CONTAINER APPEARS PRESSURIZED (I.E., BULGING) THEN THE FLOOR SUPERVISOR OR INVENTORY COORDINATOR WILL DEEM THE CONTAINER NOT SAFE FOR HANDLING.

5.2.4 Evaluate the nature of the non-compliance, as well as overall processing conditions to determine if the container may be safely handled.

5.2.5 If a NC container is deemed NOT safe for handling by the Floor Supervisor or Inventory Coordinator,
THEN segregate the NC container by moving other compliant containers away from the NC container to establish a safety separation distance (nominally a minimum 3 ft).

5.2.5.1 Establish a roped boundary, or equivalent, with warning signs or labels around the NC container as appropriate.

5.2.5.2 Notify the DO, PS, SS, EPM, SABM, and WCO of the NC container condition.

NOTE 1: A waste container is a design feature. Any condition that may challenge the credited features in the TSR is evaluated by the NCR process.

NOTE 2: The Floor Supervisor or Inventory Coordinator performs the following step.

5.2.5.3 Compare the credited features in the TSR with the container in question. Initiate an NCR in accordance with CM-P-AD-041, Nonconformance Control, if applicable.

5.2.5.4 Initiate a WNCR in accordance with CH-P-AD-044, Waste Corrective Action and Nonconformances.

5.2.5.5 IF continued work activities may be safely resumed around the separation or boundary zone of the NC container,
THEN resume normal activities per Step 5.2.6.

5.2.6 If the container(s) are deemed safe for handling by the Floor Supervisor or Inventory Coordinator,
THEN perform the following:

5.2.6.1 Attach a NON-COMPLIANT CONTAINER label on the NC container.

5.2.6.2 Stage the NC container in a temporary hold area within the Process Building and separated from other WASTE by a minimum of 3 ft, as directed by the Floor Supervisor or Inventory Coordinator.

NOTE: The remainder of Subsection 5.2 may be performed concurrently or in any order.

5.2.6.3 IF container integrity issues exist,
THEN perform one of the following:

- place in overpack
- IF deemed unsafe to overpack,
  THEN contact Regulatory Interface and Integration personnel for further direction

5.2.6.4 Continue processing acceptable containers as directed by the Floor Supervisor or Inventory Coordinator.

NOTE: NC, or potentially incompatible waste, may be discovered during processing in the Glovebox, Box Breakdown Area, Hot Cell, or Cask Processing Enclosure.

5.3 Non-Compliant or Potentially Incompatible Waste Found During Processing in the Glovebox, Box Breakdown Area, Hot Cell, or Cask Processing Enclosure

5.3.1 IF NC or potentially incompatible items or material is discovered or suspected,
THEN stop work in the immediate area
AND notify the Floor Supervisor and SS.

NOTE 1: AKE determines if the potential NC is, or could be, compliant within the current AK and provides additional information, if available.

NOTE 2: The Floor Supervisor performs the following step.

5.3.2 Determine if the potential NC or potentially incompatible waste is safe to handle with the PS/AKE/EPM/SABM/HSM/Waste Logistics Coordinator.

5.3.3 Evaluate the nature of the non-compliance/potentially incompatible waste, as well as overall processing conditions to determine if the waste may be safely handled or removed from the process area.

5.3.4 IF the waste is deemed NOT safe for handling
OR is potentially incompatible with other waste items,
THEN stop work in the immediate area,
OR as directed by the Floor Supervisor.

5.3.4.1 Notify the DO, PS, EPM, SABM, HSM, and WCO of the NC or potentially incompatible waste condition.

5.3.4.2 Initiate a WNCR in accordance with CH-P-AD-044, Waste Corrective Action and Nonconformances.

5.3.5 If the waste is deemed safe for handling
AND is compatible with other waste,
THEN perform the following:

5.3.5.1 Segregate and containerize as applicable, potentially incompatible waste away from compliant waste as directed by the Floor Supervisor.

5.3.5.2 Segregate and containerize as applicable, NC waste away from compliant waste as directed by the Floor Supervisor.

5.3.5.3 Clearly label the NC waste with the noncompliant condition.

5.3.5.4 Notify the DO, PS, EPM, SABM, and WCO of the NC waste condition.

NOTE: Once the NC waste is identified with the noncompliant condition and segregated from the compliant waste, processing of compliant waste may resume while the NC waste is dispositioned.

5.3.5.5 Initiate a WNCR in accordance with CH-P-AD-044, Waste Corrective Action and Nonconformances.

5.3.5.6 Continue processing complaint waste as directed by the Floor Supervisor.

5.3.6 IF the NC(s) are approved for return to DOE,
AND are not packaged in an approved container,
THEN package the NC(s) as directed by the Transportation Manager.

5.3.7 Attach a Waste Container Traveler folder to each container of NCs generated.

5.3.8 Return the NC to DOE in accordance with Subsection 5.5.

5.3.9 WHEN each container is returned to DOE,
THEN the applicable Container Traveler folder is forwarded to the WCO.

5.4 Acceptable Knowledge Discrepancies

5.4.1 Segregate and label the item or material found which does not conform to the waste stream description for the associated waste stream to ensure the waste is not packaged with other compliant waste.

5.4.2 Initiate a WNCR in accordance with CH-P-AD-044, Waste Corrective Action and Nonconformances, for each item or material found which does not conform to the waste stream description for the associated waste stream.

NOTE: The NC container(s) typically are returned to DOE within 30 days of documented approval for return to DOE. If the return transfer cannot be completed within the allowed 30 days, the applicable State authorities should be notified with details of the return transfer of the NC container, as applicable.

5.5 Return of Non-Compliant Containers to U.S. Department of Energy or Off-Site

5.5.1 Return the NC container to DOE in accordance with CH-REF-OP-006, Return Transfer to DOE.

6.0 RECORDS

Records are identified, classified, and maintained in accordance with CM-P-AD-049, Records Management, and CM-X-AD-026, Records Inventory and Disposition Schedule.

6.1 Record Numbering

None

6.2 Records Inventory and Disposition Schedule

There are no records generated by this document.

7.0 ATTACHMENTS

Attachment A: Acronyms/Abbreviations, Definitions, References, and Reviewer Selection for Major Revisions

Attachment A: Acronyms/Abbreviations, Definitions, References, and Reviewer Selection for Major Revisions

Acronyms/Abbreviations

AK – Acceptable Knowledge

AKE – Acceptable Knowledge Expert

DO – Director of Operations

DOE – U.S. Department of Energy

EPM – Environmental Programs Manager

HSM – Health and Safety Manager

NC – Non-Compliant

NCR – Nonconformance Report

PS – Process Superintendent

SABM – Safety Authorization Basis Manager

TRU – Transuranic

TWPC – TRU Waste Processing Center

WCO –Waste Certification Official

WNCR – Waste Nonconformance Report

Definitions

In-Process – A container is considered "in-process" once it is accepted for receipt. In process containers may be staged in a staging area awaiting active processing, actively processed by Non-Destructive Assay or Examination, opened for sorting within a processing area, staged in an aging area, or actively processed by Head Space Gas Analysis. A container is no longer "in-process" when it is staged for final packaging or shipment.

Discovery – If, after acceptance of a waste container, a condition, item, or material is found to not meet TWPC Waste Acceptance Criteria that was not clearly identified or implied by the original waste generator documentation prior to receipt of the waste container, it is considered a "discovery" condition.

Non-compliant (NC) – Containers or Items that do not meet acceptance requirements specified in CH-X-AD-001, Contact Handled Waste Acceptance Criteria, or RH-X-AD-001, Remote Handled Waste Acceptance Criteria, for the TRU Waste Processing Center (TWPC).

Developmental References

DOE/NV-325, Nevada National Security Site Waste Acceptance Criteria

CH-UET-OP-002, Contact Handled Staging Area Operations

CH-UET-OP-003, Box Breakdown Area Operations

CH-UET-OP-004, Glove Box Operations

Attachment A: Acronyms/Abbreviations, Definitions, References, and Reviewer Selection for Major Revisions

Developmental References

CH-X-AD-001, Contact Handled Waste Acceptance Criteria

CM-R-AD-001, Documented Safety Analysis

RH-X-AD-001, Remote Handled Waste Acceptance Criteria

TNHW-145, Hazardous Waste Management Permit, State of Tennessee Department of Environment and Conservation, Division of Solid Waste Management

063331P, Operating Air Permit

Cross References

CH-P-AD-044, Waste Corrective Action and Nonconformances

CH-UET-OP-001, Receipt of Contact Handled Solid Waste

CH-REF-OP-006, Return Transfer to DOE

CM-P-AD-041, Nonconformance Control

RH-UET-OP-001, Remote Handled Debris Waste Receipt

Reviewer Selection for Major Revisions

Required	Optional
Process Superintendent	Acceptable Knowledge Expert
Peer Review Specialist	Database Administrator
	Director of Operations
	Environmental Programs Manager
	Facility Manager
	Fire Protection Engineer
	Health and Safety Manager
	Quality Assurance Manager
	Radiological Control Manager
	Safety Authorization Basis Manager
	Shift Superintendent
	Transportation Manager
	Waste Certification Official

DIVIDER PAGE

Attachment 3 - Acceptable Knowledge Source Document Summary

Site(s): Oak Ridge National Laboratory	Source Document Tracking Number: P988
Waste Stream Number(s): ORNL Non-specific Library Files (Applicable only when site library is not in use)	
Acceptable Knowledge Documentation Type: ☐ TRU Waste Management Program Information ☑ Waste Stream-Specific Information ☑ Additional Information	Category: ☐ Correspondence ☐ Discrepancy Resolution ☐ Internal Procedure ☐ Miscellaneous ☑ Published Document or Internal Procedure ☐ Unpublished Documents
Title or Description of Source Document [a]: CH-TRU Waste Handling at Building 7920	
Source Document Reference Information (author(s), document and revision number, date, publisher): K. Wilson, NNFD-7920-OP-190, Rev. 0, 02/23/2010, NA	

AK # [b]	Source Doc. Page #[c]	AK Information Summary
WS2, WS4, WS9, S2, S16	Throughout	This procedure provides the instructions for packaging and documentation of contact-handled TRU waste generated in Building 7920. Appendix B provides a summary list of criteria waste must meet when packaged. Appendix C provides guidance for complying with the Waste Master Profile.

CCP RECORDS ORIGINAL
DATE REC'D 2/25/15
GPL

Attachment 3 - Acceptable Knowledge Source Document Summary (continued)

Site(s): Oak Ridge National Laboratory	Source Document Tracking Number: P988
Source Document Data Limitations (if any): 1. None.	
Acceptable Knowlege Expert: Travis Smith / [signature] Date: 02/16/2015 Print /Sign	
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DIVISION/FACILITY: NNFD/7920

PROCEDURE TYPE: Technical **(Action Steps shall be followed sequentially unless otherwise directed in this procedure)**

PROCEDURE NUMBER: NNFD-7920-OP-190

REVISION NUMBER: 0

TITLE: CH-TRU Waste Handling at Building 7920

Printed Name	Signature	Position/Title	Date
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APPROVAL			
A. W. Smith	A. W. Smith	REDC Facility Manager	1-15-10
		EFFECTIVE DATE	2/23/10

This procedure has been reviewed by assigned reviewers and concurred/approved by the personnel whose signatures appear above. Copies of this document released to personnel who are not on the controlled distribution list are not controlled copies but are for **INFORMATION ONLY**.

ASSIGNED CHANGE NUMBERS	
PERMANENT CHANGES	**ONE-TIME-USE CHANGES**
NNFD-7920-OP-190-R0-CN-1 Entered By: 2/18/11 MP	NNFD-7920-OP-190-R0-CN-_____ Entered By:_____
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NNFD-7920-OP-190-R0-CN-_____ Entered By:_____	NNFD-7920-OP-190-R0-CN-_____ Entered By:_____

Modification Log

Change # or Rev.	Page	Section/ Step	Description of Change	Effective Date
0			New procedure to address the certification, packaging and disposition of contact-handled transuranic (CH-TRU) waste.	2/23/10
CN-1	11-11a	12	Changed to comply with the revised BJC CH-TRU Waste Master Profile.	2/21/11

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INFORMATION ONLY

1. INTRODUCTION

1.1 Purpose

To provide instructions for packaging contact-handled transuranic (CH-TRU) waste generated at Building 7920 and assure that all pertinent information and data concerning the packaged waste is documented in a manner that is consistent with Bechtel Jacobs Corporation (BJC) CH-TRU Waste Master Profiles and meets the certification criteria.

1.2 Scope

This procedure applies to personnel responsible for CH-TRU waste production, packaging, and loading into CH-TRU waste containers at the REDC.

2. PRECAUTIONS/LIMITATIONS

2.1 The facility manager and/or operations supervisor shall be immediately notified of any unsatisfactory results, problems observed, or unexpected delays encountered during performance of this procedure.

3. REQUIREMENTS

3.1 REDC Laboratory Workers/Operations Personnel performing the actions outlined in this procedure shall have satisfactorily completed the ORNL Waste Generator Awareness Training as a minimum.

3.2 REDC Waste Management Representative (WMR) shall have satisfactorily completed the required training to be a certified Waste Generator at ORNL.

3.3 Each laboratory and operations area that generates CH-TRU waste will have its own CH-TRU waste receptacle(s)/container(s). Personnel working in these laboratory and operations areas are responsible for contacting the REDC WMR when waste is produced and packaged in an individual packet and ready for radiological survey and disposition into the appropriate CH-TRU waste container.

3.4 The REDC Waste Management Representative (WMR) is responsible for officially having the waste packets surveyed, placing waste packets into CH-TRU waste containers, transporting the containers to the proper staging location, completing the proper documentation, and notification of ORNL Laboratory Waste Services (LWS) that the waste is ready for disposition.

3.5 CH-TRU waste generated at the REDC shall be packaged and documented in a manner that is consistent with BJC CH-TRU Waste Master Profiles. A summary of the waste master profile is presented in Appendix B.

3.6 Guidance for complying with the BJC Waste Master Profile is detailed in Appendix C.

3.7 The REDC WMR is responsible for maintaining inventory records for all CH-TRU waste at the REDC.

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4. PREREQUISITES

4.1 Ensure that waste management activities are on the Building 7920 Plan of the Day (POD).

4.2 Ensure that a Radiation Protection representative has been notified that a CH-TRU container is ready to be moved to an interim storage location.

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5. *ACTION STEPS*

NOTE 1: *It is the responsibility of the REDC WMR to obtain the containers (drums) used for CH-TRU waste from ORNL Laboratory Waste Services (LWS) and place them at the collection sites. Typical collection locations at Building 7920 are in Rooms 108, 111, 118, 120, 208, 211, and 216. Alternate sites may be used any time the need arises by requesting the REDC WMR to set up a station.*

NOTE 2: *Only those containers which have been obtained from the LWS, and which have been pre-labeled with a container bar code, may be used.*

5.1 Preparing Waste Packages for Disposal as CH-TRU Waste

REDC WMR

5.1.1 Obtain a new numbered and approved container (55-gallon drum).

5.1.2 Ensure that the container (drum) has been pre-labeled with a container bar code.

NOTE: *Any metal or plastic intermediate waste container with a volume greater than one gallon, shall be twisted and taped or vented with an approved venting device as applicable.*

REDC LABORATORY WORKER / OPERATIONS PERSONNEL

5.1.3 Manage individual waste packets as follows:

NOTE: *The REDC WMR is responsible for completing the necessary paperwork that will be supplied to ORNL LWS.*

5.1.3.1 Ensure that the material to be discarded adheres to the guidelines specified in Appendix C, *Guidance for Complying with the BJC Waste Master Profile*.

5.1.3.2 Cover all sharp edges or glassware in the waste (with tape or overpacking) to protect plastic bagging or other primary containment barriers from punctures.

5.1.3.3 **IF** bagging the waste items out of a glove box,
THEN manage the waste packet according to the instructions provided in NNFD-7920-OP-105, *Glove Box Operations*, and GLO-1, *General Laboratory Operations*.

5.1.3.4 For other waste, bag or cover the waste with plastic as necessary to provide containment during container loading by heat sealing or taping.

5.1.3.5 Once a waste packet has been produced and is ready for placement into a CH-TRU waste drum, contact the REDC WMR to have a Radiological Control Technician (RCT) survey the packet and place the waste packet into the appropriate CH-TRU waste drum.

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5.1 **Preparing Waste Packages for Disposal as CH-TRU Waste** (cont.)

REDC LABORATORY WORKER / OPERATIONS PERSONNEL

5.1.3.6 Provide the following information to the REDC WMR, as applicable: the glovebox (or area) where the waste was generated, the item type (bag, can, or bucket), the waste item description, whether the material is RCRA, whether the bag is heat sealed, waste volume, and waste weight

RCT

5.1.3.7 Perform a radiological survey of the waste packet.

5.1.3.8 Provide the radiation survey results to the REDC WMR.

REDC WMR/RCT

5.1.3.9 **IF** the n_f reading is >200 mrem/hr at 30 centimeters,
THEN set aside the packet to be placed into a RH-TRU waste cask.

5.1.3.10 **IF** the TOTAL (n_f + β-γ) reading on the packet is <200 mrem/hr at 30 centimeters,
THEN place the packet the CH-TRU waste container.

5.1.3.11 Perform a radiological survey of the CH-TRU waste container.

5.1.3.12 If necessary, re-calculate the total radiation reading of the CH-TRU waste container.

5.1.3.13 **IF** the TOTAL radiation (n_f + β-γ) reading is now <200 mrem/hr,
THEN leave the packet in the CH-TRU waste container and proceed to Step **5.1.4**.

5.1.3.14 **IF** the TOTAL (n_f + β-γ) radiation reading is >200 mrem/hr,
THEN remove the packet from the CH-TRU container.

REDC WMR

5.1.3.15 Set the packet aside to be dispositioned into the proper waste container as necessary.

5.1.4 Compile waste data as follows:

NOTE: *When estimates are required, always apply best judgment to provide the best information possible. A conservative approach is desired in these cases.*

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5.1 **Preparing Waste Packages for Disposal as CH-TRU Waste** (cont.)

REDC WMR

5.1.4.1 Record the required data on the CH TRU Waste Inventory Log sheet (see Appendix D) for the appropriate CH-TRU waste drum corresponding to the laboratory or operations area from where the waste was generated.

5.1.4.2 **IF** uncertainties in information occur,
THEN consult with appropriate laboratory workers or operations personnel to resolve the uncertainties.

5.1.4.3 Identify, quantify, and report any hazardous materials in the waste to the REDC WMR.

5.1.4.4 If necessary contact the REDC WMR to assist in determining the disposition of hazardous waste.

5.1.4.5 Place the CH-TRU waste packet containing hazardous material into the appropriate waste container.

5.2 **Disposition of Full CH-TRU Waste Containers**

5.2.1 When the CH-TRU waste drum is full, close the CH-TRU waste drum as follows:

5.2.1.1 Close the liner bag in the CH-TRU waste container.

5.2.1.2 Position the lid ensuring that the rubber gasket in the lid is aligned properly.

5.2.1.3 Install the lid retaining ring and tighten the retaining ring bolt.

5.2.1.4 Initiate the proper disposal documentation (*ORNL LWS 2109* form).

5.2.2 Move the closed CH-TRU container to a location suitable to be monitored by Radiation Protection.

5.2.3 Request that Radiation Protection perform a radiation survey of the drum.

5.2.4 Prior to moving the closed CH-TRU container from the laboratory or area where it was staged for loading to an interim staging area, ensure that the quantity of radioactive material in the waste container is accounted for will not cause the limits of the interim staging area to be exceeded. Refer to NNFD-7920-OP-104, *Radioactive Material Inventory Control*, for the radioactive material inventory limits for Building 7920.

5.2.5 Once Radiation Protection has completed the radiation survey of the drum, move the drum to the designated interim staging area to await disposition by ORNL LWS.

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6. *REFERENCES*

6.1 Source Documents

NNFD-001, *Development, Review, and Control of Procedures*

7. *RECORDS*.

Appendix D, CH-TRU Waste Inventory Log

The official record for CH-TRU waste is the "ORNL LWS 2109" form

8. *APPENDICES*

8.1 Appendix A, *Definitions/Acronyms*

8.2 Appendix B, *Summary of Waste Profiles as Specified in the BJC CH-TRU Waste Master Profile*

8.3 Appendix C, *Guidance for complying with BJC CH-TRU Waste Master Profile*

8.4 Appendix D, *CH-TRU Waste Inventory Log*

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APPENDIX A
Definitions/Acronyms

1. **BJC** – Bechtel/Jacobs Corporation
2. **β-γ** – beta-gamma radiation
3. **CH-TRU** – Contact Handled TRU Waste
4. **Ci** – cuire, measure of radioactivity
5. **Free Liquids** - Liquids which readily separate from the solid portion of a waste under ambient temperature and pressure.
6. **Laboratory Worker** – personnel responsible for handling waste generated by operations performed in glove box laboratories (including analytical chemistry laboratories).
7. **LLW** – Low Level Waste
8. **LWS** - Lab Waste Services
9. **n_f** – neutron radiation
10. **Operations Personnel** – personnel responsible for handling waste generated by hot cell processing operations at the REDC, including waste generated by facility level maintenance and operations activities.
11. **PCB** – polychlorinated biphenyls
12. **PE** – plutonium equivalent, standardized radioactivity measurement using ^{239}Pu as the basis.
13. **RCRA** – Resource Conservation Recovery Act
14. **RCRA Waste** - Any material or combination of materials classified as hazardous by the Resource Conservation and Recovery Act. Hazardous materials are either listed in 40 CFR 261 Subpart D, or have characteristics (ignitability, corrosivity, reactivity, toxicity) identified in 40 CFR 261 Subpart C.
15. **RCT**- Radiation Control Technician
16. **RH-TRU** – Remote Handled TRU Waste
17. **SLLW** - Solid Low Level Waste
18. **TRU** - transuranic
19. **TRU Waste** - Radioactive waste contaminated with alpha emitting transuranic radionuclides (atomic number >92) with half-lives greater than 20 years and concentrations >100 nCi/g at the time of assay. Additional radioisotopes that are managed as TRU waste at REDC (and ORNL) include ^{252}Cf, ^{244}Cm, ^{233}U and other trans-curium isotopes (Bk, Es, Fm). Many of the trans-curium isotopes are neutron emitters as well as alpha emitters. TRU waste shall be segregated from SLLW.
20. **Waste Packet** - An individually wrapped and numbered waste item.
21. **Waste Generator** - Individual who has received the necessary training to certify, to the best of his/her knowledge, that CH-TRU waste meets the established acceptance criteria found in this document. (See Appendix B for details.)
22. **WMR** - Waste Management Representative, the individual within REDC with the responsibility for ensuring the radioactive waste generated in the REDC facilities is handled and disposed of in accordance with the Waste Certification Program. The WMR also certifies, to the best of his ability, that the waste meets the established acceptance criteria found in this document.
23. **WSR** - Waste Services Representative

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APPENDIX B

Summary of Waste Profiles as Specified in the BJC CH-TRU Waste Master Profile

This summary is not intended to be a complete detailed description of all CH-TRU Waste Master Profiles. Those details are listed in the basic documents referenced earlier.

CH-TRU waste shall be placed only in containers obtained from ORNL Lab Waste Services. In most cases this will be 55-gal steel drums. Waste placed in these waste containers shall meet the following criteria:

1. Loose fines or powders exceeding 1 wt % <10 μm or 15 wt % <200 μm shall be immobilized.
2. No free liquids. Containers must be well drained.
3. Pyrophoric forms of radionuclides shall constitute no more than 1 wt % of the package contents. Other pyrophoric materials are prohibited.
4. No explosives or compressed gases, as defined by 49 CFR 173, subparts C and G.
5. No hazardous waste unless co-contaminated with transuranic waste. Any present shall be identified and quantified.
6. Package (or package assemblies) total weight shall not exceed 1,000 lbs.
7. ^{235}U fissionable equivalent mass (FEM) shall be limited to 150 g per 55-gal drum.
8. Each 55-gal drum shall not exceed 80 ^{239}Pu Plutonium Equivalent Curies (PE-Ci).
9. The contact dose rate shall not exceed 200 mrem/hr at any point on the outside of the drum, and no inner item shall exceed a total of 200 mrem/hr at 30 centimeters from the unshielded surface.
10. Removable surface contamination on waste containers shall be less than 20 dpm/100 cm^2 α, or 200 dpm/100 cm^2 β-γ.
11. Thermal power shall be recorded in the data package if >0.1 watt/ft^3 (~0.75 watt/55-gal drum).

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NOTE: *The use of wire or plastic ties to aid twist and tape or fold and tape closures are allowable, but the use of supplemental sealing devices such as clamps or mechanical closures shall NOT be used.*

12. Internal bags containing the waste shall be closed by one of the following methods:

    a. Twist-and-tape closure

    b. Fold-and-tape closure

    c. Heat-seal closure

    Heat sealed bags must meet one of the following criteria:

    - < 4 liters internal volume (fully expanded)
    - > 4 liters internal volume (fully expanded) with a WIPP approved filter vent capable of a minimum total hydrogen diffusivity of 1.075e-5 mol/s/mol fraction at 25 °C
    - > 4 liters internal volume (fully expanded) with > 390 in^2 of surface area.

13. Each waste packet shall be uniquely identified by an assigned number.

14. CH-TRU waste generated shall be sufficiently characterized to identify the contents of the waste package. Characterization data shall be documented and records maintained at the point of origin.

15. PCB wastes other than PCB bulk product waste or PCB remediation waste are prohibited.

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APPENDIX C

Guidance for Complying With BJC CH-TRU Waste Master Profile

Page 1 of 2

Waste-form certification for each waste packet loaded into the container must be made by the Waste Management Represetnative. The following guidance is provided to help the waste handler apply good judgment to meet the intent of the criteria for each item.

1. Loose Fines - If loose powders (not those that adhere to bulk solids) are visible, do not load into a packet being prepared for a waste drum. The loose powder must be immobilized (i.e., grouted, foamed, etc.) before inclusion in a waste packet. BJC CH-TRU Waste Master Profile permits inclusion of a very small percentage of loose fines. REDC policy is to immobilize any visible fines.
2. Free Liquids - If free liquids are visible or known to be included in waste material, these liquids must be removed (e.g., drained or squeezed) from the waste before the waste can be included in a packet. To prevent inclusion of liquid in bottles, caps shall be removed, the bottles well drained, and the caps and bottles placed in the packet separately. This is a good engineering practice and allows the requirement of 1% by volume free liquid to be easily met.
3. Pyrophoric Materials - Pyrophoric materials are not used in established glove box and hot cell operations. Special notifications will be made if pyrophoric materials are introduced into the REDC, so that wastes of this type can be identified and excluded from CH-TRU containers.
4. Explosives and Compressed Gases - No explosives are used or are present in our containment areas. Special notifications will be made if explosive materials are introduced into the REDC, so that wastes of this type can be identified and excluded from CH-TRU waste containers. Compressed gas cylinders (e.g., spray cans) must be emptied and punctured before inclusion in a waste packet.
5. Radioactive Mixed Waste - Hazardous materials shall be included only if they are co-contaminated with transuranic radioisotopes. All hazardous materials shall be identified and quantified.
6. Package Weight - There is no limit on the individual packet weight. However, it should be limited to a weight that can be easily managed by the waste handlers.
7. 150-Gram Fissile Limit Per Drum -This limit is determined by the formula used to calculate the amount of isotopic material in each drum or package.
8. The specific activity of CH-TRU waste packages will be determined from the current curie calculation formula used by the ORNL Waste Services Representative (WSR).
9. Surface Dose Rate - Both β-γ and n_f readings must be added together to determine the total radiation.
10. Surface Contamination - Contamination levels on CH-TRU waste drums are expected to smear less than 20 dpm/100 cm^2 alpha or 200 dpm/100 cm^2 beta-gamma, unless a packet is breached or there is a contamination problem in the area. Radiation Protection personnel monitor and smear the drums for contamination to assure that ORNL contamination control standards are met before they leave the building.

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APPENDIX C

Guidance for Complying With BJC CH-TRU Waste Master Profile

11. Thermal Power - Instrumental counting will be used to calculate the output of heat generators in the waste container. However, prior to loading each packet into the container, the WMR makes a judgment whether the waste contains recoverable amounts of ^{238}Pu, ^{239}Pu, ^{241}Am, ^{244}Cm, or ^{252}Cf. Therefore, Section 5.3 of this procedure outlines a method for determining whether or not a packet may be placed in a CH-TRU waste drum without causing the total surface dose rate to exceed 200 mrem/hr at any point. (The final surface dose rate and any neutron contribution will be reported on the documentation prepared when the drum is closed). If not, an estimate of the thermal power is made for the residual amounts believed to be present.

12. Gas Generation - The CH-TRU drums will be vented with a HEPA filter vent installed in the lid of each drum.

13. Labeling -The CH-TRU drum will be labeled with the labels furnished by LWS. The packets of waste will be identified by a number on the packet.

14. Data Package - It is up to the individual REDC Laboratory Worker / Operations Personnel to provide complete information to the REDC Waste Management Representative (WMR). At the REDC, the WMR or alternate WMR will prepare the documentation for the transfer of waste packages to ORNL LWS. The specific duties of the WMR are given in Appendix A.

15. Classification of Waste as TRU - The WMR will determine if an individual package is TRU based on the calculated curies assigned to TRU isotopes and the package weight. If the value is less than 100 nCi/g, then the waste is classified as SLLW, and if greater or equal 100 nCi/g, the waste is TRU. The subsequent handling depends on whether the waste is RH or CH. If RH, the waste is placed in a concrete cask. If the waste is CH, it is placed in a drum.

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Appendix D

CH-TRU Waste Inventory Log

Item Number	Date Added	Removed By (User ID)	Glovebox Generation Location	Item Type (bag, can, or bucket)	Waste Item Description	Is the material RCRA Regulated?	Is the Heat-Sealed Bag Surface Area > 390 in^2?	Waste Volume (ft^3)	Waste Weight (lbs)	Maximum Contact Gamma Exposure Rate (mR/hr)	Maximum Contact Neutron Dose Rate (mrem/hr)	Surveyed By (User ID)	Loaded By (User ID)
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3													
4													
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CH-TRU Waste Inventory Log

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DIVISION/FACILITY: NNFD/7920

PROCEDURE TYPE: Technical **(Action Steps shall be followed sequentially unless otherwise directed in this procedure)**

PROCEDURE NUMBER: NNFD-7920-OP-190

REVISION NUMBER: 0

TITLE: CH-TRU Waste Handling at Building 7920

Printed Name	Signature	Position/Title	Date
VALIDATION			
K. Wilson	K. Wilson	REDC Technical Advisor	1/13/10
Jack Ramsey	Jack Ramsey	REDC Waste Management Representative	
T. A. Lehberger	T. A. Lehberger	REDC Waste Management Project Lead	1/14/10
CONCURRENCE			
P. D. Bailey	P. D. Bailey	REDC Operations Manager	1/14/10
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M. A. Green	M. A. Green	Safety Basis Engineer	1-14-10
APPROVAL			
A. W. Smith	A. W. Smith	REDC Facility Manager	1-15-10
		EFFECTIVE DATE	2/23/10

This procedure has been reviewed by assigned reviewers and concurred/approved by the personnel whose signatures appear above. Copies of this document released to personnel who are not on the controlled distribution list are not controlled copies but are for **INFORMATION ONLY.**

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Modification Log

Change # or Rev.	Page	Section/ Step	Description of Change	Effective Date
0			New procedure to address the certification, packaging and disposition of contact-handled transuranic (CH-TRU) waste.	2/23/10

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1. INTRODUCTION

1.1 Purpose

To provide instructions for packaging contact-handled transuranic (CH-TRU) waste generated at Building 7920 and assure that all pertinent information and data concerning the packaged waste is documented in a manner that is consistent with Bechtel Jacobs Corporation (BJC) CH-TRU Waste Master Profiles and meets the certification criteria.

1.2 Scope

This procedure applies to personnel responsible for CH-TRU waste production, packaging, and loading into CH-TRU waste containers at the REDC.

2. PRECAUTIONS/LIMITATIONS

2.1 The facility manager and/or operations supervisor shall be immediately notified of any unsatisfactory results, problems observed, or unexpected delays encountered during performance of this procedure.

3. REQUIREMENTS

3.1 REDC Laboratory Workers/Operations Personnel performing the actions outlined in this procedure shall have satisfactorily completed the ORNL Waste Generator Awareness Training as a minimum.

3.2 REDC Waste Management Representative (WMR) shall have satisfactorily completed the required training to be a certified Waste Generator at ORNL.

3.3 Each laboratory and operations area that generates CH-TRU waste will have its own CH-TRU waste receptacle(s)/container(s). Personnel working in these laboratory and operations areas are responsible for contacting the REDC WMR when waste is produced and packaged in an individual packet and ready for radiological survey and disposition into the appropriate CH-TRU waste container.

3.4 The REDC Waste Management Representative (WMR) is responsible for officially having the waste packets surveyed, placing waste packets into CH-TRU waste containers, transporting the containers to the proper staging location, completing the proper documentation, and notification of ORNL Laboratory Waste Services (LWS) that the waste is ready for disposition.

3.5 CH-TRU waste generated at the REDC shall be packaged and documented in a manner that is consistent with BJC CH-TRU Waste Master Profiles. A summary of the waste master profile is presented in Appendix B.

3.6 Guidance for complying with the BJC Waste Master Profile is detailed in Appendix C.

3.7 The REDC WMR is responsible for maintaining inventory records for all CH-TRU waste at the REDC.

4. *PREREQUISITES*

4.1 Ensure that waste management activities are on the Building 7920 Plan of the Day (POD).

4.2 Ensure that a Radiation Protection representative has been notified that a CH-TRU container is ready to be moved to an interim storage location.

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5. ACTION STEPS

NOTE 1: *It is the responsibility of the REDC WMR to obtain the containers (drums) used for CH-TRU waste from ORNL Laboratory Waste Services (LWS) and place them at the collection sites. Typical collection locations at Building 7920 are in Rooms 108, 111, 118, 120, 208, 211, and 216. Alternate sites may be used any time the need arises by requesting the REDC WMR to set up a station.*

NOTE 2: *Only those containers which have been obtained from the LWS, and which have been pre-labeled with a container bar code, may be used.*

5.1 Preparing Waste Packages for Disposal as CH-TRU Waste

REDC WMR

5.1.1 Obtain a new numbered and approved container (55-gallon drum).

5.1.2 Ensure that the container (drum) has been pre-labeled with a container bar code.

NOTE: *Any metal or plastic intermediate waste container with a volume greater than one gallon, shall be twisted and taped or vented with an approved venting device as applicable.*

REDC LABORATORY WORKER / OPERATIONS PERSONNEL

5.1.3 Manage individual waste packets as follows:

NOTE: *The REDC WMR is responsible for completing the necessary paperwork that will be supplied to ORNL LWS.*

5.1.3.1 Ensure that the material to be discarded adheres to the guidelines specified in Appendix C, *Guidance for Complying with the BJC Waste Master Profile*.

5.1.3.2 Cover all sharp edges or glassware in the waste (with tape or overpacking) to protect plastic bagging or other primary containment barriers from punctures.

5.1.3.3 **IF** bagging the waste items out of a glove box,
THEN manage the waste packet according to the instructions provided in NNFD-7920-OP-105, *Glove Box Operations*, and GLO-1, *General Laboratory Operations*.

5.1.3.4 For other waste, bag or cover the waste with plastic as necessary to provide containment during container loading by heat sealing or taping.

5.1.3.5 Once a waste packet has been produced and is ready for placement into a CH-TRU waste drum, contact the REDC WMR to have a Radiological Control Technician (RCT) survey the packet and place the waste packet into the appropriate CH-TRU waste drum.

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5.1 **Preparing Waste Packages for Disposal as CH-TRU Waste** (cont.)

REDC LABORATORY WORKER / OPERATIONS PERSONNEL

5.1.3.6 Provide the following information to the REDC WMR, as applicable: the glovebox (or area) where the waste was generated, the item type (bag, can, or bucket), the waste item description, whether the material is RCRA, whether the bag is heat sealed, waste volume, and waste weight

RCT

5.1.3.7 Perform a radiological survey of the waste packet.

5.1.3.8 Provide the radiation survey results to the REDC WMR.

REDC WMR/RCT

5.1.3.9 **IF** the n_f reading is >200 mrem/hr at 30 centimeters,
THEN set aside the packet to be placed into a RH-TRU waste cask.

5.1.3.10 **IF** the TOTAL (n_f + β-γ) reading on the packet is <200 mrem/hr at 30 centimeters,
THEN place the packet the CH-TRU waste container.

5.1.3.11 Perform a radiological survey of the CH-TRU waste container.

5.1.3.12 If necessary, re-calculate the total radiation reading of the CH-TRU waste container.

5.1.3.13 **IF** the TOTAL radiation (n_f + β-γ) reading is now <200 mrem/hr,
THEN leave the packet in the CH-TRU waste container and proceed to Step **5.1.4**.

5.1.3.14 **IF** the TOTAL (n_f + β-γ) radiation reading is >200 mrem/hr,
THEN remove the packet from the CH-TRU container.

REDC WMR

5.1.3.15 Set the packet aside to be dispositioned into the proper waste container as necessary.

5.1.4 Compile waste data as follows:

NOTE: *When estimates are required, always apply best judgment to provide the best information possible. A conservative approach is desired in these cases.*

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5.1 **Preparing Waste Packages for Disposal as CH-TRU Waste** (cont.)

REDC WMR

5.1.4.1 Record the required data on the CH TRU Waste Inventory Log sheet (see Appendix D) for the appropriate CH-TRU waste drum corresponding to the laboratory or operations area from where the waste was generated.

5.1.4.2 **IF** uncertainties in information occur,
THEN consult with appropriate laboratory workers or operations personnel to resolve the uncertainties.

5.1.4.3 Identify, quantify, and report any hazardous materials in the waste to the REDC WMR.

5.1.4.4 If necessary contact the REDC WMR to assist in determining the disposition of hazardous waste.

5.1.4.5 Place the CH-TRU waste packet containing hazardous material into the appropriate waste container.

5.2 **Disposition of Full CH-TRU Waste Containers**

5.2.1 When the CH-TRU waste drum is full, close the CH-TRU waste drum as follows:

5.2.1.1 Close the liner bag in the CH-TRU waste container.

5.2.1.2 Position the lid ensuring that the rubber gasket in the lid is aligned properly.

5.2.1.3 Install the lid retaining ring and tighten the retaining ring bolt.

5.2.1.4 Initiate the proper disposal documentation (*ORNL LWS 2109* form).

5.2.2 Move the closed CH-TRU container to a location suitable to be monitored by Radiation Protection.

5.2.3 Request that Radiation Protection perform a radiation survey of the drum.

5.2.4 Prior to moving the closed CH-TRU container from the laboratory or area where it was staged for loading to an interim staging area, ensure that the quantity of radioactive material in the waste container is accounted for will not cause the limits of the interim staging area to be exceeded. Refer to NNFD-7920-OP-104, *Radioactive Material Inventory Control*, for the radioactive material inventory limits for Building 7920.

5.2.5 Once Radiation Protection has completed the radiation survey of the drum, move the drum to the designated interim staging area to await disposition by ORNL LWS.

Document Archive Only

6. *REFERENCES*

6.1 Source Documents

NNFD-001, *Development, Review, and Control of Procedures*

7. *RECORDS*.

Appendix D, CH-TRU Waste Inventory Log

The official record for CH-TRU waste is the "ORNL LWS 2109" form

8. *APPENDICES*

8.1 Appendix A, *Definitions/Acronyms*

8.2 Appendix B, *Summary of Waste Profiles as Specified in the BJC CH-TRU Waste Master Profile*

8.3 Appendix C, *Guidance for complying with BJC CH-TRU Waste Master Profile*

8.4 Appendix D, *CH-TRU Waste Inventory Log*

INFORMATION ONLY

APPENDIX A
Definitions/Acronyms

1. **BJC** – Bechtel/Jacobs Corporation
2. **β-γ** – beta-gamma radiation
3. **CH-TRU** – Contact Handled TRU Waste
4. **Ci** – cuire, measure of radioactivity
5. **Free Liquids** - Liquids which readily separate from the solid portion of a waste under ambient temperature and pressure.
6. **Laboratory Worker** – personnel responsible for handling waste generated by operations performed in glove box laboratories (including analytical chemistry laboratories).
7. **LLW** – Low Level Waste
8. **LWS** - Lab Waste Services
9. **n_f** – neutron radiation
10. **Operations Personnel** – personnel responsible for handling waste generated by hot cell processing operations at the REDC, including waste generated by facility level maintenance and operations activities.
11. **PCB** – polychlorinated biphenyls
12. **PE** – plutonium equivalent, standardized radioactivity measurement using ^{239}Pu as the basis.
13. **RCRA** – Resource Conservation Recovery Act
14. **RCRA Waste** - Any material or combination of materials classified as hazardous by the Resource Conservation and Recovery Act. Hazardous materials are either listed in 40 CFR 261 Subpart D, or have characteristics (ignitability, corrosivity, reactivity, toxicity) identified in 40 CFR 261 Subpart C.
15. **RCT**- Radiation Control Technician
16. **RH-TRU** – Remote Handled TRU Waste
17. **SLLW** - Solid Low Level Waste
18. **TRU** - transuranic
19. **TRU Waste** - Radioactive waste contaminated with alpha emitting transuranic radionuclides (atomic number >92) with half-lives greater than 20 years and concentrations >100 nCi/g at the time of assay. Additional radioisotopes that are managed as TRU waste at REDC (and ORNL) include ^{252}Cf, ^{244}Cm, ^{233}U and other trans-curium isotopes (Bk, Es, Fm). Many of the trans-curium isotopes are neutron emitters as well as alpha emitters. TRU waste shall be segregated from SLLW.
20. **Waste Packet** - An individually wrapped and numbered waste item.
21. **Waste Generator** - Individual who has received the necessary training to certify, to the best of his/her knowledge, that CH-TRU waste meets the established acceptance criteria found in this document. (See Appendix B for details.)
22. **WMR** - Waste Management Representative, the individual within REDC with the responsibility for ensuring the radioactive waste generated in the REDC facilities is handled and disposed of in accordance with the Waste Certification Program. The WMR also certifies, to the best of his ability, that the waste meets the established acceptance criteria found in this document.
23. **WSR** - Waste Services Representative

APPENDIX B

Summary of Waste Profiles as Specified in the BJC CH-TRU Waste Master Profile

This summary is not intended to be a complete detailed description of all CH-TRU Waste Master Profiles. Those details are listed in the basic documents referenced earlier.

CH-TRU waste shall be placed only in containers obtained from ORNL Lab Waste Services. In most cases this will be 55-gal steel drums. Waste placed in these waste containers shall meet the following criteria:

1. Loose fines or powders exceeding 1 wt % <10 μm or 15 wt % <200 μm shall be immobilized.
2. No free liquids. Containers must be well drained.
3. Pyrophoric forms of radionuclides shall constitute no more than 1 wt % of the package contents. Other pyrophoric materials are prohibited.
4. No explosives or compressed gases, as defined by 49 CFR 173, subparts C and G.
5. No hazardous waste unless co-contaminated with transuranic waste. Any present shall be identified and quantified.
6. Package (or package assemblies) total weight shall not exceed 1,000 lbs.
7. ^{235}U fissionable equivalent mass (FEM) shall be limited to 150 g per 55-gal drum.
8. Each 55-gal drum shall not exceed 80 ^{239}Pu Plutonium Equivalent Curies (PE-Ci).
9. The contact dose rate shall not exceed 200 mrem/hr at any point on the outside of the drum, and no inner item shall exceed a total of 200 mrem/hr at 30 centimeters from the unshielded surface.
10. Removable surface contamination on waste containers shall be less than 20 dpm/100 cm^2 α, or 200 dpm/100 cm^2 β-γ.
11. Thermal power shall be recorded in the data package if >0.1 watt/ft^3 (~0.75 watt/55-gal drum).
12. Sealed packets must have a minimum surface area of 390 in^2 (i.e. a standard 19.375-in. sleeve that fits a 10-in. diameter bag out port that is at least 10.0625-in. long) and shall not exceed 4 liters or 1 gal. If the packets exceed 4 liters or 1 gal., they are to be vented.
13. Each waste packet shall be uniquely identified by an assigned number.

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14. CH-TRU waste generated shall be sufficiently characterized to identify the contents of the waste package. Characterization data shall be documented and records maintained at the point of origin.

15. PCB wastes other than PCB bulk product waste or PCB remediation waste are prohibited.

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APPENDIX C

Guidance for Complying With BJC CH-TRU Waste Master Profile

Page 1 of 2

Waste-form certification for each waste packet loaded into the container must be made by the Waste Management Represetnative. The following guidance is provided to help the waste handler apply good judgment to meet the intent of the criteria for each item.

1. Loose Fines - If loose powders (not those that adhere to bulk solids) are visible, do not load into a packet being prepared for a waste drum. The loose powder must be immobilized (i.e., grouted, foamed, etc.) before inclusion in a waste packet. BJC CH-TRU Waste Master Profile permits inclusion of a very small percentage of loose fines. REDC policy is to immobilize any visible fines.

2. Free Liquids - If free liquids are visible or known to be included in waste material, these liquids must be removed (e.g., drained or squeezed) from the waste before the waste can be included in a packet. To prevent inclusion of liquid in bottles, caps shall be removed, the bottles well drained, and the caps and bottles placed in the packet separately. This is a good engineering practice and allows the requirement of 1% by volume free liquid to be easily met.

3. Pyrophoric Materials - Pyrophoric materials are not used in established glove box and hot cell operations. Special notifications will be made if pyrophoric materials are introduced into the REDC, so that wastes of this type can be identified and excluded from CH-TRU containers.

4. Explosives and Compressed Gases - No explosives are used or are present in our containment areas. Special notifications will be made if explosive materials are introduced into the REDC, so that wastes of this type can be identified and excluded from CH-TRU waste containers. Compressed gas cylinders (e.g., spray cans) must be emptied and punctured before inclusion in a waste packet.

5. Radioactive Mixed Waste - Hazardous materials shall be included only if they are co-contaminated with transuranic radioisotopes. All hazardous materials shall be identified and quantified.

6. Package Weight - There is no limit on the individual packet weight. However, it should be limited to a weight that can be easily managed by the waste handlers.

7. 150-Gram Fissile Limit Per Drum -This limit is determined by the formula used to calculate the amount of isotopic material in each drum or package.

8. The specific activity of CH-TRU waste packages will be determined from the current curie calculation formula used by the ORNL Waste Services Representative (WSR).

9. Surface Dose Rate - Both β-γ and n_f readings must be added together to determine the total radiation.

10. Surface Contamination - Contamination levels on CH-TRU waste drums are expected to smear less than 20 dpm/100 cm^2 alpha or 200 dpm/100 cm^2 beta-gamma, unless a packet is breached or there is a contamination problem in the area. Radiation Protection personnel monitor and smear the drums for contamination to assure that ORNL contamination control standards are met before they leave the building.

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APPENDIX C

Guidance for Complying With BJC CH-TRU Waste Master Profile

Page 2 of 2

11. Thermal Power - Instrumental counting will be used to calculate the output of heat generators in the waste container. However, prior to loading each packet into the container, the WMR makes a judgment whether the waste contains recoverable amounts of ^{238}Pu, ^{239}Pu, ^{241}Am, ^{244}Cm, or ^{252}Cf. Therefore, Section 5.3 of this procedure outlines a method for determining whether or not a packet may be placed in a CH-TRU waste drum without causing the total surface dose rate to exceed 200 mrem/hr at any point. (The final surface dose rate and any neutron contribution will be reported on the documentation prepared when the drum is closed). If not, an estimate of the thermal power is made for the residual amounts believed to be present.

12. Gas Generation - The CH-TRU drums will be vented with a HEPA filter vent installed in the lid of each drum.

13. Labeling -The CH-TRU drum will be labeled with the labels furnished by LWS. The packets of waste will be identified by a number on the packet.

14. Data Package - It is up to the individual REDC Laboratory Worker / Operations Personnel to provide complete information to the REDC Waste Management Representative (WMR). At the REDC, the WMR or alternate WMR will prepare the documentation for the transfer of waste packages to ORNL LWS. The specific duties of the WMR are given in Appendix A.

15. Classification of Waste as TRU - The WMR will determine if an individual package is TRU based on the calculated curies assigned to TRU isotopes and the package weight. If the value is less than 100 nCi/g, then the waste is classified as SLLW, and if greater or equal 100 nCi/g, the waste is TRU. The subsequent handling depends on whether the waste is RH or CH. If RH, the waste is placed in a concrete cask. If the waste is CH, it is placed in a drum.

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Appendix D

CH-TRU Waste Inventory Log

Item Number	Date Added	Removed By (User ID)	Glovebox Generation Location	Item Type (bag, can, or bucket)	Waste Item Description	Is the material RCRA Regulated?	Is the Heat-Sealed Bag Surface Area > 350 in^2?	Waste Volume (ft^3)	Waste Weight (lbs)	Maximum Contact Gamma Exposure Rate (mR/hr)	Maximum Contact Neutron Dose Rate (mrem/hr)	Surveyed By (User ID)	Loaded By (User ID)
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3													
4													
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CH-TRU Waste Inventory Log

Item Number	Date Added	Removed By (User ID)	Glovebox Generation Location	Item Type (bag, can, or bucket)	Waste Item Description	Is the material RCRA Regulated?	Is the Heat-Sealed Bag Surface Area > 190 in^2?	Waste Volume (ft^3)	Waste Weight (lbs)	Maximum Contact Gamma Exposure Rate (mR/hr)	Maximum Contact Neutron Dose Rate (mrem/hr)	Surveyed By (User ID)	Loaded By (User ID)
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Container Number:_____ Prepared By:_____ Date:_____

Doc ID Number:_____ Reviewed By:_____ Date:_____

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Attachment 3 - Acceptable Knowledge Source Document Summary

Site(s): Oak Ridge National Laboratory	**Source Document Tracking Number: P1434**
Waste Stream Number(s): ORNL Non-specific Library Files (Applicable only when site library is not in use)	
Acceptable Knowledge Documentation Type: ☑ TRU Waste Management Program Information ☑ Waste Stream-Specific Information ☐ Additional Information	**Category:** ☐ Correspondence ☐ Discrepancy Resolution ☑ Internal Procedure ☐ Miscellaneous ☐ Published Document or Internal Procedure ☐ Unpublished Documents
Title or Description of Source Document [a] : Energetic Materials Program	
Source Document Reference Information (author(s), document and revision number, date, publisher): NA, CM-A-WP-004, Rev. 1 (Older Versions Included), 05/22/2014, TWPC	

AK # [b]	Source Doc. Page # [c]	AK Information Summary
PR8, WS5	Throughout	This program description identifies responsibilities and describes the process for managing energetic or potentially energetic materials discovered during waste repackaging operations at the TRU Waste Processing Center (TWPC). For the purposes of this procedure, an energetic or potentially energetic material is any material that may undergo a spontaneous energetic chemical reaction due to age, concentration, degradation, or oxidation potential when exposed to shock, friction, temperature change, air, or other initiating events. As part of the Hazardous Material Protection Program, the Energetic Materials Program includes the processes specific to the identification, handling, and processing of potentially energetic materials discovered during repackaging operations at the TWPC. The major elements of the Energetic Materials Program as described in Section 5.6.8.1, Hazardous Material Protection, of the CM-X-AD-022, Technical Safety Requirements include: • Availability of Energetic Material Subject Matter Experts (SMEs) with knowledge of potentially energetic material in the waste stream processes at the TWPC. • Operating procedures and worker training that address operator identification of potentially energetic materials, and actions for suspending related activities and notification of an Energetic Material SME. • Waste Programs procedures that address Energetic Material SME evaluation of potentially energetic materials and methods for processing; and identification of potentially highly energetic materials and establishment of safe conditions. • Operating procedures/special work instructions/work packages and worker training address operator handling and processing of potentially energetic materials as prescribed by an Energetic Material SME. The specific training requirements and qualifications for the Level I and II Energetic Materials SMEs are delineated. The TWPC uses a progressive evaluation process utilizing subject matter experts for the identification, handling, and processing of energetic or potentially energetic materials discovered during repackaging operations. Operating procedures, Activity Hazards Assessments, and worker training address operator identification of potentially energetic materials and actions for suspending related activities and the notification of an onsite Level 1 Energetic Material SME. Level 1 Energetic Material SMEs perform field evaluations when potentially energetic materials are discovered during repackaging operations and determine whether energetic or potentially energetic materials are present and whether review by a Level 2 Energetic Material SME is required. Level 2 Energetic Material SMEs are consulted to assist with the evaluation of discovered materials as needed or to establish appropriate methods for the safe handling and

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Attachment 3 - Acceptable Knowledge Source Document Summary (continued)

Site(s): Oak Ridge National Laboratory		Source Document Tracking Number: P1434
AK # [b]	Source Doc. Page #[c]	AK Information Summary
		processing of the materials when energetic or potentially energetic materials are discovered to be present. In the event that highly energetic materials are discovered, Level 2 Energetic Material SMEs also assist in establishing safe conditions which are documented by the Unreviewed Safety Question and Occurrence Reporting processes as appropriate. *The process used to perform the initial identification and field evaluations are illustrated in an* excellent 2 page flow diagram in Attachment B titled Flow Diagram of Energetic Materials Identification and Evaluation. There are no specific chemicals or compounds called out in the procedure. Revision 0 (Dated 05/31/2012): As part of the Hazardous Material Protection Program, the Energetic Materials Program includes the processes specific to the identification, handling, and processing of potentially energetic materials discovered during repackaging operations at the TWPC. The major elements of the Energetic Materials Program include: • *Availability of Energetic Material Subject Matter Experts (SMEs)* with knowledge of potentially energetic material in the waste stream processes at the TWPC. • Operating procedures and worker training that address operator identification of potentially energetic materials, and actions for suspending related activities and notification of an Energetic Material SME (The specific training requirements and qualifications for the Level I and II Energetic Materials SMEs are delineated.) • Waste Programs procedures that address Energetic Material SME evaluation of potentially energetic materials and methods for processing; and identification of potentially highly energetic materials and establishment of safe conditions. • Operating procedures/special work instructions/work packages and worker training address operator handling and processing of potentially energetic materials as prescribed by an Energetic Material SME. Initial Identification: • Operating procedures, Activity Hazards Assessments, and worker training address the initial identification of potentially energetic materials by operators; the appropriate actions for suspending related activities; and the notification of Level 1 Energetic Material SMEs to support repackaging operations. Standard work practices are used when encountering unidentified materials during repackaging operations, including: • Attempting to positively identify all liquids and substances encountered. • Reviewing Material Safety Data Sheets (MSDSs) to identify handling requirements of identified substances. • Treating unidentified liquids or substances as incompatible and not mixing them. • Not opening containers with unidentified powders unless determined to be safe by a Level 1 Energetic Material SME based on applicable process knowledge. • Suspending processing activities if large quantities of unidentified liquids or substances are encountered, or if unidentified cloudy solutions or crystallized residues are present. Field Evaluations:

Attachment 3 - Acceptable Knowledge Source Document Summary (continued)

Site(s): Oak Ridge National Laboratory		Source Document Tracking Number: P1434
AK # [b]	Source Doc. Page #[c]	AK Information Summary
		• Field evaluations are performed by Level 1 Energetic Material SMEs when potentially energetic materials are discovered during repackaging operations. • The Level 1 Energetic Material SME determines whether energetic or potentially energetic materials are present, and whether review by a Level 2 Energetic Material SME is required. • Level 1 Energetic Material SMEs are designated by the DWM as qualified personnel with detailed knowledge of chemicals and chemical hazards in addition to applicable process knowledge of the operations that generated the waste that is being repackaged at the TWPC. • Level 1 Energetic Material SMEs use their detailed knowledge of chemicals, chemical hazards, and process knowledge to determine whether a material is energetic or potentially energetic. • Field evaluations may conclude that a material is safe to handle and process in accordance with standard operating procedures based on positive identification of the material or applicable process knowledge of the operations that generated the waste, or that a material may be energetic or potentially energetic and will require special instructions for safely handling and processing. • If insufficient information is available to determine whether a discovered material may be energetic or potentially energetic or if the Level 1 Energetic Material SME is unable to make a determination that the material is safe to handle, Level 2 Energetic Material SMEs may be consulted during the field evaluation process to assist with the evaluation of discovered materials or to answer specific questions related to the physical characteristics of the discovered material. • If a Level 1 Energetic Material SME determines that energetic or potentially energetic materials are present, Level 2 Energetic Material SMEs may be consulted to establish appropriate methods for the safe handling and processing of the materials. The process used to perform the initial identification and field evaluations are illustrated in a two page flow diagram in Attachment B titled Flow Diagram of Energetic Materials Identification and Evaluation (See Attachment 1 of this AKA). Revision 1 (Dated 05/22/2014): Updated Attachment B with current personnel titles. This revision does not include any relevant changes to waste management from the previous revision. Procedure verification/walk down was conducted on 09/25/2015 by Jeff Harrison with Don Coffey, Level 1 Energetic Materials Subject Matter Expert.

Attachment 3 - Acceptable Knowledge Source Document Summary (continued)

Site(s): Oak Ridge National Laboratory	Source Document Tracking Number: P1434
Source Document Data Limitations (if any): 1. None.	
Acceptable Knowlege Expert: Travis Smith Date: 01/20/2016 Print /Sign	
[a] Provide description for non-titled information (i.e., container paperwork, MSDS sheets, etc) [b] Obtain from Acceptable Knowledge Documentation Checklist [c] For microfilm or microfiche, identify box, tape, reel number and location.	

Energetic Materials Program

Implementation Date: 5-22-14

APPROVAL:

Fred Heacker F. K. Heacker 4-23-14
Director of Waste Management Date

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Revision Summary

Revision	Change Summary
0	Initial Issue
1	Updated Att. B to current titles (WOL to SS)

Current Revision Specific Changes

Location	Description	Reason
Att. B	Changed WOL to SS	Update

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1.0 INTRODUCTION

1.1 Purpose

This document identifies responsibilities and describes the process for managing energetic or potentially energetic materials discovered during waste repackaging operations at the TRU Waste Processing Center (TWPC).

For the purposes of this procedure, an energetic or potentially energetic material is any material that may undergo a spontaneous energetic chemical reaction due to age, concentration, degradation, or oxidation potential when exposed to shock, friction, temperature change, air, or other initiating events.

1.2 Scope

The TWPC implements a Hazardous Material Protection Program consistent with the requirements of 29 CFR 1910, 10 CFR 835, and DOE Policy 450.4. The Hazardous Material Protection Program consists of a comprehensive integrated system for protection that combines industry standard or code compliant protective feature commensurate with the hazards. As part of the Hazardous Material Protection Program, the Energetic Materials Program includes the processes specific to the identification, handling, and processing of potentially energetic materials discovered during repackaging operations at the TWPC. The major elements of the Energetic Materials Program as described in Section 5.6.8.1, Hazardous Material Protection, of the CM-X-AD-022, Technical Safety Requirements include:

- Availability of Energetic Material Subject Matter Experts (SMEs) with knowledge of potentially energetic material in the waste stream processes at the TWPC.
- Operating procedures and worker training that address operator identification of potentially energetic materials, and actions for suspending related activities and notification of an Energetic Material SME.
- Waste Programs procedures that address Energetic Material SME evaluation of potentially energetic materials and methods for processing; and identification of potentially highly energetic materials and establishment of safe conditions.
- Operating procedures/special work instructions/work packages and worker training address operator handling and processing of potentially energetic materials as prescribed by an Energetic Material SME.

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2.0 RESPONSIBILITIES

2.1 Special Training and Qualifications

Attachment A, Acronyms/Abbreviations, Definitions, References, and Reviewer Selection for Major Revisions, is provided for reference.

2.1.1 Level 1 Energetic Materials Subject Matter Expert (SME)

Level 1 Energetic Materials SMEs are qualified TWPC onsite personnel with detailed knowledge of chemicals and chemical hazards, in addition to applicable process knowledge of the operations that generated the waste being repackaged. The individuals are assigned to perform field evaluations of the chemical hazards when potentially energetic materials are discovered during repackaging operations at the TWPC. The minimum requirements for a Level 1 Energetic Materials SME are:

- A bachelor's degree in chemistry, chemical engineering, industrial hygiene, or related safety or scientific discipline.

OR

Twenty semester-hours of college level chemistry or related science or equivalent combination of college level chemistry courses and specialized training classes in handling hazardous materials [e.g. removal operations training involving high hazard or energetic materials, Army explosive ordinance disposal training, U.S. Environmental Protection Agency Explosives and Reactive Chemical Assessment Course, Federal Bureau of Investigations improvised explosive device (bomb squad) training].

- Experience managing or performing waste management activities involving radioactively contaminated hazardous chemicals or potentially energetic materials.

For the purposes of identifying or evaluating energetic or potentially energetic materials, the term Acceptable Knowledge Expert (AKE) is equivalent to Level 1 Energetic Materials SME.

2.1.2 Level 2 Energetic Materials SME

Level 2 Energetic Materials SMEs are highly qualified personnel with demonstrated experience, knowledge, and expertise to assess hazards related to energetic chemicals/material and associated remediation approaches. Level 2 Energetic Material SMEs are typically off-site personnel who are contracted to support TWPC operations based on their unique experience, knowledge, and expertise. The minimum requirements for a Level 2 Energetic Materials SME are:

- A bachelor's degree in chemistry, chemical engineering, or related scientific discipline.

OR

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Twenty semester-hours of college level chemistry or related science or equivalent combination of college level chemistry courses and specialized training classes in handling hazardous materials [e.g. removal operations training involving high hazard or energetic materials, Army explosive ordinance disposal training, U.S. Environmental Protection Agency Explosives and Reactive Chemical Assessment Course, Federal Bureau of Investigations improvised explosive device (bomb squad) training].

- Five years demonstrated experience in conducting chemical and energetic material hazard assessments associated with shock sensitive chemicals, unknown chemicals, explosives, and reactive chemicals including determination of handling and treatment techniques.
- Three years field work with chemical and energetic materials. Field work experience may include: safe handling, stabilization, deactivation, and incident response for shock sensitive and unknown explosive or reactive chemicals.

2.2 Personnel Assignments

The following personnel are responsible for performing the activities described in this document. These TWPC personnel may assign subordinates to assist in carrying out their responsibilities as specified in this procedure.

2.2.1 Director of Waste Management (DWM)

- responsible for overall management of the Energetic Materials Program
- designates Level 1 Energetic Material SMEs as qualified onsite personnel with detailed knowledge of chemicals and chemical hazards in addition to applicable process knowledge of the operations that generated the waste being repackaged at the TWPC
- designates Level 2 Energetic Material SMEs as highly qualified personnel with demonstrated experience, knowledge, and expertise to assess hazards related to energetic chemicals and materials

2.2.2 Energetic Materials Subject Matter Experts (SMEs)

- support the DWM and operations personnel in the identification and evaluation of energetic or potentially energetic materials.

2.3 Document Maintenance

The DWM is designated the document owner and is responsible for updating this document. Approval authority rests with the DWM. Submit suggestions for revisions or improvement to the DWM utilizing Attachment E, New Document and Revision Request Form, of CM-P-AD-061, Document Preparation, Review, and Approval.

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3.0 APPROACH

The TWPC uses a progressive evaluation process utilizing subject matter experts for the identification, handling, and processing of energetic or potentially energetic materials discovered during repackaging operations. Operating procedures, Activity Hazards Assessments, and worker training address operator identification of potentially energetic materials and actions for suspending related activities and the notification of an onsite Level 1 Energetic Material SME. Level 1 Energetic Material SMEs perform field evaluations when potentially energetic materials are discovered during repackaging operations and determine whether energetic or potentially energetic materials are present and whether review by a Level 2 Energetic Material SME is required. Level 2 Energetic Material SMEs are consulted to assist with the evaluation of discovered materials as needed or to establish appropriate methods for the safe handling and processing of the materials when energetic or potentially energetic materials are discovered to be present. In the event that highly energetic materials are discovered, Level 2 Energetic Material SMEs also assist in establishing safe conditions which are documented by the Unreviewed Safety Question and Occurrence Reporting processes as appropriate.

3.1 Initial Identification

Operating procedures, Activity Hazards Assessments, and worker training address the initial identification of potentially energetic materials by operators; the appropriate actions for suspending related activities; and the notification of Level 1 Energetic Material SMEs to support repackaging operations. Standard work practices are used when encountering unidentified materials during repackaging operations, including:

- Attempting to positively identify all liquids and substances encountered.
- Reviewing Material Safety Data Sheets (MSDSs) to identify handling requirements of identified substances.
- Treating unidentified liquids or substances as incompatible and not mixing them.
- Not opening containers with unidentified powders unless determined to be safe by a Level 1 Energetic Material SME based on applicable process knowledge.
- Suspending processing activities if large quantities of unidentified liquids or substances are encountered, or if unidentified cloudy solutions or crystallized residues are present.

3.2 Field Evaluations

Field evaluations are performed by Level 1 Energetic Material SMEs when potentially energetic materials are discovered during repackaging operations. The Level 1 Energetic Material SME determines whether energetic or potentially energetic materials are present, and whether review by a Level 2 Energetic Material SME is required. Level 1 Energetic Material SMEs are designated by the DWM as qualified personnel with detailed knowledge of chemicals and chemical hazards in addition to applicable process knowledge of the operations

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that generated the waste that is being repackaged at the TWPC. Level 1 Energetic Material SMEs use their detailed knowledge of chemicals, chemical hazards, and process knowledge to determine whether a material is energetic or potentially energetic. Field evaluations may conclude that a material is safe to handle and process in accordance with standard operating procedures based on positive identification of the material or applicable process knowledge of the operations that generated the waste, or that a material may be energetic or potentially energetic and will require special instructions for safely handling and processing.

If insufficient information is available to determine whether a discovered material may be energetic or potentially energetic or if the Level 1 Energetic Material SME is unable to make a determination that the material is safe to handle, Level 2 Energetic Material SMEs may be consulted during the field evaluation process to assist with the evaluation of discovered materials or to answer specific questions related to the physical characteristics of the discovered material. If a Level 1 Energetic Material SME determines that energetic or potentially energetic materials are present, Level 2 Energetic Material SMEs may be consulted to establish appropriate methods for the safe handling and processing of the materials.

4.0 RECORDS

Records are identified, classified, and maintained in accordance with CM-P-AD-049, Records Management, and CM-X-AD-026, Records Inventory and Disposition Schedule.

4.1 Record Numbering

None

4.2 Records Inventory and Disposition Schedule

There are no records generated by this document.

5.0 ATTACHMENTS

Attachment A: Acronyms/Abbreviations, Definitions, References, and Reviewer Selection for Major Revisions

Attachment B: Flow Diagram of Energetic Materials Identification and Evaluation

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Attachment A: Acronyms/Abbreviations, Definitions, References, and Reviewer Selection for Major Revisions

Acronyms

AKE – Acceptable Knowledge Expert

DWM – Director of Waste Management

MSDS – Material Safety Data Sheet

SME – Subject Matter Expert

TRU – Transuranic

TWPC – TRU Waste Processing Center

Definitions

Level 1 Energetic Materials Subject Matter Expert (SME) – Qualified TWPC on site personnel with detailed knowledge of chemicals and chemical hazards in addition to applicable process knowledge of the operations that generated the waste that is being repackaged meeting the minimum education and experience requirements defined in Section 2.1 and assigned to perform field evaluations of the chemical hazards when potentially energetic materials are discovered during repackaging operations at the TWPC. For the purposes of identifying or evaluating energetic or potentially energetic materials, the term Acceptable Knowledge Expert (AKE) may be used to mean Level 1 Energetic Materials SME.

Level 2 Energetic Materials Subject Matter Expert (SME) – Highly qualified personnel meeting the minimum education and experience requirements defined in Section 2.1 with demonstrated experience, knowledge, and expertise to assess hazards related to energetic chemicals and materials and any associated remediation approaches. Energetic Material SMEs are typically offsite personnel who are contracted to support TWPC operations.

Energetic Material - Any material that may undergo a spontaneous energetic chemical reaction due to age, concentration, degradation, or oxidation potential when exposed to shock, friction, temperature change, air, or other initiating events.

Developmental References

CM-R-WP-005, Identification of Potential Unanalyzed Material

CM-R-AD-001, Documented Safety Analysis

CM-X-AD-022, Technical Safety Requirements

Cross References

29 CFR 1910, Occupational Safety and Health Standards

10 CFR 835, Occupational Radiation Protection

DOE P 450.4, Safety Management System Policy

CM-P-AD-049, Records Management

CM-P-AD-061, Document Preparation, Review, and Approval

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Attachment A: Acronyms/Abbreviations, Definitions, References, and Reviewer Selection for Major Revisions

CM-P-WP-016, Energetic Materials Management

CM-X-AD-026, Records Inventory and Disposition Schedule

Reviewer Selection for Major Revisions	
Required	**Optional**
AK/PK Characterization Support Lead	Nuclear Safety Analyst
Director Technical Services	
Director of Waste Management	
Health and Safety Manager	
Operations Manager	
Safety Authorization Basis Manager	
Senior Environmental Specialist	

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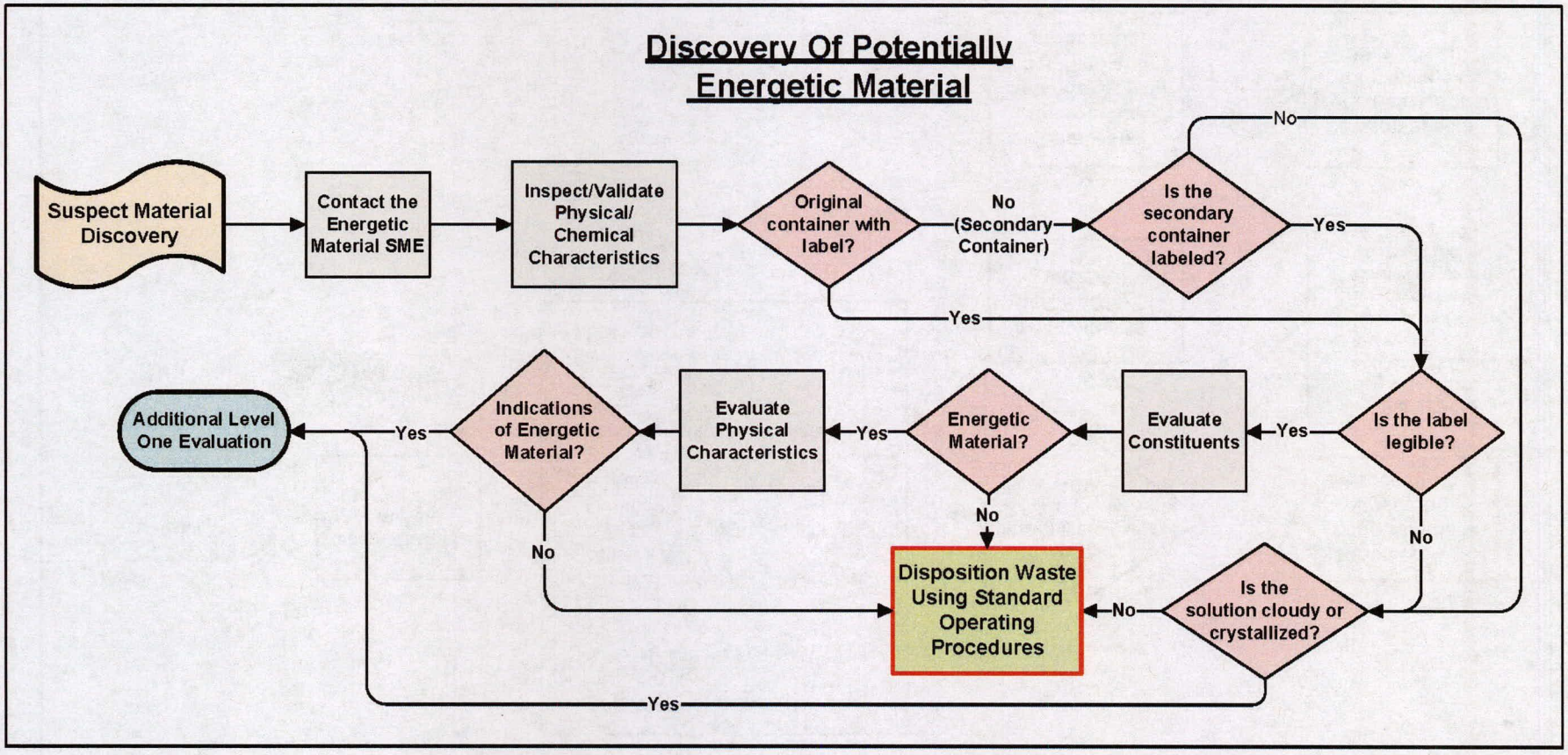
Attachment B: Flow Diagram of Energetic Materials Identification and Evaluation

(Page 1 of 2)



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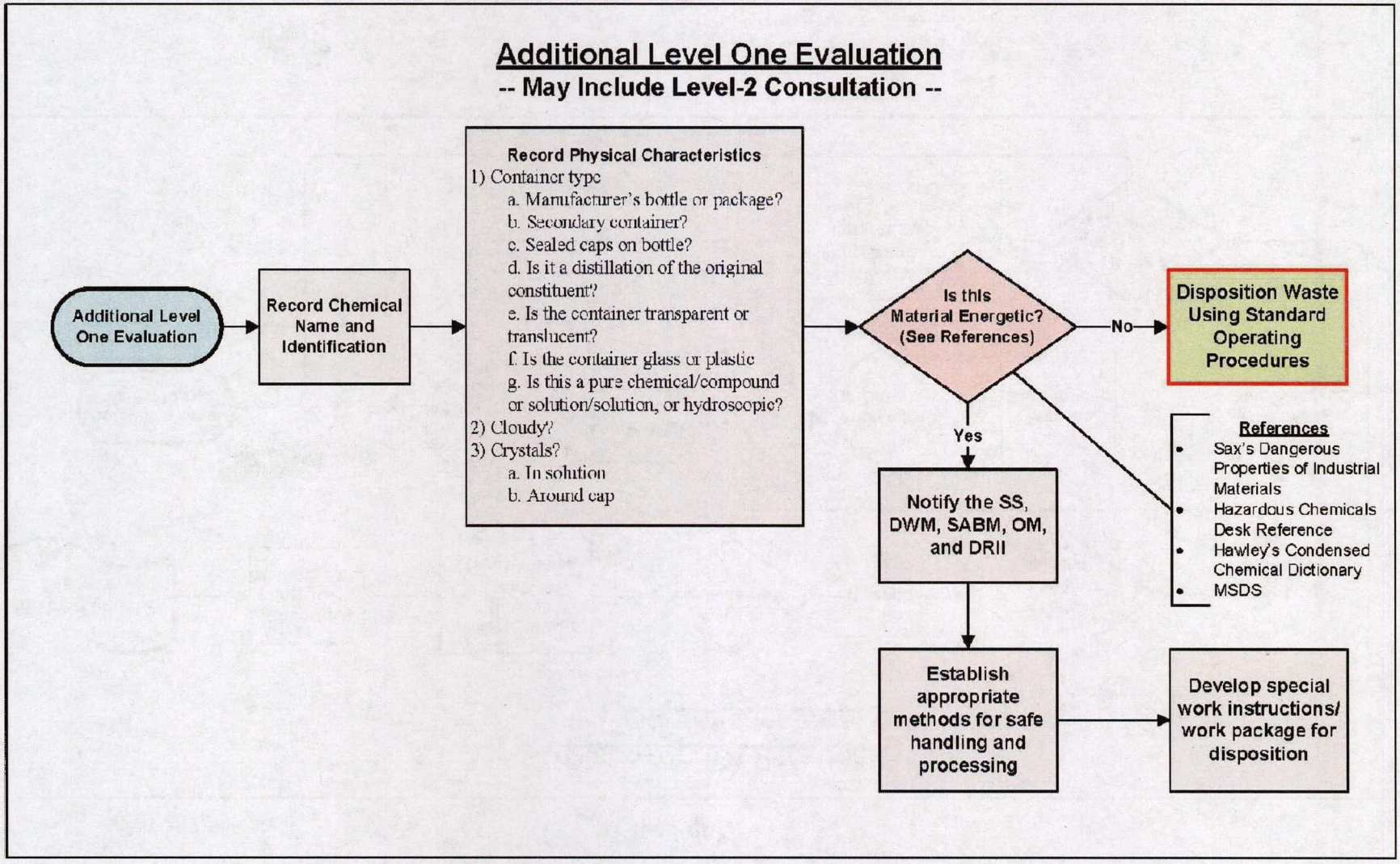
Attachment B: Flow Diagram of Energetic Materials Identification and Evaluation
(Page 2 of 2)



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Attachment 3 - Acceptable Knowledge Source Document Summary

Site(s): Oak Ridge National Laboratory	Source Document Tracking Number: P1445
Waste Stream Number(s): ORNL Non-specific Library Files (Applicable only when site library is not in use)	
Acceptable Knowledge Documentation Type: ☑ TRU Waste Management Program Information ☑ Waste Stream-Specific Information ☑ Additional Information	Category: ☐ Correspondence ☐ Discrepancy Resolution ☑ Internal Procedure ☐ Miscellaneous ☐ Published Document or Internal Procedure ☐ Unpublished Documents
Title or Description of Source Document [a]: Review of Potential Nitrate Bearing Liquids Treatment	
Source Document Reference Information (author(s), document and revision number, date, publisher): Brian Oakley, CM-R-WP-006, Rev. 0, 09/02/2015, TWPC	

AK # [b]	Source Doc. Page # [c]	AK Information Summary
PR3, PR5, PR7, PR8, WS2, WS4, WS8, WS9, WS12, S5	Throughout	This report documents the evaluation of nitrate bearing transuranic (TRU) waste streams at the TRU Waste Processing Center (TWPC) in accordance with Operating Experience Level 2 (OE-2) 2015-1, "Evaluation of Nitrate-Bearing Transuranic Waste Streams" guidance. The purpose of the evaluation is to perform a records and process review to determine potential vulnerability in Oak Ridge and take actions as necessary to address any nitrate-bearing transuranic waste streams that may have used organic neutralizers (e.g. organic amines) and/or absorbers (e.g., cellulose, corncobs or other plant based sorbents, as well as organic polymers such as polyacrylates or polyacrylamide or copolymers of polyacrylates and acrylamides) that may be potentially susceptible to an exothermic reaction similar to the energetic drum event resulting in an airborne radiological release at U.S. Department of Energy's (DOE's) Waste Isolation Pilot Plant (WIPP) near Carlsbad, New Mexico. The Oak Ridge National Laboratory (ORNL) facility missions that generated waste with potential nitrate bearing liquids in the Oak Ridge TRU waste legacy inventory are generally from two areas: 1) target processing and material recovery operations; and 2) basic science research laboratory scale operations. The target processing and material recovery operations at ORNL consisted of both hot cells and support laboratories often within the same facility. The primary mission of the facilities has been to chemically separate the actinide elements into their respective elemental groups. The missions were to provide materials for basic science research, producing special materials supporting the national defense or supporting the process development activities for the separation and recovery of the respective actinides. Materials transferred into the facilities for processing were normally contained in special targets, target rod assemblies or special material containers transferred from other DOE sites. Laboratory small scale operations included both radiochemical laboratories and basic research laboratories. Initial dissolution of solid material may require the use of 68-70% nitric acid added to solid material to complete the transition of the actinides from solid to liquid solutions followed by dilution with water to approximately 5 molar nitric acid prior to radiochemical analysis. The radiochemical laboratories generally used 5 molar nitric acid as a diluent to lower the concentration of actinides in solution, as well as, maintain the solubility of the actinides in the solution. The Oak Ridge TRU waste inventory consists primarily of debris waste and does not contain large homogeneous nitrate salt based waste streams similar to the waste associated with the energetic drum event at WIPP. However, during processing of the TRU waste inventory, small quantity laboratory scale liquids were present in approximately half of the ORNL legacy waste containers

CCP RECORDS ORIGINAL
DATE REC'D 10/8/15 MR

Attachment 3 - Acceptable Knowledge Source Document Summary (continued)

Site(s): Oak Ridge National Laboratory Source Document Tracking Number: P1445

AK # [b]	Source Doc. Page #[c]	AK Information Summary
		(predominately contact handled waste). Based upon the process knowledge of the ORNL facility missions and the development of Acceptable Knowledge (AK) Summary Reports to support TRU certification activities, these small quantity laboratory scale liquids could include predominately nitric acid or minimally other nitrate bearing materials that could exhibit the characteristic of ignitability. Thus, the non-residual liquids encountered during repackaging were treated in a TWPC Resource Conservation and Recovery Act (RCRA) permitted operation to remove the potential hazardous characteristic for both ignitability (D001) and corrosivity (D002) utilizing an approved engineered absorbent. Only one absorbent (Nochar N965) has been utilized for treatment of non-residual liquids found during waste processing at the TWPC. Nochar N965 was used at a minimum ratio of 8:1 by volume (approximately 4:1 by mass) to absorb non-residual liquids in the waste containers. Liquids were treated one at a time in batches no larger than one liter in size and packaged separately in sealed containers less than four liters in size to mitigate potential compatibility issues. The absorbent was thoroughly mixed with the liquids for at least one minute, and then allowed to sit for a minimum of five minutes. Batches of liquids were allowed to cure for a minimum of one hour prior to being packaged into an outgoing waste container. Nochar N965 is a proprietary blend organic polymer absorbent (copolymer of acrylamide) that meets the definition of organic absorbent (as specified in OE-2: 2015-1) that was used to treat potentially nitrate-bearing TRU waste at the TWPC. Therefore, based on review of operating records, all additions to potential nitrate bearing TRU waste containers for solidification/sorption of liquids were organic. The Oak Ridge potential nitrate bearing TRU waste container inventory and locations are identified in Table 5.0.

Source Document Data Limitations (if any):

1. None.

Acceptable Knowlege Expert:

Travis Smith _____ Date: 10/07/2015

Print /Sign

[a] Provide description for non-titled information (i.e., container paperwork, MSDS sheets, etc)
[b] Obtain from Acceptable Knowledge Documentation Checklist
[c] For microfilm or microfiche, identify box, tape, reel number and location.

Review of Potential Nitrate Bearing Liquids Treatment

PREPARED BY:

Brian Oakley F. K. Heacker for 9-2-15
Feedstock and Disposition Manager Date

APPROVAL:

Fred Heacker F. K. Heacker 9-2-15
Director of Waste Management, Nuclear Safety, and Environmental Programs Date

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Revision Summary

Revision	Change Summary
0	Initial issue

Current Revision Specific Changes		
Location	**Description**	**Reason**

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NOTE: Attachment A, Acronyms/Abbreviations, Definitions, References, and Reviewer Selection for Major Revisions, is provided for reference.

1.0 INTRODUCTION

1.1 Purpose

This report documents the evaluation of nitrate bearing transuranic (TRU) waste streams at the TRU Waste Processing Center (TWPC) in accordance with Operating Experience Level 2 (OE-2) 2015-1, "Evaluation of Nitrate-Bearing Transuranic Waste Streams" guidance. The purpose of the evaluation is to perform a records and process review to determine potential vulnerability in Oak Ridge and take actions as necessary to address any nitrate-bearing transuranic waste streams that may have used organic neutralizers (e.g. organic amines) and/or absorbers (e.g., cellulose, corncobs or other plant based sorbents, as well as organic polymers such as polyacrylates or polyacrylamide or co-polymers of polyacrylates and acrylamides) that may be potentially susceptible to an exothermic reaction similar to the energetic drum event resulting in an airborne radiological release at U.S. Department of Energy's (DOE's) Waste Isolation Pilot Plant (WIPP) near Carlsbad, New Mexico.

1.2 Background

On February 14, 2014, an airborne radiological release occurred at DOE's WIPP. The release was determined to be the result of an exothermic reaction involving the mixture of organic materials (Swheat Scoop® absorbent and/or neutralizer) and nitrate salts present inside a TRU drum. The drum had been remediated and certified to meet the WIPP Waste Acceptance Criteria (WAC) at the Los Alamos National Laboratory and subsequently shipped to WIPP for permanent disposal. Chemical reactions resulted in heating inside the drum that led to internal pressure buildup of combustible gases which exceeded the drum's venting capacity resulting in drum failure and a rapid release of material.

In June 2015, DOE issued OE-2: 2015-1, "Evaluation of Nitrate-Bearing Transuranic Waste Streams" requesting DOE nuclear facilities to review records and/or processes for all nitrate-bearing TRU waste streams that used neutralizers and/or absorbents for mitigation in accordance with generator site permits and the WIPP WAC. The specific actions requested include:

1) *Review records to evaluate all additions to nitrate bearing TRU waste containers for solidification, neutralization or sorption of liquid by using manufacturer information/material safety data sheet of added material to determine whether any additions were organic.*
2) *Review records to evaluate nitrate-bearing TRU waste streams to ensure the ignitability characteristic of the remaining nitrate waste was mitigated (i.e., waste no longer has the D001 ignitability characteristic identified in 40 CFR Part 261.21). It is important to ensure that the evaluation is for all the ignitability properties of the waste, including the oxidizer property. (Solely establishing that a flammable solid is not present does not ensure the absence of an oxidizer.)*

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3) *If the records review determined that organic material has or may have been added:*
   a. *Determine the location of the waste containers;*
   b. *Evaluate the situation and determine the need for immediate safety measures and enter the Potential Inadequacy of the Safety Analysis process, as appropriate;*
4) *Document and notify the Office of Nuclear Safety (AU-30), within the Office of Environment, Health, Safety and Security (AU), and Office of Environmental Management (EM-40) contacts below on the results of the review, including any waste containers where organic material may have been added.*

   It is expected that DOE Oak Ridge Office of Environmental Management will address action #4 utilizing this report.

2.0 ORNL FACILITY MISSIONS GENERATING NITRATE BEARING TRU WASTE

The Oak Ridge National Laboratory (ORNL) facility missions that generated waste with potential nitrate bearing liquids in the Oak Ridge TRU waste legacy inventory are generally from two areas: 1) target processing and material recovery operations; and 2) basic science research laboratory scale operations.

2.1 Target Processing and Material Recovery

The target processing and material recovery operations at ORNL consisted of both hot cells and support laboratories often within the same facility. The primary mission of the facilities has been to chemically separate the actinide elements into their respective elemental groups. The missions were to provide materials for basic science research, producing special materials supporting the national defense or supporting the process development activities for the separation and recovery of the respective actinides. Materials transferred into the facilities for processing were normally contained in special targets, target rod assemblies or special material containers transferred from other DOE sites. Some of the support laboratories conducted additional research and development while other laboratories supported radiochemical analysis needed for both process control and basic science research.

Target processing and material recovery operations for transuranic actinides (atomic number > 92) were controlled through process flow sheets that guided the chemical separation process conducted in the facilities. Processing operations began with dissolution of the solid material (the process of converting the material from a solid to a liquid form). The dissolution process utilized nitric acid to convert the actinides from solid form (targets) to liquid form to begin the chemical separation process. Process knowledge based on historic operations confirmed by interviews with prior members of the operations staff for the large scale processing determined that 8 molar nitric acids would be upper concentration on nitric acid used in the dissolution and processing of the actinides.

2.2 Basic Science Research Laboratories

Laboratory small scale operations included both radiochemical laboratories and basic research laboratories. Initial dissolution of solid material may require the use of 68-70% nitric acid added to solid material to complete the transition of the actinides from solid to

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liquid solutions followed by dilution with water to approximately 5 molar nitric acid prior to radiochemical analysis. The radiochemical laboratories generally used 5 molar nitric acid as a diluent to lower the concentration of actinides in solution, as well as, maintain the solubility of the actinides in the solution.

The basic science research application often included the separation of the actinides into their respective elements to allow research of the basic chemical characteristics of the element or combination of elements. The actinides (solid form) used in the research laboratories which were prepared or converted to liquid form generally followed the same process as described in Section 2.1 to transition the solid material into liquid using 5-8 molar solutions of nitric acid.

3.0 OAK RIDGE NITRATE BEARING TRU WASTE STREAMS RECORDS REVIEW AND EVALUATION (OE-2 ACTION 1)

The Oak Ridge TRU waste inventory consists primarily of debris waste and does not contain large homogeneous nitrate salt based waste streams similar to the waste associated with the energetic drum event at WIPP. However, during processing of the TRU waste inventory, small quantity laboratory scale liquids were present in approximately half of the ORNL legacy waste containers (predominately contact handled waste). Based upon the process knowledge of the ORNL facility missions and the development of Acceptable Knowledge (AK) Summary Reports to support TRU certification activities, these small quantity laboratory scale liquids could include predominately nitric acid or minimally other nitrate bearing materials that could exhibit the characteristic of ignitability. Thus, the non-residual liquids encountered during repackaging were treated in a TWPC Resource Conservation and Recovery Act (RCRA) permitted operation to remove the potential hazardous characteristic for both ignitability (D001) and corrosivity (D002) utilizing an approved engineered absorbent. Only one absorbent (Nochar N965) has been utilized for treatment of non-residual liquids found during waste processing at the TWPC. Nochar N965 was used at a minimum ratio of 8:1 by volume (approximately 4:1 by mass) to absorb non-residual liquids in the waste containers. Liquids were treated one at a time in batches no larger than one liter in size and packaged separately in sealed containers less than four liters in size to mitigate potential compatibility issues. The absorbent was thoroughly mixed with the liquids for at least one minute, and then allowed to sit for a minimum of five minutes. Batches of liquids were allowed to cure for a minimum of one hour prior to being packaged into an outgoing waste container.

Nochar N965 is a proprietary blend organic polymer absorbent (copolymer of acrylamide) that meets the definition of organic absorbent (as specified in OE-2: 2015-1) that was used to treat potentially nitrate-bearing TRU waste at the TWPC. Therefore, based on review of operating records, all additions to potential nitrate bearing TRU waste containers for solidification/sorption of liquids were organic.

4.0 EVALUATION OF NITRATE BEARING LIQUIDS IGNITABLITY CHARACTERISTIC 40 CFR 261.21 (OE-2 ACTION 2)

Nochar N965 is a proprietary blend organic polymer absorbent (copolymer of acrylamide) that is designed and manufactured for the treatment of aqueous liquids (acids to bases) as well as organic liquids (oils to solvents) to mitigate the hazardous

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characteristics of both ignitability (D001) and corrosivity (D002). It is used at multiple TRU waste facilities within the DOE complex, and has existing vendor testing data addressing the ignitability property under SW-846 Method 1030 type testing after absorption of concentrated nitric acid solutions. Use of Nochar N965 for the mitigation of ignitable characteristics (D001) is currently being reviewed throughout the DOE complex due to a lack of complete technical performance testing data in the previously performed vendor tests with emphasis on the oxidizer properties. The TWPC staff works closely with the Carlsbad Field Office/WIPP Difficult Waste team and the lead technical contacts identified in the OE-2 report, and understands that a key issue under consideration is the potential dehydration of polymer absorbents and concentration of nitrates under certain conditions. Specific concerns for the use of organic polymers include the potential for absorbed liquids to evaporate under certain environmental conditions that could lead to a nitrate bearing solid for which existing vendor testing for the mitigation of ignitability characteristics such as oxidizer hazards may not be bounding.

The TWPC located in Oak Ridge, Tennessee is classified as a humid subtropical climate zone. With warm humid conditions most of the year and precipitation of approximately 50 inches a year, moisture and condensate intrusion are typically more of a concern than the evaporation of liquids for vented containers in nominal storage conditions. Nondestructive examination of waste containers with absorbed liquids utilizing Nochar N965 that have been in storage at the TWPC for greater than five years have shown no indication of liquids separating from the absorbent material. Based on the process knowledge of how the liquids were treated, the environmental conditions of extended storage at the TWPC, and evaluation of nondestructive examination records, the Nochar N965 is expected to remain hydrated under nominal storage conditions at the TWPC.

While potential nitrate bearing liquids treated with Nochar N965 are expected to remain hydrated under nominal storage conditions and remain effective for the mitigation of ignitability characteristics while in storage at the TWPC, these conditions may not be representative of the environment to which the waste may be exposed during transportation and final disposal. Therefore, TWPC is planning to conduct additional technical performance testing to confirm that the treated absorbed liquids will remain effective for the mitigation of all characteristics of ignitability in 40 CFR 261.21 with emphasis on oxidizer properties under the SW-846 Method 1040 test or the UN oxidizing substance test (Section 34, "Classification Procedures, Test Methods and Criteria Relating to Oxidizing Substances of Division 5.1") for final waste forms.

If results of the additional testing indicate that the absorbed liquids exhibit an oxidizer property, additional processing steps may be required to ensure the mitigation of ignitability characteristics for all bounding conditions. The additional processing may include the addition of zeolites or other inorganic materials to the absorbed liquids until the final waste form can be confirmed to not exhibit the ignitability characteristic including oxidizer properties as designated in 40 CFR 261.21. Additionally, other representative testing efforts conducted by the complex may be used as warranted to make decisions regarding the ignitability characteristic.

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5.0 NITRATE BEARING LIQUIDS INVENTORY /SAFETY EVALUATION (OE-2 ACTION 3)

TWPC records for RCRA permitted treatment of non-residual liquids during waste repackaging operations were reviewed to identify drums and their location that contain either known nitrates that were identified in original waste generator records, or through existing process knowledge determinations to be potential nitrate bearing liquids that were solidified using Nochar N965.

Based upon the process knowledge of the ORNL facility missions and the development of AK Summary Reports to support TRU certification activities, these small quantity laboratory scale liquids could include predominately nitric acid or minimally other nitrate bearing materials. The review identified a total of 167 drums, one drum with known absorbed nitrate liquid (450 mL of ~0.6 M and 700 mL of ~0.5M aluminum nitrate, nonahydrate) and 166 drums with unspecified small quantity laboratory scale liquids that potentially may contain nitrate bearing (nitric acid) absorbed liquids.

The absorbed liquids originated from approximately 15 different waste streams across the Oak Ridge legacy TRU waste inventory. Approximately 102 of the drums have been characterized by nondestructive assay and confirmed to be TRU waste while approximately 65 have yet to be characterized. The Oak Ridge potential nitrate bearing TRU waste container inventory and locations are identified in Table 5.0 below.

Table 5.0, Potential Nitrate Bearing Liquids in Oak Ridge Inventory

TWPC TRU Waste Storage Areas	Drum Count
CHMB (Contact Handled Marshalling Building)	**23**
CHSA (Contact Handled Staging Area)	**18**
LABA (Low Activity Buffer Area)	**17**
MPB (Multi-Purpose Building)	**23**
Rm-231 (Process Building Room 231)	**1**
SSA (Southeast Staging Area)	**36**
WSA (West Staging Area)	**33**
ORNL Legacy TRU Waste Storage Areas	
UCOR (Building 7879)	**2**
UCOR (Building 7572)	**14**
Total	**167**

5.1 Potentially Inadequate Safety Analysis Determination

Based upon an evaluation of the situation from a Nuclear Safety perspective, there is no need for immediate safety measures. The TWPC Documented Safety Analysis (DSA) evaluated hazards associated with the receipt, processing (e.g., treatment), and staging of waste drums containing liquids (e.g., flammable). Although energetic materials are not generally introduced or processed at the TWPC, legacy waste is considered to potentially contain these types of materials. Therefore, these materials are currently considered in

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the TWPC DSA as potential initiators for fires, deflagrations, and gas generation when handling or processing the waste at the TWPC for which adequate controls have been selected and implemented. However, the conditions and accident discussed in the OE-2 document do not represent the conditions and accidents considered in the TWPC DSA as they relate to the use of Nochar N965 as an absorbent. Waste drums repackaged at the TWPC contain only small quantity laboratory scale liquids, conservatively assumed to be predominately nitric acid or minimally other nitrate bearing materials. Additionally, based on process knowledge, concentrations of no more than 5 to 8 molar are expected. Based upon a review of the information presented in the OE-2 document and information reviewed during an extensive literature search, there is no indication that the application of Nochar N965 to nitrate bearing waste would result in an exothermic reaction, particularly given the treatment methods, packaging configuration, and environmental conditions of extended storage at the TWPC. Thus, based upon a review of the "reasonableness of the situation", a potentially inadequate safety analysis (PISA) does not exist in accordance with the procedure CM-P-AD-037, Revision 7, Unreviewed Safety Question Process.

6.0 CONCLUSION

Small quantity laboratory scale liquids encountered during repackaging activities at the TWPC that could include nitric acid or other nitrate bearing materials that could exhibit the characteristic of ignitability were absorbed utilizing Nochar N965. Nochar N965 is an organic polymer absorbent that is designed and manufactured for the treatment of aqueous liquids as well as organic liquids to mitigate the hazardous characteristics of ignitability (D001) and corrosivity (D002). The OE-2 2015-1 document raises concerns associated with the use of organic polymers with nitrate bearing liquids regarding the potential concentration of nitrates through dehydration under certain environmental conditions that could lead to a nitrate bearing solid that may exhibit ignitability characteristics.

A review of TWPC records for the treatment of non-residual liquids has identified one known absorbed nitrate liquid and 166 absorbed potential nitrate liquids in the current waste inventory. Based on the process knowledge of how the liquids were treated, the environmental conditions of extended storage at the TWPC, and evaluation of nondestructive examination records, the Nochar N965 is expected to remain hydrated under nominal storage conditions at the TWPC. There are no compatibility issues for the use of Nochar N965 at the TWPC, and the waste has been determined to be safe as currently stored. Additionally, based upon a review of the "reasonableness of the situation", a PISA does not exist.

While potentially nitrate bearing liquids treated with Nochar N965 are expected to remain hydrated under nominal storage conditions and remain effective for the mitigation of ignitability characteristics while in storage at the TWPC, these conditions may not be representative of the environment to which the waste is exposed during transport and final disposal. Additional technical performance testing will be performed to confirm that the treated absorbed liquids will remain effective for the mitigation all characteristics of ignitability under 40 CFR 261.21 for bounding conditions that are established for the waste. Testing efforts will include proactive potential mitigation strategies should

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performance test results indicate a need. The potential nitrate bearing waste storage condition allows for safe and efficient recovery and mitigation if required.

7.0 ATTACHMENTS

Attachment A: Acronyms/Abbreviations, Definitions, References, and Reviewer Selection for Major Revisions

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Attachment A: Acronyms/Abbreviations, Definitions, References, and Reviewer Selection for Major Revisions

Acronyms/Abbreviations

AK – Acceptable Knowledge

DOE – U.S. Department of Energy

OE-2 – Operating Experience Level 2

ORNL – Oak Ridge National Laboratory

PISA – Potentially Inadequate Safety Analysis

RCRA – Resource Conservation and Recovery Act

TRU – Transuranic

TWPC – TRU Waste Processing Center

UCOR – URS | CH2M Oak Ridge, LLC

WAC – Waste Acceptance Criteria

WIPP –Waste Isolation Pilot Plant

Definitions

Non-Residual Liquids – Pumpable, pourable, transferable, containerized or un-containerized Liquids encountered during waste repackaging operations at the TWPC.

Developmental References

DOE Office of Environment, Health, Safety, and Security (EHSS) Operating Experience Level 2 Report, June 2015

Cross References

Waste Inventory Control System (WICS)

TWPC Waste Packaging Records

Reviewer Selection for Major Revisions

Required	Optional
Acceptable Knowledge Expert	Feedstock and Disposition Manager
Director of Waste Management, Nuclear Safety, and Environmental Programs	
Health and Safety Manager	
Safety Authorization Basis Manager	
Waste Certification Official	

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DIVIDER PAGE

Attachment 3 - Acceptable Knowledge Source Document Summary

Site(s): Oak Ridge National Laboratory	Source Document Tracking Number: U429
Waste Stream Number(s): ORNL Non-specific Library Files (Applicable only when site library is not in use)	
Acceptable Knowledge Documentation Type: ☐ TRU Waste Management Program Information ☑ Waste Stream-Specific Information ☑ Additional Information	Category: ☐ Correspondence ☐ Discrepancy Resolution ☐ Internal Procedure ☐ Miscellaneous ☐ Published Document or Internal Procedure ☑ Unpublished Documents
Title or Description of Source Document [a]: Unclassified Notebook A-6271: Building 7920, O.K. Tallent	
Source Document Reference Information (author(s), document and revision number, date, publisher): O. K. Tallent, A-6271, 0, Various	

AK # [b]	Source Doc. Page # [c]	AK Information Summary
WS2, WS8, WS11, WS12, S11	Throughout	Radionuclides: plutonium (Pu) p.68 thorium (Th) p.146 tritium (H-3) p.1 Chemicals: ascorbic acid p.120 aluminum nitrate nonahydrate (Al(NO3)3 . 9H2O) p.144 calcium nitrate tetrahydrate (Ca(NO3)2 . 4H2O) p.148 cerium (III) nitrate hexahydrate (Ce(NO3)3 . 6H2O) p.96,144 cerium (IV) oxide (ceric oxide) p.96 chromium(III) nitrate nonahydrate (Cr(NO3)3 . 9H2O) p.145 copper(II) nitrate (Cu(NO3)2) p.116 hydrofluoric acid (HF) p.70 indium nitrate nonahydrate (In(NO3)3 . 9H2O) p.148 iron(III) nitrate nonahydrate (Fe(NO3)3 . 9H2O) p.144 lanthanum(III) nitrate hexahydrate (La(NO3)3 . 6H2O) p.144 lithium (Li) p.1 lithium hydride (LiH) p.150 mercury(II) nitrate monohydrate (Hg(NO3)2 . H2O) p.131,144 D009 nickel nitrate hexahydrate (Ni(NO3)2 . 6H2O) p.148 nitric acid (HNO3) p.68 lead (Pb+4) p.67 D008 periodic acid (HIO4) p.140 plutonium dioxide (PuO2) p.68 plutonium(III) fluoride (Pu fluoride) p.122 ruthenium(III) nitrosyl hydroxide monohydrate (Ru(NO)(OH)3 . H2O) p.148 silver peroxide (Ag2O2) p.124 D011 silver oxide (Ag2O) p.80 D011 sodium dichromate dihydrate (Na2Cr2O7 . 2H2O) p.116 D007 Teflon p.88 terbium (Tb+4) p.67 thorium(IV) nitrate tetrahydrate (Th(NO3)4 . 4H2O) p.145 tin (Sn+4) p.67

NTPC RECORDS ORIGINAL
DATE REC'D 1/3/14 SP

Attachment 3 - Acceptable Knowledge Source Document Summary (continued)

Site(s): Oak Ridge National Laboratory		Source Document Tracking Number: U429
AK # [b]	Source Doc. Page # [c]	AK Information Summary
		titanium (Ti+4) p.67 vanadium pentoxide (V2O5) p.140 zinc nitrate tetrahydrate (Zn(NO3)2 . 4H2O) p.148 zirconium (Zr+4) p.141 zirconium tetrahydroxide (Zr(OH)4) p.148 Note that page numbers listed are the labeled page numbers.

Source Document Data Limitations (If any):

1. An untitled note page is inserted between pages 9 and 10.
2. Best available copy.
3. Blank pages throughout.

Acceptable Knowlege Expert:

Travis Smith _____ Date: 12/11/2013
Print /Sign

[a] Provide description for non-titled information (i.e., container paperwork, MSDS sheets, etc)
[b] Obtain from Acceptable Knowledge Documentation Checklist
[c] For microfilm or microfiche, identify box, tape, reel number and location.

DWG 73-2527

b 8-

DP-1371

Harry P. Harmon

SOME INSTRUCTIONS FOR USE OF THIS NOTEBOOK

1. This notebook is assigned to personnel performing research and development work and must be used for all original calculations, notes, and abstracts from reports.
2. Assignee is responsible for the safeguarding of this notebook in accordance with security regulations.
3. This notebook must be returned to issuing office when completed or upon termination of assignee.
4. Every page or entry should bear a date and the signature of the person who made the entry.
5. Entries should be made in ink whenever it is reasonable to do so.
6. Alteration or amplification of entries made on previous dates should be made as separate entries under their own dates and cross referenced to the previous entries.
7. Charts, drawings, and graphs drawn on special paper should be glued or otherwise securely fastened in place and should individually bear a date and signature. Do not obscure any information.
8. The notebook should be periodically reviewed by one or more independent persons in the department and should be signed and dated by them. Likewise, they should make a statement that they have "read and understood the foregoing material." Witnessing stamps for this purpose are available in your department's office.
9. It is advisable to preface each new item, such as a heat treatment, process or reaction, etc., with a very brief description of the purpose, objective, or approach.
10. Description of the invention or discovery should be complete enough to be understood by anyone skilled in the art.
11. Reference to name or catalogue number should be made when standard items are being discussed, i.e., Westinghouse pump.
12. In cases where work is conducted in cooperation with others, it is often necessary to meet with them from time to time and discuss new developments. The occurrences of such conferences should always be entered in your notebook regardless of recording elsewhere, giving the date, who was present (if possible), and an outline of the subjects discussed. This often will establish error in occasional claims of other parties that you have appropriated information from them revealed during an interview, and thus provide you with patent protection.

UCN-8201
(3 10-64)

$10.0^2 \quad 1004 \times 10^{-3}$

$12.0^2 = 3.80 \times 10^{-3}$

$16.0^2 = 2.56 \times 10^{-3}$

HP 3-1692
at Bright
3-1898

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NUCLEAR DIVISION

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UNCLASSIFIED NOTEBOOK NO. A-6271

Assigned To: O. K. Tallent

Department: Chem Tech

Location: Bldg. 7920

Date Issued: Feb. 4, 1971

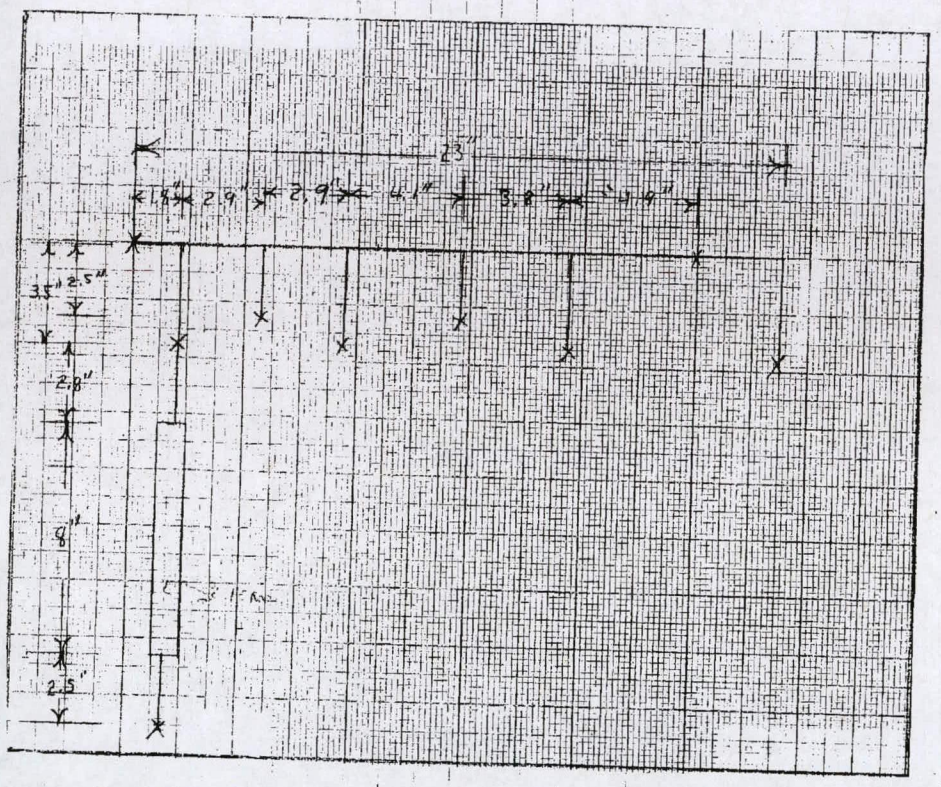
This notebook is assigned to personnel performing unclassified research and development work. Because of patent requirements, it must be returned to Laboratory Records, Building 4500, when completed or upon termination of assignee.

UCN-8202
(3 11-68)

BEST AVAILABLE COPY

Feb. 20, 1973

Started setting up to do some work to study tritium adsorption in Li metal. The first work will be using H_2 at low pressures and high temperatures using a Sievert's Sorption Rig. See next page.


23"
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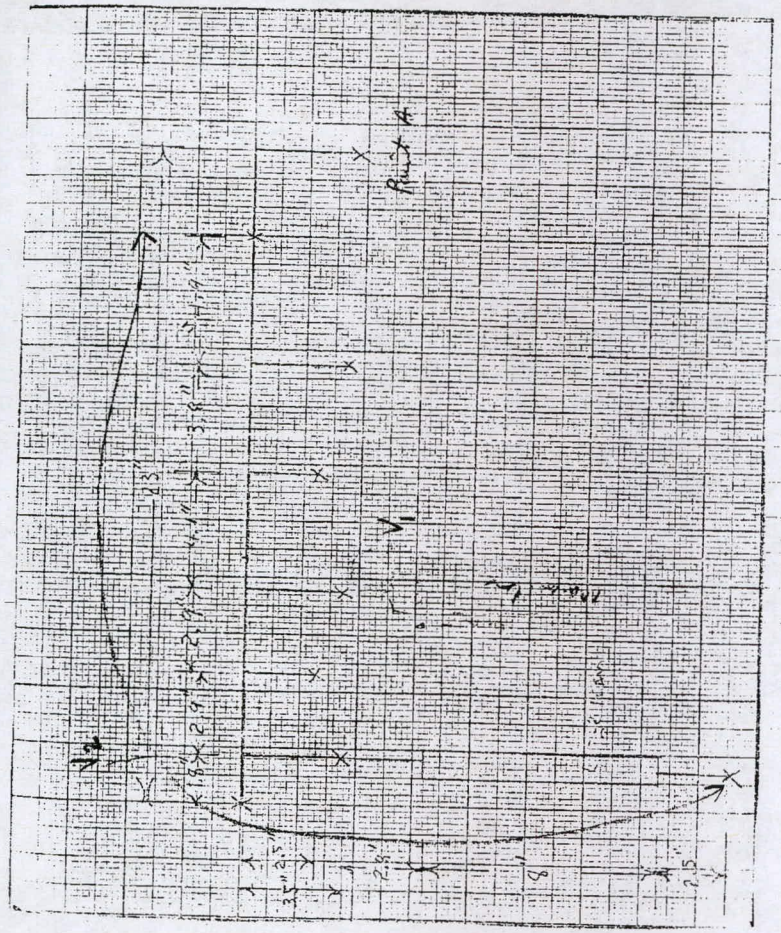


April 7, 1973

A manometer was used to determine the val of the Sievarts Sorption rig shown on page 4. The formula used was

$$V_x = \frac{P_2}{P_1}\left(V_x + \Delta V\right)$$

Test	V_2
1	127.1
2	134.2
3	130.6
4	130.9
5	133.5
6	131.6
7	131.4
8	132.0
9	131.2
10	130.6
11	129.2
12	131.5
13	131.7
14	131.6
15	130.9
16	133.3
av.	131.64

Test	V_1
1	7.18
2	7.59
3	7.42
4	7.91
5	7.08
6	7.05
7	7.76
8	7.72
av.	7.46

Difference $= V_2 - V_1 = 124.18$

$V_1 = 7.46$

Section from [illegible]

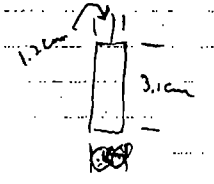
April 9, 1973

A quartz tube containing a encased sample of lithium 0.0193 g was attached to the Sievert rig (Page 4) at point A. The rig was filled with H_2 gas and then evacuated down to ~ 190 microns. [Actually 188 microns].

vol of quartz tube found to be 17.86 cc by formula on Page 5 at 25°C

The sample tube in a furnace was heated 600°C under vac (10 μ) for 8 hrs. The line to the sample was closed and 124.18 vol was filled with H_2 to 980 μ of pressure. The line to the sample was opened and the pressure went down to 922 μ.

A new sample tube and capsule were used instead of the above one. The new one was #5. Dimensions:



vol = 3.54 cc
Surface Area = 14 cm²

vol of quartz tube #5 = 9.875 cc. Total vol = 14.58 cc

April 24, 1973

The Sievert rig was filled with hydrogen and evacuated and heated under vac. to 900°C for 16 hrs. The rate of change of the Hasting Vac Gauge with sample #5 [at 0.99 gm] in the system was as follows:

Time	Reading μ
0	9
5 min	12

There was variation in the reading up to ~ 13 that appeared to due to a 10°C variation in Temperature. The system was pumped under H_2 and the results are shown on pages 8 & 9.

1973 9

check	Date	Time	manometer Right	manometer Left	rad	Pat	°C Temp Record	Δ Manometer	cm. P_{H_2}	hrs. Δ Time
1	5-24	12:38P	31.20	67.40	65.5	74.05	960	36.20	110.25	0
2		12:48	32.70	67.35	63.3	74.05	960	34.65	108.70	.167
3		12:54	34.25	67.15	61.5	74.05	960	32.90	106.95	.333
4		1:09	35.35	67.00	59.4	74.05	960	31.65	105.70	.500
5		1:38	39.70	66.70	52.9	740.5	958	26.80	100.85	1.0
6		2:38	47.20	66.1	42.3	746.2	957	18.90	92.92	2.0
7		3:38	54.65	65.0	31.7	740.2	957	10.35	84.37	3.0
8		3:46	20.30	10.1	81.3	740.2	957	-10.2	63.82	3.1 resumed Nitrogen
9		4:38	24.80	9.8	74.7	740.0	956	-15.0	59.00	4.0
10	5-25	9:20A	57.20	7.0	28.0	738.0	957	-50.2	28.60	19.75
11		9:38	57.25	7.0	27.8	737.5	957	-50.25	23.50	21.00
12		9:38	57.30	7.0	27.7	738.0	957		23.50	22.00
13		10:40	71.00	8.9	8.0	738.0	957		11.70	22.00
14		11:38	70.75	9.0	8.2	737.5	962	61.75	12.00	23.00
15		12:38	70.70	9.0	8.4	737.3	962	61.70	12.03	24.00
16		2:38P	70.30	9.0	8.9	737.0	965	61.30	12.40	26.00
17		4:38	70.00	9.05	9.4	736.0	967	60.95	12.65	28.00
18	5-26	8:25	68.70	9.20	14.3	738.0	957	59.50	14.30	39.80
19		9:39	68.50	9.20	15	737.0	957			

Furnace turned off

Capsule (#5) was badly corroded so it was punished and not to be counted in quenty again

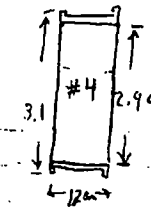
9	1607	2009	2411	
11	1848	2310	2772	
13	2125	2656	3188	

	F		
	mg/L	M	est M
20-1	26.3	1.39	1.5
-2	36.1	1.90	2.0
-3	39.6	2.09	2.5
-4	48.5	2.55	2.9

April 26, 1973.

Capsule #4 was measured before using in the Sievarts Rig.

Density of Li at 460°C = 0.43



Surface Area = 13.9 cm²
Vol = 3.28 cm³
wt Li = 0.96 g

The system was evacuated at 900°C for 3 days and then 124 cc of gas H_2 at 300°K and 40 mm of pressure was added. The vol of the system with the sample in was 133.9 cc The calc. Pressure was 43.5 mm with the sample in the system. A leak developed through one of the valves and the experiment was started over. See page 12 for results

$A = 2\pi Rh$ $h = 2.3$ cm

Surface area of .96 g of Li = 8.67 cm²

0.96 g of Li = .138 moles = $.831 \times 10^{23}$ atoms

vol per atom = $\frac{2.13}{.831 \times 10^{23}} = 2.57 \times 10^{-23}$ cm³

Diameter per atom (assuming perfect cube) = $\left(25.7 \times 10^{-24}\right)^{\frac{1}{3}}$

$= 2.932 \times 10^{-8}$ cm

Radius in atoms of Li = $\frac{0.6}{2.932 \times 10^{-8}} = .205 \times 10^{8}$

Height in atoms of Li = $\frac{2.3}{2.932 \times 10^{-8}} = .7847 \times 10^{8}$

No of Li atoms in outer layer = $2(3.14)(.205 \times 10^{8})^2 + 2(3.14)(.205 \times 10^{8})(.7847 \times 10^{8})$

No of Li atoms in outer layer = $.264 \times 10^{16} + 1.01 \times 10^{16}$

$= 1.274 \times 10^{16}$

Surface moles of Li = $\frac{1.274 \times 10^{16}}{6.02 \times 10^{23}} = .211 \times 10^{-7}$ moles

$= 2.11 \times 10^{-8}$ moles

.138

Check #	Date	Time	manometer Right	manometer Left	vol	Pat
Start	May 2	10:12A	75.8	6.70		74.8
1	May 3	8:30A				74.5
2	"	4:00P				74.5
3	May 4	12:05P				74.7
1	May 7	9:35	62.6	3.0	15.9	74.6
① 2	May 7	9:36	65.5	2.6	9.5	74.6
③ 3	May 7	9:37	65.70	2.5	9.40	74.6
4	May 7	9:40f	—	—	0	74.6
5	May 7	9:43f	—	—	0	74.5
6	May 7	2:52	—	—	0	74.52
7	May 7	3:00f	—	—	0	74.52
8	May 7	3:15f	—	—	0	74.52
9	May 7	3:30f	—	—	0	74.52
10	May 7	4:00f	—	—	0	74.52
11	May 7	4:30f	—	—	0	74.52
12	May 9	8:55A	—	—	0	74.52
13	May 9	9:55A	—	—	0	74.52
14	May 9	10:35A	—	—	0	74.52

(E) Proceed to page 1 Cage

Temp. Recorder	Δ Manometer	cm P_{H_2O}	Δt hrs	
966	69.1	5.7	0	Sample vol not in
965		~650μ	23	
945		~550μ		
925		~500μ		Pat Temp 364
				Sup. manometer reading of 96.5 cm
970	59.6	15.0		Sample vol out
970	62.5	12.05		MAN vol in
970	62.2	11.4	0	Sample In
970	—			Manometer off Scale
970	—	4.10 ②	5 5/12	Manometer Reading
970	—	.385 ③	5 1/4	Manometer
970	—	.370 ④	5 3/30	
970	—	.340 ⑤	5 3/4	
970	—	.332 ⑥	5 3/12	
970	—	.315 ⑦		
972.5	—	.305 ⑧		
990.0	—	.330		
990.0	—	.330		
990.0	—	.330		

① Vol with manometer open in and sample + manometer - out = 159.56 cc, vol sample = 35.385 cc

② Vol sample 10:25 ③ vol with manometer out sample in = 169.8 cc, Vol at V = 3.31 cc

See Page 5.

Continued on Next Page

Continued from page 13

Continued on Page 16

13d

Check at	Date	Time	Manometer Right	Manometer Left	Manometer vol.	cm P	°C Temp Recorder	Δ Manometer	cm P_{H_2}	Δt Hrs	
	May 8	[illegible] P	70.2	0.1	2.6	74.1	[illegible]		[illegible]		Added more H_2 vol = 159.5 cc
*	May 9	[illegible] A	71.1	0.1	2.5	[illegible]	[illegible]		3.1 ①		Sample [illegible]
	May 9	2:30 P	—	—	—	[illegible]	[illegible]		0.55 ①		
	May 9	[illegible] P	—	—	—	74.2	[illegible]		[illegible]		
	May 9	[illegible] P	—	—	—	74.3	975		[illegible] ①		
	May 9	[illegible] P	—	—	—	[illegible]	[illegible]		[illegible] ①		
	May 9	[illegible] P	—	—	—	[illegible]	975		0.265 ①		
	May 9	[illegible] P	—	—	—		[illegible]		[illegible] ①		
	May 9	[illegible] P	—	—	—	[illegible]	972		0.450 ①		
											System evacuated [illegible]
	May 14	[illegible] A	—	—	—	74.3	[illegible]	—	4.85 mm		[illegible]
		[illegible] A	—	—	—		[illegible]	—	[illegible]		Sample [illegible] 4.41×10⁻⁵ mole H_2
		10:23	—	—	—		[illegible]	—	2.92 mm		
		10:30	—	—	—		[illegible]	—	2.45 mm		
		10:40	—	—	—		[illegible]	—	[illegible]		
		10:50	—	—	—		[illegible]	—	0.55		
		11:00	—	—	—		[illegible]	—	0.245		280μ on [illegible]
		11:10	—	—	—		[illegible]	—	0.097		97μ
		11:40	—	—	—		951		0.050		46μ
		12:00 Pm	—	—	—		[illegible]		0.050		① 39μ
		2:45 P.m	—	—	—		[illegible]		0.070		50μ
		3:35 Pm	—	—	—		949		0.080		55μ

good points

* [illegible] H_2 added [illegible] ① [illegible]

Continued from page 15

Check	Date	Time	Reactor Temp °C	P_{H_2} mm
	May 14	3:58P	948	4.55
	May 14	4:00P	947	4.27
✓		4:10P	945	2.85
✓		4:17P	945	2.15
✓		4:30P	945	1.12
✓		4:40P	945	0.60
✓		[illegible]P	945	0.30
✓		4:55P	945	0.20
✓		5:00P	945	0.10
✓		10:20P	940	0.10
✓		10:54P	940	0.10
✓		11:06P	942	4.60
✓		11:10P	945	4.42
	May 15	[illegible]A	950	.125
✓		8:5[illegible]	950	.125
✓		8:55[illegible]	[illegible]	4.[illegible]
✓		9:58	[illegible]	4.55
		9:[illegible]5	[illegible]	[illegible]
✓		9:1[illegible]	948	3.05
✓		[illegible]	948	[illegible]
✓		[illegible]	[illegible]	1.5[illegible]
		10:00	[illegible]	[illegible]
✓		10:30	[illegible]	0.15
		10:46	945	0.135
✓		[illegible]	942	0.135
		11:50	[illegible]	[illegible]
✓		11:56	[illegible]	[illegible]
✓		12:40	940	0.56
✓		1:15	939	0.195
✓		[illegible]	939	0.150
✓		3:[illegible]	940	[illegible]
✓		3:[illegible]5	940	0.150

Increased P_{H_2} to 4.55 mm with 159.56 cc vol.

Sample in [illegible] — Sample in

1 atm

1000 μ
400 μ
245 μ
155 μ
94 μ — (2)
84 μ

Increased P_{H_2} to 4.60 with 159.56 cc vol
Sample in

130 μ — (3)
[illegible] μ

Increased P_{H_2} to 4.80 with vol = 159.56 cc
Sample in vol 10.5[illegible] [illegible] μ

[illegible] μ — Vac [illegible] μ
135 μ — (4) — Vac [illegible] μ
139 μ — Vac [illegible] 5.7 μ

Increased P_{H_2} to 3.57 with vol = [illegible] — [illegible] μ

[illegible] μ — [illegible] 5.8 μ
230 μ — (5)
135 μ — 7.5 μ
154 μ — 7.5 μ

Continued from page 17

Check	Date	time	manometer Right	manometer Left	vol	Pat	Recorder °C Temp	mm P	
1	May 15	4:1 pm.	73.2	-0.2		[illegible]		13.0	vol = 124.18 cc Sample [illegible]
2	↓	4:07 pm.	–	–	–		940	9.5	vol = 69.11 cc
3	↓	4:45 pm					938	5.0	
4	↓	5:[illegible] pm.					935	3.45	
5	↓	[illegible]					[illegible]	.128	[illegible] #6
6	May [illegible]	9:[illegible]					[illegible]	.30	
7	May 16	9:10 A	[illegible]	1.6		74.7	[illegible]	3550	vol = [illegible]
8	"	[illegible]	1250	0.5		74.7	[illegible]	3700	[illegible]
9	"	[illegible]				74.7	[illegible]	2534	Sample [illegible]
10	"	11:[illegible]					[illegible]	[illegible]	
11	"	12:05					942	1.[illegible]	
12	"	12:[illegible]					942	1.[illegible]	
13	"	[illegible]						0.80	
[illegible]		[illegible]						0.40	
15	"	1:30					[illegible]	[illegible]	
16	"	2:30					[illegible]42	[illegible]70	#7
17	"	4:25	67.9	3.6		[illegible]	[illegible]	[illegible]	vol = 139.36 Sample out
18	"	4:27					[illegible]	93.49	Sample [illegible]
19	"	[illegible] pm					[illegible]		
20	May 17	[illegible]					[illegible]	[illegible]	
[illegible]		[illegible]					[illegible]	[illegible]	#8
22		9:40 A	9.20	4.2	91	73.[illegible]	9[illegible]2	692.0	[illegible] 159.3[illegible] + 91
23	"	[illegible]	10.[illegible]	4.0	79	[illegible]	[illegible]	[illegible]	vol [illegible] Sample in
									[illegible] 172.27

Calculated P_{u} from [illegible]

Continued From Page 19

Check	Date	Time	Right	Left	Vol	P (cm)	Reactor °C Temp	mm P	
1	May 17	10:[illegible] Am	13.2	[illegible]	85.1	[illegible]	[illegible]	638	
2	May 17	11:[illegible] Am	[illegible]	[illegible].3	[illegible]	74.2	960	595	
3	"	[illegible]	24[illegible]	2.4	68.7	[illegible]	[illegible]	522	
4	"	1:55 Pm	28.5	3.5	62.9	74.2	[illegible]	[illegible]5.5	
5	"	2:5[illegible] Pm	[illegible]	2.2	57.7	74.2	[illegible]	[illegible]4.0	
6	"	2:57 Pm	34.5	6.3	52.5	74.2	[illegible]	[illegible]0.0	adjusted [illegible] in [illegible]
7	May 19	9:[illegible] Am	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible].7	
8	"	10:5[illegible] Am	64.6	[illegible]	10.0	74.[illegible]	940	13[illegible].5	
9	"	[illegible]	65.0	3.40	9.4	74.40	[illegible]	133.0	
10	"	1:30 Pm	65.2	3.90	9.1	74.35	[illegible]	[illegible]	
11	"	3:05 Pm	65.3	3.9	9.0	74.25	[illegible]	128.5	#9 — [illegible]
12	May 21	9:10 Am	64.0	4.2	10.6	743.0	960	145.5	#9a [illegible]
13	"	9:25 Am	6.7	9.7	94.55	743.0	967	776.0	Sample out [illegible]
14	"	9:29	7.4	9.45	92.9	74.3	964	759.5	Sample In [illegible]
15	"	10:[illegible]	11.0	9.00	88.2	74.3	962	723	[illegible]
16	"	11:55	17.5	8.40	78.7	74.3	965	[illegible]	[illegible]
17	"	3:00	22.2	9.00	71.8	74.2	965	[illegible]	[illegible]
18	"	4:50	25.7	7.70	66.7	74.15	962	56[illegible]	[illegible]
19	May 22	8:58 A	41.3	6.40	44.0	74.[illegible]	963	394.0	[illegible]
20	"	10:00 A	42.0	6.5[illegible]	43.1	[illegible]	965	388.0	[illegible]
21	"	12:05 P	42.25	[illegible]	[illegible]	[illegible]	[illegible]	382.5	[illegible]
22	"	1:07 P	42.50	6.25	42.40	[illegible]	[illegible]	379.5	[illegible]
23		3:00 P	42.75	6.25	42.10	[illegible]	970	376.5 ✓	# 10
24		3:12	8.9	13.60	91.4	[illegible]	[illegible]	78.84	Sample In
25	May 23	9:00 A	26.0	12.00	66.35	73.[illegible]	972	59[illegible].5	

Check	Date	Time	Manometer Right	Left	vol.	cm Patm.	Recorder Temp.	mm Hg.	
1	May 23	12:15 Pm	27.4	12.0	64.3	74.0	967	586.0	
2	"	2:45	28.0	11.8	63.4	73.95	970	577.5	
3	"	4:35	28.3	11.8	62.9	73.85	972	575.4	
4	May 24	8:55 A	30.[illegible]	11.9	59.7	73.60	970	549.0	II
5	" 24	2:20 P	31.0	11.9	5[illegible]9.0	73.55	[illegible]	[illegible]0.0	
6	" "	2:30 Pm	73.[illegible]5	0.1	0.90	73.[illegible]	973	27.0	Sample out
7	" "	2:[illegible]	[illegible]	0.2	0.[illegible]8	73.35	973		Sample In
8	" "	3:30 Pm	[illegible]	0.7	[illegible].2	73.[illegible]	972		
9	" "	4:40 Pm	65.20	0.4	9.3	73.60	975		
10	" 25	9:10 A	51.90	2.0	24.6	73.90	[illegible]	240.0	
11	" "	11:55 A	[illegible]	2.2	30.2	73.90	975	250.0	
12	" "	1:40	50.50	2.3	30.9	73.90	975	257.0	
13	" "						970		
14	" 29	8:45 A	43.70	3.2	40.7	74.10	970	336.0 (3.1)	II
15	" "	8:55	70.10	1.8	1.1	74.10	972	53.0	
16	" "	11:40	70.50	2.3	1.2	74.10	955	Oxidation indicated	

Furnace cooled and sample removed and a green coat which was on the inside of the quartz was sampled on 22-1. The capsule had a green coat also.

June 9, 1972

Recorder still off when checked by Patmonitor. Recorder read 9.35°C and Pat read 919°C 900°C

June 14 Recorder read ~~[illegible]~~ Pat read 886

June

June 15, 1973

Check #	Date	Time	Pstn	Recorder mounts Temp	P_{H_2}	Heatings
1	6-15	1010 A		900	2.26	
2		10:12 A		900	2.12	
3		10:28		898	0.90	
4		10:35	25	898	0.525	900 N
5		10:40	30	899	0.350	600 N
6		10:47	37	896	0.180	230 N
7		10:49		898	0.130	175
8		10:52	42	899	0.100	110
9		10:54	46	898	0.080	80
10		11:00	50	898	0.047	40
11		11:12	62	898	0.030	24
12		11:22	72	899	0.021	21
13		11:28	78	899	0.027	19.5
14		11:40	90	899	0.030	19.5
15		12:00	110	899	0.030	17.5
0		12:25	135	899		17.5
17		1:35	205			18.0
18		2:25	255	905	0.029	19.9

.93 Sample #6 $w = 0.93$ g

Vol micrometer 34.90 cc
Vol sample 10.45
Vol system total 168.82

Sample out
Sample in

June 18, 1973

Sievert's Rig with Sample #6 Eireneted over week end and valve closed off to pump leaving V_1 (Gauge 4) in the system along with the sample
Rock Temp° 892°C.

Check	Time	Reading	Δ Torr
1	9:16 Am.	1.0 N	0
2	9:59 Am	4.9 N	43
3	10:30 Am	5.8 N	74
4	11:05 Am	6.8 N	109
5			

Check	Date	Time	mm manometer P_{H_2}	Records Temp	Hr. Interval
1	June 19	12:30P	2.8	890°C	
2		12:32P	2.6		
3		12:40	1.9		
4		1:00	0.460		800
5		1:10	0.190		260
6		1:26	0.030		25
7		1:40	0.017		14
8		2:34	0.020	888°C	12
9		3:00	0.017	898°C	11.00
10		3:45		884°C	11.50
11		4:17		890°C	12.00
12		4:57		892°C	12.45
13		8:56P		893°C *	12.95
14		9:48P		893°C	21.54

* Pat °C = 898 ± .000347, hit = 88.0

Sample # 6
Li : 0.93 g

Start

Sample out
Sample In

2
3
4
5

June 19, 1973

Sievert Rig evacuated over night and the increase in vacuum pressure checked with the pump valved off except for $V_2 - V_1$ (page 4).

Time	N	Temp °C	Δt
8:30A	1.2		0.00
8:45	4.5	89.1	15
9:00	5.4	89.1	30
9:47	7.0		77
10:35	8.5	89.1	125
11:01	9.4	89.1	151
12:00 P.m.	11.0	89.1	210

June 19, 1923

Check	Date	Time	mm Manometer	μ Hastings	Temp	
1	June 19		4.90		891°C	Sample out
2		12:20 P.m.	4.65		891°C	Sample In
3		12:35 P.m.	2.72		891°C	
4		12:50	1.32		892°C	
5		1:00	0.73		892°C	
6		1:20	0.16	150		
7		1:25	0.12	109	892°C	
8		1:30	0.095	82	892°C	
9		1:35	0.085	72		
10		1:40	0.080	69	892°C	
11		2:00	0.080	66		
12		2:35		63.5	892°C	
13		3:00		62.0	893	
14		3:39		60.5	894	
15		4:00 P.m.	Et.			

Started evacuating again. The pressure should have gone much lower.

July 20, 1973

Sievers inj pressure build up Test

Time	N	Temp °C	Δt
8:27A	1		0
8:54	6.8	891	27
9:05	7.2		38
10:20	10.0	890	113

July 20, 1972

Check	Time	mm Manometer	N Hastings	°C Temp.
1	12:30 Pm	2.45		
2	12:33	2.35		895
3	12:40	1.60	1 atm	895
4	12:50	0.84		895
5	12:56	0.58	1000	
6	1:00	0.42	725	895
7	1:10	0.16	180	895
8	1:19		60	896
9	1:20		45	
10	1:21½		40	
11	1:23½		38	
12	1:26½		30	896
13	1:32½		25	895
14	2:00		20+	895
15	2:35		19.5	895
16	4:18		21.0	895
17	4:49		22	895
18	7:49		26	895
19	8:15 Pm		26.5	895
20	8:20 Pm		1.0	
21	8:23		1.2	

Sample #6
Li = .93 g

	Δt
Sample out	0
Sample In	0 Vol 168.82 cc
	7
	17
	23
	27
	37
	45
	47
	48½
	50½
	53½
	59½
	87
	122
	225
	256
	436

Closed Sample off + Evacuated System
Sample opening Pump Closed, N = 3.5
Evac. again with Sample closed off.

Continued next Page

Continued from P-38

Check	Time	Bearing	Temp	Δt
1	8:26P	1.2		0
2	8:27	6.5	892	1
3	8:28	8.8		2
4	8:29	9.9		3
5	8:36	~12.0	895	10
6	8:45	~12.6	894	19
7	9:26	~15	894	60

June 22, 1973

Check	Time	mm Manometer	K Hartmyc	°C Temp.
1	12:27P		2.0	893
2	12:28		3.2	
3	12:36		4.0	
4	12:39		5.0	
4	12:44		6.0	
5	12:55		7.0	
6	1:19		7.9	
7	2:47		10.1	
1	9:12		1.5	893
2			3.0	
3			3.2	

Δt
0
1
9
11
16
27
51
~~79~~ 140
0
11
16

40 · 47 / 49 / 28

Date

June 22, 1973

June 23, 1973 [After Evacuation over weekend]

79 / 60 / 19

June 25, 1973

Check	Time	mm Manometer	Hastings	°C Temp.	Δt min
1	10:40A	4.20		894	0
2	10:42A	4.00 ?		↓	2
3	10:46	3.30		↓	6
4	10:53	2.45		894	13
5	11:00	1.80		↓	20
6	11:36		55	894	56
7	11:38		40		58
8			35		59¼
9			30	894	61
10			25		64
11			~~20~~		—
12	11:48	10.0	100		68
13			33		71
14			25		74
15			20		78
16			18		81
17		26	19	894	87
18			17½		93
19	12:51 P.m.		16	894	137
20	1:15 P.m.		16	894	
21	2:45 P.m.		17.5	893	
22	3:45 P.m.		19.0	893	
23	4:15 P.m.		19.8	890	
24	4:45		20.0	890	

Sample out

Sample In Hastings out

June 26, 1973

	Check	Time	R cm manometer	L μ Hastings	MAC Load
	1	9:25A	8.4	13.5	Cal manometer
	2	9:27A			
	3	4:25P	33.1	9.00	
	4	4:48P	34.6	8.75	
July 27	5	9:55A	64.3	6.10	
	6	9:55A	64.75	6.10	
	7	11:53	65.50	6.10	
	8	12:noon			
	9	12:06			
	10	12:10	72.30	-0.2	
	11	1:Pm	71.40	+0.8	
	12	3:20	70.70	4.5	
	13	4:50	70.40	4.5	
July 28	14	8:35A	68.50	3.0	
	15	1:25P	66.40	3.1	
	16	1:30Pm			
	17	1:40Pm			

Pot Temp = 879°C, Pot Temp was in error

Recorder °C Temp	Pdam	
	744	Sample out P_{H_2} = 744+51 = 795 mm
890		Sample In, MS Load In, MA manometer out
	742	vol manometer In = 55.9 cc
893	742	
895*	743	vol manometer = 10.3 cc, P_{H_2} = 161 mm (1)
895	743	vol " = 9.7 ml, P_{H_2} = 156.6
894	743½	" " = 9.6 ml, P_{H_2} = 149.5
894		Removed 8.57 ml down to 10 ml
894		Sample back in
894	743	vol manometer ≃ 0 + P_{H_2} = 18 mm
888	743	" " ≃ 1 + P_{H_2} = 37 mm
886	742	" " ≃ 1.2 P_{H_2} = 48 mm
888	741	" " ≃ 1.7 P_{H_2} = 82 mm (2)
884	739	" " 7.2 P_{H_2} = 104 mm
888	739	" " 7.2 P_{H_2} = 122 mm
888	739	Removed 158.57 ml down to 10 ml
888	734	P_{H_2} = 5 mm with sample In Manometer out
		Run stopped because of in leakage of air by mistake

Recorder Temp checked by instrument man + it is correct

July 7, 1973

Check	Time	R cm. L Manometer	McLeod Manometer	Recorder Temp	Pstem
1	9:15 A				
2	9:30	69.75 -0.1		900°C	747½
3	9:35 A			900°C	
4	12:noon		4.60	902	
5	12:05 P		4.30	902	
6	12:10 P		3.80	902	
7	12:25 P		2.75	902	
8	1:35 P		0.98	898	
9	2:50 P		0.80	897	
10	3:30 P		0.72	895	
11	4:10 P		0.71	896	
12	4:30 P		0.69	895	
13	9:40 A (July 5, 1973)		0.69	898	
14	10:12 A		0.72	895	
15	10:30 A		0.74	895	
#1 16	11:33 A		0.73	893	
17	11:50 A	71.30 -0.3		893	742
18	11:51			893	742
19	1:00 P.m			896	
20	1:40 P.m.			895	
21	1:50 P.m		4.70	896	
22	2:45 P.m		2.34	895	
23	3:53		1.62	895	
24	4:45		1.52	895	

$Vol_{system} = 168.8$ ml

$Vol_{sample} = 10.45$

Pressure went to 33K and backed off; Calc Knud = .00184

Sample out, Manometer in, $P_{H_2} = 66$ mm

Manometer out, Sample In,

Sample out, manometer & McLeod open, $P_{H_2} = 26$ mm

Sample In " " out, $P_{H_2} = 24.39$

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Continued from Page 49

Val System 168.82 ml
Val Sample 10.45 ml

	Check	Time	R	mm McLeod	Recorder Temp	mm Potom	
July 6, 1973		9:03					
	1	9:03 Am		1.8	895	743½	#1
	2	9:18 Am	+69.9 +0.40		895	743½	Sample out, McLeod + Manometer in, P_{H_2} = 48.5 mm
	3	9:20			895	743½	Sample in, Manometer out, P_{H_2} = 45.5 mm
	4	1:40 P		4.25	893		
	5	2:45 P		3.65	894		
July 7, 1973	6	10:30 A		3.80	896		#2
	7	10:42 A	38.5	10.25	893	746	Sample out, McLeod + Manometer in P_{H_2} = 46.5 mm
	8	10:45					Sample in + McLeod in, Manometer out
July 9, 1973	9	9:05 A	38.5	10.50 (P_{H_2} = 4.67)	896	747	" " " Manometer 48.0 mm
	10	9:10	64.9	7.60 (P_{H_2} = 1.74)		747	Sample out, " , Manometer In, Value = 9.5
							#3

- Calc equil P = 36.00

#5 [illegible]

July 12, 1972

Recalibration of Volumes

V_1 = 3.31 cc

McLeod = 36.97 cc

$V_2 - V_1$ = 124.18

$V_2 - V_1$ = McLeod = 161.15

124.18
36.97
161.15

Aug 7, 1973

Test of Pressure increase in the equipment for a controll curve.

Time	Pressure N
9:50A.	10.0
10:05A	11.0
10:30	12.0
11:50	15.0
1:05P	16.5
2:00	18.0
3:46	20.0

Aug 8, 1973

	Checks	Time	mm Hg Head	Temp.	Nonane
Aug 8, 1973	1	9:44	4.55	914°C	
	2	9:44½	4.30	914°C	
	3	10:05	2.20	914°C	
	4	11:00	.125	914°C	1208
	5	11:47	.045	910°C	35.0
#1	6	12:10	.040	910°C	31.5
	7	12:37		910°C	31.0
	8	1:52		909°C	30.5
	9	2:53		906°C	31.5
	10	3:20 P.m			
	11	3:20		906°C	
	12	9:25 P.m	0.460	905°C	670
#2	13	10:00 P.m	0.460	905°C	670
P_{O_2} = 113	14	10:00 P.m		905°C	
#3	15	10:01 P.m		905°C	
Aug 9, 1973	16	8:55 A.m	5.00	905°C	
	17	9:20 A.m	4.40	745°C	
	18	9:40 A.m	4.25	750°C	
	19	12:00 noon	2.55	750°C	
#4	20	1:30 P.m	2.00	750°C	
	21	2:35 P.m	1.90	750°C	
	22	3:55 P.m	1.60 ?	750°C	
	23	4:45 P.m	1.75	750°C	
Aug 10, 1973	24	8:50 A.m	1.52	747°C	

		manometer R	manometer L	P_{atm}
Sample out	vol = 161.15			
Sample In				
Sample out	vol 161.15	+71.0	-0.3	747
Sample In				
	vol 161.15			
Sample out	vol 161.15	+70.5	+7.2	746
Sample In				

60

143 moles Li

Check	Time	Date	mm McLeod	N Heating	Manometer R	L	Patm	°C Temp	
1	12:30	8-10	1.55					750	
2	1:15	8-10			69.3	7.4	743	750	Sample out
#5 3	1:20	8-10					743	→600	Sample In P_{O_2} = 12.3 mm
4	3:41 Pm	8-12	1.90					624	
5	8:50 Am	8-13	1.55					624	
6	12 noon	8-13	1.55					→750	
#6 7	8:55 A	8-14	4.30					745	
8	12 noon	8-14	4.30					745	
P_{O_2}=10.6 mm 9 ①	9 A.m.	8-16			66.5	2.5	744	905	Manometer out, Manometer vol = 7.1 cc
P_{O_2}=16 mm 10	9 A.m	8-16			71.8	4.2	746	905	Manometer In, Manometer vol = +0.5 cc, Sample out
P_{O_2} = 442.5 11	9:45	8-16			41.3	10.95	746	905	Manometer In, Sample out, Manometer vol 44.1 cc
12	9:46	8-16			42.3	10.8	746	905	" Sample In " " 42.6
13	9:49	8-16			41.8	9.9	746	905	Manometer vol 43.3 cc
14	10:01				42.0	9.3	746	905	43.0
15	10:21				42.3	8.3	746	905	42.3
16	11:06				44.1	7.8	746	905	39.9
17	12:09 P				46.1	7.7	746	910	37.1
18	4:45 P				51.6	7.2	745	910	29.0
19	9:05A	8-17			51.8	-2.0	747	915	28.7
P_{O_2} = 211.5 20	9:06 A				55.23	1.7	747	915 * Possible Air in leak	23.5 rcs
21	10:05A				55.30	1.6	747	900	23.5
22	12:35 P				55.75	1.5			

① Calculated P_{O_2} at equilibrium = 9.43 mm

* Stopped run changed to capsule #4

Aug 21, 1973 Start with Capsule # 4

LMFBR Meeting Dec. 5, 1974

Reports Due Dec. 20 (on Mats). He will send memo on details.

Meetings on Thursdays at 3 P.m. -
sometimes only every other week on 1st + 3rd Thursday.
Informal presentations from each group about once every 3 months.

Budget - Report on accounts in mail tomorrow.
Possibility of new money at mid year?

Ions For Catalyst

Pr^{+4}

Sm^{+4}

Tb^{+4}

Ti^{+4}

Dec 10, 1974

PuO_2 microsphere Dissolution

½ g PuO_2 microspheres (New)
30 ml of 12 M HNO_3: 0.04 M NH_4F at 100 °C

Time ~~Start~~	Sample #	Equip comp
1:25 P.m.	Start	Prog 71
1:55 P.m.	68-1	2 ml
2:40 P.m	68-2	2 ml
4:30 P.m.	68-3	2 ml
9:00 P.m.	68-4+5	

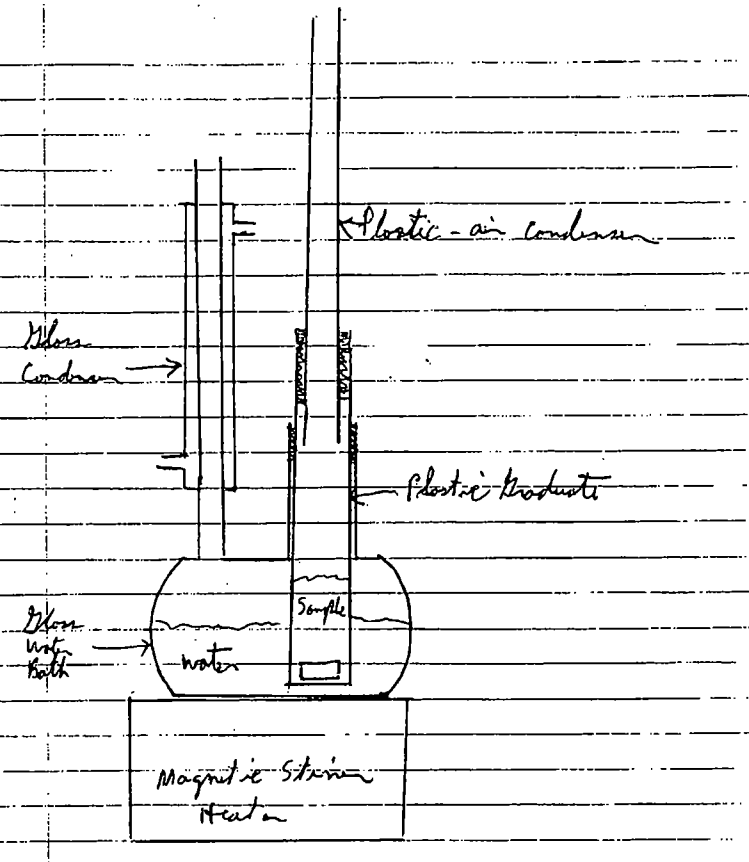
Dec 10, 1974

PuO_2 Microsphere Dissolution

Equip P 77

1 g PuO_2 Microspheres (Mw)
30 ml ~~15.7~~ M HNO_3 - 0.04 N H F at 100°C

	Time	Sample #	
	1:20 Pm	Start	
.50	1:50 Pm	70-1	2 ml
1.25	2:35 Pm	70-2	2 ml
3.05	4:25 Pm	70-3	2 ml
	8:00 Pm	70-4+5	



Dec 11, 1974

PuO_2 Microsphere Dissolution

Equipment page 71

½ g PuO_2 Microspheres (New)
30 ml 15.7 M HNO_3 - 0.02 M HF
Temp. 100°C

Sample #	Time
Start	1:35 P.m.
72-1	2:05 P.m.
-2	2:50 P.m.
-3	4:25 P.m.
-4	8:00 P.m.
-5	9:00 A.m. (12-13-74)

Dec 12, 1974

PuO_2 microsphere Dissolution

Equipment Page 71

½ g PuO_2 Microspheres (Nuc)
30 ml 12 M HNO_3 - 0.02 M HF
Temp. 100°C

Sample	Time	
Start	1:40 Pm	
74-1	2:20 Pm	0.5
-2	2:55 P.m.	1.25
-3	4:05 P.m.	2.5
-4	8:05 P.m	6.5
-5	9:00 Am (12-13-74)	

½ g PuO_2 Microspheres
12 M HNO_3 (No F-) 30 ml 100°C
for 16 hrs
74-6

Jan 7, 1975

PuO_2 Microsphere Dissolution

Equip Page 71

½ g PuO_2 Microspheres
30 ml of 15M HNO_3 – 0.01M HF
Temp of 100°C

Sample	Time (start 12:20 P.m.)
76-1	12:40
-2	2:20
-3	8:00 A.M.
-4	12:50 P. Jan 8
-5	9:20 " "

Jan 7, 1925

PuO_2 Microsphere Dissolution

Equip Page 71

½ g PuO_2 Microspheres
30 ml of 12 N HNO_3 – 0.01 N HF
Temp 100 °C

Sample	Time (Start 2:25 P.m.)
28-1	[illegible]
-2	[illegible]
-3	8½ A.m.
-4	1:25 P. Jan 8 24.75 hr
-5	[illegible] Jan 9
-6	[illegible]

24+5
30+8+4/10
54

~~Dec~~ Jan 10, 1974

PuO2 Microsphere Dissolution

Equip P. 71

1 g PuO2 Microspheres
40 ml of 12 M HNO_3-~~0.02 M~~ HF
Temp ~ 100°C [illegible]

Start 10:45 Am

Sample	Time	~~Comment~~
80-1	12:10 Pm	
-2	2:15 Pm ~~[illegible]~~	
-3	4:00 Pm ~~9:30 Am Jan 11, 1974~~	
-4 ①	9:30 Am Jan 11, 1974	
-5 ①	10:20 Am	
-6	11:45 Am	
-7	4:35 Pm	
8	8:35 Pm	

Solution cooled to 60°C and 600 mg of Ag_2O added and stirred for 15 minutes and the solution heated back to 100° and sampled.

LMFBR [illegible]

Jan 17, 1975

1. [illegible] for FF — where? — decision must [illegible] 6 months [illegible] for design

2. Money

	75 This year	76	78 - 1982
10134	820	300	300
10232	1250	1700	[illegible]
[illegible]	1450	1800	1960
[illegible]225	[illegible]	400 ([illegible])	[illegible] ([illegible])
[illegible]	[illegible]	[illegible]	[illegible]
10361	[illegible]	550	[illegible]
	—	300	500
	3929	5750	[illegible]

[illegible]

[illegible]

[illegible] River [illegible]

3. No new [illegible] money and no [illegible]

4. ~60,000 to go K-25 [illegible] money

5. RRD says X-10 organization is not good

6. RRD wants outside organization to review the program at ORNL [illegible] companies

Jim → 7. Work plan people next week meeting with Birch - Thursday afternoon probably at 1:P.m.

8. [illegible] Allied, DE, NFS, approval of work plan - even if must pay them

9. [illegible] something which can be [illegible]

10. Scale of pilot plant - May have to [illegible] by [illegible]. [illegible] studying this. Only one pilot plant [illegible] says

11. 30 day cooling - still being studied

April

Jan 21 1975

PuO_2 ∅ Dissolution

Equip [illegible] Teflon

½ g [illegible]
29 ml 12 HNO_3 - .02 M HF
[illegible]

Time Start 9:38 Am

[illegible]	Time	ml H_2O added	
84-1	[illegible] P	1	
-2	1:35	1	
[illegible]	2:40	1	
[illegible]	4:00	1	
-5	9:20 A	1	Jan 22
85-[illegible]	10:45 A	–	
84-7	1:10 P	–	
-8	3:35 P	–	
-9	9:30 A		Jan 23
-10	[illegible]		Jan 24

Jan 21 1975

PuO$_2$ Dissolution

Egip [illegible] except Teflon

½ g microspheres

[illegible] ml of 12 M HNO_3 - 0.5 M HF = [illegible]

Sample	Time	Added Vol.	Time Start 9:[illegible] Dt.
86-1	12:15 Pm	1 ml	
-2	1:30	1 ml	
-3	2:35	1	
-4	3:55	1	
-5	9:15 A	1	Jan 22
-6	10:40	-	[illegible]
-7	1:05 P	-	[illegible]
-8	3:30 P	-	
-9	9:30 A		Jan 23
-10	9:30 A		Jan 24

The results of this work were reported to F.G. Smith and R.E. Blanco on Feb. 3, 1975

Feb 1975

PuO_2 φ Dissolution

Equip pp 71 except Teflon

½ g microspheres
40 ml of 8 M HNO_3 - 0.02 M HF

Time Start 9 A.m. Tuesday Temp 100 °C

Sample #	Time	Day
88-1	1:40 Pm	Tuesday
-2	1:40 P.m	wed
-3	12:50 Pm	Thursday
-4	12:50 Pm	Friday
-5	6 Pm	Feb Sat 8
-6	4:10 Pm	Feb 9
-7	[illegible]	[illegible]
-8	1:30 Pm	Feb 11

~~We are attempting~~ an attempt is being made to design ~~our~~ experiments so that ~~we can find~~ quantitative definitions of the effects of these metal ion impurities ~~which can presented orderly and have wide general and practical~~ can be obtained.

Preliminary data ~~which we~~ which have obtained indicate that metal ion impurities are an important factor to be considered in choosing HF concentrations for ~~to be~~ use ~~and~~ in dissolving refractory PuO_2 in HNO_3-HF-H_2O systems.

Feb 7, 1975

PuO_2 ϕ Microspheres

Equip p 71 except Teflon

½ g PuO_2 Microspheres
40 ml of 8 M HNO_3 – 0.02 M HF Temp 100°C

Time start 9 Am.

Sample #	Time	Day	Ag_2O_2 added	Hrs
90-1	1:40 Pm	Tuesday	0.1 g	4.33
-2	1:40 Pm	wed.	0.1 g	28.33
-3	12:50 Pm	Thursday	0.1 g	51.33
-4	12:50 Pm	Friday	0.1 g	75.33
-5	6 P.m	Sat Feb 08	0.1 g	105.00
-6	4:10 P.m	Feb 9	0.1 g	129.00
-7	3: P.m	Feb 10	0.1 g	152.00
-8	1:30 P.m	Feb 11	—	174.5

March 4, 1975

Pur 9 Microsphere Dissolution

Equip P. 71 Except Teflon

0.5 g microspheres
30 ml of 12 M HNO_3 – 0.04 HF

Start 9:35

Sample #	Time
92-1	10:35
-2	12.05
-3	1:05
→ -4	~~2:20~~ 4:05
Note → -5	2:20

March 1, 1975

$P_{wc}O_2$ of Dissolution

Equip pg 71 Except Teflon

0.0.5 g Microspheres
30 ml of 12 M HNO_3 – 0.04 M HF

Start 4:35P 1:8 20

Sample #	Time	Volts	mAmps
94-1	10:35A	2	20-80
-2	12:05P	2	20-80
-3	1:05P	2	0-50
-4	2:20P	2	0-50
-5	4:05P	2	0-50

March 13, 1975

PuO_2 Dissolution

Teflon Equip p. 71

0.50g PuO_2

30 ml 12 M HNO_3 0.02 M HF

100 °C

Sample #	Time			
—	9:15 A	Tuesday		
96-1	10:25		1	
-2	12:22			
-3	4:20 P.m.			
-4	7:?? P	Wednesday		
-5	3:00 P	"	~~ceric~~ oxide	
-6	9:30 A	Thursday	Added 0.2g ~~$Ce(NO_3)_3 \cdot 6H_2O$~~	
-7	3:05 P			
-8	10:15 A	Friday		

Ath	P_w (mm)
1 hr	.0028
3 hr	.0071
7 hr	.0149
24 hr	.0324
29½ hr	.0362
48 hr	.0422
53½	.0422
72.7	.0473

March 10, 1975

Pu Cl_2 ϕ Dissolution

Teflon Equip. p. 71 0.50 g ϕ

30 ml 12 M HNO_3 - 0.02 M HF

100°C

Sample #	Time	amps	volts	
—	9:25 A	50	2	Tuesday
981	10:25	50	2	ϕ
-2	12:35 ⊛	50	1	
-3	4:20	50	1	
-4	9:15 A	50/120	1/3	Wednesday
-5	3:00 P	~ 300	6	
-6	9:30 A	100-200	6	Thursday Added ~1.2 g $Cu(NO_3)_2 \cdot 6H_2O$
7	3:05 P	200 →	4.5	
-8	10:15 A Friday	0?	2.4	

⊛ Yellow solid ... Cu(II) nitrate.

March 24, 1975

PuO_2 Dissolution

Teflon equip. pT1 0.50 g ea

3 ml of 12 N HNO_3 - 0.01 N HF, 100°C

	Sample #	Time
		10:15 Am
	100-1	12:15 Pm
	-2	2:30 Pm
	-3	4:15 Pm
March 25	-4	8:30 Am
	-5	10:15 Am
	-6	12:30 Pm
	-7	3:15 Pm
March	-8	8:15 Pm

March 24, 1975

PuO_2 Dissolution

Teflon apparatus, p. 71 0.50 g PuO_2 ϕ

30 ml of 12 M HNO_3 – 0.01 M HF, 100 °C

Sample #	Time	Amps	Volts	
—	10:15 Am	200-300	7	
102-1	12:15 Pm	200-300	7	
-2	2:30 Pm	200->300	7	
-3	4:15 Pm	> 300	7	
March 25 -4	8:30 Am	> 300	7	
-5	10:15 Am	> 300	7	Add'l 50 mg $Ce(NO_3)_3 \cdot 6H_2O$
-6	12:30 Pm	> 300	7	" " "
-7	3:15 Pm		7	
March 26 -8	8:15 Am			

104-1 4 N HNO_3 – Sn^{+4}

– 2 4 N HNO_3 – Pb oxidized

104-1, 2

PuO_2 ϕ Dissolution

April 4, 1972

Teflon Equip. 0.50g PuO_2 ϕ

30 ml 15.7 M HNO_3 – .070 M HF, 100°C

Start 9:55 A.M.

Sample #	Time	
106-1	10:35 A	
-2	12:20 P	
-3	1:40 P	
-4	3:55 P	added 100 mg Cerous oxide
-5	4:30 P	
-6	8:35 P	added 20 mg Cerous oxide
~~-7~~		
-7	10:45 P	" 20 mg " "
April 5 -8	9:00 A	
-9	1:20 P	Stopped

PuO_2 Microsphere Dissolution

April 4, 1975

Teflon Equip. — 0.50g ϕ

30 ml 15.7 M HNO_3 .01 M HF, Temp. 100°C

Time start ~~10:23 A~~ added 0.1g $Ce(NO_3)_3 \cdot 6H_2O$

Sample #	Time
1-0-8-1	10:23
-2	12:20 P
-3	1:40 P
-4	3:55 P
-5	4:30 P
-6 +7	8:35 P exp stopped.

PuO_2 Microsphere Dissolution

April 4, 1975

Teflon Equipment 1 g ϕ

3.0 ml 12 M HNO_3 - 0.02 M HF, Temp 100°C
2 drops 1 M $AgNO_3$

Sample #	Time
—	8:05 P.m.
110-1	10:45 P.m
-2	9:00 A.m April 5
-3	1:20 P.m
-4	9:04 P.m
-5	[illegible]
-6	9:28 A April 7
-7	12 noon April 9

PuO_2 Microsphere Dissolution

April 5, 1975

0.50 g PuO_2 ϕ

30 ml 12 M HNO_3 – 0.02 M HF

100 mg Ceric oxide

Time start 1:53 P

Sample #	Time	
1PB-1	9:00 Am	
-2	[illegible]	April 6
-3	9:25 M	April 7
-4	12:00 noon	April 9
-5		April 9
-6		

PuO_2 Microsphere Dissolution

April 10 1975

~~0.5~~ 0.5g PuO_2

30 ml of 12 M HNO_3 – 0.02 M HF

Start 9:30 ✓ Temp 100°C

Sample #	Time
114-1	11:30 Am
-2	2:15 P.m.
-3	4:00 P.m.
-4	9:00 P.m. April 11
-5	10:30 Am April 12
-6	10:40 Am April 13
-7	10:30 Am April 14

0.5g PuO_2 Microsphere Dissolution

April 10, 1975

50 mg @ $Na_2Cr_2O_7 \cdot 2H_2O$

30 ml of 12M HNO_3 - 0.02 M HF

Temp 100°C

Jar #	Time		
116-1	11:30 A	1g	Na_2 Cap
-2	2:15 P.m		
-3	4:40 P		
-4	9:00 Pm	April 11	1g Na_2O_2
-5	10:45 Am	April 12	
-6	10:40 Am	April 13	
-7	10:30	April 14	

Pu (IV) Fluoride Solubility

I N 12 N HNO_3 & 4 M HNO_3

Sample #	mMol 110-7	ml 5.77 M 12 M HNO_3, 4 M HF	ml 12 M HNO_3	HF N	
118-1	1	0	1	0.02	
-2	1	0.25	.75		
-3	1	0.50	.50		
-4	1	0.75	.25		
-5	1	1.00	—		
		ml 5.77 M 4 M HF 4 M HNO_3	ml 4 M HNO_3		
-6	1	0.25	.75	0.140	.23
-7	1	0.50	.50	.360	.39
-8	1	0.75	.25	.54	.82
-9	1	1.00	—	.72	1.51
	114-7				
118-10	1	.25	.75	.058	
11	1	.50	.50	.107	
12	1	.75	.75	.175	
13	1	1.00	—	.233	

added 1 ml H_2O to each sample
heated to 100°C for 5 min, cooled & filtered.

PuO_2 Microsphere Dissolution

April 14

No HF

30 ml of 12 M HNO_3
0.50 g PuO_2 (used)
Temp Boiling
Time added/10 mg Ag_2O_2

Sample Time Temp
— 2:35 P

50 ml of ~~EDTA~~ 4 M HNO_3, 200 g/l oxalic acid
0.50 g PuO_2 (used)
Time Start 2:25 P.M.

Pur Fluoride Solubility

Sample #	ml 8 M HNO_3	ml 10 M HNO_3	ml 12 M HNO_3	ml of 11 M HNO_3 used 8 M HNO_3	10 M HNO_3	12 M HNO_3	
122-1	.84	—	—	.16	—	—	.056
-2	.80	—	—	.20	—	—	.070
-3	.72	—	—	.28	—	—	.098
-4	.64	—	—	.36	—	—	.126
-5	—	.84	—	—	.16	—	.056
-6	—	.80	—	—	.20	—	.070
-7	—	.72	—	—	.28	—	.098
-8	—	.64	—	—	.36	—	.126
-9	—	—	.84	—	—	.16	.056
-10	—	—	.80	—	—	.20	.070
-11	—	—	.72	—	—	.28	.098
-12	—	—	.64	—	—	.36	.126
122-1	.84	—	—	.16	—	—	.056
-2	.80	—	—	.20	—	—	.070
-3	.72	—	—	.28	—	—	.098

Heated To 100°C for 30 min

$Pu O_2$ Microsphere Dissolution

April 15, 1975

30 ml of 8 N HNO_3 - .04 M HF

0.50 g $Pu O_2$

Temp? Boiling water

~~Time~~ ~~Temp~~

Sample #	Time	
—	10:55	
124-1	1:P.m	
-2	5:P.m	
-3	8:15Pm	
-4	8:35 A	April 16
-5	10:15AM ~~P~~	April 18
-6	10:20 A	April 19
-7	1:20Pm	added 100 mg Ag_2C_2
8	4:20Pm	" " "
-9	1:15Pm	April 20
-10	+	

April 15, 75

PuO_2 Microsphere Dissolution

30 ml 8 M HNO_3 + 10 x/ml HF
0.5g PuO_2
Temp 100°C

Sample #	Time	V	Temp	
—	10:55 A	2	~100	
126-1	1:00 P	2	~200	
-2	5:00 P	2	~160	
-3	8:15 P	2	~150	
-4	8:35 A	2	~100	April 16
-5	10:15 A	2	~280	April 18
-6	10:00 Am	2	~110	April 19
-7	1:20 Pm	2	~200	
-8	4:20 Pm	2	~150	
-9	1:15 Pm	2	0	April 20
-10	1:15 Pm	2	0	

Microsphere	Pictures magnification
1. Untreated	20 X
2. 112 PuO_2	20 X
3. 114 PuO_2	20 X
4. 102 PuO_2	20 X
5. 100 PuO_2	20 X
6. 110 PuO_2	20 X
7. 116 PuO_2	20 X
8. 104 PuO_2	20 X

Pu(IV) F^- Complex Study

Sample #	ml H_2O	ml 12 M HNO_3	ml 12 M HNO_3 / 1 M HF ①	~ HF M
130-1	0.5	9.5	0.0	–
-2	0.5	8.7	0.8	.008
-3	0.5	8.3	1.2	.012
-4	0.5	7.9	1.6	.016
-5	0.5	7.5	2.0	.022

~ UO_2^{2+}

Pu

① 40 ml with .72 ml of 5.77 M HF

PuO_2 & Dissolution In Hg or nitrate

131-1 Digested ½ PuO_2 in 12 M HNO_3 30 ml with 1 g $Hg(NO_3)_2 \cdot 2H_2O$

131-2 ~~Soxy~~ Same as above except with 6 M HNO_3

4-28-75

Dissolution of PuO_2 ϕ (cont'd)

4-28-72

1 g PuO_2

30 ml 0.15 M HF - 8 M HNO_3

Sample #	Time	~~Volts amps~~	
—	12:35P	~~2 — 100~~	
132-1	1:40P	~~2 — 150~~	
-2	2:55P	~~2 —~~ 75	
-3	4:35P		
-4	8:20P		
-5	9:35A	April 29	
-6	4:00P	added 10 ml more of acid solut.	↑ to 25 ml
7	9:50A	April 30	
8	12:55P		
9	9:35A	Thursday added 50 mg Ag_2O_2	
-10	1:10P		

$(5.8)(4) = (\ldots)(.15)$

4-28-75

Dissolution of PuO_2 (cont'd)

30 ml 0.15 M HF - 8 M HNO_3

1 g PuO_2

	Sample #	Time	Volts Amps	
	—	12:35	2-100	4-28-72
	132-1	1:40P	2 150	4
	-2	2:55P	2-75	
	-3	4:35P	2 100	
	-4	8:20P	2-100	
	-5	9:35A	2-100	4-29-72 (1)
	-6	4:00P	2-0	Added 10 ml (?) (?) to 25 ml
April 30	7	9:50A	2-150	
~~Thu~~	8	12:55P	2-150	
Thursday	-9	9:35A	2-150	Added 50 mg Ag_2O_2
	-10	1:10P		

(1) Dorf

5-1-75

Dissolution of PuO_2 ϕ (cont'd)

1 g PuO_2

10:45

30 ml ~~6~~ M HNO_3, ~~0.~~85 M HF

Time start 1:40 May 1 Temp 100°C

Sample #	Time	Cu Turnings added
134-1	3:05 P	✓
-2	5:30 P	✓
-3	9:45 A	✓
-4	[illegible] P	
-5	11:30 A	✓ May 3
-6	~~9:00 A~~ 3:P.m	May 4 9:00
-7	9:40 A	May 5
-8	1:00 P	May 6
-9	9:45 A	May 7
-10	9:45 A	

rel 20 ml added to ϕ 8 M HNO_3 0.085 M HF

Dissolution of PuO_2 ϕ (cont'd)

1 g PuO_2

10:40

30 ml 8 M HNO_3, 0.085 M HF

Time start 1:40 May 1 Temp 100°C

Sample #	Time	
134-1	3:05 P	
2	5:30 P	
3	9:45 A	
4	[illegible] P	
5	11:30 A	May 3
6	~~9:00 A~~ 3:00 P	~~May 4~~ May 4
7	9:40 A	May 5
8	1:00 P	added 100 mg Ag_2O_2 May 6
9	9:45	May 7
10	9:45	

5-7-75

Dissolution of PuO_2 of (used)

1 g PuO_2 (.16)

30 ml of 4 M HNO_3 - .085 M HF

100°C

Sample #	Time	Date
—	1:15P	5-7-75
136-1	1:15P	5-7-75
-2	9:45A	5-8-75
-3	7:30A	5-9-75
-4	1:40P	5-10-75
-5	7:Pm	5-11-75
-6	9:Am	5-12-75
-7	"	"
-8		
-9		
-10		

vol ≈ 20 ml

$\frac{(100)(.085)}{5.77} \approx 1.47$

$\frac{(100)(.16)}{5.77} = V_{HF} \approx 1.0$

Dissolution of PuO_2 of (used)

1 g PuO_2 .12

30 ml of 4 M HNO_3 - 0.085 M HF

100°C

Sample #	Time	Date	V	mA.
—	1:15P	5-7-75	2	150
137-1	4:15	5-7-75	2	100
-2	9:45A	5-8-75	2	—
-3	9:30A	5-9-75	2	70
-4	1:40P	5-10-75	2	100
-5	7:00Pm	5-11-75	2	— Added 5 ml of Solvent To 15 ml
-6	9:00Am	5-12-75	2	110
-7	"	"		
-8				
-9				
-10				

5-12-75

Dissolution of PuO_2 ϕ

1 g PuO_2 (ussed)

30 ml 8 M HNO_3 - 0.06 M HF, Temp 100°C

(100)(.06) / 5.7 = 1 mg HF added

Sample #	Time	Date
—	:25P	5-12
138-1	~ 3:30P or 4:P.m	
-2	9:25A	5-13
-3	5:00P	
-4	9:10A	5-14
-5	11:00A	5-15
-6		

Vol 20 ml added 1 ml quinoline

5-12-75

Dissolution of PuO_2 ϕ

1 g PuO_2 (ussed)

30 ml 8 M HNO_3 - 0.06 M HF, Temp 100°C

Sample #	Time	Date		
139-1	1:25P			
-2	~ 3:30P			
-3	8:25A	5-13	2	200
-4	5:00P		2	200
-5	9:10A	5-14	2	200
-6	11:00A	5-15	2	100
			2	100

Vol 14 ml

5-20-75

Non Fluoride PuO_2 Dissolution attempt

1g PuO_2 @
100ml of 8M HNO_3 - 100g/L HIO_4
Temp 100°
Time 24 hrs
Sample # 140-1

1g PuO_2 @
100 ml of 4M HNO_3 - 5g/L V_2O_5
Time 24 hr
Temp 100°C
Sample # 140-2

July 29, 1975

Effect of Zr^{+4} on PuO_2 Dissolution

Sample #	ml 8M HNO_3 5.77 M HF	ml of .5M $Zr(OH)_4$ 8 M HNO_3	ml of 8M HNO_3
140-1	5	0	4
-2	5	0.5	3.5
-3	5	1	3.0
-4	5	2	2.0
-5	5	3	1.0
-6	5	4	0.0
-7	5	0	4.0
-8	5	0.5	3.5
-9	5	1	3.0
-10	5	2	2.0
-11	5	3	1.0
-12	5	4	0.0

Fe^{+3} instead of Zr^{+4} for blue samples

Time at 100°C 2:55 Pm
Time off 4:25 Pm

.133 grams PuO_2 in each Sample

Dissolution of PuO_2 ϕ

(used) ½ g ϕ predigested 24 hrs in Boiling 8M HNO_3

30 ml 8M HNO_3 - 0.04 M HF

Temp 100°C

May 27, 1975

Time	Sample
12:30 P.m	—
10:20 A	142-1
2 P.m	-2
4 A.m	-3
	-4

May 28

May 29

Had to shut down and cool off over night. Started up again on 5-28 at 10:20 A Starting Cold. Improved stirring

Dissolution of PuO_2 ϕ

½ g used ϕ

30 ml 8M HNO_3 - 0.06 M HF

Temp 100°C

May 27, 1975

Time	Sample
12:30 P	—
10:20 A	142-1
2 P.m	-2
4 A.m	-3
	-4

~~May 28~~

May 28

May 29

July 8, 1975

8.05 g
7.00
1.05 g

1.05/12 = amount in each one

Objective: To study effect of presence of various metal ions on the dissolution rate of PuO_2 in HNO_3 - HF at 100 °C

Compound	m.w.	Grams in 100 ml	Sample #
$Hg(NO_3)_2 \cdot H_2O$	342.62	17.13	145-1
$Ce(NO_3)_3 \cdot 6H_2O$	434.25	21.71	145-2
$Th(NO_3)_4 \cdot 4H_2O$ or $12H_2O$	552.12	27.61	145-3 HF
~~$K(NO_3)_3 \cdot 4H_2O$~~			
$Al(NO_3)_3 \cdot 9H_2O$	375.14	18.76	145-5+6
$Fe(NO_3)_3 \cdot 9H_2O$	404.02	20.20	145-7+8
$La(NO_3)_3 \cdot 6H_2O$	433.02	21.70	145-9+10
HNO_3 added in	—		145, 11+12

10 ml of 1 M HF & 12 M HNO_3 solution

* Two ml of above solutions in 8 ml 8 M HNO_3 - 2 ml of 5.77 M HF.

Time Start 1:10 P.m. at 100 °C
approx 1.05/12 grams in each sample
Containing 10 ml of the metal HF — HNO_3 solution. Time stops 3:00 P.m.

Sample #

May 29, 1973

Recorder Temp.	Pot. Reading	Heating zone	Pot Temp.
950	36.9		889
879	33.5	7.5	865
936	36.2		871
816	31.3	7.2	752
737	27.8		668

1.000 g PuO_2 in each sample

Started Heating at 100°C at 1 P.m.

Stopped " " " 3 P.m.

July 20, 1975

Objective: Same as Thutan Page 144

Compound	M.W.	Grams In (8M HNO_3) 100 ml	Sample #
$Hg(NO_3)_2 \cdot H_2O$	342.62	17.13	146-1
$Ce(NO_3)_3 \cdot 6H_2O$	434.25	21.71	-2
$Th(NO_3)_4 \cdot 4H_2O$	552.23	27.61	-3
$Al(NO_3)_3 \cdot 9H_2O$	375.14	18.76	-4
$Fe(NO_3)_3 \cdot 9H_2O$	404.02	20.20	5 + 6
$La(NO_3)_3 \cdot 6H_2O$	433.02	21.70	7 + 8
No Additive	—		9 + 10
$Cr(NO_3)_3 \cdot 9H_2O$	400.18	20.00	11
$Cu(NO_3)_2$	241.60	12.10	12

10 ml

8 ml ml of 8 M HNO_3 - 1.5 M HF was added to 2 ml of the above dissolution solution.

G. N. Lewis J. am. Chem. Soc., 38, 762 (1916)
Note on P. 774

14 : 11 5,30 3w ✓

70 : 73,365c ✓
70 : 53,301d ✓
71 : 76,522h ✓
69 : 80,887g
70 : R 23,303 ✓
75 : 11,53.5C ✓
75 : 11 5,13oh ✓

Repeat of Page 146 with Compounds listed below

130 grams PuO_2 In each sample
Time Start 100°C 1:10 P.m.
Time Stop 2:10 P.m.

10 ml
0.10 M HF
0.10 M metal ion
4.0 M HNO_3

148-1	$Ca(NO_3)_2 \cdot 4H_2O$	
-2	$Cu(NO_3)_2 \cdot 4H_2O$	
-3	$Zn(NO_3)_2 \cdot 4H_2O$	
-4	$Zn(NO_3)_2 \cdot 4H_2O$	
-5	$Ni(NO_3)_2 \cdot 6H_2O$	
-6	$Fe(NO_3)_3 \cdot 9H_2O$	
-7	$Al(NO_3)_3 \cdot 9H_2O$	
-8	$Cr(NO_3)_3 \cdot 9H_2O$	
-9	$Rh(NO_3)(OH)_3 \cdot H_2O$	
-10	$Rh\ NO_3(OH)_3 \cdot H_2O$	
-11	$Zn(OAc)_4$	
-12	None	

Misc Notes

1. LiH is more dense than Li at ~25°C
LiH = 0.780 g/cc, Li = 0.534 g/cc

2. LiH conducts electricity. Lithium deposited at cathode and Hydrogen at the anode.

3. LiH strong reducing agent at elevated temperature.

4. LiH fairly stable in dry air.

5. Density of Li at 600°C = 0.478

6. Covalent radius of hydrogen atom 0.30 Å

473-3566
432-0915

1 in = 2.54

T = 9.6 × 10² curies/g

Surface Area Quartz container ≅ 41.87 cm²

4 [illegible] ⇌ [illegible]

$K_p = \frac{[illegible]}{P} = 1.80 \times 10^{-2}$ atm [illegible]

[illegible] T.G.O. [illegible] Chem. [illegible]
[illegible]

[illegible]°C

[illegible] VP [illegible]
[illegible]

Egan EP Ind Chem [illegible] 37 [illegible]

J.A.C.S. 1942, 64, 47

[illegible]

38.2 The [illegible] Vacuum by [illegible] pp 100

$$F = \frac{K(P_1^{1/2} - P_2^{1/2})}{l}$$

K = [illegible] constant = cm²/sec

F = The rate of [illegible] diffusing gas

l = Thickness of [illegible]

K = quantity of [illegible] passing [illegible] when [illegible] atmosphere [illegible]

K = [illegible]

Caustic work

[illegible]1040

Try HIO₄

David [illegible]
482-02[illegible]

Gas Constant = 82.057 atm/cc

Volume of capsule
Surface Area of Sample ≅ 11 sq cm

P = 0.25 = constant at ~700°C for SS

Q = permeation rate in $\frac{cc\,H_2\,(STP)}{hr}$

A = area

p = partial pressure

t = thickness in mm

$$\frac{Q}{A} = \frac{P}{t}\left(p^{1/2} - p_0^{1/2}\right)$$

Temp reading on controller = 715°C and [illegible]

temp = 675.5

Temp reading on controller = 9[illegible]°C [illegible]

[illegible] 915°C

Ti Sponge = 600°C

Ken Valentine
Y-12 3-5338
Stored in 9720-1

[illegible]	wt [illegible] g.	[illegible]
4	.96	.1383
5	.99	.143
6	1.03	.134

Charge # 3370 - 187
work order #
G-0634D-TR ✓
G-0634EAl

Joany
Binder

Microspheres   Theor Density PuO_2 = 11.46
0.0 120 m^2/g DWG 73-2527
81-100 mesh 149-177 μ
11.00 Bulk density
0.0022 cc/g pore vol
Calc. 1150°C 4% H_2
1.03×10^8 [illegible] /min/mg

4166

	New	V. Good Standing.	Bad C.E. Bogue & white
7	1411	1720 ✓	2100
9	1607	2009 ✓	2411
11	1848	2310	2772
13	2125	2656	3188

Salary

151	[illegible]	[illegible]	[illegible]
177	[illegible]	2042	[illegible]
[illegible]	1803	[illegible]	[illegible]

Attachment 3 - Acceptable Knowledge Source Document Summary

Site(s): Oak Ridge National Laboratory	Source Document Tracking Number: C078
Waste Stream Number(s): ORNL Non-specific Library Files (Applicable only when site library is not in use)	
Acceptable Knowledge Documentation Type: ☑ TRU Waste Management Program Information ☑ Waste Stream-Specific Information ☑ Additional Information	Category: ☑ Correspondence ☐ Discrepancy Resolution ☐ Internal Procedure ☐ Miscellaneous ☐ Published Document or Internal Procedure ☐ Unpublished Documents
Title or Description of Source Document [a]: Memo to Bryan Roy transmitting Historical Survey – RCRA Information	
Source Document Reference Information (author(s), document and revision number, date, publisher): James W. Moore (ZQS), NA, NA, 04/04/2005, NA	

AK # [b]	Source Doc. Page # [c]	AK Information Summary
PR2, PR3, PR4, PR6, PR7, WS1, WS2, WS3, WS4, WS6, WS7, WS8, WS9, WS11, WS12, S16	All	This chemical list was compiled and summarized by Betty Humphreys. This document was reviewed, and based on the introductory text to the chemical table it is believed that Wayne Evans and/or Charlie Roberts reveiwed this chemical list and indicated the chemicals that would potentially be present in REDC waste by circling the chemical or marking the chemical in the left margin. Chemicals that were circled or marked in the left margin are therefore indicated in the AK summary report as potentially contaminating the waste. The list referred to is relevant to Building 7920 waste. Document describes: An effort has been made to identify AK documentation. Efforts focused on 10 facilities that generated the most CH-TRU containers (~94%). This e-mail transmits a package that summarizes historical information (chemical use, radionuclides, processes) gathered for buildings 7920, 3019, 3508, 3028, 5505, 3038, 4508, 2026, 4501, and 3027 and provides lists of additional references. Building 7920: The primary work at the Radiochemical Engineering Development Center (REDC, Buildings 7920, 7930) was recovery and purification of transplutonium elements (Am through Fm). Radiochemical processing, solvent extraction, precipitation, and ion exchange processes were also conducted. Building 7920 contains nine heavily shielded hot cells. Most of REDC waste generation occurred in Bldg. 7920. Building 7930 was used exclusively for purifying and packaging Cf-252 for distribution. Prior to March 1976 all solid TRU waste from REDC was managed as RH-TRU. Stored casks generated prior to the mid to late 1980s have been known or suspect RCRA mixed wastes (typically lead or mercury). An interview confirmed that mercury vapor lamps from hot cells were disposed in the TRU casks, and possible that batteries and thermostats were also disposed. Chemical inventory lists maintained for the facility identify chemicals that may be expected to be present in the casks and include the following: Building 3019A: Radiochemical Development Facility (formerly Radiochemical Processing Pilot Plant), performed separation and purification of plutonium. 1945-1951 tested the REDOX Process using methyl ethyl ketone as the organic solvent and aluminum nitrate. 1948-1960 tested the PUREX process using tributyl phosphate (TBP) as the organic solvent and nitric acid. 1949-1968 tested fluoride volatility reprocessing for U-235 recovery from molten salt fuel. 1952 to present, tested the THOREX process for recovery of U-233 and thorium.

Attachment 3 - Acceptable Knowledge Source Document Summary (continued)

Site(s): Oak Ridge National Laboratory		Source Document Tracking Number: C078
AK # [b]	Source Doc. Page # [c]	AK Information Summary
		Building 3019B Analytical laboratory used prior to use of Building 2026 laboratory. Building 3508 Alpha Isolation Laboratory: Used to develop solvent extraction processes for transuranium and transplutonium elements and other R&D activities. An extensive variety of chemicals and potential hazardous or RCRA materials were used. Excerpts from other documents list typical materials in Building 3508, such as nitric acid, TBP, di (2-ethylhexyl) phosphoric acid, diisopropylbenzene, dodecane, hydrochloric acid, acetone, ammonium hydroxide, sodium hydroxide, mono-2-ethylhexylphosphoric acid, and xylene. Isotopes in Building 3508 include Am-241, U-233, and Pu-239. Building 3028 Processes included Short-Lived Fission Products (SLFP), Curium Source Fabrication Facilities (SFF). Chemicals in SLFP included NaOH, H2SO4, HNO3, D2EPHA, oxalic acid, lead (with byproduct Pb(NO3)2), TBP, NH4OH, HCl, H2O2, H2S, AHIBA. Chemicals used in SFF were mainly HNO3 and oxalic acid. Three additional source documents are included for Building 3028. These safety analysis/safety requirements are summarized in Source Document Tracking Numbers U007, I012, and I013. Building 5505 Transuranium Research Laboratory: Primary research in lanthanide and actinide elements, including the transuranic elements. Due to mechanical processing, the presence of iron and nickel based metals as well as mercury, lead, and other RCRA metals is likely. Small scale organic processing was performed; plastic bottles of liquid could be in the waste. An extensive variety of chemicals and potential hazardous or RCRA materials are mentioned in the references, such as HCl, ketone, xylene, carbon tetrachloride, hydrogen peroxide. Building 3038 Isotopes Research Materials Laboratory, Alpha Handling Facility: References only listed, no additional information. Building 4501 High-Level Radiochemical Laboratory (1955): Principal (perhaps sole) source of CH TRU waste generated was reactor fuel research involving the actinides and a range of basic and applied actinide chemistry and studies. The largest single source of waste was a series of Pu dioxide and Pu-dioxide-microsphere dissolution studies (1974-1983). 42 drums were generated in Building 4501 primarily from glove box facilities in Rooms 126 and 127. Two drums were generated during laboratory cleanup. Building 2026 Radioactive Materials Analytical Laboratory (1965 as replacement for the High-Level Radiation Analytical Facility in 3019B). As an analytical support facility, handled materials from a wide range of AEC/ERDA/DOE programs. Also provided analytical services support to ORNL Isotopes programs as well as chemical processing steps (acid dissolutions). Most solid CH TRU waste from Bldg. 2026 originated in glove boxes and laboratory hoods, not restricted by programmatic activity. Over the past 10-15 years, a single overhead account number was used for all waste disposal activities. Building 4508

Attachment 3 - Acceptable Knowledge Source Document Summary (continued)

Site(s): Oak Ridge National Laboratory		Source Document Tracking Number: C078
AK # [b]	Source Doc. Page # [c]	AK Information Summary
		(1960s through the early 1980s): Activities conducted in the Ceramic Fuels Alpha Facility (Room 265) or Interim Plutonium Laboratory (Room 136). Both facilities were decommissioned in the mid 1980s. Fuel development work was conducted for the Gas-Cooled Fast Breeder Reactor (GCFBR), Liquid Metal Fast Breeder Reactor (LMFBR), Molten Salt Reactor Experiment (MSRE), Light Water Breeder Reactor (LWBR), and High Temperature Gas-Cooled Reactor (HTGR) programs using Pu, U, Th, and 233-U fuels. Building 4508 Activities are described in annual reports of the Metals and Ceramics Division, and from 1970 through 1973, in Chemical Technology Division annual progress reports. Throughout CH TRU wastes were generated during 1971-1984 and during decommissioning activities in 1984-1986. Drums and large boxes of waste generated 1984-1986 consist of general waste, equipment from glove boxes, and the glove boxes.
WS8, WS12	Unnumbered	Chemicals 1,1,2-trichloroethane aluminum nitrate acetone benzene carbon tetrachloride cyclohexane di (2-ethylhexyl) ethylene glycol hydrazine monohydrate hydrochloric acid lead metal methanol methyl ethyl ketone naphthalene nitric acid phenol selenium metal silver nitrate sodium hydroxide sodium bromate sodium carbonate sodium nitrate sulfuric acid toluene tributyl phosphate phosphoric acid diisopropylbenzene dodecane hydrochloric acid ammonium hydroxide mono-2-ethylhexylphosphoric acid xylene oxalic acid hydrogen peroxide hydrogen sulfide ketone

Attachment 3 - Acceptable Knowledge Source Document Summary (continued)

Site(s): Oak Ridge National Laboratory	Source Document Tracking Number: C078

Source Document Data Limitations (if any):

1. This REDC chemical list was compiled and summarized by Betty Humphreys.

Acceptable Knowlege Expert:

Travis Smith / Date: 07/16/2014

Print /Sign

[a] Provide description for non-titled information (i.e., container paperwork, MSDS sheets, etc)
[b] Obtain from Acceptable Knowledge Documentation Checklist
[c] For microfilm or microfiche, identify box, tape, reel number and location.

C-078

Moore, James W (ZQS)

From: Moore, James W (ZQS)
Sent: Monday, April 04, 2005 1:38 PM
To: Bryan Roy (E-mail)
Cc: Bolling, David H (O68); Johnson, Marshall A (J86); Randy Clark (E-mail); Mark Peet (E-mail); Moore, James W (ZQS); Hood, Debra Marlene (AQI); Riner, Gary L. (GY4)
Subject: Historical Survey - RCRA Information

Bryan,

A RCRA information search has been conducted in an attempt to gather historical information from the generating facilities relative to chemicals used. We have assembled a package that includes a summary of the effort for each building that was investigated: 7920, 3019, 3508,3028, 5505, 3038, 4508, 2026, 4501, and 3027. Each summary includes a list of references, most of which are included in the Historical Survey listing. A few additional references are included in this package. Also included in the summaries are names of persons that were or can be contacted. Approximately 94% of the CH TRU waste containers currently in storage at ORNL were generated at these ten buildings. In addition a quick overview of the remaining facilities was done and is noted on the coversheet of the package. The search team feels that most the information needed can be found in the Historical Survey references listed in the summaries. (You should already have copies of theses references.)

This package represents the first and only delivery of the general RCRA materials search. If during processing it is determined that additional, more specific information is needed FWENC should contact Gary Riner.

Unless you object this package will be delivered to Charlotte Staggs by COB tomorrow (Tuesday, April 5, 2005.)

If you have any questions please contact Gary Riner (241-3498) or Jim Moore (574-6389).

Regards,

Jim

CH-TRU CONTAINERS
ACCEPTABLE KNOWLEDGE DOCUMENTATION

An effort has been made to identify acceptable knowledge (AK) documentation to assist in the characterization and certification of CH-TRU containers generated at ORNL. Efforts were focused on the ten facilities (Bldgs 7920, 3019, 3508, 3028, 5505, 3038, 4508, 2026, 4501, and 3027) that generated the most CH-TRU containers, as ~94% (2366 of 2526) of the containers in inventory were generated in these facilities. For these ten facilities, personnel familiar with facility operations during the period when the waste was generated were interviewed, personal historical files were reviewed where available, and references cited in BJC/OR-395, *ORNL TRU Waste Historical Survey,* J. R. Trabalka and S. N. Storch, were reviewed. The results of the investigation are reported individually for each of the ten facilities on the attached summaries. In general, it was concluded that the references cited in the Trabalka report provide the best available resource for AK documentation for the facilities. Little additional information or resources were identified during the interviews or review of other documents or files that add significantly to the information available in these references.

A cursory review was performed of available documentation for the 30+ facilities that generated the remaining 6% (160) of the CH-TRU containers. Just like the 10 facilities studied more thoroughly, it was concluded that the references cited in the Trabalka report provided the best available source of AK documentation.

BUILDING 7920 CH-TRU CONTAINERS
ACCEPTABLE KNOWLEDGE DOCUMENTATION

Building Information

The primary work at the Radiochemical Engineering Development Center (REDC, Buildings 7920, 7930) has revolved around recovery and purification of transplutonium elements (Am through Fm) from target elements irradiated in the HFIR or in reactors at Savannah River. However, a wide range of activities has been carried out at the REDC on a more limited scale. Radiochemical processing includes dissolution of irradiated targets, separation of the TRU elements from fission products and miscellaneous impurities, and, finally, separation of the TRU elements from each other. Separations are accomplished by a sequence of solvent extraction, precipitation, and ion exchange processes that collectively are referred to as a *processing campaign.*

Building 7920 contains nine heavily shielded hot cells (which contain working areas called cubicles) that house equipment for target fabrication, high-radiation-level radiochemical processing, and waste handling. In addition, the building is equipped with several laboratories that are used for process development, process-control analyses, and final TRU element product purification and packaging operations.

The bulk of the REDC waste generation has occurred in Bldg. 7920, where target fabrication and primary chemical processing activities are conducted. Building 7930 has been used exclusively for purifying and packaging ^{252}Cf for distribution. Prior to March 1976, all solid TRU wastes from the REDC were managed as RH-TRU wastes. Most solid wastes from the REDC were (are) accumulated over a significant period of time, resulting in mixing of wastes from each campaign conducted during the period of accumulation. The wastes are a diverse and heterogeneous mix of materials resulting from hot cell operations, as well as from laboratory and support activities.

Hazardous Constituents

The stored casks generated by REDC prior to the mid to late 1980's have typically been considered either known or suspect RCRA mixed wastes: "known" because records indicated the presence of lead or other characteristically hazardous materials, or "suspect" either because records indicated the potential presence of hazardous materials (typically Pb or Hg) or because insufficient information was available to make a determination. The lack of information is most pronounced for wastes generated prior to July 1986.

Since the REDC is still an active processing facility, documentation appears to be better and more available than for most of the other TRU waste generating facilities. Operating procedures and published reports include descriptions of the chemical solvents used in the process areas. Records of chemicals that have been used, and may reasonably be expected to be present in the waste, from the laboratory areas are less complete. Also, data that may be needed to evaluate potentially characteristic waste in the casks is likely incomplete.

References/Sources of Information

The summary discussion and list of references provided by Trabalka (Volume 1 and Volume 2) appears to be a relatively complete compilation of information that is readily available on potential sources of RCRA contaminants in the REDC waste. REDC is still an active facility performing similar work, and since the mid- to late-1990's, disposal of newly generated waste at WIPP has been planned. Efforts have been made to meet anticipated WAC requirements.

Personal communications with Charlie Roberts, retired Waste Generating Official for Building 7920, revealed that some additional information on chemicals used in hot cell operations may be available. During processing campaigns, chemical inventories were taken frequently (often on a 24 hr basis), and a 'punch list' would be developed when additional chemicals were needed. It was hoped that operating logs or other documentation exists with some of this information. This information has not been located to date. However, chemical inventory lists are maintained for the facility. Charlie has obtained a chemical inventory, and identified chemicals that may be expected to be present in the casks. A copy is attached.

One item that has been identified and needs to be considered/evaluated is the presence of universal waste regulated under 40CFR273. Charlie Roberts confirmed that mercury vapor lamps from hot cells were disposed in the TRU casks. It is possible batteries and thermostats have also been disposed.

In addition to the potentially relevant references identified by Trablaka, and listed in the following section, a limited number of new references have been identified. These are:

2. Smith, J. H. et al. 1988. *Oak Ridge National Laboratory Transuranic Waste Certification Program,* ORNL/TM-10322/R1, Oak Ridge National Laboratory, Oak Ridge, TN.

Addressess mixed waste characterization and RCRA requirements for newly generated waste.

3. Defense Nuclear Facilities Safety Board. 2003. *Control of Red Oil Explosions in Defense Nuclear Facilities 2003*, DNFSB/Tech-33, Washington, D.C.

Addresses properties of AMSCO-125-90W dilutent used in solvent extraction. Reports from 7920 indicate AMSCO-125-82W has been used. It appears to potentially be a characteristic RCRA waste (flashpoint 56°C) and should be evaluated to verify it is not RCRA listed.

4. Scott Aviation. 1999. Material Safety Data Sheet for Carbon Monoxide Catalyst (Hopcalite). Lancaster, NY.

Hopcalite is used in the Iodine Retention System, and has been disposed in TRU casks. Disposal considerations section of the MSDS states 'These materials contain chemicals which are listed in 40CFR261'. Therefore, it should be evaluated for potential listed RCRA waste.

Potentially Relevant References from Trabalka

The references identified by Trabalka for REDC have been reviewed, and the list of references edited to include those that may contain potentially useful information on the presence or absence of RCRA waste. The potentially relevant references are listed below.

Benker, D. E., et al. 1985. *Solvent Extraction Studies with Low-Burnup Fast Flux Test Facility Fuel in the Solvent Extraction Test Facility*, ORNL/TM-9189, Oak Ridge National Laboratory, Oak Ridge, TN.

Benker, D. E., et al. 1986. *Solvent Extraction Studies with Intermediate-Burnup Fast Flux Test Facility Fuel in the Solvent Extraction Test Facility*, ORNL/TM-9514, Oak Ridge National Laboratory, Oak Ridge, TN.

Benker, D. E., et al. 1986. *Solvent Extraction Studies of Coprocessing Flowsheets—Results from Campaign 6 of the Solvent Extraction Test Facility (SETF)*, ORNL/TM-9961, Oak Ridge National Laboratory, Oak Ridge, TN.

Benker, D. E., et al. 1986. *Solvent Extraction Studies with High-Burnup Fast Flux Test Facility Fuel in the Solvent Extraction Test Facility*, ORNL/TM-9993, Oak Ridge National Laboratory, Oak Ridge, TN.

Benker, D. E., et al. 1988. *Solvent Extraction Studies of 10% TBP Flowsheets in the Solvent Extraction Test Facility Using Irradiated Fuel from the Fast Flux Test Facility*, ORNL/TM-10266, Oak Ridge National Laboratory, Oak Ridge, TN.

Bigelow, J. E. 1998. Chemical Technology Division, Oak Ridge National Laboratory, Oak Ridge, TN, memorandum to J. R. Trabalka, Chemical Technology Division, "REDC programs through the years" (February 25).

BJCL (Bechtel Jacobs Company LLC). 2001. *ORNL TRU Waste Historical Survey–Volume 1: Origins and Characteristics of Remote-Handled Solid Transuranic Wastes*, BJC/OR-395-V/1, BJCL, Oak Ridge, TN.

BJCL (Bechtel Jacobs Company LLC). 2001. *ORNL TRU Waste Historical Survey–Volume 2: Origins and Characteristics of Contact-Handled Solid Transuranic Wastes*, BJC/OR-395-V/2, BJCL, Oak Ridge, TN.

BJCL (Bechtel Jacobs Company LLC). 2001. *ORNL TRU Waste Historical Survey–Volume 3: Recorded Characteristics of Stored Solid Transuranic Wastes*, BJC/OR-395-V/3, BJCL, Oak Ridge, TN.

Bond, W. D., et al. 1983. *Solvent Extraction Studies of Co-processing Flowsheets—Results from Campaign 5 of the Solvent Extraction Test Facility (SETF)*, ORNL/TM-8598, Oak Ridge National Laboratory, Oak Ridge, TN.

Burch, W. D., Bigelow, J. E., and King, L. J. 1969. *Transuranium Processing Plant Semiannual Report of Production, Status, and Plans for Period Ending June 30, 1968*, ORNL-4376, Oak Ridge National Laboratory, Oak Ridge, TN.

Burch, W. D., Bigelow, J. E., and King, L. J. 1969. *Transuranium Processing Plant Semiannual Report of Production, Status, and Plans for Period Ending December 31, 1968*, ORNL-4428, Oak Ridge National Laboratory, Oak Ridge, TN.

Burch, W. D., Bigelow, J. E., and King, L. J. 1970. *Transuranium Processing Plant Semiannual Report of Production, Status, and Plans for Period Ending June 30, 1969*, ORNL-4447, Oak Ridge National Laboratory, Oak Ridge, TN.

Burch, W. D., Bigelow, J. E., and King, L. J. 1970. *Transuranium Processing Plant Semiannual Report of Production, Status, and Plans for Period Ending December 31, 1969*, ORNL-4540, Oak Ridge National Laboratory, Oak Ridge, TN.

Burch, W. D., Bigelow, J. E., and King, L. J. 1971. *Transuranium Processing Plant Semiannual Report of Production, Status, and Plans for Period Ending June 30, 1970*, ORNL-4588, Oak Ridge National Laboratory, Oak Ridge, TN.

Burch, W. D., Bigelow, J. E., and King, L. J. 1971. *Transuranium Processing Plant Semiannual Report of Production, Status, and Plans for Period Ending December 31, 1970*, ORNL-4666, Oak Ridge National Laboratory, Oak Ridge, TN.

Burch, W. D., Bigelow, J. E., and King, L. J. 1971. *Transuranium Processing Plant Semiannual Report of Production, Status, and Plans for Period Ending June 30, 1971*, ORNL-4718, Oak Ridge National Laboratory, Oak Ridge, TN.

Burch, W. D., Bigelow, J. E., and King, L. J. 1972. *Transuranium Processing Plant Semiannual Report of Production, Status, and Plans for Period Ending December 31, 1971*, ORNL-4767, Oak Ridge National Laboratory, Oak Ridge, TN.

Carter, W. L., Chattin, F. R., King, L. J., Kitts, F. G., and Owsley D. B. 1995. *Certification Program for Newly Generated Remotely Handled Transuranic Waste at the Building 7920 Facility of the Radiochemical Engineering Development Center*, REDC FO/WH 5200, February 9, 1995, Chemical Technology Division, Oak Ridge National Laboratory, Oak Ridge, TN.

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Personnel Contacts

Brad Patton (UT-Battelle, 574-6800)
Wayne Evans (UT-Battelle, 574-2530).
Charlie Roberts (Retired, 588-8868)

Wayne Evans Materials   BLDG. 1720

HMISR0038
11:29:13

08-18-1997
HAZARDOUS MATERIALS INFORMATION SYSTEM
Management Inventory Summary Report (by CAREA)

UNCLASSIFIED
Page: 1
Installation: ORNL

Plant: 3 Division: 303 Department: Control Area: XD059 Building: Room: Area: WA Code:
ID: LIST: Ingredient: Mix Comp: to HAZ Class: HAZ Rating:
Expiration: Inv Status: MSDS Avail: Haz Mat Grp Cd: Phy State: Pressure Cd: Temp Cd: Cont Type Cd:

hazardous organics
non hazardous organics

CAREA: XD059 CAMPBELL G.D

RECID	**	CASNO	MATERIAL NAME	C A	R T	Total VOL/WEIGHT AMOUNT	UNIT	Total POUNDS	Total KILOGRAMS	No of Items
00038		000079-00-5	1,1,2-TRICHLOROETHANE	N	N	500.0000	ML	1.5890	0.7207	1
03389		000105-05-5	1,4-DIETHYLBENZENE (DEB)	N	N	15.6250	GAL	112.4006	50.9844	4
03133		000088-58-4	2,5-DI-TERT-BUTYLHYDROQUINONE (DBHQ)	N	N	13.4092	LB	13.4092	6.0821	5
00922		000104-76-7	2-ETHYL-1-HEXANOL (ORG.)	N	Y	60.0000	L	110.3709	50.0637	3
03214		000594-61-6	2-METHYLLACTIC ACID (ORG.)	N	N	36.6138	LB	36.6138	16.6079	4
A3705		005965-83-3	5-SULFOSALICYLIC ACID DIHYDRATE	N	N	200.0000	GM	0.4409	0.2000	1
87553		NISS	ABATRON ABACURE 50-11	N	N	4.0000	GAL	32.0456	14.5356	4
87560	*	NISS	ABATRON ABOCAST (A) AND ABOCURE (B) 8508-3 IRE	N	N	24.0000	GAL	200.2870	90.8494	2
87556		NISS	ABATRON ABOCAST 7802-1 OR 7802-2	N	N	4.0000	GAL	37.5538	17.0342	1
87894	*	NISS	ABATRON ABOCOAT AND ABOCURE 8006-1(REFER TO RECI	N	N	20.0000	GAL	166.9058	75.7078	2
00015		000064-19-7	ACETIC ACID	N	N	8.0000	LI	18.5109	8.3917	3
00677		000067-64-1	ACETONE	N	N	36.9853	L	64.2514	29.1438	10
00882		000074-86-2	ACETYLENE	N	N	100.0000	CF	6.8020	3.0852	4
A8648		NISS	ACM PRODUCTS RUBBER BONDED ABRASIVE WHEELS	N	N	30.0000	OZ	1.8750	0.8500	10
90710		NISS	ACTIVATED ALUMINA	N	N	2.0000	GAL	40.0611	18.1715	2
92300		NISS	ADOGEN 364 (ORG.)	N	N	85.2500	GAL	711.4551	322.7052	3
97008		NISS	ADSORBER RESINS AMBERLITE	N	N	1.6340	QT	3.6646	1.6621	2
89621		NISS	AJAX ALL PURPOSE CLEANER (NON-PHOSPHATE)	N	N	12.0000	OZ	0.7500	0.3401	1
83734		NISS	ALPHA WIRE PIF130 PIF200	Y	N	7.5000	LB	7.4998	3.4017	6
00355		007429-90-5	ALUMINUM METAL	N	N	31.0000	LB	31.0000	14.0613	3
00356		007784-27-2	ALUMINUM NITRATE NONAHYDRATE	N	N	12500.0000	GM	27.5575	12.4995	25
00357		001344-28-1	ALUMINUM OXIDE	N	N	3.0000	LB	3.0000	1.3607	1
72868		NISS	AMERON AMERCOAT 351 RESN	Y	N	1.2500	GAL	10.4316	4.7317	1
869		NISS	AMERON AMERCOAT 351 RESN(B2868) AND CURE(B2867)	Y	N	2.0000	GAL	16.5905	7.5707	1
00368		000506-87-6	AMMONIUM CARBONATE	N	N	4.0000	LB	4.0000	1.8143	1
00369		012125-02-9	AMMONIUM CHLORIDE	N	N	500.0000	GM	1.1023	0.5000	1
00372		001336-21-6	AMMONIUM HYDROXIDE (D002)	N	N	27.0000	L	53.5340	24.3011	7
00376		006484-52-2	AMMONIUM NITRATE (D001 oxidizer)	N	N	14.9804	KG	33.0217	14.9803	7
00378		007727-54-0	AMMONIUM PERSULFATE	N	N	2.8020	KG	6.1773	2.8020	3
00381		001762-95-4	AMMONIUM THIOCYANATE	N	N	500.0000	GM	1.1023	0.5000	1
A2379		NISS	ANALYTICAL PRODUCTS PH 10.00 CALIBRATING BUFFER	N	N	500.0000	ML	1.1023	0.5000	1
87078		NISS	AO SUPERCLEAR LENS CLEANING FLUID-LIQUID	N	N	48.0000	OZ	3.1293	1.4193	3
91286		NISS	APIEZON L GREASE	N	N	25.0000	GM	[illegible]	0.0249	1
A3272		NISS	AQUET LIQUID DETERGENT	N	N	1.0000	GAL	[illegible]	3.7967	1
01730		007440-37-1	ARGON	N	N	9071.0000	CF	[illegible]	458.2413	47
95295		NISS	ARI WASP & HORNET SPRAY - FORMULA B	N	N	56.0000	OZ	[illegible]	2.0832	4
80699		NISS	ATLANTA SUNDRIES GOOF OFF REMOVER	N	Y	2.0000	GAL	[illegible]	7.5707	1
A8316		NISS	BARNEBEY & SUTCLIFFE ACTIVATED CARBON TYPE 208C	N	Y	1024.0000	LB	[illegible]	464.4832	16
A8564		NISS	BDH BUFFER, PH 4.00, RED	N	N	500.0000	ML	[illegible]	0.5000	1
88156	**	NISS	BDH EXTRAN 300	N	N	1.0000	L	[illegible]	1.0629	1
84007		NISS	BDH SODIUM SULFIDE 3% SOLUTION FOR ZINC	N	N	1500.0000	ML	[illegible]	1.5000	3
87336		NISS	BECKMAN ELECTRODE FILLING SOLUTION	N	N	400.0000	ML	[illegible]	0.4796	4
95618		NISS	BECKMAN PH 7 BUFFER SOLUTION	N	N	500.0000	ML	[illegible]	0.5000	1
00091		000071-43-2	BENZENE	Y	Y	4.0000	L	[illegible]	3.5147	1
95639		NISS	BIO RAD AG 50W-X2, -X4, -X8, -X12, AND -X16	N	N	3000.0000	GM	6.6138	3.0000	5

* Indicates MSDS is not available
** Indicates MSDS updated within last three months

AMSCO odorless mineral spirits 64741-65-7 Cas
carbon tetrachloride
Decahydronaphthalene
Para diethyl benzene
0186123 - HDHP (HDEHP) OK
OK 03785 EDTA Na salt
OK 95134 - hydroxyl ammonium nitrate
Mercuric nitrate — D002

nt: 3 Division: 303 Department: Control Area: XD059 Building: Room: Area: WA Code:
ID: LIST: Ingredient: Mix Comp: to HAZ Class: HAZ Rating:
Date Expiration: Inv Status: MSDS Avail: Haz Mat Grp Cd: Phy State: Pressure Cd: Temp Cd: Cont Type Cd:

84152		NISS	BIO-RAD DOWEX(R) 1-X2, -X4, -X8	N	N	46.2046	LB	46.2046	20.9582
93342		NISS	BIO-RAD LABORATORIES AG MP-1	N	N	1000.0000	GM	2.2046	1.0000
06770		000298-07-7	BIS(2-ETHYLHEXYL)PHOSPHATE	N	N	3.4696	L	7.4499	3.3791
03589		001303-86-2	BORIC ANHYDRIDE	N	N	500.0000	GM	1.1023	0.5000
A7769		NISS	CALLERY HOPCALITE(TM) CATALYST L-D	N	N	192.0000	LB	192.0000	87.0906
00692		007440-44-0	CARBON	N	N	500.0000	GM	1.1023	0.5000
03489	**	001306-38-3	CERIUM OXIDE	N	N	100.0000	GM	0.2204	0.0999
07159		064365-11-3	CHARCOAL, ACTIVATED	N	N	150.0000	GM	0.3306	0.1500
07278		NISS	CHLORINE SOLUTION	N	N	2.4000	LB	2.4000	1.0884
05772		000075-77-4	CHLOROTRIMETHYLSILANE	N	N	500.0000	ML	0.9457	0.4289
00286		007789-02-8	CHROMIC NITRATE NONAHYDRATE	N	N	8.0000	GM	0.0176	0.0080
A7023		NISS	CIBA CORNING PH 4.00 BUFFER	N	N	1000.0000	ML	2.2486	1.0198
A7024		NISS	CIBA CORNING PH 7.00 BUFFER	N	N	1000.0000	ML	2.2486	1.0198
86084		NISS	CIBA-GEIGY ARALDITE GY 502	N	Y	80.0000	LB	80.0000	36.2876
86084		NISS	CIBA-GEIGY RP 3209-1 HARDENER	N	Y	36.0000	PT	36.8028	16.6932
86083		NISS	CIBA-GEIGY RP 3209-1 RESIN	N	Y	36.0000	QT	191.5236	86.8716
00420		007791-13-1	COBALT(II) CHLORIDE, HEXAHYDRATE	N	N	500.0000	GM	1.1023	0.5000
95221		NISS	COLD KILL WASP/HORNET KILLER #297852	Y	Y	120.0000	OZ	10.6560	4.8335
86089		NISS	COMPRESSED AIR	N	Y	566.0000	CF	45.5808	20.6752
85593		NISS	CON-SEAL EXTRA POLYURETHANE CONCRETE SEALER	N	N	1.0000	PT	1.0431	0.4731
84231		NISS	CONROS ROSS(R) RUBBER CEMENT	N	Y	12.0000	OZ	0.5367	0.2433
00424		007440-50-8	COPPER METAL	N	N	1.5511	LB	1.5511	0.707
03839		001317-39-1	COPPER(I) OXIDE	N	N	180.0000	GM	0.3968	0.18
86421		NISS	CRONEX(R) LIQUID FIXER (CONCENTRATE) PART A	N	N	32.0000	L	70.5472	32.0000
86422		NISS	CRONEX(R) LIQUID FIXER HARDENER, PART B	N	N	7.0000	L	15.4322	7.0000
90042		NISS	CRONEX(R) X-RAY MANUAL DEVELOPER, PART A	N	N	32.0000	L	70.5472	32.0000
90043		NISS	CRONEX(R) X-RAY MANUAL DEVELOPER, PART B	N	N	7.0000	L	15.4322	7.0000
00815		000110-82-7	CYCLOHEXANE	N	N	1.7906	GAL	11.6270	5.2738
A6788			DAP CLEAR ELASTOMERIC	Y	Y	51.5000	OZ	3.1560	1.4315
95605		NISS	DAP WELDWOOD ORIGINAL CONTACT CEMENT	Y	Y	5.0000	GAL	35.2588	15.9932
A0222			DEVCON 5-MINUTE EPOXY HARDENER (REFER TO RECID 9	N	N	7.0000	OZ	0.4557	0.2065
90511		NISS	DEVCON 5-MINUTE EPOXY RESIN	N	N	192.0000	OZ	15.0192	6.8112
90509		NISS	DEVCON ZIP GRIP 4404	N	N	15.2372	OZ	0.9506	0.4293
50150			DEVOE DEVRAN 184 CLEAR CONVERTER (97460) AND ALU	Y	N	35.0000	QT	73.0212	33.1219
91641		NISS	DI(2-ETHYLHEXYL)PHOSPHORIC ACID ORE EXTRACTION A	N	N	2.0000	KG	4.4092	2.0000
07254		025340-17-4	DIETHYLBENZENE — DEB	N	N	165.0000	GAL	1376.9730	624.5907
05923		000067-43-6	DIETHYLENETRIAMINEPENTAACETIC ACID — DTPA	N	N	2.0000	KG	4.4092	2.0000
06709		007369-66-6	DIHEXYL-N,N-DIETHYLCARBAMOYL METHYL PHOSPHONATE	N	N	1.0000	LB	1.0000	0.4534
03912	**	025321-09-9	DIISOPROPYLBENZENE — DIPB	N	N	55.0000	GAL	401.6171	182.1722
00858		000095-45-4	DIMETHYLGLYOXIME	N	N	50.0000	ML	0.1102	0.0499
02589		007789-00-6	DIPOTASSIUM CHROMATE	Y	N	2.0000	GM	0.0044	0.0020
01901		034590-94-8	DIPROPYLENE GLYCOL METHYL ETHER	N	N	2.0000	GAL	15.8727	7.1998
00579		001314-36-9	DIYTTRIUM TRIOXIDE	N	N	10.0000	LB	10.0000	4.5359
00880		000112-40-3	DODECANE	N	N	4.4195	L	7.2947	3.3087
94401		NISS	DOW CHEMICAL DOWEX(R) HCR-W2, H CATION EXCHANGE	N	N	43.3069	LB	43.3069	19.6437
87243		063148-62-9	DOW CORNING 200(R) FLUID	N	N	1017.8705	ML	2.1314	0.9662
91304		NISS	DOW CORNING SILICONE PLUS(TM) PREM 100% SIL SLNT	N	N	126.0000	OZ	11.0892	5.0304
A4811		NISS	DOW CORNING(R) 736 HEAT RESISTANT SEALANT	N	N	12.0000	OZ	0.7500	0.3400
84699		NISS	DOW CORNING(R) 748 NON-CORROSIVE SEALANT	N	N	12.0000	OZ	0.7500	0.3400
87241		NISS	DOW CORNING(R) HIGH VACUUM GREASE	N	N	10.6000	OZ	0.6910	0.3134

OK OK

* indicates MSDS is not available
** indicates MSDS updated within last three months

Plant: 3 Division: 303 Department: Control Area: XD059 Building: Room: Area: WA Code:
Item ID: LIST: Ingredient: Mix Comp: to HAZ Class: HAZ Rating:
Date Expiration: Inv Status: MSDS Avail: Haz Mat Grp Cd: Phy State: Pressure Cd: Temp Cd: Cont Type Cd:

90688		060267-37-0	DOWEX 50WX8	N	N	50.0000	LB	50.0000	22.6798	
82359		NISS	DOWEX(R) 50WX8, 100-200 MESH, H CATION EXCHANGE	N	N	5.0000	LB	5.0000	2.2678	
86876		NISS	DOWEX(R) SBR-CL ANION EXCHANGE RESIN	N	N	1.0000	LB	1.0000	0.4535	
B4730		NISS	DYNAMIS EPO PATCH & GROUT	N	N	250.0000	LB	250.0000	113.3990	
97120		NISS	EICHROM INDUSTRIES TEVA-SPEC(R) RESIN	N	N	25.0000	GM	0.0551	0.0249	
85199		NISS	EICHROM LN RESIN	N	N	100.0000	GM	0.2204	0.0998	
A3651		NISS	EICHROM RE*SPEC RESIN	N	N	50.0000	GM	0.1102	0.0499	
A4167		NISS	EM SCIENCE ETHYL ALCOHOL; DENATURED ALCOHOL	N	Y	16.0000	L	28.5716	12.9596	
93534		NISS	ENCON SAFETY PRODUCTS HYDROSEP	N	N	32.0000	OZ	2.0860	0.9460	
A7093		NISS	ENVIRONMENTAL SCIENTIFIC RADPAD	N	N	1.0000	LB	500.0000	226.7985	
A5474		NISS	ENVIRONMENTAL SCIENTIFIC RADSORB	N	N	55.0000	LB	55.0000	24.9478	
04035		012061-16-4	ERBIUM OXIDE	N	N	100.0000	GM	0.2204	0.1000	
01120		000064-17-5	ETHYL ALCOHOL	N	Y	15.0000	GAL	98.8041	44.8170	
00919		000107-21-1	ETHYLENE GLYCOL	N	Y	6.4001	GAL	59.2218	26.8626	
00917		000060-00-4	ETHYLENEDIAMINE TETRAACETIC ACID	N	N	700.0000	GM	1.5432	0.7000	
92612		NISS	EXXON RONEX MP	N	N	252.0000	OZ	15.2784	6.9300	18
87186		NISS	FERRIC CHLORIDE 10%	N	N	400.0000	GM	0.8818	0.4000	1
00434		007782-61-8	FERRIC NITRATE, NONAHYDRATE	N	N	5000.0000	GM	11.0230	5.0000	10
00441		007782-63-0	FERROUS SULFATE, HEPTAHYDRATE	N	N	1000.0000	GM	2.2046	1.0000	2
90037		NISS	FISHER SCIENTIFIC BUFFER SOLUTIONS, PH 6-8	N	N	500.0000	ML	1.1023	0.5000	1
A5277		NISS	FLEXOVIT CUT-OFF WHEELS AND DEPRESSED CENTER GRI	Y	N	20.0000	OZ	1.2500	0.5668	4
04136		000518-47-8	FLUORESCEIN, DISODIUM SALT	N	N	5000.0000	GM	11.0230	5.0000	10
00014		000064-18-6	FORMIC ACID	N	N	500.0000	ML	1.3448	0.6099	1
04148	**	007440-54-2	GADOLINIUM METAL	N	N	1.3200	GM	0.0028	0.0011	2
87503		NISS	GASOLINE, REGULAR UNLEADED	Y	Y	5.0000	GAL	41.7264	18.9269	1
89856		NISS	GB DUCT SEAL	N	N	20.0000	LB	20.0000	9.0716	4
90548		NISS	GC ELECTRONICS SOLDERING PASTE, 10-1207	N	N	6.0000	OZ	0.3364	0.1524	4
90866		NISS	GE SILICONE SEALANT GE5090	N	N	103.0000	OZ	6.7150	1.0460	10
A6849		NISS	GEOCEL PROFLEX 2300 SEALANT	N	Y	160.0000	OZ	9.9088	4.4944	16
B6647		NISS	GIBSON-HOMANS 1010, 1011, 1012 - NEOPRENE SEALAN	Y	Y	120.0000	OZ	8.9964	4.1800	12
92698		NISS	GTE THORIATED TUNGSTEN ELECTRODES	Y	N	3.0000	LB	3.0000	1.3605	3
01861		007440-59-7	HELIUM	N	N	4140.0000	CF	46.1334	20.9215	23
00082		000100-97-0	HEXAMETHYLENETETRAMINE	N	N	1.0000	KG	2.2046	1.0000	1
04245		012055-62-8	HOLMIUM OXIDE	N	N	220.0000	GM	0.4849	0.2199	3
89515		NISS	HOUSEHOLD (HANDY) OIL	N	N	21.6763	OZ	1.4128	0.6406	6
02440		007803-57-8	HYDRAZINE MONOHYDRATE	Y	N	1.0000	L	2.2707	1.0299	1
00299		010035-10-6	HYDROBROMIC ACID	N	N	500.0000	ML	3.0533	1.3849	
00870		007647-01-0	HYDROCHLORIC ACID	N	N	149.0000	LI	389.9285	176.8705	1
01113		007647-01-0	HYDROCHLORIC ACID SOLUTIONS INCLUDING TECHNICAL	N	N	20.0000	L	50.6176	22.9599	1
92587		NISS	HYDROGEN (2-5%) IN ARGON	N	N	900.0000	CF	72.4785	32.8758	3
00443		NISS	HYDROGEN PEROXIDE SOLUTION (LESS THAN 52% PEROXI	N	N	9.2000	LI	20.2824	9.1991	10
00952		000123-31-9	HYDROQUINONE	N	N	1.0000	LB	1.0000	0.4535	1
00956	**	005470-11-1	HYDROXYLAMINE HYDROCHLORIDE	N	N	1700.0000	GM	3.7479	1.7000	4
A7687		007790-26-3	ICN BIOMEDICALS SODIUM IODIDE I-131	N	N	5.0000	ML	0.0110	0.0049	1
92713		NISS	INCO INCONEL(R) FILLER METAL 62 & 62T AND 82 & 8	Y	Y	10.0000	LB	10.0000	4.5358	2
82362		NISS	INDICATING DRIERITE	N	N	2.5000	LB	2.5000	1.1338	2
83223		NISS	INDRESCO LUB-A-TUBE "KS" COMPOUND	N	N	1.0000	QT	2.0028	0.9084	1
82726		NISS	INLAND-19	N	N	18.0000	L	34.3242	15.5682	18
91495		NISS	INSTA-FOAM OZONE FRIENDLY GREAT STUFF	N	N	288.0000	OZ	24.4104	11.0724	2
07828		012068-85-8	IRON SULFIDE	N	N	15.0000	GM	0.0330	0.0148	2

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Do:	00707	**	000067-63-0	ISOPROPYL ALCOHOL ; if > 24% alcohol	N	N	57.1662	GAL	374.7374	169.9795
	81082		NISS	ISOPROPYL ALCOHOL 70% RUBBING	N	N	32.0000	LI	61.9400	28.0952
	85631		NISS	JOHNSON MATHEY TETRAAMINEPALLADIUM (II) NITRATE	N	N	10.0000	GM	0.0220	0.0099
	85630		NISS	JOHNSON MATHEY TETRAAMINEPLATINUM (II) NITRATE S	N	N	2.0000	GM	0.0044	0.0019
	82905		NISS	KANO KROIL	N	Y	6.0000	GAL	43.1112	19.555
	89779		NISS	KARNAK FLASHING CEMENT ASB-FREE	N	N	5.0000	GAL	43.3955	19.6840
	81351		NISS	KODAK PHOTO-FLO 200 SOLUTION	N	N	4.3000	L	9.7641	4.4289
	00265		007439-92-1	LEAD METAL	Y	Y	5.0000	LB	5.0000	2.2678
	91052	**	NISS	LEAK LOCK(R) PIPE JOINT COMPOUND	N	Y	27.0000	OZ	2.2878	1.0368
OK	01115		007447-41-8	LITHIUM CHLORIDE	N	N	49.0000	KG	108.0272	49.000
	05745		001310-65-2	LITHIUM HYDROXIDE	N	N	1546.4030	GM	3.4094	1.546
OK	00253		001310-66-3	LITHIUM HYDROXIDE MONOHYDRATE	N	N	2000.0000	GM	4.4092	2.000
	00461		007790-69-4	LITHIUM NITRATE	N	N	1.5000	KG	3.3069	1.500
	04392		010377-48-7	LITHIUM SULFATE	N	N	500.0000	GM	1.1023	0.5000
	87766		NISS	LOCTITE ADHESIVE/SEALANT 262	Y	N	40.0000	ML	0.0924	0.0416
	87925		NISS	LOCTITE BLACK MAX(TM) TOUGHENED ADHESIVE	N	N	2.0000	OZ	0.1302	0.0590
	92486		NISS	LOCTITE DEPEND(R) NO-MIX ADHESIVE	Y	N	50.0000	ML	0.1212	0.0548
	88568		NISS	LOCTITE LOCQUIC(R) PRIMER N (AEROSOL)	N	Y	12.0000	OZ	.0326	0.4682
	88546		NISS	LOCTITE MASTER GASKET(R) SEALANT	Y	Y	25.0000	ML	0.0606	0.0274
	85214		NISS	LOCTITE PRISM(R) 426 BLACK TOUGHENED GEL	N	N	40.0000	GM	0.0880	0.03
	81452		NISS	LOCTITE PST(R) HIGH TEMPERATURE ANTI-GALLING PIP	Y	Y	100.0000	ML	0.512	0.11
	88751		NISS	LOCTITE QUICK METAL(TM) PRESS FIT REPAIR	Y	Y	10.0000	ML	0.042	0.0109
	94079		NISS	LOCTITE QUICK SET(TM) 404 INDUSTRIAL ADHESIVE	N	N	80.0000	GM	0.176	0.0796
	88752		NISS	LOCTITE RC(TM) 609 RETAINING COMPOUND GENERAL PU	Y	N	10.0000	ML	0.02	0.0109
	86128		NISS	LOCTITE REMOVABLE THREADLOCKER 242	Y	Y	60.0000	ML	0.132	0.0594
	89865		NISS	LOCTITE SUPERBONDER(R) 409	N	N	40.0000	GM	0.0880	0.0398
	95274		NISS	LOCTITE SUPERBONDER(R) 416 GAP FILLING INSTANT A	N	N	2.0000	OZ	0.1368	0.0620
	87492		NISS	LOCTITE SUPERBONDER(R) 495 INSTANT ADHESIVE	N	N	2.0000	OZ	0.1368	0.0620
	89860		NISS	LOCTITE SUPERFLEX(R) 596 HIGH TEMPERATURE SILICO	N	N	300.0000	ML	0.6944	0.3149
	81299		NISS	LOCTITE SUPERFLEX(R) ULTRA BLUE(TM) SILICONE	N	N	600.0000	ML	1.7194	0.7798
	94357		NISS	LOCTITE(R) 271 THREADLOCKER	Y	N	20.0000	ML	0.0440	0.0198
	04398		012032-20-1	LUTETIUM OXIDE	N	N	30.0000	GM	0.0661	0.0299
	06579		010034-99-8	MAGNESIUM SULFATE HEPTAHYDRATE	N	N	50.0000	GM	0.1102	0.0499
	A8792		NISS	MASTER BUILDERS CONCRESIVE LIQUID (LPL), PART B	N	Y	2.0000	GAL	16.6904	7.5706
	96306		NISS	MASTER BUILDERS MASTERFLOW 928 GROUT	Y	N	45.0000	LB	45.0010	20.4123
	82502		NISS	MASTER MECHANIC AEROSOL	N	Y	32.0000	OZ	2.0863	0.9463
	00270		007487-94-7	MERCURIC CHLORIDE	N	Y	1.5000	KG	3.3069	1.5000
	00318	**	000067-56-1	METHANOL	N	Y	12.0000	L	20.9629	9.5086
	00037		000078-93-3	METHYL ETHYL KETONE	N	Y	1.0000	GAL	6.7212	1.0487
	05886		008012-95-1	MINERAL OIL, SEVERELY REFINED	N	N	41.5000	L	80.2832	3.4162
→	06436		008042-47-5	MINERAL OIL, WHITE — used oil / area	N	N	275.0000	GL	1971.3665	894.2060
	A9544		NISS	MOBIL DTE 11M	N	N	2.0000	QT	3.6343	1.485
	96363			N,N-BIS(2-METHYLPROPYL)-2-(OCTYLPHENYLPHOSPHENYL	N	N	4.0000	LB	4.0000	1.42
	81072		NISS	NAC INTERNATIONAL NS-4-FR NEUTRON ABSORBER KIT (	N	N	4.5000	GAL	37.5537	17.00
	00064		000091-20-3	NAPHTHALENE	N	N	500.0000	GM	1.1023	0.50
	04597		001313-97-9	NEODYMIUM OXIDE	N	N	1.0000	KG	2.2046	1.00
	90644		NISS	NEV-SZ NI LAB NGBT8 8OZ BT/C	Y	Y	48.0000	OZ	3.0000	1.360
	82613		NISS	NEW PIG AGGRESSIVE SPILL KIT (REFER TO RECIDS 93	N	N	35.0000	LB	35.0000	15.875
	81408		NISS	NEW PIG ECONOMY MAT UNIVERSAL	N	N	53.0000	LB	53.0000	24.040
	82614		NISS	NEW PIG NON-AGGRESSIVE SPILL KIT (REFER TO RECID	N	N	5.0000	LB	5.0000	2.26

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	B2611		NISS	NEW PIG PIG(R) MARKING STICKS	N	N	1.0000	LB	1.0000	0.4535
	91257	**	NISS	NEW PIG(R) REPAIR PUTTY	Y	N	147.0000	OZ	9.1875	4.1673
OK	02529		007791-20-0	NICKEL CHLORIDE HEXAHYDRATE - but very toxic	Y	N	100.0000	GM	0.2204	0.1000
	00321		007440-02-0	NICKEL METAL	Y	Y	2.0000	LB	2.0000	0.9070
Doc	00275		007697-37-2	NITRIC ACID (oxidizer	N	N	25.0000	L	82.8379	37.5750
Doc	02017		010102-43-9	NITRIC OXIDE (oxidizer	N	N	345.8078	LB	346.6052	157.2138
	02018		000139-13-9	NITRILOTRIACETIC ACID	Y	N	100.0000	GM	0.2204	0.1000
	04624		007727-37-9	NITROGEN	N	N	9614.0000	CF	750.5836	340.4610
	94627		NISS	NORTON COATED ABRASIVE PRODUCT - ADALOX & METALI	N	N	6.0000	LB	6.0000	2.7214
	A9771		NISS	NORWECO BIO-NEUTRALIZER(R)	N	N	540.0000	LB	540.0000	244.9416
	91282		NISS	OATEY PURPLE PRIMER/CLEANER	N	Y	2.0000	PINT	1.6482	0.7476
OK	00144		006153-56-6	OXALIC ACID, DIHYDRATE	N	N	15.1496	KG	33.3989	15.1493
	01133		007782-44-7	OXYGEN	N	Y	260.0000	CF	23.1943	10.5208
	89735		NISS	P-10 NUCLEAR COUNTER MIXTURE	N	N	7911.4000	CF	639.5851	290.1110
	04753		007440-05-3	PALLADIUM METAL	N	N	16.0000	LB	16.0000	7.2574
OK	87332		064771-72-8	PARAFFINS [PETROLEUM], NORMAL C5-20	N	N	2.0000	PT	1.5646	0.7096
	A1841		NISS	PEARL ABRASIVE RESINOID BONDED ABRASIVE CUTTING/	N	N	12.0000	LB	12.0000	5.4420
	91055		NISS	PERMATEX QUICK GEL(TM) NON-RUN INSTANT ADHESIVE	N	N	240.0000	GM	1.5280	0.2388
	86793		NISS	PERMATEX(R) HYDRAULIC JACK OIL	N	N	14.0000	QT	26.4335	11.9899
	95587		NISS	PERMATEX(R) THREAD SEALANT WITH TEFLON	N	N	4.0000	OZ	0.3920	0.1324
	00111		000108-95-2	PHENOL	N	Y	0.5000	LB	0.5000	0.2267
	00388		000077-09-8	PHENOLPHTHALEIN	N	N	0.7756	LB	0.7756	0.3516
	94934		NISS	PIG(R) MATS	N	N	39.0000	LB	39.0000	17.6902
	A4652		NISS	PIG(R) PATCH #PTY227, PART A (A4650), PART B (A4	N	N	8.0000	LB	8.0000	3.6286
	90960		NISS	PLEXIGLAS(R) G ACRYLIC SHEET	N	N	24.3600	LB	24.3600	11.0496
	06753		009002-88-4	POLYETHYLENE	N	N	1042.2000	LB	1042.2000	472.7372
	A7156		009002-84-0	POLYTETRAFLUOROETHYLENE	N	N	125.0000	LB	125.0000	56.6995
	92229		NISS	POLYWATER(R) LUBRICANT J	N	N	2.0000	GAL	16.8574	7.6464
	04903		000298-14-6	POTASSIUM BICARBONATE	N	N	500.0000	GM	1.1023	0.5000
OK	00495		000584-08-7	POTASSIUM CARBONATE	N	N	46500.0000	GM	102.5152	46.5005
	00496		003811-04-9	POTASSIUM CHLORATE	N	N	300.0000	GM	0.6613	0.3000
OK	00048		001310-58-3	POTASSIUM HYDROXIDE	N	N	55.0000	GAL	459.0858	208.2400
	06541		001310-58-3	POTASSIUM HYDROXIDE SOLUTIONS	N	N	165.1321	GL	2097.4309	951.3880
Doc	00508		007757-79-1	POTASSIUM NITRATE (oxidizer)	N	N	7.0000	KG	15.4322	7.0000
	50079			PPG AQUAPON PAINT COMPONENTS A & B (87050, 89385	N	N	6.0000	GL	50.0715	22.7121
	89448		NISS	PPG QUICK DRY SPRAY ENAMELS, 55-B	N	Y	144.0000	OZ	7.0404	3.1932
	85575		NISS	PPG REZ VARNISHES 77-A	N	N	1.0000	GAL	8.3452	3.7853
	89985		NISS	PPG WHITE GALVANIZED STEEL PRIMER, 6-209	N	N	1.0000	GAL	13.6862	6.2100
	00323		000074-98-6	PROPANE	N	N	520.0000	LB	520.0000	235.8640
	87535		NISS	RBS-35 CLEANING AGENT	N	N	40.0000	KG	88.1840	39.9992
	B0582		NISS	REACTOR EXPERIMENTS POLY/CAST	N	N	100.0000	LB	100.0000	45.3596
	92817		NISS	RECTORSEAL(R) NO. 100-W(TM)	N	N	384.0000	OZ	33.0456	14.9880
	05663		000989-38-8	RHODAMINE 6G	N	N	1450.0000	GM	3.1958	1.4497
	92397		NISS	RIDGID DARK THREAD CUTTING OIL	N	N	3.0000	GAL	21.7812	9.8796
	92309		NISS	ROHM AND HAAS PRIMENE(R) JM-T	N	N	500.0000	ML	1.1023	0.5000
	04997		007440-18-8	RUTHENIUM METAL	N	N	10.0000	GM	0.0220	0.0099
	B0559	**	NISS	SEE RECID 91257	Y	N	48.0000	OZ	3.0000	1.3607
	00280		007782-49-2	SELENIUM METAL	N	N	50.0000	GM	0.1102	0.0499
	B2047		NISS	SELIG ENVIRONMENTAL MASTER MECH-AERO	N	Y	240.0000	OZ	13.2996	6.0324
	B2046		NISS	SELIG ENVIRONMENTAL MASTER MECH-BULK	N	N	4.0000	GAL	27.3725	12.4160

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	A6878		NISS	SIKADUR 32 HI MOD PART A (A6876) AND PART B (A68	Y	N	4.0000	GAL	33.3810	15.1414	2
	91048	*	NISS	SIKAGARD 62, YELLOW, GREEN, GRAY, RED, TAN (A293	N	N	20.0000	GL	166.9055	75.7075	5
	00809		063231-67-4	SILICA GEL	N	N	14.8560	KG	32.7522	14.8563	1
OK	05786		014808-60-7	SILICA, CRYSTALLINE - QUARTZ	Y	N	4000.0000	GM	8.8184	4.0000	8
OK	01400		007761-88-8	SILVER NITRATE	N	N	0.7500	LB	0.7500	0.3401	1
	00525		000144-55-8	SODIUM BICARBONATE	N	N	1.0000	LB	1.0000	0.4535	1
OK	00531		007789-38-0	SODIUM BROMATE - oxidizer	N	N	3.2268	KG	7.1138	3.2267	2
OK	00534		000497-19-8	SODIUM CARBONATE	N	N	5500.0000	GM	12.1253	5.4998	11
	00536		007647-14-5	SODIUM CHLORIDE	N	N	2000.0000	GM	4.4092	2.0000	4
OK	00543		001310-73-2	SODIUM HYDROXIDE D002	N	N	33.7810	L	74.4802	33.7840	1
	A4073	**	NISS	SODIUM HYDROXIDE 40-50% SOLUTIONS	N	N	330.0000	GAL	4034.5314	1830.0510	6
	06411		NISS	SODIUM HYDROXIDE SOLUTIONS (>10%)	N	N	219.9333	GAL	1835.4158	832.5390	75
	06414		NISS	SODIUM HYDROXIDE, <10%	N	N	4.0000	L	9.2064	4.1756	4
OK	06410		NISS	SODIUM HYPOCHLORITE SOLUTIONS	N	N	6500.0000	ML	16.4645	7.4672	13
	00546		007681-82-5	SODIUM IODIDE	N	Y	125.0000	GM	0.2755	0.1249	1
OK	00528		007681-57-4	SODIUM METABISULFITE, ANHYDROUS	N	N	24.0000	KG	52.9104	24.0000	2
OK	00549		007631-99-4	SODIUM NITRATE - oxidizer	N	N	97.0000	KG	213.8462	97.0000	28
OK	00155		000062-76-0	SODIUM OXALATE	N	N	6500.0000	GM	14.3299	6.1000	13
	00254		001313-60-6	SODIUM PEROXIDE	N	N	250.0000	GM	0.5511	0.2499	1
OK	00529		001330-43-4	SODIUM TETRABORATE	N	N	500.0000	GM	1.1022	0.5000	
OK	00564		007772-98-7	SODIUM THIOSULFATE	N	N	3.0000	KG	6.6138	3.0000	
	05885		010102-17-7	SODIUM THIOSULFATE, PENTAHYDRATE	N	N	2500.0000	GM	5.5115	2.5000	
	0658		000057-11-4	STEARIC ACID	N	N	900.0000	GM	1.9841	0.9000	2
	0085		NISS	STECO TAP MAGIC ALUMINUM CUTTING FLUID	N	N	6.0000	PT	5.1570	2.3388	6
	00572		007704-34-9	SULFUR	N	N	25.0000	GM	0.0551	0.0249	1
	00351		007664-93-9	SULFURIC ACID, >40%	Y	N	1.5000	L	6.0846	2.7598	2
	00869		014807-96-6	TALC (POWDER), CONTAINING NO ASBESTOS FIBERS	N	N	0.6804	KG	1.5003	0.6805	1
	87084		NISS	TAP MAGIC CUTTING FLUID	N	Y	128.0000	OZ	8.3448	3.7848	8
	90762		NISS	TAPECOAT 20	Y	N	120.0000	LB	120.0000	54.4308	12
	90763		NISS	TAPECOAT PRIMECOAT M-6	N	Y	2.0000	GAL	18.3596	8.3278	2
	02140		013494-80-9	TELLURIUM	N	N	50.0000	GM	0.1102	0.0499	1
	05216		007446-07-3	TELLURIUM DIOXIDE	N	N	25.0000	GM	0.0551	0.0249	1
	05218		012738-76-0	TERBIUM OXIDE	N	N	10.0000	GM	0.0220	0.0099	1
OK	05270		013823-29-5	THORIUM NITRATE - oxidizer + radioactive	N	N	5000.0000	GM	11.0231	5.0000	1
	83518		013470-07-0	THORIUM NITRATE TETRAHYDRATE	N	N	5000.0000	GM	11.0231	5.0000	1
	00107		000108-88-3	TOLUENE	N	Y	7.1000	LI	13.5546	6.1478	8
	A1874		NISS	TRA-DUCT 2902 HARDENER	N	N	6.0000	LB	6.0000	2.7210	6
	00909		000078-50-2	TRI-N-OCTYLPHOSPHINE OXIDE	N	N	400.0000	GM	0.8817	0.3998	3
	08104		000102-76-1	TRIACETIN	N	N	1.0000	L	2.5564	1.1595	1
OK	00139		000126-73-8	TRIBUTYL PHOSPHATE - TBP	N	N	4.7000	L	10.0786	4.5714	6
	00039		000079-01-6	TRICHLOROETHYLENE	Y	Y	12.5000	L	40.3496	18.3021	4
	A0627		NISS	TUNGSTEN CERIUM ELECTRODES	N	N	100.0000	OZ	6.2500	2.8340	10
	02177		008006-64-2	TURPENTINE	N	N	2.0625	GAL	14.8195	6.7220	2
	00908		000057-13-6	UREA	N	N	15.5000	LB	15.5000	7.0306	2
	89871		NISS	USG JOINT TREATMENT PRODUCTS - READY MIXED COMPO	N	Y	62.0000	LB	62.0000	28.1230	1
	C0600		000050-81-7	VITAMIN C	N	N	500.0000	GM	1.1023	0.5000	1
	95296		NISS	VITRIFIED (V BOND): A OR C ABRASIVE GRINDING WHE	Y	N	168.0000	OZ	10.5000	4.7616	24
	90957		NISS	WINDEX GLASS CLEANER BLUE, RETAIL	N	Y	384.0000	OZ	24.7848	11.2416	12
	B0702		NISS	WOOD FINISH BY MINWAX	N	N	4.0000	QT	6.8598	3.1115	
	A1222		NISS	XEROX 1040/1045/1048/1050/5042/5052 DRY INK PLUS	N	N	20.0000	LB	20.0000	9.0715	

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02677	007699-45-8	ZINC BROMIDE		N	N	300.0000	ML	0.6613	0.2998	2
A7692	NISS	ZIRCAR ALUMINA *RIGIDIZER/HARDENER*		N	N	1.0000	QT	2.0863	0.9463	1
92533	NISS	ZIRCAR PRODUCTS ZIRCAR(R) ALUMINA INSULATING PRO	Y	N		3.0000	GAL	25.0356	11.3559	3
83013	NISS	ZIRCAR(R) AEROSPEX AXL, AEROSPEX AXM, AEROSPEX A	Y	N		30.5000	LB	30.5000	13.8334	18
92534	NISS	ZIRCAR(R) ALUMINA BULK FIBER OR ALUMINA INSULATI	Y	N		1.0000	LB	1.0000	0.4535	1
A4173	NISS	ZIRCAR(R) FIBROUS CERAMICS ALUMINA CEMENT	Y	N		1.0000	QT	2.0863	0.9463	1
92537	NISS	ZIRCAR(R) ZIRCONIA BULK FIBER ZYBF2	Y	N		3.0000	LB	3.0000	1.3607	1
00843	001314-23-4	ZIRCONIUM OXIDE		N	N	1.0000	KG	2.2046	1.0000	1
05805	013826-66-9	ZIRCONYL NITRATE D001		N	N	1000.0000	GM	2.2046	1.0000	2
06967	014985-18-3	ZIRCONYL NITRATE HYDRATE		N	N	6500.0000	GM	14.3299	6.4990	13
		CAREA XD059 Totals:						25826.2212	11714.6278	1526

Name Title Start End Code Vol

* indicates MSDS is not available
** indicates MSDS updated within last three months

BLDG 3019A&B CH-TRU CONTAINERS
ACCEPTABLE KNOWLEDGE DOCUMENTATION

Building Information

3019A – Radiochemical Development Facility (formerly Radiochemical Processing Pilot Plant)

1. separation and purification of plutonium
   - From 1945 to 1951, pilot plant testing of the REDOX Process; methyl ethyl ketone (hexone) used as the organic solvent and aluminum nitrate used to improve separation
   - From 1948 to 1960, pilot plant testing of the PUREX Process; tributyl phosphate (TBP) used as the organic solvent and nitric acid used to improve separation
   - From 1949 to 1968, Fluoride Volatility reprocessing testing, F_2 for ^{235}U recovery from molten salt fuel
   - From 1952 to present, testing of the THOREX process, ^{233}U and thorium recovery
2. purification of thorium, uranium, transuranium, and fission product materials
3. national repository (and dispensing facility) for ^{233}U for DP

3019B – Analytical laboratory used prior to the current Bldg 2026 laboratory

References/Sources

- ref 1: Brooksbank, RE, ORNL/TM-12720, Historical and Programmatic Overview of Building 3019, August 1994

BJCL (Bechtel Jacobs Company LLC). 2001a. *ORNL TRU Waste Historical Survey–Volume 2: Origins and Characteristics of Contact-Handled Transuranic Wastes*, BJC/OR-395-V/2 , BJCL, Oak Ridge, TN.

BJCL (Bechtel Jacobs Company LLC). 2001b. *ORNL TRU Waste Historical Survey–Volume 3: Recorded Characteristics of Stored Solid Transuranic Wastes*, BJC/OR-395-V/3, BJCL, Oak Ridge, TN.

Personnel Contacts

- Krichinsky, Alan M., 241-1820, Bldg 3019A, MS-6046
- Starnes, Billy W., 241-1837, Bldg 3019A, MS-6046

BLDG 3508 CH-TRU CONTAINERS
ACCEPTABLE KNOWLEDGE DOCUMENTATION

Building Information

As described in BJC/OR-395, *ORNL TRU Waste Historical Survey,* J. R. Trabalka and S. N. Storch, Bldg. 3508, Alpha Isolation Laboratory, was used to develop solvent extraction processes for transuranium and transplutonium elements, as well as a variety of other R&D activities. Discussions with Lynn Sowder and review of his historical file uncovered the table of Typical Toxic and Flammable Materials in Bldg. 3508 (see Attachment 1). This table was in a Facility and Process Description in an excerpt from an undated and unidentified document. The *Building 3508, Alpha Isolation Laboratory – Hazards Evaluation, Vol. 9* in the file provided by Sara Welch contains a similar table, with slightly different materials (see Attachment 2).

References in the Trabalka report pertaining to Bldg. 3508 were also reviewed. An extensive variety of chemicals and potential hazardous or RCRA materials, some of which are included in the tables cited above and some of which are not, are mentioned in these references. However, many of the references are scientific or research reports and generally do not provide the location of the operations described, the quantity of materials involved, information on how they might have been handled or dispositioned. Many of the materials listed are unusual compounds formed in the course of the research being conducted. So it is difficult to determine the relevance of this information to the characterization of the containers in question.

References/Sources

- Historical file of Lynn Sowder, including Facility and Process Description (undated) and *Facility Walk-down Questionnaire* (2001)
- Sara Welch file, including *Building 3508, Alpha Isolation Laboratory – Hazards Evaluation, Vol. 9* (1960)
- Trabalka report, references cited in Sec. 4.2.3:
  - Bond, W. D., and Leuze, R. E. 1975. *Feasibility Studies of the Partitioning of Commercial High-Level Wastes Generated in Spent Fuel Reprocessing*, ORNL-5012, Oak Ridge National Laboratory, Oak Ridge, TN.
  - Bond, W. D., and Leuze, R. E. 1976. "Removal of Actinides from High-Level Wastes Generated in the Reprocessing of Commercial Fuels," pp. 423–432 in *Transplutonium 1975*, North-Holland, Amsterdam.
  - Bond, W. D., and Leuze, R. E. 1980. "Removal of Americium and Curium from High-Level Wastes," pp. 441–453 in *Actinide Separations*, ACS Symposium Series No. 117, J. D. Navratil and W. W. Schulz (eds.), American Chemical Society, Washington, D.C.
  - Chemical Technology Division. 1970. *Chemical Technology Division Annual Progress Report for Period Ending May 31, 1970*, ORNL-4572, Oak Ridge National Laboratory, Oak Ridge, TN.
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- Jolley, R. L., Genung, R. K., McNeese, L. E., and Mrochek, J. E. 1994. *The ORNL Chemical Technology Division 1950–1994*, ORNL/M-2733/R1, Oak Ridge National Laboratory, Oak Ridge, TN.
- Kappelmann, F. A., Baybarz, R. D., Rom, A. M., and Hickey, R. L. 1973. *Safety Analysis of the Alpha Isolation Laboratory, Bldg. 3508*, ORNL/TM-3938, Oak Ridge National Laboratory, Oak Ridge, TN.
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- Thompson, G. H., et al. 1979. *Actinide Recovery from Combustible Waste: The Ce(IV)-HNO_3 System, Final Report*, RFP-2907, Rocky Flats Plant, Golden, CO.
- Till, J. E., Kaye, S. V., and Trabalka, J. R. 1976. *The Toxicity of Uranium and Plutonium to the Developing Embryos of Fish*, ORNL-5160, Oak Ridge National Laboratory, Oak Ridge, TN.

Personnel Contacts

- Hurtis Hodges (Facility Complex Manager)
- Lynn Sowder (Assigned to building in 1986)

ORNL. 3508
ATTACHMENT 1

comprise the first floor. Normal entry into the building is possible at either end of the office corridor. All laboratories and administrative areas are located on the first floor; various supporting equipment (air

Table 4-2. Typical Toxic and Flammable Materials in Building 3508

Material (form)	Usage, L/year
HNO_3 (0.1 to 15.7 M solution)	200
Tributyl phosphate (30%), dodecane	30
Di(2-ethylhexyl) phosphoric acid (HDEHP) (0.1 to 0.7 M solution)	20
Diisopropylbenzene (DIPB)	20
Dodecane	20
Alcohol	10
HCl (0.1 to 12 M solution)	10
Acetone	10
NH_4OH	10
NaOH	10

conditioning, ventilation, off-gas, etc.) are located on the second floor. The two floors are completely isolated from one another and are connected only by a door located at the top of a spiral stairway from the utility room.

A schematic outline of the first floor is shown in Fig. 4-2, and the available facilities and their functions are listed in Table 4-3.

The interior partition walls of the first floor, except the utility room, are of metal panel construction. The entire first floor, excluding the utility room, has a continuous suspended ceiling that serves as a containment barrier and prevents service lines and structural members from becoming contaminated in the event of an accident in which alpha emitters are dispersed into the laboratory rooms. The floor coverings in the room for training personnel in glove box operations, the locker room, offices,

X-622

ATTACHMENT 2 (p. 1) MASTER COPY

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ORNL
CENTRAL FILES NUMBER
CF-60-5-24

DATE: May 20, 1960

COPY NO. 83

SUBJECT: BUILDING 3508, ALPHA ISOLATION LABORATORY - HAZARDS EVALUATION, Vol. 9

TO: F. L. Culler

FROM: E. J. Frederick and R. E. Leuze

ABSTRACT

A hazards evaluation of the Alpha Isolation Laboratory facilities and operations indicates that the maximum credible accident potential exists in the multicurie purification programs. Dose values, computed according to the standard model and as a special case, are reported for the release of 30 g of Am^{241} and 250 g of U^{233}, respectively, from the glove box. It is concluded that sufficient safety features are built into the glove box to prevent the theoretical credible accident from ever occurring.

Standards of construction and containment, assumptions made to evaluate the potential hazards of release of radioactive material, and methods of calculation used for development of this hazards analysis are given in ORNL-2956, Summary Report - Hazards Analyses of Radiochemical Processing and Waste Disposal at Oak Ridge National Laboratory, Sects. 4.0, 5.0, and 6.0.

NOTICE

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ATTACHMENT 2 (p. 2)

Continuous air sampling and monitoring alpha, beta, and gamma instruments are located in laboratories 2 and 4, and a stationary air alpha sampling unit is located in the second floor utility room. The stationary unit will be replaced by a continuous type now on order. These units are pre-set to alarm when the alpha air-borne activity level reaches the mpc level and to automatically actuate dampers and put the building on emergency operating status when the air-borne level reaches 10 times the mpc. A stationary beta-gamma air sampling unit is located in the intermediate corridor between the laboratories and change room. Portable gas-flow alpha survey meters are used to monitor glove box operations in the laboratory and to monitor personnel before exit from the laboratory and in the change room as a final check before leaving the contamination zone. Daily smear counts of the whole laboratory are standard procedure for further contamination control.

4.2 Criticality

Generally, the quantity of alpha-emitting materials being isolated is sufficiently small to present no criticality hazard. If programs are extended and criticality must be observed, batch control will be followed. The following batch limits have been set for the Alpha Isolation Laboratory:

Isotope	Batch Size	Limit in Bldg.
U^{233}	250 g	350 g
Pu^{239}	250 g	350 g
Am^{241}	No criticality problem	No criticality problem

4.3 Chemicals

The type of chemicals and the quantity consumed vary from program to program and therefore an average consumption over an extended period is hard to predict. The best approximation based on the present program is:

Chemical	Quantity Consumed/day
HNO_3	500 cc of 15 M
HCl	1000 cc of 12 M
$Al(NO_3)_3$	2000 g
$LiNO_3$	500 g
LiCl	1000 g
LiOH	100 g
TBP	1000 cc of 100%
Amsco 125-82	1000 cc
Mono-2-ethylhexyl phosphoric acid	400 cc
Xylene	1600 cc

BLDG 3028 CH-TRU CONTAINERS
ACCEPTABLE KNOWLEDGE DOCUMENTATION

Building Information

Two radioactive isotope production processes were carried out in Bldg 3028 (ref 1):

- Short-Lived Fission Products (SLFP)
- Curium Source Fabrication Facilities (SFF)

Chemical used in Short-lived Fission Products Separation (see attached flow chart, Fig 4 from ref 1): NaOH, H_2SO_4, HNO_3, D2EPHA, Oxalic Acid, Lead, (byproduct was $Pb(NO_3)_2$), TBP, NH_4OH, HCl, H_2O_2, H_2S, $KMnO_4$, AHIBA.
Chemicals used in the Curium Source Fabrication seemed to be mainly HNO_3 and oxalic acid.

Reference 2 states that there are three operations in Bldg 3028; the SLFP, the Alpha Powder Facility (APF) (same as Curium Source Fabrication???), and the Biological Evaluation Laboratory (BEL). The 1984 OSR for Bldg 3028 is a companion document to the "Final Safety Analysis Report (FSAR) for Building 3028" (not located yet).

Reference 3 states that by 4/15/91, Bldg 3028 was in safe standby condition and that all processing, source fabrication, and experimental operations had been suspended and the facility was awaiting acceptance into the DOE Decontamination and Decommissioning Program.

Liquid low-level radioactive waste from drains in the operating hot cells drained to Tank WC-2. The Waste Characterization Data Manual for the Inactive LLLW Tank Systems at ORNL (DOE/OR/01-1159&D1) has analytical data from a two sludge samples and a liquid sample taken from the tank in October 1997. Data includes RCRA metals, PCBs, and anions as well as radioactive constituents (see attached).

References/Sources

- ref 1: Schaich, R.W. 6/26/78. ORNL/CF-78/84, "Safety Analysis of Building 3028"
- ref 2: Ramey, D.W. 4/27/84. "Operational Safety Requirements for Building 3028"
- ref 3: 4/15/91. "Revisions to the Operational Safety Requirements for Building 3028, Change Number 1"

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BJCL (Bechtel Jacobs Company LLC). 2001b. *ORNL TRU Waste Historical Survey–Volume 3:*

- *Recorded Characteristics of Stored Solid Transuranic Wastes*, BJC/OR-395-V/3, BJCL, Oak Ridge, TN.

Personnel Contacts

- Eversole, Robert E. (Bob), 576-7483, Bldg 3001, MS-6028: Current Position – Bldg 3028 Operations Manager. Interviewed on 2/4/05; provided safety basis documentation
- Ramey, D. W. (Dan), 574-5912, Bldg 3047A, MS-6023: prepared 1984 OSR for 3028, not interviewed as of 2/7/05
- Devore, Joe, 574-7092, Bldg 0822T, MS-6492
- Drake, David, 241-3694, Bldg 4500N, MS-6227
- Haff, K.W, (Karl); retired; does occasional subcontracting for Homeland Security Project

Setaro, Joe; retired; does occasional subcontracting for Homeland Security Project

REF. 1

OAK RIDGE NATIONAL LABORATORY
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ORNL
CENTRAL FILES NUMBER

ORNL/CF-78/84

DATE: June 26, 1978

SUBJECT: Safety Analysis of Building 3028

TO: Distribution

FROM: R. W. Schaich

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SAFETY ANALYSIS OF BUILDING 3028

R. W. Schaich

ABSTRACT

A critical review of the hazards associated with the operations performed in Building 3028 is presented. The physical facilities, operations, and operating procedures for the building are described. Analyses were made of the operational hazards and it is shown that the preliminary and secondary features of the facility are adequate to contain the radioactive materials within the confines of the building.

INTRODUCTION

Two radioactive processes of the Radioisotopes Department are located in Building 3028. These are the Short-Lived Fission Products (SLFP) and the Curium Source Fabrication Facilities (SFF). The radioisotopes involved in these operations range from the short-lived fission products (^{99}Mo, ^{131}I, ^{133}Xe, etc.) to the transuranium element ^{244}Cm. The preparation of the materials processed in this facility requires a variety of operations such as dissolution, evaporation, distillation, solvent extraction, ion exchange, calcination, sintering, vacuum hot pressing, welding, and leak testing. Because of the multiplicity of activities and operations, Building 3028 is designed to control the release of all radioactive solids, liquids, and gases to the environment.

The maximum in-process inventory of any one radioisotope campaigned in Building 3028 is listed in Table 1.

Table 1. Maximum In-Process Inventory

	Short-Lived Fission Products (Ci)	Curium Source Fabrication (g)
Fission Products	20,000	0
Americium-241	0	1000
Americium-243	0	1000
Curium-242	0	50
Curium-244	0	1000
Neptunium-237	0	1000
Plutonium-238	0	1000
Uranium-232	0	1
Uranium-235	20 g	0
Thorium-229	0	1

BUILDING DESCRIPTION

Building 3028 is located on the northwest corner of Isotope Circle in the Isotopes Area (Fig. 1) and is adjacent to the 3039 stack area. An air lock separates Building 3028 from the Radioisotope Development Laboratory (Building 3047) on the east. There are no direct personnel accesses from Building 3028 to Building 3047. Its relation to nearby facilities in terms of distance and quantities of radioactivity normally handled is listed in Table 2.

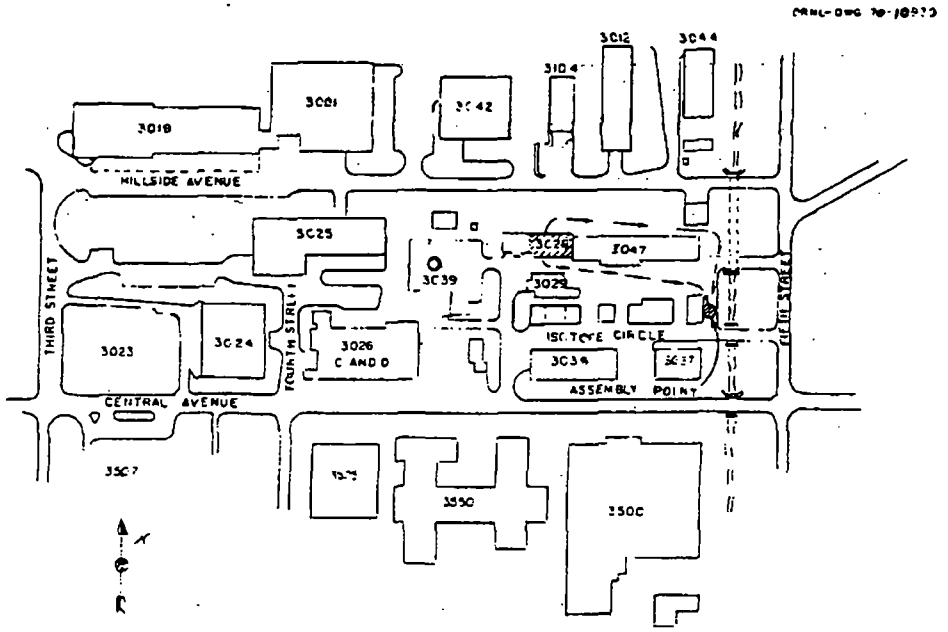


Fig. 1. Building 3028 Evacuation Route

Table 2. Adjoining Facilities and Activity Inventories

Building No.	Title	Distance		Maximum Activity Inventory (Ci)	Activity Type
		Feet	Direction		
3047	Radioisotope Development Laboratory	10	East	1×10^6	Fission Products Transuranium Elements
3029	Source Development Laboratory	30	South	5×10^5	Fission Products ^{60}Co
3039 Area	Gaseous Waste Disposal Area	100	West	0	Fission Products
3042	Oak Ridge Research Reactor	150	North	1×10^5	Fission Products
3030, 3031, 3032, 3033	Radioisotope Laboratories	100	South	1×10^3	Miscellaneous Radioisotopes
3038	Radioisotope Packing, Alpha Handling Facility, and Target Laboratory	150	South	1×10^3	Miscellaneous Radioisotopes Transuranium Elements
3037	Isotope Area Offices	225	South	None	None

The 3028 building, a steel-frame structure covered by corrugated aluminum siding, consists of a four-story operating area and a one-story cell area on the east and west sides (Figs. 2 and 3). The first floor area of the building covers 4000 ft^2 and the total volume is 80,000 ft^3 of free space. All areas of Building 3028 are equipped with water sprinklers connected to the ORNL fire protection system.

FACILITIES AND EQUIPMENT

Curium Source Fabrication Facility

The Source Fabrication Facility comprises six cells located on the first level of Building 3028 as shown in Fig. 2. The shielding characteristics and function of each cell are listed in Table 3.

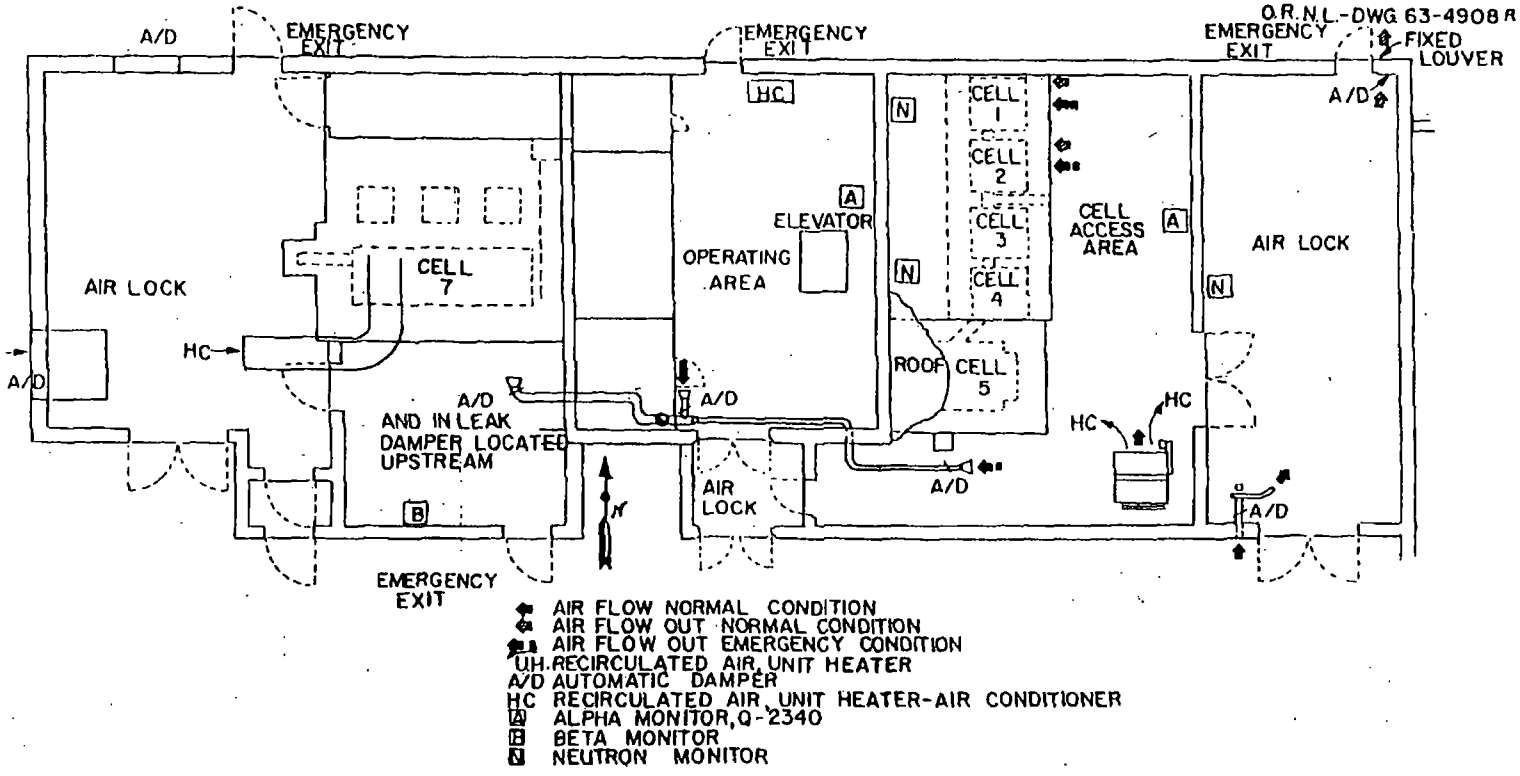


Fig. 2. First Floor - Building 3028

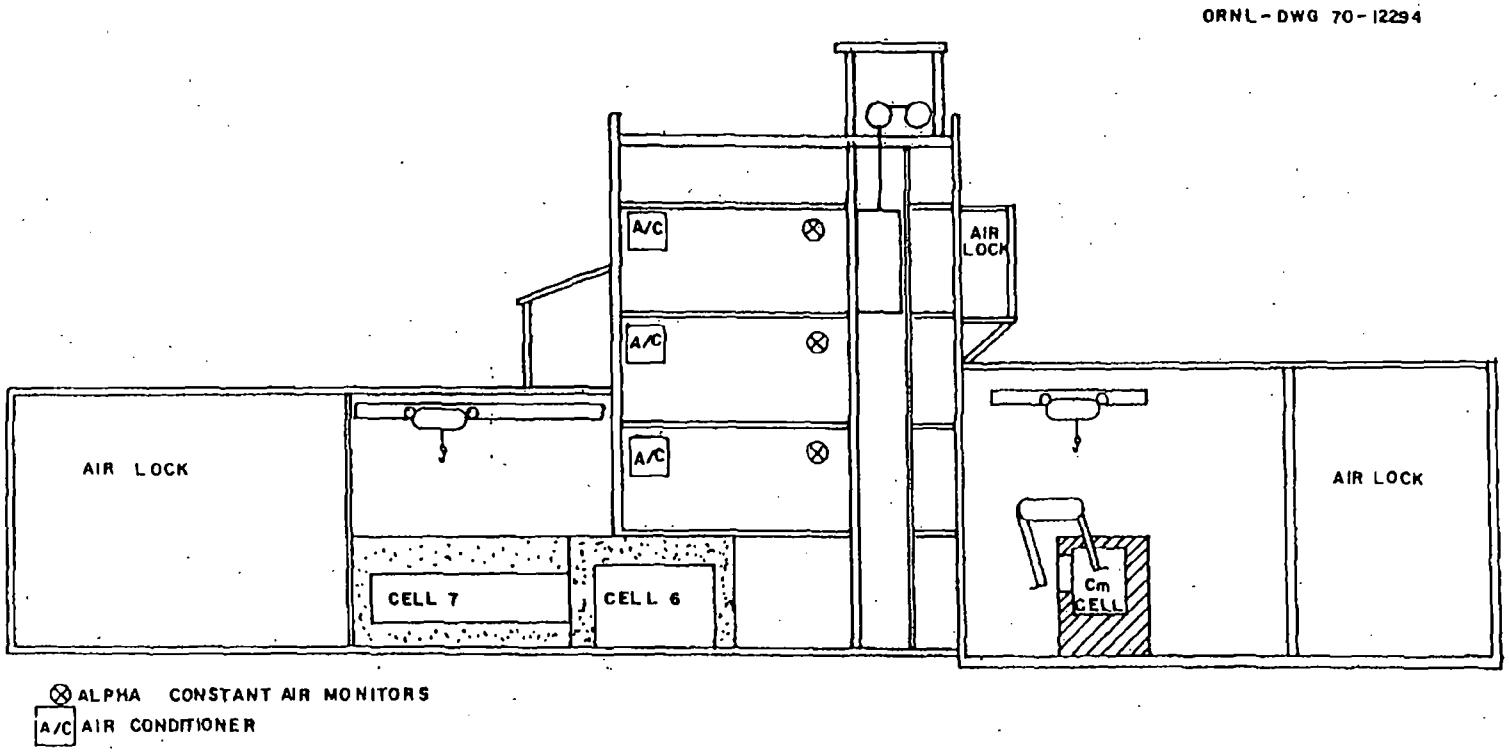


Fig. 3. Building 3028 Cutaway

Table 3. Source Fabrication Facility Cell Characteristics

Cell No.	Liner	Shielding	Designed External Radiation (mrem/hr)	Process
1	Stainless	2 ft of H_2O	<1	Precipitation
2	Stainless	2 ft of H_2O	<1	Powder preparation
3	Stainless	2 ft of H_2O	<1	Pelletization
4	Stainless	2 ft of H_2O	<1	Welding
5	Stainless	9 in. of steel + 1 ft of concrete	<1	Welding
6	Epoxy Resin	1.5 ft of barytes	<1	Off-gas cleanup

The walls of Cells 1, 2, 3, and 4 consist of steel tanks that contain 2 ft of water for neutron shielding. The steel tanks are bolted together to form the basic cell arrangement and a stainless steel liner is installed in each cell to seal all accesses to the cells. All penetrations to the cell are welded at the liner and the cells are connected in series with an air-lock system.

Extended-reach Model 8 manipulators are inserted through holes in the top of the cells which are covered by water-filled tanks for neutron shielding. The slave sections of the manipulators are covered with urethane manipulator boots sealed to the inside top surfaces of the cells. An additional plastic boot and wiper seals around the tapes in the manipulator barrels provide a secondary containment for the manipulator penetration.

Personnel access to the cells can be made by draining the water from the back shielding block and removing the tank. The cell opening is covered by a viewing window with glove ports which is gasketed to the cell liner and can be removed for direct access to a cell. Personnel access to all Building 3028 cells is controlled by Health Physics Radiation Work Permits. All cells are sealed under normal operations and are not entered until decontamination procedures have lowered radiation and contamination levels to acceptable standards.

Process Equipment

The process equipment for the Source Fabrication Facility consists of small stainless steel vessels for aqueous solution handling, stainless steel filters, furnaces for calcination of powders and pellet sintering, a vacuum hot press for pelletization, and calorimeters for thermal measurements.

The aqueous vessels are operated from a graphic panelboard, and all solution transfers are made by vacuum and gravity flow. After a solid product form is obtained, all handling operations are accomplished with extended-reach Model 8 manipulators. Due to the heat output of the ^{242}Cm and ^{244}Cm products, powder and pellet transfers are made in containers cooled with air or chilled water. The cell pans are cooled with chilled water to control cell temperatures and to remove heat in case of accidental spillage of radioactive material.

The characteristics of the vessels used in the Source Fabrication Facility are listed in Table 4.

Table 4. Source Fabrication Facility Vessels and Characteristics

Tank No.	Material Type	Volume (liters)	Agitation	Process
T-11	304 L	13	None	Feed transfer
P-11	304 L	13	Agitator	Precipitation
R-11	304 L	20	None	Vacuum receiver
S-11	Glass	0.5	None	Sampler
W-1	347	2000	Air	Waste collection
V-16	304 L	50	None	Vacuum surge tank
F-11	347	-	None	Filter
M-1	347	10	Agitator	Makeup
M-2	347	20	Agitator	Makeup

Encapsulation Equipment

Inert gas welders can be remotely operated in Cells 4 and 5 of the Source Fabrication Facility. These welders are versatile in their design to allow the encapsulation of a variety of capsule materials. The welding is accomplished under argon atmosphere, and the capsule holder forms a chill block with water coolant to remove excess heat.

Ultrasonic cleaners can be located in Cells 4 and 5 for cleaning capsules to smear tolerances. The normal decontaminant required in the cleaning process is detergent or weak acid.

Helium leak detection equipment is operated remotely to test the encapsulated source for minute leaks.

Auxiliary Equipment

A chilled water system with a capacity of five tons is used for all in-cell cooling. The chiller consists of a 5-ton compressor unit with an automatic process water condenser. The chilled water is recirculated through the cell equipment by a dual pump system. In case of power or equipment failure, process water can be passed through the cell equipment to the process waste system on a one-pass basis. An automatic makeup tank supplies the necessary water for the chilled water system. The chilled water is sampled periodically for alpha contamination to check the process coils and jackets for leaks.

The process vacuum system services the Source Fabrication Facility cells and provides the mode of solution transfer. This equipment is located in Cell 6. A filter system of stainless steel Neva Clog prefilters and testable HEPA filters removes particulate matter before air is discharged into the Isotopes Area off-gas system. The vacuum pump is started manually when solution transfers are required. A 50-liter surge tank is located on the main vacuum header and provides an adequate catch vessel for the maximum solution volume handled in the Source Fabrication Facility cells. All vacuum transfer vessels have temperature-sensitive probes which signal high liquid level in the vessel and automatically turn off the process vacuum to that vessel.

A chemical makeup area is located on the second level of the 3028 building and contains two small stainless steel vessels. These vessels are used for chemical makeup for solution addition to the in-cell vessels. The makeup tanks drain through flexible lines to funnels connected to pipes leading to vessels in the cells. The lines from the funnels have

valves located in the operating area which are opened after the funnel is partially filled with liquid. The transfer line from the funnels terminates in the cell with a stainless steel ball joint. From this point, a Tygon line is placed in the appropriate funnel for addition to the process vessel. A valve on the in-cell funnel is operated by manipulators to allow solution to flow into the vessel.

A standard wet cell battery is located in the first floor operating area to supply an emergency source of DC voltage to signal alarms in case of power failure. Emergency lighting in Building 3028 is supplied by individual wet cell lanterns, which are actuated by a failure of the 110-V AC circuit. An emergency diesel unit (3047 Bldg.) supplies power to the CAMs, CAAMs, and the Health Physics monitoring probes in case of power failure to the building.

Short-Lived Fission Products Facility

The Short-Lived Fission Products Facility consists of one large manipulator cell with two viewing windows, a ^{133}Xe recovery and purification cell, and a low-level scrubber cell for off-gas cleanup. The main cell bank has 3 ft of high-density concrete, the ^{133}Xe cell has ~3 in. of lead, and the scrubber cell has 8 in. of stacked barytes block for shielding the beta-gamma activities handled in this facility. The control of ^{131}I release is the primary design criterion from the standpoint of environmental radiation safety. The use of simple, easily replaced process equipment inside the manipulator cell and the use of manipulators for performing processing operations are the major criteria with respect to operational design.

The cell ventilation and hot off-gas services to the manipulator cell are equipped with testable HEPA filters plus testable charcoal filters (KI impregnated) with an efficiency for elemental ^{131}I of >99.9%. Since the highest potential for ^{131}I release is through the hot off-gas system, additional impregnated charcoal filters and a caustic scrubber are installed in series in the off-gas scrubber cell. All the testable filters are located in shielded areas outside the cell proper. Inside

the manipulator cell, additional HEPA filters and impregnated charcoal canisters are placed over the cell ventilation outlets. These are positioned for replacement with manipulators, and procedures are provided for their transfer from the cell in shielded carriers for disposal by land burial. Inside the manipulator cell, four glass canisters containing KI impregnated charcoal are installed in series in the off-gas system. These "home-made" canisters can be handled by manipulators and are tested before installation to show that they meet the ORNL specification of an efficiency of >99.9% for elemental ^{131}I.

Since all waste solutions from the short-lived fission products process contain some ^{131}I, control of these low-volume wastes (~10 liters per run) is necessary. This control is effected by holding all liquid wastes in the cell for a minimum of 30 days and then discharging the wastes into a 1000-gallon stainless steel collection tank (WC-2) equipped with testable HEPA and impregnated charcoal filters on the off-gas discharge. In this tank, the solutions containing ^{131}I are held in a high pH condition for decay of the ^{131}I. A remote potential for criticality exists in this vessel because of the enriched uranium in the irradiated target; therefore, depleted uranium solution is mixed with all wastes discharged to this tank.

The basic approach to process equipment design for the Short-Lived Fission Products Facility is one of simplification. The only permanently installed process vessels are a dissolver for the U-Al targets and a neutralization-distillation vessel for the ^{131}I process. The dissolver is a sealable stainless steel vessel connected directly to the ^{133}Xe recovery system through a de-entrainment trap. The neutralization-distillation vessel is a similar tank provided with fittings so that manipulator connection to various process lines can be made. Both vessels are equipped with heating-cooling jackets, pressure relief plugs, and controls for maintaining temperatures. There is a small stainless steel vacuum tank for waste holdup. All other chemical process equipment is laboratory-sized replaceable glassware.

The ^{133}Xe recovery equipment consists of a de-entrainment vessel on the off-gas from the dissolver plus molecular sieve traps cooled with liquid nitrogen or purged with helium for purification. The dissolver system is designed for minimum air leakage, and a helium purge is required to sweep the ^{133}Xe out of the dissolver and transfer it to the ^{133}Xe system.

Handling techniques and procedures have evolved as more experience with the Short-Lived Fission Products Facility has been gained. Once the basic ^{131}I control procedures were established, it became apparent that much of the ^{131}I release problem was related to non-^{131}I processes in which there were only small amounts of residual ^{131}I involved. Accordingly, much attention has been given to controlling ^{131}I in these systems. Reactions requiring acidic systems are carried out in closed vessels vented to off-gas through individual scrubber systems. During decontamination operations, acid is used only after thorough washing with NaOH and water. Steps are taken to guard against the drying of solutions containing ^{131}I, even in the NaOH systems, since ^{131}I can be released from the dry solids.

The improvements in equipment and techniques made during the past ten years have resulted in a significant decrease in the release of ^{131}I.

Radioisotope Department Laboratories

The three floor levels immediately above the cell operating area in Building 3028 have concrete floors covered with Coroseal vinyl covering, smooth wall surfaces, and adequate lighting. All three floors are air conditioned with limited makeup air.

Each floor of the facility is isolated from the floors above or below except for removable hatches (7 by 7 ft) connecting the third and fourth and the third and first levels. These hatches are used only for movement of large equipment. Entrance to all floors is provided by a two-man elevator and air-lock entrances on the north side of the building.

Emergency exit doors are provided on each floor in the southwest corner. These doors do not have air locks and, therefore, do not constitute entrances except in unusual circumstances. Each door is locked to prohibit access from the outside.

These laboratory areas will be used for research and development programs on radiactive materials requiring a contained environment. No specific program has been assigned to the second, third, or fourth floor.

CONTAINMENT

Building 3028 (Fig. 3) was sealed by cocooning all outside surfaces of the building. All normal entries to the building have air locks for lift truck and personnel access. All doors are gasketed to reduce inleakage and are supplied with automatic closures. The building inlet air supply is limited to the building leakage rate of approximately 1000 ft^3/min.

Interior partitions are provided to separate the operating areas from possibly contaminated areas, and air conditioning has been installed in all operating areas for personnel comfort.

All areas of Building 3028 are equipped with automatic dampers, discharging to the Isotopes Area cell ventilation system, to provide containment conditions of >0.30 in. of water vacuum. In the event of an accidental release of alpha, beta, or gamma activity into the building interior from the cells or glove boxes, all building openings are closed automatically. The emergency cell ventilation exhaust duct dampers are thrown to full open position and the interior of the building is exhausted to produce a vacuum of >0.3 in. of water. The signal which actuates the automatic devices is received from a one-out-of-four alarm circuitry from four alpha constant air monitors (CAAM) in the alpha operating areas, or a one-out-of-two alarm from two beta-gamma constant air monitors in the Short-Lived Fission Products Facility. During the containment period, the cells or glove boxes are controlled at >1.0 in.

of water vacuum with reference to the building interior. All air exhausted from the building during containment is passed through roughing and testable HEPA filters before discharge to the stack. The containment signal also initiates the building evacuation horn which can be heard in all areas of Building 3028.

OPERATIONS

Curium Source Fabrication

A purified aqueous solution of ^{242}Cm or ^{244}Cm can be received at the Source Fabrication Facility in a shielded cask, which can be connected to the Source Fabrication Facility process equipment for transfer of the solution. The unit chemical process accomplished in the Source Fabrication Facility cells is precipitation. Operations such as evaporation, decantation, filtration, and dissolution can be performed with the installed equipment.

The ^{242}Cm or ^{244}Cm can be precipitated as the oxalate in Cell 1. This cell contains two stainless steel vessels for solution transfer and one precipitator vessel. All tanks and the solution filter are jacketed and supplied with chilled water for cooling the process solution.

The process consists of adjusting the pH by adding small increments of HNO_3. A solution of oxalic acid is then added and the resulting solution is digested for a period of time with frequent checks on the pH. All pH determinations are made with in-cell equipment.

After digestion is complete, the slurried solution is filtered through a stainless steel filter to collect the precipitate. The filtrate is collected in a vacuum receiver tank, sampled by in-cell sampling equipment, and transferred to the Source Fabrication Facility collection tank (W-1) under the direction of supervision.

Calcination of the curium oxalate takes place in a small tube furnace and then the filter containing the calcined product is transferred to a calorimeter for product determination.

When there is no demand for ^{242}Cm, the chemical process equipment described above is used for recovery of ^{244}Cm from compounds or mixtures resulting from experiments. The Source Fabrication Facility presently receives <100-g quantities of ^{244}Cm oxide in specially designed containers from the FPDL Curium Storage System. These containers are opened in Cell 2 and the contents are weighed and calorimetered to verify shipping data.

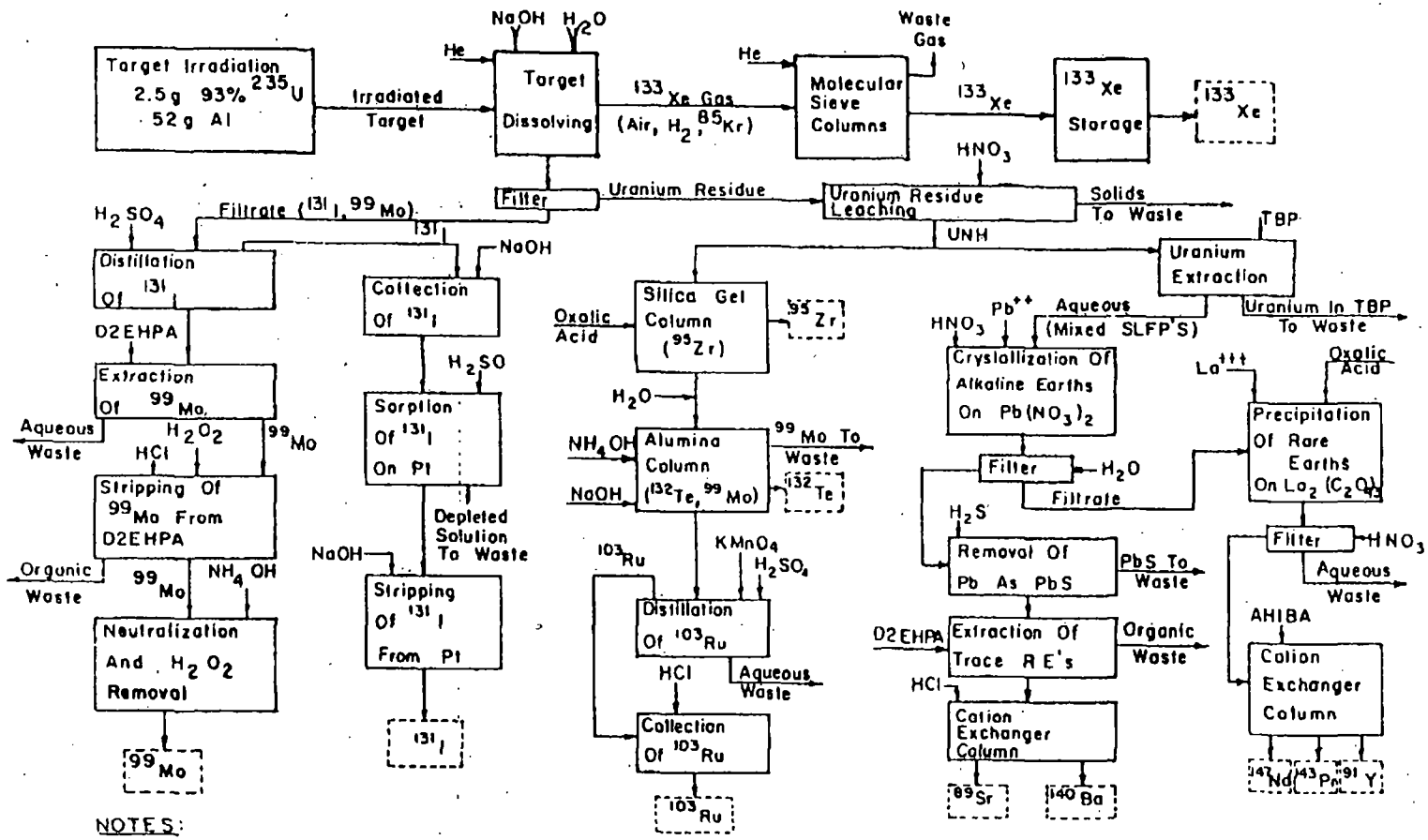
After calorimetric determination of the thermal output of the product, the powder is transferred to Cell 3 for blending and pelletization. The blended powder is mechanically measured into a graphite die body and placed in a vacuum hot press where the pellet is pressed under the desired conditions. The pelletization is continued until sufficient pellets are made to meet specifications concerning thermal output of the final source. These operations are conducted in an argon atmosphere which is required to prevent the formation of $^{244}CmO_2$ after the pellet material has been converted to $^{244}Cm_2O_3$.

The pellets are sealed in special capsules by remote welders located in Cells 4 and 5. These cells can be operated under argon atmosphere to meet the required conditions for welding. After the sources are helium leak tested they are decontaminated to smear tolerances and loaded into containers or generators for shipment to the customer.

Short-Lived Fission Products

The only short-lived fission product that is routinely recovered is ^{133}Xe; the others are processed on a demand basis. The operations described are those used to provide standard products (Fig. 4).

The short-lived fission products target consists of a hollow cylinder containing 93% enriched ^{235}U dispersed in aluminum. This target is irradiated in the Oak Ridge Research Reactor (ORR) or the High Flux Isotope Reactor (HFIR) for a period of 7 to 23 days. After the targets have been discharged from the reactors, they are transferred to the



NOTES:

[X] Indicates Purified Material; Additional Product Conversion Required

D2EHPA = Di 2-Ethylhexyl Phosphoric Acid; TBP = Tributyl Phosphoric Acid

AHIBA = Alpha Hydroxy Isobutyric Acid

Fig. 4. Short-Lived Fission Products Separation

Short-Lived Fission Products Facility where they are held for two days to permit decay of very short half-life radionuclides before processing starts.

Xenon-133

The target is placed in the dissolver vessel which is connected to the ^{133}Xe recovery system. After the system has been tested for leaks, cold caustic solution is introduced to the dissolver. The system is heated slowly until the reaction between the aluminum and the NaOH starts. This reaction is exothermic and its rate is controlled by adjusting the vessel temperature with chilled water or steam. Rare gases and hydrogen are released and are swept into the ^{133}Xe equipment with a slight flow of helium. After the reaction is complete the helium flow is maintained until all the ^{133}Xe has been removed from the dissolver.

In the ^{133}Xe equipment, the ^{133}Xe is sorbed on a molecular sieve contained in a U-tube cooled in liquid nitrogen. The ^{133}Xe is purified by elution with helium, with the ^{133}Xe fraction first being sorbed on a second molecular sieve tube then eluted and condensed in a cold trap. The ^{133}Xe is packaged either in glass ampules or in shielded gas cylinders for shipment to the customer.

Iodine-131 and Molybdenum-99

The liquid in the dissolver is diluted with water and filtered. The filtrate contains most of the ^{131}I and ^{99}Mo plus about 15% of the ^{132}Te and traces of the other short-lived fission products. The undissolved uranium residue collected on the filter is reserved while the filtrate is processed to recover the ^{131}I and ^{99}Mo in the neutralization-distillation vessel. The filtrate solution is acidified with H_2SO_4 and then heated to distill the ^{131}I. Air is drawn through the solution under off-gas, and the air plus water vapor carry the ^{131}I to the scrubber. The ^{131}I is trapped in NaOH containing a trace of sulfite. When the distillation is complete, the scrubber solution is transferred to a vessel containing platinum gauze, and the solution is acidified with H_2SO_4. The ^{131}I sorbs on the platinum, and the depleted ^{131}I solution

is removed. After the platinum has been rinsed, it is contacted with NaOH which strips the ^{131}I from the platinum. The resulting ^{131}I solution is held as a stock from which products are prepared.

The liquor remaining in the neutralization-distillation vessel after the ^{131}I process contains ^{99}Mo, significant amounts of ^{131}I and ^{132}Te, and traces of other short-lived fission products. This acid solution is transferred to a batch contactor where the ^{99}Mo is extracted into a solution containing di(2-ethylhexyl)phosphoric acid in an inert diluent. The phases are separated and the organic phase is washed with HCl; then the ^{99}Mo is stripped from the organic phase with HCl H_2O_2. After treatment to remove H_2O_2, the ^{99}Mo solution acidity is adjusted and an identical extraction sequence is done using new equipment. The ^{99}Mo solution from the second extraction cycle is adjusted with NH_4OH and sampled as product.

Single shipments of less than 3 Ci are made as solution. For larger shipments the product solution pH is adjusted with HCl and passed through a bed of alumina contained in a glass column. The ^{99}Mo sorbs on the alumina which is rinsed, dried, and shipped as a solid.

The solution from which the remaining products are recovered is obtained by leaching the uranium residue with HNO_3. The resulting solution is divided into fractions for recovery of the various products. These may be grouped into two types — those recovered directly from the solution and those requiring preliminary removal of the uranium.

The products recovered from the uranyl nitrate solution directly are ^{103}Ru, ^{132}Te, and ^{95}Zr. Since ^{95}Nb is later recovered from the ^{95}Zr product it is also included in this group. Although it is possible to process a given fraction of the feed solution for all of these products, in practice each product is usually recovered from a separate fraction.

Zirconium-95

The uranyl nitrate solution is passed through a column of silica gel, which sorbs the ^{95}Zr. The column is washed with HNO_3 and water; then the ^{95}Zr is stripped from the silica gel with oxalic acid solution. The solution is passed through a column of cation exchange resin to remove traces of contaminants. This solution is the shipping form for the ^{95}Zr and is also the feed solution from which the ^{95}Nb is recovered. This separation is done by acidifying the solution and adding $KMnO_4$. A precipitate of MnO_2 forms and carries the ^{95}Nb. After separation by centrifugation, the precipitate is dissolved in oxalic acid and a similar MnO_2 precipitation is done. This is repeated several times to remove traces of ^{95}Zr, with the oxalic acid solution finally being passed through a bed of cation resin to remove the manganese.

Tellurium-132

The uranyl nitrate solution is diluted and passed through a column of alumina, which sorbs the ^{132}Te and traces of ^{99}Mo. The alumina is washed with water and NH_4OH to remove the ^{99}Mo; then the ^{132}Te is stripped from the column with NaOH. Shipments are made either as solutions or with the ^{132}Te sorbed on small beds of alumina.

Ruthenium-103

The feed solution is adjusted with H_2SO_4 and an excess of $KMnO_4$ is added to oxidize the ^{103}Ru. The solution is heated to distill the volatile RuO_4, which is trapped in concentrated HCl in a series of scrubbers. The scrubber solution is adjusted with HCl.

Alkaline Earths

Uranium is removed from the uranyl nitrate solution by extraction into tributyl phosphate. The ^{95}Zr is usually removed at this point by sorption on silica gel even if the ^{95}Zr is not to be recovered as product. Lead carrier is added; then fuming nitric acid is added until the lead nitrate crystallizes from the solution, carrying the alkaline earths ^{89}Sr and ^{140}Ba. The solution is filtered.

The lead nitrate crystals are dissolved in water, and the lead is precipitated as the sulfide and filtered. Traces of rare-earth contaminants are removed from the filtrate by extraction into di(2-ethylhexyl)-phosphoric acid. The alkaline earths are then sorbed onto a column of cation exchange resin and separated by elution with HCl.

Rare Earths

The filtrate from the crystallization of the alkaline earths with lead nitrate contains the rare earths ^{91}Y, ^{147}Nd, and ^{143}Pr. This solution is taken to dryness; then the solids are dissolved in water and lanthanum carrier is added. The lanthanum is precipitated as the oxalate, carrying the other rare earths. After the precipitate has been filtered and washed, the rare earths are converted to the nitrate form and taken up in HNO_3. The solution is loaded onto a cation exchange resin in a column which can be heated and also can be operated under pressure. The rare earths are separated by elution with alpha-hydroxyisobutyric acid under pressure. The purified fractions of ^{91}Y, ^{147}Nd, and ^{143}Pr are acidified; then the rare earths are sorbed on individual small columns of cation resin. After these columns have been washed, the products are stripped from the resin with HCl.

WASTE DISPOSAL

Three types of waste result from operations in Building 3028: liquid, gaseous, and solid. The sources from which these wastes derive and the means of disposing of them are described below.

Liquid Waste

The liquid wastes in Building 3028 consist of intermediate level waste from cells, process waste from building floor drains, and storm sewer waste.

All in-cell solutions are sent to tank WC-2 on the ORNL Tank Farm via a gravity flow system from a valved funnel inside the cell. The normal

volume of waste should be less than 10 gal/day and the normal activity level should be less than 2000 mCi/gal. The WC-2 transfer system is contained for alpha waste handling and the tank is vented to off-gas through two testable HEPA filters and one testable charcoal filter. The cell floor drains discharge to WC-10 tank in the ORNL Tank Farm. These drains are sealed during normal operations but can be used for cell decontamination after the ^{131}I has decayed to a reasonable level. All waste volumes are continuously monitored by the ORNL Waste Monitoring System. The process waste from building floor drains is negligible; therefore, the only source of contamination to this system would be solutions used to decontaminate the operating area floor. This process waste is continuously monitored for alpha and beta-gamma activity and volume by the ORNL Waste Monitoring System. The storm sewer waste consists of all roof drainage and condensate from the building heating system; these are nonradioactive. The only possible contamination in this system, therefore, would come from an outside source which settled on the building roof.

Gaseous Waste

Gaseous wastes normally originate during cell or glove box operations and exhaust to the ORNL cell ventilation and off-gas systems. Building 3028 is kept at a vacuum of greater than 0.05 in. of water with respect to the atmosphere by means of the cell ventilation system. All air passing through this system goes through a testable HEPA filter in Building 3028 and then through FG-25 roughing filters and testable HEPA filters in the Isotopes Area filter house before discharge to the 3039 stack. The cell atmosphere is filtered through two sets of HEPA filters. The primary (cell ventilation) filters are changed routinely but are not tested after initial installation. The Isotopes Area HEPA filters, however, are routinely tested by the Inspection Engineering. Off-gas from in-cell vessels is filtered through two testable HEPA filters plus testable charcoal filters for ^{131}I removal. All HEPA filters must meet a DOP test of greater than 99.95% efficiency for particles greater than 0.3 micron.

Solid Waste

All solid wastes from Building 3028 are handled according to the Radioisotope Department Waste Handling Procedure. All alpha solid waste is considered as high-level waste. All materials are washed and removed from the cells or glove boxes by standard bagging techniques or bottom loading shielded containers. The material is triply contained and checked before being transported to the Solid Waste Storage Facility.

OPERATIONAL HAZARDS

Three of the Curium Source Fabrication cells were designed for inert atmosphere operations with an oxygen content of less than 100 ppm. The cell liners, electrical penetrations, services, etc., are sealed with vacuum-type fittings to prevent the inleakage of air. If a pressure or vacuum of >10 in. of water is accidentally created within the cell liner, the cell window will fracture and break the primary containment barrier of the cell. To prevent this type of accident, a photohelic cell will control the cell atmosphere to a water vacuum of 1.0-2.0 in. If the cell exceeds a water vacuum of 2.0 in., the photohelic cell will energize an alarm circuit and increase the flow of air or argon to the cell to maintain the water vacuum of 1.0 in. These cells are connected to the Isotopes Area cell ventilation system, which has a maximum water vacuum of 5.5 in. Thus a failure of the control circuitry could not create a negative pressure great enough to fracture a viewing window.

All equipment installed in the cells requiring additional gas flow will be safeguarded by reducing stations and orifices to prevent an over-pressure situation. If a vacuum system is attached to the cell, the discharge capacity of the system will be limited to <5 ft^3/min. The cell atmosphere control system is designed to automatically meet this flow condition and hold the cell at 1.0 in. H_2O vacuum. Inlet gas flow indicators monitor the flow to each cell and the negative pressure readings are recorded on a daily basis to determine the proper flow to each cell. The photohelic control system is designed to be fail safe

in case of electrical power failure by turning off all flow to the cells. The 3039 Stack ventilation system fails safe during a power failure by the automatic switching to steam turbines and an emergency diesel system to supply power to the cell ventilation and off-gas fans.

The measurement of the high-temperature chemical and physical properties of radioisotope power source materials is typical of a category of operations which may from time to time be carried out in the source fabrication cells. The measurements can include surface tension, viscosity, emissivity, heat capacity, compatibility, vapor pressure, melting point, thermal conductivity, and helium release. All of the above measurements require the attainment and maintenance of high temperatures.

A failure of the cooling water to a furnace which is operating at a power level of several kilowatts could result in a heat load in excess of the dissipation capabilities of the hot cell. The cooling water outlet is equipped with a flow detector which will open a switch in the event of a reduction in flow of the cooling water. The switch de-energizes a breaker which removes power from the furnace power supply and opens the normally closed cooling water valve. The pressure in the hot zone of the furnace is monitored by a pressure-sensitive switch which in the event of a water leak into the hot zone of the furnace would perform the same functions as the flow switch.

Hydrogen will be used as a reducing agent in some experiments. The explosive limits of hydrogen at atmospheric pressure and room temperature in oxygen are 4.65 to 93.9% and in air 4.00 to 74.2%. An analyzed mixture of 4% hydrogen-96% inert gas will be used as a preventive measure, and experiments of this type will be accomplished in cell atmospheres containing <100 ppm oxygen. These cells are continuously monitored by a Beckman oxygen analyzer.

The encapsulation of radioisotopes in stainless steel or other suitable metal containers will be performed by welding samples in appropriate containers. Since this is performed under an inert gas, the arc itself

is essentially inert except that it is a source of high temperature. During welding (especially of massive materials), chill blocks will be used to avoid large temperature increases within the cell and no solvents will be permitted within the cell during such operations. Since argon or helium purges are employed through the torch head, the possibility of increasing operating pressure exists, but this problem is overcome by employing a maximum pressure photohelic control which will provide additional cell exhaust capability through use of cell ventilation facilities.

PERSONNEL PROTECTION

The personnel protection program at Building 3028 is implemented through operating safeguards, radiation and contamination detection devices, training of personnel, preventive maintenance, and a continuing interest in maintaining a high safety standard.

The chemical safety practices specified in Section 1.4 of the ORNL Safety Manual are followed and special regulations that are applicable to certain jobs are posted.

Emergency cabinets are maintained in each section of the building for protection of personnel. These emergency cabinets are stocked with coveralls, gas masks, shoe covers, gloves, flashlights, and rope. All employees know the location of these cabinets and their contents.

The cell shielding is designed to limit the beta-gamma-neutron dose to personnel to <1 mrem/hr. The exposure to normal operations does not exceed 50 mrem/week. The greatest amount of exposure will come from decontamination work. The hand exposure in glove box operations is monitored by Health Physics personnel using film rings to control the radiation dose to personnel.

Radiation and contamination detection devices are located throughout the building. Monitrons (3 beta-gamma and 4 neutron) are located at

strategic points in the building for the detection of beta-gamma-neutron radiation, and all monitors are connected to an alarm and panelboard system located in each operating area and the main entrance to Building 3028. Monitors are also equipped with local alarms to notify personnel of hazardous conditions. All monitron units are checked daily for operability by Health Physics personnel. Building 3028 is connected to the ORNL central monitoring system.

Alpha constant-air monitors and beta constant-air monitors are strategically located in all operating and cell areas. These instruments are equipped with local and central alarms and are checked for operability daily.

Portable alpha counters, G-M survey meters, cutie pies, and neutron instruments are available for use in the building, and all operating personnel are trained in the use of these instruments.

Alpha and beta-gamma survey meters are located adjacent to the normal exits of the operating areas; all personnel are required to check themselves for contamination before leaving the building. Portable instruments are also available for checking alpha, beta, and gamma contamination on the outer garments.

Radiation detection equipment is located in the Health Physics Office in Building 3047 - an alpha smear counter, a beta-gamma smear counter, high-level radiation probes, portable air samplers, Hi-Vol air samplers, cutie pies, neutron and alpha survey meters, and G-M survey meters. All operating personnel are trained in the use of this equipment. Failure to use the radiation detection instruments under specified conditions is grounds for disciplinary action. All instruments are on the Instrumentation and Controls Division programmed maintenance list and are checked and calibrated on a regular basis. An emergency evacuation alarm is connected to the containment system and can be heard in all areas of the building.

TRAINING PROGRAM

A qualification program which includes an oral presentation, oral and written examinations and equipment training tests for the operating personnel in Building 3028 has been initiated. All personnel are trained in the ORNL standard operating procedures regarding safety, contamination control, radiation exposure, industrial hygiene, and manipulator cell operation. In addition, all personnel are trained in the use of radiation instruments, gas masks, lift trucks, etc., and a record of their training is filed in the Process Group office.

Some of the personnel who normally work in the building are members of the Isotopes Area Emergency Squad and are given training in fire prevention, first aid, and cardiac pulmonary resuscitation.

BLDG. 3028

REF. 2

OPERATIONAL SAFETY REQUIREMENTS

FOR

BUILDING 3028

D. W. Ramey

PREPARED BY

ORNL OPERATIONS DIVISION

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OPERATIONAL SAFETY REQUIREMENTS

FOR

BUILDING 3028

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1.0 INTRODUCTION

Building 3028 at Oak Ridge National Laboratory (ORNL) houses three separate operations. Two radioactive processes of the Radioisotope Department conducted in Building 3028 are the Short-Lived Fission Products (SLFP) processing and the Alpha Powder Facility (APF). The APF is designed to package and distribute gram quantities of alpha material while the SLFP facility separates short-lived fission products from irradiated targets. The three floor levels immediately above the APF operating area contain laboratories occupied by the Nuclear Medicine Technology Group of the Health and Safety Research Division. These laboratories, named the Biological Evaluation Laboratory (BEL), are used for routine short-term biological studies on the fate and effects of tracer levels of radiopharmaceuticals administered to small laboratory animals.

The building, equipment, and operations are described in _____ [Final Safety Analysis Report (FSAR) for Building 3028]. The specific hazards and risks associated with the operations were identified in the FSAR and the measures used to mitigate these risks are identified. The Operational Safety Requirements (OSRs) which define the limiting conditions of operation at Building 3028 are presented in this report and result from commitments made in the FSAR.

2. DEFINITIONS

The following is a list of definitions of phrases frequently used in the OSRs.

2.1 ABNORMAL OCCURRENCE

An abnormal occurrence is any of the following:

1. Exceeding a Limiting Safety System Setting.
2. Operation in violation of the Limiting Condition for Operation.
3. Incidents or conditions which prevented or could have prevented the performance of the intended safety function of an Engineered Safety Feature.
4. Release of radioactivity of a magnitude to indicate a failure of a principal physical boundary.
5. An observed inadequacy in the implementation of either administrative or procedural controls, such that the inadequacy has caused the existence or development of an unsafe condition in connection with the operation.

2.2 CALIBRATION

An adjustment of electronic, mechanical, pneumatic, or other sensing systems such that the output of the system responds with acceptable range and accuracy, to known values of the parameter that the system measures, or to known input signals when access to the primary element is limited.

2.3 CHECK

A check is a qualitative verification of acceptable performance of a component by observation of its behavior.

2.4 ENGINEERED SAFETY FEATURES

Features of equipment or instrumentation, other than those used for normal operation, that are provided to prevent, limit, or mitigate the release of radioactive material.

2.5 *FUNCTIONAL TEST*

A functional test is a test of a component or system of components to confirm that it performs as intended.

2.6 LIMITING CONDITIONS FOR OPERATIONS (LCO)

The minimum capabilities or performance levels of equipment or administrative controls required for safe operation of the facility.

2.7 LIMITING SAFETY SYSTEM SETTINGS (LSSS)

Settings for automatic alarm or protective devices related to those variables having significant safety functions. Where a limiting safety system setting is specified for a variable on which a safety limit has been placed, the setting is chosen so that protective action, either automatic or manual, will correct the abnormal situation before a safety limit is exceeded.

2.8 NORMAL OPERATION

Processing operations typical of the scope and character described in the FSAR of Building 3028.

2.9 OPERABLE

A component or system is operable when it is capable of performing its intended function when required.

2.10 OPERATING

A component or system is operating when it is performing its intended function.

2.11 QUALIFIED OPERATOR

Any individual who has successfully completed the training module for the task he is performing and has been certified by the examiner and Radioisotope Department management as qualified to perform that particular task.

2.12 RADIATION WORK PERMIT (RWP)

Authorization for one or more named employees to do a particular job that may involve exposure to a specified amount of radiation or contamination. The RWP (Form UCN-2779) describes the proposed work, the radiation conditions to be encountered, and the working restrictions and other protective measures that are required.

2.13 SAFETY LIMITS

Bounds within which the system variables must be maintained to provide adequate control of safety-related parameters and to protect the integrity of the physical systems which are designed to guard against the uncontrolled release of radioactivity.

2.14 DEFINITIONS OF SURVEILLANCE INTERVALS

Surveillance intervals are defined as follows:

1. Annually - To be performed twice each two years with any interval no greater than 15 months.

2. Biennially - To be performed twice each four years with any interval not exceeding 30 months.

3. Bimonthly - To be performed six times each year with any interval not exceeding ten weeks.

4. Biweekly - To be performed twice each month with an interval of not more than three weeks.

5. Daily - To be performed once each day with any interval no greater than 32 hours.

6. Hourly - To be performed once each hour of operation with an interval of operation no greater than 90 minutes.

7. Monthly - To be performed twelve times each year with an interval not exceeding six weeks.

8. Quarterly - To be performed four times each year with any interval not exceeding four months.

9. Semiannually - To be performed twice each year with any interval not exceeding eight months.

10. Semiweekly - To be performed twice each week at intervals not to exceed five days.

11. Shift - To be performed once each eight hours of operation with any interval of operation no greater than ten hours.

12. Weekly - To be performed four times each month with any interval no greater than ten days.

3. SAFETY LIMITS

There are no process variables observed in any operation in Building 3028 which are related to the performance and integrity of a safety system and, therefore, there are no safety limits.

4. LIMITING CONDITIONS FOR OPERATION

Limiting conditions for operation of Building 3028 are listed along with the basis for their necessity. Surveillance requirements and the basis on which these requirements are set are also listed. Unless these conditions are met, operations will not begin and existing operations in affected areas will be terminated. It should be noted, however, that Building 3028 has three independent areas of operation, and the necessity of terminating operations in one area does not necessarily require termination of all operations in the building.

4.1 PRESENCE OF FIRE PROTECTION SYSTEM

Applicability

This requirement applies to the building fire protection systems.

Objective

The objective of this requirement is to prevent the spread of radioactive material in the event of a fire at Building 3028.

Requirements

There shall be no operating in any area without the following fire safety equipment:

1. An operable sprinkler system with automatic alarm.
2. Operable portable fire extinguishers mounted in locations approved by the ORNL Fire Department.

Basis

The ORNL Fire Department is manned on a 24 hr per day, seven day per week basis. Response time in the event of an alarm is less than three minutes and is adequate protection for the facility.

Surveillance

The sprinkler and alarm system shall be inspected semiannually and will be functionally tested annually by the ORNL Fire Department per ORNL Fire Department standard test procedures.

Basis for Surveillance

This periodic surveillance complies with ORNL Fire Department Regulations which are derived from DOE orders and has been shown to be adequate to assure proper operation in the experience of ORNL fire protection personnel.

4.2 PRESENCE OF AIR MONITORING SYSTEM

Applicability

This requirement applies to the building radiation/contamination protection system.

Objective

The objective of this requirement is to ensure that adequate air sampling equipment is available and operating in the various operating areas of Building 3028.

Requirements

Operations in progress shall be terminated and no process shall be initiated in any area which does not meet the following criteria.

1. The west air lock area shall have one operating beta continuous air monitor (CAM).
2. The SLFP operating area shall have one operating CAM.

3. The Alpha Powder Facility operating area shall have one operating continuous alpha air monitor (CAAM).
4. The APF cell access area shall have two operating CAAMs.
5. The east air lock area shall have one operating CAAM.
6. Each of the three Biological Evaluation Laboratories shall have one operating CAAM.
7. The automatic containment system must either have the capability of being triggered by a manual switch or be triggered by any one CAM or CAAM high-level alarm signal.
8. The Alpha Powder Facility and the SLFP operating areas shall each have a manual switch for the purpose of triggering the automatic containment system.
9. CAAM high-level alarm setpoint shall be at 800 cpm.
10. CAM high-level alarm setpoint shall be equivalent to 4000 cpm.

Basis

Continuous monitoring for airborne radioactivity provides warning so that, in the event of a release, the building can be safely evacuated and further spread of contamination can be prevented. Air monitoring instruments, such as the CAM and CAAM, have been found sufficient to detect airborne radioactive contamination before it reaches hazardous levels.

Surveillance

Air monitors (CAM and CAAM) shall be calibrated quarterly and after maintenance that would affect their calibration. Functional checks shall be performed monthly.

Basis for Surveillance

Based on extensive operating experience at Laboratory facilities and the guidelines found in Applied Health Physics Internal Operating Procedures, the frequency of surveillance has been found to be adequate to assure reliable operation.

4.3 PRESENCE OF PERSONAL CONTAMINATION MONITORS

Applicability

This requirement applies to the building contamination survey meter.

Objective

The objective of this requirement is to prevent the spread of contamination in the event of an accidental release of radioactivity to a laboratory.

Requirements

The following contamination survey meters shall be operating at the designated exits from laboratories:

1. The south personnel exit to the west air lock shall have a beta contamination survey meter.
2. The south exit to the Alpha Powder Facility operating area shall have an alpha and a beta contamination survey meter.
3. The south exit to the east air lock shall have an alpha and a beta contamination survey meter.
4. The personnel exit to the Alpha Powder Facility manipulator cell access shall have an alpha contamination survey meter.

5. The normal exits from each of the three upper floors (Biological Evaluation Laboratory) shall have one beta contamination survey meter.

Basis

The use of personal contamination survey meters has proven to be effective in preventing the spread of contamination.

Surveillance

1. Each personal contamination survey meter shall be checked daily.
2. Each personal contamination survey meter shall be equipped with a check source. In cases where survey meters are side by side, one alpha-beta source will suffice.
3. In cases in which a survey meter is not operating, it shall be replaced with a portable instrument until maintenance is complete.

Basis for Surveillance

1. The use of a check source determines whether the instrument is operating.
2. The instruments are used to detect the presence of contamination, not to determine the quantity of activity present. Therefore, a calibration schedule is not needed.
3. Portable instruments, used in conjunction with a check source, are adequate temporary substitutes for fixed instruments. These instruments are used in the field by Health Physics Surveyors and have proved adequate.

4.4 PRESENCE OF MONITRONS

Applicability

This requirement applies to the monitron system of Building 3028.

Objective

The objective of this requirement is to ensure adequate monitoring of gamma and neutron radiation in the hot cell areas.

Requirements

The following monitrons shall be in operation at these respective locations.

1. One gamma monitron shall be located at the cell loading port for all transfers of SLFP products at this port; one gamma monitron shall be located at the target-loading port for all transfers of material into the top of the SLFP cell (Cell 7).
2. One gamma monitron shall be mounted adjacent to the xenon cubicle face.
3. One gamma monitron shall be located in the APF cell access area to survey matetial entering and leaving these cells.
4. Two neutron monitrons shall be located in the APF operating area to monitor neutron fields from the APF hot cells.
5. Gamma monitron alarm limit shall be set at 23 mR/hr.
6. Neutron monitron alarm limit shall be set at 23 mrem/hr.

Basis

Continuous monitoring of these areas provide a warning if hazardous levels of radiation exist.

Surveillance

Monitrons shall be calibrated quarterly and after maintenance that would affect their calibration.

Basis for Surveillance

Based on extensive operating experience at Laboratory facilities and the guidelines found in Applied Health Physics Internal Operating Procedures, the frequency of surveillance has been found to be adequate to assure reliable operation.

4.5 FISSILE MATERIAL CONTROL

Applicability

This requirement applies to the storage or use of fissile material.

Objective

The objective of this requirement is to prevent accumulation of greater than 500 g of fissile material to result in an accidental criticality.

Requirements

1. Each operating area using fissile material shall have an approved, current, Nuclear Safety Review (NSR). This NSR shall specify the quantities of materials and conditions for storage or processing.
2. Quantities of fissile material shall not exceed the amounts specified in the Nuclear Safety Review.

Basis

The use of NSRs at ORNL has proven to be an effective method of controlling quantities of fissile material and thus preventing accidental criticality.

Surveillance

1. An annual audit of each area shall be made by the ORNL Criticality Review Committee.
2. Each operating group shall maintain records which confirm that inventories do not exceed amounts approved in the NSRs.
3. Each operating group shall conduct monthly inventories of fissile material.

Basis for Surveillance

The requirements for surveillance have been in use for several years and have proven to be effective in preventing the accidental accumulation of fissile material.

4.6 FACILITY AUTOMATIC CONTAINMENT AND FILTRATION SYSTEM

Applicability

This requirement applies to the Automatic Containment System of Building 3028.

Objective

The objective of this requirement is to ensure that radioactive material is confined to the building in the event of contamination spread from primary containment.

Requirements

1. Building 3028's Automatic Containment System, when activated, shall maintain 0.3-in. negative w.g. with respect to the exterior of the building.

2. All air exhausted from the building during containment shall pass through testable HEPA filters before being discharged to the stack.
3. HEPA filters shall have had, at the last test, a filter efficiency of ≥99.95 percent for particles in the range of from 0.3 μm to 1 μm.
4. Exceeding an alarm setpoint on any building containment CAM or CAAM or a manual trigger shall activate, to full open, all building exhaust duct dampers.
5. Any building containment constant air monitor or manually triggered alarm signal shall also activate the building's evacuation alarm. Containment CAAM alarm setpoint shall be at 800 cpm; containment CAM alarm setpoint shall be equivalent to 4000 cpm.

Operations shall be terminated and no operations shall begin in any area which does not meet this requirement.

Basis

1. The 0.3-in. negative w.g. is selected to balance the leeside building vacuum caused by 30-mph wind. At the ORNL Bethel Valley Site, the wind velocity is less than 30 mph more than 99.5 percent of the time.
2. Past experience has shown that routinely tested HEPA filters with >99.95 percent efficiency for 0.3 μm to 1 μm particles is sufficient to prevent the release of radioactive material.

Surveillance

The Automatic Containment System shall be checked quarterly. The gages used to determine containment pressure shall be calibrated annually and after any maintenance which could affect performance. HEPA filters shall be DOP tested semiannually.

Basis for Surveillance

Past experience has shown that a quarterly check of containment is sufficient; the gages used have proven to be dependable and based upon past service experience, annual calibration is sufficient. Routine testing (that conform to ANSI 510-1982) of HEPA filters with dioctylphthalate (DOP) by ORNL Quality Assurance and Inspection personnel is sufficient to alert supervision of the possible need to replace HEPA filters.

4.7 PRIMARY CONTAINMENT AND FILTRATION SYSTEM

Applicability

This requirement applies to hot (manipulator and non-manipulator) cells in Building 3028.

Objective

The objective of this requirement is to ensure that the hot cells are maintained at a negative pressure with respect to the operating areas.

Requirements

1. No operations shall begin and operations in progress shall cease if the negative pressure of a manipulator cell in which the work is to be performed is less than 0.25-in. w.g.

2. No operation of any cell shall begin if, after the last test, the HEPA filter show a filter efficiency of less than 99.95 percent for 0.3 μm to 1 μm particles. No SLFP operation involving the processing of iodine-131 shall begin if test results of the series of charcoal filters show an overall efficiency of <99.5 percent for the removal of iodine-131.

Basis

Past experience has shown that 0.25-in. w.g. negative pressure and routinely tested HEPA filters are sufficient to prevent accidental release of radioactive materials (with the exception of iodine-131) during normal operation or in upset conditions. Past experience has shown that the use of a series of potassium iodide impregnated charcoal filters is sufficient to prevent the release of iodine-131 during normal operation or in upset conditions.

Surveillance

1. Negative pressure of manipulator cells shall be verified daily by reading gages.
2. The gages used to determine the negative pressure on manipulator cells shall be checked daily and shall be calibrated annually.
3. All SLFP manipulator cells exhausts shall pass through a series of testable HEPA filters plus testable charcoal filters which have been impregnated with potassium iodide (KI).

4. The SLFP filter pit shall contain one testable (KI impregnated) charcoal filter.
5. All APF cell exhausts shall pass through testable HEPA filters.

Basis for Surveillance

Past experience has shown that daily verifications are sufficient to assure adequate containment; the gages used to determine negative pressure have proven to be very reliable and the experience of the Instrumentation and Controls Division of ORNL indicates that a monthly check and annual calibration are sufficient. Routine testing of HEPA filters with dioctylphthalate (DOP) and charcoal filters with tracer methyl iodide-131 by ORNL Quality Assurance and Inspection personnel is sufficient to alert supervision of the possible need to replace either the HEPA or KI impregnated charcoal filters.

4.8 SLFP TARGET DISSOLVER PRESSURE RELIEF MECHANISM

Applicability

This requirement applies to the pressure relief mechanism on the short-lived fission products target dissolver.

Objective

The objective of this requirement is to ensure relief of excess pressure from the SLFP target-dissolver.

Requirements

The target dissolver shall be equipped with a weighted metal plug pressure relief device with the following characteristics:

1. The relief pressure of 0.5 psig is fixed by the weight of metal plug (2 lb over an area of 4.1 in^2).

2. The metal plug weight shall be sized to provide a positive vacuum seal, serve as a simple and adequate pressure relief mechanism, and be easily handled with hot cell manipulators.

Basis

Past experience has shown that 0.5 psig relief pressure as being sufficient from both a functional and safety viewpoint.

Surveillance

The pressure relief device shall be checked for freedom of movement before each SLFP process run to assure proper operation.

Basis for Surveillance

Since the pressure relief device is a weighted metal plug in a port on the target dissolver's lid, a check before each run to see that the plug has not become lodged in the port has proven adequate for a safe performance.

4.9 HOOD AIR FLOW

Applicability

This requirement applies to Biological Evaluation Laboratory hoods that exhaust to the cell ventilation system.

Objective

The objective of this requirement is to assure adequate air flow at the face of all hoods in order to minimize the likelihood of a release of radioactive material to the operating areas.

Requirement

Each hood shall have an air flow at its face $\geq$100 lfm (0.5 m/s) with the hood sash opened to a height of 12 inches.

Basis

Past experience has shown that 100 lfm (0.5 m/s) is adequate for hood ventilation.

Surveillance

The air flow at the face of the hoods shall be checked weekly using a laboratory air flow measuring device. This device shall be compared to a calibrated air flow measuring device semi-annually.

Basis for Surveillance

A check is sufficient to indicate if any problem exists. The calibrated air flow measuring device is operated by ORNL's Department of Quality Assurance and Inspection.

4.10 INSTRUMENT REQUIREMENTS

Applicability

This requirement applies to the process instrumentation in Building 3028. Health Physics Instrumentation is covered in requirements 4.2 through 4.4.

Objective

The objective of this requirement is to ensure that adequate instrumentation is available and operating in the various operating areas of Building 3028.

Requirements

Operations in progress shall be terminated and no process shall be initiated in any area that does not meet the following applicable criteria.

1. Manipulator cells shall be equipped with operating differential pressure gages.

2. Contained areas of Building 3028 shall be equipped with operating differential pressure gages to be used to measure negative pressure within the facility.
3. The use of furnaces or ovens will include operating temperature detection devices.
4. The use of vacuum equipment will include operating pressure/vacuum detection devices.

Basis

The varied nature of the work in Building 3028 and the segregation of the various areas require that each work area be equipped consistent with the activity performed in that area.

Surveillance

1. Prior to each operation, a verification will be made to ensure that the instrumentation is operating.
2. Building containment and manipulator cell differential pressure gages shall be calibrated annually.

Basis for Surveillance

Based on extensive operating experience, the frequency of surveillance has been found to be adequate.

5. ADMINISTRATIVE CONTROLS

5.1 CONDUCT OF OPERATION

A description of the operating organization and administration of Building 3028 is given in Section 7 of the FSAR. That section deals with the conduct of operations and covers the operating organization, lines of authority, training, configuration control, procedures, and the safety review system. This section is incorporated by reference into the Operational Safety Requirements. Personnel requirements for standard radioactive operations are governed by guidelines stipulated in the Procedures and Practices for Radiation Protection, Health Physics Manual, ORNL.

5.2 STAFF REQUIREMENTS

During any chemical processing operation, a minimum of one qualified operator shall be required to at least observe the process. This qualified operator shall have immediate access to an area supervisor who is qualified to advise on all processes.

5.3 TRAINING AND RETRAINING REQUIREMENTS

All operating personnel are trained, tested, and certified as explained in Section 7.2 of the SAR. Personnel are recertified biennially.

5.4 PERIODIC REVIEW AND AUDIT

An independent audit of operations is conducted biennially by the Director's Radioactive Operations Committee and Criticality Committee. Additional audits are conducted by the Office of Operational Safety in compliance with DOE 5480.1A, Chapter V.

5.5 ACTION TO BE TAKEN IN THE EVENT OF AN ABNORMAL OCCURRENCE

In the event of an abnormal occurrence, as defined in Section 2, the following actions shall be taken:

1. Corrective action shall be taken and at least one of the following shall be notified: Radioisotopes Department Head, Isotopes Section Leader, or Division Director.
2. A report shall be made to the ORNL Office of Operational Safety that shall include an analysis of the cause of the occurrence, efficacy of corrective action, and recommendations for measures to prevent or reduce the probability of recurrence.
3. When required, a report shall be submitted to DOE by ORNL Management.

5.6 REPORTING REQUIREMENTS

1. In addition to the reporting requirements listed in Section 5.3 and 5.4, a report shall be made by ORNL management no later than the next work day to the Safety and Environmental Control Division, DOE, Oak Ridge Operations, of the following conditions:

   a. Any release of radioactivity to the environment above the permissible limits specified in DOE 5480.1, Chapter V and XI.

b. Any exposures to personnel in controlled and uncontrolled areas that exceed the standards in DOE 5480.1, Chapter XI.

2. A report shall be made by ORNL Management within three work days to DOE-ORO of any violation of the Operational Safety Requirements.

5.7 OPERATING RECORDS

In addition to the requirements of applicable regulations, and in no way substituting thereof, records and logs shall be prepared for at least the following items and retained for a period of at least three years:

1. Normal plant operation.
2. Principal maintenance activities.
3. Abnormal occurrences.
4. Equipment and component surveillance activities required by the Operational Safety Requirements.
5. Updated, corrected, and as-built drawings of the facility (these shall be retained for the lifetime of the facility).

REF. 3

MARTIN MARIETTA

Internal Correspondence

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April 15, 1991

M. W. Kohring

Safety Documentation Revisions to the Operational Safety Requirements for Building 3028, Change No. 1, Dated April 15, 1991

Attached are the revised Operational Safety Requirements for Building 3028, Change No. 1; the 1984 version of the same report; the approval page for these changes; and the Safety Analysis Documentation Change Summary Sheet. The change includes all the approved changes to the original document which was issued May 1, 1984, the comments made by your staff on the draft submitted to you on November 5, 1990, and the comments made by your staff on the draft which was submitted to you on November 27, 1990. Previously approved changes are included in this document so that the configuration management requirements of the draft supplement to Procedure X-OS-3 can be met. After your review and concurrence, please sign, date, and return the approval page. Please direct any comments, questions, or recommendations to K. W. Haff, Building 3047, MS-6019 (4-7096).

J. R. Hightower for
R. K. Genung, 4500N, MS-6228, ORNL (4-6147)

RKG:KWH:mas

Attachments (4)

cc: D. D. Drake
J. C. Glowienka
K. W. Haff - RC
J. R. Hightower
K. H. Lin
R. S. McKeehan
B. D. Patton

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MARTIN MARIETTA ENERGY SYSTEMS, INC.

OAK RIDGE NATIONAL LABORATORY

SUBJECT: SAFETY ANALYSIS DOCUMENTATION (SAD) REVISIONS - CHANGE NUMBER 1 TO OPERATIONAL SAFETY REQUIREMENTS FOR BUILDING 3028

SAD CHANGE SUMMARY SHEET

SAD Title: Operational Safety Requirements for Building 3028

Change No.: 1 Date: April 15, 1991

Item No.	Page No.	Summary of Change and Reason for Change
1.	1-1	Introduction revised to reflect current operations in building.
2.	2-1	Definition of "Calibration" changed to agree with ORNL Quality Assurance Manual.
3.	2-2	The definition of "Check" was deleted since it is redundant in that a "Functional Test" is defined.
4.	2-2	A parenthetical note was added to the definition of "Normal Operation" to indicate that the activities described in the SAR have been discontinued.
5.	2-4	The definition of "daily" was changed to indicate that the meaning was each "working" day.
6.	3-1	The existing safety system was included in the OSR.
7.	4-1	The introduction to the Limiting Conditions for Operation was modified to indicate that the facility is locked during non-work hours.
8.	4-2	Surveillance of fire protection system modified to include portable fire extinguishers.

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Item No.	Page No.	Summary of Change and Reason for Change
9.	4-3	The requirement for each Biological Evaluation Laboratory to have one operating CAAM was eliminated. This was done since all operations in these areas (second, third, and fourth floors) have been discontinued, and all equipment has been removed or disconnected.
10.	4-3	The surveillance requirements for calibration were changed from quarterly to annually and functional checks were changed from monthly to bimonthly. This was done to be consistent with actual practice of the radiation protection groups who have adopted and follow the guidance from ANSI-323. The definition of calibration was changed (see item 2 above) which now requires an actual calibration as opposed to a functional test in the old version of this document. These surveillance requirements are much more rigorous than past practice.
11.	4-4	The new name of the ORNL division and document referenced for the surveillance requirements has been included.
12.	4-4	The use of the beta/gamma contamination survey meter at the exit from the east air lock was made optional because of the high radiation background from the filters in building 3047. Beta/gamma emitting materials are not used in this area and would not be brought into the area except in a storage or shipping container or shield.
13.	4-6	The requirement for gamma monitrons on the short-lived-fission-product (SLFP) cell loading port, the SLFP cell target loading port, and xenon cubicle face was eliminated. This was done since no processing activities are performed in these facilities.
14.	4-6	The alarm limit for the remaining monitrons was changed from 23 mrem/h to 22.5 ± 1.5 mrem/h to be consistent with actual practice.
15.	4-7	The requirements of this section were rewritten to conform to the requirements of ORNL Health Physics Procedure, RP-2.4, Appendix A: Material Control Limits for Fissile Isotopes and DOE Order 5480.5. This is not a change in operating philosophy; however, no activities with these isotopes are conducted in the facility other than storage of some materials. These materials are stored in welded capsules and are to be removed from the facility as soon as it is practical to do so.

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Item No.	Page No.	Summary of Change and Reason for Change
16.	4-8	The surveillance requirements were changed to indicate that the annual audit is now made by the Safeguards and Security Department (SSD) and that the inventories conform to requirements in the Health Physics Procedures and to indicate that permission must be obtained from the facility supervisor before any fissile materials are brought into the facility.
17.	4-8	The requirements for the containment and filtration system were rewritten to indicate that the facility is in containment at all times, and they indicate the allowable upper and lower limits of the negative pressure in the facility. A 30-s interruption of the pressure limits is allowed for opening and closing of doors.
18.	4-9	The wording of the HEPA filtration requirements was changed to reflect wording in the military standard (MIL-STD-282) and the ANSI standard (ANSI 510) which are used to evaluate these filters and their installation.
19.	4-9 & 4-9A	The wording in the requirements was changed to more clearly define how the containment system is actuated and the events which occur when the system is actuated.
20.	4-10	Surveillance requirements expanded to more clearly define HEPA filter DOP testing requirements.
21.	4-11	The wording has been changed on the surveillance requirements to read "work day" instead of "daily." This wording is in accordance with actual practice.
22.	4-11 & 4-12	The requirements and surveillance of the requirements have been changed to eliminate the need for charcoal filters for the SLFP cell and to replace them with HEPA filters. This change is justified because no processing occurs in this cell. This change has been previously approved and is included here for completeness.
23.	4-12 & 4-13	The requirement for the SLFP target dissolver pressure relief mechanism has been eliminated since the equipment is no longer used.
24.	5-1	Conduct of Operations section was revised to indicate that all of the SAR Section 7 is not applicable since all processing, source fabrication, and experimental operations have been suspended.

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Item No.	Page No.	Summary of Change and Reason for Change
25.	5-1	Staff Requirements section has been expanded to more clearly define the responsibilities of the qualified operator.
26.	5-2	Reporting requirements have been rewritten to reflect that the requirements are to be in accordance with DOE Order 5000.3A.
27.	5-3	The statement on configuration control of facility drawings has been updated to conform to actual practice.

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APPROVAL PAGE

REVISIONS TO THE OPERATIONAL SAFETY REQUIREMENTS FOR

BUILDING 3028

CHANGE NUMBER 1

APRIL 15, 1991

Approvals:

K. W. Hall — Radiochemical Processing Department Head — 4/15/91 Date

B. O Patton — Radiochemical Technology Section Head — 4/15/91 Date

[signature] — Chemical Technology Division - Associate Director — 4-15-91 Date

[signature] for RK Genung — Chemical Technology Division - Director — 4-15-91 Date

[signature] — Office of Operational Readiness and Safety — 4-18-91 Date

Paul E. Rackley — Plant Safety Evaluation Team - Chairman — 4/21/91 Date

Assistant Manager for Energy Research & Devevlopment
DOE/ORO — Date

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1.0 INTRODUCTION

Building 3028 at Oak Ridge National Laboratory (ORNL) is currently in a safe standby condition; all processing, source fabrication, and experimental operations having been suspended; awaiting funding to stabilize the facility for acceptance by the DOE Decontamination and Decommissioning (D&D) Program. Immediate future plans call for the use of the short-lived-fission-product (SLFP) cells in the disposal of liquid wastes generated in the ORNL 3000 area. The building originally housed three separate operations; the short-lived fission products processing, the alpha powder facility (APF), and laboratories for biological studies on the fate and effects of tracer levels of radiopharmaceuticals administered to small laboratory animals called the biological evaluation laboratory (BEL). The APF was designed to package and distribute gram quantities of alpha material while the SLFP facility separated short-lived fission products from irradiated targets. The building, equipment, and operations are described in the safety analysis report (SAR) for the facility. The hazards and risks associated with the past operations are identified in the SAR. The true situation in the maintenance of the facility is quite different since most operations have ceased. These Operational Safety Requirements (OSR), which define the limiting conditions of operation of the facility, are presented in this report and have been modified to reflect the current operating status.

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2.0 DEFINITIONS

The following is a list of definitions of phrases frequently used in the OSRs.

2.1 ABNORMAL OCCURRENCE

An abnormal occurrence is any of the following:

1. Exceeding a Limiting Safety System Setting.
2. Operation in violation of the Limiting Condition for Operations.
3. Incidents or conditions which prevented or could have prevented the performance of the intended safety function of an Engineered Safety Feature.
4. Release of radioactivity of a magnitude to indicate a failure of a principal physical boundary.
5. An observed inadequacy in the implementation of either administrative or procedural controls, such that the inadequacy has caused the existence or development of an unsafe condition in connection with the operation.

2.2 CALIBRATION

A comparison of measurement and test equipment (M&TE) items with reference standards or with M&TE items of equal or closer tolerance to detect and quantify inaccuracies. R

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2.3 ENGINEERED SAFETY FEATURES

Features of equipment or instrumentation, other than those used for normal operation, that are provided to prevent, limit, or mitigate the release of radioactive material.

2.4 FUNCTIONAL TEST

A functional test is a test of a component or system of components to confirm that it performs as intended.

2.5 LIMITING CONDITIONS FOR OPERATIONS (LCO)

The *minimum capabilities* or performance levels of equipment or administrative controls required for safe operation of the facility.

2.6 LIMITING SAFETY SYSTEM SETTINGS (LSSS)

Settings for automatic alarm or protective devices related to those variables having *significant* safety functions. Where a limiting safety system setting is specified for a variable on which a safety limit has been placed, the setting is chosen so that protective action, either automatic or manual, will correct the abnormal situation before a safety limit is exceeded.

2.7 NORMAL OPERATION

Processing operations typical of the scope and character described in the SAR of Building 3028. (All of these operations have now been terminated). R

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2.8 OPERABLE/OPERABILITY USE

A component or system is operable when it is capable of performing its intended function when required.

2.9 OPERATING

A component or system is operating when it is performing its intended function.

2.10 QUALIFIED OPERATOR

Any individual who has successfully completed the training module for the task he is performing and has been certified by the examiner and line management as qualified to perform that particular task.

2.11 RADIATION WORK PERMIT (RWP)

Authorization for one or more named employees to do a particular job that may involve exposure to a specified amount of radiation or contamination. The RWP (Form UCN-2779) describes the proposed work, the radiation conditions to be encountered, and the working restrictions and other protective measures that are required.

2.12 SAFETY LIMITS

Bounds within which the system variables must be maintained to provide adequate control of safety-related parameters and to protect the integrity of the physical systems which are designed to guard against the uncontrolled release of radioactivity.

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2.13 DEFINITIONS OF SURVEILLANCE INTERVALS

Surveillance intervals are defined as follows:

1. Annually - To be performed twice each two years with any interval no greater than 15 months.

2. Biennially - To be performed twice each four years with any interval not exceeding 30 months.

3. Bimonthly - To be performed six times each year with any interval not exceeding ten weeks.

4. Biweekly - To be performed twice each month with an interval of not more than three weeks.

5. Daily - To be performed once each working day with any interval no greater than 32 hours (weekends and holidays excluded). R

6. Hourly - To be performed once each hour of operation with an interval of operation no greater than 90 minutes.

7. Monthly - To be performed twelve times each year with an interval not exceeding six weeks.

8. Quarterly - To be performed four times each year with any interval not exceeding four months.

9. Semiannually - To be performed twice each year with any interval not exceeding eight months.

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10. Semiweekly - To be performed twice each week at intervals not to exceed five days.

11. Shift - To be performed once each eight hours of operation with any interval of operation no greater than ten hours.

12. Weekly - To be performed four times each month with any interval no greater than ten days.

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3.0 SAFETY LIMITS

The only system requiring a safety limit involves the off-gas system which furnishes ventilation for manipulator cells in the Alpha Powder Facility (APF). The off-gas system is a low-flow, high-negative-pressure system, and it is necessary that the negative pressure be controlled to prevent possible implosion of the manipulator cells. R

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3.1 APF OFF-GAS SYSTEM

Applicability

This requirement applies to the off-gas system located in the APF.

Objective

The objective of this requirement is to ensure that the negative pressure produced by the off-gas system is controlled and that implosion of manipulator cells is not possible.

Requirements

1. The safety limit for the vacuum relief device shall be adjusted so that negative pressure on the system cannot exceed -4.5 in. w.g.
2. The LSSS for the vacuum relief device is -4.0 in. w.g.

R

Basis

1. The off-gas system, which serves the Isotope Area of ORNL, is capable of exerting up to -40 in. w.g. negative pressure on the header serving the manipulator cells. A gage indicating system pressure is located in the APF area. A failure of the valve controlling the negative pressure to the manipulator cells in the APF at approximately -3 in. w.g. could expose these cells to up to -40 in. w.g. negative pressure. A relief device is needed since the cells could not withstand a negative pressure of this magnitude.

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APF OFF-GAS SYSTEM (Cont'd.)

2. Since all manipulator cells are designed to withstand a pressure of >-4.5 in. w.g. (negative), a relief device adjusted to -4.0 in. w.g. (negative) is more than adequate.

Surveillance

The vacuum relief device shall be calibrated annually and after any maintenance which could affect performance. It shall be functionally tested semiannually. R

Basis for Surveillance

The vacuum relief device has a history of maintenance-free operation. Semiannual function tests and an annual calibration are based upon this history of performance.

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4.0 LIMITING CONDITIONS FOR OPERATION

Limiting conditions for operation of Building 3028 are listed along with the basis for their necessity. Surveillance requirements and the basis on which these requirements are set are also listed. Unless these conditions are met, operations will not begin and existing operations in affected areas will be terminated. It should be noted, however, that Building 3028 has three independent areas of operation, and the necessity of terminating operations in one area does not necessarily require termination of all operations in the building. The building will be physically secured (locked) during all off-shift (non-working) hours. R

4.1 PRESENCE OF FIRE PROTECTION SYSTEM

Applicability

This requirement applies to the building fire protection systems.

Objective

The objective of this requirement is to prevent the spread of radioactive material in the event of a fire at Building 3028.

Requirements

There shall be no operating in any area with out the following fire safety equipment:

1. An operable sprinkler system with automatic alarm.
2. Operable portable fire extinguishers mounted in locations approved by the ORNL Fire Department.

Basis

The ORNL Fire Department is manned on a 24 h per day, seven day per week basis. Response time in the event of an alarm is less than three minutes and is adequate protection for the facility.

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Surveillance

The sprinkler and alarm system shall be inspected semiannually and will be functionally tested annually by the ORNL Fire Department in accordance with ORNL Fire Department standard test procedures. Portable fire extinguishers shall be checked periodically by the ORNL Fire Department on a schedule determined by them. R

Basis for Surveillance

This periodic surveillance complies with ORNL Fire Department procedures and regulations which are derived from DOE orders and has been shown to be adequate to assure proper operation in the experience of ORNL fire protection personnel.

4.2 PRESENCE OF AIR MONITORING SYSTEM

Applicability

This requirement applies to the building radiation/contamination protection system.

Objective

The objective of this requirement is to ensure that adequate air sampling equipment is available and operating in the various operating areas of Building 3028.

Requirements

Operations in progress shall be terminated and no process shall be initiated in any area which does not meet the following criteria.

1. The APF operating area shall have one operating continuous alpha air monitor (CAAM).
2. The west airlock shall have one operating beta/gamma continuous air monitor (CAM) and the SLFP operating area shall have one operating CAM.

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3. The APF cell access area shall have two operating CAAMs.

4. The east air lock area shall have one operating CAAM.

5. The containment system must have both the capability of being triggered by a manual switch or being triggered by any one CAM or CAAM high-level alarm signal in the operating areas or both CAAM's in the APF changing area.

6. The APF and SLFP operating areas shall each have a manual switch for the purpose of triggering the containment system.

7. The CAAM high-level alarm set point shall be at 800 cpm.

8. The CAM high-level alarm set point shall be equivalent to 4000 cpm.

Basis

Continuous monitoring for airborne radioactivity provides warning so that, in the event of a release, the building can be safely evacuated and further spread of contamination can be prevented. Air monitoring instruments, such as the CAM and the CAAM, have been found sufficient to detect airborne radioactive contamination before it reaches hazardous levels.

Surveillance

Air monitors (CAM and CAAM) shall be calibrated annually and after maintenance that would affect their calibration. Functional tests shall be performed bimonthly. R

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Basis for Surveillance

Based on extensive operating experience at ORNL facilities and the guidelines found in Environmental and Health Protection Division procedures on Radiation Protection, the frequency of surveillance has been found to be adequate to assure reliable operation. R

4.3 PRESENCE OF PERSONAL CONTAMINATION MONITORS

Applicability

This requirement applies to the building contamination survey meters.

Objective

The objective of this requirement is to prevent the spread of contamination in the event of an accidental release of radioactivity to an area.

Requirements

The following contamination survey meters shall be operating at the designated exits from this facility:

1. The south personnel exit to the west air lock shall have a beta contamination survey meter.
2. The south exit to the APF operating area shall have an alpha and a beta contamination survey meter.
3. The south exit to the east air lock shall have an alpha survey meter. R

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The personnel exit to the APF manipulator cell access area shall have an alpha contamination survey meter.

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5. The normal exits from each of the three upper floors (BEL) shall each have one beta contamination survey meter.

Basis

The use of personal contamination survey meters has proven to be effective in preventing the spread of contamination.

Surveillance

1. Each personal contamination survey meter shall be given a functional test each working day.
2. Each personal contamination survey meter shall be equipped with a check source. In cases where survey meters are side by side, one alpha-beta source will suffice.
3. In cases in which a survey meter is not operating, it shall be replaced with a portable instrument until maintenance is complete.

Basis for Surveillance

1. The use of a check source determines whether the instrument is operating.
2. The instruments are used to detect the presence of contamination, not to determine the quantity of activity present. Therefore, a calibration schedule is not needed.
3. Portable instruments, used in conjunction with a check source, are adequate temporary substitutes for fixed instruments. These instruments are used in the field by health physics surveyors and have proven adequate.

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4.4 PRESENCE OF MONITRONS

Applicability

This requirement applies to the monitron system of Building 3028.

Objective

The objective of this requirement is to ensure adequate monitoring of gamma and neutron radiation in the hot cell areas.

Requirements

The following monitrons shall be in operation at these respective locations.

1. One gamma monitron shall be located in the APF cell access area to survey materials entering and leaving these cells.
2. Two neutron monitrons shall be located in the APF operating area to monitor neutron fields from the APF hot cells. R
3. The gamma monitron alarm limit shall be set at 22.5 ± 1.5 mrem/h.
4. The neutron monitron alarm limit shall be set at 22.5 ± 1.5 mrem/h. R

Basis

Continuous monitoring of these areas provide a warning if hazardous levels of radiation exist.

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Basis

The limits of quantities specified in the referenced health physics procedures have been demonstrated to be effective in preventing criticality accidents. The use of NSRs at ORNL has also proven to be an effective method of controlling quantities of fissile material and thus preventing accidental criticality.

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Surveillance

1. An annual audit of each area for material accountability shall be made by the ORNL Safeguards and Security Department (SSD).
2. The facility supervisor shall maintain records which confirm that inventories do not exceed amounts approved in existing NSRs or the allowable limits in Appendix A of ORNL Health Physics Procedure RP-2.4. Permission must be obtained from the facility supervisor before these materials are moved into the facility. R
3. The facility manager shall conduct, or cause to be conducted, a monthly inventory of fissile material.

Basis for Surveillance

The requirements for surveillance have been in use for several years at ORNL and have proven to be effective in preventing the accidental accumulation of fissile material.

4.6 FACILITY AUTOMATIC CONTAINMENT AND FILTRATION SYSTEM

Applicability

This requirement applies to the Automatic Containment System of Building 3028.

Objective

The objective of this requirement is to ensure that radioactive material is confined to the building in the event of contamination spread from primary containment.

Requirements

1. Building 3028 shall be maintained at -0.3 to -0.34 in. w.g. (negative) pressure with respect to the exterior of the building during all operations. Momentary interruptions of 30 s, to allow for opening and closing of doors, are allowable. R

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All air exhausted from the building shall pass through testable HEPA filters before being discharged.

3. Only high efficiency particulate air (HEPA) filters having fibrous medium which produces a particle removal efficiency of at least 99.97% for 0.3 μm diameter particles of dioctylphthalate (DOP) when tested in accordance with MIL-STD-282* shall be used.

The HEPA filters shall have had; at the last test, which shall have been conducted in accordance with ANSI N510-1989†; a leak efficiency of 99.95% for particles with a diametric size distribution of:

99+% <3.0 μm

50+% <0.7 μm

10+% <0.4 μm

The HEPA filters shall be in situ leak tested at installation, replacement, or maintenance which would affect efficiency; and thereafter semiannually.

R

* MIL-STD-282, "Filter Units, Protective Clothing, Gas Masks. Components and related products; Performance-test methods."

† ANSI/ASME N510-1989, "Testing of Nuclear Air-Cleaning Systems."

4. The CAM/CAAMs located in the APF operating area, the SLFP operating area, the two located in the APF charging area, and the one located in the west airlock are defined as "containment CAM/CAAMs". The CAAM in the APF operating area, or the CAM in the SLFP operating area, or two CAAMs in the APF charging area, or

R

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one CAM in the west airlock are required to set off alarms and lights that notify personnel outside the building that a radioactive release has occurred (see #5 following). CAAM containment alarm setpoints shall be set at 800 cpm; CAM containment alarm setpoints shall be equivalent to 4000 cpm. R

5. When the building containment system is activated either by the CAM/CAAM system as described above or the manual trigger the APF operating area air conditioning system shall be deactivated, magenta lights exterior to the building will be activated, and an audible alarm will sound inside the building. All personnel will evacuate the affected area when the containment system is activated and no personnel will enter the facility except those authorized to respond to the alarm. R R

Operations shall be terminated and no operations shall begin in the designated areas which require CAAMs or CAMS which do not meet these requirements.

asis

1. The -0.3-in. w.g. (negative) pressure was selected to balance the leeward side building vacuum caused by a 30 mph wind. At the ORNL Bethel Valley Site, the wind velocity is less than 30 mph more than 99.5% of the time.
2. Past experience has shown that routinely tested HEPA filters with 99.95% efficiency for removal of particles in the size range specified above is sufficient to prevent the release of radioactive material.

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2. No operation of any cell shall begin if, after the last test, the HEPA filters show a filter efficiency of less than 99.95% for removal of 0.3 μm to 1 μm particles.

Basis

Past experience has shown that 0.25-in. w.g. negative pressure and routinely tested HEPA filters are sufficient to prevent accidental release of radioactive materials during normal operation or in upset conditions.

Surveillance

1. Negative pressure of manipulator cells shall be verified each work day by reading gages.
2. The gages used to determine the negative pressure on manipulator cells shall be read each working day to confirm that the differential pressure meets operational requirements and shall be calibrated annually. R
3. All manipulator cell exhausts shall pass through testable HEPA filters.

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4. All APE cell exhausts shall pass through testable HEPA filters.

Basis for Surveillance

Past experience has shown that daily verifications are sufficient to assure adequate containment; the gages used to determine negative pressure have proven to be very reliable and the experience of the Instrumentation and Controls Division of ORNL indicates that an annual calibration is sufficient. Routine testing of HEPA filters with DOP by the ORNL Inspection Engineering Department personnel is sufficient to alert supervision of the possible need to replace HEPA filters.

4.8 SLFP TARGET DISSOLVER PRESSURE RELIEF MECHANISM

This section has been deleted from this OSR since the equipment is no longer used. R

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4.9 HOOD AIR FLOW

Applicability

This requirement applies to the hoods on the second and third floor laboratories and exhaust to the cell ventilation system.

Objective

The objective of this requirement is to assure adequate air flow at the face of all hoods in order to minimize the likelihood of a release of radioactive material to the operating areas.

Requirement

Each hood shall have an air flow at its face ≥100 lfpm (0.5 m/s) with the hood sash opened to a height of 12 inches.

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Basis

Past experience has shown that 100 lfpm (0.5 m/s) is adequate for hood ventilation.

Surveillance

The air flow at the face of the hoods shall be checked weekly using a laboratory air flow measuring device. This device shall be compared to a calibrated air flow measuring device semi-annually.

Basis for Surveillance

A check with a laboratory air flow measuring device is sufficient to indicate if any problem exists. The calibrated air flow measuring device is operated by ORNL's Inspection Engineering Department.

4.9 INSTRUMENT REQUIREMENTS

Applicability

This requirement applies to the process instrumentation in Building 3028. Health Physics instrumentation is covered in requirements 4.2 through 4.4 of this report.

Objective

The objective of this requirement is to ensure that adequate instrumentation is available and operating in the various operating areas of Building 3028.

Requirements

Operations in progress shall be terminated and no process shall be initiated in any area that does not meet the following applicable criteria.

1. Manipulator cells shall be equipped with operating differential pressure gages.

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2. Contained areas of the building shall be equipped with operating differential pressure gages to be used to measure negative pressure within the facility.

3. The use of furnaces or ovens will include operating temperature detection devices.

4. The use of vacuum equipment will include operating pressure/vacuum detection devices.

Basis

The varied nature of the work in this build and the segregation of the various areas requires that each work area be equipped consistent with the activity performed in that area.

Surveillance

1. Prior to each operating, a verification will be made to ensure that the instrumentation is operating.

2. Building containment and manipulator cell differential pressure gages shall be calibrated annually.

Basis for Surveillance

Based on extensive operating experience, the frequency of surveillance has been found to be adequate.

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5.0 ADMINISTRATIVE CONTROLS

5.1 CONDUCT OF OPERATION

A description of the operating organization and administration of Building 3028 is given in Section 7 of the SAR. That section deals with the conduct of operations and covers the operating organization, lines of authority, training, configuration control, procedures, and the safety review system. This section is incorporated by reference into this OSR (some parts of this SAR section are not applicable since operations in the facility have been suspended). Personnel requirements for standard radioactive operations are governed by guidelines stipulated in the ORNL Health Physics Manual. R

5.2 STAFF REQUIREMENTS

During any chemical processing operation, a minimum of one qualified operator shall be required in the immediate vicinity of the work being performed to observe and assist as required in the work being performed. This qualified operator shall have immediate access to an area supervisor who is qualified to advise on all processes. R

5.3 TRAINING AND RETRAINING REQUIREMENTS

All operating personnel are trained, tested, and certified as explained in Section 7.2 of the SAR. Personnel are recertified biennially.

5.4 PERIODIC REVIEW AND AUDIT

An independent audit of operations is conducted biennially by the ORNL Director's Radioactive Operations Committee. Additional audits are conducted by the Office of Operational Readiness and Safety in compliance with DOE Order 5480.1A, Chapter V.

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5.5 ACTION TO BE TAKEN IN THE EVENT OF AN ABNORMAL OCCURRENCE

In the event of an abnormal occurrence, as defined in Section 2, the following actions shall be taken:

1. Corrective action shall be taken and at least one of the following shall be notified: Chemical Technology Division Radiochemical Processing Department Head, Radiochemical Technology Section Head, or the Chemical Technology Division Associate Director Radiochemical Processing Programs. R
2. A report shall be made to the ORNL Office of Operational Readiness and Safety which includes an analysis of the cause of the occurrence, efficacy of corrective action, and recommendations for measures to prevent or reduce the probability of recurrence.
3. When required, a report shall be submitted to DOE by ORNL Management.

5.6 REPORTING REQUIREMENTS

1. In addition to the reporting requirements listed in Section 5.4 and 5.5, a report shall be made by ORNL management to DOE in accordance with DOE Order 5000.3A. R

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2. A report shall be made by ORNL Management within three work days to DOE/OR of any violation of these Operational Safety Requirements.

5.7 OPERATING RECORDS

In addition to the requirements of applicable regulations, and in no way substituting threrof, records and logs shall be prepared for at least the following items and retained for a period of at least three years:

1. Normal plant operation.
2. Principal maintenance activities.
3. Abnormal occurrences.
4. Equipment and component surveillance activities required by these Operational Safety Requirements.
5. All facility modifications after November 1, 1990, will be accurately reflected in facility drawings. Drawings for systems modified after this date will reflect current status including past modifications. A file of configuration change memoranda will be maintained in an auditable manner. R

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OPERATIONAL SAFETY REQUIREMENTS

FOR

BUILDING 3028

prepared by

Operations Division

Approvals:

C. Faulkner — Radioisotope Department Head — 4-27-84 — Date

C. Newman — Isotopes Section Leader — 4-27-84 — Date

[illegible] — Operations Division Director — 4/27/84 — Date

[illegible] — Office of Operational Safety — 5-1-84 — Date

_____ — Assistant Manager for Energy Research and Development, DOE/ORO — _____ — Date

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OPERATIONAL SAFETY REQUIREMENTS

FOR

BUILDING 3028

D. W. Ramey

PREPARED BY

ORNL OPERATIONS DIVISION

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1.0 INTRODUCTION

Building 3028 at Oak Ridge National Laboratory (ORNL) houses three separate operations. Two radioactive processes of the Radioisotope Department conducted in Building 3028 are the Short-Lived Fission Products (SLFP) processing and the Alpha Powder Facility (APF). The APF is designed to package and distribute gram quantities of alpha material while the SLFP facility separates short-lived fission products from irradiated targets. The three floor levels immediately above the APF operating area contain laboratories occupied by the Nuclear Medicine Technology Group of the Health and Safety Research Division. These laboratories, named the Biological Evaluation Laboratory (BEL), are used for routine short-term biological studies on the fate and effects of tracer levels of radiopharmaceuticals administered to small laboratory animals.

The building, equipment, and operations are described in _____ [Final Safety Analysis Report (FSAR) for Building 3028]. The specific hazards and risks associated with the operations were identified in the FSAR and the measures used to mitigate these risks are identified. The Operational Safety Requirements (OSRs) which define the limiting conditions of operation at Building 3028 are presented in this report and result from commitments made in the FSAR.

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2. DEFINITIONS

The following is a list of definitions of phrases frequently used in the OSRs.

2.1 ABNORMAL OCCURRENCE

An abnormal occurrence is any of the following:

1. Exceeding a Limiting Safety System Setting.
2. Operation in violation of the Limiting Condition for Operation.
3. Incidents or conditions which prevented or could have prevented the performance of the intended safety function of an Engineered Safety Feature.
4. Release of radioactivity of a magnitude to indicate a failure of a principal physical boundary.
5. An observed inadequacy in the implementation of either administrative or procedural controls, such that the inadequacy has caused the existence or development of an unsafe condition in connection with the operation.

2.2 CALIBRATION

An adjustment of electronic, mechanical, pneumatic, or other sensing systems such that the output of the system responds with acceptable range and accuracy, to known values of the parameter that the system measures, or to known input signals when access to the primary element is limited.

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2.3 CHECK

A check is a qualitative verification of acceptable performance of a component by observation of its behavior.

2.4 ENGINEERED SAFETY FEATURES

Features of equipment or instrumentation, other than those used for normal operation, that are provided to prevent, limit, or mitigate the release of radioactive material.

2.5 FUNCTIONAL TEST

A functional test is a test of a component or system of components to confirm that it performs as intended.

2.6 LIMITING CONDITIONS FOR OPERATIONS (LCO)

The minimum capabilities or performance levels of equipment or administrative controls required for safe operation of the facility.

2.7 LIMITING SAFETY SYSTEM SETTINGS (LSSS)

Settings for automatic alarm or protective devices related to those variables having significant safety functions. Where a limiting safety system setting is specified for a variable on which a safety limit has been placed, the setting is chosen so that protective action, either automatic or manual, will correct the abnormal situation before a safety limit is exceeded.

2.8 NORMAL OPERATION

Processing operations typical of the scope and character described in the FSAR of Building 3028.

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2.9 OPERABLE

A component or system is operable when it is capable of performing its intended function when required.

2.10 OPERATING

A component or system is operating when it is performing its intended function.

2.11 QUALIFIED OPERATOR

Any individual who has successfully completed the training module for the task he is performing and has been certified by the examiner and Radioisotope Department management as qualified to perform that particular task.

2.12 RADIATION WORK PERMIT (RWP)

Authorization for one or more named employees to do a particular job that may involve exposure to a specified amount of radiation or contamination. The RWP (Form UCN-2779) describes the proposed work, the radiation conditions to be encountered, and the working restrictions and other protective measures that are required.

2.13 SAFETY LIMITS

Bounds within which the system variables must be maintained to provide adequate control of safety-related parameters and to protect the integrity of the physical systems which are designed to guard against the uncontrolled release of radioactivity.

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2.14 DEFINITIONS OF SURVEILLANCE INTERVALS

Surveillance intervals are defined as follows:

1. Annually - To be performed twice each two years with any interval no greater than 15 months.

2. Biennially - To be performed twice each four years with any interval not exceeding 30 months.

3. Bimonthly - To be performed six times each year with any interval not exceeding ten weeks.

4. Biweekly - To be performed twice each month with an interval of not more than three weeks.

5. Daily - To be performed once each day with any interval no greater than 32 hours.

6. Hourly - To be performed once each hour of operation with an interval of operation no greater than 90 minutes.

7. Monthly - To be performed twelve times each year with an interval not exceeding six weeks.

8. Quarterly - To be performed four times each year with any interval not exceeding four months.

9. Semiannually - To be performed twice each year with any interval not exceeding eight months.

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10. Semiweekly - To be performed twice each week at intervals not to exceed five days.

11. Shift - To be performed once each eight hours of operation with any interval of operation no greater than ten hours.

12. Weekly - To be performed four times each month with any interval no greater than ten days.

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3. SAFETY LIMITS

There are no process variables observed in any operation in Building 3028 which are related to the performance and integrity of a safety system and, therefore, there are no safety limits.

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4. LIMITING CONDITIONS FOR OPERATION

Limiting conditions for operation of Building 3028 are listed along with the basis for their necessity. Surveillance requirements and the basis on which these requirements are set are also listed. Unless these conditions are met, operations will not begin and existing operations in affected areas will be terminated. It should be noted, however, that Building 3028 has three independent areas of operation, and the necessity of terminating operations in one area does not necessarily require termination of all operations in the building.

4.1 PRESENCE OF FIRE PROTECTION SYSTEM

Applicability

This requirement applies to the building fire protection systems.

Objective

The objective of this requirement is to prevent the spread of radioactive material in the event of a fire at Building 3028.

Requirements

There shall be no operating in any area without the following fire safety equipment:

1. An operable sprinkler system with automatic alarm.
2. Operable portable fire extinguishers mounted in locations approved by the ORNL Fire Department.

Basis

The ORNL Fire Department is manned on a 24 hr per day, seven day per week basis. Response time in the event of an alarm is less than three minutes and is adequate protection for the facility.

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Surveillance

The sprinkler and alarm system shall be inspected semiannually and will be functionally tested annually by the ORNL Fire Department per ORNL Fire Department standard test procedures.

Basis for Surveillance

This periodic surveillance complies with ORNL Fire Department Regulations which are derived from DOE orders and has been shown to be adequate to assure proper operation in the experience of ORNL fire protection personnel.

4.2 PRESENCE OF AIR MONITORING SYSTEM

Applicability

This requirement applies to the building radiation/contamination protection system.

Objective

The objective of this requirement is to ensure that adequate air sampling equipment is available and operating in the various operating areas of Building 3028.

Requirements

Operations in progress shall be terminated and no process shall be initiated in any area which does not meet the following criteria.

1. The west air lock area shall have one operating beta continuous air monitor (CAM).
2. The SLFP operating area shall have one operating CAM.

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3. The Alpha Powder Facility operating area shall have one operating continuous alpha air monitor (CAAM).
4. The APF cell access area shall have two operating CAAMs.
5. The east air lock area shall have one operating CAAM.
6. Each of the three Biological Evaluation Laboratories shall have one operating CAAM.
7. The automatic containment system must either have the capability of being triggered by a manual switch or be triggered by any one CAM or CAAM high-level alarm signal.
8. The Alpha Powder Facility and the SLFP operating areas shall each have a manual switch for the purpose of triggering the automatic containment system.
9. CAAM high-level alarm setpoint shall be at 800 cpm.
10. CAM high-level alarm setpoint shall be equivalent to 4000 cpm.

Basis

Continuous monitoring for airborne radioactivity provides warning so that, in the event of a release, the building can be safely evacuated and further spread of contamination can be prevented. Air monitoring instruments, such as the CAM and CAAM, have been found sufficient to detect airborne radioactive contamination before it reaches hazardous levels.

Surveillance

Air monitors (CAM and CAAM) shall be calibrated quarterly and after maintenance that would affect their calibration. Functional checks shall be performed monthly.

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Basis for Surveillance

Based on extensive operating experience at Laboratory facilities and the guidelines found in Applied Health Physics Internal Operating Procedures, the frequency of surveillance has been found to be adequate to assure reliable operation.

4.3 PRESENCE OF PERSONAL CONTAMINATION MONITORS

Applicability

This requirement applies to the building contamination survey meter.

Objective

The objective of this requirement is to prevent the spread of contamination in the event of an accidental release of radioactivity to a laboratory.

Requirements

The following contamination survey meters shall be operating at the designated exits from laboratories:

1. The south personnel exit to the west air lock shall have a beta contamination survey meter.
2. The south exit to the Alpha Powder Facility operating area shall have an alpha and a beta contamination survey meter.
3. The south exit to the east air lock shall have an alpha and a beta contamination survey meter.
4. The personnel exit to the Alpha Powder Facility manipulator cell access shall have an alpha contamination survey meter.

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5. The normal exits from each of the three upper floors (Biological Evaluation Laboratory) shall have one beta contamination survey meter.

Basis

The use of personal contamination survey meters has proven to be effective in preventing the spread of contamination.

Surveillance

1. Each personal contamination survey meter shall be checked daily.
2. Each personal contamination survey meter shall be equipped with a check source. In cases where survey meters are side by side, one alpha-beta source will suffice.
3. In cases in which a survey meter is not operating, it shall be replaced with a portable instrument until maintenance is complete.

Basis for Surveillance

1. The use of a check source determines whether the instrument is operating.
2. The instruments are used to detect the presence of contamination, not to determine the quantity of activity present. Therefore, a calibration schedule is not needed.
3. Portable instruments, used in conjunction with a check source, are adequate temporary substitutes for fixed instruments. These instruments are used in the field by Health Physics Surveyors and have proved adequate.

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4.4 PRESENCE OF MONITRONS

Applicability

This requirement applies to the monitron system of Building 3028.

Objective

The objective of this requirement is to ensure adequate monitoring of gamma and neutron radiation in the hot cell areas.

Requirements

The following monitrons shall be in operation at these respective locations.

1. One gamma monitron shall be located at the cell loading port for all transfers of SLFP products at this port; one gamma monitron shall be located at the target-loading port for all transfers of material into the top of the SLFP cell (Cell 7).
2. One gamma monitron shall be mounted adjacent to the xenon cubicle face.
3. One gamma monitron shall be located in the APF cell access area to survey material entering and leaving these cells.
4. Two neutron monitrons shall be located in the APF operating area to monitor neutron fields from the APF hot cells.
5. Gamma monitron alarm limit shall be set at 23 mR/hr.
6. Neutron monitron alarm limit shall be set at 23 mrem/hr.

Basis

Continuous monitoring of these areas provide a warning if hazardous levels of radiation exist.

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Surveillance

Monitrons shall be calibrated quarterly and after maintenance that would affect their calibration.

Basis for Surveillance

Based on extensive operating experience at Laboratory facilities and the guidelines found in Applied Health Physics Internal Operating Procedures, the frequency of surveillance has been found to be adequate to assure reliable operation.

4.5 FISSILE MATERIAL CONTROL

Applicability

This requirement applies to the storage or use of fissile material.

Objective

The objective of this requirement is to prevent accumulation of greater than 500 g of fissile material to result in an accidental criticality.

Requirements

1. Each operating area using fissile material shall have an approved, current, Nuclear Safety Review (NSR). This NSR shall specify the quantities of materials and conditions for storage or processing.
2. Quantities of fissile material shall not exceed the amounts specified in the Nuclear Safety Review.

Basis

The use of NSRs at ORNL has proven to be an effective method of controlling quantities of fissile material and thus preventing accidental criticality.

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Surveillance

1. An annual audit of each area shall be made by the ORNL Criticality Review Committee.
2. Each operating group shall maintain records which confirm that inventories do not exceed amounts approved in the NSRs.
3. Each operating group shall conduct monthly inventories of fissile material.

Basis for Surveillance

The requirements for surveillance have been in use for several years and have proven to be effective in preventing the accidental accumulation of fissile material.

4.6 FACILITY AUTOMATIC CONTAINMENT AND FILTRATION SYSTEM

Applicability

This requirement applies to the Automatic Containment System of Building 3028.

Objective

The objective of this requirement is to ensure that radioactive material is confined to the building in the event of contamination spread from primary containment.

Requirements

1. Building 3028's Automatic Containment System, when activated, shall maintain 0.3-in. negative w.g. with respect to the exterior of the building.

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2. All air exhausted from the building during containment shall pass through testable HEPA filters before being discharged to the stack.
3. HEPA filters shall have had, at the last test, a filter efficiency of $\geq$99.95 percent for particles in the range of from 0.3 μm to 1 μm.
4. Exceeding an alarm setpoint on any building containment CAM or CAAM or a manual trigger shall activate, to full open, all building exhaust duct dampers.
5. Any building containment constant air monitor or manually triggered alarm signal shall also activate the building's evacuation alarm. Containment CAAM alarm setpoint shall be at 800 cpm; containment CAM alarm setpoint shall be equivalent to 4000 cpm.

Operations shall be terminated and no operations shall begin in any area which does not meet this requirement.

Basis

1. The 0.3-in. negative w.g. is selected to balance the leeside building vacuum caused by 30-mph wind. At the ORNL Bethel Valley Site, the wind velocity is less than 30 mph more than 99.5 percent of the time.
2. Past experience has shown that routinely tested HEPA filters with >99.95 percent efficiency for 0.3 μm to 1 μm particles is sufficient to prevent the release of radioactive material.

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Surveillance

The Automatic Containment System shall be checked quarterly. The gages used to determine containment pressure shall be calibrated annually and after any maintenance which could affect performance. HEPA filters shall be DOP tested semiannually.

Basis for Surveillance

Past experience has shown that a quarterly check of containment is sufficient; the gages used have proven to be dependable and based upon past service experience, annual calibration is sufficient. Routine testing (that conform to ANSI 510-1982) of HEPA filters with dioctylphthalate (DOP) by ORNL Quality Assurance and Inspection personnel is sufficient to alert supervision of the possible need to replace HEPA filters.

4.7 PRIMARY CONTAINMENT AND FILTRATION SYSTEM

Applicability

This requirement applies to hot (manipulator and non-manipulator) cells in Building 3028.

Objective

The objective of this requirement is to ensure that the hot cells are maintained at a negative pressure with respect to the operating areas.

Requirements

1. No operations shall begin and operations in progress shall cease if the negative pressure of a manipulator cell in which the work is to be performed is less than 0.25-in. w.g.

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2. No operation of any cell shall begin if, after the last test, the HEPA filter show a filter efficiency of less than 99.95 percent for 0.3 μm to 1 μm particles. No SLFP operation involving the processing of iodine-131 shall begin if test results of the series of charcoal filters show an overall efficiency of <99.5 percent for the removal of iodine-131.

Basis

Past experience has shown that 0.25-in. w.g. negative pressure and routinely tested HEPA filters are sufficient to prevent accidental release of radioactive materials (with the exception of iodine-131) during normal operation or in upset conditions. Past experience has shown that the use of a series of potassium iodide impregnated charcoal filters is sufficient to prevent the release of iodine-131 during normal operation or in upset conditions.

Surveillance

1. Negative pressure of manipulator cells shall be verified daily by reading gages.
2. The gages used to determine the negative pressure on manipulator cells shall be checked daily and shall be calibrated annually.
3. All SLFP manipulator cells exhausts shall pass through a series of testable HEPA filters plus testable charcoal filters which have been impregnated with potassium iodide (KI).

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4. The SLFP filter pit shall contain one testable (KI impregnated) charcoal filter.

5. All APF cell exhausts shall pass through testable HEPA filters.

Basis for Surveillance

Past experience has shown that daily verifications are sufficient to assure adequate containment; the gages used to determine negative pressure have proven to be very reliable and the experience of the Instrumentation and Controls Division of ORNL indicates that a monthly check and annual calibration are sufficient. Routine testing of HEPA filters with dioctylphthalate (DOP) and charcoal filters with tracer methyl iodide-131 by ORNL Quality Assurance and Inspection personnel is sufficient to alert supervision of the possible need to replace either the HEPA or KI impregnated charcoal filters.

4.8 SLFP TARGET DISSOLVER PRESSURE RELIEF MECHANISM

Applicability

This requirement applies to the pressure relief mechanism on the short-lived fission products target dissolver.

Objective

The objective of this requirement is to ensure relief of excess pressure from the SLFP target dissolver.

Requirements

The target dissolver shall be equipped with a weighted metal plug pressure relief device with the following characteristics:

1. The relief pressure of 0.5 psig is fixed by the weight of metal plug (2 lb over an area of 4.1 in^2).

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2. The metal plug weight shall be sized to provide a positive vacuum seal, serve as a simple and adequate pressure relief mechanism, and be easily handled with hot cell manipulators.

Basis

Past experience has shown that 0.5 psig relief pressure as being sufficient from both a functional and safety viewpoint.

Surveillance

The pressure relief device shall be checked for freedom of movement before each SLFP process run to assure proper operation.

Basis for Surveillance

Since the pressure relief device is a weighted metal plug in a port on the target dissolver's lid, a check before each run to see that the plug has not become lodged in the port has proven adequate for a safe performance.

4.9 HOOD AIR FLOW

Applicability

This requirement applies to Biological Evaluation Laboratory hoods that exhaust to the cell ventilation system.

Objective

The objective of this requirement is to assure adequate air flow at the face of all hoods in order to minimize the likelihood of a release of radioactive material to the operating areas.

Requirement

Each hood shall have an air flow at its face $\geq$100 lfm (0.5 m/s) with the hood sash opened to a height of 12 inches.

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Basis

Past experience has shown that 100 lfm (0.5 m/s) is adequate for hood ventilation.

Surveillance

The air flow at the face of the hoods shall be checked weekly using a laboratory air flow measuring device. This device shall be compared to a calibrated air flow measuring device semi-annually.

Basis for Surveillance

A check is sufficient to indicate if any problem exists. The calibrated air flow measuring device is operated by ORNL's Department of Quality Assurance and Inspection.

4.10 INSTRUMENT REQUIREMENTS

Applicability

This requirement applies to the process instrumentation in Building 3028. Health Physics Instrumentation is covered in requirements 4.2 through 4.4.

Objective

The objective of this requirement is to ensure that adequate instrumentation is available and operating in the various operating areas of Building 3028.

Requirements

Operations in progress shall be terminated and no process shall be initiated in any area that does not meet the following applicable criteria.

1. Manipulator cells shall be equipped with operating differential pressure gages.

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2. Contained areas of Building 3028 shall be equipped with operating differential pressure gages to be used to measure negative pressure within the facility.
3. The use of furnaces or ovens will include operating temperature detection devices.
4. The use of vacuum equipment will include operating pressure/vacuum detection devices.

Basis

The varied nature of the work in Building 3028 and the segregation of the various areas require that each work area be equipped consistent with the activity performed in that area.

Surveillance

1. Prior to each operation, a verification will be made to ensure that the instrumentation is operating.
2. Building containment and manipulator cell differential pressure gages shall be calibrated annually.

Basis for Surveillance

Based on extensive operating experience, the frequency of surveillance has been found to be adequate.

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5. ADMINISTRATIVE CONTROLS

5.1 CONDUCT OF OPERATION

A description of the operating organization and administration of Building 3028 is given in Section 7 of the FSAR. That section deals with the conduct of operations and covers the operating organization, lines of authority, training, configuration control, procedures, and the safety review system. This section is incorporated by reference into the Operational Safety Requirements. Personnel requirements for standard radioactive operations are governed by guidelines stipulated in the Procedures and Practices for Radiation Protection, Health Physics Manual, ORNL.

5.2 STAFF REQUIREMENTS

During any chemical processing operation, a minimum of one qualified operator shall be required to at least observe the process. This qualified operator shall have immediate access to an area supervisor who is qualified to advise on all processes.

5.3 TRAINING AND RETRAINING REQUIREMENTS

All operating personnel are trained, tested, and certified as explained in Section 7.2 of the SAR. Personnel are recertified biennially.

5.4 PERIODIC REVIEW AND AUDIT

An independent audit of operations is conducted biennially by the Director's Radioactive Operations Committee and Criticality Committee. Additional audits are conducted by the Office of Operational Safety in compliance with DOE 5480.1A, Chapter V.

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5.5 ACTION TO BE TAKEN IN THE EVENT OF AN ABNORMAL OCCURRENCE

In the event of an abnormal occurrence, as defined in Section 2, the following actions shall be taken:

1. Corrective action shall be taken and at least one of the following shall be notified: Radioisotopes Department Head, Isotopes Section Leader, or Division Director.
2. A report shall be made to the ORNL Office of Operational Safety that shall include an analysis of the cause of the occurrence, efficacy of corrective action, and recommendations for measures to prevent or reduce the probability of recurrence.
3. When required, a report shall be submitted to DOE by ORNL Management.

5.6 REPORTING REQUIREMENTS

1. In addition to the reporting requirements listed in Section 5.3 and 5.4, a report shall be made by ORNL management no later than the next work day to the Safety and Environmental Control Division, DOE, Oak Ridge Operations, of the following conditions:

   a. Any release of radioactivity to the environment above the permissible limits specified in DOE 5480.1, Chapter V and XI.

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(b) Any exposures to personnel in controlled and uncontrolled areas that exceed the standards in DOE 5480.1, Chapter XI.

2. A report shall be made by ORNL Management within three work days to DOE-ORO of any violation of the Operational Safety Requirements.

5.7 OPERATING RECORDS

In addition to the requirements of applicable regulations, and in no way substituting thereof, records and logs shall be prepared for at least the following items and retained for a period of at least three years:

1. Normal plant operation.
2. Principal maintenance activities.
3. Abnormal occurrences.
4. Equipment and component surveillance activities required by the Operational Safety Requirements.
5. Updated, corrected, and as-built drawings of the facility (these shall be retained for the lifetime of the facility).

BLDG 5505 CH-TRU CONTAINERS
ACCEPTABLE KNOWLEDGE DOCUMENTATION

Building Information

Bldg. 5505, Transuranium Research Laboratory, was discussed in multiple conversations with Dr. Haire. He noted that much of the material used by researchers at Bldg. 5505 came from REDC, so materials used in that facility could remain after its use at Bldg. 5505. Research at Bldg. 5505 primarily involved the Lanthanide and Actinide elements, which include the transuranic elements. An important goal was the search for new superheavy elements. Many operations included mechanical processing, so the presence of Fe and Ni based metals, as well as Hg, Pb, and other RCRA metals is likely. Small scale organic processing was performed, so small plastic bottles of liquid could be in the waste. Ion exchange resins may also have been discarded.

Dr. Haire noted that most of the documentation of work in the facility is in the form of research reports, which are not especially helpful in identifying and quantifying potential hazardous and other materials in the CH TRU containers. References in the Trabalka report pertaining to Bldg. 5505 were also reviewed. Many of these references are research and scientific reports. An extensive variety of chemicals and potential hazardous or RCRA materials are mentioned in these references. Many of the materials listed are unusual compounds used the research being conducted (e.g., dicyclopentadienylberkelium chloride, peroxydisulfuric acid); many are more common chemicals (e.g., HCl, ketone, xylene, carbon tetrachloride, hydrogen peroxide). However, the references generally do not provide the location of the operations described, the quantity of materials involved, or information on how they might have been handled or dispositioned. So it is difficult to determine the relevance of this information to the characterization of the containers in question.

References/Sources

- Trabalka report, references cited in Sec. 4.6:
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- Johnson, L., and Schaffer, D. 1992. "ORNL: The First 50 Years (1942–1992)," *ORNL Review* **25** (Nos. 3 & 4), 1–282.

Personnel Contacts

- Michael Pierce (Facility Complex Manager)
- Dr. Dick Haire (long-time involvement with building)

BLDG 3038 CH-TRU CONTAINERS
ACCEPTABLE KNOWLEDGE DOCUMENTATION

Building Information

- Isotopes Research Materials Laboratory
- Alpha Handling Facility

References/Sources

BJCL (Bechtel Jacobs Company LLC). 2001a. *ORNL TRU Waste Historical Survey–Volume 2: Origins and Characteristics of Contact-Handled Transuranic Wastes*, BJC/OR-395-V/2 , BJCL, Oak Ridge, TN.

BJCL (Bechtel Jacobs Company LLC). 2001b. *ORNL TRU Waste Historical Survey–Volume 3: Recorded Characteristics of Stored Solid Transuranic Wastes*, BJC/OR-395-V/3, BJCL, Oak Ridge, TN.

Personnel Contacts

Miner, JT (Tommy), 576-4881, Bldg 3034, MS-6013

BUILDING 4508 CH-TRU CONTAINERS
ACCEPTABLE KNOWLEDGE DOCUMENTATION

Building Information

The activities in Bldg. 4508 were conducted during the late 1960s through the early 1980s in either the Ceramic Fuels Alpha Facility (Room 265) or the Interim Plutonium Laboratory (Room 136). Both facilities in Bldg. 4508 were used until the early 1980s, and then were decommissioned in the mid 1980s.

Fuel development work was conducted in the facility for the Gas-Cooled Fast Breeder Reactor (GCFBR), Liquid Metal Fast Breeder Reactor (LMFBR), Molten Salt Reactor Experiment (MSRE), Light Water Breeder Reactor (LWBR), and High Temperature Gas-Cooled Reactor (HTGR) Programs. The LMFBR was designed to use (Pu, U) fuels (oxides, nitrides, and carbonitrides were explored), while the latter three reactor technologies were developed around (Th, ^{233}U) fuels. The MSRE fuel was a fluoride salt, LWBR fuels were ceramic oxide pellets, and HTGR fuels were to be carbides or oxides encased in pyrolytic carbon matrices. The R&D activities conducted in Building 4508 are described in annual reports of the Metals and Ceramics Division; in quarterly, semiannual, and annual reports to the Atomic Energy Commision/Energy Research and Development Administration/Department of Energy (AEC/ERDA/DOE); and in technical reports and open-literature publications by research staff. Lists of such publications can be found in the annual reports of the Metals and Ceramics Division, and, over the period from 1970 through 1973, in the Progress Reports section of the annual progress reports prepared by the Chemical Technology Division. Glove boxes used for work in the 1967 – 1971 period were subsequently decontaminated and converted for use in R&D on the HTGR fuel. MSRE work was limited to a single 2-month campaign in a single glove box in Room 265C during 1966–1967.

CH-TRU wastes were generated from Building 4508 received during 1971–1984, and during decommissioning activities in 1984–1986. Drums and large boxes of waste generated in 1984–1986 consist of general waste and equipment from glove boxes, and of the glove boxes themselves, as the laboratories were decommissioned.

References/Sources of Information

The summary discussion and list of references provided by Trabalka (Volume 2) appears to be a relatively complete compilation of information that is readily available on potential sources of RCRA contaminants in the Building 4508 waste. In addition to the potentially relevant references identified by Trablaka, and listed in this section, the following new reference has been identified.

1. Rom, A. M. 1967. *Design of a Jet-actuated Vacuum System for Use in the Coated Particle Development Laboratory, Building 4508*, Oak Ridge National Laboratory, Oak Ridge, TN.

Potentially Relevant References from Trabalka

The references identified by Trabalka for Building 4508 have been reviewed, and the list of references edited to include those that may contain potentially useful information on the presence or absence of RCRA waste. The potentially relevant references are listed below.

BJCL (Bechtel Jacobs Company LLC). 2001a. *ORNL TRU Waste Historical Survey–Volume 1: Origins and Characteristics of Remote-Handled Transuranic Wastes*, BJC/OR-395-V/1, BJCL, Oak Ridge, TN.

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Personnel Contacts

William H. Miller (UT-B Retired, ??)
Ron Sy (UT-B, 241-4610)

BUILDING 2026 CH-TRU CONTAINERS
ACCEPTABLE KNOWLEDGE DOCUMENTATION

Building Information

The Radioactive Materials Analytical Laboratory became operational in 1965 as a replacement for the High-Level-Radiation Analytical Facility in Building. 3019-B. Its primary mission during the first decade of operations was reportedly to provide analytical support for Bldg. 3019-A. In later years, the diversity of analytical support activities increased, and the facility currently serves as both an ORNL-wide and DOE-wide resource. The activities of the RMAL are further described in the ORNL Analytical Chemistry Division annual progress reports. The annual reports also provide bibliographies that list other technical reports and open-literature publications dealing with these activities.

Because Bldg. 2026 has always been an analytical support facility, it has handled materials from a wide range of AEC/ERDA/DOE programs. The RMAL also provided support to ORNL Isotopes programs not only by providing analytical services but also by performing chemical processing steps (e.g., acid dissolutions) in support of the Isotopes Distribution (Sales) Office and the Isotopes Research Materials Laboratory (IRML.

Most solid CH-TRU wastes from operations in Bldg. 2026 originated from glove boxes and laboratory hoods, the usage of which was not restricted by programmatic activity. The person who performed an analytical task (and who packaged the wastes) would not necessarily have known the identity of the program which requested the analysis. Over the past 10–15 y, a single overhead account number has been used for all waste disposal activities.

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The references identified by Trabalka for Building 2026 have been reviewed, and the list of references edited to include those that may contain potentially useful information on the presence or absence of RCRA waste. The potentially relevant references are listed below.

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Personnel Contacts

John Keller (UT-B, 574-4885)

BUILDING 4501 CH-TRU CONTAINERS
ACCEPTABLE KNOWLEDGE DOCUMENTATION

Building Information

The High-Level Radiochemical Laboratory, Building 4501, was one of the principal ORNL sites for reactor safety research, starting in 1955. Studies involved light water reactor (LWR), Liquid Metal Fast Breeder Reactor (LMFBR), and High Temperature Gas-Cooled Reactor (HTGR) systems. However, reactor fuel research involving the actinides and a range of basic and applied actinide chemistry studies appear to have been the principal (if not the sole) source of the CH-TRU wastes generated in Building 4501. The chemistry research was focused on the TRU isotopes, particularly Pu, and provided information on the oxidation state and polymerization behavior of Pu and other actinide isotopes under a wide range of conditions. The largest single source of wastes was a series of Pu dioxide and Pu-dioxide-microsphere dissolution studies conducted over the period 1974 to 1983. Other activities included development of new laser techniques for adjustment of actinide oxidation states in support of investigations into alternative methods for fuel reprocessing, and a Japanese proposal for Pu isotope separation using ion exchange technology was also evaluated. Additional information on R&D activities in Building 4501 is available in the references below.

A total of 42 drums of wastes were reportedly generated in Building 4501, primarily from the glove-box facilities in Rooms 126 and 127. Two drums of waste were generated during laboratory cleanup activities.

References/Sources of Information

The references identified by Trabalka for Building 4501 have been reviewed, and the list of references edited to include those that may contain potentially useful information on the presence or absence of RCRA waste. The potentially relevant references are listed below.

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Personnel Contacts

Ron Sy (UT-B, 241-4610)

BLDG 3027 CH-TRU CONTAINERS
ACCEPTABLE KNOWLEDGE DOCUMENTATION

Building Information

Bldg. 3027, Nuclear Materials Storage Vault (Safeguard Vault), was primarily a storage vault for SNM and other sensitive material generated by research or processing activities in other facilities. The Trabalka report well documents the source of much of this material. Little or no additional processing was performed in Bldg. 3027 so the material should retain the characteristics of the facility where it was originally generated.

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Personnel Contacts

- Hurtis Hodges (Facility Complex Manager)
- Steve Owens

DIVIDER PAGE

Attachment 3 - Acceptable Knowledge Source Document Summary

Site(s): Oak Ridge National Laboratory	Source Document Tracking Number: C148
Waste Stream Number(s): ORNL Non-specific Library Files (Applicable only when site library is not in use)	
Acceptable Knowledge Documentation Type: ☐ TRU Waste Management Program Information ☑ Waste Stream-Specific Information ☑ Additional Information	Category: ☑ Correspondence ☐ Discrepancy Resolution ☐ Internal Procedure ☐ Miscellaneous ☐ Published Document or Internal Procedure ☐ Unpublished Documents
Title or Description of Source Document [a]: Interviews with REDC Personnel	
Source Document Reference Information (author(s), document and revision number, date, publisher): J. Harrison; L. Watson, NA, NA, Various	

AK # [b]	Source Doc. Page # [c]	AK Information Summary
WS1, WS4, WS6, WS8, WS9, WS11, WS12, S7, S16	Throughout	Summary: The following Building 7920 personnel were interviewed over the course of 3 days: • Kenton Wilson – 6/19/07 (Ph: 865-574-6926) • Fred Chattin – 6/19/07 • Wayne Evans – 6/20/07 • Chuck Alexander – 6/20/07 • Curtis Porter – 6/20/07 • Porter Bailey – 6/20/07 • Charles Roberts (Retired) – 6/21/07 (Ph: 865-588-8868) Kenton Wilson Began in 7920 in 1974 as a Lab Aid and then a Hot Cell Technician. He was a Hot Cell Shift Supervisor starting in 1980. Transferred out of 7920 to other areas at ORNL in 1987. Came back to 7920 in 1996 as an Alternate Hot Cell Operations Supervisor. Has been the REDC Facility Manger for the last 3 years, and was the Operations Manager for 6 months before that. Building 7930 is the Californium facility. He said that the 7920 and 7930 waste drums are not commingled. The waste from the laboratory cells upstairs is not commingled with the waste from downstairs operations. • Lab 108 - Supported the hot cells; however there is not much waste from this room. This is an analytical lab. • Lab 208 - Analytical lab. They do analytical work from all over. • Lab 109 - Contains the Vault where isotopes are stored for analytical. They have done smears on all the boxes in this lab and have used the results as a composite for the waste stream for this laboratory. • Lab 209 - The support lab for Pu research. • Lab 210 - At one time, this lab did gamma spec, not much of anything else was done in this laboratory. (LLW from this lab) • Lab 111 is a subset of the Hot Cells. • Lab 211 - Research and auxiliary support lab. This lab was initially a heavy element lab, then they began to process Cm-244. • Lab 118 - Hot Cell Lab. This lab was the transfer lab and is commonly shared with Analytical Chemistry The Supplemental Reports and Quarterly Reports will have process information for these labs. There is no liquid in the waste. Any Cm and Cf in liquid form goes back to the facility for recycling. They used Ajax with ammonia as a cleaning agent to clean the gloveboxes. The numbering scheme was as follows: The ATN # was the first numbe

CCP RECORDS ORIGINAL
DATE REC'D 10/22/2014 EPT

Attachment 3 - Acceptable Knowledge Source Document Summary (continued)

Site(s): Oak Ridge National Laboratory		Source Document Tracking Number: C148
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		were numbered, i.e., 2141-2, 2141-3, 2141-4, etc. This represented different drums of waste that were picked up on the same day. They would be given the same 1st 4 numbers, and the "–X" number would be different. An example of the 2nd drum numbering sequence is X10C0300537. The first 2 numbers after the "C" indicated the year the label was printed – not necessarily the year the waste was packaged. The labels were pre-printed and handed out in batches. CH and RH waste is moved down to Cell 9 for packaging so all hot cell waste will be commingled. There is some CH that comes out of the hot cells. The method used for the 200 mR limit is by estimating the activity when filling the drum. Waste is first packed into 1 gallon cans (buckets), and a dose is taken on the bucket. These are summed as they fill the drum. Generally speaking, ½ of the CH waste generated from REDC comes form the Hot Cells. Am, Cm, Pu work was done in the Hot Cells. Mostly CH waste out of the Rm. 111 cave. The types of CH waste that we will see from the hot cells will be things like manipulator boots, light bulbs (flood lights & mercury vapor lights), empty poly bottles (melted and placed in cans). There will also be empty Pb pigs that were used for material transfer. Circuit boards will also be in waste. Resin goes into 1 liter poly bottles where it is washed with water than grouted. Then they are put into 1 gallon buckets to be transferred out of the Hot Cell. Resin will be RH waste. Hot cell work is done in campaigns. When a campaign is complete, they profile the last Cf-252 mass and apply to the hot cell campaign. They average about 1 to 2 RH waste casks per year out of the Hot Cells. Waste cans may sit in Cell 9 for as long as 10 years to "cool." There was no transition between the HFIR targets and the Mark-42 targets; therefore the waste for this work is commingled. There is no lab work associated with the Mark-42 targets, all this work is done in the Hot Cells. Originally, the targets were Pu-242, then in about 1974, they started using Cm. Occasionally some Pu comes out of the reactor rods in the Hot Cells. Fred Chattin Started in the REDC in 1965 – the Facility went hot in 1966. The program started with Pu irradiated at SRS. Pu-239 was eventually used up, and all that was left was Pu-242, Am, and Cm-244. SRS processed this to recover the Pu-242. There was Cm, but it was necessary to have Pu-242. They made targets in gloveboxes in 4508. They were the 1st targets to go in the reactor. Eventually raffanate was brought from 4507 and processed to recover the Cm, and this started going into the reactor as targets. The first set of targets were done in about 1969. After 1969, there were no more Pu-242 targets. In about the 1970-1971 timeframe, they received a set of irradiated Cm slugs from SRS, and then they received irradiated Mark-18 targets from SRS. They processed 20 of these in the 1970s. There about 60 Mark-18 targets still at SRS. They recovered Cm-244, -246, -248 from these and they had about 20 done in about the 1972-1974 timeframe. In 1986 the SETF started processing spent commercial reactor fuel, then in 1992, they got back into the Mark-42 targets. Some of the waste casks that have been managed as RH are actually CH waste. This process started in about 1977. Disposal forms started out as Form 2822 (Request for Disposal of Radioactive Solid Waste or Special Nuclear Material. This is the predecessor to the Form 2109. Wayne Evans Came to facility in 1988 in the Hot Cell process and worked there for 5 years processing HFIR targets and working on other processes. In 1992 he went into maintenance managing waste – TRU and solid low level waste (with Charlie Roberts and Dave Galbraith). He managed waste from the gloveboxes and Hot Cell. All TRU waste had to go through him. In the early days, Health Physics and Management determined the 95-98% of the contamination was Cm-244. The Facility SAR for 7920 outlined waste management practices.

Attachment 3 - Acceptable Knowledge Source Document Summary (continued)

Site(s): Oak Ridge National Laboratory		Source Document Tracking Number: C148
AK # [b]	Source Doc. Page #[c]	AK Information Summary
		He developed waste profiles. There was a waste ID for each packet of waste (as well as a Form 2822). This was from 1992 to about 1997 or 1998. On the disposal records is included the cask number and a package number. These numbers can be traced back to a particular lab. The waste is identified with the following information: the material makeup and physical characteristics. The early waste will be Cm-244 and Cf-252 and other TRU isotopes – back then it was all counted as TRU. The policy was that any waste with alpha activity went into the TRU population regardless of concentration. If the shoe covers got a "pop", they went into the TRU waste. No known alpha waste was to go into the solid low-level line. 99.9% of the waste was contaminated with Cf-252 and/or Cm-244 (from cell bank 244). The alpha in the labs may be a little different. They knew they were generating too much alpha. The first waste management procedure was developed in about 1992 or 1993. The CH TRU procedures have been revised 1 or 2 times. In 1995, a waste profile system was developed by Bechtel-Jacobs. Anything that was going to be waste was to be put in profiles. The Master Waste Profiles have information as to what was required in the 1998 timeframe. The 2109 form has a space for a waste profile number that links back to the characterization profile. In 1996 and 1997 a report was published (a thesis) – Wayne took samples and smears that were counted and found 30 different isotopes. 28 samples out of Cell 9. These were analyzed individually to estimate the TRU content of the waste. From this they developed scaling factors. Dose-to-curie was used CH waste, and Monte Carlo neutron scaling was used for RH casks. Liquids went down the drain for subsequent recovery. They stopped using the drain and began vacuuming out the liquids and pouring into containers for recovery. Saturated/wet items such as rags were dried before disposal. This practice continues today. Absorbent was not added. Chuck Alexander Sr. Scientist started in 1976 at ORNL. He has worked in REDC since 1982. For 2 years about 12 to 14 years ago he was responsible for Cubicles [hot cells] 1, 2, 3. Targets were his responsibility on the new target fabrication line. His lab was responsible for the Mark-42 targets. He has worked in Labs 109, 110, 111, 209, 210, and 211 at different times. Most of his involvement has been in Lab 211. Lab 211: 10 gloveboxes would collect waste in one drum. In 1982, waste drums started being placed in the labs for use. They did smears on the gloveboxes to characterize the waste. In the old days, they used process knowledge. The boxes in Lab 211 are as follows: • Te glovebox - This glovebox did electroplating of heavy elements. Handled Cf-249 which was isotopically pure. Maybe a little NU from Sol-Gel process. There was probably not any Pu work that went on in this glovebox. • Pu-Am box - Has the largest activity. There has been Pu (Pu-238 through Pu-242) work in this box. Most recently the waste would have been Pu-240, Pu-241, Pu-242, and a lot of Am-241 (separation from Pu). The Pu isotopes are isotopically pure (>90%). They did chemistry and source preparation in this glovebox. Most of the work is completely unrelated to the hot cell. • 3' Glovebox – Assembly of devices, source assembly and preparation involving electroplating. This box had Am-241, Cf-249, Cf-252, Cm-244, Cm-248 all of which were 90% or greater isotopically pure, except for the Cf-252 which was 80% or less. • Es-Fm Box – 6' box. Isotopes used is this box included Es-253, Es-254, Fm-255, Fm- 257, and maybe Cf-250. The Es-253 and Es-254 originated from HFIR targets. Everything transcurium came from Hot Cells. You will see Cf-249, Cf-250, Cf-251 in this glovebox from decay. Elemental separations was performed in this glovebox. • Cf-252, Cm-248 box - Mostly electroplating using ammonium acetate. Grouted small amounts of resin or fix in some fashion. • Bk Glovebox – Bk-249 or Cf-249. This box did isotopically pure separations and some electroplating. • Old Bk Glovebox – This box had Bk, Cf-249, Cf-252 and lots of fission products. Other nuclides included Am-241, Pu-238, Pu-239, Pu-240, Pu-242. Generally speaking, work was done with isotopically pure materials.

Attachment 3 - Acceptable Knowledge Source Document Summary (continued)

Site(s): Oak Ridge National Laboratory		Source Document Tracking Number: C148
AK # [b]	Source Doc. Page # [c]	AK Information Summary
		Lab 209 About 10 gloveboxes in this lab. Chuck only worked in a couple of them. • Furnace glovebox – this glovebox was to make Np-237 oxide • MDD (Modified Direct Denitration) glovebox – NU, Pu-240, Np-237, Am-241, Cm-244 • Pu oxide dispensing glovebox – Pu-238, Pu-239, Pu-240, Pu-241, Pu-242, Pu-244 oxides • I-131 glovebox • Ni-63. Nickel in chloride form • Po-209 dispensing glovebox • U-234, Th-230 dispensing glovebox – enriched materials in here • Tc-99 dispensing glovebox box • Lead-lined glovebox – Pu, Cm, and maybe Am in this box. Primarily Pu-244. Dissolved Pu oxides (there is a trace amount of Am and Cm in Pu oxides). Lab 109 • RIMS glovebox – Cm-244 (80% pure); Pu-238 (99-100% pure). This box did device testing • Welding glovebox – Cf-249 • Vault Lab 111 Contained 2 junior caves and 2 gloveboxes. • Cave – Th-229 on down. This would be low level waste; not TRU • Cave – All Cf isotopes, Am, Cm, and Pu decay daughters • Glovebox from each cave. Old cave had Europium, Gd, Am-243. Did Es and Fm separations. Ni-63; Es-253, Es-254 Organic solvents used were thyocynate and TCE. Curtis Porter He has worked at REDC since 1988. Worked in Labs 111, 109, 209, 211 and Cold Lab in 110 (low level waste). He has logbooks for these labs that identify nuclides, process steps, and chemicals used. TCE was used to separate organics from acid in Bk process. Done about 1988 and before. Lab 209 • Furnace box for making oxides • Development gloveboxes were refurbished in 1989. • The 4 dispensing gloveboxes described by Check Alexander were operations transitioned from isotope production facilities on Isotopes Circle in about 1991/1992. • Pb-Lined glovebox dissolved Pu oxides (w/ trace Am and Cm) Lab 211 • Work described by Chuck Alexander as electroplating was actually electrodeposition. First dissolved material in weak HCl. Electrodeposition originally used isopropyl alcohol but changed to ammonium acetate. Porter Bailey Went to work at REDC in January 1988. He worked primarily in the Hot Cell. He now coordinates waste from Cell 9. Hot cell CH and RH waste was put in 2 or 3 gallon poly buckets. At one time the buckets were thermally [heat] sealed, but the sealer broke so they now seat the lid but it is not heat-sealed. No tape is used to seal the lid. The buckets were placed in a placed in a plastic bag and sealed with tape. Since the sealer broke, the bucket is placed in a plastic bag and then in another plastic bag. The first bag is not sealed, and the second bag is sealed using the twist/tape method. They also used 1½ gallon metal buckets (primarily RH hot cell waste) that had a slip-lid and tape around the sealing surface of the lid. The lid has a pinky-size hole in it. 1-gallon paint cans were also used (primarily RH hot cell waste).

Attachment 3 - Acceptable Knowledge Source Document Summary (continued)

Site(s): Oak Ridge National Laboratory		Source Document Tracking Number: C148
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All glovebox waste is heat-sealed. Glovebox ports were 6" and 15".

Porter Bailey (cont.)
CH Drum Configuration:
• Drum lined with a single poly drum liner bag; rigid liners were not used
• Liner bag may be twist-tape, but may not be taped

RH Cask Configuration:
• Cask lined with a heavy plastic liner
• Cans were loaded in vinyl laundry bags (about 15 cans per bag)
• Laundry bags went into cask (about 6 to 7 bags per cask)
• Laundry bags were twisted and sealed with a metal tie
• Poly buckets were direct-loaded into casks (not in laundry bag)
• Plastic cask liner was twisted and cut with a heat knife, then wire was wrapped around top of the bag.

Charles Roberts
Charles (Charlie) started working at REDC when hot operations began in 1966/1967. He retired in 1994. He kept maintenance logs of all the waste packaging. The Maintenance group took care of the waste.

As many as 24 fiber/cardboard 5-gallon drums were placed into 4" floor casks. Some of the fiber drums had a liner. The 5-gallon drums had lids that were taped around the sealing surface. They were raw cardboard material; no waxy coating was present on the cardboard. The floor casks were for CH waste, not RH waste. The segregated burnable from non-burnable waste in separate casks.

On 10/7/1977 (according to his notes), they began using steel drums for CH waste, and no longer put CH waste into 4" floor casks.

Removed waste from 7930 (TURF) every couple of years (30 gallon drums). This waste was not mixed with the 7920 waste.

There were 4", 6" and 12" concrete casks. 4" casks were used if the dose was not high. A lot of the 108 and 208 labs' waste is in 4" casks. They tried to keep liquids out. He does not recall any pyrophoric or reactive materials coming from the gloveboxes that needed to be taken care of before being disposed.

Data Limitations: Information based on persons memory. Some of the information is relatively recent, but some dates back 20 or 30 years.

Attachment 3 - Acceptable Knowledge Source Document Summary (continued)

Site(s): Oak Ridge National Laboratory	Source Document Tracking Number: C148
Source Document Data Limitations (if any): 1. None.	
Acceptable Knowlege Expert: Travis Smith / Travis Smith Date: 07/16/2014 Print /Sign	
[a] Provide description for non-titled information (i.e., container paperwork, MSDS sheets, etc) [b] Obtain from Acceptable Knowledge Documentation Checklist [c] For microfilm or microfiche, identify box, tape, reel number and location.	

DIVIDER PAGE ONLY

NOT PART OF PAGE COUNT

Attachment 2 – Record of Communication

Waste Stream Numbers: OR-REDC-CH-HET & OR-REDC-RH-HET		Source Document #: **C148**
Interviewer: Jeff Harrison & Lisa Watson	Date: 6/19/2007 – 6/21/2007	Time:
Interviewees: See below	Group/Organization: Job Title: See below	Phone: See below Email:
Subject: Interview of REDC Personnel		

Summary: The following Building 7920 personnel were interviewed over the course of 3 days:

- Kenton Wilson – 6/19/07 (Ph: 865-574-6926)
- Fred Chattin – 6/19/07
- Wayne Evans – 6/20/07
- Chuck Alexander – 6/20/07
- Curtis Porter – 6/20/07
- Porter Bailey – 6/20/07
- Charles Roberts (Retired) – 6/21/07 (Ph: 865-588-8868)

Kenton Wilson

Began in 7920 in 1974 as a Lab Aid and then a Hot Cell Technician. He was a Hot Cell Shift Supervisor starting in 1980. Transferred out of 7920 to other areas at ORNL in 1987. Came back to 7920 in 1996 as an Alternate Hot Cell Operations Supervisor. Has been the REDC Facility Manger for the last 3 years, and was the Operations Manager for 6 months before that.

Building 7930 is the Californium facility. He said that the 7920 and 7930 waste drums are not commingled.

The waste from the laboratory cells upstairs is not commingled with the waste from downstairs operations.

- Lab 108 - Supported the hot cells; however there is not much waste from this room. This is an analytical lab.
- Lab 208 - Analytical lab. They do analytical work from all over.
- Lab 109 - Contains the Vault where isotopes are stored for analytical. They have done smears on all the boxes in this lab and have used the results as a composite for the waste stream for this laboratory.
- Lab 209 - The support lab for Pu research.
- Lab 210 - At one time, this lab did gamma spec, not much of anything else was done in this laboratory. (LLW from this lab)
- Lab 111 is a subset of the Hot Cells.
- Lab 211 - Research and auxiliary support lab. This lab was initially a heavy element lab, then they began to process Cm-244.
- Lab 118 - Hot Cell Lab. This lab was the transfer lab and is commonly shared with Analytical Chemistry

The Supplemental Reports and Quarterly Reports will have process information for these labs.

There is no liquid in the waste. Any Cm and Cf in liquid form goes back to the facility for recycling. They used Ajax with ammonia as a cleaning agent to clean the gloveboxes.

NTPC RECORDS ORIGINAL
DATE REC'D 1/3/14

Kenton Wilson (cont.)

The numbering scheme was as follows: The ATN # was the first numbering scheme. Drums were numbered, i.e., 2141-2, 2141-3, 2141-4, etc. This represented different drums of waste that were picked up on the same day. They would be given the same 1st 4 numbers, and the "–X" number would be different. An example of the 2nd drum numbering sequence is X10C0300537. The first 2 numbers after the "C" indicated the year the label was printed – not necessarily the year the waste was packaged. The labels were pre-printed and handed out in batches.

CH and RH waste is moved down to Cell 9 for packaging so all hot cell waste will be commingled. There is some CH that comes out of the hot cells. The method used for the 200 mR limit is by estimating the activity when filling the drum. Waste is first packed into 1 gallon cans (buckets), and a dose is taken on the bucket. These are summed as they fill the drum.

Generally speaking, ½ of the CH waste generated from REDC comes form the Hot Cells. Am, Cm, Pu work was done in the Hot Cells. Mostly CH waste out of the Rm. 111 cave.

The types of CH waste that we will see from the hot cells will be things like manipulator boots, light bulbs (flood lights & mercury vapor lights), empty poly bottles (melted and placed in cans). There will also be empty Pb pigs that were used for material transfer. Circuit boards will also be in waste.

Resin goes into 1 liter poly bottles where it is washed with water than grouted. Then they are put into 1 gallon buckets to be transferred out of the Hot Cell. Resin will be RH waste.

Hot cell work is done in campaigns. When a campaign is complete, they profile the last Cf-252 mass and apply to the hot cell campaign. They average about 1 to 2 RH waste casks per year out of the Hot Cells. Waste cans may sit in Cell 9 for as long as 10 years to "cool."

There was no transition between the HFIR targets and the Mark-42 targets; therefore the waste for this work is commingled. There is no lab work associated with the Mark-42 targets, all this work is done in the Hot Cells.

Originally, the targets were Pu-242, then in about 1974, they started using Cm. Occasionally some Pu comes out of the reactor rods in the Hot Cells.

Fred Chattin

Started in the REDC in 1965 – the Facility went hot in 1966. The program started with Pu irradiated at SRS. Pu-239 was eventually used up, and all that was left was Pu-242, Am, and Cm-244. SRS processed this to recover the Pu-242. There was Cm, but it was necessary to have Pu-242. They made targets in gloveboxes in 4508. They were the 1st targets to go in the reactor. Eventually raffanate was brought from 4507 and processed to recover the Cm, and this started going into the reactor as targets. The first set of targets were done in about 1969. After 1969, there were no more Pu-242 targets.

In about the 1970-1971 timeframe, they received a set of irradiated Cm slugs from SRS, and then they received irradiated Mark-18 targets from SRS. They processed 20 of these in the 1970s. There about 60 Mark-18 targets still at SRS. They recovered Cm-244, -246, -248 from these and they had about 20 done in about the 1972-1974 timeframe. In 1986 the SETF started processing spent commercial reactor fuel, then in 1992, they got back into the Mark-42 targets.

Fred Chattin (cont.)
Some of the waste casks that have been managed as RH are actually CH waste. This process started in about 1977. Disposal forms started out as Form 2822 (Request for Disposal of Radioactive Solid Waste or Special Nuclear Material. This is the predecessor to the Form 2109.

Wayne Evans
Came to facility in 1988 in the Hot Cell process and worked there for 5 years processing HFIR targets and working on other processes. In 1992 he went into maintenance managing waste – TRU and solid low level waste (with Charlie Roberts and Dave Galbraith). He managed waste from the gloveboxes and Hot Cell. All TRU waste had to go through him.

In the early days, Health Physics and Management determined the 95-98% of the contamination was Cm-244. The Facility SAR for 7920 outlined waste management practices.

He developed waste profiles. There was a waste ID for each packet of waste (as well as a Form 2822). This was from 1992 to about 1997 or 1998. On the disposal records is included the cask number and a package number. These numbers can be traced back to a particular lab.

The waste is identified with the following information: the material makeup and physical characteristics. The early waste will be Cm-244 and Cf-252 and other TRU isotopes – back then it was all counted as TRU. The policy was that any waste with alpha activity went into the TRU population regardless of concentration. If the shoe covers got a "pop", they went into the TRU waste. No known alpha waste was to go into the solid low-level line. 99.9% of the waste was contaminated with Cf-252 and/or Cm-244 (from cell bank 244). The alpha in the labs may be a little different. They knew they were generating too much alpha.

The first waste management procedure was developed in about 1992 or 1993. The CH TRU procedures have been revised 1 or 2 times. In 1995, a waste profile system was developed by Bechtel-Jacobs. Anything that was going to be waste was to be put in profiles. The Master Waste Profiles have information as to what was required in the 1998 timeframe. The 2109 form has a space for a waste profile number that links back to the characterization profile.

In 1996 and 1997 a report was published (a thesis) – Wayne took samples and smears that were counted and found 30 different isotopes. 28 samples out of Cell 9. These were analyzed individually to estimate the TRU content of the waste. From this they developed scaling factors. Dose-to-curie was used CH waste, and Monte Carlo neutron scaling was used for RH casks.

Liquids went down the drain for subsequent recovery. They stopped using the drain and began vacuuming out the liquids and pouring into containers for recovery.

Saturated/wet items such as rags were dried before disposal. This practice continues today. Absorbent was not added.

Chuck Alexander
Sr. Scientist started in 1976 at ORNL. He has worked in REDC since 1982. For 2 years about 12 to 14 years ago he was responsible for Cubicles [hot cells] 1, 2, 3. Targets were his responsibility on the new target fabrication line. His lab was responsible for the Mark-42 targets.

He has worked in Labs 109, 110, 111, 209, 210, and 211 at different times. Most of his involvement has been in Lab 211.

Chuck Alexander (cont.)

Lab 211: 10 gloveboxes would collect waste in one drum. In 1982, waste drums started being placed in the labs for use. They did smears on the gloveboxes to characterize the waste. In the old days, they used process knowledge. The boxes in Lab 211 are as follows:

- Te glovebox - This glovebox did electroplating of heavy elements. Handled Cf-249 which was isotopically pure. Maybe a little NU from Sol-Gel process. There was probably not any Pu work that went on in this glovebox.
- Pu-Am box - Has the largest activity. There has been Pu (Pu-238 through Pu-242) work in this box. Most recently the waste would have been Pu-240, Pu-241, Pu-242, and a lot of Am-241 (separation from Pu). The Pu isotopes are isotopically pure (>90%). They did chemistry and source preparation in this glovebox. Most of the work is completely unrelated to the hot cell.
- 3' Glovebox – Assembly of devices, source assembly and preparation involving electroplating. This box had Am-241, Cf-249, Cf-252, Cm-244, Cm-248 all of which were 90% or greater isotopically pure, except for the Cf-252 which was 80% or less.
- Es-Fm Box – 6' box. Isotopes used is this box included Es-253, Es-254, Fm-255, Fm- 257, and maybe Cf-250. The Es-253 and Es-254 originated from HFIR targets. Everything transcurium came from Hot Cells. You will see Cf-249, Cf-250, Cf-251 in this glovebox from decay. Elemental separations was performed in this glovebox.
- Cf-252, Cm-248 box - Mostly electroplating using ammonium acetate. Grouted small amounts of resin or fix in some fashion.
- Bk Glovebox – Bk-249 or Cf-249. This box did isotopically pure separations and some electroplating.
- Old Bk Glovebox – This box had Bk, Cf-249, Cf-252 and lots of fission products. Other nuclides included Am-241, Pu-238, Pu-239, Pu-240, Pu-242. Generally speaking, work was done with isotopically pure materials.

Lab 209

About 10 gloveboxes in this lab. Chuck only worked in a couple of them.

- Furnace glovebox – this glovebox was to make Np-237 oxide
- MDD (Modified Direct Denitration) glovebox – NU, Pu-240, Np-237, Am-241, Cm-244
- Pu oxide dispensing glovebox – Pu-238, Pu-239, Pu-240, Pu-241, Pu-242, Pu-244 oxides
- I-131 glovebox
- Ni-63. Nickel in chloride form
- Po-209 dispensing glovebox
- U-234, Th-230 dispensing glovebox – enriched materials in here
- Tc-99 dispensing glovebox box
- Lead-lined glovebox – Pu, Cm, and maybe Am in this box. Primarily Pu-244. Dissolved Pu oxides (there is a trace amount of Am and Cm in Pu oxides).

Lab 109

- RIMS glovebox – Cm-244 (80% pure); Pu-238 (99-100% pure). This box did device testing
- Welding glovebox – Cf-249
- Vault

Chuck Alexander (cont.)

Lab 111

Contained 2 junior caves and 2 gloveboxes.

- Cave – Th-229 on down. This would be low level waste; not TRU
- Cave – All Cf isotopes, Am, Cm, and Pu decay daughters
- Glovebox from each cave. Old cave had Europium, Gd, Am-243. Did Es and Fm separations. Ni-63; Es-253, Es-254

Organic solvents used were thyocynate and TCE.

Curtis Porter

He has worked at REDC since 1988. Worked in Labs 111, 109, 209, 211 and Cold Lab in 110 (low level waste). He has logbooks for these labs that identify nuclides, process steps, and chemicals used.

TCE was used to separate organics from acid in Bk process. Done about 1988 and before.

Lab 209

- Furnace box for making oxides
- Development gloveboxes were refurbished in 1989.
- The 4 dispensing gloveboxes described by Check Alexander were operations transitioned from isotope production facilities on Isotopes Circle in about 1991/1992.
- Pb-Lined glovebox dissolved Pu oxides (w/ trace Am and Cm)

Lab 211

- Work described by Chuck Alexander as electroplating was actually electrodeposition. First dissolved material in weak HCl. Electrodeposition originally used isopropyl alcohol but changed to ammonium acetate.

Porter Bailey

Went to work at REDC in January 1988. He worked primarily in the Hot Cell. He now coordinates waste from Cell 9.

Hot cell CH and RH waste was put in 2 or 3 gallon poly buckets. At one time the buckets were thermally [heat] sealed, but the sealer broke so they now seat the lid but it is not heat-sealed. No tape is used to seal the lid. The buckets were placed in a placed in a plastic bag and sealed with tape. Since the sealer broke, the bucket is placed in a plastic bag and then in another plastic bag. The first bag is not sealed, and the second bag is sealed using the twist/tape method.

They also used 1½ gallon metal buckets (primarily RH hot cell waste) that had a slip-lid and tape around the sealing surface of the lid. The lid has a pinky-size hole in it. 1-gallon paint cans were also used (primarily RH hot cell waste).

All glovebox waste is heat-sealed. Glovebox ports were 6" and 15".

Porter Bailey (cont.)

CH Drum Configuration:

- Drum lined with a single poly drum liner bag; rigid liners were not used
- Liner bag may be twist-tape, but may not be taped

RH Cask Configuration:

- Cask lined with a heavy plastic liner
- Cans were loaded in vinyl laundry bags (about 15 cans per bag)
- Laundry bags went into cask (about 6 to 7 bags per cask)
- Laundry bags were twisted and sealed with a metal tie
- Poly buckets were direct-loaded into casks (not in laundry bag)
- Plastic cask liner was twisted and cut with a heat knife, then wire was wrapped around top of the bag.

Charles Roberts

Charles (Charlie) started working at REDC when hot operations began in 1966/1967. He retired in 1994. He kept maintenance logs of all the waste packaging. The Maintenance group took care of the waste.

As many as 24 fiber/cardboard 5-gallon drums were placed into 4" floor casks. Some of the fiber drums had a liner. The 5-gallon drums had lids that were taped around the sealing surface. They were raw cardboard material; no waxy coating was present on the cardboard. The floor casks were for CH waste, not RH waste. The segregated burnable from non-burnable waste in separate casks.

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Removed waste from 7930 (TURF) every couple of years (30 gallon drums). This waste was not mixed with the 7920 waste.

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Data Limitations: Information based on persons memory. Some of the information is relatively recent, but some dates back 20 or 30 years.

Acceptable Knowledge Expert: Jeff Harrison / Jeff Harrison Date: 6/24/2008
Print / Sign

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PAGE

Attachment 3 - Acceptable Knowledge Source Document Summary

Waste Stream Number(s): OR-REDC-CH-HET, OR-REDC-RH-HET

Site(s): Oak Ridge National Laboratory	Source Document Tracking Number: C600
Acceptable Knowledge Documentation Type: ☑ TRU Waste Management Program Information ☑ Waste Stream-Specific Information ☑ Supporting Information	Category: ☑ Correspondence ☐ Discrepancy Resolution ☐ Internal Procedure or Note ☐ Miscellaneous ☐ Published Document or Controlled Database ☐ Unpublished Documents

Title of Source Document: Interviews with Don Coffey and Wayne Evans re: REDC RH Waste Cask Packaging Clarification and Swipe Sample Collection

Source Document Reference Information (author(s), document and revision number, date, publisher): K. Peters; M. Doherty, NA, NA, 06/04/2008

AK # [a]	Source Doc. Page #[b]	AK Information Summary
PR7, WS2, WS4, WS8, WS11, S12	Throughout	The subject of this interview was REDC RH Waste Cask Packaging Clarification and Swipe Sample Collection; Segregation of RH and CH waste at REDC; Radiological Distribution from Analytical Laboratories and Process Development Laboratories; Chemical Contamination from Building 7930; Collection of Swipe Samples for Radiological Characterization.

Source Document Data Limitations (if any):

1. None.

Acceptable Knowlege Expert:

Lisa Price-Watson _____ Date: 06/24/2008
Print /Sign

[a] Obtain from Acceptable Knowledge Documentation Checklist
[b] For microfilm or microfiche, identify box, tape, reel number and location.

Attachment 2 – Record of Communication

Waste Stream Number(s): OR-REDC-RH-HET		**Corresponding Source Document Tracking No:** C600
Interviewer: Steve Schafer Mark Doherty	**Date:** June 4, 2008	**Time:** 1:30 pm
Interviewee: Wayne Evans Don Coffey	**Group/Organization:** REDC **Job Title:** Mr. Evans: REDC Waste Coordinator (1993 – 2007)	**Phone:** (865) 574-2530 (Mr. Evans) (865) 241-2520 (Mr. Coffey) **E-mail:** evanscw@ornl.gov don.coffey@truproject.com

Subject: REDC RH Waste Cask Packaging Clarification and Swipe Sample Collection

1) Segregation of RH and CH waste at REDC
2) Radiological Distribution from Analytical Laboratories and Process Development Laboratories
3) Chemical Contamination from Building 7930
4) Collection of Swipe Samples for Radiological Characterization

Summary:

Mr. Evans held the position of REDC Waste Coordinator from 1993 to 2004 continues to work at the REDC as a Project Lead. As Waste Coordinator, Mr. Evans was responsible for all aspects of REDC waste management and is knowledgeable regarding historical and current waste management practices within the REDC (Buildings 7920 and 7930).

Mr. Coffey worked at the REDC beginning in 1974 as a radio chemist supporting the analytical laboratories, and he worked at the REDC for 9 years. After working stable isotope separation (Y-12, Building 9204-2) for one year, Mr. Coffey moved to the Waste Examination Assay Facility (1983 - 1993) as the operation supervisor. In 1993, Mr. Coffey moved to the Radioactive Waste Department as the Facility Manager and was responsible for all Site TRU waste storage facilities until 2007.

1) Segregation of RH and CH waste at REDC

The current AK Summary Report CCP-AK-ORNL-500 summarizes the following from source documents:

> "Prior to 1976, all Building 7920 solid wastes were managed as RH TRU waste, even though a significant portion of the inventory produced was CH-TRU waste. In March 1976, operations to formally segregate RH- from CH-TRU wastes were initiated. Intensive segregation did not occur until the 1978 time frame."

Mr. Evans confirmed the accuracy of this summary and stated the segregation of RH and CH waste was accomplished by surface dose measurements. Measurements were taken from individual cans, but were also routinely taken on individual waste items. The objective of the segregation was to ensure that loaded 55-gallon waste drums did not exceed 200 mRem/hr surface dose rate. Mr. Evans could not identify any distinction between the CH waste packaged in 55-gallon drums and the RH waste packaged in casks other than the dose rate. There are generally no distinctions in physical form or area of generation. The only difference between RH and CH waste is the magnitude of the radiological contamination on the waste item. Some waste items, such as filter bed media, are generally always highly contaminated and removed as RH waste. Mr. Evans was the individual who packaged the waste in cubicle 9 of the hot cell facility.

2) Radiological Distribution from Analytical Laboratories and Process Development Laboratories

Regarding the radiological contamination on waste from the analytical laboratories (Cubical 8, Rooms 108 and 208), Mr. Evans stated the vast majority of activities performed in the analytical laboratories was, and continues to be, analysis of samples from hot cell operations. Although a small insignificant faction of the work historically performed in the analytical laboratories has been support work for the process development laboratories (Rooms 109, 209, 111, and 211), the radiological contamination on waste from the analytical laboratories has and continues to be considered identical to the contamination on waste from the hot cells. The conclusion that the radiological distribution of waste from the analytical laboratories is the same as radiological distribution of waste from the hot cell operations has been confirmed over time by several site subject mater experts and is documented in several source documents (References I044, U045, U049).

Work in the process development laboratories dealt primarily with the purification of actinides produced from the hot operations (e.g., berkelium, californium, einsteinium, fermium) and R&D activities. Radiological contamination on waste from the process development laboratories will contain the actinide products, and will be similar the hot cell isotopic distribution except much lower in gamma emitting radioisotopes, such as cesium and other fission products.

3) Chemical and Radiological Contamination from Building 7930

CCP review of detailed packaging logs received from ORNL on 5/29/2008 for cask X10C0601826 identified one waste item indicated as originating from Building 7930, Cell C. Mr. Evans stated he did not specifically recall any waste from 7930 being placed in a 7920 cask, however he believes that it is possible and he believes this is likely not a misprint in the paperwork. Mr. Evans stated that adding lower dose rate items (i.e., CH waste) to a RH cask was common. This practice was to fill void space within the RH cask prior to closing and processing the cask. The packaging documentation confirm RH casks were loaded first with higher activity waste items, then were filled with lower activity (often CH) waste items prior to cask closure. Mr. Evans stated that buildings 7920 and 7930 are connected by a pneumatic tube transfer systems used to deliver californium product from 7920 to 7930. It is conceivable that cask X10C0601826 was available and a waste item was transferred from 7930 to 7920 for disposal in the cask.

The operations in 7930 are limited primarily to only californium product finishing and are on a much smaller scale than operations in 7920. Typically Building 7930 generates only one drum of CH-TRU waste every 6 to 12 months. That waste is generated primarily from operations supporting californium product finishing operations. Additionally, 7930 uses very few chemicals. Based on a review of the Material and Chemical Input Table in CCP-AK-ORNL-500 (Table 5-3), Mr. Evans is very confident that this table bounds any waste from 7930 and that no EPA hazardous waste numbers are associated with 7930 waste that are not associated with 7920 waste.

Follow-up with Mr. Evans

Mr. Evans obtained additional information on 6/5/2008 regarding this waste item by contacting the Building Supervisor for 7930, Mr. Scott White. Since 7930 Cell C generates very little radioactive waste, Mr. White specifically remembered this waste item. The waste was debris material (probably rags and wipe) used in a decontamination activity. Based on the location (Cell C), the operation was probably to decontaminate a californium source prior to shipment. Mr. Evans again confirmed that no decontamination materials were used in Building 7930 that were not used in Building 7920.

4) Collection of Swipe Samples for Radiological Characterization

Mr. Evans stated that he was the operator who collected the swipe samples performed to obtain characterization data for REDC TRU waste. He selected waste items to sample as directed by Lien Nguyen (who was one of the experimenters for the characterization project). Sampling was performed using Q-tips based on his experience as a hot cell operator (there is no sampling procedure for the hot cell, all manipulator work is performed by hot cell operators). Sample locations were selected based on his experience and Ms. Nguyen's requests to sample all of the various materials typically found in the waste. Ms. Nguyen was present for the collection of all of the samples and assisted in selection of the waste items sampled.

Data Limitation:

Information is based on the recollection of individuals interviewed.

Acceptable Knowledge Expert: Steve Schafer / _____ Date: 6/5/08
Print Sign

Attachment 2 - CCP Records Transmittal/Receiving Form

CCP Central Records / Records Custodian, 4021 National Parks Highway - MS: GSA 203, Carlsbad, New Mexico 88220

Telephone Number: 505-234-7523

Fax Number: 505-234-7014

☒ Original Record
☐ Fax Record
☐ E-mail Record

Attn:	Sheila Pearcy	From:	Lisa Price-Watson
Ship to:	CCP Central Records/ CCP Records Custodian	Site:	Oak Ridge National Laboratory
	4021 National Parks Highway - MS GSA 203, Carlsbad, NM 88220	Company:	LANL
		Telephone Number:	575-628-8946
Telephone Number:	505-234-7523	Date Sent:	9/3/08

Document Number	Title/Description	Record Date	Total Pages
C600	Attachment 3 - Acceptable Knowledge Source Document Summary for CCP ORNL AK	6/24/2008	1
NA 9/4/08	Interviews with Don Coffey and Wayne Evans re: REDC RH Waste Cask Packaging Clarification and Swipe Sample Collection	06/04/2008	2

Comments

None.

Acceptance/Rejection Signature and Date

Records Accepted ☒	Dani L. Parker (Signature)	TAMI PARKER (Printed Name)	9/4/08 (Date)
Records Rejected ☐	(Signature)	(Printed Name)	(Date)

Reason for Rejection:

Re-submittal:

(Signature)	(Printed Name)	(Date)

HP LaserJet *M2727nf MFP*

Fax Confirmation Report

HP LASERJET FAX

Sep-4-2008 4:32PM

Job	Date	Time	Type	Identification	Duration	Pages	Result
6840	9/ 4/2008	4:32:25PM	Send	96283238	0:24	1	OK

Controlled Copy

CCP-QP-008, Rev. 14 **Effective Date: 09/19/2007**
CCP Records Management **Page 29 of 29**

Attachment 2 - CCP Records Transmittal/Receiving Form

CCP Central Records / Records Custodian, 4021 National Parks Highway - MS: GSA 203, Carlsbad, New Mexico 88220
Telephone Number: 505-234-7523
Fax Number: 505-234-7014

☒ Original Record
☐ Fax Record
☐ E-mail Record

Attn:	Sheila Pearcy	From:	Lisa Price-Watson
Ship to:	CCP Central Records/ CCP Records Custodian	Site:	Oak Ridge National Laboratory
	4021 National Parks Highway - MS GSA 203, Carlsbad, NM 88220	Company:	LANL
		Telephone Number:	575-828-8946
Telephone Number:	505-234-7523	Date Sent:	9/3/08

CBDD	Attachment 3 - Acceptable Knowledge Source Document Summary for CCP ORNL AK	8/26/2008	1
NA 9/4/08	Interviews with Don Coffey and Wayne Evans re: RESC RH Waste Cask Packaging Clarification and Swipe Sample Collection	08/04/2008	2

None.

Acceptance/Rejection Signature and Date

Records Accepted ☒	Signature	TAMI PARKER Printed Name	9/4/08 Date
Records Rejected ☐	Signature	Printed Name	Date

Reason for Rejection:

Re-submittal:

Signature	Printed Name	Date

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Attachment 3 - Acceptable Knowledge Source Document Summary

Site(s): Oak Ridge National Laboratory	Source Document Tracking Number: P279
Waste Stream Number(s): ORNL Non-specific Library Files (Applicable only when site library is not in use)	
Acceptable Knowledge Documentation Type: ☑ TRU Waste Management Program Information ☑ Waste Stream-Specific Information ☑ Additional Information	Category: ☐ Correspondence ☐ Discrepancy Resolution ☑ Internal Procedure ☐ Miscellaneous ☐ Published Document or Internal Procedure ☐ Unpublished Documents
Title or Description of Source Document [a]: Safety Analysis for the Transuranium Processing Plant, Building 7920	
Source Document Reference Information (author(s), document and revision number, date, publisher): L. J. King, ORNL-3954, NA, 04/1968, ORNL	

AK # [b]	Source Doc. Page # [c]	AK Information Summary
PR1, PR2, PR4, WS1, WS2, WS4, WS5, WS6, WS7, WS8, WS11, S3, S16	Throughout	This SAR is for the Transuranium Processing Plant (TRU), [now the REDC]. The TRU and HFIR have been built at ORNL to provide gram quantities of many of the transuranium elements and milligram quantities of some of the transcalifornium isotopes. These radioisotopes will be used in research work by laboratories throughout the country. Page 2 The TRU Processing Plant is building 7920. it is used for the process and development work relative to the separation and recovery of transuranium elements. The building is divided into four functional areas: 1) office and conference area 2) maintenance shop 3) lab complex with 4 alpha labs, 2 cold chemical labs, 2 analytical labs, and support areas for conducting process support an development work on transuranium elements and for conducting high-alpha-level work in support of other ORNL projects 4) hot cell complex that contains 4 integrated cells for the chemical processing of irradiated HFIR targets, 3 cells for fabrication and inspection of HFIR targets, and 2 cells for high-level analytical work. Targets are irradiated in the HFIR and processing in this facility to recover transuranium isotopes. Page 5 The Transuranium Processing Plant is located in the Melton Valley area at Oak Ridge National Laboratory. Nearby facilities which include the HFIR, bldg 7900, bldg 7910, and the Thorium-Uranium Recycle Facility (TURF) building 7030. The building is a 2-sotry processing and lab bldg. The processing and lab and the one-story office and shop areas are reinforced concrete block construction. Floors are reinforced slabs that are poured or compacted aggregate or supported on structural steel. Bldg is about 620,000 cubic feet (volume), total floor area is about 29,000 square feet. The facilities consist of 9 heavily shielded cells served by master-slave manipulators, 8 labs - 4 on each of the two floors. 1 cold lab for the preparation of reagents and assembly of equipment is located between two alpha labs and the 4th lab contains analytical equipment. Figure 2.1 - Map - Oak Ridge National Laboratory Area Map, Including Melton Valley Facility Figure 2.3 - Zoning Plan - 1st Floor TRU Facility Figure 2.4 - Zoning Plan - 2nd Floor, TRU Facility

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Attachment 3 - Acceptable Knowledge Source Document Summary (continued)

Site(s): Oak Ridge National Laboratory		Source Document Tracking Number: P279
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		Page 10 The alpha lab in room 111 contains a shielded cave. The lab area contains supporting rooms for handling and storing of process reagents and the storing of glove boxes under off-gas vacuum. The 9 shielded process cells are arranged in line. Removable top plugs provide access to the cells. The top and back of the cell is served by a bridge crane in a limited access area (LAA) of the building. The front face of each cell is provided with a window, master-slave manipulators, and plugged ports for possible future installation of periscopes. The operating area is a nonrad zone of low-contamination potential. The 2nd floor immediately over the operating area is a chemical makeup area for process reagent head tanks, nonrad pumps, etc. Of the 9 rad cells, 4 contain chemical processing equipment for dissolution, solvent extraction, and precipitation processes. 3 contain equipment for the remote preparation and inspection of recycle targets. 2 cells are used for remote analytical ops. The cells are shielded by 54 in. of high-density concrete. Figure 2.5 is Space Allocation in TRU Cell Bank Figure 2.6 is Cross Section of TRU Cell Figure 2.7 is Schematic Diagram of Cubicle Ventilation Figure 2.10 - Melton Valley Area Page 56 Alpha Labs (109, 111, 209, 211) Cold Labs (110, 210) Page 57 Analytical Labs (108 and 208) Shielded Cave in Room 111 Figure 2.23 - Plan View of Shielded Caves, Room 111 Page 81 - Chemical Processes The principal function of the Transuranium Processing Plant is to prepare targets for neutron irradiation in the HFIR and to reprocess irradiated targets to recover the heavy isotopes - in general Pu-242, Am-243, and curium isotopes will be recycled to the HFIR, and the transcurium elements (Bk, Cf, Es, Fm) will be purified and held for distribution to other investigators. Table 4.1 - Approximate composition of HFIR Targets at Discharge, including: Al, Pu-242, Cm-244, Cm-248,Bk-249, Cf-252, Cf-254, mixed fission products. Page 83 Curium targets and targets of Pu-242 that have been irradiated to greater than 80% burnup will be dissolved in a Zircaloy-2 dissolver using hydrochloric acid. Targets that have less than 805 burnup of Pu-242 will be dissolved in NaOH-NaNO3. Page 85 Figure 4.1 - Block diagram of Chemical Operations in TRU.

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Site(s): Oak Ridge National Laboratory		Source Document Tracking Number: P279
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		Page 86 describes processes for Pu removal, and the Tramex process. Figure 4.2 - Tramex Flowsheet Page 88 describes the Pharex process and the Berkex process Figure 4.3 - Pharex Flowsheet Figure 4.4 - Berkex Flowsheet Page 91 describes the Cefix process Figure 4.5 - Cefix Flowsheet Figure 4.6 - Sol-Gel Process for Actinides Page 97 - Tables 4.3 and 4.4 provide the Acid Reagents and the Basic Reagents Page 98 - Tables 4.5 and 4.6 are the Salts and Sorbents Page 99 - tables 4.7, 4.8, 4.9 - Reductants, Oxidant, Organic Extractive Reagents Page 100 - Tables 4.1, 4.11 - Organic Diluents; Organic Cleaning Agents (Degreasers) Page 104 - Target Fabrication Process description is described on this page. Figure 5.1 - Flowsheet for Pellet Fabrication, Cubicle 3 Figure 5.2 - Flowsheet for Fabrication of Target Tubes, Cubicle 2 Figure 5.3 - Flowsheet for Target Assembly, Cubicle 1 Page 152 - Liquid waste process system. Liquid wastes that are susceptible to slight contamination are collected in 2 50,000 gallon capacity earth retention basins which are periodically sampled and released to Melton Creek or pumped to the main ORNL waste treatment facility in Bethel Valley for disposal (depending on analytical results). The following wastes are collected in a common header and monitored for beta-gamma radioactivity: process wastes from the labs, decontamination area, chemical makeup area, glove-box storage area, transfer area, limited-access area, operating area, recirculated cooling water system, process condensate receiver, the floor drains of limited access change room No. 2, pipe heater c114 in the off-gas system, checking and holdup area, the floor drains of change rooms Nos. 3 and 4, corridor floor drains, sink drains in the janitor's closet, cold checking and receiving area, and the men's change room No. 1. page 158 - Solid waste All solid waste that is taken from the cell cubicles will be heat sealed, either in 10-inch plastic canister or in a large plastic bag, then put into a 4" thick reinforced-concrete container. A 4" thick concrete cover will be put on the container, the cover joint will be caulked, and the container will be transported to the burial ground for disposal. Page 160 - when a concrete disposal container is full, the plastic bag is sealed, a concrete cover is installed, and the cover joint is caulked, The container is moved to the burial ground. The plastic bag is sealed by rotating the turntable to twist the bag and then heat-sealed by injection molding of a plastic plug at the small pint of the twisted bag. Chemicals: Page 88 2-ethylhexyl phenylphosphonic acid

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		kerosene HCl HNO3 KBrO3 Page 91 ammonium hydroxyisobutyrate Page 97 HCl HNO3 NaOH Page 98 LiCl Ammonium a-hydroxyisobutyrate Pentasodium diethylene-triamine pentaacetate Silica Gel Alumina Dowex 1 Dowex 50 Page 99 SnCl2HxO Methanol KBrO3 Tert-amine 2-ethylhexyl phenylphosphonic acid di(2-ethylhexyl) phosphoric acid Page 100 diethylbenzene Amsco 125-82 Decane Alcohol Acetone

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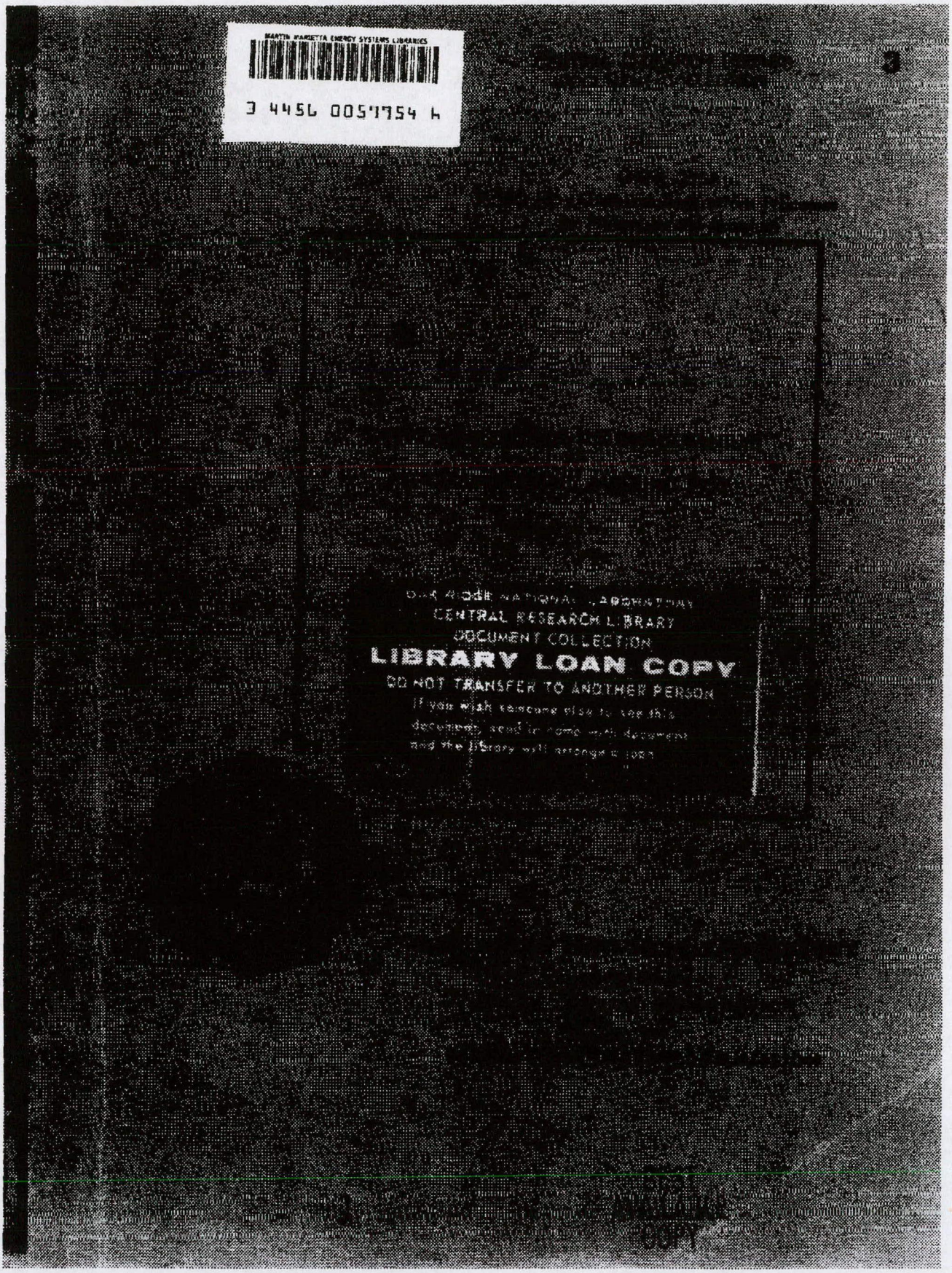
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CHEMICAL TECHNOLOGY DIVISION

SAFETY ANALYSIS FOR THE TRANSURANIUM PROCESSING PLANT, BUILDING 7920

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APRIL 1968

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OAK RIDGE NATIONAL LABORATORY
Oak Ridge, Tennessee
operated by
UNION CARBIDE CORPORATION
for the
U.S. ATOMIC ENERGY COMMISSION

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SAFETY ANALYSIS FOR THE TRANSURANIUM PROCESSING PLANT, BUILDING 7920

Edited By: L. J. King

ABSTRACT

This report presents a safety analysis of the Transuranium Processing Plant and the proposed operations and procedures. The topics covered are: (1) a description of the building and building services, with special emphasis on provisions for containment of hazardous materials; (2) processes and equipment; (3) operating safeguards; (4) control of personnel exposure; (5) operations with transuranium elements in the development laboratories, including laboratory hazards and safeguards; (6) radiation and contamination controls; (7) process safeguards; (8) waste disposal; and (9) process hazards and credible accidents.

The purpose of the Transuranium Processing Plant (TRU) is to recover transuranium elements from irradiated targets for distribution to research workers and to refabricate targets from some of the intermediate isotopes, especially americium and curium. After target dissolution, the heavy elements are separated from fission products, and the transcurium elements are separated from curium in two cycles of solvent extraction in 1.5-in.-diam pulsed-column contactors. The transcurium elements are separated from each other and purified, by batch solvent extraction and ion exchange. Most of the americium and curium is refabricated remotely into new targets for reirradiation in the High Flux Isotope Reactor.

The alpha-emitting, spontaneously fissioning actinides present novel problems in radiochemical plant design. The combination of the fast-neutron flux and the penetrating gamma rays from fission products and spontaneous fission requires shielding considerations that are normally associated with reactors. The containment of radionuclides in TRU is complicated because many of the isotopes of the transuranium elements have high specific toxicities and because the plant and equipment must be capable of accommodating extensive changes.

1. INTRODUCTION

The Transuranium Processing Plant (TRU) and the High-Flux Isotope Reactor (HFIR) have been built at Oak Ridge National Laboratory to provide gram quantities of many of the transuranium elements and milligram quantities of some of the transcalifornium isotopes. These radioisotopes will be used in research work by laboratories throughout the country.

Much has already been learned of the general chemistry of the transuranium elements through tracer level and microchemical techniques. Both the similarity between the rare earths and the actinides and the minute individual differences in their chemical behavior are of great interest. Perhaps the most significant chemical implication of transuranium element research arises simply from the fact that these elements have the heaviest nucleii and most complicated electronic structure of the known elements. The role "f electrons" play in chemical bonding is most conveniently studied in the transuranium elements.

The extensive work of recent years on the solid compounds and metals of uranium, neptunium, and plutonium has revealed a research area of unexpected richness and complexity. Indications are that the solid-state physics of the heavier transuranium elements may be equally fruitful, but detailed examination of these elements must await the large-scale productions.

Studies of many nuclear properties of specific isotopes, such as cross sections, alpha decay parameters, and nuclear energy levels have contributed to the development of theories of nuclear structures. These studies will be extended with the availability of larger quantities of the transuranium elements.

Finally, the possibility of synthesizing new elements through further neutron irradiation or heavy-particle bombardment of the heaviest elements produced is always intriguing.

The Transuranium Processing Plant, Building 7920, is to be used for process and development work relative to the separation and recovery of transuranium elements. The building is divided into four functional areas:

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1. an office and conference area adjacent to, but isolated from, areas that contain radioactivity;
2. a maintenance shop;
3. a laboratory complex consisting of four alpha laboratories, two cold chemical laboratories, two analytical laboratories, and support areas for conducting process support and development work on transuranium elements and for conducting high-alpha-level work in support of other ORNL projects;
4. an integrated hot-cell complex that contains four cells for the chemical processing of irradiated HFIR targets, three cells for fabrication and inspection of HFIR targets, and two cells for high-level analytical chemistry work.

Targets irradiated in the HFIR are processed in this facility to recover the transuranium isotopes. After target dissolution, the heavy elements are separated from fission products, and the transcurium elements are separated from curium in two cycles of solvent extraction in pulse-column contactors that are 1.5 in. in diameter. The transcurium elements are separated from each other and purified by batch solvent extraction and ion exchange. Most of the americium and curium is refabricated remotely into new targets for reirradiation in the HFIR. This irradiation-fabrication cycling of material will continue for a number of cycles — the number depending on production rates and demands for the various isotopes.

The α-emitting, spontaneously fissioning actinides have created problems that are novel in radiochemical plant design. The combination of the fast-neutron flux and the penetrating gammas from fission products and spontaneous fission requires shielding considerations normally associated with reactors. The high specific toxicity of the α-emitting actinides dictates a refined equipment design philosophy to ensure against the escape of airborne contaminants. The corrosiveness of process chloride solutions makes easy replacement of equipment highly desirable. The uncertainty of the chemical behavior of the relatively rare actinides places the Transuranium Processing Plant in the category of what must be regarded as predominantly a research

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facility, requiring laboratories and supporting facilities designed for process development, but most important, capable of accommodating rather severe revisions in process flowsheets.

The purpose of this report is to analyze the facility and the proposed operations and procedures to determine that the various programs can be conducted safely. The two major functional areas of the building, the heavy-element processing area and the laboratory area, will sometimes be discussed separately and sometimes together, as is appropriate.

First, the building and building services will be described, with special emphasis on provisions for containment of hazardous materials. This will be followed by a description of the processes to be used for recovering heavy isotopes from irradiated targets and fabricating new targets for further irradiation, including discussions of operating safeguards and control of personnel exposure. Then, operations in the laboratory area will be discussed, including laboratory hazards and safeguards. Radiation and contamination controls for the entire building will be discussed next, followed by descriptions of process safeguards in the heavy-isotope processes and liquid, gaseous, and solid waste disposal. Finally, process hazards and credible accidents will be discussed.

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2. PHYSICAL PLANT

The Transuranium Processing Plant is located in the Melton Valley area at Oak Ridge National Laboratory (Fig. 2.1). Nearby facilities, which include the High Flux Isotope Reactor (HFIR) - Building 7900, the HFIR office and maintenance building - Building 7910, and the Thorium-Uranium Recycle Facility (TURF) - Building 7930, are shown in Fig. 2.2.

2.1 Building Description

The two-story processing and laboratory portions of the building and the one-story office and shop areas are of reinforced concrete block construction. Floors are reinforced concrete slabs that are either poured on compacted aggregate or supported on structural steel. The roof is precast concrete-deck, covered with built-up roofing. Total building volume is about 620,000 ft^3, and total floor area is about 29,000 ft^2. These are distributed as follows:

	Usable Area (ft^2)	Service Area (ft^2)	Volume (ft^3)
Pits and Tunnels	1,000	-	17,000
Cells and Transfer Area	1,000	-	60,000
First Floor of Main Building	8,250	3,000	250,000
Second Floor of Main Building	8,250	3,000	250,000
Office and Maintenance	3,000	800	30,000
Shop	1,000	-	12,000
Total	22,500	6,800	619,000

2.1.1 Facilities

The facilities for handling radioactive materials consist of nine heavily shielded cells served by master-slave manipulators, and eight laboratories, four on each of two floors (Figs. 2.3 and 2.4).

One cold laboratory for the preparation of reagents and assembly of equipment is located between two alpha laboratories, and the fourth

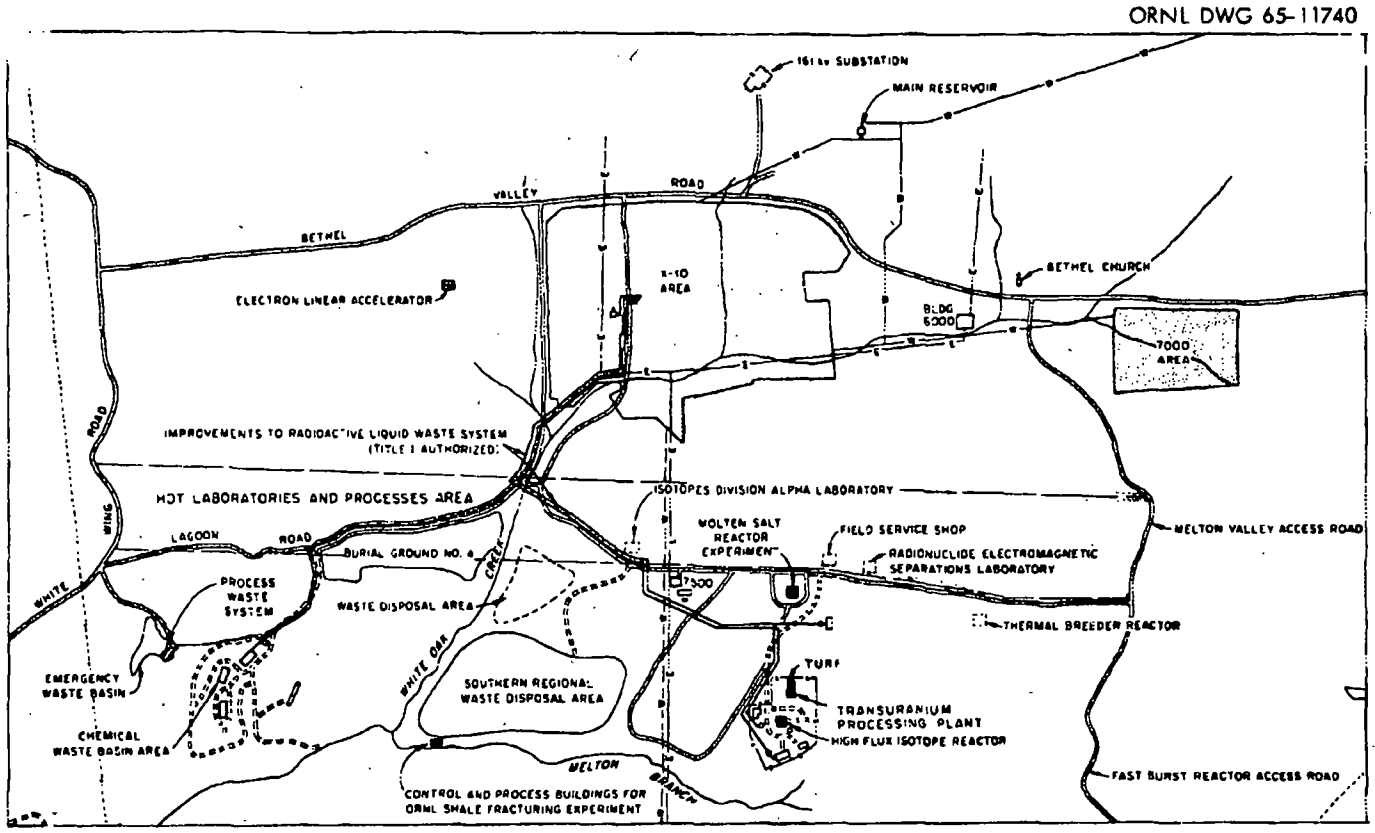

Fig. 2.1. Oak Ridge National Laboratory Area Map, Including Melton Valley Facility.

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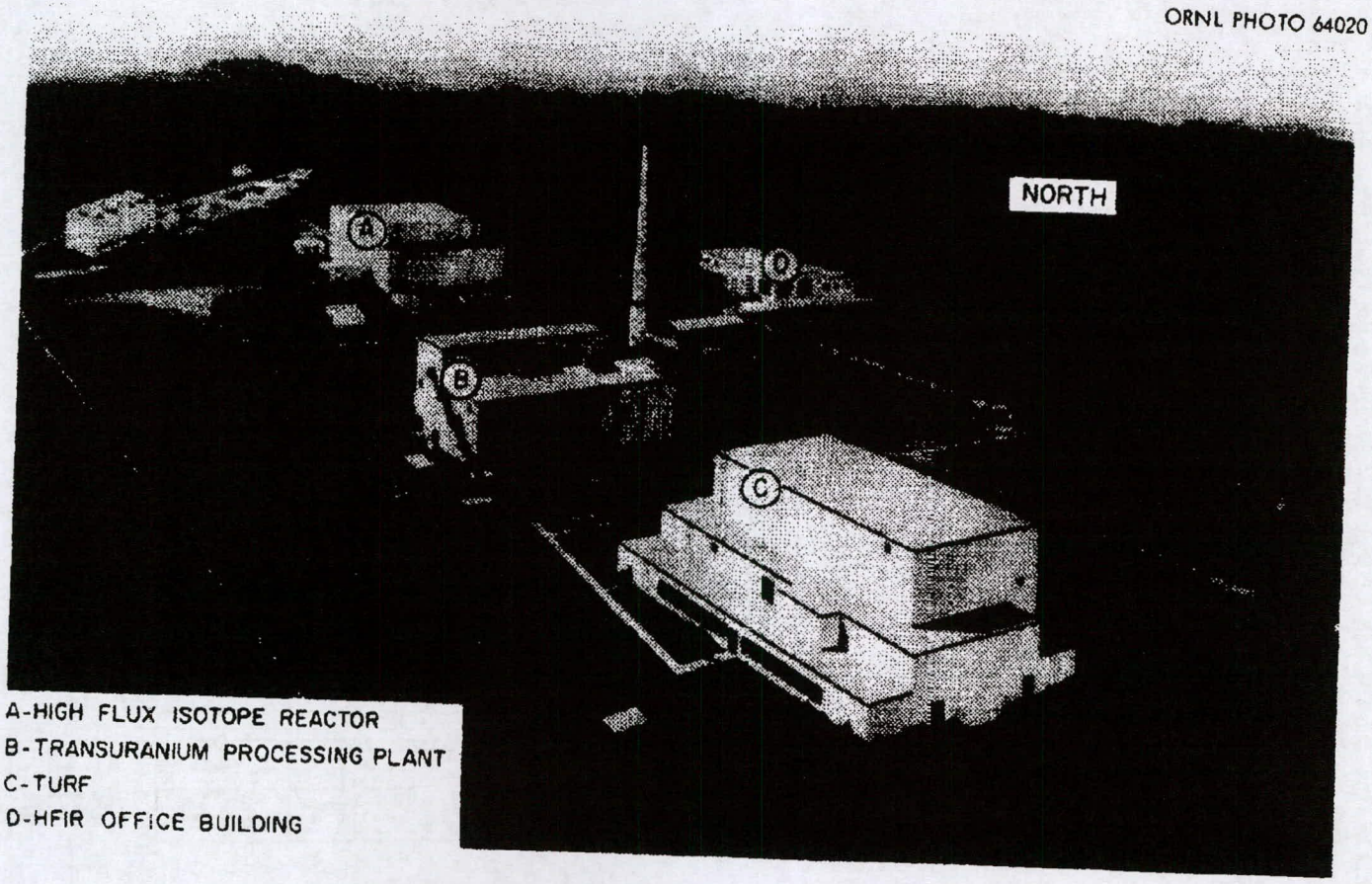

Fig. 2.2. Melton Valley Facilities.

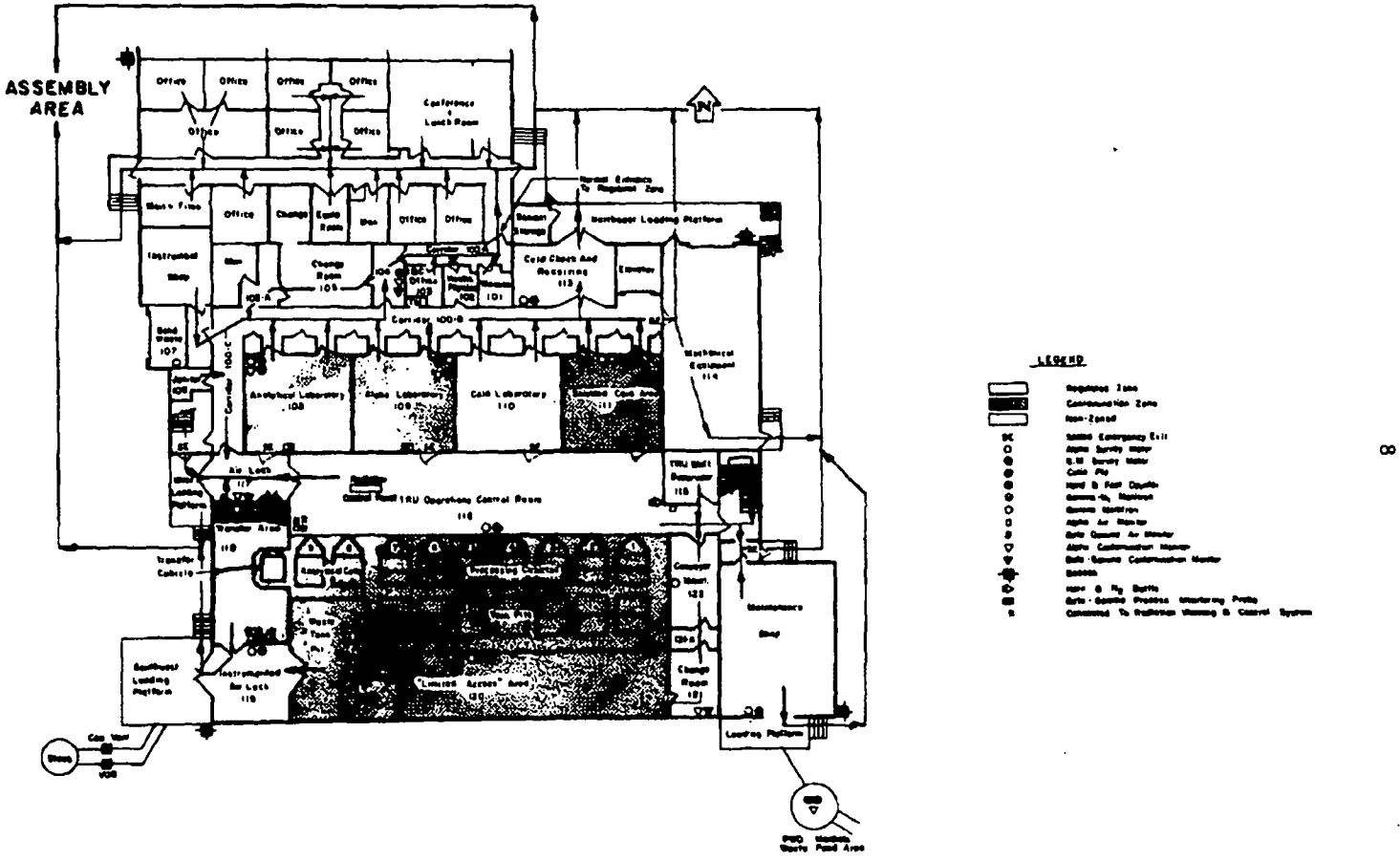

Fig. 2.3. Zoning Plan - First Floor, TRU Facility.

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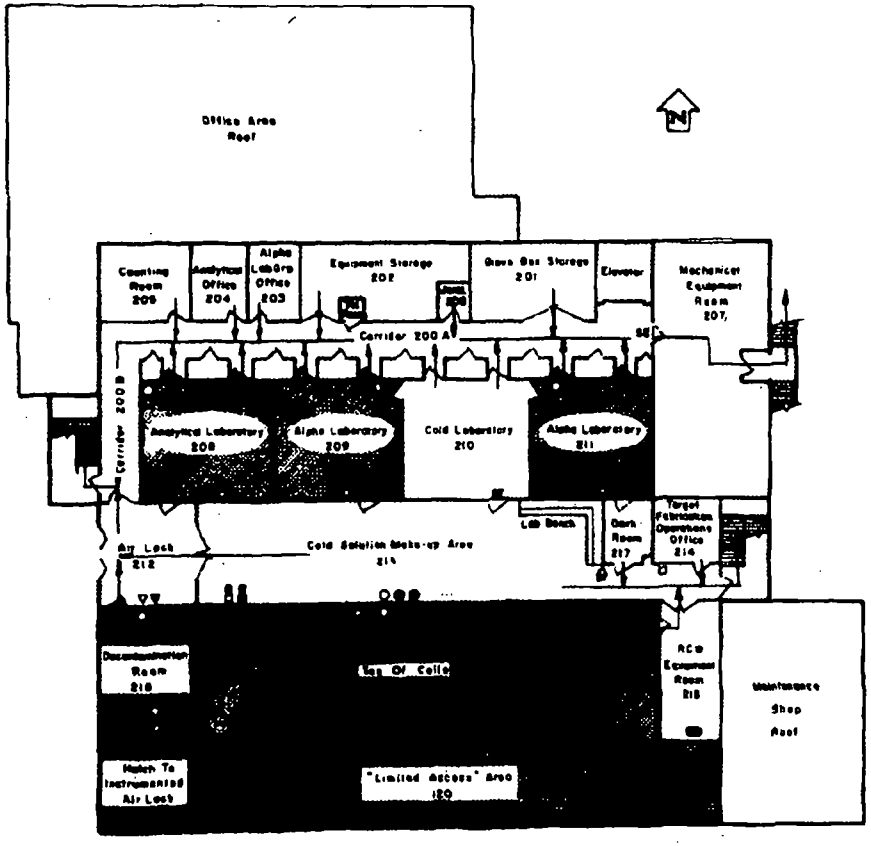

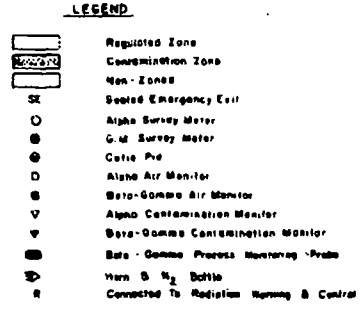

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Fig. 2.4. Zoning Plan - Second Floor, TRU Facility.

laboratory on each floor contains analytical equipment. The alpha laboratory in room 111 contains a shielded cave. The laboratory area contains supporting rooms for the handling and storing of process reagents and the storing of glove boxes under off-gas vacuum, and check and holdup areas for maintaining contamination control while things are moved in and out of the building.

The nine shielded process cells (Figs. 2.5 and 2.6) are arranged in line. Removable top plugs provide access to the cells. The top and back of the cell line is served by a bridge crane in a limited-access area of the building not normally occupied by operating personnel. The front face of each cell is provided with a window, master-slave manipulators, and plugged ports for possible future installation of periscopes.

The operating area is considered a nonradioactive zone of low-contamination potential except when manipulators must be withdrawn for repair or replacement. The second floor immediately over the operating area is a chemical makeup area for process reagent head tanks, nonradioactive pumps, and the like.

Of the ~~nine~~ radioactive cells, four contain chemical processing equipment for dissolution, solvent extraction, and precipitation processes. Three contain equipment for the remote preparation and ~~inspection~~ of recycle targets. Two cells are used for remote analytical operations. The cells are shielded by 54 in. of high-density concrete.

Within the shielded cells, process equipment is enclosed in a cubicle formed on the front and sides by the cell walls, and of epoxy resin-coated stainless steel plate on the rear wall and top; the bottom is of Hastelloy C to withstand the corrosion of accidentally spilled chloride solutions. The cubicle is not removable in the sense that a glove box would be but does constitute a containment envelope, the periphery of which is swept by a constant flow of ventilation air. The cubicle atmosphere is recycled at 350 cfm through absolute filters and a cooler, to minimize airborne particulates in the cubicle atmosphere and to remove the heat contributed by process equipment and the mercury vapor illumination lights (see Fig. 2.7). Behind and below

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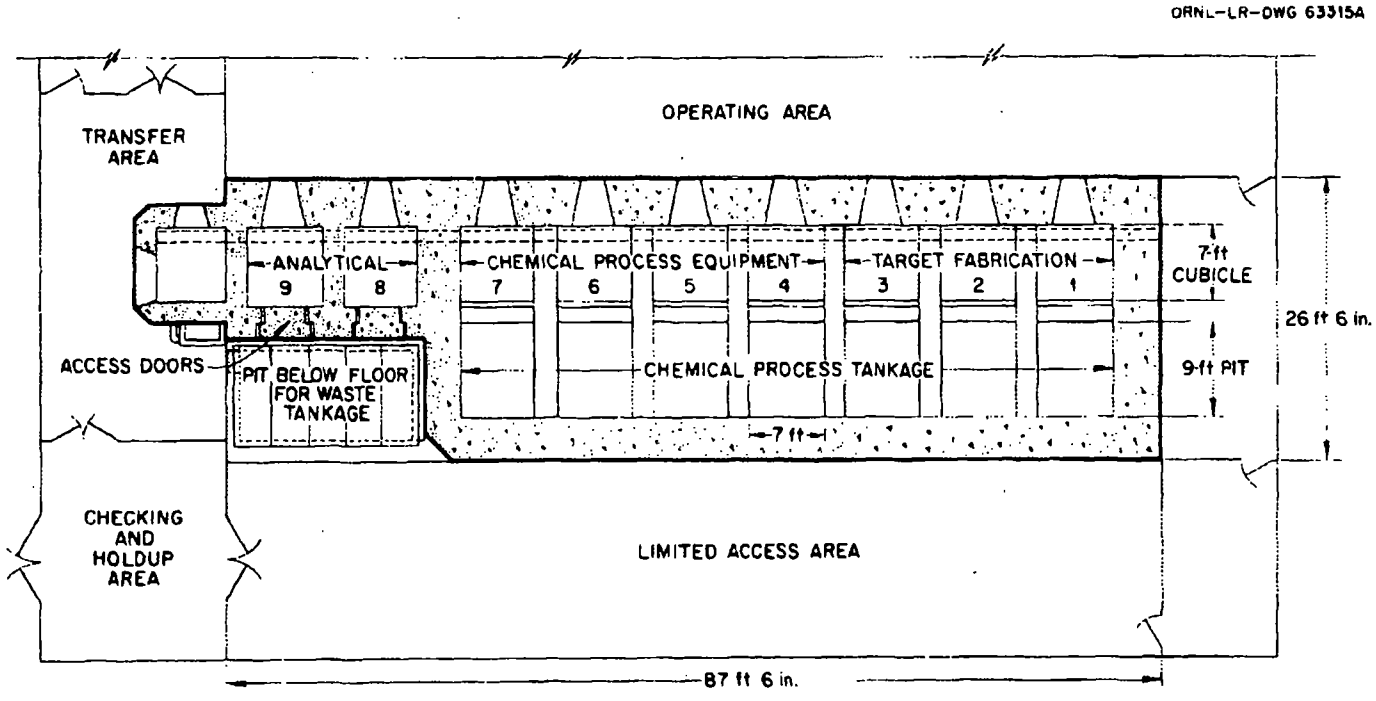

Fig. 2.5. Space Allocation in TRU Cell Bank.

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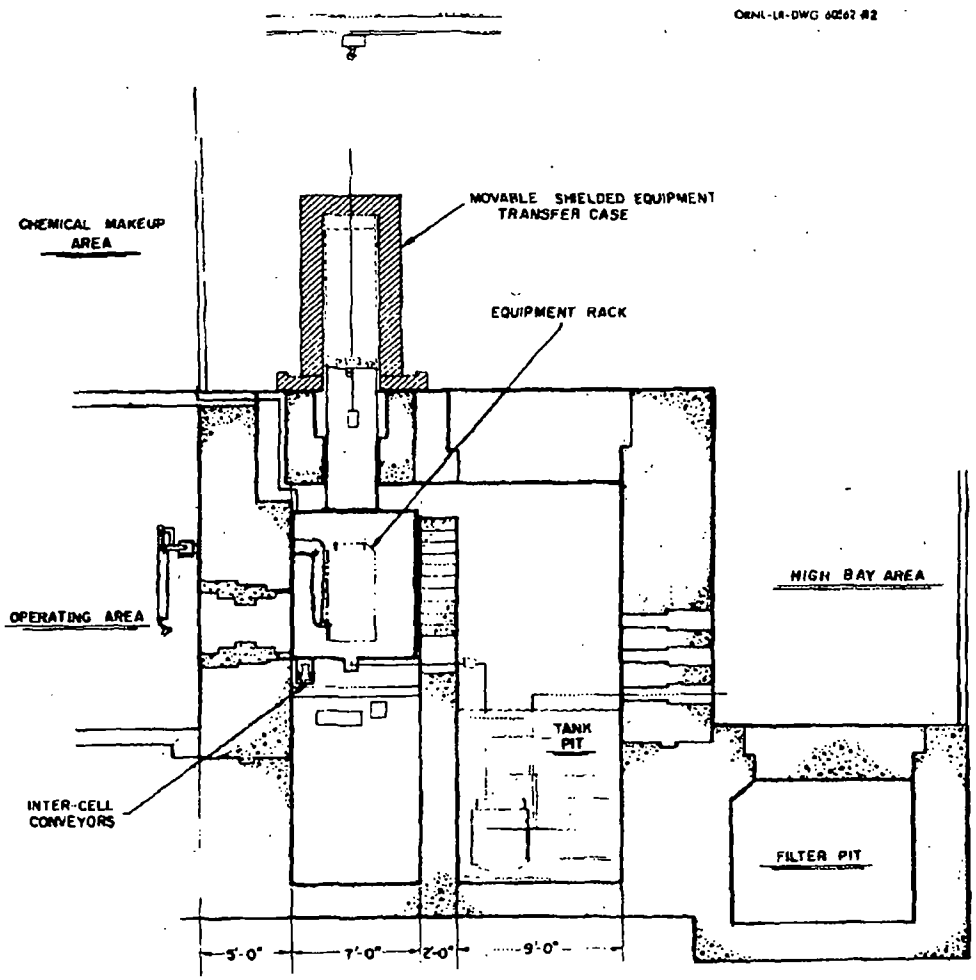

Fig. 2.6. Cross Section of TRU Cell.

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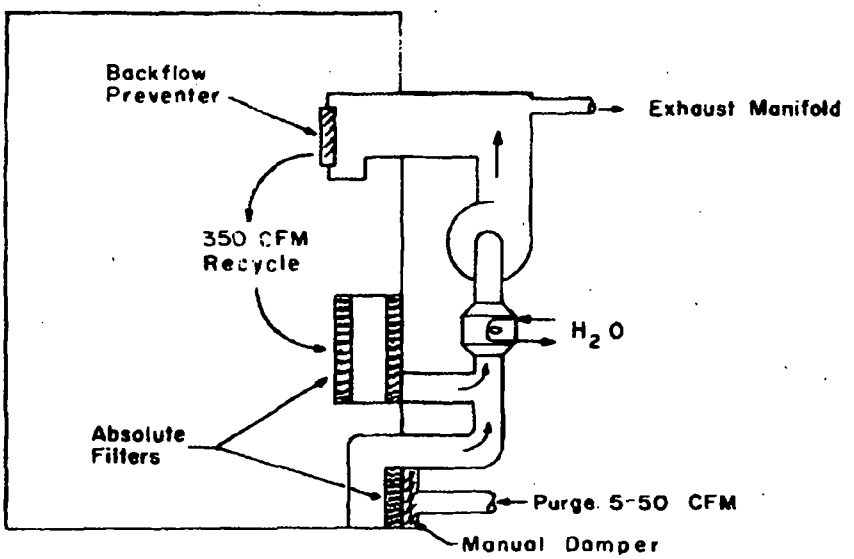

Fig. 2.7. Schematic Diagram of Cubicle Ventilation.

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the cell cubicle, and shielded from it by a concrete wall, is a tank pit for housing waste collection equipment and process and storage tanks. The tank pit is floored with a Hastelloy C pan, and the pit walls are of glass-fiber-reinforced resin. The tank pit may be flooded to provide shielding during maintenance.

Service lines enter through removable plugs in the back and top of the cell. Shielded pits behind the cell, in the limited-access-area floor, house off-gas filters and a pipe tunnel for process lines.

Communication between cells is achieved by means of a conveyor consisting of a canister on a dolly drawn by double chains. Differential motion between the chains operates an elevating mechanism on the dolly to raise the canister to seal to a companion covered opening in the cubicle floor (see Fig. 2.8). The design uses the double-cover technique pioneered by Los Alamos.

The canister, whose internal dimensions are 8 in. in diameter by 8 in. high, will be used for small tools, samples, and the like. A 12-in.-square air lock in the walls separating the cells can also be used for transfer. The conveyor communicates with each cell and with the transfer area cubicle, where the canisters can be charged or discharged. The transfer area cubicle is provided with manipulators. A glove box accessible through a rotary transfer port provides for removal of low-activity items. A door in the transfer area cubicle shield accommodates a shielded carrier that uses the double-cover technique for transfer of highly active materials such as analytical samples and solid wastes.

All chemical equipment is mounted on racks to facilitate fabrication and installation. A shielded equipment transfer case (Fig. 2.9), also using the double-cover design, is provided for the introduction of equipment racks into the cubicle. The rectangular transfer case will accommodate equipment 1.5 × 3 × 6 ft (high).

The office annex is isolated from the laboratory portion of the building except for a single doorway, and the shop area is isolated from the processing portion of the building except for a single doorway. The shop area is included in the Regulated Zone, but the office annex is not.

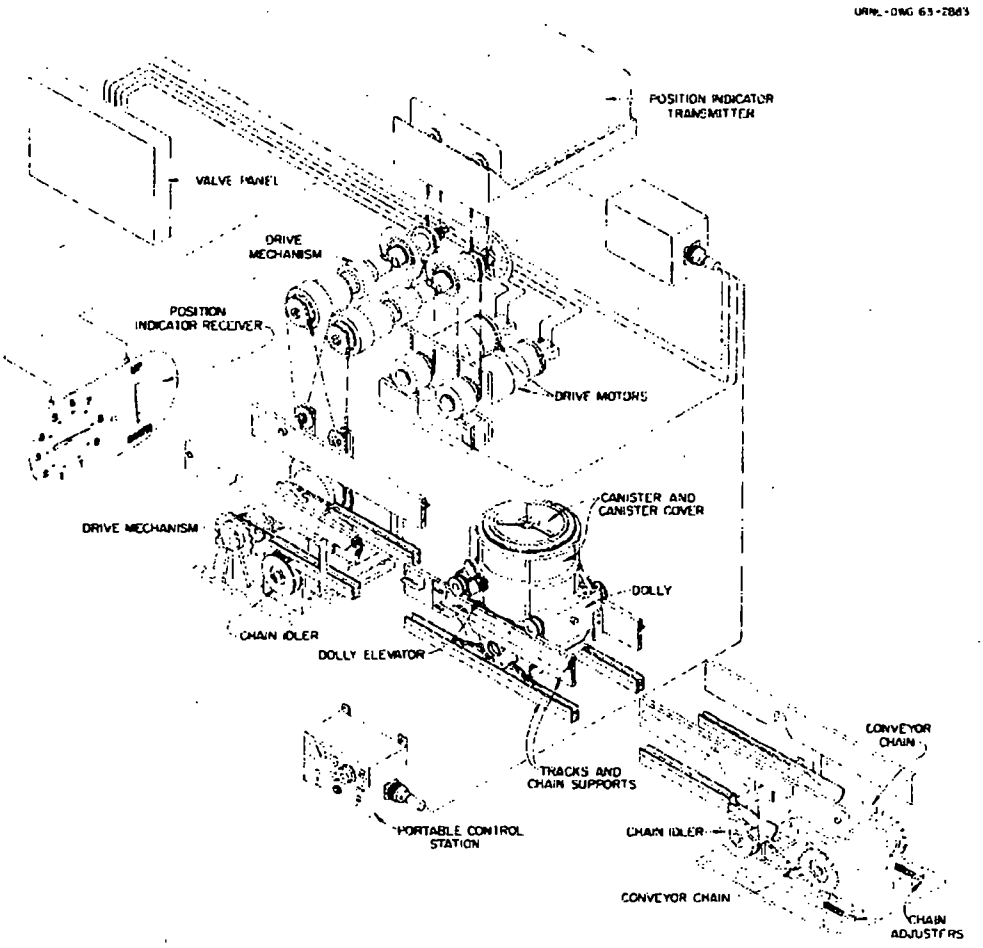

Fig. 2.8. Intercell Conveyor.

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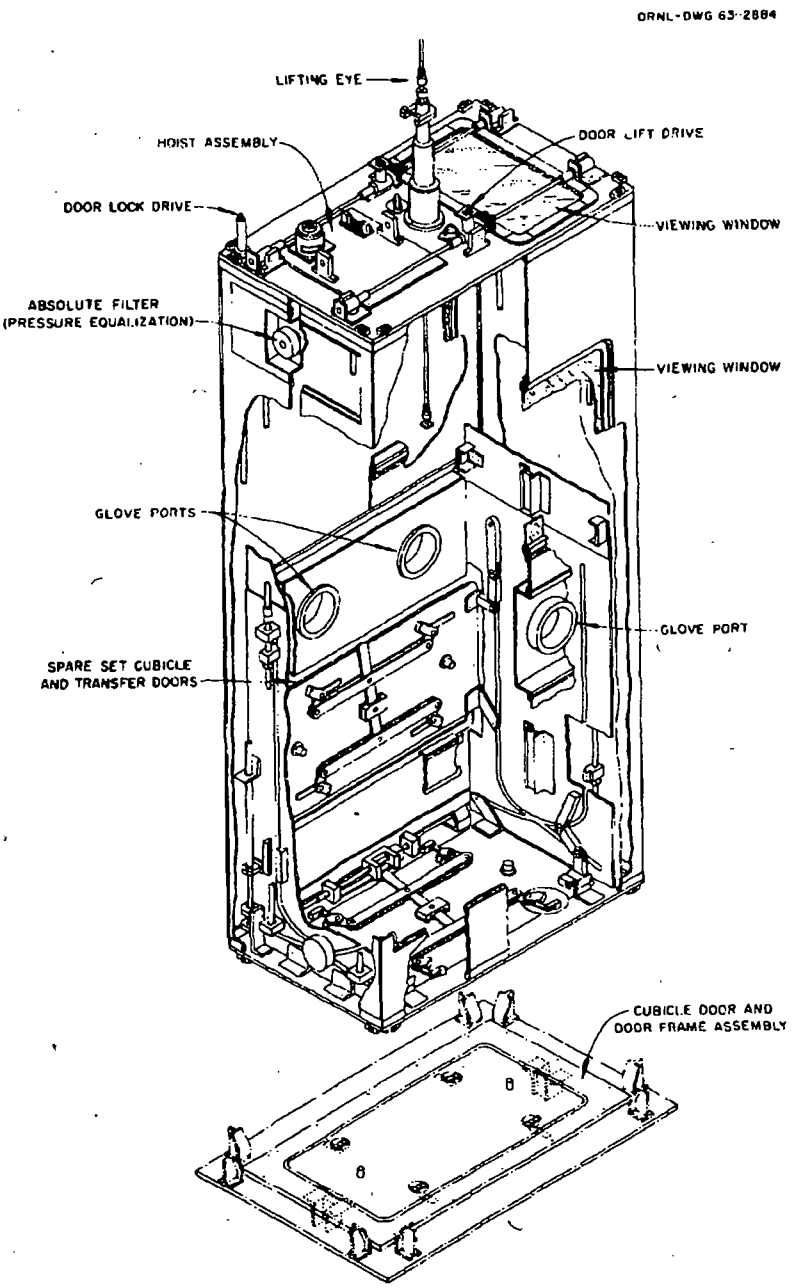

Fig. 2.9. Cutaway View of Equipment Transfer Case. The shield is not shown.

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2.2 Penetrating Radiation and Shielding

The fission source design basis for TRU shielding is considered to be the fifth-cycle target (composed of the residual actinides of the successive irradiations beginning with ^{242}Pu). On the average, a fifth-cycle target rod, containing approximately 305 mg of californium and spontaneously fissioning at a rate of 0.78×10^{12} fissions/sec will be processed at the rate of one rod every two years. Special irradiations, such as 1 g of ^{252}Cf fabricated into a target and irradiated for 30 days in the HFIR at a flux of 5×10^{15}, will spontaneously fission at a rate approximately three times that of the fifth-cycle rod; but processing of such a source is unusual and is expected to be very infrequent.

In addition to the neutrons and the gamma radiation that will originate from spontaneous fission of californium isotopes, fission products will constitute a source of gamma radiation. For design purposes, the maximum quantity of fission products was represented by the rare-earth fission products from the fissioning of 10 kg of ^{239}Pu, which will be separated from the associated ^{243}Am - ^{244}Cm in the TRU facility. After a 90-day decay period, the distribution of the rare-earth fission product gamma radiation, on which the gamma shielding requirements are based, was as follows:

500,000 curies of 1-Mev gamma emitters,
80,000 curies of 1.7-Mev gamma emitters, and
2,500 curies of 2.6-Mev gamma emitters.

The shielding of TRU is designed so that, during the processing of the maximum quantity of fission products or a fifth-cycle rod, the penetrating radiation dose rate in normally occupied areas is no greater than 0.75 mrem/hr. The dose rate of permissible hot spots on small areas, such as those opposite wall penetrations, will be no greater than 2.5 mrem/hr. For normal and routine processing, the penetrating radiation level in the operating area will be less than 0.25 mr/hr. In limited-access areas (areas not normally continuously

occupied by operating personnel) the maximum dose rate will be, nominally, 2.5 mrem/hr, with limited-area hot spots permitted up to 10 times this value. During the very infrequent operations in which the products of a special californium irradiation are handled in cubicles, the basic dose rate in normally occupied areas will be approximately 2.5 mrem/hr. For short-term nonroutine operations, such as roof plug removal, filter removal, equipment removal, cell entry, and carrier handling, radiation levels as high as 500 mrem/hr will be permitted. The neutron and gamma-ray dose rates at the surface of the 54-in.-thick high-density concrete cell wall, which constitutes the required shield to satisfy the permissible dose rate criteria, are tabulated in Table 2.1. The required shielding thickness assumes a concrete shield containing 1.67 grams of iron and 0.196 grams of H_2O per cc. The increased density contributed by the iron enhances the attenuation of gamma irradiation, but the iron, along with the water retention, is primarily required for the attenuation of the fission neutrons from the spontaneously fissioning californium.

Table 2.1 Neutron and Gamma-Radiation Dose Rates at the Outside Surface of the 54-in.-thick, High-Density Concrete Cell Wall for Various Radiation Sources Located Within the Cell

Source	Dose Rate (mrem/hr)
1. 305 mg of Cf from 5th-cycle rod (0.78×10^{12} fissions/sec, $\nu = 3.8$)	0.75
2. 1 g of Cf after special irradiation at flux of 5×10^{15} (2.7×10^{12} fissions/sec, $\nu = 3.8$)	2.5
3. Gamma radiation from rare-earth fission products resulting from burnup of 10 kg of ^{239}Pu after 90-day decay period	0.05

2.2.1 Design and Construction

Both ordinary concrete and high-density concrete were used for shielding personnel from penetrating radiation. Two kinds of aggregates were used for the high-density concrete: magnetite and a mixture of limonite and ferrophos that has the same shielding properties as magnetite for both gamma rays and neutrons. Limited availability of magnetite ore made it necessary to use the limonite-ferrophos. The high-density concrete has a density of 210 lb/ft^3 with a retained water content of 12.2 lb/ft^3. The shields were designed to be about equally effective for shielding 2.0-Mev neutrons and 2.4-Mev gamma rays.

Walls, Partitions, and Roof. — The exterior cell walls, the intercell and interior cell partitions, and the cell roof will provide gamma-neutron shielding equivalent to the following:

1.	Front wall (all cells)	54 in. of limonite-ferrophos concrete
2.	East end wall	54 in. of limonite-ferrophos concrete
3.	West end wall	24 in. of limonite-ferrophos concrete
4.	Rear wall (cells 1 to 7)	48 in. of limonite-ferrophos concrete
5.	Rear wall (cells 8 and 9)	36 in. of limonite-ferrophos concrete
6.	Roof slabs (removable)	48 in. of limonite-ferrophos concrete
7.	Intercell partitions	24 in. of magnetite concrete
	Except partition between cells 7 and 8	48 in. of magnetite concrete
8.	Interior cell partitions at operating level	18 in. of magnetite concrete

High-density concrete was used above the level of the operating-area floors, and extends far enough below the floor level to give adequate shielding. Below that level, ordinary concrete was used.

The cell roof is made of removable precast slabs of limonite-ferrophos concrete. The entire cell interior and all partition walls are completely exposed when the roof plugs are removed.

Viewing Windows. — Each of the nine cells and the transfer area cubicle have a combination lead glass and oil-filled viewing window. The cell windows are 54 in. thick, and the transfer-area cubicle window is 25 in. thick.

Radiation Shielding Doors. — In the rear wall of each of the two analytical cells (8 and 9) is a high-density door. These doors have a clear opening 4 ft wide and 7 ft high, are stepped over their entire periphery to prevent radiation streaming, and are gasketed to provide a positive seal against air inleakage when closed. The seals leaked 0.3 cfm when tested at a pressure difference of 2 in. water (gage).

2.3 Evacuation Routes

Evacuation routes out of the building are shown in Figs. 2.3 and 2.4, and the assembly point where personnel are to await instructions from the Laboratory (ORNL) Emergency Supervisor is shown in Fig. 2.10. The way in which emergencies are to be handled and the circumstances under which the evacuation routes will be used will be examined in detail in a Building 7920 Emergency Manual.

2.4 Process Equipment

Flexibility is the outstanding feature of the process equipment. Uncertainties in the chemistry of the actinides, as well as the corrosiveness of the chemicals required for the processes that will be used initially, necessitate complete and relatively simple replacement of process equipment. The large amounts of radioactivity involved require that maintenance and equipment replacement be done remotely. An all-metal piping disconnect is used throughout the plant for installing equipment and process piping. Process valves and pumps have been developed for use with the disconnect system in the limited space that is available. All process equipment was fabricated out-of-cell, using jigs that will be used to fabricate replacement equipment. A basic cubicle and cell structure was mocked up and used to test design and maintenance concepts.

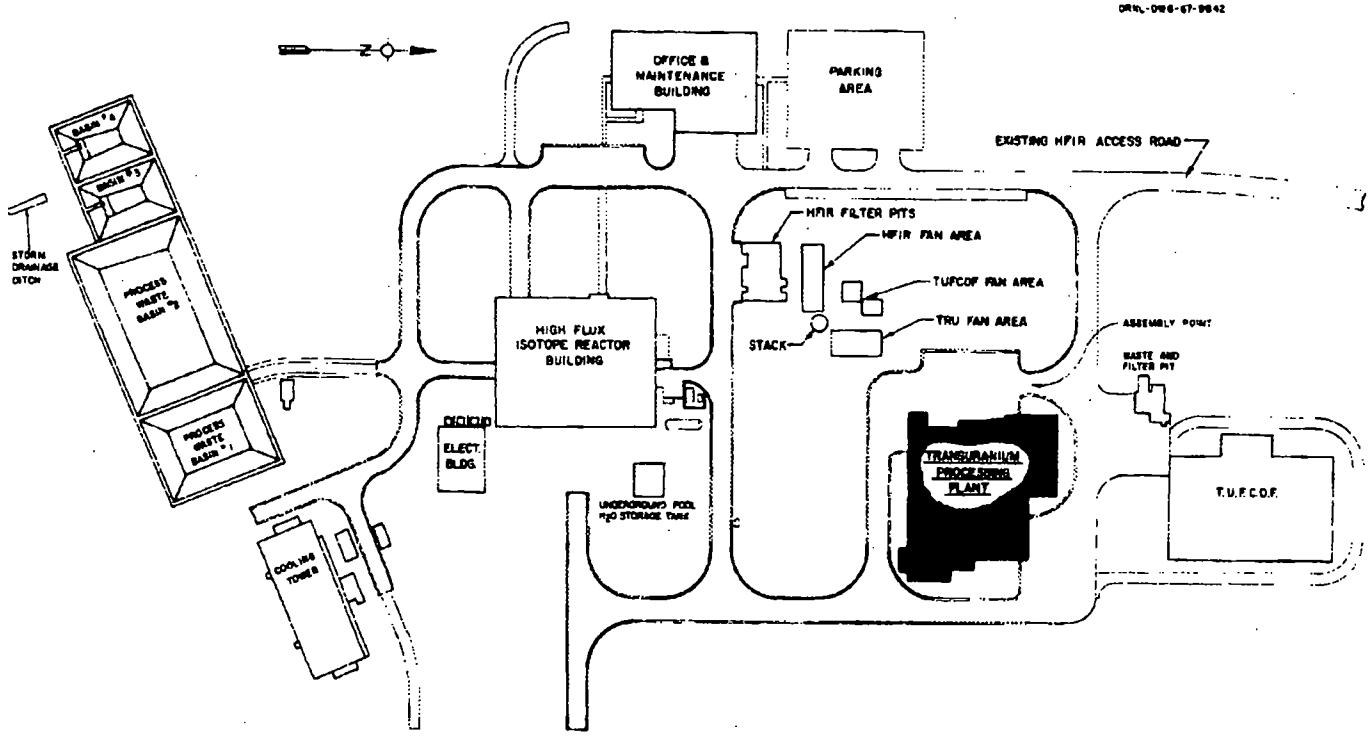

Fig. 2.10. Melton Valley Area.

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2.4.1 Cubicle Equipment

All mechanical equipment for chemical processing is located on one of three racks in each of the cubicles in cells 4 through 7. A 12-point sampling station is located in the bottom half of the back racks of the four cubicles for sampling tanks in pits 1 through 9. The side racks and the top half of the back racks contain the process equipment, which is connected to the tanks in the pits by jumper lines that pass through disconnect wells in the cubicle floor and under the floor to a group of disconnects in the pit (Fig. 2.11). The entire bundle of lines beneath each cubicle can be removed and replaced from the pit by working through an opening in the top of the cell. The opening would be made by removing some of the roof plugs.

A typical rack, for solvent extraction equipment, is illustrated in Fig. 2.12. The valves and pumps can be removed from the rack with manipulator-operated tools and replaced with new units transported to the cubicle in the intercell conveyor. Objects up to 8 in. in diameter and 8 in. high can be transported in the conveyor. The pulsed columns and other large pieces of equipment, or entire equipment racks, can be removed and replaced through a removal hatch in the cubicle top into the sealed transfer case. Jumper lines connecting equipment racks to each other and to the disconnect wells are removable by the same techniques. Service line bundles to the cubicles are removable through roof plugs in the cell bank. Use of the disconnects for all connections allows the cubicle to be remotely stripped of all process lines and equipment if necessary.

TRU Disconnects. — Removal of equipment is facilitated by an all-metal piping disconnect developed for tubing sizes from 3/8 to 3/4 in. Two conical surfaces, differing slightly in angle of the mating surfaces (18° male and 20° female), are forced together by a clamp (Fig. 2.13). The single bolt on the disconnect clamp can be operated by a manipulator-held impact wrench or directly by a long-handled socket wrench. Repeated tests of this disconnect under simulated process conditions indicated leakage rates of less than

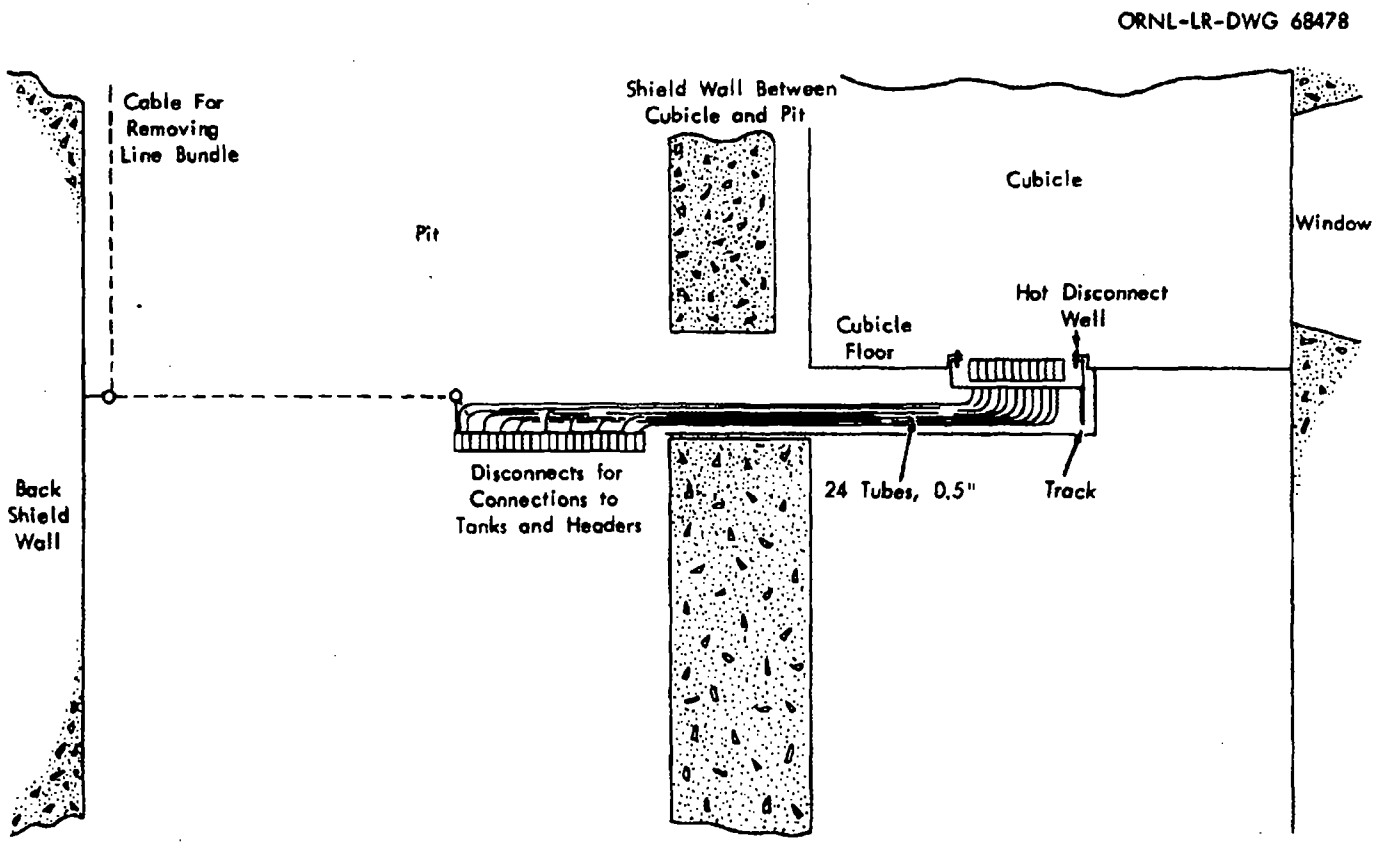

Fig. 2.11. Method of Replacing Disconnect Well.

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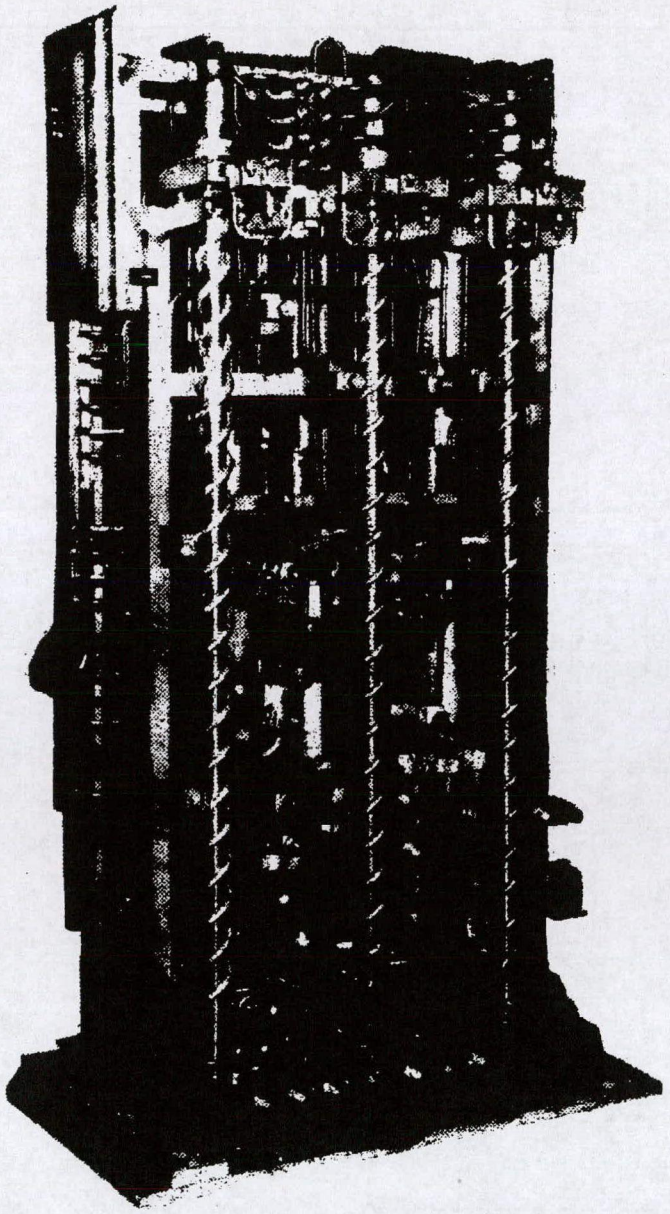

Fig. 2.12. Solvent Extraction Equipment Rack.

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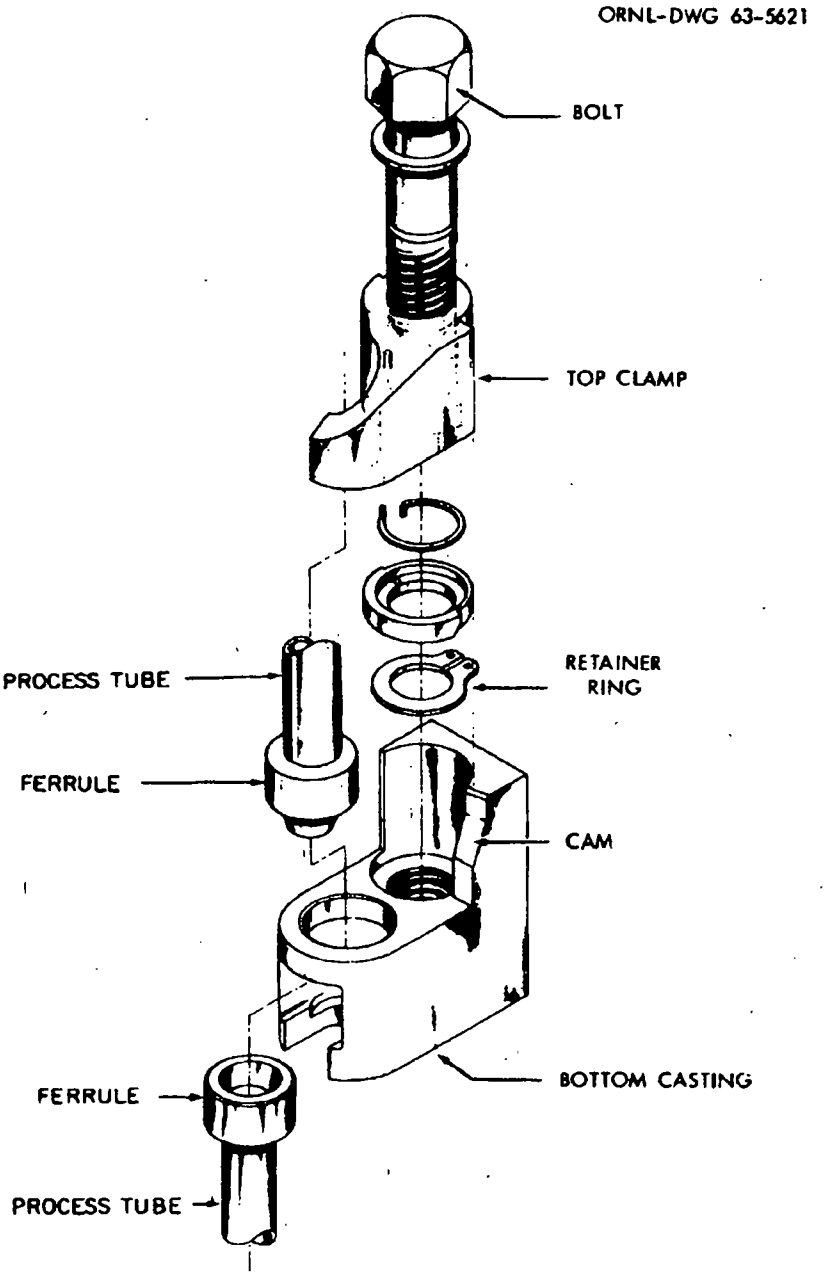

Fig. 2.13. TRU Disconnect.

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1×10^{-8} std cc of helium per second, even after several makes and breaks of the disconnect surface. This disconnect is used throughout the plant for installing equipment and process piping.

Process Pumps. — The process pumps (Fig. 2.14) are air-operated diaphragm pumps that are pulsed by alternately applying pressure and vacuum to the drive side of the diaphragm. Each pump is 6 in. in diameter and 1.5 in. thick, with a capacity of 30 to 40 liters/hr at pulsing frequencies of 60 to 80 cpm. The pumps are installed with two bolts, can be handled with the heavy-duty manipulators, and will fit into the intercell conveyor canister. There are about 40 sampler pumps and 15 feed and transfer pumps.

Sampler Station. — A 12-unit sampler is installed on the back rack in each of the four processing cells. The sampler station can be separated as a unit from the rack so that major equipment changes in the rack equipment may be made without replacing the sampler. Each of the 12 units consist of a drive pump, needle block, and bottle-handling mechanism. A conventional two-needle arrangement is used. The needle blocks are in an enclosed housing that is equipped with water spray for simple decontamination after each sampling operation. All pumps in one station are driven from the same external pressure-vacuum supply system; manipulator-operated valves on each pump are used to actuate the desired pumps.

Target Dissolver. — Targets from HFIR and other types of slugs up to 1 in. in diameter and 45 in. long are dissolved in the dissolver, T-70 (Fig. 2.15). The dissolver vessel is located in a well in the floor pan of cubicle 7, and a tantalum condenser and condensate routing system are located on the right-side equipment rack in cubicle 7. The location of the vessel in a well provides enough room within the cubicle, above the dissolver, for loading the targets which are 35 in. long (Fig. 2.16).

The dissolver and associated solution transfer system are made of Zircaloy-2. The vessel is 50 in. high, with a small-diameter lower

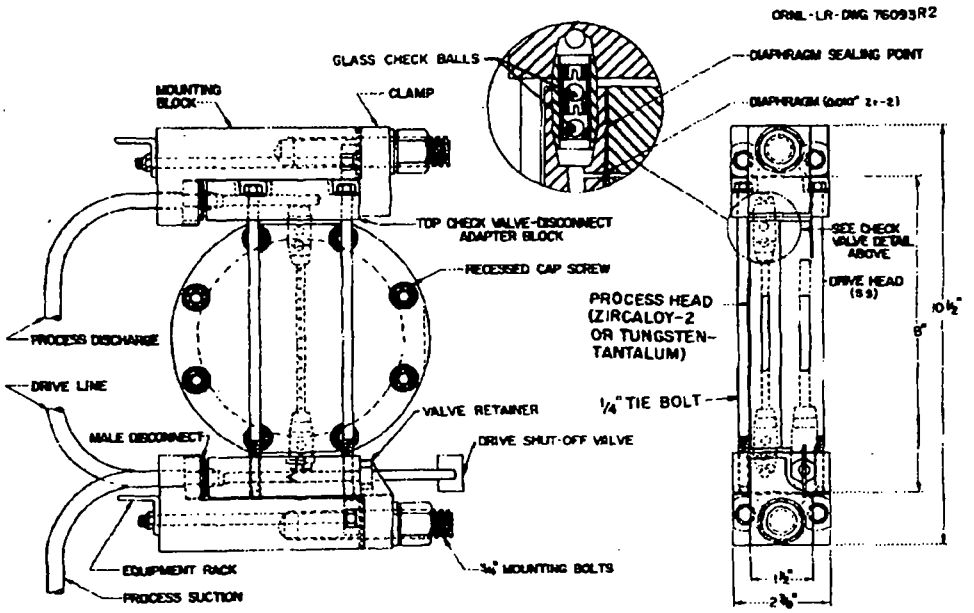

Fig. 2.14. Schematic of TRU Pump.

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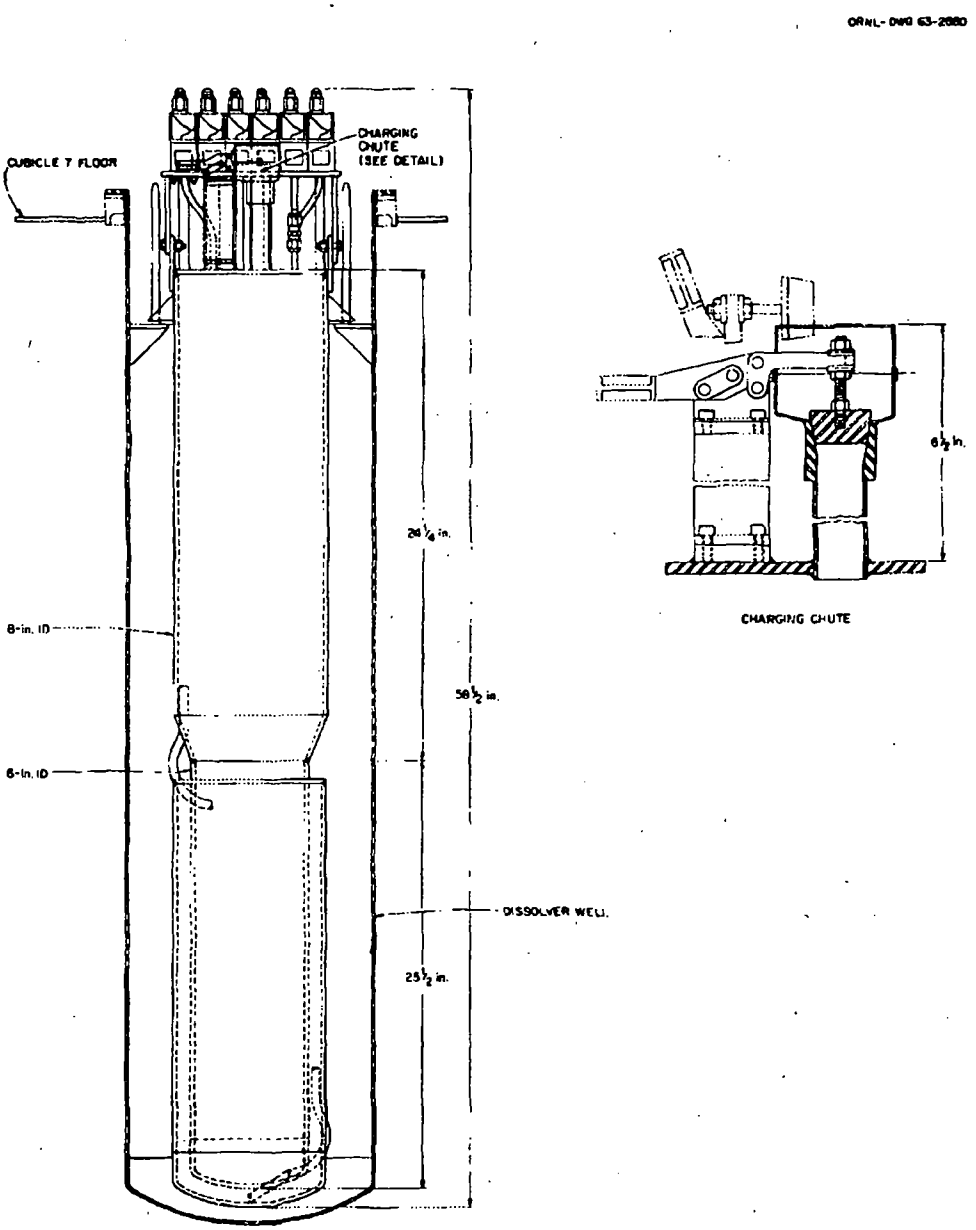

Fig. 2.15. Zircaloy-2 Dissolver.

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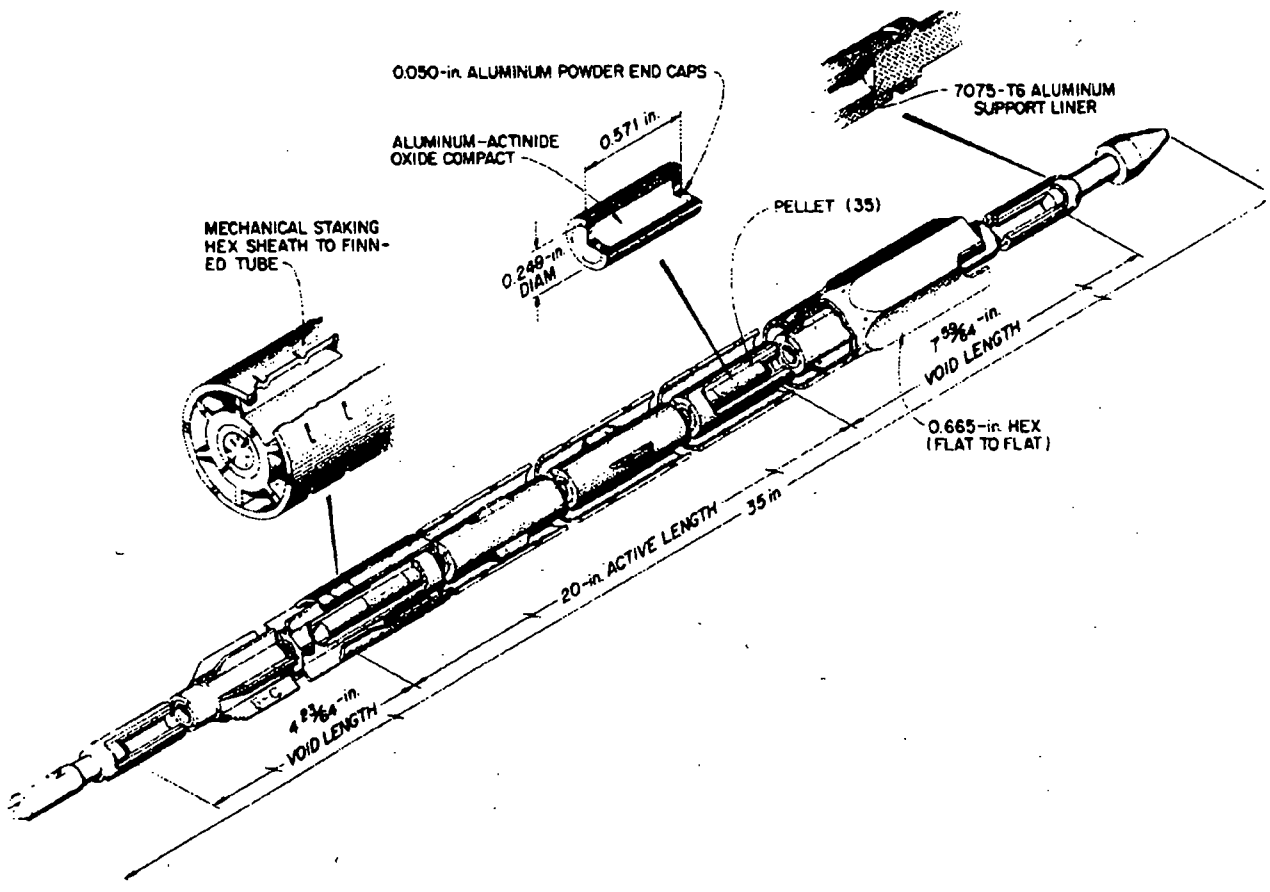

Fig. 2.16. HFIR Target Rod.

section (6-1/8 in. I.D. by 25 in. high) to minimize the amount of solution required to cover a target, and a larger-diameter upper section (8-in. I.D. by 21 in. high) for de-entrainment. The lower section is surrounded by a jacket for temperature control and is equipped with a sampler; level, density, and pressure-recording instrumentation; an air sparger; and a line for purging with air to dilute the hydrogen formed during the dissolution.

All lines that extend outside the cell bank from the interior of the dissolver are protected by radiation block valves which are closed if high activity is detected in any of the lines.

Cubicle 7 Right Rack. — This equipment rack contains an ion exchange column in addition to the dissolver condensate system. The column is to be used primarily for the recovery of plutonium from short-irradiated targets that contain significant quantities of plutonium. It is about 5 ft high, is made of 2-1/2 in.-O.D. Zircaloy-2 tubing, and the bottom portion has a jacket made of 3-1/4 in.-O.D. Zircaloy-2 tubing. Total volume is 2.7 liters.

Cubicle 7 Left Rack. — Equipment for the Tramex process occupies this rack. There are three pulsed columns that are 1-1/2 in. in diameter and have 5-ft-long contacting sections. Total volume of each column is 2 liters. Auxiliaries include the feed-metering system, pulsers, intercolumn pumps, pressure-pot flow control systems, and two solution hold-up pots. The hold-up pots (10 liters each) provide the means for isolating catch tanks during sampling and transfer. The material of construction of most surfaces that contact process solutions is Zircaloy-2. Exceptions are the tantalum-tungsten diaphragms in the pumps and the tantalum strip column C-74.

Cubicle 7 Back Rack. — The back rack contains filter F-70 and pump P-70 for transferring solution from the dissolver. Filter F-70 consists of a fiber-glass-wound filter element in a 2-1/2 in.-O.D. by 5-5/8 in.-long Zircaloy-2 tube. Total volume is about 420 cc. The bottom part of the rack contains a 12-unit sampler station.

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Cubicle 6 Right Rack. — The berkelium recovery system is located on the right-side equipment rack in cubicle 6. The major components, the batch contactor C-66, the feed and scrub hold tank T-63, and the berkelium product hold tank T-64, are made of Zircaloy-2. The contactor C-66 is a spray column 1-1/2 in. in diameter by 57-1/2 in. long with a solution outlet at the bottom and two separate spray heads in the top for introducing radioactive and cold feed solutions. Column volume is 1450 cc. Tanks T-63 and T-64 hold 9.1 and 8.6 liters, respectively.

An auxiliary equipment rack containing a dissolver system is temporarily attached to right rack 6. All equipment is of stainless steel for dissolving, in HNO_3 - HF, targets in which plutonium burnup is less than 80%. The dissolver, T-604, is a 3-ft-long, 6-in. schedule-40 pipe that has a 17-liter capacity. Off-gas scrubber C-607 is an 18-in.-long, 4-in. schedule-40 pipe packed with glass Raschig rings. Other equipment includes a condenser H-606, a sintered stainless steel filter F-605, and a pump P-608.

Cubicle 6 Left Rack. — The second-cycle solvent extraction equipment (Pharex flowsheet) is similar to the first-cycle equipment. Either the Tramex or Pharex flowsheet can be run in either set of equipment. However, some minor changes in arrangement of jumper lines would be necessary.

Cubicle 6 Back Rack. — The upper part of the back rack contains filter F-60 and process pumps P-63 and P-64. The bottom part contains a 12-unit sampler station.

Cubicle 5. — Cubicle 5 is free of equipment except for the sampler station and product distribution system on the back rack. It will be used for special separations as needed.

Cubicle 4 Right Rack. — The equipment that is located here for the separation of californium, einsteinium, and fermium is made entirely of tantalum. The process is a chromatagraphic ion exchange separation

that is effected in column C-41. Column volume is 500 cc. Other equipment includes a 5-liter, jacketed feed evaporator T-400, a 3-liter-capacity feed tank T-401, a filter F-400, and three 2-liter product tanks T-402, T-403, and T-404.

Cubicle 4 Left Rack. — Equipment for the preparation of actinide oxides for target fabrication will be located here. Design is not complete.

2.4.2 Target Fabrication Equipment

The in-cell equipment for target fabrication is located in cubicles 1, 2, and 3. Components are arranged so that the target fabrication can proceed nearly automatically. The equipment rack-disconnect concept is not used here because of the precision with which equipment must be located. However, all equipment can be repaired or replaced remotely.

The system is designed to minimize the spread of contamination. In general, operations with loose powders will be performed in cell 3, those with pellets open to the cubicle atmosphere in cell 2, and those with sealed target elements in cell 1.

Equipment layouts for cubicles 3, 2, and 1 are shown in Figs. 2.17, 2.18, and 2.19, respectively.

2.4.3 Equipment in Tank Pits

Tank pits that contain waste collection equipment, process equipment, and process and storage tanks are located behind and below the cubicles and are shielded from them by concrete walls. The tank pit floors are covered with Hastelloy C pans, and the walls are covered with glass-fiber-reinforced resin.

The equipment in the tank pits is listed in Table 2.2. The in-cell tanks for the process can be classified in three groups as: (1) feed and product evaporators, (2) product storage tanks, and (3) waste accumulation tanks. The tanks are about 4-1/2 ft high and range in volume from 20 to 600 liters. All nozzles terminate in TRU disconnects located 40 in. above the head of the tank.

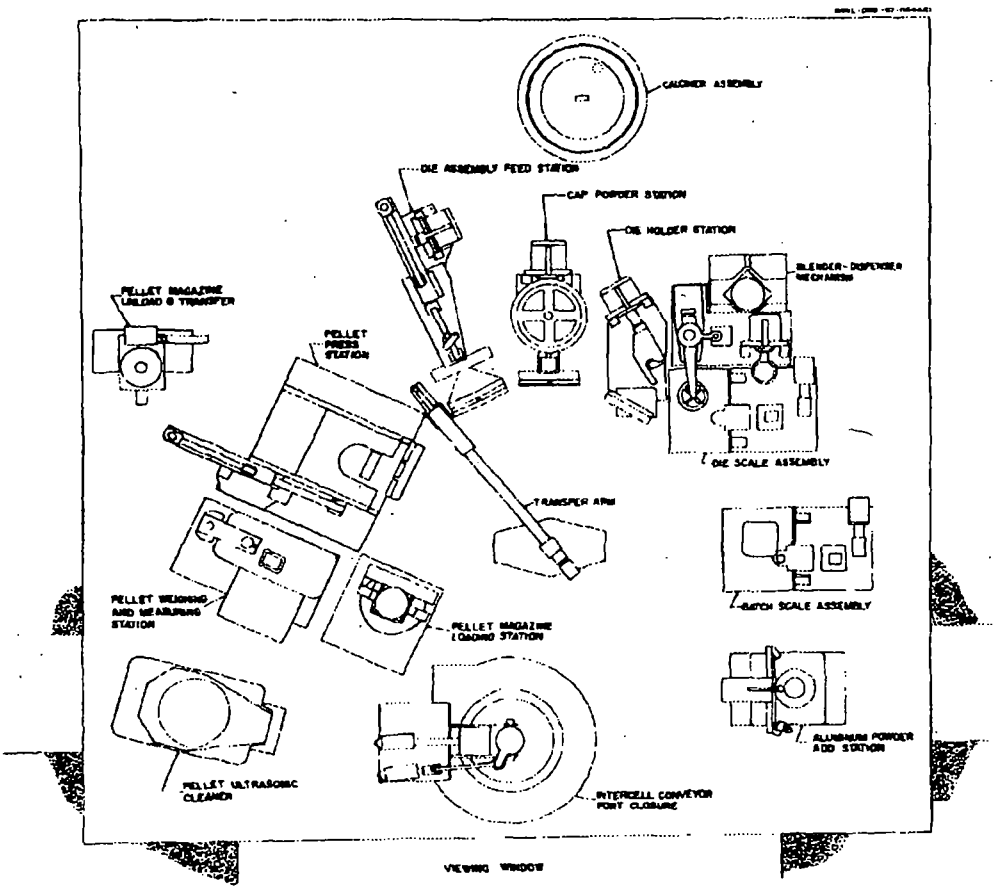

Fig. 2.17. Equipment Layout for Cubicle 3.

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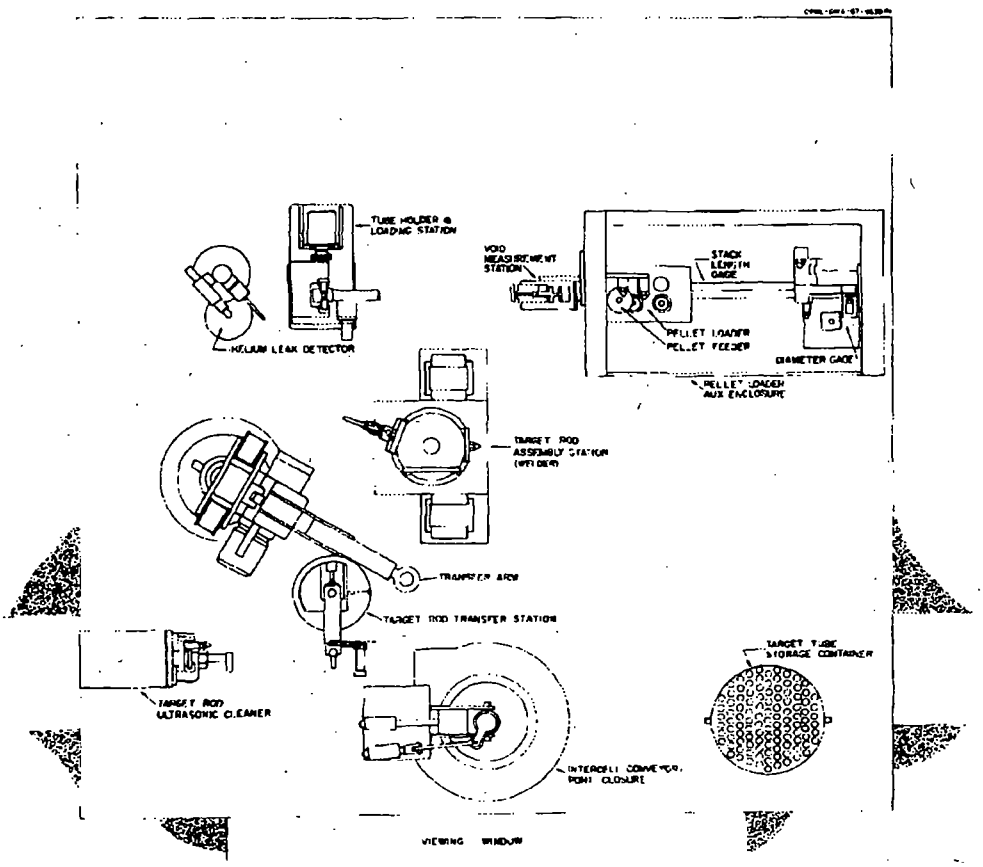

Fig. 2.18. Equipment Layout for Cubicle 2.

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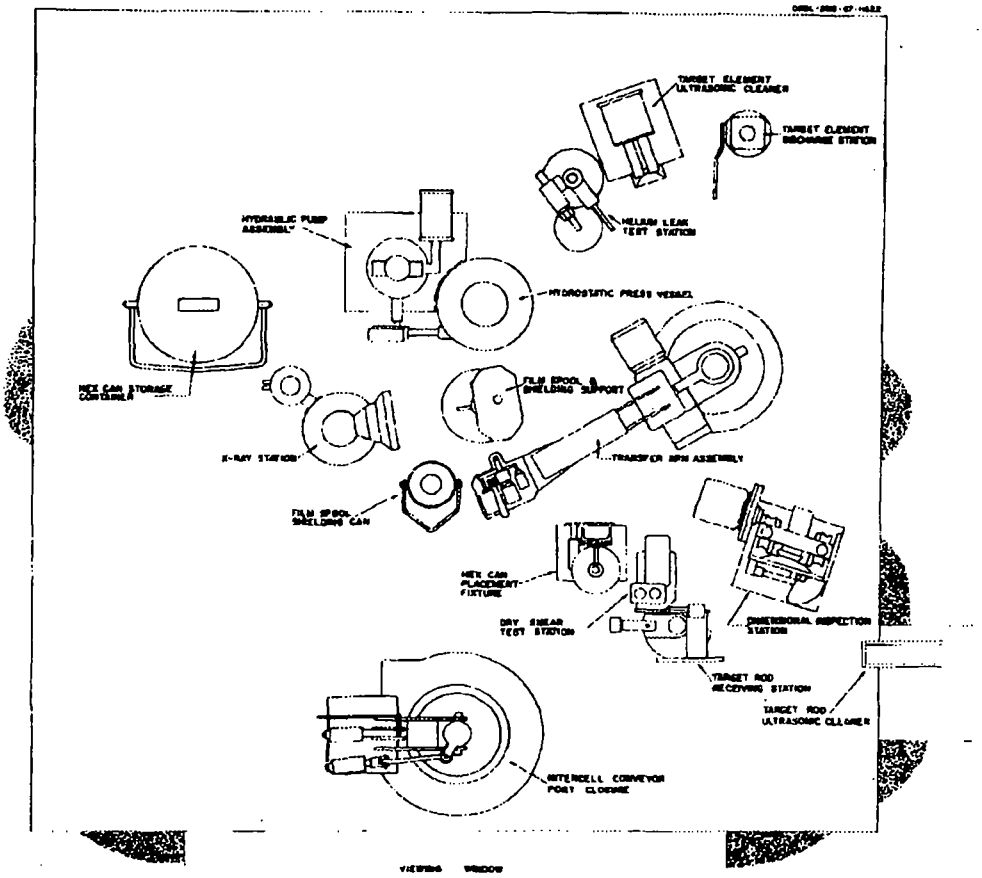

Fig. 2.19. Equipment Layout for Cubicle 1.

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Table 2.2. Tanks and Equipment in Cell Tank Pits

Location	Equipment No.	Volume	Material	Description of Process Function
Waste Tank Pit	F-111	125 gal	Stainless Steel	Waste collection from transfer-area drain and conveyor housing drain
	F-115	550 gal	Hastelloy C	Intermediate-level waste collection from building HW drains or from process
	F-126	1200 gal	Stainless Steel	Waste dilution and neutralization tank
Cell 7 Tank Pit	L-139	130 liters	Hastelloy and stainless	Vessel off-gas caustic scrubber
	T-71	70 liters	Hastelloy C	Plutonium feed adjustment tank
	T-72	83 liters	HC-Ta-Ta[a]	Feed adjustment for first-solvent extraction cycle
	T-73	70 liters	Zircaloy-2	First-cycle feed tank
	T-77	298 liters	Hastelloy C	Aqueous rework
	T-78	157 liters	Hastelloy C	Collection of waste ion exchange resin
	H-72		Ta - stainless steel	Off-gas condenser for T-72
Cell 6 Tank Pit	T-60	57 liters	HC-Ta-Ta[a]	Intercycle evaporator
	T-61	70 liters	Zircaloy-2	Second-cycle feed tank
	T-65	24 liters	HC-Ta-Ta[a]	Berkelium system feed adjustment tank
	T-66	70 liters	Zircaloy-2	Centrifuge overflow collection tank
	T-67	25 liters	Zircaloy-2	Intercycle catch tank (after first cycle)
	T-601	70 liters	Hastelloy C	Second-cycle aqueous waste catch tank
	T-602	20 liters	Zircaloy-2	Centrifuge solids feed tank
	F-61	19 liters	Zircaloy-2	Centrifuge for removing aluminum precipitate from dissolver solutions
	H-60		Ta - stainless steel[b]	Off-gas condenser for T-60
	H-65		Ta - stainless steel[b]	Off-gas condenser for T-65
Cell 5 Tank Pit	T-50	25 liters	Zircaloy-2	Transuranium product storage tank
	T-51	25 liters	Zircaloy-2	Transuranium product storage tank
	T-52	25 liters	Zircaloy-2	Transuranium product storage tank
	T-53	25 liters	Zircaloy-2	Transuranium product storage tank
	T-54	24 liters	HC-Ta-Ta[a]	Product evaporator
	H-54		Ta - stainless steel[b]	Off-gas condenser for T-54
Cell 4 Tank Pit	T-40	67 liters	HC-Ta-Ta[a]	Am-Cm evaporator
	T-41	25 liters	HC-Ta-Zr2[c]	Transuranium product hold tank
	T-42	25 liters	HC-Ta-Zr2[c]	Transuranium product hold tank
	T-43	24 liters	HC-Ta-Ta[a]	Precipitator feed adjustment
	T-45	25 liters	Zircaloy-2	Precipitator waste tank
	T-47	70 liters	Zircaloy-2	Californium storage
	T-48	25 liters	HC-Ta-Zr2[c]	Transuranium product hold tank
	H-40		Ta - stainless steel[b]	Off-gas condenser for T-40
	H-43		Ta - stainless steel[b]	Off-gas condenser for T-43
Cell 3 Tank Pit	T-30	25 liters	Zircaloy-2	Transuranium product storage
	T-31	25 liters	Zircaloy-2	Transuranium product storage
	T-32	70 liters	Zircaloy-2	Transuranium product storage
	T-33	25 liters	Zircaloy-2	Transuranium product storage
	T-34	158 liters	Hastelloy C	Process condensate collection
Cell 2 Tank Pit	T-20	78 liters	Hastelloy C	First-cycle aqueous waste
	T-21	158 liters	Hastelloy C	First-cycle organic waste
	T-22	70 liters	Hastelloy C	Second-cycle organic waste
	T-23	158 liters	Hastelloy C	Organic rework
	T-24	70 liters	Hastelloy C	Target fabrication waste collection
Cell 1 Tank Pit	T-10	634 liters	Hastelloy C	Americium-curium feed storage

[a] Hastelloy C shell, tantalum liner, tantalum head. Mercury between shell and liner for heat transfer.

[b] Condensers are tantalum tubes with stainless steel jackets.

[c] Hastelloy C shell, tantalum liner, Zircaloy-2 head. Mercury between shell and liner for heat transfer.

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The evaporators consist of tantalum-lined, Hastelloy C vessels with flanged heads of 3/8-in.-thick tantalum plate. The evaporators and associated condensers are designed for boilup rates of 15 liters/hr.

The product storage and waste accumulation tanks (Fig. 2.20) are of all-welded construction except for the tubing penetrations through the tank heads, where rolled joints are used. The product storage tanks are fabricated from Zircaloy-2, which is sufficiently resistant to corrosion to prevent the buildup of undesirable amounts of corrosion products or contaminants in the stored actinide products. The waste accumulation tanks are made of Hastelloy C, which has acceptable corrosion rates for this application. Nozzles for both types of tanks are of Zircaloy-2.

In-Cell Piping. — Service lines to the tanks cross the top of the cell bank, drop down the back face of the cells, and enter the cells through removable service plugs in the back wall. Piping connections between equipment components in both cubicle and pit are made by individual jumper lines having TRU disconnects at either end. Interconnecting jumper lines between cubicles and pits are grouped in bundles.

Piping between cells is routed through intercell piping plugs (Fig. 2.21) set into 1- by 5-ft openings in the cell partition walls. The plugs are sealed to a metal frame permanently mounted in the opening. Jumper lines run from disconnects mounted on these plugs to other locations in the pits. The waste header is installed in an opening in the removable plug, and the off-gas header is installed in a similar opening in the permanent frame above the piping plug. The waste header in any pit can be remotely replaced without disturbing the piping plugs. Individual sections of the off-gas header can be replaced only after disconnecting and moving sections in other cells.

Maintenance. — Personnel entry into the cell bank will not be required for maintenance. The pits will be flooded approximately 3 ft above the top of the tanks, and work will be done by long-handled

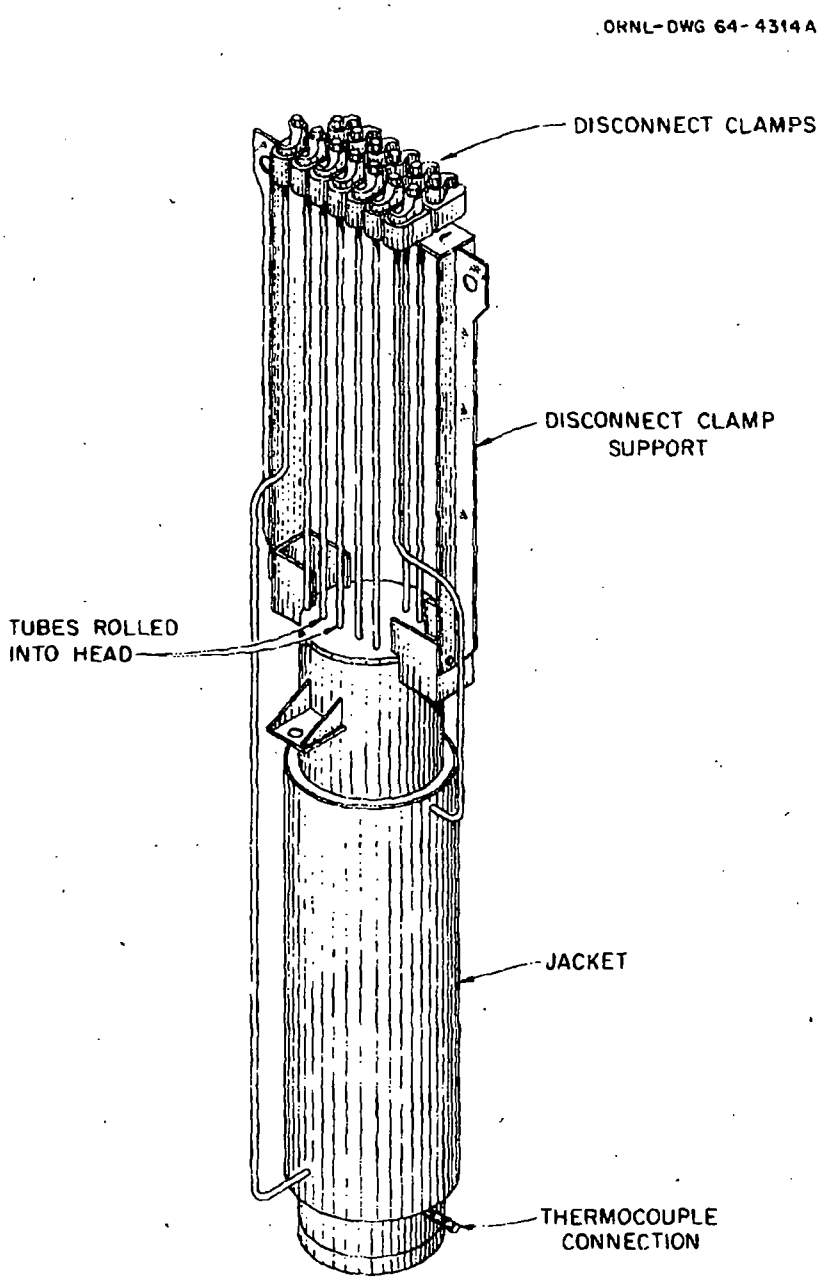

Fig. 2.20. Typical TRU Process Tank.

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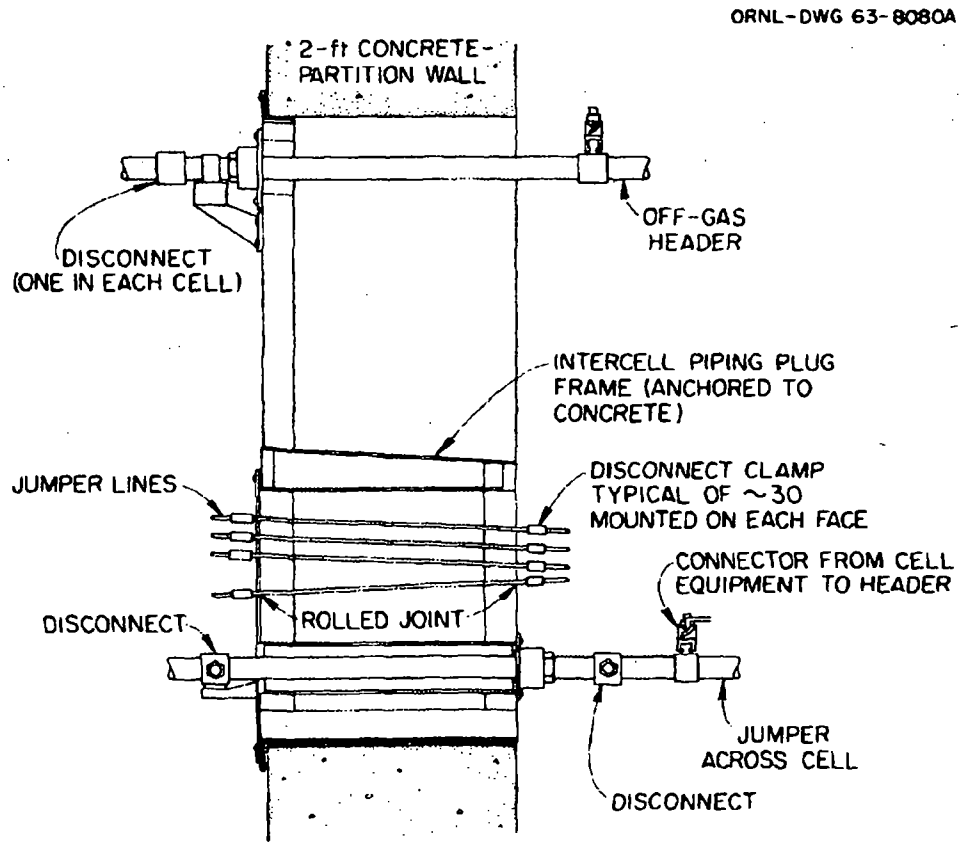

Fig. 2.21. Intercell Piping Plug.

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(about 20 ft) tools from the top of the cell bank. All disconnects will be located above the flooding level to prevent water leakage into the system during maintenance operations. Equipment to be removed from the tank pits will be pulled into shielded casks by the building crane, and the casks will be sealed for disposal.

2.4.4 Out-of-Cell Equipment

Solution makeup and process head tanks are located in the chemical makeup area, room 213. These tanks are made of mild steel coated with Penton or are of stainless steel. Process functions, volumes, and materials of construction are listed in Table 2.3.

The tanks are located over shallow pans that are continuously flushed with water. Thus, any solutions that are spilled during filling or sampling, or that drip from the tanks will not accumulate or get on the floor of the room.

Solutions are transferred from process head tanks to process equipment in the cubicles or to tanks in the tank pits by pressurizing the head tanks to 5, 10, or 25 psig. Flow to the process tanks is through flow controllers or valves, plus check valves. Head tank pressures are limited by regulators and pressure relief valves (pop-off type) to prevent excessive pressures in the tanks.

2.4.5 Transfers into or out of Cubicles

Everything that enters a cubicle from outside the cell bank or that leaves a cubicle to be removed from the cell bank must be handled either with the equipment transfer case or with the intercell conveyor. Size is the factor that determines which path is used.

Articles that will fit in the 8-in.-diameter by 8-in.-high canister are transferred using the conveyor. Both paths provide for maintaining the cubicle alpha seal.

The double-door technique is used; the door on the cubicle is locked to the door on the transfer device when the device is sealed

Table 2.3 Tanks and Equipment at Tank Pans in Makeup Area

Location	Equipment No.	Volume (liters)	Material	Process Function
Cell 4 pan	M 41	6	Stainless steel	Resin addition
4	M 43	6	Penton[a]	HNO_3 addition
4	M 50	20	Penton	Feed adjustment solution addition
4	M 610	17	Stainless steel	Addition and head tank for stainless steel dissolver
4	H 44			Heater for C41
4	H 77			Heater for C71
Cell 5 pan	M 4	75	Penton	Second-cycle organic makeup
5	M 5	156	Stainless steel	Caustic makeup
5	M 40	50	Penton	Caustic addition
5	M 51	6	Stainless steel	Product distribution flush tank
5	M 60	75	Penton	Second-cycle extractant head tank
5	M 66	5	Penton	Organic extractant head tank
5	M 67	5	Penton	Scrub and strip solution head tank
Cell 6 pan	M 1	53	Penton	HCl makeup
6	M 2	53	Penton	LiCl makeup
6	M 63	75	Penton	Second-cycle organic scrub head tank
6	M 71	53	Penton	LiCl addition
6	M 72	20	Penton	Elutriant head tank
6	M 76	53	Penton	First-cycle scrub head tank
6	M 77	53	Penton	First-cycle strip head tank
6	H 66			Heater for second-cycle columns
Cell 7 pan	M 3	75	Penton	First-cycle organic makeup
7	M 61	53	Penton	Second-cycle scrub head tank
7	M 62	53	Penton	Second-cycle strip head tank
7	M 70	20	Penton	HCl addition
7	M 73	6	Stainless steel	Resin addition
7	M 74		Stainless steel	Pressurization-surge tank for T 70 heating-cooling
7	M 75	75	Penton	First-cycle extractant head tank
7	M 78		Stainless steel	C71 pressurization tank
7	M 750	75	Penton	First-cycle organic scrub head tank
7	H 76			Heater for first-cycle columns
7	H 78			Cooler in T-70 jacket heating-cooling loop
7	H 79			Heater in T-70 jacket heating-cooling loop

[a]Carbon steel coated with Penton.

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to the cubicle. Thus, the interiors of the device and cubicle are joined, while each of the doors prevents the exterior surface of the other door from becoming contaminated.

Conveyor System for Intercell Transfers. — The function of the intercell conveyor system for TRU is to furnish communication between nine cell cubicles in the cell bank and a transfer cubicle. The conveyor and accessories consist of tracks and chain supports, drive mechanism, chain adjusters, chain idlers, dolly, canister, position indicator transmitter and receiver, and control box.

The conveyor drive mechanism, tracks and chain supports, chain adjusters, chain idlers, dolly, and canister are enclosed in an alpha-tight housing approximately 95-1/2 ft long. Openings in the top of the housing coincide with transfer ports in the nine cell cubicles and the transfer cubicle. The dolly is driven by two endless chains which extend the length of the housing. The chains are attached to the dolly mechanism and are separately powered by two reversible air motors with sealed drive shafts penetrating the housing wall. The direction of rotation of the motor that is energized determines the resultant direction of the dolly or dolly elevator: right, up or down, and left, up or down. Sensor rollers located on the dolly elevator and underneath the tracks enter accurately located vertical slots in the tracks, positioning the canister at the preselected transfer port. Any transfer port or ports can be bypassed by selecting either of the "down" modes. The canister is elevated by the dolly mechanism and is sealed to the bottom of the cubicle at the transfer port. An air-actuated port closure mechanism (located inside the cell) unlocks the canister cover from the canister and locks and seals it to the port closure. Materials to be transferred are inserted or removed from the canister with the cell master-slave manipulator.

The position indicator transmitter and receiver and control box are located in the operating area. Interlocks prevent incorrect sequencing of the normal operations and resultant break of containment.

Equipment Transfer Case for Equipment Removal System. — The equipment transfer case functions with all cell cubicles and other components that are located in the limited-access area and are concerned with the decontamination, maintenance, bagging, or burial of the large process equipment which is removed from the cell cubicles. The doors of the nine cubicles, decontamination glove box, and burial cask are all interchangeable.

Guides are located on top of the cell cubicle to give initial alignment between the transfer case and the cubicle door (see Fig. 2.9). The guide pins located in the top of the cubicle door provide final alignment of the transfer case. When the case is rested on top of this door, it compresses the gasket located on the bottom of the transfer case and effects a seal to the top of the cubicle. A manual drive simultaneously unlocks the cubicle and transfer case doors and locks and seals the two doors to each other. A mechanical indicator ensures proper position of the door lock actuator when the door is being replaced or removed from the ports. A second manual drive is used to elevate the two interlocked doors into the transfer case while equipment is being removed from the cubicle. A 1000-lb-capacity electric hoist equipped with limit switches and located inside the case is used to raise the equipment from its position in the cell cubicle.

In case of mechanical failure the doors may be replaced by means of a duplicate door combination (spare) which is stored in the transfer case on the opposite side.

The interior of the transfer case, which is of stainless steel, may be decontaminated with acid spray nozzles inserted through the top of the case. Provisions have been made to drain the case at the decontamination glove box which is located in room 216 off the limited-access area of the cell bank complex. Glove ports and viewing windows are also provided in the front and back of the transfer case to give access to the front and back of all equipment which will be lifted within the case.

Inspection ports are provided in the ends of the transfer case to allow adjustment of the door drive mechanisms. Under normal operating

conditions, no adjustment will be necessary; however, since no lubrication will be used, some adjustment may be required to compensate for wear.

A one-foot-thick concrete shield, with a lead glass window in the top, can be put around the transfer case if required. There are no penetrations in the shield through which operations can be performed.

Decontamination Glove Box. — A decontamination glove box (Fig. 2.22) is located in room 216. This device can be wheeled onto the top of the cell bank, where large equipment is introduced into it from the equipment transfer case. The transfer is made through a door in the top of the glove box that is like a door in the top of a cubicle. There is also a side-loading port, where smaller items are introduced into the glove box from the carrier from the transfer area. The provisions for maintaining containment during transfer are similar to the provisions at the transfer cubicle in room 118.

The glove box will be connected to the vessel off-gas system and intermediate-level-waste system by flexible hoses.

2.5 Building Services

2.5.1 Normal and Emergency Power Supply*

Power is normally supplied to the TRU facility from TVA feeder No. 294. All emergency power was to be provided from the HFIR normal-emergency feeders. However, the demands for HFIR emergency power exceeded the supply, and it is necessary for TRU to supplement that

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*The permanent supply system for normal and emergency power is in service; it was installed after this report was written, but prior to publication.

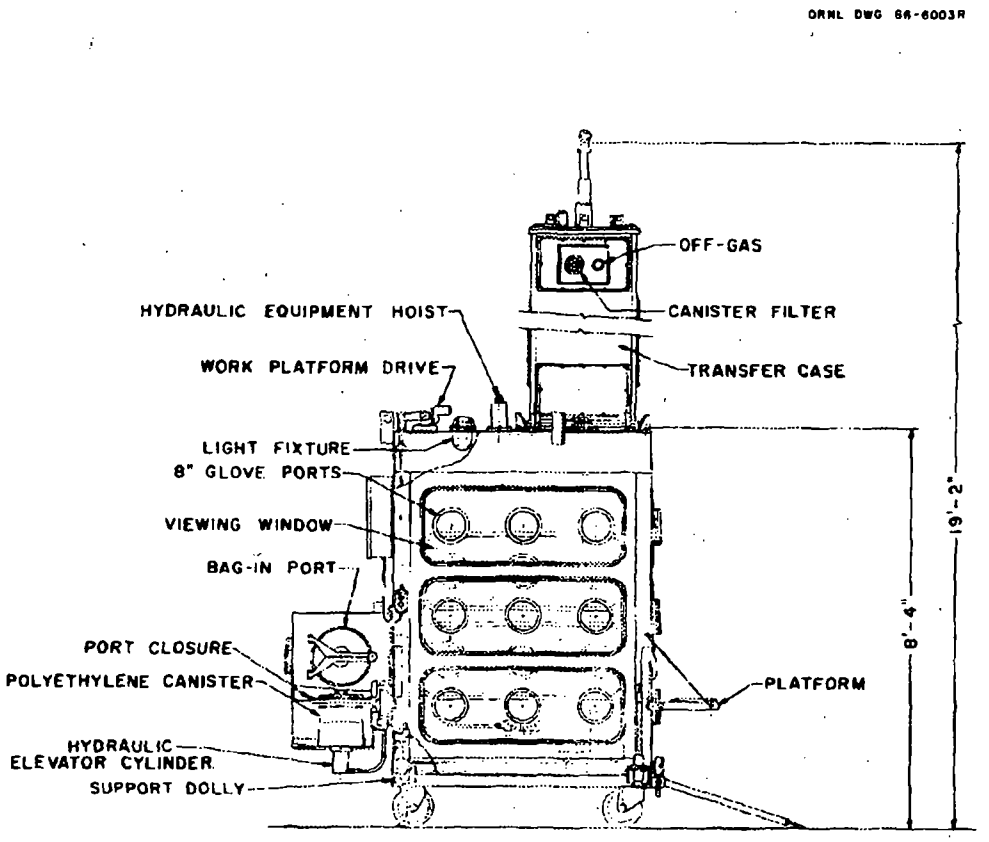

Fig. 2.22. Decontamination Glove Box.

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supply by installing a new diesel motor-generator. Until the new generator is installed, emergency power will be supplied from HFIR power that is reserved for the future needs of experiments but is not yet being used.

When the new generator is in service, primary equipment for the instrument air compressor, recirculating cooling water pump, vessel off-gas exhaust fan, cell exhaust fan, and the pump for recirculating caustic in the off-gas scrubber will be connected to one of the HFIR normal-emergency feeders; all spares will be connected to the other normal-emergency feeder. Both HFIR normal-emergency systems provide power from either of two separate feeders (TVA 294 and TVA 234), and each HFIR system is backed up by a diesel generator.

Building air supply fans, cell cubicle lighting, radiation detection and monitoring instruments, process instruments, and the two primary and two spare building exhaust fans will be supplied emergency power from the new diesel generator.

The present and future normal and emergency power arrangements are summarized in Table 2.4.

The present system is a safe system, but under some circumstances it might be necessary to evacuate the building if both HFIR diesel generators did not operate during a power failure.

Effects of Power Failure Before November 1966. — In the past three years, simultaneous failure of feeders 294 and 234 has occurred four times. In addition, in the past five years, feeder 294 has failed five times and feeder 234 has failed seven times.

Failure of 234 only has no effect on operations since all power is normally supplied by feeder 294. Failure of only feeder 294 would result in loss of all power to TRU except that coming from the HFIR normal-emergency systems. If either feeder 234 was in service or both HFIR diesel generators operated properly, the effect would be the same. Cell containment would be maintained, building exhaust fans would operate, radiation detection and monitoring instruments would operate, and cubicle lighting would stay on. Since the building supply fans

Table 2.4 Present and Planned Emergency Power for the TRU Facility

(Normally all power is supplied from TVA Feeder 294)

Description of Service	Equipment Nos.[a]	Service Required for		Emergency Power	
		Cell Containment	Controlled Shutdown	Now	Future
Instrument Air Compressor	L-133 and L-137	X	X	HFIR No. 1 and No. 2[b]	HFIR No. 1 and No. 2[b]
Recirculating Cooling Water Pump	J-113A and J-113B	X	X	HFIR No. 1 and No. 2[b]	HFIR No. 1 and No. 2[b]
VOG Exhaust Fan	AJ-112 and AJ-113	X	X	HFIR No. 1 and No. 2[b]	HFIR No. 1 and No. 2[b]
Cell Exhaust Fan	AJ-103 and AJ-104	X	X	HFIR No. 1 and No. 2[b]	HFIR No. 1 and No. 2[b]
Caustic Recirculating Pump	J-131A and J-131B	X	X	HFIR No. 1 and No. 2[b]	HFIR No. 1 and No. 2[b]
Cell Cubicle Lighting	LP-7		X	HFIR No. 2	New generator
Building Supply Air No. 1	AJ-102		X		New generator
Building Supply Air No. 2	AJ-111		X		New generator
Building Supply Air No. 3	AJ-124		X		New generator
Lab Area Exhaust Fan	AJ-120 and AJ-121		X	Both on HFIR No. 2	New generator
Processing Area Exhaust Fan	AJ-122 and AJ-123		X	Both on HFIR No. 1	New generator
Radiation Detection Instruments			X	HFIR No. 1	New generator
Process Instruments			X		New generator

[a] Two numbers indicate duplicate equipment items.

[b] One unit is on HFIR No. 1; the other unit is on HFIR No. 2.

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would be without power, the building vacuum would become greater than normal. When this was tested in January 1966 by turning off the supply fans, the pressure of the entire building decreased to −0.75 in. water (gage). The glove-box vent system reacted smoothly to maintain −0.3 in. water (gage) with respect to the building. When the supply fans were turned on, the pressure of the building returned to normal, and the glove-box vent system followed smoothly.

If feeder 234 should fail and if only HFIR diesel No. 1 should operate, there would be no cubicle lighting and no exhaust from the TRU processing area except in the limited-access area. The building would not have to be evacuated unless one of the automatic evacuation systems alarmed. If only HFIR diesel No. 2 came on, the building would have to be evacuated because there would be no exhaust from the laboratory portion of the building and the radiation detection instruments would be without power.

2.5.2 Water

Water systems for TRU include potable water, process water, demineralized water, recirculating cooling water, cooling tower water, and fire protection water.

Potable Water. — Potable water from the ORNL system is distributed at ambient temperature to drinking fountains, safety showers, lavatories, toilets, janitors' closets, and the change-room sinks. A steam-heated water heater, located in No. 2 Mechanical Equipment Room (room 207), heats the potable water for use in sinks and lavatories.

Process Water. — Process water is obtained from the potable water system via a surge tank and process water pump, both of which are located in No. 2 Mechanical Equipment Room (room 207). The surge tank provides an air break to prevent backflow of process water to the potable system. Hot process water for the laboratories, limited-access area, and the cold checking and receiving area is provided by the process water heater (130-gal capacity, steam heated - 15 psig - normal temperature, 140°F).

Cold process water is supplied to the laboratories, chemical makeup area, glove-box storage area, cold checking and receiving area, and transfer cubicle area. Hose bibs are provided in the checking and holdup area, laboratory reagent and equipment storage area, limited-access area, decontamination area, conveyor maintenance area, operating area, cold checking and receiving dock, and checking and holdup loading dock.

Demineralized Water. — Demineralized water is obtained from the HFIR demineralizers for distribution to the laboratories, cells (via chemical makeup area), decontamination area, transfer cubicle area, operating area, and the limited-access area.

Recirculating Cooling Water. — Process water is recirculated in a closed loop for use in cooling process equipment in the cells, for the vacuum system circulation cooler, and as makeup to the vacuum separator F-118. The equipment for this system, surge tank F-113 (575 gallons capacity), recycle pumps, and heat exchanger, is located in room 215.

Cooling Tower Water. — Water from the HFIR cooling tower basin is received at the TRU facility at 85°F and returned at about 95°F. A booster pump is used to increase the water pressure to 43 psi and to supply 960 gpm for the TRU facility and 890 gpm for the TURF facility. The water is used in TRU to cool the recirculating cooling water heat exchanger, the air compressors, and the chiller for building air conditioning.

Fire Protection Water. — The fire protection system is supplied from the fire protection loop encircling the building, with shut-off valves located east of the building.

2.5.3 Vacuum System*

The present vacuum system is adequate for our needs. However, there is no spare equipment, and the present vacuum pump is a mechanically sealed unit that is susceptible to leakage of radioactive liquids, with resultant maintenance and operational problems. This unit will be replaced with a water-jet vacuum pump that is designed especially to handle acidic radioactive gases. The new unit is a dual unit incorporating a multi-jet venturi through which water is circulated by a vertical centrifugal pump. It will eliminate seal or packing leakage, minimize shielding problems, and provide a spare. It is felt that the present system will be satisfactory in the interim.

Vacuum Distribution. — Vacuum lines from the laboratories, transfer area cubicle, chemical makeup area, and cells 8 and 9 tie into a common header. Vacuum is maintained at 22 in. Hg at a design flow rate of 40 cfm. The vacuum pump discharges into the vessel off-gas system.

2.5.4 Steam

Steam is supplied at 250 psig from the X-10 area. The 250-psig steam enters the building in the No. 1 Mechanical Equipment Room (room 114) where it is reduced to 100-psig and 15-psig superheated steam. The 100-psig steam is used primarily for heating process equipment and operating eductors in the cells, pipe tunnel, and cell ventilation and vessel off-gas filter pits. The 15-psig steam is used in the potable water heater, process water heater, and the building heating system. It is also used for decontamination purposes in the decontamination room and limited-access area.

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*The new vacuum system was installed after this report was written but prior to publication.

Low-pressure condensate from the water heaters and building heating system, plus 250-psig line condensate, discharges into a ditch located east of the building.

2.5.5 Compressed Air

Air is compressed to 100 psig and dried to a dew point of −40°F in equipment located in the No. 1 Mechanical Equipment Room (room 114). This equipment includes two compressors, two after-coolers and air separators, an air receiver, and an air dryer. After the dryer, the distribution header splits into a utility air header and an instrument air header. Controls are provided to automatically shut off the utility header when the system pressure drops to 75 psig. In the event of a compressor failure, the net output (76 scfm) of a single compressor is adequate for the operation of all instrumentation in the facility. Emergency power is provided for both compressors.

The 100-psig instrument air header supplies instruments and controls in the operating area, chemical makeup area, conveyor maintenance area, transfer cubicle area, mechanical equipment rooms 114 and 107, and all heating and ventilating instruments throughout the building. Instrument air is also used to purge steam supply lines to all process eductors and sump eductors for cubicle pits and tank pits 1 through 7. A pressure-reducing station located in mechanical equipment room 114 provides 25-psig filtered utility air for operating air-vacuum process pumps, for sparging tanks, and for use in the laboratories. Pressure-reducing stations located in the chemical makeup area supply 5-psig and 10-psig air to the chemical makeup and feed tanks.

The 100-psig utility air is used to purge sump eductors in cells 8 and 9, the pipe tunnel, and the filter pits. Air monitors in the conveyor maintenance area, the checking and holdup area, the limited-access area, and the decontamination area are operated by using utility air.

2.5.6 Cylinder Gas

Helium. — Helium is supplied to cubicle 2 from one cylinder in the chemical makeup area. It is used both as a cover gas for welding target elements and as an internal gas within the elements.

Argon. — Argon is supplied from one cylinder in the chemical makeup area to the automatic welder, which is in the makeup area, as cover gas for the high-frequency starter.

Nitrogen. — Nitrogen, which is used as a buffer seal on two leak-test chambers in cubicles 1 and 2 and is used to purge the chambers and associated piping, is supplied from one cylinder in the chemical makeup area.

Propane. — Propane is supplied to hoods and benches located in the "cold" chemical and analytical laboratories from cylinders located on the northeast dock.

Counter Gas. — Counter gas (90% argon, 10% methane) is supplied from cylinders located on the northeast dock to instruments in the counting room and in the first-floor analytical laboratory.

2.5.7 Fire Protection

The special fire hazards involved in TRU operations are as follows: (1) use of solvents and other flammable chemicals, (2) use of nitric acid, (3) electric-furnace calcination of americium and curium oxide powder, and (4) concentration of process liquids by steam evaporation at approximately 300°F. Most of the building interior is protected by an automatic wet-type sprinkler system. Exceptions to this general plan are laboratories 108 through 111 and 208 through 211 and the cells and cubicles. These areas are protected by an automatic pre-action system and an automatic heat-responsive system working together.

The most likely origins of fire in the laboratories are the hoods and glove boxes; the boxes that will be used to handle

quantities of solvents will have independent fire-protection systems of limited-volume water spray.

The cubicles are the most likely source of fire in the cell bank, and these are provided with independent fire-protection systems, which are backed up by the automatic pre-action systems in the cell proper.

Laboratory Pre-Action System. — The laboratories are protected by an automatic pre-action system which opens the main header valve when a temperature rise of 15 to 20°F/min is detected. Fusible spray heads initiate the sprinkler when a temperature of 165°F is reached.

Cell Pre-Action System. — The detection and actuation system for each cell consists of thermopneumatic rate-of-rise devices arranged to open the main header valve, deliver a fire signal at the annunciator panel, and transmit a fire alarm over the plant Gamewell. When a temperature of 175°F is exceeded, detection elements trip the deluge valve and spray the cells through nozzles located at the top of the cell, the 10-ft level, and underneath the cubicle. Individual systems are provided for each cell so that a heat release in one cell does not cause any other cell to be deluged with water.

Cubicle Pre-Action System. — Each cell cubicle is equipped with a rate-of-temperature-rise device arranged to deliver a local fire signal and open the main header valve when the rate of rise exceeds 15 to 20°F/min. Each cubicle is equipped with a deluge valve actuated by a pushbutton on the cell face in the operating area. Each cubicle has a separate system.

Location of Supply and Main Control Valves. — The TRU facility is connected to the ORNL fire-protection water system at the northeast corner of the building, and the supply line enters the building at the northeast corner of the first-floor mechanical equipment room (room 114). The main manual and control valves are located at this point. The fire-department siamese pumper connection is located on the east end of the north loading dock.

Fire Alarm System. — The TRU fire alarm system is connected to the ORNL fire alarm system through master box 835, located northwest of the building.

Signals into the master alarm are fed by the TRU alarm system, which is divided into 40 local zones. Twenty zones are for the general building and laboratory areas, with the red annunciator panels located on the south wall of room 104; and twenty are for the cells and cubicles, with the panel located on the control board in room 116.

Fire alarm signals originate from the following: (1) water flows into either the first- or second-floor wet sprinkler system, (2) tripping of preaction valve for the first- or second-floor laboratories by the rate-of-rise devices, (3) tripping of the preaction valve of the cell and cubicle system by the rate-of-rise devices in the cells or cubicles, and (4) 12 manually operated local fire alarm pull stations.

The fire alarm system is equipped with a standby 24-volt, heavy-duty wet-cell battery unit and battery charger to ensure operation in case of electrical power failure.

Local Fire-Fighting Devices. — A system of standpipes and hose cabinets or racks is provided throughout the building. Water supply is from the sprinkler system. Squeeze-grip-type, 15-lb CO_2 fire extinguishers are available at many building locations.

2.6 Description of Laboratory Rooms

2.6.1 Size and Layout

On each floor there are two alpha laboratories, an analytical laboratory, and a "cold" laboratory arranged as shown in Figs. 2.3 and 2.4. Alpha laboratory 111 contains a shielded alpha cave for performing development work involving alpha activity plus gamma or neutron activity. All of the laboratories are about 23-1/2 ft wide by 23 ft deep by 10-1/2 ft high. The concrete block walls are built on curbs that are poured into the floor.

Each of the laboratories is connected to a corridor through two doors and to the TRU processing area through an emergency exit door that has a crash bar on the laboratory side and no hardware on the processing area side. Each of these doorways has a 1/2-in.-high threshold that is built into the floor. Laboratory floors are covered with vinyl sheet, which is curved up the walls to the tops of the curbs. Thus, any liquids that are spilled on a laboratory floor will not run out of the room.

The emergency exit doors are gasketed and will be sealed with wire seals that will break if the doors are opened. The doors to the corridors are solid doors with glass panels, but they do not have gaskets. All doors open out from the laboratories.

The ceilings are of gypsum board with cemented, perforated-taped joints on a metal suspension system and contain sheet-metal hatches that are sealed with tape. The space above the suspended ceilings of the four laboratories on each floor is connected. Concrete block partitions between the laboratories extend 4 in. above the suspended ceiling.

On each floor the "cold" laboratory is connected to each of the two adjoining alpha laboratories by a small pass-through door that is above the level of the back counter of the laboratory benches.

2.6.2 Equipment

The alpha laboratories contain no installed laboratory furniture, except for one 24-in.-wide by 18-in.-deep stainless steel sink in each laboratory. Normally, only glove boxes and auxiliary equipment, plus a few tables and chairs, will be in the rooms. The shielded cave is discussed below in Section 2.7.

The cold laboratories and the analytical laboratories are equipped with the usual types of laboratory furniture. Working surfaces in the cold laboratories are Johns Mansville "Colorith" composition bench tops, and surfaces in the analytical laboratories are of 304L stainless steel.

2.6.3 Services

Services to the laboratories will normally include vessel off-gas, glove-box ventilation, plant vacuum (22 in. Hg), plant air (25 psig), process water, demineralized water, process drains, intermediate-level-waste drains, and propane.

Alpha Laboratories (109, 111, 209, 211). — Each alpha laboratory has a sink to which hot and cold process water, demineralized water, and a process drain are connected. There are 14 "glove-box sets" of service connections (4 sets along each side and 6 sets across the center) that enter each laboratory from the bottom of sealed service-pipe racks. There are 10 extra glove-box ventilation connections in each laboratory, two on each side and six in the center. Each "glove-box set" is composed of one 208-volt and three 120-volt electrical power receptacles, and connections for glove-box ventilation, vessel off-gas, plant vacuum, plant air, process water, and demineralized water. Glove-box ventilation connections are plugged. Lines for the other services are terminated at valves.

There are two capped process drains in the floor of each laboratory and one intermediate-level-waste and three process drain connections in the form of standpipes that stand about 3 in. above the floor and are plugged or capped. In preparation for construction of the shielded cave, all services in laboratory 111 except those on the west wall have been removed.

Cold Laboratories (110 and 210). — Both cold laboratories are equipped with ordinary laboratory benches and chemical fume hoods that are supplied with hot and cold process water, demineralized water, plant air, plant vacuum, propane, process drains, and intermediate-level-waste cup drains.

Hood ventilation is provided by exhausting room air through the hoods to the building ventilation exhaust filters.

There are capped process drains in the floors.

Analytical Laboratories (108 and 208). — The analytical laboratories are slightly different from each other. Both are equipped with ordinary laboratory benches to which hot and cold process water, demineralized water, plant air, plant vacuum, propane, and process and intermediate-level-waste drains are connected. Laboratory 208 contains two chemical fume hoods that are provided with the same services as the benches, and a perchloric acid fume hood that is supplied with plant air, propane, process water, and glove-box ventilation. The chemical fume hoods are ventilated by drawing room air through them to the building ventilation exhaust filters. There are six "glove-box sets" of services from the center pipe rack in laboratory 208, and there are nine "glove-box sets" of services from the pipe racks in laboratory 108, four on each side of the lab and one near the back wall. There are eight additional connections to the glove-box ventilation in this laboratory for open-faced glove boxes.

There are capped intermediate-level-waste standpipes and plugged process floor drains in each analytical laboratory.

2.7 Shielded Cave in Room 111

An arrangement of two shielded caves has been designed for laboratory 111 to provide space for laboratory development work, where a small amount of shielding is required and somewhat better containment is needed than is obtained from a glove box. At present only one cave is under construction; it is scheduled to be ready for operation in the late summer of 1966.* The facility has many features identical to those of the cave presently installed in Building 3508.

2.7.1 General Arrangement

The plan view depicting the arrangement of the two caves in laboratory 111 is shown in Fig. 2.23. Cave A is under construction

*The shielded cave is in service; it was finished after this report was written but prior to publication.

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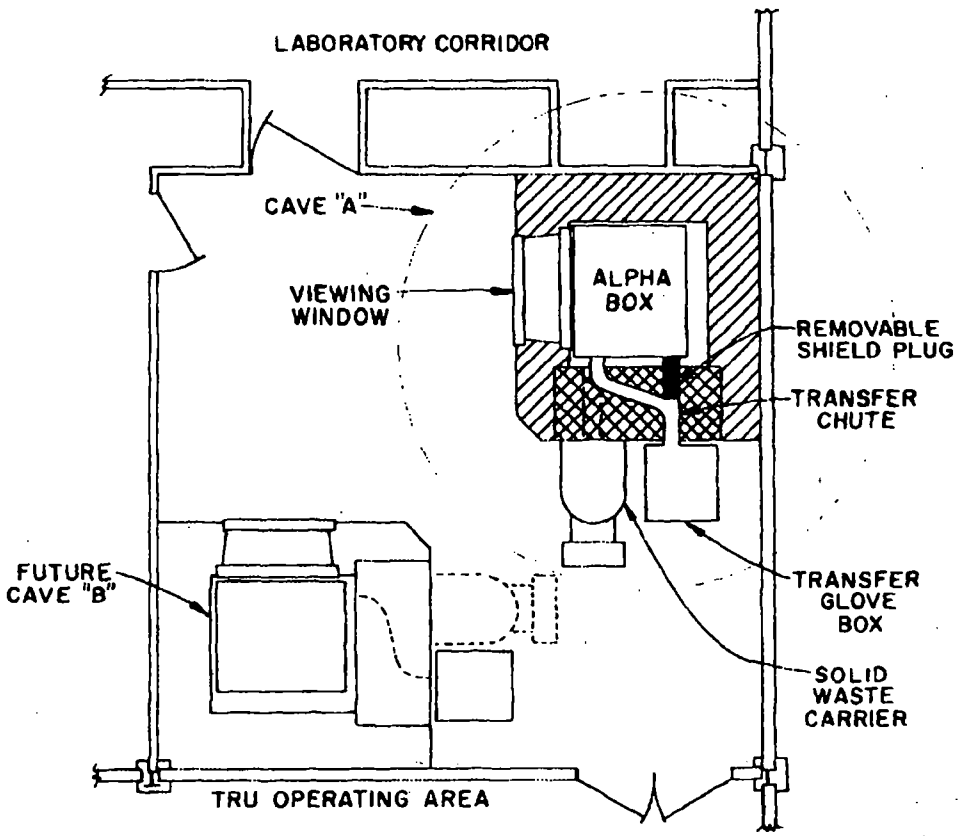

Fig. 2.23. Plan View of Shielded Caves, Room 111.

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now. Two feet of normal concrete shielding surrounds a disposable alpha box, 54 × 60 × 42 in. high. The alpha box is installed and removed after unstacking the south concrete block wall and at the same time disassembling the transfer chute. This exposes a seal plate, which can be dismantled, exposing the box. All connections to the box can then be broken and sealed, and the box can be removed. Although this operation can be done in a rather short time, it is not anticipated that the box will be replaced more than once per year. A 2-ft-thick zinc bromide shielding window provides shielding for viewing through the 1/4-in.-thick Plexiglas alpha window. Operations are done with master-slave manipulators.

Transfers in and out of the alpha box can be made by the following three methods:

1. Normal routine transfers of materials requiring little shielding are made through a standard glove box attached at the end of an S-shaped labyrinth transfer chute. The south wall is 3 ft thick, and the shielding is equivalent to the 2-ft shielding on the other walls even in the vicinity of the transfer chute. The glove box, the transfer chute, and the alpha box are connected by flanges and/or bagged connections, making all three a single containment volume. Transfers are made using a hand-powered, cable-driven cart.
2. Objects too long for passage through the chute can be inserted through an alternate port from the glove box to the rear section of the alpha box.
3. High-level radioactive materials can be loaded into or removed from a sealed port in the floor of the alpha box at the southwest corner. This operation is similar to that of removing material at the transfer cubicle in room 118. The same carrier is used, and the double-door port-closure and heat-seal mechanisms work similarly to those in the transfer cubicle.

2.7.2 Ventilation Systems

Ventilation to the cave-alpha box system is provided from the building vessel-off-gas system, a source normally maintained at −10 in. water (gage). A flow of 75 cfm is admitted to the cave space surrounding the alpha box through absolute filters in the front concrete wall. This flow is then directed into the alpha box through one set of absolute filters and out through a second set to the vessel off-gas system. The pressure in the box is controlled automatically at −0.9 in. water (gage) by a control valve in the exit line, and the exact flow rate and the pressure in the cave are set by manual dampers. This pressure is set at −0.6 in. water (gage), about midway between the pressure in the laboratory (−0.3 in. water) and that in the alpha box. A vacuum breaker capable of handling the entire 75 cfm, set at −1.3 in. water (gage), is provided on the vessel off-gas header to ensure that the box does not collapse because of a control system failure.

An auxiliary connection of the cave ventilation system to the room exhaust provides 500 cfm exhaust while the alpha box is being installed and removed. This flow is filtered through the absolute filters on the roof.

2.7.3 Other Services

An automatically actuated, limited-water-volume fire-protection system is provided for the interior of the alpha box. A water tank is partially filled and overpressured with air. On release of the water, a float valve seals off, preventing the air from bleeding into the alpha box. This arrangement is identical to the one presently installed on the similar cave in Building 3508. The float valve will be thoroughly checked prior to installation.

A drain connection is provided to the intermediate-level waste collection tank via a 2-in. connection into the existing below-floor radioactive drain system. The drain line in the box extends 6 in. above floor level, is normally plugged, and is disconnected below the floor level of the box when the box is removed.

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Low-pressure air (25 psi), demineralized water, process water, and 110-volt electrical service are provided in the alpha box.

3. CONTAINMENT

TRU has special containment provisions to ensure against the escape of process materials to the environment. Containment in the laboratories is similar to that in existing high-alpha-level laboratories. However, containment in the processing area is unusual.

The building is divided into six distinct areas: (1) cold areas such as that housing mechanical equipment, offices, change rooms, and the like; (2) laboratories; (3) operating areas; (4) limited-access areas surrounding the cell banks; (5) cells; and (6) the alpha-sealed cubicles. The distribution of the ventilating air is designed to maintain a positive flow of air from cold areas toward those of a potentially increasing contamination level. The building will be maintained at a pressure of −0.3 in. water (gage) at all times; this will prevent the escape of airborne contaminants to the environment except via the normal, filtered discharge system.

Cell process equipment is enclosed in process cubicles, which, in turn, are enclosed in the primary cell. The primary cell is enclosed by the building shell. Each enclosure is separately ventilated with differential pressures, maintained automatically, so that each enclosure is at a lower pressure than its immediate envelope. Thus the process equipment is operated at −10 in. water (gage), the processing cubicle at −1.7 in. water (gage), the cell at −1.4 in. water (gage), the limited-access area at −0.4 in. water (gage), the laboratory sections at −0.35 in. water (gage), and the building at −0.3 in. water (gage). All purge air flowing from one containment envelope to the next is introduced through filters or backflow preventers. The purge from the offices in the processing part of the building, the operating area, and the laboratories is exhausted through a set of roughing and absolute filters. The purge air exhausted from the limited-access area, the cells, and the glove boxes is filtered through one set of roughing filters and two sets of absolute filters before discharge to the environment. Air from the vessel off-gas and cubicle exhaust system is treated in a caustic scrubber both to remove noxious chemical fumes and to absorb fission product iodine; it is then filtered through three sets of filters, two

of which are absolute. After filtration, the exhaust air from vessels, cubicles, cells, and the limited-access area is discharged to the atmosphere through a 60,000-scfm, 250-ft-tall stack.

Chemical laboratory work involving the actinide elements is conducted in glove boxes, which are maintained at −0.3 in. water (gage) with respect to the laboratory and exhausted to the cell ventilation exhaust system. Purge air is introduced to the glove boxes from the laboratories through absolute filters.

3.1 Primary Containment

3.1.1 Processing Area

The containment envelope that meets the ORNL criteria for primary containment is the heavily shielded bank of process cells. As an added precaution against the release of any of the transuranic actinides, those process operations that are likely to result in release of radioactivity from process lines and vessels are performed in alpha-tight process cubicles. The cubicles contain all sampling stations and all process equipment that might require maintenance frequently or might be expected to require replacement. Except for the centrifuge for removing aluminum precipitates from the target dissolver solution and the caustic scrubber, tanks and piping are the only process equipment located in the cell bank outside of process cubicles.

Each process cubicle is located inside a separate processing cell. The cubicles are isolated from each other and from their respective cells; the cells are isolated from each other except for interconnection via the cell ventilation duct.

Cubicle Ventilation. — In each cubicle, air is circulated from the cubicle through absolute filters, past cooling coils, and then back into the cubicle at a rate high enough to remove heat produced by the process or by cell lighting. From 5 to 50 cfm of purge air from the cell in which the cubicle is contained enters each cubicle through an absolute filter. The purge rate is set from inside the

cubicle by using a manipulator to adjust a manual damper. Thus the entire exhaust capacity of 50 cfm is always available in the event the cubicle pressure starts to increase. The purge capacity of 50 cfm is more than one-tenth of a cubicle volume per minute. The cell cubicle exhaust system consists of single lines (one from each cubicle) tied into a main header. A pressure control station maintains a pressure of −0.3 in. water (gage) with respect to the cell ventilation system. Cubicle vent gases are discharged into the main off-gas system header located in the pipe tunnel, treated in a caustic scrubber, and discharged through a pipe heater, one roughing filter, and two absolute filters to the HFIR stack. This system has duplicate fans which receive emergency electrical power from different emergency systems.

Cell Ventilation. — Air for ventilating each cell is drawn from the limited-access area through a roughing filter and backflow preventer located in a duct at the rear of each cell. A manually set damper and a connection for measuring air flow rate are provided in the inlet duct to each cell to regulate air flow. Air flow patterns are shown schematically in Fig. 3.1. All inlet ducts and filters are large enough to provide each cell with 1000 cfm of ventilating air, the volume necessary for removing the 6-kw process heat load from each of cells 4 through 7. The remaining cells are supplied 370 cfm of ventilating air, which is more than the required one-tenth of a cell volume per minute.

The air is exhausted to the cell ventilation filter pit through a header that interconnects all cells and is located within the cell. Alternate exhaust blowers are connected to separate emergency power supplies. Air is passed through one roughing filter and two absolute filters before being discharged to the HFIR stack.

Transfer Case Seal. — The transfer case will be used to remove large items from a cubicle or to introduce them into a cubicle when no processing operations are being performed in the cubicle. The weight of the transfer case pressing on a gasket seals the case to the

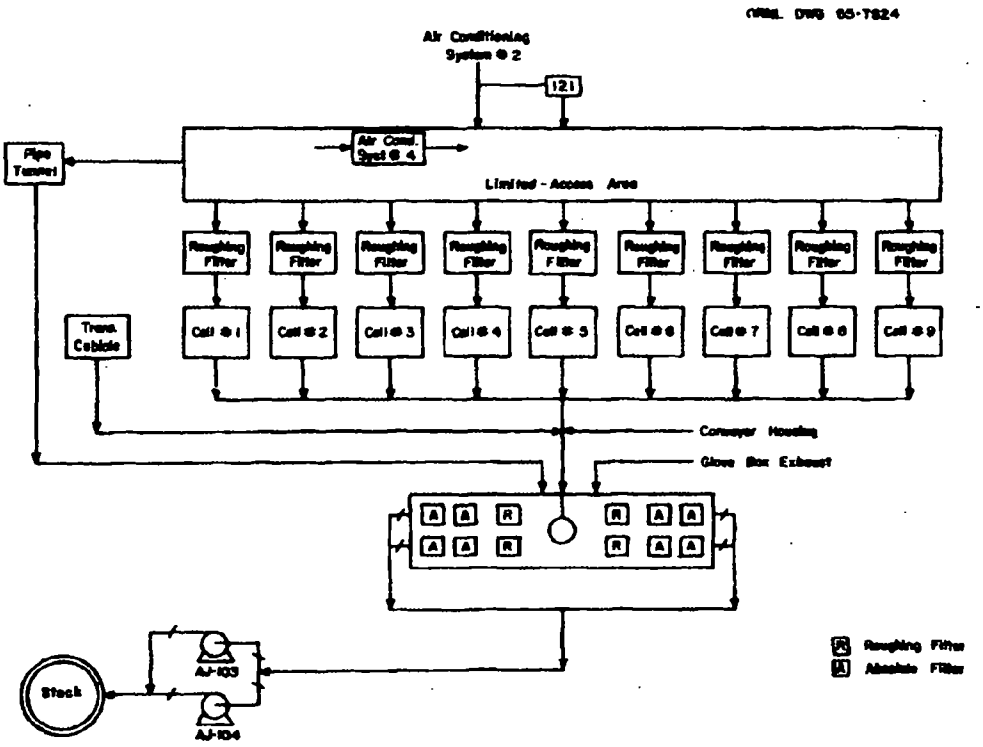

Fig. 3.1. Schematic Diagram of the Flow of Ventilating Air Through TRU Cells.

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top of the cubicle during transfer operations. There is no holddown device or automatic mechanism for preventing removal of the transfer case when the doors to the transfer case and the cubicle are open.

Intercell Conveyor Seal. — The intercell conveyor will be used to transfer small items into or out of the cubicles during operating periods as well as during maintenance periods. A locking device seals the conveyor canister to the bottom of the cubicle at the same time that the cubicle door and canister door are locked together. The same air system that actuates the canister dolly locks and unlocks the seals, and a system of interlocks prevents movement of the conveyor dolly when the cubicle and canister doors are not properly closed.

Window Seals. — The alpha-seal windows are designed to withstand a pressure of 900 lb/ft^2 without losing the seal. A prototype window was tested by mounting the assembly in a container and testing the seal with a pressure of −10 in. water (gage) on the cubicle side. The vacuum was maintained for 2 hr with no leakage. The seal window was then replaced, using the replacement equipment. Leakage did not exceed 5 cfm with a pressure of −1 in. water (gage) on the cubicle side. The alpha window assembly can be replaced from the operating area and can be removed into the cubicle so that the atmosphere of the latter is never in communication with that of the operating area.

3.1.2 Alpha Laboratories

Primary containment for handling alpha-active materials in the laboratories is provided by multicurie glove boxes (Fig. 3.2). These boxes are fabricated of mild steel and painted with Liquid Tile. The windows are safety plate glass held in place with a neoprene zipper gasket. Each box is provided with both a 6-in.- and a 12-in.-I.D. access port. Interior metal shields cover these ports when they are not in use. In addition, exterior metal access port covers are used whenever a box is left unattended for any length of time.

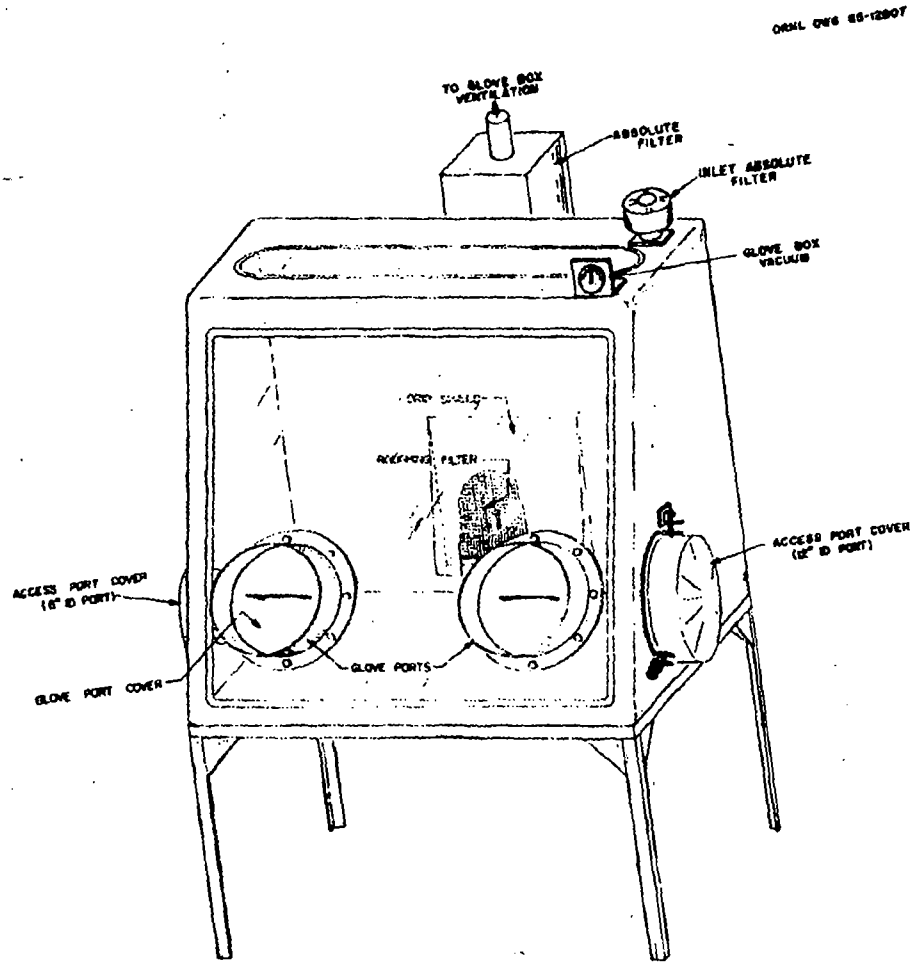

Fig. 3.2. Multicurie-Level Alpha Glove Box.

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The glove boxes are operated under a −0.30 in. water (gage) pressure with respect to the room ventilation system. This ensures that any leakage will be into the box and aids in preventing contamination from escaping from the box. Air flow through the glove box is about 0.5 cfm unless larger quantities are required for heat dissipation. All inflow air is prefiltered into the box through one or more absolute filters. Air leaving the box is filtered through a FG-50 prefilter (inside the box) plus a 12-in.-thick 99.97% absolute filter at the exit from each box.

Transfers into and out of glove boxes are made through the transfer ports. The plastic-bag transfer technique is used. This provides heat-sealed plastic containment of alpha material transferred out of the box and results in positive alpha containment during all transfer operations.

Operations within the glove box are carried out with neoprene gloves, which are held in place on the glove port ring by either rubber O-rings or metal clamps. The procedure for replacing gloves is as follows:

1. Slip old glove to front part of glove ring, but do not remove from ring.
2. Turn new glove inside out and slip over old glove on the glove ring.
3. After new glove is firmly in place, pull old glove off into the alpha box, making certain that the new glove does not slip off the glove ring. (Double grooves in the glove port ring facilitate this operation and virtually eliminate the possibility of an uncovered port, assuming normal operational skill.) Treat old glove as contaminated solid waste.
4. Monitor around edge of glove ring and decontaminate, if necessary.

Services to the boxes are provided by totally enclosed laboratory racks.

Since relatively short-term operations and programs make it desirable to incorporate flexibility and mobility as part of the operating philosophy, all service tie-ins to the box are made with nonrigid connectors. While the service racks will contain vacuum, electricity, air, gas, and water, only electricity and water are required for normal operations. Water from the service rack is used only as cooling water during reflux and distillation operations. Various cylinder gases (Ar, N_2, etc.) are routinely required. Traps are used between gas lines and reaction vessels to prevent back-siphoning of contaminated solutions into external lines. Water and gas box connections are made through valves that are opened only when required.

3.1.3 Shielded Cave

The primary containment of the shielded cave in laboratory 111 is provided by the internal alpha box, which has many features identical to the alpha glove boxes. However, it is surrounded by a 2-ft concrete shield, and operations are performed with manipulators. A glove box attached through a labyrinth transfer chute provides a means of transferring materials in and out of the alpha box by bagging techniques; and high-level activity can be removed via a sealed container and the side-loading carrier, which is also used at the transfer area.

Ventilation for this primary containment is provided by a 4-in. header, through suitable pressure controls, from the VOG system. Approximately 75 cfm of air flows from the laboratory, through absolute filters, to the cave in the space around the box, and then through a second set of absolute filters. Pressure within the alpha box is controlled at −0.7 in. water (gage) (with respect to the room) by an automatic control valve system in the exit-air flow line. The pressure in the cave itself will be approximately midway between that of the alpha box and the laboratory and will be determined by the setting of manual dampers.

During the infrequent replacement of the alpha box, the entire south wall of the cave will have to be removed. Extra ventilation is provided for this operation by a bypass into the normal room exhaust to the absolute filter-fan system on the roof. Up to 500 cfm can be exhausted during this operation.

3.2 Secondary Containment

The shell of the laboratory and processing parts of the building constitutes the secondary container for TRU. The office annex is operated at atmospheric pressure and is heated and ventilated by its own system. Thus, it is not included in this discussion.

The processing and laboratory parts of the building contain a number of air conditioning, heating, and exhaust systems that are combined to provide the pressure differences required for secondary containment. The normal ventilation for this area is designed to maintain a pressure of −0.3 in. water (gage) with respect to outdoors – the required pressure for containment under emergency conditions, as given in the ORNL Radiation Safety and Control Manual.

Details of the building ventilation systems are given in the following sections.

3.2.1 Air Conditioning and Heating System

The heating, ventilating, and air conditioning system for all building areas, except the limited-access area, is of the once-through type. The limited-access area is provided with a once-through ventilation system, plus a recirculation system which further conditions the air within the space. The chilled water from a centrifugal water chiller cools the air, and hot water generated within the building is used for reheat coils and perimeter radiation.

The equipment rooms are provided with exhaust fans for constant ventilation.

The air conditioning and heating systems filter, cool (or heat), and dehumidify air taken from outside the building. The conditioned

air is then discharged to the duct systems by centrifugal fans for distribution to the various areas. There are a total of 27 zones of temperature control. Each zone has its own hot-water reheat coil, thermostat, control valve, ductwork, and diffusers or registers. The reheat coils control the temperature of the air entering a zone, as required by the varying conditions in the space. The primary air conditioning system (No. 1) delivers conditioned air to all areas in the building, except those noted below for the other systems.

Air conditioning system No. 2 delivers conditioned air to the limited-access area and limited-access change room No. 2. Air conditioning system No. 3 delivers conditioned air to the transfer area, decontamination room, and checking and holdup area. Air conditioning system No. 4 recirculates and further conditions the air within the limited-access area.

3.2.2 Heating and Air Conditioning Controls

A pneumatic two-pipe, nonbleed type of system of automatic temperature control is provided. Steam valves in the lines to the preheat coils are controlled by an outdoor thermostat. The steam valve is full open when the outside temperature is 35°F or below. Face and bypass dampers are used to maintain the temperature of the air leaving the preheat coils at 50°F. To prevent freezing of the steam preheat coils, an alarm is sounded at a fan discharge temperature of 45°F and the fan is shut down automatically when the temperature falls to 40°F. The air temperature of the chilled-water coil is controlled by an averaging bulb in the airstream and a three-way chilled-water mixing valve at the coil. The individual temperatures of the respective spaces are maintained by means of a room type of thermostat and a three-way hot-water mixing valve at the reheat coils serving the respective areas.

The recirculation unit serving the limited-access area has a chilled-water coil with a three-way mixing valve controlled by a remote bulb thermostat set for 80°F and located in the return air,

and a steam heating coil with a steam valve controlled by a remote bulb thermostat set for 76°F and located in the return air.

3.2.3 Air Flow Pattern for the Building

A schematic diagram of air flow through the building is presented in Fig. 3.3. System No. 1 supplies air to the laboratory portion of the building and to most of the rooms in the TRU processing area. Systems 2 and 3 supply air to parts of the TRU processing area, and system 4 recirculates air within the limited-access area. The air in the laboratory portion of the building is exhausted through one of two filtered exhaust systems that are located on the roof, and the air in the TRU processing area outside of the limited-access area is exhausted through the second system on the roof.

The two systems will be referred to as systems AJ-120 and AJ-122. These are the equipment numbers for the primary blowers for the laboratory and TRU processing portions of the building.

The air in the limited-access area is exhausted through the processing cells to the HFIR stack.

The office annex is heated and ventilated separately except for the instrument shop (room 18), the air from which is exhausted through blower AJ-122.

Mechanical equipment rooms 114 and 207, waste room 107, and solvent storage room 112 are special cases (see below).

Sources of air and paths for exhaust are given below for various rooms or groups of rooms.

Laboratories. — The laboratories are supplied air partly from system No. 1 and partly from the corridors through wall louvers that have backflow restrictors. The air in all laboratories is exhausted through a filtered exhaust system (AJ-120) on the roof. Air from laboratories 109, 209, 211, 111, and 108 is exhausted at the ceilings; that from laboratories 210, 110, and 208 is exhausted through laboratory hoods to the filtered exhaust system on the roof (see description of laboratory 208 below).

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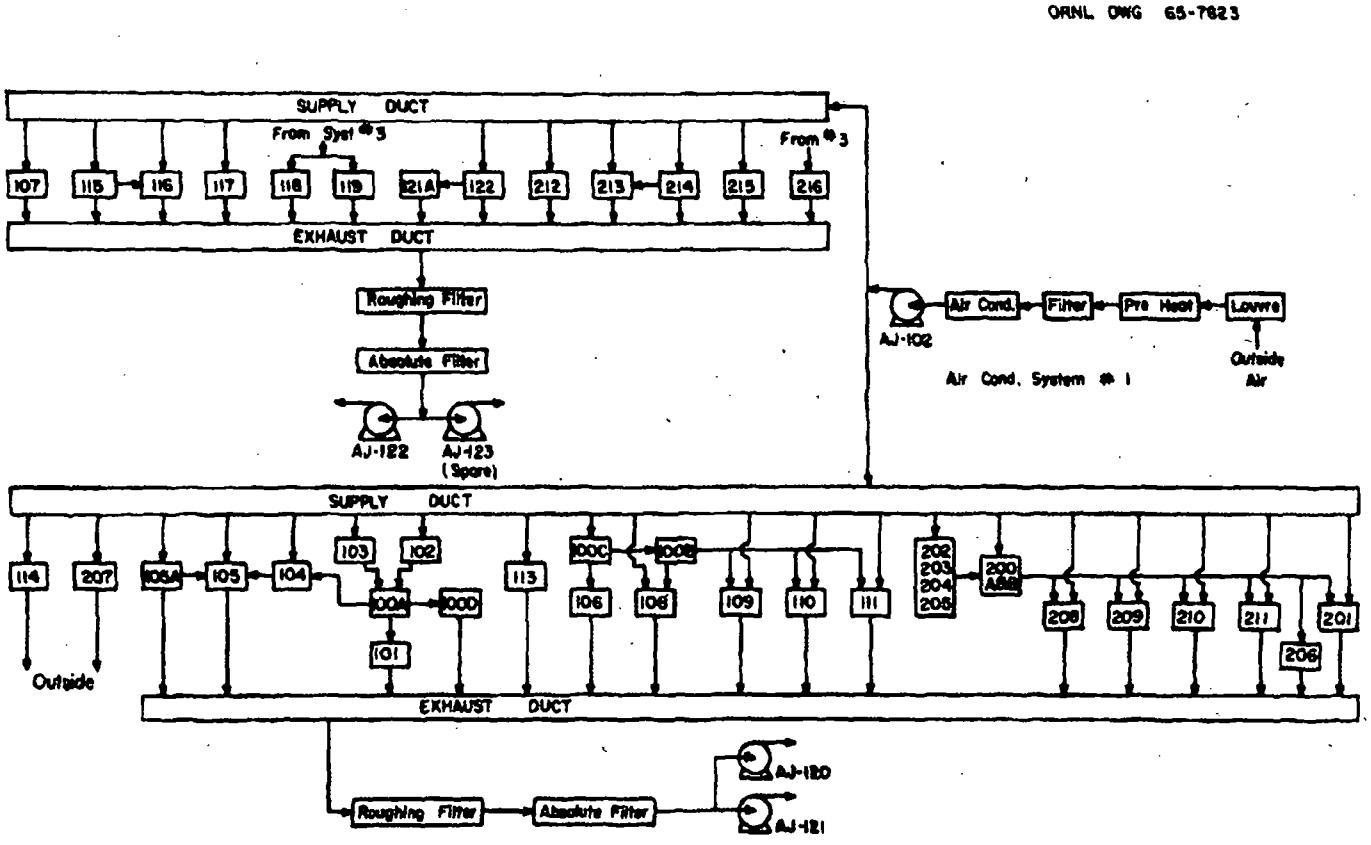

Fig. 3.3. Schematic Diagram of the Flow of Ventilating Air Through the TRU Facility.

Analytical Laboratory 208. — There are three laboratory fume hoods, which exhaust a total of 2100 cfm. An additional 1200-cfm capacity is available for open-face glove-box and/or room ventilation.

Women's Room 101. — Air is supplied from control corridor 100A through a wall louver and is exhausted to the filtered exhaust system (AJ-120) located on the roof.

Health Physics Office 102. — Conditioned air is supplied from system No. 1 and is exhausted through wall louvers to corridor 100B.

Calculating Room 103. — Conditioned air is supplied from system No. 1 and is exhausted through wall louvers to control corridor 100A. The air in control corridor 100A is exhausted partly through wall louvers to the women's room 101 and partly through room 105.

Corridors 100C and 200B. — Conditioned air is supplied to the corridors by system No. 1 and from rooms adjoining the corridor. The air is exhausted to the various laboratories, janitors' closets, and glove-box storage room.

Mechanical Equipment Rooms 114 and 207. — Air is supplied to the equipment rooms from system No. 1 for ventilation, and the areas are heated by unit heaters. These rooms operate at atmospheric pressure, and the air is exhausted, unfiltered, through wall exhaust fans.

Laboratory Waste Room 107. — Ventilation air is provided to the laboratory waste room through inleakage around the door, and is exhausted to a filtered exhaust system (AJ-122) located on the roof.

Solvent Storage Room 112. — Outside air is supplied through louvers and is exhausted by a separate sparkproof exhaust fan (AJ-109) located on the roof of the room.

Office 115. — Conditioned air is supplied to the room from system No. 1 and is exhausted through a soundproof return duct into the operating area, room 116.

Operating Area 116. — Conditioned air is supplied partly from system No. 1 and partly from the louvered exhaust from room 115. The air from this area is exhausted through the filtered exhaust system (AJ-122) located on the roof.

Conveyor Maintenance Area 122. — Conditioned air is supplied to the area from system No. 1 and is exhausted through a ceiling register and ductwork. This exhaust, along with the exhaust from the operating area (room 116), is discharged to the filtered exhaust system (AJ-122) located on the roof.

Chemical Makeup Area 213. — Conditioned air is supplied to the area from system No. 1. Air is also supplied through louvers from office 214. The air from this area is exhausted to the filtered exhaust system (AJ-122) located on the roof.

Control Office 104. — Conditioned air is supplied to the area from system No. 1 and is exhausted through louvers to change room No. 1.

Men's Change Room 105 and Men's Room 105A. — Air is supplied to the men's change room No. 1 (room 105) partly from system No. 1 and partly by louver supply from corridors 100A, 100B, and 100C, and is exhausted through the filtered exhaust system (AJ-120) located on the roof. Air is supplied to the men's room 105A partly from system No. 1 and partly through wall louvers from corridor 100B and men's change room No. 1, and is exhausted to the filtered exhaust system (AJ-120) on the roof.

Janitors' Closet 106. — Ventilation air is supplied to this room through a wall louver from corridor 100C, and is exhausted to the filtered exhaust system (AJ-120) located on the roof.

Cold Checking and Receiving 113. — Conditioned air is supplied to the room from system No. 1 and is exhausted to the filtered exhaust system (AJ-120) located on the roof.

Glove-Box Storage 201. — Conditioned air is supplied partly from system No. 1 and partly through wall louvers from laboratory corridor 200A. It is exhausted to the filtered exhaust system (AJ-120) located on the roof.

Laboratory Reagent and Equipment Storage No. 202. — Conditioned air is supplied to the area from system No. 1 and is exhausted through wall louvers to laboratory corridor 200A.

Calculating Rooms 203 and 204 and Counting Room 205. — Conditioned air is supplied to these rooms from system No. 1 and is exhausted through wall louvers to laboratory corridor 200A.

Janitors' Closet 206. — Ventilation air is supplied to this room through a wall louver from laboratory corridor 200A and is exhausted to the filtered exhaust system (AJ-120) located on the roof.

Darkroom 217. — Conditioned air is supplied from system No. 1 and is exhausted through a lighttight louver to the chemical makeup area 213.

Office 214. — Conditioned air is supplied to the room from system No. 1 and is exhausted through a wall louver into the chemical makeup area 213.

Recirculated Cooling Water Equipment Room 215. — Conditioned air is supplied from system No. 1 and is exhausted to the filtered exhaust system (AJ-122) located on the roof.

Change Rooms 3 and 4. — Conditioned air is furnished to each of the change rooms (rooms 117 and 212) by system No. 1. The air from each change room is exhausted through the filtered exhaust system (AJ-122) located on the roof.

Cell Transfer Area 118. — The cell transfer area is supplied with fresh air from system No. 3. The air from the area is exhausted through the filtered roof exhaust system (AJ-122).

Checking and Holdup Area 119. — Conditioned supply air is furnished by system No. 3. The air is exhausted through the filtered exhaust system on the roof (AJ-122). This room is provided with instrumented doors to form a positive air lock.

Decontamination Room 216. — Conditioned air is supplied to the room by system No. 3 and is exhausted to the filtered exhaust system (AJ-122) located on the roof.

Limited-Access-Area Room 120 and Change Room 2 (Room 121). — Air flow patterns for this area are shown schematically in Fig. 3.1. This area is supplied from system Nos. 2 and 4. System No. 2 provides outside air to the limited-access area, room 120, and change room No. 2 (room 121). The air from room 121 is exhausted through wall louvers to room 120. System No. 4 provides recirculated, conditioned, and filtered air in the limited-access area.

The air from the limited-access area is exhausted partly via the cell ventilation system, through 90% roughing filters, to each cell and partly by two filtered exhaust openings to the pipe tunnel for pipe tunnel ventilation. During maintenance operations, which require the roof plugs of a cell to be removed, additional air is supplied through

system No. 2 and is exhausted through the open cell. All air that is exhausted from the cells and pipe tunnel will pass through the cell ventilation filters, and from there will go to the exhaust fans and stack.

3.2.4 Building Pressure Control

The building area outside the cells is divided into six zones that are provided with differential-pressure controls and differential-pressure dampers in the air streams from the supply systems. The differential-pressure controllers (static pressure-sensing pickups) act in conjunction with the constant-volume filtered exhaust systems to maintain the required negative pressure. The six zones that are independently controlled are: (1) first-floor laboratories, offices, and corridors; (2) second-floor laboratories, offices, and corridors; (3) TRU operating area; (4) TRU makeup area; (5) TRU decontamination and transfer areas; and (6) TRU limited-access area.

3.2.5 Alpha Laboratories

The laboratory portion of the building constitutes the secondary container for the experiments done in the glove boxes and the shielded cave. The normal ventilation for this area is designed to maintain a pressure of −0.3 in. of water (gage) with respect to outdoors - the required vacuum for containment under emergency conditions, as given in the ORNL Radiation Safety and Control Manual.

The laboratory rooms provide an effective intermediate barrier to the release of radioactive materials to the environment even though the rooms are not sealed. Ventilating air for the building normally flows into the laboratories from the corridors through backflow preventers and from there to the building exhaust system. Thus, radioactive materials released to the laboratory room from a glove box would probably be retained within the room or be collected on the building exhaust system filters.

3.2.6 Portals

There are a number of kinds of portals through which parts of the building are connected and through which the building is connected to the outdoors. These are discussed further in Section 12, which deals with radiation and contamination controls.

Normal passage to and from the building is through corridor 100A, which forms a vestibule air lock connecting the monitored-exit zone checking station and the one-story office annex. The cold checking and receiving station, room 113, is a vestibule air lock through which the building is connected to the northeast loading dock. Miscellaneous materials will be delivered here, and various items leaving the building will be held here for monitoring prior to shipment. The two air locks in the processing area, rooms 117 and 212, will be used for transferring large process-related items such as manipulators or drums and carboys of chemicals. The contamination zones that are located in the transfer area and decontamination room are isolated from other operating areas and from outdoors by these two air locks which also serve as monitoring and change stations for the areas.

The stairwells on the east and west sides of the building serve as vestibule air locks between floors. The outside doors will be sealed and used only as emergency exits.

There are doors from the east end of the corridors on both floors to the mechanical equipment rooms, rooms 114 and 207, which contain doors to outside and exhaust fans that provide unfiltered discharge of air from the equipment rooms. The doors from the corridors will be sealed and are to be used only as emergency exits. The equipment rooms will normally be entered from outdoors. The maintenance shop is located outside the east stairwell air lock.

The doors in the instrumented air lock, room 119, are equipped with interlocks that prevent the outside door from being opened unless the door to the transfer area and the door and the hatch to the limited-access area are closed. Similarly, these three openings cannot be opened unless the outside door is closed. This air lock is instrumented as an added precaution against opening the contamination zones to outdoors.

4. CHEMICAL PROCESSES

4.1 General Process Description

The principal function of the Transuranium Processing Plant is to prepare targets for neutron irradiation in the HFIR and to reprocess irradiated targets to recover the heavy isotopes. In general, ^{242}Pu, ^{243}Am, and curium isotopes will be recycled to the HFIR, and the transcurium elements (berkelium, californium, einsteinium, and fermium) will be purified and held for distribution to other investigators. However, small amounts of the former group will be available for distribution, and occasional irradiation of the heavier elements will be made. The equipment available in TRU, plus the versatility of the flowsheets, enables this facility to handle other jobs. For example, it is planned to process hectogram amounts of ^{243}Am and ^{244}Cm, which are available as raffinates from the production at Savannah River of the original ^{242}Pu charge for the HFIR. The facility also has the ability to process ^{241}Am targets for recovery of decagram amounts of highly active ^{242}Cm, if further requirements for this isotope arise.

4.2 Plant Feed

TRU is designed to handle a variety of feeds. The usual feed will be HFIR-irradiated targets containing varying amounts of the heavy-element oxides dispersed in aluminum. Table 4.1 shows the expected composition of HFIR targets after each of several cycles of irradiation. A fifth-cycle target has more alpha and neutron radioactivity than any of the other materials processed, but early targets have greater amounts of gamma radioactivity.

There is a backlog of actinide materials from several sources which will supply feed to TRU until the irradiations in the HFIR become routine. These sources include the following:

1. Four "prototype" targets whose active regions are the same size as those of HFIR targets but whose external

Each alpha laboratory, as well as each cold laboratory, has an emergency exit door that opens into either the TRU operating room on the first floor or the TRU "cold"-solution-makeup area on the second floor. The analytical laboratories have emergency exit doors that open into the TRU air locks on each floor. These emergency exit doors will be sealed with tape and will be used only in emergencies. This prevents the laboratory contamination zones from being connected directly to the processing-area regulated zones.

A yellow dumpster is located in room 107. The outside door is normally closed and cannot be opened from outside. Thus, it is permissible to freely use the door that connects the corridor to room 107; this is the only way to get in and out of the instrument shop. When the dumpster needs to be moved, the instrument shop door and corridor door will be sealed temporarily until this operation is completed.

Table 4.1. Approximate Composition of HFIR Targets at Discharge

	Cycle No.		
	1	2	5
Al, g/target	200	200	200
^{242}Pu, g/target	0.02	-	-
^{244}Cm, g/target	1	1.5	0.8
^{248}Cm, g/target	0.3	1.5	13
^{249}Bk, mg/target	0.2	2.5	23
^{252}Cf, mg/target	3	17	230
^{254}Cf, mg/target	0.015	0.08	1
Mixed fission products, g/target	8	3	1.5

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configuration is different to make irradiation in one of the SRP reactors more convenient.

2. Eight slugs (fabricated at SRP) which contained all available ^{242}Pu not already committed to HFIR targets.
3. About 250 gallons of nitric acid solution containing about 260 g of ^{244}Cm and 220 g of ^{243}Am. This material was recovered from the wastes from the ^{242}Pu processing.

Table 4.2 lists the expected heavy-element compositions of these special feeds.

4.3 Flowsheet

Detailed chemical flowsheets are available as ORNL drawings (series F-12175-CD-002 through -010, plus -016). These flowsheets represent current thinking about the best means to perform the various operations but will undergo evolution as operating experience is gathered and the availability of larger amounts of the transuranium elements permits more elaborate investigation of chemical properties. It may be that even the order of the operations will change, particularly if radically different processes are developed. Figure 4.1 is a block diagram showing the interrelationship of the various operations that are discussed below.

4.3.1 Target Dissolution

All curium targets, and targets of ^{242}Pu that have been irradiated to greater than 80% burnup, will be dissolved in a Zircaloy-2 dissolver using hydrochloric acid. The dissolution will be monitored by heat evolution and controlled by regulating the temperature and acid concentration. Hydrogen produced in the dissolution reaction will be diluted immediately to 2 vol % by an air purge.

Targets that have less than 80% burnup of ^{242}Pu will be dissolved in $NaOH-NaNO_3$ solution in a stainless steel dissolver. The oxide

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Table 4.2. Expected Compositions of Special Feeds to TRU

	Number and Type		
	Four TRU-SRP Prototypes	Eight SRP Slugs	250 gal of Nitric Acid Solution
Al, g	1000	2000	-
^{242}Pu, g	12	92	0
^{243}Am, g	6	37	220
^{244}Cm, g	14	93	260
^{248}Cm, g	0.002	0.05	-
^{249}Bk, mg	0.04	0.7	-
^{252}Cf, mg	0.2	1.7	0.2
Mixed fission products, g	8	50	5000[a]

[a]Almost all γ-emitters have decayed or been separated except ^{154}Eu and ^{144}Ce.

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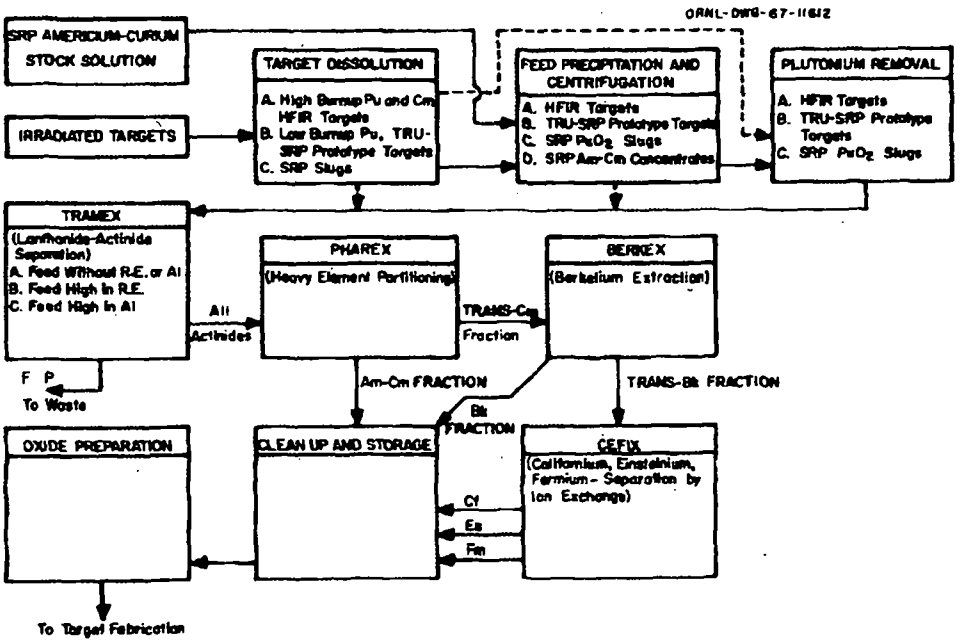

Fig. 4.1. Block Diagram of Chemical Operations in TRU.

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residues will then be dissolved in refluxing 15 M HNO_3 – 0.1 M HF. Fluoride will be removed by successive hydroxide precipitations, followed by redissolution in dilute nitric acid, until a final concentration of less than 10 ppm is reached.

4.3.2 Feed Precipitation and Centrifugation

This step is used to remove aluminum from the process solution, or, in the case of nitric acid feeds, to convert to a chloride solution for Tramex processing. The feed stock is precipitated by slow addition to excess NaOH; the solids are then collected in a semicontinuous centrifuge and, after washing, are recovered by dissolution in dilute HCl.

4.3.3 Plutonium Removal

Plutonium will be recovered prior to solvent extraction because of difficulties in adjusting its valence and the possibility of hydrolysis during Tramex processing. The plan is to sorb Pu^{4+} onto an anion exchange resin from 6 to 8 M HCl. Under these conditions, curium and californium, the major sources of α-radiation, do not sorb, and the column effluent goes directly to Tramex feed adjustment. The plutonium will be eluted with dilute HCl and saved for later decontamination from fission products.

4.3.4 Tramex (Tertiary Amine Extraction) Process

The Tramex process is a solvent-extraction process that is designed to make a complete group separation between all the rare-earth elements (or lanthanides), which include some of the major fission products, and all the transuranium elements or actinides (see Fig. 4.2). The process is an adaptation of well-known anion exchange processes and makes use of a "liquid ion exchanger," a trialkyl amine dissolved in diethylbenzene. The feed is a solution of 11 M LiCl that is 0.2 M in acid. The transuranium elements are extracted from this feed, and small amounts of rare earths which extract or have been

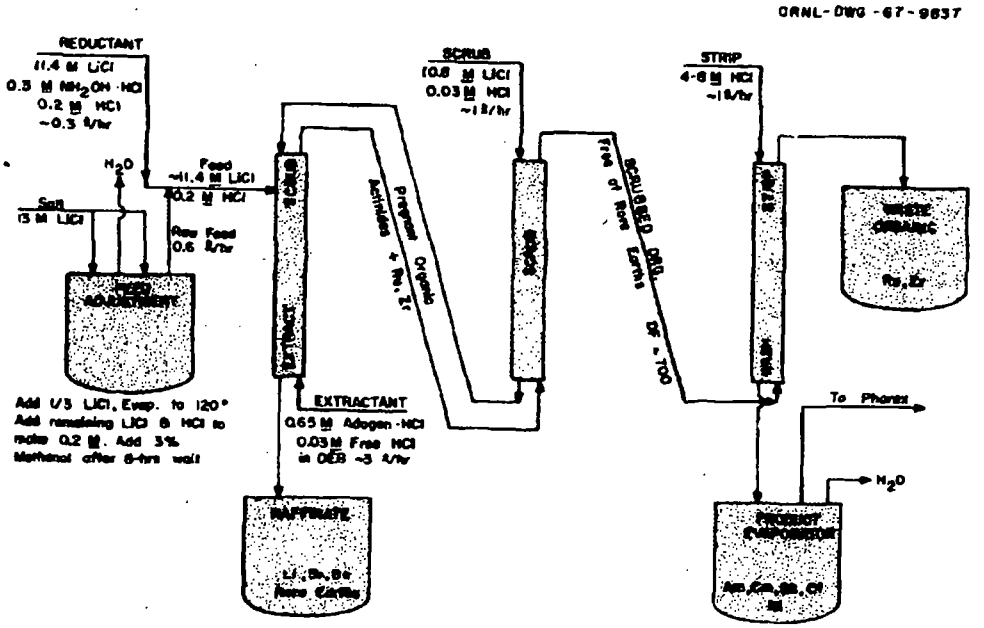

Fig. 4.2. Tramex Flowsheet.

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entrained are scrubbed out with a similar 11 M LiCl solution. The pregnant organic is stripped (or back-extracted) with 8 M HCl. It is important that the feed be free of nitrate, as this ion promotes the extraction of rare earths and destroys the group separation. Most other fission products are also removed in the Tramex process to some extent, either in the raffinate or in the waste organic. The curium and/or americium in the product are suitable for recycle to the HFIR without further decontamination from fission products because remote refabrication methods will be used.

4.3.5 Pharex (Phosphonic Acid Reagent Extraction) Process

The Pharex process is designed to provide a rough separation of the transplutonium elements into two groups. The first group contains curium and americium, if these elements happen to be present. This fraction is refabricated into HFIR targets. The second group contains the elements of special interest to the Transuranium Program: berkelium, californium, einsteinium, and fermium.

The flowsheet for this process is presented in Fig. 4.3. The Tramex product is concentrated and then diluted to make a feed of 1 M HCl. The transcurium elements are extracted from this feed by a solution of 2-ethylhexyl phenylphosphonic acid in kerosene diluent. Decontamination from curium is achieved with a 1.5 M HCl scrub, and the product is stripped (back-extracted) with 6 M HNO_3. Stripping with nitric acid is a convenient way of preparing feed for the next step in the process, berkelium extraction.

4.3.6 Berkex (Berkelium Extraction) Process

The berkelium extraction (Fig. 4.4) is carried out in a batch-differential contactor since the amount of material to be handled is small and the separation factor obtainable in this chemical system is quite large. The Pharex product is concentrated at least 10-fold and converted to 8.5 M HNO_3, 0.1 M $KBrO_3$.

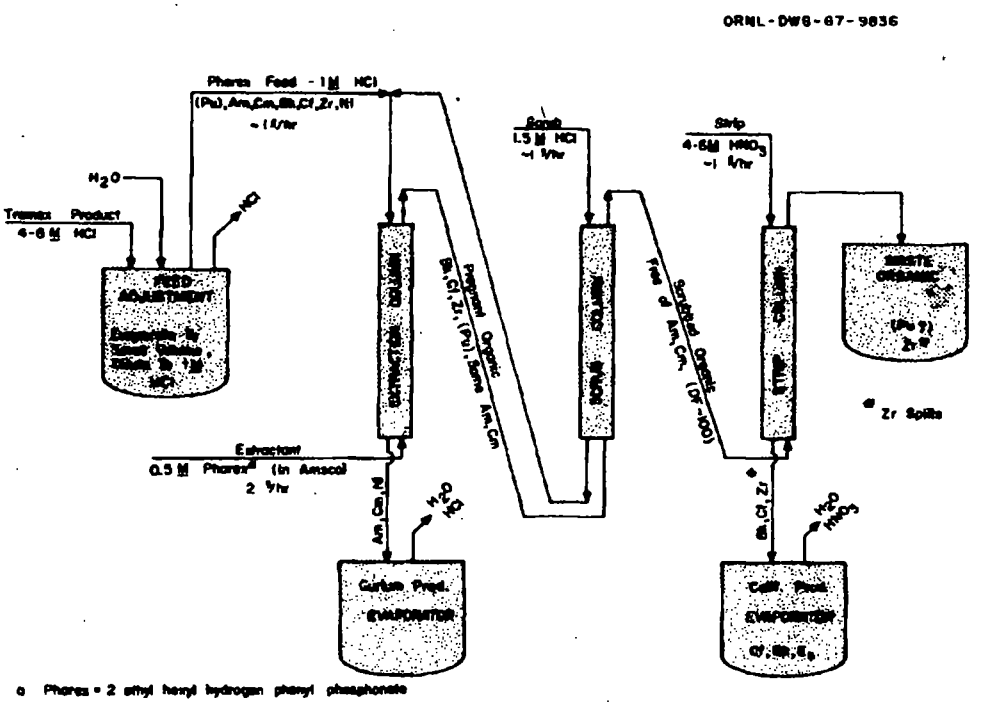

Fig. 4.3. Pharex Flowsheet.

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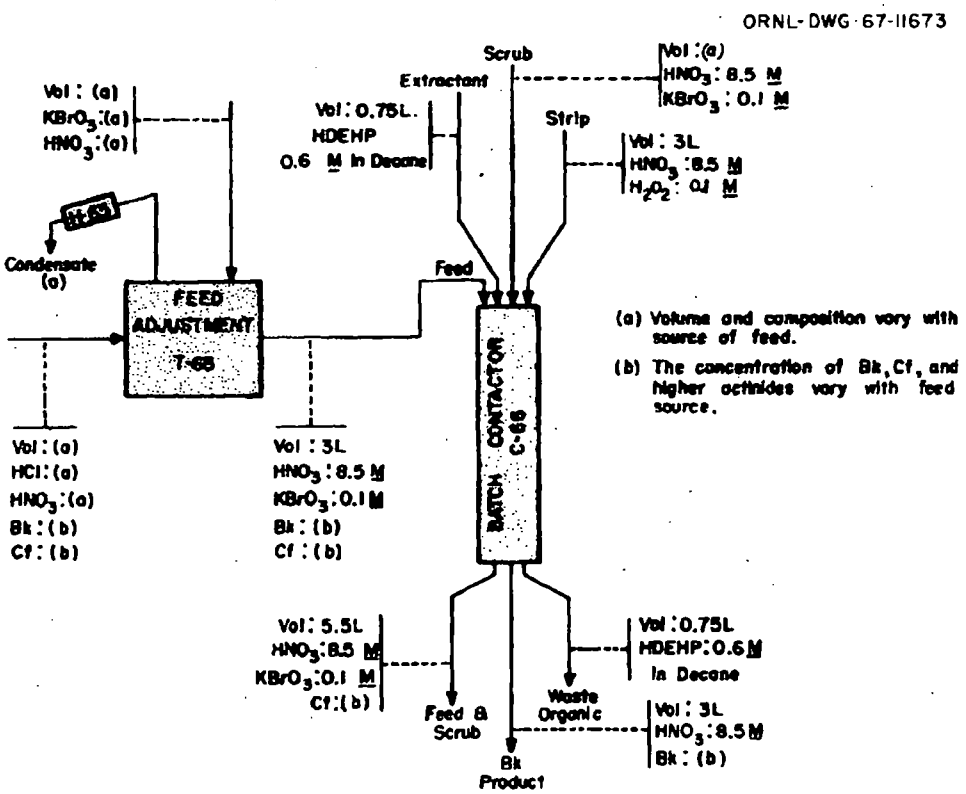

Fig. 4.4. Berkex Flowsheet.

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The $KBrO_3$ in the feed oxidizes the berkelium to the (IV) valence state so that it can be quantitatively extracted by 0.6 M di(2-ethylhexyl) phosphoric acid (HDEHP) in decane. Residual amounts of californium and other trivalent actinides are scrubbed out of the system with more 8.5 M HNO_3 - 0.1 M $KBrO_3$. The berkelium product is then recovered by stripping with 8.5 M HNO_3 containing 0.1 M H_2O_2 to reduce the berkelium back to the (III) valence state.

4.3.7 Cefix (Californium, Einsteinium, Fermium Ion Exchange) Process

The Cefix process makes a first cut between the last three elements to be recovered from HFIR targets (see Fig. 4.5). The solvent extraction product solution is treated by cation exchange and then anion exchange to separate various salts and corrosion products from the actinides. This cleanup processing must be thorough because the volume of feed to the Cefix process represents a considerable concentration of the solvent extraction product solution.

The final feed is taken up in a small volume of 0.05 M HCl and loaded in a tight band on the top of the cation chromatographic column. The bands are separated by careful elution with 0.4 M ammonium α-hydroxyisobutyrate (hence the name "but" column for the chromatographic exchanger). In-line alpha and neutron monitors help determine the proper time to make cuts in the effluent stream. Since the isobutyrate is quite radiation sensitive, the product isotopes must be recovered from the effluent streams within a few hours. The three separate product fractions are processed successively through a small cation column for this purpose.

4.3.8 Cleanup and Storage

As in the case of the Cefix process above, the various products from the separation steps will have to be concentrated many-fold before they can be stored or converted to oxides for reirradiation or shipment. It is therefore necessary to remove accumulated salts and corrosion products. The basic procedures for doing this are precipitation in caustic to remove aluminum and chromium, precipitation in

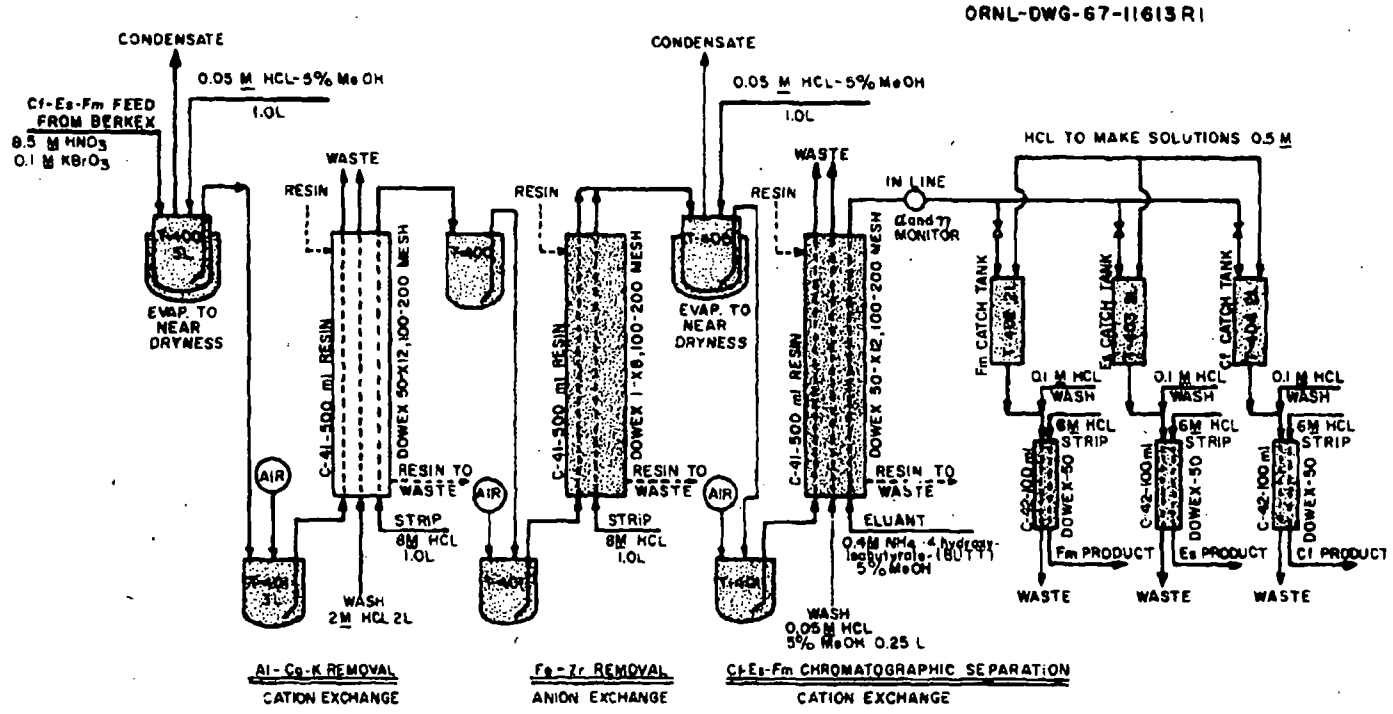

Fig. 4.5. Cefix Flowsheet.

ammonia to remove nickel and copper, and anion exchange from 8 M HCl to remove iron and zirconium. TRU has nine tanks for holding various transuranium element products, either for decay to other isotopes or for storage until requested by experimenters. Small amounts of special mixtures will be stored in solid form.

4.3.9 Oxide Preparation

Transuranium element oxides, whether for reirradiation, shipment, or storage, will be prepared by a sol-gel process (Fig. 4.6) from a highly concentrated stock solution. Again, a preliminary cleanup procedure will be necessary. The final precipitation of "clean" actinide will be made by adding the element at concentrations up to 10-20 g/liter in dilute nitric acid to an excess of 8 M NH_4OH. The resulting hydroxide precipitate will be collected in a laboratory-scale continuous centrifuge. After four washes with demineralized water, the cake will be compressed to its minimum volume and as much free water removed as possible; it will then be converted to a sol by gentle heating and the addition of a small amount of HNO_3. The sol will be dried to a gel and simultaneously formed into microspheres by spraying into a drying solvent. The dried gel microspheres will be transferred to the target fabrication section of TRU for calcination and incorporation into recycle targets.

4.3.10 Other Processes

The procedures described above are "main-line" processes. From time to time there will be special separation jobs that are performed in one of the cells reserved for this purpose. These special separations, such as milking ^{249}Cf from decaying ^{249}Bk, or purifying a sample for shipment to another site, will be performed in laboratory-type equipment especially installed in the cell for each job. These procedures will generally involve a small fraction of the amount of material handled in the main line. They will vary greatly to meet the specific requirements at hand, and no flowsheet can be presented at this time.

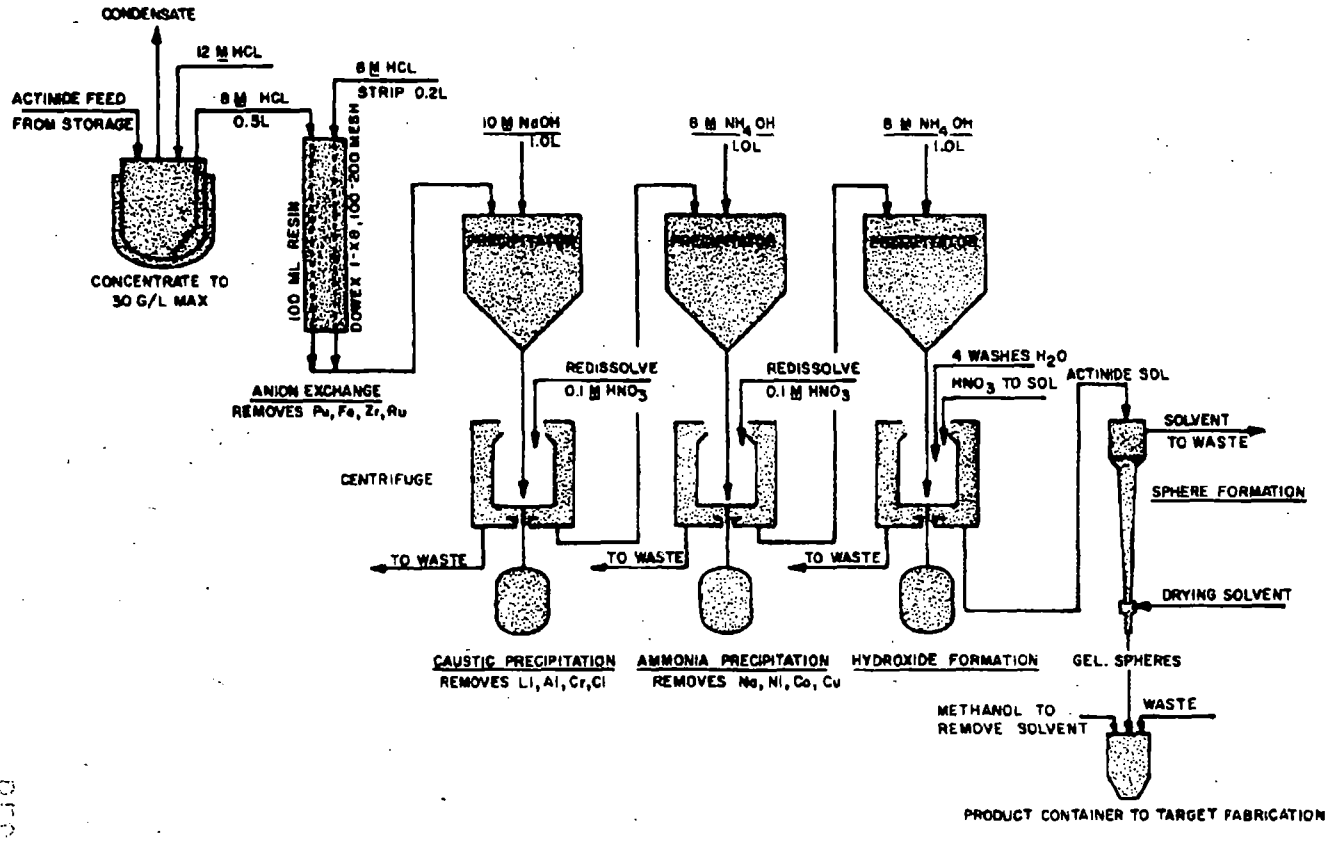

Fig. 4.6. Sol-Gel Process for Actinides.

4.4 Process Flexibility

The basic flowsheet presented above will undoubtedly be modified from time to time as more experience is gained with the chemistry of the heavy elements. This is especially true as you move from the front end of the process toward the tail end. Relatively little development work has been done to date on the Pharex, Berkex, Cefix, and sol-gel processes for actinide elements, partly because of lack of adequate facilities up until now for handling the transplutonium elements and partly because of a lack of adequate supplies of these elements for testing equipment and processes on an engineering scale. In this sense, production of the transplutonium elements will be a bootstrapping operation; as larger amounts are separated in TRU, they will serve as test materials for process development.

In addition to the above considerations, there will be some changes made for operating convenience. For example, the dissolution of aluminum in various media has been thoroughly studied. However, it is still necessary to try the different possible procedures to see which one works most efficiently in our equipment and fits in most conveniently with subsequent operations.

Examples of possible modifications which we expect to study are given in the following sections.

Target Dissolution. — Dissolution in caustic, planned for ^{242}Pu targets of low burnup, may prove to be useful for main-line targets also.

Feed Precipitation and Centrifugation. — This step could be eliminated as a means of removing the aluminum from the system either by a caustic dissolution or by a precycle of solvent extraction, using di(2-ethylhexyl) phosphoric acid, to separate actinides and rare earths from aluminum and concentrate them prior to the Tramex procedure.

Plutonium Removal. — Plutonium could be removed by anion exchange either from a chloride feed, as presently planned, or from a nitrate feed in the conventional plutonium anion-exchange process. Plutonium

might even be removed in a simultaneous plutonium-berkelium recovery extraction. At this point, we do not know whether to try to effect fission product decontamination while recovering the plutonium or to combine several plutonium batches and recycle for fission product removal.

Tramex. — This process has been studied extensively in the Curium Recovery Facility and at the Savannah River Laboratory, but much optimization remains to be done before best combinations of recovery and purification can be achieved. We may even study other diluents such as diisopropylbenzene or decalin.

Pharex. — This flowsheet definitely needs to be optimized for best californium (and berkelium) recovery while still maintaining effective decontamination from curium.

Berkelium Extraction. — Further work on this procedure awaits the availability of multimilligram amounts of berkelium. It may prove to be desirable to move the berkelium recovery to the head end of the process, in which case plutonium and cerium will also be recovered with the berkelium and an additional separation step will be required.

Cefix Process. — From this point on, process flowsheets are so dependent on future developments that it would be impossible to list possible process variations.

4.5 Reagents Used in Process

Tables 4.3 - 4.11 show the various reagents used in current TRU processes, their purposes, and the approximate rate of consumption, on a monthly basis. The last column indicates the approximate amount stored in the makeup area at any time.

Table 4.3 Acid Reagents

Reagent	Purpose	Amount Used per Month	Approximate Amount on Hand
12.2 M HCl	Target dissolution	16 liters	
	Plutonium removal (anion-exchange)	50 liters	
	Tramex strip	100 liters	
	Pharex scrub	20 liters	
	All others	14 liters	
	Total	200 liters (~16 cases)	300 liters
15.8 M HNO_3	Pharex strip	55 liters	
	Berkex scrub and strip	24 liters	
	All others	11 liters	
	Total	90 liters (~7 cases)	50 liters

Table 4.4 Basic Reagents

Reagent	Purpose	Amount Used per Month	Approximate Amount on Hand
50% NaOH	Caustic scrubber makeup	1400 liters	
	Neutralizing acid wastes	300 liters	
	Aluminum removal	20 liters	
	Product cleanup	10 liters	
	All others	5 liters	
	Total	1735 liters	400 liters

Table 4.5 Salts

Reagent	Purpose	Amount Used per Month	Approximate Amount on Hand
13 M LiCl	Tramex feed adjustment	75 liters	
	Tramex reductant	40 liters	
	Tramex scrub	120 liters	
	Total	235 liters	500 liters
Ammonium α-hydroxy-isobutyrate	Cefix	1 lb	6 lbs
Pentasodium diethylene-triamine pentaacetate	Decontamination solution	10 lbs	30 lbs

Table 4.6 Sorbents

Reagent	Purpose	Amount Used per Month	Approximate Amount on Hand
Silica Gel	Purifying DEB and Amsco	10 lbs	20 lbs
Alumina	Purifying DEB and Amsco	10 lbs	20 lbs
Dowex 1	Plutonium recovery	20 lbs	
	Product cleanup	4 lbs	
	Total	24 lbs	15 lbs
Dowex 50	Cefix	4 lbs	5 lbs

Table 4.7 Reductants

Reagent	Purpose	Amount Used per Month	Approximate Amount on Hand
$SnCl_2 \cdot H_2O$	Tramex; holding reductant for Ce	3 lbs	20 lbs
30% H_2O_2	Berkex; reductant for Bk extraction	<1 lb	10 lbs
Methanol	Tramex feed; holds acid	5 liters	Limited to 5 liters

Table 4.8 Oxidant

Reagent	Purpose	Amount Used per Month	Approximate Amount on Hand
$KBrO_3$	Berkex; Bk oxidation in feed and scrub	2 lbs	2 lbs

Table 4.9 Organic Extractive Reagents

Reagent	Purpose	Amount Used per Month	Approximate Amount on Hand
Tert-amine (2 M)	Tramex extractant	100 liters	200 liters
2-ethylhexyl phenyl-phosphonic acid	Pharex extractant	50 liters	200 liters
di(2-ethylhexyl) phosphoric acid	Berkex extractant	1 liter	100 liters

Table 4.10 Organic Diluents

Reagent	Purpose	Amount Used per Month	Approximate Amount on Hand
Diethylbenzene	Tramex diluent	200 liters	200 liters
Amsco 125-82	Pharex diluent	150 liters	200 liters
Decane	Berkex diluent	4 liters	5 liters

Table 4.11 Organic Cleaning Agents (Degreasers)

Reagent	Purpose	Amount Used per Month	Approximate Amount on Hand[a]
Alcohol (formula 3A)	Cleanout of Tramex equipment	40 liters	Limited to 5 gal
Acetone	Cleanout of Pharex and Berkex equipment	40 liters	Limited to 5 gal

[a]See also methanol, Table 4.7.

4.6 Dangerous Chemical Reactions

Most chemical reactions in the Transuranium Processing Flowsheet do not involve significant amounts of energy, either because the number of moles of reactants is vanishingly small, or because the energy released per mole is quite small. Examples of this type of reaction are the complexing of curium to make it extractable in the Tramex process:

$$Cm^{3+} + 5\ Cl^- \rightleftarrows CmCl_5^{2-} ,$$

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and the oxidation of berkelium, also to make it extractable, in the Berkex process:

$$6\ Bk^{3+} + 6\ H^{+} + BrO_3^{-} \rightleftarrows 6\ Bk^{4+} + Br^{-} + 3\ H_2O\ .$$

(The latter reaction involves a large amount of energy per mole but few moles.)

The few reactions which do involve release of significant amounts of energy are discussed below.

4.6.1 Aluminum Dissolution in HCl

Dissolution of aluminum occurs quite readily in hydrochloric acid of almost any strength. In fact, the rate is so rapid that means for its control must be provided to avoid overheating or generating of explosive mixtures in the equipment. The aluminum dissolution rate has been defined by the following equation:

$$k = M^{2.42}\ e^{(16.74\ -\ 5{,}260/T)}\ ,$$

where

k = dissolution rate, mg/(cm^2)(min),

M = HCl concentration, M,

T = temperature of metal surface, °K, generally 2 to 5 degrees higher than the solution.

In the region of interest, a temperature rise of 12°C or an increase in acid concentration of 33% will double the reaction rate. Since the reaction releases 125 kcal/mole, this heat, unless removed, will rather quickly increase the temperature of the system and accelerate the reaction. Fortunately, as the metal surface gets still hotter, a blanket of steam and hydrogen forms, which drastically limits the actual contact between acid and metal and thereby prevents the dissolution rate from rising much above 50 mg/(cm^2)(min). In the TRU dissolution the rate is controlled by adding the proper amounts of acid and adjusting the temperature to achieve a dissolution rate of 1 g/min. The dissolution rate is monitored by measuring the

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temperature rise of the cooling water. If the temperature in the dissolver becomes excessive, all heat is removed from the recirculating cooling water, thus causing the dissolver to cool. The hydrogen evolved during the dissolution step is immediately diluted to 2% by a purge of 2 cfm of air.

4.6.2 Aluminum Dissolution in $NaOH$-$NaNO_3$

This dissolution procedure will be applied to plutonium targets in which the ^{242}Pu burnup is less than 80%. If it performs satisfactorily for these targets, it may be used for the high-burnup targets also. The basic reaction, $Al + NaOH + 3\ H_2O \rightarrow NaAl(OH)_4 + 3/2H_2$, produces hydrogen and heat similar to that produced in an acid dissolution. However, the presence of NO_3^- causes most of the hydrogen to be converted to ammonia by an approximate overall reaction:

$$Al + 2\ H_2O + 0.85\ NaOH + 1.05\ NaNO_3 \rightarrow NaAl(OH)_4 + 0.9\ NaNO_2$$
$$+ 0.15\ NH_3 + 0.2\ H_2O + 0.008\ H_2$$

This reduced amount of hydrogen will permit a faster dissolution rate and still maintain the same percentage hydrogen in the off-gas. The dissolution rate will be controlled by restricting the amount of aluminum added. This is done very simply by putting the target into a tall, thin vessel. The bottom 6 in. is filled with the caustic solution, and the vessel is heated to start the reaction. As the dissolution proceeds, the bottom of the target corrodes away and the rod begins to slide down into the broth, exposing fresh surface. The temperature will rise to the boiling point and remain there as the heat of reaction is removed by refluxing. The off-gas will pass through a dilute acid scrubber to remove the ammonia.

4.6.3 Preparation of Highly Oxidizing Berkex Feed

The feed (and scrub) for Berkex (8.5 M HNO_3 - 0.1 M $KBrO_3$) is a highly oxidizing medium which reacts vigorously with reducing agents.

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The extraction equipment is periodically cleaned out with acetone to remove organic films. Great care is exercised to make sure that the acetone is completely flushed out of the column and the catch tank before the highly oxidizing feed is added.

4.7 Forbidden Reagents

Most of the main processing equipment in TRU is made of Zircaloy-2. This alloy is highly resistant to nearly every conceivable combination of acids and bases except those containing fluoride. Even small (10-25 ppm) concentrations increase the corrosion rate detectably. Fluoride contamination is believed to account for the marked corrosion observed in Zircaloy-2 mixer-settlers used by the Savannah River Laboratory and by the Curium Recovery Facility. An upper limit of 5 ppm has been placed on the fluoride content of all reagents ordered in bulk for TRU.

In spite of the importance of barring fluoride from the system, it has been found necessary to include HF as a reagent for the dissolution of high-fired, low-burnup plutonium. Therefore, a small subsystem built entirely of stainless steel has been added to one of the cubicles to perform this dissolution. All streams leaving this subsystem will either be neutralized by caustic or be decontaminated from fluoride. Hydrochloric acid must be barred from this subsystem because it corrodes stainless steel excessively.

A few parts of the system are fabricated of tantalum. Caustic solutions must be barred from these tantalum lines and vessels.

5. TARGET FABRICATION

Cell cubicles 1, 2, and 3 contain equipment that is used to process the sol-gel products from the chemical processing steps and fabricate them into target elements for irradiation in the HFIR. The elements may contain any combination of the transuranium isotopes, depending on availability and production schedules.

5.1 Process Description

Targets are fabricated by a series of simple operations. The system is designed to minimize the spread of contamination and to facilitate repair or replacement of components. Transfer arms and other special devices, operated semiautomatically, are used to move target element components between steps in the process. Master-slave manipulators are used principally for maintenance and for transfer of materials to and from the intercell conveyor. Auxiliary enclosures are used within the cubicles to minimize the spread of contamination. Whenever it was possible, sensitive parts were made small enough to fit into the intercell conveyor. All equipment may be demounted, using a manipulator-held impact wrench and an in-cubicle overhead crane, and may be removed and replaced by means of the equipment transfer case.

The process steps have been grouped in the three cubicles, according to the potential they have for releasing radioactive nuclides to the cubicle. Generally, operations with loose powders will be performed in cubicle 3, those with pellets in unsealed tubes in cubicle 2, and those with sealed target elements in cubicle 1.

5.1.1 Pellet Forming and Cleaning

Figure 5.1 is a schematic flowsheet for the pellet forming and cleaning steps that are performed in cubicle 3.

Actinide hydroxide powder in a special container is moved from cubicle 4 to cubicle 3 via the intercell conveyor and is moved to the calciner by means of the manipulator. The container with calcined

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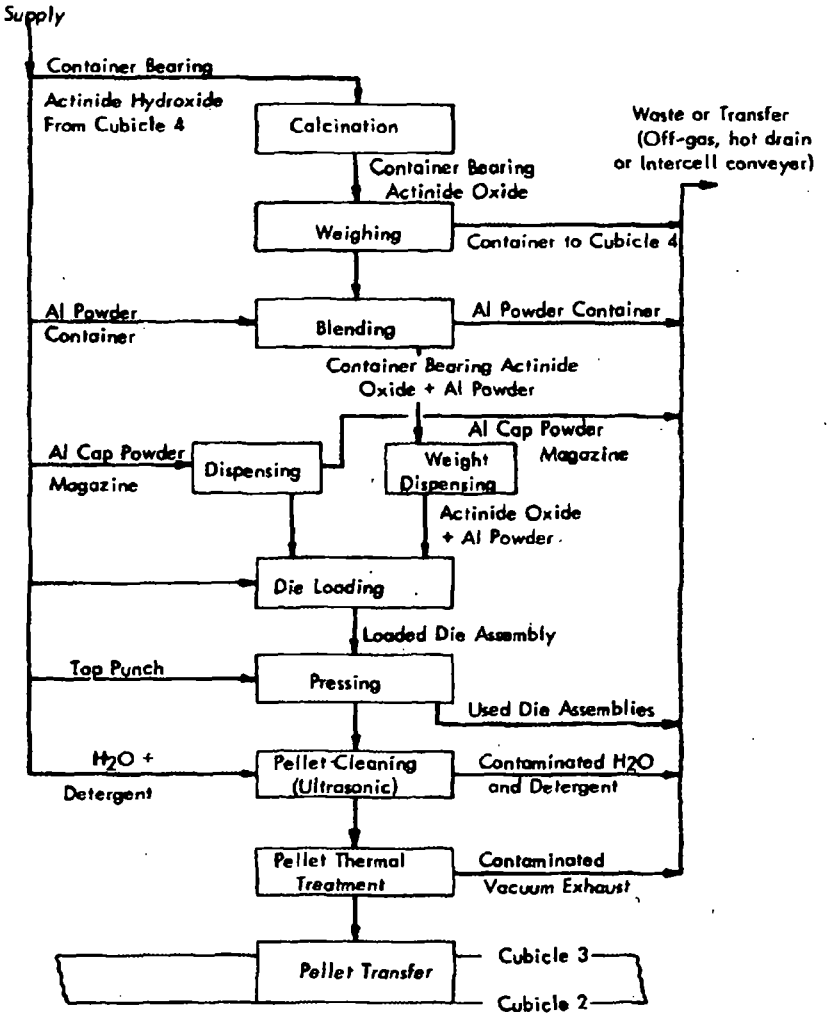

Fig. 5.1. Flowsheet for Pellet Fabrication, Cubicle 3.

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oxide is transferred by manipulator to the batch scale, where the oxide is weighed to determine the amount of aluminum powder to be added. The proper quantity of aluminum powder (weighed outside the cell bank) is put into the cubicle via the intercell conveyor and added to the actinide oxide at the powder add station. The mixture of powders is blended and dispensed to dies. Each of the dies, which are prepared outside, contains an aluminum tube and a bottom powder cap. One die at a time is placed on a scale that is interlocked with the blender-dispenser to automatically stop dispensing when the desired weight is reached. The loaded die is transferred by the transfer arm to the cap powder station, where a top punch is loaded and the pellet is pressed at about 22 tsi. The pellet is ejected from the die, and the die components are discarded.

The length of the pellets is checked, and each pellet is weighed to be sure that the actinide oxide:aluminum ratio is correct. Rejected pellets are stored for chemical reprocessing, and acceptable pellets are loaded into a magazine for subsequent fabrication steps.

The magazine containing the pellets is transferred by manipulator to the ultrasonic cleaner, where the pellets are cleaned and rinsed. It is then transferred to the pellet drier, where the pellets are dried at 500°C in a resistance-heated vacuum furnace until outgassing ceases and furnace pressure is reduced to 100 microns. The vacuum pump in the chemical makeup area induces a vacuum through an absolute filter in the cell and discharges into the VOG line in the makeup area. The dry pellets are fed through the wall to the pellet checking and loading station in cubicle 2.

5.1.2 Target Tube Assembly

Figure 5.2 is a schematic flowsheet for operations in cubicle 2.

Pellet diameters are checked automatically by passing the pellets through a diameter gage. Oversize pellets are rejected and held for chemical reprocessing. Acceptable pellets are stacked in a trough until the number required for one target have been stacked. Total length is checked to satisfy the specification that the active target length is 20 ± 0.5 in. This length may require 34, 35, or 36 pellets.

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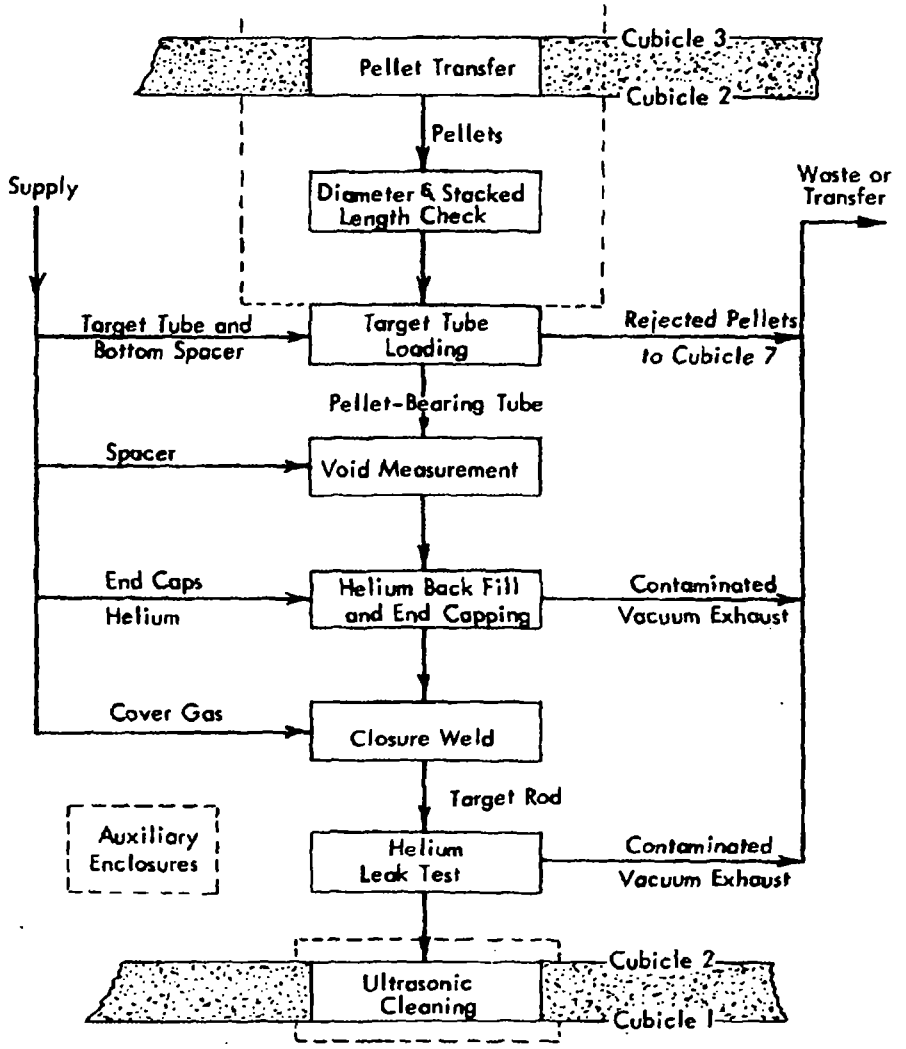

Fig. 5.2. Flowsheet for Fabrication of Target Tubes, Cubicle 2.

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A target tube with one closure weld completed and containing a bottom support sleeve is held in loading position by the tube holder and loading station. Pellets are loaded into the target tube one at a time, using a stuffing rod, and then the loaded target tube is rotated vertically 45°. The top support liner is measured and inserted; then the rod is raised upright.

The transfer arm moves the target tube to the assembly machine, the end cap is inserted into the chamber, and the welding chamber is evacuated and backfilled with helium. The end cap is pushed into the target tube to form a mechanical joint, and the closure weld is made. The transfer arm moves the closed tube (now the target rod) to the helium leak chamber, which is evacuated to the helium leak detector in the chemical makeup area. A vacuum is induced through two absolute filters in the cell and is discharged to the vessel off-gas line in the makeup area. The target rod is moved by the transfer arm to the target rod transfer station, where it is cleaned and rinsed in an ultrasonic cleaner and then inserted into cubicle 1.

5.1.3 Target Rod Assembly and Testing

The target rod is transferred by the transfer arm for all operations in cubicle 1 (Fig. 5.3). The rod is dried with a stream of heated air and is smeared for contamination. The smear pad holder contains two pads, of which only one is used to smear the tube. Both pads are removed from the cubicle and counted; the difference in counting rates is attributed to contamination on the target rod.

The transfer arm moves the rod to the x-ray station where six x-ray exposures are made (two at the end that was welded in the cubicle and one at each of four other elevations) to cover the entire pellet area of the rod.

The dimensions of the rod are checked, and the rod is moved to the hydrostatic pressure chamber where the tube is collapsed onto the pellets. The rod is again helium leak tested, and the dimensions are remeasured. If necessary, the rod is straightened and another check is made of the dimensions.

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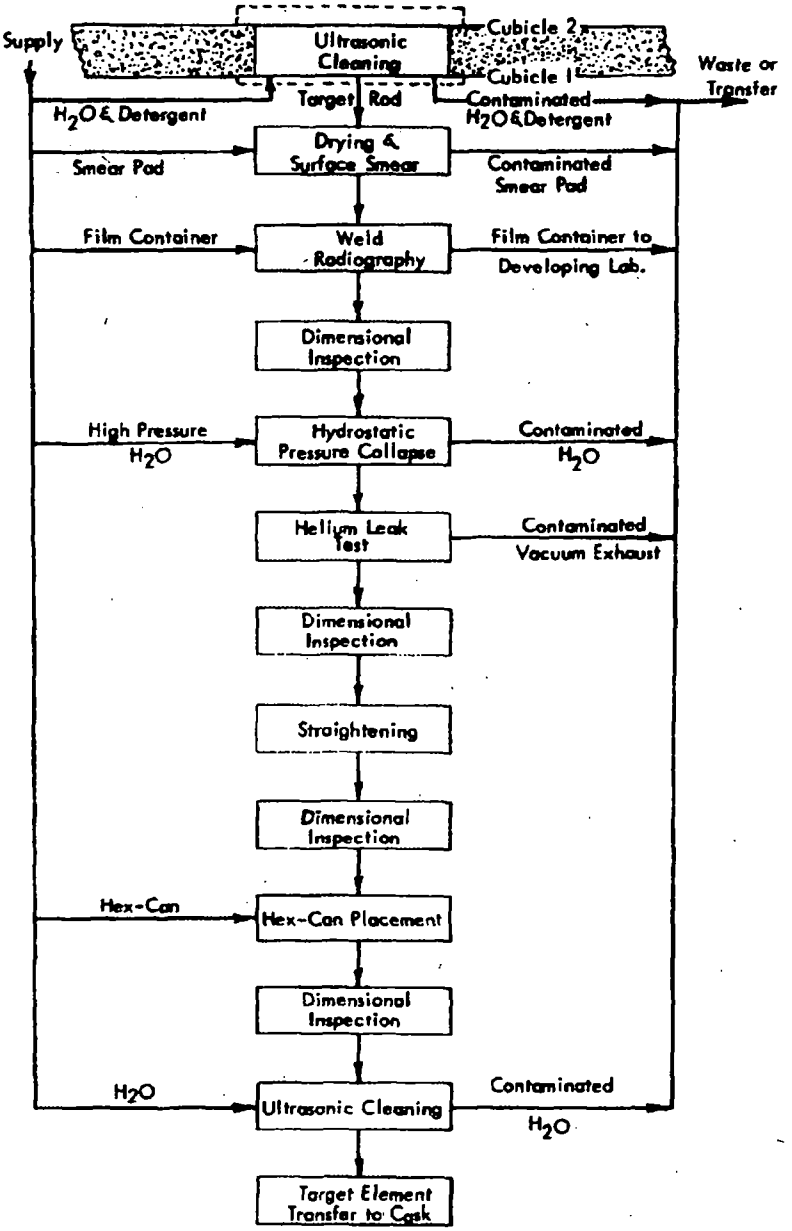

Fig. 5.3. Flowsheet for Target Assembly, Cubicle 1.

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The hexagonal can is positioned over the rod, and staking pins are driven into the can to fasten it to the rod.

The target assembly is checked for correct dimensions, ultrasonically cleaned, and moved to the discharge elevator, which raises the assembly to the carrier on top of the cell bank.

5.1.4 Disposition of Reject Rods

Rods may be rejected at several places. Their disposition will be determined by whether the reject occurred before or after the hydrostatic collapse step. If a rod is rejected before collapse, it is opened and the pellets are removed and recycled through cubicle 3. If the rod is rejected after collapse, it will be moved to cubicle 7 for dissolution and reprocessing.

5.2 Inspection of 18 HFIR Targets

About 100 to 200 μg of californium is contained in 18 target rods that were irradiated at the Savannah River Plant and then stored in the HFIR pool. There is no incentive to process these targets to recover the transuranic actinides. However, the rods have the equivalent of three months of full-power irradiation in the HFIR and will be included in the first HFIR target loading if their integrity can be ensured.

The targets will be brought from the HFIR pool to the TRU facility in the CAST cask, lowered into cubicle 1, inspected, and returned to the HFIR in the CAST cask. Movement of the targets in and out of cubicle 1 is achieved by following a written procedure that has been tested, using a dummy target rod. Ten separate inspections or operations will be performed on each rod following a detailed check sheet. The entire inspection involves 42 separate steps.

5.3 Chemical Reagents

The only reagent used in the fabrication cubicles is an aqueous solution of detergent. Acetone, used for cleaning rod components

outside the cubicles, will be included in the total inventory of Class A chemicals permitted in the chemical makeup area.

6. CRITICALITY IN PROCESSING AREA

The amount of transplutonic fissile nuclides planned for production is about 2 orders of magnitude less than a minimum critical mass; thus, no criticality hazard exists.

7. OPERATING SAFEGUARDS IN PROCESSING AREA

7.1 Operating Organization

One of the primary factors in the safe operation of any facility such as TRU is an adequately staffed and highly trained operating group. The responsibility for the safe operation of the entire facility rests with the pilot-plant group, which also operates the cell bank and all related equipment. Building service equipment, including all ventilation systems, is operated and routinely checked by the pilot-plant group. It is their responsibility to see that the required services are operating normally for the supporting groups in the laboratories and other areas of the building.

The staff consists of 11 engineers and 21 technicians, as shown in Table 7.1. The operation continues on a 7-day week, 24-hour day schedule with a shift organization, composed of an engineering supervisor and four technicians on each shift, that is supported by technical and engineering groups (including a building safety officer).

7.1.1 Responsibilities

Chief of Operations. — The shift operating group reports to the Chief of Operations. In addition to supervising the shift groups, he has the primary responsibility for administrative control and supervision, with the assistance of a Maintenance Engineer, of all maintenance activities in the building.

Shift Supervisor. — The shift supervisor on duty is responsible for all current operations in the process area, including the determination that any maintenance to be started can be done safely and will not interfere with any operation in progress. He must be aware of all cell bank and building service equipment operations that are under way, and he has the authority and responsibility to stop or change any of these operations.

Table 7.1 TRU Organization

- W. D. Burch, Building Supervisor
  - Janet Mason, Secretary
  - Nancy Wexler, Secretary
  - O. O. Yarbro, Chief of Operations
    - J. M. Turley, Maintenance Engineer
      - H. C. Thompson
    - F. R. Chattin, A-Shift Supervisor
      - C. W. Boatman
      - A. V. Wilder
      - J. B. Overton
      - C. L. Johnson[a]
    - E. D. Collins, B-Shift Supervisor
      - T. L. Douglass
      - B. J. Strader[a]
      - W. J. Bryan
      - H. S. Caldwell
    - W. W. Evans, C-Shift Supervisor
      - J. H. Brock
      - R. R. Laxson
      - R. P. Bayne[a]
      - R. C. Shipwash
    - J. E. Van Cleve,[a] D-Shift Supervisor
      - J. H. Groover
      - D. B. Owsley
      - C. L. Shepherd
      - J. T. East[a]
      - C. H. Jones
  - L. J. King, Technical Group
    - J. E. Bigelow, Flowsheet Studies and Data Analysis
      - M. C. Hill
      - W. M. Sproule
    - J. L. Matherne,[d] Engineering
    - M. K. Preston,[a] Target Fabrication Engineer
      - J. Eve[a]
    - E. M. Shuford,[b] Field Engineer
    - H. E. Cochran,[c] Instrument Engineer

[a] Assigned from Metals and Ceramics Division.
[b] Assigned from Plant and Equipment Division.
[c] Assigned from Instrumentation and Controls Division.
[d] Building Safety Officer.

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Building Safety Officer. — The Building Safety Officer is responsible for all safety matters in the building, including zoning regulations, emergency manuals and procedures, safety training, and other similar functions. In addition, he is responsible for reviewing and approving all non-routine maintenance requests and procedures, and radioactive material transfer procedures.

Technical and Engineering Groups. — These groups review and analyze all data generated in the process operations and determine process conditions for all runs.

Target Fabrication Engineer. — All target fabrication work is planned under the direction of an engineer who is fully acquainted with this equipment. He is responsible for preparing the procedures for executing the work, seeing that the assigned personnel are adequately trained, and providing day-to-day instructions for the operation. He will also analyze the results of these operations.

Building Supervisor. — The above groups report to the Building Supervisor, who has overall responsibility for the operation of the entire facility.

7.1.2 Training Programs

A full-time three-week training session was held at the beginning of the operations to fully acquaint all personnel with the facility, standard procedures, processes, and safety matters. This was followed by a six-month period of check-out operations in which all personnel were trained in their responsibilities. Future training is the responsibility of each shift supervisor, with process matters being coordinated by the Chief of Operations and safety training being organized by the Building Safety Officer.

7.2 Standard Operating Procedures

Although all personnel have been trained so that they are completely familiar with the operations they will be performing, all operations will be done by following a detailed procedure and check list.

7.2.1 Operating Manual, Check Lists, and Run Sheets

An operating manual has been prepared which describes in detail all building and process equipment and the general operating procedures to be followed, and provides all other information required for the safe operation of the building, such as process chemical information, maintenance procedures, radiation safety information, and general building safety rules. It is supplemented by an Emergency Manual which is devoted to the procedures for handling abnormal conditions and emergencies.

Detailed step-by-step check lists are provided which list every operation (such as each valve to be operated) in sequence, and provide some supplementary information.

Detailed run sheets are also provided which specify the exact conditions, flows, chemical compositions, etc. to be followed in a specific run.

7.2.2 Building Log

All building service equipment, including all ventilation systems, air compressors, water systems, the caustic scrubber, etc., are routinely inspected at the beginning of each shift. Operating conditions are logged and compared with the normal. This log is checked by the shift supervisor, and any abnormal condition is immediately investigated.

7.2.3 Transfer of Information Between Shifts

The shift supervisor is responsible for maintaining an accurate and concise record of operations in the shift log. This continuing log is the primary means of transmitting information between

shifts. An overlap period of 12 minutes by the non-technical people provides an opportunity for smooth switch-over even for a continuous operation. Operations are not normally shut down at the end of a shift. The supervisors normally discuss the operation for about 30 minutes at the shift switch-overs.

7.2.4 Procedure Changes

As the processes change, procedures must be constantly revised to bring them up to date, to refine the operations and to correct errors as they are noted. The Chief of Operations is responsible, with the concurrence of the Building Supervisor, for all changes in the operating manual and check lists. Certain changes are appropriately reviewed by the Safety Officer and the area Health Physics representative.

7.3 Maintenance Procedures

All maintenance procedures throughout the building are done under a system designed to ensure complete safety at all times. Appropriate people must approve each step and closely supervise the actual maintenance operations.

7.3.1 Work Request System

A work request form (see Fig. 7.1) has been devised to provide (1) a means of requesting maintenance to be done; (2) spaces for the appropriate people to approve the work, along with all procedures required; (3) assurance of the proper safety reviews; and (4) a permanent record of the work performed. Maintenance work may be requested by many people in the building. These requests are first acted upon by the Maintenance Engineer, who reviews the request and prepares the preliminary information on the work request form for the Plant and Equipment Division craft forces, who do the work. At this stage the job is reviewed by the Chief of Operations, who determines whether the job should be done, and, if so, what priority it should have, what

WORK REQUEST NO. _____

TRU WORK REQUEST, BLDG. 7920

DATE _____

TO	WORK ORDER NO
FROM	WORK REQUEST NO
	PRIORITY

HAZARDS WORK PERMIT, FORM UCN-326, REQUIRED ☐ YES ☐ NO

RADIATION WORK PERMIT (RWP) FORM UCN-2779, REQUIRED ☐ YES ☐ NO

BUILDING SAFETY OFFICER APPROVAL REQUIRED ☐ YES ☐ NO

EQUIPMENT OR WORK LOCATION

REFERENCE PRINTS OR OTHER

PRECAUTIONS TO BE TAKEN

TRU SAFETY OFFICER APPROVAL	DATE	CHIEF OF OPERATIONS APPROVAL	DATE

SHIFT SUPERVISOR'S APPROVAL TO PROCEED

STARTING TIME	TIME APPROVAL ENDS	SIGNED	DATE

REQUESTED COMPLETION DATE

WORK DESCRIPTION AND OTHER

REMARKS

DATE JOB COMPLETED	BY	ACTUAL TIME CHARGED

UCN-7037
(3 7-69)

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Fig. 7.1. Work Request Form.

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safety reviews, if any, are required, and when the job should appropriately be started. The approved request is then transmitted to the Plant and Equipment Division field engineering forces, who complete preparations to do the job. When the preparations are finished, the foremen review the job with the shift supervisor on duty, who ascertains that the job can be done safely at that time. He makes sure that valves and electrical breakers are appropriately tagged out and that any other preparations are completed, such as Health Physics survey, before signing the form, thus giving approval for the job to proceed. Similar approval is made at the beginning of each new shift in the event that a job carries over to the next shift.

When the work has been completed, the foreman signs the form, returns it to the shift supervisor, and informs him of anything incidental to the work request which might affect the operations. The forms are then filed permanently.

While some minor variation of the above described sequence may occur, the key steps—review and approval by the Chief of Operations and final endorsement by the shift supervisor--are mandatory.

7.3.2 Detailed Procedures

The majority of maintenance jobs are done from instructions written on the work request form, plus auxiliary sketches and drawings. However, more detailed procedures are required for in-cell maintenance work. Maintenance work performed with manipulators in the cubicles by the technicians is not done by work request form since the latter is designed only for support work by the Plant and Equipment Division. A separate form is used for in-cell work. This work will be done according to general instructions in the Operations Manual; however, each specific job must be reviewed and approved either by the Chief of Operations or by the Building Supervisor prior to starting the job.

Maintenance involving removal of equipment from the cell bank, and other in-cell maintenance where the cell is to be opened, will be done according to detailed step-by-step procedures. For semiroutine operations,

these instructions will be prepared as part of the Operations Manual. For nonroutine jobs, a special procedure will be prepared at the time the job is to be performed.

8. PERSONNEL EXPOSURE IN PROCESSING AREA

8.1 Curie Load

The largest source of β-γ radiation is the ^{144}Ce - ^{144}Pr fission product associated with the fissioning of the initial 10 kg of ^{239}Pu used to produce the ^{242}Pu target material. The cell design was based on processing 200,000 curies of this material, but most of it has now decayed; less than 10,000 curies remain.

The maximum amount of α activity stored in any cell at one time will be the 260 g of ^{244}Cm from Savannah River, equivalent to 21,000 curies.

The cubicle design is based on the shielding requirements for a fifth-cycle HFIR target, which is expected to contain 305 mg of Cf and spontaneously emit 3×10^{12} fission neutrons per second from all heavy isotopes. This is the equivalent of 80 "curies" of neutron activity. Maximum inventory in the entire cell bank is expected to be less than 5 g of Cf or about 300 "curies" of neutrons.

8.2 Personnel Exposure

The TRU shielding design will attenuate the sources listed above to a penetrating radiation dose rate of <0.75 mrem/hr in normally occupied areas, with "hot" spots of radiation no greater than 2.5 mrem/hr opposite wall penetrations. The dose rates in normally unoccupied areas will be no greater than 10 times these values.

8.3 Exposure in Radiation Zones

As indicated above, exposure in the normal operating area will be <0.75 mrem/hr or <30 mrem per 40-hr week. However, there will be a number of operations such as target charging, sample removal, waste removal, or equipment removal and decontamination that will entail part-time exposure to higher levels of radiation. These operations will be performed with the knowledge of Health Physics personnel, and the

working times will be carefully checked to make sure no individual receives an exposure in excess of that provided for in the Health Physics Manual, Section 3.2. Records of accumulated exposures will be kept for pilot-plant personnel and for craft personnel that are regularly assigned to the building.

8.4 Exposure Possibilities

The table below lists the approximate number of people that normally work in the TRU building. Visitors who may be present from time to time will be escorted through the building. They will wear film badges and either electroscope dosimeters or pocket meters.

Table 8.1 Number of Personnel Working in the TRU Facility

	Working Days	Nights and Weekends
Main Processing Area	15	5
Laboratory Area	12	3
Office Area	12	0

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9. ANALYTICAL CHEMISTRY DIVISION

The work being done by the Analytical Chemistry Division will be supervised by John Cooper, a member of that division.

Cubicles 8 and 9 will be used to collect and store samples from the cell bank, to perform analyses that must be made without dilution on highly radioactive samples, and to make dilutions for analyses that will be made in laboratories 108 and 208. All operations in the cell bank area must be coordinated with and approved by the TRU Shift Supervisor.

Operations in laboratories 108 and 208 will be those that have previously been reviewed and approved for similar facilities. New procedures will be presented for review if they appear to represent a significant departure from approved practice.

10. LABORATORY GLOVE-BOX OPERATIONS

The laboratory facilities will be used for fundamental studies and process development of alpha-active materials. Much of the work will be concerned with the development of sol-gel processes and with process development for the isolation and purification of various alpha-active materials. For this, emphasis is placed on solvent extraction and ion exchange techniques. However, any operation normally conducted in an inorganic chemistry laboratory might be adapted for use. Work will be carried out in unshielded glove boxes when only alpha containment is essential; when protection from beta-gamma or neutron radiation is necessary, the work will be done in glove boxes shielded by lead or other material and in the large shielded cave. The amount of material handled will vary from trace quantities up to 100 curies. Various isotopes of all elements from thorium through fermium, plus their daughters, will be handled. On occasion, after a special hazards review, a production-type program may be carried out.

The work will be done by experienced personnel under the supervision of M. H. Lloyd and R. E. Leuze. New personnel will probably become involved eventually. People who are not experienced in handling highly radioactive materials in glove-box operations would, of course, be fully trained before being allowed to work without close supervision.

10.1 Radiation Hazards

Alpha radiation is the predominant radiation that will be encountered, and alpha contamination will be contained by use of glove-box techniques. When gamma and neutron radiation is associated with the alpha radiation, the work will be performed in the shielded glove boxes. These boxes might have lead shadow shielding, or be fully lead-lined, and might be equipped with lead-impregnated gloves. The total dose received by personnel will be limited to that allowed by current ORNL standards.

The quantity of alpha emitters that can be handled in the laboratory facility without a formal Radiation Safety analysis (except for fissionable material - see below) is either 100 curies in a glove box or 500

curies in a shielded cave. Five hundred curies is about 150 mg of ^{242}Cm, 6 g of ^{244}Cm, or 150 g of ^{241}Am.

10.2 Criticality Hazard

Laboratory studies may be concerned with programs other than the transuranium-element production program. Therefore, although a critical mass will not be assembled during the transuranium-element program, a potential criticality hazard will exist in the laboratories in the Transuranium Processing Plant.

The assembly of a critical mass of fissionable isotopes is prevented by limiting the total inventory of those isotopes to 350 g.

To ensure that the maximum limit of 350 g of fissionable isotopes is not exceeded in the facility, an inventory will be posted on each laboratory. Transfer of quantities in excess of 5 g into or out of a laboratory must have the prior approval of the laboratory group supervisors, who will be required to keep an accurate inventory of fissionable material within the laboratory complex.

A special review will be requested for programs that require the building inventory of fissionable isotopes to be more than 350 g.

10.3 Chemical Hazards

The types of chemicals and the quantities consumed vary from program to program; however, with certain exceptions, most of the common chemicals will be in general use. Low flash-point solvents such as ether or acetone are not normally used, and chemicals or chemical combinations which could result in violent or explosive reactions are avoided. It is our general practice to investigate any reaction which is suspect prior to experiments with radioactive material in a glove box. High-flash-point solvents (>100°F) are required in solvent extraction processes; however, large quantities of such chemicals are used only in specially protected boxes (see below).

Corrosive chemicals such as acids are required routinely. The glove boxes, as designed, are not adversely affected by such reagents.

Most of the corrosive fumes which might adversely affect glove-box off-gas filters are approximately scrubbed within the box prior to release to the box off-gas.

10.4 Fire and Explosion Hazards

As in any chemical laboratory, the danger of an accidental fire and/or explosion always exists; however, extreme care is taken to minimize the likelihood of such events.

All flammable solvents, except small amounts sufficient for daily operations, are stored outside the building in an approved metal storage cabinet or in metal drums, and portable CO_2 extinguishers are available in each laboratory.

The probability of a fire is low since open flames and low-flash-point organic solvents are normally prohibited in glove-box operations. When more than 500 ml of high-flash-point solvents are required, special equipment is installed on the box. Such boxes are equipped with a water spray that is activated by a temperature-sensitive sprinkler head. The shielded-cave alpha box is equipped with a special fire protection system (see Section 2.7.3).

The possibility of an explosion inside a glove box is minimized by careful selection of reagents and proper design of experiments. In operations where combustible gases or vapors are generated, appropriate purge rates are used to keep the concentration in the off-gas below the explosive limit. When large quantities of heat are generated, such as in a furnace operation, localized cooling of the equipment is provided to prevent heat buildup and temperature rise in the box.

10.5 Maximum Credible Accident

The maximum credible accident in a laboratory is conceived to be a relatively large release of activity from an alpha glove box; however, such a release would not be expected to involve more than a fraction of the total activity within the box. Since the kind of chemical operations performed in glove boxes (primarily wet-chemistry operations)

are not conducive to formation of airborne activity, virtually all escaping activity would settle within a short distance of the glove box and would be adequately contained within the alpha laboratory.

The possible consequences of this kind of release of activity are discussed in Section 17.5.

11. OPERATING SAFEGUARDS IN ALPHA LABORATORIES

11.1 Standard Laboratory Procedures

In order to properly contain alpha-active materials and to eliminate accidental contamination of large areas, the alpha laboratories are designated as contamination zones; and special rules and procedures are required.

Since these areas may accidentally become contaminated, contamination clothing is required; and special requirements are posted at entrances. Minimum clothing requirements are:

a. contamination coveralls or contamination lab coat (buttoned)
b. shoe covers

For personnel working in or on alpha glove boxes, the minimum clothing requirements are:

a. contamination coveralls with sleeves taped
b. rubber gloves
c. yellow shoes plus shoe covers or personal shoes plus plastic boots
d. safety glasses

Upon leaving the contamination zone, personnel must do the following:

a. remove shoe covers or plastic boots
b. monitor clothing, hands, and shoes for contamination
c. remove rubber gloves

Entrance to each laboratory is provided by two doors from the access corridor. Either door may be used to enter the laboratory; however, only one of these doors will be used as a laboratory exit, and this door will be provided with an alpha monitor.

All material leaving the contamination zone must be monitored for surface contamination, and such material must be appropriately tagged by a Health Physics representative before it is removed from the adjacent regulated zone. The tag must show the approximate amount of

nuclide(s) in the package and must state that the package is free from external contamination. Contaminated materials may be removed only if they are properly packaged and there is no smearable activity on external surfaces.

Each alpha laboratory contains a pass-through door which connects to an adjoining "cold" laboratory. Before material can be passed through this door from the alpha laboratory to the "cold" laboratory, it must be appropriately monitored. The alpha monitor is conveniently located near both the pass-through door and the laboratory exit.

Standard laboratory procedure requires frequent equipment and personnel (especially gloves and shoe covers) monitoring during operations. The exact frequency depends on the nature of the work and is left to the discretion of the operator.

All detectable alpha activity outside of glove boxes or sealed containers is contamination and must be cleaned up immediately.

Two or more persons are required for any laboratory operations except those during the normal day shift. Glove-box equipment is not allowed to operate unattended.

12. RADIATION SAFETY

Only authorized ORNL personnel and official visitors will be permitted in the laboratory and processing portions of the building. The TRU operations shift supervisor is in charge of the processing areas, and the laboratory group supervisors are in charge in their areas. A sign on the door to room 104 indicates this and includes instructions on how to contact the supervisors by using the building intercom phone that is located outside the door.

There are no doors to the processing cells. The cells can be entered only while the roof plugs are removed and, even then, personnel entry is not anticipated. Personnel entry is not required for operations or maintenance. There should be no likelihood that anyone could get confused and enter a cell "by mistake."

12.1 Zoning

The building contains three kinds of Regulated Zones, as shown in Figs. 2.3 and 2.4. These areas have been marked with appropriate signs, and all personnel will observe and obey these signs. There are no unzoned areas except the office annex and rooms 101 and 103. Contamination clothing is prohibited in those areas.

12.1.1 Contamination Zones

Analytical laboratories 108 and 208, alpha laboratories 109, 111, 209, and 211, the transfer area (118), the decontamination room (216), the limited-access area (120), and the pipe tunnel are Contamination Zones.

12.1.2 Monitored-Exit Regulated Zone

The rest of the building, except the loading platforms and mechanical equipment rooms, is a Monitored-Exit Zone. This is identical to an ordinary Regulated Zone except that personnel and materials leaving the zone must be monitored for radioactive contamination.

12.1.3 Regulated Zones

The loading platforms and mechanical equipment rooms are ordinary Regulated Zones.

12.1.4 General Regulations

The following general regulations apply to the various zones:

1. Entry to and exit from the TRU facility will be only through room No. 104. The other passage ways are to be used by personnel only for emergency exit. Operational use under controlled conditions will be permitted.
2. All personnel leaving the facility will check themselves for contamination with instruments provided in room No. 104.
3. No contamination clothing is to be worn in the unzoned areas.
4. Film badges and pencil meters must be worn by all ORNL personnel in regulated zones. Pocket dosimeters may be worn by visitors.
5. Either street or Contamination Zone clothing that is not contaminated may be worn in the Regulated Zone.
6. No eating or drinking, except from approved fountains, is permitted in the Regulated Zone. Smoking is permitted in the Regulated Zone except in the chemical makeup area (room 213), the "cold" chemical laboratories (rooms 110 and 210), the laboratory equipment storage room (room 202), and the solvent storage room (room 112).
7. No eating, smoking, or drinking is permitted in the Contamination Zones.
8. The minimum clothing requirement in the Contamination Zone consists of one pair of shoe covers and a buttoned Contamination Zone lab coat. The nature of the particular job being done will determine the degree of additional clothing protection required.

9. All personnel entering the Monitored-Exit Regulated Zone from a Contamination Zone must survey themselves for alpha and beta-gamma radioactivity.

10. All articles taken from a Contamination Zone must be checked for alpha and beta-gamma radioactivity. If the article is found to be contaminated, it should be either cleaned or properly bagged and tagged to permit its subsequent safe handling outside of the Contamination Zone.

11. Personnel entering the loading platform from the "cold" checking and receiving room (room 113) must survey themselves for alpha and beta-gamma radioactivity.

12.2 Radiation Instruments

Constant air monitors and fixed and portable radiation detection equipment are located throughout the building as shown in Figs. 2.3 and 2.4. These instruments and their normal locations are listed in Table 12.1. Certain alpha air monitors and beta-gamma air monitors (those marked with an asterisk in the table) comprise the Facility Contamination Alarm System. A group of four beta-gamma air monitors, a group of six alpha air monitors, and a group of four alpha air monitors comprise three subsystems of the Facility Contamination Alarm System. Coincident high-level alarms from two monitors that are connected to the same subsystem actuate the building evacuation horn and transmit a signal to the ORNL Emergency Control Center.

Installed process and service line monitors prevent the inadvertent discharge of radioactive materials from the building. Other instruments prevent the inadvertent release of radioactive materials from the processing cells to operating areas.

12.2.1 Personnel Monitoring Instruments

All the types of instruments listed in Table 12.1 and shown in Figs. 2.3 and 2.4 have been reviewed by the ORNL Radiation Control

Table 12.1 Non-Process Radiation Detection Devices in the Transuranium Processing Plant

Room No.	Area Description	Instruments
104	Portal to Regulated Areas	1 Alpha Contamination Monitor
		1 Beta-Gamma Contamination Monitor
		1 Hand and Foot Counter
102	Health Physics Office	1 Alpha Contamination Monitor
	(includes all spares)	1 Beta-Gamma Contamination Monitor
		1 Smear Alpha Counter
		1 Smear Beta-Gamma Counter
		7 Alpha Survey Meters
		5 G-M Survey Meters
		6 Cutie Pies
		2 Thermal-Neutron Detectors
		2 Fast-Neutron Survey Meters
		1 High-Range Cutie Pie (1000 r/hr)
113	"Cold" Receiving Area	1 Alpha Survey Meter
		1 G-M Survey Meter
107	Yellow Dumpster Room	1 Gamma Monitron
108	Analytical Laboratory	1 Alpha Air Monitor*
		1 Alpha Contamination Monitor
		1 Beta-Gamma Contamination Monitor
		1 Alpha Survey Meter
		1 Cutie Pie
109	Alpha Laboratory	1 Alpha Air Monitor*
		1 Alpha Contamination Monitor
		1 Beta-Gamma Contamination Monitor
		1 Alpha Survey Meter
		1 Cutie Pie

*These instruments comprise the Facility Contamination Alarm System.

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111	Shielded-Cave Area	1 Alpha Air Monitor*
		1 Alpha Contamination Monitor
		1 Beta-Gamma Contamination Monitor
		1 Alpha Survey Meter
		1 Cutie Pie
117	Air Lock	1 Alpha Contamination Monitor
		1 Beta-Gamma Contamination Monitor
116	TRU Control Room	1 Alpha Air Monitor*
		1 Alpha Air Monitor
		1 Beta-Gamma Air Monitor*
		1 Alpha Survey Meter
		1 G-M Survey Meter
118	Transfer Area	1 Alpha Air Monitor*
		1 Beta-Gamma Air Monitor*
		1 Gamma-Neutron Monitor
		1 Alpha Survey Meter
		1 G-M Survey Meter
		1 Cutie Pie
119	Instrumented Air Lock	1 Alpha Survey Meter
		1 G-M Survey Meter
120	Limited-Access Area (Lower Level)	1 Alpha Air Monitor*
		1 Beta-Gamma Air Monitor*
		1 Alpha Survey Meter
		1 G-M Survey Meter
		1 Cutie Pie
121	Change Room	1 Alpha Contamination Monitor
		1 Beta-Gamma Contamination Monitor
122	Conveyor Maintenance Room	1 Alpha Survey Meter
	Maintenance Shop	1 Alpha Survey Meter
		1 G-M Survey Meter

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208	Analytical Laboratory	1 Alpha Air Monitor*
		1 Alpha Contamination Monitor
		1 Beta-Gamma Contamination Monitor
		1 Alpha Survey Meter
		1 Cutie Pie
209	Alpha Laboratory	1 Alpha Air Monitor*
		1 Alpha Contamination Monitor
		1 Beta-Gamma Contamination Monitor
		1 Alpha Survey Meter
		1 Cutie Pie
211	Alpha Laboratory	1 Alpha Air Monitor*
		1 Alpha Contamination Monitor
		1 Beta-Gamma Coutamination Monitor
		1 Alpha Survey Meter
		1 Cutie Pie
212	Air Lock	1 Alpha Contamination Monitor
		1 Beta-Gamma Contamination Monitor
213	Solution Makeup Area	1 Alpha Air Monitor*
		1 Alpha Air Monitor
		1 Beta-Gamma Air Monitor*
		1 Alpha Survey Meter
		1 G-M Survey Meter
		1 Cutie Pie
216	Decontamination Room	1 Alpha Air Monitor
		1 Beta-Gamma Air Monitor
		1 Alpha Survey Meter
		1 G-M Survey Meter
120	Limited-Access Area (Upper Level)	1 Alpha Air Monitor
		1 Beta-Gamma Air Monitor
		1 Alpha Survey Meter
		1 G-M Survey Meter
		1 Cutie Pie

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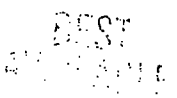
Instruments Advisory Group as required according to Section 2.2 of the ORNL Health Physics Manual. Brief descriptions are given below.

Constant Air Monitor (CAM) Model Q2118-1. — CAM monitors the quantity of particulate beta-gamma radiation in the surrounding air. A vacuum pump draws air through a filter over a G-M tube mounted in a stainless steel shield. The tube is connected to a count-rate meter, which is, in turn, connected to a strip-chart recorder which continuously records the radiation level. An associated relay-alarm system permits visible and audible alarms to be activated at predetermined levels. Alarm signals can be transmitted to distant locations.

Constant Alpha Air Monitor (CAAM) Model 2218. — This instrument is similar to the CAM. The only difference is that an alpha detector is used in the CAAM.

Monitron (Model Q1154B-1). — The monitron employs a large ionization chamber which is coated on the inside with enriched boron if it is used for the detection of gamma plus thermal-neutron radiation and is left uncoated if detection of only gamma radiation is required. The ionization chamber is connected with an amplifier circuit and a count-rate meter which reads directly in milliroentgens per hour. A relay circuit may be set to actuate an alarm at any predetermined gamma-radiation level. Alarm signals may be transmitted to distant locations.

Stationary Contamination Monitor (Model Q2277-1). — This monitor consists of a versatile counting-rate meter, ac powered, and either a zinc sulfide scintillation probe for detection of alpha radiation or a G-M counter probe for detection of beta-gamma radiation. An associated alarm circuit permits a local alarm to be actuated at predetermined levels.



Hand and Foot Counter (Model Q1939B-1). — This is a semiautomatic device for detecting beta-gamma radioactivity on shoes and hands simultaneously. Counts obtained by G-M tubes during an automatically timed interval are indicated by lights and registers. There is an auxiliary probe for monitoring other areas of the body or clothing.

Alpha Survey Meter (Model Q1975B-1). — This portable scintillation counter is a battery-powered, transistorized, amplifier with a high-voltage supply especially designed for use with an alpha scintillation probe. The device registers accumulated counts, thus obviating the difficulty of reading low counting rates on a meter. An output for earphone operation is also provided. The power is supplied by nickel-cadmium cells which are kept charged by a plug-in trickle charger operated from 110-v, 60-cps current. The probe employs a 2-in. photomultiplier, a zinc sulfide phosphor, and a lighttight window. It is relatively free of microphonics and is relatively insensitive to beta and gamma radiation.

G-M Survey Meter (Model Q2092B-1). — This survey meter is a medium-weight, portable, beta-gamma-radiation-indicating survey instrument. It was designed to work in gamma-ray intensities up to 500 mr/hr. Audible or visible indication of radiation is afforded by means of earphones and a count-rate meter.

Standard Cutie Pie (Model Q2299-2). — This is a relatively small, lightweight, portable survey instrument used for the measurement of gamma-radiation dose rates up to 10 r/hr. It is used also to indicate beta radiation.

Hi-Range Cutie Pie (Model Q2299-2). — The Hi-Range Cutie Pie is similar to the Standard Cutie Pie except that the chamber volume and the electrometer input resistors are adjusted to provide full-scale ranges of 10, 100, and 1000 rads/hr.

Fast-Neutron Survey Meter (Model 02047A-1). — This survey meter is an all-transistorized count-rate meter calibrated in terms of millirems per hour. The detector is a tissue-equivalent proportional counter. A register is provided for very low dose-rate measurements. Special circuitry provides excellent discrimination against gamma radiation.

Thermal-Neutron Counter (Model 02004A-1). — The portable thermal-neutron counter is a lightweight instrument for measuring thermal-neutron flux rates. All circuitry is transistorized, and power is provided by rechargeable nickel-cadmium cells. The detector is relatively insensitive to gamma radiation.

12.2.2 Radiation Warning and Control System

The radiation warning and control panel (Fig. 12.1) is the collection center for radiation monitoring information (including high-level alarms) from various parts of the building. A fire locator panel and all of the instruments and alarms for monitoring building services are located on adjacent panelboards. Thus, all instrumentation for monitoring building safety (radiation, fire and containment) and locating abnormal conditions is centrally located.

The major components of the radiation warning system are: (1) a beta-gamma contamination alarm system, (2) an alpha contamination alarm system, and (3) a process radiation monitor alarm system.

Beta-Gamma Contamination Alarm System. — Six constant air monitors provide radiation detection for this system. In addition to the alarms that sound at each instrument, "caution," "high-level," or "instrument inoperative" warnings for each instrument are relayed to the control panel in the operating room where alarms are actuated. Further, if two of the four instruments that are located in the limited-access area, the transfer area, the chemical makeup area, and the operating area transmit "high-level" signals simultaneously, a beta-gamma contamination evacuation alarm occurs at the panelboard, building evacuation

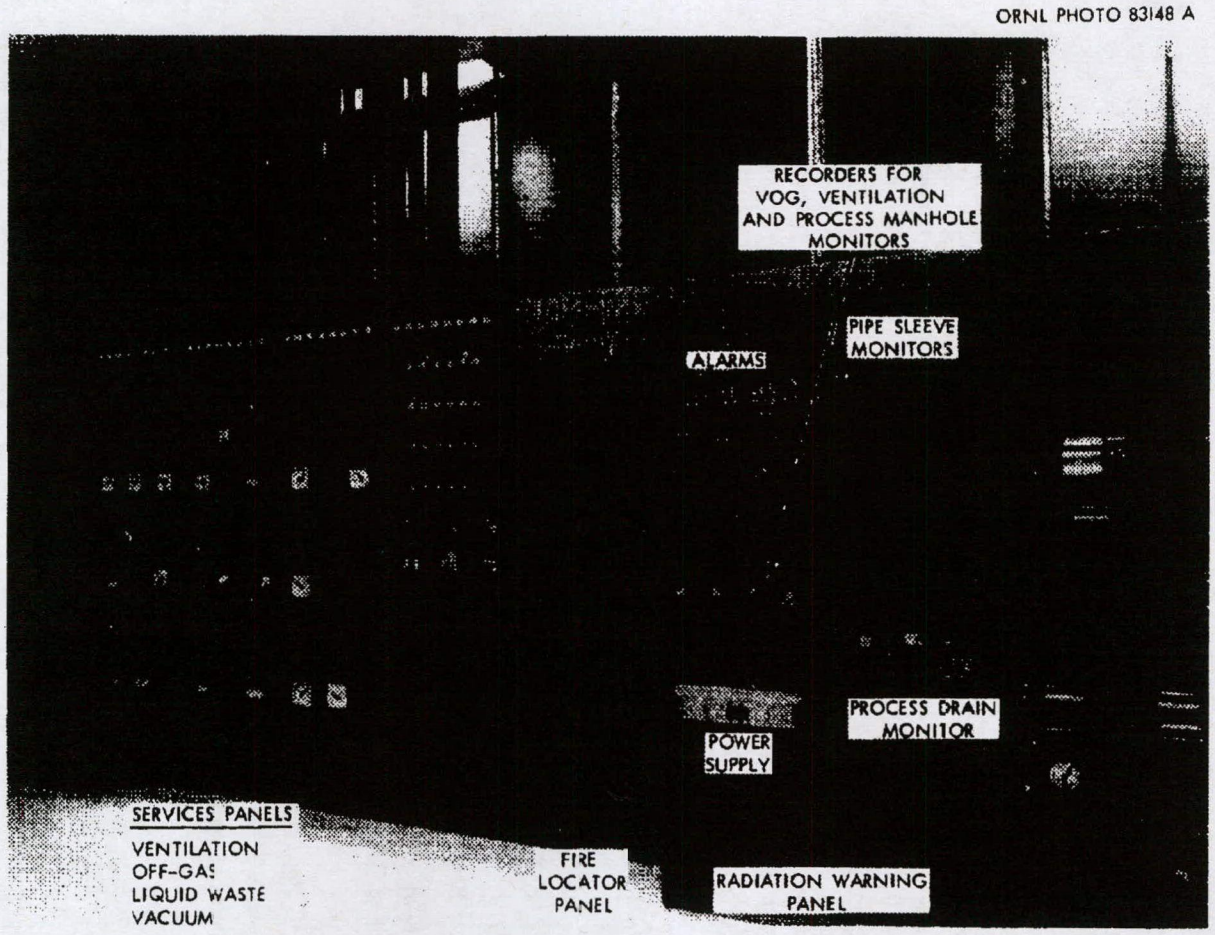


Fig. 12.1. Service, Fire, and Radiation Control Panels.

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horns are actuated, and a signal is transmitted to actuate an alarm at the ORNL Emergency Control Center. A CAM located on top of the cells and one in the decontamination room are not included in the evacuation system but do transmit signals to the control panel.

Alpha Contamination Alarm System. — Fourteen constant alpha air monitors (CAAM) are included in this system. All transmit "caution," "high-level," and "instrument inoperative" signals to the control panel in addition to displaying these conditions at each instrument. Six of these instruments form the first-floor alpha contamination evacuation alarm system, and four of them form the second-floor system. Both systems actuate building evacuation horns, alarm at the panelboard, and transmit signals to the ORNL Emergency Control Center if any two instruments in either system (that is, two instruments in the same system) simultaneously transmit "high-level" signals.

The first-floor evacuation system is made up of CAAM's in the limited-access area, the transfer area, the west end of the operating area, analytical laboratory 108, and alpha laboratories 109 and 111. The second-floor evacuation system includes CAAM's in the west end of the makeup area, analytical laboratory 208, and alpha laboratories 209 and 211. Four CAAM's that are monitored at the control panel but are not included in one of the evacuation alarm systems are located at the top of the processing cells, in the east ends of the operating area and chemical makeup area, and in the decontamination room.

Monitrons. — A beta-gamma remote monitron in the yellow dumpster room (107), and a beta-gamma-thermal-neutron remote monitron in the transfer area, transmit "caution" signals to the radiation control panel and cause the radiation warning alarm to sound at the panel.

Process Radiation System. — Signals that indicate abnormal conditions at radiation detectors that monitor various process and service piping systems are transmitted to the radiation warning panel. The function of the process radiation section is described in Section 13.

Evacuation Alarm. — A manual pushbutton is located on the radiation warning panel for actuating the building evacuation horns, which are powered by compressed nitrogen. Warning beacons on the four corners of the building flash, and a signal is transmitted to the ORNL Emergency Control Center when the evacuation alarms sound, whether the evacuation is effected by the coincidence air monitor systems or by the manual pushbutton.

12.3 Connection to the ORNL Emergency Control Center

Signals from the building evacuation alarm, the fire alarm system, and the waste tank F-126 liquid-level transmitter are automatically transmitted to the ORNL Emergency Control Center.

12.4 Radiation Surveys

Radiation surveys will be made at the discretion of the building Health Physics surveyor. As a minimum, the entire facility will be smeared once every four weeks, and the entire building will be "spot-smeared" every week.

The building will be divided into eight areas as follows:

1. Operating area
2. First floor of laboratory part of building
3. Limited-access area
4. Second floor of laboratory part of building
5. Chemical makeup area
6. Decontamination room
7. Office annex
8. Equipment rooms

A check list will be used, and a record will be maintained. Each week two of the areas will be checked thoroughly and the other six will be "spot-checked." If required, supplementary Health Physics personnel will be used to ensure the minimum check of all areas. High-traffic areas such as the main portal in room 104 will be checked at least once

daily. Whenever some operation is performed that has a high probability of spreading contamination - such as transferring waste to the solids waste station, or transferring carriers within the building or to and from the building - the area involved will be monitored, using survey instruments and smears. Any area that is suspected of being contaminated will be immediately isolated and checked. The detection of contaminated articles (including gloves and shoe covers) at a monitoring station will require a thorough survey to determine the source of the radioactivity and the extent to which contamination has been spread.

13. PROCESS SAFEGUARDS

While careful operation and good administrative controls are important in the operation of a facility such as TRU, inherent process safeguards built into the system, including adequate instrumentation, greatly enhance the probability of achieving a completely safe operation.

13.1 Instrumentation System

Although the TRU process equipment is in cells equipped with master-slave manipulators, the equipment is operated primarily from panelboards by completely remote means. Valves are air operated by panel switches; solutions are transferred by jets or pumps operated from the panelboard. Remote target fabrication equipment is highly automated, with many operations automatically sequenced from panel controls.

Every effort has been made to prevent the process solutions from getting to the panelboard in the operating area by use of remote transmitters located in the chemical makeup area, which transmit signals to the panelboard. No process lines connect directly from the cell to the operating area, and the transmitter rack is at least eight feet above all process lines.

Chemical process instrumentation is of the conventional type used elsewhere in radioactive processing plants. Tank levels are sensed by bubbler arrangements, transfers are made by steam jet or remote-head diaphragm pump, and valves are remotely operated by air pressure. Alarms are provided to warn of abnormal operating conditions, and safety interlocks are provided to automatically correct an unsafe condition.

13.2 Transfer of Process Solutions

13.2.1 Steam Jets

Solution transfers to the intermediate-level-waste collection system are made by steam jet. Steam supplies to the jets are actuated

either by a manual valve or by a panel-mounted switch which opens the valve on the steam line. These valves are located in the chemical makeup area. Protection is provided against backup of the solution into the steam line by using a continuous air purge at about 250 cc/min. This air is supplied from the building 100-psig air header and is routed through a rotameter, a small holdup tank (500 cc), and a check valve into the steam line. The air pressure and flow are maintained even during jetting operations. Air is accumulated in the holdup tank until the pressure reaches 60 psi; the air at the steam header then bleeds into the jet supply line downstream of the steam valve. When the valve is shut off, the accumulated air bleeds rapidly into the line, purging all steam and ensuring that condensation cannot pull active solutions back up the line. Tests showed the system to be completely effective.

13.2.2 Diaphragm Pumps

Most process solutions are transferred by means of remote-head diaphragm pumps. The sealed construction of the diaphragm pumps helps ensure that there is no leakage of process fluids, and the pump heads are located in the cell to ensure containment. Since the process vessels are several feet below them, these pumps must be able to induce a vacuum. This requires the pump to be driven by an alternating air-vacuum source instead of the conventional hydraulic drive system, which intensifies the problem of ensuring that no process solutions leave the cell via the drive line in the event that a diaphragm should fail. However, special process radiation monitors on the drive lines just outside the cell will detect any radioactivity in the lines and automatically switch the pump drive system to the pressure stroke to force any solution back down the line.

13.3 Process Vessel Controls

The entire process system is operated essentially at atmospheric pressure so that problems of applying pressure to the solutions outside the cell, via instrument or other lines, are not severe. To further

minimize this risk, all instrument lines are continuously purged and all lines for adding solution are equipped with spring-loaded check valves just outside the shielding walls.

13.3.1 Dissolver Control System - Method of Limiting the Hydrogen Concentration in the Off-Gas

The dissolver is the only vessel in the facility equipped with a temperature control system. This system is used in connection with an air purge to limit the hydrogen concentration in the off-gas to acceptable levels. Since the dissolution is done in the temperature range of 40 to 60°C, the dissolver is heated or cooled by pressurized hot water that is circulated through the jacket. The circulating water is cooled at a constant rate by a water-cooled heat exchanger and heated at a variable rate by an electric heater. Both the heat exchanger and electric heater are external to the jacket. The rate at which heat is added is varied by a pneumatically operated rheostat which is controlled by the dissolver temperature (sensed by a thermocouple inside the dissolver) and the controller set point.

Dissolution rates and the air purge rates are set so that hydrogen is limited to 2 ± 1% in the dissolver off-gas. The design dissolution rate of one gram of aluminum per minute is achieved by establishing the proper acid concentration and dissolver temperature. The actual rate is calculated during dissolution by a heat balance on the water loop, and recent tests have shown that this method is accurate to better than ± 50% at the design dissolution rate. Thus, the hydrogen concentration can be determined and maintained well below the explosive limit. During the dissolution, temperatures are increased in 10°C increments; the actual dissolution rate is determined at each temperature before the temperature is raised to the next level.

As added precautions, the instrument lines are equipped with automatic block valves (just outside the cell) that close on detection of radiation and with a high-temperature interlock (set at 10° above the dissolver control point) that switches the heat off, and switches the cooling water onto, the dissolver.

13.3.2 Evaporators

Steam to the six process evaporator jackets is controlled automatically at pressures established by a panelboard setting. No other controls have been incorporated into the systems because the steam is condensed without any pressurization, even with full steam on the jacket.

13.3.3 Ion Exchange Column

Radioactive solutions are pumped to the ion exchange column C-71 by a pump which is capable of developing 25 psig. Protection has been provided to ensure that the radioactive solutions are not pressured back up the wash-elutriant line to the chemical makeup area. An interlock prevents the pump from being operated unless an in-cell valve in the wash-elutriant line is closed and a pressure of 40 psi has been applied to this line above the valve.

13.4 Protection of Utilities from Process Solutions

Adequate protection has been incorporated into the equipment to ensure that process solutions do not accidentally back up into the various utility systems. In many cases, this protection is achieved by means of process radiation detectors, which control safety interlocks as described below in Section 13.5. Other methods are employed as described here.

13.4.1 Vacuum System

The vacuum system for the building is designed to handle small amounts of radioactive solution and is located remotely in the pipe tunnel. Any contaminated solutions which might get into this system from the glove-box laboratories could be handled without difficulty. The primary place where this might occur is in the air-vacuum drive system for process pumps, in the event of pump diaphragm failures.

Protection is provided by automatic interlocks off process radiation detectors as described in Section 13.5 below.

13.4.2 Water and Steam Systems

All cooling water within the cell bank is supplied by a special closed circulating water loop which, in turn, is cooled by HFIR cooling tower water in a secondary heat exchanger. The surge tank and pump are located above the cell bank so that all lines inside the cell are pressurized at all times.

Steam jackets always constitute a possible means of getting radioactive material into steam and condensate headers and any interconnecting water systems, if corrosion of a vessel should release this material into the jacket immediately after steam pressure is turned off. Process monitors on the recirculating cooling water system and steam condensate collection tank act to minimize the effects of such an incident, as described below in Section 13.5.

The TRU facility is equipped with a process water system with a complete air break, according to ORNL standards. The in-cell fire protection lines are equipped with the special backflow preventer required by ORNL standard procedures.

13.4.3 Off-Gas System

Off-gas from all process vessels and from the cubicle vent system is scrubbed in a caustic scrubber to remove chemical fumes and radioactive iodine before it is passed through absolute filters and on up the stack.

13.4.4 Electrical and Instrument Conduits

All in-cell conduits are isolated from conduits outside the cell by either sealed bulkhead fittings or by potted sections, to ensure that the conduit does not provide a path by which radioactive material can get outside the cell.

13.4.5 Compressed Air

Compressed air is used inside the cell to operate valves; it is also used in instrument-line purge systems. In all instances, the air header is at higher pressures than the in-cell process line, thus ensuring that no active solutions can get back into the air headers.

13.5 Process Radiation Monitors and Control Functions

Process radiation monitors, equipped with alarms and, in some cases, automatic interlocks, act to provide protection against the release of radioactive materials from the cell bank. While these monitors act, primarily, to warn of and correct equipment problems, they also constitute an important supplement to the over-all personnel radiation monitoring system. These detectors serve in the following ways:

1. The vessel off-gas duct and cell ventilation duct are sampled at the stack pad by automatic gas samplers, and counting rates are recorded on strip charts at the radiation panel. "High-level" alarms are transmitted to the radiation control panel and ORNL Emergency Center. Signals also warn of operating difficulty with the filter tape drive unit in the samplers. No automatic process changes are effected.
2. A beta-gamma radiation detector strapped to the process waste line in the pipe tunnel transmits a "high-level" alarm to the control panel. A strip-chart recorder, an audible count-rate monitor, and an indicator with provisions for setting the alarm set point are located on the control panel. No automatic process changes are effected.
3. An alpha radiation detector and a beta-gamma radiation detector are located in the process waste drain manhole. Data are recorded on strip-chart recorders on the control

panel. "High-level" signals actuate alarms on the panel board and cause valves in the waste system to be actuated to divert process waste to the 500,000-gal holding basin. Valves reset automatically when the alarm condition clears. Instrument failure causes the flow to be diverted.

4. A probe is strapped on the lines for air and vacuum that drive the pumps in each of cells 4 through 7. Count rate is displayed on indicators on the panelboard. In the event that a high count rate is detected, an alarm is sounded at the control panel and 25-psig air is automatically impressed on the drive lines by simply removing electrical power from the solenoid valves that control air and vacuum.

5. The lines from outside the cell to dissolver T-70 are monitored and are provided with radiation block valves. If radiation is detected, the block valves close to prevent radioactivity from leaving the cell and an alarm on the control panel is actuated. Radiation count rate is displayed on an indicator on the control panel.

6. The return line for the recirculating cooling water is monitored for beta-gamma radioactivity. Count rate is indicated on the panel, and the alarm is actuated on "high-level." At "high-level," the circulating pump is automatically stopped.

7. Steam condensate from the cells is monitored at a collection tank in the limited-access area. Count rate is indicated on the panel, and an alarm is actuated on "high-level," which simultaneously de-energizes the condensate pump, preventing activity from being pumped to the retention basin.

8. A monitor is located on the suction line to the pump that recirculates caustic through the vessel off-gas scrubber. Count rate is recorded on the panel, and an alarm is sounded by a "high-level" signal. No automatic action occurs.

14. LIQUID WASTE

Liquid wastes, including rain runoff, sanitary wastes, process waste, and intermediate-level radioactive wastes that are generated in the TRU facility are discharged into installed waste-handling systems. High-level radioactive wastes are not usually generated. Liquids that contain enough radioactive nuclides to be considered high-level wastes probably contain valuable material that would require recovery and reprocessing. Highly radioactive liquids that need to be discarded will be diluted to intermediate-level waste and handled in that system.

14.1 Storm Sewer and Foundation Drains

Perforated vitrified clay pipe is used for subsurface drainage around the cell foundation, and discharge is by free outlet to a ditch across the road east of the building. Thus, ground water will not get into the cells.

A storm sewer system with free outlets to ditches across the roads north and east of the building carries away water collected by the roof drainage system, gutter inlets, and catch basin. A number of items of service equipment drain into the storm sewer. These are building service steam traps, air conditioning intake plenums, water heaters, chilled-water expansion tank, etc. -- essentially all the equipment in the two mechanical equipment rooms. Both the pit for the HFIR tower-cooling water pump and the elevator pit drain to the storm sewer.

14.2 Sanitary Waste System

The sanitary waste system collects biological wastes from the entire processing facility and office annex, all liquid waste from the office annex, and the shower and lavatory wastes from the main change room (105), and the women's room (101). All water fountains drain to this system. The waste flows to a septic tank that is used jointly by TRU and HFIR.

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14.3 Process Waste System

Liquid wastes that are susceptible to slight contamination are collected continuously in two 50,000-gallon capacity earth retention basins. The basins are periodically sampled and, depending on analytical results, are released to Melton Creek or pumped to the main ORNL waste treatment facility in Bethel Valley for disposal. One basin collects waste while the second is being sampled and emptied.

The following wastes are collected in a common header and monitored for beta-gamma radioactivity: process wastes from the laboratories, decontamination area, chemical makeup area, glove-box storage area, transfer area, limited-access area, operating area, recirculated cooling water system, process condensate receiver, the floor drains of limited-access change room No. 2, pipe heater C-114 in the off-gas system, checking and holdup area, the floor drains of change rooms Nos. 3 and 4, corridor floor drains, sink drains in the janitor's closet, cold checking and receiving area, and the men's change room No. 1. Activity above a predetermined value activates an alarm on the radiation panel board.

Process waste from the shower and sink drains in change rooms Nos. 2, 3, and 4 enters the same waste drain header downstream of the first monitor, and the combined flow is monitored a second time. This monitoring is for both alpha and beta-gamma radioactivity and is done in the process waste drain manhole. In the event that significant radioactivity is detected, the flow will be automatically diverted to the 500,000-gallon HFIR surge basin; otherwise, it will be discharged as usual to one of the 50,000-gallon TRU basins.

Operation of the retention basins is the responsibility of the Operations Division.

The locations of process and intermediate-level waste drains are shown in Figs. 14.1 and 14.2. Figure 14.3 presents a schematic diagram of these systems.

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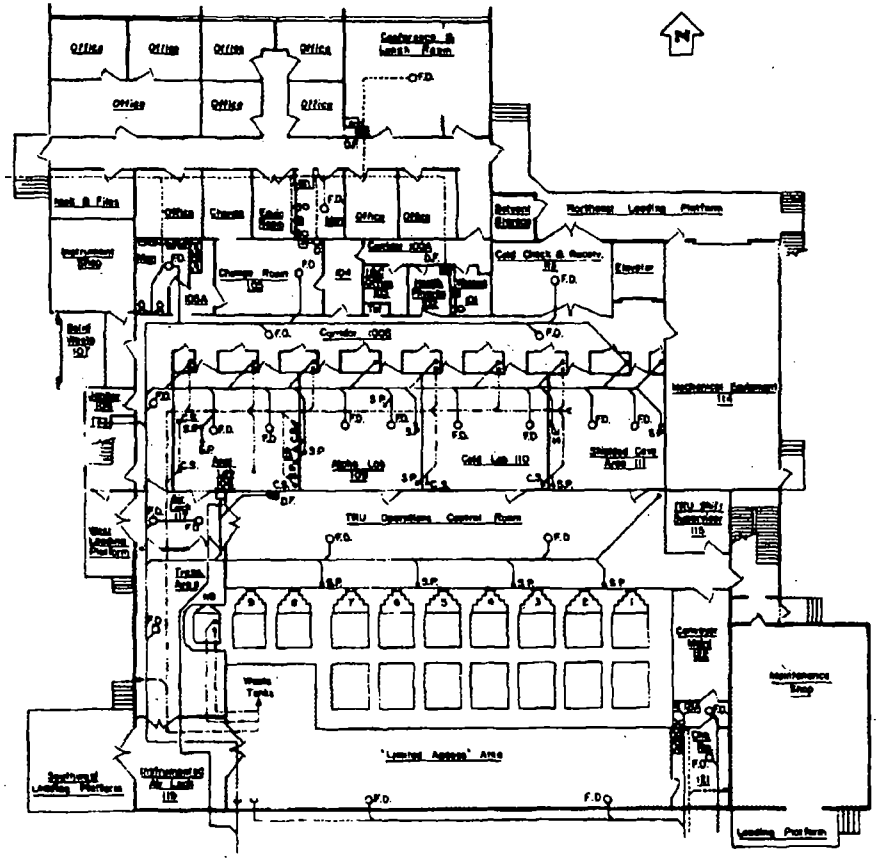

LEGEND

- Sanitary Drain
- Process Drain
- Intermediate Level Drain
- Existing Pavement
- FD Floor Drain
- CS Cap Stub
- SP Stand Pipe
- Lav. or Sink
- Urinal
- WC Water Closet
- Shower Stall

Fig. 14.1. Drain Systems - First Floor.

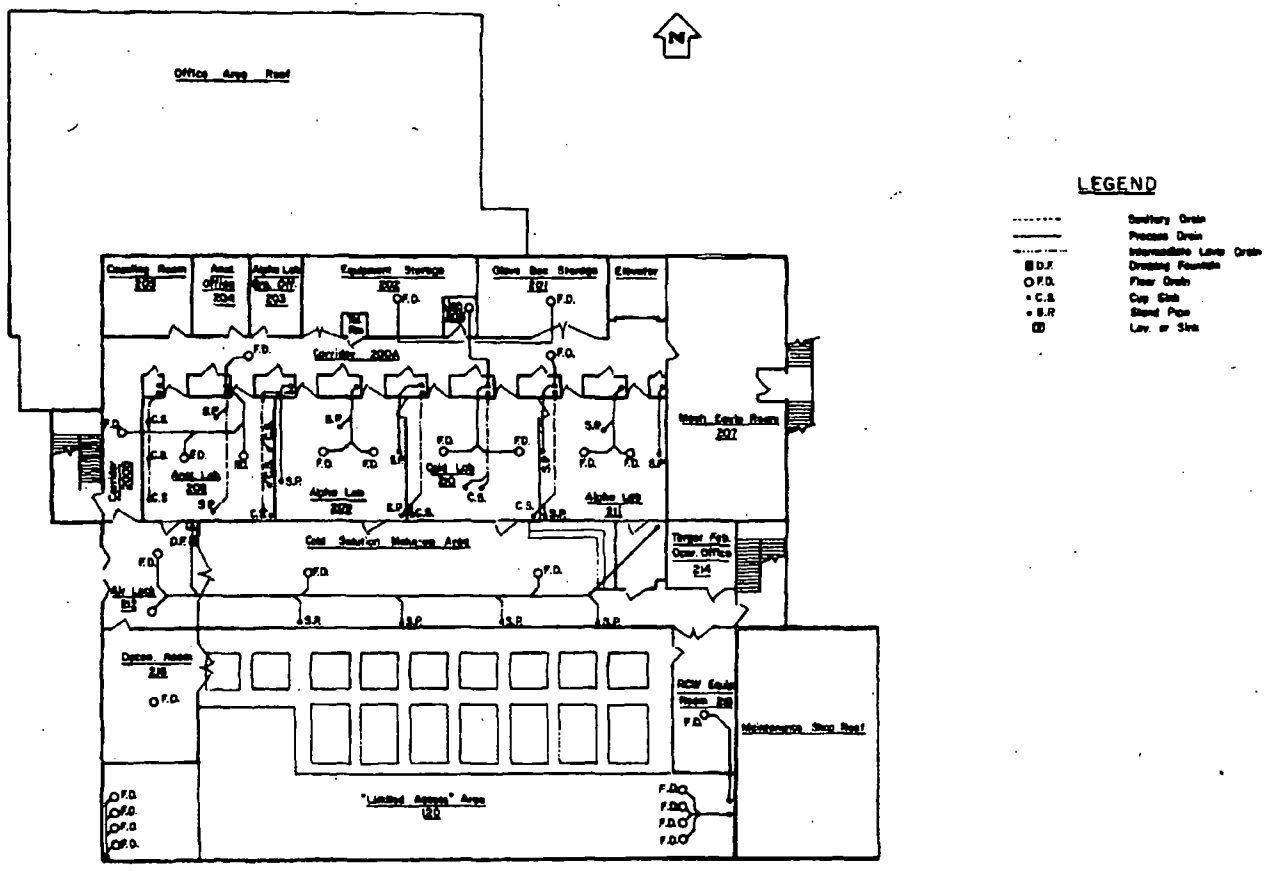

Fig. 14.2. Drain Systems - Second Floor.

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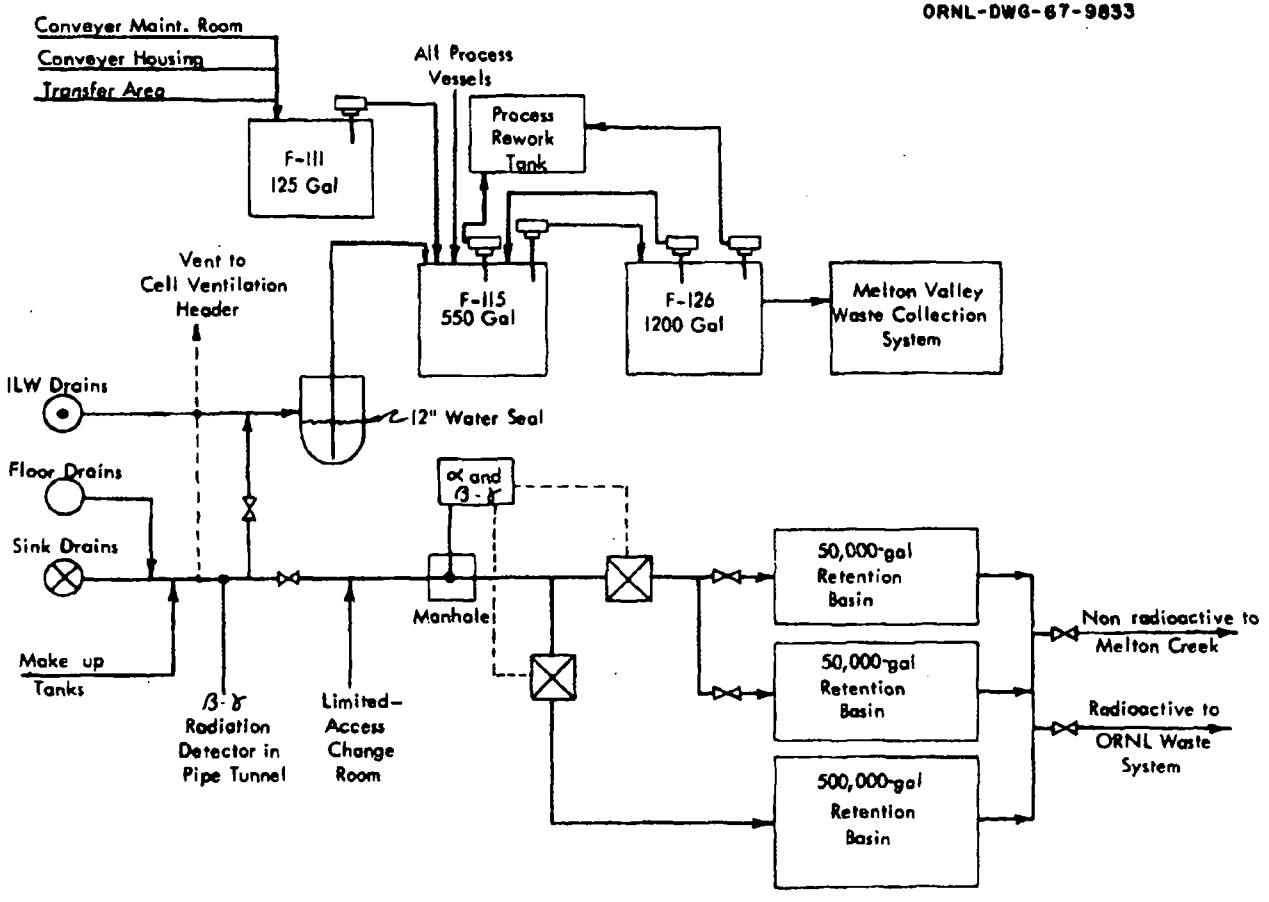

Fig. 14.3. Intermediate-Level and Process Waste Systems, Building 7920.

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14.4 System for Intermediate-Level Radiochemical Waste

Intermediate-level radiochemical waste (ILW) from the laboratories, decontamination area, off-gas header drain, vacuum system separator F-118, caustic scrubber L-131, pipe tunnel sump, vessel off-gas filter pit sump, cell-ventilation filter pit sump, cell and tank pit sumps, and the cell process waste drain header is discharged directly to collection tank F-115, which is sampled and discharged to the process waste neutralization tank F-126 or to the rework tank in cell pit 7. Following neutralization in F-126, the waste is transferred to either the rework tank in cell 7 or to the Melton Valley intermediate-level waste collection system. Neutralized waste from F-126 can also be recycled back to tank F-115.

Liquid waste from the cell transfer area and the cell conveyor housing is collected in tank F-111. After being sampled, this waste is transferred to tank F-115.

The radiochemical waste tanks are in the waste tank pit that is located behind cells 8 and 9. Tank F-111 is a 125-gal-capacity stainless steel tank that collects liquid waste from the transfer cubicle drain and the conveyor housing overflow. F-115 is a 550-gal-capacity Hastelloy C tank that is used to collect all other liquid waste that is likely to be radioactive. This includes all intermediate-level waste from building drains and all process wastes. Hastelloy C was used because of its resistance to corrosion by chlorides. F-126 is a 1200-gal stainless steel tank in which waste is neutralized and/or diluted to 5 curies/gal before it is jetted to the Melton Valley intermediate-level-waste collection station. A heel of caustic will be kept in the tank.

All three of these tanks are equipped with cooling-water jackets, liquid-level recorders, air spargers, and sampling lines.

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14.5 Disposal of Organic Chemicals

Organic waste materials are added to appropriate waste systems, depending on their radioactivity levels. Since an average of only 300 gal of organic waste will be generated per month, special disposal arrangements will not be required.

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15. SOLID WASTE

Provisions have been made for routinely handling a large variety of contaminated waste solids, including wastes generated in glove boxes, small items from the cell bank such as sample bottles, and entire equipment racks.

15.1 Solid High-Level Radioactive Waste

All solid waste that is taken from the cell cubicles will be heat sealed, either in a 10-inch plastic canister or in a large plastic bag, and then put into a 4-in.-thick reinforced-concrete container. A 4-in.-thick concrete cover will be put on the container, the cover joint will be caulked, and the container will be transported to the burial ground for disposal.

Figure 15.1 is a sketch of the solid-waste disposal station as it will be when the small plastic canisters of solid waste are being loaded. The plastic canisters are filled at the transfer cubicle, sealed, and loaded into a shielded carrier for transport to the solid-waste disposal station. An alternate top plug, equipped with a door identical to the cubicle doors, permits the disposal of an equipment rack, with complete containment being assured in all steps by use of the transfer case.

The waste disposal station provides an additional 8 inches of concrete shielding and encloses the 4-in.-thick concrete disposal container that is resting on a motor-driven turntable. A plastic bag is inserted in the disposal container and connected to a large bag ring on the bottom of the station cover. One of the plugs in the cover is removed, and the shielded carrier with the plastic canister in it is placed on top of the station. By removing the proper cover plug and by rotating the turntable to the appropriate indexing point for each transfer, it is possible to stack about 40 of the plastic containers in the disposal container. After a loading operation is completed, the carrier is removed and the plug is replaced.

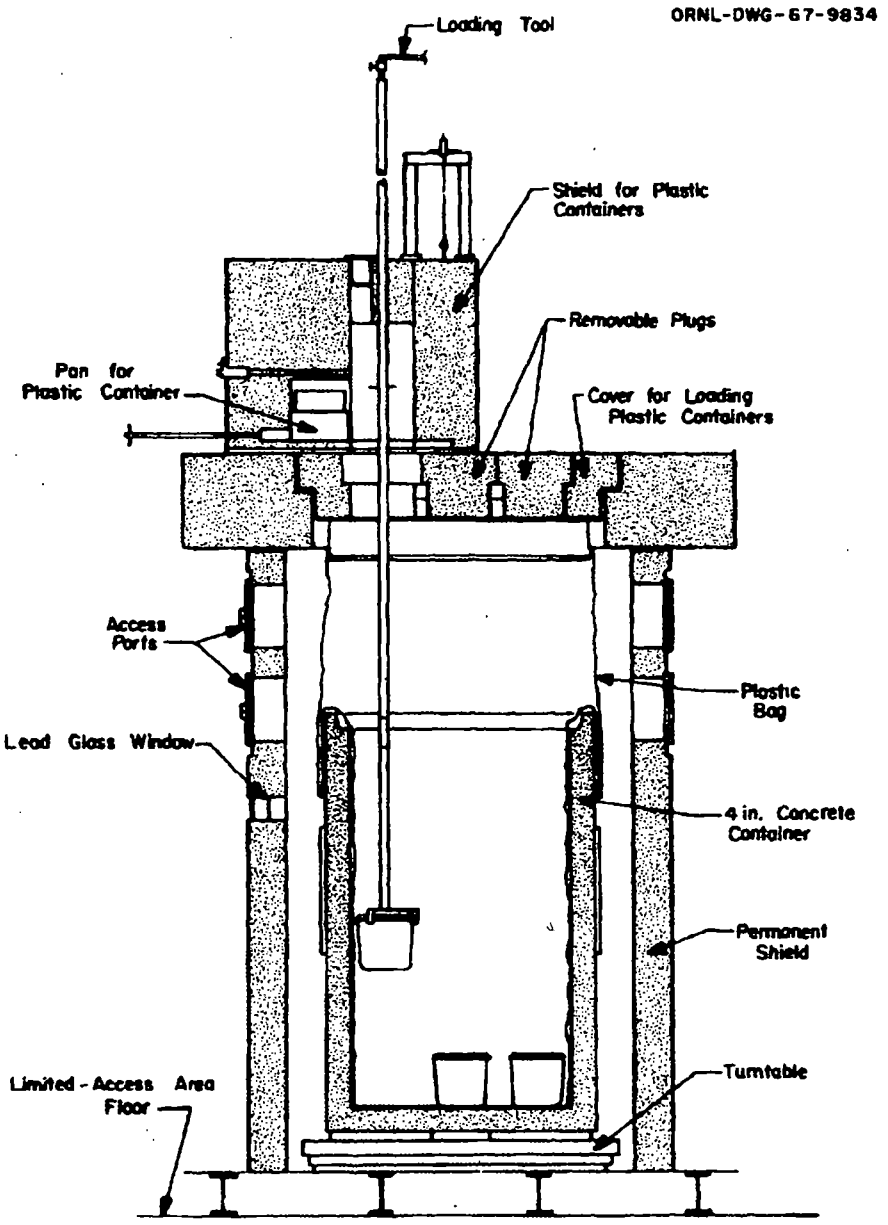

Fig. 15.1. Disposal Station for Solid Waste.

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When a concrete disposal container becomes full, or when an empty container is required for the disposal of a large piece of equipment (an equipment rack will completely fill a concrete container), the plastic bag is sealed, a concrete cover is installed, and the cover joint is caulked. The container is then removed from the station, using metal-web slings, checked for contamination, and transported to the burial ground.

The plastic bag is sealed by rotating the turntable to twist the bag into a shape that can be heat-sealed by injection molding of a plastic plug at the small point of the twisted bag. The bag is severed at this point and the upper portion of the bag seals the bottom of the top plug. After a new bag is installed, this upper portion of the old bag is dropped into it.

Both the interior of the station, outside the concrete container, and the interior of the plastic bag are continuously vented to the cell ventilation system. Proper adjustment of vacuum on both sides of the plastic bag by means of hand throttling valves will assist in the manipulation of the bag and, at the same time, ensure that proper containment is maintained.

The alternate disposal station cover, used for loading waste from the transfer case, is also concrete; however, instead of removable plugs, it has a hatch similar to that of a cell cubicle. The method of loading an equipment rack into the disposal station is the same as that of loading a rack into a process cubicle.

Loading and sealing a plastic canister are accomplished by putting the canister (with cover) into the shielded transfer-area carrier. A rod that penetrates the carrier shield is used to position the canister (in a pan connected to the rod) under the disposal port in the transfer area. This port is similar to the cubicle-intercell conveyor access door. The plastic canister is pressed against the bottom of the transfer-area disposal port, the canister cover and disposal port door are locked together, and the door is opened. After waste or other material is put into the canister, the door is closed, the canister cover is unlocked from the door, and the canister is dropped away from the bottom of the

transfer area. The heat sealer is inserted between the transfer area and the canister, and the canister is pressed against the heat sealer. Heat is applied to the plastic canister and cover until the plastic is melted enough to allow the canister elevator to move up about an inch, at which point the seal is complete. The canister is then withdrawn into the carrier for disposal.

For transferring items between the transfer area, shielded cave, or decontamination glove box, the sealing step may be omitted.

15.2 Solid Low-Level Radioactive Waste

A yellow dumpster is provided in room 107 for disposal of solid low-level radioactive waste. The dumpster will be used, primarily, for waste from the laboratories and from the analytical chemistry cells. Waste from the processing cells will normally be handled as high-level waste.

A Health Physics survey is required before any material is placed in the dumpster. An area monitron in the dumpster room will alarm if the radiation level becomes excessive.

16. GASEOUS WASTE

A vessel off-gas system discharges gaseous waste from process vessels, cell cubicles, and the plant vacuum system through a caustic scrubber and filters to the HFIR stack. Cell ventilation and glove-box ventilation systems discharge gaseous waste from alpha glove boxes and purge air from the processing cells through filters to the HFIR stack. These systems are shown schematically in Fig. 16.1. The 250-ft-tall HFIR stack has a capacity of 60,000 cfm of air.

16.1 Vessel Off-Gas and Cubicle Ventilation

16.1.1 Vessel Off-Gas

Vessels in the cell and waste tank pits are connected to a 1-1/2-in.-diam Zircaloy-2 header that runs through the cell bank to the caustic scrubber. An off-gas header from the laboratories (2-in.-diam fiberglass reinforced epoxy resin) and the recirculated-cooling-water surge tank header have separate pressure control stations to permit maintaining these areas at different pressures from the rest of the system. Off-gas headers in the chemical makeup area and decontamination room (both 2-in.-diam epoxy resin) tie directly to a 10-in.-diam Hastelloy C line to the scrubber. The cubicle ventilation header also ties to the 10-in.-diam Hastelloy line. Pressure at the scrubber inlet is automatically controlled at −10 in. water (gage) by adjustment of a valve in the suction line to the off-gas fans. The valve fails open to cause a vacuum of about −14 in. water (gage) in the system. The recirculating cooling water surge tank is controlled at −2 in. water (gage) with respect to the operating area, and the pressure in the header to the laboratories is kept at about −9.7 in. water (gage) with respect to the laboratories. The control valves for both of these systems will fail open to allow a full vacuum to be applied to the systems.

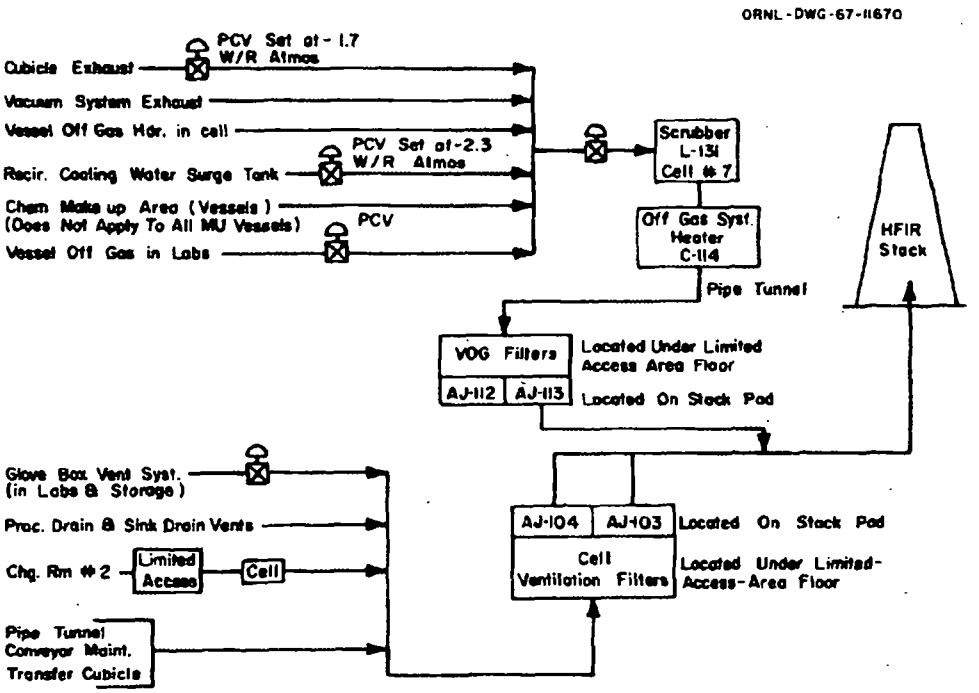

Fig. 16.1. Schematic Diagram of Off-Gas and Ventilation Systems.

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16.1.2 Cell Cubicle Ventilation

Each cubicle has a system (Fig. 2.7) that circulates air at 350 cfm from the cubicle, through absolute filters, past cooling coils (cooled by recirculating cooling water), and back into the cubicle through a backflow preventer. This system removes cubicle heat that is generated by process equipment and cubicle lights. Each cubicle is purged with from 5 to 50 cfm of air from the cell in which the cubicle is located. This air enters the recirculation duct through an absolute filter. The purge rate is adjusted, using a manual damper in the intake duct -- thus, the purge capacity of 50 cfm is constantly available in case it is needed to prevent a pressure rise in the cubicle. A single exhaust line from each cubicle is tied into an 8-in.-diam fiber-glass-reinforced epoxy resin header that runs through the cells to the caustic scrubber. A pressure controller actuates a valve in the cell cubicle ventilation header to maintain the header at a pressure of −0.3 in. water (gage) with respect to the cell ventilation system. The valve will fail open to cause a vacuum of more than 0.3 in. water (gage) in the cubicles. The cubicles have been evacuated to 10 in. water (gage) without damage.

16.1.3 Caustic Scrubber

The scrubber, located in cell pit No. 7, is a packed tower 2 ft in inside diameter and about 10 ft high. The packed section, 5 ft high, is filled with 1-inch stainless steel Pall rings. Above the liquid distributor is a 4-in.-thick Yorkmesh demister, also of stainless steel. The upper portion of the tower is stainless steel, while the lower portion, including the support plate, is Hastelloy C. The bottom portion of the tower is a reservoir for the caustic, which is recirculated to the tower by either of two recirculating pumps. Makeup caustic and water are added through nozzles either above or below the demister.

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A recent study of the scrubber, made to determine optimum operating conditions, indicated that iodine and HCl will be removed from up to 650 cfm of air with a decontamination factor of from 150 to 500. Normal flow rate is 500 cfm.

16.1.4 Filters

The filters in the exhaust of the vessel off-gas system are located in two removable filter enclosures in a filter pit under the floor of the limited-access area. Each of the steel enclosures holds one roughing and two absolute filters arranged in series. One of the enclosures will be in service, and the other will be an installed spare.

Pressure drop across the roughing filters and across the absolute filters is indicated on magnehelic gages in the limited-access area. Taps for making tests of filter efficiency using dioctylphthalate (DOP) are located in the ducts upstream and downstream of the filter pit.

The enclosures are airtight and are provided at the entrance flange with metal sliding plates to contain contaminated material when the enclosures are removed. Used enclosures are withdrawn into a shielded carrier for transportation to the burial ground, where the entire enclosure is discarded.

16.1.5 Pressure Control Instruments

The pressure at the scrubber inlet is maintained at −10 in. water (gage) by a normally-open air-operated control valve located on the stack pad. A flow switch in the fan discharge line senses loss of flow and energizes the motor on the alternate fan.

16.1.6 Off-Gas Fans

Each of two fans has a capacity of 750 cfm at a suction pressure of 34 in. water (gage). They are to be used alternately and are connected to separate emergency power supplies (HFIR normal-emergency No. 1 and No. 2).

16.2 Cell and Glove-Box Ventilation

16.2.1 Glove-Box Ventilation

Purge air is introduced into the glove boxes in the alpha laboratories through absolute filters. An exhaust duct system in laboratories 108, 109, 111, 208, 209, and 211, and in the glove-box storage area 201, is discharged into the cell ventilation filter facility upstream of the filters. The pressure in the duct is maintained at −0.3 in. water (gage) with respect to the static pressure in the first-floor laboratory corridor by an automatic control valve in the duct. A vacuum relief device that is operated by a solenoid valve and an air-operated valve limits glove-box pressure to −2 in. water (gage) to prevent glove-box collapse. The relief valve will open full if there is an air failure. The solenoid valve receives its power from the power supply for the radiation detection system, which is connected to the HFIR No. 1 normal-emergency power system.

16.2.2 Cell Ventilation System

Normal Operation. — Purge air is drawn through a roughing filter and backflow preventer into each cell and the pipe tunnel from the limited-access area. The inlet duct will handle 100 cfm at the expected operating pressures; however, manual dampers and flow measuring devices are provided at each cell for setting the purge rate to a lower value. Air is supplied to the limited-access area at a maximum rate of 6750 cfm by building supply system No. 2.

Maintenance Operations. — During maintenance operations, with a cell roof plug (maximum opening, 7 x 9 ft) removed, additional air is made available to maintain a minimum face velocity of 100 fpm across the roof plug opening.

16.2.3 Cell Ventilation Filters

Cell ventilation filters are enclosed in four steel enclosures that are similar to the off-gas filter enclosures. In each enclosure, there are three roughing and six absolute filters that are arranged to give three parallel paths through one roughing and two absolute filters. However, two enclosures are required to handle normal ventilation flows, and all four must be onstream when a cell roof plug is off. The same carrier will be used to handle these enclosures, and the ducts and enclosures have the same kind of sealing plates as the VOG enclosures. The entire enclosure will be discarded with the used filters. Pressure taps and DOP test taps are provided, and pressure drops are indicated by magnehelic gages in the limited-access area.

16.2.4 Process Drain Vent

All vent stacks in the process drain system discharge into the ventilation filter plenum.

16.2.5 Cell Ventilation Fans

There are two 13750-cfm-capacity ventilation fans. Either fan will provide the required ventilation. Both are connected to separate emergency power supplies (HFIR normal-emergency No. 1 and No. 2).

16.2.6 Pressure Control Instruments

The pressure in the ventilation duct is maintained by an automatic damper. A flow switch in the blower discharge line senses loss of flow and energizes the motor on the alternate blower.

17. PROCESS HAZARDS

17.1 Containment and Shielding

The Transuranium Processing Plant was designed and evaluated for safety with the use of containment criteria and calculational methods that have become standard at ORNL. The cells and the building constitute primary and secondary containment, respectively, for radioactive materials in vessels and cubicles within the cells. The glove boxes and the building constitute primary and secondary containment, respectively, for α-active materials in glove boxes. The laboratory rooms provide an additional containment barrier within the building. Filtered air flow is from normally nonradioactive areas to progressively more radioactive areas. Air from the glove boxes, cell cubicles, cell vessels, and the building area around the cells is discharged through separate ventilation systems, which contain double "absolute" filters, to a 250-ft stack. The air from the laboratories and the building area around the laboratories exhausts through absolute filters to the roof of the building.

A more complete discussion of the shielding of penetrating radiation and of containment and ventilation features will be found elsewhere in this report.

17.2 Operational Release of Radioactivity

17.2.1 Airborne Activity

Rare gases and halogens (from dissolution of irradiated targets and spontaneous fission of californium) and miscellaneous aerosols containing actinide elements and fission products will be released in small quantities through the vessel, cubicle, and glove-box ventilation systems to the 250-ft stack during routine operation. The effects of the maximum anticipated rates of release of these materials (Table 17.1) were calculated, using standard techniques and a deposition velocity of

Table 17.1 Effects of Operational Release of Radioactive Gases and Aerosols from TRU

Source and Type of Release	Activity Release Rates: Type of Activity	Maximum Release Rate (curies/sec)	Average Annual Release Rate (curies/day)	Ground Dose Rate or Concentration Downwind: Max. Avg.[a]	Peak[b]	Max. Avg.[c] Annual	Ground Deposition (dis/min·100 cm^2): Maximum	Max. Avg.[c] Annual
Batch dissolution of HFIR target (averages once every week) releases 40 curies of ^{133}Xe and 1 curie of ^{131}I over several minutes.	^{133}Xe ^{131}I	0.1 0.0025	5.4 0.14	0.25 mr/hr 250% $(MPC)_a$	25 mr/hr	10^{-6} mr/hr 10^{-2}% $(MPC)_a$	- 4400	- 100
Continuous release of rare-gas fission products by 100 watts of spontaneous fission in Cf (removal rate before filtration, 1.67×10^{-4} sec^{-1}).	Xe and Kr	0.0025	220	0.05 mr/hr	5 mr/hr	0.001 mr/hr	3000 Predominantly ^{138}Cs	8 73% ^{137}Cs 20% ^{89}Sr 1.1% ^{90}Sr 2.0% ^{91}Y 3.6% ^{141}Ce
Continuous production of actinide and fission product aerosols by handling operations.	Alpha-emitting actinides. Traced with ^{242}Pu, ^{244}Cm, or ^{252}Cf.	10^{-10}	10^{-5}	0.2% $(MPC)_a$	--	0.005% $(MPC)_a$	--	4.9
	Nonvolatile FP's, 10d < $T_{1/2}$ < 1 yr	10^{-8}	10^{-3}	4×10^{-5} mr/hr	0.004 mr/hr	--	270	80

[a] Maximum value over several minutes to several hours of unchanging weather conditions.

[b] Maximum value of very short duration peaks of statistical fluctuations.

[c] Maximum value averaged over yearly weather conditions.

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0.02 m/sec for particles sufficiently small to pass through absolute filters. The calculated concentrations and depositions are considered to be within the present permissible levels for the confines of ORNL.

17.2.2 Activity Discharged in Liquids

The liquid waste system is discussed in another section of this report.

17.3 Accidental Release of Radioactive Materials

There are three prominent types of accidents that could conceivably occur in the Transuranium facility and that would result in the release of radioactive materials to the environment or subject operating personnel to excessive radiation exposure. The nuclear excursion is not a possible hazard because the total quantities of fissile material that are processed, or will be accumulated, cannot approach a critical mass.

17.3.1 Glove-Box Rupture

Loss of containment by fire or explosion is discussed in the sections dealing with glove-box operations.

17.3.2 Fires

The entire building and all the laboratories are equipped with sprinkler systems in keeping with the Atomic Energy Commission's existing policy. In addition, the cells and cell cubicles are provided with sprinklers designed to serve also as decontamination sprays. All ventilation exhaust ducts and filters are of the accepted fire-resistant high-temperature type.

The structure is designed and constructed to conform with NFPA Code requirements insofar as it conforms with specific requirements to provide radiological safeguards in accordance with ORNL radiation and safety criteria.

Fires within the cell bank provide the potential for dispersing large amounts of α- and neutron-active materials. The organic diluents used for processing active materials were selected for their relatively high flash point, and the equipment and cubicles will be operated at a temperature below this flash point. The possibility of vapors accumulating to form an explosive mixture is eliminated by the large cubicle and cell ventilation exhaust system, which will dilute organic vapors and hydrogen well below the explosive limits.

From time to time it will be necessary to clean accumulated solids and films out of the solvent extraction equipment. For this purpose it is necessary to use ethanol in the Tramex equipment, and acetone in the Pharex and Berkex equipment. The equipment, including catch tanks, will be well flushed of active material and cooled to cubicle temperature before beginning the cleanout, and again well flushed of these volatile solvents before returning it to normal service. There is no hazard to the waste system, as these solvents will be diluted many-fold with various aqueous solutions before they arrive at the tank farm.

17.3.3 Chemical Explosions

The credible types of chemical explosions are radiolytic gas and nitrated organic explosions inside a process vessel within a cell. It is not credible that an explosive mixture could occur in the cell air since the ventilation rate is sufficient to dilute the organic vapor content below the explosive limit. Further, the cell air temperature will be controlled below the flash point of the organic materials used in processing.

Gas Formation by Radiolytic Decomposition. — Radiolysis of solutions containing HCl causes a destruction of acid and a release of hydrogen gas. The volume of gas thus released is always very small and is of no

concern in itself. The difficulty lies in the possibility of its forming an explosive mixture (see below). Radiolysis of the HCl has been repeatedly determined to be about 0.00067 eq/whr (G_{HCl} value = 1.9). If the missing H^+ ions are all converted to gaseous H_2 (and this is believed to be the case), the release rate would correspond to 0.35 ml of H_2 per minute per gram of ^{244}Cm (or an equivalent amount of another α-emitter). Since every storage vessel is equipped with at least three instrument lines that are purged at a rate of 0.2 cfh each, such a vessel can contain up to 32 g of ^{244}Cm or 2.3 g of ^{252}Cf without the off-gas composition exceeding 4% hydrogen. In the event that it is necessary to store larger amounts in one vessel, the purge rates will be increased proportionately.

Decomposition of HNO_3 solutions follows a completely different mechanism. In this solution, loss of acid is almost undetectable and hydrogen evolution is reduced about sevenfold to 0.05 ml per minute per gram of ^{244}Cm. Thus, 224 g of ^{244}Cm can be stored in one vessel in nitric acid solution without the vapor space exceeding 4% H_2 at regular instrument purge rates.

Gas Formation During Aluminum Dissolution. — Dissolution of aluminum in either base or acid produces hydrogen. The normal dissolution in HCl is controlled at a rate of 1 g/min, and the resulting hydrogen is diluted to 2% by a special 2.0-cfm air purge, in addition to instrument purges. The establishment of this air purge depends upon administrative control, that is, it is included on the dissolution checksheet. If for some reason the purge is omitted, the normal instrument purges would mix with the evolved H_2 and generate a mixture of 81% H_2--4% O_2--15% N_2. Also, by maloperation, an excessively high acid concentration could be added to the dissolver, or a runaway temperature could be caused by a failure of the recirculating water pump. In either case the maximum dissolution rate expected is about 50 mg/cm^2-min, as indicated in Section 4.6.1. HFIR targets have a surface area of about 1000 cm^2, so that the maximum dissolution rate would be about 50 g/min.

Hydrogen evolution would be about 1.5 cfm (not enough to pressurize the dissolver, but it could form a mixture of 50% H_2 with the purge air (see below for a discussion of explosion).

Dissolution in NaOH--$NaNO_3$ also produces hydrogen, but at a much lower rate (see Section 4.6.2). The design conditions should result in a dissolution rate of about 7 g/min. At this rate the hydrogen evolution will match that in the normal HCl dissolution and will be diluted to 3% H_2 by a 1.5-cfm air flow.

Abnormally high dissolution rates could result from adding stronger caustic than called for (5.2 M) or adding a larger volume and hence immersing the target more than the intended six inches. These possibilities will be guarded against by the usual check sheets. If this precaution fails, the gas release will still not be great enough to pressurize the vessel, but will increase the explosion hazard.

Hydrogen Explosions. — Several sources of hydrogen were discussed above, and the statement was made that under normal operating conditions the hydrogen produced would be diluted to less than 4%, the lower explosive limit. However, abnormal conditions that result in concentrations greater than 4% would not necessarily result in an explosion. A spark or an open flame is necessary to set off the mixture, and neither of these will normally be present in the piping. The explosive mixture could cause rupture of only the dissolver and the condensate receiver.

In either of the above vessels, the reaction of the stoichiometric mixture of air and hydrogen will result in a constant-volume pressure rise to 150 psig. If the dissolver should rupture, the escaping gas will raise the pressure in the cubicle by 12 in. H_2O, or to 10.6 in. H_2O greater than that of the operating area. If the condensate receiver (which is located in the cell pit) should rupture, the cell will be pressurized by 14 in. H_2O. Neither of these occurrences will result in a breach of containment, although considerable damage to equipment will result.

In any other vessels it is very unlikely that enough hydrogen can collect to cause an explosion. The off-gas manifold in the cells is a 1.75-in.-diam Zircaloy-2 tube which has a bursting pressure in excess of 9000 psi. The gases are diluted by 50-500 cfm of air in the caustic scrubber. This will reduce the hydrogen concentration to below the explosive limit.

Nitration Explosions. — In the process of adjusting feed for the Berkex and Cefix processes, the feed is evaporated to a very small volume. The nitric acid concentration increases to that of the constant boiling mixture, which is a very powerful nitrating and oxidizing agent. Organic materials are inevitably entrained in these solutions, and the possibility of nitrate explosions is very real. The diluent (Amsco 125-82) tends to steam distill in the earlier part of the evaporation, leaving the extractant residues behind. The situation is not unlike that in the product evaporator in the uranium reprocessing cycle. However, there are several ameliorating factors. No amines or phenol will be present, as was the case with the decontaminating agent that caused the violent reaction in Building 3019. The steam pressure will be reduced to the minimum necessary to accomplish the evaporation (about 20 psig). And finally, if there is a nitration reaction of the di(2-ethylhexyl) phosphoric acid or 2-ethylhexyl phenylphosphonic residues, the severity will be considerably moderated by the longer chain length of the alkyl groups (as compared with TBP). It is to be noted that an explosion of 0.22 lb of nitroethane would be the equivalent of the hydrogen explosion described on the preceding page, and significantly larger amounts of nitrooctane would be required for the same energy release. The vessels used here are quite small, and it is very unlikely that enough nitrated residue could accumulate to cause trouble.

The product of the Tramex cycle, which might contain residues of amines and aromatic diluents, will be boiled only with HCl, a procedure that has been repeatedly demonstrated to be safe.

17.4 Decontamination Hazards

Experience in the Curium Recovery Facility has shown that small equipment of the size used there and in TRU can usually be flushed sufficiently free of activity to permit extracting the equipment into a contained but unshielded transfer case. Within the transfer case, further decontamination and/or repair can be accomplished by standard glove-box techniques. The access time will be based on surveys of both beta-gamma radiation and neutron radiation.

In the event of accidental release of alpha contamination into an operating area, the cleanup squad will wear assault masks and double coveralls, with taped gloves and boots, until the area can be adequately surveyed and the actual extent of contamination ascertained. Each cleanup will be carried out under the supervision of skilled, experienced personnel.

17.5 Maximum Credible Accident

The worst accidents that may credibly occur in TRU would result from dispersal of the maximum quantity of radioactive material in a cell or glove box by a fire or explosion.

Our studies have shown that, in the event of credible (contained) accidents, the activity released from successive leaks through the primary and secondary containment walls is insignificant as compared to the credible release through the ventilation filters. In a credible accident, the blast effects of an explosion are confined to the region of primary containment (glove box, laboratory, or cell). Although a radioactive aerosol may leak through the primary containment wall and become mixed with the air in the secondary containment zone (building) during the period when the primary containment zone is pressurized, the leaked air is ordinarily not sufficient to raise the secondary containment pressure above atmospheric.

The so-called "AEC absolute" filters that are widely used in radiochemical plants are the weakest link in the containment of credible accidents. The susceptibility of the filters to both physical

and chemical degradation necessitates that their integrity and efficiency be assured by routine in-situ testing or by preplacement testing plus careful installation and operation. The filters must be protected from excessive corrosion and excessive loadings of dust or water and must be located so that they can withstand the blast wave from credible explosions without rupture. In typical facilities the tortuous path and expansions and contractions of the ventilation duct are sufficient to reduce the blast wave from credible explosions to a tolerable level at the filters.

In the evaluation of the credible accidents in TRU, it is assumed that no more than 20% of the radioactive aerosol that is dispersed in the primary containment zone passes to the filters and that the remainder is deposited on the walls and ventilation ducts. The fraction of aerosol penetrating the filters is estimated from the assumed particle size distribution in the aerosol and the efficiency of the filters as a function of particle size.

Experience with AEC absolute filters operating at the rated flow indicates that they have greater than 99.95% efficiency for removing particles of size greater than 0.3 micron, that the efficiency decreases to a minimum of approximately 87% for particles of 0.05 to 0.1-μ size, and that the efficiency is greater than 87% for particles of smaller size. These filters are approximately 99.5% efficient in removing smoke from a plutonium metal fire, varying in size from 0.004 to 0.03 μ, and the addition of one to six backup filters in series does not significantly improve the efficiency.

In these studies it is assumed that filters have removal efficiencies of 99% for particles smaller than 0.05 μ, 87% for particles 0.05 to 0.1 μ, 95% for particles 0.1 to 0.3 μ, 99.95% for particles 0.3 to 5 μ, and 100% for particles larger than 5 μ. Smokes from fires of metal, solid carbonaceous materials, or organic liquids which would be predominantly 0.01 to 0.1 μ in size are assumed to be 99% removed in filters. This slightly enhanced efficiency, as compared to 87%, partially compensates for the effects of agglomeration

in the duct and improved efficiency because of filter loading in moderately large fires involving carbonaceous solids or organic liquids.

The maximum credible accident in the glove-box laboratories of TRU would result from an explosion and fire in a glove box that contains 1 g of ^{244}Cm, the maximum quantity anticipated to be used in glove boxes. Such an accident could result in the dispersal of <1 g ^{244}Cm into the laboratory, requiring that glove-box operators evacuate immediately to prevent ingestion of a lethal dose. Allowing for 80% deposition of the smoke in the glove box and laboratory, and assuming that the filters are only 99% efficient in removing the smoke, approximately 2 mg of ^{244}Cm would be released from the roof of the building through the filtered ventilation systems. This release could cause maximum downwind ingestion doses (accumulated over a lifetime) of approximately 2 rem and contamination of approximately 8.5 square miles downwind to levels greater than 30 dis $min^{-1}dm^{-2}$ of alpha.

While absolute prevention of such glove box ruptures is impractical, the probability of such accidents will be maintained at an acceptably low value by inclusion of the multiple safeguards which were described in Sections 10.3 and 10.4.

The maximum credible accident in the cell area would be an explosion (of Al-air, H_2-air, or organic-air) in a cell cubicle containing 1 g of californium as fine powder. The explosion could have sufficient violence to shatter the vessel or cubicle and scatter its contents within the cell but would not rupture the cell wall or ventilation filters. The californium released through broken "alpha" seals in the cell wall into the building might cause lifetime doses to operating personnel of approximately 1 rem. Assuming a conservative particle size distribution (98.8% ≈ 0.3 μ, 1.1% between 0.1 and 0.3 μ, and 0.1% less than 0.1 μ) and assuming 80% removal by deposition before the filters, 0.2 mg of Cf could be released through the cell ventilation system to the 250-ft stack. This could cause maximum downwind doses (accumulated over a lifetime) of approximately 0.2 rem and contamination of approximately 6.5 square miles downwind to levels greater than 30 dis $min^{-1}dm^{-2}$ of alpha.

The possibility of such dispersive accidents is minimized through inclusion of multiple safeguards. Organic vapor explosions in vessels will be prevented practically by maintaining the organic material below its flash point and omitting possible sources of ignition. Hydrogen generated in radiolytic gas and dissolution operations will be diluted with air to ensure that the concentration is not in the explosive range.

It is not credible that an explosive mixture could occur in a significant portion of an entire cell since the ventilation rate is sufficient to effectively dilute, below the explosive limit, any organic vapor or hydrogen that is produced at the maximum credible formation rates.

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Source Document Reference Information (author(s), document and revision number, date, publisher): NA, RH-REF-OP-014, Rev. 3 (Older Versions Included), 10/01/2015, TWPC	

AK # [b]	Source Doc. Page #[c]	AK Information Summary
PR8, S2	Throughout	*This procedure provides instruction for pumping groundwater from casks and absorbing other* incidental and containerized liquids found during processing of Remote Handled (RH) waste in the Hot Cell at the TRU Waste Processing Center (TWPC). This procedure includes the following steps: Preparing for Groundwater Absorption Processing Saturated Waste Transferring Pumpable Quantities of Containerized Liquids Absorbing Containerized Non-Residual Liquids Processing Free Liquids in Cask Absorbing Residual and/or Incidental Mercury No specific chemicals were called out in the steps of this procedure. The procedure is directed towards absorbing liquids, so generic statements of "absorb with an approved absorbant" are stated, but the specific absorbant used is not called out. The procedure also discusses the clean up of a mercury spill, however, mercury is not specifically called out and cannot be traced to any waste streams from this procedure. The procedure was originally named RH-P-OP-014 and was superseded by RH-REF-OP-014. The revision numbers were reset to zero. RH-P-OP-014: Revision 0 (Dated 11/25/2008): Preparing for Liquid Absorption: • LL-A-OP-010, NTS WAC, Mixed Low Level Waste Profile, provides a list of approved absorbents. • If processing waste from casks which contain groundwater, initiate an Attachment P, Debris Waste Treatment in T-4 Hot Cell Table, of CM-P-RP-309, Environmental Permits – Inspections/Monitoring and Reporting for each drum receiving absorbed liquid waste. • If processing waste from casks which contain groundwater, ensure an intermediate container (e.g., 55-gallon drum, 5-gallon bucket, etc.) with

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DATE REC'D 2/9/16

Attachment 3 - Acceptable Knowledge Source Document Summary (continued)

Site(s): Oak Ridge National Laboratory		Source Document Tracking Number: P590
AK # [b]	Source Doc. Page #[c]	AK Information Summary
		appropriate secondary containment is available for collection of pourable/drainable quantities of groundwater from waste packages. • Place absorbent liner pad(s) or other approved absorbent material onto the Hot Cell work table and into secondary containment pan(s). Processing Incidental Liquids / Saturated Waste: • When removing waste from the cask allow groundwater to drain back into cask to the extent possible. • Drain pourable groundwater quantities from the waste into an intermediate container to the extent possible. • Place the waste on absorbent pads or approved absorbent material placed on the Hot Cell work table or floor of the Hot Cell. • Absorb quantities of incidental liquids from the waste on the Hot Cell work table as applicable, ensuring no free liquid, including droplets, are present. • Transfer wetted absorbent liner pad(s) or approved absorbent material to the appropriate waste container. • If waste processing is completed for a drum, complete the applicable Attachment P, Debris Waste Treatment in T-4 Hot Cell Table, in accordance with CM-P-RP-309, Environmental Permits – Inspections/Monitoring and Reporting for the completed drum. Transferring Pumpable Quantities of Containerized Liquids: • Remove the containerized liquids from the cask. • Transfer pumpable quantities of the liquid to the intermediate container. • Once the source container has been emptied of pumpable quantities of liquid and waste, absorb incidental quantities of liquid in the container using an absorbent liner pad or approved absorbent material. • If liquid was spilled or dropped on the Hot Cell floor or work table during the container or liquid transfer, wipe up or absorb the liquid with an absorbent liner pad or approved absorbent material. • Transfer wetted absorbent liner pad(s) or approved absorbent material to the appropriate waste container (e.g., RH or Contact Handled waste drum). Absorbing Containerized Liquids: • If not already removed from the cask, remove the containerized liquids from the cask. • Estimate the volume of liquid to be absorbed and stage an appropriate volume of approved absorbent material on the Hot Cell work table. • Inspect the original container to determine if it is acceptable for use for final processing of the containerized liquid. • If the original container is not acceptable for use, or the container contains greater than 1-liter of liquid, place a closeable container with approved absorbent material into a secondary containment pan.

Attachment 3 - Acceptable Knowledge Source Document Summary (continued)

Site(s): Oak Ridge National Laboratory		Source Document Tracking Number: P590
AK # [b]	Source Doc. Page #[c]	AK Information Summary
		• Pour no more than 1-liter of liquid into a closeable container of approved absorbent material or, if sufficient space is available and liquid volume is less than 1-liter, pour approved absorbent material into the original container. • Ensure liquid is thoroughly mixed into the absorbent for at least one minute. • To absorb incidental non-pourable liquids in the original container, pour approved absorbent material into the container. • To ensure contact, operators may use tools such as stir sticks, spatula, paint cans, etc., or shake, agitate or "massage" the container. • If the processed batch of liquid is to be transferred into a waste container which contains previously processed liquids which are potentially incompatible, allow the batch to cure for at least one hour. • Waste shall be placed into a container of same waste stream. • Batches of liquids processed from different containers (i.e., potentially incompatible liquids) must be allowed to cure prior to transferring the waste into final waste packages to prevent hazardous reactions if inadvertently mixed. • Complete Attachment O, Miscellaneous Treatment Inspection Items, of CM-P-RP-309, Environmental Permits – Inspections/Monitoring and Reporting. Processing Free Liquids in Cask: • Transfer pumpable quantities of groundwater to the designated container(s). • Free liquids found in casks in the Hot Cell are primarily groundwater; only a small residual amount of flammable liquids were packaged as waste in the concrete casks. Pumpable quantities of groundwater in casks are pumped into intermediate containers inside the Hot Cell or containers staged outside the Hot Cell for return to Oak Ridge National Laboratories. • Once the cask has been emptied of pumpable quantities of groundwater and waste, absorb residual quantities of groundwater in the cask using an absorbent liner pad or approved absorbent material. • If groundwater was spilled or dropped on the Hot Cell floor or work table during the groundwater transfer, wipe up or absorb the groundwater with an absorbent liner pad or approved absorbent material. • Transfer wetted absorbent liner pad(s) or approved absorbent material to the appropriate waste container (e.g., RH or Contact Handled waste drum). Absorbing Residual and/or Incidental Mercury: • Record a description of the item or approximate volume of mercury in the applicable waste container documentation. • If residual or incidental droplets of mercury are present in the drum, or cask, absorb the droplets using compounds from a mercury spill kit in accordance with the applicable vendor instruction for the mercury spill kit. • Transfer the waste material to the appropriate waste container. • Record the approximate volume of mercury absorbed in the applicable waste

Attachment 3 - Acceptable Knowledge Source Document Summary (continued)

Site(s): Oak Ridge National Laboratory		Source Document Tracking Number: P590
AK # [b]	Source Doc. Page #[c]	AK Information Summary
		container documentation (i.e., droplets of mercury absorbed). Revision 1 (Dated 02/01/2011): No substantive changes made in this revision related to TRU waste management. Revision 2 (Dated 03/27/2012): Document consists of the title page stating that the procedure has been superseded by RH-REF-OP-014. RH-REF-OP-014: Revision 0 (Dated 03/27/2012): Record the approximate volume of mercury absorbed on Attachment D, Contact Handled Waste Repackaging Data Form, of CH-REF-OP-013, Contact Handled Waste Repackaging (see Reference P254 in the ORNL Site Library). Revision 1 (Dated 10/01/2013): No substantive changes made in this revision related to TRU waste management. Revision 2 (Dated 01/15/2015): A new note was added to this revision referring to Attachment C, TWPC Approved Absorbents, of CH REF-OP-014, Absorbing Liquids in the Glovebox and Box Breakdown Area (see Reference P592 in the ORNL Site Library) for a list of approved absorbents (and how they are used). Revision 3 (Dated 10/01/2015): Rewritten to align with RH-UET-OP-002. This revision does not include any substantive changes to TRU waste management from the previous revision. Verification/walk down of RH-REF-OP-014 was conducted on 09/30/2015 by Jeff Harrison with Kevin East, Process Superintendent.

Attachment 3 - Acceptable Knowledge Source Document Summary (continued)

Site(s): Oak Ridge National Laboratory	Source Document Tracking Number: P590
Source Document Data Limitations (if any): 1. This procedure applies to the processing of liquids in the Hot Cell only.	
Acceptable Knowlege Expert: Travis Smith Date: 01/19/2016 Print /Sign	
[a] Provide description for non-titled information (i.e., container paperwork, MSDS sheets, etc) [b] Obtain from Acceptable Knowledge Documentation Checklist [c] For microfilm or microfiche, identify box, tape, reel number and location.	

Liquids Handling in the Hot Cell

REFERENCE

Implementation Date: 10-1-15

REWRITTEN

APPROVAL:

Kevin East Kevin A. East
Process Superintendent

9-24-15
Date

~~Wastren Advantage, Inc.~~
~~TRU Project Controlled Distribution~~
~~Issued To:~~ #1264 ~~Date: 09/28/2015~~

YD
10/01/2015

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Revision Summary

Revision	Change Summary
0	Initial issue
1	Added manipulation of the discharge valve on the pump
2	Rewritten
3	Rewritten to align with RH-UET-OP-002

Current Revision Specific Changes		
Location	**Description**	**Reason**
	Rewritten	

1.0 INTRODUCTION

1.1 Purpose

This procedure provides instruction for pumping ground water, processing free liquid, containerized non-residual liquid, saturated WASTE, and residual or incidental mercury found during processing of Remote Handled (RH) WASTE in the Hot Cell (HC) at the TRU Waste Processing Center (TWPC).

1.2 Scope

This procedure applies to pumping groundwater from casks and absorbing containerized liquids and incidental mercury..

1.3 Document Use

This document has been evaluated by the Document Use Review Team and has been determined to be a **REFERENCE** procedure.

Reference procedures are procedures that are required to be available for reference to the person performing the work, but are not required to be present at the work location during work. Procedure steps are performed as written.

2.0 PRECAUTIONS AND LIMITATIONS

2.1 Safety

- This procedure provides direction for handling hazardous and radioactive material containers.

2.2 Technical Safety Requirements

- TSR 1.3, MODES

2.3 Nuclear Criticality Safety Evaluation

- None

3.0 RESPONSIBILITIES

3.1 Personnel Assignments

The following personnel are responsible for performing the activities described in this procedure and for training to this procedure prior to accomplishing the activities described herein. These TWPC personnel may delegate alternate personnel to assist in carrying out their responsibilities.

3.1.1 Floor Supervisor

- ensures activities are completed in accordance with this procedure

3.1.2 Waste Operator

- performs activities in accordance with this procedure

3.1.3 Environmental Programs Manager (EPM)

- ensures that environmental regulatory requirements are clearly addressed in the applicable documents and training associated with this activity
- ensures that proper hazardous waste codes are applied to waste mercury
- provides direction to Operations personnel for ensuring permit compliance associated with Resource Conservation and Recovery Act treatment

3.2 Document Maintenance

The Process Superintendent (PS) is designated the document owner and is responsible for updating this document. Approval authority rests with the PS. Submit suggestions for revisions or improvement to the PS utilizing Attachment E, Revision Request Form, of CM-P-AD-061, Document Preparation, Review and Approval.

4.0 PREREQUISITES

- The HOT CELL must be in OPERATION MODE as defined in the CM-X-AD-022, Technical Safety Requirements, when WASTE is handled or moved or repackaged in the HOT CELL. **<TSR>**

NOTE 1: A list of approved absorbents is provided in Attachment C, TWPC Approved Absorbents, of CH-REF-OP-014, Absorbing Liquids in the Glovebox and Box Breakdown Area.

NOTE 2: Subsections in this procedure may be performed in any order as needed to process liquid WASTE and groundwater as found in a cask.

NOTE 3: Attachment C, Liquid Volume Conversion Chart, may be referenced for estimating volumes of liquid.

5.0 PROCEDURE

NOTE: Per CM-R-AD-016, Determination that Free Liquids in Remote Handled Concrete Casks are Due to Groundwater Infiltration, free liquids found in casks in the HC are primarily groundwater; only a small residual amount of flammable liquids were packaged as waste in the concrete casks. Pumpable quantities of groundwater in casks are pumped into intermediate containers inside the HC or containers staged outside the HC for return to Oak Ridge National Laboratory.

5.1 Preparing for Groundwater Absorption

5.1.1 IF processing WASTE from casks which contain groundwater, THEN initiate an Attachment P, Saturated Waste Treatment, of CM-P-EN-013, Environmental Permits and Compliance, for each drum receiving absorbed saturated waste.

5.1.2 IF externally wetted or leaking containers will be removed from the cask, THEN place absorbent pads on the HC floor in the transfer path and where the containers may be placed on the H C floor or work table for processing.

5.1.3 IF processing waste from casks which contain groundwater, THEN ensure an intermediate container with appropriate secondary containment is available for collection of pourable/drainable quantities of groundwater from waste packages.

NOTE 1: Steps in Subsection 5.2 may be performed in any order and repeated as necessary.

NOTE 2: Incidental liquid / saturated WASTE processing rate is not to exceed fifteen 55-gallon drum equivalents per 24-hour period.

5.2 Processing Saturated Waste

5.2.1 IF fifteen 55-gallon drum equivalents of incidental liquid/saturated WASTE have been processed within the last 24-hour period, THEN stop work and notify the Floor Supervisor and the EPM.

5.2.1.1 Exit this procedure.

NOTE: If WASTE is removed from casks containing groundwater, WASTE containers or packages may be externally wetted or contain incidental quantities of groundwater in the WASTE container or packages.

5.2.2 Allow groundwater in or on the WASTE to drain back into cask to the extent possible.

5.2.3 Place the WASTE on absorbent pads or approved absorbent material on the HC work table or floor of the HC.

5.2.4 Absorb quantities of incidental groundwater from the WASTE on the HC work table ensuring no free liquid, including droplets, are present.

5.2.5 Transfer wetted absorbent liner pad(s) or approved absorbent material to an outgoing WASTE container.

5.2.6 IF waste processing is completed for a drum, THEN complete the Attachment P, Saturated Waste Treatment, of CM-P-EN-013, Environmental Permits and Compliance, for the completed drum.

5.2.7 WHEN all saturated WASTE associated with a cask has been absorbed, THEN clean or wipe HC work table, and HC floor area to ensure no incidental groundwater or absorbent material remains prior to commencing processing of the next cask.

NOTE 1: Steps 5.3.1 through 5.3.6 may be performed in any order and repeated as necessary.

NOTE 2: The following does not pertain to containers that have been infiltrated with groundwater. The container may not be of good integrity. RH cask(s) may contain containerized liquids. Grounding or bonding do not apply when transferring small quantities (≤ 1 liter) of flammable liquids (or liquids considered to be flammable) to alternate processing containers.

NOTE 3: Containerized liquids processing rate is not to exceed 50 gallons per day.

5.3 Absorbing Containerized Non-Residual Liquids

5.3.1 IF 50 gallons of containerized liquids have been processed for the day.
THEN stop work and notify the Floor Supervisor.

5.3.1.1 Exit this procedure.

5.3.2 Initiate Attachment O, Miscellaneous Treatment Inspection Log Sheet, of CM-P-EN-013, Environmental Permits and Compliance, for each 1-liter batch treated.

NOTE: Typically, absorbent materials are designed to absorb unknown liquid at a ratio of 1:8 volume ratio of liquid to absorbent.

5.3.3 Estimate the volume of liquid to be absorbed.

5.3.4 Stage approved absorbent material on the HC work table.

NOTE: When absorbing containers of unknown liquids, a stainless steel or approved plastic secondary containment pan must be used.

5.3.5 Place the containerized liquids in a secondary containment pan with absorbent material on the HC work table.

NOTE: Liquids may be absorbed in the original container if it is closeable/sealable and is noted to be of good integrity (not cracked or brittle, no leaks, etc.) or may be transferred into new closeable container(s).

5.3.6 Inspect the original container to determine if it is acceptable for use for final processing of the containerized liquid.

5.3.6.1 IF the original container is not acceptable for use,
OR the container contains greater than 1 liter of liquid,
THEN place a closeable container with approved absorbent material into a secondary containment pan.

NOTE: Containerized liquids shall only be opened and absorbed one-at-a-time to avoid mixing of potentially incompatible substances, including quantities staged in intermediate containers. Containerized liquids are absorbed in quantities less than 1-liter in volume.

5.3.7 Using approved absorbent material, absorb 1-liter of liquid or less in a closeable container at an estimated volume ratio of 1:8 liquid to absorbent at a rate not to exceed 50 gallons per day.

5.3.8 Ensure liquid is mixed into absorbent for at least one minute.

5.3.9 Inspect container for liquids.

NOTE: Actions of the following step do not need to be documented on a treatment logsheet.

5.3.10 IF liquids are observed,
THEN add additional approved absorbent material at an estimated volume ratio of 1:8 liquid to absorbent, and repeat Steps 5.3.8 and 5.3.9 until free liquids, including droplets, are absorbed.

NOTE 1: Batches of liquids processed from different containers (i.e., potentially incompatible liquids) must be allowed to cure for at least one hour prior to transferring the waste into final waste packages to prevent hazardous reactions if inadvertently mixed.

NOTE 2: Additional batches of liquid may be processed while waiting for potentially incompatible batches to cure.

5.3.11 IF the processed batch of non-residual liquid is to be transferred into a container which contains previously processed liquids which are potentially incompatible,
THEN allow the batch to cure for at least one hour.

5.3.12 Ensure the container of absorbed non-residual liquid is closed.

5.3.13 Complete Attachment O, Miscellaneous Treatment Inspection Log Sheet, of CM-P-EN-013, Environmental Permits and Compliance.

5.3.14 Transfer the container to designated container per the applicable Attachment B, Operations Prohibited Item Processing (OPIP), of CH-REF-OP-044, Operations Prohibited Item Processing, or Attachment E, Waste Nonconformance Report (WNCR), of CH-P-AD-044, Waste Corrective Action and Nonconformances.

5.3.15 IF liquids are spilled onto the HC work table or secondary containment pan,
THEN absorb with absorbent liner pad or approved absorbent material.

5.3.15.1 IF no free liquids are observed,
THEN place material into sealable container.

5.3.15.2 Transfer sealable container to outgoing WASTE container.

5.3.16 WHEN all containerized liquids have been absorbed,
THEN clean or wipe secondary containment pans and HC work table to ensure no residual liquid or absorbent material remains prior to commencing processing of the next cask.

NOTE: Container grounding or bonding requirements do not apply when transferring groundwater to intermediate containers.

5.4 Processing Free Liquids in Cask

NOTE 1: These controls are necessary to ensure no potential air system capacity issues are encountered when the Cask Processing Enclosure (CPE) Air Compressor (C-302) is out of service and simultaneous Breathing Air System use is performed at the Box Breakdown Area or HC and CPE for airline suit and Air Operated Diaphragm (AOD) pump air supplies from C-102 or C-202.

NOTE 2: HC Floor Supervisors in conjunction with the Shift Superintendent shall control this limitation.

5.4.1 IF the CPE is operating on C-102 or C-202,
AND it is necessary to perform two of the following functions,
THEN ensure no personnel are using Breathing Air supplied from Continuous Flow Breathing Air Purifier Units 1 or 2 prior to implementing these functions:

- CPE cask water removal system liquid transfer, using the Inner Airlock AOD or the Process Area AOD systems in accordance with RH-UET-OP-105, Cask Processing Enclosure Liquids Handling System.
- CPE air hose blow-down of sort table sump pump in accordance with RH-UET-OP-105, Cask Processing Enclosure Liquids Handling System.
- Personnel are using Breathing Air supplied from Continuous Flow Breathing Air Purifier Units 3 or 4.
- HC cask water removal and transfer to tote in Dose-to-Curie using AOD pump system.

5.4.2 Ensure a pump and hose assembly is installed.

5.4.3 IF transferring groundwater to a tote external to the HC,
THEN ensure the following is performed:

5.4.3.1 Ensure the discharge valve of the pump is open.

5.4.3.2 Ensure Hazardous Waste Label with earliest accumulation start date is in place on tote to receive groundwater.

5.4.4 Transfer pumpable quantities of groundwater to the designated container(s).

5.4.5 IF WASTE prohibits pumping of groundwater,
THEN pause pumping activities.

5.4.5.1 RETURN TO RH-UET-OP-002, Hot Cell Operations, to remove contents.

NOTE: Pumping activities may be secured for breaks, end of shift, cask is empty of groundwater, etc.

5.4.6 IF securing pumping activities to tote external to the HC,
THEN close the discharge valve.

5.4.6.1 IF resuming pumping activities,
THEN RETURN TO Step 5.4.3.

5.4.7 Absorb residual quantities of groundwater in the cask using an absorbent liner pad or approved absorbent material.

5.4.8 IF groundwater was spilled or dropped on the HC floor or work table during the groundwater transfer,
THEN wipe up or absorb the groundwater with an absorbent liner pad or approved absorbent material.

5.4.8.1 Transfer wetted absorbent liner pad(s) or approved absorbent material to outgoing WASTE container.

5.5 Absorbing Residual and/or Incidental Mercury

5.5.1 IF mercury containing devices or discrete containers with mercury are found in the container,
THEN segregate item.

5.5.1.1 Repackage the item as mercury waste.

5.5.1.2 Record a description of the item or approximate volume of mercury in the WASTE container documentation.

NOTE: The EPM will provide appropriate WASTE characterization, including WASTE code data.

5.5.1.3 Transfer the container to the WASTE package per the applicable Attachment B, Operations Prohibited Item Processing (OPIP), of CH-REF-OP-044, Operations Prohibited Item Processing; or Attachment E, Waste Nonconformance Report (WNCR), of CH-P-AD-044, Waste Corrective Action and Nonconformances.

5.5.1.4 Ensure the WASTE container with the mercury waste is identified and labeled with the appropriate waste code applied.

5.5.2 IF residual or incidental droplets of mercury are present in the drum, or cask,
THEN absorb the droplets using compounds from a mercury spill kit in accordance with the applicable vendor instruction for the mercury spill kit.

5.5.2.1 Transfer the WASTE material to the appropriate outgoing WASTE container.

5.5.3 Record the approximate volume of mercury absorbed on Attachment D, Contact Handled Waste Repackaging Data Form, of CH-REF-OP-013, Contact Handled Waste Repackaging.

6.0 RECORDS

Records are identified, classified, and maintained in accordance with CM-P-AD-049, Records Management, and CM-X-AD-026, Records Inventory and Disposition Schedule.

6.1 Record Numbering

None

6.2 Records Inventory and Disposition Schedule

None

7.0 ATTACHMENTS

Attachment A: Acronyms/Abbreviations, Definitions, References, and Reviewer Selection for Major Revisions

Attachment B: Intentionally Left Blank

Attachment C: Liquid Volume Conversion Chart

Attachment A: Acronyms/Abbreviations, Definitions, References, and Reviewer Selection for Major Revisions

Acronyms/Abbreviations

AOD – Air Operated Diaphragm

CPE – Cask Processing Enclosure

EPM – Environmental Programs Manager

HC – Hot Cell

PS – Process Superintendent

RH – Remote Handled

TRU – Transuranic

TWPC – TRU Waste Processing Center

Definitions

MODE - Any one inclusive combination of applicable PROCESS AREA conditions used for assigning applicability of safety equipment and limits as specified in Table 1.3-1 with respect to the relative hazards present.

OPERATION MODE - A MODE in which all applicable Limiting Conditions for OPERATION have been met and the PROCESS AREA is performing or is capable of performing its intended function. Radioactive and/or hazardous material may or may not be present.

PROCESS AREA - A footprint or space in the facility that may consist of a room, several rooms, a floor, or the whole facility that is involved with a particular operation or procedure.

Saturated Waste - Any waste in contact with groundwater within a RH cask.

Residual Liquids - Residual liquids (i.e., liquid droplets found on the inside of the containers or bags, heels of liquids, etc.) are not considered liquids or wetted materials.

Non-Residual Liquids - Pumpable, pourable, transferable, containerized or uncontainerized liquid.

Wetted Material - Absorbent materials such as Solidasorb, kitty litter, vermiculite, mop heads, or absorbent pads, which are found in a container are assumed to have been used to absorb unknown or flammable liquids.

Developmental References

CM-R-AD-016, Determination that Free Liquids in Remote Handled Concrete Casks are Due to Groundwater Infiltration

LL-A-OP-010, Mixed Low Level Waste Profile

OAHA-02-001, Operations General

Attachment A: Acronyms/Abbreviations, Definitions, References, and Reviewer Selection for Major Revisions

Developmental References
OAHA-08-003, Hot Cell Operations
RH-UET-OP-002, Hot Cell Operations
RH-UET-OP-007, 72-B Cask Handling
T-CM-478-R-PR-004, Nochar 1/7/08 Letter Verifying TWPC Work Procedures
TNHW-145, Hazardous Waste Permit

Cross References
CH-P-AD-044, Waste Corrective Action and Nonconformances
CH-REF-OP-013, Contact Handled Waste Repackaging
CH-REF-OP-014, Absorbing Liquids in the Glovebox and Box Breakdown Area
CH-REF-OP-044, Operations Prohibited Item Processing
CM-P-EN-013, Environmental Permits and Compliance
CM-X-AD-022, Technical Safety Requirements
RH-UET-OP-105, Cask Processing Enclosure Liquids Handling System

Reviewer Selection for Major Revisions	
Required	**Optional**
Process Superintendent	Waste Certification Official
Peer Review Specialist	Health and Safety Manager
Environmental Programs Manager	Facility Manager
	Safety Authorization Basis Manager
	Quality Assurance Manager
	Radiological Control Manager
	CCP CH/RH AKE

Attachment B: Intentionally Left Blank

(Previously Recommended Tool List – May re-assign)

Attachment C: Liquid Volume Conversion Chart

1 teaspoon		1/3 tablespoon	5 ml, 5cc	
1 tablespoon	1/2 fluid ounce	3 teaspoons	15 ml, 15 cc	
2 tablespoons	1 fluid ounce	1/8 cup, 6 teaspoons	30 ml, 30 cc	
1/4 cup	2 fluid ounces	4 tablespoons	59 ml	
1/3 cup	2-2/3 fluid ounces	5 tablespoons + 1 teaspoon	79 ml	
1/2 cup	4 fluid ounces	8 tablespoons	118 ml	
2/3 cup	5-1/3 fluid ounces	10 tablespoons + 2 teaspoons	158 ml	
3/4 cup	6 fluid ounces	12 tablespoons	177 ml	
7/8 cup	7 fluid ounces	14 tablespoons	207 ml	
1 cup / 1/2 pint	8 fluid ounces	16 tablespoons	237 ml	
2 cups / 1 pint	16 fluid ounces	32 tablespoons	473 ml	
4 cups / 2 pints	32 fluid ounces	1 quart	946 ml	0.25 gallon
8 cups / 4 pints	64 fluid ounces	2 quarts	1893 ml	0.5 gallon
8 pints	128 fluid ounces	4 quarts	3785 ml	1 gallon
1 gallon	128 fluid ounces	3.785 liters	3785 ml	1 gallon
100 ml	3 fluid ounces	0.11 quarts / 0.4 cup	0.1 liter	0.03 gallon
250 ml	8.5 fluid ounces	0.26 quarts / 1.06 cup	0.25 liter	0.07 gallon
500 ml	17 fluid ounces	0.53 quarts / 2.11 cup	1/2 liter	0.13 gallon
1 liter	34 fluid ounces	1.057 quarts	1000 ml	0.26 gallon
2 liter	68 fluid ounces	2.11 quarts	2000 ml	0.53 gallon
3 liters	101 fluid ounces	3.17 quarts	3000 ml	0.79 gallon
3.785 liters	128 fluid ounces	4 quarts	3785 ml	1 gallon

DIVIDER PAGE

Attachment 3 - Acceptable Knowledge Source Document Summary

Site(s): Oak Ridge National Laboratory	Source Document Tracking Number: P989
Waste Stream Number(s): ORNL Non-specific Library Files (Applicable only when site library is not in use)	
Acceptable Knowledge Documentation Type: ☐ TRU Waste Management Program Information ☑ Waste Stream-Specific Information ☑ Additional Information	Category: ☐ Correspondence ☐ Discrepancy Resolution ☐ Internal Procedure ☐ Miscellaneous ☑ Published Document or Internal Procedure ☐ Unpublished Documents
Title or Description of Source Document [a]: RH-TRU Waste Handling in Building 7920 Cell Bank	
Source Document Reference Information (author(s), document and revision number, date, publisher): R. J. Weaver, NNFD-7920-OP-191, Rev. 1, 10/03/2014, NA	

AK # [b]	Source Doc. Page #[c]	AK Information Summary
WS2, WS4, WS9, S2, S16	Throughout	This procedure provides the instructions for packaging and documentation of remote-handled transuranic waste at Building 7920. Appendix B provides a summary list of criteria waste must meet when packaged. Appendix C provides guidance for complying with the Waste Master Profile.

CCP RECORDS ORIGINAL
DATE REC'D 2/25/15
EPT

Attachment 3 - Acceptable Knowledge Source Document Summary (continued)

Site(s): Oak Ridge National Laboratory	Source Document Tracking Number: P989
Source Document Data Limitations (if any): 1. None.	
Acceptable Knowlege Expert: Travis Smith Date: 02/16/2015 Print /Sign	
[a] Provide description for non-titled information (i.e., container paperwork, MSDS sheets, etc) [b] Obtain from Acceptable Knowledge Documentation Checklist [c] For microfilm or microfiche, identify box, tape, reel number and location.	

APPROVAL SIGNATURE SHEET

DIVISION/FACILITY: NNFD/7920

PROCEDURE TYPE: Technical **(Action Steps shall be followed sequentially unless otherwise directed in this procedure)**

PROCEDURE NUMBER: NNFD-7920-OP-191

REVISION NUMBER: 1

TITLE: RH-TRU Waste Handling in Building 7920 Cell Bank

Printed Name	Signature	Position/Title	Date
CONCURRENCE			
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		EFFECTIVE DATE	10/3/14

This procedure has been reviewed by assigned reviewers and concurred/approved by the personnel whose signatures appear above. Copies of this document released to personnel who are not on the controlled distribution list are not controlled copies but are for **INFORMATION ONLY**.

ASSIGNED CHANGE NUMBERS	
PERMANENT CHANGES	**ONE-TIME-USE CHANGES**
NNFD-7920-OP-191-R1-CN-____ Entered By:_____	NNFD-7920-OP-191-R1-CN-____ Entered By:_____
NNFD-7920-OP-191-R1-CN-____ Entered By:_____	NNFD-7920-OP-191-R1-CN-____ Entered By:_____
NNFD-7920-OP-191-R1-CN-____ Entered By:_____	NNFD-7920-OP-191-R1-CN-____ Entered By:_____
NNFD-7920-OP-191-R1-CN-____ Entered By:_____	NNFD-7920-OP-191-R1-CN-____ Entered By:_____
NNFD-7920-OP-191-R1-CN-____ Entered By:_____	NNFD-7920-OP-191-R1-CN-____ Entered By:_____

Modification Log

Change # or Rev.	Page	Section/ Step	Description of Change	Effective Date
1	All	All	Reformatted and made minor typographical and Non-Intent corrections throughout entire procedure. Revision bars are not included for these changes.	10/03/14
	4	3.1-3.7	Moved all items under the "Requirements" heading up to "Precautions/Limitations" heading and renumbered accordingly.	
		1.2	Added "...Building 7920" at end of "Scope" statement.	
		2.2	Added step for evacuation/shutdown actions.	
	6	Note 2	Deleted "NOTE 2" and renumbered "NOTE 3".	
		Note 2	Updated the title of NNFD-7920-OP-190.	
	7	5.1.9	Deleted "transfer the waste..." and replaced with "contact Building 7920..."	
		5.1.9	Deleted Note following Step 5.1.9 and subsequent steps 5.1.10 through 5.1.10.11. Renumbered steps as necessary. Rev. bars are not included for the renumbering.	
		5.1.12	Deleted "Record the radiation readings..." at end of step.	
	8	5.2.1	Deleted "(typically Cubicle 9)" and replaced "concrete cask" with "waste container".	
		5.2.4	Deleted "(typically Cubicle 9)."	
		Note	Replaced the word "cask" with "container".	
	9	Note	Deleted the Note following Step 5.2.12.	
	10	6.1.3	Added NNFD-7920-OP-100 to Source Documents section.	
		6.1.5	Added NNFD-7920-OP-190 to Source Documents section.	
	16	App E	Added signature line for "Hot Cell Operations Personnel" and deleted "and Sequence No."	

Informal

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Information Only

1. INTRODUCTION

1.1 Purpose

To provide instructions for packaging remote-handled transuranic (RH-TRU) waste generated at Building 7920 and assure that all pertinent information and data concerning the packaged waste is documented in a manner that is consistent with Bechtel Jacobs Corporation (BJC) RH-TRU Waste Master Profiles and meets the certification criteria.

1.2 Scope

This procedure applies to personnel responsible for RH-TRU waste production, packaging, and loading into specially constructed draw-string bags for removal from the hot cell bank for placement into RH-TRU waste containers at the REDC Building 7920.

2. PRECAUTIONS/LIMITATIONS

2.1 The facility manager and/or operations supervisor shall be immediately notified of any unsatisfactory results, problems observed, or unexpected delays encountered during performance of this procedure.

2.2 For evacuation conditions generated in the local area, NO actions are required. EVACUATE IMMEDIATELY!

2.3 Building 7920 Hot Cell Operations Personnel performing the actions outlined in this procedure shall have satisfactorily completed the ORNL Waste Generator Awareness Training as a minimum.

2.4 REDC Waste Management Representative (WMR) shall have satisfactorily completed the required training to be a certified Waste Generator at ORNL.

2.5 REDC Waste Management Representative (WMR)is responsible for officially closing RH-TRU waste containers, transporting the containers to the proper staging location, completing the proper documentation, and notification of ORNL Laboratory Waste Services (LWS) that the waste is ready for disposition.

2.6 RH-TRU waste generated at the REDC shall be packaged and documented in a manner that is consistent with BJC RH-TRU Waste Master Profiles. A summary of the waste master profile is presented in Appendix B.

2.7 Guidance for complying with the BJC Waste Master Profile is detailed in Appendix C.

2.8 All RH-TRU waste generated in the hot cell bank of Building 7920, will be monitored for beta-gamma and neutron radiation (if physically possible to do so) prior to removal to a RH-TRU waste container. Waste monitoring activities are performed per a separate procedure, NNFD-7920-OP-100, Transfer Area Cubicle Operations.

2.9 The REDC WMR is responsible for maintaining inventory records for all RH-TRU waste at the REDC.

3. REQUIREMENTS

NONE

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4. *PREREQUISITES*

TASK LEAD

4.1 Ensure waste management activities are on the Building 7920 Plan of the Day (POD).

4.2 Ensure any personnel entering a radiation/contamination area to perform any activities associated with performing this procedure are signed in on the appropriate Radiation Work Permit (RWP).

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5. *ACTION STEPS*

NOTE 1: *Action Steps shall be followed sequentially unless otherwise directed in this procedure.*

NOTE 2: *All waste generated in the hot cell bank is typically RH-TRU. There are a few waste items that can be disposed of as CH-TRU. The CH-TRU waste will be managed per the requirements in NNFD-7920-OP-190, CH-TRU Waste Handling at Building 7920.*

5.1 Managing RH-TRU Waste in the Hot Cell Cubicles

OPERATOR

NOTE 1: *The Building 7920 Hot Cell Operations personnel are responsible for collecting, sorting, packaging, monitoring, interim storage, and maintaining a waste inventory for all the waste generated in the hot cell bank.*

NOTE 2: *When estimates are required, always apply best judgment to provide the best information possible. A conservative approach is desired in these cases.*

NOTE 3: *Waste buckets (1-gal. paint cans) are used to collect most of the waste generated in the hot cell cubicles. Each cubicle will have at least one waste bucket for waste collection with more than one bucket typically present in each cubicle. The waste buckets may be used for interim storage of waste for future sorting and repackaging to meet BJC waste requirements. If the contents of the bucket are well defined, sorting the contents of the bucket may NOT be necessary and the waste bucket can be moved to Cubicle 9 for future radiation monitoring.*

5.1.1 Set up waste containers (1-gal. paint cans) as required in the hot cell cubicles.

NOTE: *Quite often it is possible to collect waste items in buckets and completely fill a waste bucket with items that have been identified as meeting the BJC Waste Master Profile. These waste buckets DO NOT need to be sorted in Cubicle 9 as long as the hot cell operations personnel can verify that the waste items in the bucket meet the BJC Waste Master Profile.*

5.1.2 Ensure the waste items to be loaded into the waste cans adhere to the guidelines specified in Appendix C, *Guidance for Complying with the BJC Waste Master Profile*.

5.1.3 Load waste items into the buckets, based on waste characteristics (i.e. leachable, non-leachable, meltable, glass, etc.), to reduce the amount of effort required to sort the waste once it is moved to Cubicle 9.

5.1.4 Enter the required information regarding the waste items being placed in the waste buckets on Appendix D, *Waste Loading in Progress Data Sheet*.

Information Only

5.1 **Managing RH-TRU Waste in the Hot Cell Cubicles** (cont)

OPERATOR

5.1.5 Make a notation on the *Waste Loading in Progress Data Sheet*, if any RCRA materials are loaded into the waste bucket.

5.1.6 As the waste buckets are filled, move them to Cubicle 9 and store them in the designated location for future sorting (if necessary) and/or radiation monitoring.

NOTE: *Waste buckets that have been pre-sorted during the waste bucket loading, DO NOT require sorting in Cubicle 9 to certify that they DO NOT contain prohibited materials.*

5.1.7 Once the waste buckets are in Cubicle 9, if necessary, sort the contents of the bucket to ensure that prohibited items are NOT placed in the buckets for disposal.

5.1.8 **IF** any waste item is too large to fit into a waste bucket and will fit into the conveyor bucket,
THEN transfer the waste item to Cubicle 9 for potential loading directly into the specially constructed and uniquely numbered draw-string waste bags.

5.1.9 **IF** any waste item is too large to fit into the conveyor bucket,
THEN contact Building 7920 Hot Cell Operations Supervisor for guidance on waste item disposition.

5.1.10 **IF** there is a question about how any waste item should be managed,
THEN contact the REDC WMR for direction.

5.1.11 Store unmonitored and sorted waste buckets in the designated location in Cubicle 9.

5.1.12 As waste buckets are sorted and filled, or as requested by management, monitor each waste bucket for beta-gamma and neutron radiation per NNFD-7920-OP-100, *Transfer Area Cubicle Operations*.

5.1.13 Once waste sorting is completed for a waste bucket, place a lid on the bucket,
THEN fill out Appendix E, *RH-TRU Waste Certification for Intermediate Waste Containers* using the information filled in on Appendix D, *Waste Loading in Progress Data Sheet*, for that bucket.

5.1.14 As required, monitor or resort the waste buckets,
AND record the radiation readings on Appendix E, RH-TRU Waste Certification for Intermediate Waste Containers.

5.1.15 Store all sorted and monitored waste buckets in the appropriate designated locations in Cubicle 9 to await future disposition.

Information Only

5.2 Preparing RH-TRU Waste in the Hot Cell Cubicles for Disposal

OPERATOR

5.2.1 Confirm REDC Management has scheduled for RH-TRU waste to be removed from the Building 7920 hot cell cubicles,
AND placed in a RH-TRU waste container (typically a specially fabricated waste container) at the waste load out station (RH Waste Cistern) in the LAA of Building 7920.

5.2.2 Obtain the specially constructed and uniquely numbered draw-string waste bags, for loading the RH-TRU waste buckets and other miscellaneous hot cell cubicle waste items from REDC supervision/management.

5.2.3 Prepare waste bags for loading prior to transferring into the hot cell bank by performing the following actions:

5.2.3.1 Ensure each waste bag is numbered.

5.2.3.2 Fold the top of the bag over until the top is even with the bottom of the bag.

5.2.3.3 Fold/roll the bag up in such a manner that it will be easily unfolded/unrolled once it has been transferred into the designated cubicle.

5.2.3.4 Write the bag ID number on the exposed bag so it can be viewed once it is transferred into the designated cubicle.

5.2.4 Transfer the desired number of waste bags (typically 2 or 3 bags), and "S" hooks into the hot cell bank
AND move the bags to the specified cubicle.

5.2.5 Open the bag to be loaded such that waste buckets can be easily placed into the bottom of the bag,
AND sit as flat on the floor of the cubicle as possible.

5.2.6 Position the bag in the cubicle floor so that the waste loading can be performed as conveniently as possible.

NOTE: *Waste may consist of waste buckets and/or miscellaneous other waste items being disposed of as RH-TRU waste. As a guideline, waste items that are reading <1500mR/h β-γ at 1 foot, and <50 mrem/h n_f at 3 feet are accepted for loading into the RH-TRU waste container. Occasionally, waste items that are reading slightly higher can be accepted on a case-by-case basis with concurrence of the REDC WMR.*

5.2.7 As waste (waste buckets and other miscellaneous waste items) is loaded into the waste bag, record the required information on Appendix F, *Certification of RH-TRU Waste Removed from the Cell Bank in Draw-String Plastic Bags.*

Information Only

5.2 **Preparing RH-TRU Waste in Hot Cell Cubicles for Disposal** (cont)

OPERATOR

5.2.8 Carefully load waste into the waste bag until the bag is full (a point where the bag can still be closed by the draw-string).

5.2.9 Using both master/slave manipulators (MSM), cinch the draw-string tight, **THEN** tie off the waste bag by looping one draw-string over the other, **AND** pull the draw-string back through the loop.

5.2.10 Complete filling out Appendix F, *Certification of RH-TRU-Waste Removed from the Cell Bank in Draw-String Plastic Bags*.

5.2.11 Repeat Steps **5.2.5** through **5.2.10** to load the bags transferred into the hot cell cubicles per Step **5.2.4**.

5.2.12 Transfer the loaded waste bags to the RH-TRU waste container per an approved procedure or work package for transferring RH-TRU waste from the hot cell cubicles to a RH-TRU waste container.

5.2.13 **IF** additional waste bags are to be loaded in order to fill the RH-TRU waste container,
THEN prepare and transfer additional bags into the hot cell cubicles as needed per Steps **5.2.2** through **5.2.4** and load these bags per Steps **5.2.5** through **5.2.10**.

5.2.14 Transfer the loaded waste bags to the RH-TRU waste container per Step **5.2.12**.

5.2.15 Provide the REDC WMR with the completed Appendix E's and Appendix F's associated with the RH-TRU waste container.

5.2.16 Ensure the quantity of radioactive material in the waste container is accounted for per NNFD-7920-OP-104, *Radioactive Material Inventory*.

Information Only

6. *REFERENCES*

6.1 Source Documents

6.1.1 NNFD-001, *Development, Review, and Control of Procedures*

6.1.2 NSCA 128, *Fissionable Material Operations at the Radiochemical Engineering Development Center, Building 7920*

6.1.3 NNFD-7920-OP-100, *Transfer Area Cubicle Operations*

6.1.4 NNFD-7920-OP-104, *Radioactive Material Inventory Control*

6.1.5 NNFD-7920-OP-190, *CH-TRU Waste Handling at Building 7920*

6.2 Performance Documents

6.2.1 Appendix D, *Waste Loading in Progress Data Sheet*

6.2.2 Appendix E, *RH-TRU Waste Certification for Intermediate Waste Containers*

6.2.3 Appendix F, *Certification of RH-TRU Waste Removed from the Cell Bank in Draw-String Plastic Bags*

7. *RECORDS*

7.1 Appendix D, *Waste Loading in Progress Data Sheet*, will be retained by the Hot Cell Operations personnel until all pertinent documentation has been transferred to Appendix E, *RH-TRU Waste Certification for Intermediate Waste Containers, and the REDC WMR has accepted the data.*

7.2 Appendix E, *RH-TRU Waste Certification for Intermediate Waste Containers*, and Appendix F, *Certification of RH-TRU Waste Removed from the Cell Bank in Draw-String Plastic Bags*, of this procedure will be retained by the REDC WMR to support the documentation required by ORNL LWS.

8. *APPENDICES*

8.1 Appendix A, *Definitions/Acronyms*

8.2 Appendix B, *Summary of Waste Profiles as Specified in the BJC CH-TRU Waste Master Profile*

8.3 Appendix C, *Guidance for complying with BJC CH-TRU Waste Master Profile*

8.4 Appendix D, *Waste Loading in Progress Data Sheet*

8.5 Appendix E, *RH-TRU Waste Certification for Intermediate Waste Containers*

8.6 Appendix F, *Certification of RH-TRU Waste Removed from the Cell Bank in Draw-String Plastic Bags*

Information Only

APPENDIX A
Definitions/Acronyms

1. **BJC** – Bechtel/Jacobs Corporation
2. **β-γ** – beta-gamma radiation
3. **CH-TRU** – Contact Handled TRU Waste
4. **Ci** – curie, measure of radioactivity
5. **Free Liquids** – Liquids which readily separate from the solid portion of a waste under ambient temperature and pressure.
6. **Hot Cell Operations Personnel** – personnel responsible for handling waste generated by hot cell processing operations at the REDC, including waste generated by facility level maintenance and operations activities.
7. **LAA** – Limited Access Area located in Building 7920
8. **LLW** – Low Level Waste
9. **LWS** – Lab Waste Services
10. **n_f** – neutron radiation
11. **PCB** – polychlorinated biphenyls
12. **PE** – plutonium equivalent, standardized radioactivity measurement using ^{239}Pu as the basis.
13. **RCRA** – Resource Conservation Recovery Act
14. **RCRA Waste** – Any material or combination of materials classified as hazardous by the Resource Conservation and Recovery Act. Hazardous materials are either listed in 40 CFR 261 Subpart D, or have characteristics (ignitability, corrosivity, reactivity, toxicity) identified in 40 CFR 261 Subpart C.
15. **RCT** – Radiation Control Technician
16. **RH-TRU** – Remote Handled TRU Waste, radioactive waste that exceeds 200 mrem/hr (or any of the limits for CH-TRU waste) total radiation reading.
17. **SLLW** – Solid Low Level Waste
18. **TRU** – Transuranic
19. **TRU Waste** – Radioactive waste contaminated with alpha emitting transuranic radionuclides (atomic number >92) with half-lives greater than 20 years and concentrations >100 nCi/g at the time of assay. Additional radioisotopes that are managed as TRU waste at REDC (and ORNL) include ^{252}Cf, ^{244}Cm, ^{233}U and other trans-curium isotopes (Bk, Es, Fm). Many of the trans-curium isotopes are neutron emitters as well as alpha emitters. TRU waste shall be segregated from SLLW.
20. **Waste Packet** – An individually wrapped and numbered waste item.
21. **Waste Generator** – Individual who has received the necessary training to certify, to the best of his/her knowledge, that RH-TRU waste meets the established acceptance criteria found in this document. (See Appendix B for details.).
22. **WMR** – Waste Management Representative, the individual within REDC with the responsibility for ensuring the radioactive waste generated in the REDC facilities is handled and disposed of in accordance with the Waste Certification Program. The WMR also certifies, to the best of his ability, that the waste meets the established acceptance criteria found in this document.
23. **WSR** – Waste Services Representative

Information Only

APPENDIX B
Summary of Waste Profiles as Specified in the BJC RH-TRU Waste Master Profiles

This summary is NOT intended to be a complete detailed description of all BJC RH-TRU Waste Master Profiles. Those details are listed in the basic documents referenced earlier.

RH-TRU waste shall be placed only in the large 6-inch or 12-inch wall concrete casks. Waste placed in these special containers shall meet the following criteria.

1. Loose fines or powders exceeding 1 wt % <10 μm or 15 wt % <200 μm shall be immobilized.
2. NO free liquids. Containers must be well drained.
3. Pyrophoric forms of radionuclides shall constitute NO more than 1 wt % of the package contents. Other pyrophoric materials are prohibited.
4. NO explosives or compressed gases, as defined by 49 CFR 173, subparts C and G.
5. NO hazardous waste unless co-contaminated with transuranic waste. Any present shall be identified and quantified.
6. Package (or package assemblies) total weight shall NOT exceed 18,200 lbs.
7. ^{235}U fissionable equivalent mass (FEM) shall be limited to 125 g per container.
8. Each RH-TRU container shall NOT exceed 60 ^{239}Pu plutonium Equivalent Curies (PE-Ci).
9. Removable surface contamination on waste containers shall be less than 20 dpm/100 cm^2 α, or 200 dpm/100 cm^2 β-γ.
10. Thermal power shall be recorded in the data package if >0.1 watt/ft^3 (~0.75 watt/55-gal drum).
11. A method of pressure relief will be provided for packages when the potential for gas generation is present.
12. Each waste cask shall be uniquely identified by an assigned number.
13. RH-TRU waste generated shall be sufficiently characterized to identify the contents of the waste package. Characterization data shall be documented and records maintained at the point of origin.
14. PCB wastes other than PCB bulk product waste or PCB remediation waste are prohibited.

Information Only

APPENDIX C
Guidance for Complying With BJC RH-TRU Waste Master Profiles
Page 1 of 2

Verification of the various criteria in Appendix B by personnel may NOT be possible for RH-TRU. This makes it necessary to assure that the waste-form in each waste packet loaded into the cask by the generator meets the BJC RH-TRU Waste Master Profiles. The following guidance is provided to help the waste handler apply good judgment to meet the intent of the criteria for each item.

1. Loose fines - if loose powders (NOT those that adhere to bulk solids) are visible, DO NOT load into a packet being prepared for a waste drum. The loose powder must be immobilized (i.e., grouted, foamed, etc.) Before inclusion in a waste packet. BJC CH-TRU waste master profile permits inclusion of a very small percentage of loose fines. REDC policy is to immobilize any visible fines.
2. Free Liquids - If free liquids are visible or known to be included in waste material, these liquids must be removed (e.g., drained or squeezed) from the waste before the waste can be included in a packet. To prevent inclusion of liquid in bottles, caps shall be removed, the bottles well drained, and the caps and bottles placed in the packet separately. Poly bottles will be melted and larger glass bottles will be crushed.
3. Pyrophoric Materials - Pyrophoric materials are NOT used in established glove box and hot cell operations. Special notifications will be made if pyrophoric materials are introduced into the REDC, so that wastes of this type can be identified and excluded from RH-TRU casks.
4. Explosives and Compressed Gases - NO explosives are used OR are present in our containment areas. Special notifications will be made if explosive materials are introduced into the REDC, so that wastes of this type can be identified and excluded from RH-TRU waste casks. Compressed gas cylinders (e.g., spray cans) must be emptied and punctured before inclusion in a waste packet.
5. Radioactive Mixed Waste - Hazardous materials shall be included ONLY if they are co-contaminated with transuranic radio-isotopes. At the REDC, mixed waste from the cell bank is separated from non-hazardous components (e.g., lead-containing lamp base separated from rest of the lamp) wherever possible. If the RCRA material can be separated as CH-TRU/mixed, then it is collected and removed as CH-TRU/mixed.
6. Package Weight - There is NO limit on the individual packet weight. However, it should be limited to a weight that can be easily managed by the waste handlers or MSMs.
7. 125 g of ^{235}U fissionable equivalent mass (FEM) per container - Adherence to this requirement can NOT be verified by assay of the cask. However, waste for each packet should be inspected prior to bag-out for recoverable fissile material. The disposition of such material would be determined by supervision.
8. The estimated activity of RH-TRU waste packages will be based on the neutron measurements by the RCTs.
9. Surface Dose Rate - Both β-γ and fast neutron readings must be added together to determine the total radiation rate. The total radiation reading allowed for a loaded RH-TRU waste cask will be determined by ORNL LWS and BJC on a case-by-case basis. Typically, a limit of 2 R/h total radiation (n_f + β-γ) is used in most cases.

Inactive

APPENDIX C
Guidance for Complying With BJC RH-TRU Waste Master Profiles
Page 2 of 2

10. Thermal Power - Instrumental counting will be used to calculate the output of heat generators in the waste container. However, prior to loading each packet into the container, the WMR makes a judgment whether the waste contains recoverable amounts of ^{238}Pu, ^{239}Pu, ^{241}Am, ^{244}Cm, or ^{252}Cf. If NOT, an estimate of the thermal power is made for the residual amounts believed to be present.
11. Gas Generation - The casks are NOT sealed until filled. Individual packets (waste containers) meet the volume/venting criteria. After the cask is sealed to prevent particulate escape, any gases generated will diffuse through a vent installed in the concrete casks lids and NOT allow a buildup of pressure.
12. Labeling - Casks are labeled and a container bar code is placed on each cask at REDC prior to being turned over to LWS.
13. Data Package – It is up to the individual REDC Hot Cell Operations Personnel to provide complete information to the REDC Waste Management Representative (WMR). At the REDC, the WMR or alternate WMR will prepare the documentation for the transfer of waste packages to ORNL LWS. The specific duties of the WMR are given in Appendix A.

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APPENDIX D
Waste Loading in Progress Data Sheet

Bucket ID:_____

DATE	DESCRIPTION OF MATERIAL	INITIALS

Radiation Readings:

γ at 12inches:_____ mR/h n_f at 3 feet:_____ mrem/h Date:_____

Information Only

APPENDIX E
RH-TRU Waste Certification for Intermediate Waste Containers
Page 1 of 2

CERTIFICATION OF THE INTERMEDIATE CONTAINERS OF RH-TRU WASTE
(e.g., one-gallon paint cans) FILLED IN THE CUBICLES

[Be sure to note if any RERA materials are present]

Your signature certifies a numbered, filled, and closed container containing NO fines; free liquids; pyrophoric, explosive, toxic, or corrosive materials; fissionable isotopes (>27 g/ft^3); heat sources (0.1 watt/ft^3); or RCRA materials

Intermediate Container Identification: Waste Container No.: _____
(or other container and number): _____
Date filled and closed: _____

Description of Contents:

Item(s)	Source/Waste Form Category

Radiation Readings (if taken):

γ at 12 in.: _____ mR/h Neutrons at 3 ft.: _____ mrem/h Date: _____
γ at 12 in.: _____ mR/h Neutrons at 3 ft.: _____ mrem/h Date: _____
γ at 12 in.: _____ mR/h Neutrons at 3 ft.: _____ mrem/h Date: _____

NOTE ANY RCRA MATERIALS THAT ARE PRESENT IN THIS CONTAINER

Signature of Hot Cell Operations Personnel filling and closing waste container: _____

REFERENCE: Draw String Bag No.: _____

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APPENDIX E
RH-TRU Waste Certification for Intermediate Waste Containers
Page 2 of 2

Continuation Sheet:

Item(s)	Source/Waste Form Category

Information only

APPENDIX F
Certification of RH-TRU WASTE Removed From the Cell Bank in Draw-String Plastic Bags

Page 1 of 2

Your signature certifies a numbered and closed draw-string plastic bag filled with numbered or otherwise identifiable items containing NO fines; free liquid; pyrophoric, explosive, toxic, or corrosive materials; compressed gases; fissionable isotopes (>27 g/ft^3); or heat sources (0.1 watts/ ft^3). RCRA materials must be identified, quantified, and approved by a designated GIE.

Draw-String Bag No.:_____ Date Filled and Closed: _____
Date Removed: _____ Bag Loaded in Cubicle No.: _____

Description of Contents: Page 1 of ___

Plastic Bucket / Bag No. or Other Method of ID		Radiation Readings * Transfer Area γ @ 12" mR/h	Transfer Area Nf @ 3' mrem/h	Cubicle γ @ contact mR/h	Source / Waste Form Category	RCRA Present? Yes/No
1						
2						
3						
4						
5						
6						
7						
8						

**Readings may be recorded if available. These may be from monitoring specific items at the Transfer Area cubicle or by monitoring at contact with a cubicle gamma probe.

Summary of RCRA Materials Present In the bag:

IDENTITY	QUANTITY
_____	_____
_____	_____
_____	_____
_____	_____

Responsible Hot Cell Operations personnel signature for RCRA_____

Radiation monitoring information – maximum readings found through side of concrete cask at time of removal from the waste loading station:

γ:_____mR/h Neutrons (Nf)_____mrem/h

Signature of Hot Cell Operations personnel filling and closing the Draw-String Bag: _____

REFERENCE: Cask No.: _____ and Sequence No.: _____

Information Only

APPENDIX F
Certification of RH-TRU WASTE Removed From the Cell Bank in Draw-String Plastic Bags
Page 2 of 2

Continuation Sheet:

Plastic Bucket / Bag No. or Other Method of ID		Radiation Readings *			Source / Waste Form Category	RCRA Present? Yes/No
		Transfer Area		Cubicle		
		γ @ 12" mR/h	Nf @ 3' mrem/h	γ @ contact mR/h		
9						
10						
11						
12						
13						
14						
15						
16						
17						
18						
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33						
34						

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DIVIDER PAGE

Attachment 3 - Acceptable Knowledge Source Document Summary

Site(s): Oak Ridge National Laboratory	Source Document Tracking Number: P591
Waste Stream Number(s): ORNL Non-specific Library Files (Applicable only when site library is not in use)	
Acceptable Knowledge Documentation Type: ☑ TRU Waste Management Program Information ☑ Waste Stream-Specific Information ☑ Additional Information	Category: ☐ Correspondence ☐ Discrepancy Resolution ☐ Internal Procedure ☐ Miscellaneous ☑ Published Document or Internal Procedure ☐ Unpublished Documents
Title or Description of Source Document [a]: Liquids Handling in the Cask Processing Enclosure	
Source Document Reference Information (author(s), document and revision number, date, publisher): NA, RH-REF-OP-102, Rev. 3 (Older Versions Included), 02/04/2015, TWPC	

AK #	Source Doc. Page # [b]	AK Information Summary
PR8, WS8, WS9, S2	Throughout	This document provides general instruction for handling liquids found during processing of waste in the Cask Processing Enclosure (CPE) at the TRU Waste Processing Center (TWPC). This document addresses handling of groundwater found inside concrete casks processed in the CPE, non-residual liquids for absorption, and elemental mercury. The procedure includes the following steps: Processing Non-Residual Liquids Absorbing Residual Liquids Absorbing Mercury Wetted Material Handling Groundwater Saturated Waste on Sorting Table No specific chemicals or compounds are called out in the procedure. The procedure states to add "approved absorbent material" in several places, but no specific identification of that approved absorbent material is provided. Revision 0 (Dated 03/24/2012): Ensure commercially available absorbent materials which meet applicable disposal facility waste acceptance criteria are available for use. Preparing for Liquid Absorption: • Place an absorbent liner pad or other absorbent material into a stainless or approved plastic secondary containment pan or bucket. • LL-A-OP-010, Mixed Low Level Waste Profile, provides a list of approved absorbents. • Estimate the volume of liquid to be absorbed and place an appropriate volume of approved absorbent material into an appropriately sized container. • Typically, absorbent materials are designed to absorb unknown liquid at a ratio of 1:8 volume ratio of liquid to absorbent. • If the quantity of liquid is greater than one (1) liter, prepare multiple containers or batches to process the liquid in batches no more than one (1) liter in size. Processing Non-Residual Liquids:

CCP RECORDS ORIGINAL
DATE REC'D 3/16/16

Attachment 3 - Acceptable Knowledge Source Document Summary (continued)

Site(s): Oak Ridge National Laboratory		Source Document Tracking Number: P591
AK #	**Source Doc. Page # [b]**	***AK Information Summary***
		• If more than one (1) liter of liquid is present in the container or bag, then pour, pump, or transfer no more than one (1) liter of liquid into a pre-measured bag or sealable container of approved absorbent material. • Shake or, using a stir stick or spatula tool, ensure liquid is thoroughly mixed into the absorbent for at least one (1) minute. • Allow container to sit for a minimum of five (5) minutes. • If one (1) liter or less liquid is present in the drum, box, container or bag, then transfer the liquid into a pre-measured bag or sealable container of approved absorbent material OR pour approved absorbent material into the drum, box, container or bag at an estimated volume ratio of 1:8 liquid to absorbent. • Shake or, using a stir stick or spatula tool, ensure liquid is thoroughly mixed into the absorbent for at least one (1) minute. To ensure contact, operators may use tools such as stir sticks, spatula, and paint cans, etc., or "massage" the bag. • IF liquid is in a bag, THEN shake or massage the bag to ensure that the absorbent is in contact with the liquid. • IF liquid is absorbed in paint can or other container, THEN shake or agitate the container as needed until liquid is well absorbed. • Allow waste to sit for a minimum of 5 minutes. • IF liquid was absorbed in a non-sealable container, THEN transfer the absorbed liquid into a sealable container and close the sealable container. • IF the processed batch of liquid is to be transferred into a waste container which contains previously processed liquids which are potentially incompatible, THEN allow the batch to cure for at least one hour. • Waste must be placed into a designated Prohibited Item (PI) container of same waste stream. • Batches of liquids processed from different containers (i.e., potentially incompatible liquids) must be allowed to cure prior to transferring the waste into final waste packages to prevent hazardous reactions if inadvertently mixed. • IF no liquids are observed OR when batches have cured for at least one hour, THEN transfer the waste to the appropriate designated PI waste package and note on per the applicable Attachment B, Operations Prohibited Item Processing (OPIP), of CH-REF-OP-044, Operations Prohibited Item Processing or Waste Non-Conformance Report (WNCR). • Record the approximate volume of liquids absorbed or solidified in the applicable Attachment D, Contact Handled Waste Repackaging Data Form, of CH-REF-OP-013, Contact Handled Waste Repackaging. • Complete Attachment O, Miscellaneous Treatment Inspection Log Sheet, of CM-P-RP-309, Environmental Permits - Inspections/Monitoring and Reporting. • IF liquids are spilled onto the secondary containment pan absorbent liner pad or material, THEN place the absorbent liner pad or material into a sealable container. • Allow the absorbent liner pad or material to sit for a minimum of five minutes. • IF no liquids are observed, THEN transfer the secondary containment pan absorbent liner pad or material in the sealable container to an outgoing waste package per the applicable Attachment B, Operations Prohibited Item Processing (OPIP), of CH-REF-OP-044, Operations Prohibited Item Processing. Absorbing Residual Liquids:

Attachment 3 - Acceptable Knowledge Source Document Summary (continued)

Site(s): Oak Ridge National Laboratory		Source Document Tracking Number: P591
AK #	**Source Doc. Page # [b]**	**AK Information Summary**

		• IF residual liquid is present in the drum, box, container, or bag, THEN pour approved absorbent material into the drum, box, container or bag at an estimated volume ratio of 1:8 liquid to absorbent.
		• Shake, or using a stir stick or spatula tool, ensure liquid is thoroughly mixed into the absorbent for at least 1 minute. To ensure contact, operators may use tools such as stir sticks, spatula, etc.
		• IF liquid is in a bag, THEN shake or massage the bag to ensure that the absorbent is in contact with the liquid.
		• IF liquid is absorbed in paint can or other container, THEN shake or agitate the container as needed until liquid is well absorbed.
		• Allow waste to sit for a minimum of 5 minutes.
		• IF absorbent material was used to absorb residual liquids in a box or drum, THEN transfer absorbent material from the drum or box into a container or bag(s).
		• Transfer the container or bag(s) to the appropriate outgoing waste container.
		  • Waste must be placed into an outgoing container of same waste stream.
		• Document that residual liquids were absorbed or solidified in the applicable Attachment D, Contact Handled Waste Repackaging Data Form, of CH-REF-OP-013, Contact Handled Waste Repackaging.
		Absorbing Mercury:
		• Record a description of the item or approximate volume of mercury in the applicable waste container documentation.
		• IF residual or incidental droplets of mercury are present in the cask or in any internal containers/bags, THEN absorb the droplets using compounds from a mercury spill kit in accordance with the applicable vendor instruction for the mercury spill kit.
		• Transfer the waste material to the appropriate waste container per the applicable Attachment B, Operations Prohibited Item Processing (OPIP), of CH-REF-OP-044, Operations Prohibited Item Processing.
		• Record the approximate volume of mercury absorbed in the applicable Attachment D, Contact Handled Waste Repackaging Data Form, of CH-REF-OP-013, Contact Handled Waste Repackaging (i.e., droplets of mercury absorbed).
		Wetted Material:
		• IF residual liquids are observed within or coming from the wetted material, THEN record the approximate volume of liquids absorbed or solidified on Attachment D, Contact Handled Waste Repackaging Data Form, of CH-REF-OP-013, Contact Handled Waste Repackaging.
		  • Absorbent materials such as Solid-a-sorb, kitty litter, vermiculite, mop heads, or absorbent pads which are found in a container are assumed to have been used to absorb unknown or flammable liquids and shall be considered a wetted material. Wetted material may appear dry or wet, or may be observed to contain or release residual liquids when handled.
		• Pour approved absorbent material into a sealable container at an estimated

Attachment 3 - Acceptable Knowledge Source Document Summary (continued)

Site(s): Oak Ridge National Laboratory		Source Document Tracking Number: P591
AK #	Source Doc. Page # [b]	AK Information Summary
		volume ratio of 1:8 liquid to absorbent. • Transfer wetted material into the sealable container leaving a void space at the top for additional absorbent material. • Pour approved absorbent material to fill the sealable container, and close the sealable container. • Transfer the sealable container(s) to the appropriate outgoing waste container. • Waste must be placed into an outgoing container of same waste stream. Processing Free Liquids in Cask: • Transfer pumpable quantities of groundwater to the designated Tote(s). • IF necessary to access all pumpable groundwater in the cask, THEN remove waste items from the cask to allow access to the groundwater. • Once the cask has been emptied of pumpable quantities of groundwater and waste, absorb residual quantities of groundwater in the cask. • IF groundwater was spilled or dropped on the CPE floor, or sorting table during the groundwater transfer, THEN wipe up or absorb the groundwater with an absorbent liner pad or approved absorbent material. Handling Groundwater Saturated Waste on Sorting Table: • IF waste is saturated with groundwater from the cask, THEN use the Sorting Table to collect and pump excess ground water to the tote. • IF waste is saturated with liquid (typically groundwater), THEN place the waste on the sorting table and sprinkle and mix with absorbent material until no liquid remains. • Upon completion of using the Sorting Table and prior to securing operations: • absorb residual quantities of groundwater using an absorbent liner pad or approved absorbent material • ensure the sorting table sump pump has pumped any collected liquids to the totes • Document that residual liquids were absorbed or solidified in Attachment P: Saturated Waste Treatment, of CM-P-RP-309, Environmental Permits - Inspections/Monitoring and Reporting. Revision 1 (Dated 07/09/2012): No substantive changes made in this revision related to TRU waste management. Revision 2 (Dated 11/12/2013): No substantive changes made in this revision related to TRU waste management. Revision 3 (Dated 02/04/2015): • A new note was added to this revision referring to Attachment C, TWPC Approved Absorbents, of CH REF-OP-014, Absorbing Liquids in the Glovebox and Box Breakdown Area (see Reference P592) for a list of approved absorbents (and how they are used).

Attachment 3 - Acceptable Knowledge Source Document Summary (continued)

Site(s): Oak Ridge National Laboratory		Source Document Tracking Number: P591
AK #	Source Doc. Page # [b]	AK Information Summary
		• A new Attachment C, Liquid Volume Conversion Chart, was added at Revision 3 for estimating volumes of liquid. Verification/walk down of RH-REF-OP-102 was conducted on 09/30/2015 by Jeff Harrison with Kevin East, Process Superintendent. Mr. Harrison asked Mr. East about the absorbent pads referred to in this procedure. He said they have been using the same thing for many years. They use the pink pads and red wipes made by New PIG. Mr. Harrison also asked Mr. East how the waste operators know which absorbent to use (even though the approved absorbents and their use is specified in Attachment C). He said the waste operators do not process liquids without guidance from the AKE.

Source Document Data Limitations (if any):

1. Procedure specific to TWPC.

Acceptable Knowlege Expert:

Travis Smith / Travis Smith Date: 03/16/2016
Print /Sign

[a] Provide description for non-titled information (i.e., container paperwork, MSDS sheets, etc)
[b] For microfilm or microfiche, identify box, tape, reel number and location.

Liquids Handling in the Cask Processing Enclosure

REFERENCE

Implementation Date: 2/4/15

APPROVAL:

Tim Hallman
Operations Manager

Date 1/29/15

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Init _____ _____ _____ _____ _____
Date _____ _____ _____ _____ _____
Time _____ _____ _____ _____ _____

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Revision Summary

Revision	Change Summary
0	Initial issue
1	Rewritten for better process flow
2	Update references
3	Incorporate Operator Aid 12-001 as Attachment C

Current Revision Specific Changes

Location	Description	Reason
Att. C	Added new attachment	Incorporate Operator Aid 12-001

1.0 INTRODUCTION

1.1 Purpose

This document provides general instruction for handling liquids found during processing of waste in the Cask Processing Enclosure (CPE) at the TRU Waste Processing Center (TWPC).

1.2 Scope

This document addresses handling of groundwater found inside concrete casks processed in the CPE, non-residual liquids for absorption, and elemental mercury.

1.3 Document Use

This document has been evaluated by the Document Use Review Team and has been determined to be a **REFERENCE** procedure.

REFERENCE procedures are not required to be in-hand or present for the user to actively reference during actual performance of action steps, however they may be open and referenced during the work performance based on personnel knowledge and skill level. If work is suspended due to inadequacy of procedure, then a page change notice or revision of the procedure is initiated.

2.0 PRECAUTIONS AND LIMITATIONS

2.1 Safety

- This document provides direction for handling hazardous and radioactive material containers.
- Containers of liquids up to one (1) liter in size shall only be opened and remediated one-at-a-time in the CPE, to avoid mixing of potentially incompatible substances. Volumes of non-residual liquids greater than one (1) liter in size must be divided into one (1) liter or smaller batches for processing.
- Non-residual liquids processing rate not to exceed 50 gallons per day.
- Liquids must be remediated utilizing a stainless steel or approved plastic secondary containment pan or bucket.
- Drums with flammable liquids (or liquids considered to be flammable) are grounded or bonded to prevent the build-up of static electricity during free liquid transfer.

2.2 Technical Safety Requirements

- None

2.3 Nuclear Criticality Safety Evaluation

- None

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2.4 Fire Hazards Analysis Requirements

- No single container of liquids in the CPE greater than 60 gallons may be processed, and a minimum exhaust flow of 950 cfm is required in the CPE.
- Immediately cease all work in the CPE (only the affected process enclosure) involving electrical equipment upon loss of ventilation.
- Exposed liquids that CANNOT be containerized within 3 hours or ventilation CANNOT be restored, then Lockout/Tagout (LO/TO) the electrical circuits to the enclosure, thereby eliminating the electrical hazard. The specified period of time for the CPE does not apply to groundwater.
- Minimum exhaust flow shall be achieved for a minimum of 1 hour after restoring the enclosure ventilation prior to resuming operations or removing the LO/TO of the internal electrical circuits.

3.0 RESPONSIBILITIES

3.1 Personnel Assignments

The following personnel are responsible for performing the activities described in this procedure and for training to this procedure prior to accomplishing the activities described herein. These TWPC personnel may designate alternate personnel to assist in carrying out their responsibilities as specified in this procedure.

3.1.1 Operations Manager (OM)

- approves this document

3.1.2 Waste Operator

- performs activities in accordance with this document
- completes Resource Conservation and Recovery Act inspection log sheet documenting treatment

3.1.3 Acceptable Knowledge Expert

- provide characterization information and guidance for proper, compliant management

3.1.4 Regulatory Interface and Integration Personnel

- provide characterization information and guidance for proper, compliant management

3.2 Document Maintenance

The OM is designated the document owner and is responsible for updating this document. Approval authority rests with the OM. Submit suggestions for revisions or improvement to the OM utilizing Attachment E, New Document and Revision Request Form, of CM-P-AD-061, Document Preparation, Review and Approval.

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4.0 PREREQUISITES

- Verify CPE activities have been authorized by the Shift Superintendent.
- Verify a minimum exhaust flow of 1110 cfm indicated at FIS-192 on the CPE ventilation control panel.
- Ensure decontamination materials are available.
- Ensure commercially available absorbent materials which meet applicable disposal facility waste acceptance criteria are available for use.
- Inspect sealable containers to ensure no visible holes or penetrations are present.

NOTE 1: Operations personnel perform the following steps, unless otherwise noted.

NOTE 2: Attachment C, TWPC Approved Absorbents, of CH-REF-OP-014, Absorbing Liquids in the Glovebox and Box Breakdown Area, provides a list of approved absorbents.

NOTE 3: Operations personnel consult with Acceptable Knowledge Expert and Regulatory Interface and Integration personnel, as needed, to obtain characterization information and guidance for proper, compliant management of liquid wastes.

NOTE 4: Subsection 5.0 is divided into multiple subsections. Steps within those subsections are followed in the sequence written unless stated otherwise. Operations personnel may enter specific subsections as needed to start a new work activity or resume work activities (e.g., directed by other procedures, after shift turnover, returning from the weekend, holiday, etc.), only after applicable safety precautions and prerequisites are verified to be satisfied or implemented.

NOTE 5: Attachment C, Liquid Volume Conversion Chart, may be referenced for estimating volumes of liquid.

NOTE 6: Recommended tools are listed on Attachment B, Recommended Tool List.

5.0 PROCEDURE

5.1 Processing Non-Residual Liquids

5.1.1 Initiate Attachment O, Miscellaneous Treatment Inspection Log Sheet, of CM-P-EN-013, Environmental Permits and Compliance.

NOTE: Absorbent for liquids treatment is designed to absorb unknown liquid at a ratio of 1:8 volume ratio of liquid to absorbent.

5.1.2 Estimate the volume of liquid to be absorbed.

5.1.2.1 Place absorbent pads into appropriately sized secondary container.

5.1.2.2 Place an appropriate volume of approved absorbent for liquid treatment into an approved Quality Assurance (QA) container.

5.1.2.3 Place the approved QA container in the secondary container.

5.1.3 Place container(s) with liquids into the secondary container.

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NOTE: Containers with liquids are opened and remediated one-at-a-time.

5.1.4 Open the container to access any liquid.

NOTE: The following step may be repeated until the volume of liquid is less than one (1) liter.

5.1.5 IF more than one (1) liter of liquid is present in the container, THEN transfer no more than one (1) liter of liquid into an approved QA container.

5.1.5.1 Ensure liquid is thoroughly mixed into the absorbent for at least one (1) minute.

5.1.5.2 Allow container to sit for a minimum of five (5) minutes.

5.1.5.3 Inspect QA container for liquids.

5.1.5.4 IF liquids are observed, THEN add additional approved absorbent for liquid treatment at an estimated volume ratio of 1:8 liquid to absorbent and repeat Steps 5.1.5.1 - 5.1.5.3.

5.1.6 IF one (1) liter or less liquid is present in the container, THEN transfer the liquid into an approved QA container.

5.1.6.1 Ensure liquid is thoroughly mixed into the absorbent for at least one (1) minute.

5.1.6.2 Allow container to sit for a minimum of five (5) minutes.

5.1.6.3 Inspect QA container for liquids.

5.1.6.4 IF liquids are observed, THEN add additional approved absorbent for liquid treatment at an estimated volume ratio of 1:8 liquid to absorbent and repeat Steps 5.1.6.1 - 5.1.6.3.

NOTE 1: Waste must be placed into a designated Prohibited Item (PI) container of same waste stream.

NOTE 2: Batches of liquids processed from different containers (i.e., potentially incompatible liquids) must be allowed to cure prior to transferring the waste into final waste packages to prevent hazardous reactions if inadvertently mixed.

NOTE 3: Additional batches of liquid may be processed while waiting for potentially incompatible batches to cure.

5.1.7 IF the processed batch of liquid is to be transferred into a waste container which contains previously processed liquids, THEN allow the batch to cure for at least one (1) hour.

5.1.8 Transfer the waste to the appropriate designated PI waste package and sign on the applicable attachment of CH-REF-OP-044, Operations Prohibited Item Processing, or applicable attachment of CH-P-AD-044, Waste Corrective Action and Nonconformances.

5.1.9 Record the approximate volume of liquids absorbed or solidified in the applicable Attachment D, Contact Handled Waste Repackaging Data Form, of CH-REF-OP-013, Contact Handled Waste Repackaging.

5.1.9.1 Complete Attachment O, Miscellaneous Treatment Inspection Log Sheet, of CM-P-EN-013, Environmental Permits and Compliance.

5.1.9.2 IF liquids are spilled onto the secondary containment pan absorbent liner pad or material,
THEN place the absorbent liner pad or material into a sealable container.

5.1.9.2.1 Allow the absorbent liner pad or material to sit for a minimum of 5 minutes.

5.1.9.2.2 Inspect the sealable container for liquids.

5.1.9.2.3 IF liquids are observed,
THEN add additional approved absorbent material at an estimated volume ratio of 1:8 liquid to absorbent and repeat Step 5.1.9.2.1.

5.1.10 IF no liquids are observed,
THEN transfer the secondary containment pan absorbent liner pad in the sealable container to an outgoing waste package.

5.1.11 Wipe the secondary containment pan clean to ensure no residual absorbed liquid material remains.

5.2 Absorbing Residual Liquids

5.2.1 IF residual liquid is present in the container,
THEN pour approved absorbent for liquid treatment into the container at an estimated volume ratio of 1:8 liquid to absorbent.

5.2.2 Ensure liquid is thoroughly mixed into the absorbent for at least one (1) minute.

5.2.3 Allow waste to sit for a minimum of five (5) minutes.

5.2.4 Inspect container for liquids.

5.2.5 IF liquids are observed,
THEN add additional approved absorbent for liquid treatment at an estimated volume ratio of 1:8 liquid to absorbent and repeat Steps 5.2.2 - 5.2.4.

5.2.6 Transfer the container to the appropriate outgoing waste container.

5.2.7 Document that residual liquids were absorbed or solidified in the applicable Attachment D, Contact Handled Waste Repackaging Data Form, of CH-REF-OP-013, Contact Handled Waste Repackaging.

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5.3 Absorbing Mercury

5.3.1 IF mercury containing devices and discrete containers with mercury are found in the cask or in any internal containers,
THEN segregate the item as mercury waste and repackage as follows:

5.3.1.1 Ensure the waste container with the mercury waste is identified and labeled with the appropriate waste code.

5.3.1.2 Transfer the waste to the appropriate designated PI waste package and sign on the applicable attachment of CH-REF-OP-044, Operations Prohibited Item Processing or applicable attachment of CH-P-AD-044, Waste Corrective Action and Nonconformances.

5.3.1.3 Record a description of the item or approximate volume of mercury in the applicable Attachment D, Contact Handled Waste Repackaging Data Form, of CH-REF-OP-013, Contact Handled Waste Repackaging.

5.3.2 IF residual or incidental droplets of mercury are present in the cask or in any internal containers,
THEN absorb the droplets using compounds from a mercury spill kit in accordance with the applicable vendor instruction for the mercury spill kit.

5.3.2.1 Record the approximate volume of mercury absorbed in the applicable Attachment D, Contact Handled Waste Repackaging Data Form, of CH-REF-OP-013, Contact Handled Waste Repackaging (i.e., droplets of mercury absorbed).

5.4 Wetted Material

NOTE: Absorbent materials such as Solidasorb, kitty litter, vermiculite, mop heads, or absorbent pads which are found in a container are assumed to have been used to absorb unknown or flammable liquids and shall be considered a wetted material. Wetted material may be observed to contain or release residual liquids when handled.

5.4.1 Pour approved absorbent for liquid treatment into an approved QA container.

5.4.2 Transfer wetted material into the QA container leaving a void space at the top for additional absorbent for liquid treatment.

5.4.3 Pour additional approved absorbent for liquid treatment to cover the wetted material.

5.4.4 Close the QA container.

NOTE: Waste must be placed into an outgoing container of same waste stream.

5.4.5 Transfer the QA container to the outgoing waste container.

5.5 Handling Groundwater Saturated Waste on Sorting Table

NOTE 1: Containerized liquids are not poured into the sorting table.

NOTE 2: This subsection applies to the saturated waste that is placed on the sorting table and sprinkled and mixed with absorbent material until no liquid remains.

5.5.1 Initiate an Attachment P, Saturated Waste Treatment, of CM-P-EN-013, Environmental Permits and Compliance.

5.5.2 IF waste is saturated with groundwater from the cask,
THEN use the sorting sump pump table to collect and pump excess ground water to the tote in accordance with RH-UET-OP-105, Cask Processing Enclosure Liquids Handling System
AND place the waste in a secondary containment pan and apply absorbent material until no liquid remains.

5.5.3 Upon completion of using the sorting table and prior to securing operations:

- absorb residual quantities of groundwater using an absorbent liner pad or approved absorbent material and place absorbent liner pad or approved absorbent material into outgoing waste drum
- ensure the sorting table sump pump has pumped any collected liquids to the totes

5.5.4 Document that residual liquids were absorbed or solidified in Attachment P, Saturated Waste Treatment, of CM-P-EN-013, Environmental Permits and Compliance.

6.0 RECORDS

Records are identified, classified, and maintained in accordance with CM-P-AD-049, Records Management, and CM-X-AD-026, Records Inventory and Disposition Schedule.

6.1 Record Numbering

None

6.2 Records Inventory and Disposition Schedule

None

7.0 ATTACHMENTS

Attachment A: Acronyms/Abbreviations, Definitions, References, and Reviewer Selection for Major Revisions

Attachment B: Recommended Tool List

Attachment C: Liquid Volume Conversion Chart

Attachment A: Acronyms/Abbreviations, Definitions, References, and Reviewer Selection for Major Revisions

Acronyms/Abbreviations

CPE – Cask Processing Enclosure

LO/TO – Lockout/Tagout

OM – Operations Manager

PI – Prohibited Item

QA – Quality Assurance

TRU – Transuranic

TWPC – TRU Waste Processing Center

Definitions

Groundwater - Free liquids found in concrete casks are primarily groundwater as detailed in CM-R-AD-016, Determination that Free Liquids in Remote Handled Concrete Casks are Due to Groundwater Infiltration.

Residual Liquids - Residual liquids (i.e., non-pourable, non-pumpable liquids or liquid droplets found on the inside of the containers or bags, heels of liquids, etc.) are not considered liquids or wetted materials.

Non-Residual Liquids - Pumpable, pourable, transferable, containerized or uncontainerized liquid.

Saturated Waste - Any waste in contact with groundwater within an RH cask.

Wetted Material - Absorbent materials such as Solidasorb, kitty litter, vermiculite, mop heads, or absorbent pads, which are found in a container are assumed to have been used to absorb unknown or flammable liquids.

SEALABLE CONTAINER - Sealable containers are containers having the following characteristics:

- Sealable Containers shall have a closure mechanism.
- Sealable Containers and its associated closure mechanism shall be non-metallic.
- Sealable Containers shall have no visible holes or penetrations.
- Sealable Containers shall have a minimum thickness of 5-mil or greater.

Attachment A: Acronyms/Abbreviations, Definitions, References, and Reviewer Selection for Major Revisions

Developmental References

CM-R-AD-016, Determination that Free Liquids in Remote Handled Concrete Casks are Due to Groundwater Infiltration

LL-A-OP-010, Mixed Low Level Waste Profile

OAHA-02-001, Operations General

OAHA-12-009, Cask Processing Enclosure (CPE) Operations

T-CM-478-R-PR-004, Nochar 1/7/08 Letter Verifying TWPC Work Procedures

TNHW-145, Hazardous Waste Permit

Cross References

CH-P-AD-044, Waste Corrective Action and Nonconformances

CH-REF-OP-013, Contact Handled Waste Repackaging

CH-REF-OP-014, Absorbing Liquids in the Glovebox and Box Breakdown Area

CH-REF-OP-044, Operations Prohibited Item Processing

CM-P-EN-013, Environmental Permits and Compliance

RH-UET-OP-105, Cask Processing Enclosure Liquids Handling System

Reviewer Selection for Major Revisions

Required	Optional
Operations Manager	Director of Regulatory Interface and Integration
Peer Review Specialist	Radiological Control Manager
RH Process Superintendent	Quality Assurance Manager
	Safety Authorization Basis Manager
	Health and Safety Manager
	Acceptable Knowledge Expert

Attachment B: Recommended Tool List

This list is intended as a general guide of various tools and supplies that may be used in the processing of residual liquids. Tools and supplies may include but are not limited to the following:

- impervious gloves
- various sized recloseable plastic bags (zip-lock, etc.)
- wooden or plastic stir sticks, spatulas, etc.
- absorbent pads (pan liners)
- clean rags or paper towels
- approved absorbent material
- paint can
- pump, aspirator or similar
- sealable containers
- Mercury spill kit

Attachment C: Liquid Volume Conversion Chart

1 teaspoon		1/3 tablespoon	5 ml, 5cc	
1 tablespoon	1/2 fluid ounce	3 teaspoons	15 ml, 15 cc	
2 tablespoons	1 fluid ounce	1/8 cup, 6 teaspoons	30 ml, 30 cc	
1/4 cup	2 fluid ounces	4 tablespoons	59 ml	
1/3 cup	2-2/3 fluid ounces	5 tablespoons + 1 teaspoon	79 ml	
1/2 cup	4 fluid ounces	8 tablespoons	118 ml	
2/3 cup	5-1/3 fluid ounces	10 tablespoons + 2 teaspoons	158 ml	
3/4 cup	6 fluid ounces	12 tablespoons	177 ml	
7/8 cup	7 fluid ounces	14 tablespoons	207 ml	
1 cup / 1/2 pint	8 fluid ounces	16 tablespoons	237 ml	
2 cups / 1 pint	16 fluid ounces	32 tablespoons	473 ml	
4 cups / 2 pints	32 fluid ounces	1 quart	946 ml	0.25 gallon
8 cups / 4 pints	64 fluid ounces	2 quarts	1893 ml	0.5 gallon
8 pints	128 fluid ounces	4 quarts	3785 ml	1 gallon
1 gallon	128 fluid ounces	3.785 liters	3785 ml	1 gallon
100 ml	3 fluid ounces	0.11 quarts / 0.4 cup	0.1 liter	0.03 gallon
250 ml	8.5 fluid ounces	0.26 quarts / 1.06 cup	0.25 liter	0.07 gallon
500 ml	17 fluid ounces	0.53 quarts / 2.11 cup	1/2 liter	0.13 gallon
1 liter	34 fluid ounces	1.057 quarts	1000 ml	0.26 gallon
2 liter	68 fluid ounces	2.11 quarts	2000 ml	0.53 gallon
3 liters	101 fluid ounces	3.17 quarts	3000 ml	0.79 gallon
3.785 liters	128 fluid ounces	4 quarts	3785 ml	1 gallon

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Attachment 3 - Acceptable Knowledge Source Document Summary

Site(s): Oak Ridge National Laboratory	Source Document Tracking Number: P597
Waste Stream Number(s): ORNL Non-specific Library Files (Applicable only when site library is not in use)	
Acceptable Knowledge Documentation Type: ☑ TRU Waste Management Program Information ☐ Waste Stream-Specific Information ☑ Additional Information	Category: ☐ Correspondence ☐ Discrepancy Resolution ☑ Internal Procedure ☐ Miscellaneous ☐ Published Document or Internal Procedure ☐ Unpublished Documents
Title or Description of Source Document [a] : Remote Handled Waste Acceptance Criteria	
Source Document Reference Information (author(s), document and revision number, date, publisher): NA, RH-X-AD-001, Rev. 7 (Older Versions Included), 06/15/2015, TWPC	

AK # [b]	Source Doc. Page #[c]	AK Information Summary
PR8, S2	Throughout	This document establishes the TRU Waste Processing Center (TWPC) Remote Handled Waste Acceptance Criteria (RH WAC) for the acceptance of Remote Handled (RH) Waste at the TWPC for characterization and processing. This document is not used to determine acceptability of waste or waste packages for shipment to the Waste Isolation Pilot Plant (WIPP) or Nevada National Security Site (NNSS). The primary purpose of the RH WAC is to ensure that the received waste does not compromise worker, public or environmental safety, nor violate any of the requirements of the TWPC Safety Basis or facility permits. CM-R-AD-001, Documented Safety Analysis, specifies limits that determine the scope of the RH WAC. The RH WAC also includes details relevant to the scheduling, shipping, identification, and packaging of waste to be transferred to the TWPC. References are provided for information only to the WIPP requirement. This RH WAC applies to the RH Waste stream described in Department of Energy (DOE) Contract DE-AC05-98OR22516 (the contract). The portion of these wastes that are Resource Conservation and Recovery Act (RCRA) wastes will be stored (i.e., staged for processing) by the TWPC in accordance with the Hazardous Waste Management Facility Permit Number TNHW-145 issued by the Tennessee Department of Environment and Conservation (TDEC). The gaseous effluents from these wastes are permitted to be released to the environment after high efficiency particulate air filtration by the TDEC Permit Number #063331P, Operating Permit Issued Pursuant to Tennessee Air Quality Act. The TWPC processes RH waste to the extent possible such that, once fully characterized, the waste meets one of the following definitions: Remote Handled Waste Low Level Waste Mixed Low Level Waste Transuranic Waste Mixed Transuaranic Waste Section 6.0, Waste Acceptance Criteria, discusses the following: Free Liquids Radioactive Material Content Dose Rate Limits Acceptable Waste Containers Loose Surface Contamination

CCP RECORDS ORIGINAL
DATE REC'D 2/9/16 mm

Attachment 3 - Acceptable Knowledge Source Document Summary (continued)

Site(s): Oak Ridge National Laboratory		Source Document Tracking Number: P597
AK # [b]	Source Doc. Page #[c]	AK Information Summary
		Waste Matrix - Applicable to TRU Waste Only TRU Alpha Concentration - Applicable to TRU Waste Only Acceptable Knowledge/Process Knowledge Defense Waste Determination Waste Container Information Waste Container Integrity Venting of Remote Handled Waste Container Sealed Containers > 4 Liters (Nominal) Polychlorinated Biphenyls and Asbestos Explosives or Corrosives Compressed Gases (Pressurized Containers) Etiologic Agents or Biological Waste Beryllium Pyrophorics Classified Material No specific chemicals or compounds are called out in the procedure, just examples of possible chemicals to identify, such as beryllium, in the process. Revision 0 (Dated 02/14/2008): All RCRA hazardous waste codes allowed. Upon discovery of D001, D002, and/or D003 during processing, the TWPC coordinates with DOE for disposition of waste item, up to and including return of waste item or container to DOE. Containerized/confined free liquids are anticipated to be present in RH debris waste. Free liquids, including the total residual liquid in the waste, shall be dispositioned at the TWPC as part of the characterization/treatment process to meet or comply with WIPP/NTS requirements. Some free liquid in a cask is expected as a result of ground water intrusion (specifically for casks retrieved from underground storage). Incoming waste containers shall be identifiable as part of a waste stream for which adequate AK/PK has been accumulated, reviewed, and summarized. Incoming waste shall not be known to contain dangerous constituents such as explosives or corrosives. Upon discovery during processing, the TWPC coordinates with DOE for disposition of waste item, up to and including return of waste item or container to DOE. Incoming waste containers may contain compressed gases (pressurized containers). Upon discovery in the Hot Cell the TWPC shall remove cylinder and disposition to an appropriate treatment/disposal site. Incoming RH waste containers shall not be known to contain pyrophorics (≥1 percent by weight), either radioactive or non-radioactive. Upon discovery during processing, the TWPC coordinates with DOE for disposition of waste item, up to and including return of waste item or container to DOE. Waste containers or waste articles/items discovered to be non-compliant with this RH WAC shall be evaluated by the TWPC with DOE to determine the processing path forward. If it is determined to be beyond the current capability of the facility to process or that there are no acceptable off-site disposal sites the TWPC shall segregate the item or container from the waste stream and disposition as appropriate, which may include a return transfer to DOE. Non-compliant wastes shall be handled within the safety basis and safety management system process and controls. The RH WAC expands on chemical compatibility and pyrophorics by including the

Attachment 3 - Acceptable Knowledge Source Document Summary (continued)

Site(s): Oak Ridge National Laboratory		Source Document Tracking Number: P597
AK # [b]	Source Doc. Page #[c]	AK Information Summary
		following definitions: Chemical compatibility – Assessing the properties of chemicals in a payload container (>1 weight percent); there must be no adverse safety or health hazards produced as a result of any mixtures that occur. Pyrophoric – Materials that may ignite spontaneously in air or that emit sparks when scratched or struck, especially with materials such as steel. A flammable solid that, under transport conditions, might cause fires through friction or retained heat or that can be ignited readily and, when ignited, burns vigorously and persistently so as to create a serious transportation hazard. Included in the pyrophoric definition are spontaneously combustible materials, water reactive materials, and oxidizers. Examples of nonradioactive pyrophorics are organic peroxides, sodium metal, and chlorates. Revision 1 (Dated 03/25/2008): No substantive changes made in this revision related to TRU waste management. Revision 2 (Dated 02/26/2009): No substantive changes made in this revision related to TRU waste management. Revision 3 (Dated 10/15/2009): Revised to remove prohibition of regulated asbestos. Revision 4 (Dated 08/09/2011): If the container is not on an approved AK/PK list, the containers may be approved on a case by case basis by the Acceptable Knowledge Expert/Process Knowledge Expert using generator documents, such as 2109 forms or other equivalent documents. Revised for updates and clarification on acceptance of PCBs, asbestos, and beryllium. Revision 5 (Dated 03/20/2014): No substantive changes made in this revision related to TRU waste management. Revision 6 (Dated 07/14/2014): No substantive changes made in this revision related to TRU waste management. Revision 7 (Dated 06/15/2015): Revised to reference new limits established in DSA/TSR, Rev. 31. "Each individual incoming RH waste container shall be ≤ 55 PE-Ci and ≤ 200 FGE Pu-239." The limit of 55 PE-Ci was changed from 61 PE-Ci. This revision does not include any relevant changes to waste management from the previous revision. Procedure verification/walk down was conducted by Jeff Harrison with Aaron Clements, Waste Acceptance/Transfer Lead, on 09/24/2015. Mr. Clements said generator data are compiled for evaluation against the WAC, and a checklist is completed. The procedure that implements this checklist completion is RH-REF-WP-001. Once accepted, containers are transferred from UCOR to the

Attachment 3 - Acceptable Knowledge Source Document Summary (continued)

Site(s): Oak Ridge National Laboratory		Source Document Tracking Number: P597
AK # [b]	Source Doc. Page #[c]	AK Information Summary
		TWPC.

Source Document Data Limitations (if any):

1. None.

Acceptable Knowlege Expert:

Travis Smith _____ Date: 01/20/2016
Print /Sign

[a] Provide description for non-titled information (i.e., container paperwork, MSDS sheets, etc)
[b] Obtain from Acceptable Knowledge Documentation Checklist
[c] For microfilm or microfiche, identify box, tape, reel number and location.

Remote Handled Waste Acceptance Criteria

Implementation Date: 6/15/15

APPROVAL:

Fred Heacker for Bi Oakley
Director of Waste Management

5/13/15
Date

~~Wastren Advantage, Inc.~~
~~TRU Project Controlled Distribution~~
~~Issued To:~~ ~~#1265~~ ~~Date:~~ ~~09/09/2015~~

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09/25/2015

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Revision Summary

Revision	Change Summary
0	Initial Issue
1	Procedure updated to reflect corrections on FGE restriction, filter vent requirement, and corrosive definition.
2	Remove acceptability of RH drums and RH boxes per Director of Facility Management.
3	Revised to remove prohibition of regulated asbestos.
4	Revised for updates and clarification on acceptance of PCBs, asbestos, and beryllium
5	Revised the requirement for each individual incoming RH waste container
6	Updated to match Contact Handled WAC
7	Implement DSA/TSR Rev 31

Current Revision Specific Changes

Location	Description	Reason
6.2	Changed 61 to 55	DSA/TSR Rev 31

1.0 PURPOSE

This document establishes the TRU Waste Processing Center (TWPC) Remote Handled Waste Acceptance Criteria (RH WAC) for the acceptance of Remote Handled (RH) Waste at the TWPC for characterization and processing. This document is not used to determine acceptability of waste or waste packages for shipment to the Waste Isolation Pilot Plant (WIPP) or Nevada National Security Site (NNSS). The primary purpose of the RH WAC is to ensure that the received waste does not compromise worker, public or environmental safety, nor violate any of the requirements of the TWPC Safety Basis or facility permits.

CM-R-AD-001, Documented Safety Analysis, specifies limits that determine the scope of the RH WAC. The RH WAC also includes details relevant to the scheduling, shipping, identification, and packaging of waste to be transferred to the TWPC. References are provided for information only to the WIPP requirement.

This RH WAC applies to the RH Waste stream described in Department of Energy (DOE) Contract DE-AC05-98OR22516 (the contract). The portion of these wastes that are Resource Conservation and Recovery Act (RCRA) wastes will be stored (i.e., staged for processing) by the TWPC in accordance with the Hazardous Waste Management Facility Permit Number TNHW-145 issued by the Tennessee Department of Environment and Conservation (TDEC). The gaseous effluents from these wastes are permitted to be released to the environment after high efficiency particulate air filtration by the TDEC Permit Number #063331P, Operating Permit Issued Pursuant to Tennessee Air Quality Act.

2.0 DOCUMENT MAINTENANCE

The Director of Waste Management (DWM) is designated the document owner and is responsible for updating this procedure. Approval authority rests with the DWM. Submit suggestions for revisions or improvement to the DWM utilizing Attachment E, New Document and Revision Request Form, of CM-P-AD-061, Document Preparation, Review and Approval.

3.0 GENERAL ACCEPTANCE

Since the waste is received and placed into the Process Building systems for the purpose of characterization verification, treatment and/or repackaging, certain conditions or characteristics of the waste cannot be determined or verified prior to receipt of wastes at the TWPC. Initial waste receipt or the conduct of other preliminary characterizations shall not be construed as unqualified acceptance of the waste or portions thereof. The TWPC reserves the right, in accordance with its permits and approved Documented Safety Analysis (DSA), to segregate and return to DOE waste items or container(s) that exhibit non-compliant characteristics described below.

While it is the TWPC mission to process RH waste for disposal at the applicable repository, it is understood that certain waste items may not be acceptable for disposal and must be removed from the waste stream and returned to DOE. Every effort shall be expended to minimize the return of non-compliant waste items or container(s) to DOE.

4.0 WASTE TYPES

The TWPC processes RH waste to the extent possible such that, once fully characterized, the waste meets one of the following definitions:

4.1 Remote Handled Waste

RH waste is greater than or equal to 200mR/hr contact dose rate.

4.2 Low Level Waste

Low Level Waste (LLW) contains at least a regulatory threshold concentration of radioactivity and is not classified as high-level waste, Transuranic (TRU) Waste or spent nuclear fuel or by-product material. Test specimens of fissionable material irradiated for research and development only, and not for the production of power or plutonium may be classified as LLW provided the concentration of TRU is less than or equal to 100 nCi/g.

4.3 Mixed Low Level Waste

Mixed Low Level Waste (MLLW) is LLW that contains hazardous constituents as defined by RCRA. All RCRA hazardous waste codes are acceptable for processing at TWPC. Upon discovery of D001, D002, and/or D003 during processing, the TWPC coordinates with DOE for disposition of waste item, up to and including return of waste item or container to DOE.

4.4 Transuranic Waste

TRU waste contains more than 100 nCi of alpha-emitting TRU isotopes per gram of waste, with half-lives greater than 20 years, except for (1), high-level radioactive waste, (2), waste that the Secretary has determined, with the concurrence of the Administrator, does not need the degree of isolation required by the disposal regulations, or (3), waste that the Nuclear Regulatory Commission (NRC) has approved for disposal on a case-by-case basis in accordance with 10 CFR Part 61.

4.5 Mixed Transuranic Waste

Mixed TRU waste is TRU waste that is also a hazardous waste as defined by the Hazardous Waste Act and 20.4.1.200 NMAC (incorporating 40 CFR § 261.3). All RCRA hazardous waste codes are acceptable for processing at TWPC.

5.0 NOTIFICATIONS

5.1 Waste Transfers

The transfer of waste (i.e., delivery of waste containers to the TWPC site) is controlled by procedural requirements using transfer authorization forms submitted by the TWPC to the DOE contractor responsible for managing the storage of this waste or DOE-designated Point of Contact (POC), such as the appropriate Management and Integration Contractor (M&I) subcontractor. This authorization form serves as a formal request to responsible DOE contractor for container transfer. When completed by URS | CH2M Oak Ridge LLC (UCOR) and approved by the TWPC, it serves to notify the TWPC of incoming transfers.

A just-in-time approach for the receipt of waste is utilized by the TWPC. However, appropriate changes to RCRA permit allow staging of up to five (5) RH incoming concrete casks on the 30-ton crane bay. Additionally, the TWPC may stage for shipment up to five (5) 72-B Casks on the 30-ton crane bay. Empty concrete casks awaiting shipment to NNSS as empty are excluded from this limit.

It is the TWPC goal to provide a minimum of seven-day notice of changes to scheduled RH waste transfers. Exceptions may be granted as mutually agreed to by the TWPC and the responsible DOE contractor. Additionally, to facilitate transfers the TWPC will prepare a Retrieval Plan outlining the projected container selection sequence. Transfers of RH waste may also be cancelled or suspended due to severe weather, other transfer route concerns, process interruptions, or inventory limits at the TWPC.

5.2 Packaging Changes

The waste inventory records from eMWaste data base identifies key characteristics of individual waste containers to be received at the TWPC (e.g., weight, volume, dimensions, dose rates, etc.). Discrepancies shall be formally recorded by the TWPC during receipt inspection and initial processing. However, if packaging changes are made prior to transfer, or discrepancies from the contract description are observed by the POC prior to transfer, these changes should be brought to the attention of TWPC prior to the transfer to the TWPC of the affected containers with as much advance notice as possible.

Containers delivered to the TWPC without prior approval will not be accepted.

5.3 Transfer Paperwork

- As per agreement between TWPC and the responsible DOE contractor, manifesting of the waste for transfer to the TWPC is not required, in lieu of manifesting a "Bill of Lading" will be used for each transfer.
- The POC will provide a record of the transferred inventory that lists the individual unique numbers of the containers in each transfer.

6.0 WASTE ACCEPTANCE CRITERIA

6.1 Free Liquids

Containerized/confined free liquids are anticipated to be present in RH debris waste. Free liquids, including the total residual liquid in the waste, shall be dispositioned at the TWPC as part of the characterization/treatment process to meet or comply with WIPP/NNSS requirements. Some free liquid in a cask is expected as a result of ground water intrusion (specifically for casks retrieved from underground storage). Liquids shall be treated in accordance with the RCRA permit and provisions provided in the Fire Hazard Analysis.

6.2 Radioactive Material Content

Each container will be evaluated to ensure that the individual container Pu-239 fissile gram equivalent (FGE) and Plutonium Equivalent Curie (PE-Ci) values as calculated in accordance with CH-UET-OP-014, Waste and Activity Inventory Control, are within the limits established in the DSA.

Each individual incoming RH waste container shall be $\leq$ 55 PE-Ci and $\leq$ 200 FGE ^{239}Pu.

6.3 Dose Rate Limits

Dose rate limits for RH waste receipt are bounded by the UCOR Transportation DSA. No specific TWPC dose rate limits are imposed for selection of RH concrete casks for receipt.

6.4 Acceptable Waste Containers

- 4.5" Cask
- 6" Cask
- 12" Cask
- Standard drum (greater than or equal to 55 gallon)

6.5 Loose Surface Contamination

NOTE: Concrete casks internal to the steel overpack may be contaminated above the limits listed below.

The exterior surface of incoming waste container shall be:

Beta Gamma

$\leq$ 1,000 dpm/100 cm^2

Alpha

$\leq$ 20 dpm/100 cm^2

6.6 Waste Matrix – Applicable to TRU Waste Only

Wastes shall be classified as:

- soils
- debris
- homogenous solids

6.7 TRU Alpha Concentration – Applicable to TRU Waste Only

Waste received at the TWPC is not limited to waste that meets the WIPP requirement for TRU waste. The hot cell may be used to process RH LLW or RH TRU. No restrictions are applied based on alpha activity concentration.

6.8 Acceptable Knowledge/Process Knowledge

Incoming waste containers shall be identifiable on an approved Acceptable Knowledge (AK)/Process Knowledge (PK) list as part of a waste stream for which adequate AK/PK has been accumulated, reviewed, and summarized.

If the container is not on an approved AK/PK list, the containers may be approved on a case by case basis by the Acceptable Knowledge Expert/Process Knowledge Expert using generator documents, such as 2109 forms or other equivalent documents.

6.9 Defense Waste Determination

TRU Wastes shall be defense-origin based on this information as defined by Carlsbad Field Office Chief Counsel because WIPP can accept only radioactive waste generated by atomic energy defense activities of the United States.

6.10 Waste Container Identification

Incoming waste containers shall exhibit a unique container identification number. The identification number on the outside of the overpack containing a concrete cask may be a unique number given to the overpack/package or may be the original identification number followed by an alpha designator, e.g., "A" or the letters "OP" will be added to indicate "overpack".

6.11 Waste Container Integrity

NOTE: The "lidded metal container/concrete container" are passive design features credited in the TWPC Safety Basis. (Reference CM-R-AD-001, Table 5-1).

6.11.1 Casks

Wastes shall be packaged in securely lidded concrete casks inside a steel overpack.

Concrete casks shall exhibit good integrity at time of loading into the steel overpack for transport to the TWPC.

6.11.2 Drums

Wastes shall be packaged in securely lidded metal drums. Incoming containers shall demonstrate the integrity defined in the DSA, which is verified by inspecting each container upon receipt using the following general criteria:

- no denting, deformation, breaches, creasing, cracking, or gouging that might reasonably compromise container integrity, expose the internal contents, or affect the closure of the container
- no significant rusting or a readily observable loss of metal due to oxidation (e.g., flaking, bubbling, pitting, or perforation) that causes perforation of the container
- no bulging or distortion indicative of over pressurization
- closure devices properly installed and secure

6.12 Venting of Remote Handled Waste Container

6.12.1 Concrete Casks

- RH Concrete Casks are not required to be vented.
- Unvented containers greater than 4 liters inside RH concrete casks are acceptable for delivery at the TWPC. The TWPC will open and vent as appropriate in the Hot Cell as part of the processing operations.

6.12.2 Drums

Incoming drums shall be equipped with a securely installed DRUM FILTER-VENT with headspace gas sample results that do not exceed 32,000 ppm hydrogen equivalent content and 6,000 ppm total volatile organic compounds unless they are overpacked within a metal box, concrete cask, or larger vented metal drum.

6.13 Sealed containers > 4 liters (nominal)

Sealed containers > 4 liters (nominal) are acceptable for receipt but are considered as prohibited items at WIPP.

6.14 Polychlorinated Biphenyls and Asbestos

PCBs and Asbestos are acceptable for processing at the TWPC, but must be managed in accordance with regulatory and TWPC site requirements.

6.15 Explosives or Corrosives

Incoming waste shall not be known to contain dangerous constituents such as explosives or corrosives. Upon discovery during processing, the TWPC coordinates with DOE for disposition of waste item, up to and including return of waste item or container to DOE.

6.16 Compressed Gases (Pressurized Containers)

Incoming waste containers may contain compressed gases (pressurized containers). Upon discovery in the Hot Cell the TWPC shall remove cylinder and disposition to an appropriate treatment/disposal site.

6.17 Etiologic Agents or Biological Waste

Incoming waste shall not be known to contain dangerous constituents such as, etiologic agents or biological waste. Upon discovery during processing, the TWPC coordinates with DOE for disposition of waste item, up to and including return of waste item or container to DOE.

6.18 Beryllium

NOTE: Incoming waste suspected to contain very low incidental concentrations of beryllium may be approved for acceptance to the TWPC on a case by case basis by Health and Safety (HS). The Health and Safety Manager, or designee, reviews available information and waste processing description to determine applicability of 10 CFR 850 requirements in accordance with CM-A-IH-002, Beryllium Awareness and Chronic Beryllium Disease Prevention. Documentation of approval is attached to Attachment B, Remote Handled Waste Acceptability Review Checklist, of RH-REF-WP-001, Remote Handled Waste Container Selection Process.

Incoming waste containers shall not be known to contain beryllium. (Exception: Waste containing very low incidental concentrations of beryllium that are approved by HS or Sealed Sources containing beryllium are allowable.)

6.19 Pyrophorics

Incoming RH waste containers shall not be known to contain pyrophorics (≥1 percent by weight), either radioactive or non-radioactive. Upon discovery during processing, the TWPC coordinates with DOE for disposition of waste item, up to and including return of waste item or container to DOE.

6.20 Classified Material

Incoming wastes shall not be known to contain classified materials. If discovered, the TWPC coordinates with DOE for disposition of classified material, up to and including return to DOE.

7.0 WASTE ACCEPTANCE

Acceptance of waste is accomplished in accordance with approved TWPC procedures. The first steps for acceptance of transferred wastes are accomplished through the waste container request and authorization process. Transferred waste containers are verified as being consistent with the request for transfer document upon receipt of the conveyance. The unique container numbers are verified, as the waste is off-loaded. Waste packaging integrity, dose rates, surface contamination levels, sizes, venting, and hazardous waste labeling of the waste containers are verified at various points in the receipt process.

8.0 NON-COMPLIANT WASTE

Waste containers or waste articles/items discovered to be non-compliant with this RH WAC shall be evaluated by the TWPC with DOE to determine the processing path forward. If it is determined to be beyond the current capability of the facility to process or that there are no acceptable off-site disposal sites the TWPC shall segregate the item or container from the waste stream and disposition as appropriate, which may include a return transfer to DOE. Non-compliant wastes shall be handled within the safety basis and safety management system process and controls.

9.0 RECORDS

Records are identified, classified, and maintained in accordance with CM-P-AD-049, Records Management, and CM-X-AD-026, Records Inventory and Disposition Schedule.

9.1 Record Numbering

None

9.2 Records Inventory and Disposition Schedule

There are no specific records created by this procedure.

10.0 ATTACHMENTS

Attachment A: Acronyms/Abbreviations, Definitions, References, and Reviewer Selection for Major Revisions

Attachment A: Acronyms/Abbreviations, Definitions, References, and Reviewer Selection for Major Revisions

Acronyms/Abbreviations

AK – Acceptable Knowledge

DOE – Department of Energy

DSA – Documented Safety Analysis

FGE – fissile gram equivalent

HS – Health and Safety

LLW – Low Level Waste

M&I – Management and Integration Contractor

MLLW – Mixed Low Level Waste

NNSS – Nevada National Security Site

NRC – Nuclear Regulatory Commission

PCBs – Polychlorinated Biphenyl

PE-Ci – Plutonium Equivalent Curie

PK – Process Knowledge

POC – Point of Contact

RCRA – Resource Conservation and Recovery Act

RH – Remote Handled

RH WAC – Remote Handled Waste Acceptance Criteria

TDEC – Tennessee Department of Environment and Conservation

TRU – Transuranic

TWPC – TRU Waste Processing Center

UCOR – URS | CH2M Oak Ridge LLC

WIPP – Waste Isolation Pilot Plant

Definitions

Acceptable Knowledge – Any information about the process used to generate waste, material inputs to the process, and the time period during which the waste was generated, as well as data resulting from the analysis of the waste.

Chemical compatibility – Assessing the properties of chemicals in a payload container (>1 weight percent); there must be no adverse safety or health hazards produced as a result of any mixtures that occur.

Compressed gas – Compressed gases are those materials defined as such by 49 CFR 11 Part 173, Subpart G.

Attachment A: Acronyms/Abbreviations, Definitions, References, and Reviewer Selection for Major Revisions

Definitions

Corrosive/Corrosivity – A solid waste exhibits corrosivity if a sample of the waste is either aqueous and has a pH ≤ 2 or ≥ 12.5, or it is a liquid and corrodes steel at a rate > 6.35 mm (0.250 inch), per year at a test temperature of 55° (130°F). (40 CFR 32 §261.22)

Debris Waste – Solid material exceeding a 2.36 inch (in.) (60 millimeter) particle size that is intended for disposal and that is 1) a manufactured object, or 2) plant or animal matter, or 3) natural geologic material.

Fissile Gram Equivalent (FGE) – An isotopic mass of radionuclide normalized to 239Pu.

Hazardous Waste – Those wastes which are designated hazardous by EPA (or state), regulations.

Homogeneous Solids – The summary category group that contains waste that includes is at least 50 percent by volume solid process residues.

Low Level Waste (LLW) – Waste that contains at least a regulatory threshold concentration of radioactivity and is not classified as high-level waste, TRU Waste or spent nuclear fuel or by-product material. Test specimens of fissionable material irradiated for research and development only, and not for the production of power or plutonium may be classified as LLW provided the concentration of TRU is less than or equal to 100 nCi/g.

Mixed LLW – LLW that contains hazardous constituents as defined by RCRA, or PCBs.

Pyrophoric – Materials that may ignite spontaneously in air or that emit sparks when scratched or struck, especially with materials such as steel. A flammable solid that, under transport conditions, might cause fires through friction or retained heat or that can be ignited readily and, when ignited, burns vigorously and persistently so as to create a serious transportation hazard. Included in the pyrophoric definition are spontaneously combustible materials, water reactive materials, and oxidizers. Examples of nonradioactive pyrophorics are organic peroxides, sodium metal, and chlorates.

Remote Handled Transuranic waste – Transuranic waste with a surface dose rate of 200 millirem per hour or greater.

RH LLW – LLW that exceeds 200mR/hr contact dose rate. RH-LLW will be prepared and shipped to NNSS as appropriate.

Soil/Gravel Waste – The summary category group that contains waste that is at least 50 percent by volume soil/gravel.

TRU Waste – Waste containing more than 100 nCi of alpha-emitting TRU isotopes per gram of waste, with half-lives greater than 20 years, except for (1), high-level radioactive waste, (2), waste that the Secretary has determined, with the concurrence of the Administrator, does not need the degree of isolation required by the disposal regulations, or (3), waste that the NRC has approved for disposal on a case-by-case basis in accordance with 10 CFR Part 61.

TRU-mixed waste – TRU waste that is also a hazardous waste as defined by the Hazardous Waste Act and 20.4.1.200 NMAC (incorporating 40 CFR § 261.3).

Attachment A: Acronyms/Abbreviations, Definitions, References, and Reviewer Selection for Major Revisions

Definitions

Waste Acceptance Criteria – Constraints (limits), on the physical, chemical, and radiological properties of waste and its packaging as determined by the site documented safety analysis (authorization basis) and associated technical safety requirements. Waste will not be approved for shipment and disposal until it has been certified as meeting the applicable disposal site criteria.

Waste matrix code – A DOE-developed coding system for grouping waste streams that have similar matrix constituents, especially for treatment objectives. This coding system allows waste streams within the DOE TRU waste system that have similar physical and chemical waste form properties to be categorized together.

Waste stream – A waste stream is waste material generated from a single process or from an activity which is similar in material, physical form, and hazardous constituents (WIPP Hazardous Waste Facility Permit, Attachment B).

Developmental References

DE-AC05-98OR22516, DOE Contract TRU/Alpha Low Level Waste Treatment Project

TNHW-145, Hazardous Waste Management Permit, State of Tennessee Department of Environment and Conservation, Division of Solid Waste Management

063331P, Operating Permit Issued Pursuant to Tennessee Air Quality Act, Tennessee Air Pollution Control Board, Department of Environment and Conservation, March 7, 2012

CM-R-AD-001, Documented Safety Analysis

DOE/NV-325, Nevada National Security Site Waste Acceptance Criteria

DOE/WIPP 02-3122, Waste Acceptance Criteria for WIPP

Cross References

URS | CH2M Oak Ridge LLC (UCOR) Transportation DSA

CH-UET-OP-014, Waste and Activity Inventory Control

Attachment A: Acronyms/Abbreviations, Definitions, References, and Reviewer Selection for Major Revisions

Reviewer Selection for Major Revisions	
Required	**Optional**
Director of Waste Management	Environmental Programs Manager
General Manager	Analytical Manager
Director of Operations	Quality Assurance Manager
Operations Manager	Safety Authorization Basis Manager
RH Process Superintendent	
Facility Manager	
Feedstock and Disposition Manager	
Acceptable Knowledge Expert	
Waste Acceptance/Transfer Lead	
Waste Certification Official	
Director of Safety, Health and Quality	
Health and Safety Manager	
Nuclear Criticality Safety Manager	

DIVIDER PAGE

Attachment 3 - Acceptable Knowledge Source Document Summary

Site(s): Oak Ridge National Laboratory	Source Document Tracking Number: U011
Waste Stream Number(s): ORNL Non-specific Library Files (Applicable only when site library is not in use)	
Acceptable Knowledge Documentation Type: ☑ TRU Waste Management Program Information ☑ Waste Stream-Specific Information ☑ Additional Information	Category: ☐ Correspondence ☐ Discrepancy Resolution ☐ Internal Procedure ☐ Miscellaneous ☐ Published Document or Internal Procedure ☑ Unpublished Documents
Title or Description of Source Document [a]: Safety Analysis: Transuranium Processing Plant, Building 7920	
Source Document Reference Information (author(s), document and revision number, date, publisher): L. J. King, J. E. Bigelow, E. D. Collins, and W. T. McDuffee , ORNL/TM-7688, Draft, 12/1984, ORNL	

AK # [b]	Source Doc. Page # [c]	AK Information Summary
PR1, PR2, PR4, PR6, WS1, WS2, WS3, WS5, WS6, WS7, WS8, WS9, WS11, WS12, S3	All	TRU is a remotely operated hot-cell facility. Major activities include the production of transuranium elements, Bk, Cf, Es, and Fm, and fuel cycle development for commercial nuclear power reactors. TRU has been the production, storage, and distribution center for the heavy-element research program of DOE. Facility description - Major operations are in the areas of analytical chemistry, radiochemical process development, transuranium element production, HFIR target fabrication, fuel cycle solvent extraction testing, and equipment maintenance. Cubicle 5 was dedicated for the SETF operations. Plan view and hot cell process functions are shown in Figure 4.5. Equipment located in the tank pits and its principal process functions are listed in Table 4.1. Radioactive materials used in TRU are: irradiated target, products and wastes, recycle Am and Cm, and other feed materials for making the targets, irradiated power reactor fuels, plutonium for fuel-cycle development studies, and analytical samples and standards. The principal radioactive materials handled in TRU and the quantities in which they are handled in various facilities are listed in Table 2.1. Radioactive materials used in TRU are: irradiated target, products and wastes, recycle Am and Cm, and other feed materials for making the targets, irradiated power reactor fuels, plutonium for fuel-cycle development studies, and analytical samples and standards. The principal radioactive materials handled in TRU and the quantities in which they are handled in various facilities are listed in Table 2.1. Radioactive materials used in TRU are: irradiated target, products and wastes, recycle Am and Cm, and other feed materials for making the targets, irradiated power reactor fuels, plutonium for fuel-cycle development studies, and analytical samples and standards. The principal radioactive materials handled in TRU and the quantities in which they are handled in various facilities are listed in Table 2.1. Chemical reagents used in TRU processes are listed in Table 4.8 and 4.9 along with indications of the usage. The chemicals used for the process are very corrosive. The SETF - is used for evaluating and demonstrating solvent extraction flow sheet for the recovery of uranium and plutonium from irradiated commercial power reactor fuels. There are about 2 campaigns per year of experimental operations, each requiring 2 to 3 months. The amount of material used in each campaign is ~10kg of light-water-reactor fuel in the form of Zircaloy-clad UO2 or mixed UO2-PuO2 fuel rods. The operating steps carried out in SETF campaigns are outline in figure 4.39.

CCP RECORDS ORIGINAL
DATE REC'D 2/16/16

Attachment 3 - Acceptable Knowledge Source Document Summary (continued)

Site(s): Oak Ridge National Laboratory		Source Document Tracking Number: U011
AK # [b]	Source Doc. Page # [c]	AK Information Summary
		Process Description – The major activities in TRU are 1) analytical chemistry operations, 2) chemical development operations, 3) transuranium elements production, 4) target fabrication operation, 5) SETF operations, and 6) equipment maintenance operations. Precipitation, solvent extraction, and ion exchange techniques are used in the reprocessing of reactor fuels and the conversion of recovered uranium and plutonium in the fabrication of recycle reactor fuel elements. In a typical campaign, about 13 irradiated HFIR targets plus rework material from previous campaigns are processed for three months. The composition of the feed materials is shown in table 4.10 A 6"-thick cask will hold one equipment rack or 7 to 8 trash bags, each of which can hold up to 16 1-gal paint cans. A 12"-thick cask will hold the equivalent of about 2.5 bags. Approximately 12 casks are filled each year, which will have one 12"-thick variety. Liquid wastes – Rain runoff, sanitary wastes, process waste, and intermediate level radioactive wastes are discharged into ORNL waste-handling systems. High-level fission product wastes are diluted with other building wastes to low levels of radioactivity before discharge from the building. Non radioactive organic wastes are composite in 55-gallon drums for disposal. Figure 4.48 presents a schematic diagram of the TRU process and low-level liquid waste systems. Solid wastes containing high-level of radiation are place in concrete cask and transferred to the SWSA. Materials containing less radiation and high in alpha contamination are sealed in plastic and packed in 55-gallon stainless steel drums and segregated based on burnable or non-burnable waste. Low-level wastes are sorted based on whether or not they are compactible and are also packed in 55-gallon stainless steel drums. High level Solid wastes consist of leach fuel hulls, materials insoluble in acid, spent ion exchange resins, inoperable or obsolete metallic equipment and piping, glass sample bottles, plastic bags, bottles and tubing, manipulator boots, and cloth scrub pads. Gaseous wastes from TRU are monitored and are vented directly into the atmosphere through the 7911 stack. The gaseous wastes constituents include tritium, radioiodine, fission gases (Kr, Se, and their decay products), oxides of nitrogen, HCl and HNO3 vapors, organic vapor from solvents, and small quantity of dusts and entrained liquids. Routine releases - Table 4.13 shows the release of radioactive gases during dissolution of HFIR targets. Table 4.14 shows the release of radioactive gases during dissolution of irradiated power reactor fuel as part of the SETF program. Table 4.16 shows the inventory of fission product in a transuranium element dissolver and the corresponding estimated annual entrainment release in to the VOG system and the stack. The combined estimates of routine emissions of all sources are listed in Table 4.18. Radionuclides mentioned include: Pu-242; Pu-239; Pu-237; Pu-240; Pu-242; Sr-90; Cs-137; Am-241 Chemicals mentioned: activated alumina; aluminum (powder); aluminum chloride; ammonium hydroxide; ammonium persulfate; ferric chloride; ferrous sulfamate; hydrazine hydrate; hydrochloric acid; hydrofloric acid; hydrogen peroxide; hydroxylamine hydrochloride; hydroxylamine nitrate; lithium chloride; lithium hydroxide; lithium hypochlorite; lithium nitrate; mercuric nitrate; nitric acid; nitric oxide; nitrogen trioxide; potassium bromate; potassium carbonate; potassium hydroxide; potassium nitrate; silica gel; sodium carbonate; sodium hydroxide; sodium nitrate; sodium thiosulfate; zinc bromide; acetic acid; acetone; adogen-364-HP; ascorbic acid; carbon tetrachloride; citric acid; deorized mineral spirits (Amsco); 2,5-di-tert-butylhydroquinone (DBHQ); Di(2-ethylhexyl) phosphoric acid (HDEHP); diisopropylbenzene (DIPB); Dowex 1-X8 and -X10; dowex 50W-X4 and -X8; ethanol; ethylenediaminetetraacedetic (EDTA); 2-ethyl-1-hexanol; hydroquinone; o-hydroxyisobutyric acid (AHIB): Ionac A-580; methanol; n-dodecane; n-paraffin (NPH); oxalic acid; stearic acid; tributylohosphate; trichloroethylene (TCE); xylene

Attachment 3 - Acceptable Knowledge Source Document Summary (continued)

Site(s): Oak Ridge National Laboratory		Source Document Tracking Number: U011
AK # [b]	Source Doc. Page #[c]	AK Information Summary

Source Document Data Limitations (If any):

1. Document numbering starts at iii. Page numbers iv, iv, vi, pages B-4 and B-5 are misnumbered and should have been 4-4 and 4-5.
2. Some of the information provided in this SAR is inaccurate.
3. This document is superseded by SAR/7920-CTD/01 R1 (source document 4.4).
4. This is an inactive document.

Acceptable Knowlege Expert:

Travis Smith _____ Date: 02/15/2016
Print /Sign

[a] Provide description for non-titled information (i.e., container paperwork, MSDS sheets, etc)
[b] Obtain from Acceptable Knowledge Documentation Checklist
[c] For microfilm or microfiche, identify box, tape, reel number and location.

DIVIDER PAGE

Attachment 3 - Acceptable Knowledge Source Document Summary

Site(s): Oak Ridge National Laboratory	Source Document Tracking Number: U478
Waste Stream Number(s): ORNL Non-specific Library Files (Applicable only when site library is not in use)	
Acceptable Knowledge Documentation Type: ☑ TRU Waste Management Program Information ☑ Waste Stream-Specific Information ☑ Additional Information	Category: ☐ Correspondence ☐ Discrepancy Resolution ☐ Internal Procedure ☐ Miscellaneous ☐ Published Document or Internal Procedure ☑ Unpublished Documents
Title or Description of Source Document [a]: ORNL Technical Notebook No. A-102161; Chemical Technology / Finished Products / J. T. Wiggens	
Source Document Reference Information (author(s), document and revision number, date, publisher): J. T.Wiggens, Logbook A-102161, NA, Various, Chem Tech Div / Pilot Plant / Finished products	

AK # [b]	Source Doc. Page # [c]	AK Information Summary
PR2, PR4, PR7, WS1, WS2, WS4, WS6, WS7, WS8, WS9, WS11, WS12, S11	Throughout	This is a logbook from the Chemical Technology Building Finished Products Project Building 7920 written by J.T. Wiggins. Chemicals: Ammonium (NH4) Ammonium nitrate (NH4NO3) Dowex 50W-X4 Dowex 50W-X8 Hydrochloric acid (HCl) Iron Nitrate Fe(NO3) Isopropyl Alcohol Magnesium Chloride (MgCl2) NaBrO3 Nitric Acid (HNO3) Polonium (Po-209) Sodium hydroxide (NaOH) Sodium Nitrate (NaNO3) Trichloroethylene (TCE) (Pg. 6) Radionuclides: Americium Oxide (AmO2) Americium (Am-241) Berkelium (Bk-249) Californium (Cf-249) (Cf-252) Curium (Cm-248) Einsteinium (Es-253, -254) Europium (Eu) Nibbles (oxide) Fermium (Fm-255, -257) Gadolinium (Gd) Nibbles (oxide) Gadolinium (Gd-153, -157) Plutonium (Pu—238, -239, -240, -241, -242) Other: Argon Gas Butyrate Oxalic Acid Ajax CCP RECORDS ORIGINAL DATE REC'D 10/22/2014

Attachment 3 - Acceptable Knowledge Source Document Summary (continued)

Site(s): Oak Ridge National Laboratory		Source Document Tracking Number: U478
AK # [b]	Source Doc. Page # [c]	AK Information Summary

Source Document Data Limitations (if any):

1. Best Available Copy.
2. Intentional blank pages throughout logbook.

Acceptable Knowlege Expert:

Travis Smith / [signature] Date: 07/16/2014

Print /Sign

[a] Provide description for non-titled information (i.e., container paperwork, MSDS sheets, etc)
[b] Obtain from Acceptable Knowledge Documentation Checklist
[c] For microfilm or microfiche, identify box, tape, reel number and location.

DIVIDER PAGE

Attachment 3 - Acceptable Knowledge Source Document Summary

Site(s): Oak Ridge National Laboratory	Source Document Tracking Number: U507
Waste Stream Number(s): ORNL Non-specific Library Files (Applicable only when site library is not in use)	
Acceptable Knowledge Documentation Type: ☐ TRU Waste Management Program Information ☑ Waste Stream-Specific Information ☑ Additional Information	Category: ☐ Correspondence ☐ Discrepancy Resolution ☐ Internal Procedure ☐ Miscellaneous ☐ Published Document or Internal Procedure ☑ Unpublished Documents
Title or Description of Source Document [a]: Research & Technical Notebook - Notebook No.(SM-1) A-107736-G - Building 7920, MS 6384 - Charles Alexander	
Source Document Reference Information (author(s), document and revision number, date, publisher): Charles (Chuck) Alexander, A-107736-G, NA, Various, Chem Tech Div	

AK # [b]	Source Doc. Page # [c]	AK Information Summary
WS2, WS3, WS8, WS11, WS12, S11	Throughout	This is a logbook relative to research work done in Building 7920 by Chuck Alexander. Chemicals identified include: Aluminum oxide (Al2O3) Ceresin wax (MSDS submitted to records) Gold (Au) HNO3 Lithobraze 925 (MSDS submitted to records) Silver Lithium Copper Nickel (Ni) Polyethylene Samarium (Sm) Samarium nitrate Samarium oxide Urea powder

CCP RECORDS ORIGINAL
DATE REC'D 1/3/14
DA

Attachment 3 - Acceptable Knowledge Source Document Summary (continued)

Site(s): Oak Ridge National Laboratory	Source Document Tracking Number: U507

Source Document Data Limitations (if any):

1. There were no transuranics identified in this logbook
2. This is the best available copy of this logbook.

Acceptable Knowlege Expert:

Travis Smith / Date: 12/11/2013

Print /Sign

[a] Provide description for non-titled information (i.e., container paperwork, MSDS sheets, etc)
[b] Obtain from Acceptable Knowledge Documentation Checklist
[c] For microfilm or microfiche, identify box, tape, reel number and location.

4507

Alexander Logbook Sm-1 (A-107736-G)

Chemicals
Aluminum oxide (Al2O3)
Ceresin wax (MSDS submitted to records)
Gold (Au)
HNO3
Lithobraze 925 (MSDS submitted to records)
Silver
Lithium
Copper
Nickel (Ni)
Polyethylene
Samarium (Sm)
Samarium nitrate
Samarium oxide
Urea powder

U507

Notebook No. Sm-1

MARTIN MARIETTA

Research and Technical Notebook

MANAGED BY
MARTIN MARIETTA ENERGY SYSTEMS, INC.
FOR THE UNITED STATES
DEPARTMENT OF ENERGY

MARTIN MARIETTA ENERGY SYSTEMS, INC.

Site Address ORNL
Bldg. 7920
MS 6384

Research and Technical Notebook No. A-107736-6

Assigned to: C. W. Alexander Date: 2-1996

Division: Chem. Tech.

Dept./Section:

Program/Project:

Content

Research/Technical Description(s)/	Inclusive Dates	Pages

Subject Test Brazes for Stainless Steel Encapsulation

Date Jan. (Month) 30 (Day) 19 97 (Year)

Gave Jim King of M&C two stainless steel samples with different braze materials. The first braze material was Lithobraze 925 and the second braze material was 82% Au, 18% Ni. The braze conditions are the same for both materials:

Gold-Ni	Temperature: >1750° F (>954 °C) (960°-970°)	Jim King decided that these would be the best
	Atmosphere: Argon (dry)	
	Time: 2-3 minutes at temperature	
Lithobraze	Temperature: ~910° C	
	Atmosphere: Argon (dry)	
	Time: 2-3 minutes at temperature	

Continued on page _____

C.W. Alexander — Recorded by

Jan. 30, 1997 — Date

_____ — Read and understood by

_____ — Date

Subject Preparation of Sm_2O_3 for Pressing

Date Feb. 3 1997
Month Day Year

Empty SiO_2 flask: 88.090 g (tared out)
Sm_2O_3: 4.952 g (99.9%)

Added 13.0 ml of concentrated HNO_3 to the flask. The reaction was instaneous with almost all of the Sm going immediately into solution. Placed the flask on a heating plate. Added 4 ml of deionized H_2O to the flask. The rest of the Sm appeared to go into solution. Solution was then dried down to convert the Sm to a nitrate form. Added 9.998 g of urea powder to the nitrate and placed back on the heating plate. Added another 4.894 g of urea powder to the flask. Turned off the heating plate at ~1530 hrs.

Continued on page _____

C.W. Alexander Feb. 3, 1997
Recorded by Date

Read and understood by Date

Subject Preparation of Sm_2O_3

Date Feb. 4 1997
Month Day Year

Turned the heating plate back on in order to drive off more of the excess urea prior to putting it into the furnace. Reduced the amount of excess urea and transferred the SiO_2 beaker to a small furnace to convert the Sm to the oxide.

C. W. Alexander
Recorded by

Feb. 4, 1997
Date

Continued on page ____

Read and understood by

Date

ect Test Brazes for Stainless Steel Encapsulation

Date Feb. 4 1997
Month Day Year

Jim King finished the brazing of the two test pieces. According to Jim (and to me also) is that the joint with the Lithobraze was too big a gap. The Lithobraze flowed nicely into the joint. However, the gap was not completely filled with the braze material. In the case of the Au-Ni braze alloy, the joint was completely filled with the braze material. The excess braze material outside the lap joint also appeared to wick into the joint. Under examination with a microscope, there appeared to be some surface porosity on the braze. I will probably request some sectioning and micrographs to check uniformity of the braze and the porosity.

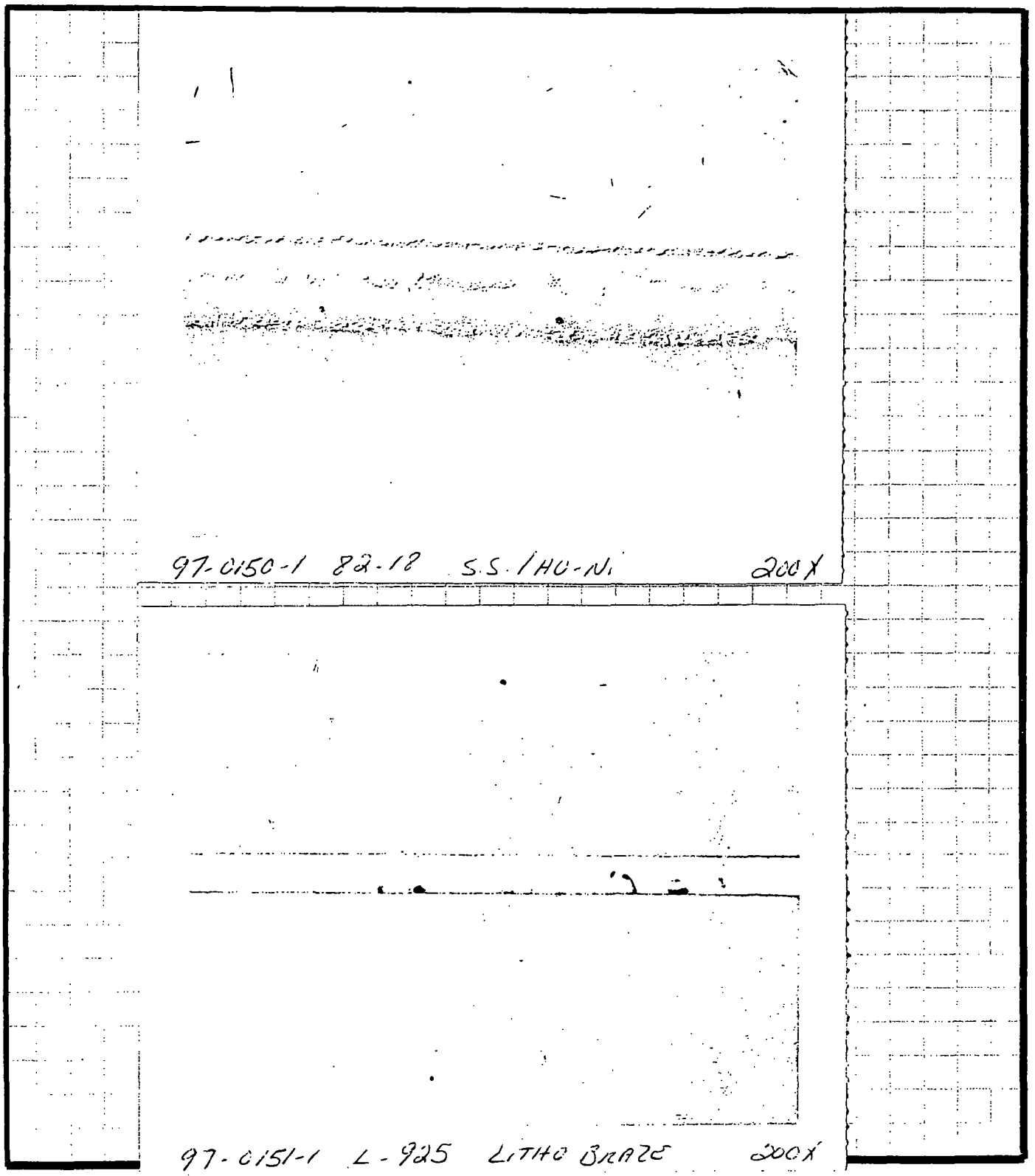
Continued on page

J. Alexander Feb. 4, 1997
led by Date

Read and understood by Date

Subject Sectioning Results of Test Brazes

Date Feb. (Month) 11 (Day) 19 97 (Year)



Continued on page _____

C.W. Alexander — Recorded by
Feb. 11, 1997 — Date

_____ — Read and understood by
_____ — Date

oject Addition of Binders to the Sm_2O_3

Date Feb (Month) 20 (Day) 1997 (Year)

We took the following aliquots and mixed them together over low heat on a heating plate:

Sm_2O_3: 0.9960 g (from the urea precipitate method)
Ceresin wax: 0.0885 g
Polyethylene: 0.0123 g
Subtotal: 1.208 g

Beaker after heating and mixing: 30.5963 g
(material was not "sticky" so we added some more ceresin wax)

Ceresin wax: 0.1143 g

Beaker after heating and mixing: 30.7063 g (0.1100 g Δ)
(material was still not sufficiently "sticky" so we added some more ceresin wax)

Ceresin wax: 0.0983 g

Beaker after heating and mixing: 30.8203 g (0.1140 g Δ)
(material now appeared to be "sticky")

MAT'L: Tool or Carbon Steel
REQ'D: 1

Continued on page _____

L.W. Alexander — Feb. 20, 1997
corded by — Date

Read and understood by — Date

Subject Loading Parameters for Pressing Sm_2O_3 Rods

Date Feb. (Month) 20 (Day) 1997 (Year)

If we desire to press a "green" rod that is 0.040" by 0.040" by 0.50", assume the following:

Sm_2O_3 T.D. : 8.347 g/cm^3

Ceresin T.D. (assumed) : 0.95 g/cm^3

Pseudo-density = (0.996/1.4206) · 8.347 + (0.313/1.4206) · 0.95

= 6.062 g/cm^3

Volume of rod = $(0.040)^2 (0.50) (2.54)^3$

= 0.0131 cm^3

Mass required/rod = 0.0795 g

Continued on page _____

C.W. Alexander — Recorded by

Feb. 20, 1997 — Date

_____ — Read and understood by

_____ — Date

#1 .066 rough edge - rough edge

.030 thick

.026 .0371 long

	Post-Sinter			
#4	34.834 mg	(49.7)	(70.09%)	(4.096
#3	39.908 mg	(56.0)	(71.26%)	
#2	49.004 mg	(68.8)	(71.23%)	
#1	56.122 mg	(78.9)	(71.13%)	

#4 0.360 long

0.040

0.031"

0.0465

2-10-97

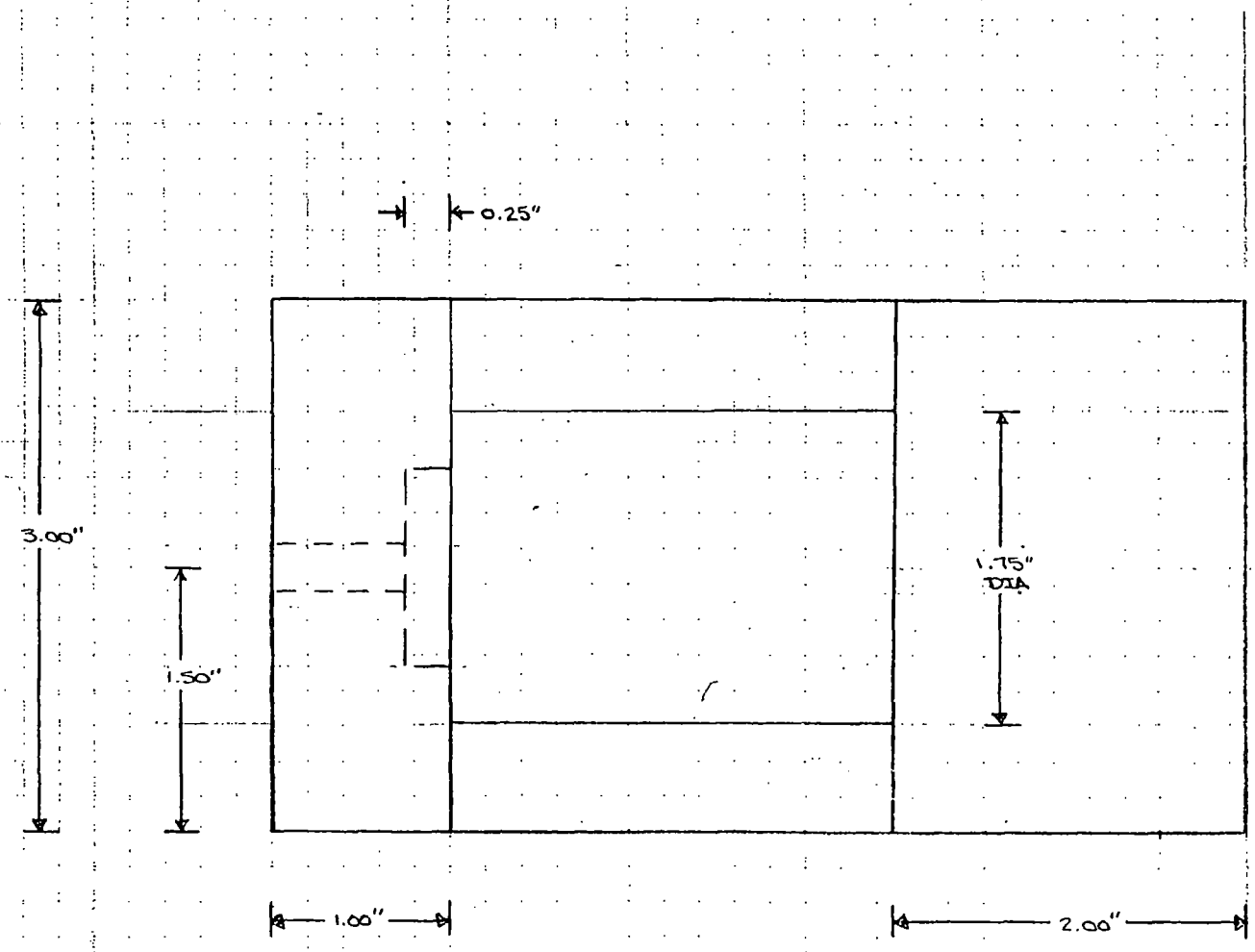
#2 20.517 ms (69.71%)

#3 20.540 ms (71.32%)

#4 19.424 ms (70.63%)

#5 19.581 ms (69.93%)

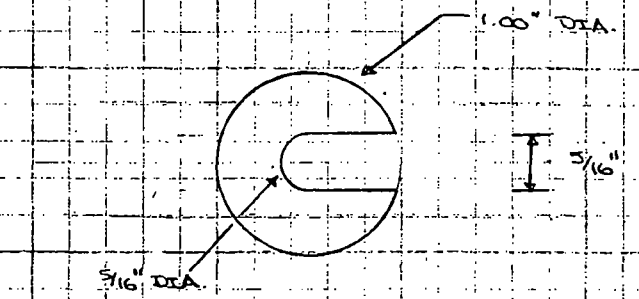
	length	diameter	original diameter 0.06250	original length reduction
#2	0.1725	0.0455	27.20%	26.75%
#3	0.1755	0.0445	28.80%	27.63%
#4	0.1625	0.0445	28.80%	27.62%
#5	0.1615	0.0445	28.80%	26.76%



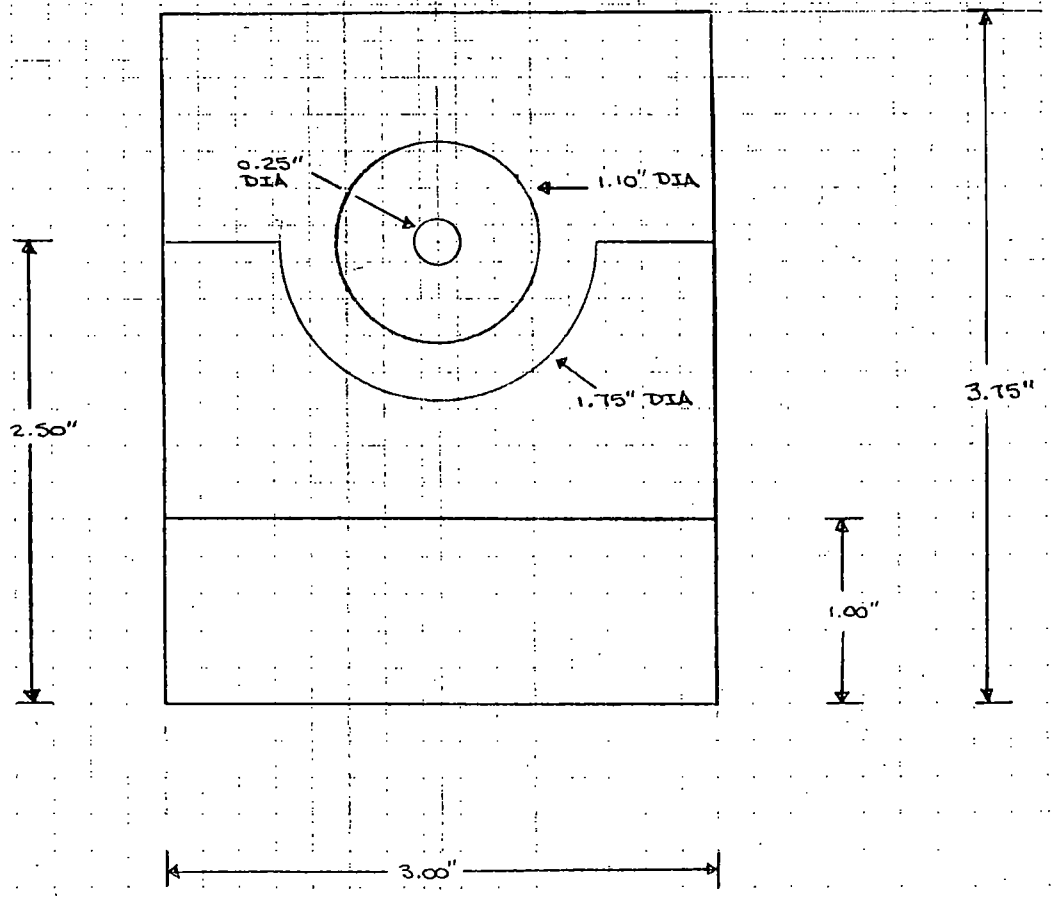
EXTRUSION DIE HOLDER
(TOP VIEW)

MAT'L: Tool or Carbon Steel
REQ'D: 1

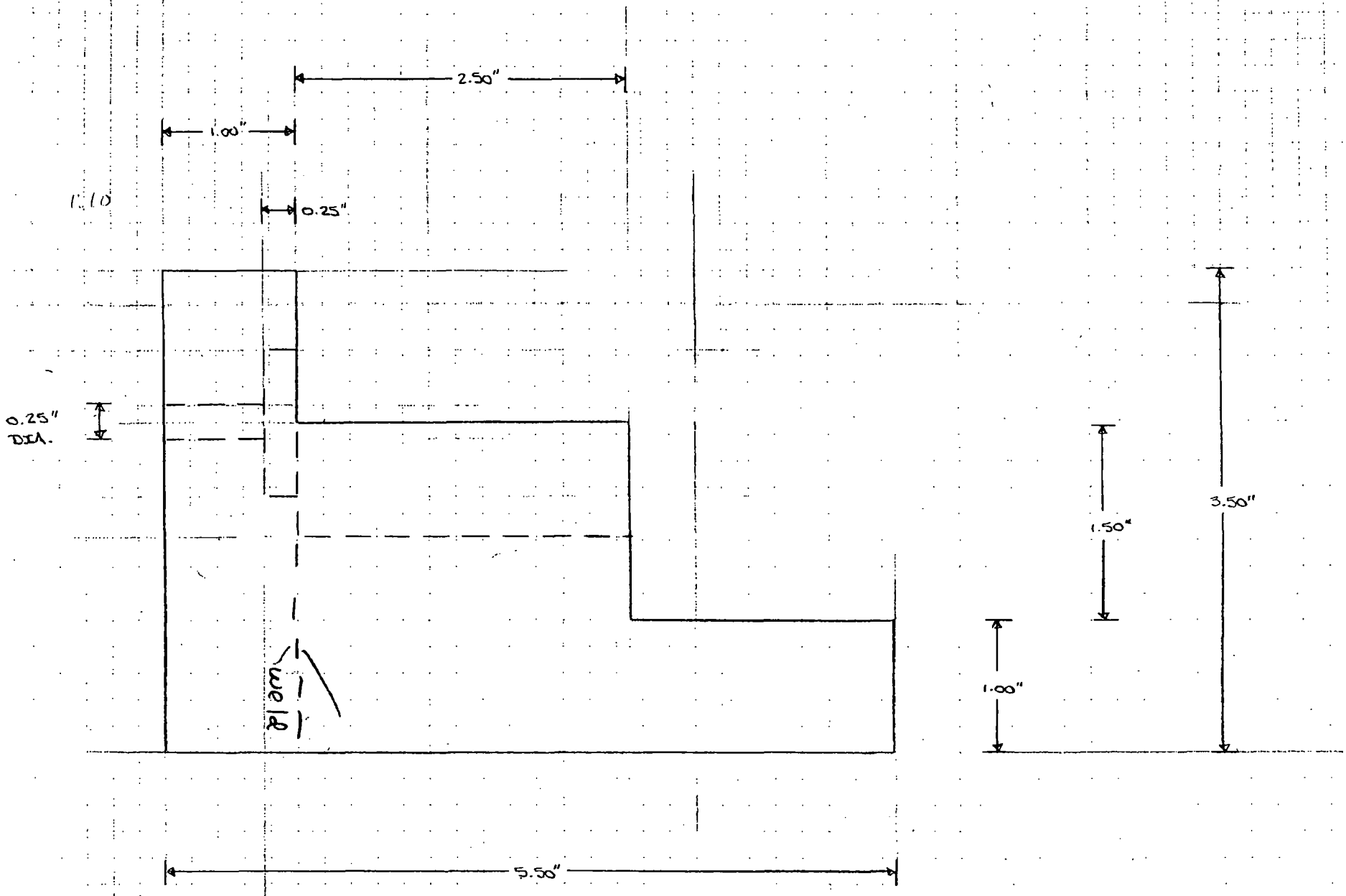
0.175 1"



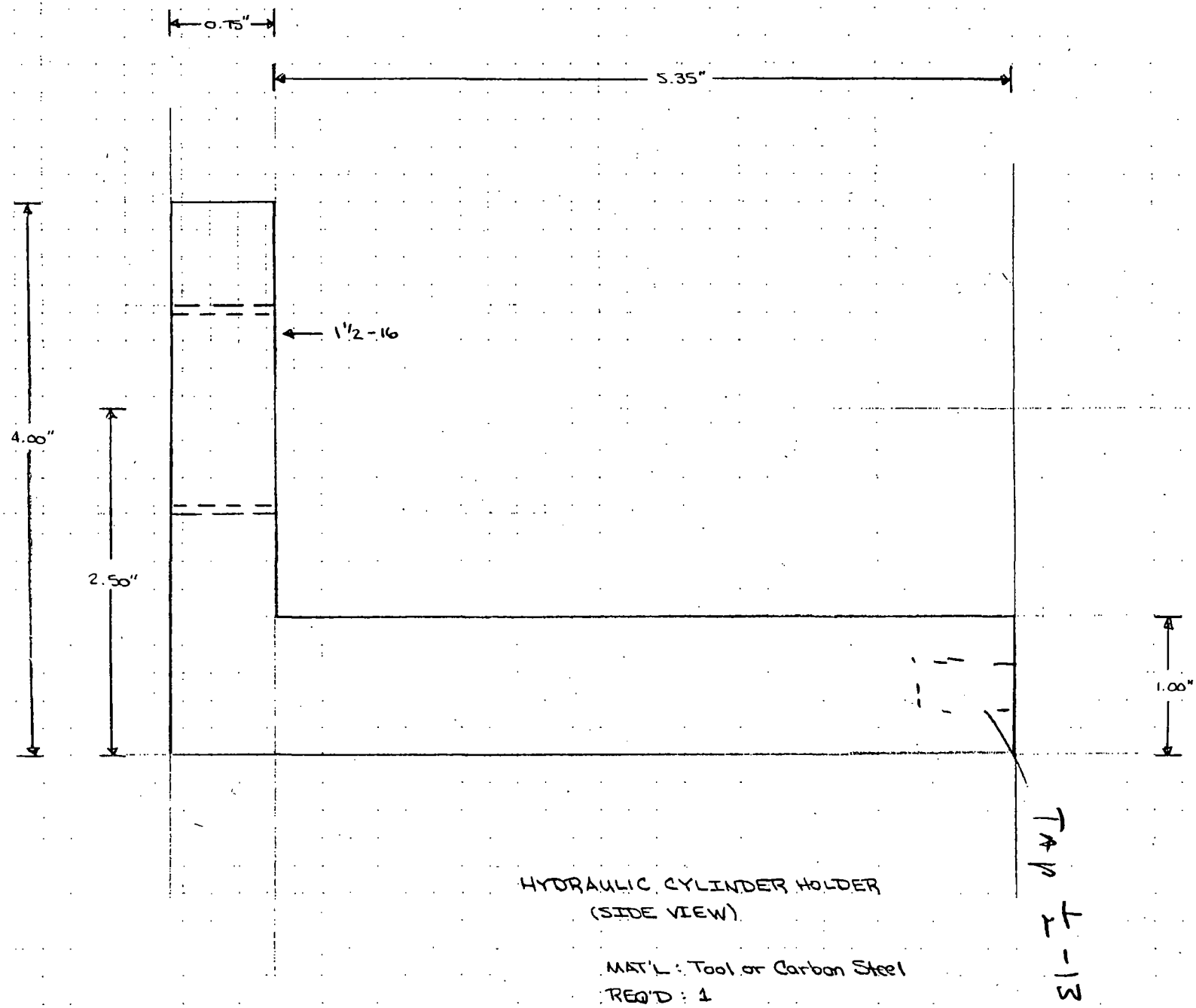
EXTRUSION DIE COLLAR
MAT'L: SS 300 Series
REQ'D: 1



EXTRUSION DIE HOLDER
(END VIEW)
MAT'L: Tool or Carbon Steel
REQ'D: 1



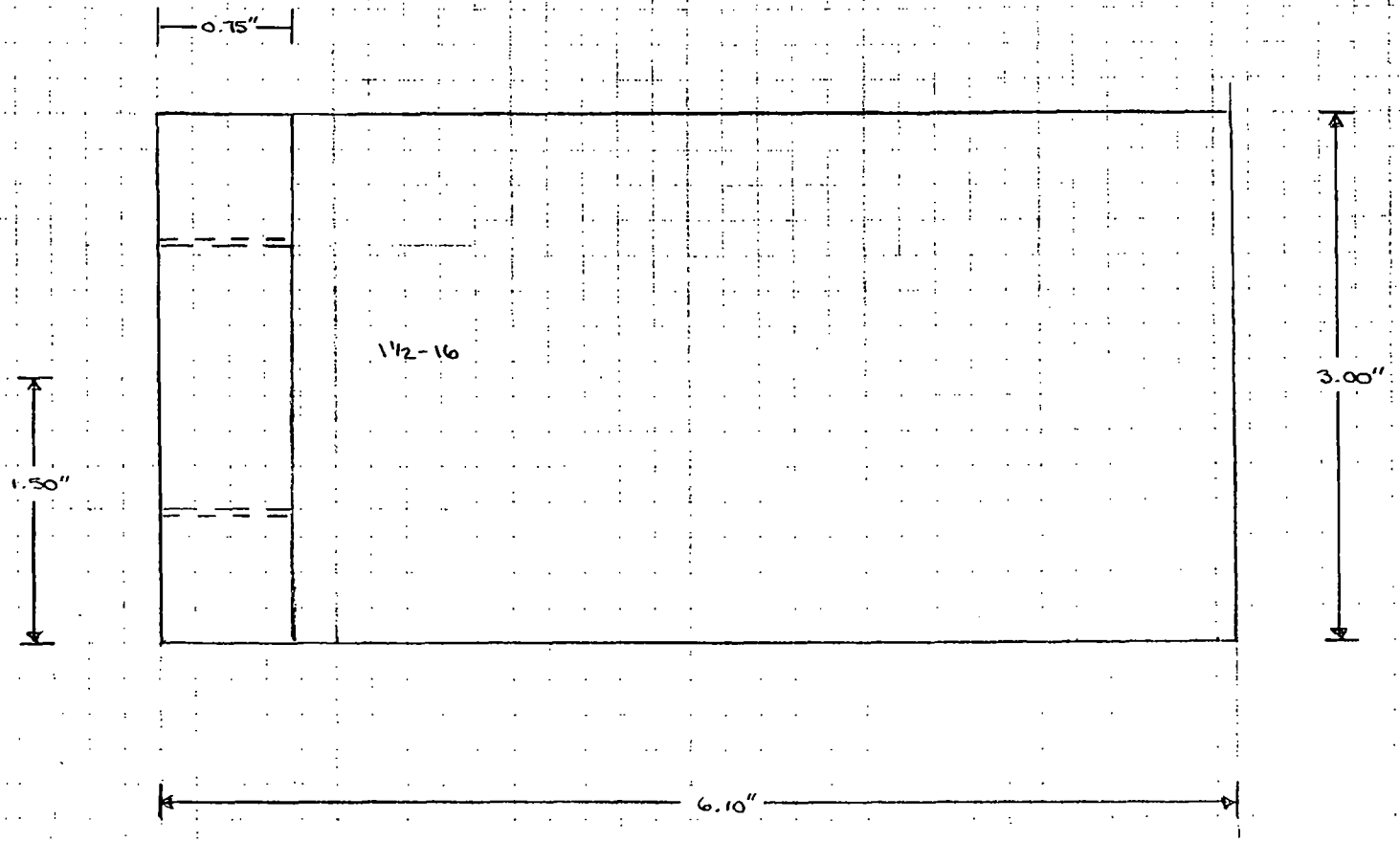
EXTRUSION TIE HOLDER
(SIDE VIEW)
MAT'L: Tool or Carbon Steel
REQ'D: 1



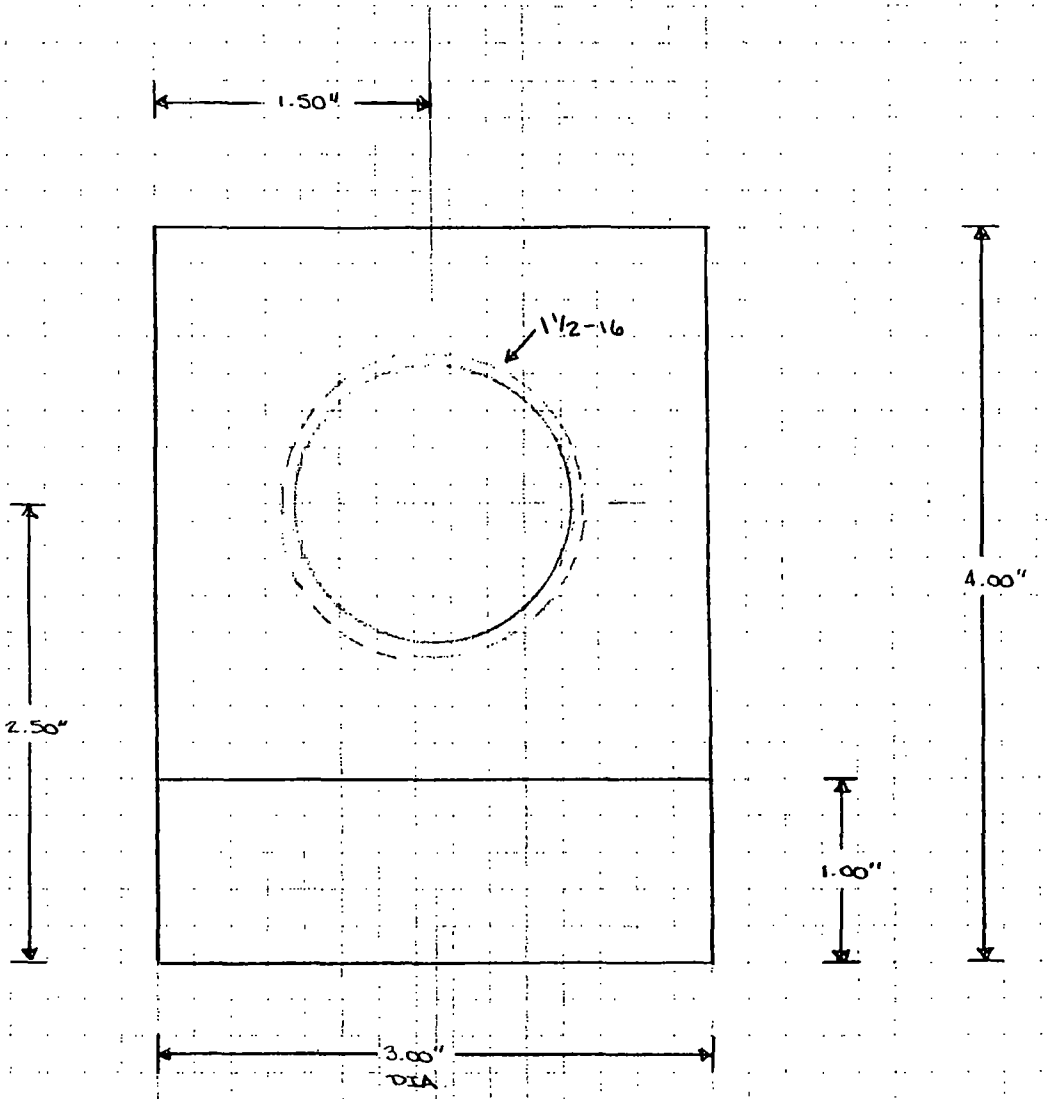
HYDRAULIC CYLINDER HOLDER
(SIDE VIEW)

MAT'L : Tool or Carbon Steel
REQ'D : 1

T-15 T-14



HYDRAULIC CYLINDER HOLDER
(TOP VIEW)
MAT'L: Tool or Carbon Steel
REQ'D: 1



HYDRAULIC CYLINDER HOLDER
(END VIEW)

MAT'L: Tool or Carbon Steel
REQ'D: 1

Subject Rod Preparation and Sintering

Date Feb. 25 1997
Month Day Year

Weighing dish: 8.6834 g (tared out)

1st Sm_2O_3 aliquot: 0.0796 g
Green rod weight: 0.0789 g (rod appears to be rectangular)

2nd Sm_2O_3 aliquot: 0.0701 g
Green rod weight: 0.0688

3rd Sm_2O_3 aliquot: 0.0583 g
Green rod weight: 0.0560 g

4th Sm_2O_3 aliquot: 0.0504 g
Green rod weight: 0.0497 g

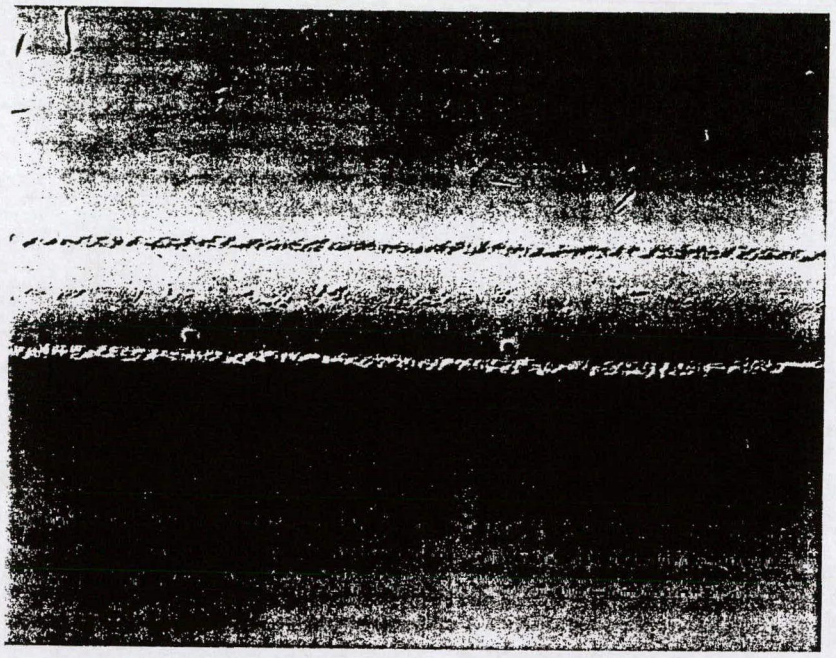
A measure of #4, prior to sintering, was 0.5" x 0.066" x 0.0445"
These measures were made using a special reticule on the microscope.

All four green rods were loaded into the high-temperature furnace. They were placed on a bed of Al_2O_3 thermocouples.

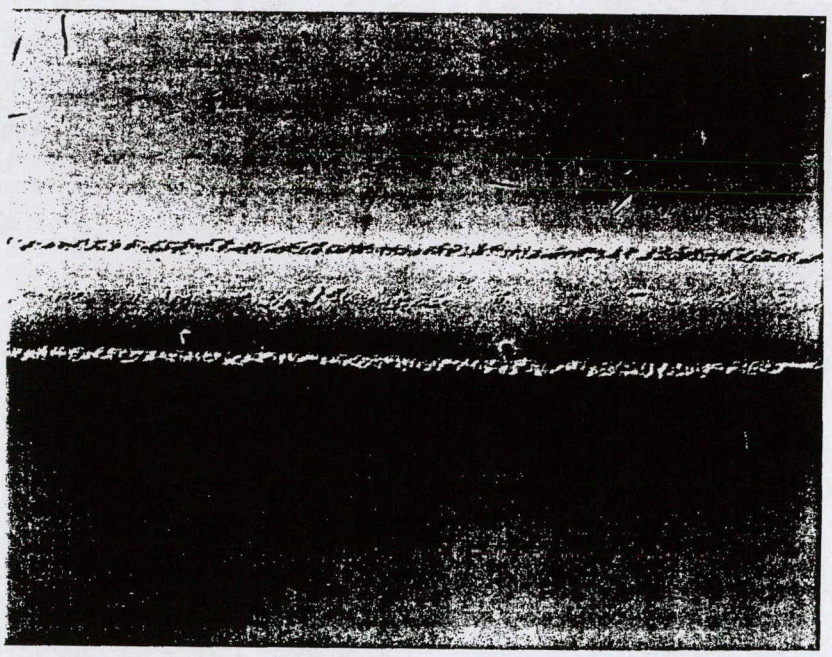
1st Ramp:

Continued on page _____

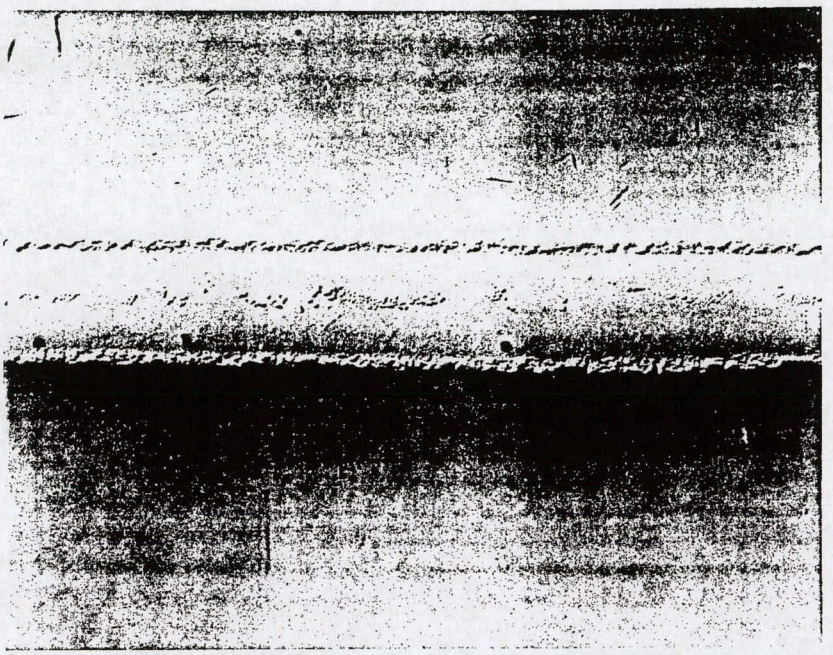
Recorded by Date Read and understood by Date



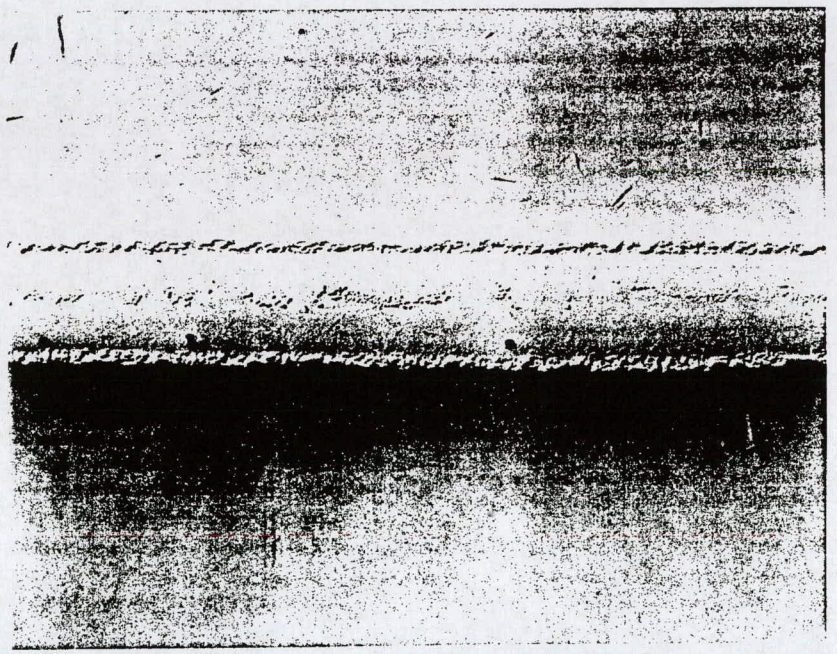
97-0150-1 82-18 S.S./AU-Ni 200X



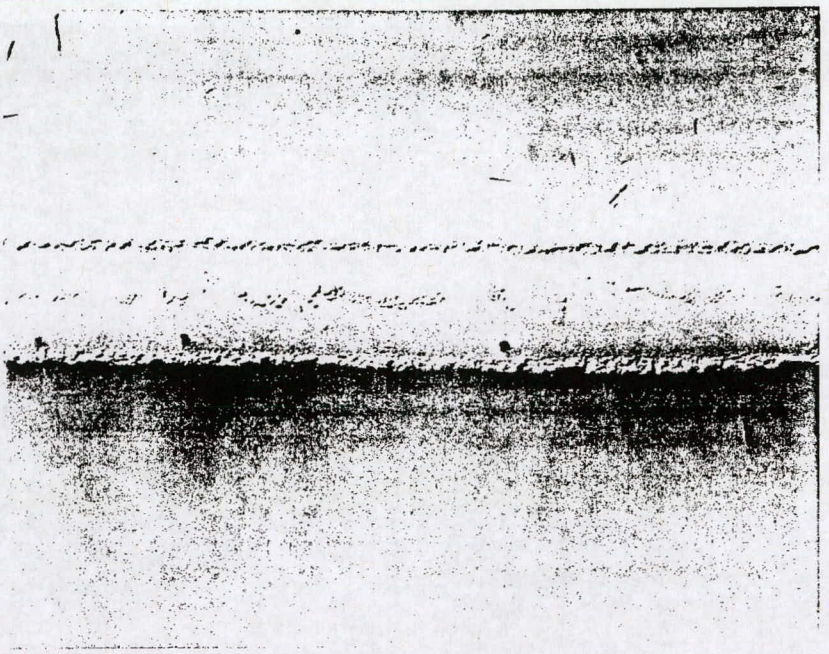
97-0150-1 82-18 S.S./AU-Ni 200X



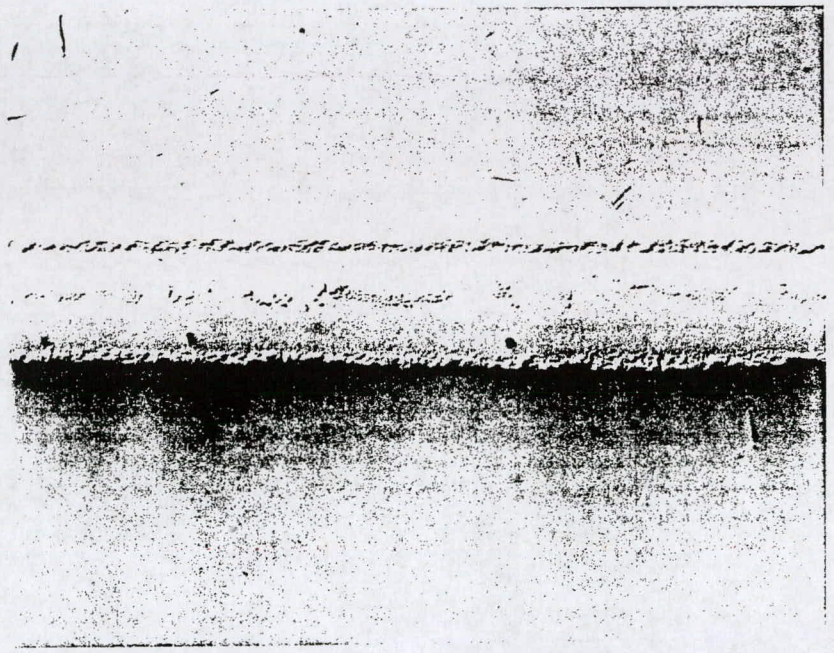
97-0150-1 82-18 S.S./AU-Ni 200X



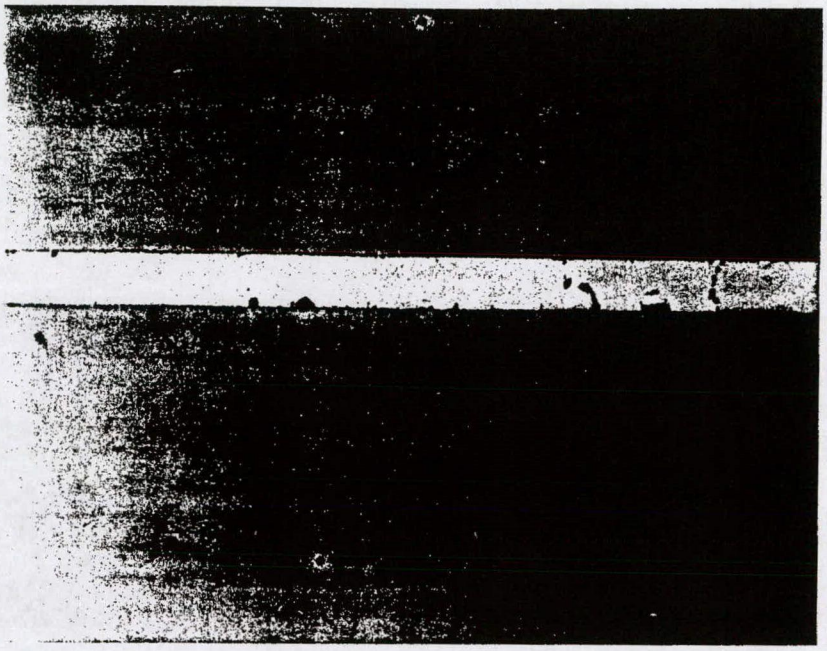
97-0150-1 82-18 S.S./AU-Ni 200X



97-0150-1 82-18 S.S./AU-Ni 200X



97-0150-1 82-18 S.S./AU-Ni 200X



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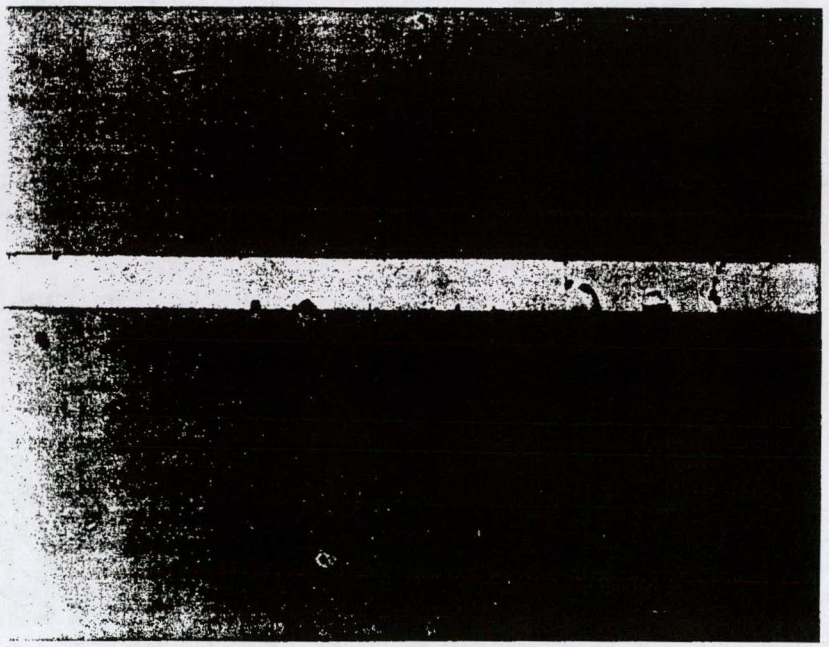

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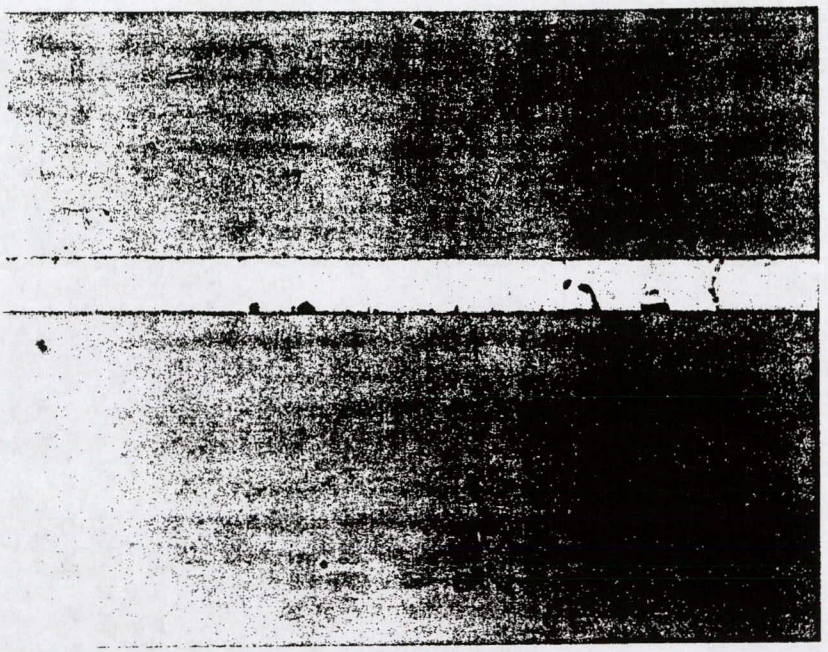

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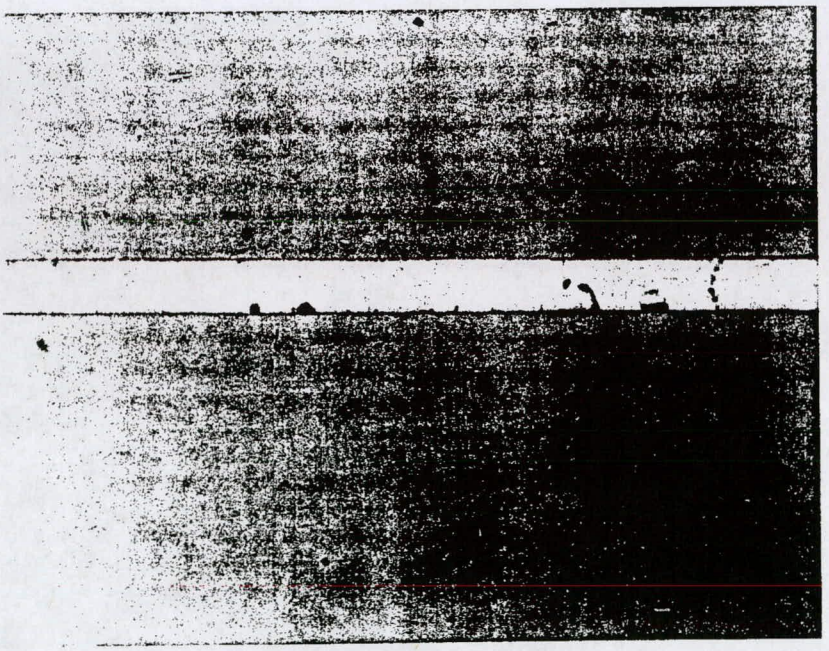
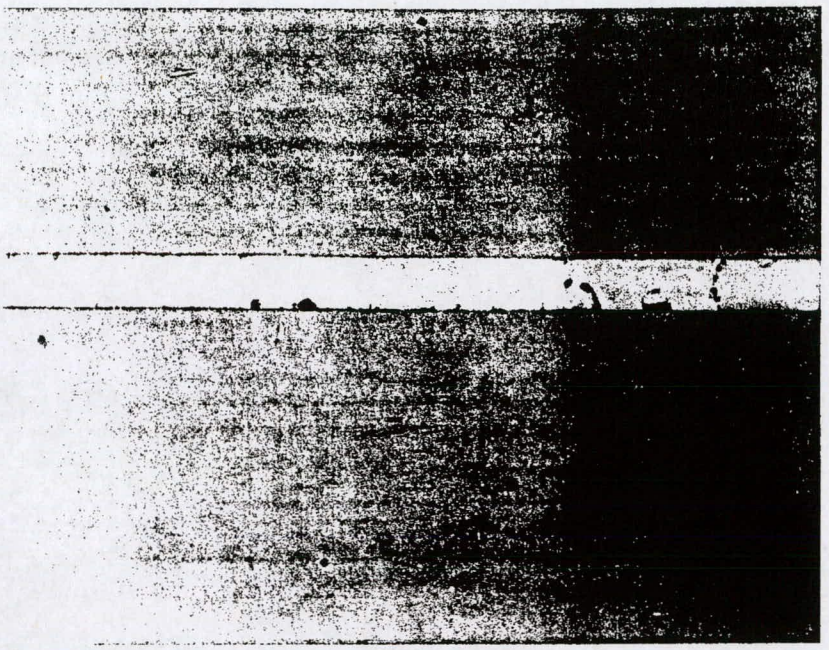
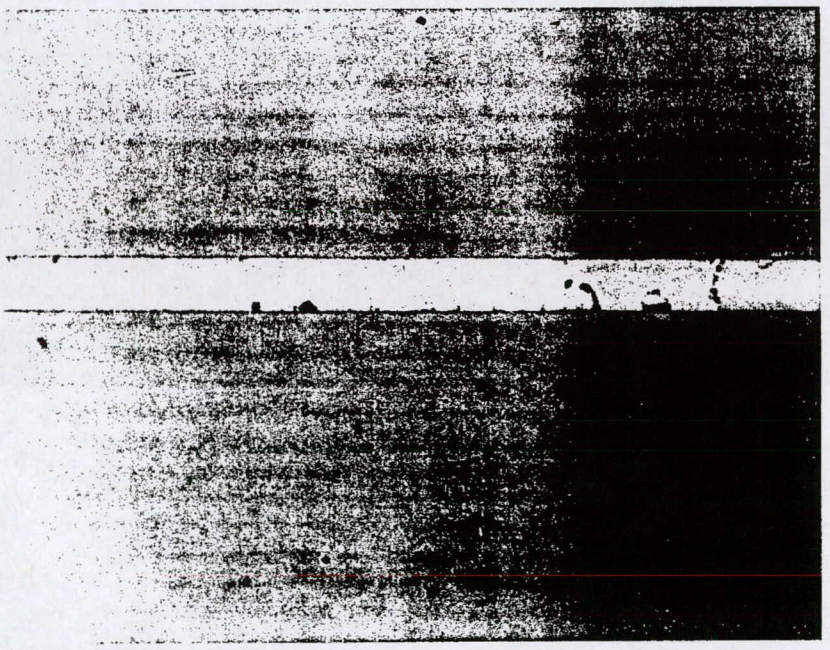


97-0151-1 L-925 LITHO BRAZE 200X



97-0151-1 L-925 LITHO BRAZE 200X



97-0151-1 L-925 LITHO BRAZE 200X

Paul Socha
(315) 853-4900

Steve Marek

80% Au, 20% Sn
(182)

280°C } Eutectic
300°-320°C }

350°-400°C } reducing

82% Au, 18% Ni

> 1750°F

75% Ar / 25% H
dry argon, -70%
dewpoint

Lithobraze 925

> 1750°F

Argon inert
atmosphere

2-3 mins at
temperature

Nicrobraze cement (volatizes at 400°F)
Stop-off (photo-resist)

Handy & Harman

TECHNICAL DATA SHEET—NUMBER D-38

INFORMATION ABOUT

LITHOBRAZE 925 and LITHOBRAZE 720 (BT)

		LITHOBRAZE 925	LITHOBRAZE 720 (BT)
NOMINAL COMPOSITIONS:	Silver	92.5% ± 0.5%	71.65% ± 0.5%
	Copper	Balance	Balance
	Lithium	0.20% $^{+0.10\%}_{-0.05\%}$	0.35% $^{+0.15\%}_{-0.10\%}$
	All Others	0.15% max.	0.15% max.
PHYSICAL PROPERTIES:	Color	Silver-White	Silver-White
	Solidus (Melting Point) (approx.)	1400°F (760°C)	1400°F (760°C)
	Liquidus (Flow Point) (approx.)	1635°F(890°C)	1400°F (760°C)
	Specific Gravity	10.11	9.67
	Density (Troy oz/cu in)	5.33	5.09
	Electrical Conductivity (% IACS)	55.2*	50.8**
	Electrical Resistivity (Microhm-cm)	3.12*	3.39**

*Measured on 0.030" diameter annealed wire with 0.22% lithium.
**Measured on 0.032" diameter annealed wire with 0.19% lithium.

BRAZING CHARACTERISTICS:

Lithobraze 925 is lithium modified sterling silver, designed primarily for fluxless furnace brazing of stainless steels. This alloy has been widely used for brazing honeycomb airframe structures made of precipitation hardening stainless steels such as 17-7PH, PH15-7Mo and AM350.

The use of Lithobraze 925 permits taking advantage of the maximum panel strength afforded by free node flow. This alloy is not suitable for torch brazing in air but must be used in a hydrogen or inert atmosphere of low dew point (—70°F/—55°C or drier). Argon is the most commonly used inert gas.

Lithobraze 720 (BT) is a lithium modified Braze 720 (BT). Braze 720 is the eutectic composition in the silver-copper system (72% Ag, 28% Cu). The lithium content facilitates the wetting of stainless and refractory metals when used in a hydrogen or inert atmosphere of low dew point (—70°F/—55°C or drier).

The use of endogas or exogas atmospheres, or standard fluxes, is not recommended since they react with the lithium and interfere with bonding. A minimum brazing temperature of 50°F (10°C) above the flow point is suggested for atmosphere furnace brazing. These alloys are particularly adaptable to brazing thin sections of stainless steels because solution of the base metal by the filler metal is negligible.

Lucas-Milhaupt, Inc.
A Handy & Harman Company
5656 S. Pennsylvania Avenue, Cudahy, WI 53110
Phone Number: (414) 769-6000

1900 Estes
703 • 30400

LUCAS-MILHAUPT, INC.

5656 S. PENNSYLVANIA AVE
CUDAHY, WI 53110

FAX MESSAGE

DATE: JAN 31, 1996 SEND TO FAX#: 423-574-4928

PLEASE NOTIFY: MR. GEORGE GARNER

AT (COMPANY NAME): OAK RIDGE NATIONAL LAB

THAT THIS MESSAGE HAS ARRIVED

FROM: STEVEN MAREK OF LUCAS-MILHAUPT INC.

PLEASE CALL US IMMEDIATELY IF THE COPY YOU RECEIVE IS INCOMPLETE OR ILLEGIBLE. OUR TELEPHONE NUMBER IS (414)769-6000. FOR TRANSMISSION OF DOCUMENTS TO US, DIAL OUR FAX NUMBER: 414-769-1093.

Attached is the technical data sheet for the lithobraze filler metal you inquired about.

Lithobraze 925

1) > 1750° F (> 954° C)

2) Ar atmosphere

3) 2-3 minutes at temperature

probably ~900° C

92% Au, 18% Ni

1) > 1750° F (> 954° C)

2) Ar atmosphere

3) 2-3 minutes at temperature

~ 990° C

Chuck Alexander 4/1/67

Handy & Harman **LITHOBRAZE 925 and LITHOBRAZE 720 (BT)**

PROPERTIES OF BRAZED JOINTS: Joints brazed with Lithobraze 925 and Lithobraze 720 have been used for applications where operating temperatures were intermittently as high as 900°F (480°C). When continuous elevated temperature exposure to oxidizing conditions is to be expected (1000 hours or more), the maximum operating temperature should be reduced to 500°F (260°C). Joints made on heat resistant alloys with these filler metals are much more resistant to interface corrosion than flux brazed joints. Final acceptance should be based on tests made under the anticipated service conditions.

USES: The principal use to date of Lithobraze 925 has been the brazing of honeycomb panel sections. It can be used for general purpose furnace brazing of stainless steels where flux must be avoided.

Lithobraze 720 is a good general purpose, low temperature filler metal of high fluidity for fluxless furnace brazing of stainless steels when used in dry hydrogen or inert atmospheres.

SPECIFICATIONS: Lithobraze 925 conforms to the following specifications:

AWS A5.8	BAg 19
ASME Blr. Pr. Vsl. Cd. Sect. II-C, SFA 5-8	BAg-19
SAE-AMS 4767A	

Lithobraze 720 conforms to the following specifications:

AWS A5.8	BAg-8a
ASME Blr. Pr. Vsl. Cd. Sect. II-C, SFA 5-8	BAg-8a

AVAILABLE FORMS: Strip, wire, powder, paste and preforms to specification.

WARRANTY CLAUSE: Handy & Harman believes the information contained herein to be reliable However, the technical information is given by Handy & Harman without charge and the user shall employ such information at its own discretion and risk, and Handy & Harman assumes no responsibility for results obtained or damages incurred from the use of such information in whole or in part.

ORNL

U507

32 pages

DIVIDER PAGE

Attachment 3 - Acceptable Knowledge Source Document Summary

Site(s): Oak Ridge National Laboratory	Source Document Tracking Number: U529

Waste Stream Number(s): ORNL Non-specific Library Files

(Applicable only when site library is not in use)

Acceptable Knowledge Documentation Type:	Category:
☑ TRU Waste Management Program Information	☐ Correspondence
☑ Waste Stream-Specific Information	☐ Discrepancy Resolution
☑ Additional Information	☑ Internal Procedure
	☐ Miscellaneous
	☐ Published Document or Internal Procedure
	☐ Unpublished Documents

Title or Description of Source Document [a]: Technical Notebook - Charles Alexander, Building 7920

Source Document Reference Information (author(s), document and revision number, date, publisher): Charles Alexander, Logbook # B000334, NA, 12/11/1985-07/29/1988, NA

AK # [b]	Source Doc. Page # [c]	AK Information Summary
PR7, WS1, WS2, WS3, WS4, WS6, WS8, WS11, WS12, S11	Throughout	This logbook is relative to research conducted in Labs 111 and 110 in Building 7920 (REDC) by Chuck Alexander. The following chemicals have been identified: Acetone (pages 1, 28 of logbook) AG 50W resin (MSDS submitted to records) Polystyrene-divinylbenzene sulfonic acid resin Alpha-hydroxyisobutyrate (AHIB) Aluminum (Al-28) Ammonium nitrate (NH4NO3) Aqua regia (MSDS submitted to records) Hydrochloric acid, concentrated Nitric acid, concentrated Barium (Ba-133) (page 102 of logbook) Cadmium (Cd) Chromium (Cr-51) (page 17 of logbook) Cobalt (Co-60) Desicote (page 1 of logbook) (MSDS submitted to records) Methyl chloroform 1,1,1, trichloroethane Silicone compound Dowex 50W resin polymer with ethenylbenzene and ethenylethylbenzene Hydrochloric acid (HCl) Lead (Pb) (page 44 of logbook) Magnesium dichloride (MgCl2) Neodymium oxide (Nd-148 oxide) Nitric acid (HNO3) Samarium nitrate Samarium oxide Sodium (Na-24) Sodium hydroxide (NaOH) Ultrex nitric acid (HNO3) (MSDS submitted to records) Zinc (Zn-65) Radionulcides are identified as follows: Aluminum, Radioactive (Al-28) Chromium-51 Cobalt-60 Gadolinium-153

CCP RECORDS ORIGINAL
DATE REC'D 10/22/2014
EPT

Attachment 3 - Acceptable Knowledge Source Document Summary (continued)

Site(s): Oak Ridge National Laboratory		Source Document Tracking Number: U529
AK # [b]	Source Doc. Page # [c]	AK Information Summary
		Neodymium (Nd) Promethium (Pm-145) Samarium (Sm) Sodium, Radioactive (Na-24) Zinc , Radioactive(Zn-65)

Source Document Data Limitations (if any):

1. Blank logbook pages are not included with this source document.
2. This is the best available copy of this logbook.

Acceptable Knowlege Expert:

Travis Smith Date: 07/16/2014

Print /Sign

[a] Provide description for non-titled information (i.e., container paperwork, MSDS sheets, etc)
[b] Obtain from Acceptable Knowledge Documentation Checklist
[c] For microfilm or microfiche, identify box, tape, reel number and location.

Alexander Logbook 21/150/REC – B000334

Labs 110 and 111

Chemicals
Acetone (pages 1, 28 of logbook)
AG 50W resin (MSDS submitted to records) Polystyrene-divinylbenzene sulfonic acid resin
Alpha-hydroxyisobutyrate (AHIB)
Aluminum (Al-28)
Ammonium nitrate (NH4NO3)
Aqua regia (MSDS submitted to records) Hydrochloric acid, concentrated Nitric acid, concentrated
Barium (Ba-133) (page 102 of logbook)
Cadmium (Cd)
Chromium (Cr-51) (page 17 of logbook)
Cobalt (Co-60)
Desicote (page 1 of logbook) (MSDS submitted to records) Methyl chloroform **1,1,1, trichloroethane** Silicone compound
Dowex 50W resin polymer with ethenylbenzene and ethenylethylbenzene
Hydrochloric acid (HCl)
Lead (Pb) (page 44 of logbook)
Magnesium dichloride (MgCl2)
Neodymium oxide (Nd-148 oxide)
Nitric acid (HNO3)
Samarium nitrate
Samarium oxide
Sodium (Na-24)
Sodium hydroxide (NaOH)
Ultrex nitric acid (HNO3) (MSDS submitted to records)
Zinc (Zn-65)
Radionuclides
Aluminum, Radioactive (Al-28)
Chromium-51
Cobalt-60
Gadolinium-153
Neodymium (Nd)
Promethium (Pm-145)
Samarium (Sm)
Sodium, Radioactive (Na-24)
Zinc , Radioactive(Zn-65)

Resins will likely be in the waste; Quartz wool will likely be in the waste.

21
150
REC

Opw 3/27/08

U529

REQUIREMENTS AND INSTRUCTIONS

1. All technical personnel are required to keep good research records; this notebook is to be used for that purpose.

2. This notebook is assigned to personnel who perform research and development work and must be used for all original descriptions of ideas and conceptions, data, calculations, notes, and sketches.

3. The assignee is responsible for the safeguarding of this notebook in accordance with appropriate security regulations.

4. This notebook must be returned to your site's records department upon termination of the assignee's employment or of the program or project, or when it ceases to be of reference value.

5. Entries must be written in ink. Pencil is not permitted.

6. Each entry must be signed and dated by the person who made the entry, and also by any others who contributed to the content thereof. If an invention is recorded, the true inventors thereof must write, *Invented by* before their name. NEVER back-date any entry for any reason whatsoever.

7. Alteration or amplification of previous entries MUST be made as new entries with the current date and cross referenced to the previous entries, which if incorrect may have one line only drawn therethrough.

7.5 NEVER erase, white-out, obliterate, or otherwise obscure any information whatsoever, for any reason.

8. Computer printouts, charts, drawings, and graphs drawn on special paper should be glued or otherwise securely fastened in place and each should have a date and signature. Do not obscure any information.

9. It is recognized that some types of original records (e. g., computer printouts, chart recordings, etc.) cannot be inserted into the notebook because of their size. Such records should be signed and dated, and reference should be made in the notebook to their existence and storage location.

10. The notebook should be periodically reviewed by at least TWO witnesses - persons not directly involved with the work and be signed and dated by them with a written statement that they have *read and understood* the entries. Witnessing stamps for this purpose are available in department offices and also the Office of General Patent Counsel. In particular, any description of potentially patentable ideas or successful tests of an idea must be witnessed quickly after entry into the notebook. Proper witnessing is very important in proving inventorship and also the date that an invention was made.

11. It is advisable to preface each new item (e g., heat treatment, process, machine, etc.) with a very brief description of the purpose and planned approach.

12. The description of a development which is considered to be an invention or discovery MUST be complete enough to be understood by anyone skilled in the art.

13. Reference to name or catalog number should be made when standard items are being discussed (e. g., Westinghouse Pump, Model ___); the source of unconventional materials should be given in more detail.

14. In cases where work is conducted in cooperation with other persons, conferences and telephone conversations should always be entered in the notebook giving the date, who was involved, and if possible, an outline of the subjects discussed, even if the information is recorded elsewhere.

15. For further information relating to the keeping of technical notebooks, please contact the Office of General Patent Counsel at 574-4177.

CAUTION: This document has not been given final patent clearance and is for internal use only. If this document is to be given public release, it must be cleared through the site Technical Information Office which will see that the proper patent and technical reviews are completed in accordance with Energy Research Policy.

The assignee stipulates that the information contained within this notebook is possibly patentable.

Signed: ______________________ Date: __________

The assignee stipulates that this technical notebook contains only random data and is not patentable information.

Signed: ______________________ Date: __________

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2⅜ 1,000,000

MADE IN U.S.A.

Assigned #B000334 Date: 8/14/98
Owner: ALEXANDER, C. W.
Badge #17294 Bldg 7920 MS 6384
Division: CHEMISTRY TECHNOLOGY
Project:

Cation Resin and Column Preparation

1. Column preparation to make column hydrophobic
   a. 40 ml of H_2O rinsed through the interior of the column. This is 2-20 ml rinses through our standard micro-columns.
   b. Dry the column with acetone.
   c. Fill the column with Desicote (proprietary name) and let it naturally drain.
   d. Dry the column using air.

2. Typical cation resin preparation and conditioning
   a. Micro-column is ~ 2½-3 ml in volume in order to allow for a 20-fold excess meq capacity for rare earth loading.
   b. Quartz wool was inserted in the column, pushed to near the bottom and rinsed with demineralized H_2O.
   c. Poured AG 50W-X8 and water into a beaker, stirred, and a small amount pipetted into the column. The resin is in the hydrogen form and is 200-400 mesh size.
   d. Loaded resin is rinsed with H_2O and quartz wool in put on top of the column.
   e. Resin is rinsed with 10 ml of 6M HCl to strip off any metal ions in the resin. The HCl rinse also insures that the resin is in the hydrogen form.
   f. Resin is then water washed to remove free acid. The effluent is checked with pH paper to test for acidity. If no acidity is found then the resin is ready for use if the hydrogen form is desired.

11 Dec 1985 — Sm Tracer Test Column Run

Earlier mass spectroscopy analysis of the enriched ^{144}Sm indicated the presence of trace amounts of Nd. ^{144}Nd and ^{145}Nd were there in sufficient quantity to make a cross section measurement by mass analysis subject to considerable uncertainty. Therefore, it was decided to do a Sm-Nd separation using a Sm tracer and cation exchange chromotography. A small amount of natural Sm was irradiated in the P-tube of HFIR to produce a small amount of ^{153}Sm. Prior to an actual separation run, it was decided to just run approximately 1/3 of the tracer( ) through the column and become familiar with its behavior. The procedure followed is outlined below.

1. The water bath surrounding the column (containing AG 50W-X8, 200-400 mesh, hydrogen form) was brought up to a temperature of 80°C.
2. 200 λ of the irradiated Sm tracer was diluted to 5.2 ml of 0.1 M HNO_3.
3. 1.2 ml of the diluted Sm tracer ② was removed for sample analysis.
4. 4.0 ml of tracer feed was put into the column at 0847 hrs for loading.
5. After column was loaded, 0.3 M NH_4NO_3 was added to the column in order to convert it to the ammonium form (when pH paper does not turn color or to a slight, yellowish color, it means the acid has all been rinsed off).
6. ~25 ml of 0.3 M NH_4NO_3, pH 4.8 was required to change the column from the hydrogen to the ammonium form.
7. H_2O was run over the column to remove excess NH_4NO_3 and any air bubbles.
8. 0.25 M AHIB, pH 4.2 was added to the column in order to start the elution. 9.5 ml of the effluent was collected in 1-5m-1.

Sm Tracer Test Column Run (cont.)

9. 0.25M AHIB, pH 4.4 was added to the column. 5.0 ml of the effluent was collected in 1-Sm-2.
10. 0.25M AHIB, pH 4.6 was added to the column. 8.1 ml of the effluent was collected in 1-Sm-3.
11. 0.25M AHIB, pH 4.6 continued to be added to the column. 2.0 ml of the effluent was collected in 1-Sm-4. The beta dosimeter reading went up slowly.
12. A new cut was made using the same AHIB. 1.7 ml of the effluent was collected in 1-Sm-5.
13. With the same AHIB, a new cut containing 1.0 ml of the effluent was collected in 1-Sm-6. The beta dosimeter has nearly returned to normal.
14. With the same AHIB, a new cut containing 1.0 ml of the effluent was collected in 1-Sm-7.
15. With the same AHIB, a new cut containing 1.0 ml of the effluent was collected in 1-Sm-8.
16. With the same AHIB, a new cut containing 3.0 ml of the effluent was collected in 1-Sm-9.
17. Column was stripped using 0.5M AHIB, pH 4.8 into 1-Sm-10. Strip volume was 8.7 ml.
18. Beta dosimeter readings were made through the cones. The results are as follows:

1-Sm-3	background (400 cpm)
1-Sm-4	1000 cpm
1-Sm-5	1400 cpm
1-Sm-6	900 cpm
1-Sm-7	700 cpm
1-Sm-8	background
1-Sm-9	background

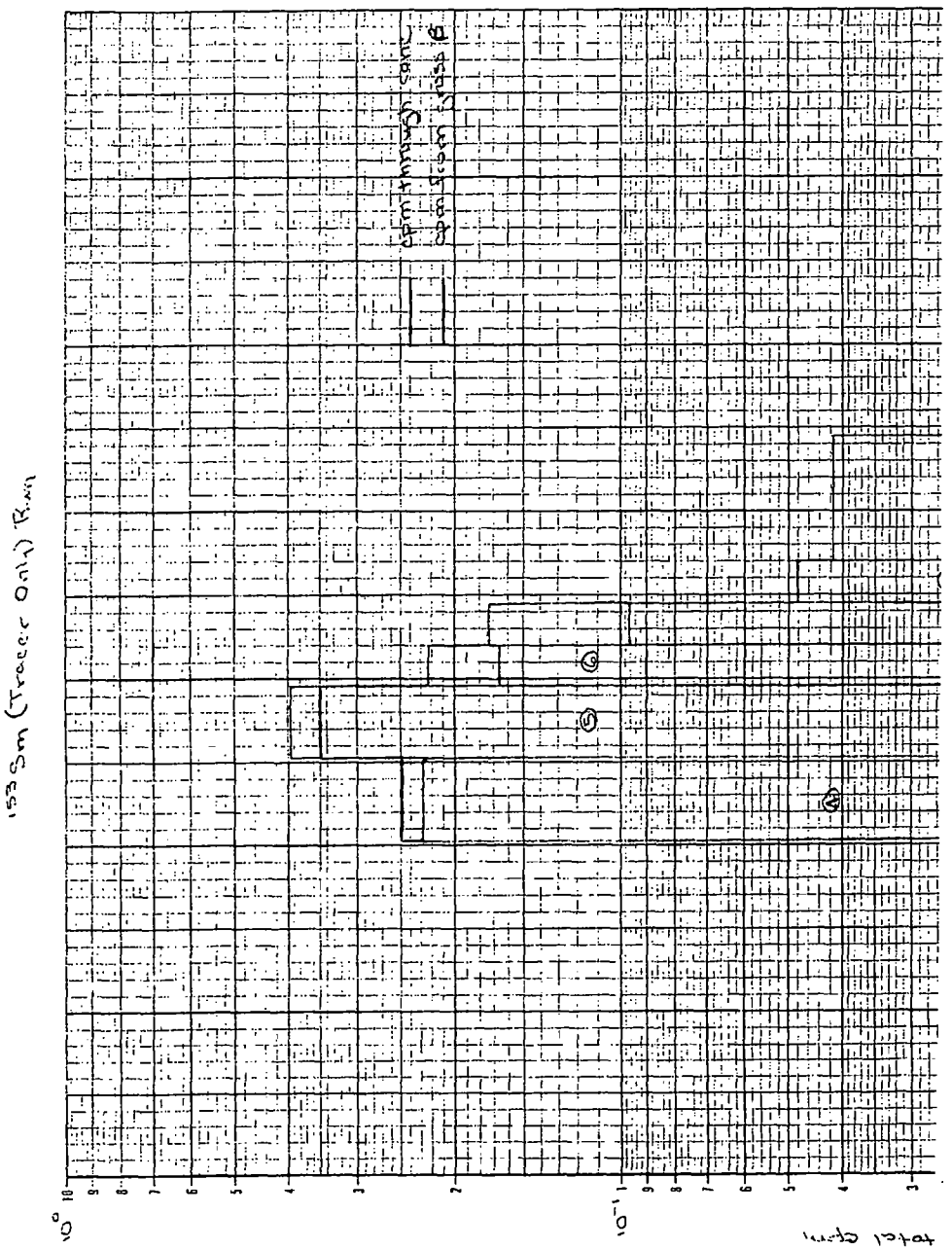
19. Selected cuts were then submitted to Analytical for gross β counting. The results follow.
20. A graph of the elution characteristics also follows.

ANALYTICAL RESULTS - 12/17/85 PAGE 1

CUSTOMER : J.S. KNAUER
ADDRESS : 7920
PHONE : 4-7071 CHARGE : 3376
REQUEST : 45645 SERIES :
RECEIVED : 12/17/85 COMPLETED : 12/1
COMMENTS : INSUFFICIENT SAMPLE FOR GROSS GAMMA

SAMPLE IDS	LAB #	GRS C/M/ML	CT TIME
1-SM-3	00003	1.35E3	12/11/85 1532
1-SM-4	00004	5.64E4	12/11/85 1537
1-SM-5	00005	1.15E5	12/11/85 1536
1-SM-6	00006	8.21E4	12/11/85 1540
1-SM-7	00007	4.81E4	12/11/85 1541
1-SM-8	00008	2.40E4	12/11/85 1543
1-SM-9	00009	6.90E3	12/11/85 1545
1-SM-FEED	FEED	9.37E4	12/11/85 1547

Sm Tracer Test Column Run (cont'd).



12 Dec 1985 Enriched ^{144}Sm-Nd Separation

The results of the Sm tracer test run were encouraging enough that we decided to go ahead with the enriched ^{144}Sm separation. The procedure followed was almost identical to the Sm tracer test.

1. The resin for the Sm tracer test was changed out and replaced with 25-50 micron resin (already conditioned).
2. The tracer was added to the 10 ml of 0.1 M HNO_3 enriched ^{144}Sm for a total of 12 ml.
3. Run started at 0914 hrs on 12 December 1985.
4. Water was added to the feed bottle, ~10 ml, to rinse out the bottle. Rinse was then added to column.
5. 0.3 M NH_4NO_3 was added to the column (initially 20 ml) to convert the cation resin from the hydrogen form to the ammonium form. The Sm loaded at the top of the column in a ~1/5" band and was kind of orange in appearance. Added another reservoir full of NH_4NO_3. pH paper was red indicating that acid (H^+ coming off column) was still coming off. Another reservoir-full of NH_4NO_3 was added. After 1/2 of this reservoir went in, the pH paper turned yellow which indicated the resin had been converted to the ammonium form.
6. H_2O was added to the column to wash off any excess NH_4NO_3. Total raffinate was 45 ml.
7. 0.25 M AHIB, pH 4.2 was added to the column. The orange color disappeared from the resin. The effluent was collected in 2-Sm-1. The background beta dosimeter reading was ~450 cpm. Final volume was 8.6 ml. No increase above background was noted.

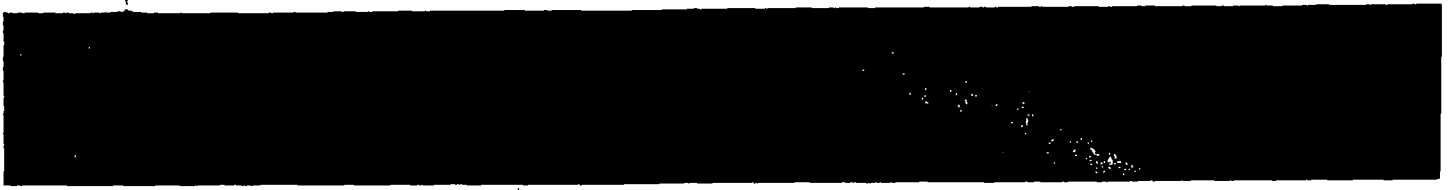
Enriched ^{144}Sm-Nd Separation (cont.)

8. 0.25M AHIB, pH 4.4 was added to the column with the effluent going into 2-Sm-2. Resin showed some signs of bubble formation. Water bath was running at a temperature of about 72-75°C. Beta dosimeter indicated activity about 2/3 of the way down the column. Virtually no increase seen on the drop dosimeter. Final volume in 2-Sm-2 was 5.5 ml.
9. 0.25 M AHIB, pH 4.65 was added to the column with the effluent going into 2-Sm-3. Starting to see a possible increase in the drop dosimeter reading. Well, maybe not. Maybe so. Final volume in 2-Sm-3 is 6.1 ml.
10. Continuing the elution with the same AHIB, we are now collecting the effluent in 2-Sm-4. Drop dosimeter reading is continuing to increase. These are ~~about~~ starting to be strong, consistent increases (~700 - 850 cpm). Final volume of 2-Sm-4 was 2.8 ml.
11. Continuing the elution with the same AHIB, we are now collecting the effluent in 2-Sm-5. Drop dosimeter readings continue to read around ~850 - 1000 cpm. Column activity readings indicate the Sm is on about the last 1/3 - 1/2 of the column. Readings on the drop dosimeter increased to a maximum of ~ 1100 cp
Cut was made when dosimeter dropped below 1000 c
Final volume of 2-Sm-5 was 2.3 ml.
12. Continuing the elution with the same AHIB, we are now collecting the effluent in 2-Sm-6. The drop dosimeter readings went back up to the 1100 - 1200 c range. Final volume of 2-Sm-6 was 1.0 ml.
13. Continuing the elution with the same AHIB, we are now collecting the effluent in 2-Sm-7. The drop dosimeter readings varied between 1150 - 1250 cpn
Final volume of 2-Sm-7 was 1.0 ml.

Enriched ^{144}Sm-Nd Separation (cont.)

14. Continuing the elution with the same AHIB, we are now collecting the effluent in 2-Sm-8. The drop dosimeter readings have dropped to around 1050-1150 cpm. Final volume of 2-Sm-8 was 1.0 ml.
15. Continuing the elution with the same AHIB, we are now collecting the effluent in 2-Sm-9. The drop dosimeter readings varied from 850-1100 cpm. The final volume of 2-Sm-9 was 1.0 ml.
16. Continuing the elution with the same AHIB, we are now collecting the effluent in 2-Sm-10. Drop dosimeter readings are now at ~700-800 cpm. The final volume of 2-Sm-10 was 1.0 ml.
17. Continuing the elution with the same AHIB, we are now collecting the effluent in 2-Sm-11. The drop dosimeter readings are now at 450-600 cpm. There is virtually no detectable activity left on the column. Final volume of 2-Sm-11 was 3.5 ml.
18. Strip of the column was begun using 0.5M AHIB, pH 4.8. The effluent was collected in 2-Sm-12. The drop dosimeter readings have returned to near background levels.
19. Beta dosimeter readings were made through the cones. The results follow.

2-Sm-3	virtually no reading on dosimeter above background
2-Sm-4	~1200 cpm (above background)
2-Sm-5	~1800 cpm "
2-Sm-6	~1000 cpm "
2-Sm-7	~1000-1200 cpm "
2-Sm-8	~1400 cpm "
2-Sm-9	~1000 cpm "
2-Sm-10	~400 cpm "
2-Sm-11	<100 cpm "



^{144}Sm Cleanup Column

13 Dec 1985

A cleanup column was deemed necessary to remove impurities from the Sm so that we would have as clean as possible a product for the cross section studies. The procedure used for cleaning up the column is detailed below.

1. −400 mesh, 50W-X4 cation resin (~2.0 ml) was conditioned and prepared for use.
2. 2-Sm-5, 2-Sm-6, 2-Sm-7, and 2-Sm-8 were added to ~~2-Sm-9~~ 2-Sm-4 as feed for the cleanup column. 1.5 ml of 2M HCl was added to the 2-Sm-8 cone and this was then successively transferred through the other sample cones to the feed in 2-Sm-4. The presence of HCl should break the butyrate complex. Beta dosimeter readings indicated no residual activity remaining in the sample cones. The cones were then rinsed with ~1.0 ml of H_2O. Final volume of the feed, 2-Sm-4, was 10.3 ml. This amount was then transferred to the column reservoir.
3. Column was equipped with an argon back-pressure and without a heated water bath. Effluent from the loading process was collected in 3-Sm-Raff. Background reading from the beta dosimeter was between ~450-550 cpm. Column activity readings indicated that the loading of the Sm occurred near the top of the column. 2-Sm-4 was then washed with ~~1~~ 0.1 M HCl and the wash was added to the column reservoir. The 0.1 M HCl should also help wash out any remaining butyrate from the cleanup column. The drop dosimeter readings remained at background levels. Final volume of 3-Sm-Raff was 13.2 ml.

^{144}Sm Cleanup Column (cont.)

4. A cut was made to 3-Sm-Wash with 0.1 M HCl still running through the column.
5. 2M HCl was added to the column with collection of the effluent going into 3-Sm-Wash. This will remove mono- and divalent materials from the cleanup column. Trivalent species, such as Sm, will not be eluted as fast as the other species. The drop dosimeter readings remained near background levels.
6. A switch from 3-Sm-Wash to 3-Sm-Prod was made when an increase in drop dosimeter activity was seen. The drop dosimeter reading continued to increase to ~ 2100 cpm.
7. 6M HCl was added to the reservoir. Peak drop dosimeter reading was around ~ 3500 cpm. This elution (?) continued till readings dropped near to background levels. The final volume of 3-Sm-Prod was 4.5 ml.
8. H_2O was added to the reservoir. Column expanded back to its original position. Drop dosimeter readings returned to background levels. Effluent was routed to 3-Sm-Wash. The final volume of 3-Sm-Wash was 10.6 ml.
9. ~~3-Sm-Prod was then evaporated to dryness and put in the muffle furnace~~ CWA
   3-Sm-Prod was evaporated to dryness, then brought up in concentrated HNO_3. This was done several times to ensure that the resultant dried product was samarium nitrate. Once the product was dried, it was put in a muffle furnace and exposed to the following heating schedule:

1 hr	100°C
1 hr	400°C
½ hr	700°C

   This schedule took the run to the morning of the 14 Dec 1985. The furnace was turned off and allowed to cool over the weekend.

^{144}Sm Cleanup Column (cont.)

16 Dec 1985

10. The purpose of the moderately-high temperature drying was to completely convert the samarium nitrate to samarium oxide. The dried sample was removed and then weighed upstairs. Assuming stoichiometry: 9.5 mg Sm_2O_3

0.857 = G.F. for ^{144}Sm

$\Rightarrow$ 8.1 mg ^{144}Sm

After weighing, the sample of Sm_2O_3 was redissolved in concentrated HNO_3 and evaporated to dryness.

17 Dec 1985

11. The samarium nitrate was redissolved in 0.1 ml of 1 M HNO_3 and then diluted to 1.0 ml with 0.9 ml of ultra-pure H_2O. 10% of this solution was then drawn off and again diluted to 1.0 ml for a concentration estimated at 0.081 $\mu g/\mu l$. This sample was sent to Ray Walker for mass spectroscopic analysis. Further work was suspended until after the holidays.

14.944 –
14.9513
14.9418
9.5 mg Sm_2O_3

0.857 = G.F. for ^{144}Sm

8.1 mg ^{144}Sm

9 Jan 1986 — Loading of ^{144}Sm into Suprasil Cylinders

Mass analysis of the separated and cleaned up ^{144}Sm showed that Nd levels had been reduced significantly enough so that we could proceed with the experiment. Therefore, it was decided to go ahead and load the Suprasil cylinders with the ^{144}Sm according to the following procedure.

1. Three small, single open-ended Suprasil cylinders were placed in an aluminum block for support and heat conduction.
2. 10λ was pipetted out of the stock solution (8.1 mg/ml) container and put in a Suprasil cylinder. This was repeated for each of the other two cylinders.
3. The loaded Suprasil cylinders and the aluminum block were taken to the hood and placed under a heat lamp. No gas purge was used.
4. After significant evaporation, another 10λ was added to each Suprasil cylinder and placed back under the heat lamp. The temperature at the face of the block was about 60°F.
5. After a total drying time of ~1½ hours the heat lamp was turned off.
6. Visual inspection with a magnifying class indicated some possible deposits of ^{144}Sm nitrate.
7. Transferred loaded cylinders to Joe Halperin of TRL for further rabbit preparation.

Unloading of ^{144}Sm rabbit

3-5 Feb 1986

Rabbit was irradiated at 0300 hrs on 18 Jan 1986 and was discharged at 0300 hrs on 21 Jan 1986. Because of window problems in Cave B, the rabbit was kept in the HFIR pool until 3 Feb 1986. The $ZnBr_2$ in the Cave B window was replaced with 2 ft. of water. The rabbit was adequately shielded by the water window. After the rabbit was transferred to Cave B by the hydraulic tube (transit time ~ 4 mins) the top and bottom of the rabbit was identified and then cut off. The rest of the day was spent trying to remove the contents of the rabbit to no avail. The rabbit was brown in color, which we had not seen before, which may be due to the longer irradiation period or time spent in pool. All previous methods of removing rabbit contents failed and three possible reasons were proposed: (1) the rabbit body had gotten out of line because of the heat, (2) pieces of Cd had softened and flowed into irregular shapes, or (3) oxide bonding between Al or Cd pieces and the rabbit body (the rabbit was welded in air rather than He). Contact dose rates (with in-cell gamma probe) of the loaded rabbit were ~ 250 r/hr.

On 4 Feb 1986 (morning), a lead rabbit holder was bagged in and transported to Cave B. The Sm rabbit was placed in the lead holder and moved to the shielded glovebox connected to Cave B. Body dose rates were tolerable (< 20 mr/hr). I am a little unsure about the exact body dose rate. See dosimeter ~~entries~~ readings at the end of this entry. Dose rates inside the glovebox were around 500 mr/hr. The high dose rates are somewhat perplexing in that ^{24}Na and ^{28}Al have decayed substantially (at least 20 half-lives).

A hammer and rod were used to try and dislodge the contents. Movement was seen, however, it was decided that the lead assembly needed to be placed in a stand if we were to efficiently and quickly remove the contents. A small stainless steel stand was fabricated. The contents were emptied out of the rabbit from top to bottom and placed in 3 separate bottles. The top shielded sample including Cd was placed in 1-86-1-A. The unshielded sample was placed in 1-86-1-B. The bottom shielded sample including Cd was placed in 1-86-1-C. Dose rates from the individual sample bottles were high so they were placed back into Cave B for the remainder of the day. On 5 Feb 1986, the sample bottles were brought in one-by-one to the shielded glovebox. The two flux wires and Suprasil cylinders containing the Sm were placed in new sample bottles, the Al was discarded, and the ~~std~~ Cd containers were returned to the <u>old</u> sample bottles. The new sample bottles carried the designations 1-86-1-A (Products), 1-86-1-B (Products) and 1-86-1-C (Products). These corresponded directly to the old sample bottle identifications. Whole body dose rates for 4 and 5 Feb averaged from 8-10 mr/day. On the 5 Feb 1986, a visual dosimeter was strapped to Joe Knauer's wrist. At the end of work it read ~44 mr which approximates to ~ 300 mr to the tips of fingers and knuckles.

The flux wires and Suprasil from the <u>Cd</u> containers read ~5 mr/hr through the gloves. The flux wires and Suprasil from the bare container read ≥ 100 mr/hr through the gloves.

Analysis of Rabbit Al Parts

7 Feb 1986 — Because of the high radiation of the Al rabbit, even after significant decay, it was decided to analyze the Al for the source of the high gamma radiation. An Al disc and Al spacer were put in 5 ml of 6M HNO_3. The Al disc read very low levels of radiation measured through the gloves and dissolved easily in the nitric acid. The dissolution was clear as was the froth during the dissolution. The Al spacer read high levels of radiation (~100 mr/hr) through the gloves and also dissolved easily in the nitric acid. The dissolution and froth generated during the dissolution were black in color. The entire sample was then submitted to analytical for gamma analysis. The results are shown below.

ANALYTICAL RESULTS - 02/11/86 PAGE 1

CUSTOMER	: CHARLES ALEXANDER		
ADDRESS	: 7920		
PHONE	: 47071	CHARGE	:
REQUEST	: 45808	SERIES	:
RECEIVED	: 02/11/86	COMPLETED	:
COMMENTS	: RESULTS IN BQ/ML OF SAMPLE		
	:		

SAMPLE IDS	LAB #	51CR	60CO	24NA	65ZN
AL-SPACER -111	00111	8.77E6	1.03E4	<900	1.66E7

As can be seen from the gamma scan, ^{65}Zn is the primary contributor to the dose rate (1.115 MeV γ with a half-life of 244.1 d). Zn is a large impurity in 7075 Al (5.6%). Therefore, if possible, we will switch from 7075 Al to 1100 Al which

Analysis of Rabbit Al parts (continued)

7 Feb 1986 has a substantially lower impurity level.

12-13 Feb 1986 Dissolution of Irradiated ^{144}Sm

All three Suprasil cylinders and six flux wires were bagged out of the shielded glovebox in 111 into uncontaminated sample bottles and transferred to the hood in 110. Sample designations are consistent with those used previously. The 1-86-1-A Suprasil cylinder was unwrapped and the aluminum foil wrapping was placed in a sample bottle tentatively marked A. Reading the cylinder with a beta/gamma probe read ~200,000 dpm at 1". Closing the shield on the probe dropped the reading to <50,000 dpm. The Al foil placed in A was very brittle. A deposit (hopefully the Sm) was seen at the bottom of the cylinder. 10λ of 6M (Ultrex) HNO_3 was added to the Suprasil cylinder. A heating lamp, 18"-24" away, was turned on and a beaker was placed over the Al block holding the Suprasil cylinder. It was leached for ~2 mins. The nitric acid leach was pipetted out of the cylinder and transferred to a 1ml volumetric labelled 1-86-1-A, $^{144-147}Sm$. The leachate read ~50,000 dpm through the sample volumetric. Cylinder read ~100,000 dpm. A second 10λ of 6M (Ultrex) HNO_3 was added to the Suprasil cylinder. The heating lamp was moved down to ~12" away from the Al block. The Suprasil was once again leached for ~2 mins. The nitric acid leach was pipetted out of cylinder and added to 1-86-1-A, $^{144-147}Sm$. The leachate read ~80,000 dpm through the sample volumetric. Suprasil cylinder read ~40,000 dpm. A third 10λ of 6M (Ultrex) HNO_3 was added to the Suprasil cylinder. The heat lamp was moved down to ~8" away from

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02/11/86

Dissolution of Irradiated ^{144}Sm (continued)

12-13 Feb 1986 the Al block. It was leached again for ~ 2 mins. The nitric acid leach was pipetted out of the cylinder and transferred to 1-86-1-A, $^{144-147}Sm$. The Suprasil cylinder read ~ 40,000 dpm. The leachate read ~ 85,000 dpm through the sample volumetric. 10λ of pure (=triply distilled) H_2O was added to the cylinder and then transferred to 1-86-1-A, $^{144-147}Sm$. Another 10λ H_2O wash was made. The leached and washed Suprasil cylinder (sitting on top of the Al block) read ~ 40,000 dpm. The cylinder was returned to 1-86-1-A. The leachate was then diluted with 150λ of pure H_2O for a total volume of 200λ.

The 1-86-1-C Suprasil cylinder was unwrapped and the aluminum foil placed back in a sample bottle tentatively marked C. Reading the Suprasil cylinder with a beta/gamma probe read ~ 190,000 dpm at 1". Closing the shield on the probe dropped the reading to < 40,000 dpm. The Al foil was very brittle. 10λ of 6M (Ultrex) HNO_3 was added to the cylinder. Heat lamp (~ 12" away) was turned on and the cylinder was leached for ~ 2 mins. The nitric acid leach was pipetted out of the cylinder and transferred to a 1 ml sample volumetric labelled 1-86-1-C, $^{144-147}Sm$. The leachate read ~ 80,000 dpm through the volumetric. The cylinder also read ~ 80,000 dpm. A second 10λ of 6M (Ultrex) HNO_3 was added to the Suprasil cylinder. It was leached for ~ 3 mins. The nitric acid leach was pipetted out of the cylinder and transferred to 1-86-1-C, $^{144-147}Sm$. The leachate read ~ 90,000 dpm through the volumetric. The Suprasil cylinder read ~ 50,000 dpm. The Suprasil cylinder also showed no discoloration due to radiation damage. A third 10λ of 6M (Ultrex)

Dissolution of Irradiated ^{144}Sm (continued)

12-13 Feb 1986 HNO_3 was added to the Suprasil cylinder and leached for ~ 3 mins. The nitric acid leach was pipetted out of the cylinder and transferred to 1-86-1-C, $^{144-147}Sm$. The Suprasil cylinder read ~ 55,000 dpm. The leachate read ~ 75,000 dpm through the volumetric. 10λ of pure (= triply distilled) H_2O was added to the cylinder and then transferred to 1-86-1-C, $^{144-147}Sm$. Another 10λ water wash was made. Washed Suprasil cylinder (on top of the Al block) read ~ 55,000 dpm. Leachate read ~ 70,000 dpm through the volumetric. The Suprasil cylinder was returned to 1-86-1-C. The leachate was then diluted with 150 λ of pure H_2O for a total volume of 200 λ. During this dissolution, the surface temperature of the Al block was measured to be between 35°C - 40°C.

The 1-86-1-B Suprasil cylinder was unwrapped and the aluminum foil placed back in a new sample bottle tentatively marked B. Reading the Suprasil cylinder with a beta/gamma probe read > 500,000 dpm. Closing the shield on the probe reduced the reading to ~ 300,000 dpm. 10λ of 6M (Ultrex) HNO_3 was added to the cylinder, the heat lamp turned on, and the cylinder was leached for ~ 3 mins. The nitric acid leach was pipetted out of the cylinder and transferred to 1-86-1-B, $^{144-147}Sm$. The leachate read > 500,000 dpm through the 1 ml sample volumetric. The cylinder read ~100,000 dpm. A second 10λ of 6M (Ultrex) HNO_3 was added to the Suprasil cylinder and leached for ~ 3 mins. The nitric acid leach was pipetted out of the cylinder and transferred to 1-86-1-B, $^{144-147}Sm$. The leachate read ~ 500,000 dpm through the sample volumetric. The cylinder read ~ 95,000 dpm. A third 10λ of 6M (Ultrex) HNO_3 was added to the cylinder. It was leached for ~ 3 mins. The nitric acid leach was pipetted out of the cylinder and transferred to 1-86-1-B, $^{144-147}Sm$. The leachate read > 500,000 dpm

Dissolution of Irradiated ^{144}Sm (continued)

12-13 Feb 1986 through the sample volumetric. The cylinder read ~80,000 dpm. The Suprasil cylinder showed no discoloration. 10 λ of pure (= triply distilled) H_2O was added to the cylinder and then transferred to 1-86-1-B, $^{144-147}Sm$. Another 10λ wash was made. The washed Suprasil cylinder (sitting on top of the Al block) read ~80,000 dpm. Leachate read ~500,000 dpm through the volumetric. The Suprasil cylinder was returned to sample bottle 1-86-1-B. The leachate was then diluted with 150 λ of pure H_2O for a total volume of 200λ. All three sample volumetrics were taped shut and packaged for shipment. On 14 Feb 1986 the three volumetrics were taken to Ray Walker of Mass Spec for analyses.

19 Feb 1986 — Loading of ^{144}Sm into Suprasil Cylinders

The first experiment went relatively successful so it was decided to proceed on to the second experiment which calls for identical loading and procedure with an expanded irradiation time of 5 days. The procedure used is identical in most respects to the one used in on 9 Jan 1986.

1. Three small, single open-ended Suprasil cylinders were placed in an aluminum block for support and heat conduction.
2. 10λ was pipetted out of the stock solution (8.1 mg/ml) container and put in a Suprasil cylinder. This was repeated for each of the other two cylinders. This was all done in the hood.
3. The three loaded cylinders were placed under a heat lamp for evaporation. No gas purge was used.
4. After significant evaporation, another 10λ was added to each Suprasil cylinder and placed back under the heat lamp.
5. After a total drying time of ~2 hrs the heat lamp was turned off.
6. Visual inspection with a magnifying glass indicated some possible deposits of the ^{144}Sm nitrate.
7. Transferred loaded cylinders to Joe Halperin of TRL for further rabbit preparation.

Return and Unloading of ^{144}Sm Rabbit

31 March 1986 One ^{144}Sm rabbit was irradiated in position 8 of HFIR. The irradiation started at 0500 hrs of 4 March 1986 and ended at 0500 hrs on 9 March 1986. Because of reshuffling of the samples in the hydraulic tube, the ^{144}Sm rabbit was taken out of the reactor twice. On 5 March 1986 the rabbit was ejected at 0255 hrs and returned to position 8 at 0300 hrs. On 7 March 1986 the rabbit was ejected at 0255 hrs and returned to position 8 at 0300 hrs. Because of continuing problems with the window in Cave B the rabbit was kept in the HFIR pool until the 27 March 1986 when it was transferred to Cave B at TRU. At ~ 1100 hrs ~~of~~ on 31 March 1986 the bottom and top ends of the rabbit were cut off with the saw in Cave B. The rabbit was then placed in the holder (Pb) and moved to the adjoining glovebox for further disassembly. The rabbit in place in the lead holder read ~100 mr/hr of β-γ at 10 inches. The bottom end of the rabbit was at the bottom of the holder. A lot of pounding with the hammer was necessary to remove the internal components. However, the components looked fine and did not appear to be heavily oxidized or show any signs of metal flow. The Cd-shielded components from the top and bottom were placed in 3-86-1-TOP and 3-86-1-BOTTOM, respectively. However, on further reflection we may have these backwards. This will be cleared up by reweighing of the flux wires and comparing with the initial values in Joe Halperin's lab book. The bare components from the middle of the rabbit were placed in 3-86-1-MIDDLE. The Cd-shielded components read in excess of 100 mr/hr at 10". After removal from the rabbit, everything was placed back into Cave B until further processing.

Unloading of Bare and Cd Containers

2 April 1986 Sample bottle 3-86-1-TOP was removed from Cave B and placed in the shielded glovebox adjoining Cave B. The first attempt using tweezers to remove the Cd lid fail. The lid, for some unknown reason, seems to be stuck on. Gripping the bottom of the Cd cylinder with pliers we were finally able to remove the Cd lid. The first flux wire came out with some tapping. The Suprasil cylinder and the second flux wire would not come out despite repeated tapping. The upper inside lip of the Cd cylinder was shaved in order to increase the inside diameter. With some additional tapping, the cylinder and second flux wire finally came out. The cylinder and two flux wires were placed in a new sample bottle labelled 3-86-1 TOP(1). 3-86-1-BOTTOM was removed from Cave B and removal of the contents from the Cd cylinder was accomplished relatively easy. All contents were placed in 3-86-1 BOTTOM(1). 3-86-1 -MIDDLE was removed from Cave B. All contents were easily removed from the Al cylinder and placed in 3-86-1 MIDDLE(1). The Cd cylinders were placed back into 3-86-1-TOP and 3-86-1-BOTTOM and returned to Cave B. To minimize contamination (alpha) the contents from each bottle were passed through the bag to uncontaminated sample bottles labelled 3-86-1 TOP(2), 3-86-1 MIDDLE(2), and 3-86-1 BOTTOM(2).

Dissolution of Irradiated ^{144}Sm

2 April 1986 All three Suprasil cylinders and six flux wires were bagged out into uncontaminated bottles and transferred to the hood in Rm 110. Sample designations are consistent with those used previously. The 3-86-1 Top(Z) Suprasil cylinder was unwrapped and the aluminum foil was placed in a sample bottle tentatively marked A. Reading the cylinder with a beta/gamma probe at ~1" read ~270,000 dpm. Closing the beta shield dropped the reading to ~70,000 dpm. The Al foil placed in A was very brittle. A deposit was seen at the bottom of the cylinder. 10λ of 6M (Ultrex) HNO_3 was added to the cylinder. A heating lamp, ~12" away, was turned on. It was leached for ~3 mins. The nitric acid leach was pipetted out of the cylinder and transferred to 3-86-1 Top, $^{144-147}Sm$. The leachate read ~120,000 dpm through the 1 ml volumetric. The cylinder read ~90,000 dpm. The temperature of the Al block used to hold the cylinder during leaching was ~42°C. A second 10λ of 6M (Ultrex) HNO_3 was added to the cylinder. The heat lamp was turned on and leached for ~3 mins. The nitric acid leach was pipetted out of the cylinder and transferred to 3-86-1 Top, $^{144-147}Sm$. The leachate read ~120,000 dpm through the volumetric. The cylinder read ~80,000 dpm. A third 10λ of 6M (Ultrex) HNO_3 was added to the cylinder. The heat lamp was turned on and the cylinder was leached for ~3 mins. The nitric acid leach was pipetted out of the cylinder and transferred to 3-86-1 Top, $^{144-147}Sm$. The leachate read ~125,000 dpm through the volumetric. The cylinder read ~80,000 dpm. Two 10λ washes of pure (triply distilled H_2O was added to the cylinder and then transferred to 3-86-1 Top, $^{144-147}Sm$. The leached and washed cylinder read ~80,000 dpm. The ~~leachate~~ cylinder was transferred back to 3-86-1 Top(Z). The leachate was

Dissolution of Irradiated ^{144}Sm (continued)

2 April 1986 — then diluted with 150λ of pure H_2O for a total volume of 200λ. The 3-86-1 BOTTOM(2) Suprasil cylinder was unwrapped and the aluminum foil wrapping was placed in a sample bottle tentatively marked C. Reading the cylinder with a beta/gamma probe at ~1" read ~230,000 dpm. Closing the beta shield dropped the reading to ~70,000 dpm. The Al foil placed in C was very brittle. A deposit was seen at the bottom of the Suprasil. 10λ of 6M (Ultrex) HNO_3 was added to the cylinder. The heating lamp was turned on and the cylinder was leached for ~3 mins. The nitric acid leach was pipetted out of the cylinder and transferred to 3-86-1 BOTTOM, $^{144-147}Sm$. The leachate read ~100,000 dpm through the 1 ml volumetric. The cylinder read ~80,000 dpm. A second 10λ of 6M (Ultrex) HNO_3 was added to the cylinder. The heating lamp was turned on and the cylinder was leached for ~3 mins. The nitric acid leach was pipetted out of the cylinder and transferred to 3-86-1 BOTTOM, $^{144-147}Sm$. The leachate read ~100,000 dpm through the volumetric. The cylinder read ~80,000 dpm. A third 10λ of 6M (Ultrex) HNO_3 was added to the cylinder. The heating lamp was turned on and the cylinder was leached for ~3 mins. The nitric acid leach was pipetted out of the cylinder and transferred to 3-86-1 BOTTOM, $^{144-147}Sm$. The leachate read ~95,000 dpm through the volumetric. The cylinder read ~80,000 dpm. Two 10λ washes of pure H_2O (triply distilled) were added to the cylinder and then transferred to 3-86-1 BOTTOM, $^{144-147}Sm$. The leached and washed cylinder read ~80,000 dpm. The washed cylinder was transferred back to 3-86-1, BOTTOM(2). The leachate was diluted with 150λ of pure water for a total volume of 200λ.

Dissolution of Irradiated ^{144}Sm (continued)

3 April 1986 The 3-86-1 MIDDLE(2) Suprasil cylinder was unwrapped and the aluminum foil wrapping was placed in a sample bottle tentatively marked B. Reading the cylinder with a beta/gamma probe at ~1" read >500,000 dpm. Closing the beta shield dropped the reading to ~450,000 dpm. The Al foil placed in sample bottle B was very brittle. A deposit was seen at the bottom of the Suprasil cylinder. 10λ of 6M (Ultrex) HNO_3 was added to the cylinder. The heating lamp was turned on and the cylinder leached for ~3 mins. The nitric acid leach was pipetted out of the cylinder and transferred to 3-86-1 MIDDLE, $^{144-147}Sm$. The leachate read >500,000 dpm through the 1 ml volumetric. The cylinder read ~210,000 dpm. A second 10λ of 6M (Ultrex) HNO_3 was added to the cylinder. The heat lamp was turned on and the cylinder was leached for ~3 mins. The nitric acid leach was pipetted out of the cylinder and transferred to 3-86-1 MIDDLE, $^{144-147}Sm$. The leachate read >500,000 dpm through the volumetric. The cylinder read ~140,000 dpm. A third 10λ of 6M (Ultrex) HNO_3 was added to the cylinder. The heat lamp was turned on and the cylinder was leached for ~3 mins. The nitric acid leach was pipetted out of the cylinder and transferred to 3-86-1 MIDDLE, $^{144-147}Sm$. The leachate read >500,000 dpm through the volumetric. The cylinder read ~140,000 dpm. Two 10λ washes of pure (triply distilled) were added to the cylinder and then transferred to 3-86-1 MIDDLE, $^{144-147}Sm$. The leached and washed cylinder read ~140,000 dpm. The cylinder was then transferred back to 3-86-1, MIDDLE(2). The leachate was diluted with 150λ of pure water for a total volume of 200λ. All three samples (3-86-1 MIDDLE $^{144-147}Sm$, 3-86-1 TOP $^{144-147}Sm$, and 3-86-1 BOTTOM $^{144-147}Sm$) were given to Ray Walker of the

Dissolution of Irradiated ^{144}Sm (continued)

3 April 1986 Analytical Chemistry Division for mass spectrometric analyses.

Preparation of ^{144}Sm for Irradiation

11 June 1986 — Work started at 1040 hrs. Started to evaporate the ^{144}Sm nitrate solution down to dryness using a heat lamp and argon purge to prevent bumping (JBK's term). As the solution is concentrated due to evaporation it turned a very noticeable yellow in color. At 1150 hrs the lamp and purge were turned off. Solution appeared to have evaporated down to dryness. It still seems to be yellow in color. Some of the ^{144}Sm has evaporated on the sides of the volumetric cone. Work was discontinued until a later date.

19 June 1986 — Preparation of ^{144}Sm for Irradiation (cont.)

Leached Suprasil capsules (~2 weeks leaching time in concentrated HNO_3) were rinsed with triply distilled H_2O and then soaked in acetone. The dried ^{144}Sm nitrate was redissolved in 1 M HNO_3 (Ultrex). The total volume added was 350λ in two 175λ aliquots. There still seemed to be a small deposit remaining. Therefore, we placed the Sm solution under a heat lamp for ~15 mins. The deposit was still there at 1315 hrs. It was decided to let the solution sit overnight at room temperature.

20 June 1986 — The deposit dissolved after sitting overnight. The solution volume still looked too large for easy pipetting, so it was decided that the ^{144}Sm nitrate solution should be evaporated back down to dryness and brought up in a smaller volume of more concentrated HNO_3. Evaporation using a heat lamp and argon gas purge was started at 0840 hrs. As the solution became more concentrated, it started to become more yellow in color. Solution was fully evaporated at 1105 hrs so the heat lamp and gas purge were turned off. 147 λ of 6 M HNO_3 (Ultrex) was added to the dried ^{144}Sm nitrate.

Preparation of ^{144}Sm for Irradiation (cont.)

20 June 1986 The residue appeared to be readily taken up by the acid. It was allowed to sit until 1340 hrs. Some solids still remained in solution so another 147λ of 6M HNO_3 (Ultrex) was added. The heat lamp was also turned on to try and force the solids into solution. The volumetric was then stoppered. The heat lamp was turned off after ~10 mins and the solution was allowed to sit. There is some question whether any solids remain. JTW thinks so, JBK thinks it is imperfections in the quartz cone. I am unsure. The quartz cone also appears to be etched or the inside has a "greasy" coating. Since the irradiation is not pressing, it was decided to set the ^{144}Sm aside for the time being.

1 July 1986 Transfer of ^{145}Pm Solution to Leached Cone

Started to work at 1300 hrs. Joe Halperin had given me ~1.6 ml of ^{145}Pm (~200 ng) in 1M HNO_3. It was decided to transfer the solution to a leached 15 ml centrifuge cone for drying down purposes. The solution was transferred to a cone labelled Pm-145 Mother. Final volume was ~3.1 ml (including washes). Transfer pipet and original bottle were washed with 6M HNO_3 (Ultrex). Pipet and original bottle were read with a β/γ probe and no radiation was found. Solution was amber in color indicating the presence of impurities.

Preparation of ^{145}Pm for Cleanup Column

1 July 1986 Evaporation of Pm-145 Mother was started at 1320 hrs with a heat lamp and argon gas purge. At about 1 ml in volume some substantial bubbling of the solution was noted (at 1435 hrs). The heat lamp was moved back but the bubbling still persisted. It did not appear, though, that the bubbling was due to boiling. Perhaps it was due to an acid/organic reaction. The bubbles rose slowly and collected at the top in a soapy film. There was a lot of coalescing at the top of the solution. Volume reduction seemed to slow around 1500 hrs so the heat lamp was moved to within ~6-7 inches of the solution. There was a lot of active foaming at the top of the solution. Heat lamp was moved back about 2 inches. The color of the solution did not intensify during evaporation. It became (the solution) very viscous so it was decided to add some more 6M HNO_3 (Ultrex), 1/2 ml, to the centrifuge cone. The additional nitric dissolved the foam. However, an interface existed at the ~0.5 ml mark. On the removal of the heat lamp, the solution solidified. Another ~1 ml. of conc. HNO_3 (Ultrex) was added to the cone at 1550 hrs. The solution was allowed to stand overnight.

2 July 1986 Started back to work at 0810 hrs. Amber-looking solids did not completely dissolve overnight. ~0.35 ml of solids still remain. Argon gas purge and heat lamp were turned back on in an effort to redissolve and evaporate down to a smaller volume. Lamp was ~5"-6" away from the cone. Bubbles started to emanate from solids seeming to indicate some type of heat-induced reaction or degassing is taking place. As the solution continued to evaporate under temperature there was rapid degassing. However, the bubbles seemed to rise rather quickly, possibly indicating that the solution was not real viscous at this point. Foaming started to appear

Preparation of ^{145}Pm for Cleanup Column (cont.)

2 July 1986 again, so the heat lamp was moved back to the solution. As it got nearer to 0.5 ml in volume it appeared to be more and more viscous. However, the color was not nearly as intense as the original solution. The lamp was turned off at 0930 hrs. Solution once again solidified at about the 0.55 ml mark on the cone. The color was a lighter amber than previously. At 1000 hrs, ~1.4 ml of aqua regia was added to the cone. It was swished around and washed along the sides to try and remove some solids from the side of the cone. There was no immediate visible dissolution of the large mass of solids. The heat lamp and gas purge were turned on at 1020 hrs. Degassing started within 5 mins. of application of heat. At about 1055 degassing had slowed considerably and the solution was almost clear. At 1100 hrs, there was very little foaming. With further evaporation more foaming became evident. However, it was not as severe as in earlier cases. At 1145 hrs ~1.5 ml of aqua regia was added to the still warm solution (~0.5 ml). An interface immediately set up at the 0.75 ml mark on the cone. So maybe we are slowly reducing the solids. At ~~1255~~ 1225 hrs degassing of the solution (now ~1 ml in volume) had slowed considerably. Bubbles were rising slowly indicating a solution with increasing viscosity. Not nearly as much foaming this time. Once again, gas emanation picked up around ~0.7 ml in volume. When the solution volume reached 0.5 ml another 1.5 ml of aqua regia was added directly to the still warm solution. The interface now seemed to be around ~0.1 ml. At least that seemed to be the origin of most of the gas bubbles. When the solution reached the 0.7 ml mark, bubbling once again increased. However, the solution color now was a

Preparation of ^{145}Pm for Cleanup Column (cont.)

2 July 1986 nice dark amber indicating that the HCl in the aqua regia was still in solution. The lamp was turned off at 1355 hrs. Foam extended up to the 2½ ml mark. Visible solids, not counting the foam, were less than 0.1 ml. About 0.5 ml of ultra-pure (triply-distilled) H_2O was added to the solution. Some of the foam readily dissolved in the H_2O. The heat lamp and argon gas purge were turned back on. During evaporation the solution was pretty cloudy. The heat lamp was turned off at 1415 hrs with the solution volume at 0.6 ml. This was allowed to cool. 0.9 ml of aqua regia was added to the cone and the heat lamp and argon purge were turned back on at 1430 hrs. White, opaque solids level was ≤ 0.2 ml. Solids were broken up using the tip of a pipet. The tip was probed and no contamination was found. Heat lamp was turned off at 1500 hrs. Foam extended up to the 3½ ml mark. A small amount of clear, visible solid remained (≤ 0.02 ml). 0.5 ml of ultra-pure H_2O was added and mixed with the solids. Two phases were readily evident. Pm-145 Mother was the centrifuged for ~ 5 mins. The centrifugate should be slightly acidic. The supernate (Pm-145 Centrifugate) read 10,000 dpm. Pm-145 Mother read 16,000 dpm. 0.65 ml of ultra-pure H_2O and ~0.1 ml of 1M HNO_3 (Ultrex) were added to Pm-145 Mother. The heat lamp and argon purge were turned back on at 1535 hrs. Heat and the argon were turned off (after 5-10 mins) and Pm-145 Mother was allowed to cool. It was placed back into the centrifuge for another 5 mins. Pm-145 Centrifugate now reads 15,000 dpm after transferring the clear solution from Mother to Centrifugate. Pm-145 Mother now reads 11,000 dpm through the cone. Amount of Pm in Mother is really more than the ratio indicates because of geometry considerations.

Preparation of ^{145}Pm for Cleanup Column (cont.)

3 July 1986 Started work at 0840 hrs. Pm-145 Centrifugate still looked free of solids, but we will take it down to dryness anyhow. Heat lamp and argon gas flow were turned on at 0850 hrs. The volume of Pm-145 Centrifugate before evaporation was ~1.5 ml. At about the 0.5 ml mark during the drying-down process some foaming and bubble formation was noted. Perhaps we still have a little aqua regia remaining in solution. Once again the solution became more viscous the smaller the volume became. At 1120 hrs the solution all of a sudden turned a nice bright yellowish color. The heat lamp was ~4" away from the solution. As the amount of solution decreased, the foaming increased and the color was now brown. It looked like dark beer. The color, after some more evaporation, changed to a reddish brown (maybe some Fe is present in solution). The solution was taken as best it could, to dryness. The amount of solids was about impossible, due to the amount of dried foam, to estimate. Heat and gas purge were turned off at 1155 hrs. Solids appeared to consist mainly of a dried film of reddish-brown foam. Cone had a reddish-brown stain considerably above the level of the foam. Work resumed at about 1315 hrs after a short break for lunch. 0.1 M HCl (Ultrex) was added to Pm-145 Centrifugate until a volume of ~2 ml was reached. Upon the addition of heat all solids went back into two phases, and, eventually after some agitation, one phase.

11 July 1986 — Cleanup Column of Small Fraction of Pm-145 Centrifugate

A small column of about ~0.4 ml of Dowex 50W-X4 was prepared by J.T. Wiggins. The O.D. of the column was ~4 mm O.D. and the resin bed was ~3½" in length. Started work at 0915 hrs. Transferred 169λ of Pm-145 Centrifugate to reservoir of cleanup column. Beta-gamma probe read between 200-300 dpm on the x1 scale when focused at the bottom of the column. Some additional 0.1 M HCl (Ultrex) was added to the column reservoir and the argon gas was turned on. The color (brownish-red) immediately spread out over the length of the resin bed. Color of the bed was now a brownish-yellow. However, a dark band was spotted at the top of the resin bed. ~0.5 ml of 0.1 M HCl was added to the reservoir. Drops were collected in Pm-145 M-1. No drop activity was detected. Beta-gamma probe of resin bed showed tight loading at the top of the column despite the fact that the color was spread out over the resin. ~0.5 ml of 0.1 M HCl was added to the reservoir. Still no visible drop activity. About 0.5 ml of H_2O (ultrapure = triply distilled) was added to the column reservoir. Drops were still collected in Pm-145 M-1. Another 0.5 ml of H_2O (ultrapure) was added to the reservoir. Still no visible drop activity. Switched collection of drops to Pm-145 M-2. Added 0.1 M HCl (Ultrex) to the reservoir. Beta-gamma drop probe showed no signs of activity. Some more 0.1 M HCl (Ultrex) was added. Solution was showing decreasing color intensity. The drop probe reading remained constant. Added about 0.5 ml of 0.5 M HCl (Ultrex) to column reservoir. Lessened argon gas pressure in order to increase residence time. Drops still collected in Pm-145 M-2. Probe of resin bed still showed tight

11 July 1986 Cleanup Column of Small Fraction of Pm-145 Centrifugate (cont.)

loading of activity at the top of the bed. At 0945 hrs 2 M HCl (Ultrex) was added to the column. Started collection of drops in Pm-145 M-3. Drop probe was still between 200-300 dpm. Some more 2 M HCl (Ultrex) was added at 0947 hrs. At 0948 hrs, beta-gamma probe showed activity about halfway down the column. Some more (~0.5 ml) 2 M HCl (Ultrex) was added to the reservoir at 0951 hrs. Drop beta-gamma probe was still between 200-300 dpm. Switched collection of drops to Pm-145 M-4 at 0952 hrs. At the switch, drop probe was reading between 300-400 dpm. At 0957 hrs, the drop probe was reading greater than 500 dpm on the X1 scale. Additional 2 M HCl was added to column reservoir. At 1001 hrs, we added 6 M HCl (Ultrex). Switched drop collection to cone labelled Pm-145 M-5. Drop probe was now reading $\leq$ 300 dpm. Beta-gamma probe of column indicated virtually no activity remaining on the column. Drop probe read between 200-300 dpm on X1 scale. Some color was still being removed from the column. There was some slight agitation on the drop probe during the strip with 6 M HCl. Resin remained colored. Added some H_2O (ultra-pure) at 1008 hrs. Run was completed at 1013 hrs.

Cone	Volume (ml)	Reading (dpm)	Color
Pm-145 M1	2.4	350-400 (500)	yellow
Pm-145 M2	2.0	450-500 (500)	slightly yellow
Pm-145 M3	1.65	350-400 (500)	very slightly yellow
Pm-145 M4	1.6	100-130 (5K)	slightly yellow, > M-2
Pm-145 M5	2.2	400-500 (500)	slightly yellow, > M-2
Bkgd		20-40 (5K)	

16 July 1986 — Preparation of Pm-145 M-4 for But Column

Spectral analysis of the various Pm-145 M solutions on the low energy spectrometer at TRL indicated that greater than 90% of the Pm-145 was in sample Pm-145 M-4. The remainder, <7%, was in sample Pm-145 M-2. It was decided to hold Pm-145 M-2 and add it to the cleanup column for the remainder of Pm-145 Centrifugate. Evaporation of Pm-145 M-4 was started at 1335 hrs using a heat lamp and argon gas purge. At 1430 hrs, Pm-145 M-4 had evaporated down to the 0.3 ml mark from a starting volume of ~1.6 ml. Some slight traces of color were beginning to show up. The heat lamp was turned off at 1505 hrs. The evaporated solution was not mass-free. Yellow rings of solids extend from the ~0.5 ml mark on down. It is too difficult to estimate the mass but it is probably greater than a milligram. Joe Halperin examined it and we tentatively decided that it was probably okay to use it for separation in the but column.

17 July 1986 — Pm-145 M-4 was brought up in 0.1 M HNO_3 (Ultrex). Volume was ~0.6 ml. Solids were still visible ~ 10 mins after the addition of the nitric acid. Will let the solution sit overnight to see if any further dissolution of the solids takes place.

18 July 1986 Cleanup Column of Pm-145 Centrifugate

Started to work on the cleanup column at 0940 hrs. Column was put together by JBK and was conditioned by myself on 17 July 1986. Since this was my first time doing a cleanup column, JTW assisted me. Column had ~1.2 ml of Dowex 50W-X4, 200-400 mesh, resin in the H^+ form. Pm-145 Centrifugate and Pm-145 M-2 (from the previous cleanup column) were added to the reservoir of the column. Both volumetric cones were washed with 0.1 M HCl (Ultrex). The washes were also added to the column reservoir. The color (brownish) quickly spread throughout the bed. Argon gas pressure was added to the column. Collection was in Pm-145 C+M-1. A beta-gamma probe was positioned to analyze the drops coming off the column. Background was between 200-300 dpm on the 1X scale. A second beta-gamma probe was available for detection of the promethium on the column. Loading was completed and addition 0.1 M HCl (Ultrex) was run through the column. Probing of the drops showed some agitation over 300 dpm, but in general, the readings were in the range of 200-300 dpm. The column resin bed was probed and it indicated a tight loading of Pm-145 at the top of the column. This was also where the brown color was most concentrated. After several additions of 0.1 M $\frac{HCl}{HNO_3}$ (Ultrex), a small addition of 2 M HCl was made to remove any Pm-145 that may have loaded on the resin that was stuck to the quartz wool (for that matter, anything that was stuck to the quartz wool). Drop collection was switched to Pm-145 C+M-2. Drop collection into this volumetric continued until the drop beta-gamma probe started to agitate. Then drop collection into Pm-145 C+M-3 took place.

18 July 1986

Cleanup Column of Pm-145 Centrifugate (cont.)

Some more 2M HCl (Ultrex) was added to the column reservoir. Probing of the column indicated that the Pm-145 band had spread considerably over the bed. When the drop beta-gamma probe increased over 500 dpm, collection was switched to sample cone Pm-145 C+M-4. Scale on drop probe was switched to the 10X scale and probe readings were generally between 650-900 dpm. Probing the column indicated that the Pm-145 was now on the lower 2/3 of the column. Some more 2M HCl (Ultrex) was added to the column reservoir. About two column volumes were collected in Pm-145 C+M-4.

Drop collection was switched to Pm-145 C+M-5 when 6 M HCl (Ultrex) was added to the reservoir. Resin bed shrunk considerably. When the drop probe dropped down below 400 dpm, H_2O (ultra-pure) was added to the reservoir. Run was completed at 1115 hrs. Collections are shown below.

Cone	Vol (ml)	Probe Reading (dpm)
Pm-145 C+M-1 (0.1 M)	10.8	300-350 (1X)
Pm-145 C+M-2 (2.0 M)	1.9	350-400 (1X)
Pm-145 C+M-3 (2.0 M)	0.8	400-450 (1X)
Pm-145 C+M-4 (2.0 M)	2.4	350-370 (10X)
Pm-145 C+M-5 (6.0 M + H_2O)	3.8	250-270 (10X)

Cones were transferred over to TRL for counting assay on the PGT Low-Energy Spectrometer. Joe Halperin took the lead on this. The results are shown on the next page.

18 July 1986 Cleanup Column of Pm-145 Centrifugate (cont.)

Cone[a,b]	326-654 x-rays	957-1105 x-rays
Pm-145 C+M-1	97	37
Pm-145 C+M-2	787	78
Pm-145 C+M-3	7745	317
Pm-145 C+M-4	291011	13506
Pm-145 C+M-5	249538	11322
Pm-145 (0.01/1.6)	11533	470
Background	87	51

[a] 120 sec. count period. [b] Gross count on MCA

As is readily evident most of the Pm-145 are in -4 and -5. Cones were re-transferred back to 7920 and stored in hood in Lab 110.

21 July 1986 Evaporation of Pm-145 C+M-4 and Pm-145 C+M-5

Work started in Lab 110 at 1320 hrs. Pm-145 C+M-1 was a very bright yellow. Pm-145 C+M-2, -3, -4 were a very light yellow in color. C+M-5 was only slightly more intense. The cone used to catch the water coming off the column after the experiment had ended was also a light yellow. This seems to indicate that the color contaminant was most likely water soluble. Some additional H_2O (ultra-pure) was added to Pm-145 C+M-4 and Pm-145 C+M-5 in order to wash down the sides. The new adjusted volume of Pm-145 C+M-4 was 4.4 ml. The heat lamp and argon gas purge were turned on at 1335 hrs. Ceased evaporation at 1615 hrs. Unfortunately, I had the purge rate too low so there was a lot of refluxing. The volume was now around 0.4 ml. The color of the solution had intensified to a definite yellow.

11 22 July 1986 Evaporation of Pm-145 C+M-4 and Pm-145 C+M-5 (cont.)

Started work at 0807 hrs. Restarted evaporation on Pm-145 C+M-4 with heat lamp and argon gas purge. Will be more careful this time to try and avoid refluxing. If there is any, the purge rate will be increased. Ringlets of solids started to appear at about the 0.5 ml mark on the cone. The color of the solution continued to intensify. Evaporation was completed at 0845 hrs. Visible solids were in excess of a milligram. Evaporation of Pm-145 C+M-5 was started at 0848 hrs. The adjusted volume of C+M-5 (due to the addition of H_2O) was 7.5 ml. Color of the solution also intensified during the evaporation. The run was completed at 1200 hrs. The amount of visible solids was considerably less than in C+M-4. The bulk of the solids started around the 0.15 ml mark. Heat lamp and argon gas were turned off and C+M-5 was capped. Both C+M-4 and C+M-5 were brought up in 1.0 ml of 0.1 M HNO_3 (Ultrex) at 1530 hrs. Solids (some) still remained after agitation. Will let the solutions sit overnight and see if all the solids are dissolved.

24 July 1986 Evaporation of Pm-145 C+M-4 and Pm-145 C+M-5 (cont.)

Solids appeared to have dissolved after sitting for ~ 1½ days. Pm-145 C+M-4 was added to Pm-145 C+M-5. The Pm-145 C+M-4 cone was washed with conc. HNO_3 (ultrex) and ultrapure H_2O. The washes were also added to Pm-145 C+M-5. Pm-145 M-4 (p. 36) was added to Pm-145 C+M-5 because it contained > 90% of the Pm-145 from the scoping cleanup column. The Pm-145 M-4 cone was washed with conc. HNO_3 (ultrex) and ultrapure H_2O and the washes were added to Pm-145 C+M-5. The final volume of Pm-145 C+M-5 was 7.3 ml. Some solids are visible at the bottom of the cone. Hopefully, the addition of heat will dissolve the solids. Pm-145 M-4 and Pm-145 C+M-4 cones were probed for radiation and none was found. In addition, the transfer pipet was also probed and no radiation was found. The heat lamp and argon gas were turned on at 1530 hrs. There was some bubbling at the bottom of the Pm-145 C+M-5 cone indicating the solids were reacting with the HNO_3 at elevated temperatures. Color of the solution was yellowish in nature. The reaction seemed to stop at 1620 hrs. No solids appeared to be visible. Ceased the run until tomorrow. The heat lamp and argon gas were turned off at 1625 hrs. On closer observation there does seem to be some solids remaining in the solution.

25 July 1986 Started back to work at 0815 hrs turning on the heat lamp and argon gas. At 1000 hrs there was a lot of fuming from the solution. The solution still probed significantly indicating that most or all of the Pm-145 was still there. Smears of the back of the hood show no activity. At the 1.0 ml mark, the solution actually seemed to be clearer than when we started. At 1020 hrs, the fuming of the solution had stopped.

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25 July 1986 Evaporation of Pm-145 CHM-4 and Pm-145 CHM-5 (cont.)

The color of the solution seemed to intensify around the 0.2 ml mark. When the solution dropped below the 0.1 ml mark it was very yellow. The solids appear to be significantly reduced. Turned off the lamp and purge at 1140 hrs and immediately added 0.2 ml of conc. HNO_3 (Ultrex). Then, we broke for lunch. Turned the heat lamp and gas purge back on at 1305 hrs. Continued to evaporate solution until 1340 hrs. Immediately added another 0.2 ml of conc. HNO_3 (Ultrex). Restarted at 1530 hrs. Solids immediately redissolved. The solution seemed to be clearer this time around. The heat lamp and gas purge were turned off at 1555 hrs. At 1605 hrs, ~ 1.0 ml of 0.1 M HNO_3 (Ultrex) was added. The solids did not readily dissolve. Added some heat and agitated the solution for a few minutes. Some solids were still visible. Decided to let the solution sit over the weekend.

28 July 1986 At 0820 hrs all traces of solids appear to be dissolved. There are some black spots on the bottom of the cone but I think they are imperfections in the quartz. It was decided that the solids have been reduced to the point that the solution is okay for a "but" column separation.

28 July 1986 — Dissolution of ^{148}Nd Oxide

A small amount of conc. HNO_3 (Ultrex) was added to vial containing the enriched ^{148}Nd. The solution turned a light blue. Maybe the color is due to the composition of the vial, maybe not. I think some of the ^{148}Nd was lost on transfer. A drop off the pipet was absorbed by some paper towel. The paper towel was leached in conc. HNO_3 (Ultrex) and transferred to 5 ml volumetric flask. 3.635 ml of ultrapure H_2O was added to volumetric flask to bring it to a calibrated volume of 5 ml.

30 July 1986 — General Housekeeping

Since Pm-145 C+M-3 had a fraction of Pm-145 in it, it was transferred to Pm-145 Mother. All other Pm-145 M- and Pm-145 C+M- solutions, except what was collected in Pm-145 C+M-5, were disposed.

Preparation of ^{148}Nd Tracer

1 Aug 1986 — A 10 ng/λ solution of the ^{148}Nd was prepared. The molarity of the solution was 0.024 M HNO_3. A nominal 100 ng (10 λ) of the ^{148}Nd was evaporated in a Suprasil capsule. This was then plugged with aluminum foil and placed inside a larger piece of quartz spacer. All of this was then placed inside a graphite rabbit for irradiation in the p-tube at HFIR. Some quartz wool was used to take up gaps in the rabbit. The rabbit was irradiated by Frank Dyer of Analytical Chemistry in the p-tube (which has a $\phi_{th} \cong 5 \times 10^{14}$) from 0904–0914. The rabbit was allowed to cool for ~35 minutes and placed in a ½" Pb carrier for transport by hand to TRU. The carrier read 10 mr/hr at contact.

~~Separation of small amount of Pm-145 + Nd-148 Tracer~~

Separation of Small Amount of Pm-145 + Nd-148/149 Tracer

1 Aug 1986 — Graphite rabbit was opened in hood and miscellaneous pieces were immediately placed in a Pb pig because of the high radiation. The Suprasil capsule and the Nd read ~3R/hr at contact. They were placed behind a Pb brick. The Suprasil was leached with two 10λ leaches (each ~2 mins in duration) of 6M HNO_3. The leaches were added to a cone containing ~10% (or 10 ng) of Pm-145 CtN-5. The solution was pipetted to the column reservoir. The cone and pipet were rinsed and rinse was also added to the column reservoir. Cone and pipet were probed for beta-gamma and none was found. Column was loaded with the Pm-145 and Nd-148/149. 0.3 M NH_4NO_3 was used to push off the H band. Column was then washed with ultrapure H_2O to rid the column of any excess NH_4NO_3. All the effluent was collected in Pm-Nd/S-1 at a rate of about 16 drops/second. Background

Separation of Small Amount of Pm-145 + Nd-148/149 Tracer (cont.)

1 Aug 1986 on the drop dosimeter was about 300 cpm. Probing of the column indicated a very tight loading band in the top 1/4" of the column. It was decided to try the separation according to a French article which used AHIB in the pH range 3.0-3.2 in a gradient manner. No molarities were given so all were prepared as 0.25 M. At 1056 hrs the elution started using pH = 3.0 AHIB and collection of all the effluent into Pm-Nd/S-2. Background was now around ~ 600 cpm, possibly due to the column being loaded with Pm and ~~Eu~~Nd. At 1110 hrs, pH 3.1 AHIB was added to the column reservoir which was still half-full of pH 3.0 AHIB. This was mixed together. Probing the column still indicated that the Pm/Nd mixture was still in a tight band at the top of the column. Collection was still in Pm-Nd/S-2. Volume in Pm-Nd/S-2 at this point was ~ 1.4 ml. At 1125 hrs, a full reservoir-full of pH 3.1 AHIB was added with collection still continuing into Pm-Nd/S-2 at the rate of 16 secs/drop. The drop dosimeter still continued to read background level. At 1134 hrs, a half-reservoir of pH 3.2 AHIB was added to the column with collection still continuing into Pm-Nd/S-2. Probing of the column indicated very little, if any, movement of the band of Nd+Pm. At this point, it was felt that the French technique was not working at all. So it was decided to up the pH of the AHIB solutions. At 1153 hrs, pH 3.48 AHIB was added to the column reservoir. Collection of the effluent was now in Pm-Nd/S-3. Drop rate was at ~ 16 secs/drop. Drop dosimeter was still reading background. At 1209 hrs pH 3.85 AHIB was added to the column reservoir. Probing of the column indicated that the tight band of Pm+Nd was still near the top of the column. Collection was still into Pm-Nd/S-3. There was so little discernible movement of the

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REACTOR EXPERIMENTS, INC.

963 TERMINAL WAY SAN CARLOS, CALIFORNIA 94070

MATERIAL DATA SHEET

Material: Cobalt-Aluminum Thickness: inch / mm Purity: 99.809%

Catalog No.: 1650 Diameter: .015 inch / mm Lot No.: 491

CHEMICAL ANALYSIS

Impurity	Maximum Percent	Impurity	Maximum Percent	Impurity	Maximum Percent	Impurity	Maximum Percent
Fe	.02	Ca	.0002				
Cu	.0007	Ti	.04				
Ni	.002						
Cr	.001						
Zn	<.005						
Mn	.002						
Si	.10						
V	.015						
Mg	.005						

John Brazier

plastic rabbit facility – 6 hrs in core

5.75×10^{14} 0.5 Mev
5.20×10^{14} resonance flux/lethargy — +8

^{147}Pm ? 2.5×10^{12} 0.5 Mev
$^{152,153}Eu$? 3×10^{14} resonance flux/lethargy — -8

16 inches of core centerline

soft - B hole

A hole

John Brazier
EG&G Idaho Inc.
Test Reactor Area
B/J 629
INEL
Scoville, Idaho 83415

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Separation of Small Amount of Pm-145 + Nd-148/149 Tracer (cont.)

1 Aug 1986 Pm + Nd it was decided to shift to the pHs used in the ^{144}Sm/Nd separation (originally suggested by JBK). So at 1218 hrs, pH 4.2 AHiB was added to the column reservoir. The drop rate had ~~increased~~ decreased to 18 sec/drop. Collection was still into Pm-Nd/S-3. Still no movement of the band. At 1227 hrs, a half-bowl full of pH 4.2 AHiB was added. Collection was still into Pm-Nd/S-3. The drop dosimeter was still reading background levels. Probing of the column indicated some spreading out of the band but the readings were still most intense at the top. At 1233 hrs a bowl-full of pH 4.4 AHiB was added to the column. Collection was now into Pm-Nd/S-4. Probing the column indicated that the leading edge of the band might be 1/4 to 1/3 of the way down the column. Drop dosimeter was still reading background levels. At 1245 hrs another bowl-full of pH 4.4 AHiB was added to the column. Collection was now into Pm-Nd/S-5. There was some small peturbations on the drop dosimeter indicating the possible presence of some radioactivity. However, probing of the column indicated the band was not near the bottom of the column. At 1251 hrs a bowl-full of pH 4.67 AHiB was added to the column. Collection was into Pm-Nd/S-6. Drop dosimeter still read background levels. Probing of the column indicated some movement of the band. At 1253 hrs, pH 4.67 AHiB was again added to the column reservoir. No change in the drop dosimeter. There was movement of the band. Collection of this particular fraction was into Pm-Nd/S-7. At 1259 hrs another bowl-full of pH 4.67 AHiB was added to the column reservoir. Collection was now into Pm-Nd/S-8. Drop dosimeter rose to ~ 900 cpm (300 cpm above background). Probing of the column

Separation of Small Amount of Pm-145 + Nd-148/149 Tracer (cont.)

1 Aug 1986 indicated that the band had moved to the lower 1/3 of the column. At 1303 hrs some more pH 4.67 AHIB was added to the column reservoir. Collection of this fraction was now into Pm-Nd/S-9. Drop dosimeter reading rose to 1800 cpm. At 1307 hrs some more pH 4.67 AHIB was added. Collection of this fraction was into Pm-Nd/S-10. Drop dosimeter reading was still above background. However, we are not seeing the valley in count rate that we expected. At 1317 hrs some pH 4.6 AHIB at 0.5 M was added to strip the column. Drop dosimeter still read around 1400 cpm. Probing of the column indicated that all Pm + Nd had been removed from the column. Cones were transferred to TRL (5505) for analysis on the x-ray spectrometer and the Ge-Li detector. Efficiency on the x-ray spectrometer drops precipitously at 100 keV so we switched to the Ge-Li detector to look for the 211 keV Nd gamma ray. The results of the measurements are shown below. Measurements started at 1400 hrs.

Sample	Vol.	72 keV[a,c]	211 keV[b,c]	72 keV[b,c]
Pm-Nd/S-1		0	0	0
S-2		0	0	0
S-3		0	0	0
S-4		0	0	0
S-5		0	3	12
S-6		0	5	4
S-7		2	4	6
S-8		88	4	664
S-9		181	9	1396
S-10		18	15	112
S-211		2	10	21

[a] x-ray detector

[b] Ge-Li detector

[c] 100 sec counting period

Separation of Small Amount of Pm-145+Nd-148/149 Tracer (cont)

1 Aug 1986 From the results it appears that the separation was pretty much a total failure. Some of it was most likely due to eluting the Pm+Nd in pH 4.67 AHiB. This probably sharpened the peaks too much. Also the Nd tracer was too rich in the 145-146 mass region. The use of the Nd tracer coupled with the low cross section for thermal neutron capture of ^{148}Nd probably increases the risk of additional 145-146 contamination rather than assisting in the Pm/Nd separation.

Separation of Pm-145 and Nd-145 Decay Daughter

3 Sept 1986 Participants in this second attempt are CWA, JBK, and Joe Halperin of Chemistry Division. Ion exchange column was prepared by JTW and was app. 4 x 100 mm, water-jacketed, and filled with Dowex 50W-X8. At 0940 hrs, column water bath was brought up to 63°C. Approximately 1 ml of solution (the total) was taken from Pm-145 CtM-5, solution was 0.1 M HNO_3, and placed in the column reservoir. Argon gas pressure was ~ 10 psi. Pm-145 CtM-5 was washed twice with 0.5 ml of 0.1 M HNO_3 and one 2 ml rinse with ultra-pure H_2O. All rinses were added to the column reservoir and, subsequently, loaded onto the column at a drop rate of about 20 drops/min ≅ 1 ml/min. Portable β/γ dosimeter showed a tight loading band at the top of the column with a count rate of about ~ 3000 cpm through the water jacket. Collection of effluent was into Pm/Nd 45-1. Added a bowl-full (~6 ml) of 0.3 M NH_4NO_3 to column reservoir to move hydrogen band off the column. pH paper indicated that H band was still on. Added another bowl and a half before hydrogen band was pushed off the column. All collection was into Pm/Nd 45-1. At 1010 hrs collection of effluent was switched to Pm/Nd 45-2. Drop rate was adjusted to ~ 10 drops/min. Added 0.25 M AHIB, pH 4.2 to column reservoir. Drop dosimeter was reading around 400 cpm. At 1024 hrs, added 0.25 M AHIB, pH 4.4 to column reservoir. Switched collection ~~to~~ to Pm/Nd 45-3. At 1036 hrs, added another bowl of 0.25 M AHIB, pH 4.4. Probing the column seemed to indicate that the center of the band was about 1/3 of the way down the column. At 1042 hrs, some additional 0.25 M AHIB, pH 4.4 was added to the column. Collection was now into Pm/Nd 45-4. Drop rate was increased to ~ 15 drops/min. The center of the Pm band now appeared to be halfway down the

Separation of Pm-145 and Nd-145 Decay Daughter (cont.)

3 Sept. 1986 column. At 1048 hrs, probing the column indicated that the Pm band was ~80% of the way down the column. Added some more 0.25 M, pH 4.4 AHIB and switched collection to Pm/Nd 45-5. At 1050 hrs the drop dosimeter showed some increased activity in the range of 400-500 cpm. At 1052 hrs switched collection to Pm/Nd 45-6. Drop dosimeter showed activity in the range of ~~400~~ 500-700 cpm. At 1055 hrs switched collection to Pm/Nd 45-7. Some additional 0.25 M, pH 4.4 AHIB was added to the reservoir. Drop dosimeter was in the range of 400-500 cpm. At 1057 hrs switched collection to Pm/Nd 45-8. Drop dosimeter was still in the range of 400-500 cpm. At 1100 hrs some additional 0.25 M, pH 4.4 AHIB was added to the column reservoir. Collection was switched to sample cone Pm/Nd 45-9. Drop dosimeter was still reading 400-500 cpm. At 1102 hrs a bowl of 0.25 M, pH 4.64 AHIB was added to the column reservoir. Drop dosimeter had dropped below 400 cpm and probing of the column indicated that the Pm band was essentially off. At 1105 hrs switched collection to Pm/Nd 45-10. Drop dosimeter was still reading below 400 cpm. At 1108 hrs switched collection to Pm/Nd 45-11. Drop dosimeter still below 400 cpm. At 1120 hrs the reservoir column was filled with 0.5 M, pH 4.8 AHIB in order to strip the column. Collection of strip was into Pm/Nd 45-Strip.

Separation of Pm-145 and Nd-145 Decay Daughter (cont'd)

3 Sept. 1986

Sample	Vol (ml)	β-γ Dosimeter Reading (cpm)
Pm/Nd AS-1	14.7	
Pm/Nd AS-2	5.6	
Pm/Nd AS-3	6.3	
Pm/Nd AS-4	2.1	
Pm/Nd AS-5	1.8	100
Pm/Nd AS-6	1.0	1200
Pm/Nd AS-7	1.0	900
Pm/Nd AS-8	0.95	500
Pm/Nd AS-9	0.95	400
Pm/Nd AS-10	1.3	450
Pm/Nd AS-11	1.9	300
Pm/Nd Strip	6.3	

Samples were taken over to TRL (Bldg 5505) and analyzed using the low energy, intrinsic Ge spectrometer. Results are shown below.

Sample[f,g,h]	Vol (ml)	36+31 KeV[a]	42 KeV[b]	67.2 KeV[c]	72.4 KeV[d]	Total[e]
Pm/Nd AS-1	14.7	3	3	20	34	379
Pm/Nd AS-2	5.6	5	1	15	26	373
Pm/Nd AS-3	6.3	17	17	22	35	593
Pm/Nd AS-4	2.1	43	20	16	29	883
Pm/Nd AS-5	1.8	26336	6621	315	543	53377
Pm/Nd AS-6	1.0	79616	20301	997	1934	163341
Pm/Nd AS-7	1.0	66535	16823	811	1542	135209
Pm/Nd AS-8	0.95	43375	11081	584	990	87669
Pm/Nd AS-9	0.95	24124	6110	295	573	48941
Pm/Nd AS-10	1.3	31011	7808	396	749	62240
Pm/Nd AS-11	1.9	29201	7481	318	653	58807
Pm/Nd Strip	6.3	67365	17186	895	1536	139186
Background		3	2	14	40	376

[a] channels 330-354
[b] channels 382-411
[c] channels 626-650
[d] channels 678-703
[e] channels 15-1024
[f] channels counting time = 120 sec
[g] channels source (midplane) to detector = 3cm
[h] gross counts instead of net

[redacted]

Separation of Pm-145 and Nd-145 Decay Daughter (cont.)

3 Sept. 1986 The ratios of the main x-ray peaks and gamma rays were compared to data compiled by Kocher. The results are shown below.

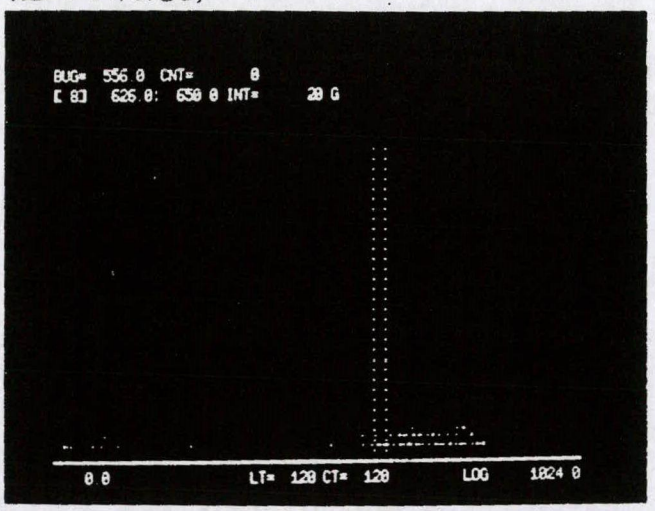
Sample	Experiment (36+31)/42	Kocher (36+31/42)	Experiment 72.4/67.2	Kocher 72.4/67.2
45-1	1.00	4.07	1.70	5.35
45-2	1.25		1.73	
45-3	1.00		1.59	
45-4	2.15		1.81	
45-5	3.98		1.72	
45-6	3.92		1.94	
45-7	3.96		1.90	
45-8	3.91		1.70	
45-9	3.95		1.94	
45-10	3.97		1.89	
45-11	3.90		2.05	
Strip	3.92		1.72	

The ratios of the x-rays agree reasonably well with Kocher's data. However, the gamma ratios do not agree well at all. The counting for this separation was done in the gross count mode. In the region of the two gamma rays there is a high baseline probably due to background, scattered radiation, and, possibly, lead x-rays. There is also a difference due to the different efficiencies of detection of the two gammas. Spot-checking by turning the MCA to the net mode resulted in ratios a lot closer to Kocher's data. Therefore, we feel our data is pretty good. Photographs of the results of the low energy spectrometer measurements follow.

Separation of Pm-145 and Nd-145 Decay Daughter (cont.)

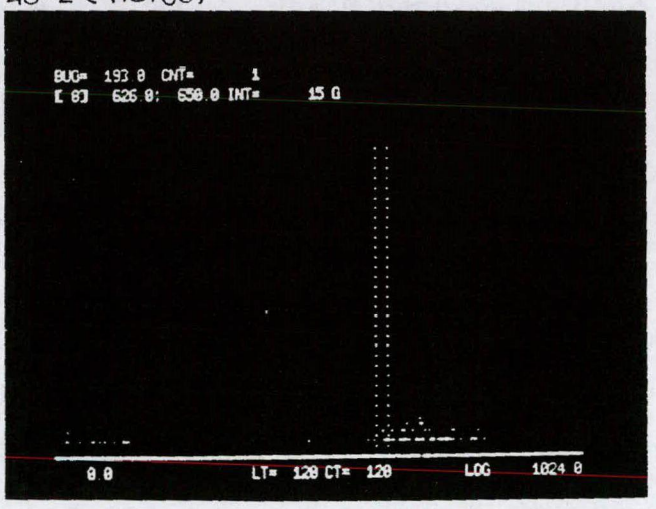
3 Sept 1986

AS-1 (9/3/86)



AS-1
(9/3/86)

AS-2 (9/3/86)



AS-2
(9/3/86)

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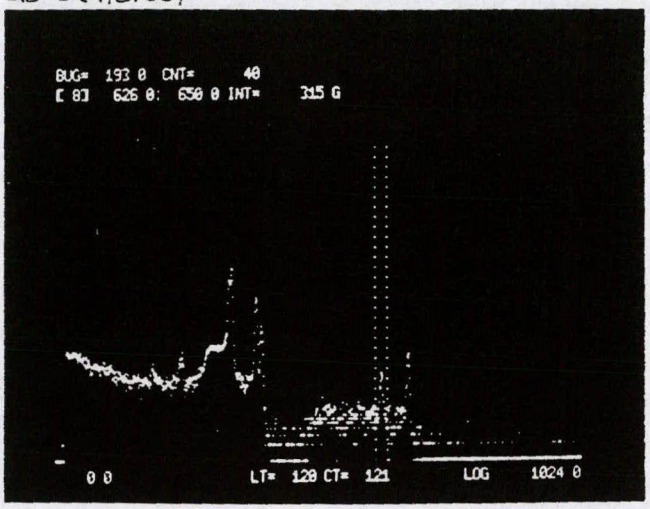
Separation of Pm-145 and Nd-145 Decay Daughter (cont.)

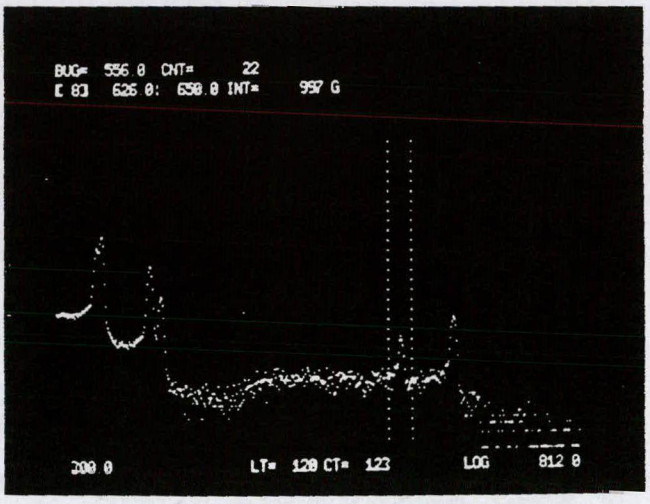
3 Sept 1986

AS-5(9/3/86)



AS-5
(9/3/86)

AS-6 (9/3/86)



AS-6
(9/3/86)

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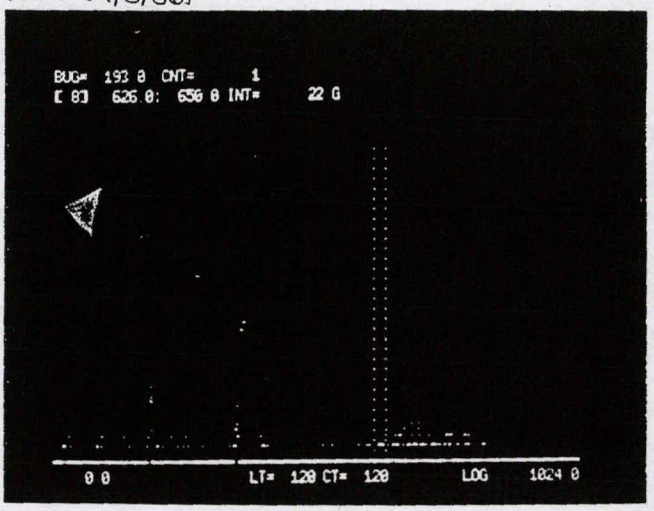
Separation of Pm-145 and Nd-145 Decay Daughter (cont.)

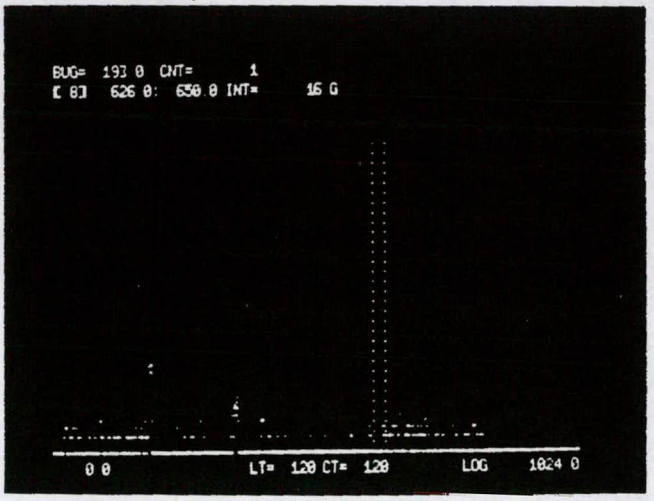
3 Sept 1986

AS-3 (9/3/86)



AS-3
(9/3/86)

AS-4 (9/3/86)



AS-4
(9/3/86)

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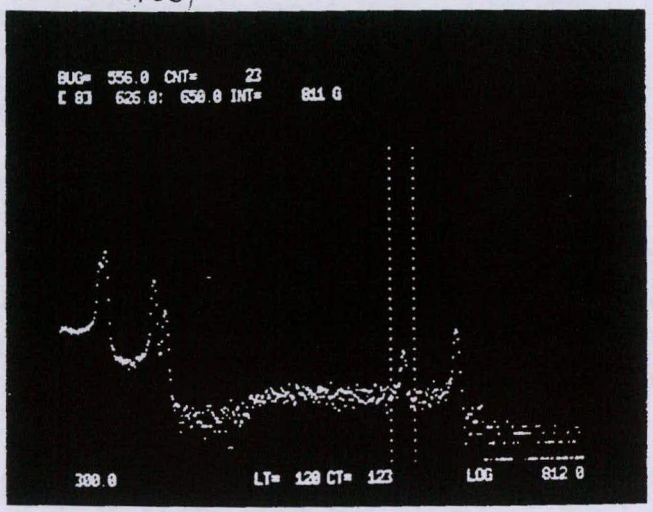
Separation of Pm-145 and Nd-145 Decay Daughter (cont.)

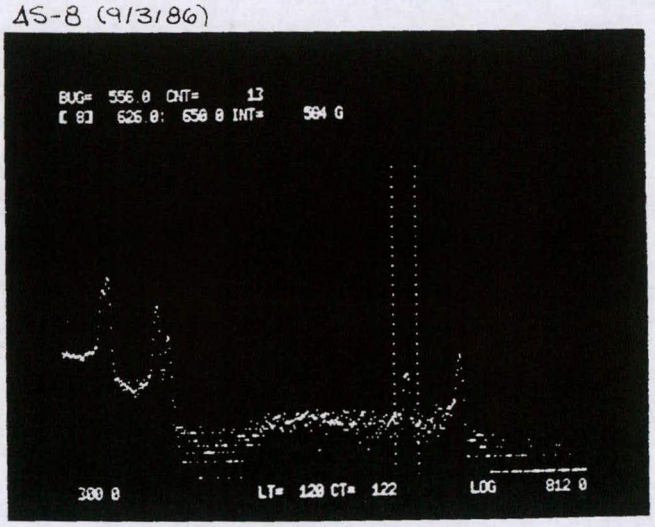
3 Sept 1986

AS-7 (9/3/86)



AS-7
(9/3/86)

AS-8 (9/3/86)



AS-8
(9/3/86)

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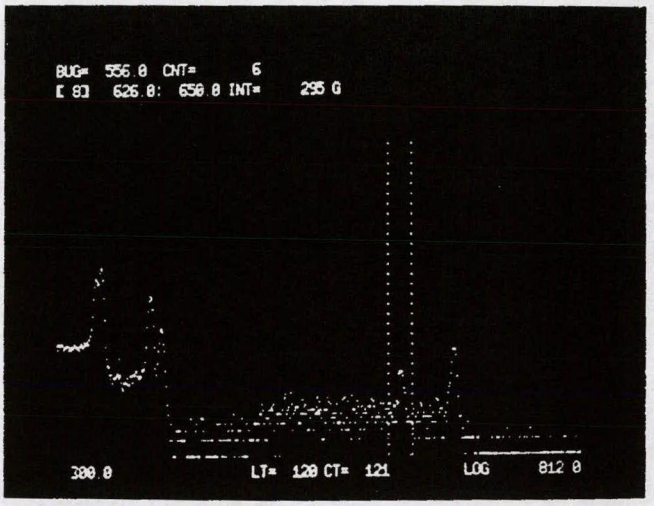
Separation of Pm-145 and Nd-145 Decay Daughter (cont.)

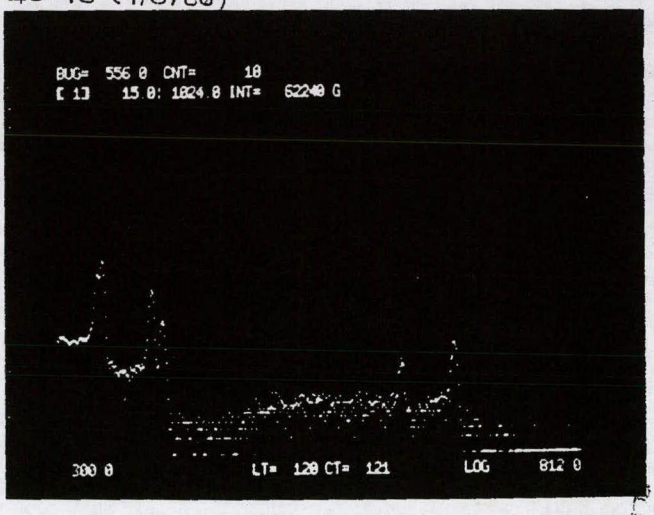
3 Sept. 1986

45-9 (9/3/86)



45-9
(9/3/86)

45-10 (9/3/86)



45-10
(9/3/86)

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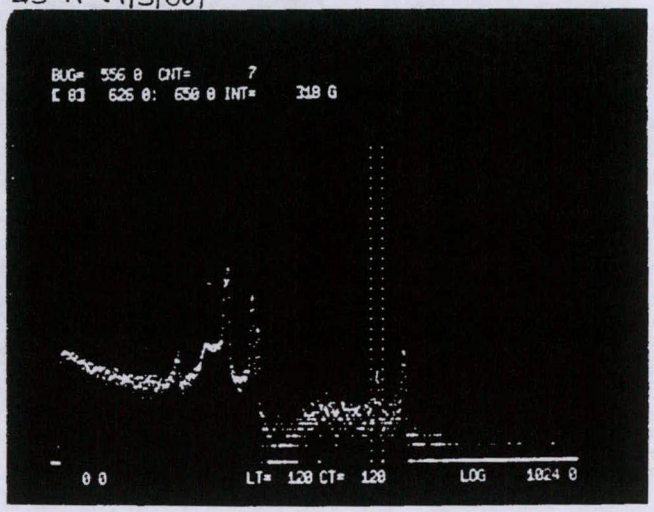
Separation of Pm-145 and Nd-145 Decay Daughter (cont.)

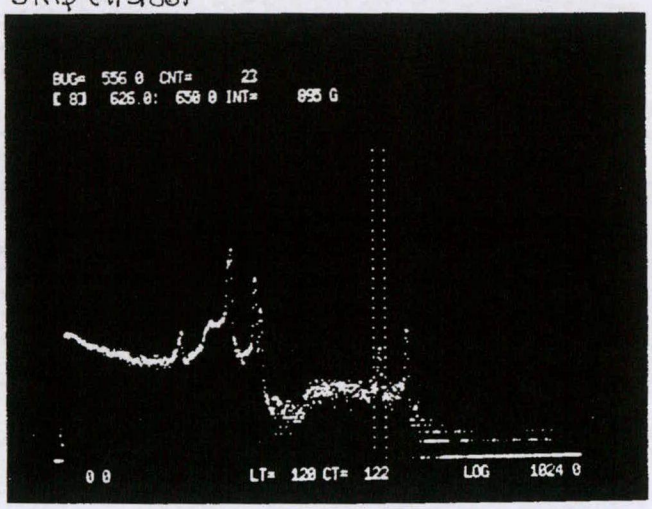
3 Sept 1986

AS-11 (9/3/86)



AS-11
(9/3/86)

Strip (9/3/86)



Strip
(9/3/86)

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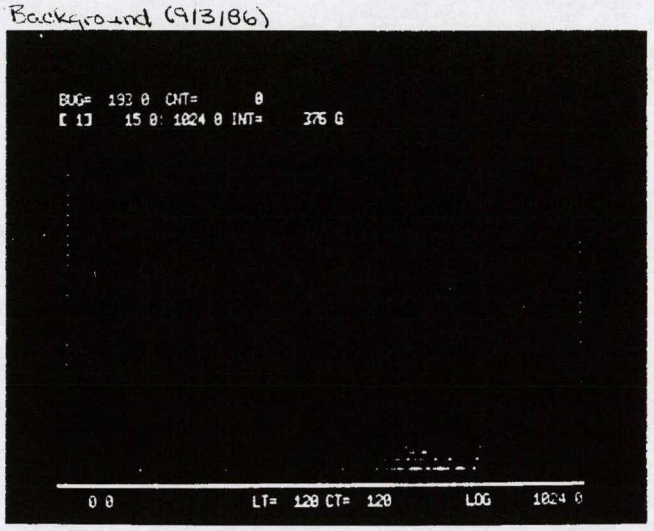
Separation of Pm-145 and Nd-145 Decay Daughter (cont.)

3 Sept. 1986

Background (9/3/86)



Background (9/3/86)

We are confused as to why so much Pm-145 was found in the strip. The decrease in concentration is not all that large between Pm/Nd 45-11 and Pm/Nd 45-Strip. Several of the fractions will be sent to Ray Walker of Analytical Chemistry for Pm and Nd mass analyses.

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Preparation of Cleanup Column for Pm-145 Fractions

9 Sept. 1986 — Column was generally prepared and conditioned according to the "recipe" on page 1 of this notebook. The column was calibrated with water to the 0.6 ml mark. The column was loaded with AG 50W-X4 cation resin, -400 mesh, and in the hydrogen form. Final resin volume was 0.6 ml which results in a column volume (free) of 0.3 ml. The column was then conditioned.

Cleanup Column for Pm/Nd 45-5 + Pm/Nd 45-6

15 Sept. 1986 — Started work at 0925 hrs. Combined Pm/Nd 45-5 into Pm/Nd 45-6 for the first cleanup run. Initial volume of 45-5 was 1.8 ml. Volume of 45-6 was 1.0 ml. Combined the two and added ½ ml of 2 M HCl to break the butyrate complex. Rinsed the cone with 0.1 M HCl and transferred to the column reservoir. All HCl is of the Ultrex form. Background on the NaI detector is 2633 counts integral and about 2 counts in the channel where we expect to see the Pm-145 x-rays. Count rate time on the portable MCA was 6 seconds. The drop rate was a drop about every 10 seconds. The background appeared to drop below the 2000 level during loading of the Pm-145 onto the column. Probing the column with a portable β/γ dosimeter indicated loading at the top of the shrunken resin. Collection was in Pm 5+6 CL-1. Drop readings on the NaI detector were still less than 2000 counts and there was no indication of any Pm-145 x-rays. Made another rinse of of 45-6 with 0.1 M HCl (Ultrex). Added another 0.1 M HCl (Ultrex) rinse (about ¼ of a bowl-full). Added another 0.1 M HCl (Ultrex) rinse of about the same volume as earlier ones. At 1035 hrs, switched to 2 M HCl as an elutriant and started collection into Pm 5+6 CL-2. At 1043 hrs added some more 2 M HCl (Ultrex), about ⅓ bowl-full, to the

Cleanup Column for Pm/Nd 45-5 + Pm/Nd 45-6 (cont.)

15 Sept. 1986 column reservoir. Started to see some indication of Pm-145 on the NaI detector. At 1048 hrs, switched collection of the effluent to Pm 5+6 CL-3 and the elutriant was switched to 6 M HCl (Ultrex). At 1051 hrs, virtually all the Pm-145 seemed to be off the column, so collection was switched to Pm 5+6 CL-4. At 1056 hrs, some more 6 M HCl (Ultrex) was added to the column reservoir and collection was switched to Pm 5+6 CL-5. H_2O (ultra-pure) was later run through the column and collected in CL-5. The cleanup column run was terminated at 1110 hrs. The collection cones were then analyzed by the NaI detector and portable MCA to try and determine where the Pm-145 was. The results are shown below.

Sample	Vol (ml)	6-sec count[a]
Pm 5+6 CL-1	7.9	2144 (int.) (Ch 1 - 12, Ch 16 - 2)
Pm 5+6 CL-2	2.2	3671 (int.) (Ch 1 - 43, Ch 16 - 31)
Pm 5+6 CL-3	0.8	20644 (int.) (Ch 1 - 683, Ch 16 - 336)
Pm 5+6 CL-4	0.8	2661 (int.) (Ch 1 - 14, Ch 16 - 10)
Pm 5+6 CL-5	2.0	2571 (int.) (Ch 1 - 11, Ch 16 - 3)
Background		2608 (int.) (Ch 1 - 8, Ch 16 - 3)

[a] Int: integral, includes all emissions through 72 kev
Ch 1: channel for x-rays
Ch 16: channel for γ-rays

As seen from the results most of the Pm-145 appears to be in CL-3. However, all cones were packaged for counting at 5505 on the low energy spectrometer (intrinsic Ge detector).

Cleanup Column for Pm/Nd 45-7

15 Sept. 1986 Started back to work at 1340 hrs. We will be working only with Pm/Nd 45-7 this time. The initial volume of Pm/Nd 45-7 is 0.9 ml. Added 0.2 ml of 2M HCl (Ultrex) to break the butyrate complex and convert it to ~0.3 M. This was added directly to cone coming up with a volume of ~1.2 ml. Cone was air-sparged to ensure mixing. The solution was then added to the column reservoir. Background on the NaI detector read 1407 counts over a 6 sec time period. Channel 16 gave 3 counts and channel 1 gave 2 counts. 45-7 was rinsed three times with 0.1 M HCl (Ultrex) and all rinses were added to the column reservoir. Initial collection of the effluent was into Pm-7 CL-1. During loading of the Pm-145 onto the column the background seemed to increase to 1600-1700 counts. The drop rate was about 10 secs/drop. At 1310 hrs, ~1/3 of a bowl-full of 0.1 M HCl (Ultrex) was added to the column reservoir. Probing of the column with a portable β/γ dosimeter indicated that loading had taken place at the top of the column. Background on the NaI detector increased during the loading period to ~2600 counts. Why this fluctuation occurs is a little strange to me. At 1315 hrs, about 1/4 of a bowl-full of 0.1 M HCl was added to the reservoir. The background seemed to shift slightly downwards. Added 2M HCl at 1322 hrs and started collection of the effluent into Pm-7 CL-2. The drop rate was slowed slightly. At 1330 hrs, probing of the column indicated that the Pm-145 was halfway down the column. Switched collection of the effluent into Pm-7 CL-3. This was rather fortuitous, because the very next drop showed indications that some Pm-145 was present. At 1341 hrs switched the elutriant to 6M HCl (Ultrex) in order to sharpen up the Pm-145 peak and minimize product volume. At 1348 hrs there was no longer any indication of Pm-145 on the column or in the drops of effluent so collection was switched to Pm-7 CL-4.

Cleanup Column for Pm/Nd 45-7 (cont.)

15 Sept. 1986 At 1345 hrs switched collection to Pm-7 CL-5 and added some additional 6M HCl (ultrex) to the column. Everything seemed to be off the column. Terminated run at 1353 hrs. The various collection cones were then analyzed by the NaI detector and portable MCA to try and determine where the Pm-145 was collected. The results are shown below.

Sample	Vol (ml)	6-sec count[a]
Pm-7 CL-1	5.1	2881 (int) (Ch 1-10, Ch 16-8)
Pm-7 CL-2	2.6	2275 (int) (Ch 1-15, Ch 16-7)
Pm-7 CL-3	0.9	17249 (int) (Ch 1-517, Ch 16-303)
Pm-7 CL-4	0.5	2787 (int) (Ch 1-13, Ch 16-7)
Pm-7 CL-5	2.6	2649 (int) (Ch 1-12, Ch 16-2)
Background		2525 (int) (Ch 1-8, Ch 16-3)

[a] int: integral, includes all emissions through 72 kev
Ch 1: channel for x-rays
Ch 16: channel for γ-rays

As seen from the results most of the Pm-145 is in CL-3. All cones were packaged and taken over to 5505 CTRL) for analysis on the low energy spectrometer.

Analysis of Pm-5+6 and Pm-7 Cleanup Fractions

15 Sept. 1986 Samples from both the Pm-5+6 cleanup column and Pm-7 cleanup column were taken over to 5505 for analysis of Pm-145 content on the low-energy spectrometer. The results are shown below.

Sample[a]	Integral[b]	38 kev[c,d]	42 kev[c,e]	67 kev[c,f]	72 kev[c,g]
Pm 5+6 CL-1[h]	521	3	1	16	11
Pm 5+6 CL-2	4855	1202	331	21	36
Pm 5+6 CL-3	79460	21142	6162	244	659
Pm 5+6 CL-4	1251	201	75	9	18
Pm 5+6 CL-5[h]	494	1	0	9	7
Pm 7 CL-1[h]	504	1	3	9	15
Pm 7 CL-2[i]	1106	161	51	9	13
Pm 7 CL-3	50913	13256	3924	158	404
Pm 7 CL-4[i]	717	58	21	8	11
Pm 7 CL-5[h]	489	4	2	5	6

[a] Counting began at 1510 hrs, 120 sec counting period, and sources were counted 2" away from detector face.

[b] Channels 36-187

[c] Peak channel

[d] Channel 85

[e] Channel 97

[f] Channel 158

[g] Channel 171

[h] No real structure

[i] Not well defined, perhaps because of short counting period.

Analysis of Pm-516 and Pm-7 Cleanup Fractions (cont.)

15 Sept. 1986 Background and standard Pm-145 analyses were also made under the same counting, detector, and MCA conditions.

Sample	Integral	38 KeV	42 KeV	67 KeV	72 KeV
Standard[a]	4514	1166	344	29	46
Background	516	2	0	8	12

[a] Nominally 1.0 ng of ^{145}Pm assuming the same efficiency as ^{241}Am

All samples were returned to Lab 110 in Bldg. 7920 after analysis.

~~Analysis of Pm-8 Cleanup Fraction~~

16 Sept. 1986 Cleanup Column for Pm/Nd 45-8

Started to work at 0950 hrs. Will be working only with Pm/Nd 45-8 today. The initial volume of 45-8 is ~0.9 ml. Added 0.2 ml of 2M HCl (Ultrex) in order to break the butyrate complex and convert it to ~0.3M. This was added directly to 45-8. About 0.15 ml of 0.1 M HCl (Ultrex) was added by accident to the cone. However, this only raised the molarity to 0.014 M. So, I decided to go ahead and add ~0.15 ml of 2M HCl. This should bring it pretty close to 0.3M. The cone, ~1.2 ml in volume, was air sparged and pipet tip was touched to the pH paper. Paper turned red indicating complex had been broken. Forced some water through the column because the reservoir had gone dry overnight. Resin seemed to recover nicely. Background (from 0 - 72 kev) on the NaI detector was 2548 counts in a 6 second period. Channel 1 read 8 counts and Channel 16 read 7 counts. 45-8 solution was put ~~onto~~ into column reservoir plus 2 1 ml rinses of 0.1 M HCl (Ultrex). Background after loading rose to 2735 counts. Channel 1 read 9 counts and Channel 16 read 7 counts. Started the actual cleanup column run at 1145 hrs. Collection was into Pm-8 CL-1. Drop rate started off at about 9 secs/drop. We decided to slow the drop rate down to about 10 secs/drop. The background seemed to drop somewhat during loading. Another 1 ml rinse of 0.1 M HCl (Ultrex) was added to the column. Probing of the column indicated loading right at the top of the column. Added about 1/3 of a bowl of 0.1 M HCl (Ultrex) at 1107 hrs. At 1115 hrs switched elutriant to 2M HCl and began collection in Pm-8 CL-2. Drop rate was now around ~10-11 seconds/drop. Switched to Pm-8 CL-3 at 1130 hrs. Effluent was still 2M. Probing of the column indicated that the Pm-145 was very near the

Cleanup Column for Pm/Nd 45-8 (cont.)

16 Sept. 1986 bottom of the column. At 1132 hrs switched elutriant to 6M HCl (ultrex) and started collecting in Pm-8 CL-4. Pm-145 seemed to come off very quickly so collection of effluent was switched to Pm-8 CL-5 at 1142 hrs. Terminated the run at 1145 hrs. The various collection cones were then analyzed by the NaI detector and portable MCA to try and determine where the Pm-145 was collected. The results are shown below.

Sample	Vol (ml)	6-sec count[a]
Pm-8 CL-1	6.3	1836 (int.) (Ch 1 - 4 cnts, Ch 16 - 2 cnts)
Pm-8 CL-2	2.1	2233 (int.) (Ch 1 - 12 cnts, Ch 16 - 5 cnts)
Pm-8 CL-3	0.5	1831 (int.) (Ch 1 - 6 cnts, Ch 16 - 2 cnts)
Pm-8 CL-4	0.7	19042 (int.) (Ch 1 - 96 cnts, Ch 16 - 223 cnts)
Pm-8 CL-5	1.3	2514 (int.) (Ch 1 - 9 cnts, Ch 16 - 6 cnts)
Background		2186 (int.) (Ch 1 - 4 cnts, Ch 16 - 2 cnts)

[a] int: integral, includes all emissions through 72 kev
Ch 1: channel for x-rays
Ch 16: channel for γ-rays

Analysis of Pm-8 Cleanup Fractions

16 Sept. 1986

Pm-8 CL-1 through CL-5 were packaged and taken over to 5505 for analysis on the low-energy spectrometer. The results are shown below.

Sample[a]	Integral[b]	38 kev[c,d]	42 kev[c,e]	67 kev[c,f]	72 kev[c,g]
Pm-8 CL-1	502	1	—	—	—
Pm-8 CL-2	505	3	—	—	—
Pm-8 CL-3	636	36	—	—	—
Pm-8 CL-4	30183	8053	—	—	—
Pm-8 CL-5	565	12	—	—	—
Background	524	1	—	—	—
Standard[h]	4924	1271	—	—	—

[a] Counting began at 1550 hrs, 120 sec counting period, and sources were 2" away from detector face.

[b] Channels 36-187

[c] Peak channel

[d] Channel 85

[e] Channel 97

[f] Channel 158

[g] Channel 171

[h] nominally 1 ng of ^{145}Pm

Evaporation of Pm-546 CL-3, Pm-7 CL-3, and Pm-8 CL-4

18 Sept. 1986 Started to work at 0810 hrs. Work today will focus on the evaporation of the Pm-145 product solutions from the three cleanup columns run earlier in the week. The first one to be evaporated is Pm-546 CL-3. The initial volume is ~0.8 ml and contains multi-nanogram quantities of Pm-145. Turned on the heat lamp and argon gas purge at 0810 hrs. Ceased evaporation at 0930 hrs. There is still a good deal of solids, ± 1 mg, which is pretty mystifying (could be Sm). The color of the solids is off-white. The solution, though, remained colorless during the evaporation. Capped the cone and removed it from the evaporation rig. Next in line was Pm-7 CL-3. The initial volume ~~was~~ is ~0.9 ml and contains multi-nanogram quantities of Pm-145. Placed CL-3 in the evaporation rig and turned on the heat lamp and argon gas purge at 0934 hrs. Terminated the evaporation run at 1032 hrs. A small amount of solids appeared to remain but not nearly as much solids as in Pm-546 CL-3. The solution, though, did remain colorless during evaporation. The solids were off-white in color. The cone was capped and removed from the evaporation rig. Started to work on Pm-8 CL-4. The initial volume of CL-4 is 0.7 ml and contains less than 10 nanograms of Pm-145. Placed the cone in the evaporation rig and turned on the heat lamp and argon gas purge at 1038 hrs. Terminated the evaporation run at 1125 hrs. ~~Beta~~ Solution was colorless during evaporation and seemed to result in a "mass-free" product. Cone was capped and all three were transferred to TRL (Bldg. 5505) for counting on the low-energy spectrometer.

18 Sept 1986

Analysis of Pm-5+6 CL-3, Pm-7 CL-3, and Pm-8 CL-4 Products

The evaporated products from Pm-5+6 CL-3, Pm-7 CL-3, and Pm-8 CL-4 were transferred to TRL for analysis on the intrinsic Ge low-energy spectrometer. The results are shown below.

Sample [a]	Integral [b]	38 kev [c,d]	72 kev [c,e]
Pm-5+6 CL-3	48453	14083	460
Pm-7 CL-3	49219	14785	405
Pm-8 CL-4	28967	8421	227
Background	103	1	9
Standard [h]	4150	1290	35

[a] Counting began at 1410 hrs, 120 sec counting period, and sources were 2" away from detector face.

[b] Channels 51-11

[c] Peak channel

[d] Channel 85

[e] Channel 176

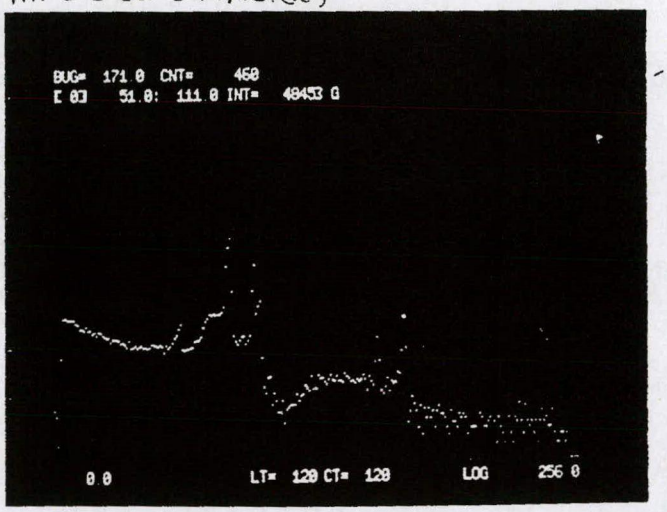
[h] Nominally, 1.0 ng of ^{145}Pm

Photographs of the low-energy spectrometer measurements follow.

Analysis of Pm-5+6 CL-3, Pm-7 CL-3, and Pm-8 CL-1 Products (cont.)

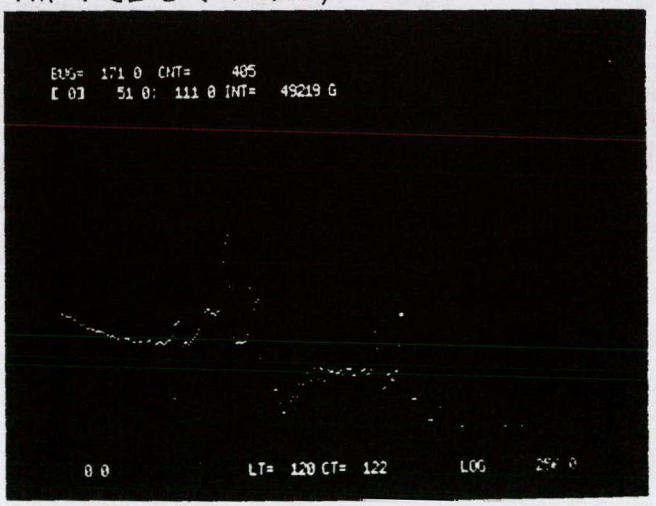
18 Sept 1986

Pm 5+6 CL-3 (9/18/86)



Pm-5+6 CL-3
(9/18/86)

Pm-7 CL-3 (9/18/86)



Pm-7 CL-3
(9/18/86)

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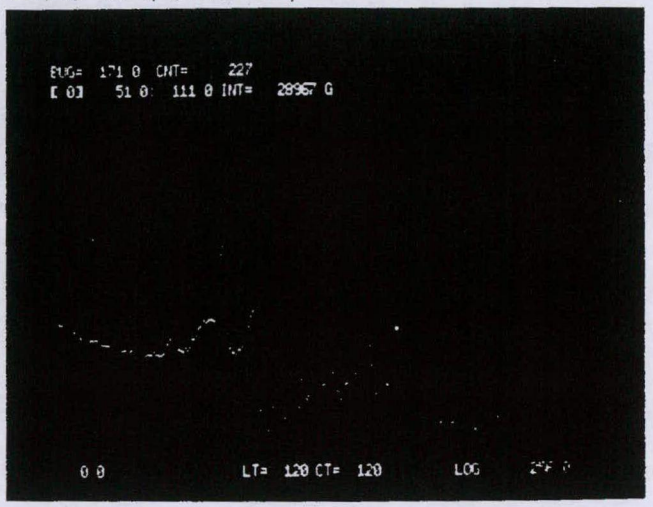
Analysis of Pm-5t6 CL-3, Pm-7 CL-3, and Pm-8 CL-4 Products (cont.)

18 Sept 1986

Pm 8 CL-4 (9/18/86)



Pm-8 CL
(9/18/86

Bkgd (9/18/86)

Backgr
(9/18/8

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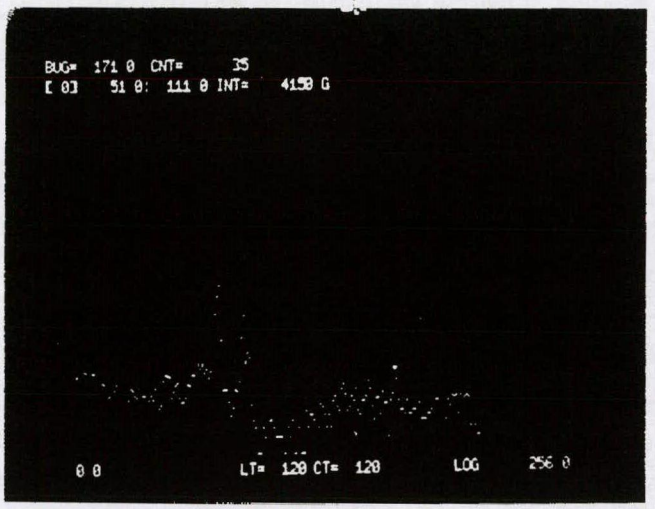
Analysis of Pm-5t6 CL-3, Pm-7 CL-3, and Pm-8 CL-4 Products (cont.)

18 Sept 1986

Std Card (9/18/86)



Standard (9/18/86)

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Preparation of Separated ^{145}Pm

30 Sept 1986 Started to work at 0845 hrs in Lab 110. Added 400λ of 8M HNO_3 (Ultrex) to Pm-5+6 CL-3, Pm-7 CL-3, and Pm-8 CL-4 in order to convert it (them) to a nitrate. At 1039 hrs Pm-7 CL-3 was put in the evaporation rig and the heat lamp and argon gas purge were turned on. The evaporation run was terminated at 1015 hrs. 400λ of 8M HNO_3 (Ultrex) was immediately added to the still warm cone. Very little solids, maybe none, were visible. Pm-5+6 CL-3 was put in the evaporation rig and the process was started at 1120 hrs. Solution turned a nice gold color when nearly all the solution was evaporated. The color may be due to Sm which would have immediately ~~proceeded~~ preceded the Pm off the separation column. The run was terminated at 1214 hrs. There were some visible solids, probably trans-~~pa~~promethium, but they seemed to be less than before. I immediately added 400λ of 8M HNO_3 (Ultrex) to Pm-5+6 CL-3 and put it aside. Pm-8 CL-4 was put in the evaporation rig at 1219 hrs and drying down commenced. Solution was colorless during evaporation. Evaporation was terminated at 1224 hrs. No solids were visible. Solutions were allowed to sit until a later date.

Additional Preparation of ^{144}Sm

29 Sept 1986

Started to work at 0950 hrs in Lab 110. ^{144}Sm solution was ~7 mg in 6 M HCl (Ultrex). Placed cone holding the ^{144}Sm solution in the evaporation rig and turned on the heat lamp and argon gas purge. The solution was initially clear with no visible solids present. Turned off the heat lamp and gas purge at 1018 hrs. Some light, yellowish-colored solids were in the bottom of the cone. At 1035 hrs, added ~400λ of 8M HNO_3 (Ultrex) to evaporated cone. Solids were readily dissolved by the nitric acid. Let the solution sit until 1305 hrs when it was placed back in the evaporation rig and evaporation started again. At 1336 hrs the evaporation was completed and another ~400λ of 8M HNO_3 (Ultrex) was added to the still warm cone. Solution was allowed to sit until 1514 hrs when the evaporation process was restarted. Solution remained colorless during most of the evaporation. Evaporation was terminated at 1600 hrs. Immediately added 400λ of 0.1 M HNO_3 to the cone and will let it sit until future aliquots of ^{144}Sm are needed.

Preparation of ^{144}Sm (1 μg/ml) Samples for Ray Walker

1 Oct. 1986

Originally, we had 8.1 mg of ^{144}Sm. 0.972 mg of the ^{144}Sm were used for the ^{144}Sm cross section experiments. This left ~7.128 mg remaining in the stock solution. Currently, this stock solution exists in 400λ of 0.1 M HNO_3 (Ultrex). The following procedure was used to produce the 1 μg/ml samples:

1) Original ^{144}Sm stock solution (p. 74) was further diluted with nominal 0.1 M HNO_3 (Ultrex) to a total volume of 713λ. This resulted in a concentration of 9.997 μg/λ.

2) A 10λ aliquot was taken from this new solution in (1) and diluted to 1000λ with nominal 0.1 M HNO_3 (Ultrex). This resulted in a concentration of 0.100 μg/λ.

3) A 10λ aliquot was taken from this new solution in (2) and diluted to 1000λ with nominal 0.1 M HNO_3 (Ultrex). This resulted in a concentration of 1.0 μg/ml.

Two 1.0 μg/ml solutions (1.0 ml each) were prepared and given to Ray Walker for his Sm/Pm mass spec work.

2 Oct. 1986 — Additional Preparation of Separated ^{145}Pm and Loading of P-Tube Graphite Rabbit

Started work at 1530 hrs on 2 Oct 86. Placed Pm-7 CL-3 in evaporation rig with heat lamp and argon gas purge. Solution was clear and colorless during evaporation. Terminated the evaporation at 1650 hrs and immediately added 230λ of 0.1 M HNO_3 (ultrex). Capped it and let it sit overnight.

3 Oct. 1986 — Started back to work at 1350 hrs. A 10λ aliquot (≈0.50 ng of ^{145}Pm) from Pm-7 CL-3 in a small Suprasil cylinder at 1350 hrs. Turned on the heat lamp to evaporate the solution in the cylinder. At 1425 hrs the evaporation was complete and another 10λ aliquot from the same batch was added to the Suprasil cylinder. Evaporation of this additional amount was completed at 1505 hrs. Probing of the cylinder with an end-window beta-gamma probe indicated that the ^{145}Pm was deposited. The Suprasil cylinder along with a 1.407 mg Co-Al flux wire were wrapped in very thin Al foil and placed in an ultra-pure graphite rabbit. Rabbit was placed in hood for safekeeping.

Irradiation of ^{145}Pm from Pm-7 CL-3

6 Oct. 1986 Frank Dyer put rabbit in p-tube at ~1000 hrs. Rabbit was scheduled to be irradiated for exactly 24 hrs. Rabbit was discharged on 7 Oct 1986 and stored in the HFIR reactor pool until ~1430 hrs when it was returned pneumatically to the P-Tube hot cell. The rabbit read ~1-2 R/hr at a couple of inches away from the rabbit.

Dissolution of ^{145}Pm P-Tube Rabbit

13 Oct 1986 Started to work at 1205 hrs in Lab 110. Background on the NaI detector over the 72 kev range is 746 counts in a 6 second counting period. Background on the "cutie pie" was ~ 2 1/2 mr/hr. Background on the β/γ dosimeter was ~ 300-400 cpm with the shield in the open position. Removed graphite rabbit from the lead pig and placed it behind a lead brick in the hood. The rabbit read ~ 40 mr/hr near contact. The rabbit read 290,000 cpm on the β/γ probe with the window open. With the shield in place the reading dropped to 220,000 cpm. Contents were removed from the rabbit. The empty graphite rabbit read ~ 16 mr/hr at contact. The Al foil-wrapped Suprasil read ~ 100 mr/hr at ~ 1/2". The Al foil, alone, read ~ 1 mr/hr at contact. The Al foil-wrapped Co flux wire read ~ 60 mr/hr at 1/2". The Co flux wire was placed in a sample bottle and returned to the lead pig. The Suprasil cylinder read ~ 1.2 R/hr at contact (must be a lot of β present). The foil had been removed. The Suprasil read 170,000 cpm on the β/γ probe with the shield closed and was off-scale when the shield was opened. Background in the hand-operating area was ~ 30-60 mr/hr. At 1245 hrs, 10λ of 6M HNO_3 (Ultrex) was added to the Suprasil cylinder. The heat lamp was turned on for ~ 3 minutes. The leach solution was then transferred to $^{145-146}Pm$ P-TUBE-1. Another 10λ of 6M HNO_3 (Ultrex) was added to the cylinder and the heat lamp again was turned on for ~ 3 mins. Transferred leach solution to P-TUBE-1. Suprasil cylinder now read ~ 190,000 cpm with the shield open. The reading dropped down to 10,000 cpm with the shield closed. Added another 10λ of 6M HNO_3 (Ultrex) at 1300 hrs. Heat lamp was turned on for another 3 mins. Suprasil cylinder, after leach solution was transferred to P-TUBE-1, read ~ 10,000 cpm with the shield closed and ~ 190,000 cpm

Dissolution of ^{145}Pm P-Tube Rabbit (cont.)

13 Oct. 1986 ... with the shield open. 10λ of triply distilled H_2O was added to the Suprasil cylinder at 1303 hrs. Another two 10λ washes of triply distilled H_2O were added to the cylinder. All washes were transferred to P-TUBE-1. The Suprasil cylinder now read ~100,000 cpm with the shield open and 5,000 cpm with the shield closed. I decided to give it another 10λ of 6 M HNO_3 (ultrex) under the heat lamp for 3 mins. The readings were the same as before. So I gave it another 10λ wash of triply distilled water. Final readings with the shield closed were ~5000 cpm and with the shield open were ~100,000 cpm. The Suprasil cylinder read ~ 60 mr/hr at 1/2". P-TUBE-1 read ~ 8 mr/hr. P-TUBE-1 read ~190,000 cpm with the shield closed and ~240,000 cpm with the shield open. At 1418 hrs, started drying down TUBE-1 with the heat lamp and argon gas purge. Terminated evaporation at 1438 hrs. P-TUBE-1 was then transferred to TRL for analysis on the Ge-Li and intrinsic Ge detectors. Initial analysis showed a tremendous amount of activity and, therefore, a lot of dead time irrespective of where we placed P-TUBE-1 in the sample holder. To alleviate this problem, a 1/8" piece of lead (actually two small pieces with about a 1/4" overlap) was placed in front of the detector. This allowed us to move P-TUBE-1 much nearer to the detector and increase the counting efficiency. The following spectra was found. No ^{146}Pm could be found because of all the activity in the energy region of interest. Therefore, it was decided to do a cleanup column prior to any more counting.

Dissolution of ^{145}Pm P-Tube Rabbit (cont.)

13 Oct. 1986

Energy(ev)	Signal Quality[a,d]	Energy(ev)	Signal Quality[b,c,d]
355.2	Medium	67.8	Medium
462.3	Medium	73.5	Medium
508.4	Low	83.4	Low
520.0	Low	101.5	Very, Very High
529.9	Very High		
537.3	Medium		
553.7	Low		
577.6	Low		
594.9	Medium		
608.1	Medium		
634.5	Low		
644.4	Medium		
707.8	Low		
721.8	Medium		
809.9	Medium		

[a] relative to those in the same column

[b] relative to those in the same column

[c] gain was changed from that used in detecting the higher energies

[d] measured with Ge-Li detector

[redacted]

Preparation of Cleanup Column for $^{145-146}$Pm P-TUBE-1

14 Oct. 1986 — Prepared a small cleanup column according, in general, to the recipe on page 1 of this document. The resin was 0.6 ml of Dowex 50W-X4. The resin size was 25-50 μ and it was in the hydrogen form. In addition, $^{145-146}$Pm P-TUBE-1 was brought up in 200λ of 0.1 M HCl (Ultrex) and allowed to sit overnight. — 15 Oct

Cleanup Column of $^{145-146}$Pm P-TUBE-1

15 Oct. 1986 — Range of interest on the portable MCA was through channel 273. Coarse gain on the MCA was set at 40. Fine gain was set at its maximum. The channel in which the peak x-rays should appear is 153 (this is a shift from previous runs which I do not understand). The region of interest background was 156 counts in a 6-sec counting period with 1 count / 6 seconds showing up in channel 153. The drop rate of the column was initially at about 1 drop / 45 secs before the addition of the feed. Loading of the feed (200λ) started at 0935 hrs. Four ~200-300λ washes of TUBE-1 were made with 0.1 M HCl (Ultrex) and added to the feed already in the column reservoir. TUBE-1 and the pipet tip read about 1 count / 6 sec using the NaI detector and the portable MCA. This is in the level of the background so it was determined that they were completely washed of the feed. Collection of the column effluent was into ^{145}Pm P1-CL1. Column reservoir read off-scale (on 100X) using end window β/γ probe. Actual loading, under slight argon pressure, began at 0947 hrs. Free column volume was ~0.3 ml. Drop rate was now about 1 drop / 30 secs. The counts per drop were elevated but no ^{145}Pm structure was seen on the portable MCA. The increased counts may be due to a general increase in the background due to loading the feed. About ½ of a bowl-full of 0.1 M HCl (Ultrex) was added to the reservoir at 1006 hrs. Probing of the column indicated loading

Cleanup Column of $^{145-146}Pm$ P-TUBE-1 (cont.)

1986 occurred in the top 1/3 inch of the column. Some γ seemed to be further down the column but not nearly as intense as the top. The β/γ probe was off scale (on the 100X) where the $^{145-146}Pm$ loaded. Drop rate was now about 1 drop every 25-30 seconds. Volume in P1-CL1 prior to second addition of HCl was about 1.2 ml net. NaI detector still showed no discernible ^{145}Pm x-ray and γ structure. Volume in P1-CL1 prior to third addition was ~2.7 ml net. Added about 1/4 bowl-full of 0.1 M HCl (Ultrex) at 1028 hrs. ROI (region of interest) counts were generally in the area of 650 counts / 6 secs. Probing along the length of the column indicated most of the activity was still at the top of the column but there appeared to be some spreading out (may merely be shine, though). At 1045 hrs added 0.5 ml of ~0.5 M HCl (Ultrex) to reservoir. Background in the ROI seemed to drop down to 300-400 counts / 6 secs. At 1054 hrs another 0.5 M HCl (Ultrex) was added to the reservoir. Drop rate increased slightly to 25 secs/drop. Still no ^{145}Pm structure on the NaI detector. At 1105 hrs added 0.5 ml of ~1 M HCl (Ultrex) to the column reservoir and switched collection to P1-CL2. Still no discernible ^{145}Pm structure on NaI detector. Portable β/γ probe, which was located ~1/3 of the way down the column did show an increase. ROI is still around 300 counts/6 secs. Another 0.5 ml of ~1 M HCl (Ultrex) was added at 1112 hrs. Portable β/γ probe showed some definite signs of movement on the 100X scale. Still no ^{145}Pm structure on the NaI detector. At 1118 hrs a small amount, <150λ, of 2M HCl (Ultrex) was added to the reservoir. Still no ^{145}Pm showing up on the NaI detector. At ~~1173~~ 1120 hrs about 1/5 of a bowl-full of the 2M HCl (Ultrex) was added to the reservoir. Collection of the eluant is now into P1-CL3. Portable β/γ probe showed

Cleanup Column of $^{145-146}Pm$ P-TUBE-1 (cont.)

15 Oct 1986 strong increases going off-scale. Added some more 2M HCl (Ultrex) at 1126 hrs. Switched to P1-CL-4 at 1135 hrs. At 1137 hrs, I switched collection to P1-CL5 because it appeared that the Pm was ready to come off. Added 6M HCl at 1138 hrs. Switched to P1-CL-6 at 1142 hrs after it appeared that most of the ^{147}Pm was off the column. All activity was off by 1145 hrs.

	Vol(ml)	Reading (cpm-net)[a]
P1-CL1	1.60	0
P1-CL2	0.95	0
P1-CL3	0.90	0
P1-CL4	0.10	0
P1-CL5	0.50	> 50,000
P1-CL6	1.20	8,000

[a] Using portable β/γ probe

After analysis at TRL, it appeared that the cleanup column did very little in reducing all the interfering activity. So P1-CL5 and P1-CL6 were combined and dried down in preparation for a separation column. Combined amount now referred to as ^{145}Pm P1.

Preparation of Separation Column for ^{145}Pm P-TUBE-1 (^{145}Pm P1)

16 Oct. 1986 — Prepared a small separation column according, in general, to the recipe on page 1 of this document. The resin, as loaded, was 0.4 ml of Dowex 50W-X8 (AG). The resin size was 25-50 μ and it was in NH_4 form. Column was additionally stripped with 0.5 M, pH 4.8, AHIB to remove any H^+ or metal ions.

Separation of ^{145}Pm P1 (P1-CL5 + P1-CL6)

20 Oct. 1986 — Work began at 0910 hrs in Lab 110. Background on the NaI detector (Ch1-293), with no Pm loaded on the column, was 315 cnts in a 6 sec counting period. Channel 159 (which we expect to be the peak x-ray channel) read 2 counts. Collection, initially, was into $^{145-146}Pm$ P1-BC1. Column was at ~80°C. Loaded (Put in the column reservoir) 0.5 ml of the Pm solution at 0935 hrs. Rinsed ^{145}Pm P1 with 500λ of 0.1 M HCl (Ultrex). Rinsed again with 300λ of ultrapure H_2O. All rinses were put in the column reservoir. Started the actual loading at 0940 hrs. Argon gas pressure was about 10 psi. Drop rate was about 1 drop every 15-20 secs. The portable β-γ probe indicated that the Pm loaded at the top of the resin. At 1000 hrs, 0.3 M NH_4NO_3 was added to the column reservoir in order to drive off the H^+ band from the resin. At ~1020 hrs, the pH paper indicated that the H^+ was coming off the column. Drop size was ~30λ per drop. Resin was fully converted at 1035 hrs. Ultra-pure H_2O was then added to the column reservoir to remove any residual ammonium nitrate. At 1045 hrs, added about 2 ml of 0.25 M, pH 3.85 AHIB to column reservoir. Collection was now routed into P1-BC2. Drop rate was now about 1 drop/24 seconds. At 1100 hrs, portable β/γ probe indicated movement of the activity band about 1/3 of the way down the column. However, most of the activity was still near the top. NaI detector still showed no discernible activity. At 1111 hrs, switched to

[redacted]

Separation of ^{145}Pm P1 (P1-CL5+P1-CL6) (cont.)

20 Oct. 1986 0.25 M, pH 4.2 AHIB. 1.8 ml of effluent from pH 3.85 AHIB (~9 column volumes) was collected. Collection of the initial pH 4.2 AHIB (1-1.2 ml) was into P1-BC2. Portable B/γ probe showed some possible activity 2/3 of the way down the column. The main band of the activity appears to be a 1/4 of the way down. At 1124 hrs about 3/4 - 1 ml of pH 4.2 AHIB was added to the reservoir. Switched collection to P1-BC3 at 1125 hrs. The background count rate on the NaI detector is now in the 400 count region for a 6 second counting period. The volume in P1-BC3 at 1133 hrs was 0.6 ml. The main band of the activity is half-way down the column. Switched collection to P1-BC4 at 1145 hrs. Switched to P1-BC5 at 1154 hrs, to P1-BC6 at 1158 hrs, to P1-BC7 at 1201 hrs, to P1-BC8 at 1205 hrs, to P1-BC9 at 1211 hrs, and to P1-BC10 at 1224 hrs. Prior to BC10, while the NaI detector was showing activity, the structure was such that it was doubtful whether it was ^{145}Pm. At 1225 hrs, added 0.5 M, pH 4.8 AHIB to column reservoir. Collection of effluent was still into P1-BC10. BC10, prior to the addition of the 0.5 M, pH 4.8 AHIB, had about 150λ of pH 4.2 AHIB in it. I suspect that most of the ^{145}Pm is in this fraction because the x-ray/γ-ray ratio is more like what I expected. Run was terminated at 1243 hrs. One problem noted during the run was channel shifting on the NaI detector during the separation. This could be alleviated by merely moving the detector back. However, this means the detection efficiency will drop for those nuclides that do not cause channel shifting. This is a problem that needs consideration.

Separation of ^{145}Pm PI (PI-CL5 + PI-CL6) (cont.)

20 Oct. 1986

Sample	Vol (ml)	6-sec count (Ch 1-204)
$^{145-146}$Pm PI-BC1	5.1	361
$^{145-146}$Pm PI-BC2	2.8	314
$^{145-146}$Pm PI-BC3	1.3	1549
$^{145-146}$Pm PI-BC4	0.75	19883
$^{145-146}$Pm PI-BC5	0.35	85660
$^{145-146}$Pm PI-BC6	0.20	58382
$^{145-146}$Pm PI-BC7	0.25	42113
$^{145-146}$Pm PI-BC8	0.35	18250
$^{145-146}$Pm PI-BC9	0.95	5312
$^{145-146}$Pm PI-BC10	1.80	2001
Background		222

Samples were transferred over to TRL for counting on 21 Oct. 1986. Counting on the Ge-Li detector confirmed our suspicions that all the ^{145}Pm was in BC10. The activity in BC1-BC9 was due to the heavier rare earths, primarily ^{153}Sm. This would indicate that there was substantial Sm contamination of the ^{145}Pm sample. In addition to this rare earth contaminant, it is felt that there is most likely some important Nd contamination of which some is from $^{145-146}$Pm decay. The results of the Ge-Li counting is shown on the next page.

Separation of ^{145}Pm P1(P1-CL5 + P1-CL6) (cont.)

20 Oct. 1986

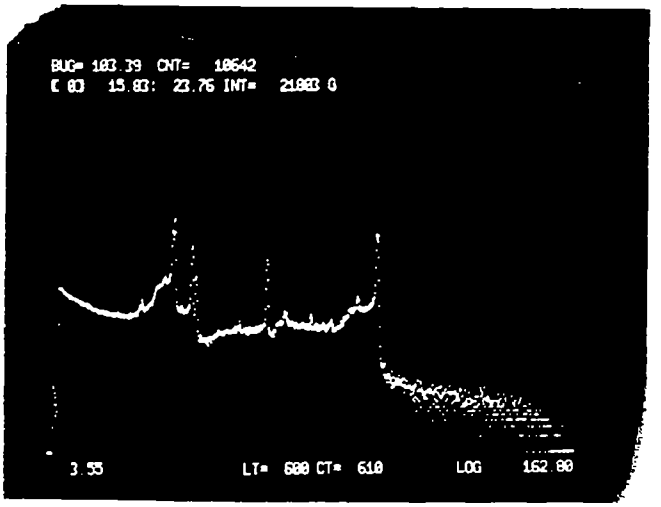
sample:bc10 date:10-21-86 time:1330 hrs
cnt time:7500 secs on shelf two in se-li detector

LT= 7500 CT= 7530

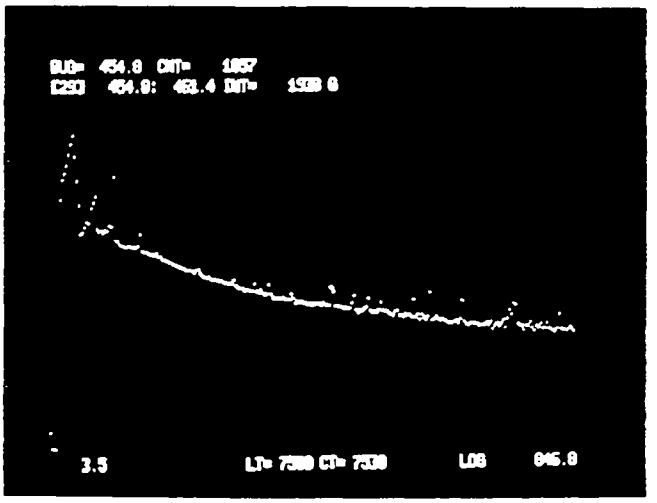
0	6401	16514	16552	0	0			
3.5	2	1	1	0	53794	124953	162322	228619
29.8	367142	573714	830302	327750	117618	41655	11691	12516
56.2	15477	19684	18668	36905	46865	60657	14201	12777
82.5	13179	11901	13463	12973	16461	15706	138227	8843
108.9	8449	7265	7167	6861	6609	6665	6660	6613
135.2	6553	6588	6680	11434	5594	5274	5196	5046
161.6	4852	4784	4571	5039	4331	4109	3759	3756
187.9	3587	3417	3354	3206	3102	2995	2858	2799
214.3	2606	2591	2420	2405	2398	2330	2171	2440
240.6	2516	2078	1858	1814	1752	1814	1622	1575
267.0	1599	1561	1477	1488	1423	1351	1345	1301
293.4	1357	1589	1230	1112	1089	1103	985	1012
319.7	1021	989	968	1325	955	924	1021	872
346.1	815	836	1278	833	732	679	707	702
372.4	676	706	656	640	640	831	675	553
398.8	600	574	593	558	568	526	548	498
425.1	498	543	543	541	480	547	511	495
451.5	486	1057	881	473	472	450	449	423
477.8	462	438	440	559	763	409	361	408
504.2	398	436	452	658	386	355	375	362
530.6	407	549	393	375	378	341	335	305
556.9	377	369	319	316	289	322	327	328
583.3	303	636	293	322	257	326	299	255
609.6	291	854	254	259	294	260	247	259
636.0	253	238	223	220	218	236	243	215
662.3	265	581	237	210	203	223	217	216
688.7	215	198	201	201	207	226	200	230
715.0	170	200	214	187	208	245	175	258
741.4	372	319	497	477	204	189	184	158
767.7	194	188	226	175	154	192	176	207
794.1	171	172	213	169	162	153	146	167
820.5	313	164	155	158	151	175	165	144

Separation of ^{145}Pm P1(P1-CL5 + P1-CL6) (cont.)

20 Oct. 1986



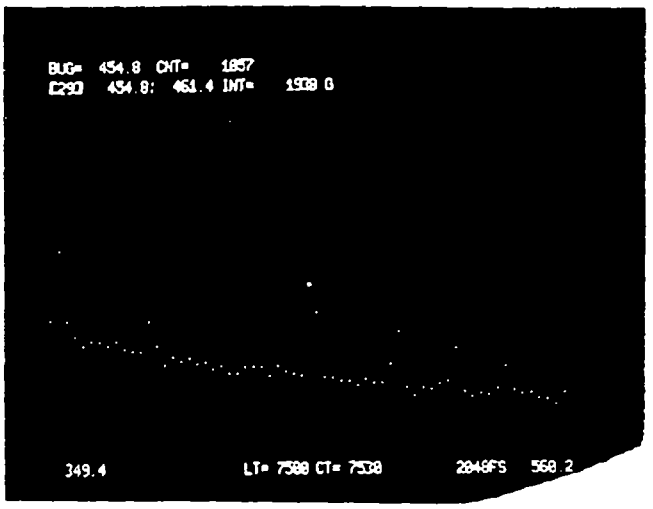
Evidence of ^{153}Sm contamination



Evidence of ^{146}Pm

Separation of ^{145}Pm P1(P1-CL5 + P1-CL6) (cont.)

20 Oct. 1986



Evidence of ^{146}Pm

Because the counts for ^{146}Pm were so low, it was decided to count BC10 for a longer period of time starting on 22 Oct. 1986. Both ^{145}Pm and ^{146}Pm were analyzed for. The results of the analyses follow.

Sample BC-10 10-22-86 15:00 1505 min Shelf 3

LT=24764 CT=24993

[29]	554.0:	560.0	INT= 14501	G	6326 N
[30]	38.0:	43.0	INT= 3579844	G	24744 N
[43]	889.0:	928.0	INT= 28412	G	5909 N

LT=24764 CT=24993

[29]	452.1:	457.0	INT= 14501	G	6326 N
[30]	31.6:	35.7	INT= 3579844	G	24744 N
[43]	725.1:	756.9	INT= 28412	G	5909 N

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Separation of ^{145}Pm P1(P1-CL5+P1-CL6) (cont.)

20-23 Oct 1986

LT=24764 CT=24993

0	5401	60274	60641	0	0			
0.6	0	0	0	0	0	0	0	0
7.1	0	0	0	0	0	1	4	5
13.7	1	3	3	3	2	1433	145156	158608
-20.2	165675	171983	181341	192309	203695	219375	238086	259737
26.7	286142	309115	334321	374217	427616	484053	552332	633879
33.2	725458	798467	869708	978387	354431	53128	457488	488229
39.7	292915	336152	506669	707437	553347	248268	90357	42804
46.3	49156	82948	69821	40596	24710	19621	19630	19912
52.8	20308	21465	22210	23048	24059	25725	27248	27937
59.3	28442	29725	35999	39111	31801	30013	30727	31689
65.8	34136	52581	85390	59846	51726	78028	56749	58684
72.3	170772	181909	56760	28036	27690	25762	25344	24838
78.9	25299	24838	24726	24127	24328	25543	26765	25382
85.4	24720	24179	24579	24928	24909	26601	26943	27981
91.9	28012	26336	26268	25651	26151	26643	29188	35312
98.4	31989	28428	28503	29673	37057	125201	336415	214938
104.9	44067	20901	20419	19969	20397	20721	21112	20487
111.5	20032	19736	19638	19523	19895	19269	19649	19111
118.0	19209	18914	19344	18918	19254	18894	18745	18884
124.5	18794	18679	18490	18587	18198	18463	18327	18267
131.0	17990	18113	17991	17930	17679	17607	17436	17392
137.5	17559	17379	17149	17279	17132	16739	16715	16690
144.1	17996	23723	32209	24214	16479	15584	15440	15549
150.6	15703	15186	14881	14786	14932	14741	14553	14494
157.1	14476	14145	14439	14169	14032	13902	13862	13803
163.6	13479	13630	13382	13506	13337	13013	12851	12817
170.1	12652	12750	12629	13212	13329	12280	12077	11756
176.7	11881	11527	11340	11281	11102	11111	10948	10628
183.2	10753	10550	10585	10851	11051	10661	10195	9822
189.7	9934	9784	9612	9668	9504	9610	9296	9256
196.2	9197	9086	9088	9031	8838	8935	8727	8527
202.7	8607	8558	8378	8328	8357	8194	8178	8119
209.3	8267	8166	7803	7834	7813	7679	7521	7601
215.8	7481	7373	7373	7317	7268	7303	7329	7117
222.3	7147	7010	7022	6877	6841	6812	6733	6627
228.8	6663	6595	6551	6391	6237	6338	6417	6394
235.3	6213	6268	6296	6832	9266	8914	6665	6279
241.8	6522	6269	5721	5482	5495	5351	5308	5276
248.4	5254	5156	5301	5003	5186	4974	5140	4972
254.9	4989	5080	4962	4879	4743	4895	4841	4636
261.4	4647	4665	4562	4503	4417	4449	4498	4319
267.9	4309	4235	4593	4563	4394	4366	4227	4166
274.4	4074	4118	4025	4134	4108	4086	3909	3918
281.0	3947	3785	3910	3814	3835	3707	3806	3687
287.5	3694	3677	3704	3641	3605	3513	3541	3588
294.0	3605	4317	5064	4135	3481	3466	3394	3466
300.5	3490	3398	3179	3254	3259	3159	3166	3133

Separation of ^{45}Pm P1(P1-CL5+P1-CL6) (cont.)

20-23 Oct. 1986

307.0	3064	3105	3026	2989	3029	2987	2922	2915
313.6	2939	2899	2966	2873	2895	2832	2912	2938
320.1	2798	2828	2851	2804	2781	2795	2714	2681
326.6	2748	2884	3196	3605	3120	2733	2638	2609
333.1	2784	2796	2572	2483	2522	2598	2936	3265
339.6	2702	2450	2485	2324	2296	2344	2319	2289
346.2	2296	2191	2258	2311	2207	2323	2912	4628
352.7	4488	2917	2193	2048	2101	2160	2046	2010
359.2	2074	2010	2115	1981	2076	1947	1969	1890
365.7	1960	1884	1972	1928	1931	2002	1908	1915
372.2	1943	1890	1929	1851	1902	1870	1818	1856
378.8	1833	1862	1885	1855	1917	1782	1832	1813
385.3	1762	1864	1941	2548	3102	2446	1814	1692
391.8	1727	1652	1643	1703	1583	1641	1619	1655
398.3	1647	1719	1685	1580	1650	1631	1604	1587
404.8	1609	1612	1604	1544	1488	1516	1666	1598
411.4	1582	1513	1487	1514	1556	1533	1498	1497
417.9	1456	1468	1473	1475	1451	1521	1444	1511
424.4	1492	1481	1440	1468	1468	1417	1428	1399
430.9	1448	1461	1413	1474	1358	1316	1382	1393
437.4	1417	1360	1438	1490	1420	1379	1353	1377
444.0	1270	1361	1341	1314	1352	1292	1344	1335
450.5	1373	1330	1391	2076	3695	3905	2100	1334
457.0	1326	1259	1253	1236	1263	1228	1260	1382
463.5	1556	1371	1278	1206	1201	1236	1244	1164
470.0	1235	1216	1226	1191	1233	1233	1161	1227
476.6	1201	1242	1201	1199	1260	1224	1210	1211
483.1	1150	1092	1237	1272	1606	2192	1962	1286
489.6	1085	1166	1124	1202	1093	1082	1090	1095
496.1	1079	1086	1004	1066	1050	1098	1078	1071
502.6	1060	1122	1128	1038	1016	1090	1134	1172
509.2	1356	1695	2283	2098	1629	1354	1139	1073
515.7	1073	1017	1029	1012	998	1039	1002	1034
522.2	1034	997	970	1010	921	1009	1005	1040
528.7	1000	1020	1115	1350	1263	1057	1043	1002
535.2	956	962	896	959	960	1024	1025	950
541.8	915	973	967	926	964	921	915	921
548.3	949	916	923	964	897	884	854	873
554.8	939	915	924	906	934	905	888	882
561.3	900	856	891	931	873	865	914	830
567.8	850	858	854	847	875	880	866	832
574.3	892	868	920	850	826	813	889	875
580.9	866	983	1646	2351	1731	1007	836	801
587.4	855	783	808	816	772	779	801	761
593.9	858	773	797	815	790	844	756	786
600.4	795	816	779	802	766	835	870	793
606.9	838	1037	2187	3326	2347	1080	750	686
613.5	732	724	708	675	697	752	767	704
620.0	726	698	703	697	731	660	684	665
626.5	687	692	684	657	705	662	678	709
633.0	742	704	677	672	674	717	670	680
639.5	666	665	675	649	681	681	680	665
646.1	674	703	622	611	660	673	668	709
652.6	653	674	669	621	635	623	677	673
659.1	679	881	1425	2105	1682	854	605	684
665.6	655	626	592	592	599	607	603	688
672.1	632	589	576	584	605	567	596	609
678.7	590	632	592	654	629	649	642	583
685.2	613	616	584	574	632	576	568	606
691.7	592	621	569	565	588	627	629	604
698.2	593	556	586	616	584	583	611	614
704.7	618	615	618	628	618	606	600	555

Separation of ^{239}Pu, ^{241}Pu, ^{241}Am and ^{244}Cm - Sample 1

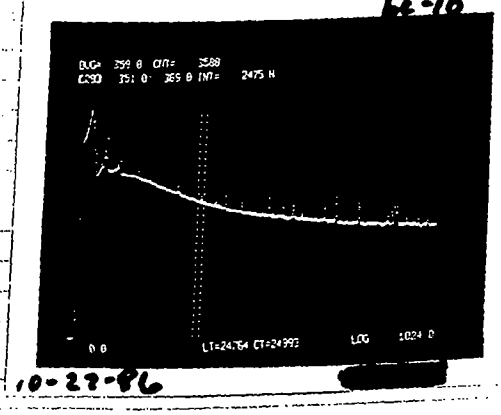
20-23 Oct. 1986

307.0	3064	3105	3026	2989	3029	2987	2922	2915
313.6	2939	2899	2966	2873	2895	2832	2912	2938
320.1	2798	2828	2851	2804	2781	2795	2714	2681
326.6	2748	2884	3196	3605	3120	2733	2638	2609
333.1	2784	2796	2572	2483	2522	2598	2936	3265
339.6	2702	2450	2485	2324	2296	2344	2319	2289
346.2	2296	2191	2258	2311	2207	2323	2912	4628
352.7	4488	2917	2193	2048	2101	2160	2046	2010
359.2	2074	2010	2115	1981	2076	1947	1969	1890
365.7	1960	1884	1972	1928	1931	2002	1908	1915
372.2	1943	1890	1929	1851	1902	1870	1818	1856
378.8	1833	1862	1885	1855	1917	1782	1832	1813
385.3	1762	1864	1941	2548	3102	2446	1814	1692
391.8	1727	1652	1643	1703	1583	1641	1619	1655
398.3	1647	1719	1685	1580	1650	1631	1604	1587
404.8	1609	1612	1604	1544	1488	1516	1666	1598
411.4	1582	1513	1487	1514	1556	1533	1498	1497
417.9	1456	1468	1473	1475	1451	1521	1444	1511
424.4	1492	1481	1440	1468	1468	1417	1428	1399
430.9	1448	1461	1413	1474	1358	1316	1382	1393
437.4	1417	1360	1438	1490	1420	1379	1353	1377
444.0	1270	1361	1341	1314	1352	1292	1344	1335
450.5	1373	1330	1391	2076	3695	3905	2100	1334
457.0	1326	1259	1253	1236	1263	1228	1260	1382
463.5	1556	1371	1278	1206	1201	1236	1244	1164
470.0	1235	1216	1226	1191	1233	1233	1161	1227
476.6	1201	1242	1201	1199	1260	1224	1210	1211
483.1	1150	1092	1237	1272	1606	2192	1962	1286
489.6	1085	1166	1124	1202	1093	1082	1090	1095
496.1	1079	1086	1004	1066	1050	1098	1078	1071
502.6	1060	1122	1128	1038	1016	1090	1134	1172
509.2	1356	1695	2283	2098	1629	1354	1139	1073
515.7	1073	1017	1029	1012	998	1039	1002	1034
522.2	1034	997	970	1010	921	1009	1005	1040
528.7	1000	1020	1115	1350	1263	1057	1043	1002
535.2	956	962	896	959	960	1024	1025	950
541.8	915	973	967	926	964	921	915	921
548.3	949	916	923	964	897	884	854	873
554.8	939	915	924	906	934	905	888	882
561.3	900	856	891	931	873	865	914	830
567.8	850	858	854	847	875	800	866	832
574.3	892	868	920	850	826	813	889	875
580.9	866	983	1646	2351	1731	1007	836	801
587.4	855	783	808	816	772	779	801	761
593.9	858	773	797	815	790	844	756	786
600.4	795	816	779	802	766	835	870	793
606.9	838	1037	2187	3326	2347	1080	750	686
613.5	732	724	708	675	697	752	767	704
620.0	726	698	703	697	731	660	684	665
626.5	687	692	684	657	705	662	678	709
633.0	742	704	677	672	674	717	670	680
639.5	666	665	675	649	681	681	680	665
646.1	674	703	622	611	660	673	668	709
652.6	653	674	669	621	635	623	677	673
659.1	679	881	1425	2105	1682	854	605	684
665.6	655	626	592	592	599	607	603	688
672.1	632	589	576	584	605	567	596	609
678.7	590	632	592	654	629	649	642	583
685.2	613	616	584	574	632	576	568	606
691.7	592	621	569	565	588	627	629	604
698.2	593	556	586	616	584	583	611	614
704.7	619	615	618	628	618	606	600	555
711.3	574	502	567	566	560	523	564	543
717.8	507	540	573	521	565	597	637	576
724.3	530	580	655	836	846	676	542	592
730.8	545	537	532	540	678	903	1113	915

Separation of ^{145}Pm P1 (P1-CL5 + P1-CL6) (cont.)

20-23 Oct. 1986

bc-10



10-27-86

BC10 Spectrum (^{145}Pm - ^{146}Pm)

(disregard RSD)

Sample bc-10 10-23-86 1333 200 minutes shelf 3

LT=12000 CT=12044

[29]	70.5:	74.2	INT=	63542 G	43562 N
[30]	7.1:	8.1	INT=	16022 G	-83 N
[43]	179.7:	187.6	INT=	13979 G	407 N

Separation of ^{145}Pm P1(P1-CL3 + P1-CL6) (cont.)

20-23. Oct. 1984	LT=12000 GT=12044								
	0	5401	27340	27414	0	0			
	-0.6	0	0	0	0	0	0	0	0
	1.0	0	0	0	0	0	12	62	71
	2.6	59	58	50	49	36	587	5116	6243
	4.2	7231	6425	5576	4991	4517	4079	3740	3580
	5.8	3444	3273	3285	3224	3258	3243	3156	3274
	7.5	3141	3165	3286	3127	3342	3131	3365	3289
	9.1	3333	3363	3427	3448	3446	3385	3532	3587
	10.7	3574	3517	3633	3597	3651	3771	3673	3791
	12.3	3750	3752	4008	3988	3972	4018	3983	4163
	13.9	4154	4057	4161	4284	4312	4298	4451	4386
	15.6	4388	4597	4591	4629	4652	4638	4684	4814
	17.2	4817	4827	4996	4932	5080	5109	5074	5170
	18.8	5249	5331	5296	5565	5413	5494	5563	5586
	20.4	5594	5866	5882	5913	5992	6052	6336	6299
	22.1	6477	6607	6656	6766	6848	6918	7011	7259
	23.7	7355	7404	7516	7778	7971	8210	8437	8769
	25.3	8829	9112	9155	9422	9704	9775	10123	10307
	26.9	10363	10460	10603	10998	11370	11645	12237	12390
	28.6	12947	13340	13901	14328	14741	15331	15722	16284
	30.2	16942	16886	17847	18470	19196	19793	20624	21383
	31.8	22194	22908	23139	23894	24975	25337	25787	26307
	33.4	27228	27504	27740	28367	29404	29993	31247	32267
	35.0	34622	37315	42434	48762	57084	65558	72510	75835
	36.7	73817	66218	54885	41383	29979	21154	15573	11975
	38.3	10405	9424	8998	8599	8649	8926	9470	10183
	39.9	11035	12305	13685	15322	17064	19370	21618	23428
	41.5	23862	22880	20534	17277	14016	11356	9166	7514
	43.2	5896	4526	3458	2554	1869	1543	1273	1232
	44.8	1174	1126	1257	1351	1536	1758	2155	2405
	46.4	2545	2347	2303	1917	1720	1492	1323	1195
	48.0	1022	891	828	732	665	627	653	638
	49.6	629	614	612	613	640	653	649	614
	51.3	650	648	662	618	687	679	718	707
	52.9	701	686	710	719	703	733	720	731
	54.5	771	775	806	742	783	822	777	850
	56.1	772	803	821	888	887	870	823	896
	57.8	898	900	901	879	910	928	872	913
	59.4	966	971	1014	1087	1152	1254	1291	1275
	61.0	1338	1229	1195	1055	1030	980	953	951
	62.6	937	949	972	974	1009	946	1030	962
	64.2	983	996	1030	1047	1091	1109	1195	1263
	65.9	1487	1853	2414	2684	2866	3045	2760	2355
	67.5	1944	1591	1402	1366	1427	1509	1953	2217
	69.1	2300	2287	2294	2049	1717	1482	1372	1354
	70.7	1436	1826	2597	3727	5009	6591	7505	7703
	72.4	6990	5693	4284	2895	1895	1283	1037	851
	74.0	866	871	876	864	852	865	826	815
	75.6	809	790	784	760	803	803	710	826
	77.2	781	789	737	734	738	801	736	747
	78.9	772	747	732	758	755	764	760	770
	80.5	747	719	759	757	739	750	777	804

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				637	650			
			757	672	668	639	700	672
			632	652	648	654	650	626
			677	627	636	607	646	643
			665	657	614	645	598	695
			634	631	617	618	607	585
			628	630	619	603	616	631
			650	630	605	598	531	597
			621	620	621	637	600	619
			582	598	562	598	623	593	620
			598	599	577	605	667	645	585
			614	617	609	625	614	628	609
			630	643	569	591	591	548	580
			599	604	557	562	605	593	603
			567	599	578	582	576	615	569
			586	626	603	559	630	609	607
			580	560	617	565	558	528	597
			598	537	541	536	570	541	550
			560	556	553	566	568	555	584
			511	570	540	552	615	529	615
			581	543	548	548	548	542	605
			539	594	626	732	808	977	1026
			529	1047	935	814	724	637	588
			1111	528	509	556	502	472	495
			515	515	523	515	514	518	570
			459	515	537	502	519	500	533
			559	477	499	490	510	459	437
			516	465	455	530	478	474	491
			473	474	504	429	453	483	479
			493	493	444	475	472	496	475
			466	488	456	485	467	477	461
			457	447	456	499	456	444	454
			467	406	499	463	459	458	437
			486	427	424	463	472	432	494
			427	423	424	395	428	475	459
			392	446	445	440	400	459	410
			419	401	432	420	410	384	393
			413	423	390	385	444	391	415
			452	437	394	395	390	445	421
			442	423	441	390	379	398	377
			442	429	369	383	410	406	386
			360	395	395	373	368	380	364
			397	393	361	378	348	365	367
			338	373	338	373	393	379	393
			377	372	375	362	385	361	331
			341	383	359	346	370	354	331
			368	312	338	383	382	345	357
			343	371	355	350	347	360	319
			394	355	301	338	308	339	310
			320	340	322	308	332	351	326
			358	334	356	286	296	359	339
			303	303	307	298	313	321	302
			312	294	296	337	291	292	323
			288	308	305	312	291	316	310
			317	289	310	307	288	291	315
			322	286	259	274	318	286	297
			294	276	307	272	281	296	283
			270	270	285	286	257	287	284
			275	281	275	270	311	257	248
			279	260	274	275	263	263	261
			292						

Separation of ^{145}Pm P1 (P1-CL5 + P1-CL6) (cont.)

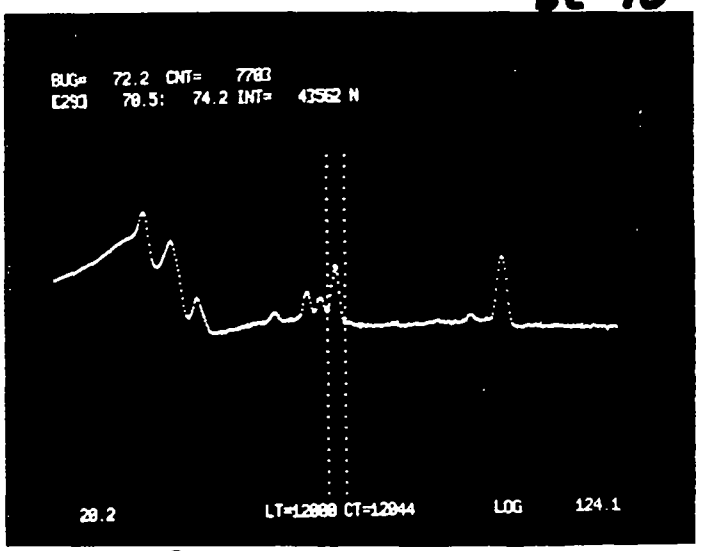
20-23 oct 1986

82.1	748	774	796	806	849	796	806	741
83.7	865	765	734	739	768	748	759	733
85.3	769	754	801	777	754	773	787	785
87.0	784	821	768	797	787	785	770	773
88.6	768	810	824	812	834	822	808	821
90.2	857	830	891	879	886	920	858	823
91.8	821	860	832	803	840	814	837	848
93.5	786	780	816	784	850	854	812	815
95.1	802	830	810	876	832	918	876	933
96.7	1048	1067	1086	1072	1072	986	955	925
98.3	888	889	892	830	852	859	875	864
99.9	848	956	867	892	911	909	957	1088
101.6	1443	1844	2886	4179	6014	8122	9720	10069
103.2	9713	7973	6152	4159	2673	1635	1148	889
104.8	752	705	697	659	657	651	686	663
106.4	650	639	678	665	674	697	698	702
108.1	694	663	656	703	693	721	718	640
109.7	675	679	757	637	650	640	679	662
111.3	655	657	632	672	668	639	700	672
112.9	670	666	677	652	648	654	650	626
114.5	625	639	665	627	636	607	646	643
116.2	627	630	634	657	614	645	598	695
117.8	579	614	628	631	617	618	607	585
119.4	641	642	650	630	619	603	616	631
121.0	622	598	621	630	605	598	531	597
122.7	618	615	582	620	621	637	600	619
124.3	617	609	598	562	598	623	593	620
125.9	616	614	599	577	605	667	645	585
127.5	606	630	617	609	625	614	628	609
129.1	577	599	643	569	591	591	548	580
130.8	652	567	604	557	562	605	593	603
132.4	563	586	599	578	582	576	615	569
134.0	527	580	626	603	559	630	609	607
135.6	590	598	560	617	565	558	528	597
137.3	603	560	537	541	536	570	541	550
138.9	509	511	556	553	566	568	555	584
140.5	557	581	570	540	552	615	529	615
142.1	535	539	543	548	548	548	542	605
143.8	585	529	594	626	732	808	977	1026
145.4	1127	1111	1047	935	814	724	637	588
147.0	494	515	528	509	556	502	472	495
148.6	493	459	515	523	515	514	518	570
150.2	477	559	515	537	502	519	500	533
151.9	514	516	477	499	490	510	459	437
153.5	478	473	465	455	530	478	474	491
155.1	480	493	474	504	429	453	483	479
156.7	489	466	493	444	475	472	496	475
158.4	502	457	488	456	485	467	477	461
160.0	481	467	447	456	499	456	444	454
161.6	483	486	406	499	463	459	458	437
163.2	433	427	427	424	463	472	432	494

Separation of ^{145}Pm P1 (P1-CL5 + P1-CL6) (cont.)

20-23 Oct 1986

bc-10

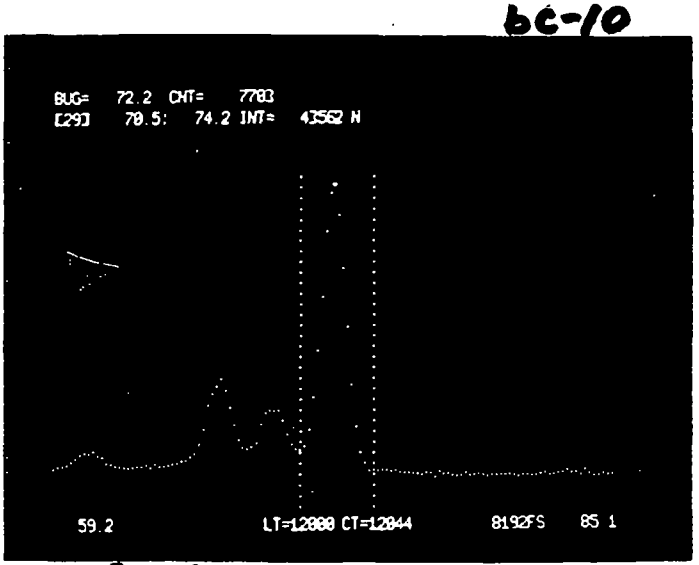


10-23-86

^{145}Pm γ's from BC10

(rightmost γ is due to ^{153}Sm)

bc-10



10-23-86

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Calculation of a Rough-Cut $^{145}Pm(n,\gamma)^{146}Pm$ Cross Section

23-24 Oct 1986 A calibration of shelf 3 on the Ge-Li detector was made for both the ^{145}Pm and ^{146}Pm energy ranges of interest. The calibrated sources, from New England Nuclear, used were ^{133}Ba, ^{137}Cs, and ^{57}Co. An ^{241}Am source from TRL was also used after calibrating it on one of the 2π counters. The results of the individual source measurements are shown below.

10-23-86 1500 hrs co-57 gain=500 ge-li det.

LT= 120 CT= 122

[25]	112.7:	146.4	INT=	137669	G	124472 N
[26]	133.4:	139.5	INT=	13753	G	13213 N
[27]	118.6:	125.3	INT=	117268	G	113391 N
[28]	77.2:	83.3	INT=	2893	G	-467 N
[29]	70.5:	74.2	INT=	1126	G	109 N
[30]	7.1:	8.1	INT=	891	G	44 N
[43]	179.7:	187.6	INT=	236	G	-17 N

LT= 123 CT= 125 [25] 112.7: 146.4 INT= 127985 N

0	5401	173	175	0	0			
112.7	155	163	164	170	180	156	178	168
114.3	187	152	173	168	166	157	181	200
116.0	204	188	198	197	220	206	197	214
117.6	231	217	239	205	228	213	253	272
119.2	258	257	303	308	346	466	823	1371
120.8	2581	4552	7099	10616	13681	15851	16241	14761
122.5	11373	8156	5136	2924	1405	662	242	118
124.1	51	41	23	25	22	26	33	36
125.7	20	21	20	19	33	32	27	25
127.3	32	19	34	29	32	29	24	24
128.9	23	34	25	23	27	24	29	33
130.6	22	17	28	22	39	25	22	28
132.2	38	27	31	40	27	40	28	33
133.8	44	40	36	39	53	69	131	224
135.4	404	694	1032	1404	1766	1860	1888	1500
137.1	1141	813	443	251	115	51	37	9
138.7	11	3	9	9	8	10	8	8
140.3	10	5	6	16	4	7	5	8
141.9	7	17	2	6	9	6	8	9
143.5	6	4	6	7	12	6	9	11
145.2	9	8	6	7	6	7		

Calculation of a Rough-Cut $^{145}Pm(n,\gamma)^{146}Pm$ Cross Section (cont.)

23-24 Oct 1986

10-23-86 1500 hrs ba-133 sain=500 setli det.

LT= 60 CT= 63

[28]	77.2:	83.3	INT=	32774 G	29084 N
[29]	70.5:	74.2	INT=	2726 G	-280 N
[30]	7.1:	8.1	INT=	1355 G	33 N
[43]	179.7:	187.6	INT=	2428 G	10 N

LT= 60 CT= 63[27] 67.3: 91.0 INT= 42208 G

0	5401	74	77	0	0			
67.3	145	145	161	140	160	144	154	142
68.9	139	161	154	134	141	154	132	135
70.5	155	165	173	153	136	162	163	135
72.2	149	154	146	128	138	144	166	135
73.8	145	179	142	144	136	146	138	136
75.4	134	157	147	157	168	155	167	159
77.0	162	188	165	181	226	199	250	334
78.6	364	462	584	663	922	1287	1925	2647
80.3	3285	3855	3899	3491	2890	1996	1245	736
81.9	431	196	112	66	71	46	58	62
83.5	62	62	62	47	57	50	59	56
85.1	47	61	52	44	61	48	63	57
86.8	64	58	54	65	49	50	44	60
88.4	49	53	56	59	49	51	63	58
90.0	71	47	57	50	62			

Calculation of a Rough-Cut $^{145}Pm(n,\gamma)^{146}Pm$ Cross Section (cont.)

23-24 Oct. 1986

10-23-86 1530 hrs am-241(14903 cpm on 10-24-84) shelf 3
Sain = 500 on Ge-Li detector

LT= 1800 CT= 1802

[23]	53.5:	65.7	INT=	15440 G	9410 N
[24]	56.5:	61.4	INT=	12027 G	9483 N
[25]	112.7:	146.4	INT=	14609 G	1329 N
[26]	133.4:	139.5	INT=	2570 G	80 N
[27]	118.6:	125.3	INT=	3131 G	-86 N
[28]	77.2:	83.3	INT=	2492 G	-73 N
[29]	70.5:	74.2	INT=	1325 G	-34 N
[30]	7.1:	8.1	INT=	757 G	12 N
[43]	179.7:	187.6	INT=	2046 G	96 N

LT= 1800 CT= 1802 [23] 53.5: 65.7 INT= 9410 N

0	5401	3410	3412	0	0			
53.5	138	138	123	145	126	127	132	142
55.1	131	139	130	146	175	152	157	154
56.7	173	157	169	189	202	253	309	487
58.4	710	980	1245	1409	1474	1251	994	696
60.0	436	263	157	108	89	64	58	74
61.6	70	60	54	63	56	62	59	63
63.2	68	50	65	78	71	58	46	69
64.9	48	64	71	63				

Calculation of a Rough-Cut $^{145}Pm(n,\gamma)^{146}Pm$ Cross Section (cont.)

23-24 Oct 1986

10-24-86 cs-137 sain=50 shelf #3 se-li det.

LT= 60 CT= 61

[23]	349.4:	362.5	INT=	1105 G	-63 N
[24]	335.6:	377.1	INT=	3560 G	-163 N
[25]	653.4:	667.3	INT=	11701 G	11506 N
[26]	623.2:	696.6	INT=	12327 G	11922 N
[27]	479.0:	505.9	INT=	1726 G	-188 N
[28]	312.8:	337.2	INT=	2035 G	70 N
[29]	285.9:	300.5	INT=	1249 G	-2 N
[30]	30.8:	34.9	INT=	3170 G	790 N
[43]	724.3:	756.1	INT=	20 G	1 N

LT= 60 CT= 61[26] 623.2: 696.6 INT= 11922 N

0	5401	74	75	0	0			
623.2	9	16	17	16	18	17	5	11
629.8	12	12	16	9	14	8	21	15
636.3	21	11	13	16	13	13	14	19
642.8	14	13	18	15	19	16	12	25
649.3	20	20	25	22	26	22	34	28
655.8	39	44	76	85	276	1257	3809	4144
662.4	1640	228	14	3	1	1	1	3
668.9	3	1	2	3	0	0	2	0
675.4	1	0	2	1	0	3	1	2
681.9	1	0	0	0	1	0	2	5
688.4	0	2	0	1	1	2	2	2
695.0	1	0						

Calculation of a Rough-Cut $^{145}Pm(n,\gamma)^{146}Pm$ Cross Section (cont.)

23-24 Oct 1986

10-24-86 ba-133 gain=50 shelf #3 ge-li det

LT= 60 CT= 62

[23]	349.4:	362.5	INT=	17465	G	16833 N
[24]	335.6:	377.1	INT=	18858	G	16614 N
[25]	653.4:	667.3	INT=	17	G	0 N
[26]	623.2:	696.6	INT=	72	G	-198 N
[27]	479.0:	505.9	INT=	56	G	-26 N
[28]	312.8:	337.2	INT=	1463	G	188 N
[29]	285.9:	300.5	INT=	1015	G	-317 N
[30]	30.8:	34.9	INT=	29002	G	-16388 N
[43]	724.3:	756.1	INT=	24	G	24 N

LT= 60 CT= 62 [24] 335.6: 377.1 INT= 16614 N

0	5401	74	76	0	0			
335.6	45	47	52	38	46	37	50	39
342.1	38	53	40	36	43	58	43	54
348.6	72	56	56	90	92	122	259	1026
355.1	4555	7352	3267	444	46	27	29	21
361.7	23	24	32	35	34	30	33	26
368.2	24	32	40	33	30	34	45	34
374.7	40	33	43					

< 200 KeV

Isotope	E(keV)	Efficiency (net count) Gain = 500
^{133}Ba	81.00	$29084/8.616\times10^5 = 0.03376$
^{57}Co	122.06	$(113391/2)/(1.541\times10^6) = 0.03680$
	136.46	$(13213/2)/1.910\times10^5 = 0.03459$
^{241}Am	59.54	$(9483/30)/((14903/0.515)*0.391)) = 0.03043$
eff.	72.4	~ 0.03243

Number of 22X Aliquots (probably last 5X first time)

1 ✓

2 ✓

3 ✓

4 ✓

5 —

6 ✓

7 ✓

8 ✓

1 ✓

2 ✓

3 ✓

4 ✓

5 ✓

6 ✓

7 ✓

8 ✓

5 Nov 96

Placed in furnace at 0900 hrs

Stayed at 100°C for one hr

Stayed at 400°C for one hr

Started at 700°C at 1115 hr

Turned off at 0820 hrs on 6 Nov 96

Calculation of a Rough-Cut $^{145}Pm(n,\gamma)^{146}Pm$ Cross Section (cont.)

23-24 Oct. 1986 — 23-24

Isotope	E(kev) (<800 kev)	Efficiency (net count) Gain = 50
^{133}Ba	356.0	$16833/1.599\times10^{6} = 0.01053$
^{137}Cs	661.6	$11506/1.877\times10^{6} = 0.006098$
eff	453.9	~ 0.009109

^{145}Pm: $^{145}\lambda = 7.446\times10^{-8}\ min^{-1}$

72.4 kev γ is 2.31% in yield (or intensity)

43562 net counts of the 72.4 kev γ in BC10 (200 min count) (p. 93)

Counting of BC10 did not take into account that the Pm was in solution in a centrifuge cone

$$^{145}A = \frac{43562 \text{ counts}}{200 \text{ mins}} \Big/ (0.03243_{eff} \cdot 0.0231)$$

$$= 2.907\times10^{8} \text{ dpm}$$

$$^{145}N = 3.904\times10^{12} \text{ atoms} = 0.940 \text{ ng of } ^{145}Pm$$

^{146}Pm: $^{146}\lambda = 2.383\times10^{-7}\ min^{-1}$

453.9 kev γ is 62.7% in intensity for EC decay

% EC decay is 63.7%

from p. 90, 6326 net counts of the 453.9 kev γ in BC10 (1505 min. count). Counting of BC10 did not take into account that the Pm was in solution in a centrifuge cone.

$$^{146}A = \frac{6326 \text{ counts}}{1505 \text{ mins}} \Big/ (0.009109_{eff} \cdot 0.627 \cdot 0.637)$$

$$= 1.155\times10^{3} \text{ dpm}$$

$$^{146}N = 4.848\times10^{9} \text{ atoms} = 1.175 \text{ pg of } ^{146}Pm$$

Calculation of a Rough-Cut $^{145}Pm(n,\gamma)^{146}Pm$ Cross Section (cont.)

23-24 Oct. 1986

$$\frac{^{146}N}{^{145}N} = \frac{4.848\times10^{+9}}{3.904\times10^{+12}} = 1.242\times10^{-3}$$

$$\sigma_{eff}^{145} \approx \frac{(^{146}N/^{145}N)}{\phi\cdot t} = \frac{1.242\times10^{-3}}{(5\times10^{14})(8.64\times10^{4})} = 2.875\times10^{-23} = 28.75\ b$$

This does not take into account the burnout of ^{146}Pm which has a $\sigma_r = 8400$ b.

The more exact relationship follows:

$$\frac{n^{146}}{n_o^{145}} = \frac{\phi\sigma_{eff}^{145}}{\phi(\sigma_{eff}^{146}-\sigma_{eff}^{145})+\lambda^{146}}\left\{\exp(-\phi\sigma_{eff}^{145}t)-\exp[-t(\phi\sigma_{eff}^{146}+\lambda^{146})]\right\}$$

Using 28.75 b and 8400 b yields,

$$\frac{n^{146}}{n_o^{145}} = \frac{5\times10^{14}\cdot28.75\times10^{-24}}{5\times10^{14}(8400\times10^{-24}-28.75\times10^{-24})}\left\{\exp(-5\times10^{14}\cdot8.64\times10^{4}\cdot28.75\times10^{-24})\right.$$

$$\left.-\exp\left[-8.64\times10^{4}(5\times10^{14}\cdot8400\times10^{-24}+3.972\times10^{-9})\right]\right\}$$

$$= 3.434\times10^{-3}(9.988\times10^{-1}-6.954\times10^{-1})$$

$$= 1.042\times10^{-3}$$

As can be seen, the two ratios do not agree so an adjustment to the approximate σ_{eff}^{145} cross section needs to be made.

Now, assume a $\sigma_{eff}^{145} = 34.27$ b and substitute back into the above equations.

$$\frac{n^{146}}{n_o^{145}} = \frac{5\times10^{14}\cdot34.27\times10^{-24}}{5\times10^{14}(8400\times10^{-24}-34.27\times10^{-24})}\left\{\exp(-5\times10^{14}\cdot8.64\times10^{4}\cdot34.27\times10^{-24})\right.$$

$$\left.-6.954\times10^{-1}\right\}$$

$$= 1.242\times10^{-3}$$

Suspect ^{147}Nd in BC10 $^{145}Pm(n,\gamma)^{146}Pm$ Experiment

27 Oct 1986 — During the initial gamma scans of BC10, a suspect gamma peak in the vicinity of 91 KeV was seen. It was thought to be ^{147}Nd, which would compromise a mass spectroscopic measurement if it was there in a reasonable quantity. Several production routes were thought of and these follow:

(1) $^{145}Sm \xrightarrow[340\text{ d}]{EC} {}^{145}Pm(n,\gamma)^{146}Pm \xrightarrow[5.5\text{ y}]{EC} {}^{146}Nd(n,\gamma)^{147}Nd$

(2) $^{145}Sm \xrightarrow[340\text{ d}]{EC} {}^{145}Pm \xrightarrow[17.7\text{ yr}]{EC} {}^{145}Nd(n,\gamma)^{146}Nd(n,\gamma)^{147}Nd$

(3) and irradiation of a natural Nd contamination that was not adequately separated during the preparation and purification of the ^{145}Pm.

The cross sections for Nd transmutations are generally low so my immediate feeling is that there was some substantial Nd (nat.) contamination of the ^{145}Pm sample. ^{145}Pm sample is ~20-30 years old and was given to Joe Halperin by Bruce Kettelle. Counting of sample BC10 began at (x-ray) 1530 on 24 Oct. 1986. Counting on the Ge-~~Li~~ detector ended at 0830* on 27 Oct. 1986. The results of the count are shown on the next page. Photographs of the spectrum are shown on p. 106. There was no calibration available at 1" from the face of the intrinsic Ge (x-ray) detector. Therefore, we attempted to calibrate the detector with a ^{57}Co and ^{133}Ba. This count was done on 31 Oct. 1986. The counting results are shown on p. 107 and 108. As can be seen from these results there was quite a lot of deadtime. However, this cannot be readily avoided and since this is being done only to get a handle on the amount of ^{147}Nd contamination it should suffice.

*However, the counting period was only for 2 days (I think). Actually, it was 66.28 hrs.

Suspect ^{147}Nd in BC10 ^{145}Pm(n,γ)^{146}Pm Experiment (cont.)

27 Oct 1986

sample bc-10 int.se det. 10-27-86 1" from det.

```
LT=42000 CT=43295[23]   90.17:   92.04 INT=    3682 N
                                     0     0
      0    5401 122020 124437   1780   2198   2662   2587   2338
  90.17    1661   1629   1635   1632
  91.42    1968   1712   1638

LT=42000 CT=43295[23]   90.17:   92.04 INT=   23440 G
                                     0     0
      0    5401 122020 124437   1780   2198   2662   2587   2338
  90.17    1661   1629   1635   1632
  91.42    1968   1712   1638

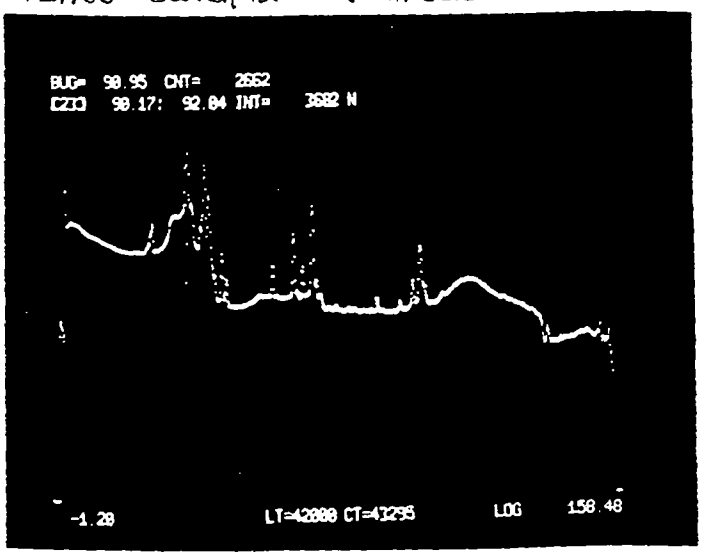
LT=42000 CT=43295                        23440 G    3682 N
  [23]   90.17:  92.04 INT=             286703 G  128705 N
  [24]   63.04:  70.99 INT=              47632 G    -537 N
  [25]  123.86: 126.51 INT=             288000 G  -35415 N
  [26]  118.09: 132.12 INT=              58287 G    4646 N
  [27]   90.48:  95.63 INT=             119923 G   26398 N
  [28]   58.67:  63.35 INT=              46872 G   -1584 N
  [29]   53.53:  56.33 INT=             277967 G   -2423 N
  [30]    4.71:   5.49 INT=              19376 G   -7436 N
  [43]  137.42: 143.51 INT=

LT=42000 CT=43295                       459728 G  368018 N
  [21]   70.37:  75.98 INT=             421987 G  353424 N
  [22]   70.84:  74.27 INT=              23440 G    3682 N
  [23]   90.17:  92.04 INT=             286703 G  128705 N
  [24]   63.04:  70.99 INT=              47632 G    -537 N
  [25]  123.86: 126.51 INT=             288000 G  -35415 N
  [26]  118.09: 132.12 INT=              58287 G    4646 N
  [27]   90.48:  95.63 INT=             119923 G   26398 N
  [28]   58.67:  63.35 INT=              46872 G   -1584 N
  [29]   53.53:  56.33 INT=             277967 G   -2423 N
  [30]    4.71:   5.49 INT=              19376 G   -7436 N
  [43]  137.42: 143.51 INT=
```

Suspect ^{147}Nd in BC10 $^{145}Pm(n,\gamma)^{146}Pm$ Experiment (cont.)

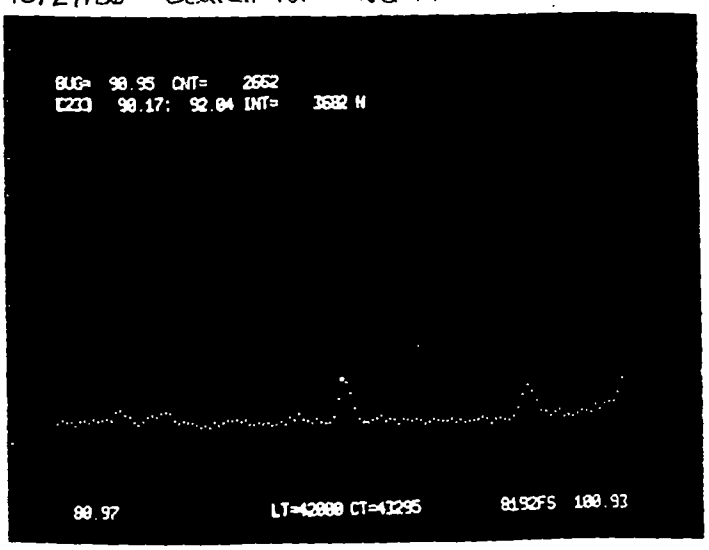
27 Oct 1986

10/27/86 Search for ^{147}Nd in BC10



Low-Energy BC10 Spectrum
(cursor on ^{147}Nd peak)

10/27/86 Search for ^{147}Nd in BC10



^{147}Nd Peak in BC10

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Suspect ^{147}Nd in BC10 $^{145}Pm(n,\gamma)^{146}Pm$ Experiment (cont.)

31 Oct. 1986

co-57 1' from int. se det. (0930 hrs) 31-oct-86 .96ci(8/18/86)(x10^{-6})

LT= 120 CT= 148

[21]	779.0:	798.0	INT=	10493 G	-11110 N
[22]	462.0:	484.0	INT=	598 G	15 N
✓[23]	762.0:	831.0	INT=	18225 G	11153 N
✓[24]	776.0:	818.0	INT=	14989 G	9886 N
[25]	802.0:	819.0	INT=	907 G	-96 N
[26]	765.0:	855.0	INT=	18078 G	8853 N
[27]	588.0:	621.0	INT=	2053 G	73 N
[28]	384.0:	414.0	INT=	655 G	85 N
[29]	351.0:	369.0	INT=	392 G	14 N
[30]	38.0:	43.0	INT=	690 G	58 N
[43]	889.0:	928.0	INT=	67 G	-11 N

channels

LT= 120 CT= 148[24] 776.0: 818.0 INT= 9886 N

0	5401	170	224	0	0			
776.0	221	188	200	200	210	198	224	185
784.0	229	292	330	395	383	393	376	367
792.0	370	461	691	1260	1855	2074	1581	847
800.0	366	200	104	106	88	56	52	56
808.0	60	53	61	60	58	40	32	28
816.0	17	22						

channels

LT= 120 CT= 148[23] 762.0: 831.0 INT= 11153 N

0	5401	170	224	0	0			
762.0	194	190	204	192	186	234	196	227
770.0	255	236	221	217	209	244	221	188
778.0	200	200	210	198	224	185	229	292
786.0	330	395	383	393	376	367	370	461
794.0	691	1260	1855	2074	1581	847	366	200
802.0	104	106	88	56	52	56	60	53
810.0	61	60	58	40	32	28	17	22
818.0	14	27	26	24	16	28	9	18
826.0	14	19	15	10	11			

Suspect ^{147}Nd in BC10 $^{145}Pm(n,\gamma)^{146}Pm$ Experiment (cont.)

31 Oct. 1986

ba-133 1" from int. ge det. 31-oct-86 1000 hrs 1.16 μCi (6/23/86)

LT= 120 CT= 155

[21]	119.32:	122.25	INT=	1272 G	-29 N
[22]	70.53:	73.91	INT=	1654 G	169 N
✓[23]	80.07:	81.76	INT=	17341 G	8794 N
✓[24]	76.38:	85.00	INT=	29330 G	26082 N
✓[25]	74.84:	85.15	INT=	30096 G	26512 N
[26]	117.17:	131.02	INT=	5975 G	-145 N
[27]	89.92:	95.00	INT=	902 G	-302 N
[28]	58.52:	63.14	INT=	2913 G	63 N
[29]	53.44:	56.21	INT=	2301 G	-615 N
[30]	5.26:	6.03	INT=	2857 G	152 N
[43]	136.26:	142.26	INT=	2201 G	134 N

LT= 120 CT= 155[23] 80.07: 81.76 INT= 8794 N

0	5401	170	233	0	0			
80.07	206	243	392	666	1349	2585	3637	3336
81.30	2134	1445	1348					

LT= 120 CT= 155[24] 76.38: 85.00 INT= 26082 N

0	5401	170	233	0	0			
76.38	84	73	69	73	74	65	87	76
77.61	75	81	91	89	72	96	95	101
78.84	100	109	129	219	322	376	325	256
80.07	206	243	392	666	1349	2585	3637	3336
81.30	2134	1445	1348	1441	1420	1178	775	568
82.53	539	592	504	452	428	354	218	87
83.77	59	28	45	33	39	27	33	32

LT= 120 CT= 155[25] 74.84: 85.15 INT= 26512 N

0	5401	170	233	0	0			
74.84	73	71	77	71	94	73	62	84
76.07	72	55	84	73	69	73	74	65
77.30	87	76	75	81	91	89	72	96
78.53	95	101	100	109	129	219	322	376
79.76	325	256	206	243	392	666	1349	2585
81.00	3637	3336	2134	1445	1348	1441	1420	1178
82.23	775	568	539	592	504	452	428	354
83.46	218	87	59	28	45	33	39	27
84.69	33	32	34					

Suspect ^{147}Nd in BC10 $^{145}Pm(n,\gamma)^{146}Pm$ Experiment (cont.)

31 Oct. 1986

Isotope	E(keV)	Efficiency (%)
^{57}Co	122.063	(9886/120)/(29,392.9) × (0.8551) = 0.328 %
^{133}Ba	80.997	(8794/120)/(42920 · 0.33) = 0.517 %
^{147}Nd	91.106	0.468 %

Taking the ^{147}Nd data, the efficiency, and decaying back to the irradiation date, 7 Oct 1986, yields the following:

$$\frac{3682 \text{ cnts (net)}}{2.386 \times 10^5 \text{ secs}} \cdot \frac{1}{0.00468 \text{ (eff)}} \cdot \exp(+7.306 \times 10^{-7} \cdot 1.728 \times 10^6) = A_o^{91.1}$$

$A_o^{91.1} = 1.165 \times 10^1$ dps

$A_o = \frac{11.65 \text{ dps}}{0.28 \text{ (branching ratio)}} = 41.62$ dps

$^{147}N = 5.697 \times 10^7$ atoms

Now, examine the possible paths of production.

(1) length of irradiation: 24 hrs

thermal flux: $5 \times 10^{14} \cong$ effective flux

$\sigma^{146} = 1.4$ b

assume $^{147}N = {}^{146}N_o \phi \sigma^{146} t$

$$^{146}N_o = \frac{6.298 \times 10^6 \cdot 5.697 \times 10^7}{5 \times 10^{14} \cdot 1.4 \times 10^{-24} \cdot 8.64 \times 10^4} = 9.419 \times 10^{11} \text{ atoms} = 2.284 \times 10^{-10} \text{ g}$$

(2) length of irradiation: 24 hrs

thermal flux: 5×10^{14}, assume resonance flux/lethargy: 2×10^{13}

$\sigma^{145} = 42$ b, $I^{146} = 240$ b, and $\sigma_{eff} = 42 + 9.6 = 51.6$ b

$$^{145}N_o = \frac{2N^{147}}{\phi^2 \sigma^{145} \sigma^{146} t^2} = \frac{2 \cdot 5.697 \times 10^7}{(5 \times 10^{14})^2 \cdot (51.6 \times 10^{-24})(1.5 \times 10^{-24})(8.64 \times 10^4)}$$

Suspect ^{147}Nd in BC10 $^{145}Pm(n,\gamma)^{146g}Pm$ Experiment (cont.)

31 Oct 1986 $^{145}N_0 = \frac{1.1\text{ℓ} \times 10^{8}}{1.67 \times 10^{-12}} = 6.82 \times 10^{19}$ atoms $= 1.641 \times 10^{-2}$ g

From this analysis it appears that the production of ^{147}Nd from double capture on ^{145}Nd is not plausible. However, production routes (1) and (3) are certainly within the realm of possibility.

Preparation of Cleanup Column for BC-10

23 Nov 1986 Prepared cleanup column for BC-10 according to, in general, the recipe given on page 1 of this document. The resin used was AG 50W-X4 and was a -400 mesh of the H^+ form. The resin, as loaded, had a volume of ~0.6 ml.

Cleanup Column of BC-10

Dec 1986 Started to work at 0900 hrs. The volume of the acidified (~0.4 M) BC-10 was 2.5 ml. The 6 second background through channel 132 was ~50-70 counts with the feed in the reservoir. Two 0.5 ml 0.1 M HCl (Ultrex) rinses were made of BC-10. Initial collection of the column was into ^{145}Pm BC10-CL1. The initial drop rate was ~15 secs/drop. The drop rate increased to 10 sec/drop which was probably due to the slight compression of the resin due to the addition of the acid. Added 1.4 ml of 0.1 M HCl (Ultrex) from BC-10 to the reservoir at 0920 hrs. The volume of ^{145}Pm BC10-CL1, prior to resuming collection, was 3.6 ml. Probing of the column with a portable β/γ probe indicated that the ^{145}Pm had loaded at the top of the column. At 0925 hrs a small amount of ultra-pure H_2O was added to the column. Collection was now into ^{145}Pm BC10-CL2. At 0929 hrs, added some 2M HCl (Ultrex) to the column reservoir. The volume of ^{145}Pm BC10-CL2 prior to receiving the 2M effluent was 0.6 ml. The drop rate was lowered slightly. The multichannel analyzer was still counting in the range of the background. At 0933 hrs, collection of the effluent was switched to ^{145}Pm BC10-CL3. At this time added some 6 M HCl (Ultrex) to bring off the ^{145}Pm in a small volume, lowered the drop rate slightly. The volume of ^{145}Pm BC10-CL2 prior to the addition of the H_2O and 6M HCl was 1.2 ml. Run was terminated at 0953 hrs.

Sample	Volume (ml)	Channels 1-132 (gross)
^{145}Pm BC-10 CL-1	4.9	68 counts/6 sec
^{145}Pm BC-10 CL-2	2.0	74 counts/6 sec
^{145}Pm BC-10 CL-3	1.9	1224 counts/6 sec

Analysis of the three samples at TRL indicated that ~99% of the ^{145}Pm was in CL-3. On 3 Dec, 1986, CL-3 was evaporated down to dryness.

MARTIN MARIETTA ENERGY SYSTEMS, INC.
POST OFFICE BOX P
OAK RIDGE, TENNESSEE 37831

Operated for the U.S. Department of Energy
Under U.S. Government Contract DE-AC05-840R21400

OAK RIDGE NATIONAL LABORATORY

ISOTOPE DISTRIBUTION DOCUMENT

113

Document Number
A 100261

BILL TO:

OAK RIDGE NATIONAL LABORATORY
P. O. BOX X
OAK RIDGE, TENNESSEE 37831

CHARGE 337066-6001

SPECIAL INSTRUCTIONS AND REMARKS

ORNL, CHEM-TECH DIVISION, C ALEXANDER
CALL FOR CUSTOMER PICKUP

Isotope Order Number
~~41-0004-1~~

Date Shipped
~~NOV-06-1987~~

Customer Code
~~49100~~

Customer's Order
337066-6001

ISOTOPE or SERVICE	DESCRIPTION (chemical/physical form, enrichment, batch number)	COMPOUND WEIGHT	MATERIAL TYPE	SALES UNIT *	TYPE SALE	NUMBER OF UNITS SHIPPED	NUMBER OF UNITS BILLED **	UNIT PRICE	EXTENSION
1. GD-156	GADOLINIUM OXIDE (SOLID)	11.5	4647-0163	MG	72	10	10		
	82.10% BATCH 128902								
	DISTRIBUTION CHARGE		4647-0163		72				
	ORDER PROCESSING CHARGE		4647-0163		71				100.00
2. GD-158	GADOLINIUM OXIDE (SOLID)	11.5	4647-0165	MG	72	10	10		
	81.00% BATCH 129102								
	DISTRIBUTION CHARGE		4647-0165		72				
	ORDER PROCESSING CHARGE		4647-0165		71				100.00
3. SGD-160	GADOLINIUM OXIDE (SOLID)	11.5	4647-0625	MG	72	10	10		
	99.98% BATCH 222702								
	DISTRIBUTION CHARGE		4647-0625		72				
	ORDER PROCESSING CHARGE		4647-0625		71				100.00
Handling Charge			3631 –	pkg					

* Ci = Curie; mCi = Millicurie; uCi = Microcurie; gr = Gram; mg = Milligram; ug = Microgram; pkg = Package
** If different from amount shipped, difference represents decay adjustment or process loss.

Sales Approval / Date

Total Charges

ATTACHMENTS: ☐ Radioactive or ☒ Stable Isotope Shipping Order ☐ Returnable Container Notice ☐ Other (See Remarks)

To Packing / Date
mc / 11-3-87

To Sales / Date
MM 11/6/87

2 Packing List

Forwarded To Accounts Receivable

UCN-12334 (3 7-84)

			LANTHANIDES AND ACTINIDES			SPECTROGRAPHIC ANALYSIS					
ELEMENT	GD										
ISOTOPE	160		AM		LA	<.02	ELEMENT	PERCENT			
SERIES	R&D		BR		LU	<.005					
SAMPLE	222702		CE	<.1	MD		CS	<.05	PD		
			CF		ND	<.05	CU	<.01	PT	<.05	
ISOTOPIC ANALYSIS			CR	<.02	NP		FE	0.04	RB		
			DY	<.1	PR	<.05	GA	<.02	RE		
	ATOMIC	PRECI-	ER	<.005	PU		GE	<.02	RH		
ISOTOPE	PERCENT	SION	ES		SM	<.05	HF	<.05	RU		
			EU	<.005	TB	<.05	HG	<.05	S		
152			FM		Y	<.005	I		SB	<.05	
154			GD		YB	<.002	IN	<.05	SC		
155	0.0006	0.00	HO	<.05	TM	<.05	IR		SE		
156	0.0014	0.00					K	<.05	SI	<.01T	
157	0.0016	0.00	30SPECTROGRAPHIC ANALYSIS				LI		SN	<.02	
158	0.0086	0.00					MG	<.01	SR	<.01	
160	99.988	0.00	00 ELEMENT		PERCENT		MN	<.01	TA	<.05	
							MO	<.01	TC		
			AG	<.005	BR		N		TE	<.05	
			AL	<.01	C		NA	<.05	TH		
			AS		CA	<.01	NB	<.05	TI	<.01	
THE LIMITS QUOTED ABOVE			AU	<.05	CB		NI	<.02	TL		
ARE AN EXPRESSION OF THE			B	<.01T	CD	<.05	O		U		
PRECISION OF THIS MEAS-			BA	0.01	CO	<.02	P		W	<.05	
UREMENT ONLY. THE ERROR			BE	<.001	CO	<.02	P		W	<.05	
IS ESTIMATED AT LESS			BI	<.02	CR	<.02	PA		ZN	<.05	
THAN 1% FROM KNOWN							PB	<.02T	ZR	<.02	
SOURCES OF SYSTEMATIC											
ERRORS.											

* <- NO SPECTRUM LINE VISIBLE. PROBABLY ABSENT, DEFINETLY LESS THAN VALUE GIVEN .

* <T- PRESENT BUT LESS THAN VALUE GIVEN.

* THE SPECTROGRAPHIC RESULTS REPORTED HEREIN ARE SEMI-QUANTITATIVE ESTIMATES AND SHOULD NOT BE INTERPRETED OR CONSTRUED TO BE PRECISE QUANTITATIVE DETERMINATIONS.

		LANTHANIDES AND ACTINIDES		SPECTROGRAPHIC ANALYSIS	
ELEMENT GD		AM	LA <.02	ELEMENT	PERCENT
ISOTOPE 156		BR	LU <.01		
SERIES		CE <.1	MD	CS	PD
SAMPLE 128902		CF	ND <.05	CU <.02	PT <.05
ISOTOPIC ANALYSIS		CR <.05	NP	FE <.02	RB <.02
		DY <.02	PR <.04	GA	RE
ISOTOPE	ATOMIC PERCENT	PRECISION	ER <.01	PU	GE	RH
152	<.1		ES	SM <.05	HF	RU
154	0.38	0.05	EU 0.02	TB <.05	HG	S
155	7.11	0.05	FM	Y <.01	I	SB
156	82.1	0.10	GD	YB <.01	IN	SC
157	6.61	0.05	HO <.02	TM <.05	IR	SE
158	2.91	0.05			IK <.01	SI <.02
160	0.83	0.05	00SPECTROGRAPHIC ANALYSIS		LI <.01	SN <.1
			00 ELEMENT	PERCENT	MG <.02	SR <.02
			AG <.02	BR	MN <.02	TA <.05
			AL <.1	C	MO <.02	TC
			AS	CA <.02	N	TE
			AU	CB <.05	NA <.01	TH
			B <.01	CD	NB	TI <.02
			BA <.02	CO <.05	NI <.05	TL
			BE	CO <.05	O	U
			BI	CR <.05	P	W <.05
					F	W <.05
					PA	ZN
					PB <.05	ZR <.05

THE LIMITS QUOTED ABOVE ARE AN EXPRESSION OF THE PRECISION OF THIS MEASUREMENT ONLY. THE ERROR IS ESTIMATED AT LESS THAN 1% FROM KNOWN SOURCES OF SYSTEMATIC ERRORS.

* <- NO SPECTRUM LINE VISIBLE, PROBABLY ABSENT, DEFINETLY LESS THAN VALUE GIVEN .

* <T- PRESENT BUT LESS THAN VALUE GIVEN.

* THE SPECTROGRAPHIC RESULTS REPORTED HEREIN ARE SEMI-QUANTITATIVE ESTIMATES AND SHOULD NOT BE INTERPRETED OR CONSTRUED TO BE PRECISE QUANTITATIVE DETERMINATIONS.

ELEMENT GD			LANTHANIDES AND ACTINIDES			SPECTROGRAPHIC ANALYSIS		
ISOTOPE 158			AM		LA <.05	ELEMENT	PERCENT	
SERIES			BR		LU <.01			
SAMPLE 129102			CE <.1		MD	CS	PD	
ISOTOPIC ANALYSIS			CF		ND <.1	CU <.02	PT <.05	
			CR <.05		NP	FE <.02	RB <.02	
			DY <.1		PR <.1	GA	RE	
ISOTOPE	ATOMIC PERCENT	PRECISION	ER <.05		PU	GE	RH	
			ES		SM <.1	HF	RU	
			EU <.05FT		TB <.1	HG	S	
152	<.1		FM		Y <.05	I	SB	
154	<.1		GD		YB <.01	IN	SC	
155	1.72	0.05	HO <.05		TM <.05	IR	SE	
156	4.82	0.05				K <.01	SI <.05	
157	9.72	0.10	00SPECTROGRAPHIC ANALYSIS			LI <.01	SN <.05	
158	81.0	0.10				MG <.02	SR <.02	
160	2.69	0.05	00 ELEMENT	PERCENT		MN <.02	TA	
						MO <.05	TC	
			AG <.02	BR		N	TE	
			AL <.05	C		NA <.01T	TH	
			AS	CA 0.02		NB	TI <.02	
THE LIMITS QUOTED ABOVE ARE AN EXPRESSION OF THE PRECISION OF THIS MEASUREMENT ONLY. THE ERROR IS ESTIMATED AT LESS THAN 1% FROM KNOWN SOURCES OF SYSTEMATIC ERRORS.			AU	CB		NI <.05	TL	
			B <.01	CD		O	U	
			BA <.02	CO <.05		P	W	
			BE	CO <.05		F	W	
			BI	CR <.05		PA	ZN	
						PB <.05	ZR <.1	

* <- NO SPECTRUM LINE VISIBLE. PROBABLY ABSENT, DEFINETLY LESS THAN VALUE GIVEN .

* <T- PRESENT BUT LESS THAN VALUE GIVEN.

* THE SPECTROGRAPHIC RESULTS REPORTED HEREIN ARE SEMI-QUANTITATIVE ESTIMATES AND SHOULD NOT BE INTERPRETED OR CONSTRUED TO BE PRECISE QUANTITATIVE DETERMINATIONS.

OAK RIDGE NATIONAL LABORATORY
Operated by Martin Marietta Energy Systems, Inc.
Isotope Distribution Office
P. O. Box X, Oak Ridge, Tennessee 37831

IDO-MSDS-00069

MATERIAL SAFETY DATA SHEET

The issuance of this document complies with the U.S. Department of Labor, Occupational Safety and Health Administration's Hazard Communication Standard 29 CFR 1910.1200. Standard must be consulted for specific requirements. This document is applicable only to small quantities of material. Small quantities are defined as less than ten (10) grams.

Definitions: NE, "Not Established"; NISS, "Not In Sources Searched"; NA, "Not Applicable"; TWA, "Time Weighted Average"; TLV, "Threshold Limit Value"; PEL, "Permissible Exposure Level."

IDENTITY (As used on label and list): Gadolinium(-152,-154,-155,-156,-157,-158,-160) Oxide

SECTION I. Manufacturer's Identification

Manufacturer's Name:

Martin Marietta Energy Systems, Inc.
c/o Oak Ridge National Laboratory
Isotope Distribution Office
P.O. Box X
Oak Ridge, Tennessee 37831

Emergency Telephone Number:
Plant Shift Supervisor (615) 574-6606

Telephone Number for Information:
Isotope Distribution Office (615) 574-6984

Date Prepared: March 18, 1987

SECTION II. Hazardous Ingredients/Identity Information

General Classification: Solid

Exposure Limits:

OSHA:	NE
ACGIH TLV:	NE
NIOSH:	NE
Immediately Dangerous to Life and Health:	NE

Chemical Formula:	Gd_2O_3	CAS Registry Number:	012064-62-9
Use:	In control rods of some nuclear reactors, coatings, lasers, laboratory reagent	RTECS Number:	NISS
		DOT Class:	NISS
		DOT Label:	NISS
		DOT Number:	NISS

Health Hazard Rating:
Fire Hazard Rating:
Reactivity Rating:

SECTION III. Physical/Chemical Characteristics

Physical Description:	Colorless, hygroscopic powder		
Molecular Weight (naturally occurring):		362.50	
Vapor Pressure:	NISS	Boiling Point:	NISS
Vapor Density:	NISS	Melting Point:	2330° +/- 20°C
Specific Gravity:	7.407 @ 15°C	Percent Volatiles:	NA
Evaporation Rate:	NISS		
Solubility:	Very slightly soluble in water		

SECTION IV. Fire and Explosion Hazard Data

Flash Point (method): NISS
Autoignition Temperature: NISS
Lower Flammability Limit: NISS
Upper Flammability Limit: NISS

Extinguishing Media: Use no water or halons

Firefighting Procedures: For minute quantities, as covered by this MSDS, firefighting techniques should concentrate on controlling the spread of the fire to other combustible materials. Wear pressure-demand, self-contained breathing apparatus and full firefighting protective clothing.

Fire and Explosion Hazards: Ignites in air at 302°-356° F. Burns vigorously in halogen vapors above 392° F.

SECTION V. Reactivity Data

Stability: Unstable NISS Stable ___
Conditions to Avoid: Heat
Incompatibility (materials to avoid): Air, halogens
Hazardous Decomposition or Byproducts: NISS
Hazardous Polymerization: May occur ___ Will not occur X

SECTION VI. Health Hazard Data

Routes of Entry: Inhalation X Skin ___ Ingestion X

Signs and Symptoms of Exposure:

Acute Inhalation: Causes increased insensitivity to heat, itching, and a sharper sense of taste and smell.

Acute Swallowing: NISS

Acute Skin Contact: NISS

Acute Eye Contact: Slight irritant

Chronic: Not considered toxic

Health Hazards (target organs/systems):

Acute: NISS

Chronic: NISS

Emergency and First Aid Procedures:

Inhalation: Remove to fresh air and give artificial respiration if not breathing. Get medical aid.

Swallowing: Induce vomiting only after massive ingestion.

Skin contact: NISS

Eye contact: Flush eyes at once with water for at least 15 minutes. Get medical aid.

Physicians' notes: NISS

Carcinogenicity: NTP NISS IARC Monographs _____ OSHA Regulated _____

Medical Conditions Generally Aggravated by Exposure: NISS

SECTION VII. Precautions for Safe Handling and Use

Steps To Be Taken in Case Material is Released or Spilled: Notify safety personnel of leaks or spills. Remove spills by vacuuming or wet sweeping in order to keep airborne dust at a minimum.

Waste Disposal Method: Collect in an appropriate container for salvage or disposal. Treat unsalvageable waste as a toxic solid in accordance with federal, state, and local regulations.

Precautions To Be Taken in Handling and Storing: Store in closed container in a cool, dry, well-ventilated, low fire-risk area. Protect from physical damage.

Other Precautions: Avoid breathing dust. Avoid skin and eye contact. Eyewash stations and washing facilities should be accessible to areas of use.

SECTION VIII. Control Measures

Respiratory Protection (specify type): Use a NIOSH-approved inorganic dust respirator when dust levels are high.

Ventilation:

Local Exhaust: Employ to keep dust levels low.

Mechanical (general): Employ to keep dust levels low.

Special: NISS

Other: NISS

Protective Gloves: Wear protective gloves.

Eye Protection: Wear chemical safety goggles.

Other Protective Clothing or Equipment: Wear protective clothing.

Work/Hygienic Practices: Wash thoroughly after handling.

DISCLAIMER

The information and opinions presented herein are based on data believed to be accurate and current as the date of this Material Safety Data Sheet. Martin Marietta Energy Systems, Inc., and the U.S. Department of Energy make no warranty or representation, express or implied, as to the accuracy or completeness of the foregoing data and safety information. The information in this Material Safety Data Sheet relates only to the specific material designated herein and does not relate to use in combination with any other material or in any process. Martin Marietta Energy Systems, Inc., and the U.S. Department of Energy assume no responsibility for any damage or injury resulting from abnormal use, from any failure to adhere to recommended practices, or from any hazards inherent in the nature of the material. It is the user's obligation to determine the conditions of safe use of this material. Actual conditions of use and handling of this material may require considerations of information other than, or in addition to, that which is provided herein.

BEST AVAILABLE COPY

10 mg/λ

1.77 mg/ml

17.7 mg/10λ

Started drying down Mo-A-CL3 at 1115 hrs on the 29 Jan 86

30 July 1986 Transferred Pm-145 C+M-3 transferred to Mother. Disposed of all other M- and C+M- solutions other than what was collected in C+M-5.

Started preparation of column. Calibrated it at ~0.4 ml

Note:
< -No spectrum line visible. Probably absent, definitely less than value given.
<T -Present, but less than value given.

ELEMENT Neodymium

ISOTOPE 148

SERIES ~~LE~~ 13.5601

ISOTOPIC ANALYSIS

ISOTOPE	ATOMIC PERCENT	PRECISION
142	2.18	± 0.05
143	1.6	0.05
144	2.17	0.05
145	1.55	0.05
146	3.42	0.05
148	87.9	0.1
150	1.2	0.05

The limits quoted above are an expression of the precision of this measurement only. The error is estimated at less than 1% from known sources of systematic errors.

SPECTROGRAPHIC ANALYSIS

GENERAL

ELEMENT	%
Al	<.05
B	<.01
Ba	<.02
Ca	.05
Cb	<.05
Co	<.05
Cr	<.05
Cu	<.05
Fe	<.02T
K	<.01
Li	<.01
Mg	<.02T
Mn	<.02
Mo	<.02
Na	<.01
Ni	.05
Pb	<.05
Pt	<.05
Rb	<.02
Si	<.05
Sn	<.05T
Ta	<.05
Ti	<.02
V	<.02
W	<.05
Zr	<.05

RARE EARTH

ELEMENT	%
Y	<.004
La	<.04T
Ce	<.2
Pr	.04
Sm	.2
Eu	<.008
Gd	<.02
Tb	<.1
Dy	<.1
Ho	<.04
Er	<.008
Tm	<.008
Yb	<.02
Lu	<.004

Quantitative estimates of the spectrographic results reported herein are constructed to be precise quantitative estimates and should not be interpreted as chemical analyses.

CBSP

Note:
< -No spectrum line visible. Probably absent, definitely less than value given.
<T -Present, but less than value given.

ELEMENT Samarium
ISOTOPE 152
SERIES ~~JM~~ 114701
SAMPLE ~~1-1-7(a)~~

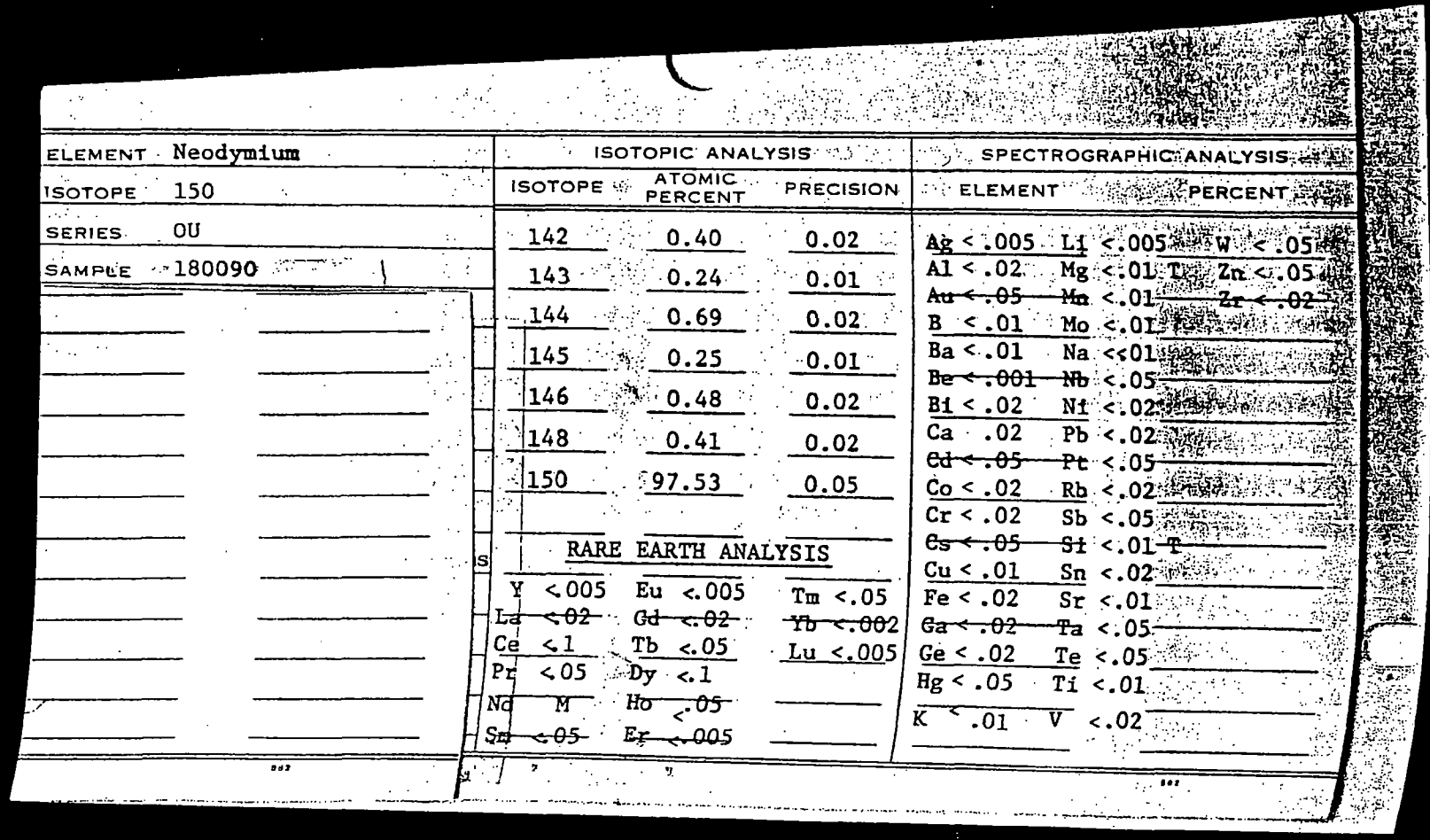
ISOTOPIC ANALYSIS		
ISOTOPE	ATOMIC PERCENT	PRECISION
144	< 0.02	----
147	0.19	± 0.02
148	0.07	0.02
149	0.11	0.02
150	0.09	0.02
152	99.06	0.05
154	0.48	0.02

The limits quoted above are an expression of the precision of this measurement only. The error is estimated at less than 1% from known sources of systematic errors.

SPECTROGRAPHIC ANALYSIS

GENERAL ELEMENT	%	RARE EARTH ELEMENT	%
Al	<.05	Y	<.02
Ba	<.05	La	<.04
Ca	.04	~~Ce~~	~~<.4~~
Cr	<.05	Pr	<.2
Co	<.05	Nd	<.2
Cu	<.05	~~Eu~~	~~<.02~~
Fe	<.02	~~Gd~~	~~<.02~~
K	<.01	Tb	<.1
Li	<.01	Dy	<.2
Mg	<.02	~~Ho~~	~~<.04~~
Mn	<.02	Er	<.008
Mo	<.05	Tm	<.04
Na	<.01	Yb	<.01
Ni	<.05	Lu	<.004
Pb	<.1		
Si	<.05		
Sn	<.05		
Ti	<.02		
V	<.02		
Zr	<.1		

The spectrographic results reported herein are semi-quantitative estimates and should not be interpreted or construed to be precise quantitative determinations.



ELEMENT Neodymium
ISOTOPE 150
SERIES OU
SAMPLE 180090

ISOTOPIC ANALYSIS

ISOTOPE	ATOMIC PERCENT	PRECISION
142	0.40	0.02
143	0.24	0.01
144	0.69	0.02
145	0.25	0.01
146	0.48	0.02
148	0.41	0.02
150	97.53	0.05

RARE EARTH ANALYSIS

Y <.005	Eu <.005	Tm <.05
La <.02	Gd <.02	Yb <.002
Ce <.1	Tb <.05	Lu <.005
Pr <.05	Dy <.1	
Nd M	Ho <.05	
Sm <.05	Er <.005	

SPECTROGRAPHIC ANALYSIS

ELEMENT	PERCENT	ELEMENT	PERCENT	ELEMENT	PERCENT
Ag	<.005	Li	<.005	W	<.05
Al	<.02	Mg	<.01	Zn	<.05
Au	<.05	Mn	<.01	Zr	<.02
B	<.01	Mo	<.01		
Ba	<.01	Na	<.01		
Be	<.001	Nb	<.05		
Bi	<.02	Ni	<.02		
Ca	.02	Pb	<.02		
Cd	<.05	Pt	<.05		
Co	<.02	Rb	<.02		
Cr	<.02	Sb	<.05		
Cs	<.05	Si	<.01		
Cu	<.01	Sn	<.02		
Fe	<.02	Sr	<.01		
Ga	<.02	Ta	<.05		
Ge	<.02	Te	<.05		
Hg	<.05	Ti	<.01		
K	<.01	V	<.02		

TIN MARIETTA ENERGY SYSTEMS, INC.
FFICE BOX P
IDGE, TENNESSEE 37831

Operated for the U.S. Department of Energy
Under U.S. Government Contract DE-AC05-840R21400

OAK RIDGE NATIONAL LABORATORY

ISOTOPE DISTRIBUTION DOCUMENT

Document Number: 127356

BILL TO:

OAK RIDGE NATIONAL LABORATORY
P. O. BOX X
OAK RIDGE, TENNESSEE 37831

XMER
CHARGE 337066-6015

SPECIAL INSTRUCTIONS AND REMARKS
ORNL, CHEM-TECH, C ALEXANDER

Isotope Order Number: 40-0003-9
Date Shipped: 2-17-87
Customer Code: 49100
Customer's Order: 337066-6015

ISOTOPE or SERVICE	DESCRIPTION (chemical/physical form, enrichment, batch number)	COMPOUND WEIGHT	MATERIAL TYPE	SALES UNIT *	TYPE SALE	NUMBER OF UNITS SHIPPED	NUMBER OF UNITS BILLED **	UNIT PRICE	EXTENSION
1. ND-146	NEODYMIUM OXIDE (SOLID) 97.63% BATCH 179801	23.3	4647-0314	MG	71	20	20	MINIMUM	150.00
Handling Charge			3631 –	pkg					

* Ci = Curie; mCi = Millicurie; uCi = Microcurie; gr = Gram; mg = Milligram; ug = Microgram; pkg = Package
** If different from amount shipped, difference represents decay adjustment or process loss.

Sales Approval / Date

Total Charges: $150.

ATTACHMENTS: ☐ Radioactive or ☐ Stable Isotope Shipping Order XX ☐ Returnable Container Notice ☐ Other (See Remarks)

To Packing / Date: 2-12-87

To Sales / Date: 2/17/87

2 Packing List

Forwarded To Accounts Receivable

UCN-12334 (3 7-84)

ELEMENT	NEODYMIUM
ISOTOPE	146
SERIES	OU
SAMPLE	179801

ISOTOPIC ANALYSIS

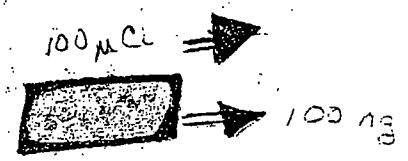
ISOTOPE	ATOMIC PERCENT	PRECISION
142	0.42	
143	0.29	
144	0.68	
145	0.64	
146	97.63	
148	0.24	
150	0.10	

RARE EARTH ANALYSIS

Y <.01	Gd <.02	Lu <.005
La <.02	Tb <.05	
Ce <.2	Dy <.1	
Pr <.05	Ho <.02	
Nd M	Er <.005	
Sm <.05	Tm <.05	
Eu <.01	Yb <.002	

SPECTROGRAPHIC ANALYSIS

ELEMENT	PERCENT	ELEMENT	PERCENT
Ag <.01		Na <.01	
Al <.05		Ni <.05	
B <.01		Pb <.02	
Ba <.01		Pt <.05	
Be <.001		Rb <.02	
Bi <.02		Sb <.05	
Ca 0.01		Si <.01 T	
Cd <.05		Sn <.02	
Co <.05		Sr <.01	
Cr <.05		Ta <.05	
Cs <.05		Ti <.01	
Cu <.01		V <.02	
Fe <.02		W <.05	
Ge <.05		Zn <.2	
Hg <.05		Zr <.05	
K <.01			
Li <.005			
Mg <.01			
Mn <.02			
Mo <.02			



phone-in-order
Jim McDonald

Intrinsic ⇒ Carlos Brooks
4-6137

Jack McGuire
4-6613

$\frac{10\ mS}{ml} = \frac{10 \times 10^{-3}\ S}{10^{-6}\ l} = 10\ \frac{mS}{m\Omega}$

100

$$\frac{\ln 2}{26.36 \cdot 24 \cdot 31 \cdot 300} \quad \frac{100 \times 10^{-9}\ g}{147} \cdot 6.023 \times 10^{23}$$

#18,000
$ 17,000

w/ ft²

$\pi d \ell$

$\pi \left(\frac{0.5}{12}\right)\left(\frac{20}{12}\right) =$

615-679-4388-3050

1.2 ml of resin of Dowex 50W-X8 (25-50μ)

10 psi of air pressure

NH_4 form

521-9191

87

Wt of 2.5 ml cone with stopper (Rm 110): 12.444 g

Wt of 2.5 ml cone with stopper (Rm 210): 12.4484 g

Wt of cone after addition of $^{146}Nd_2O_3$: 12.4732 g (24.8 mg)

1030 hrs added 200 λ of 8 M HNO_3 (UP)

Readily dissolved - light purple in color

1042 hrs added 200 λ of 0.1 M HNO_3 (UP)

Δ Mar 87

1000 - 1030 hrs

added 1200 λ of H_2O (UP) for a total volume of 1600 λ

added 530 λ of 1.0 M HNO_3 (UP) for a total volume of 2.13 ml

this yields a concentration of 10 mg of ^{146}Nd / ml

5 Mar 87

0830 hrs

removed 150 λ from the above solution and transferred it to another quartz cone.

diluted to 1 ml with 1.0 M HNO_3 (UP)

this yields a concentration of 1.5 μg of ^{146}Nd/λ

1134 °C

$\times 10^{-1}$

$\times 10^{-3}$

n bare drum contact: 28.18 R/hr

n bare drum 3' : 1.02 R/hr

$$\frac{5 \times 10^{-2} \cdot 500 \times 10^{-6} \cdot 3.1 \times 10^{12}}{4\pi (87)^2} = 20\ r/hr$$

(1.2 R/hr)

373 mr/hr at contact (n)

39 mr/hr at contact (secondary γ)

8 mr/hr at contact (prompt γ)

420 mr/hr

5.219 × 10^-4

$$\frac{10^{-1}}{4\pi (22)^2} = 1.644 \times 10^{-5} \frac{\text{mrem-hr}^{-1}}{n/\text{sec}} \cdot x \quad n/\text{sec} = 10^3\ mr/hr$$

BEST AVAILABLE COPY

2 March 1987

Pipetted 10λ of a 1.77 mg/ml solution of ^{148}Nd (~ 4.3 M HNO_3) into a small quartz cylinder. Placed on Al block and turned on heat lamp which was ~ 8" away (at 1310 hrs). Turned off at ~ 1345 hrs.

24.8 mg of $^{146}Nd_2O_3$

M.W. of $^{146}Nd_2O_3$: 339.825

^{146}Nd comprises 85.876% of $^{146}Nd_2O_3$

∴ our sample of $^{146}Nd_2O_3$ contains ~ 21.297 mg of ^{146}Nd

21.297 mg of ^{146}Nd ⟶ 2.13 ml (1 mg/ml)

150 λ ⟶ 1.0 ml (1.5 μg/λ)

$$\frac{2.13 \times 10^1 \text{ mg}}{2.13 \text{ ml}} \frac{}{\text{ml}} = 10 \text{ mg/ml}$$

$$10 \text{ mg} \cdot (0.15) = \frac{1.5 \text{ mg}}{10^3 \lambda} = 1.5 \text{ μg/λ}$$

$0.2\ ml \cdot 8\ \underline{M} + 0.2\ ml \cdot 0.1\ \underline{M} = 1.6 \times 10^{-3}\ moles + 0.02 \times 10^{-3}\ moles = 1.62 \times 10^{-3}\ moles$

$$\frac{1.62 \times 10^{-3}\ moles}{0.4 \times 10^{-3}\ liters} = 4.05\ \underline{M}$$

$$1\ ml \cdot 2\ \underline{M} = 0.4 \cdot 4.05\ \underline{M} + x \cdot 1\ \underline{M}$$

$$2 \times 10^{-3}\ moles = 1.62 \times 10^{-3}\ moles + x \cdot 1\ \underline{M}$$

$$x \cdot 1\ \underline{M} = 3.8 \times 10^{-4}$$

add 400 λ of H_2O (UP) ~
add 400 λ of H_2O (UP) =
add 400 λ of H_2O (UP) ∨
add 0.53 ml of 1 M HNO_3 (UP)

10 March 1987 Preparation of ^{146}Nd Sample

Pipetted 10λ of 1.5 μg/λ ^{146}Nd (in 1M HNO_3) into leached quartz capsule. Placed under heat lamp at 0958 hrs to dry down the solution. Turned off heat lamp at 1028 hrs.

19 Jan 1987 Pm-145 Mother

Started to work at 0825 hrs on Pm-145 Mother in an effort to continue to reduce the solids. Added a small amount of 8 M HNO_3 (ultrapure) to wash down the sides of the cone. Then turned on the heat lamp and argon gas purge. Initial volume was 5.5-6 ml. Ceased evaporation at 1100 hrs. About 0.1 ml of yellowish clear solids were formed at the bottom of the cone. Added ~2.9 ml of 8 M HNO_3(UP) and started the process over at 1107 hrs. Added 1 ml of H_2O (UP) at 1200 hrs. Quit evaporating at 1345 hrs. Solids seemed to be reduced down to 0.05 ml. Added ~3 ml of 8 M HNO_3 (UP) at 1345 hrs. Turned off heat and gas at 1545 hrs. Still a lot of solids but now they are kind of distributed up to the 2 ml mark. 4 ml of con. aqua regia was added at 1600 hrs and will be allowed to sit overnight. Restarted the evaporation at 0835 hrs on 20 Jan 1987. The solution became clear for a while but around 1120 hrs, the solution became very viscous and amber in color. Volume at this time was ~0.5 ml. The solution seemed to be drying at this stage more than evaporating. However, this was really a solidified bubble which dissolved on the addition of con. HCl (UP). Solids were in the order of ~4000X. Conc. aqua regia, ~0.8 ml, was added to the cone at 1130 hrs. Ceased evaporation at 1320 hrs. The sample was transferred to TRL where it was contacted with ~9 M $HClO_4$ (perchloric). After several contacts a small amount (~0.02 ml) of colorless solids was left in the cone. We suspect that this is a salt. On the 21 Jan 87 the sample was retransferred back to TPP. At 1030 hrs, ~0.1 ml of 1 M HNO_3 (UP) was added to the cone. The solids readily dissolved. However, after settling some solids still remained. Added ~0.9 ml of 1 M HNO_3 (UP) at 1200 hrs. The heat lamp was turned on at 1200 hrs to try and increase the dissolution rate.

23 Jan 1987

Started centrifuging Mother at 0920 hrs at speed 5 on the IEC Clinical Centrifuge. At 0925 hrs, centrifuge was turned off. Transferred ~ 0.95 ml of decanted solution from Pm-145 Mother to Pm-145 Mother A. Added 1 M HNO_3 (ultrapure) to Pm-145 Mother till the 0.1 ml mark was reached. Then added 0.9 ml of 0.1 M HNO_3 (ultrapure). Mother was then agitated and allowed to sit. At 1130 hrs, Mother was once again centrifuged. Centrifuge was turned off at 1135 hrs. Transferred ~0.95 ml of decanted solution from Pm-145 Mother to Pm-145 Mother A. Added 1 M HNO_3 (ultrapure) to Pm-145 Mother till the 0.1 ml mark was reached. Then added 0.9 ml of 0.1 M HNO_3 (ultrapure). Mother was then agitated and allowed to sit. At 1231, Mother was again centrifuged. At 1236, centrifugation was stopped. Transferred ~0.95 ml of decanted solution from Pm-145 Mother to Pm-145 Mother A. Probing both Mother and Mother A with a portable β/γ probe indicated that at least 98% of the Pm-145 was now in Mother A. Mother was packaged and taken to TRL for measurement on the Ge-Li detector. These measurements indicated that less than 0.1 ng out of 65 ng remained in the solids. The count rate over a 100 min period was ~100 counts. Mother A was then centrifuged for 5 mins starting at 1350 hrs. There did not appear to be any solids in Mother A.

0.4 - 0.5 ml -400 Dowex 50W-X4

washed with 0.1 M HCl (1/3 bowl)

" 2.0 M HCl (1/3 bowl)

" 6.0 M HCl (2/3 bowl)

" H_2O ultrapure (1 bowl)

27 Jan 1987

^{145}Pm Mother A Cleanup Column - "Semi-Stud" Run

ROI for the x-rays from Mother A ranged from channel 1-112. Coarse gain was set at 40 and fine gain at 10. Background in this ROI was 2542 in a 6 sec count. Initial vol. of Mother A was ~ 3 ml. Washed cone with 0.5 ml of 0.1 M HNO_3 and added it to Mother A which had been transferred to column reservoir. Background now read 1740 cnts in a 6 sec period. Started loading at 1300 hrs. Collection was into Pm-145 Mo-A-CL1. Drop rate was ~ 1 drop/11 secs. Drops were reading ~ 2500 counts. Rinsed cone with 0.1 M HNO_3 and added to reservoir at 1317 hrs. Probing of the column indicated that the Pm-145 had loaded at the top of the column. Switched to Mo-A-CL2 at 1324 hrs after adding about 2/3 of a bowl of 0.1 M HNO_3. Drop rate was now ~ 1 drop / 12 secs. Some 2M HNO_3 was added to reservoir at 1038 hrs. Collection was still into CL2. Switched to CL3 at 1345 hrs. Switched at 1400 hrs to CL4. Added 6M HCl at 1403 hrs. Added H_2O at 1410 hrs to column reservoir. Still collecting in CL4. Stopped run at 1415 hrs.

	β/γ	NaI (30 secs) (1-112)	Vol (ml)
CL1	Background	10985	4.4
CL2	Background	10690	3.3
CL3	10,000	453859	2.2
CL4	Background	16027	2.4

1-28-87 11:30 pm-145 samples 72 kev peak 5 min ~~2nd~~ 1 shelf ch 431-455

ACQGRP	1	ADC	1	28-JAN-87	11:46:15
TOTAL	0		0	28-JAN-87	11:38:24
LIVE	00:05:00		00:05:00		
REAL	00:00:00		00:05:02		
QUAD	0.000	SLOPE	0.168561	ZERO	-2.481

J. HALPERIN

std #2

one ns std

431 - 455:	3047	2447	600

mo-a-c11

431 - 455:	183	0	187

mo-a-c12

431 - 455:	173	0	237

mo-a-c13

431 - 455:	29583	24483	5100

mo-a-c14

431 - 455:	639	339	300
427 - 452:	638	508	130

Al - Mg - Gd PRECIPITATION
JULY 29, 1988

We dissolved 25 mg. of Al foil in .5 ml. of 6$^{M.}$ HCl in a 15 ml. graduated cone. We had to apply heat with an infrared lamp before the aluminum would react with the acid.

We weighed out 39 mg. of $MgCl_2$ (10 mg. of Mg) and added this to the Al solution. This readily dissolved . Also added were .5 ml. of the Gd feed and 2.0 ml. of 6$^{M.}$ HCl. This solution (2.5 ml.) was diluted to 10 ml. using H_2O - IX. The estimated acidity of the final solution is 1.5$^{M.}$.

We started adding 6.0$^{M.}$ NaOH in increments to observe the precipitation of the three metals. Upon the addition of 2.5 ml., there was definite precipitation - the solution became turbid. The addition of another 0.5 ml. did not seem to increase the turbidity. We allowed the solution to settle a few minutes, and then centrifuged the solution. The precipitate covered the round bottom of a 50-ml. cone. All of the metals appeared to have precipitated out of the solution.

An additional 2 ml. of 6.0$^{M.}$ NaOH (a total of 5.0 ml. of 6.0$^{M.}$ NaOH was added to the precipitation process) was added to the solution; the solution cleared somewhat, and after centrifuging, the amount of precipitate decreased by about 33%. We hoped the additional NaOH would drive the aluminum back into solution, leaving only the magnesium and the gadolinium precipitated.

The solution was then agitated and poured into a medium 30-ml. Buchner funnel. The filtrate was pulled through the funnel by means of vacuum and 25 ml. was collected in a 50-ml. graduated cone. This was in turn transferred to a small flask that had

been labeled 8H170-Gd Filtrate. About 5 ml. of the filtrate was submitted to Analytical for gamma scan analysis. On 8/5/1988, the ^{153}Gd gamma scan was reported to be <10 Bq/ml.

The precipitate was redissolved from the filter by adding 2.0$^{M.}$ HCl to the funnel. 4.1 ml. of product was caught in a 15-ml.graduated cone. This was labelled 8H170-Product.

The 8H170-Product fraction was dried down to .2 ml. using an infrared lamp. This was diluted to 1.5 ml. using H_2O - IX to redissolve the gel-like solution in the product cone, and will be further acid adjusted just prior to the AHIB column run.

AUGUST 1,1988

Fraction 8H170 Gd- Product was adjusted to 0.25$^{M.}$ HCl and pipetted into a water - jacketed separations column having 0.75 ml. of Dowex 50W-X8(-400) resin and column temperature at 80 degrees C.

RUN CHRONOLOGY

0902- We started loading the feed on the column @ 1 drop (50 lambda) / 6.7 seconds, using argon gas pressure with the argon gauge pressure set at 10 psi. The raffinate and flushes were collected in a graduated cone labelled 8H171-Gd - Raff.

0910- The feed was completed being loaded onto the column, and a H_2O-IX flush started. Radiation readings confirmed that the gadolinium had loaded at the top of the resin column.

0915- The water flush was completed, .3$^{M.}$ NH_4NO_3 flush was added to the column reservoir, and this was started through the column.

0922- After the through-put of 4 ml. of NH_4NO_3, the column had converted back to the NH_4^+ form. This was followed with a H_2O-IX flush. The total Raff. cone fraction was 10.8 ml.

0928- .25$^{M.}$ AHIB (3.8 pH) was started through the column, and collection was switched to the 8H171-Gd-1 cone. The flow rate was reduced to 1 drop every 10 seconds.

0933- 2.0 ml. had collected in cone-1. This is equivalent to 5 column volumes of through-put.

0935- We started collection in 8H171-Gd-2 as we switched to .25$^{M.}$ AHIB (4.2 pH). Radiation readings indicated that the gadolinium had migrated about half way down the column after the first 2.0 ml. of 4.2 pH had been delivered to the column.

0941- We switched to 8H171-Gd-3 cone and collected 2.0 ml.(5 bed volumes).

0943- We switched to 8H171-Gd-4 and collected .4 ml. (or 1 column volume), and stopped the run momentarily to check the radiation readings of the fractions that had been collected. Readings indicated that we had started seeing activity coming off the column in cone -3.

0946- We restarted the run and collected 1 column volume (.4 ml.) in cone 8H171-Gd-5.

0947- We collected 1 column volume in 8H171-Gd-6, and again stopped the run to check readings. There was no detectable activity in cone-6, and we restarted the run still collecting in cone-6.

0954- We stopped the run after we had collected 4 column volumes (1.6 ml.) in cone-6. We emptied the column reservoir of the remaining 4.2 pH solution, and refilled it with 0.25$^{M.}$AHIB 4.4 pH.

0957- We restarted the run, collecting in cone 8H171-Gd-7, at a flow rate of 1 drop every 10 seconds. We emptied the reservoir, stopped the run, and found no detectable activity in cone-7. Cone-7 had a final volume of 2.5 ml. (6.25 column volumes).

1007- 0.5$^{M.}$ AHIB 4.8 pH was placed into the column reservoir and we stripped the remaining impurities off the column into cone 8H171-Gd-8 with a flow rate of 1 drop every 7 seconds. Ten (10) ml. was collected in the strip cone (cone-8).

been labeled 8H170-Gd Filtrate. About 5 ml. of the filtrate was submitted to Analytical for gamma scan analysis. On 8/5/1988, the ^{153}Gd gamma scan was reported to be <10 Bq/ml.

The precipitate was redissolved from the filter by adding 2.0$^{M.}$ HCl to the funnel. 4.1 ml. of product was caught in a 15-ml.graduated cone. This was labelled 8H170-Product.

The 8H170-Product fraction was dried down to .2 ml. using an infrared lamp. This was diluted to 1.5 ml. using H_2O - IX to redissolve the gel-like solution in the product cone, and will be further acid adjusted just prior to the AHIB column run.

AUGUST 1,1988

Fraction 8H170 Gd- Product was adjusted to 0.25$^{M.}$ HCl and pipetted into a water - jacketed separations column having 0.75 ml. of Dowex 50W-X8(-400) resin and column temperature at 80 degrees C.

RUN CHRONOLOGY

0902- We started loading the feed on the column @ 1 drop (50 lambda) / 6.7 seconds, using argon gas pressure with the argon gauge pressure set at 10 psi. The raffinate and flushes were collected in a graduated cone labelled 8H171-Gd - Raff.

0910- The feed was completed being loaded onto the column, and a H_2O-IX flush started. Radiation readings confirmed that the gadolinium had loaded at the top of the resin column.

0915- The water flush was completed, .3$^{M.}$ NH_4NO_3 flush was added to the column reservoir, and this was started through the column.

0922- After the through-put of 4 ml. of NH_4NO_3, the column had converted back to the NH_4+ form. This was followed with a H_2O-IX flush. The total Raff. cone fraction was 10.8 ml.

Al - Mg - Gd PRECIPITATION
JULY 29, 1988

We dissolved 25 mg. of Al foil in .5 ml. of 6$^{M.}$ HCl in a 15 ml. graduated cone. We had to apply heat with an infrared lamp before the aluminum would react with the acid.

We weighed out 39 mg. of $MgCl_2$ (10 mg. of Mg) and added this to the Al solution. This readily dissolved . Also added were .5 ml. of the Gd feed and 2.0 ml. of 6$^{M.}$ HCl. This solution (2.5 ml.) was diluted to 10 ml. using H_2O - IX. The estimated acidity of the final solution is 1.5$^{M.}$.

We started adding 6.0$^{M.}$ NaOH in increments to observe the precipitation of the three metals. Upon the addition of 2.5 ml., there was definite precipitation - the solution became turbid. The addition of another 0.5 ml. did not seem to increase the turbidity. We allowed the solution to settle a few minutes, and then centrifuged the solution. The precipitate covered the round bottom of a 50-ml. cone. All of the metals appeared to have precipitated out of the solution.

An additional 2 ml. of 6.0$^{M.}$ NaOH (a total of 5.0 ml. of 6.0$^{M.}$ NaOH was added to the precipitation process) was added to the solution; the solution cleared somewhat, and after centrifuging, the amount of precipitate decreased by about 33%. We hoped the additional NaOH would drive the aluminum back into solution, leaving only the magnesium and the gadolinium precipitated.

The solution was then agitated and poured into a medium 30-ml. Buchner funnel. The filtrate was pulled through the funnel by means of vacuum and 25 ml. was collected in a 50-ml. graduated cone. This was in turn transferred to a small flask that had

^{145}PM FEED PREPARATION

AUGUST 25, 1988

The ^{145}Pm was in a cone marked Pm-145 MO-A-CL3 that had been found by Joe Halperin from much earlier work at ORNL. 1.5^{M}· HCl (UP) was added to the cone to dissolve the promethium. Some samarium and neodynium in small undetermined quantities are known to exist in the feed. An earlier run containing radioactive samarium, promethium, and neodynium was made and used as a yardstick for this run. This trial run used ^{147}Pm as the radioactive promethium tracer.

The dissolved ^{145}Pm was placed in a 50-ml. centrifuge tube. The dissolution cone was rinsed three times with 1.5^{M}· HCl stock solution; first with 1.4 ml., then with 1.9 ml., next with 5.0 ml., and finally with 0.7 ml. The dissolution cone and the transfer pipet had no activity when checked with a portable radiation instrument.

39 mg. of $MgCl_2$ (10 mg. of Mg) was added to the feed solution to act as a carrier for the promethium during the precipitation process. 3.4 ml. of 6.5^{N}· NaOH was added to the tube to precipitate the promethium. The resulting precipitate had a light pink color similar to the oxide form of promethium in powder form.

The precipitate/filtrate solution was transferred to a 15-ml. medium porosity Buchner funnel. The centrifuge tube was rinsed several times with 1^{N}·NaOH . After the rinses, the tube and the transfer pipet had no activity. The filtrate was collected in a 15-ml. graduated cone and it also had no activity associated with it as detected with a portable radiation meter. To the funnel was added several ml.'s of 2.0^{M}· HCl and the funnel was heated by infrared heat to aid the dissolution of the promethium/magnesium solids in the funnel. The product fraction was collected in a 15-ml. graduated cone marked ^{145}Pm+Mg. The total volume of this product fraction was about 5 ml. This was then taken to total dryness in a drying rig using infrared heat with an argon purge.

^{145}PM SEPARATION

AUGUST 26, 1988

After the product feed fraction from the preparation process was dried down, it was reconstituted to 0.5 ml. using 0.1M· HCl and then transferred to the reservoir of the separations column. This column was used on the earlier trial run. It has a bed volume of 0.6 ml. of Dowex 50W-X8(-400) resin with a column volume of approximately 0.3 ml. We attempted to use the same fractional cuts as we had in the trial run for this run; however, something went awry, and we had to make our cuts based solely upon our radiation measurements as each drop was exiting the column. Several 0.1M· HCl(UP) rinses of the feed cone were made to make sure that all of the promethium had been transferred to the separation column reservoir.

The feed was pressure-loaded onto the column using argon gas pressure. The loading rate was approximately 300 lambda/ minute (1 drop every 10 seconds). This was followed by a small volume flush of H_2O(IX) to remove any interstitial free acid from the resin column. Then the separations column was converted back to the NH_4+ form using 0.3M· NH_4NO_3. This conversion was determined to be complete by using litmus paper to determine the pH after exiting drops from the column. The column was then given a final H_2O(IX) flush to displace any free NH_4NO_3 from the column. The raffinate was collected in a cone marked REZ-Pm30-Raff with a final volume of 8.5 ml. The resin column displayed a very distinct yellow band about .25" from the top after loading.

We added 0.25M· AHIB pH 3.8 to the column reservoir and pressured this through the column at the rate of 1 drop every 10 seconds with collection in a cone marked REZ-Pm30-1. A total of 3.0 ml. of 3.8 pH was passed through the column; the yellow band eluted from the column while the 3.8 pH was pressured through the column. This 3.0 ml is equivalent to 10 column volumes. We then switched to 0.25M· AHIB pH 4.2. After 8.4 ml (28 column volumes) had been eluted through the column, we switched eluent collection to cone REZ-Pm30-2. Radiation readings indicated no activity in cone-1.

We collected 1.9 ml. (6.33 col. vols.) in cone -2 and the radiation meter appeared to be seeing above background activity coming from the column. We switched eluent collection to REZ-Pm30-3. Cone -2 read about 1000 cpm above background. While continuing with 4.2 pH 0.25M· AHIB, we collected 1.2 ml.(4 col. vols.) in cone -3; and then switched to cone -4. Cone -3 read about 1800 cpm above background.

We switched to 0.25M· AHIB pH 4.4 as we started collection in cone -4. We collected 0.6 mls.(2 col. vols.) in cone -4, then switched to cone -5 for another 0.6 mls.(2 col. vols.). The reading on cone -4 was about 400 cpm above background and on cone -5, it was about 150 cpm above background. We collected 0.6 mls.

(2 col. vols.) in cone -6 with no activity apparent and then 1.8 mls. (6 col. vols.) in a cone -7 with no activity. This indicated that all of the promethium had been eluted from the column since it was the only known radioactive constituent in the feed. We proceeded to switch to 0.5M AHIB pH 4.8 and strip the column, collecting 3.6 mls. (12 col. vols.) in a cone -8. This cone also had no detectable activity above background.

9/3/86 "But" column separation of ^{147}Pm-Nd

4×100 mm, jacketed (200-400 mesh, 8% cross linked Dowex 50) ~10# overpress, 23°

9:40 a.m. Column bath up to temp, $-H_2O$ washed.

~1 mL R.E. mixture in 0.1M HNO_3 put on column

2 × 0.5 mL 0.1M HNO_3 rinses added to column, + 2 mL H_2O

Drop rate ~2 l/min ≅ 1 ml/min.

Pentalab & detector gives ~3000 c/m for band on column

1 bead (6 mL) 0.3M NH_4NO_3, 2nd bead 0.3M NH_4NO_3, ½ bead H_2O

Tube (45-1) for tracer, H_2O, NH_4NO_3

10:12 a.m. Switch tubes 45-2 (Vol (45-1) = 14.7 mL) slow column to ~10 drops/min

Add pH 4.2, 0.25 "But"

10:16 Sep 100 drops, up to ~4.0

10:24 Switch to 45-3, Vol (45-2) = 5.6 mL add bead 4.4 "But"

10:36 add bead of 4.4 "But" – center of band at ~150 mL/min – center of band ½ down tube

10:42 Switch to 45-4, Vol (45-3) = 6.3 mL – center of band ½ down

10:45 " " 45-5, Vol (45-4) = 2.1 " center of band ~⅓ "

10:50 initial increase of activity coming off 400-500 c/m

10:52 Switch to 45-6 [Vol (45-5) = 1.8 mL (~10 drops) drops → 500-700 c/m ?

10:55 Switch to 45-7 [Vol (45-6) = 1.5 mL, 1200 c/m] drops 400-500

10:59 " to 45-8 [Vol (45-7) = 2.0 mL, 900 c/m] "

11:02 " " 45-9 [Vol (45-8) = 0.95 mL 500 c/m] "

11:02 add bead of 4.64 "But" (mixed with 45-9) drops < 400

11:05 Switch to 45-10 [Vol (45-9) = 0.95 mL 400 c/m]

(11:23) Switch to 45-11 [Vol (45-10) = 1.3 mL 450 c/m]

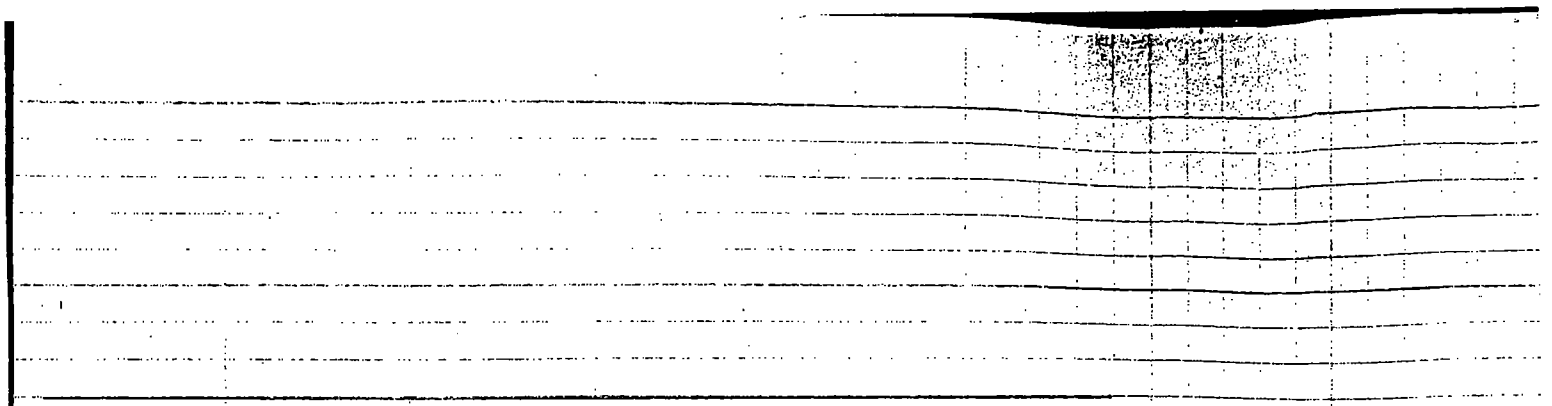
[Vol (45-11) = 1.9 mL 300 c/m]

11:20 get a drip with 0.5M But" pH = 4.8

	6: 330-354	7: 382-411	8: 626-650	5: 679-703	1: 15-1024		
t=120 secs	(6) 36-37 kev	42 kev	67.2 kev	72.4 kev		59.5	
AS-1 (14.7)	3	3	20	34	379		
AS-2 (5.6)	5	4	15	26	373		
AS-3 (6.3)	17	17	22	35	593		
AS-4 (2.1)	43	29	16	29	883		
AS-5 (1.8)	26336	6621	315	543	53377		
AS-6 (1.0)	79616	20301	997	1734	163341		
AS-7 (1.0)	66535	16823	811	1342	135209	✓	
AS-8 (0.95)	43375	11051	584	990	87669		
AS-9 (0.95)	34124	8110	295	573	68941		
AS-10 (1.3)	31011	7808	396	749	62240		
AS-11 (1.9)	29201	7491	318	653	58807		
Strip (15)	67365	17186	895	1526	135186		
Bkgd	3	2	11	40	376	(1/4)	
Am-241 (10 μCi com.)						32184	t=60 sec
3 cm dist.							
Same det. mount							

Sample	Vol (ml)	26+37 KeV [a]	42 KeV [b]	67.2 KeV [c]	72.4 KeV [d]	Total [e]
AS-1	14.7	3	3	20	34	379
AS-2	5.6	5	4	15	26	373
AS-3	6.3	17	17	22	35	593
AS-4	2.1	43	20	16	29	883
AS-5	1.8	26336	6621	315	543	53377
AS-6	1.0	79616	20301	997	1934	163341
AS-7	1.0	66535	16823	811	1542	135209
AS-8	0.95	43375	11081	584	990	87669
AS-9	0.95	21124	6110	295	573	48941
AS-10	1.3	31011	7808	396	749	62240
AS-11	1.9	29201	7481	318	653	58807
Shop		67365	17186	895	1536	139186
Bkgd		3	2	14	40	376

[a] channels 330-354
[b] channels 382-411
[c] channels 626-650
[d] channels 678-703
[e] channels 15-1024
[f] counting time = 120 sec
[g] source (midplane) to detector = 3 cm



Sample	Exp (36+37)/42	Kocher (36+37)/42	Exp 72.4/67.2	Kocher 72.4/67.2
AS-1	1.00	4.07	1.70	3.35
AS-2	1.25		1.73	
AS-3	1.00		1.59	
AS-4	2.15		1.81	
AS-5	3.98		1.72	
AS-6	3.92		1.94	
AS-7	3.96		1.90	
AS-8	3.91		1.70	
AS-9	3.95		1.94	
AS-10	3.97		1.89	
AS-11	3.90		2.05	
Str.p	3.92		1.72	

AS-5	72.4	67.08	43.10	42.30	37.48	36.98	27.85	
(4/4)	27.35	22.03						
AS-4	22.03	38.88						
(3/4)								
AS-3	21.93	38.78	11.99					
(2/3)								
Am-241	59.55	49.82	43.60 (vs)	33.31 (vs)	26.74 (m)	21.33 (m)	18.32 (b)	
	17.51 (m)	14.50 (m)						

6%

Calcined
10%

100 mg $^{64\%}Pm$ $^{1\%}Pm$ <0.5 mg ^{1-17}Pm

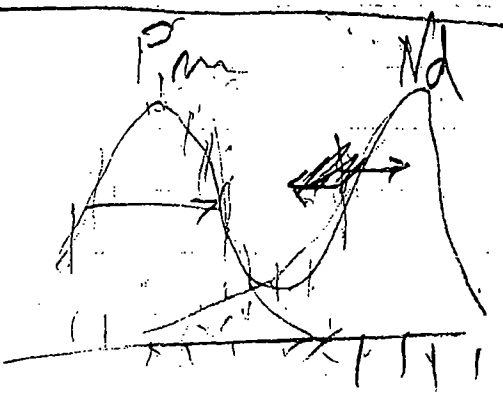
100 mg Nd 0.5 mg $^{1\%}Nd$ $^{14\%}Nd$ ~3.4 $^{1\%}Nd$ 88%

40 → 1.4 → 2.5

10-fold Nd / Pm → 0.15 .34 ± .007 9 mg

2%

Nd - Pm



15 Sept 86

Started work at 0920 hrs. Combined Pm / Nd 45-5 into Pm/Nd 45-6 for the first cleanup run. Volume of 45-5 was 1.8 ml. Volume of 45-6 was 1.9 ml. Combined the two and added ½ ml of 2M of HCl to break complex (2 used cond.). Washed 0.1 M HCl and transferred to column. Bkgd is 2633 integral and 2 counts in x-ray channel( ). Collection into CL-1. Count rate time on MCA was 6 seconds. A drop about every 10 seconds. Bkgd seemed to drop below 2000 during loading. Column probing indicated loading at the top of the shrunken resin. Drop readings were still < 2000 c and no indication of ... x-rays. Made another rinse of 45-6 with 0.1 N HCl. Added another 0.1 M HCl rinse (about ⅓ - ½ bowl full). Added another 0.1 M HCl rinse. At 1035 hrs switched to 2M and CL-2. At 1043 hrs added some more 2M HCl, about ⅓ bowl full. At 1048 hrs switched to CL-3 and 6M HCl. At 1051 switched to CL-4. At 1056 hrs switched to CL-5 and added some more 6M HCl and, later, H2O. Terminated ... at 1113 hrs.

6 sec cnt

CL-1	7.9 ml	2144	(ch 1 - 12 cnts) (ch 16 - 7 cnts)
CL-2	2.2 ml	3671	(ch 16 - 31 cnts) (ch 1 - 43 cnts)
CL-3	0.8 ml	20644	(ch 16 - 336 cnts) (ch 1 - 693 cnts)
CL-4	0.8 ml	2661	(ch 1 - 14 cnts) (ch 16 - 10 cnts)
CL-5	2.0 ml	2577	(ch 16 - 3 cnts) (ch 1 - 11 cnts)
Bkgd		2608	(ch 1 - 8 cnts) (ch 16 - 3 cnts)

MARTIN MARIETTA ENERGY SYSTEMS, INC.
POST OFFICE BOX P
OAK RIDGE, TENNESSEE 37831
Operated for the U.S. Department of Energy
Under U.S. Government Contract DE-AC05-840R21400

OAK RIDGE NATIONAL LABORATORY

ISOTOPE DISTRIBUTION DOCUMENT

LG

Document Number: 123858

BILL TO:

Charge 337066-6001

C. Alexander
Chem-Tech Division
ORNL

SPECIAL INSTRUCTIONS AND REMARKS

Isotope Order Number: 39-0019
Date Shipped:
Customer Code: 49100
Customer's Order:

ISOTOPE or SERVICE	DESCRIPTION (chemical/physical form, enrichment, batch number)	COMPOUND WEIGHT	MATERIAL TYPE	SALES UNIT *	TYPE SALE	NUMBER OF UNITS SHIPPED	NUMBER OF UNITS BILLED **	UNIT PRICE	EXTENSION
m-144	Samarium oxide (solid), 96.47%, 167090	11.6	4647-0430	mg	71	10	10	Min.	$100.00
ndling Charge			3631 –	pkg					

Ci = Curie; mCi = Millicurie; uCi = Microcurie; gr = Gram; mg = Milligram; ug = Microgram; pkg = Package
If different from amount shipped, difference represents decay adjustment or process loss.

Sales Approval / Date:

Total:

ATTACHMENTS: ☐ Radioactive or ☒ Stable Isotope Shipping Order ☐ Returnable Container Notice ☐ Other (See Remarks)

Packing / Date: MC/10-25-85

To Sales / Date: DM 10/29/85

2 Packing List

Forwarded To Accounting:

CN-12334 (3 6-84)

15 Sept 86

Started back to work at 1340 hrs. Will be working only with Pm/Nd 45-7 this time. Initial volume is 0.9 ml. Added 0.2 ml of 2M HCl to break the butyrate complex and convert it to ~ 0.3M. This was added directly to cone coming up with a volume of ~1.2 ml. Cone was air sparged to ensure mixing. Solution was added to reservoir. Bkgd read 1407 cnts in a 6 sec period. Ch. 16 gave 3 cnts and Ch 1 gave 2 cnts. Cone was rinsed three times with 0.1 M HCl and all rinses added to reservoir. Collection was into Pm 7 CL-1. During load Bkgd seemed to increase to 1600-1700 cnts. Drop rate was about 10 secs/drop. At 1310 hrs about 1/3 of a bowl was added to reservoir. Portions of the column recolored loading had taken place at the top of the column. Bkgd during this period was viewed 2600 counts. Why there is this fluctuation I do not know. At 1315 hrs about 1/4 of a bowl of 0.1 M HCl was added to the reservoir. Bkgd seemed to shift slightly downwards. Added 2M HCl at 1322 and started collection in CL-2. Drop rate was slowed slightly. At 1330 hrs probing of the column indicated Pm was halfway down the column. Switched cones at 1340 hrs to CL-3. At 1341 hrs switched to 6M HCl. Switched to CL-4 at 1344 hrs. At 1345 hrs switched to CL-5 and 6 M HCl. Everything seemed to be off the column. Terminated run at 1353 hrs.

CL-1	5.1 ml	2881	(ch 1 - 10 cnts) (ch 16 - 8 cnts)
CL-2	2.6 ml	2275	(ch 1 - 15 cnts) (ch 16 - 7 cnts)
CL-3	0.9 ml	17249	(ch 1 - 517 cnts) (ch 16 - 303 cnts)
CL-4	0.5 ml	2797	(ch 1 - 13 cnts) (ch 16 - 7 cnts)
CL-5	3.6 ml	2649	(ch 1 - 12 cnts) (ch 16 - 2 cnts)
Bkgd		2525	(ch 1 - 8 cnts) (ch 16 - 3 cnts)

13 Sept 86
1513 hrs
120 sec counting per

Off . (1)
. (2)
. (3)
. (4)
. (5)
(6)

Channels 36-187, Source 2" away			Gross	(138) 67p	(171) 72p	(47) 42p	(35) 38p
				(no real structure)			
Pm 3+6	CL-1	3/4/6*	521	16	11	1	3
	CL-2	2/4/2	4855	21	36	331	1202
	CL-3	2/4/6	79460	244	659	6162	21142
	CL-4	2/4/4	1251	9	18	75	201
	CL-5	3/4/6*	494	9	7	0	1
				(no real structure)			
Pm 7	CL-1	3/4/6*	504	9	15	3	1
				(not well defined)			
	CL-2	3/4/3	1106	9	13	51	161
	CL-3	3/4/4	50913	158	404	3924	13256
				(not well defined)			
	CL-4	3/4/5	717	8	11	21	58
				(no real structure)			
	CL-5	3/4/6*	489	5	6	2	4
	Bkgd	3/4/6*	516	8	12	0	2
	Std	3/4/6*	4514	29	46	344	1166

P-TYPE COAXIAL

1.77 mg / ml = 1.77 mg / λ

1.77 mg / λ

17.7 mg / 10λ

100 ng / 10λ

100 x 10^{-3} mg / 10 λ

0.1 mg / 10λ

10 ng / λ

$\left(\frac{17.7}{10}\right)$ $\frac{17.7 \text{ mg}}{x} = \frac{0.1 \text{ mg}}{10}$

$x = \frac{17.7 \times 10}{0.1} = 1770\ \lambda$ or 1.76 ml

$\frac{1.77 \text{ mg}}{177\ \lambda} \cdot 1 \times 10^{-2}$ mg/λ

= 10 ng/λ

= 100

4.77M $\frac{10^{-3}}{177} = \frac{0.00564}{x}$

16 Sept 86

Started back to work at 0950 hrs. Will be working only with Pm/Nd 45-8. Initial volume is 0.9 ml. Added 0.2 ml of 2M HCl to break the butyrate complex and convert it to ~0.2M. This was added directly to 45-8. About 0.15ml of 0.1 M HCl was added by accident to the cone. However, this only raised the molarity to 0.014 M. I decided to go ahead and add ~0.15 ml of 2M. This should bring it pretty close to 0.2N. The cone, ~1.2 ml in volume, was air sparged and pipet tip was touched to pH paper. Paper turned red indicating complex had been broken. Forced some water through the column because the reservoir had gone dry overnight. Background prior to loading was ~ 2548 cnts in a 6 sec. period. Ch 1 read 8 cnts and Ch 16 read 7 cnts. Collection was into Pm-8 CL-1. Two rinses of 45-8 of 0.1 M HCl (~ 1 ml each) were put in the column reservoir. Background after placing Pm in column reservoir was about 2735 cnts. Ch 16 read 7 cnts and Ch 1 read 9 cnts. Started the actual run at 1115 hrs. Drop rate initially was about 5 secs/drop. Decided to slow it down. Slowed it down to about 10 secs/drop. Bkgd seemed to drop somewhat during loading. Another 1 ml rinse of 0.1 M HCl was added to the column. Probing of the column indicated loading right at the top. Added about 1/2 of a load of 0.1 M HCl at 1157 hrs. At 1115 switched to 2M HCl and started collection in CL-2. Drop rate was ~10-11 sec/drop. Switched to CL-3 at 1130 hrs. Put in 6N at 1132 hr. Switched to CL-4. Switched to CL-5 at 1142 hrs. Terminated run at 1145 hrs.

CL-1	6.3 ml	1836	(Ch 1 - 4 cnts) (Ch 16 - 2 cnts)
CL-2	2.1 ml	2233	(Ch 1 - 12 cnts) (Ch 16 - 5 cnts)
CL-3	0.5 ml	1831	(Ch 1 - 6 cnts) (Ch 16 - 2 cnts)
CL-4	0.7 ml	19042	(Ch 1 - 96 cnts) (Ch 16 - 223 cnts)
CL-5	1.3 ml	2514	(Ch 1 - 9 cnts) (Ch 16 - 6 cnts)
Bkgd		2186	(Ch 1 - 4 cnts) (Ch 16 - 2 cnts)

11 Pm.
16 Sept 86
1550 hrs

OFF
(1)
(2)
(3)
(4)
(5)

			Gross	(85) 38 kev
Ch 36-187				
Strip (From separation)		3/4/3	53623	13501
Pm-8	CL-1	3/4/4	502	1
	CL-2	3/4/5	505	3
	CL-3	3/4/6	636	36
	CL-4	2/4/3	30183	8053
	CL-5	2/4/4	565	12
Bkgd		2/4/5	524	1
Std		2/4/6	4924	1271

ORNL

~~US10~~
~~US28~~
US29

69 pages

1.75 ml

45-5 + 45-6 = 2.8 ml of 0.25 M AHiB

(x ml) · 6M = (2.8 + x ml) · 0.3M

2.8 + x = 20x

19x = 2.8 ml

x ≅ 0.15 ml

(x ml) · 2M = (2.8 + x) ml · 0.3 M

2.8 + x = 6.667 x

5.667 x = 2.8

x ≅ 0.50 ml

(x ml) · 2M = (0.9 + x) ml · 0.3M

0.9 + x = 6.667 x

0.9 = 5.667 x

x = 0.16 ml ≅ 0.2 ml

(x ml) · 2M = (0.9 + x) ml · 0.3M

0.9 + x = 6.667 x

0.9 = 5.667 x

x = 0.16 ml ≅ 0.2 ml

(0.15 ml) · 0.1 M = (0.9 + 0.15) x M

10x = 0.15 / 1.05

x = 0.014 M

Attachment 1 – Acceptable Knowledge Documentation Checklist

Site(s): Oak Ridge National Laboratory

Waste Stream Description: Soil from NFS Stored at ORNL

Waste Stream Number(s): OR-NFS-CH-SOIL

Acceptable Knowledge Information	(1)AK#	Compiled? (Y/N)	Source Document Tracking Number
Mandatory generator site TRU waste program (PR) information			
Map of the generator site that identifies TRU waste generation, treatment, and storage areas.	PR1	Y	C099, C122, C145, M050, P014, P1373, P1374, P1402, P248, P256, P272, P273, P283, P432, U044, U054
Generator site mission descriptions related to TRU waste generation and management identifying defense and non-defense operations.	PR2	Y	C099, C100, C145, I053, M007, M021, M128, M132, P1374, P1402, P212, P218, P268, P269, P272, P432, U038, U040, U044, U050, U052, U054
Overview of the generator site and generator site TRU waste management operations in the context of the facility's mission.	PR3	Y	C099, C100, C119, C120, C121, C122, I022, I023, I043, I053, M007, M021, M128, M132, P1373, P1374, P1402, P256, P273, P283, P323, P432, U044, U052, U054
Descriptions of historical and current TRU waste generating operations, including how waste is tracked and managed and/or how operations relative to isotopic composition were tracked.	PR4	Y	C099, C100, C122, C145, C321, I022, I023, I043, I053, I056, I061, M003, M128, M132, M198, M207, P1370, P1373, P1374, P1375, P1402, P218, P268, P269, P272, P273, P321, P323, P432, P582, U043, U044, U052, U054, U055
Waste identification and/or categorization schemes and terminology used at the generator site, including codes correlating to specific isotopic distributions.	PR5	Y	C321, I022, I023, I043, I052, M198, M207, M208, M209, M217, P1402, P317, P321, P432, P582, U044, U055
Types and quantities of TRU waste generated, including historical generation through future projections.	PR6	Y	C099, C122, C126, C145, C230, I053, I056, I061, I068, M003, M007, M017, M018, M021, M128, M132, M198, M207, M217, P1370, P1373, P1374, P1375, P1402, P218, P248, P273, P274, P323, P582, U040, U043, U044, U054, U055

CCP RECORDS ORIGINAL
DATE REC'D 2/15/16
MR

Waste Stream Number(s): OR-NFS-CH-SOIL			
Acceptable Knowledge Information	[1]AK#	Compiled? (Y/N)	Source Document Tracking Number
Correlation of waste streams and description of time of generation, waste generating processes, and area and building/facility where each waste stream was generated.	PR7	Y	C099, C119, C120, C121, C122, C125, C126, C127, C129, C130, C145, C204, C205, C206, C227, C230, C321, DR013, DR022, I052, I053, I061, M003, M007, M008, M017, M052, M198, M217, P1373, P1375, P1402, P218, P248, P272, P273, P300, P303, P306, P315, P323, P582, U043, U044, U052, U054, U058
Certification procedures for waste to be sent to the WIPP facility (i.e., procedures to ensure that prohibited items are documented and managed in accordance with site-specific certification plans).	PR8	Y	M065, P1116, P1371, P1374, P1400, P1401, P1402, P1403, P1404, P218, P251, P252, P253, P254, P255, P268, P269, P273, P300, P303, P306, P315, P319, P323, P432, U044, U050, U052
Mandatory generator site TRU waste stream (WS)-specific information			
Waste stream designation	WS1	Y	C099, C100, C321, DR002, DR010, DR013, DR022, DR023, DR026, DR031, M003, M012, M017, M018, M019, M021, M128, M132, M198, M217, P268, U044
Area(s) and building(s) from which the waste stream was or is generated.	WS2	Y	C099, C100, C119, C120, C121, C122, C125, C126, C127, C129, C130, C145, C204, C205, C206, C210, C227, C230, DR010, DR013, I052, I053, I056, I058, I059, I061, I068, M003, M007, M008, M012, M017, M021, M052, M058, M065, M067, M128, M132, M198, M217, P1370, P1371, P1372, P1373, P1374, P1375, P1402, P1404, P218, P248, P256, P268, P269, P272, P273, P274, P283, P300, P303, P304, P306, P315, P317, P323, P432, P582, U016, U017, U040, U043, U044, U052, U054, U058, U597

Waste Stream Number(s): OR-NFS-CH-SOIL

Acceptable Knowledge Information	(1)AK#	Compiled? (Y/N)	Source Document Tracking Number
Waste stream volume and time period of generation	WS3	Y	C099, C100, C122, C210, C230, C321, DR010, DR013, I052, I053, I056, I061, I068, M003, M007, M012, M021, M128, M132, M198, M217, P1370, P1373, P1374, P1375, P1402, P212, P218, P248, P268, P269, P272, P273, P274, P323, P432, U016, U017, U040, U043, U044, U054, U055
Waste generating process (describe for each building) including processes associated with U134 waste generation, if applicable.	WS4	Y	C099, C100, C119, C120, C121, C122, C125, C126, C129, C130, C142, C145, C321, DR010, DR013, I053, I056, I061, I068, M008, M012, M021, M128, M132, P1370, P1371, P1373, P1374, P1375, P1404, P212, P218, P248, P268, P269, P272, P273, P274, P323, P582, U040, U043, U044, U052, U054
Process flow diagrams. For research/development, analytical laboratory waste, or other similar processes where process flow diagrams cannot be created, a description of the waste generating processes, rather than a formal process flow diagram, may be included, if	WS5	Y	C099, C125, C126, C127, I053, I056, I058, I059, I061, I068, M008, P1400, P1402, P218, P256, P273, P432, U040, U044
Summary of basis and rationale for delineating each waste stream including justification for combining waste historically managed separately as TRU mixed and TRU non-mixed waste streams into a single waste stream, that is traceable to referenced documents.	WS6	Y	DR010, DR022, M012, M017, M018, M021, M128, M132, P1370, P1373, P1374, P1375, P300, U044
Generator site mission descriptions related to TRU waste generation and management identifying defense and non-defense operations.	WS7	Y	C099, C100, C145, I053, M007, M021, M128, M132, P1375, P1402, P212, P218, P268, P269, P432, U044, U050, U052, U054
Material inputs or other information that identified the chemical contents of the waste and the stream. Includes events or processes that may have modified the chemical properties of the waste stream after generation.	WS8	Y	C119, C120, C121, C142, C145, C204, C210, C227, C309, C321, DR010, DR013, DR031, I052, I053, I056, M008, M011, M012, M017, M018, M126, M128, M132, M198, M202, M207, M208, M209, M217, P1370, P1373, P1374, P1375, P1402, P212, P248, P273, P274, P319, P323, P432, P582, U043, U044

Waste Stream Number(s): OR-NFS-CH-SOIL			
Acceptable Knowledge Information	[1]AK#	Compiled? (Y/N)	Source Document Tracking Number
Physical waste form (e.g., glovebox materials and chemicals handled during glovebox operations, if applicable), assigned summary category group, waste matrix code and materials inputs, including waste material parameters present in the waste stream. Includes events or processes that may have modified the physical properties of the waste stream after generation.	WS9	Y	C099, C122, C125, C126, C127, C129, C130, C145, C206, C210, C321, DR010, DR013, DR022, DR023, DR026, DR031, I052, I053, I056, I058, I059, I061, I068, M012, M018, M019, M021, M052, M058, M061, M067, M068, M075, M126, M128, M132, M198, M202, M207, M208, M209, M217, P014, P1370, P1371, P1372, P1373, P1374, P1375, P1402, P1404, P218, P248, P268, P269, P273, P274, P304, P319, P323, P582, U017, U040, U043, U044, U052, U054, U055
Waste identifiers assigned by the generator site (e.g., item description code, packaging identification numbers).	WS10	Y	C099, C130, M003, M012, M018, M019, M198, M202, M207, M208, M209, M217, U044
Specification of the isotopic ratios for the ten WIPP-tracked radionuclides and all radionuclides other than the ten WIPP-tracked radionuclides that contribute to 95 percent of the radioactive hazard for a payload container. Chemical and physical information that could affect the waste isotopic distribution, as well as calculations used to derive the isotopic distribution.	WS11	Y	C099, C100, C122, C145, C210, C321, DR002, I052, I053, I058, I061, I067, M003, M007, M008, M012, M016, M017, M021, M061, M065, M128, M132, M198, M211, M217, P014, P1370, P1373, P1374, P1375, P1402, P1405, P212, P218, P268, P269, P273, P274, P317, P321, P432, U016, U017, U043, U044, U050, U055, U058, U597
State and EPA hazardous waste constituents in the waste stream and state and EPA Hazardous Waste Numbers assigned, including documentation regarding how the site has historically managed the waste, including the historical regulatory status of the waste (i.e., TRU mixed versus TRU non-mixed waste).	WS12	Y	C099, C122, C142, C145, C146, C147, C204, C205, C210, C227, C309, DR010, DR013, DR031, I052, I053, I056, I058, M003, M007, M008, M011, M012, M020, M062, M063, M064, M128, M132, M198, M202, M207, M208, M209, M217, P1116, P1375, P1402, P212, P273, P304, P317, P432, U043, U044

Waste Stream Number(s): OR-NFS-CH-SOIL			
Acceptable Knowledge Information	[1]AK#	Compiled? (Y/N)	Source Document Tracking Number
Additional acceptable knowledge documentation (briefly describe):			
Process design documents (e.g., Title II Design)	S1	N	N/A
Standard operating procedures that may include a list of raw materials or reagents, a description of the process or experiment generating the waste, and a description of the waste generated and how the wastes are managed at the point of generation	S2	Y	C119, C120, C121, C122, C125, C126, C127, C129, C130, I056, I058, I059, I061, I067, I068, M210, P1370, P1371, P1372, P1400, P1401, P1403, P1407, P251, P252, P253, P254, P267, P273, P300, P303, P304, P306, P315, P582, U044
Preliminary and Final Safety Analysis Reports and technical safety requirements	S3	Y	P256, P432
Waste Packaging records	S4	Y	M003, M052
Test plans or research project reports that describe the reagents, radionuclides, and other raw materials used in experiments	S5	Y	P1372, P1404, P212
Site databases (e.g., chemical inventory database for SARA Title III requirements, SNM or nuclear material databases)	S6	Y	M012, M198, M217
Information from site personnel (e.g., documented interviews)	S7	Y	C100, C206, C210, C227, C230, C309, C321
Standard industry documents (e.g., industry specification sheets, handbooks, reference materials, or other vendor information)	S8	Y	C146, C147, M011, M210
Analytical data relevant to the waste stream, including results from fingerprint analyses, spot checks, routine verification sampling or other processes that collected information pertinent to the waste stream. This may include new information (or previously collected data) which augments required information (e.g., visual examination not performed in compliance with CCP-PO-001, radiography screening for prohibited items.	S9	Y	C122, C205, I052, I053, M017, M019, M020, M061, M062, M063, M064, M065, M068, M211, P1374, P1375, P1402, P1404, U043, U044, U597
Material Safety Data Sheets, product labels, or other product information	S10	Y	C200, C201, M011, M210
Laboratory notebooks that detail the research processes and raw materials used in an experiment	S11	Y	M052, U016
Comparable or surrogate sampling and analysis data	S12	Y	I052, P1402
Other (describe)	S13	N	N/A
Safeguards and security, Materials Control and Accountability, and other nuclear material control system data Reports of nuclear safety or criticality accidents involving special nuclear materials (SNM)	S14	N	N/A
NMMA logs or inventory records or waste disposal logs providing SNM or nuclear material information	S15	Y	M003, M012

Waste Stream Number(s): OR-NFS-CH-SOIL

Acceptable Knowledge Information	(1)AK#	Compiled? (Y/N)	Source Document Tracking Number
Packaging	S16	Y	C126, C127, C129, C130, C210, C321, C622, DR015, DR038, I052, I053, I056, I059, I061, I068, M003, M007, M012, M016, M019, M052, M058, M067, M075, M126, M128, M130, M131, M132, M133, M202, M206, M207, M208, M209, M210, P1370, P1373, P1374, P1398, P1400, P1401, P1402, P1403, P1407, P251, P252, P253, P254, P267, P268, P269, P273, P274, P276, P315, P317, P323, P432, U040, U044, U055

Acceptable knowledge information regarding waste generated off-site or from similar process:

(1) AK#s are used as identifiers for program, waste stream-specific and supporting elements. The identifiers are to be used in the Acceptable Knowledge Source Document Summary and Acceptable Knowledge Information List to aid in the page location of program and waste stream-specific elements within a given document. N/A means that item is not applicable.

Additional comments:

All required AK information has been compiled and source document tracking numbers assigned.

Acceptable Knowledge Expert: Jeff Harrison / JH Harrison Date: 5/8/2015
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Attachment 1 – Acceptable Knowledge Documentation Checklist

Site(s): Oak Ridge National Laboratory

Waste Stream Description: Immobilized Liquids and Fines from NFS

Waste Stream Number(s): OR-NFS-CH-HOM-A			
Acceptable Knowledge Information	[1]AK#	Compiled? (Y/N)	Source Document Tracking Number
Mandatory generator site TRU waste program (PR) information			
Map of the generator site that identifies TRU waste generation, treatment, and storage areas.	PR1	Y	C099, C122, C145, M050, P014, P1373, P1374, P1402, P248, P256, P272, P273, P283, P432, U044, U054
Generator site mission descriptions related to TRU waste generation and management identifying defense and non-defense operations.	PR2	Y	C099, C100, C145, I053, M007, M021, P1374, P1402, P212, P218, P268, P269, P272, P432, U038, U040, U044, U050, U052, U054
Overview of the generator site and generator site TRU waste management operations in the context of the facility's mission.	PR3	Y	C099, C100, C119, C120, C121, C122, I022, I023, I043, I053, M007, M021, P1373, P1374, P1402, P256, P273, P283, P323, P432, U038, U044, U052, U054
Descriptions of historical and current TRU waste generating operations, including how waste is tracked and managed and/or how operations relative to isotopic composition were tracked.	PR4	Y	C099, C100, C122, C145, C321, I022, I023, I043, I053, I056, I061, M003, M198, M207, P1370, P1373, P1374, P1375, P1402, P218, P268, P269, P272, P273, P321, P323, P432, P582, U038, U043, U044, U052, U054, U055
Waste identification and/or categorization schemes and terminology used at the generator site, including codes correlating to specific isotopic distributions.	PR5	Y	C321, I022, I023, I043, I052, M013, M198, M207, M208, M209, M217, P1402, P317, P321, P432, P582, U038, U044, U055
Types and quantities of TRU waste generated, including historical generation through future projections.	PR6	Y	C099, C122, C126, C145, I053, I056, I061, I068, M003, M007, M013, M017, M018, M021, M198, M207, M217, P1370, P1373, P1374, P1375, P1402, P218, P248, P273, P274, P323, P582, U038, U040, U043, U044, U054, U055

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Waste Stream Number(s): OR-NFS-CH-HOM-A

Acceptable Knowledge Information	[1]AK#	Compiled? (Y/N)	Source Document Tracking Number
Correlation of waste streams and description of time of generation, waste generating processes, and area and building/facility where each waste stream was generated.	PR7	Y	C099, C119, C120, C121, C122, C125, C126, C127, C129, C130, C145, C204, C205, C206, C227, C321, I052, I053, I061, M003, M007, M008, M013, M017, M052, M054, M198, M217, P1373, P1375, P1402, P218, P248, P272, P273, P300, P303, P306, P315, P323, P582, U038, U043, U044, U052, U054, U058
Certification procedures for waste to be sent to the WIPP facility (i.e., procedures to ensure that prohibited items are documented and managed in accordance with site-specific certification plans).	PR8	Y	M065, P1116, P1371, P1374, P1401, P1402, P1403, P1404, P218, P251, P252, P253, P254, P255, P268, P269, P273, P300, P303, P306, P315, P319, P323, P432, U044, U050, U052
Mandatory generator site TRU waste stream (WS)-specific information			
Waste stream designation	WS1	Y	C099, C100, C321, DR030, DR031, M003, M012, M013, M017, M018, M019, M021, M198, M217, P268, U044
Area(s) and building(s) from which the waste stream was or is generated.	WS2	Y	C099, C100, C119, C120, C121, C122, C125, C126, C127, C129, C130, C145, C204, C205, C206, C210, C227, I052, I053, I056, I058, I059, I061, I068, M003, M007, M008, M012, M013, M017, M021, M052, M054, M058, M065, M067, M198, M217, P1370, P1371, P1372, P1373, P1374, P1375, P1402, P1404, P218, P248, P256, P268, P269, P272, P273,P274, P283, P300, P303, P304, P306, P315, P317, P323, P432, P582, U016, U017, U040, U043, U044, U052, U054, U058, U597
Waste stream volume and time period of generation	WS3	Y	C099, C100, C122, C210, C321, I052, I053, I056, I061, I068, M003, M007, M012, M013, M021, M198, M217, P1370, P1373, P1374, P1375, P1402, P212, P218, P248, P268, P269, P272, P273, P274, P323, P432, U016, U017, U040, U043, U044, U054, U055

Waste Stream Number(s): OR-NFS-CH-HOM-A			
Acceptable Knowledge Information	[1]AK#	Compiled? (Y/N)	Source Document Tracking Number
Waste generating process (describe for each building) including processes associated with U134 waste generation, if applicable.	WS4	Y	C099, C100, C119, C120, C121, C122, C125, C126, C129, C130, C142, C145, C321, I053, I056, I061, I068, M008, M012, M021, M054, P1370, P1371, P1373, P1374, P1375, P1404, P212, P218, P248, P268, P269, P272, P273, P274, P323, P582, U040, U043, U044, U052, U054
Process flow diagrams. For research/development, analytical laboratory waste, or other similar processes where process flow diagrams cannot be created, a description of the waste generating processes, rather than a formal process flow diagram, may be included, if justified.	WS5	Y	C099, C125, C126, C127, I053, I056, I058, I059, I061, I068, M008, P1402, P218, P256, P273, P432, U040, U044
Summary of basis and rationale for delineating each waste stream including justification for combining waste historically managed separately as TRU mixed and TRU non-mixed waste streams into a single waste stream, that is traceable to referenced documents.	WS6	Y	DR030, M012, M017, M018, M021, P1370, P1373, P1374, P1375, P300, U038, U044
Generator site mission descriptions related to TRU waste generation and management identifying defense and non-defense operations.	WS7	Y	C099, C100, C145, I053, M007, M021, P1375, P1402, P212, P218, P268, P269, P432, U038, U044, U050, U052, U054
Material inputs or other information that identified the chemical contents of the waste and the stream. Includes events or processes that may have modified the chemical properties of the waste stream after generation.	WS8	Y	C119, C120, C121, C142, C145, C204, C210, C227, C309, C321, DR031, DR037, I052, I053, I056, M008, M011, M012, M013, M017, M018, M126, M198, M202, M207, M208, M209, M217, P1370, P1373, P1374, P1375, P1402, P212, P248, P273, P274, P319, P323, P432, P582, U043, U044
Physical waste form (e.g., glovebox materials and chemicals handled during glovebox operations, if applicable), assigned summary category group, waste matrix code and materials inputs, including waste material parameters present in the waste stream. Includes events or processes that may have modified the physical properties of the waste stream after generation.	WS9	Y	C099, C122, C125, C126, C127, C129, C130, C145, C206, C210, C321, DR006, DR030, DR031, DR037, I052, I053, I056, I058, I059, I061, I068, M012, M013, M018, M019, M021, M052, M053, M058, M061, M067, M068, M075, M126, M198, M202, M207, M208, M209, M217, P014, P1370, P1371, P1372, P1373, P1374, P1375, P1402, P1404, P218, P248, P268, P269, P273, P274, P304, P319, P320, P323, P582, U017, U038, U040, U043, U044, U052, U054, U055

Waste Stream Number(s): OR-NFS-CH-HOM-A			
Acceptable Knowledge Information	[1]AK#	Compiled? (Y/N)	Source Document Tracking Number
Waste identifiers assigned by the generator site (e.g., item description code, packaging identification numbers).	WS10	Y	C099, C130, M003, M012, M013, M018, M019, M198, M202, M207, M208, M209, M217, M235, U038, U044
Specification of the isotopic ratios for the ten WIPP-tracked radionuclides and all radionuclides other than the ten WIPP-tracked radionuclides that contribute to 95 percent of the radioactive hazard for a payload container. Chemical and physical information that could affect the waste isotopic distribution, as well as calculations used to derive the isotopic distribution.	WS11	Y	C099, C100, C122, C145, C209, C210, C321, I052, I053, I058, I061, I067, M003, M007, M008, M012, M013, M016, M017, M021, M054, M061, M065, M198, M211, M217, P014, P1370, P1373, P1374, P1375, P1402, P1405, P212, P218, P268, P269, P273, P274, P317, P321, P432, U016, U017, U043, U044, U050, U055, U058, U597
State and EPA hazardous waste constituents in the waste stream and state and EPA Hazardous Waste Numbers assigned, including documentation regarding how the site has historically managed the waste, including the historical regulatory status of the waste (i.e., TRU mixed versus TRU non-mixed waste).	WS12	Y	C099, C122, C142, C145, C146, C147, C204, C205, C210, C227, C309, DR031, DR037, I052, I053, I056, I058, M003, M007, M008, M011, M012, M013, M020, M062, M063, M064, M198, M202, M207, M208, M209, M217, P1116, P1375, P1402, P212, P273, P304, P317, P432, U043, U044
Additional acceptable knowledge documentation (briefly describe):			
Process design documents (e.g., Title II Design)	S1	N	N/A
Standard operating procedures that may include a list of raw materials or reagents, a description of the process or experiment generating the waste, and a description of the waste generated and how the wastes are managed at the point of generation	S2	Y	C119, C120, C121, C122, C125, C126, C127, C129, C130, I056, I058, I059, I061, I067, I068, M210, P1370, P1371, P1372, P1401, P1403, P1407, P248, P251, P252, P253, P254, P267, P273, P300, P303, P304, P306, P315, P320, P582, U044
Preliminary and Final Safety Analysis Reports and technical safety requirements	S3	Y	P248, P256, P432
Waste Packaging records	S4	Y	M003, M052
Test plans or research project reports that describe the reagents, radionuclides, and other raw materials used in experiments	S5	Y	C122, P1372, P1404, P212, U038, U043
Site databases (e.g., chemical inventory database for SARA Title III requirements, SNM or nuclear material databases)	S6	Y	M012, M013, M198, M217
Information from site personnel (e.g., documented interviews)	S7	Y	C100, C206, C210, C227, C309, C321
Standard industry documents (e.g., industry specification sheets, handbooks, reference materials, or other vendor information)	S8	Y	C146, C147, M011, M210

Waste Stream Number(s): OR-NFS-CH-HOM-A

Acceptable Knowledge Information	(1)AK#	Compiled? (Y/N)	Source Document Tracking Number
Analytical data relevant to the waste stream, including results from fingerprint analyses, spot checks, routine verification sampling or other processes that collected information pertinent to the waste stream. This may include new information (or previously collected data) which augments required information (e.g., visual examination not performed in compliance with CCP-PO-001, radiography screening for prohibited items.	S9	Y	C122, C205, I052, I053, M013, M017, M019, M020, M061, M062, M063, M064, M065, M068, M198, M211, M217, M235, P1374, P1375, P1402, P1404, U038, U043, U044, U597
Material Safety Data Sheets, product labels, or other product information	S10	Y	C200, C201, M011, M210
Laboratory notebooks that detail the research processes and raw materials used in an experiment	S11	Y	M052, U016
Comparable or surrogate sampling and analysis data	S12	Y	I052, P1402
Other (describe)	S13	N	N/A
Safeguards and security, Materials Control and Accountability, and other nuclear material control system data Reports of nuclear safety or criticality accidents involving special nuclear materials (SNM)	S14	N	N/A
NMMA logs or inventory records or waste disposal logs providing SNM or nuclear material information	S15	Y	M003, M012, M013
Packaging	S16	Y	C126, C127, C129, C130, C203, C209, C210, C321, C622, I052, I053, I056, I059, I061, I068, M003, M007, M012, M013, M016, M019, M051, M052, M053, M058, M067, M075, M126, M128, M130, M131, M132, M133, M202, M206, M207, M208, M209, M210, P1370, P1373, P1374, P1398, P1401, P1402, P1403, P1407, P251, P252, P253, P254, P267, P268, P269, P273, P274, P276, P315, P317, P320, P323, P432, U040, U044, U055

Acceptable knowledge information regarding waste generated off-site or from similar process:

(1) AK#s are used as identifiers for program, waste stream-specific and supporting elements. The identifiers are to be used in the Acceptable Knowledge Source Document Summary and Acceptable Knowledge Information List to aid in the page location of program and waste stream-specific elements within a given document. N/A means that item is not applicable.

Additional comments:

Acceptable Knowledge Expert: JEFF HARRISON / [signature] Date: 1/13/15
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Attachment 1 – Acceptable Knowledge Documentation Checklist

Page 1 of 7
EDB
3/9/2016

Site(s): Oak Ridge National Laboratory

Waste Stream Description: CH-TRU Heterogeneous Debris from REDC

Waste Stream Number(s): OR-REDC-CH-HET

Acceptable Knowledge Information	AK#	Compiled? (Y/N)	Source Document Tracking Number
Mandatory generator site TRU waste program (PR) information			
Map of the generator site that identifies TRU waste generation, treatment, and storage areas.	PR1	Y	P014, P125, P161, P256, P272, P279, P432, U482
Generator site mission descriptions related to TRU waste generation and management identifying defense and non-defense operations.	PR2	Y	C078, C098, C306 C311, DR009, I044, M023, M251, P016, P020, P021, P098, P114, P136, P1440, P145, P151, P160, P161, P173, P223, P229, P258, P272, P279, P281, P432, P569, P952, P980, P981, U011, U038, U039, U478, U501, U543, U568, U647
Overview of the generator site and generator site TRU waste management operations in the context of the facility's mission.	PR3	Y	C078, C098, I022, I023, I044, M023, M072, M251, P125, P161, P256, P272, P281, P432, P569, P981, P982, U038, U647
Descriptions of historical and current TRU waste generating operations, including how waste is tracked and managed and/or how operations relative to isotopic composition were tracked.	PR4	Y	C078, C098, C103, C176, C306, C311, I022, I023, I044, M005, M023, M072, M244, M245, P020, P021, P098, P125, P1427, P1428, P1438, P1442, P151, P161, P173, P229, P241, P242, P244, P258, P263, P272, P279, P281, P432, P582, U038, U039, U124, U125, U126, U478, U568
Waste identification and/or categorization schemes and terminology used at the generator site, including codes correlating to specific isotopic distributions.	PR5	Y	I022, I023, I044, M024, M155, M241, M244, M245, P161, P241, P242, P244, P432, P582, U038
Types and quantities of TRU waste generated, including historical generation through future projections.	PR6	Y	C078, C098, DR004, I044, M005, M023, M024, M072, M241, M244, M245, M253, M254, P125, P1427, P1428, P161, P241, P242, P244, P263, P482, P500, P582, P588, P917, U011, U038, U046, U106, U108, U109, U110, U111

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Waste Stream Number(s): OR-REDC-CH-HET

Acceptable Knowledge Information	AK#	Compiled? (Y/N)	Source Document Tracking Number
Correlation of waste streams and description of time of generation, waste generating processes, and area and building/facility where each waste stream was generated.	PR7	Y	C078, C098, C174, C307, C600, DR003, DR005, DR601, DR602, I044, M001, M005, M024, M072, M073, M100, M155, M241, M244, M245, M252, M253, M254, M267, M270, P125, P1427, P1428, P1436, P1437, P1438, P161, P173, P229, P258, P272, P281, P582, P787, U038, U039, U041, U046, U105, U108, U124, U125, U126, U403, U412, U478, U505, U508
Certification procedures for waste to be sent to the WIPP facility (i.e., procedures to ensure that prohibited items are documented and managed in accordance with site-specific certification plans).	PR8	Y	C098, C103, C172, C311, M253, M254, M267, M268, P1112, P1116, P125, P1433, P1434, P1435, P1436, P1437, P1438, P1439, P240, P241, P242, P244, P251, P252, P253, P254, P255, P263, P432, P583, P584 P587, P588, P590, P591, P592, P597, P598, P599, P787, P801, P804, P819, P820, P826, P827, P851, P988, P989, P991, P993, U647
Mandatory generator site TRU waste stream (WS)-specific information			
Waste stream designation	WS1	Y	C078, C098, C103, C148, C311, DR003, DR027, I044, M005, M023, M024, M072, M073, M100, M155, M241, M244, M245, P016, P020, P021, P098, P160, P161, P223, P258, P279, P281, P432, P827, U038, U039, U045, U108, U412, U478, U489, U529, U647
Area(s) and building(s) from which the waste stream was or is generated.	WS2	Y	C078, C098, C103, C302, C307, C311, C600, DR003, DR005, DR008, DR027, DR602, I044, M001, M005, M023, M024, M072, M155, M241, M244, M245, M253, M254, M255, M256, M257, M258, M259, M260, M261, M262, M263, M264, M265, M266, M267, M270, P016, P093, P1104, P125, P1427, P1428, P1436, P1437, P1438, P1440, P1441, P1442, P151, P160, P161, P173, P229, P256, P258, P263, P272, P279, P281, P282, P432, P582, P787, P917, P980, P986, P987, P988, P989, P991, P992, U038, U041, U045, U046, U105, U108, U125, U126, U127, U128, U129, U130, U131, U132, U133, U403, U412, U429, U437, U453, U477, U478, U482, U505, U506, U507, U508, U529, U531, U533, U537, U545, U568

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Waste Stream Number(s): OR-REDC-CH-HET

Acceptable Knowledge Information	AK#	Compiled? (Y/N)	Source Document Tracking Number
Waste stream volume and time period of generation	WS3	Y	C078, C098, C302, C311, DR003, DR005, DR602, I044, M001, M005, M023, M024, M072, M110, M155, M241, M244, M245, M270, P1112, P1427, P1428, P1438, P1441, P1442, P173, P229, P258, P272, P432, U011, U038, U046, U106, U108, U109, U110, U111, U125, U126, U482, U506, U507, U508, U529, U543, U568
Waste generating process (describe for each building) including processes associated with U134 waste generation, if applicable.	WS4	Y	C078, C098, C148, C174, C176, C600, DR008, I044, M023, M072, M155, M252, M253, M254, M255, M256, M257, M258, M259, M260, M261, M262, M263, M264, M265, M266, M267, M270, P021, P030, P125, P1428, P1436, P1437, P1440, P1441, P1442, P151, P160, P161, P173, P229, P240, P258, P263, P272, P279, P281, P282, P432, P582, P588, P905, P980, P982, P986, P987, P988, P989, P991, P992, U041, U124, U125, U126, U477, U478, U482, U505, U529, U568
Process flow diagrams. For research/development, analytical laboratory waste, or other similar processes where process flow diagrams cannot be created, a description of the waste generating processes, rather than a formal process flow diagram, may be included, if justified.	WS5	Y	M251, M252, M270, P030, P1427, P1428, P1434, P1439, P1440, P1441, P151, P160, P161, P173, P229, P256, P263, P279, P281, P432, P482, P500, P917, P983, P984, U011, U046
Summary of basis and rationale for delineating each waste stream including justification for combining waste historically managed separately as TRU mixed and TRU non-mixed waste streams into a single waste stream, that is traceable to referenced documents.	WS6	Y	C078, C148, C311, DR003, DR008, I044, M023, M024, M073, M100, M244, M245, P016, P020, P021, P098, P1112, P160, P161, P223, P241, P242, P244, P258, P279, P281, P432, P827, U038, U039, U041, U412, U478, U489, U529
Generator site mission descriptions related to TRU waste generation and management identifying defense and non-defense operations.	WS7	Y	C078, C098, C306, C311, I044, M023, M072, M251, P020, P021, P098, P114, P125, P145, P151, P160, P161, P173, P223, P229, P258, P263, P279, P281, P432, P569, P952, P980, P981, U011, U038, U039, U478, U568, U647

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Waste Stream Number(s): OR-REDC-CH-HET

Acceptable Knowledge Information	AK#	Compiled? (Y/N)	Source Document Tracking Number
Material inputs or other information that identified the chemical contents of the waste and the stream. Includes events or processes that may have modified the chemical properties of the waste stream after generation.	WS8	Y	C078, C148, C160, C172, C173, C307, C308, C600, DR005, DR008, DR602, I044, M022, M024, M072, M073, M155, M241, M244, M245, M253, M254, M255, M256, M257, M258, M259, M260, M261, M262, M263, M264, M265, M266, M267, M270, P020, P021, P030, P098, P110, P1100, P1101, P1102, P1103, P1104, P1105, P1106, P1107, P1108, P1109, P1112, P1116, P1427, P1428, P1436, P1437, P1438, P1440, P1441, P1442, P145, P151, P160, P161, P164, P173, P223, P229, P263, P279, P282, P432, P482, P500, P566, P582, P588, P590, P591, P592, P787, P801, P804, P819, P820, P826, P827, P851, P917, P980, P982, P983, P984, P985, P991, P992, U011, U038, U039, U106, U109, U124, U125, U126, U412, U425, U429, U432, U435, U436, U437, U453, U477, U478, U482, U489, U505, U506, U507, U508, U529, U531, U533, U537, U545
Physical waste form (e.g., glovebox materials and chemicals handled during glovebox operations, if applicable), assigned summary category group, waste matrix code and materials inputs, including waste material parameters present in the waste stream. Includes events or processes that may have modified the physical properties of the waste stream after generation.	WS9	Y	C078, C148, C160, C172, C307, C308, C311, DR601, M001, M024, M072, M073, M074, M110, M155, M241, M244, M245, M253, M254, M255, M256, M257, M258, M259, M260, M261, M262, M263, M264, M265, M266, M267, M268, M278, P014, P093, P1104, P1109, P1112, P1116, P125, P1427, P1436, P1437, P1438, P1442, P161, P566, P582, P588, P590, P591, P592, P598, P851, P905, P917, P980, P986, P987, P988, P989, P990, P991, P993, U011, U038, U041, U045, U105, U106, U107, U108, U124, U125, U126, U403, U477, U478, U482, U531, U533, U537, U545
Waste identifiers assigned by the generator site (e.g., item description code, packaging identification numbers).	WS10	Y	M005, M024, M073, M100, M155, M241, M244, M245, P1104, P1109, P1438, U038, U125, U531,

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Waste Stream Number(s): OR-REDC-CH-HET

Acceptable Knowledge Information	AK#	Compiled? (Y/N)	Source Document Tracking Number
Specification of the isotopic ratios for the ten WIPP-tracked radionuclides and all radionuclides other than the ten WIPP-tracked radionuclides that contribute to 95 percent of the radioactive hazard for a payload container. Chemical and physical information that could affect the waste isotopic distribution, as well as calculations used to derive the isotopic distribution.	WS11	Y	C078, C148, C302, C307, C600, DR004, DR027, I044, M005, M024, M072, M073, M074, M100, M110, M241, M244, M245, M253, M254, M255, M256, M257, M258, M259, M260, M261, M262, M263, M264, M265, M266, M270, P014, P016, P021, P030, P058, P093, P098, P110, P1104, P1112, P114, P1427, P1428, P1440, P1441, P145, P151, P160, P161, P164, P173, P229, P258, P263, P279, P281, P432, P482, P500, P566, P787, P801, P819, P820, P851, P917, P980, P982, P983, P984, P985, P991, U011, U038, U041, U045, U108, U111, U127, U128, U129, U130, U131, U132, U133, U412, U425, U429, U432, U435, U436, U437, U453, U477, U478, U482, U489, U501, U505, U506, U507, U508, U529, U531, U533, U537, U543, U545, U568, U647
State and EPA hazardous waste constituents in the waste stream and state and EPA Hazardous Waste Numbers assigned, including documentation regarding how the site has historically managed the waste, including the historical regulatory status of the waste (i.e., TRU mixed versus TRU non-mixed waste).	WS12	Y	C078, C148, C160, C307, DR005, DR008, DR602, M005, M022, M024, M072, M073, M100, M155, M241, M244, M245, P016, P020, P098, P1100, P1101, P1102, P1103, P1104, P1105, P1106, P1107, P1108, P1109, P1112, P1116, P145, P151, P160, P161, P173, P223, P263, P282, P432, P482, P500, P566, P801, P827, P851, P917, P988, P989, P993, U038, U039, U105, U106, U107, U108, U109, U110, U125, U126, U412, U425, U429, U437, U453, U477, U478, U489, U501, U505, U506, U507, U508, U529, U531, U533, U543, U545
Additional acceptable knowledge documentation (briefly describe):			
Process design documents (e.g., Title II Design)	S1	N	N/A
Standard operating procedures that may include a list of raw materials or reagents, a description of the process or experiment generating the waste, and a description of the waste generated and how the wastes are managed at the point of generation	S2	Y	P1116, P1430, P1433, P1435, P1436, P1437, P1438, P1439, P240, P241, P242, P244, P251, P252, P253, P254, P263, P282, P582, P583, P584, P585, P586, P587, P588, P589, P590, P591, P592, P597, P598, P599, P819, P827, P905, P917, P986, P987, P988, P989, P990, P991, P992, U124

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Waste Stream Number(s): OR-REDC-CH-HET

Acceptable Knowledge Information	AK#	Compiled? (Y/N)	Source Document Tracking Number
Preliminary and Final Safety Analysis Reports and technical safety requirements	S3	Y	P161, P256, P279, P432, U011
Waste Packaging records	S4	Y	M005, M073, M074, M100
Test plans or research project reports that describe the reagents, radionuclides, and other raw materials used in experiments	S5	Y	C172, P020, P021, P030, P093, P098, P110, P114, P1427, P1428, P1441, P151, P160, P173, P223, P229, P982, P983, P984, P985, U039
Site databases (e.g., chemical inventory database for SARA Title III requirements, SNM or nuclear material databases)	S6	Y	M024, M110, M241, M244, M245
Information from site personnel (e.g., documented interviews)	S7	Y	C098, C148, C173, C174, C176, C302, C306, C307, C308, C311, C600
Standard industry documents (e.g., industry specification sheets, handbooks, reference materials, or other vendor information)	S8	Y	C172, M022, M278
Analytical data relevant to the waste stream, including results from fingerprint analyses, spot checks, routine verification sampling or other processes that collected information pertinent to the waste stream. This may include new information (or previously collected data) which augments required information (e.g., visual examination not performed in compliance with CCP-PO-001, radiography screening for prohibited items.	S9	Y	I044, P173, P229, U041, U045, U105, U106, U107, U110
Material Safety Data Sheets, product labels, or other product information	S10	Y	M022
Laboratory notebooks that detail the research processes and raw materials used in an experiment	S11	Y	M001, U403, U412, U425, U429, U432, U435, U436, U437, U453, U477, U478, U482, U489, U501, U505, U506, U507, U508, U529, U531, U533, U537, U543, U545
Comparable or surrogate sampling and analysis data	S12	N	N/A
Other (describe)	S13	N	N/A
Safeguards and security, Materials Control and Accountability, and other nuclear material control system data Reports of nuclear safety or criticality accidents involving special nuclear materials (SNM)	S14	N	N/A
NMMA logs or inventory records or waste disposal logs providing SNM or nuclear material information	S15	Y	M005, M074, M100

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Waste Stream Number(s): OR-REDC-CH-HET

Acceptable Knowledge Information	AK#	Compiled? (Y/N)	Source Document Tracking Number
Packaging	S16	Y	C078, C148, C311, DR601, I044, M001, M005, M024, M072, M073, M100, M110, M155, M170, P1112, P125, P1430, P161, P240, P251, P252, P253, P254, P256, P263, P276, P279, P432, P566, P583, P584, P585, P586, P588, P589, P905, P917, P988, P989, U046, U125, U477
Acceptable knowledge information regarding waste generated off-site or from similar process: N/A			

Additional comments:
O1 through O16 relevant to sealed sources associated with ORSP waste streams, therefore these elements are not applicable to this RH TRU debris waste stream

All required AK information has been compiled and source document tracking numbers assigned.

Acceptable Knowledge Expert: Jeff Harrison (Print) / Jeff Harrison (Sign) Date: 3/9/16

3/9/2016

DIVIDER PAGE

Attachment 1 – Acceptable Knowledge Documentation Checklist

Site(s): Oak Ridge National Laboratory

Waste Stream Description: ORNL REDC RH Debris from Hot Cells

Waste Stream Number(s): OR-REDC-RH-HET

Acceptable Knowledge Information	AK#	Compiled? (Y/N)	Source Document Tracking Number
Mandatory generator site TRU waste program (PR) information			
Map of the generator site that identifies TRU waste generation, treatment, and storage areas.	PR1	Y	P014, P125, P161, P256, P272, P279, P953, P432, U482
Generator site mission descriptions related to TRU waste generation and management identifying defense and non-defense operations.	PR2	Y	C078, C098, C306, C311, DR009, I044, M023, M251, P016, P020, P021, P098, P114, P136, P145, P151, P160, P161, P173, P223, P229, P258, P272, P279, P281, P432, P569, P952, P980, P981, P1440, U011, U038, U039, U478, U501, U543, U568, U647
Overview of the generator site and generator site TRU waste management operations in the context of the facility's mission.	PR3	Y	C078, C098, I022, I023, I044, M023, M072, M251, P125, P161, P256, P272, P281, P432, P569, P981, P982, U038, U647
Descriptions of historical and current TRU waste generating operations, including how waste is tracked and managed and/or how operations relative to isotopic composition were tracked.	PR4	Y	C078, C098, C103, C176, C306, C311, I022, I023, I044, M005, M023, M072, M244, M245, P020, P021, P098, P125, P151, P161, P173, P229, P241, P242, P244, P258, P263, P272, P279, P281, P432, P582, P953, P1427, P1428, P1438, P1442, U038, U039, U124, U125, U126, U478, U568
Waste identification and/or categorization schemes and terminology used at the generator site, including codes correlating to specific isotopic distributions.	PR5	Y	I022, I023, I044, M024, M155, M241, M244, M245, P161, P241, P242, P244, P432, P582, U038
Types and quantities of TRU waste generated, including historical generation through future projections.	PR6	Y	C078, C098, I044, M005, M023, M024, M072, M241, M244, M245, M253, M254, P125, P161, P241, P242, P244, P263, P482, P500, P582, P588, P917, P953, P1427, P1428, U011, U038, U046, U111
Correlation of waste streams and description of time of generation, waste generating processes, and area and building/facility where each waste stream was generated.	PR7	Y	C078, C098, C174, C307, C600, DR003, DR005, DR601, DR602, I044, M001, M005, M024, M072, M073, M100, M155, M241, M244, M245, M252, M253, M254, M267,, P125, P161, P173, P229, P258, P272, P281, P582, P787, P953, P1427, P1428, P1436, P1437, P1438, U038, U039, U041, U046, U094, U124, U125, U126, U403, U412, U478, U505, U508
Certification procedures for waste to be sent to the WIPP facility (i.e., procedures to ensure that prohibited items are documented and managed in accordance with site-specific certification plans).	PR8	Y	C098, C103, C172, C311, M253, M254, M267, M268, P125, P240, P241, P242, P244, P251, P252, P253, P254, P255, P263, P432, P583, P584, P587, P588, P590, P591, P592, P597, P598, P599, P787, P801, P804, P819, P820, P826, P827, P851, P988, P989, P991, P993, P1112, P1116, P1433, P1433, P1435, P1436, P1437, P1438, P1439, U647

CCP RECORDS ORIGINAL
DATE REC'D 3/9/16

Waste Stream Number(s): OR-REDC-RH-HET

Acceptable Knowledge Information	AK#	Compiled? (Y/N)	Source Document Tracking Number
Mandatory generator site TRU waste stream (WS)-specific information			
Waste stream designation	WS1	Y	C078, C098, C103, C148, C311, DR003, I044, M005, M023, M024, M072, M073, M100, M155, M241, M244, M245, P016, P020, P021, P098, P160, P161, P223, P258, P279, P281, P432, P287, U038, U039, U045, U049, U412, U478, U489, U529, U647
Area(s) and building(s) from which the waste stream was or is generated.	WS2	Y	C078, C098, C103, C302, C307, C311, C600, DR003, DR005, DR008, DR600, DR602, I044, M001, M005, M023, M024, M072, M155, M241, M244, M245, M253, M254, M255, M256, M257, M258, M259, M260, M261, M262, M263, M264, M265, M266, M267, M270 P016, P093, P1104, P125, P160, P161, P173, P229, P256, P258, P263, P272, P279, P281, P282, P432, P582, P787, P917, P980, P986, P987, P988, P989, P991, P992, P1427, P1428, P1436, P1437, P1438, P1440, P1441, P1442, U011, U038, U041, U045, U046, U049, U125, U126, U127, U128, U129, U130, U131, U132, U133, U403, U412, U429, U437, U453, U477, U478, U482, U483, U505, U506, U507, U508, U529, U531, U533, U537, U545, U568
Waste stream volume and time period of generation	WS3	Y	C078, C098, C302, C311, DR003, DR005, DR602, I044, M001, M005, M023, M024, M072, M110, M155, M241, M244, M245, M270, P173, P229, P258, P272, P432, P1112, P1427, P1428, P1438, P1441, P1442, U011, U038, U046, U094, U111, U125, U126, U482, U506, U507, U508, U529, U543, U568
Waste generating process (describe for each building) including processes associated with U134 waste generation, if applicable.	WS4	Y	C078, C098, C148, C174, C176, C600, DR008, I044, M023, M072, M155, M252, M253, M254, M255, M256, M257, M258, M259, M260, M261, M262, M263, M264, M265, M266, M267, M270, P021, P030, P125, P151, P160, P161, P173, P229, P240, P258, P263, P272, P279, P281, P282, P432, P582, P588, P905, P980, P982, P986, P987, P988, P989, P991, P992, P1428, P1436, P1437, P1440, P1441, P1442, U041, U124, U125, U126, U477, U478, U482, U505, U529, U568
Process flow diagrams. For research/development, analytical laboratory waste, or other similar processes where process flow diagrams cannot be created, a description of the waste generating processes, rather than a formal process flow diagram, may be included, if justified.	WS5	Y	M251, M252, M270, P030, P151, P160, P161, P173, P229, P256, P263, P279, P281, P432, P482, P500, P917, P983, P984, P1427, P1428, P1434, P1439, P1440, P1441, U011, U046, U094
Summary of basis and rationale for delineating each waste stream including justification for combining waste historically managed separately as TRU mixed and TRU non-mixed waste streams into a single waste stream, that is traceable to referenced documents.	WS6	Y	C078, C148, C311, DR003, DR008, I044, M023, M024, M100, M073, M120, M244, M245, P016, P020, P021, P098, P160, P161, P223, P241, P242, P244, P258, P279, P281, P432, P827, P1112, U038, U039, U041, U094, U412, U478, U489, U529

Waste Stream Number(s): OR-REDC-RH-HET

Acceptable Knowledge Information	AK#	Compiled? (Y/N)	Source Document Tracking Number
Generator site mission descriptions related to TRU waste generation and management identifying defense and non-defense operations.	WS7	Y	C078, C098, C306, C311, I044, M023, M072, M251, P020, P021, P098, P114, P125, P145, P151, P160, P161, P173, P223, P229, P258, P263, P279, P281, P432, P569, P952, P980, P981, U011, U038, U039, U478, U568, U647
Material inputs or other information that identified the chemical contents of the waste and the stream. Includes events or processes that may have modified the chemical properties of the waste stream after generation.	WS8	Y	C078, C148, C160, C172, C173, C307, C308, C600, DR005, DR008, DR602, I044, M022, M024, M072, M073, M074, M155, M241, M244, M245, M253, M254, M255, M256, M257, M258, M259, M260, M261, M262, M263, M264, M265, M266, M267, M270, P020, P021, P030, P098, P110, P1100, P1101, P1102, P1103, P1104, P1105, P1106, P1107, P1108, P1109, P1112, P1116, P1427, P1428, P1436, P1437, P1438, P1440, P1441, P1442, P145, P151, P160, P161, P164, P173, P223, P229, P263, P279, P282, P432, P482, P500, P566, P582, P588, P590, P591, P592,P787, P801, P804, P819, P820, P826, P827, P851, P917, P980, P982, P983, P984, P985, P991, P992, U011, U038, U039, U124, U125, U126, U412, U425, U429, U432, U435, U436, U437, U453, U477, U478, U482, U489, U505, U506, U507, U508, U529, U531, U533, U537, U545, CCP-AK-ORNL-002
Physical waste form (e.g., glovebox materials and chemicals handled during glovebox operations, if applicable), assigned summary category group, waste matrix code and materials inputs, including waste material parameters present in the waste stream. Includes events or processes that may have modified the physical properties of the waste stream after generation.	WS9	Y	C078, C148, C160, C172, C307, C308, C311, DR601, M001, M024, M072, M073, M074, M110, M120, M155, M241, M244, M245, M253, M254, M255, M256, M257, M258, M259, M260, M261, M262, M263, M264, M265, M266, M267, M268, M278, P014, P093, P1104, P1109, P1112, P1116, P125, P1427, P1436, P1437, P1438, P1442, P161, P566, P582, P588, P590, P591, P592, P598, P851, P905, P917, P953, P980, P986, P987, P988, P989, P990, P991, P993, U011, U038, U041, U045, U049, U124, U125, U126, U403, U477, U478, U482, U483, U531, U533, U537, U545, CCP-AK-ORNL-002
Waste identifiers assigned by the generator site (e.g., item description code, packaging identification numbers).	WS10	Y	M005, M024, M073, M100, M155, M241, M244, M245, P1104, P1109, P1438, U038, U125, U531

Waste Stream Number(s): OR-REDC-RH-HET

Acceptable Knowledge Information	AK#	Compiled? (Y/N)	Source Document Tracking Number
Specification of the isotopic ratios for the ten WIPP-tracked radionuclides and all radionuclides other than the ten WIPP-tracked radionuclides that contribute to 95 percent of the radioactive hazard for a payload container. Chemical and physical information that could affect the waste isotopic distribution, as well as calculations used to derive the isotopic distribution.	WS11	Y	C078, C148, C302, C307, C600, I044, M005, M024, M072, M073, M074, M100, M110, M241, M244, M245, M253, M254, M255, M256, M257, M258, M259, M260, M261, M262, M263, M264, M265, M266, M270, P014, P016, P021, P030, P058, P093, P098, P110, P1104, P1112, P114, P1427, P1428, P1438, P1440, P1441, P145, P151, P160, P161, P164, P173, P229, P258, P263, P279, P281, P432, P482, P500, P566, P787, P801, P819, P820, P851, P917, P953, P980, P982, P983, P984, P985, P991, U011, U038, U041, U045, U049, U094, U111, U127, U128, U129, U130, U131, U132, U133, U412, U425, U429, U432, U435, U436,U437, U453, U477, U478, U482, U483, U489, U501, U505, U506, U507, U508, U529, U531, U533, U537, U543, U545, U568, U647, CCP-AK-ORNL-002
State and EPA hazardous waste constituents in the waste stream and state codes/numbers and EPA Hazardous Waste Numbers assigned, including documentation regarding how the site has historically managed the waste, including the historical regulatory status of the waste (i.e., TRU mixed versus TRU non-mixed waste).	WS12	Y	C078, C148, C160, C307, DR005, DR008, DR602, M005, M022, M024, M072, M073, M100, M155, M241, M244, M245, P016, P020, P098, P1100, P1101, P1102, P1103, P1104, P1105, P1106, P1107, P1108, P1109, P1112, P1116, P145, P151, P160, P161, P173, P223, P263, P282, P432, P482, P500, P566, P801, P827, P851, P917, P988, P989, P993, U038, U039, U125, U126, U412, U425, U429, U437, U453, U477, U478, U483, U489, U501, U505, U506, U507, U508, U529, U531, U533, U543, U545
Additional acceptable knowledge documentation (briefly describe):			
Process design documents (e.g., Title II Design)	S1	N	N/A
Standard operating procedures that may include a list of raw materials or reagents, a description of the process or experiment generating the waste, and a description of the waste generated and how the wastes are managed at the point of generation	S2	Y	P240, P241, P242, P244, P251, P252, P253, P254, P263, P282, P582, P583, P584, P585, P586, P587, P588, P589, P590, P591, P592, P597, P598, P599, P819, P827, P905, P917, P986, P987, P988, P989, P990, P991, P992, P1116, P1430, P1433, P1435, P1436, P1437, P1438, P1439, U124
Preliminary and Final Safety Analysis Reports and technical safety requirements	S3	Y	P161, P256, P279, P432, U011
Waste Packaging records	S4	Y	M005, M073, M074, M100
Test plans or research project reports that describe the reagents, radionuclides, and other raw materials used in experiments	S5	Y	C172, P020, P021, P030, P093, P098, P110, P114, P151, P160, P173, P223, P229, P982, P983, P984, P985, P1427, P1428, P1441, U039
Site databases (e.g., chemical inventory database for SARA Title III requirements, SNM or nuclear material databases)	S6	Y	M024, M110, M241, M244, M245
Information from site personnel (e.g., documented interviews)	S7	Y	C098, C148, C173, C174, C176, C302, C306, C307, C308, C311, C600

Waste Stream Number(s): OR-REDC-RH-HET

Acceptable Knowledge Information	AK#	Compiled? (Y/N)	Source Document Tracking Number
Standard industry documents (e.g., industry specification sheets, handbooks, reference materials, or other vendor information)	S8	Y	C172, M022, M278, P113
Analytical data relevant to the waste stream, including results from fingerprint analyses, spot checks, routine verification sampling or other processes that collected information pertinent to the waste stream. This may include new information (or previously collected data) which augments required information (e.g., visual examination not performed in compliance with CCP-PO-001, radiography screening for prohibited items.	S9	Y	I044, M024, P173, P228, U041, U045,
Material Safety Data Sheets, product labels, or other *product information*	S10	Y	M022
Laboratory notebooks that detail the research processes and raw materials used in an experiment	S11	Y	M001, U403, U412, U425, U429, U432, U435, U436, U437, U453, U477, U478, U482, U483, U489, U501, U505, U506, U507, U508, U529, U531, U533, U537, U543, U545
Comparable or surrogate sampling and analysis data	S12	Y	C800, U045, U129, U130, U131, U133, CCP-AK-ORNL-002
Other (describe)	S13	N	N/A
Safeguards and security, Materials Control and Accountability, and other nuclear material control system data Reports of nuclear safety or criticality accidents involving special nuclear materials (SNM)	S14	N	N/A
NMMA logs or inventory records or waste disposal logs providing SNM or nuclear material information	S15	Y	M005, M024, M074, M100
Packaging	S16	Y	C078, C148, C311, DR600, DR601, I044, M001, M005, M024, M072, M073, M100, M110, M155, M170, P125, P161, P240, P251, P252, P253, P254, P256, P263, P279, P432, P566, P583, P584, P585, P586, P588, P589, P905, P917, P988, P989, P1112, P1430, U046, U125, U477
Acceptable knowledge information regarding waste generated off-site or from similar process: CCP-AK-ORNL-002 - See relevant AK Element #s above for relevant AK from this corresponding CH AK Summary Report.			

Additional comments:
O1 through O16 relevant to sealed sources associated with ORSP waste streams, therefore these elements are not applicable to this RH TRU debris waste stream

All required AK information has been compiled and source document tracking numbers assigned.

Acceptable Knowledge Expert: Kevin J. Peters / [signature] Date: 3/9/2016
Print Sign

Attachment 4 - Acceptable Knowledge Source Document Information List

Site(s): Oak Ridge National Laboratory

Waste Stream Number: OR-NFS-CH-SOIL

Waste Stream Description: Soil from NFS Stored at ORNL

Source Document Tracking Number	Title or Description	Author	Document #	Document Revision # and Date
C099	Letter to Harold Johnson, CBFO DOE re: KAPL-NFS Transuranic Waste Background Information	Delwiche, D. A.	NA	NA, 05/03/2005
C100	Interview with Richard Booth and faxed defense and waste information for NFS, Erwin, TN TRU waste	Betty Humphrey	NA	NA, 02/24/2005
C119	Removal of Contaminated Pipe, Building 234 Area B, Memo to Ron Mitchell, Letter of Authorization (LOA)	Bill Reynolds	LOA-7000-018	NA, 03/20/2000
C120	Removal of Contaminated Piping, Building 234, Memo to Larry Burleson, Letter of Authorization (LAO)	Bill Reynolds	LOA-7000-011	NA, 03/02/2000
C121	DVRF Bale Packaging Glovebox Removal, Memo to Ron Mitchell	JJ Rogers	LOA-7000-034	NA, 02/15/2001
C122	Building 234 Characterization Results, Memo to Heather Little	Gina Craig	DCM-03-18, 44T-99-0436, GPC-99-013	NA, 09/30/1999
C125	Cleaning and Surveying the DVRF Shear Baler for PCBs, Memo to Building 234 Supervision	Gina Craig	SWI-02-035	NA, 10/03/2002
C126	Waste Packaging of the DVRF Decon Cell Perma-Con Structure, Memo to Richard A. Moore	Daniel J. O'Brien	SWI-02-001	NA, 02/18/2002
C127	Size Reduction of the NDA Station 2 Glovebox In the DVRF Decontamination Cell, Memo to Ron Mitchell and Rick Leitner	Ray Panciera	SWI-01-018	NA, 04/18/2001
C129	Size Reduction Process Ductwork within the Decontamination Cell, DVRF, Memo to Ron Mitchell and Rick Leitner	Bill Reynolds	SWI-01-015	NA, 03/15/2001
C130	Cleanout of DVRF Bale Packaging Glovebox, Memo to Ron Mitchell and Rick Leitner	JJ Rogers	SWI-01-013	NA, 03/07/2001
C142	Legal Analysis regarding Solvent Binder Used to Make Fuel	Al Floro	NA	NA, 11/28/1990
C145	Memo to Distribution re: Nuclear Fuel Services, In. (NFS) Background Information	D. W. Turner	NA	NA, 02/07/1992
C146	Paper from EPA website: Waste Minimization Assessment for a Manufacturer Producing Printed Circuit Boards	H. W. Edwards, M. Kostrzewa, P. S. Miller	NA	NA, UNK

CCP RECORDS ORIGINAL
DATE REC'D 04.20.2016

Attachment 4 - Acceptable Knowledge Source Document Information List (continued)

Source Document Tracking Number	Title or Description	Author	Document #	Document Revision # and Date
C147	Retrieved from EPA website: Consumer Product links for Mercury	EPA	NA	NA, 08/07/2007
C149	Memo to File re: CCP AK/Weston Source Document Correlation	Lisa Price-Watson	NA	NA, 10/30/2007
C153	Email Releasing ORNL Container Paperwork. Subject: The Release of Generator Disposal Forms (2822 and 2109) Forms.	Don Coffey; Dave Hamrin	NA	NA, 4/2008 - 5/2008
C172	Miscellaneous Correspondence Regarding Testing of Nochar Absorbents	Various	N/A	N/A, Various
C173	Email Correspondence Regarding TWPC Glovebox Decon	Kevin East, et al.	N/A	N/A, 11/11/2014 to 11/13/2014
C200	Internal Correspondence to M.W. Tull subject: On the Use of Rad-Sorb in NFS TRU-Waste Drums	J.A. Chapman	NA	Rev. NA, 05/26/1993
C201	Letter to Mr. Bill Reynolds, EcoTek from Terry Wickland, Product Engineer regarding Seal for *16 gauge DOT 17H stainless steel drum lid*	Terry Wickland, *Product Engineer*	NA	Rev. NA, 04/08/1993
C204	Letter to Martin W. Tull, Martin Marietta Energy Systems, from Michael L. West, Nuclear Fuel Services, Inc. regarding response to his request for information relating to the discovery of mercury during the decommissioning of Station #15 in Building 234.	Michael L. West	NA	Rev. NA, 09/03/1992
C205	Internal Correspondence to Distribtuion regarding Minutes of November 5, 1991 Meeting with NFS Regarding Process-Line Samples	Martin W. Tull	NA	Rev. NA, 11/11/1991
C206	Numerous Faxes containing handwritten notes (oversight reports) from Paul O. Emerson re: such items as sampling the top of the underground tank, Pu Crew activities, equipment issues, processing of gloveboxes, and information on drums that were packaged.	Paul O. Emerson	NA	Rev. NA, 01/09/1991 through 08/28/1992
C210	Interview re: NFS TRU Waste Shipped to Oak Ridge National Laboratory. Interviewees: Richard Booth, Richard Moore, Bob Hunt, Scott Toller, Marie Moore	J. Harrison; L. Watson	NA	NA, 09/12/2007
C227	Interview with Scott Morie from NFS	J. Harrison	NA	09/23/2010
C228	Changes Needed in CCP-AK-ORNL-001 Based on EPA Tier 1 Review	Jeff Harrison	NA	NA, 03/08/2011
C230	E-mail from Brian Oakley to Jeff Harrison, RE: NFS Schedule	Brian Oakley	N/A	N/A, 09/12/2013
C236	Acceptable Knowledge Assessment (AKA) for Waste Stream OR-NFS-CH-SOIL	Jeff Harrison	C236	Rev. 0, 04/12/2016
C309	Record of Communication Subject: NFS Soil Sampling/Analysis Data Tetrachloroethylene Use	Jeff Harrison	NA	Rev. NA, 06/04/2008
C310	Memo to Don Coffey re: Approval for Limited Use of NFS Proprietary Information	Richard L. Booth, NFS	20G-07-0030; GEN; RLB-07-085	NA, 11/12/2007

Attachment 4 - Acceptable Knowledge Source Document Information List (continued)

Source Document Tracking Number	Title or Description	Author	Document #	Document Revision # and Date
C321	Record of Communication. Subject: Soil and Groundwater Treatment Sludge to be Generated in 2011.	Jeff Harrison	NA	NA, 01/11/2011
C324	Email from Mike McCauley to Jeff Harrison, re: Use of Speedi Dri at TWPC	Mike McCauley	NA	NA, 04/07/2015
C622	Email from Don Coffey to Jeff Harrison RE: NFS BBA REPACKS NFS0385 A-H	D. Coffey, J. Montoya, J. Harrison	C622	N/A, 08/06/2010 - 08/11/2010
DR010	Discrepancy Resolution re: Incorrect Waste Stream Assignment of Soil Waste Containers	Jeff Harrison	DR010	NA, 01/12/2009
DR013	Discrepancy Resolution re: NFS Soil and Debris EPA Hazardous Waste Numbers	J. Harrison	DR013	1, 01/24/2011
DR022	Discrepancy Resolution re: OR-NFS-CH-SOIL and OR-NFS-CH-HET-A Waste Stream Designation	Jeff Harrison	NA	NA, 03/05/10
DR023	Discrepancy Resolution re: NFS0815 & X10C0506069	Jeff Harrison	NA	NA, 03/22/2010
DR026	Discrepancy Resolution re: Reassignment of NFS815 to OR-NFS-CH-SOIL	Jeff Harrison	NA	NA, 07/07/2010
DR038	Discrepancy Resolution, re: Drum NFS0815	Jeff Harrison	DR038	NA, 01/06/2014
DR041	Discrepancy Resolution, re: Container NFS0794B	Jeff Harrison	DR041	NA, 06/03/2014
I022	DOE Order 435.1, Radioactive Waste Management	US DOE	DOE O 435.1	NA, 07/09/1999
I023	Radioactive Waste Management Manual	US DOE	DOE M 435.1-1	Rev. 1, 06/19/2001
I043	Implementation Guide for Use with DOE M 435.1-1	US Department of Energy	DOE G 435.1-1	NA, 07/09/1999
I049	Waste Classification Quality Assurance Plan	Gilbert G. Rosenberger, Jr.	NFS-WST-003	Revision 1, 05/17/2002
I052	Memorandum; Building 234 Shear Baler Characterization Samples	Gina P. Craig	GPC-02-013, DC-03-18, 44T-02-0633	NA, 09/11/2002
I053	KAPL-TN Waste Profile for NFS Building 234 Soil	Joseph W. Pugh	44G-03-1050	NA, 09/11/2003
I056	Removal of Building 234 Wet Cell Permacon Containment Enclosure	Daniel Boss	DC-SWI-03-041;	NA, 06/20/2003
I058	Dismantlement of the West Wet Cell Wall in Building 234	Daniel Boss	DC-SWI-02-030	NA, 09/30/2002
I059	Waste Packaging of Wet Cell Wall in Building 234	Daniel J. O'Brien	WST-SWI-02-002	Revision 1, 09/19/2002

Attachment 4 - Acceptable Knowledge Source Document Information List (continued)

Source Document Tracking Number	Title or Description	Author	Document #	Document Revision # and Date
I061	Size Reduction of the DVRS Glovebox	Ray Panciera	DC-SWI-01-020	NA, 05/24/2001
I067	Procedure for the Operation of the Versatile Automated Gamma Assay System (VAGAS)	Materials Department	NFS-ACC-104	Revisions 0 & 8, 05/08/2000 - 09/17/2007
I068	Size Reduction of 4-inch Diameter Duct Section in Area C	Daniel Boss	DC-SWI-02-004	Revision 0, 01/25/2002
M003	ORNL UCN-2109 and UCN-2822 Forms for NFS TRU Waste and Related Paperwork for Waste Stored at ORNL (container paperwork)	NA	NA	NA, Various
M007	Internal Correspondence and the Environmental Assessment for the Receipt and Storage at ORNL, of Transuranic Waste, Mixed Transuranic Waste, and Mixed Oxide Waste from Nuclear Fuels and the Environmental Assessment for Disposition of Transuranic Waste	L.T. Cusick	LTR# ER-NEP A/92-015	Rev. NA, 11/09/1992
M008	Fax from John E. Kirkpatrick to Robert C. Mason on 01/16/1991 and the PuO2 + UO2 (mixed oxide) fuel production flow chart for Pellet Production, Rod/Assembly Fabrication, Scrap Dissolution/Recovery	Robert C. Mason	NA	NA, 01/16/1991
M011	MSDS (Material Safety Data Sheets) for Products used at NFS	Various	NA	NA, Various
M012	EM Waste Database Query - Container Information; Waste Description; Isotopes	ORNL	NA	NA, 08/09/2007
M016	Incoming Container Travelers for NFS Waste - VE Data	EnergX - ORNL	Various	NA, Various
M017	NFS NDA Data from Foster Wheeler (by container)	Foster Wheeler, ORNL	Various	NA, Various
M018	NFS Radiography (NDE) Data from Foster Wheeler (by container)	Foster Wheeler, ORNL	Various	NA, Various
M019	NFS VE Data from Foster Wheeler (by container)	Foster Wheeler, ORNL	Various	NA, Various
M020	NFS HSG Data from Foster Wheeler (by container)	Foster Wheeler, ORNL	Various	NA, Various
M021	Defense Determination Approval for ORNL/NFS-HD-001, Heterogeneous Debris - NFS	Betty Humphrey	ORNL-HD-001-IF	NA, 05/13/2005
M050	Photos of the Site	NA	NA	Rev. NA, NA
M052	Account Book No. S149 - DVRF Decommissioning and Volume Reduction Facility	NA	S149	Rev. NA, Various

Attachment 4 - Acceptable Knowledge Source Document Information List (continued)

Source Document Tracking Number	Title or Description	Author	Document #	Document Revision # and Date
M058	(Handwritten Document) Methods for: Measuring Activity in Baled Waste; Flowsheet for Immobilizing Fines; Assigning Values to Soil; Flowsheet for Packaging and Measuring Raschig Rings	N/A	NA	NA, N/A
M061	Internal Correspondence to Distribution from J.A. Chapman regarding An Evaluation of NFS Isotopic Estimates by Gamma-ray and Alpha-particle Spectroscopy	J.A. Chapman	NA	Rev. NA, 08/24/1992
M062	NFS Data Set No. 2 PCB Reanalysis of Gasket and K1 Samples	Wayne H. Griest, Analytical Chemistry Division	NA	Rev. NA, 12/30/1991
M063	NFS Data Sheet No. 3 PCB Analysis of Fresh Gasket and Pall Filter Samples and Cadmium in Pall Filter TCLP Leachate	Wayne H. Griest	NA	Rev. NA, 01/22/1992
M064	Analysis Results for Process Line Samples from Nuclear Fuel Services, Inc. and NFS Sample Set No. 3	C. E. Frye	N/A	N/A, 10/18/1991
M065	WEAF Data for NFS Drums (by container); WEAF Waste Acceptance Report; NFS Storage Project (by container)	ORNL, J. Chapman	NA	NA, 1993-1994
M067	Surveillance: Source surveillance for Contact-Handled Transuranic and Mixed Oxide Wastes	Paul Emerson	PQ-TR-3904, SS WMRA-106	Rev. NA, 12/18/1992
M068	Review of WEAF RTR Video Tapes	James Luginbyhl	N/A	11/27/07
M075	TWPC Contact Handled Waste Repackaging Data Forms for NFS Waste. (container paperwork)	ORNL	NA	NA, Various
M110	EM Waste Waste Database Query	ORNL	NA	NA, NA
M126	RTR Video Tapes and DVDs from the WEAF Facility for Oak Ridge Waste	ORNL	NA	NA, 1986 - 1992
M128	Evaluation of Additional Containers for Waste Stream OR-NFS-CH-SOIL dated September 5, 2008	J. Harrison	M128	NA, 09/05/2008
M132	Evaluation of Additional Containers for Waste Stream OR-NFS-CH-SOIL dated 9/24/2008	J. Harrison	M132	NA, 09/24/2008
M151	ORNL EM Waste Database	NA	DR-09-001168	NA, 04/22/2009
M171	ORNL EM Waste Database Query	NA	DR-10-000450	NA, 11/9/2009
M198	eMWaste Database Query	NA	DR-10-004417	NA, 08/30/2010
M206	Wet Cell Excavation TRU Waste Shipping Schedule	NFS	NA	NA, 01/11/2011
M210	TRU Project Waste Processing Facility Job Recipe, Subject: Soil-like Waste Remediation	Tim Hallman	OPS-001-08	NA, 01/29/2008

Attachment 4 - Acceptable Knowledge Source Document Information List (continued)

Source Document Tracking Number	Title or Description	Author	Document #	Document Revision # and Date
M211	Evaluation of NFS Groundwater Data	Jeff Harrison	NA	NA, 01/24/2011
M217	eMWaste Database Query from ORNL Dated 01/03/2013	ORNL	NA	NA, 01/03/2013
M235	Evaluation of Data from Source Document M064	Jeff Harrison	N/A	N/A, Undated
M269	Evaluation of Additional Containers for Waste Stream OR-NFS-CH-SOIL	Jeff Harrison	M269	NA, Various
M271	Mixed Low Level Waste Profile	Mike McCauley	LL-A-OP-010	Rev. 8, 09/30/2013
M278	New Pig WypAll X80 Wipers used at the TWPC	NA	NA	NA, NA
M289	Incoming Container Traveler	Various	NA	NA, Various
M290	Operations Prohibited Item Processing and Waste Nonconformance Reports	Various	Various	NA, Various
P014	Inventory of ORNL Remedial Action Sites: 11. Research Laboratories	T.J. Blasing, B.S. Houser	RAP 86-52	NA, 06/30/1986
P043	Oak Ridge National Laboratory, Institutional Plan, FY 1996 – FY 2001	Oak Ridge National Laboratory	ORNL/PPA-95/1	NA, 12/1995
P1082	Lockheed Martin Energy Research Corporation, ORNL, Environmental Protection Procedure: Disposal of PCB (Polychlorinated Biphenyl) Oils	Lockheed Martin, ORNL	EPM-3.1	Rev. 0A, 05/01/1993
P1083	Environmental Protection Procedure: Polychlorinated Biphenyls (PCBs)	Martin Marietta, ORNL	EPM-4.0	NA, 11/20/1989; 01/15/1987
P1084	Environmental Protection Procedure: Solid Radioactive Waste Management	Martin Marietta, ORNL	EPM-17.0	NA, 07/24/1989
P1115	Solid Waste Storage Area 5 North Transuranic Waste Engineering Study for the 22-Trench Area at Oak Ridge National Laboratory	Bechtel Jacobs	BJC/OR-898	NA, August 2001
P1116	EnergX TRU Waste Processing Center Procedure: Absorbing Liquids	NA	CH-I-OP-013	Rev. 6 (Older Versions Included), 11/17/2008
P122	The 1996 Baseline Environmental Management Report	US Department of Energy	DOE/EM-0290	NA, 06/1996
P1370	Evaluation of Techniques for Conditioning and Packaging Plutonium Contaminated Soil	NFS, Mark Wetherill	DCM-03-015-008; 44T-08-0069; MSW-08-002	NA, 11/2008

Attachment 4 - Acceptable Knowledge Source Document Information List (continued)

Source Document Tracking Number	Title or Description	Author	Document #	Document Revision # and Date
P1371	Procedure for Removal and Decontamination of Utility and Process Lines and Systems	NFS	DCM-11	Revision 2, 10/15/1992
P1372	Building 234 Soil, Groundwater, and Groundwater Sludge Sampling and Analysis Plan (NFS)	NFS	DCM-03-017-001; 44T-09-0049	Revision 0, 02/01/2010
P1373	Project Management Plan for Wet Cell Soil Excavation (NFS)	NFS	Pu-PMP-01; DAB-08-001	Revision 0, 04/28/2008
P1374	Characterization of Building 234 Waste (NFS)	NFS, Thomas Holly	DCM-03-012; TCH-08-014; 44T-08-0058	Revision 0, 11/4/2008
P1375	North Site Characterization Report for Nuclear Fuel Services, Erwin, Tennessee	Nuclear Fuel Services, Inc.	21G-99-0058	Rev.1, 07/1999
P1400	Operating Procedure for Soil Excavation, Processing and Packaging for the 234 Excavation Facility	NA	NFS-DC-133	Rev. 10 (Older Versions Included), 11/05/2015
P1401	Waste Packaging for WIPP Disposal	Michael Chase	SOP 335-L	Rev. 3 (Older Versions Included), 05/27/2014
P1402	234 Wet Cell Characterization Summary	Mark Wetherill	DCM-03-017-002	NA, 05/28/2010
P1403	Operation of the ORTEC Mobile Counting System	Richard Ratner	NFS-ACC-124	Rev. 0, 06/23/2010
P1404	Final Report: Solidification Testing for 234 Excavation Facility Decommissioning Project	Tanya Griffith	53T-10-0046	NA, 05/25/2010
P1405	Geochemical Survey of the Unaka Mountain Roadless Area, Unicoi County, Tennessee	K.A. Duttweiler, W.R. Griffitts, J.W. Whitlow, and E.F.Cooley	84-268	NA, 1984
P1407	TWPC Procedure - Pipe Overpack Container Operations	NA	CH-I-OP-029	R0, 05/05/2011
P141	Western New York Nuclear Service Center Study, Volume 2 (of 2 volumes) Companion Report	US DOE	TID-28905-3	NA, NA
P1415	Radioactive Material Shipment to CNSI Barnwell, US Ecology Richland, and to Customer	Scientific Ecology Group, Inc.	OP-4.4	Revs. 6, 7, 8, 3/11/93, 4/13/93, 4/24/97

Attachment 4 - Acceptable Knowledge Source Document Information List (continued)

Source Document Tracking Number	Title or Description	Author	Document #	Document Revision # and Date
P1432	General Requirements for Waste Handling/Packaging	Dennis Seagroves	SOP 335-A	Rev. 15.B (Older Versions Included), 05/12/2015
P1438	Identification of Potential Unanalyzed Materials	Brian Oakley	CM-R-WP-005	Rev. 0, 02/02/2012
P1444	Contact Handled Waste Container Selection Process	NA	CH-REF-WP-001	Rev. 4 (Older Versions Included), 06/22/2015
P1445	Review of Potential Nitrate Bearing Liquids Treatment	Brian Oakley	CM-R-WP-006	Rev. 0, 09/02/2015
P1446	Environmental Permits - Inspections/Monitoring and Reporting	NA	CM-P-RP-309	Rev. 24 (Older Versions Included), 08/14/2012
P1447	Plans and Practices for Groundwater Protection at the Los Alamos National Laboratory	NA	NA	NA, 2007
P203	Oak Ridge National Laboratory, The First 50 Years in Oak Ridge National Laboratory Review	L. Johnson and D Schaffer	Vol. 25, Numbers Three and Four	NA, 1992
P212	Lattice Experiments with Simulated Burned-Up Fuel for D2O Power Reactors	NP Baumann, et al	DP-1122, Reactor Technology (TID-4500)	NA, 02/1968
P218	Oak Ridge National Laboratory/Nuclear Fuel Services, Inc. NFS Waste Parameter Verification Program	Martin Marietta Energy Systems, Inc.	NA	NA, 10/29/1992
P248	Structural Assessment of Building 234 Prepared for NFS, 1205 Banner Hill Road, Erwin, TN 37650	Siddharth Shah	DCM-03-18, 44T-99-0450, SS-99-002	NA, 11/1999
P251	Box Breakdown Area Operations	NA	CH-UET-OP-003 (Changed from CH-P-OP-003)	Rev. 14 (Older Versions Included), 10/06/2015
P252	Glove Box Operations	NA	CH-UET-OP-004 (Changed from CH-P-OP-004)	Rev. 12 (Older Versions Included), 06/15/2015

Attachment 4 - Acceptable Knowledge Source Document Information List (continued)

Source Document Tracking Number	Title or Description	Author	Document #	Document Revision # and Date
P253	Drum Bag In/Bag Out and Glove Ports	NA	CH-REF-OP-011 (Changed from CH-P-OP-011)	Rev. 7 (Older Versions Included), 11/11/2015
P254	Contact Handled Waste Repackaging	NA	CH-REF-OP-013 (Changed from CH-P-OP-013)	Rev. PCN 9-1 (Older Versions Included), 06/19/2015
P255	Contact Handled Waste Acceptance Criteria	NA	CH-X-AD-001	Rev. 26 (Older Versions Included), 06/15/2015
P256	TRU/Alpha Low Level Waste (LLW) Treatment Project Documented Safety Analysis	NA	T-CM-FW-R-AD-001	Rev. 14 (Older Versions Included), 08/28/2007
P267	Nuclear Fuel Services Waste Acceptance and Storage Procedure	NA	WM-SWO-501.18	Rev. 0 & 1, 03/05/1991 & 07/12/1991
P268	ORNL WAC for Contact Handled Transuranic and Mixed Oxide Wastes from Nuclear Fuel Services INC.	NA	WMRA-WMPC-106	NA, 10/16/1992
P269	ORNL Waste Acceptance Criteria for Transuranic Waste from the Nuclear Fuel Services, Inc.; ORNL WAC for Contact-Handled Transuranic and Mixed Oxide Wastes from Nuclear Fuel Services, Inc.	NA	WM-WMCO-202	Revisions 0 and 1, 3/20/1991; 04/07/1992
P272	Oak Ridge National Laboratory Waste Management Plan	ORNL	ORNL/TM-11433	Rev. 0, 1, 2, & 3, 12/1989 - 12/1993
P273	Nuclear Fuel Services, Inc., Waste Certification Plan for Transuranic Waste	NFS	DCM-03-05; 28G-91-001	Revs. 0, 1, 07/1991; 11/1992; 02/1992
P276	Determination of H2 Diffusion Rates through Various Closures on TRU Waste Bag-Out Bags	P. D. Noll, E. L. Callis, K. M. Norman, LANL	LA-13616-MS	NA, 06/1999
P283	Plutonium Facilities Decommissioning Project Plan Condition Addendum	NFS	Appendix B, SNM-124, Chapter 7	Revision 2, 04/28/1989

Attachment 4 - Acceptable Knowledge Source Document Information List (continued)

Source Document Tracking Number	Title or Description	Author	Document #	Document Revision # and Date
P284	MGA: A Gamma Ray Spectrum Analysis Code for Determining Plutonium Isotopic Abundances	R. Gunnink	UCRL-LR-103220	4/3//90
P285	Los Alamos Radiation Monitoring Notebook	James T. Voss	LA-UR-00-2584	2/2001
P300	Operation of the Decontamination and Volume Reduction Facility	NA	DCM-08	Rev. Various, 06/21/1990 through 11/21/1992
P306	Excavation of 110 Lab Tank	NA	DCM-17	Rev. 1 (Older Versions Included), 02/11/1991
P315	Wet Cell Soil Excavation and Mixing	NA	DCM-61	Rev. 1 (Older Versions Included), 08/02/1993
P317	Packaging for Shipment to Processing, Storage, or Burial	NA	DCM-03	Rev. 6 (Older Versions Included), 07/15/1993
P321	Determination of Plutonium Isotopics for Building 110 and 234	John T. Caldwell	NA	4/28/1992
P323	Staus of Former Mixed Oxide Fuel Fabrication Facility	EcoTec, Inc.	28T-94-003	1/10/1994
P432	TRU Waste Processing Center Documented Safety Analysis	NA	CM-R-AD-001	Rev. 32 (Older Versions Included), 08/27/2015
P569	Implementation Plan for U. S. Department of Energy Order 435.1, U. S. Department of Energy - Oak Ridge Operations, Oak Ridge, Tennessee	U. S. Department of Energy - Oak ridge Operations	DOE/OR/01-1879	NA, 06/2000
P587	Energetic Materials Management	NA	CM-P-WP-016	Rev. 2 (Older Versions Included), 06/22/2015

Attachment 4 - Acceptable Knowledge Source Document Information List (continued)

Source Document Tracking Number	Title or Description	Author	Document #	Document Revision # and Date
P588	Box Breakdown Area Material Handling Recipes	NA	CH-REF-OP-001	Rev. 3 (Older Versions Included), 06/23/2015
P589	Glove Ports and Sleeve Transfers	NA	CH-REF-OP-046	Rev. 3 (Older Versions Included), 11/19/2015
P592	Absorbing Liquids in the Glovebox and Box Breakdown Area	NA	CH-REF-OP-014	Rev. PCN 5-1 (Older Versions Included), 08/27/2015
P598	Operations Prohibited Item Processing	NA	CH-REF-OP-044	Rev. 4 (Older Versions Included), 07/24/2014
P599	Non-Compliant Containers	NA	CH-REF-OP-045	Rev. 1 (Older Versions Included), 06/23/2015
U016	A Graphical Workbook for Estimating Important Quantities of NFS Radioactive Waste Constituents	JA Chapman	NA	NA, 03/1992
U017	The Intercomparison of NDA Measurements on CH-TRU Waste Between Nuclear Fuel Services, Inc. and Oak Ridge National Laboratory	JA Chapman, et al	NA	NA, 10/24/1995
U038	ORNL TRU Waste Historical Survey; Volumes 1, 2, and 3—Origins and Characteristics of Remote-Handled Transuranic Wastes (Trabalka report) Plus Appendices	J.R. Trabalka, A. J. Mattus, S.N. Storch	BJC/OR-395-V/1,2,3	Draft, 09/2001
U040	NFS response to "Transuranic Waste Baseline Inventory Report Questionnaire"	David Delwiche and John Cummings	NA	NA, 01/1996
U043	Final Report - Waste Characterization of Wastes Generated from D&D Activity; Buildings 110 and 234 on the NFS Site in Erwin, Tennessee	M. W. Tull, Martin Marietta	NA	NA, 01/31/1992
U044	Weston Report: Acceptable Knowledge Summary Report for Oak Ridge National Laboratory Contact-Handled TRU Debris Waste Facility Maintenance Operations	ORNL/Betty Humphrey	AK-ORNL-001	Rev. 3A & 4, 05/24/2006; 06/19/2006

Attachment 4 - Acceptable Knowledge Source Document Information List (continued)

Source Document Tracking Number	Title or Description	Author	Document #	Document Revision # and Date
U050	Action Description Memorandum for Disposition of Transuranic Waste and Plutonium Scrap from Nuclear Fuel Services, Inc.	NA	ANL/NE:532	12/19/1990
U052	Decommissiong Strategy in Today's Environments	NA	NA	NA
U054	Decontamination and Decommissioning of a Plutonium Fabrication Facility	Michael West, Robert Hunt, and Donald Paine	NA	NA
U055	Abstract, Calibration Schemes and Measurement Techniques	NA	NA	NA
U058	Oak Ridge National Laboratory/Nuclear Fuel Services Inc. NFS Waste Parameter Verification Program	Na	na	Rev. NA, Undated
U597	Building 234 Groundwater Design of Experiement (Groundwater Monitoring Data) (NFS)	NFS	NA	NA, 01/2010

Acceptable Knowledge Expert: **Travis Smith** **Date:** **04/20/2016**

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Attachment 4 - Acceptable Knowledge Source Document Information List

Site(s): Oak Ridge National Laboratory

Waste Stream Number: OR-NFS-CH-HOM-A

Waste Stream Description: Immobilized Liquids and Fines from NFS

Source Document Tracking Number	Title or Description	Author	Document #	Document Revision # and Date
C099	Letter to Harold Johnson, CBFO DOE re: KAPL-NFS Transuranic Waste Background Information	Delwiche, D. A.	NA	NA, 05/03/2005
C100	Interview with Richard Booth and faxed defense and waste information for NFS, Erwin, TN TRU waste	Betty Humphrey	NA	NA, 02/24/2005
C119	Removal of Contaminated Pipe, Building 234 Area B, Memo to Ron Mitchell, Letter of Authorization (LOA)	Bill Reynolds	LOA-7000-018	NA, 03/20/2000
C120	Removal of Contaminated Piping, Building 234, Memo to Larry Burleson, Letter of Authorization (LAO)	Bill Reynolds	LOA-7000-011	NA, 03/02/2000
C121	DVRF Bale Packaging Glovebox Removal, Memo to Ron Mitchell	JJ Rogers	LOA-7000-034	NA, 02/15/2001
C122	Building 234 Characterization Results, Memo to Heather Little	Gina Craig	DCM-03-18, 44T-99-0436, GPC-99-013	NA, 09/30/1999
C125	Cleaning and Surveying the DVRF Shear Baler for PCBs, Memo to Building 234 Supervision	Gina Craig	SWI-02-035	NA, 10/03/2002
C126	Waste Packaging of the DVRF Decon Cell Perma-Con Structure, Memo to Richard A. Moore	Daniel J. O'Brien	SWI-02-001	NA, 02/18/2002
C127	Size Reduction of the NDA Station 2 Glovebox In the DVRF Decontamination Cell, Memo to Ron Mitchell and Rick Leitner	Ray Panciera	SWI-01-018	NA, 04/18/2001
C129	Size Reduction Process Ductwork within the Decontamination Cell, DVRF, Memo to Ron Mitchell and Rick Leitner	Bill Reynolds	SWI-01-015	NA, 03/15/2001
C130	Cleanout of DVRF Bale Packaging Glovebox, Memo to Ron Mitchell and Rick Leitner	JJ Rogers	SWI-01-013	NA, 03/07/2001
C142	Legal Analysis regarding Solvent Binder Used to Make Fuel	Al Floro	NA	NA, 11/28/1990
C145	Memo to Distribution re: Nuclear Fuel Services, In. (NFS) Background Information	D. W. Turner	NA	NA, 02/07/1992
C146	Paper from EPA website: Waste Minimization Assessment for a Manufacturer Producing Printed Circuit Boards	H. W. Edwards, M. Kostrzewa, P. S. Miller	NA	NA, UNK

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DATE REC'D 04-20-2016 SH

Attachment 4 - Acceptable Knowledge Source Document Information List (continued)

Source Document Tracking Number	Title or Description	Author	Document #	Document Revision # and Date
C147	Retrieved from EPA website: Consumer Product links for Mercury	EPA	NA	NA, 08/07/2007
C172	Miscellaneous Correspondence Regarding Testing of Nochar Absorbents	Various	N/A	N/A, Various
C173	Email Correspondence Regarding TWPC Glovebox Decon	Kevin East, et al.	N/A	N/A, 11/11/2014 to 11/13/2014
C200	Internal Correspondence to M.W. Tull subject: On the Use of Rad-Sorb in NFS TRU-Waste Drums	J.A. Chapman	NA	Rev. NA, 05/26/1993
C201	Letter to Mr. Bill Reynolds, EcoTek from Terry Wickland, Product Engineer regarding Seal for 16 gauge DOT 17H stainless steel drum lid	Terry Wickland, Product Engineer	NA	Rev. NA, 04/08/1993
C203	Letter to Martin Tull from Robert A. Hunt regarding a picture of the proposed method to "lab pack" bottles of immobilized respirable fines and residual materials	Robert A. Hunt, Ecotek, Inc.	NA	Rev. NA, 03/23/1993
C204	Letter to Martin W. Tull, Martin Marietta Energy Systems, from Michael L. West, Nuclear Fuel Services, Inc. regarding response to his request for information relating to the discovery of mercury during the decommissioning of Station #15 in Building 234.	Michael L. West	NA	Rev. NA, 09/03/1992
C205	Internal Correspondence to Distribtuion regarding Minutes of November 5, 1991 Meeting with NFS Regarding Process-Line Samples	Martin W. Tull	NA	Rev. NA, 11/11/1991
C206	Numerous Faxes containing handwritten notes (oversight reports) from Paul O. Emerson re: such items as sampling the top of the underground tank, Pu Crew activities, equipment issues, processing of gloveboxes, and information on drums that were packaged.	Paul O. Emerson	NA	Rev. NA, 01/09/1991 through 08/28/1992
C209	Internal Correspondence to F.J. Shultz from J.A. Chapman regarding NFS Project Accomplishments for Month of April 1992	J.A. Chapman	NA	Rev. NA, 05/04/1992
C210	Interview re: NFS TRU Waste Shipped to Oak Ridge National Laboratory. Interviewees: Richard Booth, Richard Moore, Bob Hunt, Scott Toller, Marie Moore	J. Harrison; L. Watson	NA	NA, 09/12/2007
C227	Interview with Scott Morie from NFS	J. Harrison	NA	09/23/2010
C324	Email from Mike McCauley to Jeff Harrison, re: Use of Speedi Dri at TWPC	Mike McCauley	NA	NA, 04/07/2015
DR006	Discrepancy Resolution re: Physical Form of NFS-0116 & NFS-0929	Jeff Harrison	N/A	0, 11/30/07
DR030	Discrepancy Resolution re: Drum NFS0929	J. Harrison	DR030	NA, 01/10/2011
DR031	Discrepancy Resolution re: OR-NFS-CH-HOM-A EPA Hazardous Waste Number Assignment)	Jeff Harrison	DR031	NA, 01/10/2011
DR037	Discrepancy Resolution, re: Drum NFS0788A	Jeff Harrison	DR037	NA, 12/19/2013

Attachment 4 - Acceptable Knowledge Source Document Information List (continued)

Source Document Tracking Number	Title or Description	Author	Document #	Document Revision # and Date
DR039	Discrepancy Resolution, re: Drum NFS0806A	Jeff Harrison	DR039	NA, 02/24/2014
I022	DOE Order 435.1, Radioactive Waste Management	US DOE	DOE O 435.1	NA, 07/09/1999
I023	Radioactive Waste Management Manual	US DOE	DOE M 435.1-1	Rev. 1, 06/19/2001
I043	Implementation Guide for Use with DOE M 435.1-1	US Department of Energy	DOE G 435.1-1	NA, 07/09/1999
I052	Memorandum; Building 234 Shear Baler Characterization Samples	Gina P. Craig	GPC-02-013, DC-03-18, 44T-02-0633	NA, 09/11/2002
I067	Procedure for the Operation of the Versatile Automated Gamma Assay System (VAGAS)	Materials Department	NFS-ACC-104	Revisions 0 & 8, 05/08/2000 - 09/17/2007
M003	ORNL UCN-2109 and UCN-2822 Forms for NFS TRU Waste and Related Paperwork for Waste Stored at ORNL (container paperwork)	NA	NA	NA, Various
M007	Internal Correspondence and the Environmental Assessment for the Receipt and Storage at ORNL, of Transuranic Waste, Mixed Transuranic Waste, and Mixed Oxide Waste from Nuclear Fuels and the Environmental Assessment for Disposition of Transuranic Waste	L.T. Cusick	LTR# ER-NEP A/92-015	Rev. NA, 11/09/1992
M008	Fax from John E. Kirkpatrick to Robert C. Mason on 01/16/1991 and the PuO2 + UO2 (mixed oxide) fuel production flow chart for Pellet Production, Rod/Assembly Fabrication, Scrap Dissolution/Recovery	Robert C. Mason	NA	NA, 01/16/1991
M011	MSDS (Material Safety Data Sheets) for Products used at NFS	Various	NA	NA, Various
M012	EM Waste Database Query - Container Information; Waste Description; Isotopes	ORNL	NA	NA, 08/09/2007
M013	EM Waste Database Query - NFS Box Daughter and Repack Drums: Container; Waste Description; Isotopes	ORNL	NA	NA, 08/23/2007
M017	NFS NDA Data from Foster Wheeler (by container)	Foster Wheeler, ORNL	Various	NA, Various
M018	NFS Radiography (NDE) Data from Foster Wheeler (by container)	Foster Wheeler, ORNL	Various	NA, Various
M019	NFS VE Data from Foster Wheeler (by container)	Foster Wheeler, ORNL	Various	NA, Various
M020	NFS HSG Data from Foster Wheeler (by container)	Foster Wheeler, ORNL	Various	NA, Various
M021	Defense Determination Approval for ORNL/NFS-HD-001, Heterogeneous Debris - NFS	Betty Humphrey	ORNL-HD-001-IF	NA, 05/13/2005

Attachment 4 - Acceptable Knowledge Source Document Information List (continued)

Source Document Tracking Number	Title or Description	Author	Document #	Document Revision # and Date
M050	Photos of the Site	NA	NA	Rev. NA, NA
M051	Fax from Bob Hunt from Martin Tull transmitting drawing for EcoTek - The Hunt 55 Gallon Poly. Insert	Martin Tull	NA	Rev. NA, 09/01/1993
M052	Account Book No. S149 - DVRF Decommissioning and Volume Reduction Facility	NA	S149	Rev. NA, Various
M053	Letter from L.C.M. Roddye to R.L. Booth regarding Nuclear Fuel Services, Inc. - Contract DE-SCOT-86ID12630 - Closure of Nonconformance Reports NCR-X-94-WMRAD-0011, NCR-X-94-WMRAD-0012, NCR-X-94-WMRAD-0013, NCR-X-94-WMRAD-0014 AND NCR-X-94-WMRAD-0015	L.C.M. Raddye	15N-94-0054 GOV-01-01-04 NCR 86ID12630	Rev. NA, 02/10/1994
M054	Internal Correspondence to Distribution from D.W. Turner regarding Information Concerning NFS D&D Operations	D.W. Turner	NA	Rev. NA, 03/21/1991
M058	(Handwritten Document) Methods for: Measuring Activity in Baled Waste; Flowsheet for Immobilizing Fines; Assigning Values to Soil; Flowsheet for Packaging and Measuring Raschig Rings	N/A	NA	NA, N/A
M061	Internal Correspondence to Distribution from J.A. Chapman regarding An Evaluation of NFS Isotopic Estimates by Gamma-ray and Alpha-particle Spectroscopy	J.A. Chapman	NA	Rev. NA, 08/24/1992
M064	Analysis Results for Process Line Samples from Nuclear Fuel Services, Inc. and NFS Sample Set No. 3	C. E. Frye	N/A	N/A, 10/18/1991
M065	WEAF Data for NFS Drums (by container); WEAF Waste Acceptance Report; NFS Storage Project (by container)	ORNL, J. Chapman	NA	NA, 1993-1994
M067	Surveillance: Source surveillance for Contact-Handled Transuranic and Mixed Oxide Wastes	Paul Emerson	PQ-TR-3904, SS WMRA-106	Rev. NA, 12/18/1992
M068	Review of WEAF RTR Video Tapes	James Luginbyhl	N/A	11/27/07
M075	TWPC Contact Handled Waste Repackaging Data Forms for NFS Waste. (container paperwork)	ORNL	NA	NA, Various
M126	RTR Video Tapes and DVDs from the WEAF Facility for Oak Ridge Waste	ORNL	NA	NA, 1986 - 1992
M198	eMWaste Database Query	NA	DR-10-004417	NA, 08/30/2010
M202	Review of WEAF RTR Videos for NFS Immobilized Liquids and Fines	Rick Schultz	NA	NA, 10/11/2010 - 10/13/2010
M217	eMWaste Database Query from ORNL Dated 01/03/2013	ORNL	NA	NA, 01/03/2013
M235	Evaluation of Data from Source Document M064	Jeff Harrison	N/A	N/A, Undated

Attachment 4 - Acceptable Knowledge Source Document Information List (continued)

Source Document Tracking Number	Title or Description	Author	Document #	Document Revision # and Date
M278	New Pig WypAll X80 Wipers used at the TWPC	NA	NA	NA, NA
P014	Inventory of ORNL Remedial Action Sites: 11. Research Laboratories	T.J. Blasing, B.S. Houser	RAP 86-52	NA, 06/30/1986
P1116	EnergX TRU Waste Processing Center Procedure: Absorbing Liquids	NA	CH-I-OP-013	Rev. 6 (Older Versions Included), 11/17/2008
P1371	Procedure for Removal and Decontamination of Utility and Process Lines and Systems	NFS	DCM-11	Revision 2, 10/15/1992
P1374	Characterization of Building 234 Waste (NFS)	NFS, Thomas Holly	DCM-03-012; TCH-08-014; 44T-08-0058	Revision 0, 11/4/2008
P1398	TRU Waste Processing Center, High Density Waste Item Repackaging	NA	CH-I-OP-025	R0, R1, 11/16/2010, 11/19/2010
P1407	TWPC Procedure - Pipe Overpack Container Operations	NA	CH-I-OP-029	R0, 05/05/2011
P1415	Radioactive Material Shipment to CNSI Barnwell, US Ecology Richland, and to Customer	Scientific Ecology Group, Inc.	OP-4.4	Revs. 6, 7, 8, 3/11/93, 4/13/93, 4/24/97
P1438	Identification of Potential Unanalyzed Materials	Brian Oakley	CM-R-WP-005	Rev. 0, 02/02/2012
P1444	Contact Handled Waste Container Selection Process	NA	CH-REF-WP-001	Rev. 4 (Older Versions Included), 06/22/2015
P1445	Review of Potential Nitrate Bearing Liquids Treatment	Brian Oakley	CM-R-WP-006	Rev. 0, 09/02/2015
P1446	Environmental Permits - Inspections/Monitoring and Reporting	NA	CM-P-RP-309	Rev. 24 (Older Versions Included), 08/14/2012
P212	Lattice Experiments with Simulated Burned-Up Fuel for D2O Power Reactors	NP Baumann, et al	DP-1122, Reactor Technology (TID-4500)	NA, 02/1968

Attachment 4 - Acceptable Knowledge Source Document Information List (continued)

Source Document Tracking Number	Title or Description	Author	Document #	Document Revision # and Date
P218	Oak Ridge National Laboratory/Nuclear Fuel Services, Inc. NFS Waste Parameter Verification Program	Martin Marietta Energy Systems, Inc.	NA	NA, 10/29/1992
P248	Structural Assessment of Building 234 Prepared for NFS, 1205 Banner Hill Road, Erwin, TN 37650	Siddharth Shah	DCM-03-18, 44T-99-0450, SS-99-002	NA, 11/1999
P251	Box Breakdown Area Operations	NA	CH-UET-OP-003 (Changed from CH-P-OP-003)	Rev. 14 (Older Versions Included), 10/06/2015
P252	Glove Box Operations	NA	CH-UET-OP-004 (Changed from CH-P-OP-004)	Rev. 12 (Older Versions Included), 06/15/2015
P253	Drum Bag In/Bag Out and Glove Ports	NA	CH-REF-OP-011 (Changed from CH-P-OP-011)	Rev. 7 (Older Versions Included), 11/11/2015
P254	Contact Handled Waste Repackaging	NA	CH-REF-OP-013 (Changed from CH-P-OP-013)	Rev. PCN 9-1 (Older Versions Included), 06/19/2015
P255	Contact Handled Waste Acceptance Criteria	NA	CH-X-AD-001	Rev. 26 (Older Versions Included), 06/15/2015
P256	TRU/Alpha Low Level Waste (LLW) Treatment Project Documented Safety Analysis	NA	T-CM-FW-R-AD-001	Rev. 14 (Older Versions Included), 08/28/2007
P267	Nuclear Fuel Services Waste Acceptance and Storage Procedure	NA	WM-SWO-501.18	Rev. 0 & 1, 03/05/1991 & 07/12/1991
P268	ORNL WAC for Contact Handled Transuranic and Mixed Oxide Wastes from Nuclear Fuel Services INC.	NA	WMRA-WMPC-106	NA, 10/16/1992

Attachment 4 - Acceptable Knowledge Source Document Information List (continued)

Source Document Tracking Number	Title or Description	Author	Document #	Document Revision # and Date
P269	ORNL Waste Acceptance Criteria for Transuranic Waste from the Nuclear Fuel Services, Inc.; ORNL WAC for Contact-Handled Transuranic and Mixed Oxide Wastes from Nuclear Fuel Services, Inc.	NA	WM-WMCO-202	Revisions 0 and 1, 3/20/1991; 04/07/1992
P272	Oak Ridge National Laboratory Waste Management Plan	ORNL	ORNL/TM-11433	Rev. 0, 1, 2, & 3, 12/1989 - 12/1993
P273	Nuclear Fuel Services, Inc., Waste Certification Plan for Transuranic Waste	NFS	DCM-03-05; 28G-91-001	Revs. 0, 1, 07/1991; 11/1992; 02/1992
P274	Segregation and Immobilization of Particulate Fines	NFS, Decommissioning Department	DCM-58	Revisions 0, 1, 2 and 3, NA, 1993
P276	Determination of H2 Diffusion Rates through Various Closures on TRU Waste Bag-Out Bags	P. D. Noll, E. L. Callis, K. M. Norman, LANL	LA-13616-MS	NA, 06/1999
P283	Plutonium Facilities Decommissioning Project Plan Condition Addendum	NFS	Appendix B, SNM-124, Chapter 7	Revision 2, 04/28/1989
P300	Operation of the Decontamination and Volume Reduction Facility	NA	DCM-08	Rev. Various, 06/21/1990 through 11/21/1992
P303	Removal of Exhaust Systems	NA	NFS-DCM-PR-12	Rev. 1, 06/20/1990
P317	Packaging for Shipment to Processing, Storage, or Burial	NA	DCM-03	Rev. 6 (Older Versions Included), 07/15/1993
P319	Preparation of Gloveboxes for Decontaminationin the DVRF	NA	DCM-05	2, 8/16/1991
P320	Bag-Out and Glove Change	NA	NFS-DCM-PR-06	Revision 1, 6/20/1990
P321	Determination of Plutonium Isotopics for Building 110 and 234	John T. Caldwell	NA	4/28/1992
P323	Staus of Former Mixed Oxide Fuel Fabrication Facility	EcoTec, Inc.	28T-94-003	1/10/1994

Attachment 4 - Acceptable Knowledge Source Document Information List (continued)

Source Document Tracking Number	Title or Description	Author	Document #	Document Revision # and Date
P432	TRU Waste Processing Center Documented Safety Analysis	NA	CM-R-AD-001	Rev. 32 (Older Versions Included), 08/27/2015
P587	Energetic Materials Management	NA	CM-P-WP-016	Rev. 2 (Older Versions Included), 06/22/2015
P588	Box Breakdown Area Material Handling Recipes	NA	CH-REF-OP-001	Rev. 3 (Older Versions Included), 06/23/2015
P589	Glove Ports and Sleeve Transfers	NA	CH-REF-OP-046	Rev. 3 (Older Versions Included), 11/19/2015
P592	Absorbing Liquids in the Glovebox and Box Breakdown Area	NA	CH-REF-OP-014	Rev. PCN 5-1 (Older Versions Included), 08/27/2015
P598	Operations Prohibited Item Processing	NA	CH-REF-OP-044	Rev. 4 (Older Versions Included), 07/24/2014
P599	Non-Compliant Containers	NA	CH-REF-OP-045	Rev. 1 (Older Versions Included), 06/23/2015
U016	A Graphical Workbook for Estimating Important Quantities of NFS Radioactive Waste Constituents	JA Chapman	NA	NA, 03/1992
U017	The Intercomparison of NDA Measurements on CH-TRU Waste Between Nuclear Fuel Services, Inc. and Oak Ridge National Laboratory	JA Chapman, et al	NA	NA, 10/24/1995
U038	ORNL TRU Waste Historical Survey; Volumes 1, 2, and 3—Origins and Characteristics of Remote-Handled Transuranic Wastes (Trabalka report) Plus Appendices	J.R. Trabalka, A. J. Mattus, S.N. Storch	BJC/OR-395-V/1,2,3	Draft, 09/2001

Attachment 4 - Acceptable Knowledge Source Document Information List (continued)

Source Document Tracking Number	Title or Description	Author	Document #	Document Revision # and Date
U040	NFS response to "Transuranic Waste Baseline Inventory Report Questionnaire"	David Delwiche and John Cummings	NA	NA, 01/1996
U043	Final Report - Waste Characterization of Wastes Generated from D&D Activity: Buildings 110 and 234 on the NFS Site in Erwin, Tennessee	M. W. Tull, Martin Marietta	NA	NA, 01/31/1992
U044	Weston Report: Acceptable Knowledge Summary Report for Oak Ridge National Laboratory Contact-Handled TRU Debris Waste Facility Maintenance Operations	ORNL/Betty Humphrey	AK-ORNL-001	Rev. 3A & 4, 05/24/2006; 06/19/2006
U050	Action Description Memorandum for Disposition of Transuranic Waste and Plutonium Scrap from Nuclear Fuel Services, Inc.	NA	ANL/NE:532	12/19/1990
U052	Decommissiong Strategy in Today's Environments	NA	NA	NA
U054	Decontamination and Decommissioning of a Plutonium Fabrication Facility	Michael West, Robert Hunt, and Donald Paine	NA	NA
U055	Abstract, Calibration Schemes and Measurement Techniques	NA	NA	NA

Acceptable Knowledge Expert: **Travis Smith** T. Smith **Date:** **04/20/2016**

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Attachment 4 - Acceptable Knowledge Source Document Information List

Site(s): Oak Ridge National Laboratory

Waste Stream Number: OR-REDC-CH-HET

Waste Stream Description: ORNL REDC CH Debris Waste from Hot Cells

Source Document Tracking Number [a/c]	Title or Description [a]	Author	Document # [b]	Document Revision # and Date
C026	Memo to J. T. Hargrove re: Description of the Item 10PUPROD2	D.E. Benker, Martin Marietta	NA	NA, 10/09/1986
C027	Memo to J. T. Hargrove re: Description of the Item 10PUPROD3	D.E. Benker, ORNL, Bldg 7920	NA	NA, 10/09/1986
C028	Memo to J. T. Hargrove re: Description of the Item 10PUPROD4	D.E. Benker, ORNL, Bldg 7920	NA	NA, 10/09/1986
C029	Memo to Davis A. Reed, 4500-N, MS-6244 re: Composition of Curium-II Curium	J.E. Bigelow, 7930	NA	NA, 06/27/1996
C033	Email to Trabalka re: Source of Pu-238(?) from Lab 208 Cleanout in 7920 (mid – 1983)	John E. Bigelow	NA	NA, 04/14/1999
C038	Memo to W. S. Aaron re: REDC Shipment No. 1418: ~ 1.55 g of 244Cm (MC-12304)	j. b. Knauer, 7920	NA	NA, 03/23/1989
C044	Memo to J. T. Hargrove re: Description of Item 10PUPROD1	D. E. Benker, Bldg 7920	NA	NA, 04/25/1986
C046	Memo to J. A. Lenhard, DOE OR re: Materials Management Plan-ORNL	R. S. Wiltshire, ORNL	NA	NA, 06/13/1984
C053	Email to JW Moore re: Process Knowledge – [1960s] Target Leak	MB Farrar, ORNL	NA	NA, 01/06/2005
C078	Memo to Bryan Roy transmitting Historical Survey – RCRA Information	James W. Moore (ZQS)	NA	NA, 04/04/2005
C098	Interview with Wayne Evans: Waste management practices at REDC (Buildings 7920 and 7930)	Tom Krause	NA	NA , 05/09/2005
C101	Memo re: Use of ORNL/TM-7688 as Reference for Process Knowledge	R.E. Schreiber	NA	NA, 08/29/1996
C102	Memo to distribution re: Results of Testing of HEPA Filters in Waste Packets	C.W. Evans	NA	NA, 10/29/1993
C103	Memo to distribution re: Seal out buckets used at REDC	Bob Wham	NA	NA, 07/17/1995
C108	ORFWENC-003 Radiological Data Analysis	NA	NA	NA, Various

CCP RECORDS ORIGINAL
DATE REC'D 2/17/16 mrc

Attachment 4 - Acceptable Knowledge Source Document Information List (continued)

Source Document Tracking Number [a/c]	Title or Description [a]	Author	Document # [b]	Document Revision # and Date
C109	ORFWENC-004 Radiological Data Analysis	NA	NA	NA, Various
C110	ORFWENC-005 Radiological Data Analysis	NA	NA	NA, Various
C111	ORFWENC-006 Radiological Data Analysis	NA	NA	NA, Various
C112	ORFWENC-007 Radiological Data Analysis	NA	NA	NA, Various
C113	ORFWENC-008 Radiological Data Analysis	NA	NA	NA, Various
C148	Interviews with REDC Personnel	J. Harrison; L. Watson	NA	NA, Various
C149	Memo to File re: CCP AK/Weston Source Document Correlation	Lisa Price-Watson	NA	NA, 10/30/2007
C151	Internal Correspondence: Mixed Waste Drums ATN 3190 and ATN 2965	R. E. Schreiber	NA	NA, 2/6/1995
C152	Mark 42 Processing Program Materials Storage	F. L. Peishel, et.al	NA	NA, Various
C153	Email Releasing ORNL Container Paperwork. Subject: The Release of Generator Disposal Forms (2822 and 2109) Forms.	Don Coffey; Dave Hamrin	NA	NA, 4/2008 - 5/2008
C160	E-mail from Kevin East to Don Coffey re: Hot Cell Clean Up Drums	Kevin East	NA	NA, 12/01/2010
C172	Miscellaneous Correspondence Regarding Testing of Nochar Absorbents	Various	N/A	N/A, Various
C173	Email Correspondence Regarding TWPC Glovebox Decon	Kevin East, et al.	N/A	N/A, 11/11/2014 to 11/13/2014
C174	E-mail from Don Coffey, Subject: 7920 TRU Waste (REDC Timeline)	Don Coffey, et al.	NA	NA, 03/06/2013 to 12/03/2014
C175	E-mail from Dennis Benker, Subject: 7920 TRU Waste (M17 Timeline)	Dennis Benker, et al.	NA	NA, 07/23/2013 to 07/25/2013
C176	E-mail from Don Coffey, Subject: 7920 TRU Waste (Dresden LWR fuel)	Don Coffey, et al.	NA	NA, 07/25/2013
C179	Memo from Jeff Harrison to Beverly Schrock, re: Evaluation of Radiological Characterization of Drum X10CSATN03113A in Waste Stream OR-REDC-CH-HET	Jeff Harrison	NA	NA, 07/01/2015
C224	Use of Lab 5 in Building 3508 as Control Area for SNM	E. M. Robinson; B. G. Eads	NA	NA, 2/1987
C225	Memo to Herman Postma re: Implementation of the ERDA Solid Waste Information Management System (SWIMS)	E. M. King	NA	NA, 10/13/1976
C226	Memo to Distribution re: Waste Disposal Information	Roy L. Clark	NA	NA, 12/06/1976

Attachment 4 - Acceptable Knowledge Source Document Information List (continued)

Source Document Tracking Number [a/c]	Title or Description [a]	Author	Document # [b]	Document Revision # and Date
C302	ORNL Comments on CCP-AK-ORNL-500, Rev. 0, Draft D	ORNL	NA	0, 3/05/2008
C304	Deactivation of REDC Documents and Procedures	REDC Doc Control	NA	NA, 01/31/1996
C305	Memo to Transplutonium Program and Research Committee Members re: Summary of TRU Activities for FY-1983	J. E. Bigelow; ORNL	NA	NA, 10/17/1983
C306	Email: re: Addition Info for Current Research Activities at REDC	Don Coffey	NA	NA, 3/14/2008
C307	Interview of Walt Bond - Subject: Processes and Waste in Building 3508 at ORNL	Lisa Watson	NA	NA, 2/21/2008
C308	Interview of Jason Taylor, ORNL-PCB Coordinator from 1997 - 2004 re: PCB Management at ORNL	Jeff Harrison	NA	NA, 04/08/2008
C311	Interview of Don Coffey and Wayne Evans Subject: Heat-Sealed Bags Used at REDC	Jeff Harrison	C311	NA, 08/11/2008
C312	Interview of Rob Peacher Subject: Training Requirements for REDC Personnel	Sheri Nance	C312	NA, 09/08/2008
C324	Email from Mike McCauley to Jeff Harrison, re: Use of Speedi Dri at TWPC	Mike McCauley	NA	NA, 04/07/2015
C600	Interviews with Don Coffey and Wayne Evans re: REDC RH Waste Cask Packaging Clarification and Swipe Sample Collection	K. Peters; M. Doherty	NA	NA, 06/04/2008
C601	RH TRU Waste Correlation and Surrogate Summary Form for OR-REDC-RH-HET Waste Stream	K. Peters	NA	NA, 07/01/2008
DR003	Discrepancy Resolution, Re: Generation Location Discrepancies	Jeff Harrison	DR003	NA, 08/27/2008
DR004	Discrepancy Resolution, Re: Radiological Discrepancies	Jeff Harrison	DR004	NA, 01/12/2009
DR005	Discrepancy Resolution, Re: EPA Hazardous Waste Number Discrepancies	Kevin Peters	DR005	NA, 06/24/2008
DR008	Discrepancy Resolution, Re: Follow-Up on DR602 for EPA Hazardous Waste Number Discrepancies (REDC Waste)	Jeff Harrison	DR008	NA, 09/10/2008
DR009	Discrepancy Resolution, Re: Waste Incidental to Reprocessing Determination	Jeff Harrison	DR009	NA, 10/02/2008
DR027	Discrepancy Resolution, Re: AK Re-Evaluation for Two Most Prevalent Radionuclides	Jeff Harrison	DR027	NA, 07/22/2010
DR040	Discrepancy Resolution, re: Radiological Distributions for Casks X10C9402628 and X10C9600188	Jeff Harrison	DR040	NA, 05/28/2014
DR600	Discrepancy Resolution, Re: Packaging Documentation Discrepancies for Cask X10C0601826	Kevin J. Peters	DR600	NA, 06/24/2008
DR601	Discrepancy Resolution, Re: Presence of Debris Items in Poly Blocks	Kevin J. Peters	DR601	NA, 07/01/2008

Attachment 4 - Acceptable Knowledge Source Document Information List (continued)

Source Document Tracking Number [a/c]	Title or Description [a]	Author	Document # [b]	Document Revision # and Date
DR602	Discrepancy Resolution, Re: Follow-Up on DR005 for EPA Hazardous Waste Number Discrepancies	Kevin J. Peters	DR602	NA, 07/02/2008
I002	REDC Programs Through the Years	JE Bigelow	NA	NA, 02/25/1998
I022	DOE Order 435.1, Radioactive Waste Management	US DOE	DOE O 435.1	NA, 07/09/1999
I023	Radioactive Waste Management Manual	US DOE	DOE M 435.1-1	Rev. 1, 06/19/2001
I042	AKE Memo and Potential Hazardous Constituents of ORNL Waste	Betty Humphrey; Jean S. Burt	NA	NA, 06/27/2005 - 05/23/2006
I043	Implementation Guide for Use with DOE M 435.1-1	US Department of Energy	DOE G 435.1-1	NA, 07/09/1999
I044	Re-Evaluation of the Radiological Data for Legacy CH TRU Waste from REDC BUilding 7920	Don Coffey	CAN-02MVSWSF-0014	Revision 0, 04/14/2005
M001	Review by Charles Roberts of REDC Maintenance and Operational Log Books	Charles Roberts	NA	NA, Various
M002	Radioactivie Operations Committee Review of the Transuranium Processing Plant (TRU), Building 7920	Radioactive Operations Committee	ORNL/CF-85/49	NA, 02/22/1985
M005	Container Paperwork and UNC-2109 Forms for ORNL Waste Drums for REDC CH Waste	ORNL	Various	NA, Various
M012	EM Waste Database Query - Container Information; Waste Description; Isotopes	ORNL	NA	NA, 08/09/2007
M015	Process Knowledge (PK) Documentation for Building 7920/X-10	R. E. Schreiber	RES-7920-000-002	NA, 03/01/1995
M022	Collection of MSDS for REDC CH and RH Waste	Various	NA	NA, Various
M023	Defense Determination for REDC Heterogeneous Debris	B. Humphrey	NA	NA, 04/25/2005
M024	RH EM Waste Database Query	NA	NA	NA, NA
M070	Solid Transuranic Waste from Building 7920	L. J. King	NA	NA, 4/29/1980
M072	Evaluation of Additional Drums for Waste Stream OR-REDC-CH-HET	J. Harrison	NA	NA, 05/20/2008
M073	TWPC Contact Handled Waste Repackaging Data Forms for Building 7920 Waste	ORNL	NA	NA, Various
M074	UCN-2109 Forms and Related Container Paperwork for Building 7920 Waste Packaged in Boxes	ORNL	NA	NA, Various

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Source Document Tracking Number [a/c]	Title or Description [a]	Author	Document # [b]	Document Revision # and Date
M075	TWPC Contact Handled Waste Repackaging Data Forms for NFS Waste. (container paperwork)	ORNL	NA	NA, Various
M100	Container Paperwork for containers in Waste Stream OR-REDC-RH-HET (UCN-2109)	Various	NA	NA, Various
M110	EM Waste Waste Database Query	ORNL	NA	NA, NA
M111	H. Thompson Logbook, Bldg 7920 ATN Record	NA	NA	NA, Various
M112	Nondestructive Examination (NDE) and Visual Examination Data for Building 7920 TRU Waste. Foster Wheeler TRU/Alpha Low-Level Waste Treatment Project (by container)	Foster Wheeler TRU/Alpha Low-Level Waste Treatment Project	NA	NA, Various
M113	Nondestructive Assay (NDA) Data for Building 7920 TRU Waste. Foster Wheeler TRU/Alpha Low-Level Waste Treatment Project	Foster Wheeler TRU/Alpha Low-Level Waste Treatment Project	NA	NA, Various
M114	Evaluation of Additional Drums for Waste Stream OR-REDC-CH-HET	J. Harrison	NA	NA, 03/18/2008
M117	Diagram of Lid Closure System on a 30 Gallon Drum from TURF (7930) Facility	M. J. Rennich	NA	NA, 03/10/1978
M120	ORNL RH Cask Evaluation and Supplemental Packaging Documentation	ORNL	NA	NA, Various
M121	Evaluation of Additional Drums for Waste Stream OR-REDC-CH-HET	K. Peters	M121	NA, 08/20/2008
M122	Evaluation of Additional Drums for Waste Stream OR-REDC-CH-HET	J. Harrison	M122	NA, 08/25/2008
M123	Evaluation of Additional Drums for Waste Stream OR-REDC-CH-HET	J. Harrison	M123	NA, 08/26/2008
M125	Transuranium Analytical Laboratory Report	NA	NA	NA, Various
M126	RTR Video Tapes and DVDs from the WEAF Facility for Oak Ridge Waste	ORNL	NA	NA, 1986 - 1992
M127	Evaluation of Additional Drums for Waste Stream OR-REDC-CH-HET - Cask Repackaging	K. Peters	M127	NA, 09/25/2008
M134	Drum Evaluation for Additional Drums for Waste Stream OR-REDC-CH-HET dated 11/13/2008	J. Harrison	M134	Rev. NA, 11/13/2008
M135	Drum Evaluation of Additional Drums for Waste Stream OR-REDC-CH-HET dated 11/04/2008	K. Peters	M135	NA, 11/04/2008
M136	Drum Evaluation of Additional Drums for Waste Stream OR-REDC-CH-HET dated 12/17/2008	K. Peters	NA	12/17/2008
M137	Evaluation of Additional Drums for Waste Stream OR-REDC-CH-HET dated 01/14/2009	J. Harrison	M137	NA, 01/14/2009

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Source Document Tracking Number [a/c]	Title or Description [a]	Author	Document # [b]	Document Revision # and Date
M138	Evaluation of Additional Drums for Waste Stream OR-REDC-CH-HET dated 01/20/2009	K Peters	M138	NA, 01/20/2009
M139	Evaluation of Additional Drums for Waste Stream OR-REDC-CH-HET dated 01/26/2009	K. Peters	M139	NA, 01/26/2009
M140	Evaluation of Additional Drums for Waste Stream OR-REDC-CH-HET dated 01/29/2009	K. Peters	M140	NA, 01/29/2009
M146	Evaluation of Additional Drums for Waste Stream OR-REDC-CH-HET dated 02/12/2009	L. Price-Watson	M146	NA, 02/12/2009
M149	Evaluation of Additional Drums for Waste Stream OR-REDC-CH-HET dated 03/18/2009	J. Harrison	M149	NA, 03/18/2009
M150	Evaluation of Additional Drums for Waste Stream OR-REDC-CH-HET dated 03/30/2009	Kevin Peters	NA	NA, 03/30/2009
M151	ORNL EM Waste Database	NA	DR-09-001168	NA, 04/22/2009
M153	Evaluation of Additional Drums for Waste Stream OR-REDC-CH-HET dated 05/21/2009	Jeff Harrison	NA	NA, 05/21/2009
M155	Evaluations of Additional Drums for Waste Stream OR-REDC-CH-HET	Kevin Peters, et al.	NA	NA, Various
M161	Evaluation of Additional Drums for Waste Stream OR-REDC-CH-HET dated 06/16/2009 to 08/25/2009	Lisa Price-Watson, et al.	M161	NA, 06/16/2009 to 08/25/2009
M162	Defense Determination for TRU Waste Generated in the Analytical Laboratories at Oak Ridge National Laboratory Waste Stream ORNL-HD-001-ANLAB	Betty Humphrey	NA	NA, 04/25/2005
M170	Drawings and Specifications for Geotextile Drum Liners with Standing Lift Loops	NA	NA	NA, NA
M171	ORNL EM Waste Database Query	NA	DR-10-000450	NA, 11/9/2009
M195	CCP Remote-Handled Waste Visual Examination Data Forms	NA	CCP-TP-500	Rev. 8, Various
M217	eMWaste Database Query from ORNL Dated 01/03/2013	ORNL	NA	NA, 01/03/2013
M241	Information for Containers X10CSATN02077 and X10CSATN02229	Don Coffey	NA	NA, 10/26/2012
M244	UCOR TRU Database	NA	NA	NA, 09/25/2014
M245	TWPC Database	NA	NA	NA, NA
M251	Global Nuclear Energy Partnership, GNEP And The Globalization Of Nuclear Energy	Daniel T. Ingersoll	NA	NA, 09/11/2008
M252	Global Nuclear Energy Partnership, Research and Development Program	Phillip Finck	NA	NA, 04/21/2008
M253	Unreviewed Safety Question Determination (USQD) Change Package, Radiochemical Engineering Development Center (REDC) Building 7920, New Work Plan No. Voloxidation Campaign 1	M. A. Green	USQD/REDC/07-039	Rev. 1, 05/24/2007

Attachment 4 - Acceptable Knowledge Source Document Information List (continued)

Source Document Tracking Number [a/c]	Title or Description [a]	Author	Document # [b]	Document Revision # and Date
M254	Unreviewed Safety Question Determination (USQD) Change Package, Radiochemical Engineering Development Center (REDC) Building 7920, Fission Product Extraction (FPEX) Process Solvent Extraction Development Studies	M. A. Green	USQD/REDC/07-091	Rev. 0, 12/06/2007
M255	Research Safety Summary, REDC Shielded Cave Operations	Various	409.5, 409.6, 409.7, & 409.8	NA, Various
M256	Research Safety Summary, REDC Development Laboratory Operations – Lab 209	Various	2486.1 through 2486.15	NA, Various
M257	Research Safety Summary, REDC Development Laboratory Operations – Lab 211	Various	2497.1 through 2497.13	NA, Various
M258	Research Safety Summary, Building 7920 – General Use of Modified Direct Denitration and Powder Characterization Systems	Various	6135.0 through 6135.7	NA, Various
M259	Research Safety Summary, Radioisotope Power Source Development	Various	7691.0 through 7691.5	NA, Various
M260	Research Safety Summary, Processing of Ni-63	Various	8197.0, 8197.1, & 8197.2	NA, Various
M261	Research Safety Summary, HKED Calibration Standard Sample Preparation	Various	8411.0 through 8411.4	NA, Various
M262	Research Safety Summary, Laboratory 111 General Supporting Activities	Various	8603.0 through 8603.4	NA, Various
M263	Research Safety Summary, Voloxidation Studies	Various	8928.0 through 8928.3	NA, Various
M264	Research Safety Summary, Preparation of TRU Solutions for the Internal Gelation Process	Various	8964	NA, Various
M265	Research Safety Summary, Target Fabrication for the Pu-238 Project – Pellet Production	Various	11316.1, 11316.2, & 11316.3	NA, Various
M266	Research Safety Summary, Anion Exchange Purification of Radionuclides by Acidified Alcohol Solution	Various	12637	NA, Various
M267	Waste Characterization Checklist (WCC), Debris from Np-237 Pellet Production	T. Lehberger	TRU-CH-7 & TRU-RH-6	Rev. 0, 10/10/2013
M268	Approval for the Storage and Processing of Liquid Polychlorinated Biphenyls Containing Transuranic Radionuclides; Cover Letter from G. Alan Farmer to Robert C. McKay	G. Alan Farmer	U.S. DOE-ORO TN189009003	Rev. 0, 04/03/2014
M270	The Pu-238 Supply Project, Presented to 18th Symposium on Separations Science and Technology	Robert Wham	NA	NA, 10/28/2014

Attachment 4 - Acceptable Knowledge Source Document Information List (continued)

Source Document Tracking Number [a/c]	Title or Description [a]	Author	Document # [b]	Document Revision # and Date
M271	Mixed Low Level Waste Profile	Mike McCauley	LL-A-OP-010	Rev. 8, 09/30/2013
M278	New Pig WypAll X80 Wipers used at the TWPC	NA	NA	NA, NA
M281	Research Safety Summary Development and Fabrication of Radiation Signature Training Devices	Cecil V. Parks	12114.1	NA, 05/14/2015
M610	ORNL/NSTD/REDC CY-2003 Surveillance Plan and Schedule	W. George Askew	NA	Rev. 0, 09/27/2002
M612	Radiochemical Engineering Development Center TRU Waste Quarterly Surveillance	CW Evans	NA	Rev. NA, 09/07/1995
M613	Trend Analysis Status of On-Going Efforts	NA	NA	Rev. NA, Various
M614	Chemical Technology Division Self-Assessment Program	L.E. McNeese	ORNL/CF-97/161	NA, November 1997
M615	Specifications for Laminar Flow Hood	NA	NA	NA, 07/26/1996
M616	Nonconformance Report (NCR) for Hydraulic Rabbit Capsules	L.C. Smith	NRC-X-96-RR-087	Rev. NA, 09/20/1996
M617	Iron-Spectrophotometric Ortho Phenanthroline Method	NA	NA	NA, NA
M618	MOU Between the Neutron Activation Analysis Facillity and the ES&H Division	NA	AC-MOU-102-0901	Rev. 1, 12/18/1992
M619	Determiantion of Total Reducing Normality	NA	9 00720002	NA, NA
M620	Organizational Charts	NA	NA	Rev. NA, Various
M621	Oak Ridge National Laboratory Fabrication Department Test Report	NA	X-379276	Rev. NA, 11/06/1997
M622	Information Scheduling and Storage System (ISSS) Forms (RIDS)	NA	NA	Rev. NA
P004	History of the Oak Ridge National Laboratory 1943 – 1963	W.E. Thompson	Central Files No. 63-8-75	NA, 08/23/1963
P005	Oak Ridge National Laboratory Institutional Plan FY 1982 – FY 1987	H. Postma, C.C. Hopkins, C.R. Richmond, M.W. Rosenthal, D.B. Trauger, A. Zucker	ORNL/PPA-81/8	NA, 12/1981

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Source Document Tracking Number [a/c]	Title or Description [a]	Author	Document # [b]	Document Revision # and Date
P007	Oak Ridge National Laboratory Institutional Plan FY 1986-FY 1991	Senior Planning Group and Planning Staff	ORNL/PPA-85/2	NA, 10/1985
P011	Analytical Chemistry Division Annual Progress Report, Period Ending November 30, 1976	W.D. Shults	ORNL-5244	NA, 02/1977
P013	Solvent Extraction Studies with Intermediate-Burnup fast Flux Test Facility Fuel in the Solvent Extraction Test Facility	D.E. Benker, et.al	ORNL/TM-9514	NA, 04/1986
P014	Inventory of ORNL Remedial Action Sites: 11. Research Laboratories	T.J. Blasing, B.S. Houser	RAP 86-52	NA, 06/30/1986
P016	Solvent Extraction Studies with High-Burnup Fast Flux Test Facility Fuel in the Solvent Extraction Test Facility	D.E. Benker, et.al	ORNL/TM-9993	NA, 10/1986
P020	Chemical Technology Division Annual Progress Report Period Ending March 31, 1979	D.E. Ferguson, et.al	ORNL-5542	NA, 11/1979
P021	Chemical Technology Division Progress Report for the Period April 1, 1981 to March 31, 1983	R.G. Wymer, C.D. Scott	ORNL-5933	NA, 09/1983
P025	Raman Spectra of Uranyl Ion and Its Hydrolysis Products in Aqueous HNO3	L.M. Toth and G.M. Begun	Volume 85, Pages 547-549	NA, 1981
P030	Chemical Technology Division Transuranium Processing Plant Semiannual Report of Production, Status, and Plans for Period Ending June 30, 1968	W.D. Burch, J.E. Bigelow, L.J. King	ORNL-4376	NA, 04/1969
P031	Transuranium Processing Plant Semiannual Report of Production, Status, and Plans for period ending June 30, 1969	W.D. Burch, J.E. Bigelow, and L.J. King	ORNL-4447	NA, 03/1970
P032	Chemical Technology Division Transuranium Processing Plant Semiannual Report of Production, Status, and Plans for Period Ending December 31, 1971	W.D. Burch, J.E. Bigelow, L.J. King	ORNL-4767	NA, 05/1972
P033	Separation of Am, Cm, and Pu from Irradiated Targets	Felker et.al	NA	NA, NA
P037	Chemical Technology Division Annual Progress Report for Period Ending May 31, 1968	D.E. Ferguson, et.al	ORNL-4272	NA, 09/1968
P043	Oak Ridge National Laboratory, Institutional Plan, FY 1996 – FY 2001	Oak Ridge National Laboratory	ORNL/PPA-95/1	NA, 12/1995
P047	The Management of Radioactive Waste at the Oak Ridge National Laboratory: A Technical Review	Philip E. Lamoreaux et al.	DOE/DP/48010-T1	NA, 1985
P058	Statistical Analysis of Radiochemical Measurements of TRU Radionuclides in REDC Waste	J. Beauchamp, et.al	ORNL/TM-13298	NA, 10/1996

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Source Document Tracking Number [a/c]	Title or Description [a]	Author	Document # [b]	Document Revision # and Date
P059	Transuranium Processing Plant Semiannual Report of Production, Status, and Plans for Period Ending June 30, 1973	L.J. King, J.E. Bigelow, and E.D. Collins, Chemical Technology Division	ORNL-4921, UC-4-Chemistry	NA, 03/1974
P071	A Brief History of the Research Reactors Division of Oak Ridge National Laboratory	DR Stapleton	ORNUM-2342	NA, 10/15/1993
P077	Transuranium Processing Plant Report of Production, Status, and Plans for Period October 1, 1978 to September 30, 1980	L. J. King, J. E. Bigelow, and E. D. Collins	ORNL-5596	NA, 08/1981
P078	Transuranium Processing Plant Semiannual Report of Production, Status, and Plans for Period Ending June 30, 1977	L. J. King, J. E. Bigelow, and E. D. Collins	ORNL-5358	NA, 12/1977
P079	Transuranium Processing Plant Semiannual Report of Production, Status, and Plans for Period Ending December 31, 1972	L. J. King, J. E. Bigelow, and E. D. Collins	ORNL-4884	NA, 08/1973
P081	Architectural/Historical Assessment of the Oak Ridge National Laboratory, Oak Ridge Reservation, Anderson and Roane Counties, Tennessee	Martha Carver, Margaret Slater, Duvall & Associates, Inc. Cultural Resources and Environmental Services	ORNL/M-3244	NA, 01/1994
P088	Transuranium Processing Plant Semiannual Report of Production, Status, and Plans for Period Ending June 30, 1971	W. D. Burch, J. E. Bigelow, and L. J. King	ORNL-4718	NA, 12/1971
P093	Characterization of ORNL Transuranic Waste from the Measurement of Fission and Activation Products	L.K. Nguyen	NA	NA, 05/1997
P096	Chemical Technology Division Annual Progress Report, Period Ending March 31, 1974	D.E. Ferguson, et.al	ORNL-4966	NA, 08/1974
P097	Chemical Technology Division Annual Progress Report, Period Ending March 31, 1978	N/A	ORNL-5383	NA, 03/31/1978

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Source Document Tracking Number [a/c]	Title or Description [a]	Author	Document # [b]	Document Revision # and Date
P098	Chemical Technology Division Annual Progress Report, for the Period April 1, 1979 to March 31, 1971	D.E. Ferguson, Division Director; C.D. Scott, Associate Division Director; R.G. Wymer, Associate Division Director	ORNL-5757	NA, 11/1981
P099	Chemistry Division Annual Progress Report, Period Ending November 1, 1975	O.L. Keller, Division Chief; L.M. Ferris, Section Chief; R.L. Hahn, Section Chief, I.L. Thomas, Section Chief	ORNL-5111 UC-4 – Chemistry	NA, 02/1976
P1000	Standard Practice Procedure for Records Management	NA	X-AD-7	Rev. NA, 6/30/1993
P1001	ORNL Office of Quality Services Procedure for Certification of Technical Lead Auditors	NA	OQS-QA-P02	Rev. 0, 10/22/1998
P1002	Appendix A - Glassware Cleaning Procedures	S.K. Holladay	AC-OP-500-1201	Rev. 0, 10/25/1990
P1003	Quality Assurance Plan for Operations in Hot Cells, Shielded Caves, Glove Boxes, and Related Support Areas at the Radiochemical Engineering Development Center	R.M. Wham	QAP-X-88-CT-003	Rev. 0, 03/28/1990
P105	Metals and Ceramics Division Annual Progress Report for Period Ending June 30, 1973	Metals and Ceramics Division	ORNL-4870	NA, 10/1973
P1082	Lockheed Martin Energy Research Corporation, ORNL, Environmental Protection Procedure: Disposal of PCB (Polychlorinated Biphenyl) Oils	Lockheed Martin, ORNL	EPM-3.1	Rev. 0A, 05/01/1993
P1083	Environmental Protection Procedure: Polychlorinated Biphenyls (PCBs)	Martin Marietta, ORNL	EPM-4.0	NA, 11/20/1989; 01/15/1987
P1084	Environmental Protection Procedure: Solid Radioactive Waste Management	Martin Marietta, ORNL	EPM-17.0	NA, 07/24/1989
P109	Safety Analysis Report, Radiochemical Engineering Development Center, Building 7930	Chemical Technology Division	SAR/7930-CTD/01	Revision 1, 11/02/2000
P110	Chemical Technology Division Annual Progress Report for Period Ending March 31, 1972	Chemical Technology Division	ORNL-4794	NA, 08/1972

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Source Document Tracking Number [a/c]	Title or Description [a]	Author	Document # [b]	Document Revision # and Date
P1100	PCB Annual Report for Oak Ridge National Laboratory - 1986	B. D. Barkenbus; T. T. Puett; C. F. Sigmon	ORNL/TM-10495	NA, 07/1987
P1101	PCB Annual Report for Oak Ridge National Laboratory - 1987	N. S. Dailey; T. T. Puett	ORNL/TM-10858	NA, 10/1988
P1102	PCB Annual Report for Oak Ridge National Laboratory - 1988	N. S. Dailey; T. T. Puett; A. R. Witt	ORNL/TM-11247	NA, 06/1989
P1103	PCB Annual Report for Oak Ridge National Laboratory - January 1, 1989 - February 5, 1990	J. K. Greer, Jr.; A. R. Witt	ORNL/TM-11665	NA, 07/01/1990
P1104	PCB Annual Report for Oak Ridge National Laboratory - January 1, 1991 - December 31, 1991	J. K. Greer, Jr.; J. M. Finger; L. A. Walker	ORNL/TM-12132	NA, 07/01/1992
P1105	PCB Annual Report for Oak Ridge National Laboratory - February 6, 1990 - December 31, 1990	J. K. Greer, Jr.; R. C. Foley	ORNL/TM-11883	Rev. 1, 10/15/1991
P1106	PCB Annual Report for Oak Ridge National Laboratory - 1982	T. T. Clark; B. M. Eisenhower	ORNL/TM-9035	NA, 07/1984
P1107	PCB Annual Report for Oak Ridge National Laboratory - 1983	B. M. Eisenhower; C. Y, Horton; B. D. Barkenbus	ORNL/TM-9371	NA, 07/1985
P1108	PCB Annual Report for Oak Ridge National Laboratory - 1984	B. D. Barkenbus	ORNL/TM-9701	NA, 08/1985
P1109	PCB Annual Report for Oak Ridge National Laboratory - 1985	B. D. Barkenbus	ORNL/TM-10121	NA, 08/10/1986
P1112	Radioactive Solid Waste Operations Manual	ORNL	ORNL/CF-85/205	Rev. 1 & 2, 07/1985 - 01/29/1986
P1113	Oak Ridge Tennessee Flora: Preliminary Alphabetic Inventory of Vascular Plants	J. S. Olson; G. Cristofolini; S. Cristofolini	ORNL-TM-1232	NA, 2/1966
P1114	Summary of the Campaign to Process Six SRP Reactor Slugs in the Transuranium Processing Plant	L. J. King and E. D. Collins	ORNL-TM-1939	NA, April 1969
P1115	Solid Waste Storage Area 5 North Transuranic Waste Engineering Study for the 22-Trench Area at Oak Ridge National Laboratory	Bechtel Jacobs	BJC/OR-898	NA, August 2001

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Source Document Tracking Number [a/c]	Title or Description [a]	Author	Document # [b]	Document Revision # and Date
P1116	EnergX TRU Waste Processing Center Procedure: Absorbing Liquids	NA	CH-I-OP-013	Rev. 6 (Older Versions Included), 11/17/2008
P1117	PCB Annual Report for Oak Ridge National Laboratory - 1984	C. Y. Horton and B. D. Barkenbus	ORNL/TM-9701	NA, 08/28/1985
P113	Progress in Nuclear Energy, Series III, Process Chemistry, Volume 4; Section: 7.2 Processing Methods For The Recovery Of Transplutonium Elements	R.E. Leuze and M.H. Lloyd	NA	NA, 1970
P114	Chemical Technology Division Annual Progress Report for Period Ending March 31, 1971	Chemical Technology Division	ORNL-4682	NA, 07/1971
P115	Chemical Technology Division Annual Progress Report for Period Ending May 31, 1966	Chemical Technology Division	ORNL-3945	NA, 09/1966
P118	Metals and Ceramics Division Annual Progress Report For Period Ending June 30, 1971	J.H. Frye, et.al	ORNL-4770	NA, 09/1971
P121	Solvent Extraction Studies of 10% TBP Flowsheets in the Solvent Extraction Test Facility Using Irradiated Fuel from the Fast Flux Test Facility	DE Benker, et al.	ORNL/TM-10266	NA, 03/1988
P122	The 1996 Baseline Environmental Management Report	US Department of Energy	DOE/EM-0290	NA, 06/1996
P123	Solvent Extraction Studies of Coprocessing Flowsheets – Results from Campaign 6 of the Solvent Extraction Test Facility (SETF)	D.E. Benker, et.al	ORNL/TM-9961	Revision 0, 11/1986
P125	Remote-Handled Transuranic Solid Waste Characterization Study: Oak Ridge National Laboratory	RC Stewart, et al.	ORNL/TM-11050	NA, 06/1989
P126	Carlsbad Area Office Interim Guidance on Ensuring that Waste Qualifies for Disposal at the Waste Isolation Pilot Plant	US DOE/Carlsbad Area Office	NA	NA, 02/13/1997
P130	Solvent Extraction Studies of Coprocessing Flowsheets – Results from Campaign 5 of the Solvent Extraction Test Facility (SETF)	W.D. Bond, et. al.	ORNL/TM-8598	11/1983
P131	Transuranium Processing Plant Semiannual Report of Production, Status, and Plans for Period Ending June 30, 1970	WD Burch, et al.	ORNL 4588	NA, 01/1971
P1322	Use of Existing ORNL Facilities for Processing Transuranic Waste	A. L Lotts; F. E. Harrington	N/A	N/A, 10/28/1994
P133	Analytical Chemistry Division Annual Progress Report for Period Ending December 31, 1980	W. D. Schults	ORNL-5738	NA, 05/1981
P134	Tank Waste Consolidation Analysis for Transfer of ORNL RH-TRU Tank Sludges to the Melton Valley Storage Tanks	TE Kent and SM DePaoli	ORNL/TM-13367	NA, 01/1997

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Source Document Tracking Number [a/c]	Title or Description [a]	Author	Document # [b]	Document Revision # and Date
P136	Chemical Technology Division Annual Progress Report for Period Ending May 31, 1967	DE Ferguson, et al.	ORNL-4145	NA, 10/1967
P1368	Pilot Plant Section Progress Report for June 1986	R. E. Leuze	CF-86/239	NA, 7/9/1986
P1427	Cleanup of TMI-2 Demineralizer Resins	W. D. Bond, et al.	CONF-850417--18	Draft, 1985
P1428	Evaluation of the Submerged Demineralizer System (SDS) Flowsheet for Decontamination of High-Activity-Level Water at the Three Mile Island Unit 2 Nuclear Power Station	D. O. Campbell, et al.	ORNL/TM-7448	NA, 07/1980
P1430	Pipe Overpack Container Operations	N/A	CH-UET-OP-029 & CH-REF-OP-029	Rev. 1 & 0, 10/02/2013
P1433	Environmental Permits and Compliance	NA	CM-P-EN-013	Rev. 3 (Older Revisions Included), 09/28/2015
P1434	Energetic Materials Program	NA	CM-A-WP-004	Rev. 1 (Older Versions Included), 05/22/2014
P1435	Remote Handled Waste Container Selection Process	NA	RH-REF-WP-001	Rev. 1 (Older Versions Included), 06/23/2015
P1436	[PuBe Neutron Sources] Grouting Liquid Waste Solutions	T. D. Hylton, et al.	NNFD-7920-OP-233	Rev. 0, 01/28/2011
P1437	[PuBe Neutron Sources] Neutralization of Liquid Waste Solutions	T. D. Hylton, et al.	NNFD-7920-OP-234	Rev. 0, 01/28/2011
P1438	Identification of Potential Unanalyzed Materials	Brian Oakley	CM-R-WP-005	Rev. 0, 02/02/2012
P1439	Standard Operating Procedure for Assisting Generators with Waste and Excess Materials	Carolyn Waugh	TWMD-TP-574	Rev. 3 & 4, 01/21/2014 & 05/01/2015
P1440	The Plutonium-238 Supply Project, Pacific Basin Nuclear Conference	R. M. Wham, et al.	PBNC2014-xxx	NA, 08/24/2014 to 08/28/2014
P1441	Analytical Report for Destructive Analyses of MOX Spent Fuel Specimens	J. M. Giaquinto, et al.	NA	NA, NA

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Source Document Tracking Number [a/c]	Title or Description [a]	Author	Document # [b]	Document Revision # and Date
P1442	Mixed Oxide Fuel Prepared with Weapons-Derived Plutonium: Test Irradiations Summary and Preliminary LTA PIE Results	L. J. Ott, et al.	Paper 2038	NA, 09/06/2009 to 09/10/2009
P1443	Remote Handled Waste Repackaging	NA	RH-REF-OP-021	Rev. 0, 09/09/2015
P1444	Contact Handled Waste Container Selection Process	NA	CH-REF-WP-001	Rev. 4 (Older Versions Included), 06/22/2015
P1445	Review of Potential Nitrate Bearing Liquids Treatment	Brian Oakley	CM-R-WP-006	Rev. 0, 09/02/2015
P1446	Environmental Permits - Inspections/Monitoring and Reporting	NA	CM-P-RP-309	Rev. 24 (Older Versions Included), 08/14/2012
P145	Chemical Technology Division Annual Progress Report for Period Ending May 31, 1970	D. E. Ferguson, et al.	ORNL-4572	NA, 10/1970
P146	C-Tank Transfers; Transuranic Sludge Removal From the C-1, C-2, and W-23 Waste Storage Tanks at Oak Ridge National Laboratory. Oak Ridge, Tennessee	TL Dahl, et al.	BJC/OR-279	NA, 05/1999
P149	The 1996 Baseline Environmental Management Report. Volume 1	DOE	DOE/EM-0290	NA, 06/1996
P151	Chemical Technology Division Annual Progress Report for Period Ending May 31, 1973	DE Ferguson et al.	ORNL-4883, UC-10	NA, 08/1973
P153	Chemical Technology Division Annual Progress Report; Period Ending March 31, 1975	DE Ferguson et al.	ORNL-5050, UC-10	NA, 10/1975
P155	Application of the TRUEX Process to highly Irradiated Targets	L.K. Felker and D.E Benker	ORNL/TM-12784	NA, 03/1995
P156	Transuranium Processing Plant Semiannual Report Of Production, Status, and Plans For Period Ending June 30, 1976	L.J. King, J.E. Bigelow, and E.D. Collins	ORNL-5216	NA, 02/1977
P157	Chemical Technology Division, Transuranium Processing Plant Report of Production, Status, and Plans for the Period January 1, 1978 – September 30, 1978	L.J. King, J.E. Bigelow, and E.D. Collins	ORNL-5531	NA, 06/1979
P160	Chemical Technology Division Annual Progress Report; Period Ending March 31, 1977	DE Ferguson et al.	ORNL-5295 UC-10	NA, 10/1977
P161	Safety Analysis Report Radiochemical Engineering Development Center Building 7920	M. A. Green, et al.	SAR/7920-CTD/01 & ORNL/7920/SAR	Rev. 1 & 6, 03/14/2001 & 12/11/2013

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Source Document Tracking Number [a/c]	Title or Description [a]	Author	Document # [b]	Document Revision # and Date
P164	Chemical Technology Division Annual Progress Report; Period Ending March 31, 1976	DE Ferguson et al.	ORNL-5172	NA, 09/1976
P173	Solvent Extraction Studies of Coprocessing Flowsheets – Results from Campaigns 3 and 4 of the Solvent Extraction Test Facility (SETF)	ED Collins, et. al	ORNL/TM-7991	05/1982
P176	Transuranium Processing Plant Semiannual Report of Production, Status, and Plans for Period October 1, 1980 to March 31, 1983	LJ King et al	ORNL 5992, Dist. Category UC-4	NA, 10/1984
P180	Metals and Ceramics Division Annual Progress Report for Period Ending June 30, 1970	JH Frye, Jr, et al.	ORNL-4570, UC-25 – Metals, Ceramics and Materials	NA, 10/1970
P181	Metals and Ceramics Division Annual Progress Report Period Ending June 30, 1972	JH Frye, Jr, et al.	ORNL-4820, UC-25 – Metals Ceramics, and Materials	NA, 09/1972
P185	Measurements of Fission and Activation Products for Oak Ridge National Laboratory Transuranic Waste Characterization	LK Nguyen, et al.	ORNL/TM-13292	NA, 06/1997
P197	Transuranium Processing Plant Semiannual Report of Production, Status, and Plans for Period Ending December 31, 1968	WD Burch et al	ORNL 4428	NA, 11/1969
P198	Transuranium Processing Plant Semiannual Report of Production, Status, and Plans for Period Ending December 31, 1969	WD Burch et al	ORNL 4540	NA, 06/1970
P199	Transuranium Processing Plant Semiannual Report of Production, Status, and Plans for Period Ending December 31, 1970	LJ King et al	ORNL 4666	NA, 06/1971
P201	Current and Projected Liquid Low-Level Waste Generation at ORNL	SM DePaoli and AB Walker	ORNL/TM-13513	NA, 03/1998
P203	Oak Ridge National Laboratory, The First 50 Years in Oak Ridge National Laboratory Review	L. Johnson and D Schaffer	Vol. 25, Numbers Three and Four	NA, 1992
P204	Transuranium Processing Plant Semiannual Report of Production, Status, and Plans for Period Ending June 30, 1972	LJ King et al	ORNL 4833	NA, 01/1973
P205	Transuranium Processing Plant Semiannual Report of Production, Status, and Plans for Period Ending December 31, 1974	LJ King et al	ORNL 5034, UC-4-Chemistry	NA, 07/1975
P206	Transuranium Processing Plant Semiannual Report of Production, Status, and Plans for Period Ending June 30, 1975	LJ King et al	ORNL 5084, UC-4-Chemistry	NA, 03/1976
P207	Transuranium Processing Plant Semiannual Report of Production, Status, and Plans for Period Ending December 31, 1975	LJ King et al	ORNL 5146, Dist. Category UC-4	NA, 10/1976

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Source Document Tracking Number [a/c]	Title or Description [a]	Author	Document # [b]	Document Revision # and Date
P208	Transuranium Processing Plant Semiannual Report of Production, Status, and Plans for Period Ending December 31, 1976	LJ King et al	ORNL 5305 Dist. Category UC-4	NA, 10/1977
P209	Transuranium Processing Plant Semiannual Report of Production, Status, and Plans for Period Ending December 31, 1977	LJ King et al	ORNL 5415, Distribution Category UC-4	NA, 08/1978
P210	Transuranium Processing Plant Semiannual Report of Production, Status, and Plans for Period Ending December 31, 1973	LJ King et al	ORNL 4965, UC-4-Chemistry	NA, 11/1974
P211	Transuranium Processing Plant Semiannual Report of Production, Status, and Plans for Period Ending June 30, 1974	LJ King et al	ORNL 4991, UC-4-Chemistry	NA, 02/1975
P214	Federal Facility Agreement for the Oak Ridge Reservation	U. S. Environmental Protection Agency Region IV U. S. Department of Energy	DOE/OR-1014	NA, 01/01/1992
P216	The ORNL Chemical Technology Division 1950 - 1994	RL Jolley, et al.	ORNL/M-2733	Revision 1, 10/1994
P222	RCRA Facilities Assessment (RFA) – Oak Ridge National Laboratory	WJ Boegly, Jr., et al.	ORNL/RAP-12/V1	NA, 03/1987
P223	Chemical Technology Division Annual Progress Report for Period Ending May 31, 1969	DE Ferguson, et al.	ORNL-4422	NA, 10/1969
P229	Solvent Extraction Studies of Coprocessing Flowsheets – Results from Campaigns 1 and 2 of the Solvent Extraction Test Facility (SETF)	ED Collins, et. al.	ORNL/TM-7080, Dist. Category UC-86	NA, 07/1982
P230	60 Years of Great Science, 1943 - 2003, in "ORNL Review"	Various	Vol 36, Number 1	NA, 2003
P239	TRU Waste Management –Past, Present, and Future at Oak Ridge National Laboratory	Billingsley, K. M., Guay, K.P., Trabalka, J.R., Riner, G.L.	NA	NA, 03/01/2001
P240	Certification, Packaging and Disposition of Contact-Handled Transuranic (CH-TRU) Waste At the Radiochemical Engineering Development Center (REDC)	ORNL	REDC FO/WH 5100	1,2,3, Various
P241	Oak Ridge National Laboratory Contact-Handled Transuranic Waste Certification Program Plan	R.J. Hydzik	ORNL/TM-10322	Rev. 3, 2, 1, 06/1992

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Source Document Tracking Number [a/c]	Title or Description [a]	Author	Document # [b]	Document Revision # and Date
P242	Oak Ridge National Laboratory Contact-Handled Transuranic Waste Certification Program Plan	R.J. Hydzik, Jr	ORNL/TM-10322/R3	Revision 3, 06/1992
P244	Certification Document for Newly Generated Contact-Handled Transuranic Waste	W. D. Box & J. Setaro	ORNL-5985	Rev. 1 & 0, 05/1984 & 01/1984
P245	Chemical Process Engineering in the Transuanium Processing Plant	E.D. Collins and J.E. Bigelow	CONF76110110	NA, 1976
P251	Box Breakdown Area Operations	NA	CH-UET-OP-003 (Changed from CH-P-OP-003)	Rev. 14 (Older Versions Included), 10/06/2015
P252	Glove Box Operations	NA	CH-UET-OP-004 (Changed from CH-P-OP-004)	Rev. 12 (Older Versions Included), 06/15/2015
P253	Drum Bag In/Bag Out and Glove Ports	NA	CH-REF-OP-011 (Changed from CH-P-OP-011)	Rev. 7 (Older Versions Included), 11/11/2015
P254	Contact Handled Waste Repackaging	NA	CH-REF-OP-013 (Changed from CH-P-OP-013)	Rev. PCN 9-1 (Older Versions Included), 06/19/2015
P255	Contact Handled Waste Acceptance Criteria	NA	CH-X-AD-001	Rev. 26 (Older Versions Included), 06/15/2015
P256	TRU/Alpha Low Level Waste (LLW) Treatment Project Documented Safety Analysis	NA	T-CM-FW-R-AD-001	Rev. 14 (Older Versions Included), 08/28/2007
P257	Waste Treatment at the Radiochemical Engineering Development Center	Chemical Technology Division	ORNL/CP-95432	NA, 10/20/1997
P258	Production, Distribution, and Applications of Californium-252 Neutron Sources	Chemical Technology Division	ORNL-CP-102606	NA, 10/03/1999

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Source Document Tracking Number [a/c]	Title or Description [a]	Author	Document # [b]	Document Revision # and Date
P259	Chemical Technology Division Segregation of Metals-Containing Wastewater by pH	P.A. Taylor and D.R. McTaggard	ORNL/TM--11406	NA, 10/1990
P260	Radioactive Operations Committee Review of the Transuranium Processing Facility, Building 7920, and the Thorium-Uranium Recycle Facility Building 7930, March 10, 1986	J. A. Setaro	ORNL/CF-86-265	NA, 8/13/1986
P261	Radioactive Operations Committee Review of the Transuranium Processing Plant (TPP), Building 7920	J. A. Setaro	ORNL-CF-87/218	NA, 7/20/1987
P262	Radioactive Operations Committee Review of the Transuranium Processing Plant (TPP), Building 7920	L. C. Williams	ORNL-CF-88/225	NA, 8/01/1988
P263	TRU Operating Manual and Supporting Documentation	NA	NA	NA, 10/10/1980
P272	Oak Ridge National Laboratory Waste Management Plan	ORNL	ORNL/TM-11433	Rev. 0, 1, 2, & 3, 12/1989 - 12/1993
P275	Radiochemical Engineering Development Center (REDC) Radioactive Solid Low-Level Waste (SLLW) Certification Procedure	ORNL, Chemical Technology Division	REDC FO/WH 4010	Revision 0, 12/07/1994
P276	Determination of H2 Diffusion Rates through Various Closures on TRU Waste Bag-Out Bags	P. D. Noll, E. L. Callis, K. M. Norman, LANL	LA-13616-MS	NA, 06/1999
P277	Project Plan for the Evaluation of REDC Waste for TRU-Waste Radionuclides	L. Nguyen; et.al	ORNL/TM-13087	NA, 09/1996
P279	Safety Analysis for the Transuranium Processing Plant, Building 7920	L. J. King	ORNL-3954	NA, 04/1968
P280	Summary of the Campaign During July 1968 to Process Fourteen Irradiated HFIR Targets in the Transuranium Processing Plant	L. J. King; E. D. Collins	ORNL-TM-2434	NA, 12/1969
P281	Californium-252: A Remarkable Versatile Radioisotope	Irvin W. Osborne-Lee; C. W. Alexander	ORNL/TM-12706	NA, 10/10/1995
P282	Gross Alpha Activity Measurements	Chemical and Analytical Sciences Division, ORNL	Various	Various, Various
P324	Technical Safety Requirements Irradiated Fuels Examination Laboratory Building 3525	M. W. Kohring	ORNL/3525/TSR	Rev. 1, 8/1/2004
P325	Oak Ridge National Laboratory Standardized Safety Analysis Report for Nonreactor Nuclear Facilities	M. W. Kohring	ORNL/NNFD/SSAR	Rev. 1, 5/12/2004
P326	Life Cycle Baseline Summary for ADS 6504IS Isotopes Facilities Deactivation Project at Oak Ridge National Laboratory	NA	ORNL/ER-325	Rev. 1, 11/01/1995

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Source Document Tracking Number [a/c]	Title or Description [a]	Author	Document # [b]	Document Revision # and Date
P327	ORNL Isotopes Facilities Shutdown Program Plan	S.M. Gilbert; B.D. Patton; M.B. Sears	ORNL/TM-11689	NA, 10/01/1990
P330	Safety Analysis Report Irradiated Fuels Examination Laboratory / Building 3525	NA	ORNL/3525/SAR	Rev. 0 Change 1, 6/22/2006
P368	Chemistry Division Long Range Plan 1987 - 1991	M. L. Poutman	ORNL/CF-87/244	0, 7/30/1987
P379	Experimental Engineering Section Progress Report for December 1980	R. E. Leuze	ORNL/CF-81/2	0, 1/1/1981
P380	Progress Report on ORNL R&D Waste Management Program for July 1977	R. E. Blanco	ORNL/CF-77/374	0, 8/5/1977
P381	Chemical Development Section Monthly Progress Report for April 1988	J. R. Hightower	ORNL/CF-88/89	0, 5/24/1988
P385	Analytical Chemistry Division Summary Report: Radioactive Materials Analysis Section	J. R. Stokely	ORNL/CF-86/278	0, 09/01/1986
P401	Radioactive materials Analysis laboratory Quality Assurance Plan for the Characterization of Radioactive Waste	ORNL	QAP-X-96-CASD/RML-001	Revision 2, 10/1997
P405	Analysis of Dosimetry Data from the Aluminum and Beryllium Irradiation Experiment in the RB-7 Facility of HFIR	H. T. Kerr; E. J. Allen; J. H. Swanks	ORNL-TM-4725	NA, 1/30/1975
P410	Separation of Transplutoniums From Lanthanides by Tertiary Amine Extraction	R. D. Baybartz; Boyd Weaver	ORNL-3185	NA, 12/4/1961
P412	Fabrication and Preirradiation Data for High Flux Isotope Reactor Prototype Target Rods	J. D. Sease; D. M. Hewette II	ORNL-TM-811	NA, 6/1964
P415	The HFIR Water Strainer	A. A. Abbatiello; A. P. Fraas	ORNL-TM-3460	NA, 3/1972
P416	Chemical Technologies Division Annual Progress Report For Period Ending May 31, 1965	D. E. Ferguson (Division Director)	ORNL-3830	NA, 11/1965
P420	Summaries of Chemical Technology Division Programs - FY 1978	D. E. Ferguson	ORNL/CF-77/400	NA, 9/10/1977
P422	Analysis of Chemical Technology Division Waste Streams	T. J. Abraham; T. L. Donaldson; A.B. Walker; R. L. Cummins; M. E. Reeves; T. D. Hylton	ORNL/TM-11434	Rev. 0, 07/30/1990
P423	Proceedings of the Workshop on the Management of Radioactively Contaminated Soils, Knoxville, TN, November 10, 1988	T. F. Lomenick	ORNL/TM-11332	NA, 11/21/1989

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Source Document Tracking Number [a/c]	Title or Description [a]	Author	Document # [b]	Document Revision # and Date
P432	TRU Waste Processing Center Documented Safety Analysis	NA	CM-R-AD-001	Rev. 32 (Older Versions Included), 08/27/2015
P472	Radioactive Operations Committee Review of the ORNL Transuranium Research Laboratory	Radioactive Operations Committee	ORNL/CF-87/69	NA, 03/20/1987
P473	Chemical Development Section Monthly Progress Report for March 1987 from J. R. Hightower to R. G. Wymer	J. T. Bell	ORNL/CF-87/89	NA, 05/18/1987
P482	Summary of the Campaign During February 1969 to Process Six Irradiated HFIR Targets in the Transuranium Processing Plant	L. J. King; E. D. Collins	ORNL-TM-3343	0, 8/27/1971
P484	Alpha Radiolysis and Other Factors Affecting Hydrolysis of Tributyl Phosphate	M. H. Lloyd; R. L. Fellows	ORL-TM-9565	0, 6/27/1985
P492	Plutonium, Uranium, and Thorium Distribution Coefficients in the 30 vol % TBP-NDD-Nitric Acid System at 25 and 50 degrees C	J. B. Knauer; M. H. Lloyd; J. T. Barker	ORNL/TM-7804	0, 4/28/1982
P494	Uranium and Plutonium Distribution Coefficients in the 6 vol % and 30 vol % TBP-NDD Systems	J. B. Knauer; J. H. Paehler, Jr., M. G. Stewart	ORNL/TM-7493	0, 3/1981 Pub
P496	The Reduction of Plutonium (VI) to Plutonium (IV) in Nitric Acid by Nitric Oxide or Nitrogen Dioxide Gases	M. R. Bennett; A. D. Kelmers	ORNL/TM-6552	0, 11/30/1978
P497	Separation of Americium; Curium, and Rare Earths from High-Level Wastes by Oxalate Precipitation: Experiments with Synthetic Waste Solutions	C. W. Forsberg	ORNL/TM-6445	0, 1/16/1980
P498	Radiochemical Procedures	L. C/ Henley	ORNL/TM-6372	0, 6/2/1978
P499	Head-End Processing Studies with Mechanically Blended (U, Pu)O2 Reactor Fuels	J. H. Goode; R. G. Stacy	ORNL/TM-6266	0, 8/3/1978
P500	Iodox Process Tests in a Transuranium Element Production Campaign	E. D. Collins; D. E. Benker	ORNL/TM-6182	0, 6/12/1979
P501	Actinide Partitioning and Transmutation Program Progress Report for Period July 1 to September 30, 1977	D. W. Tedder; J. O. Blomeke	ORNL/TM-6174	0, 3/13/1978
P505	Waste Metal Recovery By Solvent Extraction	D. E. Ferguson; T. C. Reunion	ORNL-TM-4327	0, 7/26/1973

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Source Document Tracking Number [a/c]	Title or Description [a]	Author	Document # [b]	Document Revision # and Date
P511	Safety Analysis for the Thorium-Uranium Recycle Facility	J. W. Anderson; S. E. Bolt; J. M. Chandler	ORNL-4278	0, 05/22/1969
P519	State of the Laboratory - 1970	Alvin M. Weinberg	ORNL-CF-70-12-40	0, 12/21/1970
P520	Safety Analysis for the TURF Californium Facility	W. D. Burch	ORNL-CF-69-11-7	0, 11/3/1969
P527	Separation of Berkelium from Trivalent Actinides By Chromate Oxidation and HDEHP Extraction	J. B. Knauer; Boyd Weaver	ORNL-TM-2428	0, 11/14/1968
P535	Background Information about Chem Tech	NA	NA	NA, 5/9/1989
P538	Building 7920 Review: Follow-Up Information / Action Item Listing	J. R. Hightower	NA	NA, 12/20/1990
P539	Radioisotope Development Laboratory Building 3047 Hazards Report (Isotopes Development Center)	R. A. Robinson	ORNL-TM-946	Rev. 0, 10/05/1964
P540	Publications of the Radioactive Waste Disposal Section Health Physics Division	K. E. Cowser	ORNL-TM-3301	NA, 2/1971
P541	Phase I Safety Analysis Report Update Program (SARUP) Hazard Screening	L. J. King; J. E. Bigelow; M.A. Green; M. B. Sears; R. M. Wham; E. D. Collins	HS/7920/F/IT04/R0	0, 6/1/1992
P542	Operational Safety Requirements Transuranium Processing Plant, Building 7920	L. J. King; J. E. Bigelow; F. R. Chattin; E. D. Collins	ORNL/CF-81/242	1, 12/24/1990
P545	Isotopes Program Review Office of Nuclear Energy	David Bailey; W. H. McVey	NA	NA, 12/15/1988
P549	Hot Cells in the Chemical Technology Division; Bldgs 7920, 7930, 4507, 4501, 3019	E. D. Collins	NA	NA, 10/06/1987
P551	A Self-Replenishing Tritium Target for Neutron Generators	F. F. Haywood; Z. G. Burson; H. E. Banta	ORNL-TM-3397	NA, June 1972
P562	Analytical Chemistry Division Research and Development Monthly Summaries	W. D. Schults	Various	NA, Various
P566	ORNL Health Physics Manual	ORNL	ORNL/M-804; RP-4.1; RP-4.2; RP-5.1	NA, 11/02/1994

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Source Document Tracking Number [a/c]	Title or Description [a]	Author	Document # [b]	Document Revision # and Date
P569	Implementation Plan for U. S. Department of Energy Order 435.1, U. S. Department of Energy - Oak Ridge Operations, Oak Ridge, Tennessee	U. S. Department of Energy - Oak ridge Operations	DOE/OR/01-1879	NA, 06/2000
P582	PCB Decontamination	NA	CH-REF-OP-027	Rev. 3 (Older Versions Included), 11/04/2015
P583	Cask Processing Enclosure Operations	NA	RH-UET-OP-101	Rev. 14 (Older Versions Included), 04/09/2015
P584	Hot Cell Operations	NA	RH-UET-OP-002	Rev. 4 (Older Versions Included), 09/09/2015
P585	Remote Handled Drum In/Out Operations	NA	RH-REF-OP-003	Rev. 7 (Older Versions Included), 11/17/2015
P586	Cask Processing Enclosure Drum-In / Drum-Out	NA	RH-REF-OP-104	Rev. 6 (Older Versions Included), 06/17/2015
P587	Energetic Materials Management	NA	CM-P-WP-016	Rev. 2 (Older Versions Included), 06/22/2015
P588	Box Breakdown Area Material Handling Recipes	NA	CH-REF-OP-001	Rev. 3 (Older Versions Included), 06/23/2015
P589	Glove Ports and Sleeve Transfers	NA	CH-REF-OP-046	Rev. 3 (Older Versions Included), 11/19/2015

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Source Document Tracking Number [a/c]	Title or Description [a]	Author	Document # [b]	Document Revision # and Date
P590	Liquids Handling in the Hot Cell	NA	RH-REF-OP-014	Rev. 3 (Older Versions Included), 10/01/2015
P591	Liquids Handling in the Cask Processing Enclosure	NA	RH-REF-OP-102	Rev. 3 (Older Versions Included), 02/04/2015
P592	Absorbing Liquids in the Glovebox and Box Breakdown Area	NA	CH-REF-OP-014	Rev. PCN 5-1 (Older Versions Included), 08/27/2015
P597	Remote Handled Waste Acceptance Criteria	NA	RH-X-AD-001	Rev. 7 (Older Versions Included), 06/15/2015
P598	Operations Prohibited Item Processing	NA	CH-REF-OP-044	Rev. 4 (Older Versions Included), 07/24/2014
P599	Non-Compliant Containers	NA	CH-REF-OP-045	Rev. 1 (Older Versions Included), 06/23/2015
P601	Operation of Nuclear Measurements Corporation Gas-Flow Proportional Counter	C.D. Parks	CASD-AM-TAL-0002	Rev. 0, 03/27/2000
P602	Operation of the Tennelec LB-1000 Low Level Gas-Flow Proportional Counter	C.D. Parks	CASD-AM-TAL-0003	Rev. 0, 04/04/2000
P603	Operation of the Tennelec LB-4000 Low Level Gas-Flow Proportional Counter	C.D. Parks	CASD-AM-TAL-0004	Rev. 0, 04/04/2000
P604	Alpha Spectrometry with the Canberra Genie-ESP Data Acquisition System	C.D. Parks	CASD-AM-TAL-0005	Rev. 0, 05/08/2000
P605	Standard Analytical Method for Total Plutonium, 2-Thenoyltrifluoroacetone Extraction Method	C.D. Parks, J.M. Keller	CASD-AM-TAL-0008	Rev. 0, 05/24/2000

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Source Document Tracking Number [a/c]	Title or Description [a]	Author	Document # [b]	Document Revision # and Date
P606	Oak Ridge National Laboratory Chemical and Analytical Sciences Division Standard Anaytical Method for Total Radioactive Strontium by Extraction Chromatography	C.D. Parks	CASD-AM-TAL-0008	Rev. 0, 6/29/2001
P607	Gross Beta Activity Measurements	C.D. Parks	CASD-AM-TAL-0009	Rev. 0, 06/29/2001
P608	Oak Ridge National Laboratory Chemical and Analytical Sciences Division Standard Analytical Method for Operation of Packard Model 2500TR Liquid Scintillation Counter	C.D. Parks	CASD-AM-TAL-0010	Rev. 0, 07/25/2001
P610	The Resin Method of Sample Preparation For Isotopic Analysis of Am, CM, and CF	R.L. Walker	40307	Rev. NA, 11/14/1987
P611	The Resin Bead Method of Sample Preparation for isotopic Analysis of Pu and U	R.L. Walker	40306	Rev. NA, 08/01/1979
P612	Gross Gamma, Scintillation Method	NA	200365	Rev. NA, NA
P613	Preparation of Carbonate Free LiCl Solution	NA	100441	NA, NA
P614	Anion Exchange Separation of Uranium from Reactor Dissolver Solutions	J.L. Botts	100715	Rev. NA, 03/01/1985
P615	Loading of Resin Beads for Isotopic Dilution Mass Spectrometric Analysis of Amercium-241	J.L. Botts	10936	Rev. NA, 12/07/1987
P616	Determination of Total Solids in TPP Process Solution	J.L. Botts	1107	Rev. NA, 04/11/1988
P617	Methrohm E536 Potentiograph-Potentiometric Titrations	NA	3105	Rev. NA, NA
P618	Operation of Remote Pipetting System ORNL Model Q-5780 (Process Methods) Method No. 1 003109	W.D. Shults	3109	Rev. NA, NA
P619	Operation of Remote Titration System ORNL Model Q-5895	J.L. Botts, L.N. Klatt	1003113	Rev. NA, 01/01/1985
P620	Operation of Spectronic 501 Spectrophotometer	J.L. Botts	3034	Rev. NA, 01/28/1988
P621	Gross Neutrons Determination	J.L. Botts	20953	Rev. NA, 03/29/1988
P622	249-Berkelium Determination	J.L. Botts	31101	Rev. NA, 02/26/1988
P623	Determination of Neptunium in Fission Product Mixtures	J.L. Botts	2 31534	Rev. NA, 11/25/1987

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Source Document Tracking Number [a/c]	Title or Description [a]	Author	Document # [b]	Document Revision # and Date
P624	Determination of Uranium-232 and Uranium-233 by Alpha Spectroscopy	J.L. Botts	2 31926	Rev. NA, 12/30/1987
P625	U-233 Hexone Extraction Method	J.L. Botts	9 0123920	Rev. NA, 02/02/1988
P626	Uranium, Spectrophotometric Ammonium Thiocyanate Method	J.L. Botts	1 219210	Rev. NA, 04/13/1988
P628	Free Acid, Phenolphthalein End-Point	J.L. Botts	1 220025	Rev. NA, 02/02/1988
P629	Free Acid and Hydrolyzable Ion Concentration Using the Remote Titration System, ORNL Model Q-5895	J.L. Botts	1 220034	Rev. NA, 05/09/1988
P630	Free Acid and Adogen Determination in TRU Process Solutions	J.L. Botts	1 221011	Rev. NA, 02/25/1988
P631	Determination of pH of Aqueous Solutions	J.L. Botts	1 230041	Rev. NA, 04/15/1988
P632	Operating Procedure for Weighing and Dissolution Glovebox Line	J.L. Botts	NA	Rev. NA, 2/25/1988
P633	Oak Ridge National Laboratory Chemical and Analytical Sciences Division Standard Analytical Method for Gross Alpha Activity Measures	C.D. Parks	CASD-AM-TAL-0001	Rev. 0, 2/10/2000
P634	Measurements of Fluorescein and Rhodamine B by Fluorescence	J.L. Botts	1221025	Rev. NA, 01/28/1988
P636	Operation and Calibration of the Canberra, Nuclear Data Genie-ESP Data Acquisition and Processing System	M.R. Chattin	CSD-AM-RML-RA04	Rev. 2, 8/22/2005
P637	Administration of Chemical and Analytical Sciences Division Procedures	F.J. Smith	CASD-OP-000-AD01	Rev. NA, 3/15/1994
P638	Oak Ridge National Laboratory Standard Practice Procedure for ORNL Document Management	NA	X-AD-9	Rev. 0, 02/28/1994
P639	Oak Ridge National Laboratory Chemical and Analytical Sciences Division Chemical and Analytical Sciences Division Quality Assurance Plan	NA	QAP-X-94-CASD-001	Rev. 1, 9/29/1995
P640	Radioactive Materials Analytical Laboratory Quality Assurance Plan for the Characterization of Radioactive Waste	JM Keller	QAP-X-96-CASD/RML-001	0, 4, Various
P641	Oak Ridge National Laboratory Chemical and Analytical Sciences Division Standard Operating Procedure for Handling of Samples and Decontamination of Ion Lenses in the 5505 TRU Laboratory	D.H. Smith	CASD-OP-TRL-RP01	Rev. 1, 7/16/1999

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Source Document Tracking Number [a/c]	Title or Description [a]	Author	Document # [b]	Document Revision # and Date
P642	Oak Ridge National Laboratory Chemical and Analytical Sciences Division Standard Operating Procedure for Inorganic Mass Spectrometry Quality Assurance Plan	D.H. Smith and J.L. Wagner	QAP-X-94-CASD/IMS-001	Rev. NA, 07/31/1996
P643	Transuranium Analytical Laboratory QA Program	NA	QA-AC-103-0201	Rev. 0, 1, 11/11/1998, 7/20/1989
P644	Oak Ridge National Laboratory Chemical and Analytical Sciences Division Standard Operating Procedure for Use of Radiochemical Glove Boxes in the Transuranium Research Laboratory	F.J. Smith	CASD-OP-TR-GB01	Rev. 0, 8/22/1995
P645	Configuration Control for the Radioactive Materials Analytical Laboratory, Building 2026	J.L. Botts	AC-OP-105-0308	Rev. 0, 8/23/1993
P646	Oak Ridge National Laboratory Analytical Chemistry Division Standard Operating Procedure for Sample Tracking for the Transuranium Analysis Laboratory	J.L. Botts	AC-OP-103-0805	Rev. 0, 3/23/1989
P647	Oak Ridge National Laboratory Analytical Chemistry Division Standard Operating Procedure for Use and Handling of Chemicals for the Transuranium Analysis Laboratory	J.L. Botts	AC-OP-103-0808	Rev. 0, 3/23/1989, 9/22/1989
P648	Implementation of Quality Control Within the Transuranium Analysis Laboratory (TAL)	April Swafford Meeks	AC-OP-103-0901	Rev. 0, 3/28/1994
P649	Operation of Analytical Balances for the Transuranium Analysis Laboratory	J.L. Botts	AC-OP-103-1201	Rev. 0, 4/3/1989
P650	Chain of Custody Sample Storage for the Transuranium Analysis Laboratory	D.L. Dihel	AC-OP-103-1301	Rev. 0, 11/16/1988, 3/23/1989
P651	Chain of Custody Sample Security for the Transuranium Analysis Laboratory	D.L. Dihel	AC-OP-103-1302	Rev. 0, 3/23/1989
P652	Neutron Activation Analysis Facility Training and Certification Program for Operators of the Pneumatic Tube Systems, PTS-1 and PTS-2	L. Robinson, J.M. Keller	AC-OP-102-0207	Rev. 2, 12/1/1993
P655	Quality Assurance Project Plan For Packaging of Transplutonium Elements and other Radioactive Products by the Radiochemical Engineering Development Center for Off-Site Transportation	J.E. Bigelow	QAP-X-88-CT-001	Rev. 1, 12/1/1988
P656	Quality Assurance Plan for the ORNL Californium Shipping Container Maintained by the REDC for On-Site Transportation	J.E. Bigelow, J.B. Knauer	QAP-X-91-CT-001	Rev. 0, 03/20/1991
P657	Quality Assurance Plan for Modifications and Maintenance of Hot-Cell Support Systems and Adjunct Facilities at the REDC	R.M. Wham	QAP-X-88-CT-002	Rev. 0, 12/20/1989
P659	Lockhead Martin Energy Research Corporation Oak Ridge National Laboratory Program Description for ORNL Job Hazard Evaluation	NA	ORNL-SH-P29	Rev. 1, 9/10/1999

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Source Document Tracking Number [a/c]	Title or Description [a]	Author	Document # [b]	Document Revision # and Date
P660	Waste Certification Program Plan	NA	NA	Rev. NA, 3/30/2004
P662	Duties and Responsibilities of the Sample Custodian for the Transuranium Analysis Laboratory	D.L. Dihel	AC-OP-103-0801	Rev. 0, 3/28/1989
P663	Data Review for the Transuranium Analysis Laboratory	D.L. Dihel	AC-OP-103-0301	Rev. 0, 03/27/1989
P664	Sample Chain-of-Custody for the Transuranium Analysis Laboratory	D.L. Dihel	AC-OP-103-0804	Rev. 0, 03/23/1989
P665	Quality Assurance Program Requirements for Projects Utilizing Hot-Cell Facilities	NA	HC/QA-11560	Rev. 0, 4/12/1988
P666	Oak Ridge National Laboratory Transuranic Waste Certification Program	J.H. Smith, et.al	ORNL/TM-10322	Rev. 1, June 1987
P667	Quality Assurance Program	NA	ORNL/M-811	Various, Various
P668	RMAL-ORNL Quality Assurance Project Plan for the TRU Waste Characterization Program	NA	QAP-X-94/CASD/RML-002	Rev. 0, 6/1/1995
P669	Preparation and Documentation of Radioactive Standards, Carriers, Inorganic and Organic Standard Solutions	N.A. Teasley, Jr., J.M. Giquinto, M.P. Maskarinee	CASD-OP-RML-AD04	Rev. 0, 1/31/1995
P670	Chemical and Analytical Sciences Division Training Plan for Nuclear Facilities	R.F. Peacher	CASD-OP-000-TR02	Rev. 1, 7/1/1996
P671	Sample Management in the Radioactive Materials Analytical Laboratory, (RMAL), Building 2026	J.M. Giaquinto	CASD-OP-RML-AD02	Rev. 1, 3/31/1995
P672	Work Policies and Practices, Radioactive Materials Analytical Laboratory (RMAL), Building 2026	J. M. Giaquinto and R. D. Canaan; J.M. Keller	CASD-OP-RML-AD01	Various, Various
P673	The Analytical Chemistry Division Quality Control Program	S.K. Hollady	QA-AC-000-0901	Rev. 1, 10/251990
P674	Chemical and Analytical Sciences Division Training Program Plan	F.J. Smith	CASD-OP-000-TR01	Rev. 1, 6/1/1996
P675	Office of Quality Programs and Inspection Quality Assurance Plan	NA	QAP-X-96-QD-001	Rev. NA, 7/30/1996
P677	High Radiation Level Analytical Laboratory (HRLAL) Facility QA Program	J.L. Botts	QA-AC-105-0201	Rev. 0, 8/20/1990
P678	Radiochemical Technology Section Quality Assurance Plan	NA	RTS/QA/17	Rev. NA, 07/1992
P679	Chemical Technology Division Isotope Technology Section Quality Management Plan for the Radiochemical Engineering Development Center	R.M. Wham	REDC-QMP-1	Rev. 0, December 1996

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Source Document Tracking Number [a/c]	Title or Description [a]	Author	Document # [b]	Document Revision # and Date
P681	QA Requirements for TRU Waste Certification Program	NA	QA-L-20-100	Rev. 3, 01/31/1987
P682	Chemical Technology Division Self-Assessment Program Plan CY 1996-1998	L.E. McNeese	ORNL/CF-96/2	Rev. NA, January 1996
P683	Oak Ridge National Laboratory Organizational Charts and Document for Transferring Responsibilities to NNFD Beginning October 1, 2002	NA	NA	Rev. NA, October 2002
P685	Bagging Practices and Techniques for Standard Glovebox Operations	J.L. Botts	AC-OP-100-0910	Rev. 0, Various
P686	Preparation and Documentation of Radioactive Standards and Carriers for the Transuranium Analysis Laboratory	D.L. Dihel	AC-OP-103-0603	Rev. 0, March 1989
P687	Quality Assurance Plan for Contact-Handled Transuranic Waste Certification and Operations	NA	QAP-X-93-WMRA-056	Rev. 0, July 1993
P688	Waste Examination and Assay Facility (WEAF) Operations	W.I. Dothard	QAP-X-91-ESHC/WM-002	Rev. 1, June 1993
P689	ORNL Quality Assurance Project Plan for the Transuranic Waste Characterization Program	NA	WMRA-WMP-601	Rev. 0, December 1995
P690	Quality Assurance Plan for Research and Development Activities within the Chemical Development Section of the Chemical Technology Division	NA	QAP-X-88-CT-009	Rev. NA, January 1989
P692	Quality Assurance Program Manual Analytical Chemistry Division	NA	ORNL/M-806	Rev. NA, 10/01/1989
P693	ORNL Self-Assessment Program	NA	ORNL-QA-P03	Rev. 2, 12/20/2000
P694	ORNL Issues Management Program	NA	ORNL-QA-P04	Rev. 2, 9/29/2000
P695	ORNL Nonconformance Control Procedure	NA	ORNL-QA-P05	Rev. 1, 05/27/1998
P696	Deviation Procedure	NA	ORNL-QA-P06	DRAFT, DRAFT
P697	List of All Comments on QA-P07 ORNL Lessons Learned Program	Vince Bishop	ORNL-QA-P07	Rev. NA, 04/27/1998
P698	Control and Calibration of Measuring and Test Equipment at ORNL	NA	x-GP-8	Rev. 0, 3/18/1994
P699	ORNL Nonconformance Reporting	NA	X-QA-9	Rev. 0, 5/20/1996
P782	SNM Safeguards and Security at Building 7920, the Transuranium processing Plant (TRU)	E. D. Collins	NA	0, 3/7/1980
P784	Procedures and Information on Trash Removal from Cell G TURF	E. Cagle; D. Osucha	NA	NA, Various

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Source Document Tracking Number [a/c]	Title or Description [a]	Author	Document # [b]	Document Revision # and Date
P785	Dissolution of Pu-240/Am-241 Oxide Powder & Separation of Pu-240/Am-241 by MP-1 Column Elution	REDC	SP-PU240-INEL	NA, 09/09/2003
P786	Preparationof PuO2 Micro Spheres by TRU Resin Bead Loading and Calcination	Miting Du	REDC-Pu-7920.5	Revision 0, 08/20/2005
P787	Conversion of NH499TcO4 to H99TcO4 & Synthesis of (C2H5)4N99TcO4	Miting Du	REDC-Tc-Conv-1	Revision 1, 07/30/2004
P788	Neutron Dosimeter Assembly Outline	REDC	IM-OP-1.0	2 and 3, Various
P789	Dosimter Wire Fabrication	REDC	IM-OP-2.0	Revisions 2 and 3, 02/26/1996; 03/26/2008
P790	Preparation of Dosimeter Capsules	REDC	IM-OP-3.0	2 and 3, Various
P791	Weighing and Dispensing Dosimeter Wires	REDC	IM-OP-4.0	2, 3 and 4, Various
P792	Dosimeter Welding and Inspection	REDC	IM-OP-5.0	Revisions 2 and 3, 3/1/1996; 03/26/2008
P793	Gamma Counting of Dosimeters	REDC	IM-OP-6.0	2 and 3, Various
P794	Loading /Unloading Procedure for the REDC Cast Cask	REDC	IM-OP-10	1, 3/26/2008
P795	Segmentation of Targets and Cleaning of Cut Segments	REDC	IM-OP-11.0	Revisions 1 and 2, 03/26/2008
P796	Dissolution of Aluminum from Target Segments	REDC	IM-OP-12.0	Revision 1 and 2, 03/26/2008
P797	Nickel Pellet Dissolution and AIX Feed Preparation	REDC	IM-OP-13.0	Revisions 1 and 2, 03/26/2008
P798	Anion Exchange Purification of Ni-63	REDC	IM-OP-14.0	Revisions 1 and 2, 03/26/2008
P799	Feed Preparation for Cation Exchange Purification of Ni-63	REDC	IM-OP-15.0	Revisions 0 and 1, 03/26/2008
P800	Cation Exchange Purification of Ni-63	REDC	IM-OP-16.0	Revisions 0 and 1, 03/26/2008
P801	Removal of Chromium by Solvent Extraction	REDC	IM-OP-17.0	Revision 0, 03/26/2008

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Source Document Tracking Number [a/c]	Title or Description [a]	Author	Document # [b]	Document Revision # and Date
P802	Radiation Contamination Procedure: Decommissioning and Disposal of Alpha Glove Boxes (REF: TCFOM-10.3)	REDC	RC-OP-3.0	Revision 0, 03/26/2008
P803	Radiation/Contamination Procedure: Alpha Glove Box Operating Procedures	REDC	RC-OP-19.0	Revision 5, 11/09/1998
P804	Actinide Product Finishing/Special Projects Procedure: Actinide/Lanthanide Separation by Extraction Chromatography	REDC	PF-OP-10.0	Revision 0, 03/26/2008
P805	Actinide Product Finishing/Special Projects Procedure: Product Solution Volume Reduction/Product Evaporation	REDC	PF-OP-11.0	Revision 2, 03/26/2008
P806	Actinide Product Finishing/Special Projects Procedure: Fabrication of Electrodepositions Using Isopropanol Electrolyte	REDC	PF-OP-12.0	Revision 1, 03/26/2008
P807	Actinide Product Finishing/Special Projects Procedure: Fabrication of Electrodepositions Using Ammonium Acetate Electrolyte	REDC	PF-OP-13.0	Revision 1, 03/26/2008
P808	Pressurized Ion Exchange Column Preparation, Resin Loading, and Pre-Run Conditioning (Cave B)	REDC	PF-OP-14.0	Revision 0, 10/04/1994
P809	Actinide Product Finishing/Special Projects Procedure: Weighing and Dispensing of Radioactive Product Samples	REDC	PF-OP-17.0	Revision 0, 03/26/2008
P810	Actinide Product Finishing/Special Projects Procedure: Preparation of Samples for Radiochemical Analysis	REDC	PF-OP-18.0	Revision 2, 03/26/2008
P811	Nuclear Materials Processing Group Research Technical Procedure: Evaporation to Dryness of Solutions Using Infrared heat	Curtis Porter; REDC	NMP-PF-11.0	Revision 0, 02/16/2005
P812	Actinide Product Finishing / Special Projects Procedure: Fabrication and Testing of a Cf-252 Hemispherical Fission Chamber	N/A	PF-OP-15.0/R1	0, 1, Various
P818	Actinide Product Finishing/Special Projects Procedure: Fabrication and Testing of a Cf-252 Hemispherical Fission Chamber	REDC	PF-OP-15.0	Revisions 0 and 1, 08/13/2001 and 09/18/2001
P819	Actinide Product Finishing/Special Projects Procedure: Actinide/Lanthanide Separation Studies for the Advanced Fuel Cycle Initiative	REDC	PF-OP-30.0	Revision 0, 05/22/2003
P820	Actinide Product Finishing/Special Projects Procedure: Preparation of Chemical Reagents	REDC	PF-OP-1.0	Revision 3, 03/26/2008
P821	Pressurized Ion Exchange Column Preparation, Resin Loading, and Pre-Run Conditioning (Cave A)	REDC	PF-OP-2.0	Revision 1, 04/15/1993
P822	Actinide Product Finishing/Special Projects Procedure: Micro-Ion Exchange Column Preparation and Pre-Run Conditioning	REDC	PF-OP-3.0	Revision 2, 03/26/2008

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Source Document Tracking Number [a/c]	Title or Description [a]	Author	Document # [b]	Document Revision # and Date
P823	Actinide Separation by Pressurized Chromatographic Elution from Cation Exchange Resin in Cave B	REDC	PF-OP-4.0	Revision 0, 10/09/2000
P824	Actinide Product Finishing/Special Projects Procedure: Actinide/Lanthanide Separation by Chromatographic Elution from Cation Exchange Resin	REDC	PF-OP-6.0	Revision 1, 10/14/1994
P825	Actinide Product Finishing/Special Projects Procedure: Cationic Cleanup of Actinides/Lanthanides by Ion Exchange	REDC	PF-OP-7.0	Revision 2, 03/26/2008
P826	Actinide Product Finishing/Special Projects Procedure: Fission Product Removal by Alcoholic-HCl Ion Exchange	REDC	PF-OP-8.0	Revision 2, 03/26/2008
P827	Actinide Product Finishing/Special Projects Procedure: Organic Scrub of the Berkelium (Bk) Product from the Berkex Process	REDC	PF-OP-9.0	Revision 2, 03/26/2008
P828	Actinide product Finishing Special projects Procedure; REDC; Material Transfers with the Shield Transfer Carrier ("Mule")	REDC	PF-OP-26.0	2, 3/26/2008
P830	Chemical Technology Division, Isotope Preparation Department: Contaminated Solid Waste Handling Procedure	Isotopes, REDC	IP-003	Rev. 0 & 1, 09/01/1987; 02/15/1989
P850	ORNL Computerized Hazardous Materials Tracking System	P. Knight; D. Atkins; M. Eisenhower; T. Clark	NA	NA, 5/1985
P851	Hot Cell Experimental Procedure	F. R. Chattin	HC-EX-1	NA, 2/21/1990
P852	Standard Procedures for Hot Cell Operations (Cleanex Procedures) for Building 7920	NA	NA	NA, 8/1/1985
P853	Hot Cell Procedure: Tank T-60: Clean Out of Organic Used in a Diluent Wash Stage	F. R. Chattin	HC-OP-1010;1027; 1038	0, 6/29/1989
P854	Hot Cell Operating Procedure: Sampling of Actinide Oxide Product	Fred Chattin	HC-OP-930	NA, 2/15/1990
P855	Safety Standards	Various	NA	NA, Various
P877	Analytical Chemistry Division Employee Handbook	ORNL	M-2791	NA, 04/1993
P882	Independent Review of Safety Systems (Document Reviewed: Safety Analysis TURF, Building 7930)	NA	NA	NA, March 1991
P883	Memorandum of Understanding (MOU) Listing between Chem Tech Division and Health Protection Division	B. D. Patton	NA	NA, 4/20/1989
P885	Procedure for Trash Removal from Cell G TURF	N/A	NA	NA, 04/06/1983

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Source Document Tracking Number [a/c]	Title or Description [a]	Author	Document # [b]	Document Revision # and Date
P889	Basic Principles of Operation in the Chem Tech Division	NA	NA	NA, 6/30/1989
P894	Packaging and Transportation - Chem Tech Division	B. D. Patton	NA	NA, 5/8/1989
P905	Health Physics Procedure - Handling and Transfer of Radioactive Materials within the Laboratory and Guide for the Transfer of Materials Between Contaminated Enclosure Systems and Non-Contaminated Areas	ORNL	Procedure 4.1	NA, 01/01/1976
P910	Radioactive Operations Committee (ROC) Review of Building 7920 (TRU Facility)	Radioactive Operations Committee, ORNL	ORNL/CF-78/311	NA, 09/20/1978
P911	Quarterly Progress Report for the Chemical and Energy Research Section of the Chemical Technology Division: July-September 1999	R. T. Jubin; ORNL	ORNL/TM-1999/304	NA, March 2001
P917	Procedure 5.1 - Segregation and Management of solid Radioactive Waste Materials and supporting Solid Waste Management Documentation	ORNL	Procedure 5.1	NA, 12/15/1983, 12/15/1985
P928	Calculation of the Requirements for Operation of Refractory-Metal Components at High Temperature in Vacuum	R.E. Clausing	ORNL-TM-334	Rev. NA, 9/18/1962
P930	Independent Review of Safety Analysis Documentation for Radiochemical Engineering Development Center - Building 7930 - Inspection Record package	Performance Development Corporation	NA	NA, 3/1991
P932	Radioactive Operations Committee and Office of Operational Safety Review of the Radiochemical Engineering Development Center and the Radiochemical Processing Plant, December 12-15, 1988	NA	NA	NA, 12/1988
P942	Procedure for Disposal of F-126 Contents to MV Waste Tank WC-20	NA	NA	NA, NA
P946	Operating Manual for the ORNL Filter Removal Carrier	General Engineering Division; ORNL	68-3-18	NA, 03/1968
P947	Cm II Can Operating Procedure, Transferring Cm II Cans from the Mark 42 Transfer Cask to the Mark 42 Storage Facility	NA	CmII-OP-1.0	Revision 0, 02/09/1998
P948	Transferring Mark 42 Segments (for Verification) from the Mark 42 Storage Facility to Cubicle 7 and memo to R. M. Wham re: Determination of Fissionable Material Content for Target Assembly X42Y72 in Bldg 7920	NA	MK-OP-6.0	NA, Various
P949	Transferring Mark 42 Segments (for Verification) from the Mark 42 Storage Facility to Cubicle 7 and memo to R. M. Wham re: Determination of Fissionable Material Content for Target Assembly X33Y15 in Bldg 7920	C. W. Alexander	MK-OP-6.0	Revision 0, 02/19/1997

Attachment 4 - Acceptable Knowledge Source Document Information List (continued)

Source Document Tracking Number [a/c]	Title or Description [a]	Author	Document # [b]	Document Revision # and Date
P950	Mark 42 Operating Procedure, Transferring mark 42 Segments from the Mark 42 Storage Facility to Cubicle 7	C. W. Alexander	MK-OP-7.0	Revision 1, 06/12/2001
P951	Advanced Fuel Cycle Initiative (AFCI) Semmiannual Review	Buzz Savage	NA	NA, 9/13/2004
P952	Global Nuclear Energy Partnership Technology Development Plan	GNEP Technical Integration Office	GNEP-TECH-TR-PP-2007-00020	0, 7/25/2007
P953	Phased Construction Completion Report for the 22 Trench Waste Retrieval Project at ORNL	N/A	DOE/OR/01-2305&D1	0, 8/2006
P956	Segregation and Management of Solid Radioactive Materials	NA	NA	NA, 11/27/1985, 05/15/1986
P962	Analytical Chemistry Division Annual Progress Report Period Ending November 30, 1977	W. S. Lyon, et al.	ORNL-5360	NA, 03/1978
P963	Analytical Chemistry Division Annual Progress Report Period Ending December 31, 1978	W. S. Lyon, et al.	ORNL-5518	NA, 05/1979
P964	Analytical Chemistry Division Annual Progress Report for Period Ending December 31, 1983	W. D. Shults, et al.	ORNL-6039	NA, 05/1984
P965	Analytical Chemistry Division Annual Progress Report for Period Ending December 31, 1986	W. D. Shults	ORNL-6357	NA, 04/1987
P966	Analytical Chemistry Division Annual Progress Report for Period Ending December 31, 1988	W. D. Shults	ORNL-6547	NA, 05/1988
P967	Radioactive Operations Committee Review of Operations in Buildings 2026 and 3019B	S. E. Gheesling, et al.	ORNL/CF-90/85	NA, 06/15/1990
P968	The 1990 Radioactive Operations Committee Review of Operations in Buildings 2026 and 3019B	R. G. Wymer, et al.	ORNL/CF-90/329	NA, 03/06/1991
P969	The 1991 Radioactive Operations Committee Review of the High Radiation Level Analytical Laboratory Facilities in Buildings 2026 and 3019B	D. H. Gray, et al.	ORNL/CF-91/36	NA, 06/03/1992
P972	Radioactive Operations Committee Review of the High-Radiation Level Analytical Laboratory, Bldg. 2026, November 14, 1974	R. E. Brooksbank	ORNL/CF-74-12-11	NA, 12/06/1974
P974	Review of the Analytical Chemistry Division Operations in Building 2026 and 3019B	D. H. Gray	ORNL/CF-88/99	NA, 06/10/1988
P978	Solvent Extraction Studies with Low-Burnup Fast Flux Test Facility Fuel in the Solvent Extraction Test Facility	D. E. Benker, et al.	ORNL/TM-9189	NA, 01/1985
P980	Safety Basis Supplement for the Processing of Bettis PuBe Neutron Sources	G. G. Coppock	ORNL/7920/2010-02	Rev. 3, 08/28/2013
P981	U.S. Department of Energy Office of Inspector General Office of Audit Services, Audit Report, Plutonium-238 Production	Gregory H. Friedman	DOE/IG-0607	NA, 06/2003

Attachment 4 - Acceptable Knowledge Source Document Information List (continued)

Source Document Tracking Number [a/c]	Title or Description [a]	Author	Document # [b]	Document Revision # and Date
P982	The GNEP Coupled End-to-End (CETE) Research, Development, and Demonstration Project: Overview of the CETE Testbed Capabilities and Operations	P. D. Bailey, et al.	P6-01	NA, 05/19-22/2008
P983	Plutonium and Neptunium Conversion Using Modified Direct Denitration	L. K. Felker, et al.	NA	NA, NA
P984	Lab-Scale Demonstration of the UREX+1a Process Using Spent Fuel	Candido Pereira, et al.	NA	NA, 02/25/2007 - 03/01/2007
P985	Development of the UREX+ Co-Decontamination Solvent Extraction Process	E. D. Collins, et al.	NA	NA, NA
P986	Glove Box Operations	C. Porter	NNFD-7920-OP-105	Rev. 0, 11/01/2004
P987	Glove Box Operations	K. E. Murphy	NNFD-REDC-001	Rev. 0, 09/09/2011
P988	CH-TRU Waste Handling at Building 7920	K. Wilson	NNFD-7920-OP-190	Rev. 0, 02/23/2010
P989	RH-TRU Waste Handling in Building 7920 Cell Bank	R. J. Weaver	NNFD-7920-OP-191	Rev. 1, 10/03/2014
P990	Bag-Out Procedure for the Transfer and Decontamination Facility	R. G. Veal, et al.	TF-BO-1008	Rev. 0, 06/10/1996
P991	Disposal of Waste Solutions	M. L. Milburn, et al.	NNFD-7920-OP-142	Rev. 0, 03/31/2008
P992	[CLEANEX] Waste Organic Cleanout	R. J. Weaver, et al.	NNFD-7920-OP-195	Rev. 0, 11/18/2009
P993	Transuranic Waste Processing Center, Risk-Based Disposal Approval Request for PCBs Contaminated with Radioisotopes at the TWPC	NA	NA	NA, 03/01/2011
P994	CH-TRU Waste Handling at REDC	NA	NNFD-REDC-004	Rev. 0, 07/20/2015
U004	Draft Information for BESAC Review of HFIR (8/17/98)	J. E. Bigelow	NA	NA, 08/17/1998
U038	ORNL TRU Waste Historical Survey; Volumes 1, 2, and 3—Origins and Characteristics of Remote-Handled Transuranic Wastes (Trabalka report) Plus Appendices	J.R. Trabalka, A. J. Mattus, S.N. Storch	BJC/OR-395-V/1,2,3	Draft, 09/2001
U039	Oak Ridge Reservation Transuranic Waste Acceptable Knowledge Summary Report for the Radiochemical Engineering Development Center: Newly Generated Contact-Handled Transuranic Waste from Isotope Production	Eberline Services for DOE	ORNL-CH-AK-TBD/RA	Draft, 07/12/2002
U041	Waste Stream Profile Sheet for 7920-HCAL-007 R1 and Supporting Documentation	D. Coffey	7920-HCAL-007 R1	Revision 1, 09/06/2002

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Source Document Tracking Number [a/c]	Title or Description [a]	Author	Document # [b]	Document Revision # and Date
U044	Weston Report: Acceptable Knowledge Summary Report for Oak Ridge National Laboratory Contact-Handled TRU Debris Waste Facility Maintenance Operations	ORNL/Betty Humphrey	AK-ORNL-001	Rev. 3A & 4, 05/24/2006; 06/19/2006
U045	Waste Stream Profile Sheet for Building 7920, Hot Cells and Analytical Labs	Wayne Evans	7920-HCAL-002	NA, 04/19/1999
U046	RH Debris Waste Process Flow Descriptions	NA	RH-R-PR-001	Rev. 0, Draft D, NA
U047	Transuranic Waste Processing Center at Oak Ridge National Laboratory Remote Handled Transuranic Waste Container Selection and Transfer Plan	NA	RH-A-AD-0 02	Rev. 0 DRAFT, NA
U048	Remote Handled Transuranic Waste Transfer Project Scope and Inventory Assessment	NA	BJC/OR-DRAFT	Rev. NA, 10/2007
U049	Waste Stream Profile Sheet for 7920-HCAL-005 and Supporting documentation	ORNL	7920-HCAL-005	NA, 08/18/1999
U059	Brief History of ORNL	NA	NA	NA, 3/2/1993
U091	ORNL RH TRU Data Extracted REDC Process Information Package for Radiological Characterization for Campaigns M2, M3, M4, M5, M6, M7, M8, M9, M10, M11, M12, M13, M14, M15, M16	ORNL	NA	NA, Various
U105	Waste Stream Profile Sheet for Building 7920, Room 211, Waste Stream 7920-R211-001	Wayne Evans; Don Coffey	7920-R211-001	NA, 7/15/1999
U106	Waste Stream Profile Sheet for Building 7920, Room 108, Waste Stream 7920-R109-001 and 7920-R109-001R1	Wayne Evans; Don Coffey	NA	NA, Various
U107	Waste Stream Profile Sheet for Building 7920, Room 111, ORNL Waste Stream 7920-R111-001, and Radiological Characterization of waste from Building 7920 - Room 111 "Shielded 7920-R111 Caves, A and B"	Wayne Evans; Don Coffey	NA	NA, Various
U108	Waste Stream Profile Sheet for Building 7920, Room 109, ORNL Waste Stream 7920-R109-002	Don Coffey; Wayne Evans	NA	NA, Various
U109	Waste Stream Profile Sheet for Building 7920, Room 211, ORNL Waste Stream 7920-R211-002	Wayne Evans; Don Coffey	NA	NA, Various
U110	Data Quality Objectives (DQO) Worksheet for Building 7920, Labs 209 and 211	ORNL, Roy Banning	DQO # 08-004	NA, 07/15/2008
U111	Radiological Characterization and Quantification of Waste under WSPS REDC-001 using Microshield	Don E. Coffey, et al.	WSPS REDC-001	4, 6, 7, 8, & 9, Various
U112	Waste Characterization Checklist (WCC)	T. Lehberger; J. Selph	WCC REDC-001	3 & 4, Various
U124	Contamination Control Plan for Hot Cell (TWPC Hot Cell)	ORNL	NA	Draft, NA

Attachment 4 - Acceptable Knowledge Source Document Information List (continued)

Source Document Tracking Number [a/c]	Title or Description [a]	Author	Document # [b]	Document Revision # and Date
U125	Maintenance Work Control, Attachment C: Maintenance Work Order #CM-10-003	K. East	CM-10-003	NA, 1/12/10
U126	Maintenance Work Control, Attachment C: Maintenance Work Order #CM-10-100	Kevin East	CM-10-100	NA, 08/03/2010
U127	Radiological Quantification of Debris Waste Generated at REDC from Hot Cell and Facility Operations	Jimmy R. Selph	REDC Debris	Rev. 0, 1, 2, & 3, 01/26/2012 to 12/11/2013
U128	Radiological Quantification of Waste Generated at Building 7920 Room 216 from Glovebox Operations	Jimmy R. Selph	7920-216 Glovebox Debris	Rev. 0, 03/28/2012
U129	Evaluation of Glovebox Radio-Chemical Analytical Smear Data used to Support REDC Waste Disposal	Jimmy R. Selph	REDC Glovebox Smear Data Evaluation	Rev. 0, 1, & 4, 11/20/2009 to 03/01/2012
U130	Radiological Quantification of Waste Generated at Building 7920 Lab 209 from Glovebox Operations	Jimmy R. Selph	7920-209 Glovebox Debris	Rev. 1 & 2, 12/14/2011 to 08/03/2012
U131	Radiological Quantification of Waste Generated at Building 7920 Lab 211 from Glovebox Operations	Jimmy R. Selph	7920-211 Glovebox Debris	Rev. 0, 1, & 2, 12/15/2009 to 08/21/2012
U132	Radiological Quantification of Waste Generated at REDC from Np-237 Pellet Production Operations	Jimmy R. Selph	REDC Np-237 Pellet Production	Rev. 0, 05/13/2014
U133	Radiological Quantification of Waste Generated at Building 7920 Lab 109 from Operations Conducted in the CETE Gloveboxes	Jimmy R. Selph	7920-109 CETE Gloveboxes Debris	Rev. 1, 06/16/2014
U403	Log Book: Cave A Liner Replacement Activities	NA	NA	NA, Various
U412	Logbook Reference 6R1 - Cf-252 Electrodeposition Processing - Initial CX, TEVA, and Final CX Purifications (REDC Bldg 7920)	NA	NA	NA, Various
U415	Transuranium Material Transfer	Various	Various	NA, Various
U420	Research and Technical Notebook No. A-103608-G, Assigned to Curtis Porter, Process Development, REDC, Chemical Technology, Building 7920	Curtis Porter	A-103608-G	NA, Various
U423	Unclassified Notebook A-6228 for M. H. Lloyd, Chem. Tech., Building 7920, Issued 12/10/1970	M. H. Lloyd	N/A	N/A, 01/29/1971-09/22/1972
U424	ORNL Technical Notebook No. A-106986-G, Assigned to Milt Lloyd, Chem Tech Division	Milt Lloyd	A-106986-G	NA, Various
U425	ORNL Technical Notebook No. A-106985-G - Milt Lloyd; Susan North	Milt Lloyd	Logbook A-106985-G	NA, Various

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Source Document Tracking Number [a/c]	Title or Description [a]	Author	Document # [b]	Document Revision # and Date
U426	ORNL Technical Notebook no. A-106984-G; Susan North and Milt Lloyd	Milt Lloyd	Logbook A-106984-G	NA, Various
U428	Unclassified Notebook No. A-6272, Assigned to O. K. Tallent, Chem Tech Department, Building 7920, Issued 2/4/1971	O. K. Tallent	A-6272	NA, Various
U429	Unclassified Notebook A-6271: Building 7920, O.K. Tallent	O. K. Tallent	A-6271	0, Various
U432	O.K. Tallent Logbook A-106981-G Transferred to Milt Lloyd (Chem Tech Division, Building 7920), Dated 09/14/1994 (Solvent Extraction, etc.)	O.K. Tallent, Milt Lloyd	A-106981-G	NA, Various
U433	ORNL Technical Logbook No. A-106990-G, Milt Lloyd, Chem Technology Division Building 7920, Solvent Extraction	Milt Lloyd	A-106990-G	NA, Various
U434	ORNL Technical Notebook No. A-106983-G, Milt Lloyd/McCosh, Solvent Extraction, Chemical Technology Div. Bldg 7920, Issued 09/14/1994	McCosh	N/A	N/A, 04/10/1961-08/14/1961
U435	ORNL Technical Notebook A-106991-G, Milt Lloyd, Building 7920 Chem Tech Division, Solvent Extraction	Milt Lloyd	A-106991-G	0, 09/15/1994
U436	Unclassified Notebook No. A-6227, Milt Lloyd, Building 7920 Chem Tech Division	Milt Lloyd	A-6227	NA, Various
U437	ORNL Technical Notebook No. A-106992-G, Milt Lloyd and Susan North Lewis, Building 7920	Milt Lloyd	Logbook A-106992-G	NA, Various
U438	Unclassified Notebook No. A-6229, Milt Lloyd logbook, Building 7920 (REDC)	M. H. Lloyd	A-6229	NA, Various
U439	ORNL Technical Notebook No. A-106981-G for Milt Lloyd and O.K. Tallent, Chem Technology Division, Building 7920	Milt Lloyd; Tallent	Logbook A-106981-G	NA, Various
U441	ORNL Technical Notebook A-106988-G, Milt Lloyd and Bob Jones, Chemical Technology Division, Building 7920	Milt Lloyd, Bob Jones	Logbook A-106988-G	NA, Various
U442	Unclassified notebook No, A-6307, R. A. Ward, Health Physics, Bldg 7920	R. P. Ward	A-6307	NA, Various
U443	Unclassified Notebook No. A-6226, Milt Lloyd, Chem Tech, Bldg 7920	M. H. Lloyd	Logbook A-6226	NA, Various
U452	Research and Technical Notebook: Building 7920 (MS 6384) No. A108099-G, Curtis Porter, Chem Technology Division (Isotope Technology)	Curtis Porter	A-108099-G	0, Various
U453	ORNL Technical Notebook No. A106984-G, Milt Lloyd, Jeff Wade, O.K. Tallent, Chem Technology Division, Bldg 7920, Solvent Extraction	Milt Lloyd	Logbook A-106984-G	NA, Various
U477	ORNL Technical Notebook No. A-105094; Building 7920; REDC - Curtis Porter	C. E. Porter	Logbook A-105094	NA, Various
U478	ORNL Technical Notebook No. A-102161; Chemical Technology / Finished Products / J. T. Wiggens	J. T.Wiggens	Logbook A-102161	NA, Various

Attachment 4 - Acceptable Knowledge Source Document Information List (continued)

Source Document Tracking Number [a/c]	Title or Description [a]	Author	Document # [b]	Document Revision # and Date
U479	Logbook; TURF Project; H. C. Savage (Bldg 7930)	H. C. Savage	NA	NA, Various
U480	Logbook TURF (Bldg 7930) Operations Log #1; Pre-MSRE Fuel	NA	Logbook TURF Log #1	NA, Various
U481	Logbook REDC Building 7930 (TURF Facility); M. E. Littleton	M. E. Littleton	NA	NA, Various
U482	TURF Logbook 16L4; Building 7930; M. E. Littleton	M. E. Littleton	Logbook: TURF 16L4	NA, Various
U483	ORNL Technical Logbook; C. E. McFarland; Building 3038	C. E. McFarland	Logbook A-9372	NA, 02/20/1980 - 12/30/1980
U484	ORNL Technical Notebook No. A-105094; Assigned to C. E. Porter on 11/01/1991; ITS/REDC; Products Research and Development Projects	C. E. Porter	A-105094	NA, Various
U488	Log Book; Chemical technology Division; Building 7920; 1999 - 2000; Curtis Porter	Curtis Porter	NA	NA, Various
U489	Curtis Porter; Building 7920; Chemical Technology Division	Curtis Porter	NA	NA, Various
U490	Logbook B000555, Building 7920 MS 6384, Chemical Technology 3/22/99	Curtis E. Porter	B000555	NA, 3/22/99 - 7/10/2002
U493	Logbook TURF Building Log; 10/16/1973 - 12/17/1982	NA	NA	NA, Various
U494	Logbook: TURF (Bldg 7930) Logbook #12; 1/3/1983 - 8/21/1984	M. E. Littleton	Logbook TURF #12	NA, Various
U495	Logbook: TURF (Bldg 7930) E. B. Cagle 1987	E. B. Cagle	NA	NA, Various
U496	Logbook: TURF (Bldg 7930) Logbook E. B. Cagle; May 10, 1985	E. B. Cagle	NA	NA, Various
U497	Logbook: Log #1; Building 7930; W. Bostic, W. Miller; R. Bowman, F. Brown (TURF Bldg)	William Bostic; William Miller; R. Bowman; F. Brown	NA	NA, Various
U498	Logbook: TURF (Bldg 7930) Logbook 14 L2; 8/22/1984 - 6/23/1985	M. E. Littleton	NA	NA, Various
U499	Logbook: TURF (Bldg 7930) Log #11; 1/1/1971 - 10/5/1973	Wallis; Bostic	NA	NA, Various
U500	Logbook: TURF (Bldg 7930) Logbook 15L3; M. E. Littleton; 6/24/1986 - 8/5/1988	M. E. Littleton	NA	NA, Various
U501	Logbook: G. A. West; C. E. Roberts; H. C. Thompson; 1/4/1972; Bldg 7920 Waste Logbook	G. A. West; C. E. Roberts; H. C. Thompson	NA	NA, Various

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Source Document Tracking Number [a/c]	Title or Description [a]	Author	Document # [b]	Document Revision # and Date
U502	Logbook: TRU Log (Maintenance & Waste); G. A. West; C. E. Roberts; H. C. Thompson; Bldg 7920	G. A. West	NA	NA, Various
U503	Logbook: TRU Maintenance & Waste Disposal; Building 7920; 12/1/1977 - 2/2/1979; West; Roberts; Thompson	G. A. West; C. E. Roberts; H. C. Thompson	NA	NA, Various
U504	Isotopes Staff List	NA	NA	NA, 6/24/1988
U505	Lab Notebook: RE-2 - Analytical Chemistry Division - Charles Alexander - Building 7920	Charles (Chuck) Alexander	NA	NA, Various
U506	Research & Technical Notebook No. Te-1 - Chemical Technology Division - Building 7920 - Charles (Chuck) Alexander - A-107733-G	Charles (Chuck) Alexander	A-107733-G	NA, Various
U507	Research & Technical Notebook - Notebook No.(SM-1) A-107736-G - Building 7920, MS 6384 - Charles Alexander	Charles (Chuck) Alexander	A-107736-G	NA, Various
U508	Lab Notebook 21/150/REC - Building 7920 - Charles (Chuck) Alexander	Charles (Chuck) Alexander	21/150/REC	NA, Various
U519	TRU Log, Vol. 504, Logbook # A-8632, L. J. King, Chem Tech Division, Bldg 7920; 01/28/1979 - 02/05/1979	L.J. King	Logbook # A-8632	NA, Various
U528	Technical Notebook - Chuck Alexander - Building 7920	Charles Alexander	21/300/R; SL-AM241-SP-1	NA, 08/06/2003 - 08/01/2006
U529	Technical Notebook - Charles Alexander, Building 7920	Charles Alexander	Logbook # B000334	NA, 12/11/1985-07/29/1988
U530	Logbook A-103674; REDC Mark 42 Process Development; Charles (Chuck) Alexander; Building 7920; issued to G. D. O'Kelley	Charles (Chuck) Alexander	Logbook A-103674	NA, 10/13/1989
U531	Logbook - Building 7920 - TRU Maintenance and Waste Disposal - 02/05/1979	NA	NA	NA, 02/05/1979
U532	Logbook - Waste Transfer Area (LAA Area) - Building 7920 - C. E. Roberts - 1977	C. E. Roberts	NA	NA, 09/1977 - 03/1978
U533	Logbook #9 - Building 7920 - 07/1968 thru 01/1969	Bowman, Devall, & Miller	Logbook #9	NA, 07/1968 - 01/1969
U534	Logbook - Building 7920 - 01/1992 thru 11/1993	NA	NA	NA, 01/1992 - 11/1993
U535	Logbook - Building 7920 - Process H20 Shutdown - 04/1979 thru 02/1984	NA	NA	NA, 04/1979 - 02/1984

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Source Document Tracking Number [a/c]	Title or Description [a]	Author	Document # [b]	Document Revision # and Date
U536	Logbook - Building 7920 - 01/1989 thru 01/1990 - Waste Logbook	NA	NA	NA, 01/1989 - 01/1990
U537	Logbook - Building 7920 - 11/1982 thru 08/1984 - Waste Logbook	NA	NA	NA, 11/1982 - 08/1984
U538	Logbook - Building 7920 - 01/1984 thru 06/1984 - Waste Logbook	NA	NA	NA, 01/02/1984 - 06/08/1984
U539	Logbook - Building 7920 - 09/1981 thru 11/1982 - Waste Logbook	NA	NA	NA, 09/01/1981 - 11/08/1982
U540	Logbook - Building 7920 - 06/1980 thru 08/1981 - Waste Logbook	NA	NA	NA, 06/02/1980 - 08/27/1981
U541	Logbook - Building 7920 - 11/1969 thru 10/1972 - Waste Logbook	NA	NA	NA, 11/17/1969 - 10/23/1972
U542	Logbook - Building 7920 - 02/1972 thru 01/1973 - Waste Logbook	NA	NA	NA, 02/24/1972 - 01/10/1973
U543	Logbook - Buildings 7920 and 7930 - 06/1985 thru 09/1986 - Waste Logbook	NA	NA	NA, 06/12/1985 - 09/22/1986
U544	Logbook - Building 7920 - Bill Bryan - 12/1967 thru 02/1972	Bill Bryan	NA	NA, 12/01/1967 - 02/23/1972
U545	Logbook - Building 7920 - 11/1967 thru 12/1974 - Building Maintenance	NA	NA	NA, 11/03/1967 - 12/31/1974
U546	Logbook – Building 7920 - 02/1980 thru 11/1987 - Casks to SWSA (Best Estimates from UCN-2822 and TRU Log Books)	NA	NA	NA, 02/14/1980 – 11/05/1987
U548	PCB Related Documentation - Environmental Monitoring and Protection Committee Meeting Minutes	R. G. Jordan	NA	NA, 03/30/1978 - 11/29/1978
U568	Coupled End-to-End Demonstration Project Task Sheets - Separations	NA	CETE Task #: 4.1.4 thru 4.1.9	Rev. 0, 05/07/2007 - 05/08/2007
U601	CCP Calculation Package: Sample Radionuclide Information Input Check	J. Vance	ORNL-RH-01	Rev. 0 & 1, 04/19/2008 & 07/22/2008
U602	CCP Calculation Package: Sample Data Decay Correction	J. Vance	ORNL-RH-02	Rev. 0, 04/19/2008
U603	CCP Calculation Package: Campaigns 69 and M5 Information Input Check	J. Vance	ORNL-RH-03	Rev. 0, 04/19/2008

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Source Document Tracking Number [a/c]	Title or Description [a]	Author	Document # [b]	Document Revision # and Date
U604	CCP Calculation Package: HFIR Campaigns in SETF Information Input Check	J. Vance	ORNL-RH-04	Rev. 0 & 1, 04/16/2009 & 06/02/2009
U605	CCP Calculation Package: Mark 42 Campaign Inventory Information Input Check	J. Vance	ORNL-RH-05	Rev. 0, 04/19/2008
U606	CCP Calculation Package: Radiological Inventories for SETF Campaigns	James H. Holderness	ORNL-RH-06	Rev. 0, 04/16/2008
U607	CCP Calculation Package: Drum DTC Derivation for Cs-137, Eu-152 and Eu-154	Jim Holderness	ORNL-RH-07	Rev. 2, 02/13/2009
U608	CCP Calculation Package: Determination of Reportable Isotopes-Mark 42 Period	J. Vance	ORNL-RH-08	Rev. 0, 04/16/2008
U609	CCP Calculation Package: Campaign Inventory Information Input Check	J. Vance	ORNL-RH-09	Rev. 0, 04/01/2008
U610	CCP Calculation Package: Uncertainty Analysis	J. Vance	ORNL-RH-10	Rev. 0, 05/08/2008
U611	CCP Calculation Package: DTC Spreadsheet Mark 42 Period-Mark/HFIR	J. Vance	ORNL-RH-11	Rev. 1, 2, & 3, 05/19/2008, 05/22/2008, & 06/25/2008
U612	CCP Calculation Package: Development of Cs-137 Partition Factors	J. Vance	ORNL-RH-12	Rev. 0, 04/02/2008
U613	CCP Calculation Package: MCNP5 Uncertainty Analysis	James H. Holderness	ORNL-RH-13	Rev. 0 & 1, 04/19/2008 & 02/09/2010
U614	CCP Calculation Package: Determination of Cm-242 Processed in Campaign 69	James H. Holderness	ORNL-RH-14	Rev. 0, 04/19/2008
U615	CCP Calculation Package: Development of Campaigns 69 and M5 Inventories	David Moody	ORNL-RH-15	Rev. 0, 04/19/2008
U616	CCP Calculation Package: Direct Assay Information Input Check	J. Vance	ORNL-RH-16	Rev. 0, 05/13/2008
U617	CCP Calculation Package: Direct Assay Data Analysis	J. Vance	ORNL-RH-17	Rev. 0, 05/13/2008
U618	CCP Calculation Package: Scaling Factor Development for Mark 42 Time Period	J. Vance	ORNL-RH-18	Rev. 0, 04/19/2008
U619	CCP Calculation Package: Scaling Factor Development for the SETF Time Period	J. Vance	ORNL-RH-19	Rev. 0 & 1, 04/08/2009 & 06/02/2009
U620	CCP Calculation Package: Fission Product Contribution to Total Dose Rate	J. Vance	ORNL-RH-20	Rev. 0, 04/19/2008

Attachment 4 - Acceptable Knowledge Source Document Information List (continued)

Source Document Tracking Number [a/c]	Title or Description [a]	Author	Document # [b]	Document Revision # and Date
U621	CCP Calculation Package: Sample Scaling Factor Development	J. Vance	ORNL-RH-21	Rev. 0, 04/19/2008
U622	CCP Calculation Package: SR-90/Cs-137 Scaling Factor Development	J. Vance	ORNL-RH-22	Rev. 0, 05/14/2008
U623	CCP Calculation Package: DTC Spreadsheet Mark 42 Period-HFIR/HFIR	J. Vance	ORNL-RH-23	Rev. 1, 2, & 3, 05/19/2008, 05/22/2008, & 06/25/2008
U624	CCP Calculation Package: Pre-SETF Period Information Input Check	J. Vance	ORNL-RH-24	Rev. 0, 06/01/2009
U625	CCP Calculation Package: Uncertainty Analysis for SETF Time Period	James Holderness	ORNL-RH-25	Rev. 0 & 1, 04/06/2009 & 06/02/2009
U626	CCP Calculation Package: Determination of Neutron Surface to 1-m Dose Ratio	J. H. Holderness	ORNL-RH-26	Rev. 0, 05/23/2008
U627	CCP CalculationPackage: Ratio Between Contact and One-Meter Dose Rates	J. Vance	ORNL-RH-27	Rev. 0, 05/23/2008
U628	CCP Calculation Package: MCNP5 Neutron Dose Rate Model	James H. Holderness	ORNL-RH-28	Rev. 0, 08/10/2008
U629	CCP Calculation Package: MCNP5 Neutron Dose Rate Model for 72-B	James H. Holderness	ORNL-RH-29	Rev. 0, 08/10/2008
U630	Corrective Action Plan Report - Oak Ridge National Laboratory, Re: Plutonium ES&N Vulnerability Assessment; Lack of Technical Limits for Building 7920 Hot Cell Fire Scenarios and Personnel Contamination While Examining Scanning Electron Microscope	NA	ID #10019668 & ID #10019607	NA, 10/24/1994 - 02/15/1995
U631	Corrective Action Reports - Oak Ridge National Laboratory, Re: Unneeded Plutonium Stored On-Site; Loss of Building 7920 Supply and Building Exhaust Ventilation; Loss of Institutional Memory; & Nuclear Criticality Safety Approval	NA	ID #10019662, #10019917, #10019667, & #10025667	NA, 05/31/1995 - 05/28/1996
U632	Memo: Request for extension of calibration interval on two Snoopy Surveys	F. R. Chattin	NA	NA, 03/15/1995
U633	Internal Correspondence re: Closeout of CARS Items for Implementation Plan for 10CFR830.120 Ref ID: I0022216	D. B. Owsley	NA	NA, 05/23/1995
U634	Internal Correspondence, Re: Comments from Second Review of HP Manual Procedures	J. B. Knauer	NA	NA, 01/03/1995
U635	Internal Correspondence, Re: Meeting with Waste Management and Remedial Action's Martin Tull, 10-28-93, 12/2/93, and 12/14/93	R. E. Schreiber	NA	NA, 11/01/1993, 12/14/1993, & 12/15/1993

Attachment 4 - Acceptable Knowledge Source Document Information List (continued)

Source Document Tracking Number [a/c]	Title or Description [a]	Author	Document # [b]	Document Revision # and Date
U636	Internal Correspondence, Re: Self-Assessment for Conduct of Maintenance in the Radiochemical Engineering Development Center (REDC); Self-Assessment of NSR-19	J. B. Knauer & R. M. Wham	0049284 REDC-DCC	NA, 07/21/1995 & 03/14/1996
U637	Internal Correspondence, Re: Solid Low Level Waste (SLL) Certification Procedure, 8/2 Draft, for Radiochemical Engineering Development Center (REDC)	R. M. Wham	REDC FO/WH 4010	Rev. 0, 08/02/1994 & 08/12/1994
U638	Internal Correspondence, Re: Contract DE-AC05-96OR22464, Completion of Training Items to Meet 5480.20A Criteria	R. M. Wham	0051222 REDC-DCC	NA, 07/01/1996
U639	Letter, Re: Defense Programs (DP) Support of Cf-252 Neutron Source Program	R. M. Wham	0043099 REDC-DCC	NA, 05/20/1994
U640	Letter, Re: Response to Quality Assurance Questionnaire	J. B. Knauer	0044348 REDC-DCC	NA, 11/09/1994
U641	Internal Correspondence, Re: CARS Item I0018302, Records Inventory and Disposition Schedules (RIDS) for Radiochemical Engineering Development Center (REDC) Records; Biennial Review of REDC Quality Assurance Plans; and Authorization to Certify Waste	B. H. Kron, T. R. Jones, & B. V. Wojtowicz	0045159, 0045370, & 0049364 REDC-DCC	NA, 02/13/1995, 05/19/1995, & 09/08/1995
U642	Internal Correspondence, Re: Agreements Between Radiochemical Engineering Development Center (REDC) and Waste Management and Remedial Action Division (WMRAD); REDC Waste Handling Procedures Training; and Waste Acceptance Criteria for TRU Waste Storage	R. M. Wham, D. B. Owsley, & Dick Schreiber	0043954, 0049625, & 0051262 REDC-DCC	NA, 08/31/1994, 11/13/1995, & 07/15/1996
U643	Letter, Re: Comments on Sampling Plan for RH-TRU Waste from the REDC	R. D. Taylor	0051214 REDC-DCC	NA, 06/25/1996
U644	Memorandum, Re: Management Assessment Team for Ir-192 Production	L. E. McNeese	0053317 REDC-DCC	NA, 12/06/1996
U645	Interoffice Memorandum, Re: ORNL Records Management Review of Selected CTD Procedures	Juli Green Stewart	0050558 REDC-DCC	NA, 12/05/1995
U646	Internal Correspondence, Re: REDC Waste Quality Assurance	R. E. Schreiber	0042667 REDC-DCC	NA, 04/13/1994
U647	Issue Paper: Does Oak Ridge Have High-level Waste (HLW)?	John E. Patterson	NA	NA, 11/19/1999
U648	CCP Calculation Package: Estimate of Cs-137 Partition Factors for Sr-90, Sb-125, and Eu-155	J. Vance	ORNL-RH-30	Rev. 0, 04/06/2009
U650	CCP Calculation Package: Uncertainty Analysis for Pre-SETF Time Period	James Holderness	ORNL-RH-32	Rev. 0, 06/01/2009
U651	CCP Calculation Package: DTC Spreadsheet SETF Time Period	James Holderness	ORNL-RH-33	Rev. 0 & 1, 04/06/2009 & 06/02/2009

Attachment 4 - Acceptable Knowledge Source Document Information List (continued)

Source Document Tracking Number [a/c]	Title or Description [a]	Author	Document # [b]	Document Revision # and Date
U652	CCP Calculation Package: DTC Spreadsheet Pre-SETF Period	James Holderness	ORNL-RH-34	Rev. 0, 05/26/2009
U653	CCP Calculation Package: Scaling Factor Development for Pre-SETF Time Period	James Holderness	ORNL-RH-35	Rev. 0, 06/01/2009
U654	CCP Calculation Package: Determination of Reportable Isotopes-SETF Period	J. Vance	ORNL-RH-36	Rev. 0 & 1, 04/06/2009 & 06/02/2009
U655	CCP Calculation Package: Determination of Reportable Isotopes - Pre-SETF Period	J. Vance	ORNL-RH-37	Rev. 0, 06/01/2009
U656	CCP Calculation Package: Determination of Partition Factors for REDC Campaigns	J. Vance	ORNL-RH-38	Rev. 0, 1, & 2, 04/06/2009, 04/27/2009, & 06/02/2009
U657	CCP Calculation Package: Direct Assay Information Input Check	J. Vance	ORNL-RH-39	Rev. 0, 04/06/2009
U658	CCP Calculation Package: Direct Assay Information Input Check - Pre-SETF	J. Vance	ORNL-RH-40	Rev. 0, 06/01/2009
U659	CCP Calculation Package: Direct Assay Data Analysis	J. Vance	ONRL-RH-41	Rev. 0 & 1, 04/06/2009 & 06/02/2009
U660	CCP Calculation Package: Direct Assay Data Analysis - Pre-SETF	J. Vance	ORNL-RH-42	Rev. 0, 06/01/2009
U661	CCP Calculation Package: Residual Cs-137 Activity in HFIR Campaigns	James Holderness	ORNL-RH-43	Rev. 0, 06/01/2009
U663	CCP Calculation Package: Cs-137 Curies in Typical HFIR Target	J. Vance	ORNL-RH-45	Rev. 0, 04/06/2009
U667	CCP Calculation Package: Regression Analysis of Sample Data	James Holderness	ORNL-RH-49	Rev. 0, 04/06/2009
U668	CCP Calculation Package: Alternative Scaling Factors for Mark 42 Time Period	James Holderness	ORNL-RH-50	Rev. 0, 04/06/2009

[a] From Acceptable Knowledge Souce Document Summaries (Attachments 3)

[b] Or publisher's document number if available

[c] In the case where a AK Summary Report has been revised based on information in Attachment 11- Acceptable Knowledge Source Document Discrepancy Resolution form, identify the tracking number.

Acceptable Knowledge Expert: Travis Smith / T. Smith Date: 02/15/2016

Print/Sign

DIVIDER PAGE

Attachment 4 - Acceptable Knowledge Source Document Information List

Site(s): Oak Ridge National Laboratory

Waste Stream Number: OR-REDC-RH-HET

Waste Stream Description: ORNL REDC RH Debris Waste from Hot Cells

Source Document Tracking Number [a/c]	Title or Description [a]	Author	Document # [b]	Document Revision # and Date
C026	Memo to J. T. Hargrove re: Description of the Item 10PUPROD2	D.E. Benker, Martin Marietta	NA	NA, 10/09/1986
C027	Memo to J. T. Hargrove re: Description of the Item 10PUPROD3	D.E. Benker, ORNL, Bldg 7920	NA	NA, 10/09/1986
C028	Memo to J. T. Hargrove re: Description of the Item 10PUPROD4	D.E. Benker, ORNL, Bldg 7920	NA	NA, 10/09/1986
C029	Memo to Davis A. Reed, 4500-N, MS-6244 re: Composition of Curium-II Curium	J.E. Bigelow, 7930	NA	NA, 06/27/1996
C033	Email to Trabalka re: Source of Pu-238(?) from Lab 208 Cleanout in 7920 (mid – 1983)	John E. Bigelow	NA	NA, 04/14/1999
C038	Memo to W. S. Aaron re: REDC Shipment No. 1418: ~ 1.55 g of 244Cm (MC-12304)	j. b. Knauer, 7920	NA	NA, 03/23/1989
C044	Memo to J. T. Hargrove re: Description of Item 10PUPROD1	D. E. Benker, Bldg 7920	NA	NA, 04/25/1986
C046	Memo to J. A. Lenhard, DOE OR re: Materials Management Plan-ORNL	R. S. Wiltshire, ORNL	NA	NA, 06/13/1984
C053	Email to JW Moore re: Process Knowledge – [1960s] Target Leak	MB Farrar, ORNL	NA	NA, 01/06/2005
C078	Memo to Bryan Roy transmitting Historical Survey – RCRA Information	James W. Moore (ZQS)	NA	NA, 04/04/2005
C098	Interview with Wayne Evans: Waste management practices at REDC (Buildings 7920 and 7930)	Tom Krause	NA	NA , 05/09/2005
C101	Memo re: Use of ORNL/TM-7688 as Reference for Process Knowledge	R.E. Schreiber	NA	NA, 08/29/1996
C102	Memo to distribution re: Results of Testing of HEPA Filters in Waste Packets	C.W. Evans	NA	NA, 10/29/1993
C103	Memo to distribution re: Seal out buckets used at REDC	Bob Wham	NA	NA, 07/17/1995
C108	ORFWENC-003 Radiological Data Analysis	NA	NA	NA, Various

CCP RECORDS ORIGINAL
DATE REC'D 2/17/16

Attachment 4 - Acceptable Knowledge Source Document Information List (continued)

Source Document Tracking Number [a/c]	Title or Description [a]	Author	Document # [b]	Document Revision # and Date
C109	ORFWENC-004 Radiological Data Analysis	NA	NA	NA, Various
C110	ORFWENC-005 Radiological Data Analysis	NA	NA	NA, Various
C111	ORFWENC-006 Radiological Data Analysis	NA	NA	NA, Various
C112	ORFWENC-007 Radiological Data Analysis	NA	NA	NA, Various
C113	ORFWENC-008 Radiological Data Analysis	NA	NA	NA, Various
C148	Interviews with REDC Personnel	J. Harrison; L. Watson	NA	NA, Various
C149	Memo to File re: CCP AK/Weston Source Document Correlation	Lisa Price-Watson	NA	NA, 10/30/2007
C151	Internal Correspondence: Mixed Waste Drums ATN 3190 and ATN 2965	R. E. Schreiber	NA	NA, 2/6/1995
C152	Mark 42 Processing Program Materials Storage	F. L. Peishel, et.al	NA	NA, Various
C153	Email Releasing ORNL Container Paperwork. Subject: The Release of Generator Disposal Forms (2822 and 2109) Forms.	Don Coffey; Dave Hamrin	NA	NA, 4/2008 - 5/2008
C160	E-mail from Kevin East to Don Coffey re: Hot Cell Clean Up Drums	Kevin East	NA	NA, 12/01/2010
C172	Miscellaneous Correspondence Regarding Testing of Nochar Absorbents	Various	N/A	N/A, Various
C173	Email Correspondence Regarding TWPC Glovebox Decon	Kevin East, et al.	N/A	N/A, 11/11/2014 to 11/13/2014
C174	E-mail from Don Coffey, Subject: 7920 TRU Waste (REDC Timeline)	Don Coffey, et al.	NA	NA, 03/06/2013 to 12/03/2014
C175	E-mail from Dennis Benker, Subject: 7920 TRU Waste (M17 Timeline)	Dennis Benker, et al.	NA	NA, 07/23/2013 to 07/25/2013
C176	E-mail from Don Coffey, Subject: 7920 TRU Waste (Dresden LWR fuel)	Don Coffey, et al.	NA	NA, 07/25/2013
C224	Use of Lab 5 in Building 3508 as Control Area for SNM	E. M. Robinson; B. G. Eads	NA	NA, 2/1987
C225	Memo to Herman Postma re: Implementation of the ERDA Solid Waste Information Management System (SWIMS)	E. M. King	NA	NA, 10/13/1976
C226	Memo to Distribution re: Waste Disposal Information	Roy L. Clark	NA	NA, 12/06/1976
C302	ORNL Comments on CCP-AK-ORNL-500, Rev. 0, Draft D	ORNL	NA	0, 3/05/2008

Attachment 4 - Acceptable Knowledge Source Document Information List (continued)

Source Document Tracking Number [a/c]	Title or Description [a]	Author	Document # [b]	Document Revision # and Date
C304	Deactivation of REDC Documents and Procedures	REDC Doc Control	NA	NA, 01/31/1996
C305	Memo to Transplutonium Program and Research Committee Members re: Summary of TRU Activities for FY-1983	J. E. Bigelow; ORNL	NA	NA, 10/17/1983
C306	Email: re: Addition Info for Current Research Activities at REDC	Don Coffey	NA	NA, 3/14/2008
C307	Interview of Walt Bond - Subject: Processes and Waste in Building 3508 at ORNL	Lisa Watson	NA	NA, 2/21/2008
C308	Interview of Jason Taylor, ORNL-PCB Coordinator from 1997 - 2004 re: PCB Management at ORNL	Jeff Harrison	NA	NA, 04/08/2008
C311	Interview of Don Coffey and Wayne Evans Subject: Heat-Sealed Bags Used at REDC	Jeff Harrison	C311	NA, 08/11/2008
C312	Interview of Rob Peacher Subject: Training Requirements for REDC Personnel	Sheri Nance	C312	NA, 09/08/2008
C324	Email from Mike McCauley to Jeff Harrison, re: Use of Speedi Dri at TWPC	Mike McCauley	NA	NA, 04/07/2015
C600	Interviews with Don Coffey and Wayne Evans re: REDC RH Waste Cask Packaging Clarification and Swipe Sample Collection	K. Peters; M. Doherty	NA	NA, 06/04/2008
C601	RH TRU Waste Correlation and Surrogate Summary Form for OR-REDC-RH-HET Waste Stream	K. Peters	NA	NA, 07/01/2008
DR003	Discrepancy Resolution, Re: Generation Location Discrepancies	Jeff Harrison	DR003	NA, 06/27/2008
DR004	Discrepancy Resolution, Re: Radiological Discrepancies	Jeff Harrison	DR004	NA, 01/12/2009
DR005	Discrepancy Resolution, Re: EPA Hazardous Waste Number Discrepancies	Kevin Peters	DR005	NA, 06/24/2008
DR008	Discrepancy Resolution, Re: Follow-Up on DR602 for EPA Hazardous Waste Number Discrepancies (REDC Waste)	Jeff Harrison	DR008	NA, 09/10/2008
DR009	Discrepancy Resolution, Re: Waste Incidental to Reprocessing Determination	Jeff Harrison	DR009	NA, 10/02/2008
DR027	Discrepancy Resolution, Re: AK Re-Evaluation for Two Most Prevalent Radionuclides	Jeff Harrison	DR027	NA, 07/22/2010
DR040	Discrepancy Resolution, re: Radiological Distributions for Casks X10C9402628 and X10C9600188	Jeff Harrison	DR040	NA, 05/28/2014
DR600	Discrepancy Resolution, Re: Packaging Documentation Discrepancies for Cask X10C0601826	Kevin J. Peters	DR600	NA, 06/24/2008
DR601	Discrepancy Resolution, Re: Presence of Debris Items in Poly Blocks	Kevin J. Peters	DR601	NA, 07/01/2008
DR602	Discrepancy Resolution, Re: Follow-Up on DR005 for EPA Hazardous Waste Number Discrepancies	Kevin J. Peters	DR602	NA, 07/02/2008

Attachment 4 - Acceptable Knowledge Source Document Information List (continued)

Source Document Tracking Number [a/c]	Title or Description [a]	Author	Document # [b]	Document Revision # and Date
I002	REDC Programs Through the Years	JE Bigelow	NA	NA, 02/25/1998
I021	Certification Program for Newly Generated, Remotely Handled Transuranic Solid Waste at the Building 7920 Facility of the Radiochemical Engineering Development Center	W. L. Carter, F. R. Chattin, L. J. King, F. G. Kitts, D. B. Owsley	REDC FO/WH 5200	0, 2/9/1995
I022	DOE Order 435.1, Radioactive Waste Management	US DOE	DOE O 435.1	NA, 07/09/1999
I023	Radioactive Waste Management Manual	US DOE	DOE M 435.1-1	Rev. 1, 06/19/2001
I042	AKE Memo and Potential Hazardous Constituents of ORNL Waste	Betty Humphrey; Jean S. Burt	NA	NA, 06/27/2005 - 05/23/2006
I043	Implementation Guide for Use with DOE M 435.1-1	US Department of Energy	DOE G 435.1-1	NA, 07/09/1999
I044	Re-Evaluation of the Radiological Data for Legacy CH TRU Waste from REDC BUilding 7920	Don Coffey	CAN-02MVSWSF-0014	Revision 0, 04/14/2005
M001	Review by Charles Roberts of REDC Maintenance and Operational Log Books	Charles Roberts	NA	NA, Various
M002	Radioactivie Operations Committee Review of the Transuranium Processing Plant (TRU), Building 7920	Radioactive Operations Committee	ORNL/CF-85/49	NA, 02/22/1985
M005	Container Paperwork and UNC-2109 Forms for ORNL Waste Drums for REDC CH Waste	ORNL	Various	NA, Various
M012	EM Waste Database Query - Container Information; Waste Description; Isotopes	ORNL	NA	NA, 08/09/2007
M015	Process Knowledge (PK) Documentation for Building 7920/X-10	R. E. Schreiber	RES-7920-000-002	NA, 03/01/1995
M022	Collection of MSDS for REDC CH and RH Waste	Various	NA	NA, Various
M023	Defense Determination for REDC Heterogeneous Debris	B. Humphrey	NA	NA, 04/25/2005
M024	RH EM Waste Database Query	NA	NA	NA, NA
M070	Solid Transuranic Waste from Building 7920	L. J. King	NA	NA, 4/29/1980
M072	Evaluation of Additional Drums for Waste Stream OR-REDC-CH-HET	J. Harrison	NA	NA, 05/20/2008
M073	TWPC Contact Handled Waste Repackaging Data Forms for Building 7920 Waste	ORNL	NA	NA, Various

Attachment 4 - Acceptable Knowledge Source Document Information List (continued)

Source Document Tracking Number [a/c]	Title or Description [a]	Author	Document # [b]	Document Revision # and Date
M074	UCN-2109 Forms and Related Container Paperwork for Building 7920 Waste Packaged in Boxes	ORNL	NA	NA, Various
M075	TWPC Contact Handled Waste Repackaging Data Forms for NFS Waste. (container paperwork)	ORNL	NA	NA, Various
M100	Container Paperwork for containers in Waste Stream OR-REDC-RH-HET (UCN-2109)	Various	NA	NA, Various
M110	EM Waste Waste Database Query	ORNL	NA	NA, NA
M111	H. Thompson Logbook, Bldg 7920 ATN Record	NA	NA	NA, Various
M112	Nondestructive Examination (NDE) and Visual Examination Data for Building 7920 TRU Waste. Foster Wheeler TRU/Alpha Low-Level Waste Treatment Project (by container)	Foster Wheeler TRU/Alpha Low-Level Waste Treatment Project	NA	NA, Various
M113	Nondestructive Assay (NDA) Data for Building 7920 TRU Waste. Foster Wheeler TRU/Alpha Low-Level Waste Treatment Project	Foster Wheeler TRU/Alpha Low-Level Waste Treatment Project	NA	NA, Various
M114	Evaluation of Additional Drums for Waste Stream OR-REDC-CH-HET	J. Harrison	NA	NA, 03/18/2008
M117	Diagram of Lid Closure System on a 30 Gallon Drum from TURF (7930) Facility	M. J. Rennich	NA	NA, 03/10/1978
M120	ORNL RH Cask Evaluation and Supplemental Packaging Documentation	ORNL	NA	NA, Various
M121	Evaluation of Additional Drums for Waste Stream OR-REDC-CH-HET	K. Peters	M121	NA, 08/20/2008
M122	Evaluation of Additional Drums for Waste Stream OR-REDC-CH-HET	J. Harrison	M122	NA, 08/25/2008
M123	Evaluation of Additional Drums for Waste Stream OR-REDC-CH-HET	J. Harrison	M123	NA, 08/26/2008
M125	Transuranium Analytical Laboratory Report	NA	NA	NA, Various
M126	RTR Video Tapes and DVDs from the WEAF Facility for Oak Ridge Waste	ORNL	NA	NA, 1986 - 1992
M127	Evaluation of Additional Drums for Waste Stream OR-REDC-CH-HET - Cask Repackaging	K. Peters	M127	NA, 09/25/2008
M134	Drum Evaluation for Additional Drums for Waste Stream OR-REDC-CH-HET dated 11/13/2008	J. Harrison	M134	Rev. NA, 11/13/2008
M135	Drum Evaluation of Additional Drums for Waste Stream OR-REDC-CH-HET dated 11/04/2008	K. Peters	M135	NA, 11/04/2008

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Source Document Tracking Number [a/c]	Title or Description [a]	Author	Document # [b]	Document Revision # and Date
M136	Drum Evaluation of Additional Drums for Waste Stream OR-REDC-CH-HET dated 12/17/2008	K. Peters	NA	12/17/2008
M137	Evaluation of Additional Drums for Waste Stream OR-REDC-CH-HET dated 01/14/2009	J. Harrison	M137	NA, 01/14/2009
M138	Evaluation of Additional Drums for Waste Stream OR-REDC-CH-HET dated 01/20/2009	K Peters	M138	NA, 01/20/2009
M139	Evaluation of Additional Drums for Waste Stream OR-REDC-CH-HET dated 01/26/2009	K. Peters	M139	NA, 01/26/2009
M140	Evaluation of Additional Drums for Waste Stream OR-REDC-CH-HET dated 01/29/2009	K. Peters	M140	NA, 01/29/2009
M149	Evaluation of Additional Drums for Waste Stream OR-REDC-CH-HET dated 03/18/2009	J. Harrison	M149	NA, 03/18/2009
M151	ORNL EM Waste Database	NA	DR-09-001168	NA, 04/22/2009
M164	Memo from Jene N. Vance regarding: The Effect on the Drum Dose Rate by the Use of a Canvas Lifting Bag at ORNL	Jene N. Vance	NA	NA, 09/29/2009
M170	Drawings and Specifications for Geotextile Drum Liners with Standing Lift Loops	NA	NA	NA, NA
M171	ORNL EM Waste Database Query	NA	DR-10-000450	NA, 11/9/2009
M217	eMWaste Database Query from ORNL Dated 01/03/2013	ORNL	NA	NA, 01/03/2013
M241	Information for Containers X10CSATN02077 and X10CSATN02229	Don Coffey	NA	NA, 10/26/2012
M244	UCOR TRU Database	NA	NA	NA, 09/25/2014
M245	TWPC Database	NA	NA	NA, NA
M251	Global Nuclear Energy Partnership, GNEP And The Globalization Of Nuclear Energy	Daniel T. Ingersoll	NA	NA, 09/11/2008
M252	Global Nuclear Energy Partnership, Research and Development Program	Phillip Finck	NA	NA, 04/21/2008
M253	Unreviewed Safety Question Determination (USQD) Change Package, Radiochemical Engineering Development Center (REDC) Building 7920, New Work Plan No. Voloxidation Campaign 1	M. A. Green	USQD/REDC/07-039	Rev. 1, 05/24/2007
M254	Unreviewed Safety Question Determination (USQD) Change Package, Radiochemical Engineering Development Center (REDC) Building 7920, Fission Product Extraction (FPEX) Process Solvent Extraction Development Studies	M. A. Green	USQD/REDC/07-091	Rev. 0, 12/06/2007
M255	Research Safety Summary, REDC Shielded Cave Operations	Various	409.5, 409.6, 409.7, & 409.8	NA, Various

Attachment 4 - Acceptable Knowledge Source Document Information List (continued)

Source Document Tracking Number [a/c]	Title or Description [a]	Author	Document # [b]	Document Revision # and Date
M256	Research Safety Summary, REDC Development Laboratory Operations – Lab 209	Various	2486.1 through 2486.15	NA, Various
M257	Research Safety Summary, REDC Development Laboratory Operations – Lab 211	Various	2497.1 through 2497.13	NA, Various
M258	Research Safety Summary, Building 7920 – General Use of Modified Direct Denitration and Powder Characterization Systems	Various	6135.0 through 6135.7	NA, Various
M259	Research Safety Summary, Radioisotope Power Source Development	Various	7691.0 through 7691.5	NA, Various
M260	Research Safety Summary, Processing of Ni-63	Various	8197.0, 8197.1, & 8197.2	NA, Various
M261	Research Safety Summary, HKED Calibration Standard Sample Preparation	Various	8411.0 through 8411.4	NA, Various
M262	Research Safety Summary, Laboratory 111 General Supporting Activities	Various	8603.0 through 8603.4	NA, Various
M263	Research Safety Summary, Voloxidation Studies	Various	8928.0 through 8928.3	NA, Various
M264	Research Safety Summary, Preparation of TRU Solutions for the Internal Gelation Process	Various	8964	NA, Various
M265	Research Safety Summary, Target Fabrication for the Pu-238 Project – Pellet Production	Various	11316.1, 11316.2, & 11316.3	NA, Various
M266	Research Safety Summary, Anion Exchange Purification of Radionuclides by Acidified Alcohol Solution	Various	12637	NA, Various
M267	Waste Characterization Checklist (WCC), Debris from Np-237 Pellet Production	T. Lehberger	TRU-CH-7 & TRU-RH-6	Rev. 0, 10/10/2013
M268	Approval for the Storage and Processing of Liquid Polychlorinated Biphenyls Containing Transuranic Radionuclides; Cover Letter from G. Alan Farmer to Robert C. McKay	G. Alan Farmer	U.S. DOE-ORO TN189009003	Rev. 0, 04/03/2014
M270	The Pu-238 Supply Project, Presented to 18th Symposium on Separations Science and Technology	Robert Wham	NA	NA, 10/28/2014
M271	Mixed Low Level Waste Profile	Mike McCauley	LL-A-OP-010	Rev. 8, 09/30/2013
M278	New Pig WypAll X80 Wipers used at the TWPC	NA	NA	NA, NA
M281	Research Safety Summary Development and Fabrication of Radiation Signature Training Devices	Cecil V. Parks	12114.1	NA, 05/14/2015

Attachment 4 - Acceptable Knowledge Source Document Information List (continued)

Source Document Tracking Number [a/c]	Title or Description [a]	Author	Document # [b]	Document Revision # and Date
M610	ORNL/NSTD/REDC CY-2003 Surveillance Plan and Schedule	W. George Askew	NA	Rev. 0, 09/27/2002
M612	Radiochemical Engineering Development Center TRU Waste Quarterly Surveillance	CW Evans	NA	Rev. NA, 09/07/1995
M613	Trend Analysis Status of On-Going Efforts	NA	NA	Rev. NA, Various
M614	Chemical Technology Division Self-Assessment Program	L.E. McNeese	ORNL/CF-97/161	NA, November 1997
M615	Specifications for Laminar Flow Hood	NA	NA	NA, 07/26/1996
M616	Nonconformance Report (NCR) for Hydraulic Rabbit Capsules	L.C. Smith	NRC-X-96-RR-087	Rev. NA, 09/20/1996
M617	Iron-Spectrophotometric Ortho Phenanthroline Method	NA	NA	NA, NA
M618	MOU Between the Neutron Activation Analysis Facility and the ES&H Division	NA	AC-MOU-102-0901	Rev. 1, 12/18/1992
M619	Determiantion of Total Reducing Normality	NA	9 00720002	NA, NA
M620	Organizational Charts	NA	NA	Rev. NA, Various
M621	Oak Ridge National Laboratory Fabrication Department Test Report	NA	X-379276	Rev. NA, 11/06/1997
M622	Information Scheduling and Storage System (ISSS) Forms (RIDS)	NA	NA	Rev. NA
P004	History of the Oak Ridge National Laboratory 1943 – 1963	W.E. Thompson	Central Files No. 63-8-75	NA, 08/23/1963
P005	Oak Ridge National Laboratory Institutional Plan FY 1982 – FY 1987	H. Postma, C.C. Hopkins, C.R. Richmond, M.W. Rosenthal, D.B. Trauger, A. Zucker	ORNL/PPA-81/8	NA, 12/1981
P007	Oak Ridge National Laboratory Institutional Plan FY 1986-FY 1991	Senior Planning Group and Planning Staff	ORNL/PPA-85/2	NA, 10/1985
P011	Analytical Chemistry Division Annual Progress Report, Period Ending November 30, 1976	W.D. Shults	ORNL-5244	NA, 02/1977
P013	Solvent Extraction Studies with Intermediate-Burnup fast Flux Test Facility Fuel in the Solvent Extraction Test Facility	D.E. Benker, et.al	ORNL/TM-9514	NA, 04/1986

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Source Document Tracking Number [a/c]	Title or Description [a]	Author	Document # [b]	Document Revision # and Date
P014	Inventory of ORNL Remedial Action Sites: 11. Research Laboratories	T.J. Blasing, B.S. Houser	RAP 86-52	NA, 06/30/1986
P016	Solvent Extraction Studies with High-Burnup Fast Flux Test Facility Fuel in the Solvent Extraction Test Facility	D.E. Benker, et.al	ORNL/TM-9993	NA, 10/1986
P020	Chemical Technology Division Annual Progress Report Period Ending March 31, 1979	D.E. Ferguson, et.al	ORNL-5542	NA, 11/1979
P021	Chemical Technology Division Progress Report for the Period April 1, 1981 to March 31, 1983	R.G. Wymer, C.D. Scott	ORNL-5933	NA, 09/1983
P025	Raman Spectra of Uranyl Ion and Its Hydrolysis Products in Aqueous HNO3	L.M. Toth and G.M. Begun	Volume 85, Pages 547-549	NA, 1981
P030	Chemical Technology Division Transuranium Processing Plant Semiannual Report of Production, Status, and Plans for Period Ending June 30, 1968	W.D. Burch, J.E. Bigelow, L.J. King	ORNL-4376	NA, 04/1969
P031	Transuranium Processing Plant Semiannual Report of Production, Status, and Plans for period ending June 30, 1969	W.D. Burch, J.E. Bigelow, and L.J. King	ORNL-4447	NA, 03/1970
P032	Chemical Technology Division Transuranium Processing Plant Semiannual Report of Production, Status, and Plans for Period Ending December 31, 1971	W.D. Burch, J.E. Bigelow, L.J. King	ORNL-4767	NA, 05/1972
P033	Separation of Am, Cm, and Pu from Irradiated Targets	Felker et.al	NA	NA, NA
P037	Chemical Technology Division Annual Progress Report for Period Ending May 31, 1968	D.E. Ferguson, et.al	ORNL-4272	NA, 09/1968
P043	Oak Ridge National Laboratory, Institutional Plan, FY 1996 – FY 2001	Oak Ridge National Laboratory	ORNL/PPA-95/1	NA, 12/1995
P047	The Management of Radioactive Waste at the Oak Ridge National Laboratory: A Technical Review	Philip E. Lamoreaux et al.	DOE/DP/48010-T1	NA, 1985
P058	Statistical Analysis of Radiochemical Measurements of TRU Radionuclides in REDC Waste	J. Beauchamp, et.al	ORNL/TM-13298	NA, 10/1996
P059	Transuranium Processing Plant Semiannual Report of Production, Status, and Plans for Period Ending June 30, 1973	L.J. King, J.E. Bigelow, and E.D. Collins, Chemical Technology Division	ORNL-4921, UC-4-Chemistry	NA, 03/1974
P071	A Brief History of the Research Reactors Division of Oak Ridge National Laboratory	DR Stapleton	ORNUM-2342	NA, 10/15/1993
P077	Transuranium Processing Plant Report of Production, Status, and Plans for Period October 1, 1978 to September 30, 1980	L. J. King, J. E. Bigelow, and E. D. Collins	ORNL-5596	NA, 08/1981

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P078	Transuranium Processing Plant Semiannual Report of Production, Status, and Plans for Period Ending June 30, 1977	L. J. King, J. E. Bigelow, and E. D. Collins	ORNL-5358	NA, 12/1977
P079	Transuranium Processing Plant Semiannual Report of Production, Status, and Plans for Period Ending December 31, 1972	L. J. King, J. E. Bigelow, and E. D. Collins	ORNL-4884	NA, 08/1973
P081	Architectural/Historical Assessment of the Oak Ridge National Laboratory, Oak Ridge Reservation, Anderson and Roane Counties, Tennessee	Martha Carver, Margaret Slater, Duvall & Associates, Inc. Cultural Resources and Environmental Services	ORNL/M-3244	NA, 01/1994
P088	Transuranium Processing Plant Semiannual Report of Production, Status, and Plans for Period Ending June 30, 1971	W. D. Burch, J. E. Bigelow, and L. J. King	ORNL-4718	NA, 12/1971
P093	Characterization of ORNL Transuranic Waste from the Measurement of Fission and Activation Products	L.K. Nguyen	NA	NA, 05/1997
P096	Chemical Technology Division Annual Progress Report, Period Ending March 31, 1974	D.E. Ferguson, et.al	ORNL-4966	NA, 08/1974
P097	Chemical Technology Division Annual Progress Report, Period Ending March 31, 1978	N/A	ORNL-5383	NA, 03/31/1978
P098	Chemical Technology Division Annual Progress Report, for the Period April 1, 1979 to March 31, 1971	D.E. Ferguson, Division Director; C.D. Scott, Associate Division Director; R.G. Wymer, Associate Division Director	ORNL-5757	NA, 11/1981
P099	Chemistry Division Annual Progress Report, Period Ending November 1, 1975	O.L. Keller, Division Chief; L.M. Ferris, Section Chief; R.L. Hahn, Section Chief, I.L. Thomas, Section Chief	ORNL-5111 UC-4 – Chemistry	NA, 02/1976

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Source Document Tracking Number [a/c]	Title or Description [a]	Author	Document # [b]	Document Revision # and Date
P1000	Standard Practice Procedure for Records Management	NA	X-AD-7	Rev. NA, 6/30/1993
P1001	ORNL Office of Quality Services Procedure for Certification of Technical Lead Auditors	NA	OQS-QA-P02	Rev. 0, 10/22/1998
P1002	Appendix A - Glassware Cleaning Procedures	S.K. Holladay	AC-OP-500-1201	Rev. 0, 10/25/1990
P1003	Quality Assurance Plan for Operations in Hot Cells, Shielded Caves, Glove Boxes, and Related Support Areas at the Radiochemical Engineering Development Center	R.M. Wham	QAP-X-88-CT-003	Rev. 0, 03/28/1990
P105	Metals and Ceramics Division Annual Progress Report for Period Ending June 30, 1973	Metals and Ceramics Division	ORNL-4870	NA, 10/1973
P1082	Lockheed Martin Energy Research Corporation, ORNL, Environmental Protection Procedure: Disposal of PCB (Polychlorinated Biphenyl) Oils	Lockheed Martin, ORNL	EPM-3.1	Rev. 0A, 05/01/1993
P1083	Environmental Protection Procedure: Polychlorinated Biphenyls (PCBs)	Martin Marietta, ORNL	EPM-4.0	NA, 11/20/1989; 01/15/1987
P1084	Environmental Protection Procedure: Solid Radioactive Waste Management	Martin Marietta, ORNL	EPM-17.0	NA, 07/24/1989
P109	Safety Analysis Report, Radiochemical Engineering Development Center, Building 7930	Chemical Technology Division	SAR/7930-CTD/01	Revision 1, 11/02/2000
P110	Chemical Technology Division Annual Progress Report for Period Ending March 31, 1972	Chemical Technology Division	ORNL-4794	NA, 08/1972
P1100	PCB Annual Report for Oak Ridge National Laboratory - 1986	B. D. Barkenbus; T. T. Puett; C. F. Sigmon	ORNL/TM-10495	NA, 07/1987
P1101	PCB Annual Report for Oak Ridge National Laboratory - 1987	N. S. Dailey; T. T. Puett	ORNL/TM-10858	NA, 10/1988
P1102	PCB Annual Report for Oak Ridge National Laboratory - 1988	N. S. Dailey; T. T. Puett; A. R. Witt	ORNL/TM-11247	NA, 06/1989
P1103	PCB Annual Report for Oak Ridge National Laboratory - January 1, 1989 - February 5, 1990	J. K. Greer, Jr.; A. R. Witt	ORNL/TM-11665	NA, 07/01/1990
P1104	PCB Annual Report for Oak Ridge National Laboratory - January 1, 1991 - December 31, 1991	J. K. Greer, Jr.; J. M. Finger; L. A. Walker	ORNL/TM-12132	NA, 07/01/1992
P1105	PCB Annual Report for Oak Ridge National Laboratory - February 6, 1990 - December 31, 1990	J. K. Greer, Jr.; R. C. Foley	ORNL/TM-11883	Rev. 1, 10/15/1991

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P1106	PCB Annual Report for Oak Ridge National Laboratory - 1982	T. T. Clark; B. M. Eisenhower	ORNL/TM-9035	NA, 07/1984
P1107	PCB Annual Report for Oak Ridge National Laboratory - 1983	B. M. Eisenhower; C. Y, Horton; B. D. Barkenbus	ORNL/TM-9371	NA, 07/1985
P1108	PCB Annual Report for Oak Ridge National Laboratory - 1984	B. D. Barkenbus	ORNL/TM-9701	NA, 08/1985
P1109	PCB Annual Report for Oak Ridge National Laboratory - 1985	B. D. Barkenbus	ORNL/TM-10121	NA, 08/10/1986
P1112	Radioactive Solid Waste Operations Manual	ORNL	ORNL/CF-85/205	Rev. 1 & 2, 07/1985 - 01/29/1986
P1113	Oak Ridge Tennessee Flora: Preliminary Alphabetic Inventory of Vascular Plants	J. S. Olson; G. Cristofolini; S. Cristofolini	ORNL-TM-1232	NA, 2/1966
P1114	Summary of the Campaign to Process Six SRP Reactor Slugs in the Transuranium Processing Plant	L. J. King and E. D. Collins	ORNL-TM-1939	NA, April 1969
P1115	Solid Waste Storage Area 5 North Transuranic Waste Engineering Study for the 22-Trench Area at Oak Ridge National Laboratory	Bechtel Jacobs	BJC/OR-898	NA, August 2001
P1116	EnergX TRU Waste Processing Center Procedure: Absorbing Liquids	NA	CH-I-OP-013	Rev. 6 (Older Versions Included), 11/17/2008
P1117	PCB Annual Report for Oak Ridge National Laboratory - 1984	C. Y. Horton and B. D. Barkenbus	ORNL/TM-9701	NA, 08/28/1985
P113	Progress in Nuclear Energy, Series III, Process Chemistry, Volume 4; Section: 7.2 Processing Methods For The Recovery Of Transplutonium Elements	R.E. Leuze and M.H. Lloyd	NA	NA, 1970
P114	Chemical Technology Division Annual Progress Report for Period Ending March 31, 1971	Chemical Technology Division	ORNL-4682	NA, 07/1971
P115	Chemical Technology Division Annual Progress Report for Period Ending May 31, 1966	Chemical Technology Division	ORNL-3945	NA, 09/1966
P118	Metals and Ceramics Division Annual Progress Report For Period Ending June 30, 1971	J.H. Frye, et.al	ORNL-4770	NA, 09/1971
P121	Solvent Extraction Studies of 10% TBP Flowsheets in the Solvent Extraction Test Facility Using Irradiated Fuel from the Fast Flux Test Facility	DE Benker, et al.	ORNL/TM-10266	NA, 03/1988

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Source Document Tracking Number [a/c]	Title or Description [a]	Author	Document # [b]	Document Revision # and Date
P122	The 1996 Baseline Environmental Management Report	US Department of Energy	DOE/EM-0290	NA, 06/1996
P123	Solvent Extraction Studies of Coprocessing Flowsheets – Results from Campaign 6 of the Solvent Extraction Test Facility (SETF)	D.E. Benker, et.al	ORNL/TM-9961	Revision 0, 11/1986
P125	Remote-Handled Transuranic Solid Waste Characterization Study: Oak Ridge National Laboratory	RC Stewart, et al.	ORNL/TM-11050	NA, 06/1989
P126	Carlsbad Area Office Interim Guidance on Ensuring that Waste Qualifies for Disposal at the Waste Isolation Pilot Plant	US DOE/Carlsbad Area Office	NA	NA, 02/13/1997
P130	Solvent Extraction Studies of Coprocessing Flowsheets – Results from Campaign 5 of the Solvent Extraction Test Facility (SETF)	W.D. Bond, et. al.	ORNL/TM-8598	11/1983
P131	Transuranium Processing Plant Semiannual Report of Production, Status, and Plans for Period Ending June 30, 1970	WD Burch, et al.	ORNL 4588	NA, 01/1971
P1322	Use of Existing ORNL Facilities for Processing Transuranic Waste	A. L Lotts; F. E. Harrington	N/A	N/A, 10/28/1994
P133	Analytical Chemistry Division Annual Progress Report for Period Ending December 31, 1980	W. D. Schults	ORNL-5738	NA, 05/1981
P134	Tank Waste Consolidation Analysis for Transfer of ORNL RH-TRU Tank Sludges to the Melton Valley Storage Tanks	TE Kent and SM DePaoli	ORNL/TM-13367	NA, 01/1997
P136	Chemical Technology Division Annual Progress Report for Period Ending May 31, 1967	DE Ferguson, et al.	ORNL-4145	NA, 10/1967
P1368	Pilot Plant Section Progress Report for June 1986	R. E. Leuze	CF-86/239	NA, 7/9/1986
P1430	Pipe Overpack Container Operations	N/A	CH-UET-OP-029 & CH-REF-OP-029	Rev. 1 & 0, 10/02/2013
P1433	Environmental Permits and Compliance	NA	CM-P-EN-013	Rev. 3 (Older Revisions Included), 09/28/2015
P1434	Energetic Materials Program	NA	CM-A-WP-004	Rev. 1 (Older Versions Included), 05/22/2014

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P1435	Remote Handled Waste Container Selection Process	NA	RH-REF-WP-001	Rev. 1 (Older Versions Included), 06/23/2015
P1436	[PuBe Neutron Sources] Grouting Liquid Waste Solutions	T. D. Hylton, et al.	NNFD-7920-OP-233	Rev. 0, 01/28/2011
P1437	[PuBe Neutron Sources] Neutralization of Liquid Waste Solutions	T. D. Hylton, et al.	NNFD-7920-OP-234	Rev. 0, 01/28/2011
P1438	Identification of Potential Unanalyzed Materials	Brian Oakley	CM-R-WP-005	Rev. 0, 02/02/2012
P1439	Standard Operating Procedure for Assisting Generators with Waste and Excess Materials	Carolyn Waugh	TWMD-TP-574	Rev. 3 & 4, 01/21/2014 & 05/01/2015
P1440	The Plutonium-238 Supply Project, Pacific Basin Nuclear Conference	R. M. Wham, et al.	PBNC2014-xxx	NA, 08/24/2014 to 08/28/2014
P1441	Analytical Report for Destructive Analyses of MOX Spent Fuel Specimens	J. M. Giaquinto, et al.	NA	NA, NA
P1442	Mixed Oxide Fuel Prepared with Weapons-Derived Plutonium: Test Irradiations Summary and Preliminary LTA PIE Results	L. J. Ott, et al.	Paper 2038	NA, 09/06/2009 to 09/10/2009
P1443	Remote Handled Waste Repackaging	NA	RH-REF-OP-021	Rev. 0, 09/09/2015
P1444	Contact Handled Waste Container Selection Process	NA	CH-REF-WP-001	Rev. 4 (Older Versions Included), 06/22/2015
P1445	Review of Potential Nitrate Bearing Liquids Treatment	Brian Oakley	CM-R-WP-006	Rev. 0, 09/02/2015
P1446	Environmental Permits - Inspections/Monitoring and Reporting	NA	CM-P-RP-309	Rev. 24 (Older Versions Included), 08/14/2012
P145	Chemical Technology Division Annual Progress Report for Period Ending May 31, 1970	D. E. Ferguson, et al.	ORNL-4572	NA, 10/1970
P146	C-Tank Transfers; Transuranic Sludge Removal From the C-1, C-2, and W-23 Waste Storage Tanks at Oak Ridge National Laboratory, Oak Ridge, Tennessee	TL Dahl, et al.	BJC/OR-279	NA, 05/1999

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P149	The 1996 Baseline Environmental Management Report. Volume 1	DOE	DOE/EM-0290	NA, 06/1996
P151	Chemical Technology Division Annual Progress Report for Period Ending May 31, 1973	DE Ferguson et al.	ORNL-4883, UC-10	NA, 08/1973
P153	Chemical Technology Division Annual Progress Report; Period Ending March 31, 1975	DE Ferguson et al.	ORNL-5050, UC-10	NA, 10/1975
P155	Application of the TRUEX Process to highly Irradiated Targets	L.K. Felker and D.E Benker	ORNL/TM-12784	NA, 03/1995
P156	Transuranium Processing Plant Semiannual Report Of Production, Status, and Plans For Period Ending June 30, 1976	L.J. King, J.E. Bigelow, and E.D. Collins	ORNL-5216	NA, 02/1977
P157	Chemical Technology Division, Transuranium Processing Plant Report of Production, Status, and Plans for the Period January 1, 1978 – September 30, 1978	L.J. King, J.E. Bigelow, and E.D. Collins	ORNL-5531	NA, 06/1979
P160	Chemical Technology Division Annual Progress Report; Period Ending March 31, 1977	DE Ferguson et al.	ORNL-5295 UC-10	NA, 10/1977
P161	Safety Analysis Report Radiochemical Engineering Development Center Building 7920	M. A. Green, et al.	SAR/7920-CTD/01 & ORNL/7920/SAR	Rev. 1 & 6, 03/14/2001 & 12/11/2013
P173	Solvent Extraction Studies of Coprocessing Flowsheets – Results from Campaigns 3 and 4 of the Solvent Extraction Test Facility (SETF)	ED Collins, et. al	ORNL/TM-7991	05/1982
P176	Transuranium Processing Plant Semiannual Report of Production, Status, and Plans for Period October 1, 1980 to March 31, 1983	LJ King et al	ORNL 5992, Dist. Category UC-4	NA, 10/1984
P180	Metals and Ceramics Division Annual Progress Report for Period Ending June 30, 1970	JH Frye, Jr, et al.	ORNL-4570, UC-25 – Metals, Ceramics and Materials	NA, 10/1970
P181	Metals and Ceramics Division Annual Progress Report Period Ending June 30, 1972	JH Frye, Jr, et al.	ORNL-4820, UC-25 – Metals Ceramics, and Materials	NA, 09/1972
P185	Measurements of Fission and Activation Products for Oak Ridge National Laboratory Transuranic Waste Characterization	LK Nguyen, et al.	ORNL/TM-13292	NA, 06/1997
P197	Transuranium Processing Plant Semiannual Report of Production, Status, and Plans for Period Ending December 31, 1968	WD Burch et al	ORNL 4428	NA, 11/1969

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P198	Transuranium Processing Plant Semiannual Report of Production, Status, and Plans for Period Ending December 31, 1969	WD Burch et al	ORNL 4540	NA, 06/1970
P199	Transuranium Processing Plant Semiannual Report of Production, Status, and Plans for Period Ending December 31, 1970	LJ King et al	ORNL 4666	NA, 06/1971
P201	Current and Projected Liquid Low-Level Waste Generation at ORNL	SM DePaoli and AB Walker	ORNL/TM-13513	NA, 03/1998
P203	Oak Ridge National Laboratory, The First 50 Years in Oak Ridge National Laboratory Review	L. Johnson and D Schaffer	Vol. 25, Numbers Three and Four	NA, 1992
P204	Transuranium Processing Plant Semiannual Report of Production, Status, and Plans for Period Ending June 30, 1972	LJ King et al	ORNL 4833	NA, 01/1973
P205	Transuranium Processing Plant Semiannual Report of Production, Status, and Plans for Period Ending December 31, 1974	LJ King et al	ORNL 5034, UC-4-Chemistry	NA, 07/1975
P206	Transuranium Processing Plant Semiannual Report of Production, Status, and Plans for Period Ending June 30, 1975	LJ King et al	ORNL 5084, UC-4-Chemistry	NA, 03/1976
P207	Transuranium Processing Plant Semiannual Report of Production, Status, and Plans for Period Ending December 31, 1975	LJ King et al	ORNL 5146, Dist. Category UC-4	NA, 10/1976
P208	Transuranium Processing Plant Semiannual Report of Production, Status, and Plans for Period Ending December 31, 1976	LJ King et al	ORNL 5305 Dist. Category UC-4	NA, 10/1977
P209	Transuranium Processing Plant Semiannual Report of Production, Status, and Plans for Period Ending December 31, 1977	LJ King et al	ORNL 5415, Distribution Category UC-4	NA, 08/1978
P210	Transuranium Processing Plant Semiannual Report of Production, Status, and Plans for Period Ending December 31, 1973	LJ King et al	ORNL 4965, UC-4-Chemistry	NA, 11/1974
P211	Transuranium Processing Plant Semiannual Report of Production, Status, and Plans for Period Ending June 30, 1974	LJ King et al	ORNL 4991, UC-4-Chemistry	NA, 02/1975
P214	Federal Facility Agreement for the Oak Ridge Reservation	U. S. Environmental Protection Agency Region IV U. S. Department of Energy	DOE/OR-1014	NA, 01/01/1992
P216	The ORNL Chemical Technology Division 1950 - 1994	RL Jolley, et al.	ORNL/M-2733	Revision 1, 10/1994

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P222	RCRA Facilities Assessment (RFA) – Oak Ridge National Laboratory	WJ Boegly, Jr., et al.	ORNL/RAP-12/V1	NA, 03/1987
P223	Chemical Technology Division Annual Progress Report for Period Ending May 31, 1969	DE Ferguson, et al.	ORNL-4422	NA, 10/1969
P229	Solvent Extraction Studies of Coprocessing Flowsheets – Results from Campaigns 1 and 2 of the Solvent Extraction Test Facility (SETF)	ED Collins, et. al.	ORNL/TM-7080, Dist. Category UC-86	NA, 07/1982
P230	60 Years of Great Science, 1943 - 2003, in "ORNL Review"	Various	Vol 36, Number 1	NA, 2003
P239	TRU Waste Management –Past, Present, and Future at Oak Ridge National Laboratory	Billingsley, K. M., Guay, K.P., Trabalka, J.R., Riner, G.L.	NA	NA, 03/01/2001
P240	Certification, Packaging and Disposition of Contact-Handled Transuranic (CH-TRU) Waste At the Radiochemical Engineering Development Center (REDC)	ORNL	REDC FO/WH 5100	1,2,3, Various
P241	Oak Ridge National Laboratory Contact-Handled Transuranic Waste Certification Program Plan	R.J. Hydzik	ORNL/TM-10322	Rev. 3, 2, 1, 06/1992
P242	Oak Ridge National Laboratory Contact-Handled Transuranic Waste Certification Program Plan	R.J. Hydzik, Jr	ORNL/TM-10322/R3	Revision 3, 06/1992
P244	Certification Document for Newly Generated Contact-Handled Transuranic Waste	W. D. Box & J. Setaro	ORNL-5985	Rev. 1 & 0, 05/1984 & 01/1984
P245	Chemical Process Engineering in the Transuanium Processing Plant	E.D. Collins and J.E. Bigelow	CONF76110110	NA, 1976
P251	Box Breakdown Area Operations	NA	CH-UET-OP-003 (Changed from CH-P-OP-003)	Rev. 14 (Older Versions Included), 10/06/2015
P252	Glove Box Operations	NA	CH-UET-OP-004 (Changed from CH-P-OP-004)	Rev. 12 (Older Versions Included), 06/15/2015
P253	Drum Bag In/Bag Out and Glove Ports	NA	CH-REF-OP-011 (Changed from CH-P-OP-011)	Rev. 7 (Older Versions Included), 11/11/2015

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P254	Contact Handled Waste Repackaging	NA	CH-REF-OP-013 (Changed from CH-P-OP-013)	Rev. PCN 9-1 (Older Versions Included), 06/19/2015
P255	Contact Handled Waste Acceptance Criteria	NA	CH-X-AD-001	Rev. 26 (Older Versions Included), 06/15/2015
P256	TRU/Alpha Low Level Waste (LLW) Treatment Project Documented Safety Analysis	NA	T-CM-FW-R-AD-001	Rev. 14 (Older Versions Included), 08/28/2007
P257	Waste Treatment at the Radiochemical Engineering Development Center	Chemical Technology Division	ORNL/CP-95432	NA, 10/20/1997
P258	Production, Distribution, and Applications of Californium-252 Neutron Sources	Chemical Technology Division	ORNL-CP-102606	NA, 10/03/1999
P259	Chemical Technology Division Segregation of Metals-Containing Wastewater by pH	P.A. Taylor and D.R. McTaggard	ORNL/TM--11406	NA, 10/1990
P260	Radioactive Operations Committee Review of the Transuranium Processing Facility, Building 7920, and the Thorium-Uranium Recycle Facility Building 7930, March 10, 1986	J. A. Setaro	ORNL/CF-86-265	NA, 8/13/1986
P261	Radioactive Operations Committee Review of the Transuranium Processing Plant (TPP), Building 7920	J. A. Setaro	ORNL-CF-87/218	NA, 7/20/1987
P262	Radioactive Operations Committee Review of the Transuranium Processing Plant (TPP), Building 7920	L. C. Williams	ORNL-CF-88/225	NA, 8/01/1988
P263	TRU Operating Manual and Supporting Documentation	NA	NA	NA, 10/10/1980
P272	Oak Ridge National Laboratory Waste Management Plan	ORNL	ORNL/TM-11433	Rev. 0, 1, 2, & 3, 12/1989 - 12/1993
P275	Radiochemical Engineering Development Center (REDC) Radioactive Solid Low-Level Waste (SLLW) Certification Procedure	ORNL, Chemical Technology Division	REDC FO/WH 4010	Revision 0, 12/07/1994
P276	Determination of H2 Diffusion Rates through Various Closures on TRU Waste Bag-Out Bags	P. D. Noll, E. L. Callis, K. M. Norman, LANL	LA-13616-MS	NA, 06/1999
P277	Project Plan for the Evaluation of REDC Waste for TRU-Waste Radionuclides	L. Nguyen; et.al	ORNL/TM-13087	NA, 09/1996

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P279	Safety Analysis for the Transuranium Processing Plant, Building 7920	L. J. King	ORNL-3954	NA, 04/1968
P280	Summary of the Campaign During July 1968 to Process Fourteen Irradiated HFIR Targets in the Transuranium Processing Plant	L. J. King; E. D. Collins	ORNL-TM-2434	NA, 12/1969
P281	Californium-252: A Remarkable Versatile Radioisotope	Irvin W. Osborne-Lee; C. W. Alexander	ORNL/TM-12706	NA, 10/10/1995
P282	Gross Alpha Activity Measurements	Chemical and Analytical Sciences Division, ORNL	Various	Various, Various
P324	Technical Safety Requirements Irradiated Fuels Examination Laboratory Building 3525	M. W. Kohring	ORNL/3525/TSR	Rev. 1, 8/1/2004
P325	Oak Ridge National Laboratory Standardized Safety Analysis Report for Nonreactor Nuclear Facilities	M. W. Kohring	ORNL/NNFD/SSAR	Rev. 1, 5/12/2004
P326	Life Cycle Baseline Summary for ADS 6504IS Isotopes Facilities Deactivation Project at Oak Ridge National Laboratory	NA	ORNL/ER-325	Rev. 1, 11/01/1995
P330	Safety Analysis Report Irradiated Fuels Examination Laboratory / Building 3525	NA	ORNL/3525/SAR	Rev. 0 Change 1, 6/22/2006
P368	Chemistry Division Long Range Plan 1987 - 1991	M. L. Poutman	ORNL/CF-87/244	0, 7/30/1987
P379	Experimental Engineering Section Progress Report for December 1980	R. E. Leuze	ORNL/CF-81/2	0, 1/1/1981
P380	Progress Report on ORNL R&D Waste Management Program for July 1977	R. E. Blanco	ORNL/CF-77/374	0, 8/5/1977
P381	Chemical Development Section Monthly Progress Report for April 1988	J. R. Hightower	ORNL/CF-88/89	0, 5/24/1988
P385	Analytical Chemistry Division Summary Report: Radioactive Materials Analysis Section	J. R. Stokely	ORNL/CF-86/278	0, 09/01/1986
P401	Radioactive materials Analysis laboratory Quality Assurance Plan for the Characterization of Radioactive Waste	ORNL	QAP-X-96-CASD/RML-001	Revision 2, 10/1997
P405	Analysis of Dosimetry Data from the Aluminum and Beryllium Irradiation Experiment in the RB-7 Facility of HFIR	H. T. Kerr; E. J. Allen; J. H. Swanks	ORNL-TM-4725	NA, 1/30/1975
P410	Separation of Transplutoniums From Lanthanides by Tertiary Amine Extraction	R. D. Baybartz; Boyd Weaver	ORNL-3185	NA, 12/4/1961
P412	Fabrication and Preirradiation Data for High Flux Isotope Reactor Prototype Target Rods	J. D. Sease; D. M. Hewette II	ORNL-TM-811	NA, 6/1964

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Source Document Tracking Number [a/c]	Title or Description [a]	Author	Document # [b]	Document Revision # and Date
P415	The HFIR Water Strainer	A. A. Abbatiello; A. P. Fraas	ORNL-TM-3460	NA, 3/1972
P416	Chemical Technologies Division Annual Progress Report For Period Ending May 31, 1965	D. E. Ferguson (Division Director)	ORNL-3830	NA, 11/1965
P420	Summaries of Chemical Technology Division Programs - FY 1978	D. E. Ferguson	ORNL/CF-77/400	NA, 9/10/1977
P422	Analysis of Chemical Technology Division Waste Streams	T. J. Abraham; T. L. Donaldson; A.B. Walker; R. L. Cummins; M. E. Reeves; T. D. Hylton	ORNL/TM-11434	Rev. 0, 07/30/1990
P423	Proceedings of the Workshop on the Management of Radioactively Contaminated Soils, Knoxville, TN, November 10, 1988	T. F. Lomenick	ORNL/TM-11332	NA, 11/21/1989
P432	TRU Waste Processing Center Documented Safety Analysis	NA	CM-R-AD-001	Rev. 32 (Older Versions Included), 08/27/2015
P472	Radioactive Operations Committee Review of the ORNL Transuranium Research Laboratory	Radioactive Operations Committee	ORNL/CF-87/69	NA, 03/20/1987
P473	Chemical Development Section Monthly Progress Report for March 1987 from J. R. Hightower to R. G. Wymer	J. T. Bell	ORNL/CF-87/89	NA, 05/18/1987
P482	Summary of the Campaign During February 1969 to Process Six Irradiated HFIR Targets in the Transuranium Processing Plant	L. J. King; E. D. Collins	ORNL-TM-3343	0, 8/27/1971
P484	Alpha Radiolysis and Other Factors Affecting Hydrolysis of Tributyl Phosphate	M. H. Lloyd; R. L. Fellows	ORL-TM-9565	0, 6/27/1985
P485	Problem Safety Summary for Lab-Scale Hot-Cell Studies (Consolidated Fuel Cycle Studies) for Cell 5, Building 2026	J.C. Marten	CD-65	NA, Various
P492	Plutonium, Uranium, and Thorium Distribution Coefficients in the 30 vol % TBP-NDD-Nitric Acid System at 25 and 50 degrees C	J. B. Knauer; M. H. Lloyd; J. T. Barker	ORNL/TM-7804	0, 4/28/1982
P494	Uranium and Plutonium Distribution Coefficients in the 6 vol % and 30 vol % TBP-NDD Systems	J. B. Knauer; J. H. Paehler, Jr., M. G. Stewart	ORNL/TM-7493	0, 3/1981 Pub

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Source Document Tracking Number [a/c]	Title or Description [a]	Author	Document # [b]	Document Revision # and Date
P496	The Reduction of Plutonium (VI) to Plutonium (IV) in Nitric Acid by Nitric Oxide or Nitrogen Dioxide Gases	M. R. Bennett; A. D. Kelmers	ORNL/TM-6552	0, 11/30/1978
P497	Separation of Americium; Curium, and Rare Earths from High-Level Wastes by Oxalate Precipitation: Experiments with Synthetic Waste Solutions	C. W. Forsberg	ORNL/TM-6445	0, 1/16/1980
P498	Radiochemical Procedures	L. C/ Henley	ORNL/TM-6372	0, 6/2/1978
P499	Head-End Processing Studies with Mechanically Blended (U, Pu)O2 Reactor Fuels	J. H. Goode; R. G. Stacy	ORNL/TM-6266	0, 8/3/1978
P500	Iodox Process Tests in a Transuranium Element Production Campaign	E. D. Collins; D. E. Benker	ORNL/TM-6182	0, 6/12/1979
P501	Actinide Partitioning and Transmutation Program Progress Report for Period July 1 to September 30, 1977	D. W. Tedder; J. O. Blomeke	ORNL/TM-6174	0, 3/13/1978
P505	Waste Metal Recovery By Solvent Extraction	D. E. Ferguson; T. C. Reunion	ORNL-TM-4327	0, 7/26/1973
P511	Safety Analysis for the Thorium-Uranium Recycle Facility	J. W. Anderson; S. E. Bolt; J. M. Chandler	ORNL-4278	0, 05/22/1969
P519	State of the Laboratory - 1970	Alvin M. Weinberg	ORNL-CF-70-12-40	0, 12/21/1970
P520	Safety Analysis for the TURF Californium Facility	W. D. Burch	ORNL-CF-69-11-7	0, 11/3/1969
P527	Separation of Berkelium from Trivalent Actinides By Chromate Oxidation and HDEHP Extraction	J. B. Knauer; Boyd Weaver	ORNL-TM-2428	0, 11/14/1968
P535	Background Information about Chem Tech	NA	NA	NA, 5/9/1989
P538	Building 7920 Review: Follow-Up Information / Action Item Listing	J. R. Hightower	NA	NA, 12/20/1990
P539	Radioisotope Development Laboratory Building 3047 Hazards Report (Isotopes Development Center)	R. A. Robinson	ORNL-TM-946	Rev. 0, 10/05/1964
P540	Publications of the Radioactive Waste Disposal Section Health Physics Division	K. E. Cowser	ORNL-TM-3301	NA, 2/1971
P541	Phase I Safety Analysis Report Update Program (SARUP) Hazard Screening	L. J. King; J. E. Bigelow; M.A. Green; M. B. Sears; R. M. Wham; E. D. Collins	HS/7920/F/IT04/R0	0, 6/1/1992

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Source Document Tracking Number [a/c]	Title or Description [a]	Author	Document # [b]	Document Revision # and Date
P542	Operational Safety Requirements Transuranium Processing Plant, Building 7920	L. J. King; J. E. Bigelow; F. R. Chattin; E. D. Collins	ORNL/CF-81/242	1, 12/24/1990
P545	Isotopes Program Review Office of Nuclear Energy	David Bailey; W. H. McVey	NA	NA, 12/15/1988
P549	Hot Cells in the Chemical Technology Division; Bldgs 7920, 7930, 4507, 4501, 3019	E. D. Collins	NA	NA, 10/06/1987
P551	A Self-Replenishing Tritium Target for Neutron Generators	F. F. Haywood; Z. G. Burson; H. E. Banta	ORNL-TM-3397	NA, June 1972
P562	Analytical Chemistry Division Research and Development Monthly Summaries	W. D. Schults	Various	NA, Various
P566	ORNL Health Physics Manual	ORNL	ORNL/M-804; RP-4.1; RP-4.2; RP-5.1	NA, 11/02/1994
P569	Implementation Plan for U. S. Department of Energy Order 435.1, U. S. Department of Energy - Oak Ridge Operations, Oak Ridge, Tennessee	U. S. Department of Energy - Oak ridge Operations	DOE/OR/01-1879	NA, 06/2000
P582	PCB Decontamination	NA	CH-REF-OP-027	Rev. 3 (Older Versions Included), 11/04/2015
P583	Cask Processing Enclosure Operations	NA	RH-UET-OP-101	Rev. 14 (Older Versions Included), 04/09/2015
P584	Hot Cell Operations	NA	RH-UET-OP-002	Rev. 4 (Older Versions Included), 09/09/2015
P585	Remote Handled Drum In/Out Operations	NA	RH-REF-OP-003	Rev. 7 (Older Versions Included), 11/17/2015

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P586	Cask Processing Enclosure Drum-In / Drum-Out	NA	RH-REF-OP-104	Rev. 6 (Older Versions Included), 06/17/2015
P587	Energetic Materials Management	NA	CM-P-WP-016	Rev. 2 (Older Versions Included), 06/22/2015
P590	Liquids Handling in the Hot Cell	NA	RH-REF-OP-014	Rev. 3 (Older Versions Included), 10/01/2015
P591	Liquids Handling in the Cask Processing Enclosure	NA	RH-REF-OP-102	Rev. 3 (Older Versions Included), 02/04/2015
P597	Remote Handled Waste Acceptance Criteria	NA	RH-X-AD-001	Rev. 7 (Older Versions Included), 06/15/2015
P598	Operations Prohibited Item Processing	NA	CH-REF-OP-044	Rev. 4 (Older Versions Included), 07/24/2014
P599	Non-Compliant Containers	NA	CH-REF-OP-045	Rev. 1 (Older Versions Included), 06/23/2015
P601	Operation of Nuclear Measurements Corporation Gas-Flow Proportional Counter	C.D. Parks	CASD-AM-TAL-0002	Rev. 0, 03/27/2000
P602	Operation of the Tennelec LB-1000 Low Level Gas-Flow Proportional Counter	C.D. Parks	CASD-AM-TAL-0003	Rev. 0, 04/04/2000
P603	Operation of the Tennelec LB-4000 Low Level Gas-Flow Proportional Counter	C.D. Parks	CASD-AM-TAL-0004	Rev. 0, 04/04/2000

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Source Document Tracking Number [a/c]	Title or Description [a]	Author	Document # [b]	Document Revision # and Date
P604	Alpha Spectrometry with the Canberra Genie-ESP Data Acquisition System	C.D. Parks	CASD-AM-TAL-0005	Rev. 0, 05/08/2000
P605	Standard Analytical Method for Total Plutonium, 2-Thenoyltrifluoroacetone Extraction Method	C.D. Parks, J.M. Keller	CASD-AM-TAL-0006	Rev. 0, 05/24/2000
P606	Oak Ridge National Laboratory Chemical and Analytical Sciences Division Standard Anaytical Method for Total Radioactive Strontium by Extraction Chromatography	C.D. Parks	CASD-AM-TAL-0008	Rev. 0, 6/29/2001
P607	Gross Beta Activity Measurements	C.D. Parks	CASD-AM-TAL-0009	Rev. 0, 06/29/2001
P608	Oak Ridge National Laboratory Chemical and Analytical Sciences Division Standard Analytical Method for Operation of Packard Model 2500TR Liquid Scintillation Counter	C.D. Parks	CASD-AM-TAL-0010	Rev. 0, 07/25/2001
P610	The Resin Method of Sample Preparation For Isotopic Analysis of Am, CM, and CF	R.L. Walker	40307	Rev. NA, 11/14/1987
P611	The Resin Bead Method of Sample Preparation for isotopic Analysis of Pu and U	R.L. Walker	40306	Rev. NA, 08/01/1979
P612	Gross Gamma, Scintillation Method	NA	200365	Rev. NA, NA
P613	Preparation of Carbonate Free LiCl Solution	NA	100441	NA, NA
P614	Anion Exchange Separation of Uranium from Reactor Dissolver Solutions	J.L. Botts	100715	Rev. NA, 03/01/1985
P615	Loading of Resin Beads for Isotopic Dilution Mass Spectrometric Analysis of Amercium-241	J.L. Botts	10936	Rev. NA, 12/07/1987
P616	Determination of Total Solids in TPP Process Solution	J.L. Botts	1107	Rev. NA, 04/11/1988
P617	Methrohm E536 Potentiograph-Potentiometric Titrations	NA	3105	Rev. NA, NA
P618	Operation of Remote Pipetting System ORNL Model Q-5780 (Process Methods) Method No. 1 003109	W.D. Shults	3109	Rev. NA, NA
P619	Operation of Remote Titration System ORNL Model Q-5895	J.L. Botts, L.N. Klatt	1003113	Rev. NA, 01/01/1985
P620	Operation of Spectronic 501 Spectrophotometer	J.L. Botts	3034	Rev. NA, 01/28/1988
P621	Gross Neutrons Determination	J.L. Botts	20953	Rev. NA, 03/29/1988

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Source Document Tracking Number [a/c]	Title or Description [a]	Author	Document # [b]	Document Revision # and Date
P622	249-Berkelium Determination	J.L. Botts	31101	Rev. NA, 02/26/1988
P623	Determination of Neptunium in Fission Product Mixtures	J.L. Botts	2 31534	Rev. NA, 11/25/1987
P624	Determination of Uranium-232 and Uranium-233 by Alpha Spectroscopy	J.L. Botts	2 31926	Rev. NA, 12/30/1987
P625	U-233 Hexone Extraction Method	J.L. Botts	9 0123920	Rev. NA, 02/02/1988
P626	Uranium, Spectrophotometric Ammonium Thiocyanate Method	J.L. Botts	1 219210	Rev. NA, 04/13/1988
P628	Free Acid, Phenolphthalein End-Point	J.L. Botts	1 220025	Rev. NA, 02/02/1988
P629	Free Acid and Hydrolyzable Ion Concentration Using the Remote Titration System, ORNL Model Q-5895	J.L. Botts	1 220034	Rev. NA, 05/09/1988
P630	Free Acid and Adogen Determination in TRU Process Solutions	J.L. Botts	1 221011	Rev. NA, 02/25/1988
P631	Determination of pH of Aqueous Solutions	J.L. Botts	1 230041	Rev. NA, 04/15/1988
P632	Operating Procedure for Weighing and Dissolution Glovebox Line	J.L. Botts	NA	Rev. NA, 2/25/1988
P633	Oak Ridge National Laboratory Chemical and Analytical Sciences Division Standard Analytical Method for Gross Alpha Activity Measures	C.D. Parks	CASD-AM-TAL-0001	Rev. 0, 2/10/2000
P634	Measurements of Fluorescein and Rhodamine B by Fluorescence	J.L. Botts	1221025	Rev. NA, 01/28/1988
P636	Operation and Calibration of the Canberra, Nuclear Data Genie-ESP Data Acquisition and Processing System	M.R. Chattin	CSD-AM-RML-RA04	Rev. 2, 8/22/2005
P637	Administration of Chemical and Analytical Sciences Division Procedures	F.J. Smith	CASD-OP-000-AD01	Rev. NA, 3/15/1994
P638	Oak Ridge National Laboratory Standard Practice Procedure for ORNL Document Management	NA	X-AD-9	Rev. 0, 02/28/1994
P639	Oak Ridge National Laboratory Chemical and Analytical Sciences Division Chemical and Analytical Sciences Division Quality Assurance Plan	NA	QAP-X-94-CASD-001	Rev. 1, 9/29/1995

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Source Document Tracking Number [a/c]	Title or Description [a]	Author	Document # [b]	Document Revision # and Date
P640	Radioactive Materials Analytical Laboratory Quality Assurance Plan for the Characterization of Radioactive Waste	JM Keller	QAP-X-96-CASD/RML-001	0, 4, Various
P641	Oak Ridge National Laboratory Chemical and Analytical Sciences Division Standard Operating Procedure for Handling of Samples and Decontamination of Ion Lenses in the 5505 TRU Laboratory	D.H. Smith	CASD-OP-TRL-RP01	Rev. 1, 7/16/1999
P642	Oak Ridge National Laboratory Chemical and Analytical Sciences Division Standard Operating Procedure for Inorganic Mass Spectrometry Quality Assurance Plan	D.H. Smith and J.L. Wagner	QAP-X-94-CASD/IMS-001	Rev. NA, 07/31/1996
P643	Transuranium Analytical Laboratory QA Program	NA	QA-AC-103-0201	Rev. 0, 1, 11/11/1998, 7/20/1989
P644	Oak Ridge National Laboratory Chemical and Analytical Sciences Division Standard Operating Procedure for Use of Radiochemical Glove Boxes in the Transuranium Research Laboratory	F.J. Smith	CASD-OP-TR-GB01	Rev. 0, 8/22/1995
P645	Configuration Control for the Radioactive Materials Analytical Laboratory, Building 2026	J.L. Botts	AC-OP-105-0308	Rev. 0, 8/23/1993
P646	Oak Ridge National Laboratory Analytical Chemistry Division Standard Operating Procedure for Sample Tracking for the Transuranium Analysis Laboratory	J.L. Botts	AC-OP-103-0805	Rev. 0, 3/23/1989
P647	Oak Ridge National Laboratory Analytical Chemistry Division Standard Operating Procedure for Use and Handling of Chemicals for the Transuranium Analysis Laboratory	J.L. Botts	AC-OP-103-0808	Rev. 0, 3/23/1989, 9/22/1989
P648	Implementation of Quality Control Within the Transuranium Analysis Laboratory (TAL)	April Swafford Meeks	AC-OP-103-0901	Rev. 0, 3/28/1994
P649	Operation of Analytical Balances for the Transuranium Analysis Laboratory	J.L. Botts	AC-OP-103-1201	Rev. 0, 4/3/1989
P650	Chain of Custody Sample Storage for the Transuranium Analysis Laboratory	D.L. Dihel	AC-OP-103-1301	Rev. 0, 11/16/1988, 3/23/1989
P651	Chain of Custody Sample Security for the Transuranium Analysis Laboratory	D.L. Dihel	AC-OP-103-1302	Rev. 0, 3/23/1989
P652	Neutron Activation Analysis Facility Training and Certification Program for Operators of the Pneumatic Tube Systems, PTS-1 and PTS-2	L. Robinson, J.M. Keller	AC-OP-102-0207	Rev. 2, 12/1/1993
P655	Quality Assurance Project Plan For Packaging of Transplutonium Elements and other Radioactive Products by the Radiochemical Engineering Development Center for Off-Site Transportation	J.E. Bigelow	QAP-X-88-CT-001	Rev. 1, 12/1/1988
P656	Quality Assurance Plan for the ORNL Californium Shipping Container Maintained by the REDC for On-Site Transportation	J.E. Bigelow, J.B. Knauer	QAP-X-91-CT-001	Rev. 0, 03/20/1991

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Source Document Tracking Number [a/c]	Title or Description [a]	Author	Document # [b]	Document Revision # and Date
P657	Quality Assurance Plan for Modifications and Maintenance of Hot-Cell Support Systems and Adjunct Facilities at the REDC	R.M. Wham	QAP-X-88-CT-002	Rev. 0, 12/20/1989
P659	Lockhead Martin Energy Research Corporation Oak Ridge National Laboratory Program Description for ORNL Job Hazard Evaluation	NA	ORNL-SH-P29	Rev. 1, 9/10/1999
P660	Waste Certification Program Plan	NA	NA	Rev. NA, 3/30/2004
P662	Duties and Responsibilities of the Sample Custodian for the Transuranium Analysis Laboratory	D.L. Dihel	AC-OP-103-0801	Rev. 0, 3/28/1989
P663	Data Review for the Transuranium Analysis Laboratory	D.L. Dihel	AC-OP-103-0301	Rev. 0, 03/27/1989
P664	Sample Chain-of-Custody for the Transuranium Analysis Laboratory	D.L. Dihel	AC-OP-103-0804	Rev. 0, 03/23/1989
P665	Quality Assurance Program Requirements for Projects Utilizing Hot-Cell Facilities	NA	HC/QA-11560	Rev. 0, 4/12/1988
P666	Oak Ridge National Laboratory Transuranic Waste Certification Program	J.H. Smith, et.al	ORNL/TM-10322	Rev. 1, June 1987
P667	Quality Assurance Program	NA	ORNL/M-811	Various, Various
P668	RMAL-ORNL Quality Assurance Project Plan for the TRU Waste Characterization Program	NA	QAP-X-94/CASD/RML-002	Rev. 0, 6/1/1995
P669	Preparation and Documentation of Radioactive Standards, Carriers, Inorganic and Organic Standard Solutions	N.A. Teasley, Jr., J.M. Giquinto, M.P. Maskarinee	CASD-OP-RML-AD04	Rev. 0, 1/31/1995
P670	Chemical and Analytical Sciences Division Training Plan for Nuclear Facilities	R.F. Peacher	CASD-OP-000-TR02	Rev. 1, 7/1/1996
P671	Sample Management in the Radioactive Materials Analytical Laboratory, (RMAL), Building 2026	J.M. Giaquinto	CASD-OP-RML-AD02	Rev. 1, 3/31/1995
P672	Work Policies and Practices, Radioactive Materials Analytical Laboratory (RMAL), Building 2026	J. M. Giaquinto and R. D. Canaan; J.M. Keller	CASD-OP-RML-AD01	Various, Various
P673	The Analytical Chemistry Division Quality Control Program	S.K. Hollady	QA-AC-000-0901	Rev. 1, 10/251990
P674	Chemical and Analytical Sciences Division Training Program Plan	F.J. Smith	CASD-OP-000-TR01	Rev. 1, 6/1/1996
P675	Office of Quality Programs and Inspection Quality Assurance Plan	NA	QAP-X-96-QD-001	Rev. NA, 7/30/1996
P677	High Radiation Level Analytical Laboratory (HRLAL) Facility QA Program	J.L. Botts	QA-AC-105-0201	Rev. 0, 8/20/1990

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Source Document Tracking Number [a/c]	Title or Description [a]	Author	Document # [b]	Document Revision # and Date
P678	Radiochemical Technology Section Quality Assurance Plan	NA	RTS/QA/17	Rev. NA, 07/1992
P679	Chemical Technology Division Isotope Technology Section Quality Management Plan for the Radiochemical Engineering Development Center	R.M. Wham	REDC-QMP-1	Rev. 0, December 1996
P681	QA Requirements for TRU Waste Certification Program	NA	QA-L-20-100	Rev. 3, 01/31/1987
P682	Chemical Technology Division Self-Assessment Program Plan CY 1996-1998	L.E. McNeese	ORNL/CF-96/2	Rev. NA, January 1996
P683	Oak Ridge National Laboratory Organizational Charts and Document for Transferring Responsibilities to NNFD Beginning October 1, 2002	NA	NA	Rev. NA, October 2002
P685	Bagging Practices and Techniques for Standard Glovebox Operations	J.L. Botts	AC-OP-100-0910	Rev. 0, Various
P686	Preparation and Documentation of Radioactive Standards and Carriers for the Transuranium Analysis Laboratory	D.L. Dihel	AC-OP-103-0603	Rev. 0, March 1989
P687	Quality Assurance Plan for Contact-Handled Transuranic Waste Certification and Operations	NA	QAP-X-93-WMRA-056	Rev. 0, July 1993
P688	Waste Examination and Assay Facility (WEAF) Operations	W.I. Dothard	QAP-X-91-ESHC/WM-002	Rev. 1, June 1993
P689	ORNL Quality Assurance Project Plan for the Transuranic Waste Characterization Program	NA	WMRA-WMP-601	Rev. 0, December 1995
P690	Quality Assurance Plan for Research and Development Activities within the Chemical Development Section of the Chemical Technology Division	NA	QAP-X-88-CT-009	Rev. NA, January 1989
P692	Quality Assurance Program Manual Analytical Chemistry Division	NA	ORNL/M-806	Rev. NA, 10/01/1989
P693	ORNL Self-Assessment Program	NA	ORNL-QA-P03	Rev. 2, 12/20/2000
P694	ORNL Issues Management Program	NA	ORNL-QA-P04	Rev. 2, 9/29/2000
P695	ORNL Nonconformance Control Procedure	NA	ORNL-QA-P05	Rev. 1, 05/27/1998
P696	Deviation Procedure	NA	ORNL-QA-P06	DRAFT, DRAFT
P697	List of All Comments on QA-P07 ORNL Lessons Learned Program	Vince Bishop	ORNL-QA-P07	Rev. NA, 04/27/1998
P698	Control and Calibration of Measuring and Test Equipment at ORNL	NA	x-GP-8	Rev. 0, 3/18/1994
P699	ORNL Nonconformance Reporting	NA	X-QA-9	Rev. 0, 5/20/1996

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Source Document Tracking Number [a/c]	Title or Description [e]	Author	Document # [b]	Document Revision # and Date
P782	SNM Safeguards and Security at Building 7920, the Transuranium processing Plant (TRU)	E. D. Collins	NA	0, 3/7/1980
P784	Procedures and Information on Trash Removal from Cell G TURF	E. Cagle; D. Osucha	NA	NA, Various
P785	Dissolution of Pu-240/Am-241 Oxide Powder & Separation of Pu-240/Am-241 by MP-1 Column Elution	REDC	SP-PU240-INEL	NA, 09/09/2003
P786	Preparationof PuO2 Micro Spheres by TRU Resin Bead Loading and Calcination	Miting Du	REDC-Pu-7920.5	Revision 0, 08/20/2005
P787	Conversion of NH499TcO4 to H99TcO4 & Synthesis of (C2H5)4N99TcO4	Miting Du	REDC-Tc-Conv-1	Revision 1, 07/30/2004
P788	Neutron Dosimeter Assembly Outline	REDC	IM-OP-1.0	2 and 3, Various
P789	Dosimter Wire Fabrication	REDC	IM-OP-2.0	Revisions 2 and 3, 02/26/1996; 03/26/2008
P790	Preparation of Dosimeter Capsules	REDC	IM-OP-3.0	2 and 3, Various
P791	Weighing and Dispensing Dosimeter Wires	REDC	IM-OP-4.0	2, 3 and 4, Various
P792	Dosimeter Welding and Inspection	REDC	IM-OP-5.0	Revisions 2 and 3, 3/1/1996; 03/26/2008
P793	Gamma Counting of Dosimeters	REDC	IM-OP-6.0	2 and 3, Various
P794	Loading /Unloading Procedure for the REDC Cast Cask	REDC	IM-OP-10	1, 3/26/2008
P795	Segmentation of Targets and Cleaning of Cut Segments	REDC	IM-OP-11.0	Revisions 1 and 2, 03/26/2008
P796	Dissolution of Aluminum from Target Segments	REDC	IM-OP-12.0	Revision 1 and 2, 03/26/2008
P797	Nickel Pellet Dissolution and AIX Feed Preparation	REDC	IM-OP-13.0	Revisions 1 and 2, 03/26/2008
P798	Anion Exchange Purification of Ni-63	REDC	IM-OP-14.0	Revisions 1 and 2, 03/26/2008
P799	Feed Preparation for Cation Exchange Purification of Ni-63	REDC	IM-OP-15.0	Revisions 0 and 1, 03/26/2008

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Source Document Tracking Number [a/c]	Title or Description [a]	Author	Document # [b]	Document Revision # and Date
P800	Cation Exchange Purification of Ni-63	REDC	IM-OP-16.0	Revisions 0 and 1, 03/26/2008
P801	Removal of Chromium by Solvent Extraction	REDC	IM-OP-17.0	Revision 0, 03/26/2008
P802	Radiation Contamination Procedure: Decommissioning and Disposal of Alpha Glove Boxes (REF: TCFOM-10.3)	REDC	RC-OP-3.0	Revision 0, 03/26/2008
P803	Radiation/Contamination Procedure: Alpha Glove Box Operating Procedures	REDC	RC-OP-19.0	Revision 5, 11/09/1998
P804	Actinide Product Finishing/Special Projects Procedure: Actinide/Lanthanide Separation by Extraction Chromatography	REDC	PF-OP-10.0	Revision 0, 03/26/2008
P805	Actinide Product Finishing/Special Projects Procedure: Product Solution Volume Reduction/Product Evaporation	REDC	PF-OP-11.0	Revision 2, 03/26/2008
P806	Actinide Product Finishing/Special Projects Procedure: Fabrication of Electrodepositions Using Isopropanol Electrolyte	REDC	PF-OP-12.0	Revision 1, 03/26/2008
P807	Actinide Product Finishing/Special Projects Procedure: Fabrication of Electrodepositions Using Ammonium Acetate Electrolyte	REDC	PF-OP-13.0	Revision 1, 03/26/2008
P808	Pressurized Ion Exchange Column Preparation, Resin Loading, and Pre-Run Conditioning (Cave B)	REDC	PF-OP-14.0	Revision 0, 10/04/1994
P809	Actinide Product Finishing/Special Projects Procedure: Weighing and Dispensing of Radioactive Product Samples	REDC	PF-OP-17.0	Revision 0, 03/26/2008
P810	Actinide Product Finishing/Special Projects Procedure: Preparation of Samples for Radiochemical Analysis	REDC	PF-OP-18.0	Revision 2, 03/26/2008
P811	Nuclear Materials Processing Group Research Technical Procedure: Evaporation to Dryness of Solutions Using Infrared heat	Curtis Porter; REDC	NMP-PF-11.0	Revision 0, 02/16/2005
P812	Actinide Product Finishing / Special Projects Procedure: Fabrication and Testing of a Cf-252 Hemispherical Fission Chamber	N/A	PF-OP-15.0/R1	0, 1, Various
P818	Actinide Product Finishing/Special Projects Procedure: Fabrication and Testing of a Cf-252 Hemispherical Fission Chamber	REDC	PF-OP-15.0	Revisions 0 and 1, 08/13/2001 and 09/18/2001
P819	Actinide Product Finishing/Special Projects Procedure: Actinide/Lanthanide Separation Studies for the Advanced Fuel Cycle Initiative	REDC	PF-OP-30.0	Revision 0, 05/22/2003
P820	Actinide Product Finishing/Special Projects Procedure: Preparation of Chemical Reagents	REDC	PF-OP-1.0	Revision 3, 03/26/2008

Attachment 4 - Acceptable Knowledge Source Document Information List (continued)

Source Document Tracking Number [a/c]	Title or Description [a]	Author	Document # [b]	Document Revision # and Date
P821	Pressurized Ion Exchange Column Preparation, Resin Loading, and Pre-Run Conditioning (Cave A)	REDC	PF-OP-2.0	Revision 1, 04/15/1993
P822	Actinide Product Finishing/Special Projects Procedure: Micro-Ion Exchange Column Preparation and Pre-Run Conditioning	REDC	PF-OP-3.0	Revision 2, 03/26/2008
P823	Actinide Separation by Pressurized Chromatographic Elution from Cation Exchange Resin in Cave B	REDC	PF-OP-4.0	Revision 0, 10/09/2000
P824	Actinide Product Finishing/Special Projects Procedure: Actinide/Lanthanide Separation by Chromatographic Elution from Cation Exchange Resin	REDC	PF-OP-6.0	Revision 1, 10/14/1994
P825	Actinide Product Finishing/Special Projects Procedure: Cationic Cleanup of Actinides/Lanthanides by Ion Exchange	REDC	PF-OP-7.0	Revision 2, 03/26/2008
P826	Actinide Product Finishing/Special Projects Procedure: Fission Product Removal by Alcoholic-HCl Ion Exchange	REDC	PF-OP-8.0	Revision 2, 03/26/2008
P827	Actinide Product Finishing/Special Projects Procedure: Organic Scrub of the Berkelium (Bk) Product from the Berkex Process	REDC	PF-OP-9.0	Revision 2, 03/26/2008
P828	Actinide product Finishing Special projects Procedure; REDC; Material Transfers with the Shield Transfer Carrier ("Mule")	REDC	PF-OP-26.0	2, 3/26/2008
P830	Chemical Technology Division, Isotope Preparation Department: Contaminated Solid Waste Handling Procedure	Isotopes, REDC	IP-003	Rev. 0 & 1, 09/01/1987; 02/15/1989
P848	Glove Box Operations, Building 3038, Alpha Handling Facility	K. W. Haff; B. D. Patton	IP-1608	Rev. 1, 04/29/1994
P850	ORNL Computerized Hazardous Materials Tracking System	P. Knight; D. Atkins; M. Elsenhower; T. Clark	NA	NA, 5/1985
P851	Hot Cell Experimental Procedure	F. R. Chattin	HC-EX-1	NA, 2/21/1990
P852	Standard Procedures for Hot Cell Operations (Cleanex Procedures) for Building 7920	NA	NA	NA, 8/1/1985
P853	Hot Cell Procedure: Tank T-60: Clean Out of Organic Used in a Diluent Wash Stage	F. R. Chattin	HC-OP-1010;1027; 1038	0, 6/29/1989
P854	Hot Cell Operating Procedure: Sampling of Actinide Oxide Product	Fred Chattin	HC-OP-930	NA, 2/15/1990
P855	Safety Standards	Various	NA	NA, Various

Attachment 4 - Acceptable Knowledge Source Document Information List (continued)

Source Document Tracking Number [a/c]	Title or Description [a]	Author	Document # [b]	Document Revision # and Date
P877	Analytical Chemistry Division Employee Handbook	ORNL	M-2791	NA, 04/1993
P882	Independent Review of Safety Systems (Document Reviewed: Safety Analysis TURF, Building 7930)	NA	NA	NA, March 1991
P883	Memorandum of Understanding (MOU) Listing between Chem Tech Division and Health Protection Division	B. D. Patton	NA	NA, 4/20/1989
P885	Procedure for Trash Removal from Cell G TURF	N/A	NA	NA, 04/06/1983
P889	Basic Principles of Operation in the Chem Tech Division	NA	NA	NA, 6/30/1989
P894	Packaging and Transportation - Chem Tech Division	B. D. Patton	NA	NA, 5/8/1989
P905	Health Physics Procedure - Handling and Transfer of Radioactive Materials within the Laboratory and Guide for the Transfer of Materials Between Contaminated Enclosure Systems and Non-Contaminated Areas	ORNL	Procedure 4.1	NA, 01/01/1976
P910	Radioactive Operations Committee (ROC) Review of Building 7920 (TRU Facility)	Radioactive Operations Committee, ORNL	ORNL/CF-78/311	NA, 09/20/1978
P911	Quarterly Progress Report for the Chemical and Energy Research Section of the Chemical Technology Division: July-September 1999	R. T. Jubin; ORNL	ORNL/TM-1999/304	NA, March 2001
P917	Procedure 5.1 - Segregation and Management of solid Radioactive Waste Materials and supporting Solid Waste Management Documentation	ORNL	Procedure 5.1	NA, 12/15/1983, 12/15/1985
P928	Calculation of the Requirements for Operation of Refractory-Metal Components at High Temperature in Vacuum	R.E. Clausing	ORNL-TM-334	Rev. NA, 9/18/1962
P930	Independent Review of Safety Analysis Documentation for Radiochemical Engineering Development Center - Building 7930 - Inspection Record package	Performance Development Corporation	NA	NA, 3/1991
P932	Radioactive Operations Committee and Office of Operational Safety Review of the Radiochemical Engineering Development Center and the Radiochemical Processing Plant, December 12-15, 1988	NA	NA	NA, 12/1988
P934	A New Field Work Proposal for the Isotopes Sales and Distribution Program	Hightower; Johnson	NA	NA, 1988 - 1990
P942	Procedure for Disposal of F-126 Contents to MV Waste Tank WC-20	NA	NA	NA, NA
P946	Operating Manual for the ORNL Filter Removal Carrier	General Engineering Division; ORNL	68-3-18	NA, 03/1968

Attachment 4 - Acceptable Knowledge Source Document Information List (continued)

Source Document Tracking Number [a/c]	Title or Description [a]	Author	Document # [b]	Document Revision # and Date
P947	Cm II Can Operating Procedure, Transferring Cm II Cans from the Mark 42 Transfer Cask to the Mark 42 Storage Facility	NA	CmII-OP-1.0	Revision 0, 02/09/1998
P948	Transferring Mark 42 Segments (for Verification) from the Mark 42 Storage Facility to Cubicle 7 and memo to R. M. Wham re: Determination of Fissionable Material Content for Target Assembly X42Y72 in Bldg 7920	NA	MK-OP-6.0	NA, Various
P949	Transferring Mark 42 Segments (for Verification) from the Mark 42 Storage Facility to Cubicle 7 and memo to R. M. Wham re: Determination of Fissionable Material Content for Target Assembly X33Y15 in Bldg 7920	C. W. Alexander	MK-OP-6.0	Revision 0, 02/19/1997
P950	Mark 42 Operating Procedure, Transferring mark 42 Segments from the Mark 42 Storage Facility to Cubicle 7	C. W. Alexander	MK-OP-7.0	Revision 1, 06/12/2001
P951	Advanced Fuel Cycle Initiative (AFCI) Semmiannual Review	Buzz Savage	NA	NA, 9/13/2004
P952	Global Nuclear Energy Partnership Technology Development Plan	GNEP Technical Integration Office	GNEP-TECH-TR-PP-2007-00020	0, 7/25/2007
P953	Phased Construction Completion Report for the 22 Trench Waste Retrieval Project at ORNL	N/A	DOE/OR/01-2305&D1	0, 8/2006
P956	Segregation and Management of Solid Radioactive Materials	NA	NA	NA, 11/27/1985, 05/15/1986
P978	Solvent Extraction Studies with Low-Burnup Fast Flux Test Facility Fuel in the Solvent Extraction Test Facility	D. E. Benker, et al.	ORNL/TM-9189	NA, 01/1985
P980	Safety Basis Supplement for the Processing of Bettis PuBe Neutron Sources	G. G. Coppock	ORNL/7920/2010-02	Rev. 3, 08/28/2013
P981	U.S. Department of Energy Office of Inspector General Office of Audit Services, Audit Report, Plutonium-238 Production	Gregory H. Friedman	DOE/IG-0607	NA, 06/2003
P982	The GNEP Coupled End-to-End (CETE) Research, Development, and Demonstration Project: Overview of the CETE Testbed Capabilities and Operations	P. D. Bailey, et al.	P6-01	NA, 05/19-22/2008
P983	Plutonium and Neptunium Conversion Using Modified Direct Denitration	L. K. Felker, et al.	NA	NA, NA
P984	Lab-Scale Demonstration of the UREX+1a Process Using Spent Fuel	Candido Pereira, et al.	NA	NA, 02/25/2007 - 03/01/2007
P985	Development of the UREX+ Co-Decontamination Solvent Extraction Process	E. D. Collins, et al.	NA	NA, NA
P986	Glove Box Operations	C. Porter	NNFD-7920-OP-105	Rev. 0, 11/01/2004
P987	Glove Box Operations	K. E. Murphy	NNFD-REDC-001	Rev. 0, 09/09/2011

Attachment 4 - Acceptable Knowledge Source Document Information List (continued)

Source Document Tracking Number [b/c]	Title or Description [a]	Author	Document # [b]	Document Revision # and Date
P988	CH-TRU Waste Handling at Building 7920	K. Wilson	NNFD-7920-OP-190	Rev. 0, 02/23/2010
P989	RH-TRU Waste Handling in Building 7920 Cell Bank	R. J. Weaver	NNFD-7920-OP-191	Rev. 1, 10/03/2014
P990	Bag-Out Procedure for the Transfer and Decontamination Facility	R. G. Veal, et al.	TF-BO-1008	Rev. 0, 06/10/1996
P991	Disposal of Waste Solutions	M. L. Milburn, et al.	NNFD-7920-OP-142	Rev. 0, 03/31/2008
P992	[CLEANEX] Waste Organic Cleanout	R. J. Weaver, et al.	NNFD-7920-OP-195	Rev. 0, 11/18/2009
P993	Transuranic Waste Processing Center, Risk-Based Disposal Approval Request for PCBs Contaminated with Radioisotopes at the TWPC	NA	NA	NA, 03/01/2011
P994	CH-TRU Waste Handling at REDC	NA	NNFD-REDC-004	Rev. 0, 07/20/2015
U004	Draft Information for BESAC Review of HFIR (8/17/98)	J. E. Bigelow	NA	NA, 08/17/1998
U011	Safety Analysis: Transuranium Processing Plant, Building 7920	L. J. King, J. E. Bigelow, E. D. Collins, and W. T. McDuffee	ORNL/TM-7688	Draft, 12/1984
U038	ORNL TRU Waste Historical Survey; Volumes 1, 2, and 3—Origins and Characteristics of Remote-Handled Transuranic Wastes (Trabalka report) Plus Appendices	J.R. Trabalka, A. J. Mattus, S.N. Storch	BJC/OR-395-V/1,2,3	Draft, 09/2001
U039	Oak Ridge Reservation Transuranic Waste Acceptable Knowledge Summary Report for the Radiochemical Engineering Development Center: Newly Generated Contact-Handled Transuranic Waste from Isotope Production	Eberline Services for DOE	ORNL-CH-AK-TBD/RA	Draft, 07/12/2002
U041	Waste Stream Profile Sheet for 7920-HCAL-007 R1 and Supporting Documentation	D. Coffey	7920-HCAL-007 R1	Revision 1, 09/06/2002
U044	Weston Report: Acceptable Knowledge Summary Report for Oak Ridge National Laboratory Contact-Handled TRU Debris Waste Facility Maintenance Operations	ORNL/Betty Humphrey	AK-ORNL-001	Rev. 3A & 4, 05/24/2006; 06/19/2006
U045	Waste Stream Profile Sheet for Building 7920, Hot Cells and Analytical Labs	Wayne Evans	7920-HCAL-002	NA, 04/19/1999
U046	RH Debris Waste Process Flow Descriptions	NA	RH-R-PR-001	Rev. 0, Draft D, NA

Attachment 4 - Acceptable Knowledge Source Document Information List (continued)

Source Document Tracking Number [a/c]	Title or Description [a]	Author	Document # [b]	Document Revision # and Date
U047	Transuranic Waste Processing Center at Oak Ridge National Laboratory Remote Handled Transuranic Waste Container Selection and Transfer Plan	NA	RH-A-AD-0 02	Rev. 0 DRAFT, NA
U048	Remote Handled Transuranic Waste Transfer Project Scope and Inventory Assessment	NA	BJC/OR-DRAFT	Rev. NA, 10/2007
U049	Waste Stream Profile Sheet for 7920-HCAL-005 and Supporting documentation	ORNL	7920-HCAL-005	NA, 08/18/1999
U059	Brief History of ORNL	NA	NA	NA, 3/2/1993
U090	ORNL RH TRU Data Extracted from Process Information Package for Radiological Characterization for Campaigns 68, 69, 70, 71, 72, 73, and M1	ORNL	NA	NA, Various
U091	ORNL RH TRU Data Extracted REDC Process Information Package for Radiological Characterization for Campaigns M2, M3, M4, M5, M6, M7, M8, M9, M10, M11, M12, M13, M14, M15, M16	ORNL	NA	NA, Various
U092	ORNL RH TRU Data Extracted REDC Process Information Package for Radiological Characterization for Campaigns: 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67 - SETF Period	ORNL	NA	NA, Various
U093	ORNL RH TRU Data Extracted REDC Process Information Package for Radiological Characterization for Campaigns: 33-55 - Pre-SETF Period	ORNL	NA	NA, Various
U094	Status Briefing: Radiological Characterization of REDC RH TRU Waste at ORNL	NA	NA	NA, June 11-12, 2008
U105	Waste Stream Profile Sheet for Building 7920, Room 211, Waste Stream 7920-R211-001	Wayne Evans; Don Coffey	7920-R211-001	NA, 7/15/1999
U106	Waste Stream Profile Sheet for Building 7920, Room 108, Waste Stream 7920-R109-001 and 7920-R109-001R1	Wayne Evans; Don Coffey	NA	NA, Various
U107	Waste Stream Profile Sheet for Building 7920, Room 111, ORNL Waste Stream 7920-R111-001, and Radiological Characterization of waste from Building 7920 - Room 111 "Shielded 7920-R111 Caves, A and B"	Wayne Evans; Don Coffey	NA	NA, Various
U108	Waste Stream Profile Sheet for Building 7920, Room 109, ORNL Waste Stream 7920-R109-002	Don Coffey; Wayne Evans	NA	NA, Various
U109	Waste Stream Profile Sheet for Building 7920, Room 211, ORNL Waste Stream 7920-R211-002	Wayne Evans; Don Coffey	NA	NA, Various
U110	Data Quality Objectives (DQO) Worksheet for Building 7920, Labs 209 and 211	ORNL, Roy Banning	DQO # 08-004	NA, 07/15/2008
U111	Radiological Characterization and Quantification of Waste under WSPS REDC-001 using Microshield	Don E. Coffey, et al.	WSPS REDC-001	4, 6, 7, 8, & 9, Various

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Source Document Tracking Number [a/c]	Title or Description [a]	Author	Document # [b]	Document Revision # and Date
U112	Waste Characterization Checklist (WCC)	T. Lehberger; J. Selph	WCC REDC-001	3 & 4, Various
U124	Contamination Control Plan for Hot Cell (TWPC Hot Cell)	ORNL	NA	Draft, NA
U125	Maintenance Work Control, Attachment C: Maintenance Work Order #CM-10-003	K. East	CM-10-003	NA, 1/12/10
U126	Maintenance Work Control, Attachment C: Maintenance Work Order #CM-10-100	Kevin East	CM-10-100	NA, 08/03/2010
U127	Radiological Quantification of Debris Waste Generated at REDC from Hot Cell and Facility Operations	Jimmy R. Selph	REDC Debris	Rev. 0, 1, 2, & 3, 01/26/2012 to 12/11/2013
U128	Radiological Quantification of Waste Generated at Building 7920 Room 216 from Glovebox Operations	Jimmy R. Selph	7920-216 Glovebox Debris	Rev. 0, 03/28/2012
U129	Evaluation of Glovebox Radio-Chemical Analytical Smear Data used to Support REDC Waste Disposal	Jimmy R. Selph	REDC Glovebox Smear Data Evaluation	Rev. 0, 1, & 4, 11/20/2009 to 03/01/2012
U130	Radiological Quantification of Waste Generated at Building 7920 Lab 209 from Glovebox Operations	Jimmy R. Selph	7920-209 Glovebox Debris	Rev. 1 & 2, 12/14/2011 to 08/03/2012
U131	Radiological Quantification of Waste Generated at Building 7920 Lab 211 from Glovebox Operations	Jimmy R. Selph	7920-211 Glovebox Debris	Rev. 0, 1, & 2, 12/15/2009 to 08/21/2012
U132	Radiological Quantification of Waste Generated at REDC from Np-237 Pellet Production Operations	Jimmy R. Selph	REDC Np-237 Pellet Production	Rev. 0, 05/13/2014
U133	Radiological Quantification of Waste Generated at Building 7920 Lab 109 from Operations Conducted in the CETE Gloveboxes	Jimmy R. Selph	7920-109 CETE Gloveboxes Debris	Rev. 1, 06/16/2014
U403	Log Book: Cave A Liner Replacement Activities	NA	NA	NA, Various
U412	Logbook Reference 6R1 - Cf-252 Electrodeposition Processing - Initial CX, TEVA, and Final CX Purifications (REDC Bldg 7920)	NA	NA	NA, Various
U415	Transuranium Material Transfer	Various	Various	NA, Various
U420	Research and Technical Notebook No. A-103608-G, Assigned to Curtis Porter, Process Development, REDC, Chemical Technology, Building 7920	Curtis Porter	A-103608-G	NA, Various
U424	ORNL Technical Notebook No. A-106986-G, Assigned to Milt Lloyd, Chem Tech Division	Milt Lloyd	A-106986-G	NA, Various

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Source Document Tracking Number [a/c]	Title or Description [a]	Author	Document # [b]	Document Revision # and Date
U425	ORNL Technical Notebook No. A-106985-G - Milt Lloyd; Susan North	Milt Lloyd	Logbook A-106985-G	NA, Various
U426	ORNL Technical Notebook no. A-106984-G; Susan North and Milt Lloyd	Milt Lloyd	Logbook A-106984-G	NA, Various
U428	Unclassified Notebook No. A-6272, Assigned to O. K. Tallent, Chem Tech Department, Building 7920, Issued 2/4/1971	O. K. Tallent	A-6272	NA, Various
U429	Unclassified Notebook A-6271: Building 7920, O.K. Tallent	O. K. Tallent	A-6271	0, Various
U432	O.K. Tallent Logbook A-106981-G Transferred to Milt Lloyd (Chem Tech Division, Building 7920), Dated 09/14/1994 (Solvent Extraction, etc.)	O.K. Tallent, Milt Lloyd	A-106981-G	NA, Various
U433	ORNL Technical Logbook No. A-106990-G, Milt Lloyd, Chem Technology Division Building 7920, Solvent Extraction	Milt Lloyd	A-106990-G	NA, Various
U435	ORNL Technical Notebook A-106991-G, Milt Lloyd, Building 7920 Chem Tech Division, Solvent Extraction	Milt Lloyd	A-106991-G	0, 09/15/1994
U436	Unclassified Notebook No. A-6227, Milt Lloyd, Building 7920 Chem Tech Division	Milt Lloyd	A-6227	NA, Various
U437	ORNL Technical Notebook No. A-106992-G, Milt Lloyd and Susan North Lewis, Building 7920	Milt Lloyd	Logbook A-106992-G	NA, Various
U438	Unclassified Notebook No. A-6229, Milt Lloyd logbook, Building 7920 (REDC)	M. H. Lloyd	A-6229	NA, Various
U439	ORNL Technical Notebook No. A-106981-G for Milt Lloyd and O.K. Tallent, Chem Technology Division, Building 7920	Milt Lloyd; Tallent	Logbook A-106981-G	NA, Various
U441	ORNL Technical Notebook A-106988-G, Milt Lloyd and Bob Jones, Chemical Technology Division, Building 7920	Milt Lloyd, Bob Jones	Logbook A-106988-G	NA, Various
U442	Unclassified notebook No, A-6307, R. A. Ward, Health Physics, Bldg 7920	R. P. Ward	A-6307	NA, Various
U443	Unclassified Notebook No. A-6226, Milt Lloyd, Chem Tech, Bldg 7920	M. H. Lloyd	Logbook A-6226	NA, Various
U452	Research and Technical Notebook: Building 7920 (MS 6384) No. A108099-G, Curtis Porter, Chem Technology Division (Isotope Technology)	Curtis Porter	A-108099-G	0, Various
U453	ORNL Technical Notebook No. A106984-G, Milt Lloyd, Jeff Wade, O.K. Tallent, Chem Technology Division, Bldg 7920, Solvent Extraction	Milt Lloyd	Logbook A-106984-G	NA, Various
U477	ORNL Technical Notebook No. A-105094; Building 7920; REDC - Curtis Porter	C. E. Porter	Logbook A-105094	NA, Various
U478	ORNL Technical Notebook No. A-102161; Chemical Technology / Finished Products / J. T. Wiggens	J. T.Wiggens	Logbook A-102161	NA, Various

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Source Document Tracking Number [a/c]	Title or Description [a]	Author	Document # [b]	Document Revision # and Date
U479	Logbook; TURF Project; H. C. Savage (Bldg 7930)	H. C. Savage	NA	NA, Various
U480	Logbook TURF (Bldg 7930) Operations Log #1; Pre-MSRE Fuel	NA	Logbook TURF Log #1	NA, Various
U481	Logbook REDC Building 7930 (TURF Facility); M. E. Littleton	M. E. Littleton	NA	NA, Various
U482	TURF Logbook 16L4; Building 7930; M. E. Littleton	M. E. Littleton	Logbook: TURF 16L4	NA, Various
U483	ORNL Technical Logbook; C. E. McFarland; Building 3038	C. E. McFarland	Logbook A-9372	NA, 02/20/1980 - 12/30/1980
U484	ORNL Technical Notebook No. A-105094; Assigned to C. E. Porter on 11/01/1991; ITS/REDC; Products Research and Development Projects	C. E. Porter	A-105094	NA, Various
U488	Log Book; Chemical technology Division; Building 7920; 1999 - 2000; Curtis Porter	Curtis Porter	NA	NA, Various
U489	Curtis Porter; Building 7920; Chemical Technology Division	Curtis Porter	NA	NA, Various
U493	Logbook TURF Building Log; 10/16/1973 - 12/17/1982	NA	NA	NA, Various
U494	Logbook: TURF (Bldg 7930) Logbook #12; 1/3/1983 - 8/21/1984	M. E. Littleton	Logbook TURF #12	NA, Various
U495	Logbook: TURF (Bldg 7930) E. B. Cagle 1987	E. B. Cagle	NA	NA, Various
U496	Logbook: TURF (Bldg 7930) Logbook E. B. Cagle; May 10, 1985	E. B. Cagle	NA	NA, Various
U497	Logbook: Log #1; Building 7930; W. Bostic, W. Miller; R. Bowman, F. Brown (TURF Bldg)	William Bostic; William Miller; R. Bowman; F. Brown	NA	NA, Various
U498	Logbook: TURF (Bldg 7930) Logbook 14 L2; 8/22/1984 - 6/23/1985	M. E. Littleton	NA	NA, Various
U499	Logbook: TURF (Bldg 7930) Log #11; 1/1/1971 - 10/5/1973	Wallis; Bostic	NA	NA, Various
U500	Logbook: TURF (Bldg 7930) Logbook 15L3; M. E. Littleton; 6/24/1986 - 8/5/1988	M. E. Littleton	NA	NA, Various
U501	Logbook: G. A. West; C. E. Roberts; H. C. Thompson; 1/4/1972; Bldg 7920 Waste Logbook	G. A. West; C. E. Roberts; H. C. Thompson	NA	NA, Various
U502	Logbook: TRU Log (Maintenance & Waste); G. A. West; C. E. Roberts; H. C. Thompson; Bldg 7920	G. A. West	NA	NA, Various

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Source Document Tracking Number [a/c]	Title or Description [a]	Author	Document # [b]	Document Revision # and Date
U503	Logbook: TRU Maintenance & Waste Disposal; Building 7920; 12/1/1977 - 2/2/1979; West; Roberts; Thompson	G. A. West; C. E. Roberts; H. C. Thompson	NA	NA, Various
U504	Isotopes Staff List	NA	NA	NA, 6/24/1988
U505	Lab Notebook: RE-2 - Analytical Chemistry Division - Charles Alexander - Building 7920	Charles (Chuck) Alexander	NA	NA, Various
U506	Research & Technical Notebook No. Te-1 - Chemical Technology Division - Building 7920 - Charles (Chuck) Alexander - A-107733-G	Charles (Chuck) Alexander	A-107733-G	NA, Various
U507	Research & Technical Notebook - Notebook No.(SM-1) A-107736-G - Building 7920, MS 6384 - Charles Alexander	Charles (Chuck) Alexander	A-107736-G	NA, Various
U508	Lab Notebook 21/150/REC - Building 7920 - Charles (Chuck) Alexander	Charles (Chuck) Alexander	21/150/REC	NA, Various
U519	TRU Log, Vol. 504, Logbook # A-8632, L. J. King, Chem Tech Division, Bldg 7920; 01/28/1979 - 02/05/1979	L.J. King	Logbook # A-8632	NA, Various
U528	Technical Notebook - Chuck Alexander - Building 7920	Charles Alexander	21/300/R; SL-AM241-SP-1	NA, 08/08/2003 - 08/01/2006
U529	Technical Notebook - Charles Alexander, Building 7920	Charles Alexander	Logbook # B000334	NA, 12/11/1985-07/29/1988
U530	Logbook A-103674; REDC Mark 42 Process Development; Charles (Chuck) Alexander; Building 7920; issued to G. D. O'Kelley	Charles (Chuck) Alexander	Logbook A-103674	NA, 10/13/1989
U531	Logbook - Building 7920 - TRU Maintenance and Waste Disposal - 02/05/1979	NA	NA	NA, 02/05/1979
U532	Logbook - Waste Transfer Area (LAA Area) - Building 7920 - C. E. Roberts - 1977	C. E. Roberts	NA	NA, 09/1977 - 03/1978
U533	Logbook #9 - Building 7920 - 07/1968 thru 01/1969	Bowman, Devall, & Miller	Logbook #9	NA, 07/1968 - 01/1969
U534	Logbook - Building 7920 - 01/1992 thru 11/1993	NA	NA	NA, 01/1992 - 11/1993
U535	Logbook - Building 7920 - Process H20 Shutdown - 04/1979 thru 02/1984	NA	NA	NA, 04/1979 - 02/1984
U536	Logbook - Building 7920 - 01/1989 thru 01/1990 - Waste Logbook	NA	NA	NA, 01/1989 - 01/1990

Attachment 4 - Acceptable Knowledge Source Document Information List (continued)

Source Document Tracking Number [a/c]	Title or Description [a]	Author	Document # [b]	Document Revision # and Date
U537	Logbook - Building 7920 - 11/1982 thru 08/1984 - Waste Logbook	NA	NA	NA, 11/1982 - 08/1984
U538	Logbook - Building 7920 - 01/1984 thru 06/1984 - Waste Logbook	NA	NA	NA, 01/02/1984 - 06/08/1984
U539	Logbook - Building 7920 - 09/1981 thru 11/1982 - Waste Logbook	NA	NA	NA, 09/01/1981 - 11/08/1982
U540	Logbook - Building 7920 - 06/1980 thru 08/1981 - Waste Logbook	NA	NA	NA, 06/02/1980 - 08/27/1981
U541	Logbook - Building 7920 - 11/1969 thru 10/1972 - Waste Logbook	NA	NA	NA, 11/17/1969 - 10/23/1972
U542	Logbook - Building 7920 - 02/1972 thru 01/1973 - Waste Logbook	NA	NA	NA, 02/24/1972 - 01/10/1973
U543	Logbook - Buildings 7920 and 7930 - 06/1985 thru 09/1986 - Waste Logbook	NA	NA	NA, 06/12/1985 - 09/22/1986
U544	Logbook - Building 7920 - Bill Bryan - 12/1967 thru 02/1972	Bill Bryan	NA	NA, 12/01/1967 - 02/23/1972
U545	Logbook - Building 7920 - 11/1967 thru 12/1974 - Building Maintenance	NA	NA	NA, 11/03/1967 - 12/31/1974
U546	Logbook – Building 7920 - 02/1980 thru 11/1987 - Casks to SWSA (Best Estimates from UCN-2822 and TRU Log Books)	NA	NA	NA, 02/14/1980 – 11/05/1987
U548	PCB Related Documentation - Environmental Monitoring and Protection Committee Meeting Minutes	R. G. Jordan	NA	NA, 03/30/1978 - 11/29/1978
U568	Coupled End-to-End Demonstration Project Task Sheets - Separations	NA	CETE Task #: 4.1.4 thru 4.1.9	Rev. 0, 05/07/2007 - 05/08/2007
U601	CCP Calculation Package: Sample Radionuclide Information Input Check	J. Vance	ORNL-RH-01	Rev. 0 & 1, 04/19/2008 & 07/22/2008
U602	CCP Calculation Package: Sample Data Decay Correction	J. Vance	ORNL-RH-02	Rev. 0, 04/19/2008
U603	CCP Calculation Package: Campaigns 69 and M5 Information Input Check	J. Vance	ORNL-RH-03	Rev. 0, 04/19/2008
U604	CCP Calculation Package: HFIR Campaigns in SETF Information Input Check	J. Vance	ORNL-RH-04	Rev. 0 & 1, 04/16/2009 & 06/02/2009

Attachment 4 - Acceptable Knowledge Source Document Information List (continued)

Source Document Tracking Number [a/c]	Title or Description [a]	Author	Document # [b]	Document Revision # and Date
U605	CCP Calculation Package: Mark 42 Campaign Inventory Information Input Check	J. Vance	ORNL-RH-05	Rev. 0, 04/19/2008
U606	CCP Calculation Package: Radiological Inventories for SETF Campaigns	James H. Holderness	ORNL-RH-06	Rev. 0, 04/16/2008
U607	CCP Calculation Package: Drum DTC Derivation for Cs-137, Eu-152 and Eu-154	Jim Holderness	ORNL-RH-07	Rev. 2, 02/13/2009
U608	CCP Calculation Package: Determination of Reportable Isotopes-Mark 42 Period	J. Vance	ORNL-RH-08	Rev. 0, 04/16/2008
U609	CCP Calculation Package: Campaign Inventory Information Input Check	J. Vance	ORNL-RH-09	Rev. 0, 04/01/2008
U610	CCP Calculation Package: Uncertainty Analysis	J. Vance	ORNL-RH-10	Rev. 0, 05/08/2008
U611	CCP Calculation Package: DTC Spreadsheet Mark 42 Period-Mark/HFIR	J. Vance	ORNL-RH-11	Rev. 1, 2, & 3, 05/19/2008, 05/22/2008, & 06/25/2008
U612	CCP Calculation Package: Development of Cs-137 Partition Factors	J. Vance	ORNL-RH-12	Rev. 0, 04/02/2008
U613	CCP Calculation Package: MCNP5 Uncertainty Analysis	James H. Holderness	ORNL-RH-13	Rev. 0 & 1, 04/19/2008 & 02/09/2010
U614	CCP Calculation Package: Determination of Cm-242 Processed in Campaign 69	James H. Holderness	ORNL-RH-14	Rev. 0, 04/19/2008
U615	CCP Calculation Package: Development of Campaigns 69 and M5 Inventories	David Moody	ORNL-RH-15	Rev. 0, 04/19/2008
U616	CCP Calculation Package: Direct Assay Information Input Check	J. Vance	ORNL-RH-16	Rev. 0, 05/13/2008
U617	CCP Calculation Package: Direct Assay Data Analysis	J. Vance	ORNL-RH-17	Rev. 0, 05/13/2008
U618	CCP Calculation Package: Scaling Factor Development for Mark 42 Time Period	J. Vance	ORNL-RH-18	Rev. 0, 04/19/2008
U619	CCP Calculation Package: Scaling Factor Development for the SETF Time Period	J. Vance	ORNL-RH-19	Rev. 0 & 1, 04/06/2009 & 06/02/2009
U620	CCP Calculation Package: Fission Product Contribution to Total Dose Rate	J. Vance	ORNL-RH-20	Rev. 0, 04/19/2008
U621	CCP Calculation Package: Sample Scaling Factor Development	J. Vance	ORNL-RH-21	Rev. 0, 04/19/2008
U622	CCP Calculation Package: SR-90/Cs-137 Scaling Factor Development	J. Vance	ORNL-RH-22	Rev. 0, 05/14/2008

Attachment 4 - Acceptable Knowledge Source Document Information List (continued)

Source Document Tracking Number [a/c]	Title or Description [a]	Author	Document # [b]	Document Revision # and Date
U623	CCP Calculation Package: DTC Spreadsheet Mark 42 Period-HFIR/HFIR	J. Vance	ORNL-RH-23	Rev. 1, 2, & 3, 05/19/2008, 05/22/2008, & 06/25/2008
U624	CCP Calculation Package: Pre-SETF Period Information Input Check	J. Vance	ORNL-RH-24	Rev. 0, 06/01/2009
U625	CCP Calculation Package: Uncertainty Analysis for SETF Time Period	James Holderness	ORNL-RH-25	Rev. 0 & 1, 04/06/2009 & 06/02/2009
U626	CCP Calculation Package: Determination of Neutron Surface to 1-m Dose Ratio	J. H. Holderness	ORNL-RH-26	Rev. 0, 05/23/2008
U627	CCP CalculationPackage: Ratio Between Contact and One-Meter Dose Rates	J. Vance	ORNL-RH-27	Rev. 0, 05/23/2008
U628	CCP Calculation Package: MCNP5 Neutron Dose Rate Model	James H. Holderness	ORNL-RH-28	Rev. 0, 08/10/2008
U629	CCP Calculation Package: MCNP5 Neutron Dose Rate Model for 72-B	James H. Holderness	ORNL-RH-29	Rev. 0, 08/10/2008
U630	Corrective Action Plan Report - Oak Ridge National Laboratory, Re: Plutonium ES&N Vulnerability Assessment; Lack of Technical Limits for Building 7920 Hot Cell Fire Scenarios and Personnel Contamination While Examining Scanning Electron Microscope	NA	ID #10019668 & ID #10019607	NA, 10/24/1994 - 02/15/1995
U631	Corrective Action Reports - Oak Ridge National Laboratory, Re: Unneeded Plutonium Stored On-Site; Loss of Building 7920 Supply and Building Exhaust Ventilation; Loss of Institutional Memory; & Nuclear Criticality Safety Approval	NA	ID #10019662, #10019917, #10019667, & #10025667	NA, 05/31/1995 - 05/28/1996
U632	Memo: Request for extension of calibration interval on two Snoopy Surveys	F. R. Chattin	NA	NA, 03/15/1995
U633	Internal Correspondence re: Closeout of CARS Items for Implementation Plan for 10CFR830.120 Ref ID: I0022216	D. B. Owsley	NA	NA, 05/23/1995
U634	Internal Correspondence, Re: Comments from Second Review of HP Manual Procedures	J. B. Knauer	NA	NA, 01/03/1995
U635	Internal Correspondence, Re: Meeting with Waste Management and Remedial Action's Martin Tull, 10-28-93, 12/2/93, and 12/14/93	R. E. Schreiber	NA	NA, 11/01/1993, 12/14/1993, & 12/15/1993
U636	Internal Correspondence, Re: Self-Assessment for Conduct of Maintenance in the Radiochemical Engineering Development Center (REDC); Self-Assessment of NSR-19	J. B. Knauer & R. M. Wham	0049284 REDC-DCC	NA, 07/21/1995 & 03/14/1996

Attachment 4 - Acceptable Knowledge Source Document Information List (continued)

Source Document Tracking Number [a/c]	Title or Description [a]	Author	Document # [b]	Document Revision # and Date
U637	Internal Correspondence, Re: Solid Low Level Waste (SLL) Certification Procedure, 8/2 Draft, for Radiochemical Engineering Development Center (REDC)	R. M. Wham	REDC FO/WH 4010	Rev. 0, 08/02/1994 & 08/12/1994
U638	Internal Correspondence, Re: Contract DE-AC05-96OR22464, Completion of Training Items to Meet 5480.20A Criteria	R. M. Wham	0051222 REDC-DCC	NA, 07/01/1996
U639	Letter, Re: Defense Programs (DP) Support of Cf-252 Neutron Source Program	R. M. Wham	0043099 REDC-DCC	NA, 05/20/1994
U640	Letter, Re: Response to Quality Assurance Questionnaire	J. B. Knauer	0044348 REDC-DCC	NA, 11/09/1994
U641	Internal Correspondence, Re: CARS Item I0018302, Records Inventory and Disposition Schedules (RIDS) for Radiochemical Engineering Development Center (REDC) Records; Biennial Review of REDC Quality Assurance Plans; and Authorization to Certify Waste	B. H. Kron, T. R. Jones, & B. V. Wojtowicz	0045159, 0045370, & 0049364 REDC-DCC	NA, 02/13/1995, 05/19/1995, & 09/08/1995
U642	Internal Correspondence, Re: Agreements Between Radiochemical Engineering Development Center (REDC) and Waste Management and Remedial Action Division (WMRAD); REDC Waste Handling Procedures Training; and Waste Acceptance Criteria for TRU Waste Storage	R. M. Wham, D. B. Owsley, & Dick Schreiber	0043954, 0049625, & 0051262 REDC-DCC	NA, 08/31/1994, 11/13/1995, & 07/15/1996
U643	Letter, Re: Comments on Sampling Plan for RH-TRU Waste from the REDC	R. D. Taylor	0051214 REDC-DCC	NA, 06/25/1996
U644	Memorandum, Re: Management Assessment Team for Ir-192 Production	L. E. McNeese	0053317 REDC-DCC	NA, 12/06/1996
U645	Interoffice Memorandum, Re: ORNL Records Management Review of Selected CTD Procedures	Juli Green Stewart	0050558 REDC-DCC	NA, 12/05/1995
U646	Internal Correspondence, Re: REDC Waste Quality Assurance	R. E. Schreiber	0042667 REDC-DCC	NA, 04/13/1994
U647	Issue Paper: Does Oak Ridge Have High-level Waste (HLW)?	John E. Patterson	NA	NA, 11/19/1999
U648	CCP Calculation Package: Estimate of Cs-137 Partition Factors for Sr-90, Sb-125, and Eu-155	J. Vance	ORNL-RH-30	Rev. 0, 04/06/2009
U650	CCP Calculation Package: Uncertainty Analysis for Pre-SETF Time Period	James Holderness	ORNL-RH-32	Rev. 0, 06/01/2009
U651	CCP Calculation Package: DTC Spreadsheet SETF Time Period	James Holderness	ORNL-RH-33	Rev. 0 & 1, 04/06/2009 & 06/02/2009
U652	CCP Calculation Package: DTC Spreadsheet Pre-SETF Period	James Holderness	ORNL-RH-34	Rev. 0, 05/26/2009

Attachment 4 - Acceptable Knowledge Source Document Information List (continued)

Source Document Tracking Number [a/c]	Title or Description [a]	Author	Document # [b]	Document Revision # and Date
U653	CCP Calculation Package: Scaling Factor Development for Pre-SETF Time Period	James Holderness	ORNL-RH-35	Rev. 0, 06/01/2009
U654	CCP Calculation Package: Determination of Reportable Isotopes-SETF Period	J. Vance	ORNL-RH-36	Rev. 0 & 1, 04/06/2009 & 06/02/2009
U655	CCP Calculation Package: Determination of Reportable Isotopes - Pre-SETF Period	J. Vance	ORNL-RH-37	Rev. 0, 06/01/2009
U656	CCP Calculation Package: Determination of Partition Factors for REDC Campaigns	J. Vance	ORNL-RH-38	Rev. 0, 1, & 2, 04/06/2009, 04/27/2009, & 06/02/2009
U657	CCP Calculation Package: Direct Assay Information Input Check	J. Vance	ORNL-RH-39	Rev. 0, 04/06/2009
U658	CCP Calculation Package: Direct Assay Information Input Check - Pre-SETF	J. Vance	ORNL-RH-40	Rev. 0, 06/01/2009
U659	CCP Calculation Package: Direct Assay Data Analysis	J. Vance	ONRL-RH-41	Rev. 0 & 1, 04/06/2009 & 06/02/2009
U660	CCP Calculation Package: Direct Assay Data Analysis - Pre-SETF	J. Vance	ORNL-RH-42	Rev. 0, 06/01/2009
U661	CCP Calculation Package: Residual Cs-137 Activity in HFIR Campaigns	James Holderness	ORNL-RH-43	Rev. 0, 06/01/2009
U663	CCP Calculation Package: Cs-137 Curies in Typical HFIR Target	J. Vance	ORNL-RH-45	Rev. 0, 04/06/2009
U667	CCP Calculation Package: Regression Analysis of Sample Data	James Holderness	ORNL-RH-49	Rev. 0, 04/06/2009
U668	CCP Calculation Package: Alternative Scaling Factors for Mark 42 Time Period	James Holderness	ORNL-RH-50	Rev. 0, 04/06/2009

[a] From Acceptable Knowledge Souce Document Summaries (Attachments 3)

[b] Or publisher's document number if available

[c] In the case where a AK Summary Report has been revised based on information in Attachment 11- Acceptable Knowledge Source Document Discrepancy Resolution form, identify the tracking number.

Acceptable Knowledge Expert: Travis Smith / T. Smith **Date:** 02/15/2016

Print/Sign

Attachment 5 – Hazardous Constituents

Site(s): Oak Ridge National Laboratory

Waste Stream Description: Soil waste from Nuclear Fuel Services (OR-NFS-CH-SOIL)

Waste Stream Number: OR-NFS-CH-SOIL										
Compound	Suspected Present? (Y/N)	Suspected Concen-tration (ppm)	Used as a solvent? [a] (Y/N/NA)	Associated with packaging? (Y/N/NA)	TC constituent concentration less than regulatory level? [a] (Y/N/NA)	TC Hazardous Waste Number [a]	F-Listed Hazardous Waste Number [a]	U- or P-Listed Hazardous Waste Number [a]	EPA Hazardous Waste Number Assigned (N/Specify HWN)	State Hazardous Waste Number [b]
Metal Compounds (CCP-PO-001 – Table C3-8 & 40 CFR Part 261) [l]										
Arsenic	N	N/A	N/A	N/A	N/A	D004	N/A	N/A	N	N/A
Barium	N	N/A	N/A	N/A	N/A	D005	N/A	N/A	N	N/A
Beryllium	N	N/A	N/A	N/A	N/A	N/A	N/A	P015	N	N/A
Cadmium	N	N/A	N/A	N/A	N/A	D006	N/A	N/A	N	N/A
Chromium	N	N/A	N/A	N/A	N/A	D007	N/A	N/A	N	N/A
Lead	N	N/A	N/A	N/A	N/A	D008	N/A	N/A	N	N/A
Mercury	N	N/A	N/A	N/A	N/A	D009	N/A	U151	N	N/A
Selenium	N	N/A	N/A	N/A	N/A	D010	N/A	N/A	N	N/A
Silver	N	N/A	N/A	N/A	N/A	D011	N/A	N/A	N	N/A
Volatile Organic Compounds (CCP-PO-001 – Tables C3-2 and B3-4 & 40 CFR Part 261)										
1,1,1-Trichloroethane	N	N/A	N/A	N/A	N/A	N/A	F001/F002	U226	N	N/A
1,1,2,2-Tetrachloroethane	N	N/A	N/A	N/A	N/A	N/A	N/A	U209	N	N/A
1,1,2-Trichloro-1,2,2-trifluoroethane	N	N/A	N/A	N/A	N/A	N/A	F001/F002	N/A	N	N/A
1,1,2-Trichloroethane	N	N/A	N/A	N/A	N/A	N/A	F002	U227 [k]	N	N/A
1,1-Dichloroethane	N	N/A	N/A	N/A	N/A	N/A	N/A	U076 [k]	N	N/A
1,1-Dichloroethylene	N	N/A	N/A	N/A	N/A	D029	N/A	U078	N	N/A
1,2-Dichlorobenzene [d]	N	N/A	N/A	N/A	N/A	N/A	F002	U070	N	N/A
1,2-Dichloroethane	N	N/A	N/A	N/A	N/A	D028	N/A	U077 [k]	N	N/A
1,4-Dichlorobenzene [d]	N	N/A	N/A	N/A	N/A	D027	N/A	U072	N	N/A
2-Ethoxyethanol	N	N/A	N/A	N/A	N/A	N/A	F005	U359 [k]	N	N/A
2-Nitropropane	N	N/A	N/A	N/A	N/A	N/A	F005	U171 [k]	N	N/A
Acetone	N	N/A	N/A	N/A	N/A	N/A	F003	U002	N	N/A
Benzene	N	N/A	N/A	N/A	N/A	D018	F005	U019	N	N/A

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Attachment 5 – Hazardous Constituents (continued)

Waste Stream Number: OR-NFS-CH-SOIL

Compound	Suspected Present? (Y/N)	Suspected Concen-tration (ppm)	Used as a solvent? [a] (Y/N/NA)	Associated with packaging? (Y/N/NA)	TC constituent concentration less than regulatory level? [a] (Y/N/NA)	TC Hazardous Waste Number [a]	F-Listed Hazardous Waste Number [a]	U- or P-Listed Hazardous Waste Number [a]	EPA Hazardous Waste Number Assigned (N/Specify HWN)	State Hazardous Waste Number [b]
Volatile Organic Compounds (continued)										
Bromoform	N	N/A	N/A	N/A	N/A	N/A	N/A	U225 [k]	N	N/A
Butanol (n-Butyl alcohol)	N	N/A	N/A	N/A	N/A	N/A	F003	U031 [k]	N	N/A
Carbon disulfide	N	N/A	N/A	N/A	N/A	N/A	F005	P022 [k]	N	N/A
Carbon tetrachloride	N	N/A	N/A	N/A	N/A	D019	F001	U211 [k]	N	N/A
Chlorobenzene	N	N/A	N/A	N/A	N/A	D021	F002	U037	N	N/A
Chloroform	N	N/A	N/A	N/A	N/A	D022	N/A	U044	N	N/A
Cyclohexanone	N	N/A	N/A	N/A	N/A	N/A	F003	U057 [k]	N	N/A
Ethyl acetate	N	N/A	N/A	N/A	N/A	N/A	F003	U112 [k]	N	N/A
Ethyl benzene	N	N/A	N/A	N/A	N/A	N/A	F003	N/A	N	N/A
Ethyl ether	N	N/A	N/A	N/A	N/A	N/A	F003	U117 [k]	N	N/A
Formaldehyde [g]	N	N/A	N/A	N/A	N/A	N/A	N/A	U122	N	N/A
Hydrazine [h]	N	N/A	N/A	N/A	N/A	N/A	N/A	U133	N	N/A
Isobutanol	N	N/A	N/A	N/A	N/A	N/A	F005	U140 [k]	N	N/A
Methanol	N	N/A	N/A	N/A	N/A	N/A	F003	U154	N	N/A
Methyl ethyl ketone	N	N/A	N/A	N/A	N/A	D035	F005	U159	N	N/A
Methyl isobutyl ketone	N	N/A	N/A	N/A	N/A	N/A	F003	U161 [k]	N	N/A
Methylene chloride	N	N/A	N/A	N/A	N/A	N/A	F001/F002	U080 [k]	N	N/A
Pyridine [d]	N	N/A	N/A	N/A	N/A	D038	F005	U196	N	N/A
Tetrachloroethylene	Y	Unknown	Y	N	N	D039	F001/F002	U210	F002	N/A
Toluene	N	N/A	N/A	N/A	N/A	N/A	F005	U220	N	N/A
trans-1,2-Dichloroethylene	N	N/A	N/A	N/A	N/A	N/A	N/A	U079	N	N/A
Trichloroethylene	N	N/A	N/A	N/A	N/A	D040	F001/F002	U228	N	N/A
Trichlorofluoromethane	N	N/A	N/A	N/A	N/A	N/A	F001/F002	U121 [k]	N	N/A
Vinyl Chloride	N	N/A	N/A	N/A	N/A	D043	N/A	U043	N	N/A
Xylenes	N	N/A	N/A	N/A	N/A	N/A	F003	U239	N	N/A

Attachment 5 – Hazardous Constituents (continued)

Waste Stream Number: OR-NFS-CH-SOIL

Compound	Suspected Present? (Y/N)	Suspected Concen-tration (ppm)	Used as a solvent? [a] (Y/N/NA)	Associated with packaging? (Y/N/NA)	TC constituent concentration less than regulatory level? [a] (Y/N/NA)	TC Hazardous Waste Number [a]	F-Listed Hazardous Waste Number [a]	U- or P-Listed Hazardous Waste Number [a]	EPA Hazardous Waste Number Assigned (N/Specify HWN)	State Hazardous Waste Number [b]
Semivolatile Organic Compounds (CCP-PO-001 – Table C3-6 & 40 CFR Part 261)										
2,4,5-Trichlorophenol	N	N/A	N/A	N/A	N/A	D041 [k]	F027 [k]	N/A	N	N/A
2,4,6-Trichlorophenol	N	N/A	N/A	N/A	N/A	D042 [k]	F027 [k]	N/A	N	N/A
2,4-Dinitrophenol	N	N/A	N/A	N/A	N/A	N/A	N/A	P048 [k]	N	N/A
2,4-Dinitrotoluene	N	N/A	N/A	N/A	N/A	D030	N/A	U105	N	N/A
Cresols	N	N/A	N/A	N/A	N/A	D026	F004	U052	N	N/A
Cresols (m)	N	N/A	N/A	N/A	N/A	D024 [k]	N/A	N/A	N	N/A
Cresols (o)	N	N/A	N/A	N/A	N/A	D023 [k]	N/A	N/A	N	N/A
Cresols (p)	N	N/A	N/A	N/A	N/A	D025 [k]	N/A	N/A	N	N/A
Hexachlorobenzene	N	N/A	N/A	N/A	N/A	D032	N/A	U127 [k]	N	N/A
Hexachlorobutadiene	N	N/A	N/A	N/A	N/A	D033	N/A	U128 [k]	N	N/A
Hexachloroethane	N	N/A	N/A	N/A	N/A	D034	N/A	U131 [k]	N	N/A
Nitrobenzene	N	N/A	N/A	N/A	N/A	D036	F004	U169 [k]	N	N/A
Pentachlorophenol	N	N/A	N/A	N/A	N/A	D037	F027 [k]	N/A	N	N/A
Pesticides and Herbicides (40 CFR Part 261)										
2,4,5-TP (Silvex)	N	N/A	N/A	N/A	N/A	D017 [k]	F027 [k]	N/A	N	N/A
2,4-D	N	N/A	N/A	N/A	N/A	D016 [k]	N/A	U240 [k]	N	N/A
Chlordane	N	N/A	N/A	N/A	N/A	D020 [k]	N/A	U036 [k]	N	N/A
Endrin	N	N/A	N/A	N/A	N/A	D012 [k]	N/A	P051 [k]	N	N/A
Heptachlor (and its epoxide)	N	N/A	N/A	N/A	N/A	D031 [k]	N/A	P059 [k]	N	N/A
Lindane	N	N/A	N/A	N/A	N/A	D013 [k]	N/A	U129 [k]	N	N/A
Methoxychlor	N	N/A	N/A	N/A	N/A	D014 [k]	N/A	U247 [k]	N	N/A
Toxaphene	N	N/A	N/A	N/A	N/A	D015 [k]	N/A	P123 [k]	N	N/A

Attachment 5 – Hazardous Constituents (continued)

Waste Stream Number: OR-NFS-CH-SOIL

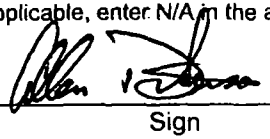
Compound	Suspected Present? (Y/N)	Suspected Concen-tration (ppm)	Used as a solvent? [a] (Y/N/NA)	Associated with packaging? (Y/N/NA)	TC constituent concentration less than regulatory level? [a] (Y/N/NA)	TC Hazardous Waste Number [a]	F-Listed Hazardous Waste Number [a]	U- or P-Listed Hazardous Waste Number [a]	EPA Hazardous Waste Number Assigned (N/Specify HWN)	State Hazardous Waste Number [b]
Other Constituents										
Wastewater treatment sludges from electroplating operations	N	N/A	N/A	N/A	N/A	N/A	F006	N/A	N	N/A
Spent cyanide plating bath solutions from electroplating operations	N	N/A	N/A	N/A	N/A	N/A	F007	N/A	N	N/A
Spent cyanides stripping and cleaning bath solutions from electroplating operations	N	N/A	N/A	N/A	N/A	N/A	F009	N/A	N	N/A
Total PCB Concentration [j]	N	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Additional EPA Hazardous Constituents (List)	N	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Note: If sampling homogeneous waste, identify all chemical constituents listed in tables C3-4, C3-6 and C3-8 of the WAP										
Additional State Hazardous Constituents [b] (List) [e]	N	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Potentially Flammable VOCs (List) [e,f]	N	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Tentatively Identified Compounds (List) [e]	N	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

Attachment 5 – Hazardous Constituents (continued)

Waste Stream Number: OR-NFS-CH-SOIL

a Source: Title 40 Code of Federal Regulations Part 261, Identification and Listing of Hazardous Waste
b. Source: Cite applicable state regulation
c. Superscript not used
d. Can also be analyzed as a semivolatile organic compound
e. Add rows or attach additional sheets as necessary
f. Flammable VOCs included in the CH-TRAMPAC
g. Required only for homogeneous solids and soil/gravel from LANL and SRS
h. Required only for homogeneous solids and soil/gravel from ORNL and SRS
i. Antimony, nickel, thallium, vanadium, and zinc are included in Table C3-8 of CCP-PO-001 but are not regulated under 40 CFR Part 261, and therefore, are not subject to AK evaluation per CCP-PO-001.
j. Source: Title 40 Code of Federal Regulations Part 761, Polychlorinated Biphenyls (PCBs) Manufacturing, Processing, Distribution in Commerce, and Use Prohibitions.
k. This EPA hazardous waste Number is not permitted for WIPP disposal.

NOTE: If any of the information requested on this form is not available or not applicable, enter N/A in the appropriate box.

Acceptable Knowledge Expert: C. Allen Dickerson /  Date: 2/3/2011
Print Sign

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Attachment 5 – Hazardous Constituents

Site(s): Oak Ridge National Laboratory

Waste Stream Description: Immobilized liquids and solids from Nuclear Fuel Services stored at the Oak Ridge National Laboratory

Waste Stream Number: OR-NFS-CH-HOM-A

Compound	Suspected Present? (Y/N)	Used as a solvent? [a] (Y/N/NA)	TC constituent concentration less than regulatory level? [a] (Y/N/NA)	TC Hazardous Waste Number [a]	F-Listed Hazardous Waste Number [a]	U- or P-Listed Hazardous Waste Number [a]	EPA Hazardous Waste Number Assigned (N/Specify HWN)	State Hazardous Waste Number [b]
Toxicity Characteristic Metal Compounds (40 CFR Part 261)								
Arsenic	Y	N/A	Y	D004	N/A	N/A	N	N/A
Barium	Y	N/A	Y	D005	N/A	N/A	N	N/A
Cadmium	Y	N/A	N	D006	N/A	N/A	D006	N/A
Chromium	Y	N/A	Y	D007	N/A	N/A	N	N/A
Lead	Y	N/A	Y	D008	N/A	N/A	N	N/A
Mercury	Y	N/A	N	D009	N/A	U151	D009	N/A
Selenium	N	N/A	N/A	D010	N/A	N/A	N	N/A
Silver	Y	N/A	Y	D011	N/A	N/A	N	N/A
Volatile Organic Compounds (40 CFR Part 261)								
1,1,1-Trichloroethane	N	N/A	N/A	N/A	F001/F002	U226	N	N/A
1,1,2,2-Tetrachloroethane	N	N/A	N/A	N/A	N/A	U209	N	N/A
1,1,2-Trichloro-1,2,2-trifluoroethane	Y	N	N/A	N/A	F001/F002	N/A	N	N/A
1,1,2-Trichloroethane	N	N/A	N/A	N/A	F002	U227 [c]	N	N/A
1,1-Dichloroethylene	N	N/A	N/A	D029	N/A	U078	N	N/A
1,2-Dichlorobenzene	N	N/A	N/A	N/A	F002	U070	N	N/A
1,2-Dichloroethane	N	N/A	N/A	D028	N/A	U077 [c]	N	N/A
1,4-Dichlorobenzene	N	N/A	N/A	D027	N/A	U072	N	N/A
1,4-Dioxane	N	N/A	N/A	N/A	N/A	U108	N	N/A
2-Ethoxyethanol	N	N/A	N/A	N/A	F005	U359 [c]	N	N/A
2-Nitropropane	N	N/A	N/A	N/A	F005	U171 [c]	N	N/A
Acetone	N	N/A	N/A	N/A	F003	U002	N	N/A

CCP RECORDS ORIGINAL
DATE REC'D 1/13/2015
EPF

Attachment 5 – Hazardous Constituents

Waste Stream Number: OR-NFS-CH-HOM-A								
Compound	Suspected Present? (Y/N)	Used as a solvent? [a] (Y/N/NA)	TC constituent concentration less than regulatory level? [a] (Y/N/NA)	TC Hazardous Waste Number [a]	F-Listed Hazardous Waste Number [a]	U- or P-Listed Hazardous Waste Number [a]	EPA Hazardous Waste Number Assigned (N/Specify HWN)	State Hazardous Waste Number [b]
Volatile Organic Compounds (continued)								
Acetonitrile	N	N/A	N/A	N/A	N/A	U003	N	N/A
Benzene	N	N/A	N/A	D018	F005	U019	N	N/A
Butanol (n-Butyl alcohol)	N	N/A	N/A	N/A	F003	U031 [c]	N	N/A
Carbon disulfide	N	N/A	N/A	N/A	F005	P022 [c]	N	N/A
Carbon tetrachloride	N	N/A	N/A	D019	F001	U211 [c]	N	N/A
Chlorobenzene	N	N/A	N/A	D021	F002	U037	N	N/A
Chloroform	N	N/A	N/A	D022	N/A	U044	N	N/A
Cyclohexanone	N	N/A	N/A	N/A	F003	U057 [c]	N	N/A
Ethyl acetate	N	N/A	N/A	N/A	F003	U112 [c]	N	N/A
Ethyl benzene	N	N/A	N/A	N/A	F003	N/A	N	N/A
Ethyl ether	N	N/A	N/A	N/A	F003	U117 [c]	N	N/A
Formaldehyde	N	N/A	N/A	N/A	N/A	U122	N	N/A
Hydrazine	N	N/A	N/A	N/A	N/A	U133	N	N/A
Isobutanol	N	N/A	N/A	N/A	F005	U140 [c]	N	N/A
Methanol	N	N/A	N/A	N/A	F003	U154	N	N/A
Methyl ethyl ketone	N	N/A	N/A	D035	F005	U159	N	N/A
Methyl isobutyl ketone	N	N/A	N/A	N/A	F003	U161 [c]	N	N/A
Methylene chloride	Y	N	N/A	N/A	F001/F002	U080 [c]	N	N/A
Pyridine	N	N/A	N/A	D038	F005	U196	N	N/A
Tetrachloroethylene	N	N/A	N/A	D039	F001/F002	U210	N	N/A
Toluene	N	N/A	N/A	N/A	F005	U220	N	N/A
trans-1,2-Dichloroethylene	N	N/A	N/A	N/A	N/A	U079	N	N/A
Trichloroethylene	N	N/A	N/A	D040	F001/F002	U228	N	N/A
Trichlorofluoromethane	N	N/A	N/A	N/A	F001/F002	U121 [c]	N	N/A
Vinyl Chloride	N	N/A	N/A	D043	N/A	U043	N	N/A
Xylenes	N	N/A	N/A	N/A	F003	U239	N	N/A

Attachment 5 – Hazardous Constituents

Waste Stream Number: OR-NFS-CH-HOM-A

Compound	Suspected Present? (Y/N)	Used as a solvent? [a] (Y/N/NA)	TC constituent concentration less than regulatory level? [a] (Y/N/NA)	TC Hazardous Waste Number [a]	F-Listed Hazardous Waste Number [a]	U- or P-Listed Hazardous Waste Number [a]	EPA Hazardous Waste Number Assigned (N/Specify HWN)	State Hazardous Waste Number [b]
Semivolatile Organic Compounds (40 CFR Part 261)								
2,4-Dinitrotoluene	N	N/A	N/A	D030	N/A	U105	N	N/A
Cresols	N	N/A	N/A	D026	F004	U052	N	N/A
Dimethyl sulfate	N	N/A	N/A	N/A	N/A	U103	N	N/A
Hexachlorobenzene	N	N/A	N/A	D032	N/A	U127 [c]	N	N/A
Hexachlorobutadiene	N	N/A	N/A	D033	N/A	U128 [c]	N	N/A
Hexachloroethane	N	N/A	N/A	D034	N/A	U131 [c]	N	N/A
Nitrobenzene	N	N/A	N/A	D036	F004	U169 [c]	N	N/A
Pentachlorophenol	N	N/A	N/A	D037	F027 [c]	N/A	N	N/A
Other Constituents								
Wastewater treatment sludges from electroplating operations	N	N/A	N/A	N/A	F006	N/A	N	N/A
Spent cyanide plating bath solutions from electroplating operations	N	N/A	N/A	N/A	F007	N/A	N	N/A
Spent cyanides stripping and cleaning bath solutions from electroplating operations	N	N/A	N/A	N/A	F009	N/A	N	N/A
Beryllium powder	N	N/A	N/A	N/A	N/A	P015	N	N/A
Cyanide (soluble cyanide salts)	N	N/A	N/A	N/A	N/A	P030	N	N/A
Potassium cyanide	N	N/A	N/A	N/A	N/A	P098	N	N/A
Potassium silver cyanide	N	N/A	N/A	N/A	N/A	P099	N	N/A
Sodium Cyanide	N	N/A	N/A	N/A	N/A	P106	N	N/A
Vanadium pentoxide	N	N/A	N/A	N/A	N/A	P120	N	N/A
Hydrofluoric acid	N	N/A	N/A	N/A	N/A	U134	N	N/A
Total PCB Concentration [d]	N	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Additional EPA Hazardous Constituents (List)	N	N/A	N/A	N/A	N/A	N/A	N	N/A
Additional State Hazardous Constituents [b] (List) [e]	N	N/A	N/A	N/A	N/A	N/A	N	N/A
Potentially Flammable VOCs (List) [e,f]	N	N/A	N/A	N/A	N/A	N/A	N/A	N/A

Attachment 5 – Hazardous Constituents

Waste Stream Number: OR-NFS-CH-HOM-A

a Source: Title 40 Code of Federal Regulations Part 261, Identification and Listing of Hazardous Waste
b. Source: Cite applicable state regulation
c. This EPA Hazardous Waste Number is not permitted for WIPP disposal.
d. Source: Title 40 Code of Federal Regulations Part 761, Polychlorinated Biphenyls (PCBs) Manufacturing, Processing, Distribution in Commerce, and Use Prohibitions.
e. Add rows or attach additional sheets as necessary
f. Flammable VOCs included in the CH-TRAMPAC

NOTE: If any of the information requested on this form is not available or not applicable, enter N/A in the appropriate box.

Acceptable Knowledge Expert: Jeff Harrison / [signature] Date: 1/8/2015
Print Sign

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Stewart, Judith - CTAC

From: Richard Blauvelt <dblauvelt@portageinc.com>
Sent: Tuesday, March 29, 2016 11:26 AM
To: Stewart, Judith - CTAC
Subject: FW: Answers
Attachments: SPM_REPORT_ORNL_032916.xls

fyi

From: Jeff Harrison [mailto:trash_talk@msn.com]
Sent: Tuesday, March 29, 2016 12:19 PM
To: Richard Blauvelt
Subject: Answers

Dick,

The Attachment 5 for NFS HOM-A was revised because I noticed I had not indicated "Yes" for 1,1,2-trichloro-1,2,2-trifluoroethane and methylene chloride. These constituents are in a binder that do not meet the definition of an F-listed waste.

I've also attached an SPM report that is generated from the IDC database. If you filter on waste stream OR-NFS-CH-HOM-A you will see RTR BDR numbers and an RTR completion date for every drum in this waste stream. Since all of these drums have been repackaged and RTR is complete, an Attachment 9 is not required.

Jeff Harrison

Nuclear Waste Partnership LLC
Contractor for the U.S. Department of Energy
Trash_Talk@msn.com (e-mail)
720.977.7042 (office)
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Attachment 5 – Hazardous Constituents

Site(s): Oak Ridge National Laboratory

Waste Stream Description: Organic and Inorganic Debris Waste (OR-REDC-CH-HET)

Waste Stream Number:										
Compound	Suspected Present? (Y/N)	Suspected Concen-tration (ppm)	Used as a solvent? [a] (Y/N/NA)	Associated with packaging? (Y/N/NA)	TC constituent concentration less than regulatory level? [a] (Y/N/NA)	TC Hazardous Waste Number [a]	F-Listed Hazardous Waste Number [a]	U- or P-Listed Hazardous Waste Number [a]	EPA Hazardous Waste Number Assigned (N/Specify HWN)	State Hazardous Waste Number [b]
Metal Compounds (CCP-PO-001 – Table B3-8 & 40 CFR Part 261) [i]										
Arsenic	Y	N/A	N/A	N/A	N/A	D004	N/A	N/A	D004	N/A
Barium	Y	Unknown	N/A	N/A	N	D005	N/A	N/A	D005	N/A
Beryllium	N	N/A	N/A	N/A	N/A	N/A	N/A	P015	N	N/A
Cadmium	Y	Unknown	N/A	N/A	N	D006	N/A	N/A	D006	N/A
Chromium	Y	N/A	N/A	N/A	N/A	D007	N/A	N/A	D007	N/A
Lead	Y	Unknown	N/A	N/A	N	D008	N/A	N/A	D008	N/A
Mercury	Y	Unknown	N/A	N/A	N	D009	N/A	U151	D009	N/A
Selenium	Y	Unknown	N/A	N/A	N	D010	N/A	N/A	D010	N/A
Silver	Y	Unknown	N/A	N/A	N	D011	N/A	N/A	D011	N/A
Volatile Organic Compounds (CCP-PO-001 – Tables B3-2 and B3-4 & 40 CFR Part 261)										
1,1,1-Trichloroethane	Y	Unknown	Y	N	N	N/A	F001/F002	U226	F002	N/A
1,1,2,2-Tetrachloroethane	N	N/A	N/A	N/A	N/A	N/A	N/A	U209	N	N/A
1,1,2-Trichloro-1,2,2-trifluoroethane	N	N/A	N/A	N/A	N/A	N/A	F001/F002	N/A	N	N/A
1,1,2-Trichloroethane	Y	N/A	N/A	N/A	N/A	N/A	F002	U227 [k]	F002	N/A
1,1-Dichloroethane	N	N/A	N/A	N/A	N/A	N/A	N/A	U076 [k]	N	N/A
1,1-Dichloroethylene	N	N/A	N/A	N/A	N/A	D029	N/A	U078	N	N/A
1,2-Dichlorobenzene [d]	N	N/A	N/A	N/A	N/A	N/A	F002	U070	N	N/A
1,2-Dichloroethane	N	N/A	N/A	N/A	N/A	D028	N/A	U077 [k]	N	N/A
1,4-Dichlorobenzene [d]	N	N/A	N/A	N/A	N/A	D027	N/A	U072	N	N/A
2-Ethoxyethanol	N	N/A	N/A	N/A	N/A	N/A	F005	U359 [k]	N	N/A
2-Nitropropane	N	N/A	N/A	N/A	N/A	N/A	F005	U171 [k]	N	N/A
Acetone	Y	N/A	Y	N/A	N/A	N/A	F003	U002	N	N/A
Benzene	Y	Unknown	Y	N	N	D018	F005	U019	F005	N/A

Attachment 5 – Hazardous Constituents (continued)

Waste Stream Number:

Compound	Suspected Present? (Y/N)	Suspected Concen-tration (ppm)	Used as a solvent? [a] (Y/N/NA)	Associated with packaging? (Y/N/NA)	TC constituent concentration less than regulatory level? [a] (Y/N/NA)	TC Hazardous Waste Number [a]	F-Listed Hazardous Waste Number [a]	U- or P-Listed Hazardous Waste Number [a]	EPA Hazardous Waste Number Assigned (N/Specify HWN)	State Hazardous Waste Number [b]
Volatile Organic Compounds (continued)										
Bromoform	N	N/A	N/A	N/A	N/A	N/A	N/A	U225 [k]	N	N/A
Butanol (n-Butyl alcohol)	N	N/A	N/A	N/A	N/A	N/A	F003	U031 [k]	N	N/A
Carbon disulfide	N	N/A	N/A	N/A	N/A	N/A	F005	P022 [k]	N	N/A
Carbon tetrachloride	Y	Unknown	Y	N	N	D019	F001	U211 [k]	D019	N/A
Chlorobenzene	N	N/A	N/A	N/A	N/A	D021	F002	U037	N	N/A
Chloroform	N	N/A	N/A	N/A	N/A	D022	N/A	U044	N	N/A
cis-1,2-Dichloroethylene [c]	N	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N	N/A
Cyclohexanone	N	N/A	N/A	N/A	N/A	N/A	F003	U057 [k]	N	N/A
Ethyl acetate	N	N/A	N/A	N/A	N/A	N/A	F003	U112 [k]	N	N/A
Ethyl benzene	N	N/A	N/A	N/A	N/A	N/A	F003	N/A	N	N/A
Ethyl ether	N	N/A	N/A	N/A	N/A	N/A	F003	U117 [k]	N	N/A
Formaldehyde [g]	N	N/A	N/A	N/A	N/A	N/A	N/A	U122	N	N/A
Hydrazine [h]	Y	N/A	N/A	N/A	N/A	N/A	N/A	U133	N	N/A
Isobutanol	N	N/A	N/A	N/A	N/A	N/A	F005	U140 [k]	N	N/A
Methanol	Y	N/A	Y	N/A	N/A	N/A	F003	U154	N	N/A
Methyl ethyl ketone	N	N/A	N/A	N/A	N/A	D035	F005	U159	N	N/A
Methyl isobutyl ketone	Y	N/A	Y	N/A	N/A	N/A	F003	U161 [k]	N	N/A
Methylene chloride	N	N/A	N/A	N/A	N/A	N/A	F001/F002	U080 [k]	N	N/A
Pyridine [d]	N	N/A	N/A	N/A	N/A	D038	F005	U196	N	N/A
Tetrachloroethylene	N	N/A	N/A	N/A	N/A	D039	F001/F002	U210	N	N/A
Toluene	Y	Unknown	Y	N	N	N/A	F005	U220	F005	N/A
trans-1,2-Dichloroethylene	N	N/A	N/A	N/A	N/A	N/A	N/A	U079	N	N/A
Trichloroethylene	Y	Unknown	Y	N	N	D040	F001/F002	U228	F002	N/A
Trichlorofluoromethane	N	N/A	N/A	N/A	N/A	N/A	F001/F002	U121 [k]	N	N/A
Vinyl Chloride	N	N/A	N/A	N/A	N/A	D043	N/A	U043	N	N/A
Xylenes	Y	N/A	Y	N/A	N/A	N/A	F003	U239	N	N/A

Attachment 5 – Hazardous Constituents (continued)

Waste Stream Number:										
Compound	Suspected Present? (Y/N)	Suspected Concen-tration (ppm)	Used as a solvent? [a] (Y/N/NA)	Associated with packaging? (Y/N/NA)	TC constituent concentration less than regulatory level? [a] (Y/N/NA)	TC Hazardous Waste Number [a]	F-Listed Hazardous Waste Number [a]	U- or P-Listed Hazardous Waste Number [a]	EPA Hazardous Waste Number Assigned (N/Specify HWN)	State Hazardous Waste Number [b]
Semivolatile Organic Compounds (CCP-PO-001 – Table B3-6 & 40 CFR Part 261)										
2,4,5-Trichlorophenol	N	N/A	N/A	N/A	N/A	D041 [k]	F027 [k]	N/A	N	N/A
2,4,6-Trichlorophenol	N	N/A	N/A	N/A	N/A	D042 [k]	F027 [k]	N/A	N	N/A
2,4-Dinitrophenol	N	N/A	N/A	N/A	N/A	N/A	N/A	P048 [k]	N	N/A
2,4-Dinitrotoluene	N	N/A	N/A	N/A	N/A	D030	N/A	U105	N	N/A
Cresols	N	N/A	N/A	N/A	N/A	D026	F004	U052	N	N/A
Cresols (m)	N	N/A	N/A	N/A	N/A	D024 [k]	N/A	N/A	N	N/A
Cresols (o)	N	N/A	N/A	N/A	N/A	D023 [k]	N/A	N/A	N	N/A
Cresols (p)	N	N/A	N/A	N/A	N/A	D025 [k]	N/A	N/A	N	N/A
Hexachlorobenzene	N	N/A	N/A	N/A	N/A	D032	N/A	U127 [k]	N	N/A
Hexachlorobutadiene	N	N/A	N/A	N/A	N/A	D033	N/A	U128 [k]	N	N/A
Hexachloroethane	N	N/A	N/A	N/A	N/A	D034	N/A	U131 [k]	N	N/A
Nitrobenzene	N	N/A	N/A	N/A	N/A	D036	F004	U169 [k]	N	N/A
Pentachlorophenol	N	N/A	N/A	N/A	N/A	D037	F027 [k]	N/A	N	N/A
Pesticides and Herbicides (40 CFR Part 261)										
2,4,5-TP (Silvex)	N	N/A	N/A	N/A	N/A	D017 [k]	F027 [k]	N/A	N	N/A
2,4-D	N	N/A	N/A	N/A	N/A	D016 [k]	N/A	U240 [k]	N	N/A
Chlordane	N	N/A	N/A	N/A	N/A	D020 [k]	N/A	U036 [k]	N	N/A
Endrin	N	N/A	N/A	N/A	N/A	D012 [k]	N/A	P051 [k]	N	N/A
Heptachlor (and its epoxide)	N	N/A	N/A	N/A	N/A	D031 [k]	N/A	P059 [k]	N	N/A
Lindane	N	N/A	N/A	N/A	N/A	D013 [k]	N/A	U129 [k]	N	N/A
Methoxychlor	N	N/A	N/A	N/A	N/A	D014 [k]	N/A	U247 [k]	N	N/A
Toxaphene	N	N/A	N/A	N/A	N/A	D015 [k]	N/A	P123 [k]	N	N/A

Attachment 5 – Hazardous Constituents (continued)

Waste Stream Number:										
Compound	Suspected Present? (Y/N)	Suspected Concen-tration (ppm)	Used as a solvent? [a] (Y/N/NA)	Associated with packaging? (Y/N/NA)	TC constituent concentration less than regulatory level? [a] (Y/N/NA)	TC Hazardous Waste Number [a]	F-Listed Hazardous Waste Number [a]	U- or P-Listed Hazardous Waste Number [a]	EPA Hazardous Waste Number Assigned (N/Specify HWN)	State Hazardous Waste Number [b]
Other Constituents										
Wastewater treatment sludges from electroplating operations	N	N/A	N/A	N/A	N/A	N/A	F006	N/A	N	N/A
Spent cyanide plating bath solutions from electroplating operations	N	N/A	N/A	N/A	N/A	N/A	F007	N/A	N	N/A
Spent cyanides stripping and cleaning bath solutions from electroplating operations	N	N/A	N/A	N/A	N/A	N/A	F009	N/A	N	N/A
Total PCB Concentration [j]	N	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Additional EPA Hazardous Constituents (List)	N	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Note: If sampling homogeneous waste, identify all chemical constituents listed in tables B3-4, B3-6 and B3-8 of the WAP										
Additional State Hazardous Constituents [b] (List) [e]	N	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Potentially Flammable VOCs (List) [e,f]	N	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Tentatively Identified Compounds (List) [e]	N	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

Attachment 5 – Hazardous Constituents (continued)

Waste Stream Number:

a Source: Title 40 Code of Federal Regulations Part 261, Identification and Listing of Hazardous Waste
b. Source: Cite applicable state regulation
c. Source: CCP-PO-001, Transuranic Waste Characterization Quality Assurance Project Plan (QAPjP)
d. Can also be analyzed as a semivolatile organic compound
e. Add rows or attach additional sheets as necessary
f. Flammable VOCs included in the CH-TRAMPAC
g. Required only for homogeneous solids and soil/gravel from LANL and SRS
h. Required only for homogeneous solids and soil/gravel from ORNL and SRS
i. Antimony, nickel, thallium, vanadium, and zinc are included in Table B3-8 of CCP-PO-001 but are not regulated under 40 CFR Part 261, and therefore, are not subject to AK evaluation.
j. Source: Title 40 Code of Federal Regulations Part 761, Polychlorinated Biphenyls (PCBs) Manufacturing, Processing, Distribution in Commerce, and Use Prohibitions.
k. This EPA hazardous waste Number is not permitted for WIPP disposal.

NOTE: If any of the information requested on this form is not available or not applicable, enter N/A in the appropriate box.

Acceptable Knowledge Expert: Lisa Rice-Watson (Print) _____ (Sign) **Date:** 12/18/05

Attachment 2 - CCP Records Transmittal/Receiving Form

CCP Central Records / Records Custodian, 4021 National Parks Highway - MS: GSA 203, Carlsbad, New Mexico 88220

Telephone Number: 505-234-7523

Fax Number: 505-234-7014

☒ Original Record
☐ Fax Record
☐ E-mail Record

Attn:	Sheila Pearcy	From:	Lisa Price-Watson
Ship to:	CCP Central Records/ CCP Records Custodian	Site:	Oak Ridge National Laboratory
	4021 National Parks Highway - MS GSA 203, Carlsbad, NM 88220	Company:	LANL
		Telephone Number:	575-628-8946
Telephone Number:	575-234-7523	Date Sent:	9/3/08

Document Number	Title/Description	Record Date	Total Pages
N/A SH 11.04.08	Attachment 5 - Hazardous Constituents for OR-REDC-CH-HET, CCP-AK-ORNL-002	07/10/2008	5
NA	NA	NA	NA

Comments
None.

Acceptance/Rejection Signature and Date

Records Accepted ☑ Sonia Gonzalez (Signature) SONIA GONZALEZ (Printed Name) 11.04.08 (Date)

Records Rejected ☐ _____ (Signature) _____ (Printed Name) _____ (Date)

Reason for Rejection: N/H

Re-submittal: _____ (Signature) _____ (Printed Name) _____ (Date)

HP LaserJet *M2727nf MFP*

Fax Confirmation Report

HP LASERJET FAX

Nov-4-2008 9:05AM

Job	Date	Time	Type	Identification	Duration	Pages	Result
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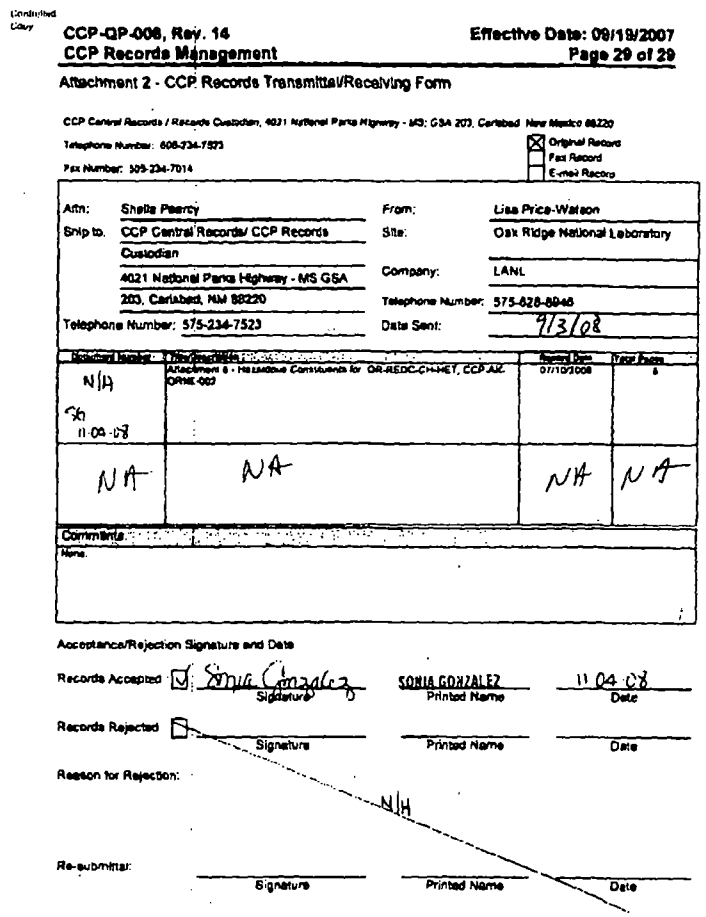

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CCP-QP-006, Rev. 14 **Effective Date: 09/19/2007**
CCP Records Management **Page 29 of 29**

Attachment 2 - CCP Records Transmittal/Receiving Form

CCP Central Records / Records Custodian, 4021 National Parks Highway - MS: GSA 203, Carlsbad New Mexico 88220
Telephone Number: 505-234-7573
Fax Number: 505-234-7014

☒ Original Record
☐ Fax Record
☐ E-mail Record

Attn:	Sheila Pearcy	From:	Lisa Price-Watson
Ship to:	CCP Central Records/ CCP Records Custodian	Site:	Oak Ridge National Laboratory
	4021 National Parks Highway - MS GSA 203, Carlsbad, NM 88220	Company:	LANL
		Telephone Number:	575-828-8946
Telephone Number:	575-234-7523	Date Sent:	9/3/08

Retrieval Number	Title/Description	Record Date	Total Pages
N/A SH 11-04-08	Attachment 6 - Hazardous Constituents for OR-REDC-CH-HET, CCP-AIL-ORNE-007	07/10/2008	6
NA	NA	NA	NA

Comments:
None.

Acceptance/Rejection Signature and Date

Records Accepted ☑ Sonia Gonzalez (Signature) SONIA GONZALEZ (Printed Name) 11 04 08 (Date)

Records Rejected ☐ (Signature) (Printed Name) (Date)

Reason for Rejection: N/A

Re-submittal: (Signature) (Printed Name) (Date)

Attachment 2 - CCP Records Transmittal/Receiving Form

CCP Central Records / Records Custodian, 4021 National Parks Highway - MS: GSA 203, Carlsbad, New Mexico 88220

Telephone Number: 505-234-7523

Fax Number: 505-234-7014

☒ Original Record
☐ Fax Record
☐ Electronic Record

Attn:	Sheila Pearcy	From:	Lisa Price-Eaton
Ship to:	CCP Central Records/ CCP Records Custodian	Site:	Oak Ridge National Laboratory
	4021 National Parks Highway - MS GSA 203, Carlsbad, NM 88220	Company:	Los Alamos National Laboratory
		Telephone Number:	575-628-3934
Telephone Number:	575-234-7523	Date Sent:	12/18/08

Document Number	Title/Description	Records Date	Total Pages
NA	Attachment 5 - Hazardous Constituents for OR-REDC-CH-HET, CCP-AK-ORNL-002 Library Set RH & CH 01/06/09	12/18/2008	5
NA	NA	NA	NA

Comments:

Please supercede the previous Attachment 5 for this waste stream.

Acceptance/Rejection Signature and Date

Records Accepted ☑	Signature	IANDE HERNANDEZ (Printed Name)	01/06/09 (Date)
Records Rejected ☐	Signature	Printed Name	Date

Reason for Rejection:

Re-submittal:

Signature	Printed Name	Date

HP LaserJet *M2727nf MFP*

Fax Confirmation Report

HP LASERJET FAX

Jan-6-2009 11:41AM

Job	Date	Time	Type	Identification	Duration	Pages	Result
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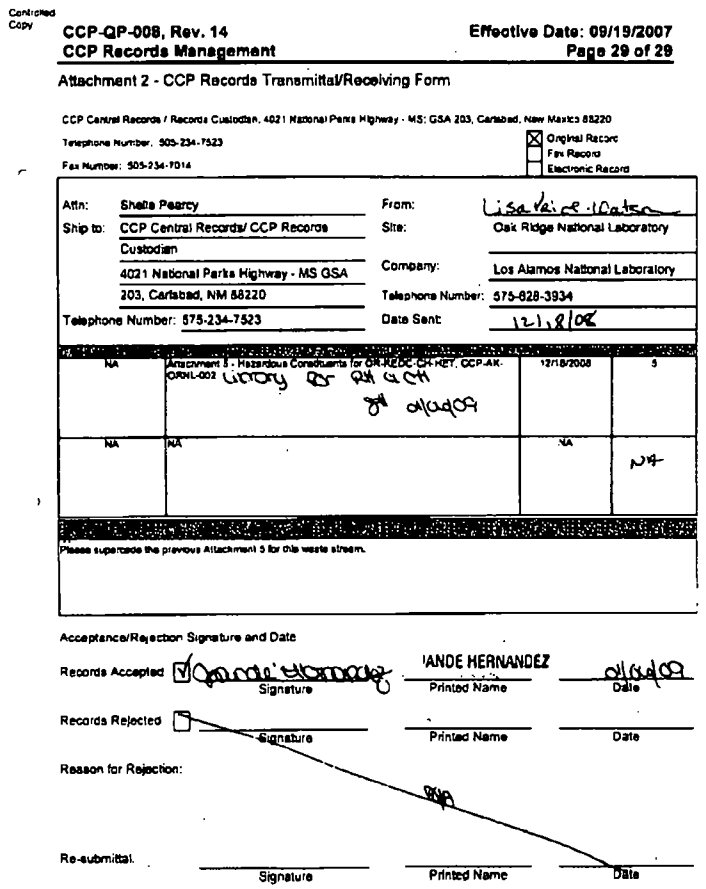

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CCP-QP-008, Rev. 14 **Effective Date: 09/19/2007**
CCP Records Management **Page 29 of 29**

Attachment 2 - CCP Records Transmittal/Receiving Form

CCP Central Records / Records Custodian, 4021 National Parks Highway - MS: GSA 203, Carlsbad, New Mexico 88220
Telephone Number: 505-234-7523
Fax Number: 505-234-7014

☒ Original Record
☐ Fax Record
☐ Electronic Record

Attn: Sheila Pearcy
Ship to: CCP Central Records/ CCP Records Custodian
4021 National Parks Highway - MS GSA 203, Carlsbad, NM 88220
Telephone Number: 575-234-7523

From: Lisa Price Cates
Site: Oak Ridge National Laboratory
Company: Los Alamos National Laboratory
Telephone Number: 575-828-3934
Date Sent: 12/18/08

NA	Attachment B - Hazardous Constituents for OR-RE/DC-CH-RET, CCP-AK-ORNL-002 Library Rev 9A & CH 9A 01/04/09	12/18/2008	5
NA	NA	NA	N/A

Please supersede the previous Attachment B for this waste stream.

Acceptance/Rejection Signature and Date

Records Accepted ☑ Signature: [signature] Printed Name: IANDE HERNANDEZ Date: 01/04/09

Records Rejected ☐ Signature: _____ Printed Name: _____ Date: _____

Reason for Rejection: N/A

Re-submittal Signature: _____ Printed Name: _____ Date: _____

DIVIDER PAGE

Attachment 5 – Hazardous Constituents – Example Form

Site(s): Oak Ridge National Laboratory (CCP-AK-ORNL-500)

Waste Stream Description: REDC RH Heterogeneous Debris Waste – OR-REDC-RH-HET

Waste Stream Number: ~~SR-REDC-RH-HET~~ REDC RH Heterogeneous Debris Waste - OR-REDC-RH-HET EJB 4/21/16

Compound	Suspected Present? (Y/N)	Used as a solvent? [a] (Y/N/NA)	Associated with packaging or radiolysis? (Y/N/NA)	TC constituent concentration less than regulatory level? [a] (Y/N/NA)	TC Hazardous Waste Number [a]	F-Listed Hazardous Waste Number [a]	U- or P-Listed Hazardous Waste Number [a]	EPA Hazardous Waste Number Assigned (N/Specify HWN)	State Hazardous Waste Number [b]
Toxicity Characteristics Metal Compounds (40 CFR Part 261)									
Arsenic	Y	N/A	N/A	N	D004	N/A	N/A	D004	N/A
Barium	Y	N/A	N/A	N	D005	N/A	N/A	D005	N/A
Cadmium	Y	N/A	N/A	N	D006	N/A	N/A	D006	N/A
Chromium	Y	N/A	N/A	N	D007	N/A	N/A	D007	N/A
Lead	Y	N/A	N/A	N	D008	N/A	N/A	D008	N/A
Mercury	Y	N/A	N/A	N	D009	N/A	U151	D009	N/A
Selenium	Y	N/A	N/A	N	D010	N/A	N/A	D010	N/A
Silver	Y	N/A	N/A	N	D011	N/A	N/A	D011	N/A
Volatile Organic Compounds (40 CFR Part 261)									
1,1,1-Trichloroethane	Y	Y	N	N/A	N/A	F001/F002	U226	F002	N/A
1,1,2,2-Tetrachloroethane	N	N/A	N/A	N/A	N/A	N/A	U209	N	N/A
1,1,2-Trichloro-1,2,2-trifluoroethane	N	N/A	N/A	N/A	N/A	F001/F002	N/A	N	N/A
1,1,2-Trichloroethane	Y	Y	N	N/A	N/A	F002	U227 [c]	F002	N/A
1,1-Dichloroethylene	N	N/A	N/A	N	D029	N/A	U078	N	N/A
1,2-Dichlorobenzene	N	N/A	N/A	N/A	N/A	F002	U070	N	N/A
1,2-Dichloroethane	N	N/A	N/A	N/A	D028	N/A	U077 [c]	N	N/A
1,4-Dichlorobenzene	N	N/A	N/A	N/A	D027	N/A	U072	N	N/A
1,4-Dioxane	N	N/A	N/A	N/A	N/A	N/A	U108	N	N/A
2-Ethoxyethanol	N	N/A	N/A	N/A	N/A	F005	U359 [c]	N	N/A
2-Nitropropane	N	N/A	N/A	N/A	N/A	F005	U171 [c]	N	N/A
Acetone	Y	N	N	N/A	N/A	F003	U002	N	N/A
Acetonitrile	N	N/A	N/A	N/A	N/A	N/A	U003	N	N/A
Benzene	Y	Y	N	N/A	D018	F005	U019	F005	N/A
Butanol (n-Butyl alcohol)	N	N/A	N/A	N/A	N/A	F003	U031 [c]	N	N/A
Carbon disulfide	N	N/A	N/A	N/A	N/A	F005	P022 [c]	N	N/A
Carbon tetrachloride	Y	Y	N (F001)	N	D019	F001	U211 [c]	D019	N/A

CCP RECORDS ORIGINAL
DATE REC'D 5/14/15 JN

Attachment 5 – Hazardous Constituents – Example Form (Continued)

Waste Stream Number: OR-REDC-RH-HET									
Compound	Suspected Present? (Y/N)	Used as a solvent? [a] (Y/N/NA)	Associated with packaging or radiolysis? (Y/N/NA)	TC constituent concentration less than regulatory level? [a] (Y/N/NA)	TC Hazardous Waste Number [a]	F-Listed Hazardous Waste Number [a]	U- or P-Listed Hazardous Waste Number [a]	EPA Hazardous Waste Number Assigned (N/Specify HWN)	State Hazardous Waste Number [b]
Volatile Organic Compounds (continued)									
Chlorobenzene	N	N/A	N/A	N/A	D021	F002	U037	N	N/A
Chloroform	N	N/A	N/A	N/A	D022	N/A	U044	N	N/A
Cyclohexanone	N	N/A	N/A	N/A	N/A	F003	U057 [c]	N	N/A
Ethyl acetate	N	N/A	N/A	N/A	N/A	F003	U112 [c]	N	N/A
Ethyl benzene	N	N/A	N/A	N/A	N/A	F003	N/A	N	N/A
Ethyl ether	N	N/A	N/A	N/A	N/A	F003	U117 [c]	N	N/A
Formaldehyde	N	N/A	N/A	N/A	N/A	N/A	U122	N	N/A
Hydrazine	Y	Y	N	N/A	N/A	N/A	U133	N	N/A
Isobutanol	N	N/A	N/A	N/A	N/A	F005	U140 [c]	N	N/A
Methanol	Y	Y	N	N/A	N/A	F003	U154	N	N/A
Methyl ethyl ketone	N	N/A	N/A	N/A	D035	F005	U159	N	N/A
Methyl isobutyl ketone	Y	Y	N	N/A	N/A	F003	U161 [c]	N	N/A
Methylene chloride	N	N/A	N/A	N/A	N/A	F001/F002	U080 [c]	N	N/A
Pyridine	N	N/A	N/A	N/A	D038	F005	U196	N	N/A
Tetrachloroethylene	N	N/A	N/A	N/A	D039	F001/F002	U210	N	N/A
Toluene	Y	Y	N	N/A	N/A	F005	U220	F005	N/A
trans-1,2-Dichloroethylene	N	N/A	N/A	N/A	N/A	N/A	U079	N	N/A
Trichloroethylene	Y	Y	N	N/A	D040	F001/F002	U228	F002	N/A
Trichlorofluoromethane	N	N/A	N/A	N/A	N/A	F001/F002	U121 [c]	N	N/A
Vinyl Chloride	N	N/A	N/A	N/A	D043	N/A	U043	N	N/A
Xylenes	Y	Y	N	N/A	N/A	F003	U239	N	N/A
Semivolatile Organic Compounds (40 CFR Part 261)									
2,4-Dinitrotoluene	N	N/A	N/A	N/A	D030	N/A	U105	N	N/A
Cresols	N	N/A	N/A	N/A	D026	F004	U052	N	N/A
Dimethyl sulfate	N	N/A	N/A	N/A	N/A	N/A	U103	N	N/A
Hexachlorobenzene	N	N/A	N/A	N/A	D032	N/A	U127 [c]	N	N/A
Hexachlorobutadiene	N	N/A	N/A	N/A	D033	N/A	U128 [c]	N	N/A
Hexachloroethane	N	N/A	N/A	N/A	D034	N/A	U131 [c]	N	N/A
Nitrobenzene	N	N/A	N/A	N/A	D036	F004	U169 [c]	N	N/A
Pentachlorophenol	N	N/A	N/A	N/A	D037	F027 [c]	N/A	N	N/A

Attachment 5 – Hazardous Constituents – Example Form (Continued)

Waste Stream Number: OR-REDC-RH-HET									
Compound	Suspected Present? (Y/N)	Used as a solvent? [a] (Y/N/NA)	Associated with packaging or radiolysis? (Y/N/NA)	TC constituent concentration less than regulatory level? [a] (Y/N/NA)	TC Hazardous Waste Number [a]	F-Listed Hazardous Waste Number [a]	U- or P-Listed Hazardous Waste Number [a]	EPA Hazardous Waste Number Assigned (N/Specify HWN)	State Hazardous Waste Number [b]
Other Constituents									
Wastewater treatment sludges from electroplating operations	N	N/A	N/A	N/A	N/A	F006	N/A	N/A	N/A
Spent cyanide plating bath solutions from electroplating operations	N	N/A	N/A	N/A	N/A	F007	N/A	N/A	N/A
Spent cyanides stripping and cleaning bath solutions from electroplating operations	N	N/A	N/A	N/A	N/A	F009	N/A	N/A	N/A
Beryllium	Y-<1% wt.	N/A	N/A	N/A	N/A	N/A	P015	N	N/A
Cyanide (soluble cyanide salts)	N	N/A	N/A	N/A	N/A	N/A	P030	N/A	N/A
Potassium cyanide	N	N/A	N/A	N/A	N/A	N/A	P098	N/A	N/A
Potassium silver cyanide	N	N/A	N/A	N/A	N/A	N/A	P099	N/A	N/A
Sodium Cyanide	N	N/A	N/A	N/A	N/A	N/A	P106	N/A	N/A
Vanadium pentoxide	N	N/A	N/A	N/A	N/A	N/A	P120	N/A	N/A
Hydrofluoric acid	N	N/A	N/A	N/A	N/A	N/A	U134	N/A	N/A
Total PCB Concentration [d] (may be present in pumps and capacitors)	Y	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Additional EPA Hazardous Constituents (List)	N	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Additional State Hazardous Constituents [b] (List) [e]	N	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

Attachment 5 – Hazardous Constituents – Example Form (Continued)

Waste Stream Number: OR-REDC-RH-HET									
Potentially Flammable VOCs (List) [e,f] Acetone Benzene Methanol Methyl isobutyl ketone Toluene Xylenes	Y	Unkown	N/A	N/A	N/A	N/A	N/A	N/A	N/A

a Source: Title 40 Code of Federal Regulations Part 261, Identification and Listing of Hazardous Waste
b. Source: Cite applicable state regulation
c. This EPA Hazardous Waste Number is not permitted for WIPP disposal.
d. Source: Title 40 Code of Federal Regulations Part 761, Polychlorinated Biphenyls (PCBs) Manufacturing, Processing, Distribution in Commerce, and Use Prohibitions.
e. Add rows or attach additional sheets as necessary
f. Flammable VOCs included in the CH-TRAMPAC

NOTE: If any of the information requested on this form is not available or not applicable, enter N/A in the appropriate box.

Acceptable Knowledge Expert: Kevin J. Peters / _____ Date: 05/07/2015
Print Sign

Attachment 6 – Waste Form, Waste Material Parameters, Prohibited Items, and Packaging Page 1 of 2

Site(s): Oak Ridge National Laboratory

Waste Stream Description: Contaminated soil from Nuclear Fuel Services, Inc.

Container ID Numbers: See CCP-TP-005, Attachment 8 for containers in this waste stream

Waste Stream Number: OR-NFS-CH-SOIL	
Physical Waste Form (e.g., debris, solidified waste)	Soil
Summary Category Group [a]	S4000
Waste Matrix Code Group [a]	Soils
Waste Matrix Code [b]	S4100
Waste Material Parameter Weights [c]	Estimated Waste Stream Weight Percent Average (attach evaluation justifying percentages)
Iron-based metals/alloys	0%
Aluminum-based metals/alloys	<0.1%
Other metals	0%
Other inorganic materials	0.1%
Cellulosics	<0.1%
Rubber	0.2%
Plastics (waste materials)	0%
Organic matrix	2.0%
Inorganic matrix	0.4%
Soils/Gravels	97.3%
Packaging Materials	Present (Y/N)?
Steel	Y
Plastics	Y
Prohibited Wastes [d,e,f,g]	Present (Y/N)?
Observable liquid shall be no more than 1 percent by volume of the outermost container at the time of RTR or VE. Observable liquid shall be no more than 60 milliliters or 3 percent by volume, whichever is greater, in an internal container. Observable liquid shall not be present in a container with EPA HWN U134 assigned.	Y
Non-radionuclide pyrophoric materials	N
Sealed containers > 4 liters	N
Hazardous waste not occurring as co-contaminants with TRU mixed waste (non-mixed hazardous waste)	N

NTPC RECORDS ORIGINAL
DATE REC'D 1/16/14 BP

Attachment 6 – Waste Form, Waste Material Parameters, Prohibited Items, and Packaging (continued)

Waste Stream Number: OR-NFS-CH-SOIL	
Explosives	N
Compressed gases	N
Residual hydrofluoric acid (if U134 assigned to stream)	N
Residual PCB liquids [j]	N
Ignitables (EPA Hazardous Waste Number D001)	N
Corrosives (EPA Hazardous Waste Number D002)	N
Reactives (EPA Hazardous Waste Number D003)	N
Waste incompatible with backfill, seal and panel closure materials, container and packaging materials, shipping container materials, or other wastes [h]	N
Spent Nuclear fuel or high-level waste [i]	N
Any un-vented plastic bags > 4 liters that have been heat-sealed	N
Additional Information (if available)	N
Packaging	
Waste container type?	55-gallon drums
Liner type?	90-mil high-density polyethylene liners with or without liner lids and/or polyethylene drum liner bags
Is liner punctured?	Y (3/8-in. vent hole)
Is filter vent installed?	Y
Maximum number of confinement layers	2

a. Source: *CCP Transuranic Waste Characterization Quality Assurance Project Plan* (CCP-PO-001) Introduction.
b. Source: *Transuranic Waste Baseline Inventory Report* (DOE/CAO-95-1121) or DOE Waste Treatability Group Guidance (DOE/LLW-217). Note: the waste matrix code should not be assigned at the summary category group level.
c. Source: CCP-PO-001 – Table C3-1. Attach the Waste Material Parameter Evaluation Memorandum used to estimate values include in this Table (see Section 4.4.27).
d. Source: CCP-PO-001 – Section C-1c
e. Source: *Transuranic Waste Acceptance Criteria for the Waste Isolation Pilot Plant* (WAC)(DOE/WIPP-02-3122), Section 3
f. Source: *TRUPACT-II Content Codes* (TRUCON) (DOE/WIPP 89-004)
g. Source: *TRUPACT-II Authorized Methods for Payload Control (TRAMPAC), Nuclear Waste Partnership,* LLC
h. This waste has been approved for disposal at the WIPP by the Permittee as documented by Appendix C1 of the WIPP RCRA Part B Permit Application and the Permittee's approval and assignment of the applicable TRUCON Codes for this waste stream.
i. Source: *Nuclear Waste Policy Act of 1982* (42 U.S.C. 10101)
j. Source: Polychlorinated Biphenyls (PCBs) manufacturing, Processing, Distribution and Commerce, and Use Prohibitions (40 CFR 761)

Acceptable Knowledge Expert: Jeff Harrison / Jeff Harrison Date: 1/16/2014
Print Sign

DIVIDER PAGE ONLY

NOT PART OF PAGE COUNT

Memorandum

To: CCP Records

From: Jeff Harrison, CCP AKE

Date: January 16, 2014

RE: Waste Material Parameter Analysis for Waste Stream OR-NFS-CH-SOIL, Nuclear Fuel Services Contact-Handled Transuranic Soil Stored at Oak Ridge National Laboratory, Revision 3

In accordance to *CCP Acceptable Knowledge Documentation*, CCP-TP-005, Revision 26, Section 4.4.26, Waste Material Parameters (WMP) shall be estimated on a weight percent basis for the waste stream, documenting the assumptions and justification for deriving the estimated WMP.

Waste stream OR-NFS-CH-SOIL is comprised of soil, rock, and gravel mixed with absorbent. Building 234 was underlain by sandy clay ranging in thickness from a few feet up to approximately 30 feet and clay mixed with gravel and rock (Reference P248). The soil was mixed with RADSORB absorbent powder which is a cross-linked homopolymer. Each drum contains 10 pounds of RADSORB (References M011, P315). A RADPAD absorbent pad (cellulosic laminate containing an organic polymer) was placed on top of the soil (References M011, U058). During the mixing process, the texture of the soils was changed to a semi-course to fine sand consistency (Reference U055).

Most of the soil (512 drums) was generated in the early-1990s. The waste disposal forms completed by NFS for these drums include a "TRU Waste Data Package" that has the gross weight and tare weight of each drum. The tare weight for these drums is 81 lbs. It is assumed that this tare weight includes the weight of the steel drum and 90-mil rigid liner which are not figured into the waste material parameter weights. The remaining soil (17 drums) was generated in 2001. The waste disposal forms completed by NFS for these drums include a "Radwaste Package Certification Record" that has the gross weight and tare weight of each drum (Reference M003). The tare weight for these drums is 58 lbs. It is assumed that this tare weight includes the weight of the steel drum (these drums do not contain 90-mil rigid liners). The net weight (gross minus tare) is assumed to be the plastic drum liner bag, RADSORB powder, RADPAD, and soil. A weight of 1.1 lbs (0.5 kg) is assigned to the plastic drum liner bag based on CCP-TP-053, CCP Standard Real-Time Radiography (RTR) Inspection Procedure. The weight of the RADSORB powder in each drum is assumed to be 10 lbs. (see previous paragraph). The weight of the RADPAD is 0.08 lbs. based on product information (Reference M011). The remaining weight is assumed to be soil.

Because the RADSORB absorbent powder is an organic polymer, it will be considered "organic matrix." RADPADS are cellulosic laminate containing an organic polymer and will be considered "cellulosics." The soil/absorbent mixture is contained in a plastic drum liner bag that is considered part of the waste and will be assigned to "plastic (waste materials)." This information combined with the weight of the waste from the waste disposal forms was used to

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estimate waste material parameter weight percentages as shown in the table below. Drum-specific data are included in Attachment 1.

Waste Stream OR-NFS-CH-SOIL Waste Material Parameters

Waste Material Parameter	Weight Percent	Weight Percent Range
Al based Metals/Alloys	0%	0%
Fe Based Metals/Alloys	0%	0%
Other Metals/Alloys	0%	0%
Other Inorganic Materials	0%	0%
Cellulosics	0.02%	0.01% – 0.11%
Plastics (waste materials)	0.2%	0.1 – 1.5%
Rubber	0%	0%
Organic Matrix	2.0%	1.5 – 13.6% [1,2]
Inorganic Matrix	0%	0%
Soils/Gravel	97.7%	84.9 – 98.3%

Notes:

1. Since RTR cannot distinguish the soil from the absorbent, and soil is the predominant waste material parameter, RTR will assign "Soils/Gravel" to the soil/absorbent mixture.
2. The 13.6% organic matrix is due to a single drum (X10C0506047) that has a reported net weight of only 74 pounds which is much lighter than most of the drums in this waste stream. It is assumed that each of the soil drums, including this one, contain 10 pounds of absorbent.

The waste description on the TWPC repackaging forms also includes concrete, but these forms have no estimated weight of the concrete (M075, M128). CCP has certified 517 drums of soil in 11 shipping lots, including several drums that are identified as containing concrete. In addition to concrete, a review of the RTR data for these 517 drums also identified small amounts of iron-based metal, including reinforcement wire, nuts, bolts, pipe, fittings, and scrap metal. Based on the RTR data, the waste material parameter weight estimates will be revised as shown below. The RTR data and calculations are provided in Attachment 2.

The soil packaged in boxes was removed from the original box and packaged into new drums in the TWPC BBA with layers of Solid-A-Sorb (diatomaceous earth) absorbent. A half bag of absorbent (12.5 pounds) was added to the bottom of the empty drum. Soil was shoveled into a 5-gallon bucket and then dumped into the drum. Another half bag of absorbent was added and these steps were repeated until the drum was about 90 percent full. This equates to approximately 75 pounds of absorbent in each drum (Reference M210). The Soli-A-Sorb will absorb water from the soil and is considered "inorganic matrix;" however, RTR may not be able to distinguish between the soil and the absorbent. Fifteen boxes were identified on the AKTSS that were packaged in this manner. Attachment 1 and the table below have been revised to include data for these 15 boxes.

These percentages do not take into account the projected volume of soil to be generated during the final phase of decommissioning which began in 2011 and will continue through Fiscal Year 2018. The soil generated during the final phase of decommissioning is excavated in batches of 154 ft^3 and mixed with 700 to 800 pounds of an organic polymer absorbent (750 pounds equals 20 ft^3). Assuming 50 gallons of waste is placed into the rigid liner, the mixture of

soil and absorbent comprises 40 gallons with 11.5 percent by volume being absorbent (equivalent to about 23 lbs) plus an additional 10 gallons (about 50 pounds) of absorbent on top of the soil. Therefore, the total weight of absorbent per drum is approximately 73 pounds (References C321, P1400, P1402). Based on the average net weight (491.61 lbs) of the soil from the initial decommissioning phase (see Attachment 1), the absorbent would be 12.93 Wt% (73/[73+491.61]x100=12.93%). Therefore it is assumed that the absorbent will be between 10 and 15 Wt% per drum.

Waste Stream OR-NFS-CH-SOIL Waste Material Parameters - Revised

Waste Material Parameter	Weight Percent	Weight Percent Range
Aluminum-based Metal/Alloy	0%	0%
Iron-based Metal/Alloy	<0.1%	0% – 1.3%
Other Metals/Alloy	0%	0%
Other Inorganic Materials	0.1%	0% – 23.2%
Cellulosics	<0.1%	0% – 0.3%
Plastics (waste materials)	0.2%	0% – 9.2% [2]
Rubber	0%	0%
Organic Matrix	2.0%	1.5% – 15.0% [3]
Inorganic Matrix	0.4% [4]	0% – 26.4%
Soils/Gravel	97.3%	73.7% – 100% [1]

1. Since RTR cannot distinguish the soil from the absorbent, and soil is the predominant waste material parameter, RTR will assign "Soils/Gravel" to the soil/absorbent mixture.
2. The 9.2% plastic is due to a single drum (X10C0506047) that has a reported net weight of only 74 pounds which is much lighter than most of the drums in this waste stream.
3. The Wt% range was expanded based on the amount of absorbent expected in soil from the final phase of decommissioning.
4. The Solid-A-Sorb used for repackaging of soil boxes is a minor component of the overall waste stream and is expected to be <0.1% once the additional 4,300 drums are included.

Attachment 1

Waste Material Parameter Weight Evaluation for Waste Stream OR-NFS-CH-SOIL

Based on Original Generator Container Paperwork

Container ID	Gross Wt (lbs)	Tare Wt (lbs)	Net Wt (lbs)	Drum Liner Bag Wt (lbs)	RADPAD Wt (lbs)	Solid-A-Sorb Wt (lbs)	RADSORB Wt (lbs)	Soil Wt (lbs)	Plastic Wt%	Cellulosic Wt%	Inorganic Matrix Wt%	Organic Matrix Wt%	Soil Wt%
NFS-0103	519	81	438	1.1	0.08	0.00	10	426.80	0.25%	0.02%	0.00%	2.28%	97.45%
NFS-0104	599	81	518	1.1	0.08	0.00	10	506.81	0.21%	0.02%	0.00%	1.93%	97.84%
NFS-0105	556	81	475	1.1	0.08	0.00	10	463.82	0.23%	0.02%	0.00%	2.11%	97.65%
NFS-0106	563	81	482	1.1	0.08	0.00	10	470.81	0.23%	0.02%	0.00%	2.07%	97.68%
NFS-0108	608	81	527	1.1	0.08	0.00	10	515.80	0.21%	0.02%	0.00%	1.90%	97.88%
NFS-0109	573	81	492	1.1	0.08	0.00	10	480.82	0.22%	0.02%	0.00%	2.03%	97.73%
NFS-0110	593	81	512	1.1	0.08	0.00	10	500.81	0.21%	0.02%	0.00%	1.95%	97.82%
NFS-0111	610	81	529	1.1	0.08	0.00	10	517.81	0.21%	0.02%	0.00%	1.89%	97.89%
NFS-0112	591	81	510	1.1	0.08	0.00	10	498.81	0.22%	0.02%	0.00%	1.96%	97.81%
NFS-0118	609	81	528	1.1	0.08	0.00	10	516.82	0.21%	0.02%	0.00%	1.89%	97.88%
NFS-0119	590	81	509	1.1	0.08	0.00	10	497.82	0.22%	0.02%	0.00%	1.96%	97.80%
NFS-0120	599	81	518	1.1	0.08	0.00	10	506.81	0.21%	0.02%	0.00%	1.93%	97.84%
NFS-0121	653	81	572	1.1	0.08	0.00	10	560.82	0.19%	0.01%	0.00%	1.75%	98.05%
NFS-0122	614	81	533	1.1	0.08	0.00	10	521.82	0.21%	0.02%	0.00%	1.88%	97.90%
NFS-0123	679	81	598	1.1	0.08	0.00	10	586.81	0.18%	0.01%	0.00%	1.67%	98.13%
NFS-0124	589	81	508	1.1	0.08	0.00	10	496.82	0.22%	0.02%	0.00%	1.97%	97.80%
NFS-0125	617	81	536	1.1	0.08	0.00	10	524.82	0.21%	0.01%	0.00%	1.87%	97.91%
NFS-0126	642	81	561	1.1	0.08	0.00	10	549.82	0.20%	0.01%	0.00%	1.78%	98.01%
NFS-0127	558	81	477	1.1	0.08	0.00	10	465.80	0.23%	0.02%	0.00%	2.10%	97.66%
NFS-0128	587	81	506	1.1	0.08	0.00	10	494.82	0.22%	0.02%	0.00%	1.98%	97.79%
NFS-0129	638	81	557	1.1	0.08	0.00	10	545.81	0.20%	0.01%	0.00%	1.80%	97.99%
NFS-0130	605	81	524	1.1	0.08	0.00	10	512.81	0.21%	0.02%	0.00%	1.91%	97.87%
NFS-0131	544	81	463	1.1	0.08	0.00	10	451.81	0.24%	0.02%	0.00%	2.16%	97.59%
NFS-0132	619	81	538	1.1	0.08	0.00	10	526.81	0.20%	0.01%	0.00%	1.86%	97.92%
NFS-0133	598	81	517	1.1	0.08	0.00	10	505.82	0.21%	0.02%	0.00%	1.93%	97.84%
NFS-0134	621	81	540	1.1	0.08	0.00	10	528.81	0.20%	0.01%	0.00%	1.85%	97.93%
NFS-0135	590	81	509	1.1	0.08	0.00	10	497.82	0.22%	0.02%	0.00%	1.96%	97.80%
NFS-0136	638	81	557	1.1	0.08	0.00	10	545.81	0.20%	0.01%	0.00%	1.80%	97.99%
NFS-0137	628	81	547	1.1	0.08	0.00	10	535.82	0.20%	0.01%	0.00%	1.83%	97.96%
NFS-0138	635	81	554	1.1	0.08	0.00	10	542.81	0.20%	0.01%	0.00%	1.81%	97.98%
NFS-0139	612	81	531	1.1	0.08	0.00	10	519.82	0.21%	0.02%	0.00%	1.88%	97.89%
NFS-0140	565	81	484	1.1	0.08	0.00	10	472.81	0.23%	0.02%	0.00%	2.07%	97.69%
NFS-0141	615	81	534	1.1	0.08	0.00	10	522.82	0.21%	0.01%	0.00%	1.87%	97.91%
NFS-0142	613	81	532	1.1	0.08	0.00	10	520.81	0.21%	0.02%	0.00%	1.88%	97.90%
NFS-0143	610	81	529	1.1	0.08	0.00	10	517.81	0.21%	0.02%	0.00%	1.89%	97.89%
NFS-0144	605	81	524	1.1	0.08	0.00	10	512.81	0.21%	0.02%	0.00%	1.91%	97.87%
NFS-0145	618	81	537	1.1	0.08	0.00	10	525.81	0.20%	0.01%	0.00%	1.86%	97.92%
NFS-0146	643	81	562	1.1	0.08	0.00	10	550.81	0.20%	0.01%	0.00%	1.78%	98.01%
NFS-0147	608	81	527	1.1	0.08	0.00	10	515.80	0.21%	0.02%	0.00%	1.90%	97.88%
NFS-0152	620	81	539	1.1	0.08	0.00	10	527.82	0.20%	0.01%	0.00%	1.86%	97.93%
NFS-0153	627	81	546	1.1	0.08	0.00	10	534.81	0.20%	0.01%	0.00%	1.83%	97.95%
NFS-0154	615	81	534	1.1	0.08	0.00	10	522.82	0.21%	0.01%	0.00%	1.87%	97.91%
NFS-0155	626	81	545	1.1	0.08	0.00	10	533.82	0.20%	0.01%	0.00%	1.83%	97.95%
NFS-0156	604	81	523	1.1	0.08	0.00	10	511.81	0.21%	0.02%	0.00%	1.91%	97.86%
NFS-0157	586	81	505	1.1	0.08	0.00	10	493.82	0.22%	0.02%	0.00%	1.98%	97.79%
NFS-0158	603	81	522	1.1	0.08	0.00	10	510.82	0.21%	0.02%	0.00%	1.92%	97.86%
NFS-0159	569	81	488	1.1	0.08	0.00	10	476.81	0.23%	0.02%	0.00%	2.05%	97.71%
NFS-0160	597	81	516	1.1	0.08	0.00	10	504.80	0.21%	0.02%	0.00%	1.94%	97.83%
NFS-0161	586	81	505	1.1	0.08	0.00	10	493.82	0.22%	0.02%	0.00%	1.98%	97.79%
NFS-0162	614	81	533	1.1	0.08	0.00	10	521.82	0.21%	0.02%	0.00%	1.88%	97.90%
NFS-0163	631	81	550	1.1	0.08	0.00	10	538.82	0.20%	0.01%	0.00%	1.82%	97.97%

Attachment 1

Waste Material Parameter Weight Evaluation for Waste Stream OR-NFS-CH-SOIL

Based on Original Generator Container Paperwork

Container ID	Gross Wt (lbs)	Tare Wt (lbs)	Net Wt (lbs)	Drum Liner Bag Wt (lbs)	RADPAD Wt (lbs)	Solid-A-Sorb Wt (lbs)	RADSORB Wt (lbs)	Soil Wt (lbs)	Plastic Wt%	Cellulosic Wt%	Inorganic Matrix Wt%	Organic Matrix Wt%	Soil Wt%
NFS-0164	583	81	502	1.1	0.08	0.00	10	490.80	0.22%	0.02%	0.00%	1.99%	97.77%
NFS-0165	545	81	464	1.1	0.08	0.00	10	452.82	0.24%	0.02%	0.00%	2.16%	97.59%
NFS-0166	601	81	520	1.1	0.08	0.00	10	508.82	0.21%	0.02%	0.00%	1.92%	97.85%
NFS-0167	608	81	527	1.1	0.08	0.00	10	515.80	0.21%	0.02%	0.00%	1.90%	97.88%
NFS-0168	564	81	483	1.1	0.08	0.00	10	471.82	0.23%	0.02%	0.00%	2.07%	97.69%
NFS-0169	591	81	510	1.1	0.08	0.00	10	498.81	0.22%	0.02%	0.00%	1.96%	97.81%
NFS-0170	561	81	480	1.1	0.08	0.00	10	468.82	0.23%	0.02%	0.00%	2.08%	97.67%
NFS-0171	555	81	474	1.1	0.08	0.00	10	462.81	0.23%	0.02%	0.00%	2.11%	97.64%
NFS-0172	556	81	475	1.1	0.08	0.00	10	463.82	0.23%	0.02%	0.00%	2.11%	97.65%
NFS-0173	541	81	460	1.1	0.08	0.00	10	448.81	0.24%	0.02%	0.00%	2.17%	97.57%
NFS-0174	554	81	473	1.1	0.08	0.00	10	461.81	0.23%	0.02%	0.00%	2.11%	97.64%
NFS-0175	584	81	503	1.1	0.08	0.00	10	491.82	0.22%	0.02%	0.00%	1.99%	97.78%
NFS-0176	573	81	492	1.1	0.08	0.00	10	480.82	0.22%	0.02%	0.00%	2.03%	97.73%
NFS-0177	559	81	478	1.1	0.08	0.00	10	466.82	0.23%	0.02%	0.00%	2.09%	97.66%
NFS-0178	593	81	512	1.1	0.08	0.00	10	500.81	0.21%	0.02%	0.00%	1.95%	97.82%
NFS-0179	533	81	452	1.1	0.08	0.00	10	440.80	0.24%	0.02%	0.00%	2.21%	97.53%
NFS-0180	624	81	543	1.1	0.08	0.00	10	531.81	0.20%	0.01%	0.00%	1.84%	97.94%
NFS-0181	608	81	527	1.1	0.08	0.00	10	515.80	0.21%	0.02%	0.00%	1.90%	97.88%
NFS-0183	562	81	481	1.1	0.08	0.00	10	469.82	0.23%	0.02%	0.00%	2.08%	97.68%
NFS-0184	613	81	532	1.1	0.08	0.00	10	520.81	0.21%	0.02%	0.00%	1.88%	97.90%
NFS-0185	560	81	479	1.1	0.08	0.00	10	467.81	0.23%	0.02%	0.00%	2.09%	97.67%
NFS-0186	623	81	542	1.1	0.08	0.00	10	530.82	0.20%	0.01%	0.00%	1.85%	97.94%
NFS-0187	557	81	476	1.1	0.08	0.00	10	464.81	0.23%	0.02%	0.00%	2.10%	97.65%
NFS-0188	620	81	539	1.1	0.08	0.00	10	527.82	0.20%	0.01%	0.00%	1.86%	97.93%
NFS-0189	565	81	484	1.1	0.08	0.00	10	472.81	0.23%	0.02%	0.00%	2.07%	97.69%
NFS-0190	602	81	521	1.1	0.08	0.00	10	509.81	0.21%	0.02%	0.00%	1.92%	97.85%
NFS-0191	590	81	509	1.1	0.08	0.00	10	497.82	0.22%	0.02%	0.00%	1.96%	97.80%
NFS-0192	538	81	457	1.1	0.08	0.00	10	445.81	0.24%	0.02%	0.00%	2.19%	97.55%
NFS-0193	572	81	491	1.1	0.08	0.00	10	479.80	0.22%	0.02%	0.00%	2.04%	97.72%
NFS-0194	585	81	504	1.1	0.08	0.00	10	492.81	0.22%	0.02%	0.00%	1.98%	97.78%
NFS-0195	647	81	566	1.1	0.08	0.00	10	554.80	0.19%	0.01%	0.00%	1.77%	98.02%
NFS-0196	557	81	476	1.1	0.08	0.00	10	464.81	0.23%	0.02%	0.00%	2.10%	97.65%
NFS-0197	528	81	447	1.1	0.08	0.00	10	435.82	0.25%	0.02%	0.00%	2.24%	97.50%
NFS-0198	547	81	466	1.1	0.08	0.00	10	454.83	0.24%	0.02%	0.00%	2.15%	97.60%
NFS-0199	552	81	471	1.1	0.08	0.00	10	459.81	0.23%	0.02%	0.00%	2.12%	97.63%
NFS-0200	592	81	511	1.1	0.08	0.00	10	499.82	0.22%	0.02%	0.00%	1.96%	97.81%
NFS-0201	586	81	505	1.1	0.08	0.00	10	493.82	0.22%	0.02%	0.00%	1.98%	97.79%
NFS-0202	603	81	522	1.1	0.08	0.00	10	510.82	0.21%	0.02%	0.00%	1.92%	97.86%
NFS-0203	575	81	494	1.1	0.08	0.00	10	482.82	0.22%	0.02%	0.00%	2.02%	97.74%
NFS-0204	562	81	481	1.1	0.08	0.00	10	469.82	0.23%	0.02%	0.00%	2.08%	97.68%
NFS-0205	570	81	489	1.1	0.08	0.00	10	477.82	0.22%	0.02%	0.00%	2.04%	97.71%
NFS-0206	627	81	546	1.1	0.08	0.00	10	534.81	0.20%	0.01%	0.00%	1.83%	97.95%
NFS-0207	622	81	541	1.1	0.08	0.00	10	529.80	0.20%	0.01%	0.00%	1.85%	97.93%
NFS-0208	575	81	494	1.1	0.08	0.00	10	482.82	0.22%	0.02%	0.00%	2.02%	97.74%
NFS-0209	603	81	522	1.1	0.08	0.00	10	510.82	0.21%	0.02%	0.00%	1.92%	97.86%
NFS-0210	600	81	519	1.1	0.08	0.00	10	507.82	0.21%	0.02%	0.00%	1.93%	97.85%
NFS-0211	549	81	468	1.1	0.08	0.00	10	456.81	0.24%	0.02%	0.00%	2.14%	97.61%
NFS-0212	619	81	538	1.1	0.08	0.00	10	526.81	0.20%	0.01%	0.00%	1.86%	97.92%
NFS-0213	555	81	474	1.1	0.08	0.00	10	462.81	0.23%	0.02%	0.00%	2.11%	97.64%
NFS-0214	634	81	553	1.1	0.08	0.00	10	541.82	0.20%	0.01%	0.00%	1.81%	97.98%
NFS-0215	644	81	563	1.1	0.08	0.00	10	551.81	0.20%	0.01%	0.00%	1.78%	98.01%

Attachment 1

Waste Material Parameter Weight Evaluation for Waste Stream OR-NFS-CH-SOIL

Based on Original Generator Container Paperwork

Container ID	Gross Wt (lbs)	Tare Wt (lbs)	Net Wt (lbs)	Drum Liner Bag Wt (lbs)	RADPAD Wt (lbs)	Solid-A-Sorb Wt (lbs)	RADSORB Wt (lbs)	Soil Wt (lbs)	Plastic Wt%	Cellulosic Wt%	Inorganic Matrix Wt%	Organic Matrix Wt%	Soil Wt%
NFS-0216	608	81	527	1.1	0.08	0.00	10	515.80	0.21%	0.02%	0.00%	1.90%	97.88%
NFS-0217	640	81	559	1.1	0.08	0.00	10	547.82	0.20%	0.01%	0.00%	1.79%	98.00%
NFS-0218	605	81	524	1.1	0.08	0.00	10	512.81	0.21%	0.02%	0.00%	1.91%	97.87%
NFS-0219	630	81	549	1.1	0.08	0.00	10	537.81	0.20%	0.01%	0.00%	1.82%	97.96%
NFS-0220	579	81	498	1.1	0.08	0.00	10	486.81	0.22%	0.02%	0.00%	2.01%	97.75%
NFS-0221	625	81	544	1.1	0.08	0.00	10	532.82	0.20%	0.01%	0.00%	1.84%	97.94%
NFS-0222	621	81	540	1.1	0.08	0.00	10	528.81	0.20%	0.01%	0.00%	1.85%	97.93%
NFS-0223	598	81	517	1.1	0.08	0.00	10	505.82	0.21%	0.02%	0.00%	1.93%	97.84%
NFS-0224	639	81	558	1.1	0.08	0.00	10	546.82	0.20%	0.01%	0.00%	1.79%	98.00%
NFS-0225	634	81	553	1.1	0.08	0.00	10	541.82	0.20%	0.01%	0.00%	1.81%	97.98%
NFS-0226	613	81	532	1.1	0.08	0.00	10	520.81	0.21%	0.02%	0.00%	1.88%	97.90%
NFS-0227	615	81	534	1.1	0.08	0.00	10	522.82	0.21%	0.01%	0.00%	1.87%	97.91%
NFS-0228	630	81	549	1.1	0.08	0.00	10	537.81	0.20%	0.01%	0.00%	1.82%	97.96%
NFS-0229	619	81	538	1.1	0.08	0.00	10	526.81	0.20%	0.01%	0.00%	1.86%	97.92%
NFS-0230	590	81	509	1.1	0.08	0.00	10	497.82	0.22%	0.02%	0.00%	1.96%	97.80%
NFS-0231	667	81	586	1.1	0.08	0.00	10	574.82	0.19%	0.01%	0.00%	1.71%	98.09%
NFS-0232	664	81	583	1.1	0.08	0.00	10	571.82	0.19%	0.01%	0.00%	1.72%	98.08%
NFS-0233	573	81	492	1.1	0.08	0.00	10	480.82	0.22%	0.02%	0.00%	2.03%	97.73%
NFS-0234	623	81	542	1.1	0.08	0.00	10	530.82	0.20%	0.01%	0.00%	1.85%	97.94%
NFS-0235	612	81	531	1.1	0.08	0.00	10	519.82	0.21%	0.02%	0.00%	1.88%	97.89%
NFS-0236	613	81	532	1.1	0.08	0.00	10	520.81	0.21%	0.02%	0.00%	1.88%	97.90%
NFS-0237	625	81	544	1.1	0.08	0.00	10	532.82	0.20%	0.01%	0.00%	1.84%	97.94%
NFS-0238	584	81	503	1.1	0.08	0.00	10	491.82	0.22%	0.02%	0.00%	1.99%	97.78%
NFS-0239	625	81	544	1.1	0.08	0.00	10	532.82	0.20%	0.01%	0.00%	1.84%	97.94%
NFS-0240	628	81	547	1.1	0.08	0.00	10	535.82	0.20%	0.01%	0.00%	1.83%	97.96%
NFS-0241	570	81	489	1.1	0.08	0.00	10	477.82	0.22%	0.02%	0.00%	2.04%	97.71%
NFS-0242	676	81	595	1.1	0.08	0.00	10	583.82	0.18%	0.01%	0.00%	1.68%	98.12%
NFS-0243	641	81	560	1.1	0.08	0.00	10	548.81	0.20%	0.01%	0.00%	1.79%	98.00%
NFS-0244	599	81	518	1.1	0.08	0.00	10	506.81	0.21%	0.02%	0.00%	1.93%	97.84%
NFS-0245	594	81	513	1.1	0.08	0.00	10	501.81	0.21%	0.02%	0.00%	1.95%	97.82%
NFS-0246	611	81	530	1.1	0.08	0.00	10	518.82	0.21%	0.02%	0.00%	1.89%	97.89%
NFS-0247	571	81	490	1.1	0.08	0.00	10	478.81	0.22%	0.02%	0.00%	2.04%	97.72%
NFS-0248	567	81	486	1.1	0.08	0.00	10	474.82	0.23%	0.02%	0.00%	2.06%	97.70%
NFS-0249	558	81	477	1.1	0.08	0.00	10	465.80	0.23%	0.02%	0.00%	2.10%	97.66%
NFS-0250	558	81	477	1.1	0.08	0.00	10	465.80	0.23%	0.02%	0.00%	2.10%	97.66%
NFS-0251	588	81	507	1.1	0.08	0.00	10	495.81	0.22%	0.02%	0.00%	1.97%	97.79%
NFS-0252	606	81	525	1.1	0.08	0.00	10	513.82	0.21%	0.02%	0.00%	1.90%	97.87%
NFS-0253	612	81	531	1.1	0.08	0.00	10	519.82	0.21%	0.02%	0.00%	1.88%	97.89%
NFS-0254	549	81	468	1.1	0.08	0.00	10	456.81	0.24%	0.02%	0.00%	2.14%	97.61%
NFS-0255	660	81	579	1.1	0.08	0.00	10	567.81	0.19%	0.01%	0.00%	1.73%	98.07%
NFS-0256	559	81	478	1.1	0.08	0.00	10	466.82	0.23%	0.02%	0.00%	2.09%	97.66%
NFS-0257	575	81	494	1.1	0.08	0.00	10	482.82	0.22%	0.02%	0.00%	2.02%	97.74%
NFS-0258	562	81	481	1.1	0.08	0.00	10	469.82	0.23%	0.02%	0.00%	2.08%	97.68%
NFS-0260	650	81	569	1.1	0.08	0.00	10	557.82	0.19%	0.01%	0.00%	1.76%	98.04%
NFS-0262	591	81	510	1.1	0.08	0.00	10	498.81	0.22%	0.02%	0.00%	1.96%	97.81%
NFS-0263	646	81	565	1.1	0.08	0.00	10	553.81	0.19%	0.01%	0.00%	1.77%	98.02%
NFS-0264	643	81	562	1.1	0.08	0.00	10	550.81	0.20%	0.01%	0.00%	1.78%	98.01%
NFS-0265	647	81	566	1.1	0.08	0.00	10	554.80	0.19%	0.01%	0.00%	1.77%	98.02%
NFS-0266	618	81	537	1.1	0.08	0.00	10	525.81	0.20%	0.01%	0.00%	1.86%	97.92%
NFS-0267	576	81	495	1.1	0.08	0.00	10	483.82	0.22%	0.02%	0.00%	2.02%	97.74%
NFS-0268	658	81	577	1.1	0.08	0.00	10	565.80	0.19%	0.01%	0.00%	1.73%	98.06%

Attachment 1

Waste Material Parameter Weight Evaluation for Waste Stream OR-NFS-CH-SOIL

Based on Original Generator Container Paperwork

Container ID	Gross Wt (lbs)	Tare Wt (lbs)	Net Wt (lbs)	Drum Liner Bag Wt (lbs)	RADPAD Wt (lbs)	Solid-A-Sorb Wt (lbs)	RADSORB Wt (lbs)	Soil Wt (lbs)	Plastic Wt%	Cellulosic Wt%	Inorganic Matrix Wt%	Organic Matrix Wt%	Soil Wt%
NFS-0269	588	81	507	1.1	0.08	0.00	10	495.81	0.22%	0.02%	0.00%	1.97%	97.79%
NFS-0270	621	81	540	1.1	0.08	0.00	10	528.81	0.20%	0.01%	0.00%	1.85%	97.93%
NFS-0271	619	81	538	1.1	0.08	0.00	10	526.81	0.20%	0.01%	0.00%	1.86%	97.92%
NFS-0272	591	81	510	1.1	0.08	0.00	10	498.81	0.22%	0.02%	0.00%	1.96%	97.81%
NFS-0273	609	81	528	1.1	0.08	0.00	10	516.82	0.21%	0.02%	0.00%	1.89%	97.88%
NFS-0274	582	81	501	1.1	0.08	0.00	10	489.81	0.22%	0.02%	0.00%	2.00%	97.77%
NFS-0275	604	81	523	1.1	0.08	0.00	10	511.81	0.21%	0.02%	0.00%	1.91%	97.86%
NFS-0276	596	81	515	1.1	0.08	0.00	10	503.81	0.21%	0.02%	0.00%	1.94%	97.83%
NFS-0277	616	81	535	1.1	0.08	0.00	10	523.81	0.21%	0.01%	0.00%	1.87%	97.91%
NFS-0278	609	81	528	1.1	0.08	0.00	10	516.82	0.21%	0.02%	0.00%	1.89%	97.88%
NFS-0279	611	81	530	1.1	0.08	0.00	10	518.82	0.21%	0.02%	0.00%	1.89%	97.89%
NFS-0280	613	81	532	1.1	0.08	0.00	10	520.81	0.21%	0.02%	0.00%	1.88%	97.90%
NFS-0281	652	81	571	1.1	0.08	0.00	10	559.81	0.19%	0.01%	0.00%	1.75%	98.04%
NFS-0282	654	81	573	1.1	0.08	0.00	10	561.81	0.19%	0.01%	0.00%	1.75%	98.05%
NFS-0283	635	81	554	1.1	0.08	0.00	10	542.81	0.20%	0.01%	0.00%	1.81%	97.98%
NFS-0284	579	81	498	1.1	0.08	0.00	10	486.81	0.22%	0.02%	0.00%	2.01%	97.75%
NFS-0285	555	81	474	1.1	0.08	0.00	10	462.81	0.23%	0.02%	0.00%	2.11%	97.64%
NFS-0286	549	81	468	1.1	0.08	0.00	10	456.81	0.24%	0.02%	0.00%	2.14%	97.61%
NFS-0287	562	81	481	1.1	0.08	0.00	10	469.82	0.23%	0.02%	0.00%	2.08%	97.68%
NFS-0288	590	81	509	1.1	0.08	0.00	10	497.82	0.22%	0.02%	0.00%	1.96%	97.80%
NFS-0289	594	81	513	1.1	0.08	0.00	10	501.81	0.21%	0.02%	0.00%	1.95%	97.82%
NFS-0290	556	81	475	1.1	0.08	0.00	10	463.82	0.23%	0.02%	0.00%	2.11%	97.65%
NFS-0291	548	81	467	1.1	0.08	0.00	10	455.82	0.24%	0.02%	0.00%	2.14%	97.61%
NFS-0292	547	81	466	1.1	0.08	0.00	10	454.83	0.24%	0.02%	0.00%	2.15%	97.60%
NFS-0293	531	81	450	1.1	0.08	0.00	10	438.82	0.24%	0.02%	0.00%	2.22%	97.52%
NFS-0294	576	81	495	1.1	0.08	0.00	10	483.82	0.22%	0.02%	0.00%	2.02%	97.74%
NFS-0295	574	81	493	1.1	0.08	0.00	10	481.81	0.22%	0.02%	0.00%	2.03%	97.73%
NFS-0296	555	81	474	1.1	0.08	0.00	10	462.81	0.23%	0.02%	0.00%	2.11%	97.64%
NFS-0297	647	81	566	1.1	0.08	0.00	10	554.80	0.19%	0.01%	0.00%	1.77%	98.02%
NFS-0298	573	81	492	1.1	0.08	0.00	10	480.82	0.22%	0.02%	0.00%	2.03%	97.73%
NFS-0299	561	81	480	1.1	0.08	0.00	10	468.82	0.23%	0.02%	0.00%	2.08%	97.67%
NFS-0300	510	81	429	1.1	0.08	0.00	10	417.81	0.26%	0.02%	0.00%	2.33%	97.39%
NFS-0301	623	81	542	1.1	0.08	0.00	10	530.82	0.20%	0.01%	0.00%	1.85%	97.94%
NFS-0302	548	81	467	1.1	0.08	0.00	10	455.82	0.24%	0.02%	0.00%	2.14%	97.61%
NFS-0303	571	81	490	1.1	0.08	0.00	10	478.81	0.22%	0.02%	0.00%	2.04%	97.72%
NFS-0304	597	81	516	1.1	0.08	0.00	10	504.80	0.21%	0.02%	0.00%	1.94%	97.83%
NFS-0305	588	81	507	1.1	0.08	0.00	10	495.81	0.22%	0.02%	0.00%	1.97%	97.79%
NFS-0306	523	81	442	1.1	0.08	0.00	10	430.82	0.25%	0.02%	0.00%	2.26%	97.47%
NFS-0307	595	81	514	1.1	0.08	0.00	10	502.82	0.21%	0.02%	0.00%	1.95%	97.82%
NFS-0308	568	81	487	1.1	0.08	0.00	10	475.81	0.23%	0.02%	0.00%	2.05%	97.70%
NFS-0309	586	81	505	1.1	0.08	0.00	10	493.82	0.22%	0.02%	0.00%	1.98%	97.79%
NFS-0310	648	81	567	1.1	0.08	0.00	10	555.82	0.19%	0.01%	0.00%	1.76%	98.03%
NFS-0311	645	81	564	1.1	0.08	0.00	10	552.82	0.20%	0.01%	0.00%	1.77%	98.02%
NFS-0312	559	81	478	1.1	0.08	0.00	10	466.82	0.23%	0.02%	0.00%	2.09%	97.66%
NFS-0313	573	81	492	1.1	0.08	0.00	10	480.82	0.22%	0.02%	0.00%	2.03%	97.73%
NFS-0314	627	81	546	1.1	0.08	0.00	10	534.81	0.20%	0.01%	0.00%	1.83%	97.95%
NFS-0315	596	81	515	1.1	0.08	0.00	10	503.81	0.21%	0.02%	0.00%	1.94%	97.83%
NFS-0316	619	81	538	1.1	0.08	0.00	10	526.81	0.20%	0.01%	0.00%	1.86%	97.92%
NFS-0317	540	81	459	1.1	0.08	0.00	10	447.81	0.24%	0.02%	0.00%	2.18%	97.56%
NFS-0318	620	81	539	1.1	0.08	0.00	10	527.82	0.20%	0.01%	0.00%	1.86%	97.93%
NFS-0319	627	81	546	1.1	0.08	0.00	10	534.81	0.20%	0.01%	0.00%	1.83%	97.95%

Attachment 1

Waste Material Parameter Weight Evaluation for Waste Stream OR-NFS-CH-SOIL

Based on Original Generator Container Paperwork

Container ID	Gross Wt (lbs)	Tare Wt (lbs)	Net Wt (lbs)	Drum Liner Bag Wt (lbs)	RADPAD Wt (lbs)	Solid-A-Sorb Wt (lbs)	RADSORB Wt (lbs)	Soil Wt (lbs)	Plastic Wt%	Cellulosic Wt%	Inorganic Matrix Wt%	Organic Matrix Wt%	Soil Wt%
NFS-0320	593	81	512	1.1	0.08	0.00	10	500.81	0.21%	0.02%	0.00%	1.95%	97.82%
NFS-0321	548	81	467	1.1	0.08	0.00	10	455.82	0.24%	0.02%	0.00%	2.14%	97.61%
NFS-0322	565	81	484	1.1	0.08	0.00	10	472.81	0.23%	0.02%	0.00%	2.07%	97.69%
NFS-0323	645	81	564	1.1	0.08	0.00	10	552.82	0.20%	0.01%	0.00%	1.77%	98.02%
NFS-0324	572	81	491	1.1	0.08	0.00	10	479.80	0.22%	0.02%	0.00%	2.04%	97.72%
NFS-0325	595	81	514	1.1	0.08	0.00	10	502.82	0.21%	0.02%	0.00%	1.95%	97.82%
NFS-0326	618	81	537	1.1	0.08	0.00	10	525.81	0.20%	0.01%	0.00%	1.86%	97.92%
NFS-0327	560	81	479	1.1	0.08	0.00	10	467.81	0.23%	0.02%	0.00%	2.09%	97.67%
NFS-0329	510	81	429	1.1	0.08	0.00	10	417.81	0.26%	0.02%	0.00%	2.33%	97.39%
NFS-0330	652	81	571	1.1	0.08	0.00	10	559.81	0.19%	0.01%	0.00%	1.75%	98.04%
NFS-0331	524	81	443	1.1	0.08	0.00	10	431.81	0.25%	0.02%	0.00%	2.26%	97.48%
NFS-0332	649	81	568	1.1	0.08	0.00	10	556.81	0.19%	0.01%	0.00%	1.76%	98.03%
NFS-0333	604	81	523	1.1	0.08	0.00	10	511.81	0.21%	0.02%	0.00%	1.91%	97.86%
NFS-0334	562	81	481	1.1	0.08	0.00	10	469.82	0.23%	0.02%	0.00%	2.08%	97.68%
NFS-0335	659	81	578	1.1	0.08	0.00	10	566.82	0.19%	0.01%	0.00%	1.73%	98.07%
NFS-0336	640	81	559	1.1	0.08	0.00	10	547.82	0.20%	0.01%	0.00%	1.79%	98.00%
NFS-0337	646	81	565	1.1	0.08	0.00	10	553.81	0.19%	0.01%	0.00%	1.77%	98.02%
NFS-0338	661	81	580	1.1	0.08	0.00	10	568.80	0.19%	0.01%	0.00%	1.72%	98.07%
NFS-0339	625	81	544	1.1	0.08	0.00	10	532.82	0.20%	0.01%	0.00%	1.84%	97.94%
NFS-0340	572	81	491	1.1	0.08	0.00	10	479.80	0.22%	0.02%	0.00%	2.04%	97.72%
NFS-0341	604	81	523	1.1	0.08	0.00	10	511.81	0.21%	0.02%	0.00%	1.91%	97.86%
NFS-0342	645	81	564	1.1	0.08	0.00	10	552.82	0.20%	0.01%	0.00%	1.77%	98.02%
NFS-0343	660	81	579	1.1	0.08	0.00	10	567.81	0.19%	0.01%	0.00%	1.73%	98.07%
NFS-0344	558	81	477	1.1	0.08	0.00	10	465.80	0.23%	0.02%	0.00%	2.10%	97.66%
NFS-0345	538	81	457	1.1	0.08	0.00	10	445.81	0.24%	0.02%	0.00%	2.19%	97.55%
NFS-0346	583	81	502	1.1	0.08	0.00	10	490.80	0.22%	0.02%	0.00%	1.99%	97.77%
NFS-0347	596	81	515	1.1	0.08	0.00	10	503.81	0.21%	0.02%	0.00%	1.94%	97.83%
NFS-0348	530	81	449	1.1	0.08	0.00	10	437.81	0.24%	0.02%	0.00%	2.23%	97.51%
NFS-0349	575	81	494	1.1	0.08	0.00	10	482.82	0.22%	0.02%	0.00%	2.02%	97.74%
NFS-0350	620	81	539	1.1	0.08	0.00	10	527.82	0.20%	0.01%	0.00%	1.86%	97.93%
NFS-0438	610	81	529	1.1	0.08	0.00	10	517.81	0.21%	0.02%	0.00%	1.89%	97.89%
NFS-0439	620	81	539	1.1	0.08	0.00	10	527.82	0.20%	0.01%	0.00%	1.86%	97.93%
NFS-0440	580	81	499	1.1	0.08	0.00	10	487.81	0.22%	0.02%	0.00%	2.00%	97.76%
NFS-0441	619	81	538	1.1	0.08	0.00	10	526.81	0.20%	0.01%	0.00%	1.86%	97.92%
NFS-0442	590	81	509	1.1	0.08	0.00	10	497.82	0.22%	0.02%	0.00%	1.96%	97.80%
NFS-0443	602	81	521	1.1	0.08	0.00	10	509.81	0.21%	0.02%	0.00%	1.92%	97.85%
NFS-0444	588	81	507	1.1	0.08	0.00	10	495.81	0.22%	0.02%	0.00%	1.97%	97.79%
NFS-0445	630	81	549	1.1	0.08	0.00	10	537.81	0.20%	0.01%	0.00%	1.82%	97.96%
NFS-0446	608	81	527	1.1	0.08	0.00	10	515.80	0.21%	0.02%	0.00%	1.90%	97.88%
NFS-0447	576	81	495	1.1	0.08	0.00	10	483.82	0.22%	0.02%	0.00%	2.02%	97.74%
NFS-0449	614	81	533	1.1	0.08	0.00	10	521.82	0.21%	0.02%	0.00%	1.88%	97.90%
NFS-0451	602	81	521	1.1	0.08	0.00	10	509.81	0.21%	0.02%	0.00%	1.92%	97.85%
NFS-0452	598	81	517	1.1	0.08	0.00	10	505.82	0.21%	0.02%	0.00%	1.93%	97.84%
NFS-0453	582	81	501	1.1	0.08	0.00	10	489.81	0.22%	0.02%	0.00%	2.00%	97.77%
NFS-0454	634	81	553	1.1	0.08	0.00	10	541.82	0.20%	0.01%	0.00%	1.81%	97.98%
NFS-0455	528	81	447	1.1	0.08	0.00	10	435.82	0.25%	0.02%	0.00%	2.24%	97.50%
NFS-0456	569	81	488	1.1	0.08	0.00	10	476.81	0.23%	0.02%	0.00%	2.05%	97.71%
NFS-0457	574	81	493	1.1	0.08	0.00	10	481.81	0.22%	0.02%	0.00%	2.03%	97.73%
NFS-0458	539	81	458	1.1	0.08	0.00	10	446.82	0.24%	0.02%	0.00%	2.18%	97.56%
NFS-0459	531	81	450	1.1	0.08	0.00	10	438.82	0.24%	0.02%	0.00%	2.22%	97.52%
NFS-0460	548	81	467	1.1	0.08	0.00	10	455.82	0.24%	0.02%	0.00%	2.14%	97.61%

Attachment 1

Waste Material Parameter Weight Evaluation for Waste Stream OR-NFS-CH-SOIL

Based on Original Generator Container Paperwork

Container ID	Gross Wt (lbs)	Tare Wt (lbs)	Net Wt (lbs)	Drum Liner Bag Wt (lbs)	RADPAD Wt (lbs)	Solid-A-Sorb Wt (lbs)	RADSORB Wt (lbs)	Soil Wt (lbs)	Plastic Wt%	Cellulosic Wt%	Inorganic Matrix Wt%	Organic Matrix Wt%	Soil Wt%
NFS-0461	557	81	476	1.1	0.08	0.00	10	464.81	0.23%	0.02%	0.00%	2.10%	97.65%
NFS-0463	601	81	520	1.1	0.08	0.00	10	508.82	0.21%	0.02%	0.00%	1.92%	97.85%
NFS-0464	598	81	517	1.1	0.08	0.00	10	505.82	0.21%	0.02%	0.00%	1.93%	97.84%
NFS-0465	620	81	539	1.1	0.08	0.00	10	527.82	0.20%	0.01%	0.00%	1.86%	97.93%
NFS-0466	597	81	516	1.1	0.08	0.00	10	504.80	0.21%	0.02%	0.00%	1.94%	97.83%
NFS-0467	558	81	477	1.1	0.08	0.00	10	465.80	0.23%	0.02%	0.00%	2.10%	97.66%
NFS-0468	555	81	474	1.1	0.08	0.00	10	462.81	0.23%	0.02%	0.00%	2.11%	97.64%
NFS-0469	539	81	458	1.1	0.08	0.00	10	446.82	0.24%	0.02%	0.00%	2.18%	97.56%
NFS-0471	555	81	474	1.1	0.08	0.00	10	462.81	0.23%	0.02%	0.00%	2.11%	97.64%
NFS-0472	565	81	484	1.1	0.08	0.00	10	472.81	0.23%	0.02%	0.00%	2.07%	97.69%
NFS-0473	617	81	536	1.1	0.08	0.00	10	524.82	0.21%	0.01%	0.00%	1.87%	97.91%
NFS-0474	624	81	543	1.1	0.08	0.00	10	531.81	0.20%	0.01%	0.00%	1.84%	97.94%
NFS-0475	615	81	534	1.1	0.08	0.00	10	522.82	0.21%	0.01%	0.00%	1.87%	97.91%
NFS-0476	611	81	530	1.1	0.08	0.00	10	518.82	0.21%	0.02%	0.00%	1.89%	97.89%
NFS-0477	585	81	504	1.1	0.08	0.00	10	492.81	0.22%	0.02%	0.00%	1.98%	97.78%
NFS-0483	734	81	653	1.1	0.08	0.00	10	641.82	0.17%	0.01%	0.00%	1.53%	98.29%
NFS-0484	698	81	617	1.1	0.08	0.00	10	605.82	0.18%	0.01%	0.00%	1.62%	98.19%
NFS-0485	714	81	633	1.1	0.08	0.00	10	621.82	0.17%	0.01%	0.00%	1.58%	98.23%
NFS-0486	663	81	582	1.1	0.08	0.00	10	570.81	0.19%	0.01%	0.00%	1.72%	98.08%
NFS-0487	605	81	524	1.1	0.08	0.00	10	512.81	0.21%	0.02%	0.00%	1.91%	97.87%
NFS-0488	598	81	517	1.1	0.08	0.00	10	505.82	0.21%	0.02%	0.00%	1.93%	97.84%
NFS-0489	583	81	502	1.1	0.08	0.00	10	490.80	0.22%	0.02%	0.00%	1.99%	97.77%
NFS-0490	581	81	500	1.1	0.08	0.00	10	488.82	0.22%	0.02%	0.00%	2.00%	97.76%
NFS-0491	597	81	516	1.1	0.08	0.00	10	504.80	0.21%	0.02%	0.00%	1.94%	97.83%
NFS-0492	565	81	484	1.1	0.08	0.00	10	472.81	0.23%	0.02%	0.00%	2.07%	97.69%
NFS-0493	591	81	510	1.1	0.08	0.00	10	498.81	0.22%	0.02%	0.00%	1.96%	97.81%
NFS-0494	567	81	486	1.1	0.08	0.00	10	474.82	0.23%	0.02%	0.00%	2.06%	97.70%
NFS-0495	608	81	527	1.1	0.08	0.00	10	515.80	0.21%	0.02%	0.00%	1.90%	97.88%
NFS-0496	630	81	549	1.1	0.08	0.00	10	537.81	0.20%	0.01%	0.00%	1.82%	97.96%
NFS-0497	622	81	541	1.1	0.08	0.00	10	529.80	0.20%	0.01%	0.00%	1.85%	97.93%
NFS-0498	570	81	489	1.1	0.08	0.00	10	477.82	0.22%	0.02%	0.00%	2.04%	97.71%
NFS-0499	600	81	519	1.1	0.08	0.00	10	507.82	0.21%	0.02%	0.00%	1.93%	97.85%
NFS-0500	631	81	550	1.1	0.08	0.00	10	538.82	0.20%	0.01%	0.00%	1.82%	97.97%
NFS-0517	638	81	557	1.1	0.08	0.00	10	545.81	0.20%	0.01%	0.00%	1.80%	97.99%
NFS-0518	673	81	592	1.1	0.08	0.00	10	580.82	0.19%	0.01%	0.00%	1.69%	98.11%
NFS-0519	644	81	563	1.1	0.08	0.00	10	551.81	0.20%	0.01%	0.00%	1.78%	98.01%
NFS-0520	627	81	546	1.1	0.08	0.00	10	534.81	0.20%	0.01%	0.00%	1.83%	97.95%
NFS-0521	648	81	567	1.1	0.08	0.00	10	555.82	0.19%	0.01%	0.00%	1.76%	98.03%
NFS-0522	678	81	597	1.1	0.08	0.00	10	585.82	0.18%	0.01%	0.00%	1.68%	98.13%
NFS-0523	626	81	545	1.1	0.08	0.00	10	533.82	0.20%	0.01%	0.00%	1.83%	97.95%
NFS-0530	656	81	575	1.1	0.08	0.00	10	563.82	0.19%	0.01%	0.00%	1.74%	98.06%
NFS-0531	605	81	524	1.1	0.08	0.00	10	512.81	0.21%	0.02%	0.00%	1.91%	97.87%
NFS-0532	634	81	553	1.1	0.08	0.00	10	541.82	0.20%	0.01%	0.00%	1.81%	97.98%
NFS-0533	623	81	542	1.1	0.08	0.00	10	530.82	0.20%	0.01%	0.00%	1.85%	97.94%
NFS-0534	656	81	575	1.1	0.08	0.00	10	563.82	0.19%	0.01%	0.00%	1.74%	98.06%
NFS-0535	623	81	542	1.1	0.08	0.00	10	530.82	0.20%	0.01%	0.00%	1.85%	97.94%
NFS-0536	611	81	530	1.1	0.08	0.00	10	518.82	0.21%	0.02%	0.00%	1.89%	97.89%
NFS-0537	596	81	515	1.1	0.08	0.00	10	503.81	0.21%	0.02%	0.00%	1.94%	97.83%
NFS-0544	607	81	526	1.1	0.08	0.00	10	514.81	0.21%	0.02%	0.00%	1.90%	97.87%
NFS-0545	572	81	491	1.1	0.08	0.00	10	479.80	0.22%	0.02%	0.00%	2.04%	97.72%
NFS-0546	561	81	480	1.1	0.08	0.00	10	468.82	0.23%	0.02%	0.00%	2.08%	97.67%

Attachment 1

Waste Material Parameter Weight Evaluation for Waste Stream OR-NFS-CH-SOIL

Based on Original Generator Container Paperwork

Container ID	Gross Wt (lbs)	Tare Wt (lbs)	Net Wt (lbs)	Drum Liner Bag Wt (lbs)	RADPAD Wt (lbs)	Solid-A-Sorb Wt (lbs)	RADSORB Wt (lbs)	Soil Wt (lbs)	Plastic Wt%	Cellulosic Wt%	Inorganic Matrix Wt%	Organic Matrix Wt%	Soil Wt%
NFS-0547	675	81	594	1.1	0.08	0.00	10	582.80	0.19%	0.01%	0.00%	1.68%	98.12%
NFS-0548	617	81	536	1.1	0.08	0.00	10	524.82	0.21%	0.01%	0.00%	1.87%	97.91%
NFS-0549	628	81	547	1.1	0.08	0.00	10	535.82	0.20%	0.01%	0.00%	1.83%	97.96%
NFS-0550	654	81	573	1.1	0.08	0.00	10	561.81	0.19%	0.01%	0.00%	1.75%	98.05%
NFS-0551	634	81	553	1.1	0.08	0.00	10	541.82	0.20%	0.01%	0.00%	1.81%	97.98%
NFS-0552	684	81	603	1.1	0.08	0.00	10	591.82	0.18%	0.01%	0.00%	1.66%	98.15%
NFS-0553	665	81	584	1.1	0.08	0.00	10	572.82	0.19%	0.01%	0.00%	1.71%	98.09%
NFS-0554	623	81	542	1.1	0.08	0.00	10	530.82	0.20%	0.01%	0.00%	1.85%	97.94%
NFS-0555	541	81	460	1.1	0.08	0.00	10	448.81	0.24%	0.02%	0.00%	2.17%	97.57%
NFS-0556	652	81	571	1.1	0.08	0.00	10	559.81	0.19%	0.01%	0.00%	1.75%	98.04%
NFS-0557	626	81	545	1.1	0.08	0.00	10	533.82	0.20%	0.01%	0.00%	1.83%	97.95%
NFS-0558	559	81	478	1.1	0.08	0.00	10	466.82	0.23%	0.02%	0.00%	2.09%	97.66%
NFS-0559	622	81	541	1.1	0.08	0.00	10	529.80	0.20%	0.01%	0.00%	1.85%	97.93%
NFS-0560	596	81	515	1.1	0.08	0.00	10	503.81	0.21%	0.02%	0.00%	1.94%	97.83%
NFS-0561	627	81	546	1.1	0.08	0.00	10	534.81	0.20%	0.01%	0.00%	1.83%	97.95%
NFS-0562	566	81	485	1.1	0.08	0.00	10	473.81	0.23%	0.02%	0.00%	2.06%	97.69%
NFS-0563	658	81	577	1.1	0.08	0.00	10	565.80	0.19%	0.01%	0.00%	1.73%	98.06%
NFS-0564	572	81	491	1.1	0.08	0.00	10	479.80	0.22%	0.02%	0.00%	2.04%	97.72%
NFS-0565	587	81	506	1.1	0.08	0.00	10	494.82	0.22%	0.02%	0.00%	1.98%	97.79%
NFS-0566	591	81	510	1.1	0.08	0.00	10	498.81	0.22%	0.02%	0.00%	1.96%	97.81%
NFS-0567	651	81	570	1.1	0.08	0.00	10	558.82	0.19%	0.01%	0.00%	1.75%	98.04%
NFS-0568	590	81	509	1.1	0.08	0.00	10	497.82	0.22%	0.02%	0.00%	1.96%	97.80%
NFS-0569	655	81	574	1.1	0.08	0.00	10	562.81	0.19%	0.01%	0.00%	1.74%	98.05%
NFS-0570	624	81	543	1.1	0.08	0.00	10	531.81	0.20%	0.01%	0.00%	1.84%	97.94%
NFS-0584	601	81	520	1.1	0.08	0.00	10	508.82	0.21%	0.02%	0.00%	1.92%	97.85%
NFS-0585	596	81	515	1.1	0.08	0.00	10	503.81	0.21%	0.02%	0.00%	1.94%	97.83%
NFS-0586	631	81	550	1.1	0.08	0.00	10	538.82	0.20%	0.01%	0.00%	1.82%	97.97%
NFS-0587	592	81	511	1.1	0.08	0.00	10	499.82	0.22%	0.02%	0.00%	1.96%	97.81%
NFS-0588	588	81	507	1.1	0.08	0.00	10	495.81	0.22%	0.02%	0.00%	1.97%	97.79%
NFS-0589	600	81	519	1.1	0.08	0.00	10	507.82	0.21%	0.02%	0.00%	1.93%	97.85%
NFS-0590	699	81	618	1.1	0.08	0.00	10	606.81	0.18%	0.01%	0.00%	1.62%	98.19%
NFS-0595	589	81	508	1.1	0.08	0.00	10	496.82	0.22%	0.02%	0.00%	1.97%	97.80%
NFS-0596	578	81	497	1.1	0.08	0.00	10	485.82	0.22%	0.02%	0.00%	2.01%	97.75%
NFS-0655	594	81	513	1.1	0.08	0.00	10	501.81	0.21%	0.02%	0.00%	1.95%	97.82%
NFS-0656	604	81	523	1.1	0.08	0.00	10	511.81	0.21%	0.02%	0.00%	1.91%	97.86%
NFS-0657	622	81	541	1.1	0.08	0.00	10	529.80	0.20%	0.01%	0.00%	1.85%	97.93%
NFS-0658	555	81	474	1.1	0.08	0.00	10	462.81	0.23%	0.02%	0.00%	2.11%	97.64%
NFS-0659	573	81	492	1.1	0.08	0.00	10	480.82	0.22%	0.02%	0.00%	2.03%	97.73%
NFS-0660	580	81	499	1.1	0.08	0.00	10	487.81	0.22%	0.02%	0.00%	2.00%	97.76%
NFS-0661	563	81	482	1.1	0.08	0.00	10	470.81	0.23%	0.02%	0.00%	2.07%	97.68%
NFS-0662	646	81	565	1.1	0.08	0.00	10	553.81	0.19%	0.01%	0.00%	1.77%	98.02%
NFS-0663	585	81	504	1.1	0.08	0.00	10	492.81	0.22%	0.02%	0.00%	1.98%	97.78%
NFS-0664	573	81	492	1.1	0.08	0.00	10	480.82	0.22%	0.02%	0.00%	2.03%	97.73%
NFS-0665	575	81	494	1.1	0.08	0.00	10	482.82	0.22%	0.02%	0.00%	2.02%	97.74%
NFS-0666	581	81	500	1.1	0.08	0.00	10	488.82	0.22%	0.02%	0.00%	2.00%	97.76%
NFS-0667	590	81	509	1.1	0.08	0.00	10	497.82	0.22%	0.02%	0.00%	1.96%	97.80%
NFS-0668	561	81	480	1.1	0.08	0.00	10	468.82	0.23%	0.02%	0.00%	2.08%	97.67%
NFS-0669	570	81	489	1.1	0.08	0.00	10	477.82	0.22%	0.02%	0.00%	2.04%	97.71%
NFS-0670	587	81	506	1.1	0.08	0.00	10	494.82	0.22%	0.02%	0.00%	1.98%	97.79%
NFS-0671	598	81	517	1.1	0.08	0.00	10	505.82	0.21%	0.02%	0.00%	1.93%	97.84%
NFS-0672	597	81	516	1.1	0.08	0.00	10	504.80	0.21%	0.02%	0.00%	1.94%	97.83%

Attachment 1

Waste Material Parameter Weight Evaluation for Waste Stream OR-NFS-CH-SOIL

Based on Original Generator Container Paperwork

Container ID	Gross Wt (lbs)	Tare Wt (lbs)	Net Wt (lbs)	Drum Liner Bag Wt (lbs)	RADPAD Wt (lbs)	Solid-A-Sorb Wt (lbs)	RADSORB Wt (lbs)	Soil Wt (lbs)	Plastic Wt%	Cellulosic Wt%	Inorganic Matrix Wt%	Organic Matrix Wt%	Soil Wt%
NFS-0675	600	81	519	1.1	0.08	0.00	10	507.82	0.21%	0.02%	0.00%	1.93%	97.85%
NFS-0676	572	81	491	1.1	0.08	0.00	10	479.80	0.22%	0.02%	0.00%	2.04%	97.72%
NFS-0677	616	81	535	1.1	0.08	0.00	10	523.81	0.21%	0.01%	0.00%	1.87%	97.91%
NFS-0678	559	81	478	1.1	0.08	0.00	10	466.82	0.23%	0.02%	0.00%	2.09%	97.66%
NFS-0679	573	81	492	1.1	0.08	0.00	10	480.82	0.22%	0.02%	0.00%	2.03%	97.73%
NFS-0680	577	81	496	1.1	0.08	0.00	10	484.81	0.22%	0.02%	0.00%	2.02%	97.75%
NFS-0681	569	81	488	1.1	0.08	0.00	10	476.81	0.23%	0.02%	0.00%	2.05%	97.71%
NFS-0682	534	81	453	1.1	0.08	0.00	10	441.82	0.24%	0.02%	0.00%	2.21%	97.53%
NFS-0683	590	81	509	1.1	0.08	0.00	10	497.82	0.22%	0.02%	0.00%	1.96%	97.80%
NFS-0684	566	81	485	1.1	0.08	0.00	10	473.81	0.23%	0.02%	0.00%	2.06%	97.69%
NFS-0685	540	81	459	1.1	0.08	0.00	10	447.81	0.24%	0.02%	0.00%	2.18%	97.56%
NFS-0686	528	81	447	1.1	0.08	0.00	10	435.82	0.25%	0.02%	0.00%	2.24%	97.50%
NFS-0687	552	81	471	1.1	0.08	0.00	10	459.81	0.23%	0.02%	0.00%	2.12%	97.63%
NFS-0688	610	81	529	1.1	0.08	0.00	10	517.81	0.21%	0.02%	0.00%	1.89%	97.89%
NFS-0689	575	81	494	1.1	0.08	0.00	10	482.82	0.22%	0.02%	0.00%	2.02%	97.74%
NFS-0690	548	81	467	1.1	0.08	0.00	10	455.82	0.24%	0.02%	0.00%	2.14%	97.61%
NFS-0691	551	81	470	1.1	0.08	0.00	10	458.82	0.23%	0.02%	0.00%	2.13%	97.62%
NFS-0692	608	81	527	1.1	0.08	0.00	10	515.80	0.21%	0.02%	0.00%	1.90%	97.88%
NFS-0693	536	81	455	1.1	0.08	0.00	10	443.82	0.24%	0.02%	0.00%	2.20%	97.54%
NFS-0694	496	81	415	1.1	0.08	0.00	10	403.81	0.27%	0.02%	0.00%	2.41%	97.31%
NFS-0695	572	81	491	1.1	0.08	0.00	10	479.80	0.22%	0.02%	0.00%	2.04%	97.72%
NFS-0696	565	81	484	1.1	0.08	0.00	10	472.81	0.23%	0.02%	0.00%	2.07%	97.69%
NFS-0697	609	81	528	1.1	0.08	0.00	10	516.82	0.21%	0.02%	0.00%	1.89%	97.88%
NFS-0698	585	81	504	1.1	0.08	0.00	10	492.81	0.22%	0.02%	0.00%	1.98%	97.78%
NFS-0699	553	81	472	1.1	0.08	0.00	10	460.82	0.23%	0.02%	0.00%	2.12%	97.63%
NFS-0700	583	81	502	1.1	0.08	0.00	10	490.80	0.22%	0.02%	0.00%	1.99%	97.77%
NFS-0701	599	81	518	1.1	0.08	0.00	10	506.81	0.21%	0.02%	0.00%	1.93%	97.84%
NFS-0702	577	81	496	1.1	0.08	0.00	10	484.81	0.22%	0.02%	0.00%	2.02%	97.75%
NFS-0703	532	81	451	1.1	0.08	0.00	10	439.81	0.24%	0.02%	0.00%	2.22%	97.52%
NFS-0704	557	81	476	1.1	0.08	0.00	10	464.81	0.23%	0.02%	0.00%	2.10%	97.65%
NFS-0705	570	81	489	1.1	0.08	0.00	10	477.82	0.22%	0.02%	0.00%	2.04%	97.71%
NFS-0706	623	81	542	1.1	0.08	0.00	10	530.82	0.20%	0.01%	0.00%	1.85%	97.94%
NFS-0707	578	81	497	1.1	0.08	0.00	10	485.82	0.22%	0.02%	0.00%	2.01%	97.75%
NFS-0708	563	81	482	1.1	0.08	0.00	10	470.81	0.23%	0.02%	0.00%	2.07%	97.68%
NFS-0709	564	81	483	1.1	0.08	0.00	10	471.82	0.23%	0.02%	0.00%	2.07%	97.69%
NFS-0710	593	81	512	1.1	0.08	0.00	10	500.81	0.21%	0.02%	0.00%	1.95%	97.82%
NFS-0711	540	81	459	1.1	0.08	0.00	10	447.81	0.24%	0.02%	0.00%	2.18%	97.56%
NFS-0712	573	81	492	1.1	0.08	0.00	10	480.82	0.22%	0.02%	0.00%	2.03%	97.73%
NFS-0713	574	81	493	1.1	0.08	0.00	10	481.81	0.22%	0.02%	0.00%	2.03%	97.73%
NFS-0714	586	81	505	1.1	0.08	0.00	10	493.82	0.22%	0.02%	0.00%	1.98%	97.79%
NFS-0715	597	81	516	1.1	0.08	0.00	10	504.80	0.21%	0.02%	0.00%	1.94%	97.83%
NFS-0716	590	81	509	1.1	0.08	0.00	10	497.82	0.22%	0.02%	0.00%	1.96%	97.80%
NFS-0717	567	81	486	1.1	0.08	0.00	10	474.82	0.23%	0.02%	0.00%	2.06%	97.70%
NFS-0718	573	81	492	1.1	0.08	0.00	10	480.82	0.22%	0.02%	0.00%	2.03%	97.73%
NFS-0719	578	81	497	1.1	0.08	0.00	10	485.82	0.22%	0.02%	0.00%	2.01%	97.75%
NFS-0720	570	81	489	1.1	0.08	0.00	10	477.82	0.22%	0.02%	0.00%	2.04%	97.71%
NFS-0721	546	81	465	1.1	0.08	0.00	10	453.81	0.24%	0.02%	0.00%	2.15%	97.60%
NFS-0722	582	81	501	1.1	0.08	0.00	10	489.81	0.22%	0.02%	0.00%	2.00%	97.77%
NFS-0723	577	81	496	1.1	0.08	0.00	10	484.81	0.22%	0.02%	0.00%	2.02%	97.75%
NFS-0724	574	81	493	1.1	0.08	0.00	10	481.81	0.22%	0.02%	0.00%	2.03%	97.73%
NFS-0725	521	81	440	1.1	0.08	0.00	10	428.81	0.25%	0.02%	0.00%	2.27%	97.46%

Attachment 1

Waste Material Parameter Weight Evaluation for Waste Stream OR-NFS-CH-SOIL

Based on Original Generator Container Paperwork

Container ID	Gross Wt (lbs)	Tare Wt (lbs)	Net Wt (lbs)	Drum Liner Bag Wt (lbs)	RADPAD Wt (lbs)	Solid-A-Sorb Wt (lbs)	RADSORB Wt (lbs)	Soil Wt (lbs)	Plastic Wt%	Cellulosic Wt%	Inorganic Matrix Wt%	Organic Matrix Wt%	Soil Wt%
NFS-0726	518	81	437	1.1	0.08	0.00	10	425.81	0.25%	0.02%	0.00%	2.29%	97.44%
NFS-0727	506	81	425	1.1	0.08	0.00	10	413.82	0.26%	0.02%	0.00%	2.35%	97.37%
NFS-0728	563	81	482	1.1	0.08	0.00	10	470.81	0.23%	0.02%	0.00%	2.07%	97.68%
NFS-0729	495	81	414	1.1	0.08	0.00	10	402.82	0.27%	0.02%	0.00%	2.42%	97.30%
NFS-0730	534	81	453	1.1	0.08	0.00	10	441.82	0.24%	0.02%	0.00%	2.21%	97.53%
NFS-0731	591	81	510	1.1	0.08	0.00	10	498.81	0.22%	0.02%	0.00%	1.96%	97.81%
NFS-0732	638	81	557	1.1	0.08	0.00	10	545.81	0.20%	0.01%	0.00%	1.80%	97.99%
NFS-0733	576	81	495	1.1	0.08	0.00	10	483.82	0.22%	0.02%	0.00%	2.02%	97.74%
NFS-0734	528	81	447	1.1	0.08	0.00	10	435.82	0.25%	0.02%	0.00%	2.24%	97.50%
NFS-0735	533	81	452	1.1	0.08	0.00	10	440.80	0.24%	0.02%	0.00%	2.21%	97.53%
NFS-0736	558	81	477	1.1	0.08	0.00	10	465.80	0.23%	0.02%	0.00%	2.10%	97.66%
NFS-0737	562	81	481	1.1	0.08	0.00	10	469.82	0.23%	0.02%	0.00%	2.08%	97.68%
NFS-0738	515	81	434	1.1	0.08	0.00	10	422.81	0.25%	0.02%	0.00%	2.30%	97.42%
NFS-0739	548	81	467	1.1	0.08	0.00	10	455.82	0.24%	0.02%	0.00%	2.14%	97.61%
NFS-0741	555	81	474	1.1	0.08	0.00	10	462.81	0.23%	0.02%	0.00%	2.11%	97.64%
NFS-0742	562	81	481	1.1	0.08	0.00	10	469.82	0.23%	0.02%	0.00%	2.08%	97.68%
NFS-0743	554	81	473	1.1	0.08	0.00	10	461.81	0.23%	0.02%	0.00%	2.11%	97.64%
NFS-0744	534	81	453	1.1	0.08	0.00	10	441.82	0.24%	0.02%	0.00%	2.21%	97.53%
NFS-0745	503	81	422	1.1	0.08	0.00	10	410.82	0.26%	0.02%	0.00%	2.37%	97.35%
NFS-0746	489	81	408	1.1	0.08	0.00	10	396.82	0.27%	0.02%	0.00%	2.45%	97.26%
NFS-0747	526	81	445	1.1	0.08	0.00	10	433.82	0.25%	0.02%	0.00%	2.25%	97.49%
NFS-0748	537	81	456	1.1	0.08	0.00	10	444.82	0.24%	0.02%	0.00%	2.19%	97.55%
NFS-0749	525	81	444	1.1	0.08	0.00	10	432.82	0.25%	0.02%	0.00%	2.25%	97.48%
NFS-0750	542	81	461	1.1	0.08	0.00	10	449.82	0.24%	0.02%	0.00%	2.17%	97.57%
NFS-0751	549	81	468	1.1	0.08	0.00	10	456.81	0.24%	0.02%	0.00%	2.14%	97.61%
NFS-0760	660	81	579	1.1	0.08	0.00	10	567.81	0.19%	0.01%	0.00%	1.73%	98.07%
NFS-0761	606	81	525	1.1	0.08	0.00	10	513.82	0.21%	0.02%	0.00%	1.90%	97.87%
NFS-0762	662	81	581	1.1	0.08	0.00	10	569.82	0.19%	0.01%	0.00%	1.72%	98.08%
NFS-0763	551	81	470	1.1	0.08	0.00	10	458.82	0.23%	0.02%	0.00%	2.13%	97.62%
NFS-0764	610	81	529	1.1	0.08	0.00	10	517.81	0.21%	0.02%	0.00%	1.89%	97.89%
NFS-0765	588	81	507	1.1	0.08	0.00	10	495.81	0.22%	0.02%	0.00%	1.97%	97.79%
NFS-0767	566	81	485	1.1	0.08	0.00	10	473.81	0.23%	0.02%	0.00%	2.06%	97.69%
NFS-0768	544	81	463	1.1	0.08	0.00	10	451.81	0.24%	0.02%	0.00%	2.16%	97.59%
NFS-0769	597	81	516	1.1	0.08	0.00	10	504.80	0.21%	0.02%	0.00%	1.94%	97.83%
NFS-0770	570	81	489	1.1	0.08	0.00	10	477.82	0.22%	0.02%	0.00%	2.04%	97.71%
NFS-0771	596	81	515	1.1	0.08	0.00	10	503.81	0.21%	0.02%	0.00%	1.94%	97.83%
NFS-0772	565	81	484	1.1	0.08	0.00	10	472.81	0.23%	0.02%	0.00%	2.07%	97.69%
NFS-0773	598	81	517	1.1	0.08	0.00	10	505.82	0.21%	0.02%	0.00%	1.93%	97.84%
NFS-0774	612	81	531	1.1	0.08	0.00	10	519.82	0.21%	0.02%	0.00%	1.88%	97.89%
NFS-0775	529	81	448	1.1	0.08	0.00	10	436.81	0.25%	0.02%	0.00%	2.23%	97.50%
NFS-0778	555	81	474	1.1	0.08	0.00	10	462.81	0.23%	0.02%	0.00%	2.11%	97.64%
NFS-0779	546	81	465	1.1	0.08	0.00	10	453.81	0.24%	0.02%	0.00%	2.15%	97.60%
NFS-0780	561	81	480	1.1	0.08	0.00	10	468.82	0.23%	0.02%	0.00%	2.08%	97.67%
NFS-0781	577	81	496	1.1	0.08	0.00	10	484.81	0.22%	0.02%	0.00%	2.02%	97.75%
NFS-0782	545	81	464	1.1	0.08	0.00	10	452.82	0.24%	0.02%	0.00%	2.16%	97.59%
NFS-0790	602	81	521	1.1	0.08	0.00	10	509.81	0.21%	0.02%	0.00%	1.92%	97.85%
NFS-0791	566	81	485	1.1	0.08	0.00	10	473.81	0.23%	0.02%	0.00%	2.06%	97.69%
NFS-0792	609	81	528	1.1	0.08	0.00	10	516.82	0.21%	0.02%	0.00%	1.89%	97.88%
NFS-0794	544	81	463	1.1	0.08	0.00	10	451.81	0.24%	0.02%	0.00%	2.16%	97.59%
NFS-0795	565	81	484	1.1	0.08	0.00	10	472.81	0.23%	0.02%	0.00%	2.07%	97.69%
NFS-0796	552	81	471	1.1	0.08	0.00	10	459.81	0.23%	0.02%	0.00%	2.12%	97.63%

Attachment 1

Waste Material Parameter Weight Evaluation for Waste Stream OR-NFS-CH-SOIL

Based on Original Generator Container Paperwork

Container ID	Gross Wt (lbs)	Tare Wt (lbs)	Net Wt (lbs)	Drum Liner Bag Wt (lbs)	RADPAD Wt (lbs)	Solid-A-Sorb Wt (lbs)	RADSORB Wt (lbs)	Soil Wt (lbs)	Plastic Wt%	Cellulosic Wt%	Inorganic Matrix Wt%	Organic Matrix Wt%	Soil Wt%
NFS-0797	565	81	484	1.1	0.08	0.00	10	472.81	0.23%	0.02%	0.00%	2.07%	97.69%
NFS-0798	518	81	437	1.1	0.08	0.00	10	425.81	0.25%	0.02%	0.00%	2.29%	97.44%
NFS-0799	524	81	443	1.1	0.08	0.00	10	431.81	0.25%	0.02%	0.00%	2.26%	97.48%
NFS-0800	505	81	424	1.1	0.08	0.00	10	412.81	0.26%	0.02%	0.00%	2.36%	97.36%
NFS-0801	571	81	490	1.1	0.08	0.00	10	478.81	0.22%	0.02%	0.00%	2.04%	97.72%
NFS-0802	616	81	535	1.1	0.08	0.00	10	523.81	0.21%	0.01%	0.00%	1.87%	97.91%
NFS-0803	471	81	390	1.1	0.08	0.00	10	378.81	0.28%	0.02%	0.00%	2.56%	97.13%
NFS-0809	608	81	527	1.1	0.08	0.00	10	515.80	0.21%	0.02%	0.00%	1.90%	97.88%
NFS-0810	456	81	375	1.1	0.08	0.00	10	363.82	0.29%	0.02%	0.00%	2.67%	97.02%
NFS-0811	513	81	432	1.1	0.08	0.00	10	420.81	0.25%	0.02%	0.00%	2.31%	97.41%
NFS-0812	568	81	487	1.1	0.08	0.00	10	475.81	0.23%	0.02%	0.00%	2.05%	97.70%
NFS-0813	574	81	493	1.1	0.08	0.00	10	481.81	0.22%	0.02%	0.00%	2.03%	97.73%
NFS-0815	403	81	322	1.1	0.08	0.00	10	310.82	0.34%	0.02%	0.00%	3.11%	96.53%
NFS-0816	317	81	236	1.1	0.08	0.00	10	224.82	0.47%	0.03%	0.00%	4.24%	95.26%
NFS-0817	353	81	272	1.1	0.08	0.00	10	260.82	0.40%	0.03%	0.00%	3.68%	95.89%
NFS-0818	469	81	388	1.1	0.08	0.00	10	376.80	0.28%	0.02%	0.00%	2.58%	97.12%
NFS-0819	533	81	452	1.1	0.08	0.00	10	440.80	0.24%	0.02%	0.00%	2.21%	97.53%
NFS-0820	497	81	416	1.1	0.08	0.00	10	404.83	0.26%	0.02%	0.00%	2.40%	97.31%
NFS-0821	494	81	413	1.1	0.08	0.00	10	401.80	0.27%	0.02%	0.00%	2.42%	97.29%
NFS-0822	517	81	436	1.1	0.08	0.00	10	424.82	0.25%	0.02%	0.00%	2.29%	97.44%
NFS-0823	467	81	386	1.1	0.08	0.00	10	374.82	0.28%	0.02%	0.00%	2.59%	97.10%
NFS-0824	539	81	458	1.1	0.08	0.00	10	446.82	0.24%	0.02%	0.00%	2.18%	97.56%
NFS-0825	536	81	455	1.1	0.08	0.00	10	443.82	0.24%	0.02%	0.00%	2.20%	97.54%
NFS-0826	532	81	451	1.1	0.08	0.00	10	439.81	0.24%	0.02%	0.00%	2.22%	97.52%
NFS-0827	424	81	343	1.1	0.08	0.00	10	331.81	0.32%	0.02%	0.00%	2.92%	96.74%
NFS-0828	497	81	416	1.1	0.08	0.00	10	404.83	0.26%	0.02%	0.00%	2.40%	97.31%
NFS-0829	523	81	442	1.1	0.08	0.00	10	430.82	0.25%	0.02%	0.00%	2.26%	97.47%
NFS-0830	394	81	313	1.1	0.08	0.00	10	301.82	0.35%	0.03%	0.00%	3.19%	96.43%
NFS-0836	610	81	529	1.1	0.08	0.00	10	517.81	0.21%	0.02%	0.00%	1.89%	97.89%
NFS-0837	653	81	572	1.1	0.08	0.00	10	560.82	0.19%	0.01%	0.00%	1.75%	98.05%
NFS-0838	624	81	543	1.1	0.08	0.00	10	531.81	0.20%	0.01%	0.00%	1.84%	97.94%
NFS-0839	619	81	538	1.1	0.08	0.00	10	526.81	0.20%	0.01%	0.00%	1.86%	97.92%
NFS-0840	552	81	471	1.1	0.08	0.00	10	459.81	0.23%	0.02%	0.00%	2.12%	97.63%
NFS-0841	549	81	468	1.1	0.08	0.00	10	456.81	0.24%	0.02%	0.00%	2.14%	97.61%
NFS-0842	571	81	490	1.1	0.08	0.00	10	478.81	0.22%	0.02%	0.00%	2.04%	97.72%
NFS-0844	584	81	503	1.1	0.08	0.00	10	491.82	0.22%	0.02%	0.00%	1.99%	97.78%
NFS-0845	511	81	430	1.1	0.08	0.00	10	418.82	0.26%	0.02%	0.00%	2.33%	97.40%
NFS-0846	631	81	550	1.1	0.08	0.00	10	538.82	0.20%	0.01%	0.00%	1.82%	97.97%
NFS-0847	530	81	449	1.1	0.08	0.00	10	437.81	0.24%	0.02%	0.00%	2.23%	97.51%
NFS-0848	542	81	461	1.1	0.08	0.00	10	449.82	0.24%	0.02%	0.00%	2.17%	97.57%
NFS-0849	602	81	521	1.1	0.08	0.00	10	509.81	0.21%	0.02%	0.00%	1.92%	97.85%
NFS-0850	607	81	526	1.1	0.08	0.00	10	514.81	0.21%	0.02%	0.00%	1.90%	97.87%
NFS-0851	654	81	573	1.1	0.08	0.00	10	561.81	0.19%	0.01%	0.00%	1.75%	98.05%
NFS-0852	557	81	476	1.1	0.08	0.00	10	464.81	0.23%	0.02%	0.00%	2.10%	97.65%
NFS-0862	550	81	469	1.1	0.08	0.00	10	457.82	0.23%	0.02%	0.00%	2.13%	97.62%
NFS-0866	501	81	420	1.1	0.08	0.00	10	408.82	0.26%	0.02%	0.00%	2.38%	97.34%
NFS-0867	531	81	450	1.1	0.08	0.00	10	438.82	0.24%	0.02%	0.00%	2.22%	97.52%
NFS-0923	597	81	516	1.1	0.08	0.00	10	504.80	0.21%	0.02%	0.00%	1.94%	97.83%
NFS-0924	640	81	559	1.1	0.08	0.00	10	547.82	0.20%	0.01%	0.00%	1.79%	98.00%
NFS-0925	574	81	493	1.1	0.08	0.00	10	481.81	0.22%	0.02%	0.00%	2.03%	97.73%
NFS-0927	505	81	424	1.1	0.08	0.00	10	412.81	0.26%	0.02%	0.00%	2.36%	97.36%

Attachment 1

Waste Material Parameter Weight Evaluation for Waste Stream OR-NFS-CH-SOIL

Based on Original Generator Container Paperwork

Container ID	Gross Wt (lbs)	Tare Wt (lbs)	Net Wt (lbs)	Drum Liner Bag Wt (lbs)	RADPAD Wt (lbs)	Solid-A-Sorb Wt (lbs)	RADSORB Wt (lbs)	Soil Wt (lbs)	Plastic Wt%	Cellulosic Wt%	Inorganic Matrix Wt%	Organic Matrix Wt%	Soil Wt%
NFS-0930	589	81	508	1.1	0.08	0.00	10	496.82	0.22%	0.02%	0.00%	1.97%	97.80%
NFS-0931	598	81	517	1.1	0.08	0.00	10	505.82	0.21%	0.02%	0.00%	1.93%	97.84%
X10C0506042	550	58	492	1.1	0.08	0.00	10	480.82	0.22%	0.02%	0.00%	2.03%	97.73%
X10C0506043	537	58	479	1.1	0.08	0.00	10	467.82	0.23%	0.02%	0.00%	2.09%	97.67%
X10C0506044	281	58	223	1.1	0.08	0.00	10	211.82	0.49%	0.04%	0.00%	4.48%	94.99%
X10C0506045	555	58	497	1.1	0.08	0.00	10	485.82	0.22%	0.02%	0.00%	2.01%	97.75%
X10C0506047	132	58	74	1.1	0.08	0.00	10	62.82	1.49%	0.11%	0.00%	13.51%	84.89%
X10C0506054	368	58	310	1.1	0.08	0.00	10	298.82	0.35%	0.03%	0.00%	3.23%	96.39%
X10C0506055	661	58	603	1.1	0.08	0.00	10	591.82	0.18%	0.01%	0.00%	1.66%	98.15%
X10C0506056	643	58	585	1.1	0.08	0.00	10	573.82	0.19%	0.01%	0.00%	1.71%	98.09%
X10C0506057	600	58	542	1.1	0.08	0.00	10	530.82	0.20%	0.01%	0.00%	1.85%	97.94%
X10C0506062	566	58	508	1.1	0.08	0.00	10	496.82	0.22%	0.02%	0.00%	1.97%	97.80%
X10C0506063	485	58	427	1.1	0.08	0.00	10	415.82	0.26%	0.02%	0.00%	2.34%	97.38%
X10C0506064	582	58	524	1.1	0.08	0.00	10	512.82	0.21%	0.02%	0.00%	1.91%	97.87%
X10C0506065	501	58	443	1.1	0.08	0.00	10	431.82	0.25%	0.02%	0.00%	2.26%	97.48%
X10C0506066	508	58	450	1.1	0.08	0.00	10	438.82	0.24%	0.02%	0.00%	2.22%	97.52%
X10C0506069	296	58	238	1.1	0.08	0.00	10	226.82	0.46%	0.03%	0.00%	4.20%	95.30%
X10C0506070	538	58	480	1.1	0.08	0.00	10	468.82	0.23%	0.02%	0.00%	2.08%	97.67%
X10C0506071	371	58	313	1.1	0.08	0.00	10	301.82	0.35%	0.03%	0.00%	3.19%	96.43%
X10C0506148A	--	--	461.56	1.1	0.00	75	0	386.76	0.24%	0.00%	16.25%	0.00%	83.79%
X10C0506150C	--	--	536.8	1.1	0.00	75	0	462.00	0.20%	0.00%	13.97%	0.00%	86.07%
X10C0506151C	--	--	459.36	1.1	0.00	75	0	384.56	0.24%	0.00%	16.33%	0.00%	83.72%
X10C0506151E	--	--	497.64	1.1	0.00	75	0	422.84	0.22%	0.00%	15.07%	0.00%	84.97%
X10C0506149B	--	--	536.8	1.1	0.00	75	0	462.00	0.20%	0.00%	13.97%	0.00%	86.07%
X10C0506149D	--	--	525.8	1.1	0.00	75	0	451.00	0.21%	0.00%	14.26%	0.00%	85.77%
X10C0506149E	--	--	493.24	1.1	0.00	75	0	418.44	0.22%	0.00%	15.21%	0.00%	84.83%
X10C0506150B	--	--	498.96	1.1	0.00	75	0	424.16	0.22%	0.00%	15.03%	0.00%	85.01%
X10C0506151B	--	--	511.28	1.1	0.00	75	0	436.48	0.22%	0.00%	14.67%	0.00%	85.37%
X10C0506152A	--	--	474.32	1.1	0.00	75	0	399.52	0.23%	0.00%	15.81%	0.00%	84.23%
X10C0506152B	--	--	512.16	1.1	0.00	75	0	437.36	0.21%	0.00%	14.64%	0.00%	85.40%
X10C0506150A	--	--	490.6	1.1	0.00	75	0	415.80	0.22%	0.00%	15.29%	0.00%	84.75%
X10C0506154G	--	--	364.98	1.1	0.00	75	0	290.18	0.30%	0.00%	20.55%	0.00%	79.51%
X10C0506148C	--	--	520.96	1.1	0.00	75	0	446.16	0.21%	0.00%	14.40%	0.00%	85.64%
X10C0506154A	--	--	284.24	1.1	0.00	75	0	209.44	0.39%	0.00%	26.39%	0.00%	73.68%
							MIN	**62.82**	**0.168%**	**0.000%**	**0.000%**	**0.000%**	**73.684%**
							MAX	**641.82**	**1.486%**	**0.108%**	**26.386%**	**13.514%**	**98.288%**
							AVERAGE	**489.17**	**0.224%**	**0.016%**	**0.4446%**	**1.977%**	**97.346%**

1. Grosss and tare weights reported on waste diposal forms (Reference M003).
2. Drum liner bag weight from CCP-TP-053 (converted from kg to lbs).
3. RADSORB weight from soil mixing procedure (Reference P315).
4. RADPAD weight from product information (Reference M011).
5. Soil weight is net weight minus liner bag and absorbent weights.

Attachment 2

Waste Material Parameter Weight Evaluation for Waste Stream OR-NFS-CH-SOIL

Based on Certified CCP RTR Data

Container	Batch Data Report No.	Lot	Cellulosics (kg)	Plastics (kg)	Rubber (kg)	Organic Matrix (kg)	Inorganic Matrix (kg)	Iron-based Metals (kg)	Alum.-based Metals (kg)	Other Metals (kg)	Other Inorganics (kg)	Soils/ gravel (kg)	Total (kg)
NFS0118	OR-RTR6-0070	1		1.0								237.7	**238.7**
NFS0347	OR-RTR6-0070	1		1.0								230.5	**231.5**
NFS0476	OR-RTR6-0070	1		1.0								238.3	**239.3**
NFS0486	OR-RTR6-0070	1		1.0								260.5	**261.5**
X10C0506055	OR-RTR6-0070	1		1.0								262.1	**263.1**
NFS0103	OR-RTR6-0080	2		1								232.5	**233.5**
NFS0104	OR-RTR6-0074	2		1								232.5	**233.5**
NFS0105	OR-RTR6-0071	2		1								212.9	**213.9**
NFS0106	OR-RTR6-0093	2		1								215.3	**216.3**
NFS0108	OR-RTR6-0075	2		1								236.7	**237.7**
NFS0109	OR-RTR6-0094	2		1								221.9	**222.9**
NFS0111	OR-RTR6-0076	2		1								236.9	**237.9**
NFS0112	OR-RTR6-0096	2		1								228.1	**229.1**
NFS0119	OR-RTR6-0096	2		1								228.1	**229.1**
NFS0120	OR-RTR6-0079	2		1								232.5	**233.5**
NFS0121	OR-RTR6-0096	2		1								257.1	**258.1**
NFS0122	OR-RTR6-0099	2		1								241.6	**242.6**
NFS0123	OR-RTR6-0098	2		1								270.1	**271.1**
NFS0124	OR-RTR6-0096	2		1								228.6	**229.6**
NFS0125	OR-RTR6-0078	2		1								242.7	**243.7**
NFS0126	OR-RTR6-0099	2		1								254.3	**255.3**
NFS0127	OR-RTR6-0079	2		1								215.7	**216.7**
NFS0131	OR-RTR6-0094	2		1								207.5	**208.5**
NFS0132	OR-RTR6-0081	2		1								241.7	**242.7**
NFS0134	OR-RTR6-0072	2		1								242.7	**243.7**
NFS0135	OR-RTR6-0075	2		1								228.5	**229.5**
NFS0136	OR-RTR6-0079	2		1								250.7	**251.7**
NFS0137	OR-RTR6-0098	2		1								246.8	**247.8**
NFS0138	OR-RTR6-0073	2		1								249.7	**250.7**
NFS0139	OR-RTR6-0073	2		1								238.3	**239.3**
NFS0140	OR-RTR6-0073	2		1								216.9	**217.9**
NFS0143	OR-RTR6-0101	2		1								237.7	**238.7**
NFS0144	OR-RTR6-0073	2		1								235.5	**236.5**
NFS0145	OR-RTR6-0073	2		1								241.5	**242.5**
NFS0152	OR-RTR6-0077	2		1								242.3	**243.3**
NFS0153	OR-RTR6-0101	2		1								245.3	**246.3**
NFS0155	OR-RTR6-0075	2		1								244.7	**245.7**
NFS0156	OR-RTR6-0098	2		1								239.1	**240.1**
NFS0157	OR-RTR6-0084	2		1								226.7	**227.7**

Attachment 2

Waste Material Parameter Weight Evaluation for Waste Stream OR-NFS-CH-SOIL

Based on Certified CCP RTR Data

Container	Batch Data Report No.	Lot	Cellulosics (kg)	Plastics (kg)	Rubber (kg)	Organic Matrix (kg)	Inorganic Matrix (kg)	Iron-based Metals (kg)	Alum.-based Metals (kg)	Other Metals (kg)	Other Inorganics (kg)	Soils/ gravel (kg)	Total (kg)
NFS0159	OR-RTR6-0096	2		1								219.6	**220.6**
NFS0160	OR-RTR6-0082	2		1								230.7	**231.7**
NFS0161	OR-RTR6-0098	2		1								227.1	**228.1**
NFS0162	OR-RTR6-0076	2		1								239.1	**240.1**
NFS0163	OR-RTR6-0084	2		1								246.7	**247.7**
NFS0164	OR-RTR6-0100	2		1								225.3	**226.3**
NFS0165	OR-RTR6-0092	2		1								208.3	**209.3**
NFS0167	OR-RTR6-0077	2		1								236.5	**237.5**
NFS0168	OR-RTR6-0096	2		1								216.6	**217.6**
NFS0171	OR-RTR6-0104	2		1								212.5	**213.5**
NFS0172	OR-RTR6-0090	2		1								212.5	**213.5**
NFS0179	OR-RTR6-0090	2		1								201.9	**202.9**
NFS0186	OR-RTR6-0075	2		1								243.1	**244.1**
NFS0194	OR-RTR6-0074	2		1								225.9	**226.9**
NFS0195	OR-RTR6-0080	2		1								254.5	**255.5**
NFS0201	OR-RTR6-0085	2		1								225.5	**226.5**
NFS0202	OR-RTR6-0095	2		1								234.7	**235.7**
NFS0203	OR-RTR6-0080	2		1								221.7	**222.7**
NFS0205	OR-RTR6-0099	2		1								219.6	**220.6**
NFS0206	OR-RTR6-0095	2		1								246.5	**247.5**
NFS0207	OR-RTR6-0096	2		1								242.7	**243.7**
NFS0208	OR-RTR6-0096	2		1								221.6	**222.6**
NFS0209	OR-RTR6-0095	2		1								235.3	**236.3**
NFS0210	OR-RTR6-0081	2		1								232.5	**233.5**
NFS0211	OR-RTR6-0093	2		1								209.9	**210.9**
NFS0212	OR-RTR6-0100	2		1								242.3	**243.3**
NFS0214	OR-RTR6-0081	2		1								248.7	**249.7**
NFS0215	OR-RTR6-0094	2		1								252.9	**253.9**
NFS0218	OR-RTR6-0100	2		1								235.6	**236.6**
NFS0219	OR-RTR6-0094	2		1								246.1	**247.1**
NFS0220	OR-RTR6-0106	2		1								223.7	**224.7**
NFS0221	OR-RTR6-0096	2		1								244.6	**245.6**
NFS0223	OR-RTR6-0093	2		1								231.7	**232.7**
NFS0225	OR-RTR6-0093	2		1								249.7	**250.7**
NFS0226	OR-RTR6-0082	2	0.5	1								238.2	**239.7**
NFS0228	OR-RTR6-0093	2		1								246.9	**247.9**
NFS0231	OR-RTR6-0071	2		1								262.9	**263.9**
NFS0233	OR-RTR6-0094	2		1								220.1	**221.1**
NFS0234	OR-RTR6-0080	2		1								243.1	**244.1**

Attachment 2

Waste Material Parameter Weight Evaluation for Waste Stream OR-NFS-CH-SOIL

Based on Certified CCP RTR Data

Container	Batch Data Report No.	Lot	Cellulosics (kg)	Plastics (kg)	Rubber (kg)	Organic Matrix (kg)	Inorganic Matrix (kg)	Iron-based Metals (kg)	Alum.-based Metals (kg)	Other Metals (kg)	Other Inorganics (kg)	Soils/ gravel (kg)	Total (kg)
NFS0235	OR-RTR6-0101	2		1								238.5	**239.5**
NFS0237	OR-RTR6-0081	2		1								244.1	**245.1**
NFS0587	OR-RTR6-0070	2		1								228.7	**229.7**
NFS0239	OR-RTR6-0071	3		1.0								244.3	**245.3**
NFS0240	OR-RTR6-0094	3		1.0								245.3	**246.3**
NFS0245	OR-RTR6-0093	3		1.0								230.3	**231.3**
NFS0247	OR-RTR6-0082	3		1.0								218.9	**219.9**
NFS0250	OR-RTR6-0100	3		1.0								213.8	**214.8**
NFS0251	OR-RTR6-0093	3		1.0								226.5	**227.5**
NFS0252	OR-RTR6-0094	3		1.0								234.7	**235.7**
NFS0253	OR-RTR6-0094	3		1.0								237.9	**238.9**
NFS0255	OR-RTR6-0071	3		1.0								234.9	**235.9**
NFS0256	OR-RTR6-0079	3		1.0								213.7	**214.7**
NFS0257	OR-RTR6-0100	3		1.0								221.3	**222.3**
NFS0258	OR-RTR6-0092	3		1.0								214.7	**215.7**
NFS0263	OR-RTR6-0096	3		1.0								253.6	**254.6**
NFS0265	OR-RTR6-0098	3		1.0								253.9	**254.9**
NFS0267	OR-RTR6-0073	3		1.0								221.5	**222.5**
NFS0268	OR-RTR6-0101	3		1.0								258.7	**259.7**
NFS0269	OR-RTR6-0073	3		1.0				0.2				227.3	**228.5**
NFS0271	OR-RTR6-0077	3		1.0								241.1	**242.1**
NFS0274	OR-RTR6-0106	3		1.0								223.6	**224.6**
NFS0276	OR-RTR6-0100	3		1.0								231	**232.0**
NFS0277	OR-RTR6-0094	3		1.0								239.7	**240.7**
NFS0280	OR-RTR6-0094	3		1.0								238.7	**239.7**
NFS0281	OR-RTR6-0098	3		1.0								256.7	**257.7**
NFS0283	OR-RTR6-0100	3		1.0								248.9	**249.9**
NFS0284	OR-RTR6-0072	3		1.0								222.9	**223.9**
NFS0286	OR-RTR6-0071	3		1.0								209.5	**210.5**
NFS0287	OR-RTR6-0080	3		1.0								214.5	**215.5**
NFS0290	OR-RTR6-0098	3		1.0								212.7	**213.7**
NFS0292	OR-RTR6-0098	3		1.0								209.2	**210.2**
NFS0296	OR-RTR6-0093	3		1.0								211.1	**212.1**
NFS0299	OR-RTR6-0072	3		1.0								215.1	**216.1**
NFS0301	OR-RTR6-0104	3		1.0								244.3	**245.3**
NFS0305	OR-RTR6-0073	3		1.0								227.1	**228.1**
NFS0306	OR-RTR6-0101	3		1.0								198.3	**199.3**
NFS0307	OR-RTR6-0084	3		1.0								230.7	**231.7**
NFS0311	OR-RTR6-0082	3		1.0								252.7	**253.7**

Attachment 2

Waste Material Parameter Weight Evaluation for Waste Stream OR-NFS-CH-SOIL

Based on Certified CCP RTR Data

Container	Batch Data Report No.	Lot	Cellulosics (kg)	Plastics (kg)	Rubber (kg)	Organic Matrix (kg)	Inorganic Matrix (kg)	Iron-based Metals (kg)	Alum.-based Metals (kg)	Other Metals (kg)	Other Inorganics (kg)	Soils/ gravel (kg)	Total (kg)
NFS0313	OR-RTR6-0081	3		1.0								220.5	**221.5**
NFS0315	OR-RTR6-0078	3		1.0								270	**271.0**
NFS0316	OR-RTR6-0071	3		1.0								241.7	**242.7**
NFS0319	OR-RTR6-0093	3		1.0								244.7	**245.7**
NFS0320	OR-RTR6-0082	3		1.0								229.4	**230.4**
NFS0321	OR-RTR6-0092	3		1.0								207.7	**208.7**
NFS0322	OR-RTR6-0071	3		1.0								215.9	**216.9**
NFS0323	OR-RTR6-0078	3		1.0								252.1	**253.1**
NFS0326	OR-RTR6-0074	3		1.0								240.7	**241.7**
NFS0327	OR-RTR6-0082	3		1.0								214.5	**215.5**
NFS0329	OR-RTR6-0101	3		1.0								191.7	**192.7**
NFS0330	OR-RTR6-0074	3		1.0								256.1	**257.1**
NFS0332	OR-RTR6-0084	3		1.0								254.7	**255.7**
NFS0334	OR-RTR6-0093	3		1.0								215.5	**216.5**
NFS0335	OR-RTR6-0072	3		1.0								259.3	**260.3**
NFS0336	OR-RTR6-0072	3		1.0								250.7	**251.7**
NFS0340	OR-RTR6-0092	3		1.0								220.1	**221.1**
NFS0341	OR-RTR6-0074	3		1.0								273	**274.0**
NFS0342	OR-RTR6-0072	3		1.0								253.1	**254.1**
NFS0344	OR-RTR6-0098	3		1.0								216	**217.0**
NFS0345	OR-RTR6-0092	3		1.0								204.3	**205.3**
NFS0348	OR-RTR6-0098	3		1.0								201	**202.0**
NFS0349	OR-RTR6-0075	3		1.0								259.8	**260.8**
NFS0350	OR-RTR6-0093	3		1.0								241.1	**242.1**
NFS0440	OR-RTR6-0092	3		1.0								224.3	**225.3**
NFS0443	OR-RTR6-0104	3		1.0								233.3	**234.3**
NFS0444	OR-RTR6-0077	3		1.0								228.5	**229.5**
NFS0445	OR-RTR6-0100	3		1.0								247.2	**248.2**
NFS0446	OR-RTR6-0078	3		1.0								236.7	**237.7**
NFS0447	OR-RTR6-0104	3		1.0								222.3	**223.3**
NFS0451	OR-RTR6-0098	3		1.0								234.9	**235.9**
NFS0454	OR-RTR6-0100	3		1.0								249.4	**250.4**
NFS0458	OR-RTR6-0093	3		1.0							0.1	205	**206.1**
NFS0461	OR-RTR6-0072	3		1.0								213.7	**214.7**
NFS0463	OR-RTR6-0093	3		1.0								232.5	**233.5**
NFS0464	OR-RTR6-0081	3		1.0								231.9	**232.9**
NFS0465	OR-RTR6-0084	3		1.0								241.7	**242.7**
NFS0467	OR-RTR6-0096	3		1.0								214.1	**215.1**
NFS0471	OR-RTR6-0071	3		1.0								212.1	**213.1**

Attachment 2

Waste Material Parameter Weight Evaluation for Waste Stream OR-NFS-CH-SOIL

Based on Certified CCP RTR Data

Container	Batch Data Report No.	Lot	Cellulosics (kg)	Plastics (kg)	Rubber (kg)	Organic Matrix (kg)	Inorganic Matrix (kg)	Iron-based Metals (kg)	Alum.-based Metals (kg)	Other Metals (kg)	Other Inorganics (kg)	Soils/ gravel (kg)	Total (kg)
NFS0146	OR-RTR6-0103	4		1.0								252.9	**253.9**
NFS0472	OR-RTR6-0095	4		1.0								217.3	**218.3**
NFS0473	OR-RTR6-0076	4		1.0								239.7	**240.7**
NFS0474	OR-RTR6-0078	4		1.0								243.4	**244.4**
NFS0475	OR-RTR6-0093	4		1.0								238.9	**239.9**
NFS0477	OR-RTR6-0094	4		1.0								225.7	**226.7**
NFS0488	OR-RTR6-0074	4		1.0								231.1	**232.1**
NFS0490	OR-RTR6-0100	4		1.0								223.5	**224.5**
NFS0492	OR-RTR6-0104	4		1.0								216.5	**217.5**
NFS0493	OR-RTR6-0098	4		1.0								229.3	**230.3**
NFS0495	OR-RTR6-0098	4		1.0								237.1	**238.1**
NFS0497	OR-RTR6-0072	4		1.0								242.3	**243.3**
NFS0498	OR-RTR6-0104	4		1.0								219.1	**220.1**
NFS0499	OR-RTR6-0075	4		1.0								232.7	**233.7**
NFS0518	OR-RTR6-0092	4		1.0								265.1	**266.1**
NFS0519	OR-RTR6-0072	4		1.0								251.7	**252.7**
NFS0520	OR-RTR6-0072	4		1.0								244.1	**245.1**
NFS0522	OR-RTR6-0096	4		1.0								268.6	**269.6**
NFS0523	OR-RTR6-0104	4		1.0								243.1	**244.1**
NFS0530	OR-RTR6-0075	4		1.0								249.5	**250.5**
NFS0531	OR-RTR6-0071	4		1.0								234.9	**235.9**
NFS0532	OR-RTR6-0072	4		1.0								248.1	**249.1**
NFS0533	OR-RTR6-0105	4		1.0								243.3	**244.3**
NFS0535	OR-RTR6-0104	4		1.0								242.9	**243.9**
NFS0544	OR-RTR6-0080	4		1.0								236.1	**237.1**
NFS0545	OR-RTR6-0094	4		1.0								221.3	**222.3**
NFS0546	OR-RTR6-0090	4		1.0								214.9	**215.9**
NFS0547	OR-RTR6-0104	4		1.0								266.3	**267.3**
NFS0548	OR-RTR6-0096	4		1.0								239.9	**240.9**
NFS0550	OR-RTR6-0096	4		1.0								257.3	**258.3**
NFS0552	OR-RTR6-0099	4		1.0								271.1	**272.1**
NFS0553	OR-RTR6-0081	4		1.0								261.7	**262.7**
NFS0556	OR-RTR6-0102	4		1.0								260.9	**261.9**
NFS0558	OR-RTR6-0081	4		1.0								221.5	**222.5**
NFS0559	OR-RTR6-0071	4		1.0								248.7	**249.7**
NFS0561	OR-RTR6-0090	4		1.0								250.3	**251.3**
NFS0562	OR-RTR6-0099	4		1.0								226.1	**227.1**
NFS0563	OR-RTR6-0077	4		1.0								266.5	**267.5**
NFS0564	OR-RTR6-0081	4		1.0								225.9	**226.9**

Attachment 2

Waste Material Parameter Weight Evaluation for Waste Stream OR-NFS-CH-SOIL

Based on Certified CCP RTR Data

Container	Batch Data Report No.	Lot	Cellulosics (kg)	Plastics (kg)	Rubber (kg)	Organic Matrix (kg)	Inorganic Matrix (kg)	Iron-based Metals (kg)	Alum.-based Metals (kg)	Other Metals (kg)	Other Inorganics (kg)	Soils/ gravel (kg)	Total (kg)
NFS0566	OR-RTR6-0081	4		1.0								224.3	**225.3**
NFS0567	OR-RTR6-0082	4		1.0								251.7	**252.7**
NFS0585	OR-RTR6-0098	4		1.0								231.1	**232.1**
NFS0586	OR-RTR6-0081	4		1.0								246.3	**247.3**
NFS0589	OR-RTR6-0077	4		1.0								232.7	**233.7**
NFS0590	OR-RTR6-0098	4		1.0								232.6	**233.6**
NFS0595	OR-RTR6-0082	4		1.0								228.3	**229.3**
NFS0596	OR-RTR6-0077	4		1.0								222.7	**223.7**
NFS0655	OR-RTR6-0082	4		1.0								230.3	**231.3**
NFS0656	OR-RTR6-0096	4		1.0								233.7	**234.7**
NFS0657	OR-RTR6-0073	4		1.0								242.9	**243.9**
NFS0658	OR-RTR6-0073	4		1.0								213.9	**214.9**
NFS0659	OR-RTR6-0094	4		1.0								221.1	**222.1**
NFS0661	OR-RTR6-0075	4		1.0								225.3	**226.3**
NFS0675	OR-RTR6-0096	4		1.0								232.9	**233.9**
NFS0677	OR-RTR6-0094	4		1.0								239.9	**240.9**
NFS0683	OR-RTR6-0094	4		1.0								237.1	**238.1**
NFS0685	OR-RTR6-0095	4		1.0								205.3	**206.3**
NFS0686	OR-RTR6-0098	4		1.0								200.3	**201.3**
NFS0692	OR-RTR6-0104	4		1.0								235.7	**236.7**
NFS0693	OR-RTR6-0095	4		1.0								204.9	**205.9**
NFS0694	OR-RTR6-0104	4		1.0								185.9	**186.9**
NFS0700	OR-RTR6-0100	4		1.0								224.3	**225.3**
NFS0701	OR-RTR6-0098	4		1.0								232.3	**233.3**
NFS0702	OR-RTR6-0104	4		1.0								222.3	**223.3**
NFS0703	OR-RTR6-0105	4		1.0								201.7	**202.7**
NFS0704	OR-RTR6-0085	4		1.0								213.9	**214.9**
NFS0706	OR-RTR6-0085	4		1.0								242.9	**243.9**
NFS0707	OR-RTR6-0105	4		1.0								222.1	**223.1**
NFS0708	OR-RTR6-0100	4		1.0								215.7	**216.7**
NFS0709	OR-RTR6-0104	4		1.0								215.7	**216.7**
NFS0710	OR-RTR6-0095	4		1.0								228.7	**229.7**
NFS0712	OR-RTR6-0096	4		1.0								220.1	**221.1**
NFS0713	OR-RTR6-0094	4		1.0								220.7	**221.7**
NFS0715	OR-RTR6-0100	4		1.0								231.1	**232.1**
NFS0154	OR-RTR6-0103	5		1.0								239.9	**240.9**
NFS0198	OR-RTR6-0103	5		1.0								208.3	**209.3**
NFS0438	OR-RTR6-0103	5		1.0								237.5	**238.5**
NFS0537	OR-RTR6-0103	5		1.0								230.3	**231.3**

Attachment 2

Waste Material Parameter Weight Evaluation for Waste Stream OR-NFS-CH-SOIL

Based on Certified CCP RTR Data

Container	Batch Data Report No.	Lot	Cellulosics (kg)	Plastics (kg)	Rubber (kg)	Organic Matrix (kg)	Inorganic Matrix (kg)	Iron-based Metals (kg)	Alum.-based Metals (kg)	Other Metals (kg)	Other Inorganics (kg)	Soils/ gravel (kg)	Total (kg)
NFS0716	OR-RTR6-0076	5		1.0								227.7	**228.7**
NFS0717	OR-RTR6-0098	5		1.0								237.6	**238.6**
NFS0718	OR-RTR6-0092	5		1.0								220.5	**221.5**
NFS0719	OR-RTR6-0094	5		1.0								222.7	**223.7**
NFS0720	OR-RTR6-0094	5		1.0								218.9	**219.9**
NFS0721	OR-RTR6-0100	5		1.0								208.7	**209.7**
NFS0722	OR-RTR6-0092	5	0.5	1.0								229.4	**230.9**
NFS0723	OR-RTR6-0101	5		1.0								222.1	**223.1**
NFS0726	OR-RTR6-0096	5		1.0								195.5	**196.5**
NFS0729	OR-RTR6-0099	5		1.0								184.6	**185.6**
NFS0730	OR-RTR6-0104	5		1.0								202.3	**203.3**
NFS0731	OR-RTR6-0099	5		1.0								229.1	**230.1**
NFS0735	OR-RTR6-0094	5		1.0								202.3	**203.3**
NFS0736	OR-RTR6-0100	5		1.0								214.2	**215.2**
NFS0738	OR-RTR6-0103	5		1.0								194.7	**195.7**
NFS0742	OR-RTR6-0077	5		1.0								214.9	**215.9**
NFS0743	OR-RTR6-0090	5		1.0								212.5	**213.5**
NFS0744	OR-RTR6-0092	5		1.0								207.1	**208.1**
NFS0745	OR-RTR6-0093	5		1.0								189.1	**190.1**
NFS0748	OR-RTR6-0077	5		1.0								204.1	**205.1**
NFS0750	OR-RTR6-0080	5		1.0								206.5	**207.5**
NFS0751	OR-RTR6-0100	5		1.0								209.9	**210.9**
NFS0760	OR-RTR6-0104	5		1.0							1.0	258.5	**260.5**
NFS0761	OR-RTR6-0081	5		1.0								235.1	**236.1**
NFS0762	OR-RTR6-0078	5		1.0								260.5	**261.5**
NFS0764	OR-RTR6-0099	5		1.0								237.6	**238.6**
NFS0768	OR-RTR6-0101	5		1.0								206.9	**207.9**
NFS0769	OR-RTR6-0100	5		1.0								219.1	**220.1**
NFS0770	OR-RTR6-0100	5		1.0								231.5	**232.5**
NFS0771	OR-RTR6-0096	5		1.0								230.1	**231.1**
NFS0773	OR-RTR6-0092	5		1.0								231.5	**232.5**
NFS0774	OR-RTR6-0073	5		1.0								238.3	**239.3**
NFS0778	OR-RTR6-0099	5		1.0								213.6	**214.6**
NFS0780	OR-RTR6-0093	5		1.0								214.9	**215.9**
NFS0781	OR-RTR6-0080	5		1.0								222.1	**223.1**
NFS0791	OR-RTR6-0071	5		1.0								218.1	**219.1**
NFS0795	OR-RTR6-0100	5		1.0								217.3	**218.3**
NFS0797	OR-RTR6-0093	5		1.0								216.5	**217.5**
NFS0801	OR-RTR6-0099	5		1.0								220.6	**221.6**

Attachment 2

Waste Material Parameter Weight Evaluation for Waste Stream OR-NFS-CH-SOIL

Based on Certified CCP RTR Data

Container	Batch Data Report No.	Lot	Cellulosics (kg)	Plastics (kg)	Rubber (kg)	Organic Matrix (kg)	Inorganic Matrix (kg)	Iron-based Metals (kg)	Alum.-based Metals (kg)	Other Metals (kg)	Other Inorganics (kg)	Soils/ gravel (kg)	Total (kg)
NFS0803	OR-RTR6-0077	5		1.0								174.7	**175.7**
NFS0810	OR-RTR6-0101	5						0.1				168.2	**168.3**
NFS0812	OR-RTR6-0101	5						0.2				219.1	**219.3**
NFS0818	OR-RTR6-0104	5						1.0				173.5	**174.5**
NFS0820	OR-RTR6-0075	5		1.0								186.5	**187.5**
NFS0825	OR-RTR6-0100	5						0.6			18.0	186.5	**205.1**
NFS0828	OR-RTR6-0093	5		1.0								185.8	**186.8**
NFS0829	OR-RTR6-0092	5		1.0								197.9	**198.9**
NFS0836	OR-RTR6-0092	5		1.0								238.1	**239.1**
NFS0837	OR-RTR6-0092	5		1.0								257.7	**258.7**
NFS0841	OR-RTR6-0078	5		1.0								210.1	**211.1**
NFS0842	OR-RTR6-0071	5		1.0								219.7	**220.7**
NFS0846	OR-RTR6-0080	5		1.0								247.1	**248.1**
NFS0848	OR-RTR6-0105	5		1.0								206.7	**207.7**
NFS0851	OR-RTR6-0104	5		1.0								257.1	**258.1**
NFS0852	OR-RTR6-0093	5		1.0								213.9	**214.9**
NFS0867	OR-RTR6-0074	5		1.0								201.5	**202.5**
NFS0923	OR-RTR6-0071	5		1.0								230.3	**231.3**
NFS0924	OR-RTR6-0098	5		1.0								250.3	**251.3**
NFS0925	OR-RTR6-0103	5		1.0								220.3	**221.3**
NFS0930	OR-RTR6-0076	5		1.0								227.3	**228.3**
X10C0506042	OR-RTR6-0111	5		1.0								208.5	**209.5**
X10C0506044	OR-RTR6-0111	5		1.0								93.7	**94.7**
X10C0506057	OR-RTR6-0111	5		1.0								232.9	**233.9**
X10C0506066	OR-RTR6-0111	5		1.0								192.7	**193.7**
X10C0506070	OR-RTR6-0103	5		1.0							15.0	189.5	**205.5**
NFS0142	OR-RTR6-0106	6		1.0								239.1	**240.1**
NFS0147	OR-RTR6-0103	6		1.0								236.9	**237.9**
NFS0169	OR-RTR6-0101	6		1.0								227.3	**228.3**
NFS0177	OR-RTR6-0105	6		1.0								214.7	**215.7**
NFS0178	OR-RTR6-0103	6		1.0								229.1	**230.1**
NFS0191	OR-RTR6-0105	6		1.0								228.3	**229.3**
NFS0192	OR-RTR6-0105	6		1.0								204.9	**205.9**
NFS0236	OR-RTR6-0104	6		1.0								238.3	**239.3**
NFS0275	OR-RTR6-0106	6		1.0								234.1	**235.1**
NFS0294	OR-RTR6-0105	6		1.0								221.3	**222.3**
NFS0297	OR-RTR6-0105	6		1.0								253.9	**254.9**
NFS0453	OR-RTR6-0101	6		1.0								224.9	**225.9**
NFS0521	OR-RTR6-0101	6		1.0								255.1	**256.1**

Attachment 2

Waste Material Parameter Weight Evaluation for Waste Stream OR-NFS-CH-SOIL

Based on Certified CCP RTR Data

Container	Batch Data Report No.	Lot	Cellulosics (kg)	Plastics (kg)	Rubber (kg)	Organic Matrix (kg)	Inorganic Matrix (kg)	Iron-based Metals (kg)	Alum.-based Metals (kg)	Other Metals (kg)	Other Inorganics (kg)	Soils/ gravel (kg)	Total (kg)
NFS0534	OR-RTR6-0101	6		1.0								257.9	**258.9**
NFS0557	OR-RTR6-0104	6		1.0								252.3	**253.3**
NFS0565	OR-RTR6-0101	6		1.0								234.5	**235.5**
NFS0698	OR-RTR6-0106	6		1.0								225.7	**226.7**
NFS0699	OR-RTR6-0105	6		1.0								211.3	**212.3**
NFS0738	OR-RTR6-0103	6		1.0								194.7	**195.7**
NFS0739	OR-RTR6-0101	6		1.0								208.7	**209.7**
NFS0749	OR-RTR6-0106	6		1.0								198.7	**199.7**
NFS0775	OR-RTR6-0101	6		1.0								200.3	**201.3**
NFS0844	OR-RTR6-0106	6		1.0				0.1				226.5	**227.6**
NFS0849	OR-RTR6-0101	6		1.0								233.9	**234.9**
X10C0506043	OR-RTR6-0103	6		1.0								203.9	**204.9**
X10C0506045	OR-RTR6-0103	6		1.0								211.9	**212.9**
X10C0506054	OR-RTR6-0103	6		3.0								126.7	**129.7**
X10C0506062	OR-RTR6-0103	6		1.0							51.0	168.1	**220.1**
X10C0506063	OR-RTR6-0103	6		1.0								181.1	**182.1**
X10C0506065	OR-RTR6-0103	6		1.0								189.3	**190.3**
X10C0506071	OR-RTR6-0103	6		1.0								130.3	**131.3**
NFS0110	OR-RTR6-0085	7		1.0								229.1	**230.1**
NFS0170	OR-RTR6-0091	7		1.0								215.3	**216.3**
NFS0174	OR-RTR6-0091	7		1.0								211.7	**212.7**
NFS0175	OR-RTR6-0091	7		1.0								225.1	**226.1**
NFS0204	OR-RTR6-0090	7		1.0								215.9	**216.9**
NFS0222	OR-RTR6-0086	7		1.0								241.7	**242.7**
NFS0232	OR-RTR6-0083	7		1.0								261.3	**262.3**
NFS0248	OR-RTR6-0085	7		1.0								217.9	**218.9**
NFS0260	OR-RTR6-0080	7		1.0								254.5	**255.5**
NFS0272	OR-RTR6-0090	7		1.0								228.3	**229.3**
NFS0282	OR-RTR6-0089	7		1.0								256.7	**257.7**
NFS0285	OR-RTR6-0086	7		1.0								212.1	**213.1**
NFS0288	OR-RTR6-0085	7		1.0								228.5	**229.5**
NFS0314	OR-RTR6-0089	7		1.0								244.7	**245.7**
NFS0324	OR-RTR6-0085	7		1.0								220.3	**221.3**
NFS0343	OR-RTR6-0085	7		1.0								258.9	**259.9**
NFS0346	OR-RTR6-0085	7		1.0								224.7	**225.7**
NFS0452	OR-RTR6-0070	7		1.0								232.5	**233.5**
NFS0457	OR-RTR6-0085	7		1.0								220.9	**221.9**
NFS0460	OR-RTR6-0086	7		1.0								208.9	**209.9**
NFS0468	OR-RTR6-0085	7		1.0								211.9	**212.9**

Attachment 2

Waste Material Parameter Weight Evaluation for Waste Stream OR-NFS-CH-SOIL

Based on Certified CCP RTR Data

Container	Batch Data Report No.	Lot	Cellulosics (kg)	Plastics (kg)	Rubber (kg)	Organic Matrix (kg)	Inorganic Matrix (kg)	Iron-based Metals (kg)	Alum.-based Metals (kg)	Other Metals (kg)	Other Inorganics (kg)	Soils/ gravel (kg)	Total (kg)
NFS0484	OR-RTR6-0085	7		1.0								277.1	**278.1**
NFS0496	OR-RTR6-0085	7		1.0								246.3	**247.3**
NFS0536	OR-RTR6-0077	7		1.0								238.3	**239.3**
NFS0551	OR-RTR6-0084	7		1.0								247.5	**248.5**
NFS0588	OR-RTR6-0091	7		1.0								226.9	**227.9**
NFS0660	OR-RTR6-0091	7		1.0								224.3	**225.3**
NFS0670	OR-RTR6-0091	7		1.0								228.1	**229.1**
NFS0671	OR-RTR6-0085	7		1.0								233.1	**234.1**
NFS0676	OR-RTR6-0086	7		1.0								220.3	**221.3**
NFS0681	OR-RTR6-0083	7		1.0								218.9	**219.9**
NFS0690	OR-RTR6-0091	7		1.0								209.3	**210.3**
NFS0695	OR-RTR6-0091	7		1.0								220.1	**221.1**
NFS0705	OR-RTR6-0084	7		1.0								218.9	**219.9**
NFS0714	OR-RTR6-0091	7		1.0								212.1	**213.1**
NFS0724	OR-RTR6-0085	7		1.0								221.3	**222.3**
NFS0725	OR-RTR6-0086	7		1.0								196.7	**197.7**
NFS0734	OR-RTR6-0089	7		1.0								199.9	**200.9**
NFS0741	OR-RTR6-0091	7		1.0								217.3	**218.3**
NFS0746	OR-RTR6-0085	7		1.0								182.3	**183.3**
NFS0763	OR-RTR6-0078	7		1.0								211.3	**212.3**
NFS0765	OR-RTR6-0086	7		1.0								227.1	**228.1**
NFS0767	OR-RTR6-0084	7		1.0								216.7	**217.7**
NFS0798	OR-RTR6-0085	7		1.0								195.3	**196.3**
NFS0799	OR-RTR6-0086	7		1.0								197.7	**198.7**
NFS0802	OR-RTR6-0086	7		1.0								239.9	**240.9**
NFS0850	OR-RTR6-0085	7		1.0								236.5	**237.5**
NFS0862	OR-RTR6-0086	7		1.0								211.5	**212.5**
NFS0931	OR-RTR6-0086	7		1.0								231.3	**232.3**
NFS0129	OR-RTR6-0074	8		1.0								250.5	**251.5**
NFS0158	OR-RTR6-0074	8		1.0								234.3	**235.3**
NFS0193	OR-RTR6-0074	8		1.0								220.1	**221.1**
NFS0196	OR-RTR6-0074	8		1.0								213.5	**214.5**
NFS0199	OR-RTR6-0086	8		1.0								211.3	**212.3**
NFS0224	OR-RTR6-0077	8		1.0								250.9	**251.9**
NFS0242	OR-RTR6-0078	8		1.0								266.7	**267.7**
NFS0246	OR-RTR6-0078	8		1.0								276.4	**277.4**
NF50254	OR-RTR6-0074	8		1.0								209.5	**210.5**
NFS0264	OR-RTR6-0081	8		1.0								251.9	**252.9**
NFS0295	OR-RTR6-0076	8		1.0								220.3	**221.3**

Attachment 2

Waste Material Parameter Weight Evaluation for Waste Stream OR-NFS-CH-SOIL

Based on Certified CCP RTR Data

Container	Batch Data Report No.	Lot	Cellulosics (kg)	Plastics (kg)	Rubber (kg)	Organic Matrix (kg)	Inorganic Matrix (kg)	Iron-based Metals (kg)	Alum.-based Metals (kg)	Other Metals (kg)	Other Inorganics (kg)	Soils/ gravel (kg)	Total (kg)
NFS0298	OR-RTR6-0089	8		1.0								220.5	**221.5**
NFS0302	OR-RTR6-0081	8		1.0								209.5	**210.5**
NFS0304	OR-RTR6-0073	8		1.0								231.7	**232.7**
NFS0308	OR-RTR6-0074	8		1.0								218.3	**219.3**
NFS0309	OR-RTR6-0074	8		1.0								225.9	**226.9**
NFS0310	OR-RTR6-0089	8		1.0								254.7	**255.7**
NFS0312	OR-RTR6-0082	8		1.0								213.7	**214.7**
NFS0317	OR-RTR6-0078	8		1.0								204.9	**205.9**
NFS0331	OR-RTR6-0074	8		1.0								198.5	**199.5**
NFS0338	OR-RTR6-0080	8		1.0								259.7	**260.7**
NFS0339	OR-RTR6-0075	8		1.0								243.3	**244.3**
NFS0439	OR-RTR6-0076	8		1.0								242.1	**243.1**
NFS0442	OR-RTR6-0076	8		1.0								228.3	**229.3**
NFS0466	OR-RTR6-0083	8		1.0								231.1	**232.1**
NFS0469	OR-RTR6-0080	8		1.0								204.9	**205.9**
NFS0483	OR-RTR6-0085	8		1.0								285.3	**286.3**
NFS0485	OR-RTR6-0076	8		1.0								284.3	**285.3**
NFS0500	OR-RTR6-0076	8		1.0								246.7	**247.7**
NFS0560	OR-RTR6-0081	8		1.0								239.7	**240.7**
NFS0568	OR-RTR6-0080	8		1.0								229.1	**230.1**
NFS0569	OR-RTR6-0081	8		1.0								257.5	**258.5**
NFS0678	OR-RTR6-0080	8		1.0								214.3	**215.3**
NFS0679	OR-RTR6-0078	8		1.0								220.3	**221.3**
NFS0682	OR-RTR6-0076	8		1.0								202.5	**203.5**
NFS0696	OR-RTR6-0076	8		1.0								217.3	**218.3**
NFS0772	OR-RTR6-0078	8		1.0								216.7	**217.7**
NFS0779	OR-RTR6-0076	8		1.0								208.5	**209.5**
NFS0790	OR-RTR6-0076	8		1.0								234.3	**235.3**
NFS0796	OR-RTR6-0074	8		1.0								210.9	**211.9**
NFS0800	OR-RTR6-0076	8		1.0								189.5	**190.5**
NFS0819	OR-RTR6-0076	8		1.0								203.4	**204.4**
NFS0823	OR-RTR6-0089	8										173.3	**173.3**
NFS0826	OR-RTR6-0074	8		1.0								202.1	**203.1**
NFS0827	OR-RTR6-0076	8		1.0								150.9	**151.9**
NFS0830	OR-RTR6-0076	8		1.0								138.3	**139.3**
NFS0838	OR-RTR6-0078	8		1.0								240.9	**241.9**
NFS0845	OR-RTR6-0090	8		1.0					0.1			192.6	**193.7**
NFS0866	OR-RTR6-0076	8		1.0								187.7	**188.7**
NFS0133	OR-RTR6-0080	9										232.7	**232.7**

Attachment 2

Waste Material Parameter Weight Evaluation for Waste Stream OR-NFS-CH-SOIL

Based on Certified CCP RTR Data

Container	Batch Data Report No.	Lot	Cellulosics (kg)	Plastics (kg)	Rubber (kg)	Organic Matrix (kg)	Inorganic Matrix (kg)	Iron-based Metals (kg)	Alum.-based Metals (kg)	Other Metals (kg)	Other Inorganics (kg)	Soils/ gravel (kg)	Total (kg)
NFS0141	OR-RTR6-0074	9										240.5	**240.5**
NFS0166	OR-RTR6-0078	9										233.7	**233.7**
NFS0173	OR-RTR6-0091	9										206.3	**206.3**
NFS0176	OR-RTR6-0091	9										220.7	**220.7**
NFS0185	OR-RTR6-0091	9										215.1	**215.1**
NFS0188	OR-RTR6-0080	9										241.9	**241.9**
NFS0189	OR-RTR6-0091	9										217.1	**217.1**
NFS0190	OR-RTR6-0077	9										233.9	**233.9**
NFS0197	OR-RTR6-0079	9										198.5	**198.5**
NFS0213	OR-RTR6-0074	9										212.9	**212.9**
NFS0216	OR-RTR6-0080	9										236.5	**236.5**
NFS0217	OR-RTR6-0080	9										250.7	**250.7**
NFS0238	OR-RTR6-0080	9										225.7	**225.7**
NFS0249	OR-RTR6-0079	9										213.1	**213.1**
NFS0262	OR-RTR6-0079	9										228.3	**228.3**
NFS0266	OR-RTR6-0073	9		1.0								240.1	**241.1**
NFS0270	OR-RTR6-0089	9										242.1	**242.1**
NFS0278	OR-RTR6-0084	9										236.5	**236.5**
NFS0293	OR-RTR6-0079	9										201.5	**201.5**
NFS0325	OR-RTR6-0079	9										230.1	**230.1**
NFS0337	OR-RTR6-0073	9		1.0								253.1	**254.1**
NFS0441	OR-RTR6-0077	9										241.3	**241.3**
NFS0449	OR-RTR6-0079	9										239.9	**239.9**
NFS0455	OR-RTR6-0078	9										199.5	**199.5**
NFS0456	OR-RTR6-0079	9										217.9	**217.9**
NFS0491	OR-RTR6-0084	9										230.9	**230.9**
NFS0494	OR-RTR6-0084	9										217.9	**217.9**
NFS0517	OR-RTR6-0091	9										250.8	**250.8**
NFS0570	OR-RTR6-0079	9										243.3	**243.3**
NFS0584	OR-RTR6-0091	9										228.3	**228.3**
NFS0662	OR-RTR6-0073	9		1.0								260.5	**261.5**
NFS0664	OR-RTR6-0077	9										225.1	**225.1**
NFS0665	OR-RTR6-0090	9										223.5	**223.5**
NFS0666	OR-RTR6-0078	9										224.3	**224.3**
NFS0669	OR-RTR6-0089	9										222.3	**222.3**
NFS0672	OR-RTR6-0077	9										231.5	**231.5**
NFS0680	OR-RTR6-0090	9										221.9	**221.9**
NFS0684	OR-RTR6-0081	9										216.7	**216.7**
NFS0687	OR-RTR6-0090	9										210.7	**210.7**

Attachment 2

Waste Material Parameter Weight Evaluation for Waste Stream OR-NFS-CH-SOIL

Based on Certified CCP RTR Data

Container	Batch Data Report No.	Lot	Cellulosics (kg)	Plastics (kg)	Rubber (kg)	Organic Matrix (kg)	Inorganic Matrix (kg)	Iron-based Metals (kg)	Alum.-based Metals (kg)	Other Metals (kg)	Other Inorganics (kg)	Soils/ gravel (kg)	Total (kg)
NFS0697	OR-RTR6-0079	9		1.0								237.1	**238.1**
NFS0711	OR-RTR6-0089	9										205.3	**205.3**
NFS0727	OR-RTR6-0090	9										189.3	**189.3**
NFS0732	OR-RTR6-0091	9										250.1	**250.1**
NFS0733	OR-RTR6-0091	9										221.9	**221.9**
NFS0737	OR-RTR6-0078	9										216.3	**216.3**
NFS0747	OR-RTR6-0077	9										198.9	**198.9**
NFS0782	OR-RTR6-0090	9										207.5	**207.5**
NFS0792	OR-RTR6-0078	9										237.7	**237.7**
NFS0128	OR-RTR6-0090	10		1.0								227.5	**228.5**
NFS0130	OR-RTR6-0084	10		1.0								235.3	**236.3**
NFS0180	OR-RTR6-0090	10		1.0								243.7	**244.7**
NFS0181	OR-RTR6-0081	10		1.0								235.1	**236.1**
NFS0184	OR-RTR6-0090	10		1.0								238.1	**239.1**
NFS0187	OR-RTR6-0090	10		1.0								213.1	**214.1**
NFS0200	OR-RTR6-0085	10		1.0								228.2	**229.2**
NFS0227	OR-RTR6-0082	10		1.0								240.1	**241.1**
NFS0241	OR-RTR6-0084	10		1.0								219.1	**220.1**
NFS0243	OR-RTR6-0083	10		1.0								250.7	**251.7**
NFS0244	OR-RTR6-0082	10		1.0								232.5	**233.5**
NFS0273	OR-RTR6-0090	10		1.0								236.9	**237.9**
NFS0279	OR-RTR6-0077	10		1.0								237.5	**238.5**
NFS0289	OR-RTR6-0084	10		1.0								229.1	**230.1**
NFS0291	OR-RTR6-0083	10		1.0								208.1	**209.1**
NFS0303	OR-RTR6-0081	10	0.5	1.0								219.2	**220.7**
NFS0333	OR-RTR6-0079	10		1.0								234.7	**235.7**
NFS0459	OR-RTR6-0082	10		1.0								201.1	**202.1**
NFS0549	OR-RTR6-0090	10		1.0								245.7	**246.7**
NFS0688	OR-RTR6-0090	10		1.0								237.1	**238.1**
NFS0544	OR-RTR6-0080	11		1.0								236.1	**237.1**
NFS0668	OR-RTR6-0094	11		1.0								220.7	**221.7**
NFS0691	OR-RTR6-0091	11		1.0								210.7	**211.7**
NFS0824	OR-RTR6-0077	11						2.6				203.3	**205.9**
NFS0847	OR-RTR6-0104	11		1.0								201.5	**202.5**
X10C0506047	OR-RTR6-0305	11		2.0								19.9	**21.9**
X10C0506064	OR-RTR6-0111	11		1.0				0.1				225.2	**226.3**
X10C0506148A	OR-RTR6-0110	11		1.0							40	168.8	**209.8**
X10C0506148C	OR-RTR6-0110	11		1.0								236.6	**237.6**
X10C0506149B	OR-RTR6-0111	11		1.0								243	**244.0**

Attachment 2

Waste Material Parameter Weight Evaluation for Waste Stream OR-NFS-CH-SOIL

Based on Certified CCP RTR Data

Container	Batch Data Report No.	Lot	Cellulosics (kg)	Plastics (kg)	Rubber (kg)	Organic Matrix (kg)	Inorganic Matrix (kg)	Iron-based Metals (kg)	Alum.-based Metals (kg)	Other Metals (kg)	Other Inorganics (kg)	Soils/ gravel (kg)	Total (kg)
X10C0506149D	OR-RTR6-0111	11		1.0								238	**239.0**
X10C0506149E	OR-RTR6-0111	11		1.0								223.2	**224.2**
X10C0506150A	OR-RTR6-0317	11		1.0								222	**223.0**
X10C0506150B	OR-RTR6-0111	11		1.0							0.5	225.3	**226.8**
X10C0506150C	OR-RTR6-0110	11		1.0				0.1				242.9	**244.0**
X10C0506151B	OR-RTR6-0111	11		1.0								231.4	**232.4**
X10C0506151C	OR-RTR6-0110	11		1.0								207.8	**208.8**
X10C0506151E	OR-RTR6-0110	11		1.0								225.2	**226.2**
X10C0506152A	OR-RTR6-0111	11		1.0								214.6	**215.6**
X10C0506152B	OR-RTR6-0111	11		1.0								231.8	**232.8**
		117645.1	**1.5**	**469.0**	**0.0**	**0.0**	**0.0**	**5.1**	**0.0**	**0.0**	**125.6**	**117043.9**	**Min**
		Wt%	**0.001%**	**0.399%**	**0.000%**	**0.000%**	**0.000%**	**0.004%**	**0.000%**	**0.000%**	**0.107%**	**99.489%**	**Max**

Attachment 2

Waste Material Parameter Weight Evaluation for Waste Stream OR-NFS-CH-SOIL

Based on Certified CCP RTR Data

Container	Cellulosics (kg)	Plastics (kg)	Rubber (kg)	Organic Matrix (kg)	Inorganic Matrix (kg)	Iron-based Metals (kg)	Alum.-based Metals (kg)	Other Metals (kg)	Other Inorganics (kg)	Soils/ gravel (kg)
NFS0118	0.0%	0.4%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	99.6%
NFS0347	0.0%	0.4%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	99.6%
NFS0476	0.0%	0.4%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	99.6%
NFS0486	0.0%	0.4%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	99.6%
X10C0506055	0.0%	0.4%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	99.6%
NFS0103	0.0%	0.4%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	99.6%
NFS0104	0.0%	0.4%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	99.6%
NFS0105	0.0%	0.5%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	99.5%
NFS0106	0.0%	0.5%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	99.5%
NFS0108	0.0%	0.4%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	99.6%
NFS0109	0.0%	0.4%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	99.6%
NFS0111	0.0%	0.4%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	99.6%
NFS0112	0.0%	0.4%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	99.6%
NFS0119	0.0%	0.4%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	99.6%
NFS0120	0.0%	0.4%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	99.6%
NFS0121	0.0%	0.4%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	99.6%
NFS0122	0.0%	0.4%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	99.6%
NFS0123	0.0%	0.4%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	99.6%
NFS0124	0.0%	0.4%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	99.6%
NFS0125	0.0%	0.4%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	99.6%
NFS0126	0.0%	0.4%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	99.6%
NFS0127	0.0%	0.5%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	99.5%
NFS0131	0.0%	0.5%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	99.5%
NFS0132	0.0%	0.4%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	99.6%
NFS0134	0.0%	0.4%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	99.6%
NFS0135	0.0%	0.4%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	99.6%
NFS0136	0.0%	0.4%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	99.6%
NFS0137	0.0%	0.4%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	99.6%
NFS0138	0.0%	0.4%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	99.6%
NFS0139	0.0%	0.4%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	99.6%
NFS0140	0.0%	0.5%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	99.5%
NFS0143	0.0%	0.4%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	99.6%
NFS0144	0.0%	0.4%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	99.6%
NFS0145	0.0%	0.4%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	99.6%
NFS0152	0.0%	0.4%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	99.6%
NFS0153	0.0%	0.4%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	99.6%
NFS0155	0.0%	0.4%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	99.6%
NFS0156	0.0%	0.4%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	99.6%
NFS0157	0.0%	0.4%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	99.6%

Attachment 2

Waste Material Parameter Weight Evaluation for Waste Stream OR-NFS-CH-SOIL

Based on Certified CCP RTR Data

Container	Cellulosics (kg)	Plastics (kg)	Rubber (kg)	Organic Matrix (kg)	Inorganic Matrix (kg)	Iron-based Metals (kg)	Alum.-based Metals (kg)	Other Metals (kg)	Other Inorganics (kg)	Soils/ gravel (kg)
NFS0159	0.0%	0.5%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	99.5%
NFS0160	0.0%	0.4%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	99.6%
NFS0161	0.0%	0.4%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	99.6%
NFS0162	0.0%	0.4%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	99.6%
NFS0163	0.0%	0.4%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	99.6%
NFS0164	0.0%	0.4%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	99.6%
NFS0165	0.0%	0.5%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	99.5%
NFS0167	0.0%	0.4%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	99.6%
NFS0168	0.0%	0.5%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	99.5%
NFS0171	0.0%	0.5%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	99.5%
NFS0172	0.0%	0.5%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	99.5%
NFS0179	0.0%	0.5%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	99.5%
NFS0186	0.0%	0.4%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	99.6%
NFS0194	0.0%	0.4%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	99.6%
NFS0195	0.0%	0.4%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	99.6%
NFS0201	0.0%	0.4%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	99.6%
NFS0202	0.0%	0.4%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	99.6%
NFS0203	0.0%	0.4%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	99.6%
NFS0205	0.0%	0.5%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	99.5%
NFS0206	0.0%	0.4%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	99.6%
NFS0207	0.0%	0.4%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	99.6%
NFS0208	0.0%	0.4%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	99.6%
NFS0209	0.0%	0.4%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	99.6%
NFS0210	0.0%	0.4%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	99.6%
NFS0211	0.0%	0.5%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	99.5%
NFS0212	0.0%	0.4%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	99.6%
NFS0214	0.0%	0.4%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	99.6%
NFS0215	0.0%	0.4%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	99.6%
NFS0218	0.0%	0.4%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	99.6%
NFS0219	0.0%	0.4%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	99.6%
NFS0220	0.0%	0.4%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	99.6%
NFS0221	0.0%	0.4%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	99.6%
NFS0223	0.0%	0.4%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	99.6%
NFS0225	0.0%	0.4%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	99.6%
NFS0226	0.2%	0.4%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	99.4%
NFS0228	0.0%	0.4%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	99.6%
NFS0231	0.0%	0.4%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	99.6%
NFS0233	0.0%	0.5%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	99.5%
NFS0234	0.0%	0.4%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	99.6%

Attachment 2

Waste Material Parameter Weight Evaluation for Waste Stream OR-NFS-CH-SOIL

Based on Certified CCP RTR Data

Container	Cellulosics (kg)	Plastics (kg)	Rubber (kg)	Organic Matrix (kg)	Inorganic Matrix (kg)	Iron-based Metals (kg)	Alum.-based Metals (kg)	Other Metals (kg)	Other Inorganics (kg)	Soils/ gravel (kg)
NFS0235	0.0%	0.4%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	99.6%
NFS0237	0.0%	0.4%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	99.6%
NFS0587	0.0%	0.4%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	99.6%
NFS0239	0.0%	0.4%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	99.6%
NFS0240	0.0%	0.4%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	99.6%
NFS0245	0.0%	0.4%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	99.6%
NFS0247	0.0%	0.5%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	99.5%
NFS0250	0.0%	0.5%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	99.5%
NFS0251	0.0%	0.4%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	99.6%
NFS0252	0.0%	0.4%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	99.6%
NFS0253	0.0%	0.4%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	99.6%
NFS0255	0.0%	0.4%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	99.6%
NFS0256	0.0%	0.5%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	99.5%
NFS0257	0.0%	0.4%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	99.6%
NFS0258	0.0%	0.5%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	99.5%
NFS0263	0.0%	0.4%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	99.6%
NFS0265	0.0%	0.4%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	99.6%
NFS0267	0.0%	0.4%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	99.6%
NFS0268	0.0%	0.4%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	99.6%
NFS0269	0.0%	0.4%	0.0%	0.0%	0.0%	0.1%	0.0%	0.0%	0.0%	99.5%
NFS0271	0.0%	0.4%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	99.6%
NFS0274	0.0%	0.4%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	99.6%
NFS0276	0.0%	0.4%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	99.6%
NFS0277	0.0%	0.4%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	99.6%
NFS0280	0.0%	0.4%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	99.6%
NFS0281	0.0%	0.4%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	99.6%
NFS0283	0.0%	0.4%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	99.6%
NFS0284	0.0%	0.4%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	99.6%
NFS0286	0.0%	0.5%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	99.5%
NFS0287	0.0%	0.5%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	99.5%
NFS0290	0.0%	0.5%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	99.5%
NFS0292	0.0%	0.5%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	99.5%
NFS0296	0.0%	0.5%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	99.5%
NFS0299	0.0%	0.5%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	99.5%
NFS0301	0.0%	0.4%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	99.6%
NFS0305	0.0%	0.4%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	99.6%
NFS0306	0.0%	0.5%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	99.5%
NFS0307	0.0%	0.4%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	99.6%
NFS0311	0.0%	0.4%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	99.6%

Attachment 2

Waste Material Parameter Weight Evaluation for Waste Stream OR-NFS-CH-SOIL

Based on Certified CCP RTR Data

Container	Cellulosics (kg)	Plastics (kg)	Rubber (kg)	Organic Matrix (kg)	Inorganic Matrix (kg)	Iron-based Metals (kg)	Alum.-based Metals (kg)	Other Metals (kg)	Other Inorganics (kg)	Soils/ gravel (kg)
NFS0313	0.0%	0.5%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	99.5%
NFS0315	0.0%	0.4%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	99.6%
NFS0316	0.0%	0.4%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	99.6%
NFS0319	0.0%	0.4%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	99.6%
NFS0320	0.0%	0.4%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	99.6%
NFS0321	0.0%	0.5%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	99.5%
NFS0322	0.0%	0.5%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	99.5%
NFS0323	0.0%	0.4%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	99.6%
NFS0326	0.0%	0.4%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	99.6%
NFS0327	0.0%	0.5%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	99.5%
NFS0329	0.0%	0.5%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	99.5%
NFS0330	0.0%	0.4%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	99.6%
NFS0332	0.0%	0.4%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	99.6%
NFS0334	0.0%	0.5%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	99.5%
NFS0335	0.0%	0.4%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	99.6%
NFS0336	0.0%	0.4%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	99.6%
NFS0340	0.0%	0.5%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	99.5%
NFS0341	0.0%	0.4%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	99.6%
NFS0342	0.0%	0.4%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	99.6%
NFS0344	0.0%	0.5%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	99.5%
NFS0345	0.0%	0.5%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	99.5%
NFS0348	0.0%	0.5%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	99.5%
NFS0349	0.0%	0.4%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	99.6%
NFS0350	0.0%	0.4%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	99.6%
NFS0440	0.0%	0.4%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	99.6%
NFS0443	0.0%	0.4%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	99.6%
NFS0444	0.0%	0.4%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	99.6%
NFS0445	0.0%	0.4%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	99.6%
NFS0446	0.0%	0.4%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	99.6%
NFS0447	0.0%	0.4%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	99.6%
NFS0451	0.0%	0.4%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	99.6%
NFS0454	0.0%	0.4%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	99.6%
NFS0458	0.0%	0.5%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	99.5%
NFS0461	0.0%	0.5%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	99.5%
NFS0463	0.0%	0.4%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	99.6%
NFS0464	0.0%	0.4%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	99.6%
NFS0465	0.0%	0.4%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	99.6%
NFS0467	0.0%	0.5%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	99.5%
NFS0471	0.0%	0.5%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	99.5%

Attachment 2

Waste Material Parameter Weight Evaluation for Waste Stream OR-NFS-CH-SOIL

Based on Certified CCP RTR Data

Container	Cellulosics (kg)	Plastics (kg)	Rubber (kg)	Organic Matrix (kg)	Inorganic Matrix (kg)	Iron-based Metals (kg)	Alum.-based Metals (kg)	Other Metals (kg)	Other Inorganics (kg)	Soils/ gravel (kg)
NFS0146	0.0%	0.4%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	99.6%
NFS0472	0.0%	0.5%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	99.5%
NFS0473	0.0%	0.4%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	99.6%
NFS0474	0.0%	0.4%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	99.6%
NFS0475	0.0%	0.4%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	99.6%
NFS0477	0.0%	0.4%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	99.6%
NFS0488	0.0%	0.4%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	99.6%
NFS0490	0.0%	0.4%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	99.6%
NFS0492	0.0%	0.5%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	99.5%
NFS0493	0.0%	0.4%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	99.6%
NFS0495	0.0%	0.4%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	99.6%
NFS0497	0.0%	0.4%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	99.6%
NFS0498	0.0%	0.5%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	99.5%
NFS0499	0.0%	0.4%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	99.6%
NFS0518	0.0%	0.4%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	99.6%
NFS0519	0.0%	0.4%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	99.6%
NFS0520	0.0%	0.4%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	99.6%
NFS0522	0.0%	0.4%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	99.6%
NFS0523	0.0%	0.4%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	99.6%
NFS0530	0.0%	0.4%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	99.6%
NFS0531	0.0%	0.4%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	99.6%
NFS0532	0.0%	0.4%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	99.6%
NFS0533	0.0%	0.4%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	99.6%
NFS0535	0.0%	0.4%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	99.6%
NFS0544	0.0%	0.4%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	99.6%
NFS0545	0.0%	0.4%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	99.6%
NFS0546	0.0%	0.5%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	99.5%
NFS0547	0.0%	0.4%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	99.6%
NFS0548	0.0%	0.4%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	99.6%
NFS0550	0.0%	0.4%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	99.6%
NFS0552	0.0%	0.4%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	99.6%
NFS0553	0.0%	0.4%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	99.6%
NFS0556	0.0%	0.4%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	99.6%
NFS0558	0.0%	0.4%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	99.6%
NFS0559	0.0%	0.4%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	99.6%
NFS0561	0.0%	0.4%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	99.6%
NFS0562	0.0%	0.4%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	99.6%
NFS0563	0.0%	0.4%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	99.6%
NFS0564	0.0%	0.4%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	99.6%

Attachment 2

Waste Material Parameter Weight Evaluation for Waste Stream OR-NFS-CH-SOIL

Based on Certified CCP RTR Data

Container	Cellulosics (kg)	Plastics (kg)	Rubber (kg)	Organic Matrix (kg)	Inorganic Matrix (kg)	Iron-based Metals (kg)	Alum.-based Metals (kg)	Other Metals (kg)	Other Inorganics (kg)	Soils/ gravel (kg)
NFS0566	0.0%	0.4%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	99.6%
NFS0567	0.0%	0.4%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	99.6%
NFS0585	0.0%	0.4%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	99.6%
NFS0586	0.0%	0.4%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	99.6%
NFS0589	0.0%	0.4%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	99.6%
NFS0590	0.0%	0.4%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	99.6%
NFS0595	0.0%	0.4%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	99.6%
NFS0596	0.0%	0.4%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	99.6%
NFS0655	0.0%	0.4%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	99.6%
NFS0656	0.0%	0.4%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	99.6%
NFS0657	0.0%	0.4%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	99.6%
NFS0658	0.0%	0.5%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	99.5%
NFS0659	0.0%	0.5%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	99.5%
NFS0661	0.0%	0.4%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	99.6%
NFS0675	0.0%	0.4%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	99.6%
NFS0677	0.0%	0.4%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	99.6%
NFS0683	0.0%	0.4%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	99.6%
NFS0685	0.0%	0.5%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	99.5%
NFS0686	0.0%	0.5%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	99.5%
NFS0692	0.0%	0.4%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	99.6%
NFS0693	0.0%	0.5%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	99.5%
NFS0694	0.0%	0.5%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	99.5%
NFS0700	0.0%	0.4%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	99.6%
NFS0701	0.0%	0.4%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	99.6%
NFS0702	0.0%	0.4%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	99.6%
NFS0703	0.0%	0.5%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	99.5%
NFS0704	0.0%	0.5%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	99.5%
NFS0706	0.0%	0.4%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	99.6%
NFS0707	0.0%	0.4%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	99.6%
NFS0708	0.0%	0.5%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	99.5%
NFS0709	0.0%	0.5%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	99.5%
NFS0710	0.0%	0.4%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	99.6%
NFS0712	0.0%	0.5%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	99.5%
NFS0713	0.0%	0.5%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	99.5%
NFS0715	0.0%	0.4%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	99.6%
NFS0154	0.0%	0.4%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	99.6%
NFS0198	0.0%	0.5%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	99.5%
NFS0438	0.0%	0.4%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	99.6%
NFS0537	0.0%	0.4%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	99.6%

Attachment 2

Waste Material Parameter Weight Evaluation for Waste Stream OR-NFS-CH-SOIL

Based on Certified CCP RTR Data

Container	Cellulosics (kg)	Plastics (kg)	Rubber (kg)	Organic Matrix (kg)	Inorganic Matrix (kg)	Iron-based Metals (kg)	Alum.-based Metals (kg)	Other Metals (kg)	Other Inorganics (kg)	Soils/ gravel (kg)
NFS0716	0.0%	0.4%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	99.6%
NFS0717	0.0%	0.4%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	99.6%
NFS0718	0.0%	0.5%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	99.5%
NFS0719	0.0%	0.4%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	99.6%
NFS0720	0.0%	0.5%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	99.5%
NFS0721	0.0%	0.5%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	99.5%
NF50722	0.2%	0.4%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	99.4%
NFS0723	0.0%	0.4%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	99.6%
NFS0726	0.0%	0.5%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	99.5%
NFS0729	0.0%	0.5%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	99.5%
NFS0730	0.0%	0.5%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	99.5%
NFS0731	0.0%	0.4%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	99.6%
NFS0735	0.0%	0.5%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	99.5%
NFS0736	0.0%	0.5%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	99.5%
NFS0738	0.0%	0.5%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	99.5%
NFS0742	0.0%	0.5%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	99.5%
NFS0743	0.0%	0.5%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	99.5%
NFS0744	0.0%	0.5%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	99.5%
NFS0745	0.0%	0.5%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	99.5%
NFS0748	0.0%	0.5%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	99.5%
NFS0750	0.0%	0.5%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	99.5%
NFS0751	0.0%	0.5%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	99.5%
NFS0760	0.0%	0.4%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.4%	99.2%
NFS0761	0.0%	0.4%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	99.6%
NFS0762	0.0%	0.4%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	99.6%
NFS0764	0.0%	0.4%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	99.6%
NFS0768	0.0%	0.5%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	99.5%
NFS0769	0.0%	0.5%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	99.5%
NFS0770	0.0%	0.4%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	99.6%
NFS0771	0.0%	0.4%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	99.6%
NFS0773	0.0%	0.4%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	99.6%
NFS0774	0.0%	0.4%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	99.6%
NFS0778	0.0%	0.5%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	99.5%
NFS0780	0.0%	0.5%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	99.5%
NFS0781	0.0%	0.4%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	99.6%
NFS0791	0.0%	0.5%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	99.5%
NFS0795	0.0%	0.5%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	99.5%
NFS0797	0.0%	0.5%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	99.5%
NFS0801	0.0%	0.5%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	99.5%

Attachment 2

Waste Material Parameter Weight Evaluation for Waste Stream OR-NFS-CH-SOIL

Based on Certified CCP RTR Data

Container	Cellulosics (kg)	Plastics (kg)	Rubber (kg)	Organic Matrix (kg)	Inorganic Matrix (kg)	Iron-based Metals (kg)	Alum.-based Metals (kg)	Other Metals (kg)	Other Inorganics (kg)	Soils/ gravel (kg)
NFS0803	0.0%	0.6%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	99.4%
NFS0810	0.0%	0.0%	0.0%	0.0%	0.0%	0.1%	0.0%	0.0%	0.0%	99.9%
NFS0812	0.0%	0.0%	0.0%	0.0%	0.0%	0.1%	0.0%	0.0%	0.0%	99.9%
NFS0818	0.0%	0.0%	0.0%	0.0%	0.0%	0.6%	0.0%	0.0%	0.0%	99.4%
NFS0820	0.0%	0.5%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	99.5%
NFS0825	0.0%	0.0%	0.0%	0.0%	0.0%	0.3%	0.0%	0.0%	8.8%	90.9%
NFS0828	0.0%	0.5%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	99.5%
NFS0829	0.0%	0.5%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	99.5%
NFS0836	0.0%	0.4%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	99.6%
NFS0837	0.0%	0.4%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	99.6%
NFS0841	0.0%	0.5%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	99.5%
NFS0842	0.0%	0.5%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	99.5%
NFS0846	0.0%	0.4%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	99.6%
NFS0848	0.0%	0.5%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	99.5%
NFS0851	0.0%	0.4%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	99.6%
NFS0852	0.0%	0.5%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	99.5%
NFS0867	0.0%	0.5%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	99.5%
NFS0923	0.0%	0.4%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	99.6%
NFS0924	0.0%	0.4%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	99.6%
NFS0925	0.0%	0.5%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	99.5%
NFS0930	0.0%	0.4%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	99.6%
X10C0506042	0.0%	0.5%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	99.5%
X10C0506044	0.0%	1.1%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	98.9%
X10C0506057	0.0%	0.4%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	99.6%
X10C0506066	0.0%	0.5%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	99.5%
X10C0506070	0.0%	0.5%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	7.3%	92.2%
NFS0142	0.0%	0.4%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	99.6%
NFS0147	0.0%	0.4%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	99.6%
NFS0169	0.0%	0.4%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	99.6%
NFS0177	0.0%	0.5%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	99.5%
NFS0178	0.0%	0.4%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	99.6%
NFS0191	0.0%	0.4%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	99.6%
NFS0192	0.0%	0.5%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	99.5%
NFS0236	0.0%	0.4%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	99.6%
NFS0275	0.0%	0.4%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	99.6%
NFS0294	0.0%	0.4%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	99.6%
NFS0297	0.0%	0.4%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	99.6%
NFS0453	0.0%	0.4%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	99.6%
NFS0521	0.0%	0.4%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	99.6%

Attachment 2

Waste Material Parameter Weight Evaluation for Waste Stream OR-NFS-CH-SOIL

Based on Certified CCP RTR Data

Container	Cellulosics (kg)	Plastics (kg)	Rubber (kg)	Organic Matrix (kg)	Inorganic Matrix (kg)	Iron-based Metals (kg)	Alum.-based Metals (kg)	Other Metals (kg)	Other Inorganics (kg)	Soils/ gravel (kg)
NFS0534	0.0%	0.4%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	99.6%
NFS0557	0.0%	0.4%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	99.6%
NFS0565	0.0%	0.4%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	99.6%
NFS0698	0.0%	0.4%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	99.6%
NFS0699	0.0%	0.5%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	99.5%
NFS0738	0.0%	0.5%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	99.5%
NFS0739	0.0%	0.5%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	99.5%
NFS0749	0.0%	0.5%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	99.5%
NFS0775	0.0%	0.5%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	99.5%
NFS0844	0.0%	0.4%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	99.5%
NFS0849	0.0%	0.4%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	99.6%
X10C0506043	0.0%	0.5%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	99.5%
X10C0506045	0.0%	0.5%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	99.5%
X10C0506054	0.0%	2.3%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	97.7%
X10C0506062	0.0%	0.5%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	23.2%	76.4%
X10C0506063	0.0%	0.5%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	99.5%
X10C0506065	0.0%	0.5%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	99.5%
X10C0506071	0.0%	0.8%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	99.2%
NFS0110	0.0%	0.4%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	99.6%
NFS0170	0.0%	0.5%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	99.5%
NFS0174	0.0%	0.5%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	99.5%
NFS0175	0.0%	0.4%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	99.6%
NFS0204	0.0%	0.5%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	99.5%
NFS0222	0.0%	0.4%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	99.6%
NFS0232	0.0%	0.4%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	99.6%
NFS0248	0.0%	0.5%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	99.5%
NFS0260	0.0%	0.4%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	99.6%
NFS0272	0.0%	0.4%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	99.6%
NFS0282	0.0%	0.4%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	99.6%
NFS0285	0.0%	0.5%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	99.5%
NFS0288	0.0%	0.4%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	99.6%
NFS0314	0.0%	0.4%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	99.6%
NFS0324	0.0%	0.5%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	99.5%
NFS0343	0.0%	0.4%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	99.6%
NFS0346	0.0%	0.4%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	99.6%
NFS0452	0.0%	0.4%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	99.6%
NFS0457	0.0%	0.5%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	99.5%
NFS0460	0.0%	0.5%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	99.5%
NFS0468	0.0%	0.5%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	99.5%

Attachment 2

Waste Material Parameter Weight Evaluation for Waste Stream OR-NFS-CH-SOIL

Based on Certified CCP RTR Data

Container	Cellulosics (kg)	Plastics (kg)	Rubber (kg)	Organic Matrix (kg)	Inorganic Matrix (kg)	Iron-based Metals (kg)	Alum.-based Metals (kg)	Other Metals (kg)	Other Inorganics (kg)	Soils/ gravel (kg)
NFS0484	0.0%	0.4%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	99.6%
NFS0496	0.0%	0.4%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	99.6%
NFS0536	0.0%	0.4%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	99.6%
NFS0551	0.0%	0.4%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	99.6%
NFS0588	0.0%	0.4%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	99.6%
NFS0660	0.0%	0.4%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	99.6%
NFS0670	0.0%	0.4%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	99.6%
NFS0671	0.0%	0.4%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	99.6%
NFS0676	0.0%	0.5%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	99.5%
NFS0681	0.0%	0.5%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	99.5%
NFS0690	0.0%	0.5%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	99.5%
NFS0695	0.0%	0.5%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	99.5%
NFS0705	0.0%	0.5%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	99.5%
NFS0714	0.0%	0.5%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	99.5%
NFS0724	0.0%	0.4%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	99.6%
NFS0725	0.0%	0.5%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	99.5%
NFS0734	0.0%	0.5%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	99.5%
NFS0741	0.0%	0.5%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	99.5%
NFS0746	0.0%	0.5%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	99.5%
NFS0763	0.0%	0.5%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	99.5%
NFS0765	0.0%	0.4%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	99.6%
NFS0767	0.0%	0.5%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	99.5%
NFS0798	0.0%	0.5%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	99.5%
NFS0799	0.0%	0.5%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	99.5%
NFS0802	0.0%	0.4%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	99.6%
NFS0850	0.0%	0.4%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	99.6%
NFS0862	0.0%	0.5%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	99.5%
NFS0931	0.0%	0.4%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	99.6%
NFS0129	0.0%	0.4%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	99.6%
NFS0158	0.0%	0.4%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	99.6%
NFS0193	0.0%	0.5%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	99.5%
NFS0196	0.0%	0.5%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	99.5%
NFS0199	0.0%	0.5%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	99.5%
NFS0224	0.0%	0.4%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	99.6%
NFS0242	0.0%	0.4%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	99.6%
NFS0246	0.0%	0.4%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	99.6%
NFS0254	0.0%	0.5%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	99.5%
NFS0264	0.0%	0.4%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	99.6%
NFS0295	0.0%	0.5%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	99.5%

Attachment 2

Waste Material Parameter Weight Evaluation for Waste Stream OR-NFS-CH-SOIL

Based on Certified CCP RTR Data

Container	Cellulosics (kg)	Plastics (kg)	Rubber (kg)	Organic Matrix (kg)	Inorganic Matrix (kg)	Iron-based Metals (kg)	Alum.-based Metals (kg)	Other Metals (kg)	Other Inorganics (kg)	Soils/ gravel (kg)
NFS0298	0.0%	0.5%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	99.5%
NFS0302	0.0%	0.5%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	99.5%
NFS0304	0.0%	0.4%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	99.6%
NFS0308	0.0%	0.5%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	99.5%
NFS0309	0.0%	0.4%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	99.6%
NFS0310	0.0%	0.4%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	99.6%
NFS0312	0.0%	0.5%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	99.5%
NFS0317	0.0%	0.5%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	99.5%
NFS0331	0.0%	0.5%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	99.5%
NFS0338	0.0%	0.4%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	99.6%
NFS0339	0.0%	0.4%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	99.6%
NFS0439	0.0%	0.4%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	99.6%
NFS0442	0.0%	0.4%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	99.6%
NFS0466	0.0%	0.4%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	99.6%
NFS0469	0.0%	0.5%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	99.5%
NFS0483	0.0%	0.3%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	99.7%
NFS0485	0.0%	0.4%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	99.6%
NFS0500	0.0%	0.4%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	99.6%
NFS0560	0.0%	0.4%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	99.6%
NFS0568	0.0%	0.4%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	99.6%
NFS0569	0.0%	0.4%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	99.6%
NFS0678	0.0%	0.5%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	99.5%
NFS0679	0.0%	0.5%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	99.5%
NFS0682	0.0%	0.5%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	99.5%
NFS0696	0.0%	0.5%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	99.5%
NFS0772	0.0%	0.5%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	99.5%
NFS0779	0.0%	0.5%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	99.5%
NFS0790	0.0%	0.4%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	99.6%
NFS0796	0.0%	0.5%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	99.5%
NFS0800	0.0%	0.5%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	99.5%
NFS0819	0.0%	0.5%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	99.5%
NFS0823	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	100.0%
NFS0826	0.0%	0.5%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	99.5%
NFS0827	0.0%	0.7%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	99.3%
NFS0830	0.0%	0.7%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	99.3%
NFS0838	0.0%	0.4%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	99.6%
NFS0845	0.0%	0.5%	0.0%	0.0%	0.0%	0.1%	0.0%	0.0%	0.0%	99.4%
NFS0866	0.0%	0.5%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	99.5%
NFS0133	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	100.0%

Attachment 2

Waste Material Parameter Weight Evaluation for Waste Stream OR-NFS-CH-SOIL

Based on Certified CCP RTR Data

Container	Cellulosics (kg)	Plastics (kg)	Rubber (kg)	Organic Matrix (kg)	Inorganic Matrix (kg)	Iron-based Metals (kg)	Alum.-based Metals (kg)	Other Metals (kg)	Other Inorganics (kg)	Soils/ gravel (kg)
NFS0141	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	100.0%
NFS0166	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	100.0%
NFS0173	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	100.0%
NFS0176	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	100.0%
NFS0185	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	100.0%
NFS0188	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	100.0%
NFS0189	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	100.0%
NFS0190	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	100.0%
NFS0197	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	100.0%
NFS0213	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	100.0%
NFS0216	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	100.0%
NFS0217	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	100.0%
NFS0238	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	100.0%
NFS0249	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	100.0%
NFS0262	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	100.0%
NFS0266	0.0%	0.4%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	99.6%
NFS0270	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	100.0%
NFS0278	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	100.0%
NFS0293	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	100.0%
NFS0325	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	100.0%
NFS0337	0.0%	0.4%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	99.6%
NFS0441	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	100.0%
NFS0449	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	100.0%
NFS0455	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	100.0%
NFS0456	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	100.0%
NFS0491	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	100.0%
NFS0494	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	100.0%
NFS0517	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	100.0%
NFS0570	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	100.0%
NFS0584	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	100.0%
NFS0662	0.0%	0.4%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	99.6%
NFS0664	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	100.0%
NFS0665	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	100.0%
NFS0666	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	100.0%
NFS0669	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	100.0%
NFS0672	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	100.0%
NFS0680	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	100.0%
NFS0684	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	100.0%
NFS0687	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	100.0%

Attachment 2

Waste Material Parameter Weight Evaluation for Waste Stream OR-NFS-CH-SOIL

Based on Certified CCP RTR Data

Container	Cellulosics (kg)	Plastics (kg)	Rubber (kg)	Organic Matrix (kg)	Inorganic Matrix (kg)	Iron-based Metals (kg)	Alum.-based Metals (kg)	Other Metals (kg)	Other Inorganics (kg)	Soils/ gravel (kg)
NFS0697	0.0%	0.4%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	99.6%
NFS0711	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	100.0%
NFS0727	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	100.0%
NFS0732	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	100.0%
NFS0733	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	100.0%
NFS0737	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	100.0%
NFS0747	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	100.0%
NFS0782	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	100.0%
NFS0792	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	100.0%
NFS0128	0.0%	0.4%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	99.6%
NFS0130	0.0%	0.4%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	99.6%
NFS0180	0.0%	0.4%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	99.6%
NFS0181	0.0%	0.4%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	99.6%
NFS0184	0.0%	0.4%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	99.6%
NFS0187	0.0%	0.5%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	99.5%
NFS0200	0.0%	0.4%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	99.6%
NFS0227	0.0%	0.4%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	99.6%
NFS0241	0.0%	0.5%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	99.5%
NFS0243	0.0%	0.4%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	99.6%
NFS0244	0.0%	0.4%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	99.6%
NFS0273	0.0%	0.4%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	99.6%
NFS0279	0.0%	0.4%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	99.6%
NFS0289	0.0%	0.4%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	99.6%
NFS0291	0.0%	0.5%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	99.5%
NFS0303	0.2%	0.5%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	99.3%
NFS0333	0.0%	0.4%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	99.6%
NFS0459	0.0%	0.5%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	99.5%
NFS0549	0.0%	0.4%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	99.6%
NFS0688	0.0%	0.4%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	99.6%
NFS0544	0.0%	0.4%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	99.6%
NFS0668	0.0%	0.5%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	99.5%
NFS0691	0.0%	0.5%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	99.5%
NFS0824	0.0%	0.0%	0.0%	0.0%	0.0%	1.3%	0.0%	0.0%	0.0%	98.7%
NFS0847	0.0%	0.5%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	99.5%
X10C0506047	0.0%	9.1%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	90.9%
X10C0506064	0.0%	0.4%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	99.5%
X10C0506148A	0.0%	0.5%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	19.1%	80.5%
X10C0506148C	0.0%	0.4%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	99.6%
X10C0506149B	0.0%	0.4%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	99.6%

Attachment 2

Waste Material Parameter Weight Evaluation for Waste Stream OR-NFS-CH-SOIL

Based on Certified CCP RTR Data

Container	Cellulosics (kg)	Plastics (kg)	Rubber (kg)	Organic Matrix (kg)	Inorganic Matrix (kg)	Iron-based Metals (kg)	Alum.-based Metals (kg)	Other Metals (kg)	Other Inorganics (kg)	Soils/ gravel (kg)
X10C0506149D	0.0%	0.4%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	99.6%
X10C0506149E	0.0%	0.4%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	99.6%
X10C0506150A	0.0%	0.4%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	99.6%
X10C0506150B	0.0%	0.4%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.2%	99.3%
X10C0506150C	0.0%	0.4%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	99.5%
X10C0506151B	0.0%	0.4%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	99.6%
X10C0506151C	0.0%	0.5%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	99.5%
X10C0506151E	0.0%	0.4%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	99.6%
X10C0506152A	0.0%	0.5%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	99.5%
X10C0506152B	0.0%	0.4%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	99.6%
	0.0%	**0.0%**	**0.0%**	**0.0%**	**0.0%**	**0.0%**	**0.0%**	**0.0%**	**0.0%**	**76.37%**
	0.23%	**9.13%**	**0.00%**	**0.00%**	**0.00%**	**1.26%**	**0.00%**	**0.00%**	**23.17%**	**100.00%**
		2.3% (w/o X10C0506047)								

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Attachment 6 – Waste Form, Waste Material Parameters, Prohibited Items, and Packaging

Site(s): Oak Ridge National Laboratory

Waste Stream Description: Immobilized liquids and fines waste from Nuclear Fuel Services, Inc.

Container ID Numbers: See CCP-TP-005, Attachment 8 for containers in this waste stream

Waste Stream Number: OR-NFS-CH-HOM-A	
Physical Waste Form (e.g., debris, solidified waste)	Homogeneous solids
Summary Category Group [a]	S3000
Waste Matrix Code Group [a]	Solidified Organics and Inorganics
Waste Matrix Code [b]	S3900
Waste Material Parameter Weights [c]	Estimated Waste Stream Weight Percent Average (attach evaluation justifying percentages)
Iron-based metals/alloys	6.1%
Aluminum-based metals/alloys	0%
Other metals	0%
Other inorganic materials	0%
Cellulosics	0%
Rubber	0%
Plastics (waste materials)	12.2%
Organic matrix	9.8%
Inorganic matrix	71.9%
Soils/Gravels	0%
Packaging Materials	Present (Y/N)?
Steel	Y
Plastics	Y
Prohibited Wastes [d,e,f,g]	Present (Y/N)?
Observable liquid shall be no more than 1 percent by volume of the outermost container at the time of RTR or VE. Observable liquid shall be no more than 60 milliliters or 3 percent by volume, whichever is greater, in an internal container. Observable liquid shall not be present in a container with EPA HWN U134 assigned.	Y
Non-radionuclide pyrophoric materials	N
Sealed containers > 4 liters	N
Hazardous waste not occurring as co-contaminants with TRU mixed waste (non-mixed hazardous waste)	N

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Attachment 6 – Waste Form, Waste Material Parameters, Prohibited Items, and Packaging (continued)

Waste Stream Number: OR-NFS-CH-HOM-A

Explosives	N
Compressed gases	N
Residual hydrofluoric acid (if U134 assigned to stream)	N
Residual PCB liquids [j]	N
Ignitables (EPA Hazardous Waste Number D001)	N
Corrosives (EPA Hazardous Waste Number D002)	N
Reactives (EPA Hazardous Waste Number D003)	N
Waste incompatible with backfill, seal and panel closure materials, container and packaging materials, shipping container materials, or other wastes [h]	N
Spent Nuclear fuel or high-level waste [i]	N
Any un-vented plastic bags > 4 liters that have been heat-sealed	Y
Additional Information (if available)	N
Packaging	
Waste container type?	55-gallon drums (some include pipe components)
Liner type?	polyethylene drum liner bags
Is liner punctured?	N/A
Is filter vent installed?	Y
Maximum number of confinement layers	1

a. Source: *CCP Transuranic Waste Characterization Quality Assurance Project Plan* (CCP-PO-001) Introduction.
b. Source: *Transuranic Waste Baseline Inventory Report* (DOE/CAO-95-1121) or DOE Waste Treatability Group Guidance (DOE/LLW-217). Note: the waste matrix code should not be assigned at the summary category group level.
c. Source: CCP-PO-001 – Table C3-1. Attach the Waste Material Parameter Evaluation Memorandum used to estimate values include in this Table (see Section 4.4.27).
d. Source: CCP-PO-001 – Section C-1c
e. Source: *Transuranic Waste Acceptance Criteria for the Waste Isolation Pilot Plant* (WAC)(DOE/WIPP-02-3122), Section 3
f. Source: *TRUPACT-II Content Codes* (TRUCON) (DOE/WIPP 89-004)
g. Source: *TRUPACT-II Authorized Methods for Payload Control (TRAMPAC), Nuclear Waste Partnership*, LLC
h. This waste has been approved for disposal at the WIPP by the Permittee as documented by Appendix C1 of the WIPP RCRA Part B Permit Application and the Permittee's approval and assignment of the applicable TRUCON Codes for this waste stream.
i. Source: *Nuclear Waste Policy Act of 1982* (42 U.S.C. 10101)
j. Source: Polychlorinated Biphenyls (PCBs) manufacturing, Processing, Distribution and Commerce, and Use Prohibitions (40 CFR 761)

Acceptable Knowledge Expert: Jeff Harrison / Jeff Harrison Date: 12/5/2013
Print Sign

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Not part of page count

To: CCP Records

Memorandum

From: Jeff Harrison, CCP AKE

Date: November 1, 2010

RE: Waste Material Parameter Analysis for Waste Stream OR-NFS-CH-HOM-A, Nuclear Fuel Services Contact-Handled Transuranic Immobilized Liquids and Fines Stored at Oak Ridge National Laboratory

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In accordance to *CCP Acceptable Knowledge Documentation*, CCP-TP-005, Revision 19, Section 4.4.24, Waste Material Parameters (WMP) shall be estimated on a weight percent basis for the waste stream, documenting the assumptions and justification for deriving the estimated WMP.

Waste stream OR-NFS-CH-HOM-A is comprised of immobilized liquids, fines, and other high activity residual materials. Respirable fines were immobilized with Portland cement and water in 2-liter HDPE bottles, and dry absorbent was added to the top of the cured waste. Aqueous liquids were immobilized with RADSORB (organic polymer absorbent) in 2-liter HDPE bottles. Miscellaneous metals (e.g., sweepings, hardware) are contained throughout the RADSORB absorbent matrix. In addition, there are a couple of HDPE bottles containing very small quantities of scrap metal such as nuts and bolts with no absorbent.

Since this waste stream is a combination of inorganic and organic homogeneous solids, Waste Matrix Code S3900, Other Homogeneous Solids, is applied to this waste stream. The definition of this Waste Matrix Code is provided in the DOE Waste Treatability Group Guidance. This category includes waste that is consistent with the definition for the homogeneous solids (S3000) summary category, but does not meet the criteria specified for either of the inorganic homogeneous solids (S3100) or organic homogeneous solids (S3200) summary categories.

Each 2-liter HDPE bottle was bagged out of the glovebox in one 12-mil PVC bag and one 25-mil nylon reinforced polyethylene bag . Depending on the level of radioactivity, the bottles were placed into a plastic centering sleeve inside the 55-gallon drum or directly into the drum. If the drum was not completely filled, NFS may have completed a layer of bottles with wrapped empty 2-liter bottles. A RADPAD absorbent pad (cellulosic laminate containing an organic polymer) was placed in the bottom of the drum and the rigid liner. A polyethylene drum liner bag also may have been placed inside the rigid liner.

The bottles and plastic bags loaded directly into drums will be repackaged at the TWPC into a cardboard tube configuration. The bottles and plastic bags contained in a plastic centering sleeve may remain in this configuration or may be repackaged into the cardboard tube configuration.

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DATE REC'D 1/3/14 SP

Waste Material Parameter Analysis for Waste Stream OR-NFS-CH-HOM-A, Revision 0

The waste material parameter weight estimates for waste stream OR-NFS-CH-HOM-A were derived from NFS container disposal paperwork, procedures, product information, and a review of previous WEAF RTR data.

NFS Form 28-001, *TRU Waste Data Package*, lists the gross weight and tare weight for each drum (Reference M003). The reported tare weights vary, and based on a review of the WEAF RTR data (Reference M126), it appears the tare weights include some of the inner packaging materials (e.g., rigid liner, plastic centering sleeve). It is assumed that the 2-liter HDPE bottles and heat-sealed bags are not included in the tare weight. The attached product information indicates a Nalgene® 2-liter HDPE wide-mouth bottle weighs 200 grams (0.44 lbs). The weight of a typical bag-out bag provided in RTR procedure CCP-TP-053 is 100 grams (0.22 lbs), and each HDPE bottle is contained in two plastic bag-out bags (0.44 lbs). The plastic bags and 2-liter HDPE bottles are included in the table as "plastics (waste materials)." For the purpose of estimating waste material parameter weights, other packaging materials are not included in the calculation.

The weight of the immobilized waste was calculated by summing the weights of the HDPE bottles and plastic bags and subtracting this total from the net weight of each drum. The WEAF RTR was reviewed to determine the contents of each bottle and to estimate the volume utilization and the volume percentage of the different materials in each bottle (Reference M202). These percentages were converted to actual volumes and then to weights based on an assumed density (see below) for the different waste materials (i.e., grouted fines, RADSORB organic polymer absorbent, and miscellaneous metals).

According to the NFS procedure for segregation and immobilization of particulate fines (Reference P274), the amount of fines in a 2-liter HDPE bottle varied, and the amount of cement and water mixed with the fines varied depending on the amount of fines. The density of the fines material is unknown so the density of the immobilized fines cannot be calculated. Instead, a density of 2.403 is assumed which is the density of concrete with gravel and of wet mortar (see attached density data).

Review of the WEAF RTR data identified numerous 2-liter HDPE bottles containing miscellaneous metals throughout a transparent resin matrix. The metals identified by RTR include scrap, sweepings, hardware (e.g., nuts, bolts, washers), and hand tools (e.g., screwdriver, wrench). To estimate the weight of the metals, the density of iron (7.85) was used (see attached density data). Based on a comparison of the net weight of the waste to the calculated weights, it appears that the volume of metals was overestimated in the review of the WEAF RTR. The metal percentages were adjusted so that the net weights and calculated weights were more comparable. It is possible that other residual debris materials (e.g., paint chips, cheesecloth, gasket material, paper filter media) may be contained in the resin matrix, but cannot be identified by RTR due to their lower densities.

Waste Material Parameter Analysis for Waste Stream OR-NFS-CH-HOM-A, Revision 0

The consistency and density of the resin matrix observed in the WEAF RTR is consistent with an organic polymer absorbent, such as RADSORB, which is a solid, granular, cross-linked homopolymer, and was a common absorbent used by NFS. RADSORB has an average density of 0.62 and can absorb up to 250 times its weight in water and up to 30 times its weight in aqueous chemical solutions (Reference M011). However, based on the net weights of the waste, it doesn't appear as if the bottles contain anywhere near that amount of liquid.

As an example, the following describes how the weights were calculated for drum NFS0150:

- This drum has a gross weight of 119 lbs and a tare weight of 100 lbs so the net weight is 19 lbs. It is assumed that the 19 lbs consists of the bottles of waste and the heat-sealed bags.
- There are three bottles in this drum. Each bottle has an empty weight of 0.44 lbs and is contained in two heat-sealed bags (0.22 lbs ea.) so the total weight of plastic is 2.64 lbs [(0.44 x 3 bottles) + (0.22 x 6 bags).
- Bottle 1 was estimated by RTR to contain 70% RADSORB and 30% metal (by volume) and is 100% full. 122 in^3 x 0.70 x 0.0224 lbs/in^3 = 1.913 lbs RADSORB. 122 in^3 x 0.30 x 0.28 lbs/in^3 = 10.248 lbs metal. 0.88 (plastic) + 1.913 + 10.248 = 13.041 lbs total weight.
- Bottle 2 was estimated by RTR to contain 70% grouted fines and 20% RADSORB (by volume) and is 90% full. 122 in^3 x 0.70 x 0.0862 lbs/in^3 = 7.361 lbs grouted fines. 122 in^3 x 0.20 x 0.0224 lbs/in^3 = 0.547 lbs RADSORB. 0.88 (plastic) + 7.361 + 0.547 = 8.788 lbs total weight.
- Bottle 3 was estimated by RTR to contain 64% RADSORB and 16% metal (by volume) and is 80% full. 122 in^3 x 0.64 x 0.0224 lbs/in^3 = 1.749 lbs RADSORB. 122 in^3 x 0.16 x 0.28 lbs/in^3 = 5.466 lbs metal. 0.88 (plastic) + 1.749 + 5.466 = 8.095 lbs total weight.
- The sum of the three bottles is 29.924 lbs (13.041 + 8.788 + 8.095). The actual net weight is only 19 lbs. Bottle 1 was adjusted to 90% RADSORB and 10% metal, and Bottle 3 was adjusted to 75% RADSORB and 5% metal. This adjustment results in a total weight of 20.181 lbs which is only 6.2% heavier than 19 lbs.

Waste Stream OR-NFS-CH-HOM-A Waste Material Parameters

Waste Material Parameter	Weight Percent	Weight Percent Range
Aluminum-based Metal/Alloy	0%	0%
Iron-based Metal/Alloy	6.1%	0% – 57.3%
Other Metals/Alloy	0%	0%
Other Inorganic Materials	0%	0%
Cellulosics	0%	0%
Plastics (waste materials)	12.2%	10.4% – 32.8%
Rubber	0%	0%
Organic Matrix	9.8%	2.5% – 50.1%
Inorganic Matrix	71.9%	0% – 85.6%
Soils/Gravel	0%	0%

Bottle Specifications

Nominal Capacity	Description	Catalog Number	Approx. Fill Capacity	Material	Color	Screw Closure Size	Closure Cat. No.	I.D. Neck (mm)	Ht. w/ Closure (mm)	Ht. w/o Closure (mm)	O.D. Body (mm)
	Bottle, WM, Square	2114-0032	1,190	HDPE	Natural	63	71-2150-0830	63/2 1/16	191/7 1/2	176/6 15/16	95/3 3/4 Square
	Jar, Straight-Side, WM	DS2115-1000	1,075	PFA	Natural	120	–	111/4 3/8	132/5 3/16	130/5 1/8	107/4 7/32
	Jar, Straight-Side, WM	2116-1000	1,230	PC	Clear	120	71-2155-1200	112/4 7/16	151/5 15/16	130/5 1/8	112/4 7/16
	Jar, Straight-Side, WM	2117-1000	1,220	PMP	Clear	120	71-2155-1200	112/4 7/16	151/5 15/16	137/5 3/8	112/4 7/16
	Jar, Straight-Side, WM	2118-0032	1,230	PP	Natural	120	71-2155-1200	112/4 7/16	151/5 15/16	137/5 3/8	112/4 7/16
	Jar, Straight-Side, WM	2119-1000	1,230	PC	Gray	120	71-2155-1200	112/4 7/16	151/5 15/16	137/5 3/8	112/4 7/16
	Jar, Mason	2115-1000	1,200	PP	Natural	70	71-2154-0700	61/2 3/8	213/8 3/8	201/7 15/16	94/3 11/16
	Bottle, Heavy Duty	2126-1000	1,100	HDPE	Natural	53B	71-2160-0530	39/1 1/2	226/8 7/8	220/8 5/8	93/3 11/16
	Bottle, Heavy Duty	2128-1000	1,100	PP	Natural	53B	71-2160-0530	39/1 1/2	226/8 7/8	220/8 5/8	93/3 11/16
1 Liter (32 oz.)	Bottle, Env. Sample, WM	DS2186-0032	1,090	HDPE	Amber	63	71-2171-0650	62/2 7/16	199/7 13/16	193/7 9/16	91/3 5/8
	Bottle, Env. Sample, WM	2189-0032	1,090	HDPE	Natural	63	71-2150-0650	62/2 7/16	199/7 13/16	195/7 11/16	91/3 5/8
	Bottle, Fluorinated, WM	2197-0032	1,100	FLPE	Natural	63	71-2150-0650	53/2 1/16	199/7 7/8	195/7 11/16	91/3 5/8
	Bottle, PassPort, WM	2198-0032	1,100	HDPE	Natural	63	71-2150-0650	53/2 1/16	199/7 7/8	195/7 11/16	91/3 5/8
	Bottle, Large, NM	2205-0032	1,180	PC	Clear	38-430	71-2160-0384	27/1 1/16	221/8 11/16	217/8 9/16	98/3 7/8
	Carboy w/Tubulation	2302-0001	1,100	LDPE	Natural	38-430	71-2160-0384	27/1 1/16	216/8 1/2	213/8 3/8	91/3 5/8
	Bottle, Biobarrier	2515-1000	1,200	PC	Lt. Blue	48	38-2515-0480	37/1 15/16	201/7 15/16	–	98/3 7/16 Square
1.5 Liter	Bottle, NM	2104-0048	1,660	HDPE	Natural	63	71-2160-0630	52/2 1/16	284/11 3/16	278/11	91/3 5/8
	Bottle, Low Particulate	342099-1000	1,100	HDPE	Natural	88-430	71-2160-0384	27/1 1/16	216/8 1/2	212/8 3/8	91/3 5/8
	Bottle, NM	1600-0064	2,200	FEP	Clear	38-430	71-2174-0384	25/1	245/9 5/8	239/9 7/16	121/4 3/4
	Bottle, Rect.	2007-0064	2,120	HDPE	Natural	63	71-2150-0630	51/2	242/9 1/2	234/9 3/16	152x84/6x3 5/16
	Bottle, Rect.	2008-0064	2,000	HDPE	Amber	63	71-2171-0630	51/2	242/9 1/2	234/9 3/16	152x84/6x3 5/16
	Bottle, Square	2015-2000	2,400	PC	Clear	53B	71-2160-0530	39/1 1/2	271/10 11/16	265/10 7/16	116/4 9/16
	Media Bottle, Stable	2019-2000	2,400	PETG	Clear	53B	71-2151-0053	39/1 1/2	271/10 11/16	265/10 7/16	116/4 9/16
	Bottle, Fluorinated, NM	2097-0005	2,100	FLPE	Natural	38-430	–	27/1 1/16	250/9 13/16	246/9 11/16	120/4 3/4
	Bottle, WM	2100-0064	2,050	FEP	Clear	53	71-2174-0530	43/1 11/16	232/9 1/8	226/8 15/16	119/4 11/16
2 Liter (1/2 gal.)	Bottle, EP Tox, WM	2101-0200	2,300	FEP	Clear	100	–	89/3 1/2	241/9 1/2	235/9 1/4	119/4 11/16
	Jar, Mason	2115-2000	2,135	PP	Natural	70	71-2154-0700	61/2 3/8	244/9 5/8	230/9 1/16	120/4 3/4
	Bottle, Large, WM	2120-0006	2,140	HDPE	Natural	100	71-2150-1000	89/3 1/2	244/9 5/8	235/9 1/4	119/4 11/16
	Bottle, Large, WM	2121-0006	2,200	PP	Natural	100	71-2150-1000	89/3 1/2	244/9 5/8	235/9 1/4	120/4 3/4
	Bottle, Large, Fluorinated, WM	2124-0006	2,140	FLPE	Natural	100	71-2150-1000	89/3 1/2	244/9 5/8	235/9 1/4	120/4 3/4
	Bottle, Heavy Duty	2125-2000	2,200	HDPE	Natural	53B	71-2160-0530	39/1 1/2	260/10 1/4	254/10	118/4 11/16
	Bottle, Heavy Duty	2128-2000	2,200	PP	Natural	53B	71-2160-0530	39/1 1/2	260/10 1/4	254/10	118/4 11/16
	Bottle, NM	2202-0006	2,100	LDPE	Natural	38-430	71-2160-0384	25/1	249/9 13/16	244/9 5/8	121/4 3/4
	Bottle, NM	2200-0006	2,200	PP	Natural	38-430	71-2160-0384	25/1	249/9 13/16	244/9 5/8	121/4 3/4
	Bottle, Large, NM	2204-0006	2,100	PP	Amber	38-430	71-2171-0384	25/1	249/9 13/16	244/9 5/8	121/4 3/4
	Bottle, Large, NM	DS2206-0210	2,275	PC	Clear	38-430	71-2160-0384	25/1	249/9 13/16	244/9 5/8	121/4 3/4
	Carboy, w/Tubulation	2302-0006	2,100	LDPE	Natural	38-430	71-2160-0384	25/1	249/9 13/16	244/9 5/8	121/4 3/4
	Bottle, Biobarrier	2515-2000	2,400	PC	Lt. Blue	48	38-2515-0480	38/1 1/2	265/10 7/16	–	116/4 9/16 Square
2.5 Liter (5/8 gal.)	Bottle, Large, NM	DS2205-0250	2,730	PC	Clear	38-430	71-2160-0384	25/1	285/11 1/4	280/11 1/16	121/4 3/4
3 Liter (4/5 gal.)	Jar, Mason	2115-3000	3,325	PP	Natural	70	71-2154-0700	61/2 3/8	248/9 3/4	230/9 1/16	156/6 1/8
	Bottle, Fluorinated, NM	2097-0010	4,160	FLPE	Natural	38-430	–	26/1 1/32	334/13 1/8	330/13	153/6
	Bottle, PassPort, NM	2099-0010	4,200	HDPE	Natural	38-430	71-2160-0384	27/1 1/16	334/13 1/8	330/13	153/6
	Bottle, Large, WM	2120-0010	4,200	HDPE	Natural	100	71-2150-1000	89/3 1/2	288/11 5/16	279/11	153/6
	Bottle, Large, WM	2121-0010	4,300	PP	Natural	100	71-2150-1000	89/3 1/2	288/11 5/16	279/11	153/6
	Bottle, Large, WM, Square	2122-0010	4,300	PP	Natural	100	71-2150-1000	89/3 1/2	292/11 1/2	277/10 15/16	142/5 5/8 Square
4 Liter (1 gal.)	Bottle, Large, WM, Square	2123-0010	4,300	HDPE	Natural	100	71-2150-1000	89/3 1/2	292/11 1/2	284/11 3/16	142/5 5/8 Square
	Bottle, Heavy Duty	2126-4000	4,100	HDPE	Natural	83B	71-2160-0830	65/2 9/16	338/13 5/16	327/12 7/8	155/6 1/8
	Bottle, Heavy Duty	2128-4000	4,100	PP	Natural	83B	71-2160-0830	65/2 9/16	338/13 5/16	327/12 7/8	155/6 1/8
	Bottle, NM	2202-0010	4,300	LDPE	Natural	38-430	71-2160-0384	25/1	333/13 1/8	328/12 15/16	152/6
	Bottle, NM	2200-0010	4,400	PP	Natural	38-430	71-2160-0384	25/1	333/13 1/8	328/12 15/16	152/6
	Bottle, Large, NM	2204-0010	4,300	PP	Amber	38-430	71-2171-0384	25/1	333/13 1/8	328/12 15/16	152/6
	Bottle, Large, NM	DS2206-0010	4,500	PC	Clear	38-430	71-2160-0384	25/1	333/13 1/8	328/12 15/16	152/6
	Jug, w/Handle	2220-0010	4,000	LDPE	Natural	38-430	71-2160-0384	25/1	304/11 15/16	301/11 7/8	152/6
	Jug, w/Handle	2221-0010	4,100	PP	Natural	38-430	71-2160-0384	25/1	304/11 15/16	301/11 7/8	152/6
	Carboy, w/Tubulation	2302-0010	4,200	LDPE	Natural	38-430	71-2160-0384	25/1	333/12 15/16	328/13	152/6
	Carboy, w/Spigot	2318-0010	3,800	LDPE	Natural	38-430	71-2160-0384	25/1 1/32	335/13 3/16	330/13	154/6 1/16
	Bottle, Biobarrier (Jug)	2589-4000	3,900	HDPE	Natural	38	–	28/1 7/16	299/11 3/4	–	143/5 5/8 Square
	Bottle, Biobarrier (Jug)	2589-4099	3,900	HDPE	Natural	38	–	28/1 7/16	299/11 3/4	–	143/5 5/8 Square
	Bottle, Biobarrier (Jug)	342589-4000	3,900	HDPE	Natural	38	–	28/1 7/16	299/11 3/4	–	143/5 5/8 Square

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* I called this phone number and asked what the empty weight of this bottle is. They said the nominal weight of this bottle is 200 g.

Chromic acid, flake	1201
Chromium	6856
Chromium ore	2162
Cinders, furnace	913
Cinders, Coal, ash	641
Clay, dry excavated	1089
Clay, wet excavated	1826
Clay, dry lump	1073
Clay, fire	1362
Clay, wet lump	1602
Clay, compacted	1746
Clover seed	769
Coal, Anthracite, solid	1506
Coal, Anthracite, broken	1105
Coal, Bituminous, solid	1346
Coal, Bituminous, broken	833
Cobaltite (cobolt ore)	6295
Coconut, meal	513
Coconut, shredded	352
Coffee, fresh beans	561
Coffee, roast beans	432
Coke	570- 650
Concrete, Asphalt	2243
Concrete, Gravel	2403
Concrete, Limestone with Portland	2371
Copper ore	1940-2590
Copper sulfate, ground	3604
Copra, medium size	529
Copra, meal, ground	641
Copra, expeller cake ground	513
Copra, expeller cake chopped	465
Cork, solid	240
Cork, ground	160
Corn, on the cob	721
Corn, shelled	721
Corn, grits	673
Cottonseed, dry, de-linted	561
Cottonseed, dry, not de-linted	320
Cottonseed, cake, lumpy	673
Cottonseed, hulls	192
Cottonseed, meal	593
Cottonseed, meats	641
Cottonwood	416
Cryolite	1602

Magnesite, solid	3011
Magnesium oxide	1940
Magnesium sulphate, crystal	1121
Magnetite, solid (iron ore)	5046
Magnetite, broken	3284
Malachite (copper ore)	3750 - 3960
Malt	336
Manganese, solid	7609
Manganese oxide	1922
Manure	400
Marble, solid	2563
Marble, broken	1570
Marl, wet, excavated	2243
Mica, solid	2883
Mica, broken	1602
Mica - flake	520
Mica - powder	986
Milk, powdered	449
Molybdenum ore	1600
Mortar, wet	2403
Mud, packed	1906
Mud, fluid	1730
Nickel ore	1600
Nickel, rolled	8666
Nickel silver	8442
Nitric acid, 91%	1506
Nitrogen	1.26
Oak, red	705
Oats	432
Oats, rolled	304
Oil cake	785
Oil, linseed	942
Oil, petroleum	881
Oxygen	1.43
Oyster shells, ground	849
Paper, standard	1201
Peanuts, shelled	641
Peanuts, not shelled	272
Peat, dry	400
Peat, moist	801
Peat, wet	1121
Pecan wood	753
Phosphate rock, broken	1762
Phosphorus	2339

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specific gravity of metals

Density of Metals.

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The mass of over 30 different metals and alloys are listed below. While the data is useful for design, individual samples will differ. Impurities will often have an influence.

A 1000kg of pure water = 1 cubic metre. Pure water was chosen as the 'base line' for specific gravity and given the value of 1. The specific gravity of all other materials are compared to water as a fraction heavier or lighter density. For example, beryllium has a specific gravity (sg) of 1.84 (1840 kg/cu. m) (see table below)
As specific gravity is just a comparison, it can be applied across any units. The density of pure water is also 62.4 lbs/cu.ft (pounds per cubic foot) and if we know that a sample of alumimium has a sg of 2.5 then we can calculate that its density is 2.5 x 62.4 = 156 lbs/cu.ft.
Note, kg/cu.m divided by 16.02 = lbs/cu.ft

[go back to density of materials home page] [density of wood] [density of liquids] [density of water]

Metal or alloy	kg/cu.m
aluminium - melted	2560 - 2640
aluminium bronze (3-10% Al)	7700 - 8700
aluminium foil	2700 -2750
antifriction metal	9130 -10600
beryllium	1840
beryllium copper	8100 - 8250
brass - casting	8400 - 8700
brass - rolled and drawn	8430 - 8730
bronze - lead	7700 - 8700
bronze - phosphorous	8780 - 8920
bronze (8-14% Sn)	7400 - 8900
cast iron	6800 - 7800
cobolt	8746
copper	8930
delta metal	8600
electrum	8400 - 8900
gold	19320
iron	7850
lead	11340
light alloy based on Al	2560 - 2800
light alloy based on Mg	1760 - 1870
magnesium	1738
mercury	13593
molybdenum	10188
monel	8360 - 8840

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Waste Stream OR-NFS-CH-HOM-A

Waste Material Parameter Weight Calculations

CONTAINER ID	Gross (lbs)	Tare (lbs)	Net (lbs)	Bottle #	Heat-Sealed Bag Wt (lbs)	2-L Bottle Wt (lbs)	Grout Fill %	RADSORB Fill %	Metal Fill %	Grout Vol (in3)	RADSORB Vol (in3)	Metal Vol (in3)	Grout Wt (lbs)	RADSORB Wt (lbs)	Metal Wt (lbs)	Plastic Wt (lbs)	Total Wt (lbs)	Inorganic Matrix Wt%	Organic Matrix Wt%	Iron-based Metal Wt%	Plastic Wt%	Actual Plastic Wt%	Plastic Wt% Diff	Net Wt Diff
NFS0107	100	84	16	1	0.44	0.44	0.40	0.10	0.00	48.8	12.2	0	4.207	0.273	0.000	0.88	5.360							
NFS0107				2	0.44	0.44	0.60	0.00	0.00	73.2	0	0	6.310	0.000	0.000	0.88	7.190							
NFS0107				3	0.44	0.44	0.60	0.10	0.00	73.2	12.2	0	6.310	0.273	0.000	0.88	7.463							
NFS0107 Total			**16**		**1.32**	**1.32**							**16.826**	**0.547**	**0.000**	**2.64**	**20.013**	**84.08%**	**2.73%**	**0.00%**	**13.19%**	**16.5%**	**3.3%**	**25%**
NFS0148	121	100	21	1	0.44	0.44	0.00	0.90	0.10	0	109.8	12.2	0.000	2.460	3.416	0.88	6.756							
NFS0148				2	0.44	0.44	0.75	0.25	0.00	91.5	30.5	0	7.887	0.683	0.000	0.88	9.451							
NFS0148				3	0.44	0.44	0.00	0.90	0.10	0	109.8	12.2	0.000	2.460	3.416	0.88	6.756							
NFS0148 Total			**21**		**1.32**	**1.32**							**7.887**	**5.602**	**6.832**	**2.64**	**22.962**	**34.35%**	**24.40%**	**29.75%**	**11.50%**	**12.6%**	**1.1%**	**9%**
NFS0149	122	100	22	1	0.44	0.44	0.80	0.20	0.00	97.6	24.4	0	8.413	0.547	0.000	0.88	9.840							
NFS0149				2	0.44	0.44	0.70	0.30	0.00	85.4	36.6	0	7.361	0.820	0.000	0.88	9.061							
NFS0149				3	0.44	0.44	0.00	0.95	0.05	0	115.9	6.1	0.000	2.596	1.708	0.88	5.184							
NFS0149 Total			**22**		**1.32**	**1.32**							**15.775**	**3.963**	**1.708**	**2.64**	**24.085**	**65.50%**	**16.45%**	**7.09%**	**10.96%**	**12.0%**	**1.0%**	**9%**
NFS0150	119	100	19	1	0.44	0.44	0.00	0.90	0.10	0	109.8	12.2	0.000	2.460	3.416	0.88	6.756							
NFS0150				2	0.44	0.44	0.70	0.20	0.00	85.4	24.4	0	7.361	0.547	0.000	0.88	8.788							
NFS0150				3	0.44	0.44	0.00	0.75	0.05	0	91.5	6.1	0.000	2.050	1.708	0.88	4.638							
NFS0150 Total			**19**		**1.32**	**1.32**							**7.361**	**5.056**	**5.124**	**2.64**	**20.181**	**36.48%**	**25.05%**	**25.39%**	**13.08%**	**13.9%**	**0.8%**	**6%**
NFS0151	121	100	21	1	0.44	0.44	0.75	0.25	0.00	91.5	30.5	0	7.887	0.683	0.000	0.88	9.451							
NFS0151				2	0.44	0.44	0.00	0.95	0.05	0	115.9	6.1	0.000	2.596	1.708	0.88	5.184							
NFS0151				3	0.44	0.44	0.60	0.40	0.00	73.2	48.8	0	6.310	1.093	0.000	0.88	8.283							
NFS0151 Total			**21**		**1.32**	**1.32**							**14.197**	**4.372**	**1.708**	**2.64**	**22.918**	**61.95%**	**19.08%**	**7.45%**	**11.52%**	**12.6%**	**1.1%**	**9%**
NFS0478	121	100	21	1	0.44	0.44	0.70	0.20	0.00	85.4	24.4	0	7.361	0.547	0.000	0.88	8.788							
NFS0478				2	0.44	0.44	0.60	0.15	0.00	73.2	18.3	0	6.310	0.410	0.000	0.88	7.600							
NFS0478				3	0.44	0.44	0.60	0.15	0.00	73.2	18.3	0	6.310	0.410	0.000	0.88	7.600							
NFS0478 Total			**21**		**1.32**	**1.32**							**19.981**	**1.366**	**0.000**	**2.64**	**23.988**	**83.30%**	**5.70%**	**0.00%**	**11.01%**	**12.6%**	**1.6%**	**14%**
NFS0479	123	100	23	1	0.44	0.44	0.55	0.15	0.00	67.1	18.3	0	5.784	0.410	0.000	0.88	7.074							
NFS0479				2	0.44	0.44	0.70	0.20	0.00	85.4	24.4	0	7.361	0.547	0.000	0.88	8.788							
NFS0479				3	0.44	0.44	0.60	0.40	0.00	73.2	48.8	0	6.310	1.093	0.000	0.88	8.283							
NFS0479 Total			**23**		**1.32**	**1.32**							**19.455**	**2.050**	**0.000**	**2.64**	**24.145**	**80.58%**	**8.49%**	**0.00%**	**10.93%**	**11.5%**	**0.5%**	**5%**
NFS0481	122	100	22	1	0.44	0.44	0.60	0.10	0.00	73.2	12.2	0	6.310	0.273	0.000	0.88	7.463							
NFS0481				2	0.44	0.44	0.60	0.30	0.00	73.2	36.6	0	6.310	0.820	0.000	0.88	8.010							
NFS0481				3	0.44	0.44	0.60	0.20	0.00	73.2	24.4	0	6.310	0.547	0.000	0.88	7.736							
NFS0481 Total			**22**		**1.32**	**1.32**							**18.930**	**1.640**	**0.000**	**2.64**	**23.209**	**81.56%**	**7.06%**	**0.00%**	**11.37%**	**12.0%**	**0.6%**	**5%**
NFS0506	270	85	185	1	0.44	0.44	0.60	0.15	0.00	73.2	18.3	0	6.310	0.410	0.000	0.88	7.600							
NFS0506				2	0.44	0.44	0.60	0.15	0.00	73.2	18.3	0	6.310	0.410	0.000	0.88	7.600							
NFS0506				3	0.44	0.44	0.60	0.15	0.00	73.2	18.3	0	6.310	0.410	0.000	0.88	7.600							
NFS0506				4	0.44	0.44	0.60	0.15	0.00	73.2	18.3	0	6.310	0.410	0.000	0.88	7.600							
NFS0506				5	0.44	0.44	0.60	0.15	0.00	73.2	18.3	0	6.310	0.410	0.000	0.88	7.600							
NFS0506				6	0.44	0.44	0.60	0.15	0.00	73.2	18.3	0	6.310	0.410	0.000	0.88	7.600							
NFS0506				7	0.44	0.44	0.60	0.15	0.00	73.2	18.3	0	6.310	0.410	0.000	0.88	7.600							
NFS0506				8	0.44	0.44	0.60	0.15	0.00	73.2	18.3	0	6.310	0.410	0.000	0.88	7.600							
NFS0506				9	0.44	0.44	0.60	0.15	0.00	73.2	18.3	0	6.310	0.410	0.000	0.88	7.600							
NFS0506				10	0.44	0.44	0.60	0.15	0.00	73.2	18.3	0	6.310	0.410	0.000	0.88	7.600							
NFS0506				11	0.44	0.44	0.60	0.15	0.00	73.2	18.3	0	6.310	0.410	0.000	0.88	7.600							
NFS0506				12	0.44	0.44	0.60	0.15	0.00	73.2	18.3	0	6.310	0.410	0.000	0.88	7.600							
NFS0506				13	0.44	0.44	0.60	0.15	0.00	73.2	18.3	0	6.310	0.410	0.000	0.88	7.600							
NFS0506				14	0.44	0.44	0.60	0.15	0.00	73.2	18.3	0	6.310	0.410	0.000	0.88	7.600							
NFS0506				15	0.44	0.44	0.60	0.15	0.00	73.2	18.3	0	6.310	0.410	0.000	0.88	7.600							
NFS0506				16	0.44	0.44	0.60	0.15	0.00	73.2	18.3	0	6.310	0.410	0.000	0.88	7.600							
NFS0506				17	0.44	0.44	0.60	0.15	0.00	73.2	18.3	0	6.310	0.410	0.000	0.88	7.600							

Waste Stream OR-NFS-CH-HOM-A

Waste Material Parameter Weight Calculations

CONTAINER ID	Gross (lbs)	Tare (lbs)	Net (lbs)	Bottle #	Heat-Sealed Bag Wt (lbs)	2-L Bottle Wt (lbs)	Grout Fill %	RADSORB Fill %	Metal Fill %	Grout Vol (in3)	RADSORB Vol (in3)	Metal Vol (in3)	Grout Wt (lbs)	RADSORB Wt (lbs)	Metal Wt (lbs)	Plastic Wt (lbs)	Total Wt (lbs)	Inorganic Matrix Wt%	Organic Matrix Wt%	Iron-based Metal Wt%	Plastic Wt%	Actual Plastic Wt%	Plastic Wt% Diff	Net Wt Diff
NFS0506				18	0.44	0.44	0.60	0.15	0.00	73.2	18.3	0	6.310	0.410	0.000	0.88	7.600							
NFS0506				19	0.44	0.44	0.60	0.15	0.00	73.2	18.3	0	6.310	0.410	0.000	0.88	7.600							
NFS0506				20	0.44	0.44	0.60	0.15	0.00	73.2	18.3	0	6.310	0.410	0.000	0.88	7.600							
NFS0506				21	0.44	0.44	0.60	0.15	0.00	73.2	18.3	0	6.310	0.410	0.000	0.88	7.600							
NFS0506				22	0.44	0.44	0.60	0.15	0.00	73.2	18.3	0	6.310	0.410	0.000	0.88	7.600							
NFS0506				23	0.44	0.44	0.60	0.15	0.00	73.2	18.3	0	6.310	0.410	0.000	0.88	7.600							
NFS0506				24	0.44	0.44	0.60	0.15	0.00	73.2	18.3	0	6.310	0.410	0.000	0.88	7.600							
NFS0506				25	0.44	0.44	0.60	0.15	0.00	73.2	18.3	0	6.310	0.410	0.000	0.88	7.600							
NFS0506				26	0.44	0.44	0.60	0.15	0.00	73.2	18.3	0	6.310	0.410	0.000	0.88	7.600							
NFS0506				27	0.44	0.44	0.60	0.15	0.00	73.2	18.3	0	6.310	0.410	0.000	0.88	7.600							
NFS0506				28	0.44	0.44	0.60	0.15	0.00	73.2	18.3	0	6.310	0.410	0.000	0.88	7.600							
NFS0506 Total			**185**		12.32	12.32							176.676	11.478	0.000	24.64	212.793	83.03%	5.39%	0.00%	11.58%	13.3%	1.7%	15%
NFS0507	274	85	189	1	0.44	0.44	0.60	0.15	0.00	73.2	18.3	0	6.310	0.410	0.000	0.88	7.600							
NFS0507				2	0.44	0.44	0.60	0.15	0.00	73.2	18.3	0	6.310	0.410	0.000	0.88	7.600							
NFS0507				3	0.44	0.44	0.60	0.15	0.00	73.2	18.3	0	6.310	0.410	0.000	0.88	7.600							
NFS0507				4	0.44	0.44	0.60	0.15	0.00	73.2	18.3	0	6.310	0.410	0.000	0.88	7.600							
NFS0507				5	0.44	0.44	0.60	0.15	0.00	73.2	18.3	0	6.310	0.410	0.000	0.88	7.600							
NFS0507				6	0.44	0.44	0.60	0.15	0.00	73.2	18.3	0	6.310	0.410	0.000	0.88	7.600							
NFS0507				7	0.44	0.44	0.60	0.15	0.00	73.2	18.3	0	6.310	0.410	0.000	0.88	7.600							
NFS0507				8	0.44	0.44	0.60	0.15	0.00	73.2	18.3	0	6.310	0.410	0.000	0.88	7.600							
NFS0507				9	0.44	0.44	0.60	0.15	0.00	73.2	18.3	0	6.310	0.410	0.000	0.88	7.600							
NFS0507				10	0.44	0.44	0.60	0.15	0.00	73.2	18.3	0	6.310	0.410	0.000	0.88	7.600							
NFS0507				11	0.44	0.44	0.60	0.15	0.00	73.2	18.3	0	6.310	0.410	0.000	0.88	7.600							
NFS0507				12	0.44	0.44	0.60	0.15	0.00	73.2	18.3	0	6.310	0.410	0.000	0.88	7.600							
NFS0507				13	0.44	0.44	0.60	0.15	0.00	73.2	18.3	0	6.310	0.410	0.000	0.88	7.600							
NFS0507				14	0.44	0.44	0.60	0.15	0.00	73.2	18.3	0	6.310	0.410	0.000	0.88	7.600							
NFS0507				15	0.44	0.44	0.60	0.15	0.00	73.2	18.3	0	6.310	0.410	0.000	0.88	7.600							
NFS0507				16	0.44	0.44	0.60	0.15	0.00	73.2	18.3	0	6.310	0.410	0.000	0.88	7.600							
NFS0507				17	0.44	0.44	0.60	0.15	0.00	73.2	18.3	0	6.310	0.410	0.000	0.88	7.600							
NFS0507				18	0.44	0.44	0.60	0.15	0.00	73.2	18.3	0	6.310	0.410	0.000	0.88	7.600							
NFS0507				19	0.44	0.44	0.60	0.15	0.00	73.2	18.3	0	6.310	0.410	0.000	0.88	7.600							
NFS0507				20	0.44	0.44	0.60	0.15	0.00	73.2	18.3	0	6.310	0.410	0.000	0.88	7.600							
NFS0507				21	0.44	0.44	0.60	0.15	0.00	73.2	18.3	0	6.310	0.410	0.000	0.88	7.600							
NFS0507				22	0.44	0.44	0.60	0.15	0.00	73.2	18.3	0	6.310	0.410	0.000	0.88	7.600							
NFS0507				23	0.44	0.44	0.60	0.15	0.00	73.2	18.3	0	6.310	0.410	0.000	0.88	7.600							
NFS0507				24	0.44	0.44	0.60	0.15	0.00	73.2	18.3	0	6.310	0.410	0.000	0.88	7.600							
NFS0507				25	0.44	0.44	0.60	0.15	0.00	73.2	18.3	0	6.310	0.410	0.000	0.88	7.600							
NFS0507				26	0.44	0.44	0.60	0.15	0.00	73.2	18.3	0	6.310	0.410	0.000	0.88	7.600							
NFS0507				27	0.44	0.44	0.60	0.15	0.00	73.2	18.3	0	6.310	0.410	0.000	0.88	7.600							
NFS0507				28	0.44	0.44	0.60	0.15	0.00	73.2	18.3	0	6.310	0.410	0.000	0.88	7.600							
NFS0507 Total			**189**		12.32	12.32							176.676	11.478	0.000	24.64	212.793	83.03%	5.39%	0.00%	11.58%	13.0%	1.5%	13%
NFS0508	187	85	102	1	0.44	0.44	0.60	0.15	0.00	73.2	18.3	0	6.310	0.410	0.000	0.88	7.600							
NFS0508				2	0.44	0.44	0.60	0.15	0.00	73.2	18.3	0	6.310	0.410	0.000	0.88	7.600							
NFS0508				3	0.44	0.44	0.60	0.15	0.00	73.2	18.3	0	6.310	0.410	0.000	0.88	7.600							
NFS0508				4	0.44	0.44	0.60	0.15	0.00	73.2	18.3	0	6.310	0.410	0.000	0.88	7.600							
NFS0508				5	0.44	0.44	0.60	0.15	0.00	73.2	18.3	0	6.310	0.410	0.000	0.88	7.600							
NFS0508				6	0.44	0.44	0.60	0.15	0.00	73.2	18.3	0	6.310	0.410	0.000	0.88	7.600							
NFS0508				7	0.44	0.44	0.60	0.15	0.00	73.2	18.3	0	6.310	0.410	0.000	0.88	7.600							
NFS0508				8	0.44	0.44	0.60	0.15	0.00	73.2	18.3	0	6.310	0.410	0.000	0.88	7.600							

Waste Stream OR-NFS-CH-HOM-A

Waste Material Parameter Weight Calculations

CONTAINER ID	Gross (lbs)	Tare (lbs)	Net (lbs)	Bottle #	Heat-Sealed Bag Wt (lbs)	2-L Bottle Wt (lbs)	Grout Fill %	RADSORB Fill %	Metal Fill %	Grout Vol (in3)	RADSORB Vol (in3)	Metal Vol (in3)	Grout Wt (lbs)	RADSORB Wt (lbs)	Metal Wt (lbs)	Plastic Wt (lbs)	Total Wt (lbs)	Inorganic Matrix Wt%	Organic Matrix Wt%	Iron-based Metal Wt%	Plastic Wt%	Actual Plastic Wt%	Plastic Wt% Diff	Net Wt Diff
NFS0508				9	0.44	0.44	0.60	0.15	0.00	73.2	18.3	0	6.310	0.410	0.000	0.88	7.600							
NFS0508				10	0.44	0.44	0.60	0.15	0.00	73.2	18.3	0	6.310	0.410	0.000	0.88	7.600							
NFS0508				11	0.44	0.44	0.60	0.15	0.00	73.2	18.3	0	6.310	0.410	0.000	0.88	7.600							
NFS0508				12	0.44	0.44	0.60	0.15	0.00	73.2	18.3	0	6.310	0.410	0.000	0.88	7.600							
NFS0508				13	0.44	0.44	0.60	0.15	0.00	73.2	18.3	0	6.310	0.410	0.000	0.88	7.600							
NFS0508 Total			**102**		5.72	5.72							82.028	5.329	0.000	11.44	98.797	83.03%	5.39%	0.00%	11.58%	11.2%	-0.4%	-3%
NFS0591	251	85	166	1	0.44	0.44	0.60	0.15	0.00	73.2	18.3	0	6.310	0.410	0.000	0.88	7.600							
NFS0591				2	0.44	0.44	0.60	0.15	0.00	73.2	18.3	0	6.310	0.410	0.000	0.88	7.600							
NFS0591				3	0.44	0.44	0.60	0.15	0.00	73.2	18.3	0	6.310	0.410	0.000	0.88	7.600							
NFS0591				4	0.44	0.44	0.60	0.15	0.00	73.2	18.3	0	6.310	0.410	0.000	0.88	7.600							
NFS0591				5	0.44	0.44	0.60	0.15	0.00	73.2	18.3	0	6.310	0.410	0.000	0.88	7.600							
NFS0591				6	0.44	0.44	0.60	0.15	0.00	73.2	18.3	0	6.310	0.410	0.000	0.88	7.600							
NFS0591				7	0.44	0.44	0.60	0.15	0.00	73.2	18.3	0	6.310	0.410	0.000	0.88	7.600							
NFS0591				8	0.44	0.44	0.60	0.15	0.00	73.2	18.3	0	6.310	0.410	0.000	0.88	7.600							
NFS0591				9	0.44	0.44	0.60	0.15	0.00	73.2	18.3	0	6.310	0.410	0.000	0.88	7.600							
NFS0591				10	0.44	0.44	0.60	0.15	0.00	73.2	18.3	0	6.310	0.410	0.000	0.88	7.600							
NFS0591				11	0.44	0.44	0.60	0.15	0.00	73.2	18.3	0	6.310	0.410	0.000	0.88	7.600							
NFS0591				12	0.44	0.44	0.60	0.15	0.00	73.2	18.3	0	6.310	0.410	0.000	0.88	7.600							
NFS0591				13	0.44	0.44	0.60	0.15	0.00	73.2	18.3	0	6.310	0.410	0.000	0.88	7.600							
NFS0591				14	0.44	0.44	0.60	0.15	0.00	73.2	18.3	0	6.310	0.410	0.000	0.88	7.600							
NFS0591				15	0.44	0.44	0.60	0.15	0.00	73.2	18.3	0	6.310	0.410	0.000	0.88	7.600							
NFS0591				16	0.44	0.44	0.60	0.15	0.00	73.2	18.3	0	6.310	0.410	0.000	0.88	7.600							
NFS0591				17	0.44	0.44	0.60	0.15	0.00	73.2	18.3	0	6.310	0.410	0.000	0.88	7.600							
NFS0591				18	0.44	0.44	0.60	0.15	0.00	73.2	18.3	0	6.310	0.410	0.000	0.88	7.600							
NFS0591				19	0.44	0.44	0.60	0.15	0.00	73.2	18.3	0	6.310	0.410	0.000	0.88	7.600							
NFS0591				20	0.44	0.44	0.60	0.15	0.00	73.2	18.3	0	6.310	0.410	0.000	0.88	7.600							
NFS0591				21	0.44	0.44	0.60	0.15	0.00	73.2	18.3	0	6.310	0.410	0.000	0.88	7.600							
NFS0591				22	0.44	0.44	0.60	0.15	0.00	73.2	18.3	0	6.310	0.410	0.000	0.88	7.600							
NFS0591				23	0.44	0.44	0.60	0.15	0.00	73.2	18.3	0	6.310	0.410	0.000	0.88	7.600							
NFS0591				24	0.44	0.44	0.60	0.15	0.00	73.2	18.3	0	6.310	0.410	0.000	0.88	7.600							
NFS0591				25	0.44	0.44	0.60	0.15	0.00	73.2	18.3	0	6.310	0.410	0.000	0.88	7.600							
NFS0591				26	0.44	0.44	0.60	0.15	0.00	73.2	18.3	0	6.310	0.410	0.000	0.88	7.600							
NFS0591				27	0.44	0.44	0.60	0.15	0.00	73.2	18.3	0	6.310	0.410	0.000	0.88	7.600							
NFS0591				28	0.44	0.44	0.60	0.15	0.00	73.2	18.3	0	6.310	0.410	0.000	0.88	7.600							
NFS0591 Total			**166**		12.32	12.32							176.676	11.478	0.000	24.64	212.793	83.03%	5.39%	0.00%	11.58%	14.8%	3.3%	28%
NFS0592	178	85	93	1	0.44	0.44	0.60	0.15	0.00	73.2	18.3	0	6.310	0.410	0.000	0.88	7.600							
NFS0592				2	0.44	0.44	0.60	0.15	0.00	73.2	18.3	0	6.310	0.410	0.000	0.88	7.600							
NFS0592				3	0.44	0.44	0.60	0.15	0.00	73.2	18.3	0	6.310	0.410	0.000	0.88	7.600							
NFS0592				4	0.44	0.44	0.60	0.15	0.00	73.2	18.3	0	6.310	0.410	0.000	0.88	7.600							
NFS0592				5	0.44	0.44	0.60	0.15	0.00	73.2	18.3	0	6.310	0.410	0.000	0.88	7.600							
NFS0592				6	0.44	0.44	0.60	0.15	0.00	73.2	18.3	0	6.310	0.410	0.000	0.88	7.600							
NFS0592				7	0.44	0.44	0.60	0.15	0.00	73.2	18.3	0	6.310	0.410	0.000	0.88	7.600							
NFS0592				8	0.44	0.44	0.60	0.15	0.00	73.2	18.3	0	6.310	0.410	0.000	0.88	7.600							
NFS0592				9	0.44	0.44	0.60	0.15	0.00	73.2	18.3	0	6.310	0.410	0.000	0.88	7.600							
NFS0592				10	0.44	0.44	0.60	0.15	0.00	73.2	18.3	0	6.310	0.410	0.000	0.88	7.600							
NFS0592				11	0.44	0.44	0.60	0.15	0.00	73.2	18.3	0	6.310	0.410	0.000	0.88	7.600							
NFS0592				12	0.44	0.44	0.60	0.15	0.00	73.2	18.3	0	6.310	0.410	0.000	0.88	7.600							
NFS0592				13	0.44	0.44	0.60	0.15	0.00	73.2	18.3	0	6.310	0.410	0.000	0.88	7.600							
NFS0592				14	0.44	0.44	0.60	0.15	0.00	73.2	18.3	0	6.310	0.410	0.000	0.88	7.600							

Waste Stream OR-NFS-CH-HOM-A

Waste Material Parameter Weight Calculations

CONTAINER ID	Gross (lbs)	Tare (lbs)	Net (lbs)	Bottle #	Heat-Sealed Bag Wt (lbs)	2-L Bottle Wt (lbs)	Grout Fill %	RADSORB Fill %	Metal Fill %	Grout Vol (in3)	RADSORB Vol (in3)	Metal Vol (in3)	Grout Wt (lbs)	RADSORB Wt (lbs)	Metal Wt (lbs)	Plastic Wt (lbs)	Total Wt (lbs)	Inorganic Matrix Wt%	Organic Matrix Wt%	Iron-based Metal Wt%	Plastic Wt%	Actual Plastic Wt%	Plastic Wt% Diff	Net Wt Diff
NFS0592 Total			**93**		**6.16**	**6.16**							**88.338**	**5.739**	**0.000**	**12.32**	**106.397**	**83.03%**	**5.39%**	**0.00%**	**11.58%**	**13.2%**	**1.7%**	**14%**
NFS0593	110	103	7	1	0.44	0.44	0.00	0.00	0.05	0	0	6.1	0.000	0.000	1.708	0.88	2.588							
NFS0593				2	0.44	0.44	0.00	0.95	0.05	0	115.9	6.1	0.000	2.596	1.708	0.88	5.184							
NFS0593 Total			**7**		**0.88**	**0.88**							**0.000**	**2.596**	**3.416**	**1.76**	**7.772**	**0.00%**	**33.40%**	**43.95%**	**22.64%**	**25.1%**	**2.5%**	**11%**
NFS0594	114	103	11	1	0.44	0.44	0.00	0.95	0.05	0	115.9	6.1	0.000	2.596	1.708	0.88	5.184							
NFS0594				2	0.44	0.44	0.00	0.90	0.10	0	109.8	12.2	0.000	2.460	3.416	0.88	6.756							
NFS0594 Total			**11**		**0.88**	**0.88**							**0.000**	**5.056**	**5.124**	**1.76**	**11.940**	**0.00%**	**42.34%**	**42.92%**	**14.74%**	**16.0%**	**1.3%**	**9%**
NFS0673	113	103	10	1	0.44	0.44	0.00	0.95	0.05	0	115.9	6.1	0.000	2.596	1.708	0.88	5.184							
NFS0673				2	0.44	0.44	0.00	0.95	0.05	0	115.9	6.1	0.000	2.596	1.708	0.88	5.184							
NFS0673 Total			**10**		**0.88**	**0.88**							**0.000**	**5.192**	**3.416**	**1.76**	**10.368**	**0.00%**	**50.08%**	**32.95%**	**16.97%**	**17.6%**	**0.6%**	**4%**
NFS0674	108	103	5	1	0.44	0.44	0.00	0.07	0.03	0	8.54	3.66	0.000	0.191	1.025	0.88	2.096							
NFS0674				2	0.44	0.44	0.00	0.25	0.05	0	30.5	6.1	0.000	0.683	1.708	0.88	3.271							
NFS0674 Total			**5**		**0.88**	**0.88**							**0.000**	**0.874**	**2.733**	**1.76**	**5.367**	**0.00%**	**16.29%**	**50.92%**	**32.79%**	**35.2%**	**2.4%**	**7%**
NFS0753	102	85	17	1	0.44	0.44	0.00	0.95	0.05	0	115.9	6.1	0.000	2.596	1.708	0.88	5.184							
NFS0753				2	0.44	0.44	0.50	0.10	0.00	61	12.2	0	5.258	0.273	0.000	0.88	6.411							
NFS0753				3	0.44	0.44	0.00	0.90	0.10	0	109.8	12.2	0.000	2.460	3.416	0.88	6.756							
NFS0753 Total			**17**		**1.32**	**1.32**							**5.258**	**5.329**	**5.124**	**2.64**	**18.351**	**28.65%**	**29.04%**	**27.92%**	**14.39%**	**15.5%**	**1.1%**	**8%**
NFS0754	94	85	9	1	0.44	0.44	0.00	0.07	0.03	0	8.54	3.66	0.000	0.191	1.025	0.88	2.096							
NFS0754				2	0.44	0.44	0.00	0.07	0.03	0	8.54	3.66	0.000	0.191	1.025	0.88	2.096							
NFS0754				3	0.44	0.44	0.40	0.10	0.00	48.8	12.2	0	4.207	0.273	0.000	0.88	5.360							
NFS0754 Total			**9**		**1.32**	**1.32**							**4.207**	**0.656**	**2.050**	**2.64**	**9.552**	**44.04%**	**6.87%**	**21.46%**	**27.64%**	**29.3%**	**1.7%**	**6%**
NFS0755	104	85	19	1	0.44	0.44	0.50	0.10	0.00	61	12.2	0	5.258	0.273	0.000	0.88	6.411							
NFS0755				2	0.44	0.44	0.60	0.00	0.00	73.2	0	0	6.310	0.000	0.000	0.88	7.190							
NFS0755				3	0.44	0.44	0.70	0.10	0.00	85.4	12.2	0	7.361	0.273	0.000	0.88	8.515							
NFS0755 Total			**19**		**1.32**	**1.32**							**18.930**	**0.547**	**0.000**	**2.64**	**22.116**	**85.59%**	**2.47%**	**0.00%**	**11.94%**	**13.9%**	**2.0%**	**16%**
NFS0757	102	83	19	1	0.44	0.44	0.00	0.80	0.10	0	97.6	12.2	0.000	2.186	3.416	0.88	6.482							
NFS0757				2	0.44	0.44	0.00	0.90	0.10	0	109.8	12.2	0.000	2.460	3.416	0.88	6.756							
NFS0757				3	0.44	0.44	0.00	0.90	0.10	0	109.8	12.2	0.000	2.460	3.416	0.88	6.756							
NFS0757 Total			**19**		**1.32**	**1.32**							**0.000**	**7.105**	**10.248**	**2.64**	**19.993**	**0.00%**	**35.54%**	**51.26%**	**13.20%**	**13.9%**	**0.7%**	**5%**
NFS0758	104	83	21	1	0.44	0.44	0.00	0.85	0.05	0	103.7	6.1	0.000	2.323	1.708	0.88	4.911							
NFS0758				2	0.44	0.44	0.00	0.80	0.20	0	97.6	24.4	0.000	2.186	6.832	0.88	9.898							
NFS0758				3	0.44	0.44	0.70	0.10	0.00	85.4	12.2	0	7.361	0.273	0.000	0.88	8.515							
NFS0758 Total			**21**		**1.32**	**1.32**							**7.361**	**4.782**	**8.540**	**2.64**	**23.324**	**31.56%**	**20.50%**	**36.61%**	**11.32%**	**12.6%**	**1.3%**	**11%**
NFS0759	99	85	14	1	0.44	0.44	0.40	0.10	0.00	48.8	12.2	0	4.207	0.273	0.000	0.88	5.360							
NFS0759				2	0.44	0.44	0.00	0.85	0.05	0	103.7	6.1	0.000	2.323	1.708	0.88	4.911							
NFS0759				3	0.44	0.44	0.00	0.95	0.05	0	115.9	6.1	0.000	2.596	1.708	0.88	5.184							
NFS0759 Total			**14**		**1.32**	**1.32**							**4.207**	**5.192**	**3.416**	**2.64**	**15.455**	**27.22%**	**33.60%**	**22.10%**	**17.08%**	**18.9%**	**1.8%**	**10%**
NFS0776	102	84	18	1	0.44	0.44	0.75	0.15	0.00	91.5	18.3	0	7.887	0.410	0.000	0.88	9.177							
NFS0776				2	0.44	0.44	0.00	0.50	0.10	0	61	12.2	0.000	1.366	3.416	0.88	5.662							
NFS0776				3	0.44	0.44	0.00	0.40	0.10	0	48.8	12.2	0.000	1.093	3.416	0.88	5.389							
NFS0776 Total			**18**		**1.32**	**1.32**							**7.887**	**2.869**	**6.832**	**2.64**	**20.229**	**38.99%**	**14.18%**	**33.77%**	**13.05%**	**14.7%**	**1.6%**	**12%**
NFS0777	101	84	17	1	0.44	0.44	0.00	0.95	0.05	0	115.9	6.1	0.000	2.596	1.708	0.88	5.184							
NFS0777				2	0.44	0.44	0.70	0.10	0.00	85.4	12.2	0	7.361	0.273	0.000	0.88	8.515							
NFS0777				3	0.44	0.44	0.00	0.75	0.05	0	91.5	6.1	0.000	2.050	1.708	0.88	4.638							
NFS0777 Total			**17**		**1.32**	**1.32**							**7.361**	**4.919**	**3.416**	**2.64**	**18.337**	**40.15%**	**26.83%**	**18.63%**	**14.40%**	**15.5%**	**1.1%**	**8%**
NFS0786	95	83	12	1	0.44	0.44	0.00	0.58	0.02	0	70.76	2.44	0.000	1.585	0.683	0.88	3.148							
NFS0786				2	0.44	0.44	0.50	0.10	0.00	61	12.2	0	5.258	0.273	0.000	0.88	6.411							
NFS0786				3	0.44	0.44	0.25	0.05	0.00	30.5	6.1	0	2.629	0.137	0.000	0.88	3.646							
NFS0786 Total			**12**		**1.32**	**1.32**							**7.887**	**1.995**	**0.683**	**2.64**	**13.205**	**59.73%**	**15.11%**	**5.17%**	**19.99%**	**22.0%**	**2.0%**	**10%**

Waste Stream OR-NFS-CH-HOM-A

Waste Material Parameter Weight Calculations

CONTAINER ID	Gross (lbs)	Tare (lbs)	Net (lbs)	Bottle #	Heat-Sealed Bag Wt (lbs)	2-L Bottle Wt (lbs)	Grout Fill %	RADSORB Fill %	Metal Fill %	Grout Vol (in3)	RADSORB Vol (in3)	Metal Vol (in3)	Grout Wt (lbs)	RADSORB Wt (lbs)	Metal Wt (lbs)	Plastic Wt (lbs)	Total Wt (lbs)	Inorganic Matrix Wt%	Organic Matrix Wt%	Iron-based Metal Wt%	Plastic Wt%	Actual Plastic Wt%	Plastic Wt% Diff	Net Wt Diff
NFS0787	100	83	17	1	0.44	0.44	0.50	0.10	0.00	61	12.2	0	5.258	0.273	0.000	0.88	6.411							
NFS0787				2	0.44	0.44	0.00	0.95	0.05	0	115.9	6.1	0.000	2.596	1.708	0.88	5.184							
NFS0787				3	0.44	0.44	0.60	0.10	0.00	73.2	12.2	0	6.310	0.273	0.000	0.88	7.463							
NFS0787 Total			**17**		1.32	1.32							**11.568**	**3.143**	**1.708**	**2.64**	**19.059**	**60.70%**	**16.49%**	**8.96%**	**13.85%**	**15.5%**	**1.7%**	**12%**
NFS0788	167	87	80	1	0.44	0.44	0.60	0.15	0.00	73.2	18.3	0	6.310	0.410	0.000	0.88	7.600							
NFS0788				2	0.44	0.44	0.60	0.15	0.00	73.2	18.3	0	6.310	0.410	0.000	0.88	7.600							
NFS0788				3	0.44	0.44	0.60	0.15	0.00	73.2	18.3	0	6.310	0.410	0.000	0.88	7.600							
NFS0788				4	0.44	0.44	0.60	0.15	0.00	73.2	18.3	0	6.310	0.410	0.000	0.88	7.600							
NFS0788				5	0.44	0.44	0.60	0.15	0.00	73.2	18.3	0	6.310	0.410	0.000	0.88	7.600							
NFS0788				6	0.44	0.44	0.60	0.15	0.00	73.2	18.3	0	6.310	0.410	0.000	0.88	7.600							
NFS0788				7	0.44	0.44	0.60	0.15	0.00	73.2	18.3	0	6.310	0.410	0.000	0.88	7.600							
NFS0788				8	0.44	0.44	0.60	0.15	0.00	73.2	18.3	0	6.310	0.410	0.000	0.88	7.600							
NFS0788				9	0.44	0.44	0.60	0.15	0.00	73.2	18.3	0	6.310	0.410	0.000	0.88	7.600							
NFS0788				10	0.44	0.44	0.60	0.15	0.00	73.2	18.3	0	6.310	0.410	0.000	0.88	7.600							
NFS0788				11	0.44	0.44	0.60	0.15	0.00	73.2	18.3	0	6.310	0.410	0.000	0.88	7.600							
NFS0788				12	0.44	0.44	0.60	0.15	0.00	73.2	18.3	0	6.310	0.410	0.000	0.88	7.600							
NFS0788				13	0.44	0.44	0.60	0.15	0.00	73.2	18.3	0	6.310	0.410	0.000	0.88	7.600							
NFS0788				14	0.44	0.44	0.60	0.15	0.00	73.2	18.3	0	6.310	0.410	0.000	0.88	7.600							
NFS0788 Total			**80**		6.16	6.16							**88.338**	**5.739**	**0.000**	**12.32**	**106.397**	**83.03%**	**5.39%**	**0.00%**	**11.58%**	**15.4%**	**3.8%**	**33%**
NFS0789	178	87	91	1	0.44	0.44	0.60	0.15	0.00	73.2	18.3	0	6.310	0.410	0.000	0.88	7.600							
NFS0789				2	0.44	0.44	0.60	0.15	0.00	73.2	18.3	0	6.310	0.410	0.000	0.88	7.600							
NFS0789				3	0.44	0.44	0.60	0.15	0.00	73.2	18.3	0	6.310	0.410	0.000	0.88	7.600							
NFS0789				4	0.44	0.44	0.60	0.15	0.00	73.2	18.3	0	6.310	0.410	0.000	0.88	7.600							
NFS0789				5	0.44	0.44	0.60	0.15	0.00	73.2	18.3	0	6.310	0.410	0.000	0.88	7.600							
NFS0789				6	0.44	0.44	0.60	0.15	0.00	73.2	18.3	0	6.310	0.410	0.000	0.88	7.600							
NFS0789				7	0.44	0.44	0.60	0.15	0.00	73.2	18.3	0	6.310	0.410	0.000	0.88	7.600							
NFS0789				8	0.44	0.44	0.60	0.15	0.00	73.2	18.3	0	6.310	0.410	0.000	0.88	7.600							
NFS0789				9	0.44	0.44	0.60	0.15	0.00	73.2	18.3	0	6.310	0.410	0.000	0.88	7.600							
NFS0789				10	0.44	0.44	0.60	0.15	0.00	73.2	18.3	0	6.310	0.410	0.000	0.88	7.600							
NFS0789				11	0.44	0.44	0.60	0.15	0.00	73.2	18.3	0	6.310	0.410	0.000	0.88	7.600							
NFS0789				12	0.44	0.44	0.60	0.15	0.00	73.2	18.3	0	6.310	0.410	0.000	0.88	7.600							
NFS0789				13	0.44	0.44	0.60	0.15	0.00	73.2	18.3	0	6.310	0.410	0.000	0.88	7.600							
NFS0789				14	0.44	0.44	0.60	0.15	0.00	73.2	18.3	0	6.310	0.410	0.000	0.88	7.600							
NFS0789 Total			**91**		6.16	6.16							**88.338**	**5.739**	**0.000**	**12.32**	**106.397**	**83.03%**	**5.39%**	**0.00%**	**11.58%**	**13.5%**	**2.0%**	**17%**
NFS0804	102	83	19	1	0.44	0.44	0.00	0.80	0.10	0	97.6	12.2	0.000	2.186	3.416	0.88	6.482							
NFS0804				2	0.44	0.44	0.00	0.70	0.15	0	85.4	18.3	0.000	1.913	5.124	0.88	7.917							
NFS0804				3	0.44	0.44	0.00	0.80	0.10	0	97.6	12.2	0.000	2.186	3.416	0.88	6.482							
NFS0804 Total			**19**		1.32	1.32							**0.000**	**6.285**	**11.956**	**2.64**	**20.881**	**0.00%**	**30.10%**	**57.26%**	**12.64%**	**13.9%**	**1.3%**	**10%**
NFS0805	102	83	19	1	0.44	0.44	0.00	0.75	0.05	0	91.5	6.1	0.000	2.050	1.708	0.88	4.638							
NFS0805				2	0.44	0.44	0.00	0.80	0.10	0	97.6	12.2	0.000	2.186	3.416	0.88	6.482							
NFS0805				3	0.44	0.44	0.00	0.75	0.05	0	91.5	6.1	0.000	2.050	1.708	0.88	4.638							
NFS0805 Total			**19**		1.32	1.32							**0.000**	**6.285**	**6.832**	**2.64**	**15.757**	**0.00%**	**39.89%**	**43.36%**	**16.75%**	**13.9%**	**-2.9%**	**-17%**
NFS0806	97	83	14	1	0.44	0.44	0.00	0.00	0.03	0	0	3.66	0.000	0.000	1.025	0.88	1.905							
NFS0806				2	0.44	0.44	0.55	0.15	0.00	67.1	18.3	0	5.784	0.410	0.000	0.88	7.074							
NFS0806				3	0.44	0.44	0.55	0.15	0.00	67.1	18.3	0	5.784	0.410	0.000	0.88	7.074							
NFS0806 Total			**14**		1.32	1.32							**11.568**	**0.820**	**1.025**	**2.64**	**16.053**	**72.06%**	**5.11%**	**6.38%**	**16.45%**	**18.9%**	**2.4%**	**15%**
NFS0808	98	83	15	1	0.44	0.44	0.00	0.99	0.01	0	120.78	1.22	0.000	2.705	0.342	0.88	3.927							
NFS0808				2	0.44	0.44	0.30	0.10	0.00	36.6	12.2	0	3.155	0.273	0.000	0.88	4.308							
NFS0808				3	0.44	0.44	0.65	0.15	0.00	79.3	18.3	0	6.836	0.410	0.000	0.88	8.126							

Waste Stream OR-NFS-CH-HOM-A

Waste Material Parameter Weight Calculations

CONTAINER ID	Gross (lbs)	Tare (lbs)	Net (lbs)	Bottle #	Heat-Sealed Bag Wt (lbs)	2-L Bottle Wt (lbs)	Grout Fill %	RADSORB Fill %	Metal Fill %	Grout Vol (in3)	RADSORB Vol (in3)	Metal Vol (in3)	Grout Wt (lbs)	RADSORB Wt (lbs)	Metal Wt (lbs)	Plastic Wt (lbs)	Total Wt (lbs)	Inorganic Matrix Wt%	Organic Matrix Wt%	Iron-based Metal Wt%	Plastic Wt%	Actual Plastic Wt%	Plastic Wt% Diff	Net Wt Diff
NFS0808 Total			**15**		**1.32**	**1.32**							**9.991**	**3.389**	**0.342**	**2.64**	**16.361**	**61.06%**	**20.71%**	**2.09%**	**16.14%**	**17.6%**	**1.5%**	**9%**
NFS0865	123	100	23	1	0.44	0.44	0.00	0.85	0.15	0	103.7	18.3	0.000	2.323	5.124	0.88	8.327							
NFS0865				2	0.44	0.44	0.75	0.25	0.00	91.5	30.5	0	7.887	0.683	0.000	0.88	9.451							
NFS0865				3	0.44	0.44	0.60	0.15	0.00	73.2	18.3	0	6.310	0.410	0.000	0.88	7.600							
NFS0865 Total			**23**		**1.32**	**1.32**							**14.197**	**3.416**	**5.124**	**2.64**	**25.377**	**55.94%**	**13.46%**	**20.19%**	**10.40%**	**11.5%**	**1.1%**	**10%**
NFS0879	128	105	23	1	0.44	0.44	0.00	0.85	0.15	0	103.7	18.3	0.000	2.323	5.124	0.88	8.327							
NFS0879				2	0.44	0.44	0.00	0.85	0.15	0	103.7	18.3	0.000	2.323	5.124	0.88	8.327							
NFS0879				3	0.44	0.44	0.70	0.15	0.00	85.4	18.3	0	7.361	0.410	0.000	0.88	8.651							
NFS0879 Total			**23**		**1.32**	**1.32**							**7.361**	**5.056**	**10.248**	**2.64**	**25.305**	**29.09%**	**19.98%**	**40.50%**	**10.43%**	**11.5%**	**1.0%**	**10%**
NFS0880	200	87	113	1	0.44	0.44	0.60	0.15	0.00	73.2	18.3	0	6.310	0.410	0.000	0.88	7.600							
NFS0880				2	0.44	0.44	0.60	0.15	0.00	73.2	18.3	0	6.310	0.410	0.000	0.88	7.600							
NFS0880				3	0.44	0.44	0.60	0.15	0.00	73.2	18.3	0	6.310	0.410	0.000	0.88	7.600							
NFS0880				4	0.44	0.44	0.60	0.15	0.00	73.2	18.3	0	6.310	0.410	0.000	0.88	7.600							
NFS0880				5	0.44	0.44	0.60	0.15	0.00	73.2	18.3	0	6.310	0.410	0.000	0.88	7.600							
NFS0880				6	0.44	0.44	0.60	0.15	0.00	73.2	18.3	0	6.310	0.410	0.000	0.88	7.600							
NFS0880				7	0.44	0.44	0.60	0.15	0.00	73.2	18.3	0	6.310	0.410	0.000	0.88	7.600							
NFS0880				8	0.44	0.44	0.60	0.15	0.00	73.2	18.3	0	6.310	0.410	0.000	0.88	7.600							
NFS0880				9	0.44	0.44	0.60	0.15	0.00	73.2	18.3	0	6.310	0.410	0.000	0.88	7.600							
NFS0880				10	0.44	0.44	0.60	0.15	0.00	73.2	18.3	0	6.310	0.410	0.000	0.88	7.600							
NFS0880				11	0.44	0.44	0.60	0.15	0.00	73.2	18.3	0	6.310	0.410	0.000	0.88	7.600							
NFS0880				12	0.44	0.44	0.60	0.15	0.00	73.2	18.3	0	6.310	0.410	0.000	0.88	7.600							
NFS0880				13	0.44	0.44	0.60	0.15	0.00	73.2	18.3	0	6.310	0.410	0.000	0.88	7.600							
NFS0880				14	0.44	0.44	0.60	0.15	0.00	73.2	18.3	0	6.310	0.410	0.000	0.88	7.600							
NFS0880 Total			**113**		**6.16**	**6.16**							**88.338**	**5.739**	**0.000**	**12.32**	**106.397**	**83.03%**	**5.39%**	**0.00%**	**11.58%**	**10.9%**	**-0.7%**	**-6%**
NFS0926	145	91	54	1	0.44	0.44	0.60	0.15	0.00	73.2	18.3	0	6.310	0.410	0.000	0.88	7.600							
NFS0926				2	0.44	0.44	0.60	0.15	0.00	73.2	18.3	0	6.310	0.410	0.000	0.88	7.600							
NFS0926				3	0.44	0.44	0.60	0.15	0.00	73.2	18.3	0	6.310	0.410	0.000	0.88	7.600							
NFS0926				4	0.44	0.44	0.60	0.15	0.00	73.2	18.3	0	6.310	0.410	0.000	0.88	7.600							
NFS0926				5	0.44	0.44	0.60	0.15	0.00	73.2	18.3	0	6.310	0.410	0.000	0.88	7.600							
NFS0926				6	0.44	0.44	0.60	0.15	0.00	73.2	18.3	0	6.310	0.410	0.000	0.88	7.600							
NFS0926				7	0.44	0.44	0.60	0.15	0.00	73.2	18.3	0	6.310	0.410	0.000	0.88	7.600							
NFS0926				8	0.44	0.44	0.60	0.15	0.00	73.2	18.3	0	6.310	0.410	0.000	0.88	7.600							
NFS0926				9	0.44	0.44	0.60	0.15	0.00	73.2	18.3	0	6.310	0.410	0.000	0.88	7.600							
NFS0926				10	0.44	0.44	0.60	0.15	0.00	73.2	18.3	0	6.310	0.410	0.000	0.88	7.600							
NFS0926 Total			**54**		**4.40**	**4.40**							**63.098**	**4.099**	**0.000**	**8.80**	**75.998**	**83.03%**	**5.39%**	**0.00%**	**11.58%**	**16.3%**	**4.7%**	**41%**
NFS0929	144	107	37	1	0.44	0.44	0.90	0.10	0.00	109.8	12.2	0	9.465	0.273	0.000	0.88	10.618							
NFS0929				2	0.44	0.44	0.00	0.99	0.01	0	120.78	1.22	0.000	2.705	0.342	0.88	3.927							
NFS0929				3	0.44	0.44	0.90	0.10	0.00	109.8	12.2	0	9.465	0.273	0.000	0.88	10.618							
NFS0929				4	0.44	0.44	0.90	0.10	0.00	109.8	12.2	0	9.465	0.273	0.000	0.88	10.618							
NFS0929				5	0.44	0.44	0.00	0.00	0.00	0	0	0	0.000	0.000	0.000	0.88	0.880							
NFS0929				6	0.44	0.44	0.00	0.95	0.05	0	115.9	6.1	0.000	2.596	1.708	0.88	5.184							
NFS0929				7	0.44	0.44	0.00	0.99	0.01	0	120.78	1.22	0.000	2.705	0.342	0.88	3.927							
NFS0929				8	0.44	0.44	0.00	0.99	0.01	0	120.78	1.22	0.000	2.705	0.342	0.88	3.927							
NFS0929				9	0.44	0.44	0.90	0.10	0.00	109.8	12.2	0	9.465	0.273	0.000	0.88	10.618							
NFS0929 Total			**37**		**3.96**	**3.96**							**37.859**	**11.806**	**2.733**	**7.920**	**60.318**	**62.77%**	**19.57%**	**4.53%**	**13.13%**	**21.4%**	**8.3%**	**63%**
Grand Total			**1584**		**110.88**	**110.88**							**1304.6**	**178.7**	**110.3**	**221.8**	**1815.4**	**71.86%**	**9.845%**	**6.08%**	**12.22%**			
																		Min -	**0.00%**	**2.47%**	**0.00%**	**10.40%**			
																		Max -	**85.59%**	**50.08%**	**57.26%**	**32.79%**			

Average of GF bottles in centering sleeve = 59.3% 15.8%
Use for GF bottles in direct-loaded drums = 60% 15%

Information from NFS Container Paperwork and WEAF RTR Observations

CONTAINER ID	WEAF RTR Tape	Package Date (M003)	# of Bottles	Screened	Immobilized	Vermiculite	Gross (lbs)	Tare (lbs)	Net (lbs)	Rigid Liner	Centering Sleeve	Sleeve Bracing	False Lid	Liquids Observed	Comp Gases Observed	Vent Hole Observed
NFS0107	NFS-101A	9/21/1993	3	Y	Y	N/A	100	84	16	N	Y	N	N	N	N	Y
NFS0148	NFS-035A	8/13/1993	3	Y	Y	Y	121	100	21	Y	Y	Y	N	N	N	Y
NFS0149	NFS-038A	8/13/1993	3	Y	Y	Y	122	100	22	Y	Y	Y	N	N	N	Y
NFS0150	NFS-041A	8/13/1993	3	Y	Y	N/A	119	100	19	Y	Y	Y	N	N	N	Y
NFS0151	NFS-036A	8/13/1993	3	Y	Y	Y	121	100	21	Y	Y	Y	N	N	N	Y
NFS0478	NFS-075A	7/9/1993	3	Y	Y	N/A	121	100	21	Y	Y	Y	N	N	N	Y
NFS0479	NFS-087A	7/9/1993	3	Y	Y	N/A	123	100	23	Y	Y	Y	N	N	N	Y
NFS0481	NFS-086A	7/9/1993	3	Y	Y	N/A	122	100	22	Y	Y	Y	N	N	N	Y
NFS0506	NFS-040A	8/15/1993	28	Y	Y	Y	270	85	185	Y	N	N	Y	N	N	Y
NFS0507	NFS-039A	8/15/1993	28	Y	Y	N/A	274	85	189	Y	N	N	Y	N	N	Y
NFS0508	NFS-035A	8/15/1993	13	Y	Y	Y	187	85	102	Y	N	N	Y	N	N	Y
NFS0591	NFS-043A	8/31/1993	28	Y	Y	Y (Radsorb)	251	85	166	Y	N	N	Y	N	N	Y
NFS0592	NFS-042A	8/31/1993	14	Y	Y	Y (Radsorb)	178	85	93	Y	N	N	Y	N	N	Y
NFS0593	NFS-045A	8/31/1993	2	Y	Y	N/A	110	103	7	Y	Y	Y	N	N	N	Y
NFS0594	NFS-045A	8/31/1993	2	Y	Y	N/A	114	103	11	Y	Y	Y	N	N	N	Y
NFS0673	NFS-055A	9/3/1993	2	Y	Y	Y	113	103	10	Y	Y	Y	N	N	N	Y
NFS0674	NFS-050A	9/3/1993	2	Y	Y	N/A	108	103	5	Y	Y	Y	N	N	N	Y
NFS0753	NFS-065A	9/17/1993	3	Y	Y	N/A	102	85	17	N	Y	N	N	N	N	Y
NFS0754	NFS-065A	9/17/1993	3	Y	Y	N/A	94	85	9	N	Y	N	N	N	N	Y
NFS0755	NFS-058A	9/17/1993	3	Y	Y	N/A	104	85	19	N	Y	N	N	N	N	Y
NFS0757	NFS-069A	9/17/1993	3	Y	Y	N/A	102	83	19	N	Y	N	N	N	N	Y
NFS0758	NFS-061A	9/17/1993	3	Y	Y	N/A	104	83	21	N	Y	N	N	N	N	Y
NFS0759	NFS-070A	9/17/1993	3	Y	Y	N/A	99	85	14	N	Y	N	N	N	N	Y
NFS0776	NFS-110A	9/18/1993	3	Y	Y	Y	102	84	18	N	Y	N	N	N	N	Y
NFS0777	NFS-085A	9/18/1993	3	Y	Y	N/A	101	84	17	N	Y	N	N	N	N	Y
NFS0786	NFS-103A	9/19/1993	3	Y	Y	Y	95	83	12	N	Y	N	N	N	N	Y
NFS0787	NFS-103A	9/19/1993	3	Y	Y	Y	100	83	17	N	Y	N	N	N	N	Y
NFS0788	NFS-105A	9/30/1993	14	Y	Y	Y	167	87	80	Y	N	N	Y	N	N	Y
NFS0789	NFS-148A	9/20/1993	14	Y	Y	N/A	178	87	91	Y	N	N	Y	N	N	Y
NFS0804	NFS-086A	9/18/1993	3	Y	Y	N/A	102	83	19	N	Y	N	N	N	N	Y
NFS0805	NFS-084A	9/18/1993	3	Y	Y	N/A	102	83	19	N	Y	N	N	N	N	Y
NFS0806	NFS-110A	9/18/1993	3	Y	Y	Y	97	83	14	N	Y	N	N	N	N	Y
NFS0808	NFS-099A	9/24/1993	3	Y	Y	N/A	98	83	15	N	Y	N	N	N	N	Y
NFS0865	NFS-126A	7/9/1993	3	Y	Y	N/A	123	100	23	Y	Y	Y	N	N	N	Y
NFS0879	NFS-134A	3/10/1994	3	Y	Y	N/A	128	105	23	Y	Y	Y	N	–	–	–
NFS0880	NFS-135A	3/21/1994	14	N/A	Y	N/A	200	87	113	Y	N	N	Y	–	–	–
NFS0926	NFS-169A	9/24/1993	10	Waste Certification Checklist missing			145	91	54	Y	N	N	Y	Y	N	Y
NFS0929	NFS-176A	3/10/1994	3	N/A	Y	N/A	144	107	37	Y	Y	Y	N	N	N	Y

DIVIDER PAGE

Attachment 6 – Waste Form, Waste Material Parameters, Prohibited Items, and Packaging

Site(s): Oak Ridge National Laboratory

Waste Stream Description: Heterogeneous debris waste from the Radiochemical Engineering Development Center

Container ID Numbers: See CCP-TP-005, Attachment 8 for containers in this waste stream

Waste Stream Number: OR-REDC-CH-HET	
Physical Waste Form (e.g., debris, solidified waste)	Debris
Summary Category Group [a]	S5000
Waste Matrix Code Group [a]	Heterogeneous Debris Waste
Waste Matrix Code [b]	S5400
Waste Material Parameter Weights [c]	Estimated Waste Stream Weight Percent Average (attach evaluation justifying percentages)
Iron-based metals/alloys	33.0%
Aluminum-based metals/alloys	1.6%
Other metals	0.9%
Other inorganic materials	12.8%
Cellulosics	4.9%
Rubber	1.3%
Plastics (waste materials)	45.5%
Organic matrix	0%
Inorganic matrix	0%
Soils/Gravels	<0.1%
Packaging Materials	Present (Y/N)?
Steel	Yes
Plastics	Yes
Prohibited Wastes [d,e,f,g]	Present (Y/N)?
Observable liquid shall be no more than 1 percent by volume of the outermost container at the time of RTR or VE. Observable liquid shall be no more than 60 milliliters or 3 percent by volume, whichever is greater, in an internal container. Observable liquid shall not be present in a container with EPA HWN U134 assigned.	Y
Non-radionuclide pyrophoric materials	N
Sealed containers > 4 liters	Y
Hazardous waste not occurring as co-contaminants with TRU mixed waste (non-mixed hazardous waste)	N

ORIGINAL

Attachment 6 – Waste Form, Waste Material Parameters, Prohibited Items, and Packaging (continued)

Waste Stream Number: OR-REDC-CH-HET	
Explosives	N
Compressed gases	Y
Residual hydrofluoric acid (if U134 assigned to stream)	N
Residual PCB liquids [j]	Y
Ignitables (EPA Hazardous Waste Number D001)	N
Corrosives (EPA Hazardous Waste Number D002)	N
Reactives (EPA Hazardous Waste Number D003)	N
Waste incompatible with backfill, seal and panel closure materials, container and packaging materials, shipping container materials, or other wastes [h]	N
Spent Nuclear fuel or high-level waste [i]	N
Any un-vented plastic bags > 4 liters that have been heat-sealed	Y
Additional Information (if available)	Some of the waste processed at the TWPC may have a stainless steel band wrapped around the twisted section of the liner bag that was tightened with a banding tool. This closure method is considered a supplemental sealing device that is unacceptable. Some drums may contain items that cannot be penetrated by RTR such as lead pigs.
Packaging	
Waste container type?	55-gallon drums. Some drums are overpacked in 79- or 85-gallon drums.
Liner type?	As generated: Single poly drum bag liner. TWPC repack: Cardboard liner and a single filtered 6-mm poly liner bag.
Is liner punctured?	Rigid liners were not used.
Is filter vent installed?	Some of the drums will have filter vents installed; however, each drum will be inspected to ensure all drums have approved filter vents installed.
Maximum number of confinement layers	Three

a. Source: *CCP Transuranic Waste Characterization Quality Assurance Project Plan* (CCP-PO-001) Introduction.
b. Source: *Transuranic Waste Baseline Inventory Report* (DOE/CAO-95-1121) or DOE Waste Treatability Group Guidance (DOE/LLW-217). Note: the waste matrix code should not be assigned at the summary category group level.
c. Source: CCP-PO-001 – Table C3-1. Attach the Waste Material Parameter Evaluation Memorandum used to estimate values include in this Table (see Section 4.4.27).
d. Source: CCP-PO-001 – Section C-1c
e. Source: *Transuranic Waste Acceptance Criteria for the Waste Isolation Pilot Plant* (WAC)(DOE/WIPP-02-3122), Section 3
f. Source: *TRUPACT-II Content Codes* (TRUCON) (DOE/WIPP 89-004)
g. Source: *TRUPACT-II Authorized Methods for Payload Control (TRAMPAC)*, Washington TRU Solutions, LLC
h. This waste has been approved for disposal at the WIPP by the Permittee as documented by Appendix C1 of the WIPP RCRA Part B Permit Application and the Permittee's approval and assignment of the applicable TRUCON Codes for this waste stream.
i. Source: *Nuclear Waste Policy Act of 1982* (42 U.S.C. 10101)
j. Source: Polychlorinated Biphenyls (PCBs) manufacturing, Processing, Distribution and Commerce, and Use Prohibitions (40 CFR 761)

Attachment 6 – Waste Form, Waste Material Parameters, Prohibited Items, and Packaging (continued) Page 3 of 3

Waste Stream Number: OR-REDC-CH-HET

Acceptable Knowledge Expert: Allen Dickerson / _____ Date: 05/31/2011
Print Sign

Memorandum

To: CCP Records

From: Jeff Harrison, CCP AKE

Date: July 11, 2008

RE: Waste Matrix Code and Waste Material Parameter Evaluation for Waste Stream OR-REDC-CH-HET, Oak Ridge National Laboratory Radiochemical Engineering Development Center Contact-Handled Transuranic Waste

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In accordance to *CCP Acceptable Knowledge Documentation*, CCP-TP-005, Revision 18, Section 4.4.24, Waste Material Parameters (WMP) shall be estimated on a weight percent basis for the waste stream, documenting the assumptions and justification for deriving the estimated WMP.

Waste Matrix Code

The waste matrix code was assigned to Waste Stream OR-REDC-CH-HET based on the evaluation of AK information relating to the physical form of the waste recorded on UCN-2109 and UCN-2822 forms and container log sheets. The UCN-2109 records an estimate of the volume percent combustible which ranges from 0 to 100 with an average of about 62 percent for the drums in this waste stream. The UCN-2822 provides total volume and combustible volume in cubic feet. The calculated volume percent combustible ranges from 0 to 100 with an average of about 54 percent. The container log sheets provide an estimate of the volume percent combustible for each package in the drum. An average was calculated for each drum and an overall average for all of the drums with container log sheets. The calculated volume percent combustible ranges from 33 to 98 with an average of about 65 percent. A few drums may contain grouted ion-exchange resin, which is considered a homogeneous waste, but individual drums are expected to contain less than 50 percent, by volume, of this waste. The combustible data and calculations are included as Attachment A.

Due to the high degree of variability in the amount of combustible waste, Waste Matrix Code S5400, Heterogeneous Debris, is applied to this waste stream. The definition of this Waste Matrix Code is provided in the DOE/LLW-217, DOE Waste Treatability Group Guidance. This category includes waste that is at least 50 percent, by volume, debris materials that do not meet the criteria for assignment as either an Inorganic Debris (S5100) or Organic Debris (S5300).

Waste Material Parameters

The waste material parameter (WMP) weight estimates for Waste Stream OR-REDC-CH-HET were derived from CCP RTR data. RTR data available as of 7-10-2008 were evaluated for 255 containers from Waste Stream OR-REDC-CH-HET generated from November 1977 to May 2005. It is assumed that the data for these 255 containers are representative of Waste Stream OR-

REDC-CH-HET as a whole. One minor exception is that RTR has not identified any drums with organic matrix; however, only a few drums are expected to contain organic matrix (grouted ion-exchange resin). Average, minimum, and maximum WMP weight percentages were calculated using the RTR data. The results of this analysis are presented in the following table. The RTR data and calculations are included as Attachment B.

Waste Material Parameter	Weight Percent	Weight Percent Range
Fe Based Metals/Alloys	33.0%	0.0 – 98.8%
Al based Metals/Alloys	1.6%	0.0 – 21.2%
Other Metals/Alloys	0.9%	0.0 – 55.9%
Other Inorganic Materials	12.8%	0.0 – 80.3%
Cellulosics	4.9%	0.0 – 70.5%
Rubber	1.3%	0.0 – 52.2%
Plastics (waste materials)	45.5%	0.0 – 100.0%
Organic Matrix [1]	0%	0.0%
Inorganic Matrix [1]	0%	0.0%
Soils	<0.1%	0.0 – 3.4%
Total Inorganic Weight %	**48.3%**	
Total Organic Weight %	**51.7%**	

1. RTR did not report organic matrix or inorganic matrix in the 255 drums included in this evaluation. However, small quantities of organic matrix (grouted ion-exchange resin) and inorganic matrix (absorbed liquid) are expected to be present in some drums in this waste stream.

DIVIDER PAGE

Attachment 6 – Waste Form, Waste Material Parameters, Prohibited Items, and Packaging

Site(s): Oak Ridge National Laboratory (RH)

Waste Stream Description: REDC RH Transuranic Debris Waste

Container ID Numbers: See CCP-TP-005 Attachment 8 and/or the AK Tracking Spreadsheet for drum identification numbers

Waste Stream Number: OR-REDC-RH-HET	
Physical Waste Form (e.g., debris, solidified waste)	Debris
Summary Category Group [a]	S5000
Waste Matrix Code Group [a]	Heterogeneous Debris Waste
Waste Matrix Code [b]	S5400
Waste Material Parameter Weights [c] See attached Evaluation (NOTE 1)	Estimated Waste Stream Weight Percent Average (attach evaluation justifying percentages)
Iron-based metals/alloys	33.0%
Aluminum-based metals/alloys	1.6%
Other metals	0.9%
Other inorganic materials	12.8%
Cellulosics	4.9%
Rubber	1.3%
Plastics (waste materials)	45.5%
Organic matrix	0.0% (see NOTE 2)
Inorganic matrix	0.0% (see NOTE 3)
Soils/Gravels	<0.1%
Packaging Materials	Present (Y/N)?
Steel	Y
Plastics	Y
Prohibited Wastes [d,e,f,g]	Present (Y/N)?
Observable liquid shall be no more than 1 percent by volume of the outermost container at the time of RTR or VE. Observable liquid shall be no more than 60 milliliters or 3 percent by volume, whichever is greater, in an internal container. Observable liquid shall not be present in a container with EPA HWN U134 assigned.	Y
Non-radionuclide pyrophoric materials	N
Sealed containers > 4 liters	Y
Hazardous waste not occurring as co-contaminants with TRU mixed waste (non-mixed hazardous waste)	N

Attachment 6 – Waste Form, Waste Material Parameters, Prohibited Items, and Packaging (continued)

Waste Stream Number: OR-REDC-RH-HET	
Explosives	N
Compressed gases	Y – aerosol cans
Residual hydrofluoric acid (if U134 assigned to stream)	N
Residual PCB liquids [i]	Y – possibly in pumps or capacitors
Ignitables (EPA Hazardous Waste Number D001)	N
Corrosives (EPA Hazardous Waste Number D002)	N
Reactives (EPA Hazardous Waste Number D003)	N
Waste incompatible with backfill, seal and panel closure materials, container and packaging materials, shipping container materials, or other wastes [h]	N
Spent Nuclear fuel or high-level waste [i]	N
Any un-vented plastic bags > 4 liters that have been heat-sealed	Y
Additional Information (if available)	Some of the waste processed at the TWPC may have a stainless steel band wrapped around the twisted section of the liner bag that was tightened with a banding tool. This closure method is considered a supplemental sealing device that is unacceptable.
Packaging	———
Waste container type?	Filtered 55-gallon drum
Liner type?	Cardboard liner in polypropylene lifting sack
Is liner punctured?	NA
Is filter vent installed?	NucFil-019DS
Maximum number of confinement layers	No layers of confinement in 55-gallon drum.

NOTES:

(1) Based on the CH WMP evaluation for waste stream (OR-REDC-CH-HET) RTR estimates (see attached).
(2) Although RTR did not identify organic matrix in this subset of drums, small amounts of organic matrix are expected to be present in the form of grouted ion-exchange resin, dried epoxy, and liquids absorbed with an organic polymer such as Nochar N910 or Nochar N965.
(3) Although RTR did not identify inorganic matrix in this subset of drums, small amounts of inorganic matrix are expected to be present in the form of liquids absorbed with an inorganic absorbent such as Solid-a-sorb or vermiculite.

Attachment 6 – Waste Form, Waste Material Parameters, Prohibited Items, and Packaging (continued) Page 3 of 3

a. Source: *CCP Transuranic Waste Characterization Quality Assurance Project Plan* (CCP-PO-001) Introduction.
b. Source: *Transuranic Waste Baseline Inventory Report* (DOE/CAO-95-1121) or DOE Waste Treatability Group Guidance (DOE/LLW-217). Note: the waste matrix code should not be assigned at the summary category group level.
c. Source: CCP-PO-001 – Table C3-1. Attach the Waste Material Parameter Evaluation Memorandum used to estimate values include in this Table.
d. Source: CCP-PO-001 – Section C-1c
e. Source: *Transuranic Waste Acceptance Criteria for the Waste Isolation Pilot Plant* (WAC)(DOE/WIPP-02-3122), Section 3
f. Source: *TRUPACT-II Content Codes* (TRUCON) (DOE/WIPP 89-004)
g. Source: *TRUPACT-II Authorized Methods for Payload Control (TRAMPAC), Nuclear Waste Partnership*, LLC
h. This waste has been approved for disposal at the WIPP by the Permittee as documented by Appendix C1 of the WIPP RCRA Part B Permit Application and the Permittee's approval and assignment of the applicable TRUCON Codes for this waste stream.
i. Source: *Nuclear Waste Policy Act of 1982* (42 U.S.C. 10101)
j. Source: Polychlorinated Biphenyls (PCBs) manufacturing, Processing, Distribution and Commerce, and Use Prohibitions (40 CFR 761)

Acceptable Knowledge Expert: Steve Schafer / Date: 03/29/2016
Print Sign

To: CCP Central Records

From: Steve Schafer, CCP AKE

Date: March 29, 2016

RE: Waste Material Parameter Estimates for Waste Stream OR-REDC-RH-HET, Oak Ridge National Laboratory Radiochemical Engineering Development Center Remote-Handled Transuranic Waste

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The purpose of this memorandum is to satisfy the requirements of the CCP AK Documentation procedure (CCP-TP-005). The procedure requires an AK Expert to evaluate the Waste Material Parameters (WMPs) of a waste stream and prepare a memorandum to CCP Records. This memo documents the WMP estimate for waste stream OR-REDC-RH-HET.

During review of the WMP estimates for waste stream OR-REDC-RH-HET for Revision 5 of the AK Summary Report (AKSR) CCP-AK-ORNL-500, it was determined that the existing WMP estimates for the corresponding CH waste stream, OR-REDC-CH-HET, provide more representative estimates of the WMPs than the previous estimates presented in Revision 4 of the AKSR. These CH estimates are based on RTR data for the corresponding CH waste stream (See attached evaluation dated 7/11/2008) that provide more accurate quantification of the WMPs than the initial unverified assumptions used for the initial WMP estimates for waste stream OR-REDC-RH-HET.

The WMP weight estimates for waste stream OR-REDC-RH-HET were derived from CCP RTR data of the corresponding CH waste stream OR-REDC-CH-HET. RTR data were evaluated for 255 containers from waste stream OR-REDC-CH-HET generated from November 1977 to May 2005. It is assumed that the data for these 255 containers are representative of waste stream OR-REDC-CH-HET as a whole. One minor exception is that RTR has not identified any drums with organic matrix; however, only a few drums are expected to contain organic matrix (grouted ion-exchange resin).

Memorandum

To: CCP Records

From: Jeff Harrison, CCP AKE

Date: July 11, 2008

RE: Waste Matrix Code and Waste Material Parameter Evaluation for Waste Stream OR-REDC-CH-HET, Oak Ridge National Laboratory Radiochemical Engineering Development Center Contact-Handled Transuranic Waste

---

In accordance to *CCP Acceptable Knowledge Documentation*, CCP-TP-005, Revision 18, Section 4.4.24, Waste Material Parameters (WMP) shall be estimated on a weight percent basis for the waste stream, documenting the assumptions and justification for deriving the estimated WMP.

Waste Matrix Code

The waste matrix code was assigned to Waste Stream OR-REDC-CH-HET based on the evaluation of AK information relating to the physical form of the waste recorded on UCN-2109 and UCN-2822 forms and container log sheets. The UCN-2109 records an estimate of the volume percent combustible which ranges from 0 to 100 with an average of about 62 percent for the drums in this waste stream. The UCN-2822 provides total volume and combustible volume in cubic feet. The calculated volume percent combustible ranges from 0 to 100 with an average of about 54 percent. The container log sheets provide an estimate of the volume percent combustible for each package in the drum. An average was calculated for each drum and an overall average for all of the drums with container log sheets. The calculated volume percent combustible ranges from 33 to 98 with an average of about 65 percent. A few drums may contain grouted ion-exchange resin, which is considered a homogeneous waste, but individual drums are expected to contain less than 50 percent, by volume, of this waste. The combustible data and calculations are included as Attachment A.

Due to the high degree of variability in the amount of combustible waste, Waste Matrix Code S5400, Heterogeneous Debris, is applied to this waste stream. The definition of this Waste Matrix Code is provided in the DOE/LLW-217, DOE Waste Treatability Group Guidance. This category includes waste that is at least 50 percent, by volume, debris materials that do not meet the criteria for assignment as either an Inorganic Debris (S5100) or Organic Debris (S5300).

Waste Material Parameters

The waste material parameter (WMP) weight estimates for Waste Stream OR-REDC-CH-HET were derived from CCP RTR data. RTR data available as of 7-10-2008 were evaluated for 255 containers from Waste Stream OR-REDC-CH-HET generated from November 1977 to May 2005. It is assumed that the data for these 255 containers are representative of Waste Stream OR-

REDC-CH-HET as a whole. One minor exception is that RTR has not identified any drums with organic matrix; however, only a few drums are expected to contain organic matrix (grouted ion-exchange resin). Average, minimum, and maximum WMP weight percentages were calculated using the RTR data. The results of this analysis are presented in the following table. The RTR data and calculations are included as Attachment B.

Waste Material Parameter	Weight Percent	Weight Percent Range
Fe Based Metals/Alloys	33.0%	0.0 – 98.8%
Al based Metals/Alloys	1.6%	0.0 – 21.2%
Other Metals/Alloys	0.9%	0.0 – 55.9%
Other Inorganic Materials	12.8%	0.0 – 80.3%
Cellulosics	4.9%	0.0 – 70.5%
Rubber	1.3%	0.0 – 52.2%
Plastics (waste materials)	45.5%	0.0 – 100.0%
Organic Matrix [1]	0%	0.0%
Inorganic Matrix [1]	0%	0.0%
Soils	<0.1%	0.0 – 3.4%
Total Inorganic Weight %	**48.3%**	
Total Organic Weight %	**51.7%**	

1. RTR did not report organic matrix or inorganic matrix in the 255 drums included in this evaluation. However, small quantities of organic matrix (grouted ion-exchange resin) and inorganic matrix (absorbed liquid) are expected to be present in some drums in this waste stream.

Attachment A

Evaluation of Data from Forms UCN-2109 and UCN-2822

Data from From UCN-2109								
Container ID	Inner Pkg #	Prohibited Items (Y/N)	Heat Sealed Bags (Y/N)	IX Resins (Y/N)	Cmbstbl Mtrl (Vol%)	Beryllium (Y/N)	No. of Sealed Layers	Sealed Layer Type*
X10C9310035	1	N	N	N	100	N	2	TT,HS
X10C9310035	2	N	N	N	100	N	2	TT,HS
X10C9310035	3	N	N	N	100	N	2	TT,HS
X10C9310035	4	N	N	N	100	N	2	TT,HS
X10C9310035 Average					**100**			
X10C9310046	1	N	Y	N	100	N	2	TT,HS
X10C9310046	2	N	N	N	100	N	2	TT,HS
X10C9310046	3	N	Y	N	60	N	2	TT,HS
X10C9310046	4	N	Y	N	60	N	2	TT,HS
X10C9310046	5	N	Y	N	100	N	2	TT,HS
X10C9310046	6	N	Y	N	100	N	2	TT,HS
X10C9310046	7	N	Y	N	0	N	2	TT,HS
X10C9310046	8	N	Y	N	60	N	2	TT,HS
X10C9310046	9	N	?	N	100	N	2	TT,HS
X10C9310046 Average					**76**			
X10C9310049	1	N	Y	N	50	N	2	TT,HS
X10C9310049	2	N	Y	N	100	N	2	TT,HS
X10C9310049	3	N	Y	N	50	N	2	TT,HS
X10C9310049	4	N	Y	N	50	N	2	TT,HS
X10C9310049	5	N	Y	N	0	N	2	TT,HS
X10C9310049	6	N	Y	N	0	N	2	TT,HS
X10C9310049	7	N	Y	N	0	N	2	TT,HS
X10C9310049	8	N	Y	N	100	N	2	TT,HS
X10C9310049	9	N	Y	N	60	N	2	TT,HS
X10C9310049 Average					**46**			
X10C9400358	1	N	N	N	40	N	2	TT,HS
X10C9400358	2	N	N	N	50	N	2	TT,HS
X10C9400358	3	N	N	N	25	N	2	TT,HS
X10C9400358	4	N	N	N	25	N	2	TT,HS
X10C9400358	5	N	N	N	40	N	2	TT,HS
X10C9400358	6	N	N	N	40	N	2	TT,HS
X10C9400358	7	N	N	N	40	N	2	TT,HS
X10C9400358	8	N	N	N	50	N	2	TT,HS
X10C9400358	9	N	N	N	80	N	2	TT,HS
X10C9400358	10	N	N	N	100	N	2	TT,HS
X10C9400358	11	N	N	N	70	N	2	TT,HS
X10C9400358	12	N	N	N	40	N	2	TT,HS
X10C9400358	13	N	N	N	100	N	2	TT,HS
X10C9400358	14	N	N	N	40	N	2	TT,HS
X10C9400358	15	N	N	N	100	N	2	TT,HS
X10C9400358	16	N	N	N	80	N	2	TT,HS
X10C9400358	17	N	N	N	40	N	2	TT,HS
X10C9400358	18	N	N	N	100	N	2	TT,HS
X10C9400358	19	N	N	N	0	N	2	TT,HS

Attachment 8 - Waste Containers List

Site(s): Oak Ridge National Laboratory

Waste Stream Number(s): OR-NFS-CH-HET, OR-NFS-CH-HET-A, OR-NFS-CH-SOIL, OR-NFS-CH-HOM-A

Waste Stream Description: Heterogeneous debris waste, soil, and homogeneous solids from Nuclear Fuel Services, Inc.

Number of Waste Containers in Waste Stream:

OR-NFS-CH-HET:	112	55-gallon drums
OR-NFS-CH-HET-A:	755	55-gallon drums
OR-NFS-CH-SOIL:	1653	55-gallon drums
OR-NFS-CH-HOM-A:	38	55-gallon drums
Total	**2558**	**55-gallon drums**

Total Existing Volume (m^3):

OR-NFS-CH-HET:	23.30	m^3
OR-NFS-CH-HET-A:	157.04	m^3
OR-NFS-CH-SOIL:	343.82	m^3
OR-NFS-CH-HOM-A:	7.9	m^3
Total	**532.06**	m^3

Is waste expected to be generated in the future? Yes and No

If yes, Estimated Future Volume (m^3): Waste streams OR-NFS-CH-HET, OR-NFS-CH-HET-A, and OR-NFS-CH-HOM-A will not be generated in the future. However, the waste stream volume may increase due to repackaging at the TWPC. Waste stream OR-NFS-CH-SOIL will be generated in the future. NFS projects 3192 drums (4300 total - 1108 added) thru FY2018.

Assumptions: See AK Summary Report

Acceptable Knowledge Expert: Jeff Harrison (Print) / Jeff Harrison (Sign) 2/11/16 (Date)

Waste Stream Container Evaluation Memo(s) for Added Containers: M076, M128, M129, M130, M131, M132, M133, M216, M269

Container Identification Number	Generation Date	Generation Point
See Attached Waste Containers List		

CCP RECORDS ORIGINAL
DATE REC'D 2/15/16
mr

Attachment 8 - Waste Containers List

Site(s): Oak Ridge National Laboratory

Waste Stream Number(s): OR-NFS-CH-HET, OR-NFS-CH-HET-A, OR-NFS-CH-SOIL, OR-NFS-CH-HOM-A

Waste Stream Description: Heterogeneous debris waste, soil, and homogeneous solids from Nuclear Fuel Services, Inc.

Number of Waste Containers in Waste Stream:

OR-NFS-CH-HET:	112 55-gallon drums
OR-NFS-CH-HET-A:	733 55-gallon drums
OR-NFS-CH-SOIL:	545 55-gallon drums
OR-NFS-CH-HOM-A:	38 55-gallon drums

Total Existing Volume (m^3):

OR-NFS-CH-HET:	23.30 m3
OR-NFS-CH-HET-A:	152.46 m3
OR-NFS-CH-SOIL:	113.36 m3
OR-NFS-CH-HOM-A:	7.90 m3

Is waste expected to be generated in the future? Yes and No

If yes, Estimated Future Volume (m^3): Waste streams OR-NFS-CH-HET, OR-NFS-CH-HET-A, and OR-NFS-CH-HOM-A will not be generated in the future. However, the waste stream volume may increase due to repackaging at the TWPC.
Waste stream OR-NFS-CH-SOIL will be generated in the future. NFS projects 4300 drums thru FY2018.

Assumptions: See AK Summary Report

Acceptable Knowledge Expert: Jeff Harrison (Print) / Jeff Harrison (Sign) 12/5/2013 (Date)

Waste Stream Container Evaluation Memo(s) for Added Containers: M076, M128, M129, M130, M131, M132, M133, M216

Container Identification Number	Generation Date	Generation Point
N of A	12/14/13	
See Attached Waste Containers List		
N/A	CP 12/14/13	

NTPC RECORDS ORIGINAL
DATE REC'D 1/3/14 SP

Attachment 3 - Acceptable Knowledge Source Document Summary

Site(s): Oak Ridge National Laboratory	Source Document Tracking Number: M269
Waste Stream Number(s): ORNL Non-specific Library Files (Applicable only when site library is not in use)	
Acceptable Knowledge Documentation Type: ☑ TRU Waste Management Program Information ☑ Waste Stream-Specific Information ☐ Additional Information	Category: ☐ Correspondence ☐ Discrepancy Resolution ☐ Internal Procedure ☑ Miscellaneous ☐ Published Document or Internal Procedure ☐ Unpublished Documents
Title or Description of Source Document [a]: Evaluation of Additional Containers for Waste Stream OR-NFS-CH-SOIL	
Source Document Reference Information (author(s), document and revision number, date, publisher): Jeff Harrison, M269, NA, Various, CCP	

AK # [b]	Source Doc. Page # [c]	AK Information Summary
PR5, PR6, PR7, PR8, WS2, WS3, WS6, WS8, WS9, WS10, WS11	Throughout	This source document is a compilation of Evaluations of Additional Containers for Waste Stream OR-NFS-CH-SOIL. Information will be added to the source document as drums are added to the waste stream. ORNL plans to add 96 drums each month from 2015 to 2017.

CCP RECORDS ORIGINAL
DATE REC'D 8/31/15 MR

Attachment 3 - Acceptable Knowledge Source Document Summary (continued)

Site(s): Oak Ridge National Laboratory		Source Document Tracking Number: M269
AK # [b]	Source Doc. Page # [c]	AK Information Summary

Source Document Data Limitations (if any):

1. Additional information will be added as the information becomes available.

Acceptable Knowlege Expert:

Travis Smith _____ Date: 07/22/2015
Print /Sign

[a] Provide description for non-titled information (i.e., container paperwork, MSDS sheets, etc)
[b] Obtain from Acceptable Knowledge Documentation Checklist
[c] For microfilm or microfiche, identify box, tape, reel number and location.

Attachment 3 - Acceptable Knowledge Source Document Summary

Site(s): Oak Ridge National Laboratory	Source Document Tracking Number: M128
Waste Stream Number(s): ORNL Non-specific Library Files (Applicable only when site library is not in use)	
Acceptable Knowledge Documentation Type: ☑ TRU Waste Management Program Information ☑ Waste Stream-Specific Information ☑ Additional Information	Category: ☐ Correspondence ☐ Discrepancy Resolution ☐ Internal Procedure ☑ Miscellaneous ☐ Published Document or Internal Procedure ☐ Unpublished Documents
Title or Description of Source Document [a]: Evaluation of Additional Containers for Waste Stream OR-NFS-CH-SOIL dated September 5, 2008	
Source Document Reference Information (author(s), document and revision number, date, publisher): J. Harrison, M128, NA, 09/05/2008	

AK # [b]	Source Doc. Page # [c]	AK Information Summary
PR2, PR3, PR4, PR6, WS1, WS2, WS3, WS4, WS6, WS7, WS8, WS9, WS11, WS12, S16	Throughout	Waste container information has been reviewed for 54 55-gallon drums to verify that the containers are bounded by the existing CCP-AK-ORNL-001, Rev. 3 AK summary report of the OR-NFS-CH-SOIL waste stream. These are daughter drums from the repackaging of waste in 6 boxes. The daughter drums are traceable to the parent box by the letter appended to the drum number. Information reviewed for the boxes consists of the ORNL UNC-2109 container paperwork forms as well as the original NFS paperwork. The conclusion is that the report bounds only 18 of the 5 daughter drums. The AK will be revised to extend the generation date range to August 2008 and to include concrete block in the waste stream description. These 18 drums are eligible to be included in the SOIL waste stream.

NTPC RECORDS ORIGINAL
DATE REC'D 12 | 15 | 13

Attachment 3 - Acceptable Knowledge Source Document Summary (continued)

Site(s): Oak Ridge National Laboratory	Source Document Tracking Number: M128

Source Document Data Limitations (If any):

1. None

Acceptable Knowlege Expert:

TRAVIS SMITH
~~Troy Greenwood~~ Date: 11/14/2013
Print TS 11/14/2013 /Sign

[a] Provide description for non-titled information (i.e., container paperwork, MSDS sheets, etc)
[b] Obtain from Acceptable Knowledge Documentation Checklist
[c] For microfilm or microfiche, identify box, tape, reel number and location.

M128

Waste container information has been reviewed for 54 55-gallon drums to verify that the containers are bounded by the existing CCP-AK-ORNL-001, Rev. 3 AK Summary Report (ORNL-001) for the OR-NFS-CH-SOIL (SOIL) waste stream. These 54 drums are daughter drums from the repackaging of waste in 6 boxes (X10C0506148, X10C0506149, X10C0506150, X10C0506151, X10C0506152, and X10C0506154). The daughter drums are traceable to the parent box by the letter appended to the drum number (e.g., X10C0506148A is a daughter from X10C0506148).

Information reviewed for the boxes consists of the ORNL UCN-2109 container paperwork forms as well as the original NFS paperwork attached to the UCN-2109 (e.g., *Radwaste Package Certification Record*). The TWPC *Contact Handled Waste Repackaging Data Form* was reviewed for each of the daughter drums. The radiological data for these boxes from a 2/29/2008 EM Waste database query were also evaluated.

Waste Generation Location And Process

The ORNL-001 AK indicates the NFS soil waste originated from beneath the Building 234 Wet Chemistry Cell. A few drums of soil are from an area around the Building 110 laboratory underground waste tank. Drums and boxes of soil from NFS are repackaged, as necessary, at the TWPC (Sections 6.1 and 6.3).

The UCN-2109 forms indicate all 6 boxes are from NFS.

The *Radwaste Package Certification Record* for 5 of the 6 boxes (X10C0506148, X10C0506149, X10C0506150, X10C0506151, and X10C0506152) identifies "Metric Compound" as the area generated. According to NFS personnel, the Metric Compound was just a location where they overpacked the legacy HICs into a burial box. The true origin of all this material was Building 234 (see attached e-mail). Therefore, the ORNL-001 AK bounds the generation location and process for these 5 boxes (and 49 daughters).

The *Radwaste Package Certification Record* for X10C0506154 does not identify the area generated, but the Gamma Waste Assay sheet identifies the location as "RBG Trench B." According to Richard Moore at NFS, RBG is the Radioactive Burial Ground, and Trench B designates one of the burial pits. The Radioactive Burial Ground is not discussed in the AK. More information is needed before the 5 daughters from X10C0506154 can be added to the SOIL waste stream. The rest of this evaluation will not discuss X10C0506154.

Time Period Of Generation

The ORNL-001 AK covers waste generated from 1993 to 2001, but also discusses 5 high-density polyethylene High Integrity Containers (packaged in five B25 boxes) containing soil from the same excavation activity that were packaged at NFS in 2005 (Section 6.2).

The *Radwaste Package Certification Record* for the 5 boxes have pack dates of 2005. These are the 5 boxes referred to in Section 6.2 of the AK. The daughters from these 5 boxes were packaged at the TWPC in July and August 2008.

The generation dates of the boxes are bounded by the ORNL-001 AK, but the generation dates of the daughter drums are not bounded. These drums should be included in the waste stream so the ORNL-001 AK will be revised to extend the generation date range to August 2008.

Physical Form

The ORNL-001 AK states that waste from the SOIL waste stream is comprised of soil, rock, and gravel mixed with absorbent. The soil was mixed with RADSORB absorbent powder (cross-linked homopolymer). A RADPAD absorbent pad (cellulosic laminate containing an organic polymer) was placed on top of the soil (Section 6.4.1). The waste stream is assigned waste matrix code is S4100, which is waste estimated to be greater than 95 percent by volume soil, including sand, silt, rock, and gravel, with rock and gravel volumes totaling less than 50 percent of the matrix (Section 6.4.1.1).

Waste material parameter weight estimates are not available for these boxes or daughter drums. The NFS paperwork for the 5 boxes describe the waste as soil. The TWPC repack forms for 18 of the daughter drums from these 5 boxes describe the waste as dirt/soil, concrete, and concrete block. The SOIL waste stream will be revised to identify concrete and concrete block. Therefore, these 18 drums are bounded by the ORNL-001 AK.

The following 31 daughter drums list numerous debris materials but no soil, and therefore, will not be included in the SOIL waste stream:

X10C0506148D	X10C0506149H	X10C0506150G	X10C0506151K
X10C0506148E	X10C0506149I	X10C0506150H	X10C0506152E
X10C0506148F	X10C0506149J	X10C0506151A	X10C0506152F
X10C0506148G	X10C0506149K	X10C0506151F	X10C0506152G
X10C0506148H	X10C0506149L	X10C0506151G	X10C0506152H
X10C0506149A	X10C0506150D	X10C0506151H	X10C0506152I
X10C0506149F	X10C0506150E	X10C0506151I	X10C0506152J
X10C0506149G	X10C0506150F	X10C0506151J	

Chemical Content

The UCN-2109 waste disposal forms do not indicate any EPA hazardous waste numbers assigned to the 5 boxes that are not already identified in the ORNL-001 AK.

Radionuclides

As shown in Table 6-4 of the ORNL-001 AK, U-238 and Pu-239 are the two most prevalent radionuclides, by mass, for the SOIL waste stream at 73.42% and 19.17%, respectively.

The two most prevalent radionuclides, by mass, for the 5 boxes are U-238 and Th-232 at 69.02% and 25.75%, respectively (see attached data from EM Waste). The Th-232 is not consistent with AK; however, the addition of these containers will not alter the two most prevalent radionuclides for the waste stream as a whole.

Prohibited Items

The UCN-2109 forms and *Radwaste Package Certification Record* for the two boxes indicate no prohibited in the waste. The TWPC *Contact Handled Waste Repackaging Data Form* for each of the daughter drums also indicate no prohibited in the waste.

Conclusion

As described above, the existing ORNL-001 AK Summary Report bounds only 18 of the 54 daughter drums evaluated. The ORNL-001 AK will be revised to extend the generation date range to August 2008 and to include concrete and concrete block in the waste stream description. These 18 drums are eligible to be included in the OR-NFS-CH-SOIL waste stream. The inclusion of these drums will not alter the waste matrix code, EPA hazardous waste codes, or the expected radionuclides (including the two most prevalent radionuclides) for the waste stream. The inclusion of these drums will not necessitate additional operator training.

	X10C0506148				X10C0506149				X10C0506150			
Nuclide	*Curies*	*Grams*	*Ci%*	*Wt%*	*Curies*	*Grams*	*Ci%*	*Wt%*	*Curies*	*Grams*	*Ci%*	*Wt%*
AM-241	2.06E-02	5.94E-03	13.38%	0.03%	2.52E-02	7.26E-03	13.39%	0.05%	2.18E-02	6.28E-03	13.41%	0.03%
PU-238	3.51E-03	2.03E-04	2.28%	0.00%	4.29E-03	2.48E-04	2.28%	0.00%	3.70E-03	2.14E-04	2.28%	0.00%
PU-239	4.17E-02	6.63E-01	27.08%	3.01%	5.10E-02	8.11E-01	27.10%	5.91%	4.40E-02	7.00E-01	27.06%	3.32%
PU-240	1.40E-02	6.09E-02	9.09%	0.28%	1.72E-02	7.48E-02	9.14%	0.55%	1.48E-02	6.43E-02	9.10%	0.31%
PU-241	7.37E-02	7.09E-04	47.85%	0.00%	9.01E-02	8.66E-04	47.87%	0.01%	7.77E-02	7.47E-04	47.78%	0.00%
TC-99	1.18E-04	6.94E-03	0.08%	0.03%	1.39E-04	8.18E-03	0.07%	0.06%	1.23E-04	7.24E-03	0.08%	0.03%
TH-228	3.89E-06	4.69E-09	0.00%	0.00%	2.86E-06	3.45E-09	0.00%	0.00%	5.23E-06	6.31E-09	0.00%	0.00%
TH-232	1.93E-07	1.74E+00	0.00%	7.90%	2.08E-07	1.87E+00	0.00%	13.66%	7.75E-07	6.98E+00	0.00%	33.15%
U-232	3.89E-06	1.80E-07	0.00%	0.00%	2.86E-06	1.32E-07	0.00%	0.00%	5.23E-06	2.42E-07	0.00%	0.00%
U-233	3.50E-04	3.59E-02	0.23%	0.16%	2.57E-04	2.63E-02	0.14%	0.19%	4.71E-04	4.83E-02	0.29%	0.23%
U-234	1.83E-05	2.90E-03	0.01%	0.01%	3.99E-06	6.31E-04	0.00%	0.00%	1.55E-05	2.45E-03	0.01%	0.01%
U-235	8.73E-07	3.99E-01	0.00%	1.81%	1.90E-07	8.68E-02	0.00%	0.63%	7.39E-07	3.37E-01	0.00%	1.60%
U-238	6.49E-06	1.91E+01	0.00%	86.76%	3.68E-06	1.08E+01	0.00%	78.93%	4.39E-06	1.29E+01	0.00%	61.31%
	1.54E-01	2.20E+01			1.88E-01	1.37E+01			1.63E-01	2.11E+01		

	X10C0506151				X10C0506152			
Nuclide	*Curies*	*Grams*	*Ci%*	*Wt%*	*Curies*	*Grams*	*Ci%*	*Wt%*
AM-241	3.26E-02	9.39E-03	13.44%	0.02%	2.97E-02	8.56E-03	13.42%	0.04%
PU-238	5.53E-03	3.20E-04	2.28%	0.00%	5.05E-03	2.92E-04	2.28%	0.00%
PU-239	6.58E-02	1.05E+00	27.13%	2.65%	6.00E-02	9.54E-01	27.11%	3.97%
PU-240	2.21E-02	9.61E-02	9.11%	0.24%	2.02E-02	8.78E-02	9.13%	0.37%
PU-241	1.16E-01	1.12E-03	47.83%	0.00%	1.06E-01	1.02E-03	47.90%	0.00%
TC-99	1.74E-04	1.02E-02	0.07%	0.03%	1.61E-04	9.47E-03	0.07%	0.04%
TH-228	2.92E-06	3.52E-09	0.00%	0.00%	1.71E-06	2.06E-09	0.00%	0.00%
TH-232	1.13E-06	1.02E+01	0.00%	25.82%	1.13E-06	1.02E+01	0.00%	42.40%
U-232	2.92E-06	1.35E-07	0.00%	0.00%	1.71E-06	7.92E-08	0.00%	0.00%
U-233	2.62E-04	2.68E-02	0.11%	0.07%	1.54E-04	1.58E-02	0.07%	0.07%
U-234	1.88E-05	2.97E-03	0.01%	0.01%	1.16E-05	1.84E-03	0.01%	0.01%
U-235	8.95E-07	4.09E-01	0.00%	1.04%	5.50E-07	2.51E-01	0.00%	1.05%
U-238	9.40E-06	2.76E+01	0.00%	70.12%	4.25E-06	1.25E+01	0.00%	52.06%
	2.43E-01	3.94E+01			2.21E-01	2.40E+01		

Total Ci	*Total g*	*Ci%*	*Wt%*
1.30E-01	3.74E-02	13.41%	0.03%
2.21E-02	1.28E-03	2.28%	0.00%
2.63E-01	4.17E+00	27.10%	3.47%
8.83E-02	3.84E-01	9.12%	0.32%
4.64E-01	4.46E-03	47.85%	0.00%
7.15E-04	4.21E-02	0.07%	0.03%
1.66E-05	2.00E-08	0.00%	0.00%
3.44E-06	3.10E+01	0.00%	25.75%
1.66E-05	7.69E-07	0.00%	0.00%
1.49E-03	1.53E-01	0.15%	0.13%
6.82E-05	1.08E-02	0.01%	0.01%
3.25E-06	1.48E+00	0.00%	1.23%
2.82E-05	8.30E+01	0.00%	69.02%
9.69E-01	1.20E+02		

Jeff Harrison

From: Jeff Harrison [trash_talk@msn.com]
Sent: Friday, August 01, 2008 4:09 PM
To: 'Coffey, Don'
Subject: RE: PK review of Box containers

Thanks Don.

This answers the NFS soil question.

Did you see my other question on X10C0402975 from REDC?

From: Coffey, Don [mailto:Don.Coffey@truproject.com]
Sent: Friday, August 01, 2008 1:08 PM
To: Jeff Harrison
Subject: FW: PK review of Box containers

Hi Jeff,

This should take care of the question.

Do you concur?

Thanks,

Don

Don E. Coffey, CHMM
don.coffey@truproject.com
865.241.2520 (office)
423.596.0258 (cell)

From: Boss, Daniel A. [mailto:DABoss@nuclearfuelservices.com]
Sent: Friday, August 01, 2008 3:01 PM

To: Coffey, Don
Subject: FW: PK review of Box containers

From: Metcalf, April D.
Sent: Friday, August 01, 2008 2:44 PM
To: Boss, Daniel A.
Subject: RE: PK review of Box containers

Daniel,

The only boxes I ever remember doing in the metric compound were the HICs that we packed into burial boxes. You're statement below is correct.

April

From: Boss, Daniel A.
Sent: Friday, August 01, 2008 11:02 AM
To: Metcalf, April D.
Subject: FW: PK review of Box containers

From: Boss, Daniel A.
Sent: Friday, August 01, 2008 11:01 AM
To: 'Coffey, Don'
Cc: Livingston, J. D.
Subject: RE: PK review of Box containers

Don,

We (JD Livingston and myself) checked box 6545, 6602, 6552, 6644,and 6651 and looked up the inner container history in our NUMAC system and it's origin was the sales order (1537X) for Bldg 234. The Metrix Compound was just a location where they overpacked the legacy HICs into a burial box. The true origin of all this material was Building 234. I have also written to a supervisor present when this was done to verify that my understanding is correct and will let you know when I hear back on that as well....but I am fairly confident this is the case. The Metrix compound (we now refer to this area as the Lauren compound) was never a Pu area but was used as an open area for overpacking.

Daniel

From: Coffey, Don [mailto:Don.Coffey@truproject.com]
Sent: Friday, August 01, 2008 9:44 AM
To: Boss, Daniel A.
Cc: Coffey, Don
Subject: FW: PK review of Box containers

Hi Daniel,

The attached file contains copies of the NFS "RADWASTE PACKAGE CERTIFICATION RECORD" for the 5 NFS boxes that contain the HICs of soil.

I also have included the e-mail from Jeff Harrison with the question about the "Area Generated __Metric Compound__".

When you have had an opportunity to review the info please give me a call.

Thanks for your help.

Don

Don E. Coffey, CHMM
don.coffey@truproject.com
865.241.2520 (office)
423.596.0258 (cell)

From: Jeff Harrison [mailto:trash_talk@msn.com]
Sent: Tuesday, July 29, 2008 9:08 PM
To: Coffey, Don
Subject: RE: PK review of Box containers

Don,

Sorry this took so long. I kind of forgot I had it.

On the 5 NFS soil boxes, there may be a problem. For all of them, the RADWASTE PACKAGE CERTIFICATION RECORD says "Metric Compound" for the Area Generated, and on the checklist for the package contents, instead of "D = Dirt/Soil/Gravel", these are all marked "O = Other (Specify)" with several numbers written in which have no meaning to me. We need to be able to link this soil to either Building 234 or the Building 110 underground waste tank. Otherwise, I can't say they are bounded by the ORNL-001 AK. Can you see if Richard Moore can shed some light on this for us?

X10C9311140, X10C9311152, and X10C9311157 are bounded by CCP-AK-ORNL-003 R0, OR-RADP-CH-HET, and therefore, can be included on the PK list.

I see in EM Waste that X10C0402975 is managed as CH but there is discussion the paperwork about the waste being a glovebox shielded with lead packaged in a cask and something about it being high inventory. Can you give me a little more information on this that explains why it should be CH and not RH.

Thanks. Jeff

From: Coffey, Don [mailto:Don.Coffey@truproject.com]
Sent: Wednesday, July 09, 2008 8:01 AM
To: Jeff Harrison
Cc: Coffey, Don
Subject: PK review of Box containers

Hi Jeff,

Please review the attached 2109 forms for the following box containers for inclusion on the TWPC PK List. The content of the box containers will be repackaged into 55 gallon drums. Once the repackaging is completed, the completed Contact Handled Waste Repackaging Data Forms will be submitted for review and addition to the CCP waste tracking system.

Please note that the electronic copy of X10C0402975 is 21.5 MB and will be sent to you thru "YouSendIt".

CCP-AK-ORNL-001 R2, OR-NFS-CH-SOIL

Box # X10C0506148
Box # X10C0506149
Box # X10C0506150
Box # X10C0506151
Box # X10C0506152

CCP-AK-ORNL-003 R0, OR-RADP-CH-HET

Box # X10C9311140
Box # X10C9311152
Box # X10C9311157
Box # X10C0402975

Please review the attached containers for concurrence that they meet the physical parameters of the respective waste stream.

Please call me if you have questions or need additional information.

Thanks,

Don

Don E. Coffey, CHMM
don.coffey@truproject.com
865.241.2520 (office)
423.596.0258 (cell)

Attachment 3 - Acceptable Knowledge Source Document Summary

Site(s): Oak Ridge National Laboratory	Source Document Tracking Number: M132
Waste Stream Number(s): ORNL Non-specific Library Files (Applicable only when site library is not in use)	
Acceptable Knowledge Documentation Type: ☑ TRU Waste Management Program Information ☑ Waste Stream-Specific Information ☑ Additional Information	Category: ☐ Correspondence ☐ Discrepancy Resolution ☐ Internal Procedure ☑ Miscellaneous ☐ Published Document or Internal Procedure ☐ Unpublished Documents
Title or Description of Source Document [a]: Evaluation of Additional Containers for Waste Stream OR-NFS-CH-SOIL dated 9/24/2008	
Source Document Reference Information (author(s), document and revision number, date, publisher): J. Harrison, M132, NA, 09/24/2008	

AK # [b]	Source Doc. Page #[c]	AK Information Summary
PR2, PR3, PR4, PR6, WS1, WS2, WS3, WS4, WS6, WS7, WS8, WS9, WS11, WS12, S16	Throughout	Waste container information was reviewed for 5 55-gallon drums to verify that the containers were bounded by the existing CCP-AK-ORNL-001, Rev. AK summary report. The conclusion was the at the report does not bound these 5 daughter drums because they are from excavation of the RBG Trench B which is not describedin the ORNL-001 AK. The AK will be revised to include this discussion and to extend the generation date range. These 5 drums are therefore eligible to be included in the OR-NFS-CH-SOIL waste stream.

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DATE REC'D 12/18/13

Attachment 3 - Acceptable Knowledge Source Document Summary (continued)

Site(s): Oak Ridge National Laboratory	Source Document Tracking Number: M132
Source Document Data Limitations (if any): 1. None.	
Acceptable Knowlege Expert: TRAVIS SMITH ~~Trey Greenwood~~ / Print TS 11/14/2013 /Sign Date: 11/14/2013	
[a] Provide description for non-titled information (i.e., container paperwork, MSDS sheets, etc) [b] Obtain from Acceptable Knowledge Documentation Checklist [c] For microfilm or microfiche, identify box, tape, reel number and location.	

Evaluation of Additional Containers for Waste Stream OR-NFS-CH-SOIL

Waste container information has been reviewed for 5 55-gallon drums to verify that the containers are bounded by the existing CCP-AK-ORNL-001, Rev. 3 AK Summary Report (ORNL-001) for the OR-NFS-CH-SOIL (SOIL) waste stream. These 5 drums are daughter drums from the repackaging of waste in box X10C0506154. The daughter drums are traceable to the parent box by the letter appended to the drum number (e.g., X10C0506154A is a daughter from X10C0506154).

Information reviewed for the box consists of the ORNL UCN-2109 container paperwork forms as well as the original NFS paperwork attached to the UCN-2109 (e.g., *Radwaste Package Certification Record*). The TWPC *Contact Handled Waste Repackaging Data Form* was reviewed for each of the daughter drums. The radiological data for the box from a 2/29/2008 EM Waste database query were also evaluated.

Waste Generation Location And Process

The ORNL-001 AK indicates the NFS soil waste originated from beneath the Building 234 Wet Chemistry Cell. A few drums of soil are from an area around the Building 110 laboratory underground waste tank. Drums and boxes of soil from NFS are repackaged, as necessary, at the TWPC (Sections 6.1 and 6.3).

The UCN-2109 forms indicate the box is from NFS. The *Radwaste Package Certification Record* for X10C0506154 does not identify the area generated, but the Gamma Waste Assay sheet identifies the location as "RBG Trench B" which is not discussed in the AK.

Richard Moore at NFS was contacted by phone the morning of 9-18-2008 to discuss RBG Trench B. He indicated that RBG is the Radioactive Burial Ground, and Trench B designates one of the burial pits. He said that NFS buried low-level waste on site from about 1966 to 1970, and Trench B was one of the earliest trenches used in 1966. The burial ground was excavated between 2000 and 2004 and the waste shipped to Envirocare. A couple of trenches had plutonium contamination which was initially a surprise but they found some documentation that said plutonium would be there. Richard has not been able to find this documentation again. Most all plutonium waste went to off-site burial. The trenches were unlined so the soil in this box (X10C0506154) would be from the trench (as opposed to being from somewhere else and buried here). The debris in this box would be from Buildings 110 or 234 because there was no other source for plutonium at NFS. It is possible that some of the debris could have originated from elsewhere at NFS if it was just laying in the trench next to the plutonium contaminated waste, but he remembered that the area of plutonium contamination was a small area at the end of the trench.

Since the excavation of RBG Trench B is not described in the ORNL-001 AK, these 5 drums of soil are not bounded by the SOIL stream. However, since the source of the contamination traces back to Buildings 110 or 234, this waste does belong in the SOIL waste stream. The ORNL-001 AK will be revised to include a discussion of this activity.

Time Period Of Generation

The ORNL-001 AK covers waste generated from 1993 to 2001 (Section 6.2).

The *Radwaste Package Certification Record* for the box has pack date of 2001. The daughters from this box were packaged at the TWPC in February 2008. The generation date of the box is bounded by the ORNL-001 AK, but the generation dates of the daughter drums are not bounded. These drums should be included in the waste stream so the ORNL-001 AK will be revised to extend the generation date range.

Physical Form

The ORNL-001 AK states that waste from the SOIL waste stream is comprised of soil, rock, and gravel mixed with absorbent. The soil was mixed with RADSORB absorbent powder (cross-linked homopolymer). A RADPAD absorbent pad (cellulosic laminate containing an organic polymer) was placed on top of the soil (Section 6.4.1). The waste stream is assigned waste matrix code is S4100, which is waste estimated to be greater than 95 percent by volume soil, including sand, silt, rock, and gravel, with rock and gravel volumes totaling less than 50 percent of the matrix (Section 6.4.1.1).

Waste material parameter weight estimates are not available for the box or daughter drums. The NFS *Radwaste Package Certification Record* for the one box has a waste description checklist with checkmarks next to dirt/soil/gravel, bitumen/asphalt, concrete/solid block, glass/graphite, metals, plastics, and trash. The TWPC *Contact Handled Waste Repackaging Data Forms* for these 5 daughter drums describe the waste as dirt/soil, rock, and absorbent which is consistent with AK (there are 25 more daughter drums from this box that contain debris waste). Therefore, these 5 drums are bounded by the ORNL-001 AK.

Chemical Content

The UCN-2109 waste disposal forms do not indicate any EPA hazardous waste numbers assigned to the one box that are not already identified in the ORNL-001 AK for the SOIL waste stream.

Radionuclides

As shown in Table 6-4 of the ORNL-001 AK, U-238 and Pu-239 are the two most prevalent radionuclides, by mass, for the SOIL waste stream at 73.42% and 19.17%, respectively.

Based on data from EM Waste (see below), the two most prevalent radionuclides, by mass, for box X10C0506154 are U-238 and Th-232 at 54.75% and 43.98%, respectively. The Th-232 is not consistent with AK; however, the addition of these daughter drums is not expected to alter the two most prevalent radionuclides for the waste stream as a whole.

Nuclide	Curies	Grams	Ci%	Wt%
AM-241	6.14E-02	1.77E-02	12.97%	0.00%
PU-238	1.04E-02	6.01E-04	2.20%	0.00%
PU-239	1.24E-01	1.97E+00	26.19%	0.08%
PU-240	4.17E-02	1.81E-01	8.81%	0.01%
PU-241	2.19E-01	2.11E-03	46.26%	0.00%
TC-99	3.34E-04	1.96E-02	0.07%	0.00%
TH-228	1.59E-04	1.92E-07	0.03%	0.00%
TH-232	1.23E-04	1.11E+03	0.03%	43.98%
U-232	1.59E-04	7.36E-06	0.03%	0.00%
U-233	1.43E-02	1.47E+00	3.02%	0.06%
U-234	1.30E-03	2.06E-01	0.27%	0.01%
U-235	6.18E-05	2.82E+01	0.01%	1.12%
U-238	4.69E-04	1.38E+03	0.10%	54.75%

Prohibited Items

The UCN-2109 form and *Radwaste Package Certification Record* for the box indicate no prohibited in the waste. The TWPC *Contact Handled Waste Repackaging Data Form* for each of the 5 daughter drums also indicate no prohibited items in the waste.

Conclusion

As described above, the existing ORNL-001 AK Summary Report does not bound these 5 daughter drums because they are from excavation of RBG Trench B which is not described in the ORNL-001 AK. The AK will be revised to include this discussion and to extend the generation date range. These 5 drums are therefore eligible to be included in the OR-NFS-CH-SOIL waste stream. The inclusion of these drums will not alter the waste matrix code, EPA hazardous waste codes, or the expected radionuclides (including the two most prevalent radionuclides) for the waste stream. The inclusion of these drums will not necessitate additional operator training.

Jeff Harrison
AKE

Signature

9/24/08
Date

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Attachment 8 - Waste Containers List

Site(s):	Oak Ridge National Laboratory
Waste Stream Number(s):	OR-REDC-CH-HET
Waste Stream Description:	Heterogeneous debris waste from the Radiochemical Engineering Development Center
Number of Waste Containers in All Waste Stream:	4138 55-gallon drums (some are in overpacks) (55 gallon drum: 0.208 m^3)
Total Existing Volume (m^3):	860.7 m^3
Is waste expected to be generated in the future?	Yes
If yes, Estimated Future Volume (m^3):	288 total drums (59.9 m^3) from repackaging existing casks, 18 drums per year (3.7 m^3 per year) from repackaging new casks, 15 to 35 drums per year (3.1 to 7.3 m^3 per year) of new drums, 16 drums per year (3.3 m3 per year) from non-routine box repackaging.
Assumptions:	See Section 5.2 of CCP-AK-ORNL-002
Waste Stream Container Evaluation Memo(s) for Added Containers:	M072, M114, M121, M122, M123, M127, M134, M135, M136, M137, M138, M139, M140, M146, M149, M150, M153 M155, M161

Container Identification Number	Generation Date	Generation Point
See Attached Waste Containers List		

Acceptable Knowledge Expert: Jeff Harrison (Print) / Jeff Harrison (Sign) 2/18/2016 (Date)

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DATE REC'D 2/19/16 mr

Attachment 3 - Acceptable Knowledge Source Document Summary

Site(s): Oak Ridge National Laboratory	Source Document Tracking Number: M161

Waste Stream Number(s): ORNL Non-specific Library Files
(Applicable only when site library is not in use)

Acceptable Knowledge Documentation Type:	Category:
☑ TRU Waste Management Program Information	☐ Correspondence
☑ Waste Stream-Specific Information	☐ Discrepancy Resolution
☐ Additional Information	☐ Internal Procedure
	☑ Miscellaneous
	☐ Published Document or Internal Procedure
	☐ Unpublished Documents

Title or Description of Source Document [a]: Evaluation of Additional Drums for Waste Stream OR-REDC-CH-HET dated 06/16/2009 to 08/25/2009

Source Document Reference Information (author(s), document and revision number, date, publisher): Lisa Price-Watson, et al., M161, NA, 06/16/2009 to 08/25/2009, NA

AK # [b]	Source Doc. Page # [c]	AK Information Summary
PR6, PR7, WS1, WS2, WS3, WS4, WS8, WS9, WS10, WS11, WS12	Throughout	Waste container information has been reviewed for 7 55-gallon drums generated during the repackaging of Building 7920 REDC waste originally packaged in concrete casks. This evaluation was performed to verify that the containers are bounded by the existing CCP-AK-ORNL-002, Revision 1, AK Summary Report for the OR-REDC-CH-HET waste stream. These 7 drums are daughter drums from the repackaging of waste contained in concrete cask X10C0201072. The daughter drums are traceable to their parent cask by the letter appended to the cask number and include the following drums; X10C0201072A, X10C0201072B, X10C0201072C, X10C0201072D, X10C0201072E, X10C0201072F and X10C0201072G. The CCP-AK-ORNL-002 AK Summary Report bounds the 7 55-gallon drums evaluated. The inclusion of these drums will not alter the waste matrix code, EPA hazardous waste numbers, or the expected radionuclides (including the two most prevalent radionuclides) for the HET waste stream. The inclusion of these drums will not necessitate additional operator training. Drums X10C0201072A, X10C0201072B, X10C0201072C, X10C0201072D, X10C0201072E, X10C0201072F and X10C0201072G are therefore eligible to be included in waste stream OR-REDC-CH-HET. 06/16/2009 Waste container information has been reviewed for 28 55-gallon drums to verify that the containers are bounded by the existing AK Summary Report, CCP-AK-ORNL-002, Revision 1, 10/30/2008 (ORNL-002 AK) for the OR-REDC-CH-HET (HET) waste stream. These 28 drums are daughter drums from the repackaging of waste contained in box X10C9602101. The daughter drums are traceable to their parent box by the letter appended to the drum number. Information reviewed for the box consisted primarily of the ORNL UCN-2109 container paperwork form and other data attached to the UCN-2109. The TWPC Contact Handled Waste Repackaging Data Form was reviewed for each of the 28 daughter drums.

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DATE REC'D 10/21/2014
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Attachment 3 - Acceptable Knowledge Source Document Summary (continued)

Site(s): Oak Ridge National Laboratory		Source Document Tracking Number: M161
AK # [b]	Source Doc. Page # [c]	AK Information Summary

Source Document Data Limitations (if any):

1. Best available copy.

Acceptable Knowlege Expert:

Travis Smith / Y. Smith Date: 03/21/2014
Print /Sign

[a] Provide description for non-titled information (i.e., container paperwork, MSDS sheets, etc)
[b] Obtain from Acceptable Knowledge Documentation Checklist
[c] For microfilm or microfiche, identify box, tape, reel number and location.

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Waste container information has been reviewed for 28 55-gallon drums to verify that the containers are bounded by the existing AK Summary Report, CCP-AK-ORNL-002, Revision 1, 10/30/2008 (ORNL-002 AK) for the OR-REDC-CH-HET (HET) waste stream. These 28 drums are daughter drums from the repackaging of waste contained in box X10C9602101. The daughter drums are traceable to their parent box by the letter appended to the drum number.

Information reviewed for the box consisted primarily of the ORNL UCN-2109 container paperwork form and other data attached to the UCN-2109 (Reference M074). The TWPC *Contact Handled Waste Repackaging Data Form* was reviewed for each of the 28 daughter drums (Reference M073).

Waste Generation Location And Process

According to the ORNL-002 AK, the HET waste stream originated in Building 7920. Areas within the building generating waste included in this waste stream are the TA (Room 118), the LAA (Room 120), and the decontamination glovebox room (Room 216) which are associated with the hot cell cubicle operations and waste transfers. Waste from the Building 7920 analytical chemistry laboratories (Rooms 108 and 208) and process development laboratories (Rooms 111, 211, 109, and 209) is also included (Section 5.1).

Wastes are generated in the Building 7920 hot cell cubicles as well as analytical laboratory and process development laboratory gloveboxes during process operations and maintenance activities. Hot cell operations generally consist of target fabrication, target processing, and analytical support. Analytical chemistry activities include pipetting, titration, dissolution, filtration, solvent extraction, and centrifugation. The process development labs conducted a wide range of fundamental research related mostly to alpha-active materials, including the development of waste separation processes. The chemical processes (e.g., solvent extraction, ion-exchange, and precipitation) performed in these gloveboxes are much the same as the hot cells but with smaller equipment and smaller amounts of material (Sections 4.5 and 5.3).

The UCN-2109 form indicates box X10C9602101 originated in the LAA; however, the Waste Container Log Sheet attached to the UCN-2109 indicates it was generated in Room 111. The Waste Container Log Sheet for X10C9602101 describes the waste as including two gloveboxes. The LAA housed systems and equipment used for movement of materials in and out of the hot cells and cubicles and in and out of the building, so Room 111 is believed to be correct. Lab 111 is described in the ORNL-002 AK, and therefore, these 28 daughter drums are bounded by the HET waste stream.

Time Period Of Generation

The ORNL-002 AK covers waste generated from April 1972 to April 2006, and indicates that the waste stream will be generated indefinitely at the rate of approximately 10 drums per year. Repackaging of this waste stream at the TWPC began in December 2006. In addition, it has

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been estimated that approximately 1,000 drums of CH-TRU waste will be generated as a result of repackaging of RH-TRU cask waste in the TWPC hot cell (Section 5.2).

X10C9602101 was generated 1/5/2000. The 28 daughter drums from this box were packaged in June 2009. Therefore, these daughter drums are bounded by the HET waste stream. The number of daughter drums produced from this box exceeds the generation rate of 10 drums per year, but that rate was based on the number of drums generated in REDC over the last five years and did not take into account drums generated from box repackaging.

Physical Form

The HET waste stream is generally comprised of cellulosics, plastic, rubber, metal, and glass. Typical waste items include aluminum foil, metal cans, hand tools, hardware (e.g., washers), light bulb bases, piping, planchets, plates, spray cans (punctured), lead, concrete, glass bottles, glass thermometers, light bulbs (incandescent and mercury vapor), absorbent pads, cloth, paper towels, personnel protective equipment (e.g., shoe covers), rags, wipes, plastic bags, bottles, caps, latex gloves, manipulator boots, pipette tips, sleeving, tape, tubing, rubber gloves and hose, equipment (e.g., electrical devices containing circuit boards and electric motors), HEPA filters, roughing filters, grouted ion-exchange resin, and absorbent (e.g., vermiculite and NOCHAR polymer) (Section 5.4.1).

The waste stream consists of the waste material parameters aluminum-based metals/alloys, iron-based metals/alloys, other metals/alloys, other inorganic materials, cellulosics, plastics, rubber, and organic matrix. Due to the high degree of variability in this waste, Waste Matrix Code S5400, Heterogeneous Debris, is applied to this waste stream. This category includes waste that is at least 50 percent, by volume, debris materials. (Sections 5.4.1.1 and 5.4.1.2).

The AK report does not identify t he presence of Asbestos but we will submit freeze file (submit freeze file)

The UCN-2109 forms indicate that X10C9602101 contains two gloveboxes (one with an asbestos furnace) and two metal bases. Review of the TWPC *Contact Handled Waste Repackaging Data Form* for each of the daughter drums indicates that in addition to the scrap metal from size-reduction of the gloveboxes, there are numerous other waste items, including secondary waste generated during the size-reduction and repackaging operations. Waste items include paper, paper towels, cloth rags, ratchet strap, smears, Swiffer pads, skull caps, cotton glove liners, cardboard, wood, leather gloves, latex gloves, foam, hard plastic block, plastic (e.g., zip ties, B2 cassettes, filters, bubble wrap, bags, tape, o-rings, buckets), rubber hoods and suits, Tyvek suits, tape, bungee cords, rope, garden sprayer hose, tygon tubing, nylon tape, nylon sling, nylon coveralls and belts, electrical wire, styrofoam, foam earplugs, foam sweat bands, foam knee pads, rubber gasket, booties, rubber gloves, lead, lead sheets, electrical cord, metal, stainless tubing, metal hardware (e.g., filter housing, fittings, garden sprayer parts), aluminum foil, stainless steel shafts, tools (e.g., scissors [wrapped in tape], pipe cutter, flashlight, knife, safety box knife, aluminum Swiffer mop handle, saw blades), alkaline batteries, broken glass,

glass tube, broken light bulbs, fire blankets, Herculite (industrial fabric), electric motor, Sawsall, band saw, shop vacuums, heating furnaces, absorbent pads, non friable asbestos, and loose absorbent (i.e., solid-a-sorb). The AK report does not specifically identify the presence of asbestos; however a freeze file change has been submitted that will incorporate the presence of waste asbestos into the CCP-AK-ORNL-002 AK report. All other waste items are consistent with the HET waste stream.

Chemical Content

The HET waste stream is assigned EPA hazardous waste numbers D004, D005, D006, D007, D008, D009, D010, D011, D019, F002, and F005 (Section 5.4.3).

The UCN-2109 waste disposal form for the box does not indicate any EPA hazardous waste numbers. Based on a review of the TWPC *Contact Handled Waste Repackaging Data Form* for each of the 28 daughter drums, hazardous waste items were identified. Specifically, lead sheets, small pieces of equipment and light bulbs that may contain solder with lead (D008) and alkaline batteries containing mercury (D009). Therefore, the daughter drums from this box are bounded by the HET waste stream.

Radionuclides

As shown in Table 5-5 of the ORNL-002 AK, all 10 WIPP required radionuclides are expected to be present in this waste stream. For the waste stream as a whole, the two most prevalent radionuclides, by mass, are Pu-239 and Th-232, and the two most prevalent radionuclides, by activity, are Cm-244 and Sr-90.

In 2000, ORNL developed a dose-to-curie model specifically for the associated cave liner. The model and supporting documentation are attached to the UCN-2109. Based on this model, the two most prevalent radionuclides, by activity, are Cm-244 at 43.5% and Eu-152 at 16.1%.

The dominant activity in this box (Cm-244) is consistent with the ORNL-002 AK, but Sr-90 was not included in the model, and Eu-152 contributes very little to the overall activity of the waste stream as shown in Table 5-5 of the ORNL-002 AK. That said, it is not expected that these drums will alter the two most prevalent radionuclides for the waste stream as a whole. Therefore, the 28 daughter drums from this box are bounded by the HET waste stream.

Prohibited Items

The UCN-2109 form for the box, and the TWPC *Contact Handled Waste Repackaging Data Form* for the 28 daughter drums did not indicate the presence of prohibited items.

Conclusion

The existing ORNL-002 AK bounds all 28 additional 55-gallon drums evaluated. These drums are therefore eligible to be included in the HET waste stream. The inclusion of these drums will not alter the waste matrix code, EPA hazardous waste numbers, or the expected radionuclides (including the two most prevalent radionuclides) for the HET waste stream. The inclusion of these drums will not necessitate additional operator training.

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Evaluation of Additional Drums for Waste Stream OR-REDC-CH-HET **August 25, 2009**

Prepared by: Steve Schafer TRAVIS SMITH FOR STEVE SCHAFER 03/21/2014

Waste container information has been reviewed for 7 55-gallon drums generated during the repackaging of Building 7920 REDC waste originally packaged in concrete casks. This evaluation was performed to verify that the containers are bounded by the existing CCP-AK-ORNL-002, Revision 1, AK Summary Report for the OR-REDC-CH-HET waste stream. These 7 drums are daughter drums from the repackaging of waste contained in concrete cask X10C0201072. The daughter drums are traceable to their parent cask by the letter appended to the cask number and include the following drums; X10C0201072A, X10C0201072B, X10C0201072C, X10C0201072D, X10C0201072E, X10C0201072F and X10C0201072G.

Information reviewed for the cask consisted of the ORNL UCN-2109 container paperwork forms (M100) and ORNL RH Cask Evaluation and Supplemental Packaging Documentation (M110). The TWPC *Contact Handled Waste Repackaging Data Form* was reviewed for each of the daughter drums to identify the waste items contained in each drum.

Waste Generation Location And Process

As described in CCP-AK-ORNL-002, waste stream OR-REDC-CH-HET originated in Building 7920. Areas within the building generating waste included in this waste stream are the TA (Room 118), the LAA (Room 120), and the decontamination glovebox room (Room 216) which are associated with the hot cell cubicle operations and waste transfers. Waste from the Building 7920 analytical chemistry laboratories (Rooms 108 and 208) may also be included. (Section 5.1).

Wastes are generated in the Building 7920 hot cell cubicles and analytical laboratory gloveboxes during process operations and maintenance activities. Hot cell operations generally consist of target fabrication, target processing, and analytical support. The waste items are removed from the hot cell cubicles through connecting gloveboxes in the TA, LAA, and decontamination glovebox room (Sections 4.5 and 5.3).

The data reviewed for cask X10C0201072 (M100 and M120) indicate that the waste consists of various debris items from 7920 Room 120. The waste is consistent with the waste stream description in CCP-AK-ORNL-002. Therefore, the area of generation for the daughter drums from this cask are bounded by waste stream OR-REDC-CH-HET.

Time Period Of Generation

Based on the evaluation of the documentation for cask X10C0201072 (performed 6/2/2008), the cask was loaded during 2003. As described in Section 4.2.1 of the AK Summary Report CCP-AK-ORNL-500 for the REDC RH debris waste stream OR-REDC-RH-HET, it has been estimated that as much as 50% of waste stored in RH cask may be CH waste. For these reasons, CCP-AK-ORNL-002 has been updated (Revision 1 dated 10/30/2008) to include the CH waste drums generated during repackaging of the REDC cask waste in the TWPC.

CCP RECORDS ORIGINAL
DATE REC'D 10/21/2014

Physical Form

Waste stream OR-REDC-CH-HET is comprised primarily of organic and inorganic debris waste items. Some of the specific waste items include aluminum foil, metal cans, hand tools, hardware (e.g., washers), light bulb bases, piping, planchets, plates, spray cans (punctured), lead, concrete, glass bottles, glass thermometers, light bulbs (incandescent and mercury vapor), absorbent pads, cloth, paper towels, personnel protective equipment (e.g., shoe covers), rags, wipes, plastic bags, bottles, caps, latex gloves, manipulator boots, pipette tips, sleeving, tape, tubing, rubber gloves and hose, equipment (e.g., electrical devices containing circuit boards and electric motors), grouted ion-exchange resin, and absorbent (e.g., vermiculite) (Section 5.4.1).

The waste stream consists of the waste material parameters aluminum-based metals/alloys, iron-based metals/alloys, other metals/alloys, other inorganic materials, cellulosics, plastics, rubber, and organic matrix. Due to the high degree of variability in this waste, Waste Matrix Code S5400, Heterogeneous Debris, is applied to this waste stream. This category includes waste that is at least 50 percent, by volume, debris materials. (Sections 5.4.1.1 and 5.4.1.2).

The description of the waste items included on the TWPC *Contact Handled Waste Repackaging Data Form* for each of the daughter drums is physically similar to and consistent with the waste stream description in the ORNL-002 AK Summary. Charcoal, charcoal filters, and charcoal filter housing is identified in the daughter repackaged drums and charcoal filters are not specifically identified in the waste stream description for OR-REDC-CH-HET. However, charcoal from charcoal filters is identified as a constituent in waste stream OR-REDC-CH-HET (Table 5-3) and the charcoal filters are also identified in the "Cubicle Operation" section of the AK summary report (Section 5.3.1). A freeze file will be submitted for CCP-AK-ORNL-002 to specifically add charcoal filters in the waste stream description.

Chemical Content

Waste stream OR-REDC-CH-HET is assigned EPA hazardous waste numbers D004, D005, D006, D007, D008, D009, D010, D011, D019, F002, and F005 (Section 5.4.3).

The documentation for the cask and the TWPC *Contact Handled Waste Repackaging Data Form* for the daughter drums did not specifically identify potential hazardous materials. However, it is assumed that the debris will be contaminated with the RCRA hazardous constituents identified in the AK record for waste materials in this stream. Therefore, the daughter drums from this cask are bounded by the RCRA characterization for waste stream OR-REDC-RH-HET.

Radionuclides

The methodology that will be employed for the radiological characterization for these repackaged drums is addressed in the AK/NDA memo written in accordance with CCP-TP-005 for this waste stream (OR-REDC-CH-HET).

Prohibited Items

The documentation for cask X10C0201072, and the TWPC *Contact Handled Waste Repackaging Data Form* for the daughter drums did not indicate the presence of prohibited items.

Conclusion

The CCP-AK-ORNL-002 AK Summary Report bounds the 7 55-gallon drums evaluated. The inclusion of these drums will not alter the waste matrix code, EPA hazardous waste numbers, or the expected radionuclides (including the two most prevalent radionuclides) for the HET waste stream. The inclusion of these drums will not necessitate additional operator training. Drums X10C0201072A, X10C0201072B, X10C0201072C, X10C0201072D, X10C0201072E, X10C0201072F and X10C0201072G are therefore eligible to be included in waste stream OR-REDC-CH-HET.

Attachment 9 – Interface Waste Management Documents List

Site: Oak Ridge National Laboratory

Waste Stream Number: OR-REDC-CH-HET, OR-REDC-RH-HET

Waste Stream Description: Heterogeneous debris from the Radiochemical Engineering Development Center (REDC), Building 7920

Document #	Revision	Date	Document Title/Description	Generator SME(s)/POC(s) [a]	Verification Date [b]	AK Source Document Tracking #
CM-R-AD-001	32	8/27/15	TRU Waste Processing Center Document Safety Analysis	Joe Jones	12/1/15	P432
CH-X-AD-001	26	6/15/15	Contact Handled Waste Acceptance Criteria	Aaron Clements	9/24/15	P255
RH-X-AD-001	7	6/15/15	Remote Handled Waste Acceptance Criteria	Aaron Clements	9/25/15	P597
CH-REF-WP-001	4	6/22/15	Contact Handled Waste Container Selection Process	Aaron Clements	9/29/15	P1444
RH-REF-WP-001	1	6/23/15	Remote Handled Waste Container Selection Process	Aaron Clements	9/29/15	P1435
CH-REF-OP-044	4	7/24/14	Operations Prohibited Item Processing	Mike Snipes	9/25/15	P598
CH-REF-OP-045	1	6/23/15	Non-Compliant Containers	Mike Snipes	9/25/15	P599
CH-REF-OP-013	PCN 9-1	6/17/15	Contact Handled Waste Repackaging	Kevin East	10/1/15	P254
CH-REF-OP-001	3	6/23/15	Box Breakdown Area Material Handling Recipes	Kevin East	10/1/15	P588
CH-REF-OP-014	PCN 5-1	6/15/15	Absorbing Liquids in the Glovebox and Box Breakdown Area	Kevin East	10/1/15	P592
RH-REF-OP-014	3	10/1/15	Liquids Handling in the Hot Cell	Kevin East	10/1/15	P590
RH-REF-OP-102	3	2/4/15	Liquids Handling in the Cask Processing Enclosure	Kevin East	10/1/15	P591
CH-REF-OP-027	3	11/4/15	PCB Decontamination	Kevin East	11/4/15	P582
CM-A-WP-004	1	5/22/14	Energetic Materials Program	Don Coffey	9/29/15	P1434
CM-P-WP-016	2	6/22/15	Energetic Materials Management	Don Coffey	9/29/15	P587
CM-P-EN-013	3	9/28/15	Environmental Permits and Compliance	Sam Thomas	9/24/15	P1433
CH-REF-OP-011	7	11/11/15	Drum Bag In/Bag Out	Kevin East	11/10/15	P253
CH-REF-OP-046	3	11/19/15	Glove Ports and Sleeve Transfers	Kevin East	12/1/15	P589
RH-REF-OP-003	7	11/17/15	Remote Handled Drum In/Out Operations	Kevin East	11/11/15	P585
RH-REF-OP-104	6	6/17/15	Cask Processing Enclosure Drum-In / Drum-Out	Kevin East	10/2/15	P586

CCP RECORDS ORIGINAL
DATE REC'D 12/3/15
MR

Attachment 9 – Interface Waste Management Documents List (continued)

Page 2 of 2

Waste Stream Number: OR-REDC-CH-HET, OR-REDC-RH-HET

POC/SME Contact Information

Contact Name	Organization/ Company Affiliation	Title/Position/Description	Phone Number(s)	Email
Clements, Aaron	TWPC/WAI	Waste Acceptance/Transfer Lead	865-574-5973	Aaron.Clements@truproject.com
Coffey, Don	TWPC/WAI	Level 1 Energetic Materials Subject Matter Expert	865-241-2520	Don.Coffey@truproject.com
East, Kevin	TWPC/WAI	Process Superintendent	865-576-1626	Kevin.East@truproject.com
Jones, Joe	Edgewater/TWPC/WAI	Safety Authorization Basis Manager	803-646-8756	Joseph.Jones@truproject.com
Snipes, Mike	TWPC/WAI	Alternate Waste Certification Official	865-576-1630	Mike.Snipes@truproject.com
Thomas, Sam	TWPC/WAI	Environmental Programs Manager	865-574-7773	Sam.Thomas@truproject.com

[a] For active procedures POCs must include representatives directly involved with waste generation, characterization, certification, and verification activities described in the procedure. This may include responsible generator site contractor/subcontractor personnel.
[b] Enter verification date or date procedure added to this attachment (date on the revised Attachment 3).

Acceptable Knowledge Expert: Jeff Harrison / Jeff Harrison Date: 12/2/2015
Print Sign

Site Management Representative: Thomas Barton / Thomas Barton Date: 12/2/2015
Print Sign

DIVIDER PAGE ONLY

NOT PART OF PAGE COUNT

From: Schrock, Beverly - NWP
To: Harrison, Jeff
Cc: Joo, Irene - NWP; Ramirez, Mike - NWP; Barton, Thomas (Thomas.Barton@truproject.com)
Subject: First Quarter 2016 Review of Interface Waste Management Documents List for ORNL
Date: Thursday, March 03, 2016 1:01:53 PM

Jeff,

Per CCP-TP-005, "CCP Acceptable Knowledge Documentation" the Site Project Manager transmits the Site Management Representative's (SMR) quarterly notification that the Interface Waste Management Documents List (IWMDL) is current to the Acceptable Knowledge Expert. For the first quarter of 2016 the IWMDL for OR-REDC-CH-HET and OR-REDC-RH-HET waste streams are current according to the email I received from Thomas Barton, SMR at Oak Ridge National Laboratory. See below.

If you have any questions, please let me know.

Thank you,
Bev

Beverly S. Schrock
Site Project Manager
Central Characterization Program
Nuclear Waste Partnership, LLC
Contractor for the U.S. Department of Energy
(575) 234-7444
(575) 706-0809 Cell

From: Barton, Thomas [mailto:Thomas.Barton@truproject.com]
Sent: Thursday, March 03, 2016 11:51 AM
To: Schrock, Beverly - NWP
Cc: Harrison, Jeff; Joo, Irene - NWP; Ramirez, Mike - NWP
Subject: RE: Quarterly Review of Interface Waste Management Documents List

Bev:

Review is complete. No update is needed as all procedures, revisions, implementation dates, and SME's are unchanged for OR-REDC-CH-HET and OR-REDC-RH-HET waste streams.

Thanks
Gio

From: Schrock, Beverly - NWP [mailto:Beverly.Schrock@wipp.ws]
Sent: Wednesday, March 02, 2016 1:13 PM
To: Barton, Thomas
Cc: Harrison, Jeff; Joo, Irene - NWP; Ramirez, Mike - NWP
Subject: Quarterly Review of Interface Waste Management Documents List

Gio,

CCP RECORDS ORIGINAL
DATE REC'D 3/9/16 mr

CCP-TP-005 requires you as the SMR to perform a quarterly review of the Interface Waste Management Documents List (IWMDL) and notify the SPM if the list is complete and if it includes the most current revision of the relevant procedures.

My records show that the IWMDL or Attachment 9 for OR-REDC-CH-HET, OR-REDC-RH-HET was completed and signed on December 2, 2015. January – March of 2016 is the first quarter after it was issued. Since we are now into March, will you please review and update if needed and communicate to me via email when that is complete?

Thank you,
Bev

Beverly S. Schrock
Site Project Manager
Central Characterization Program
Nuclear Waste Partnership, LLC
Contractor for the U.S. Department of Energy
(575) 234-7444
(575) 706-0809 Cell

Attachment 15 – CCP TRU Waste Correlation and Surrogate Form

Generator/Storage Site(s): Oak Ridge National Laboratory (RH)

Waste Stream(s): OR-REDC-RH-HET

Waste Used to Correlate: OR-REDC-CH-HET

Waste Used to Surrogate: OR-REDC-CH-HET

Information	Y/N	Source of Information
Is physical form identified?	Y	Physical form correlation is supported by ORNL CH waste stream OR-REDC-CH-HET documentation for the same debris waste generated in the REDC (Building 7920). See CCP-AK-ORNL-002.
Are chemicals identified?	Y	Chemical characterization is supported by ORNL CH waste stream OR-REDC-CH-HET documentation for the same debris waste generated in the REDC (Building 7920). See CCP-AK-ORNL-002.
Is the absence of prohibited items confirmed?	N	Demonstrating the absence of prohibited items in RH waste using CH waste AK is not proposed, only used to support historic management of these items.
Are radiological data described?	Y	NDA measurement of CH waste stream OR-REDC-CH-HET containers will be used during the data qualification of the correlating RH waste containers during dose-to-curie.

Explain/Justify the Use of Correlating/Surrogate Waste Stream Information:
(Attach additional supporting information, as applicable)

As described in the AK Summary Reports for the Building 7920 REDC RH and CH waste streams (CCP-AK-ORNL-500 and CCP-AK-ORNL-002), RH and CH debris included in waste streams OR-REDC-CH-HET and OR-REDC-RH-HET have been generated since 1972.

Prior to 1976, all Building 7920 solid wastes were managed as RH TRU waste, even though a significant portion of the inventory produced was CH-TRU waste. In March 1976, operations to formally segregate RH- from CH-TRU wastes were initiated. Intensive segregation did not occur until the 1978 time frame. Most of the waste generated prior to 1978 would have been placed into concrete casks called "floor casks." The majority of the floor casks have 4.5 inch thick side walls because the lower activity materials typically required much less shielding. This waste will contain significant amounts of lower dose rate waste (paper, glassware, PPE, wipes, glovebox equipment, and HEPA filters) generated from the laboratory and support areas. The amount of these lower dose rate materials would have decreased significantly in RH casks loaded after 1978, which will contain greater volumes of waste from hot cell activities (References P125, U038).

NTPC RECORDS ORIGINAL
DATE REC'D 1/7/14
SP

In an interview with Wayne Evans and Don Coffey (C600), they confirmed the accuracy of this summary and stated the segregation of RH and CH waste was accomplished by surface dose measurements. Measurements were taken from individual cans, but were also routinely taken on individual waste items. The objective of the segregation was to ensure that loaded 55-gallon waste drums did not exceed 200 mRem/hr. surface dose rate. Mr. Evans could not identify any distinction between the CH waste packaged in 55-gallon drums and the RH waste packaged in casks other than the dose rate. There are generally no distinctions in physical form or area of generation. The only difference between RH and CH waste is the magnitude of the radiological contamination on the waste item. Some waste items, such as filter bed media, are generally always highly contaminated and removed as RH waste.

Based on a review of the AK record relating to TRU waste management and segregation, there is no indication that there will be any significant physical or radiological difference between RH and CH waste materials generated during the same time frame from the same REDC areas.

Acceptable Knowledge Expert: Kevin J. Peters / _____ Date: 11/26/2013
Print Sign

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Attachment 8 – Waste Containers List

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KP 4/11/2016

Site(s): Oak Ridge National Laboratory (CCP-AK-ORNL-500)

Waste Stream Number(s): OR-REDC-RH-HET

Waste Stream Description: Radiological Engineering Development Center RH TRU Debris

Number of Waste Containers in Waste Stream: 255 55-gallon drums (24 concrete casks and 5 55-gallons drums to be repackaged)

Total Existing Volume (m^3): 53.0 cubic meters in repackaged 55-gallon drums

Is waste expected to be generated in the future?: Yes

If yes, Estimated Future Volume (m^3): 120 55-gallon drum equivalents (25.0 m^3) from 24 casks; 5 55-gallon drums (1.0 m^3) from repackaging 5 drums; and 10 drum equivalents (2 casks) per year ongoing (25.0 m^3/yr.).

Assumptions: It is assumed that each concrete cask (6 and 12 inch) identified as containing RH waste will generate 5 drum equivalents (255 drums of RH waste from 53 cask) and that 2 casks will be generated annually. It was also assumed that no RH waste could be generated by the repackaging of the 4-inch casks

Waste Stream Container Evaluation Memo(s) for Added Containers: C322

Container Identification Number	Generation Date	Generation Point
ORRH00220	04/22/2010	REDC Operations
ORRH00226	04/23/2010	REDC Operations
ORRH00236	04/28/2010	REDC Operations
ORRH00242	04/29/2010	REDC Operations
ORRH00248	04/30/2010	REDC Operations
ORRH00250	04/30/2010	REDC Operations
ORRH00252	04/30/2010	REDC Operations
ORRH00254	05/04/2010	REDC Operations
ORRH00255	05/04/2010	REDC Operations
ORRH00256	05/04/2010	REDC Operations
ORRH00257	05/04/2010	REDC Operations
ORRH00258	05/04/2010	REDC Operations
ORRH00267	05/06/2010	REDC Operations
ORRH00269	05/07/2010	REDC Operations
ORRH00271	05/13/2010	REDC Operations
ORRH00273	05/13/2010	REDC Operations

CP RECORDS ORIGINAL

SITE REC'D 02/16/15

Attachment 8 – Waste Containers List

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Container Identification Number	Generation Date	Generation Point
ORRH00277	05/13/2010	REDC Operations
ORRH00278	05/13/2010	REDC Operations
ORRH00285	05/14/2010	REDC Operations
ORRH00291	05/18/2010	REDC Operations
ORRH00297	05/20/2010	REDC Operations
ORRH00308	05/22/2010	REDC Operations
ORRH00309	05/24/2010	REDC Operations
ORRH00311	05/26/2010	REDC Operations
ORRH00313	05/26/2010	REDC Operations
ORRH00314	05/26/2010	REDC Operations
ORRH00315	05/26/2010	REDC Operations
ORRH00319	05/27/2010	REDC Operations
ORRH00322	05/27/2010	REDC Operations
ORRH00323	05/27/2010	REDC Operations
ORRH00324	05/29/2010	REDC Operations
ORRH00328	05/28/2010	REDC Operations
ORRH00329	06/02/2010	REDC Operations
ORRH00330	06/02/2010	REDC Operations
ORRH00331	06/02/2010	REDC Operations
ORRH00332	06/03/2010	REDC Operations
ORRH00334	06/03/2010	REDC Operations
ORRH00335	06/03/2010	REDC Operations
ORRH00337	06/09/2010	REDC Operations
ORRH00338	06/10/2010	REDC Operations
ORRH00339	06/16/2010	REDC Operations
ORRH00340	06/16/2010	REDC Operations
ORRH00341	06/16/2010	REDC Operations
ORRH00342	06/17/2010	REDC Operations
ORRH00343	06/24/2010	REDC Operations
ORRH00344	06/24/2010	REDC Operations
ORRH00345	06/24/2010	REDC Operations
ORRH00346	07/27/2010	REDC Operations
ORRH00350	06/25/2010	REDC Operations
ORRH00352	06/28/2010	REDC Operations

Attachment 8 – Waste Containers List

Container Identification Number	Generation Date	Generation Point
ORRH00353	07/02/2010	REDC Operations
ORRH00355	07/06/2010	REDC Operations
ORRH00356	07/07/2010	REDC Operations
ORRH00363	07/16/2010	REDC Operations
ORRH00367	07/28/2010	REDC Operations
ORRH00369	07/19/2010	REDC Operations
ORRH00370	07/19/2010	REDC Operations
ORRH00377	07/30/2010	REDC Operations
ORRH00379	07/30/2010	REDC Operations
ORRH00387	08/06/2010	REDC Operations
ORRH00389	08/03/2010	REDC Operations
ORRH00393	08/04/2010	REDC Operations
ORRH00395	08/04/2010	REDC Operations
ORRH00399	08/05/2010	REDC Operations
ORRH00408	08/10/2010	REDC Operations
ORRH00409	08/11/2010	REDC Operations
ORRH00414	08/11/2010	REDC Operations
ORRH00415	08/11/2010	REDC Operations
ORRH00417	08/16/2010	REDC Operations
ORRH00418	08/16/2010	REDC Operations
ORRH00424	08/12/2010	REDC Operations
ORRH00425	08/17/2010	REDC Operations
ORRH00426	08/17/2010	REDC Operations
ORRH00427	08/18/2010	REDC Operations
ORRH00428	08/20/2010	REDC Operations
ORRH00430	08/20/2010	REDC Operations
ORRH00431	08/20/2010	REDC Operations
ORRH00432	08/20/2010	REDC Operations
ORRH00435	08/26/2010	REDC Operations
ORRH00437	08/20/2010	REDC Operations
ORRH00438	08/20/2010	REDC Operations
ORRH00439	08/21/2010	REDC Operations
ORRH00440	08/21/2010	REDC Operations
ORRH00454	08/26/2010	REDC Operations

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Container Identification Number	Generation Date	Generation Point
ORRH00456	08/27/2010	REDC Operations
ORRH00458	08/27/2010	REDC Operations
ORRH00483	09/08/2010	REDC Operations
ORRH00505	09/23/2010	REDC Operations
ORRH00506	09/23/2010	REDC Operations
ORRH00507	09/23/2010	REDC Operations
ORRH00520	09/21/2010	REDC Operations
ORRH00521	09/28/2010	REDC Operations
ORRH00522	09/22/2010	REDC Operations
ORRH00523	09/22/2010	REDC Operations
ORRH00524	09/22/2010	REDC Operations
ORRH00525	09/24/2010	REDC Operations
ORRH00526	09/24/2010	REDC Operations
ORRH00527	09/24/2010	REDC Operations
ORRH00528	09/24/2010	REDC Operations
ORRH00529	09/27/2010	REDC Operations
ORRH00530	09/28/2010	REDC Operations
ORRH00531	09/30/2010	REDC Operations
ORRH00533	11/04/2010	REDC Operations
ORRH00536	11/05/2010	REDC Operations
ORRH00563	11/20/2010	REDC Operations
ORRH00577	12/02/2010	REDC Operations
ORRH00629	12/23/2010	REDC Operations
ORRH00646	05/17/2011	REDC Operations
ORRH00647	05/17/2011	REDC Operations
ORRH00648	05/17/2011	REDC Operations
ORRH00649	05/17/2011	REDC Operations
ORRH00650	05/17/2011	REDC Operations
ORRH00678	12/10/2013	REDC Operations
ORRH00679	12/11/2013	REDC Operations
ORRH00680	12/12/2013	REDC Operations
ORRH00681	12/13/2013	REDC Operations
ORRH00682	12/13/2013	REDC Operations
ORRH00683	12/16/2013	REDC Operations

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Container Identification Number	Generation Date	Generation Point
ORRH00684	12/19/2013	REDC Operations
ORRH00685	01/06/2014	REDC Operations
ORRH00686	01/14/2014	REDC Operations
ORRH00687	01/08/2014	REDC Operations
ORRH00688	01/16/2014	REDC Operations
ORRH00689	01/22/2014	REDC Operations
ORRH00690	01/23/2014	REDC Operations
ORRH00691	01/27/2014	REDC Operations
ORRH00692	02/19/2014	REDC Operations
ORRH00693	02/19/2014	REDC Operations
ORRH00694	02/20/2014	REDC Operations
ORRH00695	02/20/2014	REDC Operations
ORRH00696	02/21/2014	REDC Operations
ORRH00697	02/04/2014	REDC Operations
ORRH00699	02/10/2014	REDC Operations
ORRH00700	02/12/2014	REDC Operations
ORRH00701	02/26/2014	REDC Operations
ORRH00702	03/11/2014	REDC Operations
ORRH00703	03/11/2014	REDC Operations
ORRH00707	05/05/2014	REDC Operations
X10C0011087	11/28/2000	REDC Operations
X10C0011088*	09/19/2000	REDC Operations
X10C0011102*	04/26/2001	REDC Operations
X10C0011108*	08/12/2002	REDC Operations
X10C0201072*	01/15/2003	REDC Operations
X10C0300529	04/05/2004	REDC Operations
X10C0402925*	08/06/1976	REDC Operations
X10C0402945*	03/10/1977	REDC Operations
X10C0402970*	03/23/1978	REDC Operations
X10C0402971	04/24/1978	REDC Operations
X10C0505647	12/06/2006	REDC Operations
X10C0601826*	02/06/2007	REDC Operations
X10C0701297***	12/12/2007	REDC Operations
X10C0702207***	05/28/2008	REDC Operations

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Container Identification Number	Generation Date	Generation Point
X10C0702217***	04/08/2009	REDC Operations
X10C0702219***	07/16/2008	REDC Operations
X10C0800173***	10/26/2009	REDC Operations
X10C0900756***	06/15/2010	REDC Operations
X10C0900762***	09/17/2010	REDC Operations
X10C0901939***	0808/2011	REDC Operations
X10C0901945**	01/04/2011	REDC Process Development Laboratory (Rm. 211)
X10C0901958**	04/20/2011	REDC Process Development Laboratory (Rm. 211)
X10C1001955**	08/11/2011	REDC Process Development Laboratory (Rm. 111)
X10C1001960**	09/28/2011	REDC Process Development Laboratory (Rm. 211)
X10C1001965**	11/03/2011	REDC Process Development Laboratory (Rm. 211)
X10C1001986***	05/02/2012	REDC Operations
X10C1001990***	07/16/2012	REDC Operations (Some Rm. 111)
X10C1001991***	03/01/2013	REDC Operations (Some Rm. 111 & 112)
X10C1200368***	09/12/2013	REDC Operations
X10C1300510***	01/24/2014	REDC Operations
X10C1400865***	06/17/2014	REDC Operations
X10C9304038	09/02/1993	REDC Operations
X10C9304039*	11/08/1993	REDC Operations
X10C9310003*	05/02/1994	REDC Operations
X10C9310023*	09/09/1994	REDC Operations
X10C9402626*	03/21/1996	REDC Operations
X10C9402627*	06/26/1996	REDC Operations
X10C9402628*	09/22/1996	REDC Operations
X10C9402633*	01/03/1997	REDC Operations
X10C9402642*	06/26/1997	REDC Operations
X10C9402644	09/05/1997	REDC Operations
X10C9402650*	12/30/1997	REDC Operations
X10C9402652	11/04/1998	REDC Operations
X10C9402660	08/26/1998	REDC Operations
X10C9600188*	02/26/1996	REDC Operations
X10C9802663*	10/02/1998	REDC Operations
X10C9802684	09/01/1999	REDC Operations
X10CSATN01878*	10/05/1979	REDC Operations

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Container Identification Number	Generation Date	Generation Point
X10CSATN02012*	03/28/1980	REDC Operations
X10CSATN02062*	10/09/1980	REDC Operations
X10CSATN02071*	12/04/1980	REDC Operations
X10CSATN02078*	04/30/1981	REDC Operations
X10CSATN02241*	10/15/1981	REDC Operations
X10CSATN02244*	12/04/1981	REDC Operations
X10CSATN02277*	08/19/1982	REDC Operations
X10CSATN02284*	09/29/1982	REDC Operations
X10CSATN02434*	08/04/1983	REDC Operations
X10CSATN02438*	10/17/1983	REDC Operations
X10CSATN02450*	11/15/1983	REDC Operations
X10CSATN02455*	12/15/1983	REDC Operations
X10CSATN02457*	01/06/1984	REDC Operations
X10CSATN02461*	02/07/1984	REDC Operations
X10CSATN02474*	07/03/1984	REDC Operations
X10CSATN02493*	08/17/1984	REDC Operations
X10CSATN02612*	03/05/1985	REDC Operations
X10CSATN02614*	03/15/1985	REDC Operations
X10CSATN02634*	09/17/1985	REDC Operations
X10CSATN02640*	11/04/1985	REDC Operations
X10CSATN02645*	01/24/1986	REDC Operations
X10CSATN02664*	04/08/1986	REDC Operations
X10CSATN02665*	04/08/1986	REDC Operations
X10CSATN02682*	06/10/1986	REDC Operations
X10CSATN02689*	11/20/1986	REDC Operations
X10CSATN02694*	01/15/1987	REDC Operations
X10CSATN02698*	08/06/1986	REDC Operations
X10CSATN02699*	06/20/1986	REDC Operations
X10CSATN02866*	06/04/1987	REDC Operations
X10CSATN02869*	11/06/1987	REDC Operations
X10CSATN02874*	02/09/1989	REDC Operations
X10CSATN03043*	04/06/1992	REDC Operations
X10CSATN03208	09/04/1992	REDC Operations
X10CSATN03210*	10/04/1993	REDC Operations

Attachment 8 – Waste Containers List

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Container Identification Number	Generation Date	Generation Point
X10CSATN03211	08/10/1993	REDC Operations

* Repackaged (empty) parent casks generating 255 RH daughter drums.
** 55-gallon drums containing REDC Process Development Laboratory waste to be repackaged. Will be evaluated before drums are added to the AK Tracking Spreadsheet..
*** Casks repackaged after February 2007 to be evaluated before drums are added to the AK Tracking Spreadsheet.

Acceptable Knowledge Expert: Kevin J. Peters / _____ Date: 02/12/2015
Print Sign

Added 117 inadvertantly omited containers KP 4/11/2016

Attachment 8 – Waste Containers List

Container Identification Number	Generation Date	Generation Point
ORRH00001	05/28/2008	REDC Operations
ORRH00002	05/29/2008	REDC Operations
ORRH00003	05/30/2008	REDC Operations
ORRH00004	06/02/2008	REDC Operations
ORRH00005	06/02/2008	REDC Operations
ORRH00006	06/03/2008	REDC Operations
ORRH00008	06/04/2008	REDC Operations
ORRH00009	06/05/2008	REDC Operations
ORRH00011	06/11/2008	REDC Operations
ORRH00012	06/11/2008	REDC Operations
ORRH00013	06/12/2008	REDC Operations
ORRH00014	07/17/2008	REDC Operations
ORRH00015	07/02/2008	REDC Operations
ORRH00016	07/18/2008	REDC Operations
ORRH00017	07/17/2008	REDC Operations
ORRH00018	12/30/2008	REDC Operations
ORRH00019	04/09/2009	REDC Operations
ORRH00020	04/09/2009	REDC Operations
ORRH00021	01/15/2009	REDC Operations
ORRH00022	01/21/2009	REDC Operations
ORRH00023	01/22/2009	REDC Operations
ORRH00024	04/13/2009	REDC Operations
ORRH00025	12/30/2008	REDC Operations
ORRH00026	11/06/2008	REDC Operations
ORRH00027	04/14/2009	REDC Operations
ORRH00028	04/20/2009	REDC Operations
ORRH00030	04/21/2009	REDC Operations
ORRH00033	06/24/2009	REDC Operations

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Attachment 8 – Waste Containers List

Container Identification Number	Generation Date	Generation Point
ORRH00034	05/07/2009	REDC Operations
ORRH00035	07/06/2009	REDC Operations
ORRH00036	07/06/2009	REDC Operations
ORRH00037	06/04/2009	REDC Operations
ORRH00038	06/03/2009	REDC Operations
ORRH00039	06/04/2009	REDC Operations
ORRH00040	07/16/2009	REDC Operations
ORRH00041	08/26/2009	REDC Operations
ORRH00042	09/03/2009	REDC Operations
ORRH00043	08/26/2009	REDC Operations
ORRH00044	08/27/2009	REDC Operations
ORRH00045	08/27/2009	REDC Operations
ORRH00046	08/31/2009	REDC Operations
ORRH00047	09/01/2009	REDC Operations
ORRH00048	09/04/2009	REDC Operations
ORRH00049	09/15/2009	REDC Operations
ORRH00050	09/22/2009	REDC Operations
ORRH00051	09/23/2009	REDC Operations
ORRH00052	09/23/2009	REDC Operations
ORRH00053	09/24/2009	REDC Operations
ORRH00054	09/24/2009	REDC Operations
ORRH00055	09/25/2009	REDC Operations
ORRH00056	09/28/2009	REDC Operations
ORRH00057	09/28/2009	REDC Operations
ORRH00058	09/29/2009	REDC Operations
ORRH00059	10/06/2009	REDC Operations
ORRH00060	10/07/2009	REDC Operations
ORRH00061	10/07/2009	REDC Operations

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Attachment 8 – Waste Containers List

Container Identification Number	Generation Date	Generation Point
ORRH00062	10/08/2009	REDC Operations
ORRH00063	10/08/2009	REDC Operations
ORRH00064	10/19/2009	REDC Operations
ORRH00065	10/20/2009	REDC Operations
ORRH00066	10/29/2009	REDC Operations
ORRH00067	11/04/2009	REDC Operations
ORRH00068	11/05/2009	REDC Operations
ORRH00069	11/09/2009	REDC Operations
ORRH00070	11/09/2009	REDC Operations
ORRH00071	11/09/2009	REDC Operations
ORRH00072	11/10/2009	REDC Operations
ORRH00073	11/10/2009	REDC Operations
ORRH00074	11/10/2009	REDC Operations
ORRH00075	11/11/2009	REDC Operations
ORRH00076	11/11/2009	REDC Operations
ORRH00077	11/11/2009	REDC Operations
ORRH00078	11/11/2009	REDC Operations
ORRH00079	11/16/2009	REDC Operations
ORRH00080	11/23/2009	REDC Operations
ORRH00082	01/25/2010	REDC Operations
ORRH00083	01/26/2010	REDC Operations
ORRH00085	01/27/2010	REDC Operations
ORRH00089	01/27/2010	REDC Operations
ORRH00090	01/28/2010	REDC Operations
ORRH00091	01/28/2010	REDC Operations
ORRH00092	02/01/2010	REDC Operations
ORRH00094	02/02/2010	REDC Operations
ORRH00095	02/03/2010	REDC Operations
ORRH00096	02/03/2010	REDC Operations

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Attachment 8 – Waste Containers List

Container Identification Number	Generation Date	Generation Point
ORRH00097	02/03/2010	REDC Operations
ORRH00099	02/08/2010	REDC Operations
ORRH00100	02/08/2010	REDC Operations
ORRH00101	02/08/2010	REDC Operations
ORRH00102	02/09/2010	REDC Operations
ORRH00103	02/09/2010	REDC Operations
ORRH00104	02/10/2010	REDC Operations
ORRH00105	02/10/2010	REDC Operations
ORRH00118	03/02/2010	REDC Operations
ORRH00119	03/03/2010	REDC Operations
ORRH00120	03/03/2010	REDC Operations
ORRH00121	03/15/2010	REDC Operations
ORRH00123	03/16/2010	REDC Operations
ORRH00125	03/17/2010	REDC Operations
ORRH00129	03/29/2010	REDC Operations
ORRH00130	02/15/2010	REDC Operations
ORRH00131	03/02/2010	REDC Operations
ORRH00135	03/08/2010	REDC Operations
ORRH00139	03/11/2010	REDC Operations
ORRH00142	03/17/2010	REDC Operations
ORRH00149	03/23/2010	REDC Operations
ORRH00171	03/31/2010	REDC Operations
ORRH00173	03/31/2010	REDC Operations
ORRH00175	04/01/2010	REDC Operations
ORRH00177	04/01/2010	REDC Operations
ORRH00178	04/02/2010	REDC Operations
ORRH00180	04/05/2010	REDC Operations
ORRH00182	04/05/2010	REDC Operations

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Attachment 8 – Waste Containers List

Container Identification Number	Generation Date	Generation Point
ORRH00183	04/06/2010	REDC Operations
ORRH00188	04/07/2010	REDC Operations
ORRH00215	04/16/2010	REDC Operations
ORRH00216	04/16/2010	REDC Operations

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Attachment 3 - Acceptable Knowledge Source Document Summary

Site(s): Oak Ridge National Laboratory	Source Document Tracking Number: C322
Waste Stream Number(s): ORNL Non-specific Library Files (Applicable only when site library is not in use)	
Acceptable Knowledge Documentation Type: ☑ TRU Waste Management Program Information ☑ Waste Stream-Specific Information ☑ Additional Information	Category: ☑ Correspondence ☐ Discrepancy Resolution ☐ Internal Procedure ☐ Miscellaneous ☐ Published Document or Internal Procedure ☐ Unpublished Documents
Title or Description of Source Document [a]: Waste Container Evaluation Memorandum for Waste Stream OR-REDC-RH-HET	
Source Document Reference Information (author(s), document and revision number, date, publisher): Kevin Peters, et al., NA, NA, Various, CCP	

AK #	Source Doc. Page # [b]	AK Information Summary
PR5, PR6, PR7, WS1, WS2, WS3, WS6, WS8, WS9, WS10, S16	Throughout	The purpose of these memoranda is to satisfy the requirements of CCP AK Documentation procedure (CCP-TP-005) for updating AK for additional waste stream containers. The waste stream delineation for RH waste stream OR-REDC-RH-HET is documented in AK Summary Report CCP-AK-ORNL-500 and the Attachment 8 Waste Containers List prepared for this waste stream. This list identifies the specific containers evaluated and included in this waste stream. AK Source C322 will include Waste Stream Container Evaluation Memorandum prepared in accordance with CCP-TP-005 to document the evaluation and addition of containers to waste stream OR-REDC-RH-HET. Each container added was assessed to assure that the containers are bounded by current AK Summary Report and Attachment 8 for waste stream OR-REDC-RH-HET for the following: * Waste generation location and process * Time period of generation * Physical form compared to the assigned Waste Material Parameters and waste matrix code * Chemical content * Prohibited items * Radionuclides

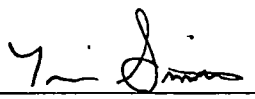
Attachment 3 - Acceptable Knowledge Source Document Summary (continued)

Site(s): Oak Ridge National Laboratory		Source Document Tracking Number: C322
AK #	Source Doc. Page # [b]	AK Information Summary

Source Document Data Limitations (if any):

1. None.

Acceptable Knowlege Expert:

Travis Smith /  Date: 04/11/2016

Print /Sign

[a] Provide description for non-titled information (i.e., container paperwork, MSDS sheets, etc)
[b] For microfilm or microfiche, identify box, tape, reel number and location.

WASTE STREAM CONTAINER EVALUATION MEMORANDUM

To: Rich Kantrowitz, CCP SPM

From: Steve Schafer, CCP AKE

Date: April 11, 2016

RE: Addition of 2 Containers to Waste Stream OR-REDC-RH-HET (AKSR CCP-AK-ORNL-500). Source Document Number C322

The purpose of this memorandum is to satisfy the requirements of CCP AK Documentation procedure (CCP-TP-005) for updating AK for the addition of waste stream containers. This memorandum will be submitted to CCP Records as source document number C322 for Acceptable Knowledge Summary Report (AKSR) CCP-AK-ORNL-500.

This memorandum presents the evaluation of 2 55-gallon drums listed in Table 1 below generated by ORNL TWPC repackaging operations. These containers were evaluated as they were generated, prior to being added to the AK Tracking Spreadsheet. These containers were evaluated and added to the waste stream in April 2015, however, the original Memo could not be located. Repackaged waste consists of REDC Building 7920 debris waste originally packaged in the concrete casks listed in Table 2 below. This evaluation included the review of existing AK for the parent casks, and review of the CCP VE Data Forms generated for these drums during packaging.

The ORNL 2109 packaging documentation (M100), inventory database (M024 and M110), and other historic cask packaging assessments (U038) were used to identify casks containing REDC Building 7920 waste to be included in waste stream OR-REDC-RH-HET. Table 2 summarizes the information obtained during the review of historic waste packaging documentation including, as available; ORNL 2109 forms, TRU Waste Certification Data Sheets, Radioactive Waste Container Log Sheets, and other documentation maintained by ORNL for the concrete casks. Based on the review of the packaging dates for waste in casks, the radiological distribution described in CCP-AK-ORNL-501 was also evaluated for the parent cask, and the results of this evaluation are included in Table 2 below.

Based on the review of the documentation described above, the 2 drums identified in Table 1 below are bounded by Revision 4 of the AKSR for the following:

1. Waste generation location and process. The cask were generated at the REDC Building 7920, and the processes generating TRU waste at this facility are described in the AKSR.
2. Time period of generation: The cask were generated within the bounding timeframes described in the AKSR.
3. Physical form compared to the assigned Waste Material Parameters and waste matrix code: Based on review of the CCP VE Data Forms, the Waste Material

Parameters and waste matrix code for each drum are consistent with those assigned to the waste stream in the AKSR.

4. Chemical content: Based on the generation time period, location, and processes the potential chemical content is documented in the AKSR. No additional chemicals were identified during VE.
5. Prohibited items: The VE Data Forms document the absence of prohibited items for each drum.
6. Radionuclides: Based on the generation time period, location, and processes the radionuclide distribution of the waste is documented CCP-AK-ORNL-501 and will be quantified during dose-to-cuie characterization of each drum.

This memorandum serves as an addendum to the waste stream Attachment 8 (Waste Containers List), and the AK Tracking Spreadsheet (AKTSS) for waste stream OR-REDC-RH-HET.

Table 1. Containers Added to OR-REDC-RH-HET

Drum ID	Package Date	Vent Date	Parent Cask(s)	Data Evaluated
ORRH00708	3/31/2015	3/31/2015	Parent X10CSATN03208 (100%)	4/16/2015
ORRH00709	4/16/2015	4/16/2015	Parent X10CSATN03208 (100%)	4/23/2015

Table 2. Original Concrete Parent Cask

Cask Identification	Package Date	Waste Description	Radiological Distribution
X10CSATN03208	09/04/1992	Dry solids (43% combustible) in 6-in-thick-walled concrete cask. Waste certification data sheets indicate the cask contains 57 sealed polyethylene buckets (holding 47 1-gal steel paint cans) of waste from cell bank containing primarily plastic (including melted polypropylene; bagging and sheeting; polyethylene blocks, bottles, and tubing; pipettes; fittings; valves; and manipulator boot and Al port ring), glass (including sample bottles; broken and intact incandescent lamps; Hg vapor lamps without Hg vapor quartz tubes; pipettes; broken glassware and mirror glass; and filters), and metal (including radiation probe, amplifier, and wire; incandescent light fixtures and wiring; tubing; tubing clamps; mirror frames; hand tools; sampler needles; metal needle block; other blocks; valves and parts; pressure gauge; nuts and bolts; electric motor; calorimetric assembly; electrical wire; and metal disc), but also included wipes, manipulator parts,	Cask Evaluated 6/26/09, Rad Dist. Mark-42/HFIR

Cask Identification	Package Date	Waste Description	Radiological Distribution
		cloth, paper, rubber (including gaskets, stoppers, and tubing), string, process filter assemblies & filter elements, and other miscellaneous equipment	

WASTE STREAM CONTAINER EVALUATION MEMORANDUM

To: Rich Kantrowitz, CCP SPM

From: Steve Schafer, CCP AKE

Date: April 6, 2016

RE: Addition of 20 Containers to Waste Stream OR-REDC-RH-HET (AKSR CCP-AK-ORNL-500). Source Document Number C322

The purpose of this memorandum is to satisfy the requirements of CCP AK Documentation procedure (CCP-TP-005) for updating AK for the addition of waste stream containers. This memorandum will be submitted to CCP Records as source document number C322 for Acceptable Knowledge Summary Report (AKSR) CCP-AK-ORNL-500.

This memorandum presents the evaluation of 20 55-gallon drums listed in Table 1 below generated by ORNL TWPC repackaging operations. These containers were evaluated as they were generated, prior to being added to the AK Tracking Spreadsheet. Repackaged waste consists of REDC Building 7920 debris waste originally packaged in the concrete casks listed in Table 2 below. This evaluation included the review of existing AK for the parent casks, and review of the CCP VE Data Forms generated for these drums during packaging.

The ORNL 2109 packaging documentation (M100), inventory database (M024 and M110), and other historic cask packaging assessments (U038) were used to identify casks containing REDC Building 7920 waste to be included in waste stream OR-REDC-RH-HET. Table 2 summarizes the information obtained during the review of historic waste packaging documentation including, as available; ORNL 2109 forms, TRU Waste Certification Data Sheets, Radioactive Waste Container Log Sheets, and other documentation maintained by ORNL for the concrete casks. Additionally, the TWPC Incoming Travelers (M286) and the outbound Container Travelers (M641) were reviewed. Based on the review of the packaging dates for waste in casks, the radiological distribution described in CCP-AK-ORNL-501 was also evaluated for each cask, and the results of this evaluation are included in Table 2 below.

The Interface Waste Management Document List (IWMD) (CCP-TP-005, Attachment 9), has been confirmed to be complete and up-to-date for waste stream OR-REDC-RH-HET. The container documentation was reviewed to assure that the containers were generated under verified procedures and bounded by Revision 4 and 5 of AKSR CCP-AK-ORNL-500. Each drum was generated under the current revisions of the procedures identified on the IWMD List.

Based on the review of the documentation described above, the 20 drums identified in Table 1 below are bounded by the Revisions 4 and 5 of the AKSR for the following:

1. Waste generation location and process. The casks were generated at the REDC Building 7920, and the processes generating TRU waste at this facility are described in the AKSR.
2. Time period of generation: The casks were generated within the bounding timeframes described in the AKSR.
3. Physical form compared to the assigned Waste Material Parameters and waste matrix code: Based on review of the CCP VE Data Forms, the Waste Material Parameters and waste matrix code for each drum are consistent with those assigned to the waste stream in the AKSR.
4. Chemical content: Based on the generation time period, location, and processes the potential chemical content is documented in the AKSR. No additional chemicals were identified during VE.
5. Prohibited items: The VE Data Forms document the absence of prohibited items for each drum.
6. Radionuclides: Based on the generation time period, location, and processes the radionuclide distribution of the waste is documented CCP-AK-ORNL-501 and will be quantified during dose-to-cuie characterization of each drum.

This memorandum serves as an addendum to the waste stream Attachment 8 (Waste Containers List), and the AK Tracking Spreadsheet (AKTSS) for waste stream OR-REDC-RH-HET will be updated to include the containers identified in Table 1.

Table 1. Containers Added to OR-REDC-RH-HET

Drum ID	Package Date	Vent Date	Parent Cask(s)	Date Evaluated
ORRH00725	11/5/2015	11/5/2015	Parent X10C9402660 (40%) and X10C9802665	11/10/2015
ORRH00726	12/6/2015	12/6/2015	Parent X10C0402941 (100%)	12/8/2015
ORRH00730	12/17/2015	12/17/2015	Parent X10C0505647 (100%)	1/27/2016
ORRH00731	12/28/2015	12/28/2015	Parent X10C0505647 (100%)	1/27/2016
ORRH00732	12/29/2015	12/29/2015	Parent X10C0505647 (100%)	1/27/2016
ORRH00734	1/19/2016	1/19/2016	Parent X10C9802684 (100%)	1/27/2016
ORRH00735	1/21/2016	1/21/2016	Parent X10C9802684 (100%)	1/27/2016
ORRH00736	2/1/2016	2/1/2016	Parent X10C0201071 (100%)	2/19/2016
ORRH00737	2/1/2016	2/1/2016	Parent X10C0201071 (100%)	2/19/2016
ORRH00738	2/4/2016	2/4/2016	Parent X10C0201071 (100%)	2/19/2016
ORRH00739	2/4/2016	2/4/2016	Parent X10C0201071 (100%)	2/19/2016
ORRH00740	2/11/2016	2/11/2016	Parent X10C9802672 (100%)	3/9/2016
ORRH00741	2/17/2016	2/17/2016	Parent X10C9802672 (100%)	3/9/2016
ORRH00742	2/17/2016	2/17/2016	Parent X10C9802672 (100%)	3/9/2016
ORRH00743	2/22/2016	2/22/2016	Parent X10C0402055 (100%)	3/9/2016
ORRH00744	2/22/2016	2/22/2016	Parent X10C0402055 (100%)	3/9/2016
ORRH00745	2/25/2016	2/25/2016	Parent X10C0402055 (100%)	3/9/2016
ORRH00746	2/29/2016	2/29/2016	Parent X10C0402055 (100%)	3/9/2016
ORRH00747	3/1/2016	3/1/2016	Parent X10C0402055 (100%)	3/9/2016
ORRH00748	3/1/2016	3/1/2016	Parent X10C0402055 (100%)	3/9/2016

Table 2. Original Concrete Parent Casks

Cask Identification	Package Date	Waste Description	Radiological Distribution
X10C9402660	08/26/1998	(a) 1000 lb of contaminated equipment (45 ft3; 25% combustible), containing 1.24 Ci of Cm-244, in 6-in-thick-walled concrete cask. (b) One VOG filter (metal, paper) from the Filter Pit in a large plastic bag. (c) External β-γ and neutron dose rates measured at contact on the bag were 1100 and 6210 mrem/h, respectively. Polyethylene beads were added to the inside of the cask to reduce the neutron dose rate.	Cask Evaluated 6/6/08, Rad Dist. Mark-42/HFIR
X10C9802665	5/6/1998	(a) 448 lb of waste (plastic, glass, metal, paper, PPE, rubber, and incidental metal; 75% combustible. (b) The wastes in 60 of the 61 bags of waste in the cask are contained in sealed 3-gal polyethylene buckets, 49 of which have a 1-gal steel paint can as the innermost waste container. Some of the buckets have waste items placed between the paint can and the wall of the bucket. The remaining bag reportedly contains 0.9 gal of plastic.	Cask Evaluated 10/27/2015, Rad Dist. Mark-42/HFIR
X10C0402941	04/28/1977	Miscellaneous non-burnable waste from cubicles in 31 paint cans in three plastic T-4 bags: three filters, polyethylene bottles, decontamination debris, and used analytical equipment (bottles, tubing, glassware, etc.)	Cask Evaluated 7/12/15, Rad Dist. Pre-SETF
X10C0505647	12/6/2006	7 buckets (in plastic bags) of metal, glass, and plastic debris.	Cask Evaluated 11/8/15, Rad Dist. Mark-42/HFIR
X10C9802684	9/1/1999	Waste (plastic, glass, metal, paper, PPE, rubber, and incidental metal; 50% combustible) contained in seven large drawstring plastic bags (Nos. 66, 67, 68, 69, 70, 71, and S-31, respectively) plus three smaller bags, each containing a plastic manipulator boot confined in a sealed polyethylene bucket, inside a larger plastic bag. Most of the materials in the seven larger bags are confined in 1-gal steel paint cans (72 in all).), However, Bag No. 70 also contains glass sample bottles confined in three SS Mark-42 target cans (~28 in long, ~ 5 in diameter each). In addition, each of the drawstring bags contains varying	Cask Evaluated 5/6/08, Rad Dist. Mark-42/HFIR

Cask Identification	Package Date	Waste Description	Radiological Distribution
		amounts of bagged miscellaneous equipment and hardware.	
X10C0201071	10/17/2002	Waste contained in 8 plastic bags containing 102 cans of metal, plastic, glass, rubber, and cellulosic debris including crushed cans, melted plastic, ceramics, light boxes, and scales. Also contains grouted resins and an electric furnace.	Cask Evaluated 6/2/08, Rad Dist. Mark-42/HFIR
X10C9802672	8/12/1999	800 lb of waste (plastic, glass, metal, paper, PPE, rubber, and incidental metal; 75% combustible). Wastes are reportedly contained in seven large drawstring plastic bags (Nos. 55, 60, 61, 62, 63, 64, and 65, respectively) inside a larger plastic bag. Most of the materials in the seven drawstring bags are confined in 1-gal steel paint cans (83 in all). However, Bag No. 60 also contains glass sample bottles in eight SS Mark-42 target cans (~28 in long, ~ 5 in diameter each) and Bag No. 62 contains glass and plastic wastes in two Mark-42 cans. All of the wastes in Bag No. 63 and Bag No. 64 were confined in paint cans, but each of the other bags contains varying amounts of bagged miscellaneous equipment and hardware.	Cask Evaluated 10/23/2015, Rad Dist. Mark-42/HFIR
X10C0402055	7/21/2005	36 bags and poly buckets containing plastic, metal, glass, cloth, and paper debris and Hopcalite filters and charcoal filters.	Cask Evaluated 12/22/2015, Rad Dist. Mark-42/HFIR

WASTE STREAM CONTAINER EVALUATION MEMORANDUM

To: Rich Kantrowitz, CCP SPM

From: Steve Schafer, CCP AKE

Date: October 24, 2015

RE: Addition of 14 Containers to Waste Stream OR-REDC-RH-HET (AKSR CCP-AK-ORNL-500). Source Document Number C322

The purpose of this memorandum is to satisfy the requirements of CCP AK Documentation procedure (CCP-TP-005) for updating AK for the addition of waste stream containers. This memorandum will be submitted to CCP Records as source document number C322 for Acceptable Knowledge Summary Report (AKSR) CCP-AK-ORNL-500.

This memorandum presents the evaluation of 14 55-gallon drums listed in Table 1 below generated by ORNL TWPC repackaging operations. These containers were evaluated as they were generated, prior to being added to the AK Tracking Spreadsheet. Repackaged waste consists of REDC Building 7920 debris waste originally packaged in the concrete casks listed in Table 2 below. This evaluation included the review of existing AK for the parent casks, and review of the CCP VE Data Forms generated for these drums during packaging.

The ORNL 2109 packaging documentation (M100), inventory database (M024 and M110), and other historic cask packaging assessments (U038) were used to identify casks containing REDC Building 7920 waste to be included in waste stream OR-REDC-RH-HET. Table 2 summarizes the information obtained during the review of historic waste packaging documentation including, as available; ORNL 2109 forms, TRU Waste Certification Data Sheets, Radioactive Waste Container Log Sheets, and other documentation maintained by ORNL for the concrete casks. Additionally, the TWPC Incoming Travelers (M286) and the outbound Container Travelers (M641) were reviewed. Based on the review of the packaging dates for waste in casks, the radiological distribution described in CCP-AK-ORNL-501 was also evaluated for each cask, and the results of this evaluation are included in Table 2 below.

It should be noted that some of the VE Data Forms for the containers listed in Table 1 identify capacitors. Based on conversations the VE operator Anthony Harley on October 9, 2015, these capacitors were cut open and verified to be dry-type and do not contain PCBs. Mr. Harley also confirmed that the sorbent identified as "NoChar" on one VE Data Form was actually an unknown sorbent likely used at REDC and not added to the waste at the TWPC. Mr. Harley indicated that future VE operation will affirmatively indicate whether identified electrical components such as capacitors do or do not contain PCBs, and the VE Date Forms will not identify a specific sorbent unless it is known.

Finally, the Interface Waste Management Document List (IWMD) (CCP-TP-005, Attachment 9), has been confirmed to be complete and up-to-date for waste stream OR-REDC-RH-HET. The container documentation was reviewed to assure that the containers were generated under verified procedures and bounded by Revision 4 of AKSR CCP-AK-ORNL-500 (dated 2/26/2014). Each drum was generated under the current revisions of the procedures identified on the IWMD List.

Based on the review of the documentation described above, the 14 drums identified in Table 1 below are bounded by the current revision of the AKSR for the following:

1. Waste generation location and process. The cask were generated at the REDC Building 7920, and the processes generating TRU waste at this facility are described in the AKSR.
2. Time period of generation: The cask were generated within the bounding timeframes described in the AKSR.
3. Physical form compared to the assigned Waste Material Parameters and waste matrix code: Based on review of the CCP VE Data Forms, the Waste Material Parameters and waste matrix code for each drum are consistent with those assigned to the waste stream in the AKSR.
4. Chemical content: Based on the generation time period, location, and processes the potential chemical content is documented in the AKSR. No additional chemicals were identified during VE.
5. Prohibited items: The VE Data Forms document the absence of prohibited items for each drum.
6. Radionuclides: Based on the generation time period, location, and processes the radionuclide distribution of the waste is documented CCP-AK-ORNL-501 and will be quantified during dose-to-cuie characterization of each drum.

This memorandum serves as an addendum to the waste stream Attachment 8 (Waste Containers List), and the AK Tracking Spreadsheet (AKTSS) for waste stream OR-REDC-RH-HET will be updated to include the containers identified in Table 1.

Table 1. Containers Added to OR-REDC-RH-HET

Drum ID	Package Date	Vent Date	Parent Cask(s)	Data Evaluated
ORRH00710	9/10/2015	9/10/2015	Parent X10C9402644 (100%)	10/9/2015
ORRH00711	9/10/2015	9/10/2015	Parent X10C9402644 (100%)	10/9/2015
ORRH00712	9/21/2015	9/21/2015	Parent X10C9402652 (100%)	10/9/2015
ORRH00713	9/15/2015	9/15/2015	Parent X10C9402644 (100%)	10/9/2015
ORRH00714	9/21/2015	9/21/2015	Parent X10C9402652 (100%)	10/9/2015
ORRH00715	9/21/2015	9/21/2015	Parent X10C9402652 (100%)	10/9/2015
ORRH00716	9/22/2015	9/22/2015	Parent X10C9402652 (100%)	10/9/2015
ORRH00717	9/22/2015	9/22/2015	Parent X10C9402652 (100%)	10/9/2015
ORRH00718	9/23/2015	9/23/2015	Parent X10C9402631 (100%)	10/9/2015
ORRH00719	9/23/2015	9/23/2015	Parent X10C9402631 (100%)	10/9/2015
ORRH00720	9/24/2015	9/24/2015	Parent X10C9402631 (100%)	10/9/2015

Table 1. Containers Added to OR-REDC-RH-HET

Drum ID	Package Date	Vent Date	Parent Cask(s)	Data Evaluated
ORRH00721	9/29/2015	9/29/2015	Parent X10C9402631 (100%)	10/9/2015
ORRH00722	10/7/2015	10/7/2015	Parent X10C9304038 (100%)	10/24/2015
ORRH00723	10/12/2015	10/12/2015	Parent X10C9304038 (100%)	10/24/2015

Table 2. Original Concrete Parent Casks

Cask Identification	Package Date	Waste Description	Radiological Distribution
X10C9304038	09/02/1993	(a) 476 lb of waste (20 ft3; 67% combustible) from the Filter Pit and the cell bank, in 6-in-thick-walled concrete cask. (b) Waste certification data sheets indicate the cask received one VOG filter and housing from the Filter Pit and 14 sealed polyethylene buckets (all holding 1-gal steel paint cans) from the cell bank containing plastic (including melted polyethylene/polypropylene, polyethylene tubes, etc.), glass (including sample bottles), cloth (including cheesecloth), metal (including needles, wire, can lids, tools, and light sockets), and paper (including wipes). (c) The WIDs indicated that the VOG filter and housing had a volume of 50 gal and weighed an estimated 400 lb. The 14 buckets of waste (volume: 2 gal each; wts: 3–12 lb) contained primarily plastic and glass items, but also included significant amounts of cloth, metal, and paper. The bucket volumes reported probably should be 3 gal (or 0.40 ft3, as given on the WID summary sheets attached to the CPL). (d) Contact dose rates on waste packages ranged from 250–2500 mrem/h β-γ and 9–400 mrem/h neutron. (e) WIMS inventory is 0.731 Ci of Cm-244, slightly less than the value on the Request for Storage/Disposal form.	Cask Evaluated 6/25/09, Rad Dist. Mark-42/HFIR
X10C9402631	11/13/1996	(a) 970 lb of waste (37.3 ft3; 58% combustible) from the cell bank and the Decontamination Room, in 6-in-thick-walled concrete cask. (b) The waste certification data sheets and the WIDs indicate the cask received three sealed 3-gal polyethylene buckets	Cask Evaluated 7/12/2015, Rad Dist. Mark-42/HFIR

Table 2. Original Concrete Parent Casks

Cask Identification	Package Date	Waste Description	Radiological Distribution
X10C9402631 (continued)		(wts: 5 lb each) containing manipulator boots, and 11 drawstring bags (volumes: 20–30 gal; wts: 60–150 lb) containing metal, plastic, paper, cloth, and glass:· Bag #7: Six Mark-42 cans and added contents (combinations of metal, glass, plastic, and rubber; three held glass sample bottles and caps only), eight 1-gal steel paint cans containing miscellaneous materials (paper, glass, dirt, plastic, metal, rubber, cloth, and tape), 10 damaged paint can lids, and a hose clamp; Bag #13: Five sealed 3-gal polyethylene buckets (containing tools, hardware, rags, and rubber gloves) and two bags (containing tools, pump, rags, plastic bags and gloves, and miscellaneous materials); Bag #14: Five bags of tools, hardware, a pump, wipes, PPE, and other miscellaneous items; Bag #15: Table (Al and SS), nine 1-gal steel paint cans (containing miscellaneous glass, metal, plastic, and paper items), and hardware (including 25 pieces of metal tubing;Bag #16: Ten 1-gal steel paint cans and three 1.5-gal paint cans (containing melted polyethylene/polypropylene, glass bottles, broken glass, wipes, and other miscellaneous items), six flattened paint cans, radiation detection equipment, and other miscellaneous metal, plastic, and rubber items;Bag #17: Pellet-making and target fabrication equipment, miscellaneous hardware, tools, microscope parts, two 1-gal steel paint cans containing glass sample bottles and metal items, and paint brush;· Bag #18: 15 1-gal steel paint cans (containing primarily glass: broken glassware, sample bottles, etc., but also wipes, plastic, paper/cardboard, electrical cord, and floor sweepings); Bag #20: Seven 1-gal steel paint cans and one 1.5-gal paint can (containing melted polyethylene/polypropylene; glass bottles; broken glass; plastic bottles, caps, and bags; wipes, paper, and "dirt"), empty paint can, miscellaneous hardware and equipment, three PVC valves, and rubber mat; Bag #21: Miscellaneous hardware and tools, Variac, plastic bagging, and sealed 3-gal polyethylene bucket containing pump bases and miscellaneous metal	

Table 2. Original Concrete Parent Casks

Cask Identification	Package Date	Waste Description	Radiological Distribution
X10C9402631 (continued)		items;· Bag #22: Miscellaneous hardware, HFIR targets (Al), and three 1-gal steel paint cans (two containing sample bottles and one with cut-up targets);Bag #24: Eight 1-gal steel paint cans and one 1.5-gal paint can (containing miscellaneous glass, metal, plastic, paper, and rubber items, plus grouted resin), manipulator part, large wrench, and Cm powder blender.	
X10C9402644	09/05/1997	(a) 192 lb of waste (25.7 ft3; 66% combustible) from the cell bank, in 6-in-thick-walled concrete cask. (b) The summary sheets attached to the CPL and the WIDs indicate the cask received 64 sealed 3-gal polyethylene buckets (wts: 3 lb each), containing primarily plastic (including melted polyethylene/polypropylene and polyethylene items), but also included paper, metal (including metal piping and batteries), and glass, along with limited amounts of cloth (including string) and wood.	Cask Evaluated 6/6/08, Rad Dist. Mark-42/HFIR
X10C9402652	11/04/1998	(a) 610 lb of waste (24.5 ft3; 37% combustible) from the cell bank, in 6-in-thick-walled concrete cask. (b) The summary sheets attached to the CPL and the WIDs indicate the cask received six 30-gal drawstring bags (wt: 100 lb each) containing a total of 95 1-gal paint cans filled with cubicle wastes, and one sealed 3-gal polyethylene bucket (wt 10 lb) containing a centrifuge. The numbers of paint cans in the bags ranged from 13 to 17, and the contents included glass, metal, and polyethylene/polypropylene.	Cask Evaluated 6/6/08, Rad Dist. Mark-42/HFIR

WASTE STREAM CONTAINER EVALUATION MEMORANDUM

To: CCP Records

From: Steve Schafer, CCP AKE

Date: March 31, 2015

RE: Explanation of Reference to "U850" in Memoranda Adding Containers to Waste Stream OR-REDC-RH-HET. Source Document Number C322

Historical CCP memoranda adding containers to wastes stream OR-REDC-RH-HET reference documentation historically "used to used to identify casks containing REDC waste be included in waste stream OR-REDC-RH-HET."

U850 was intended to reference a large database (15 MB), which contains a summary description of REDC cask contents. The database consists of information contained in source document U038, *ORNL TRU Waste Historical Survey; Volumes 1, 2, and 3—Origins and Characteristics of Remote-Handled Transuranic Wastes* (aka the Trabalka report). A source document for the database, intended to be numbered U850, was not established because all of the relevant information in the database is contained in source document U038. Reference to U850 is only found in memoranda included in Attachment 8 for waste stream OR-REDC-RH-HET.

MEMORANDUM

To: Hillari Neely, CCP SPM

From: Steve Schafer, CCP AKE

Date: February 9, 2010 4/11/2016 GRIGINAL SIGNED MEMO COULD NOT BE LOCATED.

RE: Addition of Containers ORRH00084 through ORRH00102 to Waste Stream OR-REDC-RH-HET (Parent Casks X10C9402633 and X10C9402642)

The purpose of this memorandum is to satisfy the requirements of CCP AK Documentation procedure (CCP-TP-005) for updating AK for the addition of waste stream containers.

This memorandum presents the evaluation of 55-gallon drums generated by ORNL TWPC operations repackaging operations. Repackaged waste consists of REDC Building 7920 debris waste contained in concrete casks X10C9402633 and X10C9402642. This evaluation included the review of existing AK for the casks in addition to review of the VE BDRs generated for these drums during packaging.

The 2109 packaging documentation (M100) and inventory database (M012) supplied by ORNL were used to identify casks containing REDC waste to be included in waste stream OR-REDC-RH-HET. Tables 2 and 3 summarize the information obtained during the review of historic waste packaging documentation including, as available; ORNL 2109 forms, TRU Waste Certification Data Sheets, Radioactive Waste Container Log Sheets, and other documentation maintained by ORNL for the concrete casks. The historic documentation reviewed for these casks is maintained in AK Source Documents M100. Additionally, based on the review of the packaging dates for the waste items in casks X10C9402633 and X10C9402642, the radiological characterization will be performed using the "Mark-42/HFIR" radiological distribution described in CCP-AK-ORNL-501.

Based on the cask documentation and a review of the VE BDRs generated during packaging of these drums, the containers are bounded by the current revision of the AK Summary Report, including freeze files changes, for the following:

- Waste generation location and process
- Time period of generation
- Physical form compared to the assigned Waste Material Parameters and waste matrix code
- Chemical content
- Prohibited items
- Radionuclides

Attachment 8 (Waste Containers List) and the AK Tracking Spreadsheet (AKTSS) for waste stream OR-REDC-RH-HET will be updated to include the following containers:

Table 1. Containers Added to OR-REDC-RH-HET

Drum ID	Package Date	Vent Date	Parent Cask(s)	Date Drum Evaluated
ORRH00084	1/26/2010	1/26/2010	Parent X10C9402633 (100%)	1/27/2010
ORRH00085	1/27/2010	1/27/2010	Parent X10C9402633 (100%)	1/27/2010
ORRH00086	1/26/2010	1/26/2010	Parent X10C9402633 (100%)	1/27/2010
ORRH00087	1/26/2010	1/26/2010	Parent X10C9402633 (100%)	1/27/2010
ORRH00088	1/27/2010	1/27/2010	Parent X10C9402633 (100%)	1/27/2010
ORRH00089	1/27/2010	1/27/2010	Parent X10C9402633 (100%)	2/1/2010
ORRH00090	1/28/2010	1/28/2010	Parent X10C9402633 (100%)	2/1/2010
ORRH00091	1/28/2010	1/28/2010	Parent X10C9402633 (100%)	2/1/2010
ORRH00092	2/1/2010	2/1/2010	Parent X10C9402633 (100%)	2/3/2010
ORRH00093	2/2/2010	2/2/2010	Parent X10C9402642 (100%)	2/3/2010
ORRH00094	2/2/2010	2/2/2010	Parent X10C9402633 (20%), X10C9402642 (80%)	2/3/2010
ORRH00095	2/3/2010	2/3/2010	Parent X10C9402642 (100%)	2/3/2010
ORRH00096	2/3/2010	2/3/2010	Parent X10C9402642 (100%)	2/4/2010
ORRH00097	2/3/2010	2/3/2010	Parent X10C9402642 (100%)	2/4/2010
ORRH00098	2/4/2010	2/4/2010	Parent X10C9402642 (100%)	2/4/2010
ORRH00099	2/8/2010	2/8/2010	Parent X10C9402642 (100%)	2/9/2010
ORRH00100	2/8/2010	2/8/2010	Parent X10C9402642 (100%)	2/9/2010
ORRH00101	2/8/2010	2/8/2010	Parent X10C9402642 (100%)	2/9/2010
ORRH00102	2/9/2010	2/9/2010	Parent X10C9402642 (100%)	2/9/2010

Table 2 Cask Evaluation - X10C9402633 June 26, 2009

Waste Package Date	Waste Origin	Waste Description	Chemicals/ Compounds	AK Sources	Evaluation Date
1/3/1997-5/20/1997	1/3/1997	Cask contains 14 draw string bags of solid waste originating from cubicle waste transfer area (Rm. 118). Metal, rubber, glass, plastic, combustible waste in draw string bags and twist and tape heat seal bags.	None Identified	M100	6/26/2009

Table 3 Cask Evaluation - X10C9402642 June 26, 2009

Waste Package Date	**Waste Origin**	**Waste Description**	**Chemicals/ Compounds**	**AK Sources**	**Evaluation Date**
6/26/1997-7/18/1997	6/26/1997	Waste in cans removed from the cell bank in draw-string plastic bags, including: plastic (blocks, dilution bottles, buckets, bags, melted poly, valves, Bakelite, filter cartridges), glass (samples bottles, broken mirrors, leached sample bottles, vacuum flasks, broken light bulbs, beakers), metal (cut up metal lines, preamp can, MSM tongs, poly melter, valves, lines, vices, bolts, tool racks, tools, lids, buckets, rods, co-ax cable), paper (blotter paper, wipes), cheese cloth, tape, cotton swabs, string, glass and metal columns, rubber (rubber gloves, pipette bulbs, gaskets, wire cord), leached samples, nf probe, dirt, weights, handheld pH meter, cubicle brush, F-455 filter, mercury lamp, syringe sampler, tape, grouted resin.	Mercury lamp, light bulbs, electronic equipment	M100	6/26/2009

AK18

Attachment 9 – Interface Waste Management Documents List

Site: Oak Ridge National Laboratory

Waste Stream Number: OR-REDC-CH-HET, OR-REDC-RH-HET

Waste Stream Description: Heterogeneous debris from the Radiochemical Engineering Development Center (REDC), Building 7920

Document #	Revision	Date	Document Title/Description	Generator SME(s)/POC(s) [a]	Verification Date [b]	AK Source Document Tracking #
CM-R-AD-001	32	8/27/15	TRU Waste Processing Center Document Safety Analysis	Joe Jones	12/1/15	P432
CH-X-AD-001	26	6/15/15	Contact Handled Waste Acceptance Criteria	Aaron Clements	9/24/15	P255
RH-X-AD-001	7	6/15/15	Remote Handled Waste Acceptance Criteria	Aaron Clements	9/25/15	P597
CH-REF-WP-001	4	6/22/15	Contact Handled Waste Container Selection Process	Aaron Clements	9/29/15	P1444
RH-REF-WP-001	1	6/23/15	Remote Handled Waste Container Selection Process	Aaron Clements	9/29/15	P1435
CH-REF-OP-044	4	7/24/14	Operations Prohibited Item Processing	Mike Snipes	9/25/15	P598
CH-REF-OP-045	1	6/23/15	Non-Compliant Containers	Mike Snipes	9/25/15	P599
CH-REF-OP-013	PCN 9-1	6/17/15	Contact Handled Waste Repackaging	Kevin East	10/1/15	P254
CH-REF-OP-001	3	6/23/15	Box Breakdown Area Material Handling Recipes	Kevin East	10/1/15	P588
CH-REF-OP-014	PCN 5-1	6/15/15	Absorbing Liquids in the Glovebox and Box Breakdown Area	Kevin East	10/1/15	P592
RH-REF-OP-014	3	10/1/15	Liquids Handling in the Hot Cell	Kevin East	10/1/15	P590
RH-REF-OP-102	3	2/4/15	Liquids Handling in the Cask Processing Enclosure	Kevin East	10/1/15	P591
CH-REF-OP-027	3	11/4/15	PCB Decontamination	Kevin East	11/4/15	P582
CM-A-WP-004	1	5/22/14	Energetic Materials Program	Don Coffey	9/29/15	P1434
CM-P-WP-016	2	6/22/15	Energetic Materials Management	Don Coffey	9/29/15	P587
CM-P-EN-013	3	9/28/15	Environmental Permits and Compliance	Sam Thomas	9/24/15	P1433
CH-REF-OP-011	7	11/11/15	Drum Bag In/Bag Out	Kevin East	11/10/15	P253
CH-REF-OP-046	3	11/19/15	Glove Ports and Sleeve Transfers	Kevin East	12/1/15	P589
RH-REF-OP-003	7	11/17/15	Remote Handled Drum In/Out Operations	Kevin East	11/11/15	P585
RH-REF-OP-104	6	6/17/15	Cask Processing Enclosure Drum-In / Drum-Out	Kevin East	10/2/15	P586

CCP RECORDS ORIGINAL
DATE REC'D 12/3/15
mr

Attachment 9 – Interface Waste Management Documents List (continued) Page 2 of 2

Waste Stream Number: OR-REDC-CH-HET, OR-REDC-RH-HET

POC/SME Contact Information

Contact Name	Organization/ Company Affiliation	Title/Position/Description	Phone Number(s)	Email
Clements, Aaron	TWPC/WAI	Waste Acceptance/Transfer Lead	865-574-5973	Aaron.Clements@truproject.com
Coffey, Don	TWPC/WAI	Level 1 Energetic Materials Subject Matter Expert	865-241-2520	Don.Coffey@truproject.com
East, Kevin	TWPC/WAI	Process Superintendent	865-576-1626	Kevin.East@truproject.com
Jones, Joe	Edgewater/TWPC/WAI	Safety Authorization Basis Manager	803-646-8756	Joseph.Jones@truproject.com
Snipes, Mike	TWPC/WAI	Alternate Waste Certification Official	865-576-1630	Mike.Snipes@truproject.com
Thomas, Sam	TWPC/WAI	Environmental Programs Manager	865-574-7773	Sam.Thomas@truproject.com

[a] For active procedures POCs must include representatives directly involved with waste generation, characterization, certification, and verification activities described in the procedure. This may include responsible generator site contractor/subcontractor personnel.
[b] Enter verification date or date procedure added to this attachment (date on the revised Attachment 3).

Acceptable Knowledge Expert: Jeff Harrison / Jeff Harrison Date: 12/2/2015
Print Sign

Site Management Representative: Thomas Barton / Thomas Barton Date: 12/2/2015
Print Sign

DIVIDER PAGE ONLY

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From: Schrock, Beverly - NWP
To: Harrison, Jeff
Cc: Joo, Irene - NWP; Ramirez, Mike - NWP; Barton, Thomas (Thomas.Barton@truproject.com)
Subject: First Quarter 2016 Review of Interface Waste Management Documents List for ORNL
Date: Thursday, March 03, 2016 1:01:53 PM

Jeff,

Per CCP-TP-005, "CCP Acceptable Knowledge Documentation" the Site Project Manager transmits the Site Management Representative's (SMR) quarterly notification that the Interface Waste Management Documents List (IWMDL) is current to the Acceptable Knowledge Expert. For the first quarter of 2016 the IWMDL for OR-REDC-CH-HET and OR-REDC-RH-HET waste streams are current according to the email I received from Thomas Barton, SMR at Oak Ridge National Laboratory. See below.

If you have any questions, please let me know.

Thank you,
Bev

Beverly S. Schrock
Site Project Manager
Central Characterization Program
Nuclear Waste Partnership, LLC
Contractor for the U.S. Department of Energy
(575) 234-7444
(575) 706-0809 Cell

From: Barton, Thomas [mailto:Thomas.Barton@truproject.com]
Sent: Thursday, March 03, 2016 11:51 AM
To: Schrock, Beverly - NWP
Cc: Harrison, Jeff; Joo, Irene - NWP; Ramirez, Mike - NWP
Subject: RE: Quarterly Review of Interface Waste Management Documents List

Bev:

Review is complete. No update is needed as all procedures, revisions, implementation dates, and SME's are unchanged for OR-REDC-CH-HET and OR-REDC-RH-HET waste streams.

Thanks
Gio

From: Schrock, Beverly - NWP [mailto:Beverly.Schrock@wipp.ws]
Sent: Wednesday, March 02, 2016 1:13 PM
To: Barton, Thomas
Cc: Harrison, Jeff; Joo, Irene - NWP; Ramirez, Mike - NWP
Subject: Quarterly Review of Interface Waste Management Documents List

Gio,

CCP RECORDS ORIGINAL
DATE REC'D 3/7/16 MR

CCP-TP-005 requires you as the SMR to perform a quarterly review of the Interface Waste Management Documents List (IWMDL) and notify the SPM if the list is complete and if it includes the most current revision of the relevant procedures.

My records show that the IWMDL or Attachment 9 for OR-REDC-CH-HET, OR-REDC-RH-HET was completed and signed on December 2, 2015. January – March of 2016 is the first quarter after it was issued. Since we are now into March, will you please review and update if needed and communicate to me via email when that is complete?

Thank you,
Bev

Beverly S. Schrock
Site Project Manager
Central Characterization Program
Nuclear Waste Partnership, LLC
Contractor for the U.S. Department of Energy
(575) 234-7444
(575) 706-0809 Cell

DIVIDER PAGE

Attachment 3 - Acceptable Knowledge Source Document Summary

Site(s): Oak Ridge National Laboratory	Source Document Tracking Number: DR005
Waste Stream Number(s): ORNL Non-specific Library Files (Applicable only when site library is not in use)	
Acceptable Knowledge Documentation Type: ☑ TRU Waste Management Program Information ☑ Waste Stream-Specific Information ☑ Additional Information	Category: ☐ Correspondence ☑ Discrepancy Resolution ☐ Internal Procedure ☐ Miscellaneous ☐ Published Document or Internal Procedure ☐ Unpublished Documents
Title or Description of Source Document [a]: Discrepancy Resolution, Re: EPA Hazardous Waste Number Discrepancies	
Source Document Reference Information (author(s), document and revision number, date, publisher): Kevin Peters, DR005, NA, 06/24/2008, CCP	

AK # [b]	Source Doc. Page # [c]	AK Information Summary
PR7, WS2, WS3, WS8, WS12, S13	Throughout	S13 - CCP Discrepancy Resolution Nature of Discrepancy: As described in AK Summary Reports CCP-AK-ORNL-500 (Section 5.4.2) and CCP-AK-ORNL-002 (Section 5.4.3), the assignment of EPA Hazardous Waste Numbers (HWNs) to the REDC waste streams OR-REDC-RH-HET and OR-REDC-CH-HET was based on the review of AK sources including, procedures, personnel interviews, previous AK reports, container packaging and shipping documentation, and material safety data sheet (MSDS) information for commercial products as noted in the AK record. These AK sources were reviewed to determine potential waste material inputs and possible chemical contaminants associated with the Building 7920 REDC operations. Based on this review the following EPA HWNs were assigned to the REDC CH and RH debris waste: F002, F005, D005, D006, D007, D008, D009, D010, D011, and D019. A majority of the AK sources used for development of these CCP AK Summary Reports were originally collected by Weston Solutions, Inc. (Weston) for characterization of ORNL TRU waste streams. Weston's research culminated with the Acceptable Knowledge Summary Report for Oak Ridge National Laboratory Contact-Handled TRU Debris Waste Facility Maintenance Operations (U044) dated 6/19/2006. This report includes containers of debris waste generated in the REDC (Buildings 7920 and 7930) and the Transuranium Research Laboratory (Building 5505) that were combined into waste stream ORFWENC-007. Based on Weston's characterization of the waste in this stream the following EPA HWNs were assigned: F001, F002, F004, F005, D004, D005, D006, D007, D008, D009, D010, D011, and D022. Resolution: In an effort to determine which of the HWNs assigned by Weston to the waste stream containing debris from buildings 7920, 7930, and 5505 are applicable to the Building 7920 REDC debris waste streams OR-REDC-RH-HET and OR-REDC-CH-HET, Weston's characterization approach and original characterization documentation was reviewed. As described in U044 and I042, Weston assigned HWNs to ORNL waste streams based primarily on reports describing operations conducted by the different divisions operating the numerous facilities at ORNL as described below (I042): "Chemicals used were identified from divisional annual reports and other source documents, but for the most part could not be associated with a building but with a division responsible for the research or process. Based on historical information, the AKEs were able to correlate divisions with buildings and timeframes and then buildings with waste containers. Also, the disposal request information did not include any F-listed solvents, however, there was a number of source documents that indicated solvents were used in many of the processes.

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DATE REC'D 1/3/14 SP

Attachment 3 - Acceptable Knowledge Source Document Summary (continued)

Site(s): Oak Ridge National Laboratory		Source Document Tracking Number: DR005
AK # [b]	Source Doc. Page # [c]	AK Information Summary
		Waste streams were delineated first by generating facility (ORNL stores waste from several off site facilities). Then streams were further delineated by process, such as analytical chemistry facilities, reactor facilities, isotope facilities. Further delineation was based on hazardous waste codes assigned. Hazardous waste codes were assigned by correlating a building with a division that operated that building. If the divisional reports indicated that the division used hazardous chemicals in their processes or research, the containers from the buildings associated with that division were assigned to the waste streams with the appropriate hazardous waste codes. In the small number of cases where information was available that indicated hazardous chemicals were used in a specific building, the containers from that building were placed in the waste stream with the appropriate hazardous waste codes." For the Weston waste stream (ORFWENC-007) containing the REDC waste, the Chemical Technology and Chemistry Divisions were identified as generators in the REDC and the Transuranium Research Laboratory. However, based on a review of the technical division reports these divisions conducted operations in numerous facilities not associated with the operations in these areas, including research that would not have generated radioactive waste materials. This characterization approach resulted in an extremely conservative assignment of HWNs to the waste streams. In contrast, CCP assigned HWNs based upon a review of AK documentation specific to only the operations identified in Building 7920 of the REDC. Based on this review, HWNs for the following chemicals were not assigned to waste streams OR-REDC-RH-HET and OR-REDC-CH-HET (See attached table) that were assigned to the combined Weston waste stream ORFWENC-007. The list below identifies the EPA HWN not assigned by CCP, the source document(s) sited by Weston Solutions supporting its assignment, and a brief summary of the findings of the review documenting the rational for CCP not assigning the HWN to these non-REDC activities: D004 – Arsenic AK Source P004 – Report describes research conducted prior to 1963 before the REDC was in operation (1966). AK Source P005 – Only reference to arsenic is a non-REDC related study of soil absorption of arsenic in different oxidations states. AK Source P011 – References related to non-REDC research relating to coal studies, food samples, and phenols in tobacco smoke. AK Source P020 – General discussion of research related to metals in fly ash. AK Source P021 – Feasibility study for preparing gel spheres (PUREX raffinate). AK Source P133 – General Analytical Laboratory research relating to coal studies. AK Source P170 – Theoretical study involving electron orbitals, no indication of actual arsenic contamination. D022 – Chloroform AK Source P021 – Non-REDC fossil energy coal liquefaction research. AK Source P097 – Non-REDC biotechnology and environmental studies relating to chlorinated HFIR cooling water. AK Source P099 – Non-REDC coal organic chemistry research. F001 – Carbon Tetrachloride Carbon tetrachloride sources identified both by Weston and CCP research. Since no large-scale degreasing operations identified in REDC operations, F001 not assigned and D019 conservatively assigned. F001 – Trichloroethylene Trichloroethylene sources identified both by Weston and CCP research. Since no large-scale degreasing operations identified in REDC operations, F001 not assigned and F002 assigned by CCP. F001/F002 - 1,1,2-trichloro-1,2,2-trifluoroethane and trichlorofluoromethane AK Source P162 – Associated with the Transuranium Research Laboratory in Building 5505. F001/F002 – tretrachloroethylene AK Source P037 – Non-REDC research relating to waste water treatment and disposal. F004 – p-Creosol AK Source P096 – Non-REDC biochemical technology research relating to domestic sewage plant effluent analysis. F005 – 2-ethoxyethanol AK Source P145 – Appears that identification of 2-ethoxyethanol was in error (no reference in P145) and that 2-ethylhexanol identified in the CCP report is correct.

Attachment 3 - Acceptable Knowledge Source Document Summary (continued)

Site(s): Oak Ridge National Laboratory		Source Document Tracking Number: DR005
AK # [b]	Source Doc. Page # [c]	AK Information Summary
		F005 – Pyridine AK Source P021 – Non-REDC fossil energy coal liquefaction research. AK Source P099 – Non-REDC coal organic chemistry research. Several F003 solvents were identified by both Weston and CCP. As described in the Weston AK Report and CCP AK Summary, assignment of the F003 to the waste is not appropriate if liquids are not present in the final waste form. Based on the evaluation summarized above, the following EPA HWNs are assigned to waste streams OR-REDC-RH-HET and OR-REDC-CH-HET; F002, F005, D005, D006, D007, D008, D009, D010, D011, and D019.

Source Document Data Limitations (if any):

1. None.

Acceptable Knowlege Expert:

Travis Smith / [signature] Date: 12/11/2013

Print /Sign

[a] Provide description for non-titled information (i.e., container paperwork, MSDS sheets, etc)
[b] Obtain from Acceptable Knowledge Documentation Checklist
[c] For microfilm or microfiche, identify box, tape, reel number and location.

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Attachment 11 – Acceptable Knowledge Source Document Discrepancy Resolution

Waste Stream Number(s): OR-REDC-RH-HET, OR-REDC-CH-HET

Waste Stream Description: REDC Heterogeneous Debris (CH and RH)

AK Documentation Type: [X] TRU Waste Management Program Information [X] Waste Stream Specific Information [X] Supplemental Information							
AK Source Document Discrepancy Form Tracking Number: DR005 – EPA Hazardous Waste Number Discrepancies							
Tracking #	Category[a]	Title	Document/Rev#	Author	Date	Publisher	Page #
N/A	Pub.	Central Characterization Project Acceptable Knowledge Summary Report For Oak Ridge National Laboratory Radiochemical Engineering Development Center Remote-Handled Transuranic Waste, Waste Stream: OR-REDC-RH-HET	CCP-AK-ORNL-500, Rev. 0	CCP	5/2/2008	CCP	Section 5.4.2
N/A	Pub.	Central Characterization Project Acceptable Knowledge Summary Report For Oak Ridge National Laboratory Radiochemical Engineering Development Center Contact-Handled Transuranic Waste, Waste Stream: OR-REDC-CH-HET	CCP-AK-ORNL-002, Rev. 0	CCP	5/2/2008	CCP	Section 5.4.3
I042	Corr.	AKE Memo and Potential Hazardous Constituents in ORNL Wastes	N/A	Betty Humphrey, Jean S. Burt	6/27/05-5/23/06	N/A	Throughout
U044	Pub.	Acceptable Knowledge Summary Report for Oak Ridge National Laboratory Contact-Handled TRU Debris Waste Facility Maintenance Operations	AK-ORNL-001, Rev. 4	TRU/Alpha Low Level Treatment Project	6/19/2006	N/A	Sections 2.7, 5.7, and Table 4.2

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DATE REC'D 1/3/14
SP

Nature of Discrepancy:

As described in AK Summary Reports CCP-AK-ORNL-500 (Section 5.4.2) and CCP-AK-ORNL-002 (Section 5.4.3), the assignment of EPA Hazardous Waste Numbers (HWNs) to the REDC waste streams OR-REDC-RH-HET and OR-REDC-CH-HET was based on the review of AK sources including, procedures, personnel interviews, previous AK reports, container packaging and shipping documentation, and material safety data sheet (MSDS) information for commercial products as noted in the AK record. These AK sources were reviewed to determine potential waste material inputs and possible chemical contaminants associated with the Building 7920 REDC operations. Based on this review the following EPA HWNs were assigned to the REDC CH and RH debris waste: F002, F005, D005, D006, D007, D008, D009, D010, D011, and D019.

A majority of the AK sources used for development of these CCP AK Summary Reports were originally collected by Weston Solutions, Inc. (Weston) for characterization of ORNL TRU waste streams. Weston's research culminated with the *Acceptable Knowledge Summary Report for Oak Ridge National Laboratory Contact-Handled TRU Debris Waste Facility Maintenance Operations* (U044) dated 6/19/2006. This report includes containers of debris waste generated in the REDC (Buildings 7920 and 7930) and the Transuranium Research Laboratory (Building 5505) that were combined into waste stream ORFWENC-007. Based on Weston's characterization of the waste in this stream the following EPA HWNs were assigned: F001, F002, F004, F005, D004, D005, D006, D007, D008, D009, D010, D011, and D022.

Resolution:

In an effort to determine which of the HWNs assigned by Weston to the waste stream containing debris from buildings 7920, 7930, and 5505 are applicable to the Building 7920 REDC debris waste streams OR-REDC-RH-HET and OR-REDC-CH-HET, Weston's characterization approach and original characterization documentation was reviewed. As described in U044 and I042, Weston assigned HWNs to ORNL waste streams based primarily on reports describing operations conducted by the different divisions operating the numerous facilities at ORNL as described below (I042):

> *"Chemicals used were identified from divisional annual reports and other source documents, but for the most part could not be associated with a building but with a division responsible for the research or process. Based on historical information, the AKEs were able to correlate divisions with buildings and timeframes and then buildings with waste containers. Also, the disposal request information did not include any F-listed solvents, however, there was a number of source documents that indicated solvents were used in many of the processes.*
>
> *Waste streams were delineated first by generating facility (ORNL stores waste from several off site facilities). Then streams were further delineated by process, such as analytical chemistry facilities, reactor facilities, isotope facilities. Further delineation was based on hazardous waste codes assigned.*
>
> *Hazardous waste codes were assigned by correlating a building with a division that operated that building. If the divisional reports indicated that the division used hazardous chemicals in their processes or research, the containers from the buildings associated with that division were assigned to the waste streams with the appropriate hazardous waste codes. In the small number of cases where information was available that indicated hazardous chemicals were used in a specific building, the containers from that building were placed in the waste stream with the appropriate hazardous waste codes."*

For the Weston waste stream (ORFWENC-007) containing the REDC waste, the Chemical Technology and Chemistry Divisions were identified as generators in the REDC and the Transuranium Research Laboratory. However, based on a review of the technical division reports these divisions conducted operations in numerous facilities not associated with the operations in these areas, including research that would not have generated radioactive waste materials. This characterization approach resulted in an extremely conservative assignment of HWNs to the waste streams. In contrast, CCP assigned HWNs based upon a review of AK documentation specific to only the operations identified in Building 7920 of the REDC. Based on this review, HWNs for the following chemicals were not assigned to waste streams OR-REDC-RH-HET and OR-REDC-CH-HET (See attached table) that were assigned to the combined Weston waste stream ORFWENC-007. The list below identifies the EPA HWN not assigned by CCP, the source document(s) sited by Weston Solutions supporting its assignment, and a brief summary of the findings of the review documenting the rational for CCP not assigning the HWN to these non-REDC activities:

D004 – Arsenic

AK Source P004 – Report describes research conducted prior to 1963 before the REDC was in operation (1966).

AK Source P005 – Only reference to arsenic is a non-REDC related study of soil absorption of arsenic in different oxidations states.

AK Source P011 – References related to non-REDC research relating to coal studies, food samples, and phenols in tobacco smoke.

AK Source P020 – General discussion of research related to metals in fly ash.

AK Source P021 – Feasibility study for preparing gel spheres (PUREX raffinate).

AK Source P133 – General Analytical Laboratory research relating to coal studies.

AK Source P170 – Theoretical study involving electron orbitals, no indication of actual arsenic contamination.

D022 – Chloroform

AK Source P021 – Non-REDC fossil energy coal liquefaction research.

AK Source P097 – Non-REDC biotechnology and environmental studies relating to chlorinated HFIR cooling water.

AK Source P099 – Non-REDC coal organic chemistry research.

F001 – Carbon Tetrachloride

Carbon tetrachloride sources identified both by Weston and CCP research. Since no large-scale degreasing operations identified in REDC operations, F001 not assigned and D019 conservatively assigned.

F001 – Trichloroethylene

Trichloroethylene sources identified both by Weston and CCP research. Since no large-scale degreasing operations identified in REDC operations, F001 not assigned and F002 assigned by CCP.

F001/F002 - 1,1,2-trichloro-1,2,2-trifluoroethane and trichlorofluoromotane

AK Source P162 – Associated with the Transuranium Research Laboratory in Building 5505.

F001/F002 – tretrachloroethylene

AK Source P037 – Non-REDC research relating to waste water treatment and disposal.

F004 – p-Creosol

AK Source P096 – Non-REDC biochemical technology research relating to domestic sewage plant effluent analysis.

F005 – 2-ethoxyethanol

AK Source P145 – Appears that identification of 2-ethoxyethanol was in error (no reference in P145) and that 2-ethylhexanol identified in the CCP report is correct.

F005 – Pyridine

AK Source P021 – Non-REDC fossil energy coal liquefaction research.

AK Source P099 – Non-REDC coal organic chemistry research.

Several F003 solvents were identified by both Weston and CCP. As described in the Weston AK Report and CCP AK Summary, assignment of the F003 to the waste is not appropriate if liquids are not present in the final waste form.

Based on the evaluation summarized above, the following EPA HWNs are assigned to waste streams OR-REDC-RH-HET and OR-REDC-CH-HET; F002, F005, D005, D006, D007, D008, D009, D010, D011, and D019.

Discrepancy Resolved: [X] Yes [ ] No

Acceptable Knowledge Expert: Kevin J. Peters / [signature] Date: 6/20/2008
Print Sign

Site Project Manager: Hillary J. Neely / [signature] Date: 6-24-08
Print Sign

[a] Published Document or Controlled Database (Pub.); Unpublished Data (Unpub.); Internal Procedure or Note (Proc.); Correspondence (Corr.) or Discrepancy (Disc.)

Comparison of CCP HWN Assignment to REDC Waste Materials

EPA Hazardous Waste Number	Constituent	CCP Waste Streams OR-REDC-RH-HET OR-REDC-CH-HET	Weston Waste Stream ORFWENC-007
D004	Arsenic		X
D005	Barium	X	X
D006	Cadmium	X	X
D007	Chromium	X	X
D008	Lead	X	X
D009	Mercury	X	X
D010	Selenium	X	X
D011	Silver	X	X
D019	Carbon tetrachloride	X	
D022	Chloroform		X
F001	Carbon tetrachloride		X
F001/F002	1,1,2-trichloro-1,2,2-trifluoroethane		X
F001/F002	Trichlorofluoromethane		X
F001/F002	Tetrachloroethylene		X
F002	1,1,2-Trichloroethane	X	X
F002	Trichloroethylene	X	X (F001 and F002)
F004	p-Cresol		X
F005	2-Ethoxyethanol		X
F005	Benzene	X	X
F005	Methyl ethyl ketone (MEK)	X	X
F005	Pyridine		X
F005	Toluene	X	X

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Attachment 3 - Acceptable Knowledge Source Document Summary

Site(s): Oak Ridge National Laboratory	Source Document Tracking Number: DR008

Waste Stream Number(s): ORNL Non-specific Library Files
(Applicable only when site library is not in use)

Acceptable Knowledge Documentation Type:	Category:
☐ TRU Waste Management Program Information	☐ Correspondence
☑ Waste Stream-Specific Information	☑ Discrepancy Resolution
☑ Additional Information	☐ Internal Procedure
	☐ Miscellaneous
	☐ Published Document or Internal Procedure
	☐ Unpublished Documents

Title or Description of Source Document [a]: Discrepancy Resolution, Re: Follow-Up on DR602 for EPA Hazardous Waste Number Discrepancies (REDC Waste)

Source Document Reference Information (author(s), document and revision number, date, publisher): Jeff Harrison, DR008, NA, 09/10/2008, CCP

AK # [b]	Source Doc. Page #[c]	AK Information Summary
WS2, WS4, WS6, WS8, WS12, S13	Throughout	S13 - CCP Discrepancy Resolution Nature of Discrepancy: A majority of the AK sources used for development of CCP AK Summary Reports CCP-AK-ORNL-002 (CH waste) and CCP-AK-ORNL-500 (RH waste) were originally collected by Weston Solutions, Inc. (Weston) for characterization of ORNL TRU waste streams. Weston's research culminated with the Acceptable Knowledge Summary Report for Oak Ridge National Laboratory Contact-Handled TRU Debris Waste Facility Maintenance Operations (U044) dated 6/19/2006. This report includes containers of debris waste generated in the REDC (Buildings 7920 and 7930) and the Transuranium Research Laboratory (Building 5505) that were combined into waste stream ORFWENC-007. The following EPA hazardous waste numbers were assigned to waste stream ORFWENC-007: F001, F002, F004, F005, D004, D005, D006, D007, D008, D009, D010, D011, and D022. The development of the CCP AK Summary Reports identified several discrepancies with the Weston EPA hazardous waste number assignment. Discrepancy resolution DR005 was prepared to resolve the inconsistencies documented in these two characterization programs. Based on DR005, the following hazardous waste numbers EPA HWNs were assigned to the REDC CH and RH debris waste: F002, F005, D005, D006, D007, D008, D009, D010, D011, and D019. During the ORNL RH Waste Certification Audit, it was noted that the assignment of EPA hazardous waste numbers for other chemicals was not well supported for chemicals including benzene, methyl ethyl ketone (MEK), 1,1,2-trichloroethane, and selenium. Source document C078 contains an inventory list of chemicals. This inventory list was reviewed by REDC personnel and chemical potentially present were identified with hand written circles, check marks, and notes, which are difficult to interpret. Discrepancy resolution DR602 was written to address the issues resulting from the ORNL RH Waste Certification Audit. It was determined that benzene and 1,1,2-trichloroethane were indeed applicable to the REDC waste, but MEK and selenium were not applicable to the REDC waste. DR602 also states that ongoing chemical use research is currently being conducted for the process development laboratories, and that during this review of the AK documentation, additional research will be conducted to augment the chemical use in the REDC. As a result of this ongoing research, uses/sources in Building 7920 were identified for arsenic, selenium, and 1,1,1-trichloroethane. Resolution: EPA hazardous waste number D004 (arsenic) was originally identified in the Weston AK (U044) as applicable to waste stream ORFWENC-007 which as described above includes waste from

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DATE REC'D 1/3/14 SP

Attachment 3 - Acceptable Knowledge Source Document Summary (continued)

Site(s): Oak Ridge National Laboratory		Source Document Tracking Number: DR008
AK # [b]	Source Doc. Page # [c]	AK Information Summary
		Building 7920. A review of the source documentation that supported the assignment of D004 to waste stream ORFWENC-007 (I042) determined that is was not applicable to Building 7920 (refer to DR005) and was therefore not assigned to CCP waste streams OR-REDC-CH-HET and OR-REDC-RH-HET. However, a source has been found for arsenic use in Building 7920. Section 5 of a 1971 Chemical Technology Division report (P114) describes transuranium element processing at the Transuranium Processing Plant and the High Flux Isotope Reactor. The Transuranium Processing Plant was the name used for Building 7920 before being renamed REDC. Section 5.5 of P114 describes transplutonium element research that would most likely have occurred in the Building 7920 process development labs. One of the activities involved actinide and lanthanide hydride and metallide studies in which erbium-arsenic and americium-arsenic compounds were studied. The Weston AK did not identify this activity as a source for arsenic. Based on this finding, EPA hazardous waste number D004 will be applied to CCP waste streams OR-REDC-CH-HET and OR-REDC-RH-HET. EPA hazardous waste number D010 (selenium) was originally identified in the Weston AK (U044) as applicable to waste stream ORFWENC-007 and was assigned to CCP waste streams OR-REDC-CH-HET and OR-REDC-RH-HET because it was identified in an REDC chemical inventory (C078). As a result of DR602, EPA hazardous waste number D010 was going to be removed from the CCP waste streams, but ongoing research has identified a source for selenium use in Building 7920. Selenium compounds (erbium-selenium and americium-selenium) were used in the same actinide and lanthanide hydride and metallide studies discussed above for arsenic (P114). Based on this finding, EPA hazardous waste number D010 will NOT be removed from CCP waste streams OR-REDC-CH-HET and OR-REDC-RH-HET. EPA hazardous waste number F002 was originally identified in the Weston AK (U044) as applicable to waste stream ORFWENC-007 due to the use of Freon, 1,1,2,trichloroethane, tetrachloroethylene, and trichloroethylene. Several source documents identified the use of trichloroethylene in Building 7920, but as described in DR005, it was determined that Freon and tetrachloroethylene were not applicable to waste from Building 7920. As described in DR602, the only AK source identified for 1,1,2-trichloroethane was C078 (chemical inventory list). The use of this solvent was not identified and the process of use is unknown; however, without the availability of additional information to verify that this chemical was not used in the REDC areas contaminating the RH and CH debris waste streams, EPA hazardous waste number F002 for 1,1,2-trichloroethane will be assigned to the CCP waste streams. Ongoing research has also identified the F002-listed solvent 1,1,1-trichloroethane as being used in Building 7920. A logbook from the mid-1980s for Labs 110 and 111 in Building 7920 identified the use of a product named Desicote (U529). Desicote is a rinsing aid that contains 1,1,1-trichloroethane (M022). Therefore, EPA hazardous waste number F002 for 1,1,1-trichloroethane, 1,1,2-trichloroethane, and trichloroethylene will be assigned to CCP waste streams OR-REDC-CH-HET and OR-REDC-RH-HET.

Attachment 3 - Acceptable Knowledge Source Document Summary (continued)

Site(s): Oak Ridge National Laboratory	Source Document Tracking Number: DR008
Source Document Data Limitations (if any): 1. None.	
Acceptable Knowlege Expert: Travis Smith / [signature] Date: 12/11/2013 Print /Sign	
[a] Provide description for non-titled information (i.e., container paperwork, MSDS sheets, etc) [b] Obtain from Acceptable Knowledge Documentation Checklist [c] For microfilm or microfiche, identify box, tape, reel number and location.	

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Attachment 11 - Acceptable Knowledge Source Document Discrepancy Resolution

Waste Stream Number(s): OR-REDC-CH-HET, OR-REDC-RH-HET

Waste Stream Description: CH and RH heterogeneous debris waste from Building 7920 at ORNL

AK Documentation Type: ☐ TRU Waste Management Program Information ☒ Waste Stream Specific Information ☒ Supporting Information

AK Source Document Discrepancy Form Tracking Number: **DR008**

Tracking #	*Category* °	*Title*	*Doc/Rev #*	*Author*	*Date*	*Publisher*	*Page #*
C078	Corr.	Memo to Bryan Roy transmitting Historical Survey – RCRA Information	N/A	J. W. Moore.	4/04/05	N/A	chem. list Pg. 1
DR005	Disc.	EPA Hazardous Waste Number Discrepancies	N/A	K. Peters	6/24/08	CCP	All
DR602	Disc.	EPA Hazardous Waste Number Discrepancies	N/A	K. Peters	7/2/08	CCP	All
I042	Corr.	AKE Memo and Potential Hazardous Constituents in ORNL Wastes	N/A	B. Humphrey, J. S. Burt	5/23/06	N/A	Throughout
M022	Unpub.	MSDSs for REDC CH and RH Waste	N/A	N/A	Various	Various	Desicote
P114	Pub.	Chemical Technology Division Annual Progress Report Period Ending 3/31/1971	ORNL-4682	N/A	7/1971	ORNL	125
U044	Unpub.	Acceptable Knowledge Summary Report for Oak Ridge National Laboratory Contact-Handled TRU Debris Waste	AK-ORNL-001, Rev. 4	Weston Solutions, Inc.	6/19/06	N/A	104, 105
U529	Unpub.	Technical Notebook – Charles Alexander, Building 7920	B000334	C. Alexander	12/11/85-7/29/88	N/A	1

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DATE REC'D 4/3/14
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Nature of Discrepancy:

A majority of the AK sources used for development of CCP AK Summary Reports CCP-AK-ORNL-002 (CH waste) and CCP-AK-ORNL-500 (RH waste) were originally collected by Weston Solutions, Inc. (Weston) for characterization of ORNL TRU waste streams. Weston's research culminated with the *Acceptable Knowledge Summary Report for Oak Ridge National Laboratory Contact-Handled TRU Debris Waste Facility Maintenance Operations* (U044) dated 6/19/2006. This report includes containers of debris waste generated in the REDC (Buildings 7920 and 7930) and the Transuranium Research Laboratory (Building 5505) that were combined into waste stream ORFWENC-007. The following EPA hazardous waste numbers were assigned to waste stream ORFWENC-007: F001, F002, F004, F005, D004, D005, D006, D007, D008, D009, D010, D011, and D022.

The development of the CCP AK Summary Reports identified several discrepancies with the Weston EPA hazardous waste number assignment. Discrepancy resolution DR005 was prepared to resolve the inconsistencies documented in these two characterization programs. Based on DR005, the following hazardous waste numbers EPA HWNs were assigned to the REDC CH and RH debris waste: F002, F005, D005, D006, D007, D008, D009, D010, D011, and D019.

During the ORNL RH Waste Certification Audit, it was noted that the assignment of EPA hazardous waste numbers for other chemicals was not well supported for chemicals including benzene, methyl ethyl ketone (MEK), 1,1,2-trichloroethane, and selenium. Source document C078 contains an inventory list of chemicals. This inventory list was reviewed by REDC personnel and chemical potentially present were identified with hand written circles, check marks, and notes, which are difficult to interpret. Discrepancy resolution DR602 was written to address the issues resulting from the ORNL RH Waste Certification Audit. It was determined that benzene and 1,1,2-trichloroethane were indeed applicable to the REDC waste, but MEK and selenium were not applicable to the REDC waste.

DR602 also states that ongoing chemical use research is currently being conducted for the process development laboratories, and that during this review of the AK documentation, additional research will be conducted to augment the chemical use in the REDC. As a result of this ongoing research, uses/sources in Building 7920 were identified for arsenic, selenium, and 1,1,1-trichloroethane.

Resolution:

EPA hazardous waste number D004 (arsenic) was originally identified in the Weston AK (U044) as applicable to waste stream ORFWENC-007 which as described above includes waste from Building 7920. A review of the source documentation that supported the assignment of D004 to waste stream ORFWENC-007 (I042) determined that is was not applicable to Building 7920 (refer to DR005) and was therefore not assigned to CCP waste streams OR-REDC-CH-HET and OR-REDC-RH-HET. However, a source has been found for arsenic use in Building 7920. Section 5 of a 1971 Chemical Technology Division report (P114) describes transuranium element processing at the Transuranium Processing Plant and the High Flux Isotope Reactor. The Transuranium Processing Plant was the name used for Building 7920 before being renamed REDC. Section 5.5 of P114 describes transplutonium element research that would most likely have occurred in the Building 7920 process development labs. One of the activities involved actinide and lanthanide hydride and metallide studies in which erbium-arsenic and americium-arsenic compounds were studied. The Weston AK did not identify this activity as a source for arsenic. Based on this finding, EPA hazardous waste number D004 will be applied to CCP waste streams OR-REDC-CH-HET and OR-REDC-RH-HET.

EPA hazardous waste number D010 (selenium) was originally identified in the Weston AK (U044) as applicable to waste stream ORFWENC-007 and was assigned to CCP waste streams OR-REDC-CH-HET and OR-REDC-RH-HET because it was identified in an REDC chemical inventory (C078). As a result of DR602, EPA hazardous waste number D010 was going to be removed from the CCP waste streams, but ongoing research has identified a source for selenium use in Building 7920. Selenium compounds (erbium-selenium and americium-selenium) were used in the same actinide and lanthanide hydride and metallide studies discussed above for arsenic (P114). Based on this finding, EPA hazardous waste number D010 will NOT be removed from CCP waste streams OR-REDC-CH-HET and OR-REDC-RH-HET.

EPA hazardous waste number F002 was originally identified in the Weston AK (U044) as applicable to waste stream ORFWENC-007 due to the use of Freon, 1,1,2,trichloroethane, tetrachloroethylene, and trichloroethylene. Several source documents identified the use of trichloroethylene in Building 7920, but as described in DR005, it was determined that Freon and tetrachloroethylene were not applicable to waste from Building 7920. As described in DR602, the only AK source identified for 1,1,2-trichloroethane was C078 (chemical inventory list). The use of this solvent was not identified and the process of use is unknown; however, without the availability of additional information to verify that this chemical was not used in the REDC areas contaminating the RH and CH debris waste streams, EPA hazardous waste number F002 for 1,1,2-trichloroethane will be assigned to the CCP waste streams. Ongoing research has also identified the F002-listed solvent 1,1,1-trichloroethane as being used in Building 7920. A logbook from the mid-1980s for Labs 110 and 111 in Building 7920 identified the use of a product named Desicote (U529). Desicote is a rinsing aid that contains 1,1,1-trichloroethane (M022). Therefore, EPA hazardous waste number F002 for 1,1,1-trichloroethane, 1,1,2-trichloroethane, and trichloroethylene will be assigned to CCP waste streams OR-REDC-CH-HET and OR-REDC-RH-HET.

Discrepancy Resolved: ☒ Yes ☐ No

Acceptable Knowledge Expert: Jeff Harrison / [signature] Date: 9/9/08
Print Sign

Site Project Manager: Candice Weston / [signature] Date: 09/10/08
Print Sign

[a] Published Document or Controlled Database (Pub.); Unpublished Data (Unpub.); Internal Procedure or Note (Proc.); Correspondence (Corr.) or Discrepancy (Disc.)

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Attachment 3 - Acceptable Knowledge Source Document Summary

Site(s): Oak Ridge National Laboratory	Source Document Tracking Number: DR013
Waste Stream Number(s): ORNL Non-specific Library Files (Applicable only when site library is not in use)	
Acceptable Knowledge Documentation Type: ☑ TRU Waste Management Program Information ☑ Waste Stream-Specific Information ☑ Additional Information	Category: ☐ Correspondence ☐ Discrepancy Resolution ☐ Internal Procedure ☐ Miscellaneous ☑ Published Document or Internal Procedure ☐ Unpublished Documents
Title or Description of Source Document [a]: Discrepancy Resolution re: NFS Soil and Debris EPA Hazardous Waste Numbers	
Source Document Reference Information (author(s), document and revision number, date, publisher): J. Harrison, DR013, 1, 01/24/2011	

AK # [b]	Source Doc. Page # [c]	AK Information Summary
PR7, WS1, WS2, WS3, WS4, WS8, WS9, WS12, S9	Throughout	Nature of Discrepancy: Nature of Discrepancy: NFS characterized the soil (waste stream OR-NFS-CH-SOIL) and debris (waste stream OR-NFS-CH-HET-A) as nonhazardous waste, and ORNL has continued to manage the soil and debris as nonhazardous waste since receiving it from NFS. The majority of the AK documentation reviewed supports this nonhazardous characterization, but there is evidence that the soil may be an F-listed hazardous waste. Debris waste stream OR-NFS-CH-HET-A includes drums containing small amounts of soil. In addition to being F-listed, the S5000 debris waste stream OR-NFS-CH-HET-A is assigned metal EPA hazardous waste numbers D006 (cadmium), D008 (lead), D009, mercury, and D011 (silver), and even though both the soil and debris waste streams originated from the same locations, these metal codes do not apply to OR-NFS-CH-SOIL. See DR001 for additional information on metals in debris waste stream OR-NFS-CH-HET-A. Resolution: Toxicity Characteristic Metal EPA Hazardous Waste Numbers The sources for the metal codes assigned to S5000 debris waste stream OR-NFS-CH-HET-A is as follows: D006 – Cadmium in paint and cadmium-coated hand tools. D008 – Solder in circuit boards contained in electrical equipment. D009 – Alkaline batteries, cleanup of mercury from a regulator gauge discovered on the bottom of a glovebox, and Building 110 tank contents. D011 – Solder in circuit boards contained in electrical equipment. Both the debris and soil waste streams originated primarily from decommissioning of Building 234. The debris was from within the building and concrete from the building floor, and the soil was from beneath the floor. Other sources contributing to both waste streams were the excavation of waste from the NFS burial ground (1 box) and excavation of the Building 110 underground tank. The drums of soil originating from beneath Building 234 and the Building 110 tank contain only soil, rock, and absorbent. Therefore, the sources for D006, D008, D009, and

NTPC RECORDS ORIGINAL
DATE REC'D 12/18/13

Attachment 3 - Acceptable Knowledge Source Document Summary (continued)

Site(s): Oak Ridge National Laboratory		Source Document Tracking Number: DR013
AK # [b]	Source Doc. Page #[c]	AK Information Summary
		D011 in the debris waste stream would not apply to the soil waste stream. In addition, NFS sampled and analyzed soil samples from beneath Building 234 and from the area surrounding the Building 110 tank. No metals were detected above the regulatory threshold level (RTL) in any of these samples. The only question is whether the 1 box (X10C0506154) from excavation of the NFS burial ground could contain these metals above regulatory levels. NFS did not sample the soil from the area around the waste generated from excavation of the burial ground. The container paperwork completed by NFS for the box indicated it contained both soil and debris (M003). The soil was interstitial soil from the burial ground (M132). The TWPC recently repackaged the waste in this box into 30 drums and segregated the soil into 5 of these 30 drums (M075). Because of this segregation, the sources for D006, D008, and D011 in the debris waste stream would not apply to this waste. Alkaline batteries containing mercury would also not apply to the soil. The other two sources for mercury (i.e., gauges and tank contents) are possible sources if these materials were disposed of in the NFS burial ground. Three samples were collected from the contents of the Building 110 tank. In two of the samples, all metals were below the RTL, and in the third sample mercury was detected right at the RTL (U043). So overall the tank contents would not be hazardous for mercury. In addition, soil samples from around the tank were below the RTL so one could surmise that if the soil from the burial ground was contaminated with the tank contents, it would be diluted to a point below the RTL. The TWPC uses amalgamating agents for treatment of mercury (P432). The repack forms for the debris waste from the X10C0506154 box do not identify any treated mercury nor do they identify equipment or other items that would have contained mercury (M075). NFS also consistently identified and characterized waste with mercury above the RTL as hazardous and assigned D009. This one box was characterized by NFS as nonhazardous waste (M003). For these reasons, EPA hazardous waste numbers D006, D008, D009, and D011 are not assigned to OR-NFS-CH-SOIL. F-Listed EPA Hazardous Waste Numbers The only listed solvents identified in the MOX fuel production process were methylene chloride and trichlorotrifluoroethane contained in a binder material; however, these solvents do not meet the definition of an F-listed waste (Reference P273). In addition, this binder material would not be a contaminant of the soil. No organic constituents were detected in the 11 soil samples collected from beneath the Building 234 Wet Chemistry Cell, and no organics constituents were detected above the regulatory threshold in any of the seven soil samples from the area around the Building 110 underground waste tank (References I053, U043). The F-listed solvent tetrachloroethylene was detected in one of two composite soil samples from beneath Building 234 in trace amounts (0.042 mg/L). The soil from Building 234 in this waste stream is from beneath the Wet Chemistry Cell, but the sample that contained tetrachloroethylene was collected from other locations beneath and around Building 234, not under the Wet Chemistry Cell (Reference C122). Tetrachloroethylene was not used in the Building 234 Wet Chemistry Cell or any other part of the MOX fuel production process, nor was it used in the decommissioning process. However, at one time this solvent was used in a maintenance facility located elsewhere on the NFS site and has also been detected in groundwater samples up-gradient from Building 234. The source of the tetrachloroethylene in the groundwater may be from its use in off-site facilities and may be the source of contamination for the sampled soil (Reference C309). Even though tetrachloroethylene was detected in a soil sample collected from areas in Building 234 that are not part of this soil waste stream, OR-NFS-CH-SOIL will be assigned EPA hazardous waste number F002. This is because tetrachloroethylene was found in site groundwater and was historically a common industry solvent. And because it was found in groundwater, it is assumed that soil originating anywhere on the NFS site could be contaminated with tetrachloroethylene. Also, the fact that F-listed hazardous waste numbers are assigned

Attachment 3 - Acceptable Knowledge Source Document Summary (continued)

Site(s): Oak Ridge National Laboratory		Source Document Tracking Number: DR013
AK # [b]	Source Doc. Page # [c]	AK Information Summary
		based on process knowledge and are not concentration-based led to this conservative assignment. Also, because debris waste stream OR-NFS-CH-HET-A includes drums containing small amounts of soil, EPA hazardous waste number F002 for tetrachloroethylene is assigned to this waste stream. Analytical data for samples collected in 1993 from beneath the Wet Cell prior to the initial 1993 excavation, which best represent the soil from the initial phase of decommissioning in this waste stream, had not been located until recently. No organic constituents were detected in these three soil samples (Reference P1402). However, as described in Section C4-3b of the WIPP-WAP, "if different sources of information indicate different hazardous wastes are present, then sites shall include all sources of information in its records and may choose to either conservatively assign hazardous waste numbers or assign only those numbers deemed appropriate and consistent with RCRA requirements." Therefore, waste streams OR-NFS-CH-SOIL and OR-NFS-CH-HET-A will retain EPA hazardous waste number F002 for tetrachloroethylene.

Source Document Data Limitations (if any):

1. None.

Acceptable Knowlege Expert:

Travis Smith _____ Date: 11/18/2013

Print /Sign

[a] Provide description for non-titled information (i.e., container paperwork, MSDS sheets, etc)
[b] Obtain from Acceptable Knowledge Documentation Checklist
[c] For microfilm or microfiche, identify box, tape, reel number and location.

Attachment 11 - Acceptable Knowledge Source Document Discrepancy Resolution (NFS Soil and Debris EPA Hazardous Waste Numbers)

Waste Stream Number(s): OR-NFS-SOIL, OR-NFS-CH-HET-A

Waste Stream Description: Soil and debris waste from NFS

AK Documentation Type: ☒TRU Waste Management Program Information ☒Waste Stream Specific Information ☒Supporting Info.

AK Source Document Discrepancy Form Tracking Number: **DR013, Revision 1**

Tracking #	*Category* [a]	*Title*	*Doc/Rev #*	*Author*	*Publisher*	*Date*	*Page #*
N/A	Pub.	Central Characterization Project Acceptable Knowledge Summary Report For Nuclear Fuel Services Contact-Handled Transuranic Waste Stored at Oak Ridge National Laboratory, Waste Streams OR-NFS-CH-HET-A and OR-NFS-CH-SOIL	CCP-AK-ORNL-001, Rev. 4	CCP	N/A	5/26/09	33, 34, 48, 49
C122	Corr.	Building 234 Characterization Results, Memo to Heather Little	DCM-03-18, 44T-99-0436, GPC-99-013	G. Craig	N/A	9/30/99	6 of 11
C309	Corr.	Record of Communication. Subject: NFS Soil Sampling/Analysis Data and Tetrachloroethylene Use.	N/A	J. Harrison	N/A	6/4/08	All
I053	Unpub.	KAPL-TN Waste Profile for NFS Building 234 Soil	44G-03-1050, WST-20, JWP-03-009	J. Pugh	N/A	9/11/03	Attachment 3
M003	Unpub.	ORNL UCN-2109 and UCN-2822 Forms for NFS TRU Waste and Related Paperwork	See title	ORNL/NFS	N/A	Various	X10C0506154
M075	Unpub.	TWPC Contact-Handled Waste Repackaging Forms	Attachment D	EnergX	N/A	Various	X10C0506154
M132	Unpub.	Evaluation of Additional Containers for Waste Stream OR-NFS-CH-SOIL	N/A	J. Harrison	N/A	9/24/08	1

Tracking #	Category [a]	Title	Doc/Rev #	Author	Publisher	Date	Page #
P273	Pub.	Nuclear Fuel Services, Inc., Waste Certification Plan for Transuranic Waste	28G-91-001, DCM-03-05	EcoTek	N/A	7/91, 2/92, 11/92	Appendix A, Pg 10
P432	Pub.	TRU Waste Processing Center Documented Safety Analysis	CM-R-AD-001, Revs. 15, 16, 17	EnergX	N/A	10/31/07 12/20/07 10/24/08	Sec. 2.5.2.1
P1402	Pub.	234 Wet Cell Characterization Summary	DCM-03-017-002	M. Wetherill	N/A	5/28/10	Reference 1
U043	Unpub.	Final Report - Waste Characterization of Wastes Generated from D&D Activity; Buildings 110 and 234 on the NFS Site in Erwin, Tennessee	N/A	Martin Marietta Energy Systems, Inc.	N/A	1/31/92	Lab tank contents

Nature of Discrepancy: NFS characterized the soil (waste stream OR-NFS-CH-SOIL) and debris (waste stream OR-NFS-CH-HET-A) as nonhazardous waste, and ORNL has continued to manage the soil and debris as nonhazardous waste since receiving it from NFS. The majority of the AK documentation reviewed supports this nonhazardous characterization, but there is evidence that the soil may be an F-listed hazardous waste. Debris waste stream OR-NFS-CH-HET-A includes drums containing small amounts of soil. In addition to being F-listed, the S5000 debris waste stream OR-NFS-CH-HET-A is assigned metal EPA hazardous waste numbers D006 (cadmium), D008 (lead), D009, mercury, and D011 (silver), and even though both the soil and debris waste streams originated from the same locations, these metal codes do not apply to OR-NFS-CH-SOIL. See DR001 for additional information on metals in debris waste stream OR-NFS-CH-HET-A.

Resolution:

Toxicity Characteristic Metal EPA Hazardous Waste Numbers

The sources for the metal codes assigned to S5000 debris waste stream OR-NFS-CH-HET-A is as follows:
D006 – Cadmium in paint and cadmium-coated hand tools.
D008 – Solder in circuit boards contained in electrical equipment.
D009 – Alkaline batteries, cleanup of mercury from a regulator gauge discovered on the bottom of a glovebox, and Building 110 tank contents.
D011 – Solder in circuit boards contained in electrical equipment.

Both the debris and soil waste streams originated primarily from decommissioning of Building 234. The debris was from within the building and concrete from the building floor, and the soil was from beneath the floor. Other sources contributing to both waste streams were the excavation of waste from the NFS burial ground (1 box) and excavation of the Building 110 underground tank. The drums of soil originating from beneath Building 234 and the Building 110 tank contain only soil, rock, and absorbent. Therefore, the sources for D006, D008, D009, and D011 in the debris waste stream would not apply to the soil waste stream. In addition, NFS sampled and analyzed soil samples from beneath Building 234 and from the area surrounding the Building 110 tank. No metals were detected above the regulatory threshold level (RTL) in any of these samples.

The only question is whether the 1 box (X10C0506154) from excavation of the NFS burial ground could contain these metals above regulatory levels. NFS did not sample the soil from the area around the waste generated from excavation of the burial ground. The container paperwork completed by NFS for the box indicated it contained both soil and debris (M003). The soil was interstitial soil from the burial ground (M132). The TWPC recently repackaged the waste in this box into 30 drums and segregated the soil into 5 of these 30 drums (M075). Because of this segregation, the sources for D006, D008, and D011 in the debris waste stream would not apply to this waste. Alkaline batteries containing mercury would also not apply to the soil. The other two sources for mercury (i.e., gauges and tank contents) are possible sources if these materials were disposed of in the NFS burial ground. Three samples were collected from the contents of the Building 110 tank. In two of the samples, all metals were below the RTL, and in the third sample mercury was detected right at the RTL (U043). So overall the tank contents would not be hazardous for mercury. In addition, soil samples from around the tank were below the RTL so one could surmise that if the soil from the burial ground was contaminated with the tank contents, it would be diluted to a point below the RTL. The TWPC uses amalgamating agents for treatment of mercury (P432). The repack forms for the debris waste from the X10C0506154 box do not identify any treated mercury nor do they identify equipment or other items that would have contained mercury (M075). NFS also consistently identified and characterized waste with mercury above the RTL as hazardous and assigned D009. This one box was characterized by NFS as nonhazardous waste (M003). For these reasons, EPA hazardous waste numbers D006, D008, D009, and D011 are not assigned to OR-NFS-CH-SOIL.

F-Listed EPA Hazardous Waste Numbers

The only listed solvents identified in the MOX fuel production process were methylene chloride and trichlorotrifluoroethane contained in a binder material; however, these solvents do not meet the definition of an F-listed waste (Reference P273). In addition, this binder material would not be a contaminant of the soil.

No organic constituents were detected in the 11 soil samples collected from beneath the Building 234 Wet Chemistry Cell, and no organics constituents were detected above the regulatory threshold in any of the seven soil samples from the area around the Building 110 underground waste tank (References I053, U043). The F-listed solvent tetrachloroethylene was detected in one of two composite soil samples from beneath Building 234 in trace amounts (0.042 mg/L). The soil from Building 234 in this waste stream is from beneath the Wet Chemistry Cell, but the sample that contained tetrachloroethylene was collected from other locations beneath and around Building 234, not under the Wet Chemistry Cell (Reference C122). Tetrachloroethylene was not used in the Building 234 Wet Chemistry Cell or any other part of the MOX fuel production process, nor was it used in the decommissioning process. However, at one time this solvent was used in a maintenance facility located elsewhere on the NFS site and has also been detected in groundwater samples up-gradient from Building 234. The source of the tetrachloroethylene in the groundwater may be from its use in off-site facilities and may be the source of contamination for the sampled soil (Reference C309).

Even though tetrachloroethylene was detected in a soil sample collected from areas in Building 234 that are not part of this soil waste stream, OR-NFS-CH-SOIL will be assigned EPA hazardous waste number F002. This is because tetrachloroethylene was found in site groundwater and was historically a common industry solvent. And because it was found in groundwater, it is assumed that soil originating anywhere on the NFS site could be contaminated with tetrachloroethylene. Also, the fact that F-listed hazardous waste numbers are assigned based on process knowledge and are not concentration-based led to this conservative assignment. Also, because debris waste stream OR-NFS-CH-HET-A includes drums containing small amounts of soil, EPA hazardous waste number F002 for tetrachloroethylene is assigned to this waste stream.

Analytical data for samples collected in 1993 from beneath the Wet Cell prior to the initial 1993 excavation, which best represent the soil from the initial phase of decommissioning in this waste stream, had not been located until recently. No organic constituents were detected in these three soil samples (Reference P1402). However, as described in Section C4-3b of the WIPP-WAP, "if different sources of information indicate different hazardous wastes are present, then sites shall include all sources of information in its records and may choose to either conservatively assign hazardous waste numbers or assign only those numbers deemed appropriate and consistent with RCRA requirements." Therefore, waste streams OR-NFS-CH-SOIL and OR-NFS-CH-HET-A will retain EPA hazardous waste number F002 for tetrachloroethylene.

Discrepancy Resolved: ☒ Yes ☐ No

Acceptable Knowledge Expert: Jeff Harrison (Print) / Jeff Harrison (Sign) Date: 1/24/11

Site Project Manager: Rich Kantrowitz (Print) / [signature] (Sign) Date: 1/24/11

[a] Published Document or Controlled Database (Pub.); Unpublished Data (Unpub.); Internal Procedure or Note (Proc.); Correspondence (Corr.) or Discrepancy (Disc.)

DIVIDER PAGE

Attachment 3 - Acceptable Knowledge Source Document Summary

Site(s): Oak Ridge National Laboratory	Source Document Tracking Number: DR030
Waste Stream Number(s): ORNL Non-specific Library Files (Applicable only when site library is not in use)	
Acceptable Knowledge Documentation Type: ☐ TRU Waste Management Program Information ☑ Waste Stream-Specific Information ☑ Additional Information	Category: ☐ Correspondence ☑ Discrepancy Resolution ☐ Internal Procedure ☐ Miscellaneous ☐ Published Document or Internal Procedure ☐ Unpublished Documents
Title or Description of Source Document [a]: Discrepancy Resolution re: Drum NFS0929	
Source Document Reference Information (author(s), document and revision number, date, publisher): J. Harrison, DR030, NA, 01/10/2011	

AK # [b]	Source Doc. Page # [c]	AK Information Summary
WS1, WS6, WS9, S9	Throughout	Nature of Discrepancy: The container paperwork (M003) for drum NFS0929 indicates the drum contains three 2-liter bottles. Based on an initial review of the WEAF RTR data (M068), the drum contained homogeneous solids as well as debris waste, but the debris waste appeared to be greater than 50 percent, by volume. For this reason, this drum was included in waste stream OR-NFS-CH-HET-A (DR006). However, a more thorough review of the WEAF RTR (M202) identified eight 2-liter bottles; four bottles containing a dark solid material (assumed to be grouted fines) and four bottles containing metal (fines, scrap, tools) suspended in a transparent resin material (assumed to be an organic polymer absorbent). RTR also observed a cut up 5-gallon plastic bucket. Resolution: The combination of 2-liter bottles containing grouted fines and 2-liter bottles containing organic polymer absorbent with miscellaneous metal mixed in is consistent with other drums in homogeneous waste stream OR-NFS-CH-HOM-A. Therefore, NFS0929 is being moved from waste stream OR-NFS-CH-HET-A to waste stream OR-NFS-CH-HOM-A.

NTPC RECORDS ORIGINAL
DATE REC'D 12/15/13

Attachment 3 - Acceptable Knowledge Source Document Summary (continued)

Site(s): Oak Ridge National Laboratory	Source Document Tracking Number: DR030
Source Document Data Limitations (if any): 1. None	
Acceptable Knowlege Expert: Travis Smith _____ Date: 11/18/2013 Print /Sign	
[a] Provide description for non-titled information (i.e., container paperwork, MSDS sheets, etc) [b] Obtain from Acceptable Knowledge Documentation Checklist [c] For microfilm or microfiche, identify box, tape, reel number and location.	

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Attachment 11 - Acceptable Knowledge Source Document Discrepancy Resolution – Drum NFS0929

Waste Stream Number(s): OR-NFS-CH-HET-A, OR-NFS-CH-HOM-A

Waste Stream Description: Heterogeneous debris waste and immobilized homogeneous waste from NFS

AK Documentation Type: ☐ TRU Waste Management Program Information ☒ Waste Stream Specific Information ☒ Supporting Information

AK Source Document Discrepancy Form Tracking Number: **DR030**

Tracking #	Category*	Title	Document #	Date	Page #
DR006	Disc.	Attachment 11 - Acceptable Knowledge Source Document Discrepancy Resolution (Physical Form of NFS0116 & NFS0929)	NA	11/30/07	All
M003	Unpub.	ORNL UCN-2109 and UCN-2822 Forms for NFS TRU Waste and Related Paperwork	NA	Various	NFS0929
M068	Unpub.	Review of WEAF RTR Video Tapes	NA	11/27/07	5
M202	Unpub.	Review of WEAF RTR Videos for NFS Immobilized Liquids and Fines	NA	10/14/10	29

Nature of Discrepancy: The container paperwork (M003) for drum NFS0929 indicates the drum contains three 2-liter bottles. Based on an initial review of the WEAF RTR data (M068), the drum contained homogeneous solids as well as debris waste, but the debris waste appeared to be greater than 50 percent, by volume. For this reason, this drum was included in waste stream OR-NFS-CH-HET-A (DR006). However, a more thorough review of the WEAF RTR (M202) identified eight 2-liter bottles; four bottles containing a dark solid material (assumed to be grouted fines) and four bottles containing metal (fines, scrap, tools) suspended in a transparent resin material (assumed to be an organic polymer absorbent). RTR also observed a cut up 5-gallon plastic bucket.

Resolution: The combination of 2-liter bottles containing grouted fines and 2-liter bottles containing organic polymer absorbent with miscellaneous metal mixed in is consistent with other drums in homogeneous waste stream OR-NFS-CH-HOM-A. Therefore, NFS0929 is being moved from waste stream OR-NFS-CH-HET-A to waste stream OR-NFS-CH-HOM-A.

Discrepancy Resolved: ☒ Yes ☐ No

Acceptable Knowledge Expert: Jeff Harrison / Jeff Harrison Date: 1/10/2011
Print Sign

Site Project Manager: Richard Kantrowitz / Richard Kantrowitz Date: 1/10/11
Print Sign

[a] Published Document or Controlled Database (Pub.); Unpublished Data (Unpub.); Internal Procedure or Note (Proc.); Correspondence (Corr.) or Discrepancy (Disc.)

DIVIDER PAGE

Attachment 3 - Acceptable Knowledge Source Document Summary

Site(s): Oak Ridge National Laboratory	Source Document Tracking Number: DR031
Waste Stream Number(s): ORNL Non-specific Library Files (Applicable only when site library is not in use)	
Acceptable Knowledge Documentation Type: ☑ TRU Waste Management Program Information ☑ Waste Stream-Specific Information ☑ Additional Information	Category: ☐ Correspondence ☑ Discrepancy Resolution ☐ Internal Procedure ☐ Miscellaneous ☐ Published Document or Internal Procedure ☐ Unpublished Documents
Title or Description of Source Document [a]: Discrepancy Resolution re: OR-NFS-CH-HOM-A EPA Hazardous Waste Number Assignment	
Source Document Reference Information (author(s), document and revision number, date, publisher): Jeff Harrison, DR031, NA, 01/10/2011	

AK # [b]	Source Doc. Page #[c]	AK Information Summary
PR7, WS1, WS8, WS9, WS12, S9	Throughout	Nature of Discrepancy: The immobilized homogeneous solids waste in 2-liter bottles was characterized by NFS as nonhazardous waste with the exception of drum NFS0929 which was assigned D006 (cadmium) and D009 (mercury) (M003, M198). Resolution: Analytical data from six process line samples of sweepings material identified a few samples above the regulatory level for arsenic, barium, and cadmium (C20S, M064, P273, U043). Arsenic was reported in one of six samples at 5.7 mg/L which is just slightly above the regulatory level of 5.0 mg/L. The other samples are below the regulatory level for arsenic. Barium was reported in three of six samples at 124 mg/L, 222 mg/L, and 301 mg/L which are above the regulatory level of 100 mg/l. However, the trip blank was also high in barium. The barium may have been introduced from one of the extraction columns used in the analysis which is a problem encountered periodically. Therefore, EPA hazardous waste numbers D004 (arsenic) and D009 (barium) are not assigned to this waste stream. Cadmium was reported in four of six samples at 1.2 mg/L, 1.3 mg/l, 1.S mg/L, and 24 mg/L which are above the regulatory level of 1.0 mg/L. The 24 mg/L cadmium value was outside the expected distribution from the other sample points, and consequently, this area was re-sampled. A sample composite was made of three parts new sample to one part previous sample. The result of the composite sample was 6.27 mg/L. A cadmium-coated wrench is located in one of the 2-liter bottles containing absorbent in drum NFS0929 (C210, M003, U043). Waste was also generated from the cleanup of mercury from a regulator gauge located inside a glovebox. The liquid mercury was wiped up from the glovebox floor using cheesecloth. The mercury contaminated cleanup material, and other mercury contaminated waste from the floor of the glovebox (e.g., plexiglass and small metal items) were solidified in a zinc amalgam in 2-liter bottles in drum NFS0929 (C204, C210, M052). Therefore, EPA hazardous waste numbers D006 (cadmium) and D009 (mercury) are assigned to waste stream OR-NFS-CH-HOM-A. EPA hazardous waste numbers D008 (lead) and D011 (silver) are assigned to debris waste

NTPC RECORDS ORIGINAL
DATE REC'D 12/15/13

Attachment 3 - Acceptable Knowledge Source Document Summary (continued)

Site(s): Oak Ridge National Laboratory		Source Document Tracking Number: DR031
AK # [b]	Source Doc. Page #[c]	AK Information Summary
		stream OR-NFS-CH-HET-A. The basis for these assignments to the debris waste stream were evaluated to determine if they would be applicable to waste stream OR-NFS-CH-HOM-A. The source of lead and silver is from tin/lead solder and silver solder in circuit boards contained in electrical equipment. OR-NFS-CH-HOM-A consists of grouted fines and absorbed liquids which would not contain tin/lead solder or silver solder. There are also miscellaneous metals in the waste such as sweepings, scrap, hardware (nuts, bolts, etc.), and hand tools. Electrical equipment was not identified by RTR in this waste.

Source Document Data Limitations (if any):

1. None

Acceptable Knowlege Expert:

Travis Smith _____ Date: 11/18/2013
Print /Sign

[a] Provide description for non-titled information (i.e., container paperwork, MSDS sheets, etc)
[b] Obtain from Acceptable Knowledge Documentation Checklist
[c] For microfilm or microfiche, identify box, tape, reel number and location.

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Attachment 11 - Acceptable Knowledge Source Document Discrepancy Resolution – OR-NFS-CH-HOM-A EPA Hazardous waste Numbers

Waste Stream Number(s): OR-NFS-CH-HOM-A

Waste Stream Description: Immobilized homogeneous waste from NFS

AK Documentation Type: ☒TRU Waste Management Program Information ☒Waste Stream Specific Information ☒Supporting Information

AK Source Document Discrepancy Form Tracking Number: **DR031**

Tracking #	*Category* [a]	*Title*	*Document #*	*Date*	*Page #*
C204	Corr.	Letter from Michael L. West, Nuclear Fuel Services, Inc., to Martin W. Tull, Martin Marietta Energy Systems.	NA	9/3/92	All
C205	Corr.	Internal Correspondence from Martin W. Tull. Minutes of November 5, 1991 Meeting with NFS Regarding Process-Line Samples	NA	11/11/91	All
C210	Corr.	Record of Communication. Subject: NFS TRU Waste Shipped to Oak Ridge National Laboratory.	NA	9/12/07	4
M003	Unpub.	ORNL UCN-2109 and UCN-2822 Forms for NFS TRU Waste and Related Paperwork	NA	Various	See drum list
M052	Unpub.	Logbook for the Decommissioning and Volume Reduction Facility	NA	12/6/90 – 6/2/94	239, 245
M064	Unpub.	Analytical Chemistry Data Package for NFS Sample Set No. 3.	NA	10/9/91	All
M198	Unpub.	eMWaste Database Query	DR-10-004417	8/30/10	See drum list
P273	Pub.	Nuclear Fuel Services, Inc., Waste Certification Plan for Transuranic Waste	28G-91-001, DCM-03-05	7/1991 – 11/1992	Appendix A
U043	Unpub.	Final Report - Waste Characterization of Wastes Generated from D&D Activity; Buildings 110 and 234 on the NFS Site in Erwin, Tennessee	NA	1/31/92	5 – 7

Nature of Discrepancy: The immobilized homogeneous solids waste in 2-liter bottles was characterized by NFS as nonhazardous waste with the exception of drum NFS0929 which was assigned D006 (cadmium) and D009 (mercury) (M003, M198).

Resolution: Analytical data from six process line samples of sweepings material identified a few samples above the regulatory level for arsenic, barium, and cadmium (C205, M064, P273, U043).

Arsenic was reported in one of six samples at 5.7 mg/L which is just slightly above the regulatory level of 5.0 mg/L. The other samples are below the regulatory level for arsenic. Barium was reported in three of six samples at 124 mg/L, 222 mg/L, and 301 mg/L which are above the regulatory level of 100 mg/L. However, the trip blank was also high in barium. The barium may have been introduced from one of the extraction columns used in the analysis which is a problem encountered periodically. Therefore, EPA hazardous waste numbers D004 (arsenic) and D005 (barium) are not assigned to this waste stream.

Cadmium was reported in four of six samples at 1.2 mg/L, 1.3 mg/L, 1.5 mg/L, and 24 mg/L which are above the regulatory level of 1.0 mg/L. The 24 mg/L cadmium value was outside the expected distribution from the other sample points, and consequently, this area was re-sampled. A sample composite was made of three parts new sample to one part previous sample. The result of the composite sample was 6.27 mg/L. A cadmium-coated wrench is located in one of the 2-liter bottles containing absorbent in drum NFS0929 (C210, M003, U043). Waste was also generated from the cleanup of mercury from a regulator gauge located inside a glovebox. The liquid mercury was wiped up from the glovebox floor using cheesecloth. The mercury contaminated cleanup material, and other mercury contaminated waste from the floor of the glovebox (e.g., plexiglass and small metal items) were solidified in a zinc amalgam in 2-liter bottles in drum NFS0929 (C204, C210, M052). Therefore, EPA hazardous waste numbers D006 (cadmium) and D009 (mercury) are assigned to waste stream OR-NFS-CH-HOM-A

EPA hazardous waste numbers D008 (lead) and D011 (silver) are assigned to debris waste stream OR-NFS-CH-HET-A. The basis for these assignments to the debris waste stream were evaluated to determine if they would be applicable to waste stream OR-NFS-CH-HOM-A. The source of lead and silver is from tin/lead solder and silver solder in circuit boards contained in electrical equipment. OR-NFS-CH-HOM-A consists of grouted fines and absorbed liquids which would not contain tin/lead solder or silver solder. There are also miscellaneous metals in the waste such as sweepings, scrap, hardware (nuts, bolts, etc.), and hand tools. Electrical equipment was not identified by RTR in this waste.

Discrepancy Resolved: ☒ Yes ☐ No

Acceptable Knowledge Expert: Jeff Harrison / Jeff Harrison Date: 1/10/2011
Print Sign

Site Project Manager: Richard Kantrowitz Richard Kantrowitz Date: 1/10/11
Print Sign

[a] Published Document or Controlled Database (Pub.); Unpublished Data (Unpub.); Internal Procedure or Note (Proc.); Correspondence (Corr.) or Discrepancy (Disc.)

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Attachment 3 - Acceptable Knowledge Source Document Summary

Site(s): Oak Ridge National Laboratory	Source Document Tracking Number: DR037
Waste Stream Number(s): ORNL Non-specific Library Files (Applicable only when site library is not in use)	
Acceptable Knowledge Documentation Type: ☑ TRU Waste Management Program Information ☑ Waste Stream-Specific Information ☑ Additional Information	Category: ☐ Correspondence ☑ Discrepancy Resolution ☐ Internal Procedure ☐ Miscellaneous ☐ Published Document or Internal Procedure ☐ Unpublished Documents
Title or Description of Source Document [a] : Discrepancy Resolution, re: Drum NFS0788A	
Source Document Reference Information (author(s), document and revision number, date, publisher): Jeff Harrison, DR037, NA, 12/19/2013, CCP	

AK # [b]	Source Doc. Page # [c]	AK Information Summary
PR7, PR8, WS1, WS6, WS8, WS9, WS12, S7	1-2	Nature of Discrepancy: NCR-ORNL-0872-13 was written because RTR of drum NFS0788A identified a AA battery which is potential hazardous waste not noted in the AK, and therefore, the waste does not match the waste stream description (CCP-AK-ORNL-001). Resolution: According to the attached e-mail from Don Coffey, the AA battery is inside one of the poly bottles that appears to contain absorbent. During the repackaging activity at the TWPC, only the poly bags were cut before they were placed inside the cardboard tubes. None of the poly bottles were opened during the venting of the poly bags. Therefore, the battery came from NFS. The original container paperwork for NFS0788 indicates this drum was packaged in 1993 (M003). Nothing in this paperwork identifies the presence of a battery. Since the contents of the poly bottles were not examined during repackaging at the TWPC, and RTR cannot determine the type of battery, it is assumed the AA battery could be alkaline or nickel-cadmium. Alkaline batteries produced before 1993 could contain mercury above the RCRA limit, and nickel-cadmium batteries contain cadmium above the RCRA limit. Therefore this battery is assumed to be hazardous waste assigned EPA hazardous waste numbers 0006 and 0009. Waste stream OR-NFS-CH-HOM-A is already assigned EPA hazardous waste numbers 0006 and 0009 for other reasons. Since the presence of this single AA battery does not change the waste matrix code, and EPA hazardous waste numbers 0006 and D009 are already assigned to this waste stream, an AK re-evaluation is not required. CCP-AK-ORNI-001 will be revised to include "batteries (e.g., alkaline or nickel-cadmium)" in the waste stream description, and the RCRA section of CCP-AK-ORNI-001 will be revised to identify alkaline and nickel-cadmium batteries as a source for mercury and cadmium, respectively.

CCP RECORDS ORIGINAL
DATE REC'D 10/21/2014

Attachment 3 - Acceptable Knowledge Source Document Summary (continued)

Site(s): Oak Ridge National Laboratory	Source Document Tracking Number: DR037
Source Document Data Limitations (if any): 1. None.	
Acceptable Knowlege Expert: Travis Smith / Travis Smith Date: 02/24/2014 Print /Sign	
[a] Provide description for non-titled information (i.e., container paperwork, MSDS sheets, etc) [b] Obtain from Acceptable Knowledge Documentation Checklist [c] For microfilm or microfiche, identify box, tape, reel number and location.	

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Attachment 11 - Acceptable Knowledge Source Document Discrepancy Resolution

Waste Stream Number(s): OR-NFS-CH-HOM-A

Waste Stream Description: Immobilized liquids and fines from NFS

AK Source Document Discrepancy Form Tracking Number: **DR037**

Tracking #	Title	Document/Rev#	Author	Date	Page #
N/A	CCP Nonconformance Report (NCR)	NCR-ORNL-0872-13	CCP	12/10/13	1
N/A	E-mail from Don Coffey	N/A	D. Coffey	12/19/13	1
N/A	Central Characterization Program Acceptable Knowledge Summary Report For Nuclear Fuel Services Contact-Handled Transuranic Waste Stored at Oak Ridge National Laboratory	CCP-AK-ORNL-001, Rev. 8	CCP	12/12/13	78, 79, 85, 86
M003	ORNL UCN-2109 and UCN-2822 Forms for NFS TRU Waste and Related Paperwork for Waste Stored at ORNL (container paperwork)	N/A	NFS	Various	NFS0788

Nature of Discrepancy: NCR-ORNL-0872-13 was written because RTR of drum NFS0788A identified a AA battery which is potential hazardous waste not noted in the AK, and therefore, the waste does not match the waste stream description (CCP-AK-ORNL-001).

Resolution: According to the attached e-mail from Don Coffey, the AA battery is inside one of the poly bottles that appears to contain absorbent. During the repackaging activity at the TWPC, only the poly bags were cut before they were placed inside the cardboard tubes. None of the poly bottles were opened during the venting of the poly bags. Therefore, the battery came from NFS.

The original container paperwork for NFS0788 indicates this drum was packaged in 1993 (M003). Nothing in this paperwork identifies the presence of a battery. Since the contents of the poly bottles were not examined during repackaging at the TWPC, and RTR cannot determine the type of battery, it is assumed the AA battery could be alkaline or nickel-cadmium.

NTPC RECORDS ORIGINAL
DATE REC'D 7-7-14

Alkaline batteries produced before 1993 could contain mercury above the RCRA limit, and nickel-cadmium batteries contain cadmium above the RCRA limit. Therefore this battery is assumed to be hazardous waste assigned EPA hazardous waste numbers D006 and D009. Waste stream OR-NFS-CH-HOM-A is already assigned EPA hazardous waste numbers D006 and D009 for other reasons.

Since the presence of this single AA battery does not change the waste matrix code, and EPA hazardous waste numbers D006 and D009 are already assigned to this waste stream, an AK re-evaluation is not required. CCP-AK-ORNL-001 will be revised to include "batteries (e.g., alkaline or nickel-cadmium)" in the waste stream description, and the RCRA section of CCP-AK-ORNL-001 will be revised to identify alkaline and nickel-cadmium batteries as a source for mercury and cadmium, respectively.

Discrepancy Resolved: ☒ Yes ☐ No

Acceptable Knowledge Expert: Jeff Harrison / Jeffrey L. Harrison Date: 12/19/13
Print Sign

Site Project Manager: Beverly Schrock / BSSchrock Date: 12/19/13
Print Sign

Jeff Harrison

From: Coffey, Don <Don.Coffey@truproject.com>
Sent: Thursday, December 19, 2013 12:15 PM
To: Jeff Harrison; 'Schrock, Beverly - NWP'
Cc: 'Wade, Daniel NWP'; Andrew Stallings; Coffey, Don
Subject: RE: Trend Code L NCRs (NFS0788A)

Hi Jeff & Beverly,

After reviewing the RTR examination of NFS0788A, the AA battery is inside one of the poly bottles that appears to container absorbent.

During the repackaging activity at the TWPC, only the poly bags were cut before they were placed inside the cardboard tubes. None of the poly bottles were opened during the venting of the poly bags. Therefore, the battery came from NFS as part of the waste inside the poly bottle and inside the parent drum.

Please call me if you have questions or need additional information.

Thanks,

Don

Don E. Coffey, CHMM
Transuranic Waste Processing Center (TWPC)
don.coffey@truproject.com
865.241.2520 (office)
423.596.0258 (cell)

From: Jeff Harrison [mailto:Trash_Talk@msn.com]
Sent: Wednesday, December 18, 2013 12:58 PM
To: 'Schrock, Beverly - NWP'; Coffey, Don
Cc: 'Wade, Daniel NWP'
Subject: RE: Trend Code L NCRs (NFS0788A)

Bev,
I have asked Don Coffey to see what he can find out about the batteries in NFS0788A. It is likely this AA battery was tossed into the drum by someone at the TWPC as opposed to this being an old battery that NFS threw into the drum. If it's just an alkaline battery from the TWPC, it should be low mercury and not hazardous. If that turns out to be the case, we will document this fact. But if it is a Ni-Cd battery then it is hazardous waste.

Don,
I have attached the NCR and RTR on this drum. It is described as "AA battery" so I guess there's just the one battery. I sent you an email yesterday asking about the use of Ni-Cd batteries in the BBA and CPE. I was assuming this drum was repackaged in the BBA, but it may have been repackaged in the glovebox. If it was from the glovebox, where would the battery have come from?

Jeff Harrison
Nuclear Waste Partership LLC
Contractor for the U.S. Department of Energy
Trash_Talk@msn.com (e-mail)
720.977.7042 (office)
303.918.8791 (cell)
720.977.7042 (fax)

From: Schrock, Beverly - NWP [mailto:Beverly.Schrock@wipp.ws]
Sent: Wednesday, December 18, 2013 10:01 AM
To: Harrison, Jeff
Cc: Wade, Daniel NWP
Subject: Trend Code L NCRs

Jeff,

Please take a look and advise path forward.

Thanks,
Bev ☺

Beverly S. Schrock
Site Project Manager
Central Characterization Program
Nuclear Waste Partnership, LLC
Contractor for the U.S. Department of Energy
(575) 234-7444
(575) 706-0809 Cell

DIVIDER PAGE

Attachment 3 - Acceptable Knowledge Source Document Summary

Site(s): Oak Ridge National Laboratory	Source Document Tracking Number: DR038

Waste Stream Number(s): ORNL Non-specific Library Files
(Applicable only when site library is not in use)

Acceptable Knowledge Documentation Type:	Category:
☐ TRU Waste Management Program Information	☐ Correspondence
☑ Waste Stream-Specific Information	☑ Discrepancy Resolution
☐ Additional Information	☐ Internal Procedure
	☐ Miscellaneous
	☐ Published Document or Internal Procedure
	☐ Unpublished Documents

Title or Description of Source Document [a]: Discrepancy Resolution, re: Drum NFS0815

Source Document Reference Information (author(s), document and revision number, date, publisher): Jeff Harrison, DR038, NA, 01/06/2014, CCP

AK # [b]	Source Doc. Page # [c]	AK Information Summary
WS9	1	Nature of Discrepancy: NCR-ORNL-0842-13 was written because RTR of drum NFS0815 identified soil placed directly into the rigid liner with no poly drum liner bag which is inconsistent with AK (see CCP-AK-ORNL-001, Section 6.5). Resolution: Add a new sentence to CCP-AK-ORNL-001, Section 6.5, paragraph 1 that says "Some drums may have a 90-mil liner and no polyethylene drum liner bag."

Source Document Data Limitations (if any):

1. None.

Acceptable Knowlege Expert:

Travis Smith / Date: 02/24/2014
Print /Sign

[a] Provide description for non-titled information (i.e., container paperwork, MSDS sheets, etc)
[b] Obtain from Acceptable Knowledge Documentation Checklist
[c] For microfilm or microfiche, identify box, tape, reel number and location.

CCP RECORDS ORIGINAL
DATE REC'D 10/21/2014

DIVIDER PAGE ONLY

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Attachment 11 - Acceptable Knowledge Source Document Discrepancy Resolution

Waste Stream Number(s): OR-NFS-CH-SOIL

Waste Stream Description: Contaminated soil from NFS

AK Source Document Discrepancy Form Tracking Number: **DR038**

Tracking #	Title	Document/Rev#	Author	Date	Page #
N/A	CCP Nonconformance Report (NCR)	NCR-ORNL-0842-13	CCP	12/4/13	1
N/A	Central Characterization Program Acceptable Knowledge Summary Report For Nuclear Fuel Services Contact-Handled Transuranic Waste Stored at Oak Ridge National Laboratory	CCP-AK-ORNL-001, Rev. 8	CCP	12/12/13	73

Nature of Discrepancy: NCR-ORNL-0842-13 was written because RTR of drum NFS0815 identified soil placed directly into the rigid liner with no poly drum liner bag which is inconsistent with AK (see CCP-AK-ORNL-001, Section 6.5).

Resolution: Add a new sentence to CCP-AK-ORNL-001, Section 6.5, paragraph 1 that says "Some drums may have a 90-mil liner and no polyethylene drum liner bag."

Discrepancy Resolved: ☒ Yes ☐ No

Acceptable Knowledge Expert: Jeff Harrison (Print) _____ (Sign) Date: 1/6/14

Site Project Manager: Beverly Schrock (Print) _____ (Sign) Date: 1/6/14

NTPC RECORDS ORIGINAL
DATE REC'D 2-7-14

DIVIDER PAGE

Attachment 3 - Acceptable Knowledge Source Document Summary

Site(s): Oak Ridge National Laboratory	Source Document Tracking Number: DR039

Waste Stream Number(s): ORNL Non-specific Library Files
(Applicable only when site library is not in use)

Acceptable Knowledge Documentation Type:	Category:
☐ TRU Waste Management Program Information	☐ Correspondence
☑ Waste Stream-Specific Information	☑ Discrepancy Resolution
☐ Additional Information	☐ Internal Procedure
	☐ Miscellaneous
	☐ Published Document or Internal Procedure
	☐ Unpublished Documents

Title or Description of Source Document [a]: Discrepancy Resolution, re: Drum NFS0806A

Source Document Reference Information (author(s), document and revision number, date, publisher): Jeff Harrison, DR039, NA, 02/24/2014, CCP

AK # [b]	Source Doc. Page # [c]	AK Information Summary
WS9, WS12	1-2	Nature of Discrepancy: NCR-ORNL-0873-13 was written because RTR of drum NFS0806A identified scrap lead which is not identified in the AK Report (see CCP-AK-ORNL-001, Sections 7.4.1 and 7.4.3.2). Initially, review of previous RTR data identified what could be scrap lead. However, when the kV was increased, the material lightened up suggesting it is not lead (M202). Therefore EPA hazardous waste number D008 (lead) was not assigned to waste stream OR-NFS-CH-HOM-A. Resolution: Certified RTR (OR-RTR6-0439) of this repackaged drum supersedes the RTR done that was not part of the CCP certification program. Therefore, the scrap in this bottle is assumed to be lead. This drum contains three poly bottles. Two of the bottles contain fines immobilized in cement. The one bottle containing the scrap lead is only 10% full and contains only the scrap lead. Rather than assigning EPA hazardous waste number D008 to the entire waste stream, this one bottle will be removed from the drum and dispositioned separately.

Source Document Data Limitations (if any):

1. None.

Acceptable Knowlege Expert:

Travis Smith _____ Date: 02/24/2014
Print /Sign

[a] Provide description for non-titled information (i.e., container paperwork, MSDS sheets, etc)
[b] Obtain from Acceptable Knowledge Documentation Checklist
[c] For microfilm or microfiche, identify box, tape, reel number and location.

NTPC RECORDS ORIGINAL
DATE REC'D 7-7-14

Attachment 11 - Acceptable Knowledge Source Document Discrepancy Resolution

Waste Stream Number(s): OR-NFS-CH-HOM-A

Waste Stream Description: Immobilized Liquids and Fines from NFS

AK Source Document Discrepancy Form Tracking Number: **DR039**

Tracking #	Title	Document/Rev#	Author	Date	Page #
N/A	CCP Nonconformance Report (NCR)	NCR-ORNL-0873-13	CCP	12/11/13	1
N/A	Central Characterization Program Acceptable Knowledge Summary Report For Nuclear Fuel Services Contact-Handled Transuranic Waste Stored at Oak Ridge National Laboratory	CCP-AK-ORNL-001, Rev. 9	CCP	2/6/14	78, 79, 85, 86
M202	Review of WEAF RTR Videos for NFS Immobilized Liquids and Fines	N/A	R. Schultz	10/11/10 – 10/13/10	25, 30

Nature of Discrepancy:

NCR-ORNL-0873-13 was written because RTR of drum NFS0806A identified scrap lead which is not identified in the AK Report (see CCP-AK-ORNL-001, Sections 7.4.1 and 7.4.3.2). Initially, review of previous RTR data identified what could be scrap lead. However, when the kV was Increased, the material lightened up suggesting it is not lead (M202). Therefore EPA hazardous waste number D008 (lead) was not assigned to waste stream OR-NFS-CH-HOM-A.

Resolution:

Certified RTR (OR-RTR6-0439) of this repackaged drum supersedes the RTR done that was not part of the CCP certification program. Therefore, the scrap in this bottle is assumed to be lead. This drum contains three poly bottles. Two of the bottles contain fines immobilized in cement. The one bottle containing the scrap lead is only 10% full and contains only the scrap lead. Rather than assigning EPA hazardous waste number D008 to the entire waste stream, this one bottle will be removed from the drum and dispositioned separately.

NTPC RECORDS ORIGINAL
DATE REC'D 7-1-14

Discrepancy Resolved: ☒ Yes ☐ No

Acceptable Knowledge Expert: Jeff Harrison (Print) / Jeff Harrison (Sign) Date: 2/24/14

Site Project Manager: Beverly Schrock (Print) / BSSchrock (Sign) Date: 2/24/14

DIVIDER PAGE

Attachment 3 - Acceptable Knowledge Source Document Summary

Site(s): Oak Ridge National Laboratory	Source Document Tracking Number: DR600

Waste Stream Number(s): ORNL Non-specific Library Files

(Applicable only when site library is not in use)

Acceptable Knowledge Documentation Type:	Category:
☑ TRU Waste Management Program Information	☐ Correspondence
☑ Waste Stream-Specific Information	☑ Discrepancy Resolution
☑ Additional Information	☐ Internal Procedure
	☐ Miscellaneous
	☐ Published Document or Internal Procedure
	☐ Unpublished Documents

Title or Description of Source Document [a]: Discrepancy Resolution, Re: Packaging Documentation Discrepancies for Cask X10C0601826

Source Document Reference Information (author(s), document and revision number, date, publisher): Kevin J. Peters, DR600, NA, 06/24/2008, CCP

AK # [b]	Source Doc. Page # [c]	AK Information Summary
PR7, WS2, S16	Throughout	Nature of Discrepancy: During the review of the packaging documentation for Cask X10C0601826 (M120) obtained on May 29, 2008, discrepancies were identified between this documentation and the initial packaging information on the 2109 form for this cask (M100 see attached Radioactive Waste Container Log Sheet). The 2109 form only identify six bags all originating from Building 7920, Room 120 (LAA). The packaging logs identified that these six bags contain 56 cans of waste items, in addition to 29 other items (e.g., balances, clamps, PPE, empty bottles, and shielding) listed on the logs. However, based on a review of the more detailed packaging logs (M120) it was determined that one item originating from the REDC 7930 (Cell C), two items originated from Room 211, and three items (two lead shield and a transition plate) were labeled as "Dresden" (See attached packaging documentation from M120). Resolution: In an effort to resolve these discrepancies and determine if the waste in cask X10C0601826 is bounded by the characterization for waste stream OR-REDC-RH-HET in AK Summary Report CCP-AK-ORNL-500, an interview was conducted on June 4, 2008 with ORNL waste generators Wayne Evans and Don Coffey (C600). Based on the interview and a follow-up with the REDC Building 7930 Building Supervisor, the one item in bag X430687A from 7930 was determined to be debris material (wipes and rags) likely from the decontamination of a californium source. It was determined that no chemicals other than those already identified in the AK Summary Report for REDC waste stream OR-RED-RH-HET would have been used during this activity. Additional, two other items of the 16 items contained in X430687A are identified as "lab 211 poly bottles Cf glovebox waste." Based on the interview, these empty bottles from the Process Development laboratory may be contaminated with radiological material different that that identified for waste from the Cell Bank. The radiological distribution for this contamination will be similar to the Cell waste in actinide products, but much lower in gamma emitting isotopes, such as cesium and other fission products. Additionally, it is estimated that bag X430687A would only account for 1.7% (see attached) of the total activity of the contents of this cask and most of the items in the bag consist of pipe tunnel waste from the Cell Bank that would have the same distribution estimated for waste stream OR-REDC-RH-HET. Based on this review, the Cf glovebox and Process Development Laboratory items are physically and chemically bounded by the waste stream description in the AK Summary Report for waste stream OR-REDC-RH-HET. In addition, although the radiological contamination for these items is not accounted for in CCP-AK-ORNL-501 for the waste stream, the contamination will be comparable and the contamination introduced by these items is insignificant. As expected, miscellaneous materials from earlier REDC campaigns were identified during the review of the packaging documentation in bag X430687B. This lead shielding and transition plate is from activities assumed to be involved with Dresden LWR fuel processing in the REDC.

NTPC RECORDS ORIGINAL
DATE REC'D 1/3/14 SP

Attachment 3 - Acceptable Knowledge Source Document Summary (continued)

Site(s): Oak Ridge National Laboratory		Source Document Tracking Number: DR600
AK # [b]	Source Doc. Page # [c]	AK Information Summary
		The contribution of these items to the total activity in the cask was estimated to be only 3.3% using a Dose-to-Curie Spreadsheet provided by Jene Vance (see attached). Lead and other metal items are expected in waste stream OR-RED-RH-HET and are bounded by the waste stream description in CCP-AK-ORNL-500. For the reasons stated above, it is estimated that more than 95% of the radiological activity in cask X10C0601826 is accounted for in the evaluation described in CCP-AK-ORNL-501 for the Mark 42/HFIR distribution and as a consequence it is concluded that the inclusion of the items from sources other that the cell bank will have a small, if any, impact on the estimated activity content of the waste. The inclusion of the activity from these items is well within the overall uncertainty of the estimated activity content of the waste. Accordingly, the application of the Mark 42/HFIR distribution to the waste in this cask will adequately account for the activity in these items. Additionally, these waste items (rags, wipes, empty plastic bottles, lead shielding, and metal plate) are bounded physically and chemically by the waste stream description in CCP-AK-ORNL-500. CCP-AK-ORNL-500 will be revised to note that insignificant amounts of non-routine waste from REDC operations in 7930 may be included in the waste stream. As these items are identified, they will be evaluated to determine the appropriate radiological distribution on a case-by-case basis.

Source Document Data Limitations (If any):

1. None.

Acceptable Knowlege Expert:

Travis Smith _____ Date: 12/11/2013

Print /Sign

[a] Provide description for non-titled information (i.e., container paperwork, MSDS sheets, etc)
[b] Obtain from Acceptable Knowledge Documentation Checklist
[c] For microfilm or microfiche, identify box, tape, reel number and location.

DIVIDER PAGE ONLY

Not part of page count

Attachment 11 – Acceptable Knowledge Source Document Discrepancy Resolution

Waste Stream Number(s): OR-REDC-RH-HET

Waste Stream Description: REDC Heterogeneous Debris

AK Documentation Type: [X] TRU Waste Management Program Information [X] Waste Stream Specific Information [X] Supplemental Information

AK Source Document Discrepancy Form Tracking Number: DR600 – Packaging Documentation Discrepancies for Cask X10C0601826

Tracking #	Category*	Title	Document/Rev#	Author	Date	Publisher	Page #
N/A	Pub.	Central Characterization Project Acceptable Knowledge Summary Report For Oak Ridge National Laboratory Radiochemical Engineering Development Center Remote-Handled Transuranic Waste, Waste Stream: OR-REDC-RH-HET	CCP-AK-ORNL-500, Rev. 0	CCP	5/2/2008	CCP	Sections 4.2, 5.1 and 5.5
C600	Corr.	Interview with Wayne Evans and Don Coffey: REDC RH Waste Cask Packaging Clarification and Swipe Sampling Collection	N/A	Steve Schafer	6/4/2008	CCP	All
M100	Unpub.	RH UCN-2109 Forms and Related Container Paperwork.	N/A	ORNL	Various	N/A	Cask X10C0601826
M120	Unpub.	ORNL RH Cask Evaluation and Supplemental Packaging Documentation	N/A	ORNL	Various	N/A	Cask X10C0601826

Nature of Discrepancy:

During the review of the packaging documentation for Cask X10C0601826 (M120) obtained on May 29, 2008, discrepancies were identified between this documentation and the initial packaging information on the 2109 form for this cask (M100 see attached Radioactive Waste Container Log Sheet). The 2109 form only identify six bags all originating from Building 7920, Room 120 (LAA). The packaging logs identified that these six bags contain 56 cans of waste items, in addition to 29 other items (e.g., balances, clamps, PPE, empty bottles, and shielding) listed on the logs. However, based on a review of the more detailed packaging logs (M120) it was determined that one item originating from the REDC 7930 (Cell C), two items originated from Room 211, and three items (two lead shield and a transition plate) were labeled as "Dresden" (See attached packaging documentation from M120).

DR600

NTPC RECORDS ORIGINAL
DATE REC'D 1/3/14

Resolution:

In an effort to resolve these discrepancies and determine if the waste in cask X10C0601826 is bounded by the characterization for waste stream OR-REDC-RH-HET in AK Summary Report CCP-AK-ORNL-500, an interview was conducted on June 4, 2008 with ORNL waste generators Wayne Evans and Don Coffey (C600). Based on the interview and a follow-up with the REDC Building 7930 Building Supervisor, the one item in bag X430687A from 7930 was determined to be debris material (wipes and rags) likely from the decontamination of a californium source It was determined that no chemicals other than those already identified in the AK Summary Report for REDC waste stream OR-REDC-RH-HET would have been used during this activity. Additional, two other items of the 16 items contained in X430687A are identified as "lab 211 poly bottles Cf glovebox waste." Based on the interview, these empty bottles from the Process Development laboratory may be contaminated with radiological material different that that identified for waste from the Cell Bank. The radiological distribution for this contamination will be similar to the Cell waste in actinide products, but much lower in gamma emitting isotopes, such as cesium and other fission products. Additionally, it is estimated that bag X430687A would only account for 1.7% (see attached) of the total activity of the contents of this cask and most of the items in the bag consist of pipe tunnel waste from the Cell Bank that would have the same distribution estimated for waste stream OR-REDC-RH-HET. Based on this review, the Cf glovebox and Process Development Laboratory items are physically and chemically bounded by the waste stream description in the AK Summary Report for waste stream OR-REDC-RH-HET. In addition, although the radiological contamination for these items is not accounted for in CCP-AK-ORNL-501 for the waste stream, the contamination will be comparable and the contamination introduced by these items is insignificant

As expected, miscellaneous materials from earlier REDC campaigns were identified during the review of the packaging documentation in bag X430687B. This lead shielding and transition plate is from activities assumed to be involved with Dresden LWR fuel processing in the REDC The contribution of these items to the total activity in the cask was estimated to be only 3.3% using a Dose-to-Curie Spreadsheet provided by Jene Vance (see attached). Lead and other metal items are expected in waste stream OR-REDC-RH-HET and are bounded by the waste stream description in CCP-AK-ORNL-500.

For the reasons stated above, it is estimated that more than 95% of the radiological activity in cask X10C0601826 is accounted for in the evaluation described in CCP-AK-ORNL-501 for the Mark 42/HFIR distribution and as a consequence it is concluded that the inclusion of the items from sources other that the cell bank will have a small, if any, impact on the estimated activity content of the waste The inclusion of the activity from these items is well within the overall uncertainty of the estimated activity content of the waste. Accordingly, the application of the Mark 42/HFIR distribution to the waste in this cask will adequately account for the activity in these items. Additionally, these waste items (rags, wipes empty plastic bottles, lead shielding, and metal plate) are bounded physically and chemically by the waste stream description in CCP-AK-ORNL-500. CCP-AK-ORNL-500 will be revised to note that insignificant amounts of non-routine waste from REDC operations in 7930 may be included in the waste stream. As these items are identified, they will be evaluated to determine the appropriate radiological distribution on a case-by-case basis.

Discrepancy Resolved: [X] Yes [ ] No

Acceptable Knowledge Expert: Kevin J Peters (Print) / STEVE SCHAFFER FOR (Sign) Date: 6/5/2008

Site Project Manager: Larry Porter (Print) / HILLARI J. NEELY FOR (Sign) Date: 6-24-08

[a] Published Document or Controlled Database (Pub.); Unpublished Data (Unpub.); Internal Procedure or Note (Proc.); Correspondence (Corr.) or Discrepancy (Disc.)

eWaste

Page 1 of 2

Radioactive Waste Container Log Sheet

Proper Shipping Name: _____

Logsheet ID: REDCX430687
Container Number: X10C0601826
Document ID: X430687
Location: 7920, 120 Rad Waste
90-Day Date: 02/09/2007
TSCA Date: N/A
Origin Date: 02/06/2007
TID Number: NA NA
WER: D. Coffey
Generator: T. Lehberger
Account: X7920WMD

Container Type: CASKC6
Burial Volume/ Waste Volume: 1.6 m3 / 1.55 m3
DOT Specification: NA
Scale Serial Number: NA
Scale Calibration Due Date:
Gross Weight: 14,400 lb
Waste Weight: 500 lb
Container PO Number:
Container Tare: 13,900 lb
Absorbent Type: NA
Absorbent Weight:

Solid: X
Liquid:
Gas:
Chemical Form: OXIDE
Waste Codes: D006, D008, D009, D011

DOT Hazard Class: N/A
DOT Sub Hazard Class: N/A
Packing Group (PG): N/A
Total Activity: E+00
Radionuclides:

Profile Number: TRU-RH-1, Rev 2 DBC 02/06/07

LWS Item Number/ Package Number	Specific Location	Waste Item Description	Inner Container Type	Estimated Waste Volume	Estimated Waste Weight	Absorbent Added to Package	Maximum Contact Dose Rate (rem/hr) 0 deg	Maximum Contact Dose Rate (rem/hr) 180 deg	Beta/Gamma or Alpha						
#106	120, 7920	metal, glass, plastic, circuit boards debris	BAGP	0.3 m3	80 lb	N/A	1300		N/A	N/A	N/A	N/A	N/A	N/A	N/A
#107	120, 7920	metal, glass, plastic light bulb bases debris	BAGP	0.3 m3	80 lb	N/A	1000		N/A	N/A	N/A	N/A	N/A	N/A	N/A
#108	120, 7920	metal, glass, plastic, circuit boards debris	BAGP	0.3 m3	80 lb	N/A	3800		N/A	N/A	N/A	N/A	N/A	N/A	N/A
#109	120, 7920	metal, glass, plastic, circuit boards debris	BAGP	0.3 m3	80 lb	N/A	4100		N/A	N/A	N/A	N/A	N/A	N/A	N/A
X430687A	120, 7920	plastic, rubber, rope debris, poly bottles	BAGP	0.3 m3	30 lb	N/A	200		N/A	N/A	N/A	N/A	N/A	N/A	N/A
X430687B	120, 7920	lead shielding	BAGP	0.05 m3	150 lb	N/A	320		N/A	N/A	N/A	N/A	N/A	N/A	N/A
		Totals:		1.55	500	0	10,720	0	0				0	0	0

BEST AVAILABLE

Cask Evaluation - X10C0601826 **June 5, 2008**

Internal Containers/Items	Waste Description	Estimated Weight (lbs.)	Dose - Max. Contact (mR/hr.)	Estimated Activity Factor*	Estimated Relative Activity*
106	Bag containing 14 cans of cellulosics, glass, metal, grouted material, and misc. debris (balances and clamps)	80	1300	289	12.1%
107	Bag containing 13 cans of cellulosics, glass, metal, rubber, and misc. debris (balances and clamps)	80	1000	223	9.3%
108	Bag containing 14 cans of melted plastic (7), cellulosics, glass, metal, and misc. debris	80	3800	846	35.4%
109	Bag containing 15 cans of melted plastic (9), cellulosics, glass, metal, rubber, and misc. debris	80	4100	913	38.2%
X430687A	Bag containing 16 items in two bags including pipe tunnel waste (PPE, rope) Identifies one item from 7930 Cell C, W5 6 (8 mR/hr). Includes poly bottles from process development Lab 211, indicated only as Cf glovebox waste.	30	200	41.5	1.7%
X430687B	Bag containing 3 items in identified as Dresden lead shied (2) and transition plate.	150	320	78.6	3.3%
		TOTAL		2391.1	100%

* Estimated Activity from Dose-to-Curie Spreadsheet (version 0 041508). The spreadsheet was designed to calculate the activity for 55-gallon drums at one meters gamma dose measurement. These values can only be used to estimate the relative activity for the packages not the actual activity.

GENERAL DESIGN AND COMPUTATION SHEET

JOB		DATE	SHEET OF
S.O. NO	COMPUTED	CHECKED BY	

CASK X10C060/826

#5 X430687A → PAPER, PLASTIC, CLOTH, ROPE, INC. METAL 200 mR/hr

#6 X430687B → LEAD SHIELD / TRANSITION PLATE 320 mR/hr

~~X430687C~~ ~~POLY~~ BOTTLES EMPTY

#1 BAGS #106 - 1300
#2 107 - 1000
#3 108 - 3800
#4 109 - 4100

5 ci TOTAL ACTIVITY

TRU - 469 nCi/Gr

START DATE 2/6/07

POLY BOTTLES - DOSE RATE - C. PORTER
PIPE TUNNEL PPE - DOSE RATE - E. TURNINGTON

CASK # X10C601826

1 PIPE TUNNEL WASTE - 2.7 MR/HR
2 7930 CELL C WS 6 - 8 MR/HR
3 PIPE TUNNEL WASTE - 0.5 G, 0.1 N
4 PIPE TUNNEL WASTE - 10 G, 0.9 N
5 PIPE TUNNEL WASTE - 15 MRAD
6 PIPE TUNNEL WASTE - 8 G, 0.1 N
7 PIPE TUNNEL WASTE PPE - 6,000,000 DPM
8 PIPE TUNNEL WASTE - 0.1 G, 0.1 N
9 LAB 211 POLY BOTTLES - CF GLOVE BOX WASTE
10 DRESDEN TRANSITION PLATE - SEE ATTACHED
11 PIPE TUNNEL WASTE PPE - 6,000,000 DPM
13 PIPE TUNNEL WASTEPPE - ..
14 PIPE TUNNEL WASTE ROPE - 15 MRAD
15 PIPE TUNNEL WASTE PPE - ..
16 LAB 211 POLY BOTTLES - CF GLOVE BOX WASTE
17 PIPE TUNNEL WASTE PPE - 6000000 DPM
18 DRESDEN LEAD SHIELD - 32 MR/HR
19 DRESDEN LEAD SHIELD - 14 MR/HR
20 BAG # 109 CUBICE WASTE
21 BAG # 108 CUBICLE WASTE
22 BAG # 107 CUBICLE WASTE
23 BAG # 106 CUBICLE WASTE

Waste Container Dose-to-Curie Conversion Record

Mark42/HFIR DTC Spreadsheet Verison 0 041508

Operating Procedure	CCP-TP-504 Rev. 6
Date of Survey	9/15/2008
Waste Stream Designation	OR-REDC-RH-HET
Cask Number	
Package Number	106
Container Gross Weight	118.5 kg
Estimate Fill Percentages	100 %
Container Net Weight	36.29 kg
Measured Container Dose Rate	
Quadrant #1	0 mR/hr
Quadrant #2	0 mR/hr
Quadrant #3	0 mR/hr
Quadrant #4	0 mR/hr
Calculated Average Dose Rate	1300 mR/hr
Waste Material Type	Organic

DTC Spreadsheet used to estimate the relatve activity of 6 packages in Cask X10C0601826
DR600 – Packaging Documentation Discrepancies for Cask X10C0601826

Nuclide	Curie Scaling Factors	Activity (Ci)	Grams	FGE	PECi	Watts	Uncertainty	Uncertainty in Curies	Uncertainty in Grams
U-233	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00%	0.00E+00	0.00E+00
U-234	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00%	0.00E+00	0.00E+00
U-235	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00%	0.00E+00	0.00E+00
U-238	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00%	0.00E+00	0.00E+00
Pu-238	6.24E-01	2.41E+00	1.40E-01	1.58E-02	2.19E+00	8.00E-02	98.35%	2.37E+00	1.37E-01
Pu-239	9.43E-04	3.64E-03	5.79E-02	5.79E-02	3.64E-03	1.13E-04	114.11%	4.16E-03	6.61E-02
Pu-240	1.63E-01	6.31E-01	2.74E+00	6.18E-02	6.31E-01	1.97E-02	97.22%	6.14E-01	2.67E+00
Pu-241	5.11E+00	1.98E+01	1.90E-01	4.28E-01	3.88E-01	6.29E-04	123.48%	2.44E+01	2.35E-01
Pu-242	8.32E-03	3.21E-02	8.10E+00	6.07E-02	2.92E-02	9.47E-04	97.02%	3.12E-02	7.86E+00
Am-241	3.51E-01	1.36E+00	3.91E-01	7.32E-03	1.36E+00	4.54E-02	110.36%	1.50E+00	4.32E-01
Am-243	1.17E-01	4.52E-01	2.26E+00	2.92E-02	4.52E-01	1.46E-02	94.82%	4.29E-01	2.15E+00
Cm-244	3.19E+01	1.23E+02	1.53E+00	1.37E-01	6.49E+01	4.24E+00	101.83%	1.26E+02	1.55E+00
Cm-245	3.91E-03	1.51E-02	8.81E-02	1.32E+00	0.00E+00	5.04E-04	93.03%	1.41E-02	8.19E-02
Cm-246	1.17E-01	4.53E-01	1.48E+00	0.00E+00	0.00E+00	1.49E-02	150.13%	6.81E-01	2.22E+00
Cs-137	1.00E+00	3.87E+00	4.39E-02	0.00E+00	0.00E+00	4.28E-03	29.49%	1.14E+00	1.30E-02
Ba-137m	9.46E-01	3.66E+00	6.80E-09	0.00E+00	0.00E+00	1.44E-02	29.49%	1.08E+00	2.00E-09
Sr-90	1.73E+01	6.67E+01	4.83E-01	0.00E+00	0.00E+00	7.73E-02	42.07%	2.81E+01	2.03E-01
Y-90	1.73E+01	6.67E+01	1.23E-04	0.00E+00	0.00E+00	3.69E-01	42.07%	2.81E+01	5.16E-05
Totals		2.89E+02	1.75E+01	2.12E+00	7.00E+01	4.88E+00			

	Value	(one Sigma)	
TRU Alpha Activity Concentration	1.48E+05	9.00E+04	nCi/g
TRU Alpha Activity	5.36E+00	3.27E+00	Ci
Total Pu-239 Equiv Activity	7.00E+01	6.66E+01	Ci
Total Pu-239 Fissile Gram Equiv	2.12E+00	1.43E+00	g
Total Decay Heat	4.88E+00	4.38E+00	W
Volume Activity	1.34E+00	7.14E-01	Ci/L

Originator _____ (Print Name)

Signed _____ Date _____

Information Only

Waste Container Dose-to-Curie Conversion Record

Mark42/HFIR DTC Spreadsheet Verison 0 041508

Operating Procedure	CCP-TP-504 Rev. 6
Date of Survey	9/15/2008
Waste Stream Designation	OR-REDC-RH-HET
Cask Number	
Package Number	107
Container Gross Weight	118.5 kg
Estimate Fill Percentages	100 %
Container Net Weight	**36.29 kg**
Measured Container Dose Rate	
Quadrant #1	0 mR/hr
Quadrant #2	0 mR/hr
Quadrant #3	0 mR/hr
Quadrant #4	0 mR/hr
Calculated Average Dose Rate	**1000 mR/hr**
Waste Material Type	Organic

DTC Spreadsheet used to estimate the relatve activity of 6 packages in Cask X10C0601826
DR600 – Packaging Documentation Discrepancies for Cask X10C0601826

Nuclide	Curie Scaling Factors	Activity (Ci)	Grams	FGE	PECI	Watts	Uncertainty	Uncertainty in Curies	Uncertainty in Grams
U-233	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00%	0.00E+00	0.00E+00
U-234	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00%	0.00E+00	0.00E+00
U-235	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00%	0.00E+00	0.00E+00
U-238	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00%	0.00E+00	0.00E+00
Pu-238	6.24E-01	1.86E+00	1.07E-01	1.21E-02	1.69E+00	6.15E-02	98.35%	1.83E+00	1.06E-01
Pu-239	9.43E-04	2.80E-03	4.46E-02	4.46E-02	2.80E-03	8.69E-05	114.11%	3.20E-03	5.09E-02
Pu-240	1.63E-01	4.86E-01	2.11E+00	4.75E-02	4.86E-01	1.51E-02	97.22%	4.72E-01	2.05E+00
Pu-241	5.11E+00	1.52E+01	1.46E-01	3.29E-01	2.98E-01	4.84E-04	123.48%	1.88E+01	1.81E-01
Pu-242	8.32E-03	2.47E-02	6.23E+00	4.67E-02	2.25E-02	7.29E-04	97.02%	2.40E-02	6.04E+00
Am-241	3.51E-01	1.04E+00	3.01E-01	5.63E-03	1.04E+00	3.49E-02	110.36%	1.15E+00	3.32E-01
Am-243	1.17E-01	3.48E-01	1.74E+00	2.25E-02	3.48E-01	1.12E-02	94.82%	3.30E-01	1.65E+00
Cm-244	3.19E+01	9.49E+01	1.17E+00	1.06E-01	4.99E+01	3.26E+00	101.83%	9.66E+01	1.19E+00
Cm-245	3.91E-03	1.16E-02	6.78E-02	1.02E+00	0.00E+00	3.88E-04	93.03%	1.08E-02	6.30E-02
Cm-246	1.17E-01	3.49E-01	1.14E+00	0.00E+00	0.00E+00	1.14E-02	150.13%	5.24E-01	1.70E+00
Cs-137	1.00E+00	2.97E+00	3.38E-02	0.00E+00	0.00E+00	3.29E-03	29.49%	8.77E-01	9.96E-03
Ba-137m	9.46E-01	2.81E+00	5.23E-09	0.00E+00	0.00E+00	1.11E-02	29.49%	8.29E-01	1.54E-09
Sr-90	1.73E+01	5.13E+01	3.72E-01	0.00E+00	0.00E+00	5.95E-02	42.07%	2.16E+01	1.56E-01
Y-90	1.73E+01	5.13E+01	9.43E-05	0.00E+00	0.00E+00	2.84E-01	42.07%	2.16E+01	3.97E-05
Totals		2.23E+02	1.35E+01	1.63E+00	5.38E+01	3.76E+00			

	Value	(one Sigma)	
TRU Alpha Activity Concentration	1.14E+05	6.92E+04	nCi/g
TRU Alpha Activity	4.12E+00	2.51E+00	Ci
Total Pu-239 Equiv Activity	5.38E+01	5.12E+01	Ci
Total Pu-239 Fissile Gram Equiv	1.63E+00	1.10E+00	g
Total Decay Heat	3.76E+00	3.37E+00	W
Volume Activity	1.03E+00	5.49E-01	Ci/L

Originator _____ (Print Name)

Signed _____ Date _____

Information Only

Waste Container Dose-to-Curie Conversion Record

Mark42/HFIR DTC Spreadsheet Verison 0 041508

Operating Procedure	CCP-TP-504 Rev. 6
Date of Survey	9/15/2008
Waste Stream Designation	OR-REDC-RH-HET
Cask Number	
Package Number	108
Container Gross Weight	118.5 kg
Estimate Fill Percentages	100 %
Container Net Weight	36.29 kg
Measured Container Dose Rate	
Quadrant #1	0 mR/hr
Quadrant #2	0 mR/hr
Quadrant #3	0 mR/hr
Quadrant #4	0 mR/hr
Calculated Average Dose Rate	3800 mR/hr
Waste Material Type	Organic

DTC Spreadsheet used to estimate the relatve activity of 6 packages in Cask X10C0601826
DR600 – Packaging Documentation Discrepancies for Cask X10C0601826

Nuclide	Curie Scaling Factors	Activity (Ci)	Grams	FGE	PECI	Watts	Uncertainty	Uncertainty in Curies	Uncertainty in Grams
U-233	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00%	0.00E+00	0.00E+00
U-234	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00%	0.00E+00	0.00E+00
U-235	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00%	0.00E+00	0.00E+00
U-238	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00%	0.00E+00	0.00E+00
Pu-238	6.24E-01	7.06E+00	4.08E-01	4.61E-02	6.41E+00	2.34E-01	98.35%	6.94E+00	4.01E-01
Pu-239	9.43E-04	1.07E-02	1.69E-01	1.69E-01	1.07E-02	3.30E-04	114.11%	1.22E-02	1.93E-01
Pu-240	1.63E-01	1.85E+00	8.02E+00	1.81E-01	1.85E+00	5.74E-02	97.22%	1.79E+00	7.80E+00
Pu-241	5.11E+00	6.78E+01	5.56E-01	1.25E+00	1.13E+00	1.84E-03	123.48%	7.13E+01	6.86E-01
Pu-242	8.32E-03	9.40E-02	2.37E+01	1.78E-01	8.54E-02	2.77E-03	97.02%	9.12E-02	2.30E+01
Am-241	3.51E-01	3.97E+00	1.14E+00	2.14E-02	3.97E+00	1.33E-01	110.36%	4.38E+00	1.26E+00
Am-243	1.17E-01	1.32E+00	6.62E+00	8.54E-02	1.32E+00	4.26E-02	94.82%	1.25E+00	6.27E+00
Cm-244	3.19E+01	3.61E+02	4.46E+00	4.01E-01	1.90E+02	1.24E+01	101.83%	3.67E+02	4.54E+00
Cm-245	3.91E-03	4.42E-02	2.57E-01	3.86E+00	0.00E+00	1.47E-03	93.03%	4.11E-02	2.40E-01
Cm-246	1.17E-01	1.33E+00	4.31E+00	0.00E+00	0.00E+00	4.35E-02	150.13%	1.99E+00	6.48E+00
Cs-137	1.00E+00	1.13E+01	1.28E-01	0.00E+00	0.00E+00	1.25E-02	29.49%	3.33E+00	3.79E-02
Ba-137m	9.46E-01	1.07E+01	1.99E-08	0.00E+00	0.00E+00	4.21E-02	29.49%	3.15E+00	5.86E-09
Sr-90	1.73E+01	1.95E+02	1.41E+00	0.00E+00	0.00E+00	2.26E-01	42.07%	8.20E+01	5.94E-01
Y-90	1.73E+01	1.95E+02	3.58E-04	0.00E+00	0.00E+00	1.08E+00	42.07%	8.20E+01	1.51E-04
Totals		8.46E+02	5.12E+01	6.19E+00	2.05E+02	1.43E+01			

	Value	(one Sigma)	
TRU Alpha Activity Concentration	4.32E+05	2.63E+05	nCi/g
TRU Alpha Activity	1.57E+01	9.55E+00	Ci
Total Pu-239 Equiv Activity	2.05E+02	1.95E+02	Ci
Total Pu-239 Fissile Gram Equiv	6.19E+00	4.18E+00	g
Total Decay Heat	1.43E+01	1.28E+01	W
Volume Activity	3.90E+00	2.09E+00	Ci/L

Originator _____ (Print Name)

Signed _____ Date _____

Information Only

Waste Container Dose-to-Curie Conversion Record

Mark42/HFIR

DTC Spreadsheet Verison 0 041508

Operating Procedure	CCP-TP-504 Rev. 6
Date of Survey	9/15/2008
Waste Stream Designation	OR-REDC-RH-HET
Cask Number	
Package Number	109
Container Gross Weight	118.5 kg
Estimate Fill Percentages	100 %
Container Net Weight	36.29 kg
Measured Container Dose Rate	
Quadrant #1	0 mR/hr
Quadrant #2	0 mR/hr
Quadrant #3	0 mR/hr
Quadrant #4	0 mR/hr
Calculated Average Dose Rate	4100 mR/hr
Waste Material Type	Organic

DTC Spreadsheet used to estimate the relatve activity of 6 packages in Cask X10C0601826
DR600 – Packaging Documentation Discrepancies for Cask X10C0601826

Nuclide	Curie Scaling Factors	Activity (Ci)	Grams	FGE	PECi	Watts	Uncertainty	Uncertainty in Curies	Uncertainty in Grams
U-233	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00%	0.00E+00	0.00E+00
U-234	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00%	0.00E+00	0.00E+00
U-235	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00%	0.00E+00	0.00E+00
U-238	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00%	0.00E+00	0.00E+00
Pu-238	6.24E-01	7.61E+00	4.40E-01	4.97E-02	6.92E+00	2.52E-01	98.35%	7.49E+00	4.33E-01
Pu-239	9.43E-04	1.15E-02	1.83E-01	1.83E-01	1.15E-02	3.56E-04	114.11%	1.31E-02	2.09E-01
Pu-240	1.63E-01	1.99E+00	8.66E+00	1.95E-01	1.99E+00	6.20E-02	97.22%	1.94E+00	8.42E+00
Pu-241	5.11E+00	6.23E+01	5.99E-01	1.35E+00	1.22E+00	1.98E-03	123.48%	7.70E+01	7.40E-01
Pu-242	8.32E-03	1.01E-01	2.55E+01	1.92E-01	9.22E-02	2.99E-03	97.02%	9.84E-02	2.48E+01
Am-241	3.51E-01	4.28E+00	1.23E+00	2.31E-02	4.28E+00	1.43E-01	110.36%	4.73E+00	1.36E+00
Am-243	1.17E-01	1.43E+00	7.14E+00	9.21E-02	1.43E+00	4.60E-02	94.82%	1.35E+00	6.77E+00
Cm-244	3.19E+01	3.89E+02	4.81E+00	4.33E-01	2.05E+02	1.34E+01	101.83%	3.96E+02	4.90E+00
Cm-245	3.91E-03	4.77E-02	2.78E-01	4.17E+00	0.00E+00	1.59E-03	93.03%	4.43E-02	2.58E-01
Cm-246	1.17E-01	1.43E+00	4.65E+00	0.00E+00	0.00E+00	4.69E-02	150.13%	2.15E+00	6.99E+00
Cs-137	1.00E+00	1.22E+01	1.39E-01	0.00E+00	0.00E+00	1.35E-02	29.49%	3.59E+00	4.09E-02
Ba-137m	9.46E-01	1.15E+01	2.14E-08	0.00E+00	0.00E+00	4.55E-02	29.49%	3.40E+00	6.32E-09
Sr-90	1.73E+01	2.10E+02	1.52E+00	0.00E+00	0.00E+00	2.44E-01	42.07%	8.85E+01	6.41E-01
Y-90	1.73E+01	2.10E+02	3.87E-04	0.00E+00	0.00E+00	1.16E+00	42.07%	8.85E+01	1.63E-04
Totals		9.13E+02	5.52E+01	6.68E+00	2.21E+02	1.54E+01			

	Value	(one Sigma)	
TRU Alpha Activity Concentration	4.66E+05	2.84E+05	nCi/g
TRU Alpha Activity	1.69E+01	1.03E+01	Ci
Total Pu-239 Equiv Activity	2.21E+02	2.10E+02	Ci
Total Pu-239 Fissile Gram Equiv	6.68E+00	4.51E+00	g
Total Decay Heat	1.54E+01	1.38E+01	W
Volume Activity	4.21E+00	2.25E+00	Ci/L

Originator _____ (Print Name)

Signed _____ Date _____

Information Only

Waste Container Dose-to-Curie Conversion Record

Mark42/HFIR DTC Spreadsheet Verison 0 041508

Operating Procedure	CCP-TP-504 Rev. 6
Date of Survey	9/15/2008
Waste Stream Designation	OR-REDC-RH-HET
Cask Number	
Package Number	X430687A
Container Gross Weight	118.5 kg
Estimate Fill Percentages	100 %
Container Net Weight	**13.61 kg**
Measured Container Dose Rate	
Quadrant #1	0 mR/hr
Quadrant #2	0 mR/hr
Quadrant #3	0 mR/hr
Quadrant #4	0 mR/hr
Calculated Average Dose Rate	**200 mR/hr**
Waste Material Type	Organic

DTC Spreadsheet used to estimate the relative activity of 6 packages in Cask X10C0601826
DR600 – Packaging Documentation Discrepancies for Cask X10C0601826

Nuclide	Curie Scaling Factors	Activity (Ci)	Grams	FGE	PECi	Watts	Uncertainty	Uncertainty in Curies	Uncertainty in Grams
U-233	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00%	0.00E+00	0.00E+00
U-234	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00%	0.00E+00	0.00E+00
U-235	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00%	0.00E+00	0.00E+00
U-238	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00%	0.00E+00	0.00E+00
Pu-238	6.24E-01	3.47E-01	2.00E-02	2.26E-03	3.15E-01	1.15E-02	98.06%	3.40E-01	1.96E-02
Pu-239	9.43E-04	5.23E-04	8.32E-03	8.32E-03	5.23E-04	1.62E-05	113.87%	5.96E-04	9.47E-03
Pu-240	1.63E-01	9.06E-02	3.94E-01	8.87E-03	9.06E-02	2.82E-03	96.93%	8.79E-02	3.82E-01
Pu-241	5.11E+00	2.84E+00	2.73E-02	6.14E-02	5.56E-02	9.03E-05	123.25%	3.50E+00	3.36E-02
Pu-242	8.32E-03	4.62E-03	1.16E+00	8.72E-03	4.20E-03	1.36E-04	96.73%	4.46E-03	1.12E+00
Am-241	3.51E-01	1.95E-01	5.62E-02	1.05E-03	1.95E-01	6.52E-03	110.11%	2.15E-01	6.19E-02
Am-243	1.17E-01	6.49E-02	3.25E-01	4.19E-03	6.49E-02	2.09E-03	94.53%	6.14E-02	3.07E-01
Cm-244	3.19E+01	1.77E+01	2.19E-01	1.97E-02	9.32E+00	6.09E-01	101.56%	1.80E+01	2.22E-01
Cm-245	3.91E-03	2.17E-03	1.26E-02	1.90E-01	0.00E+00	7.24E-05	92.73%	2.01E-03	1.17E-02
Cm-246	1.17E-01	6.51E-02	2.12E-01	0.00E+00	0.00E+00	2.14E-03	149.94%	9.76E-02	3.18E-01
Cs-137	1.00E+00	5.55E-01	6.31E-03	0.00E+00	0.00E+00	6.14E-04	28.52%	1.58E-01	1.80E-03
Ba-137m	9.46E-01	5.25E-01	9.76E-10	0.00E+00	0.00E+00	2.07E-03	28.52%	1.50E-01	2.78E-10
Sr-90	1.73E+01	9.57E+00	6.94E-02	0.00E+00	0.00E+00	1.11E-02	41.39%	3.96E+00	2.87E-02
Y-90	1.73E+01	9.57E+00	1.76E-05	0.00E+00	0.00E+00	5.30E-02	41.39%	3.96E+00	7.28E-06
Totals		4.15E+01	2.51E+00	3.04E-01	1.00E+01	7.01E-01			

	Value	(one Sigma)	
TRU Alpha Activity Concentration	5.65E+04	3.42E+04	nCi/g
TRU Alpha Activity	7.69E-01	4.65E-01	Ci
Total Pu-239 Equiv Activity	1.00E+01	9.53E+00	Ci
Total Pu-239 Fissile Gram Equiv	3.04E-01	2.04E-01	g
Total Decay Heat	7.01E-01	6.27E-01	W
Volume Activity	1.92E-01	1.01E-01	Ci/L

Originator _____ (Print Name)

Signed _____ Date _____

Information Only

Waste Container Dose-to-Curie Conversion Record

Mark42/HFIR DTC Spreadsheet Verison 0 041508

Operating Procedure	CCP-TP-504 Rev. 6
Date of Survey	9/15/2008
Waste Stream Designation	OR-REDC-RH-HET
Cask Number	
Package Number	X430687B
Container Gross Weight	118.5 kg
Estimate Fill Percentages	100 %
Container Net Weight	**68.04 kg**
Measured Container Dose Rate	
Quadrant #1	0 mR/hr
Quadrant #2	0 mR/hr
Quadrant #3	0 mR/hr
Quadrant #4	0 mR/hr
Calculated Average Dose Rate	**320 mR/hr**
Waste Material Type	Organic

DTC Spreadsheet used to estimate the relatve activity of 6 packages in Cask X10C0601826
DR600 – Packaging Documentation Discrepancies for Cask X10C0601826

Nuclide	Curie Scaling Factors	Activity (Ci)	Grams	FGE	PECI	Watts	Uncertainty	Uncertainty in Curies	Uncertainty in Grams
U-233	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00%	0.00E+00	0.00E+00
U-234	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00%	0.00E+00	0.00E+00
U-235	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00%	0.00E+00	0.00E+00
U-238	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00%	0.00E+00	0.00E+00
Pu-238	6.24E-01	6.56E-01	3.79E-02	4.28E-03	5.96E-01	2.17E-02	99.00%	6.49E-01	3.75E-02
Pu-239	9.43E-04	9.90E-04	1.57E-02	1.57E-02	9.90E-04	3.07E-05	114.68%	1.14E-03	1.81E-02
Pu-240	1.63E-01	1.72E-01	7.46E-01	1.68E-02	1.72E-01	5.34E-03	97.88%	1.68E-01	7.30E-01
Pu-241	5.11E+00	5.37E+00	5.16E-02	1.16E-01	1.05E-01	1.71E-04	124.00%	6.66E+00	6.40E-02
Pu-242	8.32E-03	8.74E-03	2.20E+00	1.65E-02	7.94E-03	2.57E-04	97.69%	8.53E-03	2.15E+00
Am-241	3.51E-01	3.69E-01	1.06E-01	1.99E-03	3.69E-01	1.23E-02	110.95%	4.09E-01	1.18E-01
Am-243	1.17E-01	1.23E-01	6.15E-01	7.94E-03	1.23E-01	3.96E-03	95.50%	1.17E-01	5.88E-01
Cm-244	3.19E+01	3.35E+01	4.14E-01	3.73E-02	1.76E+01	1.15E+00	102.47%	3.43E+01	4.25E-01
Cm-245	3.91E-03	4.11E-03	2.39E-02	3.59E-01	0.00E+00	1.37E-04	93.72%	3.85E-03	2.24E-02
Cm-246	1.17E-01	1.23E-01	4.01E-01	0.00E+00	0.00E+00	4.04E-03	150.56%	1.86E-01	6.04E-01
Cs-137	1.00E+00	1.05E+00	1.19E-02	0.00E+00	0.00E+00	1.16E-03	31.60%	3.32E-01	3.77E-03
Ba-137m	9.46E-01	9.94E-01	1.85E-09	0.00E+00	0.00E+00	3.92E-03	31.60%	3.14E-01	5.84E-10
Sr-90	1.73E+01	1.81E+01	1.31E-01	0.00E+00	0.00E+00	2.10E-02	43.57%	7.90E+00	5.72E-02
Y-90	1.73E+01	1.81E+01	3.33E-05	0.00E+00	0.00E+00	1.00E-01	43.57%	7.90E+00	1.45E-05
Totals		7.88E+01	4.76E+00	5.76E-01	1.90E+01	1.33E+00			

	Value	(one Sigma)	
TRU Alpha Activity Concentration	2.14E+04	1.33E+04	nCi/g
TRU Alpha Activity	1.46E+00	9.03E-01	Ci
Total Pu-239 Equiv Activity	1.90E+01	1.82E+01	Ci
Total Pu-239 Fissile Gram Equiv	5.76E-01	3.94E-01	g
Total Decay Heat	1.33E+00	1.20E+00	W
Volume Activity	3.63E-01	1.98E-01	Ci/L

Originator _____ (Print Name)

Signed _____ Date _____

Information Only

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Attachment 3 - Acceptable Knowledge Source Document Summary

Site(s): Oak Ridge National Laboratory	Source Document Tracking Number: DR601
Waste Stream Number(s): ORNL Non-specific Library Files (Applicable only when site library is not in use)	
Acceptable Knowledge Documentation Type: ☑ TRU Waste Management Program Information ☑ Waste Stream-Specific Information ☑ Additional Information	Category: ☐ Correspondence ☑ Discrepancy Resolution ☐ Internal Procedure ☐ Miscellaneous ☐ Published Document or Internal Procedure ☐ Unpublished Documents
Title or Description of Source Document [a]: Discrepancy Resolution, Re: Presence of Debris Items in Poly Blocks	
Source Document Reference Information (author(s), document and revision number, date, publisher): Kevin J. Peters, DR601, NA, 07/01/2008, CCP	

AK # [b]	Source Doc. Page # [c]	AK Information Summary
PR7, WS9, S16	Throughout	Nature of Discrepancy: AK Summary Reports CCP-AK-ORNL-500 (Section 4.2.2) and CCP-AK-ORNL-002 (Section 5.3.1) discuss the inclusion of melted plastic items in metal cans included in waste streams OR-REDC-RH-HET and OR-REDC-CH-HET. "To reduce the volume of waste, a low-temperature furnace in Cubicle 9 is used to melt small plastic items such as polyethylene bottles to consolidate them in a metal bucket. Spent cation-exchange resins are calcined, leached with nitric acid, collected in a polyethylene bottle and melted in the furnace, then placed into a metal bucket." During RHVE of 55-gallon drums ORRH00001, ORRH00002, and ORRH00003 (from parent cask X10C0011108), poly blocks were identified and placed into drums without cutting to view interior contents within the melted block. Subsequent to building these drums, RHVE operators found debris items on top of melted plastic that appeared to have been added after the melt. Because debris items were discovered on top of the plastic, VE operators began cutting poly blocks during VE. Four of the subsequent 24 poly blocks cut after the packaging of the first three drums contained debris items other than melted plastics within the melted matrix. These items included a small metal tube in one can, scrap metal in another can, and small empty glass vials in two other cans. No prohibited items were discovered. The conditions found in the poly blocks were not identified in the AK Summary Report. Resolution: In an effort to resolve the discrepancy regarding the description of the melted plastic (poly), recently received supplemental packaging documentation received from ORNL was reviewed for the casks (M120), including X10C0011108 the parent cask for drums ORRH00001, ORRH00002, and ORRH00003. Based on the review of the descriptions of cans containing melted poly (see attached) it was determined that it was common for debris items (glass, plastic, cellulosic, and metal) to be included in the cans on top of the melted plastic as observed by the VE personnel. For some of the cans containing melted poly a log sheet was included (see attached) identifying the plastic items that were included in the melt. Although there is no indication of non-plastic items being included in the melting process, plastic fittings, valves, and lines that may contain non-plastic parts were included. For these reasons, CCP-AK-ORNL-500 and CCP-AK-ORNL-002 will be revised to note that other items (glass, metal, plastic, and cellulosic) may be contained in the cans of melted poly, either in the plastic matrix or placed on top of the block in the metal can in waste streams OR-REDC-RH-HET and OR-REDC-CH-HET.

NTPC RECORDS ORIGINAL
DATE RECD 1/3/14 BP

Attachment 3 - Acceptable Knowledge Source Document Summary (continued)

Site(s): Oak Ridge National Laboratory	Source Document Tracking Number: DR601
Source Document Data Limitations (If any): 1. None.	
Acceptable Knowlege Expert: Travis Smith _____ Date: 12/11/2013 Print /Sign	
[a] Provide description for non-titled information (i.e., container paperwork, MSDS sheets, etc) [b] Obtain from Acceptable Knowledge Documentation Checklist [c] For microfilm or microfiche, identify box, tape, reel number and location.	

DIVIDER PAGE ONLY

Not part of page count

Attachment 11 – Acceptable Knowledge Source Document Discrepancy Resolution

Waste Stream Number(s): OR-REDC-RH-HET, OR-REDC-CH-HET

Waste Stream Description: REDC Heterogeneous Debris (CH and RH)

AK Documentation Type: [X] TRU Waste Management Program Information [X] Waste Stream Specific Information [X] Supplemental Information							
AK Source Document Discrepancy Form Tracking Number: DR601 – Discrepancy Resolution Regarding the Presence of Debris Items in Poly Blocks							
Tracking #	Category[a]	Title	Document/Rev#	Author	Date	Publisher	Page #
N/A	Pub.	Central Characterization Project Acceptable Knowledge Summary Report For Oak Ridge National Laboratory Radiochemical Engineering Development Center Remote-Handled Transuranic Waste, Waste Stream: OR-REDC-RH-HET	CCP-AK-ORNL-500, Rev. 0	CCP	5/2/2008	CCP	Sections 4.2.2
N/A	Pub.	Central Characterization Project Acceptable Knowledge Summary Report For Oak Ridge National Laboratory Radiochemical Engineering Development Center Contact-Handled Transuranic Waste, Waste Stream: OR-REDC-CH-HET	CCP-AK-ORNL-002, Rev. 0	CCP	12/12/2007	CCP	Section 5.3.1
N/A	NCR	L-Trend Code CCP Nonconformance Report	NCR-RHORNL-0001-08 (Rev. 0)	Ronald Reeves Irene Quintana	6/12/2008	CCP	Attached
M120	Unpub.	ORNL RH Cask Evaluation and Supplemental Packaging Documentation	N/A	ORNL	Various	N/A	Cask X10C0011108

NTPC RECORDS ORIGINAL
DATE REC'D 1/3/14
SP

Nature of Discrepancy:

AK Summary Reports CCP-AK-ORNL-500 (Section 4.2.2) and CCP-AK-ORNL-002 (Section 5.3.1) discuss the inclusion of melted plastic items in metal cans included in waste streams OR-REDC-RH-HET and OR-REDC-CH-HET.

> *"To reduce the volume of waste, a low-temperature furnace in Cubicle 9 is used to melt small plastic items such as polyethylene bottles to consolidate them in a metal bucket. Spent cation-exchange resins are calcined, leached with nitric acid, collected in a polyethylene bottle and melted in the furnace, then placed into a metal bucket."*

During RHVE of 55-gallon drums ORRH00001, ORRH00002, and ORRH00003 (from parent cask X10C0011108), poly blocks were identified and placed into drums without cutting to view interior contents within the melted block. Subsequent to building these drums, RHVE operators found debris items on top of melted plastic that appeared to have been added after the melt. Because debris items were discovered on top of the plastic, VE operators began cutting poly blocks during VE. Four of the subsequent 24 poly blocks cut after the packaging of the first three drums contained debris items other than melted plastics within the melted matrix. These items included a small metal tube in one can, scrap metal in another can, and small empty glass vials in two other cans. No prohibited items were discovered. The conditions found in the poly blocks were not identified in the AK Summary Report.

Resolution:

In an effort to resolve the discrepancy regarding the description of the melted plastic (poly), recently received supplemental packaging documentation received from ORNL was reviewed for the casks (M120), including X10C0011108 the parent cask for drums ORRH00001, ORRH00002, and ORRH00003. Based on the review of the descriptions of cans containing melted poly (see attached) it was determined that it was common for debris items (glass, plastic, cellulosic, and metal) to be included in the cans on top of the melted plastic as observed by the VE personnel. For some of the cans containing melted poly a log sheet was included (see attached) identifying the plastic items that were included in the melt. Although there is no indication of non-plastic items being included in the melting process, plastic fittings, valves, and lines that may contain non-plastic parts were included.

For these reasons, CCP-AK-ORNL-500 and CCP-AK-ORNL-002 will be revised to note that other items (glass, metal, plastic, and cellulosic) may be contained in the cans of melted poly, either in the plastic matrix or placed on top of the block in the metal can in waste streams OR-REDC-RH-HET and OR-REDC-CH-HET.

Discrepancy Resolved: [X] Yes [ ] No

Acceptable Knowledge Expert: Kevin J. Peters (Print) / (Sign) Date: 6/20/2008

Site Project Manager: Hillary J. Kelly (Print) / (Sign) Date: 7/1/2008

[a] Published Document or Controlled Database (Pub.); Unpublished Data (Unpub.); Internal Procedure or Note (Proc.); Correspondence (Corr.) or Discrepancy (Disc.)

Attachment 1 – CCP Nonconformance Report (NCR)

NCR No. NCR-RHORNL-0001-08 Revision 0

1. Lot No./Heat No. or Serial No.: N/A	2. Process (NDA, HSG, NDE, VE, Other): RHVE	3. Batch Data Report # (s): RHORVE080001 Container #(s): ORRH00001, ORRH00002, ORRH00003
4. Order/Work Order/Job Control Number (as applicable): N/A	5. PO #: N/A 6. Supplier: N/A	

DESCRIPTION OF NONCONFORMANCE

7. (a) CCP HOLD TAGS SHALL BE APPLIED UNLESS JUSTIFIED AS FOLLOWS:
Due to ALARA considerations, NCR tagging will not be applied for this NCR. Administrative control will be applied through container entry in the CCP Data Center. In addition, a listing of containers has been posted on the CCP ftp site, identifying those containers where NCR tagging is not being applied due to ALARA. Container information for this NCR has been included in the listing, which is to alert Mobile Loading Unit personnel as a second control mechanism for non-tagged containers. The current listing has been posted to the ftp site.

☐ < 100 nCi/g ☐ Prohibited Item ☐ >500 ppmv Flamm. VOCs

☐ E-Flag ☐ Receiving Inspection ☐ Transportation ☐ WWIS ☒ Other

(b) Description of Nonconformance
Required Condition (Implementing Procedure, Revision, Section & Text)

CCP-AK-ORNL-500, Rev.0, Section 4.2.2 states "To reduce the volume of waste, a low-temperature furnace in Cubicle 9 is used to melt small plastic items such as polyethylene bottles to consolidate them in a metal bucket. Spent cation-exchange resins are calcined, leached with nitric acid, collected in a polyethylene bottle and melted in the furnace, then placed into a metal bucket."

During RHVE operations, the cans with melted plastic are typically referred to as poly blocks.

(c). Actual Condition

During RHVE of containers ORRH00001, ORRH00002, ORRH00003, poly blocks were identified and placed into drums without cutting to view interior contents within the melted block. Subsequent to building these drums, RHVE operators found debris items on top of melted plastic that appeared to have been added after the melt. Because debris items were discovered on top of the plastic, VE operators began cutting poly blocks during VE. 4 of the subsequent 24 poly blocks cut to date contained debris items other than melted plastics within the melted matrix. These items included a small metal tube in one can, scrap metal in another can, and small empty glass vials in two other cans. No prohibited items were discovered. The conditions found in the poly blocks were not identified in the AK Summary Report.

8. NCR Originator (Print name, sign, and date) Ronald D. Reeves 6-12-08	9. CCP QA Engineer or Designee Validation (Print name, sign, and date) Dean Mooney 6/12/08
9a. Does this NCR have the potential to impact AK? ☒ YES ☐ NO ☐ INDETERMINATE If YES or INDETERMINATE, then apply Trend Code L in Block 12.	
10. Significant Condition? ☐ YES ☒ NO ☐ NA	11. Recurring Condition? ☐ YES ☒ NO (If YES, List NCRs/CARs)
12. Trend Code: L	13. Responsible Manager. IRENE QUINTANA

BEST AVAILABLE

Attachment 1 – CCP Nonconformance Report (NCR)	
NCR No. NCR-RHORNL-0001-08	Revision 0
FINAL DISPOSITION	
19. Final Disposition (Check One) ☐ Use-As-Is ☒ Reject ☐ Repair ☐ Rework ☐ Scrap	
(a) Technical Justification (Required for Use-As-Is and Repair dispositions. N/A for Reject, Scrap, or Rework dispositions.) N/A	
(b) Disposition Instructions (Required for Reject and Scrap, N/A for Use-As-Is, Rework, and Repair) **(The conditions identified in this BDR do not require evaluation by the AKE to determine actions necessary to correct the packaging of the waste.)** 1. BDR RHORVE08001 will be voided. 2. Waste containers ORRH00001, ORRH00002, and ORRH00003 will be opened individually, all waste removed and repackaged with any poly blocks cut open and examined in accordance with current practice. VE will be re-performed on the waste at the time of repackaging in accordance with CCP-TP-500. The waste container numbers will not change. The data will included in a new BDR. 3. Once all three waste containers are repackaged and Visual Examination complete, the waste containers will be sent through Dose-to-Curie in accordance with CCP-TP-604. The data will be included in a new BDR. 4. BDR ORRHDTC08001 will be voided. 5. The AKE will evaluate the conditions identified in the poly blocks and develop an AK Discrepancy Resolution in accordance with CCP-TP-005. The AK Discrepancy Resolution will be approved and provided to CCP Records.	
(c) Instructions for Completion of the Final Disposition, including Inspection Criteria (Required for Repair and Rework, N/A for Use-As-Is, Reject and Scrap) NA	
(d) Corrective Actions (Actions to Prevent Recurrence) - as required. N/A	
FINAL DISPOSITION APPROVALS	
20. Responsible Manager/Individual: (Print, sign, and date) IRENE QUINTANA 6/12/08	21. CCP QA Engineer or Designee: (Print, sign, and date) DEAN MOONEY 6/12/2008
Additional Approvals: (Print, sign, and date) NA	Additional Approvals: (Print, sign, and date) NA
CLOSURE	
22. Final Disposition Complete Responsible Manager/Individual: (Print, sign, and date)	
23. Final Disposition Verified – NCR Closed	CCP QA Engineer: (Print, sign, and date)

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RH-TRU WASTE CERTIFICATION DATA SHEET NO. 1

CERTIFICATION OF INTERMEDIATE CONTAINERS OF RH-TRU WASTE
(e.g., one-gallon paint cans) FILLED IN THE CUBICLES

[DO NOT USE IF RCRA MATERIALS ARE PRESENT]

Your signature certifies a numbered, filled, and closed container containing NO fines; free liquid; pyrophoric, explosive, toxic, or corrosive materials; fissionable isotopes (>27 g/ft^3); heat sources (0.1 watt/ft^3); or RCRA materials.

Intermediate Container Identification: Paint Can No.: 9333
(or other container and number): _____
Date filled and closed: 8/3/02

Description of Contents:

Item(s)	Source/Waste Form Category
Melted Poly	Cell back / plastic
Broken glass	glass
EDV Block	metal
ME-42 Lid	rubber
Rubber Gaskets	
Sample Bottle lids	

Combustibles: 90 volume %

Radiation Readings (if taken):
γ at 12 in.: BKG R/h Neutrons at 3 ft: BKG mrem/h Date: 8/2/02
γ at 12 in.: _____ R/h Neutrons at 3 ft: _____ mrem/h Date: _____

NOTE THAT NO RCRA MATERIALS ARE PRESENT IN THIS CONTAINER

Signature of Waste Generator filling and closing waste container: R. G. Warner

REFERENCE: Plastic Bucket No.: _____, or Draw String Bag No.: 81,
and Sequence No.: 5 (Data Sheet 4)

DATA SHEET FOR IN-CELL MELTING OF PLASTIC WASTE

BUCKET I.D.: 3046 STARTING DATE: 7/26/02

SHEET 1 OF 1

Time	Temp.	Items Melted	Description / Comments	Ini.
1600	220	Plastic Bags/	250 ml bottles	RJS
1915	225	1 L PB	MH4PuOx-1	RJS
2100	223	Plastic Bags, jacos, cut up poly liners		RJW
2200	221	Plastic Bags		RJW
0145	222	cut up poly line, jacos, Bags		RJW
0235	225	cut up poly line, jacos, P.B. Lids		RJW
0400	197	cut up poly line, jacos, P.B. Lids, Bags		RJW
0515	226	Plastic Bags		RJW
		Bucket Full		

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Attachment 3 - Acceptable Knowledge Source Document Summary

Site(s): Oak Ridge National Laboratory	Source Document Tracking Number: DR602
Waste Stream Number(s): ORNL Non-specific Library Files (Applicable only when site library is not in use)	
Acceptable Knowledge Documentation Type: ☑ TRU Waste Management Program Information ☑ Waste Stream-Specific Information ☑ Additional Information	Category: ☐ Correspondence ☑ Discrepancy Resolution ☐ Internal Procedure ☐ Miscellaneous ☐ Published Document or Internal Procedure ☐ Unpublished Documents
Title or Description of Source Document [a]: Discrepancy Resolution, Re: Follow-Up on DR005 for EPA Hazardous Waste Number Discrepancies	
Source Document Reference Information (author(s), document and revision number, date, publisher): Kevin J. Peters, DR602, NA, 07/02/2008, CCP	

AK # [b]	Source Doc. Page # [c]	AK Information Summary
PR7, WS2, WS3, WS8, WS12, S13	Throughout	S13 - CCP Discrepancy Resolution Nature of Discrepancy: As described in AK Summary Reports CCP-AK-ORNL-500 (Section 5.4.2) and CCP-AK-ORNL-002 (Section 5.4.3), the assignment of EPA Hazardous Waste Numbers (HWNs) to the REDC waste streams OR-REDC-RH-HET and OR-REDC-CH-HET was based on the review of AK sources including, procedures, personnel interviews, previous AK reports, container packaging and shipping documentation, and material safety data sheet (MSDS) information for commercial products as noted in the AK record. These AK sources were reviewed to determine potential waste material inputs and possible chemical contaminants associated with the Building 7920 REDC operations. Based on this review the following EPA HWNs were assigned to the REDC CH and RH debris waste: F002, F005, D005, D006, D007, D008, D009, D010, D011, and D019. A majority of the AK sources used for development of these CCP AK Summary Reports were originally collected by Weston Solutions, Inc. (Weston) for characterization of ORNL TRU waste streams. Weston's research culminated with the Acceptable Knowledge Summary Report for Oak Ridge National Laboratory Contact-Handled TRU Debris Waste Facility Maintenance Operations (U044) dated 6/19/2006. This report includes containers of debris waste generated in the REDC (Buildings 7920 and 7930) and the Transuranium Research Laboratory (Building 5505) that were combined into waste stream ORFWENC-007. Based on Weston's characterization of the waste in this stream the following EPA HWNs were assigned: F001, F002, F004, F005, D004, D005, D006, D007, D008, D009, D010, D011, and D022. Discrepancy DR005 was prepared to resolve the inconsistencies documented in these two characterization programs. However, DR005 only focused on the assignment of the HWNs when there was a discrepancy between these characterization programs. During the ORNL Certification Audit, it was noted that the assignment of EPA HWNs for other chemicals was not well supported by the AK referenced in Table 5.3 for chemicals including benzene, methyl ethyl ketone (MEK), and 1,1,2-trichloroethane, and selenium. Source document C078 contains an inventory list of chemicals. This inventory list was reviewed by REDC personnel and chemical potentially present were identified with hand written circles, check marks, and notes, which are difficult to interpret. Resolution: To resolve this discrepancy the AK sources were reviewed for primarily the chemicals assigned HWNs to determine if the referenced sources supported this assignment. Specifically, the AK sources for MEK, benzene, 1,1,2-trichloroethane, and selenium were reviewed as follows: F005 – Methyl Ethyl Ketone

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DATE REC'D 1/3/14 SP

Attachment 3 - Acceptable Knowledge Source Document Summary (continued)

Site(s): Oak Ridge National Laboratory		Source Document Tracking Number: DR602
AK # [b]	Source Doc. Page # [c]	AK Information Summary
		C078 is the only reference identified in U044 for MEK. C078 does not support the assignment of MEK. No other source identifies this chemical being used in the REDC. For this reason, MEK will be deleted from the CH and RH AK Summary Reports as an F005 solvent. F005 – Benzene C078 referenced in U044 for benzene not supported by the attached document. AK Source P020 – Non-REDC coal liquefaction and environmental research. AK Source P021 – Non-REDC fossil energy coal liquefaction research. AK Source P145 – Section 5.7 identifies benzene during a literary search regarding sulfate complexes – no indication experiments were conducted in the REDC. AK Source P162 – Experiments performed by Chemistry and Physics Division during the 1970 time frame. AK Source P160 and 164 – Describes the use of benzene during extractions operations associated with plutonium and transplutonium research that may have been conducted in the REDC process development laboratories. For this reason, F005 for benzene will continue to be assigned to REDC RH and CH waste streams. D010 – Selenium C078 referenced in U044 for selenium not supported by the attached document. AK Source P004 – Report describes research conducted prior to 1963 before the REDC was in operation (1966). AK Source P005 – Only reference to selenium is a non-REDC related study of soil absorption. AK Source P011 – References related to non-REDC research relating to food samples. AK Source P020 – General discussion of research related to metals in fly ash. C078 only reference in U044 for selenium not supported by the attached documentation in C078. No other source identifies this chemical being used in the REDC. For this reason, selenium will be deleted from the CH and RH AK Summary Reports for EPA HWN D010. F002 – 1,1,2-trichloroethane C078 is the only AK source identified for the F002 solvent 1,1,2-trichloroethane. This inventory list is hand marked and specifically identifies this chemical. The use of this solvent is not identified and the process of use is unknown. However, without the availability of additional information to verify that this chemical was not used in the REDC areas contaminating the RH and CH debris waste streams, F002 will be assigned to the waste streams. Ongoing chemical use research is currently being conducted for the process development laboratories. During this review of the AK documentation, additional research will be conducted to augment the chemical use in the REDC. In addition to the chemicals discussed above, the other chemicals in the references discussed above will be reviewed to correct the chemicals identified as potential present in the REDC was listed in source document C078. Several F003 solvents were identified by both Weston and CCP. As described in the Weston AK Report and CCP AK Summary, assignment of the F003 to the waste is not appropriate if liquids are not present in the final waste form. Based on the evaluation summarized above and that done in DR005, the following EPA HWNs are assigned to waste streams OR-REDC-RH-HET and OR-REDC-CH-HET; F002, F005, D005, D006, D007, D008, D009, D011, and D019.

Attachment 3 - Acceptable Knowledge Source Document Summary (continued)

Site(s): Oak Ridge National Laboratory	Source Document Tracking Number: DR602
Source Document Data Limitations (if any): 1. None CP 11/19	
Acceptable Knowlege Expert: Travis Smith _____ Date: 12/11/2013 Print /Sign	
[a] Provide description for non-titled information (i.e., container paperwork, MSDS sheets, etc) [b] Obtain from Acceptable Knowledge Documentation Checklist [c] For microfilm or microfiche, identify box, tape, reel number and location.	

DIVIDER PAGE ONLY

Not part of page count

Attachment 11 – Acceptable Knowledge Source Document Discrepancy Resolution

Waste Stream Number(s): OR-REDC-RH-HET, OR-REDC-CH-HET

Waste Stream Description: REDC Heterogeneous Debris (CH and RH)

AK Documentation Type: [X] TRU Waste Management Program Information [X] Waste Stream Specific Information [X] Supplemental Information							
AK Source Document Discrepancy Form Tracking Number: DR602 – EPA Hazardous Waste Number Discrepancies – DR005 Follow-up							
Tracking #	Category[a]	Title	Document/Rev#	Author	Date	Publisher	Page #
N/A	Pub.	Central Characterization Project Acceptable Knowledge Summary Report For Oak Ridge National Laboratory Radiochemical Engineering Development Center Remote-Handled Transuranic Waste, Waste Stream: OR-REDC-RH-HET	CCP-AK-ORNL-500, Rev. 0	CCP	5/2/2008	CCP	Section 5.4.2
N/A	Pub.	Central Characterization Project Acceptable Knowledge Summary Report For Oak Ridge National Laboratory Radiochemical Engineering Development Center Contact-Handled Transuranic Waste, Waste Stream: OR-REDC-CH-HET	CCP-AK-ORNL-002, Rev. 0	CCP	5/2/2008	CCP	Section 5.4.3
C078	Corr.	Memo to Bryan Roy transmitting Historical Survey – RCRA Information	N/A	James W. Moore.	4/04/2005	N/A	All
DR005	Disc.	EPA Hazardous Waste Number Discrepancies	DR005	Kevin Peters	6/20/2008	CCP	All
I042	Corr.	AKE Memo and Potential Hazardous Constituents in ORNL Wastes	N/A	Betty Humphrey, Jean S. Burt	6/27/05-5/23/06	N/A	Throughout

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DATE REC'D 1/3/14
DR602

U044	Pub.	Acceptable Knowledge Summary Report for Oak Ridge National Laboratory Contact-Handled TRU Debris Waste Facility Maintenance Operations	AK-ORNL-001, Rev. 4	TRU/Alpha Low Level Treatment Project	6/19/2006	N/A	Sections 2.7, 5.7, and Table 4.2

Nature of Discrepancy:

As described in AK Summary Reports CCP-AK-ORNL-500 (Section 5.4.2) and CCP-AK-ORNL-002 (Section 5.4.3), the assignment of EPA Hazardous Waste Numbers (HWNs) to the REDC waste streams OR-REDC-RH-HET and OR-REDC-CH-HET was based on the review of AK sources including, procedures, personnel interviews, previous AK reports, container packaging and shipping documentation, and material safety data sheet (MSDS) information for commercial products as noted in the AK record. These AK sources were reviewed to determine potential waste material inputs and possible chemical contaminants associated with the Building 7920 REDC operations. Based on this review the following EPA HWNs were assigned to the REDC CH and RH debris waste: F002, F005, D005, D006, D007, D008, D009, D010, D011, and D019.

A majority of the AK sources used for development of these CCP AK Summary Reports were originally collected by Weston Solutions, Inc. (Weston) for characterization of ORNL TRU waste streams. Weston's research culminated with the *Acceptable Knowledge Summary Report for Oak Ridge National Laboratory Contact-Handled TRU Debris Waste Facility Maintenance Operations* (U044) dated 6/19/2006. This report includes containers of debris waste generated in the REDC (Buildings 7920 and 7930) and the Transuranium Research Laboratory (Building 5505) that were combined into waste stream ORFWENC-007. Based on Weston's characterization of the waste in this stream the following EPA HWNs were assigned: F001, F002, F004, F005, D004, D005, D006, D007, D008, D009, D010, D011, and D022.

Discrepancy DR005 was prepared to resolve the inconsistencies documented in these two characterization programs. However, DR005 only focused on the assignment of the HWNs when there was a discrepancy between these characterization programs. During the ORNL Certification Audit, it was noted that the assignment of EPA HWNs for other chemicals was not well supported by the AK referenced in Table 5.3 for chemicals including benzene, methyl ethyl ketone (MEK), and 1,1,2-trichloroethane, and selenium. Source document C078 contains an inventory list of chemicals. This inventory list was reviewed by REDC personnel and chemical potentially present were identified with hand written circles, check marks, and notes, which are difficult to interpret.

Resolution:

To resolve this discrepancy the AK sources were reviewed for primarily the chemicals assigned HWNs to determine if the referenced sources supported this assignment. Specifically, the AK sources for MEK, benzene, 1,1,2-trichloroethane, and selenium were reviewed as follows:

F005 – Methyl Ethyl Ketone

C078 is the only reference identified in U044 for MEK. C078 does not support the assignment of MEK. No other source identifies this chemical being used in the REDC. For this reason, MEK will be deleted from the CH and RH AK Summary Reports as an F005 solvent.

F005 – Benzene

C078 referenced in U044 for benzene not supported by the attached document.

AK Source P020 – Non-REDC coal liquefaction and environmental research.

AK Source P021 – Non-REDC fossil energy coal liquefaction research.

AK Source P145 – Section 5.7 identifies benzene during a literary search regarding sulfate complexes – no indication experiments were conducted in the REDC.

AK Source P162 – Experiments performed by Chemistry and Physics Division during the 1970 time frame.

AK Source P160 and 164 – Describes the use of benzene during extractions operations associated with plutonium and transplutonium research that may have been conducted in the REDC process development laboratories. For this reason, F005 for benzene will continue to be assigned to REDC RH and CH waste streams.

D010 – Selenium

C078 referenced in U044 for selenium not supported by the attached document.

AK Source P004 – Report describes research conducted prior to 1963 before the REDC was in operation (1966).

AK Source P005 – Only reference to selenium is a non-REDC related study of soil absorption.

AK Source P011 – References related to non-REDC research relating to food samples.

AK Source P020 – General discussion of research related to metals in fly ash.

C078 only reference in U044 for selenium not supported by the attached documentation in C078. No other source identifies this chemical being used in the REDC. For this reason, selenium will be deleted from the CH and RH AK Summary Reports for EPA HWN D010.

F002 – 1,1,2-trichloroethane

C078 is the only AK source identified for the F002 solvent 1,1,2-trichloroethane. This inventory list is hand marked and specifically identifies this chemical. The use of this solvent is not identified and the process of use is unknown. However, without the availability of additional information to verify that this chemical was not used in the REDC areas contaminating the RH and CH debris waste streams, F002 will be assigned to the waste streams. Ongoing chemical use research is currently being conducted for the process development laboratories. During this review of the AK documentation, additional research will be conducted to augment the chemical use in the REDC.

In addition to the chemicals discussed above, the other chemicals in the references discussed above will be reviewed to correct the chemicals identified as potential present in the REDC was listed in source document C078

Several F003 solvents were identified by both Weston and CCP. As described in the Weston AK Report and CCP AK Summary, assignment of the F003 to the waste is not appropriate if liquids are not present in the final waste form.

Based on the evaluation summarized above and that done in DR005, the following EPA HWNs are assigned to waste streams OR-REDC-RH-HET and OR-REDC-CH-HET; F002, F005, D005, D006, D007, D008, D009, D011, and D019.

Discrepancy Resolved: [X] Yes [ ] No

Acceptable Knowledge Expert: Kevin J. Peters / _____ Date: 7/2/2008
Print Sign

Site Project Manager: Hugh J Neely / _____ Date: 7/2/2008
Print Sign

[a] Published Document or Controlled Database (Pub.); Unpublished Data (Unpub.); Internal Procedure or Note (Proc.); Correspondence (Corr.) or Discrepancy (Disc.)

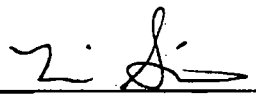
Attachment 3 - Acceptable Knowledge Source Document Summary

Site(s): Oak Ridge National Laboratory	Source Document Tracking Number: DR010
Waste Stream Number(s): ORNL Non-specific Library Files (Applicable only when site library is not in use)	
Acceptable Knowledge Documentation Type: ☑ TRU Waste Management Program Information ☑ Waste Stream-Specific Information ☑ Additional Information	Category: ☐ Correspondence ☑ Discrepancy Resolution ☐ Internal Procedure ☐ Miscellaneous ☐ Published Document or Internal Procedure ☐ Unpublished Documents
Title or Description of Source Document [a]: Discrepancy Resolution re: Incorrect Waste Stream Assignment of Soil Waste Containers	
Source Document Reference Information (author(s), document and revision number, date, publisher): Jeff Harrison, DR010, NA, 01/12/2009	

AK # [b]	Source Doc. Page # [c]	AK Information Summary
PR5, PR7, WS1, WS2, WS3, WS4, WS6, WS8, WS9, WS12, S9	All	AK identified 7 drums as soil (S4000), but RTR has determined that 5 of the drums (NFS0821, NFS0839, NFS0840, NFS0927, and X10C0506047) are predominantly debris waste (S5000) and 2 of the drums (NFS0816 and NFS0817) are predominantly absorbent (S3000). Because drums NFS0821, NFS0839, NFS0840, NFS0927, and X10C0506047 are predominantly debris waste, they are potential candidates to be included in waste stream OR-NFS-CH-HET. RTR describes these 5 drums as containing broken concrete, cinder block, reinforcement wire (i.e., rebar), rocks, scrap metal, absorbent, wire, a metal nut, nails, plastic bags, and plastic jars with soil and rock samples. These waste materials are identified in waste stream OR NFS-CH-HET. The container paperwork for these 5 drums indicate the origin of the waste is NFS 110/234 and have generation dates from September 1993 to September 2001. Waste stream OR NFS-CH-HET was generated from activities associated with the decommissioning of Buildings 110 and 234 at NFS from August 1993 to September 2003. Waste stream OR-NFS-CH-SOIL is assigned F002, and NFS debris waste stream OR-NFS-CH-HET is assigned D006, D008, D009, and D011 but not F002. Therefore, F002 needs to be added to the waste stream. However, since there is already an approved waste stream profile form for OR-NFS-CH-HET, this waste stream number will be replaced with a new waste stream number; OR-NFS-CH-HET.001 which will be assigned F002, D006, D008, D009, and D011. NFS0816 and NFS0817 are predominantly absorbent which is consistent with Summary Category Group S3000. Since there is currently no waste stream in CCP-AK-ORNL-001 for these 2 drums, they will be excluded from AK and re-evaluated in the future for assignment to a new waste stream. This discrepancy is also documented in an AK Re-evaluation.

NTPC RECORDS ORIGINAL
DATE REC'D 12/15/13

Attachment 3 - Acceptable Knowledge Source Document Summary (continued)

Site(s): Oak Ridge National Laboratory	Source Document Tracking Number: DR010
Source Document Data Limitations (if any): 1. None.	
Acceptable Knowlege Expert: Travis Smith /  Date: 11/18/2013 Print /Sign	
[a] Provide description for non-titled information (i.e., container paperwork, MSDS sheets, etc) [b] Obtain from Acceptable Knowledge Documentation Checklist [c] For microfilm or microfiche, identify box, tape, reel number and location.	

Attachment 11 - Acceptable Knowledge Source Document Discrepancy Resolution

Waste Stream Number(s): OR-NFS-CH-SOIL, OR-NFS-CH-HET

Waste Stream Description: Contaminated NFS soil and debris waste stored at ORNL

AK Documentation Type: ☒TRU Waste Management Program Information ☒Waste Stream Specific Information ☒Supporting Info.

AK Source Document Discrepancy Form Tracking Number: **DR010**

Tracking #	Category*	Title	Doc/Rev.#	Author	Publisher	Date	Page #
N/A	N/A	Central Characterization Project Acceptable Knowledge Summary Report For Nuclear Fuel Services Contact-Handled Transuranic Waste Stored at Oak Ridge National Laboratory, Waste Streams OR-NFS-CH-HET and OR-NFS-CH-SOIL	CCP-AK-ORNL-001, Rev. 3	CCP	N/A	8/11/08	Throughout
N/A	N/A	Acceptable Knowledge Re-evaluation Checklist	CCP-TP-005, Attachment 10	J. Harrison	N/A	1/8/09	All

Nature of Discrepancy: AK identified 7 drums as soil (S4000), but RTR has determined that 5 of the drums (NFS0821, NFS0839, NFS0840, NFS0927, and X10C0506047) are predominantly debris waste (S5000) and 2 of the drums (NFS0816 and NFS0817) are predominantly absorbent (S3000).

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DATE REC'D 12/18/13

Resolution: Because drums NFS0821, NFS0839, NFS0840, NFS0927, and X10C0506047 are predominantly debris waste, they are potential candidates to be included in waste stream OR-NFS-CH-HET.

RTR describes these 5 drums as containing broken concrete, cinder block, reinforcement wire (i.e., rebar), rocks, scrap metal, absorbent, wire, a metal nut, nails, plastic bags, and plastic jars with soil and rock samples. These waste materials are identified in waste stream OR-NFS-CH-HET. The container paperwork for these 5 drums indicate the origin of the waste is NFS 110/234 and have generation dates from September 1993 to September 2001. Waste stream OR-NFS-CH-HET was generated from activities associated with the decommissioning of Buildings 110 and 234 at NFS from August 1993 to September 2003.

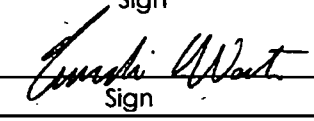
Waste stream OR-NFS-CH-SOIL is assigned F002, and NFS debris waste stream OR-NFS-CH-HET is assigned D006, D008, D009, and D011 but not F002. Therefore, F002 needs to be added to the waste stream. However, since there is already an approved waste stream profile form for OR-NFS-CH-HET, this waste stream number will be replaced with a new waste stream number; OR-NFS-CH-HET.001 which will be assigned
F002, D006, D008, D009, and D011.

NFS0816 and NFS0817 are predominantly absorbent which is consistent with Summary Category Group S3000. Since there is currently no waste stream in CCP-AK-ORNL-001 for these 2 drums, they will be excluded from AK and re-evaluated in the future for assignment to a new waste stream.

This discrepancy is also documented in an AK Re-evaluation.

Discrepancy Resolved: ☒ Yes ☐ No

Acceptable Knowledge Expert: Jeff Harrison / Date: 1/12/09
Print Sign

Site Project Manager: Candice Weston /  Date: 01/12/09
Print Sign

[a] Published Document or Controlled Database (Pub.); Unpublished Data (Unpub.); Internal Procedure or Note (Proc.); Correspondence (Corr.) or Discrepancy (Disc.)

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Attachment 3 - Acceptable Knowledge Source Document Summary

Site(s): Oak Ridge National Laboratory	Source Document Tracking Number: DR023
Waste Stream Number(s): ORNL Non-specific Library Files (Applicable only when site library is not in use)	
Acceptable Knowledge Documentation Type: ☑ TRU Waste Management Program Information ☑ Waste Stream-Specific Information ☑ Additional Information	Category: ☐ Correspondence ☑ Discrepancy Resolution ☐ Internal Procedure ☐ Miscellaneous ☐ Published Document or Internal Procedure ☐ Unpublished Documents
Title or Description of Source Document [a]: Discrepancy Resolution re: NFS0815 and X10C0506069	
Source Document Reference Information (author(s), document and revision number, date, publisher): Jeff Harrison, NA, NA, 03/22/2010, Tech Specs	

AK # [b]	Source Doc. Page # [c]	AK Information Summary
PR7, WS1, WS9, S9	Throughout	Nature of Discrepancy: AK identified drums NFS0815 and X10C0506069 as soil (M003), but RTR has determined that these drums contain predominantly debris waste. RTR describes NFS0815 as concrete with reinforcement wire. RTR describes X10C0506069 as clay pipe. Resolution: As described in Acceptable Knowledge Re-evaluation Checklist for NFS0815 and X10C0506069 dated 3/22/10, these drums are being moved to waste stream OR-NFS-CH-HET-A.

Source Document Data Limitations (if any):

1. None.

Acceptable Knowlege Expert:

Travis Smith / [signature] Date: 11/18/2013
Print /Sign

[a] Provide description for non-titled information (i.e., container paperwork, MSDS sheets, etc)
[b] Obtain from Acceptable Knowledge Documentation Checklist
[c] For microfilm or microfiche, identify box, tape, reel number and location.

NTPC RECORDS ORIGINAL
DATE REC'D 12/18/13

Attachment 11 - Acceptable Knowledge Source Document Discrepancy Resolution (NFS0815 & X10C0506069)

Waste Stream Number(s): OR-NFS-CH-SOIL, OR-NFS-CH-HET-A

Waste Stream Description: Contaminated NFS soil and debris waste stored at ORNL

AK Documentation Type: ☒TRU Waste Management Program Information ☒Waste Stream Specific Information ☒Supporting Info.

AK Source Document Discrepancy Form Tracking Number: **DR023**

Tracking #	Category*	Title	Doc/Rev #	Author	Publisher	Date	Page #
N/A	N/A	Acceptable Knowledge Re-evaluation Checklist (NFS0815 & X10C0506069)	CCP-TP-005, Rev. 18, Attachment 10	CCP	N/A	3/22/10	All
N/A	N/A	CCP Nonconformance Report	NCR-ORNL-0509-10	CCP	N/A	3/5/10	All
N/A	N/A	CCP Radiography Data Sheet	OR-RTR6-0071	CCP	N/A	7/10/08	NFS0815
N/A	N/A	CCP Radiography Data Sheet	OR-RTR6-0103	CCP	N/A	9/2/08	X10C0506069
M003	Unpub.	ORNL UCN-2109 and UCN-2822 Forms for NFS TRU Waste and Related Paperwork	See title	NFS	N/A	9/3/01	NFS0815 & X10C0506069

Nature of Discrepancy: AK identified drums NFS0815 and X10C0506069 as soil (M003), but RTR has determined that these drums contain predominantly debris waste. RTR describes NFS0815 as concrete with reinforcement wire. RTR describes X10C0506069 as clay pipe.

Resolution: As described in Acceptable Knowledge Re-evaluation Checklist for NFS0815 and X10C0506069 dated 3/22/10, these drums are being moved to waste stream OR-NFS-CH-HET-A.

Discrepancy Resolved: ☒ Yes ☐ No

Acceptable Knowledge Expert: Jeff Harrison / Jeff Harrison Date: 3/22/10
Print Sign

Site Project Manager: Richard Kantrowitz / Richard Kantrowitz Date: 3/22/10
Print Sign

* Published Document or Controlled Database (Pub.); Unpublished Data (Unpub.); Internal Procedure or Note (Proc.); Correspondence (Corr.) or Discrepancy (Disc.)

NTPC RECORDS ORIGINAL
DATE REC'D 12/18/13

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Attachment 3 - Acceptable Knowledge Source Document Summary

Site(s): Oak Ridge National Laboratory	Source Document Tracking Number: DR026

Waste Stream Number(s): ORNL Non-specific Library Files
(Applicable only when site library is not in use)

Acceptable Knowledge Documentation Type:	Category:
☑ TRU Waste Management Program Information	☐ Correspondence
☑ Waste Stream-Specific Information	☑ Discrepancy Resolution
☑ Additional Information	☐ Internal Procedure
	☐ Miscellaneous
	☐ Published Document or Internal Procedure
	☐ Unpublished Documents

Title or Description of Source Document [a]: ~~Discrepancy~~ Resolution re: Reassignment of NFS815 to OR-NFS-CH-SOIL
Discrepancy re 11/18/13

Source Document Reference Information (author(s), document and revision number, date, publisher): Jeff Harrison, NA, NA, 07/07/2010

AK # [b]	Source Doc. Page #[c]	AK Information Summary
PR7, WS1, WS9, S9	Throughout	AK originally identified drum NF5815 as soil (54000), but RTR (BDR# OR-RTR6-0071) determined that it was predominantly debris (see NCR-ORNL-0509-10). An AK Re-evaluation was written 3/22/10 and a discrepancy resolution (DR023) was also written to move this drum from OR-NFS-CH-SOIL to OR-NFS-CH-HET-A. This drum was processed through RTR once again as debris (BDR# OR-RTR6-0317). It was subsequently determined that this drum did contain greater than 50%, by volume, soil as was originally thought (see NCR-ORNL-0119-10). As described in Acceptable Knowledge Re-evaluation Checklist for NFS815 dated 7/7/2010, this drum is being moved back to waste stream OR-NFS-CH-SOIL.

Source Document Data Limitations (if any):

1. None.

Acceptable Knowlege Expert:

Travis Smith / [signature] Date: 11/18/2013
Print /Sign

[a] Provide description for non-titled information (i.e., container paperwork, MSDS sheets, etc)
[b] Obtain from Acceptable Knowledge Documentation Checklist
[c] For microfilm or microfiche, identify box, tape, reel number and location.

NTPC RECORDS ORIGINAL
DATE REC'D 12/18/13

Attachment 11 - Acceptable Knowledge Source Document Discrepancy Resolution (NFS815)

Waste Stream Number(s): OR-NFS-CH-SOIL, OR-NFS-CH-HET-A

Waste Stream Description: Contaminated NF5 soil and debris waste stored at ORNL

AK Documentation Type: ☒TRU Waste Management Program Information ☒Waste Stream Specific Information ☒Supporting Info.							
AK Source Document Discrepancy Form Tracking Number: **DR026**							
Tracking #	***Category*** [a]	***Title***	***Doc/Rev #***	***Author***	***Publisher***	***Date***	***Page #***
N/A	N/A	Acceptable Knowledge Re-evaluation Checklist (NFS0815 & X10C0506069), Waste Streams OR-NFS-CH-SOIL and OR-NFS-CH-HET-A	CCP-TP-005, Rev. 18, Attachment 10	CCP	N/A	3/22/10	All
N/A	N/A	Acceptable Knowledge Re-evaluation Checklist (NFS0815), Waste Streams OR-NFS-CH-SOIL and OR-NFS-CH-HET-A	CCP-TP-005, Rev. 19, Attachment 10	CCP	N/A	7/7/10	All
N/A	N/A	CCP Nonconformance Report	NCR-ORNL-0509-10, Rev. 0	CCP	N/A	3/5/10	All
N/A	N/A	CCP Nonconformance Report	NCR-ORNL-0119-10, Rev. 0	CCP	N/A	6/9/10	All
N/A	N/A	CCP Radiography Data Sheet	OR-RTR6-0071	CCP	N/A	7/10/08	NFS815
N/A	N/A	CCP Radiography Data Sheet	OR-RTR6-0317	CCP	N/A	6/9/10	NFS815
DR023	Disc.	Acceptable Knowledge Source Document Discrepancy Resolution, Incorrect Waste Stream Assignment for NFS0815 & X10C0506069	CCP-TP-005, Rev. 18, Attachment 11	CCP	N/A	3/22/10	All
M003	Unpub.	ORNL UCN-2109 and UCN-2822 Forms for NFS TRU Waste and Related Paperwork	See title	NFS	N/A	9/3/01	NFS815

Discrepancy Resolution DR026
Incorrect Waste Stream Assignment for NFS815

NTPC RECORDS ORIGINAL
DATE REC'D 12/18/13

Nature of Discrepancy: AK originally identified drum NFS815 as soil (S4000), but RTR (BDR# OR-RTR6-0071) determined that it was predominantly debris (see NCR-ORNL-0509-10). An AK Re-evaluation was written 3/22/10 and a discrepancy resolution (DR023) was also written to move this drum from OR-NFS-CH-SOIL to OR-NFS-CH-HET-A. This drum was processed through RTR once again as debris (BDR# OR-RTR6-0317). It was subsequently determined that this drum did contain greater than 50%, by volume, soil as was originally thought (see NCR-ORNL-0119-10).

Resolution: As described in Acceptable Knowledge Re-evaluation Checklist for NFS815 dated 7/7/2010, this drum is being moved back to waste stream OR-NFS-CH-SOIL.

Discrepancy Resolved: ☒ Yes ☐ No

Acceptable Knowledge Expert: Jeff Harrison / Jeff Harrison Date: 7/7/10
Print Sign

Site Project Manager: Candice Weston / Candice Weston Date: 07/07/10
Print Sign

Published Document or Controlled Database (Pub.); Unpublished Data (Unpub.); Internal Procedure or Note (Proc.); Correspondence (Corr.) or Discrepancy (Disc.)

DIVIDER PAGE

Attachment 3 - Acceptable Knowledge Source Document Summary

Site(s): Oak Ridge National Laboratory	Source Document Tracking Number: DR041

Waste Stream Number(s): ORNL Non-specific Library Files

(Applicable only when site library is not in use)

Acceptable Knowledge Documentation Type:	Category:
☑ TRU Waste Management Program Information	☐ Correspondence
☑ Waste Stream-Specific Information	☑ Discrepancy Resolution
☐ Additional Information	☐ Internal Procedure
	☐ Miscellaneous
	☐ Published Document or Internal Procedure
	☐ Unpublished Documents

Title or Description of Source Document [a]: Discrepancy Resolution, re: Container NFS0794B

Source Document Reference Information (author(s), document and revision number, date, publisher): Jeff Harrison, DR041, NA, 06/03/2014, CCP

AK # [b]	Source Doc. Page # [c]	AK Information Summary
PR7, WS6, WS9	1	Nature of Discrepancy: NFS0794 was identified on the original generator container paperwork as soil (Reference M003). When this drum was repackaged, the contents were divided into three drums (NFS0794A, B, and C). The repack paperwork indicates NFS0794B contains 60 percent soil and 40 percent debris (Reference M075). NCR-ORNL-0841-13 was written because RTR of drum NFS0794B identified greater than 50 percent debris. Resolution: NFS0794B will be moved from OR-NFS-CH-SOIL to OR-NFS-CH-HET-A, and an AK re-evaluation will also be completed.

Source Document Data Limitations (if any):

1. None.

Acceptable Knowlege Expert:

Travis Smith _____ Date: 06/09/2014

Print /Sign

[a] Provide description for non-titled information (i.e., container paperwork, MSDS sheets, etc)
[b] Obtain from Acceptable Knowledge Documentation Checklist
[c] For microfilm or microfiche, identify box, tape, reel number and location.

NTPC RECORDS ORIGINAL
DATE REC'D 7-7-14

Attachment 11 - Acceptable Knowledge Source Document Discrepancy Resolution

Waste Stream Number(s): OR-NFS-CH-SOIL, OR-NFS-CH-HET-A

Waste Stream Description: Contaminated soil and debris from NFS

AK Source Document Discrepancy Form Tracking Number: **DR041**

Tracking #	Title	Document/Rev#	Author	Date	Page #
N/A	CCP Nonconformance Report (NCR)	NCR-ORNL-0841-13	CCP	12/4/13	1
N/A	CCP Radiography Data Sheet	Batch Number OR-RTR7-0003	CCP	12/4/13	NFS0794B
M003	ORNL UCN-2109 and UCN-2822 Forms for NFS TRU Waste and Related Paperwork	N/A	NFS	Various	NFS0794
M075	TWPC Contact Handled Waste Repackaging Data Forms for NFS Waste	N/A	TWPC	Various	NFS0794B

Nature of Discrepancy: NFS0794 was identified on the original generator container paperwork as soil (Reference M003). When this drum was repackaged, the contents were divided into three drums (NFS0794A, B, and C). The repack paperwork indicates NFS0794B contains 60 percent soil and 40 percent debris (Reference M075). NCR-ORNL-0841-13 was written because RTR of drum NFS0794B identified greater than 50 percent debris.

Resolution: NFS0794B will be moved from OR-NFS-CH-SOIL to OR-NFS-CH-HET-A, and an AK re-evaluation will also be completed.

Discrepancy Resolved: ☒ Yes ☐ No

Acceptable Knowledge Expert: Jeff Harrison (Print) Jeff Harrison (Sign) Date: 6/3/14

Site Project Manager: Beverly Schrock (Print) BSSchrock (Sign) Date: 6/3/14

NTPC RECORDS ORIGINAL
DATE REC'D 7-7-14

DIVIDER PAGE

Attachment 10 – Acceptable Knowledge Re-evaluation Checklist

Site(s): Oak Ridge National Laboratory
Waste Stream Number(s): OR-NFS-CH-SOIL, OR-NFS-CH-HET-A
Waste Stream Description: Contaminated soil and debris from NFS
NCR numbers(s) if applicable: NCR-ORNL-0841-13
Inconsistency between waste characterization and acceptable knowledge information (describe): NFS0794B was identified by AK as containing 60 percent by volume soil and 40 percent by volume debris. RTR (Batch Number OR-RTR7-0003) determined that this drum contained >50 percent by volume debris.

Requirements	Completed? Yes/No	Additional Documentation [a]
Review existing information based on the container identification number and document all differences in EPA Hazardous Waste Number assignments. [c]	Yes	OR-NFS-CH-SOIL is assigned EPA hazardous waste number F002. OR-NFS-CH-HET-A is assigned EPA hazardous waste numbers F002, D006, D008, D009, and D011.
If differences exist in the EPA Hazardous Waste Numbers that were assigned, reassess and document all required AK information associated with the new designation. [b,c]	Yes	The EPA hazardous waste numbers assigned to OR-NFS-CH-HET-A bound those assigned to OR-NFS-CH-SOIL.
Reassess and document all testing data associated with the waste. [c]	No	N/A. There are no sampling and analytical data associated with this waste.
Verify and document that the reassigned Waste Matrix Code was generated within the specified time period, area and buildings, waste generating process, and that the process material inputs are consistent with the waste material parameters identified during RTR or VE.	Yes	RTR describes NFS0794B as containing iron-based metals (scrap, utility knife, hardware), other inorganic materials (absorbent), cellulosics (cloth, coveralls, tape), rubber (gloves), plastic (bags, scrap, air hose), and soil. These waste materials are identified in OR-NFS-CH-HET. The container paperwork for NFS0794 indicates the origin of the waste is NFS 110/234 and has a package date of 9/21/1993. Waste stream OR-NFS-CH-HET was generated from activities associated with the decommissioning of Buildings 110 and 234 at NFS from August 1993 to September 2003 which bounds this waste.
If NDA results indicate the presence of additional or different radionuclides in the waste, reassess and document AK and characterization information associated with the new information. [c]	No	N/A - Radionuclides are not discrepant. The default isotopics and two most prevalent radionuclides, by mass, for waste streams OR-NFS-CH-SOIL and OR-NFS-CH-HET-A are the same.

CCP RECORDS ORIGINAL
DATE REC'D 12/20/14

Requirements	Completed? Yes/No	Additional Documentation [a]
Record all changes to the AK records on the appropriate Attachments and resubmit to the CCP Facility Records Custodian.	Yes	The Attachment 8 Waste Containers list will be revised to remove drum NFS0794B from OR-NFS-CH-SOIL and add it to OR-NFS-CH-HET-A. This discrepancy is documented in DR041, Attachment 11 - Acceptable Knowledge Source Document Discrepancy Resolution.
If unresolved discrepancies exist in the AK information for the reassigned Waste Matrix Code, EPA Hazardous Waste Numbers, or radionuclides, document the segregation of this container, and define the actions necessary to fully characterize the waste.	No	N/A. No unresolved discrepancies exist.

a. Cite the source document, nonconformance report number, attachment, or other documentation used to support a change or no change.
b. If a toxicity characteristic contaminant is identified, it is not included as a listed waste, and analytical data regarding the concentration are not available, the corresponding EPA Hazardous Waste Number is applied.
c. Not applicable for LANL sealed source waste stream.

Acceptable Knowledge Expert:

Jeff Harrison / Jeff Harrison Date: 6/3/14
Print Sign

Site Project Manager:

Beverly Schrock / BSSchrock Date: 6/3/14
Print Sign

Attachment 10 - Acceptable Knowledge Re-evaluation Checklist (NFS0815)

Site(s): Oak Ridge National Laboratory
Waste Stream Number(s): OR-NFS-CH-SOIL, OR-NFS-CH-HET-A
Waste Stream Description: Contaminated NFS soil and debris stored at ORNL
NCR numbers(s) if applicable: NCR-ORNL-0509-10 and NCR-ORNL-0119-10
Inconsistency between waste characterization and acceptable knowledge information (describe): AK originally identified drum NFS0815 as soil (S4000), but RTR (BDR# OR-RTR6-0071) determined that it was predominantly debris (see NCR-ORNL-0509-10). An AK Re-evaluation was written 3/22/2010 and a discrepancy resolution (DR023) was also written to move this drum from OR-NFS-CH-SOIL to OR-NFS-CH-HET-A. This drum was processed through RTR once again as debris (BDR# OR-RTR6-0317). It was subsequently determined that this drum did contain greater than 50%, by volume, soil as was originally thought. This drum is therefore being moved back to OR-NFS-CH-SOIL and another discrepancy resolution (DR026) is being written.

Requirements	Completed? Yes/No	Supporting Documentation [a]
Review existing information based on the container identification number and document all differences in EPA hazardous waste number assignments. [c]	Yes	NFS0815 is being moved from waste stream OR-NFS-CH-HET-A back to waste stream OR-NFS-CH-SOIL. OR-NFS-CH-SOIL is assigned F002. OR-NFS-CH-HET-A is assigned D006, D008, D009, D011, and F002.
If differences exist in the EPA hazardous waste numbers that were assigned, reassess and document all required AK information associated with the new designation. [b,c]	Yes	The D006, D008, D009, D011 metal codes in OR-NFS-CH-HET-A are due to the presence of circuit boards, batteries, mercury-containing gauges, mercury in tank waste, paint, and cadmium-coated hand tools. The original container paperwork for NFS0815 indicates only soil. RTR describes this drum as reinforcement wire, chunks of concrete, and soil. There are no sources for these metals in this drum; and therefore; D006, D008, D009, and D011 would not apply.
Reassess and document all sampling and analytical data associated with the waste. [c]	Yes	NFS0815 was not sampled by CCP.
Verify and document that the reassigned Waste Matrix Code was generated within the specified time period, area and buildings, waste generating process, and that the process material inputs are consistent with the waste material parameters identified during RTR or VE.	Yes	Sections 6.2 and 6.3 of CCP-AK-ORNL-001 state that waste stream OR-NFS-CH-SOIL was generated from activities associated with the NFS decommissioning from February 1993 to October 1993. The NFS container paperwork indicates NFS0815 is from Building 110/234 and was packaged 9/25/1993. Section 6.4.1 in CCP-AK-ORNL-001 identifies soil, rock, and gravel, concrete pieces, and concrete block which is consistent with RTR for this drum.

ORIGINAL

Requirements	Completed? Yes/No	Supporting Documentation [a]
If NDA results indicate the presence of additional or different radionuclides in the waste, reassess and document AK and characterization information associated with the new information. [c]	No	N/A – Radionuclides are not discrepant. The default isotopics and two most prevalent radionuclides, by mass, for waste streams OR-NFS-CH-SOIL and OR-NFS-CH-HET-A are the same.
Record all changes to the AK records on the appropriate Attachments and resubmit to the CCP Facility Records Custodian.	Yes	Attachments 1 and 4 and CCP-AK-ORNL-001 will be revised to include Discrepancy Resolution DR026. The waste material parameter weight estimates on Attachment 6 and the radionuclide percentages on Attachment 7 do not need revision because they were never revised when this drum was moved from OR-NFS-CH-SOIL to OR-NFS-CH-HET-A. Attachment 8 for OR-NFS-CH-SOIL and OR-NFS-CH-HET-A will be revised so that NFS0815 is in OR-NFS-CH-SOIL.
If unresolved discrepancies exist in the AK information for the reassigned Waste Matrix Code, EPA hazardous waste numbers, or radionuclides, document the segregation of this container, and define the actions necessary to fully characterize the waste.	No	N/A. There are no unresolved discrepancies with this reassignment.

a. Cite the source document, nonconformance report number, attachment, or other documentation used to support a change or no change.
b. Ensure that if a toxicity characteristic contaminant is identified, it is not included as a listed waste, and analytical data regarding the concentration are not available, the corresponding EPA Hazardous Waste Number is applied.
c. Not applicable for LANL sealed source waste stream.

Acceptable Knowledge Expert:

Jeff Harrison — Jeff Harrison — Date: 7/7/10
Print **Sign**

Site Project Manager:

Candice Weston — Candice Weston — Date: 07/07/10
Print **Sign**

DIVIDER PAGE ONLY

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Attachment 2 – CCP Records Transmittal/Receiving Form

CCP Records / Records Custodian, 4021 National Parks Highway - MS: GSA 212, Carlsbad, New Mexico 88220

Telephone Number: 575-234-7523 or 575-234-7431

Fax Number: 575-234-7033

[X] Original Record [ ] Copy
[ ] Fax Record
[ ] Electronic Record

Attn:	Sheila Pearcy	From:	Jason Montoya
Ship to:	CCP Central Records / CCP Records	Site:	ORNL
	Custodian	Company:	Los Alamos National Laboratory
	4021 National Parks Highway	Telephone Number:	575-628-3018
	MS GSA 212	Date Sent:	07/07/2010
Telephone Number:	575-234-7523		

Document Number	Title / Description	Record Date	Total Pages
NA	Attachment 10 – Acceptable Knowledge Re-evaluation Checklist for OR-NFS-CH-SOIL, OR-NFS-CH-HET-A of CCP-AK-ORNL-001	07/07/2010	2

Comments

None.

CJC
08/10/2010

(When the Record accepted line has been completed, the rest of the page below may be left blank.)

Acceptance/Rejection Signature and Date

Records Accepted [✓]	Signature	CHERYL ARMIJO (Printed Name)	8-10-10 (Date)
Records Rejected [ ]	Signature	Printed Name	Date

Reason for Rejection:

Re-submittal:

Signature	Printed Name	Date

****
*** TX REPORT ***
****

TRANSMISSION OK

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DESTINATION ID	LANL CBAD
ST. TIME	08/10 16:10
TIME USE	00'15
PAGES SENT	1
RESULT	OK

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[X] Original Record [ ] Copy
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[ ] Electronic Record

Attn:	Sheila Pearcy	From:	Jason Montoya
Ship to:	CCP Central Records / CCP Records Custodian	Site:	ORNL
		Company:	Los Alamos National Laboratory
	4021 National Parks Highway	Telephone Number:	575-628-3018
	MS GSA 212	Date Sent:	07/07/2010
Telephone Number:	575-234-7523		

NA	Attachment 10 – Acceptable Knowledge Re-evaluation Checklist for OR-NFS-CH-SOIL, OR-NFS-CH-HET-A of CCP-AK-ORNL-001	07/07/2010	2

None.

CJC 08/10/2010

(When the Record accepted line has been completed, the rest of the page below may be left blank.)
Acceptance/Rejection Signature and Date

Records Accepted [X]	Signature	CHERYL ARMIJO (Printed Name)	8-10-10 (Date)
Records Rejected [ ]	Signature	Printed Name	Date

Reason for Rejection:

DIVIDER PAGE

Attachment 10 - Acceptable Knowledge Re-evaluation Checklist (REDC Radiological Discrepancy)

Site(s): Oak Ridge National Laboratory
Waste Stream Number(s): OR-REDC-CH-HET
Waste Stream Description: Heterogeneous debris from the Radiochemical Engineering Development Center
NCR numbers(s) if applicable: N/A
Inconsistency between waste characterization and acceptable knowledge information (describe): AK identifies Cm-244 and Sr-90 as the two most prevalent nuclides, by activity, at 56.04% and 11.92%, respectively. Through Lot 17 (375 drums), CCP assay has identified Cm-244 and Pu-241 as the two most prevalent nuclides, by activity, at 74.98% and 17.39%, respectively. Sr-90 is the third most prevalent by activity at 1.89%.

Requirements	Completed? Yes/No	Supporting Documentation [a]
Review existing information based on the container identification number and document all differences in EPA hazardous waste number assignments. [c]	No	N/A. EPA hazardous waste numbers are not discrepant.
If differences exist in the EPA hazardous waste numbers that were assigned, reassess and document all required AK information associated with the new designation. [b,c]	No	N/A. EPA hazardous waste numbers are not discrepant.
Reassess and document all sampling and analytical data associated with the waste. [c]	No	N/A. This waste stream was not sampled and analyzed by CCP for radiological parameters.
Verify and document that the reassigned Waste Matrix Code was generated within the specified time period, area and buildings, waste generating process, and that the process material inputs are consistent with the waste material parameters identified during RTR or VE.	No	N/A. The waste matrix code is not discrepant.
If NDA results indicate the presence of additional or different radionuclides in the waste, reassess and document AK and characterization information associated with the new information. [c]	Yes	The 375 drums in Lots 1 through 17 are thought to be representative of the waste stream as a whole. Therefore, the AK for the waste stream will be changed to identify Cm-244 and Pu-241 as the two most prevalent nuclides by activity. See DR027 for addition details.
Record all changes to the AK records on the appropriate Attachments and resubmit to the CCP Facility Records Custodian.	Yes	CCP-AK-ORNL-002 will be revised to summarize this AK re-evaluation.

ORIGINAL

Requirements	Completed? Yes/No	Supporting Documentation [a]
If unresolved discrepancies exist in the AK information for the reassigned Waste Matrix Code, EPA hazardous waste numbers, or radionuclides, document the segregation of this container, and define the actions necessary to fully characterize the waste.	No	N/A. There are no unresolved discrepancies with this reassignment.

a. Cite the source document, nonconformance report number, attachment, or other documentation used to support a change or no change.
b. Ensure that if a toxicity characteristic contaminant is identified, it is not included as a listed waste, and analytical data regarding the concentration are not available, the corresponding EPA Hazardous Waste Number is applied.
c. Not applicable for LANL sealed source waste stream.

Acceptable Knowledge Expert:

Jeff Harrison _____ Date: 7/22/10
Print Sign

Site Project Manager:

Candice Weston _____ Date: 07/22/10
Print Sign

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Attachment 2 - CCP Records Transmittal/Receiving Form

CCP Central Records / Records Custodian, 4021 National Parks Highway - MS: GSA 212, Carlsbad, New Mexico 88220

Telephone Number: 575-234-7523 or 575-234-7431

Fax Number: 575-234-7033

☒ Original Record ☐ Copy
☐ Fax Record
☐ Electronic Record

Attn:	Sheila Pearcy	From:	Allen Dickerson
Ship to:	CCP Central Records/ CCP Records Custodian	Site:	Oak Ridge National Laboratory
	4021 National Parks Highway	Company:	Los Alamos National Laboratory
	MS GSA 212, Carlsbad, NM 88220	Telephone Number:	575-885-8301
Telephone Number:	575-234-7523	Date Sent:	8/30/2010

NA	Attachment 10 - Acceptable Knowledge Re-evaluation Checklist (REDC Radiological Discrepancy) for OR-REDC-CH-HET AK 2 CA 8-30-10 per conversation with Allen Dickerson	7/22/2010	2
NA	NA	NA	NA

None.

(When the Record accepted line has been completed, the rest of the page may be left blank.)

Acceptance/Rejection Signature and Date

Records Accepted ☒	Signature	CHERYL ARMIJO (Printed Name)	9-1-10 (Date)
Records Rejected ☐	Signature	Printed Name	Date

Reason for Rejection:

Re-submittal:

Signature	Printed Name	Date

****
*** TX REPORT ***
****

TRANSMISSION OK

TX/RX NO	0530
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DESTINATION ID	LANL CBAD
ST. TIME	09/01 08:22
TIME USE	00'14
PAGES SENT	1
RESULT	OK

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Ship to:	CCP Central Records/ CCP Records Custodian	Site:	Oak Ridge National Laboratory
	4021 National Parks Highway	Company:	Los Alamos National Laboratory
	MS GSA 212, Carlsbad, NM 88220	Telephone Number:	575-885-8301
Telephone Number:	575-234-7523	Date Sent:	8/30/2010

NA	Attachment 10 - Acceptable Knowledge Re-evaluation Checklist (REDC Radiological Discrepancy) for OR-REDC-CH-HET AK 2 CA 8-30-10 per conversation with Allen Dickerson	7/22/2010	2
NA	NA	NA	NA

None.

(When the Record accepted line has been completed, the rest of the page may be left blank.)

Acceptance/Rejection Signature and Date

ORNL PROHIBITED ITEM NCRs

ORNL	NFS0183	CCP-AK-ORNL-001	OR-NFS-CH-SOIL	NCR-ORNL-0643-08-1	>4 Liter sealed container – unvented rigid liner
ORNL	NFS0487	CCP-AK-ORNL-001	OR-NFS-CH-SOIL	NCR-ORNL-0644-08-2	Liquid
ORNL	NFS0489	CCP-AK-ORNL-001	OR-NFS-CH-SOIL	NCR-ORNL-0650-08-2	Liquid
ORNL	NFS0663	CCP-AK-ORNL-001	OR-NFS-CH-SOIL	NCR-ORNL-0648-08-2	Liquid
ORNL	NFS0667	CCP-AK-ORNL-001	OR-NFS-CH-SOIL	NCR-ORNL-0647-08-2	Liquid
ORNL	NFS0689	CCP-AK-ORNL-001	OR-NFS-CH-SOIL	NCR-ORNL-0646-08-2	Liquid
ORNL	NFS0794	CCP-AK-ORNL-001	OR-NFS-CH-SOIL	NCR-ORNL-06420-8-2	Liquid
ORNL	NFS0809	CCP-AK-ORNL-001	OR-NFS-CH-SOIL	NCR-ORNL-0636-08-1	>4 Liter sealed container – unvented rigid liner
ORNL	NFS0813	CCP-AK-ORNL-001	OR-NFS-CH-SOIL	NCR-ORNL-0637-08-1	>4 Liter sealed container – unvented rigid liner
ORNL	NFS0822	CCP-AK-ORNL-001	OR-NFS-CH-SOIL	NCR-ORNL-0640-08-2	>4 Liter sealed container – unvented rigid liner
ORNL	X10C0402820F1	CCP-AK-ORNL-002	OR-REDC-CH-HET	NCR-ORNL-0121-15-0	PCB liquids in motor
ORNL	X10C0402857E	CCP-AK-ORNL-002	OR-REDC-CH-HET	NCR-ORNL-0053-15-2	Liquid inside PCB container
ORNL	X10C0402870R	CCP-AK-ORNL-002	OR-REDC-CH-HET	NCR-ORNL-0123-15-1	Liquid
ORNL	X10C04029841	CCP-AK-ORNL-002	OR-REDC-CH-HET	NCR-ORNL-0053-15-2	Liquid inside PCB container
ORNL	X10C9307235A1	CCP-AK-ORNL-002	OR-REDC-CH-HET	NCR-ORNL-0115-15-0	Potential PCB liquid in vacuum pump
ORNL	X10CSATN03211AJ	CCP-AK-ORNL-002	OR-REDC-CH-HET	NCR-ORNL-0128-15-0	Liquid
ORNL	X10C9312058C	CCP-AK-ORNL-011	OR-PGDP-CH-HET-A	NCR-ORNL-0118-15-1	>4 Liter sealed container
ORNL	X10CSATN02300C	CCP-AK-ORNL-004	OR-RF-CH-HET	NCR-ORNL-0124-15-0	Pressurized container
ORNL	X10C9400390A	CCP-AK-ORNL-004	OR-GENR-CH-HET	NCR-ORNL-0779-14-2	Pressurized container
ORNL	X10C0402828F	CCP-AK-ORNL-004	OR-REDC-CH-HET	NCR-ORNL-0789-14-0	Pressurized container
ORNL	X10C9312402C	CCP-AK-ORNL-004	OR-ISTP-CH-HET	NCR-ORNL-0935-14-0 NCR-ORNL-0936-14-0	Sealed container >4 Liters Impenetrable item
ORNL	X10C0402873B	CCP-AK-ORNL-004	OR-REDC-CH-HET	NCR-ORNL-0922-14-0	Pressurized container
ORNL	X10C0402820A	CCP-AK-ORNL-004	OR-REDC-CH-HET	NCR-ORNL-0788-14-0	Pressurized and ignitable container

B Schrock 3/04/16

DIVIDER PAGE

Attachment 1 – CCP Nonconformance Report (NCR)

CCP NONCONFORMANCE REPORT (NCR)

(Use NCR Continuation, Attachment 3, if necessary)

NCR No. NCR-ORNL-0643-08 Revision 1

1. Lot No., Heat No., or Serial No. (if applicable): N/A	2. Process (e.g., NDA, NDE, VE, Other): NDE	3. Batch Data Report #(s): OR-RTR6-0081
4. Order/Work Order/Job Control Number (if applicable): N/A	5. PO # (if applicable): N/A	Container #(s): NFS0183
	6. Supplier (if applicable): N/A	

DESCRIPTION OF NONCONFORMANCE

7a. NCR Description: ☐ < 100 nCi/g ☒ Prohibited Item ☐ E-Flag ☐ Receipt Inspection ☐ Transportation ☐ WWIS/WDS ☐ Other

7b. Requirement(s) (Enter Implementing Procedure No., Revision, Section No., & Quoted Text):
AS PER CCP-TP-053, REVISION 6, TABLE 1, LIST OF PROHIBITED ITEMS, "SEALED CONTAINERS GREATER THAN 4 LITERS....."

7c. Actual Condition:
>4 LITER SEALED PLASTIC CONTAINER (UN-VENTED 90 ML RIGID LINER WITH NO VENT)

REASON FOR REVISION 1: CHANGED FINAL DISPOSITION TO RETURN TO TWPC FOR REMEDIATION.

7d. Have the CCP HOLD TAGS associated with this NCR been applied? ☒ YES ☐ NO If no is checked, explain:
03/17/15 LR

8. NCR Originator:
Beverly S. Schrock (printed name) BSSchrock (signature) 3-3-15 (date)

9. Does the identified condition have the potential to impact AK? If YES or INDETERMINATE, enter Trend Code L in Block 10. ☐ YES ☒ NO ☐ INDETERMINATE

10. Trend Code: K

11. Responsible Manager: **Beverly Schrock**

12. Significant Condition? ☐ YES ☒ NO (If Yes, enter WIPP Form No.):

13. Recurring Condition? ☐ YES ☒ NO (If Yes, list NCRs and WIPP Forms):

14. QA Engineer or QA Designee validation:
Laura R. Jones (printed name) Laura Rowen Jones (signature) 03/04/2015 (date)

CCP RECORDS ORIGINAL
DATE REC'D 3-18-15 GL

Attachment 1 – CCP Nonconformance Report (NCR) (Continued)

NCR No. NCR-ORNL-0643-08 Revision 1

INTERIM DISPOSITION

15a. Interim Disposition (Check Only One):

☒ N/A (See Final Disposition) ☐ Hold ☐ Conditionally Accept ☐ Conditionally Use

☐ Sort ☐ Reinspect or Retest ☐ Remediate

15b. Instructions for Completion of the Interim Disposition:

INTERIM DISPOSITION APPROVALS

16a. Responsible Manager or Individual:

printed name signature date

16b. QA Engineer or QA Designee:

printed name signature date

Additional Approval:

printed name signature date

Additional Approval:

printed name signature date

COMPLETION OF INTERIM DISPOSITION

17. Interim Disposition Complete – Responsible Manager or Individual:

printed name signature date

18. Interim Disposition Verified – QA Engineer:

printed name signature date

Attachment 1 – CCP Nonconformance Report (NCR) (Continued)

NCR No. NCR-ORNL-0643-08 Revision 1

FINAL DISPOSITION

19. Final Disposition (Check Only One: Use-As-Is, Repair, Reject, Rework, or Scrap):
☐ Use-As-Is ☐ Repair
19a. Technical Justification – Required for Use-As-Is or Repair dispositions. [☒ N/A for Reject, Rework, or Scrap]

☒ Reject ☐ Rework ☐ Scrap
19b. Instructions for Completion – Required for Reject, Repair, Rework, or Scrap [☐ N/A for Use-As-Is]

RETURN CONTAINER TO TWPC FOR REMEDIATION.

19c. Corrective Actions (Actions to Prevent Recurrence – For Repair or Rework, if applicable.
[☒ N/A if not applicable, and for Use-As-Is, Reject, and Scrap]

FINAL DISPOSITION APPROVALS

20. Responsible Manager or Individual:

printed name	signature	date
BSSchrock	BSSchrock	3/4/15

21. QA Engineer or QA Designee:

printed name	signature	date
Laura R. Jones	Laura Ramon Jones	3/05/2015

Additional Approval:

printed name	signature	date

Additional Approval:

printed name	signature	date

CLOSURE

22. Final Disposition Complete - Responsible Manager or Individual:

printed name	signature	date
BSSchrock	BSSchrock	3/5/15

23. Attachments: 1 – Basis for NCR Closure
2 – Hold tag information

24a. HOLD TAG removal has been verified and reconciled for all nonconforming items on the NCR: ☑ LRT 03/31/15
24b. If HOLD TAG is not applicable, check: ☐ and explain:

See Attachment 2 and 3 dlg/RT 03/31/15 LRT

25. Final Disposition Verified – NCR Closed QA Engineer:

printed name	signature	date
Laura R. Jones	Laura Ramon Jones	03/17/15

Laura R. Jones Laura Ramon Jones 03/31/15 LRT

Tuesday, February 18, 2014

CONTAINERID: NFS0183

ORNL

AK DATA

Container ID	Container Type	AKA Matrix	WDS Status	AK Excluded	WSID	LOTID	LOT Excluded
NFS0183	55G		NO WDS STATUS	YES (Inactive)	OR-NFS-CH-SOIL	NONE	

BDR DATA

BDRID	Type	Status	Generation Date
OR-DWAS-0106	NDA	Complete	2008-08-14
OR-RTR6-0081	RTR	Complete	2008-07-30

NCR DATA

Container ID	NCRID	Status	Release Code
NFS0183	NCR-ORNL0050081	Closed	Resolved
NFS0183	NCR-ORNL0643080	Open	None

REJECT DATA

Container ID	BDRID	NCRID	NCR Status	Release Code	Actual Condition
NFS0183	OR-RTR6-0081	NCR-ORNL0643080	Open	None	greater than 4 LITERS SEALED PLASTIC CONTAINER (90 ml rigid linerwith no vent)

NCR - ORNL-0643-08 Rev. 1

Attachment 1 Page 1 of 1

Jones, Laura - NWP

From: Harmon, Latravia <Latravia.Harmon@truproject.com>
Sent: Wednesday, March 11, 2015 6:58 AM
To: Jones, Laura - NWP
Cc: Harmon, Latravia
Subject: RE: Revised NCR-ORNL-0643-08-1

Laura

Yes this container has a hold tag applied. I also have a request to remove the Hold tag from Veronica on 3/5/15. However, the site hasn't released the area to allow personnel entry.

Hope this helps

LaTravia N. Harmon
Quality Assurance Engineer
Nuclear Waste Partnership LLC
Contractor to the United States Department of Energy
(865)576-1650 Office
(865)441-2706 Cell
latravia.harmon@truproject.com

From: Jones, Laura - NWP [laura.jones@wipp.ws]
Sent: Monday, March 09, 2015 3:10 PM
To: Harmon, Latravia
Subject: FW: Revised NCR-ORNL-0643-08-1

Latravia,

Could you please check on hold tag for container under this NCR? There is no indication that the CCP Hold Tag was applied. Attachment 1 – CCP Nonconformance Report (NCR) Revision 15 did not have hold tag section.

Thanks and Best Regards

Laura R. Jones
Quality Assurance NCR Coordinator
Nuclear Waste Partnership, LLC
Contractor for the U.S. Department of Energy
575-234-7244 (office)
Email: laura.jones@wipp.ws

NCR – ORNL-0643-08 Rev. 1
Attachment 2 Page 1 of 2

From: Jones, Laura - NWP
Sent: Thursday, March 05, 2015 10:08 AM
To: Harmon, Latravia; Harmon, LaTravia - NWP; Leos, Greta - TFE; Navarrete, Leon - TFE; Pearcy, Sheila - TFE; Reeves, Ron - NWP; Schrock, Beverly - NWP; Stallings, Andrew - ORNL; Wade, Daniel NWP; Yturralde, Jewell - TFE
Cc: Waldram, Veronica - NWP; Ledford, Wayne - NWP; Jones, Laura - NWP
Subject: Revised NCR-ORNL-0643-08-1

All – For your information
Jewell – Please post this open NCR.

Thanks and Best Regards

Laura R. Jones
Quality Assurance NCR Coordinator
Nuclear Waste Partnership, LLC
Contractor for the U.S. Department of Energy
575-234-7244 (office)
Email: laura.jones@wipp.ws

Jones, Laura - NWP

From: Harmon, Latravia <Latravia.Harmon@truproject.com>
Sent: Thursday, March 26, 2015 8:08 AM
To: Jones, Laura - NWP
Subject: FW: Hold tag to be pulled NCR-ORNL-0643-08-1

LaTravia N. Harmon

Quality Assurance Engineer
Nuclear Waste Partnership LLC
Contractor to the United States Department of Energy
(865)576-1650 Office
(865)441-2706 Cell
latravia.harmon@truproject.com

From: Harmon, Latravia
Sent: Wednesday, March 25, 2015 6:22 AM
To: Jones, Laura - NWP
Cc: Schrock, Beverly - NWP; Wade, Daniel NWP; Reeves, Ron - NWP; Waldram, Veronica - NWP; Ledford, Wayne - NWP
Subject: RE: Hold tag to be pulled NCR-ORNL-0643-08-1

LaTravia N. Harmon

Quality Assurance Engineer
Nuclear Waste Partnership LLC
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(865)441-2706 Cell
latravia.harmon@truproject.com

From: Harmon, Latravia
Sent: Tuesday, March 24, 2015 7:57 AM
To: Jones, Laura - NWP
Cc: Schrock, Beverly - NWP; Wade, Daniel NWP; Reeves, Ron - NWP; Waldram, Veronica - NWP; Ledford, Wayne - NWP
Subject: RE: Hold tag to be pulled NCR-ORNL-0643-08-1

Laura

Hold tag for the following container removed. Please use this email as notification to proceed with closure of NCR-ORNL-0643.

Thanks and Best Regards

LaTravia N. Harmon

Quality Assurance Engineer
Nuclear Waste Partnership LLC
Contractor to the United States Department of Energy
(865)576-1650 Office

03/31/15 [illegible]

(865)441-2706 Cell
latravia.harmon@truproject.com

From: Jones, Laura - NWP [laura.jones@wipp.ws]
Sent: Thursday, March 05, 2015 2:28 PM
To: Harmon, Latravia
Cc: Schrock, Beverly - NWP; Wade, Daniel NWP; Reeves, Ron - NWP; Waldram, Veronica - NWP; Ledford, Wayne - NWP
Subject: Hold tag to be pulled NCR-ORNL-0643-08-1

Latravia,

Container below has a return resolution code, please remove hold tag and notify to close NCR.

BDR ID	Container ID	Release Code	Reason	NCR
OR-RTR6-0081	NFS0183	Returned	Container has been excluded from the AKTSS.	NCR-ORNL-0643-08-1

Thanks and Best Regards

Laura R. Jones
Quality Assurance NCR Coordinator
Nuclear Waste Partnership, LLC
Contractor for the U.S. Department of Energy
575-234-7244 (office)
Email: laura.jones@wipp.ws

DIVIDER PAGE

Attachment 1 – CCP Nonconformance Report (NCR)

NCR No. NCR-ORNL-0648-08		Revision 2
1. Lot No./Heat No. or Serial No. (as applicable): NA	2. Process (e.g., NDA, HSG, NDE, VE, Other): NDE	3. Batch Data Report #(s): OR-RTR6-0095 Container #(s): NFS0663
4. Order/Work Order/Job Control Number (as applicable): NA	5. PO # (as applicable): NA	
	6. Supplier (as applicable): NA	

DESCRIPTION OF NONCONFORMANCE

7. (a) NCR Description: ☐ < 100 nCi/g ☒ Prohibited Item ☐ >500 ppmv Flamm. VOCs

☐ E-Flag ☐ Receipt Inspection ☐ Transportation ☐ WWIS/WDS ☐ Other

7. (b) Description of Nonconformance Required Condition (Implementing Procedure, Revision, Section, & Text):
CCP-TP-053, REV 6, TABLE SECTION 4.4.3, NOTE ABOVE [H: INTERNAL CONTAINERS (E.G., BOTTLES, CANS, ETC.) SHALL BE WELL DRAINED AND CONTAIN ONLY RESIDUAL LIQUIDS (I.E., CONTAIN AS LITTLE RESIDUAL LIQUID AS IS REASONABLY ACHIEVABLE BY POURING, PUMPING, AND/OR ASPIRATING), AND IN ALL CASES, IT MUST BE LESS THAN 1 INCH OR 2.5 CENTIMETERS OF LIQUID IN THE BOTTOM OF THE CONTAINER, ...

7. (c) Actual Condition

- 200 MILS OF NON-RESIDUAL LIQUID @ 30" ON BOTTOM

REASON FOR REVISION 1: REVISED TO CHANGE THE FINAL DISPOSITION TO REMOVE THE REQUIREMENT TO SEND THE CONTAINER TO NDA TO DETERMINE IF THE CONTAINER IS TRU PRIOR TO REMEDIATION TO REMOVE PROHIBITED ITEMS

REASON FOR REVISION 2: CHANGE INSTRUCTIONS IN 19b ITEM 2 TO RETURN CONTAINER TO HOST SITE AND DELETE ITEM 3

8. NCR Originator (Print name, sign, and date)	9. CCP QA Engineer or Designee Validation (Print name, sign, and date)
BS Schrock BSSchrock 8/29/11	C M Gomez Christine M Gomez 8/29/11

9a. Does the identified condition have the potential to impact AK? ☐ YES ☒ NO ☐ INDETERMINATE
If YES or INDETERMINATE, then apply Trend Code L in Block 12.

9b. Have the CCP HOLD TAGS associated with the NCR been applied? ☒ YES ☐ NO *If no is marked, provide an explanation.*

10. Significant Condition? (If Yes, List CAR)	11. Recurring Condition?
☐ YES ☒ NO	☐ YES ☒ NO (If YES, List NCRs/CARs)
12. Trend Code: K	13. Responsible Manager: PAT TILMON

NTPC RECORDS ORIGINAL GL
DATE REC'D 3-06-14

Attachment 1 – CCP Nonconformance Report (NCR) (Continued)

NCR No.NCR-ORNL-0648-08 Revision 2	
INTERIM DISPOSITION	
14. Interim Disposition (Check One) ☒ N/A (See Final Disposition) ☐ Hold ☐ Conditional Accept ☐ Conditional Use ☐ Sort ☐ Reinspect/Retest ☐ Remediate (a) Instructions for Completion of the Interim Disposition:	
INTERIM DISPOSITION APPROVALS	
15 .Responsible Manager/Individual (Print, sign, and date)	16. CCP QA Engineer or Designee (Print, sign and date)
Additional Approvals: (Print, sign and date)	Additional Approvals: (Print, sign and date)
COMPLETION OF INTERIM DISPOSITION	
17. Interim Disposition Complete Responsible Manager/Individual: (Print, sign and date)	
18. Interim Disposition Verified CCP QA Engineer: (Print, sign and date)	

Attachment 1 – CCP Nonconformance Report (NCR) (Continued)

NCR No.NCR-ORNL-0648-08 Revision 2

FINAL DISPOSITION

19. Final Disposition (Check One)
☐ Use-As-Is ☒ Reject ☐ Repair ☐ Rework ☐ Scrap

(a) Technical Justification (Required for Use-As-Is and Repair dispositions, N/A for Reject, Scrap, or Rework dispositions.)
NA

(b) Disposition Instructions (Required for Reject and Scrap, N/A for Use-As-Is, Rework, and Repair)
1. REJECT CONTAINER IN BDR OR-RTR6-0095
2. RETURN TO HOST SITE

(c) Instructions for Completion of the Final Disposition, including Inspection Criteria (Required for Repair and Rework, N/A for Use-As-Is, Reject and Scrap)
NA

(d) Corrective Actions (Actions to Prevent Recurrence) - as required, N/A if left blank.
NA

FINAL DISPOSITION APPROVALS

20. Responsible Manager/Individual: (Print, sign, and date)	21. CCP QA Engineer or Designee: (Print, sign, and date)
BSSchrock 8/29/14 BEVERLY S SCHROCK	8/29/11 Christine Gomez CHRIS GOMEZ
Additional Approvals: (Print, sign, and date)	Additional Approvals: (Print, sign, and date)

CLOSURE

22. Final Disposition Complete Responsible Manager/Individual: (Print, sign, and date)
BSSchrock BSSchrock 2/18/14

23. Attachments: 1 - evidence for closure
2 - Hold tag documentation) NW 3-6-14

24. (a) HOLD TAG removal has been validated and reconciled for all nonconforming items on the NCR. ☐
(b) Check if not applicable (N/A) and provide an explanation here or on a continuation sheet. ☑

Please refer to attachment 2.

25. Final Disposition Verified – NCR Closed CCP QA Engineer: (Print, sign, and date)

Mak Walker Mak Walker 03/06/14

Attachment 2 – CCP SPM Radiography Project Level Validation Checklist and Summary

BDR Number: OR-RTR6-0095	Examination Date: 08/20/08			
Description of Criteria Reviewed	**Criteria Met?**			**Comments/Qualifiers**
	YES	**NO**	**NA**	
1. Is the completed, signed, and dated Independent Technical Reviewer Checklist included in the BDR? **Reference Source: CCP-PO-001, B3-10b**	X			
2. Does the BDR contain all items addressed in the BDR Table of Contents? **Reference Source: CCP-PO-001, B3-10b**	X			
3. Does the BDR include a listing of all the container numbers in the batch? **Reference Source: CCP-PO-001, B3-10b**	X			
4. List all containers that have met QAOs. **Reference Source: CCP-PO-001, B3-10b**				Container Numbers: NFS0202, NFS0206, NFS0209, NFS0318, NFS0472, NFS0554, NFS0685, NFS0693, NFS0710
5. Does the BDR identify the current implementing procedure and revision number? **Reference Source: CCP-PO-001, Table B3-11**	X			
6. Is there a reference to or copy of any associated NCRs (if any) in the BDR? **Reference Source: CCP-PO-001, Table B3-11**	X			NCR-ORNL-0648-08 for NFS0663
7. Are there 20 or fewer containers in the batch? **Reference Source: CCP-PO-001, B3-10**	X			
8. Are the data properly reported (i.e., data are reported in correct units and with correct significant figures)? **Reference Source: CCP-PO-001, B3-10b**	X			
9. Is there evidence of verification that the physical form matches the Waste Matrix Code? **Reference Source: CCP-PO-001, B3-4, Table B3-11**	X			
10. Is there evidence of verification that the physical form matches the waste stream description? **Reference Source: CCP-PO-001, B1-3, Table B3-11**	X			
11. Are prohibited items absent? **Reference Source: CCP-PO-001, B3-4a**	X			Except NFS0663 (liquids).

NCR ORNL-0648-08-2

Attachment 1 Page 1 of 2

CONTAINERID: NFS0663

ORNL

AK DATA

Container ID	Container Type	AKA Matrix	WDS Status	AK Excluded	WSID	LOTID	LOT Excluded
NFS0663	55G		NO WDS STATUS	YES (Inactive)	OR-NFS-CH-SOIL	NONE	

BDR DATA

BDRID	Type	Status	Generation Date
OR-RTR6-0095	RTR	Complete	2008-08-20

NCR DATA

Container ID	NCRID	Status	Release Code
NFS0663	NCR-ORNL0648080	Superseded	None
NFS0663	NCR-ORNL0648081	Superseded	None
NFS0663	NCR-ORNL0648082	Open	None

REJECT DATA

Container ID	BDRID	NCRID	NCR Status	Release Code	Actual Condition
NFS0663	OR-RTR6-0095	NCR-ORNL0648081	Superseded	None	~200 MILS OF NON-RESIDUAL LIQUID @ 30" ON BOTTOM REASON FOR REVISION: REVISED TO CHANGE THE FINAL DISPOSITION TO REMOVE THE REQUIREMENT TO SEND THE CONTAINER TO NDA TO DETERMINE IF THE CONTAINER IS TRU PRIOR TO REMEDIATION TO REMOVE PROHIBITED ITEMSReason for Revision 2: Change instructions in 19b item 2 to Return container to host site and delete item 3.
NFS0663	OR-RTR6-0095	NCR-ORNL0648082	Open	None	~200 MILS OF NON-RESIDUAL LIQUID @ 30" ON BOTTOM REASON FOR REVISION: REVISED TO CHANGE THE FINAL DISPOSITION TO REMOVE THE REQUIREMENT TO SEND THE CONTAINER TO NDA TO DETERMINE IF THE CONTAINER IS TRU PRIOR TO REMEDIATION TO REMOVE PROHIBITED ITEMSReason for Revision 2: Change instructions in 19b item 2 to Return container to host site and delete item 3.

NCR 02NL-0648-08-2

Attachment 1

Walker, Mak (Maryann) - NWP

From: Harmon, Latravia <Latravia.Harmon@truproject.com>
Sent: Tuesday, February 25, 2014 12:30 PM
To: Jones, Laura - NWP
Cc: Schrock, Beverly - NWP; Wade, Daniel NWP; andrew; Mueller, Terry - NWP; Walker, Mak (Maryann) - NWP; Waldram, Veronica - NWP
Subject: Hold tags to be pulled
Attachments: Picture (Device Independent Bitmap) 1.jpg

2/24/14

Laura/Mak/Terry

CONTAINERS listed below have been closed out and repacked by host site. Please close NCRs for the following.

NFS0487-	NCR-ORNL-0644-08-2
NFS0794-	NCR-ORNL-0642-08-2
NFS0689-	NCR-ORNL-0646-08
NFS0489-	NCR-ORNL-0650-08-2
→ NFS0663-	NCR-ORNL-0648-08-2
X10C9311900A-	NCR-ORNL-0146-09-1
NFS0667-	NCR-ORNL-0647-08-2

thanks

LaTravia N. Harmon
Quality Assurance Engineer
Nuclear Waste Partnership LLC
Contractor to the United States Department of Energy
(865)576-1650 Office
(865)441-2706 Cell
latravia.harmon@truproject.com

NCR ORNL-0648-08 Rev 2

Attachment 2 Page 1 of 1

Attachment 1 – CCP Nonconformance Report (NCR)

NCR No. NCR-ORNL-0648-08 Revision **1**

1. Lot No./Heat No. or Serial No.: NA	2. Process (NDA, HSG, NDE, VE, Other): NDE	3. Batch Data Report # (s): OR-RTR6-0095 Container #(s): NFS0663
4. Order/Work Order/Job Control Number (as applicable): NA	5. PO #: NA 6. Supplier: NA	

DESCRIPTION OF NONCONFORMANCE

7. (a) CCP HOLD TAGS SHALL BE APPLIED UNLESS JUSTIFIED AS FOLLOWS:

☐ < 100 nCi/g ☒ Prohibited Item ☐ >500 ppmv Flamm. VOCs

☐ E-Flag ☐ Receiving Inspection ☐ Transportation ☐ WWIS ☐ Other

(b) Description of Nonconformance
Required Condition (Implementing Procedure, Revision, Section & Text)

CCP-TP-053, REV 6, TABLE SECTION 4.4.3, NOTE ABOVE [H: INTERNAL CONTAINERS (E.G., BOTTLES, CANS, ETC.) SHALL BE WELL DRAINED AND CONTAIN ONLY RESIDUAL LIQUIDS (I.E., CONTAIN AS LITTLE RESIDUAL LIQUID AS IS REASONABLY ACHIEVABLE BY POURING, PUMPING, AND/OR ASPIRATING), AND IN ALL CASES, IT MUST BE LESS THAN 1 INCH OR 2.5 CENTIMETERS OF LIQUID IN THE BOTTOM OF THE CONTAINER,.....

(c). Actual Condition

~ 200 MILS OF NON-RESIDUAL LIQUID @ 30" ON BOTTOM

REASON FOR REVISION: REVISED TO CHANGE THE FINAL DISPOSITION TO REMOVE THE REQUIREMENT TO SEND THE CONTAINER TO NDA TO DETERMINE IF THE CONTAINER IS TRU PRIOR TO REMEDIATION TO REMOVE PROHIBITED ITEMS

(d). Attachments:
NA

8. NCR Originator (Print name, sign, and date)	9. CCP QA Engineer or Designee Validation (Print name, sign, and date)
PAT TILMON 1-7-09	DEAN MOONEY 1-8-09

9a. Does this NCR have the potential to impact AK? ☐ YES ☒ NO ☐ INDETERMINATE
If YES or INDETERMINATE, then apply Trend Code L in Block 12.

10. Significant Condition? ☐ YES ☐ NO ☒ NA	11. Recurring Condition? ☐ YES ☒ NO (If YES, List NCRs/CARs)
12. Trend Code: K	13. Responsible Manager: PAT TILMON

Superseded by Rev 2 CG 8/29/11

Attachment 1 – CCP Nonconformance Report (NCR)	
NCR No.NCR-ORNL-0648-08 Revision 1	
INTERIM DISPOSITION	
14. Interim Disposition (Check One) ☒ N/A (See final Disposition) ☐ Hold ☐ Conditional Accept ☐ Conditional Use ☐ Sort ☐Reinspect/Retest ☐ Remediate (a) Instructions for Completion of the Interim Disposition:	
INTERIM DISPOSITION APPROVALS	
15 .Responsible Manager/Individual (Print, sign, and date)	16. CCP QA Engineer or Designee (Print, sign and date)
Additional Approvals: (Print, sign and date)	Additional Approvals: (Print, sign and date)
COMPLETION OF INTERIM DISPOSITION	
17. Interim Disposition Complete Responsible Manager/Individual: (Print, sign and date)	
18. Interim Disposition Verified CCP QA Engineer: (Print, sign and date)	

Attachment 1 – CCP Nonconformance Report (NCR)

NCR No. NCR-ORNL-0648-08 Revision 1

FINAL DISPOSITION

19. Final Disposition (Check One)
☐ Use-As-Is ☒ Reject ☐ Repair ☐ Rework ☐ Scrap

(a) Technical Justification (Required for Use-As-is and Repair dispositions, N/A for Reject, Scrap, or Rework dispositions.)
NA

(b) Disposition Instructions (Required for Reject and Scrap, N/A for Use-As-Is, Rework, and Repair)

1. REJECT CONTAINER IN BDR OR-RTR6-0095
2. SEND CONTAINER TO TWPC FOR REMEDIATION
3. ONCE REMEDIATED, RE-SCAN THE WASTE CONTAINER AT RTR AND DOCUMENT RESULTS IN A NEW BDR

(c) Instructions for Completion of the Final Disposition, including Inspection Criteria (Required for Repair and Rework, N/A for Use-As-Is, Reject and Scrap)
NA

(d) Corrective Actions (Actions to Prevent Recurrence) - as required.
NA

FINAL DISPOSITION APPROVALS

20. Responsible Manager/Individual: (Print, sign, and date)	21. CCP QA Engineer or Designee: (Print, sign, and date)
PAT TILMON 1-8-09	DEAN MOONEY 1-8-09
Additional Approvals: (Print, sign, and date) NA	Additional Approvals: (Print, sign, and date) NA

CLOSURE

22. Final Disposition Complete Responsible Manager/Individual: (Print, sign, and date)

23. (a) HOLD TAG removal has been validated and reconciled for all nonconforming items on the NCR. ☐
(b) Check if not applicable (N/A) and provide an explanation here or on a continuation sheet. ☐

24. Final Disposition Verified – NCR Closed CCP QA Engineer: (Print, sign, and date)

Attachment 1 – CCP Nonconformance Report (NCR)

NCR No. NCR - ORNL - 0648 - 08 Revision 0

1. Lot No./Heat No. or Serial No.: N/A	2. Process (NDA, HSG, NDE, VE, Other): NDE	3. Batch Data Report # (s): OR-RTR6-0095
4. Order/Work Order/Job Control Number (as applicable): N/A	5. PO #: N/A 6. Supplier: N/A	Container #(s): NFS0663

DESCRIPTION OF NONCONFORMANCE

7. (a) CCP HOLD TAGS SHALL BE APPLIED UNLESS JUSTIFIED AS FOLLOWS:

☐ < 100 nCi/g ☑ Prohibited Item ☐ >500 ppmv Flamm. VOCs

☐ E-Flag ☐ Receiving Inspection ☐ Transportation ☐ WWIS ☐ Other

(b) Description of Nonconformance
Required Condition (Implementing Procedure, Revision, Section & Text)

1. As per CCP-TP-053, Rev. 6, Table Section 4.4.3, NOTE ABOVE [H],...Internal containers (e.g., bottles, cans, etc.) shall be well drained and contain only residual liquids (i.e., contain as little residual liquid as is reasonably achievable by pouring, pumping, and/or aspirating), AND in all cases, it must be less than 1 inch or 2.5 centimeters of liquid in the bottom of the container, ..."

SUPERCEDE By Rev 1 1-9-09

(c). Actual Condition

~200 mil of non-residual liquid @ 30" on bottom.

8. NCR Originator (Print name, sign, and date)	9. CCP QA Engineer or Designee Validation (Print name, sign, and date)
Steve Binning Steve Binning 8-20-2008	Dean Mooney 9/3/2008

9a. Does this NCR have the potential to impact AK? ☐ YES ☑ NO ☐ INDETERMINATE
If YES or INDETERMINATE, then apply Trend Code L in Block 12.

10. Significant Condition?	11. Recurring Condition?
☐ YES ☐ NO ☑ NA	☐ YES ☑ NO (If YES, List NCRs/CARs)
12. Trend Code: K	13. Responsible Manager: Pat Tilmon

Attachment 1 – CCP Nonconformance Report (NCR)

NCR No. NCR - ORNL - 0648 - 08 Revision 0

INTERIM DISPOSITION

14. Interim Disposition (Check One)

☑ N/A (See final Disposition) ☐ Hold ☐ Conditional Accept ☐ Conditional Use
☐ Sort ☐ Reinspect/Retest ☐ Remediate

(a) Instructions for Completion of the Interim Disposition:

SUPERCEDE
By Rev 1 1-8-09

INTERIM DISPOSITION APPROVALS

15 .Responsible Manager/Individual (Print, sign, and date)	16. CCP QA Engineer or Designee (Print, sign and date)
Additional Approvals: (Print, sign and date)	Additional Approvals: (Print, sign and date)

COMPLETION OF INTERIM DISPOSITION

17. Interim Disposition Complete Responsible Manager/Individual: (Print, sign and date)

18. Interim Disposition Verified CCP QA Engineer: (Print, sign and date)

Attachment 1 – CCP Nonconformance Report (NCR)

NCR No. NCR - ORNL - 0648 - 08 Revision 0

FINAL DISPOSITION

19. Final Disposition (Check One)
☐ Use-As-Is ☑ Reject ☐ Repair ☐ Rework ☐ Scrap

(a) Technical Justification (Required for Use-As-is and Repair dispositions, N/A for Reject, Scrap, or Rework dispositions.)

N/A

(b) Disposition Instructions (Required for Reject and Scrap, N/A for Use-As-Is, Rework, and Repair)

1. Reject container in BDR OR-RTR6-0095
2. Send container to NDA for characterization.
3. Hold container pending NDA results.
4. If NDA results are TRU, then send to TWPC for remediation.
5. Once remediated, re-scan the waste container at RTR and include results in a new BDR.

(c) Instructions for Completion of the Final Disposition, including Inspection Criteria (Required for Repair and Rework, N/A for Use-As-Is, Reject and Scrap)

N/A

SUPERCEDE
By Rev 1 1-8-09

(d) Corrective Actions (Actions to Prevent Recurrence) - as required.

N/A

FINAL DISPOSITION APPROVALS

20. Responsible Manager/Individual: (Print, sign, and date)	21. CCP QA Engineer or Designee: (Print, sign, and date)
Pat Tilmon 9-3-08	Dean Mooney 9/3/2008
Additional Approvals: (Print, sign, and date) N/A	Additional Approvals: (Print, sign, and date) N/A

CLOSURE

22. Final Disposition Complete Responsible Manager/Individual: (Print, sign, and date)

23. Final Disposition Verified – NCR Closed CCP QA Engineer: (Print, sign, and date)

DIVIDER PAGE

Attachment 1 – CCP Nonconformance Report (NCR)

CCP NONCONFORMANCE REPORT (NCR)

(Use NCR Continuation, Attachment 3, if necessary)

NCR No. NCR-ORNL-0053-15 Revision 2

1. Lot No., Heat No., or Serial No. (if applicable): N/A	2. Process (e.g., NDA, NDE, VE, Other): NDE	3. Batch Data Report #(s): OR-RTR7-0117 OR-RTR7-0035
4. Order/Work Order/Job Control Number (if applicable): N/A	5. PO # (if applicable): N/A	Container #(s): X10C0402857E X10C0402984I
	6. Supplier (if applicable): N/A	

DESCRIPTION OF NONCONFORMANCE

7a. NCR Description: ☐ < 100 nCi/g ☒ Prohibited Item ☐ E-Flag ☐ Receipt Inspection ☐ Transportation ☐ WWIS/WDS, ☐ Other

7b. Requirement(s) (Enter Implementing Procedure No., Revision, Section No., & Quoted Text):
CCP-TP-053, Rev. 15, "CCP Standard Real- Time Radiography (RTR) Inspection Procedure, Section 4.4.3 [A] states in part "Using Table 1, Prohibited Items, as a reference ...confirm there are NO prohibited items in the waste container." Table 1, Prohibited Items lists, in part, "PCB liquids", THEN ...initiate a nonconformance report

7c. Actual Condition:
Liquid inside of a PCB identified waste container.

Reason for Revision 1: Added steps to final disposition
Reason for Revision 2: Added container X10C0402984I

7d. Have the CCP HOLD TAGS associated with this NCR been applied? ☒ YES ☐ NO If no is checked, explain:
Refer to Attachment 6, 09/03/15 LRJ

8. NCR Originator:
Beverly S. Schrock (printed name) BSSchrock (signature) 6/3/15 (date)

9. Does the identified condition have the potential to impact AK? If YES or INDETERMINATE, enter Trend Code L in Block 10. ☐ YES ☒ NO ☐ INDETERMINATE

10. Trend Code: K

11. Responsible Manager: **Beverly Schrock**

12. Significant Condition? ☐ YES ☒ NO (If Yes, enter WIPP Form No.):

13. Recurring Condition? ☐ YES ☒ NO (If Yes, list NCRs and WIPP Forms):

14. QA Engineer or QA Designee validation:
Laura R. Jones (printed name) Laura Lawson Jones 06/03/15 (signature, date)

COPY

CCP RECORDS ORIGINAL
DATE REC'D 9.4.15

Attachment 1 – CCP Nonconformance Report (NCR) (Continued)

NCR No. NCR-ORNL-0053-15 Revision 2

INTERIM DISPOSITION

15a. Interim Disposition (Check Only One):

☒ N/A (See Final Disposition) ☐ Hold ☐ Conditionally Accept ☐ Conditionally Use

☐ Sort ☐ Reinspect or Retest ☐ Remediate

15b. Instructions for Completion of the Interim Disposition:

INTERIM DISPOSITION APPROVALS

16a. Responsible Manager or Individual:

printed name _____ signature _____ date _____

16b. QA Engineer or QA Designee:

printed name _____ signature _____ date _____

Additional Approval:

printed name _____ signature _____ date _____

Additional Approval:

printed name _____ signature _____ date _____

COMPLETION OF INTERIM DISPOSITION

17. Interim Disposition Complete – Responsible Manager or Individual:

printed name _____ signature _____ date _____

18. Interim Disposition Verified – QA Engineer:

printed name _____ signature _____ date _____

Attachment 1 – CCP Nonconformance Report (NCR) (Continued)

NCR No. NCR-ORNL-0053-15 Revision 2

FINAL DISPOSITION

19. Final Disposition (Check Only One: Use-As-Is, Repair, Reject, Rework, or Scrap):
☐ Use-As-Is ☐ Repair

19a. Technical Justification – Required for Use-As-Is or Repair dispositions. [☒ N/A for Reject, Rework, or Scrap]

☒ Reject ☐ Rework ☐ Scrap

19b. Instructions for Completion – Required for Reject, Repair, Rework, or Scrap [☐ N/A for Use-As-Is]
Container is not certifiable for shipment to WIPP.
1. Return containers to Host Site for remediation.
2. Exclude containers on AKTSS
3. Remove Containers from WDS.
*4. Remove containers from certification lot
5. Add this NCR to OR-RTR7-0117 as SPM attachment
6. Operator make corrections to BDR
7. ITR re-review BDR
8. SPM re-review BDR

19c. Corrective Actions (Actions to Prevent Recurrence – For Repair or Rework, if applicable.
[☒ N/A if not applicable, and for Use-As-Is, Reject, and Scrap]

FINAL DISPOSITION APPROVALS

20. Responsible Manager or Individual:

printed name	signature	date
Beverly S. Schrock	BSSchrock	6/4/15

21. QA Engineer or QA Designee:

printed name	signature	date
Laura R. Jones	Laura Raven Jones	6/4/2015

Additional Approval:

printed name	signature	date

Additional Approval:

printed name	signature	date

CLOSURE

22. Final Disposition Complete - Responsible Manager or Individual:

printed name	signature	date
BSSchrock	BSSchrock	8/19/15

23. Attachments: 1.- Email PCB Drum with liquid. 2.- Email Documenting Reportability. 3.- Evidence for NCR Closure. 4.- Hold tag Documentation.

09/11/2016 LRT

24a. HOLD TAG removal has been verified and reconciled for all nonconforming items on the NCR: ☑
24b. If HOLD TAG is not applicable, check: ☐ and explain:

See Attachment 6.

25. Final Disposition Verified – NCR Closed QA Engineer:

printed name	signature	date
Laura R. Jones	Laura Raven Jones 9/9/15 LRJ	08/03/2015

* Verified Containers are not in a LOT. 08/19/2015 LRJ
Attachment 5.- Email Documenting Corrections have been done
Attachment 6.- Hold tag removal notification. 09/03/15 LRJ

Schrock, Beverly - NWP

From: Jeff Harrison <Trash_Talk@msn.com>
Sent: Wednesday, June 03, 2015 1:40 PM
To: Schrock, Beverly - NWP; 'Diana Mccabe'
Cc: Wade, Daniel NWP; Kirkes, Creta - NWP
Subject: RE: PCB Drum with liquid
Attachments: More PCB Changes to the AKTSS.xlsx

Bev,
The TWPC has completed their review of these 29 drums to determine if they are PCB. As you will see in the attached, 4 drums have since been repackaged, 5 drums are not PCB (2 of these 5 drums have a WDS status of Approved_Cert), and the rest are PCB waste, including X10C0402984I which is the one with liquid. Once Diana makes these changes we should be aligned with the TWPC database.

Diana,
Please make the changes in the attached. As noted in column G, the first 4 drums highlighted in red should be inactive. The next 5 drums need deletions made to the comments, PCB, and out_of_service_date fields. The 14 drums after that highlighted in yellow need additions to the PCB and out_of_service_date fields. The last 6 drums do not need any changes.

Please let me know if you have any questions.

Jeff Harrison
Nuclear Waste Partership LLC
Contractor for the U.S. Department of Energy
Trash_Talk@msn.com (e-mail)
720.977.7042 (office)
303.918.8791 (cell)
720.977.7042 (fax)

From: Jeff Harrison [mailto:Trash_Talk@msn.com]
Sent: Friday, May 29, 2015 5:36 PM
To: 'Schrock, Beverly - NWP'
Cc: 'Wade, Daniel NWP'; 'Kirkes, Creta - NWP'
Subject: RE: PCB Drum with liquid

This drum is on a list of 29 that we have identified as PCB but the TWPC database does not. I sent Don this list about a month ago for review to make sure they agree with us. I think he forgot about it so I'll call him next week and see if they can review the list.

Jeff Harrison
Nuclear Waste Partership LLC
Contractor for the U.S. Department of Energy
Trash_Talk@msn.com (e-mail)
720.977.7042 (office)
303.918.8791 (cell)
720.977.7042 (fax)

From: Schrock, Beverly - NWP [mailto:Beverly.Schrock@wipp.ws]
Sent: Friday, May 29, 2015 1:28 PM

NCR ORNL-0053-15-2
Attachment 1 Page 1 of 3

To: Harrison, Jeff
Cc: Wade, Daniel NWP; Kirkes, Creta - NWP
Subject: PCB Drum with liquid

Jeff,

Container X10C0402984I was discovered to be a PCB drum with liquid that had made it into our WDS system as a certified container. Last I remember, you were digging into records and talking to ORNL to see if we were confident that the container was a PCB container. If so, I need to have it removed from WDS, and write an NCR.....

I was out for several weeks on jury duty and I dropped the ball on this. Just trying to tie up loose ends.

Thank you,
Bev

Beverly S. Schrock
Site Project Manager
Central Characterization Program
Nuclear Waste Partnership, LLC
Contractor for the U.S. Department of Energy
(575) 234-7444
(575) 706-0809 Cell

NCR ORNL-0053-15-2
Attachment 1 Page 2 of 23
CJ 4/20/16

CONTAINERID	WDS_STATUS	WASTESTREAM	COMMENTS	PCB	OUT_OF_SERVICE_DATE	
[redacted]		OR-REDC-CH-HET	Potential PCB - electric motor.			X10CD402985G1 should be inactive. It has been repackaged into X10CD402985G1A on the AKTSS and is not PCB
		OR-NBL-CH-HET	PCB item - pump with gear box.			X10C9311030A is already inactive becuase it was repackaged into X10C9311030A1 which is correctly identified as PCB
		OR-REDC-CH-HET	PCB item - vacuum pump.			X10CSATN01905S1 should be inactive. It has been repackaged into X10CSATN01905L1A on the AKTSS which is correctly identified as PCB
		OR-REDC-CH-HET	Potential PCB item-light fixture			X10CSATN02461G should be inactive. It has been repackaged into X10CSATN02461G1 on the AKTSS and is not PCB
X10CD503050A		OR-MRF-CH-HET	~~PCB item - transformer/capacitor~~	~~Yes~~	~~4/2/2001~~	The TWPC determined this is not PCB
X10C9311900A1		OR-REDC-CH-HET	~~PCB item- electric pump~~	~~Yes~~	~~6/9/1988~~	The TWPC determined this is not PCB
X10C9311954B	APPROVED_CERT	OR-ISTP-CH-HET	~~PCB item - absorbed suspect PCB oil.~~	~~Yes~~	~~9/22/1977~~	The TWPC determined this is not PCB
X10C9400204A1	APPROVED_CERT	OR-RF-CH-HET	~~PCB item - electric pump.~~	~~Yes~~	~~9/24/1976~~	The TWPC determined this is not PCB
X10CSATN02455E		OR-REDC-CH-HET	~~Potential PCB item-light fixture.~~			The TWPC determined this is not PCB
X10CD402894H	APPROVED_CERT	OR-REDC-CH-HET	Potential PCB - electric motor.	Yes	10/10/1975	The TWPC agrees that this is a PCB
X10C0402982N	APPROVED_CERT	OR-REDC-CH-HET	Potential PCB - electric motor.	Yes	9/26/1979	The TWPC agrees that this is a PCB
X10C0402984I	APPROVED_CERT	OR-REDC-CH-HET	Potential PCB - electric motor.	Yes	9/10/1979	The TWPC agrees that this is a PCB
X10CD402986P	APPROVED_CERT	OR-REDC-CH-HET	PCB item - pump (cut up)	Yes	6/27/1979	The TWPC agrees that this is a PCB
X10CD402988D	APPROVED_CERT	OR-REDC-CH-HET	Potential PCB - electric motor.	Yes	3/21/1979	The TWPC agrees that this is a PCB
X10C0402988O1	APPROVED_CERT	OR-REDC-CH-HET	PCB item - capacitor.	Yes	3/21/1979	The TWPC agrees that this is a PCB
X10C9311215A	APPROVED_CERT	OR-REDC-CH-HET	Potential PCB - electric motor.	Yes	10/4/1979	The TWPC agrees that this is a PCB
X10C9312041A		OR-PGDP-CH-HET-A	Potential PCB - electric motor, electric furnace	Yes	11/4/1971	The TWPC agrees that this is a PCB
X10C9312747A		OR-ISTP-CH-HET	Potential PCB - electric motor with gear box.	Yes	5/31/1973	The TWPC agrees that this is a PCB
X10C9312841A	APPROVED_CERT	OR-RADP-CH-HET	Potential PCB - electric motor.	Yes	4/15/1971	The TWPC agrees that this is a PCB
X10C9312911A	APPROVED_CERT	OR-ISTP-CH-HET	Potential PCB - electrical device.	Yes	6/26/1987	The TWPC agrees that this is a PCB
X10C9312988A	APPROVED_CERT	OR-ISTP-CH-HET	Potential PCB - electric motor.	Yes	8/27/1971	The TWPC agrees that this is a PCB
X10CSATN02275F	APPROVED_CERT	OR-REDC-CH-HET	Potential PCB - blower motor.	Yes	8/6/1982	The TWPC agrees that this is a PCB
X10CSATN02279A	APPROVED_CERT	OR-REDC-CH-HET	PCB item - motor capacitor.	Yes	1/4/1983	The TWPC agrees that this is a PCB
X10C9307229		OR-REDC-CH-HET	PCB item - vacuum pump	Yes	8/1/1994	The TWPC agrees that this is a PCB
X10C9307232		OR-REDC-CH-HET	PCB item - vacuum pump	Yes	8/1/1994	The TWPC agrees that this is a PCB
X10C9312615A1		OR-ISTP-CH-HET	PCB item - transformer	Yes	9/29/1971	The TWPC agrees that this is a PCB
X10C9312672A	APPROVED_CERT	OR-RADP-CH-HET	PCB item - absorbed oil residue; suspect PCB.	Yes	3/13/1980	The TWPC agrees that this is a PCB
X10C9313625		OR-REDC-CH-HET	PCB item - vacuum pump	Yes	9/9/1991	The TWPC agrees that this is a PCB
X10C9400112A	APPROVED_CERT	OR-GENR-CH-HET	PCB item - vacuum pump.	Yes	12/13/1971	The TWPC agrees that this is a PCB

NCR ORNL-0053-15-2

Attachment 1 Page 3 of 3

Jones, Laura - NWP

From: Ramirez, Mike - NWP
Sent: Thursday, June 04, 2015 10:32 AM
To: Jones, Laura - NWP,
Subject: RE: Revised NCR-ORNL-0053-15-2

Not reportable

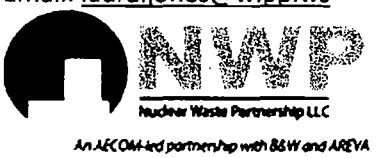
Mike Ramirez
Central Characterization Program
Certification Manager
Nuclear Waste Partnership LLC
Contractor for the U.S. Department of Energy
(575)-234-7034 Work
(575) 200-8535 Cell

From: Jones, Laura - NWP
Sent: Thursday, June 04, 2015 10:28 AM
To: Harmon, Latravia; Harmon, LaTravia - NWP; Leos, Greta - TFE; Navarrete, Leon - TFE; Tilmon, Pat; Pearcy, Sheila - TFE; Ramirez, Mike - NWP; Reeves, Ron - NWP; Schrock, Beverly - NWP; Stallings, Andrew - ORNL; Wade, Daniel NWP
Cc: Ledford, Wayne - NWP; Waldram, Veronica - NWP; Jones, Laura - NWP
Subject: Revised NCR-ORNL-0053-15-2

All – For your information
Mike – Please review for notification purposes, a container was added to the NCR.
Greta – Please post this open revised NCR.

Thanks and Best Regards

Laura R. Jones
Quality Assurance NCR Coordinator
Nuclear Waste Partnership, LLC
Contractor for the U.S. Department of Energy
575-234-7244 (office)
Email: laura.jones@wipp.ws



Jones, Laura - NWP

From: IDC (No Reply) <NOREPLY@wipp.ws>
Sent: Thursday, June 04, 2015 10:32 AM
To: DL CCP QA CBFO Notify
Subject: Project Office NCR [NCR-ORNL0053152] was just reviewed.

Certification Manager/Designee has just reviewed the project office NCR NCR-ORNL0053152 and has indicated that it [should **NOT**] be reported to CBFO. IDC has already updated the NCR for you.

Friday, August 7, 2015

CONTAINERID: X10C0402857E

ORNL

AK DATA

Container ID	Container Type	AKA Matrix	WDS Status	AK Excluded	WSID	LOTID	LOT Excluded
X10C0402857E	55G		NO WDS STATUS	YES (Inactive)	OR-REDC-CH-HET	NONE	PCB container with liquid

BDR DATA

BDRID	Type	Status	Generation Date
OR-MILCC2-0101	NDA	Complete	2014-10-22
OR-RTR7-0117	RTR	Complete	2014-10-16
OR14FG8143	HSG_TRANS	Complete	2014-10-23

NCR DATA

Container ID	NCRID	Status	Release Code
X10C0402857E	NCR-ORNL0053150	Superseded	None
X10C0402857E	NCR-ORNL0053151	Superseded	None
X10C0402857E	NCR-ORNL0053152	Open	None

REJECT DATA

Container ID	BDRID	NCRID	NCR Status	Release Code	Actual Condition
X10C0402857E	OR-RTR7-0117	NCR-ORNL0053150	Superseded	None	Liquid inside of a PCB identified waste container.Reason for Revision 1: Added steps to final disposition.
X10C0402857E	OR-RTR7-0117	NCR-ORNL0053151	Superseded	None	Liquid inside of a PCB identified waste container.Reason for Revision 1: Added steps to final disposition.Reason for Revision 2: Added Container Number X10C04029811.
X10C0402857E	OR-RTR7-0117	NCR-ORNL0053152	Open	None	Liquid inside of a PCB identified waste container.Reason for Revision 1: Added steps to final disposition.Reason for Revision 2: Added Container Number X10C04029811.

NCR ORNL-0053-15-2 Attachment 3 Page 1 of 25

CCP Radiography Data Sheet

CCP-TP-053 Attachment 2

Section 1: General Information	
[X] RTR Examination [ ] RTR Replicate Scan [ ] RTR Independent Observation	
Site ID:	ORNL
Batch Number:	OR-RTR7-0117
Examination Date:	10/16/2014
Waste Container ID:	X10C0402857E
Video/Audio Recorded Media Number:	OR-RTR7-0117 A&B
Procedure and Revision No.:	CCP-TP-053 Rev. 15
NCR(s) associated with the container? (e.g., Prohibited Items)	[X] No [✓] Yes EL 4/20/15 EL 4/20/15 NCR No.: ~~N/A~~ NCR-ORNL-0053-15 NCR No.: N/A

Section 2: Waste Container Data	
Container Type:	55 Gallon Drum
TRUCON Code:	OR 225
Waste Matrix Code:	S5400
Waste Stream I.D.:	OR-REDC-CH-HET
Waste Container Weights:	Gross Wt.: 70.9 kg Tare Wt.: 33.2 kg Net Wt.: 37.7 kg
Rigid Liner and Liner Vent Description:	Liner: [X] No [ ] Yes Lid: [X] No [ ] Yes Type: [ ] 30-mil [ ] 90-mil [ ] 110-mil [ ] 125-mil Vented: [ ] No [ ] Yes [X] N/A Punctured: [X] No [ ] Yes Mechanical Vent: [X] No [ ] Yes Fiberboard Liner: [X] No [ ] Yes Lead Lined: [X] No [ ] Yes
Number of Layers of Confinement:	Appears to be 1 layer
Volume Utilization Percentage:	85 %

CCP Radiography Data Sheet

Waste Container ID: X10C0402857E

Section 3: Container Inventory and Comments (Detailed descriptions)	
IM:	Scrap metal, electrical equipment
AM:	
OM:	
OI:	Absorbent, glass containers, broken glass, light bulb
C:	Cloth, cardboard
R:	
XPM:	Plastic sheeting, plastic containers, plastic suits, plastic tubing, coax cable
OR:	
IN:	
S:	

Section 4: Packaging Material and Waste Material Parameters	
Packaging Material:	**Estimated Weight (kg)**
Steel (ST):	27.8
Plastics (PP): Liner bag	1.0
Other: Cardboard Liner (CP)	4.4
Total Packaging Weight	33.2
Waste Material Parameter:	**Estimated Weight (kg)**
Iron-based Metal / Alloys (IM):	10.0
Aluminum-based Metals / Alloys (AM):	
Other Metals (OM):	
Other Inorganic Materials (OI)	8.0
Cellulosics (C):	5.0
Rubber (R):	
Plastics (waste materials) (XPM):	14.7
Organic Matrix (OR):	
Inorganic Matrix (IN):	
Soils (S):	
Total WMP Weight:	37.7

CCP Radiography Data Sheet

Waste Container ID: X10C0402857E

Section 5: RTR Summary (Questions answered "Yes" will be explained in the Comment block, except for Question 1)	
Is there observable liquid?	[X] Yes [ ] No
Is there any observable liquid in internal containers, more than 60 milliliters or 3 percent by volume, whichever is greater?	[ ] Yes [X] No
Is the total volume of observable liquid in the outermost container GREATER than 1% of the container?	[ ] Yes [X] No
Is there observable liquid in payload containers with an EPA Hazardous Waste Number of U134?	[ ] Yes [X] No
Is there an indication of non-radionuclide pyrophoric materials, such as elemental potassium?	[ ] Yes [X] No
Is there an indication of hazardous wastes not occurring as co-contaminants with TRU mixed wastes (non-mixed hazardous wastes)?	[ ] Yes [X] No
Is there an indication of wastes incompatible with backfill, seal and panel closures materials, container and packaging materials, shipping container materials, or other wastes (i.e., waste does NOT match TRUCON Code[s])?	[ ] Yes [X] No
Is there an indication of wastes containing explosives or compressed gases?	[ ] Yes [X] No
Is there an indication of PCBs liquids?	EL 4/20/15 [✓] Yes [~~X~~] No
Is there an indication of the waste exhibiting the characteristic of ignitability, corrosivity, or reactivity (EPA Hazardous Waste Numbers of D001, D002, or D003)?	[ ] Yes [X] No
Is the physical form of the waste inconsistent with the Waste Stream Description or the Waste Matrix Code?	[ ] Yes [X] No
CH or RH TRAMPAC	
Are there heat-sealed bags (unvented) GREATER than 4 liters and LESS than 390 square inches in the waste, or heat sealed bags not authorized in the RH TRUCON Code?	[ ] Yes [X] No
Were there Non-approved Closure Methods used on liner bags or inner bags greater than 4 liters?	[ ] Yes [X] No
Are there sealed containers GREATER than 4 liters?	[ ] Yes [X] No
Are there indications of inadequate protection for heavy and/or sharp objects?	[ ] Yes [X] No
Comments: ~~N/A~~ CL 4/20/15 NCR-ORNL-0053-15	
RTR Operator: Eric Lyles (Print Name) — Signature — 10/16/2014 4/20/15 (Date)	

Attachment 3 – CCP Radiography Independent Technical Reviewer Checklist

Batch Data Report No.: OR-RTR7-0117

Description			
1.	Were data generation and reduction conducted in a technically correct manner in accordance with the methods used?	☐ NO	☒ YES
2.	Was the correct revision of the procedure used? Procedure: CCP-TP-053 Rev.: 15	☐ NO	☒ YES
3.	Are the WMPs entered correctly?	☐ NO	☒ YES
4.	Do the estimated weights in Section 4 of Attachment 2 equal the container gross weight?	☐ NO	☒ YES
5.	Is the data reported in the proper units with the correct number of significant figures (e.g., one tenth of a kilogram)?	☐ NO	☒ YES
6.	Was transcription used? If no, proceed to question 7.	☒ NO	☐ YES
6a.	Has the data been verified for transcription errors?	☐ NO	☐ YES
7.	Does the Testing Batch Report include radiography for up to 20 containers?	☐ NO	☒ YES
8.	Are BDR contents complete and do they match the CCP Waste RTR Batch Data Report Table of Contents?	☐ NO	☒ YES
9.	Is all the data signed and dated in reproducible ink and by the individual(s) generating it?	☐ NO	☒ YES
10.	Is all data recorded clearly, legibly, and accurately?	☐ NO	☒ YES
11.	Have changes been made to original data? If no, proceed to question 12.	☒ NO DS 4-20-15	☒ YES
11a.	Have all changes to original data been lined out, initialed and dated by the individual making the changes?	☐ NO DS 4-20-15	☒ YES
11b.	Was justification made for changing the original data?	☐ NO DS 4-20-15	☒ YES
11c.	Were data changes made by the individual who originally collected the data?	☐ NO DS 4-20-15	☒ YES
12.	Does the waste match the Waste Matrix Code and Waste Stream description?	☐ NO	☒ YES
13.	Are the RTR Operator's decisions regarding the Radiography documented?	☐ NO	☒ YES
14.	Is there an adequate written description of the contents of each item?	☐ NO	☒ YES
15.	Was the video/audio recording media properly prepared and labeled for each waste container?	☐ NO	☒ YES
16.	Was the video/audio recording media check performed satisfactorily and recorded on Attachment 1?	☐ NO	☒ YES

Attachment 3 – CCP Radiography Independent Technical Reviewer Checklist (Continued)

Batch Data Report No.: OR-RTR7-0117

Description			
17.	Was the Image Test performed satisfactorily and recorded on Attachment 1?	☐ NO	☒ YES
18.	Was the Replicate Scan performed and recorded on an Attachment 2?	☐ NO	☒ YES
19.	Was the Replicate Scan RTR Operator different from the first RTR Operator?	☐ NO	☒ YES
20.	Did the Replicate Scan RTR Operator and the first RTR Operator agree on the results?	☐ NO	☒ YES
21.	Was the Independent Observation performed and recorded on an Attachment 2?	☐ NO	☒ YES
22.	Was the Independent Observation RTR Operator different from the first RTR Operator?	☐ NO	☒ YES
23.	Did the Independent Observation RTR Operator and the first RTR Operator agree on the results?	☐ NO	☒ YES
24.	Was the data collection performed by qualified individuals?	☐ NO	☒ YES
25.	Were NCRs initiated as required at DGL? If no, proceed to question 26.	☒ NO	☐ YES
	25a. Have the NCR(s) associated with RTR been included in the BDR?	☐ NO	☐ YES
26.	Is the RTR examination for CH waste? If no, proceed to question 27.	☐ NO	☒ YES
	26a. Have the CH Quality Assurance Objectives (QAOs) been met (If applicable)? Precision – Precision is maintained by reconciling any discrepancies between two radiography operators with regard to identification of the waste matrix code, liquids in excess of TSDF-WAC limits, and compressed gases through independent replicate scans and independent observations. Additionally, the precision of radiography is verified prior to use by tuning precisely enough to demonstrate compliance with QAOs through viewing an image test pattern. Accuracy – Accuracy is obtained by using a target to tune the image for maximum sharpness and by requiring operators to successfully identify 100 percent of the items required to meet the DQOs for radiography specified in CCP-PO-001, Section C-4a(1) in a training container during their initial qualification and subsequent requalification. Completeness – A video and audio media recording of the radiography examination and a validated radiography data form will be obtained for 100 percent of the waste containers subject to radiography. All video and audio media recordings and radiography data forms will be subject to validation as indicated in CCP-PO-001, Section C3-4. Comparability – The comparability of radiography data from different operators shall be enhanced by using standardized radiography procedures and operator qualifications.	☐ NO	☒ YES

Attachment 3 – CCP Radiography Independent Technical Reviewer Checklist (Continued)

Batch Data Report No.: OR-RTR7-0117

Description		
27. Is the RTR examination for RH waste? If no, proceed to comment section.	☒NO	☐YES
27a. Have the RH QAOs been met (if applicable)? Precision – Precision is maintained by reconciling any discrepancies between two operators (during Independent Observation and Replicate scans) with regard to the identification of important waste characteristics (i.e., physical form of the waste and absence of prohibited liquids) within a single container. Accuracy – Accuracy is obtained by using a target to tune the image for maximum sharpness and by requiring operators to successfully identify prohibited liquid in a training container during their initial qualification and subsequent requalification. Representativeness – All of the relevant contents in a container selected for radiography will be described. Completeness – All of the relevant waste information must be assembled and must show that each of the containers in the waste stream belongs to the waste stream. This information must be documented on videotape or other equivalent media and data form. Comparability – Comparability is ensured by meeting the program training requirements and complying with the minimum standards used to implement the radiography process.	☐NO	☐YES

Comments: ~~N/A~~ NCR-ORNL-0053-15 was initiated at SPM level. DB 4-20-15

I have reviewed 100% of the container specific and batch data in this report and find it acceptable.

Independent Technical Reviewer:

Printed Name	Signature	Date
Daphne Brothers	Daphne C Brothers	10-20-14
	Daphne D Brothers	4-20-15

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NCR ORNL-0053-15-2

Attachment 3 Page 7 of 25

Attachment 2 – CCP SPM Radiography Project Level Validation Checklist and Summary

BDR Number: OR-RTR7-0117				Examination Date(s): 10/16/2014
Description of Criteria Reviewed	**Criteria Met?**			**Comments/Qualifiers**
	YES	**NO**	**NA**	
1. Is the completed, signed, and dated Independent Technical Reviewer Checklist included in the BDR, and the independent technical reviewer was not involved in the generation or recording of the data under review? **Reference Source: CCP-PO-001, C3-4**	X			
2. Does the BDR contain all items addressed in the BDR Table of Contents? **Reference Source: CCP-PO-001, C3-4**	X			
3. Does the BDR include a listing of all the container numbers in the batch? **Reference Source: CCP-PO-001, C3-4**	X			
4. List all containers that have met QAOs. **Reference Source: CCP-PO-001, C3-4**				Container Numbers: X10C0402965A X10C0402965L X10C0402965J X10C0402965K X10C0402998F X10C0402998L X10C0402857G X10C0402857H X10C0402839A X10C0402839B X10C0402839E X10C0402839H X10C0402857F ~~X10C0402867E~~ QA 5/4/15
5. Does the BDR identify the current implementing procedure and revision number? **Reference Source: CCP-PO-001, Table C3-3**	X			
6. Is there a reference to or copy of any associated NCRs (if any) in the BDR? NA if no NCRs. **Reference Source: CCP-PO-001, Table C3-3**	X BGS 4/14/15		BGS 4/14/15 X	NCR-ORNL-0053-15 BGS 4/14/15
7. Are there 20 or fewer containers in the batch? **Reference Source: CCP-PO-001, C3-4**	X			
8. Are the data properly reported (i.e., data are reported in correct units and with correct significant figures)? **Reference Source: CCP-PO-001, C3-4**	X			
9. Is there evidence of verification that the physical form matches the Waste Matrix Code? **Reference Source: CCP-PO-001, Table C3-3**	X			

NCR ORNL-0053-15-2
Attachment 3
Page 8 of 35

CCP RECORDS ORIGINAL
DATE REC'D 10-22-14 QL

Attachment 2 – CCP SPM Radiography Project Level Validation Checklist and Summary (Continued)

BDR Number: OR-RTR7-0117			Examination Date(s): 10/16/2014	
Description of Criteria Reviewed	**Criteria Met?**			**Comments/Qualifiers**
	YES	**NO**	**NA**	
10. Is there evidence of verification that the physical form matches the waste stream description? **Reference Source: CCP-PO-001, Table C3-3**	X			
11. Are prohibited items absent? **Reference Source: CCP-PO-001, Table C3-3**	X			Except for container X10C0402857E; PCB Liquid. QW 5/4/15
12. Does observable liquid, if present, meet the criteria of the TSDF-WAC? **Reference Source: CCP-PO-001, C-1**	X			
13. Were discrepancies between two operators with regard to identification of waste matrix code, liquids in excess of the TSDF-WAC, or compressed gases through replicate scans and independent observations reconciled? NA if no discrepancies. **Reference Source: CCP-PO-001, C3-2**			X	
14. Are the training qualifications for all radiography personnel acceptable? **Reference Source: CCP-PO-001, C3-8**	X			
15. Was evidence of the video/audio check included in the BDR? **Reference Source: CCP-PO-001, C1-1**	X			
16. Was the Lines-Pair Resolution Test or Sieve Test Check included in the BDR? **Reference Source: CCP Technical Procedures**	X			
17. Was a replicate scan performed once per day, or once per batch, whichever is LESS frequent? **Reference Source: CCP-PO-001, C1-1**	X			
18. Was an independent observation performed once per day, or once per batch, whichever is LESS frequent? **Reference Source: CCP-PO-001, C1-1**	X			

NCR EWC-0053-15-2
Attachment 3
Page 9 of 25

Attachment 2 – CCP SPM Radiography Project Level Validation Checklist and Summary (Continued)

BDR Number: OR-RTR7-0117	Examination Date(s): 10/16/2014			
Description of Criteria Reviewed	**Criteria Met?**			**Comments/Qualifiers**
	YES	**NO**	**NA**	
19. Were the replicate scan and independent observation performed on different waste containers? **Reference Source: CCP-PO-001, C1-1**	X			
20. Were the personnel performing the replicate scan and independent observation different from the individual who performed the original? **Reference Source: CCP-PO-001, C1-1**	X			
21. Does the BDR include an estimate of each material parameter weight in kg for each container? **Reference Source: CCP Technical Procedures**	X			
22. Does the BDR include a description of each material parameter for each container? **Reference Source: CCP Technical Procedures**	X			
23. Is the container gross weight recorded in kilograms (kg) for each container in the BDR? **Reference Source: CCP Technical Procedures**	X			
24. Was the Scale Weight Calibration Check included in the BDR? **Reference Source: CCP Technical Procedures**			X	Scale not used.
25. Was the Scale Weight Check included in the BDR? **Reference Source: CCP Technical Procedures**			X	Scale not used.
Comments: ~~None~~ Added NCR-ORNL-0053-15 as SPM1, SPM2 & SPM3 per 4/16/15				

The container QC checks were properly performed and meet the Quality Assurance Objectives (QAOs). Proper procedures were followed during data reduction and analysis. The batch is complete, acceptable, and includes all supporting data and documentation required by the QAPjP.

Carolina Soaterna	Carolina Soaterna	10/21/14
SPM Printed Name	Signature	Date

Checklist is to be re-signed only when a re-review is performed.

Beverly Schrock	BSSchrock	Added NCR-ORNL-0053-15	4/16/15
SPM Printed Name	Signature	Reason	Date
Daniel Wade	Daniel Wade	Inverted collections	5/19/15
SPM Printed Name	Signature	Reason	Date

NCR ORNL-0053-15-2 Attachment 2 Page 10 of 35

Attachment 1 – CCP Nonconformance Report (NCR)

CCP NONCONFORMANCE REPORT (NCR)

(Use NCR Continuation, Attachment 3, if necessary)

NCR No. NCR-ORNL-0053-15 Revision 1

1. Lot No., Heat No., or Serial No. (if applicable): N/A	2. Process (e.g., NDA, NDE, VE, Other): NDE	3. Batch Data Report #(s): OR-RTR7-0117
4. Order/Work Order/Job Control Number (if applicable): N/A	5. PO # (if applicable): N/A	Container #(s): X10C0402857E
	6. Supplier (if applicable): N/A	

DESCRIPTION OF NONCONFORMANCE

7a. NCR Description: ☐ < 100 nCi/g ☒ Prohibited Item ☐ E-Flag ☐ Receipt Inspection ☐ Transportation ☐ WWIS/WDS ☐ Other

7b. *Requirement(s)* (Enter Implementing Procedure No., Revision, Section No., & Quoted Text):
CCP-TP-053, Rev. 15, "CCP Standard Real- Time Radiography (RTR) Inspection Procedure, Section 4.4.3 [A] states in part "Using Table 1, Prohibited Items, as a reference ...confirm there are NO prohibited items in the waste container." Table 1, Prohibited Items lists, in part, "PCB liquids", THEN ...initiate a nonconformance report

7c. Actual Condition:
Liquid inside of a PCB identified waste container.

Reason for Revision 1: Added steps to final disposition

7d. Have the CCP HOLD TAGS associated with this NCR been applied? ☒ YES ☐ NO *If no is checked, explain:*
04/16/15 LAS
Attachment 4.

8. NCR Originator:
Beverly S. Schrock (printed name) BSSchrock (signature) 4/16/15 (date)

9. Does the identified condition have the potential to impact AK? If YES or INDETERMINATE, enter Trend Code L in Block 10. ☐ YES ☒ NO ☐ INDETERMINATE

10. Trend Code: K

11. Responsible Manager: **Beverly Schrock**

12. Significant Condition? ☐ YES ☒ NO (If Yes, enter WIPP Form No.):

13. Recurring Condition? ☐ YES ☒ NO (If Yes, list NCRs and WIPP Forms):

14. QA Engineer or QA Designee validation:
Laura R. Jones (printed name) Laura Rachel Jones (signature) 4/16/15 (date)

NCR ORNL-0053-15-2
Attachment 3
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SPM-1
BSS 4/16/15

Attachment 1 – CCP Nonconformance Report (NCR) (Continued)

NCR No. NCR-ORNL-0053-15 Revision 1

INTERIM DISPOSITION

15a. Interim Disposition (Check Only One):

☒ N/A (See Final Disposition) ☐ Hold ☐ Conditionally Accept ☐ Conditionally Use

☐ Sort ☐ Reinspect or Retest ☐ Remediate

15b. Instructions for Completion of the Interim Disposition:

INTERIM DISPOSITION APPROVALS

16a. Responsible Manager or Individual:

printed name _____ signature _____ date _____

16b. QA Engineer or QA Designee:

printed name _____ signature _____ date _____

Additional Approval:

printed name _____ signature _____ date _____

Additional Approval:

printed name _____ signature _____ date _____

COMPLETION OF INTERIM DISPOSITION

17. Interim Disposition Complete – Responsible Manager or Individual:

printed name _____ signature _____ date _____

18. Interim Disposition Verified – QA Engineer:

printed name _____ signature _____ date _____

NCR ORNL-0053-15-2
Attachment 3
Page 12 of 25

SPM-2
ES 4/16/15

Attachment 1 – CCP Nonconformance Report (NCR) (Continued)

NCR No. NCR-ORNL-0053-15 Revision 1

FINAL DISPOSITION

19. Final Disposition (Check Only One: Use-As-Is, Repair, Reject, Rework, or Scrap):
☐ Use-As-Is ☐ Repair
19a. Technical Justification – Required for Use-As-Is or Repair dispositions. [☒ N/A for Reject, Rework, or Scrap]

☒ Reject ☐ Rework ☐ Scrap
19b. Instructions for Completion – Required for Reject, Repair, Rework, or Scrap [☐ N/A for Use-As-Is]
Container is not certifiable for shipment to WIPP.
1. Return container to Host Site for remediation.
2. Exclude container on AKTSS
3. Remove Container from WDS.
4. Remove container from certification lot
5. Add this NCR to OR-RTR7-0117 as SPM attachment
6. Operator make corrections to BDR
7. ITR re-review BDR
8. SPM re-review BDR

19c. Corrective Actions (Actions to Prevent Recurrence – For Repair or Rework, if applicable.
[☒ N/A if not applicable, and for Use-As-Is, Reject, and Scrap]

FINAL DISPOSITION APPROVALS

20. Responsible Manager or Individual:

Beverly S. Schrock	BSSchrock	4/16/15
printed name	signature	date

21. QA Engineer or QA Designee:

Laura R. Jones	Laura Ramos Jones	4/16/15
printed name	signature	date

Additional Approval:

printed name	signature	date

Additional Approval:

printed name	signature	date

CLOSURE

22. Final Disposition Complete - Responsible Manager or Individual:

printed name	signature	date

23. Attachments: 1- Hold tag application notification.

24a. HOLD TAG removal has been verified and reconciled for all nonconforming items on the NCR: ☐
24b: If HOLD TAG is not applicable, check: ☐ and explain:

25. Final Disposition Verified – NCR Closed QA Engineer:

printed name	signature	date

SPM-3
BSS 4/16/15

NCR ORNL-0053-15-2
Attachment 3
Page 13 of 85

CONTAINERID: X10C0402984I

ORNL

AK DATA

Container ID	Container Type	AKA Matrix	WDS Status	AK Excluded	WSID	LOTID	LOT Excluded
X10C0402984I	55G		NO WDS STATUS	YES (Inactive)	OR-REDC-CH-HET	NONE	PCB container with liquid

BDR DATA

BDRID	Type	Status	Generation Date
OR-MILCC2-0010	NDA	Complete	2014-05-01
OR-RTR7-0035	RTR	Complete	2014-04-17
OR14FG8051	HSG_TRANS	Complete	2014-04-29

NCR DATA

Container ID	NCRID	Status	Release Code
X10C0402984I	NCR-ORNL0053152	Open	None

REJECT DATA

Container ID	BDRID	NCRID	NCR Status	Release Code	Actual Condition
X10C0402984I	OR-RTR7-0035	NCR-ORNL0053152	Open	None	Liquid inside of a PCB identified waste container.Reason for Revision 1: Added steps to final disposition.Reason for Revision 2: Added Container Number X10C0402981I.

CCP Radiography Data Sheet

Section 1: General Information		
[X] RTR Examination	[ ] RTR Replicate Scan	[ ] RTR Independent Observation
Site ID:	ORNL	
Batch Number:	OR-RTR7-0035	
Examination Date:	4/17/2014	
Waste Container ID:	X10C0402984I	
Video/Audio Recorded Media Number:	OR-RTR7-0035	A&B
Procedure and Revision No.:	CCP-TP-053	Rev. 14
NCR(s) associated with the container? (e.g., Prohibited Items)	~~[X] No~~ [X] Yes DS 8-10-15 NCR No.: ~~N/A~~ NCR-ORNL-0053-15 DS 8-10-15 NCR No.: N/A	

Section 2: Waste Container Data		
Container Type:	55 Gallon Drum	
TRUCON Code:	OR 225	
Waste Matrix Code:	S5400	
Waste Stream I.D.:	OR-REDC-CH-HET	
Waste Container Weights:	Gross Wt.: 99.0 kg Tare Wt.: 33.2 kg Net Wt.: 65.8 kg	
Rigid Liner and Liner Vent Description:	Liner: [X] No [ ] Yes Lid: [X] No [ ] Yes Type: [ ] 30-mil [ ] 90-mil [ ] 110-mil [ ] 125-mil Vented: [ ] No [ ] Yes [X] N/A Punctured: [X] No [ ] Yes Mechanical Vent: [X] No [ ] Yes Fiberboard Liner: [X] No [ ] Yes Lead Lined: [X] No [ ] Yes	
Number of Layers of Confinement:	Appears to be 1 layer	
Volume Utilization Percentage:	70 %	

CCP Radiography Data Sheet

Waste Container ID: X10C0402984I

Section 3: Container Inventory and Comments (Detailed descriptions)	
IM:	Scrap metal, metal tubing, ~~metal~~ metal 4/21/14 hardware, metal fittings, hand tool, motorized equipment, saw blade
AM:	
OM:	
OI:	Absorbent, glass containers, floor sweepings
C:	Wood
R:	
XPM:	Plastic bag, plastic labware, plastic tubing, coax cable, plastic sheeting
OR:	
IN:	
S:	

Section 4: Packaging Material and Waste Material Parameters	
Packaging Material:	**Estimated Weight (kg)**
Steel (ST):	27.8
Plastics (PP):Liner bag	1.0
Other: Cardboard liner (CP)	4.4
Total Packaging Weight	33.2
Waste Material Parameter:	**Estimated Weight (kg)**
Iron-based Metal / Alloys (IM):	25.0
Aluminum-based Metals / Alloys (AM):	
Other Metals (OM):	
Other Inorganic Materials (OI)	15.0
Cellulosics (C):	10.0
Rubber (R):	
Plastics (waste materials) (XPM):	15.8
Organic Matrix (OR):	
Inorganic Matrix (IN):	
Soils (S):	
Total WMP Weight:	65.8

CCP Radiography Data Sheet

Waste Container ID: X10C0402984I

Section 5: RTR Summary (Questions answered "Yes" will be explained in the Comment block, except for Question 1)	
Is there observable liquid?	[X] Yes [ ] No
Is there any observable liquid in internal containers, more than 60 milliliters or 3 percent by volume, whichever is greater?	[ ] Yes [X] No
Is the total volume of observable liquid in the outermost container GREATER than 1% of the container?	[ ] Yes [X] No
Is there observable liquid in payload containers with an EPA Hazardous Waste Number of U134?	[ ] Yes [X] No
Is there an indication of non-radionuclide pyrophoric materials, such as elemental potassium?	[ ] Yes [X] No
Is there an indication of hazardous wastes not occurring as co-contaminants with TRU mixed wastes (non-mixed hazardous wastes)?	[ ] Yes [X] No
Is there an indication of wastes incompatible with backfill, seal and panel closures materials, container and packaging materials, shipping container materials, or other wastes (i.e., waste does NOT match TRUCON Code[s])?	[ ] Yes [X] No
Is there an indication of wastes containing explosives or compressed gases?	[ ] Yes [X] No
Is there an indication of PCBs liquids?	[X] Yes [X] No DB 8-10-15
Is there an indication of the waste exhibiting the characteristic of ignitability, corrosivity, or reactivity (EPA Hazardous Waste Numbers of D001, D002, or D003)?	[ ] Yes [X] No
Is the physical form of the waste inconsistent with the Waste Stream Description or the Waste Matrix Code?	[ ] Yes [X] No
CH or RH TRAMPAC	
Are there heat-sealed bags (unvented) GREATER than 4 liters and LESS than 390 square inches in the waste, or heat sealed bags not authorized in the RH TRUCON Code?	[ ] Yes [X] No
Were there Non-approved Closure Methods used on liner bags or inner bags greater than 4 liters?	[ ] Yes [X] No
Are there sealed containers GREATER than 4 liters?	[ ] Yes [X] No
Are there indications of inadequate protection for heavy and/or sharp objects?	[ ] Yes [X] No

Comments: ~~N/A~~ NCR- ORNL-0053-15 DB 8-10-15

RTR Operator:

Daphne Brothers	[signature]	4/17/2014
Print Name	Signature	Date

Attachment 3 – CCP Radiography Independent Technical Reviewer Checklist

Batch Data Report No.: OR-RTR7-0035

Description				
1.	Data generation and reduction were conducted in a technically correct manner in accordance with the methods used?	☐ NO	☑ YES	
2.	Was the correct revision of the procedure used? Procedure: CCP-TP-053 Rev.: 14	☐ NO	☑ YES	
3.	Are the WMPs entered correctly?	☐ NO	☑ YES	
4.	Do the estimated weights in Section 4 of Attachment 2 equal the container gross weight?	☐ NO	☑ YES	
5.	Is the data reported in the proper units with the correct number of significant figures (e.g., one tenth of a kilogram)?	☐ NO	☑ YES	
6.	Has the data been verified for transcription errors?	☐ NO	☐ YES	☑ N/A
7.	Does the Testing Batch Report include radiography for up to 20 containers?	☐ NO	☑ YES	
8.	BDR contents are complete and match the CCP Waste RTR Batch Data Report Table of Contents?	☐ NO	☑ YES	
9.	Is all the data signed and dated in reproducible ink and by the individual(s) generating it?	☐ NO	☑ YES	
10.	Is all data recorded clearly, legibly, and accurately?	☐ NO	☑ YES	
11.	All changes to original data lined out, initialed and dated by the individual making the changes?	☐ NO	☑ YES	☐ N/A
12.	Was justification made for changing the original data? Fo 8-10-15	~~☑ NO~~	☑ YES	☐ N/A
13.	Were data changes made by the individual who originally collected the data?	☐ NO	☑ YES	☐ N/A
14.	Does the waste match the Waste Matrix Code and Waste Stream description?	☐ NO	☑ YES	
15.	Are the RTR Operator's decisions regarding the Radiography documented?	☐ NO	☑ YES	
16.	Is there an adequate written description of the contents of each item?	☐ NO	☑ YES	
17.	Was the video/audio recording media properly prepared and labeled for each waste container?	☐ NO	☑ YES	
18.	Was the video/audio recording media check performed satisfactorily and recorded on Attachment 1?	☐ NO	☑ YES	

Attachment 3 – CCP Radiography Independent Technical Reviewer Checklist (Continued)

Batch Data Report No.: OR-RTR7-0035

Description				
19.	Was the Image Test performed satisfactorily and recorded on Attachment 1?	☐ NO	☑ YES	
20.	Was the Replicate Scan performed and recorded on an Attachment 2?	☐ NO	☑ YES	
21.	Was the Replicate Scan RTR Operator different from the first RTR Operator?	☐ NO	☑ YES	
22.	Did the Replicate Scan RTR Operator and the first RTR Operator agree on the results?	☐ NO	☑ YES	
23.	Was the Independent Observation performed and recorded on an Attachment 2?	☐ NO	☑ YES	
24.	Was the Independent Observation RTR Operator different from the first RTR Operator?	☐ NO	☑ YES	
25.	Did the Independent Observation RTR Operator and the first RTR Operator agree on the results?	☐ NO	☑ YES	
26.	Was the data collection performed by qualified individuals?	☐ NO	☑ YES	
27.	Are the NCR(s) associated with the RTR examination included in the BDR?	☐ NO	☑ YES	~~☑ N/A~~ FO 8-10-15
28.	QAOs (precision, accuracy, completeness, representativeness) have been met?	☐ NO	☑ YES	

Comments: ~~N/A~~ FO 8-10-15
OPERATOR BROOKSHIRE IS NO LONGER WORKS WITH THE CCP PROJECT. OPERATOR FRIDONEY HAS PERFORMED THE ITR FOR THIS BATCH. FO 8-10-15

I have reviewed 100% of the container specific and batch data in this report and find it acceptable.

Independent Technical Reviewer:

Printed Name	Signature	Date
John Brookshire	John Brookshire	4/21/14
FRED ONEY	FONey	8-10-15

Attachment 2 – CCP SPM Radiography Project Level Validation Checklist and Summary

BDR Number: OR-RTR7-0035				Examination Date(s): 04/17/2014
Description of Criteria Reviewed	**Criteria Met?**			**Comments/Qualifiers**
	YES	**NO**	**NA**	
1. Is the completed, signed, and dated Independent Technical Reviewer Checklist included in the BDR, and the independent technical reviewer was not involved in the generation or recording of the data under review? **Reference Source: CCP-PO-001, C3-4**	X			
2. Does the BDR contain all items addressed in the BDR Table of Contents? **Reference Source: CCP-PO-001, C3-4**	X			
3. Does the BDR include a listing of all the container numbers in the batch? **Reference Source: CCP-PO-001, C3-4**	X			
4. List all containers that have met QAOs. **Reference Source: CCP-PO-001, C3-4**				Container Numbers: X10C9312825A ~~X10C8402984I~~ GSS 8/7/15 X10CSATN02247K X10CSATN02247L X10CSATN02247J
5. Does the BDR identify the current implementing procedure and revision number? **Reference Source: CCP-PO-001, Table C3-3**	X			
6. Is there a reference to or copy of any associated NCRs (if any) in the BDR? NA if no NCRs. **Reference Source: CCP-PO-001, Table C3-3**	X		* GSS 8/7/15	NCR-ORNL-0053-15 GSS 8/7/15
7. Are there 20 or fewer containers in the batch? **Reference Source: CCP-PO-001, C3-4**	X			
8. Are the data properly reported (i.e., data are reported in correct units and with correct significant figures)? **Reference Source: CCP-PO-001, C3-4**	X			
9. Is there evidence of verification that the physical form matches the Waste Matrix Code? **Reference Source: CCP-PO-001, Table C3-3**	X			

NTPC RECORDS ORIGINAL
DATE REC'D 4/24/15

NCR ORNL-0053-15-2

Attachment 3 Page 20 of 25

Attachment 2 – CCP SPM Radiography Project Level Validation Checklist and Summary (Continued)

BDR Number: OR-RTR7-0035			Examination Date(s): 04/17/2014	
Description of Criteria Reviewed	**Criteria Met?**			**Comments/Qualifiers**
	YES	**NO**	**NA**	
10. Is there evidence of verification that the physical form matches the waste stream description? **Reference Source: CCP-PO-001, Table C3-3**	X			
11. Are prohibited items absent? **Reference Source: CCP-PO-001, Table C3-3**	X			except for X10CP402984I - liquid in RCB container. OSS 5/7/15
12. Does observable liquid, if present, meet the criteria of the TSDF-WAC? **Reference Source: CCP-PO-001, C-1**	X			
13. Were discrepancies between two operators with regard to identification of waste matrix code, liquids in excess of the TSDF-WAC, or compressed gases through replicate scans and independent observations reconciled? NA if no discrepancies. **Reference Source: CCP-PO-001, C3-2**			X	
14. Are the training qualifications for all radiography personnel acceptable? **Reference Source: CCP-PO-001, C3-8**	X			
15. Was evidence of the video/audio check included in the BDR? **Reference Source: CCP-PO-001, C1-1**	X			
16. Was the Lines-Pair Resolution Test or Sieve Test Check included in the BDR? **Reference Source: CCP Technical Procedures**	X			
17. Was a replicate scan performed once per day, or once per batch, whichever is LESS frequent? **Reference Source: CCP-PO-001, C1-1**	X			
18. Was an independent observation performed once per day, or once per batch, whichever is LESS frequent? **Reference Source: CCP-PO-001, C1-1**	X			

Attachment 2 – CCP SPM Radiography Project Level Validation Checklist and Summary (Continued)

BDR Number: OR-RTR7-0035 **Examination Date(s): 04/17/2014**

Description of Criteria Reviewed	Criteria Met? YES	NO	NA	Comments/Qualifiers
19. Were the replicate scan and independent observation performed on different waste containers? **Reference Source: CCP-PO-001, C1-1**	X			
20. Were the personnel performing the replicate scan and independent observation different from the individual who performed the original? **Reference Source: CCP-PO-001, C1-1**	X			
21. Does the BDR include an estimate of each material parameter weight in kg for each container? **Reference Source: CCP Technical Procedures**	X			
22. Does the BDR include a description of each material parameter for each container? **Reference Source: CCP Technical Procedures**	X			
23. Is the container gross weight recorded in kilograms (kg) for each container in the BDR? **Reference Source: CCP Technical Procedures**	X			
24. Was the Scale Weight Calibration Check included in the BDR? **Reference Source: CCP Technical Procedures**			X	Not used.
25. Was the Scale Weight Check included in the BDR? **Reference Source: CCP Technical Procedures**			X	Not used.

Comments: ~~None~~ BSS 8/7/15 Added NCR-ORNL-0053-15 as SPM1, SPM2, SPM3 BSS 8/7/15

The container QC checks were properly performed and meet the Quality Assurance Objectives (QAOs). Proper procedures were followed during data reduction and analysis. The batch is complete, acceptable, and includes all supporting data and documentation required by the QAPjP.

Daniel Wade	Daniel L Wade	04/24/2014
SPM Printed Name	Signature	Date

Checklist is to be re-signed only when a re-review is performed.

BSSchrock	BSSchrock	Added NCR-ORNL-0053-15	8/7/15
SPM Printed Name	Signature	Reason	Date
BSSchrock	BSSchrock	Inserted corrections into BDR	8/23/15
SPM Printed Name	Signature	Reason	Date

NCR ORNL-0053-15-2

Attachment 1 – CCP Nonconformance Report (NCR)

CCP NONCONFORMANCE REPORT (NCR)

(Use NCR Continuation, Attachment 3, if necessary)

NCR No. NCR-ORNL-0053-15 Revision 2

1. Lot No., Heat No., or Serial No. (if applicable): N/A	2. Process (e.g., NDA, NDE, VE, Other): NDE	3. Batch Data Report #(s): OR-RTR7-0117 OR-RTR7-0035
4. Order/Work Order/Job Control Number (if applicable): N/A	5. PO # (if applicable): N/A	Container #(s): X10C0402857E X10C0402984I
	6. Supplier (if applicable): N/A	

DESCRIPTION OF NONCONFORMANCE

7a. NCR Description: ☐ < 100 nCi/g ☒ Prohibited Item ☐ E-Flag ☐ Receipt Inspection ☐ Transportation ☐ WWIS/WDS ☐ Other

7b. Requirement(s) (Enter Implementing Procedure No., Revision, Section No., & Quoted Text):
CCP-TP-053, Rev. 15, "CCP Standard Real- Time Radiography (RTR) Inspection Procedure, Section 4.4.3 [A] states in part "Using Table 1, Prohibited Items, as a reference ...confirm there are NO prohibited items in the waste container." Table 1, Prohibited Items lists, in part, "PCB liquids", THEN ...initiate a nonconformance report

7c. Actual Condition:
Liquid inside of a PCB identified waste container.

Reason for Revision 1: Added steps to final disposition
Reason for Revision 2: Added container X10C0402984I

7d. Have the CCP HOLD TAGS associated with this NCR been applied? ☐ YES ☐ NO If no is checked, explain:

8. NCR Originator:
Beverly S. Schrock (printed name) BSSchrock (signature) 6/3/15 (date)

9. Does the identified condition have the potential to impact AK? If YES or INDETERMINATE, enter Trend Code L in Block 10. ☐ YES ☒ NO ☐ INDETERMINATE

10. Trend Code: K

11. Responsible Manager: **Beverly Schrock**

12. Significant Condition? ☐ YES ☒ NO (If Yes, enter WIPP Form No.):

13. Recurring Condition? ☐ YES ☒ NO (If Yes, list NCRs and WIPP Forms):

14. QA Engineer or QA Designee validation:
Laura R. Jones (printed name) Laura Lawson Jones (signature) 06/03/15 (date)

SPM-1
BSS 6/3/15

NCR ORNL-0053-15-2
Attachment 3 Page 23 of 25

Attachment 1 – CCP Nonconformance Report (NCR) (Continued)

NCR No. NCR-ORNL-0053-15 Revision 2

INTERIM DISPOSITION

15a. Interim Disposition (Check Only One):
☒ N/A (See Final Disposition) ☐ Hold ☐ Conditionally Accept ☐ Conditionally Use
☐ Sort ☐ Reinspect or Retest ☐ Remediate

15b. Instructions for Completion of the Interim Disposition:

INTERIM DISPOSITION APPROVALS

16a. Responsible Manager or Individual:

printed name _____ signature _____ date _____

16b. QA Engineer or QA Designee:

printed name _____ signature _____ date _____

Additional Approval:

printed name _____ signature _____ date _____

Additional Approval:

printed name _____ signature _____ date _____

COMPLETION OF INTERIM DISPOSITION

17. Interim Disposition Complete – Responsible Manager or Individual:

printed name _____ signature _____ date _____

18. Interim Disposition Verified – QA Engineer:

printed name _____ signature _____ date _____

SPM-2
BSS 3/7/15

Attachment 1 – CCP Nonconformance Report (NCR) (Continued)

NCR No. NCR-ORNL-0053-15 Revision 2

FINAL DISPOSITION

19. Final Disposition (Check Only One: Use-As-Is, Repair, Reject, Rework, or Scrap):
☐ Use-As-Is ☐ Repair

19a. Technical Justification – Required for Use-As-Is or Repair dispositions. [☒ N/A for Reject, Rework, or Scrap]

☒ Reject ☐ Rework ☐ Scrap

19b. Instructions for Completion – Required for Reject, Repair, Rework, or Scrap [☐ N/A for Use-As-Is]
Container is not certifiable for shipment to WIPP.

1. Return containers to Host Site for remediation.
2. Exclude containers on AKTSS
3. Remove Containers from WDS.
4. Remove containers from certification lot
5. Add this NCR to OR-RTR7-0117 as SPM attachment
6. Operator make corrections to BDR
7. ITR re-review BDR
8. SPM re-review BDR

19c. Corrective Actions (Actions to Prevent Recurrence – For Repair or Rework, if applicable.
[☒ N/A if not applicable, and for Use-As-Is, Reject, and Scrap]

FINAL DISPOSITION APPROVALS

20. Responsible Manager or Individual:

Beverly S. Schrock	BSSchrock	6/4/15
printed name	signature	date

21. QA Engineer or QA Designee:

Laura R. Jones	Laura Romero Jones	6/4/2015
printed name	signature	date

Additional Approval:

printed name	signature	date

Additional Approval:

printed name	signature	date

CLOSURE

22. Final Disposition Complete - Responsible Manager or Individual:

printed name	signature	date

23. Attachments: 1.- Email PCB Drum with liquid. 2.- Email Documenting Reportability

24a. HOLD TAG removal has been verified and reconciled for all nonconforming items on the NCR: ☐
24b. If HOLD TAG is not applicable, check: ☐ and explain:

25. Final Disposition Verified – NCR Closed QA Engineer:

printed name	signature	date

SPM-3
BSS 3/7/15

Jones, Laura - NWP

From: Harmon, Latravia <Latravia.Harmon@truproject.com>
Sent: Monday, June 08, 2015 6:13 AM
To: Jones, Laura - NWP
Cc: Ledford, Wayne - NWP; Waldram, Veronica - NWP; Harmon, Latravia
Subject: Revised NCR-ORNL-0053-15-2 (container inaccessible)

Laura,

This container is inaccessible at the current time. It was shipped to UCOR (drum storage) area on 1/6/2015. In the event the container becomes accessible, I will make notification that the hold tag was applied.

Thanks and Best Regards

LaTravia N. Harmon
Quality Assurance Engineer
Nuclear Waste Partnership LLC
Contractor to the United States Department of Energy
(865)576-1650 Office
(865)441-2706 Cell
latravia.harmon@truproject.com

From: Jones, Laura - NWP [laura.jones@wipp.ws]
Sent: Thursday, June 04, 2015 12:31 PM
To: Harmon, Latravia
Cc: Ledford, Wayne - NWP; Waldram, Veronica - NWP; Jones, Laura - NWP
Subject: FW: Revised NCR-ORNL-0053-15-2

Latravia,

Please apply hold tag for Container Number X10C0402984I, since this container was added to NCR. Thank you.

Thanks and Best Regards

Laura R. Jones
Quality Assurance NCR Coordinator
Nuclear Waste Partnership, LLC
Contractor for the U.S. Department of Energy
575-234-7244 (office)
Email: laura.jones@wipp.ws

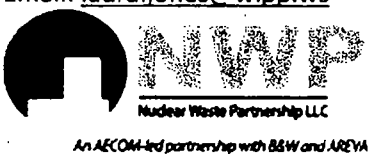
From: Jones, Laura - NWP
Sent: Thursday, June 04, 2015 10:28 AM

To: Harmon, Latravia; Harmon, LaTravia - NWP; Leos, Greta - TFE; Navarrete, Leon - TFE; Tilmon, Pat; Pearcy, Sheila - TFE; Ramirez, Mike - NWP; Reeves, Ron - NWP; Schrock, Beverly - NWP; Stallings, Andrew - ORNL; Wade, Daniel NWP
Cc: Ledford, Wayne - NWP; Waldram, Veronica - NWP; Jones, Laura - NWP
Subject: Revised NCR-ORNL-0053-15-2

All – For your information
Mike – Please review for notification purposes, a container was added to the NCR.
Greta – Please post this open revised NCR.

Thanks and Best Regards

Laura R. Jones
Quality Assurance NCR Coordinator
Nuclear Waste Partnership, LLC
Contractor for the U.S. Department of Energy
575-234-7244 (office)
Email: laura.jones@wipp.ws



Schrock, Beverly - NWP

From: Oney Fred <Fred.Oney@truproject.com>
Sent: Monday, August 10, 2015 5:57 AM
To: Schrock, Beverly - NWP
Subject: RE: Corrections needed

Bev,

The corrections have been made .

Thanks,

Fred

From: Schrock, Beverly - NWP [Beverly.Schrock@wipp.ws]
Sent: Friday, August 07, 2015 2:10 PM
To: Oney Fred
Cc: Stallings,Andrew; Pat Tilmon
Subject: Corrections needed

Fred,

Please see attached NCR-ORNL-0053-15-2.

Containers X10C0402857E in BDR OR-RTR7-0117 and X10C0402984I on BDR OR-RTR7-0035 both have liquid in a PCB identified container. Please have your operators correct their paperwork, re-ITR for me and have Patrick process as quick as you can so I can close this NCR.

If you have any questions, please let me know.

Thank you for your help,
Bev

Beverly S. Schrock
Site Project Manager
Central Characterization Program
Nuclear Waste Partnership, LLC
Contractor for the U.S. Department of Energy
(575) 234-7444
(575) 706-0809 Cell

NCR – ORNL-0053-15 Rev.2
Attachment 5 Page 1 of 1

Jones, Laura - NWP

From: Harmon, Latravia <Latravia.Harmon@truproject.com>
Sent: Thursday, August 20, 2015 5:29 AM
To: Jones, Laura - NWP
Cc: Harmon, Latravia
Subject: Hold tags pulled NCR-ORNL-0053-15-2

Laura

The hold tags for the containers below were removed. Please use this email as notification to proceed with closure of applicable NCRs. Container X10C0402857E was returned to the host site and repacked.

OR-RTR7-0117	X10C0402857E	Resolved	Instruction for final disposition have been completed, ITR and SPM reviewed BDR.	NCR-ORNL-0053-15-2
OR-RTR7-0035	X10C04029841	Resolved	Instruction for final disposition have been completed, ITR and SPM reviewed BDR.	NCR-ORNL-0053-15-2

thanks and Best Regards

LaTravia N. Harmon
Quality Assurance Engineer
Nuclear Waste Partnership LLC
Contractor to the United States Department of Energy
(865)576-1650 Office
(865)441-2706 Cell
latravia.harmon@truproject.com
Quality is the Pride of Workmanship.

From: Jones, Laura - NWP [laura.jones@wipp.ws]
Sent: Wednesday, August 19, 2015 5:08 PM
To: Harmon, Latravia
Subject: Hold tags to be pulled NCR-ORNL-0053-15-2

Hello Latravia,

Containers listed have been resolved at the project office please remove hold tags and notify to close NCR.

BDR ID	Container ID	Release Code	Reason	NCR
OR-RTR7-0117	X10C0402857E	Resolved	Instruction for final disposition have been completed, ITR and SPM reviewed BDR.	NCR-ORNL-0053-15-2
OR-RTR7-0035	X10C04029841	Resolved	Instruction for final disposition have been completed, ITR and SPM reviewed BDR.	NCR-ORNL-0053-15-2

Thanks and Best Regards

Laura R. Jones
Quality Assurance NCR Coordinator

NCR ORNL-0053-15 Rev. 2
Attachment 6 Page 1 of 1

DIVIDER PAGE

Attachment 1 – CCP Nonconformance Report (NCR)

CCP NONCONFORMANCE REPORT (NCR)

(Use NCR Continuation, Attachment 3, if necessary)

NCR No. NCR-ORNL-0789-14 **Revision 0**

1. Lot No., Heat No., or Serial No. (if applicable): N/A	2. Process (e.g., NDA, NDE, VE, Other): NDE	3. Batch Data Report #(s): OR-RTR7-0079
4. Order/Work Order/Job Control Number (if applicable): N/A	5. PO # (if applicable): N/A	Container #(s): X10C0402828F
	6. Supplier (if applicable): N/A	

DESCRIPTION OF NONCONFORMANCE

7a. NCR Description: ☐ < 100 nCi/g ☒ Prohibited Item ☐ E-Flag ☐ Receipt Inspection ☐ Transportation ☐ WWIS/WDS ☐ Other

7b. Requirement(s) (Enter Implementing Procedure No., Revision, Section No., & Quoted Text):
CCP-TP-053, Standard Real Time Radiography (RTR) Inspection Procedure, Rev. 14, Section 4.4.2 [H]states in part "Using Table 1, Prohibited Items, as a reference…confirm there are NO prohibited items in the waste container." Table 1, Prohibited Items lists, in part, "Compressed gases/Pressurized containers (e.g., aerosol cans)", **THEN** Initiate a nonconformance report (NCR) in accordance with CCP-QP-005, *CCP TRU Nonconforming Item Reporting and Control*.

7c. Actual Condition: Pressurized container at 6". (CO2 Cartridge)

7d. Have the CCP HOLD TAGS associated with this NCR been applied? ☒ YES ☐ NO If no is checked, explain:

8. NCR Originator:
Steve Redmond (printed name) _____ (signature) 8/6/14 (date)

9. Does the identified condition have the potential to impact AK? If YES or INDETERMINATE, enter Trend Code L in Block 10. ☐ YES ☒ NO ☐ INDETERMINATE

10. Trend Code: K	11. Responsible Manager: **Fred Oney**
12. Significant Condition? ☐ YES ☒ NO (If Yes, enter WIPP Form No.):	13. Recurring Condition? ☐ YES ☒ NO (If Yes, list NCRs and WIPP Forms):

14. QA Engineer or QA Designee validation:
Eric Lyles (printed name) _____ (signature) 8/7/14 (date)

CCP RECORDS ORIGINAL
DATE REC'D 4/24/15

Attachment 1 – CCP Nonconformance Report (NCR) (Continued)

NCR No. NCR-ORNL-0789-14 Revision 0

INTERIM DISPOSITION

15a. Interim Disposition (Check Only One):

☒ N/A (See Final Disposition) ☐ Hold ☐ Conditionally Accept ☐ Conditionally Use

☐ Sort ☐ Reinspect or Retest ☐ Remediate

15b. Instructions for Completion of the Interim Disposition:

INTERIM DISPOSITION APPROVALS

16a. Responsible Manager or Individual:

printed name signature date

16b. QA Engineer or QA Designee:

printed name signature date

Additional Approval:

printed name signature date

Additional Approval:

printed name signature date

COMPLETION OF INTERIM DISPOSITION

17. Interim Disposition Complete – Responsible Manager or Individual:

printed name signature date

18. Interim Disposition Verified – QA Engineer:

printed name signature date

Attachment 1 – CCP Nonconformance Report (NCR) (Continued)

NCR No. NCR-ORNL-0789-14 Revision 0

FINAL DISPOSITION

19. Final Disposition (Check Only One: Use-As-Is, Repair, Reject, Rework, or Scrap):
☐ Use-As-Is ☐ Repair

19a. Technical Justification – Required for Use-As-Is or Repair dispositions. [☒ N/A for Reject, Rework, or Scrap]

☒ Reject ☐ Rework ☐ Scrap

19b. Instructions for Completion – Required for Reject, Repair, Rework, or Scrap [☐ N/A for Use-As-Is]
Return to host site for prohibited item remediation.

19c. Corrective Actions (Actions to Prevent Recurrence – For Repair or Rework, if applicable.
[☒ N/A if not applicable, and for Use-As-Is, Reject, and Scrap]

FINAL DISPOSITION APPROVALS

20. Responsible Manager or Individual:

printed name	signature	date
FRED OAVEY		8-7-14

21. QA Engineer or QA Designee:

printed name	signature	date
Eric Cyles		8/7/14

Additional Approval:

printed name	signature	date

Additional Approval:

printed name	signature	date

CLOSURE

22. Final Disposition Complete - Responsible Manager or Individual:

printed name	signature	date
BSSchrock	BSSchrock	3-2-15

23. Attachments: 1- Evidence for NCR Closure
2- Hold tag removal notification.

24a. HOLD TAG removal has been verified and reconciled for all nonconforming items on the NCR: ☑

24b. If HOLD TAG is not applicable, check: ☐ and explain:

Refer to Attachment 2.

25. Final Disposition Verified – NCR Closed QA Engineer:

printed name	signature	date
Laura R. Jones	Laura Lauren Jones	4/24/15

Attachment 3 – CCP Nonconformance Report (NCR) Continuation Sheet

NCR No. NCR-ORNL-0789-14 Revision 0 Attachment # 1 Page 1 of 1
Continuation from Section Number: NA Container X10C0402828F was sent to Host Site and repackaged on 1/22/15.

Jones, Laura - NWP

From: Harmon, Latravia <Latravia.Harmon@truproject.com>
Sent: Thursday, April 23, 2015 1:30 PM
To: Jones, Laura - NWP
Cc: Waldram, Veronica - NWP; Ledford, Wayne - NWP
Subject: Hold tags removed

4/23/2015

Laura

Hold tags for the following containers were removed. Please use this email as notification to proceed with closure of the applicable NCRs.

NCR-ORNL-0784-14	X10C0402820F
NCR-ORNL-0788-14	X10C0402820A
NCR-ORNL-0789-14	X10C0402828F
NCR-ORNL-0917-14	X10C0402806H
NCR-ORNL-0919-14	X10C0402827G
NCR-ORNL-0231-14-1	X10CSATN03195A

thanks and Best Regards

LaTravia N. Harmon

Quality Assurance Engineer
Nuclear Waste Partnership LLC
Contractor to the United States Department of Energy
(865)576-1650 Office
(865)441-2706 Cell
latravia.harmon@truproject.com

NCR-ORNL-0789-14 Rev. 0
Attachment 2 Page 1 of 1

DIVIDER PAGE

Attachment 1 – CCP Nonconformance Report (NCR)

CCP NONCONFORMANCE REPORT (NCR)

(Use NCR Continuation, Attachment 3, if necessary)

NCR No. NCR-ORNL-0788-14 **Revision 0**

1. Lot No., Heat No., or Serial No. (if applicable): N/A	2. Process (e.g., NDA, NDE, VE, Other): NDE	3. Batch Data Report #(s): OR-RTR6-0563
4. Order/Work Order/Job Control Number (if applicable): N/A	5. PO # (if applicable): N/A	Container #(s): X10C0402820A
	6. Supplier (if applicable): N/A	

DESCRIPTION OF NONCONFORMANCE

7a. NCR Description: ☐ < 100 nCi/g ☒ Prohibited Item ☐ E-Flag ☐ Receipt Inspection ☐ Transportation ☐ WWIS/WDS ☐ Other

7b. Requirement(s) (Enter Implementing Procedure No., Revision, Section No., & Quoted Text):

CCP-TP-053, Standard Real Time Radiography (RTR) Inspection Procedure, Rev. 14, Section 4.4.2 [H]states in part "Using Table 1, Prohibited Items, as a reference…confirm there are NO prohibited items in the waste container." Table 1, Prohibited Items lists, in part, "Compressed gases/Pressurized containers (e.g., aerosol cans)" and "Ignitable" **THEN** initiate a nonconformance report (NCR) in accordance with CCP-QP-005, *CCP TRU Nonconforming Item Reporting and Control.*

7c. Actual Condition: Pressurized and Ignitable container at 3"

7d. Have the CCP HOLD TAGS associated with this NCR been applied? ☒ YES ☐ NO If no is checked, explain:

8. NCR Originator:

Daphne Brothers (printed name) — signature — 8/6/14 (date)

9. Does the identified condition have the potential to impact AK? If YES or INDETERMINATE, enter Trend Code L in Block 10. ☐ YES ☒ NO ☐ INDETERMINATE

10. Trend Code: **K**

11. Responsible Manager: **Fred Oney**

12. Significant Condition? ☐ YES ☒ NO (If Yes, enter WIPP Form No.):

13. Recurring Condition? ☐ YES ☒ NO (If Yes, list NCRs and WIPP Forms):

14. QA Engineer or QA Designee validation:

Eric Lyles (printed name) — signature — 8/7/14 (date)

CCP RECORDS ORIGINAL

DATE REC'D 4/24/15

Attachment 1 – CCP Nonconformance Report (NCR) (Continued)

NCR No. NCR-ORNL-0788-14 Revision 0

INTERIM DISPOSITION

15a. Interim Disposition (Check Only One):

☒ N/A (See Final Disposition) ☐ Hold ☐ Conditionally Accept ☐ Conditionally Use

☐ Sort ☐ Reinspect or Retest ☐ Remediate

15b. Instructions for Completion of the Interim Disposition:

INTERIM DISPOSITION APPROVALS

16a. Responsible Manager or Individual:

printed name _____ signature _____ date _____

16b. QA Engineer or QA Designee:

printed name _____ signature _____ date _____

Additional Approval:

printed name _____ signature _____ date _____

Additional Approval:

printed name _____ signature _____ date _____

COMPLETION OF INTERIM DISPOSITION

17. Interim Disposition Complete – Responsible Manager or Individual:

printed name _____ signature _____ date _____

18. Interim Disposition Verified – QA Engineer:

printed name _____ signature _____ date _____

Attachment 1 – CCP Nonconformance Report (NCR) (Continued)

NCR No. NCR-ORNL-0788-14 Revision 0

FINAL DISPOSITION

19. Final Disposition (Check Only One: Use-As-Is, Repair, Reject, Rework, or Scrap):
☐ Use-As-Is ☐ Repair
19a. Technical Justification – Required for Use-As-Is or Repair dispositions. [☒ N/A for Reject, Rework, or Scrap]

☒ Reject ☐ Rework ☐ Scrap
19b. Instructions for Completion – Required for Reject, Repair, Rework, or Scrap [☐ N/A for Use-As-Is]

Return to Host Site for prohibited item remediation

19c. Corrective Actions (Actions to Prevent Recurrence – For Repair or Rework, if applicable.
[☒ N/A if not applicable, and for Use-As-Is, Reject, and Scrap]

FINAL DISPOSITION APPROVALS

20. Responsible Manager or Individual:

printed name	signature	date
Fred Oney		8-7-14

21. QA Engineer or QA Designee:

printed name	signature	date
Eric Lyles		8/7/14

Additional Approval:

printed name	signature	date

Additional Approval:

printed name	signature	date

CLOSURE

22. Final Disposition Complete - Responsible Manager or Individual:

printed name	signature	date
BSSchrock	BSSchrock	3-2-15

23. Attachments: 1- Evidence for NCR closure.
2- Hold Tag removal notification.

24a. HOLD TAG removal has been verified and reconciled for all nonconforming items on the NCR: ☑
24b. If HOLD TAG is not applicable, check: ☐ and explain:

Refer to Attachment 2.

25. Final Disposition Verified – NCR Closed QA Engineer:

printed name	signature	date
Laura R Jones	Laura Raven Jones	4/24/2015

Attachment 3 – CCP Nonconformance Report (NCR) Continuation Sheet

NCR No. NCR-ORNL-0788-14	Revision 0	Attachment # 1	Page 1 of 1
Continuation from Section Number: NA Container X10C0402820A was sent to Host Site and repackaged on 12/23/14.			

Jones, Laura - NWP

From: Harmon, Latravia <Latravia.Harmon@truproject.com>
Sent: Thursday, April 23, 2015 1:30 PM
To: Jones, Laura - NWP
Cc: Waldram, Veronica - NWP; Ledford, Wayne - NWP
Subject: Hold tags removed

4/23/2015

Laura

Hold tags for the following containers were removed. Please use this email as notification to proceed with closure of the applicable NCRs.

NCR-ORNL-0784-14	X10C0402820F
NCR-ORNL-0788-14	X10C0402820A
NCR-ORNL-0789-14	X10C0402828F
NCR-ORNL-0917-14	X10C0402806H
NCR-ORNL-0919-14	X10C0402827G
NCR-ORNL-0231-14-1	X10CSATN03195A

thanks and Best Regards

LaTravia N. Harmon

Quality Assurance Engineer
Nuclear Waste Partnership LLC
Contractor to the United States Department of Energy
(865)576-1650 Office
(865)441-2706 Cell
latravia.harmon@truproject.com

NCR-ORNL – 0788-14 Rev. 0
Attachment 2 Page 1 of 1

Attachment 3 - Acceptable Knowledge Source Document Summary

Site(s): Oak Ridge National Laboratory	Source Document Tracking Number: C236
Waste Stream Number(s): ORNL Non-specific Library Files (Applicable only when site library is not in use)	
Acceptable Knowledge Documentation Type: ☑ TRU Waste Management Program Information ☑ Waste Stream-Specific Information ☑ Additional Information	Category: ☑ Correspondence ☐ Discrepancy Resolution ☐ Internal Procedure ☐ Miscellaneous ☐ Published Document or Internal Procedure ☐ Unpublished Documents
Title or Description of Source Document [a]: Acceptable Knowledge Assessment (AKA) for Waste Stream OR-NFS-CH-SOIL	
Source Document Reference Information (author(s), document and revision number, date, publisher): Jeff Harrison, C236, Rev. 0, 04/12/2016, CCP	

AK #	Source Doc. Page # [b]	AK Information Summary
PR5, PR6, PR7, PR8, WS1, WS2, WS3, WS8, WS9, WS10, WS11, S16	Throughout	To ensure that the AK documentation relating to the management of potentially reactive, corrosive, ignitable, and incompatible TRU waste materials is adequate, current, and accurately described in existing AK Summary Reports, a one-time AKA will be performed for each new waste stream and existing waste streams with unshipped containers. The primary focus of the AKA will be to review and verify the AK documentation associated with the historic and current use of absorbents, immobilization products, and neutralization agents used in the management of potentially corrosive, ignitable, or reactive liquids. In addition the AKA will assess the specific management of other potentially incompatible or reactive materials generated at each site (e.g., reactive metals, nitrate salts). The AKA is performed in accordance with CCP-TP-005 Section 4.13. As described in CCP-AK-ORNL-001, Revision 10, waste stream OR-NFS-CH-SOIL is CH-TRU contaminated soil generated during decontamination and decommissioning (D&D) activities at NFS. The soil originated primarily from beneath the Wet Cell in the Building 234 MOX fuel fabrication facility but also included some soil from removal of the Building 110 laboratory underground waste tank as well as the NFS Radioactive Burial Ground (RBG). The Building 110 laboratory underground waste tank was removed in 1991. The first phase of soil removal from beneath the Building 234 Wet Cell occurred in 1993. The second phase of soil removal from beneath Building 234 did not begin until 2011 and is projected to continue through FY2018. In addition, one box (which has been repackaged into several drums at the TWPC) was generated from excavation of Trench B in the NFS RBG in 2001. The unshipped TRU waste inventory in waste stream OR-NFS-CH-SOIL consists of 749 55-gallon drums: • 14 drums are from the first phase of decommissioning. Several of these drums were repackaged at the TWPC from August 2011 to June 2015 due to small amounts of liquid observed by RTR. • 6 daughter drums are from repackaging of three boxes at the TWPC in July and August 2008. • 729 drums are from the final phase of decommissioning. None of these drums have required repackaging. Historic Generator Waste Management Protocols: This section summarizes historic NFS generator waste management documents and procedures and historic ORNL waste management documents and

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Attachment 3 - Acceptable Knowledge Source Document Summary (continued)

Site(s): Oak Ridge National Laboratory		Source Document Tracking Number: C236
AK #	**Source Doc. Page #[b]**	**AK Information Summary**
		procedures applicable to waste stream OR-NFS-CH-SOIL. These documents and procedures are no longer active. • 28G-91-001, Nuclear Fuel Services, Inc. Waste Certification Plan for Transuranic Waste, Revision 0 - Reference P273 • DCM-03-05, Nuclear Fuel Services, Inc. Waste Certification Plan for Transuranic Waste - Reference P273 • DCM-03, Packaging for Shipment to Processing, Storage, or Burial - Reference P317 • DCM-17, Excavation of 110 Lab Tank - Reference P306 • DCM-61, Wet Cell Soil Excavation and Mixing - Reference P315 • WM-WMCO-202, ORNL Waste Acceptance Criteria for Transuranic Waste from the Nuclear Fuel Services - Reference P269 • WMRA-WMPC-106, ORNL Waste Acceptance Criteria for Contact Handled Transuranic and Mixed Oxide Wastes from Nuclear Fuel Services Inc. (October 1992) – Reference P268 • WM-SWO-501.18, Nuclear Fuel Services Waste Acceptance and Storage Procedure – Reference P267 Current Generator Waste Management Protocols: This section summarizes the active NFS generator waste management documents and procedures applicable to waste stream OR-NFS-CH-SOIL. The current revisions of the active procedures and documents are included in the Interface Waste Management Documents List (CCP-TP-005 Attachment 9). • NFS-DC-133, Operating Procedure for Soil Excavation, Treatment and Packaging for the 234 Excavation Facility – Reference P1400 • SOP 335-A, General Requirements for Waste Handling/Packaging – Reference P1432 • SOP 335-L, Waste Packaging for WIPP Disposal – Reference P1401 TWPC Waste Management Protocols: The waste management protocols described in the document pertain to the repackaging of this waste stream at the TWPC to remediate prohibited items and package the waste into compliant payload containers (e.g., boxes in drums). The current revisions of the active procedures and documents are included in the Interface Waste Management Documents List (CCP-TP-005 Attachment 9). • CM-R-AD-001, TRU Waste Processing Center Document Safety Analysis – Reference P432 • CH-X-AD-001, Contact Handled Waste Acceptance Criteria – Reference P255 • CH-A-OP-011, Contact Handled Waste Container Selection Process – Reference P1444 • CH-REF-WP-001, Contact Handled Waste Container Selection Process – Reference P1444

Attachment 3 - Acceptable Knowledge Source Document Summary (continued)

Site(s): Oak Ridge National Laboratory		Source Document Tracking Number: C236
AK #	**Source Doc. Page # [b]**	**AK Information Summary**

		• CH-P-OP-022, Non-Compliant Containers – Reference P599
		• CH-P-OP-045, Non-Compliant Containers – Reference P599
		• CH-REF-OP-045, Non-Compliant Containers – Reference P599
		• CH-P-OP-044, Operations Prohibited Item Processing – Reference P598
		• CH-REF-OP-044, Operations Prohibited Item Processing – Reference P598
		• CH-P-OP-013, Contact Handled Waste Repackaging – Reference P254
		• CH-REF-OP-013, Contact Handled Waste Repackaging – Reference P254
		• T-CH-FW-I-OP-001, Box Breakdown Area Material Handling Recipes – Reference P588
		• CH-P-OP-001, Box Breakdown Area Material Handling Recipes – Reference P588
		• CH-REF-OP-001, Box Breakdown Area Material Handling Recipes – Reference P588
		• CH-I-OP-013, Absorbing Liquids – Reference P1116
		• CH-REF-OP-014, Absorbing Liquids in the Glovebox and Box Breakdown Area – Reference P592
		• CM-A-WP-004, Energetic Materials Program Reference – Reference P1434
		• CM-P-WP-016, Energetic Materials Management – Reference P587
		• CM-P-RP-309, Environmental Permits – Inspections/Monitoring and Reporting – Reference P1446
		• CM-P-EN-013, Environmental Permits and Compliance – Reference P1433
		• CH-P-OP-011, Drum Bag In/Bag Out and Glove Ports – Reference P253
		• CH-REF-OP-011, Drum Bag In/Bag Out and Glove Ports – Reference P253
		• CH-P-OP-046, Glove Ports and Sleeve Transfers – Reference P589
		• CH-REF-OP-046, Glove Ports and Sleeve Transfers – Reference P589
		• CM-R-WP-006, Review of Potential Nitrate Bearing Liquids Treatment – Reference P1445
		• CH-UET-OP-003, Box Breakdown Area Operations – Reference P251
		• CH-UET-OP-004, Glove Box Operations – Reference P252
		Forms/Attachments Collected for Each Container
		• Forms/Attachments from NFS
		  • UCN-2822 Form
		  • UCN-2109 Form
		  • Attachment 6, Waste Certification Checklist For CH-TRU (from DCM-03)

Attachment 3 - Acceptable Knowledge Source Document Summary (continued)

Site(s): Oak Ridge National Laboratory		Source Document Tracking Number: C236
AK #	**Source Doc. Page #[b]**	**AK Information Summary**
		• Attachment 1, Radwaste Package Certification Record (from SOP 335-A) • Attachment 1, Waste Container Packaging Form (from SOP 335-L) • Forms/Attachments for CH Waste Repackaged at the TWPC • Attachment B, Contact Handled Waste Acceptability Review Checklist (from CH-REF-WP-001 and predecessors) • Attachment D, Contact Handled Waste Repackaging Data Form (from CH-REF-OP-013 and predecessors) • Attachment F, Uncharacterized Waste Guidance (from CH-REF-OP-013 and predecessors) • Attachment O, Miscellaneous Treatment Inspection Log Sheet (from CM-P-EN-013 and predecessors) • Attachment B, Field Evaluation of Potentially Energetic Materials (from CM-P-WP-016) • Attachment B, Operations Prohibited Item Processing (from CH-REF-OP-044 and predecessors) • Attachment E, Waste Nonconformance Report (from CH-P-AD-044 and predecessors) Absorbent/Immobilization Agents and Neutralization Agents: Neutralization Agents: Based on this review of AK documentation, neutralization agents were not used in historic NFS operations in regards to this waste stream and are not used for waste processing at the TWPC. Absorbent/Immobilization Agents (NFS): • Radsorb • Radpads • ENCAP 107 • Quik-Solid • Waste Lock 770 Absorbent/Immobilization Agents (TWPC): • Nochar N965 • Solid-a-Sorb • Quik-Solid

Attachment 3 - Acceptable Knowledge Source Document Summary (continued)

Site(s): Oak Ridge National Laboratory	Source Document Tracking Number: C236
Source Document Data Limitations (if any): 1. None.	
Acceptable Knowlege Expert: Travis Smith / [signature] Date: 04/19/2016 Print /Sign	
[a] Provide description for non-titled information (i.e., container paperwork, MSDS sheets, etc) [b] For microfilm or microfiche, identify box, tape, reel number and location.	

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Source Document C236

MEMORANDUM TO CCP CENTRAL RECORDS

TO: Beverly Schrock, CCP Site Project Manager (SPM)

FROM: Jeff Harrison, CCP Acceptable Knowledge Expert (AKE)

DATE: April 12, 2016, Revision 0

RE: Acceptable Knowledge Assessment (AKA) for Waste Stream OR-NFS-CH-SOIL

To ensure that the AK documentation relating to the management of potentially reactive, corrosive, ignitable, and incompatible TRU waste materials is adequate, current, and accurately described in existing AK Summary Reports, a one-time AKA will be performed for each new waste stream and existing waste streams with unshipped containers. The primary focus of the AKA will be to review and verify the AK documentation associated with the historic and current use of absorbents, immobilization products, and neutralization agents used in the management of potentially corrosive, ignitable, or reactive liquids. In addition the AKA will assess the specific management of other potentially incompatible or reactive materials generated at each site (e.g., reactive metals, nitrate salts). The AKA is performed in accordance with CCP-TP-005 Section 4.13.

WASTE STREAM SUMMARY

As described in CCP-AK-ORNL-001, Revision 10, waste stream OR-NFS-CH-SOIL is CH-TRU contaminated soil generated during decontamination and decommissioning (D&D) activities at NFS. The soil originated primarily from beneath the Wet Cell in the Building 234 MOX fuel fabrication facility but also included some soil from removal of the Building 110 laboratory underground waste tank as well as the NFS Radioactive Burial Ground (RBG). The Building 110 laboratory underground waste tank was removed in 1991. The first phase of soil removal from beneath the Building 234 Wet Cell occurred in 1993. The second phase of soil removal from beneath Building 234 did not begin until 2011 and is projected to continue through FY2018. In addition, one box (which has been repackaged into several drums at the TWPC) was generated from excavation of Trench 8 in the NFS RBG in 2001. The unshipped TRU waste inventory in waste stream OR-NFS-CH-SOIL consists of 749 55-gallon drums (see attached container list):

- 14 drums are from the first phase of decommissioning. Several of these drums were repackaged at the TWPC from August 2011 to June 2015 due to small amounts of liquid observed by RTR.
- 6 daughter drums are from repackaging of three boxes at the TWPC in July and August 2008.
- 729 drums are from the final phase of decommissioning. None of these drums have required repackaging.

HISTORIC GENERATOR WASTE MANAGEMENT PROTOCOLS

This section summarizes historic NFS generator waste management documents and procedures and historic ORNL waste management documents and procedures applicable to waste stream OR-NFS-CH-SOIL. These documents and procedures are no longer active.

28G-91-001, Nuclear Fuel Services, Inc. Waste Certification Plan for Transuranic Waste, Revision 0 – Reference P273

This document comprises Nuclear Fuel Services, Inc. certification plan which will be used to certify its TRU waste against the ORNL WAC for TRU waste from NFS. This plan addresses each waste acceptance

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criterion, describes the measurement techniques to accumulate data, describes methods to verify data and describes means to assess data uncertainty and confidence level.

Revision 0 (July 1991)

Compliance with Waste Acceptance Criteria:

- Immobilization – Every effort will be made to minimize particulate forms in the waste; however, the evaluation of particulate content will be made on a visual evaluation of the waste package during treatment by NFS. If particulates are present in excess of trace quantities, as determined by visual inspection, NFS shall immobilize those waste packages in accordance with NFS-DCM-03, Packaging for Shipment to Processing, Storage or Burial, Section 5.12, Handling of Waste Category 2 (see P317 below) , or when immobilization is impractical the waste packages shall include a sealed liner and shall be overpacked.
- Liquid Wastes – Every effort will be made to minimize free liquids in the waste; however, the evaluation of liquid content will be made on a visual evaluation of the waste package during treatment by NFS. If free liquids are encountered, NFS shall immobilize those liquids in accordance with NFS-DCM-03.
- Pyrophoric Materials – Based on the process flow evaluation presented in Appendix A, there is no potential for pyrophoric materials to be present in the waste stream; however, if found, they will be rendered safe by mixing with chemically stable materials or treated to remove their pyrophoric properties in accordance with NFS-DCM-03.
- Explosives and Compressed Gases – Based on the process flow evaluation presented in Appendix A, there is no potential for explosive material or compressed gases to be present in the waste stream. Waste found during decommissioning capable of detonation, or explosive decomposition or reaction at normal pressures and temperatures or of explosive reaction with water will be rendered safe in accordance with NFS-DCM-03. Compressed gas cylinders generated during decommissioning activities shall be rendered safe in accordance with NFS-DCM-03.
- Radioactive Mixed Waste – All wastes shall be identified, characterized and quantified in accordance with the Waste Characterization Sampling Plan, Appendix A, and packaged in accordance with NFS-DCM-03.

DCM-03-05, Nuclear Fuel Services, Inc. Waste Certification Plan for Transuranic Waste – Reference P273

DCM-03-05 supersedes 28G-91-001.

Revision 0 (February 1992)

Compliance with Waste Acceptance Criteria:

- Immobilization – Waste containing powders, ashes, and similar particulate materials shall be screened to remove particles below 200 microns in diameter. Particulates below 200 microns will be immobilized in accordance with DCM-03, Packaging for Shipment to Processing, Storage, or Burial (see P317 below).

No substantive changes were made in Revision 0 to the liquid, pyrophoric, explosive, compressed gas, or hazardous waste criteria in 28G-91-001.

Revision 1 (November 1992)

Compliance with Waste Acceptance Criteria:

- Immobilization – Added "and DCM-58, Segregation and Immobilization of Particulate Fines" to the end of the paragraph. [DCM-58 is not relevant to soil]
- Explosives and Compressed Gases – Added "which is verifiable via Real-Time-Radiographic examination at ORNL." to the end of the last sentence.

No substantive changes were made in Revision 1 to liquid, pyrophoric, or hazardous waste criteria.

DCM-03, Packaging for Shipment to Processing, Storage, or Burial – Reference P317

The purpose of this procedure is to establish guidance to properly classify and package NFS Plutonium Facilities Decommissioning waste. The materials shall be shipped either directly to commercial burial at Barnwell, SC, long-term storage at the Department of Energy Oak Ridge National Laboratory (DOE-ORNL) disposal site, or to Scientific Ecology Group (SEG) in Oak Ridge, Tennessee for further processing prior to disposal. Revision 0 and 1 could not be located.

Revision 2 (1/17/92)

General Comments Regarding Packaging of Contaminated Wastes

- Waste shall not contain free liquids. The containerization of free liquids is not permitted. Trace amounts of free liquids either remaining in well-drained bottles, cans, containers, or the result of condensation are not considered free liquids.
- Waste must not be readily capable of detonation or of explosive decomposition or reaction at normal pressures and temperatures, or of explosive reaction with water. Examples of compounds which might be reactive are hydrogen peroxide, nitric acid, sulfuric acid, sodium metal, thorium or uranium metal powder or turnings.
- Waste must not be pyrophoric. Pyrophoric materials contained in waste shall be treated, prepared, and packaged to be nonflammable. Pyrophoric materials are items that will spontaneously ignite, such as oily rags or powders.
- Waste must not contain hazardous waste.
- Empty propane gas cylinders must have the cores removed to ensure that the container is not pressurized. The cylinders must then be compacted in the shear/baler so as not to interfere with Real-Time Radiography interpretation.

Instructions For Packaging CH-TRU Waste For Shipment To DOE-OR

- CH-TRU waste that requires no further compaction will be packaged for shipment to DOE-OR. This waste must meet the DOE-OR WAC as certified by the Waste Certification Plan for Transuranic Waste.
- Attachment 9 shall be used as a checklist for documentation of final CH-TRU waste certification at NFS (see below for Attachment 9) [Attachment 9 is included in the container paperwork, source document M003]

Attachment 9, Waste Certification Checklist For CH-TRU

- Waste Containers
  - DOT Spec 17C or 17H
  - 90 mil polyethylene liner
- Particulate immobilized
- No free liquids

- No pyrophoric materials
- No explosives or compressed gases
- No 40 CFR 261/761 hazardous waste

Revision 3 (6/9/92)

General Comments Regarding Packaging of Contaminated Wastes

- Waste must not contain hazardous material, unless properly documented, labeled, and stored in permitted areas.

Revision 4 (11/12/92)

No substantive changes to TRU waste management or packaging were made in this revision.

Revision 5 (3/8/93)

No substantive changes to TRU waste management or packaging were made in this revision.

Revision 6 (7/15/93)

Instructions For Packaging CH-TRU Waste For Shipment To DOE-OR

- Approved absorbent material will be added to soils to prevent accumulation of free liquids. Approval absorbent pads will be added to the drums, between the bottom of the drum and the liner and at the bottom of the liner.
  - Revision 6 of this procedure was used for all drums of NFS soil shipped to ORNL.
- Attachment 9 number changed to Attachment 6

DCM-17, Excavation of 110 Lab Tank – Reference P306

The purpose of this procedure is to describe the steps to be used to excavate the lab tank and surrounding soil located behind Building 110.

Revision 0 (12/19/90)

- Where the concrete pad was located, dig straight down approximately twelve to eighteen inches until the top of the tank is reached. Remove all the soil over the tank and place it in 55-gallon drums.
- As close as possible to the side of the tank, bore a 6" diameter hole downward using a manual post hole digger until the structural integrity of the tank can be determined. Observe the structural integrity of the tank. The removed soil shall be placed in 55 gallon drums lined with two 55 gallon poly liners.
- If tank is intact: At a five and one-half foot radius from the center of the tank, dig around the tank to a depth of two feet at a 45° angle of repose. Then dig straight down around the tank at a three and one-half foot radius from the center of the tank until the bottom of the tank is reached (approximately 24"). Place the soil in 55 gallon drums lined with two 55 gallon poly liners.
- If tank is deteriorated: At a six foot radius from the center of the tank, dig to a depth of two feet at a 45° angle of repose, leaving a minimum of six inches of soil surrounding the tank intact. Then dig straight down at a four foot radius from the center of the tank, leaving the six inches of soil surrounding the tank intact, to approximately six inches below the bottom of the tank. Place removed soil in 55 gallon drums lined with two 55 gallon poly liners.

Revision 1 (February 1991)

No substantive changes to TRU waste management or packaging were made in this revision.

DCM-61, Wet Cell Soil Excavation and Mixing – Reference P315

The purpose of this procedure is to provide guidance to excavate, process and package radioactive contaminated soil from Building 234.

Revision 0 (June 1993)

Prerequisites

- Proper equipment and supplies include Radsorb powder and Radpads absorbent materials

Mixer Loading

- Mixing of soil will be done on a batch basis. Each batch will consist of soil and absorbent powder. Absorbent powder will be added at the rate of 10 pounds per packaged drum.
- When all the material for the batch has been loaded into the mixer, the mixing process is begun.

Container Loading

- Insert a RADPAD absorbent pad into the bottom of the drum.
- Insert a 90-mil polyethylene rigid liner into the drum

Revision 1 (8/2/93)

- Changed "Radsorb powder" to "Radsorb granular"
- Changed "10 pounds per packaged drum" to "approximately 10 pounds per packaged drum"
- Added "Record the container number, pounds of Radsorb, and container content weight"

WM-WMCO-202, ORNL Waste Acceptance Criteria for Transuranic Waste from the Nuclear Fuel Services – Reference P269

This document comprises the Waste Acceptance Criteria (WAC) and waste certification requirements to be employed by ORNL to establish the parameters against which NFS, Inc. must certify the waste packages intended for storage at ORNL. Specific waste certification requirements describing the acceptable methods for ensuring that the WAC are met are described in this document and considers the available technology for waste characterization, the capabilities of NFS, record keeping and tracking requirements, the certification methodology accepted by the WIPP, and other information as appropriate.

Revision 0 (March 1991)

Waste Acceptance Criteria include the following:

- Powders, ashes, fines, and similar particulate waste materials contained in the waste matrix of each package, in any quantity greater than trace amounts, shall be immobilized.
- Wastes shall not contain free liquids. The containerization of free liquids is not permitted. Trace amounts of liquid either remaining in well-drained bottles, cans, containers, or the result of condensation are not considered free liquid. Absorbed materials shall be squeezed from or, if practical, evaporated from the waste.

- Pyrophoric materials, other than radionuclides, shall be rendered safe by mixing with chemically stable materials or processed to remove their hazardous properties. No more than 1 percent by weight of the waste in each package may be pyrophoric forms of radionuclides, and these generally dispersed in the waste.
- Wastes shall contain no explosives or compressed gases as defined by 49 CFR 173, Subparts C & G.
- Wastes may contain co-contaminates of hazardous wastes as defined in 40 CFR 261, however, such co-contaminants shall be identified, characterized, and quantified. Hazardous substances, as described by 40 CFR 761, shall also be identified and quantified.

Certification requirements include the following:

- Since certain waste characteristics will be determined from process knowledge, the understanding of that process must be documented. Such documentation must include a process flow chart identifying the major steps of the process and describing the physical and chemical characteristics of the input material, process additions, and final product. Process information must also account for all chemicals or materials added during the process that could be included in the final waste.
- The operating procedures for all waste characterization and certification activities shall be documented and available for review by ORNL.
- Each waste package shall have a general description listed for the physical form of all waste components which comprise >1 percent of the waste matrix in a given package. This general description shall be in accordance with the requirements for this data on the TX-5352 Log-in Data Sheet.

Revision 1 (April 1992)

Waste Acceptance Criteria include the following:

- Powders, ashes, fines, and similar particulate waste materials shall be immobilized if more than 1 weight percent of the waste matrix in each package is in the form of particles below 10 microns in diameter, or if more than 15 weight percent is in the form of particles below 200 microns in diameter.

No substantive changes were made in Revision 1 to liquid, pyrophoric, explosive, compressed gas, or hazardous waste criteria. No substantive changes were made in Revision 1 to certification requirements.

WMRA-WMPC-106, ORNL Waste Acceptance Criteria for Contact Handled Transuranic and Mixed Oxide Wastes from Nuclear Fuel Services Inc. (October 1992) – Reference P268

WMRA-WMPC-106 superseded WM-WMCO-202. No substantive changes were made to the waste acceptance criteria or certification requirements from WM-WMCO-202.

WM-SWO-501.18, Nuclear Fuel Services Waste Acceptance and Storage Procedure – Reference P267

The purpose of this procedure is to provide the instructions for the ORNL Radioactive Solid Waste Operations (RSWO) group to accept, inspect, and store TRU radioactive solid waste generated offsite by Nuclear Fuel Services, Inc.

Revision 0 (March 1991)

- Review the Data Package to verify forms UCN-2822 and TX-5352, Data Log Sheet for Packaging TRU Waste, are provided.
- Review, the TRU log sheet, form TX-5352, to ensure it has been properly completed.

- Review form UCN-2822 to ensure it has been properly completed.

Revision 1 (July 1991)

No substantive changes to TRU waste management were made in this revision.

CURRENT GENERATOR WASTE MANAGEMENT PROTOCOLS

This section summarizes the active NFS generator waste management documents and procedures applicable to waste stream OR-NFS-CH-SOIL. The current revisions of the active procedures and documents are included in the Interface Waste Management Documents List (CCP-TP-005 Attachment 9).

NFS-DC-133, Operating Procedure for Soil Excavation, Treatment and Packaging for the 234 Excavation Facility – Reference P1400

This procedure provides the instructions to safely excavate, process, and package transuranic (TRU) waste in compliance with the Contact-Handled Transuranic Waste Packaging Instructions and low-level waste (LLW) in compliance with the Nevada Test Site (NTS) WAC. This procedure covers excavation of soil, absorbent addition, soil testing, soil transport, and final packaging of excavated soil from the 234 Excavation Facility.

Revision 0 (5/17/10)

Drum Preparation

- Obtain a clean transfer bag equipped with a filter and rigid 90-mil liner
- Place a clean transfer bag inside an empty 55-gallon drum.
- Place the rigid 90-mil liner inside the 55-gallon drum such that the clean transfer bag resides between the empty 55-gallon drum and the 90-mil liner.

Soil Excavation

- Use the excavator to excavate a soil batch of approximately 11 feet wide by 14 feet long by 1 foot deep. Add the amount of an approved absorbent specified by Area Process Engineer or Supervision to the excavator bucket. Use the excavator to deliver absorbent to the soil batch. Use the excavator to thoroughly mix the absorbent and soil batch.
- Perform paint filter testing. If paint filter test results indicate the treated soil batch fails the paint filter test, then add approximately 50 pounds of additional absorbent until paint filter test results indicate the treated soil batch passes paint filter testing.
- Stage empty stainless steel drums adjacent to the excavator. Fill the bottom of each of the drums with 4 to 8 inches of absorbent using the absorbent transfer bucket. Use the excavator to fill each of the drums with the treated soil batch.

Soil Packaging Method for Transuranic Waste

- Ensure the prepared 55-gallon drum is in place on the drum bagout station.
- Transport a stainless steel drum containing soil to one of four drum dumping stations.
- After dumping out the soil, remove the empty stainless steel drums from the drum dumpers and stage the empty drums back in the stainless steel drum staging area adjacent to the excavator.

Bag Out Operation

- Rotate the drum on the drum carousel to form a "horsetail."
- Place and tighten one zip-tie at each end of the "horsetail."
- Use tape to cover the "horsetail." Cut the center of the "horsetail." Tape over the exposed ends.

Attachment #4 – Use every time check list for packaging CH-TRU Soil and Gravel

- This form includes items such as:
  - Ensure that the outer bag consists of a WIPP approved filter bag.
  - Each bag, if closed, shall be closed by the twist-and-tape method (horse-tail) and equipped with a filter per DOE Memo, "Contact-Handled Transuranic Waste Packaging Instructions.
  - When waste is treated (i.e., absorbent added) for any reason prior to packaging, document the waste form, treatment method, absorbent used, solidification agent, and product name and manufacturer of all materials added.
  - Prior to packaging, determine that each batch of Soil and Gravel does not contain free liquid using EPA Publication SW-846 "Test Methods for Evaluating Solid Waste, Physical/Chemical Methods", Method 9095B (Paint Filter Liquids Test).
  - If liquid is determined to be present, add additional approved absorbent until the Soil and Gravel is determined not to contain free liquid using the Method 9095B Paint Filter Liquids Test.

[Attachment 4 is not included with the container paperwork. However, the form completed per SOP 335-L (see P1401 below) includes this same information.]

Revision 1 (9/3/10)

No substantive changes to TRU waste management or packaging were made in this revision.

Revision 2 (5/25/11)

Drum Preparation

- Place approximately one pound or one liter of absorbent in the empty 55-gallon drum (before placement of the liner).

Soil Excavation

- Add three 55-gallon drums filled to the top rib with absorbent to the excavator bucket.
- Stage empty stainless steel drums adjacent to the excavator. Use the excavator to fill each of the drums with soil ensuring 4 inches of void space is available for future absorbent addition.

Revision 3 (8/30/11)

Soil Excavation

- Use the excavator to fill each of the stainless steel drums with soil ensuring one of the following drum preparation methods are utilized:
  - Method 1: Fill the empty stainless steel drum with approximately seven (7) inches of an approved absorbent. Load treated soil batch on top of absorbent.
  - Method 2: Load the empty stainless steel drum with the treated soil batch leaving approximately four (4) inches of void space around the top of the drum. When Method 2 is used, four (4) inches of an approved absorbent must be added on top of the soil layer.

Attachment #4 – Use every time check list for packaging CH-TRU Soil and Gravel

- This checklist was deleted.

Revision 4 (12/14/11)

No substantive changes to TRU waste management or packaging were made in this revision.

Revision 5 (4/10/12)

- The soil excavation section was divided into two sections: "Soil Excavation" and "Soil Preparation for Packaging"

Revision 6 (6/15/12)

Soil Excavation

- The previous content of this section was deleted and replaced with "Soil excavation of the quadrants will be covered in an approved SWI."
  - This section does not include anything pertinent to AK, and therefore, the SWI is not needed.

Revision 7 (12/6/12)

No substantive changes to TRU waste management or packaging were made in this revision.

Revision 8 (5/6/13)

No substantive changes to TRU waste management or packaging were made in this revision.

Revision 9 (10/23/14)

Drum Preparation

- Specified that the 55-gallon drum is DOT 7A Type A
- Specified that the rigid 90-mil liner is poly material

Revision 10 (11/5/15)

No substantive changes to TRU waste management or packaging were made in this revision.

SOP 335-A, General Requirements for Waste Handling/Packaging – Reference P1432

The purpose of this procedure is to provide overall waste management criteria and guidelines for handling and packaging of obsolete, unwanted, used or discarded materials.

Revision 12 (4/9/10)

General Waste Management Requirements

- Each waste container's contents are certified by filling out applicable information and signing the Radwaste Package Certification Record (RPCR).
- Identify any nonconforming conditions. Identify the container with "Do Not Ship" and segregate the container.
- Describe the type and quantity of absorbent materials used. NFS approved absorbents are Waste Lock, Quik-Solid, and ENCAP.
- Heavy or sharp objects that could puncture or damage the container during normal transport must have special bracing or protection.

Hazardous Waste Classification and Packaging

- Waste Determination for hazardous constituents will be completed under the direction of the Environmental Safety Manager when the Request For Waste Determination form is submitted to the Environmental Safety Department.
- Radioactive waste that contains hazardous waste is defined as mixed waste. Package hazardous and,/or mixed wastes separately from other plant wastes. Containers in which hazardous waste is stored, transported, treated, or disposed of must meet the following requirements:
  - Use a container made of, or lined with a material compatible with the waste.
  - Do not store incompatible wastes in the same container, or place hazardous waste in an unwashed container that previously held incompatible material.
  - Clearly mark all containers with the words "Hazardous Waste," the hazardous waste code and the accumulation start date.
  - Ignitable and/or reactive wastes must be protected from sources of ignition or reaction.
- Empty gas cylinders must be at atmospheric pressure for disposal as non-hazardous waste. Aerosol cans are considered separate from gas cylinders. Aerosol cans are considered scrap metal and may be discarded when empty of liquids and pressure. They may not be punctured to release pressure. Contact Environmental Safety.
- Solid wastes that exhibit any of the characteristics of ignitability, reactivity, corrosiveness or toxicity are handled as hazardous wastes.
- Ignitability Characteristics (D001) – A solid waste exhibits the characteristics of ignitability if it has any of the following properties:
  - A liquid, other than aqueous solutions containing less than 24% alcohol by volume and has a flashpoint less than 60 degrees centigrade.
  - Not a liquid and is capable, under standard temperature and pressure, of causing fire through friction, absorption of moisture, or spontaneous chemical changes, and when ignited burns so vigorously and persistent that is creates a hazard.
  - An ignitable compressed gas.
  - An oxidizer.
  - Containers (i.e., cans, bottles, etc.) which have contained paint, solvents, oils, grease, degreasers, or other ignitable material must be empty and not contain any flammable solids before disposal.
- Reactivity Characteristics (D003) – A solid waste exhibits the characteristics of reactivity if it has any of the following properties:
  - It is normally unstable and readily undergoes violent change without detonating.
  - It is readily capable of detonation or explosive decomposition or reaction at standard temperature and pressure.
  - It reacts violently with water.
  - It forms potentially explosive mixtures with water.
  - When mixed with water it generates toxic gases, vapors, or fumes in a quantity sufficient to present a danger to human health or the environment.
  - It is cyanide or sulfide bearing waste which when exposed to pH conditions between2 and 12.5 can generate toxic gases, vapors or fumes in a quantity sufficient to present a danger to human health or the environment.
  - It is capable of detonation or explosive reaction if it is subjected to a strong initiating source or is heated under confinement.

- It is a forbidden explosive.

- Corrosivity Characteristics (D002) – A solid waste exhibits the characteristic of corrosivity if it has any of the following properties:
  - It is aqueous and has a pH less than or equal to 2 or greater than or equal to 12.5.
  - It is a liquid and corrodes steel at a rate greater than 6.35 mm (.250 inches) per year at a test temperature of 55 degrees C (130 degrees F).
- When handling any chemicals consult the MSDS for the chemical to insure proper handling and precautions.

Sorbent Use For Moisture Content Control

- NTS project specific approved absorbents are Waste Lock 770, Quik-Solid, and ENCAP. Rolled absorbents are approved for moisture control in NTS shipping containers.
- Waste Lock, Quik Solid, and ENCAP are also approved for use at NFS for waste disposal containers when approved in the profile.

Radwaste Package Certification Record

- This form includes items such as:
  - Area Generated
  - Material Type & Container Contents
  - Verification that waste is not capable of detonation, explosive decomposition, reaction, or explosive reaction with water
  - Verification that waste is not pyrophoric (spontaneously ignite)
  - Verification that waste does not contain, nor is capable of, generating quantities of toxic gases, vapors, or fumes
  - Specific absorbent added (Waste Lock 770, Quik-Solid, or ENCAP) and amount in pounds

[The Radwaste Package Certification Record is included in the container paperwork (Reference M003)]

Revision 13 (6/22/11)

No substantive changes to TRU waste management or packaging were made in this revision.

Revision 14 (6/3/13)

No substantive changes to TRU waste management or packaging were made in this revision.

Revision 15 (2/3/14)

No substantive changes to TRU waste management or packaging were made in this revision.

Revision 15.A (11/27/14)

No substantive changes to TRU waste management or packaging were made in this revision.

Revision 15.B (5/12/15)

No substantive changes to TRU waste management or packaging were made in this revision.

SOP 335-L, Waste Packaging for WIPP Disposal – Reference P1401

This SOP provides requirements for the packaging and/or repackaging of Radioactive Contact Handled Transuranic Waste destined for disposal at the Waste Isolation Pilot Plant (WIPP) in Carlsbad, New Mexico.

Revision 0 (August 2010)

The following items are prohibited in packaged CH-TRU Waste for disposal at WIPP:

- Internal shielding or deliberate waste placement to provide shielding for high radiation items. This prohibition includes waste packaged in any manner that would shield items that could be >200 mrem/hr to reduce the surface dose rate of a container to ≤200 mrem/hr.
- Machine Compacted Waste - Machine compacted waste is waste whose volume has been reduced by compaction using a mechanical compaction process.
- Free Liquids. Free Liquids shall not exceed 1 percent of the volume of the waste when the waste is in a disposal container; or 0.5 percent of the volume of the waste processed to a solidified form.
- Unvented containers larger than 4 liters.
- Non-Radioactive pyrophorics - Pyrophorics are materials that may ignite spontaneously in air or that emit sparks when scratched or struck, especially with materials such as steel. A flammable solid that, under transport conditions, might cause fires through friction or retained heat or that can be ignited readily and, when ignited, burns vigorously and persistently so as to create a serious transportation hazard. Included in the pyrophorics definition are spontaneously combustible materials, water reactive materials and oxidizers. Examples of non-radioactive pyrophorics are organic peroxides, sodium metal and chlorates.
- Radioactive pyrophorics greater than 1% by weight - Examples of radioactive pyrophorics are metallic Plutonium, Uranium or Americium.
- Non-Mixed Hazardous Waste- Hazardous waste not occurring as co-contaminants with TRU Waste.
- Waste exhibiting the Resource Conservation and Recovery Act (RCRA) characteristics of ignitability, corrosivity, or reactivity.
- Explosives.
- Compressed Gases.
- Waste that has ever been managed as high-level waste.
- Aerosol cans. If an aerosol can is encountered, segregate the container and a SWI will be written to address the packaging requirements.

Conditions and Limitations For All Packaged And Repackaged CH-TRU Waste

- Chemical compatibility shall be ensured for the waste repackaged into each individual 55-gallon drum. A guide for determining potentially incompatible waste can be found in 40 CFR Part 264 Appendix V.

General Requirements For Packaging And Repackaging CH-TRU Waste

- Approved absorbents are Waste Lock 770, Quick Solid, and Encap

Attachment 1, Waste Container Packaging Form

- This form includes items such as:
  - Rigid liner used (Yes/No)

- If rigid liner was used, list the type of rigid liner and affirm that the lid was not installed:
- Number layers of confinement
- Closure Method used for 55-gallon drum liner bag
- Closure Method used for inner bags
- All Bag Layers Vented (Yes/No)
- Waste Category Group (Homogeneous Solids/Soil and Gravel/Debris)
- Waste Stream Name
- Does this waste contain any treated liquids? If waste contains treated liquid, describe in the Comments section:
  - The waste that was treated
  - Treatment method used
  - The type of absorbent used,
  - Solidification agent used,
  - Product name and manufacturer of any material added to the waste
  - Results of a Method 9095B Paint Filter Liquids Test for each container tested.
- Was any other treatment performed prior to packaging? If yes, describe the treatment in the Comments section.

[Attachment 1 is included in the container paperwork, source document M003]

Revision 1 (October 2010)

No substantive changes to TRU waste management or packaging were made in this revision.

Revision 2 (October 2012)

No substantive changes to TRU waste management or packaging were made in this revision.

Revision 3 (May 2014)

No substantive changes to TRU waste management or packaging were made in this revision.

TWPC WASTE MANAGEMENT PROTOCOLS

The waste management protocols described below pertain to the repackaging of this waste stream at the TWPC to remediate prohibited items and package the waste into compliant payload containers (e.g., boxes in drums). The current revisions of the active procedures and documents are included in the Interface Waste Management Documents List (CCP-TP-005 Attachment 9).

CM-R-AD-001, TRU Waste Processing Center Document Safety Analysis – Reference P432

This Documented Safety Analysis (DSA) for the TWPC has been prepared to identify and assess the significant safety issues associated with the accomplishment of the TWPC's mission. The mission is to treat specific tank and solid debris wastes currently stored at various facilities on the Oak Ridge Reservation (ORR) to satisfy transportation and disposal criteria for the applicable DOE waste repositories.

Revision 16 (12/20/07)

Section 2.5.2.1, CH Solid Waste Processing Overview

- Liquids may be containerized within the waste package or may be un containerized, i.e., free liquids or absorbed liquids, within the waste package. Expected liquids consist of water and perhaps small quantities of combustibles and flammables. Containers of liquids are opened and free liquids and absorbed liquids, e.g., wetted mops and rags, are collected for treatment using an approved absorbent or solidifier, e.g., "Nochar." Amalgamating agents are used as needed for treatment of mercury. WIPP and NTS non-compliant items (e.g., aerosol cans and gas cylinders), are decontaminated and staged in a container for non-compliant items for off-site disposition at commercial processors.

Section 3.3.1.1, Hazard Identification

- Hazard identification reviewed potential project hazards within the hazard types identified below. The hazards reviewed were then compared with the facility subsystems, and then summarized within each subsystem for applicability, form, type, location, and anticipated quantity. The identified hazard types include thermal energy sources, hazardous material, kinetic energy sources, potential (pressure) energy sources, flammable material, and explosive/pyrophoric material. The Hazards Checklist provided in Appendix B of Chapter 18 presents hazards considered, screened, identified and applied to the processes at the TWPC. Specific hazards addressed include (but are not limited to):
  - pyrophorics
  - nitric acid and organics
  - uncontrolled chemical reactions
  - combustible materials
  - compressed gases
  - flammable liquids and mixtures
  - explosive chemicals

Section 3.3.2.2, Hazard Categorization

- Pyrophoric materials and water-reactive materials were typically prohibited when the drums of waste were being filled by the generators. However, there may be limited quantities of flammable liquids. Large quantities of liquids are not expected to be placed or found inside waste containers. However, small quantities of liquids are occasionally found. Organic liquid is the primary liquid of concern in thermal impact accident scenarios due to the fact that it is combustible and aqueous liquids are not combustible. Only incidental amounts of organic liquid are expected in the TRU waste inventory.

Section 3.4.1.3, Hazards and Accident Analysis Assumptions

- Over-pressurization – There is the potential for some containers to be over-pressurized and may eject material when the lid rings are loosened. This event applies only to drums with a frequency of anticipated.
- Deflagration – There is the potential for some containers to retain explosive/flammable gases. A drum may undergo lid loss and eject material if a deflagration occurs in the container. Although most of the drums the facility will be receiving are vented, a deflagration is considered to have an unmitigated frequency of anticipated. Container vents may be installed by the waste generator to release gases generated inside waste containers. In the case of unvented drums, container sampling, venting and purging processes conducted at the TWPC are considered intrusive actions. These processes have the potential for generating sparks, shock, or jarring, though they have been minimized through equipment design to the extent practical. Further, because of the unknown nature of the materials contained within the containers, exacerbated through external energy input, the possibility for an explosive condition exists. Even though precautions are taken, this work could create an explosion, deflagration, and/or a fire. If the vents function as designed, they will reduce the frequency of hydrogen gas or other volatile organic compound gas buildup that could lead to container deflagration.
- Repackaging Operations – The main hazards associated with sort and segregation activities are related to the radiological material and chemicals that could be found in the waste and the tools used for size reduction of large items. The waste may contain hazardous, flammable, or combustible materials and radioactive materials that may be exposed during sort and segregation activities. Confinement layers are deliberately breached to access and disposition prohibited items. Further, sharp tools and spark/heat producing equipment used for sort and segregation activities may breach confinement boundaries and worker PPE in the CHGB, or initiate fires and explosions. Additionally, sharp items in the waste itself may breach confinement barriers and worker PPE resulting in contaminated wounds in the CHGB.

Section 8.6.1, Hazardous Material Identification Program

- Hazardous materials identification and evaluation is assured through the Core Safety Management Functions as identified in the SMS Description, and the implementing procedures. The hazard controls are implemented on a graded approach and are based on the knowledge of the work to be performed and identification of the associated hazards. The Health and Safety Officer maintains a MSDS for chemicals and materials on the site. The hazards are further assessed through an Activity Hazard Analysis process and communicated to the site workers.

Section 9.3, Radioactive and Hazardous Waste Management Program and Organization

- Provides the organization, controls, and procedures for the safe management of radioactive and hazardous waste material. The program addresses several topics including treatment, segregation, and packaging of primary and secondary radioactive and hazardous waste materials, and characterization and certification of the waste forms to applicable WAC.

Revision 17 (10/24/08)

No substantive changes to TRU waste management were made in this revision.

Revision 18 (6/8/09)

No substantive changes to TRU waste management were made in this revision.

Revision 19 (3/23/10)

No substantive changes to TRU waste management were made in this revision.

Revision 20 (6/10/10)

No substantive changes to TRU waste management were made in this revision.

Revision 21 (11/30/10)

No substantive changes to TRU waste management were made in this revision.

Revision 22 (2/15/11)

No substantive changes to TRU waste management were made in this revision.

Revision 23 (5/5/11)

No substantive changes to TRU waste management were made in this revision.

Revision 24 (12/1/11)

Added the Cask Processing Enclosure (CPE) to the scope of this DSA.

Revision 25 (2/2/12)

The primary TRU waste management change in this revision is the addition of energetic materials requirements.

Section 2.5.2.1, CH Solid Waste Processing Overview

- Added new requirements for energetic materials:
  - The CH waste stream is assumed to not typically contain reactive or shock sensitive materials, including explosive material (with the exception of hydrogen), and pyrophoric material, or significant quantities of liquids, with the exception of some legacy waste drums and casks. However, a small population of legacy TRU waste drums has been determined to contain limited quantities of liquids, compressed gas cylinders, aerosol cans, and/or insignificant quantities of water reactive, explosive, and shock sensitive materials. For the purposes of this TWPC DSA, materials with reactive, shock sensitive, explosive, and pyrophoric characteristics are collectively referred to as energetic material.
  - In response to the discovery of potentially shock sensitive material (i.e., perchloric acid) during processing of CH waste in the Glovebox and Box Breakdown Area (BBA), an additional review of information available for the remaining CH waste stream was performed to consolidate additional information on energetic materials that could potentially be encountered during repackaging operations as reported in CM-R-WP-005, Identification of Potential Unanalyzed Materials (see Reference P1438). CM-R-WP-005 addresses the potentially shock sensitive materials discovered during processing. The report concluded that the potentially shock sensitive materials discovered in the Glovebox and BBA were of low concentration; or contained in essentially empty containers with no visible indications of shock sensitive crystalline structures. The report also concludes that knowledge of the legacy operating history and the discovery of potentially energetic material supports the waste descriptions originally developed in the Acceptable Knowledge reports in that the waste inventory does not contain items that would display significant energetic properties. Based on this information, it is determined that potentially energetic material discovered in the

waste stream would not present significant worker safety hazards in the context of the safety basis.

- This report does identify known potentially pyrophoric and water reactive materials remaining in the waste to be processed at the TWPC that may pose operational issues with respect to amenable processing configurations, logistics, and increased risk. These materials, including lithium hydride powders, lithium hydride batteries, uranium metal turnings, and plutonium metals, are known to be present in waste containers based on available records. Although, available information indicates these materials are in small quantities, these known materials are considered to be potentially highly energetic and not within the scope of this DSA to allow further planning.
- In general, energetic materials are not knowingly introduced or processed in the TWPC. However, legacy waste could contain these materials. Therefore, these materials are considered as potential initiators of fires, deflagrations, and toxic gas generation when handling or processing the waste.
- Potentially energetic material discovered in the CHGB, BBA, or CPE may be processed within the respective process enclosure(s) themselves or transferred to the Hot Cell for remediation at the discretion of an Energetic Material Subject Matter Expert.

Section 3.3.1.1, Hazard Identification

- No changes to TRU waste management were made to this section.

Section 3.3.2.1, Hazard Identification

- Added new requirements for energetic materials:
  - Based on Acceptable Knowledge (AK) reports, materials with energetic characteristics were used in the waste generator facilities. AK reports, summarized in CM-R-WP-005, Identification of Potential Unanalyzed Materials (see Reference P1438), detail all known chemicals that were utilized in the generator facilities and address their use and disposition practices.
  - The AK reports indicate that various chemicals were used in generator facilities that, in pure or concentrated form, may exhibit ignitability, corrosivity, and/or reactivity characteristics; but were not used in the facilities in their pure form. The AK reports conclude that debris waste materials are stable and will not undergo violent chemical change, that there is no indication that the waste contains explosive materials, and is not capable of detonation or explosive reaction. However, it is acknowledged that the potential exists for potentially energetic materials to be present in the waste streams. Small containers containing small quantities of liquid with labels indicating past use for perchloric acid have been found in waste being processed in the Glovebox and BBA. Further, most containers present in the waste are unmarked.
  - Based on waste processing experience, Process Knowledge related to waste generator practices, waste master profiles, AK reports, Waste Item Descriptions (i.e., 2109 forms), and the transferring contractor's package verification program, any potentially energetic materials discovered in the waste streams are expected to be in small quantities or otherwise in a form that does not present significant physical consequences to facility workers. Prior to processing the waste, the primary waste containers (e.g., drums and boxes) will have been moved numerous times. It is therefore further concluded that potentially energetic materials in the waste streams do not pose an extreme shock sensitivity hazard, an immediate hazard associated with chemical interactions, or an immediate danger of extreme heat release or explosion. Based on the types and quantities of energetic materials potentially present in the waste streams, any energetic event associated with these materials is expected to be a localized event that does not pose significant physical worker consequences in the context of the safety basis. However, energetic materials potentially present in the waste streams are considered potential initiators of fire, deflagration, and toxic gas generation events.

Section 3.3.2.2, Hazard Categorization

- No changes to TRU waste management were made to this section.

Section 3.4.1.3, Hazards and Accident Analysis Assumptions

- No changes made to the above discussions on over-pressurization, deflagration, or repackaging operations. The following additions were made to repackaging operations with regard to energetic materials:
  - Repackaging Operations – The CH waste stream is assumed to not typically contain reactive or shock sensitive materials, including explosive material (with the exception of hydrogen), and pyrophoric material, or significant quantities of liquids, with the exception of some legacy waste drums and casks. However, a small population of legacy TRU waste drums has been determined to contain only limited quantities of liquids, compressed gas cylinders, aerosol cans, and/or insignificant quantities of water reactive, shock sensitive, explosive, and shock sensitive materials. Hence, the possibility exists for potentially energetic materials to be present in the waste streams. Based on waste processing experience, Process Knowledge related to waste generators practices as detailed in Acceptable Knowledge reports, waste master profiles, Waste Item Descriptions (i.e., 2109 forms), and the transferring contractor's package verification program, any potentially energetic materials discovered in the waste streams are expected to be in small quantities or otherwise in a form that does not present significant physical consequences to facility workers.
  - Prior to processing the waste, the primary waste containers (e.g., drums and boxes) will have been moved numerous times. It is therefore further concluded that potentially energetic materials in the waste streams do not pose an extreme shock sensitivity hazard, an immediate chemical interaction hazard, or an immediate danger of extreme heat release or explosion hazard. Based on the types and quantities of energetic materials potentially present in the waste streams, any anticipated energetic event associated with these materials is expected to be a localized event that does not pose significant physical worker consequences in the context of the safety basis. However, the possibility for highly energetic material such as lithium hydride powders, lithium hydride batteries, uranium metal turnings, plutonium metals, or containers with significant potentially energetic crystalline formations present in the waste cannot be fully precluded. An event involving highly energetic material is assumed to result in significant physical hazards for the facility worker. The frequency of such an event is determined to be extremely unlikely with high consequences to the facility worker. Energetic materials potentially present in the waste streams are also considered to be potential initiators of fire, deflagration, and toxic gas generation events.
  - Waste Operators working the Glovebox, BBA, and CPE employ processes, procedures, and training during waste processing to identify non-compliant items and potentially energetic materials. Identification of these items and materials relies on information from waste generator records, container labels, container types (e.g., high integrity containers such as sealed glass ampules or welded metal capsules), and visual indicators (e.g., bulging containers, crystal formation). Unidentified liquids or substances are assumed to be potentially incompatible and are not mixed. Containers with unmarked powders are not opened until evaluated by an Energetic Material SME. The Energetic Material SME makes a determination based on available information as to whether the items or material can be handled; and whether the material or item can be processed while posing low risk to facility workers. If the Energetic Material SME determines the items or material cannot be handled or processed while maintaining low risk to facility workers (i.e., item or material is highly energetic), actions are taken to establish safe conditions and notify facility management. Safety Management Programs are utilized to ensure the risk to facility workers is adequately controlled.

Section 5.6.7.10, Identification, Handling, and Processing of Potentially Energetic Materials

- Based on waste processing experience, Process Knowledge related to waste generator practices, waste master profiles, Waste Item Descriptions (i.e., 2109 forms), and the transferring contractor's package verification program; any potentially energetic materials existing in the waste streams are expected to be in small quantities or otherwise in a form that will not result in significant energetic events and therefore do not present significant physical consequences to facility workers. However, the possibility for highly energetic materials such as lithium hydride powders, lithium hydride batteries, uranium metal turnings, plutonium metals, or containers with significant potentially energetic crystalline formations to be present in the waste cannot be fully precluded.
- An event involving highly energetic material is assumed to result in high physical consequences for the facility worker. Programmatic Administrative Controls implemented as part of the Hazardous Material Protection Program related to the identification, handling, and processing of potentially energetic material during waste packaging are credited to reduce the frequency and consequences of this event.
- The Hazardous Material Protection Program includes specific elements for the identification, handling, and processing of potentially energetic materials during repackaging operations in the Glovebox, BBA, and the CPE. The major elements of this program are as follows: 1) Availability of Energetic Material SMEs with knowledge of potentially energetic material in the waste stream processes at the TWPC, 2) Operating procedures and worker training address operator identification of potentially energetic materials, and actions for suspending related activities and notification of an Energetic Material SME, 3) Waste Programs procedures address Energetic Material SME identification of potentially energetic materials and methods for processing; and identification of potentially highly energetic materials and establishment of safe condition, and 4) Operating procedures and worker training address operator handling and processing of potentially energetic materials as prescribed by an Energetic Material SME.

Section 8.12, Identification, Handling, and Processing of Potentially Energetic materials

- Waste Operators working the CHGB, BBA, and CPE employ processes, procedures, and training during waste processing to identify non-compliant items and potentially energetic materials. Identification of these items and materials relies on information from waste generator records, container labels, container types (e.g., high integrity containers such as sealed glass ampules or welded metal capsules), and visual indicators (e.g., bulging containers, crystal formation).
  - Unidentified liquids or substances are assumed to be potentially incompatible and are not mixed.
  - Containers with unmarked powders are not opened until evaluation by an Energetic Material SME.
  - Personnel recognized as Energetic Material SMEs are engaged to assess the items or material. The Energetic Material SME makes a determination based on available information as to whether the items or material can be handled; and whether the material or item can be processed while posing low risk to facility workers. If the Energetic Material SME determines the items or material cannot be handled or processed while maintaining low risk to facility workers (i.e., item or material is highly energetic), actions are taken to establish safe conditions and to notify facility management.
  - Safety Management Programs are utilized to ensure the risk to facility workers is adequately controlled. For example, although potential energetic events associated with waste materials are assumed to not pose significant physical consequences to facility workers, potentially energetic materials may be transferred to the Hot Cell for remote processing as a conservative approach to preclude any personnel exposure to potential energetic events or as part of control of potential ignition sources.
- Energetic Material SMEs are individuals qualified to recognize and evaluate hazards associated with potentially energetic material in the waste streams processed at the TWPC. The Hazardous Material Protection Program establishes qualifications for the Energetic Material SME to ensure that the

individuals performing this function have demonstrated experience, knowledge, or field expertise as appropriate relative to assessing hazards related to chemicals, energetic materials, and remediation approaches.

- The Hazardous Material Protection Program includes specific elements for the identification, handling, and processing of potentially energetic materials during repackaging operations in the Glovebox, BBA, and the CPE. The major elements of this program are as follows:
  - Availability of Energetic Material SMEs with knowledge of potentially energetic material in the waste stream processes at the TWPC.
  - Operating procedures and worker training address operator identification of potentially energetic materials, and actions for suspending related activities and notification of an Energetic Material SME.
  - Waste Programs procedures address Energetic Material SME identification of potentially energetic materials and methods for processing; and identification of potentially highly energetic materials and establishment of safe condition.
  - Operating procedures and worker training address operator handling and processing of potentially energetic materials as prescribed by an Energetic Material SME.

Section 9.3, Radioactive and Hazardous Waste Management Program and Organization

- No changes to TRU waste management were made to this section.

Revision 26 (3/29/12)

Section 8.6.1, Hazardous Material Identification Program

- Hazardous materials identification and evaluation is assured through the Core Safety Management Functions as identified in the ISMS Description, including the Environmental Management Program, and related implementing procedures. The hazard controls are implemented on a graded approach and are based on the knowledge of the work to be performed and identification of the associated hazards. The Health and Safety Manager, through the Chemical Management System, reviews and approves proposed new chemicals; seeks suitable, safer chemical alternatives; develops criteria for the safe storage and use of chemicals; and develops work control documents to address the hazards associated with hazardous chemicals, prescribing appropriate controls, including any special training requirements. Regulatory Interface and Integration personnel also review and approve proposed new chemicals and look for less hazardous and greener chemicals, determine proper characterization and management requirements if chemicals become waste and track and report hazardous chemical used on site. The hazards are further assessed through an Activity Hazard Analysis process and communicated to the site workers.

Revision 27 (5/21/12)

No substantive changes to TRU waste management were made in this revision.

Revision 28 (5/29/13)

No substantive changes to TRU waste management were made in this revision.

Revision 29 (2/2/15)

- Section 2.5.2.1, CH Solid Waste Processing Overview, was changed to Section 2.5.1.1 with the same title. The TRU waste management information in this section did not change.

- Section 2.5.2.2, RH Solid Waste, was changed to Section 2.5.1.2, RH Solid Waste Processing Overview. The TRU waste management information in this section did not change.

Section 3.4.1.3, Hazards and Accident Analysis Assumptions

- Deflagration-to-Detonation Transition (DDT)
  - There is a potential for some containers involving powders in six 6M/2R 55-gallon drums, one birdcage inside a 55-gallon drum, and a cask containing filter housings to undergo DDT. A drum may undergo lid loss and eject material if DDT occurs in the container. The risk to facility worker would be higher than a deflagration given the higher energies involved in DDT. These containers cannot be moved at TWPC and is protected by a SAC. Further, because of the unknown nature of the materials contained within the containers, exacerbated through external energy input, the possibility for a DDT condition exists.

Revision 30 (3/31/15)

- Section 5.6.7.10, Identification, Handling, and Processing of Potentially Energetic Materials, was changed to Section 5.6.6.10 with the same title. The TRU waste management information in this section did not change.

Revision 31 (4/24/15)

No substantive changes to TRU waste management were made in this revision.

Revision 31, PCN 31-1 (5/4/15)

No substantive changes to TRU waste management were made in this revision.

Revision 32 (8/27/15)

2.5.1.2 RH Solid Waste Processing Overview

- Free, Absorbed, and Containerized Liquids
  - Free liquids that may be present in the RH casks are expected to be aqueous due to groundwater intrusion into the casks. Based on sample results from water removed from casks, radiological contaminants in the free liquids are orders of magnitude below Hazard Category 3 quantities. Liquids in containers or wetted material not as a result of contact with the aqueous groundwater is collected and treated using an approved adsorbent (e.g., NoChar)
- Prior to the receipt of RH waste, waste is verified to be compliant with the TWPC Waste Acceptance Criteria. A multi-discipline review is required prior to transfer from UCOR to the TWPC. After discussions and negotiations between UCOR and TWPC personnel, TWPC processing requirements are determined and communicated to UCOR. UCOR provides TWPC with draft load lists of containers for delivery. These containers are reviewed, selected, and approved for acceptance. Information reviewed includes (but is not limited to):
  - AK/PK Report. The AK/PK Report contains documentation for individual containers and descriptions of general waste streams including applicable WIPP characterization.
  - Generator documents, such as 2109 form, or other equivalent to verify hazardous waste codes [e.g., D001 (ignitable), D002 (corrosive), and D003 (reactive)], asbestos (e.g., friable, non-friable or unknown), presence of beryllium, sealed sources, and/or PCBs including form (articles, Bulk-Product, liquid or remediation)
  - Documented Safety Analysis (DSA) and Technical Safety Requirements (TSR)
  - RH Waste Acceptance Criteria (WAC)

- TWPC Resource Conservation and Recovery Act (RCRA) Permit

- CCP is the TRU waste certification authority for all TRU waste being shipped to WIPP. The TWPC and CCP collaborate to ensure processing and certification in a manner that enables disposal of CH- and RH-TRU waste.

CH-X-AD-001, Contact Handled Waste Acceptance Criteria – Reference P255

This document establishes the TWPC Waste Acceptance Criteria (WAC) for the acceptance of CH waste from ORNL at the TWPC for characterization and processing. This document is not used to determine acceptability of waste or waste packages for shipment to the Waste Isolation Pilot Plant or Nevada Test Site. Implementing this WAC at the TWPC ensures the safe and compliant staging and treatment of contracted waste materials in accordance with the applicable permits and authorizations and protects the environment and personnel from chemical and radiological hazards in accordance with applicable federal, state, and local laws and regulations.

Revision 11 (5/12/08)

General Acceptance

- Waste containers are authorized onto the TWPC for the purposes of verifying Acceptable Knowledge (AK)/Process Knowledge (PK), characterization, treatment, packaging, or repackaging. Accordingly, certain conditions or characteristics of the waste may not be known prior to receipt of wastes at the TWPC. Initial waste receipt and/or the conduct of other preliminary characterizations shall not be construed as unqualified acceptance of the waste or portions thereof. The TWPC reserves the right, in accordance with its contract, Memoranda of Understanding, permits, and approved DSA, to segregate and/or return to the DOE wastes determined at any point in the process to exhibit non-compliant characteristics.

Waste Acceptance Criteria

- Wastes shall be classified as either soils or debris.
- Incoming waste containers shall be identifiable as part of a waste stream for which adequate AK/PK has been accumulated, reviewed, and summarized.
- If the container is not on an approved AK/PK list, the containers may be approved on a case by case basis by the Acceptable Knowledge Expert/Process Knowledge Expert using generator documents, such as 2109 forms or other equivalent documents.
- All RCRA Hazardous Codes are allowed at the TWPC.
- Additionally, incoming waste containers shall not be known to contain:
  - regulated concentrations of polychlorinated biphenyl (PCB) or other Toxic Substances Control Act of 1976 regulated materials (e.g., ≥ 50 ppm PCBs and asbestos) – EXCEPTION: PCB bulk products and remediation wastes, e.g., ballasts, wiring, paint chips, are allowable
  - dangerous constituents such as explosives, pyrophorics, pressurized gases, etiologic agents, biological waste, or beryllium except for encased beryllium sources

Non-Compliant Waste

- Waste containers or waste articles discovered to be non-compliant with this WAC shall be segregated from the waste stream as appropriate to maintain worker and public safety. The non-compliant condition shall be reported to DOE and Tennessee Department of Environment and Conservation, as

appropriate. Disposition of non-compliant wastes shall be completed as promptly and safely as the DSA and permits require and may include return transfer to DOE.

Revision 12 (12/8/08)

Revised to remove the prohibition of allowing processing containers at TWPC with pressurized gases.

Revision 13 (5/8/09)

No substantive changes to TRU waste management were made in this revision.

Revision 14 (10/15/09)

Revised to remove the prohibition of allowing processing containers at TWPC with regulated asbestos.

Revision 15 (6/29/10)

No substantive changes to TRU waste management were made in this revision.

Revision 16 (10/14/10)

Revise to allow for acceptance of homogenous solids.

Revision 17 (4/27/11)

No substantive changes to TRU waste management were made in this revision.

Revision 18 (8/9/11)

- Revised to remove the prohibition of allowing processing containers at TWPC with PCBs and asbestos.
- Added beryllium exception for acceptance of sealed sources containing beryllium.

Revision 19 (10/20/11)

No substantive changes to TRU waste management were made in this revision.

Revision 20 (12/22/11)

No substantive changes to TRU waste management were made in this revision.

Revision 21 (8/2/12)

No substantive changes to TRU waste management were made in this revision.

Revision 22 (11/8/12)

No substantive changes to TRU waste management were made in this revision.

Revision 23 (4/22/13)

No substantive changes to TRU waste management were made in this revision.

Revision 24 (7/22/13)

No substantive changes to TRU waste management were made in this revision.

Revision 25 (8/29/13)

No substantive changes to TRU waste management were made in this revision.

Revision 26 (6/15/15)

No substantive changes to TRU waste management were made in this revision.

CH-A-OP-011, Contact Handled Waste Container Selection Process – Reference P1444

This plan identifies the responsibilities and establishes the planning process for identifying, reviewing, requesting, and approving Contact Handled (CH) Waste containers for receipt and processing at the Transuranic (TRU) Waste Processing Center (TWPC). This planning process includes reviewing available information regarding CH Waste containers against established requirements and limitations for receipt and processing of CH Waste at the TWPC. The verification of conformance of CH waste containers to the TWPC CH WAC is accomplished in multiple steps. CH-A-OP-011 was superseded by CH-REF-WP-001.

Revision 10 (5/12/08)

Information from the individual containers concerning identified and potential hazards is used to develop a task specific activity hazard analysis to ensure that personnel are trained to and understand real and potential hazards. Additional actions to reduce risks may be identified and implemented as necessary.

Container Selection

- Verify containers are part of the waste stream described in the approved AK/PK container list.
- If the container is not on an approved AK/PK list, the container may be approved on a case by case basis using generator documents, such as 2109 form or other equivalent documents.
- Ensure no regulated quantities of PCBs per TSCA indicated (e.g. <50 ppm PCBs) – EXCEPTION: PCB bulk products and remediation wastes, e.g., ballasts are allowable.
- Ensure container is not known to contain dangerous constituents such as explosives, pyrophorics, pressurized gases, etiologic agents, biological waste, or beryllium.

Attachment B, Contact Handled Waste Acceptability Review Checklist. This attachment includes the above criteria.

Acceptance of Contact Handled Waste Containers at TWPC

- Ensure the completed CH Waste Acceptability Review Checklist with appropriate AK information is attached into the applicable Incoming Container Traveler file

Revision 11 (10/2/08)

No substantive changes to TRU waste management were made in this revision.

Revision 12 (12/8/08)

- Removed the prohibition allowing containers at the TWPC with pressurized gases.
- Review available generator and/or historical information for indications on the presence of liquids or pressurized gases/aerosol cans and indicate the findings appropriately on Attachment B, Contact Handled Waste Acceptability Review Checklist.

Revision 13 (2/2/09)

- Added "Verify that additional hazardous waste codes [D001 (ignitable), D002 (corrosive), and D003 (reactive)] have been assigned, as appropriate, if liquids, aerosol cans, and potentially pressurized containers (compressed gas cylinders) are identified in the AK documentation for an individual container."
- Verify that all applicable RCRA waste codes are assigned based on available information.

Revision 14 (5/8/09)

No substantive changes to TRU waste management were made in this revision.

Revision 15 (11/2/09)

Revised to remove prohibition allowing containers at the TWPC with regulated asbestos.

Revision 16 (6/29/10)

No substantive changes to TRU waste management were made in this revision.

Revision 17 (8/9/11)

- Review available generator and/or historical information for indications on the presence of asbestos and document the findings appropriately on Attachment B, Contact Handled Waste Acceptability Review Checklist. If asbestos is present, indicate "Friable," "Non-friable," or "Unknown" on Attachment B, Contact Handled Waste Acceptability Review Checklist.
- Review available generator and/or historical information for indications on the presence of beryllium and document the findings appropriately on Attachment B, Contact Handled Waste Acceptability Review Checklist. If beryllium is present, document "Acceptable (sealed sources)" or "Unacceptable and rejected" on Attachment B, Contact Handled Waste Acceptability Review Checklist.
- Review available generator and/or historical information for indications on the presence of Polychlorinated Biphenyls (PCBs) and document the findings appropriately on Attachment B, Contact Handled Waste Acceptability Review Checklist. If PCBs are present, indicate class as "Bulk," "Liquid," "Article," "Article Container", or "Solid" on Attachment B, Contact Handled Waste Acceptability Review Checklist.

CH-REF-WP-001, Contact Handled Waste Container Selection Process – Reference P1444

CH-REF-WP-001 supersedes CH-A-OP-011.

Revision 0 (8/2/12)

If beryllium is present and not a sealed beryllium source, request HS to review available information and waste processing description to determine applicability of 10 CFR 850 requirements in accordance with CM-A-IH-002, Beryllium Awareness and Chronic Beryllium Disease Prevention. If HS approves container for acceptance, then mark Attachment B, Contact Handled Waste Acceptability Review Checklist, as "Acceptable: HS approved" and attach approval documentation to the Attachment B, Contact Handled Waste Acceptability Review Checklist.

Revision 1 (11/12/12)

No substantive changes to TRU waste management were made in this revision.

Revision 2 (7/23/13)

No substantive changes to TRU waste management were made in this revision.

Revision 3 (7/14/14)

Revised classes of PCBs to "Article," "Bulk Product," "Liquid," or "Remediation"

Revision 3 PCN 3-1 (8/13/14)

Ensure container internal packaging configuration is acceptable per the CH WAC.

Revision 4 (6/22/15)

No substantive changes to TRU waste management were made in this revision.

CH-P-OP-022, Non-Compliant Containers – Reference P599

This procedure provides instructions for the identification, handling, remediation, and, if required, return of non-compliant solid waste containers and Prohibited Items (PI) to the U.S. Department of Energy (DOE) Oak Ridge National Laboratory. This procedure also provides instructions for handling waste found to not conform to waste stream descriptions in current Acceptable Knowledge (AK) /Process Knowledge (PK) documentation, and instruction for remediation tasks that are repetitive and have established, predetermined directions for Prohibited Item Processing (PIP).

Containers that do not meet acceptance requirements specified in CH-X-AD-001, Contact Handled Waste Acceptance Criteria, for the TWPC, are considered non-compliant and are not processed at the TWPC. Non-compliant containers or materials are segregated and dispositioned for safe handling with regard to the TWPC safety basis for a return transfer to DOE. A Waste Nonconformance Report (WNCR) is initiated to disposition the waste with regard to the WIPP Waste Analysis Plan.

Items or materials which are found to not conform to the waste stream description are considered to be non-compliant waste. These items or materials are segregated as AK discrepancies at the TWPC until the AK/PK discrepancy is resolved.

Revision 6 (3/20/08)

Items or materials that have established predetermined direction for remediation in accordance with attached Table 1 may be remediated accordingly and documented in accordance with Attachment C, Prohibited Item Processing (PIP) Report.

Non-Compliant Containers Found Prior to Acceptance

- IF non-compliant conditions are identified prior to acceptance of the waste, stop work in the immediate area.
- Evaluate the nature of the non-compliance, as well as overall processing conditions to determine if the container may be safely segregated to allow continued unloading of compliant containers.
- If a non-compliant container is still on or in the transfer conveyance and is deemed NOT safe for handling by the WOL; initiate a WNCR in accordance with CH-P-AD-044, Waste Corrective Action and Nonconformance's.

Non-Compliant Containers Found After Acceptance

- Evaluate the nature of the identified unsafe condition, as well as overall processing conditions to determine if the container may be safely removed from the process area.
- IF non-compliant conditions such as those listed below exist or are developing, stop work in the immediate area and notify the WOL:
  - container is externally contaminated
  - container is leaking internal contents
  - container appears pressurized (e.g., bulging)
  - nondestructive examination reveals non-compliant item or material in the waste container (discovery)
- If a non-compliant container is deemed NOT safe for handling by the WOL, segregate the non-compliant container by moving other compliant containers away from the NC container to establish a safety separation distance (nominally a minimum 3 ft.), and initiate a WNCR in accordance with CH-P-AD-044, Waste Corrective Action and Nonconformance's.

Non-Compliant Waste Found During Processing in the Glove Box (GB) or Box Breakdown Area (BBA)

- If non-compliant items or material is discovered or suspected, stop work in the immediate area and notify the WOL.
- If the waste is deemed NOT safe for handling by the WOL; stop work in the immediate area, or as directed by the WOL.
- If the waste is deemed safe for handling by the WOL; segregate the non-compliant waste away from compliant waste as directed by the WOL and initiate a WNCR in accordance with CH-P-AD-044, Waste Corrective Action and Nonconformance's.

Prohibited Items

- WIPP Prohibited Items are listed in Attachment B, WIPP Prohibited Items, of CH-P-OP-013, Contact Handled Waste Repackaging (see Reference P254).
- Evaluate the PI, as well as overall processing conditions, to determine if the waste container may be safely handled. Remediate in accordance with Table 1, if applicable.
- Initiate an Attachment B, Prohibited Item Processing Report, and remediate in accordance with Table 1 or generate a WNCR in accordance with CH-P-AD-044, Waste Corrective Action and Nonconformance's for items which do not have a pre-determined remediation direction.
- Table 1A, Liquids
  - Absorb liquids in accordance with CH-I-OP-013, Absorbing Liquids.
  - Repackage in accordance with CH-P-OP-013, Contact Handled Waste Repackaging.
  - Complete Attachment O, RCRA Treatment Log Sheet, of CM-P-RP-309, Environmental Permits (incidental liquids are also absorbed but do not require an Attachment O).
- Table 1C, Residual Mercury
  - Absorb the droplets using compounds from a mercury spill kit in accordance with the applicable vendor instruction for mercury spill kit.
  - Return the material to the appropriate waste container.

- Record the approximate volume of mercury absorbed in the applicable waste container documentation (i.e., droplets of mercury absorbed).

Revision 7 (9/8/08)

Added hot cell to scope of this procedure.

Revision 8 (4/8/09)

Table 1A, Liquids

- Added a statement to make clear notes on the Attachment D, Contact Handled Waste Repacking Data Form (from CH-P-OP-013, Contact Handled Waste Repackaging).

Revision 9 (5/4/10)

No substantive changes to TRU waste management were made in this revision.

CH-P-OP-045, Non-Compliant Containers – Reference P599

CH-P-OP-045 and CH-P-OP-044 (see Reference P598) supersede CH-P-OP-022.

Revision 0 (5/24/10)

The prohibited items section, prohibited item tables, and Attachment B: Prohibited Item Processing Report, were removed from CH-P-OP-022 and included in new procedure CH-P-OP-044 (see Reference P598).

CH-REF-OP-045, Non-Compliant Containers – Reference P599

CH-REF-OP-045 supersedes CH-P-OP-045.

Revision 0 (9/10/13)

Added Cask Processing Enclosure to scope of the procedure.

Revision 1 (6/23/15)

No substantive changes to TRU waste management were made in this revision.

CH-P-OP-044, Operations Prohibited Item Processing – Reference P598

This procedure provides instructions for the identification, handling, remediation, and disposition of Prohibited Items (PIs). PIs may also be returned to the U.S. Department of Energy (DOE) Oak Ridge National Laboratory or shipped offsite for alternative treatment. This procedure also provides instruction for remediation tasks that are repetitive and have established predetermined directions for Operations Prohibited Item Processing (OPIP).

Resource Conservation and Recovery Act (RCRA) wastes and Toxic Substances Control Act (TSCA) wastes which meet specific TRU Waste Processing Center (TWPC) waste profile requirements and Nevada National Security Site (NNSS) Waste Acceptance Criteria are packaged for disposal at NNSS. Specific RCRA and TSCA wastes which are not packaged for disposal at NNSS may be acceptable at the Waste Isolation Pilot Plant (WIPP). These items are identified and segregated during processing to ensure proper handling and disposal in accordance with TWPC procedures.

Items or materials that do not meet acceptance requirements specified in DOE/WIPP-02-3122, Transuranic Waste Acceptance Criteria for the Waste Isolation Pilot Plant, are considered PIs. These items or materials are identified and segregated for evaluation, on-site remediation, off-site treatment, or possible return transfer to DOE.

CH-P-OP-044 supersedes CH-P-OP-022, and CH-P-OP-044 was superseded by CH-REF-OP-044.

Revision 0 (5/24/10)

Items or materials that have established predetermined direction for remediation in accordance with attached Table 1, Prohibited Item Remediation Directions, may be remediated accordingly and documented in accordance with Attachment B, Operations Prohibited Item Processing (OPIP). All other materials refer to CH-REF-OP-045, Non-Compliant Containers (see Reference P599).

PIs may be found in waste containers received at the TWPC. WIPP PIs are remediated prior to packaging for disposal at WIPP. WIPP PIs are listed in Attachment B, WIPP Prohibited Items, of CH-P-OP-013, Contact Handled Waste Repackaging (see Reference P254).

Table 1, Prohibited Item Remediation Directions:

- Liquids
  - Absorb liquids in accordance with CH-I-OP-013, Absorbing Liquids in the Glove Box and Box Breakdown Area.
  - Make clear notes on the Attachment D, Contact Handled Waste Repacking Data Form
  - Complete Attachment O, Miscellaneous Treatment Inspection Items, of CM-P-RP-309, Environmental Permits – Inspections/Monitoring and Reporting.
- Residual or incidental Mercury
  - Absorb the droplets using compounds from a mercury spill kit in accordance with the applicable vendor instruction for mercury spill kit.
  - Return the material to the appropriate waste container.
  - Record the approximate volume of mercury absorbed in the applicable waste container documentation (i.e., droplets of mercury absorbed).
- Potentially Pressurized Containers (PPC)
  - If pressurized, label the PPC with assigned number, have the RCT perform SCO survey, and bag out item
  - Have EPP personnel fill out Attachment T, Aerosol Can Management of CM-P-RP-309, Environmental Permits Inspections-Monitoring
  - Place in approved designated labeled container

Revision 1 (5/27/10)

No substantive changes to TRU waste management were made in this revision.

Revision 2 (6/9/11)

- Liquids
  - Created categories for residual and non-residual liquids.
  - Both categories are absorbed; however, non-residual liquids require an Attachment O from CM-P-RP-309, and residual liquids do not require an Attachment O.

- Containerized PCB Liquids
  - AKE, RII, or WCO/AWCO evaluates the Containerized PCB Liquid wastes (known and suspect) and documents the PCB item description, characterization, extent of contamination, and regulatory requirements on Attachment B, Operations Prohibited Item Processing (OPIP).
  - Operations ensures segregated Containerized PCB Liquid wastes are placed into daughter drums containing only waste from one AK/PK Waste Stream.
  - Daughter drums with consolidated PCB Liquid wastes (known and suspect) will undergo NDA and will be dispositioned at Perma-Fix for treatment and disposal.

CH-REF-OP-044, Operations Prohibited Item Processing – Reference P598

CH-REF-OP-044 supersedes CH-P-OP-044.

Revision 0 (3/27/12)

Table 1, Prohibited Item Remediation Directions:

- Liquids/Saturated Waste/Wetted Waste
  - Absorb in accordance with CH-REF-OP-014, Absorbing Liquids in the Glovebox and Box Breakdown Area (see Reference P592).
  - Place absorbed liquids/waste into a daughter drum (non-PI) with parent waste or from a matching waste stream.
  - Make clear notes on the Attachment D, Contact Handled Waste Repacking Data Form, of CH-REF-OP-013, Contact Handled Waste Repackaging (see Reference P254).
  - Complete Attachment O, Miscellaneous Treatment Inspection Log Sheet, or Attachment P, Saturated Waste Treatment, from CM-P-RP-309, Environmental Permits – Inspections/ Monitoring and Reporting (see Reference P1433).
- Containerized PCB Liquids
  - This table applies to containers of PCB liquids or waste articles which contain potential PCB liquids (such as gearboxes, vacuum pumps, etc).
  - Do not open the PCB container or waste articles, or absorb the PCB liquids.
  - Segregate the PCB liquids container or waste articles from other compliant waste.
  - AKE, RII, or WCO/AWCO evaluates the containerized PCB Liquid wastes (known and suspect) and documents the PCB item description, characterization, extent of contamination, and regulatory requirements on the applicable Attachment F, Unapproved PI Characterization form, from CH-REF-OP-013, Contact Handled Waste Repackaging (see Reference P254).
  - PI drums with consolidated PCB Liquid wastes (known and suspect) will undergo NDA and will be dispositioned for off-site treatment and disposal.

Revision 1 (9/10/13)

- Added reference to CPE
- Changed title of Attachment F of CH-REF-OP-013 to "Uncharacterized Waste Guidance"

Revision 2 (11/20/13)

- Revised to include requirements for CCP VE of drums containing materials (such as lead) impenetrable by RTR.

Revision 3 (7/14/14)

Revised Table 1A to add 1.A.11. 1.A.11 applies to environmental media liquids and saturated waste (waste which has absorbed known environmental media liquids from BBA).

- Process the environmental media liquids in accordance with CH-REF-OP-014, Absorbing Liquids in the Glovebox and Box Breakdown Area
- Initiate/fill out an Attachment P, Saturated Waste Treatment, of CM-P-EN-013, Environmental Permits and Compliance, for each drum receiving absorbed liquid waste.

Revision 4 (7/24/14)

Revised Table 1A to add 1.H.2. 1.H.2 applies to containers of PCB liquids or PCB articles which contain potential PCB liquids (such as electric motors, gearboxes, vacuum pumps, etc.).

- Segregate the PCB liquids container or PCB articles from other compliant waste.
- AKE and RII or designee evaluates the containerized PCB liquid wastes (known and suspect) and documents the PCB item description, characterization, extent of contamination, and regulatory requirements on the applicable Attachment F, Uncharacterized Waste Guidance, from CH-REF-OP-013, Contact Handled Waste Repackaging (see Reference P254).
- NoChar N910 PETROBOND is the only approved absorbent for the absorption, stabilization or solidification of containerized PCB liquid and is to be used in a 8:1 ratio absorbent to liquid by volume.
- Fill out Attachment Q, PCB Liquid Treatment Inspection Log Sheet, from CM-P-EN-013, Environmental Permits and Compliance (see Reference P1433).
- Place PCB articles and waste into outgoing daughter waste container. Place absorbed/treated PCB liquid on top of the waste in the outgoing container.
- Decon work area in accordance with CH-REF-OP-027, PCB Decontamination, if any spilled outside of bag or treatment pan and place in an outgoing daughter waste container.
- Make good notes on Attachment D, Contact Handled Waste Repackaging Data Form, of CH-REF-OP-013, Contact Handled Waste Repackaging (see Reference P254).

CH-P-OP-013, Contact Handled Waste Repackaging – Reference P254

This procedure provides instructions for packaging or re-packaging CH solid waste material from ORNL at the TWPC and ensures that final waste packages destined for transport to, and disposal at, WIPP comply with applicable Waste Acceptance Criteria (WAC) and Waste Analysis Plan (WAP). CH-P-OP-013 was superseded by CH-REF-OP-013.

Revision 8 (2/22/08)

Contact Handled Waste Repackaging Data Form

- Initiate an Attachment D, Contact Handled Waste Repackaging Data Form, for each waste container to be filled.

Waste Repackaging

- If items or materials identified as non-compliant in CH-X-AD-001, Contact Handled Waste Acceptance Criteria, are found, stop work in the immediate area and notify the WOL.

- If deemed safe to handle by the WOL, segregate non-compliant items or materials and process in accordance with CH-P-OP-022, Non-Compliant Containers.
- Segregate prohibited items identified in the WIPP Prohibited Items table, Attachment B of this procedure and process in accordance with CH-P-OP-022, Non-Compliant Containers.
- If the waste is not consistent with the assigned RCRA characterization as applicable, notify the Director of Environmental Programs and Permitting (DEPP) for a review of the inconsistency and appropriate corrective actions as required, including potential notification to appropriate regulatory agencies.
- Document "NO" or "YES", to indicate if the physical waste form is consistent with the assigned Waste Stream Description, Waste Matrix Code, and RCRA characterization.
    - If "NO", then initiate a Nonconformance Report in accordance with CH-P-AD-044, Waste Corrective Action and Non-Conformances.

Revision 9 (3/23/09)

No substantive changes to TRU waste management were made in this revision.

Revision 10 (7/22/09)

- Containers repackaged in the BBA may contain both heterogeneous debris and soil resulting in waste material which does not match the documented waste stream description for the parent container. If material types can be reasonably separated into different drums, then keep the different types separated.
- Check the "No" box on the "Contact Handled Waste Repackaging Form" if the daughter drum contains >50% of waste that does not match the parent containers waste stream description (matrix).

Revision 11 (2/16/10)

- Waste Containers previously packaged as Remote Handled (RH) waste that fail to meet the Waste Isolation Pilot Plant Waste Acceptance Criteria as RH waste are repackaged as CH waste. Applicable portions of the CCP RH Visual Examination documentation are transcribed to the Attachment D, CH Waste Repackaging Data Form.

Revision 12 (5/24/10)

- If items or materials identified as non-compliant in CH-X-AD-001, Contact Handled Waste Acceptance Criteria, are found, stop work in the immediate area and notify the Duty WOL. If deemed safe to handle by the Duty WOL, segregate non-compliant items or materials and process in accordance with CH-P-OP-045, Non-Compliant Containers (see Reference P599).
- When the PI is approved for processing, review any special processing instructions detailed in the applicable Attachment B, Operations Prohibited Item Processing (OPIP) of CH-P-OP-044, Operations Prohibited Item Processing (see Reference P598), and resume processing activities as directed by the Duty WOL.

Revision 13 (12/7/10)

- If necessary to co-mingle waste from two or more parent drums into the same daughter drum in the GB, notify the AKE for approval to co-mingle waste in a daughter drum.

Processing Prohibited Items:

- Segregate the PI(s) into a separate tray or area away from other compliant waste, and clearly label as appropriate while waiting for dispositioning.
- Complete an Attachment F, PI Characterization form, indicating a PI description, characterization instructions, and related regulatory requirements as applicable.
- Once the OPIP report or WNCR and Attachment F, PI Characterization form has been reviewed and approved, process PIs in accordance with the approved OPIP report and Attachment F, PI Characterization form or as directed by Duty WOL.

Processing Liquids or Wetted Waste:

- Absorbent materials such as Nochar, Solid-a-sorb, kitty litter, or vermiculite which are found in a container are assumed to have been used to absorb unknown or flammable liquids and shall be considered a wetted waste. Absorbent materials (absorbed liquids) in containers which are transferred from the HC are also considered a wetted waste.
- If non-PCB free liquid, containerized liquid, or absorbed liquid (wetted waste) is discovered, treat the waste in accordance with CH-I-OP-013, Absorbing Liquids in the Glove Box and Box Breakdown Area (see Reference P1116).

Processing Non-Compliant or Potentially Incompatible Materials:

- Prohibited quantities of liquids and other items or materials identified as NC in CH-X-AD-001, Contact Handled Waste Acceptance Criteria or potentially incompatible waste, may be discovered during processing in the GB or BBA. The Duty WOL is responsible to determine if NC or potentially incompatible waste is safe to handle. These materials are segregated for disposition and possible return to the Department of Energy – Oak Ridge
- If NC or potentially incompatible material is found, stop work and notify the Duty WOL. Refer to CH-P-OP-045, Non-Compliant Containers for guidance on dispositioning and handling of NC material. Initiate an OPIP report in accordance with CH-P-OP-044, Prohibited Items Processing, or a WNCR in accordance with CH-P-AD-044, Waste Corrective Action and Non-Conformances, as applicable. Process waste as directed by the applicable OPIP or WNCR or as directed by the Floor Supervisor or Duty WOL.

Processing Capped Pipe Nipples/2R Type Containers:

- Capped pipe nipples or 2R type containers discovered in waste containers may have been used as small strong-tight sealable containers and may conceal high hazard waste items or materials. Concealed materials may present additional uncontrolled hazards to the worker.
- If the capped/sealed pipe nipple or 2R type container is confirmed to not contain liquids or other PI, segregate the item into a designated hold area within the GB or BBA and reintroduce the item into a non-CH visual examination waste drum being repackaged from the same waste stream that the item came from.
- If the capped/sealed pipe nipple or 2R type container is identified to contain liquids or other PI, transfer the container containing the capped/sealed pipe nipple or 2R type container to Room 231 of the PB and place on hold for alternate or later processing.
- Initiate an OPIP report in accordance with CH-P-OP-044, Prohibited Items Processing, or a WNCR in accordance with CH-P-AD-044, Waste Corrective Action and Non-Conformances, as applicable.

Process the capped/sealed pipe nipple or 2R type container as directed by the applicable OPIP or WNCR or as directed by the Floor Supervisor or Duty WOL.

Processing Polychlorinated Biphenyl (PCB) Waste:

- If, during repackaging, PCB materials (solid or liquid) are discovered in parent containers not previously designated as containing PCBs, notify the AKE, RII, and Waste Management personnel.
- If, during repackaging, uncontainerized PCB liquid wastes (known or suspect) are discovered, minimize spread of liquids and isolate PCB contaminated waste, containers or equipment.
- Absorb the liquid wastes in accordance with CH-I-OP-013, Absorbing Liquids in the Glove Box and Box Breakdown Area.

Processing Potentially Pressurized Container (PPC):

- Potentially pressurized containers including aerosol cans are segregated and containerized for processing at off-site facilities.
- Initiate an OPIP report in accordance with CH-P-OP-044, Prohibited Items Processing, or a WNCR in accordance with CH-P-AD-044, Waste Corrective Action and Non-Conformances, as applicable.
- Initiate Attachment T, Aerosol Can Management, in accordance with CM-P-RP-309, Environmental Permits – Inspections/Monitoring and Reporting.
- Document a detailed description of the item on the applicable waste repackaging data form for the collection container, including size, content, and type of container.
- Items or materials which are potentially incompatible are packaged separately as applicable.

<u>Revision 14 (6/9/11)</u>

Processing Liquids or Wetted Waste:

- Absorbent materials (absorbed liquids) in containers which are transferred from the HC are also considered a wetted material. Waste material which has been exposed to or saturated with groundwater in RH casks is considered a saturated waste and is processed in the HC or CPE only.
- If non-PCB free liquid, containerized liquid, absorbed liquid (wetted material), or groundwater saturated waste (saturated waste) is discovered, treat the waste in accordance with CH-I-OP-013, Absorbing Liquids in the Glovebox and Box Breakdown Area, if working in the GB or BBA, or RH-P-OP-014, Liquids Handling in the Hot Cell, if working in the HC.

Processing Polychlorinated Biphenyl (PCB) Waste:

- Absorb the uncontainerized liquid wastes in accordance with either CH-I-OP-013, Absorbing Liquids in the Glove Box and Box Breakdown Area, if working in the GB or BBA, or RH-P-OP-014, Liquids Handling in the Hot Cell, if working in the HC.

Definitions

- Residual Liquids –Residual liquids (i.e., liquid droplets found on the inside of the containers or bags, heels of liquids, etc.) are not considered liquids or wetted materials.

CH-REF-OP-013, Contact Handled Waste Repackaging – Reference P254

CH-REF-OP-013 supersedes CH-P-OP-013.

Revision 0 (3/27/12)

Processing Liquids or Wetted Waste:

- If non-PCB free liquid, containerized liquid, absorbed liquid (wetted material), or groundwater saturated waste (saturated waste) is discovered, initiate an OPIP report in accordance with CH-REF-OP-044, Operations Prohibited Items Processing.

Processing Polychlorinated Biphenyl (PCB) Waste:

- If, during repackaging, PCB materials (solid or liquid) are discovered, initiate an OPIP report in accordance with CH-REF-OP-044, Operations Prohibited Items Processing.
- Absorb the uncontainerized liquid wastes in accordance with either CH-REF-OP-014, Absorbing Liquids in the Glovebox and Box Breakdown Area, if working in the GB or BBA, or RH-REF-OP-014, Liquids Handling in the Hot Cell, if working in the HC, or RH-REF-OP-102, Liquids Handling in the Cask Processing Enclosure.

Processing Batteries (new section):

- Document a detailed description of the battery on the associated Attachment D, Contact Handled Repackaging Data Form, including size (e.g., 9-volt, D, etc.) and type (e.g., alkaline, nickel-cadmium, lithium, etc.)
- If the battery type cannot be determined OR a lithium battery (any size) is discovered, then contact the AKE and RII personnel for assistance.
- Process the battery per the recommended disposition path as instructed on the applicable Attachment F, Unapproved PI Characterization form.

Definitions

- Wetted Material - Absorbent materials such as Solid-a-sorb, kitty litter, vermiculite, mop heads, or absorbent pads, which are found in a container are assumed to have been used to absorb unknown or flammable liquids.
- Saturated Waste – Any waste in contact with groundwater within a RH cask.

Revision 1 (5/31/12)

Processing Prohibited Items:

- Document PI characterization and recommended disposition path as applicable on the Attachment F, Uncharacterized Waste Guidance form as applicable

Processing Capped Pipe Nipples/2R Type Containers:

- Document PI characterization and recommended disposition path as applicable on the Attachment F, Uncharacterized Waste Guidance form as applicable.

Processing Polychlorinated Biphenyl (PCB) Waste:

- Ensure processing guidance and labeling requirements are documented on the applicable Attachment F, Uncharacterized Waste Guidance form.

Processing Batteries:

- Process the battery per the recommended disposition path as instructed on the applicable Attachment F, Uncharacterized Waste Guidance form.

Processing Potentially Energetic Material (new section):

- Potentially Energetic Material include materials which may have reactive, shock sensitive, explosive, or pyrophoric characteristics.
- If potentially energetic material is found, stop work in the affected process area and notify the Floor Supervisor and the DWOL.
- Notify the Energetic Material Subject Matter Expert to review the potentially energetic material.
  - The Energetic Material Subject Matter Expert reviews available waste documentation to determine if a material is energetic and provides guidance for the safe handling and recommended disposition path of energetic material. The Energetic Materials Subject Matter Expert documents safe handling guidance and recommended disposition path for energetic material on Attachment B, Field Evaluation of Potentially Energetic Materials Form, of CM-REF-WP-016, Energetic Materials Management (see Reference P587). A separate procedure may be developed specifically for processing the energetic material.
- IF the material is determined to be energetic material, THEN initiate a WNCR in accordance with CH-P-AD-044, Waste Corrective Action and Nonconformance's.
- Process the energetic material as guided by the associated; procedure developed to process the specific energetic material, Attachment B, Field Evaluation of Potentially Energetic Materials Form, of CM-REF-WP-016, Energetic Materials Management, or WNCR.

Revision 2 (10/11/12)

No substantive changes to TRU waste management were made in this revision.

Revision 3 (2/25/13)

No substantive changes to TRU waste management were made in this revision.

Revision 4 (5/6/13)

Processing Polychlorinated Biphenyl (PCB) Waste:

- Absorb the uncontainerized liquid wastes with Nochar or equivalent.

Revision 5 (8/27/13)

Add steps to process waste items greater than 200 mR/hr in the GB, BBA, or CPE; added clarification for suspect ACM determination hold points.

Revision 6 (2/3/14)

Added Attachment J, High Dose Drum Data, to document gamma on contact, gamma behind drum lid, neutron at glove port, and shielded gamma behind ¼- inch steel plate.

Revision 7 (6/25/14)

No substantive changes to TRU waste management were made in this revision.

Revision 8 (3/26/15)

No substantive changes to TRU waste management were made in this revision.

Revision 9 (6/17/15)

Waste Processing and Repackaging:

- If the container has an assigned OPIP, process in accordance with CH-REF-OP-044, Operations Prohibited Item Processing (see Reference P598).
- If the container has an assigned WNCR, process in accordance with CH-P-AD-044, Waste Corrective Action and Nonconformance's.

Revision 9, PCN 9-1 (6/19/15)

No substantive changes to TRU waste management were made in this revision.

T-CH-FW-I-OP-001, Box Breakdown Area Material Handling Recipes – Reference P588

This work instruction provides guidance for handling, lifting, and moving of large waste items and components inside the BBA that may be present in the boxes or drums received as part of the CH waste. Each recipe is intended to provide a template or initial methodology. Modifications to the recipes are anticipated and will be addressed on a case-by-case basis. T-CH-FW-I-OP-001 was superseded by CH-P-OP-001.

Revision 0 (9/28/05)

None of the recipes in this revision describe the management of liquids or other prohibited items, use of absorbents, or other relevant waste management activities.

CH-P-OP-001, Box Breakdown Area Material Handling Recipes – Reference P588

CH-P-OP-001 supersedes T-CH-FW-I-OP-001. Although the procedure number changed, the revision number continued and did not start back at zero. CH-P-OP-001 was superseded by CH-REF-OP-001.

Revision 1 (5/1/09)

Attachment E: Lead Pig or Other Shield Material Standing Recipe

- Once inspections of impenetrable objects are completed in accordance with CH-P-OP-045, Non-Compliant Containers (see Reference P599), document on the applicable repackaging data form that no additional PIs were found within the lead pig or shielding material.

Attachment G: Large Quantity (typically greater than 5 gallons) of Liquid Standing Recipe

- Transfer free liquids from container to drum or tote, being careful not to pump soil or sludge material from bottom of box.

- Sample liquid in drum or tote, and send liquid sample to lab for characterization.
- Determine disposal or processing path forward for liquids when sample data available.
- If sludge/mud is found in bottom of container, mix absorbent material such as Solid-A-Sorb into the sludge/mud.
- Remove sludge/mud from container and place into drums.

Attachment H: Soils/Rock/Concrete Standing Recipe

- Add approximately ¼ bag of absorbent material such as Solid-A-Sorb in bottom of each receptacle drum.
- If pockets of free liquid are encountered, add and mix approved absorbent material in required quantities to absorb the free liquids, then continue material removal and repackaging.
- Add approximately 1/8 bag of absorbent material such as Solid-A-Sorb to receptacle drum for each 6 inch layer of soil material added.

Revision 2 (8/10/09)

No substantive changes to TRU waste management were made in this revision.

Revision 3 (6/22/10)

Revised Attachment H for use on incoming drums only, and created Attachment I for incoming boxes.

Attachment I: Soils/Rock/Concrete in Incoming Drums Standing Recipe

- Add approximately ¼ bag of absorbent material such as Solid-A-Sorb in bottom of each receptacle drum.
- If pockets of free liquid are encountered, add and mix approved absorbent material in required quantities to absorb the free liquids, then continue material removal and repackaging.
- Add approximately 1/8 bag of absorbent material such as Solid-A-Sorb to receptacle drum for each 6 inch layer of soil material added.

Revision 4 (5/25/11)

Added Attachment K: Compacted Drum Puck Standing Recipe

Revision 5 (8/11/11)

Revised Attachment H to segregate chunks of rock and concrete larger than approximately 2 in. in size (tennis ball or larger) from soil material and repackage in separate outgoing containers.

CH-REF-OP-001, Box Breakdown Area Material Handling Recipes – Reference P588

CH-REF-OP-001 supersedes CH-P-OP-001.

Revision 0 (2/27/12)

No substantive changes to TRU waste management were made in this revision.

Revision 1 (2/21/13)

No substantive changes to TRU waste management were made in this revision.

Revision 2 (6/24/15)

Removed Attachment J: Overpacked Drums in BBA

Revision 3 (6/23/15)

No substantive changes to TRU waste management were made in this revision.

CH-I-OP-013, Absorbing Liquids – Reference P1116

This work instruction provides general instruction for absorbing residual liquids found during processing of CH waste at the TWPC. CH-I-OP-013 has been superseded by CH-REF-OP-014 (see Reference P592).

Revision 4 (6/27/08)

Preparing for Residual Liquid Absorption:

- Place an absorbent liner pad or other absorbent material into a stainless or approved plastic secondary containment pan or bucket.
- Estimate the volume of liquid to be absorbed and place an appropriate volume of approved absorbent material into an appropriately sized container.
    - Typically absorbent materials are designed to absorb unknown liquid at a ratio of 1:8 volume ratio of liquid to absorbent.
- Place a pre-measured container of approved absorbent material in or near the secondary containment pan.

Processing Residual and/or Incidental Liquids

- Initiate Attachment O, Miscellaneous Treatment Inspection Items, of CM-P-RP-309, Environmental Permits – Inspections/Monitoring and Reporting.
- Place the container or bag with residual liquids into the secondary containment pan.
    - Waste drums or boxes may contain smaller bottles, jars, buckets, tubes, ampules, or bags with residual liquids inside. Containers with liquids shall only be opened and remediated one-at-a-time.
    - If the liquids are in the drum or box (and not in small inner containers or bags), remove the free liquid from the drum or box by aspiration, or similar means, into a separate small container and/or, pour approved absorbent material into the drum or box.
- Pour no more than 1 liter of free liquid into a pre-measured container of approved absorbent material.
- Using a stir stick or similar tool, ensure liquid is thoroughly mixed into the absorbent for at least 1 minute, and allow container to sit for a minimum of 5 minutes
    - If liquid is in a bag, massage the bag to ensure that the absorbent is in contact with the liquid
    - If liquid is absorbed in paint can, it may be necessary to shake or agitate the paint can until liquid is well absorbed.
- To absorb residual non-pourable liquids in the small container or bag, pour Approved absorbent material into the small container or bag at an estimated volume ratio of 1:8 liquid to absorbent.

- If the processed batch of liquid is to be transferred into a waste container which contains previously processed liquids which are potentially incompatible, allow the batch to cure for at least one hour.
- If no free liquids are observed, or when batches have cured for at least one hour, transfer the waste to the appropriate waste package.
  - Waste must be placed into a container of same waste stream.

Absorbing Residual and/or Incidental Mercury in Drum or Box:

- If mercury containing devices and discrete containers with mercury are found in the drum or box, segregate and repackage the item as mercury waste.
- Record a description of the item or approximate volume of mercury in the applicable waste container documentation.
- If residual or incidental droplets of mercury are present in the drum or box, adsorb the droplets using compounds from a mercury spill kit in accordance with the applicable vendor instruction for the mercury spill kit.
- Transfer the waste material to the appropriate waste container.
- Record the approximate volume of mercury absorbed in the applicable waste container documentation (i.e., droplets of mercury absorbed).

Revision 5 (11/7/08)

Changed the procedure name to "Absorbing Liquids in the Glove Box and Box Breakdown Area"

Revise wording throughout to reference "Sealable Containers," and added the following definition of Sealable Container: Containers used to containerize exposed liquids may be glass containers with screwed lids, plastic containers with screwed lids, or sealable plastic containers with a minimum thickness of 5 mils.

A note was added identifying LL-A-OP-010, NTS WAC, Mixed Low Level Waste Profile (Reference M271) which provides a list of approved absorbents. LL-A-OP-010 says Sorbents, such as Speedi Dri, Quick Solid, or Solid-A-Sorb may be placed inside the disposal containers as a precautionary measure. Nochar N965 or Portland cement may be used as a solidification agent for incidental liquids.

Revision 6 (11/17/08)

Revised definition of "sealable container" to indicate they shall have a non-metallic closure mechanism, shall have no visible holes or penetrations, and shall have a minimum thickness of 5-mil or greater.

CH-REF-OP-014, Absorbing Liquids in the Glovebox and Box Breakdown Area – Reference P592

This document provides general instruction for absorbing residual/non-residual liquids found during processing of Contact Handled waste in the Glovebox (GB) and/or Box Breakdown Area (BBA) at the TWPC. CH-REF-OP-014 supersedes CH-I-OP-013 (see Reference P1116).

Revision 0 (3/27/12)

Record the approximate volume of liquids/mercury absorbed or solidified in the applicable Attachment D, Contact Handled Waste Repackaging Data Form, of CH-REF-OP-013, Contact Handled Waste Repackaging (see Reference P254).

Wetted Material:

- If residual liquids are observed within or coming from the wetted material, record the approximate volume of liquids absorbed or solidified on Attachment D, Contact Handled Waste Repackaging Data Form, of CH-REF-OP-013, Contact Handled Waste Repackaging.
    - Absorbent materials such as Solid-a-sorb, kitty litter, vermiculite, mop heads, or absorbent pads which are found in a container are assumed to have been used to absorb unknown or flammable liquids and shall be considered a wetted material. Wetted material may appear dry or wet, or may be observed to contain or release residual liquids when handled.
- Pour approved absorbent material into a sealable container at an estimated volume ratio of 1:8 liquid to absorbent.
- Transfer wetted material into the sealable container leaving a void space at the top for additional absorbent material.
- Pour approved absorbent material to fill the sealable container, and close the sealable container.
- Transfer the sealable container(s) to the appropriate outgoing waste container.
    - Waste must be placed into an outgoing container of same waste stream.

Revision 1 (12/10/13)

No substantive changes to TRU waste management were made in this revision.

Revision 2 (7/7/14)

Processing Environmental Media Liquids in Drums:

- Transfer liquid to the intermediate container.
- Once the source container has been emptied of liquid and waste, absorb incidental quantities of liquid in the container using an absorbent liner pad or approved absorbent material.
- If liquid was spilled or dropped on the BBA floor, the container or vacuum, wipe up or absorb the liquid with an absorbent liner pad or approved absorbent material.
- Transfer wetted absorbent liner pad(s) or approved absorbent material to the appropriate outgoing waste container.
- If saturated waste is encountered, then ensure the waste is placed in a secondary containment pan and apply absorbent material until no liquid remains.
- Document that residual liquids were absorbed or solidified in Attachment P, Saturated Waste Treatment, of CM-P-EN-013, Environmental Permits and Compliance.

Revision 3 (10/21/14)

Added new Attachment C with a list of approved absorbents and their uses.

- Quik-Solid QS-44 or Solid-A-Sorb is used for environmental media in drums, groundwater in casks, and saturated waste.
- NoChar N965 Liquibond is used for unknown containerized liquids/non-residual liquids/residual liquids/wetted materials.
- NoChar N910 Petrobond is used for PCB contaminated oils.

Revision 4 (2/4/15)

- Revised Attachment C to include mercury spill kits for Residual or incidental droplets of mercury.
- Added Attachment D, Liquid Volume Conversion Chart as an aid to operators

Revision 5 (6/15/15)

Revised Attachment C to indicate:

- NoChar N965 can also be used to absorb environmental media in drums, groundwater in casks, and saturated waste
- Specified Hg Absorb and PIG Mercury Absorbent Powder for residual or incidental droplets of mercury.

Revision 5, PCN 5-1 (6/15/15)

No substantive changes to TRU waste management were made in this revision.

CM-A-WP-004, Energetic Materials Program Reference – Reference P1434

This document identifies responsibilities and describes the process for managing energetic or potentially energetic materials discovered during waste repackaging operations at the TRU Waste Processing Center (TWPC). For the purposes of this procedure, an energetic or potentially energetic material is any material that may undergo a spontaneous energetic chemical reaction due to age, concentration, degradation, or oxidation potential when exposed to shock, friction, temperature change, air, or other initiating events.

Revision 0 (5/31/12)

As part of the Hazardous Material Protection Program, the Energetic Materials Program includes the processes specific to the identification, handling, and processing of potentially energetic materials discovered during repackaging operations at the TWPC. The major elements of the Energetic Materials Program include:

- Availability of Energetic Material Subject Matter Experts (SMEs) with knowledge of potentially energetic material in the waste stream processes at the TWPC.
- Operating procedures and worker training that address operator identification of potentially energetic materials, and actions for suspending related activities and notification of an Energetic Material SME (The specific training requirements and qualifications for the Level I and II Energetic Materials SMEs are delineated.)
- Waste Programs procedures that address Energetic Material SME evaluation of potentially energetic materials and methods for processing; and identification of potentially highly energetic materials and establishment of safe conditions.
- Operating procedures/special work instructions/work packages and worker training address operator handling and processing of potentially energetic materials as prescribed by an Energetic Material SME.

Initial Identification:

- Operating procedures, Activity Hazards Assessments, and worker training address the initial identification of potentially energetic materials by operators; the appropriate actions for suspending related activities; and the notification of Level 1 Energetic Material SMEs to support repackaging operations. Standard work practices are used when encountering unidentified materials during repackaging operations, including:

- Attempting to positively identify all liquids and substances encountered.
- Reviewing Material Safety Data Sheets (MSDSs) to identify handling requirements of identified substances.
- Treating unidentified liquids or substances as incompatible and not mixing them.
- Not opening containers with unidentified powders unless determined to be safe by a Level 1 Energetic Material SME based on applicable process knowledge.
- Suspending processing activities if large quantities of unidentified liquids or substances are encountered, or if unidentified cloudy solutions or crystallized residues are present.

Field Evaluations:

- Field evaluations are performed by Level 1 Energetic Material SMEs when potentially energetic materials are discovered during repackaging operations.
  - The Level 1 Energetic Material SME determines whether energetic or potentially energetic materials are present, and whether review by a Level 2 Energetic Material SME is required.
  - Level 1 Energetic Material SMEs are designated by the DWM as qualified personnel with detailed knowledge of chemicals and chemical hazards in addition to applicable process knowledge of the operations that generated the waste that is being repackaged at the TWPC.
  - Level 1 Energetic Material SMEs use their detailed knowledge of chemicals, chemical hazards, and process knowledge to determine whether a material is energetic or potentially energetic.
  - Field evaluations may conclude that a material is safe to handle and process in accordance with standard operating procedures based on positive identification of the material or applicable process knowledge of the operations that generated the waste, or that a material may be energetic or potentially energetic and will require special instructions for safely handling and processing.
- If insufficient information is available to determine whether a discovered material may be energetic or potentially energetic or if the Level 1 Energetic Material SME is unable to make a determination that the material is safe to handle, Level 2 Energetic Material SMEs may be consulted during the field evaluation process to assist with the evaluation of discovered materials or to answer specific questions related to the physical characteristics of the discovered material.
- If a Level 1 Energetic Material SME determines that energetic or potentially energetic materials are present, Level 2 Energetic Material SMEs may be consulted to establish appropriate methods for the safe handling and processing of the materials.

Revision 1 (5/22/14)

No substantive changes to TRU waste management were made in this revision.

CM-P-WP-016, Energetic Materials Management – Reference P587

This procedure identifies the responsibilities and describes the process for managing energetic or potentially energetic materials at the TWPC, and implements the program requirements described in CM-A-WP-004, Energetic Materials Program (see Reference P1434). This procedure describes the process by which energetic or potentially energetic materials are evaluated and managed at the TWPC. For the purposes of this procedure, an energetic or potentially energetic material is any material that may undergo a spontaneous energetic chemical reaction due to age, concentration, degradation, or oxidation potential when exposed to shock, friction, temperature change, air, moisture, or other initiating events.

Revision 0 (5/31/12)

Field evaluations are performed by Level 1 Energetic Material SMEs when notified by operations personnel that materials have been discovered during repackaging operations that require evaluation for the presence of potentially energetic materials.

Level 2 Energetic Material SMEs may be consulted during the field evaluation process to assist with the evaluation of discovered materials or to answer specific questions related to the physical characteristics and hazards of the discovered material.

Energetic Materials Field Evaluations:

- Inspect and identify the chemical and physical characteristics of the discovered items:
  - Container type (original packaging, secondary container, sealed capsules/bottles/high integrity containers, transparent/translucent)
  - Labels or writing present
  - Physical composition (pure chemical compounds, solutions/dilutions, or hygroscopic materials)
  - Physical form (cloudy solution, crystalline structures)
- If the material is in an original or secondary container with a legible label, evaluate the chemical hazards of the identified constituents.
- If the material is in an original or secondary container with no labeling or the labeling is illegible, evaluate the physical properties of the materials for indications that the material may potentially be energetic.
- If the material is in a sealed capsule/bottle that is a high integrity container, or the evaluation of the chemical hazards determines that the material is potentially energetic, or the material is a cloudy solution, or there are indications that crystallized residues are present:
  - Record the chemical and physical characteristics of the discovered items
  - Evaluate the chemical and physical hazards of the discovered items
  - Determine whether the discovered items are energetic or potentially energetic materials (Level 2 Energetic Material SMEs may be consulted as needed during the evaluation process)
  - If the material is identified as an energetic or potentially energetic material, contact a Level 2 Energetic Material SME for additional evaluation/special instructions
  - Record all of this information on Attachment B, Field Evaluation of Potentially Energetic Materials.
- Determine whether special disposition instructions are required for the discovered items and record on Attachment B, Field Evaluation of Potentially Energetic Materials.
  - If special disposition instructions are required, notify the Waste Operations Floor Supervisor and the DWOL that special work instructions/work package is required for disposition and document following the requirements of CH-REF-OP-013, as required.

Revision 1 (5/22/14)

No substantive changes to TRU waste management were made in this revision.

Revision 2 (6/22/15)

No substantive changes to TRU waste management were made in this revision.

CM-P-RP-309, Environmental Permits – Inspections/Monitoring and Reporting – Reference P1446

The purpose of this procedure is to establish requirements for periodic environmental regulatory and permit required inspections and/or monitoring of the TWPC site. After Revision 24 of CM-P-RP-309, several sections and attachments were excerpted from this procedure and moved to new procedure CM-P-EN-013 (see Reference P1433).

Revision 14 (1/16/08)

Attachment O: Miscellaneous Treatment Inspection Log Sheet

- Is non-compatible waste present in the treatment unit?
- Is the appropriate stabilization material available for the waste to be treated?
- Amount of stabilization agent required for liquid/mercury
- Any unanticipated reaction?
- Description of Corrective Actions (CA), including date and number of corrective action request and date of completion

Revision 15 (9/3/08)

No substantive changes to TRU waste management were made in this revision.

Revision 16 (11/25/08)

Added Attachment P: Debris Waste Treatment in T-4 Hot Cell Table

- Volume of debris
- Is non-compatible waste present in the treatment unit?
- Is the appropriate stabilization agent available for the waste to be treated?
- Amount of stabilization agent required for treatment
- Any unanticipated reaction?

Revision 17 (2/23/09)

Revised Attachment O to include the total amount of liquid/mercury treated.

Revision 18 (3/31/09)

Added Attachment R: Size Reduction Inspection Log Sheet

- Any unanticipated reactions?
- Waste appropriately treated and packaged?

Revision 19 (7/7/09)

No substantive changes to TRU waste management were made in this revision.

Revision 20 (10/19/09)

Revised Attachment O to include the Container ID. Prior to this revision, the WNCR or OPIP, which is listed on this form, must be used to identify the Container ID.

Added Attachment T: Aerosol Can Management

- If unknown, has the AKE been contacted for possible characterization
- Did AKE characterize the aerosol
- Has EPP verified that the known aerosol is compatible with other segregated aerosols

Revision 21 (10/18/10)

No substantive changes to TRU waste management were made in this revision.

Revision 22 (3/20/12)

- Renamed Attachment P to "Saturated Waste Treatment" (essential information on this form did not change)
- Deleted Attachment T: Aerosol Can Management

Revision 23 (6/28/12)

No substantive changes to TRU waste management were made in this revision.

Revision 24 (8/14/12)

No substantive changes to TRU waste management were made in this revision.

CM-P-EN-013, Environmental Permits and Compliance – Reference P1433

This procedure establishes requirements for routine environmental regulatory and permit required inspections and/or monitoring of the TWPC site, with the exception of certain aspects of air permit compliance, which are managed by TWPC radiological control under CM-P-RP-309, Air Permit Compliance-Radiological. The initial issue of this procedure excerpted sections and attachments from CM-P-RP-309 (see Reference P1446).

Revision 0 (1/16/13)

No substantive changes to TRU waste management were made in this revision.

Revision 1 (8/12/13)

No substantive changes to TRU waste management were made in this revision.

Revision 2 (7/24/14)

Added Attachment Q: PCB Liquid Treatment Inspection Log Sheet

- Total amount of PCB liquid treated
- Amount of Petro Bond stabilization agent used for liquid treatment
- Any spills or releases observed or unanticipated reactions?

Revision 3 (9/28/15)

No substantive changes to TRU waste management were made in this revision.

CH-P-OP-011, Drum Bag In/Bag Out and Glove Ports – Reference P253

This procedure provides instructions for the change out of Glove Box (GB) gloves, the use of transfer bags for individual items, and the change out of processed waste containers using a typical Bag In / Bag Out technique.

Revision 13 (2/19/08)

Removing an Item(s) Using a Transfer Sleeve (Bag-Out)

- Pass the item through the glove port into the end of the sleeve.
- Tightly twist the sleeve between the item and the glove port, forming a 6-8 in. horsetail.
- Tightly tape over the twisted portion of the transfer sleeve.
- Carefully cut through the middle of the taped joint.
- Tape over the ends of each tail to seal.

Drum Liner Seal and Cut (Bag Out)

- If drum has two liners, remove the lower cinch strap located between the upper and lower ribs of the drum port interfacing to release the inner liner bag sleeve. Slowly pull the inner drum liner sleeve down and let fall into the drum.
- Slowly turn the container on the drum lift, allowing the drum liner sleeve to be twisted into a "horse-tail" between the top of the container and the drum port interface ring.
- When a tightly twisted "horse-tail" is formed a nominal 6-8 in. in length, wrap a cable tie wrap around the top portion of the twisted section, and tighten using the appropriate banding tool.
- Wrap a second cable tie wrap around the bottom portion of the twisted section, leaving a nominal 4 in. between the bands, and tighten using the appropriate banding tool.
- Wrap the twisted section between the two bands tightly using a vinyl type tape.
- Separate the container from the drum port by cutting the twisted portion of liner between the two bands.
- Tape over the exposed ends of the liner horsetails.
    - An adhesive patch or "dot" may be used in lieu of tape to seal the exposed ends of the liner horsetail.
- Wrap additional vinyl tape around the horsetail to secure as needed.

New Drum Preparation

- Insert the drum liner into the container
- Install a protective cardboard liner insert inside the drum liner.
- If directed by the WOL, weigh and load approved absorbent material in the container.
    - A small quantity of approved absorbent material may be pre-loaded into containers prior to loading with processed waste.

Attachment B: Waste Container Traveler

- Includes dates of completion for various activities such as filter installation, application of hazardous waste label, completion of non-destructive assay [This form does not have anything needed for the AK record].

Attachment C, Waste Package Certifier Checklist.

- Attachment C includes verification that only approved and acceptable items are placed in the container per approved NTS prohibited items list and applicable Waste Profile, and only approved absorbents (non-biodegradable) are added to the container if required.

Revision 14 (3/23/09)

No substantive changes to TRU waste packaging were made in this revision.

Revision 15 (6/23/09)

No substantive changes to TRU waste packaging were made in this revision.

Revision 16 (8/24/09)

No substantive changes to TRU waste packaging were made in this revision.

Revision 17 (2/15/10)

No substantive changes to TRU waste packaging were made in this revision.

Revision 18 (5/24/10)

No substantive changes to TRU waste packaging were made in this revision.

Revision 19 (5/24/10)

No substantive changes to TRU waste packaging were made in this revision.

Revision 20 (12/7/10)

No substantive changes to TRU waste packaging were made in this revision.

Revision 21 (4/25/11)

- No longer allows the use of two drum liner bags.
- Removed glove change and sleeve transfer activities (these activities were moved to new procedure CH-P-OP-046 (see Reference P589).

Revision 22 (7/18/11)

No substantive changes to TRU waste packaging were made in this revision.

CH-REF-OP-011, Drum Bag In/Bag Out and Glove Ports – Reference P253

CH-REF-OP-011 supersedes CH-P-OP-011.

Revision 0 (10/11/12)

No substantive changes to TRU waste packaging were made in this revision.

Revision 1 (2/11/13)

No substantive changes to TRU waste packaging were made in this revision.

Revision 1 PCN 1-1 (2/5/13)

No substantive changes to TRU waste packaging were made in this revision.

Revision 2 (11/12/13)

- If preparing a 55 gallon drum, install a drum liner over the inverted protective cardboard liner.
- If preparing an 85 or 110 gallon drum, secure a cardboard disk to the cardboard liner.
- Removed the allowance for preloading a small quantity of approved absorbent material into containers prior to loading with processed waste.

Revision 3 (2/13/14)

Revised bag-out procedure to say "Perform manual horsetail, seal, and cut."

Revision 4 PCN 4-1 (6/26/14)

No substantive changes to TRU waste packaging were made in this revision.

Revision 5 (3/26/15)

Added operator aid to Attachment G for instructions on drum closure.

Revision 6 (6/22/15)

No substantive changes to TRU waste packaging were made in this revision.

Revision 7 (11/11/15)

No substantive changes to TRU waste packaging were made in this revision.

CH-P-OP-046, Glove Ports and Sleeve Transfers – Reference P589

This procedure provides instructions for the change out of Glovebox (GB) gloves, and the use of transfer bags to sleeve individual items into or out of the GB. Steps were removed from CH-P-OP-011 (see Reference P253) to create CH-P-OP-046. CH-P-OP-046 was superseded by CH-REF-OP-046.

Revision 0 (4/25/11)

Removing an Item(s) Using a Transfer Sleeve (Bag-Out)

- Pass the item through the glove port into the end of the sleeve.
- Tightly twist the sleeve between the item and the glove port, forming a 6-8 in. horsetail.
- Tightly tape over the twisted portion of the transfer sleeve.
- Carefully cut through the middle of the taped joint.
- Tape over the ends of each tail to seal.

CH-REF-OP-046, Glove Ports and Sleeve Transfers – Reference P589

CH-REF-OP-046 supersedes CH-P-OP-046.

Revision 0 (4/23/12)

No substantive changes to TRU waste packaging were made in this revision.

Revision 1 (1/8/14)

No substantive changes to TRU waste packaging were made in this revision.

Revision 2 (9/21/15)

- Changed bag-out procedure to "Perform manual horsetail, seal, and cut"
- Added cable ties and banding tool to tool list in Attachment B for bag closure.

Revision 3 (11/19/15)

No substantive changes to TRU waste packaging were made in this revision.

CM-R-WP-006, Review of Potential Nitrate Bearing Liquids Treatment – Reference P1445

This report documents the evaluation of nitrate bearing transuranic (TRU) waste streams at the TRU Waste Processing Center (TWPC) in accordance with Operating Experience Level 2 (OE-2) 2015-1, "Evaluation of Nitrate-Bearing Transuranic Waste Streams" guidance. The purpose of the evaluation is to perform a records and process review to determine potential vulnerability in Oak Ridge and take actions as necessary to address any nitrate-bearing transuranic waste streams that may have used organic neutralizers (e.g. organic amines) and/or absorbers (e.g., cellulose, corncobs or other plant based sorbents, as well as organic polymers such as polyacrylates or polyacrylamide or copolymers of polyacrylates and acrylamides) that may be potentially susceptible to an exothermic reaction similar to the energetic drum event resulting in an airborne radiological release at U.S. Department of Energy's (DOE's) Waste Isolation Pilot Plant (WIPP) near Carlsbad, New Mexico.

Target Processing and Material Recovery

- Process knowledge based on historic operations confirmed by interviews with prior members of the operations staff for the large scale processing determined that 8 molar nitric acids would be upper concentration on nitric acid used in the dissolution and processing of the actinides.

Basic Science Research Laboratories

- Initial dissolution of solid material may require the use of 68-70% nitric acid added to solid material to complete the transition of the actinides from solid to liquid solutions

Oak Ridge Nitrate Bearing TRU Waste Streams Records Review And Evaluation (OE-2 Action 1)

- The Oak Ridge TRU waste inventory consists primarily of debris waste and does not contain large homogeneous nitrate salt based waste streams similar to the waste associated with the energetic drum event at WIPP.
- However, during processing of the TRU waste inventory, small quantity laboratory scale liquids were present in approximately half of the ORNL legacy waste containers (predominately contact handled waste). Based upon the process knowledge of the ORNL facility missions and the development of Acceptable Knowledge (AK) Summary Reports to support TRU certification activities, these small

quantity laboratory scale liquids could include predominately nitric acid or minimally other nitrate bearing materials that could exhibit the characteristic of ignitability.

- Thus, the non-residual liquids encountered during repackaging were treated in a TWPC Resource Conservation and Recovery Act (RCRA) permitted operation to remove the potential hazardous characteristic for both ignitability (D001) and corrosivity (D002) utilizing an approved engineered absorbent. Only one absorbent (Nochar N965) has been utilized for treatment of non-residual liquids found during waste processing at the TWPC.
- Nochar N965 was used at a minimum ratio of 8:1 by volume (approximately 4:1 by mass) to absorb non-residual liquids in the waste containers. Liquids were treated one at a time in batches no larger than one liter in size and packaged separately in sealed containers less than four liters in size to mitigate potential compatibility issues. The absorbent was thoroughly mixed with the liquids for at least one minute, and then allowed to sit for a minimum of five minutes. Batches of liquids were allowed to cure for a minimum of one hour prior to being packaged into an outgoing waste container.

Evaluation Of Nitrate Bearing Liquids Ignitability Characteristic 40 CFR 261.21 (OE-2 Action 2)

- Nochar N965 is a proprietary blend organic polymer absorbent (copolymer of acrylamide) that is designed and manufactured for the treatment of aqueous liquids (acids to bases) as well as organic liquids (oils to solvents) to mitigate the hazardous characteristics of both ignitability (D001) and corrosivity (D002). It is used at multiple TRU waste facilities within the DOE complex, and has existing vendor testing data addressing the ignitability property under SW-846 Method 1030 type testing after absorption of concentrated nitric acid solutions.
- Use of Nochar N965 for the mitigation of ignitable characteristics (D001) is currently being reviewed throughout the DOE complex due to a lack of complete technical performance testing data in the previously performed vendor tests with emphasis on the oxidizer properties. The TWPC staff works closely with the Carlsbad Field Office/WIPP Difficult Waste team and the lead technical contacts identified in the OE-2 report, and understands that a key issue under consideration is the potential dehydration of polymer absorbents and concentration of nitrates under certain conditions. Specific concerns for the use of organic polymers include the potential for absorbed liquids to evaporate under certain environmental conditions that could lead to a nitrate bearing solid for which existing vendor testing for the mitigation of ignitability characteristics such as oxidizer hazards may not be bounding.
- Nondestructive examination of waste containers with absorbed liquids utilizing Nochar N965 that have been in storage at the TWPC for greater than five years have shown no indication of liquids separating from the absorbent material. Based on the process knowledge of how the liquids were treated, the environmental conditions of extended storage at the TWPC, and evaluation of nondestructive examination records, the Nochar N965 is expected to remain hydrated under nominal storage conditions at the TWPC.
- TWPC is planning to conduct additional technical performance testing to confirm that the treated absorbed liquids will remain effective for the mitigation of all characteristics of ignitability in 40 CFR 261.21 with emphasis on oxidizer properties under the SW-846 Method 1040 test or the UN oxidizing substance test (Section 34, "Classification Procedures, Test Methods and Criteria Relating to Oxidizing Substances of Division 5.1") for final waste forms.

Nitrate Bearing Liquids Inventory/Safety Evaluation (OE-2 Action 3)

- TWPC records for RCRA permitted treatment of non-residual liquids during waste repackaging operations were reviewed to identify drums and their location that contain either known nitrates that were identified in original waste generator records, or through existing process knowledge determinations to be potential nitrate bearing liquids that were solidified using Nochar N965. Based

upon the process knowledge of the ORNL facility missions and the development of AK Summary Reports to support TRU certification activities, these small quantity laboratory scale liquids could include predominately nitric acid or minimally other nitrate bearing materials.

- The review identified a total of 167 drums, one drum with known absorbed nitrate liquid (450 mL of ~0.6 M and 700 mL of ~0.5M aluminum nitrate, nonahydrate) and 166 drums with unspecified small quantity laboratory scale liquids that potentially may contain nitrate bearing (nitric acid) absorbed liquids. The absorbed liquids originated from approximately 15 different waste streams across the Oak Ridge legacy TRU waste inventory. Approximately 102 of the drums have been characterized by nondestructive assay and confirmed to be TRU waste while approximately 65 have yet to be characterized.

CH-UET-OP-003, Box Breakdown Area Operations – Reference P251

This procedure provides instructions for Box Breakdown Area (BBA) operations at the TRU Waste Processing Center (TWPC). CH-UET-OP-003 superseded CH-P-OP-003. CH-UET-OP-003 is not included on the IWMDL because it does not include TRU waste management activities (e.g., liquid sorption). This procedure is included in this AKA because it references other procedures for TRU waste management activities. All revisions of CH-UET-OP-003 and CH-P-OP-003 are available in CCP records but only the current revision is summarized here. Revision 14 was the current version of this procedure when this AKA was done.

Revision 14 (10/6/15)

IF preparing to transfer a loaded waste container into the BBA, review applicable container documentation in the Incoming Container Traveler File, and if necessary, real-time radiography videos, to identify general processing expectations including, but not limited to, the following:

- anticipated waste stream
- anticipated waste matrices (may be more than one)
- identified hazardous materials or PIs from NDE documentation (not applicable for boxes)
- unidentified or suspect materials or items
- presence of liquids within the box or drums
- no single container of liquids greater than 105 gallons is present within a container
- if inner potentially unvented waste drums are present
- potential polychlorinated biphenyl or PI processing instructions or hold points
- potential Operations Prohibited Item Processing report or Waste Nonconformance Report disposition and processing instructions
- appropriate container and material processing equipment is available

Processing Waste

- CH-REF-OP-001, Box Breakdown Area Material Handling Recipes (see Reference P588), contains pre-approved instruction and guidance (recipes) for removing and packaging challenging material from boxes and drums. CH-REF-OP-001, Box Breakdown Area Material Handling Recipes, may be referenced at any time during waste processing activities, as needed.
- Evaluate and disposition material in accordance with CH-REF-OP-013, Contact Handled Waste Repackaging (see Reference P254).

CH-UET-OP-004, Glove Box Operations – Reference P252

This procedure provides instructions for the loading and processing of waste containers within the Glovebox (GB) at the TRU Waste Processing Center (TWPC). CH-UET-OP-004 superseded CH-P-OP-004. CH-UET-OP-004 is not included on the IWMDL because it does not include TRU waste management activities (e.g., liquid sorption). This procedure is included in this AKA because it references other procedures for TRU waste management activities. All revisions of CH-UET-OP-004 and CH-P-OP-004 are available in CCP records but only the current revision is summarized here. Revision 12 was the current version of this procedure when this AKA was done.

Revision 12 (6/15/15)

Review documentation in the Container Traveler File, and if necessary, RTR videos to identify general processing expectations including, but not limited to, the following:

- anticipated waste stream
- anticipated waste matrixes (may be more than one)
- identified hazardous materials or prohibited items from NDE documentation
- information valuable for the preparation of processing of the container once inserted into the GB (e.g., location of free liquids that may spill when the drum is tilted for removal of contents)
- appropriate container and material processing equipment is available
- Review the Operations Prohibited Item Processing report or Waste Nonconformance report, if applicable, to verify a disposition is selected, and for specific processing instructions

Processing Waste

- Evaluate and disposition material in accordance with CH-REF-OP-013, Contact Handled Waste Repackaging (see Reference P254).
- If free liquid, containerized liquids or wetted waste materials are exposed to the GB atmosphere, containerize the exposed liquids within a sealable container immediately in accordance with CH-REF-OP-014, Absorbing Liquids in the Glovebox and Box Breakdown Area (see Reference P592).
- If the waste container has been filled, or is otherwise designated for removal from the GB, refer to CH-REF-OP-011, Drum Bag In / Bag Out, to change out waste containers (see Reference P253).

FORMS/ATTACHMENTS COLLECTED FOR EACH CONTAINER

Based on review of the above procedures, the following forms/attachments have been collected for each container addressed in this assessment, as applicable (see attached container list). A documented review of these forms will be appended to this AKA.

Forms/Attachments from NFS

- UCN-2822 Form
  - This is an ORNL form, but it is completed by NFS personnel for ORNL waste acceptance.
  - Available for containers with 1990s closure dates.
  - Included in records for waste stream OR-NFS-CH-SOIL under Reference M003.
- UCN-2109 Form
  - This is an ORNL form, but it is completed by NFS personnel for ORNL waste acceptance.
  - Available for containers with closure dates since 2005.
  - Included in records for waste stream OR-NFS-CH-SOIL under Reference M003.
- Attachment 6, Waste Certification Checklist For CH-TRU (from DCM-03)
  - Available for containers with 1990s closure dates.
  - Included in records for waste stream OR-NFS-CH-SOIL under Reference M003 (attached to the UCN-2822).
- Attachment 1, Radwaste Package Certification Record (from SOP 335-A)
  - Available for containers with closure dates since 2005.
  - Included in records for waste stream OR-NFS-CH-SOIL under Reference M003 (attached to the UCN-2109).
- Attachment 1, Waste Container Packaging Form (from SOP 335-L)
  - Available for containers with closure dates since 2011.
  - Included in records for waste stream OR-NFS-CH-SOIL under Reference M003 (attached to the UCN-2109).

Forms/Attachments for CH Waste Repackaged at the TWPC

- Attachment B, Contact Handled Waste Acceptability Review Checklist (from CH-REF-WP-001 and predecessors)
  - Included in the Incoming Waste Container Traveler file (Reference M289).
  - Completed prior to acceptance of the container at the TWPC.
  - Available for each CH parent container accepted onto the TWPC site.
- Attachment D, Contact Handled Waste Repackaging Data Form (from CH-REF-OP-013 and predecessors)
  - Completed for each CH container repackaged at the TWPC since 5/2/07.
  - Included in records for waste stream OR-NFS-CH-SOIL under Reference M075.

- Attachment F, Uncharacterized Waste Guidance (from CH-REF-OP-013 and predecessors)
  - This attachment has existed since 9/10/13.
  - Completed as necessary for CH waste repackaged at the TWPC.
  - To date, this form has not been completed for waste stream OR-NFS-CH-SOIL.
- Attachment O, Miscellaneous Treatment Inspection Log Sheet (from CM-P-EN-013 and predecessors)
  - Completed as necessary when containerized and/or non-residual liquids are absorbed.
  - Not required when absorbing incidental/residual liquids.
  - Available for waste repackaged since 8/9/07.
  - To date, this form has not been completed for waste stream OR-NFS-CH-SOIL.
- Attachment B, Field Evaluation of Potentially Energetic Materials (from CM-P-WP-016)
  - Completed as necessary to document that energetic materials were appropriately managed.
  - Available for waste repackaged since 5/31/12.
  - To date, this form has not been completed for waste stream OR-NFS-CH-SOIL.
- Attachment B, Operations Prohibited Item Processing (from CH-REF-OP-044 and predecessors)
  - Completed as necessary for prohibited items that have established predetermined direction for remediation.
  - Available for CH and RH waste repackaged since 5/24/10.
  - Included in records for waste stream OR-NFS-CH-SOIL under Reference M290.
- Attachment E, Waste Nonconformance Report (from CH-P-AD-044 and predecessors)
  - Completed as necessary to document nonconforming items in the waste.
  - After 2/15/07, a WNCR was not completed for prohibited items that had established predetermined directions for remediation (see CH-P-OP-022 and CH-REF-OP-044).
  - Included in records for waste stream OR-NFS-CH-SOIL under Reference M290.

ABSORBENT/IMMOBILIZATION AGENTS AND NEUTRALIZATION AGENTS

The following neutralization and absorbent/immobilization agents were identified during the review of the AK record for waste stream OR-NFS-CH-SOIL.

Neutralization Agents

Based on this review of AK documentation, neutralization agents were not used in historic NFS operations in regards to this waste stream and are not used for waste processing at the TWPC.

Absorbent/Immobilization Agents (NFS)

Radsorb – Used by NFS for liquid/moisture absorption in soil generated in the 1990s during the first phase of decommissioning. Soil was placed into a mixer along with 10 pounds Radsorb per drum (References P315). Radsorb is a sodium polyacrylate homopolymer (Reference M011).

Radpads – Used by NFS as a precaution for liquid/moisture absorption in soil generated in the 1990s during the first phase of decommissioning. A Radpad is placed in the bottom of the drum and on top of the soil (References P315, U058). Radpads are a cellulosic laminate containing a superabsorbent polymer (Reference M011).

ENCAP 107 – Used by NFS for liquid/moisture absorption in soil generated during the final phase of decommissioning from 2011 to present (References M003, P1401, P1432). ENCAP 107 is sodium polyacrylate (Reference M011).

Quik-Solid – Approved for use at NFS; however, based on review of container paperwork, Quik-Solid was not added to soil (References M003, P1401, P1432). Quik-Solid is sodium polyacrylate (Reference M011).

Waste Lock 770 – Approved for use at NFS; however, based on review of container paperwork, Waste Lock 770 was not added to soil (References M003, P1401, P1432). Waste Lock 770 is sodium polyacrylate (Reference M011).

Absorbent/Immobilization Agents (TWPC)

Nochar N965 – Per TWPC procedure , Nochar N965 is approved for use by the TWPC for environmental media (e.g., soil) if liquids are discovered (References M075, P592). Nochar N965 is a thermoplastic elastomer copolymer of acrylamide and is a blend of the Nochar Acid Bond and Petro Bond products (Reference M011).

Solid-a-Sorb – Per TWPC procedure, Solid-a-Sorb is approved for use by the TWPC for environmental media (e.g., soil) if liquids are discovered (References M075, P588, P592). Solid-a-Sorb is primarily diatomaceous earth with small amounts of crystalline silica (Reference M011).

Quik-Solid – Per TWPC procedure, Quik-Solid is approved for use by the TWPC for environmental media (e.g., soil) if liquids are discovered; however, based on review of container paperwork, Quik-Solid was not used (References M075, P592). Quik-Solid is sodium polyacrylate (Reference M011).

NEW AND UPDATED AK SOURCE DOCUMENTS

The following source documents are cited in AK Summary Report CCP-AK-ORNL-001, Revision 10. Missing revisions of these documents and procedures have been obtained and submitted CCP Records:

Reference P251 – CH-P-OP-003 & CP-UET-OP-003, Box Breakdown Area Operations

Reference P252 – CH-P-OP-004 & CH-UET-OP-004, Glove Box Operations

Reference P253 – CH-P-OP-011 & CH-REF-OP-011, Drum Bag In/Bag Out and Glove Ports

Reference P254 – CH-P-OP-013 & CH-REF-OP-013, Contact Handled Waste Repackaging

Reference P255 – CH-X-AD-001, Contact Handled Waste Acceptance Criteria

Reference P306 – DCM-17, Excavation of 110 Lab Tank

Reference P315 – DCM-61, Wet Cell Soil Excavation and Mixing

Reference P317 – DCM-03, Packaging for Shipment to Processing, Storage, or Burial

Reference P432 – CM-R-AD-001, TRU Waste Processing Center Document Safety Analysis (OUO)

Reference P1116 – CH-I-OP-013, Absorbing Liquids

Reference P1400 – NFS-DC-133, Operating Procedure for Soil Excavation, Treatment and Packaging for the 234 Excavation Facility

Reference P1401 – SOP 335-L, Waste Packaging for WIPP Disposal

The following source documents are not cited in AK Summary Report CCP-AK-ORNL-001, Revision 10. All relevant revisions of these documents and procedures have been submitted to CCP Records:

Reference M271 – LL-A-OP-010, NTS WAC, Mixed Low Level Waste Profile

Reference M289 – Incoming Container Traveler

Reference M290 – Operations Prohibited Item Processing and Waste Nonconformance Reports

Reference P587 – CM-P-WP-016, Energetic Materials Management

Reference P588 – T-CH-FW-I-OP-001, CH-P-OP-001, & CH-REF-OP-001, Box Breakdown Area Material Handling Recipes

Reference P589 – CH-P-OP-046 & CH-REF-OP-046, Glove Ports and Sleeve Transfers

Reference P592 – CH-REF-OP-014, Absorbing Liquids in the Glovebox and Box Breakdown Area

Reference P598 – CH-P-OP-044 & CH-REF-OP-044, Operations Prohibited Item Processing

Reference P599 – CH-P-OP-022, CH-P-OP-045, & CH-REF-OP-045, Non-Compliant Containers

Reference P1432 – SOP 335-A, General Requirements for Waste Handling/Packaging

Reference P1433 – CM-P-EN-013, Environmental Permits and Compliance

Reference P1434 – CM-A-WP-004, Energetic Materials Program Reference

Reference P1444 – CH-A-OP-011 & CH-REF-WP-001, Contact Handled Waste Container Selection Process

Reference P1445 – CM-R-WP-006, Review of Potential Nitrate Bearing Liquids Treatment

Reference P1446 – CM-P-RP-309, Environmental Permits – Inspections/Monitoring and Reporting

CONCLUSION

NFS had a TRU waste certification program and procedures in place and since decommissioning of the site began in the early-1990s, and ORNL also had a WAC in place for acceptance of NFS waste for storage. The NFS plans and procedures and ORNL WAC did not allow free liquids, pyrophorics, explosives, or compressed gases in the waste. Sodium polyacrylate absorbent (Radsorb) was mixed into the soil by NFS to prevent accumulation of free liquids. Almost 20 years later, NFS began another effort in 2011 of excavating and packaging soils, and shipping the waste to ORNL for storage. A new procedure was developed by NFS for excavation and packaging of soil which described the addition of a sodium polyacrylate absorbent (Encap) to soil to prevent accumulation of free liquids. Paint filter tests for liquids were also conducted by NFS to ensure a sufficient amount of absorbent was mixed with the soil. NFS also developed a new procedure for general waste handling and packaging, and a procedure for packaging TRU waste. The general waste handling and packaging procedure included requirements for describing the type and quantity of absorbent materials used, excluding incompatible wastes from being packaged in the same container, and prohibited ignitable, corrosive, and reactive wastes. The TRU waste packaging procedure prohibited internal shielding for high radiation items, machine-compacted waste, free liquids, unvented containers larger than four liters, pyrophorics, incompatible waste, and wastes exhibiting the characteristics of ignitability, corrosivity, or reactivity including explosives, compressed gases, and aerosol cans.

CCP began radiography of the NFS soils in 2008. Containers are repackaged at the TWPC to remediate prohibited items identified by radiography and to package the waste into compliant payload containers as necessary (e.g., repackaging of boxes containing soils into 55-gallon drums). The TWPC TRU waste certification program ensures waste transferred from ORNL storage to the TWPC site meet the TWPC WAC. The TWPC has procedures in place to identify and subsequently remove or remediate prohibited items including liquids, heat-sealed bags, sealed containers greater than four liters, pressurized containers (e.g., aerosol cans), inner containers shielding high radiation items, incompatible materials, and ignitable, corrosive, and reactive materials including energetic materials (e.g., shock sensitive, explosive, or pyrophoric materials).

Several boxes of NFS soil were repackaged into 55-gallon drums in the BBA. TWPC procedure describes the addition of Solid-a-Sorb (diatomaceous earth) between layers of soil to prevent the accumulation of free liquids. Radiography determined most of the NFS soil does not contain prohibited items; however, a few drums were determined to contain observable liquid. These drums were repackaged at the TWPC where Solid-a-Sorb or Nochar N965 (thermoplastic elastomer copolymer of acrylamide) was added to absorb the liquid.

CONTAINER ID	CONTAINER ID	CONTAINER ID	CONTAINER ID	CONTAINER ID
NFS0154	X10C1100269	X10C1250140	X10C1250227	X10C1250273
NFS0183A	X10C1100270	X10C1250148	X10C1250228	X10C1250274
NFS0183B	X10C1100271	X10C1250149	X10C1250229	X10C1250275
NFS0335	X10C1100273	X10C1250150	X10C1250230	X10C1250276
NFS0487A	X10C1100274	X10C1250154	X10C1250231	X10C1250277
NFS0489A	X10C1100275	X10C1250155	X10C1250232	X10C1250278
NFS0555A	X10C1100289	X10C1250156	X10C1250233	X10C1250280
NFS0663A	X10C1100290	X10C1250164	X10C1250234	X10C1250281
NFS0667A	X10C1100291	X10C1250169	X10C1250235	X10C1250282
NFS0689A	X10C1100292	X10C1250170	X10C1250236	X10C1250283
NFS0794A	X10C1100293	X10C1250171	X10C1250237	X10C1250284
NFS0815	X10C1100294	X10C1250174	X10C1250238	X10C1250285
NFS0822A	X10C1100295	X10C1250175	X10C1250239	X10C1250286
NFS0822B	X10C1100296	X10C1250176	X10C1250240	X10C1250287
X10C0506150B	X10C1100297	X10C1250177	X10C1250241	X10C1250288
X10C0506150C	X10C1100298	X10C1250178	X10C1250242	X10C1250289
X10C0506151B	X10C1100299	X10C1250179	X10C1250243	X10C1250290
X10C0506151C	X10C1100300	X10C1250181	X10C1250244	X10C1250291
X10C0506151E	X10C1250100	X10C1250182	X10C1250245	X10C1250292
X10C0506152B	X10C1250101	X10C1250183	X10C1250246	X10C1250293
X10C1100202	X10C1250102	X10C1250184	X10C1250247	X10C1250294
X10C1100203	X10C1250103	X10C1250186	X10C1250248	X10C1250295
X10C1100205	X10C1250104	X10C1250187	X10C1250249	X10C1250296
X10C1100208	X10C1250105	X10C1250188	X10C1250250	X10C1250297
X10C1100209	X10C1250106	X10C1250193	X10C1250251	X10C1250298
X10C1100211	X10C1250107	X10C1250196	X10C1250252	X10C1250299
X10C1100215	X10C1250108	X10C1250202	X10C1250253	X10C1250511
X10C1100216	X10C1250110	X10C1250203	X10C1250254	X10C1250514
X10C1100218	X10C1250111	X10C1250204	X10C1250256	X10C1250515
X10C1100240	X10C1250112	X10C1250205	X10C1250258	X10C1250516
X10C1100241	X10C1250113	X10C1250207	X10C1250259	X10C1250517
X10C1100242	X10C1250114	X10C1250210	X10C1250260	X10C1250525
X10C1100247	X10C1250115	X10C1250211	X10C1250261	X10C1250526
X10C1100249	X10C1250116	X10C1250213	X10C1250262	X10C1250528
X10C1100256	X10C1250118	X10C1250215	X10C1250263	X10C1250530
X10C1100257	X10C1250119	X10C1250216	X10C1250264	X10C1250534
X10C1100258	X10C1250124	X10C1250217	X10C1250265	X10C1250535
X10C1100260	X10C1250126	X10C1250218	X10C1250266	X10C1250536
X10C1100262	X10C1250127	X10C1250219	X10C1250267	X10C1250537
X10C1100264	X10C1250130	X10C1250220	X10C1250268	X10C1250540
X10C1100265	X10C1250131	X10C1250223	X10C1250269	X10C1250541
X10C1100266	X10C1250132	X10C1250224	X10C1250270	X10C1250542
X10C1100267	X10C1250135	X10C1250225	X10C1250271	X10C1250543
X10C1100268	X10C1250136	X10C1250226	X10C1250272	X10C1250544

CONTAINER ID	CONTAINER ID	CONTAINER ID	CONTAINER ID	CONTAINER ID
X10C1250545	X10C1250607	X10C1250681	X10C1250737	X10C1250827
X10C1250546	X10C1250608	X10C1250682	X10C1250738	X10C1250828
X10C1250547	X10C1250613	X10C1250683	X10C1250739	X10C1250829
X10C1250548	X10C1250640	X10C1250685	X10C1250740	X10C1250830
X10C1250549	X10C1250641	X10C1250688	X10C1250742	X10C1250831
X10C1250550	X10C1250642	X10C1250689	X10C1250743	X10C1250832
X10C1250551	X10C1250643	X10C1250694	X10C1250744	X10C1250833
X10C1250552	X10C1250644	X10C1250696	X10C1250745	X10C1250834
X10C1250553	X10C1250645	X10C1250697	X10C1250746	X10C1250835
X10C1250554	X10C1250646	X10C1250698	X10C1250747	X10C1250836
X10C1250555	X10C1250647	X10C1250699	X10C1250748	X10C1250837
X10C1250556	X10C1250648	X10C1250701	X10C1250749	X10C1250838
X10C1250557	X10C1250649	X10C1250702	X10C1250753	X10C1250839
X10C1250558	X10C1250650	X10C1250703	X10C1250754	X10C1350925
X10C1250559	X10C1250651	X10C1250704	X10C1250755	X10C1350926
X10C1250560	X10C1250652	X10C1250705	X10C1250756	X10C1350927
X10C1250561	X10C1250653	X10C1250706	X10C1250757	X10C1350928
X10C1250562	X10C1250654	X10C1250707	X10C1250758	X10C1350929
X10C1250563	X10C1250655	X10C1250708	X10C1250759	X10C1350930
X10C1250564	X10C1250656	X10C1250709	X10C1250760	X10C1350931
X10C1250565	X10C1250657	X10C1250710	X10C1250761	X10C1350932
X10C1250566	X10C1250658	X10C1250711	X10C1250762	X10C1350933
X10C1250567	X10C1250659	X10C1250712	X10C1250763	X10C1350934
X10C1250568	X10C1250660	X10C1250713	X10C1250764	X10C1350935
X10C1250569	X10C1250661	X10C1250714	X10C1250765	X10C1350936
X10C1250570	X10C1250662	X10C1250715	X10C1250767	X10C1350937
X10C1250571	X10C1250663	X10C1250716	X10C1250769	X10C1350938
X10C1250573	X10C1250664	X10C1250717	X10C1250773	X10C1350939
X10C1250574	X10C1250665	X10C1250718	X10C1250774	X10C1350940
X10C1250575	X10C1250666	X10C1250719	X10C1250776	X10C1350942
X10C1250576	X10C1250667	X10C1250720	X10C1250783	X10C1350944
X10C1250577	X10C1250668	X10C1250721	X10C1250786	X10C1350945
X10C1250578	X10C1250669	X10C1250722	X10C1250795	X10C1350946
X10C1250579	X10C1250670	X10C1250724	X10C1250797	X10C1350947
X10C1250580	X10C1250671	X10C1250726	X10C1250801	X10C1350948
X10C1250581	X10C1250672	X10C1250727	X10C1250802	X10C1350950
X10C1250582	X10C1250673	X10C1250728	X10C1250804	X10C1350951
X10C1250583	X10C1250674	X10C1250729	X10C1250806	X10C1350952
X10C1250584	X10C1250675	X10C1250731	X10C1250815	X10C1350953
X10C1250585	X10C1250676	X10C1250732	X10C1250819	X10C1350956
X10C1250586	X10C1250677	X10C1250733	X10C1250822	X10C1350957
X10C1250587	X10C1250678	X10C1250734	X10C1250824	X10C1350958
X10C1250589	X10C1250679	X10C1250735	X10C1250825	X10C1350960
X10C1250603	X10C1250680	X10C1250736	X10C1250826	X10C1350961

CONTAINER ID	CONTAINER ID	CONTAINER ID	CONTAINER ID	CONTAINER ID
X10C1350963	X10C1351013	X10C1351302	X10C1351347	X10C1351441
X10C1350964	X10C1351024	X10C1351303	X10C1351348	X10C1351442
X10C1350965	X10C1351146	X10C1351304	X10C1351349	X10C1351443
X10C1350966	X10C1351168	X10C1351305	X10C1351350	X10C1351444
X10C1350967	X10C1351169	X10C1351306	X10C1351351	X10C1351445
X10C1350969	X10C1351171	X10C1351307	X10C1351352	X10C1351446
X10C1350970	X10C1351173	X10C1351308	X10C1351353	X10C1351447
X10C1350971	X10C1351178	X10C1351310	X10C1351354	X10C1351448
X10C1350972	X10C1351180	X10C1351311	X10C1351355	X10C1351449
X10C1350973	X10C1351184	X10C1351312	X10C1351356	X10C1351450
X10C1350974	X10C1351185	X10C1351313	X10C1351357	X10C1351451
X10C1350976	X10C1351186	X10C1351314	X10C1351358	X10C1351452
X10C1350977	X10C1351187	X10C1351315	X10C1351359	X10C1351453
X10C1350978	X10C1351189	X10C1351316	X10C1351360	X10C1351454
X10C1350979	X10C1351190	X10C1351317	X10C1351361	X10C1351455
X10C1350980	X10C1351191	X10C1351318	X10C1351362	X10C1351456
X10C1350981	X10C1351195	X10C1351319	X10C1351363	X10C1351457
X10C1350982	X10C1351201	X10C1351320	X10C1351364	X10C1351458
X10C1350983	X10C1351202	X10C1351321	X10C1351365	X10C1351459
X10C1350984	X10C1351229	X10C1351322	X10C1351416	X10C1351460
X10C1350985	X10C1351275	X10C1351323	X10C1351417	X10C1351461
X10C1350986	X10C1351276	X10C1351324	X10C1351418	X10C1351462
X10C1350987	X10C1351277	X10C1351325	X10C1351419	X10C1351463
X10C1350988	X10C1351281	X10C1351326	X10C1351420	X10C1351464
X10C1350989	X10C1351282	X10C1351327	X10C1351421	X10C1351465
X10C1350990	X10C1351283	X10C1351328	X10C1351422	X10C1351466
X10C1350991	X10C1351284	X10C1351329	X10C1351423	X10C1351467
X10C1350992	X10C1351285	X10C1351330	X10C1351424	X10C1351468
X10C1350993	X10C1351286	X10C1351331	X10C1351425	X10C1351469
X10C1350994	X10C1351287	X10C1351332	X10C1351426	X10C1351470
X10C1350995	X10C1351288	X10C1351333	X10C1351427	X10C1351471
X10C1350996	X10C1351289	X10C1351334	X10C1351428	X10C1351472
X10C1350997	X10C1351290	X10C1351335	X10C1351429	X10C1351473
X10C1350998	X10C1351291	X10C1351336	X10C1351430	X10C1351474
X10C1350999	X10C1351292	X10C1351337	X10C1351431	X10C1351475
X10C1351000	X10C1351293	X10C1351338	X10C1351432	X10C1351476
X10C1351001	X10C1351294	X10C1351339	X10C1351433	X10C1351477
X10C1351002	X10C1351295	X10C1351340	X10C1351434	X10C1351478
X10C1351003	X10C1351296	X10C1351341	X10C1351435	X10C1351479
X10C1351004	X10C1351297	X10C1351342	X10C1351436	X10C1351480
X10C1351005	X10C1351298	X10C1351343	X10C1351437	X10C1351481
X10C1351006	X10C1351299	X10C1351344	X10C1351438	X10C1351482
X10C1351009	X10C1351300	X10C1351345	X10C1351439	X10C1351483
X10C1351010	X10C1351301	X10C1351346	X10C1351440	X10C1351484

CONTAINER ID	CONTAINER ID	CONTAINER ID	CONTAINER ID	CONTAINER ID
X10C1351485	X10C1351503	X10C1351522	X10C1351540	X10C1351559
X10C1351486	X10C1351504	X10C1351523	X10C1351541	X10C1351560
X10C1351487	X10C1351505	X10C1351524	X10C1351542	X10C1351561
X10C1351488	X10C1351506	X10C1351525	X10C1351544	X10C1351562
X10C1351489	X10C1351507	X10C1351526	X10C1351545	X10C1351563
X10C1351490	X10C1351508	X10C1351527	X10C1351546	X10C1351564
X10C1351491	X10C1351509	X10C1351528	X10C1351547	X10C1351565
X10C1351492	X10C1351510	X10C1351529	X10C1351548	X10C1451608
X10C1351493	X10C1351511	X10C1351530	X10C1351549	X10C1451611
X10C1351494	X10C1351512	X10C1351531	X10C1351550	X10C1451612
X10C1351495	X10C1351513	X10C1351532	X10C1351551	X10C1451615
X10C1351496	X10C1351514	X10C1351533	X10C1351552	X10C1451616
X10C1351497	X10C1351515	X10C1351534	X10C1351553	X10C1451619
X10C1351498	X10C1351516	X10C1351535	X10C1351554	X10C1451639
X10C1351499	X10C1351518	X10C1351536	X10C1351555	X10C1451642
X10C1351500	X10C1351519	X10C1351537	X10C1351556	X10C1451646
X10C1351501	X10C1351520	X10C1351538	X10C1351557	X10C1451647
X10C1351502	X10C1351521	X10C1351539	X10C1351558	

From: Soaterna, Carolina - NWP
To: Harrison, Jeff
Subject: FW: NFS Soils AKA
Date: Tuesday, April 19, 2016 1:00:15 PM

FYI

Carolina Soaterna
Central Characterization Project
Nuclear Waste Partnership, LLC
Contractor for the U.S. Department of Energy
carolina.soaterna@wipp.ws
(575) 234-7445

From: Barton, Thomas [mailto:Thomas.Barton@truproject.com]
Sent: Tuesday, April 19, 2016 12:59 PM
To: Soaterna, Carolina - NWP
Cc: Ramirez, Mike - NWP; Gulbransen, Ed -- NWP Transition Team
Subject: RE: NFS Soils AKA

Comments resolved, no further comments.

Gio

From: Soaterna, Carolina - NWP [mailto:carolina.soaterna@wipp.ws]
Sent: Tuesday, April 12, 2016 6:45 PM
To: Barton, Thomas
Cc: Ramirez, Mike - NWP; Gulbransen, Ed -- NWP Transition Team
Subject: FW: NFS Soils AKA

Thomas,

Please review when possible the attached final version of OR-NFS-CH-SOIL AKA. If you agree with the changes and have no further questions or comments please send me a written notification of concurrence.
A quick response will be greatly appreciated, thank you.

Carolina Soaterna
Central Characterization Project
Nuclear Waste Partnership, LLC
Contractor for the U.S. Department of Energy
carolina.soaterna@wipp.ws
(575) 234-7445

From: Barton, Thomas [mailto:Thomas.Barton@truproject.com]
Sent: Tuesday, April 12, 2016 12:43 PM
To: Soaterna, Carolina - NWP
Cc: Ramirez, Mike - NWP; Greenwood, Trey; Gulbransen, Ed -- NWP Transition Team
Subject: RE: NFS Soils AKA

AK23

CONTAINERID: NFS0183A

ORNL

AK DATA

Container ID	Container Type	AKA Matrix	WDS Status	AK Excluded	WSID	LOTID	LOT Excluded
NFS0183A	55G		NO WDS STATUS	NO	OR-NFS-CH-SOIL	NONE	Need WSPF Approval - NFS-C

BDR DATA

BDRID	Type	Status	Generation Date
OR-MILCC2-0196	NDA	Complete	2015-07-06
OR-RTR7-0140	RTR	Complete	2015-06-25
OR15FG8069	HSG_TRANS	Complete	2015-07-08

NCR DATA

Container ID	NCRID	Status	Release Code
NFS0183A	NO DATA		

REJECT DATA

Container ID	BDRID	NCRID	NCR Status	Release Code	Actual Condition
NFS0183A	NO DATA				

Wednesday, March 9, 2016

CONTAINERID: NFS0757A

ORNL

AK DATA

Container ID	Container Type	AKA Matrix	WDS Status	AK Excluded	WSID	LOTID	LOT Excluded
NFS0757A	55G		NO WDS STATUS	NO	OR-NFS-CH-HOM-A	NONE	Need WSPF Approval

BDR DATA

BDRID	Type	Status	Generation Date
OR-IQ3-0213	NDA	Complete	2011-07-07
OR-MILCC2-0091	NDA	Complete	2014-10-01
OR-RTR6-0426	RTR	Complete	2011-05-04
OR-RTR7-0102	RTR	Complete	2014-09-18
OR11FG11033	HSG_TRANS	Complete	2011-05-11
OR14FG8131	HSG_TRANS	Complete	2014-10-02

NCR DATA

Container ID	NCRID	Status	Release Code
NFS0757A	NCR-ORNL3015110	Closed	Resolved

REJECT DATA

Container ID	BDRID	NCRID	NCR Status	Release Code	Actual Condition
NFS0757A	OR-IQ3-0213	NCR-ORNL3015110	Closed	Resolved	The assays are rejected by the EA for high dead time and/or spectral distortion]

CONTAINERID: NFS0759B1

ORNL

AK DATA

Container ID	Container Type	AKA Matrix	WDS Status	AK Excluded	WSID	LOTID	LOT Excluded
NFS0759B1	POC 12-in		NO WDS STATUS	NO	OR-NFS-CH-HOM-A	NONE	Need WSPF Approval

BDR DATA

BDRID	Type	Status	Generation Date
OR-MILCC2-0154	NDA	Complete	2015-03-04
OR-MILCC2-0226	NDA	Complete	2015-08-31
OR-RTR7-0013	RTR	Complete	2014-02-24
OR14FG8024	HSG_TRANS	Complete	2014-02-25

NCR DATA

Container ID	NCRID	Status	Release Code
NFS0759B1	NCR-ORNL0103150	Open	None

REJECT DATA

Container ID	BDRID	NCRID	NCR Status	Release Code	Actual Condition
NFS0759B1	OR-MILCC2-0154	NCR-ORNL0103150	Open	None	The AK Tracking Spreadsheet states for drum in Box 3, "This waste is packaged in a POC." POCs are not a confirmed container geometry for assay on the MILCC2.

CONTAINERID: X10C1451639

ORNL

AK DATA

Container ID	Container Type	AKA Matrix	WDS Status	AK Excluded	WSID	LOTID	LOT Excluded
X10C1451639	55G		PRESUB_CERT	NO	OR-NFS-CH-SOIL	OR-NFS-CH-SOIL-Lot 14 (OR-NFS-CH-SOIL-Lot 14)	

BDR DATA

BDRID	Type	Status	Generation Date
OR-IQ3-0469	NDA	Complete	2015-03-13
OR-RTR6-0636	RTR	Complete	2015-03-12
OR15FG8031	HSG_TRANS	Complete	2015-03-16

NCR DATA

Container ID	NCRID	Status	Release Code
X10C1451639	NO DATA		

REJECT DATA

Container ID	BDRID	NCRID	NCR Status	Release Code	Actual Condition
X10C1451639	NO DATA				

CONTAINERID: X10CSATN03142A

ORNL

AK DATA

Container ID	Container Type	AKA Matrix	WDS Status	AK Excluded	WSID	LOTID	LOT Excluded
X10CSATN03142A	55G		APPROVED_CERT	NO	OR-REDC-CH-HET	OR-REDC-CH-HET-Lot 68 (OR-REDC-CH-HET-Lot 68)	

BDR DATA

BDRID	Type	Status	Generation Date
OR-MILCC2-0116	NDA	Complete	2014-11-18
OR-RTR7-0124	RTR	Complete	2014-11-17
OR14FG8160	HSG_TRANS	Complete	2014-11-24

NCR DATA

Container ID	NCRID	Status	Release Code
X10CSATN03142A	NO DATA		

REJECT DATA

Container ID	BDRID	NCRID	NCR Status	Release Code	Actual Condition
X10CSATN03142A	NO DATA				

CONTAINERID: X10CSATN03210B

ORNL

AK DATA

Container ID	Container Type	AKA Matrix	WDS Status	AK Excluded	WSID	LOTID	LOT Excluded
X10CSATN03210B	55G		APPROVED_CERT	NO	OR-REDC-CH-HET	OR-REDC-CH-HET-Lot 61 (OR-REDC-CH-HET-Lot 61)	

BDR DATA

BDRID	Type	Status	Generation Date
OR-DWAS-0326	NDA	Complete	2009-11-03
OR-IQ3-0061	NDA	Complete	2010-04-29
OR-MILCC2-0086	NDA	Complete	2014-09-23
OR-RTR6-0256	RTR	Complete	2009-10-28
OR-RTR6-0581	RTR	Complete	2014-09-18
OR09FG4108	HSG_TRANS	Complete	2009-11-05
OR14FG8126	HSG_TRANS	Complete	2014-09-24

NCR DATA

Container ID	NCRID	Status	Release Code
X10CSATN03210B	NCR-ORNL0817090	Closed	Resolved
X10CSATN03210B	NCR-ORNL0860100	Closed	Resolved

REJECT DATA

Container ID	BDRID	NCRID	NCR Status	Release Code	Actual Condition
X10CSATN03210B	OR-DWAS-0326	NCR-ORNL0817090	Closed	Resolved	BOTH SGS AND IPAN ASSAYS ARE REJECTED:

X10CSATN03210B	OR-IQ3-0061	NCR-ORNL0860100	Closed	Resolved	THE ASSAYS ARE REJECTED BY THE EA FOR EXCESSIVE DEAD TIMENOTE: These containers DO NOT have a path forward to determine them acceptable for certification and shipment to WIPP and are permanently returned to the host site.Containers have EITHER been previously assayed on the DWAS/IPAN/SGS NDA system and rejected, OR the excessive dead time identified by IQ3 will result in (1) excessive dead time on the SGS assay AND (2) the IPAN assay (by default) will be rejected for either "Cf-252 uncertainty in AK" (IF REDC Waste Stream) or "No default isotopics in AK" (IF RADP Waste Stream).

CONTAINERID	CONTAINER_TYPE	WHC	SITEID	WASTESTREAM	RTRBDRID	RTRSPMCOMPLETI(
NFS0107A	55G	CH	ORNL	OR-NFS-CH-HOM-A	OR-RTR6-0439	12/18/2013
NFS0148A	55G	CH	ORNL	OR-NFS-CH-HOM-A	OR-RTR6-0439	12/18/2013
NFS0149A	55G	CH	ORNL	OR-NFS-CH-HOM-A	OR-RTR6-0437	12/10/2013
NFS0150A1	55G	CH	ORNL	OR-NFS-CH-HOM-A	OR-RTR6-0438	12/12/2013
NFS0151A	55G	CH	ORNL	OR-NFS-CH-HOM-A	OR-RTR6-0438	12/12/2013
NFS0478A	55G	CH	ORNL	OR-NFS-CH-HOM-A	OR-RTR6-0437	12/10/2013
NFS0479A1	55G	CH	ORNL	OR-NFS-CH-HOM-A	OR-RTR6-0437	12/10/2013
NFS0506A	55G	CH	ORNL	OR-NFS-CH-HOM-A	OR-RTR6-0438	12/12/2013
NFS0506B	55G	CH	ORNL	OR-NFS-CH-HOM-A	OR-RTR6-0438	12/12/2013
NFS0507A	55G	CH	ORNL	OR-NFS-CH-HOM-A	OR-RTR6-0454	1/28/2014
NFS0507B	55G	CH	ORNL	OR-NFS-CH-HOM-A	OR-RTR6-0437	12/10/2013
NFS0508A	55G	CH	ORNL	OR-NFS-CH-HOM-A	OR-RTR6-0439	12/18/2013
NFS0591A	55G	CH	ORNL	OR-NFS-CH-HOM-A	OR-RTR6-0439	12/18/2013
NFS0591B	55G	CH	ORNL	OR-NFS-CH-HOM-A	OR-RTR6-0439	12/18/2013
NFS0592A	55G	CH	ORNL	OR-NFS-CH-HOM-A	OR-RTR6-0438	12/12/2013
NFS0593A	55G	CH	ORNL	OR-NFS-CH-HOM-A	OR-RTR6-0439	12/18/2013
NFS0594A	55G	CH	ORNL	OR-NFS-CH-HOM-A	OR-RTR6-0437	12/10/2013
NFS0673A	55G	CH	ORNL	OR-NFS-CH-HOM-A	OR-RTR6-0438	12/12/2013
NFS0674A	55G	CH	ORNL	OR-NFS-CH-HOM-A	OR-RTR6-0439	12/18/2013
NFS0753A	55G	CH	ORNL	OR-NFS-CH-HOM-A	OR-RTR6-0439	12/18/2013
NFS0754A	55G	CH	ORNL	OR-NFS-CH-HOM-A	OR-RTR7-0009	1/16/2014
NFS0755A	55G	CH	ORNL	OR-NFS-CH-HOM-A	OR-RTR6-0439	12/18/2013
NFS0757A	55G	CH	ORNL	OR-NFS-CH-HOM-A	OR-RTR7-0102	9/23/2014
NFS0758A	55G	CH	ORNL	OR-NFS-CH-HOM-A	OR-RTR6-0439	12/18/2013
NFS0759A	55G	CH	ORNL	OR-NFS-CH-HOM-A	OR-RTR6-0438	12/12/2013
NFS0759B1	POC 12-in	CH	ORNL	OR-NFS-CH-HOM-A	OR-RTR7-0013	3/18/2014
NFS0776A	55G	CH	ORNL	OR-NFS-CH-HOM-A	OR-RTR6-0440	12/18/2013
NFS0777A	55G	CH	ORNL	OR-NFS-CH-HOM-A	OR-RTR7-0010	1/23/2014
NFS0786A	55G	CH	ORNL	OR-NFS-CH-HOM-A	OR-RTR6-0439	12/18/2013
NFS0787A	55G	CH	ORNL	OR-NFS-CH-HOM-A	OR-RTR6-0439	12/18/2013
NFS0788A	55G	CH	ORNL	OR-NFS-CH-HOM-A	OR-RTR6-0438	12/12/2013
NFS0789A	55G	CH	ORNL	OR-NFS-CH-HOM-A	OR-RTR6-0438	12/12/2013
NFS0804A	55G	CH	ORNL	OR-NFS-CH-HOM-A	OR-RTR6-0439	12/18/2013

NFS0805A	55G	CH	ORNL	OR-NFS-CH-HOM-A	OR-RTR6-0438	12/12/2013
NFS0808A	55G	CH	ORNL	OR-NFS-CH-HOM-A	OR-RTR6-0437	12/10/2013
NFS0865A	55G	CH	ORNL	OR-NFS-CH-HOM-A	OR-RTR6-0437	12/10/2013
NFS0865B1	POC 12-in	CH	ORNL	OR-NFS-CH-HOM-A	OR-RTR7-0086	8/22/2014
NFS0879A	55G	CH	ORNL	OR-NFS-CH-HOM-A	OR-RTR6-0437	12/10/2013
NFS0880A	55G	CH	ORNL	OR-NFS-CH-HOM-A	OR-RTR6-0438	12/12/2013
NFS0926A	55G	CH	ORNL	OR-NFS-CH-HOM-A	OR-RTR6-0439	12/18/2013
NFS0929A	55G	CH	ORNL	OR-NFS-CH-HOM-A	OR-RTR6-0438	12/12/2013
NFS0103	55G	CH	ORNL	OR-NFS-CH-SOIL	OR-RTR6-0080	9/23/2008
NFS0104	55G	CH	ORNL	OR-NFS-CH-SOIL	OR-RTR6-0074	9/23/2008
NFS0105	55G	CH	ORNL	OR-NFS-CH-SOIL	OR-RTR6-0071	3/26/2012
NFS0106	55G	CH	ORNL	OR-NFS-CH-SOIL	OR-RTR6-0093	9/23/2008
NFS0108	55G	CH	ORNL	OR-NFS-CH-SOIL	OR-RTR6-0075	10/30/2008
NFS0109	55G	CH	ORNL	OR-NFS-CH-SOIL	OR-RTR6-0094	9/25/2008
NFS0110	55G	CH	ORNL	OR-NFS-CH-SOIL	OR-RTR6-0085	9/11/2008
NFS0111	55G	CH	ORNL	OR-NFS-CH-SOIL	OR-RTR6-0076	12/9/2008
NFS0112	55G	CH	ORNL	OR-NFS-CH-SOIL	OR-RTR6-0096	12/3/2008
NFS0118	55G	CH	ORNL	OR-NFS-CH-SOIL	OR-RTR6-0070	9/23/2008
NFS0119	55G	CH	ORNL	OR-NFS-CH-SOIL	OR-RTR6-0096	12/3/2008
NFS0120	55G	CH	ORNL	OR-NFS-CH-SOIL	OR-RTR6-0079	12/1/2008
NFS0121	55G	CH	ORNL	OR-NFS-CH-SOIL	OR-RTR6-0096	12/3/2008
NFS0122	55G	CH	ORNL	OR-NFS-CH-SOIL	OR-RTR6-0099	11/19/2008
NFS0123	55G	CH	ORNL	OR-NFS-CH-SOIL	OR-RTR6-0098	11/19/2008
NFS0124	55G	CH	ORNL	OR-NFS-CH-SOIL	OR-RTR6-0096	12/3/2008
NFS0125	55G	CH	ORNL	OR-NFS-CH-SOIL	OR-RTR6-0078	9/25/2008
NFS0126	55G	CH	ORNL	OR-NFS-CH-SOIL	OR-RTR6-0099	11/19/2008
NFS0127	55G	CH	ORNL	OR-NFS-CH-SOIL	OR-RTR6-0079	12/1/2008
NFS0128	55G	CH	ORNL	OR-NFS-CH-SOIL	OR-RTR6-0090	9/23/2008
NFS0129	55G	CH	ORNL	OR-NFS-CH-SOIL	OR-RTR6-0074	9/23/2008
NFS0130	55G	CH	ORNL	OR-NFS-CH-SOIL	OR-RTR6-0084	11/2/2010
NFS0131	55G	CH	ORNL	OR-NFS-CH-SOIL	OR-RTR6-0094	9/25/2008
NFS0132	55G	CH	ORNL	OR-NFS-CH-SOIL	OR-RTR6-0081	9/23/2008
NFS0133	55G	CH	ORNL	OR-NFS-CH-SOIL	OR-RTR6-0080	9/23/2008
NFS0134	55G	CH	ORNL	OR-NFS-CH-SOIL	OR-RTR6-0072	9/23/2008

NFS0135	55G	CH	ORNL	OR-NFS-CH-SOIL	OR-RTR6-0075	10/30/2008
NFS0136	55G	CH	ORNL	OR-NFS-CH-SOIL	OR-RTR6-0079	12/1/2008
NFS0137	55G	CH	ORNL	OR-NFS-CH-SOIL	OR-RTR6-0098	11/19/2008
NFS0138	55G	CH	ORNL	OR-NFS-CH-SOIL	OR-RTR6-0073	9/23/2008
NFS0139	55G	CH	ORNL	OR-NFS-CH-SOIL	OR-RTR6-0073	9/23/2008
NFS0140	55G	CH	ORNL	OR-NFS-CH-SOIL	OR-RTR6-0073	9/23/2008
NFS0141	55G	CH	ORNL	OR-NFS-CH-SOIL	OR-RTR6-0074	9/23/2008
NFS0142	55G	CH	ORNL	OR-NFS-CH-SOIL	OR-RTR6-0106	11/4/2008
NFS0143	55G	CH	ORNL	OR-NFS-CH-SOIL	OR-RTR6-0101	12/8/2008
NFS0144	55G	CH	ORNL	OR-NFS-CH-SOIL	OR-RTR6-0073	9/23/2008
NFS0145	55G	CH	ORNL	OR-NFS-CH-SOIL	OR-RTR6-0073	9/23/2008
NFS0146	55G	CH	ORNL	OR-NFS-CH-SOIL	OR-RTR6-0103	3/26/2012
NFS0147	55G	CH	ORNL	OR-NFS-CH-SOIL	OR-RTR6-0103	3/26/2012
NFS0152	55G	CH	ORNL	OR-NFS-CH-SOIL	OR-RTR6-0077	12/1/2008
NFS0153	55G	CH	ORNL	OR-NFS-CH-SOIL	OR-RTR6-0101	12/8/2008
NFS0154	55G	CH	ORNL	OR-NFS-CH-SOIL	OR-RTR7-0071	7/28/2014
NFS0155	55G	CH	ORNL	OR-NFS-CH-SOIL	OR-RTR6-0075	10/30/2008
NFS0156	55G	CH	ORNL	OR-NFS-CH-SOIL	OR-RTR6-0098	11/19/2008
NFS0157	55G	CH	ORNL	OR-NFS-CH-SOIL	OR-RTR6-0084	11/2/2010
NFS0158	55G	CH	ORNL	OR-NFS-CH-SOIL	OR-RTR6-0074	9/23/2008
NFS0159	55G	CH	ORNL	OR-NFS-CH-SOIL	OR-RTR6-0096	12/3/2008
NFS0160	55G	CH	ORNL	OR-NFS-CH-SOIL	OR-RTR6-0082	12/9/2008
NFS0161	55G	CH	ORNL	OR-NFS-CH-SOIL	OR-RTR6-0098	11/19/2008
NFS0162	55G	CH	ORNL	OR-NFS-CH-SOIL	OR-RTR6-0076	12/9/2008
NFS0163	55G	CH	ORNL	OR-NFS-CH-SOIL	OR-RTR6-0084	11/2/2010
NFS0164	55G	CH	ORNL	OR-NFS-CH-SOIL	OR-RTR6-0100	11/4/2008
NFS0165	55G	CH	ORNL	OR-NFS-CH-SOIL	OR-RTR6-0092	1/12/2009
NFS0166	55G	CH	ORNL	OR-NFS-CH-SOIL	OR-RTR6-0078	9/25/2008
NFS0167	55G	CH	ORNL	OR-NFS-CH-SOIL	OR-RTR6-0077	12/1/2008
NFS0168	55G	CH	ORNL	OR-NFS-CH-SOIL	OR-RTR6-0096	12/3/2008
NFS0169	55G	CH	ORNL	OR-NFS-CH-SOIL	OR-RTR6-0101	12/8/2008
NFS0170	55G	CH	ORNL	OR-NFS-CH-SOIL	OR-RTR6-0091	9/25/2008
NFS0171	55G	CH	ORNL	OR-NFS-CH-SOIL	OR-RTR6-0104	11/4/2008
NFS0172	55G	CH	ORNL	OR-NFS-CH-SOIL	OR-RTR6-0090	9/23/2008

NFS0173	55G	CH	ORNL	OR-NFS-CH-SOIL	OR-RTR6-0091	9/25/2008
NFS0174	55G	CH	ORNL	OR-NFS-CH-SOIL	OR-RTR6-0091	9/25/2008
NFS0175	55G	CH	ORNL	OR-NFS-CH-SOIL	OR-RTR6-0091	9/25/2008
NFS0176	55G	CH	ORNL	OR-NFS-CH-SOIL	OR-RTR6-0091	9/25/2008
NFS0177	55G	CH	ORNL	OR-NFS-CH-SOIL	OR-RTR6-0105	11/3/2008
NFS0178	55G	CH	ORNL	OR-NFS-CH-SOIL	OR-RTR6-0103	3/26/2012
NFS0179	55G	CH	ORNL	OR-NFS-CH-SOIL	OR-RTR6-0090	9/23/2008
NFS0180	55G	CH	ORNL	OR-NFS-CH-SOIL	OR-RTR6-0090	9/23/2008
NFS0181	55G	CH	ORNL	OR-NFS-CH-SOIL	OR-RTR6-0081	9/23/2008
NFS0183A	55G	CH	ORNL	OR-NFS-CH-SOIL	OR-RTR7-0140	7/9/2015
NFS0183B	55G	CH	ORNL	OR-NFS-CH-SOIL	OR-RTR7-0140	7/9/2015
NFS0184	55G	CH	ORNL	OR-NFS-CH-SOIL	OR-RTR6-0090	9/23/2008
NFS0185	55G	CH	ORNL	OR-NFS-CH-SOIL	OR-RTR6-0091	9/25/2008
NFS0186	55G	CH	ORNL	OR-NFS-CH-SOIL	OR-RTR6-0075	10/30/2008
NFS0187	55G	CH	ORNL	OR-NFS-CH-SOIL	OR-RTR6-0090	9/23/2008
NFS0188	55G	CH	ORNL	OR-NFS-CH-SOIL	OR-RTR6-0080	9/23/2008
NFS0189	55G	CH	ORNL	OR-NFS-CH-SOIL	OR-RTR6-0091	9/25/2008
NFS0190	55G	CH	ORNL	OR-NFS-CH-SOIL	OR-RTR6-0077	12/1/2008
NFS0191	55G	CH	ORNL	OR-NFS-CH-SOIL	OR-RTR6-0105	11/3/2008
NFS0192	55G	CH	ORNL	OR-NFS-CH-SOIL	OR-RTR6-0105	11/3/2008
NFS0193	55G	CH	ORNL	OR-NFS-CH-SOIL	OR-RTR6-0074	9/23/2008
NFS0194	55G	CH	ORNL	OR-NFS-CH-SOIL	OR-RTR6-0074	9/23/2008
NFS0195	55G	CH	ORNL	OR-NFS-CH-SOIL	OR-RTR6-0080	9/23/2008
NFS0196	55G	CH	ORNL	OR-NFS-CH-SOIL	OR-RTR6-0074	9/23/2008
NFS0197	55G	CH	ORNL	OR-NFS-CH-SOIL	OR-RTR6-0079	12/1/2008
NFS0198	55G	CH	ORNL	OR-NFS-CH-SOIL	OR-RTR6-0103	3/26/2012
NFS0199	55G	CH	ORNL	OR-NFS-CH-SOIL	OR-RTR6-0086	9/11/2008
NFS0200	55G	CH	ORNL	OR-NFS-CH-SOIL	OR-RTR6-0085	9/11/2008
NFS0201	55G	CH	ORNL	OR-NFS-CH-SOIL	OR-RTR6-0085	9/11/2008
NFS0202	55G	CH	ORNL	OR-NFS-CH-SOIL	OR-RTR6-0095	9/25/2008
NFS0203	55G	CH	ORNL	OR-NFS-CH-SOIL	OR-RTR6-0080	9/23/2008
NFS0204	55G	CH	ORNL	OR-NFS-CH-SOIL	OR-RTR6-0090	9/23/2008
NFS0205	55G	CH	ORNL	OR-NFS-CH-SOIL	OR-RTR6-0099	11/19/2008
NFS0206	55G	CH	ORNL	OR-NFS-CH-SOIL	OR-RTR6-0095	9/25/2008

NFS0207	55G	CH	ORNL	OR-NFS-CH-SOIL	OR-RTR6-0096	12/3/2008
NFS0208	55G	CH	ORNL	OR-NFS-CH-SOIL	OR-RTR6-0096	12/3/2008
NFS0209	55G	CH	ORNL	OR-NFS-CH-SOIL	OR-RTR6-0095	9/25/2008
NFS0210	55G	CH	ORNL	OR-NFS-CH-SOIL	OR-RTR6-0081	9/23/2008
NFS0211	55G	CH	ORNL	OR-NFS-CH-SOIL	OR-RTR6-0093	9/23/2008
NFS0212	55G	CH	ORNL	OR-NFS-CH-SOIL	OR-RTR6-0100	11/4/2008
NFS0213	55G	CH	ORNL	OR-NFS-CH-SOIL	OR-RTR6-0074	9/23/2008
NFS0214	55G	CH	ORNL	OR-NFS-CH-SOIL	OR-RTR6-0081	9/23/2008
NFS0215	55G	CH	ORNL	OR-NFS-CH-SOIL	OR-RTR6-0094	9/25/2008
NFS0216	55G	CH	ORNL	OR-NFS-CH-SOIL	OR-RTR6-0080	9/23/2008
NFS0217	55G	CH	ORNL	OR-NFS-CH-SOIL	OR-RTR6-0080	9/23/2008
NFS0218	55G	CH	ORNL	OR-NFS-CH-SOIL	OR-RTR6-0100	11/4/2008
NFS0219	55G	CH	ORNL	OR-NFS-CH-SOIL	OR-RTR6-0094	9/25/2008
NFS0220	55G	CH	ORNL	OR-NFS-CH-SOIL	OR-RTR6-0106	11/4/2008
NFS0221	55G	CH	ORNL	OR-NFS-CH-SOIL	OR-RTR6-0096	12/3/2008
NFS0222	55G	CH	ORNL	OR-NFS-CH-SOIL	OR-RTR6-0086	9/11/2008
NFS0223	55G	CH	ORNL	OR-NFS-CH-SOIL	OR-RTR6-0093	9/23/2008
NFS0224	55G	CH	ORNL	OR-NFS-CH-SOIL	OR-RTR6-0077	12/1/2008
NFS0225	55G	CH	ORNL	OR-NFS-CH-SOIL	OR-RTR6-0093	9/23/2008
NFS0226	55G	CH	ORNL	OR-NFS-CH-SOIL	OR-RTR6-0082	12/9/2008
NFS0227	55G	CH	ORNL	OR-NFS-CH-SOIL	OR-RTR6-0082	12/9/2008
NFS0228	55G	CH	ORNL	OR-NFS-CH-SOIL	OR-RTR6-0093	9/23/2008
NFS0231	55G	CH	ORNL	OR-NFS-CH-SOIL	OR-RTR6-0071	3/26/2012
NFS0232	55G	CH	ORNL	OR-NFS-CH-SOIL	OR-RTR6-0083	9/11/2008
NFS0233	55G	CH	ORNL	OR-NFS-CH-SOIL	OR-RTR6-0094	9/25/2008
NFS0234	55G	CH	ORNL	OR-NFS-CH-SOIL	OR-RTR6-0080	9/23/2008
NFS0235	55G	CH	ORNL	OR-NFS-CH-SOIL	OR-RTR6-0101	12/8/2008
NFS0236	55G	CH	ORNL	OR-NFS-CH-SOIL	OR-RTR6-0104	11/4/2008
NFS0237	55G	CH	ORNL	OR-NFS-CH-SOIL	OR-RTR6-0081	9/23/2008
NFS0238	55G	CH	ORNL	OR-NFS-CH-SOIL	OR-RTR6-0080	9/23/2008
NFS0239	55G	CH	ORNL	OR-NFS-CH-SOIL	OR-RTR6-0071	3/26/2012
NFS0240	55G	CH	ORNL	OR-NFS-CH-SOIL	OR-RTR6-0094	9/25/2008
NFS0241	55G	CH	ORNL	OR-NFS-CH-SOIL	OR-RTR6-0084	11/2/2010
NFS0242	55G	CH	ORNL	OR-NFS-CH-SOIL	OR-RTR6-0078	9/25/2008

NFS0243	55G	CH	ORNL	OR-NFS-CH-SOIL	OR-RTR6-0083	9/11/2008
NFS0244	55G	CH	ORNL	OR-NFS-CH-SOIL	OR-RTR6-0082	12/9/2008
NFS0245	55G	CH	ORNL	OR-NFS-CH-SOIL	OR-RTR6-0093	9/23/2008
NFS0246	55G	CH	ORNL	OR-NFS-CH-SOIL	OR-RTR6-0078	9/25/2008
NFS0247	55G	CH	ORNL	OR-NFS-CH-SOIL	OR-RTR6-0082	12/9/2008
NFS0248	55G	CH	ORNL	OR-NFS-CH-SOIL	OR-RTR6-0085	9/11/2008
NFS0249	55G	CH	ORNL	OR-NFS-CH-SOIL	OR-RTR6-0079	12/1/2008
NFS0250	55G	CH	ORNL	OR-NFS-CH-SOIL	OR-RTR6-0100	11/4/2008
NFS0251	55G	CH	ORNL	OR-NFS-CH-SOIL	OR-RTR6-0093	9/23/2008
NFS0252	55G	CH	ORNL	OR-NFS-CH-SOIL	OR-RTR6-0094	9/25/2008
NFS0253	55G	CH	ORNL	OR-NFS-CH-SOIL	OR-RTR6-0094	9/25/2008
NFS0254	55G	CH	ORNL	OR-NFS-CH-SOIL	OR-RTR6-0074	9/23/2008
NFS0255	55G	CH	ORNL	OR-NFS-CH-SOIL	OR-RTR6-0071	3/26/2012
NFS0256	55G	CH	ORNL	OR-NFS-CH-SOIL	OR-RTR6-0079	12/1/2008
NFS0257	55G	CH	ORNL	OR-NFS-CH-SOIL	OR-RTR6-0100	11/4/2008
NFS0258	55G	CH	ORNL	OR-NFS-CH-SOIL	OR-RTR6-0092	1/12/2009
NFS0260	55G	CH	ORNL	OR-NFS-CH-SOIL	OR-RTR6-0080	9/23/2008
NFS0262	55G	CH	ORNL	OR-NFS-CH-SOIL	OR-RTR6-0079	12/1/2008
NFS0263	55G	CH	ORNL	OR-NFS-CH-SOIL	OR-RTR6-0096	12/3/2008
NFS0264	55G	CH	ORNL	OR-NFS-CH-SOIL	OR-RTR6-0081	9/23/2008
NFS0265	55G	CH	ORNL	OR-NFS-CH-SOIL	OR-RTR6-0098	11/19/2008
NFS0266	55G	CH	ORNL	OR-NFS-CH-SOIL	OR-RTR6-0073	9/23/2008
NFS0267	55G	CH	ORNL	OR-NFS-CH-SOIL	OR-RTR6-0073	9/23/2008
NFS0268	55G	CH	ORNL	OR-NFS-CH-SOIL	OR-RTR6-0101	12/8/2008
NFS0269	55G	CH	ORNL	OR-NFS-CH-SOIL	OR-RTR6-0073	9/23/2008
NFS0270	55G	CH	ORNL	OR-NFS-CH-SOIL	OR-RTR6-0089	9/25/2008
NFS0271	55G	CH	ORNL	OR-NFS-CH-SOIL	OR-RTR6-0077	12/1/2008
NFS0272	55G	CH	ORNL	OR-NFS-CH-SOIL	OR-RTR6-0090	9/23/2008
NFS0273	55G	CH	ORNL	OR-NFS-CH-SOIL	OR-RTR6-0090	9/23/2008
NFS0274	55G	CH	ORNL	OR-NFS-CH-SOIL	OR-RTR6-0106	11/4/2008
NFS0275	55G	CH	ORNL	OR-NFS-CH-SOIL	OR-RTR6-0106	11/4/2008
NFS0276	55G	CH	ORNL	OR-NFS-CH-SOIL	OR-RTR6-0100	11/4/2008
NFS0277	55G	CH	ORNL	OR-NFS-CH-SOIL	OR-RTR6-0094	9/25/2008
NFS0278	55G	CH	ORNL	OR-NFS-CH-SOIL	OR-RTR6-0084	11/2/2010

NFS0279	55G	CH	ORNL	OR-NFS-CH-SOIL	OR-RTR6-0077	12/1/2008
NFS0280	55G	CH	ORNL	OR-NFS-CH-SOIL	OR-RTR6-0094	9/25/2008
NFS0281	55G	CH	ORNL	OR-NFS-CH-SOIL	OR-RTR6-0098	11/19/2008
NFS0282	55G	CH	ORNL	OR-NFS-CH-SOIL	OR-RTR6-0089	9/25/2008
NFS0283	55G	CH	ORNL	OR-NFS-CH-SOIL	OR-RTR6-0100	11/4/2008
NFS0284	55G	CH	ORNL	OR-NFS-CH-SOIL	OR-RTR6-0072	9/23/2008
NFS0285	55G	CH	ORNL	OR-NFS-CH-SOIL	OR-RTR6-0086	9/11/2008
NFS0286	55G	CH	ORNL	OR-NFS-CH-SOIL	OR-RTR6-0071	3/26/2012
NFS0287	55G	CH	ORNL	OR-NFS-CH-SOIL	OR-RTR6-0080	9/23/2008
NFS0288	55G	CH	ORNL	OR-NFS-CH-SOIL	OR-RTR6-0085	9/11/2008
NFS0289	55G	CH	ORNL	OR-NFS-CH-SOIL	OR-RTR6-0084	11/2/2010
NFS0290	55G	CH	ORNL	OR-NFS-CH-SOIL	OR-RTR6-0098	11/19/2008
NFS0291	55G	CH	ORNL	OR-NFS-CH-SOIL	OR-RTR6-0083	9/11/2008
NFS0292	55G	CH	ORNL	OR-NFS-CH-SOIL	OR-RTR6-0098	11/19/2008
NFS0293	55G	CH	ORNL	OR-NFS-CH-SOIL	OR-RTR6-0079	12/1/2008
NFS0294	55G	CH	ORNL	OR-NFS-CH-SOIL	OR-RTR6-0105	11/3/2008
NFS0295	55G	CH	ORNL	OR-NFS-CH-SOIL	OR-RTR6-0076	12/9/2008
NFS0296	55G	CH	ORNL	OR-NFS-CH-SOIL	OR-RTR6-0093	9/23/2008
NFS0297	55G	CH	ORNL	OR-NFS-CH-SOIL	OR-RTR6-0105	11/3/2008
NFS0298	55G	CH	ORNL	OR-NFS-CH-SOIL	OR-RTR6-0089	9/25/2008
NFS0299	55G	CH	ORNL	OR-NFS-CH-SOIL	OR-RTR6-0072	9/23/2008
NFS0301	55G	CH	ORNL	OR-NFS-CH-SOIL	OR-RTR6-0104	11/4/2008
NFS0302	55G	CH	ORNL	OR-NFS-CH-SOIL	OR-RTR6-0081	9/23/2008
NFS0303	55G	CH	ORNL	OR-NFS-CH-SOIL	OR-RTR6-0081	9/23/2008
NFS0304	55G	CH	ORNL	OR-NFS-CH-SOIL	OR-RTR6-0073	9/23/2008
NFS0305	55G	CH	ORNL	OR-NFS-CH-SOIL	OR-RTR6-0073	9/23/2008
NFS0306	55G	CH	ORNL	OR-NFS-CH-SOIL	OR-RTR6-0101	12/8/2008
NFS0307	55G	CH	ORNL	OR-NFS-CH-SOIL	OR-RTR6-0084	11/2/2010
NFS0308	55G	CH	ORNL	OR-NFS-CH-SOIL	OR-RTR6-0074	9/23/2008
NFS0309	55G	CH	ORNL	OR-NFS-CH-SOIL	OR-RTR6-0074	9/23/2008
NFS0310	55G	CH	ORNL	OR-NFS-CH-SOIL	OR-RTR6-0089	9/25/2008
NFS0311	55G	CH	ORNL	OR-NFS-CH-SOIL	OR-RTR6-0082	12/9/2008
NFS0312	55G	CH	ORNL	OR-NFS-CH-SOIL	OR-RTR6-0082	12/9/2008
NFS0313	55G	CH	ORNL	OR-NFS-CH-SOIL	OR-RTR6-0081	9/23/2008

NFS0314	55G	CH	ORNL	OR-NFS-CH-SOIL	OR-RTR6-0089	9/25/2008
NFS0315	55G	CH	ORNL	OR-NFS-CH-SOIL	OR-RTR6-0078	9/25/2008
NFS0316	55G	CH	ORNL	OR-NFS-CH-SOIL	OR-RTR6-0071	3/26/2012
NFS0317	55G	CH	ORNL	OR-NFS-CH-SOIL	OR-RTR6-0078	9/25/2008
NFS0319	55G	CH	ORNL	OR-NFS-CH-SOIL	OR-RTR6-0093	9/23/2008
NFS0320	55G	CH	ORNL	OR-NFS-CH-SOIL	OR-RTR6-0082	12/9/2008
NFS0321	55G	CH	ORNL	OR-NFS-CH-SOIL	OR-RTR6-0092	1/12/2009
NFS0322	55G	CH	ORNL	OR-NFS-CH-SOIL	OR-RTR6-0071	3/26/2012
NFS0323	55G	CH	ORNL	OR-NFS-CH-SOIL	OR-RTR6-0078	9/25/2008
NFS0324	55G	CH	ORNL	OR-NFS-CH-SOIL	OR-RTR6-0085	9/11/2008
NFS0325	55G	CH	ORNL	OR-NFS-CH-SOIL	OR-RTR6-0079	12/1/2008
NFS0326	55G	CH	ORNL	OR-NFS-CH-SOIL	OR-RTR6-0074	9/23/2008
NFS0327	55G	CH	ORNL	OR-NFS-CH-SOIL	OR-RTR6-0082	12/9/2008
NFS0329	55G	CH	ORNL	OR-NFS-CH-SOIL	OR-RTR6-0101	12/8/2008
NFS0330	55G	CH	ORNL	OR-NFS-CH-SOIL	OR-RTR6-0074	9/23/2008
NFS0331	55G	CH	ORNL	OR-NFS-CH-SOIL	OR-RTR6-0074	9/23/2008
NFS0332	55G	CH	ORNL	OR-NFS-CH-SOIL	OR-RTR6-0084	11/2/2010
NFS0333	55G	CH	ORNL	OR-NFS-CH-SOIL	OR-RTR6-0079	12/1/2008
NFS0334	55G	CH	ORNL	OR-NFS-CH-SOIL	OR-RTR6-0093	9/23/2008
NFS0335	55G	CH	ORNL	OR-NFS-CH-SOIL	OR-RTR7-0060	7/11/2014
NFS0336	55G	CH	ORNL	OR-NFS-CH-SOIL	OR-RTR6-0072	9/23/2008
NFS0337	55G	CH	ORNL	OR-NFS-CH-SOIL	OR-RTR6-0073	9/23/2008
NFS0338	55G	CH	ORNL	OR-NFS-CH-SOIL	OR-RTR6-0080	9/23/2008
NFS0339	55G	CH	ORNL	OR-NFS-CH-SOIL	OR-RTR6-0075	10/30/2008
NFS0340	55G	CH	ORNL	OR-NFS-CH-SOIL	OR-RTR6-0092	1/12/2009
NFS0341	55G	CH	ORNL	OR-NFS-CH-SOIL	OR-RTR6-0074	9/23/2008
NFS0342	55G	CH	ORNL	OR-NFS-CH-SOIL	OR-RTR6-0072	9/23/2008
NFS0343	55G	CH	ORNL	OR-NFS-CH-SOIL	OR-RTR6-0085	9/11/2008
NFS0344	55G	CH	ORNL	OR-NFS-CH-SOIL	OR-RTR6-0098	11/19/2008
NFS0345	55G	CH	ORNL	OR-NFS-CH-SOIL	OR-RTR6-0092	1/12/2009
NFS0346	55G	CH	ORNL	OR-NFS-CH-SOIL	OR-RTR6-0085	9/11/2008
NFS0347	55G	CH	ORNL	OR-NFS-CH-SOIL	OR-RTR6-0070	9/23/2008
NFS0348	55G	CH	ORNL	OR-NFS-CH-SOIL	OR-RTR6-0098	11/19/2008
NFS0349	55G	CH	ORNL	OR-NFS-CH-SOIL	OR-RTR6-0075	10/30/2008

NFS0350	55G	CH	ORNL	OR-NFS-CH-SOIL	OR-RTR6-0093	9/23/2008
NFS0438	55G	CH	ORNL	OR-NFS-CH-SOIL	OR-RTR6-0103	3/26/2012
NFS0439	55G	CH	ORNL	OR-NFS-CH-SOIL	OR-RTR6-0076	12/9/2008
NFS0440	55G	CH	ORNL	OR-NFS-CH-SOIL	OR-RTR6-0092	1/12/2009
NFS0441	55G	CH	ORNL	OR-NFS-CH-SOIL	OR-RTR6-0077	12/1/2008
NFS0442	55G	CH	ORNL	OR-NFS-CH-SOIL	OR-RTR6-0076	12/9/2008
NFS0443	55G	CH	ORNL	OR-NFS-CH-SOIL	OR-RTR6-0104	11/4/2008
NFS0444	55G	CH	ORNL	OR-NFS-CH-SOIL	OR-RTR6-0077	12/1/2008
NFS0445	55G	CH	ORNL	OR-NFS-CH-SOIL	OR-RTR6-0100	11/4/2008
NFS0446	55G	CH	ORNL	OR-NFS-CH-SOIL	OR-RTR6-0078	9/25/2008
NFS0447	55G	CH	ORNL	OR-NFS-CH-SOIL	OR-RTR6-0104	11/4/2008
NFS0449	55G	CH	ORNL	OR-NFS-CH-SOIL	OR-RTR6-0079	12/1/2008
NFS0451	55G	CH	ORNL	OR-NFS-CH-SOIL	OR-RTR6-0098	11/19/2008
NFS0452	55G	CH	ORNL	OR-NFS-CH-SOIL	OR-RTR6-0070	9/23/2008
NFS0453	55G	CH	ORNL	OR-NFS-CH-SOIL	OR-RTR6-0101	12/8/2008
NFS0454	55G	CH	ORNL	OR-NFS-CH-SOIL	OR-RTR6-0100	11/4/2008
NFS0455	55G	CH	ORNL	OR-NFS-CH-SOIL	OR-RTR6-0078	9/25/2008
NFS0456	55G	CH	ORNL	OR-NFS-CH-SOIL	OR-RTR6-0079	12/1/2008
NFS0457	55G	CH	ORNL	OR-NFS-CH-SOIL	OR-RTR6-0085	9/11/2008
NFS0458	55G	CH	ORNL	OR-NFS-CH-SOIL	OR-RTR6-0093	9/23/2008
NFS0459	55G	CH	ORNL	OR-NFS-CH-SOIL	OR-RTR6-0082	12/9/2008
NFS0460	55G	CH	ORNL	OR-NFS-CH-SOIL	OR-RTR6-0086	9/11/2008
NFS0461	55G	CH	ORNL	OR-NFS-CH-SOIL	OR-RTR6-0072	9/23/2008
NFS0463	55G	CH	ORNL	OR-NFS-CH-SOIL	OR-RTR6-0093	9/23/2008
NFS0464	55G	CH	ORNL	OR-NFS-CH-SOIL	OR-RTR6-0081	9/23/2008
NFS0465	55G	CH	ORNL	OR-NFS-CH-SOIL	OR-RTR6-0084	11/2/2010
NFS0466	55G	CH	ORNL	OR-NFS-CH-SOIL	OR-RTR6-0083	9/11/2008
NFS0467	55G	CH	ORNL	OR-NFS-CH-SOIL	OR-RTR6-0096	12/3/2008
NFS0468	55G	CH	ORNL	OR-NFS-CH-SOIL	OR-RTR6-0085	9/11/2008
NFS0469	55G	CH	ORNL	OR-NFS-CH-SOIL	OR-RTR6-0080	9/23/2008
NFS0471	55G	CH	ORNL	OR-NFS-CH-SOIL	OR-RTR6-0071	3/26/2012
NFS0472	55G	CH	ORNL	OR-NFS-CH-SOIL	OR-RTR6-0095	9/25/2008
NFS0473	55G	CH	ORNL	OR-NFS-CH-SOIL	OR-RTR6-0076	12/9/2008
NFS0474	55G	CH	ORNL	OR-NFS-CH-SOIL	OR-RTR6-0078	9/25/2008

NFS0475	55G	CH	ORNL	OR-NFS-CH-SOIL	OR-RTR6-0093	9/23/2008
NFS0476	55G	CH	ORNL	OR-NFS-CH-SOIL	OR-RTR6-0070	9/23/2008
NFS0477	55G	CH	ORNL	OR-NFS-CH-SOIL	OR-RTR6-0094	9/25/2008
NFS0483	55G	CH	ORNL	OR-NFS-CH-SOIL	OR-RTR6-0085	9/11/2008
NFS0484	55G	CH	ORNL	OR-NFS-CH-SOIL	OR-RTR6-0085	9/11/2008
NFS0485	55G	CH	ORNL	OR-NFS-CH-SOIL	OR-RTR6-0076	12/9/2008
NFS0486	55G	CH	ORNL	OR-NFS-CH-SOIL	OR-RTR6-0070	9/23/2008
NFS0487A	55G	CH	ORNL	OR-NFS-CH-SOIL	OR-RTR7-0025	3/31/2014
NFS0488	55G	CH	ORNL	OR-NFS-CH-SOIL	OR-RTR6-0074	9/23/2008
NFS0489A	55G	CH	ORNL	OR-NFS-CH-SOIL	OR-RTR7-0123	11/20/2014
NFS0490	55G	CH	ORNL	OR-NFS-CH-SOIL	OR-RTR6-0100	11/4/2008
NFS0491	55G	CH	ORNL	OR-NFS-CH-SOIL	OR-RTR6-0084	11/2/2010
NFS0492	55G	CH	ORNL	OR-NFS-CH-SOIL	OR-RTR6-0104	11/4/2008
NFS0493	55G	CH	ORNL	OR-NFS-CH-SOIL	OR-RTR6-0098	11/19/2008
NFS0494	55G	CH	ORNL	OR-NFS-CH-SOIL	OR-RTR6-0084	11/2/2010
NFS0495	55G	CH	ORNL	OR-NFS-CH-SOIL	OR-RTR6-0098	11/19/2008
NFS0496	55G	CH	ORNL	OR-NFS-CH-SOIL	OR-RTR6-0085	9/11/2008
NFS0497	55G	CH	ORNL	OR-NFS-CH-SOIL	OR-RTR6-0072	9/23/2008
NFS0498	55G	CH	ORNL	OR-NFS-CH-SOIL	OR-RTR6-0104	11/4/2008
NFS0499	55G	CH	ORNL	OR-NFS-CH-SOIL	OR-RTR6-0075	10/30/2008
NFS0500	55G	CH	ORNL	OR-NFS-CH-SOIL	OR-RTR6-0076	12/9/2008
NFS0517	55G	CH	ORNL	OR-NFS-CH-SOIL	OR-RTR6-0091	9/25/2008
NFS0518	55G	CH	ORNL	OR-NFS-CH-SOIL	OR-RTR6-0092	1/12/2009
NFS0519	55G	CH	ORNL	OR-NFS-CH-SOIL	OR-RTR6-0072	9/23/2008
NFS0520	55G	CH	ORNL	OR-NFS-CH-SOIL	OR-RTR6-0072	9/23/2008
NFS0521	55G	CH	ORNL	OR-NFS-CH-SOIL	OR-RTR6-0101	12/8/2008
NFS0522	55G	CH	ORNL	OR-NFS-CH-SOIL	OR-RTR6-0096	12/3/2008
NFS0523	55G	CH	ORNL	OR-NFS-CH-SOIL	OR-RTR6-0104	11/4/2008
NFS0530	55G	CH	ORNL	OR-NFS-CH-SOIL	OR-RTR6-0075	10/30/2008
NFS0531	55G	CH	ORNL	OR-NFS-CH-SOIL	OR-RTR6-0071	3/26/2012
NFS0532	55G	CH	ORNL	OR-NFS-CH-SOIL	OR-RTR6-0072	9/23/2008
NFS0533	55G	CH	ORNL	OR-NFS-CH-SOIL	OR-RTR6-0105	11/3/2008
NFS0534	55G	CH	ORNL	OR-NFS-CH-SOIL	OR-RTR6-0101	12/8/2008
NFS0535	55G	CH	ORNL	OR-NFS-CH-SOIL	OR-RTR6-0104	11/4/2008

NFS0536	55G	CH	ORNL	OR-NFS-CH-SOIL	OR-RTR6-0077	12/1/2008
NFS0537	55G	CH	ORNL	OR-NFS-CH-SOIL	OR-RTR6-0103	3/26/2012
NFS0544	55G	CH	ORNL	OR-NFS-CH-SOIL	OR-RTR6-0080	9/23/2008
NFS0545	55G	CH	ORNL	OR-NFS-CH-SOIL	OR-RTR6-0094	9/25/2008
NFS0546	55G	CH	ORNL	OR-NFS-CH-SOIL	OR-RTR6-0090	9/23/2008
NFS0547	55G	CH	ORNL	OR-NFS-CH-SOIL	OR-RTR6-0104	11/4/2008
NFS0548	55G	CH	ORNL	OR-NFS-CH-SOIL	OR-RTR6-0096	12/3/2008
NFS0549	55G	CH	ORNL	OR-NFS-CH-SOIL	OR-RTR6-0090	9/23/2008
NFS0550	55G	CH	ORNL	OR-NFS-CH-SOIL	OR-RTR6-0096	12/3/2008
NFS0551	55G	CH	ORNL	OR-NFS-CH-SOIL	OR-RTR6-0084	11/2/2010
NFS0552	55G	CH	ORNL	OR-NFS-CH-SOIL	OR-RTR6-0099	11/19/2008
NFS0553	55G	CH	ORNL	OR-NFS-CH-SOIL	OR-RTR6-0081	9/23/2008
NFS0554	55G	CH	ORNL	OR-NFS-CH-SOIL	OR-RTR6-0095	9/25/2008
NFS0555A	55G	CH	ORNL	OR-NFS-CH-SOIL	OR-RTR7-0140	7/9/2015
NFS0556	55G	CH	ORNL	OR-NFS-CH-SOIL	OR-RTR6-0102	11/4/2008
NFS0557	55G	CH	ORNL	OR-NFS-CH-SOIL	OR-RTR6-0104	11/4/2008
NFS0558	55G	CH	ORNL	OR-NFS-CH-SOIL	OR-RTR6-0081	9/23/2008
NFS0559	55G	CH	ORNL	OR-NFS-CH-SOIL	OR-RTR6-0071	3/26/2012
NFS0560	55G	CH	ORNL	OR-NFS-CH-SOIL	OR-RTR6-0081	9/23/2008
NFS0561	55G	CH	ORNL	OR-NFS-CH-SOIL	OR-RTR6-0090	9/23/2008
NFS0562	55G	CH	ORNL	OR-NFS-CH-SOIL	OR-RTR6-0099	11/19/2008
NFS0563	55G	CH	ORNL	OR-NFS-CH-SOIL	OR-RTR6-0077	12/1/2008
NFS0564	55G	CH	ORNL	OR-NFS-CH-SOIL	OR-RTR6-0081	9/23/2008
NFS0565	55G	CH	ORNL	OR-NFS-CH-SOIL	OR-RTR6-0101	12/8/2008
NFS0566	55G	CH	ORNL	OR-NFS-CH-SOIL	OR-RTR6-0081	9/23/2008
NFS0567	55G	CH	ORNL	OR-NFS-CH-SOIL	OR-RTR6-0082	12/9/2008
NFS0568	55G	CH	ORNL	OR-NFS-CH-SOIL	OR-RTR6-0080	9/23/2008
NFS0569	55G	CH	ORNL	OR-NFS-CH-SOIL	OR-RTR6-0081	9/23/2008
NFS0570	55G	CH	ORNL	OR-NFS-CH-SOIL	OR-RTR6-0079	12/1/2008
NFS0584	55G	CH	ORNL	OR-NFS-CH-SOIL	OR-RTR6-0091	9/25/2008
NFS0585	55G	CH	ORNL	OR-NFS-CH-SOIL	OR-RTR6-0098	11/19/2008
NFS0586	55G	CH	ORNL	OR-NFS-CH-SOIL	OR-RTR6-0081	9/23/2008
NFS0587	55G	CH	ORNL	OR-NFS-CH-SOIL	OR-RTR6-0070	9/23/2008
NFS0588	55G	CH	ORNL	OR-NFS-CH-SOIL	OR-RTR6-0091	9/25/2008

NFS0589	55G	CH	ORNL	OR-NFS-CH-SOIL	OR-RTR6-0077	12/1/2008
NFS0590	55G	CH	ORNL	OR-NFS-CH-SOIL	OR-RTR6-0098	11/19/2008
NFS0595	55G	CH	ORNL	OR-NFS-CH-SOIL	OR-RTR6-0082	12/9/2008
NFS0596	55G	CH	ORNL	OR-NFS-CH-SOIL	OR-RTR6-0077	12/1/2008
NFS0655	55G	CH	ORNL	OR-NFS-CH-SOIL	OR-RTR6-0082	12/9/2008
NFS0656	55G	CH	ORNL	OR-NFS-CH-SOIL	OR-RTR6-0096	12/3/2008
NFS0657	55G	CH	ORNL	OR-NFS-CH-SOIL	OR-RTR6-0073	9/23/2008
NFS0658	55G	CH	ORNL	OR-NFS-CH-SOIL	OR-RTR6-0073	9/23/2008
NFS0659	55G	CH	ORNL	OR-NFS-CH-SOIL	OR-RTR6-0094	9/25/2008
NFS0660	55G	CH	ORNL	OR-NFS-CH-SOIL	OR-RTR6-0091	9/25/2008
NFS0661	55G	CH	ORNL	OR-NFS-CH-SOIL	OR-RTR6-0075	10/30/2008
NFS0662	55G	CH	ORNL	OR-NFS-CH-SOIL	OR-RTR6-0073	9/23/2008
NFS0663A	55G	CH	ORNL	OR-NFS-CH-SOIL	OR-RTR7-0025	3/31/2014
NFS0664	55G	CH	ORNL	OR-NFS-CH-SOIL	OR-RTR6-0077	12/1/2008
NFS0665	55G	CH	ORNL	OR-NFS-CH-SOIL	OR-RTR6-0090	9/23/2008
NFS0666	55G	CH	ORNL	OR-NFS-CH-SOIL	OR-RTR6-0078	9/25/2008
NFS0667A	55G	CH	ORNL	OR-NFS-CH-SOIL	OR-RTR7-0025	3/31/2014
NFS0668	55G	CH	ORNL	OR-NFS-CH-SOIL	OR-RTR6-0094	9/25/2008
NFS0669	55G	CH	ORNL	OR-NFS-CH-SOIL	OR-RTR6-0089	9/25/2008
NFS0670	55G	CH	ORNL	OR-NFS-CH-SOIL	OR-RTR6-0091	9/25/2008
NFS0671	55G	CH	ORNL	OR-NFS-CH-SOIL	OR-RTR6-0085	9/11/2008
NFS0672	55G	CH	ORNL	OR-NFS-CH-SOIL	OR-RTR6-0077	12/1/2008
NFS0675	55G	CH	ORNL	OR-NFS-CH-SOIL	OR-RTR6-0096	12/3/2008
NFS0676	55G	CH	ORNL	OR-NFS-CH-SOIL	OR-RTR6-0086	9/11/2008
NFS0677	55G	CH	ORNL	OR-NFS-CH-SOIL	OR-RTR6-0094	9/25/2008
NFS0678	55G	CH	ORNL	OR-NFS-CH-SOIL	OR-RTR6-0080	9/23/2008
NFS0679	55G	CH	ORNL	OR-NFS-CH-SOIL	OR-RTR6-0078	9/25/2008
NFS0680	55G	CH	ORNL	OR-NFS-CH-SOIL	OR-RTR6-0090	9/23/2008
NFS0681	55G	CH	ORNL	OR-NFS-CH-SOIL	OR-RTR6-0083	9/11/2008
NFS0682	55G	CH	ORNL	OR-NFS-CH-SOIL	OR-RTR6-0076	12/9/2008
NFS0683	55G	CH	ORNL	OR-NFS-CH-SOIL	OR-RTR6-0094	9/25/2008
NFS0684	55G	CH	ORNL	OR-NFS-CH-SOIL	OR-RTR6-0081	9/23/2008
NFS0685	55G	CH	ORNL	OR-NFS-CH-SOIL	OR-RTR6-0095	9/25/2008
NFS0686	55G	CH	ORNL	OR-NFS-CH-SOIL	OR-RTR6-0098	11/19/2008

NFS0687	55G	CH	ORNL	OR-NFS-CH-SOIL	OR-RTR6-0090	9/23/2008
NFS0688	55G	CH	ORNL	OR-NFS-CH-SOIL	OR-RTR6-0090	9/23/2008
NFS0689A	55G	CH	ORNL	OR-NFS-CH-SOIL	OR-RTR7-0011	1/9/2014
NFS0690	55G	CH	ORNL	OR-NFS-CH-SOIL	OR-RTR6-0091	9/25/2008
NFS0691	55G	CH	ORNL	OR-NFS-CH-SOIL	OR-RTR6-0091	9/25/2008
NFS0692	55G	CH	ORNL	OR-NFS-CH-SOIL	OR-RTR6-0104	11/4/2008
NFS0693	55G	CH	ORNL	OR-NFS-CH-SOIL	OR-RTR6-0095	9/25/2008
NFS0694	55G	CH	ORNL	OR-NFS-CH-SOIL	OR-RTR6-0104	11/4/2008
NFS0695	55G	CH	ORNL	OR-NFS-CH-SOIL	OR-RTR6-0091	9/25/2008
NFS0696	55G	CH	ORNL	OR-NFS-CH-SOIL	OR-RTR6-0076	12/9/2008
NFS0697	55G	CH	ORNL	OR-NFS-CH-SOIL	OR-RTR6-0079	12/1/2008
NFS0698	55G	CH	ORNL	OR-NFS-CH-SOIL	OR-RTR6-0106	11/4/2008
NFS0699	55G	CH	ORNL	OR-NFS-CH-SOIL	OR-RTR6-0105	11/3/2008
NFS0700	55G	CH	ORNL	OR-NFS-CH-SOIL	OR-RTR6-0100	11/4/2008
NFS0701	55G	CH	ORNL	OR-NFS-CH-SOIL	OR-RTR6-0098	11/19/2008
NFS0702	55G	CH	ORNL	OR-NFS-CH-SOIL	OR-RTR6-0104	11/4/2008
NFS0703	55G	CH	ORNL	OR-NFS-CH-SOIL	OR-RTR6-0105	11/3/2008
NFS0704	55G	CH	ORNL	OR-NFS-CH-SOIL	OR-RTR6-0085	9/11/2008
NFS0705	55G	CH	ORNL	OR-NFS-CH-SOIL	OR-RTR6-0084	11/2/2010
NFS0706	55G	CH	ORNL	OR-NFS-CH-SOIL	OR-RTR6-0085	9/11/2008
NFS0707	55G	CH	ORNL	OR-NFS-CH-SOIL	OR-RTR6-0105	11/3/2008
NFS0708	55G	CH	ORNL	OR-NFS-CH-SOIL	OR-RTR6-0100	11/4/2008
NFS0709	55G	CH	ORNL	OR-NFS-CH-SOIL	OR-RTR6-0104	11/4/2008
NFS0710	55G	CH	ORNL	OR-NFS-CH-SOIL	OR-RTR6-0095	9/25/2008
NFS0711	55G	CH	ORNL	OR-NFS-CH-SOIL	OR-RTR6-0089	9/25/2008
NFS0712	55G	CH	ORNL	OR-NFS-CH-SOIL	OR-RTR6-0096	12/3/2008
NFS0713	55G	CH	ORNL	OR-NFS-CH-SOIL	OR-RTR6-0094	9/25/2008
NFS0714	55G	CH	ORNL	OR-NFS-CH-SOIL	OR-RTR6-0091	9/25/2008
NFS0715	55G	CH	ORNL	OR-NFS-CH-SOIL	OR-RTR6-0100	11/4/2008
NFS0716	55G	CH	ORNL	OR-NFS-CH-SOIL	OR-RTR6-0076	12/9/2008
NFS0717	55G	CH	ORNL	OR-NFS-CH-SOIL	OR-RTR6-0098	11/19/2008
NFS0718	55G	CH	ORNL	OR-NFS-CH-SOIL	OR-RTR6-0092	1/12/2009
NFS0719	55G	CH	ORNL	OR-NFS-CH-SOIL	OR-RTR6-0094	9/25/2008
NFS0720	55G	CH	ORNL	OR-NFS-CH-SOIL	OR-RTR6-0094	9/25/2008

NFS0721	55G	CH	ORNL	OR-NFS-CH-SOIL	OR-RTR6-0100	11/4/2008
NFS0722	55G	CH	ORNL	OR-NFS-CH-SOIL	OR-RTR6-0092	1/12/2009
NFS0723	55G	CH	ORNL	OR-NFS-CH-SOIL	OR-RTR6-0101	12/8/2008
NFS0724	55G	CH	ORNL	OR-NFS-CH-SOIL	OR-RTR6-0085	9/11/2008
NFS0725	55G	CH	ORNL	OR-NFS-CH-SOIL	OR-RTR6-0086	9/11/2008
NFS0726	55G	CH	ORNL	OR-NFS-CH-SOIL	OR-RTR6-0096	12/3/2008
NFS0727	55G	CH	ORNL	OR-NFS-CH-SOIL	OR-RTR6-0090	9/23/2008
NFS0728	55G	CH	ORNL	OR-NFS-CH-SOIL	OR-RTR6-0103	3/26/2012
NFS0729	55G	CH	ORNL	OR-NFS-CH-SOIL	OR-RTR6-0099	11/19/2008
NFS0730	55G	CH	ORNL	OR-NFS-CH-SOIL	OR-RTR6-0104	11/4/2008
NFS0731	55G	CH	ORNL	OR-NFS-CH-SOIL	OR-RTR6-0099	11/19/2008
NFS0732	55G	CH	ORNL	OR-NFS-CH-SOIL	OR-RTR6-0091	9/25/2008
NFS0733	55G	CH	ORNL	OR-NFS-CH-SOIL	OR-RTR6-0091	9/25/2008
NFS0734	55G	CH	ORNL	OR-NFS-CH-SOIL	OR-RTR6-0089	9/25/2008
NFS0735	55G	CH	ORNL	OR-NFS-CH-SOIL	OR-RTR6-0094	9/25/2008
NFS0736	55G	CH	ORNL	OR-NFS-CH-SOIL	OR-RTR6-0100	11/4/2008
NFS0737	55G	CH	ORNL	OR-NFS-CH-SOIL	OR-RTR6-0078	9/25/2008
NFS0738	55G	CH	ORNL	OR-NFS-CH-SOIL	OR-RTR6-0103	3/26/2012
NFS0739	55G	CH	ORNL	OR-NFS-CH-SOIL	OR-RTR6-0101	12/8/2008
NFS0741	55G	CH	ORNL	OR-NFS-CH-SOIL	OR-RTR6-0091	9/25/2008
NFS0742	55G	CH	ORNL	OR-NFS-CH-SOIL	OR-RTR6-0077	12/1/2008
NFS0743	55G	CH	ORNL	OR-NFS-CH-SOIL	OR-RTR6-0090	9/23/2008
NFS0744	55G	CH	ORNL	OR-NFS-CH-SOIL	OR-RTR6-0092	1/12/2009
NFS0745	55G	CH	ORNL	OR-NFS-CH-SOIL	OR-RTR6-0093	9/23/2008
NFS0746	55G	CH	ORNL	OR-NFS-CH-SOIL	OR-RTR6-0085	9/11/2008
NFS0747	55G	CH	ORNL	OR-NFS-CH-SOIL	OR-RTR6-0077	12/1/2008
NFS0748	55G	CH	ORNL	OR-NFS-CH-SOIL	OR-RTR6-0077	12/1/2008
NFS0749	55G	CH	ORNL	OR-NFS-CH-SOIL	OR-RTR6-0106	11/4/2008
NFS0750	55G	CH	ORNL	OR-NFS-CH-SOIL	OR-RTR6-0080	9/23/2008
NFS0751	55G	CH	ORNL	OR-NFS-CH-SOIL	OR-RTR6-0100	11/4/2008
NFS0760	55G	CH	ORNL	OR-NFS-CH-SOIL	OR-RTR6-0104	11/4/2008
NFS0761	55G	CH	ORNL	OR-NFS-CH-SOIL	OR-RTR6-0081	9/23/2008
NFS0762	55G	CH	ORNL	OR-NFS-CH-SOIL	OR-RTR6-0078	9/25/2008
NFS0763	55G	CH	ORNL	OR-NFS-CH-SOIL	OR-RTR6-0078	9/25/2008

NFS0764	55G	CH	ORNL	OR-NFS-CH-SOIL	OR-RTR6-0099	11/19/2008
NFS0765	55G	CH	ORNL	OR-NFS-CH-SOIL	OR-RTR6-0086	9/11/2008
NFS0767	55G	CH	ORNL	OR-NFS-CH-SOIL	OR-RTR6-0084	11/2/2010
NFS0768	55G	CH	ORNL	OR-NFS-CH-SOIL	OR-RTR6-0101	12/8/2008
NFS0769	55G	CH	ORNL	OR-NFS-CH-SOIL	OR-RTR6-0100	11/4/2008
NFS0770	55G	CH	ORNL	OR-NFS-CH-SOIL	OR-RTR6-0100	11/4/2008
NFS0771	55G	CH	ORNL	OR-NFS-CH-SOIL	OR-RTR6-0096	12/3/2008
NFS0772	55G	CH	ORNL	OR-NFS-CH-SOIL	OR-RTR6-0078	9/25/2008
NFS0773	55G	CH	ORNL	OR-NFS-CH-SOIL	OR-RTR6-0092	1/12/2009
NFS0774	55G	CH	ORNL	OR-NFS-CH-SOIL	OR-RTR6-0073	9/23/2008
NFS0775	55G	CH	ORNL	OR-NFS-CH-SOIL	OR-RTR6-0101	12/8/2008
NFS0778	55G	CH	ORNL	OR-NFS-CH-SOIL	OR-RTR6-0099	11/19/2008
NFS0779	55G	CH	ORNL	OR-NFS-CH-SOIL	OR-RTR6-0076	12/9/2008
NFS0780	55G	CH	ORNL	OR-NFS-CH-SOIL	OR-RTR6-0093	9/23/2008
NFS0781	55G	CH	ORNL	OR-NFS-CH-SOIL	OR-RTR6-0080	9/23/2008
NFS0782	55G	CH	ORNL	OR-NFS-CH-SOIL	OR-RTR6-0090	9/23/2008
NFS0790	55G	CH	ORNL	OR-NFS-CH-SOIL	OR-RTR6-0076	12/9/2008
NFS0791	55G	CH	ORNL	OR-NFS-CH-SOIL	OR-RTR6-0071	3/26/2012
NFS0792	55G	CH	ORNL	OR-NFS-CH-SOIL	OR-RTR6-0078	9/25/2008
NFS0794A	55G	CH	ORNL	OR-NFS-CH-SOIL	OR-RTR7-0008	12/27/2013
NFS0795	55G	CH	ORNL	OR-NFS-CH-SOIL	OR-RTR6-0100	11/4/2008
NFS0796	55G	CH	ORNL	OR-NFS-CH-SOIL	OR-RTR6-0074	9/23/2008
NFS0797	55G	CH	ORNL	OR-NFS-CH-SOIL	OR-RTR6-0093	9/23/2008
NFS0798	55G	CH	ORNL	OR-NFS-CH-SOIL	OR-RTR6-0085	9/11/2008
NFS0799	55G	CH	ORNL	OR-NFS-CH-SOIL	OR-RTR6-0086	9/11/2008
NFS0800	55G	CH	ORNL	OR-NFS-CH-SOIL	OR-RTR6-0076	12/9/2008
NFS0801	55G	CH	ORNL	OR-NFS-CH-SOIL	OR-RTR6-0099	11/19/2008
NFS0802	55G	CH	ORNL	OR-NFS-CH-SOIL	OR-RTR6-0086	9/11/2008
NFS0803	55G	CH	ORNL	OR-NFS-CH-SOIL	OR-RTR6-0077	12/1/2008
NFS0810	55G	CH	ORNL	OR-NFS-CH-SOIL	OR-RTR6-0101	12/8/2008
NFS0812	55G	CH	ORNL	OR-NFS-CH-SOIL	OR-RTR6-0101	12/8/2008
NFS0815	55G	CH	ORNL	OR-NFS-CH-SOIL		
NFS0818	55G	CH	ORNL	OR-NFS-CH-SOIL	OR-RTR6-0104	11/4/2008
NFS0819	55G	CH	ORNL	OR-NFS-CH-SOIL	OR-RTR6-0076	12/9/2008

NFS0820	55G	CH	ORNL	OR-NFS-CH-SOIL	OR-RTR6-0075	10/30/2008
NFS0822A	55G	CH	ORNL	OR-NFS-CH-SOIL		
NFS0822B	55G	CH	ORNL	OR-NFS-CH-SOIL		
NFS0823	55G	CH	ORNL	OR-NFS-CH-SOIL	OR-RTR6-0089	9/25/2008
NFS0824	55G	CH	ORNL	OR-NFS-CH-SOIL	OR-RTR6-0077	12/1/2008
NFS0825	55G	CH	ORNL	OR-NFS-CH-SOIL	OR-RTR6-0100	11/4/2008
NFS0826	55G	CH	ORNL	OR-NFS-CH-SOIL	OR-RTR6-0074	9/23/2008
NFS0827	55G	CH	ORNL	OR-NFS-CH-SOIL	OR-RTR6-0076	12/9/2008
NFS0828	55G	CH	ORNL	OR-NFS-CH-SOIL	OR-RTR6-0093	9/23/2008
NFS0829	55G	CH	ORNL	OR-NFS-CH-SOIL	OR-RTR6-0092	1/12/2009
NFS0830	55G	CH	ORNL	OR-NFS-CH-SOIL	OR-RTR6-0076	12/9/2008
NFS0836	55G	CH	ORNL	OR-NFS-CH-SOIL	OR-RTR6-0092	1/12/2009
NFS0837	55G	CH	ORNL	OR-NFS-CH-SOIL	OR-RTR6-0092	1/12/2009
NFS0838	55G	CH	ORNL	OR-NFS-CH-SOIL	OR-RTR6-0078	9/25/2008
NFS0841	55G	CH	ORNL	OR-NFS-CH-SOIL	OR-RTR6-0078	9/25/2008
NFS0842	55G	CH	ORNL	OR-NFS-CH-SOIL	OR-RTR6-0071	3/26/2012
NFS0844	55G	CH	ORNL	OR-NFS-CH-SOIL	OR-RTR6-0106	11/4/2008
NFS0845	55G	CH	ORNL	OR-NFS-CH-SOIL	OR-RTR6-0090	9/23/2008
NFS0846	55G	CH	ORNL	OR-NFS-CH-SOIL	OR-RTR6-0080	9/23/2008
NFS0847	55G	CH	ORNL	OR-NFS-CH-SOIL	OR-RTR6-0104	11/4/2008
NFS0848	55G	CH	ORNL	OR-NFS-CH-SOIL	OR-RTR6-0105	11/3/2008
NFS0849	55G	CH	ORNL	OR-NFS-CH-SOIL	OR-RTR6-0101	12/8/2008
NFS0850	55G	CH	ORNL	OR-NFS-CH-SOIL	OR-RTR6-0085	9/11/2008
NFS0851	55G	CH	ORNL	OR-NFS-CH-SOIL	OR-RTR6-0104	11/4/2008
NFS0852	55G	CH	ORNL	OR-NFS-CH-SOIL	OR-RTR6-0093	9/23/2008
NFS0862	55G	CH	ORNL	OR-NFS-CH-SOIL	OR-RTR6-0086	9/11/2008
NFS0866	55G	CH	ORNL	OR-NFS-CH-SOIL	OR-RTR6-0076	12/9/2008
NFS0867	55G	CH	ORNL	OR-NFS-CH-SOIL	OR-RTR6-0074	9/23/2008
NFS0923	55G	CH	ORNL	OR-NFS-CH-SOIL	OR-RTR6-0071	3/26/2012
NFS0924	55G	CH	ORNL	OR-NFS-CH-SOIL	OR-RTR6-0098	11/19/2008
NFS0925	55G	CH	ORNL	OR-NFS-CH-SOIL	OR-RTR6-0103	3/26/2012
NFS0930	55G	CH	ORNL	OR-NFS-CH-SOIL	OR-RTR6-0076	12/9/2008
NFS0931	55G	CH	ORNL	OR-NFS-CH-SOIL	OR-RTR6-0086	9/11/2008
X10C0506042	55G	CH	ORNL	OR-NFS-CH-SOIL	OR-RTR6-0111	10/2/2008

X10C0506043	55G	CH	ORNL	OR-NFS-CH-SOIL	OR-RTR6-0103	3/26/2012
X10C0506044	55G	CH	ORNL	OR-NFS-CH-SOIL	OR-RTR6-0111	10/2/2008
X10C0506045	55G	CH	ORNL	OR-NFS-CH-SOIL	OR-RTR6-0103	3/26/2012
X10C0506047	55G	CH	ORNL	OR-NFS-CH-SOIL	OR-RTR6-0305	10/27/2010
X10C0506054	55G	CH	ORNL	OR-NFS-CH-SOIL	OR-RTR6-0103	3/26/2012
X10C0506055	55G	CH	ORNL	OR-NFS-CH-SOIL	OR-RTR6-0070	9/23/2008
X10C0506057	55G	CH	ORNL	OR-NFS-CH-SOIL	OR-RTR6-0111	10/2/2008
X10C0506062	55G	CH	ORNL	OR-NFS-CH-SOIL	OR-RTR6-0103	3/26/2012
X10C0506063	55G	CH	ORNL	OR-NFS-CH-SOIL	OR-RTR6-0103	3/26/2012
X10C0506064	55G	CH	ORNL	OR-NFS-CH-SOIL	OR-RTR6-0111	10/2/2008
X10C0506065	55G	CH	ORNL	OR-NFS-CH-SOIL	OR-RTR6-0103	3/26/2012
X10C0506066	55G	CH	ORNL	OR-NFS-CH-SOIL	OR-RTR6-0111	10/2/2008
X10C0506070	55G	CH	ORNL	OR-NFS-CH-SOIL	OR-RTR6-0103	3/26/2012
X10C0506071	55G	CH	ORNL	OR-NFS-CH-SOIL	OR-RTR6-0103	3/26/2012
X10C0506148A	55G	CH	ORNL	OR-NFS-CH-SOIL	OR-RTR6-0110	1/27/2009
X10C0506149D	55G	CH	ORNL	OR-NFS-CH-SOIL	OR-RTR6-0111	10/2/2008
X10C0506150A	55G	CH	ORNL	OR-NFS-CH-SOIL	OR-RTR6-0317	10/27/2010
X10C0506150B	55G	CH	ORNL	OR-NFS-CH-SOIL	OR-RTR7-0002	12/12/2013
X10C0506150C	55G	CH	ORNL	OR-NFS-CH-SOIL	OR-RTR6-0110	1/27/2009
X10C0506151B	55G	CH	ORNL	OR-NFS-CH-SOIL	OR-RTR7-0002	12/12/2013
X10C0506151C	55G	CH	ORNL	OR-NFS-CH-SOIL	OR-RTR7-0002	12/12/2013
X10C0506151E	55G	CH	ORNL	OR-NFS-CH-SOIL	OR-RTR7-0003	12/12/2013
X10C0506152A	55G	CH	ORNL	OR-NFS-CH-SOIL	OR-RTR6-0111	10/2/2008
X10C0506152B	55G	CH	ORNL	OR-NFS-CH-SOIL	OR-RTR6-0111	10/2/2008
X10C1100202	55G	CH	ORNL	OR-NFS-CH-SOIL	OR-RTR6-0733	3/23/2016
X10C1100203	55G	CH	ORNL	OR-NFS-CH-SOIL	OR-RTR6-0733	3/23/2016
X10C1100205	55G	CH	ORNL	OR-NFS-CH-SOIL	OR-RTR6-0733	3/23/2016
X10C1100208	55G	CH	ORNL	OR-NFS-CH-SOIL	OR-RTR6-0727	3/14/2016
X10C1100209	55G	CH	ORNL	OR-NFS-CH-SOIL	OR-RTR6-0733	3/23/2016
X10C1100211	55G	CH	ORNL	OR-NFS-CH-SOIL	OR-RTR6-0733	3/23/2016
X10C1100215	55G	CH	ORNL	OR-NFS-CH-SOIL		
X10C1100216	55G	CH	ORNL	OR-NFS-CH-SOIL	OR-RTR6-0733	3/23/2016
X10C1100218	55G	CH	ORNL	OR-NFS-CH-SOIL		
X10C1100240	55G	CH	ORNL	OR-NFS-CH-SOIL	OR-RTR6-0733	3/23/2016

X10C1100241	55G	CH	ORNL	OR-NFS-CH-SOIL		
X10C1100242	55G	CH	ORNL	OR-NFS-CH-SOIL		
X10C1100247	55G	CH	ORNL	OR-NFS-CH-SOIL		
X10C1100249	55G	CH	ORNL	OR-NFS-CH-SOIL	OR-RTR6-0729	3/23/2016
X10C1100256	55G	CH	ORNL	OR-NFS-CH-SOIL		
X10C1100257	55G	CH	ORNL	OR-NFS-CH-SOIL	OR-RTR6-0732	3/23/2016
X10C1100258	55G	CH	ORNL	OR-NFS-CH-SOIL	OR-RTR6-0732	3/23/2016
X10C1100260	55G	CH	ORNL	OR-NFS-CH-SOIL		
X10C1100262	55G	CH	ORNL	OR-NFS-CH-SOIL	OR-RTR6-0732	3/23/2016
X10C1100264	55G	CH	ORNL	OR-NFS-CH-SOIL		
X10C1100265	55G	CH	ORNL	OR-NFS-CH-SOIL	OR-RTR6-0732	3/23/2016
X10C1100266	55G	CH	ORNL	OR-NFS-CH-SOIL		
X10C1100267	55G	CH	ORNL	OR-NFS-CH-SOIL		
X10C1100268	55G	CH	ORNL	OR-NFS-CH-SOIL		
X10C1100269	55G	CH	ORNL	OR-NFS-CH-SOIL		
X10C1100270	55G	CH	ORNL	OR-NFS-CH-SOIL		
X10C1100271	55G	CH	ORNL	OR-NFS-CH-SOIL	OR-RTR6-0733	3/23/2016
X10C1100273	55G	CH	ORNL	OR-NFS-CH-SOIL		
X10C1100274	55G	CH	ORNL	OR-NFS-CH-SOIL		
X10C1100275	55G	CH	ORNL	OR-NFS-CH-SOIL		
X10C1100289	55G	CH	ORNL	OR-NFS-CH-SOIL	OR-RTR6-0732	3/23/2016
X10C1100290	55G	CH	ORNL	OR-NFS-CH-SOIL	OR-RTR6-0732	3/23/2016
X10C1100291	55G	CH	ORNL	OR-NFS-CH-SOIL		
X10C1100292	55G	CH	ORNL	OR-NFS-CH-SOIL		
X10C1100293	55G	CH	ORNL	OR-NFS-CH-SOIL		
X10C1100294	55G	CH	ORNL	OR-NFS-CH-SOIL	OR-RTR6-0732	3/23/2016
X10C1100295	55G	CH	ORNL	OR-NFS-CH-SOIL		
X10C1100296	55G	CH	ORNL	OR-NFS-CH-SOIL	OR-RTR6-0732	3/23/2016
X10C1100297	55G	CH	ORNL	OR-NFS-CH-SOIL		
X10C1100298	55G	CH	ORNL	OR-NFS-CH-SOIL		
X10C1100299	55G	CH	ORNL	OR-NFS-CH-SOIL		
X10C1100300	55G	CH	ORNL	OR-NFS-CH-SOIL		
X10C1250100	55G	CH	ORNL	OR-NFS-CH-SOIL	OR-RTR6-0730	3/24/2016
X10C1250101	55G	CH	ORNL	OR-NFS-CH-SOIL	OR-RTR6-0730	3/24/2016

X10C1250102	55G	CH	ORNL	OR-NFS-CH-SOIL	OR-RTR6-0729	3/23/2016
X10C1250103	55G	CH	ORNL	OR-NFS-CH-SOIL	OR-RTR6-0729	3/23/2016
X10C1250104	55G	CH	ORNL	OR-NFS-CH-SOIL	OR-RTR6-0729	3/23/2016
X10C1250105	55G	CH	ORNL	OR-NFS-CH-SOIL	OR-RTR6-0730	3/24/2016
X10C1250106	55G	CH	ORNL	OR-NFS-CH-SOIL	OR-RTR6-0729	3/23/2016
X10C1250107	55G	CH	ORNL	OR-NFS-CH-SOIL	OR-RTR6-0730	3/24/2016
X10C1250108	55G	CH	ORNL	OR-NFS-CH-SOIL	OR-RTR6-0729	3/23/2016
X10C1250110	55G	CH	ORNL	OR-NFS-CH-SOIL	OR-RTR6-0730	3/24/2016
X10C1250111	55G	CH	ORNL	OR-NFS-CH-SOIL	OR-RTR6-0729	3/23/2016
X10C1250112	55G	CH	ORNL	OR-NFS-CH-SOIL	OR-RTR6-0729	3/23/2016
X10C1250113	55G	CH	ORNL	OR-NFS-CH-SOIL	OR-RTR6-0729	3/23/2016
X10C1250114	55G	CH	ORNL	OR-NFS-CH-SOIL	OR-RTR6-0729	3/23/2016
X10C1250115	55G	CH	ORNL	OR-NFS-CH-SOIL	OR-RTR6-0730	3/24/2016
X10C1250116	55G	CH	ORNL	OR-NFS-CH-SOIL	OR-RTR6-0729	3/23/2016
X10C1250118	55G	CH	ORNL	OR-NFS-CH-SOIL	OR-RTR6-0729	3/23/2016
X10C1250119	55G	CH	ORNL	OR-NFS-CH-SOIL	OR-RTR6-0727	3/14/2016
X10C1250130	55G	CH	ORNL	OR-NFS-CH-SOIL	OR-RTR6-0725	3/10/2016
X10C1250136	55G	CH	ORNL	OR-NFS-CH-SOIL	OR-RTR6-0725	3/10/2016
X10C1250148	55G	CH	ORNL	OR-NFS-CH-SOIL	OR-RTR6-0730	3/24/2016
X10C1250150	55G	CH	ORNL	OR-NFS-CH-SOIL	OR-RTR6-0730	3/24/2016
X10C1250156	55G	CH	ORNL	OR-NFS-CH-SOIL	OR-RTR6-0707	1/13/2016
X10C1250164	55G	CH	ORNL	OR-NFS-CH-SOIL	OR-RTR6-0718	3/10/2016
X10C1250169	55G	CH	ORNL	OR-NFS-CH-SOIL	OR-RTR6-0714	2/9/2016
X10C1250176	55G	CH	ORNL	OR-NFS-CH-SOIL	OR-RTR6-0707	1/13/2016
X10C1250177	55G	CH	ORNL	OR-NFS-CH-SOIL	OR-RTR6-0718	3/10/2016
X10C1250178	55G	CH	ORNL	OR-NFS-CH-SOIL	OR-RTR6-0659	6/2/2015
X10C1250179	55G	CH	ORNL	OR-NFS-CH-SOIL	OR-RTR6-0718	3/10/2016
X10C1250181	55G	CH	ORNL	OR-NFS-CH-SOIL	OR-RTR6-0724	3/14/2016
X10C1250182	55G	CH	ORNL	OR-NFS-CH-SOIL	OR-RTR6-0722	3/1/2016
X10C1250183	55G	CH	ORNL	OR-NFS-CH-SOIL	OR-RTR6-0718	3/10/2016
X10C1250184	55G	CH	ORNL	OR-NFS-CH-SOIL	OR-RTR6-0718	3/10/2016
X10C1250186	55G	CH	ORNL	OR-NFS-CH-SOIL	OR-RTR6-0717	2/12/2016
X10C1250187	55G	CH	ORNL	OR-NFS-CH-SOIL	OR-RTR6-0717	2/12/2016
X10C1250188	55G	CH	ORNL	OR-NFS-CH-SOIL	OR-RTR6-0707	1/13/2016

X10C1250193	55G	CH	ORNL	OR-NFS-CH-SOIL	OR-RTR6-0717	2/12/2016
X10C1250196	55G	CH	ORNL	OR-NFS-CH-SOIL	OR-RTR6-0717	2/12/2016
X10C1250202	55G	CH	ORNL	OR-NFS-CH-SOIL	OR-RTR6-0658	6/3/2015
X10C1250203	55G	CH	ORNL	OR-NFS-CH-SOIL	OR-RTR6-0722	3/1/2016
X10C1250204	55G	CH	ORNL	OR-NFS-CH-SOIL	OR-RTR6-0718	3/10/2016
X10C1250205	55G	CH	ORNL	OR-NFS-CH-SOIL	OR-RTR6-0718	3/10/2016
X10C1250207	55G	CH	ORNL	OR-NFS-CH-SOIL	OR-RTR6-0717	2/12/2016
X10C1250210	55G	CH	ORNL	OR-NFS-CH-SOIL	OR-RTR6-0717	2/12/2016
X10C1250211	55G	CH	ORNL	OR-NFS-CH-SOIL	OR-RTR6-0717	2/12/2016
X10C1250213	55G	CH	ORNL	OR-NFS-CH-SOIL	OR-RTR6-0717	2/12/2016
X10C1250215	55G	CH	ORNL	OR-NFS-CH-SOIL	OR-RTR6-0717	2/12/2016
X10C1250216	55G	CH	ORNL	OR-NFS-CH-SOIL	OR-RTR6-0717	2/12/2016
X10C1250217	55G	CH	ORNL	OR-NFS-CH-SOIL	OR-RTR6-0717	2/12/2016
X10C1250218	55G	CH	ORNL	OR-NFS-CH-SOIL	OR-RTR6-0707	1/13/2016
X10C1250219	55G	CH	ORNL	OR-NFS-CH-SOIL	OR-RTR6-0717	2/12/2016
X10C1250220	55G	CH	ORNL	OR-NFS-CH-SOIL	OR-RTR6-0718	3/10/2016
X10C1250223	55G	CH	ORNL	OR-NFS-CH-SOIL	OR-RTR6-0717	2/12/2016
X10C1250224	55G	CH	ORNL	OR-NFS-CH-SOIL	OR-RTR6-0717	2/12/2016
X10C1250225	55G	CH	ORNL	OR-NFS-CH-SOIL	OR-RTR6-0707	1/13/2016
X10C1250226	55G	CH	ORNL	OR-NFS-CH-SOIL	OR-RTR6-0717	2/12/2016
X10C1250227	55G	CH	ORNL	OR-NFS-CH-SOIL	OR-RTR6-0717	2/12/2016
X10C1250228	55G	CH	ORNL	OR-NFS-CH-SOIL	OR-RTR6-0715	2/2/2016
X10C1250229	55G	CH	ORNL	OR-NFS-CH-SOIL	OR-RTR6-0716	2/10/2016
X10C1250230	55G	CH	ORNL	OR-NFS-CH-SOIL	OR-RTR6-0715	2/2/2016
X10C1250231	55G	CH	ORNL	OR-NFS-CH-SOIL	OR-RTR6-0715	2/2/2016
X10C1250232	55G	CH	ORNL	OR-NFS-CH-SOIL	OR-RTR6-0716	2/10/2016
X10C1250233	55G	CH	ORNL	OR-NFS-CH-SOIL	OR-RTR6-0716	2/10/2016
X10C1250234	55G	CH	ORNL	OR-NFS-CH-SOIL	OR-RTR6-0716	2/10/2016
X10C1250235	55G	CH	ORNL	OR-NFS-CH-SOIL	OR-RTR6-0716	2/10/2016
X10C1250236	55G	CH	ORNL	OR-NFS-CH-SOIL	OR-RTR6-0716	2/10/2016
X10C1250237	55G	CH	ORNL	OR-NFS-CH-SOIL	OR-RTR6-0716	2/10/2016
X10C1250238	55G	CH	ORNL	OR-NFS-CH-SOIL	OR-RTR6-0716	2/10/2016
X10C1250239	55G	CH	ORNL	OR-NFS-CH-SOIL	OR-RTR6-0716	2/10/2016
X10C1250240	55G	CH	ORNL	OR-NFS-CH-SOIL	OR-RTR6-0717	2/12/2016

X10C1250241	55G	CH	ORNL	OR-NFS-CH-SOIL	OR-RTR6-0717	2/12/2016
X10C1250242	55G	CH	ORNL	OR-NFS-CH-SOIL	OR-RTR6-0716	2/10/2016
X10C1250243	55G	CH	ORNL	OR-NFS-CH-SOIL	OR-RTR6-0716	2/10/2016
X10C1250244	55G	CH	ORNL	OR-NFS-CH-SOIL	OR-RTR6-0716	2/10/2016
X10C1250245	55G	CH	ORNL	OR-NFS-CH-SOIL	OR-RTR6-0716	2/10/2016
X10C1250246	55G	CH	ORNL	OR-NFS-CH-SOIL	OR-RTR6-0715	2/2/2016
X10C1250247	55G	CH	ORNL	OR-NFS-CH-SOIL	OR-RTR6-0715	2/2/2016
X10C1250248	55G	CH	ORNL	OR-NFS-CH-SOIL	OR-RTR6-0716	2/10/2016
X10C1250249	55G	CH	ORNL	OR-NFS-CH-SOIL	OR-RTR6-0715	2/2/2016
X10C1250250	55G	CH	ORNL	OR-NFS-CH-SOIL	OR-RTR6-0716	2/10/2016
X10C1250251	55G	CH	ORNL	OR-NFS-CH-SOIL	OR-RTR6-0717	2/12/2016
X10C1250252	55G	CH	ORNL	OR-NFS-CH-SOIL	OR-RTR6-0715	2/2/2016
X10C1250253	55G	CH	ORNL	OR-NFS-CH-SOIL	OR-RTR6-0717	2/12/2016
X10C1250254	55G	CH	ORNL	OR-NFS-CH-SOIL	OR-RTR6-0715	2/2/2016
X10C1250256	55G	CH	ORNL	OR-NFS-CH-SOIL	OR-RTR6-0713	2/15/2016
X10C1250258	55G	CH	ORNL	OR-NFS-CH-SOIL	OR-RTR6-0715	2/2/2016
X10C1250259	55G	CH	ORNL	OR-NFS-CH-SOIL	OR-RTR6-0716	2/10/2016
X10C1250260	55G	CH	ORNL	OR-NFS-CH-SOIL	OR-RTR6-0716	2/10/2016
X10C1250261	55G	CH	ORNL	OR-NFS-CH-SOIL	OR-RTR6-0716	2/10/2016
X10C1250262	55G	CH	ORNL	OR-NFS-CH-SOIL	OR-RTR6-0715	2/2/2016
X10C1250263	55G	CH	ORNL	OR-NFS-CH-SOIL	OR-RTR6-0715	2/2/2016
X10C1250264	55G	CH	ORNL	OR-NFS-CH-SOIL	OR-RTR6-0716	2/10/2016
X10C1250265	55G	CH	ORNL	OR-NFS-CH-SOIL	OR-RTR6-0715	2/2/2016
X10C1250266	55G	CH	ORNL	OR-NFS-CH-SOIL	OR-RTR6-0713	2/15/2016
X10C1250267	55G	CH	ORNL	OR-NFS-CH-SOIL	OR-RTR6-0713	2/15/2016
X10C1250268	55G	CH	ORNL	OR-NFS-CH-SOIL	OR-RTR6-0713	2/15/2016
X10C1250269	55G	CH	ORNL	OR-NFS-CH-SOIL	OR-RTR6-0715	2/2/2016
X10C1250270	55G	CH	ORNL	OR-NFS-CH-SOIL	OR-RTR6-0713	2/15/2016
X10C1250271	55G	CH	ORNL	OR-NFS-CH-SOIL	OR-RTR6-0713	2/15/2016
X10C1250272	55G	CH	ORNL	OR-NFS-CH-SOIL	OR-RTR6-0713	2/15/2016
X10C1250273	55G	CH	ORNL	OR-NFS-CH-SOIL	OR-RTR6-0713	2/15/2016
X10C1250274	55G	CH	ORNL	OR-NFS-CH-SOIL	OR-RTR6-0713	2/15/2016
X10C1250275	55G	CH	ORNL	OR-NFS-CH-SOIL	OR-RTR6-0714	2/9/2016
X10C1250276	55G	CH	ORNL	OR-NFS-CH-SOIL	OR-RTR6-0715	2/2/2016

X10C1250277	55G	CH	ORNL	OR-NFS-CH-SOIL	OR-RTR6-0715	2/2/2016
X10C1250278	55G	CH	ORNL	OR-NFS-CH-SOIL	OR-RTR6-0715	2/2/2016
X10C1250280	55G	CH	ORNL	OR-NFS-CH-SOIL	OR-RTR6-0713	2/15/2016
X10C1250281	55G	CH	ORNL	OR-NFS-CH-SOIL	OR-RTR6-0713	2/15/2016
X10C1250282	55G	CH	ORNL	OR-NFS-CH-SOIL	OR-RTR6-0712	1/18/2016
X10C1250283	55G	CH	ORNL	OR-NFS-CH-SOIL	OR-RTR6-0714	2/9/2016
X10C1250284	55G	CH	ORNL	OR-NFS-CH-SOIL	OR-RTR6-0712	1/18/2016
X10C1250285	55G	CH	ORNL	OR-NFS-CH-SOIL	OR-RTR6-0712	1/18/2016
X10C1250286	55G	CH	ORNL	OR-NFS-CH-SOIL	OR-RTR6-0712	1/18/2016
X10C1250287	55G	CH	ORNL	OR-NFS-CH-SOIL	OR-RTR6-0712	1/18/2016
X10C1250288	55G	CH	ORNL	OR-NFS-CH-SOIL	OR-RTR6-0712	1/18/2016
X10C1250289	55G	CH	ORNL	OR-NFS-CH-SOIL	OR-RTR6-0715	2/2/2016
X10C1250290	55G	CH	ORNL	OR-NFS-CH-SOIL	OR-RTR6-0713	2/15/2016
X10C1250291	55G	CH	ORNL	OR-NFS-CH-SOIL	OR-RTR6-0713	2/15/2016
X10C1250292	55G	CH	ORNL	OR-NFS-CH-SOIL	OR-RTR6-0713	2/15/2016
X10C1250293	55G	CH	ORNL	OR-NFS-CH-SOIL	OR-RTR6-0715	2/2/2016
X10C1250294	55G	CH	ORNL	OR-NFS-CH-SOIL	OR-RTR6-0715	2/2/2016
X10C1250295	55G	CH	ORNL	OR-NFS-CH-SOIL	OR-RTR6-0712	1/18/2016
X10C1250296	55G	CH	ORNL	OR-NFS-CH-SOIL	OR-RTR6-0715	2/2/2016
X10C1250297	55G	CH	ORNL	OR-NFS-CH-SOIL	OR-RTR6-0714	2/9/2016
X10C1250298	55G	CH	ORNL	OR-NFS-CH-SOIL	OR-RTR6-0712	1/18/2016
X10C1250299	55G	CH	ORNL	OR-NFS-CH-SOIL	OR-RTR6-0713	2/15/2016
X10C1250511	55G	CH	ORNL	OR-NFS-CH-SOIL	OR-RTR6-0686	9/21/2015
X10C1250514	55G	CH	ORNL	OR-NFS-CH-SOIL	OR-RTR6-0686	9/21/2015
X10C1250515	55G	CH	ORNL	OR-NFS-CH-SOIL	OR-RTR6-0687	9/28/2015
X10C1250516	55G	CH	ORNL	OR-NFS-CH-SOIL	OR-RTR6-0686	9/21/2015
X10C1250517	55G	CH	ORNL	OR-NFS-CH-SOIL	OR-RTR6-0687	9/28/2015
X10C1250525	55G	CH	ORNL	OR-NFS-CH-SOIL	OR-RTR6-0678	9/1/2015
X10C1250526	55G	CH	ORNL	OR-NFS-CH-SOIL	OR-RTR6-0679	9/2/2015
X10C1250528	55G	CH	ORNL	OR-NFS-CH-SOIL	OR-RTR6-0678	9/1/2015
X10C1250530	55G	CH	ORNL	OR-NFS-CH-SOIL	OR-RTR6-0679	9/2/2015
X10C1250534	55G	CH	ORNL	OR-NFS-CH-SOIL	OR-RTR6-0682	9/16/2015
X10C1250535	55G	CH	ORNL	OR-NFS-CH-SOIL	OR-RTR6-0683	9/14/2015
X10C1250536	55G	CH	ORNL	OR-NFS-CH-SOIL	OR-RTR6-0679	9/2/2015

X10C1250537	55G	CH	ORNL	OR-NFS-CH-SOIL	OR-RTR6-0678	9/1/2015
X10C1250540	55G	CH	ORNL	OR-NFS-CH-SOIL	OR-RTR6-0679	9/2/2015
X10C1250541	55G	CH	ORNL	OR-NFS-CH-SOIL	OR-RTR6-0677	8/27/2015
X10C1250542	55G	CH	ORNL	OR-NFS-CH-SOIL	OR-RTR6-0677	8/27/2015
X10C1250543	55G	CH	ORNL	OR-NFS-CH-SOIL	OR-RTR6-0680	9/2/2015
X10C1250544	55G	CH	ORNL	OR-NFS-CH-SOIL	OR-RTR6-0683	9/14/2015
X10C1250545	55G	CH	ORNL	OR-NFS-CH-SOIL	OR-RTR6-0681	9/9/2015
X10C1250546	55G	CH	ORNL	OR-NFS-CH-SOIL	OR-RTR6-0677	8/27/2015
X10C1250547	55G	CH	ORNL	OR-NFS-CH-SOIL	OR-RTR6-0680	9/2/2015
X10C1250548	55G	CH	ORNL	OR-NFS-CH-SOIL	OR-RTR6-0682	9/16/2015
X10C1250549	55G	CH	ORNL	OR-NFS-CH-SOIL	OR-RTR6-0683	9/14/2015
X10C1250550	55G	CH	ORNL	OR-NFS-CH-SOIL	OR-RTR6-0683	9/14/2015
X10C1250551	55G	CH	ORNL	OR-NFS-CH-SOIL	OR-RTR6-0676	8/26/2015
X10C1250552	55G	CH	ORNL	OR-NFS-CH-SOIL	OR-RTR6-0683	9/14/2015
X10C1250553	55G	CH	ORNL	OR-NFS-CH-SOIL	OR-RTR6-0679	9/2/2015
X10C1250554	55G	CH	ORNL	OR-NFS-CH-SOIL	OR-RTR6-0679	9/2/2015
X10C1250555	55G	CH	ORNL	OR-NFS-CH-SOIL	OR-RTR6-0680	9/2/2015
X10C1250556	55G	CH	ORNL	OR-NFS-CH-SOIL	OR-RTR6-0682	9/16/2015
X10C1250557	55G	CH	ORNL	OR-NFS-CH-SOIL	OR-RTR6-0674	8/25/2015
X10C1250558	55G	CH	ORNL	OR-NFS-CH-SOIL	OR-RTR6-0674	8/25/2015
X10C1250559	55G	CH	ORNL	OR-NFS-CH-SOIL	OR-RTR6-0673	8/14/2015
X10C1250560	55G	CH	ORNL	OR-NFS-CH-SOIL	OR-RTR6-0672	8/13/2015
X10C1250561	55G	CH	ORNL	OR-NFS-CH-SOIL	OR-RTR6-0673	8/14/2015
X10C1250562	55G	CH	ORNL	OR-NFS-CH-SOIL	OR-RTR6-0673	8/14/2015
X10C1250563	55G	CH	ORNL	OR-NFS-CH-SOIL	OR-RTR6-0672	8/13/2015
X10C1250564	55G	CH	ORNL	OR-NFS-CH-SOIL	OR-RTR6-0673	8/14/2015
X10C1250565	55G	CH	ORNL	OR-NFS-CH-SOIL	OR-RTR6-0673	8/14/2015
X10C1250566	55G	CH	ORNL	OR-NFS-CH-SOIL	OR-RTR6-0673	8/14/2015
X10C1250567	55G	CH	ORNL	OR-NFS-CH-SOIL	OR-RTR6-0674	8/25/2015
X10C1250568	55G	CH	ORNL	OR-NFS-CH-SOIL	OR-RTR6-0674	8/25/2015
X10C1250569	55G	CH	ORNL	OR-NFS-CH-SOIL	OR-RTR6-0674	8/25/2015
X10C1250570	55G	CH	ORNL	OR-NFS-CH-SOIL	OR-RTR6-0673	8/14/2015
X10C1250571	55G	CH	ORNL	OR-NFS-CH-SOIL	OR-RTR6-0691	10/9/2015
X10C1250573	55G	CH	ORNL	OR-NFS-CH-SOIL	OR-RTR6-0674	8/25/2015

X10C1250574	55G	CH	ORNL	OR-NFS-CH-SOIL	OR-RTR6-0674	8/25/2015
X10C1250575	55G	CH	ORNL	OR-NFS-CH-SOIL	OR-RTR6-0674	8/25/2015
X10C1250576	55G	CH	ORNL	OR-NFS-CH-SOIL	OR-RTR6-0673	8/14/2015
X10C1250577	55G	CH	ORNL	OR-NFS-CH-SOIL	OR-RTR6-0674	8/25/2015
X10C1250578	55G	CH	ORNL	OR-NFS-CH-SOIL	OR-RTR6-0674	8/25/2015
X10C1250579	55G	CH	ORNL	OR-NFS-CH-SOIL	OR-RTR6-0670	8/4/2015
X10C1250580	55G	CH	ORNL	OR-NFS-CH-SOIL	OR-RTR6-0669	7/31/2015
X10C1250581	55G	CH	ORNL	OR-NFS-CH-SOIL	OR-RTR6-0672	8/13/2015
X10C1250582	55G	CH	ORNL	OR-NFS-CH-SOIL	OR-RTR6-0671	8/5/2015
X10C1250583	55G	CH	ORNL	OR-NFS-CH-SOIL	OR-RTR6-0671	8/5/2015
X10C1250584	55G	CH	ORNL	OR-NFS-CH-SOIL	OR-RTR6-0673	8/14/2015
X10C1250585	55G	CH	ORNL	OR-NFS-CH-SOIL	OR-RTR6-0669	7/31/2015
X10C1250586	55G	CH	ORNL	OR-NFS-CH-SOIL	OR-RTR6-0674	8/25/2015
X10C1250587	55G	CH	ORNL	OR-NFS-CH-SOIL	OR-RTR6-0669	7/31/2015
X10C1250589	55G	CH	ORNL	OR-NFS-CH-SOIL	OR-RTR6-0672	8/13/2015
X10C1250603	55G	CH	ORNL	OR-NFS-CH-SOIL	OR-RTR6-0686	9/21/2015
X10C1250607	55G	CH	ORNL	OR-NFS-CH-SOIL	OR-RTR6-0687	9/28/2015
X10C1250608	55G	CH	ORNL	OR-NFS-CH-SOIL	OR-RTR6-0690	9/29/2015
X10C1250613	55G	CH	ORNL	OR-NFS-CH-SOIL	OR-RTR6-0686	9/21/2015
X10C1250640	55G	CH	ORNL	OR-NFS-CH-SOIL	OR-RTR6-0676	8/26/2015
X10C1250641	55G	CH	ORNL	OR-NFS-CH-SOIL	OR-RTR6-0673	8/14/2015
X10C1250642	55G	CH	ORNL	OR-NFS-CH-SOIL	OR-RTR6-0672	8/13/2015
X10C1250643	55G	CH	ORNL	OR-NFS-CH-SOIL	OR-RTR6-0672	8/13/2015
X10C1250644	55G	CH	ORNL	OR-NFS-CH-SOIL	OR-RTR6-0674	8/25/2015
X10C1250645	55G	CH	ORNL	OR-NFS-CH-SOIL	OR-RTR6-0665	7/17/2015
X10C1250646	55G	CH	ORNL	OR-NFS-CH-SOIL	OR-RTR6-0669	7/31/2015
X10C1250647	55G	CH	ORNL	OR-NFS-CH-SOIL	OR-RTR6-0669	7/31/2015
X10C1250648	55G	CH	ORNL	OR-NFS-CH-SOIL	OR-RTR6-0668	8/4/2015
X10C1250649	55G	CH	ORNL	OR-NFS-CH-SOIL	OR-RTR6-0668	8/4/2015
X10C1250650	55G	CH	ORNL	OR-NFS-CH-SOIL	OR-RTR6-0668	8/4/2015
X10C1250651	55G	CH	ORNL	OR-NFS-CH-SOIL	OR-RTR6-0668	8/4/2015
X10C1250652	55G	CH	ORNL	OR-NFS-CH-SOIL	OR-RTR6-0669	7/31/2015
X10C1250653	55G	CH	ORNL	OR-NFS-CH-SOIL	OR-RTR6-0668	8/4/2015
X10C1250654	55G	CH	ORNL	OR-NFS-CH-SOIL	OR-RTR6-0691	10/9/2015

X10C1250655	55G	CH	ORNL	OR-NFS-CH-SOIL	OR-RTR6-0692	10/6/2015
X10C1250656	55G	CH	ORNL	OR-NFS-CH-SOIL	OR-RTR6-0668	8/4/2015
X10C1250657	55G	CH	ORNL	OR-NFS-CH-SOIL	OR-RTR6-0671	8/5/2015
X10C1250658	55G	CH	ORNL	OR-NFS-CH-SOIL	OR-RTR6-0669	7/31/2015
X10C1250659	55G	CH	ORNL	OR-NFS-CH-SOIL	OR-RTR6-0668	8/4/2015
X10C1250660	55G	CH	ORNL	OR-NFS-CH-SOIL	OR-RTR6-0665	7/17/2015
X10C1250661	55G	CH	ORNL	OR-NFS-CH-SOIL	OR-RTR6-0670	8/4/2015
X10C1250662	55G	CH	ORNL	OR-NFS-CH-SOIL	OR-RTR6-0665	7/17/2015
X10C1250663	55G	CH	ORNL	OR-NFS-CH-SOIL	OR-RTR6-0669	7/31/2015
X10C1250664	55G	CH	ORNL	OR-NFS-CH-SOIL	OR-RTR6-0692	10/6/2015
X10C1250665	55G	CH	ORNL	OR-NFS-CH-SOIL	OR-RTR6-0669	7/31/2015
X10C1250666	55G	CH	ORNL	OR-NFS-CH-SOIL	OR-RTR6-0669	7/31/2015
X10C1250667	55G	CH	ORNL	OR-NFS-CH-SOIL	OR-RTR6-0665	7/17/2015
X10C1250668	55G	CH	ORNL	OR-NFS-CH-SOIL	OR-RTR6-0668	8/4/2015
X10C1250669	55G	CH	ORNL	OR-NFS-CH-SOIL	OR-RTR6-0668	8/4/2015
X10C1250670	55G	CH	ORNL	OR-NFS-CH-SOIL	OR-RTR6-0692	10/6/2015
X10C1250671	55G	CH	ORNL	OR-NFS-CH-SOIL	OR-RTR6-0670	8/4/2015
X10C1250672	55G	CH	ORNL	OR-NFS-CH-SOIL	OR-RTR6-0670	8/4/2015
X10C1250673	55G	CH	ORNL	OR-NFS-CH-SOIL	OR-RTR6-0669	7/31/2015
X10C1250674	55G	CH	ORNL	OR-NFS-CH-SOIL	OR-RTR6-0670	8/4/2015
X10C1250675	55G	CH	ORNL	OR-NFS-CH-SOIL	OR-RTR6-0668	8/4/2015
X10C1250676	55G	CH	ORNL	OR-NFS-CH-SOIL	OR-RTR6-0668	8/4/2015
X10C1250677	55G	CH	ORNL	OR-NFS-CH-SOIL	OR-RTR6-0670	8/4/2015
X10C1250678	55G	CH	ORNL	OR-NFS-CH-SOIL	OR-RTR6-0668	8/4/2015
X10C1250679	55G	CH	ORNL	OR-NFS-CH-SOIL	OR-RTR6-0663	7/13/2015
X10C1250680	55G	CH	ORNL	OR-NFS-CH-SOIL	OR-RTR6-0712	1/18/2016
X10C1250681	55G	CH	ORNL	OR-NFS-CH-SOIL	OR-RTR6-0712	1/18/2016
X10C1250682	55G	CH	ORNL	OR-NFS-CH-SOIL	OR-RTR6-0665	7/17/2015
X10C1250683	55G	CH	ORNL	OR-NFS-CH-SOIL	OR-RTR6-0664	7/15/2015
X10C1250685	55G	CH	ORNL	OR-NFS-CH-SOIL	OR-RTR6-0712	1/18/2016
X10C1250688	55G	CH	ORNL	OR-NFS-CH-SOIL	OR-RTR6-0663	7/13/2015
X10C1250689	55G	CH	ORNL	OR-NFS-CH-SOIL	OR-RTR6-0665	7/17/2015
X10C1250694	55G	CH	ORNL	OR-NFS-CH-SOIL	OR-RTR6-0712	1/18/2016
X10C1250696	55G	CH	ORNL	OR-NFS-CH-SOIL	OR-RTR6-0712	1/18/2016

X10C1250697	55G	CH	ORNL	OR-NFS-CH-SOIL	OR-RTR6-0663	7/13/2015
X10C1250698	55G	CH	ORNL	OR-NFS-CH-SOIL	OR-RTR6-0663	7/13/2015
X10C1250699	55G	CH	ORNL	OR-NFS-CH-SOIL	OR-RTR6-0664	7/15/2015
X10C1250701	55G	CH	ORNL	OR-NFS-CH-SOIL	OR-RTR6-0664	7/15/2015
X10C1250702	55G	CH	ORNL	OR-NFS-CH-SOIL	OR-RTR6-0711	1/13/2016
X10C1250703	55G	CH	ORNL	OR-NFS-CH-SOIL	OR-RTR6-0708	1/13/2016
X10C1250704	55G	CH	ORNL	OR-NFS-CH-SOIL	OR-RTR6-0710	1/13/2016
X10C1250705	55G	CH	ORNL	OR-NFS-CH-SOIL	OR-RTR6-0711	1/13/2016
X10C1250706	55G	CH	ORNL	OR-NFS-CH-SOIL	OR-RTR6-0710	1/13/2016
X10C1250707	55G	CH	ORNL	OR-NFS-CH-SOIL	OR-RTR6-0711	1/13/2016
X10C1250708	55G	CH	ORNL	OR-NFS-CH-SOIL	OR-RTR6-0710	1/13/2016
X10C1250709	55G	CH	ORNL	OR-NFS-CH-SOIL	OR-RTR6-0711	1/13/2016
X10C1250710	55G	CH	ORNL	OR-NFS-CH-SOIL	OR-RTR6-0709	1/13/2016
X10C1250711	55G	CH	ORNL	OR-NFS-CH-SOIL	OR-RTR6-0711	1/13/2016
X10C1250712	55G	CH	ORNL	OR-NFS-CH-SOIL	OR-RTR6-0710	1/13/2016
X10C1250713	55G	CH	ORNL	OR-NFS-CH-SOIL	OR-RTR6-0710	1/13/2016
X10C1250714	55G	CH	ORNL	OR-NFS-CH-SOIL	OR-RTR6-0710	1/13/2016
X10C1250715	55G	CH	ORNL	OR-NFS-CH-SOIL	OR-RTR6-0711	1/13/2016
X10C1250716	55G	CH	ORNL	OR-NFS-CH-SOIL	OR-RTR6-0710	1/13/2016
X10C1250717	55G	CH	ORNL	OR-NFS-CH-SOIL	OR-RTR6-0709	1/13/2016
X10C1250718	55G	CH	ORNL	OR-NFS-CH-SOIL	OR-RTR6-0710	1/13/2016
X10C1250719	55G	CH	ORNL	OR-NFS-CH-SOIL	OR-RTR6-0665	7/17/2015
X10C1250720	55G	CH	ORNL	OR-NFS-CH-SOIL	OR-RTR6-0664	7/15/2015
X10C1250721	55G	CH	ORNL	OR-NFS-CH-SOIL	OR-RTR6-0711	1/13/2016
X10C1250722	55G	CH	ORNL	OR-NFS-CH-SOIL	OR-RTR6-0710	1/13/2016
X10C1250724	55G	CH	ORNL	OR-NFS-CH-SOIL	OR-RTR6-0710	1/13/2016
X10C1250726	55G	CH	ORNL	OR-NFS-CH-SOIL	OR-RTR6-0712	1/18/2016
X10C1250727	55G	CH	ORNL	OR-NFS-CH-SOIL	OR-RTR6-0664	7/15/2015
X10C1250728	55G	CH	ORNL	OR-NFS-CH-SOIL	OR-RTR6-0663	7/13/2015
X10C1250729	55G	CH	ORNL	OR-NFS-CH-SOIL	OR-RTR6-0712	1/18/2016
X10C1250731	55G	CH	ORNL	OR-NFS-CH-SOIL	OR-RTR6-0664	7/15/2015
X10C1250732	55G	CH	ORNL	OR-NFS-CH-SOIL	OR-RTR6-0663	7/13/2015
X10C1250733	55G	CH	ORNL	OR-NFS-CH-SOIL	OR-RTR6-0712	1/18/2016
X10C1250734	55G	CH	ORNL	OR-NFS-CH-SOIL	OR-RTR6-0712	1/18/2016

X10C1250735	55G	CH	ORNL	OR-NFS-CH-SOIL	OR-RTR6-0663	7/13/2015
X10C1250736	55G	CH	ORNL	OR-NFS-CH-SOIL	OR-RTR6-0712	1/18/2016
X10C1250737	55G	CH	ORNL	OR-NFS-CH-SOIL	OR-RTR6-0712	1/18/2016
X10C1250738	55G	CH	ORNL	OR-NFS-CH-SOIL	OR-RTR6-0712	1/18/2016
X10C1250739	55G	CH	ORNL	OR-NFS-CH-SOIL	OR-RTR6-0708	1/13/2016
X10C1250740	55G	CH	ORNL	OR-NFS-CH-SOIL	OR-RTR6-0711	1/13/2016
X10C1250742	55G	CH	ORNL	OR-NFS-CH-SOIL	OR-RTR6-0709	1/13/2016
X10C1250743	55G	CH	ORNL	OR-NFS-CH-SOIL	OR-RTR6-0665	7/17/2015
X10C1250744	55G	CH	ORNL	OR-NFS-CH-SOIL	OR-RTR6-0664	7/15/2015
X10C1250745	55G	CH	ORNL	OR-NFS-CH-SOIL	OR-RTR6-0711	1/13/2016
X10C1250746	55G	CH	ORNL	OR-NFS-CH-SOIL	OR-RTR6-0711	1/13/2016
X10C1250747	55G	CH	ORNL	OR-NFS-CH-SOIL	OR-RTR6-0708	1/13/2016
X10C1250748	55G	CH	ORNL	OR-NFS-CH-SOIL	OR-RTR6-0708	1/13/2016
X10C1250749	55G	CH	ORNL	OR-NFS-CH-SOIL	OR-RTR6-0708	1/13/2016
X10C1250753	55G	CH	ORNL	OR-NFS-CH-SOIL	OR-RTR6-0682	9/16/2015
X10C1250754	55G	CH	ORNL	OR-NFS-CH-SOIL	OR-RTR6-0685	9/17/2015
X10C1250755	55G	CH	ORNL	OR-NFS-CH-SOIL	OR-RTR6-0676	8/26/2015
X10C1250756	55G	CH	ORNL	OR-NFS-CH-SOIL	OR-RTR6-0692	10/6/2015
X10C1250757	55G	CH	ORNL	OR-NFS-CH-SOIL	OR-RTR6-0681	9/9/2015
X10C1250758	55G	CH	ORNL	OR-NFS-CH-SOIL	OR-RTR6-0685	9/17/2015
X10C1250759	55G	CH	ORNL	OR-NFS-CH-SOIL	OR-RTR6-0685	9/17/2015
X10C1250760	55G	CH	ORNL	OR-NFS-CH-SOIL	OR-RTR6-0682	9/16/2015
X10C1250761	55G	CH	ORNL	OR-NFS-CH-SOIL	OR-RTR6-0676	8/26/2015
X10C1250762	55G	CH	ORNL	OR-NFS-CH-SOIL	OR-RTR6-0692	10/6/2015
X10C1250763	55G	CH	ORNL	OR-NFS-CH-SOIL	OR-RTR6-0684	9/17/2015
X10C1250764	55G	CH	ORNL	OR-NFS-CH-SOIL	OR-RTR6-0693	10/14/2015
X10C1250765	55G	CH	ORNL	OR-NFS-CH-SOIL	OR-RTR6-0684	9/17/2015
X10C1250767	55G	CH	ORNL	OR-NFS-CH-SOIL	OR-RTR6-0685	9/17/2015
X10C1250769	55G	CH	ORNL	OR-NFS-CH-SOIL	OR-RTR6-0672	8/13/2015
X10C1250773	55G	CH	ORNL	OR-NFS-CH-SOIL	OR-RTR6-0685	9/17/2015
X10C1250774	55G	CH	ORNL	OR-NFS-CH-SOIL	OR-RTR6-0681	9/9/2015
X10C1250776	55G	CH	ORNL	OR-NFS-CH-SOIL	OR-RTR6-0675	8/26/2015
X10C1250783	55G	CH	ORNL	OR-NFS-CH-SOIL	OR-RTR6-0673	8/14/2015
X10C1250786	55G	CH	ORNL	OR-NFS-CH-SOIL	OR-RTR6-0676	8/26/2015

X10C1250795	55G	CH	ORNL	OR-NFS-CH-SOIL	OR-RTR6-0684	9/17/2015
X10C1250797	55G	CH	ORNL	OR-NFS-CH-SOIL	OR-RTR6-0684	9/17/2015
X10C1250801	55G	CH	ORNL	OR-NFS-CH-SOIL	OR-RTR6-0685	9/17/2015
X10C1250802	55G	CH	ORNL	OR-NFS-CH-SOIL	OR-RTR6-0684	9/17/2015
X10C1250804	55G	CH	ORNL	OR-NFS-CH-SOIL	OR-RTR6-0685	9/17/2015
X10C1250806	55G	CH	ORNL	OR-NFS-CH-SOIL	OR-RTR6-0672	8/13/2015
X10C1250815	55G	CH	ORNL	OR-NFS-CH-SOIL	OR-RTR6-0685	9/17/2015
X10C1250819	55G	CH	ORNL	OR-NFS-CH-SOIL	OR-RTR6-0693	10/14/2015
X10C1250822	55G	CH	ORNL	OR-NFS-CH-SOIL	OR-RTR7-0137	6/25/2015
X10C1250824	55G	CH	ORNL	OR-NFS-CH-SOIL	OR-RTR6-0664	7/15/2015
X10C1250825	55G	CH	ORNL	OR-NFS-CH-SOIL	OR-RTR6-0664	7/15/2015
X10C1250826	55G	CH	ORNL	OR-NFS-CH-SOIL	OR-RTR6-0671	8/5/2015
X10C1250827	55G	CH	ORNL	OR-NFS-CH-SOIL	OR-RTR6-0708	1/13/2016
X10C1250828	55G	CH	ORNL	OR-NFS-CH-SOIL	OR-RTR6-0666	7/28/2015
X10C1250829	55G	CH	ORNL	OR-NFS-CH-SOIL	OR-RTR6-0708	1/13/2016
X10C1250830	55G	CH	ORNL	OR-NFS-CH-SOIL	OR-RTR6-0691	10/9/2015
X10C1250831	55G	CH	ORNL	OR-NFS-CH-SOIL	OR-RTR6-0691	10/9/2015
X10C1250832	55G	CH	ORNL	OR-NFS-CH-SOIL	OR-RTR6-0667	7/28/2015
X10C1250833	55G	CH	ORNL	OR-NFS-CH-SOIL	OR-RTR6-0691	10/9/2015
X10C1250834	55G	CH	ORNL	OR-NFS-CH-SOIL	OR-RTR6-0667	7/28/2015
X10C1250835	55G	CH	ORNL	OR-NFS-CH-SOIL	OR-RTR6-0666	7/28/2015
X10C1250836	55G	CH	ORNL	OR-NFS-CH-SOIL	OR-RTR6-0709	1/13/2016
X10C1250837	55G	CH	ORNL	OR-NFS-CH-SOIL	OR-RTR6-0708	1/13/2016
X10C1250838	55G	CH	ORNL	OR-NFS-CH-SOIL	OR-RTR6-0694	10/14/2015
X10C1250839	55G	CH	ORNL	OR-NFS-CH-SOIL	OR-RTR6-0684	9/17/2015
X10C1350925	55G	CH	ORNL	OR-NFS-CH-SOIL	OR-RTR6-0667	7/28/2015
X10C1350926	55G	CH	ORNL	OR-NFS-CH-SOIL	OR-RTR6-0690	9/29/2015
X10C1350927	55G	CH	ORNL	OR-NFS-CH-SOIL	OR-RTR6-0667	7/28/2015
X10C1350928	55G	CH	ORNL	OR-NFS-CH-SOIL	OR-RTR6-0670	8/4/2015
X10C1350929	55G	CH	ORNL	OR-NFS-CH-SOIL	OR-RTR6-0666	7/28/2015
X10C1350930	55G	CH	ORNL	OR-NFS-CH-SOIL	OR-RTR6-0690	9/29/2015
X10C1350931	55G	CH	ORNL	OR-NFS-CH-SOIL	OR-RTR6-0670	8/4/2015
X10C1350932	55G	CH	ORNL	OR-NFS-CH-SOIL	OR-RTR6-0666	7/28/2015
X10C1350933	55G	CH	ORNL	OR-NFS-CH-SOIL	OR-RTR6-0667	7/28/2015

X10C1350934	55G	CH	ORNL	OR-NFS-CH-SOIL	OR-RTR6-0666	7/28/2015
X10C1350935	55G	CH	ORNL	OR-NFS-CH-SOIL	OR-RTR6-0690	9/29/2015
X10C1350936	55G	CH	ORNL	OR-NFS-CH-SOIL	OR-RTR6-0708	1/13/2016
X10C1350937	55G	CH	ORNL	OR-NFS-CH-SOIL	OR-RTR6-0666	7/28/2015
X10C1350938	55G	CH	ORNL	OR-NFS-CH-SOIL	OR-RTR6-0708	1/13/2016
X10C1350939	55G	CH	ORNL	OR-NFS-CH-SOIL	OR-RTR6-0666	7/28/2015
X10C1350940	55G	CH	ORNL	OR-NFS-CH-SOIL	OR-RTR6-0708	1/13/2016
X10C1350942	55G	CH	ORNL	OR-NFS-CH-SOIL	OR-RTR6-0670	8/4/2015
X10C1350944	55G	CH	ORNL	OR-NFS-CH-SOIL	OR-RTR6-0669	7/31/2015
X10C1350945	55G	CH	ORNL	OR-NFS-CH-SOIL	OR-RTR6-0667	7/28/2015
X10C1350946	55G	CH	ORNL	OR-NFS-CH-SOIL	OR-RTR6-0670	8/4/2015
X10C1350947	55G	CH	ORNL	OR-NFS-CH-SOIL	OR-RTR6-0708	1/13/2016
X10C1350948	55G	CH	ORNL	OR-NFS-CH-SOIL	OR-RTR6-0689	9/29/2015
X10C1350950	55G	CH	ORNL	OR-NFS-CH-SOIL	OR-RTR6-0661	6/9/2015
X10C1350951	55G	CH	ORNL	OR-NFS-CH-SOIL	OR-RTR6-0661	6/9/2015
X10C1350952	55G	CH	ORNL	OR-NFS-CH-SOIL	OR-RTR6-0661	6/9/2015
X10C1350953	55G	CH	ORNL	OR-NFS-CH-SOIL	OR-RTR6-0661	6/9/2015
X10C1350956	55G	CH	ORNL	OR-NFS-CH-SOIL	OR-RTR6-0664	7/15/2015
X10C1350957	55G	CH	ORNL	OR-NFS-CH-SOIL	OR-RTR7-0138	6/26/2015
X10C1350958	55G	CH	ORNL	OR-NFS-CH-SOIL	OR-RTR6-0660	6/5/2015
X10C1350960	55G	CH	ORNL	OR-NFS-CH-SOIL	OR-RTR7-0138	6/26/2015
X10C1350961	55G	CH	ORNL	OR-NFS-CH-SOIL	OR-RTR6-0660	6/5/2015
X10C1350963	55G	CH	ORNL	OR-NFS-CH-SOIL	OR-RTR7-0138	6/26/2015
X10C1350964	55G	CH	ORNL	OR-NFS-CH-SOIL	OR-RTR6-0660	6/5/2015
X10C1350965	55G	CH	ORNL	OR-NFS-CH-SOIL	OR-RTR6-0663	7/13/2015
X10C1350966	55G	CH	ORNL	OR-NFS-CH-SOIL	OR-RTR6-0660	6/5/2015
X10C1350967	55G	CH	ORNL	OR-NFS-CH-SOIL	OR-RTR7-0137	6/25/2015
X10C1350969	55G	CH	ORNL	OR-NFS-CH-SOIL	OR-RTR6-0660	6/5/2015
X10C1350970	55G	CH	ORNL	OR-NFS-CH-SOIL	OR-RTR7-0137	6/25/2015
X10C1350971	55G	CH	ORNL	OR-NFS-CH-SOIL	OR-RTR6-0660	6/5/2015
X10C1350972	55G	CH	ORNL	OR-NFS-CH-SOIL	OR-RTR6-0660	6/5/2015
X10C1350973	55G	CH	ORNL	OR-NFS-CH-SOIL	OR-RTR6-0660	6/5/2015
X10C1350974	55G	CH	ORNL	OR-NFS-CH-SOIL	OR-RTR6-0664	7/15/2015
X10C1350976	55G	CH	ORNL	OR-NFS-CH-SOIL	OR-RTR6-0660	6/5/2015

X10C1350977	55G	CH	ORNL	OR-NFS-CH-SOIL	OR-RTR7-0137	6/25/2015
X10C1350978	55G	CH	ORNL	OR-NFS-CH-SOIL	OR-RTR7-0137	6/25/2015
X10C1350979	55G	CH	ORNL	OR-NFS-CH-SOIL	OR-RTR6-0660	6/5/2015
X10C1350980	55G	CH	ORNL	OR-NFS-CH-SOIL	OR-RTR6-0707	1/13/2016
X10C1350981	55G	CH	ORNL	OR-NFS-CH-SOIL	OR-RTR6-0707	1/13/2016
X10C1350982	55G	CH	ORNL	OR-NFS-CH-SOIL	OR-RTR6-0660	6/5/2015
X10C1350983	55G	CH	ORNL	OR-NFS-CH-SOIL	OR-RTR6-0708	1/13/2016
X10C1350984	55G	CH	ORNL	OR-NFS-CH-SOIL	OR-RTR6-0663	7/13/2015
X10C1350985	55G	CH	ORNL	OR-NFS-CH-SOIL	OR-RTR6-0660	6/5/2015
X10C1350986	55G	CH	ORNL	OR-NFS-CH-SOIL	OR-RTR6-0707	1/13/2016
X10C1350987	55G	CH	ORNL	OR-NFS-CH-SOIL	OR-RTR6-0666	7/28/2015
X10C1350988	55G	CH	ORNL	OR-NFS-CH-SOIL	OR-RTR6-0666	7/28/2015
X10C1350989	55G	CH	ORNL	OR-NFS-CH-SOIL	OR-RTR6-0667	7/28/2015
X10C1350990	55G	CH	ORNL	OR-NFS-CH-SOIL	OR-RTR6-0666	7/28/2015
X10C1350991	55G	CH	ORNL	OR-NFS-CH-SOIL	OR-RTR6-0660	6/5/2015
X10C1350992	55G	CH	ORNL	OR-NFS-CH-SOIL	OR-RTR6-0707	1/13/2016
X10C1350993	55G	CH	ORNL	OR-NFS-CH-SOIL	OR-RTR6-0663	7/13/2015
X10C1350994	55G	CH	ORNL	OR-NFS-CH-SOIL	OR-RTR6-0708	1/13/2016
X10C1350995	55G	CH	ORNL	OR-NFS-CH-SOIL	OR-RTR6-0667	7/28/2015
X10C1350996	55G	CH	ORNL	OR-NFS-CH-SOIL	OR-RTR6-0663	7/13/2015
X10C1350997	55G	CH	ORNL	OR-NFS-CH-SOIL	OR-RTR6-0708	1/13/2016
X10C1350998	55G	CH	ORNL	OR-NFS-CH-SOIL	OR-RTR6-0660	6/5/2015
X10C1350999	55G	CH	ORNL	OR-NFS-CH-SOIL	OR-RTR6-0707	1/13/2016
X10C1351000	55G	CH	ORNL	OR-NFS-CH-SOIL	OR-RTR6-0707	1/13/2016
X10C1351001	55G	CH	ORNL	OR-NFS-CH-SOIL	OR-RTR6-0664	7/15/2015
X10C1351002	55G	CH	ORNL	OR-NFS-CH-SOIL	OR-RTR6-0660	6/5/2015
X10C1351003	55G	CH	ORNL	OR-NFS-CH-SOIL	OR-RTR6-0661	6/9/2015
X10C1351004	55G	CH	ORNL	OR-NFS-CH-SOIL	OR-RTR6-0707	1/13/2016
X10C1351005	55G	CH	ORNL	OR-NFS-CH-SOIL	OR-RTR6-0707	1/13/2016
X10C1351006	55G	CH	ORNL	OR-NFS-CH-SOIL	OR-RTR6-0666	7/28/2015
X10C1351009	55G	CH	ORNL	OR-NFS-CH-SOIL	OR-RTR6-0707	1/13/2016
X10C1351010	55G	CH	ORNL	OR-NFS-CH-SOIL	OR-RTR6-0707	1/13/2016
X10C1351013	55G	CH	ORNL	OR-NFS-CH-SOIL	OR-RTR6-0707	1/13/2016
X10C1351024	55G	CH	ORNL	OR-NFS-CH-SOIL	OR-RTR6-0706	1/6/2016

X10C1351146	55G	CH	ORNL	OR-NFS-CH-SOIL	OR-RTR6-0706	1/6/2016
X10C1351168	55G	CH	ORNL	OR-NFS-CH-SOIL	OR-RTR6-0705	1/6/2016
X10C1351169	55G	CH	ORNL	OR-NFS-CH-SOIL	OR-RTR6-0705	1/6/2016
X10C1351171	55G	CH	ORNL	OR-NFS-CH-SOIL	OR-RTR6-0706	1/6/2016
X10C1351173	55G	CH	ORNL	OR-NFS-CH-SOIL	OR-RTR6-0705	1/6/2016
X10C1351178	55G	CH	ORNL	OR-NFS-CH-SOIL	OR-RTR6-0706	1/6/2016
X10C1351180	55G	CH	ORNL	OR-NFS-CH-SOIL	OR-RTR6-0705	1/6/2016
X10C1351184	55G	CH	ORNL	OR-NFS-CH-SOIL	OR-RTR6-0706	1/6/2016
X10C1351185	55G	CH	ORNL	OR-NFS-CH-SOIL	OR-RTR6-0706	1/6/2016
X10C1351186	55G	CH	ORNL	OR-NFS-CH-SOIL	OR-RTR6-0706	1/6/2016
X10C1351187	55G	CH	ORNL	OR-NFS-CH-SOIL	OR-RTR6-0706	1/6/2016
X10C1351189	55G	CH	ORNL	OR-NFS-CH-SOIL	OR-RTR6-0706	1/6/2016
X10C1351190	55G	CH	ORNL	OR-NFS-CH-SOIL	OR-RTR6-0706	1/6/2016
X10C1351191	55G	CH	ORNL	OR-NFS-CH-SOIL	OR-RTR6-0706	1/6/2016
X10C1351195	55G	CH	ORNL	OR-NFS-CH-SOIL	OR-RTR6-0705	1/6/2016
X10C1351201	55G	CH	ORNL	OR-NFS-CH-SOIL	OR-RTR6-0706	1/6/2016
X10C1351202	55G	CH	ORNL	OR-NFS-CH-SOIL	OR-RTR6-0706	1/6/2016
X10C1351229	55G	CH	ORNL	OR-NFS-CH-SOIL	OR-RTR6-0653	5/20/2015
X10C1351275	55G	CH	ORNL	OR-NFS-CH-SOIL	OR-RTR6-0705	1/6/2016
X10C1351276	55G	CH	ORNL	OR-NFS-CH-SOIL	OR-RTR6-0704	11/23/2015
X10C1351277	55G	CH	ORNL	OR-NFS-CH-SOIL	OR-RTR6-0705	1/6/2016
X10C1351281	55G	CH	ORNL	OR-NFS-CH-SOIL	OR-RTR6-0704	11/23/2015
X10C1351282	55G	CH	ORNL	OR-NFS-CH-SOIL	OR-RTR6-0703	11/19/2015
X10C1351283	55G	CH	ORNL	OR-NFS-CH-SOIL	OR-RTR6-0704	11/23/2015
X10C1351284	55G	CH	ORNL	OR-NFS-CH-SOIL	OR-RTR6-0704	11/23/2015
X10C1351285	55G	CH	ORNL	OR-NFS-CH-SOIL	OR-RTR6-0705	1/6/2016
X10C1351286	55G	CH	ORNL	OR-NFS-CH-SOIL	OR-RTR6-0705	1/6/2016
X10C1351287	55G	CH	ORNL	OR-NFS-CH-SOIL	OR-RTR6-0703	11/19/2015
X10C1351288	55G	CH	ORNL	OR-NFS-CH-SOIL	OR-RTR6-0705	1/6/2016
X10C1351289	55G	CH	ORNL	OR-NFS-CH-SOIL	OR-RTR6-0705	1/6/2016
X10C1351290	55G	CH	ORNL	OR-NFS-CH-SOIL	OR-RTR6-0704	11/23/2015
X10C1351291	55G	CH	ORNL	OR-NFS-CH-SOIL	OR-RTR6-0702	11/16/2015
X10C1351292	55G	CH	ORNL	OR-NFS-CH-SOIL	OR-RTR6-0703	11/19/2015
X10C1351293	55G	CH	ORNL	OR-NFS-CH-SOIL	OR-RTR6-0702	11/16/2015

X10C1351294	55G	CH	ORNL	OR-NFS-CH-SOIL	OR-RTR6-0704	11/23/2015
X10C1351295	55G	CH	ORNL	OR-NFS-CH-SOIL	OR-RTR6-0704	11/23/2015
X10C1351296	55G	CH	ORNL	OR-NFS-CH-SOIL	OR-RTR6-0701	11/12/2015
X10C1351297	55G	CH	ORNL	OR-NFS-CH-SOIL	OR-RTR6-0702	11/16/2015
X10C1351298	55G	CH	ORNL	OR-NFS-CH-SOIL	OR-RTR6-0702	11/16/2015
X10C1351299	55G	CH	ORNL	OR-NFS-CH-SOIL	OR-RTR6-0702	11/16/2015
X10C1351300	55G	CH	ORNL	OR-NFS-CH-SOIL	OR-RTR6-0703	11/19/2015
X10C1351301	55G	CH	ORNL	OR-NFS-CH-SOIL	OR-RTR6-0704	11/23/2015
X10C1351302	55G	CH	ORNL	OR-NFS-CH-SOIL	OR-RTR6-0632	3/11/2015
X10C1351303	55G	CH	ORNL	OR-NFS-CH-SOIL	OR-RTR6-0698	10/27/2015
X10C1351304	55G	CH	ORNL	OR-NFS-CH-SOIL	OR-RTR6-0699	11/10/2015
X10C1351305	55G	CH	ORNL	OR-NFS-CH-SOIL	OR-RTR6-0698	10/27/2015
X10C1351306	55G	CH	ORNL	OR-NFS-CH-SOIL	OR-RTR6-0699	11/10/2015
X10C1351307	55G	CH	ORNL	OR-NFS-CH-SOIL	OR-RTR6-0697	10/23/2015
X10C1351308	55G	CH	ORNL	OR-NFS-CH-SOIL	OR-RTR6-0698	10/27/2015
X10C1351310	55G	CH	ORNL	OR-NFS-CH-SOIL	OR-RTR6-0632	3/11/2015
X10C1351311	55G	CH	ORNL	OR-NFS-CH-SOIL	OR-RTR6-0698	10/27/2015
X10C1351312	55G	CH	ORNL	OR-NFS-CH-SOIL	OR-RTR6-0633	3/12/2015
X10C1351313	55G	CH	ORNL	OR-NFS-CH-SOIL	OR-RTR6-0633	3/12/2015
X10C1351314	55G	CH	ORNL	OR-NFS-CH-SOIL	OR-RTR6-0698	10/27/2015
X10C1351315	55G	CH	ORNL	OR-NFS-CH-SOIL	OR-RTR6-0632	3/11/2015
X10C1351316	55G	CH	ORNL	OR-NFS-CH-SOIL	OR-RTR6-0648	4/27/2015
X10C1351317	55G	CH	ORNL	OR-NFS-CH-SOIL	OR-RTR6-0699	11/10/2015
X10C1351318	55G	CH	ORNL	OR-NFS-CH-SOIL	OR-RTR6-0699	11/10/2015
X10C1351319	55G	CH	ORNL	OR-NFS-CH-SOIL	OR-RTR6-0649	4/23/2015
X10C1351320	55G	CH	ORNL	OR-NFS-CH-SOIL	OR-RTR6-0649	4/23/2015
X10C1351321	55G	CH	ORNL	OR-NFS-CH-SOIL	OR-RTR6-0699	11/10/2015
X10C1351322	55G	CH	ORNL	OR-NFS-CH-SOIL	OR-RTR6-0699	11/10/2015
X10C1351323	55G	CH	ORNL	OR-NFS-CH-SOIL	OR-RTR6-0699	11/10/2015
X10C1351324	55G	CH	ORNL	OR-NFS-CH-SOIL	OR-RTR6-0632	3/11/2015
X10C1351325	55G	CH	ORNL	OR-NFS-CH-SOIL	OR-RTR6-0698	10/27/2015
X10C1351326	55G	CH	ORNL	OR-NFS-CH-SOIL	OR-RTR6-0699	11/10/2015
X10C1351327	55G	CH	ORNL	OR-NFS-CH-SOIL	OR-RTR6-0648	4/27/2015
X10C1351328	55G	CH	ORNL	OR-NFS-CH-SOIL	OR-RTR6-0699	11/10/2015

X10C1351329	55G	CH	ORNL	OR-NFS-CH-SOIL	OR-RTR6-0700	11/11/2015
X10C1351330	55G	CH	ORNL	OR-NFS-CH-SOIL	OR-RTR6-0700	11/11/2015
X10C1351331	55G	CH	ORNL	OR-NFS-CH-SOIL	OR-RTR6-0698	10/27/2015
X10C1351332	55G	CH	ORNL	OR-NFS-CH-SOIL	OR-RTR6-0698	10/27/2015
X10C1351333	55G	CH	ORNL	OR-NFS-CH-SOIL	OR-RTR6-0633	3/12/2015
X10C1351334	55G	CH	ORNL	OR-NFS-CH-SOIL	OR-RTR6-0698	10/27/2015
X10C1351335	55G	CH	ORNL	OR-NFS-CH-SOIL	OR-RTR6-0633	3/12/2015
X10C1351336	55G	CH	ORNL	OR-NFS-CH-SOIL	OR-RTR6-0697	10/23/2015
X10C1351337	55G	CH	ORNL	OR-NFS-CH-SOIL	OR-RTR6-0697	10/23/2015
X10C1351338	55G	CH	ORNL	OR-NFS-CH-SOIL	OR-RTR6-0699	11/10/2015
X10C1351339	55G	CH	ORNL	OR-NFS-CH-SOIL	OR-RTR6-0648	4/27/2015
X10C1351340	55G	CH	ORNL	OR-NFS-CH-SOIL	OR-RTR6-0648	4/27/2015
X10C1351341	55G	CH	ORNL	OR-NFS-CH-SOIL	OR-RTR6-0700	11/11/2015
X10C1351342	55G	CH	ORNL	OR-NFS-CH-SOIL	OR-RTR6-0652	5/19/2015
X10C1351343	55G	CH	ORNL	OR-NFS-CH-SOIL	OR-RTR6-0653	5/20/2015
X10C1351344	55G	CH	ORNL	OR-NFS-CH-SOIL	OR-RTR6-0700	11/11/2015
X10C1351345	55G	CH	ORNL	OR-NFS-CH-SOIL	OR-RTR6-0701	11/12/2015
X10C1351346	55G	CH	ORNL	OR-NFS-CH-SOIL	OR-RTR6-0701	11/12/2015
X10C1351347	55G	CH	ORNL	OR-NFS-CH-SOIL	OR-RTR6-0701	11/12/2015
X10C1351348	55G	CH	ORNL	OR-NFS-CH-SOIL	OR-RTR6-0649	4/23/2015
X10C1351349	55G	CH	ORNL	OR-NFS-CH-SOIL	OR-RTR6-0700	11/11/2015
X10C1351350	55G	CH	ORNL	OR-NFS-CH-SOIL	OR-RTR6-0653	5/20/2015
X10C1351351	55G	CH	ORNL	OR-NFS-CH-SOIL	OR-RTR6-0702	11/16/2015
X10C1351352	55G	CH	ORNL	OR-NFS-CH-SOIL	OR-RTR6-0702	11/16/2015
X10C1351353	55G	CH	ORNL	OR-NFS-CH-SOIL	OR-RTR6-0700	11/11/2015
X10C1351354	55G	CH	ORNL	OR-NFS-CH-SOIL	OR-RTR6-0702	11/16/2015
X10C1351355	55G	CH	ORNL	OR-NFS-CH-SOIL	OR-RTR6-0652	5/19/2015
X10C1351356	55G	CH	ORNL	OR-NFS-CH-SOIL	OR-RTR6-0701	11/12/2015
X10C1351357	55G	CH	ORNL	OR-NFS-CH-SOIL	OR-RTR6-0701	11/12/2015
X10C1351358	55G	CH	ORNL	OR-NFS-CH-SOIL	OR-RTR6-0700	11/11/2015
X10C1351359	55G	CH	ORNL	OR-NFS-CH-SOIL	OR-RTR6-0649	4/23/2015
X10C1351360	55G	CH	ORNL	OR-NFS-CH-SOIL	OR-RTR6-0700	11/11/2015
X10C1351361	55G	CH	ORNL	OR-NFS-CH-SOIL	OR-RTR6-0700	11/11/2015
X10C1351362	55G	CH	ORNL	OR-NFS-CH-SOIL	OR-RTR6-0649	4/23/2015

X10C1351363	55G	CH	ORNL	OR-NFS-CH-SOIL	OR-RTR6-0649	4/23/2015
X10C1351364	55G	CH	ORNL	OR-NFS-CH-SOIL	OR-RTR6-0700	11/11/2015
X10C1351365	55G	CH	ORNL	OR-NFS-CH-SOIL	OR-RTR6-0648	4/27/2015
X10C1351416	55G	CH	ORNL	OR-NFS-CH-SOIL	OR-RTR6-0648	4/27/2015
X10C1351417	55G	CH	ORNL	OR-NFS-CH-SOIL	OR-RTR6-0648	4/27/2015
X10C1351418	55G	CH	ORNL	OR-NFS-CH-SOIL	OR-RTR6-0648	4/27/2015
X10C1351419	55G	CH	ORNL	OR-NFS-CH-SOIL	OR-RTR6-0649	4/23/2015
X10C1351420	55G	CH	ORNL	OR-NFS-CH-SOIL	OR-RTR6-0702	11/16/2015
X10C1351421	55G	CH	ORNL	OR-NFS-CH-SOIL	OR-RTR6-0701	11/12/2015
X10C1351422	55G	CH	ORNL	OR-NFS-CH-SOIL	OR-RTR6-0701	11/12/2015
X10C1351423	55G	CH	ORNL	OR-NFS-CH-SOIL	OR-RTR6-0648	4/27/2015
X10C1351424	55G	CH	ORNL	OR-NFS-CH-SOIL	OR-RTR6-0701	11/12/2015
X10C1351425	55G	CH	ORNL	OR-NFS-CH-SOIL	OR-RTR6-0646	4/15/2015
X10C1351426	55G	CH	ORNL	OR-NFS-CH-SOIL	OR-RTR6-0646	4/15/2015
X10C1351427	55G	CH	ORNL	OR-NFS-CH-SOIL	OR-RTR6-0644	4/14/2015
X10C1351428	55G	CH	ORNL	OR-NFS-CH-SOIL	OR-RTR6-0648	4/27/2015
X10C1351429	55G	CH	ORNL	OR-NFS-CH-SOIL	OR-RTR6-0646	4/15/2015
X10C1351430	55G	CH	ORNL	OR-NFS-CH-SOIL	OR-RTR6-0647	4/14/2015
X10C1351431	55G	CH	ORNL	OR-NFS-CH-SOIL	OR-RTR6-0646	4/15/2015
X10C1351432	55G	CH	ORNL	OR-NFS-CH-SOIL	OR-RTR6-0648	4/27/2015
X10C1351433	55G	CH	ORNL	OR-NFS-CH-SOIL	OR-RTR6-0646	4/15/2015
X10C1351434	55G	CH	ORNL	OR-NFS-CH-SOIL	OR-RTR6-0646	4/15/2015
X10C1351435	55G	CH	ORNL	OR-NFS-CH-SOIL	OR-RTR6-0647	4/14/2015
X10C1351436	55G	CH	ORNL	OR-NFS-CH-SOIL	OR-RTR6-0649	4/23/2015
X10C1351437	55G	CH	ORNL	OR-NFS-CH-SOIL	OR-RTR6-0647	4/14/2015
X10C1351438	55G	CH	ORNL	OR-NFS-CH-SOIL	OR-RTR6-0646	4/15/2015
X10C1351439	55G	CH	ORNL	OR-NFS-CH-SOIL	OR-RTR6-0648	4/27/2015
X10C1351440	55G	CH	ORNL	OR-NFS-CH-SOIL	OR-RTR6-0646	4/15/2015
X10C1351441	55G	CH	ORNL	OR-NFS-CH-SOIL	OR-RTR6-0646	4/15/2015
X10C1351442	55G	CH	ORNL	OR-NFS-CH-SOIL	OR-RTR6-0648	4/27/2015
X10C1351443	55G	CH	ORNL	OR-NFS-CH-SOIL	OR-RTR6-0648	4/27/2015
X10C1351444	55G	CH	ORNL	OR-NFS-CH-SOIL	OR-RTR6-0646	4/15/2015
X10C1351445	55G	CH	ORNL	OR-NFS-CH-SOIL	OR-RTR6-0647	4/14/2015
X10C1351446	55G	CH	ORNL	OR-NFS-CH-SOIL	OR-RTR6-0646	4/15/2015

X10C1351447	55G	CH	ORNL	OR-NFS-CH-SOIL	OR-RTR6-0644	4/14/2015
X10C1351448	55G	CH	ORNL	OR-NFS-CH-SOIL	OR-RTR6-0647	4/14/2015
X10C1351449	55G	CH	ORNL	OR-NFS-CH-SOIL	OR-RTR6-0647	4/14/2015
X10C1351450	55G	CH	ORNL	OR-NFS-CH-SOIL	OR-RTR6-0646	4/15/2015
X10C1351451	55G	CH	ORNL	OR-NFS-CH-SOIL	OR-RTR6-0645	4/16/2015
X10C1351452	55G	CH	ORNL	OR-NFS-CH-SOIL	OR-RTR6-0647	4/14/2015
X10C1351453	55G	CH	ORNL	OR-NFS-CH-SOIL	OR-RTR6-0648	4/27/2015
X10C1351454	55G	CH	ORNL	OR-NFS-CH-SOIL	OR-RTR6-0647	4/14/2015
X10C1351455	55G	CH	ORNL	OR-NFS-CH-SOIL	OR-RTR6-0646	4/15/2015
X10C1351456	55G	CH	ORNL	OR-NFS-CH-SOIL	OR-RTR6-0645	4/16/2015
X10C1351457	55G	CH	ORNL	OR-NFS-CH-SOIL	OR-RTR6-0646	4/15/2015
X10C1351458	55G	CH	ORNL	OR-NFS-CH-SOIL	OR-RTR6-0649	4/23/2015
X10C1351459	55G	CH	ORNL	OR-NFS-CH-SOIL	OR-RTR6-0646	4/15/2015
X10C1351460	55G	CH	ORNL	OR-NFS-CH-SOIL	OR-RTR6-0646	4/15/2015
X10C1351461	55G	CH	ORNL	OR-NFS-CH-SOIL	OR-RTR6-0644	4/14/2015
X10C1351462	55G	CH	ORNL	OR-NFS-CH-SOIL	OR-RTR6-0644	4/14/2015
X10C1351463	55G	CH	ORNL	OR-NFS-CH-SOIL	OR-RTR6-0644	4/14/2015
X10C1351464	55G	CH	ORNL	OR-NFS-CH-SOIL	OR-RTR6-0644	4/14/2015
X10C1351465	55G	CH	ORNL	OR-NFS-CH-SOIL	OR-RTR6-0630	2/26/2015
X10C1351466	55G	CH	ORNL	OR-NFS-CH-SOIL	OR-RTR6-0626	2/13/2015
X10C1351467	55G	CH	ORNL	OR-NFS-CH-SOIL	OR-RTR6-0645	4/16/2015
X10C1351468	55G	CH	ORNL	OR-NFS-CH-SOIL	OR-RTR6-0644	4/14/2015
X10C1351469	55G	CH	ORNL	OR-NFS-CH-SOIL	OR-RTR6-0644	4/14/2015
X10C1351470	55G	CH	ORNL	OR-NFS-CH-SOIL	OR-RTR6-0629	2/26/2015
X10C1351471	55G	CH	ORNL	OR-NFS-CH-SOIL	OR-RTR6-0629	2/26/2015
X10C1351472	55G	CH	ORNL	OR-NFS-CH-SOIL	OR-RTR6-0626	2/13/2015
X10C1351473	55G	CH	ORNL	OR-NFS-CH-SOIL	OR-RTR6-0630	2/26/2015
X10C1351474	55G	CH	ORNL	OR-NFS-CH-SOIL	OR-RTR6-0630	2/26/2015
X10C1351475	55G	CH	ORNL	OR-NFS-CH-SOIL	OR-RTR6-0626	2/13/2015
X10C1351476	55G	CH	ORNL	OR-NFS-CH-SOIL	OR-RTR6-0626	2/13/2015
X10C1351477	55G	CH	ORNL	OR-NFS-CH-SOIL	OR-RTR6-0645	4/16/2015
X10C1351478	55G	CH	ORNL	OR-NFS-CH-SOIL	OR-RTR6-0644	4/14/2015
X10C1351479	55G	CH	ORNL	OR-NFS-CH-SOIL	OR-RTR6-0629	2/26/2015
X10C1351480	55G	CH	ORNL	OR-NFS-CH-SOIL	OR-RTR6-0645	4/16/2015

X10C1351481	55G	CH	ORNL	OR-NFS-CH-SOIL	OR-RTR6-0644	4/14/2015
X10C1351482	55G	CH	ORNL	OR-NFS-CH-SOIL	OR-RTR6-0644	4/14/2015
X10C1351483	55G	CH	ORNL	OR-NFS-CH-SOIL	OR-RTR6-0644	4/14/2015
X10C1351484	55G	CH	ORNL	OR-NFS-CH-SOIL	OR-RTR6-0645	4/16/2015
X10C1351485	55G	CH	ORNL	OR-NFS-CH-SOIL	OR-RTR6-0644	4/14/2015
X10C1351486	55G	CH	ORNL	OR-NFS-CH-SOIL	OR-RTR6-0630	2/26/2015
X10C1351487	55G	CH	ORNL	OR-NFS-CH-SOIL	OR-RTR6-0630	2/26/2015
X10C1351488	55G	CH	ORNL	OR-NFS-CH-SOIL	OR-RTR6-0630	2/26/2015
X10C1351489	55G	CH	ORNL	OR-NFS-CH-SOIL	OR-RTR6-0629	2/26/2015
X10C1351490	55G	CH	ORNL	OR-NFS-CH-SOIL	OR-RTR6-0645	4/16/2015
X10C1351491	55G	CH	ORNL	OR-NFS-CH-SOIL	OR-RTR6-0630	2/26/2015
X10C1351492	55G	CH	ORNL	OR-NFS-CH-SOIL	OR-RTR6-0630	2/26/2015
X10C1351493	55G	CH	ORNL	OR-NFS-CH-SOIL	OR-RTR6-0644	4/14/2015
X10C1351494	55G	CH	ORNL	OR-NFS-CH-SOIL	OR-RTR6-0644	4/14/2015
X10C1351495	55G	CH	ORNL	OR-NFS-CH-SOIL	OR-RTR6-0645	4/16/2015
X10C1351496	55G	CH	ORNL	OR-NFS-CH-SOIL	OR-RTR6-0645	4/16/2015
X10C1351497	55G	CH	ORNL	OR-NFS-CH-SOIL	OR-RTR6-0630	2/26/2015
X10C1351498	55G	CH	ORNL	OR-NFS-CH-SOIL	OR-RTR6-0633	3/12/2015
X10C1351499	55G	CH	ORNL	OR-NFS-CH-SOIL	OR-RTR6-0629	2/26/2015
X10C1351500	55G	CH	ORNL	OR-NFS-CH-SOIL	OR-RTR6-0632	3/11/2015
X10C1351501	55G	CH	ORNL	OR-NFS-CH-SOIL	OR-RTR6-0632	3/11/2015
X10C1351502	55G	CH	ORNL	OR-NFS-CH-SOIL	OR-RTR6-0623	2/13/2015
X10C1351503	55G	CH	ORNL	OR-NFS-CH-SOIL	OR-RTR6-0622	2/13/2015
X10C1351504	55G	CH	ORNL	OR-NFS-CH-SOIL	OR-RTR6-0623	2/13/2015
X10C1351505	55G	CH	ORNL	OR-NFS-CH-SOIL	OR-RTR6-0623	2/13/2015
X10C1351506	55G	CH	ORNL	OR-NFS-CH-SOIL	OR-RTR6-0632	3/11/2015
X10C1351507	55G	CH	ORNL	OR-NFS-CH-SOIL	OR-RTR6-0623	2/13/2015
X10C1351508	55G	CH	ORNL	OR-NFS-CH-SOIL	OR-RTR6-0623	2/13/2015
X10C1351509	55G	CH	ORNL	OR-NFS-CH-SOIL	OR-RTR6-0623	2/13/2015
X10C1351510	55G	CH	ORNL	OR-NFS-CH-SOIL	OR-RTR6-0632	3/11/2015
X10C1351511	55G	CH	ORNL	OR-NFS-CH-SOIL	OR-RTR6-0632	3/11/2015
X10C1351512	55G	CH	ORNL	OR-NFS-CH-SOIL	OR-RTR6-0630	2/26/2015
X10C1351513	55G	CH	ORNL	OR-NFS-CH-SOIL	OR-RTR6-0623	2/13/2015
X10C1351514	55G	CH	ORNL	OR-NFS-CH-SOIL	OR-RTR6-0629	2/26/2015

X10C1351515	55G	CH	ORNL	OR-NFS-CH-SOIL	OR-RTR6-0632	3/11/2015
X10C1351516	55G	CH	ORNL	OR-NFS-CH-SOIL	OR-RTR6-0622	2/13/2015
X10C1351518	55G	CH	ORNL	OR-NFS-CH-SOIL	OR-RTR6-0629	2/26/2015
X10C1351519	55G	CH	ORNL	OR-NFS-CH-SOIL	OR-RTR6-0632	3/11/2015
X10C1351520	55G	CH	ORNL	OR-NFS-CH-SOIL	OR-RTR6-0632	3/11/2015
X10C1351521	55G	CH	ORNL	OR-NFS-CH-SOIL	OR-RTR6-0632	3/11/2015
X10C1351522	55G	CH	ORNL	OR-NFS-CH-SOIL	OR-RTR6-0629	2/26/2015
X10C1351523	55G	CH	ORNL	OR-NFS-CH-SOIL	OR-RTR6-0630	2/26/2015
X10C1351524	55G	CH	ORNL	OR-NFS-CH-SOIL	OR-RTR6-0633	3/12/2015
X10C1351525	55G	CH	ORNL	OR-NFS-CH-SOIL	OR-RTR6-0629	2/26/2015
X10C1351526	55G	CH	ORNL	OR-NFS-CH-SOIL	OR-RTR6-0623	2/13/2015
X10C1351527	55G	CH	ORNL	OR-NFS-CH-SOIL	OR-RTR6-0622	2/13/2015
X10C1351528	55G	CH	ORNL	OR-NFS-CH-SOIL	OR-RTR6-0630	2/26/2015
X10C1351529	55G	CH	ORNL	OR-NFS-CH-SOIL	OR-RTR6-0623	2/13/2015
X10C1351530	55G	CH	ORNL	OR-NFS-CH-SOIL	OR-RTR6-0629	2/26/2015
X10C1351531	55G	CH	ORNL	OR-NFS-CH-SOIL	OR-RTR6-0629	2/26/2015
X10C1351532	55G	CH	ORNL	OR-NFS-CH-SOIL	OR-RTR6-0629	2/26/2015
X10C1351533	55G	CH	ORNL	OR-NFS-CH-SOIL	OR-RTR6-0626	2/13/2015
X10C1351534	55G	CH	ORNL	OR-NFS-CH-SOIL	OR-RTR6-0623	2/13/2015
X10C1351535	55G	CH	ORNL	OR-NFS-CH-SOIL	OR-RTR6-0622	2/13/2015
X10C1351536	55G	CH	ORNL	OR-NFS-CH-SOIL	OR-RTR6-0623	2/13/2015
X10C1351537	55G	CH	ORNL	OR-NFS-CH-SOIL	OR-RTR6-0627	2/26/2015
X10C1351538	55G	CH	ORNL	OR-NFS-CH-SOIL	OR-RTR6-0626	2/13/2015
X10C1351539	55G	CH	ORNL	OR-NFS-CH-SOIL	OR-RTR6-0623	2/13/2015
X10C1351540	55G	CH	ORNL	OR-NFS-CH-SOIL	OR-RTR6-0626	2/13/2015
X10C1351541	55G	CH	ORNL	OR-NFS-CH-SOIL	OR-RTR6-0633	3/12/2015
X10C1351542	55G	CH	ORNL	OR-NFS-CH-SOIL	OR-RTR6-0626	2/13/2015
X10C1351544	55G	CH	ORNL	OR-NFS-CH-SOIL	OR-RTR6-0627	2/26/2015
X10C1351545	55G	CH	ORNL	OR-NFS-CH-SOIL	OR-RTR6-0622	2/13/2015
X10C1351546	55G	CH	ORNL	OR-NFS-CH-SOIL	OR-RTR6-0626	2/13/2015
X10C1351547	55G	CH	ORNL	OR-NFS-CH-SOIL	OR-RTR6-0626	2/13/2015
X10C1351548	55G	CH	ORNL	OR-NFS-CH-SOIL	OR-RTR6-0627	2/26/2015
X10C1351549	55G	CH	ORNL	OR-NFS-CH-SOIL	OR-RTR6-0626	2/13/2015
X10C1351550	55G	CH	ORNL	OR-NFS-CH-SOIL	OR-RTR6-0633	3/12/2015

X10C1351551	55G	CH	ORNL	OR-NFS-CH-SOIL	OR-RTR6-0632	3/11/2015
X10C1351552	55G	CH	ORNL	OR-NFS-CH-SOIL	OR-RTR6-0623	2/13/2015
X10C1351553	55G	CH	ORNL	OR-NFS-CH-SOIL	OR-RTR6-0626	2/13/2015
X10C1351554	55G	CH	ORNL	OR-NFS-CH-SOIL	OR-RTR6-0626	2/13/2015
X10C1351555	55G	CH	ORNL	OR-NFS-CH-SOIL	OR-RTR6-0623	2/13/2015
X10C1351556	55G	CH	ORNL	OR-NFS-CH-SOIL	OR-RTR6-0633	3/12/2015
X10C1351557	55G	CH	ORNL	OR-NFS-CH-SOIL	OR-RTR6-0626	2/13/2015
X10C1351558	55G	CH	ORNL	OR-NFS-CH-SOIL	OR-RTR6-0626	2/13/2015
X10C1351559	55G	CH	ORNL	OR-NFS-CH-SOIL	OR-RTR6-0622	2/13/2015
X10C1351560	55G	CH	ORNL	OR-NFS-CH-SOIL	OR-RTR6-0626	2/13/2015
X10C1351561	55G	CH	ORNL	OR-NFS-CH-SOIL	OR-RTR6-0626	2/13/2015
X10C1351562	55G	CH	ORNL	OR-NFS-CH-SOIL	OR-RTR6-0626	2/13/2015
X10C1351563	55G	CH	ORNL	OR-NFS-CH-SOIL	OR-RTR6-0622	2/13/2015
X10C1351564	55G	CH	ORNL	OR-NFS-CH-SOIL	OR-RTR6-0626	2/13/2015
X10C1351565	55G	CH	ORNL	OR-NFS-CH-SOIL	OR-RTR6-0627	2/26/2015
X10C1451608	55G	CH	ORNL	OR-NFS-CH-SOIL	OR-RTR6-0635	3/19/2015
X10C1451611	55G	CH	ORNL	OR-NFS-CH-SOIL	OR-RTR6-0636	3/16/2015
X10C1451612	55G	CH	ORNL	OR-NFS-CH-SOIL	OR-RTR6-0640	6/3/2015
X10C1451615	55G	CH	ORNL	OR-NFS-CH-SOIL	OR-RTR6-0640	6/3/2015
X10C1451616	55G	CH	ORNL	OR-NFS-CH-SOIL	OR-RTR6-0643	3/31/2015
X10C1451619	55G	CH	ORNL	OR-NFS-CH-SOIL	OR-RTR6-0643	3/31/2015
X10C1451639	55G	CH	ORNL	OR-NFS-CH-SOIL	OR-RTR6-0636	3/16/2015
X10C1451642	55G	CH	ORNL	OR-NFS-CH-SOIL	OR-RTR6-0642	3/30/2015
X10C1451646	55G	CH	ORNL	OR-NFS-CH-SOIL	OR-RTR6-0642	3/30/2015
X10C1451647	55G	CH	ORNL	OR-NFS-CH-SOIL	OR-RTR6-0635	3/19/2015
X10C0000250AH	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR7-0001	12/10/2013
X10C0000250D	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0440	12/18/2013
X10C0011089A	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0582	9/24/2014
X10C0011093A	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0150	2/3/2009
X10C0011095A	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0441	12/19/2013
X10C0011100A	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0165	6/17/2009
X10C0011102A	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0237	9/23/2009
X10C0011102B	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0236	9/21/2009
X10C0011102D	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0236	9/21/2009

X10C0011103A	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0164	6/2/2009
X10C0011105	55G	CH	ORNL	OR-REDC-CH-HET		
X10C0011107A	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0167	4/27/2009
X10C0011109A	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR7-0049	6/13/2014
X10C0011110A	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0580	9/23/2014
X10C0012920A	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0151	3/2/2009
X10C0012921A	55G	CH	ORNL	OR-REDC-CH-HET		
X10C0012923A1	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0167	4/27/2009
X10C0102692G	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0343	2/28/2011
X10C0102692M	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0301	10/18/2010
X10C0102692Q	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0584	9/29/2014
X10C0102692U	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0300	10/18/2010
X10C0200883	55G	CH	ORNL	OR-REDC-CH-HET		
X10C0200885A	55G	CH	ORNL	OR-REDC-CH-HET		
X10C0201072G	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0234	9/21/2009
X10C0201073A	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0584	9/29/2014
X10C0201074A	55G	CH	ORNL	OR-REDC-CH-HET		
X10C0201075A	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0433	12/4/2013
X10C0201076A	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR7-0049	6/13/2014
X10C0201078A	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0151	3/2/2009
X10C0201754A	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0472	3/3/2014
X10C0300528A	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR7-0030	4/10/2014
X10C0300533A	55G	CH	ORNL	OR-REDC-CH-HET		
X10C0300534A	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0484	4/3/2014
X10C0300534B	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0483	3/18/2014
X10C0300535A	55G	CH	ORNL	OR-REDC-CH-HET		
X10C0300536A	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0173	4/27/2009
X10C0300538A	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0155	3/12/2009
X10C0301192A	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0061	6/18/2008
X10C0301192B	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0069	8/6/2008
X10C0301192D	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0064	6/18/2008
X10C0301192E	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0064	6/18/2008
X10C0301192F	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0064	6/18/2008
X10C0301192G	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0063	6/27/2008

X10C0301192H	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0063	6/27/2008
X10C0301192I	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0064	6/18/2008
X10C0301192II	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0062	6/18/2008
X10C0301192J	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0064	6/18/2008
X10C0301192KK	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0061	6/18/2008
X10C0301192L	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0063	6/27/2008
X10C0301192N	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0065	6/19/2008
X10C0301192O	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0065	6/19/2008
X10C0301193A	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0068	7/7/2008
X10C0301193B	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0067	8/6/2008
X10C0301193C	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0060	11/2/2010
X10C0301193E	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0061	6/18/2008
X10C0301193F	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0060	11/2/2010
X10C0301193G	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0063	6/27/2008
X10C0301193II	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0061	6/18/2008
X10C0301193JJ	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0063	6/27/2008
X10C0301193P	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0061	6/18/2008
X10C0301193Q	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0069	8/6/2008
X10C0301193R	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0061	6/18/2008
X10C0303315A	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0445	1/9/2014
X10C0401650A	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0113	1/12/2009
X10C0402053A	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0272	1/11/2010
X10C0402054A	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0535	7/1/2014
X10C0402054B	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0481	3/20/2014
X10C0402054C	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0481	3/20/2014
X10C0402054D	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0482	3/20/2014
X10C0402056A	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR7-0013	3/18/2014
X10C0402057A1	55G	CH	ORNL	OR-REDC-CH-HET		
X10C0402058A	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR7-0038	5/6/2014
X10C0402063A	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0460	2/13/2014
X10C0402064A	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0107	11/4/2008
X10C0402064B	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0107	11/4/2008
X10C0402064C	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0107	11/4/2008
X10C0402064E	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0107	11/4/2008

X10C0402064H	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0107	11/4/2008
X10C0402064K	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0106	11/4/2008
X10C0402065N	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0108	11/4/2008
X10C0402065O	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0108	11/4/2008
X10C0402065Y	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0113	1/12/2009
X10C0402068A	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0149	2/3/2009
X10C0402070A	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0113	1/12/2009
X10C0402781A	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0634	3/16/2015
X10C0402781B	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0634	3/16/2015
X10C0402781C	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0634	3/16/2015
X10C0402781E	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0654	5/20/2015
X10C0402781F	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0634	3/16/2015
X10C0402782D	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0462	2/11/2014
X10C0402783B	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0520	5/29/2014
X10C0402783C	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0571	8/26/2014
X10C0402783D	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0520	5/29/2014
X10C0402783E	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0568	8/19/2014
X10C0402784B	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR7-0034	4/24/2014
X10C0402784F1	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0478	3/13/2014
X10C0402784H1	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0467	3/3/2014
X10C0402786A	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0575	9/16/2014
X10C0402786B	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0577	9/22/2014
X10C0402786C	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0575	9/16/2014
X10C0402786D	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0575	9/16/2014
X10C0402786E	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0575	9/16/2014
X10C0402786F	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0575	9/16/2014
X10C0402786G	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0575	9/16/2014
X10C0402786H	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0575	9/16/2014
X10C0402786I	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0575	9/16/2014
X10C0402786J	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0575	9/16/2014
X10C0402786K	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0575	9/16/2014
X10C0402786L	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0575	9/16/2014
X10C0402787A	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0472	3/3/2014
X10C0402787G	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR7-0044	6/3/2014

X10C0402787H1	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0448	1/24/2014
X10C0402788A	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0531	6/25/2014
X10C0402788B	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR7-0054	6/25/2014
X10C0402788C	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR7-0054	6/25/2014
X10C0402788D	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0531	6/25/2014
X10C0402788E	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0531	6/25/2014
X10C0402788F	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0531	6/25/2014
X10C0402788G	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0531	6/25/2014
X10C0402788H	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0531	6/25/2014
X10C0402789A	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0509	5/13/2014
X10C0402789B	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0509	5/13/2014
X10C0402789C	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0509	5/13/2014
X10C0402789D	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0509	5/13/2014
X10C0402789E	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0509	5/13/2014
X10C0402789F	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR7-0054	6/25/2014
X10C0402789G	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0531	6/25/2014
X10C0402789H	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR7-0054	6/25/2014
X10C0402789I	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0531	6/25/2014
X10C0402789J	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR7-0032	4/21/2014
X10C0402789K	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0496	4/21/2014
X10C0402790A	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0504	5/1/2014
X10C0402790E	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0504	5/1/2014
X10C0402791A	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0513	5/16/2014
X10C0402792D	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR7-0054	6/25/2014
X10C0402792E	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0504	5/1/2014
X10C0402792G	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0504	5/1/2014
X10C0402792H	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0504	5/1/2014
X10C0402793A	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0584	9/29/2014
X10C0402793B	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0584	9/29/2014
X10C0402793C	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0584	9/29/2014
X10C0402793D	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0584	9/29/2014
X10C0402793E	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0581	9/23/2014
X10C0402793F	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0575	9/16/2014
X10C0402793G	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0575	9/16/2014

X10C0402793H	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0575	9/16/2014
X10C0402793I	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0575	9/16/2014
X10C0402793J	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0577	9/22/2014
X10C0402793K	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0575	9/16/2014
X10C0402794E	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR7-0011	1/9/2014
X10C0402794I	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0464	2/25/2014
X10C0402794J	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0443	1/23/2014
X10C0402795L	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0446	2/12/2014
X10C0402795M	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0447	1/9/2014
X10C0402799J	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR7-0080	8/19/2014
X10C0402800F	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0510	5/8/2014
X10C0402801A	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0517	6/2/2014
X10C0402801B	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0517	6/2/2014
X10C0402801C	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0517	6/2/2014
X10C0402801D	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0520	5/29/2014
X10C0402801E	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0520	5/29/2014
X10C0402801I	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR7-0047	6/10/2014
X10C0402801J	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR7-0046	6/10/2014
X10C0402804A	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR7-0024	3/25/2014
X10C0402804B	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0469	2/25/2014
X10C0402804C	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0486	3/27/2014
X10C0402804D	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0469	2/25/2014
X10C0402804E	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0447	1/9/2014
X10C0402804F	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0447	1/9/2014
X10C0402804G	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0449	2/4/2014
X10C0402804H	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0447	1/9/2014
X10C0402804I	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0475	3/4/2014
X10C0402804J	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0469	2/25/2014
X10C0402804K	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0587	10/7/2014
X10C0402804L	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0486	3/27/2014
X10C0402805A	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0576	9/22/2014
X10C0402805B	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0576	9/22/2014
X10C0402805C	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0576	9/22/2014
X10C0402805F	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0576	9/22/2014

X10C0402805G	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0576	9/22/2014
X10C0402805H	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0576	9/22/2014
X10C0402805J	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0576	9/22/2014
X10C0402805K	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR7-0097	9/22/2014
X10C0402805L	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR7-0097	9/22/2014
X10C0402805N	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0576	9/22/2014
X10C0402805O	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0576	9/22/2014
X10C0402806A	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0580	9/23/2014
X10C0402806B	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0575	9/16/2014
X10C0402806C	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0574	9/18/2014
X10C0402806D	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0575	9/16/2014
X10C0402806E	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0575	9/16/2014
X10C0402806F	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0577	9/22/2014
X10C0402806G	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0577	9/22/2014
X10C0402806H1	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0631	3/23/2015
X10C0402806I	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0574	9/18/2014
X10C0402807A	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0542	7/17/2014
X10C0402807B	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0542	7/17/2014
X10C0402807C	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0542	7/17/2014
X10C0402807D	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0542	7/17/2014
X10C0402807E	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0542	7/17/2014
X10C0402807I	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0544	7/23/2014
X10C0402807J	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0544	7/23/2014
X10C0402808A	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0579	9/23/2014
X10C0402808B	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0578	9/24/2014
X10C0402808C	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0577	9/22/2014
X10C0402808D	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0577	9/22/2014
X10C0402808E	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0579	9/23/2014
X10C0402808F	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0577	9/22/2014
X10C0402808G	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0578	9/24/2014
X10C0402808H	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0578	9/24/2014
X10C0402808I	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0579	9/23/2014
X10C0402808J	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0579	9/23/2014
X10C0402808K	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0579	9/23/2014

X10C0402808L	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0579	9/23/2014
X10C0402808M	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0578	9/24/2014
X10C0402808O	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR7-0097	9/22/2014
X10C0402812A	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0466	2/25/2014
X10C0402812B	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR7-0066	7/21/2014
X10C0402812C	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR7-0066	7/21/2014
X10C0402812D	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0510	5/8/2014
X10C0402812E1	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0470	3/3/2014
X10C0402812F	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR7-0031	4/14/2014
X10C0402812G1	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR7-0140	7/9/2015
X10C0402812H1	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0501	4/24/2014
X10C0402812I	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0688	9/24/2015
X10C0402812J	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR7-0065	7/22/2014
X10C0402812K	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0453	2/3/2014
X10C0402812L1	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0547	8/4/2014
X10C0402812M1	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0470	3/3/2014
X10C0402812N1	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0501	4/24/2014
X10C0402812O1	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR7-0068	7/21/2014
X10C0402813A	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0609	12/30/2014
X10C0402813B	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0602	11/25/2014
X10C0402813D	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0605	12/3/2014
X10C0402813E	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0605	12/3/2014
X10C0402813F	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0604	12/2/2014
X10C0402813J	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0602	11/25/2014
X10C0402815B	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0178	5/14/2009
X10C0402815F	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0179	6/29/2009
X10C0402815G	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0179	6/29/2009
X10C0402815H	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0178	5/14/2009
X10C0402816A	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0486	3/27/2014
X10C0402816B	55G	CH	ORNL	OR-REDC-CH-HET		
X10C0402816C1	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0654	5/20/2015
X10C0402817A1	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0588	10/8/2014
X10C0402817B	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR7-0053	6/24/2014
X10C0402817C	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR7-0014	3/4/2014

X10C0402817D1	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0612	1/16/2015
X10C0402817E	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0488	4/2/2014
X10C0402817F	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR7-0009	1/16/2014
X10C0402817G	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0473	3/3/2014
X10C0402817H	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0473	3/3/2014
X10C0402817I	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0473	3/3/2014
X10C0402817J	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR7-0053	6/24/2014
X10C0402817K	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR7-0014	3/4/2014
X10C0402817L	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0473	3/3/2014
X10C0402817M	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR7-0053	6/24/2014
X10C0402817N	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0474	3/4/2014
X10C0402818C	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0569	8/21/2014
X10C0402818E	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0569	8/21/2014
X10C0402818F	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0569	8/21/2014
X10C0402818G	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0569	8/21/2014
X10C0402818K	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0569	8/21/2014
X10C0402820A1	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0621	2/16/2015
X10C0402820B	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR7-0079	8/12/2014
X10C0402820C	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0561	8/7/2014
X10C0402820D	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0563	8/12/2014
X10C0402820E	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0562	8/8/2014
X10C0402820F1A	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR7-0130	3/25/2015
X10C0402820G	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0563	8/12/2014
X10C0402820H	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0563	8/12/2014
X10C0402820I	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0562	8/8/2014
X10C0402820J	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0562	8/8/2014
X10C0402820K	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0562	8/8/2014
X10C0402820L	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0562	8/8/2014
X10C0402820M1	55G	CH	ORNL	OR-REDC-CH-HET		
X10C0402820N	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0562	8/8/2014
X10C0402821C	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0494	4/14/2014
X10C0402821E	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0512	5/19/2014
X10C0402821F	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0512	5/19/2014
X10C0402821G	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0512	5/19/2014

X10C0402821J	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0524	6/11/2014
X10C0402821K	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0519	5/28/2014
X10C0402822A1	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR7-0037	5/1/2014
X10C0402822B	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR7-0013	3/18/2014
X10C0402822C	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0530	6/25/2014
X10C0402822D	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0461	2/11/2014
X10C0402822E	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0461	2/11/2014
X10C0402822F	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0461	2/11/2014
X10C0402822G	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0506	5/2/2014
X10C0402822I	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR7-0014	3/4/2014
X10C0402822J	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0460	2/13/2014
X10C0402822K	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0461	2/11/2014
X10C0402822L	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0462	2/11/2014
X10C0402822M	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0462	2/11/2014
X10C0402822N	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0461	2/11/2014
X10C0402822O	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR7-0011	1/9/2014
X10C0402822P	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0446	2/12/2014
X10C0402823D	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0537	7/14/2014
X10C0402825A	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0562	8/8/2014
X10C0402826C	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0519	5/28/2014
X10C0402826D	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0524	6/11/2014
X10C0402826E	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0607	12/4/2014
X10C0402826G	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR7-0038	5/6/2014
X10C0402827A	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0577	9/22/2014
X10C0402827B	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0577	9/22/2014
X10C0402827C	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0574	9/18/2014
X10C0402827D	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0574	9/18/2014
X10C0402827E	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0574	9/18/2014
X10C0402827F	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0577	9/22/2014
X10C0402827G1	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0631	3/23/2015
X10C0402827H	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0574	9/18/2014
X10C0402827I	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0574	9/18/2014
X10C0402827J	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0578	9/24/2014
X10C0402827K	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0578	9/24/2014

X10C0402827L	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0579	9/23/2014
X10C0402828A	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0563	8/12/2014
X10C0402828B	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0561	8/7/2014
X10C0402828D	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR7-0079	8/12/2014
X10C0402828E	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0561	8/7/2014
X10C0402828F1	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0631	3/23/2015
X10C0402828G	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0561	8/7/2014
X10C0402828H	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR7-0079	8/12/2014
X10C0402829A	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0481	3/20/2014
X10C0402829B	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR7-0010	1/23/2014
X10C0402829C	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR7-0011	1/9/2014
X10C0402829D	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0449	2/4/2014
X10C0402829E1	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0498	4/23/2014
X10C0402829F1	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0558	8/5/2014
X10C0402829G	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR7-0013	3/18/2014
X10C0402829H1	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0498	4/23/2014
X10C0402830B	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0559	8/7/2014
X10C0402830D	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR7-0076	8/7/2014
X10C0402830E1	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR7-0130	3/25/2015
X10C0402830F	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0561	8/7/2014
X10C0402830G	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0563	8/12/2014
X10C0402831B	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0559	8/7/2014
X10C0402831C	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR7-0077	8/7/2014
X10C0402831D	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR7-0076	8/7/2014
X10C0402831E	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR7-0077	8/7/2014
X10C0402831F	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR7-0076	8/7/2014
X10C0402831G	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR7-0076	8/7/2014
X10C0402831H	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR7-0076	8/7/2014
X10C0402832A	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR7-0079	8/12/2014
X10C0402832C	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR7-0079	8/12/2014
X10C0402832D	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR7-0080	8/19/2014
X10C0402832G	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0562	8/8/2014
X10C0402832I	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR7-0080	8/19/2014
X10C0402833A	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR7-0116	10/20/2014

X10C0402833B	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0592	10/21/2014
X10C0402833C	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR7-0116	10/20/2014
X10C0402833D	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR7-0116	10/20/2014
X10C0402833E	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0592	10/21/2014
X10C0402833F	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR7-0116	10/20/2014
X10C0402833G	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0592	10/21/2014
X10C0402833H	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0592	10/21/2014
X10C0402833I	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0592	10/21/2014
X10C0402834A	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0595	10/23/2014
X10C0402834B	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0591	10/16/2014
X10C0402834C	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0591	10/16/2014
X10C0402834D	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0592	10/21/2014
X10C0402834E	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0595	10/23/2014
X10C0402834F	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR7-0116	10/20/2014
X10C0402834G	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0591	10/16/2014
X10C0402834H	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0591	10/16/2014
X10C0402834I	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0591	10/16/2014
X10C0402834J	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR7-0116	10/20/2014
X10C0402834K	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0591	10/16/2014
X10C0402834M	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0593	10/21/2014
X10C0402835A	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0514	5/20/2014
X10C0402835B	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0446	2/12/2014
X10C0402835C1	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0498	4/23/2014
X10C0402835D	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0446	2/12/2014
X10C0402835E	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0446	2/12/2014
X10C0402835F	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0444	12/27/2013
X10C0402835G	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0514	5/20/2014
X10C0402835H	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0444	12/27/2013
X10C0402835I	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR7-0011	1/9/2014
X10C0402835J	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0444	12/27/2013
X10C0402837A	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0579	9/23/2014
X10C0402837B	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0579	9/23/2014
X10C0402837C	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0579	9/23/2014
X10C0402837D	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0600	11/20/2014

X10C0402837E	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR7-0097	9/22/2014
X10C0402837H	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR7-0097	9/22/2014
X10C0402837I	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR7-0097	9/22/2014
X10C0402837J	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR7-0097	9/22/2014
X10C0402838B	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0480	3/13/2014
X10C0402838C	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0481	3/20/2014
X10C0402838E	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0482	3/20/2014
X10C0402838F	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0484	4/3/2014
X10C0402838G	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0480	3/13/2014
X10C0402838H	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0511	5/14/2014
X10C0402839A	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR7-0117	10/21/2014
X10C0402839B	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR7-0117	10/21/2014
X10C0402839C	55G	CH	ORNL	OR-REDC-CH-HET		
X10C0402839D	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0594	10/23/2014
X10C0402839E	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR7-0117	10/21/2014
X10C0402839F	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0594	10/23/2014
X10C0402839G	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0594	10/23/2014
X10C0402839H	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR7-0117	10/21/2014
X10C0402839I	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0593	10/21/2014
X10C0402840H	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0480	3/13/2014
X10C0402841F	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0547	8/4/2014
X10C0402841G1	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0499	4/23/2014
X10C0402843F	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0538	7/14/2014
X10C0402846G	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0527	6/20/2014
X10C0402846I	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0520	5/29/2014
X10C0402846J	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0527	6/20/2014
X10C0402847B	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0446	2/12/2014
X10C0402847E	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0498	4/23/2014
X10C0402847F1	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0535	7/1/2014
X10C0402847G1	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0462	2/11/2014
X10C0402847H	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0503	4/24/2014
X10C0402847I	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0445	1/9/2014
X10C0402847J	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0534	7/1/2014
X10C0402848B	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0564	8/14/2014

X10C0402848C	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0564	8/14/2014
X10C0402848F	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR7-0081	8/13/2014
X10C0402849D	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0538	7/14/2014
X10C0402849H	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0459	2/11/2014
X10C0402849I1	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0498	4/23/2014
X10C0402852J	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0458	2/19/2014
X10C0402853A	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0499	4/23/2014
X10C0402853B	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0499	4/23/2014
X10C0402853C	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0499	4/23/2014
X10C0402853D	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0499	4/23/2014
X10C0402853E	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR7-0029	4/9/2014
X10C0402853F	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0493	4/9/2014
X10C0402853H	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0493	4/9/2014
X10C0402853I	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0494	4/14/2014
X10C0402853J	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0494	4/14/2014
X10C0402853K	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0494	4/14/2014
X10C0402853L	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0494	4/14/2014
X10C0402853M	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR7-0029	4/9/2014
X10C0402853N	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0494	4/14/2014
X10C0402853O	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0494	4/14/2014
X10C0402854E	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0489	4/2/2014
X10C0402854F	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0489	4/2/2014
X10C0402854G	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0489	4/2/2014
X10C0402854H	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0489	4/2/2014
X10C0402854I	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0489	4/2/2014
X10C0402855A	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0496	4/21/2014
X10C0402855B	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0496	4/21/2014
X10C0402855C	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR7-0033	4/21/2014
X10C0402855D	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR7-0033	4/21/2014
X10C0402855E	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR7-0032	4/21/2014
X10C0402855F	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0497	4/21/2014
X10C0402855G	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0497	4/21/2014
X10C0402855H	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0497	4/21/2014
X10C0402855I	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR7-0033	4/21/2014

X10C0402855J	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR7-0033	4/21/2014
X10C0402855K	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR7-0037	5/1/2014
X10C0402856A	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0490	4/2/2014
X10C0402856C	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0491	4/3/2014
X10C0402856D	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0491	4/3/2014
X10C0402856E	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0497	4/21/2014
X10C0402856F	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0497	4/21/2014
X10C0402856G	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0497	4/21/2014
X10C0402856H	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0497	4/21/2014
X10C0402856K	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0494	4/14/2014
X10C0402857A	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0594	10/23/2014
X10C0402857B	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0594	10/23/2014
X10C0402857C	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR7-0118	10/23/2014
X10C0402857D	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR7-0118	10/23/2014
X10C0402857E1	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR7-0143	7/28/2015
X10C0402857F	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR7-0117	10/21/2014
X10C0402857G	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR7-0117	10/21/2014
X10C0402857H	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR7-0117	10/21/2014
X10C0402857I	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0591	10/16/2014
X10C0402857J	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0592	10/21/2014
X10C0402857K	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0595	10/23/2014
X10C0402858B	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR7-0145	8/3/2015
X10C0402858C	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR7-0143	7/28/2015
X10C0402858D	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR7-0143	7/28/2015
X10C0402858I	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR7-0143	7/28/2015
X10C0402859C	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0097	12/11/2008
X10C0402859E	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0097	12/11/2008
X10C0402859G	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0097	12/11/2008
X10C0402860A	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR7-0056	7/10/2014
X10C0402860B	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0588	10/8/2014
X10C0402860C	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR7-0051	6/23/2014
X10C0402860D	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR7-0051	6/23/2014
X10C0402861B	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0602	11/25/2014
X10C0402861C	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0609	12/30/2014

X10C0402861D	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0602	11/25/2014
X10C0402861E	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0602	11/25/2014
X10C0402861F	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0609	12/30/2014
X10C0402861G	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0604	12/2/2014
X10C0402861H	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0604	12/2/2014
X10C0402861I	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0605	12/3/2014
X10C0402861J1	55G	CH	ORNL	OR-REDC-CH-HET		
X10C0402862A	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR7-0052	6/19/2014
X10C0402862B	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR7-0052	6/19/2014
X10C0402862C	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR7-0056	7/10/2014
X10C0402862D	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR7-0056	7/10/2014
X10C0402862E	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR7-0056	7/10/2014
X10C0402862F	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR7-0056	7/10/2014
X10C0402862G	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR7-0056	7/10/2014
X10C0402862I	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0529	6/20/2014
X10C0402862J	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR7-0051	6/23/2014
X10C0402862K1	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0621	2/16/2015
X10C0402864A	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0553	7/29/2014
X10C0402864B	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0553	7/29/2014
X10C0402864C	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0554	7/29/2014
X10C0402864D	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0554	7/29/2014
X10C0402864E	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0554	7/29/2014
X10C0402864F	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0553	7/29/2014
X10C0402864G	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0553	7/29/2014
X10C0402864H	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0554	7/29/2014
X10C0402864I	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR7-0071	7/28/2014
X10C0402864J	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR7-0070	7/28/2014
X10C0402864L	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0554	7/29/2014
X10C0402864M	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0553	7/29/2014
X10C0402864N	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0553	7/29/2014
X10C0402864O	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0553	7/29/2014
X10C0402864P	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR7-0071	7/28/2014
X10C0402865A	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0609	12/30/2014
X10C0402865E	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0604	12/2/2014

X10C0402865F	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0605	12/3/2014
X10C0402865G	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0609	12/30/2014
X10C0402865H	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0604	12/2/2014
X10C0402865I	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0604	12/2/2014
X10C0402865J	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0605	12/3/2014
X10C0402865K	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0604	12/2/2014
X10C0402867B	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0489	4/2/2014
X10C0402867D	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0490	4/2/2014
X10C0402868C	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0496	4/21/2014
X10C0402868D	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0496	4/21/2014
X10C0402868E	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0497	4/21/2014
X10C0402868F	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0497	4/21/2014
X10C0402868G	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR7-0037	5/1/2014
X10C0402868H	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0497	4/21/2014
X10C0402868J	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR7-0039	5/6/2014
X10C0402868K	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0507	5/12/2014
X10C0402868L	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0507	5/12/2014
X10C0402868M	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR7-0039	5/6/2014
X10C0402868N	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR7-0037	5/1/2014
X10C0402868O	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR7-0032	4/21/2014
X10C0402868P	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR7-0033	4/21/2014
X10C0402868Q	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR7-0037	5/1/2014
X10C0402868R	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR7-0033	4/21/2014
X10C0402869A	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0490	4/2/2014
X10C0402869B	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR7-0029	4/9/2014
X10C0402869C	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR7-0029	4/9/2014
X10C0402869D	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR7-0029	4/9/2014
X10C0402869E	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR7-0029	4/9/2014
X10C0402869F	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR7-0029	4/9/2014
X10C0402869G	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0496	4/21/2014
X10C0402869H	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR7-0029	4/9/2014
X10C0402869I	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0493	4/9/2014
X10C0402869J	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0496	4/21/2014
X10C0402869K	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0499	4/23/2014

X10C0402869L	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0500	4/24/2014
X10C0402869M	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0495	4/21/2014
X10C0402870A	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0655	5/26/2015
X10C0402870B	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0655	5/26/2015
X10C0402870D	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0655	5/26/2015
X10C0402870F	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0655	5/26/2015
X10C0402870G	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0655	5/26/2015
X10C0402870H	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0655	5/26/2015
X10C0402870I	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0655	5/26/2015
X10C0402870K	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0655	5/26/2015
X10C0402870L	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0655	5/26/2015
X10C0402870M	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR7-0131	4/28/2015
X10C0402870P	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR7-0131	4/28/2015
X10C0402870R1	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR7-0139	6/29/2015
X10C0402873A	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0580	9/23/2014
X10C0402873B1	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0621	2/16/2015
X10C0402873C	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0578	9/24/2014
X10C0402873D	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0574	9/18/2014
X10C0402873E	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0574	9/18/2014
X10C0402873F	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0574	9/18/2014
X10C0402873G	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0579	9/23/2014
X10C0402873H	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0579	9/23/2014
X10C0402873I	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0579	9/23/2014
X10C0402874H	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0496	4/21/2014
X10C0402875D	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0484	4/3/2014
X10C0402875F	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0484	4/3/2014
X10C0402875H	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0484	4/3/2014
X10C0402876B	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0488	4/2/2014
X10C0402876C	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0505	4/29/2014
X10C0402876D	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR7-0029	4/9/2014
X10C0402876E	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR7-0028	4/7/2014
X10C0402876F1	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0654	5/20/2015
X10C0402876G	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR7-0028	4/7/2014
X10C0402876H	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR7-0029	4/9/2014

X10C0402876I	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0491	4/3/2014
X10C0402876J	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR7-0029	4/9/2014
X10C0402876K	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR7-0029	4/9/2014
X10C0402877A	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0517	6/2/2014
X10C0402877B	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR7-0042	6/2/2014
X10C0402877C	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR7-0042	6/2/2014
X10C0402877D	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0517	6/2/2014
X10C0402877E	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR7-0082	8/19/2014
X10C0402877F	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR7-0082	8/19/2014
X10C0402877G	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR7-0076	8/7/2014
X10C0402877H	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR7-0067	7/28/2014
X10C0402878B	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0532	6/25/2014
X10C0402878C	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0531	6/25/2014
X10C0402878D	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0532	6/25/2014
X10C0402878E	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR7-0038	5/6/2014
X10C0402878F	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR7-0121	11/13/2014
X10C0402878G	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0597	11/17/2014
X10C0402878I	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0531	6/25/2014
X10C0402878J	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0531	6/25/2014
X10C0402878K	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR7-0036	4/24/2014
X10C0402878M	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0543	7/16/2014
X10C0402878N	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0617	1/27/2015
X10C0402878O	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0617	1/27/2015
X10C0402879A	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0504	5/1/2014
X10C0402879C	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0504	5/1/2014
X10C0402879D	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0504	5/1/2014
X10C0402879E	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0504	5/1/2014
X10C0402879F	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0508	5/8/2014
X10C0402879H	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0507	5/12/2014
X10C0402879I	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0508	5/8/2014
X10C0402879J	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0508	5/8/2014
X10C0402879K	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0529	6/20/2014
X10C0402879L	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0508	5/8/2014
X10C0402881B	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0507	5/12/2014

X10C0402885C	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0474	3/4/2014
X10C0402885F1	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0487	3/27/2014
X10C0402885G	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR7-0009	1/16/2014
X10C0402885H	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0474	3/4/2014
X10C0402885I1	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0508	5/8/2014
X10C0402885J	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0474	3/4/2014
X10C0402885K	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0474	3/4/2014
X10C0402886A	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR7-0029	4/9/2014
X10C0402886B	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0486	3/27/2014
X10C0402886C	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0470	3/3/2014
X10C0402886D	55G	CH	ORNL	OR-REDC-CH-HET		
X10C0402886E	55G	CH	ORNL	OR-REDC-CH-HET		
X10C0402886F	55G	CH	ORNL	OR-REDC-CH-HET		
X10C0402886G	55G	CH	ORNL	OR-REDC-CH-HET		
X10C0402886H	55G	CH	ORNL	OR-REDC-CH-HET		
X10C0402886I1	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0654	5/20/2015
X10C0402886J	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR7-0016	3/11/2014
X10C0402887A1	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0599	11/17/2014
X10C0402887H	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0566	8/20/2014
X10C0402887I	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0566	8/20/2014
X10C0402890A	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR7-0014	3/4/2014
X10C0402890B	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0527	6/20/2014
X10C0402890C	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR7-0053	6/24/2014
X10C0402890D	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR7-0054	6/25/2014
X10C0402890E	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0531	6/25/2014
X10C0402890F	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0474	3/4/2014
X10C0402890G	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR7-0053	6/24/2014
X10C0402890H	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0530	6/25/2014
X10C0402890I	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0533	7/1/2014
X10C0402890J	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0536	7/1/2014
X10C0402890K	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0527	6/20/2014
X10C0402890L	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0554	7/29/2014
X10C0402891A	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0603	12/2/2014
X10C0402891B	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0609	12/30/2014

X10C0402891C	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0609	12/30/2014
X10C0402891D	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0604	12/2/2014
X10C0402891E	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0602	11/25/2014
X10C0402891F	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0609	12/30/2014
X10C0402891G	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0604	12/2/2014
X10C0402891H	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0605	12/3/2014
X10C0402891J	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0604	12/2/2014
X10C0402891K	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0605	12/3/2014
X10C0402891L	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0609	12/30/2014
X10C0402891M	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0603	12/2/2014
X10C0402891N	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0602	11/25/2014
X10C0402891O	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0602	11/25/2014
X10C0402892E	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0464	2/25/2014
X10C0402892F	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0463	2/21/2014
X10C0402892G	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0463	2/21/2014
X10C0402892H	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR7-0010	1/23/2014
X10C0402892I	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0555	7/31/2014
X10C0402893A	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0501	4/24/2014
X10C0402893B	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0502	4/24/2014
X10C0402893C	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR7-0034	4/24/2014
X10C0402893D	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0503	4/24/2014
X10C0402893E	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0502	4/24/2014
X10C0402893F	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0500	4/24/2014
X10C0402893G	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0511	5/14/2014
X10C0402893H	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR7-0040	5/6/2014
X10C0402894A	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0525	6/11/2014
X10C0402894B	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR7-0044	6/3/2014
X10C0402894C1	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0488	4/2/2014
X10C0402894D1	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR7-0052	6/19/2014
X10C0402894E	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR7-0014	3/4/2014
X10C0402894F	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0467	3/3/2014
X10C0402894G	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR7-0018	3/11/2014
X10C0402894H	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR7-0010	1/23/2014
X10C0402894I	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR7-0018	3/11/2014

X10C0402894J	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR7-0060	7/11/2014
X10C0402894K1	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0510	5/8/2014
X10C0402896B	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0511	5/14/2014
X10C0402896C	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0505	4/29/2014
X10C0402896D	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0506	5/2/2014
X10C0402896E	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0505	4/29/2014
X10C0402896F1	55G	CH	ORNL	OR-REDC-CH-HET		
X10C0402896G	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0553	7/29/2014
X10C0402897B	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0138	2/5/2009
X10C0402897C1A	55G	CH	ORNL	OR-REDC-CH-HET		
X10C0402897D	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0138	2/5/2009
X10C0402897E	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0138	2/5/2009
X10C0402897F	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0138	2/5/2009
X10C0402897H	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0138	2/5/2009
X10C0402897J	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0138	2/5/2009
X10C0402897K	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0138	2/5/2009
X10C0402898E	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0535	7/1/2014
X10C0402898G	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0530	6/25/2014
X10C0402898L1	55G	CH	ORNL	OR-REDC-CH-HET		
X10C0402899D	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0527	6/20/2014
X10C0402899F	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0476	3/7/2014
X10C0402900I	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0555	7/31/2014
X10C0402900M	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0531	6/25/2014
X10C0402901D	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0473	3/3/2014
X10C0402901F	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0474	3/4/2014
X10C0402902A	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0501	4/24/2014
X10C0402902B	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0501	4/24/2014
X10C0402902C	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0503	4/24/2014
X10C0402902D	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0503	4/24/2014
X10C0402902E	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0503	4/24/2014
X10C0402902F	55G	CH	ORNL	OR-REDC-CH-HET		
X10C0402902G	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR7-0043	5/30/2014
X10C0402902H	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0519	5/28/2014
X10C0402902I	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0519	5/28/2014

X10C0402902J	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0520	5/29/2014
X10C0402903A	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR7-0025	3/31/2014
X10C0402903B	55G	CH	ORNL	OR-REDC-CH-HET		
X10C0402903C	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR7-0050	6/19/2014
X10C0402903D	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR7-0014	3/4/2014
X10C0402903E	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR7-0032	4/21/2014
X10C0402903F	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR7-0050	6/19/2014
X10C0402903G	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR7-0062	7/11/2014
X10C0402903H1	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0654	5/20/2015
X10C0402903I1	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR7-0076	8/7/2014
X10C0402903J1	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0654	5/20/2015
X10C0402903K	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0465	2/21/2014
X10C0402903L	55G	CH	ORNL	OR-REDC-CH-HET		
X10C0402903M	55G	CH	ORNL	OR-REDC-CH-HET		
X10C0402903N	55G	CH	ORNL	OR-REDC-CH-HET		
X10C0402903O	55G	CH	ORNL	OR-REDC-CH-HET		
X10C0402904A	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR7-0076	8/7/2014
X10C0402904B	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0614	1/13/2015
X10C0402904C	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR7-0076	8/7/2014
X10C0402904D	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR7-0078	8/7/2014
X10C0402904E	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR7-0078	8/7/2014
X10C0402904F	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR7-0076	8/7/2014
X10C0402904G	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR7-0078	8/7/2014
X10C0402904H	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR7-0078	8/7/2014
X10C0402907A	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0444	12/27/2013
X10C0402907C	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0444	12/27/2013
X10C0402907D	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0444	12/27/2013
X10C0402907E	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0444	12/27/2013
X10C0402909A	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0566	8/20/2014
X10C0402909C	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0566	8/20/2014
X10C0402909D	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0556	7/31/2014
X10C0402911A	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0441	12/19/2013
X10C0402911B1	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR7-0053	6/24/2014
X10C0402911C	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0441	12/19/2013

X10C0402911D	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0441	12/19/2013
X10C0402911E	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0441	12/19/2013
X10C0402911F	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0441	12/19/2013
X10C0402911H	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0447	1/9/2014
X10C0402911I	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0448	1/24/2014
X10C0402911J	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0447	1/9/2014
X10C0402911K	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0447	1/9/2014
X10C0402911L	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0552	7/24/2014
X10C0402911M	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0533	7/1/2014
X10C0402911N	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0447	1/9/2014
X10C0402911O	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0449	2/4/2014
X10C0402912B	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0441	12/19/2013
X10C0402912H	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0539	7/15/2014
X10C0402913A	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0548	7/23/2014
X10C0402913B	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0531	6/25/2014
X10C0402913C	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR7-0053	6/24/2014
X10C0402913G	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0548	7/23/2014
X10C0402913H	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR7-0053	6/24/2014
X10C0402913I	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0530	6/25/2014
X10C0402913J	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR7-0053	6/24/2014
X10C0402917G	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0549	7/23/2014
X10C0402917H	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0549	7/23/2014
X10C0402918A	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0467	3/3/2014
X10C0402918AF	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR7-0014	3/4/2014
X10C0402918AG	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0473	3/3/2014
X10C0402918AH	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR7-0014	3/4/2014
X10C0402918AI	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR7-0009	1/16/2014
X10C0402918AJ	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0464	2/25/2014
X10C0402918AK	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0547	8/4/2014
X10C0402918AM	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR7-0073	8/6/2014
X10C0402918AN1	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0523	6/17/2014
X10C0402918AQ	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0534	7/1/2014
X10C0402918AU	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0534	7/1/2014
X10C0402918B	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR7-0050	6/19/2014

X10C0402918BA	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR7-0072	8/7/2014
X10C0402918BB	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0532	6/25/2014
X10C0402918BC	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0547	8/4/2014
X10C0402918BE	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR7-0055	7/24/2014
X10C0402918BF	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0465	2/21/2014
X10C0402918BG	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR7-0009	1/16/2014
X10C0402918BH	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0532	6/25/2014
X10C0402918BI	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR7-0055	7/24/2014
X10C0402918BJ	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR7-0073	8/6/2014
X10C0402918BK	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR7-0073	8/6/2014
X10C0402918BL	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR7-0062	7/11/2014
X10C0402918BM	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR7-0055	7/24/2014
X10C0402918BN1	55G	CH	ORNL	OR-REDC-CH-HET		
X10C0402918BN2	55G	CH	ORNL	OR-REDC-CH-HET		
X10C0402918BN3	55G	CH	ORNL	OR-REDC-CH-HET		
X10C0402918BN4	55G	CH	ORNL	OR-REDC-CH-HET		
X10C0402918BO	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR7-0072	8/7/2014
X10C0402918BP	55G	CH	ORNL	OR-REDC-CH-HET		
X10C0402918BS	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR7-0076	8/7/2014
X10C0402918BT	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0614	1/13/2015
X10C0402918BU	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0612	1/16/2015
X10C0402918BV	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR7-0076	8/7/2014
X10C0402918BZ	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0614	1/13/2015
X10C0402918C	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR7-0038	5/6/2014
X10C0402918CA	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0612	1/16/2015
X10C0402918CB	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0614	1/13/2015
X10C0402918CC	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR7-0082	8/19/2014
X10C0402918CD	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0523	6/17/2014
X10C0402918CE	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR7-0052	6/19/2014
X10C0402918CF	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR7-0052	6/19/2014
X10C0402918CG	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR7-0053	6/24/2014
X10C0402918CH	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR7-0052	6/19/2014
X10C0402918CI	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0530	6/25/2014
X10C0402918CJ	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0523	6/17/2014

X10C0402918CK	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR7-0028	4/7/2014
X10C0402918CL	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0492	4/14/2014
X10C0402918CM	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR7-0014	3/4/2014
X10C0402918D	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR7-0069	7/21/2014
X10C0402918E	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR7-0057	7/10/2014
X10C0402918F	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0467	3/3/2014
X10C0402918G	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0572	8/29/2014
X10C0402918H	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR7-0069	7/21/2014
X10C0402918I	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR7-0057	7/10/2014
X10C0402918J	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR7-0050	6/19/2014
X10C0402918K	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0465	2/21/2014
X10C0402918L	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0467	3/3/2014
X10C0402918M	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR7-0069	7/21/2014
X10C0402918S1	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0530	6/25/2014
X10C0402918U	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR7-0062	7/11/2014
X10C0402921B	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0549	7/23/2014
X10C0402921F	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0553	7/29/2014
X10C0402923A	55G	CH	ORNL	OR-REDC-CH-HET		
X10C0402923B	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0499	4/23/2014
X10C0402923C	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0499	4/23/2014
X10C0402923D	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0499	4/23/2014
X10C0402923E	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR7-0054	6/25/2014
X10C0402923F	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR7-0054	6/25/2014
X10C0402923G	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR7-0054	6/25/2014
X10C0402923I	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR7-0054	6/25/2014
X10C0402923J	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR7-0054	6/25/2014
X10C0402924A	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0466	2/25/2014
X10C0402924B	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR7-0016	3/11/2014
X10C0402924C	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0464	2/25/2014
X10C0402924D	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0465	2/21/2014
X10C0402924E	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0464	2/25/2014
X10C0402924F	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR7-0050	6/19/2014
X10C0402925C	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0141	2/5/2009
X10C0402925D	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0141	2/5/2009

X10C0402925E	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0141	2/5/2009
X10C0402925F	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0141	2/5/2009
X10C0402925H	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0141	2/5/2009
X10C0402925I	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0141	2/5/2009
X10C0402930I	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0491	4/3/2014
X10C0402931A	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0466	2/25/2014
X10C0402931B	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0463	2/21/2014
X10C0402931C	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0466	2/25/2014
X10C0402931D	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0450	2/4/2014
X10C0402931E	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0491	4/3/2014
X10C0402931G	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0464	2/25/2014
X10C0402931H	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0463	2/21/2014
X10C0402931I	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0463	2/21/2014
X10C0402931J	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR7-0039	5/6/2014
X10C0402931K	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0464	2/25/2014
X10C0402932A	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0612	1/16/2015
X10C0402932H	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0612	1/16/2015
X10C0402933A	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0477	3/18/2014
X10C0402933B	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0456	1/29/2014
X10C0402933C	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0596	11/18/2014
X10C0402933E	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR7-0019	3/18/2014
X10C0402933G	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR7-0044	6/3/2014
X10C0402934A	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0473	3/3/2014
X10C0402934B	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0473	3/3/2014
X10C0402934D	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR7-0014	3/4/2014
X10C0402934E	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR7-0014	3/4/2014
X10C0402934F	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0473	3/3/2014
X10C0402934G	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0473	3/3/2014
X10C0402934H	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0466	2/25/2014
X10C0402934I	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0474	3/4/2014
X10C0402934J	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0541	7/17/2014
X10C0402934K	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0474	3/4/2014
X10C0402934L	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR7-0053	6/24/2014
X10C0402934M	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR7-0014	3/4/2014

X10C0402935A1A	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR7-0024	3/25/2014
X10C0402935B	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR7-0034	4/24/2014
X10C0402935C	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR7-0034	4/24/2014
X10C0402935E	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR7-0056	7/10/2014
X10C0402935F	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0606	12/2/2014
X10C0402935G	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0606	12/2/2014
X10C0402935H	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR7-0045	6/10/2014
X10C0402935I	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR7-0045	6/10/2014
X10C0402935J	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0456	1/29/2014
X10C0402935K	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0606	12/2/2014
X10C0402935L	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0573	9/9/2014
X10C0402935M	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0611	12/30/2014
X10C0402935N	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0471	3/3/2014
X10C0402935O	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0460	2/13/2014
X10C0402935P	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR7-0023	3/21/2014
X10C0402935Q	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0525	6/11/2014
X10C0402935R1	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR7-0067	7/28/2014
X10C0402935S1	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR7-0068	7/21/2014
X10C0402935T1	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0467	3/3/2014
X10C0402935U1	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0470	3/3/2014
X10C0402935V1	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR7-0033	4/21/2014
X10C0402935W1	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR7-0062	7/11/2014
X10C0402936C	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0485	3/20/2014
X10C0402936D	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0484	4/3/2014
X10C0402937A	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0593	10/21/2014
X10C0402937B	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0593	10/21/2014
X10C0402937C	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0593	10/21/2014
X10C0402937D	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0593	10/21/2014
X10C0402937E	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0594	10/23/2014
X10C0402937F	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0594	10/23/2014
X10C0402937G	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0592	10/21/2014
X10C0402937H	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0594	10/23/2014
X10C0402937I	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0593	10/21/2014
X10C0402937J	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0593	10/21/2014

X10C0402937K	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0593	10/21/2014
X10C0402939A	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR7-0060	7/11/2014
X10C0402939B	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR7-0058	8/6/2014
X10C0402939C	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0499	4/23/2014
X10C0402939D	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR7-0057	7/10/2014
X10C0402939E	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR7-0057	7/10/2014
X10C0402939F	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR7-0057	7/10/2014
X10C0402939G	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0487	3/27/2014
X10C0402939H	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0500	4/24/2014
X10C0402939I	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0500	4/24/2014
X10C0402939J	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0500	4/24/2014
X10C0402939K	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0500	4/24/2014
X10C0402939L	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR7-0061	7/21/2014
X10C0402939M	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR7-0058	8/6/2014
X10C0402939N	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR7-0057	7/10/2014
X10C0402939O	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0530	6/25/2014
X10C0402939P	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0589	10/13/2014
X10C0402939Q	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0530	6/25/2014
X10C0402940A	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0634	3/16/2015
X10C0402940B	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0639	3/19/2015
X10C0402940D	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0638	3/19/2015
X10C0402940E	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0638	3/19/2015
X10C0402940F	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0638	3/19/2015
X10C0402940G	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0634	3/16/2015
X10C0402940H	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0634	3/16/2015
X10C0402940I	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0638	3/19/2015
X10C0402940J	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0638	3/19/2015
X10C0402940L	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0639	3/19/2015
X10C0402942A	55G	CH	ORNL	OR-REDC-CH-HET		
X10C0402945B	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0149	2/3/2009
X10C0402945C	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0149	2/3/2009
X10C0402945E	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0149	2/3/2009
X10C0402945F	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0149	2/3/2009
X10C0402945G	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0149	2/3/2009

X10C0402945H	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0149	2/3/2009
X10C0402945I	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0149	2/3/2009
X10C0402946A	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0583	9/25/2014
X10C0402946H	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0583	9/25/2014
X10C0402947B	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0476	3/7/2014
X10C0402947D	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0539	7/15/2014
X10C0402948A	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0551	7/28/2014
X10C0402948C	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR7-0070	7/28/2014
X10C0402948D	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR7-0070	7/28/2014
X10C0402948E	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR7-0071	7/28/2014
X10C0402948F	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR7-0051	6/23/2014
X10C0402948G	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR7-0064	7/7/2014
X10C0402948H	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR7-0067	7/28/2014
X10C0402948I	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR7-0067	7/28/2014
X10C0402948J	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0539	7/15/2014
X10C0402948K	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR7-0055	7/24/2014
X10C0402948L	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR7-0056	7/10/2014
X10C0402948M	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR7-0055	7/24/2014
X10C0402951A	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0486	3/27/2014
X10C0402951B	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0485	3/20/2014
X10C0402951C	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR7-0024	3/25/2014
X10C0402951D	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR7-0024	3/25/2014
X10C0402951E	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0514	5/20/2014
X10C0402953B1	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR7-0048	6/12/2014
X10C0402953C	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR7-0065	7/22/2014
X10C0402953D	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR7-0031	4/14/2014
X10C0402953F	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0568	8/19/2014
X10C0402953G	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0568	8/19/2014
X10C0402953H1	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR7-0018	3/11/2014
X10C0402953I	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0568	8/19/2014
X10C0402953J	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0568	8/19/2014
X10C0402953K1	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0450	2/4/2014
X10C0402953L	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0549	7/23/2014
X10C0402953M	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR7-0020	3/18/2014

X10C0402957G	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0489	4/2/2014
X10C0402958A	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR7-0039	5/6/2014
X10C0402958B	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR7-0028	4/7/2014
X10C0402958C	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR7-0031	4/14/2014
X10C0402958E	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR7-0016	3/11/2014
X10C0402958F	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0475	3/4/2014
X10C0402958G	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR7-0045	6/10/2014
X10C0402958H1	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0472	3/3/2014
X10C0402958K1	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0477	3/18/2014
X10C0402959B	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0477	3/18/2014
X10C0402959C	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0477	3/18/2014
X10C0402959D	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0477	3/18/2014
X10C0402959E	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR7-0017	3/12/2014
X10C0402959F	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0477	3/18/2014
X10C0402959G	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0616	1/14/2015
X10C0402959H	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0554	7/29/2014
X10C0402959I	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0475	3/4/2014
X10C0402959J1	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0688	9/24/2015
X10C0402959J2	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0688	9/24/2015
X10C0402959K	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0477	3/18/2014
X10C0402959L	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR7-0016	3/11/2014
X10C0402960A	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0470	3/3/2014
X10C0402960B	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0466	2/25/2014
X10C0402960C	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0461	2/11/2014
X10C0402960D	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0507	5/12/2014
X10C0402960E	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR7-0060	7/11/2014
X10C0402960F	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0462	2/11/2014
X10C0402960G	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0446	2/12/2014
X10C0402960H	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0446	2/12/2014
X10C0402960I	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0461	2/11/2014
X10C0402960J	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR7-0020	3/18/2014
X10C0402961A	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0476	3/7/2014
X10C0402961B	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0544	7/23/2014
X10C0402961C	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0444	12/27/2013

X10C0402961D	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0443	1/23/2014
X10C0402961E	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0443	1/23/2014
X10C0402961G	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0520	5/29/2014
X10C0402961H	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0555	7/31/2014
X10C0402962A1	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR7-0139	6/29/2015
X10C0402962B	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0639	3/19/2015
X10C0402962D	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0637	3/17/2015
X10C0402962E1	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR7-0141	7/23/2015
X10C0402962I	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0637	3/17/2015
X10C0402962J	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0637	3/17/2015
X10C0402962K	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0639	3/19/2015
X10C0402962L	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0637	3/17/2015
X10C0402962M	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0639	3/19/2015
X10C0402963A	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR7-0082	8/19/2014
X10C0402963B	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR7-0082	8/19/2014
X10C0402963C	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0545	7/22/2014
X10C0402963D	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0545	7/22/2014
X10C0402963F	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR7-0066	7/21/2014
X10C0402963G	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR7-0066	7/21/2014
X10C0402963H	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0500	4/24/2014
X10C0402963I	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0500	4/24/2014
X10C0402964C	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR7-0028	4/7/2014
X10C0402964F	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR7-0028	4/7/2014
X10C0402964I	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0470	3/3/2014
X10C0402965A	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR7-0117	10/21/2014
X10C0402965B	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0592	10/21/2014
X10C0402965C	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR7-0118	10/23/2014
X10C0402965D	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0592	10/21/2014
X10C0402965F	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0593	10/21/2014
X10C0402965H	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0593	10/21/2014
X10C0402965I	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0593	10/21/2014
X10C0402965J	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR7-0117	10/21/2014
X10C0402965K	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR7-0117	10/21/2014
X10C0402965M	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0592	10/21/2014

X10C0402965N	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0592	10/21/2014
X10C0402966A	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0634	3/16/2015
X10C0402966B	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0638	3/19/2015
X10C0402966D	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0638	3/19/2015
X10C0402966E	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0634	3/16/2015
X10C0402966G	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0638	3/19/2015
X10C0402966H	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0638	3/19/2015
X10C0402966I	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0639	3/19/2015
X10C0402966J	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0638	3/19/2015
X10C0402966K	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0639	3/19/2015
X10C0402966L	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0634	3/16/2015
X10C0402966M	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0638	3/19/2015
X10C0402967A	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0533	7/1/2014
X10C0402967C	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0449	2/4/2014
X10C0402967D	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0502	4/24/2014
X10C0402967H	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0449	2/4/2014
X10C0402969A	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0555	7/31/2014
X10C0402969F	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0520	5/29/2014
X10C0402969G	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0520	5/29/2014
X10C0402969H	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0477	3/18/2014
X10C0402969I	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0520	5/29/2014
X10C0402969J	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0477	3/18/2014
X10C0402970C1	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR7-0019	3/18/2014
X10C0402970E	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0584	9/29/2014
X10C0402970F	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0581	9/23/2014
X10C0402976A	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR7-0116	10/20/2014
X10C0402976B	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0591	10/16/2014
X10C0402976C	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0592	10/21/2014
X10C0402976D	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0591	10/16/2014
X10C0402976E	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0591	10/16/2014
X10C0402976F	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0592	10/21/2014
X10C0402976G	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0592	10/21/2014
X10C0402976H	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0592	10/21/2014
X10C0402976I	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR7-0116	10/20/2014

X10C0402976J	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR7-0116	10/20/2014
X10C0402977F	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0444	12/27/2013
X10C0402977G	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0441	12/19/2013
X10C0402978B	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0486	3/27/2014
X10C0402978D	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0470	3/3/2014
X10C0402978F	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0611	12/30/2014
X10C0402978G	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0611	12/30/2014
X10C0402978I	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0471	3/3/2014
X10C0402978J	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0485	3/20/2014
X10C0402980H1A	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0589	10/13/2014
X10C0402981A	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0515	5/20/2014
X10C0402981B	55G	CH	ORNL	OR-REDC-CH-HET		
X10C0402981C	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR7-0041	5/19/2014
X10C0402981D	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR7-0041	5/19/2014
X10C0402981E	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR7-0041	5/19/2014
X10C0402981F	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0515	5/20/2014
X10C0402981G	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR7-0042	6/2/2014
X10C0402981H	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR7-0042	6/2/2014
X10C0402981I	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR7-0051	6/23/2014
X10C0402981K	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0516	5/21/2014
X10C0402981L	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0571	8/26/2014
X10C0402981M	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR7-0042	6/2/2014
X10C0402981N	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR7-0064	7/7/2014
X10C0402981O	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR7-0064	7/7/2014
X10C0402981P	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0518	5/28/2014
X10C0402982L	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0468	3/3/2014
X10C0402982N	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR7-0068	7/21/2014
X10C0402982S	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR7-0015	3/4/2014
X10C0402982T	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0464	2/25/2014
X10C0402983A	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0548	7/23/2014
X10C0402983B	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0610	1/14/2015
X10C0402983C	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0573	9/9/2014
X10C0402983D	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0573	9/9/2014
X10C0402984A1	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0487	3/27/2014

X10C0402984B1	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR7-0037	5/1/2014
X10C0402984C	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0460	2/13/2014
X10C0402984D	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR7-0074	8/1/2014
X10C0402984E1	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR7-0028	4/7/2014
X10C0402984F	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0615	1/14/2015
X10C0402984G1	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR7-0041	5/19/2014
X10C0402984H	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0614	1/13/2015
X10C0402985B1	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0472	3/3/2014
X10C0402985C	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0494	4/14/2014
X10C0402985D1	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR7-0034	4/24/2014
X10C0402985E1	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR7-0063	7/15/2014
X10C0402985F1	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0478	3/13/2014
X10C0402985G1A	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR7-0042	6/2/2014
X10C0402985H	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0481	3/20/2014
X10C0402985I1	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR7-0048	6/12/2014
X10C0402985K	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0481	3/20/2014
X10C0402985L1	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR7-0048	6/12/2014
X10C0402985M1	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR7-0018	3/11/2014
X10C0402985N	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0480	3/13/2014
X10C0402985O	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0492	4/14/2014
X10C0402985Q	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0486	3/27/2014
X10C0402985S	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR7-0067	7/28/2014
X10C0402986AA1	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR7-0031	4/14/2014
X10C0402986AB	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR7-0079	8/12/2014
X10C0402986AC	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0482	3/20/2014
X10C0402986AD	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR7-0019	3/18/2014
X10C0402986AE	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR7-0050	6/19/2014
X10C0402986AF1	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR7-0036	4/24/2014
X10C0402986AG1	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR7-0058	8/6/2014
X10C0402986B	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR7-0071	7/28/2014
X10C0402986C1	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR7-0034	4/24/2014
X10C0402986D	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0608	12/30/2014
X10C0402986E	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR7-0030	4/10/2014
X10C0402986F1	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR7-0044	6/3/2014

X10C0402986G	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR7-0045	6/10/2014
X10C0402986H	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0608	12/30/2014
X10C0402986I	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0450	2/4/2014
X10C0402986J	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0470	3/3/2014
X10C0402986K1	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0470	3/3/2014
X10C0402986L1	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR7-0057	7/10/2014
X10C0402986M	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0460	2/13/2014
X10C0402986N	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0499	4/23/2014
X10C0402986P	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0527	6/20/2014
X10C0402986Q	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0524	6/11/2014
X10C0402986R	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0447	1/9/2014
X10C0402986S	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR7-0022	3/31/2014
X10C0402986T	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0468	3/3/2014
X10C0402986U	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0492	4/14/2014
X10C0402986V	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0479	3/12/2014
X10C0402986W	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0479	3/12/2014
X10C0402986X	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0479	3/12/2014
X10C0402986Y	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0479	3/12/2014
X10C0402987A1	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR7-0044	6/3/2014
X10C0402987B1	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR7-0041	5/19/2014
X10C0402987C	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0514	5/20/2014
X10C0402987E	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR7-0023	3/21/2014
X10C0402987G	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0514	5/20/2014
X10C0402987H1	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR7-0011	1/9/2014
X10C0402987H2	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0459	2/11/2014
X10C0402987J1	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0537	7/14/2014
X10C0402987N	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0449	2/4/2014
X10C0402988A1	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR7-0055	7/24/2014
X10C0402988B	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0460	2/13/2014
X10C0402988C1	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR7-0013	3/18/2014
X10C0402988D	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR7-0020	3/18/2014
X10C0402988E	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR7-0020	3/18/2014
X10C0402988F	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0543	7/16/2014
X10C0402988G	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR7-0013	3/18/2014

X10C0402988H	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0450	2/4/2014
X10C0402988I	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0460	2/13/2014
X10C0402988J	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR7-0019	3/18/2014
X10C0402988K	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0462	2/11/2014
X10C0402988L	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR7-0020	3/18/2014
X10C0402988M	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR7-0145	8/3/2015
X10C0402988N	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0462	2/11/2014
X10C0402988O1	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0470	3/3/2014
X10C0402998B	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0591	10/16/2014
X10C0402998C	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0591	10/16/2014
X10C0402998D	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0591	10/16/2014
X10C0402998E	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0594	10/23/2014
X10C0402998F	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR7-0117	10/21/2014
X10C0402998G	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0594	10/23/2014
X10C0402998H	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0594	10/23/2014
X10C0402998I	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0594	10/23/2014
X10C0402998J	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0594	10/23/2014
X10C0402998K	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0594	10/23/2014
X10C0402998L	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR7-0117	10/21/2014
X10C0403027A	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR7-0013	3/18/2014
X10C0403027B	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0498	4/23/2014
X10C0403027E	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0534	7/1/2014
X10C0403027G	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0502	4/24/2014
X10C0403027H	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR7-0013	3/18/2014
X10C0403027I	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0538	7/14/2014
X10C0403027K	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0520	5/29/2014
X10C0403028A	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0561	8/7/2014
X10C0403028B	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0561	8/7/2014
X10C0403028C	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR7-0079	8/12/2014
X10C0403028D	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0561	8/7/2014
X10C0403028E	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0563	8/12/2014
X10C0403028F	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0563	8/12/2014
X10C0403028G	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0565	8/18/2014
X10C0403028H	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0564	8/14/2014

X10C0403028I	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0564	8/14/2014
X10C0403028J	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0564	8/14/2014
X10C0403028K	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0563	8/12/2014
X10C0403028L	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0563	8/12/2014
X10C0403028M	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR7-0080	8/19/2014
X10C0403028N	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR7-0080	8/19/2014
X10C0403028O	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR7-0080	8/19/2014
X10C0403029A	55G	CH	ORNL	OR-REDC-CH-HET		
X10C0403029B	55G	CH	ORNL	OR-REDC-CH-HET		
X10C0403029D	55G	CH	ORNL	OR-REDC-CH-HET		
X10C0403029E	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR7-0039	5/6/2014
X10C0403029F	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0443	1/23/2014
X10C0403030A1	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0280	2/1/2010
X10C0403030B	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0118	10/30/2008
X10C0403030C	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0118	10/30/2008
X10C0403030D1	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0257	12/14/2009
X10C0403030E	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0118	10/30/2008
X10C0403030F	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0118	10/30/2008
X10C0403030G	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0118	10/30/2008
X10C0403030J	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0118	10/30/2008
X10C0501411A	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0169	4/15/2009
X10C0501528	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0550	7/23/2014
X10C0501548	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0551	7/28/2014
X10C0501584A	55G	CH	ORNL	OR-REDC-CH-HET		
X10C0501640	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0193	7/7/2009
X10C0501654A	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0048	6/27/2008
X10C0501665A	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0269	1/5/2010
X10C0501679A	55G	CH	ORNL	OR-REDC-CH-HET		
X10C0501680	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR7-0071	7/28/2014
X10C0501691	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0230	9/22/2009
X10C0501697	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0229	9/10/2009
X10C0501698A	55G	CH	ORNL	OR-REDC-CH-HET		
X10C0501699	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0228	9/8/2009
X10C0501703A	55G	CH	ORNL	OR-REDC-CH-HET		

X10C0501706	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0193	7/7/2009
X10C0501719	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0141	2/5/2009
X10C0501730	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0191	6/17/2009
X10C0501733	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0222	8/31/2009
X10C0501737	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0192	7/2/2009
X10C0501803	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0043	5/19/2008
X10C0501808A	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0222	8/31/2009
X10C0501809	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0191	6/17/2009
X10C0501812	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0229	9/10/2009
X10C0501813	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0191	6/17/2009
X10C0501815	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0123	11/4/2008
X10C0501818	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0361	12/28/2010
X10C0501824	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0125	11/6/2008
X10C0501825	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0193	7/7/2009
X10C0505649A	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0540	7/14/2014
X10C0505650A1	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR7-0073	8/6/2014
X10C0505877C	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0532	6/25/2014
X10C0506144A	55G	CH	ORNL	OR-REDC-CH-HET		
X10C0506144B	55G	CH	ORNL	OR-REDC-CH-HET		
X10C0506144D	55G	CH	ORNL	OR-REDC-CH-HET		
X10C0506526A	55G	CH	ORNL	OR-REDC-CH-HET		
X10C0506526E	55G	CH	ORNL	OR-REDC-CH-HET		
X10C0506526I	55G	CH	ORNL	OR-REDC-CH-HET		
X10C0506526J	55G	CH	ORNL	OR-REDC-CH-HET		
X10C0701294A	55G	CH	ORNL	OR-REDC-CH-HET		
X10C0701295A	55G	CH	ORNL	OR-REDC-CH-HET		
X10C0701300A	55G	CH	ORNL	OR-REDC-CH-HET		
X10C0701300B	55G	CH	ORNL	OR-REDC-CH-HET		
X10C0701302A	55G	CH	ORNL	OR-REDC-CH-HET		
X10C0701303A	55G	CH	ORNL	OR-REDC-CH-HET		
X10C0702201A	55G	CH	ORNL	OR-REDC-CH-HET		
X10C0702202A	55G	CH	ORNL	OR-REDC-CH-HET		
X10C0702204A	55G	CH	ORNL	OR-REDC-CH-HET		
X10C0702205A	55G	CH	ORNL	OR-REDC-CH-HET		

X10C0702208A	55G	CH	ORNL	OR-REDC-CH-HET
X10C0702220A	55G	CH	ORNL	OR-REDC-CH-HET
X10C0702222A	55G	CH	ORNL	OR-REDC-CH-HET
X10C0702228A	55G	CH	ORNL	OR-REDC-CH-HET
X10C0702231A	55G	CH	ORNL	OR-REDC-CH-HET
X10C0800155A	55G	CH	ORNL	OR-REDC-CH-HET
X10C0800156A	55G	CH	ORNL	OR-REDC-CH-HET
X10C0800159A	55G	CH	ORNL	OR-REDC-CH-HET
X10C0800163A	55G	CH	ORNL	OR-REDC-CH-HET
X10C0800164A	55G	CH	ORNL	OR-REDC-CH-HET
X10C0800169A	55G	CH	ORNL	OR-REDC-CH-HET
X10C0800175A	55G	CH	ORNL	OR-REDC-CH-HET
X10C0800181A	55G	CH	ORNL	OR-REDC-CH-HET
X10C0800185A	55G	CH	ORNL	OR-REDC-CH-HET
X10C0800187A	55G	CH	ORNL	OR-REDC-CH-HET
X10C0801685A	55G	CH	ORNL	OR-REDC-CH-HET
X10C0801685B	55G	CH	ORNL	OR-REDC-CH-HET
X10C0801685C	55G	CH	ORNL	OR-REDC-CH-HET
X10C0802044A	55G	CH	ORNL	OR-REDC-CH-HET
X10C0802044B	55G	CH	ORNL	OR-REDC-CH-HET
X10C0802044C	55G	CH	ORNL	OR-REDC-CH-HET
X10C0802044D	55G	CH	ORNL	OR-REDC-CH-HET
X10C0802044E	55G	CH	ORNL	OR-REDC-CH-HET
X10C0802044F	55G	CH	ORNL	OR-REDC-CH-HET
X10C0802044G	55G	CH	ORNL	OR-REDC-CH-HET
X10C0802044H	55G	CH	ORNL	OR-REDC-CH-HET
X10C0802044I	55G	CH	ORNL	OR-REDC-CH-HET
X10C0802044J	55G	CH	ORNL	OR-REDC-CH-HET
X10C0900761A	55G	CH	ORNL	OR-REDC-CH-HET
X10C0901941A	55G	CH	ORNL	OR-REDC-CH-HET
X10C1001956A	55G	CH	ORNL	OR-REDC-CH-HET
X10C1001963A	55G	CH	ORNL	OR-REDC-CH-HET
X10C1001967A	55G	CH	ORNL	OR-REDC-CH-HET
X10C1001971A	55G	CH	ORNL	OR-REDC-CH-HET

X10C1001972A	55G	CH	ORNL	OR-REDC-CH-HET		
X10C1001973A	55G	CH	ORNL	OR-REDC-CH-HET		
X10C1001975A	55G	CH	ORNL	OR-REDC-CH-HET		
X10C1001978A1	55G	CH	ORNL	OR-REDC-CH-HET		
X10C1001978A2	55G	CH	ORNL	OR-REDC-CH-HET		
X10C1001985A	55G	CH	ORNL	OR-REDC-CH-HET		
X10C1001987A	55G	CH	ORNL	OR-REDC-CH-HET		
X10C1001988A	55G	CH	ORNL	OR-REDC-CH-HET		
X10C1001992G	55G	CH	ORNL	OR-REDC-CH-HET		
X10C1001992H	55G	CH	ORNL	OR-REDC-CH-HET		
X10C1200332A	55G	CH	ORNL	OR-REDC-CH-HET		
X10C1200336A	55G	CH	ORNL	OR-REDC-CH-HET		
X10C1200337A	55G	CH	ORNL	OR-REDC-CH-HET		
X10C1200364A	55G	CH	ORNL	OR-REDC-CH-HET		
X10C1200366A	55G	CH	ORNL	OR-REDC-CH-HET		
X10C1200367A	55G	CH	ORNL	OR-REDC-CH-HET		
X10C1200372A	55G	CH	ORNL	OR-REDC-CH-HET		
X10C1300500A	55G	CH	ORNL	OR-REDC-CH-HET		
X10C1300503A	55G	CH	ORNL	OR-REDC-CH-HET		
X10C1300504A	55G	CH	ORNL	OR-REDC-CH-HET		
X10C1300507A	55G	CH	ORNL	OR-REDC-CH-HET		
X10C1300514A	55G	CH	ORNL	OR-REDC-CH-HET		
X10C9304039A	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0252	12/1/2009
X10C9304039B	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0611	12/30/2014
X10C9304039D	55G	CH	ORNL	OR-REDC-CH-HET		
X10C9306657A	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0612	1/16/2015
X10C9306658A	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0580	9/23/2014
X10C9306659A	55G	CH	ORNL	OR-REDC-CH-HET		
X10C9306660A	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0409	6/6/2011
X10C9306661A	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0392	3/30/2011
X10C9306662	55G	CH	ORNL	OR-REDC-CH-HET		
X10C9307210	55G	CH	ORNL	OR-REDC-CH-HET		
X10C9307211	55G	CH	ORNL	OR-REDC-CH-HET		
X10C9307212	55G	CH	ORNL	OR-REDC-CH-HET		

X10C9307215	55G	CH	ORNL	OR-REDC-CH-HET		
X10C9307216A	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0151	3/2/2009
X10C9307218	55G	CH	ORNL	OR-REDC-CH-HET		
X10C9307220A	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0607	12/4/2014
X10C9307221A	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0605	12/3/2014
X10C9307222A	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0151	3/2/2009
X10C9307224A	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0148	2/2/2009
X10C9307225	55G	CH	ORNL	OR-REDC-CH-HET		
X10C9307226	55G	CH	ORNL	OR-REDC-CH-HET		
X10C9307227A	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0167	4/27/2009
X10C9307229	55G	CH	ORNL	OR-REDC-CH-HET		
X10C9307231	55G	CH	ORNL	OR-REDC-CH-HET		
X10C9307232	55G	CH	ORNL	OR-REDC-CH-HET		
X10C9307233	55G	CH	ORNL	OR-REDC-CH-HET		
X10C9307234A	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0113	1/12/2009
X10C9307235A1A	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR7-0130	3/25/2015
X10C9307236A1	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0155	3/12/2009
X10C9307236B	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0026	2/18/2008
X10C9307237	55G	CH	ORNL	OR-REDC-CH-HET		
X10C9307238A	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR7-0063	7/15/2014
X10C9307239A1	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0257	12/14/2009
X10C9309163G1	55G	CH	ORNL	OR-REDC-CH-HET		
X10C9309163H	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0179	6/29/2009
X10C9309163J	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0180	6/17/2009
X10C9309163N1	55G	CH	ORNL	OR-REDC-CH-HET		
X10C9309172A	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0442	2/12/2014
X10C9309191A	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0186	5/14/2009
X10C9309194G	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0179	6/29/2009
X10C9309194I	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0179	6/29/2009
X10C9309194L	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0189	6/12/2009
X10C9309195F	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0287	6/10/2010
X10C9309206L	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0152	3/26/2012
X10C9309206S	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0154	2/25/2009
X10C9309206U	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0154	2/25/2009

X10C9309207B	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0144	1/27/2009
X10C9309207I	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0142	2/5/2009
X10C9309209A	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0160	6/22/2009
X10C9309209E	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0159	3/12/2009
X10C9309210F	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0160	6/22/2009
X10C9309211V	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0144	1/27/2009
X10C9309215A	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0171	4/15/2009
X10C9309218E1	55G	CH	ORNL	OR-REDC-CH-HET		
X10C9309218F1	55G	CH	ORNL	OR-REDC-CH-HET		
X10C9309218H	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0158	3/10/2009
X10C9309218I	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0162	3/25/2009
X10C9309218K1	55G	CH	ORNL	OR-REDC-CH-HET		
X10C9309218M1	55G	CH	ORNL	OR-REDC-CH-HET		
X10C9309218N1	55G	CH	ORNL	OR-REDC-CH-HET		
X10C9309952	55G	CH	ORNL	OR-REDC-CH-HET		
X10C9309966	55G	CH	ORNL	OR-REDC-CH-HET		
X10C9309968A	55G	CH	ORNL	OR-REDC-CH-HET		
X10C9309971	55G	CH	ORNL	OR-REDC-CH-HET		
X10C9310002	55G	CH	ORNL	OR-REDC-CH-HET		
X10C9310003G	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR7-0101	9/23/2014
X10C9310022A	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0526	6/12/2014
X10C9310023A	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0257	12/14/2009
X10C9310023B	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0586	10/3/2014
X10C9310026A	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0297	10/18/2010
X10C9310032A	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0580	9/23/2014
X10C9310035	55G	CH	ORNL	OR-REDC-CH-HET		
X10C9310043A	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0165	6/17/2009
X10C9310044A	55G	CH	ORNL	OR-REDC-CH-HET		
X10C9310046A	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0148	2/2/2009
X10C9310048A	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0274	1/18/2010
X10C9310049A	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0151	3/2/2009
X10C9311036A	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR7-0007	12/27/2013
X10C9311040A	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0466	2/25/2014
X10C9311052A	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0547	8/4/2014

X10C9311053A	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0476	3/7/2014
X10C9311060A	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR7-0013	3/18/2014
X10C9311071A1	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0453	2/3/2014
X10C9311088A	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0283	2/8/2010
X10C9311099	55G	CH	ORNL	OR-REDC-CH-HET		
X10C9311120A	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0282	2/4/2010
X10C9311125A	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0253	12/2/2009
X10C9311128A	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0242	10/5/2009
X10C9311131A	55G	CH	ORNL	OR-REDC-CH-HET		
X10C9311161A	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0208	8/6/2009
X10C9311162A	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0243	10/6/2009
X10C9311185A	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0254	12/2/2009
X10C9311189A	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0233	9/16/2009
X10C9311191A	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0441	12/19/2013
X10C9311199A	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0271	12/28/2009
X10C9311200A	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0580	9/23/2014
X10C9311202A	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0172	4/27/2009
X10C9311203B	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR7-0039	5/6/2014
X10C9311205A	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0242	10/5/2009
X10C9311209A	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0499	4/23/2014
X10C9311215A	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR7-0022	3/31/2014
X10C9311235A	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR7-0018	3/11/2014
X10C9311246A	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0446	2/12/2014
X10C9311266A	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0442	2/12/2014
X10C9311269A	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0181	4/27/2009
X10C9311273A	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0260	12/16/2009
X10C9311297A	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0249	10/21/2009
X10C9311299A	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0243	10/6/2009
X10C9311300A	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR7-0020	3/18/2014
X10C9311310A	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0241	9/30/2009
X10C9311357A	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0243	10/6/2009
X10C9311367A	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0237	9/23/2009
X10C9311379A	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0164	6/2/2009
X10C9311381A	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0169	4/15/2009

X10C9311387A	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0181	4/27/2009
X10C9311388A	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0241	9/30/2009
X10C9311393A	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0258	12/14/2009
X10C9311394A	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0173	4/27/2009
X10C9311397A	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0247	10/14/2009
X10C9311404A	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR7-0036	4/24/2014
X10C9311409A	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0471	3/3/2014
X10C9311457A	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0428	5/20/2011
X10C9311474A	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0540	7/14/2014
X10C9311497A	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0193	7/7/2009
X10C9311500A	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0513	5/16/2014
X10C9311510A	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0513	5/16/2014
X10C9311513A	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0582	9/24/2014
X10C9311516A1	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0166	4/13/2009
X10C9311524A	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0189	6/12/2009
X10C9311524B	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0189	6/12/2009
X10C9311527A	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0488	4/2/2014
X10C9311528A	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0188	6/22/2009
X10C9311530A	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0254	12/2/2009
X10C9311532A	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0182	5/14/2009
X10C9311534	55G	CH	ORNL	OR-REDC-CH-HET		
X10C9311535B	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0249	10/21/2009
X10C9311537A	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0198	6/22/2009
X10C9311538A	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0227	9/10/2009
X10C9311544A	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0248	10/21/2009
X10C9311547A	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0208	8/6/2009
X10C9311562A	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0172	4/27/2009
X10C9311568A	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0273	1/18/2010
X10C9311570A	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0208	8/6/2009
X10C9311572A	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0259	12/14/2009
X10C9311573A	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0248	10/21/2009
X10C9311575A	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0173	4/27/2009
X10C9311586A	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0237	9/23/2009
X10C9311597A	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0241	9/30/2009

X10C9311599A	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0204	7/28/2009
X10C9311620A	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0252	12/1/2009
X10C9311656A	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0454	1/28/2014
X10C9311657A	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0208	8/6/2009
X10C9311659A	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0148	2/2/2009
X10C9311663A	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0273	1/18/2010
X10C9311664A	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0165	6/17/2009
X10C9311668A	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0235	9/21/2009
X10C9311672A	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR7-0052	6/19/2014
X10C9311676A	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0247	10/14/2009
X10C9311677A	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0190	6/22/2009
X10C9311678A	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0169	4/15/2009
X10C9311679A	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0168	4/15/2009
X10C9311687A	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0429	5/20/2011
X10C9311703A	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0168	4/15/2009
X10C9311742A	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0440	12/18/2013
X10C9311746A	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0149	2/3/2009
X10C9311747A	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0165	6/17/2009
X10C9311752A	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0596	11/18/2014
X10C9311760A	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0243	10/6/2009
X10C9311761A	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0276	1/18/2010
X10C9311762A	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0241	9/30/2009
X10C9311763A	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0283	2/8/2010
X10C9311786A	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0237	9/23/2009
X10C9311802A	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0253	12/2/2009
X10C9311807A1	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0248	10/21/2009
X10C9311813	55G	CH	ORNL	OR-REDC-CH-HET		
X10C9311819A	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0165	6/17/2009
X10C9311824	55G	CH	ORNL	OR-REDC-CH-HET		
X10C9311825	55G	CH	ORNL	OR-REDC-CH-HET		
X10C9311826A	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0237	9/23/2009
X10C9311827A	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0601	12/1/2014
X10C9311828A	55G	CH	ORNL	OR-REDC-CH-HET		
X10C9311828B	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0551	7/28/2014

X10C9311829	55G	CH	ORNL	OR-REDC-CH-HET		
X10C9311837	55G	CH	ORNL	OR-REDC-CH-HET		
X10C9311838	55G	CH	ORNL	OR-REDC-CH-HET		
X10C9311839	55G	CH	ORNL	OR-REDC-CH-HET		
X10C9311847A	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0278	2/1/2010
X10C9311848	55G	CH	ORNL	OR-REDC-CH-HET		
X10C9311851	55G	CH	ORNL	OR-REDC-CH-HET		
X10C9311854A	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0189	6/12/2009
X10C9311860	55G	CH	ORNL	OR-REDC-CH-HET		
X10C9311862A	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0392	3/30/2011
X10C9311865A	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0428	5/20/2011
X10C9311865B	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0442	2/12/2014
X10C9311869A	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0188	6/22/2009
X10C9311870A	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0116	12/8/2008
X10C9311873	55G	CH	ORNL	OR-REDC-CH-HET		
X10C9311874	55G	CH	ORNL	OR-REDC-CH-HET		
X10C9311876A	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR7-0017	3/12/2014
X10C9311878A	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0510	5/8/2014
X10C9311881A	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0258	12/14/2009
X10C9311888	55G	CH	ORNL	OR-REDC-CH-HET		
X10C9311890A	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0164	6/2/2009
X10C9311897	55G	CH	ORNL	OR-REDC-CH-HET		
X10C9311900A1	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0587	10/7/2014
X10C9311908A	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0255	12/3/2009
X10C9311909A1	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0247	10/14/2009
X10C9311909B	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0115	11/5/2008
X10C9311910	55G	CH	ORNL	OR-REDC-CH-HET		
X10C9311911A	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0247	10/14/2009
X10C9311914A	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0235	9/21/2009
X10C9311916	55G	CH	ORNL	OR-REDC-CH-HET		
X10C9311919A	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0586	10/3/2014
X10C9311920	55G	CH	ORNL	OR-REDC-CH-HET		
X10C9311921A	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0210	7/23/2009
X10C9311923A	55G	CH	ORNL	OR-REDC-CH-HET		

X10C9311942A	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0237	9/23/2009
X10C9311945A	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0231	9/14/2009
X10C9311962A	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR7-0006	12/18/2013
X10C9311989A	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR7-0019	3/18/2014
X10C9311990B	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0534	7/1/2014
X10C9311990D	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0534	7/1/2014
X10C9311997A	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0198	6/22/2009
X10C9312004A	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR7-0006	12/18/2013
X10C9312010A	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0238	9/24/2009
X10C9312016A	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0249	10/21/2009
X10C9312024A	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0193	7/7/2009
X10C9312034A	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0167	4/27/2009
X10C9312036A	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0190	6/22/2009
X10C9312039A	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0193	7/7/2009
X10C9312043A	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0193	7/7/2009
X10C9312046A	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0193	7/7/2009
X10C9312059A	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0169	4/15/2009
X10C9312061A	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0211	8/11/2009
X10C9312069A	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0241	9/30/2009
X10C9312083A	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0237	9/23/2009
X10C9312089A	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0255	12/3/2009
X10C9312091A	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0248	10/21/2009
X10C9312111A	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0181	4/27/2009
X10C9312117A	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0188	6/22/2009
X10C9312121A	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0249	10/21/2009
X10C9312125A	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0248	10/21/2009
X10C9312126A	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0434	12/4/2013
X10C9312128A	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0486	3/27/2014
X10C9312129A	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0181	4/27/2009
X10C9312137	55G	CH	ORNL	OR-REDC-CH-HET		
X10C9312139A	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0584	9/29/2014
X10C9312148A	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0248	10/21/2009
X10C9312164A	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0272	1/11/2010
X10C9312194A	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0546	7/23/2014

X10C9312195A	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0265	12/29/2009
X10C9312202A	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0164	6/2/2009
X10C9312203A	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0173	4/27/2009
X10C9312204A	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0187	6/10/2009
X10C9312205A	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0208	8/6/2009
X10C9312213A	55G	CH	ORNL	OR-REDC-CH-HET		
X10C9312230	55G	CH	ORNL	OR-REDC-CH-HET		
X10C9312242A	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0187	6/10/2009
X10C9312251	55G	CH	ORNL	OR-REDC-CH-HET		
X10C9312254A	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0247	10/14/2009
X10C9312255	55G	CH	ORNL	OR-REDC-CH-HET		
X10C9312258A	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0114	11/4/2008
X10C9312264A	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0237	9/23/2009
X10C9312273A	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0251	12/1/2009
X10C9312274A	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0043	5/19/2008
X10C9312280	55G	CH	ORNL	OR-REDC-CH-HET		
X10C9312287A	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0247	10/14/2009
X10C9312288A	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0187	6/10/2009
X10C9312290A	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0186	5/14/2009
X10C9312292A	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0190	6/22/2009
X10C9312295A	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0187	6/10/2009
X10C9312297A	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0180	6/17/2009
X10C9312298A	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0539	7/15/2014
X10C9312299A	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0172	4/27/2009
X10C9312303	55G	CH	ORNL	OR-REDC-CH-HET		
X10C9312304A	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0234	9/21/2009
X10C9312307A	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0247	10/14/2009
X10C9312309A	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0251	12/1/2009
X10C9312313A	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0581	9/23/2014
X10C9312315A	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0168	4/15/2009
X10C9312319A	55G	CH	ORNL	OR-REDC-CH-HET		
X10C9312321A	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0440	12/18/2013
X10C9312325A	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0260	12/16/2009
X10C9312326A	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0451	2/13/2014

X10C9312327A	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0195	6/12/2009
X10C9312332A	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0267	1/11/2010
X10C9312334A	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0282	2/4/2010
X10C9312349A	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0195	6/12/2009
X10C9312353A	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0180	6/17/2009
X10C9312356A	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0277	1/26/2010
X10C9312368A	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0165	6/17/2009
X10C9312371A	55G	CH	ORNL	OR-REDC-CH-HET		
X10C9312372A	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0208	8/6/2009
X10C9312373A	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0197	7/9/2009
X10C9312375A	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0246	10/13/2009
X10C9312385A	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0608	12/30/2014
X10C9312388A	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0116	12/8/2008
X10C9312389A	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0249	10/21/2009
X10C9312392A	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0173	4/27/2009
X10C9312393A	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0238	9/24/2009
X10C9312395A	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0210	7/23/2009
X10C9312398A	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0248	10/21/2009
X10C9312399A	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0115	11/5/2008
X10C9312401A	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0210	7/23/2009
X10C9312404A	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0230	9/22/2009
X10C9312406A	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0204	7/28/2009
X10C9312407A	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0188	6/22/2009
X10C9312409A	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0253	12/2/2009
X10C9312410A	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0429	5/20/2011
X10C9312412A	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0238	9/24/2009
X10C9312414A	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0270	1/11/2010
X10C9312416A	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0596	11/18/2014
X10C9312417A	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0283	2/8/2010
X10C9312420A	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0172	4/27/2009
X10C9312425A	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0256	12/3/2009
X10C9312428A	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0293	4/7/2010
X10C9312434A	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0172	4/27/2009
X10C9312450A	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0246	10/13/2009

X10C9312452A	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0164	6/2/2009
X10C9312453	55G	CH	ORNL	OR-REDC-CH-HET		
X10C9312455A	55G	CH	ORNL	OR-REDC-CH-HET		
X10C9312456A	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0596	11/18/2014
X10C9312457A	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0248	10/21/2009
X10C9312459A	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0234	9/21/2009
X10C9312462A	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0246	10/13/2009
X10C9312463A	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0169	4/15/2009
X10C9312464A	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0281	2/3/2010
X10C9312465A	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0282	2/4/2010
X10C9312468A	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0529	6/20/2014
X10C9312469A	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0231	9/14/2009
X10C9312470A	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0265	12/29/2009
X10C9312478A	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0189	6/12/2009
X10C9312480A	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0172	4/27/2009
X10C9312481A	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0249	10/21/2009
X10C9312482A	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0190	6/22/2009
X10C9312488A	55G	CH	ORNL	OR-REDC-CH-HET		
X10C9312489A	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0266	12/30/2009
X10C9312491A	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0188	6/22/2009
X10C9312492A	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0213	8/11/2009
X10C9312493A	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0211	8/11/2009
X10C9312503A	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0234	9/21/2009
X10C9312508A	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0165	6/17/2009
X10C9312509A	55G	CH	ORNL	OR-REDC-CH-HET		
X10C9312511	55G	CH	ORNL	OR-REDC-CH-HET		
X10C9312556A	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0204	7/28/2009
X10C9312565A	55G	CH	ORNL	OR-REDC-CH-HET		
X10C9312568A	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0246	10/13/2009
X10C9312572A	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0535	7/1/2014
X10C9312578A	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0580	9/23/2014
X10C9312582A	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0211	8/11/2009
X10C9312583A	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0238	9/24/2009
X10C9312586A	55G	CH	ORNL	OR-REDC-CH-HET		

X10C9312589A	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0189	6/12/2009
X10C9312594A	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0450	2/4/2014
X10C9312641A	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR7-0038	5/6/2014
X10C9312651A	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0242	10/5/2009
X10C9312652A	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0448	1/24/2014
X10C9312655A	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0230	9/22/2009
X10C9312665A	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0204	7/28/2009
X10C9312683A	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0211	8/11/2009
X10C9312688A	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0247	10/14/2009
X10C9312689A	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0168	4/15/2009
X10C9312695A	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0172	4/27/2009
X10C9312705A1	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0440	12/18/2013
X10C9312709A	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR7-0023	3/21/2014
X10C9312710A	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0194	6/12/2009
X10C9312711A	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0194	6/12/2009
X10C9312712A	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0194	6/12/2009
X10C9312720A	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0223	9/1/2009
X10C9312724A	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0450	2/4/2014
X10C9312726	55G	CH	ORNL	OR-REDC-CH-HET		
X10C9312733A	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0115	11/5/2008
X10C9312735A	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0188	6/22/2009
X10C9312743A	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR7-0064	7/7/2014
X10C9312746A	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0165	6/17/2009
X10C9312748A	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0254	12/2/2009
X10C9312751A	55G	CH	ORNL	OR-REDC-CH-HET		
X10C9312758A	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0493	4/9/2014
X10C9312762A	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0482	3/20/2014
X10C9312782A	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0168	4/15/2009
X10C9312797A	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0364	12/17/2010
X10C9312799	55G	CH	ORNL	OR-REDC-CH-HET		
X10C9312802	55G	CH	ORNL	OR-REDC-CH-HET		
X10C9312812	55G	CH	ORNL	OR-REDC-CH-HET		
X10C9312827A	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0354	11/2/2010
X10C9312833	55G	CH	ORNL	OR-REDC-CH-HET		

X10C9312836	55G	CH	ORNL	OR-REDC-CH-HET		
X10C9312837A	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0153	2/18/2009
X10C9312848A	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0249	10/21/2009
X10C9312849A	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0169	4/15/2009
X10C9312850A1	55G	CH	ORNL	OR-REDC-CH-HET		
X10C9312851A	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0216	8/20/2009
X10C9312858A	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0168	4/15/2009
X10C9312870A	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0270	1/11/2010
X10C9312871A	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0253	12/2/2009
X10C9312872A	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0194	6/12/2009
X10C9312874A	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0265	12/29/2009
X10C9312876A	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0160	6/22/2009
X10C9312882A	55G	CH	ORNL	OR-REDC-CH-HET		
X10C9312887A	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0231	9/14/2009
X10C9312892A	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0116	12/8/2008
X10C9312894A	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0392	3/30/2011
X10C9312902A	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0227	9/10/2009
X10C9312914A	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR7-0020	3/18/2014
X10C9312927A	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR7-0022	3/31/2014
X10C9312952A	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0194	6/12/2009
X10C9312954A	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0168	4/15/2009
X10C9312966A	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0194	6/12/2009
X10C9313033A	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0456	1/29/2014
X10C9313038A1	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0246	10/13/2009
X10C9313061A	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0242	10/5/2009
X10C9313062A	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0429	5/20/2011
X10C9313067A	55G	CH	ORNL	OR-REDC-CH-HET		
X10C9313069A	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0172	4/27/2009
X10C9313071A	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0223	9/1/2009
X10C9313083A	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0237	9/23/2009
X10C9313086A	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR7-0015	3/4/2014
X10C9313099A	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0172	4/27/2009
X10C9313109A	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0539	7/15/2014
X10C9313117A	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0464	2/25/2014

X10C9313134	55G	CH	ORNL	OR-REDC-CH-HET		
X10C9313135A	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0451	2/13/2014
X10C9313586A	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0476	3/7/2014
X10C9313601A	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0523	6/17/2014
X10C9313602	55G	CH	ORNL	OR-REDC-CH-HET		
X10C9313607A	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR7-0031	4/14/2014
X10C9313608A	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0460	2/13/2014
X10C9313609A	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0409	6/6/2011
X10C9313610	55G	CH	ORNL	OR-REDC-CH-HET		
X10C9313615	55G	CH	ORNL	OR-REDC-CH-HET		
X10C9313619	55G	CH	ORNL	OR-REDC-CH-HET		
X10C9313620	55G	CH	ORNL	OR-REDC-CH-HET		
X10C9313623A	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0486	3/27/2014
X10C9313624	55G	CH	ORNL	OR-REDC-CH-HET		
X10C9313625	55G	CH	ORNL	OR-REDC-CH-HET		
X10C9313626	55G	CH	ORNL	OR-REDC-CH-HET		
X10C9313627	55G	CH	ORNL	OR-REDC-CH-HET		
X10C9313628A	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0522	6/10/2014
X10C9313630A	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0587	10/7/2014
X10C9313631	55G	CH	ORNL	OR-REDC-CH-HET		
X10C9313632A	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR7-0062	7/11/2014
X10C9313633	55G	CH	ORNL	OR-REDC-CH-HET		
X10C9313634	55G	CH	ORNL	OR-REDC-CH-HET		
X10C9313635A	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0207	12/7/2009
X10C9313652A	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0235	9/21/2009
X10C9313656A	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0607	12/4/2014
X10C9313660A	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0580	9/23/2014
X10C9313662A	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0189	6/12/2009
X10C9313663A	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0242	10/5/2009
X10C9313667A	55G	CH	ORNL	OR-REDC-CH-HET		
X10C9313668A	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0255	12/3/2009
X10C9313673A	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0216	8/20/2009
X10C9313676A	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0242	10/5/2009
X10C9313683A	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0264	12/29/2009

X10C9400002A	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0250	12/1/2009
X10C9400006A1	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0586	10/3/2014
X10C9400014A	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR7-0015	3/4/2014
X10C9400019A	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0068	7/7/2008
X10C9400020	55G	CH	ORNL	OR-REDC-CH-HET		
X10C9400033A	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0241	9/30/2009
X10C9400036A	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0429	5/20/2011
X10C9400041A	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0447	1/9/2014
X10C9400043A	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0067	8/6/2008
X10C9400047	55G	CH	ORNL	OR-REDC-CH-HET		
X10C9400050A	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0221	8/31/2009
X10C9400051	55G	CH	ORNL	OR-REDC-CH-HET		
X10C9400056A2	55G	CH	ORNL	OR-REDC-CH-HET		
X10C9400057A	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0283	2/8/2010
X10C9400059A	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0503	4/24/2014
X10C9400060A	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0171	4/15/2009
X10C9400069A	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0421	4/28/2011
X10C9400071A	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0249	10/21/2009
X10C9400076A	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0580	9/23/2014
X10C9400077A	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0282	2/4/2010
X10C9400082A	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0154	2/25/2009
X10C9400087A	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0566	8/20/2014
X10C9400091A	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0446	2/12/2014
X10C9400091B	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR7-0016	3/11/2014
X10C9400137A	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0250	12/1/2009
X10C9400153A	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0207	12/7/2009
X10C9400156A	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0238	9/24/2009
X10C9400160A	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0169	4/15/2009
X10C9400172A	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0191	6/17/2009
X10C9400175A	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0273	1/18/2010
X10C9400178A	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0273	1/18/2010
X10C9400185A	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0166	4/13/2009
X10C9400216A	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0191	6/17/2009
X10C9400217A1A	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0214	8/20/2009

X10C9400219A	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0246	10/13/2009
X10C9400221A	55G	CH	ORNL	OR-REDC-CH-HET		
X10C9400222A	55G	CH	ORNL	OR-REDC-CH-HET		
X10C9400228A1	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0246	10/13/2009
X10C9400229A	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0441	12/19/2013
X10C9400230A	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0238	9/24/2009
X10C9400231A	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0195	6/12/2009
X10C9400244A	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0165	6/17/2009
X10C9400245A	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0266	12/30/2009
X10C9400247A	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0171	4/15/2009
X10C9400249A	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0183	5/13/2009
X10C9400254A	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0213	8/11/2009
X10C9400267A	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0568	8/19/2014
X10C9400276A	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0252	12/1/2009
X10C9400278A	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0274	1/18/2010
X10C9400279A	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0256	12/3/2009
X10C9400284A	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0182	5/14/2009
X10C9400345	55G	CH	ORNL	OR-REDC-CH-HET		
X10C9400348A	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0227	9/10/2009
X10C9400349A	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0237	9/23/2009
X10C9400354A	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0611	12/30/2014
X10C9400382A	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0167	4/27/2009
X10C9400383	55G	CH	ORNL	OR-REDC-CH-HET		
X10C9400393	55G	CH	ORNL	OR-REDC-CH-HET		
X10C9400396A	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0278	2/1/2010
X10C9400398	55G	CH	ORNL	OR-REDC-CH-HET		
X10C9400961A	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0148	2/2/2009
X10C9402616A	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0278	2/1/2010
X10C9402617A	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0585	10/7/2014
X10C9402619A	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0581	9/23/2014
X10C9402621A	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0278	2/1/2010
X10C9402626B	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0513	5/16/2014
X10C9402626C	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0513	5/16/2014
X10C9402626D	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0513	5/16/2014

X10C9402626E	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0580	9/23/2014
X10C9402627A	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR7-0074	8/1/2014
X10C9402627B1	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0654	5/20/2015
X10C9402627C	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR7-0076	8/7/2014
X10C9402627D	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR7-0076	8/7/2014
X10C9402628A	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0587	10/7/2014
X10C9402633A	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0298	11/9/2010
X10C9402633B	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0298	11/9/2010
X10C9402633C	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0450	2/4/2014
X10C9402633D	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0470	3/3/2014
X10C9402633E	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0450	2/4/2014
X10C9402642A	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0606	12/2/2014
X10C9402642D	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0608	12/30/2014
X10C9402650A	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0580	9/23/2014
X10C9402650B	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0246	10/13/2009
X10C9600188A	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR7-0074	8/1/2014
X10C9600491A	55G	CH	ORNL	OR-REDC-CH-HET		
X10C9600496A	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0151	3/2/2009
X10C9600498A	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0451	2/13/2014
X10C9600499A	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0151	3/2/2009
X10C9600500A	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0152	3/26/2012
X10C9601930A	55G	CH	ORNL	OR-REDC-CH-HET		
X10C9602122A	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0581	9/23/2014
X10C9700239A	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0157	3/10/2009
X10C9700240A	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0167	4/27/2009
X10C9700241A	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR7-0072	8/7/2014
X10C9700308A	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0580	9/23/2014
X10C9700309A	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0156	3/10/2009
X10C9700312A	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0484	4/3/2014
X10C9700315A	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0155	3/12/2009
X10C9702553A	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0582	9/24/2014
X10C9702555A	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0157	3/10/2009
X10C9702556A	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0149	2/3/2009
X10C9702557A	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0155	3/12/2009

X10C9801083	55G	CH	ORNL	OR-REDC-CH-HET		
X10C9801086A	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0157	3/10/2009
X10C9801088A	55G	CH	ORNL	OR-REDC-CH-HET		
X10C9801089A	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0586	10/3/2014
X10C9801093A	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0580	9/23/2014
X10C9801096A	55G	CH	ORNL	OR-REDC-CH-HET		
X10C9801207A	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0585	10/7/2014
X10C9801208A	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0580	9/23/2014
X10C9801209A	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0449	2/4/2014
X10C9801314A	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0155	3/12/2009
X10C9801319	55G	CH	ORNL	OR-REDC-CH-HET		
X10C9801324A	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0582	9/24/2014
X10C9802667A	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0505	4/29/2014
X10C9802669A	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0155	3/12/2009
X10C9802673A	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0167	4/27/2009
X10C9802677A	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0278	2/1/2010
X10C9802680A	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0132	12/22/2008
X10C9802681A	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR7-0125	11/26/2014
X10C9802682A	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0266	12/30/2009
X10C9902188A	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0337	11/4/2010
X10CSATN01905A	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR7-0044	6/3/2014
X10CSATN01905B	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR7-0045	6/10/2014
X10CSATN01905E	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR7-0044	6/3/2014
X10CSATN01905F1	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0451	2/13/2014
X10CSATN01905G	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR7-0031	4/14/2014
X10CSATN01905H	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR7-0030	4/10/2014
X10CSATN01905J1	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0470	3/3/2014
X10CSATN01905K	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0451	2/13/2014
X10CSATN01905L1	55G	CH	ORNL	OR-REDC-CH-HET		
X10CSATN01905L2	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0539	7/15/2014
X10CSATN01937A	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0487	3/27/2014
X10CSATN01937AA	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0610	1/14/2015
X10CSATN01937AB	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR7-0022	3/31/2014
X10CSATN01937AC	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR7-0022	3/31/2014

X10CSATN01937AD	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0460	2/13/2014
X10CSATN01937AE	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0492	4/14/2014
X10CSATN01937AF	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR7-0019	3/18/2014
X10CSATN01937AG	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0450	2/4/2014
X10CSATN01937AH	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0455	2/3/2014
X10CSATN01937AI	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR7-0068	7/21/2014
X10CSATN01937AJ	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0470	3/3/2014
X10CSATN01937AK	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR7-0031	4/14/2014
X10CSATN01937AL	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0479	3/12/2014
X10CSATN01937AM	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0457	2/4/2014
X10CSATN01937AN	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0573	9/9/2014
X10CSATN01937AC	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR7-0080	8/19/2014
X10CSATN01937AP	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0508	5/8/2014
X10CSATN01937AC	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR7-0017	3/12/2014
X10CSATN01937AR	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR7-0017	3/12/2014
X10CSATN01937B	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0459	2/11/2014
X10CSATN01937C	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0479	3/12/2014
X10CSATN01937D	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0451	2/13/2014
X10CSATN01937E	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0451	2/13/2014
X10CSATN01937F	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0459	2/11/2014
X10CSATN01937G	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0451	2/13/2014
X10CSATN01937H	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0502	4/24/2014
X10CSATN01937I	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0502	4/24/2014
X10CSATN01937J1	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0515	5/20/2014
X10CSATN01937K	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0486	3/27/2014
X10CSATN01937L	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR7-0069	7/21/2014
X10CSATN01937M	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR7-0068	7/21/2014
X10CSATN01937N	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR7-0068	7/21/2014
X10CSATN01937O	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0470	3/3/2014
X10CSATN01937P	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR7-0036	4/24/2014
X10CSATN01937Q	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR7-0038	5/6/2014
X10CSATN01937R1	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR7-0055	7/24/2014
X10CSATN01937V	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0455	2/3/2014
X10CSATN01937W	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0489	4/2/2014

X10CSATN01937X	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0464	2/25/2014
X10CSATN01937Y	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR7-0022	3/31/2014
X10CSATN01937Z	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR7-0041	5/19/2014
X10CSATN02012A	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0460	2/13/2014
X10CSATN02012C	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR7-0022	3/31/2014
X10CSATN02012E	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0468	3/3/2014
X10CSATN02012F	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0328	12/8/2010
X10CSATN02012H1	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0539	7/15/2014
X10CSATN02012I	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0459	2/11/2014
X10CSATN02012J	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0458	2/19/2014
X10CSATN02022A	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0404	8/26/2011
X10CSATN02022B	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0409	6/6/2011
X10CSATN02022C	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0409	6/6/2011
X10CSATN02022D	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0393	3/30/2011
X10CSATN02022E	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0393	3/30/2011
X10CSATN02022F	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR7-0071	7/28/2014
X10CSATN02022G	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR7-0067	7/28/2014
X10CSATN02022H	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0580	9/23/2014
X10CSATN02022I	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0580	9/23/2014
X10CSATN02022J	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0461	2/11/2014
X10CSATN02022K	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0407	4/11/2011
X10CSATN02022L	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0443	1/23/2014
X10CSATN02022M	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0514	5/20/2014
X10CSATN02022N	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0408	6/29/2011
X10CSATN02022O	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0412	5/18/2011
X10CSATN02022P	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR7-0057	7/10/2014
X10CSATN02022Q1	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0517	6/2/2014
X10CSATN02023K	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0466	2/25/2014
X10CSATN02023L	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0465	2/21/2014
X10CSATN02023O	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0547	8/4/2014
X10CSATN02023P	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0449	2/4/2014
X10CSATN02023T	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR7-0020	3/18/2014
X10CSATN02024A1	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR7-0034	4/24/2014
X10CSATN02024B	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0451	2/13/2014

X10CSATN02024C	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR7-0023	3/21/2014
X10CSATN02024E	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0572	8/29/2014
X10CSATN02024F	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0476	3/7/2014
X10CSATN02024G1	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR7-0023	3/21/2014
X10CSATN02024H	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR7-0041	5/19/2014
X10CSATN02024I	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0450	2/4/2014
X10CSATN02024J	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0476	3/7/2014
X10CSATN02024K	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR7-0019	3/18/2014
X10CSATN02024L	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR7-0018	3/11/2014
X10CSATN02024M	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0465	2/21/2014
X10CSATN02024N1	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0472	3/3/2014
X10CSATN02062A	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0449	2/4/2014
X10CSATN02062B1	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0516	5/21/2014
X10CSATN02062C	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0451	2/13/2014
X10CSATN02062D	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0450	2/4/2014
X10CSATN02062E	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0451	2/13/2014
X10CSATN02062F	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0513	5/16/2014
X10CSATN02062G	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR7-0048	6/12/2014
X10CSATN02062H	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0501	4/24/2014
X10CSATN02062I	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR7-0048	6/12/2014
X10CSATN02062J	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0513	5/16/2014
X10CSATN02062K	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR7-0048	6/12/2014
X10CSATN02062L	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0513	5/16/2014
X10CSATN02062M	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0460	2/13/2014
X10CSATN02062N	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0451	2/13/2014
X10CSATN02062O	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0469	2/25/2014
X10CSATN02070E	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0554	7/29/2014
X10CSATN02070F	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR7-0020	3/18/2014
X10CSATN02070H	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR7-0022	3/31/2014
X10CSATN02070I	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR7-0023	3/21/2014
X10CSATN02070J	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR7-0020	3/18/2014
X10CSATN02070K1	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0516	5/21/2014
X10CSATN02070L	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR7-0019	3/18/2014
X10CSATN02070N	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR7-0045	6/10/2014

X10CSATN02070O	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0524	6/11/2014
X10CSATN02071A	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR7-0069	7/21/2014
X10CSATN02071B	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0537	7/14/2014
X10CSATN02071C	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0457	2/4/2014
X10CSATN02071D	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0550	7/23/2014
X10CSATN02071E	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0461	2/11/2014
X10CSATN02071F	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0462	2/11/2014
X10CSATN02071G	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0457	2/4/2014
X10CSATN02071H	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0527	6/20/2014
X10CSATN02071I	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0524	6/11/2014
X10CSATN02071J	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0537	7/14/2014
X10CSATN02071K	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR7-0017	3/12/2014
X10CSATN02071L	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0510	5/8/2014
X10CSATN02071M	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR7-0017	3/12/2014
X10CSATN02071N	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0503	4/24/2014
X10CSATN02077A	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR7-0057	7/10/2014
X10CSATN02077B	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0465	2/21/2014
X10CSATN02077C	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR7-0057	7/10/2014
X10CSATN02077D	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR7-0057	7/10/2014
X10CSATN02077E	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR7-0015	3/4/2014
X10CSATN02077F	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR7-0050	6/19/2014
X10CSATN02077G1	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0517	6/2/2014
X10CSATN02077G2	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0568	8/19/2014
X10CSATN02077H	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0467	3/3/2014
X10CSATN02093A	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0485	3/20/2014
X10CSATN02093B	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0486	3/27/2014
X10CSATN02093C	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0435	12/10/2013
X10CSATN02093E	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR7-0022	3/31/2014
X10CSATN02093F	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR7-0045	6/10/2014
X10CSATN02093G	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR7-0023	3/21/2014
X10CSATN02093H	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0471	3/3/2014
X10CSATN02093I	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0501	4/24/2014
X10CSATN02093J	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0470	3/3/2014
X10CSATN02093K	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0480	3/13/2014

X10CSATN02093L	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0459	2/11/2014
X10CSATN02093M	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0479	3/12/2014
X10CSATN02093N	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0572	8/29/2014
X10CSATN02093O	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0480	3/13/2014
X10CSATN02200A	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR7-0034	4/24/2014
X10CSATN02200B	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR7-0052	6/19/2014
X10CSATN02200C	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR7-0045	6/10/2014
X10CSATN02200H1	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR7-0028	4/7/2014
X10CSATN02200I	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0616	1/14/2015
X10CSATN02200J	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0614	1/13/2015
X10CSATN02200M	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0502	4/24/2014
X10CSATN02200N	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR7-0027	4/7/2014
X10CSATN02200O	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0449	2/4/2014
X10CSATN02205A	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0462	2/11/2014
X10CSATN02205B	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR7-0057	7/10/2014
X10CSATN02205C	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0492	4/14/2014
X10CSATN02205D	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0580	9/23/2014
X10CSATN02205E	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR7-0026	3/31/2014
X10CSATN02205F	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0450	2/4/2014
X10CSATN02205G	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0451	2/13/2014
X10CSATN02205H	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0450	2/4/2014
X10CSATN02205I	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0589	10/13/2014
X10CSATN02205J	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0582	9/24/2014
X10CSATN02205K	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0605	12/3/2014
X10CSATN02205L	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0448	1/24/2014
X10CSATN02205M	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0589	10/13/2014
X10CSATN02223A	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0606	12/2/2014
X10CSATN02223B	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0436	12/9/2013
X10CSATN02223C	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0607	12/4/2014
X10CSATN02223D	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0606	12/2/2014
X10CSATN02223E	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0607	12/4/2014
X10CSATN02223F	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0440	12/18/2013
X10CSATN02223G	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0433	12/4/2013
X10CSATN02223H	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0433	12/4/2013

X10CSATN02223I	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0440	12/18/2013
X10CSATN02223J	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0527	6/20/2014
X10CSATN02223M	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0435	12/10/2013
X10CSATN02223N	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0436	12/9/2013
X10CSATN02229B1	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0515	5/20/2014
X10CSATN02229C1	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0516	5/21/2014
X10CSATN02229D1	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR7-0025	3/31/2014
X10CSATN02229E	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0573	9/9/2014
X10CSATN02229F1	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR7-0064	7/7/2014
X10CSATN02229G1	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR7-0044	6/3/2014
X10CSATN02229H	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR7-0019	3/18/2014
X10CSATN02229I	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0451	2/13/2014
X10CSATN02229J1	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR7-0042	6/2/2014
X10CSATN02229K1	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR7-0036	4/24/2014
X10CSATN02229L	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR7-0036	4/24/2014
X10CSATN02229M	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0455	2/3/2014
X10CSATN02240J2/	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR7-0139	6/29/2015
X10CSATN02241A	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0469	2/25/2014
X10CSATN02241B	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0435	12/10/2013
X10CSATN02241C	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR7-0021	3/20/2014
X10CSATN02241D	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR7-0025	3/31/2014
X10CSATN02241E	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR7-0067	7/28/2014
X10CSATN02241F	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR7-0071	7/28/2014
X10CSATN02241G	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR7-0067	7/28/2014
X10CSATN02241H	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0433	12/4/2013
X10CSATN02241I	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0435	12/10/2013
X10CSATN02241J	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0433	12/4/2013
X10CSATN02241K	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0433	12/4/2013
X10CSATN02241L	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0435	12/10/2013
X10CSATN02241M	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0470	3/3/2014
X10CSATN02241N	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0471	3/3/2014
X10CSATN02241O1	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR7-0051	6/23/2014
X10CSATN02241P	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR7-0060	7/11/2014
X10CSATN02244A	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0450	2/4/2014

X10CSATN02244B	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0328	12/8/2010
X10CSATN02244C	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0560	8/7/2014
X10CSATN02244D	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0621	2/16/2015
X10CSATN02244E	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0329	10/28/2010
X10CSATN02244F	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0611	12/30/2014
X10CSATN02244G	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0329	10/28/2010
X10CSATN02244H	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0329	10/28/2010
X10CSATN02244I	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0616	1/14/2015
X10CSATN02244J	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0583	9/25/2014
X10CSATN02247A	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0512	5/19/2014
X10CSATN02247B	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0512	5/19/2014
X10CSATN02247C	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0512	5/19/2014
X10CSATN02247D	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0512	5/19/2014
X10CSATN02247E	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0512	5/19/2014
X10CSATN02247F	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0512	5/19/2014
X10CSATN02247G	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0512	5/19/2014
X10CSATN02247H	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0512	5/19/2014
X10CSATN02247I	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR7-0034	4/24/2014
X10CSATN02247J	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR7-0035	4/24/2014
X10CSATN02247K	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR7-0035	4/24/2014
X10CSATN02247L	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR7-0035	4/24/2014
X10CSATN02260A	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0440	12/18/2013
X10CSATN02260B	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR7-0021	3/20/2014
X10CSATN02260C	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0434	12/4/2013
X10CSATN02260E	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR7-0021	3/20/2014
X10CSATN02260F	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0460	2/13/2014
X10CSATN02260G	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0451	2/13/2014
X10CSATN02260H	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0441	12/19/2013
X10CSATN02260J	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0435	12/10/2013
X10CSATN02260K	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0435	12/10/2013
X10CSATN02260L1	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR7-0043	5/30/2014
X10CSATN02265A	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0604	12/2/2014
X10CSATN02265B	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0603	12/2/2014
X10CSATN02265G	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0603	12/2/2014

X10CSATN02265I	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0609	12/30/2014
X10CSATN02265J	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0609	12/30/2014
X10CSATN02275A	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR7-0066	7/21/2014
X10CSATN02275B	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR7-0034	4/24/2014
X10CSATN02275C	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR7-0026	3/31/2014
X10CSATN02275D	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR7-0066	7/21/2014
X10CSATN02275E	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR7-0069	7/21/2014
X10CSATN02275F	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR7-0066	7/21/2014
X10CSATN02275G1	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0488	4/2/2014
X10CSATN02275H1	55G	CH	ORNL	OR-REDC-CH-HET		
X10CSATN02277A	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0549	7/23/2014
X10CSATN02279A	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0455	2/3/2014
X10CSATN02279B	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR7-0043	5/30/2014
X10CSATN02279C	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0467	3/3/2014
X10CSATN02279D	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR7-0043	5/30/2014
X10CSATN02279E	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR7-0065	7/22/2014
X10CSATN02279F	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR7-0021	3/20/2014
X10CSATN02279G	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0521	6/11/2014
X10CSATN02279H	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR7-0021	3/20/2014
X10CSATN02279I	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0503	4/24/2014
X10CSATN02279J	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR7-0021	3/20/2014
X10CSATN02279K	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR7-0021	3/20/2014
X10CSATN02279L	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR7-0021	3/20/2014
X10CSATN02279M	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR7-0021	3/20/2014
X10CSATN02284A	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0606	12/2/2014
X10CSATN02284I	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0450	2/4/2014
X10CSATN02284J	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0455	2/3/2014
X10CSATN02284M	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR7-0006	12/18/2013
X10CSATN02284O	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0568	8/19/2014
X10CSATN02285C	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR7-0011	1/9/2014
X10CSATN02285D	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR7-0011	1/9/2014
X10CSATN02285E1	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR7-0026	3/31/2014
X10CSATN02285F1	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR7-0027	4/7/2014
X10CSATN02285G	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0469	2/25/2014

X10CSATN02285H	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0446	2/12/2014
X10CSATN02285J	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR7-0027	4/7/2014
X10CSATN02285K	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR7-0027	4/7/2014
X10CSATN02285L	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR7-0021	3/20/2014
X10CSATN02285M	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR7-0021	3/20/2014
X10CSATN02285N	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR7-0027	4/7/2014
X10CSATN02285O1	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR7-0037	5/1/2014
X10CSATN02285P	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR7-0042	6/2/2014
X10CSATN02406A	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0508	5/8/2014
X10CSATN02406B	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR7-0001	12/10/2013
X10CSATN02406C	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR7-0001	12/10/2013
X10CSATN02406D	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0431	11/25/2013
X10CSATN02406E	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0451	2/13/2014
X10CSATN02406F	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR7-0050	6/19/2014
X10CSATN02406G	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0495	4/21/2014
X10CSATN02406H	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0584	9/29/2014
X10CSATN02406J	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR7-0050	6/19/2014
X10CSATN02406K	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0431	11/25/2013
X10CSATN02406L	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR7-0004	12/17/2013
X10CSATN02406M	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0431	11/25/2013
X10CSATN02406N	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR7-0104	9/25/2014
X10CSATN02406O	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0583	9/25/2014
X10CSATN02406P	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0450	2/4/2014
X10CSATN02434A	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0610	1/14/2015
X10CSATN02434B	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR7-0027	4/7/2014
X10CSATN02434C	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR7-0026	3/31/2014
X10CSATN02434D	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0451	2/13/2014
X10CSATN02434F	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0436	12/9/2013
X10CSATN02434G	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR7-0026	3/31/2014
X10CSATN02434H	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR7-0026	3/31/2014
X10CSATN02434I	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0582	9/24/2014
X10CSATN02434J	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0611	12/30/2014
X10CSATN02434K	55G	CH	ORNL	OR-REDC-CH-HET		
X10CSATN02434L	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0582	9/24/2014

X10CSATN02434M	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0583	9/25/2014
X10CSATN02434N	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0378	6/30/2011
X10CSATN02434O	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0611	12/30/2014
X10CSATN02434Q1	55G	CH	ORNL	OR-REDC-CH-HET		
X10CSATN02446A	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0459	2/11/2014
X10CSATN02446B	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0459	2/11/2014
X10CSATN02446C	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0615	1/14/2015
X10CSATN02446D	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR7-0045	6/10/2014
X10CSATN02446M	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR7-0021	3/20/2014
X10CSATN02446P	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR7-0017	3/12/2014
X10CSATN02446R	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0435	12/10/2013
X10CSATN02446S	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0433	12/4/2013
X10CSATN02446U	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0436	12/9/2013
X10CSATN02446V	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0501	4/24/2014
X10CSATN02450A	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0324	10/19/2010
X10CSATN02450B	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0615	1/14/2015
X10CSATN02450C	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR7-0072	8/7/2014
X10CSATN02450D	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0611	12/30/2014
X10CSATN02450E	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0589	10/13/2014
X10CSATN02450F	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0582	9/24/2014
X10CSATN02450G	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0326	11/2/2010
X10CSATN02450H	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0610	1/14/2015
X10CSATN02450J	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR7-0105	9/29/2014
X10CSATN02450K	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0583	9/25/2014
X10CSATN02450L	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0610	1/14/2015
X10CSATN02450M	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0607	12/4/2014
X10CSATN02450O	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0581	9/23/2014
X10CSATN02455B	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR7-0017	3/12/2014
X10CSATN02455C	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0460	2/13/2014
X10CSATN02455E	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0477	3/18/2014
X10CSATN02455G1	55G	CH	ORNL	OR-REDC-CH-HET		
X10CSATN02455H	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0609	12/30/2014
X10CSATN02455I	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0609	12/30/2014
X10CSATN02455J	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0588	10/8/2014

X10CSATN02455L	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0616	1/14/2015
X10CSATN02455M	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0615	1/14/2015
X10CSATN02455N	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0584	9/29/2014
X10CSATN02455O	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR7-0101	9/23/2014
X10CSATN02455P	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0607	12/4/2014
X10CSATN02461A	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0493	4/9/2014
X10CSATN02461AL	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR7-0043	5/30/2014
X10CSATN02461BC	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR7-0069	7/21/2014
X10CSATN02461BT	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR7-0041	5/19/2014
X10CSATN02461C	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR7-0031	4/14/2014
X10CSATN02461CG	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0527	6/20/2014
X10CSATN02461CT	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0556	7/31/2014
X10CSATN02461CV	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0486	3/27/2014
X10CSATN02461CV	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR7-0025	3/31/2014
X10CSATN02461CX	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0487	3/27/2014
X10CSATN02461CY	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR7-0026	3/31/2014
X10CSATN02461CZ	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0616	1/14/2015
X10CSATN02461D1	55G	CH	ORNL	OR-REDC-CH-HET		
X10CSATN02461E	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0581	9/23/2014
X10CSATN02461F	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR7-0030	4/10/2014
X10CSATN02461G1	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0515	5/20/2014
X10CSATN02461H	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR7-0034	4/24/2014
X10CSATN02461I	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0472	3/3/2014
X10CSATN02461J	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0486	3/27/2014
X10CSATN02461K	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0459	2/11/2014
X10CSATN02461L	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0491	4/3/2014
X10CSATN02461M	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0459	2/11/2014
X10CSATN02461N	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0472	3/3/2014
X10CSATN02461O	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0492	4/14/2014
X10CSATN02461P	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0494	4/14/2014
X10CSATN02461Q	55G	CH	ORNL	OR-REDC-CH-HET		
X10CSATN02474A	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0615	1/14/2015
X10CSATN02474D	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0310	10/19/2010
X10CSATN02474E	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0315	10/19/2010

X10CSATN02474F	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0310	10/19/2010
X10CSATN02474G	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0580	9/23/2014
X10CSATN02474H	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0588	10/8/2014
X10CSATN02474I	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0582	9/24/2014
X10CSATN02474J	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0572	8/29/2014
X10CSATN02474K	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0315	10/19/2010
X10CSATN02474L	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0435	12/10/2013
X10CSATN02474M	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0582	9/24/2014
X10CSATN02474N	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0582	9/24/2014
X10CSATN02474O	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0615	1/14/2015
X10CSATN02475B	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0533	7/1/2014
X10CSATN02475E	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0527	6/20/2014
X10CSATN02475H	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0527	6/20/2014
X10CSATN02475I	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR7-0015	3/4/2014
X10CSATN02475J	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0487	3/27/2014
X10CSATN02475K	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0487	3/27/2014
X10CSATN02475L	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0487	3/27/2014
X10CSATN02475M	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR7-0010	1/23/2014
X10CSATN02475N	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0445	1/9/2014
X10CSATN02475O	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR7-0010	1/23/2014
X10CSATN02482A	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0634	3/16/2015
X10CSATN02482B	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0639	3/19/2015
X10CSATN02482C	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0638	3/19/2015
X10CSATN02482D	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0639	3/19/2015
X10CSATN02482E	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0639	3/19/2015
X10CSATN02482F	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0639	3/19/2015
X10CSATN02482G	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0639	3/19/2015
X10CSATN02482H	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0639	3/19/2015
X10CSATN02482I	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0638	3/19/2015
X10CSATN02482J	55G	CH	ORNL	OR-REDC-CH-HET		
X10CSATN02482K	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0639	3/19/2015
X10CSATN02482L	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0634	3/16/2015
X10CSATN02482M	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0638	3/19/2015
X10CSATN02482N	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0638	3/19/2015

X10CSATN02493B	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0586	10/3/2014
X10CSATN02493D	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0583	9/25/2014
X10CSATN02493E	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0315	10/19/2010
X10CSATN02493F1	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR7-0143	7/28/2015
X10CSATN02493H	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0310	10/19/2010
X10CSATN02493I	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0315	10/19/2010
X10CSATN02493J	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0607	12/4/2014
X10CSATN02499A	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0542	7/17/2014
X10CSATN02499B	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR7-0057	7/10/2014
X10CSATN02499C	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0534	7/1/2014
X10CSATN02499D	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0461	2/11/2014
X10CSATN02499E	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0542	7/17/2014
X10CSATN02499F	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0464	2/25/2014
X10CSATN02499G	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR7-0011	1/9/2014
X10CSATN02499J	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0467	3/3/2014
X10CSATN02499N	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0485	3/20/2014
X10CSATN02499O	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR7-0011	1/9/2014
X10CSATN02600C	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR7-0016	3/11/2014
X10CSATN02600D	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0475	3/4/2014
X10CSATN02600E	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0475	3/4/2014
X10CSATN02600F	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0475	3/4/2014
X10CSATN02600H	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR7-0061	7/21/2014
X10CSATN02600I1	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0556	7/31/2014
X10CSATN02600J	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0534	7/1/2014
X10CSATN02607A	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR7-0066	7/21/2014
X10CSATN02607B	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0552	7/24/2014
X10CSATN02607C1	55G	CH	ORNL	OR-REDC-CH-HET		
X10CSATN02607D	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0510	5/8/2014
X10CSATN02607E	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0508	5/8/2014
X10CSATN02607F	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0440	12/18/2013
X10CSATN02607G	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0508	5/8/2014
X10CSATN02607H	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0458	2/19/2014
X10CSATN02607I	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0440	12/18/2013
X10CSATN02607J1	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0515	5/20/2014

X10CSATN02607L	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR7-0034	4/24/2014
X10CSATN02612A	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0441	12/19/2013
X10CSATN02612C	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR7-0026	3/31/2014
X10CSATN02612D	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR7-0003	12/12/2013
X10CSATN02612E	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0470	3/3/2014
X10CSATN02612F	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR7-0036	4/24/2014
X10CSATN02612G	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR7-0004	12/17/2013
X10CSATN02612H	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR7-0003	12/12/2013
X10CSATN02612I	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0436	12/9/2013
X10CSATN02612J	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0601	12/1/2014
X10CSATN02612K	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR7-0054	6/25/2014
X10CSATN02613A1	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0444	12/27/2013
X10CSATN02613B	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0445	1/9/2014
X10CSATN02613C	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0445	1/9/2014
X10CSATN02613D	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0445	1/9/2014
X10CSATN02613F1	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0448	1/24/2014
X10CSATN02613G	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0445	1/9/2014
X10CSATN02613H	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR7-0043	5/30/2014
X10CSATN02613I	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0445	1/9/2014
X10CSATN02613J	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR7-0042	6/2/2014
X10CSATN02613K1	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0501	4/24/2014
X10CSATN02613L	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR7-0024	3/25/2014
X10CSATN02613M	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR7-0024	3/25/2014
X10CSATN02626A	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR7-0073	8/6/2014
X10CSATN02626B	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0462	2/11/2014
X10CSATN02626C	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0461	2/11/2014
X10CSATN02626D	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0461	2/11/2014
X10CSATN02626E	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR7-0057	7/10/2014
X10CSATN02626F	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0440	12/18/2013
X10CSATN02626G	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0440	12/18/2013
X10CSATN02626H	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0464	2/25/2014
X10CSATN02626I	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0615	1/14/2015
X10CSATN02626J	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR7-0025	3/31/2014
X10CSATN02626K	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR7-0026	3/31/2014

X10CSATN02626L	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR7-0025	3/31/2014
X10CSATN02627A	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0502	4/24/2014
X10CSATN02627B1	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR7-0066	7/21/2014
X10CSATN02627C	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0524	6/11/2014
X10CSATN02627D	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0487	3/27/2014
X10CSATN02627E	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0502	4/24/2014
X10CSATN02627F	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0555	7/31/2014
X10CSATN02627H	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0488	4/2/2014
X10CSATN02627I	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0498	4/23/2014
X10CSATN02627J	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0552	7/24/2014
X10CSATN02627K	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0488	4/2/2014
X10CSATN02627L	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0545	7/22/2014
X10CSATN02627M	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0539	7/15/2014
X10CSATN02632F	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0492	4/14/2014
X10CSATN02632I	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR7-0037	5/1/2014
X10CSATN02632J	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0544	7/23/2014
X10CSATN02632K1	55G	CH	ORNL	OR-REDC-CH-HET		
X10CSATN02632L1	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0515	5/20/2014
X10CSATN02634A	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0481	3/20/2014
X10CSATN02634B	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0457	2/4/2014
X10CSATN02634C	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0457	2/4/2014
X10CSATN02634D	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0617	1/27/2015
X10CSATN02634E	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0617	1/27/2015
X10CSATN02634F	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0617	1/27/2015
X10CSATN02634G1	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR7-0044	6/3/2014
X10CSATN02634H	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0616	1/14/2015
X10CSATN02634I	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0480	3/13/2014
X10CSATN02634K	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0514	5/20/2014
X10CSATN02640A	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR7-0066	7/21/2014
X10CSATN02640B	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR7-0064	7/7/2014
X10CSATN02640C	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0539	7/15/2014
X10CSATN02640E	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR7-0039	5/6/2014
X10CSATN02640F	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0464	2/25/2014
X10CSATN02640G	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0520	5/29/2014

X10CSATN02640H	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR7-0020	3/18/2014
X10CSATN02640I	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0472	3/3/2014
X10CSATN02640J	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR7-0009	1/16/2014
X10CSATN02640K	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0510	5/8/2014
X10CSATN02644B	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0486	3/27/2014
X10CSATN02644C	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0491	4/3/2014
X10CSATN02644D	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0491	4/3/2014
X10CSATN02644F	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0498	4/23/2014
X10CSATN02644G	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0498	4/23/2014
X10CSATN02644H1	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0545	7/22/2014
X10CSATN02644J	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0462	2/11/2014
X10CSATN02644K	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0462	2/11/2014
X10CSATN02644L	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0542	7/17/2014
X10CSATN02644M	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR7-0057	7/10/2014
X10CSATN02645A	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR7-0019	3/18/2014
X10CSATN02645B	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR7-0042	6/2/2014
X10CSATN02645C	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR7-0043	5/30/2014
X10CSATN02645D	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR7-0043	5/30/2014
X10CSATN02645E	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR7-0043	5/30/2014
X10CSATN02645F	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0492	4/14/2014
X10CSATN02645G	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR7-0031	4/14/2014
X10CSATN02645H1	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0539	7/15/2014
X10CSATN02645I	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0530	6/25/2014
X10CSATN02645L	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0458	2/19/2014
X10CSATN02645M	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0459	2/11/2014
X10CSATN02645N1	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR7-0074	8/1/2014
X10CSATN02645O	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0458	2/19/2014
X10CSATN02664A1	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR7-0141	7/23/2015
X10CSATN02664B	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR7-0041	5/19/2014
X10CSATN02664C	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0455	2/3/2014
X10CSATN02664D	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0488	4/2/2014
X10CSATN02664E	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR7-0043	5/30/2014
X10CSATN02664F	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR7-0042	6/2/2014
X10CSATN02664G	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0468	3/3/2014

X10CSATN02664H	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0470	3/3/2014
X10CSATN02664I	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR7-0026	3/31/2014
X10CSATN02664J	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0471	3/3/2014
X10CSATN02664L	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR7-0101	9/23/2014
X10CSATN02664M	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR7-0025	3/31/2014
X10CSATN02665A1	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR7-0042	6/2/2014
X10CSATN02665B	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0504	5/1/2014
X10CSATN02665G	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR7-0037	5/1/2014
X10CSATN02665H	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR7-0061	7/21/2014
X10CSATN02682A	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR7-0003	12/12/2013
X10CSATN02682C	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0435	12/10/2013
X10CSATN02682D	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR7-0003	12/12/2013
X10CSATN02682E	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR7-0027	4/7/2014
X10CSATN02682F	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0613	1/14/2015
X10CSATN02682G	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0610	1/14/2015
X10CSATN02682H	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0610	1/14/2015
X10CSATN02682I	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0485	3/20/2014
X10CSATN02682J	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR7-0026	3/31/2014
X10CSATN02682K	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0455	2/3/2014
X10CSATN02682L	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR7-0027	4/7/2014
X10CSATN02682M	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0607	12/4/2014
X10CSATN02682N	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0508	5/8/2014
X10CSATN02689A	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0315	10/19/2010
X10CSATN02689E	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0581	9/23/2014
X10CSATN02689I	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0609	12/30/2014
X10CSATN02689L	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0621	2/16/2015
X10CSATN02689M	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0319	3/1/2011
X10CSATN02689N	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0335	10/27/2010
X10CSATN02689T	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0600	11/20/2014
X10CSATN02689U1	55G	CH	ORNL	OR-REDC-CH-HET		
X10CSATN02694D	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0586	10/3/2014
X10CSATN02694G	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0309	10/19/2010
X10CSATN02694H	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0311	10/28/2010
X10CSATN02694I	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0608	12/30/2014

X10CSATN02694J	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR7-0057	7/10/2014
X10CSATN02694K	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR7-0025	3/31/2014
X10CSATN02694M	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0596	11/18/2014
X10CSATN02694N	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0607	12/4/2014
X10CSATN02694O	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0608	12/30/2014
X10CSATN02698A	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0455	2/3/2014
X10CSATN02698B	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0612	1/16/2015
X10CSATN02698C	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0612	1/16/2015
X10CSATN02698D	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0472	3/3/2014
X10CSATN02698E	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0477	3/18/2014
X10CSATN02698G	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR7-0017	3/12/2014
X10CSATN02698H	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR7-0020	3/18/2014
X10CSATN02698I	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR7-0019	3/18/2014
X10CSATN02698J	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0489	4/2/2014
X10CSATN02698K	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR7-0015	3/4/2014
X10CSATN02698M	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0489	4/2/2014
X10CSATN02698O	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0487	3/27/2014
X10CSATN02699A	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0603	12/2/2014
X10CSATN02866A	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR7-0125	11/26/2014
X10CSATN02866C	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0307	10/8/2010
X10CSATN02866D	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0312	10/28/2010
X10CSATN02866F	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0613	1/14/2015
X10CSATN02866I	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0347	11/2/2010
X10CSATN02869A	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0610	1/14/2015
X10CSATN02869B	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0613	1/14/2015
X10CSATN02869C	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0585	10/7/2014
X10CSATN02869D	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0310	10/19/2010
X10CSATN02869E	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0315	10/19/2010
X10CSATN02869F	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR7-0125	11/26/2014
X10CSATN02869G	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0608	12/30/2014
X10CSATN02870A	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0543	7/16/2014
X10CSATN02870B	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0543	7/16/2014
X10CSATN02870C1	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0515	5/20/2014
X10CSATN02870D	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR7-0065	7/22/2014

X10CSATN02870E	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0543	7/16/2014
X10CSATN02870F	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR7-0065	7/22/2014
X10CSATN02870G	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0543	7/16/2014
X10CSATN02870H	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0541	7/17/2014
X10CSATN02870I	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0510	5/8/2014
X10CSATN02870J	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0510	5/8/2014
X10CSATN02870L1	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR7-0042	6/2/2014
X10CSATN02870M	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR7-0049	6/13/2014
X10CSATN02874A	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0616	1/14/2015
X10CSATN02874B	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0538	7/14/2014
X10CSATN02874C	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0617	1/27/2015
X10CSATN02874D	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0616	1/14/2015
X10CSATN02874E	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0300	10/18/2010
X10CSATN02874F	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0300	10/18/2010
X10CSATN02874G	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0300	10/18/2010
X10CSATN02874H	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0586	10/3/2014
X10CSATN02874J	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR7-0125	11/26/2014
X10CSATN02874K	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0611	12/30/2014
X10CSATN02874L	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR7-0025	3/31/2014
X10CSATN03031A	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0513	5/16/2014
X10CSATN03042A	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0455	2/3/2014
X10CSATN03042B	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR7-0031	4/14/2014
X10CSATN03042C	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0499	4/23/2014
X10CSATN03042D	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0493	4/9/2014
X10CSATN03042E	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0532	6/25/2014
X10CSATN03042F	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR7-0038	5/6/2014
X10CSATN03042G	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR7-0056	7/10/2014
X10CSATN03042H	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR7-0057	7/10/2014
X10CSATN03042I	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR7-0038	5/6/2014
X10CSATN03043A	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0581	9/23/2014
X10CSATN03043C	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0581	9/23/2014
X10CSATN03043D	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0269	1/5/2010
X10CSATN03043E	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0608	12/30/2014
X10CSATN03043F	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0581	9/23/2014

X10CSATN03113A	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR7-0052	6/19/2014
X10CSATN03127A	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0551	7/28/2014
X10CSATN03139A	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0611	12/30/2014
X10CSATN03142A	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR7-0124	1/8/2015
X10CSATN03145A	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0528	6/18/2014
X10CSATN03165A	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0539	7/15/2014
X10CSATN03167A	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0429	5/20/2011
X10CSATN03168E	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR7-0116	10/20/2014
X10CSATN03173A	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0586	10/3/2014
X10CSATN03175A	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0586	10/3/2014
X10CSATN03175B	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0586	10/3/2014
X10CSATN03180A	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0528	6/18/2014
X10CSATN03181B	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0539	7/15/2014
X10CSATN03184A	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0523	6/17/2014
X10CSATN03188A	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR7-0048	6/12/2014
X10CSATN03189B	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0586	10/3/2014
X10CSATN03208A	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR7-0144	8/4/2015
X10CSATN03208B	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR7-0144	8/4/2015
X10CSATN03208C	55G	CH	ORNL	OR-REDC-CH-HET		
X10CSATN03208E	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR7-0144	8/4/2015
X10CSATN03208F	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR7-0143	7/28/2015
X10CSATN03208G	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR7-0143	7/28/2015
X10CSATN03208H	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR7-0144	8/4/2015
X10CSATN03208I	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR7-0145	8/3/2015
X10CSATN03208J	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR7-0144	8/4/2015
X10CSATN03208K	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR7-0145	8/3/2015
X10CSATN03208L	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR7-0145	8/3/2015
X10CSATN03208M	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR7-0144	8/4/2015
X10CSATN03208N	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR7-0144	8/4/2015
X10CSATN03210A	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0256	12/3/2009
X10CSATN03210B	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0581	9/23/2014
X10CSATN03210C	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0257	12/14/2009
X10CSATN03210D	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0256	12/3/2009
X10CSATN03211A	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR7-0146	8/4/2015

X10CSATN03211AJ	55G	CH	ORNL	OR-REDC-CH-HET		
X10CSATN03211B	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR7-0147	8/4/2015
X10CSATN03211C	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR7-0146	8/4/2015
X10CSATN03211D	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR7-0146	8/4/2015
X10CSATN03211E	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR7-0146	8/4/2015
X10CSATN03211F	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR7-0147	8/4/2015
X10CSATN03211G	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR7-0147	8/4/2015
X10CSATN03211H	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR7-0147	8/4/2015
X10CSATN03211I	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR7-0146	8/4/2015
X10CSATN03211J	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR7-0146	8/4/2015
X10CSATN03211K	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR7-0149	8/5/2015
X10CSATN03211L	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR7-0149	8/5/2015
X10CSATN03211M	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR7-0146	8/4/2015
X10CSATN03211N	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR7-0146	8/4/2015
X10CSATN03211P	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR7-0148	8/5/2015
X10CSATN03211R	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR7-0149	8/5/2015
X10CSATN03211S	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR7-0148	8/5/2015
X10CSATN03211T	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR7-0149	8/5/2015
X10CSATN03211U	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR7-0149	8/5/2015
X10CSATN03217A	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR7-0052	6/19/2014
X10CSATN03219A	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR7-0076	8/7/2014
X10CSATN03222B	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0523	6/17/2014
X10CSATN03223A	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0556	7/31/2014
X10CSATN03224A	55G	CH	ORNL	OR-REDC-CH-HET		
X10CSATN03226A	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0552	7/24/2014
X10CSATN03227A	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR7-0046	6/10/2014
X10CSATN03228A	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0455	2/3/2014
X10CSATN03555A	55G	CH	ORNL	OR-REDC-CH-HET	OR-RTR6-0587	10/7/2014

Attachment D: Contact Handled Waste Repackaging Data Form

Page 1 of 3

Section 1: General Information

Examination Start Date: 3-17-15 | Originally packaged as RH Waste ☐ Yes ☑ No

Container Number: NFS0183A

Container Type: 55 gal. drum | Thickness of Bag Liner: 6 mil

Bag Liner Description: ☑ Non-Rigid ☑ Filtered Vent ☑ Poly ☐ Rigid ☐ Non-vented ☐ Other:

Waste Stream Identification #: OR-NFS-CH-SOIL

Physical waste form matches the assigned Waste Stream Description and RCRA characterization?
☐ NO ☑ YES

New Waste Stream Identification Number if assigned:

Are sharp or heavy objects are blocked, braced, or packaged to provide puncture protection for the waste container?
☐ NO ☑ YES

Volume Utilization Percentage: 95 %

Number of Container Liners used: 1

Closure Method for Container Liner: twist & tape

Number of Inner Bags: 0

Verified no inner packages are heat sealed? ☐ NO ☑ YES ☐ N/A

Number for Layers of Confinement: 1

Container Filter and Drum Enclosure Data

Filter Torque Wrench Serial/ID No. 061308159 2

Calibration Due Date: 10-7-15

Lid Ring Bolt Torque Wrench: 061308159 2 (3/18/15) 051001453 (3/18/15)

Manufacturer's Closure spec: PQ080 Rev D

Filter Model No. UT2424X00237

Serial No. 0326

Torque Value 6 ft. lbs.

Calibration Due Date: ~~10-7-15~~ 7/23/15

Source Container #:	Waste Stream #:	Original Parent Container #:	Waste Stream #:
NFS0183	OR-NFS-CH-SOIL		

Attachment D: Contact Handled Waste Repackaging Data Form

Page 2 of 3

Section 2: Waste Package Data			Data Page 1 of 1
Container Number: NFS0183A			Examination Date: 3-17-15
Item #	If Drum Puck, SS or CS	Waste Item Description	
1	N/A	No char, plastic, super sak, jam nut, rubber booties, latex gloves, duct tape, cotton liners, masselin, 60% soil & rock.	
Waste Repackaging Operator:	Jason Brown (Print Name)	Jason Brown (Signature)	3-17-15 (Date)

Attachment D: Contact Handled Waste Repackaging Data Form

Page 3 of 3

Section 3: Comments

Container Number:	NFS 0183A	**Examination Date:**	3-17-15

Waste repackaged in accordance with OPIP# 2015-046 & 2015-053

Waste repackaged in accordance with WNCR# N/A

note 1: Drum contains 60% soil & rock. JCB 3-17-15

note 2: As per OPIP-2015-053 residual liquid found, no char added. JCB 3-17-15.

note 3: Greater than 4 Liter container found, Opened; NFS 0183A contains No (JCB 3-17-15) < > 4 Liter container. JCB 3-17-15

note 4: Data correction. (note 4) JCB 3-17-15

PCB Bulk Product Characterization:

Section 4: Approvals

Signature below signifies that waste in this container has been examined and documented as required.

Waste Repackaging Operator: Jason Brown (Print Name)	Jason Brown (Signature)	3-17-15 (Date)
Waste Repackaging Data Form Reviewer: Donald Jones (Print Name)	Donald Jones (Signature)	3.17-15 (Date)

Signature below signifies that the Waste Stream Identification Number has been verified to be consistent with the original parent container and that objective evidence of the Waste Stream Identification Number is included in the applicable Waste Container Traveler.

Waste Package Verifier: Jeff Chapman (Print Name)	Jeff Chapman (Signature)	3-18-15 (Date)

*File with Waste Container Traveler.

Init _____ _____ _____ _____ _____

Date _____ _____ _____ _____ _____

Time _____ _____ _____ _____ _____

Attachment D: Contact Handled Waste Repackaging Data Form

Page 1 of 3

Section 1: General Information

Examination Start Date: 3-17-15	**Originally packaged as RH Waste** ☐ Yes ☑ No
Container Number: NFS0183B	
Container Type: 55 gallon drum	**Thickness of Bag Liner:** 6 mil
Bag Liner Description: ☑ Non-Rigid ☑ Filtered Vent ☑ Poly ☐ Rigid ☐ Non-vented ☐ Other:	
Waste Stream Identification #: OR-NFS-CH-SOIL	
Physical waste form matches the assigned Waste Stream Description and RCRA characterization? ☐ NO ☑ YES	
New Waste Stream Identification Number if assigned	
Are sharp or heavy objects are blocked, braced, or packaged to provide puncture protection for the waste container? ☐ NO ☑ YES	
Volume Utilization Percentage: 95 %	
Number of Container Liners used: 1	
Closure Method for Container Liner: twist & tape	
Number of Inner Bags: 0	
Verified no inner packages are heat sealed? ☐ NO ☑ YES ☐ N/A	
Number for Layers of Confinement: 1	

Container Filter and Drum Enclosure Data

Filter Torque Wrench	**Filter Model No.** UT9424X00337
Serial/ID No. 0101308159 2	**Serial No.** 00237
Calibration Due Date: 10-7-15	**Torque Value** 6 ft. lbs.
Lid Ring Bolt Torque Wrench: 05100145 31	**Calibration Due Date:** 7/28/15
Manufacturer's Closure spec: PQ080 Rev D	

Source Container #:	Waste Stream #:	Original Parent Container #:	Waste Stream #:
NFS 0183	OR-NFS-CH-SOIL		

Attachment D: Contact Handled Waste Repackaging Data Form

Page 2 of 3

Section 2: Waste Package Data			Data Page 1 of 1
Container Number: NFS 0183B		Examination Date: 3-17-15	
Item #	If Drum Puck, SS or CS	Waste Item Description	
1	N/A	NO char, super sak, plastic, cut up 90 mil. liner, 60 % soil & rock, leather gloves, paper, masselin, tyveks, latex gloves, rubber booties.	
Waste Repackaging Operator:	Jason Brown (Print Name)	Jason Brown (Signature)	3-17-15 (Date)

Attachment D: Contact Handled Waste Repackaging Data Form

Page 3 of 3

Section 3: Comments			
Container Number:	NFS0183B	**Examination Date:**	3-17-15
Waste repackaged in accordance with OPIP#	2015-046 & 2015-053		
Waste repackaged in accordance with WNCR#	N/A		
note 1: Drum contains 60% soil & rock. JCB 3-17-15			
note 2: As per OPIP-2015-053 residual liquid found. No char added. JCB 3-17-15			
note 3: Greater 4 Liter container found & cut up. JCB 3-17-15			
PCB Bulk Product Characterization:			

Section 4: Approvals		
Signature below signifies that waste in this container has been examined and documented as required.		
Waste Repackaging Operator: Jason Brown (Print Name)	Jason Brown (Signature)	3-17-15 (Date)
Waste Repackaging Data Form Reviewer: Ronald Jones (Print Name)	Ronald Jones (Signature)	3.17.15 (Date)
Signature below signifies that the Waste Stream Identification Number has been verified to be consistent with the original parent container and that objective evidence of the Waste Stream Identification Number is included in the applicable Waste Container Traveler.		
Waste Package Verifier: Jeff Chapman (Print Name)	Jeff Chapman (Signature)	3-18-15 (Date)

*File with Waste Container Traveler.

Init _____ _____ _____ _____ _____
Date _____ _____ _____ _____ _____
Time _____ _____ _____ _____ _____

DIVIDER PAGE

REQUEST FOR STORAGE OR DISPOSAL OF RADIOACTIVE SOLID WASTE OR SPECIAL MATERIALS

78244

Requester: Executes this section before arranging material transfer

Date	Origin of Waste bldg. no.	Requester's Signature	Badge No.	Phone No.	Building/Mail Stop
/10/93	NFS 110/234	T. Bennett			P.O. Box 1234 Erwin, TN 7702

NON RECORD COPY

(CHECK IF APPLICABLE)	Total Volume (Cu. Ft. only)	Combustible Vol. (Cu. Ft. only)	Weight (Lbs. only)	Accountability no. (mm.no.)
X OFFSITE	7.50	0.0	562	
___ CONSTRUCTION	Charge Work Order Number: 3325-7016		(FOR WASTE OPERATIONS USE ONLY) COST SYMBOL B	COST ADJUSTMENT

Waste Classification (check only one)

1. X TRU or U-233 (Retrievable) (>100μCi/Kg)
2. __ URANIUM/THORIUM
3. __ FISSION PRODUCT
4. __ INDUCED ACTIVITY
5. __ TRITIUM
6. __ BETA-GAMMA TRU or U-233 (>100μCi/Kg)
7. __ ALPHA TRU or U-233 (<100μCi/Kg) BETA-GAMMA TRU or U-233
8. __ OTHER _____
9. __ LANDFILL/SUSPECT
A. __ CONTAMINATED ASBESTOS

COPY

Type of Waste (check only one) BRIEF DESCRIPTION

__ (BW) BIOLOGICAL WASTE _____
__ (CE) CONTAMINATED EQUIPMENT _____
__ (DD) DECONTAMINATION DEBRIS _____
X (DS) DRY SOLIDS SOIL
__ (SS) SOLIDIFIED SLUDGE _____
__ (NC) NOT CLASSIFIED _____

CONTAINER TYPE (check only one)

1. X 55 GAL SS DRUM
2. __ 30 GAL SS DRUM
3. __ 4-1/2" WALL CONCRETE CASK
4. __ 6" WALL CONCRETE CASK
5. __ 12" WALL CONCRETE CASK
6. __ 55 GAL BI DRUM
7. __ 30 GAL BI DRUM
8. __ WOODEN BOX
9. __ OTHER
10. __ GI CAN
11. __ PLASTIC
12. __ DUMPSTER
13. __ NONE
14. __ CASK NO ___ WALLTHICKNESS ___ IN. SHIELDING MTL ___
15. __ METAL BOX __

CAUTION
This information must NOT be released externally until it has been reviewed by the appropriate Classification and Information Control Office.

PRINCIPAL ISOTOPE(S): (BEST ESTIMATE)
*Refer to the Attached Manifests

1. IDENTITY ____	QUANTITY ____	__ GRAMS __ CURIES	2. IDENTITY ____	QUANTITY ____	__ GRAMS __ CURIES
3. IDENTITY ____	QUANTITY ____	__ GRAMS __ CURIES	4. IDENTITY ____	QUANTITY ____	__ GRAMS __ CURIES

REQUESTER'S COMMENTS FOR THOSE HANDLING WASTE IN THE FIELD:

TOTAL CURIES (BEST EST.) 1.193E+00

WMO FIELD REPRESENTATIVE (APPROVAL SIGNATURE): P G Cleveland — DATE: 10/16/93

HEALTH PHYSICIST: EXECUTES THIS SECTION BEFORE MATERIAL TRANSFER

RADIATION DATA:
BETA-GAMMA: FOR PACKAGE 0.3 mrem/hr. @ 0 in.

SURFACE CONT. <20 dpm (alpha): <20 dpm (beta/gamma): Neutron reading <0.5 mrem/hr

HP SURVEYOR'S COMMENTS FOR THOSE HANDLING WASTE IN THE FIELD: Entered 10/19/93 by KM/KM
Billed 11/3/93 by KM 12-10-93

Drum ATN: NFS 0183 Shipment #: 4226-30	HP'S SIGNATURE	DATE

UCN-2822

STORAGE OR DISPOSAL OF RADIOACTIVE SOLID WASTE OR SPECIAL MATERIALS

DOCUMENT NO. 78244
PAGE 2

COMPACTION WASTE: COMPLETED AND THEN APPROVED BY SWSA FOREMAN

LOW LEVEL BOX INFORMATION

LL NUMBER	FULL BOX (Y/N)	FULL BOX WEIGHT	PORTION (FRACTION)	TOTAL POST-VOL	COMMENTS	FOR DMC USE ONLY
TOTALS						

Date of Compaction:

Compacting Operators:

and

SWSA Foreman's Signature:

SWSA FOREMAN COMPLETES AND APPROVES FOR NON-COMPACTED WASTE

Waste Was (check one): ☑ Retrievable ☐ Buried

SWSA No.: 5

Storage/Disposal Date: 10/21/93

ATN NO.: NFS-183

Low Level No.:

Facility (check one): ☑ Building ☐ Well ☐ Landfill ☐ Tumulus ☐ Trench ☐ On Ground Storage

Location No.: B7879

Location Within Facility: Rank: File: Layer:

Waste Description: CH-TRU

Comments from SWSA Foreman regarding waste and/or operations:

Foreman's Signature: R L White

WASTE EXAMINATION (WEAF): COMPLETES AND FORWARDS TO DMC

Waste Inspection Level: ☒ RTR ☐ PAN/SGS

Rated: ☒ Pass ☐ Fail

Inspection Officier: J.E. Madison

Date: 12-8-93

DISTRIBUTION: Copy 1 - Attach to 2822 and forward to DMC
Copy 2 - Retained by SWSA Foreman
Copy 3 - Retained by WEAF/Compacting Team (If Applicable)

UCN-2822A
(3 12-91)

COPY 1

D615

OAK RIDGE NATIONAL LABORATORY
MARTIN MARIETTA ENERGY SYSTEMS, INC.

USE THIS NUMBER ON ALL CONTINUATION PAGES

Generator Name: Nuclear Fuel Services, Inc.

Continuation Sheet

Shipment ID No: IC#: 4226-30

Disposal Container

(20) ITEM NUMBER	(21) RADIO-NUCLIDE EACH CONTAINER	(22) PERCENT OF ACTIVITY or mCi of EACH NUCLIDE	(23) ACTIVITY EACH CONTAINER (mCi)	(24) PHYSICAL FORM	(25) CHEMICAL FORM and NAME & % of CHELATING AGENT	(26) WASTE DESCRIPTION	(27) WASTE FORM CLASS	(28) SPECIAL NUCLEAR MATERIAL (grams)	(29) SOURCE MATERIAL (pounds)	(30) CONTAINER WEIGHT (pounds)	(31) CONTAINER VOLUME (Cu Ft)	(32) CONTAINER TYPE	(33) RADIATION LEVELS CONTAINER SURFACE (x) mR/hr ( ) R/hr	(33) (TI) 1 Meter mR/hr	(34) CONTAMINATION CONTAINER SURFACE (DPM/100cm2) Alpha	(34) Beta-Gamma	(35) FISSILE CLASS	(36) LABELS/MARKINGS USED	
A60014	U234	3.27E+00	1.193E+03	SOLID	OXIDE	SOIL	>C	3.10E+00	0.02	562	7.50	DRUM	< 0.30	< 0.20	< 20	< 200	III	Radioactive-	N.O.S.
2142	U235	2.51E-04	-07															Radioactive-	
NFS-0183	U238	3.27E-03	-06															Radioactive-	
	PU238	1.44E+01	-02															Radioactive-	
	PU239	1.63E+02	-01															Radioactive-	
	PU240	7.08E+01	-02															Radioactive-	
	PU241	8.84E+02	-01															Radioactive-	
	PU242	5.60E-03	-06															Radioactive-	
	AM241	5.67E+01	-02															Radioactive-	
																		Radioactive-	
A60015	U234	3.50E+00	1.274E+03	SOLID	OXIDE	SOIL	>C	3.31E+00	0.02	550	7.50	DRUM	< 0.40	< 0.20	< 20	< 200	III	Radioactive-	N.O.S.
2143	U235	2.68E-04	-07															Radioactive-	
NFS-0182	U238	3.49E-03	-06															Radioactive-	
	PU238	1.54E+01	-02															Radioactive-	
	PU239	1.74E+02	-01															Radioactive-	
	PU240	7.57E+01	-02															Radioactive-	
	PU241	9.44E+02	-01															Radioactive-	
	PU242	5.98E-03	-06															Radioactive-	
	AM241	6.06E+01	-02															Radioactive-	
																		Radioactive-	
2			2.467E+03			PAGE TOTALS		6.40E+00	0.04	1112	15.00			< 0.40					

Form No.
( )

DISPOSAL SITE COPY

TX-5352

DATA LOG SHEET FOR PACKAGING TRU WASTE

[An entry is required for each column. See instruction sheet for directions.]

Drum ATN: NFS-0183
Building No.: NFS 110/234
Room No.: _____

Content Code: OR125A
OR125B

1. Pak No.	2. Date	3. Radiation (mRem/h)		4. Activity (Cl)	5. Dominant Radionuclides	6. Physical Form	7. Chemical Form	8. Percent Comb.	9. Haz. Mtl (Y/N)	10. Signature	11. Data Log Sheet Verification	
		Beta, Gamma	Neut.								Date	Signature
9425-1	08/10/93			1.193E+00	* See Manifest	SOLID	OXIDE	0.0	N	J Peters	8-10-93	T. Bennett

Proper Drum Closure (Signature): T. Bennett

Generator Certification Official (Signature): T. Bennett

Authorized Radioactive Solid Waste Operations (Signature): C.G. Cleveland

Note: If column 9 = Yes, complete supplemental form TX-5352A.

Appendix 1 **CHECK SHEET for NFS DRUM RECEIPT**

SWSA Foreman		**INITIALS**
1.	55-gallon drum NFS number 183	
2.	Bar code sticker installed in two locations on the drum.	RLW
3.	Tamper Indicating Device (TID) is attached to the drum. TID # A40019	RLW
4.	Drum is free from damage (visual inspection).	RLW
5.	Nuc-Filter is installed in the drum lid.	RLW
6.	Bolt ring is installed properly and bolt is torqued to 45-ft-lb.	RLW
7.	HP has surveyed the drum, UCN-2785 is attached.	RLW
8.	A "Hazardous Waste" label is on the drum (if required).	NA

Comments: _____

SWSA Foreman signature R L White **Badge No.** 20405 **Date** 10/18/93

RSWO Technician		
9.	Form UCN-2822 complete.	PGC
10.	Form TX-5352 complete.	PGC
11.	Form TX-5352A complete (if applicable).	NA
12.	IC number recorded on form UCN-2822. IC # 4226-30.	PGC
13.	^{235}U equivalent fissile material total has been calculated. (4.29E+00 grams)	PGC
14.	Drum/documentation is accepted by RSWOG for WEAF inspection.	PGC

Comments: _____

RSWO Technician signature P G Cleveland **Badge No.** 12661 **Date** 10/21/93

NFS Shipment IC#: 4226-30

Radionuclide	Specific Activity (Ci/g)	U235 Equivalent Factor	Container Number: NFS-0183		
			Act. (mCi)	Wght (g)	U235 Equiv (g)
U233	9.47E-03	1.40E+00			
U234			3.27E+00		
U235	2.14E-06	1.00E+00	2.51E-04	1.17E-01	1.17E-01
U238			3.27E-03		
Pu238	1.74E+01	2.30E-01	1.44E+01	8.28E-04	1.90E-04
Pu239	6.14E-02	1.56E+00	1.63E+02	2.65E+00	4.14E+00
Pu240			7.08E+01		
Pu241	1.12E+02	3.50E+00	8.84E+02	7.89E-03	2.76E-02
Pu242			5.60E-03		
Am241	3.24E+00	4.40E-02	5.67E+01	1.75E-02	7.70E-04
			TOTAL U235 Equiv (g):		**4.29E+00**

DRUM NO. NFS-0183

PROCUREMENT QUALITY
SOURCE SURVEILLANCE PLAN

PLAN NO.	REV. NO.
SS WMRA-106	Original
ISSUE DATE: 12-18-92	REV. DATE

ITEM NAME	VENDOR(S)	PAGE
Contact-Handled Transuranic and Mixed Oxide Waste	NFS/ECOTEK/SEG	1 of 2

P.O. NO. / ITEM	SPEC. NO. / REV.	DWG. NO. / REV.
	WMRA-WMPC-106 Contact-Handled Transuranic and Mixed Oxide Waste	

FOR ACTIVITIES **REFERENCE**

SHIP TO : ORNL

SHIPMENT NO: 4226-30
(NO. 14 FROM NFS)

QUANTITY: 16 55-GALLON DRUMS

TRANSURANIC WASTE

By affixing his signature or stamp to the checklist, the Field Quality Representative (FQR) assures that he has reviewed or observed the activity and verifies all Testing and Packaging operations were performed per approved procedures.

Note: Some activities may be performed at SEG.

ACTIVITY	SOURCE SURVEILLANCE PLAN REFERENCE PARAGRAPH	STAMP/ SIGNATURE	DATE
1. Waste Certification Requirements	4.1 thru 4.9	MARTIN FOR 18	10/12/93
2. Containers	4.10	MARTIN FOR 18	
3. Immobilization	4.11	MARTIN FOR 18	
4. No Liquids	4.12	MARTIN FOR 18	
5. Pyrophoric Materials	4.13	MARTIN FOR 18	
6. No Explosives or Compressed gas	4.14	MARTIN FOR 18	
7. Hazardous Waste Characterization	4.15	MARTIN FOR 18	
8. Specific Activity	4.16	MARTIN FOR 18	
9. Weight	4.17	MARTIN FOR 18	
Fissile Content	4.18	MARTIN FOR 18	10/12/93

MARTIN FOR 18

DRUM NO. NFS-0183

PROCUREMENT QUALITY
SOURCE SURVEILLANCE PLAN

PLAN NO	REV. NO.
SS WMRA-106	Original
ISSUE DATE: 12-18-92	REV. DATE

ITEM NAME	VENDOR(S)	PAGE
Contact-Handled Transuranic and Mixed Oxide Waste	NFS/ECOTEK/SEG	2 of 2

P.O. NO. / ITEM	SPEC. NO. / REV.	DWG. NO. / REV.
	WMRA-WMPC-106 Contact-Handled Transuranic and Mixed Oxide Waste	

FOR ACTIVITIES	REFERENCE	
1. Equivalent Activity	4.19	MARTIN FOR 18 10/12/93
2. Surface Dose Rate	4.20	MARTIN FOR 18
3. Surface Contamination	4.21	MARTIN FOR 18
4. Thermal Power	4.22	MARTIN FOR 18
5. Gas Generation	4.23	MARTIN FOR 18
6. Labeling	4.24	MARTIN FOR 18
7. Data Package	4.25	MARTIN FOR 18
8. Notification	6.0	MARTIN FOR 18
9. Certification	7.0	MARTIN FOR 18 10/12/93

Drum ATN: NFS-0128, NFS-0129, NFS-0130, NFS-0132, NFS-0134, NFS-0178, NFS-0180, NFS-0181, NFS-0182, NFS-0183, NFS-0553, NFS-0561, NFS-0564, NFS-0755, NFS-0758, NFS-0761

~~Comments:~~

QR R.G. Williams Stamp MARTIN FOR 18 Date 10/12/93

R.G. WILLIAMS
MARTIN MARIETTA FQR

MARTIN FOR

TRU WASTE DATA PACKAGE

1. Drum ATN Number: NFS-0183
2. Shipment Number: 4226-30
3. Date Packaged: 08/10/93
4. Date of Shipment: 10/13/93
5. Date Certified: 08/10/93
6. Gross Weight: 562 lbs, Tare: 81 lbs

7. CONTENT INFORMATION (* See Attached Manifest for Isotopic Breakdown)

a. Physical Description: SOIL	
b. Chemical Form: OXIDE	c. Iron Content: 0.0 % by weight
d. Thermal Power: < 0.1 W/ft^3	e. Organic Content: 0.0 % by volume
f. Organic Content: 0.0 % by weight	g. ^{239}Pu - fissile gram equivalent: 2.77 +/- 1.36
h. Homogenous: [X] YES [ ] NO	i. ^{239}Pu - equivalent activity: 0.322 +/- 0.159 Ci
j. TRU Activity Concentration: 1399 +/- 689 nCi/gm	

8. HAZARDOUS CONSTITUENTS

Constituent	Concentration	Analytical Method
Not Present	0.000000000000	

Date of Analyses: 08/10/93

9. NEUTRON ABSORBERS PRESENT

Element	Weight %	Volume %	Analytical Method
Not Present	0.0	0.0	

Date of Analyses: 08/10/93

MARTIN FOR 18

10. MAXIMUM SURFACE DOSE RATE

Beta / Gamma	Alpha	Neutron
< 200 dpm/100cm² 0.3 mrem/hr	< 20 dpm/100cm²	2.5 mrem/hr
Performed by: David Guinn		Date: 8-10-93

OAK RIDGE NATIONAL LABORATORY
MARTIN MARIETTA ENERGY SYSTEMS, INC.

USE THIS NUMBER ON ALL CONTINUATION PAGES

Generator Name: Nuclear Fuel Services, Inc.

Continuation Sheet

Shipment ID No: IC#: 4226-30

Disposal Container

(20) ITEM NUMBER	(21) RADIO-NUCLIDE EACH CONTAINER	(22) PERCENT OF ACTIVITY or mCi of EACH NUCLIDE	(23) ACTIVITY EACH CONTAINER (mCi)	(24) PHYSICAL FORM	(25) CHEMICAL FORM and NAME & % of CHELATING AGENT	(26) WASTE DESCRIPTION	(27) WASTE FORM CLASS	(28) SPECIAL NUCLEAR MATERIAL (grams)	(29) SOURCE MATERIAL (pounds)	(30) CONTAINER WEIGHT (pounds)	(31) CONTAINER VOLUME (Cu Ft)	(32) CONTAINER TYPE	(33) RADIATION LEVELS (TI) CONTAINER SURFACE (x) mR/hr ( ) R/hr	(33) 1 Meter mR/hr	(34) CONTAMINATION CONTAINER SURFACE (DPM/100cm2) Alpha	(34) Beta-Gamma	(35) FISSILE CLASS	(36) LABELS/MARKINGS USED	
A40016	U234	3.27E+00	1.193E+03	SOLID	OXIDE	SOIL	>C	3.10E+00	0.02	562	7.50	DRUM	< 0.30	< 0.20	< 20	< 200	III	Radioactive-	N.O.S.
2142	U235	2.51E-04																Radioactive-	
NFS-0183	U238	3.27E-03																Radioactive-	
	PU238	1.44E+01																Radioactive-	
	PU239	1.63E+02																Radioactive-	
	PU240	7.08E+01																Radioactive-	
	PU241	8.84E+02																Radioactive-	
	PU242	5.60E-03																Radioactive-	
	AM241	5.67E+01																Radioactive-	
																		Radioactive-	
A40015	U234	3.50E+00	1.274E+03	SOLID	OXIDE	SOIL	>C	3.31E+00	0.02	550	7.50	DRUM	< 0.40	< 0.20	< 20	< 200	III	Radioactive-	N.O.S.
2143	U235	2.68E-04																Radioactive-	
NFS-0182	U238	3.49E-03																Radioactive-	
	PU238	1.54E+01																Radioactive-	
	PU239	1.74E+02																Radioactive-	
	PU240	7.57E+01																Radioactive-	
	PU241	9.44E+02																Radioactive-	
	PU242	5.98E-03																Radioactive-	
	AM241	6.06E+01																Radioactive-	
																		Radioactive-	
2			2.467E+03			PAGE TOTALS		6.40E+00	0.04	1112	15.00			< 0.40					

Form No.
( )

DISPOSAL SITE COPY

Lot 210
MTS-2142

NFS-0183
A 40014
2125334

Attachment 6

WASTE CERTIFICATION CHECKLIST FOR CH-TRU

Criteria	Specification	Supervisor Initial
1	WASTE CONTAINER: *(Interim package for SEG):*	
	DOT Spec 17C or 17H	TB
	Stainless Steel *(N/A)*	TB
	55-gallon capacity *(40-gallon capacity)*	TB
	polyethylene liner *(N/A)*	TB
	No handles, cleats, or lifting devices	TB
2	IMMOBILIZATION:	
	Particulate bearing material screened	N/A
	Particulate immobilized	↓
	Vermiculite added	↓
3	LIQUID WASTES:	
	No free liquids present	TB
4	PYROPHORIC MATERIALS:	
	No pyrophoric materials present	TB
	Pyrophoric materials stabilized, if present; otherwise N/A	N/A
5	EXPLOSIVES AND COMPRESSED GASES:	
	Gas can pins removed / can compacted	N/A
	No explosive material present	TB
	Explosive material stabilized, if present; otherwise N/A	N/A
6	RADIOACTIVE MIXED WASTES:	
	No 40CFR261/761 hazardous waste/substance present	TB
	Material identified/quantified, if present; otherwise N/A	N/A
7	ACTIVITY CONCENTRATION OF WASTE:	
	Waste package ≥ 100 nCi/gm	TB

MARTIN FOR JB

2142

Criteria	Specification	Supervisor Initial
8	WASTE PACKAGE WEIGHT: Waste package ≤ 800 pounds	TB
9	NUCLEAR CRITICALITY: ^{239}Pu fissile gram equivalent ≤ 128 gm (≤42 gm)	TB
10	^{239}Pu EQUIVALENT ACTIVITY: ^{239}Pu equivalent activity ≤ 1,000 Ci (≤333 Ci)	TB
11	SURFACE DOSE RATE: Maximum surface dose rate ≤ 200 mRem/hr Neutron dose rate ≤ 20 mRem/hr Neutron dose reported if > 20 mRem/hr; otherwise N/A	TB TB N/A
12	SURFACE CONTAMINATION: Surface contamination ≤ 20 dpm/100cm² α Surface contamination ≤ 200 dpm/100cm² ß/γ	TB TB
13	THERMAL POWER: Thermal power ≤ .1 watt/ft³ Thermal power reported if ≥ .1 watt/ft³; otherwise N/A	TB N/A
14	GAS GENERATION: Polyethylene liner fitted with 3/8" hole (N/A) Drum lid bung fitted with HEPA filter (Torque) (N/A)	TB TB
15	LABELING: ORNL accountability transfer bar code attached	TB
16	DATA PACKAGE: Data package verified complete and accurate	TB/JT
17	HEPA Filter torque: 15±1.5 ft-lbs. (raised nipple bung) →25±2.5 ft-lbs (flush bung) Closure Lug Bolt Torque - 45-50 ft. lbs; lock nut on outside	TB TB
18	Approved absorbent material added	TB

SIGNATURES:
Supervisor completing checksheet T. Bennett Date: 8-10-93
MTS QA review V. Toler Date: 10/8/93
Project Manager/Director Donald Lemmon Date: 10/7/93

MARTIN FOR JB

NONMIXED CH-TRU
VERIFICATION CHECKLIST
(DATA PACKAGE)

WASTE PACKAGE NO. NFS-0183

Note: A completed Data Package checklist must be generated with each 55-gal waste container during the verification process and will become part of the documentation retained for that waste package.

Data Package

1. Date of Packaging	✓
2. Max Surface Dose Rate	✓
3. Weight	✓
4. Physical Description	✓
5. Assay Information	✓
6. Radionuclide Data (Qual & Quan)	✓
7. Organics (Weight & Volume %)	✓
8. Thermal Power	✓
9. Shipment No.	✓
10. Date of Shipment	✓
11. Radionuclide Chemical Form	✓
12. Neutron Poisons	N/A
13. Iron Content	✓
14. Radionuclide Distribution	✓
15. Sampling Results (If Required)	N/A
16. Documentation	✓

Verification complete. Items 1 - 16 verified.

Laboratory Certification Official

11/17/93
Date

WEAF DATA ENTRY SYSTEM FOR THE NFS WASTE STORAGE PROJECT

DATA ENTRY VERIFICATION FORM

Name Input	: S E Williams	Waste Type	: TRUSOIL
ATN Number	: NFS-0183	Date of Input	: 11-04-93
Gross Weight (lb)	: 562	Date of Shipment	: 10-13-93
Tare Weight (lb)	: 81	Date of Receipt	: 10-13-93

Iron Content by Weight% :	0.00			
TRU Activity Conc. (nCi/g):	1399.00	Error:	689.00	%error: 0.49
Pu239 Fissile Gram Eq. (g):	2.77	Error:	1.36	%error: 0.49
Pu239 Equiv. Activity (Ci):	0.32	Error:	0.16	%error: 0.50
Thermal Power (> 0.1W/ft^3) :	0.00			
Inhalation Dose Eq.(MOX ONLY):	0.00			
Neutron Absorbers {text} :	0.00			

ISOTOPE ACTIVITY (mCi)

U-233:	0.00E+00	Pu-238:	1.44E+01	Am-241:	5.67E+01
U-234:	3.27E+00	Pu-239:	1.63E+02		
U-235:	2.51E-04	Pu-240:	7.08E+01		
U-238:	3.27E-03	Pu-241:	8.84E+02		
		Pu-242:	5.60E-03		
Sum:	3.27E+00		1.13E+03		5.67E+01

Total Radioactivity Reported on Manifest (mCi): 1.19E+03

DRUM PROFILE FOR SUPERCOMPACTED WASTE

	Pack Number	Activity (mCi)	
Top Pack :		0.00E+00	
Middle Pack :		0.00E+00	Activity
Bottom Pack :		0.00E+00	Total (mCi): 0.00E+00

Technician Notes:
Time > 8:31:13 AM

Signature: Sherry E. Williams Date: 11-6-93

Written to: D:\NFS\DATA\NFS_IN.TMP, WAC file: D:\NFS\V1.1\WAC.DAT
File saved as: D:\NFS\DATA\NFS0183.DAT

WEAF DATA ENTRY SYSTEM FOR THE NFS WASTE STORAGE PROJECT
CHECK OF COMPUTED VALUES AND NOMINAL EXPECTATION

ATN Number	: NFS-0183	Waste Type	: TRUSOIL
Gross Weight (lb)	: 562	Date of Input	: 11-04-93
Tare Weight (lb)	: 81	Density (g/cm3)	: 1.05
Net Weight (lb)	: 481.0		
Net Weight (kg)	: 218.4		

	Isotope	Activity (mCi)	Mass (g)	Element Mass(g)
	*U-233 :	0.00E+00	0.000	
	U-234 :	3.27E+00	0.538	
	U-235 :	2.51E-04	0.118	
	U-238 :	3.27E-03	9.879	10.535
	*PU-238 :	1.44E+01	0.001	
	*PU-239 :	1.63E+02	2.629	
	*PU-240 :	7.08E+01	0.312	
	PU-241 :	8.84E+02	0.009	
	*PU-242 :	5.60E-03	0.001	2.952
* TRU isotope	*AM-241 :	5.67E+01	0.017	0.017

ISOTOPICS — Total Mass---> 13.504

Weight percent U: 0.780

U233/U: 0.000
U234/U: 0.051
U235/U: 0.011
U238/U: 0.938

Weight percent Pu: 0.219

Pu238/Pu: 0.000
Pu239/Pu: 0.891
Pu240/Pu: 0.106
Pu241/Pu: 0.003
Pu242/Pu: 0.000

Weight percent Am: 0.0012

CALCULATIONS OF WASTE ACCEPTANCE CRITERIA

	Reported Qty.	Calculated Qty.
TRU Activity Concentration (nCi/g) :	1399.000	1396.254
Pu239 Fissile Gram Equivalent (g) :	2.770	2.734
Pu239 Equivalent Activity (Ci) :	0.320	0.322
Thermal Power (W/ft^3) :	0.000	0.001
Inhalation Dose Equivalent (g) :	0.000	0.000
U235 Equivalent Mass (g) :		4.266

RESULTS OF NOMINAL EXPECTATION TESTS

Isotopic weight%:
W% ERRORS---> U < 80% *

WAC calculations:
CALCULATIONS ARE NOMINAL, WITHIN 3%

File Saved As: D:\NFS\DATA\NFS0183.DAT

DIVIDER PAGE

Shipped to ORNL from NFS WIPP14006 (4/29/14)

Waste/Material Generation

ALL FIELDS MUST BE COMPLETE

X10C1451639

Revision Nbr.: 0

K1. Document ID Number
X10C1451639

Generation Process Information					
W1. Generator's Name (Print): SAWYER, HOPE	W2. Badge Number: 000033	W3. Generator's Phone No.: (423) 735-9141 ext. 1610 x1610	W4. Mail Stop: N/A	W5. Charge No/WO: N/A	
W6. Generator's Company: NUCLEAR FUEL SERVICES	W7. Work Pkg. Nbr.: N/A	W30. Project Id / WBS#: QT / N/A	W8. Origin Site: NFS	W9. Origin Facility: 234	W10. Origin Room/Area: WET CELL
CERCLA Ind: N	W11. Radiological Area? [X] Yes [ ] No	W12. WSW Number: NFS-SOILS-GRAVEL	W13. Process Category: PRO	W14. Process Activity: A32	W15. AWA Number: N/A
W16. Physical Form: SOLID	W17. Material Type(s): MT012	W18. Waste Item Desc. Attachment: B	W19. Profile No. / Rev.: TRU-CH-7 Rev. 0		

Waste Subcategories (Check all)								
	Yes	No		Yes	No		Yes	No
W20. Biological		X	W23. Construction Debris		X	W26. Classified		X
W21. Accountable		X	W24. Medical		X	W27. Regulated Asbestos		X
W22. Carcinogen		X	W25. Sanitary / Industrial		X	W28. Non-Regulated Asbestos		X

W29. Waste Description
CH-TRU SOIL AND GRAVEL FROM NFS DRUM #7445554

Handling/Pickup Information					
P1. Holding Site: NFS	P2. Holding Facility: NFS	P3. Holding Rm/Area: NFS	P4. Pickup Site: NFS	P5. Pickup Facility: NFS	P6. Pickup Area: NFS
(Reserved)	P7. Respirator: [X] None [ ] Half [ ] Full [ ] Unknown	P8. Cartridge Type: N/A			
P9. Handling Instructions: N/A					

I0. Item/Container 1 of 1

Waste Item/ Container Information					
I1. Waste Item ID Number: X10C1451639-1	I2. Origin Date: 02/05/2014	I3. RCRA 90-day Start Date: N/A	Apply to WID	*X10C1451639*	
I5. Container ID Number: X10C1451639	I6. PCB Start Date: N/A	I17. DOE LLW Start Date: N/A			
I7. Absorbent Matls. [X] Yes [ ] No	I8. NMC&A Form: N/A	I9. Est Net Vol: 55	I10. Units: Gal		
I11. Area of Contamination: 100 [ ] in2 [X] cm2 [ ] ft2	I12. Est Gross Wt: 232	I13. Units: KG	I14. Inner Container Type: SELF	I15. Outer Container Type: DRUM55	
I18. Seal No. 1: H87872	I19. Seal No. 2: NA	RESERVED			

I16. HP Tag No. N/A	Surface Contamination (dpm/100cm2) Transfer	Surface Contamination (dpm/100cm2) Direct Read	Dose Rate at Surface (mrem/hr)	Dose Rate at 1 Meter (mrem/hr)	Dose Rate at 1 Foot (mrem/hr)	Instrument Identification
Alpha	<0	N/A				1786
Beta/Gamma	<33	N/A	0.05	< <0.05	< 0.05	N/A
Neutron			N/A		N/A	N/A

PDCC Information Only DO NOT COPY

Signatures and Appro						
S1. Generator: SAWYER, HOPE	Badge: 000033	Date: 03/01/2014	S3. HP: LIT	Badge: 000031	Survey Date: 02/17/2014	
S2. Verifier: CHASE, MICHAEL	Badge: 000020	Date: 03/05/2014	S4. De	Badge:	Date:	

K1. Document ID Number
X10C1451639

TRU/TRU MIXED WASTE

ATTACHMENT B

ALL FIELDS MUST BE COMPLETED

Prohibited Items	Yes	No		Yes	No
B1. Pyrophoric Materials		X	B6. Ignition Sources		X
B2. Active Chelating Agents (> 1% of waste)		X	B7. Free Liquids		X
B3. Sealed Internal containers > 1 gallon		X	B8. Etiological Agents		X
B4. Explosive Materials		X	(Reserved)		
B5. Small Particulates (<= 1% by wt < 10ym; <= 15% by wt < 200ym)					X

B9. Biological Waste	B10. Chelating Agents	B11. Heat Sealed Bags	B12. Ion Exchange Resins	B13. TRUCON Code	B14. Thermal Power
☐ Yes ☒ No	☐ Yes ☒ No	☐ Yes ☒ No	☐ Yes ☒ No		N/A W/ft3

B15. Combustible Material	B16. Beryllium			B17. TRU WASTE TYPES(s)
N/A vol%	N/A	☐ Yes ☒ No	☐ ppm ☐ grams	

B18. Number of Sealed Layers	B19. Sealed Layers Types(s)	B20. Special Case Wastes	B21. RAD Handling Type
1	12MIL LINER HORSE TAIL CLOSURE	☐ Yes ☒ No	☒ Contact ☐ Remote

Radioisotope Determination Method	
Document Types	Document Number(s)
R1. Analysis LSID#	Pu Report Calc and ISOTOPIC HTML Report
	R2. NDA# N/A
R3. PK Documentation #	DCM-03-017-002, 234 WET CELL CHARACTERIZATION

R4. Fissile Content (FGE of U-235)	R5. Enrichment (wt% of U-235)	R6. Chemical Form
5.1211E-01 grams	1.6400E+01	N/A

☒ R11. Radioisotope Continuation Sheet(s) 1 through 1 attached.

RCRA/TSCA Determination Method	
Document Types	Document Number(s)
T1. Analysis LSID#	N/A
T2. PK Documentation #	DCM-03-017-002, 234 WET CELL CHARACTERIZATION

T6. PCB Present	T7. PCB Concentration	T8. PCB Source Concentration	T9. PCB Source Concentration Range (ppm)
☐ Yes ☒ No	N/A ppm	N/A ppm	☒ NA ☐ <=1.99 ☐ 2 - 49.99 ☐ 50 - 499.99 ☐ >=500

Determination	Yes	No
T3. RCRA Waste		X
T4. TSCA Waste		X
T5. Underlying Hazardous Constituent(s) Present		X

Particulate Information (B22)
B22. Particulate Loading by Weight %
☒ <1% ☐ >= 1 and < 33% ☐ >= 33%

☐ T16. Constituent Continuation Sheet(s) _____ through _____ attached.

V1.

I certify that the waste described above meets the requirements of the Profile identified on UCN-2109.

Or, I certify that the waste meets the conditions stipulated in variance number(s) VR12-014

To the best of my knowledge, I believe the information I have submitted is true, accurate, and complete. I am currently authorized by my company to perform waste certification functions.

Signature Waste Certifier	Printed Name	Badge Number	Date
	LIVINGSTON J. D.	000023	03/05/2014

S4. Derivative Classifier	Badge	Date

K1. Document ID Number
X10C1451639

RADIOISOTOPE CONTINUATION SHEET

(Continuation Page 1 of 1)

R7. Radioisotope	R8. Quantity	R9. Units	R10. NARM Yes	R10. NARM No
AM-241	1.03E-02	Ci		X
CO-60	6.869E-09	Ci		X
CS-137	1.255E-08	Ci		X
EU-152	6.761E-08	Ci		X
K-40	2.47E-06	Ci		X
PU-238	1.647E-03	Ci		X
PU-239	2.028E-02	Ci		X
PU-240	6.795E-03	Ci		X
PU-241	2.543E-02	Ci		X
TC-99	5.253E-05	Ci		X
TH-228	8.114E-08	Ci		X
TH-232	2.706E-07	Ci		X
U-232	8.114E-08	Ci		X
U-233	7.302E-06	Ci		X
U-234	1.454E-06	Ci		X
U-235	6.924E-08	Ci		X
U-238	6.567E-06	Ci		X

Signatures and Approvals		
S4. Derivative Classifier	Badge	Date

Quantity (gms):	180.300	Waste Net (kgs)	1.803E+02	Date of Last Entry	2/19/2014	11:55 AM

3/6/2013 Last Modified

This sheet to be used only for soil and debris from Building 234 Wet Cell measured on the ORTEC

) NUMBER: 7445554

ISOTOPE	CONC IN WASTE (pCi/g)	SPEC ACT Ci/g	A2 Ci	A2 FRACT	QUANTITY g	EFF A2 (Ci)	EXEMPT MAT'L (Ci/g)	Mixture (Ci/g)	EXEMPT CONSIGN (Ci)	Mixture (Ci)	Total Activity (pCi)	Total Activity (Ci)	RQ limits (Ci)	RQ fraction	RQ/NON RQ
Am-241	57,100.00	3.4	2.70E-02	0.3813	3.03E-03	5.91E+00	2.70E-11	5.91E+09	2.70E-07	5.91E+05	1.0295E+10	0.01028513	0.01	1.029513	
U-235	0.38	2.20E-06	Unlim		3.15E-02		2.70E-10	3.97E+03	2.70E-07	3.97E+00	69235.2	6.9235E-06	0.1	6.924E-07	NON RQ
U-238	36.42	3.40E-07	Unlim		1.93E+01		2.70E-10	3.77E+05	2.70E-07	3.77E+02	8566526	8.5665E-06	0.1	8.567E-05	NON RQ
Th-228	0.45	8.20E+02	2.70E-02	0.0000	9.89E-11	4.65E-05	2.70E-11	4.65E+04	2.70E-07	4.65E+00	81135	8.1135E-08	0.01	8.114E-06	NON RQ
Th-232	1.50	1.10E-07	Unlim		2.48E+00		2.70E-10	1.55E+04	2.70E-07	1.55E+01	270630.3	2.7063E-07	0.001	0.0002706	NON RQ
U-232	0.45	2.20E+01	2.70E-02	0.0000	3.69E-09	4.65E-05	2.70E-02	4.65E-05	2.70E-08	4.65E-01	81135	8.1135E-08	0.01	8.114E-06	NON RQ
U-233	40.50	9.70E-03	1.60E-01	0.0000	7.53E-04	7.07E-04	2.70E-02	4.19E-03	2.70E-08	4.19E+01	7302150	7.3022E-06	0.1	7.302E-05	NON RQ
U-234	9.06	6.20E-03	1.60E-01	0.0000	2.36E-04	1.41E-04	2.70E-10	8.34E+04	2.70E-08	8.34E+00	1453939.2	1.4539E-06	0.1	1.454E-05	NON RQ
Tc-99	291.37	1.70E-02	24	0.0000	3.09E-03	3.38E-05	2.70E-07	3.01E+03	2.70E-04	3.01E+00	52534011	5.2534E-05	10	5.253E-06	NON RQ
Th-230	229.45	2.10E-02	2.70E-02	0.0015	1.97E-03	2.37E-02	2.70E-11	2.37E+07	2.70E-07	2.37E+03	41369113.8	4.1369E-05	0.01	0.0041369	NON RQ
Pu-238	9,136.00	17	2.70E-02	0.0810	9.69E-05	9.45E-01	2.70E-11	9.45E+08	2.70E-07	9.45E+04	1647220800	0.00164722	0.01	0.1647221	NON RQ
Pu-239	112,487.00	6.20E-02	2.70E-02	0.7512	3.27E-01	1.16E+01	2.70E-11	1.16E+10	2.70E-07	1.16E+06	2.0281E+10	0.02028141	0.01	2.0281406	
Pu-240	37,686.00	2.30E-01	2.70E-02	0.2517	2.86E-02	3.90E+00	2.70E-11	3.90E+09	2.70E-07	3.90E+05	6794785800	0.00679479	0.01	0.6794788	NON RQ
Pu-241	141,037.00	100	1.6	0.0159	2.54E-04	2.46E-01	2.70E-09	1.46E+08	2.70E-06	1.46E+05	2.5429E+10	0.02542897	1	0.025429	NON RQ
TOTAL:	358,064.59	pCi/g	SUM:	1.4626	A2 (Ci):	4.41E-02	Eff:	4.43E-11	Eff:	4.19E-07			Total RQ	3.9319	

Shipment Total Activities	84,557,241,676	pCi
	65	mCi
	2.389	MBq

SUM of TRU WASTE ISOTOPES Pu-241, Pu-238, Pu-239		nCi/g	Waste Fractions
and Pu-240:	216,409.00	216.41	2.16
Pu-241:	141,037.00	141.04	0.04
Tc-99:	291.37	0.29	0.00
	Sum:	357.448	2.20

gms fissile mat'l:	0.3596
Total grams of Pu	0.3570
ENRICHMENT	0.16% DEPLETED
Limit to be an Exempt Concentration:	4.43E+01 pCi/g
Limit to be an Exempt Consignment:	4.19E+05 pCi
Lim Quant:	44,138,099 pCi
LSA-I lim:	1,330 pCi/g OR: 1.28E+07 pCi
LSA-II lim:	4,413,810 pCi/g
LSA-III lim:	88,276,199 pCi/g

ALL MARKINGS AND LABELS APPLY

RQ

~~YELLOW-II~~

WHITE I

FISSILE EXCEPTED

TRU

LSA-II

Total Th (g)	2.46
Total U (g)	19.35
Total Pu (g)	0.38

	Total Activity (Ci)	Total Activity (Bq)
Am-241	1.030E-02	3.81E+08
U-235	6.924E-08	2.56E+03
U-238	6.567E-08	2.43E+05
Th-228	8.114E-08	3.00E+03
Th-232	2.706E-07	1.00E+04
U-232	8.114E-08	3.00E+03
U-233	7.302E-06	2.70E+05
U-234	1.454E-06	5.38E+04
Tc-99	5.253E-05	1.94E+06
Th-230	4.137E-05	1.53E+06
Pu-238	1.647E-03	6.09E+07
Pu-239	2.028E-02	7.50E+08
Pu-240	6.795E-03	2.51E+08
Pu-241	2.543E-02	9.41E+08
	0.064557242	2.39E+09

	Element Tot U	Isotope U235	U233	Pu	Th232	Th228	Pu239	Am241
	grams	grams	grams	grams	grams	grams	grams	grams
	19.348	0.031	0.0008	0.357019	2.460	0.0000000001	0.327119	0.00302798
if > 0.5 MC&A Reportable		NO	NO	NO				

2109 Accountability Box I	
Tot U/LEU =	NO
Pu =	NO

967521

Bldg 234 pCi/g to Ci

Container #	Nuclide	pCi/g	Conversion Factor	Ci/g	Net kg's	g's	Ci	Nuclide
7445554	Eu-152	3.750E-01	1.00E-12	3.750E-13	1.803E+02	1.803E+05	6.761E-08	Eu-152
	Co-60	3.810E-02		3.810E-14			6.869E-09	Co-60
	Cs-137	6.960E-02		6.960E-14			1.255E-08	Cs-137
	K-40	1.370E+01		1.370E-11			2.470E-06	K-40

Container: 7445554

Net Weight: 1803 kgs

			1σ Unc (in %)
Am-241:	5.71E+04	pCi/g	15.37
Pu-238:	9.14E+03	pCi/g	
Pu-239:	1.13E+05	pCi/g	Activites
Pu-240:	3.77E+04	pCi/g	derived from
Pu-241:	1.41E+05	pCi/g	Am-241
Pu-242:	4.09E+00	pCi/g	

	Measured Result (in pCi/g)		MDA (in pCi/g)	1σ Unc (in %)
U-235:		or	0.384	(leave blank if an MDA)
U-238:	36.42	or		

Total TRU Activity: 216.5 nCi/g +/- 35%

Max TRU Activity (including Unc.): 291.6 nCi/g (at a confidence interval of 95%)

TRU ⟶ UCOR

FGE (Pu-239): 0.49 g<150

PE-Ci (Pu-239): 0.0394 Ci<80

Total U = 19.6 g (U-235 + U-238 only)

Enrichment = 0.16 %

Analyst: Roger Williams Date: 2-12-14

Reviewer: Tonya Duffield Date: 2/12/14

Isotopic V4.2.4

Sample Name: 7445554

Spectrum File Name: C:\User\7445554 Iso02701-N2632 Digidart SN 16658.An1

Acquisition information

Start time	2/11/2014 12:55:58 PM		
Live time:	1200	Real time:	1230
Detector:	N2632 Digidart SN 16658	Dead time (%):	2.44

Calibration

File name: C:\User\Factory Isotopic Calibration Det N42092A_121010.Clb

Energy calibration	Created	12/10/2010 2:59:09 PM
	Zero offset	0.0563631
	Gain	0.2501949
	Quadratic	-2.38355E-08
Efficiency calibration	Created	2/3/2010 12:17:51 PM
	Type	Quadratic
	Uncertainty Above Knee	0.95%
	Uncertainty Below Knee	0.34%
	Coefficients (Above the Knee)	-1.436356, -0.9891938, 2.025728E-02
	Coefficients (Below the Knee)	-10.23893, 2.029431, -0.237760S
	Detector calibration point-source reference distance:	30.0 cm

Library

Main analysis library	C:\User\NFS_Pu.Lib
Library match width	0.4

Analysis parameters

Start channel:	20	Stop channel:	12000
Peak cutoff (%):	50.0	Peak search sensitivity:	4
MDA type:	Currie Limit	Background type:	Auto
Base Activity Units:	uCi/Kg	Activity scaling factor:	1.000E+6/1.000E+3
Activity Label:	pCi	Quantity Label:	g
Random error (%):	0.0	Systematic error (%):	10.0
Directed fit:	No	Uncertainty in percent:	Yes
Counting uncertainty only:	No	Confidence level (sigma):	1

Spectral corrections

Decay correct to date:	No	Decay correction date/time:	N/A
PBC correction:	Yes	PBC File:	PBC Iso02603-N1814 MCB 129 1-20-2014.Pbc

Unknown peaks

Channel	Energy	Bkg Counts	Net Counts	CPS	1 Sigma	FWHM (keV)	Suspect	Flags
52.45	13.18	414	312	0.260	12.63	1.058	TH-234	s
95.88	24.04	630	691	0.576	7.65	0.912	SN-113	s

108.29	27.15	555	182	0.152	24.15	0.913	SN-113	s
197.29	49.42	31486	5100	4.250	9.63	1.661	EU-155	s
377.88	94.60	1288	334	0.279	16.14	0.880	PA-234	D
394.18	98.67	1601	1355	1.129	6.04	1.185	PA-234	sM
411.92	103.11	1272	698	0.582	9.85	1.116	GD-153	s
500.92	125.38	475	215	0.179	18.36	1.154	PA-234	sM
1407.32	352.11	95	137	0.114	16.85	0.975	PB-214	

s - Peak fails shape tests.
D - Peak area deconvoluted.
M - Peak is close to a library peak.

Library peak matrix

Nuclide	Energy	Activity(pCi/g)	Codes	MDA	Comments
AM-241	59.49	4.325E+1	(P	5.462E-2	GK
CO-60	1173.70	0.000E+0	%P	7.833E-4	G
	1332.08	0.000E+0	%	5.281E-4	G
CS-137	661.41	0.000E+0	%P	1.110E-3	G
EU-152	121.16	0.000E+0	&P	5.208E-3	GK
	244.84	0.000E+0	%P	1.805E-2	G
	344.28	0.000E+0	%P	4.983E-3	GK
	367.90	0.000E+0	%P	2.096E-1	G
	411.33	0.000E+0	%P	5.889E-2	G
	443.93	0.000E+0	%P	3.134E-2	G
	777.71	0.000E+0	&P	9.250E-3	G
	867.45	0.000E+0	%P	2.361E-2	G
	1086.08	0.000E+0	%P	9.279E-3	G
	1112.45	0.000E+0	%P	8.255E-3	G
	1407.98	0.000E+0	%P	8.325E-3	GK
K-40	1461.09	3.086E-1	(P	4.267E-2	G
PU-239	115.35	6.171E+2	-	3.448E+2	G
	116.24	0.000E+0	%P	3.783E+2	G
	129.31	6.303E+2	-P	4.832E+1	G
	203.60	6.097E+2	-	3.186E+2	G
	332.97	1.316E+3	+P	3.913E+2	G
	345.75	9.542E+2	&(P	2.284E+2	G
	375.18	1.010E+3	?(P	9.448E+1	G
	393.05	1.472E+3	+P	4.316E+2	G
	413.90	1.014E+3	(P	9.698E+1	G
	422.57	0.000E+0	%P	9.515E+2	G
	451.54	2.713E+3	+P	9.712E+2	G
	756.31	0.000E+0	%P	1.472E+4	G
Th-228P	74.87	0.000E+0	%P	2.685E-2	G
	77.17	0.000E+0	%P	1.536E-2	G
	87.13	0.000E+0	%P	4.438E-2	G
	89.74	0.000E+0	%P	1.510E-1	G
	238.77	0.000E+0	%P	4.341E-3	G
	240.90	0.000E+0	%P	4.437E-2	G
	276.22	0.000E+0	&P	4.199E-2	G
	300.17	0.000E+0	%P	5.190E-2	G

	511.09	0.000E+0	P	4.254E-2	G
	583.32	0.000E+0	%P	6.439E-3	G
	726.66	0.000E+0	%P	2.339E-2	G
	860.06	0.000E+0	%P	3.579E-2	G
	2614.01	2.413E-2	?P	1.694E-2	G
	129.09	0.000E+0		1.186E-1	G
	270.07	0.000E+0	%P	3.247E-2	G
	327.96	0.000E+0	%P	3.234E-2	G
	338.04	0.000E+0	%P	1.297E-2	G
	463.17	0.000E+0	%P	3.593E-2	G
Th-232P	755.21	0.000E+0	%P	1.498E-1	G
	794.25	1.238E-1	&P	4.680E-2	G
	911.47	2.760E-2	(P	8.782E-3	K
	965.14	0.000E+0	%P	3.457E-2	G
	969.27	0.000E+0	%P	1.545E-2	G
	1587.83	0.000E+0	%P	4.537E-2	G
	84.09	0.000E+0	%P	3.890E-2	A
	89.89	0.000E+0	%	6.105E-2	XA
	93.29	0.000E+0	%P	5.229E-2	XA
	106.14	0.000E+0	&P	6.232E-2	A
U-235	109.38	0.000E+0	%P	1.154E-1	A
	144.03	0.000E+0	%P	1.385E-2	G
	162.92	0.000E+0	%P	1.668E-2	G
	184.94	0.000E+0	&P	3.095E-3	K
	202.18	0.000E+0	%P	1.193E-1	A
	205.09	0.000E+0	%P	2.135E-2	G
	62.87	0.000E+0	%P	3.248E-2	GA
	92.32	0.000E+0	%P	1.021E-1	A
U-238	92.73	0.000E+0	%P	9.617E-2	GA
	112.81	0.000E+0	%P	6.090E-1	A
	765.36	0.000E+0	&P	3.210E-1	GA
	1001.73	6.978E-1	?(P	9.319E-2	GK

Codes:
(- This peak used in the nuclide activity average.
* - Peak is too wide, but only one peak in library.
! - Peak is part of a multiplet and this area went negative during deconvolution.
? - Peak is too narrow.
@ - Peak is too wide at FW25M, but ok at FWHM.
% - Peak fails sensitivity test.
$ - Peak identified, but first peak of this nuclide failed one or more qualification tests.
+ - Peak activity higher than counting uncertainty range.
- - Peak activity lower than counting uncertainty range.
= - Peak outside analysis energy range.
& - Calculated peak centroid is not close enough to the library energy centroid for positive identification.
P - Peakbackground subtraction

Comments:
G - Gamma Ray
X - X-Ray
P - Positron Decay
S - Single-Escape
D - Double-Escape
K - Key Line
A - Not in Average

General Configuration Info

Configuration name:	Soil and Sludge Drum ✓	Has Collimator:	Yes
Orientation:	Side	Detector Height:	43.180 cm
Detector standoff:	86.400 cm	Collimator depth/recess:	5.000 cm
Crystal diameter (mm):	40.00	Crystal Length (mm):	60.00
Database:	C:\User\IsotopicDB.mdb		

Container

Type:	Cylinder	Material:	Steel-Flat Rolled
Thickness (entered):	0.17 cm	Thickness (effective):	0.17 cm
Height:	78.7 cm	Fill Height:	78.1 cm
Diameter:	58.7 cm		
Tare weight:	51.71 kg	Container density:	7.60 g/cc

Outer Container

Material:	Plastic	Thickness:	0.23 cm
Density:	1.10 g/cc		

Matrix

Material:	Soil	Density (initial estimated):	1.650 g/cc
U total fraction (initial estimated):	0.02	Pu total fraction (initial estimated):	0.0
Thickness:	58.41 cm		
Weight fraction of U (eff.):	0.0		
Weight fraction of Pu (eff.):	0.01		
Volume:	2.09E+5 cc		
Gross weight:	2.320E+2 kg ✓		
Net weight:	1.803E+2 kg ✓		
Density (measured):	0.862 g/cc		
Density (adjusted):	0.862 g/cc		

Collimator

Type:		Material:	Pb
Thickness:	4.600 cm	Density:	11.344 g/cc
Diameter:	11.000 cm	Recess:	5.000 cm

Isotopic Results

Nuclide	Weight(g)	Activity (pCi/g)	% Uncertainty (1Sigma)
U-235	0.000E+00	~~0.000E+00~~ < .384 RA 2-12-14	74.50
U-238	1.971E+01	3.642E+01	20.01
Th-232P	2.459E+00	1.501E+00	18.35
EU-152	0.000E+00	0.000E+00	101.64
Th-228P	0.000E+00	~~0.000E+00~~ < .45 RA 2-12-14	21.50
PU-239	2.294E-01	7.888E+04	16.49
CO-60	0.000E+00	0.000E+00	200.34
AM-241	2.999E-03	5.711E+04	15.37
CS-137	0.000E+00	0.000E+00	378.78
K-40	3.456E-01	1.370E+01	13.24

Total Activity

Total Activity:	1.36E+05 pCi/g
Total Alpha Activity:	1.36E+05 pCi/g
Total Transuranic Activity:	**1.36E+05 pCi/g** 216 nCi/g RA 2-12-14

Uranium Analysis

Total grams of uranium:	(1.971E+01 +/- 3.945E+00) grams < 19.6 RA 2-12-14

Plutonium Analysis

Grams of plutonium:	2.294E-01

MDA for Measured Geometry

Nuclide	Ref. gamma ray(keV)	Grams	pCi/g
U-235	184.94	3.20E-02	3.84E-01
U-238	1001.73	2.63E+00	4.86E+00
AM-241	59.49	3.79E-06	7.21E+01
PU-239	413.9	2.20E-02	7.55E+03
K-40	1461.09	4.78E-02	1.89E+00
CO-60	1173.7	6.08E-12	3.81E-02
CS-137	661.41	1.45E-10	6.96E-02
EU-152	1407.98	3.83E-10	3.75E-01
Th-228P	238.77	9.91E-11	4.51E-01
Th-232P	911.47	7.82E-01	4.78E-01

*** The weight of the container was not used

Peak Correction Factors

Energy	Nuclide	Activity* (pCi/g)	Air	Item Correction	Coll.	Activity** (pCi/g)
59.49#	AM-241	4.325E+01	1.019	1.30E+3	1.00E+0	5.71E+04
115.35	PU-239	6.171E+02	1.016	1.74E+2	1.00E+0	1.09E+05
129.31	PU-239	6.303E+02	1.015	1.79E+2	1.00E+0	1.14E+05
203.60	PU-239	6.097E+02	1.014	1.14E+2	1.00E+0	7.02E+04
332.97	PU-239	1.316E+03	1.011	8.55E+1	1.00E+0	1.14E+05
345.75	PU-239	9.542E+02	1.011	8.39E+1	1.00E+0	8.10E+04
375.18	PU-239	1.010E+03	1.011	8.07E+1	1.00E+0	8.23E+04
393.05	PU-239	1.472E+03	1.011	7.89E+1	1.00E+0	1.17E+05
413.90#	PU-239	1.014E+03	1.010	7.70E+1	1.00E+0	7.89E+04
451.54	PU-239	2.713E+03	1.010	7.40E+1	1.00E+0	2.03E+05
794.25	Th-232P	1.238E-01	1.008	5.74E+1	1.00E+0	7.16E+00
911.47#	Th-232P	2.760E-02	1.007	5.40E+1	1.00E+0	1.50E+00
1001.73#	U-238	6.978E-01	1.007	5.18E+1	1.00E+0	3.64E+01
1461.09#	K-40	3.086E-01	1.006	4.41E+1	1.00E+0	1.37E+01
2614.01	Th-228P	2.413E-02	1.004	3.57E+1	1.00E+0	8.66E-01

* Activity calculated as point source at reference distance with all listed spectral corrections applied
** Corrected activity, including geometry, attenuation and other applicable corrections.
# Reference gamma ray

Peak Info. Sorted by Nuclide

Nuclide	Energy (keV)	Energy Diff(keV)	Activity (pCi/g)	Interference present
U-238	1001.73#	-0.70	3.64E+1	No
Th-232P	794.25	0.70	7.16E+0	No
Th-232P	911.47#	-0.37	1.50E+0	No
Th-228P	2614.01	0.34	8.66E-1	No
PU-239	115.35	0.00	1.09E+5	No
PU-239	129.31	-0.03	1.14E+5	No
PU-239	203.60	-0.08	7.02E+4	No
PU-239	332.97	-0.17	1.14E+5	No
PU-239	345.75	-0.79	8.10E+4	No
PU-239	375.18	-0.16	8.23E+4	No
PU-239	393.05	0.01	1.17E+5	No
PU-239	413.90#	-0.21	7.89E+4	No
PU-239	451.54	-0.09	2.03E+5	No
AM-241	59.49#	0.05	5.71E+4	No
K-40	1461.09#	-0.39	1.37E+1	No

Reference gamma ray

MDA Correction Factor Summary

Nuclide	Energy (keV)	Input MDA (pCi/g)	Air mu/CF	Item Correction	Decay	Activity (pCi/g)
U-235	184.94	3.10E-3	0.126/1.01	1.22E+2	1.00E+0	3.84E-1
U-238	1001.73	9.32E-2	0.063/1.01	5.18E+1	1.00E+0	4.86E+0
AM-241	59.49	5.46E-2	0.174/1.02	1.30E+3	1.00E+0	7.21E+1
PU-239	413.90	9.70E+1	0.095/1.01	7.70E+1	1.00E+0	7.55E+3
K-40	1461.09	4.27E-2	0.053/1.01	4.41E+1	1.00E+0	1.89E+0
CO-60	1173.70	7.83E-4	0.059/1.01	4.84E+1	1.00E+0	3.81E-2
CS-137	661.41	1.11E-3	0.077/1.01	6.22E+1	1.00E+0	6.96E-2
EU-152	1407.98	8.32E-3	0.054/1.01	4.48E+1	1.00E+0	3.75E-1
Th-228P	238.77	4.34E-3	0.117/1.01	1.03E+2	1.00E+0	4.51E-1
Th-232P	911.47	8.78E-3	0.066/1.01	5.40E+1	1.00E+0	4.78E-1

Estimate of Uncertainty (1 Sigma)

Nuclide	Count Stat.	Other Pk	Correction Uncertainty(%)	Total
U-235	73.3	5.0	13.6	74.5
U-238	16.2	5.0	11.7	20.0
Th-232P	14.1	5.0	11.8	18.3
EU-152	100.8	5.0	12.9	101.6
Th-228P	16.3	5.0	14.0	21.5
PU-239	11.1	5.0	12.2	16.5
CO-60	200.0	5.0	11.6	200.3
AM-241	0.2	5.0	15.4	15.4
CS-137	378.6	5.0	11.9	378.8
K-40	6.5	5.0	11.5	13.2

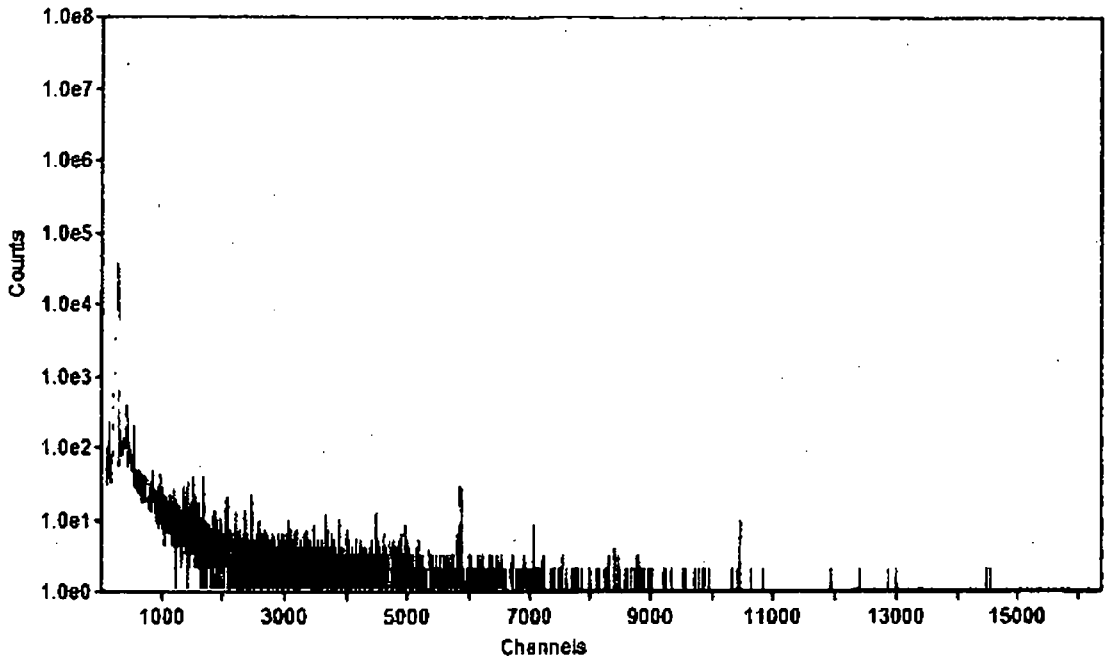
Units of uncertainty are in percent

Estimate of Enrichment Uncertainty (1 Sigma)

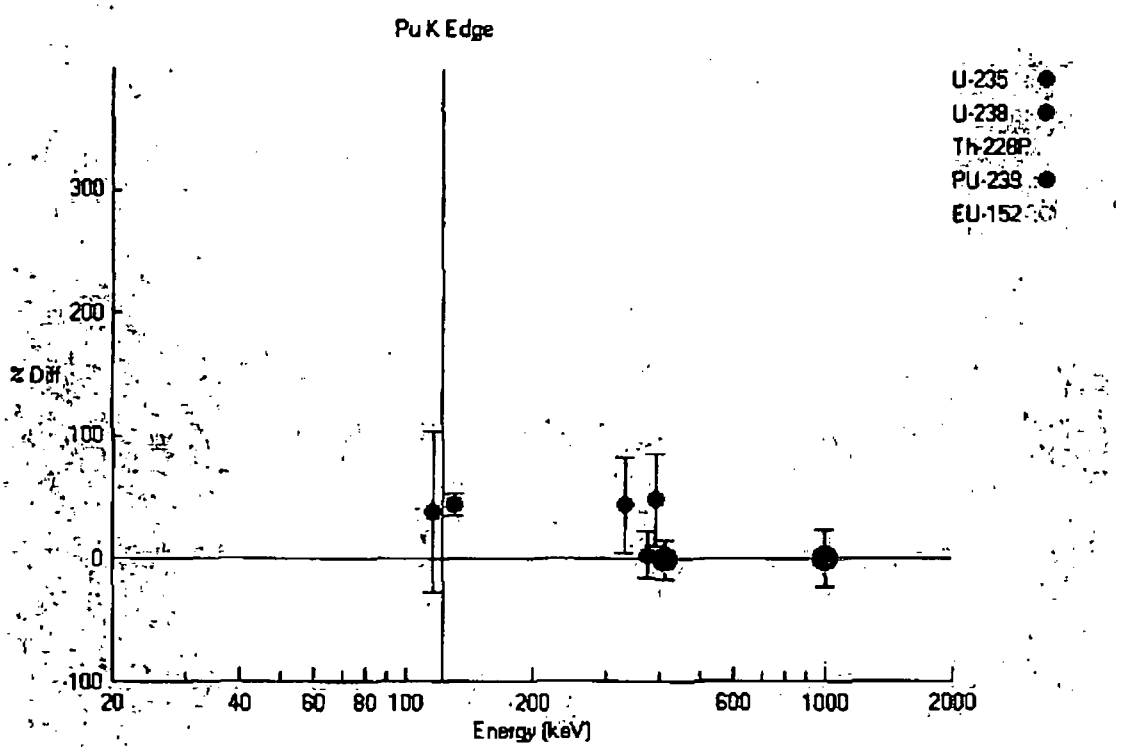
Item	Uncertainty in percent

U-235 (185.7 keV)	74.5
U-238 (1001.0 keV)	20.0
Total Enrichment Uncertainty	77.14

Spectrum image



Peak analysis plot



Signatures

Operator: Nick N Harris Signature:

Comments:

LOA # NA (if applicable)

Attachment 1

Waste Container Packaging Form

Revision 0

(Typical)

Unique Container ID #: 7445554 Page 1 of 4 (incl. attachments)

Section 1: General Information
Unique Container Identification Number: 7445554
DOE or DOE Contract Site Name: **Nuclear Fuel Services**
☒ Initial Waste Packaging ☐ Repackaging
Date(s) of Packaging or Repackaging: 2/1/5/14
Audio-Video Recording Number: 2
Site Procedure Number and Revision Used: **SOP-335-L Rev** 1 **SOP-335-A Rev** 13

Section 2: Waste Container Information	
Container Type: ☒ 55-gallon drum DOT-7A-TYPE-A,	
☒ Container Verified Empty Prior to Packaging	
Rigid Liner Used? ☒ Yes ☐ No If rigid liner was used, list the type of rigid liner and affirm that the lid was not installed: **WIPP approved 90-mil Liner. Lid not installed**	
Container Filter Vent with sample port septum: Minimum H_2 Diffusivity 1.85E-05 mol/s/mol? ☒ Yes ☐ No Identification of the filter manufacturer: UT942400232, Date of manufacture, or lot number, or unique serial number: 1/9/2	
Number layers of confinement: ☒ one ☐ two	
Closure Method used for 55-gallon drum liner bag: **Horse-tail** Closure Method used for inner bags: N/A	
All Bag Layers Vented? ☒ Yes ☐ No Minimum H_2 Diffusivity of Bag Filters 1.075E-05 mol/s/mol? ☒ Yes ☐ No	
Waste Container Weight	Container gross wt: 232 kg. Container tare wt: 51.7 kg. Waste net wt: 180.3 kg.
Container Fill Percentage: 100 %	
Waste Category Group: ☐ **Homogeneous Solids** ☒ **Soil and Gravel** ☐ **Debris**	
Waste Stream Name: **Pu Soil & Gravel** ☐ **Legacy Waste**	
TID Identification Number(s): 1380382	

LOA # NA (if applicable)

Waste Container Packaging Form (att 1)
Revision 0
(Typical)

Unique Container ID #: 7445554 Page 2 of 4 (incl. attachments)

Section 3: Feed Container Information (Repackaging Only)
Feed Container Type: ☐ **55-gallon drum** ☐ **Other:**_____
Feed Container ID Number:

Section 4: Container Inventory

If loading bagged or wrapped waste, the unique identification number for each bag or wrap shall be entered in the "waste item" column. "See attached" may be entered in the "waste description" column if the completed Waste Bag or Wrap Inventory Form contains the waste description and is attached to this form.

Are "Waste Bag or Wrap Inventory Forms" attached for items listed below? ☐ Yes ☐ No

Waste Item or Bag/Wrap ID#	Waste Description (including weight % of iron-based metals/alloys, aluminum-based metals/alloys, other metals, cellulosics, rubber, plastics, inorganic materials, and soil/gravel)
	N/A

LOA # NA (if applicable)

Waste Container Packaging Form (att 1)
Revision 0
(Typical)

Unique Container ID #: 7445554 Page 3 of 4 (incl. attachments)

Section 5: Packaging Summary	Yes	No
Does this waste contain any treated liquids? If waste contains treated liquid, describe in the Comments section: • The waste that was treated • Treatment method used • The type of absorbent used, • Solidification agent used, • Product name and manufacturer of any material added to the waste • Results of a Method 9095B Paint Filter Liquids Test for each container tested (including container #).	☒	☐
Was any other treatment performed prior to packaging? If yes, describe the treatment in the Comments section.	☐	☒
Was this waste packaged in accordance with the "CH-TRU Waste Packaging Instructions"? If not, attach the letter from the Director, Office of Disposal Operations, EM Headquarters Office of Regulatory Compliance that approves the variance.	☒	☐

Comments:

-Paint Filter Test 01-6-17 passed.
-There are no free liquids in the soil.
-Approximately 4 inches of Encap absorbent was added to the drum.

Container closed per manufacturer instructions.
-Torque Wrench Serial #: TW-131
-Final Torque Value: 60 ft-lbs.
-Calibration Date: 01/29/2014
-Calibration Due Date: 01/29/2015

Actual gross weight has been recorder using the following:
-Scale Serial #: WC-072
-Calibration Date: 03/12/2013
-Calibration Due Date: 03/12/2014

LOA # NA (if applicable)

Waste Container Packaging Form (att 1)
Revision 0
(Typical)

Unique Container ID #: 7445554 Page 4 of 4 (incl. attachments)

Section 6: Operator Information
List all personnel loading waste into container: Marilyn Garland
Printed names and signatures of two site personnel who are approving this form attesting that all items in the container are listed in this form (Section 7: Radiological Properties completion occurs after signature)

Printed Name: [illegible]	Printed Name: Hope Sawyer
Signature: [signature]	Signature: [signature]
Date: 2/5/14	Date: 2/5/14

Section 7: Radiological Properties

List the isotopes that contribute to 95% of the radiological hazard including their associated activities and masses:

☐ Th-228		☒ Am-241	5.71 E04 pCi/g
☐ Th-232		☐ Tc-99	
☐ U-232		☐ Pu-238	
☐ U-233		☒ Pu-239	1.13 E05 pCi/g
☐ U-234		☒ Pu-240	3.77 E04 pCi/g
☐ U-235		☒ Pu-241	1.41 E05 pCi/g
☐ U-238		☐	
☐ U-Dep		☐	

Fissile gram equivalents (FGEs) in the container: .49 FGEs

Plutonium equivalent curies (PE-Ci) in the container: .0394 PE-Ci

Highest measured surface dose rate of the loaded container: .05 mrem/hr

TRU alpha activity of waste in container: 216.5 nCi/gram

Printed or typed name and phone number of point of contact for radiological characterization information: **Tom Holly 423-735-5618**

loaded on 2/5/14

FM-WST-022 REV 15
SOP 335 Section A, Rev. 15
LOA # NA (if applicable)

ATTACHMENT A

RADWASTE PACKAGE CERTIFICATION RECORD

FM-WST-022 (Revision 15)

Container 7747-5554 Sales Order 1537-X Batch or ID Quad 7-B-L2

Seal H876725 Seal (NIC) NA Seal (NIC) NA Seal (NIC) NA

Gross Weight 2325 Tare 522 Net 1803 Area Generated 2314

NuMac ☑ "Remove Material from Process" ☐ "Place in Overpack Container ☑ "Apply A Seal"

☑ Drum ☐ Pail ☐ Box ☐ Bulk Bag ☐ Intermodal ☐ Sea-Land ☐ Other (Specify)_____

U (g) 19.34 U-235(g) .03 Th (g) 2.46 Am-241(pCi/g) 57,100 Pu Project: ☑ Yes ☐ No

Outage 0 measurement in inches from top of material to top of container

Container Checklist. Must Verify All That Apply

- ☑ No holes in shipping container
- ☑ No excessive rust container integrity intact
- ☐ Inspected welds intact
- ☑ No sharp dents or bulges that could cause container failure
- ☑ Drums / Bulk Bags have inner liners
- ☑ Gasket on container in good condition correctly positioned
- ☐ Bulk Bags container integrity intact
- ☑ No patched holes or bungs
- ☐ Pallet checked per SOP 335-A, 6.18.18

Check One:

☑ Conforming Package ☐ Non-Conforming Package If Non-Conforming PIRC ID Tracking Number _____

Note: If non-conforming stop packaging and notify Transportation Waste Supervision

Material Type & Container Contents - Check all that apply

- ☐ Ashes (particulate material)
- ☐ Stabilized Caustic
- ☐ Insulation
- ☐ Dirt/Soil/Gravel
- ☐ Glass
- ☐ Stabilized Raffinate
- ☐ Roof Debris
- ☐ Resins
- ☑ Metal
- ☐ Solidified Wastes
- ☐ Equipment
- ☑ Wood
- ☑ Trash (plastic, paper, PPE)
- ☐ WWTF Press Cake
- ☐ Filters (pall, process, HEPA)
- ☐ Other (Specify)_____
- ☐ At least one dimension < 10 inches and length <12 feet (Energy Solutions shipments)

Prohibited Items list (if waste contains these items check the box)

- ☐ Free Liquids (includes liquids contained in equipment)
- ☑ TRansUranic JBL 2-18-14
- ☐ Asbestos
- ☐ Graphite
- ☐ Contaminated lead
- ☐ Particulate (ash, dust, etc.)
- ☐ Beryllium
- ☐ Mercury trash
- ☐ Aerosol Cans
- ☐ PCBs
- ☐ Sealed Source
- ☐ Electronic Components (e.g., circuit boards, mercury switches, lead lined monitors)
- ☐ Mixed Waste (RCRA Hazardous and Radioactive must be treated prior to disposal)

Note: Transportation Waste Management will further evaluate package based on checked boxes).

Verify that package does not contain materials below by checking each box

- ☑ Waste does not contain biological, pathogenic, or infectious material
- ☑ Waste is not capable of detonation, explosive decomposition, reaction, or explosive reaction with water
- ☑ Waste is not pyrophoric (spontaneously ignite)
- ☑ Waste does not contain, nor is capable of generating quantities of toxic gases, vapors, or fumes
- ☑ Waste does not contain hazardous materials/chemical (including but not limited to lead, mercury, asbestos)

Note: If material is unknown submit a Request for Waste Determination Form (NFS-GH-38) to Environmental Safety and note on the back.

Container Closure (check all that apply)

- ☑ Container Closed per Manufacturer's Closure Instructions
- ☑ Package loaded to minimize void space
- ☐ Absorbent rolled up

Only NFS approved absorbents used, approximate amounts calculated per SOP 335-A, 15.5

- ☐ Quik-Solid®, granular approximately _____ lbs added
- ☐ Waste Lock® 770, granular approximately _____ lbs added
- ☑ ENCAP, granular approximately 36 lbs added

I hereby certify I have inspected the above-described waste burial package and it complies with the requirements noted in SOP 335, current revision.

Signatures:

*Packer (Operator, Yard, etc.)	Date	*Packer (Operator, Yard, etc.)	Date	*Packer (Operator, Yard, etc.)	Date	*Approval	Date
[signature]	2/6/14	[signature]	2-6-14			[signature]	2/6/14

I have reviewed the Attesting Information on the back of this form.

ATTACHMENT A
RADWASTE PACKAGE CERTIFICATION RECORD
FM-WST-022 (Revision 15)

Attesting Information

1. **Waste Water Treatment Facility container verification for the prohibited materials will be based on the person attesting to the contents as, "to the best of his / her knowledge", without having the container in view at all times while being filled. The person(s) filling the container will attest to the visible contents without disturbing the contents of the container.**

2. **Three (3) individuals attesting: waste material packaged as the final packaging act, inside a MAA, destined for off-site disposal or removal, not continuously stored in 306 East Secured Storage Area or 310 Warehouse Secured Storage Area.**

3. **Two (2) individuals attesting: waste material packaged inside an MAA, if after packaging, it is continuously stored in 306 East Secured Storage Area not packaged as a final act prior to shipment or stored in 310 Warehouse Secured Storage Area after NDA measurement by a third independent individual, or NDA scanned by a third independent individual and goes directly from storage to a shipping conveyance.**

4. **Two (2) individuals attesting: waste material packaged outside an MAA.**

As a minimum these individuals, by their signature, are attesting to:

Container and/or seal numbers,
Material type / form,
Nothing other than stated material type or form placed in the container during loading,
Material not concealed/shielded within container to avoid detection,
Verification of material type,

Comments: _____

	Print Name	Signature	Date
ATTACHMENT APPROVAL	Brad L McKeehan		1/21/14

FALSIFICATION STATEMENT

Knowingly or willfully falsifying or concealing a material fact on this form, or making false, fictitious or fraudulent statements or representations herein could constitute a felony punishable under federal statutes.

NFS PROPRIETARY INFORMATION

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HEA-02-04

Nuclear Fuel Services, Inc.

Erwin, Tennessee 37650

Shipping Container Survey Form

Shipping Container: ☐ Incoming ☒ Outgoing

Shipment ID# _____

Vehicle ID# _____

Shipper: _____

Consignee: _____

☒ Waste Burial Container

Origin: 234 Pu

Container Type

☒ Drum ☐ Sack

☐ Box ☐ Bucket

☐ Intermodal ☐ Sample

☐ SeaLand ☐ Other _____

Seal #	Container #		Removable Surface Contamination (dpm/100 cm²) Top Alpha	Top Beta	Side Alpha	Side Beta	Bottom Alpha	Bottom Beta	Recheck	Maximum Dose Rate (mR/hr) Contact	30 cm*	1 Meter
H87871	7445430	1	NO	25	4	NO	4	NO		0.05	< 0.05	< 0.05
H87872	744 5554	2	NO	33	NO	NO	NO	NO		0.05	< 0.05	< 0.05
H87869	7445612	3	4	NO	NO	25	4	10		0.05	< 0.05	< 0.05
H87870	744 5547	4	NO	72	NO	21	NO	NO		0.05	< 0.05	< 0.05
		5										
		6										
		7										
		8										
		9										
		10										
		11										
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		23										
		24										
		25										
		26										
		27										
		28										
		29										
		30										

Initial Survey Info:
RT: Brad Odum
Date/Time: 2·5·14 / 1330
Instr. #: PIC-4
Bkgd: α 0.10, β 39.47

Recheck Survey Info

Dose Rate Survey Info
B. Odum
2·5·14 / 1330
001786
< 0.1mR/hr
Brandon Lux 2/17/14

*Required For NTS Shipments Only

NUCLEAR FUEL SERVICES, INC.
a subsidiary of The Babcock & Wilcox Company

• 1205 banner hill road • erwin, tn 37650 • tel: 423.743.9141
• www.nuclearfuelservices.com

DCM-03-09
44T-09-018
TCH-09-004

To: Transportation and Waste Management

From: Tom Holly

Date: March 23, 2009

Re: Isotope Factors for Pu Waste and Debris Calculations

The purpose of this memorandum is to summarize the factors which may be used to determine the various isotopes in waste and debris shipments from the 234 Excavation Facility and former Building 234 using the results from Non-Destructive Assay (NDA) measurements. In May 2001, Dr. Thomas Huston, Health Physicist, performed an extensive assessment of the original process feed materials and available building characterization data in order to generate the initial scaling factors published in report:

> "Recommended Radionuclide Concentrations and Relationships to Support a Waste Profile for Bldg. 234 Wet Cell/DVRF Wastes Destined for Disposal at the Hanford Low Level Burial Grounds" (Ref. 21T-01-0596).

September 13, 2001, Mr. Gil Rosenberger, Retired Health Physicists for Transportation and Waste Management, summarized the results from the above mentioned report in memorandum "Isotopic Factors for Pu Waste and Debris Calculations" (Ref. 44T-01-0654). As fully described in Mr. Huston's report above and stated as an equation in Attachment I to Mr. Rosenberger's memorandum, the isotopic activity concentration for plutonium-238, 239, 240, and 241is derived from the direct gamma measurement of americium-241, as expressed in the units pCi/g material. Americium-241 is a daughter product from the decay of plutonium-241, which has a short half-life (14.4 years) in comparison to the remaining radionuclides associated with this waste stream.

In January 2008, the plutonium decommissioning project at NFS was re-started with the goal of excavating the remaining soil contaminated to Class C concentrations and greater. Given that seven (7) years had passed since the initial characterization report was published, the additional decay of plutonium-241 and resultant in-growth of americium-241 warranted an up to date evaluation of the scaling factors to determine what impact if any this time delay may have on waste characterization. In August 2008, Mr. Ron Fine, Pu Project Health Physicist, performed the calculations to decay-correct the remaining plutonium and americium activity in order to establish "new" scaling factors (Ref. Addendum to Attachment 5 of the 2001 Report).

Attachment I summarizes the new, decay-corrected scaling factors to be used to determine the plutonium activity concentration in the remaining soil and debris from the 234 Excavation Facility and former Building 234. The extended half-life of the remaining radionuclides associated with this waste stream considers any decay negligible; therefore, the distribution and factors presented in the 2001 characterization report remain unchanged.

Prepared By:

Thomas C. Holly, Pu Project Waste Lead

Approved By:

Ron Fine, Project Health Physicist

Jason Faddis, Health Physicist (Peer Review)

Reinhard Friske, NFS WCO

DCM-03-09
44T-09-018
TCH-09-004

Attachment I
Isotopic Scaling Factors for the 234 Excavation Facility

Entered 3-27-09
WIMS

	Isotope	Radioactivity pCi/g material
✓1	U-235[1]	Use NDA Result
✓2	U-238[1]	Use NDA Result
✓3	Th-232[1]	Use NDA Result
✓4	Th-228[1]	Use NDA Result
✓5	Am-241[1]	Use NDA Result
✓6	U-232[2]	=Th-228
✓7	U-233[2]	✓90*(pCi Th-228/g material)
✓8	U-234[2]	✓21*(pCi U-235/g material)
✓9	Pu-238[3]	✓0.16*(pCi Am-241/g material)
✓10	Pu-239[3]	✓1.97*(pCi Am-241/g material)
✓11	Pu-240[3]	✓0.66*(pCi Am-241/g material)
✓12	Pu-241[3]	✓2.47*(pCi Am-241/g material)
✓13	Tc-99[2]	✓ 0.0047(pCi Am-241/g material) + 23
*✓14	Th-230[4]	6.3*(pCi U-238/g material)

Footnote:
1. Direct NDA measurement.
2. Unchanged for 2001 characterization.
3. Decay-corrected.
4. Derived from building and soil characterization data.
5. * NON REPORTABLE, INACTIVE IN WIMS Manifest Stream per TCH & JDL 3-27-09

Calc_Sheet_X10C1451639.xls
RFD DATA

CONTAINER ID	DESCRIPTION	CONTAINER TYPE	CONTAINER VOLUME	WASTE VOLUME	WASTE GROSS WEIGHT	CONTAINER TARE	WASTE NET WEIGHT	ORIGIN DATE	RCRA START DATE	PCB START DATE	LLW START DATE
			ft³	ft³	lbs	lbs	lbs				
X10C1451639	CH-TRU SOIL AND GRAVEL FROM NFS	DRUM55	7.50	7.00	511.4	113.96	397.41	2/5/2014	NA	NA	NA
			gal	gal	kg	kg	kg				
			56.10	52.36	232.0	51.7	180.3				
			m³	m³	g	g	g				
			0.21	0.19822	2.32E+05	5.17E+04	1.80E+05				
			L	L							
			212.4	198.2							

Density Determination

Calculated Density		Estimated Density
Net Weight / Net Volume	Gross Weight / Gross Volume	Average Density From Table 1.
Kg/m³	Kg/m³	Kg/m³
9.09E+02	1.09E+03	1.04E+03

Table 1. Estimated Density of Common Materials

Item	Item Components	Density	Average Density
		Kg/m³	Kg/m³
DAW	Garbage	4.81E+02	1.04E+03
	Leather	9.45E+02	
	Rubber	1.52E+03	
	Paper	1.20E+03	
METAL	Aluminum	2.64E+03	9.87E+03
	Cast Steel	7.85E+03	
	Cast Lead	1.91E+04	
WOOD	Red Cedar	3.84E+02	7.48E+02
	Ash Wood	6.73E+02	
	Red Oak	1.19E+03	
ASBESTOS	Asbestos (solid)	2.45E+03	1.40E+03
	Asbestos (shredded)	3.52E+02	
URANIUM METAL	Uranium Metal	1.91E+04	1.91E+04

Calc_Sheet_X10C1451639.xls
RAD DATA

CONTAINER ID:	X10C1451639						
RADIONUCLIDE	RADIONUCLIDE ACTIVITY	RADIONUCLIDE CONCENTRATION	RADIONUCLIDE CONCENTRATION	RADIONUCLIDE CONCENTRATION UNCERTAINTY	RADIONUCLIDE CONCENTRATION + UNCERTAINTY	RADIONUCLIDE CONCENTRATION CALCULATED WITH NET VOLUME	RADIONUCLIDE CONCENTRATION CALCULATED WITH ESTIMATED DENSITY
	Ci	nCi/g	pCi/g	pCi/g	pCi/g	Ci/m³	Ci/m³
TOTAL ACTIVITY:	8.45E-02					uCi/cm³	uCi/cm³
AM241	1.03E-02	5.714E+01	5.714E+04	[redacted]	5.714E+04	5.196E-02	5.927E-02
CO60	6.87E-09	3.811E-05	3.811E-02		3.811E-02	3.465E-08	3.952E-08
CS137	1.26E-08	6.962E-05	6.962E-02		6.962E-02	6.331E-08	7.221E-08
EU152	6.76E-08	3.751E-04	3.751E-01		3.751E-01	3.411E-07	3.890E-07
K40	2.47E-06	1.370E-02	1.370E+01		1.370E+01	1.246E-05	1.421E-05
PU238	1.65E-03	9.137E+00	9.137E+03		9.137E+03	8.309E-03	9.477E-03
PU239	2.03E-02	1.125E+02	1.125E+05		1.125E+05	1.023E-01	1.167E-01
PU240	6.80E-03	3.770E+01	3.770E+04		3.770E+04	3.428E-02	3.910E-02
PU241	2.54E-02	1.411E+02	1.411E+05		1.411E+05	1.283E-01	1.463E-01
TC99	5.25E-05	2.914E-01	2.914E+02		2.914E+02	2.650E-04	3.023E-04
TH228	8.11E-08	4.501E-04	4.501E-01		4.501E-01	4.093E-07	4.669E-07
TH232	2.71E-07	1.501E-03	1.501E+00		1.501E+00	1.365E-06	1.557E-06
U232	8.11E-08	4.501E-04	4.501E-01		4.501E-01	4.093E-07	4.669E-07
U233	7.30E-06	4.051E-02	4.051E+01		4.051E+01	3.684E-05	4.202E-05
U234	1.45E-06	8.066E-03	8.066E+00		8.066E+00	7.335E-06	8.368E-06
U235	6.92E-08	3.841E-04	3.841E-01		3.841E-01	3.493E-07	3.984E-07
U238	6.57E-06	3.643E-02	3.643E+01		3.643E+01	3.313E-05	3.779E-05
[redacted]							

Calc_Sheet_X10C1451639.xls
SNM DETERMINATION U235 ONLY

CONTAINER ID: X10C1451639

THE DATA PROVIDED IN THIS SPREADSHEET ADDRESSES *EC-230-SNM, REVISION 3, CONDITION 2a* ONLY. FOR COMPLETE SNM EXEMPTION CERTIFICATION, THE ENTIRE ENERGYSOLUTIONS DOCUMENT MUST BE ADDRESSED.

THIS WASTE EXCEEDS ENERGYSOLUTIONS SNM LIMITS

U235 PRESENT IN WASTE:	YES
U235 MEASUREMENT UNCERTAINTY EXCEEDS *EC-0230-SNM, REVISION 3,* U235 UNCERTAINTY LIMITS:	NO
U235 CONCENTRATION EXCEEDS *EC-0230-SNM, REVISION 3,* U235 CONCENTRATION LIMITS:	NO

	ENERGYSOLUTIONS U235 LIMITS									CALCULATIONS					
RADIONUCLIDE		U235 CONCENTRATION LIMIT		MEASUREMENT UNCERTAINTY		ENRICHMENT LIMIT	WEIGHT PERCENT OF MATERIALS IN CONDITION 2c		WEIGHT PERCENT OF MATERIALS IN CONDITION 2d	U235 CONCENTRATION (Total Activity+ Uncertainty)	ENRICHMENT	U235 MEASUREMENT UNCERTAINTY	COLUMN F THRU K CONDITIONS APPLY	U235 CONCENTRATION LIMIT EXCEEDED	MEASUREMENT UNCERTAINTY EXCEEDED
		pCi/g		pCi/g		WT %				pCi/g	WT %	pCi/g			
U235	≤	1900	≤	285	<	10.00	≤ 20.00	≤	1.00				NO		
U235	≤	1190	≤	179	≥	10.00	≤ 20.00	≤	1.00	1.79E+02	0.164	1.79E+02	YES	NO	NO
U235	≤	160	≤	24	≥	10.00	Sum of Condition 2c and Condition 2d ≤ 45 % of waste by weight.						NO		
U235	≤	680	≤	102	≥	10.00	Unlimited		Unlimited				NO		

Condition 2c: The waste does not contain pure forms of chemicals containing carbon, fluorine, magnesium, or bismuth in bulk quantities. See EC-0230-SNM, Rev 3, Condition 2c.

Condition 2d: The waste does not contain total quantities of beryllium, hydrogenous material enriched in deuterium, or graphite above one percent of the total weight of the waste. See EC-0230-SNM, Rev 3, Condition 2d.

Calc_Sheet_X10C1451639.xls
SNM DETERMINATION EXCLUDES U235

CONTAINER ID:	X10C1451639						

THE DATA PROVIDED IN THIS SPREADSHEET ADDRESSES *EC-230-SNM, REVISION 3, CONDITION 2a* ONLY. FOR COMPLETE SNM EXEMPTION CERTIFICATION, THE ENTIRE ENERGYSOLUTIONS DOCUMENT MUST BE ADDRESSED.

THIS WASTE EXCEEDS ENERGYSOLUTIONS SNM TABLE I LIMITS

NUMBER OF *EC-230-SNM, REVISION 3, TABLE I* RADIONUCLIDES PRESENT IN WASTE:	5
NUMBER OF RADIONUCLIDES EXCEEDING *EC-230-SNM, REVISION 3, TABLE I* MAXIMUM CONCENTRATION VALUE:	3
NUMBER OF RADIONUCLIDES EXCEEDING *EC-230-SNM, REVISION 3, TABLE I* MEASUREMENT UNCERTAINTY:	0

ENERGYSOLUTIONS SNM TABLE I LIMITS			CALCULATIONS					
RADIONUCLIDE	MAXIMUM CONCENTRATION pCi/g	MEASUREMENT UNCERTAINTY pCi/g	RADIONUCLIDE PRESENT IN WASTE	CONCENTRATION OF RADIONUCLIDE IN WASTE	CONCENTRATION UNIT	MEASUREMENT UNCERTAINTY	EXCEEDS MAXIMUM RADIONUCLIDE CONCENTRATION IN SNM TABLE I	EXCEEDS MEASUREMENT UNCERTAINTY IN SNM TABLE I
U233	7.50E+04	1.13E+04	U233	1.129E+04	pCi/g	1.13E+04	NO	NO
PU236	5.00E+02	7.50E+01						
PU238	1.00E+04	1.50E+03	PU238	1.064E+04	pCi/g	1.50E+03	EXCEEDANCE	NO
PU239	1.00E+04	1.50E+03	PU239	1.140E+05	pCi/g	1.50E+03	EXCEEDANCE	NO
PU240	1.00E+04	1.50E+03	PU240	3.920E+04	pCi/g	1.50E+03	EXCEEDANCE	NO
PU241	3.50E+05	5.00E+04	PU241	1.911E+05	pCi/g	5.00E+04	NO	NO
PU242	1.00E+04	1.50E+03						
PU243	5.00E+02	7.50E+01						
PU244	5.00E+02	7.50E+01						

Calc_Sheet_X10C1451639.xls
ESOLU TABLE I ESTIMATED DENSITY

CONTAINER ID:	X10C1451639			THE DATA PROVIDED IN THIS SPREADSHEET ADDRESSES ENERGYSOLUTIONS *BULK WASTE DISPOSAL AND TREATMENT FACILITIES WASTE ACCEPTANCE CRITERIA*, REV 6, SECTION 3.1.1., TABLE I (FROM UTAH ADMINISTRATIVE CODE R313-15-1008). FOR COMPLETE WASTE CERTIFICATION, THE ENTIRE ENERGYSOLUTIONS DOCUMENT MUST BE ADDRESSED.					
			OVERALL CLASS:	NOT CLASS A WASTE				
			TABLE I WASTE CLASS:	DOES NOT MEET TABLE I CLASS A REQUIREMENTS				
NUMBER OF TABLE I RADIONUCLIDES PRESENT IN WASTE:			6					
TABLE I SUM OF FRACTIONS:			2.205E+01					
NUMBER OF RADIONUCLIDES EXCEEDING 0.1 x TABLE I VALUE:			3					
NUMBER OF RADIONUCLIDES EXCEEDING TABLE I VALUE:			1					
ENERGYSOLUTIONS TABLE I			CALCULATIONS					
RADIONUCLIDE	CONCENTRATION		RADIONUCLIDE PRESENT IN WASTE	CONCENTRATION OF RADIONUCLIDE PRESENT IN WASTE	CONCENTRATION UNIT	EXCEEDS 0.1 x TABLE I VALUE	WASTE VALUE ÷ (0.1 x TABLE I VALUE)	EXCEEDS TABLE I VALUE
	Ci/m³	nCi/g						
C14	8							
C14 (activated metal)	80							
Ni59 (activated metal)	220							
Nb94 (activated metal)	0.2							
TC99	3		TC99	3.023E-04	Ci/m3	NO	1.008E-03	NO
I129	0.08							
PU241		3500	PU241	1.411E+02	nCi/g	NO	4.031E-01	NO
CM242		20000						
RA226		100						
ALPHA EMITTING TRANSURANICS WITH HALF LIFE > 5 YRS		100	SUM ALPHA EMITTING TRU WITH 1/2 LIFE > 5 YRS	2.165E+02	nCi/g	EXCEEDANCE	2.165E+01	EXCEEDANCE
AM241		100	AM241	5.714E+01	nCi/g	EXCEEDANCE	5.714E+00	
AM242M		100						
AM243		100						
BK247		100						
CF249		100						
CF250		100						
CF251		100						
CM243		100						
CM244		100						
CM245		100						
CM246		100						
CM247		100						
CM248		100						
CM250		100						
NP237		100						
PU238		100	PU238	9.137E+00	nCi/g	NO	9.137E-01	NO
PU239		100	PU239	1.125E+02	nCi/g	EXCEEDANCE	1.125E+01	EXCEEDANCE
PU240		100	PU240	3.770E+01	nCi/g	EXCEEDANCE	3.770E+00	NO
PU242		100						
PU244		100						

Calc_Sheet_X10C1451639.xls
ESOLU TABLE I ACTUAL DENSITY

CONTAINER ID:	X10C1451639		THE DATA PROVIDED IN THIS SPREADSHEET ADDRESSES ENERGYSOLUTIONS *BULK WASTE DISPOSAL AND TREATMENT FACILITIES WASTE ACCEPTANCE CRITERIA*, REV 6, SECTION 3.1.1., TABLE I (FROM UTAH ADMINISTRATIVE CODE R313-15-1009). FOR COMPLETE WASTE CERTIFICATION, THE ENTIRE ENERGYSOLUTIONS DOCUMENT MUST BE ADDRESSED.
		OVERALL CLASS:	NOT CLASS A WASTE
		TABLE I WASTE CLASS:	DOES NOT MEET TABLE I CLASS A REQUIREMENTS
NUMBER OF TABLE I RADIONUCLIDES PRESENT IN WASTE:		6	
TABLE I SUM OF FRACTIONS:		2.205E+01	
NUMBER OF RADIONUCLIDES EXCEEDING 0.1 x TABLE I VALUE:		3	
NUMBER OF RADIONUCLIDES EXCEEDING TABLE I VALUE:		1	

ENERGYSOLUTIONS TABLE I			CALCULATIONS					
RADIONUCLIDE	CONCENTRATION Ci/m³	CONCENTRATION nCi/g	RADIONUCLIDE PRESENT IN WASTE	CONCENTRATION OF RADIONUCLIDE PRESENT IN WASTE	CONCENTRATION UNIT	EXCEEDS 0.1 x TABLE I VALUE	WASTE VALUE ÷ (0.1 x TABLE I VALUE)	EXCEEDS TABLE I VALUE
C14	8							
C14 (activated metal)	80							
Ni59 (activated metal)	220							
Nb94 (activated metal)	0.2							
TC99	3		TC99	2.650E-04	Ci/m3	NO	8.834E-04	NO
I129	0.08							
PU241		3500	PU241	1.411E+02	nCi/g	NO	4.031E-01	NO
CM242		20000						
RA226		100						
ALPHA EMITTING TRANSURANICS WITH HALF LIFE > 5 YRS		100	SUM ALPHA EMITTING TRU WITH 1/2 LIFE > 5 YRS	2.165E+02	nCi/g	EXCEEDANCE	2.165E+01	EXCEEDANCE
AM241		100	AM241	5.714E+01	nCi/g	EXCEEDANCE	5.714E+00	NO
AM242M		100						
AM243		100						
BK247		100						
CF249		100						
CF250		100						
CF251		100						
CM243		100						
CM244		100						
CM245		100						
CM246		100						
CM247		100						
CM248		100						
CM250		100						
NP237		100						
PU238		100	PU238	9.137E+00	nCi/g	NO	9.137E-01	NO
PU239		100	PU239	1.125E+02	nCi/g	EXCEEDANCE	1.125E+01	EXCEEDANCE
PU240		100	PU240	3.770E+01	nCi/g	EXCEEDANCE	3.770E+00	NO
PU242		100						
PU244		100						

Calc_Sheet_X10C1451639.xls
ESOL TABLE II ESTIMATED DENSITY

CONTAINER ID:	X10C1451639			THE DATA PROVIDED IN THIS SPREADSHEET ADDRESSES ENERGYSOLUTIONS *BULK WASTE DISPOSAL AND TREATMENT FACILITIES WASTE ACCEPTANCE CRITERIA*, REV 6, SECTION 3.1.1., TABLE II (FROM UTAH ADMINISTRATIVE CODE R313-15-1008). FOR COMPLETE WASTE CERTIFICATION, THE ENTIRE ENERGYSOLUTIONS DOCUMENT MUST BE ADDRESSED.					
			OVERALL CLASS:	NOT CLASS A WASTE				
			TABLE II WASTE CLASS:	A				
NUMBER OF TABLE II RADIONUCLIDES PRESENT IN WASTE:			3					
TABLE II SUM OF FRACTIONS:			7.294E-08					
NUMBER OF RADIONUCLIDES EXCEEDING COLUMN 1 VALUE:			0					
NUMBER OF RADIONUCLIDES EXCEEDING COLUMN 2 VALUE:			0					
NUMBER OF RADIONUCLIDES EXCEEDING COLUMN 3 VALUE:			0					
	ENERGYSOLUTIONS TABLE II			CALCULATIONS				
RADIONUCLIDE	CONCENTRATION			RADIONUCLIDE PRESENT IN WASTE	CONCENTRATION OF RADIONUCLIDE PRESENT IN WASTE	EXCEEDS TABLE II, COLUMN 1 VALUE	WASTE VALUE ÷ COLUMN 1 VALUE	EXCEEDS TABLE II, COLUMN 2 VALUE	EXCEEDS TABLE II, COLUMN 3 VALUE
	COLUMN 1 Ci/m3	COLUMN 2 Ci/m3	COLUMN 3 Ci/m3		Ci/m3				
)	40								
)60	700			CO60	3.952E-08	NO	5.646E-11	NO	NO
63	3.5	70	700						
63 (act)	35	700	7000						
390	0.04	150	7000						
3137	1	44	4600	CS137	7.221E-08	NO	7.221E-08	NO	NO
OTAL ALL ADIONUCLIDES WITH ALF LIFE 5 YRS	700			SUM ALL RADIONUCLIDES WITH 1/2 LIFE < 5 YRS	4.669E-07	NO	6.670E-10	NO	NO

Calc_Sheet_X10C1451639.xls
ESOLU TABLE II ACTUAL DENSITY

CONTAINER ID:	X10C1451639			THE DATA PROVIDED IN THIS SPREADSHEET ADDRESSES ENERGYSOLUTIONS *BULK WASTE DISPOSAL AND TREATMENT FACILITIES WASTE ACCEPTANCE CRITERIA*, REV 6, SECTION 3.1.1., TABLE II (FROM UTAH ADMINISTRATIVE CODE R313-15-1008). FOR COMPLETE WASTE CERTIFICATION, THE ENTIRE ENERGYSOLUTIONS DOCUMENT MUST BE ADDRESSED.				
			OVERALL CLASS:	NOT CLASS A WASTE				
			TABLE II WASTE CLASS:	A				
NUMBER OF TABLE II RADIONUCLIDES PRESENT IN WASTE:			3					
TABLE II SUM OF FRACTIONS:			6.395E-08					
NUMBER OF RADIONUCLIDES EXCEEDING COLUMN 1 VALUE:			0					
NUMBER OF RADIONUCLIDES EXCEEDING COLUMN 2 VALUE:			0					
NUMBER OF RADIONUCLIDES EXCEEDING COLUMN 3 VALUE:			0					
	ENERGYSOLUTIONS TABLE II			CALCULATIONS				
RADIONUCLIDE	CONCENTRATION			RADIONUCLIDE PRESENT IN WASTE	CONCENTRATION OF RADIONUCLIDE PRESENT IN WASTE	EXCEEDS TABLE II, COLUMN 1 VALUE	WASTE VALUE / COLUMN 1 VALUE	EXCEEDS TABLE II, COLUMN 2 VALUE	EXCEEDS TABLE II, COLUMN 3 VALUE
	COLUMN 1 Ci/m3	COLUMN 2 Ci/m3	COLUMN 3 Ci/m3		Ci/m3				
H3	40								
CO60	700			CO60	3.465E-08	NO	4.951E-11	NO	NO
NI63	3.5	70	700						
NI63 (act)	35	700	7000						
SR90	0.04	150	7000						
CS137	1	44	4600	CS137	6.331E-08	NO	6.331E-08	NO	NO
TOTAL ALL RADIONUCLIDES WITH HALF LIFE < 5 YRS	700			SUM ALL RADIONUCLIDES WITH 1/2 LIFE < 5 YRS	4.093E-07	NO	5.848E-10	NO	NO

Calc_Sheet_X10C1451639.xls
FISSILE GRAM-ENRICHMENT

CONTAINER ID:	X10C1451639				
Enrichment (Weight % U-235):	0.164			Includes U-235 Total U-235 FGE/FEM:	5.460E-01
				Does Not Include U-235 Total U-235 FGE/FEM:	5.140E-01
				Total Pu-239 FGE/FEM:	3.500E-01
RADIONUCLIDE	SPECIFIC ACTIVITY	RFD DATA	MASS	FGE/FEM FACTOR	FGE/FEM
	Ci/g	Ci	g		g
			Ci / Specific Activity		*Total Grams Radionuclide x FGE Factor*
Am241	3.4246E+00	1.03E-02	3.0077E-03	0.044	1.3234E-04
Am242m	1.0466E+01			54.00	
Am243	1.9914E-01			0.028	
Cf249	4.0908E+00			70.00	
Cf251	1.5844E+00			140.00	
Cm243	5.1567E+01			7.80	
Cm244	8.0819E+01			0.23	
Cm245	1.7149E-01			23.00	
Cm247	9.2683E-05			0.78	
Np236	9.7682E-03			140.00	
Np237	7.0414E-04			0.035	
Pu238	1.7020E+01	1.65E-03	9.6769E-05	0.23	2.2257E-05
Pu239	6.1976E-02	2.03E-02	3.2722E-01	1.56	5.1047E-01
Pu239/240	6.1976E-02			1.56	
Pu240	2.2673E-01	6.80E-03	2.9970E-02	0.047	1.4086E-03
Pu241	1.0291E+02	2.54E-02	2.4711E-04	3.50	8.6488E-04
Pu242	3.9217E-03			0.018	
U233/234	9.6277E-03			1.40	
U233	9.6800E-03	7.30E-06	7.5434E-04	1.40	1.0561E-03
U235	2.1596E-06	6.92E-08	3.2061E-02	1.00	3.2061E-02
RADIONUCLIDE	RFD DATA	SPECIFIC ACTIVITY	MASS	RADIONUCLIDE	URANIUM CONCENTRATION
	Ci	Ci/g	g	Wt%	ppm
TOTALS:	1.55E-05		1.96E+01	100.00	1.09E+02
U232	8.11E-08	2.15E+01	3.7740E-09	0.0000000	
U233	7.30E-06	9.68E-03	7.5434E-04	0.004	
U234	1.45E-06	6.25E-03	2.3264E-04	0.001	
U235	6.92E-08	2.16E-06	3.2056E-02	0.164	
U236		6.47E-05		0.00	
U238	6.57E-06	3.36E-07	1.9545E+01	99.831	

Calc_Sheet_X10C1451639.xls
TRU AND H3 CALCULATION

CONTAINER ID:	X10C1451639					TRU radionuclides are defined in the Oak Ridge Reservation Transuranic Master Profiles as AM241, AM242m, AM243, BK247, CF249, CF251, CM243, CM245, CM246, CM247, CM248, CM250, NP237, PU238, PU239, PU240, PU242, and PU244.		
RADIOISOTOPE	QUANTITY	TRU ISOTOPES AM-CF	TRU ISOTOPES CM	TRU ISOTOPES NP-PU	H3	TRU ISOTOPES	TRU ISOTOPES	H3
	Ci	Ci	Ci	Ci	Ci	Ci	nCi/g	nCi/g
						3.90E-02	2.16E+02	0.00E+00
AM241	1.03E-02	1.03E-02						
CO60	6.87E-09							
CS137	1.26E-08							
EU152	6.76E-08							
K40	2.47E-06							
PU238	1.65E-03			1.65E-03				
PU239	2.03E-02			2.03E-02				
PU240	6.80E-03			6.80E-03				
PU241	2.54E-02							
TC99	5.25E-05							
TH228	8.11E-08							
TH232	2.71E-07							
U232	8.11E-08							
U233	7.30E-06							
U234	1.45E-06							
U235	6.92E-08							
U238	6.57E-06							

Calc_Sheet_X10C1451639.xls
ACCOUNTABILITY X10

CONTAINER ID:	X10C1451639					THE SHEET ADDRESSES THE REQUIREMENTS OF *ORNL NMC&A ACCOUNTING PROCEDURES, 04/02/2007, NUMBER 2.2.2, SPECIFICALLY, PART II, ACCOUNTABLE QUANTITIES.*		
			Wt % U235:	0.164			MATERIAL ACCOUNTABLE:	YES
RADIONUCLIDE	SA	AFD DATA	MASS	NM REPORTING UNIT	RADIONUCLIDE	ACCOUNTABLE ASTERISK QUANTITY	ACCOUNTABLE REPORTABLE QUANTITY	ACCOUNTABLE DETERMINATION
	Ci/g	Ci	g			g	g	
Am241	3.43E+00	1.03E-02	3.00E-03	g	Am241	5.00E-02	5.00E-01	
Am243	1.99E-01			g	Am243	5.00E-02	5.00E-01	
Bk249	1.64E+03			ug	Bk249	5.00E-08	5.00E-07	
Cf252	5.36E+02			ug	Cf252	5.00E-08	5.00E-07	
Total Cm		0.00E+00	0.00E+00	g	Total Cm	5.00E-02	5.00E-01	
Cm238	5.49E+06			g				
Cm240	2.02E+04			g				
Cm241	1.65E+04			g				
Cm242	3.31E+03			g				
Cm243	5.18E+01			g				
Cm244	8.09E+01			g				
Cm245	1.72E-01			g				
Cm246	3.07E-01			g	Cm248	5.00E-02	5.00E-01	
Cm247	8.28E-05			g				
Cm248	4.25E-03			g				
Cm249	1.18E+07			g				
H3	9.67E+03			.01g	H3	5.00E-04	5.00E-03	
Deuterium				0.1 kg	Deuterium	5.00E+00	5.00E+01	
Enriched Lithium				1 kg	Enriched Lithium	5.00E+01	5.00E+02	
Total Np		0.00E+00	0.00E+00	g	Total Np	5.00E-02	5.00E-01	
Np232	5.51E+07			g				
Np233	2.23E+07			g				
Np234	1.27E+05			g				
Np235	1.40E+00			g				
Np236	2.40E+00			g				
Np236m	5.90E+05			g				
Np237	7.05E-04			g		5.00E-02	5.00E-01	
Np238	2.59E+05			g				
Np239	2.32E+05			g				
Np240	1.21E+07			g				
Pu239 + Pu241		4.57E-02	3.26E-01	g	Pu239 + Pu241	5.00E-02	5.00E-01	ASTERISK QTY
Pu238	1.71E+01	1.66E-03	9.63E-05	.1g	Pu238	5.00E-03	5.00E-02	
Pu239	8.22E-02	2.03E-02	3.28E-01	g	Pu239	5.00E-02	5.00E-01	ASTERISK QTY
Pu240	2.28E-01	6.80E-03	2.98E-02	g	Pu240	5.00E-02	5.00E-01	
Pu241	1.03E+02	2.54E-02	2.47E-04	g	Pu241	5.00E-02	5.00E-01	
Pu242	3.83E-03			g	Pu242	5.00E-02	5.00E-01	
Total Th		3.52E-07	2.48E+00	Kg	Total Th	5.00E+01	5.00E+02	
Th228	2.68E+07			Kg				
Th227	3.07E+04			Kg				
Th228	8.20E+02	8.11E-08	9.90E-11	Kg				
Th229	2.13E-01			Kg				
Th230	2.02E-02			Kg				
Th231	5.32E+05			Kg				
Th232	1.09E-07	2.71E-07	2.48E+00	Kg				
Th234	2.32E+04			Kg				
Total U (Enriched)		0.00E+00	0.00E+00	g	Total U (Enriched)	5.00E-02	5.00E-01	
U230	2.73E+04			g				
U231	1.35E+05			g				
U232	2.15E+01			g				
U233	9.68E-03			g	U233	5.00E-02	5.00E-01	
U234	6.25E-03			g				
U235	2.16E-06			g				
U236	6.47E-05			g				
U237	8.16E+04			g				
U238	3.36E-07			g				
U239	3.34E+07			g				
U240	9.26E+05			g				
Total U (Depleted)		1.55E-05	1.98E+01	Kg	Total U (Depleted)	5.00E+01	5.00E+02	
U230	2.73E+04			Kg				
U231	1.35E+05			Kg				
U232	2.15E+01	8.11E-08	3.77E-09	Kg				
U233	9.68E-03	7.30E-06	7.54E-04	Kg	U233	5.00E-02	5.00E-01	
U234	6.25E-03	1.45E-06	2.33E-04	Kg				
U235	2.16E-06	6.92E-08	3.21E-02	Kg				
U236	6.47E-05			Kg				
U237	8.16E+04			Kg				
U238	3.36E-07	8.57E-06	1.96E+01	Kg				
U239	3.34E+07			Kg				
U240	9.26E+05			Kg				
Total U (Normal)		0.00E+00	0.00E+00	Kg	Total U (Normal)	5.00E+01	5.00E+02	
U230	2.73E+04			Kg				
U231	1.35E+05			Kg				
U232	2.15E+01			Kg				
U233	9.68E-03			Kg	U233	5.00E-02	5.00E-01	
U234	6.25E-03			Kg				
U235	2.16E-06			Kg				
U236	6.47E-05			Kg				
U237	8.16E+04			Kg				
U238	3.36E-07			Kg				
U239	3.34E+07			Kg				
U240	9.26E+05			Kg				

Calc_Sheet_X10C1451639.xls
CAT 3 DETERMINATION

CONTAINER ID:	X10C1451639					
					TOTAL CAT 3 FRACTION:	7.533E-02
ICRP-30 RADIONUCLIDE	CATEGORY 3 THESHOLD	CATEGORY 3 THESHOLD	CAT 3 CALCULATED SPECIFIC ACTIVITY	SPECIFIC ACTIVITY	ACTIVITY	CAT 3 FRACTION
	Ci	g	Ci/g	Ci/g	Ci	
AM241	5.20E-01	1.50E-01	3.47E+00	3.43E+00	1.03E-02	1.98E-02
CO60	2.80E+02	2.50E-01	1.12E+03	1.13E+03	6.87E-09	2.45E-11
CS137	6.00E+01	6.90E-01	8.70E+01	8.70E+01	1.26E-08	2.09E-10
EU152	2.00E+02	1.20E+00	1.67E+02	1.77E+02	6.76E-08	3.38E-10
K40	1.70E+02	2.40E+07	7.08E-06	6.99E-06	2.47E-06	1.45E-08
PU238	6.20E-01	3.60E-02	1.72E+01	1.71E+01	1.65E-03	2.66E-03
PU239	5.20E-01	8.40E+00	6.19E-02	6.22E-02	2.03E-02	3.90E-02
PU240	5.20E-01	2.28E+00	2.28E-01	2.28E-01	6.80E-03	1.31E-02
PU241	3.20E+01	3.10E-01	1.03E+02	1.03E+02	2.54E-02	7.95E-04
TC99	1.70E+03	1.00E+05	1.70E-02	1.70E-02	5.25E-05	3.09E-08
TH228	1.00E+00	1.20E-03	8.33E+02	8.20E+02	8.11E-08	8.11E-08
TH232	1.00E-01	9.10E+05	1.10E-07	1.09E-07	2.71E-07	2.71E-06
U232	8.20E-01	3.81E-02	2.15E+01	2.15E+01	8.11E-08	9.90E-08
U233	4.20E+00	4.40E+02	9.55E-03	9.68E-03	7.30E-06	1.74E-06
U234	4.20E+00	6.70E+02	6.27E-03	6.25E-03	1.45E-06	3.46E-07
U235	4.20E+00	1.90E+06	2.21E-06	2.16E-06	6.92E-08	1.65E-08
U238	4.20E+00	1.30E+07	3.23E-07	3.36E-07	6.57E-06	1.56E-06

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Waste Approval Checklist

UCN-2109 No. *X10C1451639*

Master Profile No. TRU-CH-7 **Revision No.** 0

1. EVALUATION AGAINST MASTER PROFILE

Complete the following checks based on a review of the UCN-2109 and supporting documentation

No.	Action	Yes	No	N/A
1	Is the UCN-2109 form set entered in eMWaste and has it been QC Released?	☒	☐	☐
2	For the following items, does the information in the data package provide sufficient data to meet the requirements of the Master Profile?			
2a	Does the Material Description match the Profile?	☒	☐	☐
2b	Are the Chemical Constituent Limitations met?	☒	☐	☐
2c	Are the Radiological Constituent Limitations met?	☒	☐	☐
2d	Are the Physical Parameters met?	☐	☒	☐
2e	Are the Characterization Parameters and Methodologies consistent with the Profile?	☒	☐	☐
2f	Are Prohibited Items excluded from the waste?	☒	☐	☐
2g	Are Packaging Requirements met?	☒	☐	☐
2h	Are Additional Requirements (if any) met?	☒	☐	☐
3	If fissile isotopes are present, has U^{235} fissile equivalent mass (FEM) been calculated?	☒	☐	☐
4	If the U^{235} FEM exceeds 15 grams per container, is the materials packaged in a Type A container or is a fissile exemption provided?	☐	☐	☒
5	Are radiological calculation sheets included in the data package?	☒		☐

Comments: Variance VR12-014 for use of UT9424 Vents

Approved for Acceptance Based Upon Review Against Master Profile:

Name: Akhalesh Bisaria Signature: Akhalesh Bisaria Date: 4/5/14
Project Technical Staff

Note: This form cannot be completed by the individual signing as the UCN-2109 waste certifier

Disposition Path (Check One) ☑ WDP Storage
☐ Shipment/Other

2. AUTHORIZATION FOR RECEIPT INTO WDP STORAGE

Designated Facility 7572

Name: S.E. Baity Signature: S. E. Baity Date: 4/22/14
Facility Engineer

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Container Evaluation Checklist

1. GENERAL INFORMATION

Container ID No.: (If multiple containers, a container list is required.) See Container List – WIPP14006	UCN-2109 No.: (if applicable): See Container List – WIPP14006
Waste Stream Type (e.g., RCRA Mixed): CH TRU	Contact Name: Chad York

(circle one of the options below)

Pickup/Receipt for On-site Storage (Sects. 1,2, 3, and Form-1899)	Pickup/Receipt for Inter-site Move to a WDO Storage Facility (Sects. 1,2, 3, and Form-1899)	Receipt of an Intra-site Move from WDO Operation (Sects. 1, 2, 3)	Receipt from non-WDO or Off-site Facility (Sects. 1,2, 3, and Form-1899)

2. EVALUATION FOR WDP STORAGE

Chemical/Physical/Radiological Properties Evaluation: If "yes" is marked, ensure safe handling information, labeling information, and/or storage limitations are identified on the container list.	**Yes**	**No**
1. Does the proposed move conform to PROC-WD-5012, Attachment 1, *Waste Stream Facility Guide*?	√	
2. Does the proposed move allow actions IAW PROC-WD-5012, Attachment 2, *Permitted Activities*?	√	
3. Are the container types and materials proposed for movement identified in PROC-WD-5012, Attachment 3, *Summary of Typical Container Types and Materials Stored*?	√	
4. Does the proposed move comply with PROC-WD-5012, Attachment 4, *Radiological Inventory Limits* for the target facility?	√	
5. Does the proposed move comply with PROC-WD-5012, Attachment 5, *Radiological Inventory Limits for Staging* for the target staging area?	√	
6. Does the proposed move comply with the container criteria and facility criteria in PROC-WD-5012, Attachment 6, *Facility and Container Limits Guide* for the target facility?	√	
7. Does the container list, if generated, identify any unique hazard(s) associated with container movement AND list tools/equipment needed to mitigate those hazard(s)?		√
8. Nuclear Material (NM) Accountability: Authorization to Ship required (Form-557)?	√	
NM Transaction required (Form-171)?	√	

3. WDP STORAGE FACILITY AND TRANSPORT AUTHORIZATION

9. Designated Storage Facility: 7572	√	

10. Complete the following radiological inventory evaluation for the designated storage facility.

Facility Criteria	Receiving Limits		Current Inventory	This Shipment	After Shipment
	Facility	Container			
U^{235} FEM	n/a	150g	2.96E+03	3.21E+01*	2.99E+03*
CAT 2 TQ sum of fractions	6.30E+01	6.62E+00	6.56E+00	3.89E-02*	6.60E+00*
CAT 3 TQ sum of fractions	----	-----	-----	-----	-----

11. Authorized for Pickup (N/A for generator delivery)	Name: N/A	Signature: -----	Date: -----
12. Authorized for Storage	Name: S. E. Baity	Signature: S. E Baity	Date: 4/21/14

*Includes values for Shipment Nos. WIPP14005 and WIPP14006.

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Container Inspection Checklist

Container ID #: X10C1451639 (check one for each item)

Container Identification and Physical Condition	Sat	Unsat	N/A
Container ID matches Container List	✓		
Excessive dents observed	✓		
Excessive rust observed (>10%)	✓		
Leaks observed	✓		
Signs of over pressurization (bulging, sound of escaping gas, etc.) observed	✓		
Conatiner is closed and secure	✓		
If container is a ring-type drum, bolt ring is in proper placement and jam nut is tight	✓		
If containeris a bung-type drum, bungs are seated with no stripped threads observed and plugs are solid	✓		
Capacity and weight are marked on container	✓		
Container size matches Container list	✓		
Pallet is in good condition and appears sound			✓
FOR ORNL ONLY if container is a TRU drum or cask: Filter vent is in place and appears unobstructed by visual check. Record Vent Model No. UT9424-00232-0192	✓		

Comments/Corrective Actions:

Acceptable for Pickup/Transport/Receipt into Storage:

Name/Badge #	Signature	Date
Chris Raymond 107381	[signature]	5-5-14

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Drum Filter Vent and Sample Port Installation & Field Sampling Record

ITEM	DESCRIPTION / RESULTS			Initial	Date
Container No.	X10C1451639			CR	5.5.14
Dose Rate (mrem/hr)	**Contact**	**30 cm As Necessary**	**1 Meter As Necessary**		
Beta / Gamma	<0.5	<0.5	<0.5	SG	5-8-14
Neutrons	<0.5	<0.5	<0.5		5-8-14
Lid Restraint Device	Installed below chime (rolling hoop).			NA	
Drum Ring Secure	Ring is correctly positioned, closure torqued per vendor specifications (if vendor specs are not known – 45 ft/lbs min.), and jam nut is tight.			CR	5-5-14
Weight and Size	eMWaste Weight: 232 kg Field Weight: 232 kg Drum Size: 55g			CR	5.5.14
Filter Vent(s)	NF051 vent(s) installed/secured IAW* PROC-OP-5151 or existing NFT certified WIPP-approved vents. (See list of vents in PROC-OP-5151, Attachment.). Serial number(s) of vents installed: S/N 0192 S/N S/N			CR	5-5-14
Rapid Port Used	RP EG 003L	RP KF 001L	RP BH 006L	NA	
Sample Ports	Install/secure newly added sample ports NF050-FT sample port IAW* PROC-OP-5151. Serial number(s) of ports installed. S/N 0192 S/N S/N			CR	5.5.14

Head Space Sampling Results	**Ambient Temp °F**	**LEL/Vol %**	**H2 PPM**	**VOC's PPM**	**O2 %**	**Analytical Inst.**

Notifications: Notify the Supervisor if High Hydrogen (80% LEL, or H_2 is >32,000 ppm) is present.

Additional Sampling, if required	**Ambient Temp °F**	**LEL/Vol %**	**H2 PPM**	**VOC's PPM**	**O2 %**	**Analytical Inst.**

NOTE: As necessary, continue recording sample results on back of form.

Comments (include container destination):

*IAW = In Accordance With

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Drum Filter Vent and Sample Port Installation & Field Sampling Record

Sampling Results (cont.)

ITEM	DESCRIPTION / RESULTS						Initial	Date
Container No.	X10C1451639							
Additional Sampling, If required	Ambient Temp °F	LEL/Vol %	H2 PPM	VOC's PPM	O2 %	Analytical Inst		
Additional Sampling, If required	Ambient Temp °F	LEL/Vol %	H2 PPM	VOC's PPM	O2 %	Analytical Inst.		
Additional Sampling, If required	Ambient Temp °F	LEL/Vol %	H2 PPM	VOC's PPM	O2 %	Analytical Inst.		
Additional Sampling, If required	Ambient Temp °F	LEL/Vol %	H2 PPM	VOC's PPM	O2 %	Analytical Inst.		
Additional Sampling, If required	Ambient Temp °F	LEL/Vol %	H2 PPM	VOC's PPM	O2 %	Analytical Inst.		
Additional Sampling, If required	Ambient Temp °F	LEL/Vol %	H2 PPM	VOC's PPM	O2 %	Analytical Inst.		
Additional Comments								

Supervisor/Field Engineer/Facility Engineer: Travis Willis *Signature* 5-13-14 *Date*

DIVIDER PAGE

Attachment D: Contact Handled Waste Repackaging Data Form

Page 1 of 3

Section 1: General Information

Examination Start Date: 8.23.11 Originally packaged as RH Waste ☐ Yes ☒ No

Container Number: NFS0759B1

Container Type: 55 gallon drum Thickness of Bag Liner: 90 mil

Bag Liner Description: ☐ Non-Rigid ☒ Filtered Vent ☐ Poly ☒ Rigid ☐ Non-vented ☒ Other: N/A

Waste Stream Identification #: OR-NFS-CH-HOM-A

Physical waste form matches the assigned Waste Stream Description and RCRA characterization?
☐ NO ☒ YES

New Waste Stream Identification Number if assigned

Are sharp or heavy objects are blocked, braced, or packaged to provide puncture protection for the waste container?
☐ NO ☒ YES

Volume Utilization Percentage: 95 %

Number of Container Liners used: 1

Closure Method for Container Liner: press Fit Lid

Number of Inner Bags: 1

Verified no inner packages are heat sealed? ☐ NO ☒ YES

Layers of Confinement: Number of Layers: 2

Container Filter and Drum Enclosure Data

Filter Torque Wrench Serial/ID No. 0704500011 Calibration Due Date: 5.16.12

Filter Model No. NUCFIL-019DS Serial No. JJ-653 Torque Value 10 ft. lbs.

Lid Ring Bolt Torque Wrench: 0610032473 Calibration Due Date: 2.8.12

Manufacturer's Closure spec: PQ080 REV D

Source Container #:	Waste Stream #:	Original Parent Container #:	Waste Stream #:
NFS-0481A1	OR-NFS-CH-HOM-A		
NFS-0759B	OR-NFS-CH-HOM-A		

Attachment D: Contact Handled Waste Repackaging Data Form

Page 2 of 3

Section 2: Waste Package Data			Data Page 1 of 1
Container Number: NFS-075981		Examination Date: 8-23-11	
Item #	If Drum Puck, SS or CS	Waste Item Description	
1	N/A	Grout Bottle 8620 from NFS-0481A1	
2	N/A	Grout Bottle 8619 from NFS-0481A1	
3	N/A	Grout Bottle 8621 from NFS-0481A1	
4	N/A	Grout Bottle 7403 from NFS-0759B	
5	N/A	Plastic and foam used for shoring	
Waste Repackaging Operator:	Gregory Abbott (Print Name)	(Signature)	8-23-11 (Date)

Attachment D: Contact Handled Waste Repackaging Data Form
Page 3 of 3

Section 3: Comments			
Container Number:	NFS-07598	**Examination Date:**	8-23-11
Waste repackaged in accordance with OPIP N/A ☑ Yes ☐ No ☐ If No, explanation required			
OPIP #			
Waste repackaged in accordance with WNCR N/A ☐ Yes ☒ No ☐ If No, explanation required			
WNCR # 2011-006, 2011-001			
Grout bottles #8619, 8620 : 8621 from NFS-048IA1, grout bottle #7403 from NFS-0759B, plastic and foam for packaging/shoring GA 8-23-11			
PCB Bulk Product Characterization:			

Section 4: Approvals		
Signature below signifies that waste in this container has been examined and documented as required.		
Waste Repackaging Operator:		
Gregory Abbott Print Name	Signature	8-23-11 Date
Waste Repackaging Data Form Reviewer:		
T Hill Print Name	Signature	8-23-11 Date
Signature below signifies that the Waste Stream Identification Number has been verified to be consistent with the original parent container and that objective evidence of the Waste Stream Identification Number is included in the applicable Waste Container Traveler.		
Waste Package Certifier:		
Steve Isbill Print Name	Signature	8-24-11 Date

DIVIDER PAGE

REQUEST FOR STORAGE OR DISPOSAL OF RADIOACTIVE SOLID WASTE OR SPECIAL MATERIALS

78489

Requester: Executes this section before arranging material transfer

Date	Origin of Waste bldg. no.	Requester's Signature	Badge No.	Phone No.	Building/Mail Stop
9/93	NFS 110/234	T Burnett			P.O. Box 1234 Erwin, TN 7702

NON-RECORD COPY

(CHECK IF APPLICABLE)	Total Volume (Cu. Ft. only)	Combustible Vol. (Cu. Ft. only)	Weight (Lbs. only)	Accountability no. (mm.no.)
X OFFSITE	7.50	0.0	122	
___ CONSTRUCTION	Charge Work Order Number: 3325-7016		(FOR WASTE OPERATIONS USE ONLY) COST SYMBOL B	COST ADJUSTMENT

Waste Classification (check only one)

1. X TRU or U-233 (Retrievable) (>100μCi/Kg)
2. __ URANIUM/THORIUM
3. __ FISSION PRODUCT
4. __ INDUCED ACTIVITY
5. __ TRITIUM
6. __ BETA-GAMMA TRU or U-233 (>100μCi/Kg)
7. __ ALPHA TRU or U-233 (<100μCi/Kg) BETA-GAMMA TRU or U-233
8. __ OTHER _____
9. __ LANDFILL/SUSPECT
A. __ CONTAMINATED ASBESTOS

Type of Waste (check only one) BRIEF DESCRIPTION

__ (BW) BIOLOGICAL WASTE _____
__ (CE) CONTAMINATED EQUIPMENT _____
__ (DD) DECONTAMINATION DEBRIS _____
X (DS) DRY SOLIDS 2-LITER BOTTLES
__ (SS) SOLIDIFIED SLUDGE _____
__ (NC) NOT CLASSIFIED _____

CAUTION
This information must NOT be released externally until it has been reviewed by the appropriate Site Classification and Information Control Office.

CONTAINER TYPE (check only one)

1. X 55 GAL DRUM
2. __ 30 GAL SLIP PAIL
3. __ 4-1/2" WALL CONCRETE CASK
4. __ 6" WALL CONCRETE CASK
5. __ 12" WALL CONCRETE CASK
6. __ 55 GAL BI DRUM
7. __ 30 GAL BI DRUM
8. __ WOODEN BOX _____
9. __ OTHER
10. __ GI CAN
11. __ PLASTIC
12. __ DUMPSTER
13. __ NONE
14. __ CASK NO ____ WALLTHICKNESS ___IN. SHIELDING MTL ____
15. __ METAL BOX __

PRINCIPAL ISOTOPE(S): (BEST ESTIMATE)
*Refer to the Attached Manifests

1. IDENTITY ____	QUANTITY ____	__ GRAMS __ CURIES		2. IDENTITY ____	QUANTITY ____	__ GRAMS __ CURIES	
3. IDENTITY ____	QUANTITY ____	__ GRAMS __ CURIES		4. IDENTITY ____	QUANTITY ____	__ GRAMS __ CURIES	

REQUESTER'S COMMENTS FOR THOSE HANDLING WASTE IN THE FIELD:

TOTAL CURIES (BEST EST.) 1.538E+02

WMO FIELD REPRESENTATIVE (APPROVAL SIGNATURE) P G Cleveland

DATE 12-11-93

HEALTH PHYSICIST: EXECUTES THIS SECTION BEFORE MATERIAL TRANSFER

RADIATION DATA:
BETA-GAMMA: FOR PACKAGE 5.0 mrem/hr. @ 0 in.

SURFACE CONT. <20 dpm (alpha): <200 dpm (beta/gamma): Neutron reading <015 mrem/hr

SURVEYOR'S COMMENTS FOR THOSE HANDLING WASTE IN THE FIELD: Entered 12/14/93 by KM
Billed 12/17/93 by DN
1-7-94

Drum ATN: NFS-0481 Shipment #: IC#: 4226-43	HP'S SIGNATURE	DATE

UCN-2822

STORAGE OR DISPOSAL OF RADIOACTIVE SOLID WASTE
OR SPECIAL MATERIALS WASTE TRACKING UPDATE

DOCUMENT NO.
PAGE 2 78489

COMPACTION WASTE: COMPLETED AND THEN APPROVED BY SWSA FOREMAN				
LL BOX NUMBER	TOTAL POST-VOL	(%) PORTION	FULL BOX (Y/N)	COMMENTS
TOTALS				

Date of Compaction:

Compacting Operators:

and

SWSA Foreman's Signature:

SWSA FOREMAN COMPLETES AND APPROVES FOR NON-COMPACTED WASTE

Waste Was (check one):	SWSA No.:	Storage/Disposal Date:	ATN NO.:	Low Level No.:
☑ Retrievable ☐ Buried	5	12/11/93	NFS-481	

Facility (check one):

☑ Building ☐ Well ☐ Landfill ☐ Tumulus ☐ Trench ☐ On Ground Storage

Location No.:	Location Within Facility:	Waste Description:
B7879	Rank: File: Layer:	CH-TRU

Comments from SWSA Foreman regarding waste and/or operations: Shipment 43

Foreman's Signature: R L White

WASTE EXAMINATION (WEAF): COMPLETES AND FORWARDS TO DMC

Waste Inspection Level:	Rated:	Inspection Officier:	Date:
☒ RTR ☐ PAN/SGS	☒ Pass ☐ Fail	J.E. Madison	2-3-94

DISTRIBUTION: Copy 1 - Attach to 2822 and forward to DMC
Copy 2 - Retained by SWSA Foreman
Copy 3 - Retained by WEAF/Compacting Team (If Applicable)

UCN-2822A
(3 3-90)

COPY 1

Generator Name: Nuclear Fuel Services, Inc.

Continuation Sheet

Shipment ID No: ICP: 4226-43

Disposal Container

(20) ITEM NUMBER	(21) RADIO-NUCLIDE EACH CONTAINER	(22) PERCENT OF ACTIVITY or mCi of EACH NUCLIDE	(23) ACTIVITY EACH CONTAINER (mCi)	(24) PHYSICAL FORM	(25) CHEMICAL FORM and NAME & % of CHELATING AGENT	(26) WASTE DESCRIPTION	(27) WASTE FORM CLASS	(28) SPECIAL NUCLEAR MATERIAL (grams)	(29) SOURCE MATERIAL (pounds)	(30) CONTAINER WEIGHT (pounds)	(31) CONTAINER VOLUME (Cu Ft)	(32) CONTAINER TYPE	(33) RADIATION LEVELS CONTAINER SURFACE (x) mR/hr ( ) R/hr	(33) (TI) 1 Meter mR/hr	(34) CONTAMINATION CONTAINER SURFACE (DPM/100cm2) Alpha	(34) Beta-Gamma	(35) FISSILE CLASS	(36) LABELS/MARKINGS USED
A38720	PU238	1.44E+03	9.28E+04	SOLID	OXIDE	2-LITER BOTTLES	>C	3.84E+01	0.00	123	7.50	DRUM	< 4.00	< 0.08	< 20	< 200	III	Radioactive- N.O.S.
1890	PU239	1.77E+03																Radioactive-
NFS-0679	PU240	1.96E+03																Radioactive-
	PU241	8.48E+04																Radioactive-
	PU242	6.85E-01																Radioactive-
	AM241	2.88E+03																Radioactive-
																		Radioactive-
																		Radioactive-
																		Radioactive-
																		Radioactive-
A38726	PU238	2.53E+03	1.53E+05	SOLID	OXIDE	2-LITER BOTTLES	>C	5.47E+01	0.00	122	7.50	DRUM	< 5.00	< 0.08	< 20	< 200	III	Radioactive- N.O.S.
1892	PU239	2.46E+03																Radioactive-
NFS-0680	PU240	2.97E+03																Radioactive-
	PU241	1.41E+05																Radioactive-
	PU242	1.22E+00																Radioactive-
	AM241	4.97E+03																Radioactive-
																		Radioactive-
																		Radioactive-
																		Radioactive-
																		Radioactive-
2			2.46E+05			PAGE TOTALS		9.31E+01	0.00	245	15.00			< 0.16				

Form No.
( )

DISPOSAL SITE COPY

TX-5352

DATA LOG SHEET FOR PACKAGING TRU WASTE

[An entry is required for each column. See instruction sheet for directions.]

Drum ATN: NFS-0481
Building No.: NFS 110/234
Room No.: _____

Content Code: _____ OR125A
_____ OR125B

1. Pak No.	2. Date	3. Radiation (mRem/h)		4. Activity (Ci)	5. Dominant Radionuclides	6. Physical Form	7. Chemical Form	8. Percent Comb.	9. Haz. Mtl (Y/N)	10. Signature	11. Data Log Sheet Verification	
		Beta, Gamma	Neut.								Date	Signature
8619-1	07/09/93			8.286E+01	* See Manifest	SOLID	OXIDE	0.0	N	O. Hurley	7-9-93	T. Bennett
8620-2	07/09/93			2.648E+01	* See Manifest	SOLID	OXIDE	0.0	N	↓	↓	↓
8621-3	07/09/93			4.445E+01	* See Manifest	SOLID	OXIDE	0.0	N	↓	↓	↓

Proper Drum Closure (Signature): T. Bennett

Generator Certification Official (Signature): T. Bennett

Authorized Radioactive Solid Waste Operations (Signature): LG Cleveland

Note: If column 9 = Yes, complete supplemental form TX-5352A.

TRU WASTE DATA PACKAGE

1. Drum ATN Number: NFS-0481
2. Shipment Number: IC#: 4226-43
3. Date Packaged: 07/09/93
4. Date of Shipment: 12/3/93
5. Date Certified: 07/09/93
6. Gross Weight: 122 lbs, Tare: ~~81~~ 100 lbs

7. CONTENT INFORMATION (* See Attached Manifest for Isotopic Breakdown)

a. Physical Description: 2-LITER BOTTLES	
b. Chemical Form: OXIDE	c. Iron Content: 8.0 % by weight
d. Thermal Power: 1.2E+00 W/ft^3	e. Organic Content: 98.0 % by volume
f. Organic Content: 90.0 % by weight	g. ^{239}Pu - fissile gram equivalent: 43.63 +/- 10.50
h. Homogenous: [ ] YES [X] NO	i. ^{239}Pu - equivalent activity: 15.461 +/- 3.720 Ci
j. TRU Activity Concentration: 1319613 +/- 317518 nCi/gm	

8. HAZARDOUS CONSTITUENTS

Constituent	Concentration	Analytical Method
Not Present	0.000000000000	

Date of Analyses: 07/09/93

9. NEUTRON ABSORBERS PRESENT

Element	Weight %	Volume %	Analytical Method
Not Present	0.0	0.0	

Date of Analyses: 07/09/93

10. MAXIMUM SURFACE DOSE RATE

Beta / Gamma	Alpha	Neutron
< 200 dpm/100cm^2 5.0 mrem/hr	< 20 dpm/100cm^2	4.5 mrem/hr
Performed by: R. Edwards		Date: 7-9-93

FORM 28-001 09/92 REVISION 3 DECOMMISSIONING

OAK RIDGE NATIONAL LABORATORY
MARTIN MARIETTA ENERGY SYSTEMS, INC.

USE THIS NUMBER ON ALL CONTINUATION PAGES

Generator Name: Nuclear Fuel Services, Inc.

Continuation Sheet

Shipment ID No: ICP: 4226-43

Disposal Container

(20) ITEM NUMBER	(21) RADIO-NUCLIDE EACH CONTAINER	(22) PERCENT OF ACTIVITY or mCi of EACH NUCLIDE	(23) ACTIVITY EACH CONTAINER (mCi)	(24) PHYSICAL FORM	(25) CHEMICAL FORM and NAME & % of CHELATING AGENT	(26) WASTE DESCRIPTION	(27) WASTE FORM CLASS	(28) SPECIAL NUCLEAR MATERIAL (grams)	(29) SOURCE MATERIAL (pounds)	(30) CONTAINER WEIGHT (pounds)	(31) CONTAINER VOLUME (Cu Ft)	(32) CONTAINER TYPE	(33) RADIATION LEVELS (TI) CONTAINER SURFACE (x) mR/hr ( ) R/hr	(33) RADIATION LEVELS (TI) 1 Meter mR/hr	(34) CONTAMINATION CONTAINER SURFACE (DPM/100cm2) Alpha	(34) CONTAMINATION CONTAINER SURFACE (DPM/100cm2) Beta-Gamma	(35) FISSILE CLASS	(36) LABELS/MARKINGS USED
A38728	PU238	1.44E+03	9.28?E+04	SOLID	OXIDE	2-LITER BOTTLES	>C	3.84E+01	0.00	123	7.50	DRUM	< 5.00	< 0.08	< 20	< 200	III	Radioactive- N.O.S.
1890	PU239	1.77E+03																Radioactive-
NFS-0479	PU240	1.96E+03																Radioactive-
	PU241	8.48E+04																Radioactive-
	PU242	6.85E-01																Radioactive-
	AM241	2.88E+03																Radioactive-
																		Radioactive-
																		Radioactive-
																		Radioactive-
																		Radioactive-
A38726	PU238	2.53E+03	1.53?E+05	SOLID	OXIDE	2-LITER BOTTLES	>C	5.47E+01	0.00	122	7.50	DRUM	< 5.00	< 0.08	< 20	< 200	III	Radioactive- N.O.S.
1892	PU239	2.46E+03																Radioactive-
NFS-0479	PU240	2.97E+03																Radioactive-
	PU241	1.41E+05																Radioactive-
	PU242	1.22E+00																Radioactive-
	AM241	4.97E+03																Radioactive-
																		Radioactive-
																		Radioactive-
																		Radioactive-
																		Radioactive-
2			2.46?E+05			PAGE TOTALS		9.31E+01	0.00	245	15.00			< 0.16				

Form No.
( )

DISPOSAL SITE COPY

Appendix 1

CHECK SHEET for NFS DRUM RECEIPT

SWSA Foreman — **INITIALS**

1. 55-gallon drum NFS number 0481 —
2. Bar code sticker installed in two locations on the drum. JRA
3. Tamper Indicating Device (TID) is attached to the drum. TID # A38730 JRA
4. Drum is free from damage (visual inspection). JRA
5. Nuc-Filter is installed in the drum lid. JRA
6. Bolt ring is installed properly and bolt is torqued to 45-ft-lb. JRA
7. HP has surveyed the drum, UCN-2785 is attached. JRA
8. A "Hazardous Waste" label is on the drum (if required). JRA

Comments: _____

SWSA Foreman signature Jack L Adams Badge No. 16792 Date 12-6-93

RSWO Technician

9. Form UCN-2822 complete. YGC
10. Form TX-5352 complete. YGC
11. Form TX-5352A complete (if applicable). NA
12. IC number recorded on form UCN-2822. IC # 4226-43. YGC
13. ^{235}U equivalent fissile material total has been calculated. (6.70E+01 grams) YGC
14. Drum/documentation is accepted by RSWOG for WEAF inspection. YGC

Comments: _____

RSWO Technician signature YG Cleveland Badge No. 12661 Date 12-11-93

NFS Shipment IC#: 4226-43

Radionuclide	Specific Activity (Ci/g)	U235 Equivalent Factor	Container Number: NFS-0481		
			Act. (mCi)	Wght (g)	U235 Equiv (g)
U233	9.47E-03	1.40E+00			
U234					
U235	2.14E-06	1.00E+00			
U238					
Pu238	1.74E+01	2.30E-01	2.53E+03	1.45E-01	3.34E-02
Pu239	6.14E-02	1.56E+00	2.46E+03	4.01E+01	6.25E+01
Pu240			2.97E+03		
Pu241	1.12E+02	3.50E+00	1.41E+05	1.26E+00	4.41E+00
Pu242			1.22E+00		
Am241	3.24E+00	4.40E-02	4.97E+03	1.53E+00	6.75E-02
			TOTAL U235 Equiv (g):		**6.70E+01**

DRUM NO. NFS-0481

PROCUREMENT QUALITY
SOURCE SURVEILLANCE PLAN

PLAN NO.	REV. NO.
SS WMRA-106	Original
ISSUE DATE: 12-18-92	REV. DATE

ITEM NAME	VENDOR(S)	PAGE
Contact-Handled Transuranic and Mixed Oxide Waste	NFS/ECOTEK/SEG	1 of 2

P.O. NO. / ITEM	SPEC. NO. / REV.	DWG. NO. / REV.
	WMRA-WMPC-106 Contact-Handled Transuranic and Mixed Oxide Waste	

FOR ACTIVITIES — REFERENCE

SHIP TO: ORNL

SHIPMENT NO: 4226-43
(NO. 22 FROM NFS)

QUANITY: 16 55-GALLON DRUMS

TRANSURANIC WASTE

y affixing his signature or stamp to the checklist, the Field Quality epresentative (FQR) assures that he has reviewed or observed the activity nd verifies all Testing and Packaging operations were performed per pproved procedures.

lote: Some activities may be performed at SEG.

ACTIVITY	SOURCE SURVEILLANCE PLAN REFERENCE PARAGRAPH	STAMP/ SIGNATURE	DATE
1. Waste Certification Requirements	4.1 thru 4.9	MARTIN FOR 18	12/2/93
2. Containers	4.10	MARTIN FOR 18	
3. Immobilization	4.11	MARTIN FOR 18	
4. No Liquids	4.12	MARTIN FOR 18	
5. Pyrophoric Materials	4.13	MARTIN FOR 18	
6. No Explosives or Compressed gas	4.14	MARTIN FOR 18	
7. Hazardous Waste Characterization	4.15	MARTIN FOR 18	
8. Specific Activity	4.16	MARTIN FOR 18	
9. Weight	4.17	MARTIN FOR 18	
(ssile Content	4.18	MARTIN FOR 18	12/2/93

MARTIN FOR 18

DRUM NO. NFS-0481

PROCUREMENT QUALITY
SOURCE SURVEILLANCE PLAN

PLAN NO	REV. NO.
SS WMRA-106	Original
ISSUE DATE 12-18-92	REV. DATE

NAME	VENDOR(S)	PAGE
ntact-Handled Transuranic and ked Oxide Waste	NFS/ECOTEK/SEG	2 of 2

NO.	ITEM	SPEC. NO.	REV.	DWG. NO.	REV.
		WMRA-WMPC-106 Contact-Handled Transuranic and Mixed Oxide Waste			

FOR ACTIVITIES	REFERENCE	
Equivalent Activity	4.19	MARTIN FOR 18 12/2/93
Surface Dose Rate	4.20	MARTIN FOR 18
Surface Contamination	4.21	MARTIN FOR 18
Thermal Power	4.22	MARTIN FOR 18
Gas Generation	4.23	MARTIN FOR 18
Labeling	4.24	MARTIN FOR 18
Data Package	4.25	MARTIN FOR 18
Notification	6.0	MARTIN FOR 18
Certification	7.0	MARTIN FOR 18 12/2/93

m ATN: NFS-0239, 0240, 0249, 0257, 0258, 0280, 0313, 0326, 0329, 0330, 0331, 0333, 0463, 0464, 0479, 0481

nments:

R R.G. Williams Stamp MARTIN FOR 18 Date 12/2/93

R.G. WILLIAMS
MARTIN MARIETTA FQR

MARTIN FOR 18

Attachment 6

WASTE CERTIFICATION CHECKLIST FOR CH-TRU

Criteria	Specification	Supervisor Initial
1	WASTE CONTAINER: *(Interim package for SEG):*	TB
	DOT Spec 17C or 17H	TB
	Stainless Steel *(N/A)*	TB
	55-gallon capacity *(40-gallon capacity)*	TB
	polyethylene liner *(N/A)*	TB
	No handles, cleats, or lifting devices	
2	IMMOBILIZATION:	TB
	Particulate bearing material screened	TB
	Particulate immobilized	N/A
	Vermiculite added	
3	LIQUID WASTES:	TB
	No free liquids present	
4	PYROPHORIC MATERIALS:	TB
	No pyrophoric materials present	N/A
	Pyrophoric materials stabilized, if present; otherwise N/A	
5	EXPLOSIVES AND COMPRESSED GASES:	N/A
	Gas can pins removed / can compacted	TB
	No explosive material present	N/A
	Explosive material stabilized, if present; otherwise N/A	
6	RADIOACTIVE MIXED WASTES:	TB
	No 40CFR261/761 hazardous waste/substance present	N/A
	Material identified/quantified, if present; otherwise N/A	
7	ACTIVITY CONCENTRATION OF WASTE:	TB
	Waste package ≥ 100 nCi/gm	

1892

Criteria	Specification	Supervisor Initial
8	WASTE PACKAGE WEIGHT: Waste package ≤ 800 pounds	TB
9	NUCLEAR CRITICALITY: ^{239}Pu fissile gram equivalent ≤ 128 gm *(≤42 gm)*	TB
10	^{239}Pu EQUIVALENT ACTIVITY: ^{239}Pu equivalent activity ≤ 1,000 Ci *(≤333 Ci)*	TB
11	SURFACE DOSE RATE: Maximum surface dose rate ≤ 200 mRem/hr Neutron dose rate ≤ 20 mRem/hr Neutron dose reported if > 20 mRem/hr; otherwise N/A	TB TB N/A
12	SURFACE CONTAMINATION: Surface contamination ≤ 20 dpm/100cm² α Surface contamination ≤ 200 dpm/100cm² ß/γ	TB TB
13	THERMAL POWER: Thermal power ≤ .1 watt/ft³ Thermal power reported if ≥ .1 watt/ft³; otherwise N/A	~~TB~~ NA 12/1/93 ~~N/A~~ NA 12/1/93
14	GAS GENERATION: Polyethylene liner fitted with 3/8" hole *(N/A)* Drum lid bung fitted with HEPA filter (Torque) *(N/A)*	TB TB
15	LABELING: ORNL accountability transfer bar code attached	TB
16	DATA PACKAGE: Data package verified complete and accurate	TB/DJ
17	HEPA Filter torque: 15±1.5 ft-lbs. (raised nipple bung) 25±2.5 ft-lbs (flush bung) Closure Lug Bolt Torque - 45-50 ft. lbs; lock nut on outside	TB TB
18	Approved absorbent material added	TB

SIGNATURES:
Supervisor completing checksheet T. Bowman Date: 7-9-93
MTS QA review S. Toler Date: 12/1/93
Project Manager/Director Donald Spence Date: 12/1/93

MARTIN FOR JB

NONMIXED CH-TRU
VERIFICATION CHECKLIST
(DATA PACKAGE)

WASTE PACKAGE NO. NFS-0481

Note: A completed Data Package checklist must be generated with each 55-gal waste container during the verification process and will become part of the documentation retained for that waste package.

Data Package

1. Date of Packaging	✓
2. Max Surface Dose Rate	✓
3. Weight	✓
4. Physical Description	✓
5. Assay Information	✓
6. Radionuclide Data (Qual & Quan)	✓
7. Organics (Weight & Volume %)	✓
8. Thermal Power	✓
9. Shipment No.	✓
10. Date of Shipment	✓
11. Radionuclide Chemical Form	✓
12. Neutron Poisons	N/A
13. Iron Content	✓
14. Radionuclide Distribution	✓
15. Sampling Results (If Required)	N/A
16. Documentation	✓

Verification complete, Items 1 - 16 verified.

Laboratory Certification Official

1/5/94
Date

WEAF DATA ENTRY SYSTEM FOR THE NFS WASTE STORAGE PROJECT

DATA ENTRY VERIFICATION FORM (ver. 1.3)

Name Input	: S L Gottman	Waste Type	: TRU-IMM
ATN Number	: NFS-0481	Date of Input	: 12-14-93
Gross Weight (lb)	: 122	Date of Shipment	: 12-03-93
Tare Weight (lb)	: 100	Date of Receipt	: 12-03-93

Iron Content by Weight% : 8.00

TRU Activity Conc. (nCi/g): 1319613.00 Error: 317518.00 %error: 0.24

Pu239 Fissile Gram Eq. (g): 43.63 Error: 10.50 %error: 0.24

Pu239 Equiv. Activity (Ci): 15.46 Error: 3.72 %error: 0.24

Thermal Power (> 0.1W/ft^3) : 1.20 No. of 2-1 bottles: 3

Inhalation Dose Eq.(MOX ONLY): 0.00

Neutron Absorbers {text} : 0.0

ISOTOPE ACTIVITY (mCi)

U-233:	0.00E+00	Pu-238:	2.53E+03	Am-241:	4.97E+03
U-234:	0.00E+00	Pu-239:	2.46E+03		
U-235:	0.00E+00	Pu-240:	2.97E+03		
U-238:	0.00E+00	Pu-241:	1.41E+05		
		Pu-242:	1.22E+00		
Sum:	0.00E+00		1.49E+05		4.97E+03

Total Radioactivity Reported on Manifest (mCi): 1.54E+05

DRUM PROFILE FOR SUPERCOMPACTED WASTE

	Pack Number	Activity (mCi)	
Top Pack :	8621	4.45E+04	
Middle Pack :	8620	2.65E+04	Activity
Bottom Pack :	8619	8.29E+04	Total (mCi): 1.54E+05

Technician Notes:
Time > 1:00:28 PM

Signature: S L Gottman/dew Date: 12-20-93

Written to: D:\NFS\DATA\NFS_IN.TMP, WAC file: D:\NFS\V1.1\WAC.DAT
File saved as: D:\NFS\DATA\NFS0481.DAT

WEAF DATA ENTRY SYSTEM FOR THE NFS WASTE STORAGE PROJECT
CHECK OF COMPUTED VALUES AND NOMINAL EXPECTATION

ATN Number	: NFS-0481	Waste Type	: TRU-IMM
Gross Weight (lb)	: 122	Date of Input	: 12-14-93
Tare Weight (lb)	: 100	Density (g/cm3)	: 0.95
Net Weight (lb)	: 22.0		
Net Weight (kg)	: 10.0		

	Isotope	Activity (mCi)	Mass (g)	Element Mass(g)
	*U-233 :	0.00E+00	0.000	
	U-234 :	0.00E+00	0.000	
	U-235 :	0.00E+00	0.000	
	U-238 :	0.00E+00	0.000	0.000
	*PU-238 :	2.53E+03	0.148	
	*PU-239 :	2.46E+03	39.677	
	*PU-240 :	2.97E+03	13.084	
	PU-241 :	1.41E+05	1.369	
	*PU-242 :	1.22E+00	0.310	54.588
* TRU isotope	*AM-241 :	4.97E+03	1.449	1.449

ISOTOPICS

Total Mass---> 56.037

Weight percent U: 0.000

U233/U: 0.000
U234/U: 0.000
U235/U: 0.000
U238/U: 0.000

Weight percent Pu: 0.974

Pu238/Pu: 0.003
Pu239/Pu: 0.727
Pu240/Pu: 0.240
Pu241/Pu: 0.025
Pu242/Pu: 0.006

Weight percent Am: 0.0259

CALCULATIONS OF WASTE ACCEPTANCE CRITERIA

	Reported Qty.	Calculated Qty.
TRU Activity Concentration (nCi/g) :	1319613.000	1294675.625
Pu239 Fissile Gram Equivalent (g) :	43.630	43.225
Pu239 Equivalent Activity (Ci) :	15.460	15.466
Thermal Power (W/ft^3) :	1.200	1.204
Inhalation Dose Equivalent (g) :	0.000	0.000
U235 Equivalent Mass (g) :		67.450

RESULTS OF NOMINAL EXPECTATION TESTS

Isotopic weight%:
W% ERRORS---> U < 80% * Pu239/Pu < 90% *

WAC calculations:
CALCULATIONS ARE NOMINAL, WITHIN 3%

File Saved As: D:\NFS\DATA\NFS0481.DAT

DIVIDER PAGE

REQUEST FOR STORAGE OR DISPOSAL OF RADIOACTIVE SOLID WASTE OR SPECIAL MATERIALS

NOT A RECORD COPY

87764
~~87414~~
DJE 10/25/93

Requester: Executes this section before arranging material transfer

Date	Origin of Waste bldg. no.	Requester's Signature	Badge No.	Phone No.	Building/Mail Stop
09/17/93	NFS 110/234	T. Bennett			P.O. Box 1234 Erwin, TN 7702

(CHECK IF APPLICABLE)	Total Volume (Cu. Ft. only)	Combustible Vol. (Cu. Ft. only)	Weight (Lbs. only)	Accountability no. (mm.no.)
X OFFSITE	7.50	0.0	99	
___ CONSTRUCTION	Charge Work Order Number: 3325-7016		(FOR WASTE OPERATIONS USE ONLY) COST SYMBOL B	COST ADJUSTMENT

Waste Classification (check only one)

1. X TRU or U-233 (Retrievable) (>100μCi/Kg)
2. __ URANIUM/THORIUM
3. __ FISSION PRODUCT
4. __ INDUCED ACTIVITY
5. __ TRITIUM
6. __ BETA-GAMMA TRU or U-233 (>100μCi/Kg)
7. __ ALPHA TRU or U-233 (<100μCi/Kg) BETA-GAMMA TRU or U-233
8. __ OTHER _____
9. __ LANDFILL/SUSPECT
A. __ CONTAMINATED ASBESTOS

CAUTION
This information must NOT be released externally until it has been reviewed by the appropriate Classification and Information Control Office.

Type of Waste (check only one) BRIEF DESCRIPTION

__ (BW) BIOLOGICAL WASTE _____
__ (CE) CONTAMINATED EQUIPMENT _____
__ (DD) DECONTAMINATION DEBRIS _____
X (DS) DRY SOLIDS 2-LITER BOTTLES
__ (SS) SOLIDIFIED SLUDGE _____
__ (NC) NOT CLASSIFIED _____

CONTAINER TYPE (check only one)

1. X 55 GAL SS DRUM
2. __ 30 GAL SS DRUM
3. __ 4-1/2" WALL CONCRETE CASK
4. __ 6" WALL CONCRETE CASK
5. __ 12" WALL CONCRETE CASK
6. __ 55 GAL BI DRUM
7. __ 30 GAL BI DRUM
8. __ WOODEN BOX _____
9. __ OTHER
10. __ GI CAN
11. __ PLASTIC
12. __ DUMPSTER
13. __ NONE
14. __ CASK NO ____ WALLTHICKNESS ___IN. SHIELDING MTL ____
15. __ METAL BOX __

PRINCIPAL ISOTOPE(S): (BEST ESTIMATE)
*Refer to the Attached Manifests

1. IDENTITY ____	QUANTITY ____	__ GRAMS __ CURIES	2. IDENTITY ____	QUANTITY ____	__ GRAMS __ CURIES
3. IDENTITY ____	QUANTITY ____	__ GRAMS __ CURIES	4. IDENTITY ____	QUANTITY ____	__ GRAMS __ CURIES

REQUESTER'S COMMENTS FOR THOSE HANDLING WASTE IN THE FIELD:

TOTAL CURIES (BEST EST.)
8.534E+01

WMO FIELD REPRESENTATIVE (APPROVAL SIGNATURE): P G Cleveland
DATE: 11/7/93

HEALTH PHYSICIST: EXECUTES THIS SECTION BEFORE MATERIAL TRANSFER

RADIATION DATA:
BETA-GAMMA: FOR PACKAGE 10 mrem/hr. @ 0 in.

SURFACE CONT. <20 dpm (alpha): <200 dpm (beta/gamma): Neutron reading <0.5 mrem/hr

HP SURVEYOR'S COMMENTS FOR THOSE HANDLING WASTE IN THE FIELD:
Entered 11/8/93 KM
Billed 11/8/93 KM 12/27/ KSC

Drum ~~STN-NFS-07597~~ Shipment #: 4226-35	HP'S SIGNATURE	DATE

UCN-2822

STORAGE OR DISPOSAL OF RADIOACTIVE SOLID WASTE OR SPECIAL MATERIALS

DOCUMENT NO.
PAGE 2 87764

COMPACTION WASTE: COMPLETED AND THEN APPROVED BY SWSA FOREMAN

LOW LEVEL BOX INFORMATION

LL NUMBER	FULL BOX (Y/N)	FULL BOX WEIGHT	PORTION (FRACTION)	TOTAL POST-VOL	COMMENTS	FOR DMC USE ONLY
TOTALS						

Date of Compaction:

Compacting Operators:

and

SWSA Foreman's Signature:

SWSA FOREMAN COMPLETES AND APPROVES FOR NON-COMPACTED WASTE

Waste Was (check one): ☑ Retrievable ☐ Buried

SWSA No.: 5

Storage/Disposal Date: 11/8/93

ATN NO.: NFS 759

Low Level No.:

Facility (check one): ☑ Building ☐ Well ☐ Landfill ☐ Tumulus ☐ Trench ☐ On Ground Storage

Location No.: B 7879

Location Within Facility: Rank: File: Layer:

Waste Description: CH-TRU

Comments from SWSA Foreman regarding waste and/or operations:

Foreman's Signature: R. White

WASTE EXAMINATION (WEAF): COMPLETES AND FORWARDS TO DMC

Waste Inspection Level: ☒ RTR ☐ PAN/SGS

Rated: ☒ Pass ☐ Fail

Inspection Officier: J.E. Madison

Date: 1-4-94

DISTRIBUTION: Copy 1 - Attach to 2822 and forward to DMC
Copy 2 - Retained by SWSA Foreman
Copy 3 - Retained by WEAF/Compacting Team (If Applicable)

UCN-2822A
(3 12-91)

COPY 1

OAK RIDGE NATIONAL LABORATORY
MARTIN MARIETTA ENERGY SYSTEMS, INC.

USE THIS NUMBER ON ALL CONTINUATION PAGES

Generator Name: Nuclear Fuel Services, Inc.

Continuation Sheet

Shipment ID No: ICH: 4226-35

Disposal Container

(20) ITEM NUMBER	(21) RADIO-NUCLIDE EACH CONTAINER	(22) PERCENT OF ACTIVITY or mCi of EACH NUCLIDE	(23) ACTIVITY EACH CONTAINER (mCi)	(24) PHYSICAL FORM	(25) CHEMICAL FORM and NAME & % of CHELATING AGENT	(26) WASTE DESCRIPTION	(27) WASTE FORM CLASS	(28) SPECIAL NUCLEAR MATERIAL (grams)	(29) SOURCE MATERIAL (pounds)	(30) CONTAINER WEIGHT (pounds)	(31) CONTAINER VOLUME (Cu Ft)	(32) CONTAINER TYPE	(33) RADIATION LEVELS (TI) CONTAINER SURFACE (x) mR/hr ( ) R/hr	(33) 1 Meter mR/hr	(34) CONTAMINATION CONTAINER SURFACE (DPM/100cm2) Alpha	(34) Beta-Gamma	(35) FISSILE CLASS	(36) LABELS/MARKINGS USED
142601	U234	1.78E+02	7.120E+04	SOLID	OXIDE	2-LITER BOTTLES	>C	7.51E+01	1.45	102	7.50	DRUM	< 6.00	< 1.00	< 20	< 200	III	Radioactive- N.O.S.
2505	U235	1.37E-02	-05															Radioactive-
IFS-0757	U238	2.09E-01	-04															Radioactive-
	PU238	3.95E-02	-01															Radioactive-
	PU239	3.62E-02	00															Radioactive-
	PU240	2.09E-03	00															Radioactive-
	PU241	6.37E-04	+01															Radioactive-
	PU242	1.53E-01	-04															Radioactive-
	AM241	1.18E-03	00															Radioactive-
																		Radioactive-
142603	U234	4.11E-02	8.534E+04	SOLID	OXIDE	2-LITER BOTTLES	>C	7.78E+01	3.55	99	7.50	DRUM	<10.00	< 3.00	< 20	< 200	III	Radioactive- N.O.S.
2507	U235	3.79E-03	-06															Radioactive-
IFS-0759	U238	5.14E-01	-04															Radioactive-
	PU238	6.63E+02	-01															Radioactive-
	PU239	3.92E+03	00															Radioactive-
	PU240	2.62E+03	00															Radioactive-
	PU241	7.55E+04	+01															Radioactive-
	PU242	2.56E+01	-04															Radioactive-
	AM241	2.19E+03	00															Radioactive-
																		Radioactive-
			1.565E+05			PAGE TOTALS		1.53E+02	5.00	201	15.00			< 4.00				

Form No.
( )

DISPOSAL SITE COPY

TX-5352

DATA LOG SHEET FOR PACKAGING TRU WASTE

[An entry is required for each column. See instruction sheet for directions.]

Drum ATN: NFS-0759
Building No.: NFS 110/234
Room No.: _____

Content Code: _____ OR125A
_____ OR125B

1. Pak No.	2. Date	3. Radiation (mRem/h) Beta, Gamma	3. Radiation (mRem/h) Neut.	4. Activity (Ci)	5. Dominant Radionuclides	6. Physical Form	7. Chemical Form	8. Percent Comb.	9. Haz. Mtl (Y/N)	10. Signature	11. Data Log Sheet Verification Date	11. Data Log Sheet Verification Signature
7291-1	09/17/93			1.886E+01	* See Manifest	SOLID	OXIDE	0.0	N	O. Hedley	9.17.93	T. Bennett
7403-2	09/17/93			6.136E+01	* See Manifest	SOLID	OXIDE	0.0	N	↓	↓	↓
9606-3	09/17/93			5.122E+00	* See Manifest	SOLID	OXIDE	0.0	N	↓	↓	↓

Proper Drum Closure (Signature): T. Bennett

Generator Certification Official (Signature): T. Bennett

Authorized Radioactive Solid Waste Operations (Signature): LG Cleveland

Note: If column 9 = Yes, complete supplemental form TX-5352A.

TRU WASTE DATA PACKAGE

1. Drum ATN Number: NFS-0759
2. Shipment Number: TR#: 4226-35
3. Date Packaged: 09/17/93
4. Date of Shipment: 10/29/93 -01
5. Date Certified: 09/17/93
6. Gross Weight: 99 lbs, Tare: ~~81~~ 85 lbs

7. CONTENT INFORMATION (* See Attached Manifest for Isotopic Breakdown)

a. Physical Description: 2-LITER BOTTLES	
b. Chemical Form: OXIDE	c. Iron Content: 0.0 % by weight
d. Thermal Power: 8.5E-01 W/ft^3	e. Organic Content: 0.0 % by volume
f. Organic Content: 0.0 % by weight	g. ^{239}Pu - fissile gram equivalent: 67.05 +/- 9.95
h. Homogenous: [ ] YES [X] NO	i. ^{239}Pu - equivalent activity: 10.923 +/- 1.620 Ci
j. TRU Activity Concentration: 1479705 +/- 219485 nCi/gm	

8. HAZARDOUS CONSTITUENTS

Constituent	Concentration	Analytical Method
Not Present	0.000000000000	

Date of Analyses: 09/17/93

9. NEUTRON ABSORBERS PRESENT

Element	Weight %	Volume %	Analytical Method
Not Present	0.0	0.0	

Date of Analyses: 09/17/93

10. MAXIMUM SURFACE DOSE RATE

Beta / Gamma		Alpha	Neutron
< 200 dpm/100cm²	10 mrem/hr	< 20 dpm/100cm²	4.5 mrem/hr
Performed by: AL [signature]			Date: 9-18-93

MARTI FOR LB

FORM 28-001 09/92 REVISION 3 DECOMMISSIONING

OAK RIDGE NATIONAL LABORATORY
MARTIN MARIETTA ENERGY SYSTEMS, INC.

USE THIS NUMBER ON ALL CONTINUATION PAGES

Generator Name: Nuclear Fuel Services, Inc.

Continuation Sheet

Shipment ID No: ICR: 4226-35

Disposal Container

(20) ITEM NUMBER	(21) RADIO-NUCLIDE EACH CONTAINER	(22) PERCENT OF ACTIVITY or mCi of EACH NUCLIDE	(23) ACTIVITY EACH CONTAINER (mCi)	(24) PHYSICAL FORM	(25) CHEMICAL FORM and NAME & % of CHELATING AGENT	(26) WASTE DESCRIPTION	(27) WASTE FORM CLASS	(28) SPECIAL NUCLEAR MATERIAL (grams)	(29) SOURCE MATERIAL (pounds)	(30) CONTAINER WEIGHT (pounds)	(31) CONTAINER VOLUME (Cu Ft)	(32) CONTAINER TYPE	(33) RADIATION LEVELS (TI) CONTAINER SURFACE (x) mR/hr ( ) R/hr	(33) 1 Meter mR/hr	(34) CONTAMINATION CONTAINER SURFACE (DPM/100cm2) Alpha	(34) Beta-Gamma	(35) FISSILE CLASS	(36) LABELS/MARKINGS USED	
42601	U234	1.78E+02	7.120E+04	SOLID	OXIDE	2-LITER BOTTLES	>C	7.51E+01	1.45	102	7.50	DRUM	< 6.00	< 1.00	< 20	< 200	III	Radioactive-	N.O.S.
2505	U235	1.37E-02																Radioactive-	
IFS-0757	U238	2.09E-01																Radioactive-	
	PU238	3.95E+02																Radioactive-	
	PU239	3.62E+03																Radioactive-	
	PU240	2.09E+03																Radioactive-	
	PU241	6.37E+04																Radioactive-	
	PU242	1.53E-01																Radioactive-	
	AM241	1.18E+03																Radioactive-	
																		Radioactive-	
42603	U234	4.11E+02	8.534E+04	SOLID	OXIDE	2-LITER BOTTLES	>C	7.78E+01	3.55	99	7.50	DRUM	<10.00	< 3.00	< 20	< 200	III	Radioactive-	N.O.S.
2507	U235	3.79E-03																Radioactive-	
IFS-0759	U238	5.14E-01																Radioactive-	
	PU238	6.63E+02																Radioactive-	
	PU239	3.92E+03																Radioactive-	
	PU240	2.62E+03																Radioactive-	
	PU241	7.55E+04																Radioactive-	
	PU242	2.56E-01																Radioactive-	
	AM241	2.19E+03																Radioactive-	
																		Radioactive-	
			1.565E+05			PAGE TOTALS		1.53E+02	5.00	201	15.00			< 4.00					

Form No.
( )

DISPOSAL SITE COPY

Appendix 1 **CHECK SHEET for NFS DRUM RECEIPT**

SWSA Foreman		INITIALS
1.	55-gallon drum NFS number 759	
2.	Bar code sticker installed in two locations on the drum.	RLW
3.	Tamper Indicating Device (TID) is attached to the drum. TID # A42603	RLW
4.	Drum is free from damage (visual inspection).	RLW
5.	Nuc-Filter is installed in the drum lid.	RLW
6.	Bolt ring is installed properly and bolt is torqued to 45-ft-lb.	RLW
7.	HP has surveyed the drum, UCN-2785 is attached.	RLW
8.	A "Hazardous Waste" label is on the drum (if required).	NA

Comments: _____

SWSA Foreman signature R L White Badge No. 20405 Date 11/3/93

RSWO Technician		
9.	Form UCN-2822 complete.	PGC
10.	Form TX-5352 complete.	PGC
11.	Form TX-5352A complete (if applicable).	NA
12.	IC number recorded on form UCN-2822. IC # 4226-35	PGC
13.	^{235}U equivalent fissile material total has been calculated. (1.04E+02 grams)	PGC
14.	Drum/documentation is accepted by RSWOG for WEAF inspection.	PGC

Comments: _____

RSWO Technician signature P G Cleveland Badge No. 12661 Date 11/7/93

NFS Shipment IC#: 4226-35

Radionuclide	Specific Activity (Ci/g)	U235 Equivalent Factor	Container Number: NFS-0759		
			Act. (mCi)	Wght (g)	U235 Equiv (g)
U233	9.47E-03	1.40E+00			
U234			4.11E+02		
U235	2.14E-06	1.00E+00	3.79E-03	1.77E+00	1.77E+00
U238			5.14E-01		
Pu238	1.74E+01	2.30E-01	6.63E+02	3.81E-02	8.76E-03
Pu239	6.14E-02	1.56E+00	3.92E+03	6.38E+01	9.96E+01
Pu240			2.62E+03		
Pu241	1.12E+02	3.50E+00	7.55E+04	6.74E-01	2.36E+00
Pu242			2.56E-01		
Am241	3.24E+00	4.40E-02	2.19E+03	6.76E-01	2.97E-02
			TOTAL U235 Equiv (g):		**1.04E+02**

DRUM NO. NFS-0759

PROCUREMENT QUALITY
SOURCE SURVEILLANCE PLAN

PLAN NO.	REV. NO
SS WMRA-106	Original
ISSUE DATE	REV. DATE
12-18-92	

ITEM NAME	VENDOR(S)	PAGE
Contact-Handled Transuranic and Mixed Oxide Waste	NFS/ECOTEK/SEG	1 of 2
P.O NO / ITEM	SPEC. NO. / REV.	DWG. NO. / REV.
	WMRA-WMPC-106 Contact-Handled Transuranic and Mixed Oxide Waste	

FOR ACTIVITIES REFERENCE

SHIP TO: ORNL

SHIPMENT NO: 4226-35 (NO. 17 FROM NFS)

QUANITY: 16 55-GALLON DRUMS

TRANSURANIC WASTE

By affixing his signature or stamp to the checklist, the Field Quality Representative (FQR) assures that he has reviewed or observed the activity and verifies all Testing and Packaging operations were performed per approved procedures.

Note: Some activities may be performed at SEG.

ACTIVITY	SOURCE SURVEILLANCE PLAN REFERENCE PARAGRAPH	STAMP/ SIGNATURE	DATE
1. Waste Certification Requirements	4.1 thru 4.9	MARTIN FOR 18	10/28/93
2. Containers	4.10	MARTIN FOR 18	
3. Immobilization	4.11	MARTIN FOR 18	
4. No Liquids	4.12	MARTIN FOR 18	
5. Pyrophoric Materials	4.13	MARTIN FOR 18	
6. No Explosives or Compressed gas	4.14	MARTIN FOR 18	
7. Hazardous Waste Characterization	4.15	MARTIN FOR 18	
8. Specific Activity	4.16	MARTIN FOR 18	
9. Weight	4.17	MARTIN FOR 18	
0. Fissile Content	4.18	MARTIN FOR 18	10/28/93

Drum No. NFS-0759

PROCUREMENT QUALITY
SOURCE SURVEILLANCE PLAN

PLAN NO	REV. NO.
SS WMRA-106	Original
ISSUE DATE: 12-18-92	REV. DATE:

ITEM NAME	VENDOR(S)	PAGE
Contact-Handled Transuranic and Mixed Oxide Waste	NFS/ECOTEK/SEG	2 of 2

P.O. NO. / ITEM	SPEC. NO. / REV.	DWG. NO. / REV.
	WMRA-WMPC-106 Contact-Handled Transuranic and Mixed Oxide Waste	

FQR ACTIVITIES	REFERENCE	
11. Equivalent Activity	4.19	MARTIN FOR 18 10/28/94
12. Surface Dose Rate	4.20	MARTIN FOR 18
13. Surface Contamination	4.21	MARTIN FOR 18
14. Thermal Power	4.22	MARTIN FOR 18
15. Gas Generation	4.23	MARTIN FOR 18
16. Labeling	4.24	MARTIN FOR 18
17. Data Package	4.25	MARTIN FOR 18
18. Notification	6.0	MARTIN FOR 18
19. Certification	7.0	MARTIN FOR 18 10/28/94

Drum ATN: NFS-0376, NFS-0380, NFS-0381, NFS-0382, NFS-0383, NFS-0384, NFS-0385, NFS-0386, NFS-0404, NFS-0405, NFS-0406, NFS-0757, NFS-0759, NFS-0832, NFS-0833, NFS-0834

Comments:

FQR R.G. Williams Stamp MARTIN FOR 18 Date 10/28/94

R.G. WILLIAMS
MARTIN MARIETTA FQR

MARTIN FOR 18

2507
NFS-0754

Attachment 6

WASTE CERTIFICATION CHECKLIST FOR CH-TRU

Criteria	Specification		Supervisor Initial
1	WASTE CONTAINER:	*(Interim package for SEG):*	
	DOT Spec 17C or 17H		RM
	Stainless Steel	*(N/A)*	RM
	55-gallon capacity	*(40-gallon capacity)*	RM
	polyethylene liner	*(N/A)*	RM
	No handles, cleats, or lifting devices		RM
2	IMMOBILIZATION:		
	Particulate bearing material screened		~~N/A~~ TB 10/25/93
	Particulate immobilized		TB 10/25/93
	Vermiculite added		~~N/A~~ TB 10/25/93
3	LIQUID WASTES:		
	No free liquids present		RM
4	PYROPHORIC MATERIALS:		
	No pyrophoric materials present		RM
	Pyrophoric materials stabilized, if present; otherwise N/A		N/A
5	EXPLOSIVES AND COMPRESSED GASES:		
	Gas can pins removed / can compacted		N/A
	No explosive material present		RM
	Explosive material stabilized, if present; otherwise N/A		N/A
6	RADIOACTIVE MIXED WASTES:		
	No 40CFR261/761 hazardous waste/substance present		RM
	Material identified/quantified, if present; otherwise N/A		RM
7	ACTIVITY CONCENTRATION OF WASTE:		
	Waste package ≥ 100 nCi/gm		RM

ARTICLE FOR 18

Criteria	Specification	Supervisor Initial
8	WASTE PACKAGE WEIGHT: Waste package ≤ 800 pounds	RM
9	NUCLEAR CRITICALITY: ^{239}Pu fissile gram equivalent ≤ 128 gm *(≤42 gm)*	RM
10	^{239}Pu EQUIVALENT ACTIVITY: ^{239}Pu equivalent activity ≤ 1,000 Ci *(≤333 Ci)*	RM
11	SURFACE DOSE RATE: Maximum surface dose rate ≤ 200 mRem/hr Neutron dose rate ≤ 20 mRem/hr Neutron dose reported if > 20 mRem/hr; otherwise N/A	RM RM N/A
12	SURFACE CONTAMINATION: Surface contamination ≤ 20 dpm/100cm² α Surface contamination ≤ 200 dpm/100cm² ß/γ	RM RM
13	THERMAL POWER: Thermal power ≤ .1 watt/ft³ Thermal power reported if ≥ .1 watt/ft³; otherwise N/A	~~RM~~ N/A RE 10/25/93 ~~N/A~~ OK 10/25/93
14	GAS GENERATION: Polyethylene liner fitted with 3/8" hole *(N/A)* Drum lid bung fitted with HEPA filter (Torque) *(N/A)*	RM RM
15	LABELING: ORNL accountability transfer bar code attached	RM
16	DATA PACKAGE: Data package verified complete and accurate	RM/SS
17	HEPA Filter torque: 15±1.5 ft-lbs. (raised nipple bung) →25±2.5 ft-lbs (flush bung) Closure Lug Bolt Torque - 45-50 ft. lbs; lock nut on outside	RM RM
18	Approved absorbent material added	RM MARTIN FOR 18

SIGNATURES:
Supervisor completing checksheet R. Mitchell Date: 9-18-93
MTS QA review J. Toler Date: 10/27/93
Project Manager/Director T. Bennett for D. Lewis Date: 10-27-93

NONMIXED CH-TRU
VERIFICATION CHECKLIST
(DATA PACKAGE)

WASTE PACKAGE NO. NFS-0759

Note: A completed Data Package checklist must be generated with each 55-gal waste container during the verification process and will become part of the documentation retained for that waste package.

Data Package

1. Date of Packaging	✓
2. Max Surface Dose Rate	✓
3. Weight	✓
4. Physical Description	✓
5. Assay Information	✓
6. Radionuclide Data (Qual & Quan)	✓
7. Organics (Weight & Volume %)	✓
8. Thermal Power	✓
9. Shipment No.	✓
10. Date of Shipment	✓
11. Radionuclide Chemical Form	✓
12. Neutron Poisons	N/A
13. Iron Content	✓
14. Radionuclide Distribution	✓
15. Sampling Results (If Required)	N/A
16. Documentation	✓

Verification complete, Items 1 - 16 verified.

Laboratory Certification Official

12/17/93
Date

WEAF DATA ENTRY SYSTEM FOR THE NFS WASTE STORAGE PROJECT

DATA ENTRY VERIFICATION FORM

Name Input	: S L Gottman	Waste Type	: TRU-IMM
ATN Number	: NFS-0759	Date of Input	: 11-23-93
Gross Weight (lb)	: 99	Date of Shipment	: 10-29-93
Tare Weight (lb)	: 85	Date of Receipt	: 10-29-93

Iron Content by Weight% :	0.00			
TRU Activity Conc. (nCi/g):	1479705.00	Error:	219485.00	%error: 0.15
Pu239 Fissile Gram Eq. (g):	67.05	Error:	9.95	%error: 0.15
Pu239 Equiv. Activity (Ci):	10.92	Error:	1.62	%error: 0.15
Thermal Power (> 0.1W/ft^3) :	0.85			
Inhalation Dose Eq.(MOX ONLY):	0.00			
Neutron Absorbers {text} :	0.0			

ISOTOPE ACTIVITY (mCi)

U-233:	0.00E+00	Pu-238:	6.63E+02	Am-241:	2.19E+03
U-234:	4.11E+02	Pu-239:	3.92E+03		
U-235:	3.79E-03	Pu-240:	2.62E+03		
U-238:	5.14E-01	Pu-241:	7.55E+04		
		Pu-242:	2.56E-01		
Sum:	4.12E+02		8.27E+04		2.19E+03

Total Radioactivity Reported on Manifest (mCi): 8.53E+04

DRUM PROFILE FOR SUPERCOMPACTED WASTE

	Pack Number	Activity (mCi)	
Top Pack :	9606	5.12E+03	
Middle Pack :	7403	6.14E+04	Activity
Bottom Pack :	7291	1.89E+04	Total (mCi): 8.54E+04

Technician Notes:
Time > 12:59:02 PM

Signature: S. L. Gottman Date: 11/30/93

Written to: D:\NFS\DATA\NFS_IN.TMP, WAC file: D:\NFS\V1.1\WAC.DAT
File saved as: D:\NFS\DATA\NFS0759.DAT

WEAF DATA ENTRY SYSTEM FOR THE NFS WASTE STORAGE PROJECT
CHECK OF COMPUTED VALUES AND NOMINAL EXPECTATION

ATN Number	: NFS-0759	Waste Type	: TRU-IMM
Gross Weight (lb)	: 99	Date of Input	: 11-23-93
Tare Weight (lb)	: 85	Density (g/cm3)	: 0.61
Net Weight (lb)	: 14.0		
Net Weight (kg)	: 6.4		

	Isotope	Activity (mCi)	Mass (g)	Element Mass(g)
	*U-233 :	0.00E+00	0.000	
	U-234 :	4.11E+02	67.599	
	U-235 :	3.79E-03	1.788	
	U-238 :	5.14E-01	1552.870	%1622.257
	*PU-238 :	6.63E+02	0.039	
	*PU-239 :	3.92E+03	63.226	
	*PU-240 :	2.62E+03	11.542	
	PU-241 :	7.55E+04	0.733	
	*PU-242 :	2.56E-01	0.065	75.604
* TRU isotope	*AM-241 :	2.19E+03	0.638	0.638

ISOTOPICS

Total Mass---> 1698.500

Weight percent U: 0.955

U233/U: 0.000
U234/U: 0.042
U235/U: 0.001
U238/U: 0.957

Weight percent Pu: 0.045

Pu238/Pu: 0.001
Pu239/Pu: 0.836
Pu240/Pu: 0.153
Pu241/Pu: 0.010
Pu242/Pu: 0.001

Weight percent Am: 0.0004

CALCULATIONS OF WASTE ACCEPTANCE CRITERIA

	Reported Qty.	Calculated Qty.
TRU Activity Concentration (nCi/g) :	1479705.000	1477856.500
Pu239 Fissile Gram Equivalent (g) :	67.050	66.392
Pu239 Equivalent Activity (Ci) :	10.920	10.919
Thermal Power (W/ft^3) :	0.850	0.871
Inhalation Dose Equivalent (g) :	0.000	0.000
U235 Equivalent Mass (g) :		103.600

RESULTS OF NOMINAL EXPECTATION TESTS

Isotopic weight%:
W% ERRORS---> Pu239/Pu < 90% *

WAC calculations:
CALCULATIONS ARE NOMINAL, WITHIN 3%

File Saved As: D:\NFS\DATA\NFS0759.DAT

DIVIDER PAGE

Attachment D: Contact Handled Waste Repackaging Data Form

Page 1 of 3

Section 1: General Information			
Examination Start Date: 12-22-10		Originally packaged as RH Waste ☐ Yes ☑ No	
Container Number: NFS0757A			
Container Type: 55gal		Thickness of Bag Liner: 6 mil	
Bag Liner Description: ☑ Non-Rigid ☑ Filtered Vent ☑ Poly ☐ Rigid ☐ Non-vented ☐ Other:			
Waste Stream Identification #: OR-NFS-CH-Hom-A			
Physical waste form matches the assigned Waste Stream Description and RCRA characterization? ☐ NO ☑ YES			
New Waste Stream Identification Number if assigned			
Are sharp or heavy objects are blocked, braced, or packaged to provide puncture protection for the waste container? ☐ NO ☑ YES			
Volume Utilization Percentage: N/A %			
Number of Container Liners used: 1			
Closure Method for Container Liner: twist + Tape			
Number of Inner Bags: 0			
Verified no inner packages are heat sealed? ☐ NO ☑ YES			
Layers of Confinement: Number of Layers: 1			
Container Filter and Drum Enclosure Data Filter Torque Wrench Serial/ID No. 050750 4120 Calibration Due Date: 2/2/11 Lid Ring Bolt Torque Wrench: 508025907 4 Manufacturer's Closure spec: 60 ft lbs		Filter Model No. HT9424X00213 Serial No. 0368 Torque Value 6 ft lbs Calibration Due Date: 4-19-11	

Source Container #:	Waste Stream #:	Original Parent Container #:	Waste Stream #:
NFS0757	OR-NFS-CH-Hom-A		

Attachment D: Contact Handled Waste Repackaging Data Form

Page 2 of 3

Section 2: Waste Package Data			Data Page 1 of 1
Container Number: NFS0757A		Examination Date: 12-22-10	
Item #	If Drum Puck, SS or CS	Waste Item Description	
1	N/A	Grout container 8559 265 mR	
2	N/A	Grout container 8110 225 mR	
3	N/A	Grout container 7301 297 mR	
~~4~~ Lim 12/23/10	~~N/A~~		
4 WOTE 1			
Waste Repackaging Operator:	William S. Young (Print Name)	William S. Young (Signature)	12-22-10 (Date)

Attachment D: Contact Handled Waste Repackaging Data Form
Page 3 of 3

Section 3: Comments

Container Number:	NF50757A	Examination Date:	12-22-10

Waste repackaged in accordance with OPIP N/A ☑ Yes ☐ No ☐ If No, explanation required

OPIP #

Waste repackaged in accordance with WNCR N/A ☑ Yes ☐ No ☐ If No, explanation required

WNCR #

Grout container 8559 43 mR Shielded
Grout Container 8110 30 mR Shielded
Grout Container 7301 50 mR Shielded

NOTE 1: Data Entry Correction Run 12/23/10

Section 4: Approvals

Signature below signifies that waste in this container has been examined and determined to be acceptable waste forms.

Waste Repackaging Operator:		
William S. Young	William S Young	12-22-10
Print Name	Signature	Date

Waste Repackaging Data Form Reviewer:		
J.C.		12-22-10
Print Name	Signature	Date

Signature below signifies that the Waste Stream Identification Number has been verified to be consistent with the original parent container and that objective evidence of the Waste Stream Identification Number is included in the applicable Waste Container Traveler.

Waste Package Certifier:		
Bernie Moore	Bernie Moore	12-22-10
Print Name	Signature	Date

Attachment C: Bottle Placement Form

Drum Number NFS0757A

Tube Number	Bottom		Middle		Top	
1	Bottle Id:		Bottle Id:		Bottle Id:	
	Dose Rate:		Dose Rate:	NA W.S.Y. 12-22-10	Dose Rate:	
2	Bottle Id:		Bottle Id:		Bottle Id:	
	Dose Rate:		Dose Rate:		Dose Rate:	
3	Bottle Id:	8559	Bottle Id:	8110	Bottle Id:	7301
	Dose Rate:	265 mR	Dose Rate:	225 mR	Dose Rate:	297 mR
4	Bottle Id:		Bottle Id:		Bottle Id:	
	Dose Rate:		Dose Rate:		Dose Rate:	
5	Bottle Id:		Bottle Id:	NA W.S.Y. 12-22-10	Bottle Id:	
	Dose Rate:		Dose Rate:		Dose Rate:	
6	Bottle Id:		Bottle Id:		Bottle Id:	
	Dose Rate:		Dose Rate:		Dose Rate:	

Comments:

8559 43mR Shielded
8110 30mR Shielded W.S.Y. 12-22-10
7301 50mR Shielded

DIVIDER PAGE

REQUEST FOR STORAGE OR DISPOSAL OF RADIOACTIVE SOLID WASTE OR SPECIAL MATERIALS

~~NON-RECORD UNIT~~

87762
~~87412~~
DPE 10/25/93

Requester: Executes this section before arranging material transfer

Date	Origin of Waste bldg. no.	Requester's Signature	Badge No.	Phone No.	Building/Mail Stop
09/17/93	NFS 110/234	R. Mitchell			P.O. Box 1234 Erwin, TN 7702

(CHECK IF APPLICABLE)	Total Volume (Cu. Ft. only)	Combustible Vol. (Cu. Ft. only)	Weight (Lbs. only)	Accountability no. (mm.no.)
X OFFSITE	7.50	0.0	102	
___ CONSTRUCTION	Charge Work Order Number: 3325-7016		(FOR WASTE OPERATIONS USE ONLY) COST SYMBOL: B	COST ADJUSTMENT

Waste Classification (check only one)

1. X TRU or U-233 (Retrievable) (>100μCi/Kg)
2. __ URANIUM/THORIUM
3. __ FISSION PRODUCT
4. __ INDUCED ACTIVITY
5. __ TRITIUM
6. __ BETA-GAMMA TRU or U-233 (>100μCi/Kg)
7. __ ALPHA TRU or U-233 (<100μCi/Kg) BETA-GAMMA TRU or U-233
8. __ OTHER _____
9. __ LANDFILL/SUSPECT
A. __ CONTAMINATED ASBESTOS

CAUTION
This information must NOT be released externally until it has been reviewed by the appropriate Site Classification and Information Control Office.

Type of Waste (check only one) BRIEF DESCRIPTION

__ (BW) BIOLOGICAL WASTE _____
__ (CE) CONTAMINATED EQUIPMENT _____
__ (DD) DECONTAMINATION DEBRIS _____
__ (DS) DRY SOLIDS 2-LITER BOTTLES
__ (SS) SOLIDIFIED SLUDGE _____
__ (NC) NOT CLASSIFIED _____

CONTAINER TYPE (check only one)

1. X 55 GAL SS DRUM
2. __ 30 GAL SS DRUM
3. __ 4-1/2" WALL CONCRETE CASK
4. __ 6" WALL CONCRETE CASK
5. __ 12" WALL CONCRETE CASK
6. __ 55 GAL BI DRUM
7. __ 30 GAL BI DRUM
8. __ WOODEN BOX _____
9. __ OTHER
10. __ GI CAN
11. __ PLASTIC
12. __ DUMPSTER
13. __ NONE
14. __ CASK NO ____ WALLTHICKNESS ___IN. SHIELDING MTL ____
15. __ METAL BOX __

PRINCIPAL ISOTOPE(S): (BEST ESTIMATE)
*Refer to the Attached Manifests

1. IDENTITY ____	QUANTITY ____	__ GRAMS __ CURIES	2. IDENTITY ____	QUANTITY ____	__ GRAMS __ CURIES
3. IDENTITY ____	QUANTITY ____	__ GRAMS __ CURIES	4. IDENTITY ____	QUANTITY ____	__ GRAMS __ CURIES

REQUESTER'S COMMENTS FOR THOSE HANDLING WASTE IN THE FIELD:

TOTAL CURIES (BEST EST.) 7.120E+01

WMO FIELD REPRESENTATIVE (APPROVAL SIGNATURE): P G Cleveland

DATE: 11/7/93

HEALTH PHYSICIST: EXECUTES THIS SECTION BEFORE MATERIAL TRANSFER

RADIATION DATA:
BETA-GAMMA: FOR PACKAGE 6.0 mrem/hr. @ 0 in.

MARTIN FOR LB

SURFACE CONT. <20 dpm (alpha): <200 dpm (beta/gamma): Neutron reading <0.6 mrem/hr

HP SURVEYOR'S COMMENTS FOR THOSE HANDLING WASTE IN THE FIELD:

Entered 11/8/93 KM 12/2 KS
Billed 11/8/93 KM

Drum ATN: NFS-0757 Shipment #: 4226-35	HP'S SIGNATURE	DATE

UCN-2822

STORAGE OR DISPOSAL OF RADIOACTIVE SOLID WASTE OR SPECIAL MATERIALS

DOCUMENT NO. 87762
PAGE 2

COMPACTION WASTE: COMPLETED AND THEN APPROVED BY SWSA FOREMAN

LOW LEVEL BOX INFORMATION

LL NUMBER	FULL BOX (Y/N)	FULL BOX WEIGHT	PORTION (FRACTION)	TOTAL POST-VOL	COMMENTS	FOR DMC USE ONLY
TOTALS						

Date of Compaction:

Compacting Operators:

and

SWSA Foreman's Signature:

SWSA FOREMAN COMPLETES AND APPROVES FOR NON-COMPACTED WASTE

Waste Was (check one): ☑ Retrievable ☐ Buried

SWSA No.: 5

Storage/Disposal Date: 11/8/93

ATN NO.: NFS 757

Low Level No.:

Facility (check one): ☑ Building ☐ Well ☐ Landfill ☐ Tumulus ☐ Trench ☐ On Ground Storage

Location No.: B 7879

Location Within Facility: Rank: File: Layer:

Waste Description: CH-TRU

Comments from SWSA Foreman regarding waste and/or operations:

Foreman's Signature: R L White

WASTE EXAMINATION (WEAF): COMPLETES AND FORWARDS TO DMC

Waste Inspection Level: ☒ RTR ☐ PAN/SGS

Rated: ☒ Pass ☐ Fail

Inspection Officier: Sherry E. Williams

Date: 1-3-94

DISTRIBUTION: Copy 1 - Attach to 2822 and forward to DMC
Copy 2 - Retained by SWSA Foreman
Copy 3 - Retained by WEAF/Compacting Team (If Applicable)

UCN-2822A
(3 12-91)

COPY 1

OAK RIDGE NATIONAL LABORATORY
MARTIN MARIETTA ENERGY SYSTEMS, INC.

USE THIS NUMBER ON ALL CONTINUATION PAGES

Generator Name: Nuclear Fuel Services, Inc.

Continuation Sheet

Shipment ID No: ICH: 4226-35

Disposal Container

(20) ITEM NUMBER	(21) RADIO-NUCLIDE EACH CONTAINER	(22) PERCENT OF ACTIVITY or uCi of EACH NUCLIDE	(23) ACTIVITY EACH CONTAINER (uCi)	(24) PHYSICAL FORM	(25) CHEMICAL FORM and NAME & % of CHELATING AGENT	(26) WASTE DESCRIPTION	(27) WASTE FORM CLASS	(28) SPECIAL NUCLEAR MATERIAL (grams)	(29) SOURCE MATERIAL (pounds)	(30) CONTAINER WEIGHT (pounds)	(31) CONTAINER VOLUME (Cu Ft)	(32) CONTAINER TYPE	(33) RADIATION LEVELS CONTAINER SURFACE (x) mR/hr ( ) R/hr	(33) (T1) 1 Meter mR/hr	(34) CONTAMINATION CONTAINER SURFACE (DPM/100cm2) Alpha	(34) Beta-Gamma	(35) FISSILE CLASS	(36) LABELS/MARKINGS USED
42601	U234	1.78E-02	7.120E+04	SOLID	OXIDE	2-LITER BOTTLES	>C	7.51E+01	1.45	102	7.50	DRUM	< 6.00	< 1.00	< 20	< 200	III	Radioactive- N.O.S.
2505	U235	1.37E-03	-05															Radioactive-
IFS-0757	U238	2.09E-01	-04															Radioactive-
	PU238	3.95E+02	-01															Radioactive-
	PU239	3.62E+03	06															Radioactive-
	PU240	2.09E+03	00															Radioactive-
	PU241	6.37E+04	+01															Radioactive-
	PU242	1.53E-01	-04															Radioactive-
	AM241	1.18E+03	06															Radioactive-
																		Radioactive-
42603	U234	4.11E+02	8.534E+04	SOLID	OXIDE	2-LITER BOTTLES	>C	7.78E+01	3.55	99	7.50	DRUM	<10.00	< 3.00	< 20	< 200	III	Radioactive- N.O.S.
2507	U235	3.79E-03	-06															Radioactive-
IFS-0759	U238	5.14E-01	-04															Radioactive-
	PU238	6.63E+02	-01															Radioactive-
	PU239	3.92E+03	00															Radioactive-
	PU240	2.62E+03	00															Radioactive-
	PU241	7.55E+04	+01															Radioactive-
	PU242	2.56E-01	-04															Radioactive-
	AM241	2.19E+03	00															Radioactive-
																		Radioactive-
		1.565E+05				PAGE TOTALS		1.53E+02	5.00	201	15.00			< 4.00				

Form No.
( )

DISPOSAL SITE COPY

TX-5352

DATA LOG SHEET FOR PACKAGING TRU WASTE

[An entry is required for each column. See instruction sheet for directions.]

Drum ATN: NFS-0757
Building No.: NFS 110/234
Room No.: _____

Content Code: _____ OR125A
_____ OR125B

1. Pak No.	2. Date	3. Radiation (mRem/h) Beta, Gamma	3. Radiation (mRem/h) Neut.	4. Activity (Ci)	5. Dominant Radionuclides	6. Physical Form	7. Chemical Form	8. Percent Comb.	9. Haz. Mtl (Y/N)	10. Signature	11. Data Log Sheet Verification Date	11. Data Log Sheet Verification Signature
7301-1	09/17/93			4.540E+01	* See Manifest	SOLID	OXIDE	0.0	N	R Campbell	9-17-93	R Mitchell
8110-2	09/17/93			1.251E+01	* See Manifest	SOLID	OXIDE	0.0	N	↓	↓	↓
8559-3	09/17/93			1.329E+01	* See Manifest	SOLID	OXIDE	0.0	N	↓	↓	↓

Proper Drum Closure (Signature): R. Mitchell

Generator Certification Official (Signature): R. Mitchell

Authorized Radioactive Solid Waste Operations (Signature): T G Cleveland

Note: If column 9 = Yes, complete supplemental form TX-5352A.

TRU WASTE DATA PACKAGE

1. Drum ATN Number: NFS-0757
2. Shipment Number: IC#: 4226-35
3. Date Packaged: 09/17/93
4. Date of Shipment: 10/29/93
5. Date Certified: 09/17/93
6. Gross Weight: 102 lbs, Tare: ~~81~~ RC lbs 83.0

7. CONTENT INFORMATION (* See Attached Manifest for Isotopic Breakdown)

a. Physical Description: 2-LITER BOTTLES	
b. Chemical Form: OXIDE	c. Iron Content: 0.0 % by weight
d. Thermal Power: 6.5E-01 W/ft^3	e. Organic Content: 0.0 % by volume
f. Organic Content: 0.0 % by weight	g. ^{239}Pu - fissile gram equivalent: 64.81 +/- 13.79
h. Homogenous: [ ] YES [X] NO	i. ^{239}Pu - equivalent activity: 8.539 +/- 1.817 Ci
j. TRU Activity Concentration: 844626 +/- 179702 nCi/gm	

8. HAZARDOUS CONSTITUENTS

Constituent	Concentration	Analytical Method
Not Present	0.000000000000	

Date of Analyses: 09/17/93

9. NEUTRON ABSORBERS PRESENT

Element	Weight %	Volume %	Analytical Method
Not Present	0.0	0.0	

Date of Analyses: 09/17/93

10. MAXIMUM SURFACE DOSE RATE

Beta / Gamma	Alpha	Neutron
< 200 dpm/100cm^2 6.0 mrem/hr	< 20 dpm/100cm^2	< 5 mrem/hr
Performed by: B.L. Bill Lewis		Date: 9-18-93

MARTIN FOR 18

OAK RIDGE NATIONAL LABORATORY
MARTIN MARIETTA ENERGY SYSTEMS, INC.

USE THIS NUMBER ON ALL CONTINUATION PAGES

Generator Name: Nuclear Fuel Services, Inc.

Continuation Sheet

Shipment ID No: ICW: 4226-35

Disposal Container

(20) ITEM NUMBER	(21) RADIONUCLIDE EACH CONTAINER	(22) PERCENT OF ACTIVITY or mCi of EACH NUCLIDE	(23) ACTIVITY EACH CONTAINER (mCi)	(24) PHYSICAL FORM	(25) CHEMICAL FORM and NAME & % of CHELATING AGENT	(26) WASTE DESCRIPTION	(27) WASTE FORM CLASS	(28) SPECIAL NUCLEAR MATERIAL (grams)	(29) SOURCE MATERIAL (pounds)	(30) CONTAINER WEIGHT (pounds)	(31) CONTAINER VOLUME (Cu Ft)	(32) CONTAINER TYPE	(33) RADIATION LEVELS CONTAINER SURFACE (x) mR/hr ( ) R/hr	(33) (TI) 1 Meter mR/hr	(34) CONTAMINATION CONTAINER SURFACE (DPM/100cm2) Alpha	(34) Beta-Gamma	(35) FISSILE CLASS	(36) LABELS/MARKINGS USED	
42601	U234	1.78E+02	7.120E+04	SOLID	OXIDE	2-LITER BOTTLES	>C	7.51E+01	1.45	102	7.50	DRUM	< 6.00	< 1.00	< 20	< 200	III	Radioactive-	N.O.S.
2505	U235	1.37E-02																Radioactive-	
IFS-0757	U238	2.09E-01																Radioactive-	
	PU238	3.95E+02																Radioactive-	
	PU239	3.62E+03																Radioactive-	
	PU240	2.09E+03																Radioactive-	
	PU241	6.37E+04																Radioactive-	
	PU242	1.53E-01																Radioactive-	
	AM241	1.18E+03																Radioactive-	
																		Radioactive-	
42603	U234	4.11E+02	8.534E+04	SOLID	OXIDE	2-LITER BOTTLES	>C	7.78E+01	3.55	99	7.50	DRUM	<10.00	< 3.00	< 20	< 200	III	Radioactive-	N.O.S.
2507	U235	3.79E-03																Radioactive-	
IFS-0759	U238	5.14E-01																Radioactive-	
	PU238	6.63E+02																Radioactive-	
	PU239	3.92E+03																Radioactive-	
	PU240	2.62E+03																Radioactive-	
	PU241	7.55E+04																Radioactive-	
	PU242	2.56E-01																Radioactive-	
	AM241	2.19E+03																Radioactive-	
																		Radioactive-	
			1.565E+05			PAGE TOTALS		1.53E+02	5.00	201	15.00			< 4.00					

Form No.
( )

DISPOSAL SITE COPY

Appendix 1

CHECK SHEET for NFS DRUM RECEIPT

SWSA Foreman — **INITIALS**

1. 55-gallon drum NFS number 757 — RLW
2. Bar code sticker installed in two locations on the drum. — RLW
3. Tamper Indicating Device (TID) is attached to the drum. TID # A42601 — RLW
4. Drum is free from damage (visual inspection). — RLW
5. Nuc-Filter is installed in the drum lid. — RLW
6. Bolt ring is installed properly and bolt is torqued to 45-ft-lb. — RLW
7. HP has surveyed the drum, UCN-2785 is attached. — RLW
8. A "Hazardous Waste" label is on the drum (if required). — NA

Comments: _____

SWSA Foreman signature RL White Badge No. 20405 Date 11/3/93

RSWO Technician

9. Form UCN-2822 complete. — YGC
10. Form TX-5352 complete. — YGC
11. Form TX-5352A complete (if applicable). — NA
12. IC number recorded on form UCN-2822. IC # 4226-35 — YGC
13. ^{235}U equivalent fissile material total has been calculated. (1.00 E+02 grams) — YGC
14. Drum/documentation is accepted by RSWOG for WEAF inspection. — YGC

Comments: _____

RSWO Technician signature YG Cleveland Badge No. 13661 Date 11/7/93

NFS Shipment IC#: 4226-35

Radionuclide	Specific Activity (Ci/g)	U235 Equivalent Factor	Container Number: NFS-0757		
			Act. (mCi)	Wght (g)	U235 Equiv (g)
U233	9.47E-03	1.40E+00			
U234			1.78E+02		
U235	2.14E-06	1.00E+00	1.37E-02	6.40E+00	6.40E+00
U238			2.09E-01		
Pu238	1.74E+01	2.30E-01	3.95E+02	2.27E-02	5.22E-03
Pu239	6.14E-02	1.56E+00	3.62E+03	5.90E+01	9.20E+01
Pu240			2.09E+03		
Pu241	1.12E+02	3.50E+00	6.37E+04	5.69E-01	1.99E+00
Pu242			1.53E-01		
Am241	3.24E+00	4.40E-02	1.18E+03	3.64E-01	1.60E-02
			TOTAL U235 Equiv (g):		1.00E+02

DRUM NO. NFS-0257

PROCUREMENT QUALITY
SOURCE SURVEILLANCE PLAN

PLAN NO.	REV. NO.
SS WMRA-106	Original
ISSUE DATE: 12-18-92	REV. DATE

ITEM NAME	VENDOR(S)	PAGE
Contact-Handled Transuranic and Mixed Oxide Waste	NFS/ECOTEK/SEG	1 of 2
P.O. NO. / ITEM	SPEC. NO. / REV.	DWG. NO. / REV.
	WMRA-WMPC-106 Contact-Handled Transuranic and Mixed Oxide Waste	

FOR ACTIVITIES — REFERENCE

SHIP TO: ORNL

SHIPMENT NO: 4226-35 (NO. 17 FROM NFS)

QUANITY: 16 55-GALLON DRUMS

TRANSURANIC WASTE

y affixing his signature or stamp to the checklist, the Field Quality epresentative (FQR) assures that he has reviewed or observed the activity id verifies all Testing and Packaging operations were performed per pproved procedures.

ote: Some activities may be performed at SEG.

ACTIVITY	SOURCE SURVEILLANCE PLAN REFERENCE PARAGRAPH	STAMP/ SIGNATURE	DATE
.. Waste Certification Requirements	4.1 thru 4.9	MARTIN FOR 18	10/28/93
2. Containers	4.10	MARTIN FOR 18	
3. Immobilization	4.11	MARTIN FOR 18	
4. No Liquids	4.12	MARTIN FOR 18	
5. Pyrophoric Materials	4.13	MARTIN FOR 18	
6. No Explosives or Compressed gas	4.14	MARTIN FOR 18	
7. Hazardous Waste Characterization	4.15	MARTIN FOR 18	
8. Specific Activity	4.16	MARTIN FOR 18	
9. Weight	4.17	MARTIN FOR 18	
0. Fissile Content	4.18	MARTIN FOR 18	10/28/93

Drum No. NFS-0757

PROCUREMENT QUALITY
SOURCE SURVEILLANCE PLAN

PLAN NO	REV. NO.
SS WMRA-106	Original
ISSUE DATE 12-18-92	REV. DATE

ITEM NAME	VENDOR(S)	PAGE
Contact-Handled Transuranic and Mixed Oxide Waste	NFS/ECOTEK/SEG	2 of 2

P.O. NO. / ITEM	SPEC. NO. / REV.	DWG. NO. / REV.
	WMRA-WMPC-106 Contact-Handled Transuranic and Mixed Oxide Waste	

FOR ACTIVITIES	REFERENCE	
1. Equivalent Activity	4.19	MARTIN FOR 18 10/28/94
2. Surface Dose Rate	4.20	MARTIN FOR 18
3. Surface Contamination	4.21	MARTIN FOR 18
4. Thermal Power	4.22	MARTIN FOR 18
5. Gas Generation	4.23	MARTIN FOR 18
6. Labeling	4.24	MARTIN FOR 18
7. Data Package	4.25	MARTIN FOR 18
8. Notification	6.0	MARTIN FOR 18
9. Certification	7.0	MARTIN FOR 18 10/28/94

Drum ATN: NFS-0376, NFS-0380, NFS-0381, NFS-0382, NFS-0383, NFS-0384, NFS-0385, NFS-0386, NFS-0404, NFS-0405, NFS-0406, NFS-0757, NFS-0759, NFS-0832, NFS-0833, NFS-0834

Comments:

FQR R.G. Williams Stamp MARTIN FOR EQR 18 Date 10/28/93

R.G. Williams
Martin Marietta FQR

MARTIN FOR 18

2113215
A42601
2505
NFS-0757

Attachment 6

WASTE CERTIFICATION CHECKLIST FOR CH-TRU

Criteria	Specification	Supervisor Initial
1	WASTE CONTAINER: *(Interim package for SEG):*	
	DOT Spec 17C or 17H	RM
	Stainless Steel *(N/A)*	RM
	55-gallon capacity *(40-gallon capacity)*	RM
	polyethylene liner *(N/A)*	RM
	No handles, cleats, or lifting devices	RM
2	IMMOBILIZATION:	
	Particulate bearing material screened	RM
	Particulate immobilized	RM
	Vermiculite added	N/A
3	LIQUID WASTES:	
	No free liquids present	RM
4	PYROPHORIC MATERIALS:	
	No pyrophoric materials present	RM
	Pyrophoric materials stabilized, if present; otherwise N/A	N/A
5	EXPLOSIVES AND COMPRESSED GASES:	
	Gas can pins removed / can compacted	N/A
	No explosive material present	RM
	Explosive material stabilized, if present; otherwise N/A	N/A
6	RADIOACTIVE MIXED WASTES:	
	No 40CFR261/761 hazardous waste/substance present	RM
	Material identified/quantified, if present; otherwise N/A	RM
7	ACTIVITY CONCENTRATION OF WASTE:	RM

Criteria	Specification	Supervisor Initial
8	WASTE PACKAGE WEIGHT: Waste package ≤ 800 pounds	RM
9	NUCLEAR CRITICALITY: ^{239}Pu fissile gram equivalent ≤ 128 gm (≤ 42 gm)	RM
10	^{239}Pu EQUIVALENT ACTIVITY: ^{239}Pu equivalent activity ≤ 1,000 Ci (≤ 333 Ci)	RM
11	SURFACE DOSE RATE: Maximum surface dose rate ≤ 200 mRem/hr Neutron dose rate ≤ 20 mRem/hr Neutron dose reported if > 20 mRem/hr; otherwise N/A	RM RM N/A
12	SURFACE CONTAMINATION: Surface contamination ≤ 20 dpm/100cm^2 α Surface contamination ≤ 200 dpm/100cm^2 ß/γ	RM RM
13	THERMAL POWER: Thermal power ≤ .1 watt/ft^3 Thermal power reported if ≥ .1 watt/ft^3; otherwise N/A	N/A RM
14	GAS GENERATION: Polyethylene liner fitted with 3/8" hole (N/A) Drum lid bung fitted with HEPA filter (Torque) (N/A)	RM RM
15	LABELING: ORNL accountability transfer bar code attached	RM
16	DATA PACKAGE: Data package verified complete and accurate	TB/JJ
17	HEPA Filter torque: 15±1.5 ft-lbs. (raised nipple bung) →25±2.5 ft-lbs (flush bung) Closure Lug Bolt Torque - 45-50 ft. lbs; lock nut on outside	RM RM
18	Approved absorbent material added	RM

SIGNATURES:
Supervisor completing checkshee R. Mitchell Date: 9-18-93
TTS QA review J Toler Date: 10/27/93
Project Manager/Director T. Bennett for D. Lewis Date: 10-27-93

MARTIN FOR 18

NONMIXED CH-TRU
VERIFICATION CHECKLIST
(DATA PACKAGE)

WASTE PACKAGE NO. NFS-0257

Note: A completed Data Package checklist must be generated with each 55-gal waste container during the verification process and will become part of the documentation retained for that waste package.

Data Package

1. Date of Packaging	✓
2. Max Surface Dose Rate	✓
3. Weight	✓
4. Physical Description	✓
5. Assay Information	✓
6. Radionuclide Data (Qual & Quan)	✓
7. Organics (Weight & Volume %)	✓
8. Thermal Power	✓
9. Shipment No.	✓
10. Date of Shipment	✓
11. Radionuclide Chemical Form	✓
12. Neutron Poisons	N/A
13. Iron Content	✓
14. Radionuclide Distribution	✓
15. Sampling Results (If Required)	N/A
16. Documentation	✓

Verification complete, Items 1 - 16 verified.

Laboratory Certification Official

12/17/93
Date

WEAF DATA ENTRY SYSTEM FOR THE NFS WASTE STORAGE PROJECT

DATA ENTRY VERIFICATION FORM

Name Input	: S L Gottman	Waste Type	: TRU-IMM
ATN Number	: NFS-0757	Date of Input	: 11-23-93
Gross Weight (lb)	: 102	Date of Shipment	: 10-29-93
Tare Weight (lb)	: 83	Date of Receipt	: 10-29-93

Iron Content by Weight% :	0.00			
TRU Activity Conc. (nCi/g):	844626.00	Error:	179702.00	%error: 0.21
Pu239 Fissile Gram Eq. (g):	64.81	Error:	13.79	%error: 0.21
Pu239 Equiv. Activity (Ci):	8.54	Error:	1.82	%error: 0.21
Thermal Power (> 0.1W/ft^3) :	0.65			
Inhalation Dose Eq.(MOX ONLY):	0.00			
Neutron Absorbers {text} :	0.0			

ISOTOPE ACTIVITY (mCi)

U-233:	0.00E+00	Pu-238:	3.95E+02	Am-241:	1.18E+03
U-234:	1.78E+02	Pu-239:	3.62E+03		
U-235:	1.37E-02	Pu-240:	2.09E+03		
U-238:	2.09E-01	Pu-241:	6.37E+04		
		Pu-242:	1.53E-01		
Sum:	1.78E+02		6.98E+04		1.18E+03

Total Radioactivity Reported on Manifest (mCi): 7.12E+04

DRUM PROFILE FOR SUPERCOMPACTED WASTE

	Pack Number	Activity (mCi)	
Top Pack :	8559	1.33E+04	
Middle Pack :	8110	1.25E+04	Activity
Bottom Pack :	7301	4.54E+04	Total (mCi): 7.12E+04

Technician Notes:
Time > 1:04:59 PM

Signature: S.L. Gottman Date: 11/30/93

Written to: D:\NFS\DATA\NFS_IN.TMP, WAC file: D:\NFS\V1.1\WAC.DAT
File saved as: D:\NFS\DATA\NFS0757.DAT

WEAF DATA ENTRY SYSTEM FOR THE NFS WASTE STORAGE PROJECT
CHECK OF COMPUTED VALUES AND NOMINAL EXPECTATION

ATN Number	: NFS-0757	Waste Type	: TRU-IMM
Gross Weight (lb)	: 102	Date of Input	: 11-23-93
Tare Weight (lb)	: 83	Density (g/cm3)	: 0.82
Net Weight (lb)	: 19.0		
Net Weight (kg)	: 8.6		

Isotope	Activity (mCi)	Mass (g)	Element Mass(g)
*U-233 :	0.00E+00	0.000	
U-234 :	1.78E+02	29.276	
U-235 :	1.37E-02	6.462	
U-238 :	2.09E-01	631.420	667.159
*PU-238 :	3.95E+02	0.023	
*PU-239 :	3.62E+03	58.387	
*PU-240 :	2.09E+03	9.207	
PU-241 :	6.37E+04	0.618	
*PU-242 :	1.53E-01	0.039	68.275
* TRU isotope *AM-241 :	1.18E+03	0.344	0.344

ISOTOPICS

Total Mass---> 735.777

Weight percent U: 0.907

U233/U: 0.000
U234/U: 0.044
U235/U: 0.010
U238/U: 0.946

Weight percent Pu: 0.093

Pu238/Pu: 0.000
Pu239/Pu: 0.855
Pu240/Pu: 0.135
Pu241/Pu: 0.009
Pu242/Pu: 0.001

Weight percent Am: 0.0005

CALCULATIONS OF WASTE ACCEPTANCE CRITERIA

	Reported Qty.	Calculated Qty.
TRU Activity Concentration (nCi/g) :	844626.000	844557.438
Pu239 Fissile Gram Equivalent (g) :	64.810	64.206
Pu239 Equivalent Activity (Ci) :	8.540	8.544
Thermal Power (W/ft^3) :	0.650	0.660
Inhalation Dose Equivalent (g) :	0.000	0.000
U235 Equivalent Mass (g) :		100.192

RESULTS OF NOMINAL EXPECTATION TESTS

Isotopic weight%:
W% ERRORS---> Pu239/Pu < 90% *

WAC calculations:
CALCULATIONS ARE NOMINAL, WITHIN 3%

File Saved As: D:\NFS\DATA\NFS0757.DAT

DIVIDER PAGE

Attachment D: Contact Handled Waste Repackaging Data Form

Page 1 of 3

Section 1: General Information	
Examination Start Date: 10-14-09	
Container Number: X10CSetN03210A	
Container Type: 55 GAL	Thickness of Bag Liner: 6 mil
Bag Liner Description: ☒ Non-Rigid ☒ Filtered Vent ☒ Poly ☐ Rigid ☐ Non-vented ☐ Other:	
Waste Stream Identification #: OR-Reoc-RH-Het	
Physical waste form matches the assigned Waste Stream Description and RCRA characterization? ☐ NO ☑ YES	
New Waste Stream Identification Number if assigned	
Are sharp or heavy objects are blocked, braced, or packaged to provide puncture protection for the waste container? ☐ NO ☑ YES	
Volume Utilization Percentage: 95 %	
Number of Container Liners used: 1	
Closure Method for Container Liner: TWIST & TAPE	
Number of Inner Bags: 0	
Verified no inner packages are heat sealed? ☐ NO ☑ YES	
Layers of Confinement: Number of Layers: 1	

Container Filter and Drum Enclosure Data

Filter Torque Wrench
Serial/ID No. 0507504120
Calibration Due Date: 10-17-09

Filter Model No. UT9424X 00201
Serial No. 0105
Torque Value 6 ft. lbs.

Lid Ring Bolt Torque Wrench: 3060106592
Manufacturer's Closure spec: 60 +1 18

Calibration Due Date: 8-10-10

Source Container #:	Waste Stream #:	Original Parent Container #:	Waste Stream #:
X10CSetN03210	OR-Reoc-RH-Het		

Attachment D: Contact Handled Waste Repackaging Data Form

Page 2 of 3

Section 2: Waste Package Data			Data Page 1 of 1
Container Number: X10C5at00321OA			Examination Date: 10-14-09
Item #	**If Drum Puck, SS or CS**	**Waste Item Description**	
1		Poly Bucket ~~DEI~~ Pieces, plastic BAGS, Cask Remnant, metal LiDS, MSM Boot piece. Note #1 10/14/09 JL	
Waste Repackaging Operator:		WAYNE LEMONS (Print Name)	Signature / Date: 10-14-09

Attachment D: Contact Handled Waste Repackaging Data Form

Page 3 of 3

Section 3: Comments			
Container Number:	X10CS4tN03210A	**Examination Date:**	10-14-09
Note #1 Data entry corrected 10/14/09 TA			

Section 4: Approvals		
Signature below signifies that waste in this container has been examined and determined to be acceptable waste forms.		
Waste Repackaging Operator:		
WAYNE LEMONS	Wayne Lemons	10-14-09
Print Name	**Signature**	**Date**
Waste Repackaging Data Form Reviewer:		
FRANK ANDERSON	Frank Anderson	10/14/09
Print Name	**Signature**	**Date**
Signature below signifies that the Waste Stream Identification Number has been verified to be consistent with the original parent container and that objective evidence of the Waste Stream Identification Number is included in the applicable Waste Container Traveler.		
Waste Package Certifier:		
Anthony Presley	Anthony Presley	10-15-09
Print Name	**Signature**	**Date**

Attachment D: Contact Handled Waste Repackaging Data Form

Page 1 of 3

Section 1: General Information	
Examination Start Date: 10-15-09	
Container Number: X10C Sat No 3210B	
Container Type: 55 gal	Thickness of Bag Liner: 6 mil
Bag Liner Description: ☒ Non-Rigid ☒ Filtered Vent ☒ Poly ☐ Rigid ☐ Non-vented ☐ Other:	
Waste Stream Identification #: OR-REOC-RH-Het	
Physical waste form matches the assigned Waste Stream Description and RCRA characterization? ☐ NO ☒ YES	
New Waste Stream Identification Number if assigned	
Are sharp or heavy objects are blocked, braced, or packaged to provide puncture protection for the waste container? ☐ NO ☒ YES	
Volume Utilization Percentage: 95 %	
Number of Container Liners used: 1	
Closure Method for Container Liner: Twist + Tape	
Number of Inner Bags: 0	
Verified no inner packages are heat sealed? ☐ NO ☒ YES	
Layers of Confinement: Number of Layers: 1	

Container Filter and Drum Enclosure Data

Filter Torque Wrench Serial/ID No. A000248 Calibration Due Date: 10,17,09

Filter Model No. 4T9424X00201 Serial No. 0262 Torque Value 64.165

Lid Ring Bolt Torque Wrench: 5060106592 Calibration Due Date: 8-10-10

Manufacturer's Closure spec: 60 ft lb

Source Container #:	Waste Stream #:	Original Parent Container #:	Waste Stream #:
X10C Sat No 3210	OR-REOC-RH-Het		

Attachment D: Contact Handled Waste Repackaging Data Form

Page 2 of 3

Section 2: Waste Package Data			Data Page 1 of 1
Container Number: X10C sat NO 3210B		Examination Date: 10-15-09	
Item #	If Drum Puck, SS or CS	Waste Item Description	
1		DAum Remnant with Electrical Tape, open plastic bags with masking Tape, Plastic sheeting, plastic lids, open plastic buckets, msm boot pieces, metal lids, plastic bucket pieces, Breached amp cans, Duct Tape, open metal cans, wood ruler cotton string, Absorbant PAD, CARD BOARD CAN.	
Waste Repackaging Operator:		Matthew McPeters Print Name	Matthew McPeters Signature / 10-15-09 Date

Attachment D: Contact Handled Waste Repackaging Data Form

Page 3 of 3

Section 3: Comments			
Container Number:	X10CSATN03210B	Examination Date:	10-15-09

Section 4: Approvals		
Signature below signifies that waste in this container has been examined and determined to be acceptable waste forms.		
Waste Repackaging Operator:		
Mitch McPeters Print Name	Mitch McPeters Signature	10-15-09 Date
Waste Repackaging Data Form Reviewer:		
David Lamance Print Name	David Lamance Signature	10-15-09 Date
Signature below signifies that the Waste Stream Identification Number has been verified to be consistent with the original parent container and that objective evidence of the Waste Stream Identification Number is included in the applicable Waste Container Traveler.		
Waste Package Certifier:		
James H Nelson Print Name	J H Nel Signature	10-15-09 Date

Attachment D: Contact Handled Waste Repackaging Data Form

Page 1 of 3

Section 1: General Information	
Examination Start Date: 10·15·09	
Container Number: X10CSATNO3210C	
Container Type: 55 GALLON DRUM	Thickness of Bag Liner: 6 mil
Bag Liner Description: ☒ Non-Rigid ☒ Filtered Vent ☒ Poly ☐ Rigid ☐ Non-vented ☐ Other:	
Waste Stream Identification #: OR·REDC·RH-HET	
Physical waste form matches the assigned Waste Stream Description and RCRA characterization? ☐NO ☒YES	
New Waste Stream Identification Number if assigned	
Are sharp or heavy objects are blocked, braced, or packaged to provide puncture protection for the waste container? ☐NO ☒ YES	
Volume Utilization Percentage: 95 %	
Number of Container Liners used: 1	
Closure Method for Container Liner: TWIST & TAPE	
Number of Inner Bags: 0	
Verified no inner packages are heat sealed? ☐ NO ☒ YES	
Layers of Confinement: Number of Layers: 1	
Container Filter and Drum Enclosure Data Filter Torque Wrench 9/16 191409 SMC NOTE 1 Serial/ID No. ~~A0002448~~ 0502750 4120 Calibration Due Date: 10/17/09 Lid Ring Bolt Torque Wrench: 5080259074 Manufacturer's Closure spec: 60 FT/lb	Filter Model No. VT942HX00201 Serial No. 02604 Torque Value 6 FT/lbs Calibration Due Date: 5·21·10

Source Container #:	Waste Stream #:	Original Parent Container #:	Waste Stream #:
X10CSATNO3210	OR-REDC-RH-HET		

Attachment D: Contact Handled Waste Repackaging Data Form

Page 2 of 3

Section 2: Waste Package Data			Data Page 1 of 1
Container Number: X10CSATNO3210C			Examination Date: 10-15-09
Item #	If Drum Puck, SS or CS	Waste Item Description	
1	N/A	Drum Remnant, Plastic, cut-up plastic buckets, masking Tape cut open plastic Lids, Duct Tape	
Waste Repackaging Operator:		Martin Jones (Print Name)	Martin Jones (Signature) 10-15-09 (Date)

Attachment D: Contact Handled Waste Repackaging Data Form

Page 3 of 3

Section 3: Comments			
Container Number:	X10CSATN03210C	Examination Date:	10-15-09
NOTE! - Entry Error Corrected. JMC 10-14-09			

Section 4: Approvals		
Signature below signifies that waste in this container has been examined and determined to be acceptable waste forms.		
Waste Repackaging Operator:		
Martin Jones	Martin Jones	10-15-09
Print Name	**Signature**	**Date**
Waste Repackaging Data Form Reviewer:		
Josh Coffey	Josh Coffey	10-15-09
Print Name	**Signature**	**Date**
Signature below signifies that the Waste Stream Identification Number has been verified to be consistent with the original parent container and that objective evidence of the Waste Stream Identification Number is included in the applicable Waste Container Traveler.		
Waste Package Certifier:		
FRANK Anderson		10/15/09
Print Name	**Signature**	**Date**

Attachment D: Contact Handled Waste Repackaging Data Form

Page 1 of 3

Section 1: General Information

Examination Start Date: 10-15-09

Container Number: X10CSATN03210D

Container Type: 55 Gallon Drum | Thickness of Bag Liner: 6 mil

Bag Liner Description: [X] Non-Rigid [X] Filtered Vent [X] Poly [ ] Rigid [ ] Non-vented [ ] Other:

Waste Stream Identification #: OR-REdC-RH-HET

Physical waste form matches the assigned Waste Stream Description and RCRA characterization?
[ ] NO [✓] YES

New Waste Stream Identification Number if assigned | N/A

Are sharp or heavy objects are blocked, braced, or packaged to provide puncture protection for the waste container?
[ ] NO [✓] YES

Volume Utilization Percentage: 95 %

Number of Container Liners used: 1

Closure Method for Container Liner: Twist & Tape

Number of Inner Bags: 0

Verified no inner packages are heat sealed? [ ] NO [✓] YES

Layers of Confinement: Number of Layers: 1

Container Filter and Drum Enclosure Data

Filter Torque Wrench
Serial/ID No. 0507504120
Calibration Due Date: 10-17-09

Filter Model No. 4T9424X00201
Serial No. 0256
Torque Value 60 Ft lbs

Lid Ring Bolt Torque Wrench: 5060106592
Manufacturer's Closure spec: 60 Ft lbs

Calibration Due Date: 8-10-10

Source Container #:	Waste Stream #:	Original Parent Container #:	Waste Stream #:
X10CSATN03210	OR-REdC-RH-HET		

Attachment D: Contact Handled Waste Repackaging Data Form

Page 2 of 3

Section 2: Waste Package Data		10/15/09 Note①	Data Page 1 of 1
Container Number:	~~X10CSATN03200~~ MW	X10CSATN03210 D	Examination Date: 10-15-09

Item #	If Drum Puck, SS or CS	Waste Item Description
1	N/A	Plastic lids, Metal lids, Drum Remnant, cut up plastic buckets MSM Boots, Empty Metal Bucket, Broken glass flood light bulbs, wire brush, Duct tape, Metal Hardware, Metal Handle, Rubber Stoppers, MSM Tools, plastic Blocks, Absorbent pads, METAL LATCH, Electrical Cord + Plugs, Metal tubing, Paper, Stainless Steel Lid, String, Plastic Plastic tubing, Empty glass bottles, Broken glass, Cloth Rags, Maskin tape, Hand tools, plastic fittings, cut poly blocks, glass lab ware,

Waste Repackaging Operator:	David Lamarre (Print Name)	Dave Lamarre (Signature)	10-15-09 (Date)

Attachment D: Contact Handled Waste Repackaging Data Form

Page 3 of 3

Section 3: Comments			
Container Number:	X10CSATND3210D	Examination Date:	10-15-09
Note ① Error Entry, Error Corrected MW 10/15/09			

Section 4: Approvals		
Signature below signifies that waste in this container has been examined and determined to be acceptable waste forms.		
Waste Repackaging Operator:		
David Lamance	Dave Lamance	10-15-09
Print Name	Signature	Date
Waste Repackaging Data Form Reviewer:		
Mitch McPeters	Mitch McPeters	10-15-09
Print Name	Signature	Date
Signature below signifies that the Waste Stream Identification Number has been verified to be consistent with the original parent container and that objective evidence of the Waste Stream Identification Number is included in the applicable Waste Container Traveler.		
Waste Package Certifier:		
Mike White	Mike White	10/15/09
Print Name	Signature	Date

DIVIDER PAGE

WITS / 2109 (RFD)

(NOTE: All information (i.e., RFD/NDA data, Analytical, change logs, etc.) needs to be reviewed for best available data.) 12/1/05

RFD: X10IS085737 **Origin Facility:** 7920 **Reviewed by:** K. A. Bale
Container ID: X10CSATN03210 **Current Facility:** 7855
Review date: 1/3/05

Waste Item ID: X10IS085737-1
Description: "PLASTIC, METAL, PAPER, CLOTH SOLIDS"

Circle data checked: (2109/RFD) NDA Analytical PKform Other: Trabalka Report

CONSTITUENTS:

Do Constituents match folder? (Yes) No

ISOTOPES:

CF-252	0.11	CI ✓	CM-244	0.48	CI ✓	CS-137	0.33 CI ✓

Do Isotope(s) match folder? (Yes) No

EPA CODES:

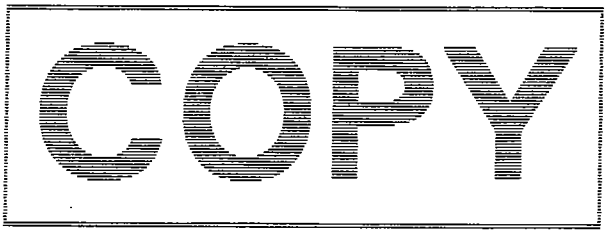
Do EPA codes match folder? (Yes) No
Is attachment designation correct? (Yes) No
Do flags reflect what data represents? (Yes) No

Attachment: B
RAD: Y **RCRA:** N
LLW N **PCB:** N
TRU: Y **TSCA:** N
SNF: N

RCRA start date:
PCB start date:

Is RCRA start date correct? (Yes) No
Is PCB start date correct? (Yes) No

ATN-3210



(If WITS changes need to be made, fill out a change log with justification and submit to WIMSHELP@bjcllc.org)

P 2

REQUEST FOR STORAGE OR DISPOSAL OF RADIOACTIVE SOLID WASTE OR SPECIAL MATERIALS

Number: 85737

NON-RECORD COPY

GCO Section

(GCO and Radiation Protection Sections Must Be Complete Before Arranging Material Transfer)

Date	Origin of Waste	G.C.O. Signature (Legible)	Badge No.	Div. Code	Phone No.
8/17/93	7920	C. E. Roberts	6129	3370	4-7071

Mailing Address (Bldg/MS)	Total Volume (ft^3)	Comb. Volume (ft^3)	Weight (lbs)	UCN 2681 No.
7920/6384	~~00~~ 58	~~70~~ 40	9500	

Charge/Work Order No.	Waste Class Code	Waste Type Code	PACKAGE TYPE CODES
3370-6001	6	~~05~~ 93	

RCRA Present (Y/N)	Asbestos - UCN 13386 No.	Inner	Outer	Dumpster No.
N		11	4	

Principle Isotopes Contributing More Than 5% Total Package Activity

(Report Fissile, Uranium/Thorium in Grams)

Identity	Curies	Grams	Identity	Curies	Grams
1. Cm244	0.48	0.006	8.		
2. Cs137	0.33	0.0004	9.		
3. Cf252	0.11	0.0002	10.		
4.			11.		
5.			12.		
6.			13.		
7.			14.		

CAUTION

This information must **NOT** be released externally until it has been reviewed by the appropriate site Classification and Information Control Office.

General Waste Description/Comments: PLASTIC, METAL, PAPER, CLOTH

RADIATION PROTECTION

EXTERIOR TRANSFERABLE CONTAMINATION:

Alpha <20 dpm/100 cm^2 Beta/Gamma <200 dpm/100 cm^2

DOSE RATE:

Beta/Gamma: Surface 350 mrem/hr @ one meter 20 mrem/hr

Neutron: Surface 250 mrem/hr @ one meter 4 mrem/hr

Survey Instrument Serial Number: 7920: 7R; 285; 1L

Radiation Protection Signature	Badge No.	Date
J C Richter	6289	8-18-93

RADIOACTIVE SOLID WASTE OPERATIONS

RSWO Signature	Badge No.	Date
P G Cleveland	12661	8-23-93

Basic Description (DOT)	Cost Symbol	Adjustment
	V	

Comments: "RADIOACTIVE MATERIAL N.O.S., UN2982"

ENTERED OCT 0 5 1993 KAm

BILLED OCT 06 1993 KAm

LLN	WSR Number:			ATN
				3210

UCN-2822 (3 9-92)

DISTRIBUTION: WHITE - SWSA FOREMAN FORWARDS TO DMC
BLUE - RETAINED BY SWSA FOREMAN
CANARY - RETAINED BY GENERATOR

STORAGE OR DISPOSAL OF RADIOACTIVE SOLID WASTE OR SPECIAL MATERIALS

DOCUMENT NO. 85737
PAGE 2

COMPACTION WASTE: COMPLETED AND THEN APPROVED BY SWSA FOREMAN

LOW LEVEL BOX INFORMATION						
LL NUMBER	FULL BOX (Y/N)	FULL BOX WEIGHT	PORTION (FRACTION)	TOTAL POST-VOL	COMMENTS	FOR DMC USE ONLY
TOTALS						

Date of Compaction:

Compacting Operators:

and

SWSA Foreman's Signature:

SWSA FOREMAN COMPLETES AND APPROVES FOR NON-COMPACTED WASTE

Waste Was (check one):	SWSA No.:	Storage/Disposal Date:	ATN NO.:	Low Level No.:
☑ Retrievable ☐ Buried	5	10/4/93	3210	

Facility (check one):

☑ Building ☐ Well ☐ Landfill ☐ Tumulus ☐ Trench ☐ On Ground Storage

Location No.:	Location Within Facility:	Waste Description:
B7855	Rank: 7 File: C Layer:	RH-TRU

Comments from SWSA Foreman regarding waste and/or operations:

located in cell D, FILE C, RANK 7

Foreman's Signature: R L White

WASTE EXAMINATION (WEAF): COMPLETES AND FORWARDS TO DMC

Waste Inspection Level:	Rated:	Inspection Officier:	Date:
☐ RTR ☐ PAN/SGS	☐ Pass ☐ Fail		

DISTRIBUTION: Copy 1 - Attach to 2822 and forward to DMC
Copy 2 - Retained by SWSA Foreman
Copy 3 - Retained by WEAF/Compacting Team (If Applicable)

UCN-2822A
(3 12-91)

COPY 1

P 4

ON-SITE RADIOACTIVE MATERIAL SHIPPING PAPER

Page 1 of 1

Proper Shipping Name: "RADIOACTIVE MATERIAL N.O.S., UN2982" Total Curies: 9.2E-1

Hazard Class: Radioactive UN/NA Identification Number: UN 2982

Number of Containers: 1 Gross Weight (material & packaging): 9500 RQ (Yes/No): NO

Shipment Origin: 7920 Shipment Destination: SWSA 6

Radioactive Material Description:

Name of each radionuclide: See attached 2822

Physical and chemical form: See RH-TRU waste Certification Data Attached

Activity per container: See attached 2822

Labels (White-I, Yellow-II or III): Yellow III

Transport index (if Yellow-II or III):

Fissile class (I, II, III or Fissile Exempt): N/H

Package identification number: ATN # 3210

Required Placards: Radioactive Emergency Contact: 574-6606

Originator's Signature: P G Cleveland Date: 8-23-93 Phone: 576-7401

Vehicle Operator: Date: Badge Number:

TY-5775 (DMC-GP 1/15/93)

P5

Nuclide	Activity in Ci	Weight in Pounds	Package Volume Cu ft	Activity in mCi	Specific Activity mCi/gm	LSA Limit mCi/gram	Sp. Act. divided by LSA Limit	LSA	A-2 in Curies	LSA Type A	LSA Type B	Package Ci/Cu ft	Package meets PA limit for IWMF	Package meets PA limit for Silo	Fissile Quantity in grams	TRU Quantity nCi/gm
Cs-137	3.30E-01	1000	58	3.30E+02	7.27E-04	0.3	2.42E-03	TRUE	10	TRUE	FALSE	0.00E+00	TRUE	TRUE		
Cf-252	0.11	1000	58	1.10E+02	2.42E-04	0.0001	2.42E+00	FALSE	0.009	FALSE	TRUE	1.90E-03	no value	no value		242.2907
Cm-244	0.48	1000	58	4.80E+02	1.06E-03	0.0001	1.06E+01	FALSE	0.01	FALSE	TRUE	8.28E-03	TRUE	TRUE	0.001378	1057.269
							1.30E+01									

(3/90)

DATA LOG SHEET FOR PACKAGING TRU WASTE

Drum ATN:
Building No.:
Room No.:

Pg 1

[An entry is required for each column. See instruction sheet for directions]

DOCNO: 85737 ATN NO: 3210

Content Code: ☐ OR125A ☐ OR125B

1. Pak No.	2. Date	3. Radiation (mRem/h) Beta, Gamma	3. Radiation (mRem/h) Neut.	4. Activity (Ci)	5. Dominant Radionuclides	6. Physical Form	7. Chemical Form	8. Percent Comb.	9. Has Mtl (Y/N)	10. Signature	11. Data Log Sheet Verification Date	11. Data Log Sheet Verification Signature
		8/17/93				SEE DATA PACKAGE FOR				#3210		

Proper Drum Closure (Signature): _____

Generator Certification Official (Signature): _____

Authorized Radioactive Solid Waste Operations (Signature):

NOTE: If column 9 = Yes, complete supplemental form TX-535

BUILDING 7920 FACILITY

RADIOCHEMICAL ENGINEERING DEVELOPMENT CENTER

NEWLY GENERATED, REMOTELY HANDLED TRANSURANIC WASTE

Certification of Contents

(Data Package)

for

Cask No.: ATN-3210

✓ Cask Contains NO RCRA Material

_____ Cask Contains RCRA Material as Summarized on Data Sheet No. 3

Data Package Assembled and Checked by:

C. E. Ratliff — Generator Certification Official

_____ Quality Assurance Representative

P 8

RH-TRU WASTE CERTIFICATION DATA SHEET NO. 3

CERTIFICATION OF RH-TRU WASTE LOADED INTO A CONCRETE CASK
IN THE BUILDING 7920 WASTE LOADING STATION

Cask No.: ATN- 3210 Building 7920

Date Sealed: 8/17/93 Cask Thickness: 6''

Your initials certify a numbered container (or otherwise identifiable item) containing NO fines; free liquid; pyrophoric, explosive, toxic or corrosive materials; compressed gases; fissionable isotopes (>27 g/ft^3); or heat sources (>0.1 watt/ft^3). RCRA materials must be identified, quantified, and approved by the OAR.

Description of Contents: Page 1 of 3

Sequence Number	Plastic Bucket/ Bag No. or Other Method of I.D.	Source/ Waste Form Category	RCRA Present? Yes/No	Combustibles (vol %)	Date Added	Initials
1	W-311	Cell Bank	N	25%	10-15-92	RCP
2	W-312	Cell Bank	N	75%	10-15-92	RCP
3	W-314	Cell Bank	N	75%	10-21-92	RCP
4	W-315	Cell Bank	N	100%	10-21-92	RCP
~~5~~	~~W-316~~	~~Cell Bank~~	~~N~~	~~75%~~	~~10-21-92~~	~~RCP~~
6	W-313	Cell Bank	N	75%	10-21-92	RCP
7	W-317	Cell Bank	N	25%	10-26-92	RCP
8	W-324	CELL BANK	N	98%	1/26/93	CET

[See Page 2 for continuation]

Estimated Total Combustibles: 70 vol %

Summary of RCRA Materials Present in the Closed Cask:

Identity	Quantity
None	

OAR Signature for RCRA: _____

Radiation monitoring information—maximum readings found through side of concrete cask at time of removal from the waste loading station:

β-γ: 0.35 R/h; neutrons: 250 mrem/h

Signature of GCO: C. E. Roberts

(Your signature verifies that the cask contains only waste items with the above certification.)

Signature of OAR: [signature]

(Your signature certifies that proper documentation exists for all waste placed in the cask.)

RH-TRU WASTE CERTIFICATION DATA SHEET NO. 3

(continued)

Cask No.: ATN- 3210 Building 7920

Description of Contents: (continued) Page 2 of 3

Plastic Bucket/ Bag No. or Other Method of I.D.	Source/ Waste Form Category	RCRA Present? Yes/No	Combus-tibles (vol %)	Date Added	Initials
9 W-337	CELL BANK (1861)	N	75	3/1/93	CWE
10 W-336	CELL BANK (1785)	N	100	3/1/93	CWE
11 W-338	BUCKET # 1997	N	75	3/3/93	CER
12 W-339	BUCKET # 1935	N	80	3/3/93	CER
13 W-340	BUCKET # 1985	N	75	3/4/93	CWE
14 W-341	BUCKET # 1891	N	100	3/4/93	CWE
15 W-342	BUCKET # 1863	N	100	3/4/93	CWE
16 W-343	BUCKET # NO I.D.	N	98	3/10/93	CWE
17 W-344	BUCKET # 2013	N	10	3/10/93	CWE
18 W-346	BUCKET # 2001	N	75	3/11/93	CWE
19 W-347	BUCKET # 1979	N	10	3/11/93	CWE
20 W-352	BUCKET # 2024	N	90	4/5/93	CWE
21 W-353	BUCKET # 1834	N	90	4/5/93	CWE
22 W-354	BUCKET # 1980	N	90	4/6/93	CWE
23 W-355	BUCKET # 1966	N	90	4/6/93	CWE
24 W-356	BUCKET # 2030	N	90	4/6/93	CWE
25 W-358	BUCKET # 2032	N	90	4/7/93	CWE
26 W-359	BUCKET # 1983	N	100	4/7/93	CWE
27 W-385	BUCKET # 1883	N	60	6/15/93	CWE
28 W-386	BUCKET # 1803	N	80	6/15/93	CWE
29 W-388	BUCKET # 1963	N	90	6/16/93	CWE
30 W-389	BUCKET # 3441	N	80	6/16/93	CWE
31 W-392	BUCKET # 1990	N	75	6/22/93	CWE
32 W-393	BUCKET # 2129	N	90	6/22/93	CWE
33 W-395	BUCKET # NO I.D.	N	25	6/23/93	CWE
34 W-396	BUCKET # 2022	N	80	6/23/93	CWE
35 W-397	BUCKET # 1950	N	75	6/23/93	CWE
36 W-403	BUCKET # NO #	N	90	6/29/93	CWE

1 Sequence Number

[See Page 3 for continuation]

(continued)

Cask No.: ATN- 3210 Building 7920

Description of Contents: (continued) Page 3 of 3

	Plastic Bucket/ Bag No. or Other Method of I.D.	Source/ Waste Form Category	RCRA Present? Yes/No	Combus-tibles (vol %)	Date Added	Initials
37	W-404	BUCKET # 1996	N	100	6/29/93	CWE
38	W-405	BUCKET # 1817	N	90	6/29/93	CWE
39	W-408	BUCKET # 1939	N	90	7/1/93	CWE
40	W-409	BUCKET # 2058	N	90	7/1/93	CWE
41	W-410	BUCKET # 69	N	90	7/1/93	CWE
42	W-411	BUCKET # 2018	N	100	7/1/93	CWE
43	W-413	BUCKET # 2034	N	70	7/1/93	CWE
44	W-414	BUCKET # 2016	N	80	7/7/93	CWE
45	W-415	BUCKET # 2066	N	20	7/7/93	CWE
46	W-416	BUCKET # 1977	N	80	7/7/93	CWE
47	01	01	N	80	7/7/93	CWE
48	W-417	BUCKET # 1903	N	75	7/20/93	CWE
49	W-419	BUCKET # 3210	N	75	7/20/93	CWE
50	W-420	BUCKET # NO I.D.	N	85	7/20/93	CWE
51	W-421	BUCKET # 1826	N	50	7/20/93	CWE
52	W-427	BUCKET # 2085	N	80	7/27/93	CWE
53	W-429	BUCKET # 1871	N	0	7/27/93	CWE
54	W-432	BUCKET # 1922	N	50	7/29/93	CWE
55	W-433	BUCKET # 2114	N	0	7/29/93	CWE
56	W-434	BUCKET # 2111	N	0	7/29/93	CWE
57	W-440	BUCKET # 1918	N	20	8/3/93	CWE
58	W-443	BUCKET # TAN	N	0	8/4/93	CWE
59	W-444	BUCKET # ~~PC3~~ 2054	N	80	8/4/93	CWE
60	W-445	BUCKET # 1937	N	80	8/4/93	CWE
61	W-446	BUCKET # 2029	N	0	8/4/93	CWE
	Cask off gassed and sealed				8/17/93	

1 Sequence Number [See Page __ for continuation]

RH-TRU WASTE CERTIFICATION DATA SHEET NO. 2

CERTIFICATION OF RH-TRU WASTE REMOVED FROM THE CELL BANK IN PLASTIC BUCKETS

[DO NOT USE IF RCRA MATERIALS ARE PRESENT]

Your signature certifies a numbered, filled, and sealed plastic bucket containing NO fines; free liquid; pyrophoric, explosive, toxic or corrosive materials; compressed gases; fissionable isotopes (>27 g/ft^3); heat sources (>0.1 watt/ft^3); or RCRA materials.

Plastic Bucket No.: W-311 Date Filled and Sealed: 10-15-92

Description of Contents of the Plastic Bucket:

Item(s)	Source/Waste Form Category
Intermediate Container No. (if used): 1938 paint can	(See attached intermediate container data sheet for contents.)
Additional Materials: none	Cell Bank

Combustibles: 25% vol %

Radiation Readings (if taken):

β-γ at 12 in.: 0.020 R/h β-γ at Contact: 0.230 R/h

Neutrons at 3 ft: 3.0 mrem/h Neutrons at Contact: 50.0 mrem/h

NOTE THAT NO RCRA MATERIALS ARE PRESENT IN THIS PLASTIC BUCKET

Signature of GCO Sealing the Plastic Bucket: R C Potter

REFERENCE: Cask No.: ATN-3210 and
Sequence No.: 1 (Data Sheet 3)

RH-TRU WASTE CERTIFICATION DATA SHEET NO. 1

CERTIFICATION OF INTERMEDIATE CONTAINERS OF RH-TRU WASTE
(e.g., one-gallon paint cans) FILLED IN THE CUBICLES

[DO NOT USE IF RCRA MATERIALS ARE PRESENT]

Your signature certifies a numbered, filled, and closed container containing NO fines; free liquid; pyrophoric, explosive, toxic, or corrosive materials; compressed gases; fissionable isotopes (>27 g/ft^3); heat sources (>0.1 watt/ft^3); or RCRA materials.

Intermediate Container Identification: Paint Can No.: 1938

(or other container and number): _____

Date Filled and Closed: 10-14-92

Description of Contents:

Item(s)	Source/Waste Form Category
Valve parts (metal)	Cell Bank
sheet plastic	Cell Bank
Wipes	Cell Bank
glass bottles (empty)	Cell Bank
sampler blocks	Cell Bank
hand tools	Cell Bank

Combustibles: 25 % vol %

Radiation Readings (if taken):
β-γ at 12 in.: 0.020 R/h Neutrons at 3 ft: 3.0 mrem/h

NOTE THAT NO RCRA MATERIALS ARE PRESENT IN THIS CONTAINER

Signature of GCO Filling and Closing Container: R.C. Potter

REFERENCE: Plastic Bucket No.: W-311, or
Draw-String Bag No.: — and Sequence No.: 1 (Data Sheet 4)

RH-TRU WASTE CERTIFICATION DATA SHEET NO. 2

CERTIFICATION OF RH-TRU WASTE REMOVED FROM THE CELL BANK IN PLASTIC BUCKETS

[DO NOT USE IF RCRA MATERIALS ARE PRESENT]

Your signature certifies a numbered, filled, and sealed plastic bucket containing NO fines; free liquid; pyrophoric, explosive, toxic or corrosive materials; compressed gases; fissionable isotopes (>27 g/ft^3); heat sources (>0.1 watt/ft^3); or RCRA materials.

Plastic Bucket No.: W-312 Date Filled and Sealed: 10-15-92

Description of Contents of the Plastic Bucket:

Item(s)	Source/Waste Form Category
Intermediate Container No. (if used): Non ledgible paint can	(See attached intermediate container data sheet for contents.)
Additional Materials: None	Cell Bank

Combustibles: 75% vol %

Radiation Readings (if taken):

β-γ at 12 in.: 0.260 R/h β-γ at Contact: 2.0 R/h

Neutrons at 3 ft: 12.0 mrem/h Neutrons at Contact: 300 mrem/h

NOTE THAT NO RCRA MATERIALS ARE PRESENT IN THIS PLASTIC BUCKET

Signature of GCO Sealing the Plastic Bucket: R A Potter

REFERENCE: Cask No.: ATN-3210 and
Sequence No.: 2 (Data Sheet 3)

RH-TRU WASTE CERTIFICATION DATA SHEET NO. 1

CERTIFICATION OF INTERMEDIATE CONTAINERS OF RH-TRU WASTE (e.g., one-gallon paint cans) FILLED IN THE CUBICLES

[DO NOT USE IF RCRA MATERIALS ARE PRESENT]

Your signature certifies a numbered, filled, and closed container containing NO fines; free liquid; pyrophoric, explosive, toxic, or corrosive materials; compressed gases; fissionable isotopes (>27 g/ft^3); heat sources (>0.1 watt/ft^3); or RCRA materials.

Intermediate Container Identification: Paint Can No.: "non legible"
(or other container and number): _____

Date Filled and Closed: 10-14-92

Description of Contents:

Item(s)	Source/Waste Form Category
Melted poly	Cell Bank
Sheet plastic	Cell Bank

Combustibles: 15% vol %

Radiation Readings (if taken):
β-γ at 12 in.: 0.260 R/h Neutrons at 3 ft: 12.0 mrem/h

NOTE THAT NO RCRA MATERIALS ARE PRESENT IN THIS CONTAINER

Signature of GCO Filling and Closing Container: K. C. Patten

REFERENCE: Plastic Bucket No.: W-312 or
Draw-String Bag No.: —— and Sequence No.: 2 (Data Sheet 4)

RH-TRU WASTE CERTIFICATION DATA SHEET NO. 2

CERTIFICATION OF RH-TRU WASTE REMOVED FROM THE CELL BANK IN PLASTIC BUCKETS

[DO NOT USE IF RCRA MATERIALS ARE PRESENT]

Your signature certifies a numbered, filled, and sealed plastic bucket containing NO fines; free liquid; pyrophoric, explosive, toxic or corrosive materials; compressed gases; fissionable isotopes (>27 g/ft^3); heat sources (>0.1 watt/ft^3); or RCRA materials.

Plastic Bucket No.: W-314 Date Filled and Sealed: ~~10-22-92~~ corrected POP. 10-21-92

Description of Contents of the Plastic Bucket:

Item(s)	Source/Waste Form Category
Intermediate Container No. (if used): None	(See attached intermediate container data sheet for contents.)
Additional Materials	
M3M boot w/ring	Cell Bank

Combustibles: 75% vol %

Radiation Readings (if taken):

β-γ at 12 in.: 0.185 R/h β-γ at Contact: 1.0 R/h

Neutrons at 3 ft: 0. mrem/h Neutrons at Contact: 2.0 mrem/h

NOTE THAT NO RCRA MATERIALS ARE PRESENT IN THIS PLASTIC BUCKET

Signature of GCO Sealing the Plastic Bucket: R O Keller

REFERENCE: Cask No.: ATN- 3210 and
Sequence No.: 3 (Data Sheet 3)

RH-TRU WASTE CERTIFICATION DATA SHEET NO. 2

CERTIFICATION OF RH-TRU WASTE REMOVED FROM THE CELL BANK IN PLASTIC BUCKETS

[DO NOT USE IF RCRA MATERIALS ARE PRESENT]

Your signature certifies a numbered, filled, and sealed plastic bucket containing NO fines; free liquid; pyrophoric, explosive, toxic or corrosive materials; compressed gases; fissionable isotopes (>27 g/ft^3); heat sources (>0.1 watt/ft^3); or RCRA materials.

Plastic Bucket No.: W-315 ~~#314~~ Date Filled and Sealed: RAP 10-21-93 ~~10-20-93~~

Description of Contents of the Plastic Bucket:

Item(s)	Source/Waste Form Category
Intermediate Container No. (if used): None	(See attached intermediate container data sheet for contents.)
Additional Materials	
MSM boot pieces	Cell Bank

Combustibles: 100 % vol %

Radiation Readings (if taken):

β-γ at 12 in.: Not taken R/h β-γ at Contact: 2.9 R/h

Neutrons at 3 ft: Not taken mrem/h Neutrons at Contact: 5.0 mrem/h

NOTE THAT NO RCRA MATERIALS ARE PRESENT IN THIS PLASTIC BUCKET

Signature of GCO Sealing the Plastic Bucket: R Galter

REFERENCE: Cask No.: ATN- 3210 and
Sequence No.: 4 (Data Sheet 3)

RH-TRU WASTE CERTIFICATION DATA SHEET NO. 2

CERTIFICATION OF RH-TRU WASTE REMOVED FROM THE CELL BANK IN PLASTIC BUCKETS

[DO NOT USE IF RCRA MATERIALS ARE PRESENT]

Your signature certifies a numbered, filled, and sealed plastic bucket containing NO fines; free liquid; pyrophoric, explosive, toxic or corrosive materials; compressed gases; fissionable isotopes (>27 g/ft^3); heat sources (>0.1 watt/ft^3); or RCRA materials.

Plastic Bucket No.: W-313 Date Filled and Sealed: 10-21-92

Description of Contents of the Plastic Bucket:

Item(s)	Source/Waste Form Category
Intermediate Container No. (if used): None	(See attached intermediate container data sheet for contents.)
Additional Materials	
MSM boot w/ring	Cell Bank

Combustibles: 75% vol %

Radiation Readings (if taken):

β-γ at 12 in.: 0.005 R/h β-γ at Contact: 0.400 R/h

Neutrons at 3 ft: 0.0 none mrem/h Neutrons at Contact: 0.5 mrem/h

NOTE THAT NO RCRA MATERIALS ARE PRESENT IN THIS PLASTIC BUCKET

Signature of GCO Sealing the Plastic Bucket: [signature]

REFERENCE: Cask No.: ATN- 3210 and
Sequence No.: 6 (Data Sheet 3)

RH-TRU WASTE CERTIFICATION DATA SHEET NO. 2

CERTIFICATION OF RH-TRU WASTE REMOVED FROM THE CELL BANK IN PLASTIC BUCKETS

[DO NOT USE IF RCRA MATERIALS ARE PRESENT]

Your signature certifies a numbered, filled, and sealed plastic bucket containing NO fines; free liquid; pyrophoric, explosive, toxic or corrosive materials; compressed gases; fissionable isotopes (>27 g/ft^3); heat sources (>0.1 watt/ft^3); or RCRA materials.

Plastic Bucket No.: W-317 Date Filled and Sealed: 10-26-92

Description of Contents of the Plastic Bucket:

Item(s)	Source/Waste Form Category
Intermediate Container No. (if used): 1982 paint can	(See attached intermediate container data sheet for contents.)
Additional Materials	
None	

Combustibles: 95 vol %

Radiation Readings (if taken):

β-γ at 12 in.: 0.550 R/h β-γ at Contact: 0.960 R/h

Neutrons at 3 ft: 2.0 mrem/h Neutrons at Contact: 20.0 mrem/h

NOTE THAT NO RCRA MATERIALS ARE PRESENT IN THIS PLASTIC BUCKET

Signature of GCO Sealing the Plastic Bucket: R O Potter

REFERENCE: Cask No.: ATN-3310 and
Sequence No.: 7 (Data Sheet 3)

RH-TRU WASTE CERTIFICATION DATA SHEET NO. 1

CERTIFICATION OF INTERMEDIATE CONTAINERS OF RH-TRU WASTE (e.g., one-gallon paint cans) FILLED IN THE CUBICLES

[DO NOT USE IF RCRA MATERIALS ARE PRESENT]

Your signature certifies a numbered, filled, and closed container containing NO fines; free liquid; pyrophoric, explosive, toxic, or corrosive materials; compressed gases; fissionable isotopes (>27 g/ft^3); heat sources (>0.1 watt/ft^3); or RCRA materials.

Intermediate Container Identification: Paint Can No.: 1982

(or other container and number): _____

Date Filled and Closed: 10-26-92

Description of Contents:

Item(s)	Source/Waste Form Category
Empty glass sample bottles	Cell Bank
plastic bottle caps	Cell Bank
needles	Cell Bank

Combustibles: 25% vol %

Radiation Readings (if taken):

β-γ at 12 in.: 0.550 R/h Neutrons at 3 ft: 2.0 mrem/h

NOTE THAT NO RCRA MATERIALS ARE PRESENT IN THIS CONTAINER

Signature of GCO Filling and Closing Container: R. Patterson

REFERENCE: Plastic Bucket No.: W-317, or

Draw-String Bag No.: _____ and Sequence No.: 7 (Data Sheet 4)

RH-TRU WASTE CERTIFICATION DATA SHEET NO. 2

CERTIFICATION OF RH-TRU WASTE REMOVED FROM THE CELL BANK IN PLASTIC BUCKETS

[DO NOT USE IF RCRA MATERIALS ARE PRESENT]

Your signature certifies a numbered, filled, and sealed plastic bucket containing NO fines; free liquid; pyrophoric, explosive, toxic or corrosive materials; compressed gases; fissionable isotopes (>27 g/ft^3); heat sources (>0.1 watt/ft^3); or RCRA materials.

Plastic Bucket No.: W-324 Date Filled and Sealed: 1/20/93

Description of Contents of the Plastic Bucket:

Item(s)	Source/Waste Form Category
Intermediate Container No. (if used): NONE	(See attached intermediate container data sheet for contents.)
Additional Materials	
MSM BOOT	CELL BANK

Combustibles: 98 vol %

Radiation Readings (if taken):

β-γ at 12 in.: 200 R/h β-γ at Contact: 2.5 R/h

Neutrons at 3 ft: BKg mrem/h Neutrons at Contact: 7 mrem/h

NOTE THAT NO RCRA MATERIALS ARE PRESENT IN THIS PLASTIC BUCKET

Signature of GCO Sealing the Plastic Bucket: CW Evans

REFERENCE: Cask No.: ATN- 3210 and
Sequence No.: 8 (Data Sheet 3)

RH-TRU WASTE CERTIFICATION DATA SHEET NO. 2

CERTIFICATION OF RH-TRU WASTE REMOVED FROM THE CELL BANK IN PLASTIC BUCKETS

[DO NOT USE IF RCRA MATERIALS ARE PRESENT]

Your signature certifies a numbered, filled, and sealed plastic bucket containing NO fines; free liquid; pyrophoric, explosive, toxic or corrosive materials; compressed gases; fissionable isotopes (>27 g/ft^3); heat sources (>0.1 watt/ft^3); or RCRA materials.

Plastic Bucket No.: W-337 Date Filled and Sealed: 3/1/93

Description of Contents of the Plastic Bucket:

Item(s)	Source/Waste Form Category
Intermediate Container No. (if used): 1861	(See attached intermediate container data sheet for contents.)
Additional Materials	
NONE	

Combustibles: 75 vol %

Radiation Readings (if taken):

β-γ at 12 in.: 1.0 R/h β-γ at Contact: 6.2 R/h

Neutrons at 3 ft: BKG mrem/h Neutrons at Contact: 50 mrem/h

NOTE THAT NO RCRA MATERIALS ARE PRESENT IN THIS PLASTIC BUCKET

Signature of GCO Sealing the Plastic Bucket: C W Evans

REFERENCE: Cask No.: ATN- 3210 and
Sequence No.: 9 (Data Sheet 3)

RH-TRU WASTE CERTIFICATION DATA SHEET NO. 1

CERTIFICATION OF INTERMEDIATE CONTAINERS OF RH-TRU WASTE
(e.g., one-gallon paint cans) FILLED IN THE CUBICLES

[DO NOT USE IF RCRA MATERIALS ARE PRESENT]

Your signature certifies a numbered, filled, and closed container containing NO fines; free liquid; pyrophoric, explosive, toxic, or corrosive materials; compressed gases; fissionable isotopes (>27 g/ft^3); heat sources (>0.1 watt/ft^3); or RCRA materials.

Intermediate Container Identification: Paint Can No.: 1861

(or other container and number): _____

Date Filled and Closed: 2/8/93

Description of Contents:

Item(s)	Source/Waste Form Category
WIRE	RADIATION PROBE WIRE
CONNECTORS	AND CONNECTORS
STRING	LOWERING SUPPLIES to CUB.

Combustibles: 75 vol %

Radiation Readings (if taken):
β-γ at 12 in.: 1 R/h Neutrons at 3 ft: 20 mrem/h

NOTE THAT NO RCRA MATERIALS ARE PRESENT IN THIS CONTAINER

Signature of GCO Filling and Closing Container: W Evans

REFERENCE: Plastic Bucket No.: W-337 or
Draw-String Bag No.: _____ and Sequence No.: 9 (Data Sheet 4)

RH-TRU WASTE CERTIFICATION DATA SHEET NO. 2

CERTIFICATION OF RH-TRU WASTE REMOVED FROM THE CELL BANK IN PLASTIC BUCKETS

[DO NOT USE IF RCRA MATERIALS ARE PRESENT]

Your signature certifies a numbered, filled, and sealed plastic bucket containing NO fines; free liquid; pyrophoric, explosive, toxic or corrosive materials; compressed gases; fissionable isotopes (>27 g/ft^3); heat sources (>0.1 watt/ft^3); or RCRA materials.

Plastic Bucket No.: W-~~338~~ 336 Date Filled and Sealed: 3/1 93

Description of Contents of the Plastic Bucket:

Item(s)	Source/Waste Form Category
Intermediate Container No. (if used): 1785	(See attached intermediate container data sheet for contents.)
Additional Materials	
NONE	

Combustibles: 100 vol %

Radiation Readings (if taken):

β-γ at 12 in.: BKG R/h β-γ at Contact: 1.0 R/h

Neutrons at 3 ft: BKG mrem/h Neutrons at Contact: 25 mrem/h

NOTE THAT NO RCRA MATERIALS ARE PRESENT IN THIS PLASTIC BUCKET

Signature of GCO Sealing the Plastic Bucket: C W Evans

REFERENCE: Cask No.: ATN- 3R10 and
Sequence No.: 10 (Data Sheet 3)

RH-TRU WASTE CERTIFICATION DATA SHEET NO. 1

CERTIFICATION OF INTERMEDIATE CONTAINERS OF RH-TRU WASTE
(e.g., one-gallon paint cans) FILLED IN THE CUBICLES

[DO NOT USE IF RCRA MATERIALS ARE PRESENT]

Your signature certifies a numbered, filled, and closed container containing NO fines; free liquid; pyrophoric, explosive, toxic, or corrosive materials; compressed gases; fissionable isotopes (>27 g/ft^3); heat sources (>0.1 watt/ft^3); or RCRA materials.

Intermediate Container Identification: Paint Can No.: 1785

(or other container and number):

Date Filled and Closed: 2/8/93

Description of Contents:

Item(s)	Source/Waste Form Category
MELTED POLY STRING	POLY USED IN PROCESSING LOWERING IN SUPPLIES

Combustibles: 100 vol %

Radiation Readings (if taken):
β-γ at 12 in.: .050 R/h Neutrons at 3 ft: BKG mrem/h

NOTE THAT NO RCRA MATERIALS ARE PRESENT IN THIS CONTAINER

Signature of GCO Filling and Closing Container: A W Evans

REFERENCE: Plastic Bucket No.: W-336 or
Draw-String Bag No.: _____ and Sequence No.: 10 (Data Sheet 4)

RH-TRU WASTE CERTIFICATION DATA SHEET NO. 2

CERTIFICATION OF RH-TRU WASTE REMOVED FROM THE CELL BANK IN PLASTIC BUCKETS

[DO NOT USE IF RCRA MATERIALS ARE PRESENT]

Your signature certifies a numbered, filled, and sealed plastic bucket containing NO fines; free liquid; pyrophoric, explosive, toxic or corrosive materials; compressed gases; fissionable isotopes (>27 g/ft^3); heat sources (>0.1 watt/ft^3); or RCRA materials.

Plastic Bucket No.: W-338 Date Filled and Sealed: 3/3/93

Description of Contents of the Plastic Bucket:

Item(s)	Source/Waste Form Category
Intermediate Container No. (if used): 1997	(See attached intermediate container data sheet for contents.)
Additional Materials	
NONE	

Combustibles: 75 vol %

Radiation Readings (if taken):

β-γ at 12 in.: .750 R/h β-γ at Contact: 1.5 R/h

Neutrons at 3 ft: BKG mrem/h Neutrons at Contact: 26 mrem/h

NOTE THAT NO RCRA MATERIALS ARE PRESENT IN THIS PLASTIC BUCKET

Signature of GCO Sealing the Plastic Bucket: A D Evans

REFERENCE: Cask No.: ATN-3210 and
Sequence No.: 11 (Data Sheet 3)

RH-TRU WASTE CERTIFICATION DATA SHEET NO. 1

CERTIFICATION OF INTERMEDIATE CONTAINERS OF RH-TRU WASTE
(e.g., one-gallon paint cans) FILLED IN THE CUBICLES

[DO NOT USE IF RCRA MATERIALS ARE PRESENT]

Your signature certifies a numbered, filled, and closed container containing NO fines; free liquid; pyrophoric, explosive, toxic, or corrosive materials; compressed gases; fissionable isotopes (>27 g/ft^3); heat sources (>0.1 watt/ft^3); or RCRA materials.

Intermediate Container Identification: Paint Can No.: 1997

(or other container and number): _____

Date Filled and Closed: 2/8/93

Description of Contents:

Item(s)	Source/Waste Form Category
STRING	LOWERING SUPPLIES TO CUB.
GLASS	PROCESSING SOLUTION
WIPES	CUB. CLEANING

Combustibles: 75 vol %

Radiation Readings (if taken):
β-γ at 12 in.: 1.75 R/h Neutrons at 3 ft: BKG mrem/h

NOTE THAT NO RCRA MATERIALS ARE PRESENT IN THIS CONTAINER

Signature of GCO Filling and Closing Container: A D Evans

REFERENCE: Plastic Bucket No.: W338, or
Draw-String Bag No.: _____ and Sequence No.: 11 (Data Sheet 4)

RH-TRU WASTE CERTIFICATION DATA SHEET NO. 2

CERTIFICATION OF RH-TRU WASTE REMOVED FROM THE CELL BANK IN PLASTIC BUCKETS

[DO NOT USE IF RCRA MATERIALS ARE PRESENT]

Your signature certifies a numbered, filled, and sealed plastic bucket containing NO fines; free liquid; pyrophoric, explosive, toxic or corrosive materials; compressed gases; fissionable isotopes (>27 g/ft^3); heat sources (>0.1 watt/ft^3); or RCRA materials.

Plastic Bucket No.: W-339 Date Filled and Sealed: 3/3/93

Description of Contents of the Plastic Bucket:

Item(s)	Source/Waste Form Category
Intermediate Container No. (if used): 1935	(See attached intermediate container data sheet for contents.)
Additional Materials	

Combustibles: 80 vol %

Radiation Readings (if taken):

β-γ at 12 in.: .700 R/h β-γ at Contact: 4.5 R/h

Neutrons at 3 ft: BKG mrem/h Neutrons at Contact: 20 mrem/h

NOTE THAT NO RCRA MATERIALS ARE PRESENT IN THIS PLASTIC BUCKET

Signature of GCO Sealing the Plastic Bucket: C. E. Roberts

REFERENCE: Cask No.: ATN-3210 and
Sequence No.: 12 (Data Sheet 3)

RH-TRU WASTE CERTIFICATION DATA SHEET NO. 1

CERTIFICATION OF INTERMEDIATE CONTAINERS OF RH-TRU WASTE (e.g., one-gallon paint cans) FILLED IN THE CUBICLES

[DO NOT USE IF RCRA MATERIALS ARE PRESENT]

Your signature certifies a numbered, filled, and closed container containing NO fines; free liquid; pyrophoric, explosive, toxic, or corrosive materials; compressed gases; fissionable isotopes (>27 g/ft^3); heat sources (>0.1 watt/ft^3); or RCRA materials.

Intermediate Container Identification: Paint Can No.: 1935

(or other container and number): _____

Date Filled and Closed: 2/8 93

Description of Contents:

Item(s)	Source/Waste Form Category
STRING	USED to LOWER SUPPLIES
PLASTIC	to CUB.

Combustibles: 100 vol %

Radiation Readings (if taken):

β-γ at 12 in.: .700 R/h Neutrons at 3 ft: BKG mrem/h

NOTE THAT NO RCRA MATERIALS ARE PRESENT IN THIS CONTAINER

Signature of GCO Filling and Closing Container: Lee Evans

REFERENCE: Plastic Bucket No.: W 339, or

Draw-String Bag No.: _____ and Sequence No.: 12 (Data Sheet 4)

RH-TRU WASTE CERTIFICATION DATA SHEET NO. 2

CERTIFICATION OF RH-TRU WASTE REMOVED FROM THE CELL BANK IN PLASTIC BUCKETS

[DO NOT USE IF RCRA MATERIALS ARE PRESENT]

Your signature certifies a numbered, filled, and sealed plastic bucket containing NO fines; free liquid; pyrophoric, explosive, toxic or corrosive materials; compressed gases; fissionable isotopes (>27 g/ft^3); heat sources (>0.1 watt/ft^3); or RCRA materials.

Plastic Bucket No.: W-340 Date Filled and Sealed: 3/4/93

Description of Contents of the Plastic Bucket:

Item(s)	Source/Waste Form Category
Intermediate Container No. (if used): 1985	(See attached intermediate container data sheet for contents.)
Additional Materials	
NONE	

Combustibles: 75 vol %

Radiation Readings (if taken):

β-γ at 12 in.: .250 R/h β-γ at Contact: .250 R/h

Neutrons at 3 ft: 10 mrem/h Neutrons at Contact: 50 mrem/h

NOTE THAT NO RCRA MATERIALS ARE PRESENT IN THIS PLASTIC BUCKET

Signature of GCO Sealing the Plastic Bucket: A O Evans

REFERENCE: Cask No.: ATN- 3210 and
Sequence No.: 13 (Data Sheet 3)

RH-TRU WASTE CERTIFICATION DATA SHEET NO. 1

CERTIFICATION OF INTERMEDIATE CONTAINERS OF RH-TRU WASTE
(e.g., one-gallon paint cans) FILLED IN THE CUBICLES

[DO NOT USE IF RCRA MATERIALS ARE PRESENT]

Your signature certifies a numbered, filled, and closed container containing NO fines; free liquid; pyrophoric, explosive, toxic, or corrosive materials; compressed gases; fissionable isotopes (>27 g/ft^3); heat sources (>0.1 watt/ft^3); or RCRA materials.

Intermediate Container Identification: Paint Can No.: 1985

(or other container and number): _____

Date Filled and Closed: 2/8/93

Description of Contents:

Item(s)	Source/Waste Form Category
MELTED POLY GLASS BOTTLES	POLY USED IN PROCESSING SAMPLE BOTTLES (USED)

Combustibles: 75 vol %

Radiation Readings (if taken):
β-γ at 12 in.: .250 R/h Neutrons at 3 ft: 10 mrem/h

NOTE THAT NO RCRA MATERIALS ARE PRESENT IN THIS CONTAINER

Signature of GCO Filling and Closing Container: QD Evans

REFERENCE: Plastic Bucket No.: W-340 or
Draw-String Bag No.: _____ and Sequence No.: 13 (Data Sheet 4)

RH-TRU WASTE CERTIFICATION DATA SHEET NO. 2

CERTIFICATION OF RH-TRU WASTE REMOVED FROM THE CELL BANK IN PLASTIC BUCKETS

[DO NOT USE IF RCRA MATERIALS ARE PRESENT]

Your signature certifies a numbered, filled, and sealed plastic bucket containing NO fines; free liquid; pyrophoric, explosive, toxic or corrosive materials; compressed gases; fissionable isotopes (>27 g/ft^3); heat sources (>0.1 watt/ft^3); or RCRA materials.

Plastic Bucket No.: W-341 Date Filled and Sealed: 3/4/93

Description of Contents of the Plastic Bucket:

Item(s)	Source/Waste Form Category
Intermediate Container No. (if used): 1891	(See attached intermediate container data sheet for contents.)
Additional Materials	
NONE	

Combustibles: _____ vol %

Radiation Readings (if taken):

β-γ at 12 in.: .350 R/h β-γ at Contact: .750 R/h

Neutrons at 3 ft: BKG mrem/h Neutrons at Contact: 75 mrem/h

NOTE THAT NO RCRA MATERIALS ARE PRESENT IN THIS PLASTIC BUCKET

Signature of GCO Sealing the Plastic Bucket: Cleo Evans

REFERENCE: Cask No.: ATN- 3210 and
Sequence No.: 14 (Data Sheet 3)

RH-TRU WASTE CERTIFICATION DATA SHEET NO. 1

CERTIFICATION OF INTERMEDIATE CONTAINERS OF RH-TRU WASTE
(e.g., one-gallon paint cans) FILLED IN THE CUBICLES

[DO NOT USE IF RCRA MATERIALS ARE PRESENT]

Your signature certifies a numbered, filled, and closed container containing NO fines; free liquid; pyrophoric, explosive, toxic, or corrosive materials; compressed gases; fissionable isotopes (>27 g/ft^3); heat sources (>0.1 watt/ft^3); or RCRA materials.

Intermediate Container Identification: Paint Can No.: 1891

(or other container and number): _____

Date Filled and Closed: 2/8/93

Description of Contents:

Item(s)	Source/Waste Form Category
MELTED POLY FILTER	POLY USED in PROCESSING FILTERING WASTE

Combustibles: 100 vol %

Radiation Readings (if taken):
β-γ at 12 in.: .450 R/h Neutrons at 3 ft: 20 mrem/h

NOTE THAT NO RCRA MATERIALS ARE PRESENT IN THIS CONTAINER

Signature of GCO Filling and Closing Container: C W Evans

REFERENCE: Plastic Bucket No.: W-341, or
Draw-String Bag No.: _____ and Sequence No.: 14 (Data Sheet 4)

RH-TRU WASTE CERTIFICATION DATA SHEET NO. 2

CERTIFICATION OF RH-TRU WASTE REMOVED FROM THE CELL BANK IN PLASTIC BUCKETS

[DO NOT USE IF RCRA MATERIALS ARE PRESENT]

Your signature certifies a numbered, filled, and sealed plastic bucket containing NO fines; free liquid; pyrophoric, explosive, toxic or corrosive materials; compressed gases; fissionable isotopes (>27 g/ft^3); heat sources (>0.1 watt/ft^3); or RCRA materials.

Plastic Bucket No.: W-342 Date Filled and Sealed: 3/4/93

Description of Contents of the Plastic Bucket:

Item(s)	Source/Waste Form Category
Intermediate Container No. (if used): 1863	(See attached intermediate container data sheet for contents.)
Additional Materials	
NONE	

Combustibles: 100 vol %

Radiation Readings (if taken):

β-γ at 12 in.: .750 R/h β-γ at Contact: .750 R/h

Neutrons at 3 ft: 10 mrem/h Neutrons at Contact: 20 mrem/h

NOTE THAT NO RCRA MATERIALS ARE PRESENT IN THIS PLASTIC BUCKET

Signature of GCO Sealing the Plastic Bucket: dO Evans

REFERENCE: Cask No.: ATN- 3210 and
Sequence No.: 15 (Data Sheet 3)

RH-TRU WASTE CERTIFICATION DATA SHEET NO. 1

CERTIFICATION OF INTERMEDIATE CONTAINERS OF RH-TRU WASTE (e.g., one-gallon paint cans) FILLED IN THE CUBICLES

[DO NOT USE IF RCRA MATERIALS ARE PRESENT]

Your signature certifies a numbered, filled, and closed container containing NO fines; free liquid; pyrophoric, explosive, toxic, or corrosive materials; compressed gases; fissionable isotopes (>27 g/ft^3); heat sources (>0.1 watt/ft^3); or RCRA materials.

Intermediate Container Identification: Paint Can No.: 1863

(or other container and number): _____

Date Filled and Closed: 2/8/93

Description of Contents:

Item(s)	Source/Waste Form Category
WIPES	CLEANING CLOTH.
FILTER	FILTERING WASTE

Combustibles: 100 vol %

Radiation Readings (if taken):

β-γ at 12 in.: .750 R/h Neutrons at 3 ft: 10 mrem/h

NOTE THAT NO RCRA MATERIALS ARE PRESENT IN THIS CONTAINER

Signature of GCO Filling and Closing Container: Dw Evans

REFERENCE: Plastic Bucket No.: W342 or

Draw-String Bag No.: _____ and Sequence No.: 15 (Data Sheet 4)

RH-TRU WASTE CERTIFICATION DATA SHEET NO. 2

CERTIFICATION OF RH-TRU WASTE REMOVED FROM THE CELL BANK IN PLASTIC BUCKETS

[DO NOT USE IF RCRA MATERIALS ARE PRESENT]

Your signature certifies a numbered, filled, and sealed plastic bucket containing NO fines; free liquid; pyrophoric, explosive, toxic or corrosive materials; compressed gases; fissionable isotopes (>27 g/ft^3); heat sources (>0.1 watt/ft^3); or RCRA materials.

Plastic Bucket No.: W-343 Date Filled and Sealed: 3/10/93

Description of Contents of the Plastic Bucket:

Item(s)	Source/Waste Form Category
Intermediate Container No. (if used): No I.D.	(See attached intermediate container data sheet for contents.)
Additional Materials	
NONE	

Combustibles: 98 vol %

Radiation Readings (if taken):

β-γ at 12 in.: 1.8 R/h β-γ at Contact: 2.0 R/h

Neutrons at 3 ft: BKG mrem/h Neutrons at Contact: 50 mrem/h

NOTE THAT NO RCRA MATERIALS ARE PRESENT IN THIS PLASTIC BUCKET

Signature of GCO Sealing the Plastic Bucket: Leo Evans

REFERENCE: Cask No.: ATN- 3210 and
Sequence No.: 16 (Data Sheet 3)

RH-TRU WASTE CERTIFICATION DATA SHEET NO. 1

CERTIFICATION OF INTERMEDIATE CONTAINERS OF RH-TRU WASTE (e.g., one-gallon paint cans) FILLED IN THE CUBICLES

[DO NOT USE IF RCRA MATERIALS ARE PRESENT]

Your signature certifies a numbered, filled, and closed container containing NO fines; free liquid; pyrophoric, explosive, toxic, or corrosive materials; compressed gases; fissionable isotopes (>27 g/ft^3); heat sources (>0.1 watt/ft^3); or RCRA materials.

Intermediate Container Identification: Paint Can No.: No I.D. #

(or other container and number):

Date Filled and Closed: 2/8/93

Description of Contents:

Item(s)	Source/Waste Form Category
String	LOWER SUPPLIES to CoB
WIRE	RADIATION PROBE WIRE
ROPE	LOWER SUPPLIES to CoB.
PLASTIC	UNMELTABLE POLY USED IN
FILTER	PROCESSING
	FILTER USED FILTER SOLIDS
	FROM PRODUCT

Combustibles: 98 vol %

Radiation Readings (if taken):

β-γ at 12 in.: 2 R/h Neutrons at 3 ft: 10 mrem/h

NOTE THAT NO RCRA MATERIALS ARE PRESENT IN THIS CONTAINER

Signature of GCO Filling and Closing Container: CW Evans

REFERENCE: Plastic Bucket No.: W-343 or

Draw-String Bag No.: _____ and Sequence No.: 16 (Data Sheet 4)

RH-TRU WASTE CERTIFICATION DATA SHEET NO. 2

CERTIFICATION OF RH-TRU WASTE REMOVED FROM THE CELL BANK IN PLASTIC BUCKETS

[DO NOT USE IF RCRA MATERIALS ARE PRESENT]

Your signature certifies a numbered, filled, and sealed plastic bucket containing NO fines; free liquid; pyrophoric, explosive, toxic or corrosive materials; compressed gases; fissionable isotopes (>27 g/ft^3); heat sources (>0.1 watt/ft^3); or RCRA materials.

Plastic Bucket No.: W-344 Date Filled and Sealed: 3/10/93

Description of Contents of the Plastic Bucket:

Item(s)	Source/Waste Form Category
Intermediate Container No. (if used): 2013	(See attached intermediate container data sheet for contents.)
Additional Materials	
NONE	

Combustibles: 10 vol %

Radiation Readings (if taken):

β-γ at 12 in.: BKG R/h β-γ at Contact: .450 R/h

Neutrons at 3 ft: BKG mrem/h Neutrons at Contact: 20 mrem/h

NOTE THAT NO RCRA MATERIALS ARE PRESENT IN THIS PLASTIC BUCKET

Signature of GCO Sealing the Plastic Bucket: A D Evans

REFERENCE: Cask No.: ATN- 3210 and
Sequence No.: 17 (Data Sheet 3)

RH-TRU WASTE CERTIFICATION DATA SHEET NO. 1

CERTIFICATION OF INTERMEDIATE CONTAINERS OF RH-TRU WASTE (e.g., one-gallon paint cans) FILLED IN THE CUBICLES

[DO NOT USE IF RCRA MATERIALS ARE PRESENT]

Your signature certifies a numbered, filled, and closed container containing NO fines; free liquid; pyrophoric, explosive, toxic, or corrosive materials; compressed gases; fissionable isotopes (>27 g/ft^3); heat sources (>0.1 watt/ft^3); or RCRA materials.

Intermediate Container Identification: Paint Can No.: 2013

(or other container and number): _____

Date Filled and Closed: 2/8/93

Description of Contents:

Item(s)	Source/Waste Form Category
WIRE (COATED)	RADIATION PROBE WIRE
BOTTLES	USED SAMPLE BOTTLES

Combustibles: 10 vol %

Radiation Readings (if taken):

β-γ at 12 in.: .020 R/h Neutrons at 3 ft: 20 mrem/h

NOTE THAT NO RCRA MATERIALS ARE PRESENT IN THIS CONTAINER

Signature of GCO Filling and Closing Container: A W Evans

REFERENCE: Plastic Bucket No.: W-344 or

Draw-String Bag No.: _____ and Sequence No.: 17 (Data Sheet 4)

RH-TRU WASTE CERTIFICATION DATA SHEET NO. 2

CERTIFICATION OF RH-TRU WASTE REMOVED FROM THE CELL BANK IN PLASTIC BUCKETS

[DO NOT USE IF RCRA MATERIALS ARE PRESENT]

Your signature certifies a numbered, filled, and sealed plastic bucket containing NO fines; free liquid; pyrophoric, explosive, toxic or corrosive materials; compressed gases; fissionable isotopes (>27 g/ft^3); heat sources (>0.1 watt/ft^3); or RCRA materials.

Plastic Bucket No.: W-346 Date Filled and Sealed: 3/11/93

Description of Contents of the Plastic Bucket:

Item(s)	Source/Waste Form Category
Intermediate Container No. (if used): 2001	(See attached intermediate container data sheet for contents.)
Additional Materials	
NONE	

Combustibles: 75 vol %

Radiation Readings (if taken):

β-γ at 12 in.: .600 R/h β-γ at Contact: .900 R/h

Neutrons at 3 ft: BKG mrem/h Neutrons at Contact: 30 mrem/h

NOTE THAT NO RCRA MATERIALS ARE PRESENT IN THIS PLASTIC BUCKET

Signature of GCO Sealing the Plastic Bucket: AW Evans

REFERENCE: Cask No.: ATN- 3210 and
Sequence No.: 18 (Data Sheet 3)

RH-TRU WASTE CERTIFICATION DATA SHEET NO. 1

CERTIFICATION OF INTERMEDIATE CONTAINERS OF RH-TRU WASTE (e.g., one-gallon paint cans) FILLED IN THE CUBICLES

[DO NOT USE IF RCRA MATERIALS ARE PRESENT]

Your signature certifies a numbered, filled, and closed container containing NO fines; free liquid; pyrophoric, explosive, toxic, or corrosive materials; compressed gases; fissionable isotopes (>27 g/ft^3); heat sources (>0.1 watt/ft^3); or RCRA materials.

Intermediate Container Identification: Paint Can No.: 2001

(or other container and number): _____

Date Filled and Closed: 2/8/93

Description of Contents:

Item(s)	Source/Waste Form Category
MELTED POLY	POLY USED IN PROCESSING
GLASS	GLASS USED IN PROCESSING

Combustibles: 75 vol %

Radiation Readings (if taken):

β-γ at 12 in.: .550 R/h Neutrons at 3 ft: BKG mrem/h

NOTE THAT NO RCRA MATERIALS ARE PRESENT IN THIS CONTAINER

Signature of GCO Filling and Closing Container: Ao Evans

REFERENCE: Plastic Bucket No.: W-346 or

Draw-String Bag No.: _____ and Sequence No.: 18 (Data Sheet 4)

RH-TRU WASTE CERTIFICATION DATA SHEET NO. 2

CERTIFICATION OF RH-TRU WASTE REMOVED FROM THE CELL BANK IN PLASTIC BUCKETS

[DO NOT USE IF RCRA MATERIALS ARE PRESENT]

Your signature certifies a numbered, filled, and sealed plastic bucket containing NO fines; free liquid; pyrophoric, explosive, toxic or corrosive materials; compressed gases; fissionable isotopes (>27 g/ft^3); heat sources (>0.1 watt/ft^3); or RCRA materials.

Plastic Bucket No.: W-347 Date Filled and Sealed: 3/11/93

Description of Contents of the Plastic Bucket:

Item(s)	Source/Waste Form Category
Intermediate Container No. (if used): 1979	(See attached intermediate container data sheet for contents.)
Additional Materials	
NONE	

Combustibles: 10 vol %

Radiation Readings (if taken):

β-γ at 12 in.: .250 R/h β-γ at Contact: .350 R/h

Neutrons at 3 ft: BKG mrem/h Neutrons at Contact: 30 mrem/h

NOTE THAT NO RCRA MATERIALS ARE PRESENT IN THIS PLASTIC BUCKET

Signature of GCO Sealing the Plastic Bucket: CW Evans

REFERENCE: Cask No.: ATN- 3210 and
Sequence No.: 19 (Data Sheet 3)

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RH-TRU WASTE CERTIFICATION DATA SHEET NO. 1

CERTIFICATION OF INTERMEDIATE CONTAINERS OF RH-TRU WASTE (e.g., one-gallon paint cans) FILLED IN THE CUBICLES

[DO NOT USE IF RCRA MATERIALS ARE PRESENT]

Your signature certifies a numbered, filled, and closed container containing NO fines; free liquid; pyrophoric, explosive, toxic, or corrosive materials; compressed gases; fissionable isotopes (>27 g/ft^3); heat sources (>0.1 watt/ft^3); or RCRA materials.

Intermediate Container Identification: Paint Can No.: 1979

(or other container and number): _____

Date Filled and Closed: 2/8/93

Description of Contents:

Item(s)	Source/Waste Form Category
GLASS BOTTLES	SAMPLE BTLS. FROM PROCESSING
BOTTLE LIDS	

Combustibles: 10 vol %

Radiation Readings (if taken):

β-γ at 12 in.: .250 R/h Neutrons at 3 ft: BKG mrem/h

NOTE THAT NO RCRA MATERIALS ARE PRESENT IN THIS CONTAINER

Signature of GCO Filling and Closing Container: C W Evans

REFERENCE: Plastic Bucket No.: W-347 or

Draw-String Bag No.: _____ and Sequence No.: 19 (Data Sheet 4)

RH-TRU WASTE CERTIFICATION DATA SHEET NO. 2

CERTIFICATION OF RH-TRU WASTE REMOVED FROM THE CELL BANK IN PLASTIC BUCKETS

[DO NOT USE IF RCRA MATERIALS ARE PRESENT]

Your signature certifies a numbered, filled, and sealed plastic bucket containing NO fines; free liquid; pyrophoric, explosive, toxic or corrosive materials; compressed gases; fissionable isotopes (>27 g/ft^3); heat sources (>0.1 watt/ft^3); or RCRA materials.

Plastic Bucket No.: W-352 Date Filled and Sealed: 4/5/93

Description of Contents of the Plastic Bucket:

Item(s)	Source/Waste Form Category
Intermediate Container No. (if used): 2024	(See attached intermediate container data sheet for contents.)
Additional Materials	
NONE	

Combustibles: 90 vol %

Radiation Readings (if taken):

β-γ at 12 in.: .125 R/h β-γ at Contact: .200 R/h

Neutrons at 3 ft: BK6 mrem/h Neutrons at Contact: 50 mrem/h

NOTE THAT NO RCRA MATERIALS ARE PRESENT IN THIS PLASTIC BUCKET

Signature of GCO Sealing the Plastic Bucket: A D Evans

REFERENCE: Cask No.: ATN- 3210 and
Sequence No.: 20 (Data Sheet 3)

RH-TRU WASTE CERTIFICATION DATA SHEET NO. 1

CERTIFICATION OF INTERMEDIATE CONTAINERS OF RH-TRU WASTE (e.g., one-gallon paint cans) FILLED IN THE CUBICLES

[DO NOT USE IF RCRA MATERIALS ARE PRESENT]

Your signature certifies a numbered, filled, and closed container containing NO fines; free liquid; pyrophoric, explosive, toxic, or corrosive materials; compressed gases; fissionable isotopes (>27 g/ft^3); heat sources (>0.1 watt/ft^3); or RCRA materials.

Intermediate Container Identification: Paint Can No.: 2024

(or other container and number):

Date Filled and Closed: 3/19/93

Description of Contents:

Item(s)	Source/Waste Form Category
MELTED POLY GLASS	MISC. POLY USED IN CELL USED SAMPLE BTLS.

COPY

Combustibles: 90 vol %

Radiation Readings (if taken):

β-γ at 12 in.: .125 R/h Neutrons at 3 ft: BK 6 mrem/h

NOTE THAT NO RCRA MATERIALS ARE PRESENT IN THIS CONTAINER

Signature of GCO Filling and Closing Container: CW Evans

REFERENCE: Plastic Bucket No.: W-352 or

Draw-String Bag No.: _____ and Sequence No.: 20 (Data Sheet 4)

RH-TRU WASTE CERTIFICATION DATA SHEET NO. 2

CERTIFICATION OF RH-TRU WASTE REMOVED FROM THE CELL BANK IN PLASTIC BUCKETS

[DO NOT USE IF RCRA MATERIALS ARE PRESENT]

Your signature certifies a numbered, filled, and sealed plastic bucket containing NO fines; free liquid; pyrophoric, explosive, toxic or corrosive materials; compressed gases; fissionable isotopes (>27 g/ft^3); heat sources (>0.1 watt/ft^3); or RCRA materials.

Plastic Bucket No.: W-353 Date Filled and Sealed: 4/5/93

Description of Contents of the Plastic Bucket:

Item(s)	Source/Waste Form Category
Intermediate Container No. (if used): 1834	(See attached intermediate container data sheet for contents.)
Additional Materials	
NONE	

Combustibles: 90 vol %

Radiation Readings (if taken):

β-γ at 12 in.: .275 R/h β-γ at Contact: 1.0 R/h

Neutrons at 3 ft: 3K6 mrem/h Neutrons at Contact: 30-0 mrem/h

NOTE THAT NO RCRA MATERIALS ARE PRESENT IN THIS PLASTIC BUCKET

Signature of GCO Sealing the Plastic Bucket: C W Evans

REFERENCE: Cask No.: ATN- 3210 and
Sequence No.: 21 (Data Sheet 3)

RH-TRU WASTE CERTIFICATION DATA SHEET NO. 1

CERTIFICATION OF INTERMEDIATE CONTAINERS OF RH-TRU WASTE (e.g., one-gallon paint cans) FILLED IN THE CUBICLES

[DO NOT USE IF RCRA MATERIALS ARE PRESENT]

Your signature certifies a numbered, filled, and closed container containing NO fines; free liquid; pyrophoric, explosive, toxic, or corrosive materials; compressed gases; fissionable isotopes (>27 g/ft^3); heat sources (>0.1 watt/ft^3); or RCRA materials.

Intermediate Container Identification: Paint Can No.: 1834

(or other container and number):

Date Filled and Closed: 3/19/93

Description of Contents:

Item(s)	Source/Waste Form Category
MELTED POLY GLASS	MISC. POLY USED IN CELL USED SAMPLE BTLS.

Combustibles: 90 vol %

Radiation Readings (if taken):

β-γ at 12 in.: .300 R/h Neutrons at 3 ft: BK6 mrem/h

NOTE THAT NO RCRA MATERIALS ARE PRESENT IN THIS CONTAINER

Signature of GCO Filling and Closing Container: Clw Evans

REFERENCE: Plastic Bucket No.: W-353 or

Draw-String Bag No.: _____ and Sequence No.: 21 (Data Sheet 4)

RH-TRU WASTE CERTIFICATION DATA SHEET NO. 2

CERTIFICATION OF RH-TRU WASTE REMOVED FROM THE CELL BANK IN PLASTIC BUCKETS

[DO NOT USE IF RCRA MATERIALS ARE PRESENT]

Your signature certifies a numbered, filled, and sealed plastic bucket containing NO fines; free liquid; pyrophoric, explosive, toxic or corrosive materials; compressed gases; fissionable isotopes (>27 g/ft^3); heat sources (>0.1 watt/ft^3); or RCRA materials.

Plastic Bucket No.: W-354 Date Filled and Sealed: 4/6/93

Description of Contents of the Plastic Bucket:

Item(s)	Source/Waste Form Category
Intermediate Container No. (if used): 1980	(See attached intermediate container data sheet for contents.)
Additional Materials	
NONE	

Combustibles: 90 vol %

Radiation Readings (if taken):

β-γ at 12 in.: .100 R/h β-γ at Contact: .500 R/h

Neutrons at 3 ft: BKG mrem/h Neutrons at Contact: 30 mrem/h

NOTE THAT NO RCRA MATERIALS ARE PRESENT IN THIS PLASTIC BUCKET

Signature of GCO Sealing the Plastic Bucket: C.W. Evans

REFERENCE: Cask No.: ATN- 3210 and
Sequence No.: 22 (Data Sheet 3)

RH-TRU WASTE CERTIFICATION DATA SHEET NO. 1

CERTIFICATION OF INTERMEDIATE CONTAINERS OF RH-TRU WASTE (e.g., one-gallon paint cans) FILLED IN THE CUBICLES

[DO NOT USE IF RCRA MATERIALS ARE PRESENT]

Your signature certifies a numbered, filled, and closed container containing NO fines; free liquid; pyrophoric, explosive, toxic, or corrosive materials; compressed gases; fissionable isotopes (>27 g/ft^3); heat sources (>0.1 watt/ft^3); or RCRA materials.

Intermediate Container Identification: Paint Can No.: 1980

(or other container and number):

Date Filled and Closed: 3/19/93

Description of Contents:

Item(s)	Source/Waste Form Category
MELTED POLY GLASS	MISC. POLY USED IN CELL USED SAMPLE BTLS.

Combustibles: 90 vol %

Radiation Readings (if taken):

β-γ at 12 in.: 100 R/h Neutrons at 3 ft: BKG mrem/h

NOTE THAT NO RCRA MATERIALS ARE PRESENT IN THIS CONTAINER

Signature of GCO Filling and Closing Container: A D Evans

REFERENCE: Plastic Bucket No.: W-354, or

Draw-String Bag No.: _____ and Sequence No.: 22 (Data Sheet 4)

RH-TRU WASTE CERTIFICATION DATA SHEET NO. 2

CERTIFICATION OF RH-TRU WASTE REMOVED FROM THE CELL BANK IN PLASTIC BUCKETS

[DO NOT USE IF RCRA MATERIALS ARE PRESENT]

Your signature certifies a numbered, filled, and sealed plastic bucket containing NO fines; free liquid; pyrophoric, explosive, toxic or corrosive materials; compressed gases; fissionable isotopes (>27 g/ft^3); heat sources (>0.1 watt/ft^3); or RCRA materials.

Plastic Bucket No.: W-355 Date Filled and Sealed: 4/6/93

Description of Contents of the Plastic Bucket:

Item(s)	Source/Waste Form Category
Intermediate Container No. (if used): 1966	(See attached intermediate container data sheet for contents.)
Additional Materials	
NONE	

Combustibles: 90 vol %

Radiation Readings (if taken):

β-γ at 12 in.: 100 R/h β-γ at Contact: 250 R/h

Neutrons at 3 ft: 0.46 mrem/h Neutrons at Contact: 70 mrem/h

NOTE THAT NO RCRA MATERIALS ARE PRESENT IN THIS PLASTIC BUCKET

Signature of GCO Sealing the Plastic Bucket: C W Evans

REFERENCE: Cask No.: ATN- 3210 and
Sequence No.: 22 (Data Sheet 3)

RH-TRU WASTE CERTIFICATION DATA SHEET NO. 1

CERTIFICATION OF INTERMEDIATE CONTAINERS OF RH-TRU WASTE (e.g., one-gallon paint cans) FILLED IN THE CUBICLES

[DO NOT USE IF RCRA MATERIALS ARE PRESENT]

Your signature certifies a numbered, filled, and closed container containing NO fines; free liquid; pyrophoric, explosive, toxic, or corrosive materials; compressed gases; fissionable isotopes (>27 g/ft^3); heat sources (>0.1 watt/ft^3); or RCRA materials.

Intermediate Container Identification: Paint Can No.: 1966

(or other container and number):

Date Filled and Closed: 3/19/93

Description of Contents:

Item(s)	Source/Waste Form Category
MELTED POLY GLASS	MISC. POLY FROM INCELL USED SAMPLE BTLS.

Combustibles: 90 vol %

Radiation Readings (if taken):

β-γ at 12 in.: .100 R/h Neutrons at 3 ft: BKG mrem/h

NOTE THAT NO RCRA MATERIALS ARE PRESENT IN THIS CONTAINER

Signature of GCO Filling and Closing Container: C W Evans

REFERENCE: Plastic Bucket No.: W-355 or

Draw-String Bag No.: _____ and Sequence No.: 23 (Data Sheet 4)

RH-TRU WASTE CERTIFICATION DATA SHEET NO. 2

CERTIFICATION OF RH-TRU WASTE REMOVED FROM THE CELL BANK IN PLASTIC BUCKETS

[DO NOT USE IF RCRA MATERIALS ARE PRESENT]

Your signature certifies a numbered, filled, and sealed plastic bucket containing NO fines; free liquid; pyrophoric, explosive, toxic or corrosive materials; compressed gases; fissionable isotopes (>27 g/ft^3); heat sources (>0.1 watt/ft^3); or RCRA materials.

Plastic Bucket No.: W-356 Date Filled and Sealed: 4/6/93

Description of Contents of the Plastic Bucket:

Item(s)	Source/Waste Form Category
Intermediate Container No. (if used): 2056	(See attached intermediate container data sheet for contents.)
Additional Materials	
NONE	

Combustibles: 90 vol %

Radiation Readings (if taken):

β-γ at 12 in.: .100 R/h β-γ at Contact: .150 R/h

Neutrons at 3 ft: BKG mrem/h Neutrons at Contact: 50 mrem/h

NOTE THAT NO RCRA MATERIALS ARE PRESENT IN THIS PLASTIC BUCKET

Signature of GCO Sealing the Plastic Bucket: CW Evans

REFERENCE: Cask No.: ATN- 320 and
Sequence No.: 24 (Data Sheet 3)

RH-TRU WASTE CERTIFICATION DATA SHEET NO. 1

CERTIFICATION OF INTERMEDIATE CONTAINERS OF RH-TRU WASTE (e.g., one-gallon paint cans) FILLED IN THE CUBICLES

[DO NOT USE IF RCRA MATERIALS ARE PRESENT]

Your signature certifies a numbered, filled, and closed container containing NO fines; free liquid; pyrophoric, explosive, toxic, or corrosive materials; compressed gases; fissionable isotopes (>27 g/ft^3); heat sources (>0.1 watt/ft^3); or RCRA materials.

Intermediate Container Identification: Paint Can No.: 2056

(or other container and number): _____

Date Filled and Closed: 3/19/93

Description of Contents:

Item(s)	Source/Waste Form Category
MELTED POLY GLASS	MISC. POLY FROM INCELL SAMPLE BTLS. USED IN CELL

Combustibles: 90 vol %

Radiation Readings (if taken):

β-γ at 12 in.: .050 R/h Neutrons at 3 ft: BKG mrem/h

NOTE THAT NO RCRA MATERIALS ARE PRESENT IN THIS CONTAINER

Signature of GCO Filling and Closing Container: [signature]

REFERENCE: Plastic Bucket No.: W-356, or

Draw-String Bag No.: _____ and Sequence No.: 24 (Data Sheet 4)

RH-TRU WASTE CERTIFICATION DATA SHEET NO. 2

CERTIFICATION OF RH-TRU WASTE REMOVED FROM THE CELL BANK IN PLASTIC BUCKETS

[DO NOT USE IF RCRA MATERIALS ARE PRESENT]

Your signature certifies a numbered, filled, and sealed plastic bucket containing NO fines; free liquid; pyrophoric, explosive, toxic or corrosive materials; compressed gases; fissionable isotopes (>27 g/ft^3); heat sources (>0.1 watt/ft^3); or RCRA materials.

Plastic Bucket No.: W-358 Date Filled and Sealed: 4/7/93

Description of Contents of the Plastic Bucket:

Item(s)	Source/Waste Form Category
Intermediate Container No. (if used): 2032	(See attached intermediate container data sheet for contents.)
Additional Materials	
NONE	

Combustibles: 90 vol %

Radiation Readings (if taken):

β-γ at 12 in.: 1.5 R/h β-γ at Contact: 2.0 R/h

Neutrons at 3 ft: BKG mrem/h Neutrons at Contact: 20 mrem/h

NOTE THAT NO RCRA MATERIALS ARE PRESENT IN THIS PLASTIC BUCKET

Signature of GCO Sealing the Plastic Bucket: A D Evans

REFERENCE: Cask No.: ATN-3210 and
Sequence No.: 25 (Data Sheet 3)

RH-TRU WASTE CERTIFICATION DATA SHEET NO. 1

CERTIFICATION OF INTERMEDIATE CONTAINERS OF RH-TRU WASTE (e.g., one-gallon paint cans) FILLED IN THE CUBICLES

[DO NOT USE IF RCRA MATERIALS ARE PRESENT]

Your signature certifies a numbered, filled, and closed container containing NO fines; free liquid; pyrophoric, explosive, toxic, or corrosive materials; compressed gases; fissionable isotopes (>27 g/ft^3); heat sources (>0.1 watt/ft^3); or RCRA materials.

Intermediate Container Identification: Paint Can No.: 2032

(or other container and number): _____

Date Filled and Closed: 3/19/93

Description of Contents:

Item(s)	Source/Waste Form Category
MELTED POLY GLASS	MISC. POLY USED IN CELL
	SAMPLE BTL. USED IN CELL

Combustibles: 90 vol %

Radiation Readings (if taken):

β-γ at 12 in.: 800 R/h Neutrons at 3 ft: BKG mrem/h

NOTE THAT NO RCRA MATERIALS ARE PRESENT IN THIS CONTAINER

Signature of GCO Filling and Closing Container: AW Evans

REFERENCE: Plastic Bucket No.: W-358, or

Draw-String Bag No.: _____ and Sequence No.: 25 (Data Sheet 4)

P 12

RH-TRU WASTE CERTIFICATION DATA SHEET NO. 2

CERTIFICATION OF RH-TRU WASTE REMOVED FROM THE CELL BANK IN PLASTIC BUCKETS

[DO NOT USE IF RCRA MATERIALS ARE PRESENT]

Your signature certifies a numbered, filled, and sealed plastic bucket containing NO fines; free liquid; pyrophoric, explosive, toxic or corrosive materials; compressed gases; fissionable isotopes (>27 g/ft^3); heat sources (>0.1 watt/ft^3); or RCRA materials.

Plastic Bucket No.: W-359 Date Filled and Sealed: 4/7/93

Description of Contents of the Plastic Bucket:

Item(s)	Source/Waste Form Category
Intermediate Container No. (if used): 1983	(See attached intermediate container data sheet for contents.)
Additional Materials	
NONE	

Combustibles: 100 vol %

Radiation Readings (if taken):

β-γ at 12 in.: 800 R/h β-γ at Contact: 3.5 R/h

Neutrons at 3 ft: BKG mrem/h Neutrons at Contact: 70 mrem/h

NOTE THAT NO RCRA MATERIALS ARE PRESENT IN THIS PLASTIC BUCKET

Signature of GCO Sealing the Plastic Bucket: A W Evans

REFERENCE: Cask No.: ATN- 3210 and
Sequence No.: 26 (Data Sheet 3)

RH-TRU WASTE CERTIFICATION DATA SHEET NO. 1

CERTIFICATION OF INTERMEDIATE CONTAINERS OF RH-TRU WASTE (e.g., one-gallon paint cans) FILLED IN THE CUBICLES

[DO NOT USE IF RCRA MATERIALS ARE PRESENT]

Your signature certifies a numbered, filled, and closed container containing NO fines; free liquid; pyrophoric, explosive, toxic, or corrosive materials; compressed gases; fissionable isotopes (>27 g/ft^3); heat sources (>0.1 watt/ft^3); or RCRA materials.

Intermediate Container Identification: Paint Can No.: 1983

(or other container and number): _____

Date Filled and Closed: 3/19/93

Description of Contents:

Item(s)	Source/Waste Form Category
MELTED POLY WIPES	MISC. POLY USED IN CELL WIPES FROM IN CELL CLEANING

Combustibles: 100 vol %

Radiation Readings (if taken):

β-γ at 12 in.: .800 R/h Neutrons at 3 ft: BKG mrem/h

NOTE THAT NO RCRA MATERIALS ARE PRESENT IN THIS CONTAINER

Signature of GCO Filling and Closing Container: [signature]

REFERENCE: Plastic Bucket No.: W-359 or

Draw-String Bag No.: _____ and Sequence No.: 26 (Data Sheet 4)

RH-TRU WASTE CERTIFICATION DATA SHEET NO. 2

CERTIFICATION OF RH-TRU WASTE REMOVED FROM THE CELL BANK IN PLASTIC BUCKETS

[DO NOT USE IF RCRA MATERIALS ARE PRESENT]

Your signature certifies a numbered, filled, and sealed plastic bucket containing NO fines; free liquid; pyrophoric, explosive, toxic or corrosive materials; compressed gases; fissionable isotopes (>27 g/ft^3); heat sources (>0.1 watt/ft^3); or RCRA materials.

Plastic Bucket No.: W-385 Date Filled and Sealed: 6/15/93

Description of Contents of the Plastic Bucket:

Item(s)	Source/Waste Form Category
Intermediate Container No. (if used): 1883	(See attached intermediate container data sheet for contents.)
Additional Materials	
NONE	

Combustibles: 60 vol %

Radiation Readings (if taken):

β-γ at 12 in.: 1.75 R/h β-γ at Contact: 3.0 R/h

Neutrons at 3 ft: 40 mrem/h Neutrons at Contact: 600 mrem/h

NOTE THAT NO RCRA MATERIALS ARE PRESENT IN THIS PLASTIC BUCKET

Signature of GCO Sealing the Plastic Bucket: A D Evans

REFERENCE: Cask No.: ATN- 3210 and
Sequence No.: 27 (Data Sheet 3)

RH-TRU WASTE CERTIFICATION DATA SHEET NO. 1

CERTIFICATION OF INTERMEDIATE CONTAINERS OF RH-TRU WASTE (e.g., one-gallon paint cans) FILLED IN THE CUBICLES

[DO NOT USE IF RCRA MATERIALS ARE PRESENT]

Your signature certifies a numbered, filled, and closed container containing NO fines; free liquid; pyrophoric, explosive, toxic, or corrosive materials; compressed gases; fissionable isotopes (>27 g/ft^3); heat sources (>0.1 watt/ft^3); or RCRA materials.

Intermediate Container Identification: Paint Can No.: 1883

(or other container and number): _____

Date Filled and Closed: 6/8/93

Description of Contents:

Item(s)	Source/Waste Form Category
POLY METAL WIPES	CELL BANK

Combustibles: 60 vol %

Radiation Readings (if taken):

β-γ at 12 in.: 1.75 R/h Neutrons at 3 ft: 40 mrem/h

NOTE THAT NO RCRA MATERIALS ARE PRESENT IN THIS CONTAINER

Signature of GCO Filling and Closing Container: A W Evans

REFERENCE: Plastic Bucket No.: W-385 or

Draw-String Bag No.: _____ and Sequence No.: 27 (Data Sheet 4)

RH-TRU WASTE CERTIFICATION DATA SHEET NO. 2

CERTIFICATION OF RH-TRU WASTE REMOVED FROM THE CELL BANK IN PLASTIC BUCKETS

[DO NOT USE IF RCRA MATERIALS ARE PRESENT]

Your signature certifies a numbered, filled, and sealed plastic bucket containing NO fines; free liquid; pyrophoric, explosive, toxic or corrosive materials; compressed gases; fissionable isotopes (>27 g/ft^3); heat sources (>0.1 watt/ft^3); or RCRA materials.

Plastic Bucket No.: W-386 Date Filled and Sealed: 6/15/93

Description of Contents of the Plastic Bucket:

Item(s)	Source/Waste Form Category
Intermediate Container No. (if used): 1803	(See attached intermediate container data sheet for contents.)
Additional Materials	
NONE.	

Combustibles: 80 vol %

Radiation Readings (if taken):

β-γ at 12 in.: .750 R/h β-γ at Contact: 3.0 R/h

Neutrons at 3 ft: 20 mrem/h Neutrons at Contact: 500 mrem/h

NOTE THAT NO RCRA MATERIALS ARE PRESENT IN THIS PLASTIC BUCKET

Signature of GCO Sealing the Plastic Bucket: A D Evans

REFERENCE: Cask No.: ATN- 3210 and
Sequence No.: 28 (Data Sheet 3)

RH-TRU WASTE CERTIFICATION DATA SHEET NO. 1

CERTIFICATION OF INTERMEDIATE CONTAINERS OF RH-TRU WASTE (e.g., one-gallon paint cans) FILLED IN THE CUBICLES

[DO NOT USE IF RCRA MATERIALS ARE PRESENT]

Your signature certifies a numbered, filled, and closed container containing NO fines; free liquid; pyrophoric, explosive, toxic, or corrosive materials; compressed gases; fissionable isotopes (>27 g/ft^3); heat sources (>0.1 watt/ft^3); or RCRA materials.

Intermediate Container Identification: Paint Can No.: 1803

(or other container and number):

Date Filled and Closed: 6/8/93

Description of Contents:

Item(s)	Source/Waste Form Category
WIPES	
GLASS	
POLY	CELL BANK
METAL	

Combustibles: 80 vol %

Radiation Readings (if taken):

β-γ at 12 in.: .750 R/h Neutrons at 3 ft: 20 mrem/h

NOTE THAT NO RCRA MATERIALS ARE PRESENT IN THIS CONTAINER

Signature of GCO Filling and Closing Container: C W Evans

REFERENCE: Plastic Bucket No.: W-386, or

Draw-String Bag No.: _____ and Sequence No.: 28 (Data Sheet 4)

RH-TRU WASTE CERTIFICATION DATA SHEET NO. 2

CERTIFICATION OF RH-TRU WASTE REMOVED FROM THE CELL BANK IN PLASTIC BUCKETS

[DO NOT USE IF RCRA MATERIALS ARE PRESENT]

Your signature certifies a numbered, filled, and sealed plastic bucket containing NO fines; free liquid; pyrophoric, explosive, toxic or corrosive materials; compressed gases; fissionable isotopes (>27 g/ft^3); heat sources (>0.1 watt/ft^3); or RCRA materials.

Plastic Bucket No.: W-388 Date Filled and Sealed: 6/16/93

Description of Contents of the Plastic Bucket:

Item(s)	Source/Waste Form Category
Intermediate Container No. (if used): 1963	(See attached intermediate container data sheet for contents.)
Additional Materials	
None	

Combustibles: 90 vol %

Radiation Readings (if taken):

β-γ at 12 in.: .300 R/h β-γ at Contact: .250 R/h

Neutrons at 3 ft: BKG mrem/h Neutrons at Contact: 30 mrem/h

NOTE THAT NO RCRA MATERIALS ARE PRESENT IN THIS PLASTIC BUCKET

Signature of GCO Sealing the Plastic Bucket: A J Evans

REFERENCE: Cask No.: ATN-3210 and
Sequence No.: 29 (Data Sheet 3)

RH-TRU WASTE CERTIFICATION DATA SHEET NO. 1

CERTIFICATION OF INTERMEDIATE CONTAINERS OF RH-TRU WASTE (e.g., one-gallon paint cans) FILLED IN THE CUBICLES

[DO NOT USE IF RCRA MATERIALS ARE PRESENT]

Your signature certifies a numbered, filled, and closed container containing NO fines; free liquid; pyrophoric, explosive, toxic, or corrosive materials; compressed gases; fissionable isotopes (>27 g/ft^3); heat sources (>0.1 watt/ft^3); or RCRA materials.

Intermediate Container Identification: Paint Can No.: 1963

(or other container and number): _____

Date Filled and Closed: 6/16/93

Description of Contents:

Item(s)	Source/Waste Form Category
MELTED POLY	
GLASS	
PLASTIC	CELL BANK

Combustibles: 90 vol %

Radiation Readings (if taken):

β-γ at 12 in.: 300 R/h Neutrons at 3 ft: BKG mrem/h

NOTE THAT NO RCRA MATERIALS ARE PRESENT IN THIS CONTAINER

Signature of GCO Filling and Closing Container: CW Evans

REFERENCE: Plastic Bucket No.: W-388, or

Draw-String Bag No.: _____ and Sequence No.: 29 (Data Sheet 4)

RH-TRU WASTE CERTIFICATION DATA SHEET NO. 2

CERTIFICATION OF RH-TRU WASTE REMOVED FROM THE CELL BANK IN PLASTIC BUCKETS

[DO NOT USE IF RCRA MATERIALS ARE PRESENT]

Your signature certifies a numbered, filled, and sealed plastic bucket containing NO fines; free liquid; pyrophoric, explosive, toxic or corrosive materials; compressed gases; fissionable isotopes (>27 g/ft^3); heat sources (>0.1 watt/ft^3); or RCRA materials.

Plastic Bucket No.: W-389 Date Filled and Sealed: 6/16/88

Description of Contents of the Plastic Bucket:

Item(s)	Source/Waste Form Category
Intermediate Container No. (if used): 3441	(See attached intermediate container data sheet for contents.)
Additional Materials	
NONE	

Combustibles: 80 vol %

Radiation Readings (if taken):

β-γ at 12 in.: .400 R/h β-γ at Contact: .900 R/h

Neutrons at 3 ft: BKG mrem/h Neutrons at Contact: 150 mrem/h

NOTE THAT NO RCRA MATERIALS ARE PRESENT IN THIS PLASTIC BUCKET

Signature of GCO Sealing the Plastic Bucket: AD Evans

REFERENCE: Cask No.: ATN-3210 and
Sequence No.: 30 (Data Sheet 3).

RH-TRU WASTE CERTIFICATION DATA SHEET NO. 1

CERTIFICATION OF INTERMEDIATE CONTAINERS OF RH-TRU WASTE (e.g., one-gallon paint cans) FILLED IN THE CUBICLES

[DO NOT USE IF RCRA MATERIALS ARE PRESENT]

Your signature certifies a numbered, filled, and closed container containing NO fines; free liquid; pyrophoric, explosive, toxic, or corrosive materials; compressed gases; fissionable isotopes (>27 g/ft^3); heat sources (>0.1 watt/ft^3); or RCRA materials.

Intermediate Container Identification: Paint Can No.: 3441

(or other container and number): _____

Date Filled and Closed: 6/16/93

Description of Contents:

Item(s)	Source/Waste Form Category
WIPES	
METAL	
POLY	

Combustibles: 80 vol %

Radiation Readings (if taken):

β-γ at 12 in.: 400 R/h Neutrons at 3 ft: BKG mrem/h

NOTE THAT NO RCRA MATERIALS ARE PRESENT IN THIS CONTAINER

Signature of GCO Filling and Closing Container: CW Evans

REFERENCE: Plastic Bucket No.: W-389 or

Draw-String Bag No.: _____ and Sequence No.: 30 (Data Sheet 4)

RH-TRU WASTE CERTIFICATION DATA SHEET NO. 2

CERTIFICATION OF RH-TRU WASTE REMOVED FROM THE CELL BANK IN PLASTIC BUCKETS

[DO NOT USE IF RCRA MATERIALS ARE PRESENT]

Your signature certifies a numbered, filled, and sealed plastic bucket containing NO fines; free liquid; pyrophoric, explosive, toxic or corrosive materials; compressed gases; fissionable isotopes (>27 g/ft^3); heat sources (>0.1 watt/ft^3); or RCRA materials.

Plastic Bucket No.: W-392 Date Filled and Sealed: 6/22/93

Description of Contents of the Plastic Bucket:

Item(s)	Source/Waste Form Category
Intermediate Container No. (if used): 1990	(See attached intermediate container data sheet for contents.)
Additional Materials	
NONE	

Combustibles: 75 vol %

Radiation Readings (if taken):

β-γ at 12 in.: 300 R/h β-γ at Contact: 500 R/h

Neutrons at 3 ft: BKG mrem/h Neutrons at Contact: 35 mrem/h

NOTE THAT NO RCRA MATERIALS ARE PRESENT IN THIS PLASTIC BUCKET

Signature of GCO Sealing the Plastic Bucket: C W Evans

REFERENCE: Cask No.: ATN- 3210 and
Sequence No.: 31 (Data Sheet 3)

RH-TRU WASTE CERTIFICATION DATA SHEET NO. 1

CERTIFICATION OF INTERMEDIATE CONTAINERS OF RH-TRU WASTE (e.g., one-gallon paint cans) FILLED IN THE CUBICLES

[DO NOT USE IF RCRA MATERIALS ARE PRESENT]

Your signature certifies a numbered, filled, and closed container containing NO fines; free liquid; pyrophoric, explosive, toxic, or corrosive materials; compressed gases; fissionable isotopes (>27 g/ft^3); heat sources (>0.1 watt/ft^3); or RCRA materials.

Intermediate Container Identification: Paint Can No.: 1990

(or other container and number): _____

Date Filled and Closed: 6/16/93

Description of Contents:

Item(s)	Source/Waste Form Category
STRING	
WIPES	CELL BANK
METAL	

Combustibles: 75 vol %

Radiation Readings (if taken):

β-γ at 12 in.: .300 R/h Neutrons at 3 ft: BKG mrem/h

NOTE THAT NO RCRA MATERIALS ARE PRESENT IN THIS CONTAINER

Signature of GCO Filling and Closing Container: A O Evans

REFERENCE: Plastic Bucket No.: W-392, or

Draw-String Bag No.: _____ and Sequence No.: 31 (Data Sheet 4)

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RH-TRU WASTE CERTIFICATION DATA SHEET NO. 2

CERTIFICATION OF RH-TRU WASTE REMOVED FROM THE CELL BANK IN PLASTIC BUCKETS

[DO NOT USE IF RCRA MATERIALS ARE PRESENT]

Your signature certifies a numbered, filled, and sealed plastic bucket containing NO fines; free liquid; pyrophoric, explosive, toxic or corrosive materials; compressed gases; fissionable isotopes (>27 g/ft^3); heat sources (>0.1 watt/ft^3); or RCRA materials.

Plastic Bucket No.: W-393 Date Filled and Sealed: 6/22/9-

Description of Contents of the Plastic Bucket:

Item(s)	Source/Waste Form Category
Intermediate Container No. (if used): a129	(See attached intermediate container data sheet for contents.)
Additional Materials	
None	

Combustibles: 90 vol %

Radiation Readings (if taken):

β-γ at 12 in.: 150 R/h β-γ at Contact: 250 R/h

Neutrons at 3 ft: BKG mrem/h Neutrons at Contact: 15 mrem/h

NOTE THAT NO RCRA MATERIALS ARE PRESENT IN THIS PLASTIC BUCKET

Signature of GCO Sealing the Plastic Bucket: A O Evans

REFERENCE: Cask No.: ATN-3210 and
Sequence No.: 32 (Data Sheet 3)

RH-TRU WASTE CERTIFICATION DATA SHEET NO. 2

CERTIFICATION OF RH-TRU WASTE REMOVED FROM THE CELL BANK IN PLASTIC BUCKETS

[DO NOT USE IF RCRA MATERIALS ARE PRESENT]

Your signature certifies a numbered, filled, and sealed plastic bucket containing NO fines; free liquid; pyrophoric, explosive, toxic or corrosive materials; compressed gases; fissionable isotopes (>27 g/ft^3); heat sources (>0.1 watt/ft^3); or RCRA materials.

Plastic Bucket No.: W-395 Date Filled and Sealed: 6/23/93

Description of Contents of the Plastic Bucket:

Item(s)	Source/Waste Form Category
Intermediate Container No. (if used): No I.D.#	(See attached intermediate container data sheet for contents.)
Additional Materials	
NONE	

Combustibles: _____ vol %

Radiation Readings (if taken):

β-γ at 12 in.: .050 R/h β-γ at Contact: .700 ~~.070~~ aoe R/h

Neutrons at 3 ft: BKG mrem/h Neutrons at Contact: 60 mrem/h

NOTE THAT NO RCRA MATERIALS ARE PRESENT IN THIS PLASTIC BUCKET

Signature of GCO Sealing the Plastic Bucket: AO Evans

REFERENCE: Cask No.: ATN- 3210 and
Sequence No.: 33 (Data Sheet 3)

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RH-TRU WASTE CERTIFICATION DATA SHEET NO. 1

CERTIFICATION OF INTERMEDIATE CONTAINERS OF RH-TRU WASTE
(e.g., one-gallon paint cans) FILLED IN THE CUBICLES

[DO NOT USE IF RCRA MATERIALS ARE PRESENT]

Your signature certifies a numbered, filled, and closed container containin fines; free liquid; pyrophoric, explosive, toxic, or corrosive materials; c pressed gases; fissionable isotopes (>27 g/ft^3); heat sources (>0.1 watt/ft or RCRA materials.

Intermediate Container Identification: Paint Can No.: No #

(or other container and number):

Date Filled and Closed: 5/24/93

Description of Contents:

Item(s)	Source/Waste Form Category
METAL	
POLY	CELL BANK
GLASS	

Combustibles: 25 vol %

Radiation Readings (if taken):
β-γ at 12 in.: .050 R/h Neutrons at 3 ft: BKG mrem/h

NOTE THAT NO RCRA MATERIALS ARE PRESENT IN THIS CONTAINER

Signature of GCO Filling and Closing Container: CW Estes

REFERENCE: Plastic Bucket No.: W-395, or
Draw-String Bag No.: _____ and Sequence No.: 33 (Data Sheet 4)

RH-TRU WASTE CERTIFICATION DATA SHEET NO. 2

CERTIFICATION OF RH-TRU WASTE REMOVED FROM THE CELL BANK IN PLASTIC BUCKETS

[DO NOT USE IF RCRA MATERIALS ARE PRESENT]

Your signature certifies a numbered, filled, and sealed plastic bucket containing NO fines; free liquid; pyrophoric, explosive, toxic or corrosive materials; compressed gases; fissionable isotopes (>27 g/ft^3); heat sources (>0.1 watt/ft^3); or RCRA materials.

Plastic Bucket No.: W-396 Date Filled and Sealed: 6/23/93

Description of Contents of the Plastic Bucket:

Item(s)	Source/Waste Form Category
Intermediate Container No. (if used): 2022	(See attached intermediate container data sheet for contents.)
Additional Materials	
NONE	

Combustibles: 80 vol %

Radiation Readings (if taken):

β-γ at 12 in.: .100 R/h β-γ at Contact: .800 R/h

Neutrons at 3 ft: BKG mrem/h Neutrons at Contact: 150 mrem/h

NOTE THAT NO RCRA MATERIALS ARE PRESENT IN THIS PLASTIC BUCKET

Signature of GCO Sealing the Plastic Bucket: C W Evans

REFERENCE: Cask No.: ATN-3210 and
Sequence No.: 34 (Data Sheet 3)

RH-TRU WASTE CERTIFICATION DATA SHEET NO. 1

CERTIFICATION OF INTERMEDIATE CONTAINERS OF RH-TRU WASTE
(e.g., one-gallon paint cans) FILLED IN THE CUBICLES

[DO NOT USE IF RCRA MATERIALS ARE PRESENT]

Your signature certifies a numbered, filled, and closed container containing NO fines; free liquid; pyrophoric, explosive, toxic, or corrosive materials; compressed gases; fissionable isotopes (>27 g/ft^3); heat sources (>0.1 watt/ft^3); or RCRA materials.

Intermediate Container Identification: Paint Can No.: 2022

(or other container and number):

Date Filled and Closed: 6/8/93

Description of Contents:

Item(s)	Source/Waste Form Category
String	
Poly	CELL BANK
Glass	

Combustibles: 80 vol %

Radiation Readings (if taken):
β-γ at 12 in.: .100 R/h Neutrons at 3 ft: BKG mrem/h

NOTE THAT NO RCRA MATERIALS ARE PRESENT IN THIS CONTAINER

Signature of GCO Filling and Closing Container: A D Evans

REFERENCE: Plastic Bucket No.: W-396, or
Draw-String Bag No.: _____ and Sequence No.: 34 (Data Sheet 4)

RH-TRU WASTE CERTIFICATION DATA SHEET NO. 2

CERTIFICATION OF RH-TRU WASTE REMOVED FROM THE CELL BANK IN PLASTIC BUCKETS

[DO NOT USE IF RCRA MATERIALS ARE PRESENT]

Your signature certifies a numbered, filled, and sealed plastic bucket containing NO fines; free liquid; pyrophoric, explosive, toxic or corrosive materials; compressed gases; fissionable isotopes (>27 g/ft^3); heat sources (>0.1 watt/ft^3); or RCRA materials.

Plastic Bucket No.: W-397 Date Filled and Sealed: 6/23/93

Description of Contents of the Plastic Bucket:

Item(s)	Source/Waste Form Category
Intermediate Container No. (if used): 1950	(See attached intermediate container data sheet for contents.)
Additional Materials	
NONE	

Combustibles: 75 vol %

Radiation Readings (if taken):

β-γ at 12 in.: .250 R/h β-γ at Contact: 1.1 R/h

Neutrons at 3 ft: BKG mrem/h Neutrons at Contact: 160 mrem/h

NOTE THAT NO RCRA MATERIALS ARE PRESENT IN THIS PLASTIC BUCKET

Signature of GCO Sealing the Plastic Bucket: AO Evans

REFERENCE: Cask No.: ATN- 3210 and
Sequence No.: 35 (Data Sheet 3)

RH-TRU WASTE CERTIFICATION DATA SHEET NO. 1

CERTIFICATION OF INTERMEDIATE CONTAINERS OF RH-TRU WASTE
(e.g., one-gallon paint cans) FILLED IN THE CUBICLES

[DO NOT USE IF RCRA MATERIALS ARE PRESENT]

Your signature certifies a numbered, filled, and closed container containing NO fines; free liquid; pyrophoric, explosive, toxic, or corrosive materials; compressed gases; fissionable isotopes (>27 g/ft^3); heat sources (>0.1 watt/ft^3); or RCRA materials.

Intermediate Container Identification: Paint Can No.: 1950
(or other container and number):
Date Filled and Closed: 6/8/93

Description of Contents:

Item(s)	Source/Waste Form Category
WIPES	
POLY	
METAL	CELL BANK
GLASS	

Combustibles: 75 vol %

Radiation Readings (if taken):
β-γ at 12 in.: .250 R/h Neutrons at 3 ft: BKG mrem/h

NOTE THAT NO RCRA MATERIALS ARE PRESENT IN THIS CONTAINER

Signature of GCO Filling and Closing Container: CW Evans

REFERENCE: Plastic Bucket No.: W347 or
Draw-String Bag No.: _____ and Sequence No.: 35 (Data Sheet 4)

RH-TRU WASTE CERTIFICATION DATA SHEET NO. 2

CERTIFICATION OF RH-TRU WASTE REMOVED FROM THE CELL BANK IN PLASTIC BUCKETS

[DO NOT USE IF RCRA MATERIALS ARE PRESENT]

Your signature certifies a numbered, filled, and sealed plastic bucket containing NO fines; free liquid; pyrophoric, explosive, toxic or corrosive materials; compressed gases; fissionable isotopes (>27 g/ft^3); heat sources (>0.1 watt/ft^3); or RCRA materials.

Plastic Bucket No.: W403 Date Filled and Sealed: 6/29/93

Description of Contents of the Plastic Bucket:

Item(s)	Source/Waste Form Category
Intermediate Container No. (if used): NOT	(See attached intermediate container data sheet for contents.)
Additional Materials	
NONE	

Combustibles: 90 vol %

Radiation Readings (if taken):

β-γ at 12 in.: .250 R/h β-γ at Contact: .350 R/h

Neutrons at 3 ft: BKG mrem/h Neutrons at Contact: 30 mrem/h

NOTE THAT NO RCRA MATERIALS ARE PRESENT IN THIS PLASTIC BUCKET

Signature of GCO Sealing the Plastic Bucket: A O Evans

REFERENCE: Cask No.: ATN- 3210 and

Sequence No.: ~~4353~~ 4356 (Data Sheet 3)

6/29/93

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RH-TRU WASTE CERTIFICATION DATA SHEET NO. 1

CERTIFICATION OF INTERMEDIATE CONTAINERS OF RH-TRU WASTE
(e.g., one-gallon paint cans) FILLED IN THE CUBICLES

[DO NOT USE IF RCRA MATERIALS ARE PRESENT]

Your signature certifies a numbered, filled, and closed container containing NO fines; free liquid; pyrophoric, explosive, toxic, or corrosive materials; compressed gases; fissionable isotopes (>27 g/ft^3); heat sources (>0.1 watt/ft^3); or RCRA materials.

Intermediate Container Identification: Paint Can No.: NO #

(or other container and number): _____

Date Filled and Closed: 6/29/83

Description of Contents:

Item(s)	Source/Waste Form Category
MELTED POLY	
GLASS	CELL BANK

Combustibles: 90% vol %

Radiation Readings (if taken):
β-γ at 12 in.: .250 R/h Neutrons at 3 ft: BK6 mrem/h

NOTE THAT NO RCRA MATERIALS ARE PRESENT IN THIS CONTAINER

Signature of GCO Filling and Closing Container: CW Evans

REFERENCE: Plastic Bucket No.: W-403, or
Draw-String Bag No.: _____ and Sequence No.: 316 25 (Data Sheet 4)

RH-TRU WASTE CERTIFICATION DATA SHEET NO. 2

CERTIFICATION OF RH-TRU WASTE REMOVED FROM THE CELL BANK IN PLASTIC BUCKETS

[DO NOT USE IF RCRA MATERIALS ARE PRESENT]

Your signature certifies a numbered, filled, and sealed plastic bucket containing NO fines; free liquid; pyrophoric, explosive, toxic or corrosive materials; compressed gases; fissionable isotopes (>27 g/ft^3); heat sources (>0.1 watt/ft^3); or RCRA materials.

Plastic Bucket No.: W-404 Date Filled and Sealed: 6/29/93

Description of Contents of the Plastic Bucket:

Item(s)	Source/Waste Form Category
Intermediate Container No. (if used): 1996	(See attached intermediate container data sheet for contents.)
Additional Materials	
NONE	

Combustibles: 100 vol %

Radiation Readings (if taken):

β-γ at 12 in.: .400 R/h β-γ at Contact: .500 R/h

Neutrons at 3 ft: 3 mrem/h Neutrons at Contact: 50 mrem/h

NOTE THAT NO RCRA MATERIALS ARE PRESENT IN THIS PLASTIC BUCKET

Signature of GCO Sealing the Plastic Bucket: [signature]

REFERENCE: Cask No.: ATN- 3210 and
Sequence No.: ~~3037~~ 3038 (Data Sheet 3)

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RH-TRU WASTE CERTIFICATION DATA SHEET NO. 1

CERTIFICATION OF INTERMEDIATE CONTAINERS OF RH-TRU WASTE
(e.g., one-gallon paint cans) FILLED IN THE CUBICLES

[DO NOT USE IF RCRA MATERIALS ARE PRESENT]

Your signature certifies a numbered, filled, and closed container containing NO fines; free liquid; pyrophoric, explosive, toxic, or corrosive materials; compressed gases; fissionable isotopes (>27 g/ft^3); heat sources (>0.1 watt/ft^3); or RCRA materials.

Intermediate Container Identification: Paint Can No.: 1996

(or other container and number): _____

Date Filled and Closed: 6/29/93

Description of Contents:

Item(s)	Source/Waste Form Category
MELTED POLY	CELL BLOCK

Combustibles: 100% vol %

Radiation Readings (if taken):
β-γ at 12 in.: .400 R/h Neutrons at 3 ft: 4 mrem/h

NOTE THAT NO RCRA MATERIALS ARE PRESENT IN THIS CONTAINER

Signature of GCO Filling and Closing Container: AW Evans

REFERENCE: Plastic Bucket No.: W-404, or
Draw-String Bag No.: _____ and Sequence No.: 37/36 (Data Sheet 4)
AWE

RH-TRU WASTE CERTIFICATION DATA SHEET NO. 2

CERTIFICATION OF RH-TRU WASTE REMOVED FROM THE CELL BANK IN PLASTIC BUCKETS

[DO NOT USE IF RCRA MATERIALS ARE PRESENT]

Your signature certifies a numbered, filled, and sealed plastic bucket containing NO fines; free liquid; pyrophoric, explosive, toxic or corrosive materials; compressed gases; fissionable isotopes (>27 g/ft^3); heat sources (>0.1 watt/ft^3); or RCRA materials.

Plastic Bucket No.: W-405 Date Filled and Sealed: 6/24/93

Description of Contents of the Plastic Bucket:

Item(s)	Source/Waste Form Category
Intermediate Container No. (if used): 1817	(See attached intermediate container data sheet for contents.)
Additional Materials	
NONE	

Combustibles: 90 vol %

Radiation Readings (if taken):

β-γ at 12 in.: 400 R/h β-γ at Contact: 800 R/h

Neutrons at 3 ft: BKG mrem/h Neutrons at Contact: 60 mrem/h

NOTE THAT NO RCRA MATERIALS ARE PRESENT IN THIS PLASTIC BUCKET

Signature of GCO Sealing the Plastic Bucket: C W Ferrara

REFERENCE: Cask No.: ATN- 821D and
Sequence No.: ~~3738~~ 3738 (Data Sheet 3)

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RH-TRU WASTE CERTIFICATION DATA SHEET NO. 1

CERTIFICATION OF INTERMEDIATE CONTAINERS OF RH-TRU WAST
(e.g., one-gallon paint cans) FILLED IN THE CUBICLES

[DO NOT USE IF RCRA MATERIALS ARE PRESENT]

Your signature certifies a numbered, filled, and closed container c
fines; free liquid; pyrophoric, explosive, toxic, or corrosive mate
pressed gases; fissionable isotopes (>27 g/ft^3); heat sources (>0.1
or RCRA materials.

Intermediate Container Identification: Paint Can No.: 1817

(or other container and number): _____

Date Filled and Closed: 6/29/93

Description of Contents:

Item(s)	Source/Waste Form Category
MELTED POLY	
GLASS	CELL BANK

Combustibles: 90 vol %

Radiation Readings (if taken):
β-γ at 12 in.: .400 R/h Neutrons at 3 ft: BKG

NOTE THAT NO RCRA MATERIALS ARE PRESENT IN THIS CONTAINER

Signature of GCO Filling and Closing Container: [signature]

REFERENCE: Plastic Bucket No.: W-405 or
Draw-String Bag No.: _____ and Sequence No.: 38 (Data S

RH-TRU WASTE CERTIFICATION DATA SHEET NO. 2

CERTIFICATION OF RH-TRU WASTE REMOVED FROM THE CELL BANK IN PLASTIC BUCKETS

[DO NOT USE IF RCRA MATERIALS ARE PRESENT]

Your signature certifies a numbered, filled, and sealed plastic buck taining NO fines; free liquid; pyrophoric, explosive, toxic or corro materials; compressed gases; fissionable isotopes (>27 g/ft^3); heat (>0.1 watt/ft^3); or RCRA materials.

Plastic Bucket No.: W-408 Date Filled and Sealed: 7/

Description of Contents of the Plastic Bucket:

Item(s)	Source/Waste Form Category
Intermediate Container No. (if used): 1939	(See attached intermediate containe sheet for contents.)
Additional Materials	
None	

Combustibles: 90 vol %

Radiation Readings (if taken):

β-γ at 12 in.: .200 R/h β-γ at Contact: .200 R/h

Neutrons at 3 ft: BKG mrem/h Neutrons at Contact: 40

NOTE THAT NO RCRA MATERIALS ARE PRESENT IN THIS PLASTIC BUCKET

Signature of GCO Sealing the Plastic Bucket: CW Evans

REFERENCE: Cask No.: ATN- 3210 and
Sequence No.: 39 (Data Sheet 3)

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RH-TRU WASTE CERTIFICATION DATA SHEET NO. 1

CERTIFICATION OF INTERMEDIATE CONTAINERS OF RH-TRU WASTE
(e.g., one-gallon paint cans) FILLED IN THE CUBICLES

[DO NOT USE IF RCRA MATERIALS ARE PRESENT]

Your signature certifies a numbered, filled, and closed container contain: fines; free liquid; pyrophoric, explosive, toxic, or corrosive materials; pressed gases; fissionable isotopes (>27 g/ft^3); heat sources (>0.1 watt/f or RCRA materials.

Intermediate Container Identification: Paint Can No.: 1939

(or other container and number): _____

Date Filled and Closed: 6/29/93

Description of Contents:

Item(s)	Source/Waste Form Category
MELTED POLY GLASS	CELL BANK

Combustibles: 90 vol %

Radiation Readings (if taken):
β-γ at 12 in.: ~200 R/h Neutrons at 3 ft: BKG mrem/h

NOTE THAT NO RCRA MATERIALS ARE PRESENT IN THIS CONTAINER

Signature of GCO Filling and Closing Container: AW Evans

REFERENCE: Plastic Bucket No.: W-408, or
Draw-String Bag No.: _____ and Sequence No.: 39 (Data Sheet 4)

RH-TRU WASTE CERTIFICATION DATA SHEET NO. 2

CERTIFICATION OF RH-TRU WASTE REMOVED FROM THE CELL BANK IN PLASTIC BUCKETS

[DO NOT USE IF RCRA MATERIALS ARE PRESENT]

Your signature certifies a numbered, filled, and sealed plastic bucket containing NO fines; free liquid; pyrophoric, explosive, toxic or corrosive materials; compressed gases; fissionable isotopes (>27 g/ft^3); heat sources (>0.1 watt/ft^3); or RCRA materials.

Plastic Bucket No.: W-409 Date Filled and Sealed: 7/1/93

Description of Contents of the Plastic Bucket:

Item(s)	Source/Waste Form Category
Intermediate Container No. (if used): 2058	(See attached intermediate container data sheet for contents.)
Additional Materials	
NONE	

Combustibles: 90 vol %

Radiation Readings (if taken):

β-γ at 12 in.: .250 R/h β-γ at Contact: .250 R/h

Neutrons at 3 ft: BKG mrem/h Neutrons at Contact: 30 mrem/h

NOTE THAT NO RCRA MATERIALS ARE PRESENT IN THIS PLASTIC BUCKET

Signature of GCO Sealing the Plastic Bucket: C W Evans

REFERENCE: Cask No.: ATN- 3210 and
Sequence No.: 40 (Data Sheet 3)

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RH-TRU WASTE CERTIFICATION DATA SHEET NO. 1

CERTIFICATION OF INTERMEDIATE CONTAINERS OF RH-TRU WASTE
(e.g., one-gallon paint cans) FILLED IN THE CUBICLES

[DO NOT USE IF RCRA MATERIALS ARE PRESENT]

Your signature certifies a numbered, filled, and closed container containing N fines; free liquid; pyrophoric, explosive, toxic, or corrosive materials; compressed gases; fissionable isotopes (>27 g/ft^3); heat sources (>0.1 watt/ft^3); or RCRA materials.

Intermediate Container Identification: Paint Can No.: 2058
(or other container and number): _____
Date Filled and Closed: 6/29/93

Description of Contents:

Item(s)	Source/Waste Form Category
MELTED POLY GLASS	CELL BANK

Combustibles: 90 vol %

Radiation Readings (if taken):
β-γ at 12 in.: .250 R/h Neutrons at 3 ft: BKG mrem/h

NOTE THAT NO RCRA MATERIALS ARE PRESENT IN THIS CONTAINER

Signature of GCO Filling and Closing Container: [signature]

REFERENCE: Plastic Bucket No.: W-409 or
Draw-String Bag No.: _____ and Sequence No.: 40 (Data Sheet 4)

RH-TRU WASTE CERTIFICATION DATA SHEET NO. 2

CERTIFICATION OF RH-TRU WASTE REMOVED FROM THE CELL BANK IN PLASTIC BUCKETS

[DO NOT USE IF RCRA MATERIALS ARE PRESENT]

Your signature certifies a numbered, filled, and sealed plastic bucket containing NO fines; free liquid; pyrophoric, explosive, toxic or corrosive materials; compressed gases; fissionable isotopes (>27 g/ft^3); heat sources (>0.1 watt/ft^3); or RCRA materials.

NO

Plastic Bucket No.: W-410 Date Filled and Sealed: 7/1/93

Description of Contents of the Plastic Bucket:

Item(s)	Source/Waste Form Category
Intermediate Container No. (if used): 109	(See attached intermediate container data sheet for contents.)
Additional Materials	
NONE	

Combustibles: 90 vol %

Radiation Readings (if taken):

β-γ at 12 in.: .100 R/h β-γ at Contact: .150 R/h

Neutrons at 3 ft: BKG mrem/h Neutrons at Contact: 60 mrem/h

NOTE THAT NO RCRA MATERIALS ARE PRESENT IN THIS PLASTIC BUCKET

Signature of GCO Sealing the Plastic Bucket: Ole Evans

REFERENCE: Cask No.: ATN- 3210 and
Sequence No.: 41 (Data Sheet 3)

RH-TRU WASTE CERTIFICATION DATA SHEET NO. 1

CERTIFICATION OF INTERMEDIATE CONTAINERS OF RH-TRU WASTE (e.g., one-gallon paint cans) FILLED IN THE CUBICLES

[DO NOT USE IF RCRA MATERIALS ARE PRESENT]

Your signature certifies a numbered, filled, and closed container containing NO fines; free liquid; pyrophoric, explosive, toxic, or corrosive materials; compressed gases; fissionable isotopes (>27 g/ft^3); heat sources (>0.1 watt/ft^3); or RCRA materials.

Intermediate Container Identification: Paint Can No.: 69

(or other container and number): _____

Date Filled and Closed: 6/29/93

Description of Contents:

Item(s)	Source/Waste Form Category
RUBBER	
PAPER	CELL BANK
PLASTIC	
METAL	

Combustibles: 90 vol %

Radiation Readings (if taken):

β-γ at 12 in.: .100 R/h Neutrons at 3 ft: BKG mrem/h

NOTE THAT NO RCRA MATERIALS ARE PRESENT IN THIS CONTAINER

Signature of GCO Filling and Closing Container: AW Evans

REFERENCE: Plastic Bucket No.: W-410 or

Draw-String Bag No.: _____ and Sequence No.: 41 (Data Sheet 4)

RH-TRU WASTE CERTIFICATION DATA SHEET NO. 2

CERTIFICATION OF RH-TRU WASTE REMOVED FROM THE CELL BANK IN PLASTIC BUCKETS

[DO NOT USE IF RCRA MATERIALS ARE PRESENT]

Your signature certifies a numbered, filled, and sealed plastic bucket containing NO fines; free liquid; pyrophoric, explosive, toxic or corrosive materials; compressed gases; fissionable isotopes (>27 g/ft^3); heat sources (>0.1 watt/ft^3); or RCRA materials.

Plastic Bucket No.: W-411 Date Filled and Sealed: 8/1/93

Description of Contents of the Plastic Bucket:

Item(s)	Source/Waste Form Category
Intermediate Container No. (if used): 2018	(See attached intermediate container data sheet for contents.)
Additional Materials	
NONE	CELL BANK

Combustibles: 100 vol %

Radiation Readings (if taken):

β-γ at 12 in.: .400 R/h β-γ at Contact: 1.3 R/h

Neutrons at 3 ft: 2 mrem/h Neutrons at Contact: 70 mrem/h

NOTE THAT NO RCRA MATERIALS ARE PRESENT IN THIS PLASTIC BUCKET

Signature of GCO Sealing the Plastic Bucket: C W Evans

REFERENCE: Cask No.: ATN-3210 and
Sequence No.: 42 (Data Sheet 3)

RH-TRU WASTE CERTIFICATION DATA SHEET NO. 1

CERTIFICATION OF INTERMEDIATE CONTAINERS OF RH-TRU WASTE
(e.g., one-gallon paint cans) FILLED IN THE CUBICLES

[DO NOT USE IF RCRA MATERIALS ARE PRESENT]

Your signature certifies a numbered, filled, and closed container containing NO fines; free liquid; pyrophoric, explosive, toxic, or corrosive materials; compressed gases; fissionable isotopes (>27 g/ft^3); heat sources (>0.1 watt/ft^3); or RCRA materials.

Intermediate Container Identification: Paint Can No.: 2018

(or other container and number): _____

Date Filled and Closed: 5/24/82

Description of Contents:

Item(s)	Source/Waste Form Category
MELTED POLY WIPES	CELC BANK

Combustibles: 100 vol %

Radiation Readings (if taken):
β-γ at 12 in.: 400 R/h Neutrons at 3 ft: 2 mrem/h

NOTE THAT NO RCRA MATERIALS ARE PRESENT IN THIS CONTAINER

Signature of GCO Filling and Closing Container: AO Evans

REFERENCE: Plastic Bucket No.: W-411, or
Draw-String Bag No.: _____ and Sequence No.: 42 (Data Sheet 4)

RH-TRU WASTE CERTIFICATION DATA SHEET NO. 2

CERTIFICATION OF RH-TRU WASTE REMOVED FROM THE CELL BANK IN PLASTIC BUCKETS

[DO NOT USE IF RCRA MATERIALS ARE PRESENT]

Your signature certifies a numbered, filled, and sealed plastic bucket containing NO fines; free liquid; pyrophoric, explosive, toxic or corrosive materials; compressed gases; fissionable isotopes (>27 g/ft^3); heat sources (>0.1 watt/ft^3); or RCRA materials.

Plastic Bucket No.: W-413 Date Filled and Sealed: 7/1/93

Description of Contents of the Plastic Bucket:

Item(s)	Source/Waste Form Category
Intermediate Container No. (if used): 2034	(See attached intermediate container data sheet for contents.)
Additional Materials	
NONE	

Combustibles: 70 vol %

Radiation Readings (if taken):

β-γ at 12 in.: 1.2 R/h β-γ at Contact: 5.0 R/h

Neutrons at 3 ft: 25 mrem/h Neutrons at Contact: 500 mrem/h

NOTE THAT NO RCRA MATERIALS ARE PRESENT IN THIS PLASTIC BUCKET

Signature of GCO Sealing the Plastic Bucket: A. Evans

REFERENCE: Cask No.: ATN- 3210 and
Sequence No.: 43 (Data Sheet 3)

RH-TRU WASTE CERTIFICATION DATA SHEET NO. 1

CERTIFICATION OF INTERMEDIATE CONTAINERS OF RH-TRU WASTE
(e.g., one-gallon paint cans) FILLED IN THE CUBICLES

[DO NOT USE IF RCRA MATERIALS ARE PRESENT]

Your signature certifies a numbered, filled, and closed container containing NC fines; free liquid; pyrophoric, explosive, toxic, or corrosive materials; compressed gases; fissionable isotopes (>27 g/ft^3); heat sources (>0.1 watt/ft^3); or RCRA materials.

Intermediate Container Identification: Paint Can No.: 2034

(or other container and number):

Date Filled and Closed: 7/1/93

Description of Contents:

Item(s)	Source/Waste Form Category
METAL	
PAPER	CELL BANK
GLASS	

Combustibles: 70 vol %

Radiation Readings (if taken):
β-γ at 12 in.: 1-2 R/h Neutrons at 3 ft: 25 mrem/h

NOTE THAT NO RCRA MATERIALS ARE PRESENT IN THIS CONTAINER

Signature of GCO Filling and Closing Container: A W Evans

REFERENCE: Plastic Bucket No.: W-413 or
Draw-String Bag No.: _____ and Sequence No.: 43 (Data Sheet 4)

RH-TRU WASTE CERTIFICATION DATA SHEET NO. 2

CERTIFICATION OF RH-TRU WASTE REMOVED FROM THE CELL BANK IN PLASTIC BUCKETS

[DO NOT USE IF RCRA MATERIALS ARE PRESENT]

Your signature certifies a numbered, filled, and sealed plastic bucket containing NO fines; free liquid; pyrophoric, explosive, toxic or corrosive materials; compressed gases; fissionable isotopes (>27 g/ft^3); heat sources (>0.1 watt/ft^3); or RCRA materials.

Plastic Bucket No.: W-414 Date Filled and Sealed: 7/7/93

Description of Contents of the Plastic Bucket:

Item(s)	Source/Waste Form Category
Intermediate Container No. (if used): 2016	(See attached intermediate container data sheet for contents.)
Additional Materials	
Metal Lid	Cell Bank

Combustibles: 80 vol %

Radiation Readings (if taken):

β-γ at 12 in.: .300 R/h β-γ at Contact: .300 R/h

Neutrons at 3 ft: 1 mrem/h Neutrons at Contact: 50 mrem/h

NOTE THAT NO RCRA MATERIALS ARE PRESENT IN THIS PLASTIC BUCKET

Signature of GCO Sealing the Plastic Bucket: C W Evans

REFERENCE: Cask No.: ATN- 3210 and
Sequence No.: 44 (Data Sheet 3)

RH-TRU WASTE CERTIFICATION DATA SHEET NO. 1

CERTIFICATION OF INTERMEDIATE CONTAINERS OF RH-TRU WAS
(e.g., one-gallon paint cans) FILLED IN THE CUBICLES

[DO NOT USE IF RCRA MATERIALS ARE PRESENT]

Your signature certifies a numbered, filled, and closed container (fines; free liquid; pyrophoric, explosive, toxic, or corrosive mate pressed gases; fissionable isotopes (>27 g/ft^3); heat sources (>0.1 or RCRA materials.

Intermediate Container Identification: Paint Can No.: 20,
(or other container and number): _____
Date Filled and Closed: 7/7/93

Description of Contents:

Item(s)	Source/Waste Form Category
POLY	
GLASS	CELL BANK

Combustibles: 80 vol %

Radiation Readings (if taken):
β-γ at 12 in.: 300 R/h Neutrons at 3 ft: 1

NOTE THAT NO RCRA MATERIALS ARE PRESENT IN THIS CONTAINER

Signature of GCO Filling and Closing Container: AW Evans

REFERENCE: Plastic Bucket No.: W-414, or
Draw-String Bag No.: _____ and Sequence No.: 44 (Data She

RH-TRU WASTE CERTIFICATION DATA SHEET NO. 2

CERTIFICATION OF RH-TRU WASTE REMOVED FROM THE CELL BANK IN PLASTIC BUCKETS

[DO NOT USE IF RCRA MATERIALS ARE PRESENT]

Your signature certifies a numbered, filled, and sealed plastic bucket containing NO fines; free liquid; pyrophoric, explosive, toxic or corrosive materials; compressed gases; fissionable isotopes (>27 g/ft^3); heat source (>0.1 watt/ft^3); or RCRA materials.

Plastic Bucket No.: W-415 Date Filled and Sealed: 7/71

Description of Contents of the Plastic Bucket:

Item(s)	Source/Waste Form Category
Intermediate Container No. (if used): 2066	(See attached intermediate container data sheet for contents.)
Additional Materials	
NONE	

Combustibles: 20 vol %

Radiation Readings (if taken):

β-γ at 12 in.: .350 R/h β-γ at Contact: .900 R/h

Neutrons at 3 ft: 3 mrem/h Neutrons at Contact: 200 mrem/h

NOTE THAT NO RCRA MATERIALS ARE PRESENT IN THIS PLASTIC BUCKET

Signature of GCO Sealing the Plastic Bucket: C W Evans

REFERENCE: Cask No.: ATN-3210 and
Sequence No.: 45 (Data Sheet 3)

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RH-TRU WASTE CERTIFICATION DATA SHEET NO. 1

CERTIFICATION OF INTERMEDIATE CONTAINERS OF RH-TRU WAS
(e.g., one-gallon paint cans) FILLED IN THE CUBICLES

[DO NOT USE IF RCRA MATERIALS ARE PRESENT]

Your signature certifies a numbered, filled, and closed container
fines; free liquid; pyrophoric, explosive, toxic, or corrosive mat
pressed gases; fissionable isotopes (>27 g/ft^3); heat sources (>0.
or RCRA materials.

Intermediate Container Identification: Paint Can No.: 201
(or other container and number):
Date Filled and Closed: 7/7/93

Description of Contents:

Item(s)	Source/Waste Form Category
GLASS	
POLY	
METAL	CELL BANK

Combustibles: 20 vol %

Radiation Readings (if taken):
β-γ at 12 in.: 350 R/h Neutrons at 3 ft: 3

NOTE THAT NO RCRA MATERIALS ARE PRESENT IN THIS CONTAINER

Signature of GCO Filling and Closing Container: CW Evans

REFERENCE: Plastic Bucket No.: W-415 or
Draw-String Bag No.: _____ and Sequence No.: 45 (Data Sh

RH-TRU WASTE CERTIFICATION DATA SHEET NO. 2

CERTIFICATION OF RH-TRU WASTE REMOVED FROM THE CELL BANK IN PLASTIC BUCKETS

[DO NOT USE IF RCRA MATERIALS ARE PRESENT]

Your signature certifies a numbered, filled, and sealed plastic bucket containing NO fines; free liquid; pyrophoric, explosive, toxic or corrosive materials; compressed gases; fissionable isotopes (>27 g/ft^3); heat sources (>0.1 watt/ft^3); or RCRA materials.

Plastic Bucket No.: W-416 Date Filled and Sealed: 7/7/93

Description of Contents of the Plastic Bucket:

Item(s)	Source/Waste Form Category
Intermediate Container No. (if used): 1977	(See attached intermediate container data sheet for contents.)
Additional Materials	
NONE	

Combustibles: 80 vol %

Radiation Readings (if taken):

β-γ at 12 in.: .650 R/h β-γ at Contact: 1.5 R/h

Neutrons at 3 ft: 6 mrem/h Neutrons at Contact: 400 mrem/h

NOTE THAT NO RCRA MATERIALS ARE PRESENT IN THIS PLASTIC BUCKET

Signature of GCO Sealing the Plastic Bucket: CW Evans

REFERENCE: Cask No.: ATN- 3210 and
Sequence No.: 46 (Data Sheet 3)

P52

RH-TRU WASTE CERTIFICATION DATA SHEET NO. 1

CERTIFICATION OF INTERMEDIATE CONTAINERS OF RH-TRU WAS
(e.g., one-gallon paint cans) FILLED IN THE CUBICLES

[DO NOT USE IF RCRA MATERIALS ARE PRESENT]

Your signature certifies a numbered, filled, and closed container c
fines; free liquid; pyrophoric, explosive, toxic, or corrosive mate
pressed gases; fissionable isotopes (>27 g/ft^3); heat sources (>0.1
or RCRA materials.

Intermediate Container Identification: Paint Can No.: 197
(or other container and number):
Date Filled and Closed: 7/7/93

Description of Contents:

Item(s)	Source/Waste Form Category
POLY	
GLASS	CELL BANK

Combustibles: 80 vol %

Radiation Readings (if taken):
β-γ at 12 in.: .650 R/h Neutrons at 3 ft: 6

NOTE THAT NO RCRA MATERIALS ARE PRESENT IN THIS CONTAINER

Signature of GCO Filling and Closing Container: Geo Evans

REFERENCE: Plastic Bucket No.: W-416, or
Draw-String Bag No.: _____ and Sequence No.: 46 (Data Sh

RH-TRU WASTE CERTIFICATION DATA SHEET NO. 2

CERTIFICATION OF RH-TRU WASTE REMOVED FROM THE CELL BANK IN PLASTIC BUCKETS

[DO NOT USE IF RCRA MATERIALS ARE PRESENT]

Your signature certifies a numbered, filled, and sealed plastic bucket containing NO fines; free liquid; pyrophoric, explosive, toxic or corrosive materials; compressed gases; fissionable isotopes (>27 g/ft^3); heat sources (>0.1 watt/ft^3); or RCRA materials.

Plastic ~~Bucket No~~ BAG No.: 01 Date Filled and Sealed: 7/1/93

Description of Contents of the Plastic Bucket:

Item(s)	Source/Waste Form Category
Intermediate Container No. (if used): NONE	(See attached intermediate container data sheet for contents.)
Additional Materials	
CARD BOARD	GLOVE BOX
GLASS	
METAL	
CLOTH	

COPY

Combustibles: 80 vol %

Radiation Readings (if taken):

β-γ at 12 in.: .050 R/h β-γ at Contact: .800 R/h

Neutrons at 3 ft: 0 mrem/h Neutrons at Contact: 0 mrem/h

NOTE THAT NO RCRA MATERIALS ARE PRESENT IN THIS PLASTIC BUCKET

Signature of GCO Sealing the Plastic Bucket: G. Evans

REFERENCE: Cask No.: ATN- 3210 and
Sequence No.: 47 (Data Sheet 3)

RH-TRU WASTE CERTIFICATION DATA SHEET NO. 2

CERTIFICATION OF RH-TRU WASTE REMOVED FROM THE CELL BANK IN PLASTIC BUCKETS

[DO NOT USE IF RCRA MATERIALS ARE PRESENT]

Your signature certifies a numbered, filled, and sealed plastic bucket containing NO fines; free liquid; pyrophoric, explosive, toxic or corrosive materials; compressed gases; fissionable isotopes (>27 g/ft^3); heat sources (>0.1 watt/ft^3); or RCRA materials.

Plastic Bucket No.: W-417 Date Filled and Sealed: 7/20/93

Description of Contents of the Plastic Bucket:

Item(s)	Source/Waste Form Category
Intermediate Container No. (if used): 1905	(See attached intermediate container data sheet for contents.)
Additional Materials	
NONE	

Combustibles: 75 vol %

Radiation Readings (if taken):

β-γ at 12 in.: .800 R/h β-γ at Contact: 5 R/h

Neutrons at 3 ft: BKG mrem/h Neutrons at Contact: 400 mrem/h

NOTE THAT NO RCRA MATERIALS ARE PRESENT IN THIS PLASTIC BUCKET

Signature of GCO Sealing the Plastic Bucket: W Evans

REFERENCE: Cask No.: ATN- 3210 and
Sequence No.: 48 (Data Sheet 3)

RH-TRU WASTE CERTIFICATION DATA SHEET NO. 1

CERTIFICATION OF INTERMEDIATE CONTAINERS OF RH-TRU WAS
(e.g., one-gallon paint cans) FILLED IN THE CUBICLES

[DO NOT USE IF RCRA MATERIALS ARE PRESENT]

Your signature certifies a numbered, filled, and closed container
fines; free liquid; pyrophoric, explosive, toxic, or corrosive mat
pressed gases; fissionable isotopes (>27 g/ft^3); heat sources (>0.1
or RCRA materials.

Intermediate Container Identification: Paint Can No.: 190 :
(or other container and number):
Date Filled and Closed: 7/7/93

Description of Contents:

Item(s)	Source/Waste Form Category
POLY	
METAL	CELL BANK
GLASS	
CLOTH	

Combustibles: 75 vol %

Radiation Readings (if taken):
β-γ at 12 in.: 800 R/h Neutrons at 3 ft: BK6

NOTE THAT NO RCRA MATERIALS ARE PRESENT IN THIS CONTAINER

Signature of GCO Filling and Closing Container: AW Evans

REFERENCE: Plastic Bucket No.: 417, or
Draw-String Bag No.: _____ and Sequence No.: 48 (Data Sh

RH-TRU WASTE CERTIFICATION DATA SHEET NO. 2

CERTIFICATION OF RH-TRU WASTE REMOVED FROM THE CELL BANK IN PLASTIC BUCKETS

[DO NOT USE IF RCRA MATERIALS ARE PRESENT]

Your signature certifies a numbered, filled, and sealed plastic bucket containing NO fines; free liquid; pyrophoric, explosive, toxic or corrosive materials; compressed gases; fissionable isotopes (>27 g/ft^3); heat sources (>0.1 watt/ft^3); or RCRA materials.

NO

Plastic Bucket No.: W-419 Date Filled and Sealed: 7/20/93

Description of Contents of the Plastic Bucket:

Item(s)	Source/Waste Form Category
Intermediate Container No. (if used): 1866	(See attached intermediate container data sheet for contents.)
Additional Materials	
NONE	

Combustibles: 7.5 vol %

Radiation Readings (if taken):

β-γ at 12 in.: .100 R/h β-γ at Contact: .350 R/h

Neutrons at 3 ft: 8K6 mrem/h Neutrons at Contact: 17 mrem/h

NOTE THAT NO RCRA MATERIALS ARE PRESENT IN THIS PLASTIC BUCKET

Signature of GCO Sealing the Plastic Bucket: C W Eaves

REFERENCE: Cask No.: ATN- 3210 and
Sequence No.: 49 (Data Sheet 3)

RH-TRU WASTE CERTIFICATION DATA SHEET NO. 1

CERTIFICATION OF INTERMEDIATE CONTAINERS OF RH-TRU WASTE
(e.g., one-gallon paint cans) FILLED IN THE CUBICLES

[DO NOT USE IF RCRA MATERIALS ARE PRESENT]

Your signature certifies a numbered, filled, and closed container containin fines; free liquid; pyrophoric, explosive, toxic, or corrosive materials; c pressed gases; fissionable isotopes (>27 g/ft^3); heat sources (>0.1 watt/ft or RCRA materials.

Intermediate Container Identification: Paint Can No.: 1866
(or other container and number):
Date Filled and Closed: 7/7/93

Description of Contents:

Item(s)	Source/Waste Form Category
METAL	
PAPER	
POLY	CELL BANK

Combustibles: 75 vol %

Radiation Readings (if taken):
β-γ at 12 in.: .100 R/h Neutrons at 3 ft: BK6 mrem/h

NOTE THAT NO RCRA MATERIALS ARE PRESENT IN THIS CONTAINER

Signature of GCO Filling and Closing Container: AW Evans

REFERENCE: Plastic Bucket No. W-419, or
Draw-String Bag No.: _____ and Sequence No.: 49 (Data Sheet 4)

RH-TRU WASTE CERTIFICATION DATA SHEET NO. 2

CERTIFICATION OF RH-TRU WASTE REMOVED FROM THE CELL BANK IN PLASTIC BUCKETS

[DO NOT USE IF RCRA MATERIALS ARE PRESENT]

Your signature certifies a numbered, filled, and sealed plastic bucket containing NO fines; free liquid; pyrophoric, explosive, toxic or corrosive materials; compressed gases; fissionable isotopes (>27 g/ft^3); heat sources (>0.1 watt/ft^3); or RCRA materials.

Plastic Bucket No.: W-420 Date Filled and Sealed: 7/20/93

Description of Contents of the Plastic Bucket:

Item(s)	Source/Waste Form Category
Intermediate Container No. (if used): NOID.	(See attached intermediate container data sheet for contents.)
Additional Materials	
NONE	

Combustibles: 95 vol %

Radiation Readings (if taken):

β-γ at 12 in.: .250 R/h β-γ at Contact: 2.1 R/h

Neutrons at 3 ft: 3 mrem/h Neutrons at Contact: 300 mrem/h

NOTE THAT NO RCRA MATERIALS ARE PRESENT IN THIS PLASTIC BUCKET

Signature of GCO Sealing the Plastic Bucket: CW Evans

REFERENCE: Cask No.: ATN- 3210 and
Sequence No.: 50 (Data Sheet 3)

RH-TRU WASTE CERTIFICATION DATA SHEET NO. 1

CERTIFICATION OF INTERMEDIATE CONTAINERS OF RH-TRU WASTE (e.g., one-gallon paint cans) FILLED IN THE CUBICLES

[DO NOT USE IF RCRA MATERIALS ARE PRESENT]

Your signature certifies a numbered, filled, and closed container contain fines; free liquid; pyrophoric, explosive, toxic, or corrosive materials; pressed gases; fissionable isotopes (>27 g/ft^3); heat sources (>0.1 watt/ or RCRA materials.

Intermediate Container Identification: Paint Can No.: NO I.I

(or other container and number):

Date Filled and Closed: 7/7/93

Description of Contents:

Item(s)	Source/Waste Form Category
PAPER	
METAL	CELL BANK
PLASTIC	

Combustibles: 85 vol %

Radiation Readings (if taken):

β-γ at 12 in.: .250 R/h Neutrons at 3 ft: 3 mrem/

NOTE THAT NO RCRA MATERIALS ARE PRESENT IN THIS CONTAINER

Signature of GCO Filling and Closing Container: W Evans

REFERENCE: Plastic Bucket No.: W-420, or

Draw-String Bag No.: _____ and Sequence No.: 50 (Data Sheet 4)

RH-TRU WASTE CERTIFICATION DATA SHEET NO. 2

CERTIFICATION OF RH-TRU WASTE REMOVED FROM THE CELL BANK IN PLASTIC BUCKETS

[DO NOT USE IF RCRA MATERIALS ARE PRESENT]

Your signature certifies a numbered, filled, and sealed plastic bucket containing NO fines; free liquid; pyrophoric, explosive, toxic or corrosive materials; compressed gases; fissionable isotopes (>27 g/ft^3); heat sources (>0.1 watt/ft^3); or RCRA materials.

Plastic Bucket No.: IN-421 Date Filled and Sealed: 7/20/93

Description of Contents of the Plastic Bucket:

Item(s)	Source/Waste Form Category
Intermediate Container No. (if used): 1826	(See attached intermediate container data sheet for contents.)
Additional Materials	
NONE	

Combustibles: 50 vol %

Radiation Readings (if taken):

β-γ at 12 in.: .100 R/h β-γ at Contact: .250 R/h

Neutrons at 3 ft: BK6 mrem/h Neutrons at Contact: 40 mrem/h

NOTE THAT NO RCRA MATERIALS ARE PRESENT IN THIS PLASTIC BUCKET

Signature of GCO Sealing the Plastic Bucket: Ace Evans

REFERENCE: Cask No.: ATN- 3210 and
Sequence No.: 51 (Data Sheet 3)

RH-TRU WASTE CERTIFICATION DATA SHEET NO. 1

CERTIFICATION OF INTERMEDIATE CONTAINERS OF RH-TRU WA
(e.g., one-gallon paint cans) FILLED IN THE CUBICLE

[DO NOT USE IF RCRA MATERIALS ARE PRESENT]

Your signature certifies a numbered, filled, and closed container
fines; free liquid; pyrophoric, explosive, toxic, or corrosive mat
pressed gases; fissionable isotopes (>27 g/ft^3); heat sources (>0.
or RCRA materials.

Intermediate Container Identification: Paint Can No.: 182

(or other container and number): _____

Date Filled and Closed: 7/7/93

Description of Contents:

Item(s)	Source/Waste Form Category
METAL	
WOOD	
POLY	CELL BANK

Combustibles: 50 vol %

Radiation Readings (if taken):
β-γ at 12 in.: .100 R/h Neutrons at 3 ft: BKG

NOTE THAT NO RCRA MATERIALS ARE PRESENT IN THIS CONTAINER

Signature of GCO Filling and Closing Container: AW Evans

REFERENCE: Plastic Bucket No.: W-421 or
Draw-String Bag No.: _____ and Sequence No.: 51 (Data S

RH-TRU WASTE CERTIFICATION DATA SHEET NO. 2

CERTIFICATION OF RH-TRU WASTE REMOVED FROM THE CELL BANK IN PLASTIC BUCKETS

[DO NOT USE IF RCRA MATERIALS ARE PRESENT]

Your signature certifies a numbered, filled, and sealed plastic bucket containing NO fines; free liquid; pyrophoric, explosive, toxic or corrosive materials; compressed gases; fissionable isotopes (>27 g/ft^3); heat sources (>0.1 watt/ft^3); or RCRA materials.

Plastic Bucket No.: W-427 Date Filled and Sealed: 7/27/93

Description of Contents of the Plastic Bucket:

Item(s)	Source/Waste Form Category
Intermediate Container No. (if used): 2055	(See attached intermediate container data sheet for contents.)
Additional Materials	
NONE	

Combustibles: 80 vol %

Radiation Readings (if taken):

β-γ at 12 in.: .075 R/h β-γ at Contact: .350 R/h

Neutrons at 3 ft: 3 mrem/h Neutrons at Contact: 300 mrem/h

NOTE THAT NO RCRA MATERIALS ARE PRESENT IN THIS PLASTIC BUCKET

Signature of GCO Sealing the Plastic Bucket: AW Evans

REFERENCE: Cask No.: ATN-3210 and
Sequence No.: 52 (Data Sheet 3)

CERTIFICATION OF INTERMEDIATE CONTAINERS OF RH-TRU WASTE
(e.g., one-gallon paint cans) FILLED IN THE CUBICLES

[DO NOT USE IF RCRA MATERIALS ARE PRESENT]

Your signature certifies a numbered, filled, and closed container containing NO fines; free liquid; pyrophoric, explosive, toxic, or corrosive materials; compressed gases; fissionable isotopes (>27 g/ft^3); heat sources (>0.1 watt/ft^3); or RCRA materials.

Intermediate Container Identification: Paint Can No.: 2085

(or other container and number): _____

Date Filled and Closed: 7/20/93

Description of Contents:

Item(s)	Source/Waste Form Category
WIPES	PAPER
GLASS	GLASS
STRING	NYLON / CELL BANK
WIRE	METAL

Combustibles: 80 vol %

Radiation Readings (if taken):
β-γ at 12 in.: .075 R/h Neutrons at 3 ft: 3 mrem/h

NOTE THAT NO RCRA MATERIALS ARE PRESENT IN THIS CONTAINER

Signature of GCO Filling and Closing Container: CW Evans

REFERENCE: Plastic Bucket No.: W-427, or
Draw-String Bag No.: _____ and Sequence No.: 52 (Data Sheet 4)

RH-TRU WASTE CERTIFICATION DATA SHEET NO. 2

CERTIFICATION OF RH-TRU WASTE REMOVED FROM THE CELL BANK IN PLASTIC BUCKETS

[DO NOT USE IF RCRA MATERIALS ARE PRESENT]

Your signature certifies a numbered, filled, and sealed plastic bucket containing NO fines; free liquid; pyrophoric, explosive, toxic or corrosive materials; compressed gases; fissionable isotopes (>27 g/ft^3); heat sources (>0.1 watt/ft^3); or RCRA materials.

Plastic Bucket No.: W-429 Date Filled and Sealed: 7/27/93

Description of Contents of the Plastic Bucket:

Item(s)	Source/Waste Form Category
Intermediate Container No. (if used): 1871	(See attached intermediate container data sheet for contents.)
Additional Materials	
NONE	

Combustibles: 0 vol %

Radiation Readings (if taken):

β-γ at 12 in.: .250 R/h β-γ at Contact: .800 R/h

Neutrons at 3 ft: BKG mrem/h Neutrons at Contact: 50 mrem/h

NOTE THAT NO RCRA MATERIALS ARE PRESENT IN THIS PLASTIC BUCKET

Signature of GCO Sealing the Plastic Bucket: A.O. Evans

REFERENCE: Cask No.: ATN- 3210 and
Sequence No.: 53 (Data Sheet 3)

CERTIFICATION OF INTERMEDIATE CONTAINERS OF RH-TRU WASTE
(e.g., one-gallon paint cans) FILLED IN THE CUBICLES

[DO NOT USE IF RCRA MATERIALS ARE PRESENT]

Your signature certifies a numbered, filled, and closed container containing NO fines; free liquid; pyrophoric, explosive, toxic, or corrosive materials; compressed gases; fissionable isotopes (>27 g/ft^3); heat sources (>0.1 watt/ft^3); or RCRA materials.

Intermediate Container Identification: Paint Can No.: 1871

(or other container and number):

Date Filled and Closed: 7/20/93

Description of Contents:

Item(s)	Source/Waste Form Category
TOWGS TARGET SHROUDS	METAL / CELL BANK

Combustibles: 0 vol %

Radiation Readings (if taken):
β-γ at 12 in.: .250 R/h Neutrons at 3 ft: BKG mrem/h

NOTE THAT NO RCRA MATERIALS ARE PRESENT IN THIS CONTAINER

Signature of GCO Filling and Closing Container: A W Evans

REFERENCE: Plastic Bucket No.: W-429, or
Draw-String Bag No.: _____ and Sequence No.: 53 (Data Sheet 4)

RH-TRU WASTE CERTIFICATION DATA SHEET NO. 2

CERTIFICATION OF RH-TRU WASTE REMOVED FROM THE CELL BANK IN PLASTIC BUCKETS

[DO NOT USE IF RCRA MATERIALS ARE PRESENT]

Your signature certifies a numbered, filled, and sealed plastic bucket containing NO fines; free liquid; pyrophoric, explosive, toxic or corrosive materials; compressed gases; fissionable isotopes (>27 g/ft^3); heat sources (>0.1 watt/ft^3); or RCRA materials.

Plastic Bucket No.: W-432 Date Filled and Sealed: 7/29/93

Description of Contents of the Plastic Bucket:

Item(s)	Source/Waste Form Category
Intermediate Container No. (if used): 1922	(See attached intermediate container data sheet for contents.)
Additional Materials	
NONE	

Combustibles: 50 vol %

Radiation Readings (if taken):

β-γ at 12 in.: 1.0 R/h β-γ at Contact: 7.5 R/h

Neutrons at 3 ft: BKG mrem/h Neutrons at Contact: 300 mrem/h

NOTE THAT NO RCRA MATERIALS ARE PRESENT IN THIS PLASTIC BUCKET

Signature of GCO Sealing the Plastic Bucket: C. Evans

REFERENCE: Cask No.: ATN- 3210 and
Sequence No.: 5K (Data Sheet 3)

RH-TRU WASTE CERTIFICATION DATA SHEET NO. 1

CERTIFICATION OF INTERMEDIATE CONTAINERS OF RH-TRU WASTE (e.g., one-gallon paint cans) FILLED IN THE CUBICLES

[DO NOT USE IF RCRA MATERIALS ARE PRESENT]

Your signature certifies a numbered, filled, and closed container containing fines; free liquid; pyrophoric, explosive, toxic, or corrosive materials; compressed gases; fissionable isotopes (>27 g/ft^3); heat sources (>0.1 watt/ft^3) or RCRA materials.

Intermediate Container Identification: Paint Can No.: 1922

(or other container and number): _____

Date Filled and Closed: 7/28/93

Description of Contents:

Item(s)	Source/Waste Form Category
GLASS	CELL BANK
STRING	
CLOTH	

Combustibles: 50 vol %

Radiation Readings (if taken):

β-γ at 12 in.: 1.0 R/h Neutrons at 3 ft: BKG mrem/h

NOTE THAT NO RCRA MATERIALS ARE PRESENT IN THIS CONTAINER

Signature of GCO Filling and Closing Container: A J Evans

REFERENCE: Plastic Bucket No.: W432 or

Draw-String Bag No.: _____ and Sequence No.: 54 (Data Sheet 4)

RH-TRU WASTE CERTIFICATION DATA SHEET NO. 2

CERTIFICATION OF RH-TRU WASTE REMOVED FROM THE CELL BANK IN PLASTIC BUCKETS

[DO NOT USE IF RCRA MATERIALS ARE PRESENT]

Your signature certifies a numbered, filled, and sealed plastic bucket containing NO fines; free liquid; pyrophoric, explosive, toxic or corrosive materials; compressed gases; fissionable isotopes (>27 g/ft^3); heat sources (>0.1 watt/ft^3); or RCRA materials.

Plastic Bucket No.: W-433 Date Filled and Sealed: 7/29/93

Description of Contents of the Plastic Bucket:

Item(s)	Source/Waste Form Category
Intermediate Container No. (if used): 2114	(See attached intermediate container data sheet for contents.)
Additional Materials	
NONE	

Combustibles: 0 vol %

Radiation Readings (if taken):

β-γ at 12 in.: .025 R/h β-γ at Contact: .150 R/h

Neutrons at 3 ft: BK6 mrem/h Neutrons at Contact: 150 mrem/h

NOTE THAT NO RCRA MATERIALS ARE PRESENT IN THIS PLASTIC BUCKET

Signature of GCO Sealing the Plastic Bucket: A. Evans

REFERENCE: Cask No.: ATN- 3210 and
Sequence No.: 55 (Data Sheet 3)

RH-TRU WASTE CERTIFICATION DATA SHEET NO. 1

CERTIFICATION OF INTERMEDIATE CONTAINERS OF RH-TRU WASTE
(e.g., one-gallon paint cans) FILLED IN THE CUBICLES

[DO NOT USE IF RCRA MATERIALS ARE PRESENT]

Your signature certifies a numbered, filled, and closed container containing NO fines; free liquid; pyrophoric, explosive, toxic, or corrosive materials; compressed gases; fissionable isotopes (>27 g/ft^3); heat sources (>0.1 watt/ft^3); or RCRA materials.

Intermediate Container Identification: Paint Can No.: 2114

(or other container and number):

Date Filled and Closed: 7/28/93

Description of Contents:

Item(s)	Source/Waste Form Category
TOOLS	
GLASS	METAL / CELL BANK

Combustibles: 0 vol %

Radiation Readings (if taken):
β-γ at 12 in.: .025 R/h Neutrons at 3 ft: BKG mrem/h

NOTE THAT NO RCRA MATERIALS ARE PRESENT IN THIS CONTAINER

Signature of GCO Filling and Closing Container: C W Evans

REFERENCE: Plastic Bucket No.: W483 or
Draw-String Bag No.: _____ and Sequence No.: 55 (Data Sheet 4)

RH-TRU WASTE CERTIFICATION DATA SHEET NO. 2

CERTIFICATION OF RH-TRU WASTE REMOVED FROM THE CELL BANK IN PLASTIC BUCKETS

[DO NOT USE IF RCRA MATERIALS ARE PRESENT]

Your signature certifies a numbered, filled, and sealed plastic bucket containing NO fines; free liquid; pyrophoric, explosive, toxic or corrosive materials; compressed gases; fissionable isotopes (>27 g/ft^3); heat sources (>0.1 watt/ft^3); or RCRA materials.

Plastic Bucket No.: W-434 Date Filled and Sealed: 7/29/93

Description of Contents of the Plastic Bucket:

Item(s)	Source/Waste Form Category
Intermediate Container No. (if used): 2111	(See attached intermediate container data sheet for contents.)
Additional Materials	
NONE	

Combustibles: 0 vol %

Radiation Readings (if taken):

β-γ at 12 in.: .100 R/h β-γ at Contact: .350 R/h

Neutrons at 3 ft: BK6 mrem/h Neutrons at Contact: 15 mrem/h

NOTE THAT NO RCRA MATERIALS ARE PRESENT IN THIS PLASTIC BUCKET

Signature of GCO Sealing the Plastic Bucket: C W Evans

REFERENCE: Cask No.: ATN- 3210 and
Sequence No.: 56 (Data Sheet 3)

RH-TRU WASTE CERTIFICATION DATA SHEET NO. 1

CERTIFICATION OF INTERMEDIATE CONTAINERS OF RH-TRU WASTE (e.g., one-gallon paint cans) FILLED IN THE CUBICLES

[DO NOT USE IF RCRA MATERIALS ARE PRESENT]

Your signature certifies a numbered, filled, and closed container containin fines; free liquid; pyrophoric, explosive, toxic, or corrosive materials; c pressed gases; fissionable isotopes (>27 g/ft^3); heat sources (>0.1 watt/ft or RCRA materials.

Intermediate Container Identification: Paint Can No.: 2111

(or other container and number): _____

Date Filled and Closed: 7/28/93

Description of Contents:

Item(s)	Source/Waste Form Category
GLASS	
METAL	CELL BANK

Combustibles: 0 vol %

Radiation Readings (if taken):

β-γ at 12 in.: .100 R/h Neutrons at 3 ft: BK6 mrem/h

NOTE THAT NO RCRA MATERIALS ARE PRESENT IN THIS CONTAINER

Signature of GCO Filling and Closing Container: A O Evans

REFERENCE: Plastic Bucket No.: 4434, or

Draw-String Bag No.: _____ and Sequence No.: 56 (Data Sheet 4)

RH-TRU WASTE CERTIFICATION DATA SHEET NO. 2

CERTIFICATION OF RH-TRU WASTE REMOVED FROM THE CELL BANK IN PLASTIC BUCKETS

[DO NOT USE IF RCRA MATERIALS ARE PRESENT]

Your signature certifies a numbered, filled, and sealed plastic bucket containing NO fines; free liquid; pyrophoric, explosive, toxic or corrosive materials; compressed gases; fissionable isotopes (>27 g/ft^3); heat sources (>0.1 watt/ft^3); or RCRA materials.

Plastic Bucket No.: W-440 Date Filled and Sealed: 8/3/93

Description of Contents of the Plastic Bucket:

Item(s)	Source/Waste Form Category
Intermediate Container No. (if used): 1918	(See attached intermediate container data sheet for contents.)
Additional Materials	
NONE	

Combustibles: 20 vol %

Radiation Readings (if taken):

β-γ at 12 in.: .500 R/h β-γ at Contact: 3.1 R/h

Neutrons at 3 ft: BKG mrem/h Neutrons at Contact: 30 mrem/h

NOTE THAT NO RCRA MATERIALS ARE PRESENT IN THIS PLASTIC BUCKET

Signature of GCO Sealing the Plastic Bucket: C W Evans

REFERENCE: Cask No.: ATN-3210 and
Sequence No.: 57 (Data Sheet 3)

RH-TRU WASTE CERTIFICATION DATA SHEET NO. 1

CERTIFICATION OF INTERMEDIATE CONTAINERS OF RH-TRU WAS
(e.g., one-gallon paint cans) FILLED IN THE CUBICLES

[DO NOT USE IF RCRA MATERIALS ARE PRESENT]

Your signature certifies a numbered, filled, and closed container c
fines; free liquid; pyrophoric, explosive, toxic, or corrosive mate
pressed gases; fissionable isotopes (>27 g/ft^3); heat sources (>0.1
or RCRA materials.

Intermediate Container Identification: Paint Can No.: 191

(or other container and number):

Date Filled and Closed: 7/28/93

Description of Contents:

Item(s)	Source/Waste Form Category
GLASS	
WIPES	CELL BANK

Combustibles: 20 vol %

Radiation Readings (if taken):

β-γ at 12 in.: .500 R/h Neutrons at 3 ft: BKG

NOTE THAT NO RCRA MATERIALS ARE PRESENT IN THIS CONTAINER

Signature of GCO Filling and Closing Container: CW Evans

REFERENCE: Plastic Bucket No.: W-440, or

Draw-String Bag No.: _____ and Sequence No.: 57 (Data Sh

RH-TRU WASTE CERTIFICATION DATA SHEET NO. 2

CERTIFICATION OF RH-TRU WASTE REMOVED FROM THE CELL BANK IN PLASTIC BUCKETS

[DO NOT USE IF RCRA MATERIALS ARE PRESENT]

Your signature certifies a numbered, filled, and sealed plastic bucket containing NO fines; free liquid; pyrophoric, explosive, toxic or corrosive materials; compressed gases; fissionable isotopes (>27 g/ft^3); heat sources (>0.1 watt/ft^3); or RCRA materials.

Plastic Bucket No.: WC443 Date Filled and Sealed: 8/4/93

Description of Contents of the Plastic Bucket:

Item(s)	Source/Waste Form Category
Intermediate Container No. (if used): TAN Bucket	(See attached intermediate container data sheet for contents.)
Additional Materials	
NONE	

Combustibles: 0 vol %

Radiation Readings (if taken):

β-γ at 12 in.: .025 R/h β-γ at Contact: 250 R/h

Neutrons at 3 ft: BK6 mrem/h Neutrons at Contact: 20 mrem/h

NOTE THAT NO RCRA MATERIALS ARE PRESENT IN THIS PLASTIC BUCKET

Signature of GCO Sealing the Plastic Bucket: C W Evans

REFERENCE: Cask No.: ATN- 3210 and
Sequence No.: 58 (Data Sheet 3)

RH-TRU WASTE CERTIFICATION DATA SHEET NO. 1

CERTIFICATION OF INTERMEDIATE CONTAINERS OF RH-TRU WASTE (e.g., one-gallon paint cans) FILLED IN THE CUBICLES

[DO NOT USE IF RCRA MATERIALS ARE PRESENT]

Your signature certifies a numbered, filled, and closed container containing NO fines; free liquid; pyrophoric, explosive, toxic, or corrosive materials; compressed gases; fissionable isotopes (>27 g/ft^3); heat sources (>0.1 watt/ft^3); or RCRA materials.

Intermediate Container Identification: Paint Can No.: TAN BUCKET

(or other container and number): _____

Date Filled and Closed: 7/28/93

Description of Contents:

Item(s)	Source/Waste Form Category
GLASS	CELL BANK

Combustibles: 0 vol %

Radiation Readings (if taken):

β-γ at 12 in.: .025 R/h Neutrons at 3 ft: BKG mrem/h

NOTE THAT NO RCRA MATERIALS ARE PRESENT IN THIS CONTAINER

Signature of GCO Filling and Closing Container: C W Evans

REFERENCE: Plastic Bucket No.: W-443 or

Draw-String Bag No.: _____ and Sequence No.: 58 (Data Sheet 4)

RH-TRU WASTE CERTIFICATION DATA SHEET NO. 2

CERTIFICATION OF RH-TRU WASTE REMOVED FROM THE CELL BANK IN PLASTIC BUCKETS

[DO NOT USE IF RCRA MATERIALS ARE PRESENT]

Your signature certifies a numbered, filled, and sealed plastic bucket containing NO fines; free liquid; pyrophoric, explosive, toxic or corrosive materials; compressed gases; fissionable isotopes (>27 g/ft^3); heat sources (>0.1 watt/ft^3); or RCRA materials.

Plastic Bucket No.: W-444 Date Filled and Sealed: 8/4/93

Description of Contents of the Plastic Bucket:

Item(s)	Source/Waste Form Category
Intermediate Container No. (if used): 2059	(See attached intermediate container data sheet for contents.)
Additional Materials	
NONE	

Combustibles: <0 vol %

Radiation Readings (if taken):

β-γ at 12 in.: 600 R/h β-γ at Contact: 700 R/h

Neutrons at 3 ft: 2K6 mrem/h Neutrons at Contact: 90 mrem/h

NOTE THAT NO RCRA MATERIALS ARE PRESENT IN THIS PLASTIC BUCKET

Signature of GCO Sealing the Plastic Bucket: A W Evans

REFERENCE: Cask No.: ATN-3210 and
Sequence No.: 59 (Data Sheet 3)

RH-TRU WASTE CERTIFICATION DATA SHEET NO. 1

CERTIFICATION OF INTERMEDIATE CONTAINERS OF RH-TRU WASTE (e.g., one-gallon paint cans) FILLED IN THE CUBICLES

[DO NOT USE IF RCRA MATERIALS ARE PRESENT]

Your signature certifies a numbered, filled, and closed container containing NO fines; free liquid; pyrophoric, explosive, toxic, or corrosive materials; compressed gases; fissionable isotopes (>27 g/ft^3); heat sources (>0.1 watt/ft^3); or RCRA materials.

Intermediate Container Identification: Paint Can No.: 2059

(or other container and number): _____

Date Filled and Closed: 8/4/93

Description of Contents:

Item(s)	Source/Waste Form Category
POLY/ GLASS	CELL BANK

Combustibles: 80 vol %

Radiation Readings (if taken):

β-γ at 12 in.: 1600 R/h Neutrons at 3 ft: BKG mrem/h

NOTE THAT NO RCRA MATERIALS ARE PRESENT IN THIS CONTAINER

Signature of GCO Filling and Closing Container: _____

REFERENCE: Plastic Bucket No.: W-444 or

Draw-String Bag No.: _____ and Sequence No.: 59 (Data Sheet 4)

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RH-TRU WASTE CERTIFICATION DATA SHEET NO. 2

CERTIFICATION OF RH-TRU WASTE REMOVED FROM THE CELL BANK IN PLASTIC BUCKETS

[DO NOT USE IF RCRA MATERIALS ARE PRESENT]

Your signature certifies a numbered, filled, and sealed plastic bucket containing NO fines; free liquid; pyrophoric, explosive, toxic or corrosive materials; compressed gases; fissionable isotopes (>27 g/ft^3); heat sources (>0.1 watt/ft^3); or RCRA materials.

Plastic Bucket No.: W-445 Date Filled and Sealed: 8/4/93

Description of Contents of the Plastic Bucket:

Item(s)	Source/Waste Form Category
Intermediate Container No. (if used): 1937	(See attached intermediate container data sheet for contents.)
Additional Materials	
NONE	

Combustibles: 80 vol %

Radiation Readings (if taken):

β-γ at 12 in.: 200 R/h β-γ at Contact: 350 R/h

Neutrons at 3 ft: BK6 mrem/h Neutrons at Contact: 70 mrem/h

NOTE THAT NO RCRA MATERIALS ARE PRESENT IN THIS PLASTIC BUCKET

Signature of GCO Sealing the Plastic Bucket: C W Evans

REFERENCE: Cask No.: ATN-3210 and
Sequence No.: 60 (Data Sheet 3)

RH-TRU WASTE CERTIFICATION DATA SHEET NO. 1

CERTIFICATION OF INTERMEDIATE CONTAINERS OF RH-TRU WASTE (e.g., one-gallon paint cans) FILLED IN THE CUBICLES

[DO NOT USE IF RCRA MATERIALS ARE PRESENT]

Your signature certifies a numbered, filled, and closed container containing NO fines; free liquid; pyrophoric, explosive, toxic, or corrosive materials; compressed gases; fissionable isotopes (>27 g/ft^3); heat sources (>0.1 watt/ft^3); or RCRA materials.

Intermediate Container Identification: Paint Can No.: 1937

(or other container and number):

Date Filled and Closed: 8/4/93

Description of Contents:

Item(s)	Source/Waste Form Category
POLY	
GLASS	CELL BANK

Combustibles: 80 vol %

Radiation Readings (if taken):

β-γ at 12 in.: .200 R/h Neutrons at 3 ft: BKG mrem/h

NOTE THAT NO RCRA MATERIALS ARE PRESENT IN THIS CONTAINER

Signature of GCO Filling and Closing Container: CW Evans

REFERENCE: Plastic Bucket No. W-445, or

Draw-String Bag No.: _____ and Sequence No.: 60 (Data Sheet 4)

RH-TRU WASTE CERTIFICATION DATA SHEET NO. 2

CERTIFICATION OF RH-TRU WASTE REMOVED FROM THE CELL BANK IN PLASTIC BUCKETS

[DO NOT USE IF RCRA MATERIALS ARE PRESENT]

Your signature certifies a numbered, filled, and sealed plastic bucket containing NO fines; free liquid; pyrophoric, explosive, toxic or corrosive materials; compressed gases; fissionable isotopes (>27 g/ft^3); heat sources (>0.1 watt/ft^3); or RCRA materials.

Plastic Bucket No.: W-446 Date Filled and Sealed: 8/4/93

Description of Contents of the Plastic Bucket:

Item(s)	Source/Waste Form Category
Intermediate Container No. (if used): 2029	(See attached intermediate container data sheet for contents.)
Additional Materials	
NONE	

Combustibles: 0 vol %

Radiation Readings (if taken):

β-γ at 12 in.: .200 R/h β-γ at Contact: .300 R/h

Neutrons at 3 ft: BKG mrem/h Neutrons at Contact: 40 mrem/h

NOTE THAT NO RCRA MATERIALS ARE PRESENT IN THIS PLASTIC BUCKET

Signature of GCO Sealing the Plastic Bucket: C W Evans

REFERENCE: Cask No.: ATN- 5210 and
Sequence No.: 61 (Data Sheet 3)

RH-TRU WASTE CERTIFICATION DATA SHEET NO. 1

CERTIFICATION OF INTERMEDIATE CONTAINERS OF RH-TRU WASTE (e.g., one-gallon paint cans) FILLED IN THE CUBICLES

[DO NOT USE IF RCRA MATERIALS ARE PRESENT]

Your signature certifies a numbered, filled, and closed container containing NO fines; free liquid; pyrophoric, explosive, toxic, or corrosive materials; compressed gases; fissionable isotopes (>27 g/ft^3); heat sources (>0.1 watt/ft^3); or RCRA materials.

Intermediate Container Identification: Paint Can No.: 2029

(or other container and number): _____

Date Filled and Closed: 8/4/93

Description of Contents:

Item(s)	Source/Waste Form Category
CONCRETE	CELL BANK
GLASS	

Combustibles: 0 vol %

Radiation Readings (if taken):

β-γ at 12 in.: .200 R/h Neutrons at 3 ft: BKG mrem/h

NOTE THAT NO RCRA MATERIALS ARE PRESENT IN THIS CONTAINER

Signature of GCO Filling and Closing Container: A O Evans

REFERENCE: Plastic Bucket No.: W-446, or

Draw-String Bag No.: _____ and Sequence No.: 61 (Data Sheet 4).

DIVIDER PAGE

Attachment D: Contact Handled Waste Repackaging Data Form

Page 1 of 3

Section 1: General Information

Examination Start Date: 9-16-14	**Originally packaged as RH Waste** ☐ Yes ☑ No
Container Number: X10CSATN03142A	
Container Type: 55 Gallon Drum	**Thickness of Bag Liner:** 6 mil
Bag Liner Description: ☑ Non-Rigid ☑ Filtered Vent ☑ Poly ☐ Rigid ☐ Non-vented ☐ Other:	
Waste Stream Identification #: OR-REDC-CH-MET	
Physical waste form matches the assigned Waste Stream Description and RCRA characterization? ☐ NO ☑ YES	
New Waste Stream Identification Number if assigned	
Are sharp or heavy objects are blocked, braced, or packaged to provide puncture protection for the waste container? ☐ NO ☑ YES	
Volume Utilization Percentage: 90 %	
Number of Container Liners used: 1	
Closure Method for Container Liner: Twist & Tape	
Number of Inner Bags: 1	
Verified no inner packages are heat sealed? ☐ NO ☑ YES ☐ N/A	
Number for Layers of Confinement: 2	

Container Filter and Drum Enclosure Data

Filter Torque Wrench MSQ-17-H Nork3 **Filter Model No.** 0146
Serial/ID No. ~~UT942X00236~~ UT9424X00236 **Serial No.** 05100165164
Calibration Due Date: 2-26-15 **Torque Value** 6 ft lbs
Lid Ring Bolt Torque Wrench: 05100197OB **Calibration Due Date:** 3-10-15
Manufacturer's Closure spec: P0090 Rev. D

Source Container #:	Waste Stream #:	Original Parent Container #:	Waste Stream #:
X10CSATN03142	OR-REDC-CH-MET		

Init	ZLA	RLR	RJ		
Date	9-16-14	9-17-14	9-17-14		
Time	8:00	8:00	15:55		

Attachment D: Contact Handled Waste Repackaging Data Form

Page 2 of 3

Section 2: Waste Package Data			Data Page 1 of 2
Container Number: X10LSATN03142A		Examination Date: 9-16-14	
Item #	If Drum Puck, SS or CS	Waste Item Description	
1	N/A	Plastic, Tape, cardboard, No-Chaz, Quick Seal, 9-16-14 Metal Paint Can, crushed 5 Gallon Bucket, Glass labware, Metal Bolt, Paper, Latex Gloves, Metal labware, Metal Hand tools Rubber Tubing, Leather Gloves, Pink Absorbent Pad, Tygon Tubing, Perhaps Cans	
Waste Repackaging Operator:		Richard L Alston	9-16-14
		Print Name	Signature / Date

Init	RLA	RLA			
Date	9-16-14	9-17-14			
Time	8:00	8:00			

Attachment D: Contact Handled Waste Repackaging Data Form

Page 2 of 3

Section 2: Waste Package Data			Data Page 2 of 2
Container Number: X10CATN03142A		**Examination Date:** 9-17-14	
Item #	**If Drum Puck, SS or CS**	**Waste Item Description**	
1	N/A	Muffle Furnace, Plastic, Pump motor, NOCHAR, Flask Heater, Leather Gloves	
		Dry Red Rags	
Waste Repackaging Operator:		Richard L. Alston (Print Name)	Signature / 9-17-14 (Date)

~DCRM~ Printed from controlled source on 09-17-14, 09:12:24 hours.

Attachment D: Contact Handled Waste Repackaging Data Form

Page 3 of 3

Section 3: Comments

Container Number:	XIOCSATN03142A	**Examination Date:**	9-16-14
Waste repackaged in accordance with OPIP#	OPIP-2014-036, OPIP-2014-262,		OPIP 2014-241 ~~262~~ RLA 9-17-14 Note 1
Waste repackaged in accordance with WNCR#	N/A		

Note #1: Error Correction RLA 9-17-14

Note #2: Waste Repackaged in Accordance with OPIP RLA 9-17-14

Note 3: Data entry correction. MSJ 9-17-14

Note 4: Motor and gear drive was found during processing. Unit was disassembled and deemed PCB contaminated per AKE and RII. Only residual oils were found present. Nochar Petraband N910 was added to residual oil and open motor / gear drive was also filled with Petraband. PCB contaminated items and decon materials were bagged seperate and included with waste. MSJ 9-17-14

NOTE 5: ENVIRONMENTAL MEDIA LIQUIDS TRANSFORMED INTO XIOC05D3140. 10/1/14 MSJ

NOTE 6: ASBESTOS FURNACE & HEATER PLACED IN XIOCSATN03142A. 10/1/14 MSJ

PCB Bulk Product Characterization:

Section 4: Approvals

Signature below signifies that waste in this container has been examined and documented as required.

Waste Repackaging Operator: Richard L. Alston (Print Name)	(Signature)	9-17-14 (Date)
Waste Repackaging Data Form Reviewer: Matt Jack (Print Name)	(Signature)	9-17-14 (Date)

Signature below signifies that the Waste Stream Identification Number has been verified to be consistent with the original parent container and that objective evidence of the Waste Stream Identification Number is included in the applicable Waste Container Traveler.

Waste Package Verifier: Ricky Johnson (Print Name)	(Signature)	9-17-14 (Date)

*File with Waste Container Traveler.

Init	RLA	RLA			
Date	9-16-14	9-17-14			
Time	8:00	9:00			

Attachment F: Uncharacterized Waste Guidance

Record No: UWG- X10CSATN03142
(Container Number)

Initiation Date:	9/16/2014
Parent Container ID#:	X10CSATN03142
PI or daughter Container ID#, if applicable:	X10CSATN03142A
PI Description:	① Suspect asbestos square furnace ② Suspect asbestos flask heater
PI Characterization:	① Regulated asbestos containing material ② Regulated asbestos containing material
PI Regulatory Requirements:	① Manage as friable asbestos ② Manage as friable asbestos
PI Processing or Recommended Disposition Path:	① Process per OPIP 1.I.1. ② Process per OPIP 1.I.1.

RII Personnel	Thomas G. Barton / Thomas G Barton Print / Sign Name	9/16/2014 Date
AKE	Don E. Coffey / Don E Coffey Print / Sign Name	09/16/14 Date
Waste Operator **(PI processed per recommended disposition path)**	Richard L. Alston Print / Sign Name	9-17-14 Date
EPM	Print / Sign Name	Date

Original to Document Control.
Copy to associated WNCR or OPIP, if applicable.
Copy to Waste Container Traveler.

MSJ
9-17-14
0600

Attachment F: Uncharacterized Waste Guidance

Record No: UWG- X10CSATN03142
(Container Number)

Initiation Date:	9/16/2014
Parent Container ID#:	X10CSATN03142
PI or daughter Container ID#, if applicable:	X10CSATN03142 A

PI Description: Suspect PCB motor with worm gear.

PI Characterization: If liquids found within manage as PCB.
If no liquids found within manage as NON-PCB.

PI Regulatory Requirements: If liquids - manage as PCB
If no liquids - manage as scrap metal.

PI Processing or Recommended Disposition Path:
Disassemble ~~Paint~~ TGB 9/16/14 motor and worm gear assembly, if liquids are found absorb with Nochar Petrobond and place all items in daughter and manage daughter as PCB Remediation.
TGB 9/16/14 If Decontaminate all tools and include decon materials with daughter.

RII Personnel	Thomas G. Barton / Thomas G Barton Print / Sign Name	9/16/2014 Date
AKE	Brad E. Coffey / Brad E Coffey Print / Sign Name	09/16/14 Date
Waste Operator **(PI processed per recommended disposition path)**	Richard L. Alston Print / Sign Name	9-17-14 Date
EPM	Print / Sign Name	Date

If no liquids manage as scrap metal.

Original to Document Control.
Copy to associated WNCR or OPIP, if applicable.
Copy to Waste Container Traveler.

INSJ
9-17-14

DIVIDER PAGE

WITS / 2109 (RFD)

(NOTE: All information (i.e., RFD, NDA data, Analytical, change logs, etc.) needs to be reviewed for best available data.)

RFD: X10IS075854 ✓ Origin Facility: 7920 ✓ Reviewed by: Brian Bates

Container ID: X10CSATN03142 ✓ Current Facility: 7834

Review date: 12-2-04

Waste Item ID: X10IS075854-1

Description: TRU CERTIFIED WASTE FROM LAB 111 - TRABALKA REPORT NOTED THAT AM-243 WAS 0.141 MCI ON THE LOG SHEET.

Circle data checked: 2109/RFD NDA Analytical PKform Other: _____

CONSTITUENTS:

Do Constituents match folder? (Yes) No

ISOTOPES:

AM-243	0.0000141 ✓	CI	CF-249	0.00006 ✓	CI	CF-252	0.0087 ✓	CI
CM-244	0.0000115 ✓	CI	CS-137	0.0000115 ✓	CI			

Do Isotope(s) match folder? (Yes) No

EPA CODES:

Do EPA codes match folder? (Yes) No

Attachment: B

Is attachment designation correct? (Yes) No

RAD: Y RCRA: N

Do flags reflect what data represents? (Yes) No

LLW N PCB: N

TRU: Y TSCA: N

SNF: N

RCRA start date:

Is RCRA start date correct? (Yes) No

PCB start date:

Is PCB start date correct? (Yes) No

ATN- 3142

(If WITS changes need to be made, fill out a change log with justification and submit to WIMSHELP@bjcllc.org)

REQUEST FOR STORAGE OR DISPOSAL OF RADIOACTIVE SOLID WASTE OR SPECIAL MATERIALS

NO. 75854

REQUESTER: EXECUTES THIS SECTION BEFORE ARRANGING MATERIAL TRANSFER

DATE	ORIGIN OF WASTE (BULDG. NO.)	REQUESTER'S SIGNATURE	BADGE NO.	PHONE NO	BUILDING/MAIL STOP
11-5-92	7920	D. M. Gallimath	9306	4-7071	7920/6384

(CHECK IF APPLICABLE)	TOTAL VOLUME (CU. FT. ONLY)	COMBUSTIBLE VOL (CU. FT. ONLY)	WEIGHT (LBS ONLY)	ACCOUNTABILITY NO. (MM NO.)
☐ OFFSITE	7.5	3.0	420 169 165	
☐ CONSTRUCTION	CHARGE/WORK ORDER NUMBER: 3370-6001	COST SYMBOL: G	(FOR WASTE OPERATIONS USE ONLY) COST ADJUSTMENT:	

WASTE CLASSIFICATION (CHECK ONLY ONE)

1. ☒ TRU OR U-233 (RETRIEVABLE) (> 100 μ Ci/Kg)
2. ☐ URANIUM/THORIUM
3. ☐ FISSION PRODUCT
4. ☐ INDUCED ACTIVITY
5. ☐ TRITIUM
6. ☐ BETA-GAMMA TRU OR U-233 (> 100 μ Ci/Kg) (RETRIEVABLE)
7. ☐ ALPHA TRU OR U-233 (<100 μCi/Kg) BETA-GAMMA TRU OR U-233 (< 100 μ Ci/Kg)
8. ☐ OTHER _____
9. ☐ LANDFILL/SUSPECT
A. ☐ CONTAMINATED ASBESTOS

TYPE OF WASTE (CHECK ONLY ONE)

- ☐ (BW) BIOLOGICAL WASTE
- ☐ (CE) CONTAMINATED EQUIPMENT
- ☐ (DD) DECONTAMINATION DEBRIS
- ☒ (DS) DRY SOLIDS
- ☐ (SS) SOLIDIFIED SLUDGE
- ☐ (NC) NOT CLASSIFIED

BRIEF DESCRIPTION: TRU CERTIFIED WASTE FROM LAB III

CONTAINER TYPE (CHECK ONLY ONE)

1. ☒ 55 GAL SS DRUM ATN 3142
2. ☐ 30 GAL SS DRUM
3. ☐ 4-½ " WALL CONCRETE CASK
4. ☐ 6" WALL CONCRETE CASK
5. ☐ 12" WALL CONCRETE CASK
6. ☐ 55 GAL BI DRUM
7. ☐ 30 GAL BI DRUM
8. ☐ WOODEN BOX _____
9. ☐ OTHER _____
10. ☐ GI CAN
11. ☐ PLASTIC
12. ☐ DUMPSTER
13. ☐ NONE
14. ☐ CASK NO. _____ WALL THICKNESS _____ IN. SHIELDING MTL _____
15. ☐ METAL BOX _____

PRINCIPAL ISOTOPE(S): (BEST ESTIMATE)

1. IDENTITY	Cf^{252}	QUANTITY 8.7^{E-3}	☐ GRAMS ☒ CURIES	2. IDENTITY	Cs^{137}	QUANTITY 1.15^{E-5}	☐ GRAMS ☒ CURIES
3. IDENTITY	Cf^{249}	QUANTITY 6.0^{E-5}	☐ GRAMS ☒ CURIES	4. IDENTITY	Cm^{244}	QUANTITY 1.15^{E-5}	☐ GRAMS ☒ CURIES

Am^{243} 1.41^{E-5}

REQUESTER'S COMMENTS FOR THOSE HANDLING WASTE IN THE FIELD:

RADIOACTIVE YELLOW II CAUTION

TOTAL CURIES (BEST ESTIMATE): 8.9 DCB 1-6-93 ~~1.19E-4~~ 009 ~~8.9 E-3~~ DCA 11-7-92 ~~8.9 E-3~~ 11-9-92

This information must NOT be released externally until it has been reviewed by the appropriate site classification information Control Office.

WMO FIELD REPRESENTATIVE (APPROVAL SIGNATURE): Jack P Odom — DATE: 11/18/92

HEALTH PHYSICIST: EXECUTES THIS SECTION BEFORE MATERIAL TRANSFER

RADIATION DATA:

BETA-GAMMA: FOR PACKAGE 60 mrem/hr @ contact in.

ENTERED DEC 0 3 1992 KMD

SURFACE CONT. <20 dpm (alpha); <200 dpm (beta/gamma); NEUTRON READING 1 mrem/hr

HP SURVEYOR'S COMMENTS FOR THOSE HANDLING WASTE IN THE FIELD:

ATN 3142

HP'S SIGNATURE: Brenda Boarisney — DATE: 11-11-92

UCN-2822 (3 9-88)

DISTRIBUTION: WHITE - SWSA FOREMAN FORWARDS TO DCC
BLUE - RETAINED BY SWSA FOREMAN
CANARY - RETAINED BY GENERATOR

KMD BILLED DEC 1992

STORAGE OR DISPOSAL OF RADIOACTIVE SOLID WASTE OR SPECIAL MATERIALS

DOCUMENT NO. 75854
PAGE 2

COMPACTION WASTE: COMPLETED AND THEN APPROVED BY SWSA FOREMAN

LOW LEVEL BOX INFORMATION						
LL NUMBER	FULL BOX (Y/N)	FULL BOX WEIGHT	PORTION (FRACTION)	TOTAL POST-VOL	COMMENTS	FOR DMC USE ONLY
TOTALS						

Date of Compaction:

Compacting Operators:

and

SWSA Foreman's Signature:

SWSA FOREMAN COMPLETES AND APPROVES FOR NON-COMPACTED WASTE

Waste Was (check one):	SWSA No.:	Storage/Disposal Date:	ATN NO.:	Low Level No.:
☑ Retrievable ☐ Buried	5	11/19/92	3142	

Facility (check one):

☑ Building ☐ Well ☐ Landfill ☐ Tumulus ☐ Trench ☐ On Ground Storage

Location No.:	Location Within Facility:	Waste Description:
B7824	Rank: File: Layer:	CH-TRU

Comments from SWSA Foreman regarding waste and/or operations:

Foreman's Signature: R L White

WASTE EXAMINATION (WEAF): COMPLETES AND FORWARDS TO DMC

Waste Inspection Level:	Rated:	Inspection Officier:	Date:
☑ RTR ☐ PAN/SGS	☑ Pass ☐ Fail	Richard D. Sais	11-25-92

DISTRIBUTION: Copy 1 - Attach to 2822 and forward to DMC
Copy 2 - Retained by SWSA Foreman
Copy 3 - Retained by WEAF/Compacting Team (If Applicable)

UCN-2822A
(3 12-91)

COPY 1

TX-6352
(3/90)

DATA LOG SHEET FOR PACKAGING TRU WASTE

[An entry is required for each column. See instruction sheet for directions]

Drum ATN: 3142
Building No.: 7920
Room No.: 111

Content Code: [X] OR125A [ ] OR125B

1. Pak No.	2. Date	3. Radiation (mRem/h) Beta, Gamma	Neut.	4. Activity (Ci)	5. Dominant Radionuclides	6. Physical Form	7. Chemical Form	8. Percent Comb.	9. Has Mtl (Y/N)	10. Signature	11. Data Log Sheet Verification Date	Signature
1	8/2/91	75	0	5.25E-4 Ci	252Cf	Metal Ring stand Base	oxide	<1%	No	J.T. Wiggins	8/6/91	J.T. Wiggins
2	8/2/91	150	0	1.05E-3 Ci	252Cf	Tools	oxide	1	No	J.T. Wiggins	8-6-91	J.T. Wiggins
3	8/2/91	750	0	5.25E-3 Ci	252Cf	Tygon tubing	oxide	100	No	J.T. Wiggins	8-6-91	J.T. Wiggins
4	8/6/91	14	0	~~9.9E-5~~ 1.08E-4 Ci	252Cf	Ring stand rods plastic	oxide	5	No	C.E. Porter	8-6-91	J.T. Wiggins
5	8/6/91	40	0	2.8E-4 Ci	252Cf	Glass, Metal bucket plastic	oxide	1	No	C.E. Porter	8-6-91	J.T. Wiggins
6	10/24/91	<5	0	7.5E-5	249Cf-252Cf	Plastic, Metal Rod Cheese Cloth, Al foil	oxide	90	No	J.T. Wiggins	11-11-92	R. Rodriguez
7	10/31/91	2	0	7.5E-5	249Cf	Plastic, Paper, Cloth, glass cone	oxide	98	No	J.T. Wiggins	11-11-92	R. Rodriguez
8	11/6/92	2	0	RER 1.5E-5 ~~1.4E-5~~	137Cs, 244Cm	Plastic, pepa, cloth, glass tops	nitrate	98	No	C.W. Alexander	11-11-92	R. Rodriguez
9	11/6/92	1	0	RER 8.0E-6 ~~7.0E-6~~	137Cs, 244Cm	Plastic, paper, glass and pipets	nitrate	3	No	C.W. Alexander	11-11-92	R. Rodriguez
10	6/2/92	160	1	1.3E-3	252Cf	Plastic, Al can, cloth	oxide	75%	No	J.T. Wiggins	11-11-92	R. Rodriguez
~~11~~	~~6/2/92~~	~~175~~	~~180~~	~~3.3E-3~~	~~252Cf~~	~~Plastic, Polybottles~~	~~oxide~~	~~100~~	~~No~~	~~J.T. Wiggins~~	11-11-92	R. Rodriguez
	→	Packet #11		was transferred	to RH-TRU waste ←						~~11-11-92~~	~~R. Rodriguez~~
12	6/25/92	25	0	RER ~~1.76E-4~~ 1.3E-4	252Cf	14 Lard Can Pump motor	oxide	1	No	J.T. Wiggins	11-11-92	R. Rodriguez
13	6/25/92	2	0	~~1.5E-5~~ 1.4E-5	252Cf	14 Lard Can muffle Furnace	oxide	1	No	J.T. Wiggins	11-11-92	R. Rodriguez
14	9/30/92	1	0	8.0E-6	252Cf	Cave B Glove Box Plastic	oxide	100	No	C.E. Porter	11-11-92	R. Rodriguez

Proper Drum Closure (Signature): D. M. Galbraith

Generator Certification Official (Signature): D. M. Galbraith

Authorized Radioactive Solid Waste Operations (Signature): Jack P. Downer 11/17/92

NOTE: If column 9 = Yes, complete supplemental form TX-6352A.

TX-5352
(3/90)

DATA LOG SHEET FOR PACKAGING TRU WASTE

[An entry is required for each column. See instruction sheet for directions]

Drum ATN: 3142
Building No.: 7920
Room No.: 111

Content Code: [Y] OR125A [ ] OR125B

1. Pak No.	2. Date	3. Radiation (mRem/h) Beta, Gamma	3. Radiation (mRem/h) Neut.	4. Activity (Ci)	5. Dominant Radionuclides	6. Physical Form	7. Chemical Form	8. Percent Comb.	9. Haz. Mtl (Y/N)	10. Signature	11. Data Log Sheet Verification Date	11. Data Log Sheet Verification Signature
15	10/29/92	20	0	1.41E-4	^{243}Am	metal balance	oxide	<1%	N	Curtis Porter	11-11-92	R Rodriguez
					D. M. Hallbratt*		11-5-92					

Proper Drum Closure (Signature): D. M. Hallbratt*

Generator Certification Official (Signature): D. M. Hallbratt*

Authorized Radioactive Solid Waste Operations (Signature): Jack P Adams 11/17/92

NOTE: If column 9 = Yes, complete supplemental form TX-5352A.

ON-SITE RADIOACTIVE MATERIAL SHIPPING PAPER

Page 1 of 1

Hazard Class: Radioactive UN/NA Identification Number: 2982

Number of Containers: 1 Gross Weight (material & packaging): 172

Shipment Origin: 7920 Shipment Destination: SWSAS

Radioactive Material Description:

Name of each radionuclide: See 2822 Attached

Physical and chemical form: See TX5352 Attached

Activity per container: See 2822 Attached

Labels (White-I, Yellow-II or III): Radioactive Yellow II

Transport index (if Yellow-II or III): 2.8

Fissile class (I, II, or III; if applicable): N/A

Package identification number: ATM # 3142

Required Placards: RADIOACTIVE Emergency Contact: 4-6606

Originator's Signature: P. G. Cleveland Phone: 576-7401 576-4759

Vehicle Operator: J I Davis Badge Number: 142162

TX-5725 (DMC-CP 9/21/92)

CHECK SHEET FOR DRUM INSPECTION

Drum ATN 3142

Drum LLN _____

ACTION	COMPLETED
Radiation Tag (UCN-2785) attached and properly filled out	✓
Survey instrument serial number recorded on Radiation Tag (UCN-2785)	✓
Documentation Complete: Request for Storage or Disposal of Radioactive Waste or Special Materials (UCN-2822)	✓
Documentation Complete: ORNL Nuclear Materials Intra-Laboratory Transfer (UCN-2681)	NA
Check for Physical Damage (visual)	✓
Bolt ring properly installed and in place	✓
Closure bolt torqued to 45 ft-lb Torque Wrench (Cal. Date): 9-11-93 Torque Wrench I.D. No.: BD-5738	✓
Jam nut in proper	✓
Drum checked to be 17-H	✓
Bar code installed and in place	✓

COMMENTS

Approved By: P. G. Cleveland Date: 11-18-92

STORAGE OR DISPOSAL OF RADIOACTIVE SOLID WASTE OR SPECIAL MATERIALS WASTE TRACKING UPDATE

DOCUMENT NO. 75854
PAGE 3

THIS PORTION TO BE COMPLETED BY SWSA FOREMAN/WEAF

TRANSFERRED FROM: B 7824 | DATE OF TRANSFER: 11/30/92

CONTAINER TYPE: ☐ LL Drum _____ ☐ LL Vault _____ ☐ LL Box _____
☑ TRU Drum 3/42 ☐ Other _____

Comments:

☐ Buried ☑ Retrievable

New Disposal/Storage Location: B 7879

RANK: A FILE: 2 LAYER: 3 Shipment No.: _____

SWSA FOREMAN'S APPROVAL: R R White

THIS PORTION TO BE COMPLETED BY DOCUMENTATION MANAGEMENT CENTER

DATE RECEIVED: NOV 30 1992 | DATE UPDATED: 12/4/92 DH

UPDATED BY:

DISTRIBUTION: Copy 1 - Forward to DMC
Copy 2 - Retained by SWSA Foreman
Copy 3 - Retained by WEAF (If Applicable)

UCN-28228
(3 3-90)

COPY 1

WASTE T/S/D RECORD

DOCNO: 75854

Document ID

FACILITY INFORMATION

F1. T/S/D Site	F2. T/S/D Facility	(Reserved)
X10	7834	

ACTIVITY LOG

C1. Activity Code	C2. Date	C3. Container/Item ID No.	C4. T/S/D Area	C5. Location			C6. Net Vol.	C7. Vol. (Units)	C8. Gross Wt (Kg)	C9. Operator's Signature	C10. Badge No.
Store	5-14-94	ATN- 3076									
		3183									
		3223									
		3196									
		[redacted]									
		3166									
		2922									
		3550									
		3165									
		3192									

COMMENTS

Drums moved from B7879. Placed in Cell E

ENTERED MAY 31 1994

SIGNATURE and APPROVALS

I. Foreman	Badge	Date
P G Cleveland	12661	5-14-94

	Badge	Date

TX-5754 V1.0A (DMC-CP)

DIVIDER PAGE

WITS / 2109 (RFD)

(NOTE: All information (i.e., RFD, NDA data, Analytical, change logs, etc.) needs to be reviewed for best available data.) 3p

RFD: X10I9418692
Container ID: X10C9402660

Origin Facility: 7920
Current Facility: 7883

Reviewed by: K.A. Balo

Review date: 12/30/04

Waste Item ID: X10I9418692-1

Description: "RADIOCHEMICAL PROCESSING FOR ISOTOPE SEPARATION AND PURIFICATION METAL, PAPER (VOG FILTER), POLYETHYLENE BEAD***PER TRABALKA REVIEW: EXERNAL BETA-GAMMA AND NEUTRON DOSE RATES MEASURED AT CONTACT ON THE BAG WERE 1

Circle data checked: (2109/RFD) NDA Analytical PKform Other: Trabalka Report

CONSTITUENTS:

Do Constituents match folder? (Yes) No

ISOTOPES:

CM-244 1.24 CI

Do Isotope(s) match folder? (Yes) No

EPA CODES:

Do EPA codes match folder? (Yes) No

Attachment: B

Is attachment designation correct? (Yes) No

RAD: Y RCRA: N
LLW N PCB: N
TRU: Y TSCA: N
SNF: N

Do Tags reflect what data represents? (Yes) No

RCRA start date:

Is RCRA start date correct? (Yes) No

PCB start date:

Is PCB start date correct? (Yes) No

COPY

(If WITS changes need to be made, fill out a change log with justification and submit to WIMSHELP@bjcllc.org)

P 7 2

WASTE ITEM DESCRIPTION

K1. Document ID Number: X10I9418692

ALL FIELDS MUST BE COMPLETED

NON RECORD COPY

X10C9402660

Generation Process Information

W1. Generator's Name (Print)	W2. Badge Number	W3. Generator's Phone No.	W4. Mail Stop	W5. Charge No/WO
EVANS, CW	028492	(423)574-2500	6384	3370600I

W6. Generator's Company	W7. Origin Division	W8. Origin Site	W9. Origin Facility	W10. Origin Room/Area	W11. Radiological Area?
LMER	003	X10	7920	118	[X] Yes [ ] No

W12. Process Stream ID	W13. Process Category	W14. Process Activity	W15. AWA Number
UNK	PRO	A49	NA

W16. Physical Form	W17. Material Type(s)	W18. Waste Item Description Attachment
SOLID	MT007 MT008	B

Waste Subcategories (Check all)

	Yes	No		Yes	No		Yes	No
W20. Biological		X	W23. Construction Debris		X	W26. Classified		X
W21. Accountable		X	W24. Medical		X	W27. Friable Asbestos		X
W22. Carcinogen		X	W25. Sanitary/Industrial		X	W28. Non-Friable Asbestos		X

W29. Waste Description

RADIOCHEMICAL PROCESSING FOR ISOTOPE SEPARATION AND PURIFICATION METAL, PAPER (VOG FILTER),
POLYETHYLENE BEADS WERE ADDED TO THE INSIDE OF THE CASK TO REDUCE THE NEUTRON DOSE RATE.

COPY

Approved
AUG 1998
PGWOG
AKL

Handling/Picking Information

P1. Holding Site	P2. Holding Facility	P3. Holding Rm/Area	P4. Pickup Site	P5. Pickup Facility	P6. Pickup Area
X10	7920	118	X10	7920	118

(Reserved)	P7. Respirator	P8. Cartridge Type
	[X] None [ ] Half [ ] Full [✓] Unknown	NA

P9. Handling Instructions
NA

10. Item/Container 1 of 1

Waste Item/Container Information

I1. Waste Item ID Number	I2. Origin Date	I3. RCRA 90-day	I4.
X10I9418692	08-26-1998	Start Date — NA	Waste Item (Label A) X10I9418692 Revision 1.00

I5. Container ID Number	I6. PCB Start Date	I7. Absorbent Materials
X10C9402660	NA	[ ] Yes [X] No

I8. NMC&A Form	I9. Est Net Vol	I10. Units
NA	45	FT3

I11. Area of Contamination	I12. Est Gross Wt	I13. Units	I14. Inner Container Type	I15. Outer Container Type
NA [ ] in² [ ] cm² [ ] ft²	1000	LB	BAG8	CASKC6

CAUTION
This information must NOT be
It has
been reviewed by the appropriate
site Classification and Information
Control Office.

I16. HP Tag No.	Surface Contamination (dpm/100cm²) Transfer	Surface Contamination (dpm/100cm²) Direct Read	Dose Rate at Surface (mrem/hr)	Dose Rate at 1 L Meter (mrem/hr)	Dose Rate at 1 Foot (mrem/hr)	Instrument Identification
NA						NA
Alpha	NA	NA				
Beta/Gamma	NA	NA	1100	NA	600	7920-05
Neutron			6210	NA	3370	7920-04R

Signatures and Approvals

S1. Generator	Badge	Date	S3. HP Technician	Badge	Survey Date
EVANS CW	028492	08-27-1998	WAGGONER JK	032927	08-27-1998
S2. Verification Officer	**Badge**	**Date**	**S4. Derivative Classifier**	**Badge**	**Date**
EVANS CW	028492	08-27-1998		NA	

LOCKHEED MARTIN

K1. Document ID Number: X10I9418692

TRU/TRU MIXED WASTE ATTACHMENT B

ALL FIELDS MUST BE COMPLETED

Prohibited Items	Yes	No		Yes	No
B1. Pyrophoric Materials		X	B6. Ignition Sources		X
B2. Active Chelating Agents (> 1% of waste)		X	B7. Free Liquids		X
B3. Sealed Internal containers > 1 gallon		X	B8. Etiological Agents		X
B4. Explosive Materials		X	(Reserved)		
B5. Small Particulates (<= 1% by wt < 10um; <= 15% by wt < 200um)					X

B9. Biological Waste	B10. Chelating Agents	B11. Heat Sealed Bags	B12. Ion Exchange Resins	B13. TRUCON Code	B14. Thermal Power
☐ Yes ☒ No	☐ Yes ☒ No	☐ Yes ☒ No	☐ Yes ☒ No	OR125A	< 0.1 W/ft³

B15. Combustible Material	B16. Beryllium		B17. TRU Waste Type(s)
25 vol%	NA	☐ ppm ☐ grams	CW MW

B18. Number of Sealed Layers	B19. Sealed Layer Type(s)	B20. Special Case Waste	B21. RAD Handling Type
2	TWIST TAPE	☐ Yes ☒ No	☐ Contact ☒ Remote

NA

Radioisotope Determination Method		R7. Radioisotope	R8. Quantity	R9. Units			R10. NARM	
Document Type	Document Number(s)			Ci	grams	pCi/l	Yes	No
R1. Analysis LSID#	NA	CM-244	1.24	X			NA	NA
	R2. NDA# NA							
R3. PK Form UCN 20116#	RES7920-000-002							
R4. Fissile Content (FGE of U-235) NA grams	R5. Enrichment (wt% of U-235) NA							
R6. Chemical Form OXIDE								

☐ R11. Radioisotope Continuation Sheet(s) ____ through ____ attached.

RCRA/TSCA Determination Method		Determination	Yes	No
Document Type	Document Number(s)			
T1. Analysis LSID#	NA	T3. RCRA Waste		X
		T4. TSCA Waste		X
T2. PK Form UCN 20116#	RES7920-000-002	T5. Underlying Hazardous Constituent(s) Present		X

T6. PCB Present	T7. PCB Concentration	T8. PCB Source Concentration	T9. PCB Source Concentration Range (ppm)
☐ Yes ☒ No	NA ppm	NA ppm	☒ NA ☐ <=1.99 ☐ 2 - 49.99 ☐ 50 - 499.99 ☐ >= 500

T10. Substance ID	T11. Conc	T12. Units	T13. EPA Code(s)	T14. Underlying Hazardous Constituent
NA	NA	NA	NA	☐ Yes ☒ No
T15. Substance Name: NA				
T10. Substance ID	T11. Conc	T12. Units	T13. EPA Code(s)	T14. Underlying Hazardous Constituent
				☐ Yes ☐ No
T15. Substance Name				

☐ T16. Constituent Continuation Sheet(s) ____ through ____ attached.

VI. I certify that I have been provided sufficient information concerning the above described waste to apply the requirements of ES/WM-10, Waste Acceptance Criteria for the Oak Ridge Reservation, and, based on this information, I further certify that this waste material:

1) Is accurately described above and packaged in accordance with Waste Certification Procedure ORNL/TM-13288,R-2 Rev Date 09-01-1997, and

2) Meet the Waste Acceptance Criteria for the TRU/TRU MIXED WASTE Category, as listed in ES/WM-10.

3) Or, if applicable, meets the conditions stipulated in variance number(s) ____

I further certify that all required documentation is attached to the UCN 2109 and that, to the best of my knowledge and belief, the information on the UCN 2109 is complete and accurate. I am currently authorized to perform Waste Certifier functions.

Signature Waste Certifier	Printed Name	Badge Number	Date

S4. Derivative Classifier	Badge	Date
	NA	

DIVIDER PAGE

WITS / 2109 (RFD)

(NOTE: All information (i.e., RFD, NDA data, Analytical, change logs, etc.) needs to be reviewed for best available data.)

RFD: X10I9900382
Container ID: X10C9802665

Origin Facility: 7920
Current Facility: 7883

Reviewed by: K. A. Bolo

Review date: 12/30/04

Waste Item ID: X10I9900382-1

Description: "PLASTIC, GLASS, METAL, PAPER, PPE, RUBBER, INCIDENTAL METAL***PER TRABALKA REVIEW: 448 LB OF WASTE CONTAINING 20.1 CI OF CM-244, 1.47 CI OF PU-241, AND 4.51 CI OF SR-90, ALONG WITH SMALLER QUANITITIES OF OTHER TRU AND FUSSION PRODUCT RADIONUCLIDES. ALL

Circle data checked: (2109/RFD) NDA Analytical PKform Other: Trabalka Report

CONSTITUENTS:

ISOTOPES:

Do Constituents match folder? (Yes) No

AG-110	0.00913	CI ✓	AM-241	0.164	CI ✓	AM-243	0.0117	CI ✓
CE-141	0.258	CI ✓	CE-144	0.0831	CI ✓	CF-249	0.00018	CI ✓
CF-250	0.00763	CI ✓	CF-251	0.0000333	CI ✓	CF-252	0.296	CI ✓
CM-242	0.0897	CI ✓	CM-244	20.1	CI ✓	CM-246	0.141	CI ✓
CM-248	0.000376	CI ✓	CO-60	0.00484	CI ✓	CS-134	0.0466	CI ✓
CS-137	0.609	CI ✓	EU-152	0.0178	CI ✓	EU-154	0.088	CI ✓
EU-155	0.0636	CI ✓	NB-95	0.0622	CI ✓	NP-239	0.0233	CI ✓
PU-238	0.123	CI ✓	PU-239	0.0601	CI ✓	PU-241	1.47	CI ✓
PU-242	0.00153	CI ✓	RU-103	0.121	CI ✓	RU-106	0.548	CI ✓
SB-125	0.0321	CI ✓	SR-90	4.51	CI ✓	ZR-95	0.0655	CI ✓

Do Isotope(s) match folder? (Yes) No

EPA CODES:

Attachment: B
RAD: Y **RCRA:** ~~Y~~ N
LLW N **PCB:** N
TRU: Y **TSCA:** N
SNF: N

COPY

Do EPA codes match folder? (Yes) No
Is attachment designation correct? (Yes) No
Do flags reflect what data represents? Yes (No)

RCRA start date:
PCB start date:

Is RCRA start date correct? (Yes) No
Is PCB start date correct? (Yes) No

(If WITS changes need to be made, fill out a change log with justification and submit to WIMSHELP@bjcllc.org)

Data/Manifest Package Change Log

Site ID: X-10 **RFD (2109) Number:** X10C9402665

Container or Waste Item ID(s): X10C9402665

Date: 12/30/04 **Signature:** K. A. Bate **Badge #:** 030338 **Effective as of:** 12/30/04

Instructions: Document necessary changes made to 2109 or Manifest Data Packages. Retain this form inside the Data Package indefinitely.

Description of Change/Addition:

Change the RCRA flag from "U" to "N".

Justification:

This will match the information on the RFD.

Actions to be Taken: (i.e. Field Operations apply label)

Reviewer Use Only:

Rad Review: Y ☐ N ☒ **Reviewed by:** _____ **Date:** _____

Chem Review: Y ☐ N ☒ **Reviewed by:** _____ **Date** _____

WIMS Use Only
Magic Case No.:_____ Initials:_____Date:_____

[redacted]

WASTE ITEM DESCRIPTION RECORD

K1. Document ID Number X10I9900382

NON COPY

ALL FIELDS MUST BE COMPLETED

X10C9802665

Generation/Process Information

W1. Generator's Name (Print)	W2. Badge Number	W3. Generator's Phone No.	W4. Mail Stop	W5. Charge No/WO
EVANS, CW	028492	(423)574-2530	6384	33706001

W6. Generator's Company	W7. Origin Division	W8. Origin Site	W9. Origin Facility	W10. Origin Room/Area	W11. Radiological Area?
LMER	003	X10	7920	118	[X] Yes [ ] No

W12. Process Stream ID	W13. Process Category	W14. Process Activity	W15. AWA Number
UNK	PRO	A49	NA

W16. Physical Form	W17. Material Type(s)	W18. Waste Item Description Attachment
SOLID	MT005 MT008 MT010	B

Waste Subcategories (Check all)

	Yes	No		Yes	No		Yes	No
W20. Biological		X	W23. Construction Debris		X	W26. Classified		X
W21. Accountable		X	W24. Medical		X	W27. Friable Asbestos		X
W22. Carcinogen		X	W25. Sanitary/Industrial		X	W28. Non-Friable Asbestos		X

W29. Waste Description

PLASTIC, GLASS, METAL, PAPER, PPE, RUBBER, INCIDENTAL METAL

Handling/Pickup Information

P1. Holding Site	P2. Holding Facility	P3. Holding Rm/Area	P4. Pickup Site	P5. Pickup Facility	P6. Pickup Area
X10	7920	OUTSIDE	X10	7920	OUTSIDE

(Reserved)

P7. Respirator [X] None [ ] Half [ ] Full [ ] Unknown

P8. Cartridge Type NA

P9. Handling Instructions NA

CAUTION

This information must NOT be released externally until it has been reviewed by the appropriate site Classification and Information Control Office

10. Item/Container 1 of 1

Waste Item/Container Information

I1. Waste Item ID Number	I2. Origin Date	I3. RCRA 90-day Start Date	I4.
X10I9900382	05-06-1999	NA	Item Label (Label B) X10I9900382 Revision 1.00

I5. Container ID Number	I6. PCB Start Date	I7. Absorbent Materials			
X10C9802665	NA	[ ] Yes [X] No			

I8. NMC&A Form	I9. Est Net Vol	I10. Units			
NA	58.5	FT3			

I11. Area of Contamination	I12. Est Gross Wt	I13. Units	I14. Inner Container Type	I15. Outer Container Type
NA [ ] in² [ ] cm² [ ] ft²	13500	LB	NA	CASKC

I16. HP Tag No.	Surface Contamination (dpm/100cm²) Transfer	Surface Contamination (dpm/100cm²) Direct Read	Dose Rate at Surface (mrem/hr)	Dose Rate at 1 Meter (mrem/hr)	Dose Rate at 1 Foot (mrem/hr)	Instrument Identification
YT						
Alpha	< 20	NA				CTA-038
Beta/Gamma	< 200	NA	200	40	NA	7920-08I, CTB-045
Neutron			300	130	NA	7920-02R

Signatures and Approvals

S1. Generator	Badge	Date	S3. HP Technician	Badge	Survey Date
EVANS CW	028492	05-06-1999	WAGGONER JK	032927	05-06-1999
S2. Verification Officer	**Badge**	**Date**	**S4. Derivative Classifier**	**Badge**	**Date**
COFFEY DE	013443	08-18-1999			

CONTROLLED MATERIAL

K1. Document ID Number: X10I9900382

TRU/TRU MIXED WASTE ATTACHMENT B

ALL FIELDS MUST BE COMPLETED

Prohibited Items	Yes	No		Yes	No
B1. Pyrophoric Materials		X	B6. Ignition Sources		X
B2. Active Chelating Agents (> 1% of waste)		X	B7. Free Liquids		X
B3. Sealed Internal containers > 1 gallon		X	B8. Etiological Agents		X
B4. Explosive Materials		X	(Reserved)		
B5. Small Particulates (<= 1% by wt < 10um; <= 15% by wt < 200um)					X

B9. Biological Waste	B10. Chelating Agents	B11. Heat Sealed Bags	B12. Ion Exchange Resins	B13. TRUCON Code	B14. Thermal Power
☐ Yes ☒ No	☐ Yes ☒ No	☐ Yes ☒ No	☐ Yes ☒ No	OR125A	1.25E-2 W/ft³

B15. Combustible Material	B16. Beryllium		B17. TRU Waste Type(s)
75 vol%	NA	☐ ppm ☐ grams	CW GW MW

B18. Number of Sealed Layers	B19. Sealed Layer Type(s)	B20. Special Case Waste	B21. RAD Handling Type
2	TWIST TAPE	☐ Yes ☒ No	☐ Contact ☒ Remote

NA

Radioisotope Determination Method

Document Type	Document Number(s)
R1. Analysis LSID#	NA
	R2. NDA# NA
R3. PK Form UCN 20116#	7920-HCAL-005

R4. Fissile Content (FGE of U-235): 1.64E+0 grams

R5. Enrichment (wt% of U-235): NA

R6. Chemical Form: OXIDE

R7. Radioisotope	R8. Quantity	R9. Units: Ci	grams	pCi/g	R10. NARM: Yes	No
CO-60	4.84E-03	X			NA	NA
SR-90	4.51E00	X			NA	NA
NB-95	6.22E-02	X			NA	NA
ZR-95	6.55E-02	X			NA	NA
RU-103	1.21E-01	X			NA	NA
RU-106	5.48E-01	X			NA	NA

☐ R11. Radioisotope Continuation Sheet(s) _____ through _____ attached.

RCRA/TSCA Determination Method

Document Type	Document Number(s)
T1. Analysis LSID#	NA
T2. PK Form UCN 20116#	7920-HCAL-005

T3. RCRA Waste	Yes	No
		X
T4. TSCA Waste		X
T5. Underlying Hazardous Constituent(s) Present		X

T6. PCB Present: ☐ Yes ☒ No

T7. PCB Concentration: NA ppm

T8. PCB Source Concentration: NA ppm

T9. PCB Source Concentration Range (ppm): ☒ NA ☐ <=1.99 ☐ 2 - 49.99 ☐ 50 - 499.99 ☐ >= 500

T10. Substance ID	T11. Conc	T12. Units	T13. EPA Code(s)	T14. Underlying Hazardous Constituent
	NA	NA	NA	☐ Yes ☒ No

T15. Substance Name:

T10. Substance ID	T11. Conc	T12. Units	T13. EPA Code(s)	T14. Underlying Hazardous Constituent
				☐ Yes ☐ No

T15. Substance Name:

☐ T16. Constituent Continuation Sheet(s) _____ through _____ attached.

1. I certify that I have been provided sufficient information concerning the above described waste to apply the requirements of ES/WM-10, Waste Acceptance Criteria for the Oak Ridge Reservation, and, based on this information, I further certify that this waste material:

- Is accurately described above and packaged in accordance with Waste Certification Procedure _____ Rev Date _____, and
- Meet the Waste Acceptance Criteria for the TRU/TRU MIXED WASTE Category, as listed in ES/WM-10.
- Or, if applicable, meets the conditions stipulated in variance number(s) _____

further certify that all required documentation is attached to the UCN 2109 and that, to the best of my knowledge and belief, the information on the UCN 109 is complete and accurate. I am currently authorized to perform Waste Certifier functions.

Signature Waste Certifier	Printed Name	Badge Number	Date

T17. Derivative Classifier	Badge	Date

UNCLASSIFIED

K1. Document ID Number

X10I9900382

RADIOISOTOPE CONTINUATION SHEET

(Continuation Page 1 of 1)

R7. Radioisotope	R8. Quantity	R9. Units Ci	G	pCi/g	RTLE Yes	NARM No
AG-110M	9.13E-03	X			NA	NA
SB-125	3.21E-02	X			NA	NA
CS-134	4.66E-02	X			NA	NA
CS-137	6.09E-01	X			NA	NA
CE-141	2.58E-01	X			NA	NA
CE-144	8.31E-02	X			NA	NA
EU-152	1.78E-02	X			NA	NA
EU-154	8.80E-02	X			NA	NA
EU-155	6.36E-02	X			NA	NA
NP-239	2.33E-02	X			NA	NA
PU-238	1.23E-01	X			NA	NA
PU-239	6.01E-02	X			NA	NA
PU-241	1.47E00	X			NA	NA
PU-242	1.53E-03	X			NA	NA
AM-241	1.64E-01	X			NA	NA
AM-243	1.17E-02	X			NA	NA
CM-242	8.97E-02	X			NA	NA
CM-244	2.01E01	X			NA	NA
CM-246	1.41E-01	X			NA	NA
CM-248	3.76E-04	X			NA	NA
CF-249	1.80E-04	X			NA	NA
CF-250	7.63E-03	X			NA	NA
CF-251	3.33E-05	X			NA	NA
CF-252	2.96E-01	X			NA	NA
					NA	NA
					NA	NA
					NA	NA
					NA	NA
					NA	NA

Signatures and Approvals

S4. Derivative Classifier | Badge | Date

UNCLASSIFIED

X10C9802665 @ 7920
IWID DON COFFEY
9/7/99

Waste Packet WID#	Origin Date	Packet DOT Subtype Determination: DOT Rad Determination Act (nCi/gm)	DOT Rad Determination (RAD/NON RAD)	Limited Quantity	LSA	Type A or B	RQ Sum Of Fractions	Packet Tot Act (Ci)	TRU Conc (nCi/gm)	U235 Fissile Equiv. Mass (gm)	Decay Heat (Watts/ft^3)	Packet Information: Packet Type	Pkt Empty Wght (lbs)	Waste Wght (lbs)
[redacted]	[redacted]	1.43E+05	DOT RAD	> 0.001 A2	Exceeds	Type B	2.11E+03	2.901E+01	2.47E+03	1.64E+00	1.28E-02	[redacted]	[redacted]	448.0
Container Totals														
1			DOT RAD	NO	NO	Type B	>RQ	2.901E+01		1.638E+00	1.280E-02			448
			DOT Subtype Unity Sum Of Fractions ->			1.97E+03		*< HRCQ*						

X10C9802665 @ 7920
IWID DON COFFEY
9/7/99

Waste Packet WID#	Origin Date	Measured Wght (lbs)	Packet Vol. (ft^3)	* General Waste Description	DAC Waste Type Code (1 thru 4)	LSA Form (SCO or Uniform)	IF SCO, Surface Cont (dpm/100 cm^2)	Rad Survey Information Surface Dose Rate (mr/hr) Gamma	Neutron	SLLW CO60	SLLW SR90
[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	INCIDENTAL	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
Container Totals											
1		448	58.50		[redacted]	1		[redacted]	[redacted]	4.84E-03	4.51E+00
										[redacted]	[redacted]
										[redacted]	[redacted]

X10C9802665 @ 7920
IWID DON COFFEY
9/7/99

Waste Packet WID#	Origin Date	Activity (Ci) SLLW NB95	SLLW ZR95	SLLW RU103	SLLW RU106	SLLW AG110M	SLLW SB125	SLLW CS134	SLLW CS137	SLLW CE141	SLLW CE144	Activity (Ci) SLLW EU152	SLLW EU154	SLLW EU155	SLLW NP239
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
Container Totals															
1		6.22E-02	6.55E-02	1.21E-01	5.48E-01	9.13E-03	3.21E-02	4.66E-02	6.09E-01	2.58E-01	8.31E-02	1.78E-02	8.80E-02	6.36E-02	2.33E-02
		[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
		[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]

X10C9802665 @ 7920
IWID DON COFFEY
9/7/99

Waste Packet WID#	Origin Date	Activity (Ci) TRU/FIS PU238	TRU/FIS PU239	FIS PU241	TRU/FIS PU242	TRU/FIS AM241	TRU/FIS AM243	SLLW CM242	FIS CM244	TRU CM246	TRU CM248	Activity (Ci) TRU/FIS CF249	SLLW CF250	TRU/FIS CF251	SLLW CF252
[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
Container Totals															
1		1.23E-01	6.01E-02	1.47E+00	1.53E-03	1.64E-01	1.17E-02	8.97E-02	2.01E+01	1.41E-01	3.76E-04	1.80E-04	7.63E-03	3.33E-05	2.96E-01
[redacted]															
[redacted]															

P10

Date: 9/15/99

Isotope Characterization for containers:

X10C9802665
X10C9802672
X10C9801509
X10C9801207
X10C9801203
X10C9801730
X10C9802669

Analytical determination of the isotopic ratio between Plutonium 239 and Plutonium 240 is difficult. All of the Pu239/Pu240 was conservatively assigned to Pu239 for characterization purposes. This gives the most conservative estimates for the facility safety documentation. The Actual ratio may be different and the amount carried on the Nuclear Materials Accountability forms may be different.

DOE-STD-1027-92; Nuclear Safety Analysis Report Methodology
Safety Assessment Sum Of Fractions Calculation

Facility: [redacted]
Container ID #: [redacted]
Waste Type Code (1 - 6): [redacted]
SA Waste Type Code: TRU-Type2

Nuclide	Specific Activity (Ci/gm)	U233 FEM Factors	Dose Factors * Lung Class	HF* (rem/Ci)	HF** (rem/Ci)	Haz Class Category 3 Limits (Ci)	Pu-239 WR(i) => HF*=239/HF(i)	Sr-90 WR(i) => HF(Sr90)/HF(i)	Cs-137 Effective Dose Rate Factors (mrem/yr/Ci/m^3)	Cs-137 Equiv. Factors	Radionuclide Activity (Ci)	U-235 Equiv. (Grams)	Haz Class Sum of Fractions (< 1)	Pu-239 Equiv. (Ci)	Sr-90 Equiv. (Ci)	Cs-137 Equiv. (Ci)
AC225	5.7973E+04		D		[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[redacted]					
AC227	7.2346E+01		D		[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[redacted]					
AG108M	2.6037E+01		Y		[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[redacted]		9.34E-12	9.49E-07	3.72E-04	9.97E-03
AG110M	4.7478E+03		Y		[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[redacted]					
AG111	1.5774E+05		Y		[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[redacted]					
AL26	1.9877E-02		D		[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[redacted]	2.11E-03	1.64E-06	1.67E-01	6.36E-01	1.20E-03
AM241	3.4246E+00	4.40E-02	W	330	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[redacted]					
AM242M	1.0466E+01	5.40E-01	W		[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[redacted]	1.65E-03	1.17E-07	1.19E-02	1.64E+00	2.30E-04
AM243	1.9914E-01	2.80E-02	W	330	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[redacted]					
AS73	2.2252E+04		W		[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[redacted]					
AS74	9.9139E+04		W		[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[redacted]					
AU195	3.5946E+03		Y		[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[redacted]					
AU199	2.0882E+05		Y		[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[redacted]					
BA133	2.5476E+02		D		[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[redacted]					
BA137M	5.3724E+08					[illegible]	NA	NA	[illegible]	[illegible]	[redacted]					
BA140	7.3076E+04		D		[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[redacted]					
BE7	3.4968E+05		Y		[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[redacted]					
BI207	5.3379E+01		W		[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[redacted]					
BI208	4.6636E-03					[illegible]			[illegible]	[illegible]	[redacted]					
BK247	1.0477E+00		W		[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[redacted]					
BK249	1.6370E+03		W		[illegible]	[illegible]	[illegible]	[illegible]	NA		[redacted]					
BR82	1.0811E+06		W		[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[redacted]					
C14	4.4511E+00		NA		[illegible]	[illegible]	[illegible]	[illegible]	NA		[redacted]					
CD109	2.5870E+03		D		[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[redacted]					
CE139	6.8169E+03		Y		[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[redacted]		4.24E-11	4.30E-06	1.69E-01	7.66E-03
CE141	2.8463E+04		Y		[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[redacted]		3.61E-10	3.70E-05	2.24E-02	3.31E-04
CE144	3.1799E+03		Y		[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[redacted]	3.07E-03	1.90E-09	1.94E-04	7.62E-02	2.27E-05
CF249	4.0908E+00	7.00E-01	W	NA	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[redacted]		3.23E-08	3.29E-03	1.29E+00	2.52E-07
CF250	1.0921E+02		W	NA	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[redacted]	2.94E-03	3.39E-10	1.66E-01	1.41E-02	1.31E-06
CF251	1.5844E+00	1.40E-03	W		[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[redacted]		7.40E-07	7.53E-02	2.96E-01	1.34E-06
CF252	5.3379E+02		Y	130	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[redacted]					
CL36	3.2937E-02		W		[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[redacted]					
CM240	2.0130E+04		W		[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[redacted]		2.91E-07	2.99E-01	1.17E+00	3.31E-06
CM242	3.3080E+03		W		[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[redacted]					
CM243	5.1567E+01	7.80E+00	W		[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[redacted]	3.72E-02	1.05E-04	1.04E-01	4.17E-03	6.46E-04
CM244	8.0819E+01	2.30E-01	W	300	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[redacted]					
CM245	1.7149E-01	2.30E-01	W		[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[redacted]		1.47E-06	1.49E-01	3.86E+01	3.81E-06
CM246	3.0692E-01		W		[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[redacted]					
CM247	9.2683E-05	7.80E-01	W		[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[redacted]		1.38E-08	1.40E-03	3.30E-01	3.91E-09
CM248	4.2354E-03		W		[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[redacted]					
CO56	2.9978E+04		Y		[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[redacted]					
CO57	8.4204E+03		Y		[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[redacted]					
CO58	3.1713E+04		Y		[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[redacted]		1.41E-11	1.42E-06	3.53E-04	4.74E-03
CO60	1.1292E+03		Y	0.2	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[redacted]					
CR51	9.2320E+04		Y		[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[redacted]					
CS129	7.5544E+05		D		[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[redacted]		7.71E-07	4.29E-06	1.63E-03	2.87E-02
CS134	1.2935E+03		D		[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[redacted]					
CS136	7.2881E+04		D		[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[redacted]		6.62E-06	3.82E-05	1.30E-02	1.43E-01
CS137	8.6992E+01		D	0.03	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[redacted]					
CU64	3.8313E+06		Y		[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[redacted]					
DY166	2.3111E+05		W		[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[redacted]					
ES253	2.3273E+04		W		[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[redacted]					
ES254M	3.1332E+05		W		[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[redacted]		7.34E-11	7.61E-06	3.01E-03	8.01E-03
EU152	1.7626E+02		W	NA	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[redacted]		4.42E-10	4.49E-05	1.76E-02	4.81E-02
EU154	2.6332E+02		W		[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[redacted]		4.78E-11	4.46E-06	1.91E-03	1.41E-03
EU155	4.6432E+02		W		[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[redacted]					
EU156	5.5046E+04		W		[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[redacted]					
FE55	2.3785E+03		D		[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[redacted]					
FE59	4.9686E+04		D	0.014	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[redacted]					
GD153	3.5281E+03		D	NA	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[redacted]					
GE68	9.6346E+03		W		[illegible]	[illegible]	[illegible]	[illegible]	NA		[redacted]					
H3	1.7001E+04		NA		[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[redacted]					
HF181	1.7001E+04		D		[illegible]	[illegible]	[illegible]	[illegible]			[redacted]					
HF182	2.1802E-04		D		[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[redacted]					
HG194	3.3411E+00		D		[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[redacted]					
HG203	1.3789E+04		D		[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[redacted]					
HO166M	1.7923E+00		W		[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[redacted]					
I122	4.2767E+08					[illegible]	NA	NA	[illegible]	[illegible]	[redacted]					
I123	1.9282E+06		D		[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[redacted]					
I124	2.3164E+05		D		[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[redacted]					
I125	1.7351E+04		D		[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[redacted]					
I129	1.7633E-04		D		[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[redacted]					
I131	1.2385E+05		D		[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[redacted]					
I132	1.1316E+06		D		[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[redacted]					
I133	3.5414E+05		D		[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[redacted]					
IN111	4.1864E+05		D		[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[redacted]					
IN114M	2.3111E+04		D		[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[redacted]					
IR192	9.2917E+03		Y		[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[redacted]					
K40	6.9913E-06		D		[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[redacted]					
KR85	3.9193E+02					[illegible]	NA	NA	[illegible]	[illegible]	[redacted]					
LA140	5.5323E+05		W		[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[redacted]					
LU173	1.5066E+03		Y		[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[redacted]					
MFP	NA		NA		[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[redacted]					
MN54	7.7372E+03		W		[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[redacted]					
MO99	4.7912E+05		Y		[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[redacted]					
NA22	6.2386E+03		D		[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[redacted]					
NA24	8.7901E+06		D		[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[redacted]					
NB94	1.8715E-01		Y		[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[redacted]		3.31E-12	3.49E-07	2.15E-04	1.59E-02
NB95	3.9264E+04		Y		[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[redacted]					
ND144	4.3135E-10					[illegible]	NA	NA	NA		[redacted]					
NI59	8.0706E-02		D		[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[redacted]					
NI63	5.6630E+01		D		[illegible]	[illegible]	[illegible]	[illegible]	NA		[redacted]					
NP236	9.7672E-03	1.40E-02	W		[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[redacted]					
NP237	7.0414E-04	3.30E-02	W	NA	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[redacted]		1.02E-12	1.01E-07	3.94E-05	1.31E-03
NP239	2.3173E+05		W		[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[redacted]					
OS191	4.4146E+04		Y		[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[redacted]					
OS194	3.0681E+02		Y		[illegible]	[illegible]	[illegible]	[illegible]	NA		[redacted]					
P32	2.8541E+05		W		[illegible]	[illegible]	[illegible]	[illegible]	NA		[redacted]					
P33	1.5599E+05		W		[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[redacted]					
PA231	4.7192E-02		Y		[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[redacted]					
PA233	2.0734E+04		Y		[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[redacted]					
PB210	7.6260E+01		D		[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[redacted]					
PB212	1.3879E+06		D		[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[redacted]					
PD109	2.0964E+06		Y		[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[redacted]					
PM143	1.3915E+02		Y		[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[redacted]					
PM146	4.4231E+02		Y		[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[redacted]					
PM147	9.2606E+02		Y	0.09	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[redacted]					
PO209	1.6732E+01					[illegible]	NA	NA	[illegible]	[illegible]	[redacted]					
PO210	4.4897E+03		D		[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[redacted]					
PT195M	1.6644E+05		D		[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[redacted]					
PU236	5.3076E+02		W		[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[redacted]	1.61E-03	1.09E-06	1.11E-01	4.35E+01	4.17E-06
PU238	1.7102E+01	2.30E-01	W	460	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[redacted]	1.31E+00	3.39E-07	6.01E-02	2.36E+01	1.90E-06
PU239	6.1978E-02	1.34E+00	W	310	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[redacted]					
PU240	2.2673E-01	4.70E-02	W	310	[illegible]	[illegible]	[illegible]	[illegible]	NA	1	[redacted]	3.09E-02	2.83E-07	2.88E-02	1.13E+01	
PU241	1.0291E+02	3.30E+00	W	10	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[redacted]	7.02E-03	1.42E-08	1.44E-03	5.63E-01	4.12E-08
PU242	3.9217E-03	1.81E-02	W	490	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[redacted]					
PU244	1.7719E-05		W		[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[redacted]					
RA223	5.1175E+04		W		[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[redacted]					
RA224	1.5910E+05		W		[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[redacted]					

P12

DOE-STD-1027-92; Nuclear Safety Analysis Report Methodology
Safety Assessment Sum Of Fractions Calculation

Facility: [redacted]
Container ID #: [redacted]
Waste Type Code (1 - 6): [redacted]
SA Waste Type Code: TRU-Type2

Nuclide	Specific Activity (Ci/gm)	U235 FEM Factors	Dose Factors * Lung Class	f1* (mrem/uCi)	H*** (rem/uCi)	HazClass Category 3 Limits (Ci)	Pu-239 WR(i) **	Sr-90 WR(i) **	EH-0070 Effective Dose Rate Factors	Co60 Equiv. Factors	Radionuclide Activity (Ci)	U-235 Equiv. (Grams)	Haz Class Sum of Fractions (< 1)	Pu-239 Equiv. (Ci)	Sr-90 Equiv. (Ci)	Co60 Equiv. (Ci)
RA226	9.8742E-01		W	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[redacted]					
RA228	2.7241E-02		W		[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[redacted]					
RE186	1.8867E+05		W		[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[redacted]					
RE188	9.8068E+05		W		[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[redacted]					
RH101	1.0715E+03		Y		[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[redacted]					
RN222	1.3361E+05					[illegible]	NA	NA	[illegible]	[illegible]	[redacted]					
RU103	3.2262E+04		Y		[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[redacted]		3.40E-07	1.11E-06	2.26E-04	2.25E-02
RU106	3.3030E+03		Y		[illegible]	[illegible]	[illegible]	[illegible]	NA		[redacted]		8.44E-05	4.73E-04	1.83E-01	
S35	4.2388E+04		W		[illegible]	[illegible]	[illegible]	[illegible]	NA		[redacted]					
SB124	1.7474E+04		W		[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[redacted]					
SB125	1.0461E+03		W		[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[redacted]		6.17E-12	6.17E-07	2.42E-04	3.26E-03
SB126	8.3437E+04		W		[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[redacted]					
SC46	3.3876E+04		Y		[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[redacted]					
SE75	1.4521E+04		W		[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[redacted]					
SM145	2.6435E+03		W		[illegible]	[illegible]	[illegible]	[illegible]	NA		[redacted]					
SM151	2.6271E+01		W		[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[redacted]					
SN113	1.0030E+04		W		[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[redacted]					
SN117M	8.1916E+04		W		[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[redacted]					
SN119M	3.7411E+03		W		[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[redacted]					
SR85	2.3467E+04		Y		[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[redacted]					
SR89	2.9901E+04		Y		[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[redacted]					
SR90	1.3923E+02		Y	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	NA		[redacted]		1.13E-07	1.13E-02	4.51E+00	
TA179	1.1146E+03		Y		[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[redacted]					
TA182	6.2322E+03		Y		[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[redacted]					
TB160	1.1276E+04		W		[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[redacted]					
TC95M	2.2008E+04					[illegible]	NA	NA	[illegible]	[illegible]	[redacted]					
TC99	1.6936E-02		W	NA	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[redacted]					
TC99M	5.2615E+06		D		[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[redacted]					
TE123M	8.8395E+03		W		[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[redacted]					
TH228	8.1879E+02		Y		[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[redacted]					
TH229	2.1247E-01		W		[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[redacted]					
TH230	2.0591E-02		W		[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[redacted]					
TH232	1.0996E-07		W	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[redacted]					
TH234	2.3130E+04		Y		[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[redacted]					
TI44	1.7160E-02		Y		[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[redacted]					
TL204	4.6312E+02		D		[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[redacted]					
U232	2.2342E+01		Y	NA	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[redacted]					
U233	9.6177E-03	1.40E+00	Y	130	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[redacted]					
U234	6.2191E-03		Y	130	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[redacted]					
U235	2.1596E-06	1.00E+00	Y	120	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[redacted]					
U236	6.4613E-05		Y	130	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[redacted]					
U238	3.3584E-07		Y	120	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[redacted]					
W181	5.9461E+03		D		[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[redacted]					
W185	9.3885E+03		D		[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[redacted]					
W187	7.0046E+05		D		[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[redacted]					
W188	9.9975E+03		D		[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[redacted]					
XE133	2.3472E+05					[illegible]	NA	NA	[illegible]	[illegible]	[redacted]					
Y88	1.3994E+04		Y		[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[redacted]					
Y90	5.4262E+05		Y	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	NA		[redacted]					
YB169	2.4112E+04		Y		[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[redacted]					
ZN65	8.2211E+03		Y		[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[redacted]					
ZR88	1.7773E+04		D		[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[redacted]					
ZR95	2.1447E+04		D		1.91E-02	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[redacted]		2.43E-11	2.44E-06	9.57E-0[illegible]	1.92E-02
								TOTALS:			2.90E+01	1.64E+00	2.03E-04	1.13E+01	4.42E+03	3.18E-01

* AMAD = 1 micrometer
** WR(i) is the weighting factor, defined as the ratio of committed effective dose equivalent of Pu239 (or Sr90) to that of the ith radionuclide. WR(i) is computed using the DOE/EH-0071 dose conversion factors. (For example, Pu-239 is 31 times more hazardous than Pu-241, per unit intake)
*** Y-90 is in equilibrium with Sr-90
NA Not Available

REFERENCES
** Sr90 Percent — WHC/DOE-174, Rev. 1, Estimates of Internal Dose Equivalent from Inhalation and Ingestion of Selected Radionuclides, D.D. Dunning.
*** Step Factors — DOE/EH-0071, Internal Dose Conversion Factors for Calculation of Dose to the Public, USDOE, July 1988.

NOTES:

1. EH-0070, Effective Dose Rate Factors, has no dose factors for these isotopes. Co60 Equiv Factors developed from ICRP-30 listed x-ray and gamma average energy emission per decay (MeV/dis). Equiv Factor developed by ratioing isotope avg energy to Co60's avg energy.

2. y Ba137m emissions considered as Cs137 due to short half life of Ba137m (i.e. approx. 2.5 minutes).

3. e from the table. This provides the most conservative value.

5/1/95 Added new isotope to data file: Pu236, obtained Sp.A from Dataleo NUCDAT, Inhalation dose factors from EH-0071, Highest of Inhalation Dose Class, and External Effective Dose Rate from EH-0070, Effective from Contaminated Air Emmersion Tables.

5/26/95 Added new isotope to data file: Br82, obtained Sp.A from Dataleo NUCDAT, Inhalation dose factors from EH-0071, Highest of Inhalation Dose Class, and External Effective Dose Rate from EH-0070, Effective from Contaminated Air Emmersion Tables.

9/1/95 Added new isotope to data file: Nb95, obtained Sp.A from Dataleo NUCDAT, Inhalation dose factors from EH-0071, Highest of Inhalation Dose Class, and External Effective Dose Rate from EH-0070, Effective from Contaminated Air Emmersion Tables.

9/7/95 Added new isotopes to data file: Nd144 and Tc95m, obtained Sp.A from Dataleo NUCDAT, Did not find Inhalation dose factors from EH-0071 for either isotope, Highest of Inhalation Dose Class, and External Found TC95m Effective Dose Rate from EH-0070, Effective from Contaminated Air Emmersion Tables, but did not find value for Nd144.

9/11/95 Added new isotopes to data file: Bk249, Cm244, Rh101 and La173, obtained Sp.A from Dataleo NUCDAT, Did not find Inhalation dose factors from EH-0071 for Rh101 and La173 isotope, Highest of Inhalation Dose Class, and External. EH-0070, Effective Dose Rate Factors, has no dose factors for Rh101 and La173 isotopes. Co60 Equiv Factors developed from ICRP-30 listed x-ray and gamma.

4/18/96 Added new isotopes to data file: Mo99, Dy166, Ho166m, Ac225, Tb160

10/21/96 Added new isotopes to data file: Ba140

1/9/97 Added new isotopes to data file: In114m and Sr99. Updated In111 data was not all complete.

3/25/97 Added new isotopes to data file: Ra224

4/8/98 Added new isotopes to data file: Ar-73, As-74, Bi-208, Pm-145, Sm-145, Tc-99m, W-181, and Zr-88.

4/20/98 Added new isotope to data file: Co-56

5/8/98 Added new isotope to data file: W-185

WASTE ITEM REVIEW

WASTE ITEM REVIEW INFORMATION

WID No / CONTAINER No	REVIEWER'S BADGE No.	REVIEW DATE
X10C9802665 X10I9900382	744158	09/07/1999

DOT INFORMATION

UN/NA ID No.	HAZARD CLASS	PACKING GROUP	LABELS REQUIRED
UN2982	7		7

DOT BASIC DESCRIPTION

Radioactive material, n.o.s., 7, UN2982 solid/oxide, Co60, Sr90, Nb95, Zr95, Ru103, Ru106, Ag110m, Sb125, Cs134, Cs137, Ce141, Ce144, Eu152, Eu154, Eu155, Np239, Pu238, Pu239, Pu241, Pu242, Am241, Am243, Cm242, Cm246, Cm248, Cf249, Cf250, Cf251, Cf252, 2.901E1 Ci Fissile exempt

COMMENTS

Paper, Plastic, Metal, PPE

OAK RIDGE NATIONAL LABORATORY
MANAGED BY LOCKHEED MARTIN ENERGY RESEARCH CORPORATION
FOR THE U.S. DEPARTMENT OF ENERGY

POST OFFICE BOX 2008
OAK RIDGE, TN 37831-6269

PHONE: (423) 574-4562
FAX: (423) 241-2262
INTERNET: tfx@ornl.gov

Date: August 30, 1999

To: B. C. McClelland

c: B. V. Shelton, K. W. Eldridge (RC)

From: T. F. Scanlan, ORNL Waste Certification Official (WCO)

Subject: Certification of Oak Ridge National Laboratory (ORNL) Waste

I certify, consistent with the ORNL Waste Certification Program Plan (ORNL/TM-13288), that the waste item(s) identified below meet the acceptance requirements of the receiving organization/facility as defined by Bechtel Jacobs Company, LLC.

WPR Number	Waste Item ID Number:
X10R9800488	X10I9815229
X10R9900004	X10I9418640
	X10I9418641
	X10I9418642
X10R9900005	X10I9418590
	X10I9418591
	X10I9418592
	X10I9418593
	X10I9418594
	X10I9418595
	X10I9418596
	X10I9418597
	X10I9418598
	X10I9418599
	X10I9418600
	X10I9418601
	X10I9418602
	X10I9418603
	X10I9418604
	X10I9418605
	X10I9418606
	X10I9418607

B. C. McClelland
Page 2 of 2
August 30, 1999

WPR Number	Waste Item ID Number:
X10R9900005 (continued)	X10I9418608 X10I9418609 X10I9418610 X10I9418611 X10I9418612 X10I9418613
X10R9900008	X10I9904194 X10I9904195 X10I9904196
X10R9900009	X10I9904075 X10I9904076 X10I9904077
X10R9900010	X10I9900382 X10I9900383
X10R9900022	X10I9904150 X10I9904151
X10R9900425	X10I9905230 X10I9905231 X10I9905232

T. F. Scanlan, Waste Certification Official, ORNL

8/30/99
Date

Please sign and date below indicating receipt of the Certification Package for the waste item(s) listed above.

Representative, Bechtel Jacobs Company, LLC

8/30/99
Date

Neutron Modeling of 6 in. Goethite Concrete Cask

Radiochemical Engineering Development Center

Waste from the Hot Cells and Transuranium Analysis Laboratories

WID # X10I9900382

Weight(lbs.):	448.0			1.25E-02	Watts/ft3
Pack. Size:	58.5	ft3		1.64E+00	FGE of U-235
0 deg.	130.0	*mr/hr neutron only*	130.0	*Avg. mR/hr neutron only (0° &180°)*	2.47E+03 TRU nci/g
180 deg.	130.0	*mr/hr neutron only*	4.25	mrem/hr/ug Cf-252 @ 1m	

	Nuclide	Ave. Act. (Bq/total)	Ave. Act. (Ci/total)	Total Act. (%)	micrograms Cf-252	*mR/hr to Ci*	*Calc. Ci from Cf-252 Data*	Nuclide	*Curies*
1	Co-60	2.01E+03	5.43E-08	0.017%			4.84E-03	Co-60	4.84E-03
2	Sr-90	1.87E+06	5.05E-05	15.516%			4.51E+00	Sr-90	4.51E+00
3	Nb-95	2.58E+04	6.97E-07	0.214%			6.22E-02	Nb-95	6.22E-02
4	Zr-95	2.72E+04	7.35E-07	0.226%			6.55E-02	Zr-95	6.55E-02
5	Ru-103	5.03E+04	1.36E-06	0.417%			1.21E-01	Ru-103	1.21E-01
6	Ru-106	2.27E+05	6.15E-06	1.887%			5.48E-01	Ru-106	5.48E-01
7	Ag-110m	3.79E+03	1.02E-07	0.031%			9.13E-03	Ag-110m	9.13E-03
8	Sb-125	1.33E+04	3.60E-07	0.111%			3.21E-02	Sb-125	3.21E-02
9	Cs-134	1.93E+04	5.22E-07	0.160%			4.66E-02	Cs-134	4.66E-02
10	Cs-137	2.53E+05	6.83E-06	2.098%			6.09E-01	Cs-137	6.09E-01
11	Ce-141	1.07E+05	2.89E-06	0.888%			2.58E-01	Ce-141	2.58E-01
12	Ce-144	3.45E+04	9.32E-07	0.286%			8.31E-02	Ce-144	8.31E-02
13	Eu-152	7.39E+03	2.00E-07	0.061%			1.78E-02	Eu-152	1.78E-02
14	Eu-154	3.65E+04	9.87E-07	0.303%			8.80E-02	Eu-154	8.80E-02
15	Eu-155	2.64E+04	7.13E-07	0.219%			6.36E-02	Eu-155	6.36E-02
16	Np-239	9.66E+03	2.61E-07	0.080%			2.33E-02	Np-239	2.33E-02
17	Pu-238	5.10E+04	1.38E-06	0.424%			1.23E-01	Pu-238	1.23E-01
18	Pu-239	2.49E+04	6.74E-07	0.207%			6.01E-02	Pu-239	6.01E-02
19	Pu-241	6.09E+05	1.65E-05	5.057%			1.47E+00	Pu-241	1.47E+00
20	Pu-242	6.36E+02	1.72E-08	0.005%			1.53E-03	Pu-242	1.53E-03
21	Am-241	6.79E+04	1.84E-06	0.564%			1.64E-01	Am-241	1.64E-01
22	Am-243	4.85E+03	1.31E-07	0.040%			1.17E-02	Am-243	1.17E-02
23	Cm-242	3.72E+04	1.01E-06	0.309%			8.97E-02	Cm-242	8.97E-02
24	Cm-244	8.36E+06	2.26E-04	69.349%			2.01E+01	Cm-244	2.01E+01
25	Cm-246	5.83E+04	1.58E-06	0.484%			1.41E-01	Cm-246	1.41E-01
26	Cm-248	1.56E+02	4.22E-09	0.001%			3.76E-04	Cm-248	3.76E-04
27	Cf-249	7.47E+01	2.02E-09	0.001%			1.80E-04	Cf-249	1.80E-04
28	Cf-250	3.17E+03	8.56E-08	0.026%			7.63E-03	Cf-250	7.63E-03
29	Cf-251	1.38E+01	3.74E-10	0.0001%			3.33E-05	Cf-251	3.33E-05
30	Cf-252	1.23E+05	3.32E-06	1.019%	5.53E+02	2.96E-01	2.96E-01	Cf-252	2.96E-01
		Total Act. Ci.	3.26E-04	100.000%				total Ci	2.90E+01

Pu-238	1.23E-01
Pu-239	6.01E-02
Pu-242	1.53E-03
Am-241	1.64E-01
Am-243	1.17E-02
Cm-246	1.41E-01
Cm-248	3.76E-04
Cf-249	1.80E-04
Cf-251	3.33E-05
TRU nuclides	5.02E-01
est. wt. #	448.0
wt. G	203209
TRU nci/g	2470.0

Nuclide	*Cf Gr.*	*Curies*	*Grams*	*Curies*	*Grams*	*U-235 Equiv.*
Pu238	7.47E-01	1.23E-01		0.00E+00	7.47E-02	1.65E-03
Pu239	6.20E-02	6.01E-02		0.00E+00	6.20E-02	1.39E-03
Pu242	5.03E-02	1.47E+00		0.00E+00	1.45E-02	5.00E-02
Pu242	3.92E-03	1.53E-03		0.00E+00	3.90E-03	7.02E-03
Am241	3.42E+00	1.64E-01		0.00E+00	4.79E-02	2.41E-03
Am243	1.99E-01	1.17E-02		0.00E+00	5.88E-02	1.65E-03
Cm244	8.08E-05	2.01E-01		0.00E+00	2.49E-01	5.72E-02
Cm246	3.07E-01	1.41E-01		0.00E+00	5.13E-06	2.00E-06
Cf249	4.09E+00	1.80E-04		0.00E+00	4.40E-05	5.03E-05
Cf251	1.58E+00	3.33E-05		0.00E+00	2.10E-05	2.94E-05
Cf252	5.36E-02		5.53E-04	2.96E-01	0.00E+00	

Total FGE of U-235 1.64E+00

Prepared by Don E. Coffey 08/13/99 Printed 8/20/99 @ 6:55 AM by MSC

Neutron Modeling of 6 in. Goethite Concrete Cask

Radiochemical Engineering Development Center

Waste from the Hot Cells and Transuranium Analysis Laboratories

Conversion Factors to convert Ci (MeV/dis) to Watts		
3.70E+10	dis/sec/Ci	
1.60E-06	ergs/MeV	
1.00E+00	J/W/ergs/sec	
1.00E+03	W/kW	
5.92E-03	Watts/Ci(MeV/dis)	

WID #	Decay Heat (Avg MeV/dis)	Activity (Ci)	Decay Heat (W)	
X10I9900382	2.60E+00	4.84E-03	7.45E-05	Co-60
X10I9900382	1.96E-01	4.51E+00	5.23E-03	Sr-90
X10I9900382	8.10E-01	6.22E-02	2.98E-04	Nb-95
X10I9900382	8.55E-01	6.55E-02	3.32E-04	Zr-95
X10I9900382	5.44E-01	1.21E-01	3.90E-04	Ru-103
X10I9900382	1.00E-02	5.48E-01	3.24E-05	Ru-106
X10I9900382	2.83E+00	9.13E-03	1.53E-04	Ag-110m
X10I9900382	5.31E-01	3.21E-02	1.01E-04	Sb-125
X10I9900382	1.72E+00	4.66E-02	4.75E-04	Cs-134
X10I9900382	1.87E-01	6.09E-01	6.74E-04	Cs-137
X10I9900382	2.46E-01	2.58E-01	3.76E-04	Ce-141
X10I9900382	1.13E-01	8.31E-02	5.57E-05	Ce-144
X10I9900382	1.30E+00	1.78E-02	1.37E-04	Eu-152
X10I9900382	1.53E+00	8.80E-02	7.98E-04	Eu-154
X10I9900382	1.24E-01	6.36E-02	4.67E-05	Eu-155
X10I9900382	4.33E-01	2.33E-02	5.97E-05	Np-239
X10I9900382	5.60E+00	1.23E-01	4.07E-03	Pu-238
X10I9900382	5.24E+00	6.01E-02	1.86E-03	Pu-239
X10I9900382	5.37E-03	1.47E+00	4.67E-05	Pu-241
X10I9900382	4.98E+00	1.53E-03	4.52E-05	Pu-242
X10I9900382	5.65E+00	1.64E-01	5.49E-03	Am-241
X10I9900382	5.44E+00	1.17E-02	3.77E-04	Am-243
X10I9900382	6.21E+00	8.97E-02	3.30E-03	Cm-242
X10I9900382	5.90E+00	2.01E+01	7.02E-01	Cm-244
X10I9900382	5.53E+00	1.41E-01	4.62E-03	Cm-246
X10I9900382	2.17E+01	3.76E-04	4.83E-05	Cm-248
X10I9900382	6.30E+00	1.80E-04	6.71E-06	Cf-249
X10I9900382	6.29E+00	7.63E-03	2.84E-04	Cf-250
X10I9900382	6.20E+00	3.33E-05	1.22E-06	Cf-251
X10I9900382	1.26E+00	2.96E-01	2.21E-03	Cf-252
		Total thermal watts	7.34E-01	

Nuclear Materials Controlled for Accountability

Nuclide	Ci/Gr	Curies	Grams	Curies *formula*	Grams *formula*	Nuclide
Pu238	1.7102E+01	1.2300E-01		0.00E+00	7.19E-03	Pu238
Pu239	6.1976E-02	6.0100E-02		0.00E+00	9.70E-01	Pu239
Pu241	1.0291E+02	1.4700E+00		0.00E+00	1.43E-02	Pu241
Pu242	3.9217E-03	1.5300E-03		0.00E+00	3.90E-01	Pu242
Am241	3.4246E+00	1.6400E-01		0.00E+00	4.79E-02	Am241
Am243	1.9914E-01	1.1700E-02		0.00E+00	5.88E-02	Am243
Cm242	3.3080E+03	8.9700E-02		0.00E+00	2.71E-05	Cm242
Cm244	8.0819E+01	2.0100E+01		0.00E+00	2.49E-01	Cm244
Cm246	3.0692E-01	1.4100E-01		0.00E+00	4.59E-01	Cm246
Cm248	4.2354E-03	3.7600E-04		0.00E+00	8.88E-02	Cm248
Cf252	5.3579E+02	2.9600E-01		0.00E+00	5.52E-04	Cf252

WSPS#: 7920-HCAL-005
Approved 8/18/99

WASTE STREAM PROFILE SHEET

WARNING: PROCEED ONLY IF THE WASTE ITEM CANNOT BE CLASSIFIED AS: RCRA, PCB, OR TRU DEFINED WASTE, OR DOES NOT CONTAIN ANY PROHIBITED ITEMS.

PROCESS INFORMATION

#1 GENERAL INFORMATION

Provide the location of the waste generation. Be specific enough to include: building #, area, room number, or any other relevant information that will give the exact location of waste generation. Bldg. 7920, Hot Cells and Analytical Labs

List the waste generator and phone number: WAYNE EVANS ph# 574-2530

#2 PROCESS TYPE

Check one time if this is the only anticipated waste from this particular process.
Check ongoing if additional waste will be produced in the future from this process.

THIS PROCESS IS: ONE TIME ☐ (MOVE TO STEP 4) ONGOING ☒

#3 RADIOISOTOPE IDENTIFICATION

BASED ON AVAILABLE INFORMATION, LIST POSSIBLE RADIOISOTOPES THAT MAY BE PRESENT IN THE WASTE OR PROCESS.

see attached				

WASTE INFORMATION

#4 WASTE CONTAMINATION MECHANISM

Check the box for **surface mechanism** if the waste will become contaminated by surface interaction or the waste is contaminated on the surface (see attached Table of Common Waste Items). Check the box for **volume contamination** if the contamination is distributed throughout the bulk of the waste item (see attached Table of Common Waste Items).

SURFACE MECHANISM ☑ VOLUME CONTAMINATION ☐

#5 WASTE DESCRIPTION

Briefly describe how waste became radioactively contaminated (include any process knowledge) material became contaminated by contact with radionuclides

List contaminated items (see attached Table of Common Waste Items).

paper, plastic, glass tools, PPE, ~~metal~~ metal not qualifying	as SCO,

Fig. 2. Waste Stream Profile Sheet

4

WASTE STREAM PROFILE SHEET

#6 DETERMINATION OF ACTIVITY*

Check calculational if information used to determine activity is from mass balance or an activation process. Check measurements if activity will be calculated from sampling and analysis or direct reading measurements:

CALCULATIONAL ☐ MEASUREMENTS ☒

*NOTE: ANY METHODS THAT ARE USED TO DETERMINE ACTIVITY THAT ARE NOT PART OF WM-SWO-507 MUST BE ATTACHED TO THE WSPS AND APPROVED BY RSWOG PRIOR TO ASSIGNING THE WASTE STREAM ID NUMBER.

#7 RADIOLOGICAL WASTE MEASUREMENTS

Check the appropriate boxes for the type of radiation measurements that have already been taken:

☒ NEUTRON Activity

SURFACE BETA/GAMMA ☐ SURFACE ALPHA ☐ GAMMA EXPOSURE RATE ☒

SMEARS ☐ HOW WERE SMEARS ANALYZED? see WSPS-7920-HCAL-002

ATTACH RESULTS TO THIS SHEET

THESE MEASUREMENTS SHOULD CONFIRM PROCESS KNOWLEDGE. IF THEY DO NOT, ADDITIONAL SAMPLING AND ANALYSIS IS NEEDED.

#8 RADIOISOTOPE RATIOS

Based on process knowledge or sampling and analysis, list the radioisotopes that occur in the waste, and what percent by activity that radioisotope represents as a whole of all radioisotopes in the waste.

NOTE: If these ratios cannot be determined appropriately, then further sampling and analysis needs to be performed to provide this information.

LIST RADIOISOTOPES AND THEIR ASSOCIATED ACTIVITY RATIOS

ISOTOPE	% OF TOTAL	ISOTOPE	% OF TOTAL	ISOTOPE	% OF TOTAL
see attached					

Checking the following boxes appropriately will help determine which method from WM-SWO-507 to use when actually calculating isotopic activity. The following four check boxes represent all methods for determining activity.

#9 CHECK ANY BOXES THAT APPLY: ☒ NEUTRON MEASUREMENT

Note: Waste did not come in contact with RCRA/TSCA Constituents. DAC 4/14/99

☐ GAMMA EMITTERS PRESENT ☐ ACCESSIBLE SURFACES

☒ SHIELDED GAMMA RAYS ☐ MEASURABLE GAMMA EXPOSURE RATE

#10 WASTE STREAM I.D. # (Assigned by RSWOG representative)

Label the waste stream I.D. # here when the waste stream profile sheet has been approved and a unique identifier has been produced for this particular waste stream:

WASTE STREAM I.D. NUMBER: 7920-HCAL-005

WARNING: Do not attempt to seal waste container before receiving waste stream I.D.

Fig. 2. (cont.)

WASTE STREAM PROFILE SHEET

#11
PROVIDE REFERENCES FOR ALL MATERIAL AND INFORMATION USED TO DOCUMENT PROCESS KNOWLEDGE

REFERENCE	LOCATION
NEUTRON SHIELDING EFFECTIVENESS of GOE Thite High Density CONCRETE ORNL/TM-1999/170, DRAFT	Attached.
WSPS-7920-HCAL-002	On file

SUBMITTED BY: [signature] DATE 08/17/99

APPROVED BY: [signature] DATE 8/18/99
RSWOG OPS Supervisor

Fig. 2. (cont.)

WASTE STREAM PROFILE SHEET

TABLE OF COMMON WASTE ITEMS

SURFACE CONTAMINATION	SURFACE CONTAMINATION	VOLUME CONTAMINATION
Box compactor	Lab sample derived waste*	Absorbent materials
Buckets	Lab waste (syringes, etc.)*	Animal carcasses
Cans, metal	Ladders	Concrete rubble (scabbled)
Cargo trailers	Large pieces of equipment	Filter cake
Ceiling tiles*	Lead bricks	Floor sweeping fines
Concrete block	Motors	Grit blast media
Concrete slab (asphalt)	Pipe insulation	Incinerator ash
Conduit*	Pipe, metal	Ion exchange resins
Control panels	Pipe, plastic*	MVST supernate
Drums with bungs	Plastic*	Sewage sludge (dried)
Drums, open-top 55-gal	PPE*	Slag
Duct work*	Pumps	Sludge
Dumpsters	Respirator cartridges*	Smelted metal
Electric tools	Rubber hose*	Soil
Electronic boxes	Sample bottle (glass, plastic)*	Supercompacted material
Electrostatic precipitator	Scintillation vials*	Vacuum cleaner bags
Felt liner*	Scrap metal	Vegetation (bushes, trees)
Floor tiles (asbestos)*	Sheet metal*	
Gas cylinder	Smears and Planchets*	
Gauges	Shredder	
Glove box	Strippable coatings*	
Hand tools	Tanks with manholes	
HEPA filters	Trash*	
Hercuflite*	Valves	
Jib crane	Welding rods	
Lab hood	Wire, cable, wire rope*	
	Wooden boards*	

* STANDARD GEOMETRY MAY BE USED TO CALCULATE ACTIVITY (Ci)

Fig. 2. (cont.)

OAK RIDGE NATIONAL LABORATORY
MANAGED BY LOCKHEED MARTIN ENERGY RESEARCH CORPORATION
FOR THE U.S. DEPARTMENT OF ENERGY

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Date: August 18, 1999

To: Memo to file

From: D. E. Coffey, 3047, MS 6020, 576-7349

Subject: Waste Stream Profile Sheet (WSPS) 7920-HCAL-005 Data Description

The following information is provided to assist with the data flow logic used in WSPS 7920-HCAL-005 for Building 7920 remote handled (RH) transuranic (TRU) waste.

A study was performed to determine the neutron shielding characteristics of the goethite high density concrete cask using both field surveys and Monte Carlo Neutron-Particle (MCNP) code modeling data. A 102 microgram californium-252 source was used for the study. The field surveys were taken using a REM 500™ neutron survey instrument manufactured by Far West Technologies Measurements. The measurements were compared to the modeling results from the MCNP code. The study is documented in a Master of Science Report, "*Neutron Shielding Effectiveness of Goethite High Density Concrete*" prepared by Keith Waggoner, July, 1999, Draft ORNL/TM-1999/170.

A factor to convert the neutron millirem/hr dose rates @ 1 meter from the wall of the RH TRU waste cask to microgram quantities of Cf-252 was calculated. Two neutron dose rates are taken on opposite sides of the waste cask. The first dose rate @ 1 meter is taken at the highest mr/hr rate of the cask, then the second dose rate is taken at a distance of 1 meter on the opposite side of the waste cask. The two dose rates are averaged to normalize the Cf-252 to the theoretical centered inside the waste cask. The averaged neutron mr/hr dose rate is used to calculated the amount of Cf-252 inside the waste cask. The remaining radionuclides are calculated using the quantity of Cf-252 in the waste cask and the isotopic distribution documented in WSPS 7920-HCAL-002.

J. K. Waggoner, 01:01 PM 8/11/99 , TM number for thesis

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Don:
Here is the number: ORNL/TM-1999/170.

The report Cover
Acknowledgement
Table of Contents
Abstract
attached, the
remainer of report on
file w/ Don E Coffey

NEUTRON SHIELDING EFFECTIVENESS OF GOETHITE HIGH DENSITY CONCRETE

Report # 2 –
Presented for the
Master of Science Degree
The University of Tennessee

Keith Waggoner
July 7, 1999

Acknowledgments

For her MCNP expertise and skill with partial differential equations, but especially for her encouragement, the author owes a special debt of gratitude to Cathy Simmons of Oak Ridge National Laboratory.

The author's role in this study was merely one of collecting and reporting data. The conception, research, design, development, fabrication and funding of the goethite cask were performed or sponsored by Chemical Technology Division personnel working at the Radiochemical Engineering Development Center at Oak Ridge National Laboratory. The following Chemical Technology Division personnel made significant contributions to this project: C. W. (Chuck) Alexander, Connie Atkins, John K. Arthur, Paul A Balo, John E. Bigelow, R. R. (Ron) Brunson, G. Dean Campbell, T. D. (Trev) Clure, C. Wayne Evans, J. B. (Joe) Knauer, Sonia L. Lay, M. E. (Mike) Littleton, Rodger C. Martin, Robert R. McMahon, J. H. (Jim) Miller, D. H. (Pete) Newman, Gary D. Owen, Brad D. Patton, Jane A. Posey, C. M. (Cathy) Simmons, E. H. (Ed) Smith, R. J. (Ray) Vedder and R. M. (Bob) Wham.

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In writing this report, the advice and knowledge of several others were relied upon, including Daryl Downing of Oak Ridge National Laboratory, John Handloser of Far West Technologies, Larry F. Miller of The University of Tennessee, and John Richey of Far West Technologies.

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Abstract

A transuranic waste cask was fabricated using a unique concrete composed of hematite, goethite and cement. This particular mixture is not known to have been used in any application before and its neutron shielding characteristics have not been studied previously. A 102 μg ^{252}Cf neutron source was positioned inside the cask while neutron dose equivalent rates at the surface of the cask and at one meter are measured. The measured neutron dose equivalent rates are compared to calculated neutron dose equivalent rates for 102 μg of unshielded ^{252}Cf at the same distances to find percent dose equivalent reduction. In addition, the test cask and source were modeled with a Monte Carlo Neutron-Particle code (MCNP). Experimental and MCNP results show close agreement. The test cask is later filled with actual transuranic waste and neutron dose equivalent rates recorded for comparison to experimental data. The neutron dose equivalent rate is reduced by an additional 80% by filling the voids in the loaded cask with high density polyethylene beads. For comparison, a limestone concrete cask of similar dimensions is tested with the same source, instruments and geometry. The hematite/goethite concrete mixture is about 1.2 times more effective than limestone concrete for neutron dose equivalent rate reduction. The same ^{252}Cf source is used to determine the neutron shielding effectiveness of three other materials; lithium-impregnated wax, high density polyethylene slabs and water-extended polyester. Water-extended polyester is the most effective neutron shield of those tested. Lithium-impregnated wax is slightly less effective than polyethylene for shielding neutrons.

Cf-252 Neutron Measurements
Masters of Science Thesis by Keith Waggoner

Monte Carlo Neutron-Particle Code (MCNP)

Waggoner, Keith, ORNL Office of Radiation Protection, Neutron Shielding Effectiveness of Goethite High Density Concrete, Draft ORNL/TM-1999/170, July , 1999.

Goethite High Density Concrete

102 micrograms of Cf^{252} point source in a 6 inch goethite cask

Cf^{252} = 2.3xE9 n/s/mg

Cask Dimensions: Outside diameter 54 inches
Inside diameter 48 inches
Wall Thickness 6 inches
Height 86.5 inches
Weight 13000 lbs.

	Source Position	Detector Position	Measured Dose rate (mrem/hr)	MCNP Calculated Dose (mrem/hr)
	Inside Wall	Outside Wall	1468	
	Inside Center	Outside Wall	46.8	
	Inside Center	@ 1 meter	24	24.5

TRU Waste

	Source (ug)	(mrem/hr @ 1 m)	ug/mrem/hr	Cask mrem/hr	(ug)	g Cf^{251}
Measured	102	24	4.25	130	552.5	5.53E-04
MCNP	102	24.5	4.16	130	541.2	5.41E-04

Nuclide	Specific Activity Ci/Gr	Curies	Grams	Curies *formula*	Grams *formula*	U-235 FGE from Ci *Equivalent*	U-235 FGE from gram *Equivalent*
Cf252	5.36E+02		5.53E-04	2.96E-01	0.00E+00		
Cf252	5.36E+02		5.41E-04	2.90E-01	0.00E+00		

Cf-252 Neutron Measurements
Masters of Science Thesis by Keith Waggoner

Monte Carlo Neutron-Particle Code (MCNP)

Waggoner, Keith, ORNL Office of Radiation Protection, Neutron Shielding Effectiveness of Goethite High Density Concrete, Draft ORNL/TM-1999/170, July 1999.

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Cf252	5.36E+02		5.53E-04	2.96E-01	0.00E+00		
Cf252	5.36E+02		5.41E-04	2.90E-01	0.00E+00		

Neutron Modeling of 6 in. Goethite Concrete Cask

Radiochemical Engineering Development Center

Waste from the Hot Cells and Transuranium Analysis Laboratories

WID # X10I9900382

Weight(lbs.):	448.0		
Pack. Size:	58.5	ft3	
0 deg.	130.0	*mr/hr neutron only*	
180 deg.	130.0	*mr/hr neutron only*	

1.25E-02 Watts/ft3
1.64E+00 FGE of U-235
2.47E+03 TRU nci/g
130.0 *Avg. mR/hr neutron only (0° &180°)*
4.25 mrem/hr/ug Cf-252 @ 1 m

	Nuclide	Ave. Act. (Bq/total)	Ave. Act. (Ci/total)	Total Act. (%)	micrograms Cf-252	*mR/hr to Ci*	*Calc. Ci from Cf-252 Data*	Nuclide	*Curies*
1	Co-60	2.01E+03	5.43E-08	0.017%			4.84E-03	Co-60	4.84E-03
2	Sr-90	1.87E+06	5.05E-05	15.516%			4.51E+00	Sr-90	4.51E+00
3	Nb-95	2.58E+04	6.97E-07	0.214%			6.22E-02	Nb-95	6.22E-02
4	Zr-95	2.72E+04	7.35E-07	0.226%			6.55E-02	Zr-95	6.55E-02
5	Ru-103	5.03E+04	1.36E-06	0.417%			1.21E-01	Ru-103	1.21E-01
6	Ru-106	2.27E+05	6.15E-06	1.887%			5.48E-01	Ru-106	5.48E-01
7	Ag-110m	3.79E+03	1.02E-07	0.031%			9.13E-03	Ag-110m	9.13E-03
8	Sb-125	1.33E+04	3.60E-07	0.111%			3.21E-02	Sb-125	3.21E-02
9	Cs-134	1.93E+04	5.22E-07	0.160%			4.66E-02	Cs-134	4.66E-02
10	Cs-137	2.53E+05	6.83E-06	2.098%			6.09E-01	Cs-137	6.09E-01
11	Ce-141	1.07E+05	2.89E-06	0.888%			2.58E-01	Ce-141	2.58E-01
12	Ce-144	3.45E+04	9.32E-07	0.286%			8.31E-02	Ce-144	8.31E-02
13	Eu-152	7.39E+03	2.00E-07	0.061%			1.78E-02	Eu-152	1.78E-02
14	Eu-154	3.65E+04	9.87E-07	0.303%			8.80E-02	Eu-154	8.80E-02
15	Eu-155	2.64E+04	7.13E-07	0.219%			6.36E-02	Eu-155	6.36E-02
16	Np-239	9.66E+03	2.61E-07	0.080%			2.33E-02	Np-239	2.33E-02
17	Pu-238	5.10E+04	1.38E-06	0.424%			1.23E-01	Pu-238	1.23E-01
18	Pu-239	2.49E+04	6.74E-07	0.207%			6.01E-02	Pu-239	6.01E-02
19	Pu-241	6.09E+05	1.65E-05	5.057%			1.47E+00	Pu-241	1.47E+00
20	Pu-242	6.36E+02	1.72E-08	0.005%			1.53E-03	Pu-242	1.53E-03
21	Am-241	6.79E+04	1.84E-06	0.564%			1.64E-01	Am-241	1.64E-01
22	Am-243	4.85E+03	1.31E-07	0.040%			1.17E-02	Am-243	1.17E-02
23	Cm-242	3.72E+04	1.01E-06	0.309%			8.97E-02	Cm-242	8.97E-02
24	Cm-244	8.36E+06	2.26E-04	69.349%			2.01E+01	Cm-244	2.01E+01
25	Cm-246	5.83E+04	1.58E-06	0.484%			1.41E-01	Cm-246	1.41E-01
26	Cm-248	1.56E+02	4.22E-09	0.001%			3.76E-04	Cm-248	3.76E-04
27	Cf-249	7.47E+01	2.02E-09	0.001%			1.80E-04	Cf-249	1.80E-04
28	Cf-250	3.17E+03	8.56E-08	0.026%			7.63E-03	Cf-250	7.63E-03
29	Cf-251	1.38E+01	3.74E-10	0.0001%			3.33E-05	Cf-251	3.33E-05
30	Cf-252	1.23E+05	3.32E-06	1.019%	5.53E+02	2.96E-01	2.96E-01	Cf-252	2.96E-01
		Total Act. Ci.	3.26E-04	100.000%				total Ci	2.90E+01

Pu-238	1.23E-01
Pu-239	6.01E-02
Pu-242	1.53E-03
Am-241	1.64E-01
Am-243	1.17E-02
Cm-246	1.41E-01
Cm-248	3.76E-04
Cf-249	1.80E-04
Cf-251	3.33E-05
TRU nuclides	5.02E-01
est. wt. #	448.0
wt. G	203209
TRU nci/g	2470.0

Nuclide	*Ci/Gr*	*Curies*	*Grams*	*Curies*	*Grams*	*U-235 Equiv*
Pu238	1.71E-01	1.23E-01		0.00E+00	7.19E-02	1.65E-02
Pu239	6.20E-02	6.01E-02		0.00E+00	9.69E-01	1.53E+00
Pu241	1.03E-02	1.47E+00		0.00E+00	1.43E-02	5.00E-02
Pu242	5.92E-04	1.53E-03		0.00E+00	2.59E-03	7.02E-03
Am241	3.42E-03	1.64E-01		0.00E+00	4.79E-02	2.71E-02
Am243	1.99E-03	1.17E-02		0.00E+00	5.38E-02	1.65E-03
Cm244	8.08E-01	2.01E+01		0.00E+00	2.49E-01	5.72E-02
Cm246	3.07E-01	1.41E-01		0.00E+00	5.13E-04	4.00E-06
Cf249	4.09E-01	1.80E-04		0.00E+00	4.40E-05	5.08E-05
Cf251	1.58E+00	3.33E-05		0.00E+00	2.10E-05	2.94E-04
Cf252	5.36E-02		5.53E+01	2.96E-01	5.53E+00	

Total FGE of U-235 1.64E+00

Neutron Modeling of 6 in. Goethite Concrete Cask

Radiochemical Engineering Development Center

Waste from the Hot Cells and Transuranium Analysis Laboratories

Conversion Factors to convert Ci (MeV/dis) to Watts

3.70E+10	(dis/sec)/Ci
1.60E-06	ergs/MeV
1.00E+10	kW/(ergs/sec)
1.00E+03	W/kW
5.92E-03	Watts/[Ci (MeV/dis)]

WID #	Decay Heat (Avg MeV/dis)	Activity (Ci)	Decay Heat (W)	
X10I9900382	2.60E+00	4.84E-03	7.45E-05	Co-60
X10I9900382	1.96E-01	4.51E+00	5.23E-03	Sr-90
X10I9900382	8.10E-01	6.22E-02	2.98E-04	Nb-95
X10I9900382	8.55E-01	6.55E-02	3.32E-04	Zr-95
X10I9900382	5.44E-01	1.21E-01	3.90E-04	Ru-103
X10I9900382	1.00E-02	5.48E-01	3.24E-05	Ru-106
X10I9900382	2.83E+00	9.13E-03	1.53E-04	Ag-110m
X10I9900382	5.31E-01	3.21E-02	1.01E-04	Sb-125
X10I9900382	1.72E+00	4.66E-02	4.75E-04	Cs-134
X10I9900382	1.87E-01	6.09E-01	6.74E-04	Cs-137
X10I9900382	2.46E-01	2.58E-01	3.76E-04	Ce-141
X10I9900382	1.13E-01	8.31E-02	5.57E-05	Ce-144
X10I9900382	1.30E+00	1.78E-02	1.37E-04	Eu-152
X10I9900382	1.53E+00	8.80E-02	7.98E-04	Eu-154
X10I9900382	1.24E-01	6.36E-02	4.67E-05	Eu-155
X10I9900382	4.33E-01	2.33E-02	5.97E-05	Np-239
X10I9900382	5.60E+00	1.23E-01	4.07E-03	Pu-238
X10I9900382	5.24E+00	6.01E-02	1.86E-03	Pu-239
X10I9900382	5.37E-03	1.47E+00	4.67E-05	Pu-241
X10I9900382	4.98E+00	1.53E-03	4.52E-05	Pu-242
X10I9900382	5.65E+00	1.64E-01	5.49E-03	Am-241
X10I9900382	5.44E+00	1.17E-02	3.77E-04	Am-243
X10I9900382	6.21E+00	8.97E-02	3.30E-03	Cm-242
X10I9900382	5.90E+00	2.01E+01	7.02E-01	Cm-244
X10I9900382	5.53E+00	1.41E-01	4.62E-03	Cm-246
X10I9900382	2.17E+01	3.76E-04	4.83E-05	Cm-248
X10I9900382	6.30E+00	1.80E-04	6.71E-06	Cf-249
X10I9900382	6.29E+00	7.63E-03	2.84E-04	Cf-250
X10I9900382	6.20E+00	3.33E-05	1.22E-06	Cf-251
X10I9900382	1.26E+00	2.96E-01	2.21E-03	Cf-252
		Total thermal watts	7.34E-01	

Nuclear Materials Controlled for Accountability

Nuclide	Ci/Gr	Curies	Grams	Curies *formula*	Grams *formula*	Nuclide
Pu238	1.7102E+01	1.2300E-01		0.00E+00	7.19E-03	Pu238
Pu239	6.1976E-02	6.0100E-02		0.00E+00	9.70E-01	Pu239
Pu241	1.0291E+02	1.4700E+00		0.00E+00	1.43E-02	Pu241
Pu242	3.9217E-03	1.5300E-03		0.00E+00	3.90E-01	Pu242
Am241	3.4246E+00	1.6400E-01		0.00E+00	4.79E-02	Am241
Am243	1.9914E-01	1.1700E-02		0.00E+00	5.88E-02	Am243
Cm242	3.3080E+03	8.9700E-02		0.00E+00	2.71E-05	Cm242
Cm244	8.0819E+01	2.0100E+01		0.00E+00	2.49E-01	Cm244
Cm246	3.0692E-01	1.4100E-01		0.00E+00	4.59E-01	Cm246
Cm248	4.2354E-03	3.7600E-04		0.00E+00	8.88E-02	Cm248
Cf252	5.3579E+02	2.9600E-01		0.00E+00	5.52E-04	Cf252

Neutron Modeling of 6 in. Goethite Concrete Cask

Radiochemical Engineering Development Center

Waste from the Hot Cells and Transuranium Analysis Laboratories

WID # X10I9900382

Weight(lbs):	448.0	
Pack. Size:	58.5	ft3
0 deg.	~~130.0~~	*mr/hr neutron only*
180 deg.	~~130.0~~	*mr/hr neutron only*

1.25E-02 Watts/ft3
1.64E+00 FGE of U-235
2.47E+03 TRU nci/g
130.0 *Avg. mR/hr neutron only (0° &180°)*
4.25 *mrem/hr/ug Cf-252 @ 1 m*

	Nuclide	Ave. Act. (Bq/total)	Ave. Act. (Ci/total)	Total Act. (%)	micrograms Cf-252	*mR/hr to Ci*	*Calc. Ci from Cf-252 Data*	Nuclide	*Curies*
1	Co-60	2.01E+03	5.43E-08	0.017%			4.84E-03	Co-60	4.84E-03
2	Sr-90	1.87E+06	5.05E-05	15.516%			4.51E+00	Sr-90	4.51E+00
3	Nb-95	2.58E+04	6.97E-07	0.214%			6.22E-02	Nb-95	6.22E-02
4	Zr-95	2.72E+04	7.35E-07	0.226%			6.55E-02	Zr-95	6.55E-02
5	Ru-103	5.03E+04	1.36E-06	0.417%			1.21E-01	Ru-103	1.21E-01
6	Ru-106	2.27E+05	6.15E-06	1.887%			5.48E-01	Ru-106	5.48E-01
7	Ag-110m	3.79E+03	1.02E-07	0.031%			9.13E-03	Ag-110m	9.13E-03
8	Sb-125	1.33E+04	3.60E-07	0.111%			3.21E-02	Sb-125	3.21E-02
9	Cs-134	1.93E+04	5.22E-07	0.160%			4.66E-02	Cs-134	4.66E-02
10	Cs-137	2.53E+05	6.83E-06	2.098%			6.09E-01	Cs-137	6.09E-01
11	Ce-141	1.07E+05	2.89E-06	0.888%			2.58E-01	Ce-141	2.58E-01
12	Ce-144	3.45E+04	9.32E-07	0.286%			8.31E-02	Ce-144	8.31E-02
13	Eu-152	7.39E+03	2.00E-07	0.061%			1.78E-02	Eu-152	1.78E-02
14	Eu-154	3.65E+04	9.87E-07	0.303%			8.80E-02	Eu-154	8.80E-02
15	Eu-155	2.64E+04	7.13E-07	0.219%			6.36E-02	Eu-155	6.36E-02
16	Np-239	9.66E+03	2.61E-07	0.080%			2.33E-02	Np-239	2.33E-02
17	Pu-238	5.10E+04	1.38E-06	0.424%			1.23E-01	Pu-238	1.23E-01
18	Pu-239	2.49E+04	6.74E-07	0.207%			6.01E-02	Pu-239	6.01E-02
19	Pu-241	~~6.09E+05~~	~~1.65E-05~~	5.057%			1.47E+00	Pu-241	1.47E+00
20	Pu-242	6.36E+02	1.72E-08	0.005%			1.53E-03	Pu-242	1.53E-03
21	Am-241	6.79E+04	1.84E-06	0.564%			1.64E-01	Am-241	1.64E-01
22	Am-243	4.85E+03	1.31E-07	0.040%			1.17E-02	Am-243	1.17E-02
23	Cm-242	3.72E+04	1.01E-06	0.309%			8.97E-02	Cm-242	8.97E-02
24	Cm-244	8.36E+06	2.26E-04	69.349%			2.01E+01	Cm-244	2.01E+01
25	Cm-246	5.83E+04	1.58E-06	0.484%			1.41E-01	Cm-246	1.41E-01
26	Cm-248	1.56E+02	4.22E-09	0.001%			3.76E-04	Cm-248	3.76E-04
27	Cf-249	7.47E+01	2.02E-09	0.000%			1.80E-04	Cf-249	1.80E-04
28	Cf-250	3.17E+03	8.56E-08	0.026%			7.63E-03	Cf-250	7.63E-03
29	Cf-251	1.38E+01	3.74E-10	0.000%			3.33E-05	Cf-251	3.33E-05
30	Cf-252	1.23E+05	~~3.32E-06~~	1.019%	5.53E+02	2.96E-01	2.96E-01	Cf-252	2.96E-01
		Total Act. Ci:	2.39E-04	100.000%					2.90E+01

Pu-238	1.23E-01
Pu-239	6.01E-02
Pu-242	1.53E-03
Am-241	1.64E-01
Am-243	1.17E-02
Cm-246	1.41E-01
Cm-248	3.76E-04
Cf-249	1.80E-04
Cf-251	3.33E-05
TRU nuclides	5.02E-01
est. wt. #	448.0
wt. G	203209
TRU nci/g	2470.0

Nuclide	*Ci/G*	*Curies*	*Grams*	*Curies*	*Grams*	*U-235 Equiv.*
Pu238	7.47E-01	1.23E-01		0.00E+00	7.19E-03	1.65E-04
Pu239	6.70E-02	6.01E-02		0.00E+00	9.70E-01	1.51E-02
Pu240	1.03E-02	1.47E-03		0.00E+00	1.43E-02	2.00E-04
Pu242	1.92E-03	1.53E-03		0.00E+00	7.90E-01	2.02E-03
Am241	3.42E-01	1.64E-01		0.00E+00	4.79E-02	2.40E-03
Am243	3.39E-01	1.17E-02		0.00E+00	3.38E-02	1.65E-03
Cm244	8.08E+01	2.01E+01		0.00E+00	2.49E-01	3.72E-02
Cm246	2.46E-01	1.41E-01		0.00E+00	5.19E-06	4.00E-06
Cf249	5.09E+00	1.80E-04		0.00E+00	4.49E-05	3.08E-03
Cf251	1.58E+00	3.33E-05		0.00E+00	2.10E-05	2.94E-03
Cf252	5.76E+00	2.96E-01	5.53E+02	2.96E-01	0.00E+00	

Total FGE of U-235 1.64E+00

Neutron Modeling of 6 in. Goethite Concrete Cask

Radiochemical Engineering Development Center

Waste from the Hot Cells and Transuranium Analysis Laboratories

WID # X10I9900382

Weight(lbs):	448.0		
Pack. Size:	58.5	ft3	
0 deg.	130.0	*mr/hr neutron only*	
180 deg.	130.0	*mr/hr neutron only*	

1.25E-02 Watts/ft3
1.64E+00 FGE of U-235
1.47E+03 TRU nci/g
130.0 *Avg. mR/hr neutron only (0° & 180°)*
4.25 mrem/hr/ug Cf-252 @ 1 m

	Nuclide	Ave. Act. (Bq/total)	Ave. Act. (Ci/total)	Total Act. (%)	micrograms Cf-252	*mR/hr to Ci*	*Calc. Ci from Cf-252 Data*	Nuclide	*Curies*
1	Co-60	2.01E+03	5.43E-08	0.017%			4.84E-03	Co-60	4.84E-03
2	Sr-90	1.87E+06	5.05E-05	15.516%			4.51E+00	Sr-90	4.51E+00
3	Nb-95	2.58E+04	6.97E-07	0.214%			6.22E-02	Nb-95	6.22E-02
4	Zr-95	2.72E+04	7.35E-07	0.226%			6.55E-02	Zr-95	6.55E-02
5	Ru-103	5.03E+04	1.36E-06	0.417%			1.21E-01	Ru-103	1.21E-01
6	Ru-106	2.27E+05	6.15E-06	1.887%			5.48E-01	Ru-106	5.48E-01
7	Ag-110m	3.79E+03	1.02E-07	0.031%			9.13E-03	Ag-110m	9.13E-03
8	Sb-125	1.33E+04	3.60E-07	0.111%			3.21E-02	Sb-125	3.21E-02
9	Cs-134	1.93E+04	5.22E-07	0.160%			4.66E-02	Cs-134	4.66E-02
10	Cs-137	2.53E+05	6.83E-06	2.098%			6.09E-01	Cs-137	6.09E-01
11	Ce-141	1.07E+05	2.89E-06	0.888%			2.58E-01	Ce-141	2.58E-01
12	Ce-144	3.45E+04	9.32E-07	0.286%			8.31E-02	Ce-144	8.31E-02
13	Eu-152	7.39E+03	2.00E-07	0.061%			1.78E-02	Eu-152	1.78E-02
14	Eu-154	3.65E+04	9.87E-07	0.303%			8.80E-02	Eu-154	8.80E-02
15	Eu-155	2.64E+04	7.13E-07	0.219%			6.36E-02	Eu-155	6.36E-02
16	Np-239	9.66E+03	2.61E-07	0.080%			2.33E-02	Np-239	2.33E-02
17	Pu-238	5.10E+04	1.38E-06	0.424%			1.23E-01	Pu-238	1.23E-01
18	Pu-239	2.49E+04	6.74E-07	0.207%			6.01E-02	Pu-239	6.01E-02
19	Pu-241	6.09E+05	1.65E-05	5.057%			1.47E+00	Pu-241	1.47E+00
20	Pu-242	6.36E+02	1.72E-08	0.005%			1.53E-03	Pu-242	1.53E-03
21	Am-241	6.79E+04	1.84E-06	0.564%			1.64E-01	Am-241	1.64E-01
22	Am-243	4.85E+03	1.31E-07	0.040%			1.17E-02	Am-243	1.17E-02
23	Cm-242	3.72E+04	1.01E-06	0.309%			8.97E-02	Cm-242	8.97E-02
24	Cm-244	8.36E+06	2.26E-04	69.349%			2.01E+01	Cm-244	2.01E+01
25	Cm-246	5.83E+04	1.58E-06	0.484%			1.41E-01	Cm-246	1.41E-01
26	Cm-248	1.56E+02	4.22E-09	0.001%			3.76E-04	Cm-248	3.76E-04
27	Cf-249	7.47E+01	2.02E-09	0.001%			1.80E-04	Cf-249	1.80E-04
28	Cf-250	3.17E+03	8.56E-08	0.026%			7.63E-03	Cf-250	7.63E-03
29	Cf-251	1.38E+01	3.74E-10	0.0001%			3.33E-05	Cf-251	3.33E-05
30	Cf-252	1.23E+05	3.32E-06	1.019%	5.53E+02	2.96E-01	2.96E-01	Cf-252	2.96E-01
	Total Act. Ci.		3.26E-04	100.000%					2.90E+01

Pu-238	1.23E-01
Pu-239	6.01E-02
Pu-242	1.53E-03
Am-241	1.64E-01
Am-243	1.17E-02
Cm-246	1.41E-01
Cm-248	3.76E-04
Cf-249	1.80E-04
Cf-251	3.33E-05
TRU nuclides	5.02E-01
est. wt. #	448.0
wt. G	203209
TRU nci/g	2470.0

Nuclide	Ci/Gr	Curies	Grams	Curies	Grams	U-235 Equiv.
Pu238	2.41E-01	1.23E-01	5.09E-01	0.00E+00	0.00E+00	7.65E-03
Pu239	6.20E-02	6.01E-02	9.70E-01	0.00E+00	0.00E+00	5.11E-03
Pu241	1.03E-02	1.47E+00	1.43E+02	0.00E+00	0.00E+00	5.00E-02
Pu242	3.92E-03	1.53E-03	3.90E-01	0.00E+00	0.00E+00	2.02E-03
Am241	3.42E-03	1.64E-01	4.79E-02	0.00E+00	0.00E+00	2.51E-03
Am243	2.99E-01	1.17E-02	3.88E-02	0.00E+00	0.00E+00	1.65E-03
Cm244	3.08E-01	2.01E+01	2.49E+01	0.00E+00	0.00E+00	1.72E-02
Cm246	3.07E-01	1.41E-01	1.13E-06	0.00E+00	0.00E+00	1.00E-06
Cm249	4.09E+00	1.80E-04	1.40E-05	0.00E+00	0.00E+00	1.08E-03
Cf251	1.58E+00	3.33E-05	2.10E-05	0.00E+00	0.00E+00	1.94E-03
Cf252	5.36E+02	5.53E-06	1.03E-02	2.96E-01	0.00E+00	1.91E-01

Total FGE of U-235 1.64E+00

Neutron Modeling of 6 in. Goethite Concrete Cask

Radiochemical Engineering Development Center

Waste from the Hot Cells and Transuranium Analysis Laboratories

WID #	Decay Heat (Avg MeV/dis)	Activity (Ci)	Decay Heat (W)	
X10I9900382	2.60E+00	4.84E-03	7.45E-05	Co-60
X10I9900382	1.96E-01	4.51E+00	5.23E-03	Sr-90
X10I9900382	8.10E-01	6.22E-02	2.98E-04	Nb-95
X10I9900382	8.55E-01	6.55E-02	3.32E-04	Zr-95
X10I9900382	5.44E-01	1.21E-01	3.90E-04	Ru-103
X10I9900382	1.00E-02	5.48E-01	3.24E-05	Ru-106
X10I9900382	2.83E+00	9.13E-03	1.53E-04	Ag-110m
X10I9900382	5.31E-01	3.21E-02	1.01E-04	Sb-125
X10I9900382	1.72E+00	4.66E-02	4.75E-04	Cs-134
X10I9900382	1.87E-01	6.09E-01	6.74E-04	Cs-137
X10I9900382	2.46E-01	2.58E-01	3.76E-04	Ce-141
X10I9900382	1.13E-01	8.31E-02	5.57E-05	Ce-144
X10I9900382	1.30E+00	1.78E-02	1.37E-04	Eu-152
X10I9900382	1.53E+00	8.80E-02	7.98E-04	Eu-154
X10I9900382	1.24E-01	6.36E-02	4.67E-05	Eu-155
X10I9900382	4.33E-01	2.33E-02	5.97E-05	Np-239
X10I9900382	5.60E+00	1.23E-01	4.07E-03	Pu-238
X10I9900382	5.24E+00	6.01E-02	1.86E-03	Pu-239
X10I9900382	5.37E-03	1.47E+00	4.67E-05	Pu-241
X10I9900382	4.98E+00	1.53E-03	4.52E-05	Pu-242
X10I9900382	5.65E+00	1.64E-01	5.49E-03	Am-241
X10I9900382	5.44E+00	1.17E-02	3.77E-04	Am-243
X10I9900382	6.21E+00	8.97E-02	3.30E-03	Cm-242
X10I9900382	5.90E+00	2.01E+01	7.02E-01	Cm-244
X10I9900382	5.53E+00	1.41E-01	4.62E-03	Cm-246
X10I9900382	2.17E+01	3.76E-04	4.83E-05	Cm-248
X10I9900382	6.30E+00	1.80E-04	6.71E-06	Cf-249
X10I9900382	6.29E+00	7.63E-03	2.84E-04	Cf-250
X10I9900382	6.20E+00	3.33E-05	1.22E-06	Cf-251
X10I9900382	1.26E+00	2.96E-01	2.21E-03	Cf-252
		Total thermal watts	7.34E-01	

Neutron Modeling of 6 in. Goethite Concrete Cask

Radiochemical Engineering Development Center

Waste from the Hot Cells and Transuranium Analysis Laboratories

WID # X10I9900382

Weight(lbs.):	448.0		
Pack. Size:	58.5	ft3	
0 deg.	130.0	*mr/hr neutron only*	
180 deg.	130.0	*mr/hr neutron only*	

1.25E-02 Watts/ft3
1.64E+00 FGE of U-235
2.47E+03 TRU nci/g
130.0 *Avg. mR/hr neutron only (0° &180°)*
4.25 mrem/hr/ug Cf-252 @ 1 m

	Nuclide	Ave. Act. (Bq/total)	Ave. Act. (Ci/total)	Total Act. (%)	micrograms Cf-252	*mR/hr to Ci*	*Calc. Ci from Cf-252 Data*	Nuclide	*Curies*
1	Co-60	2.01E+03	5.43E-08	0.017%			4.84E-03	Co-60	4.84E-03
2	Sr-90	1.87E+06	5.05E-05	15.516%			4.51E+00	Sr-90	4.51E+00
3	Nb-95	2.58E+04	6.97E-07	0.214%			6.22E-02	Nb-95	6.22E-02
4	Zr-95	2.72E+04	7.35E-07	0.226%			6.55E-02	Zr-95	6.55E-02
5	Ru-103	5.03E+04	1.36E-06	0.417%			1.21E-01	Ru-103	1.21E-01
6	Ru-106	2.27E+05	6.15E-06	1.887%			5.48E-01	Ru-106	5.48E-01
7	Ag-110m	3.79E+03	1.02E-07	0.031%			9.13E-03	Ag-110m	9.13E-03
8	Sb-125	1.33E+04	3.60E-07	0.111%			3.21E-02	Sb-125	3.21E-02
9	Cs-134	1.93E+04	5.22E-07	0.160%			4.66E-02	Cs-134	4.66E-02
10	Cs-137	2.53E+05	6.83E-06	2.098%			6.09E-01	Cs-137	6.09E-01
11	Ce-141	1.07E+05	2.89E-06	0.888%			2.58E-01	Ce-141	2.58E-01
12	Ce-144	3.45E+04	9.32E-07	0.286%			8.31E-02	Ce-144	8.31E-02
13	Eu-152	7.39E+03	2.00E-07	0.061%			1.78E-02	Eu-152	1.78E-02
14	Eu-154	3.65E+04	9.87E-07	0.303%			8.80E-02	Eu-154	8.80E-02
15	Eu-155	2.64E+04	7.13E-07	0.219%			6.36E-02	Eu-155	6.36E-02
16	Np-239	9.66E+03	2.61E-07	0.080%			2.33E-02	Np-239	2.33E-02
17	Pu-238	5.10E+04	1.38E-06	0.424%			1.23E-01	Pu-238	1.23E-01
18	Pu-239	2.49E+04	6.74E-07	0.207%			6.01E-02	Pu-239	6.01E-02
19	Pu-241	6.09E+05	1.65E-05	5.057%			1.47E+00	Pu-241	1.47E+00
20	Pu-242	6.36E+02	1.72E-08	0.005%			1.53E-03	Pu-242	1.53E-03
21	Am-241	6.79E+04	1.84E-06	0.564%			1.64E-01	Am-241	1.64E-01
22	Am-243	4.85E+03	1.31E-07	0.040%			1.17E-02	Am-243	1.17E-02
23	Cm-242	3.72E+04	1.01E-06	0.309%			8.97E-02	Cm-242	8.97E-02
24	Cm-244	8.36E+06	2.26E-04	69.349%			2.01E+01	Cm-244	2.01E+01
25	Cm-246	5.83E+04	1.58E-06	0.484%			1.41E-01	Cm-246	1.41E-01
26	Cm-248	1.56E+02	4.22E-09	0.001%			3.76E-04	Cm-248	3.76E-04
27	Cf-249	7.47E+01	2.02E-09	0.001%			1.80E-04	Cf-249	1.80E-04
28	Cf-250	3.17E+03	8.56E-08	0.026%			7.63E-03	Cf-250	7.63E-03
29	Cf-251	1.38E+01	3.74E-10	0.0001%			3.33E-05	Cf-251	3.33E-05
30	Cf-252	1.23E+05	3.32E-06	1.019%	5.53E+02	2.96E-01	2.96E-01	Cf-252	2.96E-01
		Total Act. Ci.	3.26E-04	100.000%				total Cr	2.90E+01

Pu-238	1.23E-01
Pu-239	6.01E-02
Pu-242	1.53E-03
Am-241	1.64E-01
Am-243	1.17E-02
Cm-246	1.41E-01
Cm-248	3.76E-04
Cf-249	1.80E-04
Cf-251	3.33E-05
TRU nuclides	5.02E-01
est. wt. #	448.0
wt. G	203209
TRU nci/g	2470.0

Nuclide	Gi/Gr	Curies	Grams	Curies	Grams	Cf-252 Equiv.
Pu238	1.37E-01	1.23E-01		0.00E+00	7.49E-03	1.65E-03
Pu239	6.70E-02	6.01E-02		0.00E+00	9.79E-01	1.58E-01
Pu241	1.63E-02	1.47E+00		0.00E+00	1.45E-02	3.90E-02
Pu242	3.42E-04	1.53E-03		0.00E+00	3.20E-01	7.02E-03
Am241	3.42E+00	1.64E-01		0.00E+00	4.79E-02	2.31E-02
Am243	1.99E-01	1.17E-02		0.00E+00	5.88E-02	1.65E-02
Cm244	3.08E-03	2.01E+01		0.00E+00	6.49E-01	2.79E-02
Cm246	3.03E-01	1.41E-01		0.00E+00	4.71E-06	2.00E-06
Cf249	4.09E-01	1.80E-04		0.00E+00	4.40E-05	3.08E-05
Cf251	1.58E+00	3.33E-05		0.00E+00	2.10E-05	2.94E-05
Cf252	5.36E-02		5.53E-04	2.96E-01	0.00E+00	

Total FGE of U-235 1.64E+00

Neutron Modeling of 6 in. Goethite Concrete Cask

Radiochemical Engineering Development Center

Waste from the Hot Cells and Transuranium Analysis Laboratories

Conversion Factors to convert Gr/MeV/dis to Watts

3.70E+10	dis/sec/Ci
1.60E-06	ergs/MeV
1.00E-10	KW/(ergs/sec)
1.00E+03	W/KW
5.92E-05	Watts/[Gr(MeV/dis)]

WID #	Decay Heat (Avg MeV/dis)	Activity (Ci)	Decay Heat (W)	
X10I9900382	2.60E+00	4.84E-03	7.45E-05	Co-60
X10I9900382	1.96E-01	4.51E+00	5.23E-03	Sr-90
X10I9900382	8.10E-01	6.22E-02	2.98E-04	Nb-95
X10I9900382	8.55E-01	6.55E-02	3.32E-04	Zr-95
X10I9900382	5.44E-01	1.21E-01	3.90E-04	Ru-103
X10I9900382	1.00E-02	5.48E-01	3.24E-05	Ru-106
X10I9900382	2.83E+00	9.13E-03	1.53E-04	Ag-110m
X10I9900382	5.31E-01	3.21E-02	1.01E-04	Sb-125
X10I9900382	1.72E+00	4.66E-02	4.75E-04	Cs-134
X10I9900382	1.87E-01	6.09E-01	6.74E-04	Cs-137
X10I9900382	2.46E-01	2.58E-01	3.76E-04	Ce-141
X10I9900382	1.13E-01	8.31E-02	5.57E-05	Ce-144
X10I9900382	1.30E+00	1.78E-02	1.37E-04	Eu-152
X10I9900382	1.53E+00	8.80E-02	7.98E-04	Eu-154
X10I9900382	1.24E-01	6.36E-02	4.67E-05	Eu-155
X10I9900382	4.33E-01	2.33E-02	5.97E-05	Np-239
X10I9900382	5.60E+00	1.23E-01	4.07E-03	Pu-238
X10I9900382	5.24E+00	6.01E-02	1.86E-03	Pu-239
X10I9900382	5.37E-03	1.47E+00	4.67E-05	Pu-241
X10I9900382	4.98E+00	1.53E-03	4.52E-05	Pu-242
X10I9900382	5.65E+00	1.64E-01	5.49E-03	Am-241
X10I9900382	5.44E+00	1.17E-02	3.77E-04	Am-243
X10I9900382	6.21E+00	8.97E-02	3.30E-03	Cm-242
X10I9900382	5.90E+00	2.01E+01	7.02E-01	Cm-244
X10I9900382	5.53E+00	1.41E-01	4.62E-03	Cm-246
X10I9900382	2.17E+01	3.76E-04	4.83E-05	Cm-248
X10I9900382	6.30E+00	1.80E-04	6.71E-06	Cf-249
X10I9900382	6.29E+00	7.63E-03	2.84E-04	Cf-250
X10I9900382	6.20E+00	3.33E-05	1.22E-06	Cf-251
X10I9900382	1.26E+00	2.96E-01	2.21E-03	Cf-252
		Total thermal watts	7.34E-01	

Nuclear Materials Controlled for Accountability

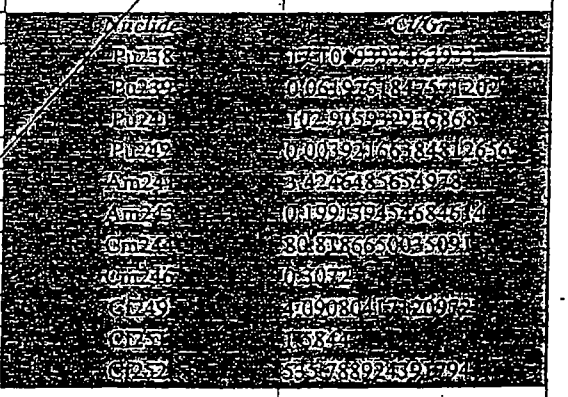
Nuclide	Ci/Gr	Curies	Grams	Curies *formula*	Grams *formula*	Nuclide
Pu238	6.7102E+01	2.2300E-01		0.00E+00	7.19E-03	Pu238
Pu239	6.1976E-02	6.0100E-02		0.00E+00	9.70E-01	Pu239
Pu241	1.0291E+02	1.4700E+00		0.00E+00	1.43E-02	Pu241
Pu242	3.9217E-03	1.5300E-03		0.00E+00	3.90E-01	Pu242
Am241	3.4246E+00	1.6400E-01		0.00E+00	4.79E-02	Am241
Am243	1.9914E-01	1.1700E-02		0.00E+00	5.88E-02	Am243
Cm242	3.3080E+03	8.9700E-02		0.00E+00	2.71E-05	Cm242
Cm244	8.0819E+01	2.0100E+01		0.00E+00	2.49E-01	Cm244
Cm246	3.0692E-01	1.4100E-01		0.00E+00	4.59E-01	Cm246
Cm248	4.2354E-03	3.7600E-04		0.00E+00	8.88E-02	Cm248
Cf252	5.3579E+02	1.9600E-01		0.00E+00	5.52E-04	Cf252

Neutron Modeling of 6 in. Goethite Concrete Cask

Radiochemical Engineering Development Center

Waste from the Hot Cells and Transuranium Analysis Laboratories

	A	B	C	D	E
1					
2		*WID # X10I9900382*			
3		*Weight(lbs):*	448		
4		*Pack. Size:*	58.5	*ft3*	
5		*0 deg.*	130	*mr/hr neutron only*	
6		*180 deg.*	130	*mr/hr neutron only*	
7		Nuclide	Ave. Act.	Ave. Act.	Total Act.
8			(Bq/total)	(Ci/total)	(%)
9	1	Co-60	2008.53571428571	=C9/37000000000	=D9/$D$39
10	2	Sr-90	1870000	=C10/37000000000	=D10/$D$39
11	3	Nb-95	25800	=C11/37000000000	=D11/$D$39
12	4	Zr-95	27200	=C12/37000000000	=D12/$D$39
13	5	Ru-103	50300	=C13/37000000000	=D13/$D$39
14	6	Ru-106	227398.571428571	=C14/37000000000	=D14/$D$39
15	7	Ag-110m	3790.5	=C15/37000000000	=D15/$D$39
16	8	Sb-125	13323.9285714286	=C16/37000000000	=D16/$D$39
17	9	Cs-134	19328.3214285714	=C17/37000000000	=D17/$D$39
18	10	Cs-137	252863.928571429	=C18/37000000000	=D18/$D$39
19	11	Ce-141	107000	=C19/37000000000	=D19/$D$39
20	12	Ce-144	34500	=C20/37000000000	=D20/$D$39
21	13	Eu-152	7387.85714285714	=C21/37000000000	=D21/$D$39
22	14	Eu-154	36512.5	=C22/37000000000	=D22/$D$39
23	15	Eu-155	26396.7857142857	=C23/37000000000	=D23/$D$39
24	16	Np-239	9661.42857142857	=C24/37000000000	=D24/$D$39
25	17	Pu-238	510428.817857143	=C25/37000000000	=D25/$D$39
26	18	Pu-239	24939.1314285714	=C26/37000000000	=D26/$D$39
27	19	Pu-241	=C25*11.94	=C27/37000000000	=D27/$D$39
28	20	Pu-242	635.918214285714	=C28/37000000000	=D28/$D$39
29	21	Am-241	67921.0714285714	=C29/37000000000	=D29/$D$39
30	22	Am-243	4845.28571428571	=C30/37000000000	=D30/$D$39
31	23	Cm-242	37237.9662337662	=C31/37000000000	=D31/$D$39
32	24	Cm-244	8358083.92857143	=C32/37000000000	=D32/$D$39
33	25	Cm-246	58326.3875944484	=C33/37000000000	=D33/$D$39
34	26	Cm-248	156.237572315738	=C34/37000000000	=D34/$D$39
35	27	Cf-249	74.6960183506157	=C35/37000000000	=D35/$D$39
36	28	Cf-250	3165.7359832512	=C36/37000000000	=D36/$D$39
37	29	Cf-251	13.8323206741561	=C37/37000000000	=D37/$D$39
38	30	Cf-252	122871.319480519	=C38/37000000000	=D38/$D$39
39			Total Act: Ci.	=SUM(D9:D38)	=SUM(E9:E38)
40					
41					
42		Pu-238	=J25		
43		Pu-239	=J26		
44		Pu-242	=J28		
45		Am-241	=J29		
46		Am-243	=J30		
47		Cm-246	=J33		
48		Cm-248	=J34		
49		Cf-249	=J35		
50		Cf-251	=J37		
51		TRU nuclides	=SUM(C42:C50)		
52		est. wt. #	=C3		
53		wt. G	=CONVERT(C52,"lbm","g		
54		TRU nci/g	=(C51*C53)/0.000000001		



Neutron Modeling of 6 in. Goethite Concrete Cask

Radiochemical Engineering Development Center

~~Waste from the Hot Cells and Transuranium Analysis Laboratories~~

	F	G	H	I
1				
2			=N39*C4	Watts/ft3
3			=J54	FGE of U-235
4			=C54	TRU nci/g
5	=($C$5+$C$6)/2	Avg. mR/hr neutron onl		
6	4.25	mrem/hr/ug Cf-252		
7	micrograms	mR/hr	Calc. Ci from	Nuclide
8	Cf-252	to Ci	Cf252 Data	
9			=($G$38/$E$38)*E9	Co-60
10			=($G$38/$E$38)*E10	Sr-90
11			=($G$38/$E$38)*E11	Nb-95
12			=($G$38/$E$38)*E12	Zr-95
13			=($G$38/$E$38)*E13	Ru-103
14			=($G$38/$E$38)*E14	Ru-106
15			=($G$38/$E$38)*E15	Ag-110m
16			=($G$38/$E$38)*E16	Sb-125
17			=($G$38/$E$38)*E17	Cs-134
18			=($G$38/$E$38)*E18	Cs-137
19			=($G$38/$E$38)*E19	Ce-141
20			=($G$38/$E$38)*E20	Ce-144
21			=($G$38/$E$38)*E21	Eu-152
22			=($G$38/$E$38)*E22	Eu-154
23			=($G$38/$E$38)*E23	Eu-155
24			=($G$38/$E$38)*E24	Np-239
25			=($G$38/$E$38)*E25	Pu-238
26			=($G$38/$E$38)*E26	Pu-239
27			=($G$38/$E$38)*E27	Pu-241
28			=($G$38/$E$38)*E28	Pu-242
29			=($G$38/$E$38)*E29	Am-241
30			=($G$38/$E$38)*E30	Am-243
31			=($G$38/$E$38)*E31	Cm-242
32			=($G$38/$E$38)*E32	Cm-244
33			=($G$38/$E$38)*E33	Cm-246
34			=($G$38/$E$38)*E34	Cm-248
35			=($G$38/$E$38)*E35	Cf-249
36			=($G$38/$E$38)*E36	Cf-250
37			=($G$38/$E$38)*E37	Cf-251
38	=F6*F5	=H5	=G38	Cf-252
39				
40				
41				
42	Curies	Grams	Curies	Grams
43	[illegible]		=E43*G43	=F43/E43
44	=I26		=E44*G44	=F44/E44
45	=I27		=E45*G45	=F45/E45
46	=I28		=E46*G46	=F46/E46
47	=I29		=E47*G47	=F47/E47
48	=I30		=E48*G48	=F48/E48
49	=I32		=E49*G49	=F49/E49
50	=I33		=E50*G50	5.13147413380212E-06
51	=I35		=E51*G51	=F51/E51
52	=I37		=E52*G52	=F52/E52
53		=F38*0.000001	=E53*G53	=F53/E53
54				Total FGE of U-235

Neutron Modeling of 6 in. Goethite Concrete Cask

Radiochemical Engineering Development Center

Waste from the Hot Cells and Transuranium Analysis Laboratories

	J	K	L
1			Conversion factors to convert Ci to Me
2			3.7000E+010
3			0.000001 G
4			0.000000000001
5			1.006
6			=62+63+64+65
7	*Curies*	WID #	Decay Heat (Avg MeV/dis)
8			
9	=ROUND(H9,IF(SIGN(L	=$C$2	2.600161
10	=ROUND(H10,IF(SIGN(L	=$C$2	0.196
11	=ROUND(H11,IF(SIGN(L	=$C$2	0.8100524
12	=ROUND(H12,IF(SIGN(L	=$C$2	0.855148
13	=ROUND(H13,IF(SIGN(L	=$C$2	0.543777
14	=ROUND(H14,IF(SIGN(L	=$C$2	0.01
15	=ROUND(H15,IF(SIGN(L	=$C$2	=2.81+0.0158
16	=ROUND(H16,IF(SIGN(L	=$C$2	0.53112
17	=ROUND(H17,IF(SIGN(L	=$C$2	1.72133
18	=ROUND(H18,IF(SIGN(L	=$C$2	0.187
19	=ROUND(H19,IF(SIGN(L	=$C$2	0.246458
20	=ROUND(H20,IF(SIGN(L	=$C$2	0.1132
21	=ROUND(H21,IF(SIGN(L	=$C$2	1.2965
22	=ROUND(H22,IF(SIGN(L	=$C$2	1.5312
23	=ROUND(H23,IF(SIGN(L	=$C$2	0.123917
24	=ROUND(H24,IF(SIGN(L	=$C$2	0.43295
25	=ROUND(H25,IF(SIGN(L	=$C$2	5.59563
26	=ROUND(H26,IF(SIGN(L	=$C$2	5.2393
27	=ROUND(H27,IF(SIGN(L	=$C$2	0.00536652
28	=ROUND(H28,IF(SIGN(L	=$C$2	4.98481
29	=ROUND(H29,IF(SIGN(L	=$C$2	=5.65+0.00436
30	=ROUND(H30,IF(SIGN(L	=$C$2	=5.44+0.000885
31	=ROUND(H31,IF(SIGN(L	=$C$2	6.21244
32	=ROUND(H32,IF(SIGN(L	=$C$2	5.90149
33	=ROUND(H33,IF(SIGN(L	=$C$2	=5.53
34	=ROUND(H34,IF(SIGN(L	=$C$2	21.7
35	=ROUND(H35,IF(SIGN(L	=$C$2	=6.29+0.0108
36	=ROUND(H36,IF(SIGN(L	=$C$2	6.290583
37	=ROUND(H37,IF(SIGN(L	=$C$2	=6.2+0.00295
38	=ROUND(H38,IF(SIGN(L	=$C$2	=1.26+0.000129
39	=SUM(J9:J38)		
40			
41	U-235		
42	Equiv		
43	=J43*L43		
44	=J44*L44		
45	=J45*L45		
46	=J46*L46		
47	=J47*L47		
48	=J48*L48		
49	=J49*L49		
50	=J50*L50		
51	=J51*L51		
52	=J52*L52		
53			
54	=SUM(J43:J53)		

Neutron Modeling of 6 in. Goethite Concrete Cask

Radiochemical Engineering Development Center

Waste from the Hot Cells and Transuranium Analysis Laboratories

	M	N	O
1			
2	(dis/sec-Ci		
3	ergs/MeV		
4	3.7E+10 dis/sec/Ci		
5	6.24E+12 MeV/W-sec		
6	Watts/Ci (MeV/dis)		
7	Activity	Decay Heat	
8	(Ci)	(W)	
9	=J9	=M9*L9*$L$6	Co-60
10	=J10	=M10*L10*$L$6	Sr-90
11	=J11	=M11*L11*$L$6	Nb-95
12	=J12	=M12*L12*$L$6	Zr-95
13	=J13	=M13*L13*$L$6	Ru-103
14	=J14	=M14*L14*$L$6	Ru-106
15	=J15	=M15*L15*$L$6	Ag-110m
16	=J16	=M16*L16*$L$6	Sb-125
17	=J17	=M17*L17*$L$6	Cs-134
18	=J18	=M18*L18*$L$6	Cs-137
19	=J19	=M19*L19*$L$6	Ce-141
20	=J20	=M20*L20*$L$6	Ce-144
21	=J21	=M21*L21*$L$6	Eu-152
22	=J22	=M22*L22*$L$6	Eu-154
23	=J23	=M23*L23*$L$6	Eu-155
24	=J24	=M24*L24*$L$6	Np-239
25	=J25	=M25*L25*$L$6	Pu-238
26	=J26	=M26*L26*$L$6	Pu-239
27	=J27	=M27*L27*$L$6	Pu-241
28	=J28	=M28*L28*$L$6	Pu-242
29	=J29	=M29*L29*$L$6	Am-241
30	=J30	=M30*L30*$L$6	Am-243
31	=J31	=M31*L31*$L$6	Cm-242
32	=J32	=M32*L32*$L$6	Cm-244
33	=J33	=M33*L33*$L$6	Cm-246
34	=J34	=M34*L34*$L$6	Cm-248
35	=J35	=M35*L35*$L$6	Cf-249
36	=J36	=M36*L36*$L$6	Cf-250
37	=J37	=M37*L37*$L$6	Cf-251
38	=J38	=M38*L38*$L$6	Cf-252
39		Total thermal watts =SUM(N9:N38)	
40			
41			
42			
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Neutron Modeling of 6 in. Goethite Concrete Cask

Radiochemical Engineering Development Center

Waste from the Hot Cells and Transuranium Analysis Laboratories

	P	Q
1	[redacted]	
2		
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5		
6		
7		
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DIVIDER PAGE

WITS 2109 (RFD)

(NOTE: All information (i.e., RFD, NDA data, Analytical, change logs, etc.) needs to be reviewed for best available data.)

RFD: X10C9402631
Container ID: X10C9402631

Origin Facility: 7920
Current Facility: 7855

Reviewed by: K. A. Balo
Review date: 1/2/05

Waste Item ID: X10C9402631-1
Description: "~~RADIOCHEMICAL PROCESSING FOR ISOTOPE SEPARATION AND PURIFICATIO~RADIOCHEMICAL PROCESSING FOR ISOTOPE SEPARATION AND PURIFICATION, RUBBER WIRE COVE"

Circle data checked: (2109/RFD) NDA Analytical PKform Other: Trabalka Report

CONSTITUENTS:

Do Constituents match folder? (Yes) No

ISOTOPES:
CM-244 1.96994 CI

Do Isotope(s) match folder? (Yes) No

EPA CODES:

Do EPA codes match folder? (Yes) No
Is attachment designation correct? (Yes) No
Do flags reflect what data represents? Yes (No)

Attachment: B
RAD: Y RCRA: ~~Y~~ N
LLW N PCB: N
TRU: Y TSCA: N
SNF: N

RCRA start date:
PCB start date:

Is RCRA start date correct? (Yes) No
Is PCB start date correct? (Yes) No

COPY

(If WITS changes need to be made, fill out a change log with justification and submit to WIMSHELP@bjcllc.org)

d

Data/Manifest Package Change Log

Site ID: X-10 **RFD (2109) Number:** X10C9402631

Container or Waste Item ID(s): X10C9402631

Date: 12/30/04 **Signature:** K. A. Bates **Badge #:** 030338 **Effective as of:** 12/30/04

Instructions: Document necessary changes made to 2109 or Manifest Data Packages. Retain this form inside the Data Package indefinitely.

Description of Change/Addition:

Change the RCRA flag from "U" to "N".

Justification:

This will match the information on the RFD.

Actions to be Taken: (i.e. Field Operations apply label)

Reviewer Use Only:

Rad Review: Y ☐ N ☒ **Reviewed by:** A. D. Cole 36709 **Date:** 1/5/05

Chem Review: Y ☐ N ☒ **Reviewed by:** _____ **Date** _____

P2

NON-RECORD COPY

History

WASTE ITEM ID: X10C9402631-1 ALIAS ITEM ID:
CONTAINER_ID: X10C9402631 ALIAS CONT ID:
ORIGIN DATE: 11/13/1996 STATUS: FULL ITEM_STATUS: STORED
MASTER PROFILE: REVISION:
EPA CODES:

REPORTING WASTE STREAM: PROCESS STREAM:
WASTE GROUP DESCRIPTION:
WASTE TYPE:
CURRENT EMWIR GROUP ID: T2320
CURRENT CONTROL TABLE GROUP ID: TLA05
CURRENT DISPOSITION PROJECT GROUP ID: 824
CURRENT DISPOSITION POPULATION GROUP ID: TBD
ORIGIN SITE ID: X10 PHYSICAL FORM: SOLID
ORIGIN FACILITY: 7920 ORIGIN DIV.: 003 PROCESS:
ORIGIN AREA ID: 118 GENERATOR: 028492 EVANS

CAUTION

This information must NOT be released externally until it has been reviewed by the appropriate site Classification and Information Control Office.

CONTAINER TYPE: CASKC6 REQ DOC ID: X10C9402631
GROSS WASTE ITEM WEIGHT: 4295.52 (KG) 9470.00 (LB)
WASTE ITEM VOLUME: 437.62 (GAL) 58.50 (FT3)
FIRST DATE TO STORAGE: 12/18/1996 LAST INVENTORY DATE:10/03/2002
ORR FIRST STORAGE DATE: 12/18/1996 RAD CAT:
RCRA DATE: PCB DATE:
NDA DATE: NDA REPORT DATE:
LLW START DATE:

GENERATOR CHARACTERIZATION		WASTE MANAGEMENT CHARACTERIZATION	
CHEMICAL	N	CHEMICAL	N
RAD	Y	RAD	Y
ASBESTOS	N	ASBESTOS	N
SANITARY	N	SANITARY	N
CONSTRUCTION	N	CONSTRUCTION	N
MEDICAL	N	MEDICAL	N
BIOLOGICAL	N	BIOLOGICAL	N
ACCOUNTABLE	N	ACCOUNTABLE	N
CARCINOGENIC	N	CARCINOGENIC	N
COMPACTIBLE	N	COMPACTIBLE	N
RECYCLABLE	N	RECYCLABLE	N
CLASSIFIED	U	CLASSIFIED	U
RCRA	U	RCRA	U
TSCA	U	TSCA	N
PCB	U	PCB	N
ATTACHMENT	B	ATTACHMENT	B
PPM/CONC:		PPM/CONC:	
PCB/SOURCE:		PCB/SOURCE:	

TSD METHODS:

HP TAG NO	SURFACE CONTAMINATION		DOSE RATE AT		INSTRUMENT ID
	TRANSFER	DIRECT	SURFACE	1 METER	1 FOOT

DISCLAIMER: The data presented in WITS consists of best available data for internal use only and is not approved for PUBLIC RELEASE. Weights and volumes may have rounding errors.

History

ALPHA	- 0	- 0			
BETA/GAM	- 0	- 0	- 0	- 0	- 0
NEUTRON			- 0	- 0	- 0

Report Parameter- Container ID: X10C9402631 Waste Item ID: X10C9402631-1

DATE	FACILITY	AREA	DIKE(X)	ROW(Y)	LVL(Z)	DOC ID

EVT	STATUS	STAT	EVENT	COD/MANIFEST	WEIGHT(KG)	CONTAINER ID
11/13/1996 00:00:02	7920		118			
VERIFIED	STORED	RPK	96 4183578		4295.52	X10C9402631
LABPACK	SOURCE X10I9416384-1			X10I9416384		
11/14/1996 00:00:02	7920		118			
VERIFIED	STORED	RPK	96 4183589		4295.52	X10C9402631
LABPACK	SOURCE X10I9416389-1			X10I9416389		
LABPACK	SOURCE X10I9416390-1			X10I9416390		
12/06/1996 00:00:02	7920		118			
VERIFIED	STORED	RPK	96 4183728		4295.52	X10C9402631
LABPACK	SOURCE X10I9416485-1			X10I9416485		
LABPACK	SOURCE X10I9416491-1			X10I9416491		
LABPACK	SOURCE X10I9416492-1			X10I9416492		
LABPACK	SOURCE X10I9416494-1			X10I9416494		
LABPACK	SOURCE X10I9416495-1			X10I9416495		
LABPACK	SOURCE X10I9416496-1			X10I9416496		
LABPACK	SOURCE X10I9416497-1			X10I9416497		
LABPACK	SOURCE X10I9416577-1			X10I9416577		
LABPACK	SOURCE X10I9416580-1			X10I9416580		
LABPACK	SOURCE X10I9416581-1			X10I9416581		
LABPACK	SOURCE X10I9416582-1			X10I9416582		
12/11/1996 00:00:00	UNKNOWN		NONE			
VERIFIED	GENERATED	REQ	96 4866785		X10C9402631	
12/18/1996 00:07:00	7834		U			
VERIFIED	STORED	PKP	96 4587949		4295.52	X10C9402631
12/18/1996 00:07:00	7834		U			TSD X10T0005795
VERIFIED	STORED	MOV	96 4626609		4295.52	X10C9402631
12/18/1996 00:07:01	7834		U			TSD X10T0005795
VERIFIED	STORED	MOV	96 4222902		4295.52	X10C9402631
01/13/1998 00:08:00	7855		NA			TSD X10T0007506
VERIFIED	STORED	MOV	98 4223936		4295.52	X10C9402631
01/13/1998 00:08:00	7855		NA			TSD X10T0007506
VERIFIED	STORED	MOV	98 4627645		4295.52	X10C9402631

DISCLAIMER: The data presented in WITS consists of best available data for internal use only and is not approved for PUBLIC RELEASE. Weights and volumes may have rounding errors.

History

Report Parameter- Container ID: X10C9402631 Waste Item ID: X10C9402631-1

DATE	FACILITY	AREA	DIKE(X)	ROW(Y)	LVL(Z)	DOC ID
EVT STATUS	STAT	EVENT	COD/MANIFEST	WEIGHT(KG)	CONTAINER ID	
01/04/2001 09:25:38	7855		NA			
COMPLETED	STORED	LGY	00	4926503	4295.52	X10C9402631
01/05/2001 15:01:07	7855		NA			
COMPLETED	STORED	LGY	00	4926540	4295.52	X10C9402631
10/03/2002 00:00:00	7855		NA			
COMPLETED	STORED	INV	02	4938109	4295.52	X10C9402631
12/16/2002 00:00:00	7855		NA			JO X10J6286337
COMPLETED	STORED	INV	02	4939209	4295.52	X10C9402631

DISCLAIMER: The data presented in WITS consists of best available data for internal use only and is not approved for PUBLIC RELEASE. Weights and volumes may have rounding errors.

WASTE ITEM DESCRIPTION

X10I9416384
Revision 1.00

ALL FIELDS MUST BE COMPLETED

Generation/Process Information

W1. Generator's Name (Print)	W2. Badge Number	W3. Generator's Phone No.	W4. Mail Stop	W5. Charge No/WO
EVANS, CW	028492	(423)574-2530	6384	33706001

W6. Generator's Company	W7. Origin Division	W8. Origin Site	W9. Origin Facility	W10. Origin Room/Area	W11. Radiological Area?
LMER	003	X10	7920	118	[X] Yes [ ] No

W12. Process Stream ID	W13. Process Category	W14. Process Activity	W15. AWA Number
UNK	PRO	A49	NA

W16. Physical Form	W17. Material Type(s)	W18. Waste Item Description Attachment
SOLID	MT007 MT010	B

Waste Subcategories (Check all)

	Yes	No		Yes	No		Yes	No
W20. Biological		X	W23. Construction Debris		X	W26. Classified		X
W21. Accountable		X	W24. Medical		X	W27. Friable Asbestos		X
W22. Carcinogen		X	W25. Sanitary/Industrial		X	W28. Non-Friable Asbestos		X

W29. Waste Description

RADIOCHEMICAL PROCESSING FOR ISOTOPE SEPARATION AND PURIFICATION

DEC 1996 Approved RSW08 NA

Handling/Pickup Information

P1. Holding Site	P2. Holding Facility	P3. Holding Rm/Area	P4. Pickup Site	P5. Pickup Facility	P6. Pickup Area
X10	7920	120	X10	7920	120

Respirator	P7. Respirator	P8. Cartridge Type
	[X] None [ ] Half [ ] Full [ ] Unknown	NA

P9. Handling Instructions
NA

I0. Item/Container 1 of 1

Waste Item/Container Information

I1. Waste Item ID Number	I2. Origin Date	I3. RCRA 90-day	I4.
X10I9416384	11-13-1996	Start Date NA	(Affix Barcode Label Here)
I5. Container ID Number	**I6. PCB Start Date**	**I7. Absorbent Materials**	
X10C9402631	NA	[ ] Yes [X] No	
I8. NMC&A Form	**I9. Est Net Vol**	**I10. Units**	
NA	3	GAL	

I11. Area of Contamination	I12. Est Gross Wt	I13. Units	I14. Inner Container Type	I15. Outer Container Type
NA [ ] in² [ ] cm² [ ] ft²	5	LB	BAGP	CASKC6

I16. HP Tag No.	Surface Contamination (dpm/100cm²) Transfer	Direct Read	Dose Rate at Surface (mrem/hr)	Dose Rate at 1 Meter (mrem/hr)	Dose Rate at 1 Foot (mrem/hr)	Instrument Identification
~~NA~~ Y						
Alpha AKJ 12/16/96	<20 ~~NA~~	NA				NA
Beta/Gamma	<200 ~~NA~~	NA	200	NA	NA	7920-031
Neutron			600	NA	NA	7920-03R

Signatures and Approvals

S1. Generator	Badge	Date	S3. HP Technician	Badge	Survey Dat
SUBMITTED EVANS CW	028492	11-13-1996	SUBMITTED WAGGONER JK	032927	11-13-19
S2. Verification Officer	**Badge**	**Date**	**S4. Derivative Classifier**	**Badge**	**Date**
SUBMITTED EVANS CW	028492	11-13-1996	SUBMITTED	NA	

[redacted]

X10I9416384

TRU/TRU MIXED WASTE ATTACHMENT B

ALL FIELDS MUST BE COMPLETED

Prohibited Items	Yes	No		Yes	No
B1. Pyrophoric Materials		X	B6. Ignition Sources		X
B2. Active Chelating Agents (> 1% of waste)		X	B7. Free Liquids		X
B3. Sealed Internal containers > 1 gallon		X	B8. Etiological Agents		X
B4. Explosive Materials		X	[redacted] (Reserved)		
B5. Small Particulates (<= 1% by wt < 10um; <= 15% by wt < 200um)					X

B9. Biological Waste	B10. Chelating Agents	B11. Heat Sealed Bags	B12. Ion Exchange Resins	B13. TRUCON Code	B14. Thermal Power
☐ Yes ☒ No	☐ Yes ☒ No	☒ Yes ☐ No	☐ Yes ☒ No	OR125A	< 0.1 W/ft³

B15. Combustible Material	B16. Beryllium		B17. TRU Waste Type(s)
75 vol%	NA	☐ ppm ☐ grams	CW MW

B18. Number of Sealed Layers	B19. Sealed Layer Type(s)	B20. Special Case Waste	B21. RAD Handling Type
2	TWIST TAPE HEAT SEAL	☐ Yes ☒ No	☐ Contact ☒ Remote

NA

Radioisotope Determination Method			R7. Radioisotope	R8. Quantity	R9. Units			R10 NARM	
Document Type	Document Number(s)				Ci	grams	pCi/g	Yes	No
R1. Analysis LSID#	NA		CM-244	1.2E-1	X			NA	NA
		R2. NDA# NA							
R3. PK Form UCN 20116#	ORNL/TM-7688								
R4. Fissile Content (FGE of U-235) NA grams		R5. Enrichment (wt% of U-235) NA							
R6. Chemical Form OXIDE									

☐ R11. Radioisotope Continuation Sheet(s) _____ through _____ attached.

RCRA/TSCA Determination Method		Determination	Yes	No
Document Type	Document Number(s)			
T1. Analysis LSID#	NA	T3. RCRA Waste		X
		T4. TSCA Waste		X
T2. PK Form UCN 20116#	ORNL/TM-7688	T5. Underlying Hazardous Constituent(s) Present		X

T6. PCB Present	T7. PCB Concentration	T8. PCB Source Concentration	T9. PCB Source Concentration Range (ppm)
☐ Yes ☒ No	NA ppm	NA ppm	☒ NA ☐ <=1.99 ☐ 2 - 49.99 ☐ 50 - 499.99 ☐ >= 500

T10. Substance ID	T11. Conc	T12. Units	T13. EPA Code(s)	T14. Underlying Hazardous Constituent
NA	NA	NA	NA	☐ Yes ☒ No

T15. Substance Name

T10. Substance ID	T11. Conc	T12. Units	T13. EPA Code(s)	T14. Underlying Hazardous Constituent
				☐ Yes ☐ No

T15. Substance Name

☐ T16. Constituent Continuation Sheet(s) _____ through _____ attached.

V1. I certify that I have been provided sufficient information concerning the above described waste to apply the requirements of ES/WM-10, Waste Acceptance Criteria for the Oak Ridge Reservation, and, based on this information, I further certify that this waste material:

1) Is accurately described above and packaged in accordance with Waste Certification Procedure ORNL/TM-7688
Rev Date _____, and

2) Meet the Waste Acceptance Criteria for the TRU/TRU MIXED WASTE Category, as listed in ES/WM-10.

3) Or, if applicable, meets the conditions stipulated in variance number(s) _____

I further certify that all required documentation is attached to the UCN 2109 and that, to the best of my knowledge and belief, the information on the UCN 2109 is complete and accurate. I am currently authorized to perform Waste Certifier functions.

SUBMITTED [signature]	EVANS CW	028492	11-13-1996
Signature Waste Certifier	Printed Name	Badge Number	Date

V4. Derivative Classifier	Badge	Date
SUBMITTED	NA	

WASTE ITEM DESCRIPTION

X10I9416389
Revision 1.00

ALL FIELDS MUST BE COMPLETED

Generation/Process Information

W1. Generator's Name (Print)	W2. Badge Number	W3. Generator's Phone No.	W4. Mail Stop	W5. Charge No/WO
EVANS, CW	028492	(423)574-2530	6384	33706001

W6. Generator's Company	W7. Origin Division	W8. Origin Site	W9. Origin Facility	W10. Origin Room/Area	W11. Radiological Area
LMER	003	X10	7920	118	[X] Yes [ ] No

W12. Process Stream ID	W13. Process Category	W14. Process Activity	W15. AWA Number
UNK	PRO	A49	NA

W16. Physical Form	W17. Material Type(s)	W18. Waste Item Description Attachment
SOLID	MT010	B

Waste Subcategories (Check all)

	Yes	No		Yes	No		Yes	No
W20. Biological		X	W23. Construction Debris		X	W26. Classified		X
W21. Accountable		X	W24. Medical		X	W27. Friable Asbestos		X
W22. Carcinogen		X	W25. Sanitary/Industrial		X	W28. Non-Friable Asbestos		X

W29. Waste Description

RADIOCHEMICAL PROCESSING FOR ISOTOPE SEPARATION AND PURIFICATION

DEC 1996 Approved

Handling/Pickup Information

P1. Holding Site	P2. Holding Facility	P3. Holding Rm/Area	P4. Pickup Site	P5. Pickup Facility	P6. Pickup Area
X10	7920	120	X10	7920	120

(Received)	P7. Respirator	P8. Cartridge Type
	[X] None [ ] Half [ ] Full [ ] Unknown	NA

P9. Handling Instructions
NA

I0. Item/Container 1 of 1

Waste Item/Container Information

I1. Waste Item ID Number	I2. Origin Date	I3. RCRA 90-day	I4.
X10I9416389	11-14-1996	Start Date NA	(Affix Barcode Label Here)
I5. Container ID Number	I6. PCB Start Date	I7. Absorbent Materials	
X10C9402631	NA	[ ] Yes [X] No	
I8. NMC&A Form	I9. Est Net Vol	I10. Units	
NA	3	GAL	

I11. Area of Contamination	I12. Est Gross Wt	I13. Units	I14. Inner Container Type	I15. Outer Container Type
NA [ ] in² [ ] cm² [ ] ft²	5	LB	BAGP	CASKC6

I16. HP Tag No. ~~NA~~ Y	Surface Contamination (dpm/100cm²) Transfer	Direct Read	Dose Rate at Surface (mrem/hr)	Dose Rate at 1 Meter (mrem/hr)	Dose Rate at 1 Foot (mrem/hr)	I17. Instrument Identification
Alpha AL 11/13/96	<20 ~~NA~~	NA				NA
Beta/Gamma	<200 ~~NA~~	NA	100	NA	NA	7920-031
Neutron			500	NA	NA	792003R

Signatures and Approvals

S1. Generator	Badge	Date	S3. HP Technician	Badge	Survey Da
SUBMITTED CW EVANS CW	028492	11-14-1996	SUBMITTED WAGGONER JK	032927	11-14-19
S2. Verification Officer	**Badge**	**Date**	**S4. Derivative Classifier**	**Badge**	**Date**
SUBMITTED EVANS CW	028492	11-14-1996	SUBMITTED	NA	

[redacted]

X10I9416389

TRU/TRU MIXED WASTE
ATTACHMENT B

ALL FIELDS MUST BE COMPLETED

Prohibited Items	Yes	No		Yes	No
B1. Pyrophoric Materials		X	B6. Ignition Sources		X
B2. Active Chelating Agents (> 1% of waste)		X	B7. Free Liquids		X
B3. Sealed Internal containers > 1 gallon		X	B8. Etiological Agents		X
B4. Explosive Materials		X	(Reserved)		
B5. Small Particulates (<= 1% by wt < 10um; <= 15% by wt < 200um)					X

B9. Biological Waste	B10. Chelating Agents	B11. Heat Sealed Bags	B12. Ion Exchange Resins	B13. TRUCON Code	B14. Thermal Power
☐ Yes ☒ No	☐ Yes ☒ No	☒ Yes ☐ No	☐ Yes ☒ No	OR125A	< 0.1 W/ft³

B15. Combustible Material	B16. Beryllium	B17. TRU Waste Type(s)
50 vol%	NA ☐ ppm ☐ grams	CW MW

B18. Number of Sealed Layers	B19. Sealed Layer Type(s)	B20. Special Case Waste	B21. RAD Handling Type
2	TWIST TAPE HEAT SEAL	☐ Yes ☒ No	☐ Contact ☒ Remote

NA

Radioisotope Determination/Method

Document Type	Document Number(s)
R1. Analysis LSID#	NA
R2. NDA#	NA
R3. PK Form UCN 20116#	ORNL/TM-7688
R4. Fissile Content (FGE of U-235)	NA grams
R5. Enrichment (wt% of U-235)	NA
R6. Chemical Form	OXIDE

R7. Radioisotope	R8. Quantity	R9. Units Ci	grams	DCFs	R10. NARM Yes	No
CM-244	1.0E-1	X			NA	NA

☐ R11. Radioisotope Continuation Sheet(s) _____ through _____ attached.

RCRA/TSCA Determination Method

Document Type	Document Number(s)
T1. Analysis LSID#	NA
T2. PK Form UCN 20116#	ORNL/TM-7688

Determination	Yes	No
T3. RCRA Waste		X
T4. TSCA Waste		X
T5. Underlying Hazardous Constituent(s) Present		X

T6. PCB Present	T7. PCB Concentration	T8. PCB Source Concentration	T9. PCB Source Concentration Range (ppm)
☐ Yes ☒ No	NA ppm	NA ppm	☒ NA ☐ <=1.99 ☐ 2 - 49.99 ☐ 50 - 499.99 ☐ >= 500

T10. Substance ID	T11. Conc	T12. Units	T13. EPA Code(s)	T14. Underlying Hazardous Constituent
NA	NA	NA	NA	☐ Yes ☒ No

T15. Substance Name

T10. Substance ID	T11. Conc	T12. Units	T13. EPA Code(s)	T14. Underlying Hazardous Constituent
				☐ Yes ☐ No

T15. Substance Name

☐ T16. Constituent Continuation Sheet(s) _____ through _____ attached.

V1. I certify that I have been provided sufficient information concerning the above described waste to apply the requirements of ES/WM-10, Waste Acceptance Criteria for the Oak Ridge Reservation, and, based on this information, I further certify that this waste material:

1) Is accurately described above and packaged in accordance with Waste Certification Procedure ORNL/TM-7688
Rev Date _____, and

2) Meet the Waste Acceptance Criteria for the TRU/TRU MIXED WASTE Category, as listed in ES/WM-10.

3) Or, if applicable, meets the conditions stipulated in variance number(s) _____

I further certify that all required documentation is attached to the UCN 2109 and that, to the best of my knowledge and belief, the information on the UCN 2109 is complete and accurate. I am currently authorized to perform Waste Certifier functions.

SUBMITTED	EVANS CW	028492	11-14-1996
Signature Waste Certifier	Printed Name	Badge Number	Date

S4. Derivative Classifier	Badge	Date
SUBMITTED	NA	

id

WASTE ITEM DESCRIPTION

X10I9416390
Revision 1.00

ALL FIELDS MUST BE COMPLETED

Generation/Process Information

W1. Generator's Name (Print)	W2. Badge Number	W3. Generator's Phone No.	W4. Mail Stop	W5. Charge No/WO
EVANS, CW	028492	(423)574-2530	6384	33706001

W6. Generator's Company	W7. Origin Division	W8. Origin Site	W9. Origin Facility	W10. Origin Room/Area	W11. Radiological Area
LMER	003	X10	7920	118	[X] Yes [ ] N

W12. Process Stream ID	W13. Process Category	W14. Process Activity	W15. AWA Number
UNK	PRO	A49	NA

W16. Physical Form	W17. Material Type(s)	W18. Waste Item Description Attachment
SOLID	MT007 MT010 MT008	B

Waste Subcategories (Check all)

	Yes	No		Yes	No		Yes	N
W20. Biological		X	W23. Construction Debris		X	W26. Classified		
W21. Accountable		X	W24. Medical		X	W27. Friable Asbestos		
W22. Carcinogen		X	W25. Sanitary/Industrial		X	W28. Non-Friable Asbestos		

W29. Waste Description

RADIOCHEMICAL PROCESSING FOR ISOTOPE SEPARATION AND PURIFICATION

DEC 1996
Approved
RSWOG
AKL

Handling/Pickup Information

P1. Holding Site	P2. Holding Facility	P3. Holding Rm/Area	P4. Pickup Site	P5. Pickup Facility	P6. Pickup Area
X10	7920	120	X10	7920	120

(Reserved)	P7. Respirator	P8. Cartridge Type
	[X] None [ ] Half [ ] Full [ ] Unknown	NA

P9. Handling Instructions
NA

I0. Item/Container 1 of 1

Waste Item/Container Information

I1. Waste Item ID Number	I2. Origin Date	I3. RCRA 90-day Start Date	I4.
X10I9416390	11-14-1996	NA	(Affix Barcode Label Here)

I5. Container ID Number	I6. PCB Start Date	I7. Absorbent Materials	
X10C9402631	NA	[ ] Yes	[X] No

I8. NMC&A Form	I9. Est Net Vol	I10. Units
NA	3	GAL

I11. Area of Contamination	I12. Est Gross Wt	I13. Units	I14. Inner Container Type	I15. Outer Container Typ
NA [ ] in² [ ] cm² [ ] ft²	5	LB	BAGP	CASKC6

I16. HP Tag No. NA Y	Surface Contamination (dpm/100 cm²) Transfer	Surface Contamination (dpm/100 cm²) Direct Read	Dose Rate at Surface (mrem/hr)	Dose Rate at 1 Meter (mrem/hr)	Dose Rate at 1 Foot (mrem/hr)	Instrument Identification
Alpha	220 ~~NA~~	NA				NA
Beta/Gamma	<200 ~~NA~~	NA	120	NA	NA	7920-03I
Neutron			800	NA	NA	7920-03R

Signatures and Approvals

S1. Generator	Badge	Date	S3. HP Technician	Badge	Survey Da
SUBMITTED EVANS CW	028492	11-14-1996	SUBMITTED WAGGONER JK	032927	11-14-19
S2. Verification Officer	**Badge**	**Date**	**S4. Derivative Classifier**	**Badge**	**Date**
SUBMITTED EVANS CW	028492	11-14-1996	SUBMITTED	NA	

[redacted]

X10I9416390

TRU/TRU MIXED WASTE ATTACHMENT B

ALL FIELDS MUST BE COMPLETED

Prohibited Items	Yes	No		Yes	No
B1. Pyrophoric Materials		X	B6. Ignition Sources		X
B2. Active Chelating Agents (> 1% of waste)		X	B7. Free Liquids		X
B3. Sealed Internal containers > 1 gallon		X	B8. Etiological Agents		X
B4. Explosive Materials		X	(Reserved)		
B5. Small Particulates (<= 1% by wt < 10um; <= 15% by wt < 200um)					X

B9. Biological Waste	B10. Chelating Agents	B11. Heat Sealed Bags	B12. Ion Exchange Resins	B13. TRUCON Code	B14. Thermal Power
☐ Yes ☒ No	☐ Yes ☒ No	☒ Yes ☐ No	☐ Yes ☒ No	OR125A	< 0.1 W/ft³

B15. Combustible Material	B16. Beryllium		B17. TRU Waste Type(s)
100 vol%	NA	☐ ppm ☐ grams	CW

B18. Number of Sealed Layers	B19. Sealed Layer Type(s)	B20. Special Case Waste	B21. RAD Handling Type
2	TWIST TAPE HEAT SEAL	☐ Yes ☒ No	☐ Contact ☒ Remote

N A

Radioisotope Determination Method			R7. Radioisotope	R8. Quantity	R9. Units Ci	grams	PCi/g	R10. NARM Yes	No
Document Type	Document Number(s)								
R1. Analysis LSID#	NA		CM-244	1.6E-1	X			NA	NA
		R2. NDA# NA							
R3. PK Form UCN 20116#	ORNL/TM-7688								
R4. Fissile Content (FGE of U-235) NA grams		R5. Enrichment (wt% of U-235) NA							
R6. Chemical Form OXIDE									

☐ R11. Radioisotope Continuation Sheet(s) _____ through _____ attached.

RCRA/TSCA Determination Method			Determination	Yes	No
Document Type	Document Number(s)				
T1. Analysis LSID#	NA		T3. RCRA Waste		X
			T4. TSCA Waste		X
T2. PK Form UCN 20116#	ORNL/TM-7688		T5. Underlying Hazardous Constituent(s) Present		X

T6. PCB Present	T7. PCB Concentration	T8. PCB Source Concentration	T9. PCB Source Concentration Range (ppm)
☐ Yes ☒ No	NA ppm	NA ppm	☒ NA ☐ <=1.99 ☐ 2 - 49.99 ☐ 50 - 499.99 ☐ >= 500

T10. Substance ID	T11. Conc	T12. Units	T13. EPA Code(s)	T14. Underlying Hazardous Constituent
NA	NA	NA	NA	☐ Yes ☒ No

T15. Substance Name

T10. Substance ID	T11. Conc	T12. Units	T13. EPA Code(s)	T14. Underlying Hazardous Constituent
				☐ Yes ☐ No

T15. Substance Name

☐ T16. Constituent Continuation Sheet(s) _____ through _____ attached.

V1. I certify that I have been provided sufficient information concerning the above described waste to apply the requirements of ES/WM-10, Waste Acceptance Criteria for the Oak Ridge Reservation, and, based on this information, I further certify that this waste material:

1) Is accurately described above and packaged in accordance with Waste Certification Procedure ORNL/TM-7688
Rev Date _____, and

2) Meet the Waste Acceptance Criteria for the TRU/TRU MIXED WASTE Category, as listed in ES/WM-10.

3) Or, if applicable, meets the conditions stipulated in variance number(s) _____

I further certify that all required documentation is attached to the UCN 2109 and that, to the best of my knowledge and belief, the information on the UCN 2109 is complete and accurate. I am currently authorized to perform Waste Certifier functions.

SUBMITTED	EVANS CW	028492	11-14-1996
Signature Waste Certifier	Printed Name	Badge Number	Date

S4. Derivative Classifier	Badge	Date
SUBMITTED	NA	

ld

WASTE ITEM DESCRIPTION

X1019416485
Revision 1.00

ALL FIELDS MUST BE COMPLETED

Generation/Process Information

W1. Generator's Name (Print)	W2. Badge Number	W3. Generator's Phone No.	W4. Mail Stop	W5. Charge No/WO
EVANS, CW	028492	(423)574-2530	6384	33706001

W6. Generator's Company	W7. Origin Division	W8. Origin Site	W9. Origin Facility	W10. Origin Room/Area	W11. Radiological Area?
LMER	003	X10	7920	118	[X] Yes [ ] No

W12. Process Stream ID	W13. Process Category	W14. Process Activity	W15. AWA Number
UNK	PRO	A49	NA

W16. Physical Form	W17. Material Type(s)	W18. Waste Item Description Attachment
SOLID	MT005 MT010 MT007	B

Waste Subcategories (Check all)

	Yes	No		Yes	No		Yes	No
W20. Biological		X	W23. Construction Debris		X	W26. Classified		X
W21. Accountable		X	W24. Medical		X	W27. Friable Asbestos		X
W22. Carcinogen		X	W25. Sanitary/Industrial		X	W28. Non-Friable Asbestos		X

W29. Waste Description

RADIOCHEMICAL PROCESSING FOR ISOTOPE SEPARATION AND PURIFICATION

Approved
PSWOG
ARL

Handling/Pickup Information

P1. Holding Site	P2. Holding Facility	P3. Holding Rm/Area	P4. Pickup Site	P5. Pickup Facility	P6. Pickup Area
X10	7920	120	X10	7920	120

(Reserved)	P7. Respirator	P8. Cartridge Type
	[X] None [ ] Half [ ] Full [ ] Unknown	NA

P9. Handling Instructions
NA

I0. Item/Container 1 of 1

Waste Item/Container Information

I1. Waste Item ID Number	I2. Origin Date	I3. RCRA 90-day Start Date	I4.
X1019416485	12-06-1996	NA	(Affix Barcode Label Here)

I5. Container ID Number	I6. PCB Start Date	I7. Absorbent Materials
X10C9402631	NA	[ ] Yes [X] No

I8. NMC&A Form	I9. Est Net Vol	I10. Units
NA	30	GAL

I11. Area of Contamination	I12. Est Gross Wt	I13. Units	I14. Inner Container Type	I15. Outer Container Type
NA [ ] in² [ ] cm² [ ] ft²	100	LB	BAGP	CASKC6

I16. HP Tag No. NA Y	Surface Contamination (dpm/100cm²) Transfer	Direct/Read	Dose Rate at Surface (mrem/h)	Dose Rate at 1 Meter (mrem/h)	Dose Rate at 1 Foot (mrem/h)	Instrument Identification
Alpha HJW 7/15/96	<20 ~~NA~~	NA				NA
Beta/Gamma	<200 ~~NA~~	NA	1200	NA	NA	7920-071
Neutron			2800	NA	NA	REM-177

Signatures and Approvals

S1. Generator	Badge	Date	S3. HP Technician	Badge	Survey Da
SUBMITTED EVANS CW	028492	12-06-1996	SUBMITTED WAGGONER JK	032927	12-06-19
S2. Verification Officer	**Badge**	**Date**	**S4. Derivative Classifier**	**Badge**	**Date**
SUBMITTED EVANS CW	028492	12-06-1996	SUBMITTED	NA	

[redacted]

X1: Document ID Number

X10I9416485

TRU/TRU MIXED WASTE ATTACHMENT B

ALL FIELDS MUST BE COMPLETED

Prohibited Items	Yes	No		Yes	No
B1. Pyrophoric Materials		X	B6. Ignition Sources		X
B2. Active Chelating Agents (> 1% of waste)		X	B7. Free Liquids		X
B3. Sealed Internal containers > 1 gallon		X	B8. Etiological Agents		X
B4. Explosive Materials		X	(Reserved)		
B5. Small Particulates (<= 1% by wt < 10um; <= 15% by wt < 200um)					X

B9. Biological Waste	B10. Chelating Agents	B11. Heat Sealed Bags	B12. Ion Exchange Resins	B13. TRUCON Code	B14. Thermal Power
☐ Yes ☒ No	☐ Yes ☒ No	☐ Yes ☒ No	☐ Yes ☒ No	OR125A	< 0.1 W/ft³

B15. Combustible Material	B16. Beryllium		B17. TRU Waste Type(s)
25 vol%	NA	☐ ppm ☐ grams	CW GW MW

B18. Number of Sealed Layers	B19. Sealed Layer Type(s)	B20. Special Case Waste	B21. RAD Handling Type
2	DRAW STRING BAGS	☐ Yes ☒ No	☐ Contact ☒ Remote

NA

Radioisotope Determination Method			R7. Radioisotope	R8. Quantity	R9. Units			R10. NARM	
Document Type	Document Number(s)				Ci	grams	nCi/g	Yes	No
R1. Analysis LSID#	NA		CM-244	5.64E-1	X			NA	NA
		R2. NDA# NA							
R3. PK Form UCN 20116#	ORNL/TM-7688								
R4. Fissile Content (FGE of U-235) NA grams	R5. Enrichment (wt% of U-235) NA								
R6. Chemical Form OXIDE									

☐ R11. Radioisotope Continuation Sheet(s) _____ through _____ attached.

RCRA/TSCA Determination Method		Determination	Yes	No
Document Type	Document Number(s)			
T1. Analysis LSID#	NA	T3. RCRA Waste		X
		T4. TSCA Waste		X
T2. PK Form UCN 20116#	ORNL/TM-7688	T5. Underlying Hazardous Constituent(s) Present		X

T6. PCB Present	T7. PCB Concentration	T8. PCB Source Concentration	T9. PCB Source Concentration Range (ppm)
☐ Yes ☒ No	NA ppm	NA ppm	☒ NA ☐ <=1.99 ☐ 2 - 49.99 ☐ 50 - 499.99 ☐ >= 500

T10. Substance ID	T11. Conc	T12. Units	T13. EPA Code(s)	T14. Underlying Hazardous Constituent
NA	NA	NA	NA	☐ Yes ☒ No

T15. Substance Name

T10. Substance ID	T11. Conc	T12. Units	T13. EPA Code(s)	T14. Underlying Hazardous Constituent
				☐ Yes ☐ No

T15. Substance Name

☐ T16. Constituent Continuation Sheet(s) _____ through _____ attached.

V1. I certify that I have been provided sufficient information concerning the above described waste to apply the requirements of ES/WM-10, Waste Acceptance Criteria for the Oak Ridge Reservation, and, based on this information, I further certify that this waste material:

1) Is accurately described above and packaged in accordance with Waste Certification Procedure ORNL/TM-7688 Rev Date _____, and

2) Meet the Waste Acceptance Criteria for the TRU/TRU MIXED WASTE Category, as listed in ES/WM-10.

3) Or, if applicable, meets the conditions stipulated in variance number(s) _____

I further certify that all required documentation is attached to the UCN 2109 and that, to the best of my knowledge and belief, the information on the UCN 2109 is complete and accurate. I am currently authorized to perform Waste Certifier functions.

SUBMITTED	EVANS CW	028492	12-06-1996
Signature Waste Certifier	Printed Name	Badge Number	Date

S4. Derivative Classifier	Badge	Date
SUBMITTED	NA	

WASTE ITEM DESCRIPTION

X1019416491
Revision 1.00

ALL FIELDS MUST BE COMPLETED

Generation/Process Information

W1. Generator's Name (Print)	W2. Badge Number	W3. Generator's Phone No.	W4. Mail Stop	W5. Charge No/WO
EVANS, CW	028492	(423)574-2530	6384	33706001

W6. Generator's Company	W7. Origin Division	W8. Origin Site	W9. Origin Facility	W10. Origin Room/Area	W11. Radiological Area
LMER	003	X10	7920	118	[X] Yes [ ] No

W12. Process Stream ID	W13. Process Category	W14. Process Activity	W15. AWA Number
UNK	PRO	A49	NA

W16. Physical Form	W17. Material Type(s)	W18. Waste Item Description Attachment
SOLID	MT007 MT010	B

Waste Subcategories (Check all)

	Yes	No		Yes	No		Yes	No
W20. Biological		X	W23. Construction Debris		X	W26. Classified		X
W21. Accountable		X	W24. Medical		X	W27. Friable Asbestos		X
W22. Carcinogen		X	W25. Sanitary/Industrial		X	W28. Non-Friable Asbestos		X

W29. Waste Description

RADIOCHEMICAL PROCESSING FOR ISOTOPE SEPARATION AND PURIFICATION

DEC 1996
Approved
RSWOG
ARL

Handling/Pickup Information

P1. Holding Site	P2. Holding Facility	P3. Holding Rm/Area	P4. Pickup Site	P5. Pickup Facility	P6. Pickup Area
X10	7920	120	X10	7920	120

(Reserved)	P7. Respirator	P8. Cartridge Type
	[X] None [ ] Half [ ] Full [ ] Unknown	NA

P9. Handling Instructions
NA

I0. Item/Container 1 of 1

Waste Item/Container Information

I1. Waste Item ID Number	I2. Origin Date	I3. RCRA 90-day Start Date	I4.
X1019416491	12-06-1996	NA	(Affix Barcode Label Here)

I5. Container ID Number	I6. PCB Start Date	I7. Absorbent Materials
X10C9402631	NA	[ ] Yes [X] No

I8. NMC&A Form	I9. Est Net Vol	I10. Units
NA	20	GAL

I11. Area of Contamination	I12. Est Gross Wt	I13. Units	I14. Inner Container Type	I15. Outer Container Type
NA [ ] in² [ ] cm² [ ] ft²	60	LB	BAGP	CASKC6

I16. HP Tag No.	Surface Contamination (dpm/100cm²) Transfer	Surface Contamination (dpm/100cm²) Direct Read	Dose Rate at Surface (mrem/hr)	Dose Rate at 1 Meter (mrem/hr)	Dose Rate at 1 Foot (mrem/hr)	Instrument Identification
NA Y						
Alpha	<20 NA	NA				NA
Beta/Gamma	<200 NA	NA	60	NA	NA	7920-071
Neutron			5	NA	NA	REM-177

Signatures and Approvals

S1. Generator	Badge	Date	S3. HP Technician	Badge	Survey Da
SUBMITTED EVANS CW	028492	12-06-1996	SUBMITTED WAGGONER JK	032927	12-06-19
S2. Verification Officer	**Badge**	**Date**	**S4. Derivative Classifier**	**Badge**	**Date**
SUBMITTED EVANS CW	028492	12-06-1996	SUBMITTED	NA	

p 1 4

TRU/TRU MIXED WASTE ATTACHMENT B

X10I9416491

ALL FIELDS MUST BE COMPLETED

Prohibited Items	Yes	No		Yes	No
B1. Pyrophoric Materials		X	B6. Ignition Sources		X
B2. Active Chelating Agents (> 1% of waste)		X	B7. Free Liquids		X
B3. Sealed Internal containers > 1 gallon		X	B8. Etiological Agents		X
B4. Explosive Materials		X	(Reserved)		
B5. Small Particulates (<= 1% by wt < 10um; <= 15% by wt < 200um)					X

B9. Biological Waste	B10. Chelating Agents	B11. Heat Sealed Bags	B12. Ion Exchange Resins	B13. TRUCON Code	B14. Thermal Power
☐ Yes ☒ No	☐ Yes ☒ No	☐ Yes ☒ No	☐ Yes ☒ No	OR125A	< 0.1 W/ft³

B15. Combustible Material	B16. Beryllium		B17. TRU Waste Type(s)
50 vol%	NA	☐ ppm ☐ grams	CW MW

B18. Number of Sealed Layers	B19. Sealed Layer Type(s)	B20. Special Case Waste	B21. RAD Handling Type
2	DRAW STRING BAGS	☐ Yes ☒ No	☐ Contact ☒ Remote

N A

Radioisotope Determination Method			R7. Radioisotope	R8. Quantity	R9. Units			R10. NARM	
Document Type	Document Number(s)				Ci	grams	pCi/g	Yes	No
R1. Analysis LSID#	NA		CM-244	1.2E-3	X			NA	NA
		R2. NDA# NA							
R3. PK Form UCN 20116#	ORNL/TM-7688								
R4. Fissile Content (FGE of U-235) NA grams		R5. Enrichment (wt% of U-235) NA							
R6. Chemical Form OXIDE									

☐ R11. Radioisotope Continuation Sheet(s) _____ through _____ attached.

RCRA/TSCA Determination Method		Determination	Yes	No
Document Type	Document Number(s)			
T1. Analysis LSID#	NA	T3. RCRA Waste		X
		T4. TSCA Waste		X
T2. PK Form UCN 20116#	ORNL/TM-7688	T5. Underlying Hazardous Constituent(s) Present		X

T6. PCB Present	T7. PCB Concentration	T8. PCB Source Concentration	T9. PCB Source Concentration Range (ppm)
☐ Yes ☒ No	NA ppm	NA ppm	☒ NA ☐ <=1.99 ☐ 2 - 49.99 ☐ 50 - 499.99 ☐ >= 500

T10. Substance ID	T11. Conc	T12. Units	T13. EPA Code(s)	T14. Underlying Hazardous Constituent
NA	NA	NA	NA	☐ Yes ☒ No

T15. Substance Name

T10. Substance ID	T11. Conc	T12. Units	T13. EPA Code(s)	T14. Underlying Hazardous Constituent
				☐ Yes ☐ No

T15. Substance Name

☐ T16. Constituent Continuation Sheet(s) _____ through _____ attached.

VI. I certify that I have been provided sufficient information concerning the above described waste to apply the requirements of ES/WM-10, Waste Acceptance Criteria for the Oak Ridge Reservation, and, based on this information, I further certify that this waste material:

1) Is accurately described above and packaged in accordance with Waste Certification Procedure ORNL/TM-7688 Rev Date _____, and

2) Meet the Waste Acceptance Criteria for the TRU/TRU MIXED WASTE Category, as listed in ES/WM-10.

3) Or, if applicable, meets the conditions stipulated in variance number(s) _____

I further certify that all required documentation is attached to the UCN 2109 and that, to the best of my knowledge and belief, the information on the UCN 2109 is complete and accurate. I am currently authorized to perform Waste Certifier functions.

SUBMITTED	EVANS CW	028492	12-06-1996
Signature Waste Certifier	Printed Name	Badge Number	Date

S4. Derivative Classifier	Badge	Date
SUBMITTED	NA	

WASTE ITEM DESCRIPTION

X10I9416492
Revision 1.00

ALL FIELDS MUST BE COMPLETED

Generation Process Information

W1. Generator's Name (Print)	W2. Badge Number	W3. Generator's Phone No.	W4. Mail Stop	W5. Charge No/WO
EVANS, CW	028492	(423)574-2530	6384	33706001

W6. Generator's Company	W7. Origin Division	W8. Origin Site	W9. Origin Facility	W10. Origin Room/Area	W11. Radiological Area
LMER	003	X10	7920	118	[X] Yes [ ] No

W12. Process Stream ID	W13. Process Category	W14. Process Activity	W15. AWA Number
UNK	PRO	A49	NA

W16. Physical Form	W17. Material Type(s)	W18. Waste Item Description Attachment
SOLID	MT010 MT007	B

Waste Subcategories (Check all)

	Yes	No		Yes	No		Yes	N
W20. Biological		X	W23. Construction Debris		X	W26. Classified		
W21. Accountable		X	W24. Medical		X	W27. Friable Asbestos		
W22. Carcinogen		X	W25. Sanitary/Industrial		X	W28. Non-Friable Asbestos		

W29. Waste Description

RADIOCHEMICAL PROCESSING FOR ISOTOPE SEPARATION AND PURIFICATION

DEC 1996 Approved RSW AKL

Pickup Information

P1. Holding Site	P2. Holding Facility	P3. Holding Rm/Area	P4. Pickup Site	P5. Pickup Facility	P6. Pickup Area
X10	7920		X10	7920	120

(Reserved)	P7. Respirator	P8. Cartridge Type
	[X] None [ ] Half [ ] Full [ ] Unknown	NA

P9. Handling Instructions
NA

I0. Item/Container 1 of 1

Waste Item/Container Information

I1. Waste Item ID Number	I2. Origin Date	I3. RCRA 90-day Start Date	I4.
X10I9416492	12-06-1996	NA	(Affix Barcode Label Here)

I5. Container ID Number	I6. PCB Start Date	I7. Absorbent Materials	I8. NMC&A Form	I9. Est Net Vol	I10. Units
X10C9402631	NA	[ ] Yes [X] No	NA	20	GAL

I11. Area of Contamination	I12. Est Gross Wt	I13. Units	I14. Inner Container Type	I15. Outer Container Type
NA [ ] in² [ ] cm² [ ] ft²	60	LB	BAGP	CASKC6

I16. HP Tag No. NA Y	Surface Contamination (dpm/100cm²) Transfer	Surface Contamination (dpm/100cm²) Direct Read	Dose Rate at Surface (mrem/hr)	Dose Rate at 1 Meter (mrem/hr)	Dose Rate at 1 Foot (mrem/hr)	Instrument Identification
Alpha	NA <20	NA				NA
Beta/Gamma	NA <200	NA	10	NA	NA	7920-071
Neutron			2	NA	NA	REM-177

Signatures and Approvals

S1. Generator	Badge	Date	S3. HP Technician	Badge	Survey Da
SUBMITTED EVANS CW	028492	12-06-1996	SUBMITTED WAGGONER JK	032927	12-06-19

S2. Verification Officer	Badge	Date	S4. Derivative Classifier	Badge	Date
SUBMITTED EVANS CW	028492	12-06-1996	SUBMITTED	NA	

[redacted]

X10I94P6492

TRU/TRU MIXED WASTE ATTACHMENT B

ALL FIELDS MUST BE COMPLETED

Prohibited Items	Yes	No		Yes	No
B1. Pyrophoric Materials		X	B6. Ignition Sources		X
B2. Active Chelating Agents (> 1% of waste)		X	B7. Free Liquids		X
B3. Sealed Internal containers > 1 gallon		X	B8. Etiological Agents		X
B4. Explosive Materials		X	(Reserved)		
B5. Small Particulates (<= 1% by wt < 10um; <= 15% by wt < 200um)					X

B9. Biological Waste	B10. Chelating Agents	B11. Heat Sealed Bags	B12. Ion Exchange Resins	B13. TRUCON Code	B14. Thermal Power
[ ] Yes [X] No	[ ] Yes [X] No	[ ] Yes [X] No	[ ] Yes [X] No	OR125A	< 0.1 W/ft³

B15. Combustible Material	B16. Beryllium	B17. TRU Waste Type(s)
75 vol%	NA [ ] ppm [ ] grams	CW MW

B18. Number of Sealed Layers	B19. Sealed Layer Type(s)	B20. Special Case Waste	B21. RAD Handling Type
2	DRAW STRING BAGS	[ ] Yes [X] No	[ ] Contact [X] Remote

NA

Radioisotope Determination Method				R7. Radioisotope	R8. Quantity	R9. Units			R10. NARM	
Document Type(s)	Document Number(s)					Ci	grams	pCi/g	Yes	No
R1. Analysis LSID#	NA			CM-244	4.4E-4	X			NA	NA
		R2. NDA#	NA							
R3. PK Form UCN 20116#	ORNL/TM-7688									
R4. Fissile Content (FGE of U-235)		R5. Enrichment (wt% of U-235)								
NA grams		NA								
R6. Chemical Form										
OXIDE										

[ ] R11. Radioisotope Continuation Sheet(s) _____ through _____ attached.

RCRA/TSCA Determination Method		Determination	Yes	No
Document Type(s)	Document Number(s)			
T1. Analysis LSID#	NA	T3. RCRA Waste		X
		T4. TSCA Waste		X
T2. PK Form UCN 20116#	ORNL/TM-7688	T5. Underlying Hazardous Constituent(s) Present		X

T6. PCB Present	T7. PCB Concentration	T8. PCB Source Concentration	T9. PCB Source Concentration Range (ppm)
[ ] Yes [X] No	NA ppm	NA ppm	[X] NA [ ] <=1.99 [ ] 2 - 49.99 [ ] 50 - 499.99 [ ] >= 500

T10. Substance ID	T11. Conc	T12. Units	T13. EPA Code(s)	T14. Underlying Hazardous Constituent
NA	NA	NA	NA	[ ] Yes [X] No

T15. Substance Name

T10. Substance ID	T11. Conc	T12. Units	T13. EPA Code(s)	T14. Underlying Hazardous Constituent
				[ ] Yes [ ] No

T15. Substance Name

[ ] T16. Constituent Continuation Sheet(s) _____ through _____ attached.

V1. *I certify that I have been provided sufficient information concerning the above described waste to apply the requirements of ES/WM-10, Waste Acceptance Criteria for the Oak Ridge Reservation, and, based on this information, I further certify that this waste material:*

1) Is accurately described above and packaged in accordance with Waste Certification Procedure ORNL/TM-7688
Rev Date _____, and

2) Meet the Waste Acceptance Criteria for the TRU/TRU MIXED WASTE Category, as listed in ES/WM-10.

3) Or, if applicable, meets the conditions stipulated in variance number(s) _____

I further certify that all required documentation is attached to the UCN 2109 and that, to the best of my knowledge and belief, the information on the UCN 2109 is complete and accurate. I am currently authorized to perform Waste Certifier functions.

SUBMITTED	EVANS CW	028492	12-06-1996
Signature Waste Certifier	Printed Name	Badge Number	Date

S4. Derivative Classifier	Badge	Date
SUBMITTED	NA	

ld

WASTE ITEM DESCRIPTION

X10I9416494
Revision 1.00

ALL FIELDS MUST BE COMPLETED

Generation Process Information

W1. Generator's Name (Print)	W2. Badge Number	W3. Generator's Phone No.	W4. Mail Stop	W5. Charge No/WO
EVANS, CW	028492	(423)574-2530	6384	33706001

W6. Generator's Company	W7. Origin Division	W8. Origin Site	W9. Origin Facility	W10. Origin Room/Area	W11. Radiological Area?
LMER	003	X10	7920	118	[X] Yes [ ] No

W12. Process Stream ID	W13. Process Category	W14. Process Activity	W15. AWA Number
UNK	PRO	A49	NA

W16. Physical Form	W17. Material Type(s)	W18. Waste Item Description Attachment
SOLID	MT005 MT007 MT010	B

Waste Subcategories (Check all)

	Yes	No		Yes	No		Yes	No
W20. Biological		X	W23. Construction Debris		X	W26. Classified		X
W21. Accountable		X	W24. Medical		X	W27. Friable Asbestos		X
W22. Carcinogen		X	W25. Sanitary/Industrial		X	W28. Non-Friable Asbestos		X

W29. Waste Description

RADIOCHEMICAL PROCESSING FOR ISOTOPE SEPARATION AND PURIFICATION

DEC 1996
Approved
Locked

Pickup Information

P1. Holding Site	P2. Holding Facility	P3. Holding Rm/Area	P4. Pickup Site	P5. Pickup Facility	P6. Pickup Area
X10	7920	120	X10	7920	120

Reserved	P7. Respirator	P8. Cartridge Type
	[X] None [ ] Half [ ] Full [ ] Unknown	NA

P9. Handling Instructions
NA

I0. Item/Container 1 of 1

Waste Item/Container Information

I1. Waste Item ID Number	I2. Origin Date	I3. RCRA 90-day Start Date	I4.
X10I9416494	12-06-1996	NA	(Affix Barcode Label Here)

I5. Container ID Number	I6. PCB Start Date	I7. Absorbent Materials	I8. NMC&A Form	I9. Est Net Vol	I10. Units
X10C9402631	NA	[ ] Yes [X] No	NA	30	GAL

I11. Area of Contamination	I12. Est Gross Wt	I13. Units	I14. Inner Container Type	I15. Outer Container Type
NA [ ] in² [ ] cm² [ ] ft²	150	LB	BAGP	CASKC6

I16. HP Tag No. ~~NA~~ Y	Surface Contamination (dpm/100 cm²) Transfer	Surface Contamination (dpm/100 cm²) Direct Read	Dose Rate at Surface (mrem/hr)	Dose Rate at 1 Meter (mrem/hr)	Dose Rate at 1 Foot (mrem/hr)	Instrument Identification
Alpha AKU Y13/SK	<20 ~~NA~~	NA				NA
Beta/Gamma	<2000 ~~NA~~	NA	230	NA	NA	7920-071
Neutron			180	NA	NA	REM-177

Signatures and Approvals

S1. Generator	Badge	Date	S3. HP Technician	Badge	Survey Dat
SUBMITTED EVANS CW	028492	12-06-1996	SUBMITTED WAGGONER JK	032927	12-06-19
S2. Verification Officer	**Badge**	**Date**	**S4. Derivative Classifier**	**Badge**	**Date**
SUBMITTED EVANS CW	028492	12-06-1996	SUBMITTED	NA	

[redacted]

X10I9416494

TRU/TRU MIXED WASTE ATTACHMENT B

ALL FIELDS MUST BE COMPLETED

Prohibited Items	Yes	No		Yes	No
B1. Pyrophoric Materials		X	B6. Ignition Sources		X
B2. Active Chelating Agents (> 1% of waste)		X	B7. Free Liquids		X
B3. Sealed Internal containers > 1 gallon		X	B8. Etiological Agents		X
B4. Explosive Materials		X	(Reserved)		
B5. Small Particulates (<= 1% by wt < 10um; <= 15% by wt < 200um)					X

B9. Biological Waste	B10. Chelating Agents	B11. Heat Sealed Bags	B12. Ion Exchange Resins	B13. TRUCON Code	B14. Thermal Power
☐ Yes ☒ No	☐ Yes ☒ No	☐ Yes ☒ No	☐ Yes ☒ No	OR125A	< 0.1 W/ft³

B15. Combustible Material	B16. Beryllium		B17. TRU Waste Type(s)
25 vol%	NA	☐ ppm ☐ grams	CW GW MW

B18. Number of Sealed Layers	B19. Sealed Layer Type(s)	B20. Special Case Waste	B21. RAD Handling Type
2	DRAW STRING BAGS	☐ Yes ☒ No	☐ Contact ☒ Remote

NA

R1-R6 Radioisotope Determination Method			R7 Radioisotope	R8 Quantity	R9 Units			R10 NA	R11 MM
Document Type	Document Number(s)				Ci	grams	pCi/g	Yes	No
R1. Analysis LSID#	NA		CM-244	3.69E-2	X			NA	NA
		R2. NDA# NA							
R3. PK Form UCN 20116#	ORNL/TM-7688								
R4. Fissile Content (FGE of U-235) NA grams		R5. Enrichment (wt% of U-235) NA							
R6. Chemical Form OXIDE									

☐ R11. Radioisotope Continuation Sheet(s) _____ through _____ attached.

RCRA/TSCA Determination Method		Determination	Yes	No
Document Type	Document Number(s)			
T1. Analysis LSID#	NA	T3. RCRA Waste		X
		T4. TSCA Waste		X
T2. PK Form UCN 20116#	ORNL/TM-7688	T5. Underlying Hazardous Constituent(s) Present		X

T6. PCB Present	T7. PCB Concentration	T8. PCB Source Concentration	T9. PCB Source Concentration Range (ppm)
☐ Yes ☒ No	NA ppm	NA ppm	☒ NA ☐ <=1.99 ☐ 2 - 49.99 ☐ 50 - 499.99 ☐ >= 500

T10. Substance ID	T11. Conc	T12. Units	T13. EPA Code(s)	T14. Underlying Hazardous Constituent
NA	NA	NA	NA	☐ Yes ☒ No

T15. Substance Name

T10. Substance ID	T11. Conc	T12. Units	T13. EPA Code(s)	T14. Underlying Hazardous Constituent
				☐ Yes ☐ No

T15. Substance Name

☐ T16. Constituent Continuation Sheet(s) _____ through _____ attached.

V1. I certify that I have been provided sufficient information concerning the above described waste to apply the requirements of ES/WM-10, Waste Acceptance Criteria for the Oak Ridge Reservation, and, based on this information, I further certify that this waste material:

1) Is accurately described above and packaged in accordance with Waste Certification Procedure ORNL/TM-7688
Rev Date _____, and

2) Meet the Waste Acceptance Criteria for the TRU/TRU MIXED WASTE Category, as listed in ES/WM-10.

3) Or, if applicable, meets the conditions stipulated in variance number(s) _____

I further certify that all required documentation is attached to the UCN 2109 and that, to the best of my knowledge and belief, the information on the UCN 2109 is complete and accurate. I am currently authorized to perform Waste Certifier functions.

SUBMITTED	EVANS CW	028492	12-06-1996
Signature Waste Certifier	Printed Name	Badge Number	Date

V4. Derivative Classifier	Badge	Date
SUBMITTED	NA	

WASTE ITEM DESCRIPTION

X10I9416495
Revision 1.00

ALL FIELDS MUST BE COMPLETED

Generation/Process Information

W1. Generator's Name (Print)	W2. Badge Number	W3. Generator's Phone No.	W4. Mail Stop	W5. Charge No/WO
EVANS, CW	028492	(423)574-2530	6384	33706001

W6. Generator's Company	W7. Origin Division	W8. Origin Site	W9. Origin Facility	W10. Origin Room/Area	W11. Radiological Area?
LMER	003	X10	7920	118	[X] Yes [ ] No

W12. Process Stream ID	W13. Process Category	W14. Process Activity	W15. AWA Number
UNK	PRO	A49	NA

W16. Physical Form	W17. Material Type(s)	W18. Waste Item Description Attachment
SOLID	MT005 MT008 MT007	B

Waste Subcategories (Check all)

	Yes	No		Yes	No		Yes	No
W20. Biological		X	W23. Construction Debris		X	W26. Classified		X
W21. Accountable		X	W24. Medical		X	W27. Friable Asbestos		X
W22. Carcinogen		X	W25. Sanitary/Industrial		X	W28. Non-Friable Asbestos		X

W29. Waste Description

RADIOCHEMICAL PROCESSING FOR ISOTOPE SEPARATION AND PURIFICATION

DEC 1996
Approved

Handling/Pickup Information

P1. Holding Site	P2. Holding Facility	P3. Holding Rm/Area	P4. Pickup Site	P5. Pickup Facility	P6. Pickup Area
X10	7920	120	X10	7920	120

Reserved	P7. Respirator	P8. Cartridge Type
	[X] None [ ] Half [ ] Full [ ] Unknown	NA

P9. Handling Instructions
NA

I0. Item/Container 1 of 1

Waste Item/Container Information

I1. Waste Item ID Number	I2. Origin Date	I3. RCRA 90-day Start Date	I4.
X10I9416495	12-06-1996	NA	(Affix Barcode Label Here)

I5. Container ID Number	I6. PCB Start Date	I7. Absorbent Materials
X10C9402631	NA	[ ] Yes [X] No

I8. NMC&A Form	I9. Est Net Vol	I10. Units
NA	30	GAL

I11. Area of Contamination	I12. Est Gross Wt	I13. Units	I14. Inner Container Type	I15. Outer Container Typ
NA [ ] in² [ ] cm² [ ] ft²	100	LB	BAGP	CASKC6

I16. HP Tag No. ~~NA~~ Y	Surface Contamination (dpm/100cm²) Transfer	Direct Read	Dose Rate at Surface (mrem/hr)	Dose Rate Read Meter (mrem/hr)	Dose Rate at 1 Foot (mrem/hr)	Instrument Identification
Alpha ALL 12/13/96	<20 ~~NA~~	NA				NA
Beta/Gamma	<200 ~~NA~~	NA	1000	NA	NA	7920-07I
Neutron			2000	NA	NA	REM-177

Signatures and Approvals

S1. Generator	Badge	Date	S3. HP Technician	Badge	Survey Da
SUBMITTED CW Evans EVANS CW	028492	12-06-1996	SUBMITTED JK Waggoner WAGGONER JK	032927	12-06-19
S2. Verification Officer	**Badge**	**Date**	**S4. Derivative Classifier**	**Badge**	**Date**
SUBMITTED CW Evans EVANS CW	028492	12-06-1996	SUBMITTED	NA	

X10I9416495

TRU/TRU MIXED WASTE ATTACHMENT B

ALL FIELDS MUST BE COMPLETED

Prohibited Items	Yes	No		Yes	No
B1. Pyrophoric Materials		X	B6. Ignition Sources		X
B2. Active Chelating Agents (> 1% of waste)		X	B7. Free Liquids		X
B3. Sealed Internal containers > 1 gallon		X	B8. Etiological Agents		X
B4. Explosive Materials		X	(Reserved)		
B5. Small Particulates (<= 1% by wt < 10um; <= 15% by wt < 200um)					X

B9. Biological Waste	B10. Chelating Agents	B11. Heat Sealed Bags	B12. Ion Exchange Resins	B13. TRUCON Code	B14. Thermal Power
☐ Yes ☒ No	☐ Yes ☒ No	☐ Yes ☒ No	☐ Yes ☒ No	OR125A	< 0.1 W/ft³

B15. Combustible Material	B16. Beryllium	B17. TRU Waste Type(s)
50 vol%	NA ☐ ppm ☐ grams	CW GW MW

B18. Number of Sealed Layers	B19. Sealed Layer Type(s)	B20. Special Case Waste	B21. RAD Handling Type
2	DRAW STRING BAGS	☐ Yes ☒ No (NA)	☐ Contact ☒ Remote

Radioisotope Determination Method			R7. Radioisotope	R8. Quantity	R9. Units			R10. NARM	
Document Type	Document Number(s)				Ci	grams	pCi/g	Yes	No
R1. Analysis LSID#	NA		CM-244	4.04E-1	X			NA	NA
		R2. NDA# NA							
R3. PK Form UCN 20116#	ORNL/TM-7688								
R4. Fissile Content (FGE of U-235) NA grams		R5. Enrichment (wt% of U-235) NA							
R6. Chemical Form OXIDE									

☐ R11. Radioisotope Continuation Sheet(s) _____ through _____ attached.

RCRA/TSCA Determination Method		Determination	Yes	No
Document Type	Document Number(s)			
T1. Analysis LSID#	NA	T3. RCRA Waste		X
		T4. TSCA Waste		X
T2. PK Form UCN 20116#	ORNL/TM-7688	T5. Underlying Hazardous Constituent(s) Present		X

T6. PCB Present	T7. PCB Concentration	T8. PCB Source Concentration	T9. PCB Source Concentration Range (ppm)
☐ Yes ☒ No	NA ppm	NA ppm	☒ NA ☐ <=1.99 ☐ 2 - 49.99 ☐ 50 - 499.99 ☐ >= 500

T10. Substance ID	T11. Conc	T12. Units	T13. EPA Code(s)	T14. Underlying Hazardous Constituent	
NA	NA	NA	NA		☐ Yes ☒ No
T15. Substance Name					

T10. Substance ID	T11. Conc	T12. Units	T13. EPA Code(s)	T14. Underlying Hazardous Constituent	
					☐ Yes ☐ No
T15. Substance Name					

☐ T16. Constituent Continuation Sheet(s) _____ through _____ attached.

VI. I certify that I have been provided sufficient information concerning the above described waste to apply the requirements of ES/WM-10, Waste Acceptance Criteria for the Oak Ridge Reservation, and, based on this information, I further certify that this waste material:

1) Is accurately described above and packaged in accordance with Waste Certification Procedure ORNL/TM-7688
Rev Date _____, and

2) Meet the Waste Acceptance Criteria for the TRU/TRU MIXED WASTE Category, as listed in ES/WM-10.

3) Or, if applicable, meets the conditions stipulated in variance number(s) _____

I further certify that all required documentation is attached to the UCN 2109 and that, to the best of my knowledge and belief, the information on the UCN 2109 is complete and accurate. I am currently authorized to perform Waste Certifier functions.

SUBMITTED	EVANS CW	028492	12-06-1996
Signature Waste Certifier	Printed Name	Badge Number	Date

S4. Derivative Classifier	Badge	Date
SUBMITTED	NA	

P 2

WASTE ITEM DESCRIPTION

X10I9416496
Revision 1.00

ALL FIELDS MUST BE COMPLETED

Generation Process Information

W1. Generator's Name (Print)	W2. Badge Number	W3. Generator's Phone No.	W4. Mail Stop	W5. Charge No/WO
EVANS, CW	028492	(423)574-2530	6384	33706001

W6. Generator's Company	W7. Origin Division	W8. Origin Site	W9. Origin Facility	W10. Origin Room/Area	W11. Radiological Area?
LMER	003	X10	7920	118	[X] Yes [ ] No

W12. Process Stream ID	W13. Process Category	W14. Process Activity	W15. AWA Number
UNK	PRO	A49	NA

W16. Physical Form	W17. Material Type(s)	W18. Waste Item Description Attachment
SOLID	MT005 MT007 MT099	B

Waste Subcategories (Check all)

	Yes	No		Yes	No		Yes	No
W20. Biological		X	W23. Construction Debris		X	W26. Classified		X
W21. Accountable		X	W24. Medical		X	W27. Friable Asbestos		X
W22. Carcinogen		X	W25. Sanitary/Industrial		X	W28. Non-Friable Asbestos		X

W29. Waste Description

RADIOCHEMICAL PROCESSING FOR ISOTOPE SEPARATION AND PURIFICATION — RUBBER WIRE COVER

DEC 1996 Approved RSWOG AKL

Handling/Pickup Information

P1. Holding Site	P2. Holding Facility	P3. Holding Rm/Area	P4. Pickup Site	P5. Pickup Facility	P6. Pickup Area
X10	7920	120	X10	7920	120

(Reserved)	P7. Respirator	P8. Cartridge Type
	[X] None [ ] Half [ ] Full [ ] Unknown	NA

P9. Handling Instructions
NA

I0. Item/Container 1 of 1

Waste Item/Container Information

I1. Waste Item ID Number	I2. Origin Date	I3. RCRA 90-day Start Date	I4.
X10I9416496	12-06-1996	NA	(Affix Barcode Label Here)

I5. Container ID Number	I6. PCB Start Date	I7. Absorbent Materials	
X10C9402631	NA	[ ] Yes	[X] No

I8. NMC&A Form	I9. Est Net Vol	I10. Units
NA	30	GAL

I11. Area of Contamination	I12. Est Gross Wt	I13. Units	I14. Inner Container Type	I15. Outer Container Type
NA [ ] in² [ ] cm² [ ] ft²	100	LB	BAGP	CASKC6

I16. HP Tag No.	Surface Contamination (dpm/100cm²)		Dose Rate at Surface (mrem/h)	Dose Rate at 1 Meter (mrem/h)	Dose Rate at 1 Foot (mrem/h)	Instrument Identification
~~NA~~ Y	Transfer	Direct Read				
Alpha	<20 ~~NA~~	NA				NA
Beta/Gamma	<200 ~~NA~~	NA	35	NA	NA	7920-07I
Neutron			76	NA	NA	REM-177

Signatures and Approvals

S1. Generator	Badge	Date	S3. HP Technician	Badge	Survey Da
SUBMITTED EVANS CW	028492	12-06-1996	SUBMITTED WAGGONER JK	032927	12-06-19

S2. Verification Officer	Badge	Date	S4. Derivative Classifier	Badge	Date
SUBMITTED EVANS CW	028492	12-06-1996	SUBMITTED	NA	

X10I941658

TRU/TRU MIXED WASTE ATTACHMENT B

ALL FIELDS MUST BE COMPLETED

Prohibited Items	Yes	No	Prohibited Items	Yes	No
B1. Pyrophoric Materials		X	B6. Ignition Sources		X
B2. Active Chelating Agents (> 1% of waste)		X	B7. Free Liquids		X
B3. Sealed Internal containers > 1 gallon		X	B8. Etiological Agents		X
B4. Explosive Materials		X	(Reserved)		
B5. Small Particulates (<= 1% by wt < 10um; <= 15% by wt < 200um)					X

B9. Biological Waste	B10. Chelating Agents	B11. Heat Sealed Bags	B12. Ion Exchange Resins	B13. TRUCON Code	B14. Thermal Power
☐ Yes ☒ No	☐ Yes ☒ No	☐ Yes ☒ No	☐ Yes ☒ No	OR125A	< 0.1 W/ft³

B15. Combustible Material	B16. Beryllium		B17. TRU Waste Type(s)
50 vol%	NA	☐ ppm ☐ grams	CW GW MW

B18. Number of Sealed Layers	B19. Sealed Layer Type(s)	B20. Special Case Waste	B21. RAD Handling Type
2	DRAW STRING BAGS	☐ Yes ☒ No	☐ Contact ☒ Remote

NA

Radioisotope Determination Method			R7. Radioisotope	R8. Quantity	R9. Units		R10. NARM	
Document Type	Document Number(s)				Curies	grams pCi/g	Yes	No
R1. Analysis LSID#	NA		CM-244	2.57E-1	X		NA	NA
	R2. NDA# NA							
R3. PK Form UCN 20116#	ORNL/TM-7688							
R4. Fissile Content (FGE of U-235) NA grams	R5. Enrichment (wt% of U-235) NA							
R6. Chemical Form OXIDE								

☐ R11. Radioisotope Continuation Sheet(s) _____ through _____ attached.

RCRA/TSCA Determination Method		Determination	Yes	No
Document Type	Document Number(s)			
T1. Analysis LSID#	NA	T3. RCRA Waste		X
		T4. TSCA Waste		X
T2. PK Form UCN 20116#	ORNL/TM-7688	T5. Underlying Hazardous Constituent(s) Present		X

T6. PCB Present	T7. PCB Concentration	T8. PCB Source Concentration	T9. PCB Source Concentration Range (ppm)
☐ Yes ☒ No	NA ppm	NA ppm	☒ NA ☐ <=1.99 ☐ 2 - 49.99 ☐ 50 - 499.99 ☐ >= 500

T10. Substance ID	T11. Conc	T12. Units	T13. EPA Code(s)	T14. Underlying Hazardous Constituent
NA	NA	NA	NA	☐ Yes ☒ No

T15. Substance Name

T10. Substance ID	T11. Conc	T12. Units	T13. EPA Code(s)	T14. Underlying Hazardous Constituent
				☐ Yes ☐ No

T15. Substance Name

☐ T16. Constituent Continuation Sheet(s) _____ through _____ attached.

V1. I certify that I have been provided sufficient information concerning the above described waste to apply the requirements of ES/WM-10, Waste Acceptance Criteria for the Oak Ridge Reservation, and, based on this information, I further certify that this waste material:

1) Is accurately described above and packaged in accordance with Waste Certification Procedure ORNL/TM-7688 Rev Date _____, and

2) Meet the Waste Acceptance Criteria for the TRU/TRU MIXED WASTE Category, as listed in ES/WM-10.

3) Or, if applicable, meets the conditions stipulated in variance number(s) _____

I further certify that all required documentation is attached to the UCN 2109 and that, to the best of my knowledge and belief, the information on the UCN 2109 is complete and accurate. I am currently authorized to perform Waste Certifier functions.

SUBMITTED C W Evans	EVANS CW	028492	12-06-1996
Signature Waste Certifier	Printed Name	Badge Number	Date

S4. Derivative Classifier	Badge	Date
SUBMITTED	NA	

p 3 3

WASTE ITEM DESCRIPTION

X1019416582
Revision 1.00

ALL FIELDS MUST BE COMPLETED

Generation/Process Information

W1. Generator's Name (Print)	W2. Badge Number	W3. Generator's Phone No.	W4. Mail Stop	W5. Charge No/WO
EVANS, CW	028492	(423)574-2530	6384	33706001

W6. Generator's Company	W7. Origin Division	W8. Origin Site	W9. Origin Facility	W10. Origin Room/Area	W11. Radiological Area?
LMER	003	X10	7920	118	[X] Yes [ ] No

W12. Process Stream ID	W13. Process Category	W14. Process Activity	W15. AWA Number
UNK	PRO	A49	NA

W16. Physical Form	W17. Material Type(s)	W18. Waste Item Description Attachment
SOLID	MT010 MT007 MT099	B

Waste Subcategories (Check all)

	Yes	No		Yes	No		Yes	No
W20. Biological		X	W23. Construction Debris		X	W26. Classified		X
W21. Accountable		X	W24. Medical		X	W27. Friable Asbestos		X
W22. Carcinogen		X	W25. Sanitary/Industrial		X	W28. Non-Friable Asbestos		X

W29. Waste Description

RADIOCHEMICAL PROCESSING FOR ISOTOPE SEPARATION AND PURIFICATION — RUBBER

DEC 1996
Approved
RSWOG
AKL

Holding/Pickup Information

P1. Holding Site	P2. Holding Facility	P3. Holding Rm/Area	P4. Pickup Site	P5. Pickup Facility	P6. Pickup Area
X10	7920	120	X10	7920	120

(Reserved)	P7. Respirator	P8. Cartridge Type
	[X] None [ ] Half [ ] Full [ ] Unknown	NA

P9. Handling Instructions
NA

I0. Item/Container 1 of 1

Waste Item/Container Information

I1. Waste Item ID Number	I2. Origin Date	I3. RCRA 90-day Start Date	I4.
X1019416582	12-06-1996	NA	(Affix Barcode Label Here)

I5. Container ID Number	I6. PCB Start Date	I7. Absorbent Materials	
X10C9402631	NA	[ ] Yes	[X] No

I8. NMC&A Form	I9. Est Net Vol	I10. Units
NA	20	GAL

I11. Area of Contamination	I12. Est Gross Wt	I13. Units	I14. Inner Container Type	I15. Outer Container Type
NA [ ] in² [ ] cm² [ ] ft²	75	LB	BAGP	CASKC6

I16. HP Tag No. ~~NA~~ Y	Surface Contamination Transferable (dpm/100cm²)	Surface Contamination Direct/Fixed (dpm/100cm²)	Dose Rate at Surface (mrem/h)	Dose Rate at 1 Meter (mrem/h)	Dose Rate at 1 Foot (mrem/h)	Instrument Identification
Alpha AKL 12/13/96	<20 NA	NA				NA
Beta/Gamma	<200 NA	NA	360	NA	NA	7920-071
Neutron			1280	NA	NA	REM-177

Signatures and Approvals

S1. Generator	Badge	Date	S3. HP Technician	Badge	Survey Dat
SUBMITTED EVANS CW	028492	12-06-1996	SUBMITTED WAGGONER JK	032927	12-06-19

S2. Verification Officer	Badge	Date	S4. Derivative Classifier	Badge	Date
SUBMITTED EVANS CW	028492	12-06-1996	SUBMITTED	NA	

X10I9416581

TRU/TRU MIXED WASTE
ATTACHMENT B

ALL FIELDS MUST BE COMPLETED

Prohibited Items	Yes	No		Yes	No
B1. Pyrophoric Materials		X	B6. Ignition Sources		X
B2. Active Chelating Agents (> 1% of waste)		X	B7. Free Liquids		X
B3. Sealed Internal containers > 1 gallon		X	B8. Etiological Agents		X
B4. Explosive Materials		X	(Reserved)		
B5. Small Particulates (<= 1% by wt < 10um; <= 15% by wt < 200um)					X

B9. Biological Waste	B10. Chelating Agents	B11. Heat Sealed Bags	B12. Ion Exchange Resins	B13. TRUCON Code	B14. Thermal Power
☐ Yes ☒ No	☐ Yes ☒ No	☐ Yes ☒ No	☐ Yes ☒ No	OR125A	< 0.1 W/ft³

B15. Combustible Material	B16. Beryllium		B17. TRU Waste Type(s)
0 vol%	NA	☐ ppm ☐ grams	CW MW

B18. Number of Sealed Layers	B19. Sealed Layer Type(s)	B20. Special Case Waste	B21. RAD Handling Type
2	DRAW STRING BAGS	☐ Yes ☒ No NA	☐ Contact ☒ Remote

Radioisotope Determination Method		R7. Radioisotope	R8. Quantity	R9. Units			R10. NARM	
Document Type	Document Number(s)			Ci	grams	pCi	Yes	No
R1. Analysis LSID#	NA	CM-244	3.6E-4	X			NA	NA
	R2. NDA# NA							
R3. PK Form UCN 20116#	ORNL/TM-7688							
R4. Fissile Content (FGE of U-235) NA grams	R5. Enrichment (wt% of U-235) NA							
R6. Chemical Form OXIDE								

☐ R11. Radioisotope Continuation Sheet(s) _____ through _____ attached.

RCRA/TSCA Determination Method		Determination	Yes	No
Document Type	Document Number(s)			
T1. Analysis LSID#	NA	T3. RCRA Waste		X
		T4. TSCA Waste		X
T2. PK Form UCN 20116#	ORNL/TM-7688	T5. Underlying Hazardous Constituent(s) Present		X

T6. PCB Present	T7. PCB Concentration	T8. PCB Source Concentration	T9. PCB Source Concentration Range (ppm)
☐ Yes ☒ No	NA ppm	NA ppm	☒ NA ☐ <=1.99 ☐ 2 - 49.99 ☐ 50 - 499.99 ☐ >= 500

T10. Substance ID	T11. Conc	T12. Units	T13. EPA Code(s)	T14. Underlying Hazardous Constituent
NA	NA	NA	NA	☐ Yes ☒ No
T15. Substance Name				

T10. Substance ID	T11. Conc	T12. Units	T13. EPA Code(s)	T14. Underlying Hazardous Constituent
				☐ Yes ☐ No
T15. Substance Name				

☐ T16. Constituent Continuation Sheet(s) _____ through _____ attached.

V1. I certify that I have been provided sufficient information concerning the above described waste to apply the requirements of ES/WM-10, Waste Acceptance Criteria for the Oak Ridge Reservation, and, based on this information, I further certify that this waste material:

1) Is accurately described above and packaged in accordance with Waste Certification Procedure ORNL/TM-7688 Rev Date _____, and

2) Meet the Waste Acceptance Criteria for the TRU/TRU MIXED WASTE Category, as listed in ES/WM-10.

3) Or, if applicable, meets the conditions stipulated in variance number(s) _____

I further certify that all required documentation is attached to the UCN 2109 and that, to the best of my knowledge and belief, the information on the UCN 2109 is complete and accurate. I am currently authorized to perform Waste Certifier functions.

SUBMITTED	EVANS CW	028492	12-06-1996
Signature Waste Certifier	Printed Name	Badge Number	Date

S4. Derivative Classifier	Badge	Date
SUBMITTED	NA	

p 3 1

WASTE ITEM DESCRIPTION

X10I9416581
Revision 1.00

ALL FIELDS MUST BE COMPLETED

Generation Process Information

W1. Generator's Name (Print)	W2. Badge Number	W3. Generator's Phone No.	W4. Mail Stop	W5. Charge No/WO
EVANS, CW	028492	(423)574-2530	6384	33706001

W6. Generator's Company	W7. Origin Division	W8. Origin Site	W9. Origin Facility	W10. Origin Room/Area	W11. Radiological Area
LMER	003	X10	7920	118	[X] Yes [ ] No

W12. Process Stream ID	W13. Process Category	W14. Process Activity	W15. AWA Number
UNK	PRO	A49	NA

W16. Physical Form	W17. Material Type(s)	W18. Waste Item Description Attachment
SOLID	MT007 MT010 MT099	B

Waste Subcategories (Check all)

	Yes	No		Yes	No		Yes	No
W20. Biological		X	W23. Construction Debris		X	W26. Classified		X
W21. Accountable		X	W24. Medical		X	W27. Friable Asbestos		X
W22. Carcinogen		X	W25. Sanitary/Industrial		X	W28. Non-Friable Asbestos		X

W29. Waste Description

RADIOCHEMICAL PROCESSING FOR ISOTOPE SEPARATION AND PURIFICATION RUBBER

DEC 1996
Approved
RSWOG
AKL

Handling/Pickup Information

P1. Holding Site	P2. Holding Facility	P3. Holding Rm/Area	P4. Pickup Site	P5. Pickup Facility	P6. Pickup Area
X10	7920	120	X10	7920	120

(Reserved)	P7. Respirator	P8. Cartridge Type
	[X] None [ ] Half [ ] Full [ ] Unknown	NA

P9. Handling Instructions
NA

I0. Item/Container 1 of 1

Waste Item/Container Information

I1. Waste Item ID Number	I2. Origin Date	I3. RCRA 90-day Start Date	I4.
X10I9416581	12-06-1996	NA	(Affix Barcode Label Here)

I5. Container ID Number	I6. PCB Start Date	I7. Absorbent Materials
X10C9402631	NA	[ ] Yes [X] No

I8. NMC&A Form	I9. Est Net Vol	I10. Units
NA	20	GAL

I11. Area of Contamination	I12. Est Gross Wt	I13. Units	I14. Inner Container Type	I15. Outer Container Type
NA [ ] in² [ ] cm² [ ] ft²	60	LB	BAGP	CASKC6

I16. HP Tag No. NA Y	Surface Contamination (dpm/100 cm²) Transfer	Surface Contamination (dpm/100 cm²) Direct/Read	Dose Rate at Surface (mrem/hr)	Dose Rate at 1 Meter (mrem/hr)	Dose Rate at 1 Foot (mrem/hr)	Instrument Identification
Alpha AKL 12/9/96	<20 ~~NA~~	NA				NA
Beta/Gamma	<200 ~~NA~~	NA	15	NA	NA	7920-071
Neutron			1.5	NA	NA	REM-177

Signatures and Approvals

S1. Generator	Badge	Date	S3. HP Technician	Badge	Survey Da
SUBMITTED EVANS CW	028492	12-06-1996	SUBMITTED WAGGONER JK	032927	12-06-19

S2. Verification Officer	Badge	Date	S4. Derivative Classifier	Badge	Date
SUBMITTED EVANS CW	028492	12-06-1996	SUBMITTED	NA	

[redacted]

X10I9416580

TRU/TRU MIXED WASTE ATTACHMENT B

ALL FIELDS MUST BE COMPLETED

Prohibited Items	Yes	No		Yes	No
B1. Pyrophoric Materials		X	B6. Ignition Sources		X
B2. Active Chelating Agents (> 1% of waste)		X	B7. Free Liquids		X
B3. Sealed Internal containers > 1 gallon		X	B8. Etiological Agents		X
B4. Explosive Materials		X	(Reserved)		
B5. Small Particulates (<= 1% by wt < 10um; <= 15% by wt < 200um)					X

B9. Biological Waste	B10. Chelating Agents	B11. Heat Sealed Bags	B12. Ion Exchange Resins	B13. TRUCON Code	B14. Thermal Power
☐ Yes ☒ No	☐ Yes ☒ No	☐ Yes ☒ No	☐ Yes ☒ No	OR125A	< 0.1 W/ft³

B15. Combustible Material	B16. Beryllium		B17. TRU Waste Type(s)
0 vol%	NA	☐ ppm ☐ grams	GW MW

B18. Number of Sealed Layers	B19. Sealed Layer Type(s)	B20. Special Case Waste	B21. RAD Handling Type
2	DRAW STRING BAGS	☐ Yes ☒ No	☐ Contact ☒ Remote

NA

Radioisotope Determination Method			R7. Radioisotope	R8. Quantity	R9. Units			R10. NARM	
Document Type	Document Number(s)				Ci	grams	pCi/g	Yes	No
R1. Analysis LSID#	NA		CM-244	3.8E-2	X			NA	NA
		R2. NDA# NA							
R3. PK Form UCN 20116#	ORNL/TM-7688								
R4. Fissile Content (FGE of U-235) NA grams		R5. Enrichment (wt% of U-235) NA							
R6. Chemical Form OXIDE									

☐ R11. Radioisotope Continuation Sheet(s) _____ through _____ attached.

RCRA/TSCA Determination Method			Determination	Yes	No
Document Type	Document Number(s)				
T1. Analysis LSID#	NA		T3. RCRA Waste		X
			T4. TSCA Waste		X
T2. PK Form UCN 20116#	ORNL/TM-7688		T5. Underlying Hazardous Constituent(s) Present		X

T6. PCB Present	T7. PCB Concentration	T8. PCB Source Concentration	T9. PCB Source Concentration Range (ppm)
☐ Yes ☒ No	NA ppm	NA ppm	☒ NA ☐ <=1.99 ☐ 2 - 49.99 ☐ 50 - 499.99 ☐ >= 500

T10. Substance ID	T11. Conc	T12. Units	T13. EPA Code(s)	T14. Underlying Hazardous Constituent
NA	NA	NA	NA	☐ Yes ☒ No

T15. Substance Name

T10. Substance ID	T11. Conc	T12. Units	T13. EPA Code(s)	T14. Underlying Hazardous Constituent
				☐ Yes ☐ No

T15. Substance Name

☐ T16. Constituent Continuation Sheet(s) _____ through _____ attached.

V1. I certify that I have been provided sufficient information concerning the above described waste to apply the requirements of ES/WM-10, Waste Acceptance Criteria for the Oak Ridge Reservation, and, based on this information, I further certify that this waste material:

1) Is accurately described above and packaged in accordance with Waste Certification Procedure ORNL/TM-7688
Rev Date _____, and

2) Meet the Waste Acceptance Criteria for the TRU/TRU MIXED WASTE Category, as listed in ES/WM-10.

3) Or, if applicable, meets the conditions stipulated in variance number(s) _____

I further certify that all required documentation is attached to the UCN 2109 and that, to the best of my knowledge and belief, the information on the UCN 2109 is complete and accurate. I am currently authorized to perform Waste Certifier functions.

SUBMITTED C W Evans	EVANS CW	028492	12-06-1996
Signature Waste Certifier	Printed Name	Badge Number	Date

S4. Derivative Classifier	Badge	Date
SUBMITTED	NA	

R 2 9

WASTE ITEM DESCRIPTION

X10I9416580
Revision 1.00

ALL FIELDS MUST BE COMPLETED

Generation Process Information

W1. Generator's Name (Print)	W2. Badge Number	W3. Generator's Phone No.	W4. Mail Stop	W5. Charge No/WO
EVANS, CW	028492	(423)574-2530	6384	33706001

W6. Generator's Company	W7. Origin Division	W8. Origin Site	W9. Origin Facility	W10. Origin Room/Area	W11. Radiological Area?
LMER	003	X10	7920	118	[X] Yes [ ] No

W12. Process Stream ID	W13. Process Category	W14. Process Activity	W15. AWA Number
UNK	PRO	A49	NA

W16. Physical Form	W17. Material Type(s)	W18. Waste Item Description Attachment
SOLID	MT005 MT007	B

Waste Subcategories (Check all)

	Yes	No		Yes	No		Yes	No
W20. Biological		X	W23. Construction Debris		X	W26. Classified		X
W21. Accountable		X	W24. Medical		X	W27. Friable Asbestos		X
W22. Carcinogen		X	W25. Sanitary/Industrial		X	W28. Non-Friable Asbestos		X

W29. Waste Description

RADIOCHEMICAL PROCESSING FOR ISOTOPE SEPARATION AND PURIFICATION

DEC 1996
Approved
AKL

Pickup Information

P1. Holding Site	P2. Holding Facility	P3. Holding Rm/Area	P4. Pickup Site	P5. Pickup Facility	P6. Pickup Area
X10	7920	120	X10	7920	120

(Reserved)	P7. Respirator	P8. Cartridge Type
	[X] None [ ] Half [ ] Full [ ] Unknown	NA

P9. Handling Instructions
NA

I0. Item/Container 1 of 1

Waste Item/Container Information

I1. Waste Item ID Number	I2. Origin Date	I3. RCRA 90-day Start Date	I4.
X10I9416580	12-06-1996	NA	(Affix Barcode Label Here)

I5. Container ID Number	I6. PCB Start Date	I7. Absorbent Materials	I8. NMC&A Form	I9. Est Net Vol	I10. Units
X10C9402631	NA	[ ] Yes [X] No	NA	20	GAL

I11. Area of Contamination	I12. Est Gross Wt	I13. Units	I14. Inner Container Type	I15. Outer Container Type
NA [ ] in² [ ] cm² [ ] ft²	75	LB	BAGP	CASKC6

I16. HP Tag No. ~~NA~~ Y	Surface Contamination (dpm/100 cm²) Smear/Transferable	Surface Contamination (dpm/100 cm²) Direct/Read	Dose Rate Contact/Surface (mrem/hr)	Dose Rate Contact/1 Meter (mrem/hr)	Dose Rate Contact/Foot (mrem/hr)	Instrument Identification
Alpha ~~AKL 12/04/96~~	<20 ~~NA~~	NA				NA
Beta/Gamma	<200 ~~NA~~	NA	40	NA	NA	7920-071
Neutron			140	NA	NA	REM-177

Signatures and Approvals

S1. Generator	Badge	Date	S3. HP Technician	Badge	Survey Da
SUBMITTED EVANS CW	028492	12-06-1996	SUBMITTED WAGGONER JK	032927	12-06-19

S2. Verification Officer	Badge	Date	S4. Derivative Classifier	Badge	Date
SUBMITTED EVANS CW	028492	12-06-1996	SUBMITTED	NA	

X10I9416577

TRU/TRU MIXED WASTE ATTACHMENT B

ALL FIELDS MUST BE COMPLETED

Prohibited Items	Yes	No		Yes	No
B1. Pyrophoric Materials		X	B6. Ignition Sources		X
B2. Active Chelating Agents (> 1% of waste)		X	B7. Free Liquids		X
B3. Sealed Internal containers > 1 gallon		X	B8. Etiological Agents		X
B4. Explosive Materials		X	(Reserved)		
B5. Small Particulates (<= 1% by wt < 10um; <= 15% by wt < 200um)					X

B9. Biological Waste	B10. Chelating Agents	B11. Heat Sealed Bags	B12. Ion Exchange Resins	B13. TRUCON Code	B14. Thermal Power
☐ Yes ☒ No	☐ Yes ☒ No	☐ Yes ☒ No	☐ Yes ☒ No	OR125A	< 0.1 W/ft³

B15. Combustible Material	B16. Beryllium		B17. TRU Waste Type(s)
25 vol%	NA	☐ ppm ☐ grams	CW GW MW

B18. Number of Sealed Layers	B19. Sealed Layer Type(s)	B20. Special Case Waste	B21. RAD Handling Type
2	DRAW STRING BAGS	☐ Yes ☒ No	☐ Contact ☒ Remote

NA

Radioisotope Determination Method			R7. Radioisotope	R8. Quantity	R9. Units			R10. NARM	
Document Type	Document Number(s)				Ci	grams	pCi/g	Yes	No
R1. Analysis LSID#	NA		CM-244	3.74E-3	X			NA	NA
		R2. NDA# NA							
R3. PK Form UCN 20116#	ORNL/TM-7688								
R4. Fissile Content (FGE of U-235) NA grams		R5. Enrichment (wt% of U-235) NA							
R6. Chemical Form	OXIDE								

☐ R11. Radioisotope Continuation Sheet(s) _____ through _____ attached.

RCRA/TSCA Determination Method		Determination	Yes	No
Document Type	Document Number(s)			
T1. Analysis LSID#	NA	T3. RCRA Waste		X
		T4. TSCA Waste		X
T2. PK Form UCN 20116#	ORNL/TM-7688	T5. Underlying Hazardous Constituent(s) Present		X

T6. PCB Present	T7. PCB Concentration	T8. PCB Source Concentration	T9. PCB Source Concentration Range (ppm)
☐ Yes ☒ No	NA ppm	NA ppm	☒ NA ☐ <=1.99 ☐ 2 - 49.99 ☐ 50 - 499.99 ☐ >= 500

T10. Substance ID	T11. Conc	T12. Units	T13. EPA Code(s)	T14. Underlying Hazardous Constituent
NA	NA	NA	NA	☐ Yes ☒ No

T15. Substance Name

T10. Substance ID	T11. Conc	T12. Units	T13. EPA Code(s)	T14. Underlying Hazardous Constituent
				☐ Yes ☐ No

T15. Substance Name

☐ T16. Constituent Continuation Sheet(s) _____ through _____ attached.

V1. I certify that I have been provided sufficient information concerning the above described waste to apply the requirements of ES/WM-10, Waste Acceptance Criteria for the Oak Ridge Reservation, and, based on this information, I further certify that this waste material:

1) Is accurately described above and packaged in accordance with Waste Certification Procedure ORNL/TM-7688 Rev Date _____, and

2) Meet the Waste Acceptance Criteria for the TRU/TRU MIXED WASTE Category, as listed in ES/WM-10.

3) Or, if applicable, meets the conditions stipulated in variance number(s) _____

I further certify that all required documentation is attached to the UCN 2109 and that, to the best of my knowledge and belief, the information on the UCN 2109 is complete and accurate. I am currently authorized to perform Waste Certifier functions.

Signature Waste Certifier	Printed Name	Badge Number	Date
SUBMITTED CW Evans	EVANS CW	028492	12-06-1996

S4. Derivative Classifier	Badge	Date
SUBMITTED	NA	

WASTE ITEM DESCRIPTION

X10I9416577
Revision 1.00

ALL FIELDS MUST BE COMPLETED

Generation/Process Information

W1. Generator's Name (Print)	W2. Badge Number	W3. Generator's Phone No.	W4. Mail Stop	W5. Charge No/WO
EVANS, CW	028492	(423)574-2530	6384	33706001

W6. Generator's Company	W7. Origin Division	W8. Origin Site	W9. Origin Facility	W10. Origin Room/Area	W11. Radiological Area
LMER	003	X10	7920	118	[X] Yes [ ] No

W12. Process Stream ID	W13. Process Category	W14. Process Activity	W15. AWA Number
UNK	PRO	A49	NA

W16. Physical Form	W17. Material Type(s)	W18. Waste Item Description Attachment
SOLID	MT005 MT010 MT007	B

Waste Subcategories (Check all)

	Yes	No		Yes	No		Yes	No
W20. Biological		X	W23. Construction Debris		X	W26. Classified		X
W21. Accountable		X	W24. Medical		X	W27. Friable Asbestos		X
W22. Carcinogen		X	W25. Sanitary/Industrial		X	W28. Non-Friable Asbestos		X

W29. Waste Description

RADIOCHEMICAL PROCESSING FOR ISOTOPE SEPARATION AND PURIFICATION

DEC 1996
Approved
RSWOD
AKL

Handling Information

P1. Holding Site	P2. Holding Facility	P3. Holding Rm/Area	P4. Pickup Site	P5. Pickup Facility	P6. Pickup Area
X10	7920	120	X10	7920	120

(Reserved)	P7. Respirator	P8. Cartridge Type
	[X] None [ ] Half [ ] Full [ ] Unknown	NA

P9. Handling Instructions
NA

I0. Item/Container 1 of 1

Waste Item/Container Information

I1. Waste Item ID Number	I2. Origin Date	I3. RCRA 90-day Start Date	I4.
X10I9416577	12-06-1996	NA	(Affix Barcode Label Here)

I5. Container ID Number	I6. PCB Start Date	I7. Absorbent Materials	I8. NMC&A Form	I9. Est Net Vol	I10. Units
X10C9402631	NA	[ ] Yes [X] No	NA	20	GAL

I11. Area of Contamination	I12. Est Gross Wt	I13. Units	I14. Inner Container Type	I15. Outer Container Type
NA [ ] in² [ ] cm² [ ] ft²	75	LB	BAGP	CASKC6

I16. HP Tag No. NA Y	Surface Contamination (dpm/100cm²) Transfer	Surface Contamination (dpm/100cm²) Direct Read	Dose Rate at Surface (mrem/hr)	Dose Rate at 1 Meter (mrem/hr)	Dose Rate at 1 Foot (mrem/hr)	Instrument Identification
Alpha AKJ 12/17/96	<20 ~~NA~~	NA				NA
Beta/Gamma	<200 ~~NA~~	NA	600	NA	NA	7920-071
Neutron			175	NA	NA	REM-177

Signatures and Approvals

S1. Generator	Badge	Date	S3. HP Technician	Badge	Survey Da
SUBMITTED EVANS CW	028492	12-06-1996	SUBMITTED WAGGONER JK	032927	12-06-19
S2. Verification Officer	**Badge**	**Date**	**S4. Derivative Classifier**	**Badge**	**Date**
SUBMITTED EVANS CW	028492	12-06-1996	SUBMITTED	NA	

X10I9416497

TRU/TRU MIXED WASTE ATTACHMENT B

ALL FIELDS MUST BE COMPLETED

Prohibited Items	Yes	No		Yes	No
B1. Pyrophoric Materials		X	B6. Ignition Sources		X
B2. Active Chelating Agents (> 1% of waste)		X	B7. Free Liquids		X
B3. Sealed Internal containers > 1 gallon		X	B8. Etiological Agents		X
B4. Explosive Materials		X	(Reserved)		
B5. Small Particulates (<= 1% by wt < 10um; <= 15% by wt < 200um)					X

B9. Biological Waste	B10. Chelating Agents	B11. Heat Sealed Bags	B12. Ion Exchange Resins	B13. TRUCON Code	B14. Thermal Power
☐ Yes ☒ No	☐ Yes ☒ No	☐ Yes ☒ No	☐ Yes ☒ No	OR125A	< 0.1 W/ft³

B15. Combustible Material	B16. Beryllium		B17. TRU Waste Type(s)
25 vol%	NA	☐ ppm ☐ grams	CW GW MW

B18. Number of Sealed Layers	B19. Sealed Layer Type(s)	B20. Special Case Waste	B21. RAD Handling Type
2	DRAW STRING BAGS	☐ Yes ☒ No	☐ Contact ☒ Remote

NA

Radioisotope Determination Method			R7. Radioisotope	R8. Quantity	R9. Units			R10. NARM	
Document Type	Document Number(s)				Ci	grams	pCi/g	Yes	No
R1. Analysis LSID#	NA		CM-244	2.68E-1	X			NA	NA
		R2. NDA# NA							
R3. PK Form UCN 20116#	ORNL/TM-7688								
R4. Fissile Content (FGE of U-235) NA grams		R5. Enrichment (wt% of U-235) NA							
R6. Chemical Form OXIDE									

☐ R11. Radioisotope Continuation Sheet(s) _____ through _____ attached.

RCRA/TSCA Determination Method		Determination	Yes	No
Document Type	Document Number(s)			
T1. Analysis LSID#	NA	T3. RCRA Waste		X
		T4. TSCA Waste		X
T2. PK Form UCN 20116#	ORNL/TM-7688	T5. Underlying Hazardous Constituent(s) Present		X

T6. PCB Present	T7. PCB Concentration	T8. PCB Source Concentration	T9. PCB Source Concentration Range (ppm)
☐ Yes ☒ No	NA ppm	NA ppm	☒ NA ☐ <=1.99 ☐ 2 - 49.99 ☐ 50 - 499.99 ☐ >= 500

T10. Substance ID	T11. Conc	T12. Units	T13. EPA Code(s)	T14. Underlying Hazardous Constituent
NA	NA	NA	NA	☐ Yes ☒ No

T15. Substance Name

T10. Substance ID	T11. Conc	T12. Units	T13. EPA Code(s)	T14. Underlying Hazardous Constituent
				☐ Yes ☐ No

T15. Substance Name

☐ T16. Constituent Continuation Sheet(s) _____ through _____ attached.

V1. I certify that I have been provided sufficient information concerning the above described waste to apply the requirements of ES/WM-10, Waste Acceptance Criteria for the Oak Ridge Reservation, and, based on this information, I further certify that this waste material:

1) Is accurately described above and packaged in accordance with Waste Certification Procedure ORNL/TM-7688 Rev Date _____, and

2) Meet the Waste Acceptance Criteria for the TRU/TRU MIXED WASTE Category, as listed in ES/WM-10.

3) Or, if applicable, meets the conditions stipulated in variance number(s) _____

I further certify that all required documentation is attached to the UCN 2109 and that, to the best of my knowledge and belief, the information on the UCN 2109 is complete and accurate. I am currently authorized to perform Waste Certifier functions.

SUBMITTED	EVANS CW	028492	12-06-1996
Signature Waste Certifier	Printed Name	Badge Number	Date

S4. Derivative Classifier	Badge	Date
SUBMITTED	NA	

WASTE ITEM DESCRIPTION

X10I9416497
Revision 1.00

ALL FIELDS MUST BE COMPLETED

Generation Process Information

W1. Generator's Name (Print)	W2. Badge Number	W3. Generator's Phone No.	W4. Mail Stop	W5. Charge No/WO
EVANS, CW	028492	(423)574-2530	6384	33706001

W6. Generator's Company	W7. Origin Division	W8. Origin Site	W9. Origin Facility	W10. Origin Room/Area	W11. Radiological Area
LMER	003	X10	7920	118	[X] Yes [ ] No

W12. Process Stream ID	W13. Process Category	W14. Process Activity	W15. AWA Number
UNK	PRO	A49	NA

W16. Physical Form	W17. Material Type(s)	W18. Waste Item Description Attachment
SOLID	MT003 MT005 MT007	B

Waste Subcategories (Check all)

	Yes	No		Yes	No		Yes	No
W20. Biological		X	W23. Construction Debris		X	W26. Classified		
W21. Accountable		X	W24. Medical		X	W27. Friable Asbestos		
W22. Carcinogen		X	W25. Sanitary/Industrial		X	W28. Non-Friable Asbestos		

W29. Waste Description

RADIOCHEMICAL PROCESSING FOR ISOTOPE SEPARATION AND PURIFICATION

DEC 1996 Approved RSWOC AKL

Handling/Pickup Information

P1. Holding Site	P2. Holding Facility	P3. Holding Rm/Area	P4. Pickup Site	P5. Pickup Facility	P6. Pickup Area
X10	7920	120	X10	7920	120

Reserved	P7. Respirator	P8. Cartridge Type
	[X] None [ ] Half [ ] Full [ ] Unknown	NA

P9. Handling Instructions
NA

I0. Item/Container 1 of 1

Waste Item/Container Information

I1. Waste Item ID Number	I2. Origin Date	I3. RCRA 90-day Start Date	I4.
X10I9416497	12-06-1996	NA	(Affix Barcode Label Here)

I5. Container ID Number	I6. PCB Start Date	I7. Absorbent Materials	I8. NMC&A Form	I9. Est Net Vol	I10. Units
X10C9402631	NA	[ ] Yes [X] No	NA	30	GAL

I11. Area of Contamination	I12. Est Gross Wt	I13. Units	I14. Inner Container Type	I15. Outer Container Type
NA [ ] in² [ ] cm² [ ] ft²	100	LB	BAGP	CASKC6

I16. HP Tag No. NA Y	Surface Contamination (dpm/100cm²) Transfer	Surface Contamination (dpm/100cm²) Direct Read	Dose Rate at Surface (mrem/hr)	Dose Rate at 1 Meter (mrem/hr)	Dose Rate at 1 Foot (mrem/hr)	Instrument Identification
Alpha AKL 12/10/96	<20 ~~NA~~	NA				NA
Beta/Gamma	<200 ~~NA~~	NA	2000	NA	NA	7920-071
Neutron			1300	NA	NA	REM-177

Signatures and Approvals

S1. Generator	Badge	Date	S3. HP Technician	Badge	Survey Da
SUBMITTED EVANS CW	028492	12-06-1996	SUBMITTED WAGGONER JK	032927	12-06-19
S2. Verification Officer	**Badge**	**Date**	**S4. Derivative Classifier**	**Badge**	**Date**
SUBMITTED EVANS CW	028492	12-06-1996	SUBMITTED	NA	

X10I9416496

TRU/TRU MIXED WASTE ATTACHMENT B

ALL FIELDS MUST BE COMPLETED

Prohibited Items	Yes	No		Yes	No
B1. Pyrophoric Materials		X	B6. Ignition Sources		X
B2. Active Chelating Agents (> 1% of waste)		X	B7. Free Liquids		X
B3. Sealed Internal containers > 1 gallon		X	B8. Etiological Agents		X
B4. Explosive Materials		X	(Reserved)		
B5. Small Particulates (<= 1% by wt < 10um; <= 15% by wt < 200um)					X

B9. Biological Waste	B10. Chelating Agents	B11. Heat Sealed Bags	B12. Ion Exchange Resins	B13. TRUCON Code	B14. Thermal Power
☐ Yes ☒ No	☐ Yes ☒ No	☐ Yes ☒ No	☐ Yes ☒ No	OR125A	< 0.1 W/ft³

B15. Combustible Material	B16. Beryllium		B17. TRU Waste Type(s)
0 vol%	NA	☐ ppm ☐ grams	CW MW

B18. Number of Sealed Layers	B19. Sealed Layer Type(s)	B20. Special Case Waste	B21. RAD Handling Type
2	DRAW STRING BAGS	☐ Yes ☒ No	☐ Contact ☒ Remote

NA

Radioisotope Determination Method		R7. Radioisotope	R8. Quantity	R9. Units			R10. NARM	
Document Type(s)	Document Number(s)			Ci	grams	pCi/g	Yes	No
R1. Analysis LSID#	NA	CM-244	1.53E-2	X			NA	NA
	R2. NDA# NA							
R3. PK Form UCN 20116#	ORNL/TM-7688							
R4. Fissile Content (FGE of U-235) NA grams	R5. Enrichment (wt% of U-235) NA							
R6. Chemical Form OXIDE								

☐ R11. Radioisotope Continuation Sheet(s) _____ through _____ attached.

RCRA/TSCA Determination Method		Determination	Yes	No
Document Type(s)	Document Number(s)			
T1. Analysis LSID#	NA	T3. RCRA Waste		X
		T4. TSCA Waste		X
T2. PK Form UCN 20116#	ORNL/TM-7688	T5. Underlying Hazardous Constituent(s) Present		X

T6. PCB Present	T7. PCB Concentration	T8. PCB Source Concentration	T9. PCB Source Concentration Range (ppm)
☐ Yes ☒ No	NA ppm	NA ppm	☒ NA ☐ <=1.99 ☐ 2 - 49.99 ☐ 50 - 499.99 ☐ >= 500

T10. Substance ID	T11. Conc	T12. Units	T13. EPA Code(s)	T14. Underlying Hazardous Constituent
NA	NA	NA	NA	☐ Yes ☒ No

T15. Substance Name

T10. Substance ID	T11. Conc	T12. Units	T13. EPA Code(s)	T14. Underlying Hazardous Constituent
				☐ Yes ☐ No

T15. Substance Name

☐ T16. Constituent Continuation Sheet(s) _____ through _____ attached.

V1. I certify that I have been provided sufficient information concerning the above described waste to apply the requirements of ES/WM-10, Waste Acceptance Criteria for the Oak Ridge Reservation, and, based on this information, I further certify that this waste material:

1) Is accurately described above and packaged in accordance with Waste Certification Procedure ORNL/TM-7688 Rev Date _____, and

2) Meet the Waste Acceptance Criteria for the TRU/TRU MIXED WASTE Category, as listed in ES/WM-10.

3) Or, if applicable, meets the conditions stipulated in variance number(s) _____

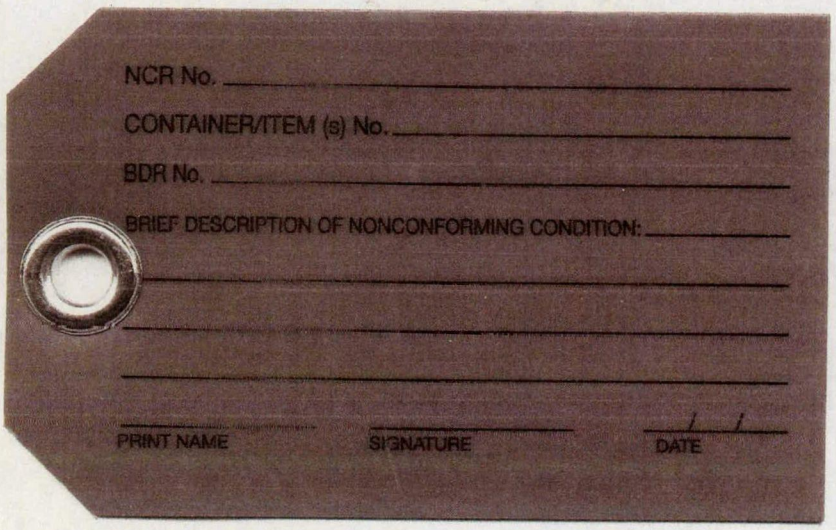
I further certify that all required documentation is attached to the UCN 2109 and that, to the best of my knowledge and belief, the information on the UCN 2109 is complete and accurate. I am currently authorized to perform Waste Certifier functions.

SUBMITTED	EVANS CW	028492	12-06-1996
Signature Waste Certifier	Printed Name	Badge Number	Date

S4. Derivative Classifier	Badge	Date
SUBMITTED	NA	

p 23

CCP HOLD TAG
DO NOT REMOVE UNTIL RESOLUTION OF NONCONFORMING CONDITION
COMMENTS:
NOT SUITABLE FOR USE AND/OR SHIPMENT TO WIPP WITH THIS NONCONFORMING CONDITION


NCR No.
CONTAINER/ITEM (s) No.
BDR No.
BRIEF DESCRIPTION OF NONCONFORMING CONDITION:
PRINT NAME
SIGNATURE
DATE

Attachment 2 – Container Inspection/Weight Report

Structural Integrity / Safe to Handle YES / NO		Container ID Number	Filters meet requirements YES / NO		Filter Information (Manufacturer, date of manufacture, lot number, unique serial number, as applicable)	Rad Survey Label (Circle)		Gross Container Weight (kg)	Initials	Date
(YES)	NO	X10C1250673	(YES)	NO	UT9424 00208 0223	(SAT)	UNSAT	261.3	ST	7-28-15
(YES)	NO	X10C1250665	(YES)	NO	UT9424 00208 0265	(SAT)	UNSAT	235.6	ST	7-28-15
(YES)	NO	X10C1250646	(YES)	NO	UT9424 00208 0234	(SAT)	UNSAT	254.3	ST	7-28-15
(YES)	NO	X10C1250652	(YES)	NO	UT9424 00208 0236	(SAT)	UNSAT	229.6	ST	7-28-15
(YES)	NO	X10C1250647	(YES)	NO	UT9424 00208 0222	(SAT)	UNSAT	233.3	ST	7-28-15
(YES)	NO	X10C1250658	(YES)	NO	UT9424 00208 0261	(SAT)	UNSAT	246.5	ST	7-28-15
(YES)	NO	X10C1250666	(YES)	NO	UT9424 00208 0264	(SAT)	UNSAT	234.5	ST	7-28-15
(YES)	NO	X10C1250580	(YES)	NO	UT9424 00208 1043	(SAT)	UNSAT	231.9	ST	7-28-15
(YES)	NO	X10C1250675	(YES)	NO	UT9424 00208 0266	(SAT)	UNSAT	198.8	ST	7-28-15
(YES)	NO	X10C1250653	(YES)	NO	UT9424 00208 0230	(SAT)	UNSAT	243.3	ST	7-28-15

Scale ID #	Location	Calibration Due Date	Scale Calibration Due Date Valid YES / NO	Scale Calibration Check SAT / UNSAT		Initials	Date
WIPP 157	ORNL/CH3A	1-7-16	Yes	(SAT)	UNSAT	ST	7-28-15

Comments: N/A

Completed by: Shawn Treadway (Print Name) _____ (Signature) 7-28-15 (Date)

VPM/Designee Verification: Andrew Stallings (Print Name) _____ (Signature) 7-28-15 (Date)

COPY

NTPC RECORDS ORIGINAL
DATE REC'D 7-28-2015

Attachment 2 – Container Inspection/Weight Report

AK-2

Structural Integrity / Safe to Handle YES / NO		Container ID Number	Filters meet requirements YES / NO		Filter Information (Manufacturer, date of manufacture, lot number, unique serial number, as applicable)	Rad Survey Label (Circle)		Gross Container Weight (kg)	Initials	Date
(YES)	NO	X10C0402870F	(YES)	NO	UT9424X 00237 0175	(SAT)	UNSAT	46.3	ST	5-14-15
(YES)	NO	X10C0402870E	(YES)	NO	UT9424X 00237 0164	(SAT)	UNSAT	47.2	ST	5-14-15
(YES)	NO	X10C0402870H	(YES)	NO	UT9424X 00237 0169	(SAT)	UNSAT	60.6	ST	5-14-15
(YES)	NO	X10C0402870G	(YES)	NO	UT9424X 00237 0348	(SAT)	UNSAT	81.7	ST	5-14-15
(YES)	NO	X10C0402870K	(YES)	NO	UT9424X 00237 0347	(SAT)	UNSAT	66.5	ST	5-14-15
(YES)	NO	X10C0402870J	(YES)	NO	UT9424X 00237 0332	(SAT)	UNSAT	70.1	ST	5-14-15
(YES)	NO	X10C0402870L	(YES)	NO	UT9424X 00237 0342	(SAT)	UNSAT	58.2	ST	5-14-15
(YES)	NO	X10C0402870I	(YES)	NO	UT9424X 00237 0355	(SAT)	UNSAT	80.1	ST	5-14-15
(YES)	NO	X10C0402870D	(YES)	NO	UT9424X 00237 0178	(SAT)	UNSAT	64.7	ST	5-14-15
(YES)	NO	X10C0402870A	(YES)	NO	UT9424X 00237 0168	(SAT)	UNSAT	62.5	ST	5-14-15

Scale ID #	Location	Calibration Due Date	Scale Calibration Due Date Valid YES / NO	Scale Calibration Check SAT / UNSAT		Initials	Date
WIPP 151	ORNL/CHSA	1-7-16	Yes	(SAT)	UNSAT	ST	5-14-15

Comments: N/A

Completed by: 5.14.15 Shawn Treadway _____ 5-14-15
Print Name Signature Date

VPM/Designee Verification: Andrew Stallings _____ 5.14.15
Print Name Signature Date

COPY

NTPC RECORDS ORIGINAL
DATE REC'D 5-14-2015

Attachment 2 – Container Inspection/Weight Report

	Structural Integrity / Safe to Handle YES / NO		Container ID Number	Filters meet requirements YES / NO		Filter Information (Manufacturer, date of manufacture, lot number, unique serial number, as applicable)	Rad Survey Label (Circle)		Gross Container Weight (kg)	Initials	Date
*	(YES)	NO	X10C9311865B	(YES)	NO	UT9424X 00213 0008	(SAT)	UNSAT	88	ST	11-14-13
*	(YES)	NO	NFS0920A	(YES)	NO	UT9424X 00209 0068	(SAT)	UNSAT	76	ST	11-14-13
*	(YES)	NO	X10C9312745A	(YES)	NO	UT9424X 00210 0577	(SAT)	UNSAT	64	ST	11-14-13
	(YES)	NO	NFS0423D	(YES)	NO	UT9424X 00210 0385	(SAT)	UNSAT	65	ST	11-14-13
*	(YES)	NO	X10C9311266A	(YES)	NO	UT9424X 00210 0305	(SAT)	UNSAT	65	ST	11-14-13
*	(YES)	NO	NFS0880A	(YES)	NO	UT9424X 00213 0360	(SAT)	UNSAT	96	ST	11-14-13
	(YES)	NO	X10C9312004A	(YES)	NO	UT9424X 00216 0123	(SAT)	UNSAT	110	ST	11-14-13
	(YES)	NO	X10C9313119B	(YES)	NO	NUCFIL-019DS 9/09 EJ-803	(SAT)	UNSAT	52	ST	11-14-13
	(YES)	NO	X10C9311774A	(YES)	NO	UT9424X 00215 0204	(SAT)	UNSAT	79	ST	11-14-13
FOM-A *	(YES)	NO	NFS0929A	(YES)	NO	UT9424X 00213 0350	(SAT)	UNSAT	87	ST	11-14-13

Scale ID #.	Location	Calibration Due Date	Scale Calibration Due Date Valid YES / NO	Scale Calibration Check SAT / UNSAT N/A		Initials	Date
N/A	N/A	N/A	N/A	SAT	UNSAT	N/A	N/A

Comments: * These containers were previously entered into container management.

Completed by: Shawn Treadway (Print Name) _____ (Signature) 11-14-2013 (Date)

VPM/Designee Verification: Andrew O. Stallings (Print Name) _____ (Signature) 11-14-13 (Date)

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DATE REC'D 11-14-13

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AK28

NWP
Nuclear Waste Partnership LLC
An AECOM-led partnership with BWXT and AREVA

CP:16:01090
UFC:5900.00

INTER-OFFICE CORRESPONDENCE

DATE: April 15, 2016

FROM: B. S. Schrock BSSchrock LOCATION: Certification

TO: A. O. Stallings LOCATION: Host Site Operations Oak Ridge National Laboratory

SUBJECT: ACCEPTABLE KNOWLEDGE ACCURACY REPORT: OAK RIDGE NATIONAL LABORATORY WASTE STREAM NUMBER OR-NFS-CH-SOIL, SOILS, FOR LOTS 13 - 17, CUMULATIVE FOR LOTS 1 - 17

Purpose

Procedure CCP-TP-005, Central Characterization Program (CCP) Acceptable Knowledge documentation, requires that Acceptable Knowledge (AK) accuracy be evaluated and documented, either on a lot or waste stream basis. The purpose of this correspondence is twofold. First, it documents the results of the AK accuracy determination for waste containers in waste stream OR-NFS-CH-SOIL, lots 13 through 17 that have not previously been evaluated. Second, it provides a summary of AK accuracy for waste containers in waste stream OR-NFS-CH-SOIL, lots 1 through 17.

METHODOLOGY

In accordance with CCP-TP-005, applicable CCP Waste Stream Characterization Checklists (CCP-TP-005, Attachment 13) and Acceptable Knowledge Re-Evaluation Checklists (CCP-TP-005, Attachment 10) were reviewed for waste stream OR-NFS-CH-SOIL, lots 13 through 17 to determine if waste containers had waste matrix codes (WMCs) reassigned, Environmental Protection Agency (EPA) Hazardous Waste Numbers (HWNs) reassigned, or were found to have radiological data inconsistent with AK. The list of waste containers for lots 13 through 17 (124 containers) is provided on the Correlation of Container forms that accompanies this AK Accuracy Report. The results of the AK accuracy determination for these waste containers are described in the Results section.

The results of the AK accuracy determination for waste containers comprising lots 13 through 17 were combined with the results from previous AK accuracy determinations for lots 1 through 12 and containers requiring special consideration to provide the overall AK accuracy, for lots 1 through 17 in terms of accuracy percentage. The results of the AK accuracy evaluation for waste containers in waste stream OR-NFS-CH-SOIL comprising lots 1 through 17 are

P.O. Box 2078 • Carlsbad, New Mexico USA 88221-2078
Phone: (575) 234-7200 • Fax: (575) 234-7083

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addressed in the Summary section of this memorandum and documented on the attached AK Accuracy Report form (CCP-TP-005, Attachment 14).

Results of AK Accuracy Determination Waste Stream OR-NFS-CH-SOIL, Lots 13 – 17

A review of applicable CCP Waste Stream Characterization Checklists (CCP-TP-005, Attachment 13) and AKR Checklists (CCP-TP-005, Attachment 10) for waste stream OR-NFS-CH-SOIL indicates the following:

- One container was reassigned to a different WMC.
- There were no new EPA HWNs assigned.
- Containers were consistent with the AK which identified U-238 and Pu-239 as the most predominant radionuclides by weight percent.

Containers Requiring Special Consideration

One AK re-evaluation was generated during this reporting period (6/3/2014).

SUMMARY

There are a total of 656 waste containers in lots 1 - 17 for waste stream OR-NFS-CH-SOIL for which AK accuracy was determined. The breakdown of results is:

- Lots 1 - 10 (reference Inter-office Correspondence CP:09:01518, issued 12/18/2009) include 512 containers. One AK re-evaluation was performed that moved 2 containers from S4000 to S3000, and 5 containers from S4000 to S5000. Therefore, 505 containers were consistent with AK.
- Lot 11 (reference Inter-office Correspondence CP:11:01018, issued 1/05/2011 and CP:11:01103, issued 2/09/2011) includes 19 containers. An AK re-evaluation was conducted that moved 2 containers from S4000 to S5000. Therefore, 17 of these containers were consistent with AK.
- Lot 12 includes 1 container (reference Inter-office Correspondence CP:12:01135, issued 3/22/2012). This container was consistent with AK.
- Lots 13 – 17 include 124 containers (reference Inter-office Correspondence CP:15:01269, issued 12/3/2015. An AK re-evaluation was performed that moved 1 container from S4000 to S5000. Therefore, 123 containers are consistent with AK.

The percentage of waste containers found to be consistent with AK for waste stream OR-NFS-CH-SOIL is therefore:

(646/656) x 100 = 98.5%

If you have any questions, or if you would like more information about the contents of this AK Accuracy Report, please contact me at Extension 7444.

BSS: rg

Enclosures: 1. CCP-TP-005, Attachment 14, CCP AK Accuracy Report OR-NFS-CH-SOIL
2. CCP-TP-002, Attachment 4, CCP Correlation of Container Identification Number to Batch Data Report Numbers, Lots 13 - 17

cc: NWP:
(without enclosures)
W. W. Allen ED
M. F. Ramirez ED
R. D. Reeves ED

(with enclosure)
CCP Records Custodian GSA-212

Tech Specs:
J. Harrison ED

ORNL
(with enclosures)
T. G. Barton ED

Attachment 14 – CCP Acceptable Knowledge Accuracy Report – Example Form

CCP Acceptable Knowledge Accuracy Report

Site(s): OAK RIDGE NATIONAL LABORATORY

Waste Stream Number(s): OR-NFS-CH-SOIL

Waste Stream Description: SOIL

Waste Containers:	Waste Matrix Code Reassigned? (Y/N)	EPA Hazardous Waste Number Reassigned? (Y/N)	Radiological Data Consistent with AK? (Y/N)
NFS0794B	Y	N/A	N/A
	N		
	A		

* The WCPIP does not require the evaluation of AK accuracy relating to EPA Hazardous Waste Number assignment; however, the reassignment of a container to another RH waste stream or new RH waste stream based on CCP testing or Permittee confirmation testing results will count against the AK accuracy for TRU (RH and CH) waste streams.

Total containers in this report: 656
Total containers consistent with AK: 646
Percent containers consistent with AK: 98.5

Site Project Manager:

Beverly S. Schrock / BSSchrock Date: 4/14/16
Print Sign

Acceptable Knowledge Expert:

Jeff Harrison / Jeff Harrison Date: 4/14/16
Print Sign

CCP Correlation of Container Identification Numbers to Batch Data Report Numbers

Waste Stream: # OR-NFS-CH-SOIL Lot # 13

Container ID Number	Historical Container ID	NDA BDR	RTR BDR	VE BDR	Load/Manage Overpack Yes	Transportation Headspace Gas	
						FGA	GGT
X10C1351504	N/A	OR-IQ3-0451	OR-RTR6-0623	N/A	No	OR15FG8017	N/A
X10C1351505	N/A	OR-IQ3-0450	OR-RTR6-0623	N/A	No	OR15FG8017	N/A
X10C1351507	N/A	OR-IQ3-0451	OR-RTR6-0623	N/A	No	OR15FG8017	N/A
X10C1351508	N/A	OR-IQ3-0451	OR-RTR6-0623	N/A	No	OR15FG8017	N/A
X10C1351509	N/A	OR-IQ3-0450	OR-RTR6-0623	N/A	No	OR15FG8017	N/A

Roger Whiteaker — Signature of Site Project Manager
Roger Whiteaker — Printed Name
04/07/2015 — Date

CCP Correlation of Container Identification Numbers to Batch Data Report Numbers

Waste Stream: # OR-NFS-CH-SOIL Lot # 14

Container ID Number	Historical Container ID	NDA BDR	RTR BDR	VE BDR	Load/Manage Overpack Yes	Transportation Headspace Gas	
						FGA	GGT
X10C1351427	N/A	OR-IQ3-0480	OR-RTR6-0644	N/A	No	OR15FG8044	N/A
X10C1351429	N/A	OR-IQ3-0482	OR-RTR6-0646	N/A	No	OR15FG8045	N/A
X10C1351431	N/A	OR-IQ3-0482	OR-RTR6-0646	N/A	No	OR15FG11007	N/A
X10C1351433	N/A	OR-IQ3-0482	OR-RTR6-0646	N/A	No	OR15FG11007	N/A
X10C1351434	N/A	OR-IQ3-0482	OR-RTR6-0646	N/A	No	OR15FG11007	N/A
X10C1351438	N/A	OR-IQ3-0482	OR-RTR6-0646	N/A	No	OR15FG8045	N/A
X10C1351440	N/A	OR-IQ3-0482	OR-RTR6-0646	N/A	No	OR15FG11007	N/A
X10C1351446	N/A	OR-IQ3-0482	OR-RTR6-0646	N/A	No	OR15FG11007	N/A
X10C1351447	N/A	OR-IQ3-0479	OR-RTR6-0644	N/A	No	OR15FG8044	N/A
X10C1351450	N/A	OR-IQ3-0482	OR-RTR6-0646	N/A	No	OR15FG11007	N/A
X10C1351451	N/A	OR-IQ3-0481	OR-RTR6-0645	N/A	No	OR15FG8044	N/A
X10C1351456	N/A	OR-IQ3-0481	OR-RTR6-0645	N/A	No	OR15FG8044	N/A
X10C1351457	N/A	OR-IQ3-0482	OR-RTR6-0646	N/A	No	OR15FG11007	N/A
X10C1351459	N/A	OR-IQ3-0482	OR-RTR6-0646	N/A	No	OR15FG8045	N/A
X10C1351460	N/A	OR-IQ3-0482	OR-RTR6-0646	N/A	No	OR15FG8045	N/A
X10C1351461	N/A	OR-IQ3-0480	OR-RTR6-0644	N/A	No	OR15FG8044	N/A
X10C1351462	N/A	OR-IQ3-0479	OR-RTR6-0644	N/A	No	OR15FG8044	N/A
X10C1351463	N/A	OR-IQ3-0480	OR-RTR6-0644	N/A	No	OR15FG8044	N/A
X10C1351464	N/A	OR-IQ3-0480	OR-RTR6-0644	N/A	No	OR15FG8044	N/A
X10C1351467	N/A	OR-IQ3-0480	OR-RTR6-0645	N/A	No	OR15FG8044	N/A
X10C1351468	N/A	OR-IQ3-0479	OR-RTR6-0644	N/A	No	OR15FG8044	N/A
X10C1351469	N/A	OR-IQ3-0479	OR-RTR6-0644	N/A	No	OR15FG8044	N/A
X10C1351477	N/A	OR-IQ3-0481	OR-RTR6-0645	N/A	No	OR15FG8044	N/A
X10C1351478	N/A	OR-IQ3-0479	OR-RTR6-0644	N/A	No	OR15FG8044	N/A
X10C1351480	N/A	OR-IQ3-0481	OR-RTR6-0645	N/A	No	OR15FG8044	N/A
X10C1351481	N/A	OR-IQ3-0480	OR-RTR6-0644	N/A	No	OR15FG8044	N/A
X10C1351482	N/A	OR-IQ3-0480	OR-RTR6-0644	N/A	No	OR15FG8044	N/A
X10C1351483	N/A	OR-IQ3-0479	OR-RTR6-0644	N/A	No	OR15FG8044	N/A
X10C1351484	N/A	OR-IQ3-0480	OR-RTR6-0645	N/A	No	OR15FG8044	N/A
X10C1351485	N/A	OR-IQ3-0480	OR-RTR6-0644	N/A	No	OR15FG8044	N/A
X10C1351490	N/A	OR-IQ3-0481	OR-RTR6-0645	N/A	No	OR15FG8044	N/A

CCP Correlation of Container Identification Numbers to Batch Data Report Numbers

Waste Stream: # OR-NFS-CH-SOIL Lot # 14

Container ID Number	Historical Container ID	NDA BDR	RTR BDR	VE BDR	Load/Manage Overpack Yes	Transportation Headspace Gas	
						FGA	GGT
X10C1351493	N/A	OR-IQ3-0479	OR-RTR6-0644	N/A	No	OR15FG8044	N/A
X10C1351494	N/A	OR-IQ3-0479	OR-RTR6-0644	N/A	No	OR15FG8044	N/A
X10C1351495	N/A	OR-IQ3-0481	OR-RTR6-0645	N/A	No	OR15FG8044	N/A
X10C1351496	N/A	OR-IQ3-0481	OR-RTR6-0645	N/A	No	OR15FG8044	N/A
X10C1451608	N/A	OR-IQ3-0468	OR-RTR6-0635	N/A	No	OR15FG8031	N/A
X10C1451611	N/A	OR-IQ3-0469	OR-RTR6-0636	N/A	No	OR15FG8031	N/A
X10C1451612	N/A	OR-IQ3-0472	OR-RTR6-0640	N/A	No	OR15FG11004	N/A
X10C1451615	N/A	OR-IQ3-0472	OR-RTR6-0640	N/A	No	OR15FG11004	N/A
X10C1451616	N/A	OR-IQ3-0478	OR-RTR6-0643	N/A	No	OR15FG8040	N/A
X10C1451619	N/A	OR-IQ3-0478	OR-RTR6-0643	N/A	No	OR15FG8040	N/A
X10C1451639	N/A	OR-IQ3-0469	OR-RTR6-0636	N/A	No	OR15FG8031	N/A
X10C1451642	N/A	OR-IQ3-0477	OR-RTR6-0642	N/A	No	OR15FG8041	N/A
X10C1451646	N/A	OR-IQ3-0477	OR-RTR6-0642	N/A	No	OR15FG8041	N/A
X10C1451647	N/A	OR-IQ3-0468	OR-RTR6-0635	N/A	No	OR15FG8031	N/A

Rick Whiteley — Signature of Site Project Manager
Rick Whiteley — Printed Name
06/01/2015 — Date

CCP Correlation of Container Identification Numbers to Batch Data Report Numbers

Waste Stream: # OR-NFS-CH-SOIL Lot # 15

Container ID Number	Historical Container ID	NDA BDR	RTR BDR	VE BDR	Load/Manage Overpack Yes	Transportation Headspace Gas	
						FGA	GGT
X10C1351229	N/A	OR-IQ3-0496	OR-RTR6-0653	N/A	No	OR15FG8052	N/A
X10C1351316	N/A	OR-IQ3-0486	OR-RTR6-0648	N/A	No	OR15FG8049	N/A
X10C1351319	N/A	OR-IQ3-0487	OR-RTR6-0649	N/A	No	OR15FG8049	N/A
X10C1351320	N/A	OR-IQ3-0487	OR-RTR6-0649	N/A	No	OR15FG8049	N/A
X10C1351327	N/A	OR-IQ3-0487	OR-RTR6-0648	N/A	No	OR15FG8049	N/A
X10C1351339	N/A	OR-IQ3-0487	OR-RTR6-0648	N/A	No	OR15FG8049	N/A
X10C1351340	N/A	OR-IQ3-0486	OR-RTR6-0648	N/A	No	OR15FG8049	N/A
X10C1351342	N/A	OR-IQ3-0495	OR-RTR6-0652	N/A	No	OR15FG8052	N/A
X10C1351343	N/A	OR-IQ3-0496	OR-RTR6-0653	N/A	No	OR15FG8052	N/A
X10C1351348	N/A	OR-IQ3-0487	OR-RTR6-0649	N/A	No	OR15FG8049	N/A
X10C1351350	N/A	OR-IQ3-0496	OR-RTR6-0653	N/A	No	OR15FG8052	N/A
X10C1351355	N/A	OR-IQ3-0495	OR-RTR6-0652	N/A	No	OR15FG8052	N/A
X10C1351359	N/A	OR-IQ3-0487	OR-RTR6-0649	N/A	No	OR15FG8049	N/A
X10C1351362	N/A	OR-IQ3-0487	OR-RTR6-0649	N/A	No	OR15FG8049	N/A
X10C1351363	N/A	OR-IQ3-0488	OR-RTR6-0649	N/A	No	OR15FG8049	N/A
X10C1351365	N/A	OR-IQ3-0486	OR-RTR6-0648	N/A	No	OR15FG8049	N/A
X10C1351416	N/A	OR-IQ3-0486	OR-RTR6-0648	N/A	No	OR15FG8049	N/A
X10C1351417	N/A	OR-IQ3-0485	OR-RTR6-0648	N/A	No	OR15FG8049	N/A
X10C1351418	N/A	OR-IQ3-0487	OR-RTR6-0648	N/A	No	OR15FG8049	N/A
X10C1351419	N/A	OR-IQ3-0487	OR-RTR6-0649	N/A	No	OR15FG8049	N/A
X10C1351423	N/A	OR-IQ3-0486	OR-RTR6-0648	N/A	No	OR15FG8049	N/A
X10C1351425	N/A	OR-IQ3-0483	OR-RTR6-0646	N/A	No	OR15FG11007	N/A
X10C1351426	N/A	OR-IQ3-0483	OR-RTR6-0646	N/A	No	OR15FG11007	N/A
X10C1351428	N/A	OR-IQ3-0485	OR-RTR6-0648	N/A	No	OR15FG8049	N/A
X10C1351430	N/A	OR-IQ3-0484	OR-RTR6-0647	N/A	No	OR15FG8045	N/A
X10C1351432	N/A	OR-IQ3-0486	OR-RTR6-0648	N/A	No	OR15FG8049	N/A
X10C1351435	N/A	OR-IQ3-0484	OR-RTR6-0647	N/A	No	OR15FG8045	N/A
X10C1351436	N/A	OR-IQ3-0488	OR-RTR6-0649	N/A	No	OR15FG8049	N/A
X10C1351437	N/A	OR-IQ3-0484	OR-RTR6-0647	N/A	No	OR15FG8045	N/A
X10C1351439	N/A	OR-IQ3-0486	OR-RTR6-0648	N/A	No	OR15FG8049	N/A
X10C1351441	N/A	OR-IQ3-0483	OR-RTR6-0646	N/A	No	OR15FG11007	N/A

CCP Correlation of Container Identification Numbers to Batch Data Report Numbers

Waste Stream: # OR-NFS-CH-SOIL Lot # 15

Container ID Number	Historical Container ID	NDA BDR	RTR BDR	VE BDR	Load/Manage Overpack Yes	Transportation Headspace Gas	
						FGA	GGT
X10C1351442	N/A	OR-IQ3-0487	OR-RTR6-0648	N/A	No	OR15FG8049	N/A
X10C1351443	N/A	OR-IQ3-0487	OR-RTR6-0648	N/A	No	OR15FG8049	N/A
X10C1351444	N/A	OR-IQ3-0483	OR-RTR6-0646	N/A	No	OR15FG11007	N/A
X10C1351445	N/A	OR-IQ3-0485	OR-RTR6-0647	N/A	No	OR15FG8045	N/A
X10C1351448	N/A	OR-IQ3-0484	OR-RTR6-0647	N/A	No	OR15FG8045	N/A
X10C1351449	N/A	OR-IQ3-0483	OR-RTR6-0647	N/A	No	OR15FG8045	N/A
X10C1351452	N/A	OR-IQ3-0484	OR-RTR6-0647	N/A	No	OR15FG8045	N/A
X10C1351453	N/A	OR-IQ3-0487	OR-RTR6-0648	N/A	No	OR15FG8049	N/A
X10C1351454	N/A	OR-IQ3-0484	OR-RTR6-0647	N/A	No	OR15FG8045	N/A
X10C1351455	N/A	OR-IQ3-0483	OR-RTR6-0646	N/A	No	OR15FG11007	N/A
X10C1351458	N/A	OR-IQ3-0488	OR-RTR6-0649	N/A	No	OR15FG8049	N/A

Signature of Site Project Manager | Rick Whiteley (Printed Name) | 06/08/2015 (Date)

CCP Correlation of Container Identification Numbers to Batch Data Report Numbers

Waste Stream: # OR-NFS-CH-SOIL Lot # 16

Container ID Number	Historical Container ID	NDA BDR	RTR BDR	VE BDR	Load/Manage Overpack Yes	Transportation Headspace Gas	
						FGA	GGT
X10C1250178	N/A	OR-IQ3-0507	OR-RTR6-0659	N/A	No	OR15FG8062	N/A
X10C1250202	N/A	OR-IQ3-0505	OR-RTR6-0658	N/A	No	OR15FG8061	N/A
X10C1350950	N/A	OR-IQ3-0509	OR-RTR6-0661	N/A	No	OR15FG8063	N/A
X10C1350951	N/A	OR-IQ3-0509	OR-RTR6-0661	N/A	No	OR15FG8063	N/A
X10C1350952	N/A	OR-IQ3-0509	OR-RTR6-0661	N/A	No	OR15FG8063	N/A
X10C1350953	N/A	OR-IQ3-0509	OR-RTR6-0661	N/A	No	OR15FG8063	N/A
X10C1350958	N/A	OR-IQ3-0508	OR-RTR6-0660	N/A	No	OR15FG8063	N/A
X10C1350961	N/A	OR-IQ3-0508	OR-RTR6-0660	N/A	No	OR15FG8063	N/A
X10C1350964	N/A	OR-IQ3-0508	OR-RTR6-0660	N/A	No	OR15FG8063	N/A
X10C1350966	N/A	OR-IQ3-0509	OR-RTR6-0660	N/A	No	OR15FG8063	N/A
X10C1350969	N/A	OR-IQ3-0508	OR-RTR6-0660	N/A	No	OR15FG8063	N/A
X10C1350971	N/A	OR-IQ3-0508	OR-RTR6-0660	N/A	No	OR15FG8063	N/A
X10C1350972	N/A	OR-IQ3-0509	OR-RTR6-0660	N/A	No	OR15FG8063	N/A
X10C1350973	N/A	OR-IQ3-0509	OR-RTR6-0660	N/A	No	OR15FG8063	N/A
X10C1350976	N/A	OR-IQ3-0508	OR-RTR6-0660	N/A	No	OR15FG8063	N/A
X10C1350979	N/A	OR-IQ3-0508	OR-RTR6-0660	N/A	No	OR15FG8063	N/A
X10C1350982	N/A	OR-IQ3-0508	OR-RTR6-0660	N/A	No	OR15FG8063	N/A
X10C1350985	N/A	OR-IQ3-0508	OR-RTR6-0660	N/A	No	OR15FG8063	N/A
X10C1350991	N/A	OR-IQ3-0509	OR-RTR6-0660	N/A	No	OR15FG8063	N/A
X10C1350998	N/A	OR-IQ3-0508	OR-RTR6-0660	N/A	No	OR15FG8063	N/A
X10C1351002	N/A	OR-IQ3-0508	OR-RTR6-0660	N/A	No	OR15FG8063	N/A
X10C1351003	N/A	OR-IQ3-0509	OR-RTR6-0661	N/A	No	OR15FG8063	N/A

Rick Whiteley — Rick Whiteley — 06/29/2015

Signature of Site Project Manager | Printed Name | Date

CCP Correlation of Container Identification Numbers to Batch Data Report Numbers

Waste Stream: # OR-NFS-CH-SOIL Lot # 17

Container ID Number	Historical Container ID	NDA BDR	RTR BDR	VE BDR	Load/Manage Overpack Yes	Transportation Headspace Gas	
						FGA	GGT
NFS0822A	N/A	OR-IQ3-0510	N/A	ORVECH0126	No	OR15FG8064	N/A
NFS0822B	N/A	OR-IQ3-0510	N/A	ORVECH0126	No	OR15FG8064	N/A
X10C1250822	N/A	OR-IQ3-0513	OR-RTR7-0137	N/A	No	OR15FG8065	N/A
X10C1350957	N/A	OR-IQ3-0514	OR-RTR7-0138	N/A	No	OR15FG8066	N/A
X10C1350960	N/A	OR-IQ3-0514	OR-RTR7-0138	N/A	No	OR15FG8066	N/A
X10C1350963	N/A	OR-IQ3-0514	OR-RTR7-0138	N/A	No	OR15FG8066	N/A
X10C1350967	N/A	OR-IQ3-0513	OR-RTR7-0137	N/A	No	OR15FG8065	N/A
X10C1350970	N/A	OR-IQ3-0512	OR-RTR7-0137	N/A	No	OR15FG8065	N/A
X10C1350977	N/A	OR-IQ3-0513	OR-RTR7-0137	N/A	No	OR15FG8065	N/A
X10C1350978	N/A	OR-IQ3-0512	OR-RTR7-0137	N/A	No	OR15FG8065	N/A

Rick Whiteley — Rick Whiteley — 07/14/2015
Signature of Site Project Manager — Printed Name — Date

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NWP
Nuclear Waste Partnership LLC
An AECOM-led partnership with BWXT and AREVA

CP:16:01095
UFC:5900.00

INTER-OFFICE CORRESPONDENCE

DATE: April 21, 2016

FROM: B. S. Schrock for B. Schrock LOCATION: Certification

TO: A. O. Stallings LOCATION: Host Site Operations Oak Ridge National Laboratory

SUBJECT: REVISED CCP-AK-ORNL-001 ACCEPTABLE KNOWLEDGE ACCURACY REPORT: OAK RIDGE NATIONAL LABORATORY WASTE STREAM NUMBER OR-NFS-CH-HOM-A, NO NEW LOTS, CUMULATIVE FOR LOT 1

Purpose

This memorandum and enclosure supersedes CP:16:01087 dated April 15, 2016, in order to add two additional bullets under the summary.

Procedure CCP-TP-005, Central Characterization Project Acceptable Knowledge Documentation, requires that Acceptable Knowledge (AK) accuracy be evaluated and documented, either on a subset of containers from the subject waste stream or a waste stream lot. The purpose of this correspondence is to document that no new lots have been generated and subsequently reviewed for accuracy since the last reporting period.

METHODOLOGY

In accordance with CCP-TP-005, applicable CCP Waste Stream Characterization Checklists (CCP-TP-005, Attachment 13) and Acceptable Knowledge Re-Evaluation Checklists (CCP-TP-005, Attachment 10) were reviewed, if additional lots have been generated since the last reporting period.

The results of the AK accuracy determination for containers in Lot 1 are reiterated in the Summary section of this correspondence and documented in the attached AK Accuracy Report form (CCP-TP-005, Attachment 14)

Results of AK Accuracy Determination Waste Stream OR-NFS-CH-HOM-A, No New Lots

There are no new lots reviewed during this reporting period.

Containers Requiring Special Consideration

No AK re-evaluations occurred during this AK accuracy evaluation period.

CCP RECORDS ORIGINAL
DATE REC'D 4/21/16

SUMMARY

There are a total of 5 waste containers in lot 1 for waste stream OR-NFS-CH-HOM-A for which AK accuracy was determined. The breakdown of results is:

- Lot 1 included 5 containers, of these containers, all were determined to be consistent with AK.
- For this waste stream, AK identifies the two most prevalent isotopes by weight to be U-238 and Pu-239. Th-232 and Pu-239 are the two most prevalent isotopes by weight in Lot 1. An Assessment as to whether an AK re-evaluation is necessary will be postponed until there are sufficient NDA assay data to be reasonably certain they are representative of the waste stream.
- Ra-226, Th-229, Th-232, U-232, and Am-243 were identified by NDA in this lot, but these nuclides are not identified in the CCP-AK-ORNL-001 Rev. 10 AK Summary Report. However, none of these nuclides contribute to 95% of the radioactive hazard in any of the containers, and therefore, CCP-AK-ORNL-001 does not need to be revised to include these nuclides.

The percentage of waste containers found to be consistent with AK for waste stream OR-NFS-CH-HOM-A is therefore:

(5/5) x 100 = 100%

If you have any questions, or if you would like more information about the contents of this AK Accuracy Report, please contact me at Extension 7444.

BSS:rg

Enclosure: 1. CCP-TP-005, Attachment 14, CCP AK Accuracy Report OR-NFS-CH-HOM-A

cc: NWP:
(without enclosure)
W. W. Allen ED
R. D. Reeves ED
M. F. Ramirez ED

(with enclosure)
CCP Records Custodian GSA-212

Tech Specs:
(without enclosure)
J. Harrison ED

ORNL
(with enclosure)
T. G. Barton ED

Attachment 14 – CCP Acceptable Knowledge Accuracy Report – Example Form

CCP Acceptable Knowledge Accuracy Report

Site(s): OAK RIDGE NATIONAL LABORATORY

Waste Stream Number(s): OR-NFS-CH-HOM-A

Waste Stream Description: SOLIDIFIED ORGANICS AND INORGANICS

Waste Containers:	Waste Matrix Code Reassigned? (Y/N)	EPA Hazardous Waste Number Reassigned? (Y/N)	Radiological Data Consistent with AK? (Y/N)
None	N/A	N/A	N/A
	N		
	A		

* The WCPIP does not require the evaluation of AK accuracy relating to EPA Hazardous Waste Number assignment; however, the reassignment of a container to another RH waste stream or new RH waste stream based on CCP testing or Permittee confirmation testing results will count against the AK accuracy for TRU (RH and CH) waste streams.

Total containers in this report: 5
Total containers consistent with AK: 5
Percent containers consistent with AK: 100

Site Project Manager:

Beverly S. Schrock / for B Schrock Date: 4/21/2016
Print Sign

Acceptable Knowledge Expert:

Jeff Harrison / Date: 4/21/2016
Print Sign

DIVIDER

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Nuclear Waste Partnership LLC

An AECOM-led partnership with BWXT and AREVA

CP:16:01088
UFC:5900.00

INTER-OFFICE CORRESPONDENCE

DATE: April 15, 2016

FROM: B. S. Schrock BSSchrock LOCATION: Certification

TO: A. O. Stallings LOCATION: Host Site Operations Oak Ridge National Laboratory

SUBJECT: ACCEPTABLE KNOWLEDGE ACCURACY REPORT: OAK RIDGE NATIONAL LABORATORY WASTE STREAM NUMBER, OR-REDC-CH-HET, HETEROGENEOUS DEBRIS WASTE, LOTS 45 THROUGH 76, CUMULATIVE FOR LOTS 1 THROUGH 76

PURPOSE

Procedure CCP-TP-005, Central Characterization Program (CCP) Acceptable Knowledge documentation, requires that Acceptable Knowledge (AK) accuracy be evaluated and documented, either on a lot or waste stream basis. The purpose of this memorandum is twofold. First, it documents the results of the AK accuracy determination for waste containers in waste stream OR-REDC-CH-HET, lots 45 through 76 that have previously not been evaluated. Second, it provides a summary of AK accuracy for waste containers in waste stream OR-REDC-CH-HET, lots 1 through 76.

METHODOLOGY

In accordance with CCP-TP-005, applicable CCP Waste Stream Characterization Checklists (Attachment 13) and Acceptable Knowledge Re-Evaluation Checklists (Attachment 10) were reviewed for waste stream OR-REDC-CH-HET, lots 45 through 76 to determine if waste containers had waste matrix codes (WMCs) reassigned, Environmental Protection Agency (EPA) Hazardous Waste Numbers (HWNs) reassigned, or were found to have radiological data inconsistent with AK. The total list of waste containers for lots 45 through 76 (1304 containers) is provided on the Correlation of Container forms that accompanies this AK Accuracy Report. The results of the AK accuracy determination for these waste containers are described in the Results section.

The results of the AK accuracy determination for waste containers comprising lots 45 through 76 were combined with the results from previous AK accuracy determinations for lots 1 through 44 and containers requiring special consideration to provide the overall AK accuracy, for lots 1 through 76 in terms of accuracy percentage. The results of the AK accuracy evaluation for waste containers in waste stream OR-REDC-CH-HET comprising lots 1 through 76 are addressed in the Summary section of this memorandum and documented on the attached AK Accuracy Report form (CCP-TP-005, Attachment 14).

CCP RECORDS ORIGINAL
DATE REC'D 4/15/2016

RESULTS OF ACCEPTABLE KNOWLEDGE ACCURACY DETERMINATION

A review of applicable CCP Waste Stream Characterization Checklists (CCP-TP-005, Attachment 13) and AKR Checklists (CCP- TP-005, Attachment 10) for waste stream OR-REDC-CH-HET indicates the following:

- No containers were reassigned to a different WMC.
- There were no new EPA HWNs assigned.
- The AK identifies Cm-244 and Pu-241 as the most predominant radionuclides by mass. For these lots, Cm-244 and Pu-241 were not always the most prevalent isotopes, however this was not considered significant because the other isotopes identified were anticipated in the waste. No containers were eliminated due to isotopic content.

Containers Requiring Special Consideration

No AK re-evaluations occurred during this AK accuracy evaluation period.

Summary

There are 2,443 waste containers in lots 1 through 76 for waste stream OR-REDC-CH-HET for which AK accuracy was determined. Following is the breakdown of results.

- Lots 1 through 12 (reference Inter-office Correspondence CP:10:01035, issued 1/18/2010) include 216 containers. All of these containers were consistent with AK.
- Lots 13 through 21 includes 243 containers (reference Inter-office Correspondence CP:11:01060, issued 1/24/2011). All of these containers were consistent with AK. For these lots, Cm-244 and Pu-241 were not always the most prevalent isotopes. A re-evaluation was performed on 7/22/10 to change the most prevalent isotopes from Cm-244 and Sr-90 to Cm-244 and Pu-241.
- Lots 22 through 24 include 58 containers (reference Inter-office Correspondence CP:12:01144, issued 3/22/2012). All of these containers were consistent with AK.
- Lots 25 through 44 include 622 containers (reference Inter-office Correspondence CP:15:01058, issued 2/18/2015). All of these containers were consistent with AK.
- Lots 45 through 75 include 1,298 containers (reference Inter-office Correspondence CP:15:01273, issued 12/8/2015). All of these containers were consistent with AK.
- Lot 76 includes 6 containers (reference Inter-office Correspondence CP:16:01044, issued 2/11/2016). All of these containers were consistent with AK.

The percentage of waste containers found to be consistent with AK is therefore:

2,443 /2,443 x 100 = 100%

If you have any questions, or if you would like more information about the contents of this AK Accuracy Report, please contact me at Extension 7444.

BSS:rg

Enclosures: 1. CCP-TP-005, Attachment 14, CCP AK Accuracy Report OR-REDC-CH-HET
2. CCP-TP-002, Attachment 4, CCP Correlation of Container Identification Number to Bach Data Report Numbers, Lots 45 - 76

cc: NTP:
(without enclosures)

W. W. Allen	ED
R. D. Reeves	ED
M. F. Ramirez	ED

(with enclosures)

CCp Records Custodian	GSA-212

Tech Specs:

J. Harrison	ED

ORNL

(with enclosures)	ED
T. G. Barton	

Attachment 14 – CCP Acceptable Knowledge Accuracy Report – Example Form

CCP Acceptable Knowledge Accuracy Report

Site(s): OAK RIDGE NATIONAL LABORATORY

Waste Stream Number(s): OR-REDC-CH-HET

Waste Stream Description: HETEROGENEOUS DEBRIS WASTE

Waste Containers:	Waste Matrix Code Reassigned? (Y/N)	EPA Hazardous Waste Number Reassigned? (Y/N)	Radiological Data Consistent with AK? (Y/N)
None	N/A	N/A	N/A
	N/A		

* The WCPIP does not require the evaluation of AK accuracy relating to EPA Hazardous Waste Number assignment; however, the reassignment of a container to another RH waste stream or new RH waste stream based on CCP testing or Permittee confirmation testing results will count against the AK accuracy for TRU (RH and CH) waste streams.

Total containers in this report: 2,443
Total containers consistent with AK: 2,443
Percent containers consistent with AK: 100

Site Project Manager:

Beverly S. Schrock / BSSchrock Date: 4/14/16
Print Sign

Acceptable Knowledge Expert:

Jeff Harrison / Jeff Harrison Date: 4/14/16
Print Sign

CCP Correlation of Container Identification Numbers to Batch Data Report Numbers

Waste Stream: # OR-REDC-CH-HET Lot # 45

Container ID Number	Historical Container ID	NDA BDR	RTR BDR	VE BDR	Load/Manage Overpack Yes	Transportation Headspace Gas	
						FGA	GGT
X10C0000250D	N/A	OR-MILCC2-0037	OR-RTR6-0440	N/A	No	OR14FG8075	N/A
X10C0011089A	N/A	OR-MILCC2-0087	OR-RTR6-0582	N/A	No	OR14FG8128	N/A
X10C0011095A	N/A	OR-MILCC2-0037	OR-RTR6-0441	N/A	No	OR14FG8079	N/A
X10C0011109A	N/A	OR-MILCC2-0076	OR-RTR7-0049	N/A	No	OR14FG8114	N/A
X10C0102692Q	N/A	OR-MILCC2-0090	OR-RTR6-0584	N/A	No	OR14FG8130	N/A
X10C0201073A	N/A	OR-MILCC2-0088	OR-RTR6-0584	N/A	No	OR14FG8128	N/A
X10C0201075A	N/A	OR-MILCC2-0037	OR-RTR6-0433	N/A	No	OR14FG8075	N/A
X10C0201754A	N/A	OR-MILCC2-0027	OR-RTR6-0472	N/A	No	OR14FG4043	N/A
X10C0300528A	N/A	OR-MILCC2-0106	OR-RTR7-0030	N/A	No	OR14FG8148	N/A
X10C0300533A	N/A	OR-MILCC2-0097	N/A	ORVECH0105	No	OR14FG8139	N/A
X10C0300534A	N/A	OR-MILCC2-0059	OR-RTR6-0484	N/A	No	OR14FG8031	N/A
X10C0300535A	N/A	OR-MILCC2-0097	N/A	ORVECH0106	No	OR14FG8139	N/A
X10C0402058A	N/A	OR-MILCC2-0034	OR-RTR7-0038	N/A	No	OR14FG8071	N/A
X10C0402783C	N/A	OR-MILCC2-0082	OR-RTR6-0571	N/A	No	OR14FG8122	N/A
X10C0402784B	N/A	OR-MILCC2-0070	OR-RTR7-0034	N/A	No	OR14FG8051	N/A
X10C0402784F1	N/A	OR-MILCC2-0007	OR-RTR6-0478	N/A	No	OR14FG8043	N/A
X10C0402784H1	N/A	OR-MILCC2-0008	OR-RTR6-0467	N/A	No	OR14FG8026	N/A
X10C0402786B	N/A	OR-MILCC2-0097	OR-RTR6-0577	N/A	No	OR14FG8139	N/A
X10C0402786F	N/A	OR-MILCC2-0082	OR-RTR6-0575	N/A	No	OR14FG8124	N/A
X10C0402787A	N/A	OR-MILCC2-0070	OR-RTR6-0472	N/A	No	OR14FG8024	N/A
X10C0402788B	N/A	OR-MILCC2-0047	OR-RTR7-0054	N/A	No	OR14FG8084	N/A
X10C0402788C	N/A	OR-MILCC2-0047	OR-RTR7-0054	N/A	No	OR14FG8084	N/A
X10C0402789F	N/A	OR-MILCC2-0048	OR-RTR7-0054	N/A	No	OR14FG8085	N/A
X10C0402789H	N/A	OR-MILCC2-0049	OR-RTR7-0054	N/A	No	OR14FG8097	N/A
X10C0402789I	N/A	OR-MILCC2-0089	OR-RTR6-0531	N/A	No	OR14FG8130	N/A
X10C0402789J	N/A	OR-MILCC2-0092	OR-RTR7-0032	N/A	No	OR14FG8133	N/A
X10C0402792D	N/A	OR-MILCC2-0049	OR-RTR7-0054	N/A	No	OR14FG8088	N/A
X10C0402793A	N/A	OR-MILCC2-0091	OR-RTR6-0584	N/A	No	OR14FG8131	N/A
X10C0402793B	N/A	OR-MILCC2-0094	OR-RTR6-0584	N/A	No	OR14FG8135	N/A
X10C0402793C	N/A	OR-MILCC2-0095	OR-RTR6-0584	N/A	No	OR14FG8135	N/A

CCP Correlation of Container Identification Numbers to Batch Data Report Numbers

Waste Stream: # OR-REDC-CH-HET Lot # 45

Container ID Number	Historical Container ID	NDA BDR	RTR BDR	VE BDR	Load/Manage Overpack Yes	Transportation Headspace Gas	
						FGA	GGT
X10C0402793D	N/A	OR-MILCC2-0088	OR-RTR6-0584	N/A	No	OR14FG8128	N/A
X10C0402793E	N/A	OR-MILCC2-0086	OR-RTR6-0581	N/A	No	OR14FG8126	N/A
X10C0402794E	N/A	OR-IQ3-0410	OR-RTR7-0011	N/A	No	OR14FG8153	N/A
X10C0402801I	N/A	OR-MILCC2-0040	OR-RTR7-0047	N/A	No	OR14FG8077	N/A
X10C0402801J	N/A	OR-MILCC2-0078	OR-RTR7-0046	N/A	No	OR14FG4062	N/A
X10C0402804I	N/A	OR-MILCC2-0006	OR-RTR6-0475	N/A	No	OR14FG8056	N/A
X10C0402804L	N/A	OR-MILCC2-0006	OR-RTR6-0486	N/A	No	OR14FG8050	N/A
X10C0402805G	N/A	OR-MILCC2-0090	OR-RTR6-0576	N/A	No	OR14FG8130	N/A
X10C0402805H	N/A	OR-MILCC2-0090	OR-RTR6-0576	N/A	No	OR14FG8130	N/A

Roger Whiteaker — Signature of Site Project Manager
Roger Whiteaker — Printed Name
01/26/2015 — Date

CCP Correlation of Container Identification Numbers to Batch Data Report Numbers

Waste Stream: # OR-REDC-CH-HET Lot # 46

Container ID Number	Historical Container ID	NDA BDR	RTR BDR	VE BDR	Load/Manage Overpack Yes	Transportation Headspace Gas	
						FGA	GGT
X10C0402805K	N/A	OR-MILCC2-0082	OR-RTR7-0097	N/A	No	OR14FG8123	N/A
X10C0402806F	N/A	OR-MILCC2-0082	OR-RTR6-0577	N/A	No	OR14FG8124	N/A
X10C0402808A	N/A	OR-MILCC2-0083	OR-RTR6-0579	N/A	No	OR14FG8123	N/A
X10C0402808C	N/A	OR-MILCC2-0085	OR-RTR6-0577	N/A	No	OR14FG8126	N/A
X10C0402808F	N/A	OR-MILCC2-0085	OR-RTR6-0577	N/A	No	OR14FG8126	N/A
X10C0402808G	N/A	OR-MILCC2-0082	OR-RTR6-0578	N/A	No	OR14FG8124	N/A
X10C0402808H	N/A	OR-MILCC2-0082	OR-RTR6-0578	N/A	No	OR14FG8124	N/A
X10C0402808I	N/A	OR-MILCC2-0084	OR-RTR6-0579	N/A	No	OR14FG8124	N/A
X10C0402808J	N/A	OR-MILCC2-0084	OR-RTR6-0579	N/A	No	OR14FG8124	N/A
X10C0402808K	N/A	OR-MILCC2-0083	OR-RTR6-0579	N/A	No	OR14FG8123	N/A
X10C0402808L	N/A	OR-MILCC2-0084	OR-RTR6-0579	N/A	No	OR14FG8126	N/A
X10C0402808O	N/A	OR-MILCC2-0083	OR-RTR7-0097	N/A	No	OR14FG8123	N/A
X10C0402812B	N/A	OR-MILCC2-0051	OR-RTR7-0066	N/A	No	OR14FG4055	N/A
X10C0402812C	N/A	OR-MILCC2-0051	OR-RTR7-0066	N/A	No	OR14FG4055	N/A
X10C0402812D	N/A	OR-MILCC2-0024	OR-RTR6-0510	N/A	No	OR14FG8063	N/A
X10C0402812E1	N/A	OR-MILCC2-0009	OR-RTR6-0470	N/A	No	OR14FG8026	N/A
X10C0402812F	N/A	OR-MILCC2-0040	OR-RTR7-0031	N/A	No	OR14FG8077	N/A
X10C0402812H1	N/A	OR-MILCC2-0049	OR-RTR6-0501	N/A	No	OR14FG8088	N/A
X10C0402812J	N/A	OR-MILCC2-0080	OR-RTR7-0065	N/A	No	OR14FG8118	N/A
X10C0402812N1	N/A	OR-MILCC2-0058	OR-RTR6-0501	N/A	No	OR14FG8051	N/A
X10C0402812O1	N/A	OR-MILCC2-0053	OR-RTR7-0068	N/A	No	OR14FG8090	N/A
X10C0402816A	N/A	OR-MILCC2-0097	OR-RTR6-0486	N/A	No	OR14FG8141	N/A
X10C0402817B	N/A	OR-MILCC2-0054	OR-RTR7-0053	N/A	No	OR14FG8085	N/A
X10C0402817C	N/A	OR-MILCC2-0046	OR-RTR7-0014	N/A	No	OR14FG8026	N/A
X10C0402817J	N/A	OR-MILCC2-0054	OR-RTR7-0053	N/A	No	OR14FG8085	N/A
X10C0402817K	N/A	OR-MILCC2-0044	OR-RTR7-0014	N/A	No	OR14FG8025	N/A
X10C0402817M	N/A	OR-MILCC2-0054	OR-RTR7-0053	N/A	No	OR14FG8085	N/A
X10C0402820B	N/A	OR-MILCC2-0065	OR-RTR7-0079	N/A	No	OR14FG8102	N/A
X10C0402820D	N/A	OR-MILCC2-0071	OR-RTR6-0563	N/A	No	OR14FG8108	N/A

CCP Correlation of Container Identification Numbers to Batch Data Report Numbers

Waste Stream: # OR-REDC-CH-HET

Lot # 46

Container ID Number	Historical Container ID	NDA BDR	RTR BDR	VE BDR	Load/Manage Overpack Yes	Transportation Headspace Gas	
						FGA	GGT
X10C0402822B	N/A	OR-MILCC2-0061	OR-RTR7-0013	N/A	No	OR14FG8024	N/A
X10C0402822D	N/A	OR-MILCC2-0070	OR-RTR6-0461	N/A	No	OR14FG8025	N/A
X10C0402822I	N/A	OR-MILCC2-0046	OR-RTR7-0014	N/A	No	OR14FG8026	N/A
X10C0402822K	N/A	OR-MILCC2-0030	OR-RTR6-0461	N/A	No	OR14FG4006	N/A
X10C0402825A	N/A	OR-MILCC2-0089	OR-RTR6-0562	N/A	No	OR14FG8130	N/A
X10C0402826G	N/A	OR-MILCC2-0025	OR-RTR7-0038	N/A	No	OR14FG8065	N/A
X10C0402827A	N/A	OR-MILCC2-0084	OR-RTR6-0577	N/A	No	OR14FG8126	N/A
X10C0402827B	N/A	OR-MILCC2-0090	OR-RTR6-0577	N/A	No	OR14FG8130	N/A
X10C0402827F	N/A	OR-MILCC2-0085	OR-RTR6-0577	N/A	No	OR14FG8126	N/A
X10C0402827J	N/A	OR-MILCC2-0083	OR-RTR6-0578	N/A	No	OR14FG8123	N/A
X10C0402827K	N/A	OR-MILCC2-0083	OR-RTR6-0578	N/A	No	OR14FG8123	N/A

Rick Whiteley — Signature of Site Project Manager

Rick Whiteley — Printed Name

01/26/2015 — Date

CCP Correlation of Container Identification Numbers to Batch Data Report Numbers

Waste Stream: # OR-REDC-CH-HET Lot # 47

Container ID Number	Historical Container ID	NDA BDR	RTR BDR	VE BDR	Load/Manage Overpack Yes	Transportation Headspace Gas	
						FGA	GGT
X10C0402827L	N/A	OR-MILCC2-0083	OR-RTR6-0579	N/A	No	OR14FG8123	N/A
X10C0402828D	N/A	OR-MILCC2-0066	OR-RTR7-0079	N/A	No	OR14FG8103	N/A
X10C0402828H	N/A	OR-MILCC2-0065	OR-RTR7-0079	N/A	No	OR14FG8102	N/A
X10C0402829G	N/A	OR-MILCC2-0061	OR-RTR7-0013	N/A	No	OR14FG8101	N/A
X10C0402830D	N/A	OR-MILCC2-0110	OR-RTR7-0076	N/A	No	OR14FG8152	N/A
X10C0402831D	N/A	OR-MILCC2-0110	OR-RTR7-0076	N/A	No	OR14FG8152	N/A
X10C0402831G	N/A	OR-MILCC2-0110	OR-RTR7-0076	N/A	No	OR14FG8152	N/A
X10C0402832A	N/A	OR-MILCC2-0065	OR-RTR7-0079	N/A	No	OR14FG8102	N/A
X10C0402832C	N/A	OR-MILCC2-0065	OR-RTR7-0079	N/A	No	OR14FG8104	N/A
X10C0402833A	N/A	OR-MILCC2-0102	OR-RTR7-0116	N/A	No	OR14FG8146	N/A
X10C0402833C	N/A	OR-MILCC2-0100	OR-RTR7-0116	N/A	No	OR14FG8142	N/A
X10C0402833D	N/A	OR-MILCC2-0102	OR-RTR7-0116	N/A	No	OR14FG8146	N/A
X10C0402833F	N/A	OR-MILCC2-0102	OR-RTR7-0116	N/A	No	OR14FG8146	N/A
X10C0402834B	N/A	OR-MILCC2-0101	OR-RTR6-0591	N/A	No	OR14FG8143	N/A
X10C0402834C	N/A	OR-MILCC2-0098	OR-RTR6-0591	N/A	No	OR14FG8141	N/A
X10C0402834D	N/A	OR-IQ3-0403	OR-RTR6-0592	N/A	No	OR14FG8146	N/A
X10C0402834E	N/A	OR-IQ3-0399	OR-RTR6-0595	N/A	No	OR14FG8154	N/A
X10C0402834F	N/A	OR-MILCC2-0102	OR-RTR7-0116	N/A	No	OR14FG8146	N/A
X10C0402834G	N/A	OR-MILCC2-0102	OR-RTR6-0591	N/A	No	OR14FG8145	N/A
X10C0402834H	N/A	OR-MILCC2-0098	OR-RTR6-0591	N/A	No	OR14FG8141	N/A
X10C0402834J	N/A	OR-MILCC2-0098	OR-RTR7-0116	N/A	No	OR14FG8141	N/A
X10C0402835A	N/A	OR-MILCC2-0023	OR-RTR6-0514	N/A	No	OR14FG8062	N/A
X10C0402835G	N/A	OR-MILCC2-0023	OR-RTR6-0514	N/A	No	OR14FG8062	N/A
X10C0402837B	N/A	OR-MILCC2-0084	OR-RTR6-0579	N/A	No	OR14FG8124	N/A
X10C0402837C	N/A	OR-MILCC2-0084	OR-RTR6-0579	N/A	No	OR14FG8124	N/A
X10C0402837H	N/A	OR-MILCC2-0090	OR-RTR7-0097	N/A	No	OR14FG8130	N/A
X10C0402837J	N/A	OR-MILCC2-0083	OR-RTR7-0097	N/A	No	OR14FG8123	N/A
X10C0402839A	N/A	OR-MILCC2-0101	OR-RTR7-0117	N/A	No	OR14FG8143	N/A
X10C0402839B	N/A	OR-MILCC2-0101	OR-RTR7-0117	N/A	No	OR14FG8143	N/A
X10C0402839E	N/A	OR-MILCC2-0101	OR-RTR7-0117	N/A	No	OR14FG8143	N/A
X10C0402839H	N/A	OR-MILCC2-0101	OR-RTR7-0117	N/A	No	OR14FG8143	N/A
X10C0402839I	N/A	OR-IQ3-0398	OR-RTR6-0593	N/A	No	OR14FG8154	N/A

CCP Correlation of Container Identification Numbers to Batch Data Report Numbers

Waste Stream: # OR-REDC-CH-HET Lot # 47

Container ID Number	Historical Container ID	NDA BDR	RTR BDR	VE BDR	Load/Manage Overpack Yes	Transportation Headspace Gas	
						FGA	GGT
X10C0402848F	N/A	OR-MILCC2-0075	OR-RTR7-0081	N/A	No	OR14FG8113	N/A
X10C0402853D	N/A	OR-MILCC2-0092	OR-RTR6-0499	N/A	No	OR14FG8133	N/A
X10C0402853N	N/A	OR-MILCC2-0040	OR-RTR6-0494	N/A	No	OR14FG8077	N/A
X10C0402854H	N/A	OR-MILCC2-0011	OR-RTR6-0489	N/A	No	OR14FG4029	N/A
X10C0402855A	N/A	OR-MILCC2-0011	OR-RTR6-0496	N/A	No	OR14FG4029	N/A
X10C0402855B	N/A	OR-MILCC2-0011	OR-RTR6-0496	N/A	No	OR14FG4029	N/A
X10C0402855C	N/A	OR-MILCC2-0093	OR-RTR7-0033	N/A	No	OR14FG8135	N/A
X10C0402855D	N/A	OR-MILCC2-0093	OR-RTR7-0033	N/A	No	OR14FG8135	N/A

Rick Whiteley — Signature of Site Project Manager
Rick Whiteley — Printed Name
01/26/2015 — Date

CCP Correlation of Container Identification Numbers to Batch Data Report Numbers

Waste Stream: # OR-REDC-CH-HET Lot # 48

Container ID Number	Historical Container ID	NDA BDR	RTR BDR	VE BDR	Load/Manage Overpack Yes	Transportation Headspace Gas	
						FGA	GGT
X10C0402855E	N/A	OR-MILCC2-0092	OR-RTR7-0032	N/A	No	OR14FG8133	N/A
X10C0402855G	N/A	OR-MILCC2-0011	OR-RTR6-0497	N/A	No	OR14FG4029	N/A
X10C0402855H	N/A	OR-MILCC2-0023	OR-RTR6-0497	N/A	No	OR14FG8063	N/A
~~X10C0402855I~~	~~N/A~~	~~OR-MILCC2-0093~~	~~OR-RTR7-0033~~	~~N/A~~	~~No~~	~~OR14FG8135~~	~~N/A~~
X10C0402855J	N/A	OR-MILCC2-0093	OR-RTR7-0033	N/A	No	OR14FG8133	N/A
X10C0402856H	N/A	OR-MILCC2-0011	OR-RTR6-0497	N/A	No	OR14FG4029	N/A
X10C0402857C	N/A	OR-MILCC2-0101	OR-RTR7-0118	N/A	No	OR14FG8143	N/A
X10C0402857D	N/A	OR-MILCC2-0102	OR-RTR7-0118	N/A	No	OR14FG8147	N/A
~~X10C0402857E~~	~~N/A~~	~~OR-MILCC2-0101~~	~~OR-RTR7-0117~~	~~N/A~~	~~No~~	~~OR14FG8143~~	~~N/A~~
X10C0402857F	N/A	OR-MILCC2-0101	OR-RTR7-0117	N/A	No	OR14FG8143	N/A
X10C0402857G	N/A	OR-MILCC2-0101	OR-RTR7-0117	N/A	No	OR14FG8143	N/A
X10C0402857H	N/A	OR-MILCC2-0101	OR-RTR7-0117	N/A	No	OR14FG8143	N/A
X10C0402860C	N/A	OR-MILCC2-0041	OR-RTR7-0051	N/A	No	OR14FG8079	N/A
X10C0402860D	N/A	OR-MILCC2-0039	OR-RTR7-0051	N/A	No	OR14FG8077	N/A
X10C0402862A	N/A	OR-MILCC2-0039	OR-RTR7-0052	N/A	No	OR14FG8077	N/A
X10C0402862B	N/A	OR-MILCC2-0038	OR-RTR7-0052	N/A	No	OR14FG8075	N/A
X10C0402862C	N/A	OR-MILCC2-0076	OR-RTR7-0056	N/A	No	OR14FG8114	N/A
X10C0402862E	N/A	OR-MILCC2-0076	OR-RTR7-0056	N/A	No	OR14FG8114	N/A
X10C0402862F	N/A	OR-MILCC2-0076	OR-RTR7-0056	N/A	No	OR14FG8114	N/A
X10C0402862G	N/A	OR-MILCC2-0076	OR-RTR7-0056	N/A	No	OR14FG8115	N/A
X10C0402862I	N/A	OR-MILCC2-0090	OR-RTR6-0529	N/A	No	OR14FG8130	N/A
X10C0402862J	N/A	OR-MILCC2-0041	OR-RTR7-0051	N/A	No	OR14FG8079	N/A
X10C0402864I	N/A	OR-MILCC2-0056	OR-RTR7-0071	N/A	No	OR14FG8093	N/A
X10C0402864J	N/A	OR-MILCC2-0057	OR-RTR7-0070	N/A	No	OR14FG8096	N/A
X10C0402864P	N/A	OR-MILCC2-0056	OR-RTR7-0071	N/A	No	OR14FG8096	N/A
X10C0402868H	N/A	OR-MILCC2-0023	OR-RTR6-0497	N/A	No	OR14FG8062	N/A
X10C0402868J	N/A	OR-MILCC2-0010	OR-RTR7-0039	N/A	No	OR14FG8054	N/A
X10C0402868O	N/A	OR-MILCC2-0092	OR-RTR7-0032	N/A	No	OR14FG8133	N/A
X10C0402868P	N/A	OR-MILCC2-0093	OR-RTR7-0033	N/A	No	OR14FG8135	N/A
X10C0402868R	N/A	OR-MILCC2-0091	OR-RTR7-0033	N/A	No	OR14FG8133	N/A

FAILED RW FGGR 8/19/15

Liquid BS 8/7/15

CCP Correlation of Container Identification Numbers to Batch Data Report Numbers

Waste Stream: # OR-REDC-CH-HET Lot # 48

Container ID Number	Historical Container ID	NDA BDR	RTR BDR	VE BDR	Load/Manage Overpack Yes	Transportation Headspace Gas	
						FGA	GGT
X10C0402869C	N/A	OR-MILCC2-0111	OR-RTR7-0029	N/A	No	OR14FG8153	N/A
X10C0402869D	N/A	OR-MILCC2-0111	OR-RTR7-0029	N/A	No	OR14FG8153	N/A
X10C0402869E	N/A	OR-MILCC2-0111	OR-RTR7-0029	N/A	No	OR14FG8153	N/A
X10C0402869G	N/A	OR-MILCC2-0016	OR-RTR6-0496	N/A	No	OR14FG4029	N/A
X10C0402869J	N/A	OR-MILCC2-0016	OR-RTR6-0496	N/A	No	OR14FG4029	N/A
X10C0402869K	N/A	OR-MILCC2-0091	OR-RTR6-0499	N/A	No	OR14FG8133	N/A
X10C0402869L	N/A	OR-MILCC2-0094	OR-RTR6-0500	N/A	No	OR14FG8135	N/A
X10C0402873G	N/A	OR-MILCC2-0084	OR-RTR6-0579	N/A	No	OR14FG8124	N/A
X10C0402873H	N/A	OR-MILCC2-0084	OR-RTR6-0579	N/A	No	OR14FG8126	N/A
X10C0402873I	N/A	OR-MILCC2-0084	OR-RTR6-0579	N/A	No	OR14FG8126	N/A

Roger Whiteaker — Roger Whiteaker — 01/27/2015
Signature of Site Project Manager — Printed Name — Date

Roger Whiteaker — ROGER WHITEAKER — 02/19/2015

CCP Correlation of Container Identification Numbers to Batch Data Report Numbers

Waste Stream: # OR-REDC-CH-HET Lot # 49

Container ID Number	Historical Container ID	NDA BDR	RTR BDR	VE BDR	Load/Manage Overpack Yes	Transportation Headspace Gas	
						FGA	GGT
X10C0402876E	N/A	OR-MILCC2-0112	OR-RTR7-0028	N/A	No	OR14FG8154	N/A
X10C0402876H	N/A	OR-MILCC2-0112	OR-RTR7-0029	N/A	No	OR14FG8155	N/A
X10C0402876J	N/A	OR-MILCC2-0112	OR-RTR7-0029	N/A	No	OR14FG8154	N/A
X10C0402877A	N/A	OR-MILCC2-0021	OR-RTR6-0517	N/A	No	OR14FG8060	N/A
X10C0402877D	N/A	OR-MILCC2-0021	OR-RTR6-0517	N/A	No	OR14FG8060	N/A
X10C0402877E	N/A	OR-MILCC2-0075	OR-RTR7-0082	N/A	No	OR14FG8113	N/A
X10C0402877F	N/A	OR-MILCC2-0073	OR-RTR7-0082	N/A	No	OR14FG4061	N/A
X10C0402877G	N/A	OR-MILCC2-0109	OR-RTR7-0076	N/A	No	OR14FG8151	N/A
X10C0402877H	N/A	OR-MILCC2-0053	OR-RTR7-0067	N/A	No	OR14FG8090	N/A
X10C0402878E	N/A	OR-MILCC2-0025	OR-RTR7-0038	N/A	No	OR14FG8067	N/A
X10C0402878G	N/A	OR-IQ3-0410	OR-RTR6-0597	N/A	No	OR14FG8154	N/A
X10C0402879K	N/A	OR-MILCC2-0090	OR-RTR6-0529	N/A	No	OR14FG8130	N/A
X10C0402886A	N/A	OR-MILCC2-0112	OR-RTR7-0029	N/A	No	OR14FG8155	N/A
X10C0402886B	N/A	OR-MILCC2-0082	OR-RTR6-0486	N/A	No	OR14FG8124	N/A
X10C0402886C	N/A	OR-MILCC2-0008	OR-RTR6-0470	N/A	No	OR14FG8026	N/A
X10C0402886J	N/A	OR-MILCC2-0060	OR-RTR7-0016	N/A	No	OR14FG8097	N/A
X10C0402887A	N/A	OR-IQ3-0412	OR-RTR6-0599	N/A	No	OR14FG8157	N/A
X10C0402890A	N/A	OR-MILCC2-0045	OR-RTR7-0014	N/A	No	OR14FG8025	N/A
X10C0402890C	N/A	OR-MILCC2-0047	OR-RTR7-0053	N/A	No	OR14FG8084	N/A
X10C0402890D	N/A	OR-MILCC2-0049	OR-RTR7-0054	N/A	No	OR14FG8088	N/A
X10C0402890G	N/A	OR-MILCC2-0054	OR-RTR7-0053	N/A	No	OR14FG8085	N/A
X10C0402892H	N/A	OR-IQ3-0410	OR-RTR7-0010	N/A	No	OR14FG8154	N/A
X10C0402893A	N/A	OR-MILCC2-0021	OR-RTR6-0501	N/A	No	OR14FG8060	N/A
X10C0402893C	N/A	OR-MILCC2-0070	OR-RTR7-0034	N/A	No	OR14FG8051	N/A
X10C0402893H	N/A	OR-MILCC2-0009	OR-RTR7-0040	N/A	No	OR14FG8054	N/A
X10C0402894D	N/A	OR-MILCC2-0036	OR-RTR7-0052	N/A	No	OR14FG8073	N/A
X10C0402894E	N/A	OR-MILCC2-0046	OR-RTR7-0014	N/A	No	OR14FG8026	N/A
X10C0402894F	N/A	OR-MILCC2-0009	OR-RTR6-0467	N/A	No	OR14FG8026	N/A
X10C0402894G	N/A	OR-MILCC2-0007	OR-RTR7-0018	N/A	No	OR14FG8036	N/A
X10C0402894I	N/A	OR-MILCC2-0033	OR-RTR7-0018	N/A	No	OR14FG8034	N/A
X10C0402894J	N/A	OR-MILCC2-0103	OR-RTR7-0060	N/A	No	OR14FG8145	N/A

CCP Correlation of Container Identification Numbers to Batch Data Report Numbers

Waste Stream: # OR-REDC-CH-HET Lot # 49

Container ID Number	Historical Container ID	NDA BDR	RTR BDR	VE BDR	Load/Manage Overpack Yes	Transportation Headspace Gas	
						FGA	GGT
X10C0402894K	N/A	OR-MILCC2-0024	OR-RTR6-0510	N/A	No	OR14FG8063	N/A
X10C0402903C	N/A	OR-MILCC2-0040	OR-RTR7-0050	N/A	No	OR14FG8077	N/A
X10C0402903D	N/A	OR-MILCC2-0045	OR-RTR7-0014	N/A	No	OR14FG8025	N/A
X10C0402903E	N/A	OR-MILCC2-0092	OR-RTR7-0032	N/A	No	OR14FG8133	N/A
X10C0402903F	N/A	OR-MILCC2-0041	OR-RTR7-0050	N/A	No	OR14FG4052	N/A
X10C0402903I1	N/A	OR-MILCC2-0062	OR-RTR7-0076	N/A	No	OR14FG8099	N/A
X10C0402904A	N/A	OR-MILCC2-0109	OR-RTR7-0076	N/A	No	OR14FG8151	N/A
X10C0402904C	N/A	OR-MILCC2-0109	OR-RTR7-0076	N/A	No	OR14FG8151	N/A
X10C0402904D	N/A	OR-MILCC2-0066	OR-RTR7-0078	N/A	No	OR14FG8103	N/A

R P Whiteley — Signature of Site Project Manager
Rick Whiteley — Printed Name
01/28/2015 — Date

CCP Correlation of Container Identification Numbers to Batch Data Report Numbers

Waste Stream: # OR-REDC-CH-HET Lot # 50

Container ID Number	Historical Container ID	NDA BDR	RTR BDR	VE BDR	Load/Manage Overpack Yes	Transportation Headspace Gas	
						FGA	GGT
X10C0402904E	N/A	OR-MILCC2-0066	OR-RTR7-0078	N/A	No	OR14FG8103	N/A
X10C0402904F	N/A	OR-MILCC2-0062	OR-RTR7-0076	N/A	No	OR14FG8101	N/A
X10C0402904G	N/A	OR-MILCC2-0066	OR-RTR7-0078	N/A	No	OR14FG8103	N/A
X10C0402904H	N/A	OR-MILCC2-0066	OR-RTR7-0078	N/A	No	OR14FG8103	N/A
X10C0402911B1	N/A	OR-MILCC2-0047	OR-RTR7-0053	N/A	No	OR14FG8084	N/A
X10C0402911L	N/A	OR-MILCC2-0055	OR-RTR6-0552	N/A	No	OR14FG8092	N/A
X10C0402911M	N/A	OR-MILCC2-0039	OR-RTR6-0533	N/A	No	OR14FG8073	N/A
X10C0402913C	N/A	OR-MILCC2-0054	OR-RTR7-0053	N/A	No	OR14FG8085	N/A
X10C0402913H	N/A	OR-MILCC2-0047	OR-RTR7-0053	N/A	No	OR14FG8084	N/A
X10C0402913J	N/A	OR-MILCC2-0047	OR-RTR7-0053	N/A	No	OR14FG8084	N/A
X10C0402918A	N/A	OR-MILCC2-0008	OR-RTR6-0467	N/A	No	OR14FG8026	N/A
X10C0402918AF	N/A	OR-MILCC2-0045	OR-RTR7-0014	N/A	No	OR14FG8025	N/A
X10C0402918AG	N/A	OR-MILCC2-0003	OR-RTR6-0473	N/A	No	OR14FG8047	N/A
X10C0402918AH	N/A	OR-MILCC2-0045	OR-RTR7-0014	N/A	No	OR14FG8025	N/A
X10C0402918B	N/A	OR-MILCC2-0041	OR-RTR7-0050	N/A	No	OR14FG8079	N/A
X10C0402918BA	N/A	OR-MILCC2-0110	OR-RTR7-0072	N/A	No	OR14FG8152	N/A
X10C0402918BE	N/A	OR-MILCC2-0036	OR-RTR7-0055	N/A	No	OR14FG8075	N/A
X10C0402918BI	N/A	OR-MILCC2-0043	OR-RTR7-0055	N/A	No	OR14FG8081	N/A
X10C0402918BL	N/A	OR-MILCC2-0106	OR-RTR7-0062	N/A	No	OR14FG8149	N/A
X10C0402918BM	N/A	OR-MILCC2-0043	OR-RTR7-0055	N/A	No	OR14FG8081	N/A
X10C0402918BO	N/A	OR-MILCC2-0108	OR-RTR7-0072	N/A	No	OR14FG8150	N/A
X10C0402918BS	N/A	OR-MILCC2-0062	OR-RTR7-0076	N/A	No	OR14FG8099	N/A
X10C0402918BV	N/A	OR-MILCC2-0062	OR-RTR7-0076	N/A	No	OR14FG8100	N/A
X10C0402918C	N/A	OR-MILCC2-0025	OR-RTR7-0038	N/A	No	OR14FG8065	N/A
X10C0402918CC	N/A	OR-MILCC2-0075	OR-RTR7-0082	N/A	No	OR14FG8113	N/A
X10C0402918CE	N/A	OR-MILCC2-0039	OR-RTR7-0052	N/A	No	OR14FG8077	N/A
X10C0402918CF	N/A	OR-MILCC2-0039	OR-RTR7-0052	N/A	No	OR14FG8077	N/A
X10C0402918CG	N/A	OR-MILCC2-0054	OR-RTR7-0053	N/A	No	OR14FG8085	N/A
X10C0402918CH	N/A	OR-MILCC2-0036	OR-RTR7-0052	N/A	No	OR14FG8073	N/A

CCP Correlation of Container Identification Numbers to Batch Data Report Numbers

Waste Stream: # OR-REDC-CH-HET Lot # 50

Container ID Number	Historical Container ID	NDA BDR	RTR BDR	VE BDR	Load/Manage Overpack Yes	Transportation Headspace Gas	
						FGA	GGT
X10C0402918CI	N/A	OR-MILCC2-0090	OR-RTR6-0530	N/A	No	OR14FG8130	N/A
X10C0402918CK	N/A	OR-MILCC2-0111	OR-RTR7-0028	N/A	No	OR14FG8154	N/A
X10C0402918CL	N/A	OR-MILCC2-0096	OR-RTR6-0492	N/A	No	OR14FG8137	N/A
X10C0402918CM	N/A	OR-MILCC2-0046	OR-RTR7-0014	N/A	No	OR14FG8026	N/A
X10C0402918D	N/A	OR-MILCC2-0057	OR-RTR7-0069	N/A	No	OR14FG8094	N/A
X10C0402918F	N/A	OR-MILCC2-0008	OR-RTR6-0467	N/A	No	OR14FG8026	N/A
X10C0402918G	N/A	OR-MILCC2-0082	OR-RTR6-0572	N/A	No	OR14FG8124	N/A
X10C0402918H	N/A	OR-MILCC2-0057	OR-RTR7-0069	N/A	No	OR14FG8094	N/A
X10C0402918J	N/A	OR-MILCC2-0041	OR-RTR7-0050	N/A	No	OR14FG8079	N/A
X10C0402918K	N/A	OR-MILCC2-0028	OR-RTR6-0465	N/A	No	OR14FG8018	N/A
X10C0402918M	N/A	OR-MILCC2-0058	OR-RTR7-0069	N/A	No	OR14FG8095	N/A

Roger Whiteaker — Signature of Site Project Manager
Roger Whiteaker — Printed Name
01/29/2015 — Date

CCP Correlation of Container Identification Numbers to Batch Data Report Numbers

Waste Stream: # OR-REDC-CH-HET Lot # 51

Container ID Number	Historical Container ID	NDA BDR	RTR BDR	VE BDR	Load/Manage Overpack Yes	Transportation Headspace Gas	
						FGA	GGT
X10C0402918U	N/A	OR-MILCC2-0106	OR-RTR7-0062	N/A	No	OR14FG8149	N/A
X10C0402923E	N/A	OR-MILCC2-0049	OR-RTR7-0054	N/A	No	OR14FG8088	N/A
X10C0402923F	N/A	OR-MILCC2-0049	OR-RTR7-0054	N/A	No	OR14FG8097	N/A
X10C0402923G	N/A	OR-MILCC2-0049	OR-RTR7-0054	N/A	No	OR14FG8088	N/A
X10C0402923I	N/A	OR-MILCC2-0049	OR-RTR7-0054	N/A	No	OR14FG8088	N/A
X10C0402923J	N/A	OR-MILCC2-0049	OR-RTR7-0054	N/A	No	OR14FG8097	N/A
X10C0402924D	N/A	OR-MILCC2-0028	OR-RTR6-0465	N/A	No	OR14FG8018	N/A
X10C0402924E	N/A	OR-MILCC2-0028	OR-RTR6-0464	N/A	No	OR14FG8018	N/A
X10C0402924F	N/A	OR-MILCC2-0041	OR-RTR7-0050	N/A	No	OR14FG8079	N/A
X10C0402931E	N/A	OR-MILCC2-0106	OR-RTR6-0491	N/A	No	OR14FG8148	N/A
X10C0402931G	N/A	OR-MILCC2-0028	OR-RTR6-0464	N/A	No	OR14FG8018	N/A
X10C0402933A	N/A	OR-MILCC2-0033	OR-RTR6-0477	N/A	No	OR14FG8034	N/A
X10C0402933B	N/A	OR-MILCC2-0027	OR-RTR6-0456	N/A	No	OR14FG4043	N/A
X10C0402933E	N/A	OR-MILCC2-0042	OR-RTR7-0019	N/A	No	OR14FG8079	N/A
X10C0402934D	N/A	OR-MILCC2-0045	OR-RTR7-0014	N/A	No	OR14FG8025	N/A
X10C0402934E	N/A	OR-MILCC2-0110	OR-RTR7-0014	N/A	No	OR14FG8025	N/A
X10C0402934L	N/A	OR-MILCC2-0054	OR-RTR7-0053	N/A	No	OR14FG8085	N/A
X10C0402934M	N/A	OR-MILCC2-0045	OR-RTR7-0014	N/A	No	OR14FG8025	N/A
X10C0402935B	N/A	OR-MILCC2-0010	OR-RTR7-0034	N/A	No	OR14FG8051	N/A
X10C0402935C	N/A	OR-MILCC2-0070	OR-RTR7-0034	N/A	No	OR14FG8051	N/A
X10C0402935E	N/A	OR-MILCC2-0076	OR-RTR7-0056	N/A	No	OR14FG8115	N/A
X10C0402935N	N/A	OR-MILCC2-0045	OR-RTR6-0471	N/A	No	OR14FG8025	N/A
X10C0402935O	N/A	OR-MILCC2-0046	OR-RTR6-0460	N/A	No	OR14FG8026	N/A
X10C0402935Q	N/A	OR-MILCC2-0078	OR-RTR6-0525	N/A	No	OR14FG4062	N/A
X10C0402935R1	N/A	OR-MILCC2-0053	OR-RTR7-0067	N/A	No	OR14FG8090	N/A
X10C0402935S1	N/A	OR-MILCC2-0053	OR-RTR7-0068	N/A	No	OR14FG8090	N/A
X10C0402935T1	N/A	OR-MILCC2-0008	OR-RTR6-0467	N/A	No	OR14FG8026	N/A
X10C0402935U1	N/A	OR-MILCC2-0008	OR-RTR6-0470	N/A	No	OR14FG8026	N/A
X10C0402935V1	N/A	OR-MILCC2-0093	OR-RTR7-0033	N/A	No	OR14FG8135	N/A
X10C0402937A	N/A	OR-IQ3-0398	OR-RTR6-0593	N/A	No	OR14FG8155	N/A
X10C0402937I	N/A	OR-IQ3-0398	OR-RTR6-0593	N/A	No	OR14FG8155	N/A
X10C0402937K	N/A	OR-IQ3-0398	OR-RTR6-0593	N/A	No	OR14FG8155	N/A

CCP Correlation of Container Identification Numbers to Batch Data Report Numbers

Waste Stream: # OR-REDC-CH-HET Lot # 51

Container ID Number	Historical Container ID	NDA BDR	RTR BDR	VE BDR	Load/Manage Overpack Yes	Transportation Headspace Gas	
						FGA	GGT
X10C0402939A	N/A	OR-MILCC2-0103	OR-RTR7-0060	N/A	No	OR14FG8145	N/A
X10C0402939B	N/A	OR-MILCC2-0104	OR-RTR7-0058	N/A	No	OR14FG8147	N/A
X10C0402939C	N/A	OR-MILCC2-0091	OR-RTR6-0499	N/A	No	OR14FG8133	N/A
X10C0402939H	N/A	OR-MILCC2-0093	OR-RTR6-0500	N/A	No	OR14FG8135	N/A
X10C0402939I	N/A	OR-MILCC2-0094	OR-RTR6-0500	N/A	No	OR14FG8135	N/A
X10C0402939K	N/A	OR-MILCC2-0094	OR-RTR6-0500	N/A	No	OR14FG8135	N/A
X10C0402939L	N/A	OR-MILCC2-0108	OR-RTR7-0061	N/A	No	OR14FG8150	N/A
X10C0402939M	N/A	OR-MILCC2-0104	OR-RTR7-0058	N/A	No	OR14FG8147	N/A

Rick Whiteley — Signature of Site Project Manager
Rick Whiteley — Printed Name
01/30/2015 — Date

CCP Correlation of Container Identification Numbers to Batch Data Report Numbers

Waste Stream: # OR-REDC-CH-HET Lot # 52

Container ID Number	Historical Container ID	NDA BDR	RTR BDR	VE BDR	Load/Manage Overpack Yes	Transportation Headspace Gas	
						FGA	GGT
X10C0402939O	N/A	OR-MILCC2-0090	OR-RTR6-0530	N/A	No	OR14FG8130	N/A
~~X10C0402948B~~	~~N/A~~	~~OR-MILCC2-0055~~	~~OR-RTR7-0070~~	~~N/A~~	~~No~~	~~OR14FG8092~~	~~N/A~~ (1) RL 3/13
X10C0402948C	N/A	OR-MILCC2-0057	OR-RTR7-0070	N/A	No	OR14FG8096	N/A
X10C0402948D	N/A	OR-MILCC2-0056	OR-RTR7-0070	N/A	No	OR14FG8097	N/A
X10C0402948E	N/A	OR-MILCC2-0056	OR-RTR7-0071	N/A	No	OR14FG8093	N/A
X10C0402948F	N/A	OR-MILCC2-0041	OR-RTR7-0051	N/A	No	OR14FG8079	N/A
X10C0402948G	N/A	OR-MILCC2-0103	OR-RTR7-0064	N/A	No	OR14FG8146	N/A
X10C0402948H	N/A	OR-MILCC2-0053	OR-RTR7-0067	N/A	No	OR14FG8090	N/A
X10C0402948I	N/A	OR-MILCC2-0053	OR-RTR7-0067	N/A	No	OR14FG8090	N/A
X10C0402948K	N/A	OR-MILCC2-0043	OR-RTR7-0055	N/A	No	OR14FG8081	N/A
X10C0402948L	N/A	OR-MILCC2-0076	OR-RTR7-0056	N/A	No	OR14FG4062	N/A
X10C0402948M	N/A	OR-MILCC2-0043	OR-RTR7-0055	N/A	No	OR14FG8081	N/A
X10C0402951A	N/A	OR-MILCC2-0016	OR-RTR6-0486	N/A	No	OR14FG4029	N/A
X10C0402951B	N/A	OR-MILCC2-0034	OR-RTR6-0485	N/A	No	OR14FG8034	N/A
X10C0402953C	N/A	OR-MILCC2-0080	OR-RTR7-0065	N/A	No	OR14FG8118	N/A
X10C0402953D	N/A	OR-MILCC2-0039	OR-RTR7-0031	N/A	No	OR14FG8077	N/A
X10C0402953F	N/A	OR-MILCC2-0082	OR-RTR6-0568	N/A	No	OR14FG8124	N/A
X10C0402953G	N/A	OR-MILCC2-0079	OR-RTR6-0568	N/A	No	OR14FG4063	N/A
X10C0402953H1	N/A	OR-MILCC2-0007	OR-RTR7-0018	N/A	No	OR14FG8036	N/A
X10C0402953J	N/A	OR-MILCC2-0079	OR-RTR6-0568	N/A	No	OR14FG4063	N/A
X10C0402953K1	N/A	OR-MILCC2-0029	OR-RTR6-0450	N/A	No	OR14FG8017	N/A
X10C0402953L	N/A	OR-MILCC2-0058	OR-RTR6-0549	N/A	No	OR14FG8096	N/A
X10C0402953M	N/A	OR-MILCC2-0027	OR-RTR7-0020	N/A	No	OR14FG4045	N/A
X10C0402957G	N/A	OR-MILCC2-0011	OR-RTR6-0489	N/A	No	OR14FG4029	N/A
X10C0402958C	N/A	OR-MILCC2-0092	OR-RTR7-0031	N/A	No	OR14FG8133	N/A
X10C0402958F	N/A	OR-MILCC2-0003	OR-RTR6-0475	N/A	No	OR14FG8047	N/A
X10C0402958H1	N/A	OR-MILCC2-0061	OR-RTR6-0472	N/A	No	OR14FG8105	N/A
X10C0402958K1	N/A	OR-MILCC2-0033	OR-RTR6-0477	N/A	No	OR14FG8034	N/A

CCP Correlation of Container Identification Numbers to Batch Data Report Numbers

Waste Stream: # OR-REDC-CH-HET Lot # 52

Container ID Number	Historical Container ID	NDA BDR	RTR BDR	VE BDR	Load/Manage Overpack Yes	Transportation Headspace Gas	
						FGA	GGT
X10C0402960A	N/A	OR-MILCC2-0045	OR-RTR6-0470	N/A	No	OR14FG8025	N/A
X10C0402960B	N/A	OR-MILCC2-0045	OR-RTR6-0466	N/A	No	OR14FG8025	N/A
X10C0402960C	N/A	OR-MILCC2-0030	OR-RTR6-0461	N/A	No	OR14FG4006	N/A
X10C0402960E	N/A	OR-MILCC2-0103	OR-RTR7-0060	N/A	No	OR14FG8145	N/A
X10C0402960F	N/A	OR-MILCC2-0028	OR-RTR6-0462	N/A	No	OR14FG8018	N/A
X10C0402960I	N/A	OR-MILCC2-0030	OR-RTR6-0461	N/A	No	OR14FG4006	N/A
X10C0402960J	N/A	OR-MILCC2-0037	OR-RTR7-0020	N/A	No	OR14FG8075	N/A
X10C0402963F	N/A	OR-MILCC2-0050	OR-RTR7-0066	N/A	No	OR14FG4055	N/A
X10C0402963G	N/A	OR-MILCC2-0054	OR-RTR7-0066	N/A	No	OR14FG8092	N/A
X10C0402964F	N/A	OR-MILCC2-0111	OR-RTR7-0028	N/A	No	OR14FG8154	N/A
X10C0402965A	N/A	OR-MILCC2-0101	OR-RTR7-0117	N/A	No	OR14FG8143	N/A
X10C0402965C	N/A	OR-MILCC2-0102	OR-RTR7-0118	N/A	No	OR14FG8147	N/A

Roger Whiteaker — Roger Whiteaker — 02/03/2015
Signature of Site Project Manager — Printed Name — Date

Roger Whiteaker — ROGER WHITEAKER — 3/13/2015

(1) >200 MRHM/HR DOSE ON CONTACT RW 3/13/15

CCP Correlation of Container Identification Numbers to Batch Data Report Numbers

Waste Stream: # OR-REDC-CH-HET Lot # 53

Container ID Number	Historical Container ID	NDA BDR	RTR BDR	VE BDR	Load/Manage Overpack Yes	Transportation Headspace Gas	
						FGA	GGT
X10C0402965F	N/A	OR-IQ3-0398	OR-RTR6-0593	N/A	No	OR14FG8154	N/A
X10C0402965I	N/A	OR-IQ3-0398	OR-RTR6-0593	N/A	No	OR14FG8154	N/A
X10C0402965J	N/A	OR-MILCC2-0101	OR-RTR7-0117	N/A	No	OR14FG8143	N/A
X10C0402965K	N/A	OR-MILCC2-0101	OR-RTR7-0117	N/A	No	OR14FG8143	N/A
X10C0402965M	N/A	OR-IQ3-0403	OR-RTR6-0592	N/A	No	OR14FG8146	N/A
X10C0402965N	N/A	OR-IQ3-0402	OR-RTR6-0592	N/A	No	OR14FG8146	N/A
X10C0402970C1	N/A	OR-MILCC2-0042	OR-RTR7-0019	N/A	No	OR14FG8079	N/A
X10C0402976A	N/A	OR-MILCC2-0098	OR-RTR7-0116	N/A	No	OR14FG8141	N/A
X10C0402976B	N/A	OR-MILCC2-0101	OR-RTR6-0591	N/A	No	OR14FG8143	N/A
X10C0402976D	N/A	OR-MILCC2-0107	OR-RTR6-0591	N/A	No	OR14FG8149	N/A
X10C0402976F	N/A	OR-MILCC2-0098	OR-RTR6-0592	N/A	No	OR14FG8141	N/A
X10C0402976G	N/A	OR-MILCC2-0098	OR-RTR6-0592	N/A	No	OR14FG8141	N/A
X10C0402976H	N/A	OR-MILCC2-0098	OR-RTR6-0592	N/A	No	OR14FG8141	N/A
X10C0402976I	N/A	OR-MILCC2-0100	OR-RTR7-0116	N/A	No	OR14FG8142	N/A
X10C0402976J	N/A	OR-MILCC2-0100	OR-RTR7-0116	N/A	No	OR14FG8142	N/A
X10C0402978I	N/A	OR-MILCC2-0045	OR-RTR6-0471	N/A	No	OR14FG8025	N/A
X10C0402981A	N/A	OR-MILCC2-0020	OR-RTR6-0515	N/A	No	OR14FG8059	N/A
X10C0402981F	N/A	OR-MILCC2-0022	OR-RTR6-0515	N/A	No	OR14FG8061	N/A
X10C0402981I	N/A	OR-MILCC2-0040	OR-RTR7-0051	N/A	No	OR14FG8077	N/A
X10C0402981K	N/A	OR-MILCC2-0022	OR-RTR6-0516	N/A	No	OR14FG4038	N/A
X10C0402981L	N/A	OR-MILCC2-0082	OR-RTR6-0571	N/A	No	OR14FG8122	N/A
X10C0402981N	N/A	OR-MILCC2-0104	OR-RTR7-0064	N/A	No	OR14FG8146	N/A
X10C0402981O	N/A	OR-MILCC2-0103	OR-RTR7-0064	N/A	No	OR14FG8146	N/A
X10C0402981P	N/A	OR-MILCC2-0021	OR-RTR6-0518	N/A	No	OR14FG8060	N/A
X10C0402982N	N/A	OR-MILCC2-0053	OR-RTR7-0068	N/A	No	OR14FG8090	N/A
X10C0402982S	N/A	OR-MILCC2-0041	OR-RTR7-0015	N/A	No	OR14FG8079	N/A
X10C0402983A	N/A	OR-MILCC2-0058	OR-RTR6-0548	N/A	No	OR14FG8095	N/A
X10C0402984C	N/A	OR-MILCC2-0046	OR-RTR6-0460	N/A	No	OR14FG8026	N/A

CCP Correlation of Container Identification Numbers to Batch Data Report Numbers

Waste Stream: # OR-REDC-CH-HET Lot # 53

Container ID Number	Historical Container ID	NDA BDR	RTR BDR	VE BDR	Load/Manage Overpack Yes	Transportation Headspace Gas	
						FGA	GGT
~~X10C0402984I~~	~~N/A~~	~~OR-MILCC2-0010~~	~~OR-RTR7-0035~~	~~N/A~~	~~No~~	~~OR14FG8051~~	~~N/A~~
X10C0402985B1	N/A	OR-MILCC2-0070	OR-RTR6-0472	N/A	No	OR14FG8024	N/A
X10C0402985C	N/A	OR-MILCC2-0039	OR-RTR6-0494	N/A	No	OR14FG8077	N/A
X10C0402985D1	N/A	OR-MILCC2-0010	OR-RTR7-0034	N/A	No	OR14FG8051	N/A
X10C0402985E1	N/A	OR-MILCC2-0106	OR-RTR7-0063	N/A	No	OR14FG8148	N/A
X10C0402985F1	N/A	OR-MILCC2-0008	OR-RTR6-0478	N/A	No	OR14FG8043	N/A
X10C0402985H	N/A	OR-MILCC2-0032	OR-RTR6-0481	N/A	No	OR14FG8070	N/A
X10C0402985K	N/A	OR-MILCC2-0032	OR-RTR6-0481	N/A	No	OR14FG8070	N/A
X10C0402985L1	N/A	OR-MILCC2-0078	OR-RTR7-0048	N/A	No	OR14FG4062	N/A
X10C0402985M1	N/A	OR-MILCC2-0007	OR-RTR7-0018	N/A	No	OR14FG8036	N/A
X10C0402985N	N/A	OR-MILCC2-0026	OR-RTR6-0480	N/A	No	OR14FG8065	N/A
X10C0402985O	N/A	OR-MILCC2-0023	OR-RTR6-0492	N/A	No	OR14FG8062	N/A

Lignid BS

Roger Whiteaker — Signature of Site Project Manager

Roger Whiteaker — Printed Name

02/10/2015 — Date

CCP Correlation of Container Identification Numbers to Batch Data Report Numbers

Waste Stream: # OR-REDC-CH-HET Lot # 54

Container ID Number	Historical Container ID	NDA BDR	RTR BDR	VE BDR	Load/Manage Overpack Yes	Transportation Headspace Gas	
						FGA	GGT
X10C0402985S	N/A	OR-MILCC2-0052	OR-RTR7-0067	N/A	No	OR14FG8090	N/A
X10C0402986AA1	N/A	OR-MILCC2-0092	OR-RTR7-0031	N/A	No	OR14FG8133	N/A
X10C0402986AB	N/A	OR-MILCC2-0065	OR-RTR7-0079	N/A	No	OR14FG8103	N/A
X10C0402986AC	N/A	OR-MILCC2-0026	OR-RTR6-0482	N/A	No	OR14FG8065	N/A
X10C0402986AD	N/A	OR-MILCC2-0042	OR-RTR7-0019	N/A	No	OR14FG8079	N/A
X10C0402986AE	N/A	OR-MILCC2-0041	OR-RTR7-0050	N/A	No	OR14FG8079	N/A
X10C0402986AG1	N/A	OR-MILCC2-0104	OR-RTR7-0058	N/A	No	OR14FG8146	N/A
X10C0402986B	N/A	OR-MILCC2-0056	OR-RTR7-0071	N/A	No	OR14FG8093	N/A
X10C0402986C1	N/A	OR-MILCC2-0044	OR-RTR7-0034	N/A	No	OR14FG8051	N/A
X10C0402986E	N/A	OR-MILCC2-0106	OR-RTR7-0030	N/A	No	OR14FG8148	N/A
X10C0402986I	N/A	OR-MILCC2-0031	OR-RTR6-0450	N/A	No	OR14FG8016	N/A
X10C0402986J	N/A	OR-MILCC2-0046	OR-RTR6-0470	N/A	No	OR14FG8026	N/A
X10C0402986K1	N/A	OR-MILCC2-0046	OR-RTR6-0470	N/A	No	OR14FG8025	N/A
X10C0402986M	N/A	OR-MILCC2-0046	OR-RTR6-0460	N/A	No	OR14FG8026	N/A
X10C0402986N	N/A	OR-MILCC2-0092	OR-RTR6-0499	N/A	No	OR14FG8133	N/A
X10C0402986S	N/A	OR-MILCC2-0050	OR-RTR7-0022	N/A	No	OR14FG8031	N/A
X10C0402986U	N/A	OR-MILCC2-0016	OR-RTR6-0492	N/A	No	OR14FG8067	N/A
X10C0402986W	N/A	OR-MILCC2-0027	OR-RTR6-0479	N/A	No	OR14FG4043	N/A
X10C0402986Y	N/A	OR-MILCC2-0027	OR-RTR6-0479	N/A	No	OR14FG4043	N/A
X10C0402988A1	N/A	OR-MILCC2-0043	OR-RTR7-0055	N/A	No	OR14FG8081	N/A
X10C0402988C1	N/A	OR-MILCC2-0060	OR-RTR7-0013	N/A	No	OR14FG8024	N/A
X10C0402988D	N/A	OR-MILCC2-0035	OR-RTR7-0020	N/A	No	OR14FG8072	N/A
X10C0402988E	N/A	OR-MILCC2-0037	OR-RTR7-0020	N/A	No	OR14FG8075	N/A
X10C0402988F	N/A	OR-MILCC2-0067	OR-RTR6-0543	N/A	No	OR14FG8104	N/A
X10C0402988G	N/A	OR-MILCC2-0060	OR-RTR7-0013	N/A	No	OR14FG8024	N/A
X10C0402988H	N/A	OR-MILCC2-0029	OR-RTR6-0450	N/A	No	OR14FG8017	N/A
X10C0402988I	N/A	OR-MILCC2-0006	OR-RTR6-0460	N/A	No	OR14FG8056	N/A
X10C0402988J	N/A	OR-MILCC2-0042	OR-RTR7-0019	N/A	No	OR14FG8079	N/A
X10C0402988K	N/A	OR-MILCC2-0030	OR-RTR6-0462	N/A	No	OR14FG4006	N/A
X10C0402988L	N/A	OR-MILCC2-0037	OR-RTR7-0020	N/A	No	OR14FG8075	N/A
X10C0402988O1	N/A	OR-MILCC2-0005	OR-RTR6-0470	N/A	No	OR14FG8049	N/A
X10C0402998C	N/A	OR-MILCC2-0102	OR-RTR6-0591	N/A	No	OR14FG8145	N/A

CCP Correlation of Container Identification Numbers to Batch Data Report Numbers

Waste Stream: # OR-REDC-CH-HET Lot # 54

Container ID Number	Historical Container ID	NDA BDR	RTR BDR	VE BDR	Load/Manage Overpack Yes	Transportation Headspace Gas	
						FGA	GGT
X10C0402998D	N/A	OR-MILCC2-0102	OR-RTR6-0591	N/A	No	OR14FG8145	N/A
X10C0402998F	N/A	OR-MILCC2-0101	OR-RTR7-0117	N/A	No	OR14FG8143	N/A
X10C0402998K	N/A	OR-IQ3-0399	OR-RTR6-0594	N/A	No	OR14FG8142	N/A
X10C0402998L	N/A	OR-MILCC2-0101	OR-RTR7-0117	N/A	No	OR14FG8143	N/A
X10C0403027A	N/A	OR-MILCC2-0060	OR-RTR7-0013	N/A	No	OR14FG8024	N/A
X10C0403027H	N/A	OR-MILCC2-0060	OR-RTR7-0013	N/A	No	OR14FG8024	N/A
X10C0403028C	N/A	OR-MILCC2-0066	OR-RTR7-0079	N/A	No	OR14FG8103	N/A
X10C0501679A	N/A	OR-IQ3-0404	N/A	ORVECH0105	No	OR14FG8151	N/A

Signature of Site Project Manager | Rick Whiteley (Printed Name) | 02/03/2015 (Date)

CCP Correlation of Container Identification Numbers to Batch Data Report Numbers

Waste Stream: # OR-REDC-CH-HET Lot # 55

Container ID Number	Historical Container ID	NDA BDR	RTR BDR	VE BDR	Load/Manage Overpack Yes	Transportation Headspace Gas	
						FGA	GGT
X10C0402813D	N/A	OR-IQ3-0418	OR-RTR6-0605	N/A	No	OR14FG8161	N/A
X10C0402813F	N/A	OR-IQ3-0418	OR-RTR6-0604	N/A	No	OR14FG8162	N/A
X10C0402817F	N/A	OR-IQ3-0439	OR-RTR7-0009	N/A	No	OR15FG8006	N/A
X10C0402835I	N/A	OR-IQ3-0438	OR-RTR7-0011	N/A	No	OR15FG8006	N/A
X10C0402839D	N/A	OR-IQ3-0401	OR-RTR6-0594	N/A	No	OR14FG8170	N/A
X10C0402839F	N/A	OR-IQ3-0401	OR-RTR6-0594	N/A	No	OR14FG8170	N/A
X10C0402861I	N/A	OR-IQ3-0419	OR-RTR6-0605	N/A	No	OR14FG8164	N/A
X10C0402865E	N/A	OR-IQ3-0418	OR-RTR6-0604	N/A	No	OR14FG8162	N/A
X10C0402865F	N/A	OR-IQ3-0419	OR-RTR6-0605	N/A	No	OR14FG8164	N/A
X10C0402865I	N/A	OR-IQ3-0417	OR-RTR6-0604	N/A	No	OR14FG8161	N/A
X10C0402865J	N/A	OR-IQ3-0419	OR-RTR6-0605	N/A	No	OR14FG8164	N/A
X10C0402865K	N/A	OR-IQ3-0417	OR-RTR6-0604	N/A	No	OR14FG8162	N/A
X10C0402878N	N/A	OR-IQ3-0440	OR-RTR6-0617	N/A	No	OR15FG8007	N/A
X10C0402878O	N/A	OR-IQ3-0440	OR-RTR6-0617	N/A	No	OR15FG8007	N/A
X10C0402891A	N/A	OR-IQ3-0417	OR-RTR6-0603	N/A	No	OR14FG8161	N/A
X10C0402891G	N/A	OR-IQ3-0418	OR-RTR6-0604	N/A	No	OR14FG8161	N/A
X10C0402891H	N/A	OR-IQ3-0419	OR-RTR6-0605	N/A	No	OR14FG8164	N/A
X10C0402891J	N/A	OR-IQ3-0418	OR-RTR6-0604	N/A	No	OR14FG8161	N/A
X10C0402891K	N/A	OR-IQ3-0419	OR-RTR6-0605	N/A	No	OR14FG8164	N/A
X10C0402891M	N/A	OR-IQ3-0417	OR-RTR6-0603	N/A	No	OR14FG8162	N/A
X10C0402918AI	N/A	OR-IQ3-0439	OR-RTR7-0009	N/A	No	OR15FG8006	N/A
X10C0402959G	N/A	OR-IQ3-0438	OR-RTR6-0616	N/A	No	OR15FG8006	N/A
X10C0402998G	N/A	OR-IQ3-0398	OR-RTR6-0594	N/A	No	OR14FG8170	N/A
X10C0402998H	N/A	OR-IQ3-0398	OR-RTR6-0594	N/A	No	OR14FG8170	N/A
X10C0402998I	N/A	OR-IQ3-0398	OR-RTR6-0594	N/A	No	OR14FG8170	N/A
X10C0402998J	N/A	OR-IQ3-0398	OR-RTR6-0594	N/A	No	OR14FG8170	N/A
X10C9311036A	N/A	OR-IQ3-0439	OR-RTR7-0007	N/A	No	OR15FG8006	N/A
X10C9311409A	N/A	OR-MILCC2-0006	OR-RTR6-0471	N/A	No	OR14FG8056	N/A

CCP Correlation of Container Identification Numbers to Batch Data Report Numbers

Waste Stream: # OR-REDC-CH-HET Lot # 55

Container ID Number	Historical Container ID	NDA BDR	RTR BDR	VE BDR	Load/Manage Overpack Yes	Transportation Headspace Gas	
						FGA	GGT
X10C9311962A	N/A	OR-IQ3-0440	OR-RTR7-0006	N/A	No	OR15FG8006	N/A
X10C9312004A	N/A	OR-IQ3-0440	OR-RTR7-0006	N/A	No	OR15FG8007	N/A
X10C9312128A	N/A	OR-MILCC2-0006	OR-RTR6-0486	N/A	No	OR14FG8050	N/A
X10C9402633D	N/A	OR-MILCC2-0005	OR-RTR6-0470	N/A	No	OR14FG4026	N/A
X10CSATN01905J1	N/A	OR-MILCC2-0006	OR-RTR6-0470	N/A	No	OR14FG4025	N/A
X10CSATN01937O	N/A	OR-MILCC2-0005	OR-RTR6-0470	N/A	No	OR14FG4026	N/A
X10CSATN02012J	N/A	OR-MILCC2-0006	OR-RTR6-0458	N/A	No	OR14FG8056	N/A
X10CSATN02062O	N/A	OR-MILCC2-0005	OR-RTR6-0469	N/A	No	OR14FG4026	N/A
X10CSATN02093B	N/A	OR-MILCC2-0006	OR-RTR6-0486	N/A	No	OR14FG8050	N/A
X10CSATN02093H	N/A	OR-MILCC2-0005	OR-RTR6-0471	N/A	No	OR14FG4026	N/A
X10CSATN02241M	N/A	OR-MILCC2-0005	OR-RTR6-0470	N/A	No	OR14FG4026	N/A
X10CSATN02241N	N/A	OR-MILCC2-0005	OR-RTR6-0471	N/A	No	OR14FG4026	N/A
X10CSATN02265A	N/A	OR-IQ3-0418	OR-RTR6-0604	N/A	No	OR14FG8162	N/A
X10CSATN02265B	N/A	OR-IQ3-0417	OR-RTR6-0603	N/A	No	OR14FG8162	N/A
X10CSATN02461CV	N/A	OR-MILCC2-0006	OR-RTR6-0486	N/A	No	OR14FG8050	N/A
X10CSATN02461CX1	N/A	OR-MILCC2-0008	OR-RTR6-0487	N/A	No	OR14FG4021	N/A
X10CSATN02612D	N/A	OR-IQ3-0440	OR-RTR7-0003	N/A	No	OR15FG8006	N/A
X10CSATN02612G	N/A	OR-IQ3-0438	OR-RTR7-0004	N/A	No	OR15FG8006	N/A
X10CSATN02612H	N/A	OR-IQ3-0440	OR-RTR7-0003	N/A	No	OR15FG8006	N/A
X10CSATN02682A	N/A	OR-IQ3-0439	OR-RTR7-0003	N/A	No	OR15FG8006	N/A
X10CSATN02682D	N/A	OR-IQ3-0439	OR-RTR7-0003	N/A	No	OR15FG8006	N/A
X10CSATN02698O	N/A	OR-MILCC2-0008	OR-RTR6-0487	N/A	No	OR14FG4021	N/A

Roger Whiteaker 02/16/2015

Signature of Site Project Manager | Printed Name | Date

CCP Correlation of Container Identification Numbers to Batch Data Report Numbers

Waste Stream: # OR-REDC-CH-HET Lot # 56

Container ID Number	Historical Container ID	NDA BDR	RTR BDR	VE BDR	Load/Manage Overpack Yes	Transportation Headspace Gas	
						FGA	GGT
X10C0402868M	N/A	OR-MILCC2-0009	OR-RTR7-0039	N/A	No	OR14FG8165	N/A
X10C0402931J	N/A	OR-MILCC2-0009	OR-RTR7-0039	N/A	No	OR14FG8165	N/A
X10C0402958A	N/A	OR-MILCC2-0009	OR-RTR7-0039	N/A	No	OR14FG8165	N/A
X10C9311878A	N/A	OR-MILCC2-0023	OR-RTR6-0510	N/A	No	OR14FG4039	N/A
X10C9312594A	N/A	OR-MILCC2-0030	OR-RTR6-0450	N/A	No	OR14FG8016	N/A
X10C9312652A	N/A	OR-MILCC2-0028	OR-RTR6-0448	N/A	No	OR14FG4007	N/A
X10C9313135A	N/A	OR-MILCC2-0029	OR-RTR6-0451	N/A	No	OR14FG8017	N/A
X10C9402633C	N/A	OR-MILCC2-0031	OR-RTR6-0450	N/A	No	OR14FG8016	N/A
X10C9402633E	N/A	OR-MILCC2-0031	OR-RTR6-0450	N/A	No	OR14FG8016	N/A
X10CSATN01905K	N/A	OR-MILCC2-0031	OR-RTR6-0451	N/A	No	OR14FG8016	N/A
X10CSATN01937AD	N/A	OR-MILCC2-0030	OR-RTR6-0460	N/A	No	OR14FG4006	N/A
X10CSATN01937AG	N/A	OR-MILCC2-0029	OR-RTR6-0450	N/A	No	OR14FG8017	N/A
X10CSATN01937AM	N/A	OR-MILCC2-0030	OR-RTR6-0457	N/A	No	OR14FG4006	N/A
X10CSATN01937B	N/A	OR-MILCC2-0030	OR-RTR6-0459	N/A	No	OR14FG8017	N/A
X10CSATN01937E	N/A	OR-MILCC2-0029	OR-RTR6-0451	N/A	No	OR14FG8017	N/A
X10CSATN01937J1	N/A	OR-MILCC2-0022	OR-RTR6-0515	N/A	No	OR14FG4038	N/A
X10CSATN01937X	N/A	OR-MILCC2-0028	OR-RTR6-0464	N/A	No	OR14FG8018	N/A
X10CSATN02023P	N/A	OR-MILCC2-0028	OR-RTR6-0449	N/A	No	OR14FG4007	N/A
X10CSATN02024I	N/A	OR-MILCC2-0031	OR-RTR6-0450	N/A	No	OR14FG4005	N/A
X10CSATN02062A	N/A	OR-MILCC2-0028	OR-RTR6-0449	N/A	No	OR14FG8018	N/A
X10CSATN02062B1	N/A	OR-MILCC2-0022	OR-RTR6-0516	N/A	No	OR14FG4038	N/A
X10CSATN02062C	N/A	OR-MILCC2-0031	OR-RTR6-0451	N/A	No	OR14FG4005	N/A
X10CSATN02062E	N/A	OR-MILCC2-0031	OR-RTR6-0451	N/A	No	OR14FG4005	N/A
X10CSATN02062M	N/A	OR-MILCC2-0030	OR-RTR6-0460	N/A	No	OR14FG4006	N/A
X10CSATN02071F	N/A	OR-MILCC2-0029	OR-RTR6-0462	N/A	No	OR14FG8017	N/A
X10CSATN02071L	N/A	OR-MILCC2-0024	OR-RTR6-0510	N/A	No	OR14FG4040	N/A
X10CSATN02200O	N/A	OR-MILCC2-0028	OR-RTR6-0449	N/A	No	OR14FG4007	N/A
X10CSATN02205A	N/A	OR-MILCC2-0029	OR-RTR6-0462	N/A	No	OR14FG8017	N/A
X10CSATN02205F	N/A	OR-MILCC2-0031	OR-RTR6-0450	N/A	No	OR14FG4005	N/A
X10CSATN02205G	N/A	OR-MILCC2-0030	OR-RTR6-0451	N/A	No	OR14FG8017	N/A

CCP Correlation of Container Identification Numbers to Batch Data Report Numbers

Waste Stream: # OR-REDC-CH-HET Lot # 56

Container ID Number	Historical Container ID	NDA BDR	RTR BDR	VE BDR	Load/Manage Overpack Yes	Transportation Headspace Gas	
						FGA	GGT
X10CSATN02205H	N/A	OR-MILCC2-0028	OR-RTR6-0450	N/A	No	OR14FG8020	N/A
X10CSATN02205L	N/A	OR-MILCC2-0030	OR-RTR6-0448	N/A	No	OR14FG8017	N/A
X10CSATN02244A	N/A	OR-MILCC2-0031	OR-RTR6-0450	N/A	No	OR14FG4005	N/A
X10CSATN02247K	N/A	OR-MILCC2-0009	OR-RTR7-0035	N/A	No	OR14FG4027	N/A
X10CSATN02247L	N/A	OR-MILCC2-0009	OR-RTR7-0035	N/A	No	OR14FG4027	N/A
X10CSATN02260C	N/A	OR-MILCC2-0029	OR-RTR6-0434	N/A	No	OR14FG8068	N/A
X10CSATN02284I	N/A	OR-MILCC2-0028	OR-RTR6-0450	N/A	No	OR14FG8020	N/A
X10CSATN02406E	N/A	OR-MILCC2-0029	OR-RTR6-0451	N/A	No	OR14FG4046	N/A
X10CSATN02434D	N/A	OR-MILCC2-0029	OR-RTR6-0451	N/A	No	OR14FG8017	N/A
X10CSATN02461M	N/A	OR-MILCC2-0029	OR-RTR6-0459	N/A	No	OR14FG8017	N/A
X10CSATN02474L	N/A	OR-MILCC2-0028	OR-RTR6-0435	N/A	No	OR14FG8068	N/A
X10CSATN02607E	N/A	OR-MILCC2-0023	OR-RTR6-0508	N/A	No	OR14FG4039	N/A
X10CSATN02607G	N/A	OR-MILCC2-0023	OR-RTR6-0508	N/A	No	OR14FG4039	N/A
X10CSATN02626B	N/A	OR-MILCC2-0029	OR-RTR6-0462	N/A	No	OR14FG8017	N/A
X10CSATN02626H	N/A	OR-MILCC2-0028	OR-RTR6-0464	N/A	No	OR14FG8018	N/A
X10CSATN02634K	N/A	OR-MILCC2-0022	OR-RTR6-0514	N/A	No	OR14FG4038	N/A
X10CSATN02640K	N/A	OR-MILCC2-0024	OR-RTR6-0510	N/A	No	OR14FG4040	N/A
X10CSATN02682N	N/A	OR-MILCC2-0023	OR-RTR6-0508	N/A	No	OR14FG4039	N/A
X10CSATN02870C1	N/A	OR-MILCC2-0022	OR-RTR6-0515	N/A	No	OR14FG4038	N/A
X10CSATN02870J	N/A	OR-MILCC2-0024	OR-RTR6-0510	N/A	No	OR14FG4040	N/A

Roger Whiteaker — Signature of Site Project Manager
Roger Whiteaker — Printed Name
02/23/2015 — Date

CCP Correlation of Container Identification Numbers to Batch Data Report Numbers

Waste Stream: # OR-REDC-CH-HET Lot # 57

Container ID Number	Historical Container ID	NDA BDR	RTR BDR	VE BDR	Load/Manage Overpack Yes	Transportation Headspace Gas	
						FGA	GGT
X10C0402786A	N/A	OR-MILCC2-0140	OR-RTR6-0575	N/A	No	OR15FG8015	N/A
X10C0402786D	N/A	OR-MILCC2-0140	OR-RTR6-0575	N/A	No	OR15FG8015	N/A
X10C0402786E	N/A	OR-MILCC2-0142	OR-RTR6-0575	N/A	No	OR15FG8015	N/A
X10C0402786I	N/A	OR-MILCC2-0140	OR-RTR6-0575	N/A	No	OR15FG8015	N/A
X10C0402786K	N/A	OR-MILCC2-0140	OR-RTR6-0575	N/A	No	OR15FG8015	N/A
X10C0402786L	N/A	OR-MILCC2-0140	OR-RTR6-0575	N/A	No	OR15FG8015	N/A
X10C0402806B	N/A	OR-MILCC2-0142	OR-RTR6-0575	N/A	No	OR15FG8016	N/A
X10C0402806D	N/A	OR-MILCC2-0140	OR-RTR6-0575	N/A	No	OR15FG8015	N/A
X10C0402806E	N/A	OR-MILCC2-0142	OR-RTR6-0575	N/A	No	OR15FG8015	N/A
X10C0402813E	N/A	OR-MILCC2-0137	OR-RTR6-0605	N/A	No	OR15FG8018	N/A
X10C0402861H	N/A	OR-MILCC2-0137	OR-RTR6-0604	N/A	No	OR15FG8018	N/A
X10C0402877B	N/A	OR-MILCC2-0139	OR-RTR7-0042	N/A	No	OR15FG8008	N/A
X10C0402902G	N/A	OR-MILCC2-0139	OR-RTR7-0043	N/A	No	OR15FG8009	N/A
X10C0402904B	N/A	OR-MILCC2-0134	OR-RTR6-0614	N/A	No	OR15FG8005	N/A
X10C0402935J	N/A	OR-MILCC2-0143	OR-RTR6-0456	N/A	No	OR14FG8015	N/A
X10C0402981C	N/A	OR-MILCC2-0138	OR-RTR7-0041	N/A	No	OR15FG8009	N/A
X10C0402981D	N/A	OR-MILCC2-0138	OR-RTR7-0041	N/A	No	OR15FG8009	N/A
X10C0402981E	N/A	OR-MILCC2-0138	OR-RTR7-0041	N/A	No	OR15FG8009	N/A
X10C0402984G1	N/A	OR-MILCC2-0138	OR-RTR7-0041	N/A	No	OR15FG8009	N/A
X10C0402985G1A	N/A	OR-MILCC2-0139	OR-RTR7-0042	N/A	No	OR15FG8008	N/A
X10CSATN01937AH	N/A	OR-MILCC2-0143	OR-RTR6-0455	N/A	No	OR14FG8015	N/A
X10CSATN02024H	N/A	OR-MILCC2-0138	OR-RTR7-0041	N/A	No	OR15FG8009	N/A
X10CSATN02200I	N/A	OR-MILCC2-0139	OR-RTR6-0616	N/A	No	OR15FG8009	N/A
X10CSATN02223D	N/A	OR-MILCC2-0134	OR-RTR6-0606	N/A	No	OR15FG8005	N/A
X10CSATN02229J1	N/A	OR-MILCC2-0139	OR-RTR7-0042	N/A	No	OR15FG8008	N/A
X10CSATN02260L1	N/A	OR-MILCC2-0138	OR-RTR7-0043	N/A	No	OR15FG8009	N/A
X10CSATN02265J	N/A	OR-MILCC2-0134	OR-RTR6-0609	N/A	No	OR15FG8005	N/A

CCP Correlation of Container Identification Numbers to Batch Data Report Numbers

Waste Stream: # OR-REDC-CH-HET Lot # 57

Container ID Number	Historical Container ID	NDA BDR	RTR BDR	VE BDR	Load/Manage Overpack Yes	Transportation Headspace Gas	
						FGA	GGT
X10CSATN02279A	N/A	OR-MILCC2-0143	OR-RTR6-0455	N/A	No	OR14FG8015	N/A
X10CSATN02279B	N/A	OR-MILCC2-0138	OR-RTR7-0043	N/A	No	OR15FG8009	N/A
X10CSATN02279D	N/A	OR-MILCC2-0138	OR-RTR7-0043	N/A	No	OR15FG8009	N/A
X10CSATN02284J	N/A	OR-MILCC2-0143	OR-RTR6-0455	N/A	No	OR14FG4004	N/A
X10CSATN02285P	N/A	OR-MILCC2-0138	OR-RTR7-0042	N/A	No	OR15FG8009	N/A
X10CSATN02446C	N/A	OR-MILCC2-0134	OR-RTR6-0615	N/A	No	OR15FG8005	N/A
X10CSATN02461AU1	N/A	OR-MILCC2-0138	OR-RTR7-0043	N/A	No	OR15FG8009	N/A
X10CSATN02461CZ	N/A	OR-MILCC2-0139	OR-RTR6-0616	N/A	No	OR15FG8009	N/A
X10CSATN02474A	N/A	OR-MILCC2-0134	OR-RTR6-0615	N/A	No	OR15FG8005	N/A
X10CSATN02626I	N/A	OR-MILCC2-0134	OR-RTR6-0615	N/A	No	OR15FG8005	N/A
X10CSATN02634D	N/A	OR-MILCC2-0137	OR-RTR6-0617	N/A	No	OR15FG8012	N/A
X10CSATN02634E	N/A	OR-MILCC2-0139	OR-RTR6-0617	N/A	No	OR15FG8009	N/A
X10CSATN02634F	N/A	OR-MILCC2-0137	OR-RTR6-0617	N/A	No	OR15FG8012	N/A
X10CSATN02634H	N/A	OR-MILCC2-0139	OR-RTR6-0616	N/A	No	OR15FG8009	N/A
X10CSATN02645C	N/A	OR-MILCC2-0139	OR-RTR7-0043	N/A	No	OR15FG8009	N/A
X10CSATN02665A1	N/A	OR-MILCC2-0138	OR-RTR7-0042	N/A	No	OR15FG8009	N/A
X10CSATN02682K	N/A	OR-MILCC2-0143	OR-RTR6-0455	N/A	No	OR14FG4004	N/A
X10CSATN02870L1	N/A	OR-MILCC2-0138	OR-RTR7-0042	N/A	No	OR15FG8009	N/A
X10CSATN02874A	N/A	OR-MILCC2-0139	OR-RTR6-0616	N/A	No	OR15FG8008	N/A
X10CSATN02874C	N/A	OR-MILCC2-0137	OR-RTR6-0617	N/A	No	OR15FG8012	N/A
X10CSATN02874D	N/A	OR-MILCC2-0139	OR-RTR6-0616	N/A	No	OR15FG8008	N/A
X10CSATN03042A	N/A	OR-MILCC2-0143	OR-RTR6-0455	N/A	No	OR14FG8015	N/A
X10CSATN03175A	N/A	OR-MILCC2-0142	OR-RTR6-0586	N/A	No	OR15FG8015	N/A

Roger Whiteaker — Signature of Site Project Manager

Roger Whiteaker — Printed Name

02/24/2015 — Date

CCP Correlation of Container Identification Numbers to Batch Data Report Numbers

Waste Stream: # OR-REDC-CH-HET Lot # 58

Container ID Number	Historical Container ID	NDA BDR	RTR BDR	VE BDR	Load/Manage Overpack Yes	Transportation Headspace Gas	
						FGA	GGT
X10C0402817D1	N/A	OR-IQ3-0427	OR-RTR6-0612	N/A	No	OR15FG8002	N/A
X10C0402820M1	N/A	OR-IQ3-0415	N/A	ORVECH0116	No	OR14FG8169	N/A
X10C0402829B	N/A	OR-IQ3-0415	OR-RTR7-0010	N/A	No	OR14FG8169	N/A
X10C0402837D	N/A	OR-IQ3-0414	OR-RTR6-0600	N/A	No	OR14FG8169	N/A
X10C0402891D	N/A	OR-IQ3-0420	OR-RTR6-0604	N/A	No	OR14FG8164	N/A
X10C0402909D	N/A	OR-IQ3-0432	OR-RTR6-0556	N/A	No	OR15FG8004	N/A
X10C0402918BZ	N/A	OR-IQ3-0432	OR-RTR6-0614	N/A	No	OR14FG8173	N/A
X10C0402932A	N/A	OR-IQ3-0427	OR-RTR6-0612	N/A	No	OR15FG8002	N/A
X10C0402961B	N/A	OR-IQ3-0431	OR-RTR6-0544	N/A	No	OR15FG8003	N/A
X10C0402963D	N/A	OR-IQ3-0430	OR-RTR6-0545	N/A	No	OR14FG8173	N/A
X10C0402987H1	N/A	OR-IQ3-0413	OR-RTR7-0011	N/A	No	OR14FG8157	N/A
X10C0403029E	N/A	OR-MILCC2-0010	OR-RTR7-0039	N/A	No	OR14FG8165	N/A
X10C9311203B	N/A	OR-MILCC2-0010	OR-RTR7-0039	N/A	No	OR14FG8054	N/A
X10C9311827A	N/A	OR-IQ3-0415	OR-RTR6-0601	N/A	No	OR14FG8166	N/A
X10C9312194A	N/A	OR-IQ3-0431	OR-RTR6-0546	N/A	No	OR15FG8003	N/A
~~X10C9402626A~~	~~N/A~~	~~OR-MILCC2-0021~~	~~OR-RTR6-0517~~	~~N/A~~	~~No~~	~~OR14FG4037~~	~~N/A~~ 7 2 RW MR
X10CSATN01937AJ	N/A	OR-MILCC2-0003	OR-RTR6-0470	N/A	No	OR14FG4024	N/A
X10CSATN01937C	N/A	OR-MILCC2-0027	OR-RTR6-0479	N/A	No	OR14FG8066	N/A
X10CSATN01937G	N/A	OR-MILCC2-0026	OR-RTR6-0451	N/A	No	OR14FG4042	N/A
X10CSATN02012A	N/A	OR-MILCC2-0004	OR-RTR6-0460	N/A	No	OR14FG4023	N/A
X10CSATN02012I	N/A	OR-MILCC2-0004	OR-RTR6-0459	N/A	No	OR14FG4023	N/A
X10CSATN02024L	N/A	OR-MILCC2-0007	OR-RTR7-0018	N/A	No	OR14FG8036	N/A
X10CSATN02062D	N/A	OR-MILCC2-0027	OR-RTR6-0450	N/A	No	OR14FG8020	N/A
X10CSATN02077G1	N/A	OR-MILCC2-0021	OR-RTR6-0517	N/A	No	OR14FG4037	N/A
X10CSATN02093K	N/A	OR-MILCC2-0026	OR-RTR6-0480	N/A	No	OR14FG4042	N/A
X10CSATN02093M	N/A	OR-MILCC2-0026	OR-RTR6-0479	N/A	No	OR14FG4042	N/A
X10CSATN02093O	N/A	OR-MILCC2-0032	OR-RTR6-0480	N/A	No	OR14FG4048	N/A
X10CSATN02200A	N/A	OR-MILCC2-0010	OR-RTR7-0034	N/A	No	OR14FG4027	N/A
X10CSATN02200M	N/A	OR-MILCC2-0004	OR-RTR6-0502	N/A	No	OR14FG4024	N/A
X10CSATN02229B1	N/A	OR-MILCC2-0020	OR-RTR6-0515	N/A	No	OR14FG4036	N/A
X10CSATN02229C1	N/A	OR-MILCC2-0020	OR-RTR6-0516	N/A	No	OR14FG4035	N/A
X10CSATN02406A	N/A	OR-MILCC2-0016	OR-RTR6-0508	N/A	No	OR14FG4044	N/A

CCP Correlation of Container Identification Numbers to Batch Data Report Numbers

Waste Stream: # OR-REDC-CH-HET Lot # 58

Container ID Number	Historical Container ID	NDA BDR	RTR BDR	VE BDR	Load/Manage Overpack Yes	Transportation Headspace Gas	
						FGA	GGT
X10CSATN02406G	N/A	OR-MILCC2-0016	OR-RTR6-0495	N/A	No	OR14FG4044	N/A
X10CSATN02406P	N/A	OR-MILCC2-0027	OR-RTR6-0450	N/A	No	OR14FG8020	N/A
X10CSATN02461G1	N/A	OR-MILCC2-0020	OR-RTR6-0515	N/A	No	OR14FG4036	N/A
X10CSATN02475M	N/A	OR-IQ3-0415	OR-RTR7-0010	N/A	No	OR14FG8169	N/A
X10CSATN02475O	N/A	OR-IQ3-0415	OR-RTR7-0010	N/A	No	OR14FG8166	N/A
X10CSATN02499G	N/A	OR-IQ3-0413	OR-RTR7-0011	N/A	No	OR14FG8157	N/A
X10CSATN02499O	N/A	OR-IQ3-0413	OR-RTR7-0011	N/A	No	OR14FG8156	N/A
X10CSATN02607C1	N/A	OR-IQ3-0404	N/A	ORVECH0109	No	OR14FG8151	N/A
X10CSATN02607D	N/A	OR-MILCC2-0016	OR-RTR6-0510	N/A	No	OR14FG4044	N/A
X10CSATN02607J1	N/A	OR-MILCC2-0020	OR-RTR6-0515	N/A	No	OR14FG4036	N/A
X10CSATN02632J	N/A	OR-IQ3-0430	OR-RTR6-0544	N/A	No	OR15FG8002	N/A
X10CSATN02634A	N/A	OR-MILCC2-0026	OR-RTR6-0481	N/A	No	OR14FG4042	N/A
X10CSATN02640E	N/A	OR-MILCC2-0010	OR-RTR7-0039	N/A	No	OR14FG8054	N/A
X10CSATN02640H	N/A	OR-MILCC2-0027	OR-RTR7-0020	N/A	No	OR14FG8066	N/A
X10CSATN02644H1	N/A	OR-IQ3-0430	OR-RTR6-0545	N/A	No	OR15FG8002	N/A
X10CSATN02698H	N/A	OR-MILCC2-0027	OR-RTR7-0020	N/A	No	OR14FG8066	N/A
X10CSATN03042F	N/A	OR-MILCC2-0025	OR-RTR7-0038	N/A	No	OR14FG4044	N/A
X10CSATN03042I	N/A	OR-MILCC2-0025	OR-RTR7-0038	N/A	No	OR14FG4044	N/A

Signature of Site Project Manager — Rick Whiteley (Printed Name) — 03/02/2015 (Date)

Roger Whitaker — ROGER WHITEAKER — 5/13/15

CCP Correlation of Container Identification Numbers to Batch Data Report Numbers

Waste Stream: # OR-REDC-CH-HET Lot # 59

Container ID Number	Historical Container ID	NDA BDR	RTR BDR	VE BDR	Load/Manage Overpack Yes	Transportation Headspace Gas	
						FGA	GGT
X10C0402793H	N/A	OR-MILCC2-0141	OR-RTR6-0575	N/A	No	OR15FG8016	N/A
X10C0402806C	N/A	OR-MILCC2-0141	OR-RTR6-0574	N/A	No	OR15FG8015	N/A
X10C0402827E	N/A	OR-MILCC2-0141	OR-RTR6-0574	N/A	No	OR15FG8015	N/A
X10C0402861G	N/A	OR-MILCC2-0136	OR-RTR6-0604	N/A	No	OR15FG8025	N/A
X10C0402873F	N/A	OR-MILCC2-0141	OR-RTR6-0574	N/A	No	OR15FG8015	N/A
X10C0402935F	N/A	OR-MILCC2-0133	OR-RTR6-0606	N/A	No	OR15FG8007	N/A
X10C0402935G	N/A	OR-MILCC2-0133	OR-RTR6-0606	N/A	No	OR15FG8007	N/A
X10C0402935K	N/A	OR-MILCC2-0133	OR-RTR6-0606	N/A	No	OR15FG8018	N/A
X10C0402987B1	N/A	OR-MILCC2-0136	OR-RTR7-0041	N/A	No	OR15FG8018	N/A
X10C0402987H2	N/A	OR-MILCC2-0145	OR-RTR6-0459	N/A	No	OR14FG4004	N/A
X10C9313607A	N/A	OR-MILCC2-0093	OR-RTR7-0031	N/A	No	OR14FG8133	N/A
X10C9313656A	N/A	OR-MILCC2-0133	OR-RTR6-0607	N/A	No	OR15FG8018	N/A
X10CSATN01905G	N/A	OR-MILCC2-0093	OR-RTR7-0031	N/A	No	OR14FG8133	N/A
X10CSATN01937AK	N/A	OR-MILCC2-0092	OR-RTR7-0031	N/A	No	OR14FG8133	N/A
X10CSATN01937D	N/A	OR-MILCC2-0144	OR-RTR6-0451	N/A	No	OR14FG8015	N/A
X10CSATN01937H	N/A	OR-MILCC2-0146	OR-RTR6-0502	N/A	No	OR15FG8021	N/A
X10CSATN01937I	N/A	OR-MILCC2-0146	OR-RTR6-0502	N/A	No	OR15FG8021	N/A
X10CSATN01937V	N/A	OR-MILCC2-0144	OR-RTR6-0455	N/A	No	OR14FG4004	N/A
X10CSATN01937Z	N/A	OR-MILCC2-0136	OR-RTR7-0041	N/A	No	OR15FG8008	N/A
X10CSATN02024E	N/A	OR-MILCC2-0141	OR-RTR6-0572	N/A	No	OR15FG8015	N/A
X10CSATN02062N	N/A	OR-MILCC2-0145	OR-RTR6-0451	N/A	No	OR14FG8015	N/A
X10CSATN02077D	N/A	OR-MILCC2-0133	OR-RTR7-0057	N/A	No	OR15FG8018	N/A
X10CSATN02223C	N/A	OR-MILCC2-0133	OR-RTR6-0607	N/A	No	OR15FG8007	N/A
X10CSATN02223E	N/A	OR-MILCC2-0133	OR-RTR6-0607	N/A	No	OR15FG8007	N/A
X10CSATN02229I	N/A	OR-MILCC2-0144	OR-RTR6-0451	N/A	No	OR14FG8015	N/A
X10CSATN02229M	N/A	OR-MILCC2-0144	OR-RTR6-0455	N/A	No	OR14FG4004	N/A
X10CSATN02244J	N/A	OR-MILCC2-0094	OR-RTR6-0583	N/A	No	OR14FG8134	N/A

CCP Correlation of Container Identification Numbers to Batch Data Report Numbers

Waste Stream: # OR-REDC-CH-HET Lot # 59

Container ID Number	Historical Container ID	NDA BDR	RTR BDR	VE BDR	Load/Manage Overpack Yes	Transportation Headspace Gas	
						FGA	GGT
X10CSATN02260G	N/A	OR-MILCC2-0144	OR-RTR6-0451	N/A	No	OR14FG8015	N/A
X10CSATN02284M	N/A	OR-MILCC2-0145	OR-RTR7-0006	N/A	No	OR14FG8015	N/A
X10CSATN02285O1	N/A	OR-MILCC2-0146	OR-RTR7-0037	N/A	No	OR15FG8021	N/A
X10CSATN02406B	N/A	OR-MILCC2-0146	OR-RTR7-0001	N/A	No	OR14FG4004	N/A
X10CSATN02406C	N/A	OR-MILCC2-0146	OR-RTR7-0001	N/A	No	OR14FG8015	N/A
X10CSATN02406O	N/A	OR-MILCC2-0094	OR-RTR6-0583	N/A	No	OR14FG8135	N/A
X10CSATN02434C	N/A	OR-MILCC2-0146	OR-RTR7-0026	N/A	No	OR15FG8018	N/A
X10CSATN02450J	N/A	OR-MILCC2-0094	OR-RTR7-0105	N/A	No	OR14FG8134	N/A
X10CSATN02461BT1	N/A	OR-MILCC2-0136	OR-RTR7-0041	N/A	No	OR15FG8008	N/A
X10CSATN02461C	N/A	OR-MILCC2-0092	OR-RTR7-0031	N/A	No	OR14FG8133	N/A
X10CSATN02613H	N/A	OR-MILCC2-0136	OR-RTR7-0043	N/A	No	OR15FG8008	N/A
X10CSATN02613J	N/A	OR-MILCC2-0136	OR-RTR7-0042	N/A	No	OR15FG8008	N/A
X10CSATN02645B	N/A	OR-MILCC2-0136	OR-RTR7-0042	N/A	No	OR15FG8008	N/A
X10CSATN02645D	N/A	OR-MILCC2-0136	OR-RTR7-0043	N/A	No	OR15FG8008	N/A
X10CSATN02645E	N/A	OR-MILCC2-0136	OR-RTR7-0043	N/A	No	OR15FG8008	N/A
X10CSATN02645G	N/A	OR-MILCC2-0093	OR-RTR7-0031	N/A	No	OR14FG8133	N/A
X10CSATN02664B	N/A	OR-MILCC2-0136	OR-RTR7-0041	N/A	No	OR15FG8021	N/A
X10CSATN02664E	N/A	OR-MILCC2-0136	OR-RTR7-0043	N/A	No	OR15FG8008	N/A
X10CSATN02664F	N/A	OR-MILCC2-0136	OR-RTR7-0042	N/A	No	OR15FG8008	N/A
X10CSATN02665B	N/A	OR-MILCC2-0146	OR-RTR6-0504	N/A	No	OR15FG8021	N/A
X10CSATN02682M	N/A	OR-MILCC2-0133	OR-RTR6-0607	N/A	No	OR15FG8018	N/A
X10CSATN02698A	N/A	OR-MILCC2-0144	OR-RTR6-0455	N/A	No	OR14FG4004	N/A
X10CSATN03042B	N/A	OR-MILCC2-0092	OR-RTR7-0031	N/A	No	OR14FG8133	N/A

Roger Whiteaker 03/04/2015

Signature of Site Project Manager | Printed Name | Date

CCP Correlation of Container Identification Numbers to Batch Data Report Numbers

Waste Stream: # OR-REDC-CH-HET Lot # 60

Container ID Number	Historical Container ID	NDA BDR	RTR BDR	VE BDR	Load/Manage Overpack Yes	Transportation Headspace Gas	
						FGA	GGT
X10C0402860A	N/A	OR-MILCC2-0132	OR-RTR7-0056	N/A	No	OR15FG8011	N/A
X10C0402862D	N/A	OR-MILCC2-0131	OR-RTR7-0056	N/A	No	OR15FG8016	N/A
X10C0402865G	N/A	OR-MILCC2-0148	OR-RTR6-0609	N/A	No	OR15FG8023	N/A
X10C0402868G	N/A	OR-MILCC2-0148	OR-RTR7-0037	N/A	No	OR15FG8023	N/A
X10C0402868Q	N/A	OR-MILCC2-0148	OR-RTR7-0037	N/A	No	OR15FG8023	N/A
X10C0402891B	N/A	OR-MILCC2-0148	OR-RTR6-0609	N/A	No	OR15FG8023	N/A
X10C0402918E	N/A	OR-MILCC2-0132	OR-RTR7-0057	N/A	No	OR15FG8005	N/A
X10C0402918I	N/A	OR-MILCC2-0132	OR-RTR7-0057	N/A	No	OR15FG8005	N/A
X10C0402939D	N/A	OR-MILCC2-0131	OR-RTR7-0057	N/A	No	OR15FG8011	N/A
X10C0402939E	N/A	OR-MILCC2-0131	OR-RTR7-0057	N/A	No	OR15FG8011	N/A
X10C0402939F	N/A	OR-MILCC2-0131	OR-RTR7-0057	N/A	No	OR15FG8011	N/A
X10C0402939N	N/A	OR-MILCC2-0131	OR-RTR7-0057	N/A	No	OR15FG8011	N/A
X10C0402986AF1	N/A	OR-MILCC2-0148	OR-RTR7-0036	N/A	No	OR15FG8023	N/A
X10C0402986L1	N/A	OR-MILCC2-0132	OR-RTR7-0057	N/A	No	OR15FG8019	N/A
X10C9311235A	N/A	OR-MILCC2-0033	OR-RTR7-0018	N/A	No	OR14FG8034	N/A
X10C9312641A	N/A	OR-MILCC2-0034	OR-RTR7-0038	N/A	No	OR14FG4050	N/A
X10C9400059A	N/A	OR-MILCC2-0149	OR-RTR6-0503	N/A	No	OR15FG8023	N/A
X10C9400091B	N/A	OR-MILCC2-0033	OR-RTR7-0016	N/A	No	OR14FG8034	N/A
X10CSATN01937P	N/A	OR-MILCC2-0148	OR-RTR7-0036	N/A	No	OR15FG8021	N/A
X10CSATN01937Q	N/A	OR-MILCC2-0034	OR-RTR7-0038	N/A	No	OR14FG4050	N/A
X10CSATN01937Y	N/A	OR-MILCC2-0050	OR-RTR7-0022	N/A	No	OR14FG8031	N/A
X10CSATN02022P	N/A	OR-MILCC2-0132	OR-RTR7-0057	N/A	No	OR15FG8005	N/A
X10CSATN02070H	N/A	OR-MILCC2-0050	OR-RTR7-0022	N/A	No	OR14FG8031	N/A
X10CSATN02071N	N/A	OR-MILCC2-0149	OR-RTR6-0503	N/A	No	OR15FG8023	N/A
X10CSATN02077A	N/A	OR-MILCC2-0132	OR-RTR7-0057	N/A	No	OR15FG8005	N/A
X10CSATN02077C	N/A	OR-MILCC2-0132	OR-RTR7-0057	N/A	No	OR15FG8007	N/A
X10CSATN02093A	N/A	OR-MILCC2-0034	OR-RTR6-0485	N/A	No	OR14FG8034	N/A

CCP Correlation of Container Identification Numbers to Batch Data Report Numbers

Waste Stream: # OR-REDC-CH-HET Lot # 60

Container ID Number	Historical Container ID	NDA BDR	RTR BDR	VE BDR	Load/Manage Overpack Yes	Transportation Headspace Gas	
						FGA	GGT
X10CSATN02093E	N/A	OR-MILCC2-0050	OR-RTR7-0022	N/A	No	OR14FG8031	N/A
X10CSATN02205B	N/A	OR-MILCC2-0131	OR-RTR7-0057	N/A	No	OR15FG8011	N/A
X10CSATN02229K1	N/A	OR-MILCC2-0148	OR-RTR7-0036	N/A	No	OR15FG8023	N/A
X10CSATN02265I	N/A	OR-MILCC2-0148	OR-RTR6-0609	N/A	No	OR15FG8023	N/A
X10CSATN02279F	N/A	OR-MILCC2-0033	OR-RTR7-0021	N/A	No	OR14FG8165	N/A
X10CSATN02279H	N/A	OR-MILCC2-0034	OR-RTR7-0021	N/A	No	OR14FG4050	N/A
X10CSATN02279I	N/A	OR-MILCC2-0149	OR-RTR6-0503	N/A	No	OR15FG8023	N/A
X10CSATN02279J	N/A	OR-MILCC2-0034	OR-RTR7-0021	N/A	No	OR14FG4050	N/A
X10CSATN02279K	N/A	OR-MILCC2-0034	OR-RTR7-0021	N/A	No	OR14FG4050	N/A
X10CSATN02279L	N/A	OR-MILCC2-0033	OR-RTR7-0021	N/A	No	OR14FG8165	N/A
X10CSATN02279M	N/A	OR-MILCC2-0034	OR-RTR7-0021	N/A	No	OR14FG4050	N/A
X10CSATN02499B	N/A	OR-MILCC2-0131	OR-RTR7-0057	N/A	No	OR15FG8011	N/A
X10CSATN02499J	N/A	OR-MILCC2-0050	OR-RTR6-0467	N/A	No	OR14FG8088	N/A
X10CSATN02607H	N/A	OR-MILCC2-0050	OR-RTR6-0458	N/A	No	OR14FG4055	N/A
X10CSATN02626E	N/A	OR-MILCC2-0132	OR-RTR7-0057	N/A	No	OR15FG8019	N/A
X10CSATN02634B	N/A	OR-MILCC2-0050	OR-RTR6-0457	N/A	No	OR14FG4055	N/A
X10CSATN02644M	N/A	OR-MILCC2-0131	OR-RTR7-0057	N/A	No	OR15FG8011	N/A
X10CSATN02645L	N/A	OR-MILCC2-0050	OR-RTR6-0458	N/A	No	OR14FG8088	N/A
X10CSATN02682I	N/A	OR-MILCC2-0034	OR-RTR6-0485	N/A	No	OR14FG8034	N/A
X10CSATN02694J	N/A	OR-MILCC2-0132	OR-RTR7-0057	N/A	No	OR15FG8019	N/A
X10CSATN02698E	N/A	OR-MILCC2-0033	OR-RTR6-0477	N/A	No	OR14FG8034	N/A
X10CSATN02870F	N/A	OR-MILCC2-0050	OR-RTR7-0065	N/A	No	OR14FG4055	N/A
X10CSATN03042H	N/A	OR-MILCC2-0132	OR-RTR7-0057	N/A	No	OR15FG8007	N/A

Roger Whiteaker — Signature of Site Project Manager
Roger Whiteaker — Printed Name
03/09/2015 — Date

CCP Correlation of Container Identification Numbers to Batch Data Report Numbers

Waste Stream: # OR-REDC-CH-HET Lot # 61

Container ID Number	Historical Container ID	NDA BDR	RTR BDR	VE BDR	Load/Manage Overpack Yes	Transportation Headspace Gas	
						FGA	GGT
X10C0402970E	N/A	OR-MILCC2-0088	OR-RTR6-0584	N/A	No	OR14FG8128	N/A
X10C0402970F	N/A	OR-MILCC2-0086	OR-RTR6-0581	N/A	No	OR14FG8126	N/A
X10C9312313A	N/A	OR-MILCC2-0086	OR-RTR6-0581	N/A	No	OR14FG8126	N/A
X10C9400076A	N/A	OR-MILCC2-0100	OR-RTR6-0580	N/A	No	OR14FG8142	N/A
X10C9402619A	N/A	OR-MILCC2-0086	OR-RTR6-0581	N/A	No	OR14FG8126	N/A
X10C9702553A	N/A	OR-MILCC2-0088	OR-RTR6-0582	N/A	No	OR14FG8128	N/A
X10C9801324A	N/A	OR-MILCC2-0087	OR-RTR6-0582	N/A	No	OR14FG8128	N/A
X10CSATN01937W	N/A	OR-MILCC2-0069	OR-RTR6-0489	N/A	No	OR14FG8106	N/A
X10CSATN02022H	N/A	OR-MILCC2-0100	OR-RTR6-0580	N/A	No	OR14FG8144	N/A
X10CSATN02022I	N/A	OR-MILCC2-0100	OR-RTR6-0580	N/A	No	OR14FG8142	N/A
X10CSATN02200N	N/A	OR-MILCC2-0069	OR-RTR7-0027	N/A	No	OR14FG8106	N/A
X10CSATN02205D	N/A	OR-MILCC2-0100	OR-RTR6-0580	N/A	No	OR14FG8142	N/A
X10CSATN02205J	N/A	OR-MILCC2-0087	OR-RTR6-0582	N/A	No	OR14FG8128	N/A
X10CSATN02275C	N/A	OR-MILCC2-0068	OR-RTR7-0026	N/A	No	OR14FG8105	N/A
X10CSATN02275G1	N/A	OR-MILCC2-0069	OR-RTR6-0488	N/A	No	OR14FG8106	N/A
X10CSATN02285E1	N/A	OR-MILCC2-0068	OR-RTR7-0026	N/A	No	OR14FG8105	N/A
X10CSATN02285F1	N/A	OR-MILCC2-0069	OR-RTR7-0027	N/A	No	OR14FG8106	N/A
X10CSATN02285K	N/A	OR-MILCC2-0069	OR-RTR7-0027	N/A	No	OR14FG8106	N/A
X10CSATN02406H	N/A	OR-MILCC2-0088	OR-RTR6-0584	N/A	No	OR14FG8128	N/A
X10CSATN02406N	N/A	OR-MILCC2-0088	OR-RTR7-0104	N/A	No	OR14FG8129	N/A
X10CSATN02434B	N/A	OR-MILCC2-0069	OR-RTR7-0027	N/A	No	OR14FG8106	N/A
X10CSATN02434G	N/A	OR-MILCC2-0068	OR-RTR7-0026	N/A	No	OR14FG8105	N/A
X10CSATN02434H	N/A	OR-MILCC2-0068	OR-RTR7-0026	N/A	No	OR14FG8105	N/A
X10CSATN02434I	N/A	OR-MILCC2-0087	OR-RTR6-0582	N/A	No	OR14FG8128	N/A
X10CSATN02434L	N/A	OR-MILCC2-0087	OR-RTR6-0582	N/A	No	OR14FG8128	N/A
X10CSATN02450F	N/A	OR-MILCC2-0087	OR-RTR6-0582	N/A	No	OR14FG8128	N/A
X10CSATN02450K	N/A	OR-MILCC2-0088	OR-RTR6-0583	N/A	No	OR14FG8129	N/A
X10CSATN02450O	N/A	OR-MILCC2-0086	OR-RTR6-0581	N/A	No	OR14FG8126	N/A

CCP Correlation of Container Identification Numbers to Batch Data Report Numbers

Waste Stream: # OR-REDC-CH-HET Lot # 61

Container ID Number	Historical Container ID	NDA BDR	RTR BDR	VE BDR	Load/Manage Overpack Yes	Transportation Headspace Gas	
						FGA	GGT
X10CSATN02455N	N/A	OR-MILCC2-0088	OR-RTR6-0584	N/A	No	OR14FG8128	N/A
X10CSATN02455O	N/A	OR-MILCC2-0100	OR-RTR7-0101	N/A	No	OR14FG8144	N/A
X10CSATN02461CY	N/A	OR-MILCC2-0068	OR-RTR7-0026	N/A	No	OR14FG8105	N/A
X10CSATN02474I	N/A	OR-MILCC2-0087	OR-RTR6-0582	N/A	No	OR14FG8128	N/A
X10CSATN02474M	N/A	OR-MILCC2-0087	OR-RTR6-0582	N/A	No	OR14FG8128	N/A
X10CSATN02474N	N/A	OR-MILCC2-0087	OR-RTR6-0582	N/A	No	OR14FG8128	N/A
X10CSATN02612C	N/A	OR-MILCC2-0068	OR-RTR7-0026	N/A	No	OR14FG8105	N/A
X10CSATN02626K	N/A	OR-MILCC2-0068	OR-RTR7-0026	N/A	No	OR14FG8105	N/A
X10CSATN02664D	N/A	OR-MILCC2-0069	OR-RTR6-0488	N/A	No	OR14FG8106	N/A
X10CSATN02664I	N/A	OR-MILCC2-0068	OR-RTR7-0026	N/A	No	OR14FG8105	N/A
X10CSATN02664L	N/A	OR-MILCC2-0100	OR-RTR7-0101	N/A	No	OR14FG8144	N/A
X10CSATN02682E	N/A	OR-MILCC2-0069	OR-RTR7-0027	N/A	No	OR14FG8106	N/A
X10CSATN02682J	N/A	OR-MILCC2-0069	OR-RTR7-0026	N/A	No	OR14FG8106	N/A
X10CSATN02682L	N/A	OR-MILCC2-0069	OR-RTR7-0027	N/A	No	OR14FG8106	N/A
X10CSATN02698J	N/A	OR-MILCC2-0069	OR-RTR6-0489	N/A	No	OR14FG8106	N/A
X10CSATN02698M	N/A	OR-MILCC2-0069	OR-RTR6-0489	N/A	No	OR14FG8106	N/A
X10CSATN02869C	N/A	OR-MILCC2-0100	OR-RTR6-0585	N/A	No	OR14FG8143	N/A
X10CSATN03043A	N/A	OR-MILCC2-0086	OR-RTR6-0581	N/A	No	OR14FG8126	N/A
X10CSATN03043C	N/A	OR-MILCC2-0086	OR-RTR6-0581	N/A	No	OR14FG8126	N/A
X10CSATN03043F	N/A	OR-MILCC2-0086	OR-RTR6-0581	N/A	No	OR14FG8126	N/A
X10CSATN03168E	N/A	OR-MILCC2-0100	OR-RTR7-0116	N/A	No	OR14FG8142	N/A
X10CSATN03210B	N/A	OR-MILCC2-0086	OR-RTR6-0581	N/A	No	OR14FG8126	N/A

Signature of Site Project Manager | Roger Whiteaker (Printed Name) | 03/11/2015 (Date)

CCP Correlation of Container Identification Numbers to Batch Data Report Numbers

Waste Stream: # OR-REDC-CH-HET Lot # 62

Container ID Number	Historical Container ID	NDA BDR	RTR BDR	VE BDR	Load/Manage Overpack Yes	Transportation Headspace Gas	
						FGA	GGT
X10CSATN02247F	N/A	OR-MILCC2-0095	OR-RTR6-0512	N/A	No	OR14FG8137	N/A
X10CSATN02247H	N/A	OR-MILCC2-0095	OR-RTR6-0512	N/A	No	OR14FG8137	N/A
X10CSATN02260B	N/A	OR-MILCC2-0035	OR-RTR7-0021	N/A	No	OR14FG8072	N/A
X10CSATN02260E	N/A	OR-MILCC2-0035	OR-RTR7-0021	N/A	No	OR14FG8072	N/A
X10CSATN02260F	N/A	OR-MILCC2-0096	OR-RTR6-0460	N/A	No	OR14FG8141	N/A
X10CSATN02285L	N/A	OR-MILCC2-0035	OR-RTR7-0021	N/A	No	OR14FG8072	N/A
X10CSATN02406F	N/A	OR-MILCC2-0041	OR-RTR7-0050	N/A	No	OR14FG4052	N/A
X10CSATN02406J	N/A	OR-MILCC2-0041	OR-RTR7-0050	N/A	No	OR14FG8079	N/A
X10CSATN02406K	N/A	OR-MILCC2-0036	OR-RTR6-0431	N/A	No	OR14FG8022	N/A
X10CSATN02446M	N/A	OR-MILCC2-0035	OR-RTR7-0021	N/A	No	OR14FG8072	N/A
X10CSATN02446S	N/A	OR-MILCC2-0037	OR-RTR6-0433	N/A	No	OR14FG8075	N/A
X10CSATN02461O	N/A	OR-MILCC2-0096	OR-RTR6-0492	N/A	No	OR14FG8137	N/A
X10CSATN02499D	N/A	OR-MILCC2-0039	OR-RTR6-0461	N/A	No	OR14FG4007	N/A
X10CSATN02607F	N/A	OR-MILCC2-0036	OR-RTR6-0440	N/A	No	OR14FG8165	N/A
X10CSATN02607I	N/A	OR-MILCC2-0037	OR-RTR6-0440	N/A	No	OR14FG8075	N/A
X10CSATN02626C	N/A	OR-MILCC2-0039	OR-RTR6-0461	N/A	No	OR14FG4007	N/A
X10CSATN02645A	N/A	OR-MILCC2-0042	OR-RTR7-0019	N/A	No	OR14FG4052	N/A
X10CSATN02698I	N/A	OR-MILCC2-0042	OR-RTR7-0019	N/A	No	OR14FG4052	N/A
X10CSATN03031A	N/A	OR-MILCC2-0095	OR-RTR6-0513	N/A	No	OR14FG8137	N/A
X10CSATN03042D	N/A	OR-MILCC2-0096	OR-RTR6-0493	N/A	No	OR14FG8137	N/A
~~X10CSATN03113A~~	~~N/A~~	~~OR-MILCC2-0039~~	~~OR-RTR7-0052~~	~~N/A~~	~~No~~	~~OR14FG8077~~	~~N/A~~ (1) RU 7,
X10CSATN03217A	N/A	OR-MILCC2-0039	OR-RTR7-0052	N/A	No	OR14FG8077	N/A

Roger Whiteaker — Signature of Site Project Manager
Roger Whiteaker — Printed Name
03/16/2015 — Date

Roger Whiteaker
ROGER WHITEAKER 7/15/15

(1) CONTAINER RAN THROUGH ASSAY- NDA ~~RETURNED~~ MEMO STATES, "THIS DRUM WILL NOT BE SUBJECT TO CCP ASSAY UNTIL FURTHER EVALUATION CAN BE DONE."

CCP Correlation of Container Identification Numbers to Batch Data Report Numbers

Waste Stream: # OR-REDC-CH-HET Lot # 63

Container ID Number	Historical Container ID	NDA BDR	RTR BDR	VE BDR	Load/Manage Overpack Yes	Transportation Headspace Gas	
						FGA	GGT
X10C0501680	N/A	OR-MILCC2-0056	OR-RTR7-0071	N/A	No	OR14FG8096	N/A
X10C9311215A	N/A	OR-MILCC2-0060	OR-RTR7-0022	N/A	No	OR14FG8031	N/A
X10C9311989A	N/A	OR-MILCC2-0046	OR-RTR7-0019	N/A	No	OR14FG8084	N/A
X10C9312927A	N/A	OR-MILCC2-0051	OR-RTR7-0022	N/A	No	OR14FG8031	N/A
X10C9313086A	N/A	OR-MILCC2-0043	OR-RTR7-0015	N/A	No	OR14FG4054	N/A
X10C9400014A	N/A	OR-MILCC2-0045	OR-RTR7-0015	N/A	No	OR14FG8082	N/A
X10CSATN01937AB	N/A	OR-MILCC2-0059	OR-RTR7-0022	N/A	No	OR14FG8031	N/A
X10CSATN01937AC	N/A	OR-MILCC2-0060	OR-RTR7-0022	N/A	No	OR14FG8031	N/A
X10CSATN01937AI	N/A	OR-MILCC2-0057	OR-RTR7-0068	N/A	No	OR14FG8094	N/A
X10CSATN01937L	N/A	OR-MILCC2-0057	OR-RTR7-0069	N/A	No	OR14FG8094	N/A
X10CSATN01937M	N/A	OR-MILCC2-0056	OR-RTR7-0068	N/A	No	OR14FG8094	N/A
X10CSATN01937N	N/A	OR-MILCC2-0057	OR-RTR7-0068	N/A	No	OR14FG8094	N/A
X10CSATN01937R1	N/A	OR-MILCC2-0043	OR-RTR7-0055	N/A	No	OR14FG4054	N/A
X10CSATN02012C	N/A	OR-MILCC2-0051	OR-RTR7-0022	N/A	No	OR14FG8031	N/A
X10CSATN02022F	N/A	OR-MILCC2-0056	OR-RTR7-0071	N/A	No	OR14FG8093	N/A
X10CSATN02022G	N/A	OR-MILCC2-0052	OR-RTR7-0067	N/A	No	OR14FG8093	N/A
X10CSATN02024A1	N/A	OR-MILCC2-0043	OR-RTR7-0034	N/A	No	OR14FG8051	N/A
X10CSATN02024F	N/A	OR-MILCC2-0060	OR-RTR6-0476	N/A	No	OR14FG8097	N/A
X10CSATN02024J	N/A	OR-MILCC2-0060	OR-RTR6-0476	N/A	No	OR14FG8097	N/A
X10CSATN02071A	N/A	OR-MILCC2-0055	OR-RTR7-0069	N/A	No	OR14FG8092	N/A
X10CSATN02071D	N/A	OR-MILCC2-0058	OR-RTR6-0550	N/A	No	OR14FG4057	N/A
X10CSATN02077E	N/A	OR-MILCC2-0044	OR-RTR7-0015	N/A	No	OR14FG4054	N/A
X10CSATN02241C	N/A	OR-MILCC2-0032	OR-RTR7-0021	N/A	No	OR14FG4048	N/A
X10CSATN02241E	N/A	OR-MILCC2-0052	OR-RTR7-0067	N/A	No	OR14FG8090	N/A
X10CSATN02241F	N/A	OR-MILCC2-0056	OR-RTR7-0071	N/A	No	OR14FG4057	N/A
X10CSATN02241G	N/A	OR-MILCC2-0052	OR-RTR7-0067	N/A	No	OR14FG8093	N/A
X10CSATN02247I	N/A	OR-MILCC2-0044	OR-RTR7-0034	N/A	No	OR14FG4027	N/A
X10CSATN02247J	N/A	OR-MILCC2-0048	OR-RTR7-0035	N/A	No	OR14FG8085	N/A
X10CSATN02275A	N/A	OR-MILCC2-0052	OR-RTR7-0066	N/A	No	OR14FG8090	N/A
X10CSATN02275B	N/A	OR-MILCC2-0059	OR-RTR7-0034	N/A	No	OR14FG4027	N/A
X10CSATN02275D	N/A	OR-MILCC2-0051	OR-RTR7-0066	N/A	No	OR14FG8088	N/A
X10CSATN02275E	N/A	OR-MILCC2-0055	OR-RTR7-0069	N/A	No	OR14FG8092	N/A
X10CSATN02275F	N/A	OR-MILCC2-0051	OR-RTR7-0066	N/A	No	OR14FG4055	N/A

CCP Correlation of Container Identification Numbers to Batch Data Report Numbers

Waste Stream: # OR-REDC-CH-HET Lot # 63

Container ID Number	Historical Container ID	NDA BDR	RTR BDR	VE BDR	Load/Manage Overpack Yes	Transportation Headspace Gas	
						FGA	GGT
X10CSATN02277A	N/A	OR-MILCC2-0058	OR-RTR6-0549	N/A	No	OR14FG4057	N/A
X10CSATN02285G	N/A	OR-MILCC2-0061	OR-RTR6-0469	N/A	No	OR14FG4059	N/A
X10CSATN02285M	N/A	OR-MILCC2-0032	OR-RTR7-0021	N/A	No	OR14FG4048	N/A
X10CSATN02455C	N/A	OR-MILCC2-0048	OR-RTR6-0460	N/A	No	OR14FG8085	N/A
X10CSATN02461BQ1	N/A	OR-MILCC2-0058	OR-RTR7-0069	N/A	No	OR14FG8095	N/A
X10CSATN02461N	N/A	OR-MILCC2-0060	OR-RTR6-0472	N/A	No	OR14FG8097	N/A
X10CSATN02475I	N/A	OR-MILCC2-0044	OR-RTR7-0015	N/A	No	OR14FG4054	N/A
X10CSATN02499E	N/A	OR-MILCC2-0058	OR-RTR6-0542	N/A	No	OR14FG8095	N/A
X10CSATN02607A	N/A	OR-MILCC2-0051	OR-RTR7-0066	N/A	No	OR14FG8088	N/A
X10CSATN02607L	N/A	OR-MILCC2-0043	OR-RTR7-0034	N/A	No	OR14FG4027	N/A
X10CSATN02612F	N/A	OR-MILCC2-0032	OR-RTR7-0036	N/A	No	OR14FG4048	N/A
X10CSATN02612K	N/A	OR-MILCC2-0055	OR-RTR7-0054	N/A	No	OR14FG8092	N/A
X10CSATN02627B1	N/A	OR-MILCC2-0054	OR-RTR7-0066	N/A	No	OR14FG8092	N/A
X10CSATN02634I	N/A	OR-MILCC2-0032	OR-RTR6-0480	N/A	No	OR14FG4048	N/A
X10CSATN02640A	N/A	OR-MILCC2-0052	OR-RTR7-0066	N/A	No	OR14FG8090	N/A
X10CSATN02664H	N/A	OR-MILCC2-0060	OR-RTR6-0470	N/A	No	OR14FG8097	N/A
X10CSATN02698K	N/A	OR-MILCC2-0044	OR-RTR7-0015	N/A	No	OR14FG4054	N/A

Rick Whiteley — Signature of Site Project Manager
Rick Whiteley — Printed Name
03/17/2015 — Date

CCP Correlation of Container Identification Numbers to Batch Data Report Numbers

Waste Stream: # OR-REDC-CH-HET Lot # 64

Container ID Number	Historical Container ID	NDA BDR	RTR BDR	VE BDR	Load/Manage Overpack Yes	Transportation Headspace Gas	
						FGA	GGT
X10C0402813A	N/A	OR-MILCC2-0151	OR-RTR6-0609	N/A	No	OR15FG8025	N/A
X10C0402822A1	N/A	OR-MILCC2-0147	OR-RTR7-0037	N/A	No	OR15FG8021	N/A
X10C0402855K	N/A	OR-MILCC2-0147	OR-RTR7-0037	N/A	No	OR15FG8021	N/A
X10C0402861C	N/A	OR-MILCC2-0152	OR-RTR6-0609	N/A	No	OR15FG8026	N/A
X10C0402861F	N/A	OR-MILCC2-0152	OR-RTR6-0609	N/A	No	OR15FG8026	N/A
X10C0402865A	N/A	OR-MILCC2-0152	OR-RTR6-0609	N/A	No	OR15FG8026	N/A
X10C0402868N	N/A	OR-MILCC2-0147	OR-RTR7-0037	N/A	No	OR15FG8021	N/A
X10C0402878K	N/A	OR-MILCC2-0147	OR-RTR7-0036	N/A	No	OR15FG8021	N/A
X10C0402891C	N/A	OR-MILCC2-0151	OR-RTR6-0609	N/A	No	OR15FG8025	N/A
X10C0402891F	N/A	OR-MILCC2-0152	OR-RTR6-0609	N/A	No	OR15FG8026	N/A
X10C0402891L	N/A	OR-MILCC2-0150	OR-RTR6-0609	N/A	No	OR15FG8023	N/A
X10C0402918BT	N/A	OR-MILCC2-0135	OR-RTR6-0614	N/A	No	OR15FG8011	N/A
X10C0402918CB	N/A	OR-MILCC2-0135	OR-RTR6-0614	N/A	No	OR15FG8011	N/A
X10C0402924B	N/A	OR-MILCC2-0150	OR-RTR7-0016	N/A	No	OR14FG8033	N/A
~~X10C0402925G1~~	~~N/A~~	~~OR-MILCC2-0150~~	~~OR-RTR7-0016~~	~~N/A~~	~~No~~	~~OR14FG8034~~	~~N/A~~ 7200 uL/HR 2W 5/13/11
X10C0402935P	N/A	OR-MILCC2-0151	OR-RTR7-0023	N/A	No	OR14FG8032	N/A
X10C0402958E	N/A	OR-MILCC2-0150	OR-RTR7-0016	N/A	No	OR14FG8033	N/A
X10C0402959L	N/A	OR-MILCC2-0150	OR-RTR7-0016	N/A	No	OR14FG8033	N/A
X10C0402983B	N/A	OR-MILCC2-0151	OR-RTR6-0610	N/A	No	OR15FG8025	N/A
X10C0402984B1	N/A	OR-MILCC2-0147	OR-RTR7-0037	N/A	No	OR15FG8021	N/A
X10C0402984F	N/A	OR-MILCC2-0135	OR-RTR6-0615	N/A	No	OR15FG8012	N/A
X10C0402984H	N/A	OR-MILCC2-0135	OR-RTR6-0614	N/A	No	OR15FG8011	N/A
X10C0402986D	N/A	OR-MILCC2-0151	OR-RTR6-0608	N/A	No	OR15FG8025	N/A
X10C0402986H	N/A	OR-MILCC2-0129	OR-RTR6-0608	N/A	No	OR15FG8018	N/A
X10C0402987E	N/A	OR-MILCC2-0150	OR-RTR7-0023	N/A	No	OR14FG8032	N/A
X10C9311404A	N/A	OR-MILCC2-0147	OR-RTR7-0036	N/A	No	OR15FG8021	N/A
X10C9312385A	N/A	OR-MILCC2-0128	OR-RTR6-0608	N/A	No	OR15FG8001	N/A

CCP Correlation of Container Identification Numbers to Batch Data Report Numbers

Waste Stream: # OR-REDC-CH-HET Lot # 64

Container ID Number	Historical Container ID	NDA BDR	RTR BDR	VE BDR	Load/Manage Overpack Yes	Transportation Headspace Gas	
						FGA	GGT
X10CSATN02024C	N/A	OR-MILCC2-0150	OR-RTR7-0023	N/A	No	OR14FG8032	N/A
X10CSATN02093G	N/A	OR-MILCC2-0150	OR-RTR7-0023	N/A	No	OR14FG8032	N/A
X10CSATN02200J	N/A	OR-MILCC2-0135	OR-RTR6-0614	N/A	No	OR15FG8011	N/A
X10CSATN02229L	N/A	OR-MILCC2-0147	OR-RTR7-0036	N/A	No	OR15FG8021	N/A
X10CSATN02434A	N/A	OR-MILCC2-0129	OR-RTR6-0610	N/A	No	OR15FG8001	N/A
X10CSATN02450H	N/A	OR-MILCC2-0128	OR-RTR6-0610	N/A	No	OR15FG8001	N/A
X10CSATN02450L	N/A	OR-MILCC2-0129	OR-RTR6-0610	N/A	No	OR15FG8001	N/A
X10CSATN02455H	N/A	OR-MILCC2-0128	OR-RTR6-0609	N/A	No	OR14FG8172	N/A
X10CSATN02461K	N/A	OR-MILCC2-0061	OR-RTR6-0459	N/A	No	OR14FG4059	N/A
X10CSATN02600C	N/A	OR-MILCC2-0150	OR-RTR7-0016	N/A	No	OR14FG8033	N/A
X10CSATN02632I	N/A	OR-MILCC2-0147	OR-RTR7-0037	N/A	No	OR15FG8021	N/A
X10CSATN02634C	N/A	OR-MILCC2-0061	OR-RTR6-0457	N/A	No	OR14FG8099	N/A
X10CSATN02640B	N/A	OR-MILCC2-0128	OR-RTR7-0064	N/A	No	OR14FG8172	N/A
X10CSATN02640I	N/A	OR-MILCC2-0061	OR-RTR6-0472	N/A	No	OR14FG8105	N/A
X10CSATN02664J	N/A	OR-MILCC2-0061	OR-RTR6-0471	N/A	No	OR14FG4059	N/A
X10CSATN02665G	N/A	OR-MILCC2-0147	OR-RTR7-0037	N/A	No	OR15FG8021	N/A
X10CSATN02682F	N/A	OR-MILCC2-0152	OR-RTR6-0613	N/A	No	OR15FG8026	N/A
X10CSATN02682G	N/A	OR-MILCC2-0129	OR-RTR6-0610	N/A	No	OR15FG8001	N/A
X10CSATN02682H	N/A	OR-MILCC2-0128	OR-RTR6-0610	N/A	No	OR15FG8001	N/A
X10CSATN02694I	N/A	OR-MILCC2-0129	OR-RTR6-0608	N/A	No	OR15FG8001	N/A
X10CSATN02694O	N/A	OR-MILCC2-0129	OR-RTR6-0608	N/A	No	OR15FG8001	N/A
X10CSATN02869A	N/A	OR-MILCC2-0128	OR-RTR6-0610	N/A	No	OR15FG8001	N/A
X10CSATN02869G	N/A	OR-MILCC2-0128	OR-RTR6-0608	N/A	No	OR15FG8001	N/A

Roger Whiteaker — Signature of Site Project Manager
Roger Whiteaker — Printed Name
03/18/2015 — Date

Roger Whiteaker
ROGER WHITEAKER
5/13/15

CCP Correlation of Container Identification Numbers to Batch Data Report Numbers

Waste Stream: # OR-REDC-CH-HET Lot # 65

Container ID Number	Historical Container ID	NDA BDR	RTR BDR	VE BDR	Load/Manage Overpack Yes	Transportation Headspace Gas	
						FGA	GGT
X10C0402986G	N/A	OR-MILCC2-0121	OR-RTR7-0045	N/A	No	OR14FG8163	N/A
X10C0402998E	N/A	OR-MILCC2-0107	OR-RTR6-0594	N/A	No	OR14FG8149	N/A
X10C9306658A	N/A	OR-MILCC2-0099	OR-RTR6-0580	N/A	No	OR14FG8144	N/A
X10C9307238A	N/A	OR-MILCC2-0107	OR-RTR7-0063	N/A	No	OR14FG8149	N/A
X10C9310032A	N/A	OR-MILCC2-0099	OR-RTR6-0580	N/A	No	OR14FG8144	N/A
X10C9311060A	N/A	OR-MILCC2-0114	OR-RTR7-0013	N/A	No	OR14FG8156	N/A
X10C9311200A	N/A	OR-MILCC2-0099	OR-RTR6-0580	N/A	No	OR14FG8144	N/A
X10C9312416A	N/A	OR-MILCC2-0113	OR-RTR6-0596	N/A	No	OR14FG8155	N/A
X10C9312578A	N/A	OR-MILCC2-0099	OR-RTR6-0580	N/A	No	OR14FG8141	N/A
X10C9313660A	N/A	OR-MILCC2-0099	OR-RTR6-0580	N/A	No	OR14FG8144	N/A
X10C9402626E	N/A	OR-MILCC2-0098	OR-RTR6-0580	N/A	No	OR14FG8141	N/A
X10C9402650A	N/A	OR-MILCC2-0099	OR-RTR6-0580	N/A	No	OR14FG8144	N/A
X10C9801093A	N/A	OR-MILCC2-0099	OR-RTR6-0580	N/A	No	OR14FG8144	N/A
X10C9801208A	N/A	OR-MILCC2-0099	OR-RTR6-0580	N/A	No	OR14FG8141	N/A
X10CSATN01905B	N/A	OR-MILCC2-0121	OR-RTR7-0045	N/A	No	OR14FG8163	N/A
X10CSATN01937AN	N/A	OR-MILCC2-0107	OR-RTR6-0573	N/A	No	OR14FG8149	N/A
X10CSATN02062G	N/A	OR-MILCC2-0121	OR-RTR7-0048	N/A	No	OR14FG8163	N/A
X10CSATN02062I	N/A	OR-MILCC2-0121	OR-RTR7-0048	N/A	No	OR14FG8163	N/A
X10CSATN02070N	N/A	OR-MILCC2-0121	OR-RTR7-0045	N/A	No	OR14FG8163	N/A
X10CSATN02474G	N/A	OR-MILCC2-0099	OR-RTR6-0580	N/A	No	OR14FG8141	N/A
X10CSATN02482L	N/A	OR-IQ3-0467	OR-RTR6-0634	N/A	No	OR15FG8032	N/A
X10CSATN02600H	N/A	OR-MILCC2-0107	OR-RTR7-0061	N/A	No	OR14FG8150	N/A

Roger Whiteaker — Signature of Site Project Manager

Roger Whiteaker — Printed Name

03/24/2015 — Date

CCP Correlation of Container Identification Numbers to Batch Data Report Numbers

Waste Stream: # OR-REDC-CH-HET Lot # 66

Container ID Number	Historical Container ID	NDA BDR	RTR BDR	VE BDR	Load/Manage Overpack Yes	Transportation Headspace Gas	
						FGA	GGT
X10C0402831E	N/A	OR-MILCC2-0124	OR-RTR7-0077	N/A	No	OR15FG8018	N/A
X10C0402877C	N/A	OR-MILCC2-0123	OR-RTR7-0042	N/A	No	OR14FG8171	N/A
X10C0402903A	N/A	OR-MILCC2-0125	OR-RTR7-0025	N/A	No	OR14FG8035	N/A
X10C0402918AM	N/A	OR-MILCC2-0127	OR-RTR7-0073	N/A	No	OR14FG8172	N/A
X10C0402918BF	N/A	OR-MILCC2-0153	OR-RTR6-0465	N/A	No	OR14FG8020	N/A
X10C0402918BJ	N/A	OR-MILCC2-0127	OR-RTR7-0073	N/A	No	OR14FG8172	N/A
X10C0402918BK	N/A	OR-MILCC2-0127	OR-RTR7-0073	N/A	No	OR14FG8172	N/A
X10C0402918BU	N/A	OR-MILCC2-0124	OR-RTR6-0612	N/A	No	OR14FG8171	N/A
X10C0402918CA	N/A	OR-MILCC2-0124	OR-RTR6-0612	N/A	No	OR14FG8171	N/A
X10C0402918L	N/A	OR-MILCC2-0153	OR-RTR6-0467	N/A	No	OR14FG8020	N/A
X10C0402924A	N/A	OR-MILCC2-0153	OR-RTR6-0466	N/A	No	OR14FG8020	N/A
X10C0402924C	N/A	OR-MILCC2-0153	OR-RTR6-0464	N/A	No	OR14FG8020	N/A
X10C0402933G	N/A	OR-MILCC2-0123	OR-RTR7-0044	N/A	No	OR14FG8171	N/A
X10C0402935M	N/A	OR-MILCC2-0124	OR-RTR6-0611	N/A	No	OR14FG8172	N/A
X10C0402939J	N/A	OR-MILCC2-0127	OR-RTR6-0500	N/A	No	OR15FG8016	N/A
X10C0402981G	N/A	OR-MILCC2-0123	OR-RTR7-0042	N/A	No	OR14FG8171	N/A
X10C0402981H	N/A	OR-MILCC2-0123	OR-RTR7-0042	N/A	No	OR14FG8171	N/A
X10C0402981M	N/A	OR-MILCC2-0123	OR-RTR7-0042	N/A	No	OR14FG8171	N/A
X10C0402984A1	N/A	OR-MILCC2-0125	OR-RTR6-0487	N/A	No	OR14FG8035	N/A
X10C0402985Q	N/A	OR-MILCC2-0125	OR-RTR6-0486	N/A	No	OR14FG8035	N/A
X10C0402986T	N/A	OR-MILCC2-0153	OR-RTR6-0468	N/A	No	OR14FG8020	N/A
X10C0402987A1	N/A	OR-MILCC2-0123	OR-RTR7-0044	N/A	No	OR14FG8171	N/A
X10C9306657A	N/A	OR-MILCC2-0124	OR-RTR6-0612	N/A	No	OR14FG8171	N/A
X10CSATN01905A	N/A	OR-MILCC2-0123	OR-RTR7-0044	N/A	No	OR14FG8171	N/A
X10CSATN01905E	N/A	OR-MILCC2-0123	OR-RTR7-0044	N/A	No	OR14FG8171	N/A
X10CSATN01905H	N/A	OR-MILCC2-0106	OR-RTR7-0030	N/A	No	OR14FG8148	N/A
X10CSATN01937AO	N/A	OR-MILCC2-0124	OR-RTR7-0080	N/A	No	OR14FG8171	N/A

CCP Correlation of Container Identification Numbers to Batch Data Report Numbers

Waste Stream: # OR-REDC-CH-HET Lot # 66

Container ID Number	Historical Container ID	NDA BDR	RTR BDR	VE BDR	Load/Manage Overpack Yes	Transportation Headspace Gas	
						FGA	GGT
X10CSATN01937K	N/A	OR-MILCC2-0125	OR-RTR6-0486	N/A	No	OR14FG8035	N/A
X10CSATN02012E	N/A	OR-MILCC2-0153	OR-RTR6-0468	N/A	No	OR14FG8020	N/A
X10CSATN02205C	N/A	OR-MILCC2-0106	OR-RTR6-0492	N/A	No	OR14FG8148	N/A
X10CSATN02229D1	N/A	OR-MILCC2-0127	OR-RTR7-0025	N/A	No	OR14FG8035	N/A
X10CSATN02229G1	N/A	OR-MILCC2-0123	OR-RTR7-0044	N/A	No	OR14FG8171	N/A
X10CSATN02244F	N/A	OR-MILCC2-0124	OR-RTR6-0611	N/A	No	OR14FG8172	N/A
X10CSATN02434J	N/A	OR-MILCC2-0125	OR-RTR6-0611	N/A	No	OR15FG8018	N/A
X10CSATN02434O	N/A	OR-MILCC2-0125	OR-RTR6-0611	N/A	No	OR15FG8018	N/A
X10CSATN02450D	N/A	OR-MILCC2-0124	OR-RTR6-0611	N/A	No	OR14FG8172	N/A
X10CSATN02461CW	N/A	OR-MILCC2-0127	OR-RTR7-0025	N/A	No	OR14FG8035	N/A
X10CSATN02461F	N/A	OR-MILCC2-0106	OR-RTR7-0030	N/A	No	OR14FG8148	N/A
X10CSATN02461J	N/A	OR-MILCC2-0125	OR-RTR6-0486	N/A	No	OR14FG8035	N/A
X10CSATN02461L	N/A	OR-MILCC2-0106	OR-RTR6-0491	N/A	No	OR14FG8148	N/A
X10CSATN02626J	N/A	OR-MILCC2-0125	OR-RTR7-0025	N/A	No	OR14FG8035	N/A
X10CSATN02626L	N/A	OR-MILCC2-0127	OR-RTR7-0025	N/A	No	OR14FG8035	N/A
X10CSATN02634G1	N/A	OR-MILCC2-0123	OR-RTR7-0044	N/A	No	OR14FG8171	N/A
X10CSATN02645F	N/A	OR-MILCC2-0106	OR-RTR6-0492	N/A	No	OR14FG8148	N/A
X10CSATN02664G	N/A	OR-MILCC2-0153	OR-RTR6-0468	N/A	No	OR14FG8020	N/A
X10CSATN02664M	N/A	OR-MILCC2-0125	OR-RTR7-0025	N/A	No	OR14FG8035	N/A
X10CSATN02698B	N/A	OR-MILCC2-0124	OR-RTR6-0612	N/A	No	OR14FG8171	N/A
X10CSATN02698C	N/A	OR-MILCC2-0124	OR-RTR6-0612	N/A	No	OR14FG8171	N/A
X10CSATN02874L	N/A	OR-MILCC2-0125	OR-RTR7-0025	N/A	No	OR14FG8035	N/A
X10CSATN03139A	N/A	OR-MILCC2-0125	OR-RTR6-0611	N/A	No	OR14FG8172	N/A

Roger Whiteaker 03/30/2015

Signature of Site Project Manager | Printed Name | Date

CCP Correlation of Container Identification Numbers to Batch Data Report Numbers

Waste Stream: # OR-REDC-CH-HET Lot # 67

Container ID Number	Historical Container ID	NDA BDR	RTR BDR	VE BDR	Load/Manage Overpack Yes	Transportation Headspace Gas	
						FGA	GGT
X10CSATN02244I	N/A	OR-MILCC2-0158	OR-RTR6-0616	N/A	No	OR15FG8008	N/A
X10CSATN02247A	N/A	OR-MILCC2-0126	OR-RTR6-0512	N/A	No	OR15FG8019	N/A
X10CSATN02247B	N/A	OR-MILCC2-0126	OR-RTR6-0512	N/A	No	OR15FG8019	N/A
X10CSATN02247D	N/A	OR-MILCC2-0126	OR-RTR6-0512	N/A	No	OR15FG8019	N/A
X10CSATN02247G	N/A	OR-MILCC2-0126	OR-RTR6-0512	N/A	No	OR14FG8172	N/A
X10CSATN02279E	N/A	OR-MILCC2-0080	OR-RTR7-0065	N/A	No	OR14FG8118	N/A
X10CSATN02284O	N/A	OR-MILCC2-0080	OR-RTR6-0568	N/A	No	OR14FG8118	N/A
X10CSATN02446D	N/A	OR-MILCC2-0122	OR-RTR7-0045	N/A	No	OR15FG8007	N/A
X10CSATN02482A	N/A	OR-MILCC2-0159	OR-RTR6-0634	N/A	No	OR15FG8033	N/A
X10CSATN02607B	N/A	OR-MILCC2-0120	OR-RTR6-0552	N/A	No	OR14FG8163	N/A
X10CSATN02613L	N/A	OR-MILCC2-0159	OR-RTR7-0024	N/A	No	OR14FG8033	N/A
X10CSATN02626A	N/A	OR-MILCC2-0157	OR-RTR7-0073	N/A	No	OR15FG8030	N/A
X10CSATN02645N1	N/A	OR-MILCC2-0157	OR-RTR7-0074	N/A	No	OR15FG8030	N/A
X10CSATN02689T	N/A	OR-MILCC2-0118	OR-RTR6-0600	N/A	No	OR14FG8163	N/A
X10CSATN02694K	N/A	OR-MILCC2-0120	OR-RTR7-0025	N/A	No	OR14FG8035	N/A
X10CSATN02699A	N/A	OR-MILCC2-0119	OR-RTR6-0603	N/A	No	OR14FG8163	N/A
X10CSATN02866A	N/A	OR-MILCC2-0120	OR-RTR7-0125	N/A	No	OR14FG8162	N/A
X10CSATN02869F	N/A	OR-MILCC2-0120	OR-RTR7-0125	N/A	No	OR14FG8162	N/A
X10CSATN02874J	N/A	OR-MILCC2-0120	OR-RTR7-0125	N/A	No	OR14FG8162	N/A
X10CSATN03145A	N/A	OR-MILCC2-0161	OR-RTR6-0528	N/A	No	OR14FG4047	N/A
X10CSATN03188A	N/A	OR-MILCC2-0122	OR-RTR7-0048	N/A	No	OR15FG8007	N/A
X10CSATN03227A	N/A	OR-MILCC2-0079	OR-RTR7-0046	N/A	No	OR14FG4063	N/A

Signature of Site Project Manager | Roger Whiteaker (Printed Name) | 03/31/2015 (Date)

CCP Correlation of Container Identification Numbers to Batch Data Report Numbers

Waste Stream: # OR-REDC-CH-HET Lot # 68

Container ID Number	Historical Container ID	NDA BDR	RTR BDR	VE BDR	Load/Manage Overpack Yes	Transportation Headspace Gas	
						FGA	GGT
X10C0402806H1	N/A	OR-IQ3-0463	OR-RTR6-0631	N/A	No	OR15FG8032	N/A
X10C0402813B	N/A	OR-IQ3-0416	OR-RTR6-0602	N/A	No	OR15FG8034	N/A
X10C0402813J	N/A	OR-IQ3-0416	OR-RTR6-0602	N/A	No	OR15FG8035	N/A
X10C0402820A1	N/A	OR-IQ3-0447	OR-RTR6-0621	N/A	No	OR15FG8014	N/A
X10C0402821E	N/A	OR-IQ3-0447	OR-RTR6-0512	N/A	No	OR15FG8014	N/A
X10C0402826E	N/A	OR-IQ3-0421	OR-RTR6-0607	N/A	No	OR15FG8034	N/A
X10C0402861B	N/A	OR-IQ3-0416	OR-RTR6-0602	N/A	No	OR15FG8034	N/A
X10C0402861E	N/A	OR-IQ3-0416	OR-RTR6-0602	N/A	No	OR15FG8035	N/A
X10C0402873B1	N/A	OR-IQ3-0447	OR-RTR6-0621	N/A	No	OR15FG8014	N/A
X10C0402891O	N/A	OR-IQ3-0416	OR-RTR6-0602	N/A	No	OR15FG8035	N/A
X10C0402935A1A	N/A	OR-IQ3-0461	OR-RTR7-0024	N/A	No	OR14FG8033	N/A
X10C0402940D	N/A	OR-IQ3-0471	OR-RTR6-0638	N/A	No	OR15FG8033	N/A
X10C0402940E	N/A	OR-IQ3-0470	OR-RTR6-0638	N/A	No	OR15FG8033	N/A
X10C0402940F	N/A	OR-IQ3-0471	OR-RTR6-0638	N/A	No	OR15FG8033	N/A
X10C0402940I	N/A	OR-IQ3-0471	OR-RTR6-0638	N/A	No	OR15FG8033	N/A
X10C0402940L	N/A	OR-IQ3-0471	OR-RTR6-0639	N/A	No	OR15FG8033	N/A
X10C0402951D	N/A	OR-IQ3-0461	OR-RTR7-0024	N/A	No	OR14FG8033	N/A
X10C0402962J	N/A	OR-IQ3-0470	OR-RTR6-0637	N/A	No	OR15FG8033	N/A
X10C0402962K	N/A	OR-MILCC2-0162	OR-RTR6-0639	N/A	No	OR15FG8036	N/A
X10C0402966B	N/A	OR-IQ3-0471	OR-RTR6-0638	N/A	No	OR15FG8033	N/A
X10C0402966D	N/A	OR-IQ3-0471	OR-RTR6-0638	N/A	No	OR15FG8033	N/A
X10C0402966G	N/A	OR-IQ3-0471	OR-RTR6-0638	N/A	No	OR15FG8033	N/A
X10C0402966H	N/A	OR-MILCC2-0161	OR-RTR6-0638	N/A	No	OR15FG8036	N/A
X10C0402983C	N/A	OR-MILCC2-0115	OR-RTR6-0573	N/A	No	OR14FG8160	N/A
X10C9311752A	N/A	OR-MILCC2-0112	OR-RTR6-0596	N/A	No	OR14FG8154	N/A
X10C9312139A	N/A	OR-MILCC2-0091	OR-RTR6-0584	N/A	No	OR14FG8131	N/A
X10C9312468A	N/A	OR-MILCC2-0089	OR-RTR6-0529	N/A	No	OR14FG8129	N/A
X10C9313109A	N/A	OR-MILCC2-0112	OR-RTR6-0539	N/A	No	OR14FG8154	N/A

CCP Correlation of Container Identification Numbers to Batch Data Report Numbers

Waste Stream: # OR-REDC-CH-HET Lot # 68

Container ID Number	Historical Container ID	NDA BDR	RTR BDR	VE BDR	Load/Manage Overpack Yes	Transportation Headspace Gas	
						FGA	GGT
X10C9402627C	N/A	OR-MILCC2-0063	OR-RTR7-0076	N/A	No	OR14FG4058	N/A
X10C9402627D	N/A	OR-MILCC2-0063	OR-RTR7-0076	N/A	No	OR14FG4058	N/A
X10C9602122A	N/A	OR-MILCC2-0085	OR-RTR6-0581	N/A	No	OR14FG8126	N/A
X10CSATN02024N1	N/A	OR-MILCC2-0070	OR-RTR6-0472	N/A	No	OR14FG8024	N/A
X10CSATN02070O	N/A	OR-MILCC2-0078	OR-RTR6-0524	N/A	No	OR14FG4062	N/A
X10CSATN02200C	N/A	OR-MILCC2-0078	OR-RTR7-0045	N/A	No	OR14FG4062	N/A
X10CSATN02200H1	N/A	OR-MILCC2-0111	OR-RTR7-0028	N/A	No	OR14FG8153	N/A
X10CSATN02223J	N/A	OR-MILCC2-0090	OR-RTR6-0527	N/A	No	OR14FG8130	N/A
X10CSATN02265G	N/A	OR-IQ3-0416	OR-RTR6-0603	N/A	No	OR15FG8034	N/A
X10CSATN02434M	N/A	OR-MILCC2-0089	OR-RTR6-0583	N/A	No	OR14FG8130	N/A
X10CSATN02461E	N/A	OR-MILCC2-0090	OR-RTR6-0581	N/A	No	OR14FG8131	N/A
X10CSATN02461H	N/A	OR-MILCC2-0070	OR-RTR7-0034	N/A	No	OR14FG4027	N/A
X10CSATN02461I	N/A	OR-MILCC2-0070	OR-RTR6-0472	N/A	No	OR14FG8024	N/A
X10CSATN02482B	N/A	OR-MILCC2-0162	OR-RTR6-0639	N/A	No	OR15FG8036	N/A
X10CSATN02612E	N/A	OR-MILCC2-0070	OR-RTR6-0470	N/A	No	OR14FG4060	N/A
X10CSATN02612J	N/A	OR-MILCC2-0116	OR-RTR6-0601	N/A	No	OR14FG8160	N/A
X10CSATN02689E	N/A	OR-MILCC2-0091	OR-RTR6-0581	N/A	No	OR14FG8131	N/A
X10CSATN02694M	N/A	OR-MILCC2-0111	OR-RTR6-0596	N/A	No	OR14FG8153	N/A
X10CSATN02870M	N/A	OR-MILCC2-0078	OR-RTR7-0049	N/A	No	OR14FG4062	N/A
X10CSATN02874B	N/A	OR-MILCC2-0063	OR-RTR6-0538	N/A	No	OR14FG4058	N/A
X10CSATN03142A	N/A	OR-MILCC2-0116	OR-RTR7-0124	N/A	No	OR14FG8160	N/A
X10CSATN03219A	N/A	OR-MILCC2-0062	OR-RTR7-0076	N/A	No	OR14FG8099	N/A

Roger Whiteaker — Signature of Site Project Manager
Roger Whiteaker — Printed Name
04/08/2015 — Date

CCP Correlation of Container Identification Numbers to Batch Data Report Numbers

Waste Stream: # OR-REDC-CH-HET Lot # 69

Container ID Number	Historical Container ID	NDA BDR	RTR BDR	VE BDR	Load/Manage Overpack Yes	Transportation Headspace Gas	
						FGA	GGT
X10C0402054A	N/A	OR-MILCC2-0166	OR-RTR6-0535	N/A	No	OR15FG8039	N/A
X10C0402781A	N/A	OR-MILCC2-0160	OR-RTR6-0634	N/A	No	OR15FG8033	N/A
X10C0402781B	N/A	OR-MILCC2-0160	OR-RTR6-0634	N/A	No	OR15FG8033	N/A
X10C0402789D	N/A	OR-MILCC2-0166	OR-RTR6-0509	N/A	No	OR15FG8039	N/A
X10C0402827G1	N/A	OR-MILCC2-0166	OR-RTR6-0631	N/A	No	OR15FG8039	N/A
X10C0402828F1	N/A	OR-MILCC2-0166	OR-RTR6-0631	N/A	No	OR15FG8039	N/A
X10C0402849D	N/A	OR-IQ3-0455	OR-RTR6-0538	N/A	No	OR15FG8022	N/A
X10C0402865H	N/A	OR-MILCC2-0130	OR-RTR6-0604	N/A	No	OR15FG8016	N/A
X10C0402940B	N/A	OR-MILCC2-0165	OR-RTR6-0639	N/A	No	OR15FG8037	N/A
X10C0402940J	N/A	OR-MILCC2-0166	OR-RTR6-0638	N/A	No	OR15FG8038	N/A
X10C0402951C	N/A	OR-MILCC2-0166	OR-RTR7-0024	N/A	No	OR14FG8033	N/A
X10C0402962A	N/A	OR-MILCC2-0164	OR-RTR6-0639	N/A	No	OR15FG8037	N/A
X10C0402962B	N/A	OR-MILCC2-0164	OR-RTR6-0639	N/A	No	OR15FG8037	N/A
X10C0402962D	N/A	OR-MILCC2-0165	OR-RTR6-0637	N/A	No	OR15FG8037	N/A
X10C0402962I	N/A	OR-MILCC2-0165	OR-RTR6-0637	N/A	No	OR15FG8037	N/A
X10C0402962L	N/A	OR-MILCC2-0164	OR-RTR6-0637	N/A	No	OR15FG8037	N/A
X10C0402962M	N/A	OR-MILCC2-0166	OR-RTR6-0639	N/A	No	OR15FG8038	N/A
X10C9307220A	N/A	OR-MILCC2-0130	OR-RTR6-0607	N/A	No	OR15FG8016	N/A
X10C9307221A	N/A	OR-MILCC2-0130	OR-RTR6-0605	N/A	No	OR15FG8012	N/A
X10C9307235A1A	N/A	OR-MILCC2-0166	OR-RTR7-0130	N/A	No	OR15FG8038	N/A
X10C9310023B	N/A	OR-MILCC2-0142	OR-RTR6-0586	N/A	No	OR15FG8016	N/A
X10C9313630A	N/A	OR-MILCC2-0164	OR-RTR6-0587	N/A	No	OR15FG8037	N/A
X10C9402617A	N/A	OR-MILCC2-0142	OR-RTR6-0585	N/A	No	OR15FG8016	N/A
X10C9402628A	N/A	OR-MILCC2-0164	OR-RTR6-0587	N/A	No	OR15FG8037	N/A
X10C9402642A	N/A	OR-MILCC2-0130	OR-RTR6-0606	N/A	No	OR15FG8016	N/A
X10C9801089A	N/A	OR-MILCC2-0142	OR-RTR6-0586	N/A	No	OR15FG8016	N/A
X10C9801207A	N/A	OR-MILCC2-0142	OR-RTR6-0585	N/A	No	OR15FG8016	N/A

CCP Correlation of Container Identification Numbers to Batch Data Report Numbers

Waste Stream: # OR-REDC-CH-HET Lot # 69

Container ID Number	Historical Container ID	NDA BDR	RTR BDR	VE BDR	Load/Manage Overpack Yes	Transportation Headspace Gas	
						FGA	GGT
X10CSATN02023T	N/A	OR-MILCC2-0165	OR-RTR7-0020	N/A	No	OR15FG8037	N/A
X10CSATN02205K	N/A	OR-MILCC2-0130	OR-RTR6-0605	N/A	No	OR15FG8012	N/A
X10CSATN02223A	N/A	OR-MILCC2-0130	OR-RTR6-0606	N/A	No	OR15FG8016	N/A
X10CSATN02284A	N/A	OR-MILCC2-0130	OR-RTR6-0606	N/A	No	OR15FG8016	N/A
X10CSATN02455E	N/A	OR-MILCC2-0160	OR-RTR6-0477	N/A	No	OR14FG8033	N/A
X10CSATN02482C	N/A	OR-MILCC2-0165	OR-RTR6-0638	N/A	No	OR15FG8037	N/A
X10CSATN02482D	N/A	OR-MILCC2-0165	OR-RTR6-0639	N/A	No	OR15FG8037	N/A
X10CSATN02482E	N/A	OR-MILCC2-0165	OR-RTR6-0639	N/A	No	OR15FG8037	N/A
X10CSATN02482G	N/A	OR-MILCC2-0166	OR-RTR6-0639	N/A	No	OR15FG8038	N/A
X10CSATN02482H	N/A	OR-MILCC2-0166	OR-RTR6-0639	N/A	No	OR15FG8039	N/A
X10CSATN02482I	N/A	OR-MILCC2-0166	OR-RTR6-0638	N/A	No	OR15FG8038	N/A
X10CSATN02482K	N/A	OR-MILCC2-0166	OR-RTR6-0639	N/A	No	OR15FG8038	N/A
X10CSATN02482N	N/A	OR-MILCC2-0166	OR-RTR6-0638	N/A	No	OR15FG8038	N/A
X10CSATN02493B	N/A	OR-MILCC2-0164	OR-RTR6-0586	N/A	No	OR15FG8037	N/A
X10CSATN02613M	N/A	OR-MILCC2-0160	OR-RTR7-0024	N/A	No	OR14FG8033	N/A
X10CSATN02689L	N/A	OR-MILCC2-0160	OR-RTR6-0621	N/A	No	OR15FG8033	N/A
X10CSATN02694D	N/A	OR-MILCC2-0164	OR-RTR6-0586	N/A	No	OR15FG8037	N/A
X10CSATN02874H	N/A	OR-MILCC2-0142	OR-RTR6-0586	N/A	No	OR15FG8016	N/A

Roger Whiteaker 05/28/2015

Signature of Site Project Manager | Printed Name | Date

CCP Correlation of Container Identification Numbers to Batch Data Report Numbers

Waste Stream: # OR-REDC-CH-HET Lot # 70

Container ID Number	Historical Container ID	NDA BDR	RTR BDR	VE BDR	Load/Manage Overpack Yes	Transportation Headspace Gas	
						FGA	GGT
X10C0402832D	N/A	OR-IQ3-0428	OR-RTR7-0080	N/A	No	OR15FG8056	N/A
X10C0402832I	N/A	OR-IQ3-0428	OR-RTR7-0080	N/A	No	OR15FG8056	N/A
X10C0402837I	N/A	OR-MILCC2-0154	OR-RTR7-0097	N/A	No	OR14FG8120	N/A
X10C0402885G	N/A	OR-MILCC2-0173	OR-RTR7-0009	N/A	No	OR15FG8054	N/A
X10C0402918BG	N/A	OR-MILCC2-0173	OR-RTR7-0009	N/A	No	OR15FG8054	N/A
X10C0402932H	N/A	OR-IQ3-0427	OR-RTR6-0612	N/A	No	OR15FG8056	N/A
X10C0402935W1	N/A	OR-MILCC2-0155	OR-RTR7-0062	N/A	No	OR15FG8028	N/A
X10C0402939P	N/A	OR-MILCC2-0163	OR-RTR6-0589	N/A	No	OR15FG8036	N/A
X10C0402959E	N/A	OR-MILCC2-0168	OR-RTR7-0017	N/A	No	OR15FG8042	N/A
X10C0402963A	N/A	OR-IQ3-0426	OR-RTR7-0082	N/A	No	OR15FG8048	N/A
X10C0402963B	N/A	OR-IQ3-0426	OR-RTR7-0082	N/A	No	OR15FG8048	N/A
X10C0402966I	N/A	OR-IQ3-0471	OR-RTR6-0639	N/A	No	OR15FG8046	N/A
X10C0402966J	N/A	OR-IQ3-0471	OR-RTR6-0638	N/A	No	OR15FG8046	N/A
X10C0402966K	N/A	OR-IQ3-0471	OR-RTR6-0639	N/A	No	OR15FG8046	N/A
X10C0402966L	N/A	OR-MILCC2-0159	OR-RTR6-0634	N/A	No	OR15FG8036	N/A
X10C0403028N	N/A	OR-IQ3-0428	OR-RTR7-0080	N/A	No	OR15FG8056	N/A
X10C0403028O	N/A	OR-IQ3-0427	OR-RTR7-0080	N/A	No	OR15FG8056	N/A
X10C9304039B	N/A	OR-MILCC2-0155	OR-RTR6-0611	N/A	No	OR15FG8002	N/A
X10C9311919A	N/A	OR-MILCC2-0141	OR-RTR6-0586	N/A	No	OR15FG8015	N/A
X10C9402642D	N/A	OR-MILCC2-0151	OR-RTR6-0608	N/A	No	OR15FG8025	N/A
X10CSATN01937AQ	N/A	OR-MILCC2-0168	OR-RTR7-0017	N/A	No	OR15FG8043	N/A
X10CSATN01937AR	N/A	OR-MILCC2-0171	OR-RTR7-0017	N/A	No	OR15FG8051	N/A
X10CSATN02071K	N/A	OR-MILCC2-0171	OR-RTR7-0017	N/A	No	OR15FG8051	N/A
X10CSATN02071M	N/A	OR-MILCC2-0169	OR-RTR7-0017	N/A	No	OR15FG8043	N/A
X10CSATN02241P	N/A	OR-MILCC2-0154	OR-RTR7-0060	N/A	No	OR15FG8029	N/A
X10CSATN02244C	N/A	OR-MILCC2-0159	OR-RTR6-0560	N/A	No	OR15FG8036	N/A
X10CSATN02244D	N/A	OR-MILCC2-0159	OR-RTR6-0621	N/A	No	OR15FG8033	N/A

CCP Correlation of Container Identification Numbers to Batch Data Report Numbers

Waste Stream: # OR-REDC-CH-HET Lot # 70

Container ID Number	Historical Container ID	NDA BDR	RTR BDR	VE BDR	Load/Manage Overpack Yes	Transportation Headspace Gas	
						FGA	GGT
X10CSATN02446P	N/A	OR-MILCC2-0171	OR-RTR7-0017	N/A	No	OR15FG8051	N/A
X10CSATN02450E	N/A	OR-MILCC2-0163	OR-RTR6-0589	N/A	No	OR15FG8036	N/A
X10CSATN02455B	N/A	OR-MILCC2-0168	OR-RTR7-0017	N/A	No	OR15FG8043	N/A
X10CSATN02455I	N/A	OR-MILCC2-0129	OR-RTR6-0609	N/A	No	OR15FG8018	N/A
X10CSATN02455J	N/A	OR-MILCC2-0163	OR-RTR6-0588	N/A	No	OR15FG8036	N/A
X10CSATN02455P	N/A	OR-MILCC2-0129	OR-RTR6-0607	N/A	No	OR15FG8001	N/A
X10CSATN02474H	N/A	OR-MILCC2-0163	OR-RTR6-0588	N/A	No	OR15FG8036	N/A
X10CSATN02482F	N/A	OR-IQ3-0471	OR-RTR6-0639	N/A	No	OR15FG8046	N/A
X10CSATN02493D	N/A	OR-MILCC2-0141	OR-RTR6-0583	N/A	No	OR15FG8015	N/A
X10CSATN02493J	N/A	OR-MILCC2-0129	OR-RTR6-0607	N/A	No	OR15FG8016	N/A
X10CSATN02640J	N/A	OR-MILCC2-0173	OR-RTR7-0009	N/A	No	OR15FG8054	N/A
X10CSATN02689I	N/A	OR-MILCC2-0154	OR-RTR6-0609	N/A	No	OR15FG8001	N/A
X10CSATN02694N	N/A	OR-MILCC2-0129	OR-RTR6-0607	N/A	No	OR15FG8018	N/A
X10CSATN02698G	N/A	OR-MILCC2-0171	OR-RTR7-0017	N/A	No	OR15FG8051	N/A
X10CSATN02866F	N/A	OR-MILCC2-0151	OR-RTR6-0613	N/A	No	OR15FG8025	N/A
X10CSATN02869B	N/A	OR-MILCC2-0153	OR-RTR6-0613	N/A	No	OR15FG8026	N/A
X10CSATN02874K	N/A	OR-MILCC2-0151	OR-RTR6-0611	N/A	No	OR15FG8025	N/A
X10CSATN03043E	N/A	OR-MILCC2-0129	OR-RTR6-0608	N/A	No	OR15FG8018	N/A

Signature of Site Project Manager | Roger Whiteaker (Printed Name) | 06/01/2015 (Date)

CCP Correlation of Container Identification Numbers to Batch Data Report Numbers

Waste Stream: # OR-REDC-CH-HET Lot # 71

Container ID Number	Historical Container ID	NDA BDR	RTR BDR	VE BDR	Load/Manage Overpack Yes	Transportation Headspace Gas	
						FGA	GGT
X10C0402781E	N/A	OR-MILCC2-0180	OR-RTR6-0654	N/A	No	OR15FG8057	N/A
X10C0402816C1	N/A	OR-MILCC2-0180	OR-RTR6-0654	N/A	No	OR15FG8057	N/A
X10C0402820E	N/A	OR-MILCC2-0174	OR-RTR6-0562	N/A	No	OR14FG8101	N/A
X10C0402834M	N/A	OR-MILCC2-0102	OR-RTR6-0593	N/A	No	OR14FG8145	N/A
X10C0402853H	N/A	OR-MILCC2-0097	OR-RTR6-0493	N/A	No	OR14FG8141	N/A
X10C0402862K1	N/A	OR-MILCC2-0167	OR-RTR6-0621	N/A	No	OR15FG8039	N/A
X10C0402870A	N/A	OR-IQ3-0501	OR-RTR6-0655	N/A	No	OR15FG8057	N/A
X10C0402870B	N/A	OR-IQ3-0501	OR-RTR6-0655	N/A	No	OR15FG8057	N/A
X10C0402870D	N/A	OR-MILCC2-0181	OR-RTR6-0655	N/A	No	OR15FG8058	N/A
X10C0402870F	N/A	OR-MILCC2-0181	OR-RTR6-0655	N/A	No	OR15FG8058	N/A
X10C0402870G	N/A	OR-MILCC2-0181	OR-RTR6-0655	N/A	No	OR15FG8058	N/A
X10C0402870H	N/A	OR-MILCC2-0181	OR-RTR6-0655	N/A	No	OR15FG8058	N/A
X10C0402870I	N/A	OR-IQ3-0501	OR-RTR6-0655	N/A	No	OR15FG8057	N/A
X10C0402870K	N/A	OR-MILCC2-0181	OR-RTR6-0655	N/A	No	OR15FG8058	N/A
X10C0402870L	N/A	OR-MILCC2-0181	OR-RTR6-0655	N/A	No	OR15FG8058	N/A
X10C0402876F1	N/A	OR-MILCC2-0180	OR-RTR6-0654	N/A	No	OR15FG8057	N/A
X10C0402886I1	N/A	OR-MILCC2-0180	OR-RTR6-0654	N/A	No	OR15FG8057	N/A
X10C0402898E	N/A	OR-IQ3-0446	OR-RTR6-0535	N/A	No	OR15FG8013	N/A
X10C0402903J1	N/A	OR-MILCC2-0180	OR-RTR6-0654	N/A	No	OR15FG8057	N/A
X10C0402947D	N/A	OR-IQ3-0452	OR-RTR6-0539	N/A	No	OR15FG8019	N/A
X10C0402967A	N/A	OR-IQ3-0446	OR-RTR6-0533	N/A	No	OR15FG8013	N/A
X10C0402978F	N/A	OR-IQ3-0424	OR-RTR6-0611	N/A	No	OR15FG8048	N/A
X10C0402978G	N/A	OR-IQ3-0424	OR-RTR6-0611	N/A	No	OR15FG8048	N/A
X10C0402983D	N/A	OR-MILCC2-0117	OR-RTR6-0573	N/A	No	OR14FG8165	N/A
X10C9402627B1	N/A	OR-MILCC2-0180	OR-RTR6-0654	N/A	No	OR15FG8057	N/A
X10CSATN02450M	N/A	OR-MILCC2-0131	OR-RTR6-0607	N/A	No	OR15FG8011	N/A
X10CSATN02482M	N/A	OR-IQ3-0470	OR-RTR6-0638	N/A	No	OR15FG8046	N/A

CCP Correlation of Container Identification Numbers to Batch Data Report Numbers

Waste Stream: # OR-REDC-CH-HET Lot # 71

Container ID Number	Historical Container ID	NDA BDR	RTR BDR	VE BDR	Load/Manage Overpack Yes	Transportation Headspace Gas	
						FGA	GGT
X10CSATN02640C	N/A	OR-IQ3-0452	OR-RTR6-0539	N/A	No	OR15FG8019	N/A
X10CSATN03175B	N/A	OR-MILCC2-0102	OR-RTR6-0586	N/A	No	OR14FG8147	N/A

Roger Whiteaker — Signature of Site Project Manager

Roger Whiteaker — Printed Name

06/08/2015 — Date

CCP Correlation of Container Identification Numbers to Batch Data Report Numbers

Waste Stream: # OR-REDC-CH-HET Lot # 72

Container ID Number	Historical Container ID	NDA BDR	RTR BDR	VE BDR	Load/Manage Overpack Yes	Transportation Headspace Gas	
						FGA	GGT
X10C0200885A	N/A	OR-MILCC2-0166	N/A	ORVECH0010	No	OR15FG8038	N/A
X10C0402804A	N/A	OR-MILCC2-0167	OR-RTR7-0024	N/A	No	OR14FG8033	N/A
X10C0402820F1A	N/A	OR-IQ3-0476	OR-RTR7-0130	N/A	No	OR15FG8046	N/A
X10C0402830E1	N/A	OR-IQ3-0475	OR-RTR7-0130	N/A	No	OR15FG8046	N/A
X10C0402831C	N/A	OR-IQ3-0427	OR-RTR7-0077	N/A	No	OR15FG8056	N/A
X10C0402831F	N/A	OR-IQ3-0427	OR-RTR7-0076	N/A	No	OR15FG8048	N/A
X10C0402831H	N/A	OR-IQ3-0427	OR-RTR7-0076	N/A	No	OR15FG8047	N/A
X10C0402861J1	N/A	OR-MILCC2-0167	N/A	ORVECH0129	No	OR15FG8039	N/A
X10C0402870M	N/A	OR-IQ3-0489	OR-RTR7-0131	N/A	No	OR15FG8050	N/A
X10C0402870P	N/A	OR-IQ3-0489	OR-RTR7-0131	N/A	No	OR15FG8050	N/A
X10C0402898L1	N/A	OR-IQ3-0374	N/A	ORVECH0114	No	OR15FG8056	N/A
X10C0402918BN1	N/A	OR-MILCC2-0130	N/A	ORVECH0121	No	OR15FG8016	N/A
X10C0402918BN2	N/A	OR-IQ3-0422	N/A	ORVECH0121	No	OR15FG8034	N/A
X10C0402918BN4	N/A	OR-IQ3-0422	N/A	ORVECH0121	No	OR15FG8034	N/A
X10C0501698A	N/A	OR-IQ3-0404	N/A	ORVECH0109	No	OR14FG8153	N/A
X10C9310003G	N/A	OR-MILCC2-0100	OR-RTR7-0101	N/A	No	OR14FG8144	N/A
X10C9311876A	N/A	OR-MILCC2-0169	OR-RTR7-0017	N/A	No	OR15FG8042	N/A
X10C9312743A	N/A	OR-MILCC2-0103	OR-RTR7-0064	N/A	No	OR14FG8145	N/A
X10C9313632A	N/A	OR-MILCC2-0105	OR-RTR7-0062	N/A	No	OR14FG8147	N/A
X10C9700241A	N/A	OR-MILCC2-0110	OR-RTR7-0072	N/A	No	OR14FG8152	N/A
X10CSATN02070I	N/A	OR-MILCC2-0172	OR-RTR7-0023	N/A	No	OR14FG8032	N/A
X10CSATN02285N	N/A	OR-MILCC2-0174	OR-RTR7-0027	N/A	No	OR14FG8042	N/A
X10CSATN02434Q1	N/A	OR-MILCC2-0140	N/A	ORVECH0108	No	OR15FG8016	N/A
X10CSATN02450C	N/A	OR-MILCC2-0108	OR-RTR7-0072	N/A	No	OR14FG8150	N/A
X10CSATN02665H	N/A	OR-MILCC2-0108	OR-RTR7-0061	N/A	No	OR14FG8150	N/A
X10CSATN03042G	N/A	OR-MILCC2-0105	OR-RTR7-0056	N/A	No	OR14FG8147	N/A

Rick Whiteley — Signature of Site Project Manager
Rick Whiteley — Printed Name
06/15/2015 — Date

CCP Correlation of Container Identification Numbers to Batch Data Report Numbers

Waste Stream: # OR-REDC-CH-HET Lot # 73

Container ID Number	Historical Container ID	NDA BDR	RTR BDR	VE BDR	Load/Manage Overpack Yes	Transportation Headspace Gas	
						FGA	GGT
X10C0000250AH	N/A	OR-MILCC2-0145	OR-RTR7-0001	N/A	No	OR14FG8015	N/A
X10C0402799J	N/A	OR-IQ3-0429	OR-RTR7-0080	N/A	No	OR15FG8068	N/A
X10C0402812G1	N/A	OR-MILCC2-0193	OR-RTR7-0140	N/A	No	OR15FG11012	N/A
~~X10C0402855I~~	~~N/A~~	~~OR-MILCC2-0093~~	~~OR-RTR7-0093~~	~~N/A~~	~~No~~	~~OR15FG8065~~	~~N/A~~ - FAILED EGGR
X10C0402870R1	N/A	OR-MILCC2-0191	OR-RTR7-0139	N/A	No	OR15FG11010	N/A
X10C0402896F1	N/A	OR-IQ3-0429	N/A	ORVECH0115	No	OR15FG8068	N/A
X10C0402962A1	N/A	OR-MILCC2-0191	OR-RTR7-0139	N/A	No	OR15FG11010	N/A
X10C0403028M	N/A	OR-IQ3-0429	OR-RTR7-0080	N/A	No	OR15FG8068	N/A
X10CSATN01937AA	N/A	OR-IQ3-0429	OR-RTR6-0610	N/A	No	OR15FG8068	N/A
X10CSATN02240J2A	N/A	OR-MILCC2-0192	OR-RTR7-0139	N/A	No	OR15FG11011	N/A
X10CSATN02450B	N/A	OR-MILCC2-0134	OR-RTR6-0615	N/A	No	OR15FG8012	N/A
X10CSATN02455G1	N/A	OR-MILCC2-0172	N/A	ORVECH0134	No	OR15FG8070	N/A
X10CSATN02455L	N/A	OR-MILCC2-0154	OR-RTR6-0616	N/A	No	OR15FG8008	N/A
X10CSATN02455M	N/A	OR-MILCC2-0134	OR-RTR6-0615	N/A	No	OR15FG8012	N/A
X10CSATN02474J	N/A	OR-MILCC2-0160	OR-RTR6-0572	N/A	No	OR15FG8033	N/A
X10CSATN02474O	N/A	OR-MILCC2-0134	OR-RTR6-0615	N/A	No	OR15FG8012	N/A
X10CSATN02689U1	N/A	OR-MILCC2-0172	N/A	ORVECH0137	No	OR15FG8070	N/A

RW 8/13/15

Roger Whiteaker — Signature of Site Project Manager
Roger Whiteaker — Printed Name
07/24/2015 — Date

Roger Whiteaker ROGER WHITEAKER 8/13/2015

Effective Date 6/19/2013 ~~6/4/2013~~
Rev 01-19-2016

CCP Correlation of Container Identification Numbers to Batch Data Report Numbers

Waste Stream: # OR-REDC-CH-HET Lot # 74

Container ID Number	Historical Container ID	NDA BDR	RTR BDR	VE BDR	Load/Manage Overpack Yes	Transportation Headspace Gas	
						FGA	GGT
X10C0402857E1	N/A	OR-MILCC2-0217	OR-RTR7-0143	N/A	No	OR15FG8088	N/A
X10C0402858D	N/A	OR-MILCC2-0216	OR-RTR7-0143	N/A	No	OR15FG8088	N/A
X10C0402858I	N/A	OR-MILCC2-0216	OR-RTR7-0143	N/A	No	OR15FG8088	N/A
X10C0402903H1	N/A	OR-MILCC2-0215	OR-RTR6-0654	N/A	No	OR15FG8085	N/A
X10C0402939G	N/A	OR-MILCC2-0217	OR-RTR6-0487	N/A	No	OR14FG8035	N/A
X10C0402962E1	N/A	OR-MILCC2-0214	OR-RTR7-0141	N/A	No	OR15FG8085	N/A
X10C0402988M	N/A	OR-MILCC2-0212	OR-RTR7-0145	N/A	No	OR15FG8082	N/A
X10C0402988N	N/A	OR-MILCC2-0217	OR-RTR6-0462	N/A	No	OR15FG8088	N/A
X10CSATN02493F1	N/A	OR-MILCC2-0215	OR-RTR7-0143	N/A	No	OR15FG8085	N/A
X10CSATN02664A1	N/A	OR-MILCC2-0214	OR-RTR7-0141	N/A	No	OR15FG8085	N/A
X10CSATN03208B	N/A	OR-MILCC2-0216	OR-RTR7-0144	N/A	No	OR15FG8088	N/A
X10CSATN03208E	N/A	OR-MILCC2-0216	OR-RTR7-0144	N/A	No	OR15FG8088	N/A
X10CSATN03208F	N/A	OR-MILCC2-0216	OR-RTR7-0143	N/A	No	OR15FG8088	N/A
X10CSATN03208G	N/A	OR-MILCC2-0216	OR-RTR7-0143	N/A	No	OR15FG8088	N/A
X10CSATN03208H	N/A	OR-MILCC2-0216	OR-RTR7-0144	N/A	No	OR15FG8088	N/A
X10CSATN03208I	N/A	OR-MILCC2-0212	OR-RTR7-0145	N/A	No	OR15FG8082	N/A
X10CSATN03208J	N/A	OR-MILCC2-0216	OR-RTR7-0144	N/A	No	OR15FG8088	N/A
X10CSATN03211D	N/A	OR-MILCC2-0215	OR-RTR7-0146	N/A	No	OR15FG8085	N/A
X10CSATN03211E	N/A	OR-MILCC2-0212	OR-RTR7-0146	N/A	No	OR15FG8082	N/A
X10CSATN03211K	N/A	OR-MILCC2-0212	OR-RTR7-0149	N/A	No	OR15FG8082	N/A
X10CSATN03211L	N/A	OR-MILCC2-0212	OR-RTR7-0149	N/A	No	OR15FG8082	N/A
X10CSATN03211P	N/A	OR-MILCC2-0212	OR-RTR7-0148	N/A	No	OR15FG8082	N/A
X10CSATN03211R	N/A	OR-MILCC2-0212	OR-RTR7-0149	N/A	No	OR15FG8082	N/A
X10CSATN03211S	N/A	OR-MILCC2-0217	OR-RTR7-0148	N/A	No	OR15FG8088	N/A
X10CSATN03211T	N/A	OR-MILCC2-0215	OR-RTR7-0149	N/A	No	OR15FG8085	N/A

Signature of Site Project Manager | Roger Whiteaker (Printed Name) | 10/14/2015 (Date)

CCP Correlation of Container Identification Numbers to Batch Data Report Numbers

Waste Stream: # OR-REDC-CH-HET

Lot # 75

Container ID Number	Historical Container ID	NDA BDR	RTR BDR	VE BDR	Load/Manage Overpack Yes	Transportation Headspace Gas	
						FGA	GGT
X10C0201076A	N/A	OR-MILCC2-0078	OR-RTR7-0049	N/A	No	OR14FG4062	N/A
X10C0402855I	N/A	OR-MILCC2-0093	OR-RTR7-0033	N/A	No	OR15FG8090	N/A
X10C0402858B	N/A	OR-IQ3-0532	OR-RTR7-0145	N/A	No	OR15FG8078	N/A
X10C0402858C	N/A	OR-IQ3-0529	OR-RTR7-0143	N/A	No	OR15FG8075	N/A
X10CSATN02461D1	N/A	OR-MILCC2-0210	N/A	ORVECH0147	No	OR15FG8085	N/A
X10CSATN02664C	N/A	OR-MILCC2-0223	OR-RTR6-0455	N/A	No	OR14FG4002	N/A
X10CSATN03113A	N/A	OR-MILCC2-0039	OR-RTR7-0052	N/A	No	OR14FG8077	N/A
X10CSATN03208A	N/A	OR-MILCC2-0208	OR-RTR7-0144	N/A	No	OR15FG8078	N/A
X10CSATN03208K	N/A	OR-MILCC2-0210	OR-RTR7-0145	N/A	No	OR15FG8083	N/A
X10CSATN03208L	N/A	OR-MILCC2-0210	OR-RTR7-0145	N/A	No	OR15FG8083	N/A
X10CSATN03208M	N/A	OR-MILCC2-0204	OR-RTR7-0144	N/A	No	OR15FG8076	N/A
X10CSATN03208N	N/A	OR-MILCC2-0204	OR-RTR7-0144	N/A	No	OR15FG8076	N/A
X10CSATN03211A	N/A	OR-MILCC2-0211	OR-RTR7-0146	N/A	No	OR15FG8083	N/A
X10CSATN03211B	N/A	OR-MILCC2-0210	OR-RTR7-0147	N/A	No	OR15FG8083	N/A
X10CSATN03211C	N/A	OR-MILCC2-0210	OR-RTR7-0146	N/A	No	OR15FG8083	N/A
X10CSATN03211F	N/A	OR-MILCC2-0208	OR-RTR7-0147	N/A	No	OR15FG8078	N/A
X10CSATN03211G	N/A	OR-MILCC2-0210	OR-RTR7-0147	N/A	No	OR15FG8083	N/A
X10CSATN03211H	N/A	OR-MILCC2-0210	OR-RTR7-0147	N/A	No	OR15FG8083	N/A
X10CSATN03211N	N/A	OR-MILCC2-0211	OR-RTR7-0146	N/A	No	OR15FG8082	N/A
X10CSATN03211U	N/A	OR-IQ3-0538	OR-RTR7-0149	N/A	No	OR15FG8084	N/A

Rick Whiteley — Signature of Site Project Manager

Rick Whiteley — Printed Name

10/15/2015 — Date

6/19/2013
Effective Date ~~6/4/2013~~
REW 01-19-2016

CCP Correlation of Container Identification Numbers to Batch Data Report Numbers

Waste Stream: # OR-REDC-CH-HET Lot # 76

Container ID Number	Historical Container ID	NDA BDR	RTR BDR	VE BDR	Load/Manage Overpack Yes	Transportation Headspace Gas	
						FGA	GGT
X10C0402959J1	N/A	OR-IQ3-0569	OR-RTR6-0688	N/A	No	OR15FG8096	N/A
X10C0402959J2	N/A	OR-IQ3-0569	OR-RTR6-0688	N/A	No	OR15FG8096	N/A
X10CSATN02632K1	N/A	OR-MILCC2-0222	N/A	ORVECH0146	No	OR15FG8101	N/A
X10CSATN03211I	N/A	OR-MILCC2-0217	OR-RTR7-0146	N/A	No	OR15FG8079	N/A
X10CSATN03211J	N/A	OR-MILCC2-0218	OR-RTR7-0146	N/A	No	OR15FG8079	N/A
X10CSATN03211M	N/A	OR-MILCC2-0218	OR-RTR7-0146	N/A	No	OR15FG8079	N/A

Rick Whiteley — Signature of Site Project Manager
Rick Whiteley — Printed Name
12/30/2015 — Date

DIVIDER PAGE

NWP
Nuclear Waste Partnership LLC

A URS-led partnership with B&W and AREVA

CP:16:01062
UFC:5900.00

INTER-OFFICE CORRESPONDENCE

DATE: March 3, 2016

FROM: R. P. Kantrowitz RPK LOCATION: Remote-Handled Projects

TO: CCP Records Custodian GSA-212 LOCATION: Central Characterization Program

SUBJECT: NMED ACCEPTABLE KNOWLEDGE ACCURACY REPORT: OAK RIDGE NATIONAL LABORATORY REMOTE-HANDLED TRANSURANIC CCP-AK-ORNL-500, WASTE STREAM NUMBER OR-REDC-RH-HET, LOTS 1 THROUGH 33

Purpose

CCP-TP-005, Revision 28, *CCP Acceptable Knowledge Documentation*, requires that Acceptable Knowledge (AK) accuracy be evaluated and documented. The purpose of this correspondence is to document the results of the AK accuracy evaluation for containers in waste stream OR-REDC-RH-HET, Heterogeneous Debris Waste, lots 1 through 33.

Methodology

In accordance with CCP-TP-005, the CCP *Waste Stream Characterization Checklist* (Attachment 13) was used to perform the AK accuracy review for lots 1 through 33 in waste stream OR-REDC-RH-HET. An *Acceptable Knowledge Re-Evaluation Checklist* (Attachment 10) was not generated for the review of this report.

The results of the AK accuracy evaluation for waste stream OR-REDC-RH-HET, lots 1 through 33, are documented on the attached *CCP Acceptable Knowledge Accuracy Report* form (Attachment 14). A total of 259 RH-TRU waste containers have been evaluated for AK accuracy and none had their Waste Matrix Codes (WMCs) reassigned, Environmental Protection Agency (EPA) Hazardous Waste Numbers (HWNs) reassigned, or were found to have radiological data inconsistent with AK. The results of the AK accuracy determination for waste stream OR-REDC-RH-HET, lots 1 through 33, are addressed in the following sections of this correspondence.

Results of Acceptable Knowledge Accuracy Determination

Acceptable Knowledge Re-Evaluation and Confirmation for Waste Stream OR-REDC-RH-HET

An AK re-evaluation checklist was not generated for this waste stream. The following parameters were described in AK Summary Report CCP-AK-ORNL-500.

- The AK identifies the waste as heterogeneous debris.
- The waste stream was determined to contain Resource Conservation and Recovery Act-regulated constituents and is assigned the following EPA HWNs: D004, D005, D006, D007, D008, D009, D010, D011, D019, F002, and F005.
- No EPA HWNs were reassigned to this waste stream.

The waste material parameters, EPA HWNs and radionuclides are, within reasonable error, as predicted in AK Summary Report CCP-AK-ORNL-500. No additional AK re-evaluations are required at this time.

Other Considerations

A CCP-TP-005 Attachment 10 was not generated for this waste stream. No drums were eliminated from waste stream OR-REDC-RH-HET due to the radioisotopic content. Based on the criteria for calculating accuracy, the accuracy for the waste stream is 100 percent, as calculated below.

Summary

There are 259 RH-TRU waste containers in lots 1 through 33 for waste stream OR-REDC-RH-HET; the 259 containers are consistent with AK.

[(259/259)*100]=100%

This AK Accuracy Report has been prepared in accordance with CCP-TP-005. The included Attachment 14 and Attachment 13s contain the listing of the waste containers evaluated in this waste stream for AK accuracy evaluation.

If you have any questions, or if you would like more information about the contents of this AK Accuracy Report, please contact me at (575) 234-7511.

RPK:rg

Attachments
1 – CCP-TP-005 Attachment 14, *CCP Acceptable Knowledge Accuracy Report*
2 – CCP Correlation of Container Identification Numbers to Batch Data Report Numbers Lots 1 – 33.

cc: NWP (without attachments)
I. S. Joo ED
D. W. Moody ED
C. A. Turner ED

TechSpecs (with Attachments)

K. Peters ED

QA:16:00003 **AK29**
UFC:2300.00

NWP
Nuclear Waste Partnership LLC
An AECOM-led partnership with B&W and AREVA

INTER-OFFICE CORRESPONDENCE

DATE: January 7, 2016

FROM: V. K. Cannon LOCATION: Quality Assurance

TO: W. W. Allen FOR Distribution LOCATION: Various

SUBJECT: TRANSMITTAL AND CLOSURE OF NWP QUALITY ASSURANCE AUDIT I15-14, CCP QA PROGRAM

Each year, Nuclear Waste Partnership LLC (NWP) QA evaluates approximately one half of the CCP QA Program; alternately evaluating the corresponding half of the program in the following year. These annual audits are performed at a host/generator site, and at the Program Office (Skeen-Whitlock Building).

The site visit portion of Audit I15-14 was performed at the Los Alamos National Laboratory (LANL), Los Alamos, New Mexico. The scope of Audit I15-14 included evaluation of the adequacy, effectiveness, and implementation of the following program elements:

- Personnel Qualification and Training
- Quality Improvement
  - Quality-affecting problems
  - Nonconformances
  - Corrective Action
- Work Processes
  - Item Identification and Control
  - Special Processes
  - Handling, Storage, Shipping
- Inspection and Testing
  - M&TE, and M&DC
  - Acceptance of Items or Services
  - Inspection
- Management Assessment
- Acceptable Knowledge (AK)

This audit resulted in the identification of one finding, and two observations. The finding is documented on WIPP Form (WF) 15-865, and corrective actions will be tracked through the WIPP Issues Management System. This audit is considered closed with the issue of this report.

If you have any questions, or need further information about this audit, please contact Ms. Cathy Nesser, at (575) 234-8376.

CN:ab

Attachment

P.O. Box 2078 • Carlsbad, New Mexico USA 88221-2078
Phone: (575) 234-7200 • Fax: (575) 234-7083

Distribution:

M. F. Sharif ED
B. E. Stubbs ED

cc: W. W. Allen ED
E. L. Ater ED
B. Broomfield ED
A. J. Fisher ED
T. A. Groover ED
M. S. Hendrickson ED
L. E. Hernandez ED
R. J. Kuhn ED
M. McDaniel ED
S. K. Pearcy ED
S. A. Punchios 451-27
M. Ramirez ED
R. D. Reeves ED
C. E. Simmons ED
C. Soaterna ED
V. M. Waldram ED
Quality Assurance Audit File I15-14

NUCLEAR WASTE PARTNERSHIP LLC
QUALITY ASSURANCE AUDIT REPORT
Central Characterization Program
Site: Los Alamos National Laboratory
I15-14

I. EXECUTIVE SUMMARY

Nuclear Waste Partnership (NWP) LLC Quality Assurance (QA) performed audit I15-14 of the Centralized Characterization Program (CCP) QA Program, September 29 – October 8, 2015.

Each year, NWP QA evaluates approximately one half of the CCP QA Program; alternately evaluating the corresponding half of the program in the following year. One waste generator site/facility is included in the audit each year. The site visit portion of audit I15-14 was performed at Los Alamos National Laboratory (LANL).

With exception of the issues identified herein as findings or observations, it was determined that the QA program elements established and implemented in the Central Characterization Program, and specifically at the CCP work area at Los Alamos National Laboratory, are effective. This audit resulted in the identification of one finding, and two observations.

II. AUDIT DETAILS

Purpose and Scope:

Audit activities during the site visit included evaluation of the following program elements:

- Personnel Qualification and Training
- Quality Improvement
  - Quality-affecting problems
  - Nonconformances
  - Corrective Action
- Work Processes
  - Item Identification and Control
  - Special Processes
  - Handling, Storage, Shipping
- Inspection and Testing
  - M&TE, and M&DC
  - Acceptance of Items or Services
  - Inspection
- Management Assessment

Audit I15-14 focused upon adequacy, effectiveness, and implementation of the above elements, plus the remaining, applicable nine elements of American Society of Mechanical Engineers (ASME)/Nuclear Quality Assurance (NQA)-1-1989, *Quality Assurance Program Requirements for Nuclear Facilities*.

An additional element, Acceptable Knowledge, was included in the audit scope. This scope is included each year, in accordance with a CCP Management request that documentation and activities associated with establishment of Acceptable Knowledge be included in each annual audit.

Audit activities included observation of processes; documents and records review; and, personnel interviews. Audit activities were performed in accordance with prepared checklists, developed in accordance with WIPP Procedure (WP) 13-QA.03, *Quality Assurance Independent Assessment Program.* Individual criteria were expanded where necessary to adequately demonstrate compliance with documented requirements.

The most recent prior NWP QA Audit (I15-01) of CCP was performed October – December 2014, and resulted in no findings, and no conditions corrected during the audit. An effectiveness review of corrective actions was therefore, not a required element of this audit.

Criteria Used:

- DOE/CBFO-94-1012, *U.S. Department of Energy Carlsbad Field Office Quality Assurance Program Document*
- ASME/NQA-1-1989, *Quality Assurance Program Requirements for Nuclear Facilities*
- WIPP Procedure (WP) 13-1, *Nuclear Waste Partnership LLC Quality Assurance Program Description*
- WP 15-GM.03, *Integrated Safety Management System Description*
- WP 04-CO.01, *Conduct of Operations*

Audit Team:

Lead Auditor:
C. E. Nesser, NWP QA

Auditor:
V. M. Waldram, NWP QA Assurance Programs

Inclusive Dates of Audit:

September 29 – October 8, 2015

Location of the Audit:

Skeen-Whitlock Building (Program Office)
Carlsbad, New Mexico

LANL TA-54
Los Alamos National laboratory
Los Alamos, New Mexico

Safety and Security:

Audit activities performed at the Program Office were completed in an administrative area. No specific PPE was required for this portion of the audit

The audit team was composed of auditors familiar with the LANL TA-54 facility and operations, and aware of the personal protective equipment (PPE), i.e. safety glasses and closed-toe shoes, required to enter operational areas at LANL. Audit team members adhered to all postings, signage, and escort instructions during audit activities.

Determination of these safety requirements is in alignment with WP 15-GM.03, *Integrated Safety Management (ISM) System Description,* §6.0, *Implementation of ISM;* §6.1, *ISM Guiding Principles;* and, §6.1.5, Guiding Principle 5: *Identification of Safety Standards and Requirements.*

Conclusions:

Program Office:

During audit activities performed in the Program Office (Skeen-Whitlock Building), it was observed that, other than the following issue, activities are performed in accordance with approved program documents and implementing procedures.

CCP participation in the NWP Quality Credit Card (QCard) program (WP 15-PC3044) is limited to purchase of specialty gases for use at generator sites. Records generated during the QCard process include, but are not limited to, QCard Inspection Plans, and CCP Receipt Inspection Verification Sheet(s) (RIVS). QCard records beginning in 2012 were reviewed. This review revealed several instances in which QA personnel (previously designated as CCP QA) did not review and/or close the RIVS for QCard purchases. Identified examples were limited to 2012 and 2013, and determined to be attributable to an individual who is no longer with NWP.

It was observed that personnel assigned to CCP QA beginning in 2014 ensured that QCard records were appropriately signed and closed in accordance with procedural requirements. This is further addressed as **I15-14-O-01**.

LANL/TA-54:

It should be noted that there are currently no handling/shipping activities (relative to containers) being performed at LANL; and, no handling/shipping activities were being performed at LANL during the audit period.

Although no container handling/shipping is being performed at LANL, the audit team was able to observe other daily activities relative to continued operation of the organization. While at LANL/TA-54, auditors observed activities and reviewed records relative to personnel qualification and training; quality improvement; work processes; item identification and control; special processes; handling, storage, and shipping; acceptance of items or services; inspection; management assessment; Acceptable Knowledge; and, Conduct of Operations.

With exception of the issues identified below, it was determined that activities are performed in accordance with approved program documents and implementing procedures.

Conduct of Operations

During the site visit, it was noted through audit team observations and personnel interviews, that communications between CCP and LANS had diminished in frequency (daily and/or weekly) since February 2014. Prior to February 2014, daily coordination meetings were typical.

Following completion of on-site audit activities, the audit team was notified that weekly meetings between CCP and LANS have resumed.

Training/Qualification Documentation

Qualification cards currently in use are designed with a section for on-the-job or hands-on training that must be finished prior to completion of the qualification card.

Upon review of training records, one instance was identified in which an obsolete version of a form was used. CCP-QP-002, Attachment 5 -*Training Container Data and Evaluation Sheet,* was completed using Revision 36. The form used should have been Revision 39. No additional instances were identified. This is an isolated incident, but one of several incidents relative to attention to detail. This and other, similar issues are further addressed as **I15-14-O-02**.

Records of a Training Container scan were reviewed. Records indicated that the operator-in-training did not call out glovebox windows or a cheesecloth bundle. The cheesecloth bundle could be seen as an item to be called out. Additionally, the operator called out a 500 mL container with 20 mL of liquid. This item should have been identified as a 250 mL bottle with 10 mL of liquid. Records did not indicate that the CE identified any discrepancies or counseled the operator. This is further addressed as **I15-14-F-01.**

CCP/LANL Interface Document Review

Using the site electronic document management system (Q&MIS), the audit team verified that, with exception of one document, LANS personnel reviewed program documents (listed in Attachment 2 to this report) as required. This is considered an isolated incident, and included only for documentation of the issue.

Acceptable Knowledge

Review of documentation relative to Acceptable Knowledge (AK) was performed using a checklist based on requirements from NM4890139088, the *WIPP Hazardous Waste Facility Permit (HWFP)*, and specific to waste streams LA-MHD03.001, LA-CIN03.001, and LA-MIN05-V.001.

As a result of this review, it was determined that the reviewed documentation and activities associated with Acceptable Knowledge are adequately addressed.

With exception of the issues identified herein, it was determined that the QA program elements established and implemented in the Central Characterization Program, and specifically at the CCP work area at Los Alamos National Laboratory are effective. This audit resulted in the identification of one finding, and two observations. The finding will be tracked through closure in accordance with WP 15-GM1002, *Issues Management Processing of WIPP Forms*. This audit is therefore, considered closed with issue of this report.

III. FINDING(S)

When responding to audit findings, the following elements are required to be addressed:

- Cause of nonconformance
- Interim actions planned to correct the nonconformance
- Evaluation of the extent of the condition beyond that cited in the report
- Actions planned to prevent recurrence
- Schedule of implementation/completion

I15-14-F-01 (WF 15-865)

Condition observed

Records of a Training Container scan were reviewed. Records indicated that the operator (in training) did not call out glovebox windows or a cheesecloth bundle. The cheesecloth bundle could be seen as an item to be called out. Additionally, the operator called out a 500 mL container with 20 mL of liquid. This item should have been identified as a 250 mL bottle with 10 mL of liquid. Records did not indicate that the CE identified any discrepancies or counseled the operator.

Requirement not met

CCP-QP-002, Section 5.0, states, "Review the Training Container scan and document discrepancies (accuracy and consistency) in Block 5 of Attachment 5."

CCP-QP-002, Section 8.0, states, "If the Operator fails to identify an item that is not a DQO, counsel the operator on the item(s) missed."

IV. OBSERVATIONS

I15-14-O-01

Condition observed

CCP participation in the NWP Quality Credit Card (QCard) program (WP 15-PC3044) is limited to purchase of specialty gases for use at generator sites. Records generated during the QCard process include, but are not limited to, QCard Inspection Plans, and CCP Receipt Inspection Verification Sheet(s) (RIVS). QCard records beginning in 2012 were reviewed. This review revealed several instances in which QA personnel (previously designated as CCP QA) did not

review and/or close the RIVS for QCard purchases. Identified examples were limited to 2012 and 2013, and were attributed to one individual who is no longer with NWP.

It was observed that personnel assigned to CCP QA beginning in 2014 ensured that QCard records were appropriately signed and closed in accordance with procedural requirements.

I15-14-O-02

Condition observed

Several examples of inattention to detail were observed. A limited number of these incidents were noted during the audit. This issue is therefore, not considered programmatic.

Upon review of training records, it was observed that:

- an obsolete version of a form was used. CCP-QP-002, *Attachment 5-Training Container Data and Evaluation Sheet,* was completed on Revision 36. The form used should have been Revision 39.
- the resume for a VPM was not included in the individual's training file.
- the training file for a NDE CE included a job application for the position rather than a resume.

V. ATTACHMENTS

1. Attachment 1 – Table of Personnel Contacted
2. Attachment 2 – Table of Documents Reviewed

VI. SIGNATURES

Prepared by: _____ 1/7/16
C.E. Nesser, Lead Auditor
Quality Assurance
Date

Approved by: _____ 1/7/2016
R.J. Kuhn, Manager
Assurance Programs
Date

Attachment 1, *Table of Personnel Contacted*

[A] Attended Audit Entrance Meeting
[B] Contacted During the Audit
[C] Attended Audit Exit Meeting

Personnel Contacted	A	B	C
Nuclear Waste Partnership LLC			
Program Office			
C. Armijo		X	
M. Billet		X	
A. Fisher		X	
S. Pearcy		X	
C. Soaterna		X	X
LANL TA-54			
C. Simmons	X	X	
T. Groover	X	X	
T. Mojica		X	
E. Rios		X	
P. Robida		X	
R. Baca		X	
R. Jagielski		X	
A. Brister		X	
L. Green		X	
S. Aragon		X	
M. Simmons		X	
Technical Specialists			
T. Greenwood		X	
K. Peters		X	

Attachment 2, *Table of Documents Reviewed*

Document Identification	Document Title or Description
ASME/NQA-1-1989	American Society for Mechanical Engineering (ASME)/Nuclear Quality Assurance (NQA)-1-1989, *Quality Assurance Program Requirements for Nuclear Facilities*
DOE/CBFO-94-1012, Revision 12, August 3, 2015	*U.S. Department of Energy Carlsbad Field Office Quality Assurance Program Document*
WIPP Procedure (WP) 13-1, Revision 36, November 12, 2014	*Nuclear Waste Partnership LLC Quality Assurance Program Description*
NM4890139088-TSDF, March 2015	*WIPP Hazardous Waste Facility Permit*
WP 04-CO.01, Revision 3, February 21, 2013	*Conduct of Operations*
WP 15-GM1002, Revision 4, June 9, 2015	*Issues Management Processing of WIPP Forms*
WP 15-GM.03, Revision 9, February 24, 2015	*Integrated Safety Management System Description*
CCP-QP-002, Revision 39, April 14, 2015	*CCP Training and Qualification Plan*
CCP-QP-005, Revision 25, July 29, 2015	*CCP TRU Nonconforming Item Reporting and Control*
CCP-QP-008, Revision 24, February 10, 2015	*CCP Records Management*
CCP-QP-017, Revision 4, August 14, 2013	*CCP Identification and Control of Items*
CCP-QP-018, Revision 11, May 7, 2014	*CCP Management Assessment*
CCP-QP-023, Revision 4, January 15, 2013	*CCP Handling, Storage and Shipping*
CCP-PO-001, Revision 21, May 31, 2013	*CCP TRU Waste Characterization Quality Assurance Project Plan*
CCP-PO-002, Revision 27, May 31, 2013	*CCP Transuranic Waste Certification Plan*
CCP-PO-005, Revision 26, February 25, 2015	*CCP Conduct of Operations*
CCP-PO-012, Revision 15, January 23, 2014	*CCP/LANL Interface Document*
CCP-TP-005, Revision 27, August 26, 2015	*CCP Acceptable Knowledge Documentation*
CCP-TP-028, Revision 9, June 16, 2014	*CCP Radiographic Test Drum and Training Container Construction*
CCP-TP-047, Revision 12, November 6, 2013	*CCP Mobile IQ3 Gamma Scanner Operation*
CCP-TP-053, Revision 15, September 11, 2014	*CCP Standard Real-Time Radiography (RTR) Inspection Procedure*
CCP-TP-076, Revision 1, March 25, 2014	*CCP Operating the Mobile ISOCS Large Container Counter Using NDA 2000*
CCP-TP-113, Revision 19, June 23, 2015	*CCP Standard Waste Visual Examination*
DOE/WIPP 06-3345, Revision 9, May 19, 2015	*WIPP Flammable Gas Analysis*
(Tech Area) TA-54-375	*SWB Storage Plan*
LAVE030003, Examination date September 15, 2014	*VE Batch Data Report*
LAVE030015, Examination date July 6, 2015	*VE Batch Data Report*
LAVE030018, Examination date July 15, 2015	*VE Batch Data Report*
5LANDA0012, Batch date September 1, 2015	*Nondestructive Assay Batch Data Report*
LA-RTR2-15-0001, February 11, 2015	*Radiography Batch Data Report*
Management Assessment (MA)-CCP-0001-15	*Effectiveness of the Records Index Module in the Integrated Data Center*

Document Identification	Document Title or Description
MA-CCP-0003-15	*Implementation of CCP-TP-113 at TA-55*
MA-CCP-0007-14	*RTR Data Generation and Review*
MA-CCP-0015-14	*Safety Conscience Work Environment Process Implementation*
MA-CCP-0017-14	*Adherence to Conduct of Operations Requirements During CH Data Review, RH Data Review, Lot Evaluations, and Waste Stream Profile Form Generation Activities*
Surveillance Report (SUR)-LANL-12-14, December 17, 2014	*MOVER Verification*
SUR-LANL-08-14, September 22, 2014	*Nondestructive Assay Mobile In-Situ Object Counting System, Large Container Counter at LANL*
SUR-LANL-04-15, July 9, 2015	*LANL CCP Software*
SUR-LANL-03-15, May 27, 2105	*NDA Operations*
SUR-LANL-05-15, June 30, 2015	*MOVER Verification*
Receipt Inspection Verification Sheet (RIVS) 501894, December 17, 2013	3 Filtered bags for LANL
RIVS 502596, June 5, 2014	Nucfil 072 filters for LANL
RIVS 503509, February 18, 2015	85-gal drums
RIVS 415596/QAIP 7559-QA-2014	Gases for LANL
RIVS 415596/QAIP 7130-QA-2014	Nitrogen for LANL
RIVS 415596/QAIP 6778-QA-2013	CCV Gas for LANL
RIVS 415596/ QAIP 8008-QA-2015	Nitrogen for INL
RIVS 415596/ QAIP 6947-QA-2013	Cylinder of Internal Standard Gas for INL
RIVS 415596/QAIP 6433-QA-2012	ICAL gas for INL
Nonconformance Report (NCR)-LANL0103140, January 23, 2014	Closure May 1, 2014
NCR-LANL0737130, August 13, 2013	Closure October 17, 2013
NCR-LANL0417130, September 3, 2013	Closure April 1, 2014
NCR-LANL0024150, March 3, 2015	Closure March 17, 2015
NCR-LANL0022150, January 15, 2015	Closure January 22, 2015
Equipment Number 033138	Calibration Certificate for Scale
Equipment Number 033641	Calibration Certificate for Torque Wrench
T. Hasselstrom	CCP-QP-002, Attachment 5, *Training Container Data and Evaluation Sheet*
T. Mojica	VPM-01, Revision 5; Qualification card and other required documentation
W. Cameron	VPM-01, Revision 2; Qualification card and other required documentation
T. Groover	SPM-01, Revision 18; VPM-01, Revision 3; Qualification card and other required documentation
C. Soaterna	SPM-01, Revision 13; Qualification card and other required documentation

Document Identification	Document Title or Description
C. Simmons	SPM-01, Revision 18; Qualification card and other required documentation
P. Robida	VE-01, Revision 5; Qualification card and other required documentation
L. Ortega; P. Ausmus; E. Rios; and, D. Potter	VE-01, Revision 6; Qualification card and other required documentation
S. Martinez	Cognizant Engineer for Nondestructive Examination Appointment Letter; Resume
S. Nance; M. Papp	AKE-01, Revision 7
D. Hemsing; J. Thompson	CMR VEE Appointment Letter
CCP-AK-LANL-009, Revision 8, November 5, 2013	*Central Characterization Program Acceptable Knowledge Summary Report for Los Alamos National Laboratory Chemistry and Metallurgy Research (CMR) Facility Waste Streams: LA-MHD03.001, LA-CIN03.001, LA-MIN05-V.001*
CCP-TP-005, Revision 27, August 27, 2015, Attachment 4, *Acceptable Knowledge Source Document Information List*	LA-MHD03.001 (AK9) LA-CIN03.001 (AK9) LA-MIN05-V.001 (AK9)
CCP-TP-005, Revision 27, August 27, 2015, Attachment 11, *Acceptable Knowledge Source Document Discrepancy Resolution*	DR009, LA-CIN03.001 (AK9)
CCP-TP-005, Revision 27, August 27, 2015, Attachment 14, *CCP Acceptable Knowledge Accuracy Report*	LA-MHD03.001 (AK9), Lots 87-105 LA-CIN03.001 (AK9), Lot 1 LA-MIN05-V.001 (AK9), Lots 1-2
List of Qualified Individuals (LOQI)	Regularly updated, and available via the CCP Integrated Data Center (IDC)
LANS personnel review of the following documents was verified in Q&MIS:	CCP LANL AK Summary Reports CCP-CM-003, *CCP High Efficiency Neutron Counter (HENC-01) (Equipment #NDA-HENC-01) Equipment Description* CCP-CM-018, *CCP Real-Time Radiography MCS Unit #3 LANL Unit #2 (Equipment #NDE-RTR-03/LANL-RTR-02) Equipment Description* CCP-CM-024, *CCP High Efficiency Neutron Counter (HENC-02) (Equipment #NDA-HENC-02) Equipment Description* CCP-CM-028, *CCP Real-Time Radiography LANL Unit #1 (Equipment #LANL-RTR-01) Equipment Description* CCP-HSP-014, *Health and Safety Program Implementation for CCP* CCP-PO-016, *CCP Gas Generation Testing Quality Assurance Project Plan* CCP-TP-053, *CCP Standard Real-Time Radiography (RTR) Inspection Procedure* CCP-TP-054, *CCP Adjustable Center of Gravity Lift Fixture Preoperational Checks and Shutdown*

Document Identification	Document Title or Description
	CCP-TP-059, *CCP Operating the Super High Efficiency Neutron (SuperHENC) Using NDA200* CCP-TP-063, *CCP Operating the High Efficiency Neutron Counter Using NDA 2000* CCP-TP-064, *CCP Calibrating the High Efficiency Counter and the Super High Efficiency Neutron Counter Using NDA 2000* CCP-TP-066, *CCP Radiography Screening Procedure for Prohibited Items* CCP-TP-068, *CCP Standardized Container Management* CCP-TP-069, *CCP Sealed Source Visual Examination and Packaging* CCP-TP-076, *CCP Operating the Mobile ISOCS Large Container Counter Using NDA 2000* CCP-TP-077, *CCP Calibrating the Mobile ISOCS Large Container Counter Using NDA 2000* CCP-TP-082, *CCP Waste Container Filter Vent Operation* CCP-TP-083, *CCP Gas Generation Testing* CCP-TP-086, *CCP CH Packaging Payload Assembly* CCP-TP-101, *CCP Off-Site Source Recovery Project Sealed Source Radiological Characterization* CCP-TP-103, *CCP Data Reviewing, Validating, and Reporting Procedure for the NDA Counters at LANL using NDA 2000* CCP-TP-107, *CCP Operating the High Efficiency Neutron Counter #3 (HENC #3) Using NDA 2000* CCP-TP-108, *CCP Calibrating the High Efficiency Neutron Counter #3 (HENC #3) Using NDA 2000* CCP-TP-113, *CCP Standard Contact-Handled Waste Visual Examination* CCP-TP-120, *CCP Container Management* CCP-TP-121, *CCP RTR #1 Operating Procedure* CCP-TP-122, *CCP RTR #2 Operating Procedure* CCP-TP-198, *CCP HE-RTR Operating Procedure*
LANL AK Tracking Spreadsheet (AKTSS), September 28, 2015	

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Attachment 3 – Management Assessment Plan

Management Assessment Plan
(Management Assessment Number MA-CCP-0002-16)

Management Assessment Plan

The plan is for CCP to visit ORNL and conduct field observations of ORNL personnel as they perform repackaging operations on TRU waste in accordance with ORNL procedures.

Management Assessment Scope

The assessment will be performed on waste stream OR-REDC-CH-HET, described in CCP-AK-ORNL-002, as it is processed/treated at the Oak Ridge National Laboratory (ORNL).

If Visual Examination (VE) of waste in waste stream OR-REDC-CH-HET is being performed under the CCP program while the management assessment is occurring, the team will also evaluate VE activities in accordance with CCP-TP-113, Revision 19, at the TRU Waste Processing Center.

Management Assessment Team

Beverly Schrock, Team Lead
Andrew Stallings, Team Member

Assessment Date

The assessment is scheduled to begin on Monday, January 25, 2016.

Site Procedures

The following ORNL site procedures will be among those that to be assessed by the team (other procedures may be added during the actual assessment):

CH-P-OP-013, *CH Waste Packaging*
CH-REF-OP-013, *CH Waste Repackaging*
CH-REF-OP-014, *Absorbing Liquids in the Glovebox and Box Breakdown Area*

Fisher, AJ - NWP

From:	Reeves, Ron - NWP
Sent:	Friday, January 22, 2016 1:22 PM
To:	Barton, Thomas (Thomas.Barton@truproject.com)
Cc:	Coffey, Don; Stallings, Andrew - ORNL; Schrock, Beverly - NWP; Fisher, AJ - NWP
Subject:	CCP Management Assessment/Field Observations
Attachments:	FINAL (external) Plan for MA-CCP-0002-16 [Waste Material Field Observations at ORNL].doc

The purpose of this correspondence is to confirm previous arrangements for CCP personnel to conduct field observations of ORNL packaging/repackaging operations of TRU waste in accordance with Oak Ridge National Laboratory (ORNL) procedures. The observations will be performed on waste stream OR-REDC-CH-HET, described in CCP-AK-ORNL-002, as the waste is processed at ORNL. CCP will document the results of the observations in a management assessment report: the plan for the assessment is attached to this correspondence. The plan identifies the team members, the scope, and the ORNL procedures that will be used for observation (more procedures may be added as the work progresses).

If Visual Examination (VE) of waste in waste stream OR-REDC-CH-HET is being performed under the CCP program during the period of the visit, the team will also evaluate VE activities in accordance with CCP-TP-113, Revision 19, at the TRU Waste Processing Center.

As agreed, the team will begin performing observations on Monday, January 25, 2016: the evaluation is expected to continue for several days. The team will inform cognizant ORNL person of any issues or concerns that may arise, as soon as they are identified.

Please contact Andrew Stallings at 865-574-5929 or Beverly Schrock at 575-234-7444 if there are any questions or if additional information is required.

Ron Reeves
Central Characterization Project
Nuclear Waste Partnership LLC
Contractor for the U.S. Department of Energy
575-234-7345 (W)
575-499-6470 (C)

External Management Assessment Plan for

MA-CCP-0002-16

Waste Material Field Observations at ORNL

CCP will not accept waste from any waste stream with unresolved deficiencies against the associated AK.

Management Assessment Scope

The assessment will be performed on waste stream OR-REDC-CH-HET, described in CCP-AK-ORNL-002, as it is processed/treated at the Oak Ridge National Laboratory (ORNL).

If Visual Examination (VE) of waste in waste stream OR-REDC-CH-HET is being performed under the CCP program while the management assessment is occurring, the team will also evaluate VE activities in accordance with CCP-TP-113, Revision 19, at the TRU Waste Processing Center.

Management Assessment Team

Beverly Schrock, Team Lead
Andrew Stallings, Team Member

Elements to be Assessed

The elements to be assessed during the management assessment are:

- Observation of ORNL personnel processing TRU waste during repackaging and treatment prior to the waste being handed over to CCP for characterization
- Discussions with ORNL personnel about their processes and absorbent materials used
- Witnessing procedure implementation during ORNL repackaging and treatment activities

Site Procedures

The following ORNL site procedures will be among those that to be assessed by the team (other procedures may be added during the actual assessment):

CH-P-OP-013, *CH Waste Packaging*
CH-REF-OP-013, *CH Waste Repackaging*
CH-REF-OP-014, *Absorbing Liquids in the Glovebox and Box Breakdown Area*

Deliverables:

The Management Assessment Plan is complete (this document). The management assessment report will reflect the content of the management assessment plan. Required deliverables are the following:

- Management Assessment Plan (this document)
- Management Assessment Report

Attachment 3 – Management Assessment Plan

Management Assessment Plan
(Management Assessment Number MA-CCP-0002-16)

Background:

Investigations in response to the drum that breached at the WIPP in February 2014 showed that the main reason why the event occurred was that the generator site failed to follow its internal procedures and program controls. DOE and NWP are strengthening their programs to provide themselves with more visibility to generator site processing/treatment activities being applied to active waste streams prior to the waste being handed over to CCP for characterization, certification, and shipment.

Management Assessment Plan

This is a first-of a-kind CCP evaluation of generator site processing/treatment of TRU waste prior to turnover of the waste to CCP for characterization, certification, and shipment. This evaluation, and others like it in the future, will be conducted to provide CCP with additional assurance that generator sites are following their internal procedures as they process/treat waste before the waste is handed over to CCP.

The assessment team will use information provided in Acceptable Knowledge Summary Report CCP-AK-ORNL-002 and applicable Site procedures as the foundation for the assessment activities. The results of this management assessment will be used to facilitate the development of formal procedural requirements for similar evaluations on a continuing basis.

Evaluations will be waste-stream specific, and will include actual observation of processing/treatment activities, interviews with operations personnel, and (where appropriate) confirmation that materials used in processing/treatment are of the right pedigree and no substitutions have been made.

The assessment will be performed in strict accordance with CCP-QP-018. What follows is specific guidance regarding the way that any deficiencies will be documented and tracked to resolution:

1. Deficiencies will be promptly reported to cognizant generator site management, with the expectation that management will take appropriate action as required by their respective quality assurance programs.

2. Regardless of the generator site response, CCP will document deficiencies using the WIPP Form program. It is not expected that NCRs will be necessary during the assessment, since the waste under observation will still be with the generator site and not under the CCP program. Information collected during the assessment may later result in NCRs for affected waste that has already been turned over to CCP.

3. Any deficiencies identified during these assessments will impact Acceptable Knowledge (AK) in some way: e.g., the team may find that source document procedures are not being followed or that processing/treatment steps are being applied that are not captured in AK. For this reason, WIPP Forms will be written against the applicable AK/waste stream being assessed.

notate the items they are using for their experiments. These log sheets are used to fill out the 2109 form that is sent to TWPC listing what is in the container. Lab personnel also may take pictures of the items before the items are packaged up and transferred to the drum that will eventually be sent to the TWPC. The packet that is sent with the drum will include pictures that are attached to the 2109 forms that our Acceptable Knowledge Experts use in writing the Acceptable Knowledge Report Summaries for the waste at ORNL. The REDC Hot Cell has liquid recovery tanks connected to the hot cells that any liquid is sent to and processed via their liquid waste storage tanks located behind and below the hot cell cubicles.

During this visit there were not any containers going through the VE process while I was at the site. This process will be observed in a future management assessment.

Deficiencies:
None

Other Conditions Requiring Resolution:
None

Observations:
The operators at the TWPC and at the REDC laboratory were very knowledgeable and were willing to explain their processes and share information with us.

Recommendations:
When the procedure is written for the CCP Waste Management Field Observations, I would recommend that attachments be included in the procedure that will cover the planning and results for each observation completed.

Programmatic Strengths:
The TWPC operators were working to current revision of procedures and were practicing verbatim compliance.

Actions Taken/ Corrected During Assessment:
None needed.

Assessment Leader: Beverly Schrock BSSchrock 3/3/16
Print/Sign *Date*

Manager's Approval: Mike Ramirez Mike Ramirez 3-3-2016
Print/Sign *Date*

Safety Review: (if applicable, or "N/A") N/A BSS 3/3/16
Print/Sign *Date*

Attachment 1 – Management Assessment Report Format

Management Assessment Number: MA-CCP-0002-16

Date Initiated: January 25, 2016

Assessment Type: Management

Project or Program: Central Characterization Program

Basis for Assessment: CCP-AK-ORNL-002, "Central Characterization Program Acceptable Knowledge Summary Report For Oak Ridge National Laboratory Radiochemical Engineering Development Center Contact-Handled Waste" and Management Direction

Purpose: Visit ORNL and conduct field observations of ORNL personnel as they perform waste packaging and repackaging operations on TRU waste in accordance with ORNL procedures, and compare the observation to the Acceptable Knowledge description. Lessons learned from this assessment will be incorporated into a new CCP procedure for future field observations.

Background: In the past, it may not have been possible to verify if an item in a waste container matches the AK based solely on its physical appearance observed during RTR or VE. For example, if previously generated absorbent material is observed, RTR or VE may not be able to confirm what liquid was actually absorbed, what absorbent was used, or whether the liquid was treated prior to absorption if it was required. A new CCP procedure is being developed to observe waste generator processes upstream of RTR or VE.

Results: Observed personnel at the TRU Waste Processing Center (TWPC) who were sorting Contact Handled (CH) and Remote Handled (RH) items in the Hot Cell at the Processing Building. The items were out of cask X10C0201071 which is from the OR-REDC-RH-HET waste stream. The operators were working out of TWPC procedure, RH-REF-OP-021-R3, "Remote Handled Waste Repackaging . I spoke with the operators at the Hot Cell as well as the supervisor on duty, about what absorbents are used during their processing. The supervisor on the floor advised that there are two absorbents used at the Hot Cell at the TWPC while they are repackaging waste. The absorbents are Nochar N910 Petrobond for suspect PCB liquids and Nochar N965 for all other liquids. I did not observe the absorbents being used during my observation.

Visited the Radiochemical Engineering Development Center (REDC), Building 7920. Made several trips over several days and observed different steps in their lab process as well as toured the Hot Cell area. The lab personnel use NNFD-REDC-004, "CH-TRU Waste Handling at REDC" details their handling of free liquids. They DO NOT absorb any free liquids unless the liquid and the absorbent to be used have been fully evaluated for chemical compatibility and the absorbed liquid and type of absorbent are documented in the waste item description field in Appendix C, "CH-TRU Waste Inventory Log". I was shown the log sheets that the scientist/lab personnel use to

Attachment 13 - CCP Waste Stream Characterization Checklist

AK30

Page 1 of 2

Site(s): ORNL

Waste Stream Number: OR-NFS-CH-SOIL (CCP-AK-ORNL-001) Lot # (if applicable) 14

Waste Stream Description: Soil

Acceptable Knowledge Information or other data points[a]	Characterization Method(s)	Acceptable Knowledge Re-evaluation Required? Yes/No[b]?	Comments[c]
Physical waste form/description	RTR	No	RTR Data Sheets indicate consistency with Attachment 6 of CCP-TP-005.
Waste material parameters weights	RTR	No	RTR Data Sheets indicate consistency with the Waste Material Parameter table as listed in the AK. See additional attached sheets.
Waste percent volume consistent with nondestructive examination or visual examination data and audio/video tapes or equivalent media	RTR	No	RTR Data Sheets indicate consistency with CCP-AK-ORNL-001. See additional attached sheets.
Summary category group assignment	RTR	No	RTR Data Sheets are consistent with CCP-TP-005, Attachment 6.
Waste matrix code assignment	RTR	No	Waste Matrix Code S4100 is consistent with data from RTR data sheets.
Absence of prohibited items	RTR	No	RTR did not identify any prohibited items.
EPA Hazardous Waste Number assignment [d]	AK	No	Characterization results consistent with CCP-AK-ORNL-001.
Toxicity characteristic code assignment	AK	No	Consistent with CCP-AK-ORNL-001.
VOCs from packaging materials or radiolysis present	AK	No	CCP-TP-005 Attachment 5 does not identify any VOCs associated with packaging or radiolysis.
State Hazardous Waste Number assignment	AK	No	No additional State Hazardous Waste codes are identified in CCP-TP-005, Attachment 5.
Radionuclides present	NDA	No	See Additional Comments section and additional sheets attached.
Other radiological parameters: (specify)	NDA	No	No additional radiological parameters identified.

CCP RECORDS ORIGINAL

DATE REC'D 12-3-2015 JN

Attachment 13 - CCP Waste Stream Characterization Checklist

Site(s): ORNL
Waste Stream Number: OR-NFS-CH-SOIL (CCP-AK-ORNL-001) Lot # (if applicable) 14
Waste Stream Description: Soil

Additional Comments:

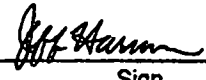
- For this waste stream, AK identifies the two most prevalent isotopes, by weight percent, to be: U-238 at 73.42% and Pu-239 at 19.17%.
- The two most prevalent isotopes by weight percent for the lot are: 93.29% U-238 and 5.91% Pu-239.
- For the waste stream to date, the two most prevalent isotopes by weight percent are: 82.33% Pu-239 and 9.35% U-238. This does not compare favorably with AK; however, at this time there are not enough data to request an AK re-evaluation.
- Ra-226 was reported by NDA in this lot at trace levels.This isotope is not identified in the CCP-AK-ORNL-001 Rev. 10 AK Summary Report or the NDA Memorandum. However, this isotope does not contribute to 95% of the radioactive hazard for the payload containers in this lot, and therefore, the AK Summary does not need to be revised to include Ra-226.

a. Identified in the AK Summary Report or included in the in-process record documentation (e.g., BDR's).
b. If 'Yes,' AK Expert completes an Acceptable Knowledge Re-evaluation Checklist.
c. Identify the source of the waste characterization information (e.g., batch data report).
d. Ensure that, if a toxicity characteristic contaminant is identified, it is not included as a listed waste, and if analytical data regarding the concentration are not available, the corresponding EPA Hazardous Waste Code is applied.

Site Project Manager:

Rick Whiteley		6/1/2015
Print	Sign	Date

Acceptable Knowledge Expert:

JEFF HARRISON		6/5/2015
Print	Sign	Date

NDA Isotopic Weight Percent
OR-NFS-CH-SOIL
Lot 14

CONTAINERID	NDABDR	SR-90	CS-137	RA-226	U-233	U-234	U-235	U-238	NP-237	PU-238	PU-239	PU-240	PU-241	PU-242	AM-241	AM-243
X10C1351427	OR-IQ3-0480	1.66E-08	2.64E-08	1.52E-07		6.03E-05	3.01E-02	8.49E+00	2.08E-04	9.07E-05	3.66E-01	3.05E-02	3.70E-04	1.86E-04	3.60E-03	
X10C1351429	OR-IQ3-0482	7.26E-10	1.15E-09	1.70E-07				8.71E+00	2.16E-04	4.84E-05	4.25E-01	3.20E-02	3.41E-04	2.00E-04	3.88E-03	
X10C1351431	OR-IQ3-0482	1.57E-09	2.50E-09	1.51E-07		4.94E-05	2.47E-02	9.95E+00	2.14E-04	5.04E-05	3.35E-01	2.66E-02	2.51E-04	1.69E-04	3.66E-03	
X10C1351433	OR-IQ3-0482	1.24E-09	1.97E-09	1.87E-07		7.18E-05	3.58E-02	1.42E+01	4.44E-04	9.05E-05	9.08E-01	5.80E-02	6.56E-04	3.57E-04	7.30E-03	
X10C1351434	OR-IQ3-0482	7.56E-09	1.20E-08	1.57E-07		9.02E-05	4.50E-02	7.46E+00	2.73E-04	6.38E-05	4.88E-01	3.76E-02	3.70E-04	2.28E-04	4.36E-03	
X10C1351438	OR-IQ3-0482	7.96E-10	1.26E-09	1.65E-07		8.22E-05	4.10E-02	8.00E+00	3.00E-04	7.98E-05	3.94E-01	3.62E-02	3.82E-04	3.83E-04	4.06E-03	
X10C1351440	OR-IQ3-0482	1.69E-08	2.69E-08	1.52E-07		6.37E-05	3.18E-02	7.77E+00	2.67E-04	6.35E-05	4.49E-01	3.63E-02	3.68E-04	2.25E-04	4.37E-03	
X10C1351446	OR-IQ3-0482	1.69E-08	2.68E-08	1.75E-07		8.32E-05	4.15E-02	7.10E+00	2.62E-04	3.11E-05	4.31E-01	3.13E-02	3.49E-04	1.97E-04	4.18E-03	
X10C1351447	OR-IQ3-0479	1.86E-08	2.96E-08	2.21E-07				9.00E+00	2.88E-04	7.99E-05	4.57E-01	4.04E-02	4.56E-04	2.46E-04	4.38E-03	
X10C1351450	OR-IQ3-0482	1.61E-08	2.56E-08	1.42E-07				3.74E+00	1.04E-04	4.34E-05	2.20E-01	1.71E-02	2.44E-04	1.09E-04	1.72E-03	
X10C1351451	OR-IQ3-0481	1.72E-08	2.74E-08	1.98E-07				6.29E+00	2.26E-04	3.35E-05	4.41E-01	3.51E-02	3.46E-04	2.15E-04	3.93E-03	
X10C1351456	OR-IQ3-0481	1.24E-09	1.97E-09	1.74E-07				5.91E+00	2.06E-04	6.84E-05	3.27E-01	2.81E-02	3.19E-04	1.75E-04	2.99E-03	
X10C1351457	OR-IQ3-0482	2.10E-09	3.34E-09	1.74E-07		6.02E-05	3.00E-02	9.34E+00	3.08E-04	7.97E-05	4.35E-01	3.78E-02	4.08E-04	2.35E-04	4.38E-03	
X10C1351459	OR-IQ3-0482	1.11E-09	1.77E-09	1.86E-07		5.99E-05	2.99E-02	8.76E+00	3.31E-04	5.15E-05	4.27E-01	3.52E-02	3.86E-04	2.26E-04	4.30E-03	
X10C1351460	OR-IQ3-0482	7.85E-10	1.25E-09	1.57E-07		8.06E-05	4.02E-02	7.59E+00	2.55E-04	5.86E-05	4.45E-01	3.83E-02	3.61E-04	2.35E-04	3.65E-03	
X10C1351461	OR-IQ3-0480	1.63E-08	2.59E-08	1.45E-07		5.34E-05	2.67E-02	6.80E+00	1.80E-04	4.04E-05	3.96E-01	3.41E-02	2.74E-04	1.99E-04	3.51E-03	
X10C1351462	OR-IQ3-0479	1.95E-08	3.09E-08	2.27E-07		8.93E-05	4.46E-02	5.26E+00	2.51E-04	9.25E-05	5.65E-01	4.64E-02	4.81E-04	2.71E-04	4.27E-03	
X10C1351463	OR-IQ3-0480	1.63E-08	2.58E-08	1.65E-07		5.77E-05	2.88E-02	7.26E+00	2.21E-04	6.43E-05	3.94E-01	3.23E-02	3.41E-04	1.96E-04	3.30E-03	
X10C1351464	OR-IQ3-0480	1.68E-08	2.66E-08	2.04E-07		7.43E-05	3.71E-02	6.78E+00	2.50E-04	8.34E-05	4.48E-01	3.54E-02	4.29E-04	2.17E-04	4.29E-03	
X10C1351467	OR-IQ3-0480	1.60E-08	2.54E-08	1.48E-07				6.08E+00	2.09E-04	7.17E-05	3.76E-01	2.75E-02	3.45E-04	1.72E-04	3.08E-03	
X10C1351468	OR-IQ3-0479	1.76E-08	2.80E-08	2.03E-07				7.33E+00	2.38E-04	4.96E-05	4.29E-01	3.30E-02	2.93E-04	2.07E-04	4.19E-03	
X10C1351469	OR-IQ3-0479	1.57E-08	2.49E-08	1.82E-07				4.87E+00	2.81E-04	3.95E-05	3.48E-01	3.03E-02	2.68E-04	1.92E-04	3.81E-03	
X10C1351477	OR-IQ3-0481	3.49E-09	5.54E-09	1.72E-07		7.05E-05	3.52E-02	5.39E+00	2.64E-04	3.65E-05	3.89E-01	3.19E-02	2.85E-04	1.98E-04	3.53E-03	
X10C1351478	OR-IQ3-0479	1.64E-08	2.60E-08	1.98E-07				5.33E+00	2.58E-04	5.49E-05	3.87E-01	3.28E-02	3.29E-04	2.00E-04	3.54E-03	
X10C1351480	OR-IQ3-0481	7.01E-09	1.11E-08	1.68E-07				4.31E+00	1.92E-04	8.35E-05	4.17E-01	3.43E-02	3.61E-04	2.06E-04	3.44E-03	
X10C1351481	OR-IQ3-0480	1.45E-08	2.31E-08	8.14E-08				4.38E+00	1.61E-04	2.28E-05	2.76E-01	2.30E-02	2.36E-04	1.39E-04	2.78E-03	
X10C1351482	OR-IQ3-0480	1.63E-08	2.59E-08	1.22E-07		6.13E-05	3.06E-02	9.22E+00	2.71E-04	8.03E-05	4.43E-01	3.30E-02	3.75E-04	2.08E-04	4.05E-03	
X10C1351483	OR-IQ3-0479	1.63E-08	2.58E-08	1.48E-07		4.87E-05	2.43E-02	3.90E+00	1.54E-04	4.36E-05	2.66E-01	2.29E-02	2.94E-04	1.44E-04	2.51E-03	
X10C1351484	OR-IQ3-0480	1.41E-08	2.24E-08	1.15E-07		6.30E-05	3.14E-02	5.35E+00	1.94E-04	3.57E-05	3.28E-01	2.53E-02	2.30E-04	1.51E-04	3.06E-03	

Supporting Documentation

CONTAINERID	NDABDR	SR-90	CS-137	RA-226	U-233	U-234	U-235	U-238	NP-237	PU-238	PU-239	PU-240	PU-241	PU-242	AM-241	AM-243
X10C1351485	OR-IQ3-0480	1.58E-08	2.51E-08	1.78E-07		7.41E-05	3.70E-02	6.62E+00	2.54E-04	4.15E-05	3.79E-01	3.12E-02	3.26E-04	1.85E-04	3.46E-03	
X10C1351490	OR-IQ3-0481	1.64E-08	2.60E-08	2.07E-07				6.16E+00	2.65E-04	4.36E-05	4.21E-01	3.48E-02	3.20E-04	2.14E-04	3.42E-03	
X10C1351493	OR-IQ3-0479	1.68E-08	2.66E-08	1.77E-07				8.48E+00	2.09E-04	1.04E-04	4.38E-01	3.71E-02	3.99E-04	2.19E-04	2.95E-03	
X10C1351494	OR-IQ3-0479	1.70E-08	2.69E-08	1.93E-07					2.23E-04	2.21E-05	4.06E-01	3.14E-02	2.87E-04	1.87E-04	3.88E-03	
X10C1351495	OR-IQ3-0481	8.25E-10	1.31E-09	1.66E-07				9.30E+00	1.91E-04	5.66E-05	4.14E-01	3.57E-02	3.66E-04	2.11E-04	3.43E-03	
X10C1351496	OR-IQ3-0481	1.72E-08	2.73E-08	2.02E-07		5.29E-05	2.64E-02	5.81E+00	2.85E-04	4.35E-05	4.81E-01	4.02E-02	4.36E-04	2.43E-04	4.32E-03	
X10C1451608	OR-IQ3-0468	1.49E-09	2.37E-09	1.65E-07					1.01E-04	2.26E-05	1.64E-01	1.46E-02	1.67E-04	8.91E-05	1.56E-03	
X10C1451611	OR-IQ3-0469	1.71E-09	2.71E-09	1.65E-07				4.33E+00	1.61E-04	2.56E-05	1.38E-01	1.20E-02	1.46E-04	9.31E-05	1.65E-03	
X10C1451612	OR-IQ3-0472	8.51E-10	1.35E-09	1.95E-07				2.90E+00	1.12E-04	3.79E-05	2.04E-01	1.65E-02	1.73E-04	1.04E-04	1.69E-03	
X10C1451615	OR-IQ3-0472	8.68E-10	1.38E-09	1.65E-07				3.13E+00	1.10E-04	2.38E-05	1.76E-01	1.43E-02	1.31E-04	8.49E-05	1.52E-03	
X10C1451616	OR-IQ3-0478	1.61E-08	2.56E-08	1.58E-07					1.71E-04	3.65E-05	2.36E-01	1.95E-02	2.00E-04	1.23E-04	2.18E-03	
X10C1451619	OR-IQ3-0478	1.62E-08	2.58E-08	1.70E-07		4.83E-05	2.41E-02	4.96E+00	8.83E-05	4.19E-05	2.42E-01	3.06E-02	3.17E-04	1.73E-04	1.84E-03	
X10C1451639	OR-IQ3-0469	1.16E-08	1.85E-08	1.73E-07						4.13E-05	1.96E-01	1.66E-02	1.88E-04	9.58E-05	1.71E-03	
X10C1451642	OR-IQ3-0477	5.14E-09	8.16E-09	1.81E-07				3.59E+00		3.77E-05	1.70E-01	1.38E-02	1.22E-04	7.81E-05	1.40E-03	
X10C1451646	OR-IQ3-0477	9.59E-09	1.52E-08	1.68E-07					1.03E-04	2.93E-05	1.79E-01	1.60E-02	1.68E-04	9.04E-05	1.28E-03	
X10C1451647	OR-IQ3-0468	1.61E-09	2.56E-09	1.60E-07					9.54E-05	2.94E-05	2.09E-01	1.89E-02	1.64E-04	1.06E-04	1.50E-03	
		4.75E-07	7.54E-07	7.66E-06		1.40E-03	6.96E-01	2.60E+02	9.39E-03	2.37E-03	1.65E+01	1.35E+00	1.41E-02	8.38E-03	1.48E-01	
Total Mass	278.5386182															
		< 0.01 %	< 0.01 %	< 0.01 %		< 0.01 %	0.25 %	93.29 %	< 0.01 %	< 0.01 %	5.91 %	0.48 %	< 0.01 %	< 0.01 %	0.05 %	

Individual Container Weight %

CONTAINERID	NDABDR	SR-90	CS-137	RA-226	U-233	U-234	U-235	U-238	NP-237	PU-238	PU-239	PU-240	PU-241	PU-242	AM-241	AM-243
X10C1351427	OR-IQ3-0480	0.00 %	0.00 %	0.00 %		0.00 %	0.34 %	95.17 %	0.00 %	0.00 %	4.10 %	0.34 %	0.00 %	0.00 %	0.04 %	
X10C1351429	OR-IQ3-0482	0.00 %	0.00 %	0.00 %				94.97 %	0.00 %	0.00 %	4.63 %	0.35 %	0.00 %	0.00 %	0.04 %	
X10C1351431	OR-IQ3-0482	0.00 %	0.00 %	0.00 %		0.00 %	0.24 %	96.22 %	0.00 %	0.00 %	3.24 %	0.26 %	0.00 %	0.00 %	0.04 %	
X10C1351433	OR-IQ3-0482	0.00 %	0.00 %	0.00 %		0.00 %	0.24 %	93.36 %	0.00 %	0.00 %	5.97 %	0.38 %	0.00 %	0.00 %	0.05 %	
X10C1351434	OR-IQ3-0482	0.00 %	0.00 %	0.00 %		0.00 %	0.56 %	92.83 %	0.00 %	0.00 %	6.07 %	0.47 %	0.00 %	0.00 %	0.05 %	
X10C1351438	OR-IQ3-0482	0.00 %	0.00 %	0.00 %		0.00 %	0.48 %	94.38 %	0.00 %	0.00 %	4.65 %	0.43 %	0.00 %	0.00 %	0.05 %	
X10C1351440	OR-IQ3-0482	0.00 %	0.00 %	0.00 %		0.00 %	0.38 %	93.70 %	0.00 %	0.00 %	5.41 %	0.44 %	0.00 %	0.00 %	0.05 %	
X10C1351446	OR-IQ3-0482	0.00 %	0.00 %	0.00 %		0.00 %	0.55 %	93.31 %	0.00 %	0.00 %	5.66 %	0.41 %	0.00 %	0.00 %	0.05 %	
X10C1351447	OR-IQ3-0479	0.00 %	0.00 %	0.00 %				94.71 %	0.00 %	0.00 %	4.81 %	0.43 %	0.00 %	0.00 %	0.05 %	

Supporting Documentation

CONTAINERID	NDABDR	SR-90	CS-137	RA-226	U-233	U-234	U-235	U-238	NP-237	PU-238	PU-239	PU-240	PU-241	PU-242	AM-241	AM-243
X10C1351450	OR-IQ3-0482	0.00 %	0.00 %	0.00 %				93.99 %	0.00 %	0.00 %	5.53 %	0.43 %	0.01 %	0.00 %	0.04 %	
X10C1351451	OR-IQ3-0481	0.00 %	0.00 %	0.00 %				92.90 %	0.00 %	0.00 %	6.51 %	0.52 %	0.01 %	0.00 %	0.06 %	
X10C1351456	OR-IQ3-0481	0.00 %	0.00 %	0.00 %				94.28 %	0.00 %	0.00 %	5.22 %	0.45 %	0.01 %	0.00 %	0.05 %	
X10C1351457	OR-IQ3-0482	0.00 %	0.00 %	0.00 %		0.00 %	0.30 %	94.84 %	0.00 %	0.00 %	4.42 %	0.38 %	0.00 %	0.00 %	0.04 %	
X10C1351459	OR-IQ3-0482	0.00 %	0.00 %	0.00 %		0.00 %	0.32 %	94.63 %	0.00 %	0.00 %	4.61 %	0.38 %	0.00 %	0.00 %	0.05 %	
X10C1351460	OR-IQ3-0482	0.00 %	0.00 %	0.00 %		0.00 %	0.50 %	93.49 %	0.00 %	0.00 %	5.48 %	0.47 %	0.00 %	0.00 %	0.04 %	
X10C1351461	OR-IQ3-0480	0.00 %	0.00 %	0.00 %		0.00 %	0.37 %	93.65 %	0.00 %	0.00 %	5.45 %	0.47 %	0.00 %	0.00 %	0.05 %	
X10C1351462	OR-IQ3-0479	0.00 %	0.00 %	0.00 %		0.00 %	0.75 %	88.83 %	0.00 %	0.00 %	9.54 %	0.78 %	0.01 %	0.00 %	0.07 %	
X10C1351463	OR-IQ3-0480	0.00 %	0.00 %	0.00 %		0.00 %	0.37 %	94.05 %	0.00 %	0.00 %	5.10 %	0.42 %	0.00 %	0.00 %	0.04 %	
X10C1351464	OR-IQ3-0480	0.00 %	0.00 %	0.00 %		0.00 %	0.51 %	92.80 %	0.00 %	0.00 %	6.13 %	0.48 %	0.01 %	0.00 %	0.06 %	
X10C1351467	OR-IQ3-0480	0.00 %	0.00 %	0.00 %				93.72 %	0.00 %	0.00 %	5.80 %	0.42 %	0.01 %	0.00 %	0.05 %	
X10C1351468	OR-IQ3-0479	0.00 %	0.00 %	0.00 %				94.01 %	0.00 %	0.00 %	5.50 %	0.42 %	0.00 %	0.00 %	0.05 %	
X10C1351469	OR-IQ3-0479	0.00 %	0.00 %	0.00 %				92.71 %	0.01 %	0.00 %	6.62 %	0.58 %	0.01 %	0.00 %	0.07 %	
X10C1351477	OR-IQ3-0481	0.00 %	0.00 %	0.00 %		0.00 %	0.60 %	92.13 %	0.00 %	0.00 %	6.65 %	0.55 %	0.00 %	0.00 %	0.06 %	
X10C1351478	OR-IQ3-0479	0.00 %	0.00 %	0.00 %				92.63 %	0.00 %	0.00 %	6.73 %	0.57 %	0.01 %	0.00 %	0.06 %	
X10C1351480	OR-IQ3-0481	0.00 %	0.00 %	0.00 %				90.44 %	0.00 %	0.00 %	8.75 %	0.72 %	0.01 %	0.00 %	0.07 %	
X10C1351481	OR-IQ3-0480	0.00 %	0.00 %	0.00 %				93.54 %	0.00 %	0.00 %	5.89 %	0.49 %	0.01 %	0.00 %	0.06 %	
X10C1351482	OR-IQ3-0480	0.00 %	0.00 %	0.00 %		0.00 %	0.31 %	94.74 %	0.00 %	0.00 %	4.55 %	0.34 %	0.00 %	0.00 %	0.04 %	
X10C1351483	OR-IQ3-0479	0.00 %	0.00 %	0.00 %		0.00 %	0.58 %	92.50 %	0.00 %	0.00 %	6.31 %	0.54 %	0.01 %	0.00 %	0.06 %	
X10C1351484	OR-IQ3-0480	0.00 %	0.00 %	0.00 %		0.00 %	0.55 %	93.23 %	0.00 %	0.00 %	5.72 %	0.44 %	0.00 %	0.00 %	0.05 %	
X10C1351485	OR-IQ3-0480	0.00 %	0.00 %	0.00 %		0.00 %	0.52 %	93.61 %	0.00 %	0.00 %	5.36 %	0.44 %	0.00 %	0.00 %	0.05 %	
X10C1351490	OR-IQ3-0481	0.00 %	0.00 %	0.00 %				93.05 %	0.00 %	0.00 %	6.36 %	0.53 %	0.00 %	0.00 %	0.05 %	
X10C1351493	OR-IQ3-0479	0.00 %	0.00 %	0.00 %				94.65 %	0.00 %	0.00 %	4.89 %	0.41 %	0.00 %	0.00 %	0.03 %	
X10C1351494	OR-IQ3-0479	0.00 %	0.00 %	0.00 %					0.05 %	0.01 %	91.86 %	7.10 %	0.06 %	0.04 %	0.88 %	
X10C1351495	OR-IQ3-0481	0.00 %	0.00 %	0.00 %				95.35 %	0.00 %	0.00 %	4.24 %	0.37 %	0.00 %	0.00 %	0.04 %	
X10C1351496	OR-IQ3-0481	0.00 %	0.00 %	0.00 %		0.00 %	0.41 %	91.31 %	0.00 %	0.00 %	7.56 %	0.63 %	0.01 %	0.00 %	0.07 %	
X10C1451608	OR-IQ3-0468	0.00 %	0.00 %	0.00 %					0.06 %	0.01 %	90.84 %	8.09 %	0.09 %	0.05 %	0.86 %	
X10C1451611	OR-IQ3-0469	0.00 %	0.00 %	0.00 %				96.61 %	0.00 %	0.00 %	3.08 %	0.27 %	0.00 %	0.00 %	0.04 %	
X10C1451612	OR-IQ3-0472	0.00 %	0.00 %	0.00 %				92.87 %	0.00 %	0.00 %	6.53 %	0.53 %	0.01 %	0.00 %	0.05 %	
X10C1451615	OR-IQ3-0472	0.00 %	0.00 %	0.00 %				94.22 %	0.00 %	0.00 %	5.30 %	0.43 %	0.00 %	0.00 %	0.05 %	
X10C1451616	OR-IQ3-0478	0.00 %	0.00 %	0.00 %					0.07 %	0.01 %	91.40 %	7.55 %	0.08 %	0.05 %	0.84 %	
X10C1451619	OR-IQ3-0478	0.00 %	0.00 %	0.00 %		0.00 %	0.46 %	94.31 %	0.00 %	0.00 %	4.60 %	0.58 %	0.01 %	0.00 %	0.03 %	
X10C1451639	OR-IQ3-0469	0.00 %	0.00 %	0.00 %						0.02 %	91.32 %	7.73 %	0.09 %	0.04 %	0.80 %	

Supporting Documentation

CONTAINERID	NDABDR	SR-90	CS-137	RA-226	U-233	U-234	U-235	U-238	NP-237	PU-238	PU-239	PU-240	PU-241	PU-242	AM-241	AM-243
X10C1451642	OR-IQ3-0477	0.00 %	0.00 %	0.00 %				95.09 %		0.00 %	4.50 %	0.37 %	0.00 %	0.00 %	0.04 %	
X10C1451646	OR-IQ3-0477	0.00 %	0.00 %	0.00 %					0.05 %	0.01 %	91.01 %	8.14 %	0.09 %	0.05 %	0.65 %	
X10C1451647	OR-IQ3-0468	0.00 %	0.00 %	0.00 %					0.04 %	0.01 %	90.95 %	8.22 %	0.07 %	0.05 %	0.65 %	

Supporting Documentation

NDA Isotopic Weight Percent Rollup
OR-NFS-CH-SOIL
Lots 1 Thru 14

		SR-90	CS-137	RA-226	TH-229	U-235	U-233	U-234	U-232	U-238	NP-237	PU-239	PU-242	PU-240	PU-238	PU-241	AM-241	AM-243	CF-249
		5.46E-06	7.54E-06	8.31E-06	7.31E-06	7.69E-01		1.54E-03	1.12E-05	4.81E+02	1.32E+00	4.24E+03	2.25E+00	3.86E+02	7.46E-01	5.44E+00	3.27E+01	2.62E-05	1.71E-07
		5.46E-06	7.54E-06	8.31E-06	7.31E-06	7.69E-01		1.54E-03	1.12E-05	4.81E+02	1.32E+00	4.24E+03	2.25E+00	3.86E+02	7.46E-01	5.44E+00	3.27E+01	2.62E-05	1.71E-07
Total Mass	5.15E+03																		
		< 0.01 %	< 0.01 %	< 0.01 %	< 0.01 %	0.01 %		< 0.01 %	< 0.01 %	9.35 %	0.03 %	82.33 %	0.04 %	7.49 %	0.01 %	0.11 %	0.63 %	< 0.01 %	< 0.01 %

RTR Data
OR-NFS-CH-SOIL
Lot 14

Batch Data Report No.	Container	Cellulosics (kg)	Plastics (kg)	Rubber (kg)	Organic Matrix (kg)	Inorganic Matrix (kg)	Iron-based Metals (kg)	Aluminum-based Metals (kg)	Other Metals (kg)	Other Inorganics (kg)	Soils/Gravel (kg)	Total Organic (kg)	Total Inorganic (kg)	Total Waste Weight (kg)
OR-RTR6-0644	X10C1351427				2						195.9	2	195.9	197.9
OR-RTR6-0646	X10C1351429				2						201.1	2	201.1	203.1
OR-RTR6-0646	X10C1351431		2		2						168.9	4	168.9	172.9
OR-RTR6-0646	X10C1351433		2		3						203.6	5	203.6	208.6
OR-RTR6-0646	X10C1351434				3						192.3	3	192.3	195.3
OR-RTR6-0646	X10C1351438				3						191.8	3	191.8	194.8
OR-RTR6-0646	X10C1351440				3						197.9	3	197.9	200.9
OR-RTR6-0646	X10C1351446				2						200.9	2	200.9	202.9
OR-RTR6-0644	X10C1351447				3						206.4	3	206.4	209.4
OR-RTR6-0646	X10C1351450				2						177.5	2	177.5	179.5
OR-RTR6-0645	X10C1351451				3						218.7	3	218.7	221.7
OR-RTR6-0645	X10C1351456				2						204	2	204	208
OR-RTR6-0646	X10C1351457				3						211.2	3	211.2	214.2
OR-RTR6-0646	X10C1351459				2						195.6	2	195.6	197.6
OR-RTR6-0646	X10C1351460		2		2.5						185.2	4.5	185.2	189.7
OR-RTR6-0644	X10C1351461				3						203.5	3	203.5	206.5
OR-RTR6-0644	X10C1351462				3						202	3	202	205
OR-RTR6-0644	X10C1351463				3						199.1	3	199.1	202.1
OR-RTR6-0644	X10C1351464				2						217.2	2	217.2	219.2
OR-RTR6-0645	X10C1351467				2						181.1	2	181.1	183.1
OR-RTR6-0644	X10C1351468				2						190.8	2	190.8	192.8
OR-RTR6-0644	X10C1351469				3						188.6	3	188.6	191.6
OR-RTR6-0645	X10C1351477				2						202.9	2	202.9	204.9
OR-RTR6-0644	X10C1351478				2						170.9	2	170.9	172.9
OR-RTR6-0645	X10C1351480				2						199.4	2	199.4	201.4
OR-RTR6-0644	X10C1351481				3						168	3	168	171
OR-RTR6-0644	X10C1351482				2						210	2	210	212
OR-RTR6-0644	X10C1351483				3						177.2	3	177.2	180.2
OR-RTR6-0645	X10C1351484				3						154	3	154	157
OR-RTR6-0644	X10C1351485				3						210.6	3	210.6	213.6

Supporting Documentation

RTR Data
OR-NFS-CH-SOIL
Lot 14

OR-RTR6-0645	X10C1351490				2						197.4	2	197.4	199.4
OR-RTR6-0644	X10C1351493				2						178.1	2	178.1	180.1
OR-RTR6-0644	X10C1351494				2						198.4	2	198.4	200.4
OR-RTR6-0645	X10C1351495				3						187.9	3	187.9	190.9
OR-RTR6-0645	X10C1351496				3						196.8	3	196.8	199.8
OR-RTR6-0635	X10C1451608				1.7						183	1.7	183	184.7
OR-RTR6-0636	X10C1451611		0.5		2						167	2.5	167	169.5
OR-RTR6-0640	X10C1451612				2.5						197	2.5	197	199.5
OR-RTR6-0640	X10C1451615				2.9		0.1				189	2.9	189.1	192
OR-RTR6-0643	X10C1451616				2.5						198.2	2.5	198.2	200.7
OR-RTR6-0643	X10C1451619				3						202.7	3	202.7	205.7
OR-RTR6-0636	X10C1451639		0.5		3						193.3	3.5	193.3	198.8
OR-RTR6-0642	X10C1451642				2.3						179	2.3	179	181.3
OR-RTR6-0642	X10C1451646				1.9						177	1.9	177	178.9
OR-RTR6-0635	X10C1451647				2						189	2	189	191

RTR Data
OR-NFS-CH-SOIL
Lot 14

Batch Data Report No.	Container	Cellulosics Weight %	Plastics Weight %	Rubber Weight %	Organic Matrix Weight %	Inorganic Matrix Weight %	Iron-based Metals Weight %	Aluminum-based Metals Weight %	Other Metals Weight %	Other Inorganics Weight %	Soils/gravel Weight %
OR-RTR6-0644	X10C1351427	.00 %	.00 %	.00 %	1.01 %	.00 %	.00 %	.00 %	.00 %	.00 %	98.99 %
OR-RTR6-0646	X10C1351429	.00 %	.00 %	.00 %	.98 %	.00 %	.00 %	.00 %	.00 %	.00 %	99.02 %
OR-RTR6-0646	X10C1351431	.00 %	1.16 %	.00 %	1.16 %	.00 %	.00 %	.00 %	.00 %	.00 %	97.69 %
OR-RTR6-0646	X10C1351433	.00 %	.96 %	.00 %	1.44 %	.00 %	.00 %	.00 %	.00 %	.00 %	97.60 %
OR-RTR6-0646	X10C1351434	.00 %	.00 %	.00 %	1.54 %	.00 %	.00 %	.00 %	.00 %	.00 %	98.46 %
OR-RTR6-0646	X10C1351438	.00 %	.00 %	.00 %	1.54 %	.00 %	.00 %	.00 %	.00 %	.00 %	98.46 %
OR-RTR6-0646	X10C1351440	.00 %	.00 %	.00 %	1.49 %	.00 %	.00 %	.00 %	.00 %	.00 %	98.51 %
OR-RTR6-0646	X10C1351446	.00 %	.00 %	.00 %	.99 %	.00 %	.00 %	.00 %	.00 %	.00 %	99.01 %
OR-RTR6-0644	X10C1351447	.00 %	.00 %	.00 %	1.43 %	.00 %	.00 %	.00 %	.00 %	.00 %	98.57 %
OR-RTR6-0646	X10C1351450	.00 %	.00 %	.00 %	1.11 %	.00 %	.00 %	.00 %	.00 %	.00 %	98.89 %
OR-RTR6-0645	X10C1351451	.00 %	.00 %	.00 %	1.35 %	.00 %	.00 %	.00 %	.00 %	.00 %	98.65 %
OR-RTR6-0645	X10C1351456	.00 %	.00 %	.00 %	.97 %	.00 %	.00 %	.00 %	.00 %	.00 %	99.03 %
OR-RTR6-0646	X10C1351457	.00 %	.00 %	.00 %	1.40 %	.00 %	.00 %	.00 %	.00 %	.00 %	98.60 %
OR-RTR6-0646	X10C1351459	.00 %	.00 %	.00 %	1.01 %	.00 %	.00 %	.00 %	.00 %	.00 %	98.99 %
OR-RTR6-0646	X10C1351460	.00 %	1.05 %	.00 %	1.32 %	.00 %	.00 %	.00 %	.00 %	.00 %	97.63 %
OR-RTR6-0644	X10C1351461	.00 %	.00 %	.00 %	1.45 %	.00 %	.00 %	.00 %	.00 %	.00 %	98.55 %
OR-RTR6-0644	X10C1351462	.00 %	.00 %	.00 %	1.46 %	.00 %	.00 %	.00 %	.00 %	.00 %	98.54 %
OR-RTR6-0644	X10C1351463	.00 %	.00 %	.00 %	1.48 %	.00 %	.00 %	.00 %	.00 %	.00 %	98.52 %
OR-RTR6-0644	X10C1351464	.00 %	.00 %	.00 %	.91 %	.00 %	.00 %	.00 %	.00 %	.00 %	99.09 %
OR-RTR6-0645	X10C1351467	.00 %	.00 %	.00 %	1.09 %	.00 %	.00 %	.00 %	.00 %	.00 %	98.91 %
OR-RTR6-0644	X10C1351468	.00 %	.00 %	.00 %	1.04 %	.00 %	.00 %	.00 %	.00 %	.00 %	98.96 %
OR-RTR6-0644	X10C1351469	.00 %	.00 %	.00 %	1.57 %	.00 %	.00 %	.00 %	.00 %	.00 %	98.43 %
OR-RTR6-0645	X10C1351477	.00 %	.00 %	.00 %	.98 %	.00 %	.00 %	.00 %	.00 %	.00 %	99.02 %
OR-RTR6-0644	X10C1351478	.00 %	.00 %	.00 %	1.16 %	.00 %	.00 %	.00 %	.00 %	.00 %	98.84 %
OR-RTR6-0645	X10C1351480	.00 %	.00 %	.00 %	.99 %	.00 %	.00 %	.00 %	.00 %	.00 %	99.01 %
OR-RTR6-0644	X10C1351481	.00 %	.00 %	.00 %	1.75 %	.00 %	.00 %	.00 %	.00 %	.00 %	98.25 %

Supporting Documentation

RTR Data
OR-NFS-CH-SOIL
Lot 14

OR-RTR6-0644	X10C1351482	.00 %	.00 %	.00 %	.94 %	.00 %	.00 %	.00 %	.00 %	.00 %	99.06 %
OR-RTR6-0644	X10C1351483	.00 %	.00 %	.00 %	1.66 %	.00 %	.00 %	.00 %	.00 %	.00 %	98.34 %
OR-RTR6-0645	X10C1351484	.00 %	.00 %	.00 %	1.91 %	.00 %	.00 %	.00 %	.00 %	.00 %	98.09 %
OR-RTR6-0644	X10C1351485	.00 %	.00 %	.00 %	1.40 %	.00 %	.00 %	.00 %	.00 %	.00 %	98.60 %
OR-RTR6-0645	X10C1351490	.00 %	.00 %	.00 %	1.00 %	.00 %	.00 %	.00 %	.00 %	.00 %	99.00 %
OR-RTR6-0644	X10C1351493	.00 %	.00 %	.00 %	1.11 %	.00 %	.00 %	.00 %	.00 %	.00 %	98.89 %
OR-RTR6-0644	X10C1351494	.00 %	.00 %	.00 %	1.00 %	.00 %	.00 %	.00 %	.00 %	.00 %	99.00 %
OR-RTR6-0645	X10C1351495	.00 %	.00 %	.00 %	1.57 %	.00 %	.00 %	.00 %	.00 %	.00 %	98.43 %
OR-RTR6-0645	X10C1351496	.00 %	.00 %	.00 %	1.50 %	.00 %	.00 %	.00 %	.00 %	.00 %	98.50 %
OR-RTR6-0635	X10C1451608	.00 %	.00 %	.00 %	.92 %	.00 %	.00 %	.00 %	.00 %	.00 %	99.08 %
OR-RTR6-0636	X10C1451611	.00 %	.29 %	.00 %	1.18 %	.00 %	.00 %	.00 %	.00 %	.00 %	98.53 %
OR-RTR6-0640	X10C1451612	.00 %	.00 %	.00 %	1.25 %	.00 %	.00 %	.00 %	.00 %	.00 %	98.75 %
OR-RTR6-0640	X10C1451615	.00 %	.00 %	.00 %	1.51 %	.00 %	.05 %	.00 %	.00 %	.00 %	98.44 %
OR-RTR6-0643	X10C1451616	.00 %	.00 %	.00 %	1.25 %	.00 %	.00 %	.00 %	.00 %	.00 %	98.75 %
OR-RTR6-0643	X10C1451619	.00 %	.00 %	.00 %	1.46 %	.00 %	.00 %	.00 %	.00 %	.00 %	98.54 %
OR-RTR6-0636	X10C1451639	.00 %	.25 %	.00 %	1.52 %	.00 %	.00 %	.00 %	.00 %	.00 %	98.22 %
OR-RTR6-0642	X10C1451642	.00 %	.00 %	.00 %	1.27 %	.00 %	.00 %	.00 %	.00 %	.00 %	98.73 %
OR-RTR6-0642	X10C1451646	.00 %	.00 %	.00 %	1.06 %	.00 %	.00 %	.00 %	.00 %	.00 %	98.94 %
OR-RTR6-0635	X10C1451647	.00 %	.00 %	.00 %	1.05 %	.00 %	.00 %	.00 %	.00 %	.00 %	98.95 %

Lot	14	Waste Stream Waste Material Parameter Weight Percent Lot Total							
Cellulosics	Plastics	Rubber	Organic Matrix	Inorganic Matrix	Iron-based Metals	Aluminum-based Metals	Other Metals	Other Inorganics	Soils/gravel
.00 %	.08 %	.00 %	1.27 %	.00 %	.00 %	.00 %	.00 %	.00 %	98.65 %

Supporting Documentation

NDE Density Rollup Data Through Lot: 14
OR-NFS-CH-SOIL

Waste Stream Waste Material Parameter Weight Percent

Cellulosics	Plastics	Rubber	Organic Matrix	Inorganic Matrix	Iron-based Metals	Aluminum-based Metals	Other Metals	Other Inorganics	Soils/Gravel
0.00 %	0.38 %	0.00 %	0.10 %	0.00 %	0.01 %	0.00 %	0.07 %	0.03 %	99.40 %

Supporting Documentation

DIVIDER PAGE

NWP
Nuclear Waste Partnership LLC
An AECOM-led partnership with B&W and AREVA

CP:15:01269
UFC:5900.00

INTER-OFFICE CORRESPONDENCE

DATE: December 3, 2015

FROM: B. S. Schrock BSSchrock LOCATION: Certification

TO: CCP Records Custodian GSA-212 LOCATION: Central Characterization Program

SUBJECT: TRANSMITTAL OF OAK RIDGE NATIONAL LABORATORY CHARACTERIZATION INFORMATION SUMMARY FOR WASTE STREAM #OR-NFS-CH-SOIL (CCP-AK-ORNL-001), LOT 13, LOT 14, LOT 15, LOT 16 AND LOT 17

Please accept the attached Oak Ridge National Laboratory Characterization Information Summaries to be placed in Records for Waste Stream #OR-NFS-CH- SOIL (CCP-AK-ORNL-001), Lot 13, Lot 14, Lot 15, Lot 16 and Lot 17.

BSS:lcg

Attachment

cc: (without attachment)
M. F. Ramirez ED
A. O. Stallings ED
D. Wade ED

CCP RECORDS ORIGINAL
DATE REC'D 12.08.2015 JM

P.O. Box 2078 • Carlsbad, New Mexico USA 88221-2078
Phone: (575) 234-7200 • Fax: (575) 234-7083

CHARACTERIZATION INFORMATION SUMMARY

WSPF# OR-NFS-CH-SOIL Rev. 0 (CCP-AK-ORNL-001)

Lot 13

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Correlation of Container Identification Numbers to Batch Data Report Numbers..... 5

RTR/VE Summary of Prohibited Items and AK Confirmation..... 6

Reconciliation with Data Quality Objectives..... 7

CCP Characterization Information Summary Cover Page

Waste Stream # OR-NFS-CH-SOIL Lot #: 13

AK Expert Review: N/A Date: N/A

SPM Review: Roger Whiteaker Roger Whiteaker Date: 04/07/2015

SPM signature certifies that through Acceptable Knowledge testing and/or analysis that the waste identified in this summary is not corrosive, ignitable, reactive, or incompatible with the TSDF.

A summary of the Acceptable Knowledge regarding this waste stream containing specific information about the corrosivity, reactivity, and ignitability of the waste stream is included as an attachment to the Waste Stream Profile Form. By reference, that information is included in this lot.

List of procedures used:

Non Destructive Assay (NDA):

CCP-TP-048	Rev. 16	11/01/2013 Mobile IQ3 System Data Reviewing, Validating, and Reporting Procedure
CCP-TP-048	Rev. 15	03/24/2011 Mobile IQ3 System Data Reviewing, Validating, and Reporting Procedure
CCP-TP-048	Rev. 14	03/08/2010 Mobile IQ3 System Data Reviewing, Validating, and Reporting Procedure
CCP-TP-048	Rev. 13	10/12/2009 Mobile IQ3 System Data Reviewing, Validating, and Reporting Procedure
CCP-TP-048	Rev. 12	09/09/2009 Mobile IQ3 System Data Reviewing, Validating, and Reporting Procedure
CCP-TP-048	Rev. 11	02/19/2008 Mobile IQ3 System Data Reviewing, Validating, and Reporting Procedure
CCP-TP-048	Rev. 10	11/16/2006 Mobile IQ3 System Data Reviewing, Validating, and Reporting Procedure
CCP-TP-048	Rev. 9	11/03/2005 Mobile IQ3 System Data Reviewing, Validating, and Reporting Procedure
CCP-TP-048	Rev. 8	09/21/2005 Mobile IQ3 System Data Reviewing, Validating, and Reporting Procedure
CCP-TP-048	Rev. 7	03/14/2005 Mobile IQ3 System Data Reviewing, Validating, and Reporting Procedure
CCP-TP-048	Rev. 6	10/18/2004 Mobile IQ3 System Data Reviewing, Validating, and Reporting Procedure
CCP-TP-048	Rev. 5	06/08/2004 Mobile IQ3 System Data Reviewing, Validating, and Reporting Procedure
CCP-TP-048	Rev. 4	12/04/2003 Mobile IQ3 System Data Reviewing, Validating, and Reporting Procedure
CCP-TP-048	Rev. 3	09/03/2003 Mobile IQ3 System Data Reviewing, Validating, and Reporting Procedure
CCP-TP-048	Rev. 2	04/25/2003 Mobile IQ3 System Data Reviewing, Validating, and Reporting Procedure
CCP-TP-048	Rev. 1	03/21/2003 Mobile IQ3 System Data Reviewing, Validating, and Reporting Procedure
CCP-TP-048	Rev. 0	02/05/2003 Mobile IQ3 System Data Reviewing, Validating, and Reporting Procedure

Project Level Data Validation / DQO Reconciliation:

CCP-TP-001	Rev. 21	06/06/2013 CCP Project Level Data Validation and Verification
CCP-TP-001	Rev. 20	09/27/2012 CCP Project Level Data Validation and Verification
CCP-TP-001	Rev. 19	12/29/2010 CCP Project Level Data Validation and Verification
CCP-TP-001	Rev. 18	08/09/2010 CCP Project Level Data Validation and Verification
CCP-TP-001	Rev. 17	09/24/2007 CCP Project Level Data Validation and Verification
CCP-TP-001	Rev. 16	04/26/2007 CCP Project Level Data Validation and Verification
CCP-TP-001	Rev. 15	11/22/2006 CCP Project Level Data Validation and Verification
CCP-TP-001	Rev. 14	11/16/2006 CCP Project Level Data Validation and Verification
CCP-TP-001	Rev. 13	07/21/2006 CCP Project Level Data Validation and Verification
CCP-TP-001	Rev. 12	05/25/2006 CCP Project Level Data Validation and Verification
CCP-TP-001	Rev. 11	03/23/2005 CCP Project Level Data Validation and Verification

CCP-TP-002	Rev. 26	06/19/2013 CCP Reconciliation of DQOs and Reporting Characterization Data
CCP-TP-002	Rev. 25	02/11/2013 CCP Reconciliation of DQOs and Reporting Characterization Data
CCP-TP-002	Rev. 24	12/28/2011 CCP Reconciliation of DQOs and Reporting Characterization Data
CCP-TP-002	Rev. 23	12/29/2010 CCP Reconciliation of DQOs and Reporting Characterization Data
CCP-TP-002	Rev. 22	06/30/2010 CCP Reconciliation of DQOs and Reporting Characterization Data
CCP-TP-002	Rev. 21	08/04/2009 CCP Reconciliation of DQOs and Reporting Characterization Data
CCP-TP-002	Rev. 20	08/18/2008 CCP Reconciliation of DQOs and Reporting Characterization Data
CCP-TP-002	Rev. 19	12/22/2006 CCP Reconciliation of DQOs and Reporting Characterization Data
CCP-TP-002	Rev. 18	11/16/2006 CCP Reconciliation of DQOs and Reporting Characterization Data
CCP-TP-002	Rev. 17	10/10/2006 CCP Reconciliation of DQOs and Reporting Characterization Data
CCP-TP-002	Rev. 16	06/06/2006 CCP Reconciliation of DQOs and Reporting Characterization Data
CCP-TP-002	Rev. 15	08/16/2005 CCP Reconciliation of DQOs and Reporting Characterization Data
CCP-TP-002	Rev. 14	03/29/2005 CCP Reconciliation of DQOs and Reporting Characterization Data

CCP-TP-005	Rev. 26	08/12/2013 CCP Acceptable Knowledge Documentation
CCP-TP-005	Rev. 25	06/19/2013 CCP Acceptable Knowledge Documentation
CCP-TP-005	Rev. 24	11/28/2011 CCP Acceptable Knowledge Documentation
CCP-TP-005	Rev. 23	06/30/2011 CCP Acceptable Knowledge Documentation
CCP-TP-005	Rev. 22	04/21/2011 CCP Acceptable Knowledge Documentation
CCP-TP-005	Rev. 21	12/29/2010 CCP Acceptable Knowledge Documentation
CCP-TP-005	Rev. 20	11/01/2010 CCP Acceptable Knowledge Documentation
CCP-TP-005	Rev. 19	07/06/2010 CCP Acceptable Knowledge Documentation
CCP-TP-005	Rev. 18	11/16/2006 CCP Acceptable Knowledge Documentation

CCP-TP-005	Rev. 17	08/05/2008 CCP Acceptable Knowledge Documentation
CCP-TP-005	Rev. 16	02/27/2008 CCP Acceptable Knowledge Documentation
CCP-TP-005	Rev. 15	03/31/2005 CCP Acceptable Knowledge Documentation

CCP-TP-030	Rev. 34	02/02/2015 CCP CH TRU Waste Certification and WWIS/WDS Data Entry
CCP-TP-030	Rev. 33	11/19/2013 CCP CH TRU Waste Certification and WWIS/WDS Data Entry
CCP-TP-030	Rev. 32	08/20/2013 CCP CH TRU Waste Certification and WWIS/WDS Data Entry
CCP-TP-030	Rev. 31	11/19/2012 CCP CH TRU Waste Certification and WWIS/WDS Data Entry
CCP-TP-030	Rev. 30	05/21/2012 CCP CH TRU Waste Certification and WWIS/WDS Data Entry
CCP-TP-030	Rev. 29	04/28/2011 CCP CH TRU Waste Certification and WWIS/WDS Data Entry
CCP-TP-030	Rev. 28	05/12/2010 CCP CH TRU Waste Certification and WWIS/WDS Data Entry
CCP-TP-030	Rev. 27	12/14/2009 CCP CH TRU Waste Certification and WWIS Data Entry
CCP-TP-030	Rev. 26	05/27/2009 CCP CH TRU Waste Certification and WWIS Data Entry
CCP-TP-030	Rev. 25	01/22/2009 CCP CH TRU Waste Certification and WWIS Data Entry
CCP-TP-030	Rev. 24	08/20/2008 CCP CH TRU Waste Certification and WWIS Data Entry
CCP-TP-030	Rev. 23	03/12/2008 CCP CH TRU Waste Certification and WWIS Data Entry
CCP-TP-030	Rev. 22	07/24/2007 CCP CH TRU Waste Certification and WWIS Data Entry
CCP-TP-030	Rev. 21	05/21/2007 CCP CH TRU Waste Certification and WWIS Data Entry
CCP-TP-030	Rev. 20	02/07/2007 CCP CH TRU Waste Certification and WWIS Data Entry
CCP-TP-030	Rev. 19	11/16/2006 CCP CH TRU Waste Certification and WWIS Data Entry
CCP-TP-030	Rev. 18	05/01/2006 CCP TRU Waste Certification and WWIS Data Entry
CCP-TP-030	Rev. 17	12/29/2005 CCP TRU Waste Certification and WWIS Data Entry
CCP-TP-030	Rev. 16	04/22/2005 CCP TRU Waste Certification and WWIS Data Entry

Radiography (RTR/NDE):

CCP-TP-053	Rev. 15	09/11/2014 CCP Standard Real-Time Radiography (RTR) Inspection Procedure
CCP-TP-053	Rev. 14	09/25/2013 CCP Standard Real-Time Radiography (RTR) Inspection Procedure
CCP-TP-053	Rev. 13	05/14/2013 CCP Standard Real-Time Radiography (RTR) Inspection Procedure
CCP-TP-053	Rev. 12	08/22/2012 CCP Standard Real-Time Radiography (RTR) Inspection Procedure
CCP-TP-053	Rev. 11	07/20/2011 CCP Standard Real-Time Radiography (RTR) Inspection Procedure
CCP-TP-053	Rev. 10	03/04/2011 CCP Standard Real-Time Radiography (RTR) Inspection Procedure
CCP-TP-053	Rev. 9	09/30/2010 CCP Standard Real-Time Radiography (RTR) Inspection Procedure
CCP-TP-053	Rev. 8	06/30/2010 CCP Standard Real-Time Radiography (RTR) Inspection Procedure
CCP-TP-053	Rev. 7	10/21/2009 CCP Standard Real-Time Radiography (RTR) Inspection Procedure
CCP-TP-053	Rev. 6	03/04/2008 CCP Standard Real-Time Radiography (RTR) Inspection Procedure
CCP-TP-053	Rev. 5	11/16/2006 CCP Standard Real-Time Radiography (RTR) Inspection Procedure
CCP-TP-053	Rev. 4	12/22/2005 CCP Standard Real-Time Radiography (RTR) Inspection Procedure
CCP-TP-053	Rev. 3	03/21/2005 CCP Standard Real-Time Radiography (RTR) Inspection Procedure
CCP-TP-053	Rev. 2	07/14/2004 CCP Standard Real-Time Radiography (RTR) Inspection Procedure

WAP Certification:

CCP-PO-001	Rev. 21	05/31/2013 CCP Transuranic Waste Characterization Quality Assurance Project Plan
CCP-PO-001	Rev. 20	08/16/2011 CCP Transuranic Waste Characterization Quality Assurance Project Plan
CCP-PO-001	Rev. 19	12/29/2010 CCP Transuranic Waste Characterization Quality Assurance Project Plan
CCP-PO-001	Rev. 18	06/30/2010 CCP Transuranic Waste Characterization Quality Assurance Project Plan
CCP-PO-001	Rev. 17	06/23/2009 CCP Transuranic Waste Characterization Quality Assurance Project Plan
CCP-PO-001	Rev. 16	10/31/2007 CCP Transuranic Waste Characterization Quality Assurance Project Plan
CCP-PO-001	Rev. 15	08/10/2007 CCP Transuranic Waste Characterization Quality Assurance Project Plan
CCP-PO-001	Rev. 14	03/28/2007 CCP Transuranic Waste Characterization Quality Assurance Project Plan
CCP-PO-001	Rev. 13	11/16/2006 CCP Transuranic Waste Characterization Quality Assurance Project Plan
CCP-PO-001	Rev. 12	03/22/2006 CCP Transuranic Waste Characterization Quality Assurance Project Plan
CCP-PO-001	Rev. 11	03/10/2005 CCP Transuranic Waste Characterization Quality Assurance Project Plan

CCP-PO-002	Rev. 27	05/31/2013 CCP Transuranic Waste Certification Plan
CCP-PO-002	Rev. 26	07/14/2011 CCP Transuranic Waste Certification Plan
CCP-PO-002	Rev. 25	12/29/2010 CCP Transuranic Waste Certification Plan
CCP-PO-002	Rev. 24	06/30/2010 CCP Transuranic Waste Certification Plan
CCP-PO-002	Rev. 23	04/07/2010 CCP Transuranic Waste Certification Plan
CCP-PO-002	Rev. 22	01/12/2010 CCP Transuranic Waste Certification Plan
CCP-PO-002	Rev. 21	01/26/2009 CCP Transuranic Waste Certification Plan
CCP-PO-002	Rev. 20	11/02/2007 CCP Transuranic Waste Certification Plan
CCP-PO-002	Rev. 19	05/22/2007 CCP Transuranic Waste Certification Plan
CCP-PO-002	Rev. 18	11/16/2006 CCP Transuranic Waste Certification Plan
CCP-PO-002	Rev. 17	11/16/2006 CCP Transuranic Waste Certification Plan
CCP-PO-002	Rev. 16	11/16/2006 CCP Transuranic Waste Certification Plan
CCP-PO-002	Rev. 15	03/22/2006 CCP Transuranic Waste Certification Plan
CCP-PO-002	Rev. 14	12/28/2005 CCP Transuranic Waste Certification Plan
CCP-PO-002	Rev. 13	05/09/2005 CCP Transuranic Waste Certification Plan

CCP-PO-003	Rev. 13	07/31/2013 Transuranic Authorized Methods for Payload Control (CCP CH-TRAMPC)
CCP-PO-003	Rev. 12	12/29/2010 Transuranic Authorized Methods for Payload Control (CCP CH-TRAMPC)
CCP-PO-003	Rev. 11	06/04/2009 Transuranic Authorized Methods for Payload Control (CCP CH-TRAMPC)
CCP-PO-003	Rev. 10	11/16/2008 Transuranic Authorized Methods for Payload Control (CCP CH-TRAMPC)
CCP-PO-003	Rev. 9	12/29/2005 Transuranic Authorized Methods for Payload Control (CCP CH-TRAMPC)
CCP-PO-003	Rev. 8	01/25/2005 Transuranic Authorized Methods for Payload Control (CCP CH-TRAMPC)
CCP-PO-003	Rev. 7	11/22/2004 Transuranic Authorized Methods for Payload Control (CCP CH-TRAMPC)
CCP-PO-003	Rev. 6	06/08/2004 Transuranic Authorized Methods for Payload Control (CCP CH-TRAMPC)
CCP-PO-003	Rev. 5	09/19/2003 Transuranic Authorized Methods for Payload Control (CCP CH-TRAMPC)
CCP-PO-003	Rev. 4	02/11/2003 Transuranic Authorized Methods for Payload Control (CCP CH-TRAMPC)
CCP-PO-003	Rev. 3	05/31/2002 Transuranic Authorized Methods for Payload Control (CCP CH-TRAMPC)

CCP Correlation of Container Identification Numbers to Batch Data Report Numbers

Waste Stream: # OR-NFS-CH-SOIL Lot # 13

Container ID Number	Historical Container ID	NDA BDR	RTR BDR	VE BDR	Load/Manage Overpack Yes	Transportation Headspace Gas	
						FGA	GGT
X10C1351504	N/A	OR-IQ3-0451	OR-RTR6-0623	N/A	No	OR15FG8017	N/A
X10C1351505	N/A	OR-IQ3-0450	OR-RTR6-0623	N/A	No	OR15FG8017	N/A
X10C1351507	N/A	OR-IQ3-0451	OR-RTR6-0623	N/A	No	OR15FG8017	N/A
X10C1351508	N/A	OR-IQ3-0451	OR-RTR6-0623	N/A	No	OR15FG8017	N/A
X10C1351509	N/A	OR-IQ3-0450	OR-RTR6-0623	N/A	No	OR15FG8017	N/A

Roger Whiteaker — Signature of Site Project Manager
Roger Whiteaker — Printed Name
04/07/2015 — Date

CCP RTR/VE Summary of Prohibited Items and AK Confirmation

Waste Stream Number: OR-NFS-CH-SOIL Lot #: 13

Container Number	RTR Prohibited Items [a,b]	Visual Examination Prohibited Items [a,b]	Does the Physical Form of the Waste Match the Waste Stream Description as Determined by AK
See correlation of container ID numbers for list of remaining drum numbers in this Lot.	None of the containers in this lot had prohibited items identified during RTR.	VE was not used to certify any containers in this Lot.	The physical form of the waste matches the waste stream description as determined by AK.
a. See Batch Data Reports			
b. If AK has assigned U134 to this waste stream, then any liquids in these containers are prohibited items (not acceptable by the TSDF).			
Justification for the selection of RTR and/or VE: RTR was selected as the characterization method for this lot because the waste was previously packaged and RTR meets all the Data Quality Objectives for NDE for the waste.			

Site Project Manager Signature | Roger Whiteaker Printed Name | 04/07/2015 Date

CCP Reconciliation with Data Quality Objectives

WSPF# OR-NFS-CH-SOIL Rev. 0 Lot # 13

Sampling Completeness

RTR/VE:

Number of Valid Samples: 5 Number of Total Samples Analyzed: 5

Percent Complete: 100 (QAO is 100%)

Radiological:

Number of Valid Samples: 5 Number of Total Samples Analyzed: 5

Percent Complete: 100 (QAO is 100%)

	Y/N/NA	Reconciliation Parameter
1	Y	Waste Matrix Code.
2	Y	Waste Material Parameter Weights.
3	Y	The TRU activity reported in the BDRs for each container demonstrates with a 95% probability that the container of waste contains TRU radioactive waste.
4	N	AK Sufficiency. Is there an approved AK sufficiency Determination for this waste stream?
5	Y	The data demonstrates whether the waste stream exhibits a toxicity characteristic under Title 40 Code of Federal Regulations (CFR), Part 261, Identification and Listing of Hazardous Waste, Subpart C, Characteristics of Hazardous Waste.
6	Y	Does the waste stream contain listed waste found in 20.4.1.200 NMAC incorporating 40 CFR Part 261, Subpart D, Lists of Hazardous Wastes.
7	Y	Waste stream can be classified as hazardous or nonhazardous.
8	Y	The overall completeness, comparability, and representativeness QAOs were met for each of the analytical and testing procedures as specified in the WAP Sections C3-1 through C3-2 prior to submittal of a waste stream profile form for a waste steam or waste stream lot.

	Completeness	Comparability	Representativeness
Radiography	Y	Y	Y
VE	NA	NA	NA

Comments: None

Roger Whiteaker 04/07/2015

Signature of Site Project Manager Printed Name Date

CHARACTERIZATION INFORMATION SUMMARY

WSPF# OR-NFS-CH-SOIL Rev. 0 (CCP-AK-ORNL-001)

Lot 14

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CCP Characterization Information Summary Cover Page

Waste Stream # OR-NFS-CH-SOIL Lot #: 14

AK Expert Review: N/A Date: N/A

SPM Review: Rick Whiteley Date: 06/01/2015

SPM signature certifies that through Acceptable Knowledge testing and/or analysis that the waste identified in this summary is not corrosive, ignitable, reactive, or incompatible with the TSDF.

A summary of the Acceptable Knowledge regarding this waste stream containing specific information about the corrosivity, reactivity, and ignitability of the waste stream is included as an attachment to the Waste Stream Profile Form. By reference, that information is included in this lot.

List of procedures used:

Non Destructive Assay (NDA):

CCP-TP-048	Rev. 16	11/01/2013 Mobile IQ3 System Data Reviewing, Validating, and Reporting Procedure
CCP-TP-048	Rev. 15	03/24/2011 Mobile IQ3 System Data Reviewing, Validating, and Reporting Procedure
CCP-TP-048	Rev. 14	03/08/2010 Mobile IQ3 System Data Reviewing, Validating, and Reporting Procedure
CCP-TP-048	Rev. 13	10/12/2009 Mobile IQ3 System Data Reviewing, Validating, and Reporting Procedure
CCP-TP-048	Rev. 12	09/08/2009 Mobile IQ3 System Data Reviewing, Validating, and Reporting Procedure
CCP-TP-048	Rev. 11	02/18/2008 Mobile IQ3 System Data Reviewing, Validating, and Reporting Procedure
CCP-TP-048	Rev. 10	11/18/2008 Mobile IQ3 System Data Reviewing, Validating, and Reporting Procedure
CCP-TP-048	Rev. 9	11/03/2005 Mobile IQ3 System Data Reviewing, Validating, and Reporting Procedure
CCP-TP-048	Rev. 8	09/21/2005 Mobile IQ3 System Data Reviewing, Validating, and Reporting Procedure
CCP-TP-048	Rev. 7	03/14/2005 Mobile IQ3 System Data Reviewing, Validating, and Reporting Procedure
CCP-TP-048	Rev. 6	10/18/2004 Mobile IQ3 System Data Reviewing, Validating, and Reporting Procedure
CCP-TP-048	Rev. 5	06/08/2004 Mobile IQ3 System Data Reviewing, Validating, and Reporting Procedure
CCP-TP-048	Rev. 4	12/04/2003 Mobile IQ3 System Data Reviewing, Validating, and Reporting Procedure
CCP-TP-048	Rev. 3	09/03/2003 Mobile IQ3 System Data Reviewing, Validating, and Reporting Procedure
CCP-TP-048	Rev. 2	04/25/2003 Mobile IQ3 System Data Reviewing, Validating, and Reporting Procedure
CCP-TP-048	Rev. 1	03/21/2003 Mobile IQ3 System Data Reviewing, Validating, and Reporting Procedure
CCP-TP-048	Rev. 0	02/05/2003 Mobile IQ3 System Data Reviewing, Validating, and Reporting Procedure

Project Level Data Validation / DQO Reconciliation:

CCP-TP-001	Rev. 21	06/06/2013 CCP Project Level Data Validation and Verification
CCP-TP-001	Rev. 20	09/27/2012 CCP Project Level Data Validation and Verification
CCP-TP-001	Rev. 19	12/29/2010 CCP Project Level Data Validation and Verification
CCP-TP-001	Rev. 18	08/09/2010 CCP Project Level Data Validation and Verification
CCP-TP-001	Rev. 17	09/24/2007 CCP Project Level Data Validation and Verification
CCP-TP-001	Rev. 16	04/26/2007 CCP Project Level Data Validation and Verification
CCP-TP-001	Rev. 15	11/22/2006 CCP Project Level Data Validation and Verification
CCP-TP-001	Rev. 14	11/16/2006 CCP Project Level Data Validation and Verification
CCP-TP-001	Rev. 13	07/21/2006 CCP Project Level Data Validation and Verification
CCP-TP-001	Rev. 12	05/25/2006 CCP Project Level Data Validation and Verification
CCP-TP-001	Rev. 11	03/23/2005 CCP Project Level Data Validation and Verification

CCP-TP-002	Rev. 26	06/19/2013 CCP Reconciliation of DQOs and Reporting Characterization Data
CCP-TP-002	Rev. 25	02/11/2013 CCP Reconciliation of DQOs and Reporting Characterization Data
CCP-TP-002	Rev. 24	12/28/2011 CCP Reconciliation of DQOs and Reporting Characterization Data
CCP-TP-002	Rev. 23	12/29/2010 CCP Reconciliation of DQOs and Reporting Characterization Data
CCP-TP-002	Rev. 22	08/30/2010 CCP Reconciliation of DQOs and Reporting Characterization Data
CCP-TP-002	Rev. 21	08/04/2009 CCP Reconciliation of DQOs and Reporting Characterization Data
CCP-TP-002	Rev. 20	08/18/2008 CCP Reconciliation of DQOs and Reporting Characterization Data
CCP-TP-002	Rev. 19	12/22/2006 CCP Reconciliation of DQOs and Reporting Characterization Data
CCP-TP-002	Rev. 18	11/16/2006 CCP Reconciliation of DQOs and Reporting Characterization Data
CCP-TP-002	Rev. 17	10/10/2006 CCP Reconciliation of DQOs and Reporting Characterization Data
CCP-TP-002	Rev. 16	06/06/2006 CCP Reconciliation of DQOs and Reporting Characterization Data
CCP-TP-002	Rev. 15	08/16/2005 CCP Reconciliation of DQOs and Reporting Characterization Data
CCP-TP-002	Rev. 14	03/29/2005 CCP Reconciliation of DQOs and Reporting Characterization Data

CCP-TP-005	Rev. 26	08/12/2013 CCP Acceptable Knowledge Documentation
CCP-TP-005	Rev. 25	06/19/2013 CCP Acceptable Knowledge Documentation
CCP-TP-005	Rev. 24	11/28/2011 CCP Acceptable Knowledge Documentation
CCP-TP-005	Rev. 23	06/30/2011 CCP Acceptable Knowledge Documentation
CCP-TP-005	Rev. 22	04/21/2011 CCP Acceptable Knowledge Documentation
CCP-TP-005	Rev. 21	12/29/2010 CCP Acceptable Knowledge Documentation
CCP-TP-005	Rev. 20	11/01/2010 CCP Acceptable Knowledge Documentation
CCP-TP-005	Rev. 19	07/06/2010 CCP Acceptable Knowledge Documentation
CCP-TP-005	Rev. 18	11/16/2006 CCP Acceptable Knowledge Documentation
CCP-TP-005	Rev. 17	06/05/2006 CCP Acceptable Knowledge Documentation

CCP-TP-005	Rev. 16	02/27/2006 CCP Acceptable Knowledge Documentation
CCP-TP-005	Rev. 15	03/31/2005 CCP Acceptable Knowledge Documentation

CCP-TP-030	Rev. 34	02/02/2015 CCP CH TRU Waste Certification and WWIS/WDS Data Entry
CCP-TP-030	Rev. 33	11/18/2013 CCP CH TRU Waste Certification and WWIS/WDS Data Entry
CCP-TP-030	Rev. 32	06/20/2013 CCP CH TRU Waste Certification and WWIS/WDS Data Entry
CCP-TP-030	Rev. 31	11/18/2012 CCP CH TRU Waste Certification and WWIS/WDS Data Entry
CCP-TP-030	Rev. 30	05/21/2012 CCP CH TRU Waste Certification and WWIS/WDS Data Entry
CCP-TP-030	Rev. 29	04/28/2011 CCP CH TRU Waste Certification and WWIS/WDS Data Entry
CCP-TP-030	Rev. 28	05/12/2010 CCP CH TRU Waste Certification and WWIS/WDS Data Entry
CCP-TP-030	Rev. 27	12/14/2009 CCP CH TRU Waste Certification and WWIS Data Entry
CCP-TP-030	Rev. 26	05/27/2009 CCP CH TRU Waste Certification and WWIS Data Entry
CCP-TP-030	Rev. 25	01/22/2009 CCP CH TRU Waste Certification and WWIS Data Entry
CCP-TP-030	Rev. 24	08/20/2008 CCP CH TRU Waste Certification and WWIS Data Entry
CCP-TP-030	Rev. 23	03/12/2008 CCP CH TRU Waste Certification and WWIS Data Entry
CCP-TP-030	Rev. 22	07/24/2007 CCP CH TRU Waste Certification and WWIS Data Entry
CCP-TP-030	Rev. 21	05/21/2007 CCP CH TRU Waste Certification and WWIS Data Entry
CCP-TP-030	Rev. 20	02/07/2007 CCP CH TRU Waste Certification and WWIS Data Entry
CCP-TP-030	Rev. 19	11/16/2006 CCP CH TRU Waste Certification and WWIS Data Entry
CCP-TP-030	Rev. 18	05/01/2006 CCP TRU Waste Certification and WWIS Data Entry
CCP-TP-030	Rev. 17	12/29/2005 CCP TRU Waste Certification and WWIS Data Entry
CCP-TP-030	Rev. 16	04/22/2005 CCP TRU Waste Certification and WWIS Data Entry

Radiography (RTR/NDE):

CCP-TP-053	Rev. 15	09/11/2014 CCP Standard Real-Time Radiography (RTR) Inspection Procedure
CCP-TP-053	Rev. 14	09/25/2013 CCP Standard Real-Time Radiography (RTR) Inspection Procedure
CCP-TP-053	Rev. 13	05/14/2013 CCP Standard Real-Time Radiography (RTR) Inspection Procedure
CCP-TP-053	Rev. 12	08/22/2012 CCP Standard Real-Time Radiography (RTR) Inspection Procedure
CCP-TP-053	Rev. 11	07/20/2011 CCP Standard Real-Time Radiography (RTR) Inspection Procedure
CCP-TP-053	Rev. 10	03/04/2011 CCP Standard Real-Time Radiography (RTR) Inspection Procedure
CCP-TP-053	Rev. 9	09/30/2010 CCP Standard Real-Time Radiography (RTR) Inspection Procedure
CCP-TP-053	Rev. 8	08/30/2010 CCP Standard Real-Time Radiography (RTR) Inspection Procedure
CCP-TP-053	Rev. 7	10/21/2009 CCP Standard Real-Time Radiography (RTR) Inspection Procedure
CCP-TP-053	Rev. 6	03/04/2008 CCP Standard Real-Time Radiography (RTR) Inspection Procedure
CCP-TP-053	Rev. 5	11/16/2006 CCP Standard Real-Time Radiography (RTR) Inspection Procedure
CCP-TP-053	Rev. 4	12/22/2005 CCP Standard Real-Time Radiography (RTR) Inspection Procedure
CCP-TP-053	Rev. 3	03/21/2005 CCP Standard Real-Time Radiography (RTR) Inspection Procedure
CCP-TP-053	Rev. 2	07/14/2004 CCP Standard Real-Time Radiography (RTR) Inspection Procedure

WAP Certification:

CCP-PO-001	Rev. 21	05/31/2013 CCP Transuranic Waste Characterization Quality Assurance Project Plan
CCP-PO-001	Rev. 20	06/16/2011 CCP Transuranic Waste Characterization Quality Assurance Project Plan
CCP-PO-001	Rev. 19	12/28/2010 CCP Transuranic Waste Characterization Quality Assurance Project Plan
CCP-PO-001	Rev. 18	06/30/2010 CCP Transuranic Waste Characterization Quality Assurance Project Plan
CCP-PO-001	Rev. 17	06/23/2009 CCP Transuranic Waste Characterization Quality Assurance Project Plan
CCP-PO-001	Rev. 16	10/31/2007 CCP Transuranic Waste Characterization Quality Assurance Project Plan
CCP-PO-001	Rev. 15	08/10/2007 CCP Transuranic Waste Characterization Quality Assurance Project Plan
CCP-PO-001	Rev. 14	03/28/2007 CCP Transuranic Waste Characterization Quality Assurance Project Plan
CCP-PO-001	Rev. 13	11/16/2006 CCP Transuranic Waste Characterization Quality Assurance Project Plan
CCP-PO-001	Rev. 12	03/22/2006 CCP Transuranic Waste Characterization Quality Assurance Project Plan
CCP-PO-001	Rev. 11	03/10/2005 CCP Transuranic Waste Characterization Quality Assurance Project Plan

CCP-PO-002	Rev. 27	05/31/2013 CCP Transuranic Waste Certification Plan
CCP-PO-002	Rev. 26	07/14/2011 CCP Transuranic Waste Certification Plan
CCP-PO-002	Rev. 25	12/29/2010 CCP Transuranic Waste Certification Plan
CCP-PO-002	Rev. 24	06/30/2010 CCP Transuranic Waste Certification Plan
CCP-PO-002	Rev. 23	04/07/2010 CCP Transuranic Waste Certification Plan
CCP-PO-002	Rev. 22	01/12/2010 CCP Transuranic Waste Certification Plan
CCP-PO-002	Rev. 21	01/26/2009 CCP Transuranic Waste Certification Plan
CCP-PO-002	Rev. 20	11/02/2007 CCP Transuranic Waste Certification Plan
CCP-PO-002	Rev. 19	05/22/2007 CCP Transuranic Waste Certification Plan
CCP-PO-002	Rev. 18	11/16/2006 CCP Transuranic Waste Certification Plan
CCP-PO-002	Rev. 17	11/16/2006 CCP Transuranic Waste Certification Plan
CCP-PO-002	Rev. 16	11/16/2006 CCP Transuranic Waste Certification Plan
CCP-PO-002	Rev. 15	03/22/2006 CCP Transuranic Waste Certification Plan
CCP-PO-002	Rev. 14	12/29/2005 CCP Transuranic Waste Certification Plan
CCP-PO-002	Rev. 13	05/09/2005 CCP Transuranic Waste Certification Plan

CCP-PO-003	Rev. 13	07/31/2013	Transuranic Authorized Methods for Payload Control (CCP CH-TRAMPC)
CCP-PO-003	Rev. 12	12/29/2010	Transuranic Authorized Methods for Payload Control (CCP CH-TRAMPC)
CCP-PO-003	Rev. 11	08/04/2009	Transuranic Authorized Methods for Payload Control (CCP CH-TRAMPC)
CCP-PO-003	Rev. 10	11/18/2008	Transuranic Authorized Methods for Payload Control (CCP CH-TRAMPC)
CCP-PO-003	Rev. 9	12/29/2005	Transuranic Authorized Methods for Payload Control (CCP CH-TRAMPC)
CCP-PO-003	Rev. 8	01/25/2005	Transuranic Authorized Methods for Payload Control (CCP CH-TRAMPC)
CCP-PO-003	Rev. 7	11/22/2004	Transuranic Authorized Methods for Payload Control (CCP CH-TRAMPC)
CCP-PO-003	Rev. 6	06/08/2004	Transuranic Authorized Methods for Payload Control (CCP CH-TRAMPC)
CCP-PO-003	Rev. 5	09/19/2003	Transuranic Authorized Methods for Payload Control (CCP CH-TRAMPC)
CCP-PO-003	Rev. 4	02/11/2003	Transuranic Authorized Methods for Payload Control (CCP CH-TRAMPC)
CCP-PO-003	Rev. 3	05/31/2002	Transuranic Authorized Methods for Payload Control (CCP CH-TRAMPC)

CCP Correlation of Container Identification Numbers to Batch Data Report Numbers

Waste Stream: # OR-NFS-CH-SOIL Lot # 14

Container ID Number	Historical Container ID	NDA BDR	RTR BDR	VE BDR	Load/Manage Overpack Yes	Transportation Headspace Gas	
						FGA	GGT
X10C1351427	N/A	OR-IQ3-0480	OR-RTR6-0644	N/A	No	OR15FG8044	N/A
X10C1351429	N/A	OR-IQ3-0482	OR-RTR6-0646	N/A	No	OR15FG8045	N/A
X10C1351431	N/A	OR-IQ3-0482	OR-RTR6-0646	N/A	No	OR15FG11007	N/A
X10C1351433	N/A	OR-IQ3-0482	OR-RTR6-0646	N/A	No	OR15FG11007	N/A
X10C1351434	N/A	OR-IQ3-0482	OR-RTR6-0646	N/A	No	OR15FG11007	N/A
X10C1351438	N/A	OR-IQ3-0482	OR-RTR6-0646	N/A	No	OR15FG8045	N/A
X10C1351440	N/A	OR-IQ3-0482	OR-RTR6-0646	N/A	No	OR15FG11007	N/A
X10C1351446	N/A	OR-IQ3-0482	OR-RTR6-0646	N/A	No	OR15FG11007	N/A
X10C1351447	N/A	OR-IQ3-0479	OR-RTR6-0644	N/A	No	OR15FG8044	N/A
X10C1351450	N/A	OR-IQ3-0482	OR-RTR6-0646	N/A	No	OR15FG11007	N/A
X10C1351451	N/A	OR-IQ3-0481	OR-RTR6-0645	N/A	No	OR15FG8044	N/A
X10C1351456	N/A	OR-IQ3-0481	OR-RTR6-0645	N/A	No	OR15FG8044	N/A
X10C1351457	N/A	OR-IQ3-0482	OR-RTR6-0646	N/A	No	OR15FG11007	N/A
X10C1351459	N/A	OR-IQ3-0482	OR-RTR6-0646	N/A	No	OR15FG8045	N/A
X10C1351460	N/A	OR-IQ3-0482	OR-RTR6-0646	N/A	No	OR15FG8045	N/A
X10C1351461	N/A	OR-IQ3-0480	OR-RTR6-0644	N/A	No	OR15FG8044	N/A
X10C1351462	N/A	OR-IQ3-0479	OR-RTR6-0644	N/A	No	OR15FG8044	N/A
X10C1351463	N/A	OR-IQ3-0480	OR-RTR6-0644	N/A	No	OR15FG8044	N/A
X10C1351464	N/A	OR-IQ3-0480	OR-RTR6-0644	N/A	No	OR15FG8044	N/A
X10C1351467	N/A	OR-IQ3-0480	OR-RTR6-0645	N/A	No	OR15FG8044	N/A
X10C1351468	N/A	OR-IQ3-0479	OR-RTR6-0644	N/A	No	OR15FG8044	N/A
X10C1351469	N/A	OR-IQ3-0479	OR-RTR6-0644	N/A	No	OR15FG8044	N/A
X10C1351477	N/A	OR-IQ3-0481	OR-RTR6-0645	N/A	No	OR15FG8044	N/A
X10C1351478	N/A	OR-IQ3-0479	OR-RTR6-0644	N/A	No	OR15FG8044	N/A
X10C1351480	N/A	OR-IQ3-0481	OR-RTR6-0645	N/A	No	OR15FG8044	N/A
X10C1351481	N/A	OR-IQ3-0480	OR-RTR6-0644	N/A	No	OR15FG8044	N/A
X10C1351482	N/A	OR-IQ3-0480	OR-RTR6-0644	N/A	No	OR15FG8044	N/A
X10C1351483	N/A	OR-IQ3-0479	OR-RTR6-0644	N/A	No	OR15FG8044	N/A
X10C1351484	N/A	OR-IQ3-0480	OR-RTR6-0645	N/A	No	OR15FG8044	N/A
X10C1351485	N/A	OR-IQ3-0480	OR-RTR6-0644	N/A	No	OR15FG8044	N/A
X10C1351490	N/A	OR-IQ3-0481	OR-RTR6-0645	N/A	No	OR15FG8044	N/A

CCP Correlation of Container Identification Numbers to Batch Data Report Numbers

Waste Stream: # OR-NFS-CH-SOIL Lot # 14

Container ID Number	Historical Container ID	NDA BDR	RTR BDR	VE BDR	Load/Manage Overpack Yes	Transportation Headspace Gas	
						FGA	GGT
X10C1351493	N/A	OR-IQ3-0479	OR-RTR6-0644	N/A	No	OR15FG8044	N/A
X10C1351494	N/A	OR-IQ3-0479	OR-RTR6-0644	N/A	No	OR15FG8044	N/A
X10C1351495	N/A	OR-IQ3-0481	OR-RTR6-0645	N/A	No	OR15FG8044	N/A
X10C1351496	N/A	OR-IQ3-0481	OR-RTR6-0645	N/A	No	OR15FG8044	N/A
X10C1451608	N/A	OR-IQ3-0468	OR-RTR6-0635	N/A	No	OR15FG8031	N/A
X10C1451611	N/A	OR-IQ3-0469	OR-RTR6-0636	N/A	No	OR15FG8031	N/A
X10C1451612	N/A	OR-IQ3-0472	OR-RTR6-0640	N/A	No	OR15FG11004	N/A
X10C1451615	N/A	OR-IQ3-0472	OR-RTR6-0640	N/A	No	OR15FG11004	N/A
X10C1451616	N/A	OR-IQ3-0478	OR-RTR6-0643	N/A	No	OR15FG8040	N/A
X10C1451619	N/A	OR-IQ3-0478	OR-RTR6-0643	N/A	No	OR15FG8040	N/A
X10C1451639	N/A	OR-IQ3-0469	OR-RTR6-0636	N/A	No	OR15FG8031	N/A
X10C1451642	N/A	OR-IQ3-0477	OR-RTR6-0642	N/A	No	OR15FG8041	N/A
X10C1451646	N/A	OR-IQ3-0477	OR-RTR6-0642	N/A	No	OR15FG8041	N/A
X10C1451647	N/A	OR-IQ3-0468	OR-RTR6-0635	N/A	No	OR15FG8031	N/A

Rick Whiteley — Signature of Site Project Manager
Rick Whiteley — Printed Name
06/01/2015 — Date

CCP RTR/VE Summary of Prohibited Items and AK Confirmation

Waste Stream Number: OR-NFS-CH-SOIL Lot #: 14

Container Number	RTR Prohibited Items [a,b]	Visual Examination Prohibited Items [a,b]	Does the Physical Form of the Waste Match the Waste Stream Description as Determined by AK
See correlation of container ID numbers for list of remaining drum numbers in this Lot.	None of the containers in this lot had prohibited items identified during RTR.	VE was not used to certify any containers in this Lot.	The physical form of the waste matches the waste stream description as determined by AK.
a. See Batch Data Reports			
b. If AK has assigned U134 to this waste stream, then any liquids in these containers are prohibited items (not acceptable by the TSDF).			
Justification for the selection of RTR and/or VE: RTR was selected as the characterization method for this lot because the waste was previously packaged and RTR meets all the Data Quality Objectives for NDE for the waste.			

Rick Whiteley — Site Project Manager Signature
Rick Whiteley — Printed Name
06/01/2015 — Date

CCP Reconciliation with Data Quality Objectives

WSPF# OR-NFS-CH-SOIL Rev. 0 Lot # 14

Sampling Completeness

RTR/VE:

Number of Valid Samples: 45 Number of Total Samples Analyzed: 45

Percent Complete: 100 (QAO is 100%)

Radiological:

Number of Valid Samples: 45 Number of Total Samples Analyzed: 45

Percent Complete: 100 (QAO is 100%)

	Y/N/NA	Reconciliation Parameter
1	Y	Waste Matrix Code.
2	Y	Waste Material Parameter Weights.
3	Y	The TRU activity reported in the BDRs for each container demonstrates with a 95% probability that the container of waste contains TRU radioactive waste.
4	N	AK Sufficiency. Is there an approved AK sufficiency Determination for this waste stream?
5	Y	The data demonstrates whether the waste stream exhibits a toxicity characteristic under Title 40 Code of Federal Regulations (CFR), Part 261, Identification and Listing of Hazardous Waste, Subpart C, Characteristics of Hazardous Waste.
6	Y	Does the waste stream contain listed waste found in 20.4.1.200 NMAC incorporating 40 CFR Part 261, Subpart D, Lists of Hazardous Wastes.
7	Y	Waste stream can be classified as hazardous or nonhazardous.
8	Y	The overall completeness, comparability, and representativeness QAOs were met for each of the analytical and testing procedures as specified in the WAP Sections C3-1 through C3-2 prior to submittal of a waste stream profile form for a waste steam or waste stream lot.

	Completeness	Comparability	Representativeness
Radiography	Y	Y	Y
VE	NA	NA	NA

Comments: None

Signature of Site Project Manager — Rick Whiteley (Printed Name) — 06/01/2015 (Date)

CHARACTERIZATION INFORMATION SUMMARY

WSPF# OR-NFS-CH-SOIL Rev. 0 (CCP-AK-ORNL-001)

Lot 15

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CCP Characterization Information Summary Cover Page

Waste Stream # OR-NFS-CH-SOIL Lot #: 15

AK Expert Review: N/A Date: N/A

SPM Review: Rick Whiteley Rick Whiteley Date: 06/08/2015

SPM signature certifies that through Acceptable Knowledge testing and/or analysis that the waste identified in this summary is not corrosive, ignitable, reactive, or incompatible with the TSDF.

A summary of the Acceptable Knowledge regarding this waste stream containing specific information about the corrosivity, reactivity, and ignitability of the waste stream is included as an attachment to the Waste Stream Profile Form. By reference, that information is included in this lot.

List of procedures used:

Non Destructive Assay (NDA):

CCP-TP-048	Rev. 16	11/01/2013 Mobile IQ3 System Data Reviewing, Validating, and Reporting Procedure
CCP-TP-048	Rev. 15	03/24/2011 Mobile IQ3 System Data Reviewing, Validating, and Reporting Procedure
CCP-TP-048	Rev. 14	03/08/2010 Mobile IQ3 System Data Reviewing, Validating, and Reporting Procedure
CCP-TP-048	Rev. 13	10/12/2009 Mobile IQ3 System Data Reviewing, Validating, and Reporting Procedure
CCP-TP-048	Rev. 12	09/09/2009 Mobile IQ3 System Data Reviewing, Validating, and Reporting Procedure
CCP-TP-048	Rev. 11	02/19/2008 Mobile IQ3 System Data Reviewing, Validating, and Reporting Procedure
CCP-TP-048	Rev. 10	11/16/2006 Mobile IQ3 System Data Reviewing, Validating, and Reporting Procedure
CCP-TP-048	Rev. 9	11/03/2005 Mobile IQ3 System Data Reviewing, Validating, and Reporting Procedure
CCP-TP-048	Rev. 8	09/21/2005 Mobile IQ3 System Data Reviewing, Validating, and Reporting Procedure
CCP-TP-048	Rev. 7	03/14/2005 Mobile IQ3 System Data Reviewing, Validating, and Reporting Procedure
CCP-TP-048	Rev. 6	10/18/2004 Mobile IQ3 System Data Reviewing, Validating, and Reporting Procedure
CCP-TP-048	Rev. 5	06/08/2004 Mobile IQ3 System Data Reviewing, Validating, and Reporting Procedure
CCP-TP-048	Rev. 4	12/04/2003 Mobile IQ3 System Data Reviewing, Validating, and Reporting Procedure
CCP-TP-048	Rev. 3	09/03/2003 Mobile IQ3 System Data Reviewing, Validating, and Reporting Procedure
CCP-TP-048	Rev. 2	04/25/2003 Mobile IQ3 System Data Reviewing, Validating, and Reporting Procedure
CCP-TP-048	Rev. 1	03/21/2003 Mobile IQ3 System Data Reviewing, Validating, and Reporting Procedure
CCP-TP-048	Rev. 0	02/05/2003 Mobile IQ3 System Data Reviewing, Validating, and Reporting Procedure

Project Level Data Validation / DQO Reconciliation:

CCP-TP-001	Rev. 21	06/06/2013 CCP Project Level Data Validation and Verification
CCP-TP-001	Rev. 20	09/27/2012 CCP Project Level Data Validation and Verification
CCP-TP-001	Rev. 19	12/28/2010 CCP Project Level Data Validation and Verification
CCP-TP-001	Rev. 18	08/09/2010 CCP Project Level Data Validation and Verification
CCP-TP-001	Rev. 17	09/24/2007 CCP Project Level Data Validation and Verification
CCP-TP-001	Rev. 16	04/26/2007 CCP Project Level Data Validation and Verification
CCP-TP-001	Rev. 15	11/22/2006 CCP Project Level Data Validation and Verification
CCP-TP-001	Rev. 14	11/16/2006 CCP Project Level Data Validation and Verification
CCP-TP-001	Rev. 13	07/21/2006 CCP Project Level Data Validation and Verification
CCP-TP-001	Rev. 12	05/25/2006 CCP Project Level Data Validation and Verification
CCP-TP-001	Rev. 11	03/23/2005 CCP Project Level Data Validation and Verification

CCP-TP-002	Rev. 26	06/19/2013 CCP Reconciliation of DQOs and Reporting Characterization Data
CCP-TP-002	Rev. 25	02/11/2013 CCP Reconciliation of DQOs and Reporting Characterization Data
CCP-TP-002	Rev. 24	12/28/2011 CCP Reconciliation of DQOs and Reporting Characterization Data
CCP-TP-002	Rev. 23	12/29/2010 CCP Reconciliation of DQOs and Reporting Characterization Data
CCP-TP-002	Rev. 22	08/30/2010 CCP Reconciliation of DQOs and Reporting Characterization Data
CCP-TP-002	Rev. 21	08/04/2009 CCP Reconciliation of DQOs and Reporting Characterization Data
CCP-TP-002	Rev. 20	08/18/2008 CCP Reconciliation of DQOs and Reporting Characterization Data
CCP-TP-002	Rev. 19	12/22/2006 CCP Reconciliation of DQOs and Reporting Characterization Data
CCP-TP-002	Rev. 18	11/16/2006 CCP Reconciliation of DQOs and Reporting Characterization Data
CCP-TP-002	Rev. 17	10/10/2006 CCP Reconciliation of DQOs and Reporting Characterization Data
CCP-TP-002	Rev. 16	06/06/2006 CCP Reconciliation of DQOs and Reporting Characterization Data
CCP-TP-002	Rev. 15	08/16/2005 CCP Reconciliation of DQOs and Reporting Characterization Data
CCP-TP-002	Rev. 14	03/29/2005 CCP Reconciliation of DQOs and Reporting Characterization Data

CCP-TP-005	Rev. 26	06/12/2013 CCP Acceptable Knowledge Documentation
CCP-TP-005	Rev. 25	06/19/2013 CCP Acceptable Knowledge Documentation
CCP-TP-005	Rev. 24	11/28/2011 CCP Acceptable Knowledge Documentation
CCP-TP-005	Rev. 23	08/30/2011 CCP Acceptable Knowledge Documentation
CCP-TP-005	Rev. 22	04/21/2011 CCP Acceptable Knowledge Documentation
CCP-TP-005	Rev. 21	12/29/2010 CCP Acceptable Knowledge Documentation
CCP-TP-005	Rev. 20	11/01/2010 CCP Acceptable Knowledge Documentation
CCP-TP-005	Rev. 19	07/06/2010 CCP Acceptable Knowledge Documentation
CCP-TP-005	Rev. 18	11/16/2006 CCP Acceptable Knowledge Documentation
CCP-TP-005	Rev. 17	08/05/2006 CCP Acceptable Knowledge Documentation

CCP-TP-005	Rev. 16	02/27/2008 CCP Acceptable Knowledge Documentation
CCP-TP-005	Rev. 15	03/31/2005 CCP Acceptable Knowledge Documentation

CCP-TP-030	Rev. 34	02/02/2015 CCP CH TRU Waste Certification and WWIS/WDS Data Entry
CCP-TP-030	Rev. 33	11/19/2013 CCP CH TRU Waste Certification and WWIS/WDS Data Entry
CCP-TP-030	Rev. 32	08/20/2013 CCP CH TRU Waste Certification and WWIS/WDS Data Entry
CCP-TP-030	Rev. 31	11/19/2012 CCP CH TRU Waste Certification and WWIS/WDS Data Entry
CCP-TP-030	Rev. 30	05/21/2012 CCP CH TRU Waste Certification and WWIS/WDS Data Entry
CCP-TP-030	Rev. 29	04/26/2011 CCP CH TRU Waste Certification and WWIS/WDS Data Entry
CCP-TP-030	Rev. 28	05/12/2010 CCP CH TRU Waste Certification and WWIS/WDS Data Entry
CCP-TP-030	Rev. 27	12/14/2009 CCP CH TRU Waste Certification and WWIS Data Entry
CCP-TP-030	Rev. 26	05/27/2009 CCP CH TRU Waste Certification and WWIS Data Entry
CCP-TP-030	Rev. 25	01/22/2009 CCP CH TRU Waste Certification and WWIS Data Entry
CCP-TP-030	Rev. 24	08/20/2008 CCP CH TRU Waste Certification and WWIS Data Entry
CCP-TP-030	Rev. 23	03/12/2008 CCP CH TRU Waste Certification and WWIS Data Entry
CCP-TP-030	Rev. 22	07/24/2007 CCP CH TRU Waste Certification and WWIS Data Entry
CCP-TP-030	Rev. 21	05/21/2007 CCP CH TRU Waste Certification and WWIS Data Entry
CCP-TP-030	Rev. 20	02/07/2007 CCP CH TRU Waste Certification and WWIS Data Entry
CCP-TP-030	Rev. 19	11/16/2006 CCP CH TRU Waste Certification and WWIS Data Entry
CCP-TP-030	Rev. 18	05/01/2006 CCP TRU Waste Certification and WWIS Data Entry
CCP-TP-030	Rev. 17	12/29/2005 CCP TRU Waste Certification and WWIS Data Entry
CCP-TP-030	Rev. 16	04/22/2005 CCP TRU Waste Certification and WWIS Data Entry

Radiography (RTR/NDE):

CCP-TP-053	Rev. 15	09/11/2014 CCP Standard Real-Time Radiography (RTR) Inspection Procedure
CCP-TP-053	Rev. 14	09/25/2013 CCP Standard Real-Time Radiography (RTR) Inspection Procedure
CCP-TP-053	Rev. 13	05/14/2013 CCP Standard Real-Time Radiography (RTR) Inspection Procedure
CCP-TP-053	Rev. 12	08/22/2012 CCP Standard Real-Time Radiography (RTR) Inspection Procedure
CCP-TP-053	Rev. 11	07/20/2011 CCP Standard Real-Time Radiography (RTR) Inspection Procedure
CCP-TP-053	Rev. 10	03/04/2011 CCP Standard Real-Time Radiography (RTR) Inspection Procedure
CCP-TP-053	Rev. 9	09/30/2010 CCP Standard Real-Time Radiography (RTR) Inspection Procedure
CCP-TP-053	Rev. 8	08/30/2010 CCP Standard Real-Time Radiography (RTR) Inspection Procedure
CCP-TP-053	Rev. 7	10/21/2009 CCP Standard Real-Time Radiography (RTR) Inspection Procedure
CCP-TP-053	Rev. 6	03/04/2008 CCP Standard Real-Time Radiography (RTR) Inspection Procedure
CCP-TP-053	Rev. 5	11/16/2006 CCP Standard Real-Time Radiography (RTR) Inspection Procedure
CCP-TP-053	Rev. 4	12/22/2005 CCP Standard Real-Time Radiography (RTR) Inspection Procedure
CCP-TP-053	Rev. 3	03/21/2005 CCP Standard Real-Time Radiography (RTR) Inspection Procedure
CCP-TP-053	Rev. 2	07/14/2004 CCP Standard Real-Time Radiography (RTR) Inspection Procedure

WAP Certification:

CCP-PO-001	Rev. 21	05/31/2013 CCP Transuranic Waste Characterization Quality Assurance Project Plan
CCP-PO-001	Rev. 20	06/16/2011 CCP Transuranic Waste Characterization Quality Assurance Project Plan
CCP-PO-001	Rev. 19	12/29/2010 CCP Transuranic Waste Characterization Quality Assurance Project Plan
CCP-PO-001	Rev. 18	08/30/2010 CCP Transuranic Waste Characterization Quality Assurance Project Plan
CCP-PO-001	Rev. 17	08/23/2009 CCP Transuranic Waste Characterization Quality Assurance Project Plan
CCP-PO-001	Rev. 16	10/31/2007 CCP Transuranic Waste Characterization Quality Assurance Project Plan
CCP-PO-001	Rev. 15	08/10/2007 CCP Transuranic Waste Characterization Quality Assurance Project Plan
CCP-PO-001	Rev. 14	03/28/2007 CCP Transuranic Waste Characterization Quality Assurance Project Plan
CCP-PO-001	Rev. 13	11/16/2006 CCP Transuranic Waste Characterization Quality Assurance Project Plan
CCP-PO-001	Rev. 12	03/22/2006 CCP Transuranic Waste Characterization Quality Assurance Project Plan
CCP-PO-001	Rev. 11	03/10/2005 CCP Transuranic Waste Characterization Quality Assurance Project Plan

CCP-PO-002	Rev. 27	05/31/2013 CCP Transuranic Waste Certification Plan
CCP-PO-002	Rev. 26	07/14/2011 CCP Transuranic Waste Certification Plan
CCP-PO-002	Rev. 25	12/29/2010 CCP Transuranic Waste Certification Plan
CCP-PO-002	Rev. 24	08/30/2010 CCP Transuranic Waste Certification Plan
CCP-PO-002	Rev. 23	04/07/2010 CCP Transuranic Waste Certification Plan
CCP-PO-002	Rev. 22	01/12/2010 CCP Transuranic Waste Certification Plan
CCP-PO-002	Rev. 21	01/26/2009 CCP Transuranic Waste Certification Plan
CCP-PO-002	Rev. 20	11/02/2007 CCP Transuranic Waste Certification Plan
CCP-PO-002	Rev. 19	05/22/2007 CCP Transuranic Waste Certification Plan
CCP-PO-002	Rev. 18	11/16/2006 CCP Transuranic Waste Certification Plan
CCP-PO-002	Rev. 17	11/16/2006 CCP Transuranic Waste Certification Plan
CCP-PO-002	Rev. 16	11/16/2006 CCP Transuranic Waste Certification Plan
CCP-PO-002	Rev. 15	03/22/2006 CCP Transuranic Waste Certification Plan
CCP-PO-002	Rev. 14	12/29/2005 CCP Transuranic Waste Certification Plan
CCP-PO-002	Rev. 13	05/09/2005 CCP Transuranic Waste Certification Plan

CCP-PO-003	Rev. 13	07/31/2013	Transuranic Authorized Methods for Payload Control (CCP CH-TRAMPC)
CCP-PO-003	Rev. 12	12/29/2010	Transuranic Authorized Methods for Payload Control (CCP CH-TRAMPC)
CCP-PO-003	Rev. 11	06/04/2009	Transuranic Authorized Methods for Payload Control (CCP CH-TRAMPC)
CCP-PO-003	Rev. 10	11/16/2006	Transuranic Authorized Methods for Payload Control (CCP CH-TRAMPC)
CCP-PO-003	Rev. 9	12/29/2005	Transuranic Authorized Methods for Payload Control (CCP CH-TRAMPC)
CCP-PO-003	Rev. 8	01/25/2005	Transuranic Authorized Methods for Payload Control (CCP CH-TRAMPC)
CCP-PO-003	Rev. 7	11/22/2004	Transuranic Authorized Methods for Payload Control (CCP CH-TRAMPC)
CCP-PO-003	Rev. 6	08/08/2004	Transuranic Authorized Methods for Payload Control (CCP CH-TRAMPC)
CCP-PO-003	Rev. 5	09/19/2003	Transuranic Authorized Methods for Payload Control (CCP CH-TRAMPC)
CCP-PO-003	Rev. 4	02/11/2003	Transuranic Authorized Methods for Payload Control (CCP CH-TRAMPC)
CCP-PO-003	Rev. 3	05/31/2002	Transuranic Authorized Methods for Payload Control (CCP CH-TRAMPC)

CCP Correlation of Container Identification Numbers to Batch Data Report Numbers

Waste Stream: # OR-NFS-CH-SOIL Lot # 15

Container ID Number	Historical Container ID	NDA BDR	RTR BDR	VE BDR	Load/Manage Overpack Yes	Transportation Headspace Gas	
						FGA	GGT
X10C1351229	N/A	OR-IQ3-0496	OR-RTR6-0653	N/A	No	OR15FG8052	N/A
X10C1351316	N/A	OR-IQ3-0486	OR-RTR6-0648	N/A	No	OR15FG8049	N/A
X10C1351319	N/A	OR-IQ3-0487	OR-RTR6-0649	N/A	No	OR15FG8049	N/A
X10C1351320	N/A	OR-IQ3-0487	OR-RTR6-0649	N/A	No	OR15FG8049	N/A
X10C1351327	N/A	OR-IQ3-0487	OR-RTR6-0648	N/A	No	OR15FG8049	N/A
X10C1351339	N/A	OR-IQ3-0487	OR-RTR6-0648	N/A	No	OR15FG8049	N/A
X10C1351340	N/A	OR-IQ3-0486	OR-RTR6-0648	N/A	No	OR15FG8049	N/A
X10C1351342	N/A	OR-IQ3-0495	OR-RTR6-0652	N/A	No	OR15FG8052	N/A
X10C1351343	N/A	OR-IQ3-0496	OR-RTR6-0653	N/A	No	OR15FG8052	N/A
X10C1351348	N/A	OR-IQ3-0487	OR-RTR6-0649	N/A	No	OR15FG8049	N/A
X10C1351350	N/A	OR-IQ3-0496	OR-RTR6-0653	N/A	No	OR15FG8052	N/A
X10C1351355	N/A	OR-IQ3-0495	OR-RTR6-0652	N/A	No	OR15FG8052	N/A
X10C1351359	N/A	OR-IQ3-0487	OR-RTR6-0649	N/A	No	OR15FG8049	N/A
X10C1351362	N/A	OR-IQ3-0487	OR-RTR6-0649	N/A	No	OR15FG8049	N/A
X10C1351363	N/A	OR-IQ3-0488	OR-RTR6-0649	N/A	No	OR15FG8049	N/A
X10C1351365	N/A	OR-IQ3-0486	OR-RTR6-0648	N/A	No	OR15FG8049	N/A
X10C1351416	N/A	OR-IQ3-0486	OR-RTR6-0648	N/A	No	OR15FG8049	N/A
X10C1351417	N/A	OR-IQ3-0485	OR-RTR6-0648	N/A	No	OR15FG8049	N/A
X10C1351418	N/A	OR-IQ3-0487	OR-RTR6-0648	N/A	No	OR15FG8049	N/A
X10C1351419	N/A	OR-IQ3-0487	OR-RTR6-0649	N/A	No	OR15FG8049	N/A
X10C1351423	N/A	OR-IQ3-0486	OR-RTR6-0648	N/A	No	OR15FG8049	N/A
X10C1351425	N/A	OR-IQ3-0483	OR-RTR6-0646	N/A	No	OR15FG11007	N/A
X10C1351426	N/A	OR-IQ3-0483	OR-RTR6-0646	N/A	No	OR15FG11007	N/A
X10C1351428	N/A	OR-IQ3-0485	OR-RTR6-0648	N/A	No	OR15FG8049	N/A
X10C1351430	N/A	OR-IQ3-0484	OR-RTR6-0647	N/A	No	OR15FG8045	N/A
X10C1351432	N/A	OR-IQ3-0486	OR-RTR6-0648	N/A	No	OR15FG8049	N/A
X10C1351435	N/A	OR-IQ3-0484	OR-RTR6-0647	N/A	No	OR15FG8045	N/A
X10C1351436	N/A	OR-IQ3-0488	OR-RTR6-0649	N/A	No	OR15FG8049	N/A
X10C1351437	N/A	OR-IQ3-0484	OR-RTR6-0647	N/A	No	OR15FG8045	N/A
X10C1351439	N/A	OR-IQ3-0486	OR-RTR6-0648	N/A	No	OR15FG8049	N/A
X10C1351441	N/A	OR-IQ3-0483	OR-RTR6-0646	N/A	No	OR15FG11007	N/A

CCP Correlation of Container Identification Numbers to Batch Data Report Numbers

Waste Stream: # OR-NFS-CH-SOIL Lot # 15

Container ID Number	Historical Container ID	NDA BDR	RTR BDR	VE BDR	Load/Manage Overpack Yes	Transportation Headspace Gas	
						FGA	GGT
X10C1351442	N/A	OR-IQ3-0487	OR-RTR6-0648	N/A	No	OR15FG8049	N/A
X10C1351443	N/A	OR-IQ3-0487	OR-RTR6-0648	N/A	No	OR15FG8049	N/A
X10C1351444	N/A	OR-IQ3-0483	OR-RTR6-0646	N/A	No	OR15FG11007	N/A
X10C1351445	N/A	OR-IQ3-0485	OR-RTR6-0647	N/A	No	OR15FG8045	N/A
X10C1351448	N/A	OR-IQ3-0484	OR-RTR6-0647	N/A	No	OR15FG8045	N/A
X10C1351449	N/A	OR-IQ3-0483	OR-RTR6-0647	N/A	No	OR15FG8045	N/A
X10C1351452	N/A	OR-IQ3-0484	OR-RTR6-0647	N/A	No	OR15FG8045	N/A
X10C1351453	N/A	OR-IQ3-0487	OR-RTR6-0648	N/A	No	OR15FG8049	N/A
X10C1351454	N/A	OR-IQ3-0484	OR-RTR6-0647	N/A	No	OR15FG8045	N/A
X10C1351455	N/A	OR-IQ3-0483	OR-RTR6-0646	N/A	No	OR15FG11007	N/A
X10C1351458	N/A	OR-IQ3-0488	OR-RTR6-0649	N/A	No	OR15FG8049	N/A

Signature of Site Project Manager | Rick Whiteley (Printed Name) | 06/08/2015 (Date)

CCP RTR/VE Summary of Prohibited Items and AK Confirmation

Waste Stream Number: OR-NFS-CH-SOIL Lot #: 15

Container Number	RTR Prohibited Items [a,b]	Visual Examination Prohibited Items [a,b]	Does the Physical Form of the Waste Match the Waste Stream Description as Determined by AK
See correlation of container ID numbers for list of remaining drum numbers in this Lot.	None of the containers in this lot had prohibited items identified during RTR.	VE was not used to certify any containers in this Lot.	The physical form of the waste matches the waste stream description as determined by AK.
a. See Batch Data Reports			
b. If AK has assigned U134 to this waste stream, then any liquids in these containers are prohibited items (not acceptable by the TSDF).			
Justification for the selection of RTR and/or VE: RTR was selected as the characterization method for this lot because the waste was previously packaged and RTR meets all the Data Quality Objectives for NDE for the waste.			

Rick Whiteley — Site Project Manager Signature
Rick Whiteley — Printed Name
06/08/2015 — Date

CCP Reconciliation with Data Quality Objectives

WSPF# OR-NFS-CH-SOIL Rev. 0 Lot # 15

Sampling Completeness

RTR/VE:

Number of Valid Samples: 42 Number of Total Samples Analyzed: 42
Percent Complete: 100 (QAO is 100%)

Radiological:

Number of Valid Samples: 42 Number of Total Samples Analyzed: 42
Percent Complete: 100 (QAO is 100%)

	Y/N/NA	Reconciliation Parameter
1	Y	Waste Matrix Code.
2	Y	Waste Material Parameter Weights.
3	Y	The TRU activity reported in the BDRs for each container demonstrates with a 95% probability that the container of waste contains TRU radioactive waste.
4	N	AK Sufficiency. Is there an approved AK sufficiency Determination for this waste stream?
5	Y	The data demonstrates whether the waste stream exhibits a toxicity characteristic under Title 40 Code of Federal Regulations (CFR), Part 261, Identification and Listing of Hazardous Waste, Subpart C, Characteristics of Hazardous Waste.
6	Y	Does the waste stream contain listed waste found in 20.4.1.200 NMAC incorporating 40 CFR Part 261, Subpart D, Lists of Hazardous Wastes.
7	Y	Waste stream can be classified as hazardous or nonhazardous.
8	Y	The overall completeness, comparability, and representativeness QAOs were met for each of the analytical and testing procedures as specified in the WAP Sections C3-1 through C3-2 prior to submittal of a waste stream profile form for a waste steam or waste stream lot.

	Completeness	Comparability	Representativeness
Radiography	Y	Y	Y
VE	NA	NA	NA

Comments: None

Rick Whiteley 06/08/2015

Signature of Site Project Manager | Printed Name | Date

CHARACTERIZATION INFORMATION SUMMARY

WSPF# OR-NFS-CH-SOIL Rev. 0 (CCP-AK-ORNL-001)

Lot 16

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CCP Characterization Information Summary Cover Page

Waste Stream # OR-NFS-CH-SOIL Lot #: 16

AK Expert Review: N/A Date: N/A

SPM Review: Rick Whiteley Rick Whiteley Date: 06/29/2015

SPM signature certifies that through Acceptable Knowledge testing and/or analysis that the waste identified in this summary is not corrosive, ignitable, reactive, or incompatible with the TSDF.

A summary of the Acceptable Knowledge regarding this waste stream containing specific information about the corrosivity, reactivity, and ignitability of the waste stream is included as an attachment to the Waste Stream Profile Form. By reference, that information is included in this lot.

List of procedures used:

Non Destructive Assay (NDA):

CCP-TP-048	Rev. 16	11/01/2013 Mobile IQ3 System Data Reviewing, Validating, and Reporting Procedure
CCP-TP-048	Rev. 15	03/24/2011 Mobile IQ3 System Data Reviewing, Validating, and Reporting Procedure
CCP-TP-048	Rev. 14	03/08/2010 Mobile IQ3 System Data Reviewing, Validating, and Reporting Procedure
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CCP-TP-048	Rev. 1	03/21/2003 Mobile IQ3 System Data Reviewing, Validating, and Reporting Procedure
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CCP-TP-030	Rev. 16	04/22/2005 CCP TRU Waste Certification and WWIS Data Entry

Radiography (RTR/NDE):

CCP-TP-053	Rev. 15	09/11/2014 CCP Standard Real-Time Radiography (RTR) Inspection Procedure
CCP-TP-053	Rev. 14	09/25/2013 CCP Standard Real-Time Radiography (RTR) Inspection Procedure
CCP-TP-053	Rev. 13	05/14/2013 CCP Standard Real-Time Radiography (RTR) Inspection Procedure
CCP-TP-053	Rev. 12	08/22/2012 CCP Standard Real-Time Radiography (RTR) Inspection Procedure
CCP-TP-053	Rev. 11	07/20/2011 CCP Standard Real-Time Radiography (RTR) Inspection Procedure
CCP-TP-053	Rev. 10	03/04/2011 CCP Standard Real-Time Radiography (RTR) Inspection Procedure
CCP-TP-053	Rev. 9	09/30/2010 CCP Standard Real-Time Radiography (RTR) Inspection Procedure
CCP-TP-053	Rev. 8	06/30/2010 CCP Standard Real-Time Radiography (RTR) Inspection Procedure
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CCP-TP-053	Rev. 6	03/04/2008 CCP Standard Real-Time Radiography (RTR) Inspection Procedure
CCP-TP-053	Rev. 5	11/16/2006 CCP Standard Real-Time Radiography (RTR) Inspection Procedure
CCP-TP-053	Rev. 4	12/22/2005 CCP Standard Real-Time Radiography (RTR) Inspection Procedure
CCP-TP-053	Rev. 3	03/21/2005 CCP Standard Real-Time Radiography (RTR) Inspection Procedure
CCP-TP-053	Rev. 2	07/14/2004 CCP Standard Real-Time Radiography (RTR) Inspection Procedure

WAP Certification:

CCP-PO-001	Rev. 21	05/31/2013 CCP Transuranic Waste Characterization Quality Assurance Project Plan
CCP-PO-001	Rev. 20	08/16/2011 CCP Transuranic Waste Characterization Quality Assurance Project Plan
CCP-PO-001	Rev. 19	12/28/2010 CCP Transuranic Waste Characterization Quality Assurance Project Plan
CCP-PO-001	Rev. 18	08/30/2010 CCP Transuranic Waste Characterization Quality Assurance Project Plan
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CCP-PO-001	Rev. 16	10/31/2007 CCP Transuranic Waste Characterization Quality Assurance Project Plan
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CCP-PO-001	Rev. 12	03/22/2006 CCP Transuranic Waste Characterization Quality Assurance Project Plan
CCP-PO-001	Rev. 11	03/10/2005 CCP Transuranic Waste Characterization Quality Assurance Project Plan

CCP-PO-002	Rev. 27	05/31/2013 CCP Transuranic Waste Certification Plan
CCP-PO-002	Rev. 26	07/14/2011 CCP Transuranic Waste Certification Plan
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CCP-PO-002	Rev. 14	12/29/2005 CCP Transuranic Waste Certification Plan
CCP-PO-002	Rev. 13	05/09/2005 CCP Transuranic Waste Certification Plan

CCP-PO-003	Rev. 13	07/31/2013	Transuranic Authorized Methods for Payload Control (CCP CH-TRAMPC)
CCP-PO-003	Rev. 12	12/29/2010	Transuranic Authorized Methods for Payload Control (CCP CH-TRAMPC)
CCP-PO-003	Rev. 11	06/04/2009	Transuranic Authorized Methods for Payload Control (CCP CH-TRAMPC)
CCP-PO-003	Rev. 10	11/16/2006	Transuranic Authorized Methods for Payload Control (CCP CH-TRAMPC)
CCP-PO-003	Rev. 9	12/29/2005	Transuranic Authorized Methods for Payload Control (CCP CH-TRAMPC)
CCP-PO-003	Rev. 8	01/25/2005	Transuranic Authorized Methods for Payload Control (CCP CH-TRAMPC)
CCP-PO-003	Rev. 7	11/22/2004	Transuranic Authorized Methods for Payload Control (CCP CH-TRAMPC)
CCP-PO-003	Rev. 6	08/08/2004	Transuranic Authorized Methods for Payload Control (CCP CH-TRAMPC)
CCP-PO-003	Rev. 5	06/18/2003	Transuranic Authorized Methods for Payload Control (CCP CH-TRAMPC)
CCP-PO-003	Rev. 4	02/11/2003	Transuranic Authorized Methods for Payload Control (CCP CH-TRAMPC)
CCP-PO-003	Rev. 3	05/31/2002	Transuranic Authorized Methods for Payload Control (CCP CH-TRAMPC)

CCP Correlation of Container Identification Numbers to Batch Data Report Numbers

Waste Stream: # OR-NFS-CH-SOIL Lot # 16

Container ID Number	Historical Container ID	NDA BDR	RTR BDR	VE BDR	Load/Manage Overpack Yes	Transportation Headspace Gas	
						FGA	GGT
X10C1250178	N/A	OR-IQ3-0507	OR-RTR6-0659	N/A	No	OR15FG8062	N/A
X10C1250202	N/A	OR-IQ3-0505	OR-RTR6-0658	N/A	No	OR15FG8061	N/A
X10C1350950	N/A	OR-IQ3-0509	OR-RTR6-0661	N/A	No	OR15FG8063	N/A
X10C1350951	N/A	OR-IQ3-0509	OR-RTR6-0661	N/A	No	OR15FG8063	N/A
X10C1350952	N/A	OR-IQ3-0509	OR-RTR6-0661	N/A	No	OR15FG8063	N/A
X10C1350953	N/A	OR-IQ3-0509	OR-RTR6-0661	N/A	No	OR15FG8063	N/A
X10C1350958	N/A	OR-IQ3-0508	OR-RTR6-0660	N/A	No	OR15FG8063	N/A
X10C1350961	N/A	OR-IQ3-0508	OR-RTR6-0660	N/A	No	OR15FG8063	N/A
X10C1350964	N/A	OR-IQ3-0508	OR-RTR6-0660	N/A	No	OR15FG8063	N/A
X10C1350966	N/A	OR-IQ3-0509	OR-RTR6-0660	N/A	No	OR15FG8063	N/A
X10C1350969	N/A	OR-IQ3-0508	OR-RTR6-0660	N/A	No	OR15FG8063	N/A
X10C1350971	N/A	OR-IQ3-0508	OR-RTR6-0660	N/A	No	OR15FG8063	N/A
X10C1350972	N/A	OR-IQ3-0509	OR-RTR6-0660	N/A	No	OR15FG8063	N/A
X10C1350973	N/A	OR-IQ3-0509	OR-RTR6-0660	N/A	No	OR15FG8063	N/A
X10C1350976	N/A	OR-IQ3-0508	OR-RTR6-0660	N/A	No	OR15FG8063	N/A
X10C1350979	N/A	OR-IQ3-0508	OR-RTR6-0660	N/A	No	OR15FG8063	N/A
X10C1350982	N/A	OR-IQ3-0508	OR-RTR6-0660	N/A	No	OR15FG8063	N/A
X10C1350985	N/A	OR-IQ3-0508	OR-RTR6-0660	N/A	No	OR15FG8063	N/A
X10C1350991	N/A	OR-IQ3-0509	OR-RTR6-0660	N/A	No	OR15FG8063	N/A
X10C1350998	N/A	OR-IQ3-0508	OR-RTR6-0660	N/A	No	OR15FG8063	N/A
X10C1351002	N/A	OR-IQ3-0508	OR-RTR6-0660	N/A	No	OR15FG8063	N/A
X10C1351003	N/A	OR-IQ3-0509	OR-RTR6-0661	N/A	No	OR15FG8063	N/A

Rick Whiteley — Signature of Site Project Manager
Rick Whiteley — Printed Name
06/29/2015 — Date

CCP RTR/VE Summary of Prohibited Items and AK Confirmation

Waste Stream Number: OR-NFS-CH-SOIL Lot #: 16

Container Number	RTR Prohibited Items [a,b]	Visual Examination Prohibited Items [a,b]	Does the Physical Form of the Waste Match the Waste Stream Description as Determined by AK
See correlation of container ID numbers for list of remaining drum numbers in this Lot.	None of the containers in this lot had prohibited items identified during RTR.	VE was not used to certify any containers in this Lot.	The physical form of the waste matches the waste stream description as determined by AK.
a. See Batch Data Reports			
b. If AK has assigned U134 to this waste stream, then any liquids in these containers are prohibited items (not acceptable by the TSDF).			
Justification for the selection of RTR and/or VE: RTR was selected as the characterization method for this lot because the waste was previously packaged and RTR meets all the Data Quality Objectives for NDE for the waste.			

Rick Whiteley — Site Project Manager Signature
Rick Whiteley — Printed Name
06/29/2015 — Date

CCP Reconciliation with Data Quality Objectives

WSPF# OR-NFS-CH-SOIL Rev. 0 Lot # 16

Sampling Completeness

RTR/VE:
Number of Valid Samples: 22 Number of Total Samples Analyzed: 22
Percent Complete: 100 (QAO is 100%)

Radiological:
Number of Valid Samples: 22 Number of Total Samples Analyzed: 22
Percent Complete: 100 (QAO is 100%)

	Y/N/NA	Reconciliation Parameter
1	Y	Waste Matrix Code.
2	Y	Waste Material Parameter Weights.
3	Y	The TRU activity reported in the BDRs for each container demonstrates with a 95% probability that the container of waste contains TRU radioactive waste.
4	N	AK Sufficiency. Is there an approved AK sufficiency Determination for this waste stream?
5	Y	The data demonstrates whether the waste stream exhibits a toxicity characteristic under Title 40 Code of Federal Regulations (CFR), Part 261, Identification and Listing of Hazardous Waste, Subpart C, Characteristics of Hazardous Waste.
6	Y	Does the waste stream contain listed waste found in 20.4.1.200 NMAC incorporating 40 CFR Part 261, Subpart D, Lists of Hazardous Wastes.
7	Y	Waste stream can be classified as hazardous or nonhazardous.
8	Y	The overall completeness, comparability, and representativeness QAOs were met for each of the analytical and testing procedures as specified in the WAP Sections C3-1 through C3-2 prior to submittal of a waste stream profile form for a waste steam or waste stream lot.

	Completeness	Comparability	Representativeness
Radiography	Y	Y	Y
VE	NA	NA	NA

Comments: None

Rick Whiteley — Signature of Site Project Manager
Rick Whiteley — Printed Name
06/29/2015 — Date

CHARACTERIZATION INFORMATION SUMMARY

WSPF# OR-NFS-CH-SOIL Rev. 0 (CCP-AK-ORNL-001)

Lot 17

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CCP Characterization Information Summary Cover Page

Waste Stream # OR-NFS-CH-SOIL Lot #: 17

AK Expert Review: N/A Date: N/A

SPM Review: Rick Whiteley Rick Whiteley Date: 07/14/2015

SPM signature certifies that through Acceptable Knowledge testing and/or analysis that the waste identified in this summary is not corrosive, ignitable, reactive, or incompatible with the TSDF.

A summary of the Acceptable Knowledge regarding this waste stream containing specific information about the corrosivity, reactivity, and ignitability of the waste stream is included as an attachment to the Waste Stream Profile Form. By reference, that information is included in this lot.

List of procedures used:

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CCP-TP-030	Rev. 16	04/22/2005 CCP TRU Waste Certification and WWIS Data Entry

Visual Examination (VE):

CCP-TP-113	Rev. 19	06/23/2015 CCP Standard Contact-Handled Waste Visual Examination
CCP-TP-113	Rev. 18	09/25/2013 CCP Standard Contact-Handled Waste Visual Examination
CCP-TP-113	Rev. 17	06/04/2013 CCP Standard Contact-Handled Waste Visual Examination
CCP-TP-113	Rev. 16	04/25/2011 CCP Standard Contact-Handled Waste Visual Examination
CCP-TP-113	Rev. 15	12/29/2010 CCP Standard Contact-Handled Waste Visual Examination
CCP-TP-113	Rev. 14	06/30/2010 CCP Standard Contact-Handled Waste Visual Examination
CCP-TP-113	Rev. 13	03/11/2009 CCP Standard Contact-Handled Waste Visual Examination
CCP-TP-113	Rev. 12	12/01/2008 CCP Standard Contact-Handled Waste Visual Examination
CCP-TP-113	Rev. 11	11/12/2008 CCP Standard Contact-Handled Waste Visual Examination
CCP-TP-113	Rev. 10	07/09/2008 CCP Standard Contact-Handled Waste Visual Examination
CCP-TP-113	Rev. 9	03/05/2008 CCP Standard Waste Visual Examination
CCP-TP-113	Rev. 8	09/04/2007 CCP Standard Waste Visual Examination
CCP-TP-113	Rev. 7	03/19/2007 CCP Standard Waste Visual Examination
CCP-TP-113	Rev. 6	11/16/2006 CCP Standard Waste Visual Examination
CCP-TP-113	Rev. 5	08/28/2006 CCP Standard Waste Visual Examination
CCP-TP-113	Rev. 4	12/22/2005 CCP Standard Waste Visual Examination

WAP Certification:

CCP-PO-001	Rev. 21	05/31/2013 CCP Transuranic Waste Characterization Quality Assurance Project Plan
CCP-PO-001	Rev. 20	06/16/2011 CCP Transuranic Waste Characterization Quality Assurance Project Plan
CCP-PO-001	Rev. 19	12/29/2010 CCP Transuranic Waste Characterization Quality Assurance Project Plan
CCP-PO-001	Rev. 18	06/30/2010 CCP Transuranic Waste Characterization Quality Assurance Project Plan
CCP-PO-001	Rev. 17	06/23/2009 CCP Transuranic Waste Characterization Quality Assurance Project Plan
CCP-PO-001	Rev. 16	10/31/2007 CCP Transuranic Waste Characterization Quality Assurance Project Plan
CCP-PO-001	Rev. 15	08/10/2007 CCP Transuranic Waste Characterization Quality Assurance Project Plan
CCP-PO-001	Rev. 14	03/28/2007 CCP Transuranic Waste Characterization Quality Assurance Project Plan
CCP-PO-001	Rev. 13	11/16/2006 CCP Transuranic Waste Characterization Quality Assurance Project Plan
CCP-PO-001	Rev. 12	03/22/2006 CCP Transuranic Waste Characterization Quality Assurance Project Plan
CCP-PO-001	Rev. 11	03/10/2005 CCP Transuranic Waste Characterization Quality Assurance Project Plan

CCP-PO-002	Rev. 27	05/31/2013 CCP Transuranic Waste Certification Plan
CCP-PO-002	Rev. 26	07/14/2011 CCP Transuranic Waste Certification Plan
CCP-PO-002	Rev. 25	12/29/2010 CCP Transuranic Waste Certification Plan
CCP-PO-002	Rev. 24	06/30/2010 CCP Transuranic Waste Certification Plan
CCP-PO-002	Rev. 23	04/07/2010 CCP Transuranic Waste Certification Plan
CCP-PO-002	Rev. 22	01/12/2010 CCP Transuranic Waste Certification Plan
CCP-PO-002	Rev. 21	01/26/2009 CCP Transuranic Waste Certification Plan
CCP-PO-002	Rev. 20	11/02/2007 CCP Transuranic Waste Certification Plan
CCP-PO-002	Rev. 19	05/22/2007 CCP Transuranic Waste Certification Plan
CCP-PO-002	Rev. 18	11/16/2006 CCP Transuranic Waste Certification Plan
CCP-PO-002	Rev. 17	11/16/2006 CCP Transuranic Waste Certification Plan
CCP-PO-002	Rev. 16	11/16/2006 CCP Transuranic Waste Certification Plan
CCP-PO-002	Rev. 15	03/22/2006 CCP Transuranic Waste Certification Plan
CCP-PO-002	Rev. 14	12/28/2005 CCP Transuranic Waste Certification Plan
CCP-PO-002	Rev. 13	05/09/2005 CCP Transuranic Waste Certification Plan

CCP-PO-003	Rev. 13	07/31/2013	Transuranic Authorized Methods for Payload Control (CCP CH-TRAMPC)
CCP-PO-003	Rev. 12	12/29/2010	Transuranic Authorized Methods for Payload Control (CCP CH-TRAMPC)
CCP-PO-003	Rev. 11	08/04/2009	Transuranic Authorized Methods for Payload Control (CCP CH-TRAMPC)
CCP-PO-003	Rev. 10	11/16/2006	Transuranic Authorized Methods for Payload Control (CCP CH-TRAMPC)
CCP-PO-003	Rev. 9	12/29/2005	Transuranic Authorized Methods for Payload Control (CCP CH-TRAMPC)
CCP-PO-003	Rev. 8	01/25/2005	Transuranic Authorized Methods for Payload Control (CCP CH-TRAMPC)
CCP-PO-003	Rev. 7	11/22/2004	Transuranic Authorized Methods for Payload Control (CCP CH-TRAMPC)
CCP-PO-003	Rev. 6	06/08/2004	Transuranic Authorized Methods for Payload Control (CCP CH-TRAMPC)
CCP-PO-003	Rev. 5	09/19/2003	Transuranic Authorized Methods for Payload Control (CCP CH-TRAMPC)
CCP-PO-003	Rev. 4	02/11/2003	Transuranic Authorized Methods for Payload Control (CCP CH-TRAMPC)
CCP-PO-003	Rev. 3	05/31/2002	Transuranic Authorized Methods for Payload Control (CCP CH-TRAMPC)

CCP Correlation of Container Identification Numbers to Batch Data Report Numbers

Waste Stream: # OR-NFS-CH-SOIL Lot # 17

Container ID Number	Historical Container ID	NDA BDR	RTR BDR	VE BDR	Load/Manage Overpack Yes	Transportation Headspace Gas	
						FGA	GGT
NFS0822A	N/A	OR-IQ3-0510	N/A	ORVECH0126	No	OR15FG8064	N/A
NFS0822B	N/A	OR-IQ3-0510	N/A	ORVECH0126	No	OR15FG8064	N/A
X10C1250822	N/A	OR-IQ3-0513	OR-RTR7-0137	N/A	No	OR15FG8065	N/A
X10C1350957	N/A	OR-IQ3-0514	OR-RTR7-0138	N/A	No	OR15FG8066	N/A
X10C1350960	N/A	OR-IQ3-0514	OR-RTR7-0138	N/A	No	OR15FG8066	N/A
X10C1350963	N/A	OR-IQ3-0514	OR-RTR7-0138	N/A	No	OR15FG8066	N/A
X10C1350967	N/A	OR-IQ3-0513	OR-RTR7-0137	N/A	No	OR15FG8065	N/A
X10C1350970	N/A	OR-IQ3-0512	OR-RTR7-0137	N/A	No	OR15FG8065	N/A
X10C1350977	N/A	OR-IQ3-0513	OR-RTR7-0137	N/A	No	OR15FG8065	N/A
X10C1350978	N/A	OR-IQ3-0512	OR-RTR7-0137	N/A	No	OR15FG8065	N/A

Rick Whiteley — Signature of Site Project Manager
Rick Whiteley — Printed Name
07/14/2015 — Date

CCP RTR/VE Summary of Prohibited Items and AK Confirmation

Waste Stream Number: OR-NFS-CH-SOIL Lot #: 17

Container Number	RTR Prohibited Items [a,b]	Visual Examination Prohibited Items [a,b]	Does the Physical Form of the Waste Match the Waste Stream Description as Determined by AK
See correlation of container ID numbers for list of remaining drum numbers in this Lot.	None of the containers in this lot had prohibited items identified during RTR.	None of the containers in this Lot had prohibited items identified during Visual Examination technique.	The physical form of the waste matches the waste stream description as determined by AK.
a. See Batch Data Reports			
b. If AK has assigned U134 to this waste stream, then any liquids in these containers are prohibited items (not acceptable by the TSDF).			
Justification for the selection of RTR and/or VE: RTR was selected as the characterization method for this lot because the waste was previously packaged and RTR meets all the Data Quality Objectives for NDE for the waste, VE was selected as the characterization method because VE meets the Data Quality Objectives'			

Rick Whiteley — Site Project Manager Signature
Rick Whiteley — Printed Name
07/14/2015 — Date

CCP Reconciliation with Data Quality Objectives

WSPF# OR-NFS-CH-SOIL Rev. 0 Lot # 17

Sampling Completeness

RTR/VE:

Number of Valid Samples: 10 Number of Total Samples Analyzed: 10

Percent Complete: 100 (QAO is 100%)

Radiological:

Number of Valid Samples: 10 Number of Total Samples Analyzed: 10

Percent Complete: 100 (QAO is 100%)

	Y/N/NA	Reconciliation Parameter
1	Y	Waste Matrix Code.
2	Y	Waste Material Parameter Weights.
3	Y	The TRU activity reported in the BDRs for each container demonstrates with a 95% probability that the container of waste contains TRU radioactive waste.
4	N	AK Sufficiency. Is there an approved AK sufficiency Determination for this waste stream?
5	Y	The data demonstrates whether the waste stream exhibits a toxicity characteristic under Title 40 Code of Federal Regulations (CFR), Part 261, Identification and Listing of Hazardous Waste, Subpart C, Characteristics of Hazardous Waste.
6	Y	Does the waste stream contain listed waste found in 20.4.1.200 NMAC incorporating 40 CFR Part 261, Subpart D, Lists of Hazardous Wastes.
7	Y	Waste stream can be classified as hazardous or nonhazardous.
8	Y	The overall completeness, comparability, and representativeness QAOs were met for each of the analytical and testing procedures as specified in the WAP Sections C3-1 through C3-2 prior to submittal of a waste stream profile form for a waste steam or waste stream lot.

	Completeness	Comparability	Representativeness
Radiography	Y	Y	Y
VE	Y	Y	Y

Comments: None

R Whiteley Rick Whiteley 07/14/2015

Signature of Site Project Manager Printed Name Date

DIVIDER PAGE

Attachment 13 - CCP Waste Stream Characterization Checklist

Site(s): ORNL
Waste Stream Number: OR-REDC-CH-HET (CCP-AK-ORNL-002)
Lot # (if applicable) 60
Waste Stream Description: Heterogeneous Debris

Acceptable Knowledge Information or other data points[a]	Characterization Method(s)	Acceptable Knowledge Re-evaluation Required? Yes/No[b]?	Comments[c]
Physical waste form/description	RTR	No	RTR Data Sheets indicate consistency with Attachment 6 of CCP-TP-005.
Waste material parameters weights	RTR	No	RTR Data Sheets indicate consistency with the Waste Material Parameter table as listed in the AK. See additional attached sheets.
Waste percent volume consistent with nondestructive examination or visual examination data and audio/video tapes or equivalent media	RTR	No	RTR Data Sheets indicate consistency with CCP-AK-ORNL-002. See additional attached sheets.
Summary category group assignment	RTR	No	RTR Data Sheets are consistent with CCP-TP-005, Attachment 6.
Waste matrix code assignment	RTR	No	Waste Matrix Code S5400 is consistent with data from RTR data sheets.
Absence of prohibited items	RTR	No	RTR did not identify any prohibited items.
EPA Hazardous Waste Number assignment [d]	AK	No	Characterization results consistent with CCP-AK-ORNL-002.
Toxicity characteristic code assignment	AK	No	Consistent with CCP-AK-ORNL-002.
VOCs from packaging materials or radiolysis present	AK	No	CCP-TP-005 Attachment 5 does not identify any VOCs associated with packaging or radiolysis.
State Hazardous Waste Number assignment	AK	No	No additional State Hazardous Waste codes are identified in CCP-TP-005, Attachment 5.
Radionuclides present	NDA	No	See Additional Comments section and additional sheets attached.
Other radiological parameters: (specify)	NDA	No	No additional radiological parameters identified.

CCP RECORDS ORIGINAL
DATE REC'D 12.3.15 JY

Attachment 13 - CCP Waste Stream Characterization Checklist

Site(s): ORNL
Waste Stream Number: OR-REDC-CH-HET (CCP-AK-ORNL-002) Lot # (if applicable) 60
Waste Stream Description: Heterogeneous Debris

Additional Comments:

- For this waste stream, AK identifies the two most prevalent isotopes, by activity percent, to be: Cm-244 at 74.98% and Pu-241 at 17.39%.
- The two most prevalent isotopes by activity percent for the lot are: 69.91% Cm-244 and 14.85% Pu-241.
- For the waste stream to date, the two most prevalent isotopes by activity percent are: 84.75% Cm-244 and 5.66% Pu-241.

a. Identified in the AK Summary Report or included in the in-process record documentation (e.g., BDR's).

b. If 'Yes,' AK Expert completes an Acceptable Knowledge Re-evaluation Checklist.

c. Identify the source of the waste characterization information (e.g., batch data report).

d. Ensure that, if a toxicity characteristic contaminant is identified, it is not included as a listed waste, and if analytical data regarding the concentration are not available, the corresponding EPA Hazardous Waste Code is applied.

Site Project Manager:

Roger Whiteaker	Roger Whiteaker	3/9/2015
Print	Sign	Date

Acceptable Knowledge Expert:

Jeff Harrison	Jeff Harrison	3/16/15
Print	Sign	Date

NDA Isotopic Activity Percent
OR-REDC-CH-HET
Lot 60

CONTAINERID	NDABDR	CO-60	SR-90	CS-137	EU-154	RA-226	U-232	U-233	U-234	U-235	U-238	NP-237	PU-238	PU-239	PU-240
X10C0402860A	OR-MILCC2-0132	5.09E-05	2.66E-01	1.54E-02		2.07E-05							2.54E-03		5.21E-02
X10C0402862D	OR-MILCC2-0131	2.27E-05	5.78E-02	3.35E-03									7.31E-04		1.50E-02
X10C0402865G	OR-MILCC2-0148		8.60E-05	4.99E-06		6.98E-07							1.96E-02	2.03E-01	8.24E-02
X10C0402868G	OR-MILCC2-0148	5.33E-06	4.34E-03	2.52E-04									2.76E-04		5.66E-03
X10C0402868Q	OR-MILCC2-0148	5.13E-06	1.32E-02	7.66E-04									1.58E-04		3.24E-03
X10C0402891B	OR-MILCC2-0148	1.60E-05	1.94E-02	1.12E-03									1.26E-04		2.58E-03
X10C0402918E	OR-MILCC2-0132	5.38E-06	2.16E-02	1.25E-03									3.50E-04		7.18E-03
X10C0402918I	OR-MILCC2-0132	8.91E-06	1.63E-01	9.44E-03									3.47E-04		7.12E-03
X10C0402939D	OR-MILCC2-0131	1.70E-05	1.09E-01	6.29E-03		4.83E-04							1.02E-03		2.10E-02
X10C0402939E	OR-MILCC2-0131	2.38E-05	2.25E-01	1.31E-02		5.58E-04							1.24E-03		2.54E-02
X10C0402939F	OR-MILCC2-0131	1.48E-05	7.02E-02	4.07E-03		6.35E-04							1.30E-03		2.67E-02
X10C0402939N	OR-MILCC2-0131	3.34E-06	5.88E-02	3.41E-03									1.25E-04		2.56E-03
X10C0402986AF1	OR-MILCC2-0148	4.72E-05	3.54E-01	2.05E-02		2.29E-03							3.72E-02	3.49E-02	5.95E-02
X10C0402986L1	OR-MILCC2-0132	1.73E-06	1.04E-01	6.00E-03		5.79E-06							3.53E-03	3.31E-03	5.64E-03
X10C9311235A	OR-MILCC2-0033		6.58E-05	3.81E-06	1.24E-04							2.64E-06			
X10C9312641A	OR-MILCC2-0034		3.57E-04	2.07E-05								3.06E-06			
X10C9400059A	OR-MILCC2-0149		6.99E-05	4.05E-06											
X10C9400091B	OR-MILCC2-0033		1.89E-05	1.10E-06								3.83E-06	3.71E-02	3.82E-01	1.55E-01
X10CSATN01937P	OR-MILCC2-0148	1.61E-06	8.86E-02	5.13E-03									5.42E-03	5.08E-03	8.66E-03
X10CSATN01937Q	OR-MILCC2-0034	3.13E-06	1.71E-01	9.89E-03									1.20E-02	1.13E-02	1.93E-02
X10CSATN01937Y	OR-MILCC2-0050	4.82E-07	6.22E-03	3.61E-04								8.82E-05	4.72E-03	4.43E-03	7.55E-03
X10CSATN02022P	OR-MILCC2-0132	1.35E-06	1.07E-01	6.23E-03		1.24E-05							1.82E-03	1.71E-03	2.91E-03
X10CSATN02070H	OR-MILCC2-0050	9.33E-07	2.25E-02	1.30E-03									2.09E-03	1.96E-03	3.34E-03
X10CSATN02071N	OR-MILCC2-0149	3.09E-06	4.18E-02	2.42E-03		9.23E-06						2.15E-06	3.99E-03	3.74E-03	6.38E-03
X10CSATN02077A	OR-MILCC2-0132	1.24E-05	1.80E-01	1.05E-02									1.17E-02	1.10E-02	1.88E-02
X10CSATN02077C	OR-MILCC2-0132	7.72E-06	1.97E-01	1.14E-02									5.68E-03	5.33E-03	9.09E-03
X10CSATN02093A	OR-MILCC2-0034		6.03E-02	3.50E-03									3.67E-03	3.44E-03	5.87E-03
X10CSATN02093E	OR-MILCC2-0050	1.16E-06	4.80E-03	2.79E-04									8.71E-04	8.18E-04	1.39E-03
X10CSATN02205B	OR-MILCC2-0131	2.43E-06	3.38E-02	1.96E-03		2.84E-06							2.34E-03	2.20E-03	3.75E-03
X10CSATN02229K1	OR-MILCC2-0148	3.76E-05	2.30E-01	1.33E-02		9.37E-04							2.55E-02	2.40E-02	4.08E-02
X10CSATN02265I	OR-MILCC2-0148		3.61E-02	2.09E-03									3.86E-04	3.62E-04	6.18E-04
X10CSATN02279F	OR-MILCC2-0033	5.05E-06	2.74E-02	1.59E-03								2.15E-06	1.79E-02	1.68E-02	2.86E-02

CONTAINERID	NDABDR	CO-60	SR-90	CS-137	EU-154	RA-226	U-232	U-233	U-234	U-235	U-238	NP-237	PU-238	PU-239	PU-240
X10CSATN02279H	OR-MILCC2-0034	3.44E-07	1.31E-02	7.61E-04									3.73E-03	3.50E-03	5.97E-03
X10CSATN02279I	OR-MILCC2-0149	9.12E-07	2.76E-02	1.60E-03									2.74E-03	2.57E-03	4.39E-03
X10CSATN02279J	OR-MILCC2-0034	3.67E-06	5.34E-02	3.10E-03								2.69E-06	2.13E-02	2.00E-02	3.41E-02
X10CSATN02279K	OR-MILCC2-0034	2.45E-07	6.73E-03	3.90E-04								7.84E-07	1.73E-03	1.62E-03	2.77E-03
X10CSATN02279L	OR-MILCC2-0033	1.75E-06	3.53E-02	2.05E-03									8.78E-03	8.24E-03	1.41E-02
X10CSATN02279M	OR-MILCC2-0034	5.84E-06	5.42E-02	3.14E-03								9.34E-06	1.95E-02	1.83E-02	3.12E-02
X10CSATN02499B	OR-MILCC2-0131		9.46E-03	5.48E-04		1.29E-05							8.41E-02	3.70E-02	2.32E-03
X10CSATN02499J	OR-MILCC2-0050	2.45E-06	2.06E-02	1.19E-03									7.40E-04	6.95E-04	1.18E-03
X10CSATN02607H	OR-MILCC2-0050	4.44E-06	3.01E-02	1.74E-03									2.44E-03	2.29E-03	3.91E-03
X10CSATN02626E	OR-MILCC2-0132	1.50E-06	2.63E-02	1.52E-03		2.70E-05							1.94E-03	1.83E-03	3.11E-03
X10CSATN02634B	OR-MILCC2-0050	3.92E-06	5.92E-02	3.43E-03									4.37E-04	4.10E-04	7.00E-04
X10CSATN02644M	OR-MILCC2-0131	5.77E-07	1.77E-02	1.02E-03		5.34E-05							1.69E-04	1.58E-04	2.70E-04
X10CSATN02645L	OR-MILCC2-0050	8.09E-06	8.47E-02	4.91E-03									8.96E-04	8.41E-04	1.43E-03
X10CSATN02682I	OR-MILCC2-0034	4.20E-06	1.04E-01	6.04E-03									1.31E-03	1.23E-03	2.10E-03
X10CSATN02694J	OR-MILCC2-0132	3.48E-06	1.65E-02	9.56E-04		1.83E-05							1.14E-03	1.07E-03	1.82E-03
X10CSATN02698E	OR-MILCC2-0033	2.45E-06	1.06E-01	6.16E-03									1.97E-03	1.85E-03	3.16E-03
X10CSATN02870F	OR-MILCC2-0050		1.27E-03	7.39E-05								9.51E-06	3.04E-04	2.85E-04	4.87E-04
X10CSATN03042H	OR-MILCC2-0132	5.95E-05	6.45E-02	3.74E-03		5.48E-04							2.17E-02	2.04E-02	3.47E-02
		4.03E-04	3.40E+00	1.97E-01	1.24E-04	5.61E-03						1.24E-04	3.79E-01	8.38E-01	7.76E-01
Total Activity	69.26275502														
		< 0.01 %	4.91 %	0.28 %	< 0.01 %	< 0.01 %						< 0.01 %	0.55 %	1.21 %	1.12 %

Individual Container Activity %

CONTAINERID	NDABDR	CO-60	SR-90	CS-137	EU-154	RA-226	U-232	U-233	U-234	U-235	U-238	NP-237	PU-238	PU-239	PU-240
X10C0402860A	OR-MILCC2-0132	0.00 %	0.39 %	0.04 %		0.00 %							0.03 %		46.83 %
X10C0402862D	OR-MILCC2-0131	0.00 %	0.30 %	0.03 %									0.03 %		46.96 %
X10C0402865G	OR-MILCC2-0148		0.00 %	0.00 %		0.00 %							0.03 %	88.85 %	9.83 %
X10C0402868G	OR-MILCC2-0148	0.00 %	0.07 %	0.01 %									0.03 %		51.87 %
X10C0402868Q	OR-MILCC2-0148	0.00 %	0.33 %	0.03 %									0.03 %		49.93 %
X10C0402891B	OR-MILCC2-0148	0.00 %	0.59 %	0.05 %									0.03 %		47.58 %
X10C0402918E	OR-MILCC2-0132	0.00 %	0.26 %	0.02 %									0.03 %		52.15 %
X10C0402918I	OR-MILCC2-0132	0.00 %	1.72 %	0.16 %									0.03 %		45.64 %
X10C0402939D	OR-MILCC2-0131	0.00 %	0.37 %	0.03 %		0.23 %							0.03 %		43.97 %
X10C0402939E	OR-MILCC2-0131	0.00 %	0.64 %	0.06 %		0.22 %							0.03 %		43.71 %

Supporting Documentation

CONTAINERID	NDABDR	CO-60	SR-90	CS-137	EU-154	RA-226	U-232	U-233	U-234	U-235	U-238	NP-237	PU-238	PU-239	PU-240
X10C0402939F	OR-MILCC2-0131	0.00 %	0.19 %	0.02 %		0.24 %							0.03 %		44.02 %
X10C0402939N	OR-MILCC2-0131	0.00 %	1.73 %	0.16 %									0.03 %		45.97 %
X10C0402986AF1	OR-MILCC2-0148	0.00 %	0.23 %	0.02 %		0.21 %							0.20 %	51.66 %	24.04 %
X10C0402986L1	OR-MILCC2-0132	0.00 %	0.70 %	0.06 %		0.01 %							0.19 %	49.52 %	23.09 %
X10C9311235A	OR-MILCC2-0033		0.00 %	0.00 %	0.00 %							13.06 %			
X10C9312641A	OR-MILCC2-0034		0.00 %	0.00 %								2.47 %			
X10C9400059A	OR-MILCC2-0149		0.01 %	0.00 %											
X10C9400091B	OR-MILCC2-0033		0.00 %	0.00 %								0.08 %	0.03 %	88.61 %	9.81 %
X10CSATN01937P	OR-MILCC2-0148	0.00 %	0.41 %	0.04 %									0.20 %	52.26 %	24.35 %
X10CSATN01937Q	OR-MILCC2-0034	0.00 %	0.36 %	0.03 %									0.20 %	52.14 %	24.32 %
X10CSATN01937Y	OR-MILCC2-0050	0.00 %	0.01 %	0.00 %								17.65 %	0.04 %	10.08 %	4.70 %
X10CSATN02022P	OR-MILCC2-0132	0.00 %	1.44 %	0.13 %		0.02 %							0.20 %	50.87 %	23.68 %
X10CSATN02070H	OR-MILCC2-0050	0.00 %	0.27 %	0.02 %									0.20 %	51.48 %	23.95 %
X10CSATN02071N	OR-MILCC2-0149	0.00 %	0.21 %	0.02 %		0.01 %						2.14 %	0.16 %	42.30 %	19.68 %
X10CSATN02077A	OR-MILCC2-0132	0.00 %	0.39 %	0.04 %									0.20 %	52.51 %	24.50 %
X10CSATN02077C	OR-MILCC2-0132	0.00 %	0.87 %	0.08 %									0.20 %	52.57 %	24.51 %
X10CSATN02093A	OR-MILCC2-0034		0.41 %	0.04 %									0.20 %	52.65 %	24.57 %
X10CSATN02093E	OR-MILCC2-0050	0.00 %	0.14 %	0.01 %									0.20 %	52.52 %	24.43 %
X10CSATN02205B	OR-MILCC2-0131	0.00 %	0.35 %	0.03 %		0.00 %							0.19 %	50.46 %	23.45 %
X10CSATN02229K1	OR-MILCC2-0148	0.00 %	0.23 %	0.02 %		0.13 %							0.20 %	52.03 %	24.26 %
X10CSATN02265I	OR-MILCC2-0148		2.17 %	0.20 %									0.19 %	48.36 %	22.52 %
X10CSATN02279F	OR-MILCC2-0033	0.00 %	0.04 %	0.00 %								0.59 %	0.20 %	52.09 %	24.22 %
X10CSATN02279H	OR-MILCC2-0034	0.00 %	0.09 %	0.01 %									0.20 %	52.75 %	24.60 %
X10CSATN02279I	OR-MILCC2-0149	0.00 %	0.25 %	0.02 %									0.20 %	52.22 %	24.29 %
X10CSATN02279J	OR-MILCC2-0034	0.00 %	0.06 %	0.01 %								0.61 %	0.20 %	52.12 %	24.20 %
X10CSATN02279K	OR-MILCC2-0034	0.00 %	0.09 %	0.01 %								2.14 %	0.19 %	50.54 %	23.53 %
X10CSATN02279L	OR-MILCC2-0033	0.00 %	0.10 %	0.01 %									0.20 %	52.64 %	24.50 %
X10CSATN02279M	OR-MILCC2-0034	0.00 %	0.06 %	0.01 %								1.88 %	0.16 %	42.07 %	19.54 %
X10CSATN02499B	OR-MILCC2-0131		0.01 %	0.00 %		0.00 %							0.79 %	95.29 %	1.63 %
X10CSATN02499J	OR-MILCC2-0050	0.00 %	0.49 %	0.04 %									0.14 %	36.69 %	17.10 %
X10CSATN02607H	OR-MILCC2-0050	0.00 %	0.25 %	0.02 %									0.16 %	42.20 %	19.62 %
X10CSATN02626E	OR-MILCC2-0132	0.00 %	0.33 %	0.03 %		0.05 %							0.20 %	50.92 %	23.73 %
X10CSATN02634B	OR-MILCC2-0050	0.00 %	2.96 %	0.27 %									0.18 %	45.61 %	21.22 %
X10CSATN02644M	OR-MILCC2-0131	0.00 %	1.83 %	0.17 %		0.77 %							0.14 %	36.39 %	16.98 %
X10CSATN02645L	OR-MILCC2-0050	0.00 %	2.17 %	0.20 %									0.19 %	48.17 %	22.38 %
X10CSATN02682I	OR-MILCC2-0034	0.00 %	1.82 %	0.17 %									0.19 %	48.06 %	22.34 %

CONTAINERID	NDABDR	CO-60	SR-90	CS-137	EU-154	RA-226	U-232	U-233	U-234	U-235	U-238	NP-237	PU-238	PU-239	PU-240
X10CSATN02694J	OR-MILCC2-0132	0.00 %	0.34 %	0.03 %		0.05 %							0.19 %	49.35 %	23.01 %
X10CSATN02698E	OR-MILCC2-0033	0.00 %	1.02 %	0.09 %									0.15 %	39.57 %	18.40 %
X10CSATN02870F	OR-MILCC2-0050		0.00 %	0.00 %								4.51 %	0.01 %	1.54 %	0.72 %
X10CSATN03042H	OR-MILCC2-0132	0.00 %	0.07 %	0.01 %		0.09 %							0.20 %	52.02 %	24.26 %

Supporting Documentation

NDA Isotopic Activity Percent
OR-REDC-CH-HET
Lot 60

CONTAINERID	NDABDR	PU-241	PU-242	AM-241	AM-243	CM-243	CM-244	CM-245	CM-246	CF-249
X10C0402860A	OR-MILCC2-0132	5.72E-03	1.27E-05	8.14E-03	3.18E-03		6.23E+00	6.36E-04	4.83E-02	3.80E-05
X10C0402862D	OR-MILCC2-0131	1.64E-03	3.65E-06	9.45E-04	9.14E-04		1.79E+00	1.83E-04	1.39E-02	2.81E-05
X10C0402865G	OR-MILCC2-0148	5.82E-01	2.13E-05	9.38E-02		6.27E-03	6.98E-01	5.49E-05		9.38E-04
X10C0402868G	OR-MILCC2-0148	6.21E-04	1.38E-06	1.34E-04	3.45E-04		2.78E-01	6.91E-05	5.25E-03	6.88E-05
X10C0402868Q	OR-MILCC2-0148	3.55E-04	7.90E-07	8.15E-05	1.97E-04		2.44E-01	3.95E-05	3.00E-03	8.70E-06
X10C0402891B	OR-MILCC2-0148	2.83E-04	6.29E-07	2.41E-04	1.57E-04		2.78E-01	3.14E-05	2.39E-03	3.57E-05
X10C0402918E	OR-MILCC2-0132	7.88E-04	1.75E-06	2.46E-04	4.38E-04		3.16E-01	8.76E-05	6.66E-03	1.27E-05
X10C0402918I	OR-MILCC2-0132	7.81E-04	1.74E-06	2.86E-03	4.34E-04		8.51E-01	8.68E-05	6.59E-03	3.28E-05
X10C0402939D	OR-MILCC2-0131	2.30E-03	5.12E-06	4.45E-02	1.28E-03		2.51E+00	2.56E-04	1.94E-02	6.40E-05
X10C0402939E	OR-MILCC2-0131	2.78E-03	6.19E-06	5.78E-02	1.55E-03		3.03E+00	3.09E-04	2.35E-02	7.01E-05
X10C0402939F	OR-MILCC2-0131	2.93E-03	6.50E-06	5.53E-02	1.63E-03		3.19E+00	3.25E-04	2.47E-02	2.98E-05
X10C0402939N	OR-MILCC2-0131	2.81E-04	6.24E-07	6.78E-04	1.56E-04		3.06E-01	3.12E-05	2.37E-03	3.67E-05
X10C0402986AF1	OR-MILCC2-0148	5.88E-01	5.73E-05	9.43E-02	4.00E-03		4.84E+00	5.72E-04	3.89E-02	7.39E-05
X10C0402986L1	OR-MILCC2-0132	5.58E-02	5.43E-06	2.31E-02	3.80E-04		4.59E-01	5.43E-05	3.69E-03	6.67E-06
X10C9311235A	OR-MILCC2-0033			7.39E-03	4.54E-03					1.61E-04
X10C9312641A	OR-MILCC2-0034	4.86E+00		2.13E-01	1.24E-02			5.37E-05		4.72E-05
X10C9400059A	OR-MILCC2-0149			1.07E-02						1.78E-02
X10C9400091B	OR-MILCC2-0033	1.13E+00	4.01E-05	2.77E-01		2.36E-03		1.12E-05		1.40E-03
X10CSATN01937P	OR-MILCC2-0148	8.56E-02	8.34E-06	7.46E-03	5.83E-04		7.05E-01	8.33E-05	5.67E-03	3.32E-05
X10CSATN01937Q	OR-MILCC2-0034	1.90E-01	1.85E-05	1.94E-02	1.30E-03		1.57E+00	1.85E-04	1.26E-02	2.47E-05
X10CSATN01937Y	OR-MILCC2-0050	7.46E-02	7.27E-06	1.54E+00	5.08E-04		6.14E-01	7.26E-05	4.94E-03	2.38E-06
X10CSATN02022P	OR-MILCC2-0132	2.88E-02	2.80E-06	5.32E-03	1.96E-04		2.37E-01	2.80E-05	1.90E-03	
X10CSATN02070H	OR-MILCC2-0050	3.30E-02	3.21E-06	6.49E-03	2.25E-04		2.72E-01	3.21E-05	2.18E-03	9.26E-06
X10CSATN02071N	OR-MILCC2-0149	6.31E-02	6.14E-06	8.93E-02	4.29E-04		5.19E-01	6.14E-05	4.17E-03	1.92E-05
X10CSATN02077A	OR-MILCC2-0132	1.85E-01	1.81E-05	9.76E-03	1.26E-03		1.53E+00	1.80E-04	1.23E-02	3.62E-05
X10CSATN02077C	OR-MILCC2-0132	8.99E-02	8.75E-06	1.49E-03	6.12E-04		7.40E-01	8.75E-05	5.95E-03	3.30E-05
X10CSATN02093A	OR-MILCC2-0034	5.80E-02	5.65E-06	2.18E-03	3.95E-04		4.78E-01	5.65E-05	3.84E-03	2.79E-05
X10CSATN02093E	OR-MILCC2-0050	1.38E-02	1.34E-06	1.11E-03	9.38E-05		1.13E-01	1.34E-05	9.12E-04	1.67E-06
X10CSATN02205B	OR-MILCC2-0131	3.71E-02	3.61E-06	1.19E-02	2.52E-04		3.05E-01	3.61E-05	2.45E-03	1.47E-05
X10CSATN02229K1	OR-MILCC2-0148	4.04E-01	3.93E-05	4.79E-02	2.75E-03		3.32E+00	3.93E-04	2.67E-02	6.52E-05
X10CSATN02265I	OR-MILCC2-0148	6.11E-03	5.95E-07	2.80E-03	4.16E-05		5.03E-02	5.94E-06	4.04E-04	
X10CSATN02279F	OR-MILCC2-0033	2.83E-01	2.76E-05	2.87E-02	1.93E-03		2.33E+00	2.75E-04	1.87E-02	1.83E-05

CONTAINERID	NDABDR	PU-241	PU-242	AM-241	AM-243	CM-243	CM-244	CM-245	CM-246	CF-249
X10CSATN02279H	OR-MILCC2-0034	5.90E-02	5.74E-06	2.98E-03	4.02E-04		4.86E-01	5.74E-05	3.90E-03	1.74E-06
X10CSATN02279I	OR-MILCC2-0149	4.33E-02	4.22E-06	4.63E-03	2.95E-04		3.57E-01	4.22E-05	2.87E-03	1.87E-06
X10CSATN02279J	OR-MILCC2-0034	3.37E-01	3.28E-05	3.26E-02	2.30E-03		2.78E+00	3.28E-04	2.23E-02	1.40E-05
X10CSATN02279K	OR-MILCC2-0034	2.74E-02	2.66E-06	5.06E-03	1.86E-04		2.25E-01	2.66E-05	1.81E-03	8.16E-07
X10CSATN02279L	OR-MILCC2-0033	1.39E-01	1.35E-05	9.57E-03	9.46E-04		1.14E+00	1.35E-04	9.19E-03	5.18E-05
X10CSATN02279M	OR-MILCC2-0034	3.08E-01	3.00E-05	4.59E-01	2.10E-03		2.54E+00	3.00E-04	2.04E-02	2.78E-05
X10CSATN02499B	OR-MILCC2-0131	6.56E-02	3.59E-06	3.72E-02	6.79E-05		1.25E-01	6.15E-06		9.45E-06
X10CSATN02499J	OR-MILCC2-0050	1.17E-02	1.14E-06	3.20E-02	7.97E-05		9.64E-02	1.14E-05	7.74E-04	5.88E-06
X10CSATN02607H	OR-MILCC2-0050	3.86E-02	3.76E-06	6.16E-02	2.63E-04		3.18E-01	3.76E-05	2.55E-03	1.39E-05
X10CSATN02626E	OR-MILCC2-0132	3.08E-02	3.00E-06	7.78E-03	2.09E-04		2.53E-01	2.99E-05	2.03E-03	3.88E-06
X10CSATN02634B	OR-MILCC2-0050	6.92E-03	6.73E-07	5.57E-03	4.71E-05		5.69E-02	6.73E-06	4.57E-04	2.33E-06
X10CSATN02644M	OR-MILCC2-0131	2.67E-03	2.60E-07	6.93E-03	1.82E-05		2.20E-02	2.59E-06	1.76E-04	1.82E-06
X10CSATN02645L	OR-MILCC2-0050	1.42E-02	1.38E-06	7.06E-03	9.65E-05		1.17E-01	1.38E-05	9.38E-04	1.06E-05
X10CSATN02682I	OR-MILCC2-0034	2.08E-02	2.02E-06	1.11E-02	1.41E-04		1.71E-01	2.02E-05	1.37E-03	7.76E-06
X10CSATN02694J	OR-MILCC2-0132	1.80E-02	1.75E-06	6.76E-03	1.23E-04		1.81E-01	1.75E-05	1.19E-03	1.60E-05
X10CSATN02698E	OR-MILCC2-0033	3.12E-02	3.04E-06	6.39E-02	2.13E-04		2.57E-01	3.04E-05	2.07E-03	1.34E-05
X10CSATN02870F	OR-MILCC2-0050	4.81E-03	4.68E-07	9.51E-01	3.28E-05		3.96E-02	4.68E-06	3.18E-04	1.09E-06
X10CSATN03042H	OR-MILCC2-0132	3.43E-01	3.34E-05	1.03E-01	2.34E-03		1.45E+00	3.34E-04	2.27E-02	6.41E-05
		1.03E+01	4.60E-04	4.47E+00	5.20E-02	8.63E-03	4.84E+01	5.71E-03	3.96E-01	2.14E-02
Total Activity	69.26275502									
		14.85 %	< 0.01 %	6.46 %	0.08 %	0.01 %	69.91 %	< 0.01 %	0.57 %	0.03 %

Individual Container Activity %

CONTAINERID	NDABDR	PU-241	PU-242	AM-241	AM-243	CM-243	CM-244	CM-245	CM-246	CF-249
X10C0402860A	OR-MILCC2-0132	0.01 %	0.66 %	0.48 %	3.24 %		15.60 %	0.75 %	31.97 %	0.00 %
X10C0402862D	OR-MILCC2-0131	0.01 %	0.66 %	0.20 %	3.25 %		15.65 %	0.75 %	32.16 %	0.00 %
X10C0402865G	OR-MILCC2-0148	0.15 %	0.15 %	0.74 %		0.00 %	0.23 %	0.01 %		0.01 %
X10C0402868G	OR-MILCC2-0148	0.01 %	0.73 %	0.08 %	3.60 %		7.10 %	0.84 %	35.62 %	0.03 %
X10C0402868Q	OR-MILCC2-0148	0.01 %	0.70 %	0.08 %	3.45 %		10.47 %	0.80 %	34.15 %	0.01 %
X10C0402891B	OR-MILCC2-0148	0.01 %	0.66 %	0.29 %	3.28 %		14.23 %	0.76 %	32.47 %	0.04 %
X10C0402918E	OR-MILCC2-0132	0.01 %	0.73 %	0.12 %	3.61 %		6.40 %	0.84 %	35.81 %	0.01 %
X10C0402918I	OR-MILCC2-0132	0.01 %	0.64 %	1.22 %	3.16 %		15.31 %	0.73 %	31.35 %	0.01 %
X10C0402939D	OR-MILCC2-0131	0.01 %	0.62 %	6.19 %	3.05 %		14.66 %	0.71 %	30.12 %	0.01 %
X10C0402939E	OR-MILCC2-0131	0.01 %	0.61 %	6.56 %	3.02 %		14.56 %	0.70 %	29.89 %	0.01 %

Supporting Documentation

CONTAINERID	NDABDR	PU-241	PU-242	AM-241	AM-243	CM-243	CM-244	CM-245	CM-246	CF-249
X10C0402939F	OR-MILCC2-0131	0.01 %	0.62 %	6.06 %	3.06 %		14.75 %	0.71 %	30.29 %	0.00 %
X10C0402939N	OR-MILCC2-0131	0.01 %	0.64 %	0.81 %	3.17 %		15.30 %	0.74 %	31.41 %	0.04 %
X10C0402986AF1	OR-MILCC2-0148	0.52 %	1.33 %	2.52 %	1.84 %		5.46 %	0.31 %	11.65 %	0.00 %
X10C0402986L1	OR-MILCC2-0132	0.50 %	1.28 %	6.23 %	1.76 %		5.23 %	0.29 %	11.13 %	0.00 %
X10C9311235A	OR-MILCC2-0033			7.51 %	79.29 %					0.14 %
X10C9312641A	OR-MILCC2-0034	26.84 %		35.25 %	35.25 %			0.18 %		0.01 %
X10C9400059A	OR-MILCC2-0149			41.79 %						58.21 %
X10C9400091B	OR-MILCC2-0033	0.16 %	0.15 %	1.16 %		0.00 %		0.00 %		0.00 %
X10CSATN01937P	OR-MILCC2-0148	0.53 %	1.34 %	1.38 %	1.86 %		5.52 %	0.31 %	11.79 %	0.01 %
X10CSATN01937Q	OR-MILCC2-0034	0.53 %	1.34 %	1.62 %	1.86 %		5.53 %	0.31 %	11.75 %	0.00 %
X10CSATN01937Y	OR-MILCC2-0050	0.10 %	0.26 %	63.40 %	0.36 %		1.07 %	0.06 %	2.27 %	0.00 %
X10CSATN02022P	OR-MILCC2-0132	0.52 %	1.31 %	2.87 %	1.81 %		5.38 %	0.30 %	11.47 %	
X10CSATN02070H	OR-MILCC2-0050	0.52 %	1.33 %	3.08 %	1.82 %		5.44 %	0.30 %	11.58 %	0.00 %
X10CSATN02071N	OR-MILCC2-0149	0.43 %	1.09 %	18.21 %	1.51 %		4.47 %	0.25 %	9.52 %	0.00 %
X10CSATN02077A	OR-MILCC2-0132	0.53 %	1.36 %	0.84 %	1.87 %		5.58 %	0.31 %	11.87 %	0.00 %
X10CSATN02077C	OR-MILCC2-0132	0.53 %	1.36 %	0.27 %	1.87 %		5.56 %	0.31 %	11.86 %	0.00 %
X10CSATN02093A	OR-MILCC2-0034	0.53 %	1.36 %	0.60 %	1.88 %		5.57 %	0.31 %	11.86 %	0.01 %
X10CSATN02093E	OR-MILCC2-0050	0.53 %	1.35 %	1.29 %	1.87 %		5.53 %	0.31 %	11.82 %	0.00 %
X10CSATN02205B	OR-MILCC2-0131	0.51 %	1.30 %	4.92 %	1.79 %		5.33 %	0.30 %	11.36 %	0.01 %
X10CSATN02229K1	OR-MILCC2-0148	0.53 %	1.34 %	1.89 %	1.85 %		5.50 %	0.31 %	11.73 %	0.00 %
X10CSATN02265I	OR-MILCC2-0148	0.49 %	1.25 %	6.77 %	1.72 %		5.12 %	0.29 %	10.93 %	
X10CSATN02279F	OR-MILCC2-0033	0.53 %	1.34 %	1.61 %	1.85 %		5.50 %	0.31 %	11.72 %	0.00 %
X10CSATN02279H	OR-MILCC2-0034	0.53 %	1.36 %	0.81 %	1.88 %		5.57 %	0.31 %	11.88 %	0.00 %
X10CSATN02279I	OR-MILCC2-0149	0.53 %	1.35 %	1.70 %	1.86 %		5.51 %	0.31 %	11.75 %	0.00 %
X10CSATN02279J	OR-MILCC2-0034	0.53 %	1.34 %	1.53 %	1.86 %		5.50 %	0.31 %	11.73 %	0.00 %
X10CSATN02279K	OR-MILCC2-0034	0.51 %	1.30 %	2.85 %	1.80 %		5.34 %	0.30 %	11.38 %	0.00 %
X10CSATN02279L	OR-MILCC2-0033	0.53 %	1.35 %	1.10 %	1.87 %		5.54 %	0.31 %	11.83 %	0.01 %
X10CSATN02279M	OR-MILCC2-0034	0.43 %	1.08 %	19.11 %	1.50 %		4.45 %	0.25 %	9.47 %	0.00 %
X10CSATN02499B	OR-MILCC2-0131	0.10 %	0.15 %	1.73 %	0.05 %		0.25 %	0.01 %		0.00 %
X10CSATN02499J	OR-MILCC2-0050	0.37 %	0.95 %	30.57 %	1.30 %		3.87 %	0.22 %	8.26 %	0.00 %
X10CSATN02607H	OR-MILCC2-0050	0.43 %	1.09 %	20.53 %	1.49 %		4.46 %	0.25 %	9.49 %	0.00 %
X10CSATN02626E	OR-MILCC2-0132	0.52 %	1.31 %	3.93 %	1.82 %		5.39 %	0.30 %	11.48 %	0.00 %
X10CSATN02634B	OR-MILCC2-0050	0.46 %	1.17 %	11.16 %	1.62 %		4.82 %	0.27 %	10.26 %	0.00 %
X10CSATN02644M	OR-MILCC2-0131	0.37 %	0.94 %	28.83 %	1.30 %		3.85 %	0.22 %	8.21 %	0.01 %
X10CSATN02645L	OR-MILCC2-0050	0.49 %	1.24 %	7.30 %	1.71 %		5.06 %	0.28 %	10.80 %	0.01 %
X10CSATN02682I	OR-MILCC2-0034	0.49 %	1.24 %	7.85 %	1.71 %		5.07 %	0.28 %	10.79 %	0.00 %

CONTAINERID	NDABDR	PU-241	PU-242	AM-241	AM-243	CM-243	CM-244	CM-245	CM-246	CF-249
X10CSATN02694J	OR-MILCC2-0132	0.50 %	1.27 %	5.65 %	1.76 %		6.40 %	0.29 %	11.13 %	0.01 %
X10CSATN02698E	OR-MILCC2-0033	0.40 %	1.02 %	24.62 %	1.40 %		4.18 %	0.23 %	8.91 %	0.00 %
X10CSATN02870F	OR-MILCC2-0050	0.02 %	0.04 %	92.60 %	0.05 %		0.16 %	0.01 %	0.35 %	0.00 %
X10CSATN03042H	OR-MILCC2-0132	0.53 %	1.34 %	4.77 %	1.86 %		2.82 %	0.31 %	11.72 %	0.00 %

NDA Isotopic Activity Percent Rollup
OR-REDC-CH-HET
Lots 1 Thru 60

		CO-60	SR-90	NB-94	RU-106	SB-125	CS-134	CS-137	EU-152	EU-154	RA-226	AC-227	TH-232	TH-229	U-235	U-233	U-234	U-232	U-238	NP-237
		1.04E-02	5.44E+01	3.04E-04		3.60E-03	2.96E-04	3.16E+00	2.73E-03	4.82E-02	6.87E-02	6.25E-03	2.45E-06	3.97E-05	7.43E-05	9.66E-02	5.20E-03	4.04E-03	1.88E-03	7.52E-03
		1.04E-02	5.44E+01	3.04E-04		3.60E-03	2.96E-04	3.16E+00	2.73E-03	4.82E-02	6.87E-02	6.25E-03	2.45E-06	3.97E-05	7.43E-05	9.66E-02	5.20E-03	4.04E-03	1.88E-03	7.52E-03
Total Activity	2.12E+03																			
		< 0.01 %	2.57 %	< 0.01 %		< 0.01 %	< 0.01 %	0.15 %	< 0.01 %	< 0.01 %	< 0.01 %	< 0.01 %	< 0.01 %	< 0.01 %	< 0.01 %	< 0.01 %	< 0.01 %	< 0.01 %	< 0.01 %	< 0.01 %

NDA Isotopic Activity Percent Rollup
OR-REDC-CH-HET
Lots 1 Thru 60

		PU-238	PU-241	PU-239	PU-242	PU-240	AM-243	AM-241	CM-248	CM-243	CM-245	CM-246	CM-244	CF-251	CF-250	CF-249	CF-252
		2.99E+01	1.20E+02	1.48E+01	5.20E-02	2.61E+01	1.52E+00	5.31E+01	1.79E-04	1.63E-02	2.59E-01	1.90E+01	1.79E+03	1.39E-06	2.05E-02	1.71E-01	3.18E-03
		2.99E+01	1.20E+02	1.48E+01	5.20E-02	2.61E+01	1.52E+00	5.31E+01	1.79E-04	1.63E-02	2.59E-01	1.90E+01	1.79E+03	1.39E-06	2.05E-02	1.71E-01	3.18E-03
Total Activity	2.12E+03																
		1.41 %	5.66 %	0.70 %	< 0.01 %	1.23 %	0.07 %	2.51 %	< 0.01 %	< 0.01 %	0.01 %	0.90 %	84.75 %	< 0.01 %	< 0.01 %	< 0.01 %	< 0.01 %

RTR Data
OR-REDC-CH-HET
Lot 60

Batch Data Report No.	Container	Cellulosics (kg)	Plastics (kg)	Rubber (kg)	Organic Matrix (kg)	Inorganic Matrix (kg)	Iron-based Metals (kg)	Aluminum-based Metals (kg)	Other Metals (kg)	Other Inorganics (kg)	Soils/Gravel (kg)	Total Organic (kg)	Total Inorganic (kg)	Total Waste Weight (kg)
OR-RTR7-0056	X10C0402860A	1	9.2				2		1	1.5		10.2	4.5	14.7
OR-RTR7-0056	X10C0402862D		7.7				2		0.5	1.5		7.7	4	11.7
OR-RTR6-0609	X10C0402865G		8				9.9			9		8	18.9	26.9
OR-RTR7-0037	X10C0402868G	8	11.7	0.1			6			6		19.8	12	31.8
OR-RTR7-0037	X10C0402868Q	3	8.3				6			4		11.3	10	21.3
OR-RTR6-0609	X10C0402891B		15				3			12.6		15	15.6	30.6
OR-RTR7-0057	X10C0402918E	2	11.4	0.5			5			2		13.9	7	20.9
OR-RTR7-0057	X10C0402918I		7.6				8			4		7.6	12	19.6
OR-RTR7-0057	X10C0402939D	1	6				9.5			5		7	14.5	21.5
OR-RTR7-0057	X10C0402939E	1	8				8.2			5		9	13.2	22.2
OR-RTR7-0057	X10C0402939F	0.1	5				11.9			0.5		5.1	12.4	17.5
OR-RTR7-0057	X10C0402939N	4	6				19.5	7.5		2		10	29	39
OR-RTR7-0036	X10C0402986AF1	4.5	6.3				9.5		0.1	26.4		10.8	36	46.8
OR-RTR7-0057	X10C0402986L1	5	8				12			25.4		13	37.4	50.4
OR-RTR7-0018	X10C9311235A	2	7.8				1			4		9.8	5	14.8
OR-RTR7-0038	X10C9312641A		10.5				22.3		5	9		10.5	36.3	46.8
OR-RTR6-0503	X10C9400059A		12				10			18.8		12	28.8	40.8
OR-RTR7-0016	X10C9400091B		5				4.5		0.3	4		5	8.8	13.8
OR-RTR7-0036	X10CSATN01937P	2	6.8	1			3			2		9.8	5	14.8
OR-RTR7-0038	X10CSATN01937Q	3.5	15				3.3			3		18.5	6.3	24.8
OR-RTR7-0022	X10CSATN01937Y	3.5	3.8				4			0.5		7.3	4.5	11.8
OR-RTR7-0057	X10CSATN02022P	4	7.3				3	2		3		11.3	8	19.3
OR-RTR7-0022	X10CSATN02070H	2.6	3.3				10.5			1.4		5.9	11.9	17.8
OR-RTR6-0503	X10CSATN02071N	2	5.8				2			5		7.8	7	14.8
OR-RTR7-0057	X10CSATN02077A		12.6				8	20		5		12.6	33	45.6
OR-RTR7-0057	X10CSATN02077C		6				8.5	4				6	12.5	18.5
OR-RTR6-0485	X10CSATN02093A	4	7.8				4			2		11.8	6	17.8
OR-RTR7-0022	X10CSATN02093E	2.2	5.8				3		4	0.8		8	7.8	15.8
OR-RTR7-0057	X10CSATN02205B	2	6				7.2			4		8	11.2	19.2
OR-RTR7-0036	X10CSATN02229K1	4	7.8				6	15		5		11.8	26	37.8
OR-RTR6-0609	X10CSATN02265I	8	10				2.5			10		18	12.5	30.5
OR-RTR7-0021	X10CSATN02279F		9.5				2.3			2		9.5	4.3	13.8
OR-RTR7-0021	X10CSATN02279H	1	7.1				2.5			0.2		8.1	2.7	10.8

RTR Data
OR-REDC-CH-HET
Lot 60

OR-RTR6-0503	X10CSATN02279I		6.3				2.5			2		6.3	4.5	10.8
OR-RTR7-0021	X10CSATN02279J	3.5	6				7			2.3		9.5	9.3	18.8
OR-RTR7-0021	X10CSATN02279K	3	4.5				2			0.3		7.5	2.3	9.8
OR-RTR7-0021	X10CSATN02279L	0.1	9				3.3			1.4		9.1	4.7	13.8
OR-RTR7-0021	X10CSATN02279M	5	6.2				15		0.1	2.5		11.2	17.6	28.8
OR-RTR7-0057	X10CSATN02499B		4				18.4			3		4	21.4	25.4
OR-RTR6-0467	X10CSATN02499J	2	6.8				6			5		8.8	11	19.8
OR-RTR6-0458	X10CSATN02607H		8.6	1			2.8		3	1.4		9.6	7.2	16.8
OR-RTR7-0057	X10CSATN02626E		6.6				3			5		6.6	8	14.6
OR-RTR6-0457	X10CSATN02634B	3.5	5.3				4		8.5	0.5		8.8	13	21.8
OR-RTR7-0057	X10CSATN02644M	2	5				8.3					7	8.3	15.3
OR-RTR6-0458	X10CSATN02645L	3	7.3				1.5			2		10.3	3.5	13.8
OR-RTR6-0485	X10CSATN02682I	4	8				4.3		3	2.5		12	9.8	21.8
OR-RTR7-0057	X10CSATN02694J	2	5				6	2	8.4	4		7	20.4	27.4
OR-RTR6-0477	X10CSATN02698E	3	5				5.3		8	4.5		8	17.8	25.8
OR-RTR7-0065	X10CSATN02870F	2	7				6		2	3		9	11	20
OR-RTR7-0057	X10CSATN03042H	3	8				11.5			10		11	21.5	32.5

RTR Data
OR-REDC-CH-HET
Lot 60

Batch Data Report No.	Container	Cellulosics Weight %	Plastics Weight %	Rubber Weight %	Organic Matrix Weight %	Inorganic Matrix Weight %	Iron-based Metals Weight %	Aluminum-based Metals Weight %	Other Metals Weight %	Other Inorganics Weight %	Soils/gravel Weight %
OR-RTR7-0056	X10C0402860A	6.80 %	62.59 %	.00 %	.00 %	.00 %	13.61 %	.00 %	6.80 %	10.20 %	.00 %
OR-RTR7-0056	X10C0402862D	.00 %	65.81 %	.00 %	.00 %	.00 %	17.09 %	.00 %	4.27 %	12.82 %	.00 %
OR-RTR6-0609	X10C0402865G	.00 %	29.74 %	.00 %	.00 %	.00 %	36.80 %	.00 %	.00 %	33.46 %	.00 %
OR-RTR7-0037	X10C0402868G	25.16 %	36.79 %	.31 %	.00 %	.00 %	18.87 %	.00 %	.00 %	18.87 %	.00 %
OR-RTR7-0037	X10C0402868Q	14.08 %	38.97 %	.00 %	.00 %	.00 %	28.17 %	.00 %	.00 %	18.78 %	.00 %
OR-RTR6-0609	X10C0402891B	.00 %	49.02 %	.00 %	.00 %	.00 %	9.80 %	.00 %	.00 %	41.18 %	.00 %
OR-RTR7-0057	X10C0402918E	9.57 %	54.55 %	2.39 %	.00 %	.00 %	23.92 %	.00 %	.00 %	9.57 %	.00 %
OR-RTR7-0057	X10C0402918I	.00 %	38.78 %	.00 %	.00 %	.00 %	40.82 %	.00 %	.00 %	20.41 %	.00 %
OR-RTR7-0057	X10C0402939D	4.65 %	27.91 %	.00 %	.00 %	.00 %	44.19 %	.00 %	.00 %	23.26 %	.00 %
OR-RTR7-0057	X10C0402939E	4.50 %	36.04 %	.00 %	.00 %	.00 %	36.94 %	.00 %	.00 %	22.52 %	.00 %
OR-RTR7-0057	X10C0402939F	.57 %	28.57 %	.00 %	.00 %	.00 %	68.00 %	.00 %	.00 %	2.86 %	.00 %
OR-RTR7-0057	X10C0402939N	10.26 %	15.38 %	.00 %	.00 %	.00 %	50.00 %	19.23 %	.00 %	5.13 %	.00 %
OR-RTR7-0036	X10C0402986AF1	9.62 %	13.46 %	.00 %	.00 %	.00 %	20.30 %	.00 %	.21 %	56.41 %	.00 %
OR-RTR7-0057	X10C0402986L1	9.92 %	15.87 %	.00 %	.00 %	.00 %	23.81 %	.00 %	.00 %	50.40 %	.00 %
OR-RTR7-0018	X10C9311235A	13.51 %	52.70 %	.00 %	.00 %	.00 %	6.76 %	.00 %	.00 %	27.03 %	.00 %
OR-RTR7-0038	X10C9312641A	.00 %	22.44 %	.00 %	.00 %	.00 %	47.65 %	.00 %	10.68 %	19.23 %	.00 %
OR-RTR6-0503	X10C9400059A	.00 %	29.41 %	.00 %	.00 %	.00 %	24.51 %	.00 %	.00 %	46.08 %	.00 %
OR-RTR7-0016	X10C9400091B	.00 %	36.23 %	.00 %	.00 %	.00 %	32.61 %	.00 %	2.17 %	28.99 %	.00 %
OR-RTR7-0036	X10CSATN01937P	13.51 %	45.95 %	6.76 %	.00 %	.00 %	20.27 %	.00 %	.00 %	13.51 %	.00 %
OR-RTR7-0038	X10CSATN01937Q	14.11 %	60.48 %	.00 %	.00 %	.00 %	13.31 %	.00 %	.00 %	12.10 %	.00 %
OR-RTR7-0022	X10CSATN01937Y	29.66 %	32.20 %	.00 %	.00 %	.00 %	33.90 %	.00 %	.00 %	4.24 %	.00 %
OR-RTR7-0057	X10CSATN02022P	20.73 %	37.82 %	.00 %	.00 %	.00 %	15.54 %	10.36 %	.00 %	15.54 %	.00 %
OR-RTR7-0022	X10CSATN02070H	14.61 %	18.54 %	.00 %	.00 %	.00 %	58.99 %	.00 %	.00 %	7.87 %	.00 %
OR-RTR6-0503	X10CSATN02071N	13.51 %	39.19 %	.00 %	.00 %	.00 %	13.51 %	.00 %	.00 %	33.78 %	.00 %
OR-RTR7-0057	X10CSATN02077A	.00 %	27.63 %	.00 %	.00 %	.00 %	17.54 %	43.86 %	.00 %	10.96 %	.00 %
OR-RTR7-0057	X10CSATN02077C	.00 %	32.43 %	.00 %	.00 %	.00 %	45.95 %	21.62 %	.00 %	.00 %	.00 %
OR-RTR6-0485	X10CSATN02093A	22.47 %	43.82 %	.00 %	.00 %	.00 %	22.47 %	.00 %	.00 %	11.24 %	.00 %
OR-RTR7-0022	X10CSATN02093E	13.92 %	36.71 %	.00 %	.00 %	.00 %	18.99 %	.00 %	25.32 %	5.06 %	.00 %
OR-RTR7-0057	X10CSATN02205B	10.42 %	31.25 %	.00 %	.00 %	.00 %	37.50 %	.00 %	.00 %	20.83 %	.00 %
OR-RTR7-0036	X10CSATN02229K1	10.58 %	20.63 %	.00 %	.00 %	.00 %	15.87 %	39.68 %	.00 %	13.23 %	.00 %
OR-RTR6-0609	X10CSATN02265I	26.23 %	32.79 %	.00 %	.00 %	.00 %	8.20 %	.00 %	.00 %	32.79 %	.00 %
OR-RTR7-0021	X10CSATN02279F	.00 %	68.84 %	.00 %	.00 %	.00 %	16.67 %	.00 %	.00 %	14.49 %	.00 %
OR-RTR7-0021	X10CSATN02279H	9.26 %	65.74 %	.00 %	.00 %	.00 %	23.15 %	.00 %	.00 %	1.85 %	.00 %

RTR Data
OR-REDC-CH-HET
Lot 60

OR-RTR6-0503	X10CSATN02279I	.00 %	58.33 %	.00 %	.00 %	.00 %	23.15 %	.00 %	.00 %	18.52 %	.00 %
OR-RTR7-0021	X10CSATN02279J	18.62 %	31.91 %	.00 %	.00 %	.00 %	37.23 %	.00 %	.00 %	12.23 %	.00 %
OR-RTR7-0021	X10CSATN02279K	30.61 %	45.92 %	.00 %	.00 %	.00 %	20.41 %	.00 %	.00 %	3.06 %	.00 %
OR-RTR7-0021	X10CSATN02279L	.72 %	65.22 %	.00 %	.00 %	.00 %	23.91 %	.00 %	.00 %	10.14 %	.00 %
OR-RTR7-0021	X10CSATN02279M	17.36 %	21.53 %	.00 %	.00 %	.00 %	52.08 %	.00 %	.35 %	8.68 %	.00 %
OR-RTR7-0057	X10CSATN02499B	.00 %	15.75 %	.00 %	.00 %	.00 %	72.44 %	.00 %	.00 %	11.81 %	.00 %
OR-RTR6-0467	X10CSATN02499J	10.10 %	34.34 %	.00 %	.00 %	.00 %	30.30 %	.00 %	.00 %	25.25 %	.00 %
OR-RTR6-0458	X10CSATN02607H	.00 %	51.19 %	5.95 %	.00 %	.00 %	16.67 %	.00 %	17.86 %	8.33 %	.00 %
OR-RTR7-0057	X10CSATN02626E	.00 %	45.21 %	.00 %	.00 %	.00 %	20.55 %	.00 %	.00 %	34.25 %	.00 %
OR-RTR6-0457	X10CSATN02634B	16.06 %	24.31 %	.00 %	.00 %	.00 %	18.35 %	.00 %	38.99 %	2.29 %	.00 %
OR-RTR7-0057	X10CSATN02644M	13.07 %	32.68 %	.00 %	.00 %	.00 %	54.25 %	.00 %	.00 %	.00 %	.00 %
OR-RTR6-0458	X10CSATN02645L	21.74 %	52.90 %	.00 %	.00 %	.00 %	10.87 %	.00 %	.00 %	14.49 %	.00 %
OR-RTR6-0485	X10CSATN02682I	18.35 %	36.70 %	.00 %	.00 %	.00 %	19.72 %	.00 %	13.76 %	11.47 %	.00 %
OR-RTR7-0057	X10CSATN02694J	7.30 %	18.25 %	.00 %	.00 %	.00 %	21.90 %	7.30 %	30.66 %	14.60 %	.00 %
OR-RTR6-0477	X10CSATN02698E	11.63 %	19.38 %	.00 %	.00 %	.00 %	20.54 %	.00 %	31.01 %	17.44 %	.00 %
OR-RTR7-0065	X10CSATN02870F	10.00 %	35.00 %	.00 %	.00 %	.00 %	30.00 %	.00 %	10.00 %	15.00 %	.00 %
OR-RTR7-0057	X10CSATN03042H	9.23 %	24.62 %	.00 %	.00 %	.00 %	35.38 %	.00 %	.00 %	30.77 %	.00 %

Total Lot Weight %								
Cellulosics Weight %	Plastics Weight %	Rubber Weight %	Organic Matrix Weight %	Inorganic Matrix Weight %	Iron-based Metals Weight %	Aluminum-based Metals Weight %	Other Metals Weight %	Other Inorganics Weight %
9.33 %	33.01 %	.23 %	.00 %	.00 %	28.65 %	4.43 %	3.85 %	20.50 %

Total Lot % Volume	
Organic	Inorganic
36.48 %	63.52 %

NDE Density Rollup Data Through Lot: 60
OR-REDC-CH-HET

Waste Stream Waste Material Parameter Weight Percent

Cellulosics	Plastics	Rubber	Organic Matrix	Inorganic Matrix	Iron-based Metals	Aluminum-based Metals	Other Metals	Other Inorganics	Soils/Gravel
10.55 %	33.73 %	1.30 %	0.02 %	0.02 %	30.05 %	1.58 %	2.45 %	20.31 %	0.00 %

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PAGE

Attachment 13 - CCP Waste Stream Characterization Checklist

Site(s): ORNL
Waste Stream Number: OR-REDC-CH-HET (CCP-AK-ORNL-002) Lot # (if applicable) 68
Waste Stream Description: Heterogeneous Debris

Acceptable Knowledge Information or other data points[a]	Characterization Method(s)	Acceptable Knowledge Re-evaluation Required? Yes/No[b]?	Comments[c]
Physical waste form/description	RTR	No	RTR Data Sheets indicate consistency with Attachment 6 of CCP-TP-005.
Waste material parameters weights	RTR	No	RTR Data Sheets indicate consistency with the Waste Material Parameter table as listed in the AK. See additional attached sheets.
Waste percent volume consistent with nondestructive examination or visual examination data and audio/video tapes or equivalent media	RTR	No	RTR Data Sheets indicate consistency with CCP-AK-ORNL-002. See additional attached sheets.
Summary category group assignment	RTR	No	RTR Data Sheets are consistent with CCP-TP-005, Attachment 6.
Waste matrix code assignment	RTR	No	Waste Matrix Code S5400 is consistent with data from RTR data sheets.
Absence of prohibited items	RTR	No	RTR did not identify any prohibited items.
EPA Hazardous Waste Number assignment [d]	AK	No	Characterization results consistent with CCP-AK-ORNL-002.
Toxicity characteristic code assignment	AK	No	Consistent with CCP-AK-ORNL-002.
VOCs from packaging materials or radiolysis present	AK	No	CCP-TP-005 Attachment 5 does not identify any VOCs associated with packaging or radiolysis.
State Hazardous Waste Number assignment	AK	No	No additional State Hazardous Waste codes are identified in CCP-TP-005, Attachment 5.
Radionuclides present	NDA	No	See Additional Comments section and additional sheets attached.
Other radiological parameters: (specify)	NDA	No	No additional radiological parameters identified.

CCP RECORDS ORIGINAL
DATE REC'D 12.3.2015

Attachment 13 - CCP Waste Stream Characterization Checklist

Site(s): ORNL
Waste Stream Number: OR-REDC-CH-HET (CCP-AK-ORNL-002) Lot # (if applicable) 68
Waste Stream Description: Heterogeneous Debris

Additional Comments:

- For this waste stream, AK identifies the two most prevalent isotopes, by activity percent, to be: Cm-244 at 74.98% and Pu-241 at 17.39%.
- The two most prevalent isotopes by activity percent for the lot are: 80.38% Cm-244 and 9.25% Pu-241.
- For the waste stream to date, the two most prevalent isotopes by activity percent are: 82.82% Cm-244 and 6.86% Pu-241.

a. Identified in the AK Summary Report or included in the in-process record documentation (e.g., BDR's).

b. If 'Yes,' AK Expert completes an Acceptable Knowledge Re-evaluation Checklist.

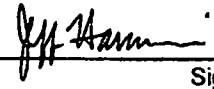
c. Identify the source of the waste characterization information (e.g., batch data report).

d. Ensure that, if a toxicity characteristic contaminant is identified, it is not included as a listed waste, and if analytical data regarding the concentration are not available, the corresponding EPA Hazardous Waste Code is applied.

Site Project Manager:

Roger Whiteaker		4/8/2015
Print	Sign	Date

Acceptable Knowledge Expert:

Jeff Harrison		4/14/2015
Print	Sign	Date

NDA Isotopic Activity Percent
OR-REDC-CH-HET
Lot 68

CONTAINERID	NDABDR	CO-60	SR-90	CS-134	CS-137	EU-152	EU-154	RA-226	AC-227	U-232	U-233	U-234	U-235	U-238	NP-237	PU-238	PU-239
X10C0402806H1	OR-IQ3-0463		7.02E-03		4.07E-04										7.63E-07	1.74E-04	
X10C0402813B	OR-IQ3-0416		3.11E-04		1.80E-05											2.51E-04	
X10C0402813J	OR-IQ3-0416		2.14E-02		1.24E-03											1.86E-05	
X10C0402820A1	OR-IQ3-0447		2.97E-03		1.72E-04										1.07E-08	1.54E-04	2.65E-03
X10C0402821E	OR-IQ3-0447		7.38E-05		4.28E-06										3.34E-08	1.30E-03	2.41E-03
X10C0402826E	OR-IQ3-0421		1.36E-04		7.86E-06			2.57E-07								3.86E-04	
X10C0402861B	OR-IQ3-0416		2.76E-03		1.60E-04			2.53E-07								1.18E-04	
X10C0402861E	OR-IQ3-0416		3.20E-03		1.86E-04											5.76E-04	
X10C0402873B1	OR-IQ3-0447		2.08E-04		1.20E-05			6.69E-08							5.69E-07	1.52E-03	1.57E-02
X10C0402891O	OR-IQ3-0416		3.38E-03		1.96E-04											1.52E-04	
X10C0402935A1A	OR-IQ3-0461		1.49E-02		8.64E-04			1.24E-06								6.69E-05	
X10C0402940D	OR-IQ3-0471		1.07E-03		6.22E-05			2.10E-07							2.33E-07	1.71E-04	
X10C0402940E	OR-IQ3-0470		3.60E-03		2.09E-04										7.89E-07	1.86E-03	
X10C0402940F	OR-IQ3-0471		3.80E-04		2.20E-05			1.18E-07							1.63E-07	9.17E-05	9.35E-04
X10C0402940I	OR-IQ3-0471		4.36E-03		2.53E-04			6.29E-07							6.33E-07	4.70E-04	
X10C0402940L	OR-IQ3-0471		2.68E-03		1.55E-04			1.21E-06							9.18E-07	1.16E-03	
X10C0402951D	OR-IQ3-0461		4.59E-05		2.66E-06											1.32E-04	
X10C0402962J	OR-IQ3-0470		5.15E-03		2.99E-04											2.02E-04	
X10C0402962K	OR-MILCC2-0162	3.62E-06	1.83E-02		1.06E-03											1.40E-04	
X10C0402966B	OR-IQ3-0471		2.48E-03		1.44E-04			2.31E-07							1.99E-07	8.69E-06	1.90E-03
X10C0402966D	OR-IQ3-0471		6.47E-03		3.75E-04											2.12E-05	
X10C0402966G	OR-IQ3-0471		5.09E-03		2.95E-04			5.71E-07							6.19E-07	5.04E-05	
X10C0402966H	OR-MILCC2-0161	1.71E-05	9.80E-02		5.68E-03											7.77E-04	
X10C0402983C	OR-MILCC2-0115	1.35E-05	3.44E-01		1.99E-02											4.56E-03	2.98E-06
X10C9311752A	OR-MILCC2-0112		8.74E-04		5.07E-05												
X10C9312139A	OR-MILCC2-0091		2.73E-04		1.58E-05										1.82E-06	9.38E-03	9.68E-02
X10C9312468A	OR-MILCC2-0089		8.16E-05		4.73E-06		3.17E-06								1.11E-05		
X10C9313109A	OR-MILCC2-0112		1.64E-04		9.50E-06			1.82E-06							2.58E-06		
X10C9402627C	OR-MILCC2-0063		7.45E-03		4.32E-04											1.41E-03	3.67E-07
X10C9402627D	OR-MILCC2-0063		1.56E-03		9.06E-05											5.98E-03	1.55E-06
X10C9602122A	OR-MILCC2-0085		1.98E-02		1.15E-03										1.27E-05	9.22E-02	1.14E-04
X10CSATN02024N1	OR-MILCC2-0070		3.01E-02		1.75E-03										8.27E-06	1.08E-01	1.01E-01
X10CSATN02070O	OR-MILCC2-0078	8.00E-07	3.16E-02		1.83E-03											1.08E-03	1.01E-03
X10CSATN02200C	OR-MILCC2-0078		3.82E-02		2.21E-03											2.16E-03	2.03E-03
X10CSATN02200H1	OR-MILCC2-0111	8.89E-08	3.28E-04		1.90E-05			2.03E-06								6.16E-05	5.78E-05

CONTAINERID	NDABDR	CO-60	SR-90	CS-134	CS-137	EU-152	EU-154	RA-226	AC-227	U-232	U-233	U-234	U-235	U-238	NP-237	PU-238	PU-239
X10CSATN02223J	OR-MILCC2-0090	3.21E-06	4.17E-02		2.42E-03											9.61E-04	9.02E-04
X10CSATN02265G	OR-IQ3-0416		1.86E-02		1.08E-03											3.66E-04	3.43E-04
X10CSATN02434M	OR-MILCC2-0089	4.05E-06	2.62E-02		1.52E-03			4.85E-04								1.46E-03	1.37E-03
X10CSATN02461E	OR-MILCC2-0090	1.87E-05	6.97E-02		4.04E-03											2.99E-03	2.80E-03
X10CSATN02461H	OR-MILCC2-0070	9.17E-06	9.87E-02		5.72E-03											5.59E-03	5.24E-03
X10CSATN02461I	OR-MILCC2-0070		6.86E-02		3.98E-03			1.42E-04								4.59E-03	4.31E-03
X10CSATN02482B	OR-MILCC2-0162	4.27E-07	2.21E-01		1.28E-02			1.31E-05								1.32E-03	1.24E-03
X10CSATN02612E	OR-MILCC2-0070		3.10E-02		1.80E-03			6.88E-05								1.83E-03	1.71E-03
X10CSATN02612J	OR-MILCC2-0116		1.10E-01		6.38E-03			5.32E-03								6.94E-03	6.52E-03
X10CSATN02689E	OR-MILCC2-0091	3.45E-06	7.35E-03		4.26E-04			3.09E-04								8.91E-04	8.36E-04
X10CSATN02694M	OR-MILCC2-0111	2.15E-05	2.76E-02		1.60E-03			1.29E-04								1.16E-03	1.09E-03
X10CSATN02870M	OR-MILCC2-0078	1.18E-07	3.89E-04		2.26E-05										3.61E-07	4.29E-05	4.03E-05
X10CSATN02874B	OR-MILCC2-0063	5.64E-06	2.46E-02		1.42E-03											5.15E-03	4.84E-03
X10CSATN03142A	OR-MILCC2-0116		1.20E-04		6.96E-06												
X10CSATN03219A	OR-MILCC2-0082	7.53E-06	4.10E-02		2.38E-03											5.23E-03	6.45E-06
		1.09E-04	1.46E+00		8.49E-02		3.17E-06	6.48E-03							4.28E-05	2.73E-01	2.56E-01
Total Activity	37.04975236																
		< 0.01 %	3.95 %		0.23 %		< 0.01 %	0.02 %							< 0.01 %	0.74 %	0.69 %

Individual Container Activity %

CONTAINERID	NDABDR	CO-60	SR-90	CS-134	CS-137	EU-152	EU-154	RA-226	AC-227	U-232	U-233	U-234	U-235	U-238	NP-237	PU-238	PU-239
X10C0402806H1	OR-IQ3-0463		0.15 %		0.01 %										3.11 %	0.03 %	
X10C0402813B	OR-IQ3-0416		0.00 %		0.00 %											0.03 %	
X10C0402813J	OR-IQ3-0416		2.75 %		0.25 %											0.02 %	
X10C0402820A1	OR-IQ3-0447		0.03 %		0.00 %										1.78 %	0.01 %	50.40 %
X10C0402821E	OR-IQ3-0447		0.00 %		0.00 %										0.11 %	0.17 %	89.01 %
X10C0402826E	OR-IQ3-0421		0.00 %		0.00 %			0.00 %								0.03 %	
X10C0402861B	OR-IQ3-0416		0.09 %		0.01 %			0.00 %								0.03 %	
X10C0402861E	OR-IQ3-0416		0.02 %		0.00 %											0.03 %	
X10C0402873B1	OR-IQ3-0447		0.00 %		0.00 %			0.00 %							0.28 %	0.03 %	88.41 %
X10C0402891O	OR-IQ3-0416		0.08 %		0.01 %											0.03 %	
X10C0402935A1A	OR-IQ3-0461		0.83 %		0.08 %			0.01 %								0.03 %	
X10C0402940D	OR-IQ3-0471		0.02 %		0.00 %			0.00 %							1.00 %	0.03 %	
X10C0402940E	OR-IQ3-0470		0.01 %		0.00 %										0.31 %	0.03 %	
X10C0402940F	OR-IQ3-0471		0.01 %		0.00 %			0.00 %							0.70 %	0.02 %	45.79 %
X10C0402940I	OR-IQ3-0471		0.03 %		0.00 %			0.00 %							0.98 %	0.03 %	
X10C0402940L	OR-IQ3-0471		0.01 %		0.00 %			0.00 %							0.58 %	0.03 %	

Supporting Documentation

CONTAINERID	NDABDR	CO-60	SR-90	CS-134	CS-137	EU-152	EU-154	RA-226	AC-227	U-232	U-233	U-234	U-235	U-238	NP-237	PU-238	PU-239
X10C0402951D	OR-IQ3-0461		0.00 %		0.00 %											0.03 %	
X10C0402962J	OR-IQ3-0470		0.10 %		0.01 %											0.03 %	
X10C0402962K	OR-MILCC2-0162	0.00 %	0.53 %		0.05 %											0.03 %	
X10C0402966B	OR-IQ3-0471		0.05 %		0.01 %			0.00 %							0.86 %	0.00 %	93.24 %
X10C0402966D	OR-IQ3-0471		1.05 %		0.10 %											0.03 %	
X10C0402966G	OR-IQ3-0471		0.33 %		0.03 %			0.01 %							7.90 %	0.03 %	
X10C0402966H	OR-MILCC2-0161	0.00 %	0.47 %		0.04 %											0.03 %	
X10C0402983C	OR-MILCC2-0115	0.00 %	26.55 %		2.44 %											2.85 %	0.51 %
X10C9311752A	OR-MILCC2-0112		0.08 %		0.01 %												
X10C9312139A	OR-MILCC2-0091		0.00 %		0.00 %										0.15 %	0.03 %	88.19 %
X10C9312468A	OR-MILCC2-0089		0.00 %		0.00 %		0.00 %								38.79 %		
X10C9313109A	OR-MILCC2-0112		0.01 %		0.00 %			0.01 %							18.19 %		
X10C9402627C	OR-MILCC2-0063		0.23 %		0.02 %											0.35 %	0.02 %
X10C9402627D	OR-MILCC2-0063		0.01 %		0.00 %											0.31 %	0.02 %
X10C9602122A	OR-MILCC2-0085		0.02 %		0.00 %										2.81 %	0.84 %	0.29 %
X10CSATN02024N1	OR-MILCC2-0070		0.01 %		0.00 %										0.38 %	0.20 %	53.04 %
X10CSATN02070O	OR-MILCC2-0078	0.00 %	0.71 %		0.07 %											0.20 %	50.80 %
X10CSATN02200C	OR-MILCC2-0078		0.43 %		0.04 %											0.20 %	51.13 %
X10CSATN02200H1	OR-MILCC2-0111	0.00 %	0.07 %		0.01 %			0.06 %								0.10 %	26.39 %
X10CSATN02223J	OR-MILCC2-0090	0.00 %	0.88 %		0.08 %											0.16 %	42.43 %
X10CSATN02265G	OR-IQ3-0416		1.27 %		0.12 %											0.20 %	51.92 %
X10CSATN02434M	OR-MILCC2-0089	0.00 %	0.43 %		0.04 %			1.11 %								0.19 %	50.38 %
X10CSATN02461E	OR-MILCC2-0090	0.00 %	0.59 %		0.05 %											0.20 %	52.47 %
X10CSATN02461H	OR-MILCC2-0070	0.00 %	0.44 %		0.04 %											0.20 %	52.30 %
X10CSATN02461I	OR-MILCC2-0070		0.37 %		0.03 %			0.11 %								0.20 %	52.03 %
X10CSATN02482B	OR-MILCC2-0162	0.00 %	3.78 %		0.35 %			0.03 %								0.18 %	47.28 %
X10CSATN02612E	OR-MILCC2-0070		0.42 %		0.04 %			0.13 %								0.20 %	51.32 %
X10CSATN02612J	OR-MILCC2-0116		0.39 %		0.04 %			2.60 %								0.20 %	50.73 %
X10CSATN02689E	OR-MILCC2-0091	0.00 %	0.20 %		0.02 %			1.17 %								0.20 %	50.61 %
X10CSATN02694M	OR-MILCC2-0111	0.00 %	0.58 %		0.05 %			0.38 %								0.20 %	51.45 %
X10CSATN02870M	OR-MILCC2-0078	0.00 %	0.03 %		0.00 %										6.34 %	0.03 %	8.05 %
X10CSATN02874B	OR-MILCC2-0063	0.00 %	0.12 %		0.01 %											0.20 %	52.78 %
X10CSATN03142A	OR-MILCC2-0116		0.01 %		0.00 %												
X10CSATN03219A	OR-MILCC2-0062	0.00 %	0.76 %		0.07 %											0.78 %	0.27 %

NDA Isotopic Activity Percent
OR-REDC-CH-HET
Lot 68

CONTAINERID	NDABDR	PU-240	PU-241	PU-242	AM-241	AM-243	CM-243	CM-244	CM-245	CM-246	CF-249
X10C0402806H1	OR-IQ3-0463	3.56E-03	3.91E-04	8.69E-07	9.02E-04	2.17E-04		4.26E-01	4.35E-05	3.30E-03	6.31E-06
X10C0402813B	OR-IQ3-0416	5.15E-03	5.66E-04	1.26E-06	2.77E-04	3.14E-04		6.17E-01	6.29E-05	4.78E-03	1.54E-04
X10C0402813J	OR-IQ3-0416	3.82E-04	4.19E-05	9.32E-08	6.55E-03	2.33E-05		4.57E-02	4.66E-06	3.54E-04	7.50E-06
X10C0402820A1	OR-IQ3-0447	3.16E-03	3.47E-04	7.71E-07	3.79E-02	1.93E-04		3.78E-01	3.86E-05	2.93E-03	1.20E-05
X10C0402821E	OR-IQ3-0447	9.37E-04	6.69E-03	1.00E-07	1.42E-03	9.11E-07		2.37E-03			
X10C0402826E	OR-IQ3-0421	7.91E-03	8.68E-04	1.93E-06	7.28E-05	4.82E-04		9.46E-01	9.64E-05	7.33E-03	5.03E-05
X10C0402861B	OR-IQ3-0416	2.41E-03	2.64E-04	5.88E-07	1.29E-04	1.47E-04		2.88E-01	2.94E-05	2.23E-03	2.79E-06
X10C0402861E	OR-IQ3-0416	1.18E-02	1.30E-03	2.88E-06	1.45E-04	7.20E-04		1.41E+00	1.44E-04	1.09E-02	4.76E-06
X10C0402873B1	OR-IQ3-0447	6.37E-03	4.51E-02	1.65E-06	1.04E-02	3.47E-06		2.11E-02			
X10C0402891O	OR-IQ3-0416	3.11E-03	3.42E-04	7.60E-07	1.27E-05	1.90E-04		3.73E-01	3.80E-05	2.89E-03	1.51E-06
X10C0402935A1A	OR-IQ3-0461	1.37E-03	1.51E-04	3.34E-07	3.16E-04	8.36E-05		1.64E-01	1.67E-05	1.27E-03	1.36E-05
X10C0402940D	OR-IQ3-0471	3.50E-03	3.84E-04	8.54E-07	6.87E-04	2.13E-04		4.19E-01	4.27E-05	3.24E-03	5.23E-06
X10C0402940E	OR-IQ3-0470	3.81E-02	4.18E-03	9.29E-06	6.16E-04	2.32E-03		4.55E+00	4.64E-04	3.53E-02	1.49E-05
X10C0402940F	OR-IQ3-0471	1.88E-03	2.06E-04	4.58E-07	3.43E-04	1.15E-04		2.25E-01	2.29E-05	1.74E-03	2.27E-06
X10C0402940I	OR-IQ3-0471	9.63E-03	1.06E-03	2.35E-06	1.40E-03	5.87E-04		1.15E+00	1.17E-04	8.92E-03	3.58E-04
X10C0402940L	OR-IQ3-0471	2.37E-02	2.61E-03	5.79E-06	6.80E-04	1.45E-03		2.84E+00	2.89E-04	2.20E-02	3.28E-04
X10C0402951D	OR-IQ3-0461	2.70E-03	2.96E-04	6.58E-07	1.55E-05	1.65E-04		3.23E-01	3.29E-05	2.50E-03	1.21E-07
X10C0402962J	OR-IQ3-0470	4.15E-03	4.55E-04	1.01E-06	4.35E-05	2.53E-04		4.96E-01	5.06E-05	3.85E-03	7.49E-06
X10C0402962K	OR-MILCC2-0162	2.86E-03	3.14E-04	6.98E-07	5.50E-04	1.74E-04		1.79E-01	3.49E-05	2.65E-03	1.93E-05
X10C0402966B	OR-IQ3-0471	1.78E-04	1.95E-05	4.34E-08	8.98E-04	1.09E-05		2.13E-02	2.17E-06	1.65E-04	3.94E-07
X10C0402966D	OR-IQ3-0471	4.35E-04	4.77E-05	1.06E-07	1.17E-03	2.65E-05		5.20E-02	5.30E-06	4.03E-04	1.38E-06
X10C0402966G	OR-IQ3-0471	1.03E-03	1.13E-04	2.52E-07	1.87E-03	6.30E-05		1.24E-01	1.26E-05	9.58E-04	2.95E-06
X10C0402966H	OR-MILCC2-0161	1.59E-02	1.75E-03	3.89E-06	9.52E-03	9.72E-04		1.91E+00	1.94E-04	1.48E-02	1.44E-05
X10C0402983C	OR-MILCC2-0115	2.10E-04	6.22E-05	3.05E-07	3.95E-03	7.64E-04		2.33E-02	2.98E-06	1.78E-05	3.36E-05
X10C9311752A	OR-MILCC2-0112				9.56E-04	9.56E-04					1.05E-02
X10C9312139A	OR-MILCC2-0091	3.93E-02	2.82E-01	1.02E-05	9.05E-02		2.57E-04		1.07E-05		4.15E-03
X10C9312468A	OR-MILCC2-0089				3.68E-02	2.83E-03					1.47E-04
X10C9313109A	OR-MILCC2-0112				3.10E-03	3.10E-03					2.16E-04
X10C9402627C	OR-MILCC2-0063	1.63E-03	3.78E-04	3.67E-07	3.41E-03	1.11E-04		3.62E-01	2.78E-05	3.11E-03	9.58E-06
X10C9402627D	OR-MILCC2-0063	6.90E-03	1.60E-03	1.55E-06	5.48E-02	4.70E-04		1.53E+00	1.18E-04	1.32E-02	
X10C9602122A	OR-MILCC2-0085	2.43E-02	7.54E-01	1.24E-03	8.27E-02	1.70E-02		1.48E+00	5.61E-04	1.75E-02	2.94E-06
X10CSATN02024N1	OR-MILCC2-0070	1.72E-01	1.70E+00	1.66E-04	4.16E-01	1.16E-02		4.39E+00	1.65E-03	1.12E-01	6.73E-05
X10CSATN02070O	OR-MILCC2-0078	1.72E-03	1.70E-02	1.66E-06	3.63E-03	1.16E-04		1.40E-01	1.66E-05	1.13E-03	6.46E-04
X10CSATN02200C	OR-MILCC2-0078	3.46E-03	3.42E-02	3.33E-06	7.74E-03	2.33E-04		2.82E-01	3.33E-05	2.26E-03	1.30E-05
X10CSATN02200H1	OR-MILCC2-0111	9.86E-05	9.74E-04	9.49E-08	6.12E-03	6.64E-06		8.02E-03	9.48E-07	6.45E-05	2.57E-07

CONTAINERID	NDABDR	PU-240	PU-241	PU-242	AM-241	AM-243	CM-243	CM-244	CM-245	CM-246	CF-249
X10CSATN02223J	OR-MILCC2-0090	1.54E-03	1.52E-02	1.48E-06	2.29E-02	1.04E-04		1.25E-01	1.48E-05	1.01E-03	1.19E-05
X10CSATN02265G	OR-IQ3-0416	5.85E-04	5.78E-03	5.63E-07	3.98E-04	3.94E-05		4.76E-02	5.63E-06	3.83E-04	1.03E-05
X10CSATN02434M	OR-MILCC2-0089	2.34E-03	2.32E-02	2.26E-06	5.92E-03	1.58E-04		1.91E-01	2.25E-05	1.53E-03	7.48E-06
X10CSATN02461E	OR-MILCC2-0090	4.78E-03	4.72E-02	4.60E-06	2.21E-03	3.22E-04		3.89E-01	4.60E-05	3.12E-03	1.03E-05
X10CSATN02461H	OR-MILCC2-0070	8.94E-03	8.84E-02	8.61E-06	7.41E-03	6.02E-04		7.28E-01	8.60E-05	5.85E-03	1.09E-05
X10CSATN02461I	OR-MILCC2-0070	7.34E-03	7.26E-02	7.07E-06	8.19E-03	4.94E-04		5.98E-01	7.06E-05	4.80E-03	4.92E-05
X10CSATN02482B	OR-MILCC2-0162	2.12E-03	2.09E-02	2.04E-06	1.01E-02	1.43E-04		1.72E-01	2.04E-05	1.38E-03	
X10CSATN02612E	OR-MILCC2-0070	2.92E-03	2.89E-02	2.81E-06	5.33E-03	1.97E-04		2.38E-01	2.81E-05	1.91E-03	8.87E-05
X10CSATN02612J	OR-MILCC2-0116	1.11E-02	1.10E-01	1.07E-05	1.15E-02	7.48E-04		9.04E-01	1.07E-04	7.27E-03	6.63E-05
X10CSATN02689E	OR-MILCC2-0091	1.43E-03	1.41E-02	1.37E-06	3.27E-03	9.59E-05		1.16E-01	1.37E-05	9.32E-04	1.20E-05
X10CSATN02694M	OR-MILCC2-0111	1.86E-03	1.84E-02	1.79E-06	2.83E-03	1.25E-04		1.51E-01	1.79E-05	1.21E-03	1.83E-05
X10CSATN02870M	OR-MILCC2-0078	6.87E-05	6.79E-04	6.61E-08	2.17E-02	4.62E-06		5.59E-03	6.60E-07	4.49E-05	1.64E-07
X10CSATN02874B	OR-MILCC2-0063	8.24E-03	8.15E-02	7.93E-06	3.83E-03	5.55E-04		6.71E-01	7.93E-05	5.39E-03	7.66E-06
X10CSATN03142A	OR-MILCC2-0116				9.60E-03	2.07E-03					3.00E-05
X10CSATN03219A	OR-MILCC2-0062	1.38E-03	4.28E-02	7.03E-05	8.82E-03	9.63E-04		2.67E-01	3.18E-05	9.92E-04	
		4.54E-01	3.43E+00	1.58E-03	9.10E-01	5.25E-02	2.57E-04	2.98E+01	4.71E-03	3.18E-01	1.71E-02
Total Activity	37.04975236										
		1.23 %	9.25 %	< 0.01 %	2.46 %	0.14 %	< 0.01 %	80.38 %	0.01 %	0.86 %	0.05 %

Individual Container Activity %

CONTAINERID	NDABDR	PU-240	PU-241	PU-242	AM-241	AM-243	CM-243	CM-244	CM-245	CM-246	CF-249
X10C0402806H1	OR-IQ3-0463	45.22 %	0.01 %	0.63 %	0.76 %	3.14 %		15.09 %	0.73 %	31.11 %	0.00 %
X10C0402813B	OR-IQ3-0416	47.03 %	0.01 %	0.66 %	0.17 %	3.25 %		15.68 %	0.76 %	32.32 %	0.08 %
X10C0402813J	OR-IQ3-0416	29.79 %	0.01 %	0.42 %	33.86 %	2.06 %		9.95 %	0.48 %	20.39 %	0.03 %
X10C0402820A1	OR-IQ3-0447	16.37 %	0.00 %	0.23 %	13.07 %	1.14 %		5.48 %	0.26 %	11.23 %	0.00 %
X10C0402821E	OR-IQ3-0447	9.47 %	0.15 %	0.06 %	0.95 %	0.01 %		0.07 %			
X10C0402826E	OR-IQ3-0421	47.14 %	0.01 %	0.66 %	0.03 %	3.26 %		15.71 %	0.76 %	32.37 %	0.02 %
X10C0402861B	OR-IQ3-0416	47.04 %	0.01 %	0.66 %	0.17 %	3.26 %		15.71 %	0.76 %	32.26 %	0.00 %
X10C0402861E	OR-IQ3-0416	47.11 %	0.01 %	0.66 %	0.04 %	3.26 %		15.76 %	0.76 %	32.34 %	0.00 %
X10C0402873B1	OR-IQ3-0447	9.82 %	0.15 %	0.15 %	1.06 %	0.01 %		0.09 %			
X10C0402891O	OR-IQ3-0416	47.10 %	0.01 %	0.66 %	0.01 %	3.27 %		15.75 %	0.76 %	32.32 %	0.00 %
X10C0402935A1A	OR-IQ3-0461	46.39 %	0.01 %	0.65 %	0.71 %	3.21 %		15.51 %	0.75 %	31.80 %	0.03 %
X10C0402940D	OR-IQ3-0471	46.35 %	0.01 %	0.65 %	0.60 %	3.22 %		15.47 %	0.75 %	31.90 %	0.00 %
X10C0402940E	OR-IQ3-0470	47.04 %	0.01 %	0.66 %	0.05 %	3.25 %		15.68 %	0.76 %	32.20 %	0.00 %
X10C0402940F	OR-IQ3-0471	25.11 %	0.01 %	0.35 %	0.30 %	1.74 %		8.37 %	0.40 %	17.19 %	0.00 %
X10C0402940I	OR-IQ3-0471	46.45 %	0.01 %	0.65 %	0.45 %	3.22 %		15.45 %	0.75 %	31.88 %	0.10 %
X10C0402940L	OR-IQ3-0471	46.94 %	0.01 %	0.66 %	0.09 %	3.24 %		15.60 %	0.75 %	32.05 %	0.04 %

CONTAINERID	NDABDR	PU-240	PU-241	PU-242	AM-241	AM-243	CM-243	CM-244	CM-245	CM-246	CF-249
X10C0402951D	OR-IQ3-0461	47.19 %	0.01 %	0.66 %	0.02 %	3.26 %		15.74 %	0.76 %	32.32 %	0.00 %
X10C0402962J	OR-IQ3-0470	47.19 %	0.01 %	0.66 %	0.03 %	3.25 %		15.73 %	0.76 %	32.23 %	0.00 %
X10C0402962K	OR-MILCC2-0162	50.37 %	0.01 %	0.71 %	0.64 %	3.49 %		8.80 %	0.81 %	34.54 %	0.02 %
X10C0402966B	OR-IQ3-0471	2.38 %	0.00 %	0.03 %	0.80 %	0.16 %		0.80 %	0.04 %	1.63 %	0.00 %
X10C0402966D	OR-IQ3-0471	43.12 %	0.01 %	0.60 %	7.64 %	2.99 %		14.35 %	0.69 %	29.42 %	0.01 %
X10C0402966G	OR-IQ3-0471	40.95 %	0.01 %	0.57 %	4.91 %	2.83 %		13.68 %	0.66 %	28.08 %	0.01 %
X10C0402966H	OR-MILCC2-0161	46.10 %	0.01 %	0.65 %	1.82 %	3.19 %		15.37 %	0.74 %	31.59 %	0.00 %
X10C0402983C	OR-MILCC2-0115	9.87 %	0.01 %	0.82 %	12.26 %	40.74 %		3.05 %	0.18 %	0.62 %	0.09 %
X10C9311752A	OR-MILCC2-0112				3.65 %	62.52 %					33.74 %
X10C9312139A	OR-MILCC2-0091	9.78 %	0.15 %	0.15 %	1.49 %		0.00 %		0.00 %		0.06 %
X10C9312468A	OR-MILCC2-0089				26.27 %	34.86 %					0.09 %
X10C9313109A	OR-MILCC2-0112				4.50 %	77.03 %					0.26 %
X10C9402627C	OR-MILCC2-0063	30.31 %	0.02 %	0.39 %	4.19 %	2.35 %		18.79 %	0.68 %	42.64 %	0.01 %
X10C9402627D	OR-MILCC2-0063	27.16 %	0.01 %	0.35 %	14.30 %	2.10 %		16.80 %	0.61 %	38.33 %	
X10C9602122A	OR-MILCC2-0085	16.69 %	1.14 %	48.97 %	3.76 %	13.24 %		2.84 %	0.51 %	8.89 %	0.00 %
X10CSATN02024N1	OR-MILCC2-0070	24.67 %	0.54 %	1.36 %	3.94 %	1.88 %		1.76 %	0.31 %	11.91 %	0.00 %
X10CSATN02070O	OR-MILCC2-0078	23.69 %	0.52 %	1.31 %	3.30 %	1.81 %		5.36 %	0.30 %	11.44 %	0.49 %
X10CSATN02200C	OR-MILCC2-0078	23.77 %	0.52 %	1.32 %	3.53 %	1.81 %		5.41 %	0.30 %	11.52 %	0.00 %
X10CSATN02200H1	OR-MILCC2-0111	12.27 %	0.27 %	0.68 %	50.34 %	0.94 %		2.79 %	0.16 %	5.94 %	0.00 %
X10CSATN02223J	OR-MILCC2-0090	19.71 %	0.43 %	1.09 %	19.44 %	1.51 %		4.48 %	0.25 %	9.53 %	0.01 %
X10CSATN02265G	OR-IQ3-0416	24.18 %	0.53 %	1.34 %	1.09 %	1.85 %		5.48 %	0.31 %	11.71 %	
X10CSATN02434M	OR-MILCC2-0089	23.38 %	0.51 %	1.30 %	3.93 %	1.79 %		5.31 %	0.30 %	11.33 %	0.00 %
X10CSATN02461E	OR-MILCC2-0090	24.49 %	0.53 %	1.35 %	0.75 %	1.87 %		5.55 %	0.31 %	11.84 %	0.00 %
X10CSATN02461H	OR-MILCC2-0070	24.36 %	0.53 %	1.35 %	1.34 %	1.86 %		5.53 %	0.31 %	11.75 %	0.00 %
X10CSATN02461I	OR-MILCC2-0070	24.22 %	0.53 %	1.34 %	1.79 %	1.85 %		5.50 %	0.31 %	11.70 %	0.01 %
X10CSATN02482B	OR-MILCC2-0162	22.06 %	0.48 %	1.22 %	6.97 %	1.69 %		5.01 %	0.28 %	10.66 %	
X10CSATN02612E	OR-MILCC2-0070	23.99 %	0.52 %	1.32 %	2.90 %	1.83 %		5.43 %	0.30 %	11.57 %	0.04 %
X10CSATN02612J	OR-MILCC2-0116	23.67 %	0.52 %	1.31 %	1.62 %	1.81 %		5.36 %	0.30 %	11.45 %	0.01 %
X10CSATN02689E	OR-MILCC2-0091	23.55 %	0.51 %	1.30 %	3.57 %	1.80 %		5.36 %	0.30 %	11.40 %	0.01 %
X10CSATN02694M	OR-MILCC2-0111	23.91 %	0.52 %	1.32 %	2.41 %	1.83 %		5.44 %	0.30 %	11.58 %	0.01 %
X10CSATN02870M	OR-MILCC2-0078	3.75 %	0.08 %	0.21 %	78.51 %	0.29 %		0.85 %	0.05 %	1.81 %	0.00 %
X10CSATN02874B	OR-MILCC2-0063	24.56 %	0.54 %	1.36 %	0.76 %	1.87 %		5.58 %	0.31 %	11.91 %	0.00 %
X10CSATN03142A	OR-MILCC2-0116				21.20 %	78.74 %					0.06 %
X10CSATN03219A	OR-MILCC2-0062	15.52 %	1.06 %	45.52 %	6.57 %	12.33 %		8.39 %	0.47 %	8.26 %	

NDA Isotopic Activity Percent Rollup
OR-REDC-CH-HET
Lots 1 Thru 68

		CO-60	SR-90	NB-94	RU-106	SB-125	CS-134	CS-137	EU-152	EU-154	RA-226	AC-227	TH-232	TH-229	U-232	U-233	U-235	U-238	U-234	NP-237
		1.41E-02	7.80E+01	3.04E-04		3.60E-03	2.97E-04	4.53E+00	3.04E-03	4.86E-02	1.42E-01	9.79E-03	2.45E-06	3.97E-05	4.04E-03	1.91E-01	9.28E-05	1.89E-03	6.22E-03	1.64E-02
		1.41E-02	7.80E+01	3.04E-04		3.60E-03	2.97E-04	4.53E+00	3.04E-03	4.86E-02	1.42E-01	9.79E-03	2.45E-06	3.97E-05	4.04E-03	1.91E-01	9.28E-05	1.89E-03	6.22E-03	1.64E-02
Total Activity	2.55E+03																			
		< 0.01 %	3.06 %	< 0.01 %		< 0.01 %	< 0.01 %	0.18 %	< 0.01 %	< 0.01 %	< 0.01 %	< 0.01 %	< 0.01 %	< 0.01 %	< 0.01 %	< 0.01 %	< 0.01 %	< 0.01 %	< 0.01 %	< 0.01 %

NDA Isotopic Activity Percent Rollup
OR-REDC-CH-HET
Lots 1 Thru 68

		PU-238	PU-239	PU-240	PU-241	PU-242	AM-241	AM-243	CM-246	CM-248	CM-243	CM-244	CM-245	CF-249	CF-251	CF-250	CF-252
		3.24E+01	1.90E+01	3.16E+01	1.75E+02	5.80E-02	7.16E+01	2.00E+00	2.24E+01	1.79E-04	1.96E-02	2.11E+03	3.07E-01	2.45E-01	1.39E-06	2.05E-02	3.18E-03
		3.24E+01	1.90E+01	3.16E+01	1.75E+02	5.80E-02	7.16E+01	2.00E+00	2.24E+01	1.79E-04	1.96E-02	2.11E+03	3.07E-01	2.45E-01	1.39E-06	2.05E-02	3.18E-03
Total Activity	2.55E+03																
		1.27 %	0.75 %	1.24 %	6.86 %	< 0.01 %	2.81 %	0.08 %	0.88 %	< 0.01 %	< 0.01 %	82.82 %	0.01 %	< 0.01 %	< 0.01 %	< 0.01 %	< 0.01 %

RTR Data
OR-REDC-CH-HET
Lot 68

Batch Data Report No.	Container	Cellulosics (kg)	Plastics (kg)	Rubber (kg)	Organic Matrix (kg)	Inorganic Matrix (kg)	Iron-based Metals (kg)	Aluminum-based Metals (kg)	Other Metals (kg)	Other Inorganics (kg)	Soils/Gravel (kg)	Total Organic (kg)	Total Inorganic (kg)	Total Waste Weight (kg)
OR-RTR6-0631	X10C0402806H1		8				25.3			5		8	30.3	38.3
OR-RTR6-0602	X10C0402813B		12				7.8			10		12	17.8	29.8
OR-RTR6-0602	X10C0402813J	2	10				12.9			8		12	20.9	32.9
OR-RTR6-0621	X10C0402820A1	4	10				13			24.3		14	37.3	51.3
OR-RTR6-0512	X10C0402821E	5	19.3				0.1			10		24.3	10.1	34.4
OR-RTR6-0607	X10C0402826E		14.6				2	2		15		14.6	19	33.6
OR-RTR6-0602	X10C0402861B		10.5				17			2		10.5	19	29.5
OR-RTR6-0602	X10C0402861E		10				64	2		1.6		10	67.6	77.6
OR-RTR6-0621	X10C0402873B1	4	10.5				7			5		14.5	12	26.5
OR-RTR6-0602	X10C0402891O	12	18				4			10		30	14	44
OR-RTR7-0024	X10C0402935A1A	6.5	8.5				7.1			4		15	11.1	26.1
OR-RTR6-0638	X10C0402940D		6				25			5.4		6	30.4	36.4
OR-RTR6-0638	X10C0402940E		3.8				12			10		3.8	22	25.8
OR-RTR6-0638	X10C0402940F		2				10			8.4		2	18.4	20.4
OR-RTR6-0638	X10C0402940I	0.1	9				20			10		9.1	30	39.1
OR-RTR6-0639	X10C0402940L	2	5				8			9.3		7	17.3	24.3
OR-RTR7-0024	X10C0402951D	2	8.8	3			1			3		13.8	4	17.8
OR-RTR6-0637	X10C0402962J		17.2				4			2.5		17.2	6.5	23.7
OR-RTR6-0639	X10C0402962K	14.5	8				1			3		22.5	4	26.5
OR-RTR6-0638	X10C0402966B	2	8	0.1			0.2			3.5		10.1	3.7	13.8
OR-RTR6-0638	X10C0402966D	2	14				1.5			1		16	2.5	18.5
OR-RTR6-0638	X10C0402966G	5	16				1.5			8		21	9.5	30.5
OR-RTR6-0638	X10C0402966H	2.5	6				26			5		8.5	31	39.5
OR-RTR6-0573	X10C0402983C		4.2				5			4.6		4.2	9.6	13.8
OR-RTR6-0596	X10C9311752A		9				15	2	2.2	8		9	27.2	36.2
OR-RTR6-0584	X10C9312139A	1	9.2				2			1		10.2	3	13.2
OR-RTR6-0529	X10C9312468A	3.5	7.3	0.3			2			3.8		11.1	5.8	16.9
OR-RTR6-0539	X10C9313109A	0.4	6				14			4		6.4	18	24.4
OR-RTR7-0076	X10C9402627C	10	9.9				5	2				19.9	7	26.9
OR-RTR7-0076	X10C9402627D	17	8				1					25	1	26

Supporting Documentation

RTR Data
OR-REDC-CH-HET
Lot 68

OR-RTR6-0581	X10C9602122A		12.5				10			8		12.5	18	30.5
OR-RTR6-0472	X10CSATN02024N1		6				37.8			3		6	40.8	46.8
OR-RTR6-0524	X10CSATN02070O	1	10				13.2			1		11	14.2	25.2
OR-RTR7-0045	X10CSATN02200C	4	4.4				3.5		0.3	3		8.4	6.8	15.2
OR-RTR7-0028	X10CSATN02200H1	7	11.5				1.1			1.2		18.5	2.3	20.8
OR-RTR6-0527	X10CSATN02223J		4.8				8	1		3		4.8	12	16.8
OR-RTR6-0603	X10CSATN02265G		8.3				0.1			5		8.3	5.1	13.4
OR-RTR6-0583	X10CSATN02434M	5	3.2				3		4	3		8.2	10	18.2
OR-RTR6-0581	X10CSATN02461E	3	7				0.2	10		7.5		10	17.7	27.7
OR-RTR7-0034	X10CSATN02461H	3.2	5.5	0.3			20.5	4		1.4		9	25.9	34.9
OR-RTR6-0472	X10CSATN02461I	2.1	5				12.2			1.5		7.1	13.7	20.8
OR-RTR6-0639	X10CSATN02482B		8.3				4	2		5		8.3	11	19.3
OR-RTR6-0470	X10CSATN02612E	2	4				5.8			4		6	9.8	15.8
OR-RTR6-0601	X10CSATN02612J	2.2	4				7.2		3	5		6.2	15.2	21.4
OR-RTR6-0581	X10CSATN02689E	3.5	6.8				1			2.6		10.3	3.6	13.9
OR-RTR6-0596	X10CSATN02694M	2	8				3.5			2		10	5.5	15.5
OR-RTR7-0049	X10CSATN02870M		2				19.1					2	19.1	21.1
OR-RTR6-0538	X10CSATN02874B	3.4	5.5				3.5			2		8.9	5.5	14.4
OR-RTR7-0124	X10CSATN03142A	2	8				44.1			2		10	46.1	56.1
OR-RTR7-0076	X10CSATN03219A		9				9.4	2		7		9	18.4	27.4

RTR Data
OR-REDC-CH-HET
Lot 68

Batch Data Report No.	Container	Cellulosics Weight %	Plastics Weight %	Rubber Weight %	Organic Matrix Weight %	Inorganic Matrix Weight %	Iron-based Metals Weight %	Aluminum-based Metals Weight %	Other Metals Weight %	Other Inorganics Weight %	Soils/gravel Weight %
OR-RTR6-0631	X10C0402806H1	.00 %	20.89 %	.00 %	.00 %	.00 %	66.06 %	.00 %	.00 %	13.05 %	.00 %
OR-RTR6-0602	X10C0402813B	.00 %	40.27 %	.00 %	.00 %	.00 %	26.17 %	.00 %	.00 %	33.56 %	.00 %
OR-RTR6-0602	X10C0402813J	6.08 %	30.40 %	.00 %	.00 %	.00 %	39.21 %	.00 %	.00 %	24.32 %	.00 %
OR-RTR6-0621	X10C0402820A1	7.80 %	19.49 %	.00 %	.00 %	.00 %	25.34 %	.00 %	.00 %	47.37 %	.00 %
OR-RTR6-0512	X10C0402821E	14.53 %	56.10 %	.00 %	.00 %	.00 %	.29 %	.00 %	.00 %	29.07 %	.00 %
OR-RTR6-0607	X10C0402826E	.00 %	43.45 %	.00 %	.00 %	.00 %	5.95 %	5.95 %	.00 %	44.64 %	.00 %
OR-RTR6-0602	X10C0402861B	.00 %	35.59 %	.00 %	.00 %	.00 %	57.63 %	.00 %	.00 %	6.78 %	.00 %
OR-RTR6-0602	X10C0402861E	.00 %	12.89 %	.00 %	.00 %	.00 %	82.47 %	2.58 %	.00 %	2.06 %	.00 %
OR-RTR6-0621	X10C0402873B1	15.09 %	39.62 %	.00 %	.00 %	.00 %	26.42 %	.00 %	.00 %	18.87 %	.00 %
OR-RTR6-0602	X10C0402891O	27.27 %	40.91 %	.00 %	.00 %	.00 %	9.09 %	.00 %	.00 %	22.73 %	.00 %
OR-RTR7-0024	X10C0402935A1A	24.90 %	32.57 %	.00 %	.00 %	.00 %	27.20 %	.00 %	.00 %	15.33 %	.00 %
OR-RTR6-0638	X10C0402940D	.00 %	16.48 %	.00 %	.00 %	.00 %	68.68 %	.00 %	.00 %	14.84 %	.00 %
OR-RTR6-0638	X10C0402940E	.00 %	14.73 %	.00 %	.00 %	.00 %	46.51 %	.00 %	.00 %	38.76 %	.00 %
OR-RTR6-0638	X10C0402940F	.00 %	9.80 %	.00 %	.00 %	.00 %	49.02 %	.00 %	.00 %	41.18 %	.00 %
OR-RTR6-0638	X10C0402940I	.26 %	23.02 %	.00 %	.00 %	.00 %	51.15 %	.00 %	.00 %	25.58 %	.00 %
OR-RTR6-0639	X10C0402940L	8.23 %	20.58 %	.00 %	.00 %	.00 %	32.92 %	.00 %	.00 %	38.27 %	.00 %
OR-RTR7-0024	X10C0402951D	11.24 %	49.44 %	16.85 %	.00 %	.00 %	5.62 %	.00 %	.00 %	16.85 %	.00 %
OR-RTR6-0637	X10C0402962J	.00 %	72.57 %	.00 %	.00 %	.00 %	16.88 %	.00 %	.00 %	10.55 %	.00 %
OR-RTR6-0639	X10C0402962K	54.72 %	30.19 %	.00 %	.00 %	.00 %	3.77 %	.00 %	.00 %	11.32 %	.00 %
OR-RTR6-0638	X10C0402966B	14.49 %	57.97 %	.72 %	.00 %	.00 %	1.45 %	.00 %	.00 %	25.36 %	.00 %
OR-RTR6-0638	X10C0402966D	10.81 %	75.68 %	.00 %	.00 %	.00 %	8.11 %	.00 %	.00 %	5.41 %	.00 %
OR-RTR6-0638	X10C0402966G	16.39 %	52.46 %	.00 %	.00 %	.00 %	4.92 %	.00 %	.00 %	26.23 %	.00 %
OR-RTR6-0638	X10C0402966H	6.33 %	15.19 %	.00 %	.00 %	.00 %	65.82 %	.00 %	.00 %	12.66 %	.00 %
OR-RTR6-0573	X10C0402983C	.00 %	30.43 %	.00 %	.00 %	.00 %	36.23 %	.00 %	.00 %	33.33 %	.00 %
OR-RTR6-0596	X10C9311752A	.00 %	24.86 %	.00 %	.00 %	.00 %	41.44 %	5.52 %	6.08 %	22.10 %	.00 %
OR-RTR6-0584	X10C9312139A	7.58 %	69.70 %	.00 %	.00 %	.00 %	15.15 %	.00 %	.00 %	7.58 %	.00 %
OR-RTR6-0529	X10C9312468A	20.71 %	43.20 %	1.78 %	.00 %	.00 %	11.83 %	.00 %	.00 %	22.49 %	.00 %
OR-RTR6-0539	X10C9313109A	1.64 %	24.59 %	.00 %	.00 %	.00 %	57.38 %	.00 %	.00 %	16.39 %	.00 %
OR-RTR7-0076	X10C9402627C	37.17 %	36.80 %	.00 %	.00 %	.00 %	18.59 %	7.43 %	.00 %	.00 %	.00 %
OR-RTR7-0076	X10C9402627D	65.38 %	30.77 %	.00 %	.00 %	.00 %	3.85 %	.00 %	.00 %	.00 %	.00 %

RTR Data
OR-REDC-CH-HET
Lot 68

OR-RTR6-0581	X10C9602122A	.00 %	40.98 %	.00 %	.00 %	.00 %	32.79 %	.00 %	.00 %	26.23 %	.00 %
OR-RTR6-0472	X10CSATN02024N1	.00 %	12.82 %	.00 %	.00 %	.00 %	80.77 %	.00 %	.00 %	6.41 %	.00 %
OR-RTR6-0524	X10CSATN02070O	3.97 %	39.68 %	.00 %	.00 %	.00 %	52.38 %	.00 %	.00 %	3.97 %	.00 %
OR-RTR7-0045	X10CSATN02200C	26.32 %	28.95 %	.00 %	.00 %	.00 %	23.03 %	.00 %	1.97 %	19.74 %	.00 %
OR-RTR7-0028	X10CSATN02200H1	33.65 %	55.29 %	.00 %	.00 %	.00 %	5.29 %	.00 %	.00 %	5.77 %	.00 %
OR-RTR6-0527	X10CSATN02223J	.00 %	28.57 %	.00 %	.00 %	.00 %	47.62 %	5.95 %	.00 %	17.86 %	.00 %
OR-RTR6-0603	X10CSATN02265G	.00 %	61.94 %	.00 %	.00 %	.00 %	.75 %	.00 %	.00 %	37.31 %	.00 %
OR-RTR6-0583	X10CSATN02434M	27.47 %	17.58 %	.00 %	.00 %	.00 %	16.48 %	.00 %	21.98 %	16.48 %	.00 %
OR-RTR6-0581	X10CSATN02461E	10.83 %	25.27 %	.00 %	.00 %	.00 %	.72 %	36.10 %	.00 %	27.08 %	.00 %
OR-RTR7-0034	X10CSATN02461H	9.17 %	15.76 %	.86 %	.00 %	.00 %	58.74 %	11.46 %	.00 %	4.01 %	.00 %
OR-RTR6-0472	X10CSATN02461I	10.10 %	24.04 %	.00 %	.00 %	.00 %	58.65 %	.00 %	.00 %	7.21 %	.00 %
OR-RTR6-0639	X10CSATN02482B	.00 %	43.01 %	.00 %	.00 %	.00 %	20.73 %	10.36 %	.00 %	25.91 %	.00 %
OR-RTR6-0470	X10CSATN02612E	12.66 %	25.32 %	.00 %	.00 %	.00 %	36.71 %	.00 %	.00 %	25.32 %	.00 %
OR-RTR6-0601	X10CSATN02612J	10.28 %	18.69 %	.00 %	.00 %	.00 %	33.64 %	.00 %	14.02 %	23.36 %	.00 %
OR-RTR6-0581	X10CSATN02689E	25.18 %	48.92 %	.00 %	.00 %	.00 %	7.19 %	.00 %	.00 %	18.71 %	.00 %
OR-RTR6-0596	X10CSATN02694M	12.90 %	51.61 %	.00 %	.00 %	.00 %	22.58 %	.00 %	.00 %	12.90 %	.00 %
OR-RTR7-0049	X10CSATN02870M	.00 %	9.48 %	.00 %	.00 %	.00 %	90.52 %	.00 %	.00 %	.00 %	.00 %
OR-RTR6-0538	X10CSATN02874B	23.61 %	38.19 %	.00 %	.00 %	.00 %	24.31 %	.00 %	.00 %	13.89 %	.00 %
OR-RTR7-0124	X10CSATN03142A	3.57 %	14.26 %	.00 %	.00 %	.00 %	78.61 %	.00 %	.00 %	3.57 %	.00 %
OR-RTR7-0076	X10CSATN03219A	.00 %	32.85 %	.00 %	.00 %	.00 %	34.31 %	7.30 %	.00 %	25.55 %	.00 %

Total Lot Weight %

Cellulosics Weight %	Plastics Weight %	Rubber Weight %	Organic Matrix Weight %	Inorganic Matrix Weight %	Iron-based Metals Weight %	Aluminum-based Metals Weight %	Other Metals Weight %	Other Inorganics Weight %
9.90 %	30.78 %	.27 %	.00 %	.00 %	37.99 %	1.97 %	.69 %	18.40 %

Total Lot % Volume

Organic	Inorganic
37.13 %	62.87 %

NDE Density Rollup Data Through Lot: 68
OR-REDC-CH-HET

Waste Stream Waste Material Parameter Weight Percent

Cellulosics	Plastics	Rubber	Organic Matrix	Inorganic Matrix	Iron-based Metals	Aluminum-based Metals	Other Metals	Other Inorganics	Soils/Gravel
10.44 %	33.35 %	1.14 %	0.01 %	0.02 %	30.91 %	1.94 %	2.37 %	19.81 %	0.00 %

DIVIDER PAGE

NWP
Nuclear Waste Partnership LLC
An AECOM-led partnership with B&W and AREVA

CP:15:01273
UFC:5900.00

INTER-OFFICE CORRESPONDENCE

DATE: December January 8, 2015
BSS 12/8/15

FROM: B. S. Schrock BSSchrock LOCATION: Certification

TO: CCP Records Custodian GSA-212 LOCATION: Central Characterization Program

SUBJECT: TRANSMITTAL OF OAK RIDGE NATIONAL LABORATORY CHARACTERIZATION INFORMATION SUMMARY FOR WASTE STREAM #OR-REDC-CH-HET (CCP-AK-ORNL-002), LOT 45, LOT 46, LOT 47, LOT 48, LOT 49, LOT 50, LOT 51, LOT 52, LOT 53, LOT 54, LOT 55, LOT 56, LOT 57, LOT 58, LOT 59, LOT 60, LOT 61, LOT 62, LOT 63, LOT 64, LOT 65, LOT 66, LOT 67, LOT 68, LOT 69, LOT 70, LOT 71, LOT 72, LOT 73, LOT 74 AND LOT 75

Reference: WTS Memorandum CP:15:01268; UFC:5900.00 from Ms. B.S. Schrock to CCP Records Custodian, dated January 5, 2015 subject: Transmittal of Oak Ridge National Laboratory Characterization Information Summary for Waste Stream #OR-REDC-CH-HET-A (CCP-AK-ORNL-002), Lot 45, Lot 46, Lot 47, Lot 48, Lot 49, Lot 50, Lot 51, Lot 52, Lot 53, Lot 54, Lot 55, Lot 56, Lot 57, Lot 58, Lot 59, Lot 60, Lot 61, Lot 62, Lot 63, Lot 64, Lot 65, Lot 66, Lot 67, Lot 68, Lot 69, Lot 70, Lot 71, Lot 72, Lot 73, Lot 74 and Lot 75

The original memorandum was revised because the waste stream was listed incorrectly as OR-REDC-CH-HET-A, it should have been listed as OR-REDC-CH-HET.

Please accept the attached Oak Ridge National Laboratory Characterization Information Summaries to be placed in Records for Waste Stream #OR-REDC-CH-HET (CCP-AK-ORNL-002), Lot 45, Lot 46, Lot 47, Lot 48, Lot 49, Lot 50, Lot 51, Lot 52, Lot 53, Lot 54, Lot 55, Lot 56, Lot 57, Lot 58, Lot 59, Lot 60, Lot 61, Lot 62, Lot 63, Lot 64, Lot 65, Lot 66, Lot 67, Lot 68, Lot 69, Lot 70, Lot 71, Lot 72, Lot 73, Lot 74 and Lot 75.

If you have any questions, please call me at 575-234-7444.

BSS:lcg

Attachment

cc: (without attachment)
D. Wade ED
M. Ramirez ED
A. Stallings ED

CCP RECORDS ORIGINAL
DATE REC'D 12-08-2015 JY

CHARACTERIZATION INFORMATION SUMMARY

WSPF# OR-REDC-CH-HET Rev. 0 (CCP-AK-ORNL-002)

Lot 45

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CCP Characterization Information Summary Cover Page

Waste Stream # OR-REDC-CH-HET Lot #: 45

AK Expert Review: N/A Date: N/A

SPM Review: Roger Whiteaker Date: 01/26/2015

SPM signature certifies that through Acceptable Knowledge testing and/or analysis that the waste identified in this summary is not corrosive, ignitable, reactive, or incompatible with the TSDF.

A summary of the Acceptable Knowledge regarding this waste stream containing specific information about the corrosivity, reactivity, and ignitability of the waste stream is included as an attachment to the Waste Stream Profile Form. By reference, that information is included in this lot.

List of procedures used:

Non Destructive Assay (NDA):

CCP-TP-048	Rev. 16	11/01/2013 Mobile IQ3 System Data Reviewing, Validating, and Reporting Procedure
CCP-TP-048	Rev. 15	03/24/2011 Mobile IQ3 System Data Reviewing, Validating, and Reporting Procedure
CCP-TP-048	Rev. 14	03/08/2010 Mobile IQ3 System Data Reviewing, Validating, and Reporting Procedure
CCP-TP-048	Rev. 13	10/12/2009 Mobile IQ3 System Data Reviewing, Validating, and Reporting Procedure
CCP-TP-048	Rev. 12	09/08/2009 Mobile IQ3 System Data Reviewing, Validating, and Reporting Procedure
CCP-TP-048	Rev. 11	02/19/2008 Mobile IQ3 System Data Reviewing, Validating, and Reporting Procedure
CCP-TP-048	Rev. 10	11/16/2006 Mobile IQ3 System Data Reviewing, Validating, and Reporting Procedure
CCP-TP-048	Rev. 9	11/03/2005 Mobile IQ3 System Data Reviewing, Validating, and Reporting Procedure
CCP-TP-048	Rev. 8	09/21/2005 Mobile IQ3 System Data Reviewing, Validating, and Reporting Procedure
CCP-TP-048	Rev. 7	03/14/2005 Mobile IQ3 System Data Reviewing, Validating, and Reporting Procedure
CCP-TP-048	Rev. 6	10/18/2004 Mobile IQ3 System Data Reviewing, Validating, and Reporting Procedure
CCP-TP-048	Rev. 5	08/08/2004 Mobile IQ3 System Data Reviewing, Validating, and Reporting Procedure
CCP-TP-048	Rev. 4	12/04/2003 Mobile IQ3 System Data Reviewing, Validating, and Reporting Procedure
CCP-TP-048	Rev. 3	09/03/2003 Mobile IQ3 System Data Reviewing, Validating, and Reporting Procedure
CCP-TP-048	Rev. 2	04/25/2003 Mobile IQ3 System Data Reviewing, Validating, and Reporting Procedure
CCP-TP-048	Rev. 1	03/21/2003 Mobile IQ3 System Data Reviewing, Validating, and Reporting Procedure
CCP-TP-048	Rev. 0	02/05/2003 Mobile IQ3 System Data Reviewing, Validating, and Reporting Procedure

Project Level Data Validation / DQO Reconciliation:

CCP-TP-001	Rev. 21	06/06/2013 CCP Project Level Data Validation and Verification
CCP-TP-001	Rev. 20	09/27/2012 CCP Project Level Data Validation and Verification
CCP-TP-001	Rev. 19	12/29/2010 CCP Project Level Data Validation and Verification
CCP-TP-001	Rev. 18	08/09/2010 CCP Project Level Data Validation and Verification
CCP-TP-001	Rev. 17	09/24/2007 CCP Project Level Data Validation and Verification
CCP-TP-001	Rev. 16	04/26/2007 CCP Project Level Data Validation and Verification
CCP-TP-001	Rev. 15	11/22/2006 CCP Project Level Data Validation and Verification
CCP-TP-001	Rev. 14	11/16/2006 CCP Project Level Data Validation and Verification
CCP-TP-001	Rev. 13	07/21/2006 CCP Project Level Data Validation and Verification
CCP-TP-001	Rev. 12	05/25/2006 CCP Project Level Data Validation and Verification
CCP-TP-001	Rev. 11	03/23/2005 CCP Project Level Data Validation and Verification

CCP-TP-002	Rev. 26	06/19/2013 CCP Reconciliation of DQOs and Reporting Characterization Data
CCP-TP-002	Rev. 25	02/11/2013 CCP Reconciliation of DQOs and Reporting Characterization Data
CCP-TP-002	Rev. 24	12/28/2011 CCP Reconciliation of DQOs and Reporting Characterization Data
CCP-TP-002	Rev. 23	12/29/2010 CCP Reconciliation of DQOs and Reporting Characterization Data
CCP-TP-002	Rev. 22	08/30/2010 CCP Reconciliation of DQOs and Reporting Characterization Data
CCP-TP-002	Rev. 21	08/04/2009 CCP Reconciliation of DQOs and Reporting Characterization Data
CCP-TP-002	Rev. 20	08/18/2008 CCP Reconciliation of DQOs and Reporting Characterization Data
CCP-TP-002	Rev. 19	12/22/2006 CCP Reconciliation of DQOs and Reporting Characterization Data
CCP-TP-002	Rev. 18	11/16/2006 CCP Reconciliation of DQOs and Reporting Characterization Data
CCP-TP-002	Rev. 17	10/10/2006 CCP Reconciliation of DQOs and Reporting Characterization Data
CCP-TP-002	Rev. 16	06/06/2006 CCP Reconciliation of DQOs and Reporting Characterization Data
CCP-TP-002	Rev. 15	08/16/2005 CCP Reconciliation of DQOs and Reporting Characterization Data
CCP-TP-002	Rev. 14	03/29/2005 CCP Reconciliation of DQOs and Reporting Characterization Data

CCP-TP-005	Rev. 26	08/12/2013 CCP Acceptable Knowledge Documentation
CCP-TP-005	Rev. 25	08/19/2013 CCP Acceptable Knowledge Documentation
CCP-TP-005	Rev. 24	11/28/2011 CCP Acceptable Knowledge Documentation
CCP-TP-005	Rev. 23	06/30/2011 CCP Acceptable Knowledge Documentation
CCP-TP-005	Rev. 22	04/21/2011 CCP Acceptable Knowledge Documentation
CCP-TP-005	Rev. 21	12/29/2010 CCP Acceptable Knowledge Documentation
CCP-TP-005	Rev. 20	11/01/2010 CCP Acceptable Knowledge Documentation
CCP-TP-005	Rev. 19	07/06/2010 CCP Acceptable Knowledge Documentation
CCP-TP-005	Rev. 18	11/16/2006 CCP Acceptable Knowledge Documentation

CCP-TP-005	Rev. 17	06/05/2008 CCP Acceptable Knowledge Documentation
CCP-TP-005	Rev. 16	02/27/2006 CCP Acceptable Knowledge Documentation
CCP-TP-005	Rev. 15	03/31/2005 CCP Acceptable Knowledge Documentation

CCP-TP-030	Rev. 33	11/19/2013 CCP CH TRU Waste Certification and WWIS/WDS Data Entry
CCP-TP-030	Rev. 32	06/20/2013 CCP CH TRU Waste Certification and WWIS/WDS Data Entry
CCP-TP-030	Rev. 31	11/19/2012 CCP CH TRU Waste Certification and WWIS/WDS Data Entry
CCP-TP-030	Rev. 30	05/21/2012 CCP CH TRU Waste Certification and WWIS/WDS Data Entry
CCP-TP-030	Rev. 29	04/26/2011 CCP CH TRU Waste Certification and WWIS/WDS Data Entry
CCP-TP-030	Rev. 28	05/12/2010 CCP CH TRU Waste Certification and WWIS/WDS Data Entry
CCP-TP-030	Rev. 27	12/14/2009 CCP CH TRU Waste Certification and WWIS Data Entry
CCP-TP-030	Rev. 26	05/27/2009 CCP CH TRU Waste Certification and WWIS Data Entry
CCP-TP-030	Rev. 25	01/22/2009 CCP CH TRU Waste Certification and WWIS Data Entry
CCP-TP-030	Rev. 24	08/20/2008 CCP CH TRU Waste Certification and WWIS Data Entry
CCP-TP-030	Rev. 23	03/12/2008 CCP CH TRU Waste Certification and WWIS Data Entry
CCP-TP-030	Rev. 22	07/24/2007 CCP CH TRU Waste Certification and WWIS Data Entry
CCP-TP-030	Rev. 21	05/21/2007 CCP CH TRU Waste Certification and WWIS Data Entry
CCP-TP-030	Rev. 20	02/07/2007 CCP CH TRU Waste Certification and WWIS Data Entry
CCP-TP-030	Rev. 19	11/16/2006 CCP CH TRU Waste Certification and WWIS Data Entry
CCP-TP-030	Rev. 18	05/01/2006 CCP TRU Waste Certification and WWIS Data Entry
CCP-TP-030	Rev. 17	12/29/2005 CCP TRU Waste Certification and WWIS Data Entry
CCP-TP-030	Rev. 16	04/22/2005 CCP TRU Waste Certification and WWIS Data Entry

Radiography (RTR/NDE):

CCP-TP-053	Rev. 15	09/11/2014 CCP Standard Real-Time Radiography (RTR) Inspection Procedure
CCP-TP-053	Rev. 14	09/25/2013 CCP Standard Real-Time Radiography (RTR) Inspection Procedure
CCP-TP-053	Rev. 13	05/14/2013 CCP Standard Real-Time Radiography (RTR) Inspection Procedure
CCP-TP-053	Rev. 12	08/22/2012 CCP Standard Real-Time Radiography (RTR) Inspection Procedure
CCP-TP-053	Rev. 11	07/20/2011 CCP Standard Real-Time Radiography (RTR) Inspection Procedure
CCP-TP-053	Rev. 10	03/04/2011 CCP Standard Real-Time Radiography (RTR) Inspection Procedure
CCP-TP-053	Rev. 9	09/30/2010 CCP Standard Real-Time Radiography (RTR) Inspection Procedure
CCP-TP-053	Rev. 8	06/30/2010 CCP Standard Real-Time Radiography (RTR) Inspection Procedure
CCP-TP-053	Rev. 7	10/21/2009 CCP Standard Real-Time Radiography (RTR) Inspection Procedure
CCP-TP-053	Rev. 6	03/04/2008 CCP Standard Real-Time Radiography (RTR) Inspection Procedure
CCP-TP-053	Rev. 5	11/16/2006 CCP Standard Real-Time Radiography (RTR) Inspection Procedure
CCP-TP-053	Rev. 4	12/22/2005 CCP Standard Real-Time Radiography (RTR) Inspection Procedure
CCP-TP-053	Rev. 3	03/21/2005 CCP Standard Real-Time Radiography (RTR) Inspection Procedure
CCP-TP-053	Rev. 2	07/14/2004 CCP Standard Real-Time Radiography (RTR) Inspection Procedure

Visual Examination (VE):

CCP-TP-113	Rev. 18	09/25/2013 CCP Standard Contact-Handled Waste Visual Examination
CCP-TP-113	Rev. 17	06/04/2013 CCP Standard Contact-Handled Waste Visual Examination
CCP-TP-113	Rev. 16	04/25/2011 CCP Standard Contact-Handled Waste Visual Examination
CCP-TP-113	Rev. 15	12/29/2010 CCP Standard Contact-Handled Waste Visual Examination
CCP-TP-113	Rev. 14	06/30/2010 CCP Standard Contact-Handled Waste Visual Examination
CCP-TP-113	Rev. 13	03/11/2009 CCP Standard Contact-Handled Waste Visual Examination
CCP-TP-113	Rev. 12	12/01/2008 CCP Standard Contact-Handled Waste Visual Examination
CCP-TP-113	Rev. 11	11/12/2008 CCP Standard Contact-Handled Waste Visual Examination
CCP-TP-113	Rev. 10	07/09/2008 CCP Standard Contact-Handled Waste Visual Examination
CCP-TP-113	Rev. 9	03/05/2008 CCP Standard Waste Visual Examination
CCP-TP-113	Rev. 8	09/04/2007 CCP Standard Waste Visual Examination
CCP-TP-113	Rev. 7	03/19/2007 CCP Standard Waste Visual Examination
CCP-TP-113	Rev. 6	11/16/2006 CCP Standard Waste Visual Examination
CCP-TP-113	Rev. 5	08/28/2006 CCP Standard Waste Visual Examination
CCP-TP-113	Rev. 4	12/22/2005 CCP Standard Waste Visual Examination

WAP Certification:

CCP-PO-001	Rev. 21	05/31/2013 CCP Transuranic Waste Characterization Quality Assurance Project Plan
CCP-PO-001	Rev. 20	06/16/2011 CCP Transuranic Waste Characterization Quality Assurance Project Plan
CCP-PO-001	Rev. 19	12/28/2010 CCP Transuranic Waste Characterization Quality Assurance Project Plan
CCP-PO-001	Rev. 18	09/30/2010 CCP Transuranic Waste Characterization Quality Assurance Project Plan
CCP-PO-001	Rev. 17	06/23/2009 CCP Transuranic Waste Characterization Quality Assurance Project Plan
CCP-PO-001	Rev. 16	10/31/2007 CCP Transuranic Waste Characterization Quality Assurance Project Plan
CCP-PO-001	Rev. 15	08/10/2007 CCP Transuranic Waste Characterization Quality Assurance Project Plan
CCP-PO-001	Rev. 14	03/28/2007 CCP Transuranic Waste Characterization Quality Assurance Project Plan
CCP-PO-001	Rev. 13	11/16/2006 CCP Transuranic Waste Characterization Quality Assurance Project Plan
CCP-PO-001	Rev. 12	03/22/2006 CCP Transuranic Waste Characterization Quality Assurance Project Plan
CCP-PO-001	Rev. 11	03/10/2005 CCP Transuranic Waste Characterization Quality Assurance Project Plan

CCP-PO-002	Rev. 27	05/31/2013 CCP Transuranic Waste Certification Plan
CCP-PO-002	Rev. 26	07/14/2011 CCP Transuranic Waste Certification Plan
CCP-PO-002	Rev. 25	12/29/2010 CCP Transuranic Waste Certification Plan
CCP-PO-002	Rev. 24	06/30/2010 CCP Transuranic Waste Certification Plan
CCP-PO-002	Rev. 23	04/07/2010 CCP Transuranic Waste Certification Plan
CCP-PO-002	Rev. 22	01/12/2010 CCP Transuranic Waste Certification Plan
CCP-PO-002	Rev. 21	01/28/2009 CCP Transuranic Waste Certification Plan
CCP-PO-002	Rev. 20	11/02/2007 CCP Transuranic Waste Certification Plan
CCP-PO-002	Rev. 19	05/22/2007 CCP Transuranic Waste Certification Plan
CCP-PO-002	Rev. 18	11/16/2006 CCP Transuranic Waste Certification Plan
CCP-PO-002	Rev. 17	11/16/2006 CCP Transuranic Waste Certification Plan
CCP-PO-002	Rev. 16	11/16/2006 CCP Transuranic Waste Certification Plan
CCP-PO-002	Rev. 15	03/22/2006 CCP Transuranic Waste Certification Plan
CCP-PO-002	Rev. 14	12/28/2005 CCP Transuranic Waste Certification Plan
CCP-PO-002	Rev. 13	05/08/2005 CCP Transuranic Waste Certification Plan

CCP-PO-003	Rev. 13	07/31/2013 Transuranic Authorized Methods for Payload Control (CCP CH-TRAMPC)
CCP-PO-003	Rev. 12	12/29/2010 Transuranic Authorized Methods for Payload Control (CCP CH-TRAMPC)
CCP-PO-003	Rev. 11	09/04/2009 Transuranic Authorized Methods for Payload Control (CCP CH-TRAMPC)
CCP-PO-003	Rev. 10	11/16/2006 Transuranic Authorized Methods for Payload Control (CCP CH-TRAMPC)
CCP-PO-003	Rev. 9	12/28/2005 Transuranic Authorized Methods for Payload Control (CCP CH-TRAMPC)
CCP-PO-003	Rev. 8	01/25/2005 Transuranic Authorized Methods for Payload Control (CCP CH-TRAMPC)
CCP-PO-003	Rev. 7	11/22/2004 Transuranic Authorized Methods for Payload Control (CCP CH-TRAMPC)
CCP-PO-003	Rev. 6	08/08/2004 Transuranic Authorized Methods for Payload Control (CCP CH-TRAMPC)
CCP-PO-003	Rev. 5	09/19/2003 Transuranic Authorized Methods for Payload Control (CCP CH-TRAMPC)
CCP-PO-003	Rev. 4	02/11/2003 Transuranic Authorized Methods for Payload Control (CCP CH-TRAMPC)
CCP-PO-003	Rev. 3	05/31/2002 Transuranic Authorized Methods for Payload Control (CCP CH-TRAMPC)

CCP Correlation of Container Identification Numbers to Batch Data Report Numbers

Waste Stream: # OR-REDC-CH-HET Lot # 45

Container ID Number	Historical Container ID	NDA BDR	RTR BDR	VE BDR	Load/Manage Overpack Yes	Transportation Headspace Gas	
						FGA	GGT
X10C0000250D	N/A	OR-MILCC2-0037	OR-RTR6-0440	N/A	No	OR14FG8075	N/A
X10C0011089A	N/A	OR-MILCC2-0087	OR-RTR6-0582	N/A	No	OR14FG8128	N/A
X10C0011095A	N/A	OR-MILCC2-0037	OR-RTR6-0441	N/A	No	OR14FG8079	N/A
X10C0011109A	N/A	OR-MILCC2-0076	OR-RTR7-0049	N/A	No	OR14FG8114	N/A
X10C0102692Q	N/A	OR-MILCC2-0090	OR-RTR6-0584	N/A	No	OR14FG8130	N/A
X10C0201073A	N/A	OR-MILCC2-0088	OR-RTR6-0584	N/A	No	OR14FG8128	N/A
X10C0201075A	N/A	OR-MILCC2-0037	OR-RTR6-0433	N/A	No	OR14FG8075	N/A
X10C0201754A	N/A	OR-MILCC2-0027	OR-RTR6-0472	N/A	No	OR14FG4043	N/A
X10C0300528A	N/A	OR-MILCC2-0106	OR-RTR7-0030	N/A	No	OR14FG8148	N/A
X10C0300533A	N/A	OR-MILCC2-0097	N/A	ORVECH0105	No	OR14FG8139	N/A
X10C0300534A	N/A	OR-MILCC2-0059	OR-RTR6-0484	N/A	No	OR14FG8031	N/A
X10C0300535A	N/A	OR-MILCC2-0097	N/A	ORVECH0106	No	OR14FG8139	N/A
X10C0402058A	N/A	OR-MILCC2-0034	OR-RTR7-0038	N/A	No	OR14FG8071	N/A
X10C0402783C	N/A	OR-MILCC2-0082	OR-RTR6-0571	N/A	No	OR14FG8122	N/A
X10C0402784B	N/A	OR-MILCC2-0070	OR-RTR7-0034	N/A	No	OR14FG8051	N/A
X10C0402784F1	N/A	OR-MILCC2-0007	OR-RTR6-0478	N/A	No	OR14FG8043	N/A
X10C0402784H1	N/A	OR-MILCC2-0008	OR-RTR6-0467	N/A	No	OR14FG8026	N/A
X10C0402786B	N/A	OR-MILCC2-0097	OR-RTR6-0577	N/A	No	OR14FG8139	N/A
X10C0402786F	N/A	OR-MILCC2-0082	OR-RTR6-0575	N/A	No	OR14FG8124	N/A
X10C0402787A	N/A	OR-MILCC2-0070	OR-RTR6-0472	N/A	No	OR14FG8024	N/A
X10C0402788B	N/A	OR-MILCC2-0047	OR-RTR7-0054	N/A	No	OR14FG8084	N/A
X10C0402788C	N/A	OR-MILCC2-0047	OR-RTR7-0054	N/A	No	OR14FG8084	N/A
X10C0402789F	N/A	OR-MILCC2-0048	OR-RTR7-0054	N/A	No	OR14FG8085	N/A
X10C0402789H	N/A	OR-MILCC2-0049	OR-RTR7-0054	N/A	No	OR14FG8097	N/A
X10C0402789I	N/A	OR-MILCC2-0089	OR-RTR6-0531	N/A	No	OR14FG8130	N/A
X10C0402789J	N/A	OR-MILCC2-0092	OR-RTR7-0032	N/A	No	OR14FG8133	N/A
X10C0402792D	N/A	OR-MILCC2-0049	OR-RTR7-0054	N/A	No	OR14FG8088	N/A
X10C0402793A	N/A	OR-MILCC2-0091	OR-RTR6-0584	N/A	No	OR14FG8131	N/A
X10C0402793B	N/A	OR-MILCC2-0094	OR-RTR6-0584	N/A	No	OR14FG8135	N/A
X10C0402793C	N/A	OR-MILCC2-0095	OR-RTR6-0584	N/A	No	OR14FG8135	N/A

CCP Correlation of Container Identification Numbers to Batch Data Report Numbers

Waste Stream: # OR-REDC-CH-HET Lot # 45

Container ID Number	Historical Container ID	NDA BDR	RTR BDR	VE BDR	Load/Manage Overpack Yes	Transportation Headspace Gas	
						FGA	GGT
X10C0402793D	N/A	OR-MILCC2-0088	OR-RTR6-0584	N/A	No	OR14FG8128	N/A
X10C0402793E	N/A	OR-MILCC2-0086	OR-RTR6-0581	N/A	No	OR14FG8126	N/A
X10C0402794E	N/A	OR-IQ3-0410	OR-RTR7-0011	N/A	No	OR14FG8153	N/A
X10C04028011	N/A	OR-MILCC2-0040	OR-RTR7-0047	N/A	No	OR14FG8077	N/A
X10C0402801J	N/A	OR-MILCC2-0078	OR-RTR7-0046	N/A	No	OR14FG4062	N/A
X10C04028041	N/A	OR-MILCC2-0006	OR-RTR6-0475	N/A	No	OR14FG8056	N/A
X10C0402804L	N/A	OR-MILCC2-0006	OR-RTR6-0486	N/A	No	OR14FG8050	N/A
X10C0402805G	N/A	OR-MILCC2-0090	OR-RTR6-0576	N/A	No	OR14FG8130	N/A
X10C0402805H	N/A	OR-MILCC2-0090	OR-RTR6-0576	N/A	No	OR14FG8130	N/A

Roger Whiteaker — Signature of Site Project Manager
Roger Whiteaker — Printed Name
01/26/2015 — Date

CCP RTR/VE Summary of Prohibited Items and AK Confirmation

Waste Stream Number: OR-REDC-CH-HET Lot #: 45

Container Number	RTR Prohibited Items [a,b]	Visual Examination Prohibited Items [a,b]	Does the Physical Form of the Waste Match the Waste Stream Description as Determined by AK
See correlation of container ID numbers for list of remaining drum numbers in this Lot.	None of the containers in this lot had prohibited items identified during RTR.	None of the containers in this Lot had prohibited items identified during Visual Examination technique.	The physical form of the waste matches the waste stream description as determined by AK.
a. See Batch Data Reports			
b. If AK has assigned U134 to this waste stream, then any liquids in these containers are prohibited items (not acceptable by the TSDF).			
Justification for the selection of RTR and/or VE: RTR was selected as the characterization method for this lot because the waste was previously packaged and RTR meets all the Data Quality Objectives for NDE for the waste. VE was selected as the characterization method because VE meets the Data Quality Objectives'			

Roger Whitaker — Site Project Manager Signature

Roger Whitaker — Printed Name

01/26/2015 — Date

CCP Reconciliation with Data Quality Objectives

WSPF# OR-REDC-CH-HET Rev. 0 Lot # 45

Sampling Completeness

RTR/VE:

Number of Valid Samples: 39 Number of Total Samples Analyzed: 39
Percent Complete: 100 (QAO is 100%)

Radiological:

Number of Valid Samples: 39 Number of Total Samples Analyzed: 39
Percent Complete: 100 (QAO is 100%)

	Y/N/NA	Reconciliation Parameter
1	Y	Waste Matrix Code.
2	Y	Waste Material Parameter Weights.
3	Y	The TRU activity reported in the BDRs for each container demonstrates with a 95% probability that the container of waste contains TRU radioactive waste.
4	N	AK Sufficiency. Is there an approved AK sufficiency Determination for this waste stream?
5	Y	The data demonstrates whether the waste stream exhibits a toxicity characteristic under Title 40 Code of Federal Regulations (CFR), Part 261, Identification and Listing of Hazardous Waste, Subpart C, Characteristics of Hazardous Waste.
6	Y	Does the waste stream contain listed waste found in 20.4.1.200 NMAC incorporating 40 CFR Part 261, Subpart D, Lists of Hazardous Wastes.
7	Y	Waste stream can be classified as hazardous or nonhazardous.
8	Y	The overall completeness, comparability, and representativeness QAOs were met for each of the analytical and testing procedures as specified in the WAP Sections C3-1 through C3-2 prior to submittal of a waste stream profile form for a waste steam or waste stream lot.

	Completeness	Comparability	Representativeness
Radiography	Y	Y	Y
VE	Y	Y	Y

Comments: None

Roger Whiteaker 01/26/2015

Signature of Site Project Manager Printed Name Date

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Attachment 13 - CCP Waste Stream Characterization Checklist

Site(s): ORNL
Waste Stream Number: OR-REDC-RH-HET (CCP-AK-ORNL-500) Lot # (if applicable) 29
Waste Stream Description: Heterogeneous Debris Waste

Acceptable Knowledge Information or other data points[a]	Characterization Method(s)	Acceptable Knowledge Re-evaluation Required? Yes/No[b]?	Comments[c]
Physical waste form/description	VE	No	VE Data Sheets indicate consistency with Attachment 6 of CCP-TP-005.
Waste material parameters weights	AK	No	VE Data Sheets indicate consistency with the Waste Material Parameter table as listed in the AK. See additional attached sheets.
Waste percent volume consistent with nondestructive examination or visual examination data and audio/video tapes or equivalent media	AK, VE	No	VE Data Sheets indicate consistency with CCP-AK-ORNL-500. See additional attached sheets.
Summary category group assignment	AK, VE	No	VE Data Sheets are consistent with CCP-TP-005, Attachment 6.
Waste matrix code assignment	AK, VE	No	Waste Matrix Code S5400 is consistent with data from VE data sheets.
Absence of prohibited items	AK, VE	No	VE did not identify any prohibited items.
EPA Hazardous Waste Number assignment[d]	AK	No	Characterization results consistent with CCP-AK-ORNL-500.
Toxicity characteristic code assignment	AK	No	Consistent with CCP-AK-ORNL-500.
VOCs from packaging materials or radiolysis present	AK	No	CCP-TP-005 Attachment 5 does not identify any VOCs associated with packaging or radiolysis.
State Hazardous Waste Number assignment	AK	No	No additional State Hazardous Waste codes are identified in CCP-TP-005, Attachment 5.
Radionuclides present	DTC	No	Radionuclides reported were determined according to CCP-AK-ORNL-501.
Other radiological parameters: (specify)	DTC	No	The calculation of determining the 18 radionuclides constituting greater than 95% of the hazard is documented in CCP-AK-ORNL-501.

NTPC RECORDS ORIGINAL
DATE REC'D 2/5/15 SP

Attachment 13 - CCP Waste Stream Characterization Checklist

Site(s): ORNL
Waste Stream Number: OR-REDC-RH-HET (CCP-AK-ORNL-500) Lot # (if applicable) 29
Waste Stream Description: Heterogeneous Debris Waste

Additional Comments:

VE BDRS: ORNLRHVE13001, ORNLRHVE13002, ORNLRHVE13003, ORNLRHVE13004, ORNLRHVE13005, ORNLRHVE13006, ORNLRHVE14002, ORNLRHVE14004, ORNLRHVE14005, ORNLRHVE14007, ORNLRHVE14008, ORNLRHVE14009, ORNLRHVE14010, ORNLRHVE14011, ORNLRHVE14012

DTC BDRs: ORRHDTC13001, ORRHDTC14001, ORRHDTC14002

a. Identified in the AK Summary Report or included in the in-process record documentation (e.g., BDR's).
b. If 'Yes,' AK Expert completes an Acceptable Knowledge Re-evaluation Checklist.
c. Identify the source of the waste characterization information (e.g., batch data report).
d. Ensure that, if a toxicity characteristic contaminant is identified, it is not included as a listed waste, and if analytical data regarding the concentration are not available, the corresponding EPA Hazardous Waste Code is applied.

Site Project Manager:

Irene Joo	Irene Joo	1/25/2015
Print	Sign	Date

Acceptable Knowledge Expert:

Steve Schafer		1/26/2015
Print	Sign	Date

Attachment 13 - CCP Waste Stream Characterization Checklist

Site(s): ORNL
Waste Stream Number: OR-REDC-RH-HET (CCP-AK-ORNL-500) Lot # (if applicable) 30
Waste Stream Description: Heterogeneous Debris Waste

Acceptable Knowledge Information or other data points[a]	Characterization Method(s)	Acceptable Knowledge Re-evaluation Required? Yes/No[b]?	Comments[c]
Physical waste form/description	VE	No	VE Data Sheets indicate consistency with Attachment 6 of CCP-TP-005.
Waste material parameters weights	VE	No	VE Data Sheets indicate consistency with the Waste Material Parameter table as listed in the AK.
Waste percent volume consistent with nondestructive examination or visual examination data and audio/video tapes or equivalent media	VE	No	VE Data Sheets indicate consistency with CCP-AK-ORNL-500.
Summary category group assignment	VE	No	VE Data Sheets are consistent with CCP-TP-005, Attachment 6.
Waste matrix code assignment	VE	No	Waste Matrix Code S5400 is consistent with data from VE data sheets.
Absence of prohibited items	VE	No	VE did not identify any prohibited items.
EPA Hazardous Waste Number assignment [d]	AK	No	Characterization results consistent with CCP-AK-ORNL-500.
Toxicity characteristic code assignment	AK	No	Consistent with CCP-AK-ORNL-500.
VOCs from packaging materials or radiolysis present	AK	No	CCP-TP-005 Attachment 5 does not identify any VOCs associated with packaging or radiolysis.
State Hazardous Waste Number assignment	AK	No	No additional State Hazardous Waste codes are identified in CCP-TP-005, Attachment 5.
Radionuclides present	AK, DTC	No	Radionuclides present were determined according to CCP-AK-ORNL-501 and quantified using the DTC method
Other radiological parameters: (specify)	AK, DTC	No	The 18 radionuclides constituting greater than 95% of the hazard were calculated and reported, CCP-AK-ORNL-501

CCP RECORDS ORIGINAL
DATE REC'D 2-29-16

Attachment 13 - CCP Waste Stream Characterization Checklist

Site(s): ORNL
Waste Stream Number: OR-REDC-RH-HET (CCP-AK-ORNL-500) Lot # (if applicable) 30
Waste Stream Description: Heterogeneous Debris Waste

Additional Comments:

VE BDRS: ORNLRHVE14001, ORNLRHVE14003, ORNLRHVE14008, ORNLRHVE14013, ORNLRHVE14014, ORNLRHVE14016

Radiological Data: ORRHDTC14001, ORRHDTC14002, ORRHDTC15001, ORRHDTC15002

FGA BDRS: OR15FG11003, OR15FG11006, OR15FG11008

a. Identified in the AK Summary Report or included in the in-process record documentation (e.g., BDR's).
c. Identify the source of the waste characterization information (e.g., batch data report).

d. Ensure that, if a toxicity characteristic contaminant is identified, it is not included as a listed waste, and if analytical data regarding the concentration are not available, the corresponding EPA Hazardous Waste Code is applied.

Site Project Manager:

Print	Sign	Date
Irene Joo	Irene Joo	2/29/16

Acceptable Knowledge Expert:

Print	Sign	Date
Kevin J. Peters		2/29/2016

Attachment 13 - CCP Waste Stream Characterization Checklist

Site(s): ORNL
Waste Stream Number: OR-REDC-RH-HET (CCP-AK-ORNL-500) Lot # (If applicable) 30
Waste Stream Description: Heterogeneous Debris Waste

Acceptable Knowledge Information or other data points[a]	Characterization Method(s)	Acceptable Knowledge Re-evaluation Required? Yes/No[b]?	Comments[c]
Physical waste form/description	VE	No	VE Data Sheets indicate consistency with Attachment 6 of CCP-TP-005.
Waste material parameters weights	VE	No	VE Data Sheets indicate consistency with the Waste Material Parameter table as listed in the AK.
Waste percent volume consistent with nondestructive examination or visual examination data and audio/video tapes or equivalent media	VE	No	VE Data Sheets indicate consistency with CCP-AK-ORNL-500.
Summary category group assignment	VE	No	VE Data Sheets are consistent with CCP-TP-005, Attachment 6.
Waste matrix code assignment	VE	No	Waste Matrix Code S5400 is consistent with data from VE data sheets.
Absence of prohibited items	VE	No	VE did not identify any prohibited items.
EPA Hazardous Waste Number assignment [d]	AK	No	Characterization results consistent with CCP-AK-ORNL-500.
Toxicity characteristic code assignment	AK	No	Consistent with CCP-AK-ORNL-500.
VOCs from packaging materials or radiolysis present	AK	No	CCP-TP-005 Attachment 5 does not identify any VOCs associated with packaging or radiolysis.
State Hazardous Waste Number assignment	AK	No	No additional State Hazardous Waste codes are identified in CCP-TP-005, Attachment 5.
Radionuclides present	AK, DTC	No	Radionuclides present were determined according to CCP-AK-ORNL-501 and quantified using the DTC method
Other radiological parameters: (specify)	AK, DTC	No	The 18 radionuclides constituting greater than 95% of the hazard were calculated and reported, CCP-AK-ORNL-501

CCP RECORDS ORIGINAL
DATE REC'D 2-29-16

Attachment 13 - CCP Waste Stream Characterization Checklist

Site(s): ORNL
Waste Stream Number: OR-REDC-RH-HET (CCP-AK-ORNL-500) Lot # (if applicable) 30
Waste Stream Description: Heterogeneous Debris Waste

Additional Comments:

VE BDRS: ORNLRHVE14001, ORNLRHVE14003, ORNLRHVE14008, ORNLRHVE14013, ORNLRHVE14014, ORNLRHVE14018

Radiological Data: ORRHDTC14001, ORRHDTC14002, ORRHDTC15001, ORRHDTC15002

FGA BDRS: OR15FG11003, OR15FG11008, OR15FG11008

a. Identified in the AK Summary Report or included in the in-process record documentation (e.g., BDR's).
c. Identify the source of the waste characterization information (e.g., batch data report).

d. Ensure that, if a toxicity characteristic contaminant is identified, it is not included as a listed waste, and if analytical data regarding the concentration are not available, the corresponding EPA Hazardous Waste Code is applied.

Site Project Manager:

Print	Sign	Date
Irene Joo	Irene Joo	2/29/16

Acceptable Knowledge Expert:

Print	Sign	Date
Kevin J. Peters		2/29/2016

Attachment 13 - CCP Waste Stream Characterization Checklist

Site(s): ORNL

Waste Stream Number: OR-REDC-RH-HET (CCP-AK-ORNL-500) Lot # (if applicable) 31

Waste Stream Description: Heterogeneous Debris Waste

Acceptable Knowledge Information or other data points[a]	Characterization Method(s)	Acceptable Knowledge Re-evaluation Required? Yes/No[b]?	Comments[c]
Physical waste form/description	VE	No	VE Data Sheets indicate consistency with Attachment 6 of CCP-TP-005.
Waste material parameters weights	VE	No	VE Data Sheets indicate consistency with the Waste Material Parameter table as listed in the AK.
Waste percent volume consistent with nondestructive examination or visual examination data and audio/video tapes or equivalent media	VE	No	VE Data Sheets indicate consistency with CCP-AK-ORNL-500.
Summary category group assignment	VE	No	VE Data Sheets are consistent with CCP-TP-005, Attachment 6.
Waste matrix code assignment	VE	No	Waste Matrix Code S5400 is consistent with data from VE data sheets.
Absence of prohibited items	VE	No	VE did not identify any prohibited items.
EPA Hazardous Waste Number assignment[d]	AK	No	Characterization results consistent with CCP-AK-ORNL-500.
Toxicity characteristic code assignment	AK	No	Consistent with CCP-AK-ORNL-500.
VOCs from packaging materials or radiolysis present	AK	No	CCP-TP-005 Attachment 5 does not identify any VOCs associated with packaging or radiolysis.
State Hazardous Waste Number assignment	AK	No	No additional State Hazardous Waste codes are identified in CCP-TP-005, Attachment 5.
Radionuclides present	AK, DTC	No	Radionuclides present were determined according to CCP-AK-ORNL-501 and quantified using the DTC method
Other radiological parameters: (specify)	AK, DTC	No	The 18 radionuclides constituting greater than 95% of the hazard were calculated and reported, CCP-AK-ORNL-501

CCP RECORDS ORIGINAL
DATE REC'D 2-22-16 JY

Attachment 13 - CCP Waste Stream Characterization Checklist

Site(s): ORNL
Waste Stream Number: OR-REDC-RH-HET (CCP-AK-ORNL-500) Lot # (if applicable) 31
Waste Stream Description: Heterogeneous Debris Waste

Additional Comments:

VE BDRS: ORNLRHVE15001, ORNLRHVE15002

Radiological Data: ORRHDTC15003, ORRHDTC15004

FGA BDRS: OR15FG11008, OR15FG11009

a. Identified in the AK Summary Report or included in the in-process record documentation (e.g., BDR's).
c. Identify the source of the waste characterization information (e.g., batch data report).

d. Ensure that, if a toxicity characteristic contaminant is identified, it is not included as a listed waste, and if analytical data regarding the concentration are not available, the corresponding EPA Hazardous Waste Code is applied.

Site Project Manager:

Irene Joo		2/29/16
Print	Sign	Date

Acceptable Knowledge Expert:

Kevin J. Peters		2/29/2016
Print	Sign	Date

Attachment 13 - CCP Waste Stream Characterization Checklist

Site(s): ORNL

Waste Stream Number: OR-REDC-RH-HET (CCP-AK-ORNL-500) Lot # (if applicable) 32

Waste Stream Description: Heterogeneous Debris Waste

Acceptable Knowledge information or other data points[a]	Characterization Method(s)	Acceptable Knowledge Re-evaluation Required? Yes/No[b]?	Comments[c]
Physical waste form/description	VE	No	VE Data Sheets indicate consistency with Attachment 6 of CCP-TP-005.
Waste material parameters weights	VE	No	VE Data Sheets indicate consistency with the Waste Material Parameter table as listed in the AK.
Waste percent volume consistent with nondestructive examination or visual examination data and audio/video tapes or equivalent media	VE	No	VE Data Sheets indicate consistency with CCP-AK-ORNL-500.
Summary category group assignment	VE	No	VE Data Sheets are consistent with CCP-TP-005, Attachment 6.
Waste matrix code assignment	VE	No	Waste Matrix Code S5400 is consistent with data from VE data sheets.
Absence of prohibited items	VE	No	VE did not identify any prohibited items.
EPA Hazardous Waste Number assignment[d]	AK	No	Characterization results consistent with CCP-AK-ORNL-500.
Toxicity characteristic code assignment	AK	No	Consistent with CCP-AK-ORNL-500.
VOCs from packaging materials or radiolysis present	AK	No	CCP-TP-005 Attachment 5 does not identify any VOCs associated with packaging or radiolysis.
State Hazardous Waste Number assignment	AK	No	No additional State Hazardous Waste codes are identified in CCP-TP-005, Attachment 5.
Radionuclides present	AK, DTC	No	Radionuclides present were determined according to CCP-AK-ORNL-501 and quantified using the DTC method
Other radiological parameters: (specify)	AK, DTC	No	The 18 radionuclides constituting greater than 95% of the hazard were calculated and reported. CCP-AK-ORNL-501

CCP RECORDS ORIGINAL
DATE REC'D 11/09/15

Attachment 13 - CCP Waste Stream Characterization Checklist

Site(s): ORNL
Waste Stream Number: OR-REDC-RH-HET (CCP-AK-ORNL-500) Lot # (if applicable) 32
Waste Stream Description: Heterogeneous Debris Waste

Additional Comments:

VE BDRS: ORNLRHVE15003, ORNLRHVE15004, ORNLRHVE15005, ORNLRHVE15006, ORNLRHVE15007, ORNLRHVE15008, ORNLRHVE15009

Radiological Data: ORRHDTC15005

FGA BDRS: OR15FG11014, OR15FG11015

a. Identified in the AK Summary Report or included in the In-process record documentation (e.g., BDR's).
c. Identify the source of the waste characterization information (e.g., batch data report).

d. Ensure that, if a toxicity characteristic contaminant is identified, it is not included as a listed waste, and if analytical data regarding the concentration are not available, the corresponding EPA Hazardous Waste Code is applied.

Site Project Manager:

Print	Sign	Date
Irene Joo	Irene Joo	11/5/15

Acceptable Knowledge Expert:

Print	Sign	Date
Kevin J. Peters		11/5/2015

Attachment 13 - CCP Waste Stream Characterization Checklist

Site(s): ORNL

Waste Stream Number: OR-REDC-RH-HET (CCP-AK-ORNL-500) Lot # (if applicable) 33

Waste Stream Description: Heterogeneous Debris Waste

Acceptable Knowledge information or other data points[a]	Characterization Method(s)	Acceptable Knowledge Re-evaluation Required? Yes/No[b]?	Comments[c]
Physical waste form/description	VE	No	VE Data Sheets indicate consistency with Attachment 6 of CCP-TP-005.
Waste material parameters weights	VE	No	VE Data Sheets indicate consistency with the Waste Material Parameter table as listed in the AK.
Waste percent volume consistent with nondestructive examination or visual examination data and audio/video tapes or equivalent media	VE	No	VE Data Sheets indicate consistency with CCP-AK-ORNL-500.
Summary category group assignment	VE	No	VE Data Sheets are consistent with CCP-TP-005, Attachment 6.
Waste matrix code assignment	VE	No	Waste Matrix Code S5400 is consistent with data from VE data sheets.
Absence of prohibited items	VE	No	VE did not identify any prohibited items.
EPA Hazardous Waste Number assignment[d]	AK	No	Characterization results consistent with CCP-AK-ORNL-500.
Toxicity characteristic code assignment	AK	No	Consistent with CCP-AK-ORNL-500.
VOCs from packaging materials or radiolysis present	AK	No	CCP-TP-005 Attachment 5 does not identify any VOCs associated with packaging or radiolysis.
State Hazardous Waste Number assignment	AK	No	No additional State Hazardous Waste codes are identified in CCP-TP-005, Attachment 6.
Radionuclides present	AK, DTC	No	Radionuclides present were determined according to CCP-AK-ORNL-501 and quantified using the DTC method
Other radiological parameters: (specify)	AK, DTC	No	The 18 radionuclides constituting greater than 95% of the hazard were calculated and reported, CCP-AK-ORNL-501

CCP RECORDS ORIGINAL
DATE REC'D 2.29.16 JY.

Attachment 13 - CCP Waste Stream Characterization Checklist

Site(s): ORNL
Waste Stream Number: OR-REDC-RH-HET (CCP-AK-ORNL-500) Lot # (if applicable) 33
Waste Stream Description: Heterogeneous Debris Waste

Additional Comments:

VE BDRS: ORNLRHVE15010, ORNLRHVE15011, ORNLRHVE15012

Radiological Data: ORRHDTC15006, ORRHDTC15007

FGA BDRS: OR15FG11016, OR15FG11017

a. Identified in the AK Summary Report or included in the in-process record documentation (e.g., BDR's).
c. Identify the source of the waste characterization information (e.g., batch data report).

d. Ensure that, if a toxicity characteristic contaminant is identified, it is not included as a listed waste, and if analytical data regarding the concentration are not available, the corresponding EPA Hazardous Waste Code is applied.

Site Project Manager:

Irene Jao		2/29/16
Print	Sign	Date

Acceptable Knowledge Expert:

Kwin J. Peters		2/29/2016
Print	Sign	Date

DIVIDER PAGE

Nuclear Waste Partnership LLC

A URS-led partnership with B&W and AREVA

CP:15:01033
UFC:5900.00

INTER-OFFICE CORRESPONDENCE

DATE: January 26, 2015

FROM: I. S. Joo LOCATION: Remote-Handled Projects

TO: CCP Records Custodian GSA-212 LOCATION: Central Characterization Program

SUBJECT: TRANSMITTAL OF CHARACTERIZATION RECONCILIATION REPORT FOR REMOTE-HANDLED LOT 29 FOR WASTE STREAM OR-REDC-RH-HET (CCP-AK-ORNL-500)

Please accept the attached Characterization Reconciliation Report for the Remote-Handled Oak Ridge National Laboratory Lot 29 for waste stream OR-REDC-RH-HET (CCP-AK-ORNL-500).

IJ:jmc

Attachment

cc: (without attachment)
D. W. Moody ED
C. A. Turner ED

NTPC RECORDS ORIGINAL
DATE REC'D 2/5/15 SP

Attachment 1 - Summary of Characterization by Container Number

CRR Number: CRR-ORNL-OR-REDC-RH-HET-0029
Waste Stream: OR-REDC-RH-HET
Summary Category Group (SCG): *S5000*
Waste Matrix Code (WMC): S5400
Waste Characterization Site: RH_ORNL

Radiological Characterization Method: DTC
(e.g. AK, DTC, DA, NDA, D&G)
Acceptable Knowledge Qualification: *Confirmatory Testing*
(e.g. Peer Review, Corroborating data, Confirmatory testing, as applicable)

			TRU Alpha Activity Concentration (TAAC)		Volume Activity (Ci/L)			RH Waste Determination: Surface Dose (SD) Rate Measurements	
Container ID Number	Radiological BDR Number	NDE BDR Number	TAAC (nCi/g)	TAAC (≥ 100 nCi/g)	Value	1σ Unc.	Evaluation (≤ 23 Ci/L)	SD Rate (rem / hr)	SD rate >200 mrem/hr and ≤ 1,000 rem/hr
ORRH00678	ORRHDTC13001	ORNLRHVE13001	1.18E+04	TRU	8.19E-02	6.81E-02	Pass	0.23	Remote-Handled
ORRH00679	ORRHDTC13001	ORNLRHVE13002	1.20E+04	TRU	6.63E-02	5.50E-02	Pass	0.21	Remote-Handled
ORRH00680	ORRHDTC13001	ORNLRHVE13003	4.31E+04	TRU	2.94E-01	2.44E-01	Pass	0.39	Remote-Handled
ORRH00681	ORRHDTC13001	ORNLRHVE13004	3.70E+04	TRU	2.89E-01	2.41E-01	Pass	0.36	Remote-Handled
ORRH00682	ORRHDTC13001	ORNLRHVE13004	2.36E+04	TRU	1.61E-01	1.34E-01	Pass	0.25	Remote-Handled
ORRH00683	ORRHDTC13001	ORNLRHVE13005	3.25E+04	TRU	2.57E-01	2.14E-01	Pass	0.4	Remote-Handled
ORRH00684	ORRHDTC13001	ORNLRHVE13006	3.16E+04	TRU	2.12E-01	1.76E-01	Pass	0.3	Remote-Handled
ORRH00687	ORRHDTC14001	ORNLRHVE14002	1.60E+04	TRU	1.84E-01	1.54E-01	Pass	0.25	Remote-Handled
ORRH00688	ORRHDTC14001	ORNLRHVE14004	3.61E+04	TRU	4.02E-01	3.36E-01	Pass	0.52	Remote-Handled
ORRH00689	ORRHDTC14001	ORNLRHVE14005	5.47E+04	TRU	3.89E-01	3.23E-01	Pass	0.58	Remote-Handled
ORRH00691	ORRHDTC14001	ORNLRHVE14007	1.64E+04	TRU	9.09E-02	7.55E-02	Pass	0.21	Remote-Handled
ORRH00697	ORRHDTC14001	ORNLRHVE14008	1.35E+04	TRU	1.11E-01	9.23E-02	Pass	0.35	Remote-Handled
ORRH00692	ORRHDTC14002	ORNLRHVE14011	1.26E+04	TRU	1.44E-01	1.20E-01	Pass	0.23	Remote-Handled
ORRH00693	ORRHDTC14002	ORNLRHVE14011	4.41E+04	TRU	4.01E-01	3.34E-01	Pass	0.53	Remote-Handled
ORRH00695	ORRHDTC14002	ORNLRHVE14012	3.31E+04	TRU	3.84E-01	3.20E-01	Pass	0.48	Remote-Handled
ORRH00699	ORRHDTC14002	ORNLRHVE14009	1.82E+04	TRU	2.75E-01	2.31E-01	Pass	0.30	Remote-Handled
ORRH00700	ORRHDTC14002	ORNLRHVE14010	1.35E+04	TRU	2.13E-01	1.79E-01	Pass	0.25	Remote-Handled
	N/A								

Irene Joo
SPM Name (*print*)

SPM Signature (*sign*)

1/25/2015
Date

Attachment 2 - Remote-Handled Characterization Reconciliation Report Data Quality Objectives (DQOs) and Quality Assurance Objectives (QAOs)

CRR Number: CRR-ORNL-OR-REDC-RH-HET-0029
Waste Stream: OR-REDC-RH-HET
Site: RH_ORNL

Data Quality Objectives (DQOs)	Yes	No	N/A	Source Document(s) (List BDRs, reports, AK documents, etc.)
Defense Waste, High Level, and Spent Nuclear Fuel Determination - WCPIP Section 2.1.1				
Was the waste generated by, or comingled with, atomic energy defense activities? Is the waste verified not to be high-level waste or spent nuclear fuel?	X			CCP-AK-ORNL-500, Rev. 4, Sections 4.4 and 4.5 and Source documents I022, I023, I044, M023, P161, P258, P281, P569, U038, U039, U647.
TRU Waste Determination - WCPIP Section 2.1.2.1				
Does the waste contain more than 100 nCi of TRU isotopes per gram of waste?	X			ORRHDTC13001, ORRHDTC14001, ORRHDTC14002 Waste Container Dose-to-Curie conversion record sheets
RH Waste Determination - WCPIP Section 2.1.2.2				
Is the surface dose rate equal to or greater than 200 mrem/hr and less than 1000 rem/hr?	X			Radiological survey reports provided by ORNL
Activity Determination - WCPIP Section 2.1.2.3				
Is the volume activity of the container less than 23 Ci/L per canister? (SPM evaluation is on container basis)	X			ORRHDTC13001, ORRHDTC14001, ORRHDTC14002 Waste Container Dose-to-Curie conversion record sheets
Liquids - WCPIP Section 2.1.3.1				
Is the amount of liquids in the container less than one percent by volume?	X			ORNLRHVE13001, ORNLRHVE13002, ORNLRHVE13003, ORNLRHVE13004, ORNLRHVE13005, ORNLRHVE13006, ORNLRHVE14002, ORNLRHVE14004, ORNLRHVE14005, ORNLRHVE14007, ORNLRHVE14008, ORNLRHVE14009, ORNLRHVE14010, ORNLRHVE14011, ORNLRHVE14012 Waste Container VE data sheets
Physical Form - WCPIP Section 2.1.3.2				
Does the physical form of the waste accurately delineate the waste stream?	X			ORNLRHVE13001, ORNLRHVE13002, ORNLRHVE13003, ORNLRHVE13004, ORNLRHVE13005, ORNLRHVE13006, ORNLRHVE14002, ORNLRHVE14004, ORNLRHVE14005, ORNLRHVE14007, ORNLRHVE14008, ORNLRHVE14009, ORNLRHVE14010, ORNLRHVE14011, ORNLRHVE14012 Waste Container VE data sheets

Superceded
RK 2/17/15

Attachment 2 - Remote-Handled Characterization Reconciliation Report Data Quality Objectives (DQOs) and Quality Assurance Objectives (QAOs)

CRR Number: CRR-ORNL-OR-REDC-RH-HET-0029
Waste Stream: OR-REDC-RH-HET
Site: RH_ORNL

Data Quality Objectives (DQOs)	Yes	No	N/A	Source Document(s) (List BDRs, reports, AK documents, etc.)
Defense Waste, High Level, and Spent Nuclear Fuel Determination - WCPIP Section 2.1.1				
Was the waste generated by, or comingled with, atomic energy defense activities? Is the waste verified not to be high-level waste or spent nuclear fuel?	X			CCP-AK-ORNL-500, Rev. 4, Sections 4.4 and 4.5 and Source documents I022, I023, I044, M023, P161, P258, P281, P569, U038, U039, U647.
TRU Waste Determination - WCPIP Section 2.1.2.1				
Does the waste contain more than 100 nCi of TRU isotopes per gram of waste?	X			ORRHDTC13001, ORRHDTC14001, ORRH14002 Waste Container Dose-to-Curie conversion record sheets
RH Waste Determination - WCPIP Section 2.1.2.2				
Is the surface dose rate equal to or greater than 200 mrem/hr and less than 1000 rem/hr?	X			Radiological survey reports provided by ORNL
Activity Determination - WCPIP Section 2.1.2.3				
Is the volume activity of the container less than 23 Ci/L per canister? (SPM evaluation is on container basis)	X			ORRHDTC13001, ORRHDTC14001, ORRH14002 Waste Container Dose-to-Curie conversion record sheets
Liquids - WCPIP Section 2.1.3.1				
Is the amount of liquids in the container less than one percent by volume?	X			ORNLRHVE13001, ORNLRHVE13002, ORNLRHVE13003, ORNLRHVE13004, ORNLRHVE13005, ORNLRHVE13006, ORNLRHVE14002, ORNLRHVE14004, ORNLRHVE14005, ORNLRHVE14007, ORNLRHVE14008, ORNLRHVE14009, ORNLRHVE14010, ORNLRHVE14011, ORNLRHVE14012 Waste Container VE data sheets
Physical Form - WCPIP Section 2.1.3.2				
Does the physical form of the waste accurately delineate the waste stream?	X			ORNLRHVE13001, ORNLRHVE13002, ORNLRHVE13003, ORNLRHVE13004, ORNLRHVE13005, ORNLRHVE13006, ORNLRHVE14002, ORNLRHVE14004, ORNLRHVE14005, ORNLRHVE14007, ORNLRHVE14008, ORNLRHVE14009, ORNLRHVE14010, ORNLRHVE14011, ORNLRHVE14012 Waste Container VE data sheets

Attachment 2 - Remote-Handled Characterization Reconciliation Report Data Quality Objectives (DQOs) and Quality Assurance Objectives (QAOs)

Quality Assurance Objectives (QAOs)	Yes	No	N/A
Acceptable Knowledge (AK) - WCPIP Section 4.1			
Precision - Not applicable QAO for this method			X
Accuracy - AK accuracy assesses the percentage of waste containers that require reassignment to a new Summary Category Group or new waste stream based on the reevaluation of AK or on obtaining testing, sampling and/or analysis data. Is the percentage of waste containers that confirm the physical and radiological properties greater than or equal to 90%?	X		
Representativeness - Does the process of obtaining, evaluating, and documenting the AK information ensure it was performed in accordance with the minimum standards established in AK procedure CCP-TP-005?	X		
Completeness - Does the AK record contain 100% of the information required for each container in the waste stream? (Usability of the AK information will be assessed for completeness during audits.)	X		
Comparability – Was the AK compiled in compliance with AK procedure(s) and associated training requirements?	X		

Physical Characterization Methods

Quality Assurance Objectives (QAOs)	Yes	No	N/A
Visual Examination (VE) - WCPIP Section 4.2.1			
Was VE used in the physical characterization?	X		
Precision - Were discrepancies, if any, regarding important waste characteristics (i.e., physical form of the waste and absence of prohibited liquids) within a single container reconciled between two operators?	X		
Accuracy - Have VE operators passed a comprehensive examination with a score of 80% and demonstrated satisfactory performance in the presence of the VE expert during initial qualification and requalification?	X		
Representativeness – Are the waste contents placed in the waste containers described on the data forms?	X		
Completeness – Has the relevant waste information been collected and documented?	X		
Comparability – Was the VE information compiled in compliance with VE procedure(s) and associated training requirements?	X		

Real-Time Radiography (RTR) - WCPIP Section 4.2.2			
Was RTR used in the physical characterization?		X	
Precision - Were discrepancies, if any, regarding important waste characteristics (i.e., physical form of the waste and absence of prohibited liquids) within a single container reconciled between two operators (during independent observations and replicate scans)?			X
Accuracy – Was a target used to tune the image for maximum sharpness and were operators required to identify prohibited liquid in a training container during qualification and requalification?			X
Representativeness – Were all the relevant waste contents in each container described?			X
Completeness – Was relevant waste information assembled to show that each of the containers in the waste stream belongs to the waste stream? This information must be documented on videotape or other equivalent media and data form.			X
Comparability – Was the RTR information compiled in compliance with RTR procedure(s) and associated training requirements?			X

Attachment 2 - Remote-Handled Characterization Reconciliation Report Data Quality Objectives (DQOs) and Quality Assurance Objectives (QAOs)

Radiological Characterization Methods

Quality Assurance Objectives (QAOs)	Yes	No	N/A
Dose-to-Curie (DTC) - WCPIP Section 4.3.2			
Was DTC used for radiological characterization?	X		
Precision - Not applicable QAO for this method			X
Accuracy – Were standardized and benchmarked radiation transport computer codes used?	X		
Representativeness – Was an appropriate model of the actual physical drum dose rate configuration used and documented by an independent review of the DTC correlation?	X		
Completeness – Were calculations used that span the full range of important parameter values (such as density) which are expected to be encountered with the actual RH TRU containers?	X		
Comparability - Not applicable QAO for this method			X
Dose Rate Measurements associated with DTC - WCPIP Section 4.3.2			
Precision – Was the reported relative percent difference (RPD) less than or equal to 40%?	X		
Accuracy – Has a calibration for the dose-rate instrument used been established, maintained, and documented within the recommendations of the manufacturer?	X		
Representativeness - Not applicable QAO for this method			X
Completeness - Not applicable QAO for this method			X
Comparability - Not applicable QAO for this method			X

Nondestructive Assay (NDA) - WCPIP Section 4.3.3			
Was NDA used for radiological characterization?		X	
Precision – Does the reported %RSD comply with CCP-TP-506, Table 4.2?			X
Accuracy – Is the reported %R less than or equal to ± 30% on non-interfering matrix?			X
Representativeness – Has each waste container been assayed?			X
Completeness – Is 100% of the NDA data valid and usable?			X
Comparability – Was the NDA process implemented in accordance to NDA standards and were associated training requirements met?			X

Quality Assurance Objectives (QAOs)	Yes	No	N/A
Sampling - WCPIP Section 4.3.4.1			
Was sampling used for radiological characterization?		X	
Precision - Not applicable QAO for this method			X
Accuracy – Was an appropriate sample design developed and approved by CBFO for collecting an adequate number of samples such that the one-sigma uncertainty in the mean value of the sample-generated scaling factor is within a factor of two?			X
Representativeness – Was representativeness described in the associated sampling plan?			X
Completeness – Was the QAO for a minimum set of radionuclides specified in the sampling plan?			X
Comparability - Not applicable QAO for this method			X
Sample Collection - WCPIP Section 4.3.4.2			
Accuracy – Was sampling equipment verified as clean by the use of standard radiological control survey methods?			X

Attachment 2 - Remote-Handled Characterization Reconciliation Report Data Quality Objectives (DQOs) and Quality Assurance Objectives (QAOs)

Radiological Characterization Methods, continued

Radiochemistry Analysis - WCPIP Section 4.3.4.3			
Precision – Was the RPD less than or equal to 40% or laboratory acceptable precision criteria?			X
Accuracy – Was the reported %R LCS within ±25%; Was the reported MS ±50%?			X
Representativeness - Not applicable QAO for this method			X
Completeness -Not applicable QAO for this method			X
Comparability: Not applicable QAO for this method			X

Modeling to Confirm or Derive Radionuclide Distributions - WCPIP Section 4.3.5			
Was modeling used for radiological characterization?		X	
Precision - Not applicable QAO for this method			X
Accuracy – Do the modeling results compare to sample results within a factor of two?			X
Representativeness – Was the composition and burnup information for a minimum of 50% of the radioactive materials identified in the AK record involved in the generation of the waste included in the modeling?			X
Completeness - Not applicable QAO for this method			X
Comparability - Not applicable QAO for this method			X

Quality Assurance Objectives (QAOs)	**Yes**	**No**	**N/A**
Surface Dose Rate - WCPIP Section 4.3.7			
Were surface dose rates used for radiological characterization?	X		
Precision – Was the reported RPD equal or less than 40%?	X		
Accuracy - Manufacturer typically specifies a flat energy response of 10 to 20% across the applicable energy range. Was the repeatability of the measurement within about 10% at the higher gamma dose rates?	X		
Representativeness – Was the measurement is applied to the entire waste container?	X		
Completeness – Were 100% of the measurements, needed to determine surface dose rate, performed and useable?	X		
Comparability - Not applicable QAO for this method			X

Gravimetric *or* Dimensional Measurements - WCPIP Section 4.3.8			
Was Gravimetric or Dimensional measurement used?		X	
Precision – Was the measurement equipment maintained according to manufacturer's recommendation?			X
Accuracy – Was the balance readout within 2% of the check weight. Was the length measurement within 0.1 of an inch as verified by a second operator?			X
Representativeness - Not applicable QAO for this method			X
Completeness – Was every quantity of fuel test specimen loaded into container is measured?			X
Comparability - Not applicable QAO for this method			X

Attachment 2 - Remote-Handled Characterization Reconciliation Report Data Quality Objectives (DQOs) and Quality Assurance Objectives (QAOs)

Radiological Characterization Methods, continued

Gravimetric *and* Dimensional Method - WCPIP Section 4.3.8			
Was Gravimetric and Dimensional method used?		X	
Precision - Not applicable QAO for this method			X
Accuracy - Fuel test specimen design and irradiated information is used for individual fuel test specimen pins in combination of the length and gravimetric measurement. Were scaling factors developed from isotope depletion code?			X
Representativeness – Is the design information representative for each specific fuel test specimen quantity loaded into container?			X
Completeness – Was every quantity of fuel test specimen loaded into container is measured?			X
Comparability - Not applicable QAO for this method			X

Attachment 3 – Sum of Fractions Evaluation

Drum Identification Number	F_s Value
ORRH00678	7.85E-05
ORRH00679	6.35E-05
ORRH00680	2.82E-04
ORRH00681	2.77E-04
ORRH00682	1.55E-04
ORRH00683	2.47E-04
ORRH00684	2.03E-04
ORRH00687	1.76E-04
ORRH00688	3.85E-04
ORRH00689	3.72E-04
ORRH00691	8.72E-05

ORRH00697	1.06E-04
ORRH00692	1.38E-04
ORRH00693	3.85E-04
ORRH00695	3.68E-04
ORRH00699	2.64E-04
ORRH00700	2.05E-04

Where *fs* is the sum fractions, A_{Cs} is the Cs-137 activity in the drum, A_{Eu} is the Eu-154 activity, and A_{Co} is the Co-60 activity.

If *fs* <1 then the drum is shippable. If *fs* >1 then the drum needs further evaluation to determine if it is shippable.

DIVIDER PAGE

Nuclear Waste Partnership LLC

An AECOM-led partnership with B&W and AREVA

CP:16:1601059
UFC:5900.00

INTER-OFFICE CORRESPONDENCE

DATE: February 29, 2016

FROM: Irene Joo LOCATION: RH Projects

TO: CCP Records Custodian GSA-212 LOCATION: Central Characterization Program

SUBJECT: TRANSMITTAL OF CHARACTERIZATION RECONCILIATION REPORT FOR REMOTE-HANDLED LOTS 30-33 FOR WASTE STREAM OR-REDC-RH-HET (CCP-AK-ORNL-500)

Please accept the attached Characterization Reconciliation Report for the Remote-Handled Oak Ridge National Laboratory Lots 30-33 for waste stream OR-REDC-RH-HET (CCP-AK-ORNL-500).

IJ:rg

Attachment

cc: (without attachment)
R. Kantrowitz

P.O. Box 2078 • Carlsbad, New Mexico USA 88221-2078
Phone: (575) 234-7200 • Fax: (575) 234-7083

CCP RECORDS ORIGINAL
DATE REC'D 3/2/16

Attachment 1 - Summary of Characterization by Container Number

CRR Number: CRR-ORNL-OR-REDC-RH-HET-0030
Waste Stream: OR-REDC-RH-HET
Summary Category Group (SCG): S5000
Waste Matrix Code (WMC): S5400
Waste Characterization Site: RH_ORNL

Radiological Characterization Method: (e.g. AK, DTC, DA, NDA, D&G)
Acceptable Knowledge Qualification: Confirmatory testing (e.g. Peer Review, Corroborating data, Confirmatory testing)

			TRU Alpha Activity Concentration (TAAC)		Volume Acitivity (Ci/L)			RH Waste Determination: Surface Dose (SD) Rate Measurements	
Container ID Number	Radiological BDR Number	NDE BDR Number	TAAC (nCi/g)	TAAC (≥ 100 nCi/g)	Value	1 s Unc.	Evaluation(≤ 23 Ci/L)	SD Rate (rem / hr)	SD rate >200 mrem/hr and ≤ 1000 rem/hr
ORRH00685	ORRHDTC14001	ORNLRHVE14001	1.67E+04	TRU	1.17E-01	9.72E-02	Pass	2.78E-01	Remote-Handled
ORRH00686	ORRHDTC14001	ORNLRHVE14003	1.97E+04	TRU	1.14E-01	9.47E-02	Pass	4.33E-01	Remote-Handled
ORRH00690	ORRHDTC14001	ORNLRHVE14006	5.91E+03	TRU	7.27E-02	6.07E-02	Pass	2.31E-01	Remote-Handled
ORRH00696	ORRHDTC14002	ORNLRHVE14013	1.75E+04	TRU	2.01E-01	1.68E-01	Pass	2.76E-01	Remote-Handled
ORRH00701	ORRHDTC15002	ORNLRHVE14014	7.22E+04	TRU	4.37E-01	3.63E-01	Pass	5.47E-01	Remote-Handled
ORRH00707	ORRHDTC15001	ORNLRHVE14016	2.02E+04	TRU	3.36E-01	2.82E-01	Pass	3.43E-01	Remote-Handled
Comments									

Irene Joo 02/29/2016
SPM Print/Sign Name and Date

Attachment 2 - Remote-Handled Characterization Reconciliation Report Data Quality Objectives

CRR Number: CRR-ORNL-OR-REDC-RH-HET-0030
Waste Stream: OR-REDC-RH-HET
Site: RH_ORNL

Data Quality Objectives (DQOs)	Yes	No	NA	Characterization Method & Sources (e.g. List BDRs, reports, AK documents)
Defense Waste, High Level, and Spent Nuclear Fuel Determination - WCPIP Section 2.1.1				
Was the waste generated by, or comingled with, atomic energy defense activities? Is the waste verified not to be high-level waste, or spent nuclear fuel?	X			CCP-AK-ORNL-500, Rev. 4, Sections 4.4 and 4.5 and Source documents I022, I023, I044, M023, P161, P258, P281, P569, U038, U039, U647, DR009
TRU Waste Determination - WCPIP Section 2.1.2.1				
Does the waste contain more than 100 nCi of TRU isotopes per gram of waste?	X			ORRHDTC14001, ORRHDTC14002, ORRHDTC15001, ORRHDTC15002 Waste Container Dose-to-Curie conversion record sheets
RH Waste Determination - WCPIP Section 2.1.2.2				
Is the Surface dose rate equal to or greater than 200 mrem/hr and less than 1000 rem/hr	X			Radiological survey reports provided by ORNL
Activity Determination - WCPIP Section 2.1.2.3				
Is the volume activity of the container less than 23 Ci/L per canister? (SPM evaluation is on container basis)	X			ORRHDTC14001, ORRHDTC14002, ORRHDTC15001, ORRHDTC15002 Waste Container Dose-to-Curie conversion record sheets
Liquids - WCPIP Section 2.1.3.1				
Is the amount of liquids in the container less than one percent by volume?	X			ORNLRHVE14001, ORNLRHVE14003, ORNLRHVE14006, ORNLRHVE14013, ORNLRHVE14014, ORNLRHVE14016 Waste Container VE data sheets
Physical Form - WCPIP Section 2.1.3.2				
Does the physical form of the waste accurately delineate the waste stream?	X			ORNLRHVE14001, ORNLRHVE14003, ORNLRHVE14006, ORNLRHVE14013, ORNLRHVE14014, ORNLRHVE14016 Waste Container VE data sheets

Quality Assurance Objectives (QAOs)	Yes	No	NA
Acceptable Knowledge (AK) - WCPIP Section 4.1			
Precision - Not applicable QAO for this method			X

Accuracy - AK accuracy assesses the percentage of waste containers that require reassignment to a new Summary Category Group or new waste stream based on the reevaluation of AK or on obtaining testing, sampling and/or analysis data. Is the percentage of waste containers that confirm the physical and radiological properties greater than or equal to 90%?	X		
Representativeness - Does the process of obtaining, evaluating, and documenting the AK information ensure it was performed in accordance with the minimum standards established in AK procedure CCP-TP-005?	X		
Completeness - Does the AK record contain 100% of the information required for each container in the waste stream? (Usability of the AK information will be assessed for completeness during audits)	X		
Comparability -Was the AK compiled in compliance with AK procedure(s) and associated training requirements?	X		

Physical Characterization Methods

Quality Assurance Objectives (QAOs)	**Yes**	**No**	**NA**
Visual Examination (VE) - WCPIP Section 4.2.1			
Was VE used in the physical characterization?	X		
Precision - Were discrepancies, if any, regarding important waste characteristics (i.e. physical form of the waste and absence of prohibited liquids) within a single container reconciled between two operators?	X		
Accuracy - Have VE operators passed a comprehensive examination with a score of 80% and demonstrated satisfactory performance in the presence of the VE expert during initial qualification and requalification?	X		
Representativeness - Are the waste contents placed in the waste containers described on the data sheet?	X		
Completeness - Has the relevant waste information must be collected and documented?	X		
Comparability - Was the VE information compiled in compliance with VE procedure(s) and associated training requirements?	X		
Real-Time Radiography (RTR) - WCPIP Section 4.2.2			

Was RTR used in the physical characterization?		X	
Precision -Were discrepancies, if any, regarding important waste characteristics (i.e. physical form of the waste and absence of prohibited liquids) within a single container reconciled between two operators (during independent observations and replicate scans)?			X
Accuracy - Was a target used to tune the image for maximum sharpness and were operators required to identify prohibited liquid in a training container during qualification and requalification?			X
Representativeness - Were all the relevant waste contents in each container described?			X
Completeness - Was relevant waste information assembled to show			X
Comparability - Was the RTR information compiled in compliance wi			X
Dose-to-Curie (DTC) - WCPIP Section 4.3.2			
Was DTC used for radiological characterization?	X		
Precision - Not applicable QAO for this method			X
Accuracy - Were standardized and benchmarked radiation transport computer codes used?	X		
Representativeness - Was an appropriate model of the actual physical drum dose rate configuration used and documented by an independent review of the DTC correlation?	X		
Completeness - Were calculations used that span the full range of important parameter values (such as density) which are expected to be encountered with the actual RH TRU containers?	X		
Comparability - Not applicable QAO for this method			X
Dose Rate Measurement associated with DTC - WCPIP Section 4.3.2			
Precision - Was the reported relative percent difference (RPD) less than or equal to 40%?	X		
Accuracy - Has a calibration for the dose-rate instrument used been established, maintained, and documented within the recommendations of the manufacturer?	X		
Representativeness - Not applicable QAO for this method			X
Completeness - Not applicable QAO for this method			X
Comparability - Not applicable QAO for this method			X
Nondestructive Assay (NDA) - WCPIP Section 4.3.3			
Was NDA used for radiological characterization?		X	
Precision - Does the reported %RSD comply with CCP-TP-506, Table 4.2?			X

Accuracy - Is the reported %R less than or equal to ± 30% on non-interfering matrix?			X
Representativeness - Has each waste container been assayed?			X
Completeness - Is 100% of the NDA data valid and usable?			X
Comparability - Was the NDA process implemented in accordance to NDA standards and was associated training requirements met?			X
Sampling - WCPIP Section 4.3.4.1			
Was sampling used for radiological characterization?		X	
Precision - Not applicable QAO for this method			X
Accuracy - Was an appropriate sample design developed and approved by CBFO for collecting an adequate number of samples such that the one-sigma uncertainty in the mean value of the sample-generated scaling factor is within a factor of two?			X
Representativeness - Was representativeness described in the associated sampling plan?			X
Completeness - Was the QAO for a minimum set of radionuclides sp			X
Comparability - Not applicable QAO for this method			X
Sample Collection - WCPIP Section 4.3.4.2			
Accuracy - Was sampling equipment verified as clean by the use of standard radiological control survey methods?			X
Radiochemistry Analysis - WCPIP 4.3.4.3			
Precision - Was the RPD less than or equal to 40% or laboratory acceptable precision criteria?			X
Accuracy - Was the reported %R LCS within ±25%; was the reported			X
Representativeness - Not applicable QAO for this method			X
Completeness - Not applicable QAO for this method			X
Comparability: Not applicable QAO for this method			X
Modeling to Confirm or Derive Radionuclide Distributions - WCPIP 4.3.5			
Was modeling used for radiological characterization?		X	
Precision - Not applicable QAO for this method			X
Accuracy - Do the modeling results compare to sample results within a factor of two?			X
Representativeness - Was the composition and burnup information for a minimum of 50% of the radioactive materials identified in the AK record involved in the generation of the waste included in the modeling?			X
Completeness - Not applicable QAO for this method			X
Comparability - Not applicable QAO for this method			X

Surface Dose Rate - WCPIP Section 4.3.7			
Were surface dose rates used for radiological characterization?	X		
Precision - Was the reported RPD equal to or less than 40%?	X		
Accuracy - manufacturer typically specifies a flat energy response of 10 to 20% across the applicable energy range. Was the repeatability of the measurement within about 10% at the higher gamma dose rate?	X		
Representativeness - Was the measurement applied to the entire container?	X		
Completeness - Were 100% of the measurements, needed to determine surface dose rate, performed and usable?	X		
Comparability - Not applicable QAO for this method			X
Gravimetric or Dimensional Measurements - WCPIP Section 4.3.8			
Was Gravimetric or Dimensional measurement used?		X	
Precision - Was the measurement equipment maintained according to manufacturer's recommendation?			X
Accuracy - Was the balance readout within 2% of the check weight? Was the length measurement within 0.1 of an inch as verified by a second operator?			X
Representativeness - Not applicable QAO for this method			X
Completeness - Was every quantity of fuel test specimen loaded into the container measured?			X
Comparability - Not applicable QAO for this method			X
Gravimetric and Dimensional Method - WCPIP Section 4.3.8			
Was Gravimetric and Dimensional method used?		X	
Precision - Not applicable QAO for this method			X
Accuracy - fuel test specimen design and irradiated information is used for individual fuel test specimen pins in combination of the length and gravimetric measurement. Were scaling factors developed from isotope depletion code?			X
Representativeness - Is the design information representative for each specific fuel test specimen quantity loaded into the container?			X
Completeness - Was every quantity of fuel test specimen loaded into the container measured?			X
Comparability - Not applicable QAO for this method			X

Attachment 3 - Sum of Fractions Evaluation

Drum Identification Number	F_s value
ORRH00685	9.99E-05
ORRH00686	9.76E-05
ORRH00690	6.19E-05
ORRH00696	1.71E-04
ORRH00701	3.73E-04
ORRH00707	3.22E-04

$$fs = \frac{A_{Cs}}{288} + \frac{A_{Eu}}{3.52} + \frac{A_{Co}}{4.26}$$

Where fs is the sum fractions, A_{Cs} is the Cs-137 activity in the drum, A_{Eu} is the Eu-154 activity, and A_{Co} is the Co-60 activity.

If $fs < 1$ then the drum is shippable. If $fs > 1$ then the drum needs further evaluation to determine if it is shippable.

Attachment 1 - Summary of Characterization by Container Number

CRR Number: CRR-ORNL-OR-REDC-RH-HET-0031
Waste Stream: OR-REDC-RH-HET
Summary Category Group (SCG): S5000
Waste Matrix Code (WMC): S5400
Waste Characterization Site: RH_ORNL

Radiological Characterization Method:
(e.g. AK, DTC, DA, NDA, D&G)
Acceptable Knowledge Qualification: Confirmatory testing
(e.g. Peer Review, Corroborating data, Confirmatory testing)

			TRU Alpha Activity Concentration (TAAC)		Volume Acitivity (Ci/L)			RH Waste Determination: Surface Dose (SD) Rate Measurements	
Container ID Number	Radiological BDR Number	NDE BDR Number	TAAC (nCi/g)	TAAC (≥ 100 nCi/g)	Value	1 s Unc.	Evaluation(≤ 23 Ci/L)	SD Rate (rem / hr)	SD rate >200 mrem/hr and ≤ 1000 rem/hr
ORRH00708	ORRHDTC15003	ORNLRHVE15001	1.64E+03	TRU	1.37E-02	7.27E-03	Pass	3.12E-01	Remote-Handled
ORRH00709	ORRHDTC15004	ORNLRHVE15002	2.55E+03	TRU	2.03E-02	1.07E-02	Pass	2.88E-01	Remote-Handled
Comments									

Irene Joo 05/14/2015
SPM Print/Sign Name and Date

Attachment 2 - Remote-Handled Characterization Reconciliation Report Data Quality Objectives

CRR Number: CRR-ORNL-OR-REDC-RH-HET-0031
Waste Stream: OR-REDC-RH-HET
Site: RH_ORNL

Data Quality Objectives (DQOs)	Yes	No	NA	Characterization Method & Sources (e.g. List BDRs, reports, AK documents)
Defense Waste, High Level, and Spent Nuclear Fuel Determination - WCPIP Section 2.1.1				
Was the waste generated by, or comingled with, atomic energy defense activities? Is the waste verified not to be high-level waste, or spent nuclear fuel?	X			CCP-AK-ORNL-500, Rev. 4, Sections 4.4 and 4.5 and Source documents I022, I023, I044, M023, P161, P258, P281, P569, U038, U039, U647, DR009
TRU Waste Determination - WCPIP Section 2.1.2.1				
Does the waste contain more than 100 nCi of TRU isotopes per gram of waste?	X			ORRHDTC15003, ORRHDTC15004 Waste Container Dose-to-Curie conversion record sheets
RH Waste Determination - WCPIP Section 2.1.2.2				
Is the Surface dose rate equal to or greater than 200 mrem/hr and less than 1000 rem/hr	X			Radiological survey reports provided by ORNL
Activity Determination - WCPIP Section 2.1.2.3				
Is the volume activity of the container less than 23 Ci/L per canister? (SPM evaluation is on container basis)	X			ORRHDTC15003, ORRHDTC15004 Waste Container Dose-to-Curie conversion record sheets
Liquids - WCPIP Section 2.1.3.1				
Is the amount of liquids in the container less than one percent by volume?	X			ORNLRHVE15001, ORNLRHVE15002 Waste Container VE data sheets
Physical Form - WCPIP Section 2.1.3.2				
Does the physical form of the waste accurately delineate the waste stream?	X			ORNLRHVE15001, ORNLRHVE15002 Waste Container VE data sheets

Quality Assurance Objectives (QAOs)	Yes	No	NA
Acceptable Knowledge (AK) - WCPIP Section 4.1			
Precision - Not applicable QAO for this method			X

Accuracy - AK accuracy assesses the percentage of waste containers that require reassignment to a new Summary Category Group or new waste stream based on the reevaluation of AK or on obtaining testing, sampling and/or analysis data. Is the percentage of waste containers that confirm the physical and radiological properties greater than or equal to 90%?	X		
Representativeness - Does the process of obtaining, evaluating, and documenting the AK information ensure it was performed in accordance with the minimum standards established in AK procedure CCP-TP-005?	X		
Completeness - Does the AK record contain 100% of the information required for each container in the waste stream? (Usability of the AK information will be assessed for completeness during audits)	X		
Comparability -Was the AK compiled in compliance with AK procedure(s) and associated training requirements?	X		

Physical Characterization Methods

Quality Assurance Objectives (QAOs)	Yes	No	NA
Visual Examination (VE) - WCPIP Section 4.2.1			
Was VE used in the physical characterization?	X		
Precision - Were discrepancies, if any, regarding important waste characteristics (i.e. physical form of the waste and absence of prohibited liquids) within a single container reconciled between two operators?	X		
Accuracy - Have VE operators passed a comprehensive examination with a score of 80% and demonstrated satisfactory performance in the presence of the VE expert during initial qualification and requalification?	X		
Representativeness - Are the waste contents placed in the waste containers described on the data sheet?	X		
Completeness - Has the relevant waste information must be collected and documented?	X		
Comparability - Was the VE information compiled in compliance with VE procedure(s) and associated training requirements?	X		
Real-Time Radiography (RTR) - WCPIP Section 4.2.2			

Was RTR used in the physical characterization?		X	
Precision -Were discrepancies, if any, regarding important waste characteristics (i.e. physical form of the waste and absence of prohibited liquids) within a single container reconciled between two operators (during independent observations and replicate scans)?			X
Accuracy - Was a target used to tune the image for maximum sharpness and were operators required to identify prohibited liquid in a training container during qualification and requalification?			X
Representativeness - Were all the relevant waste contents in each container described?			X
Completeness - Was relevant waste information assembled to show			X
Comparability - Was the RTR information compiled in compliance wi			X
Dose-to-Curie (DTC) - WCPIP Section 4.3.2			
Was DTC used for radiological characterization?	X		
Precision - Not applicable QAO for this method			X
Accuracy - Were standardized and benchmarked radiation transport computer codes used?	X		
Representativeness - Was an appropriate model of the actual physical drum dose rate configuration used and documented by an independent review of the DTC correlation?	X		
Completeness - Were calculations used that span the full range of important parameter values (such as density) which are expected to be encountered with the actual RH TRU containers?	X		
Comparability - Not applicable QAO for this method			X
Dose Rate Measurement associated with DTC - WCPIP Section 4.3.2			
Precision - Was the reported relative percent difference (RPD) less than or equal to 40%?	X		
Accuracy - Has a calibration for the dose-rate instrument used been established, maintained, and documented within the recommendations of the manufacturer?	X		
Representativeness - Not applicable QAO for this method			X
Completeness - Not applicable QAO for this method			X
Comparability - Not applicable QAO for this method			X
Nondestructive Assay (NDA) - WCPIP Section 4.3.3			
Was NDA used for radiological characterization?		X	
Precision - Does the reported %RSD comply with CCP-TP-506, Table 4.2?			X

Accuracy - Is the reported %R less than or equal to ± 30% on non-interfering matrix?			X
Representativeness - Has each waste container been assayed?			X
Completeness - Is 100% of the NDA data valid and usable?			X
Comparability - Was the NDA process implemented in accordance to NDA standards and was associated training requirements met?			X
Sampling - WCPIP Section 4.3.4.1			
Was sampling used for radiological characterization?		X	
Precision - Not applicable QAO for this method			X
Accuracy - Was an appropriate sample design developed and approved by CBFO for collecting an adequate number of samples such that the one-sigma uncertainty in the mean value of the sample-generated scaling factor is within a factor of two?			X
Representativeness - Was representativeness described in the associated sampling plan?			X
Completeness - Was the QAO for a minimum set of radionuclides sp			X
Comparability - Not applicable QAO for this method			X
Sample Collection - WCPIP Section 4.3.4.2			
Accuracy - Was sampling equipment verified as clean by the use of standard radiological control survey methods?			X
Radiochemistry Analysis - WCPIP 4.3.4.3			
Precision - Was the RPD less than or equal to 40% or laboratory acceptable precision criteria?			X
Accuracy - Was the reported %R LCS within ±25%; was the reported			X
Representativeness - Not applicable QAO for this method			X
Completeness - Not applicable QAO for this method			X
Comparability: Not applicable QAO for this method			X
Modeling to Confirm or Derive Radionuclide Distributions - WCPIP 4.3.5			
Was modeling used for radiological characterization?		X	
Precision - Not applicable QAO for this method			X
Accuracy - Do the modeling results compare to sample results within a factor of two?			X
Representativeness - Was the composition and burnup information for a minimum of 50% of the radioactive materials identified in the AK record involved in the generation of the waste included in the modeling?			X
Completeness - Not applicable QAO for this method			X
Comparability - Not applicable QAO for this method			X

Surface Dose Rate - WCPIP Section 4.3.7			
Were surface dose rates used for radiological characterization?	X		
Precision - Was the reported RPD equal to or less than 40%?	X		
Accuracy - manufacturer typically specifies a flat energy response of 10 to 20% across the applicable energy range. Was the repeatability of the measurement within about 10% at the higher gamma dose rate?	X		
Representativeness - Was the measurement applied to the entire container?	X		
Completeness - Were 100% of the measurements, needed to determine surface dose rate, performed and usable?	X		
Comparability - Not applicable QAO for this method			X
Gravimetric or Dimensional Measurements - WCPIP Section 4.3.8			
Was Gravimetric or Dimensional measurement used?		X	
Precision - Was the measurement equipment maintained according to manufacturer's recommendation?			X
Accuracy - Was the balance readout within 2% of the check weight? Was the length measurement within 0.1 of an inch as verified by a second operator?			X
Representativeness - Not applicable QAO for this method			X
Completeness - Was every quantity of fuel test specimen loaded into the container measured?			X
Comparability - Not applicable QAO for this method			X
Gravimetric and Dimensional Method - WCPIP Section 4.3.8			
Was Gravimetric and Dimensional method used?		X	
Precision - Not applicable QAO for this method			X
Accuracy - fuel test specimen design and irradiated information is used for individual fuel test specimen pins in combination of the length and gravimetric measurement. Were scaling factors developed from isotope depletion code?			X
Representativeness - Is the design information representative for each specific fuel test specimen quantity loaded into the container?			X
Completeness - Was every quantity of fuel test specimen loaded into the container measured?			X
Comparability - Not applicable QAO for this method			X

Attachment 3 - Sum of Fractions Evaluation

Drum Identification Number	F_s value
ORRH00708	1.38E-04
ORRH00709	2.04E-04

$$fs = \frac{A_{Cs}}{288} + \frac{A_{Eu}}{3.52} + \frac{A_{Co}}{4.26}$$

Where fs is the sum fractions, A_{Cs} is the Cs-137 activity in the drum, A_{Eu} is the Eu-154 activity, and A_{Co} is the Co-60 activity.

If $fs < 1$ then the drum is shippable. If $fs > 1$ then the drum needs further evaluation to determine if it is shippable.

Attachment 1 - Summary of Characterization by Container Number

CRR Number: CRR-ORNL-OR-REDC-RH-HET-0032
Waste Stream: OR-REDC-RH-HET
Summary Category Group (SCG): S5000
Waste Matrix Code (WMC): S5400
Waste Characterization Site: RH_ORNL

Radiological Characterization Method: (e.g. AK, DTC, DA, NDA, D&G)
Acceptable Knowledge Qualification: Confirmatory testing (e.g. Peer Review, Corroborating data, Confirmatory testing)

			TRU Alpha Activity Concentration (TAAC)		Volume Acitivity (Ci/L)			RH Waste Determination: Surface Dose (SD) Rate Measurements	
Container ID Number	Radiological BDR Number	NDE BDR Number	TAAC (nCi/g)	TAAC (≥ 100 nCi/g)	Value	1 s Unc.	Evaluation(≤ 23 Ci/L)	SD Rate (rem / hr)	SD rate >200 mrem/hr and ≤ 1000 rem/hr
ORRH00710	ORRHDTC15005	ORNLRHVE15003	5.24E+03	TRU	2.75E-02	1.54E-02	Pass	4.83E-01	Remote-Handled
ORRH00711	ORRHDTC15005	ORNLRHVE15003	3.39E+03	TRU	1.95E-02	1.09E-02	Pass	3.27E-01	Remote-Handled
ORRH00712	ORRHDTC15005	ORNLRHVE15005	4.53E+03	TRU	4.89E-02	2.78E-02	Pass	8.13E-01	Remote-Handled
ORRH00713	ORRHDTC15005	ORNLRHVE15004	4.67E+03	TRU	2.38E-02	1.33E-02	Pass	4.18E-01	Remote-Handled
ORRH00714	ORRHDTC15005	ORNLRHVE15005	4.85E+03	TRU	5.37E-02	3.06E-02	Pass	9.30E-01	Remote-Handled
ORRH00715	ORRHDTC15005	ORNLRHVE15005	3.23E+03	TRU	2.89E-02	1.63E-02	Pass	4.90E-01	Remote-Handled
ORRH00716	ORRHDTC15005	ORNLRHVE15006	1.41E+03	TRU	1.09E-02	6.16E-03	Pass	2.24E-01	Remote-Handled
ORRH00717	ORRHDTC15005	ORNLRHVE15006	3.58E+03	TRU	4.63E-02	2.66E-02	Pass	7.05E-01	Remote-Handled
ORRH00718	ORRHDTC15005	ORNLRHVE15007	5.17E+03	TRU	5.62E-02	3.20E-02	Pass	9.37E-01	Remote-Handled
ORRH00719	ORRHDTC15005	ORNLRHVE15007	7.56E+03	TRU	1.08E-01	6.20E-02	Pass	1.70E+00	Remote-Handled
ORRH00720	ORRHDTC15005	ORNLRHVE15008	1.69E+03	TRU	2.41E-02	1.39E-02	Pass	3.92E-01	Remote-Handled
ORRH00721	ORRHDTC15005	ORNLRHVE15009	7.10E+02	TRU	9.40E-03	5.40E-03	Pass	2.82E-01	Remote-Handled
Comments									

Irene Joo 11/02/2016
SPM Print/Sign Name and Date

Attachment 2 - Remote-Handled Characterization Reconciliation Report Data Quality Objectives

CRR Number: CRR-ORNL-OR-REDC-RH-HET-0032
Waste Stream: OR-REDC-RH-HET
Site: RH_ORNL

Data Quality Objectives (DQOs)	Yes	No	NA	Characterization Method & Sources (e.g. List BDRs, reports, AK documents)
Defense Waste, High Level, and Spent Nuclear Fuel Determination - WCPIP Section 2.1.1				
Was the waste generated by, or comingled with, atomic energy defense activities? Is the waste verified not to be high-level waste, or spent nuclear fuel?	X			CCP-AK-ORNL-500, Rev. 4, Sections 4.4 and 4.5 and Source documents I022, I023, I044, M023, P161, P258, P281, P569, U038, U039, U647, DR009
TRU Waste Determination - WCPIP Section 2.1.2.1				
Does the waste contain more than 100 nCi of TRU isotopes per gram of waste?	X			ORRHDTC15005 Waste Container Dose-to-Curie conversion record sheets
RH Waste Determination - WCPIP Section 2.1.2.2				
Is the Surface dose rate equal to or greater than 200 mrem/hr and less than 1000 rem/hr	X			Radiological survey reports provided by ORNL
Activity Determination - WCPIP Section 2.1.2.3				
Is the volume activity of the container less than 23 Ci/L per canister? (SPM evaluation is on container basis)	X			ORRHDTC15005 Waste Container Dose-to-Curie conversion record sheets
Liquids - WCPIP Section 2.1.3.1				
Is the amount of liquids in the container less than one percent by volume?	X			ORNLRHVE15003, ORNLRHVE15004, ORNLRHVE15005, ORNLRHVE15006, ORNLRHVE15007, ORNLRHVE15008, ORNLRHVE15009 Waste Container VE data sheets
Physical Form - WCPIP Section 2.1.3.2				
Does the physical form of the waste accurately delineate the waste stream?	X			ORNLRHVE15003, ORNLRHVE15004, ORNLRHVE15005, ORNLRHVE15006, ORNLRHVE15007, ORNLRHVE15008, ORNLRHVE15009 Waste Container VE data sheets

Quality Assurance Objectives (QAOs)	Yes	No	NA
Acceptable Knowledge (AK) - WCPIP Section 4.1			
Precision - Not applicable QAO for this method			X

Accuracy - AK accuracy assesses the percentage of waste containers that require reassignment to a new Summary Category Group or new waste stream based on the reevaluation of AK or on obtaining testing, sampling and/or analysis data. Is the percentage of waste containers that confirm the physical and radiological properties greater than or equal to 90%?	X		
Representativeness - Does the process of obtaining, evaluating, and documenting the AK information ensure it was performed in accordance with the minimum standards established in AK procedure CCP-TP-005?	X		
Completeness - Does the AK record contain 100% of the information required for each container in the waste stream? (Usability of the AK information will be assessed for completeness during audits)	X		
Comparability -Was the AK compiled in compliance with AK procedure(s) and associated training requirements?	X		

Physical Characterization Methods

Quality Assurance Objectives (QAOs)	**Yes**	**No**	**NA**
Visual Examination (VE) - WCPIP Section 4.2.1			
Was VE used in the physical characterization?	X		
Precision - Were discrepancies, if any, regarding important waste characteristics (i.e. physical form of the waste and absence of prohibited liquids) within a single container reconciled between two operators?	X		
Accuracy - Have VE operators passed a comprehensive examination with a score of 80% and demonstrated satisfactory performance in the presence of the VE expert during initial qualification and requalification?	X		
Representativeness - Are the waste contents placed in the waste containers described on the data sheet?	X		
Completeness - Has the relevant waste information must be collected and documented?	X		
Comparability - Was the VE information compiled in compliance with VE procedure(s) and associated training requirements?	X		
Real-Time Radiography (RTR) - WCPIP Section 4.2.2			

Was RTR used in the physical characterization?		X	
Precision -Were discrepancies, if any, regarding important waste characteristics (i.e. physical form of the waste and absence of prohibited liquids) within a single container reconciled between two operators (during independent observations and replicate scans)?			X
Accuracy - Was a target used to tune the image for maximum sharpness and were operators required to identify prohibited liquid in a training container during qualification and requalification?			X
Representativeness - Were all the relevant waste contents in each container described?			X
Completeness - Was relevant waste information assembled to show			X
Comparability - Was the RTR information compiled in compliance wi			X
Dose-to-Curie (DTC) - WCPIP Section 4.3.2			
Was DTC used for radiological characterization?	X		
Precision - Not applicable QAO for this method			X
Accuracy - Were standardized and benchmarked radiation transport computer codes used?	X		
Representativeness - Was an appropriate model of the actual physical drum dose rate configuration used and documented by an independent review of the DTC correlation?	X		
Completeness - Were calculations used that span the full range of important parameter values (such as density) which are expected to be encountered with the actual RH TRU containers?	X		
Comparability - Not applicable QAO for this method			X
Dose Rate Measurement associated with DTC - WCPIP Section 4.3.2			
Precision - Was the reported relative percent difference (RPD) less than or equal to 40%?	X		
Accuracy - Has a calibration for the dose-rate instrument used been established, maintained, and documented within the recommendations of the manufacturer?	X		
Representativeness - Not applicable QAO for this method			X
Completeness - Not applicable QAO for this method			X
Comparability - Not applicable QAO for this method			X
Nondestructive Assay (NDA) - WCPIP Section 4.3.3			
Was NDA used for radiological characterization?		X	
Precision - Does the reported %RSD comply with CCP-TP-506, Table 4.2?			X

Accuracy - Is the reported %R less than or equal to ± 30% on non-interfering matrix?			X
Representativeness - Has each waste container been assayed?			X
Completeness - Is 100% of the NDA data valid and usable?			X
Comparability - Was the NDA process implemented in accordance to NDA standards and was associated training requirements met?			X
Sampling - WCPIP Section 4.3.4.1			
Was sampling used for radiological characterization?		X	
Precision - Not applicable QAO for this method			X
Accuracy - Was an appropriate sample design developed and approved by CBFO for collecting an adequate number of samples such that the one-sigma uncertainty in the mean value of the sample-generated scaling factor is within a factor of two?			X
Representativeness - Was representativeness described in the associated sampling plan?			X
Completeness - Was the QAO for a minimum set of radionuclides sp			X
Comparability - Not applicable QAO for this method			X
Sample Collection - WCPIP Section 4.3.4.2			
Accuracy - Was sampling equipment verified as clean by the use of standard radiological control survey methods?			X
Radiochemistry Analysis - WCPIP 4.3.4.3			
Precision - Was the RPD less than or equal to 40% or laboratory acceptable precision criteria?			X
Accuracy - Was the reported %R LCS within ±25%; was the reported			X
Representativeness - Not applicable QAO for this method			X
Completeness - Not applicable QAO for this method			X
Comparability: Not applicable QAO for this method			X
Modeling to Confirm or Derive Radionuclide Distributions - WCPIP 4.3.5			
Was modeling used for radiological characterization?		X	
Precision - Not applicable QAO for this method			X
Accuracy - Do the modeling results compare to sample results within a factor of two?			X
Representativeness - Was the composition and burnup information for a minimum of 50% of the radioactive materials identified in the AK record involved in the generation of the waste included in the modeling?			X
Completeness - Not applicable QAO for this method			X

Comparability - Not applicable QAO for this method			X
Surface Dose Rate - WCPIP Section 4.3.7			
Were surface dose rates used for radiological characterization?	X		
Precision - Was the reported RPD equal to or less than 40%?	X		
Accuracy - manufacturer typically specifies a flat energy response of 10 to 20% across the applicable energy range. Was the repeatability of the measurement within about 10% at the higher gamma dose rate?	X		
Representativeness - Was the measurement applied to the entire container?	X		
Completeness - Were 100% of the measurements, needed to determine surface dose rate, performed and usable?	X		
Comparability - Not applicable QAO for this method			X
Gravimetric or Dimensional Measurements - WCPIP Section 4.3.8			
Was Gravimetric or Dimensional measurement used?		X	
Precision - Was the measurement equipment maintained according to manufacturer's recommendation?			X
Accuracy - Was the balance readout within 2% of the check weight? Was the length measurement within 0.1 of an inch as verified by a second operator?			X
Representativeness - Not applicable QAO for this method			X
Completeness - Was every quantity of fuel test specimen loaded into the container measured?			X
Comparability - Not applicable QAO for this method			X
Gravimetric and Dimensional Method - WCPIP Section 4.3.8			
Was Gravimetric and Dimensional method used?		X	
Precision - Not applicable QAO for this method			X
Accuracy - fuel test specimen design and irradiated information is used for individual fuel test specimen pins in combination of the length and gravimetric measurement. Were scaling factors developed from isotope depletion code?			X
Representativeness - Is the design information representative for each specific fuel test specimen quantity loaded into the container?			X
Completeness - Was every quantity of fuel test specimen loaded into the container measured?			X
Comparability - Not applicable QAO for this method			X

Attachment 3 - Sum of Fractions Evaluation

Drum Identification Number	F_s value
ORRH00710	2.92E-04
ORRH00711	2.07E-04
ORRH00712	5.19E-04
ORRH00713	2.53E-04
ORRH00714	5.70E-04
ORRH00715	3.06E-04
ORRH00716	1.16E-04
ORRH00717	4.91E-04
ORRH00718	5.96E-04
ORRH00719	1.14E-03
ORRH00720	2.55E-04
ORRH00721	9.98E-05

$$fs = \frac{A_{Cs}}{288} + \frac{A_{Eu}}{3.52} + \frac{A_{Co}}{4.26}$$

Where fs is the sum fractions, A_{Cs} is the Cs-137 activity in the drum, A_{Eu} is the Eu-154 activity, and A_{Co} is the Co-60 activity.

If $fs < 1$ then the drum is shippable. If $fs > 1$ then the drum needs further evaluation to determine if it is shippable.

Attachment 1 - Summary of Characterization by Container Number

CRR Number: CRR-ORNL-OR-REDC-RH-HET-0033
Waste Stream: OR-REDC-RH-HET
Summary Category Group (SCG): S5000
Waste Matrix Code (WMC): S5400
Waste Characterization Site: RH_ORNL

Radiological Characterization Method:
(e.g. AK, DTC, DA, NDA, D&G)
Acceptable Knowledge Qualification: Confirmatory testing
(e.g. Peer Review, Corroborating data, Confirmatory testing)

			TRU Alpha Activity Concentration (TAAC)		Volume Acitivity (Ci/L)			RH Waste Determination: Surface Dose (SD) Rate Measurements	
Container ID Number	Radiological BDR Number	NDE BDR Number	TAAC (nCi/g)	TAAC (≥ 100 nCi/g)	Value	1 s Unc.	Evaluation(≤ 23 Ci/L)	SD Rate (rem / hr)	SD rate >200 mrem/hr and ≤ 1000 rem/hr
ORRH00722	ORRHDTC15006	ORNLRHVE15010	1.05E+04	TRU	1.29E-01	7.39E-02	Pass	1.72E+00	Remote-Handled
ORRH00723	ORRHDTC15006	ORNLRHVE15011	1.84E+03	TRU	1.15E-02	6.47E-03	Pass	3.40E-01	Remote-Handled
ORRH00725	ORRHDTC15007	ORNLRHVE15012	7.66E+03	TRU	7.26E-02	4.12E-02	Pass	1.38E+00	Remote-Handled
Comments									

Irene Joo 01/12/2016
SPM Print/Sign Name and Date

Attachment 2 - Remote-Handled Characterization Reconciliation Report Data Quality Objectives

CRR Number: CRR-ORNL-OR-REDC-RH-HET-0033
Waste Stream: OR-REDC-RH-HET
Site: RH_ORNL

Data Quality Objectives (DQOs)	Yes	No	NA	Characterization Method & Sources (e.g. List BDRs, reports, AK documents)
Defense Waste, High Level, and Spent Nuclear Fuel Determination - WCPIP Section 2.1.1				
Was the waste generated by, or comingled with, atomic energy defense activities? Is the waste verified not to be high-level waste, or spent nuclear fuel?	X			CCP-AK-ORNL-500, Rev. 4, Sections 4.4 and 4.5 and Source documents I022, I023, I044, M023, P161, P258, P281, P569, U038, U039, U647, DR009
TRU Waste Determination - WCPIP Section 2.1.2.1				
Does the waste contain more than 100 nCi of TRU isotopes per gram of waste?	X			ORRHDTC15006, ORRHDTC15007 Waste Container Dose-to-Curie conversion record sheets
RH Waste Determination - WCPIP Section 2.1.2.2				
Is the Surface dose rate equal to or greater than 200 mrem/hr and less than 1000 rem/hr	X			Radiological survey reports provided by ORNL
Activity Determination - WCPIP Section 2.1.2.3				
Is the volume activity of the container less than 23 Ci/L per canister? (SPM evaluation is on container basis)	X			ORRHDTC15006, ORRHDTC15007 Waste Container Dose-to-Curie conversion record sheets
Liquids - WCPIP Section 2.1.3.1				
Is the amount of liquids in the container less than one percent by volume?	X			ORNLRHVE15010, ORNLRHVE15011, ORNLRHVE15012 Waste Container VE data sheets
Physical Form - WCPIP Section 2.1.3.2				
Does the physical form of the waste accurately delineate the waste stream?	X			ORNLRHVE15010, ORNLRHVE15011, ORNLRHVE15012 Waste Container VE data sheets

Quality Assurance Objectives (QAOs)	Yes	No	NA
Acceptable Knowledge (AK) - WCPIP Section 4.1			
Precision - Not applicable QAO for this method			X

Accuracy - AK accuracy assesses the percentage of waste containers that require reassignment to a new Summary Category Group or new waste stream based on the reevaluation of AK or on obtaining testing, sampling and/or analysis data. Is the percentage of waste containers that confirm the physical and radiological properties greater than or equal to 90%?	X		
Representativeness - Does the process of obtaining, evaluating, and documenting the AK information ensure it was performed in accordance with the minimum standards established in AK procedure CCP-TP-005?	X		
Completeness - Does the AK record contain 100% of the information required for each container in the waste stream? (Usability of the AK information will be assessed for completeness during audits)	X		
Comparability -Was the AK compiled in compliance with AK procedure(s) and associated training requirements?	X		

Physical Characterization Methods

Quality Assurance Objectives (QAOs)	**Yes**	**No**	**NA**
Visual Examination (VE) - WCPIP Section 4.2.1			
Was VE used in the physical characterization?	X		
Precision - Were discrepancies, if any, regarding important waste characteristics (i.e. physical form of the waste and absence of prohibited liquids) within a single container reconciled between two operators?	X		
Accuracy - Have VE operators passed a comprehensive examination with a score of 80% and demonstrated satisfactory performance in the presence of the VE expert during initial qualification and requalification?	X		
Representativeness - Are the waste contents placed in the waste containers described on the data sheet?	X		
Completeness - Has the relevant waste information must be collected and documented?	X		
Comparability - Was the VE information compiled in compliance with VE procedure(s) and associated training requirements?	X		
Real-Time Radiography (RTR) - WCPIP Section 4.2.2			

Was RTR used in the physical characterization?		X	
Precision -Were discrepancies, if any, regarding important waste characteristics (i.e. physical form of the waste and absence of prohibited liquids) within a single container reconciled between two operators (during independent observations and replicate scans)?			X
Accuracy - Was a target used to tune the image for maximum sharpness and were operators required to identify prohibited liquid in a training container during qualification and requalification?			X
Representativeness - Were all the relevant waste contents in each container described?			X
Completeness - Was relevant waste information assembled to show			X
Comparability - Was the RTR information compiled in compliance wi			X
Dose-to-Curie (DTC) - WCPIP Section 4.3.2			
Was DTC used for radiological characterization?	X		
Precision - Not applicable QAO for this method			X
Accuracy - Were standardized and benchmarked radiation transport computer codes used?	X		
Representativeness - Was an appropriate model of the actual physical drum dose rate configuration used and documented by an independent review of the DTC correlation?	X		
Completeness - Were calculations used that span the full range of important parameter values (such as density) which are expected to be encountered with the actual RH TRU containers?	X		
Comparability - Not applicable QAO for this method			X
Dose Rate Measurement associated with DTC - WCPIP Section 4.3.2			
Precision - Was the reported relative percent difference (RPD) less than or equal to 40%?	X		
Accuracy - Has a calibration for the dose-rate instrument used been established, maintained, and documented within the recommendations of the manufacturer?	X		
Representativeness - Not applicable QAO for this method			X
Completeness - Not applicable QAO for this method			X
Comparability - Not applicable QAO for this method			X
Nondestructive Assay (NDA) - WCPIP Section 4.3.3			
Was NDA used for radiological characterization?		X	
Precision - Does the reported %RSD comply with CCP-TP-506, Table 4.2?			X

Accuracy - Is the reported %R less than or equal to ± 30% on non-interfering matrix?			X
Representativeness - Has each waste container been assayed?			X
Completeness - Is 100% of the NDA data valid and usable?			X
Comparability - Was the NDA process implemented in accordance to NDA standards and was associated training requirements met?			X
Sampling - WCPIP Section 4.3.4.1			
Was sampling used for radiological characterization?		X	
Precision - Not applicable QAO for this method			X
Accuracy - Was an appropriate sample design developed and approved by CBFO for collecting an adequate number of samples such that the one-sigma uncertainty in the mean value of the sample-generated scaling factor is within a factor of two?			X
Representativeness - Was representativeness described in the associated sampling plan?			X
Completeness - Was the QAO for a minimum set of radionuclides sp			X
Comparability - Not applicable QAO for this method			X
Sample Collection - WCPIP Section 4.3.4.2			
Accuracy - Was sampling equipment verified as clean by the use of standard radiological control survey methods?			X
Radiochemistry Analysis - WCPIP 4.3.4.3			
Precision - Was the RPD less than or equal to 40% or laboratory acceptable precision criteria?			X
Accuracy - Was the reported %R LCS within ±25%; was the reported			X
Representativeness - Not applicable QAO for this method			X
Completeness - Not applicable QAO for this method			X
Comparability: Not applicable QAO for this method			X
Modeling to Confirm or Derive Radionuclide Distributions - WCPIP 4.3.5			
Was modeling used for radiological characterization?		X	
Precision - Not applicable QAO for this method			X
Accuracy - Do the modeling results compare to sample results within a factor of two?			X
Representativeness - Was the composition and burnup information for a minimum of 50% of the radioactive materials identified in the AK record involved in the generation of the waste included in the modeling?			X
Completeness - Not applicable QAO for this method			X
Comparability - Not applicable QAO for this method			X

Surface Dose Rate - WCPIP Section 4.3.7			
Were surface dose rates used for radiological characterization?	X		
Precision - Was the reported RPD equal to or less than 40%?	X		
Accuracy - manufacturer typically specifies a flat energy response of 10 to 20% across the applicable energy range. Was the repeatability of the measurement within about 10% at the higher gamma dose rate?	X		
Representativeness - Was the measurement applied to the entire container?	X		
Completeness - Were 100% of the measurements, needed to determine surface dose rate, performed and usable?	X		
Comparability - Not applicable QAO for this method			X
Gravimetric or Dimensional Measurements - WCPIP Section 4.3.8			
Was Gravimetric or Dimensional measurement used?		X	
Precision - Was the measurement equipment maintained according to manufacturer's recommendation?			X
Accuracy - Was the balance readout within 2% of the check weight? Was the length measurement within 0.1 of an inch as verified by a second operator?			X
Representativeness - Not applicable QAO for this method			X
Completeness - Was every quantity of fuel test specimen loaded into the container measured?			X
Comparability - Not applicable QAO for this method			X
Gravimetric and Dimensional Method - WCPIP Section 4.3.8			
Was Gravimetric and Dimensional method used?		X	
Precision - Not applicable QAO for this method			X
Accuracy - fuel test specimen design and irradiated information is used for individual fuel test specimen pins in combination of the length and gravimetric measurement. Were scaling factors developed from isotope depletion code?			X
Representativeness - Is the design information representative for each specific fuel test specimen quantity loaded into the container?			X
Completeness - Was every quantity of fuel test specimen loaded into the container measured?			X
Comparability - Not applicable QAO for this method			X

Attachment 3 - Sum of Fractions Evaluation

Drum Identification Number	F_s value
ORRH00722	1.37E-03
ORRH00723	1.23E-04
ORRH00725	7.71E-04

$$fs = \frac{A_{Cs}}{288} + \frac{A_{Eu}}{3.52} + \frac{A_{Co}}{4.26}$$

Where fs is the sum fractions, A_{Cs} is the Cs-137 activity in the drum, A_{Eu} is the Eu-154 activity, and A_{Co} is the Co-60 activity.

If $fs < 1$ then the drum is shippable. If $fs > 1$ then the drum needs further evaluation to determine if it is shippable.

DIVIDER PAGE

Washington
TRU Solutions LLC

CP:09:01234
UFC:5900.00

INTER-OFFICE CORRESPONDENCE

DATE: June 3, 2009

FROM: H. J. Neely

LOCATION: Special Operations and Remote-Handled Development

TO: CCP Records Custodian GSA-103

LOCATION: Retrieval, Characterization & Transportation

SUBJECT: TRANSMITTAL OF WASTE STREAM PROFILE FORM FOR OR-REDC-RH-HET, AT THE OAK RIDGE NATIONAL LABORATORY

Please accept the attached waste stream profile form for OR-REDC-RH-HET, to be placed in records for the Oak Ridge National Laboratory.

HJN:jmc

Attachment

cc: (without enclosure)
I. S. Quintana ED
M. Sensibaugh ED

Attachment 2 –CCP Waste Stream Profile Form

(1) Waste Stream Profile Number: OR-REDC-RH-HET				
(2) Generator site name: Oak Ridge National Laboratory			(4)Technical contact: Mike Sensibaugh	
(3) Generator site EPA ID: TN1890090003			(6) Technical contact phone number: 575-234-7122	
(5) Date of audit report approval by New Mexico Environment Department (NMED): September 9, 2008				
(7) Title, version number, and date of documents used for WAP Certification: CCP-PO-001, CCP Transuranic Waste Characterization Quality Assurance Project Plan, Rev. 16, October 31, 2007 CCP-PO-002, CCP Transuranic Waste Certification Plan, Rev. 21, January 26, 2009 CCP-PO-027 CCP/TRU Waste Processing Center/Oakridge National Laboratory Interface Document, Revision 0, October 2, 2007.				
(8) Did your facility generate this waste?	YES	X	NO	
(9) If no, provide the name and EPA ID of the original generator: NA				
Waste Stream Information[1]				
(10) WIPP ID: OR-W212[3]			(11) Summary Category Group: S5000	
(12) Waste Matrix Code Group: Heterogeneous Debris Waste			(13) Waste Stream Name: Remote Handled Heterogeneous Debris Waste from the Radiochemistry Engineering Development Center	
(14) Description from the TWBIR: Radionuclides from updated model. Mixed waste treated to LDR.				
(15) Defense TRU Waste:	YES	X	NO	
(16) Check One:	CH		RH	X
(17) Number of SWBs: N/A	(18) Number of Drums: NA		(19) Number of Canisters: 691[4]	
(20) Batch Data report numbers supporting this waste stream characterization: See Characterization Information Summary (CIS) Correlation of Container Identification Numbers to Batch Data Report Numbers				
(21) List applicable EPA Hazardous Waste Numbers:[2] D004, D005, D006, D007, D008, D009, D010, D011, D019, F002, and F005				
(22) Applicable TRUCON Content Numbers: OR 325				
(23)**Acceptable Knowledge Information**[1]				
[For the following, enter the supporting documentation used (i.e., references and dates)]				
Required Program Information				
(23A) Map of site: CCP-AK-ORNL-500, Revision 1, October 3, 2008, Figures 1, 2, and 3				
(23B) Facility mission description: CCP-AK-ORNL-500, Revision 1, October 3, 2008, Section 4.1				
(23C) Description of operations that generate waste: CCP-AK-ORNL-500, Revision 1, October 3, 2008, Section 5.3				
(23D) Waste identification/categorization schemes: CCP-AK-ORNL-500, Revision 1, October 3, 2008, Section 4.2 and 5.4				
(23E) Types and quantities of waste generated: CCP-AK-ORNL-500, Revision 0, May 2, 2008, Section 4.2.1				
(23F) Correlation of waste streams generated from the same building and process, as applicable: CCP-AK-ORNL-500, Revision 1, October 3, 2008, Section 4.2.2				
(24) Waste certification procedures: : CCP-TP-530, Rev. 7, CCP TRU Waste Certification and WWIS Data Entry, July 11, 2008				

(25)Required Waste Stream Information			
(25A) Area(s) and building(s) from which the waste stream was generated: CCP-AK-ORNL-500, Revision 1, October 3, 2008, Section 5.1			
(25B) Waste stream volume and time period of generation: CCP-AK-ORNL-500, Revision 1, October 3, 2008, Section 5.2			
(25C) Waste generating process description for each building: CCP-AK-ORNL-500, Revision 1, October 3, 2008, Section 5.3			
(25D) Waste Process flow diagrams: CCP-AK-ORNL-500, Revision 1, October 3, 2008, Figures 4, 5, 6, 7, 8 and 9			
(25E) Material inputs or other information identifying chemical/radionuclide content and physical waste form: CCP-AK-ORNL-500, Revision 1, October 3, 2008, Section 5.4			
(25F) Waste Material Parameter Weight Estimates per unit of waste: See Table 2 of the Summation of Aspects of AK Summary Report: OR-REDC-RH-HET			
(26) Which Defense Activity generated the waste: (check one)[5]			
	Weapons activities including defense inertial confinement fusion		Naval Reactors development
	Verification and control technology		Defense research and development
	Defense nuclear waste and material by products management	X	Defense nuclear material production
	Defense nuclear waste and materials security and safeguards and security investigations		
(27)Supplemental Documentation			
(27A) Process design documents: See S1 AK#s on Attachment 1 to Summation of Aspects of AK Summary Report			
(27B) Standard operating procedures: See S2 AK#s on Attachment 1 to Summation of Aspects of AK Summary Report			
(27C) Safety Analysis Reports: See S3 AK#s on Attachment 1 to Summation of Aspects of AK Summary Report			
(27D) Waste packaging logs: NA			
(28E) Test plans/research project reports: See S5 AK#s on Attachment 1 to Summation of Aspects of AK Summary Report			
(27F) Site databases: NA			
(27G) Information from site personnel: See S7 AK#s on Attachment 1 to Summation of Aspects of AK Summary Report			
(27H) Standard industry documents: See S8 AK#s on Attachment 1 to Summation of Aspects of AK Summary Report			
(27I) Previous analytical data: See S9 AK#s on Attachment 1 to Summation of Aspects of AK Summary Report			
(27J) Material safety data sheets: See S10 AK#s on Attachment 1 to Summation of Aspects of AK Summary Report			
(27K) Sampling and analysis data from comparable/surrogate Waste: See S12 AK#s on Attachment 1 to Summation of Aspects of AK Summary Report			
(27L) Laboratory notebooks: See S11 AK#s on Attachment 1 to Summation of Aspects of AK Summary Report			
Confirmation Information[2]			
For the following, when applicable, enter procedure title(s), number(s) and date(s)			
(28)	Radiography: NA		
(29)	Visual Examination: CCP Remote-Handled Waste Visual Examination, CCP-TP-500, Revision 8, 7/24/2008		

(30)Comments:
For a list of the waste characterization procedures used and date of the respective procedures see the list of procedures on the attached CIS.

Reviewed by AK Expert: YES [X] **Date: 2/18/09**

Reviewed by STR (if necessary): YES [ ] NA [ ] **Date:**

Waste Stream Profile Form Certification:

I hereby certify that I have reviewed the information in this Waste Stream Profile Form, and it is complete and accurate to the best of my knowledge. I understand that this information will be made available to regulatory agencies and that there are significant penalties for submitting false information, including the possibility of fines and imprisonment for knowing violations.

(31)	(32)	(33)
Signature of Site Project Manager	Irene Quintana Printed Name	2/18/09 Date

NOTE:
(1) Use back of sheet or continuation sheets, if required.
(2) If, radiography, visual examination were used to confirm EPA Hazardous Waste Numbers, attach signed Characterization Information Summary documenting this determination.
(3) TWBIR numbers OR-W211 and OR-W214 also apply.
(4) Waste stream OR-REDC-RH-HET consists of casks, 55-gallon drums and a B-88 box that will be packaged into 2055 55-gallon drums and then into 685 canisters. Six additional canisters are projected for this waste stream.
(5) The following defense activities also resulted in generation of this waste: naval reactors development, defense nuclear waste and by-products management and defense research and development activities.

CHARACTERIZATION INFORMATION SUMMARY

WSPF # OR-REDC-RH-HET

Lot 1

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CCP Characterization Information Summary Cover Page

Waste Stream #: OR-REOC-RH-HET Sub-Lot #: 1

AK Expert Review: Kevin Peters Date: 2/18/2009

SPM Reviewer: Hilgit Neely Date: 2/18/2009

SPM signature certifies that through Acceptable Knowledge testing and/or analysis that the waste identified in this summary is not corrosive, ignitable, reactive, or incompatible with the TSDF.

A summary of the Acceptable Knowledge regarding this waste stream containing specific information about the corrosivity, reactivity, and ignitability of the waste stream is included as an attachment to the Waste Stream Profile Form. By reference, that information is included in this lot.

List of procedures used:

Headspace Gas Sampling and Analysis (HSG):

CCP-TP-093	Rev. 13	03/19/07	CCP Sampling of TRU Waste Containers
CCP-TP-108	Rev. 6	07/12/07	CCP Headspace Gas Sampling Batch Data Report Preparation
CCP-TP-173	Rev. 0	05/03/07	CCP Analysis of Gas Samples for VOCs by GC/FID
CCP-TP-175	Rev. 0	05/02/07	CCP Analysis of Gas Samples for VOCs by GC/MS

Visual Examination (VE):

CCP-TP-300	Rev. 7	02/27/08	CCP Remote-Handled Waste Visual Examination
CCP-TP-600	Rev. 8	07/24/08	CCP Remote-Handled Waste Visual Examination

Project Level Data Validation / DQO Reconciliation:

CCP-TP-001	Rev. 17	09/24/07	CCP Project Level Data Validation and Verification
CCP-TP-002	Rev. 20	08/18/08	CCP Reconciliation of DQOs and Reporting Characterization Data
CCP-TP-003	Rev. 19	10/02/07	CCP Data Analysis for S3000, S4000, and S5000 Characterization
CCP-TP-005	Rev. 18	11/18/08	CCP Acceptable Knowledge Documentation

WAP Certification:

CCP-PO-001	Rev. 16	10/31/07	CCP Transuranic Waste Characterization Quality Assurance Project Plan

CCP Correlation of Container Identification Numbers to Batch Data Report Numbers

Waste Stream: # OR-REDC-RH-HET Sub-Lot # 1

Container ID Number	Historical Container ID	NDA BDR or Radiological Characterization BDR (CH only)	RTR BDR	VE BDR	Solids Sampling BDR	Solids Analytical BDR	Load Management/ Overpack Yes	Permit Required Headspace Gas BDR			
								Sample	Analysis		
ORRH00001	NA	NA	NA	RHORVE080005	NA	NA		ORHSGS08005	ECL08012M	ECL08012G	NA
ORRH00002	NA	NA	NA	RHORVE080005	NA	NA		ORHSGS08005	ECL08012M	ECL08012G	NA
ORRH00003	NA	NA	NA	RHORVE080005	NA	NA		ORHSGS08005	ECL08012M	ECL08012G	NA
ORRH00004	NA	NA	NA	RHORVE080002	NA	NA		DRHSGS08003	ECL08010M	ECL08010G	NA
ORRH00005*	NA	NA	NA	NA	NA	NA		ORHSGS08003	ECL08010M	ECL08010G	NA
ORRH00006	NA	NA	NA	RHORVE080002	NA	NA		ORHSGS08003	ECL08010M	ECL08010G	NA
ORRH00007*	NA	NA	NA	NA	NA	NA		ORHSGS08003	ECL08010M	ECL08010G	NA
ORRH00008*	NA	NA	NA	NA	NA	NA		ORHSGS08003	ECL08010M	ECL08010G	NA
ORRH00009*	NA	NA	NA	NA	NA	NA		ORHSGS08003	ECL08010M	ECL08010G	NA
ORRH00010*	NA	NA	NA	NA	NA	NA		ORHSGS08003	ECL08010M	ECL08010G	NA
ORRH00011	NA	NA	NA	RHORVE080004	NA	NA		NA	NA	NA	NA
ORRH00012	NA	NA	NA	RHORVE080004	NA	NA		NA	NA	NA	NA
ORRH00013	NA	NA	NA	RHORVE080005	NA	NA		ORHSGS08005	ECL08012M	ECL08012G	NA
ORRH00014	NA	NA	NA	RHORVE080006	NA	NA		NA	NA	NA	NA
ORRH00015	NA	NA	NA	RHORVE080006	NA	NA		NA	NA	NA	NA
ORRH00016	NA	NA	NA	RHORVE080006	NA	NA		NA	NA	NA	NA
ORRH00017	NA	NA	NA	RHORVE080006	NA	NA		NA	NA	NA	NA

* Container is included for the HSG Characterization Module for WWIS but are not certifiable

for Hillari J. Neely
Signature of Site Project Manager

Hillari J. Neely
Printed Name

2/19/2009
Date

CCP Headspace Gas UCL_{90} Evaluation Form

WSPF #: OR-REDC-RH-HET **Waste Stream Lot Number** 1 through 1

ANALYTE	Transform Data Used (No, Data-Log, SQRT, other)	# Samples above MDL (1)	# Samples	Maximum (ppmv)	Mean (ppmv)	SD (ppmv)	UCL_{90} (ppmv)	PRQL (ppmv)	Transformed PRQL (N/A or Value)	UCL_{90} > PRQL Yes	EPA Code
Benzene	SQRT	9	11	1.76	0.95	0.55	1.18	10	3.16		
Bromoform	SQRT	0	11	0.32	0.18	0.09	0.21	10	3.16		
Carbon tetrachloride	Log	0	11	-2.12	-3.60	0.96	-3.20	10	2.30		
Chlorobenzene	Log	0	11	-1.97	-3.43	0.97	-3.03	10	2.30		
Chloroform	SQRT	1	11	0.32	0.18	0.08	0.21	10	3.16		
Cyclohexane [a]	Log	0	11	-1.29	-2.77	0.97	-2.37	10	2.30		
1,1-Dichloroethane	SQRT	0	11	0.41	0.22	0.11	0.26	10	3.16		
1,2-Dichloroethane	Log	0	11	-1.97	-3.44	0.97	-3.04	10	2.30		
1,1-Dichloroethylene	SQRT	0	11	0.49	0.26	0.13	0.32	10	3.16		
cis-1,2-Dichloroethylene	Log	0	11	-1.83	-3.31	0.97	-2.90	10	2.30		
trans-1,2-Dichloroethylene	Log	0	11	-1.49	-2.96	0.97	-2.56	10	2.30		
Ethyl benzene	SQRT	0	11	0.39	0.21	0.10	0.25	10	3.16		
Ethyl ether	Log	0	11	-1.43	-2.89	0.97	-2.49	10	2.30		
Methylene chloride	No	3	11	0.27	0.11	0.08	0.15	10	N/A		
1,1,2,2-Tetrachloroethane	SQRT	0	11	0.51	0.28	0.13	0.33	10	3.16		
Tetrachloroethylene	SQRT	0	11	0.34	0.18	0.09	0.22	10	3.16		
Toluene	SQRT	5	11	0.61	0.37	0.18	0.45	10	3.16		
1,1,1-Trichloroethane	Log	0	11	-1.97	-3.46	0.97	-3.06	10	2.30		
Trichloroethylene	SQRT	0	11	0.32	0.17	0.08	0.21	10	3.16		
1,1,2-Trichloro-1,2,2-trifluoroethane	Log	0	11	-2.21	-3.66	0.97	-3.26	10	2.30		
1,2,4-Trimethylbenzene [a]	SQRT	0	11	0.41	0.22	0.11	0.26	10	3.16		
1,3,5-Trimethylbenzene [a]	SQRT	0	11	0.41	0.22	0.11	0.26	10	3.16		
m-Xylene [b]	Log	0	11	-1.80	-3.28	0.97	-2.88	10	2.30		
p-Xylene [b]	Log	0	11	-1.80	-3.28	0.97	-2.88	10	2.30		
o-Xylene	SQRT	0	11	0.36	0.19	0.09	0.23	10	3.16		
Acetone	SQRT	11	11	11.40	5.83	3.45	7.26	100	10.00		
1-Butanol	Log	10	11	2.25	-0.17	1.69	0.53	100	4.61		
Methanol	No	0	11	4.55	4.35	0.13	4.41	100	N/A		
Methyl ethyl ketone	SQRT	10	11	3.87	1.95	1.17	2.44	100	10.00		
Methyl isobutyl ketone	SQRT	9	11	1.52	0.82	0.48	1.02	100	10.00		

CCP Headspace Gas UCL_{90} Evaluation Form

WSPF #: OR-REDC-RH-HET **Waste Stream Lot Number** 1 through 1

ANALYTE	Transform Data Used (No, Data-Log, SQRT, other)	# Samples above MDL (1)	# Samples	Maximum (ppmv)	Mean (ppmv)	SD (ppmv)	UCL_{90} (ppmv)	PRQL (ppmv)	Transformed PRQL (N/A or Value)	UCL_{90} > PRQL Yes	EPA Code
Chloromethane[a]	SQRT	10	11	2.98	1.61	0.95	2.00	100	3.16		
Carbon Disulfide[a]	Log	1	11	-0.45	-3.03	1.25	-2.51	10	2.30		
1,2-Dichloropropane[a]	Log	0	11	-1.77	-3.23	0.96	-2.83	10	2.30		
Trichlorofluoromethane[c]	Log	0	11	-1.22	-2.69	0.97	-2.29	10	2.30		

[a] These compounds are from the TRAMPAC and or CH TRUCON Appendix B and are flammable VOCs that do not appear in the QAPjP or the WIPP WAP. These are not part of the target analyte list, but samples may be analyzed for these compounds.

[b] These xylene isomers cannot be resolved by the analytical methods employed in the program. m-Xylene and p-Xylene will be reported as "Total m-p-Xylene."

[c] Noted analytes are not required but are reported by the Environmental Chemistry Laboratory at Idaho and are included on the UCL90 for completeness.

Comments:

(1) For analytes where there were no samples measured above the MDL value, 1/2 of the MDL value was used. (Per section B4 of the WAP, 1/2 of the MDL value is used in calculating the mean concentration.)

Signature of Site Project Manager — Hillari Neely (Printed Name) — 2/18/2009 (Date)

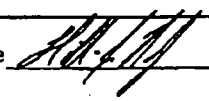
CCP Headspace Gas Summary Data

Waste Stream Number OR-REDC-RH-HET Sub-Lot Number (s) 1

Tentatively Identified Compound	Maximum Observed Estimated Concentrations (ppmv)	# Samples Containing TIC	% Detected
2-Methyl-1-propanol	3.10	1	9.09%

Data Supports EPA Hazardous Waste Numbers Assigned by AK? Yes ☑ No ☐

If no, describe the basis for assigning the EPA Hazardous Waste Codes:

SPM Signature  Date 2/18/2009

CCP RTR/VE Summary of Prohibited Items and AK Confirmation

Waste Stream Number: OR-REDC-RH-HET Sub-Lot(s)#: 1

Container Number	RTR Prohibited Items [a]	Visual Examination Prohibited Items [a]
See correlation of container ID numbers for list of remaining drum numbers in this Lot.	Radiography was not used to verify prohibited items.	None of the containers in this lot had prohibited items identified during Visual Examination.

a. See Batch Data Reports

b. If AK has assigned U134 to this waste stream, then any liquids in these containers are prohibited items (not acceptable by the TSDF).

Site Project Manager Signature | Hillari Neely (Printed Name) | 2/18/2009 (Date)

CCP Reconcilliation with Data Quality Objectives

WSF# OR-REDC-RH-HET Lot # 1

Sampling Completeness

VE
Number of Valid Samples: 11 Number of Total Samples Analyzed: 11
Percent Complete: 100 (QAO is 100%)

RTR
Number of Valid Samples: NA Number of Total Samples Analyzed: NA
Percent Complete: NA (QAO is 100%)

HSG
Number of Valid Samples: 11 Number of Total Samples collected: 11
Percent Complete 100 (QAO is ≥90%)

Total VOC
Number of Valid Samples: NA Number of Total Samples collected: NA
Percent Complete: NA (QAO is ≥90%)
Number of Valid Samples: NA Number of Total Samples analyzed: NA
Percent Complete: NA (QAO is ≥90%)

Total SVOC
Number of Valid Samples: NA Number of Total Samples collected: NA
Percent Complete: NA (QAO is ≥90%)
Number of Valid Samples: NA Number of Total Samples analyzed: NA
Percent Complete: NA (QAO is ≥90%)

Total Metals
Number of Valid Samples: NA Number of Total Samples collected: NA
Percent Complete: NA (QAO is ≥90%)
Number of Valid Samples: NA Number of Total Samples analyzed: NA
Percent Complete: NA (QAO is ≥90%)

CCP Reconcilliation with Data Quality Objectives

WSF# OR-REDC-RH-HET Lot # 1

	Y/N/NA	Reconcilliation Parameter
1	Y	Waste Matrix Code.
2	Y	Waste Material Parameter Weights.
3	Y	The waste matrix code identified is consistent with the type of sampling and analysis used to characterize the waste.
4	Y	The TRU activity reported in the BDRs for each container demonstrates with a 95% probability that the container of waste contains TRU radioactive waste.
5	NA	AK Sufficiency. Is there an approved AK sufficiency Determination for this waste stream?
6	Y	Mean concentrations, UCL90 values for the mean concentration, standard deviations, and the number of samples collected for each VOC in the HSG of each container were calculated and compared with the program required quantitation limits, as reported in CCP TP 003, Attachment 3, and additional Environmental Protection Agency (EPA) Hazardous Waste Numbers were assigned as required. Samples were randomly collected (when appropriate).
7a	NA	Mean concentrations, UCL90 values for the mean concentration, standard deviations, and the number of samples collected for solids VOCs were calculated and compared with the program required quantitation limits and regulatory thresholds, as reported in the Characterization Information Summary, CCP-TP-003-Attachment 4, and additional EPA Hazardous Waste Numbers were assigned as required. Samples were randomly collected.
7b	NA	Mean concentrations, UCL90 values for the mean concentration, standard deviations, and the number of samples collected for solids SVOCs were calculated and compared with the program required quantitation limits and regulatory thresholds, as reported in the Characterization Information Summary, CCP TP 003 Attachment 5, and additional EPA Hazardous Waste Numbers were assigned as required. Samples were randomly collected.
7c	NA	Mean concentrations, (UCL90) values for the mean concentration, standard deviations, and the number of samples collected for total metals were calculated and compared with the program required quantitation limits and regulatory thresholds, as reported in the Characterization Information Summary, CCP TP 003 Attachment 6, and additional EPA Hazardous Waste Numbers were assigned as required. Samples were randomly collected.

CCP Reconcilliation with Data Quality Objectives

WSF# OR-REDC-RH-HET Lot # 1

8	Y	The data demonstrates whether the waste stream exhibits a toxicity characteristic under Title 40 Code of Federal Regulations (CFR), Part 261, Identification and Listing of Hazardous Waste, Subpart C, Characteristics of Hazardous Waste.
9	Y	Does the waste stream contain listed waste found in 20.4.1.200 NMAC incorporating 40 CFR Part 261, Subpart D, Lists of Hazardous Wastes.
10	Y	Waste stream can be classified as hazardous or nonhazardous at the 90-percent confidence level.
11	Y	Appropriate packaging configuration and Drum Age Criteria (DAC) is applied and documented in the headspace gas sampling documentation, and the drum age met prior to sampling.
12	Y	TICs were appropriately identified and reported in accordance with the requirements of Section B3-1 of the QAPjP.
13	Y	The PRQLs for headspace gas VOCs were met for all analyses as evidenced by the analytical batch data reports.
14		The overall completeness, comparability, and representativeness QAOs were met for each of the analytical and testing procedures as specified in CCP-PO-001 Sections B3-2 through B3-9 prior to submittal of a waste stream profile form for a waste steam or waste stream lot.

	Completeness	Comparability	Representativeness
Radiography	NA	NA	NA
VE	Y	Y	Y
Headspace Gas Analysis	Y	Y	Y
Solids Sampling	NA	NA	NA
Solids VOCs	NA	NA	NA
Solids SVOCs	NA	NA	NA
Solids Metals	NA	NA	NA

Comments. N/A

Signature of Site Project Manager | Hillari Neely, Printed Name | 2/19/2009, Date

SUMMATION OF ASPECTS OF AK SUMMARY REPORT: OR-REDC-RH-HET

Overview:

Waste Stream OR-REDC-RH-HET is Remote-Handled (RH) Transuranic (TRU) heterogeneous debris generated in Building 7920 of the Radiochemical Engineering Development Center (REDC) and has subsequently been repackaged in Building 7880 of the Transuranic Waste Processing Center (TWPC) at the Oak Ridge National Laboratory (ORNL) in Oak Ridge, Tennessee. The waste was generated from 1972 to present. Waste Stream OR-REDC-RH-HET includes debris originating from target fabrication and processing, analytical chemistry, and process development activities. This debris is currently stored in storage containers such as concrete casks, boxes, and drums at the ORNL. These storage containers are transferred to the TWPC hot cell in the Building 7880 for repackaging and WIPP certification.

Since 1966, the REDC was the production, storage, and distribution center for the Department of Energy (DOE) heavy element research program, producing Berkelium (Bk)-249, Californium (Cf)-252, Einsteinium (Es)-253, and Fermium (Fm)-257. In approximately 1970, target rods containing plutonium, americium, and curium were remotely fabricated in the Building 7920 hot cells, irradiated in the High Flux Isotope Reactor (HFIR) facility, and then processed in the Building 7920 hot cells for the separation and purification of the heavy actinide elements. The purified Bk-249, Es-253, and Fm-257 were packaged for shipment whereas the Cf-252 was fabricated into neutron sources. Between 1979 and 1986, some uranium fuel cycle development work was performed in the Building 7920 Solvent Extraction Test Facility (SETF). Solvent extraction flow sheets for processing irradiated fuels from commercial light water reactors and fast breeder reactors were developed and tested, and plutonium recovery schemes were demonstrated. Since 1991, the REDC has processed Mark-42 target assemblies that were irradiated at the Savannah River Site (SRS). High-purity Americium (Am)-243, Curium (Cm)-244, and Plutonium (Pu)-242 are separated and recovered in Building 7920 for shipment to the Los Alamos National Laboratory (LANL).

The Cf-252 neutron sources are utilized for defense related applications that include neutron radiography of weapons components and military aircraft, neutron counting of fissile material and transuranic waste, land mine detection, and in-field inspection and identification of chemical weapons and high explosives. Special production of targets (referred to as campaigns) ran concurrently with the Solvent Extraction Test Facility (SETF) and Mark-42 campaigns. Due to the similarity in radiological contamination from HFIR target campaigns, the waste generated from SETF and Mark-42 campaigns were not segregated from waste generated by the HFIR target campaigns. Therefore, the TRU wastes generated from the REDC, waste stream OR-REDC-RH-HET, is defense related waste generated from nuclear materials production in addition to naval reactor development, and defense nuclear waste and by-products management.

This Summation of the AK Summary Report includes information to support Waste Stream Profile Form (WSPF) number OR-REDC-RH-HET for RH TRU debris. The primary source of information for this Summation is CCP-AK-ORNL-500, Central Characterization Project *Acceptable Knowledge Summary Report For Oak Ridge National Laboratory Radiochemical* Engineering Development Center Remote-Handled Transuranic Waste, Waste Stream: OR-REDC-RH-HET, Rev. 1, October 3, 2008. CCP-AK-ORNL-500 includes information obtained from numerous sources, including facility safety basis documentation, historical document archives, generator and storage facility waste records and documents, program/processing documentation, and interviews with knowledgeable personnel.

Waste Stream Identification Summary:

Site Where TRU Waste Was Generated:	Oak Ridge National Laboratory
Waste Stream Name:	Remote Handled Heterogeneous Debris Waste from the Radiochemistry Engineering Development Center
Waste Stream Number:	OR-REDC-RH-HET
Dates of Waste Generation:	1972 to present
Summary Category Group:	S5000 – Debris Waste
Waste Matrix Code Group:	Heterogeneous Debris Waste
Waste Matrix Code:	S5400, Heterogeneous Debris
Waste Stream TWBIR Identification:	OR-W212[1]
Waste Stream Volume:	685 canisters (current)[2] 6 canisters (projected)[3]
RCRA EPA Hazardous Waste Numbers:	D004, D005, D006, D007, D008, D009, D010, D011, D019, F002, and F005
TRUCON Content Numbers:	OR 325

Waste Stream Description and Physical Form:

Waste Stream OR-REDC-RH-HET is comprised primarily of repackaged organic and inorganic debris waste items. The waste includes cellulosics, plastic, rubber, metal, and glass items as follows: paper, cotton, cloth, and wood, including wipes, swabs, bags, towels, rags, protective clothing, gloves, rope, string, cardboard, brushes, blotter paper, and filter paper; polyethylene, polypropylene, polyvinyl chloride, Tygon tubing, nylon, Bakelite (methacrylate polymer plastic), and Plexiglass items, including sheeting, melted plastic, beads, blocks, tape, tubing, bags, fittings, buckets, bottles, caps, pans, discs, brushes, laboratory equipment (pipettes, syringes), circuit boards, gloves, manipulator boots; gaskets, rings, hose/tubing, squeegees, bulbs, stoppers, gloves, boots, leaded glovebox gloves, wire/cord/cable insulation; glass bottles, laboratory glassware, pipettes, columns, plates, thermometers, light bulbs (mercury and incandescent), mirrors, lenses, insulation, and broken glass; carbon steel, stainless steel, and iron. Non-ferrous materials include items made from aluminum, brass, copper, and lead. Metal waste items include cans, needles, tubes, valves, cable, wire, planchets, piping, tools (tongs, dies, punches, wrenches, knives, clamps, tweezers), foil,

[1] TWBIR numbers OR-W211 and OR-W214 also apply.
[2] Waste stream OR-REDC-RH-HET consists of casks, 55-gallon drums and a B-88 box that will be packaged into 2055 55-gallon drums and then into 685 canisters.
[3] Building 7920 REDC operations will generate approximately 3.4 m3 (two casks) of waste to be reprocessed in the TWPC with no projected end date. The projected waste stream volume includes one year of newly generated waste that will be packaged into canisters.

weights, blocks, plates, frames, columns, racks, shielding, sheeting, light fixtures, equipment (circuit boards, pumps, motors, balances, ultrasonic cleaners, hot plates, furnaces, centrifuges), hardware (nuts, bolts, brackets, washers), manipulator parts, and metal filter components.

Secondary waste generated during repackaging operations in the TWPC hot cell includes amalgamated mercury, water absorbed with Nochar (a proprietary nonhazardous polymer absorbent) and vermiculite, personal protective equipment (PPE), and equipment (tools and manipulator parts).

This waste stream is assigned Waste Matrix Code S5400, Heterogeneous Debris. This category includes waste that is at least 50 percent, by volume, debris materials that do not meet the criteria for assignment as either an Inorganic Debris (S5100) or Organic Debris (S5300). The debris that comprises waste stream OR-REDC-RH-HET was generated from a single process or from an activity that is similar in material, physical form, and hazardous constituents and is therefore, a single waste stream.

Point of Generation - Area and Building of Generation

This heterogeneous debris waste stream was generated in Building 7920 which is part of the REDC located at the ORNL in Oak Ridge, Tennessee. The waste is transferred to the TWPC hot cell in Building 7880 for repackaging and certification.

Generating Process

Building 7920 operations include chemical processing, target fabrication, analytical laboratory, and process development activities. These operations represent the chemical processing activities in the REDC; however, special separation projects, referred to as campaigns, were periodically performed. These special small scale separation campaigns (e.g., separating Cf-249 from decaying Bk-249 or purifying a sample for shipment to another site) were performed in the hot cell. Chemicals used in Building 7920 operations or that were identified as part of the REDC chemical inventory may contaminate this waste stream.

Chemical Processing

Transuranium element processing includes the dissolution of irradiated targets, the separation of the transuranium elements and the removal of impurities and fission products. This is accomplished using solvent extraction, precipitation, and ion-exchange. Recovered americium and curium are purified and converted to oxide for fabrication of new targets.

Berkelium, einsteinium, and fermium are separated from curium and californium and purified further by additional cycles of ion-exchange. The purified products are then packaged for shipment. The californium is sorbed on resin and calcined to convert the californium to the oxysulfate for future use.

The Solvent Extraction Test Facility (SETF) operated from 1979 through 1986 and recovered uranium and plutonium from irradiated commercial power reactor fuels. This was achieved by dissolution of irradiated fuel assembly sections, solvent extraction, ion-exchange, precipitation, and calcination.

The Mark-42 program began operation in 1991 and includes the dissolution of irradiated segments; the separation of the transuranium elements and removal of impurities, activation products, and fission products. This is accomplished using solvent extraction, precipitation, and ion-exchange process steps.

The Global Nuclear Energy Partnering (GNEP) program initiated in May 2007 involves the demonstration of isotopic separations technologies using fuel from the H.B. Robinson and Dresden LWR reactors.

The REDC supports small-scale experiments involving the separation of fission products such as tritium, C-14, iodine, krypton, and xenon from uranium fuel oxides followed by chemical extraction.

Hazardous chemicals used in these processes include: acids (2-ethylhexyl phenylphosphonic, ascorbic, citric, hydrochloric, hydrofluoric, nitric, and oxalic), bases (ammonium hydroxide, lithium hydroxide, potassium hydroxide, and sodium hydroxide), and solvents (1,1,2-trichloro ethane, acetone, benzene, hydrazine, methanol, methyl isobutyl ketone, trichloroethylene, toluene, and xylene).

Target Fabrication

Actinide oxide (americium and curium) is incorporated into aluminum target rods for irradiation in the High Flux Isotope Reactor (HFIR). The operations and inspections performed to incorporate the actinide oxide include pellet forming, weighing, measurement, calorimetry, thermal cleaning, target loading, welding, x-ray examination, helium leak tests, dimensional inspections, hydrostatic compression of the aluminum tube around the pellets, coolant shroud attachment, decontamination, and carrier loading for transfer to the HFIR.

Analytical Laboratory

Samples are collected and then stored in the analytical laboratory. Radiochemical analyses are performed on highly-radioactive samples in analytical chemistry gloveboxes. Sample preparation includes pipetting, titration, dissolution, filtration, solvent extraction, and centrifugation.

Hazardous chemicals used in these processes include: acids (ascorbic, citric, formic, hydrobromic, hydrochloric, hydrofluoric, nitric, nitrous, oxalic, selenic, sulfamic, and sulfuric), bases (ammonium hydroxide, lithium hydroxide, potassium hydroxide, sodium hydroxide, and tetraethylammonium hydroxide), and solvents (1,1,1-trichloroethane, acetone, benzene, hydrazine, methanol, methyl isobutyl ketone, trichloroethylene, toluene, and xylene).

Process Development

The process development alpha laboratories have been used for studies and process development of alpha-active materials. Early work focused on development of sol-gel processes (fuel pellet processes) and isolation and purification of alpha-active materials. Other research and process development work included reprocessing of reactor fuels, conversion of recovered uranium and plutonium for use in reactor fuel elements, and development of waste separation processes. The chemical processes (e.g., solvent extraction, ion-exchange, and precipitation) performed in process development are similar to those processes performed in the hot cells but on a smaller scale.

Maintenance Operations

The processing equipment in the hot cells was maintained or replaced within the hot cell cubicles using remote techniques. Occasionally, large equipment and equipment racks require maintenance that cannot be performed in the cubicles. These items are moved to the decontamination glovebox for cleaning (using acetone, and ethanol-methanol mixtures) and repaired. For maintenance operations in a tank pit, work may be performed directly in the pit or remotely from the top of the pit. Maintenance of the off-gas systems for the cells and the process tanks generate HEPA filters, charcoal and Hopcalite organic vapor trap filters (mixture of copper and manganese oxide used as a catalyst to convert carbon monoxide to carbon dioxide). Glovebox operations are performed using neoprene or leaded glovebox gloves which are periodically replaced. Glovebox equipment and components require periodic decontamination, inspection, maintenance, repair and replacement. Glovebox interiors require regular decontamination using pentasodium diethylene triamine pentaacetate, ethanol and Ajax.

Process Waste Handling

Glovebox waste transfers are accomplished using plastic bags and cardboard ice cream cartons. Large pieces of equipment are transferred through the roof door. Liquid waste is transferred out of the gloveboxes through liquid waste lines and is not part of the waste stream.

Prior to 1976, Building 7920 solid waste was managed as RH TRU waste, even though a significant portion of the inventory produced was CH-TRU waste. In March 1976, operations were initiated to segregate RH from CH-TRU waste but were not fully implemented until 1978. Most of the waste generated prior to 1978 was placed into concrete casks. This waste contains lower dose rate waste (paper, glassware, PPE, wipes, glovebox equipment, and HEPA filters) generated from the laboratory and support areas. The quantity of lower dose rate waste decreased significantly in RH casks loaded after 1978, which contain greater volumes of waste from hot cell activities.

In the hot cell cubicles, waste is placed into small containers (e.g., plastic buckets or metal cans) and monitored for radiation. Depending on the type of waste and radiation level, the item is leached using nitric acid, rinsed with water, and dried before placement into the bucket or can. Larger waste items are cut up to fit into the buckets. To reduce the volume of waste, a furnace is used to melt plastic items such as polyethylene bottles and to consolidate them in a metal bucket.

Spent cation-exchange resins are calcined, leached with nitric acid, collected in a polyethylene bottle and melted in the furnace, then placed into a metal bucket. Spent anion-exchange resins are de-nitrated, rinsed with water and grouted (using concrete) in a metal bucket. Empty metal buckets are crushed. Waste buckets are transferred from the hot cell cubicles for characterization. The buckets are also transferred for monitoring of beta-gamma and neutron radiation. Buckets that have low radiation levels are disposed as waste and are not part of this waste stream.

Larger equipment, such as processing racks, charcoal filter beds, and Hopcalite organic filters traps are directly loaded into the casks. Racks were packaged in polyethylene bags then placed into the concrete cask. Lead bricks were used to balance the processing racks and will be found in the disposal casks. The concrete casks of TRU waste are loaded in a solid waste loading station. The cask lid is installed, sealed with roofing pitch, and secured.

REDC waste has been generated with limited segregation based on the radiological and chemical properties. Solid waste from the REDC is accumulated over a long period of time,

resulting in mixing of campaigns of waste. As containers of REDC debris are generated during repackaging in the TWPC, the container-specific documentation is reviewed to ensure that each container included in waste stream OR-REDC-RH-HET meets the requirements identified in the WIPP-WAP and the WCPIP.

Table 1 identifies the RCRA toxicity characteristic constituents in this waste stream.

Table 1 – Metal and organic TC and F-Listed Contaminants for Waste Stream OR-REDC-RH-HET

Chemical	CAS Number	EPA Hazardous Waste Numbers
Arsenic	7440-38-2	D004
Barium	7440-39-3	D005
Benzene	71-43-2	F005
Cadmium	7440-43-9	D006
Carbon tetrachloride	56-23-5	D019
Chromium	7440-47-3	D007
Lead	7439-92-1	D008
Mercury	7439-97-6	D009
Selenium	7782-49-2	D010
Silver	7440-22-4	D011
Toluene	108-88-3	F005
1,1,1-Trichloroethane	71-55-6	F002
1,1,2-Trichloroethane	79-00-5	F002
Trichloroethylene	79-01-6	F002

RCRA Determinations - Hazardous Waste Determinations

Waste generated in this waste stream does not qualify for any of the exclusions outlined in 40 CFR 260 or 261. Visual examination is used to verify that the waste stream is not a liquid waste and does not contain explosives, non-radioactive pyrophoric material, compressed gasses or reactive waste. Therefore, this waste stream does not exhibit the characteristic for ignitability (D001), corrosivity (D002), or reactivity (D003).

Ignitability

The waste does not meet the definition of ignitability as defined in 40 CFR 261.21. The material is not a liquid, an ignitable compressed gas, or an oxidizer, and is not capable of causing fire through friction, absorption of moisture, or spontaneous chemical change. The waste does not meet the definition of a DOT oxidizer as defined in 49 CFR 173.

REDC process solutions and reagents (such as hydrazine) were not prepared in the gloveboxes and hot cells and were introduced into the closed loop process tanks. The resulting waste process solutions were piped out of the facility and are not included in the inventory of REDC waste for repackage (References P161, P241, P242, P263, P282, and U011). Acetone and ethanol-methanol mixtures were used for equipment degreasing in the REDC but are not present in liquid form.

Visual examination is performed to ensure the absence of compressed gases (e.g., un-punctured aerosol cans) and that liquids do not exceed the amount allowed by the WIPP-WAP. Any container identified with compressed gases, or liquids will be segregated from the waste stream during characterization and will not be eligible for disposal at WIPP until further characterization and/or processing is conducted. Therefore, this waste stream does not exhibit the characteristic of ignitability (D001).

Corrosivity

The waste does not meet the definition of corrosivity as defined in 40 CFR 261.22. The debris is not liquid and VE is performed to ensure liquids were not added to containers.

Chemicals such as acetic, citric, hydrofluoric, hydrochloric, oxalic and sulfuric acid; hydrazine and lithium hydroxide were used during dissolution, extraction, and titration processes or were identified on chemical inventories. Prohibited quantities of liquids identified during VE will be removed and/or immobilized using concrete grout, Nochar and vermiculite. Therefore the characteristic of corrosivity (D002) does not apply to this waste stream. (References P161, U011 and U046)

Reactivity

The waste does not meet the definition of reactivity as defined in 40 CFR 261.23. The materials are stable and will not undergo violent chemical change. The materials will not react violently with water, form potentially explosive mixtures with water, or generate toxic gases, vapors, or fumes when mixed with water. The waste does not contain reactive cyanide or sulfide compounds. The materials are not capable of detonation or explosive reaction if subjected to a strong initiating source if heated under confinement. The materials are not readily capable of detonation or explosive decomposition or reaction at standard temperature and pressure.

Hazardous chemical reagents may contaminate this waste stream. Preventative measures have been taken to ensure that nitrated ion-exchange resins are treated prior to disposal as follows. Anion-exchange resins used with nitric acid are flushed from the column, rinsed with ammonium hydroxide to convert the resin to the hydroxide form, air dried, and grouted in metal cans. Spent cation-exchange resins are calcined to an oxysulfate ash, and the ash is leached with nitric acid and dried prior to assimilation (and fixing) into melted polyethylene waste in a metal bucket. Prohibited quantities of liquids identified during VE are removed and/or immobilized during repackaging. Waste Stream OR-REDC-RH-HET is therefore not reactive (HWN D003) (References P161 and U011).

Toxicity Characteristic Metals

This waste stream exhibits the characteristic of toxicity per 40 CFR 261.24. The toxicity characteristic contaminants fall into two categories; metals and organics. The debris may contain toxicity characteristic metals based on the following identified uses/sources and is toxicity characteristic for organics. Where a constituent has been identified and there is no quantitative data available to demonstrate that the concentration of a constituent is below regulatory threshold levels, the applicable EPA HWN is conservatively applied to the waste stream in accordance with the CCP AK procedure CCP-TP-005.

Arsenic (D004) was used in actinide and lanthanide hydride and metallide studies. Barium (D005), cadmium (D006), chromium (D007), and lead (D008) have been attributed to fission product contaminants, product solution impurities (e.g. Berkelium-Californium separation, fission product contaminants) and target cladding. Cadmium is also attributed to flashlight batteries and electronic equipment. The presence of lead (D008) in this waste stream is attributed to lead shielding, gloves, batteries, electronic equipment and is a fission product contaminant of the HFIR targets. The presence of mercury (D009) in this waste stream is attributed to vapor lamps, electronic equipment, thermostats and solder. Selenium (D010) metal was identified on an REDC inorganic chemical inventory. Silver (D011) is assigned due to photographic development solutions and circuit boards in the waste. Based on AK, EPA HWNs D004, D005, D006, D007, D008, D009, D010, D011 are assigned to waste stream OR-REDC-CH-HET (Reference DR005 and DR602).

Toxicity Characteristic Organics

Waste stream OR-REDC-RH-HET does meet the definition of toxicity for organic compounds as defined in 40 CFR Part 261, Subpart C (40 CFR 261.24). Toxicity characteristic organic compounds were identified in the REDC processes. Where a constituent has been identified and there is no quantitative data available to demonstrate that the concentration is below regulatory threshold, the applicable EPA HWN is conservatively applied to the waste stream.

The AK identified the use of organic toxicity characteristic compounds including benzene (D018), carbon tetrachloride (HWN D019), and trichloroethylene (D040). EPA HWNs F005 and F002 are assigned to the waste stream for F-listed solvents benzene (F005) and trichloroethylene (F002). Because the more specific F-listed EPA HWNs have been assigned for these compounds, assignment of the corresponding toxicity characteristic HWNs D018 and D040 is not necessary. Therefore only D019 is conservatively assigned to waste stream OR-REDC-RH-HET for carbon tetrachloride (identified in the REDC inorganic chemical inventory). (Reference DR005 and DR602).

F-Listed Waste

Waste stream OR-REDC-RH-HET is an F-listed hazardous waste because the debris was mixed with or contains hazardous wastes from non-specific sources listed in 40 CFR Part 261, Subpart D (40 CFR 261.31).

F002 and F005-listed solvents were identified on REDC chemical inventories. Toluene (F005) was identified as a constituent in the liquid scintillation reagent Ultima Gold that was used in the laboratory. F003 constituents, including acetone, methanol, methyl isobutyl ketone, and xylene are listed solely because these solvents are ignitable. The waste stream will not exhibit the characteristic of ignitability because it is not liquid; therefore, F003 is not assigned. Although F001-listed solvents were identified in the AK record (carbon tetrachloride and trichloroethylene), no "large-scale" degreasing operation such as cold cleaning or vapor degreasing on an industrial scale was performed and F001 is not applied.

The following is a listing of the EPA HWNs and associated constituents assigned to waste stream OR-REDC-RH-HET.

(F002)
1,1,1-Trichloroethane, 1,1,2-trichloroethane, trichloroethylene

(F005)
Benzene and toluene

U, K, and P-Listed Chemicals

Waste stream OR-REDC-RH-HET does not contain a discarded commercial chemical product, an off-specification commercial chemical product, or a container residue or spill residue thereof (40 CFR 261.33). No U, K and P- listed chemicals were identified in the AK record for waste stream OR-REDC-RH-HET. The only sources identified for beryllium were small foil targets and source plates electroplated with microgram quantities of transplutonium elements. Review of the container documentation did not identify beryllium as a component of the waste in these containers. Therefore, if present, beryllium is a process contaminant. Since no beryllium powder will be present in the debris waste, P015 is not assigned to the waste stream.

Hydrofluoric acid (U134) was used as a dissolution reagent; however, there is no indication that unused acids or other reagents, or spills of these reagents were disposed of in this waste stream. Therefore, no U-and P-listed EPA HWNs are assigned to waste stream OR-REDC-RH-HET (References M005, M100 and P223).

The material in waste stream OR-REDC-RH-HET is not a hazardous waste from sources specified in 40 CFR 261.32. Waste stream OR-REDC-RH-HET is therefore not assigned a K-listed HWN.

Headspace Gas/Volatile Organic Compound Information

Headspace gas sampling was performed on 11 randomly selected containers. No UCL_{90} values exceeded the PRQLs for VOCs and SVOCs. One TIC (2-methyl-1-propanol) was identified but was not found in greater than 25% of the containers in this lot. These data are consistent with AK. The specifics of this information are included in the attached Characterization Information Summary Report. No EPA hazardous waste numbers were assigned based on headspace gas sampling analysis results.

Conclusion

The following EPA hazardous waste numbers are assigned to this waste stream: D004, D005, D006, D007, D008, D009, D010, D011, D019, F002 and F005.

Polychlorinated Biphenyls (PCBs)

Based on a review of the AK record, incandescent bulbs, mercury-vapor bulbs, vacuum pumps, and lighting fixtures (bases) were identified in the RH container documentation, however items potentially containing polychlorinated biphenyl (PCB) compounds were not specifically identified (capacitors, ballasts, etc.). No other potential sources for PCBs were identified in the AK record for this stream; however the ORNL waste management practices described in the AK record did not historically identify PCB materials as prohibited items or special management of these materials in the REDC. Additionally, interviews with ORNL waste management personnel have identified that vacuum pumps and capacitors containing PCB liquids could potentially be present in ORNL waste containers. If the waste is found to contain fluorescent light ballasts or other potential PCB-containing items during repackaging, these items will be managed in accordance with the PCB disposal requirements in the WIPP-WAC. (References C307, C308, M024, M100, P240, and P263).

Prohibited Items

The absence of prohibited items is determined and documented through acceptable knowledge and characterization activities. Visual examination is performed on each container in this waste stream as a confirmation activity. The following items have been determined as not present in the waste:

- Liquids
- Non-radioactive pyrophoric materials
- Waste incompatible with backfill, seal and panel closure materials, container and packaging materials, or other wastes
- Explosives or compressed gases
- Waste with PCBs not authorized under an EPA PCB waste disposal authorization
- Waste exhibiting the characteristics of ignitability, corrosivity, or reactivity
- Non-mixed hazardous wastes
- Waste that has ever been managed as high-level waste and waste from tanks specified in Table B-8 of the WIPP Hazardous Waste Facility Permit, unless specifically approved through a Class 3 permit modification.
- Any waste container from a waste stream (or waste stream lot) which has not undergone either radiographic or visual examination of a statistically representative subpopulation of the waste stream in each shipment, as described in the WIPP Hazardous Waste Facility Permit, Attachment B7.

Each container of waste is certified and shipped only after visual examination:

- Did not identify any prohibited items in the waste container, or
- All prohibited items found in a waste container by visual examination are identified and corrected (i.e., eliminated or removed) through the site non-conformance reporting system.

Method for Determining Waste Material Parameter Weights per Unit of Waste

The waste material parameter weight estimates for waste stream OR-REDC-RH-HET were derived from data located on site-specific waste disposal, transportation, and storage forms from 45 casks generated from 1991 through 2007. These containers are considered representative of the waste stream because the production operations that generated this waste

were consistent through the generation timeline. An analysis of the site-specific and VE data were performed, the results of which are presented in Table 2.

Table 2. Waste Stream OR-REDC-RH-HET Waste Material Parameters

Waste Material Parameter	Weight Percent	Weight Percent Range
Iron-based Metals/Alloys	59.13%	30.23% – 95.51%
Aluminum based Metals/Alloys	0.01%	0.0% – 0.64%
Other Metals	5.91%	0.0% – 52.38%
Other Inorganic Materials	16.78%	0.0% – 47.51%
Cellulosics	6.68%	0.0% – 18.03%
Plastics (waste materials)	8.62%	1.44% – 30.97%
Rubber	1.66%	0.0% – 11.9%
Organic Matrix	0.00%	0.0% – 0.0%
Inorganic Matrix	1.21%	0.0% – 7.93%
Soils/Gravel	0.00%	0.0% – 0.0%

List of AK Sufficiency Determinations

No AK Sufficiency Determinations apply to this waste stream.

Transportation

This waste stream and its chemical constituents have been reviewed for consistency with listed TRUCON codes and they are consistent. The waste stream and chemical constituents will be reviewed for consistency with the applicable TRUCON Content Number prior to shipment.

Radionuclide Information

The two most prevalent radionuclides by mass in this waste stream are Pu-239 and Cm-246. The isotopes expected to be present in the waste stream are listed in Table 3.

Table 3. Radionuclides in Waste Stream OR-REDC-RH-HET

WIPP Tracked Radionuclides	Additional Reported Radionuclides		
Am-241	Am-243	Cm-242	Ru-103
Pu-238	Ba-137m	Cm-244	Ru-106
Pu-239	Cf-249	Cm-246	Ag-110m
Pu-240	Cf-250	Cm-248	Sb-125
Pu-242	Cf-251	Eu-152	U-235
U-233 (Not expected)	Cf-252	Eu-154	U-236
U-234	Ce-141	Eu-155	Y-90
U-238	Ce-144	Nb-95	Zr-95
Cs-137	Cs-134	Np-239	
Sr-90	Co-60	Pu-241	

Payload management will not be employed for Oak Ridge National Laboratory.

Attachment 1

AK SOURCE DOCUMENTS, SUPPLEMENTAL DOCUMENTATION

Source Document Tracking Number	AK #	Title	Document Number	Date
C046	S5	Memo to J. A. Lenhard, DOE OR re: Materials Management Plan-ORNL	NA	06/13/1984
C307	NA	Interview of Walt Bond. Subject: Processes and Waste in Building 3508 at ORNL	NA	2/21/2008
C308	NA	Interview of Jason Taylor. Subject: PCB Management at ORNL.	NA	4/8/2008
DR005	NA	EPA Hazardous Waste Number Discrepancies	NA	06/24/08
DR602	NA	Discrepancy Resolution Follow-up on DR005 for EPA Hazardous Waste Number Discrepancy	NA	07/02/08
M005	NA	UCN-2109 Forms and Related Container Paperwork.	NA	Various
M024	S6, S9	RH EM Waste Database Query	NA	10/04/2007
P146	S9	C-Tank Transfers; Transuranic Sludge Removal From the C-1, C-2, and W-23 Waste Storage Tanks at Oak Ridge National Laboratory. Oak Ridge, Tennessee	BJC/OR-279	05/1999
P161	NA	Safety Analysis Report Radiochemical Engineering Development Center Building 7920	SAR/7920-CTD/0	3/14/2001
P223	NA	Chemical Technology Division Annual Progress Report for Period Ending 5/31/1969	ORNL-4422	Oct-69
P240	NA	Packaging and Disposition of Contact-Handled Transuranic Waste At the Radiochemical Engineering Development Center	REDC FO/WH 5100, Rev. 1 & 2	1/26/1995;7/15/1998
P241	NA	Oak Ridge National Laboratory Contact-Handled Transuranic Waste Certification Program Plan	ORNL/TM-10322/2, Rev. 2	8/1/1990

Source Document Tracking Number	AK #	Title	Document Number	Date
P242	NA	Oak Ridge National Laboratory Contact-Handled Transuranic Waste Certification Program Plan	ORNL/TM-10322/R3, Rev. 3	Jun-92
P263	NA	TRU Operating Manual and Supporting Documentation	NA	10/10/1980
P282	NA	Building 7920 Analytical Chemistry Procedures	Various	Various
P324	S3	Technical Safety Requirements Irradiated Fuels Examination Laboratory Building 3525	ORNL/3525/TSR	8/1/2004
P325	S3	Oak Ridge National Laboratory Standardized Safety Analysis Report for Nonreactor Nuclear Facilities	ORNL/NNFD/SSAR	5/12/2004
P330	S3	Safety Analysis Report Irradiated Fuels Examination Laboratory / Building 3525	ORNL/3525/SAR	6/22/2006
P401	S13	Radioactive materials Analysis laboratory Quality Assurance Plan for the Characterization of Radioactive Waste	QAP-X-96-CASD/RML-001	10/1997
P424	S5	Californium-252: A Remarkable Versatile Radioisotope	ORNL/TM-12706	10/10/1995
U011	NA	Safety Analysis: Transuranium Processing Plant, Building 7920	ORNL/TM-7688, Draft	Dec-84
U049	S9	Waste Stream Profile Sheet for 7920-HCAL-005 and Supporting documentation	7920-HCAL-005	08/18/1999
U601	S9	CCP Calculation Package: Sample Radionuclide Information Input Check	ORNL-RH-01	04/19/2008
U602	S9	CCP Calculation Package: Sample Data Decay Correction	ORNL-RH-02	04/19/2008
U603	S9	CCP Calculation Package: Campaigns 69 and M5 Information Input Check	ORNL-RH-03	04/19/2008
U605	S9	CCP Calculation Package: Mark 42 Campaigns Inventory Information Input Check	ORNL-RH-05	04/19/2008
Source Document Tracking	AK #	Title	Document Number	Date

Number				
U606	S9	CCP Calculation Package: Radiological Inventories for SETF Campaigns	ORNL-RH-06	04/19/2008
U607	S9	CCP Calculation Package: Dose-to-Curie Derivation for Cs-137, Eu-152 and Eu-154	ORNL-RH-07	04/19/2008; 05/23/2008
U608	S9	CCP Calculation Package: Determination of Reportable Isotopes-Mark 42 Period	ORNL-RH-08	04/19/2008
U609	S9	CCP Calculation Package: Campaign Inventory Information Input Check	ORNL-RH-09	04/19/2008
U610	S9	CCP Calculation Package: Uncertainty Analysis	ORNL-RH-10	05/13/2008
U611	S9	CCP Calculation Package: DTC Spreadsheet for Mark 42 Time-Mark/HFIR	ORNL-RH-11	05/22/2008
U612	S9	CCP Calculation Package: Development of Cs-137 Partition Factors	ORNL-RH-12	04/19/2008
U613	S9	CCP Calculation Package: MCNP5 Uncertainty Analysis	ORNL-RH-13	04/19/2008
U614	S9	CCP Calculation Package: Determination of Cm-242 Processed in Campaign 69	ORNL-RH-14	04/19/2008
U615	S9	CCP Calculation Package: Development of Campaigns 69 and M5 Inventories	ORNL-RH-15	04/19/2008
U616	S9	CCP Calculation Package: Direct Assay Information Input Check	ORNL-RH-16	05/13/2008
U617	S9	CCP Calculation Package: Direct Assay Data Analysis	ORNL-RH-17	05/13/2008
U618	S9	CCP Calculation Package: Scaling Factor Development for Mark 42 Time Period	ORNL-RH-18	04/19/2008
U620	S9	CCP Calculation Package: Fission Product Contribution to Total Dose Rate	ORNL-RH-20	04/19/2008
U621	S9	CCP Calculation Package: Sample Scaling Factor Development	ORNL-RH-21	04/19/2008
U622	S9	CCP Calculation Package: SR-90/Cs-137 Scaling Factor Development	ORNL-RH-22	05/14/2008
Source Document Tracking	AK #	Title	Document Number	Date

Number				
U623	S9	CCP Calculation Package: DTC Spreadsheet for Mark 42 Time-HFIR/HFIR	ORNL-RH-23	05/22/2008
U626	S9	CCP Calculation Package for: Determination of Neutron Surface to 1-m Dose Ratio	ORNL-RH-26	05/23/2008
U627	S9	CCP Calculation Package for: Ratio Between Contact and One Meter Dose Rates	ORNL-RH-27	05/23/2008

Alphanumeric Designations

C Correspondence
D Documents
DR Discrepancy Resolution
M Miscellaneous
P Procedures and Published Documents
U Unpublished Documents

AK Numbers

S1 Process Design Documents
S2 Standard Operating Procedure
S3 Safety Analysis Reports
S4 Waste Packaging Logs
S5 Test plans/research project reports
S6 Site databases
S7 Information from site personnel
S8 Standard industry documents
S9 Previous analytical data
S10 Material safety data sheets
S11 Laboratory Notebooks
S12 Comparable or surrogate sampling and analysis data
S13 Other

DIVIDER PAGE

NWP
Nuclear Waste Partnership LLC

A URS-led partnership with B&W and AREVA

CP:15:01033
UFC:5900.00

INTER-OFFICE CORRESPONDENCE

DATE: January 26, 2015

FROM: I. S. Joo LOCATION: Remote-Handled Projects

TO: CCP Records Custodian GSA-212 LOCATION: Central Characterization Program

SUBJECT: TRANSMITTAL OF CHARACTERIZATION RECONCILIATION REPORT FOR REMOTE-HANDLED LOT 29 FOR WASTE STREAM OR-REDC-RH-HET (CCP-AK-ORNL-500)

Please accept the attached Characterization Reconciliation Report for the Remote-Handled Oak Ridge National Laboratory Lot 29 for waste stream OR-REDC-RH-HET (CCP-AK-ORNL-500).

IJ:jmc

Attachment

cc: (without attachment)
D. W. Moody ED
C. A. Turner ED

NTPC RECORDS ORIGINAL
DATE REC'D 2/5/15

Attachment 1 - Summary of Characterization by Container Number

CRR Number: CRR-ORNL-OR-REDC-RH-HET-0029
Waste Stream: OR-REDC-RH-HET
Summary Category Group (SCG): S5000
Waste Matrix Code (WMC): S5400
Waste Characterization Site: RH_ORNL

Radiological Characterization Method: DTC
(e.g. AK, DTC, DA, NDA, D&G)
Acceptable Knowledge Qualification: Confirmatory Testing
(e.g. Peer Review, Corroborating data, Confirmatory testing, as applicable)

			TRU Alpha Activity Concentration (TAAC)		Volume Activity (Ci/L)			RH Waste Determination: Surface Dose (SD) Rate Measurements	
Container ID Number	Radiological BDR Number	NDE BDR Number	TAAC (nCi/g)	TAAC (≥ 100 nCi/g)	Value	1σ Unc.	Evaluation (≤ 23 Ci/L)	SD Rate (rem / hr)	SD rate >200 mrem/hr and ≤ 1,000 rem/hr
ORRH00678	ORRHDTC13001	ORNLRHVE13001	1.18E+04	TRU	8.19E-02	6.81E-02	Pass	0.23	Remote-Handled
ORRH00679	ORRHDTC13001	ORNLRHVE13002	1.20E+04	TRU	6.63E-02	5.50E-02	Pass	0.21	Remote-Handled
ORRH00680	ORRHDTC13001	ORNLRHVE13003	4.31E+04	TRU	2.94E-01	2.44E-01	Pass	0.39	Remote-Handled
ORRH00681	ORRHDTC13001	ORNLRHVE13004	3.70E+04	TRU	2.89E-01	2.41E-01	Pass	0.36	Remote-Handled
ORRH00682	ORRHDTC13001	ORNLRHVE13004	2.36E+04	TRU	1.61E-01	1.34E-01	Pass	0.25	Remote-Handled
ORRH00683	ORRHDTC13001	ORNLRHVE13005	3.25E+04	TRU	2.57E-01	2.14E-01	Pass	0.4	Remote-Handled
ORRH00684	ORRHDTC13001	ORNLRHVE13006	3.16E+04	TRU	2.12E-01	1.76E-01	Pass	0.3	Remote-Handled
ORRH00687	ORRHDTC14001	ORNLRHVE14002	1.60E+04	TRU	1.84E-01	1.54E-01	Pass	0.25	Remote-Handled
ORRH00688	ORRHDTC14001	ORNLRHVE14004	3.61E+04	TRU	4.02E-01	3.36E-01	Pass	0.52	Remote-Handled
ORRH00689	ORRHDTC14001	ORNLRHVE14005	5.47E+04	TRU	3.89E-01	3.23E-01	Pass	0.58	Remote-Handled
ORRH00691	ORRHDTC14001	ORNLRHVE14007	1.64E+04	TRU	9.09E-02	7.55E-02	Pass	0.21	Remote-Handled
ORRH00697	ORRHDTC14001	ORNLRHVE14008	1.35E+04	TRU	1.11E-01	9.23E-02	Pass	0.35	Remote-Handled
ORRH00692	ORRHDTC14002	ORNLRHVE14011	1.26E+04	TRU	1.44E-01	1.20E-01	Pass	0.23	Remote-Handled
ORRH00693	ORRHDTC14002	ORNLRHVE14011	4.41E+04	TRU	4.01E-01	3.34E-01	Pass	0.53	Remote-Handled
ORRH00695	ORRHDTC14002	ORNLRHVE14012	3.31E+04	TRU	3.84E-01	3.20E-01	Pass	0.48	Remote-Handled
ORRH00699	ORRHDTC14002	ORNLRHVE14009	1.82E+04	TRU	2.75E-01	2.31E-01	Pass	0.30	Remote-Handled
ORRH00700	ORRHDTC14002	ORNLRHVE14010	1.35E+04	TRU	2.13E-01	1.79E-01	Pass	0.25	Remote-Handled
	N/A								

Irene Joo
SPM Name (*print*)

SPM Signature (*sign*)

1/25/2015
Date

Attachment 2 - Remote-Handled Characterization Reconciliation Report Data Quality Objectives (DQOs) and Quality Assurance Objectives (QAOs)

CRR Number: CRR-ORNL-OR-REDC-RH-HET-0029
Waste Stream: OR-REDC-RH-HET
Site: RH_ORNL

Data Quality Objectives (DQOs)	Yes	No	N/A	Source Document(s) (List BDRs, reports, AK documents, etc.)
Defense Waste, High Level, and Spent Nuclear Fuel Determination - WCPIP Section 2.1.1				
Was the waste generated by, or comingled with, atomic energy defense activities? Is the waste verified not to be high-level waste or spent nuclear fuel?	X			CCP-AK-ORNL-500, Rev. 4, Sections 4.4 and 4.5 and Source documents I022, I023, I044, M023, P161, P258, P281, P569, U038, U039, U647.
TRU Waste Determination - WCPIP Section 2.1.2.1				
Does the waste contain more than 100 nCi of TRU isotopes per gram of waste?	X			ORRHDTC13001, ORRHDTC14001, ORRHDTC14002 Waste Container Dose-to-Curie conversion record sheets
RH Waste Determination - WCPIP Section 2.1.2.2				
Is the surface dose rate equal to or greater than 200 mrem/hr and less than 1000 rem/hr?	X			Radiological survey reports provided by ORNL
Activity Determination - WCPIP Section 2.1.2.3				
Is the volume activity of the container less than 23 Ci/L per canister? (SPM evaluation is on container basis)	X			ORRHDTC13001, ORRHDTC14001, ORRHDTC14002 Waste Container Dose-to-Curie conversion record sheets
Liquids - WCPIP Section 2.1.3.1				
Is the amount of liquids in the container less than one percent by volume?	X			ORNLRHVE13001, ORNLRHVE13002, ORNLRHVE13003, ORNLRHVE13004, ORNLRHVE13005, ORNLRHVE13006, ORNLRHVE14002, ORNLRHVE14004, ORNLRHVE14005, ORNLRHVE14007, ORNLRHVE14008, ORNLRHVE14009, ORNLRHVE14010, ORNLRHVE14011, ORNLRHVE14012 Waste Container VE data sheets
Physical Form - WCPIP Section 2.1.3.2				
Does the physical form of the waste accurately delineate the waste stream?	X			ORNLRHVE13001, ORNLRHVE13002, ORNLRHVE13003, ORNLRHVE13004, ORNLRHVE13005, ORNLRHVE13006, ORNLRHVE14002, ORNLRHVE14004, ORNLRHVE14005, ORNLRHVE14007, ORNLRHVE14008, ORNLRHVE14009, ORNLRHVE14010, ORNLRHVE14011, ORNLRHVE14012 Waste Container VE data sheets

Superceded
RK 2/17/15

Attachment 2 - Remote-Handled Characterization Reconciliation Report Data Quality Objectives (DQOs) and Quality Assurance Objectives (QAOs)

CRR Number: CRR-ORNL-OR-REDC-RH-HET-0029
Waste Stream: OR-REDC-RH-HET
Site: RH_ORNL

Data Quality Objectives (DQOs)	Yes	No	N/A	Source Document(s) (List BDRs, reports, AK documents, etc.)
Defense Waste, High Level, and Spent Nuclear Fuel Determination - WCPIP Section 2.1.1				
Was the waste generated by, or comingled with, atomic energy defense activities? Is the waste verified not to be high-level waste or spent nuclear fuel?	X			CCP-AK-ORNL-500, Rev. 4, Sections 4.4 and 4.5 and Source documents I022, I023, I044, M023, P161, P258, P281, P569, U038, U039, U647.
TRU Waste Determination - WCPIP Section 2.1.2.1				
Does the waste contain more than 100 nCi of TRU isotopes per gram of waste?	X			ORRHDTC13001, ORRHDTC14001, ORRH14002 Waste Container Dose-to-Curie conversion record sheets
RH Waste Determination - WCPIP Section 2.1.2.2				
Is the surface dose rate equal to or greater than 200 mrem/hr and less than 1000 rem/hr?	X			Radiological survey reports provided by ORNL
Activity Determination - WCPIP Section 2.1.2.3				
Is the volume activity of the container less than 23 Ci/L per canister? (SPM evaluation is on container basis)	X			ORRHDTC13001, ORRHDTC14001, ORRH14002 Waste Container Dose-to-Curie conversion record sheets
Liquids - WCPIP Section 2.1.3.1				
Is the amount of liquids in the container less than one percent by volume?	X			ORNLRHVE13001, ORNLRHVE13002, ORNLRHVE13003, ORNLRHVE13004, ORNLRHVE13005, ORNLRHVE13006, ORNLRHVE14002, ORNLRHVE14004, ORNLRHVE14005, ORNLRHVE14007, ORNLRHVE14008, ORNLRHVE14009, ORNLRHVE14010, ORNLRHVE14011, ORNLRHVE14012 Waste Container VE data sheets
Physical Form - WCPIP Section 2.1.3.2				
Does the physical form of the waste accurately delineate the waste stream?	X			ORNLRHVE13001, ORNLRHVE13002, ORNLRHVE13003, ORNLRHVE13004, ORNLRHVE13005, ORNLRHVE13006, ORNLRHVE14002, ORNLRHVE14004, ORNLRHVE14005, ORNLRHVE14007, ORNLRHVE14008, ORNLRHVE14009, ORNLRHVE14010, ORNLRHVE14011, ORNLRHVE14012 Waste Container VE data sheets

Attachment 2 - Remote-Handled Characterization Reconciliation Report Data Quality Objectives (DQOs) and Quality Assurance Objectives (QAOs)

Quality Assurance Objectives (QAOs)	Yes	No	N/A
Acceptable Knowledge (AK) - WCPIP Section 4.1			
Precision - Not applicable QAO for this method			X
Accuracy - AK accuracy assesses the percentage of waste containers that require reassignment to a new Summary Category Group or new waste stream based on the reevaluation of AK or on obtaining testing, sampling and/or analysis data. Is the percentage of waste containers that confirm the physical and radiological properties greater than or equal to 90%?	X		
Representativeness - Does the process of obtaining, evaluating, and documenting the AK information ensure it was performed in accordance with the minimum standards established in AK procedure CCP-TP-005?	X		
Completeness - Does the AK record contain 100% of the information required for each container in the waste stream? (Usability of the AK information will be assessed for completeness during audits.)	X		
Comparability – Was the AK compiled in compliance with AK procedure(s) and associated training requirements?	X		

Physical Characterization Methods

Quality Assurance Objectives (QAOs)	Yes	No	N/A
Visual Examination (VE) - WCPIP Section 4.2.1			
Was VE used in the physical characterization?	X		
Precision - Were discrepancies, if any, regarding important waste characteristics (i.e., physical form of the waste and absence of prohibited liquids) within a single container reconciled between two operators?	X		
Accuracy - Have VE operators passed a comprehensive examination with a score of 80% and demonstrated satisfactory performance in the presence of the VE expert during initial qualification and requalification?	X		
Representativeness – Are the waste contents placed in the waste containers described on the data forms?	X		
Completeness – Has the relevant waste information been collected and documented?	X		
Comparability – Was the VE information compiled in compliance with VE procedure(s) and associated training requirements?	X		

Real-Time Radiography (RTR) - WCPIP Section 4.2.2			
Was RTR used in the physical characterization?		X	
Precision - Were discrepancies, if any, regarding important waste characteristics (i.e., physical form of the waste and absence of prohibited liquids) within a single container reconciled between two operators (during independent observations and replicate scans)?			X
Accuracy – Was a target used to tune the image for maximum sharpness and were operators required to identify prohibited liquid in a training container during qualification and requalification?			X
Representativeness – Were all the relevant waste contents in each container described?			X
Completeness – Was relevant waste information assembled to show that each of the containers in the waste stream belongs to the waste stream? This information must be documented on videotape or other equivalent media and data form.			X
Comparability – Was the RTR information compiled in compliance with RTR procedure(s) and associated training requirements?			X

Attachment 2 - Remote-Handled Characterization Reconciliation Report Data Quality Objectives (DQOs) and Quality Assurance Objectives (QAOs)

Radiological Characterization Methods

Quality Assurance Objectives (QAOs)	Yes	No	N/A
Dose-to-Curie (DTC) - WCPIP Section 4.3.2			
Was DTC used for radiological characterization?	X		
Precision - Not applicable QAO for this method			X
Accuracy – Were standardized and benchmarked radiation transport computer codes used?	X		
Representativeness – Was an appropriate model of the actual physical drum dose rate configuration used and documented by an independent review of the DTC correlation?	X		
Completeness – Were calculations used that span the full range of important parameter values (such as density) which are expected to be encountered with the actual RH TRU containers?	X		
Comparability - Not applicable QAO for this method			X
Dose Rate Measurements associated with DTC - WCPIP Section 4.3.2			
Precision – Was the reported relative percent difference (RPD) less than or equal to 40%?	X		
Accuracy – Has a calibration for the dose-rate instrument used been established, maintained, and documented within the recommendations of the manufacturer?	X		
Representativeness - Not applicable QAO for this method			X
Completeness - Not applicable QAO for this method			X
Comparability - Not applicable QAO for this method			X

Nondestructive Assay (NDA) - WCPIP Section 4.3.3			
Was NDA used for radiological characterization?		X	
Precision – Does the reported %RSD comply with CCP-TP-506, Table 4.2?			X
Accuracy – Is the reported %R less than or equal to ± 30% on non-interfering matrix?			X
Representativeness – Has each waste container been assayed?			X
Completeness – Is 100% of the NDA data valid and usable?			X
Comparability – Was the NDA process implemented in accordance to NDA standards and were associated training requirements met?			X

Quality Assurance Objectives (QAOs)	Yes	No	N/A
Sampling - WCPIP Section 4.3.4.1			
Was sampling used for radiological characterization?		X	
Precision - Not applicable QAO for this method			X
Accuracy – Was an appropriate sample design developed and approved by CBFO for collecting an adequate number of samples such that the one-sigma uncertainty in the mean value of the sample-generated scaling factor is within a factor of two?			X
Representativeness – Was representativeness described in the associated sampling plan?			X
Completeness – Was the QAO for a minimum set of radionuclides specified in the sampling plan?			X
Comparability - Not applicable QAO for this method			X
Sample Collection - WCPIP Section 4.3.4.2			
Accuracy – Was sampling equipment verified as clean by the use of standard radiological control survey methods?			X

Attachment 2 - Remote-Handled Characterization Reconciliation Report Data Quality Objectives (DQOs) and Quality Assurance Objectives (QAOs)

Radiological Characterization Methods, continued

Radiochemistry Analysis - WCPIP Section 4.3.4.3			
Precision – Was the RPD less than or equal to 40% or laboratory acceptable precision criteria?			X
Accuracy – Was the reported %R LCS within ±25%; Was the reported MS ±50%?			X
Representativeness - Not applicable QAO for this method			X
Completeness -Not applicable QAO for this method			X
Comparability: Not applicable QAO for this method			X

Modeling to Confirm or Derive Radionuclide Distributions - WCPIP Section 4.3.5			
Was modeling used for radiological characterization?		X	
Precision - Not applicable QAO for this method			X
Accuracy – Do the modeling results compare to sample results within a factor of two?			X
Representativeness – Was the composition and burnup information for a minimum of 50% of the radioactive materials identified in the AK record involved in the generation of the waste included in the modeling?			X
Completeness - Not applicable QAO for this method			X
Comparability - Not applicable QAO for this method			X

Quality Assurance Objectives (QAOs)	**Yes**	**No**	**N/A**
Surface Dose Rate - WCPIP Section 4.3.7			
Were surface dose rates used for radiological characterization?	X		
Precision – Was the reported RPD equal or less than 40%?	X		
Accuracy - Manufacturer typically specifies a flat energy response of 10 to 20% across the applicable energy range. Was the repeatability of the measurement within about 10% at the higher gamma dose rates?	X		
Representativeness – Was the measurement is applied to the entire waste container?	X		
Completeness – Were 100% of the measurements, needed to determine surface dose rate, performed and useable?	X		
Comparability - Not applicable QAO for this method			X

Gravimetric *or* Dimensional Measurements - WCPIP Section 4.3.8			
Was Gravimetric or Dimensional measurement used?		X	
Precision – Was the measurement equipment maintained according to manufacturer's recommendation?			X
Accuracy – Was the balance readout within 2% of the check weight. Was the length measurement within 0.1 of an inch as verified by a second operator?			X
Representativeness - Not applicable QAO for this method			X
Completeness – Was every quantity of fuel test specimen loaded into container is measured?			X
Comparability - Not applicable QAO for this method			X

Attachment 2 - Remote-Handled Characterization Reconciliation Report Data Quality Objectives (DQOs) and Quality Assurance Objectives (QAOs)

Radiological Characterization Methods, continued

Gravimetric *and* Dimensional Method - WCPIP Section 4.3.8			
Was Gravimetric and Dimensional method used?		X	
Precision - Not applicable QAO for this method			X
Accuracy - Fuel test specimen design and irradiated information is used for individual fuel test specimen pins in combination of the length and gravimetric measurement. Were scaling factors developed from isotope depletion code?			X
Representativeness – Is the design information representative for each specific fuel test specimen quantity loaded into container?			X
Completeness – Was every quantity of fuel test specimen loaded into container is measured?			X
Comparability - Not applicable QAO for this method			X

Attachment 3 – Sum of Fractions Evaluation

Drum Identification Number	F_s Value
ORRH00678	7.85E-05
ORRH00679	6.35E-05
ORRH00680	2.82E-04
ORRH00681	2.77E-04
ORRH00682	1.55E-04
ORRH00683	2.47E-04
ORRH00684	2.03E-04
ORRH00687	1.76E-04
ORRH00688	3.85E-04
ORRH00689	3.72E-04
ORRH00691	8.72E-05

ORRH00697	1.06E-04
ORRH00692	1.38E-04
ORRH00693	3.85E-04
ORRH00695	3.68E-04
ORRH00699	2.64E-04
ORRH00700	2.05E-04

Where *fs* is the sum fractions, A_{Cs} is the Cs-137 activity in the drum, A_{Eu} is the Eu-154 activity, and A_{Co} is the Co-60 activity.

If *fs* <1 then the drum is shippable. If *fs* >1 then the drum needs further evaluation to determine if it is shippable.

DIVIDER PAGE

Nuclear Waste Partnership LLC
An AECOM-led partnership with B&W and AREVA

CP:16:1601059
UFC:5900.00

INTER-OFFICE CORRESPONDENCE

DATE: February 29, 2016

FROM: Irene Joo LOCATION: RH Projects

TO: CCP Records Custodian GSA-212 LOCATION: Central Characterization Program

SUBJECT: TRANSMITTAL OF CHARACTERIZATION RECONCILIATION REPORT FOR REMOTE-HANDLED LOTS 30-33 FOR WASTE STREAM OR-REDC-RH-HET (CCP-AK-ORNL-500)

Please accept the attached Characterization Reconciliation Report for the Remote-Handled Oak Ridge National Laboratory Lots 30-33 for waste stream OR-REDC-RH-HET (CCP-AK-ORNL-500).

IJ:rg

Attachment

cc: (without attachment)
R. Kantrowitz

P.O. Box 2078 • Carlsbad, New Mexico USA 88221-2078
Phone: (575) 234-7200 • Fax: (575) 234-7083

CCP RECORDS ORIGINAL
DATE REC'D 3/2/16

Attachment 1 - Summary of Characterization by Container Number

CRR Number: CRR-ORNL-OR-REDC-RH-HET-0030

Waste Stream: OR-REDC-RH-HET

Summary Category Group (SCG): S5000

Waste Matrix Code (WMC): S5400

Waste Characterization Site: RH_ORNL

Radiological Characterization Method: (e.g. AK, DTC, DA, NDA, D&G)

Acceptable Knowledge Qualification: Confirmatory testing (e.g. Peer Review, Corroborating data, Confirmatory testing)

			TRU Alpha Activity Concentration (TAAC)		Volume Acitivity (Ci/L)			RH Waste Determination: Surface Dose (SD) Rate Measurements	
Container ID Number	Radiological BDR Number	NDE BDR Number	TAAC (nCi/g)	TAAC (≥ 100 nCi/g)	Value	1 s Unc.	Evaluation(≤ 23 Ci/L)	SD Rate (rem / hr)	SD rate >200 mrem/hr and ≤ 1000 rem/hr
ORRH00685	ORRHDTC14001	ORNLRHVE14001	1.67E+04	TRU	1.17E-01	9.72E-02	Pass	2.78E-01	Remote-Handled
ORRH00686	ORRHDTC14001	ORNLRHVE14003	1.97E+04	TRU	1.14E-01	9.47E-02	Pass	4.33E-01	Remote-Handled
ORRH00690	ORRHDTC14001	ORNLRHVE14006	5.91E+03	TRU	7.27E-02	6.07E-02	Pass	2.31E-01	Remote-Handled
ORRH00696	ORRHDTC14002	ORNLRHVE14013	1.75E+04	TRU	2.01E-01	1.68E-01	Pass	2.76E-01	Remote-Handled
ORRH00701	ORRHDTC15002	ORNLRHVE14014	7.22E+04	TRU	4.37E-01	3.63E-01	Pass	5.47E-01	Remote-Handled
ORRH00707	ORRHDTC15001	ORNLRHVE14016	2.02E+04	TRU	3.36E-01	2.82E-01	Pass	3.43E-01	Remote-Handled
Comments									

Irene Joo 02/29/2016

SPM Print/Sign Name and Date

Attachment 2 - Remote-Handled Characterization Reconciliation Report Data Quality Objectives

CRR Number: CRR-ORNL-OR-REDC-RH-HET-0030
Waste Stream: OR-REDC-RH-HET
Site: RH_ORNL

Data Quality Objectives (DQOs)	Yes	No	NA	Characterization Method & Sources (e.g. List BDRs, reports, AK documents)
Defense Waste, High Level, and Spent Nuclear Fuel Determination - WCPIP Section 2.1.1				
Was the waste generated by, or comingled with, atomic energy defense activities? Is the waste verified not to be high-level waste, or spent nuclear fuel?	X			CCP-AK-ORNL-500, Rev. 4, Sections 4.4 and 4.5 and Source documents I022, I023, I044, M023, P161, P258, P281, P569, U038, U039, U647, DR009
TRU Waste Determination - WCPIP Section 2.1.2.1				
Does the waste contain more than 100 nCi of TRU isotopes per gram of waste?	X			ORRHDTC14001, ORRHDTC14002, ORRHDTC15001, ORRHDTC15002 Waste Container Dose-to-Curie conversion record sheets
RH Waste Determination - WCPIP Section 2.1.2.2				
Is the Surface dose rate equal to or greater than 200 mrem/hr and less than 1000 rem/hr	X			Radiological survey reports provided by ORNL
Activity Determination - WCPIP Section 2.1.2.3				
Is the volume activity of the container less than 23 Ci/L per canister? (SPM evaluation is on container basis)	X			ORRHDTC14001, ORRHDTC14002, ORRHDTC15001, ORRHDTC15002 Waste Container Dose-to-Curie conversion record sheets
Liquids - WCPIP Section 2.1.3.1				
Is the amount of liquids in the container less than one percent by volume?	X			ORNLRHVE14001, ORNLRHVE14003, ORNLRHVE14006, ORNLRHVE14013, ORNLRHVE14014, ORNLRHVE14016 Waste Container VE data sheets
Physical Form - WCPIP Section 2.1.3.2				
Does the physical form of the waste accurately delineate the waste stream?	X			ORNLRHVE14001, ORNLRHVE14003, ORNLRHVE14006, ORNLRHVE14013, ORNLRHVE14014, ORNLRHVE14016 Waste Container VE data sheets

Quality Assurance Objectives (QAOs)	Yes	No	NA
Acceptable Knowledge (AK) - WCPIP Section 4.1			
Precision - Not applicable QAO for this method			X

Accuracy - AK accuracy assesses the percentage of waste containers that require reassignment to a new Summary Category Group or new waste stream based on the reevaluation of AK or on obtaining testing, sampling and/or analysis data. Is the percentage of waste containers that confirm the physical and radiological properties greater than or equal to 90%?	X		
Representativeness - Does the process of obtaining, evaluating, and documenting the AK information ensure it was performed in accordance with the minimum standards established in AK procedure CCP-TP-005?	X		
Completeness - Does the AK record contain 100% of the information required for each container in the waste stream? (Usability of the AK information will be assessed for completeness during audits)	X		
Comparability -Was the AK compiled in compliance with AK procedure(s) and associated training requirements?	X		

Physical Characterization Methods

Quality Assurance Objectives (QAOs)	Yes	No	NA
Visual Examination (VE) - WCPIP Section 4.2.1			
Was VE used in the physical characterization?	X		
Precision - Were discrepancies, if any, regarding important waste characteristics (i.e. physical form of the waste and absence of prohibited liquids) within a single container reconciled between two operators?	X		
Accuracy - Have VE operators passed a comprehensive examination with a score of 80% and demonstrated satisfactory performance in the presence of the VE expert during initial qualification and requalification?	X		
Representativeness - Are the waste contents placed in the waste containers described on the data sheet?	X		
Completeness - Has the relevant waste information must be collected and documented?	X		
Comparability - Was the VE information compiled in compliance with VE procedure(s) and associated training requirements?	X		
Real-Time Radiography (RTR) - WCPIP Section 4.2.2			

Was RTR used in the physical characterization?		X	
Precision -Were discrepancies, if any, regarding important waste characteristics (i.e. physical form of the waste and absence of prohibited liquids) within a single container reconciled between two operators (during independent observations and replicate scans)?			X
Accuracy - Was a target used to tune the image for maximum sharpness and were operators required to identify prohibited liquid in a training container during qualification and requalification?			X
Representativeness - Were all the relevant waste contents in each container described?			X
Completeness - Was relevant waste information assembled to show			X
Comparability - Was the RTR information compiled in compliance wi			X
Dose-to-Curie (DTC) - WCPIP Section 4.3.2			
Was DTC used for radiological characterization?	X		
Precision - Not applicable QAO for this method			X
Accuracy - Were standardized and benchmarked radiation transport computer codes used?	X		
Representativeness - Was an appropriate model of the actual physical drum dose rate configuration used and documented by an independent review of the DTC correlation?	X		
Completeness - Were calculations used that span the full range of important parameter values (such as density) which are expected to be encountered with the actual RH TRU containers?	X		
Comparability - Not applicable QAO for this method			X
Dose Rate Measurement associated with DTC - WCPIP Section 4.3.2			
Precision - Was the reported relative percent difference (RPD) less than or equal to 40%?	X		
Accuracy - Has a calibration for the dose-rate instrument used been established, maintained, and documented within the recommendations of the manufacturer?	X		
Representativeness - Not applicable QAO for this method			X
Completeness - Not applicable QAO for this method			X
Comparability - Not applicable QAO for this method			X
Nondestructive Assay (NDA) - WCPIP Section 4.3.3			
Was NDA used for radiological characterization?		X	
Precision - Does the reported %RSD comply with CCP-TP-506, Table 4.2?			X

Accuracy - Is the reported %R less than or equal to ± 30% on non-interfering matrix?			X
Representativeness - Has each waste container been assayed?			X
Completeness - Is 100% of the NDA data valid and usable?			X
Comparability - Was the NDA process implemented in accordance to NDA standards and was associated training requirements met?			X
Sampling - WCPIP Section 4.3.4.1			
Was sampling used for radiological characterization?		X	
Precision - Not applicable QAO for this method			X
Accuracy - Was an appropriate sample design developed and approved by CBFO for collecting an adequate number of samples such that the one-sigma uncertainty in the mean value of the sample-generated scaling factor is within a factor of two?			X
Representativeness - Was representativeness described in the associated sampling plan?			X
Completeness - Was the QAO for a minimum set of radionuclides sp			X
Comparability - Not applicable QAO for this method			X
Sample Collection - WCPIP Section 4.3.4.2			
Accuracy - Was sampling equipment verified as clean by the use of standard radiological control survey methods?			X
Radiochemistry Analysis - WCPIP 4.3.4.3			
Precision - Was the RPD less than or equal to 40% or laboratory acceptable precision criteria?			X
Accuracy - Was the reported %R LCS within ±25%; was the reported			X
Representativeness - Not applicable QAO for this method			X
Completeness - Not applicable QAO for this method			X
Comparability: Not applicable QAO for this method			X
Modeling to Confirm or Derive Radionuclide Distributions - WCPIP 4.3.5			
Was modeling used for radiological characterization?		X	
Precision - Not applicable QAO for this method			X
Accuracy - Do the modeling results compare to sample results within a factor of two?			X
Representativeness - Was the composition and burnup information for a minimum of 50% of the radioactive materials identified in the AK record involved in the generation of the waste included in the modeling?			X
Completeness - Not applicable QAO for this method			X
Comparability - Not applicable QAO for this method			X

Surface Dose Rate - WCPIP Section 4.3.7			
Were surface dose rates used for radiological characterization?	X		
Precision - Was the reported RPD equal to or less than 40%?	X		
Accuracy - manufacturer typically specifies a flat energy response of 10 to 20% across the applicable energy range. Was the repeatability of the measurement within about 10% at the higher gamma dose rate?	X		
Representativeness - Was the measurement applied to the entire container?	X		
Completeness - Were 100% of the measurements, needed to determine surface dose rate, performed and usable?	X		
Comparability - Not applicable QAO for this method			X
Gravimetric or Dimensional Measurements - WCPIP Section 4.3.8			
Was Gravimetric or Dimensional measurement used?		X	
Precision - Was the measurement equipment maintained according to manufacturer's recommendation?			X
Accuracy - Was the balance readout within 2% of the check weight? Was the length measurement within 0.1 of an inch as verified by a second operator?			X
Representativeness - Not applicable QAO for this method			X
Completeness - Was every quantity of fuel test specimen loaded into the container measured?			X
Comparability - Not applicable QAO for this method			X
Gravimetric and Dimensional Method - WCPIP Section 4.3.8			
Was Gravimetric and Dimensional method used?		X	
Precision - Not applicable QAO for this method			X
Accuracy - fuel test specimen design and irradiated information is used for individual fuel test specimen pins in combination of the length and gravimetric measurement. Were scaling factors developed from isotope depletion code?			X
Representativeness - Is the design information representative for each specific fuel test specimen quantity loaded into the container?			X
Completeness - Was every quantity of fuel test specimen loaded into the container measured?			X
Comparability - Not applicable QAO for this method			X

Attachment 3 - Sum of Fractions Evaluation

Drum Identification Number	F_s value
ORRH00685	9.99E-05
ORRH00686	9.76E-05
ORRH00690	6.19E-05
ORRH00696	1.71E-04
ORRH00701	3.73E-04
ORRH00707	3.22E-04

$$fs = \frac{A_{Cs}}{288} + \frac{A_{Eu}}{3.52} + \frac{A_{Co}}{4.26}$$

Where fs is the sum fractions, A_{Cs} is the Cs-137 activity in the drum, A_{Eu} is the Eu-154 activity, and A_{Co} is the Co-60 activity.

If $fs < 1$ then the drum is shippable. If $fs > 1$ then the drum needs further evaluation to determine if it is shippable.

Attachment 1 - Summary of Characterization by Container Number

CRR Number: CRR-ORNL-OR-REDC-RH-HET-0031
Waste Stream: OR-REDC-RH-HET
Summary Category Group (SCG): S5000
Waste Matrix Code (WMC): S5400
Waste Characterization Site: RH_ORNL

Radiological Characterization Method:
(e.g. AK, DTC, DA, NDA, D&G)
Acceptable Knowledge Qualification: Confirmatory testing
(e.g. Peer Review, Corroborating data, Confirmatory testing)

			TRU Alpha Activity Concentration (TAAC)		Volume Acitivity (Ci/L)			RH Waste Determination: Surface Dose (SD) Rate Measurements	
Container ID Number	Radiological BDR Number	NDE BDR Number	TAAC (nCi/g)	TAAC (≥ 100 nCi/g)	Value	1 s Unc.	Evaluation(≤ 23 Ci/L)	SD Rate (rem / hr)	SD rate >200 mrem/hr and ≤ 1000 rem/hr
ORRH00708	ORRHDTC15003	ORNLRHVE15001	1.64E+03	TRU	1.37E-02	7.27E-03	Pass	3.12E-01	Remote-Handled
ORRH00709	ORRHDTC15004	ORNLRHVE15002	2.55E+03	TRU	2.03E-02	1.07E-02	Pass	2.88E-01	Remote-Handled
Comments									

Irene Joo 05/14/2015
SPM Print/Sign Name and Date

Attachment 2 - Remote-Handled Characterization Reconciliation Report Data Quality Objectives

CRR Number: CRR-ORNL-OR-REDC-RH-HET-0031
Waste Stream: OR-REDC-RH-HET
Site: RH_ORNL

Data Quality Objectives (DQOs)	Yes	No	NA	Characterization Method & Sources (e.g. List BDRs, reports, AK documents)
Defense Waste, High Level, and Spent Nuclear Fuel Determination - WCPIP Section 2.1.1				
Was the waste generated by, or comingled with, atomic energy defense activities? Is the waste verified not to be high-level waste, or spent nuclear fuel?	X			CCP-AK-ORNL-500, Rev. 4, Sections 4.4 and 4.5 and Source documents I022, I023, I044, M023, P161, P258, P281, P569, U038, U039, U647, DR009
TRU Waste Determination - WCPIP Section 2.1.2.1				
Does the waste contain more than 100 nCi of TRU isotopes per gram of waste?	X			ORRHDTC15003, ORRHDTC15004 Waste Container Dose-to-Curie conversion record sheets
RH Waste Determination - WCPIP Section 2.1.2.2				
Is the Surface dose rate equal to or greater than 200 mrem/hr and less than 1000 rem/hr	X			Radiological survey reports provided by ORNL
Activity Determination - WCPIP Section 2.1.2.3				
Is the volume activity of the container less than 23 Ci/L per canister? (SPM evaluation is on container basis)	X			ORRHDTC15003, ORRHDTC15004 Waste Container Dose-to-Curie conversion record sheets
Liquids - WCPIP Section 2.1.3.1				
Is the amount of liquids in the container less than one percent by volume?	X			ORNLRHVE15001, ORNLRHVE15002 Waste Container VE data sheets
Physical Form - WCPIP Section 2.1.3.2				
Does the physical form of the waste accurately delineate the waste stream?	X			ORNLRHVE15001, ORNLRHVE15002 Waste Container VE data sheets

Quality Assurance Objectives (QAOs)	Yes	No	NA
Acceptable Knowledge (AK) - WCPIP Section 4.1			
Precision - Not applicable QAO for this method			X

Accuracy - AK accuracy assesses the percentage of waste containers that require reassignment to a new Summary Category Group or new waste stream based on the reevaluation of AK or on obtaining testing, sampling and/or analysis data. Is the percentage of waste containers that confirm the physical and radiological properties greater than or equal to 90%?	X		
Representativeness - Does the process of obtaining, evaluating, and documenting the AK information ensure it was performed in accordance with the minimum standards established in AK procedure CCP-TP-005?	X		
Completeness - Does the AK record contain 100% of the information required for each container in the waste stream? (Usability of the AK information will be assessed for completeness during audits)	X		
Comparability -Was the AK compiled in compliance with AK procedure(s) and associated training requirements?	X		

Physical Characterization Methods

Quality Assurance Objectives (QAOs)	Yes	No	NA
Visual Examination (VE) - WCPIP Section 4.2.1			
Was VE used in the physical characterization?	X		
Precision - Were discrepancies, if any, regarding important waste characteristics (i.e. physical form of the waste and absence of prohibited liquids) within a single container reconciled between two operators?	X		
Accuracy - Have VE operators passed a comprehensive examination with a score of 80% and demonstrated satisfactory performance in the presence of the VE expert during initial qualification and requalification?	X		
Representativeness - Are the waste contents placed in the waste containers described on the data sheet?	X		
Completeness - Has the relevant waste information must be collected and documented?	X		
Comparability - Was the VE information compiled in compliance with VE procedure(s) and associated training requirements?	X		
Real-Time Radiography (RTR) - WCPIP Section 4.2.2			

Was RTR used in the physical characterization?		X	
Precision -Were discrepancies, if any, regarding important waste characteristics (i.e. physical form of the waste and absence of prohibited liquids) within a single container reconciled between two operators (during independent observations and replicate scans)?			X
Accuracy - Was a target used to tune the image for maximum sharpness and were operators required to identify prohibited liquid in a training container during qualification and requalification?			X
Representativeness - Were all the relevant waste contents in each container described?			X
Completeness - Was relevant waste information assembled to show			X
Comparability - Was the RTR information compiled in compliance wi			X
Dose-to-Curie (DTC) - WCPIP Section 4.3.2			
Was DTC used for radiological characterization?	X		
Precision - Not applicable QAO for this method			X
Accuracy - Were standardized and benchmarked radiation transport computer codes used?	X		
Representativeness - Was an appropriate model of the actual physical drum dose rate configuration used and documented by an independent review of the DTC correlation?	X		
Completeness - Were calculations used that span the full range of important parameter values (such as density) which are expected to be encountered with the actual RH TRU containers?	X		
Comparability - Not applicable QAO for this method			X
Dose Rate Measurement associated with DTC - WCPIP Section 4.3.2			
Precision - Was the reported relative percent difference (RPD) less than or equal to 40%?	X		
Accuracy - Has a calibration for the dose-rate instrument used been established, maintained, and documented within the recommendations of the manufacturer?	X		
Representativeness - Not applicable QAO for this method			X
Completeness - Not applicable QAO for this method			X
Comparability - Not applicable QAO for this method			X
Nondestructive Assay (NDA) - WCPIP Section 4.3.3			
Was NDA used for radiological characterization?		X	
Precision - Does the reported %RSD comply with CCP-TP-506, Table 4.2?			X

Accuracy - Is the reported %R less than or equal to ± 30% on non-interfering matrix?			X
Representativeness - Has each waste container been assayed?			X
Completeness - Is 100% of the NDA data valid and usable?			X
Comparability - Was the NDA process implemented in accordance to NDA standards and was associated training requirements met?			X
Sampling - WCPIP Section 4.3.4.1			
Was sampling used for radiological characterization?		X	
Precision - Not applicable QAO for this method			X
Accuracy - Was an appropriate sample design developed and approved by CBFO for collecting an adequate number of samples such that the one-sigma uncertainty in the mean value of the sample-generated scaling factor is within a factor of two?			X
Representativeness - Was representativeness described in the associated sampling plan?			X
Completeness - Was the QAO for a minimum set of radionuclides sp			X
Comparability - Not applicable QAO for this method			X
Sample Collection - WCPIP Section 4.3.4.2			
Accuracy - Was sampling equipment verified as clean by the use of standard radiological control survey methods?			X
Radiochemistry Analysis - WCPIP 4.3.4.3			
Precision - Was the RPD less than or equal to 40% or laboratory acceptable precision criteria?			X
Accuracy - Was the reported %R LCS within ±25%; was the reported			X
Representativeness - Not applicable QAO for this method			X
Completeness - Not applicable QAO for this method			X
Comparability: Not applicable QAO for this method			X
Modeling to Confirm or Derive Radionuclide Distributions - WCPIP 4.3.5			
Was modeling used for radiological characterization?		X	
Precision - Not applicable QAO for this method			X
Accuracy - Do the modeling results compare to sample results within a factor of two?			X
Representativeness - Was the composition and burnup information for a minimum of 50% of the radioactive materials identified in the AK record involved in the generation of the waste included in the modeling?			X
Completeness - Not applicable QAO for this method			X
Comparability - Not applicable QAO for this method			X

Surface Dose Rate - WCPIP Section 4.3.7			
Were surface dose rates used for radiological characterization?	X		
Precision - Was the reported RPD equal to or less than 40%?	X		
Accuracy - manufacturer typically specifies a flat energy response of 10 to 20% across the applicable energy range. Was the repeatability of the measurement within about 10% at the higher gamma dose rate?	X		
Representativeness - Was the measurement applied to the entire container?	X		
Completeness - Were 100% of the measurements, needed to determine surface dose rate, performed and usable?	X		
Comparability - Not applicable QAO for this method			X
Gravimetric or Dimensional Measurements - WCPIP Section 4.3.8			
Was Gravimetric or Dimensional measurement used?		X	
Precision - Was the measurement equipment maintained according to manufacturer's recommendation?			X
Accuracy - Was the balance readout within 2% of the check weight? Was the length measurement within 0.1 of an inch as verified by a second operator?			X
Representativeness - Not applicable QAO for this method			X
Completeness - Was every quantity of fuel test specimen loaded into the container measured?			X
Comparability - Not applicable QAO for this method			X
Gravimetric and Dimensional Method - WCPIP Section 4.3.8			
Was Gravimetric and Dimensional method used?		X	
Precision - Not applicable QAO for this method			X
Accuracy - fuel test specimen design and irradiated information is used for individual fuel test specimen pins in combination of the length and gravimetric measurement. Were scaling factors developed from isotope depletion code?			X
Representativeness - Is the design information representative for each specific fuel test specimen quantity loaded into the container?			X
Completeness - Was every quantity of fuel test specimen loaded into the container measured?			X
Comparability - Not applicable QAO for this method			X

Attachment 3 - Sum of Fractions Evaluation

Drum Identification Number	F_s value
ORRH00708	1.38E-04
ORRH00709	2.04E-04

$$fs = \frac{A_{Cs}}{288} + \frac{A_{Eu}}{3.52} + \frac{A_{Co}}{4.26}$$

Where fs is the sum fractions, A_{Cs} is the Cs-137 activity in the drum, A_{Eu} is the Eu-154 activity, and A_{Co} is the Co-60 activity.

If $fs < 1$ then the drum is shippable. If $fs > 1$ then the drum needs further evaluation to determine if it is shippable.

Attachment 1 - Summary of Characterization by Container Number

CRR Number: CRR-ORNL-OR-REDC-RH-HET-0032
Waste Stream: OR-REDC-RH-HET
Summary Category Group (SCG): S5000
Waste Matrix Code (WMC): S5400
Waste Characterization Site: RH_ORNL

Radiological Characterization Method: (e.g. AK, DTC, DA, NDA, D&G)
Acceptable Knowledge Qualification: Confirmatory testing (e.g. Peer Review, Corroborating data, Confirmatory testing)

			TRU Alpha Activity Concentration (TAAC)		Volume Acitivity (Ci/L)			RH Waste Determination: Surface Dose (SD) Rate Measurements	
Container ID Number	Radiological BDR Number	NDE BDR Number	TAAC (nCi/g)	TAAC (≥ 100 nCi/g)	Value	1 s Unc.	Evaluation(≤ 23 Ci/L)	SD Rate (rem / hr)	SD rate >200 mrem/hr and ≤ 1000 rem/hr
ORRH00710	ORRHDTC15005	ORNLRHVE15003	5.24E+03	TRU	2.75E-02	1.54E-02	Pass	4.83E-01	Remote-Handled
ORRH00711	ORRHDTC15005	ORNLRHVE15003	3.39E+03	TRU	1.95E-02	1.09E-02	Pass	3.27E-01	Remote-Handled
ORRH00712	ORRHDTC15005	ORNLRHVE15005	4.53E+03	TRU	4.89E-02	2.78E-02	Pass	8.13E-01	Remote-Handled
ORRH00713	ORRHDTC15005	ORNLRHVE15004	4.67E+03	TRU	2.38E-02	1.33E-02	Pass	4.18E-01	Remote-Handled
ORRH00714	ORRHDTC15005	ORNLRHVE15005	4.85E+03	TRU	5.37E-02	3.06E-02	Pass	9.30E-01	Remote-Handled
ORRH00715	ORRHDTC15005	ORNLRHVE15005	3.23E+03	TRU	2.89E-02	1.63E-02	Pass	4.90E-01	Remote-Handled
ORRH00716	ORRHDTC15005	ORNLRHVE15006	1.41E+03	TRU	1.09E-02	6.16E-03	Pass	2.24E-01	Remote-Handled
ORRH00717	ORRHDTC15005	ORNLRHVE15006	3.58E+03	TRU	4.63E-02	2.66E-02	Pass	7.05E-01	Remote-Handled
ORRH00718	ORRHDTC15005	ORNLRHVE15007	5.17E+03	TRU	5.62E-02	3.20E-02	Pass	9.37E-01	Remote-Handled
ORRH00719	ORRHDTC15005	ORNLRHVE15007	7.56E+03	TRU	1.08E-01	6.20E-02	Pass	1.70E+00	Remote-Handled
ORRH00720	ORRHDTC15005	ORNLRHVE15008	1.69E+03	TRU	2.41E-02	1.39E-02	Pass	3.92E-01	Remote-Handled
ORRH00721	ORRHDTC15005	ORNLRHVE15009	7.10E+02	TRU	9.40E-03	5.40E-03	Pass	2.82E-01	Remote-Handled
Comments									

Irene Joo 11/02/2016
SPM Print/Sign Name and Date

Attachment 2 - Remote-Handled Characterization Reconciliation Report Data Quality Objectives

CRR Number: CRR-ORNL-OR-REDC-RH-HET-0032
Waste Stream: OR-REDC-RH-HET
Site: RH_ORNL

Data Quality Objectives (DQOs)	Yes	No	NA	Characterization Method & Sources (e.g. List BDRs, reports, AK documents)
Defense Waste, High Level, and Spent Nuclear Fuel Determination - WCPIP Section 2.1.1				
Was the waste generated by, or comingled with, atomic energy defense activities? Is the waste verified not to be high-level waste, or spent nuclear fuel?	X			CCP-AK-ORNL-500, Rev. 4, Sections 4.4 and 4.5 and Source documents I022, I023, I044, M023, P161, P258, P281, P569, U038, U039, U647, DR009
TRU Waste Determination - WCPIP Section 2.1.2.1				
Does the waste contain more than 100 nCi of TRU isotopes per gram of waste?	X			ORRHDTC15005 Waste Container Dose-to Curie conversion record sheets
RH Waste Determination - WCPIP Section 2.1.2.2				
Is the Surface dose rate equal to or greater than 200 mrem/hr and less than 1000 rem/hr	X			Radiological survey reports provided by ORNL
Activity Determination - WCPIP Section 2.1.2.3				
Is the volume activity of the container less than 23 Ci/L per canister? (SPM evaluation is on container basis)	X			ORRHDTC15005 Waste Container Dose-to Curie conversion record sheets
Liquids - WCPIP Section 2.1.3.1				
Is the amount of liquids in the container less than one percent by volume?	X			ORNLRHVE15003, ORNLRHVE15004, ORNLRHVE15005, ORNLRHVE15006, ORNLRHVE15007, ORNLRHVE15008, ORNLRHVE15009 Waste Container VE data sheets
Physical Form - WCPIP Section 2.1.3.2				
Does the physical form of the waste accurately delineate the waste stream?	X			ORNLRHVE15003, ORNLRHVE15004, ORNLRHVE15005, ORNLRHVE15006, ORNLRHVE15007, ORNLRHVE15008, ORNLRHVE15009 Waste Container VE data sheets

Quality Assurance Objectives (QAOs)	Yes	No	NA
Acceptable Knowledge (AK) - WCPIP Section 4.1			
Precision - Not applicable QAO for this method			X

Accuracy - AK accuracy assesses the percentage of waste containers that require reassignment to a new Summary Category Group or new waste stream based on the reevaluation of AK or on obtaining testing, sampling and/or analysis data. Is the percentage of waste containers that confirm the physical and radiological properties greater than or equal to 90%?	X		
Representativeness - Does the process of obtaining, evaluating, and documenting the AK information ensure it was performed in accordance with the minimum standards established in AK procedure CCP-TP-005?	X		
Completeness - Does the AK record contain 100% of the information required for each container in the waste stream? (Usability of the AK information will be assessed for completeness during audits)	X		
Comparability -Was the AK compiled in compliance with AK procedure(s) and associated training requirements?	X		

Physical Characterization Methods

Quality Assurance Objectives (QAOs)	**Yes**	**No**	**NA**
Visual Examination (VE) - WCPIP Section 4.2.1			
Was VE used in the physical characterization?	X		
Precision - Were discrepancies, if any, regarding important waste characteristics (i.e. physical form of the waste and absence of prohibited liquids) within a single container reconciled between two operators?	X		
Accuracy - Have VE operators passed a comprehensive examination with a score of 80% and demonstrated satisfactory performance in the presence of the VE expert during initial qualification and requalification?	X		
Representativeness - Are the waste contents placed in the waste containers described on the data sheet?	X		
Completeness - Has the relevant waste information must be collected and documented?	X		
Comparability - Was the VE information compiled in compliance with VE procedure(s) and associated training requirements?	X		
Real-Time Radiography (RTR) - WCPIP Section 4.2.2			

Was RTR used in the physical characterization?		X	
Precision -Were discrepancies, if any, regarding important waste characteristics (i.e. physical form of the waste and absence of prohibited liquids) within a single container reconciled between two operators (during independent observations and replicate scans)?			X
Accuracy - Was a target used to tune the image for maximum sharpness and were operators required to identify prohibited liquid in a training container during qualification and requalification?			X
Representativeness - Were all the relevant waste contents in each container described?			X
Completeness - Was relevant waste information assembled to show			X
Comparability - Was the RTR information compiled in compliance wi			X
Dose-to-Curie (DTC) - WCPIP Section 4.3.2			
Was DTC used for radiological characterization?	X		
Precision - Not applicable QAO for this method			X
Accuracy - Were standardized and benchmarked radiation transport computer codes used?	X		
Representativeness - Was an appropriate model of the actual physical drum dose rate configuration used and documented by an independent review of the DTC correlation?	X		
Completeness - Were calculations used that span the full range of important parameter values (such as density) which are expected to be encountered with the actual RH TRU containers?	X		
Comparability - Not applicable QAO for this method			X
Dose Rate Measurement associated with DTC - WCPIP Section 4.3.2			
Precision - Was the reported relative percent difference (RPD) less than or equal to 40%?	X		
Accuracy - Has a calibration for the dose-rate instrument used been established, maintained, and documented within the recommendations of the manufacturer?	X		
Representativeness - Not applicable QAO for this method			X
Completeness - Not applicable QAO for this method			X
Comparability - Not applicable QAO for this method			X
Nondestructive Assay (NDA) - WCPIP Section 4.3.3			
Was NDA used for radiological characterization?		X	
Precision - Does the reported %RSD comply with CCP-TP-506, Table 4.2?			X

Accuracy - Is the reported %R less than or equal to ± 30% on non-interfering matrix?			X
Representativeness - Has each waste container been assayed?			X
Completeness - Is 100% of the NDA data valid and usable?			X
Comparability - Was the NDA process implemented in accordance to NDA standards and was associated training requirements met?			X
Sampling - WCPIP Section 4.3.4.1			
Was sampling used for radiological characterization?		X	
Precision - Not applicable QAO for this method			X
Accuracy - Was an appropriate sample design developed and approved by CBFO for collecting an adequate number of samples such that the one-sigma uncertainty in the mean value of the sample-generated scaling factor is within a factor of two?			X
Representativeness - Was representativeness described in the associated sampling plan?			X
Completeness - Was the QAO for a minimum set of radionuclides sp			X
Comparability - Not applicable QAO for this method			X
Sample Collection - WCPIP Section 4.3.4.2			
Accuracy - Was sampling equipment verified as clean by the use of standard radiological control survey methods?			X
Radiochemistry Analysis - WCPIP 4.3.4.3			
Precision - Was the RPD less than or equal to 40% or laboratory acceptable precision criteria?			X
Accuracy - Was the reported %R LCS within ±25%; was the reported			X
Representativeness - Not applicable QAO for this method			X
Completeness - Not applicable QAO for this method			X
Comparability: Not applicable QAO for this method			X
Modeling to Confirm or Derive Radionuclide Distributions - WCPIP 4.3.5			
Was modeling used for radiological characterization?		X	
Precision - Not applicable QAO for this method			X
Accuracy - Do the modeling results compare to sample results within a factor of two?			X
Representativeness - Was the composition and burnup information for a minimum of 50% of the radioactive materials identified in the AK record involved in the generation of the waste included in the modeling?			X
Completeness - Not applicable QAO for this method			X

Comparability - Not applicable QAO for this method			X
Surface Dose Rate - WCPIP Section 4.3.7			
Were surface dose rates used for radiological characterization?	X		
Precision - Was the reported RPD equal to or less than 40%?	X		
Accuracy - manufacturer typically specifies a flat energy response of 10 to 20% across the applicable energy range. Was the repeatability of the measurement within about 10% at the higher gamma dose rate?	X		
Representativeness - Was the measurement applied to the entire container?	X		
Completeness - Were 100% of the measurements, needed to determine surface dose rate, performed and usable?	X		
Comparability - Not applicable QAO for this method			X
Gravimetric or Dimensional Measurements - WCPIP Section 4.3.8			
Was Gravimetric or Dimensional measurement used?		X	
Precision - Was the measurement equipment maintained according to manufacturer's recommendation?			X
Accuracy - Was the balance readout within 2% of the check weight? Was the length measurement within 0.1 of an inch as verified by a second operator?			X
Representativeness - Not applicable QAO for this method			X
Completeness - Was every quantity of fuel test specimen loaded into the container measured?			X
Comparability - Not applicable QAO for this method			X
Gravimetric and Dimensional Method - WCPIP Section 4.3.8			
Was Gravimetric and Dimensional method used?		X	
Precision - Not applicable QAO for this method			X
Accuracy - fuel test specimen design and irradiated information is used for individual fuel test specimen pins in combination of the length and gravimetric measurement. Were scaling factors developed from isotope depletion code?			X
Representativeness - Is the design information representative for each specific fuel test specimen quantity loaded into the container?			X
Completeness - Was every quantity of fuel test specimen loaded into the container measured?			X
Comparability - Not applicable QAO for this method			X

Attachment 3 - Sum of Fractions Evaluation

Drum Identification Number	F_s value
ORRH00710	2.92E-04
ORRH00711	2.07E-04
ORRH00712	5.19E-04
ORRH00713	2.53E-04
ORRH00714	5.70E-04
ORRH00715	3.06E-04
ORRH00716	1.16E-04
ORRH00717	4.91E-04
ORRH00718	5.96E-04
ORRH00719	1.14E-03
ORRH00720	2.55E-04
ORRH00721	9.98E-05

$$fs = \frac{A_{Cs}}{288} + \frac{A_{Eu}}{3.52} + \frac{A_{Co}}{4.26}$$

Where fs is the sum fractions, A_{Cs} is the Cs-137 activity in the drum, A_{Eu} is the Eu-154 activity, and A_{Co} is the Co-60 activity.

If $fs < 1$ then the drum is shippable. If $fs > 1$ then the drum needs further evaluation to determine if it is shippable.

Attachment 1 - Summary of Characterization by Container Number

CRR Number: CRR-ORNL-OR-REDC-RH-HET-0033
Waste Stream: OR-REDC-RH-HET
Summary Category Group (SCG): S5000
Waste Matrix Code (WMC): S5400
Waste Characterization Site: RH_ORNL

Radiological Characterization Method:
(e.g. AK, DTC, DA, NDA, D&G)
Acceptable Knowledge Qualification: Confirmatory testing
(e.g. Peer Review, Corroborating data, Confirmatory testing)

			TRU Alpha Activity Concentration (TAAC)		Volume Acitivity (Ci/L)			RH Waste Determination: Surface Dose (SD) Rate Measurements	
Container ID Number	Radiological BDR Number	NDE BDR Number	TAAC (nCi/g)	TAAC (≥ 100 nCi/g)	Value	1 s Unc.	Evaluation(≤ 23 Ci/L)	SD Rate (rem / hr)	SD rate >200 mrem/hr and ≤ 1000 rem/hr
ORRH00722	ORRHDTC15006	ORNLRHVE15010	1.05E+04	TRU	1.29E-01	7.39E-02	Pass	1.72E+00	Remote-Handled
ORRH00723	ORRHDTC15006	ORNLRHVE15011	1.84E+03	TRU	1.15E-02	6.47E-03	Pass	3.40E-01	Remote-Handled
ORRH00725	ORRHDTC15007	ORNLRHVE15012	7.66E+03	TRU	7.26E-02	4.12E-02	Pass	1.38E+00	Remote-Handled
Comments									

Irene Joo 01/12/2016
SPM Print/Sign Name and Date

Attachment 2 - Remote-Handled Characterization Reconciliation Report Data Quality Objectives

CRR Number: CRR-ORNL-OR-REDC-RH-HET-0033
Waste Stream: OR-REDC-RH-HET
Site: RH_ORNL

Data Quality Objectives (DQOs)	Yes	No	NA	Characterization Method & Sources (e.g. List BDRs, reports, AK documents)
Defense Waste, High Level, and Spent Nuclear Fuel Determination - WCPIP Section 2.1.1				
Was the waste generated by, or comingled with, atomic energy defense activities? Is the waste verified not to be high-level waste, or spent nuclear fuel?	X			CCP-AK-ORNL-500, Rev. 4, Sections 4.4 and 4.5 and Source documents I022, I023, I044, M023, P161, P258, P281, P569, U038, U039, U647, DR009
TRU Waste Determination - WCPIP Section 2.1.2.1				
Does the waste contain more than 100 nCi of TRU isotopes per gram of waste?	X			ORRHDTC15006, ORRHDTC15007 Waste Container Dose-to-Curie conversion record sheets
RH Waste Determination - WCPIP Section 2.1.2.2				
Is the Surface dose rate equal to or greater than 200 mrem/hr and less than 1000 rem/hr	X			Radiological survey reports provided by ORNL
Activity Determination - WCPIP Section 2.1.2.3				
Is the volume activity of the container less than 23 Ci/L per canister? (SPM evaluation is on container basis)	X			ORRHDTC15006, ORRHDTC15007 Waste Container Dose-to-Curie conversion record sheets
Liquids - WCPIP Section 2.1.3.1				
Is the amount of liquids in the container less than one percent by volume?	X			ORNLRHVE15010, ORNLRHVE15011, ORNLRHVE15012 Waste Container VE data sheets
Physical Form - WCPIP Section 2.1.3.2				
Does the physical form of the waste accurately delineate the waste stream?	X			ORNLRHVE15010, ORNLRHVE15011, ORNLRHVE15012 Waste Container VE data sheets

Quality Assurance Objectives (QAOs)	Yes	No	NA
Acceptable Knowledge (AK) - WCPIP Section 4.1			
Precision - Not applicable QAO for this method			X

Accuracy - AK accuracy assesses the percentage of waste containers that require reassignment to a new Summary Category Group or new waste stream based on the reevaluation of AK or on obtaining testing, sampling and/or analysis data. Is the percentage of waste containers that confirm the physical and radiological properties greater than or equal to 90%?	X		
Representativeness - Does the process of obtaining, evaluating, and documenting the AK information ensure it was performed in accordance with the minimum standards established in AK procedure CCP-TP-005?	X		
Completeness - Does the AK record contain 100% of the information required for each container in the waste stream? (Usability of the AK information will be assessed for completeness during audits)	X		
Comparability -Was the AK compiled in compliance with AK procedure(s) and associated training requirements?	X		

Physical Characterization Methods

Quality Assurance Objectives (QAOs)	**Yes**	**No**	**NA**
Visual Examination (VE) - WCPIP Section 4.2.1			
Was VE used in the physical characterization?	X		
Precision - Were discrepancies, if any, regarding important waste characteristics (i.e. physical form of the waste and absence of prohibited liquids) within a single container reconciled between two operators?	X		
Accuracy - Have VE operators passed a comprehensive examination with a score of 80% and demonstrated satisfactory performance in the presence of the VE expert during initial qualification and requalification?	X		
Representativeness - Are the waste contents placed in the waste containers described on the data sheet?	X		
Completeness - Has the relevant waste information must be collected and documented?	X		
Comparability - Was the VE information compiled in compliance with VE procedure(s) and associated training requirements?	X		
Real-Time Radiography (RTR) - WCPIP Section 4.2.2			

Was RTR used in the physical characterization?		X	
Precision -Were discrepancies, if any, regarding important waste characteristics (i.e. physical form of the waste and absence of prohibited liquids) within a single container reconciled between two operators (during independent observations and replicate scans)?			X
Accuracy - Was a target used to tune the image for maximum sharpness and were operators required to identify prohibited liquid in a training container during qualification and requalification?			X
Representativeness - Were all the relevant waste contents in each container described?			X
Completeness - Was relevant waste information assembled to show			X
Comparability - Was the RTR information compiled in compliance wi			X
Dose-to-Curie (DTC) - WCPIP Section 4.3.2			
Was DTC used for radiological characterization?	X		
Precision - Not applicable QAO for this method			X
Accuracy - Were standardized and benchmarked radiation transport computer codes used?	X		
Representativeness - Was an appropriate model of the actual physical drum dose rate configuration used and documented by an independent review of the DTC correlation?	X		
Completeness - Were calculations used that span the full range of important parameter values (such as density) which are expected to be encountered with the actual RH TRU containers?	X		
Comparability - Not applicable QAO for this method			X
Dose Rate Measurement associated with DTC - WCPIP Section 4.3.2			
Precision - Was the reported relative percent difference (RPD) less than or equal to 40%?	X		
Accuracy - Has a calibration for the dose-rate instrument used been established, maintained, and documented within the recommendations of the manufacturer?	X		
Representativeness - Not applicable QAO for this method			X
Completeness - Not applicable QAO for this method			X
Comparability - Not applicable QAO for this method			X
Nondestructive Assay (NDA) - WCPIP Section 4.3.3			
Was NDA used for radiological characterization?		X	
Precision - Does the reported %RSD comply with CCP-TP-506, Table 4.2?			X

Accuracy - Is the reported %R less than or equal to ± 30% on non-interfering matrix?			X
Representativeness - Has each waste container been assayed?			X
Completeness - Is 100% of the NDA data valid and usable?			X
Comparability - Was the NDA process implemented in accordance to NDA standards and was associated training requirements met?			X
Sampling - WCPIP Section 4.3.4.1			
Was sampling used for radiological characterization?		X	
Precision - Not applicable QAO for this method			X
Accuracy - Was an appropriate sample design developed and approved by CBFO for collecting an adequate number of samples such that the one-sigma uncertainty in the mean value of the sample-generated scaling factor is within a factor of two?			X
Representativeness - Was representativeness described in the associated sampling plan?			X
Completeness - Was the QAO for a minimum set of radionuclides sp			X
Comparability - Not applicable QAO for this method			X
Sample Collection - WCPIP Section 4.3.4.2			
Accuracy - Was sampling equipment verified as clean by the use of standard radiological control survey methods?			X
Radiochemistry Analysis - WCPIP 4.3.4.3			
Precision - Was the RPD less than or equal to 40% or laboratory acceptable precision criteria?			X
Accuracy - Was the reported %R LCS within ±25%; was the reported			X
Representativeness - Not applicable QAO for this method			X
Completeness - Not applicable QAO for this method			X
Comparability: Not applicable QAO for this method			X
Modeling to Confirm or Derive Radionuclide Distributions - WCPIP 4.3.5			
Was modeling used for radiological characterization?		X	
Precision - Not applicable QAO for this method			X
Accuracy - Do the modeling results compare to sample results within a factor of two?			X
Representativeness - Was the composition and burnup information for a minimum of 50% of the radioactive materials identified in the AK record involved in the generation of the waste included in the modeling?			X
Completeness - Not applicable QAO for this method			X
Comparability - Not applicable QAO for this method			X

Surface Dose Rate - WCPIP Section 4.3.7			
Were surface dose rates used for radiological characterization?	X		
Precision - Was the reported RPD equal to or less than 40%?	X		
Accuracy - manufacturer typically specifies a flat energy response of 10 to 20% across the applicable energy range. Was the repeatability of the measurement within about 10% at the higher gamma dose rate?	X		
Representativeness - Was the measurement applied to the entire container?	X		
Completeness - Were 100% of the measurements, needed to determine surface dose rate, performed and usable?	X		
Comparability - Not applicable QAO for this method			X
Gravimetric or Dimensional Measurements - WCPIP Section 4.3.8			
Was Gravimetric or Dimensional measurement used?		X	
Precision - Was the measurement equipment maintained according to manufacturer's recommendation?			X
Accuracy - Was the balance readout within 2% of the check weight? Was the length measurement within 0.1 of an inch as verified by a second operator?			X
Representativeness - Not applicable QAO for this method			X
Completeness - Was every quantity of fuel test specimen loaded into the container measured?			X
Comparability - Not applicable QAO for this method			X
Gravimetric and Dimensional Method - WCPIP Section 4.3.8			
Was Gravimetric and Dimensional method used?		X	
Precision - Not applicable QAO for this method			X
Accuracy - fuel test specimen design and irradiated information is used for individual fuel test specimen pins in combination of the length and gravimetric measurement. Were scaling factors developed from isotope depletion code?			X
Representativeness - Is the design information representative for each specific fuel test specimen quantity loaded into the container?			X
Completeness - Was every quantity of fuel test specimen loaded into the container measured?			X
Comparability - Not applicable QAO for this method			X

Attachment 3 - Sum of Fractions Evaluation

Drum Identification Number	F_s value
ORRH00722	1.37E-03
ORRH00723	1.23E-04
ORRH00725	7.71E-04

$$fs = \frac{A_{Cs}}{288} + \frac{A_{Eu}}{3.52} + \frac{A_{Co}}{4.26}$$

Where fs is the sum fractions, A_{Cs} is the Cs-137 activity in the drum, A_{Eu} is the Eu-154 activity, and A_{Co} is the Co-60 activity.

If $fs < 1$ then the drum is shippable. If $fs > 1$ then the drum needs further evaluation to determine if it is shippable.

Attachment 3 – Visual Examination Site Project Manager Checklist

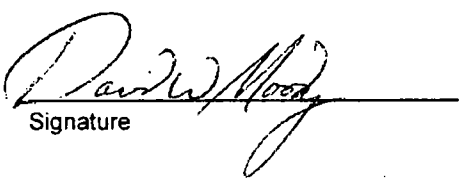
Batch Data Report No.: ORNLRHVE15007

1. Has all the data received an independent technical review as evidenced by a completed checklist (Attachment 2) and the appropriate ITR signature?		☐ NO	☒ YES
2. Are BDR contents complete and match the Visual Examination Batch Data Report Table of Contents?		☐ NO	☒ YES
3. Is the BDR complete (appropriately filled in forms for each container)?		☐ NO	☒ YES
4. Have the RH Quality Assurance Objectives (QAOs) for VE been met?			
Precision – reconciled discrepancies between operators		☐ NO	☒ YES
Accuracy – trained operators		☐ NO	☒ YES
Representativeness – description of container contents		☐ NO	☒ YES
Completeness – completed data form and/or recording		☐ NO	☒ YES
Comparability – proper training and adequate AK for unopened containers		☐ NO	☒ YES
5. Were NCRs generated included in the BDR?	☐ NO	☐ YES	☒ N/A

Comments: None

SPM:

David W. Moody
Printed Name


Signature

28 September 2015
Date

CCP RECORDS ORIGINAL
DATE REC'D 9/28/15

Attachment 4 – Visual Examination Batch Data Report Cover Sheet

Batch Data Report No.: ORNLRHVEI5007 Date: 9-23-15

	Waste Container ID Number:
1	ORRH00718
2	ORRH00719
3	
4	
5	
6	
7	
8	
9	
10	
11	
12	N/A A.H. 9-23-15
13	
14	
15	
16	
17	
18	
19	
20	

NTPC RECORDS ORIGINAL
DATE REC'D 9-24-2015

Attachment 5 – Visual Examination Batch Data Report Table of Contents

Batch Data Report No.: ORNL RHVE 15007 Date: 9-23-15

Item	Description	Page No.
1	Visual Examination Batch Data Report Cover Sheet (Attachment 4)	1
2	Visual Examination Batch Data Report Table of Contents (Attachment 5)	2
3	Visual Examination Data Forms (Attachment 1)	3
4	Visual Examination Independent Technical Reviewer Checklist (Attachment 2)	7
5	Copy of NCRs (N/A [if not applicable])	N/A

Attachment 1 – Visual Examination Data Form

Site ID: RHORNL			
Examination Date: 9-23-15	Batch Number: ORNL RHVE15007		
Procedure #: CCP-TP-500	Revision #: 15	Video #: N/A	
Recording Equipment Check: ☐SAT ☐UNSAT ☑N/A	Recording Start: N/A	Recording Stop: N/A	
Inspection of Container to be loaded during VE: ☑SAT ☐UNSAT			

Indirect load Container ☑N/A	Final Output Container ☐ N/A
Container ID Number:	Container ID Number: ORRH00718
Container Type:	Container Type: 55 gallon drum
Waste Matrix Code:	Waste Matrix Code: SS400
Waste Stream:	Waste Stream: OR-REDC-RH-HET
	Poly Rigid Liner: ☐Y ☑N Thickness: / Poly Rigid Liner Lid: ☐ Y ☑N
	Poly Rigid Liner Vented or Hole Size: N/A
Percent Fill: / Percent Organic Waste:	Percent Fill: 100 % / Percent Organic Waste: 20 %
Layers of Confinement: / Closure Method:	Layers of Confinement: 0 / Closure Method: N/A

Comments (e.g., filter information, NCRs):
Nucfil-019DS BK-28
cask # X10C9402631

Waste Description:
Super sack (P)
cardboard liner (C)
poly blocks (P)
aluminum capacitor (Am)
string (C)
metal cans (IM)
metal lids (IM)
electrical cords (R)(OM)
metal labware (IM)
glass vials (OIM)
cloth pieces (C)
floor sweepings (IM)(Am)(R)(OIM) (C)

Attachment 1 – Visual Examination Data Form (continued)

Container ID Number CRRH00718

Prohibited Item(s) Summary	YES	NO
Does the container have observable liquid equal to or greater than 1 percent by volume of the outermost container at the time of RTR or VE?	☐	☑
Does the container have observable liquid more than 60 milliliters or 3 percent by volume, whichever is greater in an internal container?	☐	☑
Does the container have observable liquid with an EPA hazardous waste number (HWN) U134 assigned?	☐	☑
Does the container have observable liquid containing PCBs?	☐	☑
Is there an indication of non-radionuclide pyrophoric materials, such as elemental potassium?	☐	☑
Is there an indication of hazardous wastes not occurring as co-contaminants with TRU mixed wastes (non-mixed hazardous wastes)?	☐	☑
Is there an indication of wastes incompatible with backfill, seal and panel closures materials, container and packaging materials, shipping container materials, or other wastes (i.e., waste does **NOT** match Table of Allowable Materials for RH-TRU Waste in the RH-TRAMPAC)?	☐	☑
Is there an indication of wastes containing explosives or compressed gases?	☐	☑
Is there an indication of polychlorinated biphenyls (PCBs) not authorized under an EPA PCB waste disposal authorization?	☐	☑
Is there an indication of the waste exhibiting the characteristic of ignitability, corrosivity, or reactivity (EPA Hazardous Waste Numbers of D001, D002, or D003)?	☐	☑
Is the physical form of the waste inconsistent with the Waste Stream Description or the Waste Matrix Code?	☐	☑
RH-72B Criteria		
Were there Non-approved Closure Methods used on liner bags or inner bags greater than 4 liters?	☐	☑
Are there sealed containers GREATER than 4 liters or heat sealed bags **NOT** defined in the applicable TRUCON Code?	☐	☑
Are there indications of inadequate protection (blocked or braced) for heavy and/or sharp objects?	☐	☑
Is the waste consistent with the TRUCON Code?	☑	☐

Comments: N/A

Visual Examination Operator 1:
Anthony Henry (Print Name) — Signature — 9-23-15 (Date)

Visual Examination Operator 2:
Jason Cofer (Print Name) — Signature — 9-23-15 (Date)

Attachment 1 – Visual Examination Data Form

Site ID: RHORNL			
Examination Date: 9-23-15		Batch Number: ORNLRHVE15007	
Procedure #: CCP-TP-500		Revision #: 15	Video #: N/A
Recording Equipment Check: ☐SAT ☐UNSAT ☑N/A		Recording Start: N/A	Recording Stop: N/A
Inspection of Container to be loaded during VE: ☑SAT ☐UNSAT			
Indirect load Container: ☑N/A		Final Output Container ☐ N/A	
Container ID Number:		Container ID Number: ORRH00719	
Container Type:		Container Type: 55 gallon drum	
Waste Matrix Code:		Waste Matrix Code: S5400	
Waste Stream:		Waste Stream: OR-REDC-RH-HET	
		Poly Rigid Liner: ☐Y ☑N Thickness:	Poly Rigid Liner Lid: ☐ Y ☑N
		Poly Rigid Liner Vented or Hole Size: N/A	
Percent Fill:	Percent Organic Waste:	Percent Fill: 100%	Percent Organic Waste: 20%
Layers of Confinement:	Closure Method:	Layers of Confinement: 0	Closure Method: N/A

Comments (e.g., filter information, NCRs):
Nucfil-019DS BK-45
cask # X10C940 2631

Waste Description:
Super sack (P)
cardboard liner (C)
metal cans (IM)
metal lids (IM)
cloth bags (C)
paper (C)
glass vials (OIM)
floor sweepings (IM) (AM)(R) (OIM)
electrical cords (R) (OM)
metal hooks (IM)

Attachment 1 – Visual Examination Data Form (continued)

Container ID Number ORRH00719

Prohibited Item(s) Summary	YES	NO
Does the container have observable liquid equal to or greater than 1 percent by volume of the outermost container at the time of RTR or VE?	☐	☑
Does the container have observable liquid more than 60 milliliters or 3 percent by volume, whichever is greater in an internal container?	☐	☑
Does the container have observable liquid with an EPA hazardous waste number (HWN) U134 assigned?	☐	☑
Does the container have observable liquid containing PCBs?	☐	☑
Is there an indication of non-radionuclide pyrophoric materials, such as elemental potassium?	☐	☑
Is there an indication of hazardous wastes not occurring as co-contaminants with TRU mixed wastes (non-mixed hazardous wastes)?	☐	☑
Is there an indication of wastes incompatible with backfill, seal and panel closures materials, container and packaging materials, shipping container materials, or other wastes (i.e., waste does **NOT** match Table of Allowable Materials for RH-TRU Waste in the RH-TRAMPAC)?	☐	☑
Is there an indication of wastes containing explosives or compressed gases?	☐	☑
Is there an indication of polychlorinated biphenyls (PCBs) not authorized under an EPA PCB waste disposal authorization?	☐	☑
Is there an indication of the waste exhibiting the characteristic of ignitability, corrosivity, or reactivity (EPA Hazardous Waste Numbers of D001, D002, or D003)?	☐	☑
Is the physical form of the waste inconsistent with the Waste Stream Description or the Waste Matrix Code?	☐	☑
RH72B Criteria		
Were there Non-approved Closure Methods used on liner bags or inner bags greater than 4 liters?	☐	☑
Are there sealed containers GREATER than 4 liters or heat sealed bags **NOT** defined in the applicable TRUCON Code?	☐	☑
Are there indications of inadequate protection (blocked or braced) for heavy and/or sharp objects?	☐	☑
Is the waste consistent with the TRUCON Code?	☑	☐

Comments: N/A

Visual Examination Operator 1:		
Anthony Harley		9-23-15
Print Name	Signature	Date
Visual Examination Operator 2:		
Jason Cofer		9-23-15
Print Name	Signature	Date

Attachment 2 – Visual Examination Independent Technical Reviewer Checklist

Batch Data Report No.: ORNLRHVE15007

1. Were data generation and reduction conducted in a technically correct manner in accordance with the methods (procedure) used?	☐ NO	☑ YES
2. Was the correct revision of the operating procedure used?	☐ NO	☑ YES
3. Has the data been reviewed for errors?	☐ NO	☑ YES
4. Are BDR contents complete and do they match CCP waste VE Batch Data report Table of Contents?	☐ NO	☑ YES
5. Does the testing batch report include VE for up to 20 containers?	☐ NO	☑ YES
6. Is all data signed and dated in reproducible ink by the individual(s) generating it?	☐ NO	☑ YES
7. Is all data recorded clearly, legibly, and accurately?	☐ NO	☑ YES
8. Were changes made to original data? If NO, proceed to question 11.	☑ NO	☐ YES
9. Have all changes made to original data been lined out, initialed and dated by the individual making the changes?	☐ NO	☐ YES
10. Were the data changes made by the individual who originally collected the data or by an equally qualified individual?	☐ NO	☐ YES
11. Is there an adequate written description of the contents of each container?	☐ NO	☑ YES
12. Was VE of each container performed by at least two qualified VEO's or was an Audio/Video recording properly prepared for each container?	☐ NO	☑ YES
13. Has each container in this BDR been evaluated for the presence of prohibited wastes?	☐ NO	☑ YES
14. Did the physical form of the waste match the waste matrix code and waste stream description?	☐ NO	☑ YES
15. Was an NCR required at the data generation level? If NO, proceed to question 17.	☑ NO	☐ YES
16. Is a copy of the NCR included in the BDR?	☐ NO	☐ YES
17. Have the RH Quality Assurance Objectives (QAOs) for VE been met? **Precision** – Precision is maintained by reconciling any discrepancies between two operators (or between the operator and the Independent Technical Reviewer) with regard to the identification of important waste characteristics (i.e., physical form of the waste and absence of prohibited liquids) within a single container. **Accuracy** – Accuracy is maintained by requiring operators to pass a comprehensive examination with a score of 80% and demonstrate satisfactory performance in the presence of the VE expert during their initial qualification and subsequent requalification. **Representativeness** – The contents placed in a container will be described on the data forms.	☐ NO	☑ YES

Attachment 2 – Visual Examination Independent Technical Reviewer Checklist (Continued)

Batch Data Report No.: ORNLRHVE 15007

Completeness – The relevant waste information must be collected. This information must be documented on a videotape and/or data form, or other unalterable media. **Comparability** – Comparability is ensured by the characterization program meeting the training requirements and complying with the minimum standards used to implement this characterization process. In some instances, waste will be contained in opaque containers and not all items will be visible to the operator (e.g., sealed paint cans or 5-gallon buckets). If these containers are not opened during VE, source documents must be available in the AK record that allow the operator to identify the contents of the closed containers.		
Comments: N/A		
Independent Technical Reviewer Derek Matheny Printed Name	Signature	9/24/15 Date

DIVIDER PAGE ONLY

Not Part of Page Count

Attachment 2 – CCP Records Transmittal/Receiving Form

CCP Records / Records Custodian, 4021 National Parks Highway - MS: GSA 212, Carlsbad, New Mexico 88220

Telephone Number: 575-234-7523

Fax Number: 575-234-7033

Attn:	Linda Castro	From:	David W. Moody
Ship to:	CCP Records	Site:	ORNL RH
	4021 National Parks Hwy	Company:	NWP
	MS:GSA:212	Telephone Number:	303-963-5036
	Carlsbad NM 88220	Date Sent:	28 September 2015
Telephone Number:	575-234-7130		

Document Number	Title / Description	Record Date	Total Pages
ORNLRHVE15007	SPM Checklist for ORNL RH VE BDR ORNLRHVE15007	28 Sept 2015	1
	NA		

Comments

None

(When the Record accepted line has been completed, the rest of the page below may be left blank.)

Acceptance/Rejection Signature and Date

Records Accepted ☑	Linda Castro (Signature)	Linda Castro (Printed Name)	09/28/15 (Date)
Records Rejected ☐	_____ (Signature)	_____ (Printed Name)	_____ (Date)

Reason for Rejection:

Re-submittal:	_____ (Signature)	_____ (Printed Name)	_____ (Date)

```
**********************************
***        Send Results        ***
**********************************

   Sending is complete.

Job No.                    2278
Address                    913038432208
Name                       DENVER SPMS
Start Time                 09/28 02:24 PM
Call Length                00'18
Sheets                     1
Result                     OK
```

Controlled Copy

CCP-QP-008, Rev. 24 **Effective Date: 02/10/2015**
CCP Records Management **Page 35 of 35**

Attachment 2 – CCP Records Transmittal/Receiving Form

CCP Records / Records Custodian, 4021 National Parks Highway - MS: GSA 212, Carlsbad, New Mexico 88220

Telephone Number: 575-234-7523

Fax Number: 575-234-7033

Attn:	Linda Castro	From:	David W. Moody
Ship to:	CCP Records	Site:	ORNL RH
	4021 National Parks Hwy	Company:	NWP
	MS:GSA:212	Telephone Number:	303-983-5036
	Carlsbad NM 88220	Date Sent:	28 September 2015
Telephone Number:	575-234-7130		

Document Number	Title / Description	Record Date	Total Pages
ORNLRHVE15007	SPM Checklist for ORNL RH VE BDR ORNLRHVE15007	28 Sept 2015	1
	NA		

Comments

None

(When the Record accepted line has been completed, the rest of the page below may be left blank.)

Acceptance/Rejection Signature and Date

Records Accepted ☑	Linda Castro (Signature)	Linda Castro (Printed Name)	09/28/15 (Date)
Records Rejected ☐	Signature	Printed Name	Date

Attachment 2 – CCP Records Transmittal/Receiving Form

CCP Records / Records Custodian, 4021 National Parks Highway - MS: GSA 212, Carlsbad, New Mexico 88220

Telephone Number: 575-234-7523

Fax Number: 575-234-7033

Attn:	CCP RECORDS	From:	PATRICK SMITH II
Ship to:	CCP RECORDS CUSTODIAN	Site:	ORNL
	4021 NATIONAL PARKS HWY.	Company:	TFE INC.
	MS GSA 212	Telephone Number:	865-574-6002
	CARLSBAD, NM 88220-9082	Date Sent:	9-30-2015
Telephone Number:	575-234-7523		

Document Number	Title / Description	Record Date	Box Number
ORNLRHVE15007	RH VE BDR	9-23-2015	8
N/A	N/A	N/A	N/A
N/A	N/A	N/A	N/A
N/A	N/A	N/A	N/A
N/A	N/A	N/A	N/A
N/A	N/A	N/A	N/A
Comments:			
N/A			

(When the Record accepted line has been completed, the rest of the page below may be left blank.)
Acceptance/Rejection Signature and Date

Records Accepted ☒ Linda Castro — Signature | Linda Castro — Printed Name | 10/02/15 — Date

Records Rejected ☐ _____ — Signature | _____ — Printed Name | _____ — Date

Reason for Rejection:

Re-submittal: _____ — Signature | _____ — Printed Name | _____ — Date

****
*** TX REPORT ***
****

TRANSMISSION OK

TX/RX NO	2582
DESTINATION TEL #	918655768703
DESTINATION ID	ORNL
ST. TIME	10/01 15:43
TIME USE	00'16
PAGES SENT	1
RESULT	OK

Attachment 2 – CCP Records Transmittal/Receiving Form

CCP Records / Records Custodian, 4021 National Parks Highway - MS: GSA 212, Carlsbad, New Mexico 88220

Telephone Number: 575-234-7523

Fax Number: 575-234-7033

Attn:	CCP RECORDS	From:	PATRICK SMITH II
Ship to:	CCP RECORDS CUSTODIAN	Site:	ORNL
	4021 NATIONAL PARKS HWY.	Company:	TFE INC.
	MS GSA 212	Telephone Number:	865-574-6002
	CARLSBAD, NM 88220-9082	Date Sent:	9-30-2015
Telephone Number:	575-234-7523		

ORNLRHVE15007	RH VE BDR	9-23-2015	8
N/A	N/A	N/A	N/A
N/A	N/A	N/A	N/A
N/A	N/A	N/A	N/A
N/A	N/A	N/A	N/A
N/A	N/A	N/A	N/A

N/A

(When the Record accepted line has been completed, the rest of the page below may be left blank.)
Acceptance/Rejection Signature and Date

Attachment 3 – Visual Examination Site Project Manager Checklist

Batch Data Report No.: ORNLRHVE15012

1. Has all the data received an independent technical review as evidenced by a completed checklist (Attachment 2) and the appropriate ITR signature?		☐ NO	☒ YES
2. Are BDR contents complete and match the Visual Examination Batch Data Report Table of Contents?		☐ NO	☒ YES
3. Is the BDR complete (appropriately filled in forms for each container)?		☐ NO	☒ YES
4. Have the RH Quality Assurance Objectives (QAOs) for VE been met?			
Precision – reconciled discrepancies between operators		☐ NO	☒ YES
Accuracy – trained operators		☐ NO	☒ YES
Representativeness – description of container contents		☐ NO	☒ YES
Completeness – completed data form and/or recording		☐ NO	☒ YES
Comparability – proper training and adequate AK for unopened containers		☐ NO	☒ YES
5. Were NCRs generated included in the BDR?	☐ NO	☒ YES RK 12/7/15	☒ N/A RK 12/7/15

Comments: ~~None~~ RK 12/7/15

NCR-RHORNL-0335-15 R.1 Added as SPM Attachment RK 12/7/15
NCR-RHORNL-0337-15 added as SPM attachment AK ~~1/6/15~~ 1/6/16 AK 1/6/16

SPM:

David W. Moody — Printed Name
Signature — 10 November 2015 — Date

Richard Kantrowitz — 12/7/15
Richard Kantrowitz — 1/6/16

CCP RECORDS ORIGINAL
DATE REC'D 11/11/15

Attachment 1 – CCP Nonconformance Report (NCR)

CCP NONCONFORMANCE REPORT (NCR)

(Use NCR Continuation, Attachment 3, if necessary)

NCR No. NCR-RHORNL-0335-15 Revision 1

1. Lot No., Heat No., or Serial No. (if applicable): n/a	2. Process (e.g., NDA, NDE, VE, Other): RH VE	3. Batch Data Report #(s): ORNLRHVE15012
4. Order/Work Order/Job Control Number (if applicable): n/a	5. PO # (if applicable): n/a	Container #(s): ORRH00725
	6. Supplier (if applicable): n/a	

DESCRIPTION OF NONCONFORMANCE

7a. NCR Description: ☐ < 100 nCi/g ☐ Prohibited Item ☐ E-Flag ☐ Receipt Inspection ☐ Transportation ☐ WWIS/WDS ☒ Other

7b. Requirement(s) (Enter Implementing Procedure No., Revision, Section No., & Quoted Text):

CCP-TP-500 Rev 15

4.1.2[C] Examine the container packaging and waste, **AND** record the description of the material in the Waste Description field on Attachment 1.

4.4.3[A] IF data affecting inconsistencies, mistakes, omissions, etc., are noted during the SPM review, that impact or change the characterization data, **THEN** initiate an NCR in accordance with CCP-QP-005.

7c. Actual Condition:

A waste item, super sack, was missing from the Attachment 1.
This NCR was revised to add Cardboard Liner which was left off the original NCR.

7d. Have the CCP HOLD TAGS associated with this NCR been applied? ☐ YES ☒ NO If no is checked, explain:

Due to ALARA considerations, NCR tagging will not be applied for this NCR. Administrative control will be applied through container entry in the CCP Data center In addition a listing of containers will be posted on the CCP sftp. Site identifying those containers where NCR tagging is not being applied Container information for this NCR will be included in the listing which is to alert Mobile Loading Unit personnel as a second control mechanism for non-tagged containers

8. NCR Originator:

David W. Moody (printed name) — signature — 18 Nov 2015 (date)

9. Does the identified condition have the potential to impact AK? If YES or INDETERMINATE, enter Trend Code L in Block 10. ☐ YES ☒ NO ☐ INDETERMINATE

10. Trend Code: A	11. Responsible Manager: Rich Kantrowitz
12. Recurring Condition? ☐ YES ☒ NO (If Yes, list NCRs and WIPP Forms):	13. Significant Coridition? ☐ YES ☒ NO (If Yes, enter WIPP Form No.):

14. QA Engineer or QA Designee validation:

Laura R. Jones (printed name) — Laura Ramos Jones (signature) — 11/19/15 (date)

SPM-1 RK 12/7/15

Attachment 1 – CCP Nonconformance Report (NCR) (Continued)

NCR No. NCR-RHORNL-0335-15 Revision 1

INTERIM DISPOSITION

15a. Interim Disposition (Check Only One):

☒ N/A (See Final Disposition) ☐ Hold ☐ Conditionally Accept ☐ Conditionally Use

☐ Sort ☐ Reinspect or Retest ☐ Remediate

15b. Instructions for Completion of the Interim Disposition:

INTERIM DISPOSITION APPROVALS

16a. Responsible Manager or Individual:

printed name _____ signature _____ date _____

16b. QA Engineer or QA Designee:

printed name _____ signature _____ date _____

Additional Approval:

printed name _____ signature _____ date _____

COMPLETION OF INTERIM DISPOSITION

17. Interim Disposition Complete – Responsible Manager or Individual:

printed name _____ signature _____ date _____

18. Interim Disposition Verified – QA Engineer:

printed name _____ signature _____ date _____

SPM-2 RK 12/2/15

Attachment 1 – CCP Nonconformance Report (NCR) (Continued)

NCR No. NCR-RHORNL-0335-15 Revision 1

FINAL DISPOSITION

19. Final Disposition (Check Only One: Use-As-Is, Repair, Reject, Rework, or Scrap):
☐ Use-As-Is ☐ Repair

19a. Technical Justification – Required for Use-As-Is or Repair dispositions. [☒ N/A for Reject, Rework, or Scrap]

☐ Reject ☒ Rework ☐ Scrap

19b. Instructions for Completion – Required for Reject, Repair, Rework, or Scrap [☐ N/A for Use-As-Is]

1. Have Operator add missing waste items to Attachment 1 and document changes.
2. Add NCR and NCR information to the BDR
3. Have ITR perform re-review
4. Submit BDR to CCP Records

19c. Corrective Actions (Actions to Prevent Recurrence – For Repair or Rework, if applicable.
[☒ N/A if not applicable, and for Use-As-Is, Reject, and Scrap]

FINAL DISPOSITION APPROVALS

20. Responsible Manager or Individual:
Richard Kautzwitz (printed name) | signature | 11/19/15 (date)

21. QA Engineer or QA Designee:
Laura R. Jones (printed name) | Laura Ramer Jones (signature) | 11/19/15 (date)

Additional Approval:
printed name | signature | date

CLOSURE

22. Final Disposition Complete - Responsible Manager or Individual:
printed name | signature | date

23. Attachments: 1- Email Documenting Reportability.

24a. HOLD TAG removal has been verified and reconciled for all nonconforming items on the NCR: ☐
24b. If HOLD TAG is not applicable, check: ☐ and explain:

25. Final Disposition Verified – NCR Closed QA Engineer:
printed name | signature | date

SPM-3 AK 12/9/15

Attachment 1 – CCP Nonconformance Report (NCR)

CCP NONCONFORMANCE REPORT (NCR)

(Use NCR Continuation, Attachment 3, if necessary)

NCR No. NCR-RHORNL-0337-15 Revision 0

1. Lot No., Heat No., or Serial No. (if applicable): NA	2. Process (e.g., NDA, NDE, VE, Other): RH-VE	3. Batch Data Report #(s): See Attachment 1
4. Order/Work Order/Job Control Number (if applicable): NA	5. PO # (if applicable): NA	Container #(s): See Attachment 1
	6. Supplier (if applicable): NA	

DESCRIPTION OF NONCONFORMANCE

7a. NCR Description: ☐ < 100 nCi/g ☐ Prohibited Item ☐ E-Flag ☐ Receipt Inspection ☐ Transportation ☐ WWIS/WDS ☒ Other

7b. Requirement(s) (Enter Implementing Procedure No., Revision, Section No., & Quoted Text):

CCP-TP-500, Rev. 15, Section 4.1.1 [A], "Record the following information on Attachment1: [A.1] Site Identification."

7c. Actual Condition:

The Site ID is incorrectly listed on the Visual Examination Data Form. The "RH" designator is missing.

7d. Have the CCP HOLD TAGS associated with this NCR been applied? ☐ YES ☒ NO If no is checked, explain:

HOLD TAGS will not be applied to items identified on this NCR because of ALARA consideration. Container Management will apply through administrative control. In addition, these containers have been identified on the CCP sftp site. Container information from this NCR has been included in the list, which is to alert Mobile Loading Unit personnel as a second method of control of non-tagged containers.

8. NCR Originator:

Richard Kantrowitz (printed name) Richard Kantrowitz (signature) 12/22/15 (date)

9. Does the identified condition have the potential to impact AK? If YES or INDETERMINATE, enter Trend Code L in Block 10. ☐ YES ☒ NO ☐ INDETERMINATE

10. Trend Code: A	11. Responsible Manager: Richard Kantrowitz
12. Recurring Condition? ☐ YES ☒ NO (If Yes, list NCRs and WIPP Forms):	13. Significant Condition? ☐ YES ☒ NO (If Yes, enter WIPP Form No.):

14. QA Engineer or QA Designee validation:

Veronica Waldram (printed name) Veronica Waldram (signature) 12/22/15 (date)

SPM-4 AK 1/6/16

Attachment 1 – CCP Nonconformance Report (NCR) (Continued)

NCR No. NCR-RHORNL-0337-15 Revision 0

INTERIM DISPOSITION

15a. Interim Disposition (Check Only One):
☒ N/A (See Final Disposition) ☐ Hold ☐ Conditionally Accept ☐ Conditionally Use
☐ Sort ☐ Reinspect or Retest ☐ Remediate

15b. Instructions for Completion of the Interim Disposition:

INTERIM DISPOSITION APPROVALS

16a. Responsible Manager or Individual:

printed name signature date

16b. QA Engineer or QA Designee:

printed name signature date

Additional Approval:

printed name signature date

COMPLETION OF INTERIM DISPOSITION

17. Interim Disposition Complete – Responsible Manager or Individual:

printed name signature date

18. Interim Disposition Verified – QA Engineer:

printed name signature date

SPM-5 RK 1/16/16

Attachment 1 – CCP Nonconformance Report (NCR) (Continued)

NCR No. NCR-RHORNL-0337-15 Revision 0

FINAL DISPOSITION

19. Final Disposition (Check Only One: Use-As-Is, Repair, Reject, Rework, or Scrap):
☐ Use-As-Is ☐ Repair

19a. Technical Justification – Required for Use-As-Is or Repair dispositions. [☒ N/A for Reject, Rework, or Scrap]

N/A

☐ Reject ☒ Rework ☐ Scrap

19b. Instructions for Completion – Required for Reject, Repair, Rework, or Scrap [☐ N/A for Use-As-Is]

1) DGL to correct the Site ID on the Visual Examination Data Form.
2) DGL to add NCR to the BDR.
3) DGL to correct/update Attachments 2 and 6 as necessary – including re-sign and date.
4) DGL to submit corrections to Records.
5) SPM to insert corrected pages and re-review.

19c. Corrective Actions (Actions to Prevent Recurrence – For Repair or Rework, if applicable.
[☒ N/A if not applicable, and for Use-As-Is, Reject, and Scrap]

FINAL DISPOSITION APPROVALS

20. Responsible Manager or Individual:

printed name	signature	date
Richard Kantrowitz	[signature]	12/22/15

21. QA Engineer or QA Designee:

printed name	signature	date
Veronica Waldram	Veronica Waldram	12/22/15

Additional Approval:

printed name	signature	date

CLOSURE

22. Final Disposition Complete - Responsible Manager or Individual:

printed name	signature	date

23. Attachments: 1- BDR/Container combination. 2- Email Documenting Reportability.

24a. HOLD TAG removal has been verified and reconciled for all nonconforming items on the NCR: ☐

24b. If HOLD TAG is not applicable, check: ☐ and explain:

25. Final Disposition Verified – NCR Closed QA Engineer:

printed name	signature	date

SPM-6 RK 1/6/16

Attachment 3 – CCP Nonconformance Report (NCR) Continuation Sheet

NCR No. NCR-RHORNL-0337-15 Revision 0 Attachment # 1 Page 1 of 1

Continuation from Section Number: 3

List of affected containers/BDRs:

Container ID	BDR ID
ORRH00708	ORNLRHVE15001
ORRH00708	ORNLRHVE15001_QTR0215
ORRH00709	ORNLRHVE15002
ORRH00725	ORNLRHVE15012
ORRH00726	ORNLRHVE15013

SPM-7 RK 11/6/16

Attachment 4 – Visual Examination Batch Data Report Cover Sheet

Batch Data Report No.: ORNLRHVE15012 Date: 11-5-15

	Waste Container ID Number:
1	ORRH00725
2	
3	
4	
5	
6	
7	
8	
9	
10	
11	N/A
12	A.H.
13	11-5-15
14	
15	
16	
17	
18	
19	
20	

NTPC RECORDS ORIGINAL
DATE REC'D 11-10-2015

Attachment 5 – Visual Examination Batch Data Report Table of Contents

Batch Data Report No.: ORNLRHVE15012 Date: 11-5-15

Item	Description	Page No.
1	Visual Examination Batch Data Report Cover Sheet (Attachment 4)	1
2	Visual Examination Batch Data Report Table of Contents (Attachment 5)	2
3	Visual Examination Data Forms (Attachment 1)	3
4	Visual Examination Independent Technical Reviewer Checklist (Attachment 2)	5
5	Copy of NCRs (N/A [if not applicable])	N/A

Attachment 1 – Visual Examination Data Form

Site ID: ORNL A.H. 12-30-15 RHORNL			
Examination Date: 11-5-15	Batch Number: ORNLRHVE15012		
Procedure #: CCP-TP-500	Revision #: 15	Video #: N/A	
Recording Equipment Check: ☐SAT ☐UNSAT ☑N/A	Recording Start: N/A	Recording Stop: N/A	
Inspection of Container to be loaded during VE: ☑SAT ☐UNSAT			
Indirect load Container ☑N/A	Final Output Container ☐ N/A		
Container ID Number:	Container ID Number: ORRH00725		
Container Type:	Container Type: 55 gallon drum		
Waste Matrix Code:	Waste Matrix Code: 55400		
Waste Stream:	Waste Stream: OR-REDC-RH-HET		
	Poly Rigid Liner: ☐Y ☑N Thickness: N/A	Poly Rigid Liner Lid: ☐Y ☑N	
	Poly Rigid Liner Vented or Hole Size: N/A		
Percent Fill: Percent Organic Waste:	Percent Fill: 100% Percent Organic Waste: 40%		
Layers of Confinement: Closure Method:	Layers of Confinement: 0 Closure Method: N/A		

Comments (e.g., filter information, NCRs):
Nucfil-0190S BK-49
cask # X10C9402660 - 40%
cask # X10C9802665 - 60%

Waste Description:

filter media (C)
plastic pieces (P)
saw blades (IM)
cloth rag (C)
aluminum foil (AM)
glass vials (OIM)
broken glass (OIM)
wooden stick (C)
electrical plugs (IM) (C) (P)
rubber hose (R)
plastic bags (P)
electrical cord (P)(OM)
metal scrap (IM)
metal lids (IM)
metal cans (IM)
paper (C)
concrete block (OIM)
electrical connector (OM)(IM)
string (C)
absorbent pad (C)
manipulator finger (IM)
plastic bag (P)
cardboard liner (C) A.H. 11-19-15
Super sack (P) A.H. 11-19-15

Attachment 1 – Visual Examination Data Form (continued)

Container ID Number ORRHW0725

Prohibited Item(s) Summary	YES	NO
Does the container have observable liquid equal to or greater than 1 percent by volume of the outermost container at the time of RTR or VE?	☐	☑
Does the container have observable liquid more than 60 milliliters or 3 percent by volume, whichever is greater in an internal container?	☐	☑
Does the container have observable liquid with an EPA hazardous waste number (HWN) U134 assigned?	☐	☑
Does the container have observable liquid containing PCBs?	☐	☑
Is there an indication of non-radionuclide pyrophoric materials, such as elemental potassium?	☐	☑
Is there an indication of hazardous wastes not occurring as co-contaminants with TRU mixed wastes (non-mixed hazardous wastes)?	☐	☑
Is there an indication of wastes incompatible with backfill, seal and panel closures materials, container and packaging materials, shipping container materials, or other wastes (i.e., waste does **NOT** match Table of Allowable Materials for RH-TRU Waste in the RH-TRAMPAC)?	☐	☑
Is there an indication of wastes containing explosives or compressed gases?	☐	☑
Is there an indication of polychlorinated biphenyls (PCBs) not authorized under an EPA PCB waste disposal authorization?	☐	☑
Is there an indication of the waste exhibiting the characteristic of ignitability, corrosivity, or reactivity (EPA Hazardous Waste Numbers of D001, D002, or D003)?	☐	☑
Is the physical form of the waste inconsistent with the Waste Stream Description or the Waste Matrix Code?	☐	☑
Waste Criteria		
Were there Non-approved Closure Methods used on liner bags or inner bags greater than 4 liters?	☐	☑
Are there sealed containers GREATER than 4 liters or heat sealed bags **NOT** defined in the applicable TRUCON Code?	☐	☑
Are there indications of inadequate protection (blocked or braced) for heavy and/or sharp objects?	☐	☑
Is the waste consistent with the TRUCON Code?	☑	☐

Comments: N/A

Visual Examination Operator 1:		
Anthony Harley		12-30-15
Print Name	Signature	11-5-15
		Date 11-19-15
Visual Examination Operator 2:		
Pat Tilman		11-5-15
Print Name	Signature	Date
		11-19-15
		12-30-15

Attachment 2 – Visual Examination Independent Technical Reviewer Checklist

Batch Data Report No.: ORNLRHVE 15012

1.	Were data generation and reduction conducted in a technically correct manner in accordance with the methods (procedure) used?	☐ NO	☑ YES
2.	Was the correct revision of the operating procedure used?	☐ NO	☑ YES
3.	Has the data been reviewed for errors?	☐ NO	☑ YES
4.	Are BDR contents complete and do they match CCP waste VE Batch Data report Table of Contents?	☐ NO	☑ YES
5.	Does the testing batch report include VE for up to 20 containers?	☐ NO	☑ YES
6.	Is all data signed and dated in reproducible ink by the individual(s) generating it?	☐ NO	☑ YES
7.	Is all data recorded clearly, legibly, and accurately?	☐ NO	☑ YES
8.	Were changes made to original data? If NO, proceed to question 11.	☑ ~~NO~~ DM 11/19/15	☑ YES
9.	Have all changes made to original data been lined out, initialed and dated by the individual making the changes?	☐ NO	☑ YES DM 11/19/15
10.	Were the data changes made by the individual who originally collected the data or by an equally qualified individual?	☐ NO	☑ YES DM 11/19/15
11.	Is there an adequate written description of the contents of each container?	☐ NO	☑ YES
12.	Was VE of each container performed by at least two qualified VEO's or was an Audio/Video recording properly prepared for each container?	☐ NO	☑ YES
13.	Has each container in this BDR been evaluated for the presence of prohibited wastes?	☐ NO	☑ YES
14.	Did the physical form of the waste match the waste matrix code and waste stream description?	☐ NO	☑ YES
15.	Was an NCR required at the data generation level? If NO, proceed to question 17.	☑ NO	☐ YES
16.	Is a copy of the NCR included in the BDR?	☐ NO	☐ YES
17.	Have the RH Quality Assurance Objectives (QAOs) for VE been met?	☐ NO	☑ YES

Precision – Precision is maintained by reconciling any discrepancies between two operators (or between the operator and the Independent Technical Reviewer) with regard to the identification of important waste characteristics (i.e., physical form of the waste and absence of prohibited liquids) within a single container.

Accuracy – Accuracy is maintained by requiring operators to pass a comprehensive examination with a score of 80% and demonstrate satisfactory performance in the presence of the VE expert during their initial qualification and subsequent requalification.

Representativeness – The contents placed in a container will be described on the data forms.

Attachment 2 – Visual Examination Independent Technical Reviewer Checklist (Continued)

Batch Data Report No.: ORNLRHVE15012

Completeness – The relevant waste information must be collected. This information must be documented on a videotape and/or data form, or other unalterable media. **Comparability** – Comparability is ensured by the characterization program meeting the training requirements and complying with the minimum standards used to implement this characterization process. In some instances, waste will be contained in opaque containers and not all items will be visible to the operator (e.g., sealed paint cans or 5-gallon buckets). If these containers are not opened during VE, source documents must be available in the AK record that allow the operator to identify the contents of the closed containers.		

Comments: N/A

Independent Technical Reviewer		
Derek Mathews		11/10/15
Printed Name	Signature	Date

11/19/15
12/30/15

DIVIDER PAGE ONLY

Not part of page count

Attachment 2 – CCP Records Transmittal/Receiving Form

CCP Records / Records Custodian, 4021 National Parks Highway - MS: GSA 212, Carlsbad, New Mexico 88220

Telephone Number: 575-234-7523

Fax Number: 575-234-7033

Attn:	Linda Castro	From:	David W. Moody
Ship to:	CCP Records	Site:	ORNL RH
	4021 National Parks Hwy	Company:	NWP
	MS:GSA:212	Telephone Number:	303-963-5036
	Carlsbad NM 88220	Date Sent:	10 November 2015
Telephone Number:	575-234-7130		

Document Number	Title / Description	Record Date	Total Pages
ORNLRHVE15012	SPM Checklist for ORNL RH VE BDR ORNLRHVE15012	10 Nov 2015	1
	NA		

Comments

None

(When the Record accepted line has been completed, the rest of the page below may be left blank.)
Acceptance/Rejection Signature and Date

Records Accepted ☒ Linda Castro (Signature) | Linda Castro (Printed Name) | 11/11/15 (Date)

Records Rejected ☐ _____ (Signature) | _____ (Printed Name) | _____ (Date)

Reason for Rejection:

Re-submittal: _____ (Signature) | _____ (Printed Name) | _____ (Date)

```
**********************************
***        Send Results        ***
**********************************

   Sending is complete.

Job No.                    3210
Address                    913038432208
Name                       DENVER SPMS
Start Time                 11/11 07:40 AM
Call Length                00'19
Sheets                     1
Result                     OK
```


Attachment 2 – CCP Records Transmittal/Receiving Form

CCP Records / Records Custodian, 4021 National Parks Highway - MS: GSA 212, Carlsbad, New Mexico 88220

Telephone Number: 575-234-7523

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	4021 National Parks Hwy	Company:	NWP
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	Carlsbad NM 88220	Date Sent:	10 November 2015
Telephone Number:	575-234-7130		

Document Number	Title / Description	Record Date	Total Pages
ORNLRHVE15012	SPM Checklist for ORNL RH VE BDR ORNLRHVE15012	10 Nov 2015	1
	NA		

Comments

None

(When the Record accepted line has been completed, the rest of the page below may be left blank.)

Acceptance/Rejection Signature and Date

Records Accepted	☑ Linda Castro (Signature)	Linda Castro (Printed Name)	11/11/15 (Date)
Records Rejected	☐ (Signature)	(Printed Name)	(Date)

Attachment 2 – CCP Records Transmittal/Receiving Form

CCP Records / Records Custodian, 4021 National Parks Highway - MS: GSA 212, Carlsbad, New Mexico 88220

Telephone Number: 575-234-7523

Fax Number: 575-234-7033

Attn:	CCP RECORDS	From:	PATRICK SMITH II
Ship to:	CCP RECORDS CUSTODIAN	Site:	ORNL
	4021 NATIONAL PARKS HWY.	Company:	TFE INC.
	MS GSA 212	Telephone Number:	865-574-6002
	CARLSBAD, NM 88220-9082	Date Sent:	11-12-2015
Telephone Number:	575-234-7523		

Document Number	Title/Description	Record Date	Total Pages
ORNLRHVE15012	~~FGA BDR~~ ORNL RH V E BDR 12/7/15	11-10-2015	6
N/A	N/A	N/A	N/A
N/A	N/A	N/A	N/A
N/A	N/A	N/A	N/A
N/A	N/A	N/A	N/A
N/A	N/A	N/A	N/A

Comments

N/A

(When the Record accepted line has been completed, the rest of the page below may be left blank.)
Acceptance/Rejection Signature and Date

Records Accepted ☒	Linda Castro (Signature)	Linda Castro (Printed Name)	11/20/15 (Date)
Records Rejected ☐	(Signature)	(Printed Name)	(Date)

Reason for Rejection:

Re-submittal:	(Signature)	(Printed Name)	(Date)

****
*** Send Results ***
****

Sending is complete.

Job No.	3450
Address	918655768703
Name	ORNL
Start Time	12/07 10:59 AM
Call Length	00'20
Sheets	1
Result	OK

Attachment 2 – CCP Records Transmittal/Receiving Form

CCP Records / Records Custodian, 4021 National Parks Highway - MS: GSA 212, Carlsbad, New Mexico 88220

Telephone Number: 575-234-7523

Fax Number: 575-234-7033

Attn:	CCP RECORDS	From:	PATRICK SMITH II
Ship to:	CCP RECORDS CUSTODIAN	Site:	ORNL
	4021 NATIONAL PARKS HWY.	Company:	TFE INC.
	MS GSA 212	Telephone Number:	865-574-6002
	CARLSBAD, NM 88220-9082	Date Sent:	11-12-2015
Telephone Number:	575-234-7523		

ORNLRHVE15012	~~EGA-BDR~~ ORNLRHVE BDR 12/7/15 (L)	11-10-2015	6
N/A	N/A	N/A	N/A
N/A	N/A	N/A	N/A
N/A	N/A	N/A	N/A
N/A	N/A	N/A	N/A
N/A	N/A	N/A	N/A

Comments

N/A

(When the Record accepted line has been completed, the rest of the page below may be left blank.)
Acceptance/Rejection Signature and Date

Records Accepted ☒	Linda Castro (Signature)	Linda Castro (Printed Name)	12/20/15 (Date)
Records Rejected ☐	(Signature)	(Printed Name)	(Date)

Attachment 2 – CCP Records Transmittal/Receiving Form

CCP Records / Records Custodian, 4021 National Parks Highway - MS: GSA 212, Carlsbad, New Mexico 88220

Telephone Number: 575-234-7523

Fax Number: 575-234-7033

Attn:	CCP RECORDS	From:	PATRICK SMITH II
Ship to:	CCP RECORDS CUSTODIAN	Site:	ORNL
	4021 NATIONAL PARKS HWY.	Company:	TFE INC.
	MS GSA 212	Telephone Number:	865-574-6002
	CARLSBAD, NM 88220-9082	Date Sent:	11-19-2015
Telephone Number:	575-234-7523		

Document Number	Title / Description	Record Date	Total Pages
ORNLRHVE15012	ATTACHMENT 1 – VISUAL EXAMINATION DATA FORM (CORRECTED) Container: ORRH00725	~~11-5-2015~~ 12/3/15 11-19-2015 12/7/15	2
ORNLRHVE15012	ATTACHMENT 2 – VE ITR CHECKLIST (CORRECTED)	~~11-5-2015~~ 11-19-2015	2
N/A	N/A	N/A	N/A
N/A	N/A	N/A	N/A

Comments

CONTACT SPM TO INSERT PAGES INTO BDR

(When the Record accepted line has been completed, the rest of the page below may be left blank.)
Acceptance/Rejection Signature and Date

Records Accepted	☑	[signature]	Leon Navarrete	12/7/15
		Signature	Printed Name	Date
Records Rejected	☐			
		Signature	Printed Name	Date

Reason for Rejection:

Re-submittal:

Signature	Printed Name	Date

****
*** Send Results ***
****

Sending is complete.

Job No.	3449
Address	918655768703
Name	ORNL
Start Time	12/07 10:51 AM
Call Length	00'19
Sheets	1
Result	OK

Attachment 2 – CCP Records Transmittal/Receiving Form

CCP Records / Records Custodian, 4021 National Parks Highway - MS: GSA 212, Carlsbad, New Mexico 88220

Telephone Number: 575-234-7523

Fax Number: 575-234-7033

Attn:	CCP RECORDS	From:	PATRICK SMITH II
Ship to:	CCP RECORDS CUSTODIAN	Site:	ORNL
	4021 NATIONAL PARKS HWY.	Company:	TFE INC.
	MS GSA 212	Telephone Number:	865-574-6002
	CARLSBAD, NM 88220-9082	Date Sent:	11-19-2015
Telephone Number:	575-234-7523		

ORNLRHVE15012	ATTACHMENT 1 – VISUAL EXAMINATION DATA FORM (CORRECTED) Container: ORRH00725	~~11-5-2015~~ 11-19-2015	2
ORNLRHVE15012	ATTACHMENT 2 – VE ITR CHECKLIST (CORRECTED)	~~11-5-2015~~ 11-19-2015	2
N/A	N/A	N/A	N/A
N/A	N/A	N/A	N/A

CONTACT SPM TO INSERT PAGES INTO BDR

(When the Record accepted line has been completed, the rest of the page below may be left blank.)
Acceptance/Rejection Signature and Date

Records Accepted ☑ _____ Leon Navarrete 12/7/15
Signature Printed Name Date

Records Rejected ☐

Attachment 2 – CCP Records Transmittal/Receiving Form

CCP Records / Records Custodian, 4021 National Parks Highway - MS: GSA 212, Carlsbad, New Mexico 88220

Telephone Number: 575-234-7523

Fax Number: 575-234-7033

Attn:	CCP RECORDS	From:	PATRICK SMITH II
Ship to:	CCP RECORDS CUSTODIAN	Site:	ORNL
	4021 NATIONAL PARKS HWY.	Company:	TFE INC.
	MS GSA 212	Telephone Number:	865-574-6002
	CARLSBAD, NM 88220-9082	Date Sent:	12-31-2015
Telephone Number:	575-234-7523		

Document Number	Title / Description	Record Date	Total Pages
ORNLRHVE15012	Attachment 1 – Visual Examination Data Form Container: ORRH00725 (CORRECTED)	11-05-2015	2
ORNLRHVE15012	Attachment 2 – Visual Examination Independent Technical Reviewer Checklist (CORRECTED)	11-05-2015	2
N/A	N/A	N/A	N/A
N/A	N/A	N/A	N/A
N/A	N/A	N/A	N/A
N/A	N/A	N/A	N/A

Comments

N/A

(When the Record accepted line has been completed, the rest of the page below may be left blank.)
Acceptance/Rejection Signature and Date

Records Accepted	☑	Signature	Jewell Hurrable	1-6-16 Date
Records Rejected	☐	Signature	Printed Name	Date

Reason for Rejection:

Re-submittal:

Signature	Printed Name	Date

****
*** Send Results ***
****

Sending is complete.

Job No.	3741
Address	918655768703
Name	ORNL
Start Time	01/06 10:03 AM
Call Length	00'30
Sheets	1
Result	OK

Attachment 2 – CCP Records Transmittal/Receiving Form

CCP Records / Records Custodian, 4021 National Parks Highway - MS: GSA 212, Carlsbad, New Mexico 88220

Telephone Number: 575-234-7523

Fax Number: 575-234-7033

Attn:	CCP RECORDS	From:	PATRICK SMITH II
Ship to:	CCP RECORDS CUSTODIAN	Site:	ORNL
	4021 NATIONAL PARKS HWY.	Company:	TFE INC.
	MS GSA 212	Telephone Number:	865-574-6002
	CARLSBAD, NM 88220-9082	Date Sent:	12-31-2015
Telephone Number:	575-234-7523		

ORNLRHVE15012	Attachment 1 – Visual Examination Data Form Container: ORRH00725 (CORRECTED)	11-05-2015	2
ORNLRHVE15012	Attachment 2 – Visual Examination Independent Technical Reviewer Checklist (CORRECTED)	11-05-2015	2
N/A	N/A	N/A	N/A
N/A	N/A	N/A	N/A
N/A	N/A	N/A	N/A
N/A	N/A	N/A	N/A

N/A

(When the Record accepted line has been completed, the rest of the page below may be left blank.)
Acceptance/Rejection Signature and Date

Attachment 2 – CCP SPM Radiography Project Level Validation Checklist and Summary

BDR Number: OR-RTR7-0140			Examination Date(s): 06/25/2015	
Description of Criteria Reviewed	**Criteria Met?**			**Comments/Qualifiers**
	YES	**NO**	**NA**	
1. Is the completed, signed, and dated Independent Technical Reviewer Checklist included in the BDR, and the independent technical reviewer was not involved in the generation or recording of the data under review? **Reference Source: CCP-PO-001, C3-4**	X			
2. Does the BDR contain all items addressed in the BDR Table of Contents? **Reference Source: CCP-PO-001, C3-4**	X			
3. Does the BDR include a listing of all the container numbers in the batch? **Reference Source: CCP-PO-001, C3-4**	X			
4. List all containers that have met QAOs. **Reference Source: CCP-PO-001, C3-4**				Container Numbers: NFS0183A, X10C9313009A1, NFS0555A, X10C0102692D1, X10C0402812G1, X10C0402938G, X10C9311456A1, NFS0183B, X10C9312763B1, X10C9312763H1, X10C9400390A1
5. Does the BDR identify the current implementing procedure and revision number? **Reference Source: CCP-PO-001, Table C3-3**	X			
6. Is there a reference to or copy of any associated NCRs (if any) in the BDR? NA if no NCRs. **Reference Source: CCP-PO-001, Table C3-3**			X	
7. Are there 20 or fewer containers in the batch? **Reference Source: CCP-PO-001, C3-4**	X			
8. Are the data properly reported (i.e., data are reported in correct units and with correct significant figures)? **Reference Source: CCP-PO-001, C3-4**	X			
9. Is there evidence of verification that the physical form matches the Waste Matrix Code? **Reference Source: CCP-PO-001, Table C3-3**	X			

CCP RECORDS ORIGINAL
DATE REC'D 07/10/15 LC

Attachment 2 – CCP SPM Radiography Project Level Validation Checklist and Summary (Continued)

BDR Number: OR-RTR7-0140	Examination Date(s): 06/25/2015			
Description of Criteria Reviewed	**Criteria Met?**			**Comments/Qualifiers**
	YES	**NO**	**NA**	
10. Is there evidence of verification that the physical form matches the waste stream description? **Reference Source: CCP-PO-001, Table C3-3**	X			
11. Are prohibited items absent? **Reference Source: CCP-PO-001, Table C3-3**	X			
12. Does observable liquid, if present, meet the criteria of the TSDF-WAC? **Reference Source: CCP-PO-001, C-1**			X	No liquids identified on BDR Data Sheets.
13. Were discrepancies between two operators with regard to identification of waste matrix code, liquids in excess of the TSDF-WAC, or compressed gases through replicate scans and independent observations reconciled? NA if no discrepancies. **Reference Source: CCP-PO-001, C3-2**			X	
14. Are the training qualifications for all radiography personnel acceptable? **Reference Source: CCP-PO-001, C3-8**	X			
15. Was evidence of the video/audio check included in the BDR? **Reference Source: CCP-PO-001, C1-1**	X			
16. Was the Lines-Pair Resolution Test or Sieve Test Check included in the BDR? **Reference Source: CCP Technical Procedures**	X			
17. Was a replicate scan performed once per day, or once per batch, whichever is LESS frequent? **Reference Source: CCP-PO-001, C1-1**	X			
18. Was an independent observation performed once per day, or once per batch, whichever is LESS frequent? **Reference Source: CCP-PO-001, C1-1**	X			

Attachment 2 – CCP SPM Radiography Project Level Validation Checklist and Summary (Continued)

BDR Number: OR-RTR7-0140 **Examination Date(s): 06/25/2015**

Description of Criteria Reviewed	Criteria Met? YES	NO	NA	Comments/Qualifiers
19. Were the replicate scan and independent observation performed on different waste containers? **Reference Source: CCP-PO-001, C1-1**	X			
20. Were the personnel performing the replicate scan and independent observation different from the individual who performed the original? **Reference Source: CCP-PO-001, C1-1**	X			
21. Does the BDR include an estimate of each material parameter weight in kg for each container? **Reference Source: CCP Technical Procedures**	X			
22. Does the BDR include a description of each material parameter for each container? **Reference Source: CCP Technical Procedures**	X			
23. Is the container gross weight recorded in kilograms (kg) for each container in the BDR? **Reference Source: CCP Technical Procedures**	X			
24. Was the Scale Weight Calibration Check included in the BDR? **Reference Source: CCP Technical Procedures**			X	Scale not used
25. Was the Scale Weight Check included in the BDR? **Reference Source: CCP Technical Procedures**			X	Scale not used

Comments: **NONE:**

The container QC checks were properly performed and meet the Quality Assurance Objectives (QAOs). Proper procedures were followed during data reduction and analysis. The batch is complete, acceptable, and includes all supporting data and documentation required by the QAPjP.

Rick Whiteley	Rick Whiteley	07/09/2015
SPM Printed Name	Signature	Date

Checklist is to be re-signed only when a re-review is performed.

SPM Printed Name	Signature	Reason	Date
SPM Printed Name	Signature	Reason	Date

Attachment 5–CCP Radiography Batch Data Report Cover Sheet

Site ID: ORNL

Batch Data Report No.: OR-RTR7-0140 ☑ CH ☐ RH Date: 6-25-15

Waste Container ID Numbers	
Replicate Scan:	NFS0555A
Independent Observation:	X10C9312763H1
1	X10C9312763H1
2	X10C0402938G
3	X10C9400390A1
4	NFS0183A
5	NFS0555A
6	X10C9313009A1
7	NFS0183B
8	X10C9312763B1
9	X10C0402812G1
10	X10C9311456A1
11	X10C0102692D1
12	N/A
13	N/A
14	N/A
15	N/A
16	N/A
17	N/A
18	N/A
19	N/A
20	N/A

RTR Operator:

Daphne Brothers		6-25-15
Printed Name	Signature	Date

Independent Technical Reviewer:

Eric Lyles		7/6/15
Printed Name	Signature	Date

NTPC RECORDS ORIGINAL
DATE REC'D 7.7.15 JH

Attachment 4 – CCP Radiography Batch Data Report Table of Contents and Batch Narrative

Batch Data Report No.: OR-RTR7-0140 Date: 6-25-15

Table Of Contents		
Item	Description	Page No.
1	CCP Radiography Batch Data Report Cover Sheet	1
2	CCP Radiography Batch Data Report Table Of Contents	2
3	CCP RTR Measurement Control Report	3
4	CCP Radiography Data Sheets	4
5	Copy of NCRs (NA, If Not Applicable)	N/A
6	CCP Independent Technical Reviewer Checklist	43

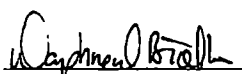
Batch Narrative
All Quality Checks were performed and recorded on CCP-TP-053, Rev.15, CCP Radiography Measurement Control Report.

Daphne Brothers
RTR Operator

Signature

6-25-15
Date

Attachment 1 – CCP RTR Measurement Control Report

Site ID: ORNL		
Batch Data Report No.: OR-RTR7-0140		
Examination Date: 6-25-15		
Control Checks		
Video/Audio Recorded Media System Check	☑ SAT	☐ UNSAT
Image Test : 10 Lines (Minimum acceptable is 5 lines-pair/cm or #6 Sieve is viewable)	☑ SAT	☐ UNSAT
Comments: N/A		
RTR Operator:		
Daphne Brothers Printed Name	 Signature	6-25-15 Date

CCP Radiography Data Sheet

Section 1: General Information	
☐ RTR Examination ☒ RTR Replicate Scan ☐ RTR Independent Observation	
Site ID:	ORNL
Batch Number:	OR-RTR7-0140
Examination Date:	6/25/2015
Waste Container ID:	NFS0555A
Video/Audio Recorded Media Number:	OR-RTR7-0140 A&B
Procedure and Revision No.:	CCP-TP-053 Rev. 15
NCR(s) associated with the container? (e.g., Prohibited Items)	☒ No ☐ Yes NCR No.: N/A NCR No.: N/A

Section 2: Waste Container Data	
Container Type:	55 Gallon Drum
TRUCON Code:	OR 227
Waste Matrix Code:	S4100
Waste Stream I.D.:	OR-NFS-CH-SOIL
Waste Container Weights:	Gross Wt.: 259.8 kg Tare Wt.: 33.2 kg Net Wt.: 226.6 kg
Rigid Liner and Liner Vent Description:	Liner: ☒ No ☐ Yes Lid: ☒ No ☐ Yes Type: ☐ 30-mil ☐ 90-mil ☐ 110-mil ☐ 125-mil Vented: ☐ No ☐ Yes ☒ N/A Punctured: ☒ No ☐ Yes Mechanical Vent: ☒ No ☐ Yes Fiberboard Liner: ☒ No ☐ Yes Lead Lined: ☒ No ☐ Yes
Number of Layers of Confinement:	Appears to be 1 layer
Volume Utilization Percentage:	95 %

CCP Radiography Data Sheet

Waste Container ID: NFS0555A

Section 3: Container Inventory and Comments (Detailed descriptions)	
IM:	Scrap metal
AM:	
OM:	
OI:	
C:	
R:	
XPM:	Scrap plastic, plastic sheeting
OR:	Absorbent
IN:	
S:	Soil

Section 4: Packaging Material and Waste Material Parameters	
Packaging Material:	**Estimated Weight (kg)**
Steel (ST):	27.8
Plastics (PP): Liner bag	1.0
Other: Cardboard (CP)	4.4
Total Packaging Weight	33.2
Waste Material Parameter:	**Estimated Weight (kg)**
Iron-based Metal / Alloys (IM):	0.1
Aluminum-based Metals / Alloys (AM):	
Other Metals (OM):	
Other Inorganic Materials (OI)	
Cellulosics (C):	
Rubber (R):	
Plastics (waste materials) (XPM):	6.5
Organic Matrix (OR):	1.5
Inorganic Matrix (IN):	
Soils (S):	218.5
Total WMP Weight:	226.6

CCP Radiography Data Sheet

Waste Container ID: NFS0555A

Section 5: RTR Summary (Questions answered "Yes" will be explained in the Comment block, except for Question 1)	
Is there observable liquid?	☐ Yes ☒ No
Is there any observable liquid in internal containers, more than 60 milliliters or 3 percent by volume, whichever is greater?	☐ Yes ☒ No
Is the total volume of observable liquid in the outermost container GREATER than 1% of the container?	☐ Yes ☒ No
Is there observable liquid in payload containers with an EPA Hazardous Waste Number of U134?	☐ Yes ☒ No
Is there an indication of non-radionuclide pyrophoric materials, such as elemental potassium?	☐ Yes ☒ No
Is there an indication of hazardous wastes not occurring as co-contaminants with TRU mixed wastes (non-mixed hazardous wastes)?	☐ Yes ☒ No
Is there an indication of wastes incompatible with backfill, seal and panel closures materials, container and packaging materials, shipping container materials, or other wastes (i.e., waste does NOT match TRUCON Code[s])?	☐ Yes ☒ No
Is there an indication of wastes containing explosives or compressed gases?	☐ Yes ☒ No
Is there an indication of PCBs liquids?	☐ Yes ☒ No
Is there an indication of the waste exhibiting the characteristic of ignitability, corrosivity, or reactivity (EPA Hazardous Waste Numbers of D001, D002, or D003)?	☐ Yes ☒ No
Is the physical form of the waste inconsistent with the Waste Stream Description or the Waste Matrix Code?	☐ Yes ☒ No
CH or RH TRAMPAC	
Are there heat-sealed bags (unvented) GREATER than 4 liters and LESS than 390 square inches in the waste, or heat sealed bags not authorized in the RH TRUCON Code?	☐ Yes ☒ No
Were there Non-approved Closure Methods used on liner bags or inner bags greater than 4 liters?	☐ Yes ☒ No
Are there sealed containers GREATER than 4 liters?	☐ Yes ☒ No
Are there indications of inadequate protection for heavy and/or sharp objects?	☐ Yes ☒ No

Comments: This Replicate Scan Agrees with the original Scan. 10 6-25-15

RTR Operator:

Fred Oney		6/25/2015
Print Name	Signature	Date

CCP Radiography Data Sheet

Section 1: General Information	
[ ] RTR Examination [ ] RTR Replicate Scan [X] RTR Independent Observation	
Site ID:	ORNL
Batch Number:	OR-RTR7-0140
Examination Date:	6/25/2015
Waste Container ID:	X10C9312763H1
Video/Audio Recorded Media Number:	OR-RTR7-0140 A&B
Procedure and Revision No.:	CCP-TP-053 Rev. 15
NCR(s) associated with the container? (e.g., Prohibited Items)	[X] No [ ] Yes NCR No.: N/A NCR No.: N/A

Section 2: Waste Container Data	
Container Type:	55 Gallon Drum
TRUCON Code:	OR 225
Waste Matrix Code:	S5400
Waste Stream I.D.:	OR-RADP-CH-HET
Waste Container Weights:	Gross Wt.: 76.3 kg Tare Wt.: 33.2 kg Net Wt.: 43.1 kg
Rigid Liner and Liner Vent Description:	Liner: [X] No [ ] Yes Lid: [X] No [ ] Yes Type: [ ] 30-mil [ ] 90-mil [ ] 110-mil [ ] 125-mil Vented: [ ] No [ ] Yes [X] N/A Punctured: [X] No [ ] Yes Mechanical Vent: [X] No [ ] Yes Fiberboard Liner: [X] No [ ] Yes Lead Lined: [X] No [ ] Yes
Number of Layers of Confinement:	Appears to be 1 layer
Volume Utilization Percentage:	85 %

CCP Radiography Data Sheet

Waste Container ID: X10C9312763H1

Section 3: Container Inventory and Comments (Detailed descriptions)

IM: Scrap metal, saw blades, metal fittings

AM:

OM:

OI: Absorbent

C: Coveralls, cardboard

R: Rubber gloves

XPM: Plastic sheeting, plastic container, plastic tubing

OR:

IN:

S:

Section 4: Packaging Material and Waste Material Parameters

Packaging Material:	**Estimated Weight (kg)**
Steel (ST):	27.8
Plastics (PP): Liner bag	1.0
Other: Cardboard (CP)	4.4
Total Packaging Weight	33.2
Waste Material Parameter:	**Estimated Weight (kg)**
Iron-based Metal / Alloys (IM):	6.0
Aluminum-based Metals / Alloys (AM):	
Other Metals (OM):	
Other Inorganic Materials (OI)	1.5
Cellulosics (C):	11.0
Rubber (R):	0.1
Plastics (waste materials) (XPM):	24.5
Organic Matrix (OR):	
Inorganic Matrix (IN):	
Soils (S):	
Total WMP Weight:	43.1

CCP Radiography Data Sheet

Waste Container ID: X10C9312763H1

Section 5: RTR Summary (Questions answered "Yes" will be explained in the Comment block, except for Question 1)	
Is there observable liquid?	☐ Yes ☒ No
Is there any observable liquid in internal containers, more than 60 milliliters or 3 percent by volume, whichever is greater?	☐ Yes ☒ No
Is the total volume of observable liquid in the outermost container GREATER than 1% of the container?	☐ Yes ☒ No
Is there observable liquid in payload containers with an EPA Hazardous Waste Number of U134?	☐ Yes ☒ No
Is there an indication of non-radionuclide pyrophoric materials, such as elemental potassium?	☐ Yes ☒ No
Is there an indication of hazardous wastes not occurring as co-contaminants with TRU mixed wastes (non-mixed hazardous wastes)?	☐ Yes ☒ No
Is there an indication of wastes incompatible with backfill, seal and panel closures materials, container and packaging materials, shipping container materials, or other wastes (i.e., waste does NOT match TRUCON Code[s])?	☐ Yes ☒ No
Is there an indication of wastes containing explosives or compressed gases?	☐ Yes ☒ No
Is there an indication of PCBs liquids?	☐ Yes ☒ No
Is there an indication of the waste exhibiting the characteristic of ignitability, corrosivity, or reactivity (EPA Hazardous Waste Numbers of D001, D002, or D003)?	☐ Yes ☒ No
Is the physical form of the waste inconsistent with the Waste Stream Description or the Waste Matrix Code?	☐ Yes ☒ No
CH or RH TRAMPAC	
Are there heat-sealed bags (unvented) GREATER than 4 liters and LESS than 390 square inches in the waste, or heat sealed bags not authorized in the RH TRUCON Code?	☐ Yes ☒ No
Were there Non-approved Closure Methods used on liner bags or inner bags greater than 4 liters?	☐ Yes ☒ No
Are there sealed containers GREATER than 4 liters?	☐ Yes ☒ No
Are there indications of inadequate protection for heavy and/or sharp objects?	☐ Yes ☒ No

Comments: This Independent observation agrees with the original scan. FO 6-25-15

RTR Operator:

Fred Oney		6/25/2015
Print Name	Signature	Date

CCP Radiography Data Sheet

Section 1: General Information	
[X] RTR Examination [ ] RTR Replicate Scan [ ] RTR Independent Observation	
Site ID:	ORNL
Batch Number:	OR-RTR7-0140
Examination Date:	6/25/2015
Waste Container ID:	X10C9312763H1
Video/Audio Recorded Media Number:	OR-RTR7-0140 A&B
Procedure and Revision No.:	CCP-TP-053 Rev. 15
NCR(s) associated with the container? (e.g., Prohibited Items)	[X] No [ ] Yes NCR No.: N/A NCR No.: N/A

Section 2: Waste Container Data	
Container Type:	55 Gallon Drum
TRUCON Code:	OR 225
Waste Matrix Code:	S5400
Waste Stream I.D.:	OR-RADP-CH-HET
Waste Container Weights:	Gross Wt.: 76.3 kg Tare Wt.: 33.2 kg Net Wt.: 43.1 kg
Rigid Liner and Liner Vent Description:	Liner: [X] No [ ] Yes Lid: [X] No [ ] Yes Type: [ ] 30-mil [ ] 90-mil [ ] 110-mil [ ] 125-mil Vented: [ ] No [ ] Yes [X] N/A Punctured: [X] No [ ] Yes Mechanical Vent: [X] No [ ] Yes Fiberboard Liner: [X] No [ ] Yes Lead Lined: [X] No [ ] Yes
Number of Layers of Confinement:	Appears to be 1 layer
Volume Utilization Percentage:	85 %

LD

CCP Radiography Data Sheet

Waste Container ID: X10C9312763H1

Section 3: Container Inventory and Comments (Detailed descriptions)	
IM:	Scrap metal, saw blades
AM:	
OM:	
OI:	Absorbent
C:	Cardboard, coveralls
R:	Rubber gloves
XPM:	Plastic sheeting, plastic tubing, plastic container
OR:	
IN:	
S:	

Section 4: Packaging Material and Waste Material Parameters	
Packaging Material:	**Estimated Weight (kg)**
Steel (ST):	27.8
Plastics (PP): Liner bag	1.0
Other: Cardboard (CP)	4.4
Total Packaging Weight	33.2
Waste Material Parameter:	**Estimated Weight (kg)**
Iron-based Metal / Alloys (IM):	5.0
Aluminum-based Metals / Alloys (AM):	
Other Metals (OM):	
Other Inorganic Materials (OI)	2.0
Cellulosics (C):	10.0
Rubber (R):	0.1
Plastics (waste materials) (XPM):	26.0
Organic Matrix (OR):	
Inorganic Matrix (IN):	
Soils (S):	
Total WMP Weight:	43.1

CCP Radiography Data Sheet

Waste Container ID: X10C9312763H1

Section 5: RTR Summary (Questions answered "Yes" will be explained in the Comment block, except for Question 1)	
Is there observable liquid?	☐ Yes ☒ No
Is there any observable liquid in internal containers, more than 60 milliliters or 3 percent by volume, whichever is greater?	☐ Yes ☒ No
Is the total volume of observable liquid in the outermost container GREATER than 1% of the container?	☐ Yes ☒ No
Is there observable liquid in payload containers with an EPA Hazardous Waste Number of U134?	☐ Yes ☒ No
Is there an indication of non-radionuclide pyrophoric materials, such as elemental potassium?	☐ Yes ☒ No
Is there an indication of hazardous wastes not occurring as co-contaminants with TRU mixed wastes (non-mixed hazardous wastes)?	☐ Yes ☒ No
Is there an indication of wastes incompatible with backfill, seal and panel closures materials, container and packaging materials, shipping container materials, or other wastes (i.e., waste does NOT match TRUCON Code[s])?	☐ Yes ☒ No
Is there an indication of wastes containing explosives or compressed gases?	☐ Yes ☒ No
Is there an indication of PCBs liquids?	☐ Yes ☒ No
Is there an indication of the waste exhibiting the characteristic of ignitability, corrosivity, or reactivity (EPA Hazardous Waste Numbers of D001, D002, or D003)?	☐ Yes ☒ No
Is the physical form of the waste inconsistent with the Waste Stream Description or the Waste Matrix Code?	☐ Yes ☒ No
CH or RH TRAMPAC	
Are there heat-sealed bags (unvented) GREATER than 4 liters and LESS than 390 square inches in the waste, or heat sealed bags not authorized in the RH TRUCON Code?	☐ Yes ☒ No
Were there Non-approved Closure Methods used on liner bags or inner bags greater than 4 liters?	☐ Yes ☒ No
Are there sealed containers GREATER than 4 liters?	☐ Yes ☒ No
Are there indications of inadequate protection for heavy and/or sharp objects?	☐ Yes ☒ No
Comments: N/A	

RTR Operator:

Daphne Brothers	Daphne Brothers	6/25/2015
Print Name	Signature	Date

CCP Radiography Data Sheet

Section 1: General Information	
[X] RTR Examination [ ] RTR Replicate Scan [ ] RTR Independent Observation	
Site ID:	ORNL
Batch Number:	OR-RTR7-0140
Examination Date:	6/25/2015
Waste Container ID:	X10C0402938G
Video/Audio Recorded Media Number:	OR-RTR7-0140 A&B
Procedure and Revision No.:	CCP-TP-053 Rev. 15
NCR(s) associated with the container? (e.g., Prohibited Items)	[X] No [ ] Yes NCR No.: N/A NCR No.: N/A

Section 2: Waste Container Data	
Container Type:	55 Gallon Drum
TRUCON Code:	OR 225
Waste Matrix Code:	S5400
Waste Stream I.D.:	OR-RF-CH-HET
Waste Container Weights:	Gross Wt.: 50.8 kg Tare Wt.: 33.2 kg Net Wt.: 17.6 kg
Rigid Liner and Liner Vent Description:	Liner: [X] No [ ] Yes Lid: [X] No [ ] Yes Type: [ ] 30-mil [ ] 90-mil [ ] 110-mil [ ] 125-mil Vented: [ ] No [ ] Yes [X] N/A Punctured: [X] No [ ] Yes Mechanical Vent: [X] No [ ] Yes Fiberboard Liner: [X] No [ ] Yes Lead Lined: [X] No [ ] Yes
Number of Layers of Confinement:	Appears to be 1 layer
Volume Utilization Percentage:	90 %

CCP Radiography Data Sheet

Waste Container ID: X10C0402938G

Section 3: Container Inventory and Comments (Detailed descriptions)	
IM:	Scrap metal, saw blades
AM:	
OM:	
OI:	Absorbent
C:	Wood framed filters
R:	
XPM:	Plastic sheeting
OR:	
IN:	
S:	

Section 4: Packaging Material and Waste Material Parameters	
Packaging Material:	**Estimated Weight (kg)**
Steel (ST):	27.8
Plastics (PP): Liner bag	1.0
Other: Cardboard (CP)	4.4
Total Packaging Weight	33.2
Waste Material Parameter:	**Estimated Weight (kg)**
Iron-based Metal / Alloys (IM):	0.6
Aluminum-based Metals / Alloys (AM):	
Other Metals (OM):	
Other Inorganic Materials (OI)	1.0
Cellulosics (C):	11.0
Rubber (R):	
Plastics (waste materials) (XPM):	5.0
Organic Matrix (OR):	
Inorganic Matrix (IN):	
Soils (S):	
Total WMP Weight:	17.6

CCP Radiography Data Sheet

Waste Container ID: X10C0402938G

Section 5: RTR Summary (Questions answered "Yes" will be explained in the Comment block, except for Question 1)	
Is there observable liquid?	☐ Yes ☒ No
Is there any observable liquid in internal containers, more than 60 milliliters or 3 percent by volume, whichever is greater?	☐ Yes ☒ No
Is the total volume of observable liquid in the outermost container GREATER than 1% of the container?	☐ Yes ☒ No
Is there observable liquid in payload containers with an EPA Hazardous Waste Number of U134?	☐ Yes ☒ No
Is there an indication of non-radionuclide pyrophoric materials, such as elemental potassium?	☐ Yes ☒ No
Is there an indication of hazardous wastes not occurring as co-contaminants with TRU mixed wastes (non-mixed hazardous wastes)?	☐ Yes ☒ No
Is there an indication of wastes incompatible with backfill, seal and panel closures materials, container and packaging materials, shipping container materials, or other wastes (i.e., waste does NOT match TRUCON Code[s])?	☐ Yes ☒ No
Is there an indication of wastes containing explosives or compressed gases?	☐ Yes ☒ No
Is there an indication of PCBs liquids?	☐ Yes ☒ No
Is there an indication of the waste exhibiting the characteristic of ignitability, corrosivity, or reactivity (EPA Hazardous Waste Numbers of D001, D002, or D003)?	☐ Yes ☒ No
Is the physical form of the waste inconsistent with the Waste Stream Description or the Waste Matrix Code?	☐ Yes ☒ No
CH or RH TRAMPAC	
Are there heat-sealed bags (unvented) GREATER than 4 liters and LESS than 390 square inches in the waste, or heat sealed bags not authorized in the RH TRUCON Code?	☐ Yes ☒ No
Were there Non-approved Closure Methods used on liner bags or inner bags greater than 4 liters?	☐ Yes ☒ No
Are there sealed containers GREATER than 4 liters?	☐ Yes ☒ No
Are there indications of inadequate protection for heavy and/or sharp objects?	☐ Yes ☒ No
Comments: N/A	

RTR Operator:

Daphne Brothers	Daphne Brothers	6/25/2015
Print Name	Signature	Date

CCP Radiography Data Sheet

Section 1: General Information	
[X] RTR Examination [ ] RTR Replicate Scan [ ] RTR Independent Observation	
Site ID:	ORNL
Batch Number:	OR-RTR7-0140
Examination Date:	6/25/2015
Waste Container ID:	X10C9400390A1
Video/Audio Recorded Media Number:	OR-RTR7-0140 A&B
Procedure and Revision No.:	CCP-TP-053 Rev. 15
NCR(s) associated with the container? (e.g., Prohibited Items)	[X] No [ ] Yes NCR No.: N/A NCR No.: N/A

Section 2: Waste Container Data	
Container Type:	55 Gallon Drum
TRUCON Code:	OR 225
Waste Matrix Code:	S5400
Waste Stream I.D.:	OR-GENR-CH-HET
Waste Container Weights:	Gross Wt.: 79.2 kg Tare Wt.: 33.2 kg Net Wt.: 46.0 kg
Rigid Liner and Liner Vent Description:	Liner: [X] No [ ] Yes Lid: [X] No [ ] Yes Type: [ ] 30-mil [ ] 90-mil [ ] 110-mil [ ] 125-mil Vented: [ ] No [ ] Yes [X] N/A Punctured: [X] No [ ] Yes Mechanical Vent: [X] No [ ] Yes Fiberboard Liner: [X] No [ ] Yes Lead Lined: [X] No [ ] Yes
Number of Layers of Confinement:	Appears to be 1 layer
Volume Utilization Percentage:	95 %

CCP Radiography Data Sheet

Waste Container ID: X10C9400390A1

Section 3: Container Inventory and Comments (Detailed descriptions)	
IM:	Scrap metal, hand tools, metal hardware, electrical equipment, punctured aerosol cans
AM:	
OM:	
OI:	Glass containers, absorbents
C:	Brushes, cardboard, tape
R:	Rubber gloves
XPM:	Plastic sheeting, plastic containers, plastic caps
OR:	
IN:	
S:	

Section 4: Packaging Material and Waste Material Parameters	
Packaging Material:	**Estimated Weight (kg)**
Steel (ST):	27.8
Plastics (PP): Liner bag	1.0
Other: Cardboard (CP)	4.4
Total Packaging Weight	33.2
Waste Material Parameter:	**Estimated Weight (kg)**
Iron-based Metal / Alloys (IM):	26.0
Aluminum-based Metals / Alloys (AM):	
Other Metals (OM):	
Other Inorganic Materials (OI)	4.8
Cellulosics (C):	5.0
Rubber (R):	0.2
Plastics (waste materials) (XPM):	10.0
Organic Matrix (OR):	
Inorganic Matrix (IN):	
Soils (S):	
Total WMP Weight:	46.0

CCP Radiography Data Sheet

Waste Container ID: X10C9400390A1

Section 5: RTR Summary (Questions answered "Yes" will be explained in the Comment block, except for Question 1)	
Is there observable liquid?	☐ Yes ☒ No
Is there any observable liquid in internal containers, more than 60 milliliters or 3 percent by volume, whichever is greater?	☐ Yes ☒ No
Is the total volume of observable liquid in the outermost container GREATER than 1% of the container?	☐ Yes ☒ No
Is there observable liquid in payload containers with an EPA Hazardous Waste Number of U134?	☐ Yes ☒ No
Is there an indication of non-radionuclide pyrophoric materials, such as elemental potassium?	☐ Yes ☒ No
Is there an indication of hazardous wastes not occurring as co-contaminants with TRU mixed wastes (non-mixed hazardous wastes)?	☐ Yes ☒ No
Is there an indication of wastes incompatible with backfill, seal and panel closures materials, container and packaging materials, shipping container materials, or other wastes (i.e., waste does NOT match TRUCON Code[s])?	☐ Yes ☒ No
Is there an indication of wastes containing explosives or compressed gases?	☐ Yes ☒ No
Is there an indication of PCBs liquids?	☐ Yes ☒ No
Is there an indication of the waste exhibiting the characteristic of ignitability, corrosivity, or reactivity (EPA Hazardous Waste Numbers of D001, D002, or D003)?	☐ Yes ☒ No
Is the physical form of the waste inconsistent with the Waste Stream Description or the Waste Matrix Code?	☐ Yes ☒ No
CH or RH TRAMPAC	
Are there heat-sealed bags (unvented) GREATER than 4 liters and LESS than 390 square inches in the waste, or heat sealed bags not authorized in the RH TRUCON Code?	☐ Yes ☒ No
Were there Non-approved Closure Methods used on liner bags or inner bags greater than 4 liters?	☐ Yes ☒ No
Are there sealed containers GREATER than 4 liters?	☐ Yes ☒ No
Are there indications of inadequate protection for heavy and/or sharp objects?	☐ Yes ☒ No
Comments: N/A	

RTR Operator:

Daphne Brothers	Daphne O Brothers	6/25/2015
Print Name	Signature	Date

CCP Radiography Data Sheet

Section 1: General Information	
[X] RTR Examination [ ] RTR Replicate Scan [ ] RTR Independent Observation	
Site ID:	ORNL
Batch Number:	OR-RTR7-0140
Examination Date:	6/25/2015
Waste Container ID:	NFS0183A
Video/Audio Recorded Media Number:	OR-RTR7-0140 A&B
Procedure and Revision No.:	CCP-TP-053 Rev. 15
NCR(s) associated with the container? (e.g., Prohibited Items)	[X] No [ ] Yes NCR No.: N/A NCR No.: N/A

Section 2: Waste Container Data	
Container Type:	55 Gallon Drum
TRUCON Code:	OR 227
Waste Matrix Code:	S4100
Waste Stream I.D.:	OR-NFS-CH-SOIL
Waste Container Weights:	Gross Wt.: 164.4 kg Tare Wt.: 33.2 kg Net Wt.: 131.2 kg
Rigid Liner and Liner Vent Description:	Liner: [X] No [ ] Yes Lid: [X] No [ ] Yes Type: [ ] 30-mil [ ] 90-mil [ ] 110-mil [ ] 125-mil Vented: [ ] No [ ] Yes [X] N/A Punctured: [X] No [ ] Yes Mechanical Vent: [X] No [ ] Yes Fiberboard Liner: [X] No [ ] Yes Lead Lined: [X] No [ ] Yes
Number of Layers of Confinement:	Appears to be 1 layer
Volume Utilization Percentage:	85 %

CCP Radiography Data Sheet

Waste Container ID: NFS0183A

Section 3: Container Inventory and Comments (Detailed descriptions)	
IM:	Scrap metal
AM:	
OM:	
OI:	
C:	Cloth
R:	
XPM:	Plastic sheeting, plastic container
OR:	Absorbent
IN:	
S:	Soil

Section 4: Packaging Material and Waste Material Parameters	
Packaging Material:	**Estimated Weight (kg)**
Steel (ST):	27.8
Plastics (PP): Liner bag	1.0
Other: Cardboard (CP)	4.4
Total Packaging Weight	33.2
Waste Material Parameter:	**Estimated Weight (kg)**
Iron-based Metal / Alloys (IM):	0.2
Aluminum-based Metals / Alloys (AM):	
Other Metals (OM):	
Other Inorganic Materials (OI)	
Cellulosics (C):	1.0
Rubber (R):	
Plastics (waste materials) (XPM):	2.0
Organic Matrix (OR):	1.0
Inorganic Matrix (IN):	
Soils (S):	127.0
Total WMP Weight:	131.2

CCP Radiography Data Sheet

Waste Container ID: NFS0183A

Section 5: RTR Summary (Questions answered "Yes" will be explained in the Comment block, except for Question 1)	
Is there observable liquid?	☐ Yes ☒ No
Is there any observable liquid in internal containers, more than 60 milliliters or 3 percent by volume, whichever is greater?	☐ Yes ☒ No
Is the total volume of observable liquid in the outermost container GREATER than 1% of the container?	☐ Yes ☒ No
Is there observable liquid in payload containers with an EPA Hazardous Waste Number of U134?	☐ Yes ☒ No
Is there an indication of non-radionuclide pyrophoric materials, such as elemental potassium?	☐ Yes ☒ No
Is there an indication of hazardous wastes not occurring as co-contaminants with TRU mixed wastes (non-mixed hazardous wastes)?	☐ Yes ☒ No
Is there an indication of wastes incompatible with backfill, seal and panel closures materials, container and packaging materials, shipping container materials, or other wastes (i.e., waste does NOT match TRUCON Code[s])?	☐ Yes ☒ No
Is there an indication of wastes containing explosives or compressed gases?	☐ Yes ☒ No
Is there an indication of PCBs liquids?	☐ Yes ☒ No
Is there an indication of the waste exhibiting the characteristic of ignitability, corrosivity, or reactivity (EPA Hazardous Waste Numbers of D001, D002, or D003)?	☐ Yes ☒ No
Is the physical form of the waste inconsistent with the Waste Stream Description or the Waste Matrix Code?	☐ Yes ☒ No
CH or RH TRAMPAC	
Are there heat-sealed bags (unvented) GREATER than 4 liters and LESS than 390 square inches in the waste, or heat sealed bags not authorized in the RH TRUCON Code?	☐ Yes ☒ No
Were there Non-approved Closure Methods used on liner bags or inner bags greater than 4 liters?	☐ Yes ☒ No
Are there sealed containers GREATER than 4 liters?	☐ Yes ☒ No
Are there indications of inadequate protection for heavy and/or sharp objects?	☐ Yes ☒ No
Comments: N/A	

RTR Operator:

Daphne Brothers	Daphne Brothers	6/25/2015
Print Name	Signature	Date

CCP Radiography Data Sheet

Section 1: General Information	
[X] RTR Examination [ ] RTR Replicate Scan [ ] RTR Independent Observation	
Site ID:	ORNL
Batch Number:	OR-RTR7-0140
Examination Date:	6/25/2015
Waste Container ID:	NFS0555A
Video/Audio Recorded Media Number:	OR-RTR7-0140 A&B
Procedure and Revision No.:	CCP-TP-053 Rev. 15
NCR(s) associated with the container? (e.g., Prohibited Items)	[X] No [ ] Yes NCR No.: N/A NCR No.: N/A

Section 2: Waste Container Data	
Container Type:	55 Gallon Drum
TRUCON Code:	OR 227
Waste Matrix Code:	S4100
Waste Stream I.D.:	OR-NFS-CH-SOIL
Waste Container Weights:	Gross Wt.: 259.8 kg Tare Wt.: 33.2 kg Net Wt.: 226.6 kg
Rigid Liner and Liner Vent Description:	Liner: [X] No [ ] Yes Lid: [X] No [ ] Yes Type: [ ] 30-mil [ ] 90-mil [ ] 110-mil [ ] 125-mil Vented: [ ] No [ ] Yes [X] N/A Punctured: [X] No [ ] Yes Mechanical Vent: [X] No [ ] Yes Fiberboard Liner: [X] No [ ] Yes Lead Lined: [X] No [ ] Yes
Number of Layers of Confinement:	Appears to be 1 layer
Volume Utilization Percentage:	95 %

CCP Radiography Data Sheet

Waste Container ID: NFS0555A

Section 3: Container Inventory and Comments (Detailed descriptions)
IM: Scrap metal
AM:
OM:
OI:
C:
R:
XPM: Scrap plastic, plastic sheeting, plastic tubing
OR: Absorbent
IN:
S: Soil

Section 4: Packaging Material and Waste Material Parameters

Packaging Material:	**Estimated Weight (kg)**
Steel (ST):	27.8
Plastics (PP): Liner bag	1.0
Other: Cardboard (CP)	4.4
Total Packaging Weight	33.2
Waste Material Parameter:	**Estimated Weight (kg)**
Iron-based Metal / Alloys (IM):	0.2
Aluminum-based Metals / Alloys (AM):	
Other Metals (OM):	
Other Inorganic Materials (OI)	
Cellulosics (C):	
Rubber (R):	
Plastics (waste materials) (XPM):	7.0
Organic Matrix (OR):	1.4
Inorganic Matrix (IN):	
Soils (S):	218.0
Total WMP Weight:	226.6

CCP Radiography Data Sheet

Waste Container ID: NFS0555A

Section 5: RTR Summary (Questions answered "Yes" will be explained in the Comment block, except for Question 1)	
Is there observable liquid?	☐ Yes ☒ No
Is there any observable liquid in internal containers, more than 60 milliliters or 3 percent by volume, whichever is greater?	☐ Yes ☒ No
Is the total volume of observable liquid in the outermost container GREATER than 1% of the container?	☐ Yes ☒ No
Is there observable liquid in payload containers with an EPA Hazardous Waste Number of U134?	☐ Yes ☒ No
Is there an indication of non-radionuclide pyrophoric materials, such as elemental potassium?	☐ Yes ☒ No
Is there an indication of hazardous wastes not occurring as co-contaminants with TRU mixed wastes (non-mixed hazardous wastes)?	☐ Yes ☒ No
Is there an indication of wastes incompatible with backfill, seal and panel closures materials, container and packaging materials, shipping container materials, or other wastes (i.e., waste does NOT match TRUCON Code[s])?	☐ Yes ☒ No
Is there an indication of wastes containing explosives or compressed gases?	☐ Yes ☒ No
Is there an indication of PCBs liquids?	☐ Yes ☒ No
Is there an indication of the waste exhibiting the characteristic of ignitability, corrosivity, or reactivity (EPA Hazardous Waste Numbers of D001, D002, or D003)?	☐ Yes ☒ No
Is the physical form of the waste inconsistent with the Waste Stream Description or the Waste Matrix Code?	☐ Yes ☒ No
CH or RH TRAMPAC	
Are there heat-sealed bags (unvented) GREATER than 4 liters and LESS than 390 square inches in the waste, or heat sealed bags not authorized in the RH TRUCON Code?	☐ Yes ☒ No
Were there Non-approved Closure Methods used on liner bags or inner bags greater than 4 liters?	☐ Yes ☒ No
Are there sealed containers GREATER than 4 liters?	☐ Yes ☒ No
Are there indications of inadequate protection for heavy and/or sharp objects?	☐ Yes ☒ No
Comments: N/A	

RTR Operator:

Daphne Brothers	Daphne Brothers	6/25/2015
Print Name	Signature	Date

CCP Radiography Data Sheet

Section 1: General Information	
[X] RTR Examination [ ] RTR Replicate Scan [ ] RTR Independent Observation	
Site ID:	ORNL
Batch Number:	OR-RTR7-0140
Examination Date:	6/25/2015
Waste Container ID:	X10C9313009A1
Video/Audio Recorded Media Number:	OR-RTR7-0140 A&B
Procedure and Revision No.:	CCP-TP-053 Rev. 15
NCR(s) associated with the container? (e.g., Prohibited Items)	[X] No [ ] Yes NCR No.: N/A NCR No.: N/A

Section 2: Waste Container Data	
Container Type:	55 Gallon Drum
TRUCON Code:	OR 225
Waste Matrix Code:	S5400
Waste Stream I.D.:	OR-RADP-CH-HET
Waste Container Weights:	Gross Wt.: 86.8 kg Tare Wt.: 33.2 kg Net Wt.: 53.6 kg
Rigid Liner and Liner Vent Description:	Liner: [X] No [ ] Yes Lid: [X] No [ ] Yes Type: [ ] 30-mil [ ] 90-mil [ ] 110-mil [ ] 125-mil Vented: [ ] No [ ] Yes [X] N/A Punctured: [X] No [ ] Yes Mechanical Vent: [X] No [ ] Yes Fiberboard Liner: [X] No [ ] Yes Lead Lined: [X] No [ ] Yes
Number of Layers of Confinement:	Appears to be 1 layer
Volume Utilization Percentage:	95 %

CCP Radiography Data Sheet

Waste Container ID: X10C9313009A1

Section 3: Container Inventory and Comments (Detailed descriptions)	
IM:	Scrap metal, hand tools, pipe nipples, metal hardware, drum vents, metal lid
AM:	
OM:	Scrap lead
OI:	Glass containers
C:	Cardboard
R:	
XPM:	Plastic sheeting, plastic containers
OR:	
IN:	
S:	

Section 4: Packaging Material and Waste Material Parameters	
Packaging Material:	**Estimated Weight (kg)**
Steel (ST):	27.8
Plastics (PP): Liner bag	1.0
Other: Cardboard (CP)	4.4
Total Packaging Weight	33.2
Waste Material Parameter:	**Estimated Weight (kg)**
Iron-based Metal / Alloys (IM):	30.0
Aluminum-based Metals / Alloys (AM):	
Other Metals (OM):	1.0
Other Inorganic Materials (OI)	6.6
Cellulosics (C):	5.0
Rubber (R):	
Plastics (waste materials) (XPM):	11.0
Organic Matrix (OR):	
Inorganic Matrix (IN):	
Soils (S):	
Total WMP Weight:	53.6

CCP Radiography Data Sheet

Waste Container ID: X10C9313009A1

Section 5: RTR Summary (Questions answered "Yes" will be explained in the Comment block, except for Question 1)	
Is there observable liquid?	☐ Yes ☒ No
Is there any observable liquid in internal containers, more than 60 milliliters or 3 percent by volume, whichever is greater?	☐ Yes ☒ No
Is the total volume of observable liquid in the outermost container GREATER than 1% of the container?	☐ Yes ☒ No
Is there observable liquid in payload containers with an EPA Hazardous Waste Number of U134?	☐ Yes ☒ No
Is there an indication of non-radionuclide pyrophoric materials, such as elemental potassium?	☐ Yes ☒ No
Is there an indication of hazardous wastes not occurring as co-contaminants with TRU mixed wastes (non-mixed hazardous wastes)?	☐ Yes ☒ No
Is there an indication of wastes incompatible with backfill, seal and panel closures materials, container and packaging materials, shipping container materials, or other wastes (i.e., waste does NOT match TRUCON Code[s])?	☐ Yes ☒ No
Is there an indication of wastes containing explosives or compressed gases?	☐ Yes ☒ No
Is there an indication of PCBs liquids?	☐ Yes ☒ No
Is there an indication of the waste exhibiting the characteristic of ignitability, corrosivity, or reactivity (EPA Hazardous Waste Numbers of D001, D002, or D003)?	☐ Yes ☒ No
Is the physical form of the waste inconsistent with the Waste Stream Description or the Waste Matrix Code?	☐ Yes ☒ No
CH or RH TRAMPAC	
Are there heat-sealed bags (unvented) GREATER than 4 liters and LESS than 390 square inches in the waste, or heat sealed bags not authorized in the RH TRUCON Code?	☐ Yes ☒ No
Were there Non-approved Closure Methods used on liner bags or inner bags greater than 4 liters?	☐ Yes ☒ No
Are there sealed containers GREATER than 4 liters?	☐ Yes ☒ No
Are there indications of inadequate protection for heavy and/or sharp objects?	☐ Yes ☒ No
Comments: N/A	

RTR Operator:

Daphne Brothers	Daphne O'Brothers	6/25/2015
Print Name	Signature	Date

CCP Radiography Data Sheet

Section 1: General Information	
[X] RTR Examination [ ] RTR Replicate Scan [ ] RTR Independent Observation	
Site ID:	ORNL
Batch Number:	OR-RTR7-0140
Examination Date:	6/25/2015
Waste Container ID:	NFS0183B
Video/Audio Recorded Media Number:	OR-RTR7-0140 A&B
Procedure and Revision No.:	CCP-TP-053 Rev. 15
NCR(s) associated with the container? (e.g., Prohibited Items)	[X] No [ ] Yes NCR No.: N/A NCR No.: N/A

Section 2: Waste Container Data	
Container Type:	55 Gallon Drum
TRUCON Code:	OR 227
Waste Matrix Code:	S4100
Waste Stream I.D.:	OR-NFS-CH-SOIL
Waste Container Weights:	Gross Wt.: 152.0 kg Tare Wt.: 33.2 kg Net Wt.: 118.8 kg
Rigid Liner and Liner Vent Description:	Liner: [X] No [ ] Yes Lid: [X] No [ ] Yes Type: [ ] 30-mil [ ] 90-mil [ ] 110-mil [ ] 125-mil Vented: [ ] No [ ] Yes [X] N/A Punctured: [X] No [ ] Yes Mechanical Vent: [X] No [ ] Yes Fiberboard Liner: [X] No [ ] Yes Lead Lined: [X] No [ ] Yes
Number of Layers of Confinement:	Appears to be 1 layer
Volume Utilization Percentage:	80 %

CCP Radiography Data Sheet

Waste Container ID: NFS0183B

Section 3: Container Inventory and Comments (Detailed descriptions)	
IM:	
AM:	
OM:	
OI:	
C:	Cloth, coveralls
R:	
XPM:	Scrap plastic, plastic sheeting, plastic tubing
OR:	Absorbent
IN:	
S:	Soil

Section 4: Packaging Material and Waste Material Parameters

Packaging Material:	Estimated Weight (kg)
Steel (ST):	27.8
Plastics (PP): Liner bag	1.0
Other: Cardboard (CP)	4.4
Total Packaging Weight	33.2
Waste Material Parameter:	**Estimated Weight (kg)**
Iron-based Metal / Alloys (IM):	
Aluminum-based Metals / Alloys (AM):	
Other Metals (OM):	
Other Inorganic Materials (OI)	
Cellulosics (C):	2.8
Rubber (R):	
Plastics (waste materials) (XPM):	8.0
Organic Matrix (OR):	1.0
Inorganic Matrix (IN):	
Soils (S):	107.0
Total WMP Weight:	118.8

CCP Radiography Data Sheet

Waste Container ID: NFS0183B

Section 5: RTR Summary (Questions answered "Yes" will be explained in the Comment block, except for Question 1)	
Is there observable liquid?	☐ Yes ☒ No
Is there any observable liquid in internal containers, more than 60 milliliters or 3 percent by volume, whichever is greater?	☐ Yes ☒ No
Is the total volume of observable liquid in the outermost container GREATER than 1% of the container?	☐ Yes ☒ No
Is there observable liquid in payload containers with an EPA Hazardous Waste Number of U134?	☐ Yes ☒ No
Is there an indication of non-radionuclide pyrophoric materials, such as elemental potassium?	☐ Yes ☒ No
Is there an indication of hazardous wastes not occurring as co-contaminants with TRU mixed wastes (non-mixed hazardous wastes)?	☐ Yes ☒ No
Is there an indication of wastes incompatible with backfill, seal and panel closures materials, container and packaging materials, shipping container materials, or other wastes (i.e., waste does NOT match TRUCON Code[s])?	☐ Yes ☒ No
Is there an indication of wastes containing explosives or compressed gases?	☐ Yes ☒ No
Is there an indication of PCBs liquids?	☐ Yes ☒ No
Is there an indication of the waste exhibiting the characteristic of ignitability, corrosivity, or reactivity (EPA Hazardous Waste Numbers of D001, D002, or D003)?	☐ Yes ☒ No
Is the physical form of the waste inconsistent with the Waste Stream Description or the Waste Matrix Code?	☐ Yes ☒ No
CH or RH TRAMPAC	
Are there heat-sealed bags (unvented) GREATER than 4 liters and LESS than 390 square inches in the waste, or heat sealed bags not authorized in the RH TRUCON Code?	☐ Yes ☒ No
Were there Non-approved Closure Methods used on liner bags or inner bags greater than 4 liters?	☐ Yes ☒ No
Are there sealed containers GREATER than 4 liters?	☐ Yes ☒ No
Are there indications of inadequate protection for heavy and/or sharp objects?	☐ Yes ☒ No
Comments: N/A	

RTR Operator:

Daphne Brothers	Daphne Brothers	6/25/2015
Print Name	Signature	Date

CCP Radiography Data Sheet

Section 1: General Information	
[X] RTR Examination [ ] RTR Replicate Scan [ ] RTR Independent Observation	
Site ID:	ORNL
Batch Number:	OR-RTR7-0140
Examination Date:	6/25/2015
Waste Container ID:	X10C9312763B1
Video/Audio Recorded Media Number:	OR-RTR7-0140 A&B
Procedure and Revision No.:	CCP-TP-053 Rev. 15
NCR(s) associated with the container? (e.g., Prohibited Items)	[X] No [ ] Yes NCR No.: N/A NCR No.: N/A

Section 2: Waste Container Data	
Container Type:	55 Gallon Drum
TRUCON Code:	OR 225
Waste Matrix Code:	S5400
Waste Stream I.D.:	OR-RADP-CH-HET
Waste Container Weights:	Gross Wt.: 71.2 kg Tare Wt.: 33.2 kg Net Wt.: 38.0 kg
Rigid Liner and Liner Vent Description:	Liner: [X] No [ ] Yes Lid: [X] No [ ] Yes Type: [ ] 30-mil [ ] 90-mil [ ] 110-mil [ ] 125-mil Vented: [ ] No [ ] Yes [X] N/A Punctured: [X] No [ ] Yes Mechanical Vent: [X] No [ ] Yes Fiberboard Liner: [X] No [ ] Yes Lead Lined: [X] No [ ] Yes
Number of Layers of Confinement:	Appears to be 1 layer
Volume Utilization Percentage:	85 %

CCP Radiography Data Sheet

Waste Container ID: X10C9312763B1

Section 3: Container Inventory and Comments (Detailed descriptions)	
IM:	Scrap metal, metal lids, metal hardware, electrical equipment
AM:	
OM:	Scrap lead
OI:	Absorbent
C:	Cloth, coveralls, cardboard
R:	
XPM:	Plastic sheeting, plastic containers, plastic tubing
OR:	
IN:	
S:	

Section 4: Packaging Material and Waste Material Parameters	
Packaging Material:	**Estimated Weight (kg)**
Steel (ST):	27.8
Plastics (PP): Liner bag	1.0
Other: Cardboard (CP)	4.4
Total Packaging Weight	33.2
Waste Material Parameter:	**Estimated Weight (kg)**
Iron-based Metal / Alloys (IM):	12.0
Aluminum-based Metals / Alloys (AM):	
Other Metals (OM):	3.0
Other Inorganic Materials (OI)	1.0
Cellulosics (C):	10.0
Rubber (R):	
Plastics (waste materials) (XPM):	12.0
Organic Matrix (OR):	
Inorganic Matrix (IN):	
Soils (S):	
Total WMP Weight:	38.0

CCP Radiography Data Sheet

Waste Container ID: X10C9312763B1

Section 5: RTR Summary (Questions answered "Yes" will be explained in the Comment block, except for Question 1)	
Is there observable liquid?	☐ Yes ☒ No
Is there any observable liquid in internal containers, more than 60 milliliters or 3 percent by volume, whichever is greater?	☐ Yes ☒ No
Is the total volume of observable liquid in the outermost container GREATER than 1% of the container?	☐ Yes ☒ No
Is there observable liquid in payload containers with an EPA Hazardous Waste Number of U134?	☐ Yes ☒ No
Is there an indication of non-radionuclide pyrophoric materials, such as elemental potassium?	☐ Yes ☒ No
Is there an indication of hazardous wastes not occurring as co-contaminants with TRU mixed wastes (non-mixed hazardous wastes)?	☐ Yes ☒ No
Is there an indication of wastes incompatible with backfill, seal and panel closures materials, container and packaging materials, shipping container materials, or other wastes (i.e., waste does NOT match TRUCON Code[s])?	☐ Yes ☒ No
Is there an indication of wastes containing explosives or compressed gases?	☐ Yes ☒ No
Is there an indication of PCBs liquids?	☐ Yes ☒ No
Is there an indication of the waste exhibiting the characteristic of ignitability, corrosivity, or reactivity (EPA Hazardous Waste Numbers of D001, D002, or D003)?	☐ Yes ☒ No
Is the physical form of the waste inconsistent with the Waste Stream Description or the Waste Matrix Code?	☐ Yes ☒ No
CH or RH TRAMPAC	
Are there heat-sealed bags (unvented) GREATER than 4 liters and LESS than 390 square inches in the waste, or heat sealed bags not authorized in the RH TRUCON Code?	☐ Yes ☒ No
Were there Non-approved Closure Methods used on liner bags or inner bags greater than 4 liters?	☐ Yes ☒ No
Are there sealed containers GREATER than 4 liters?	☐ Yes ☒ No
Are there indications of inadequate protection for heavy and/or sharp objects?	☐ Yes ☒ No
Comments: N/A	

RTR Operator:

Daphne Brothers	Daphne Brothers	6/25/2015
Print Name	Signature	Date

CCP Radiography Data Sheet

Section 1: General Information	
[X] RTR Examination [ ] RTR Replicate Scan [ ] RTR Independent Observation	
Site ID:	ORNL
Batch Number:	OR-RTR7-0140
Examination Date:	6/25/2015
Waste Container ID:	X10C0402812G1
Video/Audio Recorded Media Number:	OR-RTR7-0140 A&B
Procedure and Revision No.:	CCP-TP-053 Rev. 15
NCR(s) associated with the container? (e.g., Prohibited Items)	[X] No [ ] Yes NCR No.: N/A NCR No.: N/A

Section 2: Waste Container Data	
Container Type:	55 Gallon Drum
TRUCON Code:	OR 225
Waste Matrix Code:	S5400
Waste Stream I.D.:	OR-REDC-CH-HET
Waste Container Weights:	Gross Wt.: 78.8 kg Tare Wt.: 33.2 kg Net Wt.: 45.6 kg
Rigid Liner and Liner Vent Description:	Liner: [X] No [ ] Yes Lid: [X] No [ ] Yes Type: [ ] 30-mil [ ] 90-mil [ ] 110-mil [ ] 125-mil Vented: [ ] No [ ] Yes [X] N/A Punctured: [X] No [ ] Yes Mechanical Vent: [X] No [ ] Yes Fiberboard Liner: [X] No [ ] Yes Lead Lined: [X] No [ ] Yes
Number of Layers of Confinement:	Appears to be 1 layer
Volume Utilization Percentage:	70 %

CCP Radiography Data Sheet

Waste Container ID: X10C0402812G1

Section 3: Container Inventory and Comments (Detailed descriptions)	
IM:	Scrap metal, metal tubing
AM:	
OM:	
OI:	Absorbent, glass containers, broken glass
C:	Brush, cardboard
R:	
XPM:	Plastic sheeting, plastic containers, plastic tubing, scrap plastic
OR:	
IN:	
S:	

Section 4: Packaging Material and Waste Material Parameters	
Packaging Material:	**Estimated Weight (kg)**
Steel (ST):	27.8
Plastics (PP): Liner bag	1.0
Other: Cardboard (CP)	4.4
Total Packaging Weight	33.2
Waste Material Parameter:	**Estimated Weight (kg)**
Iron-based Metal / Alloys (IM):	15.0
Aluminum-based Metals / Alloys (AM):	
Other Metals (OM):	
Other Inorganic Materials (OI)	12.6
Cellulosics (C):	4.0
Rubber (R):	
Plastics (waste materials) (XPM):	14.0
Organic Matrix (OR):	
Inorganic Matrix (IN):	
Soils (S):	
Total WMP Weight:	45.6

CCP Radiography Data Sheet

Waste Container ID: X10C0402812G1

Section 5: RTR Summary (Questions answered "Yes" will be explained in the Comment block, except for Question 1)	
Is there observable liquid?	☐ Yes ☒ No
Is there any observable liquid in internal containers, more than 60 milliliters or 3 percent by volume, whichever is greater?	☐ Yes ☒ No
Is the total volume of observable liquid in the outermost container GREATER than 1% of the container?	☐ Yes ☒ No
Is there observable liquid in payload containers with an EPA Hazardous Waste Number of U134?	☐ Yes ☒ No
Is there an indication of non-radionuclide pyrophoric materials, such as elemental potassium?	☐ Yes ☒ No
Is there an indication of hazardous wastes not occurring as co-contaminants with TRU mixed wastes (non-mixed hazardous wastes)?	☐ Yes ☒ No
Is there an indication of wastes incompatible with backfill, seal and panel closures materials, container and packaging materials, shipping container materials, or other wastes (i.e., waste does NOT match TRUCON Code[s])?	☐ Yes ☒ No
Is there an indication of wastes containing explosives or compressed gases?	☐ Yes ☒ No
Is there an indication of PCBs liquids?	☐ Yes ☒ No
Is there an indication of the waste exhibiting the characteristic of ignitability, corrosivity, or reactivity (EPA Hazardous Waste Numbers of D001, D002, or D003)?	☐ Yes ☒ No
Is the physical form of the waste inconsistent with the Waste Stream Description or the Waste Matrix Code?	☐ Yes ☒ No
CH or RH TRAMPAC	
Are there heat-sealed bags (unvented) GREATER than 4 liters and LESS than 390 square inches in the waste, or heat sealed bags not authorized in the RH TRUCON Code?	☐ Yes ☒ No
Were there Non-approved Closure Methods used on liner bags or inner bags greater than 4 liters?	☐ Yes ☒ No
Are there sealed containers GREATER than 4 liters?	☐ Yes ☒ No
Are there indications of inadequate protection for heavy and/or sharp objects?	☐ Yes ☒ No
Comments: N/A	

RTR Operator:

Daphne Brothers	Daphne Brothers	6/25/2015
Print Name	Signature	Date

CCP Radiography Data Sheet

Section 1: General Information	
[X] RTR Examination [ ] RTR Replicate Scan [ ] RTR Independent Observation	
Site ID:	ORNL
Batch Number:	OR-RTR7-0140
Examination Date:	6/25/2015
Waste Container ID:	X10C9311456A1
Video/Audio Recorded Media Number:	OR-RTR7-0140 A&B
Procedure and Revision No.:	CCP-TP-053 Rev. 15
NCR(s) associated with the container? (e.g., Prohibited Items)	[X] No [ ] Yes NCR No.: N/A NCR No.: N/A

Section 2: Waste Container Data	
Container Type:	55 Gallon Drum
TRUCON Code:	OR 225
Waste Matrix Code:	S5400
Waste Stream I.D.:	OR-ISTP-CH-HET
Waste Container Weights:	Gross Wt.: 88.1 kg Tare Wt.: 33.2 kg Net Wt.: 54.9 kg
Rigid Liner and Liner Vent Description:	Liner: [X] No [ ] Yes Lid: [X] No [ ] Yes Type: [ ] 30-mil [ ] 90-mil [ ] 110-mil [ ] 125-mil Vented: [ ] No [ ] Yes [X] N/A Punctured: [X] No [ ] Yes Mechanical Vent: [X] No [ ] Yes Fiberboard Liner: [X] No [ ] Yes Lead Lined: [X] No [ ] Yes
Number of Layers of Confinement:	Appears to be 1 layer
Volume Utilization Percentage:	95 %

CCP Radiography Data Sheet

Waste Container ID: X10C9311456A1

Section 3: Container Inventory and Comments	(Detailed descriptions)
IM:	Open 30 gallon drum, metal hardware, scrap metal, hand tools, pipe nipple, metal lid, drum closure ring, drum lid
AM:	
OM:	Battery
OI:	Absorbent, glass containers
C:	Cloth, cardboard
R:	
XPM:	Plastic sheeting, plastic tubing
OR:	
IN:	
S:	

Section 4: Packaging Material and Waste Material Parameters	
Packaging Material:	**Estimated Weight (kg)**
Steel (ST):	27.8
Plastics (PP): Liner bag	1.0
Other: Cardboard (CP)	4.4
Total Packaging Weight	33.2
Waste Material Parameter:	**Estimated Weight (kg)**
Iron-based Metal / Alloys (IM):	38.0
Aluminum-based Metals / Alloys (AM):	
Other Metals (OM):	0.1
Other Inorganic Materials (OI)	3.0
Cellulosics (C):	8.8
Rubber (R):	
Plastics (waste materials) (XPM):	5.0
Organic Matrix (OR):	
Inorganic Matrix (IN):	
Soils (S):	
Total WMP Weight:	54.9

CCP Radiography Data Sheet

Waste Container ID: X10C9311456A1

Section 5: RTR Summary (Questions answered "Yes" will be explained in the Comment block, except for Question 1)	
Is there observable liquid?	☐ Yes ☒ No
Is there any observable liquid in internal containers, more than 60 milliliters or 3 percent by volume, whichever is greater?	☐ Yes ☒ No
Is the total volume of observable liquid in the outermost container GREATER than 1% of the container?	☐ Yes ☒ No
Is there observable liquid in payload containers with an EPA Hazardous Waste Number of U134?	☐ Yes ☒ No
Is there an indication of non-radionuclide pyrophoric materials, such as elemental potassium?	☐ Yes ☒ No
Is there an indication of hazardous wastes not occurring as co-contaminants with TRU mixed wastes (non-mixed hazardous wastes)?	☐ Yes ☒ No
Is there an indication of wastes incompatible with backfill, seal and panel closures materials, container and packaging materials, shipping container materials, or other wastes (i.e., waste does NOT match TRUCON Code[s])?	☐ Yes ☒ No
Is there an indication of wastes containing explosives or compressed gases?	☐ Yes ☒ No
Is there an indication of PCBs liquids?	☐ Yes ☒ No
Is there an indication of the waste exhibiting the characteristic of ignitability, corrosivity, or reactivity (EPA Hazardous Waste Numbers of D001, D002, or D003)?	☐ Yes ☒ No
Is the physical form of the waste inconsistent with the Waste Stream Description or the Waste Matrix Code?	☐ Yes ☒ No
CH or RH TRAMPAC	
Are there heat-sealed bags (unvented) GREATER than 4 liters and LESS than 390 square inches in the waste, or heat sealed bags not authorized in the RH TRUCON Code?	☐ Yes ☒ No
Were there Non-approved Closure Methods used on liner bags or inner bags greater than 4 liters?	☐ Yes ☒ No
Are there sealed containers GREATER than 4 liters?	☐ Yes ☒ No
Are there indications of inadequate protection for heavy and/or sharp objects?	☐ Yes ☒ No

Comments: N/A

RTR Operator:

Daphne Brothers	Daphne Brothers	6/25/2015
Print Name	Signature	Date

CCP Radiography Data Sheet

Section 1: General Information	
[X] RTR Examination [ ] RTR Replicate Scan [ ] RTR Independent Observation	
Site ID:	ORNL
Batch Number:	OR-RTR7-0140
Examination Date:	6/25/2015
Waste Container ID:	X10C0102692D1
Video/Audio Recorded Media Number:	OR-RTR7-0140 A&B
Procedure and Revision No.:	CCP-TP-053 Rev. 15
NCR(s) associated with the container? (e.g., Prohibited Items)	[X] No [ ] Yes NCR No.: N/A NCR No.: N/A

Section 2: Waste Container Data	
Container Type:	55 Gallon Drum
TRUCON Code:	OR 225
Waste Matrix Code:	S5400
Waste Stream I.D.:	OR-REDC-CH-HET
Waste Container Weights:	Gross Wt.: 71.1 kg Tare Wt.: 33.2 kg Net Wt.: 37.9 kg
Rigid Liner and Liner Vent Description:	Liner: [X] No [ ] Yes Lid: [X] No [ ] Yes Type: [ ] 30-mil [ ] 90-mil [ ] 110-mil [ ] 125-mil Vented: [ ] No [ ] Yes [X] N/A Punctured: [X] No [ ] Yes Mechanical Vent: [X] No [ ] Yes Fiberboard Liner: [X] No [ ] Yes Lead Lined: [X] No [ ] Yes
Number of Layers of Confinement:	Appears to be 1 layer
Volume Utilization Percentage:	90 %

CCP Radiography Data Sheet

Waste Container ID: X10C0102692D1

Section 3: Container Inventory and Comments (Detailed descriptions)	
IM:	Scrap metal, utility knife
AM:	Aluminum collars
OM:	
OI:	
C:	Cardboard
R:	Rubber gloves
XPM:	Plastic sheeting, plastic tubing, plastic suits
OR:	
IN:	
S:	

Section 4: Packaging Material and Waste Material Parameters	
Packaging Material:	**Estimated Weight (kg)**
Steel (ST):	27.8
Plastics (PP): Liner bag	1.0
Other: Cardboard (CP)	4.4
Total Packaging Weight	33.2
Waste Material Parameter:	**Estimated Weight (kg)**
Iron-based Metal / Alloys (IM):	3.7
Aluminum-based Metals / Alloys (AM):	4.0
Other Metals (OM):	
Other Inorganic Materials (OI)	
Cellulosics (C):	4.0
Rubber (R):	0.2
Plastics (waste materials) (XPM):	26.0
Organic Matrix (OR):	
Inorganic Matrix (IN):	
Soils (S):	
Total WMP Weight:	37.9

CCP Radiography Data Sheet

Waste Container ID: X10C0102692D1

Section 5: RTR Summary (Questions answered "Yes" will be explained in the Comment block, except for Question 1)	
Is there observable liquid?	☐ Yes ☒ No
Is there any observable liquid in internal containers, more than 60 milliliters or 3 percent by volume, whichever is greater?	☐ Yes ☒ No
Is the total volume of observable liquid in the outermost container GREATER than 1% of the container?	☐ Yes ☒ No
Is there observable liquid in payload containers with an EPA Hazardous Waste Number of U134?	☐ Yes ☒ No
Is there an indication of non-radionuclide pyrophoric materials, such as elemental potassium?	☐ Yes ☒ No
Is there an indication of hazardous wastes not occurring as co-contaminants with TRU mixed wastes (non-mixed hazardous wastes)?	☐ Yes ☒ No
Is there an indication of wastes incompatible with backfill, seal and panel closures materials, container and packaging materials, shipping container materials, or other wastes (i.e., waste does NOT match TRUCON Code[s])?	☐ Yes ☒ No
Is there an indication of wastes containing explosives or compressed gases?	☐ Yes ☒ No
Is there an indication of PCBs liquids?	☐ Yes ☒ No
Is there an indication of the waste exhibiting the characteristic of ignitability, corrosivity, or reactivity (EPA Hazardous Waste Numbers of D001, D002, or D003)?	☐ Yes ☒ No
Is the physical form of the waste inconsistent with the Waste Stream Description or the Waste Matrix Code?	☐ Yes ☒ No
CH or RH TRAMPAC	
Are there heat-sealed bags (unvented) GREATER than 4 liters and LESS than 390 square inches in the waste, or heat sealed bags not authorized in the RH TRUCON Code?	☐ Yes ☒ No
Were there Non-approved Closure Methods used on liner bags or inner bags greater than 4 liters?	☐ Yes ☒ No
Are there sealed containers GREATER than 4 liters?	☐ Yes ☒ No
Are there indications of inadequate protection for heavy and/or sharp objects?	☐ Yes ☒ No
Comments: N/A	
RTR Operator: Daphne Brothers (Print Name) / Signature / 6/25/2015 (Date)	

Attachment 3 – CCP Radiography Independent Technical Reviewer Checklist

Batch Data Report No.: OR-RTR7-0140

Description			
1.	Were data generation and reduction conducted in a technically correct manner in accordance with the methods used?	☐ NO	☑ YES
2.	Was the correct revision of the procedure used? Procedure: CCP-TP-053 Rev.: 15	☐ NO	☑ YES
3.	Are the WMPs entered correctly?	☐ NO	☑ YES
4.	Do the estimated weights in Section 4 of Attachment 2 equal the container gross weight?	☐ NO	☑ YES
5.	Is the data reported in the proper units with the correct number of significant figures (e.g., one tenth of a kilogram)?	☐ NO	☑ YES
6.	Was transcription used? If no, proceed to question 7.	☑ NO	☐ YES
	6a. Has the data been verified for transcription errors?	☐ NO	☐ YES
7.	Does the Testing Batch Report include radiography for up to 20 containers?	☐ NO	☑ YES
8.	Are BDR contents complete and do they match the CCP Waste RTR Batch Data Report Table of Contents?	☐ NO	☑ YES
9.	Is all the data signed and dated in reproducible ink and by the individual(s) generating it?	☐ NO	☑ YES
10.	Is all data recorded clearly, legibly, and accurately?	☐ NO	☑ YES
11.	Have changes been made to original data? If no, proceed to question 12.	☑ NO	☐ YES
	11a. Have all changes to original data been lined out, initialed and dated by *the individual making the changes*?	☐ NO	☐ YES
	11b. Was justification made for changing the original data?	☐ NO	☐ YES
	11c. Were data changes made by the individual who originally collected the data?	☐ NO	☐ YES
12.	Does the waste match the Waste Matrix Code and Waste Stream description?	☐ NO	☑ YES
13.	Are the RTR Operator's decisions regarding the Radiography documented?	☐ NO	☑ YES
14.	Is there an adequate written description of the contents of each item?	☐ NO	☑ YES
15.	Was the video/audio recording media properly prepared and labeled for each waste container?	☐ NO	☑ YES
16.	Was the video/audio recording media check performed satisfactorily and recorded on Attachment 1?	☐ NO	☑ YES

Attachment 3 – CCP Radiography Independent Technical Reviewer Checklist (Continued)

Batch Data Report No.: OR-RTR7-0140

Description			
17.	Was the Image Test performed satisfactorily and recorded on Attachment 1?	☐NO	☑YES
18.	Was the Replicate Scan performed and recorded on an Attachment 2?	☐NO	☑YES
19.	Was the Replicate Scan RTR Operator different from the first RTR Operator?	☐NO	☑YES
20.	Did the Replicate Scan RTR Operator and the first RTR Operator agree on the results?	☐NO	☑YES
21.	Was the Independent Observation performed and recorded on an Attachment 2?	☐NO	☑YES
22.	Was the Independent Observation RTR Operator different from the first RTR Operator?	☐NO	☑YES
23.	Did the Independent Observation RTR Operator and the first RTR Operator agree on the results?	☐NO	☑YES
24.	Was the data collection performed by qualified individuals?	☐NO	☑YES
25.	Were NCRs initiated as required at DGL? If no, proceed to question 26.	☑NO	☐YES
25a.	Have the NCR(s) associated with RTR been included in the BDR?	☐NO	☐YES
26.	Is the RTR examination for CH waste? If no, proceed to question 27.	☐NO	☑YES
26a.	Have the CH Quality Assurance Objectives (QAOs) been met (if applicable)? Precision – Precision is maintained by reconciling any discrepancies between two radiography operators with regard to identification of the waste matrix code, liquids in excess of TSDF-WAC limits, and compressed gases through independent replicate scans and independent observations. Additionally, the precision of radiography is verified prior to use by tuning precisely enough to demonstrate compliance with QAOs through viewing an image test pattern. Accuracy – Accuracy is obtained by using a target to tune the image for maximum sharpness and by requiring operators to successfully identify 100 percent of the items required to meet the DQOs for radiography specified in CCP-PO-001, Section C-4a(1) in a training container during their initial qualification and subsequent requalification. Completeness – A video and audio media recording of the radiography examination and a validated radiography data form will be obtained for 100 percent of the waste containers subject to radiography. All video and audio media recordings and radiography data forms will be subject to validation as indicated in CCP-PO-001, Section C3-4. Comparability – The comparability of radiography data from different operators shall be enhanced by using standardized radiography procedures and operator qualifications.	☐NO	☑YES

Attachment 3 – CCP Radiography Independent Technical Reviewer Checklist (Continued)

Batch Data Report No.: OR-RTR7-0140

Description		
27. Is the RTR examination for RH waste? If no, proceed to comment section.	☑ NO	☐ YES
27a. Have the RH QAOs been met (if applicable)? Precision – Precision is maintained by reconciling any discrepancies between two operators (during Independent Observation and Replicate scans) with regard to the identification of important waste characteristics (i.e., physical form of the waste and absence of prohibited liquids) within a single container. Accuracy – Accuracy is obtained by using a target to tune the image for maximum sharpness and by requiring operators to successfully identify prohibited liquid in a training container during their initial qualification and subsequent requalification. Representativeness – All of the relevant contents in a container selected for radiography will be described. Completeness – All of the relevant waste information must be assembled and must show that each of the containers in the waste stream belongs to the waste stream. This information must be documented on videotape or other equivalent media and data form. Comparability – Comparability is ensured by meeting the program training requirements and complying with the minimum standards used to implement the radiography process.	☐ NO	☐ YES

Comments: N/A

I have reviewed 100% of the container specific and batch data in this report and find it acceptable.

Independent Technical Reviewer:

Printed Name	Signature	Date
Eric Lytes		7/6/15

DIVIDER PAGE ONLY

Not Part of Page Count

Attachment 2 – CCP Records Transmittal/Receiving Form

CCP Records / Records Custodian, 4021 National Parks Highway - MS: GSA 212, Carlsbad, New Mexico 88220

Telephone Number: 575-234-7523

Fax Number: 575-234-7033

Attn:	CCP Records Custodian	From:	Jewell Yturralde
Ship to:	4021 National Parks Highway	Site:	ORNL
	Carlsbad NM 88220	Company:	TFE Inc.
	MS GSA 212	Telephone Number:	865-574-6002
		Date Sent:	7/8/2015
Telephone Number:	575-234-7523		

Package/Item #	Title/Description	Record Date	Item Status
OR-RTR7-0140	NDE RTR 7 VIDEO DISC B	6/25/15	N/A

Comments:

(When the Record accepted line has been completed, the rest of the page below may be left blank.)

Acceptance/Rejection Signature and Date

Records Accepted	☑	Signature	Jewell Yturralde Printed Name	7.14.15 Date
Records Rejected	☐	Signature	Printed Name	Date

Reason for Rejection:

Re-submittal:

Signature	Printed Name	Date

****
*** Send Results ***
****

Sending is complete.

Job No.	0998
Address	918655768703
Name	ORNL
Start Time	07/14 09:03 AM
Call Length	00'20
Sheets	1
Result	OK

Attachment 2 – CCP Records Transmittal/Receiving Form

CCP Records / Records Custodian, 4021 National Parks Highway - MS: GSA 212, Carlsbad, New Mexico 88220

Telephone Number: 575-234-7523

Fax Number: 575-234-7033

Attn:	CCP Records Custodian	From:	Jewell Yturralde
Ship to:	4021 National Parks Highway	Site:	ORNL
	Carlsbad NM 88220	Company:	TFE Inc.
	MS GSA 212	Telephone Number:	865-574-6002
		Date Sent:	7/8/2015
Telephone Number:	575-234-7523		

OR-RTR7-0140	NDE RTR 7 VIDEO DISC B	6/25/15	N/A

(When the Record accepted line has been completed, the rest of the page below may be left blank.)

Acceptance/Rejection Signature and Date

Records Accepted ☑ Signature Jewell Yturralde Printed Name 7-14-15 Date

Records Rejected ☐

Attachment 2 – CCP Records Transmittal/Receiving Form

CCP Records / Records Custodian, 4021 National Parks Highway - MS: GSA 212, Carlsbad, New Mexico 88220

Telephone Number: 575-234-7523

Fax Number: 575-234-7033

Attn:	CCP RECORDS	From:	PATRICK SMITH II
Ship to:	CCP RECORDS CUSTODIAN	Site:	ORNL
	4021 NATIONAL PARKS HWY.	Company:	TFE INC.
	MS GSA 212	Telephone Number:	865-574-6002
	CARLSBAD, NM 88220-9082	Date Sent:	7-20-2015
Telephone Number:	575-234-7523		

Document Number	Title/Description	Records Date	Storage Time
OR-RTR7-0140	RTR BDR	6-25-2015	45
OR-RTR7-0140	RTR DVD (DISK A)	6-25-2015	N/A
N/A	N/A	N/A	N/A
N/A	N/A	N/A	N/A
N/A	N/A	N/A	N/A
N/A	N/A	N/A	N/A

Comments

N/A

(When the Record accepted line has been completed, the rest of the page below may be left blank.)
Acceptance/Rejection Signature and Date

Records Accepted ☑	Signature	Printed Name	Date
	Signature	Printed Name	Date
Records Rejected ☐	Signature	Printed Name	Date

Reason for Rejection:

Re-submittal:

Signature	Printed Name	Date

****
*** Send Results ***
****

Sending is complete.

Job No.	1115
Address	918655768703
Name	ORNL
Start Time	07/22 09:10 AM
Call Length	00'31
Sheets	1
Result	OK

Attachment 2 – CCP Records Transmittal/Receiving Form

CCP Records / Records Custodian, 4021 National Parks Highway - MS: GSA 212, Carlsbad, New Mexico 88220

Telephone Number: 575-234-7523

Fax Number: 575-234-7033

Attn:	CCP RECORDS	From:	PATRICK SMITH II
Ship to:	CCP RECORDS CUSTODIAN	Site:	ORNL
	4021 NATIONAL PARKS HWY.	Company:	TFE INC.
	MS GSA 212	Telephone Number:	865-574-6002
	CARLSBAD, NM 88220-9082	Date Sent:	7-20-2015
Telephone Number:	575-234-7523		

OR-RTR7-0140	RTR BDR	6-25-2015	45
OR-RTR7-0140	RTR DVD (DISK A)	6-25-2015	N/A
N/A	N/A	N/A	N/A
N/A	N/A	N/A	N/A
N/A	N/A	N/A	N/A
N/A	N/A	N/A	N/A

N/A

(When the Record accepted line has been completed, the rest of the page below may be left blank.)
Acceptance/Rejection Signature and Date

Records Accepted ☑ Signature Jarvis Hurralde Printed Name 7-22-15. Date

Records Rejected ☐ _____

Attachment 2 – CCP SPM Radiography Project Level Validation Checklist and Summary

BDR Number: OR-RTR7-0102				Examination Date(s): 09/18/2014
Description of Criteria Reviewed	Criteria Met? YES	NO	NA	Comments/Qualifiers
1. Is the completed, signed, and dated Independent Technical Reviewer Checklist included in the BDR, and the independent technical reviewer was not involved in the generation or recording of the data under review? **Reference Source: CCP-PO-001, C3-4**	X			
2. Does the BDR contain all items addressed in the BDR Table of Contents? **Reference Source: CCP-PO-001, C3-4**	X			
3. Does the BDR include a listing of all the container numbers in the batch? **Reference Source: CCP-PO-001, C3-4**	X			
4. List all containers that have met QAOs. **Reference Source: CCP-PO-001, C3-4**				Container Numbers: NFS0900B NFS0757A NFS0900A NFS0900C NFS0889A NFS0855C NFS0604B NFS0882C NFS0893C
5. Does the BDR identify the current implementing procedure and revision number? **Reference Source: CCP-PO-001, Table C3-3**	X			
6. Is there a reference to or copy of any associated NCRs (if any) in the BDR? NA if no NCRs. **Reference Source: CCP-PO-001, Table C3-3**	CJ 11/5/14 X		~~X~~	NCR-ORNL-0856-14) CJ 11/5/14 Use-as-is
7. Are there 20 or fewer containers in the batch? **Reference Source: CCP-PO-001, C3-4**	X			
8. Are the data properly reported (i.e., data are reported in correct units and with correct significant figures)? **Reference Source: CCP-PO-001, C3-4**	X			
9. Is there evidence of verification that the physical form matches the Waste Matrix Code? **Reference Source: CCP-PO-001, Table C3-3**	X			

NTPC RECORDS ORIGINAL
DATE RECD 9-24-14 GL

Attachment 2 – CCP SPM Radiography Project Level Validation Checklist and Summary (Continued)

BDR Number: OR-RTR7-0102				**Examination Date(s): 09/18/2014**
Description of Criteria Reviewed	**Criteria Met?**			**Comments/Qualifiers**
	YES	**NO**	**NA**	
10. Is there evidence of verification that the physical form matches the waste stream description? **Reference Source: CCP-PO-001, Table C3-3**	X			
11. Are prohibited items absent? **Reference Source: CCP-PO-001, Table C3-3**	X			
12. Does observable liquid, if present, meet the criteria of the TSDF-WAC? **Reference Source: CCP-PO-001, C-1**			X	No observable liquid.
13. Were discrepancies between two operators with regard to identification of waste matrix code, liquids in excess of the TSDF-WAC, or compressed gases through replicate scans and independent observations reconciled? NA if no discrepancies. **Reference Source: CCP-PO-001, C3-2**			X	
14. Are the training qualifications for all radiography personnel acceptable? **Reference Source: CCP-PO-001, C3-8**	X			
15. Was evidence of the video/audio check included in the BDR? **Reference Source: CCP-PO-001, C1-1**	X			
16. Was the Lines-Pair Resolution Test or Sieve Test Check included in the BDR? **Reference Source: CCP Technical Procedures**	X			
17. Was a replicate scan performed once per day, or once per batch, whichever is LESS frequent? **Reference Source: CCP-PO-001, C1-1**	X			
18. Was an independent observation performed once per day, or once per batch, whichever is LESS frequent? **Reference Source: CCP-PO-001, C1-1**	X			

Attachment 2 – CCP SPM Radiography Project Level Validation Checklist and Summary (Continued)

BDR Number: OR-RTR7-0102	**Examination Date(s): 09/18/2014**			
Description of Criteria Reviewed	**Criteria Met?**			**Comments/Qualifiers**
	YES	**NO**	**NA**	
19. Were the replicate scan and independent observation performed on different waste containers? **Reference Source: CCP-PO-001, C1-1**	X			
20. Were the personnel performing the replicate scan and independent observation different from the individual who performed the original? **Reference Source: CCP-PO-001, C1-1**	X			
21. Does the BDR include an estimate of each material parameter weight in kg for each container? **Reference Source: CCP Technical Procedures**	X			
22. Does the BDR include a description of each material parameter for each container? **Reference Source: CCP Technical Procedures**	X			
23. Is the container gross weight recorded in kilograms (kg) for each container in the BDR? **Reference Source: CCP Technical Procedures**	X			
24. Was the Scale Weight Calibration Check included in the BDR? **Reference Source: CCP Technical Procedures**			X	Scale not used.
25. Was the Scale Weight Check included in the BDR? **Reference Source: CCP Technical Procedures**			X	Scale not used.
Comments: ~~None~~ See SPM1-067 CS 11/5/14 CS 11/5/14				
The container QC checks were properly performed and meet the Quality Assurance Objectives (QAOs). Proper procedures were followed during data reduction and analysis. The batch is complete, acceptable, and includes all supporting data and documentation required by the QAPjP.				
Carolina Soaterna — SPM Printed Name	Carolina Soaterna — Signature			9/23/14 — Date

Checklist is to be re-signed only when a re-review is performed.

SPM Printed Name	Signature	Reason	Date
Carolina Soaterna	Carolina Soaterna	NCE ORNL-0856 rf	11/5/14

Attachment 1 – CCP Nonconformance Report (NCR)

CCP NONCONFORMANCE REPORT (NCR)

(Use NCR Continuation, Attachment 3, if necessary)

NCR No. NCR-ORNL-0856-14 Revision 0

1. Lot No., Heat No., or Serial No. (if applicable): N/A	2. Process (e.g., NDA, NDE, VE, Other): NDE	3. Batch Data Report #(s): OR-RTR7-0102
4. Order/Work Order/Job Control Number (if applicable): N/A	5. PO # (if applicable): N/A	Container #(s): NFS0889A
	6. Supplier (if applicable): N/A	

DESCRIPTION OF NONCONFORMANCE

7a. NCR Description: ☐ < 100 nCi/g ☐ Prohibited Item ☐ E-Flag ☐ Receipt Inspection ☐ Transportation ☐ WWIS/WDS ☒ Other

7b. Requirement(s) (Enter Implementing Procedure No., Revision, Section No., & Quoted Text):

CCP-QP-008 Rev. 23 CCP Records Management
Section 4.7.1 Make necessary changes, additions, revisions and supplements in accordance with the following guidelines
[A] Corrections
[A.1] Correct errors by drawing a single line through the incorrect information (leaving the original text readable), entering the correct information, AND initialing and dating each correction made.

7c. Actual Condition:

Operator failed to initial and date comment made in CCP-TP-053 Attachment 2, Section 5 (CCP Radiography Data Sheet).

7d. Have the CCP HOLD TAGS associated with this NCR been applied? ☐ YES ☒ NO If no is checked, explain:

Final Disposition is Use-As-Is

8. NCR Originator:

Carolina Soaterna (printed name) Carolina Soaterna (signature) 11/5/14 (date)

9. Does the identified condition have the potential to impact AK? If YES or INDETERMINATE, enter Trend Code L in Block 10. ☐ YES ☒ NO ☐ INDETERMINATE

10. Trend Code: A

11. Responsible Manager: **Beverly S. Schrock**

12. Significant Condition? ☐ YES ☒ NO (If Yes, enter WIPP Form No.):

13. Recurring Condition? ☐ YES ☒ NO (If Yes, list NCRs and WIPP Forms):

14. QA Engineer or QA Designee validation:

Laura Jones (printed name) Laura Ramos Jones (signature) 11/05/14 (date)

COPY

SPM 11/5/14

CCP RECORDS ORIGINAL
DATE REC'D 11-05-14

Attachment 1 – CCP Nonconformance Report (NCR) (Continued)

NCR No. NCR-ORNL-0856-14 Revision 0

INTERIM DISPOSITION

15a. Interim Disposition (Check Only One):

☒ N/A (See Final Disposition) ☐ Hold ☐ Conditionally Accept ☐ Conditionally Use

☐ Sort ☐ Reinspect or Retest ☐ Remediate

15b. Instructions for Completion of the Interim Disposition:

INTERIM DISPOSITION APPROVALS

16a. Responsible Manager or Individual:

printed name _____ signature _____ date _____

16b. QA Engineer or QA Designee:

printed name _____ signature _____ date _____

Additional Approval:

printed name _____ signature _____ date _____

Additional Approval:

printed name _____ signature _____ date _____

COMPLETION OF INTERIM DISPOSITION

17. Interim Disposition Complete – Responsible Manager or Individual:

printed name _____ signature _____ date _____

18. Interim Disposition Verified – QA Engineer:

printed name _____ signature _____ date _____

SPM2 CS 11/5/14

Attachment 1 – CCP Nonconformance Report (NCR) (Continued)

NCR No. NCR-ORNL-0856-14 Revision 0

FINAL DISPOSITION

19. Final Disposition (Check Only One: Use-As-Is, Repair, Reject, Rework, or Scrap):
☒ Use-As-Is ☐ Repair

19a. Technical Justification – Required for Use-As-Is or Repair dispositions. [☐ N/A for Reject, Rework, or Scrap]
Operator provided email confirming the statement written in comment section for container NFS0889A is appropriate. Therefore there were no data affecting changes.

☐ Reject ☐ Rework ☐ Scrap

19b. Instructions for Completion – Required for Reject, Repair, Rework, or Scrap [☒ N/A for Use-As-Is]

19c. Corrective Actions (Actions to Prevent Recurrence – For Repair or Rework, if applicable.
[☒ N/A if not applicable, and for Use-As-Is, Reject, and Scrap]

FINAL DISPOSITION APPROVALS

20. Responsible Manager or Individual:
Carolina Soaterna (printed name) — Carolina Soaterna (signature) — 11/5/14 (date)

21. QA Engineer or QA Designee:
Laura Jones (printed name) — Laura Ramey Jones (signature) — 11/5/14 (date)

Additional Approval:
printed name — signature — date

Additional Approval:
printed name — signature — date

CLOSURE

22. Final Disposition Complete - Responsible Manager or Individual:
Carolina Soaterna (printed name) — Carolina Soaterna (signature) — 11/5/14 (date)

23. Attachments: 1.– Email Documenting Reportability. 2.– Basis for NCR Closure.

24a. HOLD TAG removal has been verified and reconciled for all nonconforming items on the NCR: ☐
24b. If HOLD TAG is not applicable, check: ☒ and explain:
See Section 7d.

25. Final Disposition Verified – NCR Closed QA Engineer:
Laura R. Jones (printed name) — Laura Ramey Jones (signature) — 11/05/2014 (date)

SPR3 EJ 11/5/14

Jones, Laura - NWP

From: Ramirez, Mike - NWP
Sent: Wednesday, November 05, 2014 12:55 PM
To: Jones, Laura - NWP
Subject: RE: New NCR-ORNL-0856-14

Not reportable

Mike Ramirez
Central Characterization Project
Nuclear Waste Partnership LLC
Contractor for the U.S. Department of Energy
(575)-234-7034

From: Jones, Laura - NWP
Sent: Wednesday, November 05, 2014 12:44 PM
To: Leos, Greta - TFE; Navarrete, Leon - TFE; Pearcy, Sheila - TFE; Ramirez, Mike - NWP; Reeves, Ron - NWP; Schrock, Beverly - NWP; Stallings, Andrew - ORNL; Wade, Daniel NWP; Harmon, LaTravia - NWP; Soaterna, Carolina - NWP
Cc: Walker, Mak (Maryann) - NWP; Waldram, Veronica - NWP; Ledford, Wayne - NWP; Jones, Laura - NWP
Subject: New NCR-ORNL-0856-14

All – For your information.
Mike – Please review for notification purposes.
Greta – Please post this open NCR.

Thanks and Best Regards

Laura R. Jones
Quality Assurance NCR Coordinator
Nuclear Waste Partnership, LLC
Contractor for the U.S. Department of Energy
575-234-7244 (office)
Email: laura.jones@wipp.ws

NCR -ORNL-0856-14 Rev. 0
Attachment 1 Page 1 of 2

SP74 CS 11/5/14

Jones, Laura - NWP

From: IDC (No Reply) <NOREPLY@wipp.ws>
Sent: Wednesday, November 05, 2014 1:31 PM
To: DL CCP QA CBFO Notify
Subject: Project Office NCR [NCR-ORNL0856140] was just reviewed.

Certification Manager/Designee has just reviewed the project office NCR NCR-ORNL0856140 and has indicated that it [should **NOT**] be reported to CBFO. IDC has already updated the NCR for you.

NCR-ORNL-0856-14 Rev.0

Attachment 1 Page 2 of 2

SM5 11/5/14

Hello,

After discussion with the RTR LO at the TWPC, I understand the intent and do agree that the statement included in the comment section on page 24 of Batch OR-RTR7-0102, container ID NFS0889A, dated 9/18/14 was hand written by me on the date that the RTR was performed.

Robert Stephen (Steve) Redmond
VJT, NDE operator contracted to
NWP
Cell phone: 803-671-2142

NCR-ORNL-0856-14 Rev. 0

Attachment 2 Page 1 of 2

SP 7G
09/15/14

Soaterna, Carolina - NWP

From: steve redmond <redmond1969@live.com>
Sent: Tuesday, November 04, 2014 1:45 PM
To: Soaterna, Carolina - NWP
Cc: fred oney; fred.oney@truproject.com
Subject: OR-RTR7-0102, NFS0889A
Attachments: OR-RTR7-0102.doc

Here is the requested email.

NCR - ORNL-0856-14 Rev. 6
Attachment 2 Page 2 of 2

SP77 CJ 11/5/14

Attachment 5–CCP Radiography Batch Data Report Cover Sheet

Site ID: ORNL

Batch Data Report No.: OR-RTR7-0102 ☑ CH ☐ RH Date: 9/18/14

Waste Container ID Numbers	
Replicate Scan:	NFS0757A
Independent Observation:	NFS0900B
1	NFS0900B
2	NFS0757A
3	NFS0900A
4	NFS0900C
5	~~NFS0899A~~ NFS0889A 9-18-14
6	NFS0855C
7	NFS0604B
8	NFS0882C
9	NFS0893C
10	N/A
11	N/A
12	N/A
13	N/A
14	N/A
15	N/A
16	N/A
17	N/A
18	N/A
19	N/A
20	N/A

RTR Operator:

Steve Redmond		9/18/14
Printed Name	Signature	Date

Independent Technical Reviewer:

Fred Owsley		9-22-14
Printed Name	Signature	Date

NTPC RECORDS ORIGINAL
DATE REC'D 9-22-2014
PII

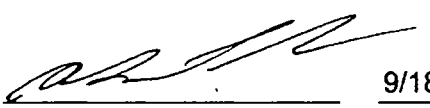
Attachment 4 – CCP Radiography Batch Data Report Table of Contents and Batch Narrative

Batch Data Report No.: OR-RTR7-0102 Date: 9/18/14

Table Of Contents		
Item	Description	Page No.
1	CCP Radiography Batch Data Report Cover Sheet	1
2	CCP Radiography Batch Data Report Table Of Contents	2
3	CCP RTR Measurement Control Report	3
4	CCP Radiography Data Sheets	4
5	Copy of NCRs (NA, If Not Applicable)	N/A
6	CCP Independent Technical Reviewer Checklist	37

Batch Narrative
All Quality Checks were performed and recorded on CCP-TP-053, Rev. 15 CCP Radiography Measurement Control Report.

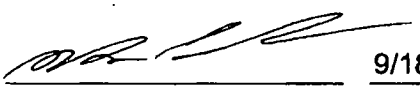
Steve Redmond — RTR Operator


Signature

9/18/14 — Date

2

Attachment 1 – CCP RTR Measurement Control Report

Site ID: ORNL		
Batch Data Report No.: OR-RTR7-0102		
Examination Date: 9/18/14		
Control Checks		
Video/Audio Recorded Media System Check	☑ SAT	☐ UNSAT
Image Test : 12 Lines (Minimum acceptable is 5 lines-pair/cm or #6 Sieve is viewable)	☑ SAT	☐ UNSAT
Comments: N/A		
RTR Operator:		
Steve Redmond (Printed Name)	 (Signature)	9/18/14 (Date)

3

CCP Radiography Data Sheet

CCP-TP-053 Attachment 2

Section 1: General Information	
☐ RTR Examination ☒ RTR Replicate Scan ☐ RTR Independent Observation	
Site ID:	ORNL
Batch Number:	OR-RTR7-0102
Examination Date:	9/18/2014
Waste Container ID:	NFS0757A
Video/Audio Recorded Media Number:	OR-RTR7-0102 A&B
Procedure and Revision No.:	CCP-TP-053 Rev. 15
NCR(s) associated with the container? (e.g., Prohibited Items)	☒ No ☐ Yes NCR No.: N/A NCR No.: N/A

Section 2: Waste Container Data	
Container Type:	55 Gallon Drum
TRUCON Code:	OR 227
Waste Matrix Code:	S3900
Waste Stream I.D.:	OR-NFS-CH-HOM-A
Waste Container Weights:	Gross Wt.: 52.9 kg Tare Wt.: 43.8 kg Net Wt.: 9.1 kg
Rigid Liner and Liner Vent Description:	Liner: ☒ No ☐ Yes Lid: ☒ No ☐ Yes Type: ☐ 30-mil ☐ 90-mil ☐ 110-mil ☐ 125-mil Vented: ☐ No ☐ Yes ☒ N/A Punctured: ☒ No ☐ Yes Mechanical Vent: ☒ No ☐ Yes Fiberboard Liner: ☒ No ☐ Yes Lead Lined: ☒ No ☐ Yes
Number of Layers of Confinement:	Appears to be 1 layer
Volume Utilization Percentage:	90 %

4

CCP Radiography Data Sheet

Waste Container ID: NFS0757A

Section 3: Container Inventory and Comments (Detailed descriptions)

IM: Scrap metal, metal hardware

AM:

OM:

OI:

C:

R:

XPM: Plastic sheeting, plastic containers

OR: Absorbent

IN:

S:

Section 4: Packaging Material and Waste Material Parameters

Packaging Material:	**Estimated Weight (kg)**
Steel (ST):	27.8
Plastics (PP):Liner bag	1.0
Other: Cardboard tube inserts (CP)	15.0
Total Packaging Weight	43.8
Waste Material Parameter:	**Estimated Weight (kg)**
Iron-based Metal / Alloys (IM):	3.0
Aluminum-based Metals / Alloys (AM):	
Other Metals (OM):	
Other Inorganic Materials (OI)	
Cellulosics (C):	
Rubber (R):	
Plastics (waste materials) (XPM):	3.0
Organic Matrix (OR):	3.1
Inorganic Matrix (IN):	
Soils (S):	
Total WMP Weight:	9.1

5

CCP Radiography Data Sheet

Waste Container ID: NFS0757A

Section 5: RTR Summary (Questions answered "Yes" will be explained in the Comment block, except for Question 1)	
Is there observable liquid?	☐ Yes ☒ No
Is there any observable liquid in internal containers, more than 60 milliliters or 3 percent by volume, whichever is greater?	☐ Yes ☒ No
Is the total volume of observable liquid in the outermost container GREATER than 1% of the container?	☐ Yes ☒ No
Is there observable liquid in payload containers with an EPA Hazardous Waste Number of U134?	☐ Yes ☒ No
Is there an indication of non-radionuclide pyrophoric materials, such as elemental potassium?	☐ Yes ☒ No
Is there an indication of hazardous wastes not occurring as co-contaminants with TRU mixed wastes (non-mixed hazardous wastes)?	☐ Yes ☒ No
Is there an indication of wastes incompatible with backfill, seal and panel closures materials, container and packaging materials, shipping container materials, or other wastes (i.e., waste does NOT match TRUCON Code[s])?	☐ Yes ☒ No
Is there an indication of wastes containing explosives or compressed gases?	☐ Yes ☒ No
Is there an indication of PCBs liquids?	☐ Yes ☒ No
Is there an indication of the waste exhibiting the characteristic of ignitability, corrosivity, or reactivity (EPA Hazardous Waste Numbers of D001, D002, or D003)?	☐ Yes ☒ No
Is the physical form of the waste inconsistent with the Waste Stream Description or the Waste Matrix Code?	☐ Yes ☒ No
CH or RH TRAMPAC	
Are there heat-sealed bags (unvented) GREATER than 4 liters and LESS than 390 square inches in the waste, or heat sealed bags not authorized in the RH TRUCON Code?	☐ Yes ☒ No
Were there Non-approved Closure Methods used on liner bags or inner bags greater than 4 liters?	☐ Yes ☒ No
Are there sealed containers GREATER than 4 liters?	☐ Yes ☒ No
Are there indications of inadequate protection for heavy and/or sharp objects?	☐ Yes ☒ No

Comments: This Replicate Scan agrees with the original Scan. DB 9-18-14

RTR Operator:

Daphne Brothers	Daphne D Brothers	9/18/2014
Print Name	Signature	Date

6

CCP Radiography Data Sheet

Section 1: General Information	
☐ RTR Examination ☐ RTR Replicate Scan ☒ RTR Independent Observation	
Site ID:	ORNL
Batch Number:	OR-RTR7-0102
Examination Date:	9/18/2014
Waste Container ID:	NFS0900B
Video/Audio Recorded Media Number:	OR-RTR7-0102 A&B
Procedure and Revision No.:	CCP-TP-053 Rev. 15
NCR(s) associated with the container? (e.g., Prohibited Items)	☒ No ☐ Yes NCR No.: N/A NCR No.: N/A

Section 2: Waste Container Data	
Container Type:	55 Gallon Drum
TRUCON Code:	OR 225
Waste Matrix Code:	S5400
Waste Stream I.D.:	OR-NFS-CH-HET-A
Waste Container Weights:	Gross Wt.: 133.7 kg Tare Wt.: 33.2 kg Net Wt.: 100.5 kg
Rigid Liner and Liner Vent Description:	Liner: ☒ No ☐ Yes Lid: ☒ No ☐ Yes Type: ☐ 30-mil ☐ 90-mil ☐ 110-mil ☐ 125-mil Vented: ☐ No ☐ Yes ☒ N/A Punctured: ☒ No ☐ Yes Mechanical Vent: ☒ No ☐ Yes Fiberboard Liner: ☒ No ☐ Yes Lead Lined: ☒ No ☐ Yes
Number of Layers of Confinement:	Appears to be 1 layer
Volume Utilization Percentage:	65 %

7

CCP Radiography Data Sheet

Waste Container ID: NFS0900B

Section 3: Container Inventory and Comments	(Detailed descriptions)
IM:	Scrap metal, saw blade
AM:	
OM:	
OI:	Absorbent
C:	
R:	
XPM:	Scrap plastic, plastic sheeting, plastic tubing
OR:	
IN:	
S:	

Section 4: Packaging Material and Waste Material Parameters	
Packaging Material:	**Estimated Weight (kg)**
Steel (ST):	27.8
Plastics (PP):Liner bag	1.0
Other: Cardboard liner (CP)	4.4
Total Packaging Weight	33.2
Waste Material Parameter:	**Estimated Weight (kg)**
Iron-based Metal / Alloys (IM):	80.0
Aluminum-based Metals / Alloys (AM):	
Other Metals (OM):	
Other Inorganic Materials (OI)	7.5
Cellulosics (C):	
Rubber (R):	
Plastics (waste materials) (XPM):	13.0
Organic Matrix (OR):	
Inorganic Matrix (IN):	
Soils (S):	
Total WMP Weight:	100.5

CCP Radiography Data Sheet

Waste Container ID: NFS0900B

Section 5: RTR Summary (Questions answered "Yes" will be explained in the Comment block, except for Question 1)	
Is there observable liquid?	☐ Yes ☒ No
Is there any observable liquid in internal containers, more than 60 milliliters or 3 percent by volume, whichever is greater?	☐ Yes ☒ No
Is the total volume of observable liquid in the outermost container GREATER than 1% of the container?	☐ Yes ☒ No
Is there observable liquid in payload containers with an EPA Hazardous Waste Number of U134?	☐ Yes ☒ No
Is there an indication of non-radionuclide pyrophoric materials, such as elemental potassium?	☐ Yes ☒ No
Is there an indication of hazardous wastes not occurring as co-contaminants with TRU mixed wastes (non-mixed hazardous wastes)?	☐ Yes ☒ No
Is there an indication of wastes incompatible with backfill, seal and panel closures materials, container and packaging materials, shipping container materials, or other wastes (i.e., waste does NOT match TRUCON Code[s])?	☐ Yes ☒ No
Is there an indication of wastes containing explosives or compressed gases?	☐ Yes ☒ No
Is there an indication of PCBs liquids?	☐ Yes ☒ No
Is there an indication of the waste exhibiting the characteristic of ignitability, corrosivity, or reactivity (EPA Hazardous Waste Numbers of D001, D002, or D003)?	☐ Yes ☒ No
Is the physical form of the waste inconsistent with the Waste Stream Description or the Waste Matrix Code?	☐ Yes ☒ No
CH or RH TRAMPAC	
Are there heat-sealed bags (unvented) GREATER than 4 liters and LESS than 390 square inches in the waste, or heat sealed bags not authorized in the RH TRUCON Code?	☐ Yes ☒ No
Were there Non-approved Closure Methods used on liner bags or inner bags greater than 4 liters?	☐ Yes ☒ No
Are there sealed containers GREATER than 4 liters?	☐ Yes ☒ No
Are there indications of inadequate protection for heavy and/or sharp objects?	☐ Yes ☒ No

Comments: This Independent Observation agrees with the original scan. DB 9-18-14

RTR Operator:

Daphne Brothers	Daphne Brothers	9/18/2014
Print Name	Signature	Date

CCP Radiography Data Sheet

Section 1: General Information	
[X] RTR Examination [ ] RTR Replicate Scan [ ] RTR Independent Observation	
Site ID:	ORNL
Batch Number:	OR-RTR7-0102
Examination Date:	9/18/2014
Waste Container ID:	NFS0900B
Video/Audio Recorded Media Number:	OR-RTR7-0102 A&B
Procedure and Revision No.:	CCP-TP-053 Rev. 15
NCR(s) associated with the container? (e.g., Prohibited Items)	[X] No [ ] Yes NCR No.: N/A NCR No.: N/A

Section 2: Waste Container Data	
Container Type:	55 Gallon Drum
TRUCON Code:	OR 225
Waste Matrix Code:	S5400
Waste Stream I.D.:	OR-NFS-CH-HET-A
Waste Container Weights:	Gross Wt.: 133.7 kg Tare Wt.: 33.2 kg Net Wt.: 100.5 kg
Rigid Liner and Liner Vent Description:	Liner: [X] No [ ] Yes Lid: [X] No [ ] Yes Type: [ ] 30-mil [ ] 90-mil [ ] 110-mil [ ] 125-mil Vented: [ ] No [ ] Yes [X] N/A Punctured: [X] No [ ] Yes Mechanical Vent: [X] No [ ] Yes Fiberboard Liner: [X] No [ ] Yes Lead Lined: [X] No [ ] Yes
Number of Layers of Confinement:	Appears to be 1 layer
Volume Utilization Percentage:	65 %

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CCP Radiography Data Sheet

Waste Container ID: NFS0900B

Section 3: Container Inventory and Comments	(Detailed descriptions)
IM:	Scrap metal, saw blade
AM:	
OM:	
OI:	Absorbent
C:	
R:	
XPM:	Scrap plastic, plastic sheeting, plastic tubing
OR:	
IN:	
S:	

Section 4: Packaging Material and Waste Material Parameters	
Packaging Material:	**Estimated Weight (kg)**
Steel (ST):	27.8
Plastics (PP):Liner bag	1.0
Other: Cardboard liner (CP)	4.4
Total Packaging Weight	33.2
Waste Material Parameter:	**Estimated Weight (kg)**
Iron-based Metal / Alloys (IM):	80.0
Aluminum-based Metals / Alloys (AM):	
Other Metals (OM):	
Other Inorganic Materials (OI)	8.0
Cellulosics (C):	
Rubber (R):	
Plastics (waste materials) (XPM):	12.5
Organic Matrix (OR):	
Inorganic Matrix (IN):	
Soils (S):	
Total WMP Weight:	100.5

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CCP Radiography Data Sheet

Waste Container ID: NFS0900B

Section 5: RTR Summary (Questions answered "Yes" will be explained in the Comment block, except for Question 1)	
Is there observable liquid?	☐ Yes ☒ No
Is there any observable liquid in internal containers, more than 60 milliliters or 3 percent by volume, whichever is greater?	☐ Yes ☒ No
Is the total volume of observable liquid in the outermost container GREATER than 1% of the container?	☐ Yes ☒ No
Is there observable liquid in payload containers with an EPA Hazardous Waste Number of U134?	☐ Yes ☒ No
Is there an indication of non-radionuclide pyrophoric materials, such as elemental potassium?	☐ Yes ☒ No
Is there an indication of hazardous wastes not occurring as co-contaminants with TRU mixed wastes (non-mixed hazardous wastes)?	☐ Yes ☒ No
Is there an indication of wastes incompatible with backfill, seal and panel closures materials, container and packaging materials, shipping container materials, or other wastes (i.e., waste does NOT match TRUCON Code[s])?	☐ Yes ☒ No
Is there an indication of wastes containing explosives or compressed gases?	☐ Yes ☒ No
Is there an indication of PCBs liquids?	☐ Yes ☒ No
Is there an indication of the waste exhibiting the characteristic of ignitability, corrosivity, or reactivity (EPA Hazardous Waste Numbers of D001, D002, or D003)?	☐ Yes ☒ No
Is the physical form of the waste inconsistent with the Waste Stream Description or the Waste Matrix Code?	☐ Yes ☒ No
CH or RH TRAMPAC	
Are there heat-sealed bags (unvented) GREATER than 4 liters and LESS than 390 square inches in the waste, or heat sealed bags not authorized in the RH TRUCON Code?	☐ Yes ☒ No
Were there Non-approved Closure Methods used on liner bags or inner bags greater than 4 liters?	☐ Yes ☒ No
Are there sealed containers GREATER than 4 liters?	☐ Yes ☒ No
Are there indications of inadequate protection for heavy and/or sharp objects?	☐ Yes ☒ No
Comments:N/A	

RTR Operator:

Steve Redmond		9/18/2014
Print Name	Signature	Date

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CCP Radiography Data Sheet

Section 1: General Information	
[X] RTR Examination [ ] RTR Replicate Scan [ ] RTR Independent Observation	
Site ID:	ORNL
Batch Number:	OR-RTR7-0102
Examination Date:	9/18/2014
Waste Container ID:	NFS0757A
Video/Audio Recorded Media Number:	OR-RTR7-0102 A&B
Procedure and Revision No.:	CCP-TP-053 Rev. 15
NCR(s) associated with the container? (e.g., Prohibited Items)	[X] No [ ] Yes NCR No.: N/A NCR No.: N/A

Section 2: Waste Container Data	
Container Type:	55 Gallon Drum
TRUCON Code:	OR 227
Waste Matrix Code:	S3900
Waste Stream I.D.:	OR-NFS-CH-HOM-A
Waste Container Weights:	Gross Wt.: 52.9 kg Tare Wt.: 43.8 kg Net Wt.: 9.1 kg
Rigid Liner and Liner Vent Description:	Liner: [X] No [ ] Yes Lid: [X] No [ ] Yes Type: [ ] 30-mil [ ] 90-mil [ ] 110-mil [ ] 125-mil Vented: [ ] No [ ] Yes [X] N/A Punctured: [X] No [ ] Yes Mechanical Vent: [X] No [ ] Yes Fiberboard Liner: [X] No [ ] Yes Lead Lined: [X] No [ ] Yes
Number of Layers of Confinement:	Appears to be 1 layer
Volume Utilization Percentage:	90 %

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CCP Radiography Data Sheet

Waste Container ID: NFS0757A

Section 3: Container Inventory and Comments (Detailed descriptions)	
IM:	Metal hardware, scrap metal
AM:	
OM:	
OI:	
C:	
R:	
XPM:	Plastic containers, plastic sheeting
OR:	Absorbent
IN:	
S:	

Section 4: Packaging Material and Waste Material Parameters	
Packaging Material:	**Estimated Weight (kg)**
Steel (ST):	27.8
Plastics (PP):Liner bag	1.0
Other: Cardboard tube inserts (CP)	15.0
Total Packaging Weight	43.8
Waste Material Parameter:	**Estimated Weight (kg)**
Iron-based Metal / Alloys (IM):	3.1
Aluminum-based Metals / Alloys (AM):	
Other Metals (OM):	
Other Inorganic Materials (OI)	
Cellulosics (C):	
Rubber (R):	
Plastics (waste materials) (XPM):	3.0
Organic Matrix (OR):	3.0
Inorganic Matrix (IN):	
Soils (S):	
Total WMP Weight:	9.1

CCP Radiography Data Sheet

Waste Container ID: NFS0757A

Section 5: RTR Summary (Questions answered "Yes" will be explained in the Comment block, except for Question 1)	
Is there observable liquid?	☐ Yes ☒ No
Is there any observable liquid in internal containers, more than 60 milliliters or 3 percent by volume, whichever is greater?	☐ Yes ☒ No
Is the total volume of observable liquid in the outermost container GREATER than 1% of the container?	☐ Yes ☒ No
Is there observable liquid in payload containers with an EPA Hazardous Waste Number of U134?	☐ Yes ☒ No
Is there an indication of non-radionuclide pyrophoric materials, such as elemental potassium?	☐ Yes ☒ No
Is there an indication of hazardous wastes not occurring as co-contaminants with TRU mixed wastes (non-mixed hazardous wastes)?	☐ Yes ☒ No
Is there an indication of wastes incompatible with backfill, seal and panel closures materials, container and packaging materials, shipping container materials, or other wastes (i.e., waste does NOT match TRUCON Code[s])?	☐ Yes ☒ No
Is there an indication of wastes containing explosives or compressed gases?	☐ Yes ☒ No
Is there an indication of PCBs liquids?	☐ Yes ☒ No
Is there an indication of the waste exhibiting the characteristic of ignitability, corrosivity, or reactivity (EPA Hazardous Waste Numbers of D001, D002, or D003)?	☐ Yes ☒ No
Is the physical form of the waste inconsistent with the Waste Stream Description or the Waste Matrix Code?	☐ Yes ☒ No
CH or RH TRAMPAC	
Are there heat-sealed bags (unvented) GREATER than 4 liters and LESS than 390 square inches in the waste, or heat sealed bags not authorized in the RH TRUCON Code?	☐ Yes ☒ No
Were there Non-approved Closure Methods used on liner bags or inner bags greater than 4 liters?	☐ Yes ☒ No
Are there sealed containers GREATER than 4 liters?	☐ Yes ☒ No
Are there indications of inadequate protection for heavy and/or sharp objects?	☐ Yes ☒ No
Comments:N/A	

RTR Operator:

Steve Redmond		9/18/2014
Print Name	Signature	Date

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CCP Radiography Data Sheet

Section 1: General Information	
[X] RTR Examination [ ] RTR Replicate Scan [ ] RTR Independent Observation	
Site ID:	ORNL
Batch Number:	OR-RTR7-0102
Examination Date:	9/18/2014
Waste Container ID:	NFS0900A
Video/Audio Recorded Media Number:	OR-RTR7-0102 A&B
Procedure and Revision No.:	CCP-TP-053 Rev. 15
NCR(s) associated with the container? (e.g., Prohibited Items)	[X] No [ ] Yes NCR No.: N/A NCR No.: N/A

Section 2: Waste Container Data	
Container Type:	55 Gallon Drum
TRUCON Code:	OR 225
Waste Matrix Code:	S5400
Waste Stream I.D.:	OR-NFS-CH-HET-A
Waste Container Weights:	Gross Wt.: 126.3 kg Tare Wt.: 33.2 kg Net Wt.: 93.1 kg
Rigid Liner and Liner Vent Description:	Liner: [X] No [ ] Yes Lid: [X] No [ ] Yes Type: [ ] 30-mil [ ] 90-mil [ ] 110-mil [ ] 125-mil Vented: [ ] No [ ] Yes [X] N/A Punctured: [X] No [ ] Yes Mechanical Vent: [X] No [ ] Yes Fiberboard Liner: [X] No [ ] Yes Lead Lined: [X] No [ ] Yes
Number of Layers of Confinement:	Appears to be 1 layer
Volume Utilization Percentage:	80 %

16

CCP Radiography Data Sheet

Waste Container ID: NFS0900A

Section 3: Container Inventory and Comments	(Detailed descriptions)
IM:	Scrap metal, metal hardware
AM:	
OM:	Batteries
OI:	Absorbent
C:	Cardboard, cloth
R:	
XPM:	Plastic sheeting, scrap plastic
OR:	
IN:	
S:	

Section 4: Packaging Material and Waste Material Parameters	
Packaging Material:	**Estimated Weight (kg)**
Steel (ST):	27.8
Plastics (PP):Liner bag	1.0
Other: Cardboard liner (CP)	4.4
Total Packaging Weight	33.2
Waste Material Parameter:	**Estimated Weight (kg)**
Iron-based Metal / Alloys (IM):	81.0
Aluminum-based Metals / Alloys (AM):	
Other Metals (OM):	0.2
Other Inorganic Materials (OI)	2.0
Cellulosics (C):	5.0
Rubber (R):	
Plastics (waste materials) (XPM):	4.9
Organic Matrix (OR):	
Inorganic Matrix (IN):	
Soils (S):	
Total WMP Weight:	93.1

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CCP Radiography Data Sheet

Waste Container ID: NFS0900A

Section 5: RTR Summary (Questions answered "Yes" will be explained in the Comment block, except for Question 1)	
Is there observable liquid?	☐ Yes ☒ No
Is there any observable liquid in internal containers, more than 60 milliliters or 3 percent by volume, whichever is greater?	☐ Yes ☒ No
Is the total volume of observable liquid in the outermost container GREATER than 1% of the container?	☐ Yes ☒ No
Is there observable liquid in payload containers with an EPA Hazardous Waste Number of U134?	☐ Yes ☒ No
Is there an indication of non-radionuclide pyrophoric materials, such as elemental potassium?	☐ Yes ☒ No
Is there an indication of hazardous wastes not occurring as co-contaminants with TRU mixed wastes (non-mixed hazardous wastes)?	☐ Yes ☒ No
Is there an indication of wastes incompatible with backfill, seal and panel closures materials, container and packaging materials, shipping container materials, or other wastes (i.e., waste does NOT match TRUCON Code[s])?	☐ Yes ☒ No
Is there an indication of wastes containing explosives or compressed gases?	☐ Yes ☒ No
Is there an indication of PCBs liquids?	☐ Yes ☒ No
Is there an indication of the waste exhibiting the characteristic of ignitability, corrosivity, or reactivity (EPA Hazardous Waste Numbers of D001, D002, or D003)?	☐ Yes ☒ No
Is the physical form of the waste inconsistent with the Waste Stream Description or the Waste Matrix Code?	☐ Yes ☒ No
CH or RH TRAMPAC	
Are there heat-sealed bags (unvented) GREATER than 4 liters and LESS than 390 square inches in the waste, or heat sealed bags not authorized in the RH TRUCON Code?	☐ Yes ☒ No
Were there Non-approved Closure Methods used on liner bags or inner bags greater than 4 liters?	☐ Yes ☒ No
Are there sealed containers GREATER than 4 liters?	☐ Yes ☒ No
Are there indications of inadequate protection for heavy and/or sharp objects?	☐ Yes ☒ No
Comments: N/A	

RTR Operator:

Steve Redmond		9/18/2014
Print Name	Signature	Date

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CCP Radiography Data Sheet

Section 1: General Information	
[X] RTR Examination [ ] RTR Replicate Scan [ ] RTR Independent Observation	
Site ID:	ORNL
Batch Number:	OR-RTR7-0102
Examination Date:	9/18/2014
Waste Container ID:	NFS0900C
Video/Audio Recorded Media Number:	OR-RTR7-0102 A&B
Procedure and Revision No.:	CCP-TP-053 Rev. 15
NCR(s) associated with the container? (e.g., Prohibited Items)	[X] No [ ] Yes NCR No.: N/A NCR No.: N/A

Section 2: Waste Container Data	
Container Type:	55 Gallon Drum
TRUCON Code:	OR 225
Waste Matrix Code:	S5400
Waste Stream I.D.:	OR-NFS-CH-HET-A
Waste Container Weights:	Gross Wt.: 110.3 kg Tare Wt.: 33.2 kg Net Wt.: 77.1 kg
Rigid Liner and Liner Vent Description:	Liner: [X] No [ ] Yes Lid: [X] No [ ] Yes Type: [ ] 30-mil [ ] 90-mil [ ] 110-mil [ ] 125-mil Vented: [ ] No [ ] Yes [X] N/A Punctured: [X] No [ ] Yes Mechanical Vent: [X] No [ ] Yes Fiberboard Liner: [X] No [ ] Yes Lead Lined: [X] No [ ] Yes
Number of Layers of Confinement:	Appears to be 1 layer
Volume Utilization Percentage:	75 %

CCP Radiography Data Sheet

Waste Container ID: NFS0900C

Section 3: Container Inventory and Comments	(Detailed descriptions)
IM:	Scrap metal, metal pipe, metal hardware
AM:	
OM:	
OI:	Absorbent
C:	Cardboard, cloth, coveralls
R:	Rubber gloves
XPM:	Plastic sheeting, scrap plastic, plastic tubing, plastic suits
OR:	
IN:	
S:	

Section 4: Packaging Material and Waste Material Parameters	
Packaging Material:	**Estimated Weight (kg)**
Steel (ST):	27.8
Plastics (PP):Liner bag	1.0
Other: Cardboard liner (CP)	4.4
Total Packaging Weight	33.2
Waste Material Parameter:	**Estimated Weight (kg)**
Iron-based Metal / Alloys (IM):	57.0
Aluminum-based Metals / Alloys (AM):	
Other Metals (OM):	
Other Inorganic Materials (OI)	4.0
Cellulosics (C):	4.0
Rubber (R):	1.0
Plastics (waste materials) (XPM):	11.1
Organic Matrix (OR):	
Inorganic Matrix (IN):	
Soils (S):	
Total WMP Weight:	77.1

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CCP Radiography Data Sheet

Waste Container ID: NFS0900C

Section 5: RTR Summary (Questions answered "Yes" will be explained in the Comment block, except for Question 1)	
Is there observable liquid?	☐ Yes ☒ No
Is there any observable liquid in internal containers, more than 60 milliliters or 3 percent by volume, whichever is greater?	☐ Yes ☒ No
Is the total volume of observable liquid in the outermost container GREATER than 1% of the container?	☐ Yes ☒ No
Is there observable liquid in payload containers with an EPA Hazardous Waste Number of U134?	☐ Yes ☒ No
Is there an indication of non-radionuclide pyrophoric materials, such as elemental potassium?	☐ Yes ☒ No
Is there an indication of hazardous wastes not occurring as co-contaminants with TRU mixed wastes (non-mixed hazardous wastes)?	☐ Yes ☒ No
Is there an indication of wastes incompatible with backfill, seal and panel closures materials, container and packaging materials, shipping container materials, or other wastes (i.e., waste does NOT match TRUCON Code[s])?	☐ Yes ☒ No
Is there an indication of wastes containing explosives or compressed gases?	☐ Yes ☒ No
Is there an indication of PCBs liquids?	☐ Yes ☒ No
Is there an indication of the waste exhibiting the characteristic of ignitability, corrosivity, or reactivity (EPA Hazardous Waste Numbers of D001, D002, or D003)?	☐ Yes ☒ No
Is the physical form of the waste inconsistent with the Waste Stream Description or the Waste Matrix Code?	☐ Yes ☒ No
CH or RH TRAMPAC	
Are there heat-sealed bags (unvented) GREATER than 4 liters and LESS than 390 square inches in the waste, or heat sealed bags not authorized in the RH TRUCON Code?	☐ Yes ☒ No
Were there Non-approved Closure Methods used on liner bags or inner bags greater than 4 liters?	☐ Yes ☒ No
Are there sealed containers GREATER than 4 liters?	☐ Yes ☒ No
Are there indications of inadequate protection for heavy and/or sharp objects?	☐ Yes ☒ No
Comments:N/A	
RTR Operator: Steve Redmond (Print Name) / Signature / 9/18/2014 (Date)	

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CCP Radiography Data Sheet

CCP-TP-053 Attachment 2

Section 1: General Information	
[X] RTR Examination [ ] RTR Replicate Scan [ ] RTR Independent Observation	
Site ID:	ORNL
Batch Number:	OR-RTR7-0102
Examination Date:	9/18/2014
Waste Container ID:	NFS0899A 9-18-14
Video/Audio Recorded Media Number:	OR-RTR7-0102 A&B
Procedure and Revision No.:	CCP-TP-053 Rev. 15
NCR(s) associated with the container? (e.g., Prohibited Items)	[X] No [ ] Yes NCR No.: N/A NCR No.: N/A

Section 2: Waste Container Data	
Container Type:	55 Gallon Drum
TRUCON Code:	OR 225
Waste Matrix Code:	S5400
Waste Stream I.D.:	OR-NFS-CH-HET-A
Waste Container Weights:	Gross Wt.: 122.1 kg Tare Wt.: 33.2 kg Net Wt.: 88.9 kg
Rigid Liner and Liner Vent Description:	Liner: [X] No [ ] Yes Lid: [X] No [ ] Yes Type: [ ] 30-mil [ ] 90-mil [ ] 110-mil [ ] 125-mil Vented: [ ] No [ ] Yes [X] N/A Punctured: [X] No [ ] Yes Mechanical Vent: [X] No [ ] Yes Fiberboard Liner: [X] No [ ] Yes Lead Lined: [X] No [ ] Yes
Number of Layers of Confinement:	Appears to be 1 layer
Volume Utilization Percentage:	70 %

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CCP Radiography Data Sheet

Waste Container ID: NFS0899A 4-18-14

Section 3: Container Inventory and Comments	(Detailed descriptions)
IM:	Scrap metal, metal hardware
AM:	
OM:	
OI:	Absorbent
C:	
R:	
XPM:	Plastic sheeting, scrap plastic
OR:	
IN:	
S:	

Section 4: Packaging Material and Waste Material Parameters	
Packaging Material:	**Estimated Weight (kg)**
Steel (ST):	27.8
Plastics (PP):Liner bag	1.0
Other: Cardboard liner (CP)	4.4
Total Packaging Weight	33.2
Waste Material Parameter:	**Estimated Weight (kg)**
Iron-based Metal / Alloys (IM):	66.0
Aluminum-based Metals / Alloys (AM):	
Other Metals (OM):	
Other Inorganic Materials (OI)	10.0
Cellulosics (C):	
Rubber (R):	
Plastics (waste materials) (XPM):	12.9
Organic Matrix (OR):	
Inorganic Matrix (IN):	
Soils (S):	
Total WMP Weight:	88.9

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CCP Radiography Data Sheet

Waste Container ID: NFS08899A 9-18-14

Section 5: RTR Summary (Questions answered "Yes" will be explained in the Comment block, except for Question 1)	
Is there observable liquid?	☐ Yes ☒ No
Is there any observable liquid in internal containers, more than 60 milliliters or 3 percent by volume, whichever is greater?	☐ Yes ☒ No
Is the total volume of observable liquid in the outermost container GREATER than 1% of the container?	☐ Yes ☒ No
Is there observable liquid in payload containers with an EPA Hazardous Waste Number of U134?	☐ Yes ☒ No
Is there an indication of non-radionuclide pyrophoric materials, such as elemental potassium?	☐ Yes ☒ No
Is there an indication of hazardous wastes not occurring as co-contaminants with TRU mixed wastes (non-mixed hazardous wastes)?	☐ Yes ☒ No
Is there an indication of wastes incompatible with backfill, seal and panel closures materials, container and packaging materials, shipping container materials, or other wastes (i.e., waste does NOT match TRUCON Code[s])?	☐ Yes ☒ No
Is there an indication of wastes containing explosives or compressed gases?	☐ Yes ☒ No
Is there an indication of PCBs liquids?	☐ Yes ☒ No
Is there an indication of the waste exhibiting the characteristic of ignitability, corrosivity, or reactivity (EPA Hazardous Waste Numbers of D001, D002, or D003)?	☐ Yes ☒ No
Is the physical form of the waste inconsistent with the Waste Stream Description or the Waste Matrix Code?	☐ Yes ☒ No
CH or RH TRAMPAC	
Are there heat-sealed bags (unvented) GREATER than 4 liters and LESS than 390 square inches in the waste, or heat sealed bags not authorized in the RH TRUCON Code?	☐ Yes ☒ No
Were there Non-approved Closure Methods used on liner bags or inner bags greater than 4 liters?	☐ Yes ☒ No
Are there sealed containers GREATER than 4 liters?	☐ Yes ☒ No
Are there indications of inadequate protection for heavy and/or sharp objects?	☐ Yes ☒ No

Comments: ~~N/A~~ The incorrect Drum number was entered on the video Display and Attachment 2. The changes to Attachment 2 Reflect the correct containat Identification.

RTR Operator:

Steve Redmond		9/18/2014
Print Name	Signature	Date

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CCP Radiography Data Sheet

Section 1: General Information	
[X] RTR Examination [ ] RTR Replicate Scan [ ] RTR Independent Observation	
Site ID:	ORNL
Batch Number:	OR-RTR7-0102
Examination Date:	9/18/2014
Waste Container ID:	NFS0855C
Video/Audio Recorded Media Number:	OR-RTR7-0102 A&B
Procedure and Revision No.:	CCP-TP-053 Rev. 15
NCR(s) associated with the container? (e.g., Prohibited Items)	[X] No [ ] Yes NCR No.: N/A NCR No.: N/A

Section 2: Waste Container Data	
Container Type:	55 Gallon Drum
TRUCON Code:	OR 225
Waste Matrix Code:	S5400
Waste Stream I.D.:	OR-NFS-CH-HET-A
Waste Container Weights:	Gross Wt.: 66.5 kg Tare Wt.: 33.2 kg Net Wt.: 33.3 kg
Rigid Liner and Liner Vent Description:	Liner: [X] No [ ] Yes Lid: [X] No [ ] Yes Type: [ ] 30-mil [ ] 90-mil [ ] 110-mil [ ] 125-mil Vented: [ ] No [ ] Yes [X] N/A Punctured: [X] No [ ] Yes Mechanical Vent: [X] No [ ] Yes Fiberboard Liner: [X] No [ ] Yes Lead Lined: [X] No [ ] Yes
Number of Layers of Confinement:	Appears to be 1 layer
Volume Utilization Percentage:	80 %

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CCP Radiography Data Sheet

Waste Container ID: NFS0855C

Section 3: Container Inventory and Comments (Detailed descriptions)	
IM:	Metal pipe, scrap metal, metal hardware
AM:	
OM:	
OI:	Absorbent
C:	Cloth
R:	
XPM:	Plastic sheeting, scrap plastic
OR:	
IN:	
S:	

Section 4: Packaging Material and Waste Material Parameters	
Packaging Material:	**Estimated Weight (kg)**
Steel (ST):	27.8
Plastics (PP):Liner bag	1.0
Other: Cardboard liner (CP)	4.4
Total Packaging Weight	33.2
Waste Material Parameter:	**Estimated Weight (kg)**
Iron-based Metal / Alloys (IM):	24.0
Aluminum-based Metals / Alloys (AM):	
Other Metals (OM):	
Other Inorganic Materials (OI)	2.0
Cellulosics (C):	3.0
Rubber (R):	
Plastics (waste materials) (XPM):	4.3
Organic Matrix (OR):	
Inorganic Matrix (IN):	
Soils (S):	
Total WMP Weight:	33.3

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CCP Radiography Data Sheet

Waste Container ID: NFS0855C

Section 5: RTR Summary (Questions answered "Yes" will be explained in the Comment block, except for Question 1)	
Is there observable liquid?	☐ Yes ☒ No
Is there any observable liquid in internal containers, more than 60 milliliters or 3 percent by volume, whichever is greater?	☐ Yes ☒ No
Is the total volume of observable liquid in the outermost container GREATER than 1% of the container?	☐ Yes ☒ No
Is there observable liquid in payload containers with an EPA Hazardous Waste Number of U134?	☐ Yes ☒ No
Is there an indication of non-radionuclide pyrophoric materials, such as elemental potassium?	☐ Yes ☒ No
Is there an indication of hazardous wastes not occurring as co-contaminants with TRU mixed wastes (non-mixed hazardous wastes)?	☐ Yes ☒ No
Is there an indication of wastes incompatible with backfill, seal and panel closures materials, container and packaging materials, shipping container materials, or other wastes (i.e., waste does NOT match TRUCON Code[s])?	☐ Yes ☒ No
Is there an indication of wastes containing explosives or compressed gases?	☐ Yes ☒ No
Is there an indication of PCBs liquids?	☐ Yes ☒ No
Is there an indication of the waste exhibiting the characteristic of ignitability, corrosivity, or reactivity (EPA Hazardous Waste Numbers of D001, D002, or D003)?	☐ Yes ☒ No
Is the physical form of the waste inconsistent with the Waste Stream Description or the Waste Matrix Code?	☐ Yes ☒ No
CH or RH TRAMPAC	
Are there heat-sealed bags (unvented) GREATER than 4 liters and LESS than 390 square inches in the waste, or heat sealed bags not authorized in the RH TRUCON Code?	☐ Yes ☒ No
Were there Non-approved Closure Methods used on liner bags or inner bags greater than 4 liters?	☐ Yes ☒ No
Are there sealed containers GREATER than 4 liters?	☐ Yes ☒ No
Are there indications of inadequate protection for heavy and/or sharp objects?	☐ Yes ☒ No
Comments: N/A	

RTR Operator:

Steve Redmond		9/18/2014
Print Name	Signature	Date

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CCP Radiography Data Sheet

Section 1: General Information	
[X] RTR Examination [ ] RTR Replicate Scan [ ] RTR Independent Observation	
Site ID:	ORNL
Batch Number:	OR-RTR7-0102
Examination Date:	9/18/2014
Waste Container ID:	NFS0604B
Video/Audio Recorded Media Number:	OR-RTR7-0102 A&B
Procedure and Revision No.:	CCP-TP-053 Rev. 15
NCR(s) associated with the container? (e.g., Prohibited Items)	[X] No [ ] Yes NCR No.: N/A NCR No.: N/A

Section 2: Waste Container Data	
Container Type:	55 Gallon Drum
TRUCON Code:	OR 225
Waste Matrix Code:	S5400
Waste Stream I.D.:	OR-NFS-CH-HET-A
Waste Container Weights:	Gross Wt.: 142.0 kg Tare Wt.: 33.2 kg Net Wt.: 108.8 kg
Rigid Liner and Liner Vent Description:	Liner: [X] No [ ] Yes Lid: [X] No [ ] Yes Type: [ ] 30-mil [ ] 90-mil [ ] 110-mil [ ] 125-mil Vented: [ ] No [ ] Yes [X] N/A Punctured: [X] No [ ] Yes Mechanical Vent: [X] No [ ] Yes Fiberboard Liner: [X] No [ ] Yes Lead Lined: [X] No [ ] Yes
Number of Layers of Confinement:	Appears to be 1 layer
Volume Utilization Percentage:	75 %

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CCP Radiography Data Sheet

Waste Container ID: NFS0604B

Section 3: Container Inventory and Comments	(Detailed descriptions)
IM:	Scrap metal, metal hardware
AM:	
OM:	
OI:	Absorbent
C:	Tape, coveralls
R:	Rubber gloves
XPM:	Plastic sheeting, plastic tubing, plastic suits, scrap plastic
OR:	
IN:	
S:	

Section 4: Packaging Material and Waste Material Parameters	
Packaging Material:	**Estimated Weight (kg)**
Steel (ST):	27.8
Plastics (PP):Liner bag	1.0
Other: Cardboard liner (CP)	4.4
Total Packaging Weight	33.2
Waste Material Parameter:	**Estimated Weight (kg)**
Iron-based Metal / Alloys (IM):	87.0
Aluminum-based Metals / Alloys (AM):	
Other Metals (OM):	
Other Inorganic Materials (OI)	5.0
Cellulosics (C):	2.0
Rubber (R):	2.0
Plastics (waste materials) (XPM):	12.8
Organic Matrix (OR):	
Inorganic Matrix (IN):	
Soils (S):	
Total WMP Weight:	108.8

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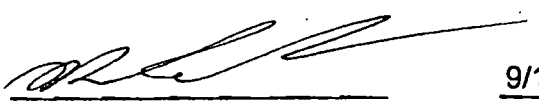
CCP Radiography Data Sheet

Waste Container ID: NFS0604B

Section 5: RTR Summary (Questions answered "Yes" will be explained in the Comment block, except for Question 1)	
Is there observable liquid?	☐ Yes ☒ No
Is there any observable liquid in internal containers, more than 60 milliliters or 3 percent by volume, whichever is greater?	☐ Yes ☒ No
Is the total volume of observable liquid in the outermost container GREATER than 1% of the container?	☐ Yes ☒ No
Is there observable liquid in payload containers with an EPA Hazardous Waste Number of U134?	☐ Yes ☒ No
Is there an indication of non-radionuclide pyrophoric materials, such as elemental potassium?	☐ Yes ☒ No
Is there an indication of hazardous wastes not occurring as co-contaminants with TRU mixed wastes (non-mixed hazardous wastes)?	☐ Yes ☒ No
Is there an indication of wastes incompatible with backfill, seal and panel closures materials, container and packaging materials, shipping container materials, or other wastes (i.e., waste does NOT match TRUCON Code[s])?	☐ Yes ☒ No
Is there an indication of wastes containing explosives or compressed gases?	☐ Yes ☒ No
Is there an indication of PCBs liquids?	☐ Yes ☒ No
Is there an indication of the waste exhibiting the characteristic of ignitability, corrosivity, or reactivity (EPA Hazardous Waste Numbers of D001, D002, or D003)?	☐ Yes ☒ No
Is the physical form of the waste inconsistent with the Waste Stream Description or the Waste Matrix Code?	☐ Yes ☒ No
CH or RH TRAMPAC	
Are there heat-sealed bags (unvented) GREATER than 4 liters and LESS than 390 square inches in the waste, or heat sealed bags not authorized in the RH TRUCON Code?	☐ Yes ☒ No
Were there Non-approved Closure Methods used on liner bags or inner bags greater than 4 liters?	☐ Yes ☒ No
Are there sealed containers GREATER than 4 liters?	☐ Yes ☒ No
Are there indications of inadequate protection for heavy and/or sharp objects?	☐ Yes ☒ No

Comments: N/A

RTR Operator:

Steve Redmond		9/18/2014
Print Name	Signature	Date

CCP Radiography Data Sheet

Section 1: General Information	
[X] RTR Examination [ ] RTR Replicate Scan [ ] RTR Independent Observation	
Site ID:	ORNL
Batch Number:	OR-RTR7-0102
Examination Date:	9/18/2014
Waste Container ID:	NFS0882C
Video/Audio Recorded Media Number:	OR-RTR7-0102 A&B
Procedure and Revision No.:	CCP-TP-053 Rev. 15
NCR(s) associated with the container? (e.g., Prohibited Items)	[X] No [ ] Yes NCR No.: N/A NCR No.: N/A

Section 2: Waste Container Data	
Container Type:	55 Gallon Drum
TRUCON Code:	OR 225
Waste Matrix Code:	S5400
Waste Stream I.D.:	OR-NFS-CH-HET-A
Waste Container Weights:	Gross Wt.: 70.2 kg Tare Wt.: 33.2 kg Net Wt.: 37.0 kg
Rigid Liner and Liner Vent Description:	Liner: [X] No [ ] Yes Lid: [X] No [ ] Yes Type: [ ] 30-mil [ ] 90-mil [ ] 110-mil [ ] 125-mil Vented: [ ] No [ ] Yes [X] N/A Punctured: [X] No [ ] Yes Mechanical Vent: [X] No [ ] Yes Fiberboard Liner: [X] No [ ] Yes Lead Lined: [X] No [ ] Yes
Number of Layers of Confinement:	Appears to be 1 layer
Volume Utilization Percentage:	65 %

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CCP Radiography Data Sheet

Waste Container ID: NFS0882C

Section 3: Container Inventory and Comments (Detailed descriptions)	
IM:	Scrap metal, metal hardware
AM:	
OM:	
OI:	Absorbent
C:	Cloth
R:	
XPM:	Plastic sheeting
OR:	
IN:	
S:	

Section 4: Packaging Material and Waste Material Parameters	
Packaging Material:	**Estimated Weight (kg)**
Steel (ST):	27.8
Plastics (PP):Liner bag	1.0
Other: Cardboard liner (CP)	4.4
Total Packaging Weight	33.2
Waste Material Parameter:	**Estimated Weight (kg)**
Iron-based Metal / Alloys (IM):	26.0
Aluminum-based Metals / Alloys (AM):	
Other Metals (OM):	
Other Inorganic Materials (OI)	2.0
Cellulosics (C):	3.0
Rubber (R):	
Plastics (waste materials) (XPM):	6.0
Organic Matrix (OR):	
Inorganic Matrix (IN):	
Soils (S):	
Total WMP Weight:	37.0

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CCP Radiography Data Sheet

Waste Container ID: NFS0882C

Section 5: RTR Summary (Questions answered "Yes" will be explained in the Comment block, except for Question 1)	
Is there observable liquid?	☐ Yes ☒ No
Is there any observable liquid in internal containers, more than 60 milliliters or 3 percent by volume, whichever is greater?	☐ Yes ☒ No
Is the total volume of observable liquid in the outermost container GREATER than 1% of the container?	☐ Yes ☒ No
Is there observable liquid in payload containers with an EPA Hazardous Waste Number of U134?	☐ Yes ☒ No
Is there an indication of non-radionuclide pyrophoric materials, such as elemental potassium?	☐ Yes ☒ No
Is there an indication of hazardous wastes not occurring as co-contaminants with TRU mixed wastes (non-mixed hazardous wastes)?	☐ Yes ☒ No
Is there an indication of wastes incompatible with backfill, seal and panel closures materials, container and packaging materials, shipping container materials, or other wastes (i.e., waste does NOT match TRUCON Code[s])?	☐ Yes ☒ No
Is there an indication of wastes containing explosives or compressed gases?	☐ Yes ☒ No
Is there an indication of PCBs liquids?	☐ Yes ☒ No
Is there an indication of the waste exhibiting the characteristic of ignitability, corrosivity, or reactivity (EPA Hazardous Waste Numbers of D001, D002, or D003)?	☐ Yes ☒ No
Is the physical form of the waste inconsistent with the Waste Stream Description or the Waste Matrix Code?	☐ Yes ☒ No
CH or RH TRAMPAC	
Are there heat-sealed bags (unvented) GREATER than 4 liters and LESS than 390 square inches in the waste, or heat sealed bags not authorized in the RH TRUCON Code?	☐ Yes ☒ No
Were there Non-approved Closure Methods used on liner bags or inner bags greater than 4 liters?	☐ Yes ☒ No
Are there sealed containers GREATER than 4 liters?	☐ Yes ☒ No
Are there indications of inadequate protection for heavy and/or sharp objects?	☐ Yes ☒ No
Comments:N/A	

RTR Operator:

Steve Redmond		9/18/2014
Print Name	Signature	Date

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CCP Radiography Data Sheet

Section 1: General Information	
[X] RTR Examination [ ] RTR Replicate Scan [ ] RTR Independent Observation	
Site ID:	ORNL
Batch Number:	OR-RTR7-0102
Examination Date:	9/18/2014
Waste Container ID:	NFS0893C
Video/Audio Recorded Media Number:	OR-RTR7-0102 A&B
Procedure and Revision No.:	CCP-TP-053 Rev. 15
NCR(s) associated with the container? (e.g., Prohibited Items)	[X] No [ ] Yes NCR No.: N/A NCR No.: N/A

Section 2: Waste Container Data	
Container Type:	55 Gallon Drum
TRUCON Code:	OR 225
Waste Matrix Code:	S5400
Waste Stream I.D.:	OR-NFS-CH-HET-A
Waste Container Weights:	Gross Wt.: 120.6 kg Tare Wt.: 33.2 kg Net Wt.: 87.4 kg
Rigid Liner and Liner Vent Description:	Liner: [X] No [ ] Yes Lid: [X] No [ ] Yes Type: [ ] 30-mil [ ] 90-mil [ ] 110-mil [ ] 125-mil Vented: [ ] No [ ] Yes [X] N/A Punctured: [X] No [ ] Yes Mechanical Vent: [X] No [ ] Yes Fiberboard Liner: [X] No [ ] Yes Lead Lined: [X] No [ ] Yes
Number of Layers of Confinement:	Appears to be 1 layer
Volume Utilization Percentage:	65 %

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CCP Radiography Data Sheet

Waste Container ID: NFS0893C

Section 3: Container Inventory and Comments	(Detailed descriptions)
IM:	Scrap metal, metal pipe, saw blade
AM:	
OM:	
OI:	Absorbent
C:	Wood, coveralls, tape
R:	
XPM:	Plastic sheeting, plastic tubing
OR:	
IN:	
S:	

Section 4: Packaging Material and Waste Material Parameters	
Packaging Material:	**Estimated Weight (kg)**
Steel (ST):	27.8
Plastics (PP):Liner bag	1.0
Other: Cardboard liner (CP)	4.4
Total Packaging Weight	33.2
Waste Material Parameter:	**Estimated Weight (kg)**
Iron-based Metal / Alloys (IM):	74.0
Aluminum-based Metals / Alloys (AM):	
Other Metals (OM):	
Other Inorganic Materials (OI)	5.0
Cellulosics (C):	1.0
Rubber (R):	
Plastics (waste materials) (XPM):	7.4
Organic Matrix (OR):	
Inorganic Matrix (IN):	
Soils (S):	
Total WMP Weight:	87.4

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CCP Radiography Data Sheet

Waste Container ID: NFS0893C

Section 5: RTR Summary (Questions answered "Yes" will be explained in the Comment block, except for Question 1)	
Is there observable liquid?	☐ Yes ☒ No
Is there any observable liquid in internal containers, more than 60 milliliters or 3 percent by volume, whichever is greater?	☐ Yes ☒ No
Is the total volume of observable liquid in the outermost container GREATER than 1% of the container?	☐ Yes ☒ No
Is there observable liquid in payload containers with an EPA Hazardous Waste Number of U134?	☐ Yes ☒ No
Is there an indication of non-radionuclide pyrophoric materials, such as elemental potassium?	☐ Yes ☒ No
Is there an indication of hazardous wastes not occurring as co-contaminants with TRU mixed wastes (non-mixed hazardous wastes)?	☐ Yes ☒ No
Is there an indication of wastes incompatible with backfill, seal and panel closures materials, container and packaging materials, shipping container materials, or other wastes (i.e., waste does NOT match TRUCON Code[s])?	☐ Yes ☒ No
Is there an indication of wastes containing explosives or compressed gases?	☐ Yes ☒ No
Is there an indication of PCBs liquids?	☐ Yes ☒ No
Is there an indication of the waste exhibiting the characteristic of ignitability, corrosivity, or reactivity (EPA Hazardous Waste Numbers of D001, D002, or D003)?	☐ Yes ☒ No
Is the physical form of the waste inconsistent with the Waste Stream Description or the Waste Matrix Code?	☐ Yes ☒ No
CH or RH TRAMPAC	
Are there heat-sealed bags (unvented) GREATER than 4 liters and LESS than 390 square inches in the waste, or heat sealed bags not authorized in the RH TRUCON Code?	☐ Yes ☒ No
Were there Non-approved Closure Methods used on liner bags or inner bags greater than 4 liters?	☐ Yes ☒ No
Are there sealed containers GREATER than 4 liters?	☐ Yes ☒ No
Are there indications of inadequate protection for heavy and/or sharp objects?	☐ Yes ☒ No
Comments:N/A	

RTR Operator:		
Steve Redmond		9/18/2014
Print Name	Signature	Date

Attachment 3 – CCP Radiography Independent Technical Reviewer Checklist

Batch Data Report No.: OR-RTR7-0102

Description			
1.	Were data generation and reduction conducted in a technically correct manner in accordance with the methods used?	☐ NO	☑ YES
2.	Was the correct revision of the procedure used? Procedure: CCP-TP-053 Rev.: 15	☐ NO	☑ YES
3.	Are the WMPs entered correctly?	☐ NO	☑ YES
4.	Do the estimated weights in Section 4 of Attachment 2 equal the container gross weight?	☐ NO	☑ YES
5.	Is the data reported in the proper units with the correct number of significant figures (e.g., one tenth of a kilogram)?	☐ NO	☑ YES
6.	Was transcription used? If no, proceed to question 7.	☑ NO	☐ YES
	6a. Has the data been verified for transcription errors?	☐ NO	☐ YES
7.	Does the Testing Batch Report include radiography for up to 20 containers?	☐ NO	☑ YES
8.	Are BDR contents complete and do they match the CCP Waste RTR Batch Data Report Table of Contents?	☐ NO	☑ YES
9.	Is all the data signed and dated in reproducible ink and by the individual(s) generating it?	☐ NO	☑ YES
10.	Is all data recorded clearly, legibly, and accurately?	☐ NO	☑ YES
11.	Have changes been made to original data? If no, proceed to question 12.	☐ NO	☑ YES
	11a. Have all changes to original data been lined out, initialed and dated by the individual making the changes?	☐ NO	☑ YES
	11b. Was justification made for changing the original data?	☐ NO	☑ YES
	11c. Were data changes made by the individual who originally collected the data?	☐ NO	☑ YES
12.	Does the waste match the Waste Matrix Code and Waste Stream description?	☐ NO	☑ YES
13.	Are the RTR Operator's decisions regarding the Radiography documented?	☐ NO	☑ YES
14.	Is there an adequate written description of the contents of each item?	☐ NO	☑ YES
15.	Was the video/audio recording media properly prepared and labeled for each waste container?	☐ NO	☑ YES
16.	Was the video/audio recording media check performed satisfactorily and recorded on Attachment 1?	☐ NO	☑ YES

Attachment 3 – CCP Radiography Independent Technical Reviewer Checklist (Continued)

Batch Data Report No.: OR-RTR7-0102

Description			
17.	Was the Image Test performed satisfactorily and recorded on Attachment 1?	☐NO	☑YES
18.	Was the Replicate Scan performed and recorded on an Attachment 2?	☐NO	☑YES
19.	Was the Replicate Scan RTR Operator different from the first RTR Operator?	☐NO	☑YES
20.	Did the Replicate Scan RTR Operator and the first RTR Operator agree on the results?	☐NO	☑YES
21.	Was the Independent Observation performed and recorded on an Attachment 2?	☐NO	☑YES
22.	Was the Independent Observation RTR Operator different from the first RTR Operator?	☐NO	☑YES
23.	Did the Independent Observation RTR Operator and the first RTR Operator agree on the results?	☐NO	☑YES
24.	Was the data collection performed by qualified individuals?	☐NO	☑YES
25.	Were NCRs initiated as required at DGL? If no, proceed to question 26.	☑NO	☐YES
	25a. Have the NCR(s) associated with RTR been included in the BDR?	☐NO	☐YES
26.	Is the RTR examination for CH waste? If no, proceed to question 27.	☐NO	☑YES
	26a. Have the CH Quality Assurance Objectives (QAOs) been met (if applicable)? Precision – Precision is maintained by reconciling any discrepancies between two radiography operators with regard to identification of the waste matrix code, liquids in excess of TSDF-WAC limits, and compressed gases through independent replicate scans and independent observations. Additionally, the precision of radiography is verified prior to use by tuning precisely enough to demonstrate compliance with QAOs through viewing an image test pattern. Accuracy – Accuracy is obtained by using a target to tune the image for maximum sharpness and by requiring operators to successfully identify 100 percent of the items required to meet the DQOs for radiography specified in CCP-PO-001, Section C-4a(1) in a training container during their initial qualification and subsequent requalification. Completeness – A video and audio media recording of the radiography examination and a validated radiography data form will be obtained for 100 percent of the waste containers subject to radiography. All video and audio media recordings and radiography data forms will be subject to validation as indicated in CCP-PO-001, Section C3-4. Comparability – The comparability of radiography data from different operators shall be enhanced by using standardized radiography procedures and operator qualifications.	☐NO	☑YES

Attachment 3 – CCP Radiography Independent Technical Reviewer Checklist (Continued)

Batch Data Report No.: OR-RTR7-0102

Description		
27. Is the RTR examination for RH waste? If no, proceed to comment section.	☑ NO	☐ YES
27a. Have the RH QAOs been met (if applicable)? Precision – Precision is maintained by reconciling any discrepancies between two operators (during Independent Observation and Replicate scans) with regard to the identification of important waste characteristics (i.e., physical form of the waste and absence of prohibited liquids) within a single container. Accuracy – Accuracy is obtained by using a target to tune the image for maximum sharpness and by requiring operators to successfully identify prohibited liquid in a training container during their initial qualification and subsequent requalification. Representativeness – All of the relevant contents in a container selected for radiography will be described. Completeness – All of the relevant waste information must be assembled and must show that each of the containers in the waste stream belongs to the waste stream. This information must be documented on videotape or other equivalent media and data form. Comparability – Comparability is ensured by meeting the program training requirements and complying with the minimum standards used to implement the radiography process.	☐ NO	☐ YES

Comments: N/A

I have reviewed 100% of the container specific and batch data in this report and find it acceptable.

Independent Technical Reviewer:

Fred Owey — Printed Name

Signature

9-22-14 — Date

DIVIDER PAGE ONLY

NOT PART OF PAGE COUNT

Attachment 2 – CCP Records Transmittal/Receiving Form

CCP Records / Records Custodian, 4021 National Parks Highway - MS: GSA 212, Carlsbad, New Mexico 88220

Telephone Number: 575-234-7523

Fax Number: 575-234-7033

[x] Original Record [ ] Copy
[ ] Fax Record
[ ] Electronic Record

Attn:	CCP RECORDS	From:	PATRICK SMITH II
Ship to:	CCP RECORDS CUSTODIAN	Site:	ORNL
	4021 NATIONAL PARKS HWY.	Company:	TFE INC.
	MS GSA 212	Telephone Number:	865-574-6002
	CARLSBAD, NM 88220-9082	Date Sent:	9-24-2014
Telephone Number:	575-234-7523		

Document Number	Title / Description	Record Date	Total Pages
OR-RTR7-0102	RTR DVD (DISK B)	9-18-2014	N/A
N/A	N/A	N/A	N/A
N/A	N/A	N/A	N/A
N/A	N/A	N/A	N/A
N/A	N/A	N/A	N/A
N/A	N/A	N/A	N/A

Comments

N/A

(When the Record accepted line has been completed, the rest of the page below may be left blank.)
Acceptance/Rejection Signature and Date

Records Accepted [✓]	Signature	Greta Leos (Printed Name)	9-29-14 (Date)
Records Rejected [ ]	Signature	Printed Name	Date

Reason for Rejection:

Re-submittal:

Signature	Printed Name	Date

```
**********************
***   TX REPORT    ***
**********************

TRANSMISSION OK

TX/RX NO                0844
DESTINATION TEL #       918655768703
DESTINATION ID          ORNL
ST. TIME                09/30 07:33
TIME USE                00'41
PAGES SENT                1
RESULT                  OK
```


Attachment 2 – CCP Records Transmittal/Receiving Form

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	4021 NATIONAL PARKS HWY.	Company:	TFE INC.
	MS GSA 212	Telephone Number:	865-574-6002
	CARLSBAD, NM 88220-9082	Date Sent:	9-24-2014
Telephone Number:	575-234-7523		

OR-RTR7-0102	RTR DVD (DISK B)	9-18-2014	N/A
N/A	N/A	N/A	N/A
N/A	N/A	N/A	N/A
N/A	N/A	N/A	N/A
N/A	N/A	N/A	N/A
N/A	N/A	N/A	N/A

N/A

(When the Record accepted line has been completed, the rest of the page below may be left blank.)
Acceptance/Rejection Signature and Date

Attachment 2 – CCP Records Transmittal/Receiving Form

CCP Records / Records Custodian, 4021 National Parks Highway - MS: GSA 212, Carlsbad, New Mexico 88220

Telephone Number: 575-234-7523

Fax Number: 575-234-7033

[X] Original Record [ ] Copy
[ ] Fax Record
[ ] Electronic Record

Attn:	CCP RECORDS	From:	PATRICK SMITH II
Ship to:	CCP RECORDS CUSTODIAN	Site:	ORNL
	4021 NATIONAL PARKS HWY.	Company:	TFE INC.
	MS GSA 212	Telephone Number:	865-574-6002
	CARLSBAD, NM 88220-9082	Date Sent:	10-2-2014
Telephone Number:	575-234-7523		

Document Number	Title / Description	Record Date	Total Pages
OR-RTR7-0102	RTR BDR	9-18-2014	39
OR-RTR7-0102	RTR DVD (DISK A)	9-18-2014	N/A
N/A	N/A	N/A	N/A
N/A	N/A	N/A	N/A
N/A	N/A	N/A	N/A
N/A	N/A	N/A	N/A

Comments:

N/A

(When the Record accepted line has been completed, the rest of the page below may be left blank.)
Acceptance/Rejection Signature and Date

Records Accepted [✓]	Signature	Greta Leos Printed Name	10-07-14 Date
Records Rejected [ ]	Signature	Printed Name	Date

Reason for Rejection:

Re-submittal:

Signature	Printed Name	Date

```
**************************************
***        Send Results            ***
**************************************

   Sending is complete.

Job No.                    0827
Address                    918655768703
Name                       ORNL
Start Time                 10/08 09:26 AM
Call Length                00'46
Sheets                     1
Result                     OK
```


Attachment 2 – CCP Records Transmittal/Receiving Form

CCP Records / Records Custodian, 4021 National Parks Highway - MS: GSA 212, Carlsbad, New Mexico 88220

Telephone Number: 575-234-7523

Fax Number: 575-234-7033

[X] Original Record [ ] Copy
[ ] Fax Record
[ ] Electronic Record

Attn:	CCP RECORDS	From:	PATRICK SMITH II
Ship to:	CCP RECORDS CUSTODIAN	Site:	ORNL
	4021 NATIONAL PARKS HWY.	Company:	TFE INC.
	MS GSA 212	Telephone Number:	865-574-6002
	CARLSBAD, NM 88220-9082	Date Sent:	10-2-2014
Telephone Number:	575-234-7523		

Document Number	Description	Record Date	Comments
OR-RTR7-0102	RTR BDR	9-18-2014	39
OR-RTR7-0102	RTR DVD (DISK A)	9-18-2014	N/A
N/A	N/A	N/A	N/A
N/A	N/A	N/A	N/A
N/A	N/A	N/A	N/A
N/A	N/A	N/A	N/A

Comments:

N/A

(When the Record accepted line has been completed, the rest of the page below may be left blank.)
Acceptance/Rejection Signature and Date

Records Accepted [✓] Signature Greta Leos Printed Name 10-07-14 Date

Records Rejected [ ] _____ _____ _____

Attachment 2 – CCP SPM Radiography Project Level Validation Checklist and Summary

BDR Number: OR-RTR7-0013 **Examination Date(s):** 02/24/2014

Description of Criteria Reviewed	Criteria Met? YES	NO	NA	Comments/Qualifiers
1. Is the completed, signed, and dated Independent Technical Reviewer Checklist included in the BDR, and the independent technical reviewer was not involved in the generation or recording of the data under review? **Reference Source: CCP-PO-001, C3-4**	X			
2. Does the BDR contain all items addressed in the BDR Table of Contents? **Reference Source: CCP-PO-001, C3-4**	X			
3. Does the BDR include a listing of all the container numbers in the batch? **Reference Source: CCP-PO-001, C3-4**	X			
4. List all containers that have met QAOs. **Reference Source: CCP-PO-001, C3-4**				Container Numbers: NFS0759B1 X10C0402056A X10C0402819D X10C0402822B X10C0402829G X10C0402988C1 X10C0402988G X10C0403027A X10C0403027H X10C9311060A
5. Does the BDR identify the current implementing procedure and revision number? **Reference Source: CCP-PO-001, Table C3-3**	X			
6. Is there a reference to or copy of any associated NCRs (if any) in the BDR? NA if no NCRs. **Reference Source: CCP-PO-001, Table C3-3**			X	
7. Are there 20 or fewer containers in the batch? **Reference Source: CCP-PO-001, C3-4**	X			
8. Are the data properly reported (i.e., data are reported in correct units and with correct significant figures)? **Reference Source: CCP-PO-001, C3-4**	X			
9. Is there evidence of verification that the physical form matches the Waste Matrix Code? **Reference Source: CCP-PO-001, Table C3-3**	X			

NTPC RECORDS ORIGINAL GL
DATE REC'D: 3-18-14

Attachment 2 – CCP SPM Radiography Project Level Validation Checklist and Summary (Continued)

BDR Number: OR-RTR7-0013			Examination Date(s): 02/24/2014	
Description of Criteria Reviewed	**Criteria Met?**			**Comments/Qualifiers**
	YES	**NO**	**NA**	
10. Is there evidence of verification that the physical form matches the waste stream description? **Reference Source: CCP-PO-001, Table C3-3**	X			
11. Are prohibited items absent? **Reference Source: CCP-PO-001, Table C3-3**	X			
12. Does observable liquid, if present, meet the criteria of the TSDF-WAC? **Reference Source: CCP-PO-001, C-1**	X			
13. Were discrepancies between two operators with regard to identification of waste matrix code, liquids in excess of the TSDF-WAC, or compressed gases through replicate scans and independent observations reconciled? NA if no discrepancies. **Reference Source: CCP-PO-001, C3-2**			X	
14. Are the training qualifications for all radiography personnel acceptable? **Reference Source: CCP-PO-001, C3-8**	X			
15. Was evidence of the video/audio check included in the BDR? **Reference Source: CCP-PO-001, C1-1**	X			
16. Was the Lines-Pair Resolution Test or Sieve Test Check included in the BDR? **Reference Source: CCP Technical Procedures**	X			
17. Was a replicate scan performed once per day, or once per batch, whichever is LESS frequent? **Reference Source: CCP-PO-001, C1-1**	X			
18. Was an independent observation performed once per day, or once per batch, whichever is LESS frequent? **Reference Source: CCP-PO-001, C1-1**	X			

Attachment 2 – CCP SPM Radiography Project Level Validation Checklist and Summary (Continued)

BDR Number: OR-RTR7-0013 **Examination Date(s):** 02/24/2014

Description of Criteria Reviewed	Criteria Met? YES	NO	NA	Comments/Qualifiers
19. Were the replicate scan and independent observation performed on different waste containers? **Reference Source: CCP-PO-001, C1-1**	X			
20. Were the personnel performing the replicate scan and independent observation different from the individual who performed the original? **Reference Source: CCP-PO-001, C1-1**	X			
21. Does the BDR include an estimate of each material parameter weight in kg for each container? **Reference Source: CCP Technical Procedures**	X			
22. Does the BDR include a description of each material parameter for each container? **Reference Source: CCP Technical Procedures**	X			
23. Is the container gross weight recorded in kilograms (kg) for each container in the BDR? **Reference Source: CCP Technical Procedures**	X			
24. Was the Scale Weight Calibration Check included in the BDR? **Reference Source: CCP Technical Procedures**			X	Not used.
25. Was the Scale Weight Check included in the BDR? **Reference Source: CCP Technical Procedures**			X	Not used.

Comments: None.

The container QC checks were properly performed and meet the Quality Assurance Objectives (QAOs). Proper procedures were followed during data reduction and analysis. The batch is complete, acceptable, and includes all supporting data and documentation required by the QAPjP.

Daniel Wade		03/18/2014
SPM Printed Name	Signature	Date

Checklist is to be re-signed only when a re-review is performed.

SPM Printed Name	Signature	Reason	Date
SPM Printed Name	Signature	Reason	Date

Attachment 5–CCP Radiography Batch Data Report Cover Sheet

Site ID: ORNL

Batch Data Report No.: OR-RTR7-0013 ☑ CH ☐ RH Date: 2/24/14

Waste Container ID Numbers	
Replicate Scan:	X10C0402819D
Independent Observation:	X10C0402988G
1	NFS0759B1
2	X10C0402056A
3	X10C0402988G
4	X10C0402819D
5	X10C0402822B
6	X10C0402829G
7	X10C0402988C1
8	X10C9311060A
9	X10C0403027A
10	X10C0403027H
11	N/A
12	N/A
13	N/A
14	N/A
15	N/A
16	N/A
17	N/A
18	N/A
19	N/A
20	N/A

RTR Operator:

Steve Redmond — Printed Name

Signature

2/24/14 — Date 3-11-14

working receipt? OK

Independent Technical Reviewer:

Daphne Brothers — Printed Name

Daphne D Brothers — Signature

3/11/14 — Date

NTPC RECORDS ORIGINAL
DATE REC'D 3-11-2013

Attachment 4 – CCP Radiography Batch Data Report Table of Contents and Batch Narrative

Batch Data Report No.: OR-RTR7-0013 Date: 2/24/14

Table Of Contents		
Item	Description	Page No.
1	CCP Radiography Batch Data Report Cover Sheet	1
2	CCP Radiography Batch Data Report Table Of Contents	2
3	CCP RTR Measurement Control Report	3
4	CCP Radiography Data Sheets	4
5	Copy of NCRs (NA, If Not Applicable)	N/A
6	CCP Independent Technical Reviewer Checklist	40

Batch Narrative
All Quality Checks were performed and recorded on CCP-TP-053, Rev. 14 CCP Radiography Measurement Control Report.

Steve Redmond — RTR Operator

Signature

2/24/14 — Date

Attachment 1 – CCP RTR Measurement Control Report

Site ID: ORNL		
Batch Data Report No.: OR-RTR7-0013		
Examination Date: 2/24/14		
Control Checks		
Video/Audio Recorded Media System Check	☑ SAT	☐ UNSAT
Image Test : 13 Lines (Minimum acceptable is 5 lines-pair/cm or #6 Sieve is viewable)	☑ SAT	☐ UNSAT
Comments: N/A		
RTR Operator:		
Steve Redmond (Printed Name)	Signature	2/24/14 (Date)

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CCP Radiography Data Sheet

Section 1: General Information	
☐ RTR Examination ☒ RTR Replicate Scan ☐ RTR Independent Observation	
Site ID:	ORNL
Batch Number:	OR-RTR7-0013
Examination Date:	2/24/2014
Waste Container ID:	X10C0402819D
Video/Audio Recorded Media Number:	OR-RTR7-0013 A&B
Procedure and Revision No.:	CCP-TP-053 Rev. 14
NCR(s) associated with the container? (e.g., Prohibited Items)	☒ No ☐ Yes NCR No.: N/A NCR No.: N/A

Section 2: Waste Container Data	
Container Type:	55 Gallon Drum
TRUCON Code:	OR 225
Waste Matrix Code:	S5400
Waste Stream I.D.:	OR-REDC-CH-HET
Waste Container Weights:	Gross Wt.: 46.6 kg Tare Wt.: 33.2 kg Net Wt.: 13.4 kg
Rigid Liner and Liner Vent Description:	Liner: ☒ No ☐ Yes Lid: ☒ No ☐ Yes Type: ☐ 30-mil ☐ 90-mil ☐ 110-mil ☐ 125-mil Vented: ☐ No ☐ Yes ☒ N/A Punctured: ☒ No ☐ Yes Mechanical Vent: ☒ No ☐ Yes Fiberboard Liner: ☒ No ☐ Yes Lead Lined: ☒ No ☐ Yes
Number of Layers of Confinement:	Appears to be 2 layers
Volume Utilization Percentage:	80 %

CCP Radiography Data Sheet

Waste Container ID: X10C0402819D

Section 3: Container Inventory and Comments	(Detailed descriptions)
IM:	Metal hardware
AM:	
OM:	
OI:	Absorbent
C:	Cloth
R:	Rubber gloves
XPM:	Plastic bags, plastic containers, plastic caps, plastic sheeting
OR:	
IN:	
S:	

Section 4: Packaging Material and Waste Material Parameters	
Packaging Material:	**Estimated Weight (kg)**
Steel (ST):	27.8
Plastics (PP): Liner Bag	1.0
Other: Cardboard Liner (CP)	4.4
Total Packaging Weight	33.2
Waste Material Parameter:	**Estimated Weight (kg)**
Iron-based Metal / Alloys (IM):	0.1
Aluminum-based Metals / Alloys (AM):	
Other Metals (OM):	
Other Inorganic Materials (OI)	5.5
Cellulosics (C):	3.5
Rubber (R):	0.3
Plastics (waste materials) (XPM):	4.0
Organic Matrix (OR):	
Inorganic Matrix (IN):	
Soils (S):	
Total WMP Weight:	13.4

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CCP Radiography Data Sheet

Waste Container ID: X10C0402819D

Section 5: RTR Summary (Questions answered "Yes" will be explained in the Comment block, except for Question 1)	
Is there observable liquid?	[X] Yes [ ] No
Is there any observable liquid in internal containers, more than 60 milliliters or 3 percent by volume, whichever is greater?	[ ] Yes [X] No
Is the total volume of observable liquid in the outermost container GREATER than 1% of the container?	[ ] Yes [X] No
Is there observable liquid in payload containers with an EPA Hazardous Waste Number of U134?	[ ] Yes [X] No
Is there an indication of non-radionuclide pyrophoric materials, such as elemental potassium?	[ ] Yes [X] No
Is there an indication of hazardous wastes not occurring as co-contaminants with TRU mixed wastes (non-mixed hazardous wastes)?	[ ] Yes [X] No
Is there an indication of wastes incompatible with backfill, seal and panel closures materials, container and packaging materials, shipping container materials, or other wastes (i.e., waste does NOT match TRUCON Code[s])?	[ ] Yes [X] No
Is there an indication of wastes containing explosives or compressed gases?	[ ] Yes [X] No
Is there an indication of PCBs liquids?	[ ] Yes [X] No
Is there an indication of the waste exhibiting the characteristic of ignitability, corrosivity, or reactivity (EPA Hazardous Waste Numbers of D001, D002, or D003)?	[ ] Yes [X] No
Is the physical form of the waste inconsistent with the Waste Stream Description or the Waste Matrix Code?	[ ] Yes [X] No.
CH or RH TRAMPAC	
Are there heat-sealed bags (unvented) GREATER than 4 liters and LESS than 390 square inches in the waste, or heat sealed bags not authorized in the RH TRUCON Code?	[ ] Yes [X] No
Were there Non-approved Closure Methods used on liner bags or inner bags greater than 4 liters?	[ ] Yes [X] No
Are there sealed containers GREATER than 4 liters?	[ ] Yes [X] No
Are there indications of inadequate protection for heavy and/or sharp objects?	[ ] Yes [X] No

Comments: The Replicate agrees with the original scan. JMB 2/24/14
After further review with the original operator, I agree there is also observable liquid in the folds of plastic bags in this drum. JMB 2/24/14

RTR Operator:

John Brookshire	John Brookshire	2/24/2014
Print Name	Signature	Date

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CCP Radiography Data Sheet

Section 1: General Information	
☐ RTR Examination ☐ RTR Replicate Scan ☒ RTR Independent Observation	
Site ID:	ORNL
Batch Number:	OR-RTR7-0013
Examination Date:	2/24/2014
Waste Container ID:	X10C0402988G
Video/Audio Recorded Media Number:	OR-RTR7-0013 A&B
Procedure and Revision No.:	CCP-TP-053 Rev. 14
NCR(s) associated with the container? (e.g., Prohibited Items)	☒ No ☐ Yes NCR No.: N/A NCR No.: N/A

Section 2: Waste Container Data	
Container Type:	55 Gallon Drum
TRUCON Code:	OR 225
Waste Matrix Code:	S5400
Waste Stream I.D.:	OR-REDC-CH-HET
Waste Container Weights:	Gross Wt.: 45.6 kg Tare Wt.: 33.2 kg Net Wt.: 12.4 kg
Rigid Liner and Liner Vent Description:	Liner: ☒ No ☐ Yes Lid: ☒ No ☐ Yes Type: ☐ 30-mil ☐ 90-mil ☐ 110-mil ☐ 125-mil Vented: ☐ No ☐ Yes ☒ N/A Punctured: ☒ No ☐ Yes Mechanical Vent: ☒ No ☐ Yes Fiberboard Liner: ☒ No ☐ Yes Lead Lined: ☒ No ☐ Yes
Number of Layers of Confinement:	Appears to be 1 layer
Volume Utilization Percentage:	85 %

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CCP Radiography Data Sheet

Waste Container ID: X10C0402988G

Section 3: Container Inventory and Comments	(Detailed descriptions)
IM:	Metal cans, scrap metal
AM:	
OM:	Lead sheets
OI:	Floor sweepings, glassware
C:	Cloth
R:	
XPM:	Plastic sheeting, scrap plastic, plastic containers
OR:	
IN:	
S:	

Section 4: Packaging Material and Waste Material Parameters	
Packaging Material:	**Estimated Weight (kg)**
Steel (ST):	27.8
Plastics (PP): Liner Bag	1.0
Other: Cardboard Liner (CP)	4.4
Total Packaging Weight	33.2
Waste Material Parameter:	**Estimated Weight (kg)**
Iron-based Metal / Alloys (IM):	2.2
Aluminum-based Metals / Alloys (AM):	
Other Metals (OM):	5.0
Other Inorganic Materials (OI)	0.4
Cellulosics (C):	0.3
Rubber (R):	
Plastics (waste materials) (XPM):	4.5
Organic Matrix (OR):	
Inorganic Matrix (IN):	
Soils (S):	
Total WMP Weight:	12.4

CCP Radiography Data Sheet

Waste Container ID: X10C0402988G

Section 5: RTR Summary (Questions answered "Yes" will be explained in the Comment block, except for Question 1)	
Is there observable liquid?	☐ Yes ☒ No
Is there any observable liquid in internal containers, more than 60 milliliters or 3 percent by volume, whichever is greater?	☐ Yes ☒ No
Is the total volume of observable liquid in the outermost container GREATER than 1% of the container?	☐ Yes ☒ No
Is there observable liquid in payload containers with an EPA Hazardous Waste Number of U134?	☐ Yes ☒ No
Is there an indication of non-radionuclide pyrophoric materials, such as elemental potassium?	☐ Yes ☒ No
Is there an indication of hazardous wastes not occurring as co-contaminants with TRU mixed wastes (non-mixed hazardous wastes)?	☐ Yes ☒ No
Is there an indication of wastes incompatible with backfill, seal and panel closures materials, container and packaging materials, shipping container materials, or other wastes (i.e., waste does NOT match TRUCON Code[s])?	☐ Yes ☒ No
Is there an indication of wastes containing explosives or compressed gases?	☐ Yes ☒ No
Is there an indication of PCBs liquids?	☐ Yes ☒ No
Is there an indication of the waste exhibiting the characteristic of ignitability, corrosivity, or reactivity (EPA Hazardous Waste Numbers of D001, D002, or D003)?	☐ Yes ☒ No
Is the physical form of the waste inconsistent with the Waste Stream Description or the Waste Matrix Code?	☐ Yes ☒ No
CH or RH TRAMPAC	
Are there heat-sealed bags (unvented) GREATER than 4 liters and LESS than 390 square inches in the waste, or heat sealed bags not authorized in the RH TRUCON Code?	☐ Yes ☒ No
Were there Non-approved Closure Methods used on liner bags or inner bags greater than 4 liters?	☐ Yes ☒ No
Are there sealed containers GREATER than 4 liters?	☐ Yes ☒ No
Are there indications of inadequate protection for heavy and/or sharp objects?	☐ Yes ☒ No

Comments: The Independent Observation agrees with the original scan. JNB 2/24/14

RTR Operator:

John Brookshire	John Brookshire	2/24/2014
Print Name	Signature	Date

CCP Radiography Data Sheet

Section 1: General Information	
[X] RTR Examination [ ] RTR Replicate Scan [ ] RTR Independent Observation	
Site ID:	ORNL
Batch Number:	OR-RTR7-0013
Examination Date:	2/24/2014
Waste Container ID:	NFS0759B1
Video/Audio Recorded Media Number:	OR-RTR7-0013 A&B
Procedure and Revision No.:	CCP-TP-053 Rev. 14
NCR(s) associated with the container? (e.g., Prohibited Items)	[X] No [ ] Yes NCR No.: N/A NCR No.: N/A

Section 2: Waste Container Data	
Container Type:	Standard Pipe Overpack (12-inch diameter)
TRUCON Code:	OR 227
Waste Matrix Code:	S3900
Waste Stream I.D.:	OR-NFS-CH-HOM-A
Waste Container Weights:	Gross Wt.: 156.7 kg Tare Wt.: 3-11-14 ~~142.6~~ 144.0 3-11-14 kg Net Wt.: 3/11/14 ~~13.9~~ 12.2 3-11-14 kg
Rigid Liner and Liner Vent Description:	Liner: [ ] No [X] Yes Lid: [ ] No [X] Yes Type: [ ] 30-mil [X] 90-mil [ ] 110-mil [ ] 125-mil Vented: [ ] No [X] Yes [ ] N/A Punctured: [ ] No [X] Yes Mechanical Vent: [X] No [ ] Yes Fiberboard Liner: [X] No [ ] Yes Lead Lined: [X] No [ ] Yes
Number of Layers of Confinement:	Appears to be 1 layer
Volume Utilization Percentage:	75 %

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CCP Radiography Data Sheet

Waste Container ID: NFS0759B1

Section 3: Container Inventory and Comments (Detailed descriptions)	
IM:	
AM:	
OM:	
OI:	Absorbed material, floor sweepings
C:	
R:	
XPM:	Plastic bags, plastic containers
OR:	Absorbent
IN:	
S:	

Section 4: Packaging Material and Waste Material Parameters	
Packaging Material:	**Estimated Weight (kg)**
Steel (ST):	3-11-14 ~~109.1~~ 3-11-14 102.2
Plastics (PP):90 mil liner	3-11-14 ~~6.2~~ 3-11-14 6.4
Other: Fiberboard dunnage (CP)	3-11-14 ~~27.5~~ 3-11-14 35.4
Total Packaging Weight	3-11-14 ~~142.8~~ 3-11-14 144.0
Waste Material Parameter:	**Estimated Weight (kg)**
Iron-based Metal / Alloys (IM):	
Aluminum-based Metals / Alloys (AM):	
Other Metals (OM):	
Other Inorganic Materials (OI)	3-11-14 ~~10.5~~ 3-11-14 9.3
Cellulosics (C):	
Rubber (R):	
Plastics (waste materials) (XPM):	3.0
Organic Matrix (OR):	0.4
Inorganic Matrix (IN):	
Soils (S):	
Total WMP Weight:	3-11-14 ~~13.9~~ 3-11-14 12.7

CCP Radiography Data Sheet

Waste Container ID: NFS0759B1

Section 5: RTR Summary (Questions answered "Yes" will be explained in the Comment block, except for Question 1)	
Is there observable liquid?	☐ Yes ☒ No
Is there any observable liquid in internal containers, more than 60 milliliters or 3 percent by volume, whichever is greater?	☐ Yes ☒ No
Is the total volume of observable liquid in the outermost container GREATER than 1% of the container?	☐ Yes ☒ No
Is there observable liquid in payload containers with an EPA Hazardous Waste Number of U134?	☐ Yes ☒ No
Is there an indication of non-radionuclide pyrophoric materials, such as elemental potassium?	☐ Yes ☒ No
Is there an indication of hazardous wastes not occurring as co-contaminants with TRU mixed wastes (non-mixed hazardous wastes)?	☐ Yes ☒ No
Is there an indication of wastes incompatible with backfill, seal and panel closures materials, container and packaging materials, shipping container materials, or other wastes (i.e., waste does NOT match TRUCON Code[s])?	☐ Yes ☒ No
Is there an indication of wastes containing explosives or compressed gases?	☐ Yes ☒ No
Is there an indication of PCBs liquids?	☐ Yes ☒ No
Is there an indication of the waste exhibiting the characteristic of ignitability, corrosivity, or reactivity (EPA Hazardous Waste Numbers of D001, D002, or D003)?	☐ Yes ☒ No
Is the physical form of the waste inconsistent with the Waste Stream Description or the Waste Matrix Code?	☐ Yes ☒ No
CH or RH TRAMPAC	
Are there heat-sealed bags (unvented) GREATER than 4 liters and LESS than 390 square inches in the waste, or heat sealed bags not authorized in the RH TRUCON Code?	☐ Yes ☒ No
Were there Non-approved Closure Methods used on liner bags or inner bags greater than 4 liters?	☐ Yes ☒ No
Are there sealed containers GREATER than 4 liters?	☐ Yes ☒ No
Are there indications of inadequate protection for heavy and/or sharp objects?	☐ Yes ☒ No

Comments: ~~N/A~~ 3-11-14 Per CCP Operator Aid: OA-ORNL-0132-14 Rev. 0 the Tare weights for the packaging materials were updated. The waste container weights in Section 2 and the packaging material and waste material parameter weights in Section 4 have been updated to Reflect this change. 3-11-14

RTR Operator:

Steve Redmond		2/24/2014
Print Name	Signature	Date 3-11-14

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CCP Radiography Data Sheet

Section 1: General Information	
[X] RTR Examination [ ] RTR Replicate Scan [ ] RTR Independent Observation	
Site ID:	ORNL
Batch Number:	OR-RTR7-0013
Examination Date:	2/24/2014
Waste Container ID:	X10C0402056A
Video/Audio Recorded Media Number:	OR-RTR7-0013 A&B
Procedure and Revision No.:	CCP-TP-053 Rev. 14
NCR(s) associated with the container? (e.g., Prohibited Items)	[X] No [ ] Yes NCR No.: N/A NCR No.: N/A

Section 2: Waste Container Data	
Container Type:	55 Gallon Drum
TRUCON Code:	OR 225
Waste Matrix Code:	S5400
Waste Stream I.D.:	OR-REDC-CH-HET
Waste Container Weights:	Gross Wt.: 58.1 kg Tare Wt.: 33.2 kg Net Wt.: 24.9 kg
Rigid Liner and Liner Vent Description:	Liner: [X] No [ ] Yes Lid: [X] No [ ] Yes Type: [ ] 30-mil [ ] 90-mil [ ] 110-mil [ ] 125-mil Vented: [ ] No [ ] Yes [X] N/A Punctured: [X] No [ ] Yes Mechanical Vent: [X] No [ ] Yes Fiberboard Liner: [X] No [ ] Yes Lead Lined: [X] No [ ] Yes
Number of Layers of Confinement:	Appears to be 1 layer
Volume Utilization Percentage:	95 %

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CCP Radiography Data Sheet

Waste Container ID: X10C0402056A

Section 3: Container Inventory and Comments	(Detailed descriptions)
IM:	Scrap metal, open pipe nipple, metal hardware, scissors, metal container, hand tools, electrical devices, utility knife
AM:	
OM:	
OI:	Glass containers, absorbent, broken glass
C:	Cloth, brushes
R:	Rubber stoppers, rubber gloves
XPM:	Plastic sheeting, plastic containers, scrap plastic, plastic bag, plastic caps, plastic tubing, coax cable, open plastic container
OR:	
IN:	
S:	

Section 4: Packaging Material and Waste Material Parameters	
Packaging Material:	**Estimated Weight (kg)**
Steel (ST):	27.8
Plastics (PP):Liner bag	1.0
Other: Cardboard liner (CP)	4.4
Total Packaging Weight	33.2
Waste Material Parameter:	**Estimated Weight (kg)**
Iron-based Metal / Alloys (IM):	11.3
Aluminum-based Metals / Alloys (AM):	
Other Metals (OM):	
Other Inorganic Materials (OI)	0.7
Cellulosics (C):	4.0
Rubber (R):	2.6
Plastics (waste materials) (XPM):	6.3
Organic Matrix (OR):	
Inorganic Matrix (IN):	
Soils (S):	
Total WMP Weight:	24.9

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CCP Radiography Data Sheet

Waste Container ID: X10C0402056A

Section 5: RTR Summary (Questions answered "Yes" will be explained in the Comment block, except for Question 1)	
Is there observable liquid?	☐ Yes ☒ No
Is there any observable liquid in internal containers, more than 60 milliliters or 3 percent by volume, whichever is greater?	☐ Yes ☒ No
Is the total volume of observable liquid in the outermost container GREATER than 1% of the container?	☐ Yes ☒ No
Is there observable liquid in payload containers with an EPA Hazardous Waste Number of U134?	☐ Yes ☒ No
Is there an indication of non-radionuclide pyrophoric materials, such as elemental potassium?	☐ Yes ☒ No
Is there an indication of hazardous wastes not occurring as co-contaminants with TRU mixed wastes (non-mixed hazardous wastes)?	☐ Yes ☒ No
Is there an indication of wastes incompatible with backfill, seal and panel closures materials, container and packaging materials, shipping container materials, or other wastes (i.e., waste does NOT match TRUCON Code[s])?	☐ Yes ☒ No
Is there an indication of wastes containing explosives or compressed gases?	☐ Yes ☒ No
Is there an indication of PCBs liquids?	☐ Yes ☒ No
Is there an indication of the waste exhibiting the characteristic of ignitability, corrosivity, or reactivity (EPA Hazardous Waste Numbers of D001, D002, or D003)?	☐ Yes ☒ No
Is the physical form of the waste inconsistent with the Waste Stream Description or the Waste Matrix Code?	☐ Yes ☒ No
CH or RH TRAMPAC	
Are there heat-sealed bags (unvented) GREATER than 4 liters and LESS than 390 square inches in the waste, or heat sealed bags not authorized in the RH TRUCON Code?	☐ Yes ☒ No
Were there Non-approved Closure Methods used on liner bags or inner bags greater than 4 liters?	☐ Yes ☒ No
Are there sealed containers GREATER than 4 liters?	☐ Yes ☒ No
Are there indications of inadequate protection for heavy and/or sharp objects?	☐ Yes ☒ No

Comments: N/A

RTR Operator:

Steve Redmond		2/24/2014
Print Name	Signature	Date

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CCP Radiography Data Sheet

Section 1: General Information	
[X] RTR Examination [ ] RTR Replicate Scan [ ] RTR Independent Observation	
Site ID:	ORNL
Batch Number:	OR-RTR7-0013
Examination Date:	2/24/2014
Waste Container ID:	X10C0402988G
Video/Audio Recorded Media Number:	OR-RTR7-0013 A&B
Procedure and Revision No.:	CCP-TP-053 Rev. 14
NCR(s) associated with the container? (e.g., Prohibited Items)	[X] No [ ] Yes NCR No.: N/A NCR No.: N/A

Section 2: Waste Container Data	
Container Type:	55 Gallon Drum
TRUCON Code:	OR 225
Waste Matrix Code:	S5400
Waste Stream I.D.:	OR-REDC-CH-HET
Waste Container Weights:	Gross Wt.: 45.6 kg Tare Wt.: 33.2 kg Net Wt.: 12.4 kg
Rigid Liner and Liner Vent Description:	Liner: [X] No [ ] Yes Lid: [X] No [ ] Yes Type: [ ] 30-mil [ ] 90-mil [ ] 110-mil [ ] 125-mil Vented: [ ] No [ ] Yes [X] N/A Punctured: [X] No [ ] Yes Mechanical Vent: [X] No [ ] Yes Fiberboard Liner: [X] No [ ] Yes Lead Lined: [X] No [ ] Yes
Number of Layers of Confinement:	Appears to be 1 layer
Volume Utilization Percentage:	85 %

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CCP Radiography Data Sheet

Waste Container ID: X10C0402988G

Section 3: Container Inventory and Comments	(Detailed descriptions)
IM:	Scrap metal
AM:	
OM:	Lead sheeting
OI:	Floor sweepings, glass containers, absorbent
C:	Cloth
R:	
XPM:	Plastic sheeting, scrap plastic, plastic containers, open plastic containers
OR:	
IN:	
S:	

Section 4: Packaging Material and Waste Material Parameters	
Packaging Material:	**Estimated Weight (kg)**
Steel (ST):	27.8
Plastics (PP):Liner bag	1.0
Other: Cardboard liner (CP)	4.4
Total Packaging Weight	33.2
Waste Material Parameter:	**Estimated Weight (kg)**
Iron-based Metal / Alloys (IM):	2.0
Aluminum-based Metals / Alloys (AM):	
Other Metals (OM):	5.0
Other Inorganic Materials (OI)	0.5
Cellulosics (C):	0.3
Rubber (R):	
Plastics (waste materials) (XPM):	4.6
Organic Matrix (OR):	
Inorganic Matrix (IN):	
Soils (S):	
Total WMP Weight:	12.4

CCP Radiography Data Sheet

Waste Container ID: X10C0402988G

Section 5: RTR Summary (Questions answered "Yes" will be explained in the Comment block, except for Question 1)	
Is there observable liquid?	☐ Yes ☒ No
Is there any observable liquid in internal containers, more than 60 milliliters or 3 percent by volume, whichever is greater?	☐ Yes ☒ No
Is the total volume of observable liquid in the outermost container GREATER than 1% of the container?	☐ Yes ☒ No
Is there observable liquid in payload containers with an EPA Hazardous Waste Number of U134?	☐ Yes ☒ No
Is there an indication of non-radionuclide pyrophoric materials, such as elemental potassium?	☐ Yes ☒ No
Is there an indication of hazardous wastes not occurring as co-contaminants with TRU mixed wastes (non-mixed hazardous wastes)?	☐ Yes ☒ No
Is there an indication of wastes incompatible with backfill, seal and panel closures materials, container and packaging materials, shipping container materials, or other wastes (i.e., waste does NOT match TRUCON Code[s])?	☐ Yes ☒ No
Is there an indication of wastes containing explosives or compressed gases?	☐ Yes ☒ No
Is there an indication of PCBs liquids?	☐ Yes ☒ No
Is there an indication of the waste exhibiting the characteristic of ignitability, corrosivity, or reactivity (EPA Hazardous Waste Numbers of D001, D002, or D003)?	☐ Yes ☒ No
Is the physical form of the waste inconsistent with the Waste Stream Description or the Waste Matrix Code?	☐ Yes ☒ No
CH or RH TRAMPAC	
Are there heat-sealed bags (unvented) GREATER than 4 liters and LESS than 390 square inches in the waste, or heat sealed bags not authorized in the RH TRUCON Code?	☐ Yes ☒ No
Were there Non-approved Closure Methods used on liner bags or inner bags greater than 4 liters?	☐ Yes ☒ No
Are there sealed containers GREATER than 4 liters?	☐ Yes ☒ No
Are there indications of inadequate protection for heavy and/or sharp objects?	☐ Yes ☒ No
Comments:N/A	

RTR Operator:

Steve Redmond		2/24/2014
Print Name	Signature	Date

CCP Radiography Data Sheet

Section 1: General Information	
[X] RTR Examination [ ] RTR Replicate Scan [ ] RTR Independent Observation	
Site ID:	ORNL
Batch Number:	OR-RTR7-0013
Examination Date:	2/24/2014
Waste Container ID:	X10C0402819D
Video/Audio Recorded Media Number:	OR-RTR7-0013 A&B
Procedure and Revision No.:	CCP-TP-053 Rev. 14
NCR(s) associated with the container? (e.g., Prohibited Items)	[X] No [ ] Yes NCR No.: N/A NCR No.: N/A

Section 2: Waste Container Data	
Container Type:	55 Gallon Drum
TRUCON Code:	OR 225
Waste Matrix Code:	S5400
Waste Stream I.D.:	OR-REDC-CH-HET
Waste Container Weights:	Gross Wt.: 46.6 kg Tare Wt.: 33.2 kg Net Wt.: 13.4 kg
Rigid Liner and Liner Vent Description:	Liner: [X] No [ ] Yes Lid: [X] No [ ] Yes Type: [ ] 30-mil [ ] 90-mil [ ] 110-mil [ ] 125-mil Vented: [ ] No [ ] Yes [X] N/A Punctured: [X] No [ ] Yes Mechanical Vent: [X] No [ ] Yes Fiberboard Liner: [X] No [ ] Yes Lead Lined: [X] No [ ] Yes
Number of Layers of Confinement:	Appears to be 2 layers
Volume Utilization Percentage:	80 %

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CCP Radiography Data Sheet

Waste Container ID: X10C0402819D

Section 3: Container Inventory and Comments (Detailed descriptions)	
IM:	Metal hardware
AM:	
OM:	
OI:	Absorbent
C:	Cloth
R:	
XPM:	Plastic bag, plastic sheeting, plastic caps, plastic containers
OR:	
IN:	
S:	

Section 4: Packaging Material and Waste Material Parameters	
Packaging Material:	**Estimated Weight (kg)**
Steel (ST):	27.8
Plastics (PP):Liner bag	1.0
Other: Cardboard liner (CP)	4.4
Total Packaging Weight	33.2
Waste Material Parameter:	**Estimated Weight (kg)**
Iron-based Metal / Alloys (IM):	0.1
Aluminum-based Metals / Alloys (AM):	
Other Metals (OM):	
Other Inorganic Materials (OI)	5.8
Cellulosics (C):	4.0
Rubber (R):	
Plastics (waste materials) (XPM):	3.5
Organic Matrix (OR):	
Inorganic Matrix (IN):	
Soils (S):	
Total WMP Weight:	13.4

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CCP Radiography Data Sheet

Waste Container ID: X10C0402819D

Section 5: RTR Summary (Questions answered "Yes" will be explained in the Comment block, except for Question 1)	
Is there observable liquid?	[X] Yes [ ] No
Is there any observable liquid in internal containers, more than 60 milliliters or 3 percent by volume, whichever is greater?	[ ] Yes [X] No
Is the total volume of observable liquid in the outermost container GREATER than 1% of the container?	[ ] Yes [X] No
Is there observable liquid in payload containers with an EPA Hazardous Waste Number of U134?	[ ] Yes [X] No
Is there an indication of non-radionuclide pyrophoric materials, such as elemental potassium?	[ ] Yes [X] No
Is there an indication of hazardous wastes not occurring as co-contaminants with TRU mixed wastes (non-mixed hazardous wastes)?	[ ] Yes [X] No
Is there an indication of wastes incompatible with backfill, seal and panel closures materials, container and packaging materials, shipping container materials, or other wastes (i.e., waste does NOT match TRUCON Code[s])?	[ ] Yes [X] No
Is there an indication of wastes containing explosives or compressed gases?	[ ] Yes [X] No
Is there an indication of PCBs liquids?	[ ] Yes [X] No
Is there an indication of the waste exhibiting the characteristic of ignitability, corrosivity, or reactivity (EPA Hazardous Waste Numbers of D001, D002, or D003)?	[ ] Yes [X] No
Is the physical form of the waste inconsistent with the Waste Stream Description or the Waste Matrix Code?	[ ] Yes [X] No
CH or RH TRAMPAC	
Are there heat-sealed bags (unvented) GREATER than 4 liters and LESS than 390 square inches in the waste, or heat sealed bags not authorized in the RH TRUCON Code?	[ ] Yes [X] No
Were there Non-approved Closure Methods used on liner bags or inner bags greater than 4 liters?	[ ] Yes [X] No
Are there sealed containers GREATER than 4 liters?	[ ] Yes [X] No
Are there indications of inadequate protection for heavy and/or sharp objects?	[ ] Yes [X] No
Comments:N/A	

RTR Operator:

Steve Redmond		2/24/2014
Print Name	Signature	Date

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CCP Radiography Data Sheet

CCP-TP-053 Attachment 2

Section 1: General Information	
[X] RTR Examination [ ] RTR Replicate Scan [ ] RTR Independent Observation	
Site ID:	ORNL
Batch Number:	OR-RTR7-0013
Examination Date:	2/24/2014
Waste Container ID:	X10C0402822B
Video/Audio Recorded Media Number:	OR-RTR7-0013 A&B
Procedure and Revision No.:	CCP-TP-053 Rev. 14
NCR(s) associated with the container? (e.g., Prohibited Items)	[X] No [ ] Yes NCR No.: N/A NCR No.: N/A

Section 2: Waste Container Data	
Container Type:	55 Gallon Drum
TRUCON Code:	OR 225
Waste Matrix Code:	S5400
Waste Stream I.D.:	OR-REDC-CH-HET
Waste Container Weights:	Gross Wt.: 70.7 kg Tare Wt.: 33.2 kg Net Wt.: 37.5 kg
Rigid Liner and Liner Vent Description:	Liner: [X] No [ ] Yes Lid: [X] No [ ] Yes Type: [ ] 30-mil [ ] 90-mil [ ] 110-mil [ ] 125-mil Vented: [ ] No [ ] Yes [X] N/A Punctured: [X] No [ ] Yes Mechanical Vent: [X] No [ ] Yes Fiberboard Liner: [X] No [ ] Yes Lead Lined: [X] No [ ] Yes
Number of Layers of Confinement:	Appears to be 1 layer
Volume Utilization Percentage:	95 %

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CCP Radiography Data Sheet

Waste Container ID: X10C0402822B

Section 3: Container Inventory and Comments	(Detailed descriptions)
IM:	Scrap metal, saw blade, metal hardware, metal tubing
AM:	
OM:	
OI:	Absorbent
C:	Brush, cloth
R:	
XPM:	Plastic containers, plastic sheeting, scrap plastic, open plastic container
OR:	
IN:	
S:	

Section 4: Packaging Material and Waste Material Parameters	
Packaging Material:	**Estimated Weight (kg)**
Steel (ST):	27.8
Plastics (PP):Liner bag	1.0
Other: Cardboard liner (CP)	4.4
Total Packaging Weight	33.2
Waste Material Parameter:	**Estimated Weight (kg)**
Iron-based Metal / Alloys (IM):	15.0
Aluminum-based Metals / Alloys (AM):	
Other Metals (OM):	
Other Inorganic Materials (OI)	8.0
Cellulosics (C):	6.0
Rubber (R):	
Plastics (waste materials) (XPM):	8.5
Organic Matrix (OR):	
Inorganic Matrix (IN):	
Soils (S):	
Total WMP Weight:	37.5

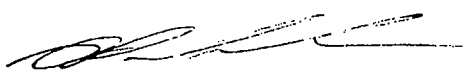
CCP Radiography Data Sheet

Waste Container ID: X10C0402822B

Section 5: RTR Summary (Questions answered "Yes" will be explained in the Comment block, except for Question 1)	
Is there observable liquid?	[X] Yes [ ] No
Is there any observable liquid in internal containers, more than 60 milliliters or 3 percent by volume, whichever is greater?	[ ] Yes [X] No
Is the total volume of observable liquid in the outermost container GREATER than 1% of the container?	[ ] Yes [X] No
Is there observable liquid in payload containers with an EPA Hazardous Waste Number of U134?	[ ] Yes [X] No
Is there an indication of non-radionuclide pyrophoric materials, such as elemental potassium?	[ ] Yes [X] No
Is there an indication of hazardous wastes not occurring as co-contaminants with TRU mixed wastes (non-mixed hazardous wastes)?	[ ] Yes [X] No
Is there an indication of wastes incompatible with backfill, seal and panel closures materials, container and packaging materials, shipping container materials, or other wastes (i.e., waste does NOT match TRUCON Code[s])?	[ ] Yes [X] No
Is there an indication of wastes containing explosives or compressed gases?	[ ] Yes [X] No
Is there an indication of PCBs liquids?	[ ] Yes [X] No
Is there an indication of the waste exhibiting the characteristic of ignitability, corrosivity, or reactivity (EPA Hazardous Waste Numbers of D001, D002, or D003)?	[ ] Yes [X] No
Is the physical form of the waste inconsistent with the Waste Stream Description or the Waste Matrix Code?	[ ] Yes [X] No
CH or RH TRAMPAC	
Are there heat-sealed bags (unvented) GREATER than 4 liters and LESS than 390 square inches in the waste, or heat sealed bags not authorized in the RH TRUCON Code?	[ ] Yes [X] No
Were there Non-approved Closure Methods used on liner bags or inner bags greater than 4 liters?	[ ] Yes [X] No
Are there sealed containers GREATER than 4 liters?	[ ] Yes [X] No
Are there indications of inadequate protection for heavy and/or sharp objects?	[ ] Yes [X] No

Comments:N/A

RTR Operator:

Steve Redmond		2/24/2014
Print Name	Signature	Date

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CCP Radiography Data Sheet

CCP-TP-053 Attachment 2

Section 1: General Information	
[X] RTR Examination [ ] RTR Replicate Scan [ ] RTR Independent Observation	
Site ID:	ORNL
Batch Number:	OR-RTR7-0013
Examination Date:	2/24/2014
Waste Container ID:	X10C0402829G
Video/Audio Recorded Media Number:	OR-RTR7-0013 A&B
Procedure and Revision No.:	CCP-TP-053 Rev. 14
NCR(s) associated with the container? (e.g., Prohibited Items)	[X] No [ ] Yes NCR No.: N/A NCR No.: N/A

Section 2: Waste Container Data	
Container Type:	55 Gallon Drum
TRUCON Code:	OR 225
Waste Matrix Code:	S5400
Waste Stream I.D.:	OR-REDC-CH-HET
Waste Container Weights:	Gross Wt.: 65.2 kg Tare Wt.: 33.2 kg Net Wt.: 32.0 kg
Rigid Liner and Liner Vent Description:	Liner: [X] No [ ] Yes Lid: [X] No [ ] Yes Type: [ ] 30-mil [ ] 90-mil [ ] 110-mil [ ] 125-mil Vented: [ ] No [ ] Yes [X] N/A Punctured: [X] No [ ] Yes Mechanical Vent: [X] No [ ] Yes Fiberboard Liner: [X] No [ ] Yes Lead Lined: [X] No [ ] Yes
Number of Layers of Confinement:	Appears to be 1 layer
Volume Utilization Percentage:	75 %

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CCP Radiography Data Sheet

Waste Container ID: X10C0402829G

Section 3: Container Inventory and Comments	(Detailed descriptions)
IM:	Scrap metal, electrical device, hand tools
AM:	
OM:	
OI:	Absorbent, glassware, glass containers, broken glass
C:	Cloth
R:	
XPM:	Plastic sheeting, plastic containers, plastic caps
OR:	
IN:	
S:	

Section 4: Packaging Material and Waste Material Parameters	
Packaging Material:	**Estimated Weight (kg)**
Steel (ST):	27.8
Plastics (PP):Liner bag	1.0
Other: Cardboar linerd (CP)	4.4
Total Packaging Weight	33.2
Waste Material Parameter:	**Estimated Weight (kg)**
Iron-based Metal / Alloys (IM):	5.0
Aluminum-based Metals / Alloys (AM):	
Other Metals (OM):	
Other Inorganic Materials (OI)	6.7
Cellulosics (C):	12.0
Rubber (R):	
Plastics (waste materials) (XPM):	8.3
Organic Matrix (OR):	
Inorganic Matrix (IN):	
Soils (S):	
Total WMP Weight:	32.0

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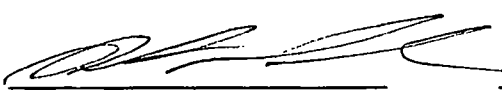
CCP Radiography Data Sheet

Waste Container ID: X10C0402829G

Section 5: RTR Summary (Questions answered "Yes" will be explained in the Comment block, except for Question 1)	
Is there observable liquid?	[X] Yes [ ] No
Is there any observable liquid in internal containers, more than 60 milliliters or 3 percent by volume, whichever is greater?	[ ] Yes [X] No
Is the total volume of observable liquid in the outermost container GREATER than 1% of the container?	[ ] Yes [X] No
Is there observable liquid in payload containers with an EPA Hazardous Waste Number of U134?	[ ] Yes [X] No
Is there an indication of non-radionuclide pyrophoric materials, such as elemental potassium?	[ ] Yes [X] No
Is there an indication of hazardous wastes not occurring as co-contaminants with TRU mixed wastes (non-mixed hazardous wastes)?	[ ] Yes [X] No
Is there an indication of wastes incompatible with backfill, seal and panel closures materials, container and packaging materials, shipping container materials, or other wastes (i.e., waste does NOT match TRUCON Code[s])?	[ ] Yes [X] No
Is there an indication of wastes containing explosives or compressed gases?	[ ] Yes [X] No
Is there an indication of PCBs liquids?	[ ] Yes [X] No
Is there an indication of the waste exhibiting the characteristic of ignitability, corrosivity, or reactivity (EPA Hazardous Waste Numbers of D001, D002, or D003)?	[ ] Yes [X] No
Is the physical form of the waste inconsistent with the Waste Stream Description or the Waste Matrix Code?	[ ] Yes [X] No
CH or RH TRAMPAC	
Are there heat-sealed bags (unvented) GREATER than 4 liters and LESS than 390 square inches in the waste, or heat sealed bags not authorized in the RH TRUCON Code?	[ ] Yes [X] No
Were there Non-approved Closure Methods used on liner bags or inner bags greater than 4 liters?	[ ] Yes [X] No
Are there sealed containers GREATER than 4 liters?	[ ] Yes [X] No
Are there indications of inadequate protection for heavy and/or sharp objects?	[ ] Yes [X] No
Comments: N/A	

RTR Operator:

Steve Redmond		2/24/2014
Print Name	Signature	Date

27

CCP Radiography Data Sheet

Section 1: General Information	
[X] RTR Examination [ ] RTR Replicate Scan [ ] RTR Independent Observation	
Site ID:	ORNL
Batch Number:	OR-RTR7-0013
Examination Date:	2/24/2014
Waste Container ID:	X10C0402988C1
Video/Audio Recorded Media Number:	OR-RTR7-0013 A&B
Procedure and Revision No.:	CCP-TP-053 Rev. 14
NCR(s) associated with the container? (e.g., Prohibited Items)	[X] No [ ] Yes NCR No.: N/A NCR No.: N/A

Section 2: Waste Container Data	
Container Type:	55 Gallon Drum
TRUCON Code:	OR 225
Waste Matrix Code:	S5400
Waste Stream I.D.:	OR-REDC-CH-HET
Waste Container Weights:	Gross Wt.: 50.0 kg Tare Wt.: 33.2 kg Net Wt.: 16.8 kg
Rigid Liner and Liner Vent Description:	Liner: [X] No [ ] Yes Lid: [X] No [ ] Yes Type: [ ] 30-mil [ ] 90-mil [ ] 110-mil [ ] 125-mil Vented: [ ] No [ ] Yes [X] N/A Punctured: [X] No [ ] Yes Mechanical Vent: [X] No [ ] Yes Fiberboard Liner: [X] No [ ] Yes Lead Lined: [X] No [ ] Yes
Number of Layers of Confinement:	Appears to be 1 layer
Volume Utilization Percentage:	90 %

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CCP Radiography Data Sheet

Waste Container ID: X10C0402988C1

Section 3: Container Inventory and Comments	(Detailed descriptions)
IM:	Scrap metal, metal containers, metal fittings
AM:	
OM:	
OI:	Glass containers, absorbent, broken glass
C:	Cloth, cardboard
R:	
XPM:	Open plastic containers, plastic sheeting, plastic containers, manipulator boots, coax cable, plastic tubing, scrap plastic, plastic caps
OR:	
IN:	
S:	

Section 4: Packaging Material and Waste Material Parameters	
Packaging Material:	**Estimated Weight (kg)**
Steel (ST):	27.8
Plastics (PP):Liner bag	1.0
Other: Cardboard liner (CP)	4.4
Total Packaging Weight	33.2
Waste Material Parameter:	**Estimated Weight (kg)**
Iron-based Metal / Alloys (IM):	5.8
Aluminum-based Metals / Alloys (AM):	
Other Metals (OM):	
Other Inorganic Materials (OI)	1.0
Cellulosics (C):	4.0
Rubber (R):	
Plastics (waste materials) (XPM):	6.0
Organic Matrix (OR):	
Inorganic Matrix (IN):	
Soils (S):	
Total WMP Weight:	16.8

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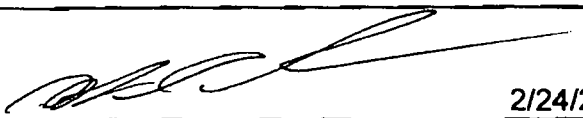
CCP Radiography Data Sheet

Waste Container ID: X10C0402988C1

Section 5: RTR Summary (Questions answered "Yes" will be explained in the Comment block, except for Question 1)	
Is there observable liquid?	☐ Yes ☒ No
Is there any observable liquid in internal containers, more than 60 milliliters or 3 percent by volume, whichever is greater?	☐ Yes ☒ No
Is the total volume of observable liquid in the outermost container GREATER than 1% of the container?	☐ Yes ☒ No
Is there observable liquid in payload containers with an EPA Hazardous Waste Number of U134?	☐ Yes ☒ No
Is there an indication of non-radionuclide pyrophoric materials, such as elemental potassium?	☐ Yes ☒ No
Is there an indication of hazardous wastes not occurring as co-contaminants with TRU mixed wastes (non-mixed hazardous wastes)?	☐ Yes ☒ No
Is there an indication of wastes incompatible with backfill, seal and panel closures materials, container and packaging materials, shipping container materials, or other wastes (i.e., waste does NOT match TRUCON Code[s])?	☐ Yes ☒ No
Is there an indication of wastes containing explosives or compressed gases?	☐ Yes ☒ No
Is there an indication of PCBs liquids?	☐ Yes ☒ No
Is there an indication of the waste exhibiting the characteristic of ignitability, corrosivity, or reactivity (EPA Hazardous Waste Numbers of D001, D002, or D003)?	☐ Yes ☒ No
Is the physical form of the waste inconsistent with the Waste Stream Description or the Waste Matrix Code?	☐ Yes ☒ No
CH or RH TRAMPAC	
Are there heat-sealed bags (unvented) GREATER than 4 liters and LESS than 390 square inches in the waste, or heat sealed bags not authorized in the RH TRUCON Code?	☐ Yes ☒ No
Were there Non-approved Closure Methods used on liner bags or inner bags greater than 4 liters?	☐ Yes ☒ No
Are there sealed containers GREATER than 4 liters?	☐ Yes ☒ No
Are there indications of inadequate protection for heavy and/or sharp objects?	☐ Yes ☒ No
Comments:N/A	

RTR Operator:

Steve Redmond		2/24/2014
Print Name	Signature	Date

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CCP Radiography Data Sheet

Section 1: General Information	
[X] RTR Examination [ ] RTR Replicate Scan [ ] RTR Independent Observation	
Site ID:	ORNL
Batch Number:	OR-RTR7-0013
Examination Date:	2/24/2014
Waste Container ID:	X10C9311060A
Video/Audio Recorded Media Number:	OR-RTR7-0013 A&B
Procedure and Revision No.:	CCP-TP-053 Rev. 14
NCR(s) associated with the container? (e.g., Prohibited Items)	[X] No [ ] Yes NCR No.: N/A NCR No.: N/A

Section 2: Waste Container Data	
Container Type:	55 Gallon Drum
TRUCON Code:	OR 225
Waste Matrix Code:	S5400
Waste Stream I.D.:	OR-REDC-CH-HET
Waste Container Weights:	Gross Wt.: 57.0 kg Tare Wt.: 33.2 kg Net Wt.: 23.8 kg
Rigid Liner and Liner Vent Description:	Liner: [X] No [ ] Yes Lid: [X] No [ ] Yes Type: [ ] 30-mil [ ] 90-mil [ ] 110-mil [ ] 125-mil Vented: [ ] No [ ] Yes [X] N/A Punctured: [X] No [ ] Yes Mechanical Vent: [X] No [ ] Yes Fiberboard Liner: [X] No [ ] Yes Lead Lined: [X] No [ ] Yes
Number of Layers of Confinement:	Appears to be 1 layer
Volume Utilization Percentage:	85 %

CCP Radiography Data Sheet

Waste Container ID: X10C9311060A

Section 3: Container Inventory and Comments (Detailed descriptions)	
IM:	Metal hardware, filter vents, scissors, scrap metal
AM:	
OM:	
OI:	Glass container, glass vacuum tube
C:	Wood, cloth
R:	
XPM:	Plastic containers, plastic caps, plastic sheeting, scrap plastic
OR:	
IN:	
S:	

Section 4: Packaging Material and Waste Material Parameters	
Packaging Material:	**Estimated Weight (kg)**
Steel (ST):	27.8
Plastics (PP):Liner bag	1.0
Other: Cardboard liner (CP)	4.4
Total Packaging Weight	33.2
Waste Material Parameter:	**Estimated Weight (kg)**
Iron-based Metal / Alloys (IM):	1.0
Aluminum-based Metals / Alloys (AM):	
Other Metals (OM):	
Other Inorganic Materials (OI)	1.0
Cellulosics (C):	10.0
Rubber (R):	
Plastics (waste materials) (XPM):	11.8
Organic Matrix (OR):	
Inorganic Matrix (IN):	
Soils (S):	
Total WMP Weight:	23.8

CCP Radiography Data Sheet

Waste Container ID: X10C9311060A

Section 5: RTR Summary (Questions answered "Yes" will be explained in the Comment block, except for Question 1)	
Is there observable liquid?	☐ Yes ☒ No
Is there any observable liquid in internal containers, more than 60 milliliters or 3 percent by volume, whichever is greater?	☐ Yes ☒ No
Is the total volume of observable liquid in the outermost container GREATER than 1% of the container?	☐ Yes ☒ No
Is there observable liquid in payload containers with an EPA Hazardous Waste Number of U134?	☐ Yes ☒ No
Is there an indication of non-radionuclide pyrophoric materials, such as elemental potassium?	☐ Yes ☒ No
Is there an indication of hazardous wastes not occurring as co-contaminants with TRU mixed wastes (non-mixed hazardous wastes)?	☐ Yes ☒ No
Is there an indication of wastes incompatible with backfill, seal and panel closures materials, container and packaging materials, shipping container materials, or other wastes (i.e., waste does NOT match TRUCON Code[s])?	☐ Yes ☒ No
Is there an indication of wastes containing explosives or compressed gases?	☐ Yes ☒ No
Is there an indication of PCBs liquids?	☐ Yes ☒ No
Is there an indication of the waste exhibiting the characteristic of ignitability, corrosivity, or reactivity (EPA Hazardous Waste Numbers of D001, D002, or D003)?	☐ Yes ☒ No
Is the physical form of the waste inconsistent with the Waste Stream Description or the Waste Matrix Code?	☐ Yes ☒ No
CH or RH TRAMPAC	
Are there heat-sealed bags (unvented) GREATER than 4 liters and LESS than 390 square inches in the waste, or heat sealed bags not authorized in the RH TRUCON Code?	☐ Yes ☒ No
Were there Non-approved Closure Methods used on liner bags or inner bags greater than 4 liters?	☐ Yes ☒ No
Are there sealed containers GREATER than 4 liters?	☐ Yes ☒ No
Are there indications of inadequate protection for heavy and/or sharp objects?	☐ Yes ☒ No
Comments: N/A	

RTR Operator:

Steve Redmond		2/24/2014
Print Name	Signature	Date

CCP Radiography Data Sheet

CCP-TP-053 Attachment 2

Section 1: General Information	
[X] RTR Examination [ ] RTR Replicate Scan [ ] RTR Independent Observation	
Site ID:	ORNL
Batch Number:	OR-RTR7-0013
Examination Date:	2/24/2014
Waste Container ID:	X10C0403027A
Video/Audio Recorded Media Number:	OR-RTR7-0013 A&B
Procedure and Revision No.:	CCP-TP-053 Rev. 14
NCR(s) associated with the container? (e.g., Prohibited Items)	[X] No [ ] Yes NCR No.: N/A NCR No.: N/A

Section 2: Waste Container Data	
Container Type:	55 Gallon Drum
TRUCON Code:	OR 225
Waste Matrix Code:	S5400
Waste Stream I.D.:	OR-REDC-CH-HET
Waste Container Weights:	Gross Wt.: 60.0 kg Tare Wt.: 33.2 kg Net Wt.: 26.8 kg
Rigid Liner and Liner Vent Description:	Liner: [X] No [ ] Yes Lid: [X] No [ ] Yes Type: [ ] 30-mil [ ] 90-mil [ ] 110-mil [ ] 125-mil Vented: [ ] No [ ] Yes [X] N/A Punctured: [X] No [ ] Yes Mechanical Vent: [X] No [ ] Yes Fiberboard Liner: [X] No [ ] Yes Lead Lined: [X] No [ ] Yes
Number of Layers of Confinement:	Appears to be 1 layer
Volume Utilization Percentage:	80 %

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CCP Radiography Data Sheet

Waste Container ID: X10C0403027A

Section 3: Container Inventory and Comments (Detailed descriptions)	
IM:	Scrap metal
AM:	
OM:	
OI:	Absorbent, glassware, broken glass, glass containers, concrete pieces
C:	Cloth
R:	
XPM:	Plastic sheeting, plastic containers, plastic tubing, scrap plastic
OR:	
IN:	
S:	

Section 4: Packaging Material and Waste Material Parameters	
Packaging Material:	**Estimated Weight (kg)**
Steel (ST):	27.8
Plastics (PP):Liner bag	1.0
Other: Cardboard liner (CP)	4.4
Total Packaging Weight	33.2
Waste Material Parameter:	**Estimated Weight (kg)**
Iron-based Metal / Alloys (IM):	0.5
Aluminum-based Metals / Alloys (AM):	
Other Metals (OM):	
Other Inorganic Materials (OI)	12.0
Cellulosics (C):	8.0
Rubber (R):	
Plastics (waste materials) (XPM):	6.3
Organic Matrix (OR):	
Inorganic Matrix (IN):	
Soils (S):	
Total WMP Weight:	26.8

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CCP Radiography Data Sheet

Waste Container ID: X10C0403027A

Section 5: RTR Summary (Questions answered "Yes" will be explained in the Comment block, except for Question 1)	
Is there observable liquid?	☐ Yes ☒ No
Is there any observable liquid in internal containers, more than 60 milliliters or 3 percent by volume, whichever is greater?	☐ Yes ☒ No
Is the total volume of observable liquid in the outermost container GREATER than 1% of the container?	☐ Yes ☒ No
Is there observable liquid in payload containers with an EPA Hazardous Waste Number of U134?	☐ Yes ☒ No
Is there an indication of non-radionuclide pyrophoric materials, such as elemental potassium?	☐ Yes ☒ No
Is there an indication of hazardous wastes not occurring as co-contaminants with TRU mixed wastes (non-mixed hazardous wastes)?	☐ Yes ☒ No
Is there an indication of wastes incompatible with backfill, seal and panel closures materials, container and packaging materials, shipping container materials, or other wastes (i.e., waste does NOT match TRUCON Code[s])?	☐ Yes ☒ No
Is there an indication of wastes containing explosives or compressed gases?	☐ Yes ☒ No
Is there an indication of PCBs liquids?	☐ Yes ☒ No
Is there an indication of the waste exhibiting the characteristic of ignitability, corrosivity, or reactivity (EPA Hazardous Waste Numbers of D001, D002, or D003)?	☐ Yes ☒ No
Is the physical form of the waste inconsistent with the Waste Stream Description or the Waste Matrix Code?	☐ Yes ☒ No
CH or RH TRAMPAC	
Are there heat-sealed bags (unvented) GREATER than 4 liters and LESS than 390 square inches in the waste, or heat sealed bags not authorized in the RH TRUCON Code?	☐ Yes ☒ No
Were there Non-approved Closure Methods used on liner bags or inner bags greater than 4 liters?	☐ Yes ☒ No
Are there sealed containers GREATER than 4 liters?	☐ Yes ☒ No
Are there indications of inadequate protection for heavy and/or sharp objects?	☐ Yes ☒ No
Comments: N/A	

RTR Operator:

Steve Redmond		2/24/2014
Print Name	Signature	Date

CCP Radiography Data Sheet

Section 1: General Information	
[X] RTR Examination [ ] RTR Replicate Scan [ ] RTR Independent Observation	
Site ID:	ORNL
Batch Number:	OR-RTR7-0013
Examination Date:	2/24/2014
Waste Container ID:	X10C0403027H
Video/Audio Recorded Media Number:	OR-RTR7-0013 A&B
Procedure and Revision No.:	CCP-TP-053 Rev. 14
NCR(s) associated with the container? (e.g., Prohibited Items)	[X] No [ ] Yes NCR No.: N/A NCR No.: N/A

Section 2: Waste Container Data	
Container Type:	55 Gallon Drum
TRUCON Code:	OR 225
Waste Matrix Code:	S5400
Waste Stream I.D.:	OR-REDC-CH-HET
Waste Container Weights:	Gross Wt.: 61.0 kg Tare Wt.: 33.2 kg Net Wt.: 27.8 kg
Rigid Liner and Liner Vent Description:	Liner: [X] No [ ] Yes Lid: [X] No [ ] Yes Type: [ ] 30-mil [ ] 90-mil [ ] 110-mil [ ] 125-mil Vented: [ ] No [ ] Yes [X] N/A Punctured: [X] No [ ] Yes Mechanical Vent: [X] No [ ] Yes Fiberboard Liner: [X] No [ ] Yes Lead Lined: [X] No [ ] Yes
Number of Layers of Confinement:	Appears to be 1 layer
Volume Utilization Percentage:	80 %

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CCP Radiography Data Sheet

Waste Container ID: X10C0403027H

Section 3: Container Inventory and Comments	(Detailed descriptions)
IM:	Scrap metal, metal hardware, hand tool, metal fittings
AM:	Aluminum collar
OM:	
OI:	Absorbent, glass containers, broken glass, tile
C:	Wood, cloth
R:	
XPM:	Plastic sheeting, plastic caps, manipulator boots, plastic containers
OR:	
IN:	
S:	

Section 4: Packaging Material and Waste Material Parameters	
Packaging Material:	**Estimated Weight (kg)**
Steel (ST):	27.8
Plastics (PP):Liner bag	1.0
Other: Cardboard liner (CP)	4.4
Total Packaging Weight	33.2
Waste Material Parameter:	**Estimated Weight (kg)**
Iron-based Metal / Alloys (IM):	2.3
Aluminum-based Metals / Alloys (AM):	2.3
Other Metals (OM):	
Other Inorganic Materials (OI)	5.0
Cellulosics (C):	10.9
Rubber (R):	
Plastics (waste materials) (XPM):	7.3
Organic Matrix (OR):	
Inorganic Matrix (IN):	
Soils (S):	
Total WMP Weight:	27.8

CCP Radiography Data Sheet

Waste Container ID: X10C0403027H

Section 5: RTR Summary (Questions answered "Yes" will be explained in the Comment block, except for Question 1)	
Is there observable liquid?	☐ Yes ☒ No
Is there any observable liquid in internal containers, more than 60 milliliters or 3 percent by volume, whichever is greater?	☐ Yes ☒ No
Is the total volume of observable liquid in the outermost container GREATER than 1% of the container?	☐ Yes ☒ No
Is there observable liquid in payload containers with an EPA Hazardous Waste Number of U134?	☐ Yes ☒ No
Is there an indication of non-radionuclide pyrophoric materials, such as elemental potassium?	☐ Yes ☒ No
Is there an indication of hazardous wastes not occurring as co-contaminants with TRU mixed wastes (non-mixed hazardous wastes)?	☐ Yes ☒ No
Is there an indication of wastes incompatible with backfill, seal and panel closures materials, container and packaging materials, shipping container materials, or other wastes (i.e., waste does NOT match TRUCON Code[s])?	☐ Yes ☒ No
Is there an indication of wastes containing explosives or compressed gases?	☐ Yes ☒ No
Is there an indication of PCBs liquids?	☐ Yes ☒ No
Is there an indication of the waste exhibiting the characteristic of ignitability, corrosivity, or reactivity (EPA Hazardous Waste Numbers of D001, D002, or D003)?	☐ Yes ☒ No
Is the physical form of the waste inconsistent with the Waste Stream Description or the Waste Matrix Code?	☐ Yes ☒ No
CH or RH TRAMPAC	
Are there heat-sealed bags (unvented) GREATER than 4 liters and LESS than 390 square inches in the waste, or heat sealed bags not authorized in the RH TRUCON Code?	☐ Yes ☒ No
Were there Non-approved Closure Methods used on liner bags or inner bags greater than 4 liters?	☐ Yes ☒ No
Are there sealed containers GREATER than 4 liters?	☐ Yes ☒ No
Are there indications of inadequate protection for heavy and/or sharp objects?	☐ Yes ☒ No
Comments:N/A	

RTR Operator:

Steve Redmond		2/24/2014
Print Name	Signature	Date

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Attachment 3 – CCP Radiography Independent Technical Reviewer Checklist

Batch Data Report No.: OR-RTR7-0013

Description				
1.	Data generation and reduction were conducted in a technically correct manner in accordance with the methods used?	☐ NO	☒ YES	
2.	Was the correct revision of the procedure used? Procedure: CCP-TP-053 Rev.: 14	☐ NO	☒ YES	
3.	Are the WMPs entered correctly?	☐ NO	☒ YES	
4.	Do the estimated weights in Section 4 of Attachment 2 equal the container gross weight?	☐ NO	☒ YES	
5.	Is the data reported in the proper units with the correct number of significant figures (e.g., one tenth of a kilogram)?	☐ NO	☒ YES	
6.	Has the data been verified for transcription errors?	☐ NO	☐ YES	☒ N/A
7.	Does the Testing Batch Report include radiography for up to 20 containers?	☐ NO	☒ YES	
8.	BDR contents are complete and match the CCP Waste RTR Batch Data Report Table of Contents?	☐ NO	☒ YES	
9.	Is all the data signed and dated in reproducible ink and by the individual(s) generating it?	☐ NO	☒ YES	
10.	Is all data recorded clearly, legibly, and accurately?	☐ NO	☒ YES	
11.	All changes to original data lined out, initialed and dated by the individual making the changes?	☐ NO	☒ YES	☐ N/A
12.	Was justification made for changing the original data?	☐ NO	☒ YES	☐ N/A
13.	Were data changes made by the individual who originally collected the data?	☐ NO	☒ YES	☐ N/A
14.	Does the waste match the Waste Matrix Code and Waste Stream description?	☐ NO	☒ YES	
15.	Are the RTR Operator's decisions regarding the Radiography documented?	☐ NO	☒ YES	
16.	Is there an adequate written description of the contents of each item?	☐ NO	☒ YES	
17.	Was the video/audio recording media properly prepared and labeled for each waste container?	☐ NO	☒ YES	
18.	Was the video/audio recording media check performed satisfactorily and recorded on Attachment 1?	☐ NO	☒ YES	

Attachment 3 – CCP Radiography Independent Technical Reviewer Checklist (Continued)

Batch Data Report No.: OR-RTR7-0013

Description				
19.	Was the Image Test performed satisfactorily and recorded on Attachment 1?	☐ NO	☒ YES	
20.	Was the Replicate Scan performed and recorded on an Attachment 2?	☐ NO	☒ YES	
21.	Was the Replicate Scan RTR Operator different from the first RTR Operator?	☐ NO	☒ YES	
22.	Did the Replicate Scan RTR Operator and the first RTR Operator agree on the results?	☐ NO	☒ YES	
23.	Was the Independent Observation performed and recorded on an Attachment 2?	☐ NO	☒ YES	
24.	Was the Independent Observation RTR Operator different from the first RTR Operator?	☐ NO	☒ YES	
25.	Did the Independent Observation RTR Operator and the first RTR Operator agree on the results?	☐ NO	☒ YES	
26.	Was the data collection performed by qualified individuals?	☐ NO	☒ YES	
27.	Are the NCR(s) associated with the RTR examination included in the BDR?	☐ NO	☐ YES	☒ N/A
28.	QAOs (precision, accuracy, completeness, representativeness) have been met?	☐ NO	☒ YES	

Comments: N/A

I have reviewed 100% of the container specific and batch data in this report and find it acceptable.

Independent Technical Reviewer:

Printed Name	Signature	Date
Daphne Brothers	Daphne O Brothers	3/11/14

DIVIDER PAGE ONLY

NOT PART OF PAGE COUNT

Attachment 2 – CCP Records Transmittal/Receiving Form

CCP Records / Records Custodian, 4021 National Parks Highway - MS: GSA 212, Carlsbad, New Mexico 88220

Telephone Number: 575-234-7523, 575-234-7431, or 575-234-7095

Fax Number: 575-234-7033

[X] Original Record [ ] Copy
[ ] Fax Record
[ ] Electronic Record

Attn:	CCP RECORDS	From:	PATRICK SMITH II
Ship to:	CCP RECORDS CUSTODIAN	Site:	ORNL
	4021 NATIONAL PARKS HWY.	Company:	S.M. STOLLER CORP.
	MS GSA 212	Telephone Number:	865-574-6002
	CARLSBAD, NM 88220-9082	Date Sent:	3-19-2014
Telephone Number:	575-234-7523		

Document Number	Title / Description	Record Date	Total Pages
OR-RTR7-0013	RTR DVD (DISK B)	2-24-2014	N/A
N/A	N/A	N/A	N/A
N/A	N/A	N/A	N/A
N/A	N/A	N/A	N/A
N/A	N/A	N/A	N/A
N/A	N/A	N/A	N/A

Comments

N/A

(When the Record accepted line has been completed, the rest of the page below may be left blank.)

Acceptance/Rejection Signature and Date

Records Accepted [✓]	Signature	Greta Leos (Printed Name)	3-25-14 (Date)
Records Rejected [ ]	Signature	Printed Name	Date

Reason for Rejection:

Re-submittal:	Signature	Printed Name	Date

****
*** Send Results ***
****

Sending is complete.

Job No.	2504
Address	918655768703
Name	ORNL
Start Time	03/25 01:19 PM
Call Length	00'48
Sheets	1
Result	OK

Controlled Copy

Attachment 2 – CCP Records Transmittal/Receiving Form

CCP Records / Records Custodian, 4021 National Parks Highway - MS: GSA 212, Carlsbad, New Mexico 88220

Telephone Number: 575-234-7523, 575-234-7431, or 575-234-7095

Fax Number: 575-234-7033

[X] Original Record [ ] Copy
[ ] Fax Record
[ ] Electronic Record

Attn:	CCP RECORDS	From:	PATRICK SMITH II
Ship to:	CCP RECORDS CUSTODIAN	Site:	ORNL
	4021 NATIONAL PARKS HWY.	Company:	S.M. STOLLER CORP.
	MS GSA 212	Telephone Number:	865-574-6002
	CARLSBAD, NM 88220-9082	Date Sent:	3-19-2014
Telephone Number:	575-234-7523		

Document Number	Description	Project Closure	Total Pages
OR-RTR7-0013	RTR DVD (DISK B)	2-24-2014	N/A
N/A	N/A	N/A	N/A
N/A	N/A	N/A	N/A
N/A	N/A	N/A	N/A
N/A	N/A	N/A	N/A
N/A	N/A	N/A	N/A

Comments:

N/A

(When the Record accepted line has been completed, the rest of the page below may be left blank.)

Acceptance/Rejection Signature and Date

Records Accepted [x] Greta Leos 3-25-14
Signature Printed Name Date

Records Rejected [ ]

Attachment 2 – CCP Records Transmittal/Receiving Form

CCP Records / Records Custodian, 4021 National Parks Highway - MS: GSA 212, Carlsbad, New Mexico 88220

Telephone Number: 575-234-7523, 575-234-7431, or 575-234-7095

Fax Number: 575-234-7033

[X] Original Record [ ] Copy
[ ] Fax Record
[ ] Electronic Record

Attn:	CCP RECORDS	From:	PATRICK SMITH II
Ship to:	CCP RECORDS CUSTODIAN	Site:	ORNL
	4021 NATIONAL PARKS HWY.	Company:	S.M. STOLLER CORP.
	MS GSA 212	Telephone Number:	865-574-6002
	CARLSBAD, NM 88220-9082	Date Sent:	3-27-2014
Telephone Number:	575-234-7523		

Document Number	Title / Description	Record Date	Total Pages
OR-RTR7-0013	RTR BDR	2-24-2014	41
OR-RTR7-0013	RTR DVD (DISK A)	2-24-2014	N/A
N/A	N/A	N/A	N/A
N/A	N/A	N/A	N/A
N/A	N/A	N/A	N/A
N/A	N/A	N/A	N/A

Comments

N/A

(When the Record accepted line has been completed, the rest of the page below may be left blank.)
Acceptance/Rejection Signature and Date

Records Accepted [☑]	Signature	Greta Leos (Printed Name)	4-01-14 (Date)
Records Rejected [ ]	Signature	Printed Name	Date

Reason for Rejection:

Re-submittal:

Signature	Printed Name	Date

****
*** Send Results ***
****

Sending is complete.

Job No.	2687
Address	918655768703
Name	ORNL
Start Time	04/01 12:38 PM
Call Length	00'48
Sheets	1
Result	OK

Attachment 2 – CCP Records Transmittal/Receiving Form

CCP Records / Records Custodian, 4021 National Parks Highway - MS: GSA 212, Carlsbad, New Mexico 88220

Telephone Number: 575-234-7523, 575-234-7431, or 575-234-7095

Fax Number: 575-234-7033

[X] Original Record [ ] Fax Record [ ] Electronic Record [ ] Copy

Attn:	CCP RECORDS	From:	PATRICK SMITH II
Ship to:	CCP RECORDS CUSTODIAN	Site:	ORNL
	4021 NATIONAL PARKS HWY.	Company:	S.M. STOLLER CORP.
	MS GSA 212	Telephone Number:	865-574-6002
	CARLSBAD, NM 88220-9082	Date Sent:	3-27-2014
Telephone Number:	575-234-7523		

Document Number	Description	Record Date	Page Count
OR-RTR7-0013	RTR BDR	2-24-2014	41
OR-RTR7-0013	RTR DVD (DISK A)	2-24-2014	N/A
N/A	N/A	N/A	N/A
N/A	N/A	N/A	N/A
N/A	N/A	N/A	N/A
N/A	N/A	N/A	N/A

Comments

N/A

(When the Record accepted line has been completed, the rest of the page below may be left blank.)

Acceptance/Rejection Signature and Date

Records Accepted [☑] Signature: Greta Leos Printed Name: Greta Leos Date: 4-01-14

Records Rejected [ ]

Attachment 2 – CCP SPM Radiography Project Level Validation Checklist and Summary

BDR Number: OR-RTR6-0636				Examination Date(s): 03/12/2015
Description of Criteria Reviewed	**Criteria Met?**			**Comments/Qualifiers**
	YES	**NO**	**NA**	
1. Is the completed, signed, and dated Independent Technical Reviewer Checklist included in the BDR, and the independent technical reviewer was not involved in the generation or recording of the data under review? **Reference Source: CCP-PO-001, C3-4**	X			
2. Does the BDR contain all items addressed in the BDR Table of Contents? **Reference Source: CCP-PO-001, C3-4**	X			
3. Does the BDR include a listing of all the container numbers in the batch? **Reference Source: CCP-PO-001, C3-4**	X			
4. List all containers that have met QAOs. **Reference Source: CCP-PO-001, C3-4**				Container Numbers: X10C1451633 X10C1451643 X10C1451639 X10C1451611 X10C1451634 X10C1451626 X10C1451582 X10C1451631 X10C1451598
5. Does the BDR identify the current implementing procedure and revision number? **Reference Source: CCP-PO-001, Table C3-3**	X			
6. Is there a reference to or copy of any associated NCRs (if any) in the BDR? NA if no NCRs. **Reference Source: CCP-PO-001, Table C3-3**			X	
7. Are there 20 or fewer containers in the batch? **Reference Source: CCP-PO-001, C3-4**	X			
8. Are the data properly reported (i.e., data are reported in correct units and with correct significant figures)? **Reference Source: CCP-PO-001, C3-4**	X			
9. Is there evidence of verification that the physical form matches the Waste Matrix Code? **Reference Source: CCP-PO-001, Table C3-3**	X			

CCP RECORDS ORIGINAL
DATE REC'D 3-10-15 GL

Attachment 2 – CCP SPM Radiography Project Level Validation Checklist and Summary (Continued)

BDR Number: OR-RTR6-0636				**Examination Date(s): 03/12/2015**
Description of Criteria Reviewed	**Criteria Met?**			**Comments/Qualifiers**
	YES	**NO**	**NA**	
10. Is there evidence of verification that the physical form matches the waste stream description? **Reference Source: CCP-PO-001, Table C3-3**	X			
11. Are prohibited items absent? **Reference Source: CCP-PO-001, Table C3-3**	X			
12. Does observable liquid, if present, meet the criteria of the TSDF-WAC? **Reference Source: CCP-PO-001, C-1**			X	No observable liquid.
13. Were discrepancies between two operators with regard to identification of waste matrix code, liquids in excess of the TSDF-WAC, or compressed gases through replicate scans and independent observations reconciled? NA if no discrepancies. **Reference Source: CCP-PO-001, C3-2**			X	
14. Are the training qualifications for all radiography personnel acceptable? **Reference Source: CCP-PO-001, C3-8**	X			
15. Was evidence of the video/audio check included in the BDR? **Reference Source: CCP-PO-001, C1-1**	X			
16. Was the Lines-Pair Resolution Test or Sieve Test Check included in the BDR? **Reference Source: CCP Technical Procedures**	X			
17. Was a replicate scan performed once per day, or once per batch, whichever is LESS frequent? **Reference Source: CCP-PO-001, C1-1**	X			
18. Was an independent observation performed once per day, or once per batch, whichever is LESS frequent? **Reference Source: CCP-PO-001, C1-1**	X			

Attachment 2 – CCP SPM Radiography Project Level Validation Checklist and Summary (Continued)

BDR Number: OR-RTR6-0636				Examination Date(s): 03/12/2015
Description of Criteria Reviewed	**Criteria Met?**			**Comments/Qualifiers**
	YES	**NO**	**NA**	
19. Were the replicate scan and independent observation performed on different waste containers? **Reference Source: CCP-PO-001, C1-1**	X			
20. Were the personnel performing the replicate scan and independent observation different from the individual who performed the original? **Reference Source: CCP-PO-001, C1-1**	X			
21. Does the BDR include an estimate of each material parameter weight in kg for each container? **Reference Source: CCP Technical Procedures**	X			
22. Does the BDR include a description of each material parameter for each container? **Reference Source: CCP Technical Procedures**	X			
23. Is the container gross weight recorded in kilograms (kg) for each container in the BDR? **Reference Source: CCP Technical Procedures**	X			
24. Was the Scale Weight Calibration Check included in the BDR? **Reference Source: CCP Technical Procedures**			X	Not used.
25. Was the Scale Weight Check included in the BDR? **Reference Source: CCP Technical Procedures**			X	Not used.
Comments: None.				
The container QC checks were properly performed and meet the Quality Assurance Objectives (QAOs). Proper procedures were followed during data reduction and analysis. The batch is complete, acceptable, and includes all supporting data and documentation required by the QAPjP.				
Daniel Wade				03/16/2015
SPM Printed Name	Signature			Date

Checklist is to be re-signed only when a re-review is performed.

SPM Printed Name	Signature	Reason	Date
SPM Printed Name	Signature	Reason	Date

Attachment 5–CCP Radiography Batch Data Report Cover Sheet

Site ID: ORNL

Batch Data Report No.: OR-RTR6-0636 ☑ CH ☐ RH Date: 3/12/15

Waste Container ID Numbers	
Replicate Scan:	X10C1451598
Independent Observation:	X10C1451633
1	X10C1451633
2	X10C1451643
3	X10C1451639
4	X10C1451611
5	X10C1451634
6	X10C1451626
7	X10C1451582
8	X10C1451631
9	X10C1451598
10	N/A
11	N/A
12	N/A
13	N/A
14	N/A
15	N/A
16	N/A
17	N/A
18	N/A
19	N/A
20	N/A

RTR Operator:

Eric Lyles — Printed Name | Signature | 3/12/15 — Date

Independent Technical Reviewer:

Fred Olney — Printed Name | Signature | 3-12-15 — Date

NTPC RECORDS ORIGINAL
DATE REC'D 3-12-2015

Attachment 4 – CCP Radiography Batch Data Report Table of Contents and Batch Narrative

Batch Data Report No.: OR-RTR6-0636 Date: 3/12/15

Table Of Contents		
Item	Description	Page No.
1	CCP Radiography Batch Data Report Cover Sheet	1
2	CCP Radiography Batch Data Report Table Of Contents	2
3	CCP RTR Measurement Control Report	3
4	CCP Radiography Data Sheets	4
5	Copy of NCRs (NA, If Not Applicable)	N/A
6	CCP Independent Technical Reviewer Checklist	37

Batch Narrative
All Quality Checks were performed and recorded on CCP-TP-053, Rev.15 CCP Radiography Measurement Control Report.

Eric Lyles — RTR Operator

Signature

3/12/15 — Date

2

Attachment 1 – CCP RTR Measurement Control Report

Site ID: ORNL		
Batch Data Report No.: OR-RTR6-0636		
Examination Date: 3/12/15		
Control Checks		
Video/Audio Recorded Media System Check	☑ SAT	☐ UNSAT
Image Test : 7 Lines (Minimum acceptable is 5 lines-pair/cm or #6 Sieve is viewable)	☑ SAT	☐ UNSAT
Comments: N/A		
RTR Operator: Eric Lyles / Printed Name	Signature	3/12/15 / Date

3

CCP Radiography Data Sheet

CCP-TP-053 Attachment 2

Section 1: General Information	
☐ RTR Examination ☒ RTR Replicate Scan ☐ RTR Independent Observation	
Site ID:	ORNL
Batch Number:	OR-RTR6-0636
Examination Date:	3/12/2015
Waste Container ID:	X10C1451598
Video/Audio Recorded Media Number:	OR-RTR6-0636 A&B
Procedure and Revision No.:	CCP-TP-053 Rev. 15
NCR(s) associated with the container? (e.g., Prohibited Items)	☒ No ☐ Yes NCR No.: N/A NCR No.: N/A

Section 2: Waste Container Data	
Container Type:	55 Gallon Drum
TRUCON Code:	OR 227
Waste Matrix Code:	S4100
Waste Stream I.D.:	OR-NFS-CH-SOIL
Waste Container Weights:	Gross Wt.: 232.2 kg Tare Wt.: 35.2 kg Net Wt.: 197.0 kg
Rigid Liner and Liner Vent Description:	Liner: ☐ No ☒ Yes Lid: ☒ No ☐ Yes Type: ☐ 30-mil ☒ 90-mil ☐ 110-mil ☐ 125-mil Vented: ☐ No ☒ Yes ☐ N/A Punctured: ☒ No ☐ Yes Mechanical Vent: ☒ No ☐ Yes Fiberboard Liner: ☒ No ☐ Yes Lead Lined: ☒ No ☐ Yes
Number of Layers of Confinement:	Appears to be 1 layer
Volume Utilization Percentage:	90 %

CCP Radiography Data Sheet

Waste Container ID: X10C1451598

Section 3: Container Inventory and Comments	(Detailed descriptions)
IM:	
AM:	
OM:	
OI:	
C:	
R:	
XPM:	
OR:	Absorbent
IN:	
S:	Soil

Section 4: Packaging Material and Waste Material Parameters	
Packaging Material:	**Estimated Weight (kg)**
Steel (ST):	27.8
Plastics (PP): Liner bag, Rigid Liner	7.4
Other:	0.0
Total Packaging Weight	35.2
Waste Material Parameter:	**Estimated Weight (kg)**
Iron-based Metal / Alloys (IM):	
Aluminum-based Metals / Alloys (AM):	
Other Metals (OM):	
Other Inorganic Materials (OI)	
Cellulosics (C):	
Rubber (R):	
Plastics (waste materials) (XPM):	
Organic Matrix (OR):	2.5
Inorganic Matrix (IN):	
Soils (S):	194.5
Total WMP Weight:	197.0

CCP Radiography Data Sheet

Waste Container ID: X10C1451598

Section 5: RTR Summary (Questions answered "Yes" will be explained in the Comment block, except for Question 1)	
Is there observable liquid?	☐ Yes ☒ No
Is there any observable liquid in internal containers, more than 60 milliliters or 3 percent by volume, whichever is greater?	☐ Yes ☒ No
Is the total volume of observable liquid in the outermost container GREATER than 1% of the container?	☐ Yes ☒ No
Is there observable liquid in payload containers with an EPA Hazardous Waste Number of U134?	☐ Yes ☒ No
Is there an indication of non-radionuclide pyrophoric materials, such as elemental potassium?	☐ Yes ☒ No
Is there an indication of hazardous wastes not occurring as co-contaminants with TRU mixed wastes (non-mixed hazardous wastes)?	☐ Yes ☒ No
Is there an indication of wastes incompatible with backfill, seal and panel closures materials, container and packaging materials, shipping container materials, or other wastes (i.e., waste does NOT match TRUCON Code[s])?	☐ Yes ☒ No
Is there an indication of wastes containing explosives or compressed gases?	☐ Yes ☒ No
Is there an indication of PCBs liquids?	☐ Yes ☒ No
Is there an indication of the waste exhibiting the characteristic of ignitability, corrosivity, or reactivity (EPA Hazardous Waste Numbers of D001, D002, or D003)?	☐ Yes ☒ No
Is the physical form of the waste inconsistent with the Waste Stream Description or the Waste Matrix Code?	☐ Yes ☒ No
CH or RH TRAMPAC	
Are there heat-sealed bags (unvented) GREATER than 4 liters and LESS than 390 square inches in the waste, or heat sealed bags not authorized in the RH TRUCON Code?	☐ Yes ☒ No
Were there Non-approved Closure Methods used on liner bags or inner bags greater than 4 liters?	☐ Yes ☒ No
Are there sealed containers GREATER than 4 liters?	☐ Yes ☒ No
Are there indications of inadequate protection for heavy and/or sharp objects?	☐ Yes ☒ No

Comments: This Replicate Scan agrees with the original Scan. DB 3-12-15

RTR Operator:

Daphne Brothers	Daphne L Brothers	3/12/2015
Print Name	Signature	Date

CCP Radiography Data Sheet

Section 1: General Information	
☐ RTR Examination ☐ RTR Replicate Scan ☒ RTR Independent Observation	
Site ID:	ORNL
Batch Number:	OR-RTR6-0636
Examination Date:	3/12/2015
Waste Container ID:	X10C1451633
Video/Audio Recorded Media Number:	OR-RTR6-0636 A&B
Procedure and Revision No.:	CCP-TP-053 Rev. 15
NCR(s) associated with the container? (e.g., Prohibited Items)	☒ No ☐ Yes NCR No.: N/A NCR No.: N/A

Section 2: Waste Container Data	
Container Type:	55 Gallon Drum
TRUCON Code:	OR 227
Waste Matrix Code:	S4100
Waste Stream I.D.:	OR-NFS-CH-SOIL
Waste Container Weights:	Gross Wt.: 242.9 kg Tare Wt.: 35.2 kg Net Wt.: 207.7 kg
Rigid Liner and Liner Vent Description:	Liner: ☐ No ☒ Yes Lid: ☒ No ☐ Yes Type: ☐ 30-mil ☒ 90-mil ☐ 110-mil ☐ 125-mil Vented: ☐ No ☒ Yes ☐ N/A Punctured: ☒ No ☐ Yes Mechanical Vent: ☒ No ☐ Yes Fiberboard Liner: ☒ No ☐ Yes Lead Lined: ☒ No ☐ Yes
Number of Layers of Confinement:	Appears to be 1 layer
Volume Utilization Percentage:	90 %

CCP Radiography Data Sheet

Waste Container ID: X10C1451633

Section 3: Container Inventory and Comments (Detailed descriptions)
IM:
AM:
OM:
OI:
C:
R:
XPM:
OR: Absorbent
IN:
S: Soil

Section 4: Packaging Material and Waste Material Parameters	
Packaging Material:	**Estimated Weight (kg)**
Steel (ST):	27.8
Plastics (PP): Liner bag, Rigid Liner	7.4
Other:	0.0
Total Packaging Weight	35.2
Waste Material Parameter:	**Estimated Weight (kg)**
Iron-based Metal / Alloys (IM):	
Aluminum-based Metals / Alloys (AM):	
Other Metals (OM):	
Other Inorganic Materials (OI)	
Cellulosics (C):	
Rubber (R):	
Plastics (waste materials) (XPM):	
Organic Matrix (OR):	2.7
Inorganic Matrix (IN):	
Soils (S):	205.0
Total WMP Weight:	207.7

CCP Radiography Data Sheet

Waste Container ID: X10C1451633

Section 5: RTR Summary (Questions answered "Yes" will be explained in the Comment block, except for Question 1)	
Is there observable liquid?	☐ Yes ☒ No
Is there any observable liquid in internal containers, more than 60 milliliters or 3 percent by volume, whichever is greater?	☐ Yes ☒ No
Is the total volume of observable liquid in the outermost container GREATER than 1% of the container?	☐ Yes ☒ No
Is there observable liquid in payload containers with an EPA Hazardous Waste Number of U134?	☐ Yes ☒ No
Is there an indication of non-radionuclide pyrophoric materials, such as elemental potassium?	☐ Yes ☒ No
Is there an indication of hazardous wastes not occurring as co-contaminants with TRU mixed wastes (non-mixed hazardous wastes)?	☐ Yes ☒ No
Is there an indication of wastes incompatible with backfill, seal and panel closures materials, container and packaging materials, shipping container materials, or other wastes (i.e., waste does NOT match TRUCON Code[s])?	☐ Yes ☒ No
Is there an indication of wastes containing explosives or compressed gases?	☐ Yes ☒ No
Is there an indication of PCBs liquids?	☐ Yes ☒ No
Is there an indication of the waste exhibiting the characteristic of ignitability, corrosivity, or reactivity (EPA Hazardous Waste Numbers of D001, D002, or D003)?	☐ Yes ☒ No
Is the physical form of the waste inconsistent with the Waste Stream Description or the Waste Matrix Code?	☐ Yes ☒ No
CH or RH TRAMPAC	
Are there heat-sealed bags (unvented) GREATER than 4 liters and LESS than 390 square inches in the waste, or heat sealed bags not authorized in the RH TRUCON Code?	☐ Yes ☒ No
Were there Non-approved Closure Methods used on liner bags or inner bags greater than 4 liters?	☐ Yes ☒ No
Are there sealed containers GREATER than 4 liters?	☐ Yes ☒ No
Are there indications of inadequate protection for heavy and/or sharp objects?	☐ Yes ☒ No

Comments: This Independent Observation agrees with the original Scan. DB 3-12-15

RTR Operator:

Daphne Brothers	Daphne Brothers	3/12/2015
Print Name	Signature	Date

CCP Radiography Data Sheet

CCP-TP-053 Attachment 2

Section 1: General Information		
[X] RTR Examination	[ ] RTR Replicate Scan	[ ] RTR Independent Observation
Site ID:	ORNL	
Batch Number:	OR-RTR6-0636	
Examination Date:	3/12/2015	
Waste Container ID:	X10C1451633	
Video/Audio Recorded Media Number:	OR-RTR6-0636	A&B
Procedure and Revision No.:	CCP-TP-053	Rev. 15
NCR(s) associated with the container? (e.g., Prohibited Items)	[X] No [ ] Yes NCR No.: N/A NCR No.: N/A	

Section 2: Waste Container Data	
Container Type:	55 Gallon Drum
TRUCON Code:	OR 227
Waste Matrix Code:	S4100
Waste Stream I.D.:	OR-NFS-CH-SOIL
Waste Container Weights:	Gross Wt.: 242.9 kg Tare Wt.: 35.2 kg Net Wt.: 207.7 kg
Rigid Liner and Liner Vent Description:	Liner: [ ] No [X] Yes Lid: [X] No [ ] Yes Type: [ ] 30-mil [X] 90-mil [ ] 110-mil [ ] 125-mil Vented: [ ] No [X] Yes [ ] N/A Punctured: [X] No [ ] Yes Mechanical Vent: [X] No [ ] Yes Fiberboard Liner: [X] No [ ] Yes Lead Lined: [X] No [ ] Yes
Number of Layers of Confinement:	Appears to be 1 layer
Volume Utilization Percentage:	90 %

CCP Radiography Data Sheet

Waste Container ID: X10C1451633

Section 3: Container Inventory and Comments (Detailed descriptions)
IM:
AM:
OM:
OI:
C:
R:
XPM:
OR: Absorbent
IN:
S: Soil

Section 4: Packaging Material and Waste Material Parameters	
Packaging Material:	**Estimated Weight (kg)**
Steel (ST):	27.8
Plastics (PP): Liner bag, Rigid Liner	7.4
Other:	0.0
Total Packaging Weight	35.2
Waste Material Parameter:	**Estimated Weight (kg)**
Iron-based Metal / Alloys (IM):	
Aluminum-based Metals / Alloys (AM):	
Other Metals (OM):	
Other Inorganic Materials (OI)	
Cellulosics (C):	
Rubber (R):	
Plastics (waste materials) (XPM):	
Organic Matrix (OR):	3.0
Inorganic Matrix (IN):	
Soils (S):	204.7
Total WMP Weight:	207.7

CCP Radiography Data Sheet

Waste Container ID: X10C1451633

Section 5: RTR Summary (Questions answered "Yes" will be explained in the Comment block, except for Question 1)	
Is there observable liquid?	☐ Yes ☒ No
Is there any observable liquid in internal containers, more than 60 milliliters or 3 percent by volume, whichever is greater?	☐ Yes ☒ No
Is the total volume of observable liquid in the outermost container GREATER than 1% of the container?	☐ Yes ☒ No
Is there observable liquid in payload containers with an EPA Hazardous Waste Number of U134?	☐ Yes ☒ No
Is there an indication of non-radionuclide pyrophoric materials, such as elemental potassium?	☐ Yes ☒ No
Is there an indication of hazardous wastes not occurring as co-contaminants with TRU mixed wastes (non-mixed hazardous wastes)?	☐ Yes ☒ No
Is there an indication of wastes incompatible with backfill, seal and panel closures materials, container and packaging materials, shipping container materials, or other wastes (i.e., waste does NOT match TRUCON Code[s])?	☐ Yes ☒ No
Is there an indication of wastes containing explosives or compressed gases?	☐ Yes ☒ No
Is there an indication of PCBs liquids?	☐ Yes ☒ No
Is there an indication of the waste exhibiting the characteristic of ignitability, corrosivity, or reactivity (EPA Hazardous Waste Numbers of D001, D002, or D003)?	☐ Yes ☒ No
Is the physical form of the waste inconsistent with the Waste Stream Description or the Waste Matrix Code?	☐ Yes ☒ No
CH or RH TRAMPAC	
Are there heat-sealed bags (unvented) GREATER than 4 liters and LESS than 390 square inches in the waste, or heat sealed bags not authorized in the RH TRUCON Code?	☐ Yes ☒ No
Were there Non-approved Closure Methods used on liner bags or inner bags greater than 4 liters?	☐ Yes ☒ No
Are there sealed containers GREATER than 4 liters?	☐ Yes ☒ No
Are there indications of inadequate protection for heavy and/or sharp objects?	☐ Yes ☒ No
Comments: N/A	

RTR Operator:

Eric Lyles	[signature]	3/12/2015
Print Name	Signature	Date

CCP Radiography Data Sheet

Section 1: General Information	
[X] RTR Examination [ ] RTR Replicate Scan [ ] RTR Independent Observation	
Site ID:	ORNL
Batch Number:	OR-RTR6-0636
Examination Date:	3/12/2015
Waste Container ID:	X10C1451643
Video/Audio Recorded Media Number:	OR-RTR6-0636 A&B
Procedure and Revision No.:	CCP-TP-053 Rev. 15
NCR(s) associated with the container? (e.g., Prohibited Items)	[X] No [ ] Yes NCR No.: N/A NCR No.: N/A

Section 2: Waste Container Data	
Container Type:	55 Gallon Drum
TRUCON Code:	OR 227
Waste Matrix Code:	S4100
Waste Stream I.D.:	OR-NFS-CH-SOIL
Waste Container Weights:	Gross Wt.: 206.2 kg Tare Wt.: 35.2 kg Net Wt.: 171.0 kg
Rigid Liner and Liner Vent Description:	Liner: [ ] No [X] Yes Lid: [X] No [ ] Yes Type: [ ] 30-mil [X] 90-mil [ ] 110-mil [ ] 125-mil Vented: [ ] No [X] Yes [ ] N/A Punctured: [X] No [ ] Yes Mechanical Vent: [X] No [ ] Yes Fiberboard Liner: [X] No [ ] Yes Lead Lined: [X] No [ ] Yes
Number of Layers of Confinement:	Appears to be 1 layer
Volume Utilization Percentage:	80 %

CCP Radiography Data Sheet

Waste Container ID: X10C1451643

Section 3: Container Inventory and Comments (Detailed descriptions)
IM:
AM:
OM:
OI:
C:
R:
XPM:
OR: Absorbent
IN:
S: Soil

Section 4: Packaging Material and Waste Material Parameters	
Packaging Material:	**Estimated Weight (kg)**
Steel (ST):	27.8
Plastics (PP): Liner bag, Rigid Liner	7.4
Other:	0.0
Total Packaging Weight	35.2
Waste Material Parameter:	**Estimated Weight (kg)**
Iron-based Metal / Alloys (IM):	
Aluminum-based Metals / Alloys (AM):	
Other Metals (OM):	
Other Inorganic Materials (OI)	
Cellulosics (C):	
Rubber (R):	
Plastics (waste materials) (XPM):	
Organic Matrix (OR):	2.0
Inorganic Matrix (IN):	
Soils (S):	169.0
Total WMP Weight:	171.0

CCP Radiography Data Sheet

Waste Container ID: X10C1451643

Section 5: RTR Summary (Questions answered "Yes" will be explained in the Comment block, except for Question 1)	
Is there observable liquid?	☐ Yes ☒ No
Is there any observable liquid in internal containers, more than 60 milliliters or 3 percent by volume, whichever is greater?	☐ Yes ☒ No
Is the total volume of observable liquid in the outermost container GREATER than 1% of the container?	☐ Yes ☒ No
Is there observable liquid in payload containers with an EPA Hazardous Waste Number of U134?	☐ Yes ☒ No
Is there an indication of non-radionuclide pyrophoric materials, such as elemental potassium?	☐ Yes ☒ No
Is there an indication of hazardous wastes not occurring as co-contaminants with TRU mixed wastes (non-mixed hazardous wastes)?	☐ Yes ☒ No
Is there an indication of wastes incompatible with backfill, seal and panel closures materials, container and packaging materials, shipping container materials, or other wastes (i.e., waste does NOT match TRUCON Code[s])?	☐ Yes ☒ No
Is there an indication of wastes containing explosives or compressed gases?	☐ Yes ☒ No
Is there an indication of PCBs liquids?	☐ Yes ☒ No
Is there an indication of the waste exhibiting the characteristic of ignitability, corrosivity, or reactivity (EPA Hazardous Waste Numbers of D001, D002, or D003)?	☐ Yes ☒ No
Is the physical form of the waste inconsistent with the Waste Stream Description or the Waste Matrix Code?	☐ Yes ☒ No
CH or RH TRAMPAC	
Are there heat-sealed bags (unvented) GREATER than 4 liters and LESS than 390 square inches in the waste, or heat sealed bags not authorized in the RH TRUCON Code?	☐ Yes ☒ No
Were there Non-approved Closure Methods used on liner bags or inner bags greater than 4 liters?	☐ Yes ☒ No
Are there sealed containers GREATER than 4 liters?	☐ Yes ☒ No
Are there indications of inadequate protection for heavy and/or sharp objects?	☐ Yes ☒ No
Comments: N/A	

RTR Operator:

Eric Lyles		3/12/2015
Print Name	Signature	Date

CCP Radiography Data Sheet

CCP-TP-053 Attachment 2

Section 1: General Information	
[X] RTR Examination [ ] RTR Replicate Scan [ ] RTR Independent Observation	
Site ID:	ORNL
Batch Number:	OR-RTR6-0636
Examination Date:	3/12/2015
Waste Container ID:	X10C1451639
Video/Audio Recorded Media Number:	OR-RTR6-0636 A&B
Procedure and Revision No.:	CCP-TP-053 Rev. 15
NCR(s) associated with the container? (e.g., Prohibited Items)	[X] No [ ] Yes NCR No.: N/A NCR No.: N/A

Section 2: Waste Container Data	
Container Type:	55 Gallon Drum
TRUCON Code:	OR 227
Waste Matrix Code:	S4100
Waste Stream I.D.:	OR-NFS-CH-SOIL
Waste Container Weights:	Gross Wt.: 232.0 kg Tare Wt.: 35.2 kg Net Wt.: 196.8 kg
Rigid Liner and Liner Vent Description:	Liner: [ ] No [X] Yes Lid: [X] No [ ] Yes Type: [ ] 30-mil [X] 90-mil [ ] 110-mil [ ] 125-mil Vented: [ ] No [X] Yes [ ] N/A Punctured: [X] No [ ] Yes Mechanical Vent: [X] No [ ] Yes Fiberboard Liner: [X] No [ ] Yes Lead Lined: [X] No [ ] Yes
Number of Layers of Confinement:	Appears to be 1 layer
Volume Utilization Percentage:	85 %

CCP Radiography Data Sheet

Waste Container ID: X10C1451639

Section 3: Container Inventory and Comments	(Detailed descriptions)
IM:	
AM:	
OM:	
OI:	
C:	
R:	
XPM:	Plastic sheeting
OR:	Absorbent
IN:	
S:	Soil

Section 4: Packaging Material and Waste Material Parameters	
Packaging Material:	**Estimated Weight (kg)**
Steel (ST):	27.8
Plastics (PP): Liner bag, Rigid Liner	7.4
Other:	0.0
Total Packaging Weight	35.2
Waste Material Parameter:	**Estimated Weight (kg)**
Iron-based Metal / Alloys (IM):	
Aluminum-based Metals / Alloys (AM):	
Other Metals (OM):	
Other Inorganic Materials (OI)	
Cellulosics (C):	
Rubber (R):	
Plastics (waste materials) (XPM):	0.5
Organic Matrix (OR):	3.0
Inorganic Matrix (IN):	
Soils (S):	193.3
Total WMP Weight:	196.8

CCP Radiography Data Sheet

Waste Container ID: X10C1451639

Section 5: RTR Summary (Questions answered "Yes" will be explained in the Comment block, except for Question 1)	
Is there observable liquid?	☐ Yes ☒ No
Is there any observable liquid in internal containers, more than 60 milliliters or 3 percent by volume, whichever is greater?	☐ Yes ☒ No
Is the total volume of observable liquid in the outermost container GREATER than 1% of the container?	☐ Yes ☒ No
Is there observable liquid in payload containers with an EPA Hazardous Waste Number of U134?	☐ Yes ☒ No
Is there an indication of non-radionuclide pyrophoric materials, such as elemental potassium?	☐ Yes ☒ No
Is there an indication of hazardous wastes not occurring as co-contaminants with TRU mixed wastes (non-mixed hazardous wastes)?	☐ Yes ☒ No
Is there an indication of wastes incompatible with backfill, seal and panel closures materials, container and packaging materials, shipping container materials, or other wastes (i.e., waste does NOT match TRUCON Code[s])?	☐ Yes ☒ No
Is there an indication of wastes containing explosives or compressed gases?	☐ Yes ☒ No
Is there an indication of PCBs liquids?	☐ Yes ☒ No
Is there an indication of the waste exhibiting the characteristic of ignitability, corrosivity, or reactivity (EPA Hazardous Waste Numbers of D001, D002, or D003)?	☐ Yes ☒ No
Is the physical form of the waste inconsistent with the Waste Stream Description or the Waste Matrix Code?	☐ Yes ☒ No
CH or RH TRAMPAC	
Are there heat-sealed bags (unvented) GREATER than 4 liters and LESS than 390 square inches in the waste, or heat sealed bags not authorized in the RH TRUCON Code?	☐ Yes ☒ No
Were there Non-approved Closure Methods used on liner bags or inner bags greater than 4 liters?	☐ Yes ☒ No
Are there sealed containers GREATER than 4 liters?	☐ Yes ☒ No
Are there indications of inadequate protection for heavy and/or sharp objects?	☐ Yes ☒ No
Comments: N/A	

RTR Operator:

Eric Lyles		3/12/2015
Print Name	Signature	Date

CCP Radiography Data Sheet

CCP-TP-053 Attachment 2

Section 1: General Information	
[X] RTR Examination [ ] RTR Replicate Scan [ ] RTR Independent Observation	
Site ID:	ORNL
Batch Number:	OR-RTR6-0636
Examination Date:	3/12/2015
Waste Container ID:	X10C1451611
Video/Audio Recorded Media Number:	OR-RTR6-0636 A&B
Procedure and Revision No.:	CCP-TP-053 Rev. 15
NCR(s) associated with the container? (e.g., Prohibited Items)	[X] No [ ] Yes NCR No.: N/A NCR No.: N/A

Section 2: Waste Container Data	
Container Type:	55 Gallon Drum
TRUCON Code:	OR 227
Waste Matrix Code:	S4100
Waste Stream I.D.:	OR-NFS-CH-SOIL
Waste Container Weights:	Gross Wt.: 204.7 kg Tare Wt.: 35.2 kg Net Wt.: 169.5 kg
Rigid Liner and Liner Vent Description:	Liner: [ ] No [X] Yes Lid: [X] No [ ] Yes Type: [ ] 30-mil [X] 90-mil [ ] 110-mil [ ] 125-mil Vented: [ ] No [X] Yes [ ] N/A Punctured: [X] No [ ] Yes Mechanical Vent: [X] No [ ] Yes Fiberboard Liner: [X] No [ ] Yes Lead Lined: [X] No [ ] Yes
Number of Layers of Confinement:	Appears to be 1 layer
Volume Utilization Percentage:	80 %

CCP Radiography Data Sheet

Waste Container ID: X10C1451611

Section 3: Container Inventory and Comments (Detailed descriptions)
IM:
AM:
OM:
OI:
C:
R:
XPM: Plastic sheeting
OR: Absorbent
IN:
S: Soil

Section 4: Packaging Material and Waste Material Parameters	
Packaging Material:	**Estimated Weight (kg)**
Steel (ST):	27.8
Plastics (PP): Liner bag, Rigid Liner	7.4
Other:	0.0
Total Packaging Weight	35.2
Waste Material Parameter:	**Estimated Weight (kg)**
Iron-based Metal / Alloys (IM):	
Aluminum-based Metals / Alloys (AM):	
Other Metals (OM):	
Other Inorganic Materials (OI)	
Cellulosics (C):	
Rubber (R):	
Plastics (waste materials) (XPM):	0.5
Organic Matrix (OR):	2.0
Inorganic Matrix (IN):	
Soils (S):	167.0
Total WMP Weight:	169.5

CCP Radiography Data Sheet

Waste Container ID: X10C1451611

Section 5: RTR Summary (Questions answered "Yes" will be explained in the Comment block, except for Question 1)	
Is there observable liquid?	☐ Yes ☒ No
Is there any observable liquid in internal containers, more than 60 milliliters or 3 percent by volume, whichever is greater?	☐ Yes ☒ No
Is the total volume of observable liquid in the outermost container GREATER than 1% of the container?	☐ Yes ☒ No
Is there observable liquid in payload containers with an EPA Hazardous Waste Number of U134?	☐ Yes ☒ No
Is there an indication of non-radionuclide pyrophoric materials, such as elemental potassium?	☐ Yes ☒ No
Is there an indication of hazardous wastes not occurring as co-contaminants with TRU mixed wastes (non-mixed hazardous wastes)?	☐ Yes ☒ No
Is there an indication of wastes incompatible with backfill, seal and panel closures materials, container and packaging materials, shipping container materials, or other wastes (i.e., waste does NOT match TRUCON Code[s])?	☐ Yes ☒ No
Is there an indication of wastes containing explosives or compressed gases?	☐ Yes ☒ No
Is there an indication of PCBs liquids?	☐ Yes ☒ No
Is there an indication of the waste exhibiting the characteristic of ignitability, corrosivity, or reactivity (EPA Hazardous Waste Numbers of D001, D002, or D003)?	☐ Yes ☒ No
Is the physical form of the waste inconsistent with the Waste Stream Description or the Waste Matrix Code?	☐ Yes ☒ No
CH or RH TRAMPAC	
Are there heat-sealed bags (unvented) GREATER than 4 liters and LESS than 390 square inches in the waste, or heat sealed bags not authorized in the RH TRUCON Code?	☐ Yes ☒ No
Were there Non-approved Closure Methods used on liner bags or inner bags greater than 4 liters?	☐ Yes ☒ No
Are there sealed containers GREATER than 4 liters?	☐ Yes ☒ No
Are there indications of inadequate protection for heavy and/or sharp objects?	☐ Yes ☒ No
Comments: N/A	
RTR Operator: Eric Lyles (Print Name) / Signature / 3/12/2015 (Date)	

CCP Radiography Data Sheet

Section 1: General Information		
[X] RTR Examination	[ ] RTR Replicate Scan	[ ] RTR Independent Observation
Site ID:	ORNL	
Batch Number:	OR-RTR6-0636	
Examination Date:	3/12/2015	
Waste Container ID:	X10C1451634	
Video/Audio Recorded Media Number:	OR-RTR6-0636	A&B
Procedure and Revision No.:	CCP-TP-053	Rev. 15
NCR(s) associated with the container? (e.g., Prohibited Items)	[X] No [ ] Yes NCR No.: N/A NCR No.: N/A	

Section 2: Waste Container Data	
Container Type:	55 Gallon Drum
TRUCON Code:	OR 227
Waste Matrix Code:	S4100
Waste Stream I.D.:	OR-NFS-CH-SOIL
Waste Container Weights:	Gross Wt.: 222.1 kg Tare Wt.: 35.2 kg Net Wt.: 186.9 kg
Rigid Liner and Liner Vent Description:	Liner: [ ] No [X] Yes Lid: [X] No [ ] Yes Type: [ ] 30-mil [X] 90-mil [ ] 110-mil [ ] 125-mil Vented: [ ] No [X] Yes [ ] N/A Punctured: [X] No [ ] Yes Mechanical Vent: [X] No [ ] Yes Fiberboard Liner: [X] No [ ] Yes Lead Lined: [X] No [ ] Yes
Number of Layers of Confinement:	Appears to be 1 layer
Volume Utilization Percentage:	90 %

CCP Radiography Data Sheet

Waste Container ID: X10C1451634

Section 3: Container Inventory and Comments (Detailed descriptions)
IM:
AM:
OM:
OI:
C:
R:
XPM:
OR: Absorbent
IN:
S: Soil

Section 4: Packaging Material and Waste Material Parameters	
Packaging Material:	**Estimated Weight (kg)**
Steel (ST):	27.8
Plastics (PP): Liner bag, Rigid Liner	7.4
Other:	0.0
Total Packaging Weight	35.2
Waste Material Parameter:	**Estimated Weight (kg)**
Iron-based Metal / Alloys (IM):	
Aluminum-based Metals / Alloys (AM):	
Other Metals (OM):	
Other Inorganic Materials (OI)	
Cellulosics (C):	
Rubber (R):	
Plastics (waste materials) (XPM):	
Organic Matrix (OR):	3.0
Inorganic Matrix (IN):	
Soils (S):	183.9
Total WMP Weight:	186.9

CCP Radiography Data Sheet

Waste Container ID: X10C1451634

Section 5: RTR Summary (Questions answered "Yes" will be explained in the Comment block, except for Question 1)	
Is there observable liquid?	☐ Yes ☒ No
Is there any observable liquid in internal containers, more than 60 milliliters or 3 percent by volume, whichever is greater?	☐ Yes ☒ No
Is the total volume of observable liquid in the outermost container GREATER than 1% of the container?	☐ Yes ☒ No
Is there observable liquid in payload containers with an EPA Hazardous Waste Number of U134?	☐ Yes ☒ No
Is there an indication of non-radionuclide pyrophoric materials, such as elemental potassium?	☐ Yes ☒ No
Is there an indication of hazardous wastes not occurring as co-contaminants with TRU mixed wastes (non-mixed hazardous wastes)?	☐ Yes ☒ No
Is there an indication of wastes incompatible with backfill, seal and panel closures materials, container and packaging materials, shipping container materials, or other wastes (i.e., waste does NOT match TRUCON Code[s])?	☐ Yes ☒ No
Is there an indication of wastes containing explosives or compressed gases?	☐ Yes ☒ No
Is there an indication of PCBs liquids?	☐ Yes ☒ No
Is there an indication of the waste exhibiting the characteristic of ignitability, corrosivity, or reactivity (EPA Hazardous Waste Numbers of D001, D002, or D003)?	☐ Yes ☒ No
Is the physical form of the waste inconsistent with the Waste Stream Description or the Waste Matrix Code?	☐ Yes ☒ No
CH or RH TRAMPAC	
Are there heat-sealed bags (unvented) GREATER than 4 liters and LESS than 390 square inches in the waste, or heat sealed bags not authorized in the RH TRUCON Code?	☐ Yes ☒ No
Were there Non-approved Closure Methods used on liner bags or inner bags greater than 4 liters?	☐ Yes ☒ No
Are there sealed containers GREATER than 4 liters?	☐ Yes ☒ No
Are there indications of inadequate protection for heavy and/or sharp objects?	☐ Yes ☒ No

Comments: N/A

RTR Operator:

Eric Lyles		3/12/2015
Print Name	Signature	Date

CCP Radiography Data Sheet

Section 1: General Information		
[X] RTR Examination	[ ] RTR Replicate Scan	[ ] RTR Independent Observation
Site ID:	ORNL	
Batch Number:	OR-RTR6-0636	
Examination Date:	3/12/2015	
Waste Container ID:	X10C1451626	
Video/Audio Recorded Media Number:	OR-RTR6-0636	A&B
Procedure and Revision No.:	CCP-TP-053	Rev. 15
NCR(s) associated with the container? (e.g., Prohibited Items)	[X] No [ ] Yes NCR No.: N/A NCR No.: N/A	

Section 2: Waste Container Data	
Container Type:	55 Gallon Drum
TRUCON Code:	OR 227
Waste Matrix Code:	S4100
Waste Stream I.D.:	OR-NFS-CH-SOIL
Waste Container Weights:	Gross Wt.: 230.2 kg Tare Wt.: 35.2 kg Net Wt.: 195.0 kg
Rigid Liner and Liner Vent Description:	Liner: [ ] No [X] Yes Lid: [X] No [ ] Yes Type: [ ] 30-mil [X] 90-mil [ ] 110-mil [ ] 125-mil Vented: [ ] No [X] Yes [ ] N/A Punctured: [X] No [ ] Yes Mechanical Vent: [X] No [ ] Yes Fiberboard Liner: [X] No [ ] Yes Lead Lined: [X] No [ ] Yes
Number of Layers of Confinement:	Appears to be 1 layer
Volume Utilization Percentage:	85 %

CCP Radiography Data Sheet

Waste Container ID: X10C1451626

Section 3: Container Inventory and Comments (Detailed descriptions)
IM:
AM:
OM:
OI:
C:
R:
XPM: Plastic sheeting
OR: Absorbent
IN:
S: Soil

Section 4: Packaging Material and Waste Material Parameters	
Packaging Material:	**Estimated Weight (kg)**
Steel (ST):	27.8
Plastics (PP): Liner bag, Rigid Liner	7.4
Other:	0.0
Total Packaging Weight	35.2
Waste Material Parameter:	**Estimated Weight (kg)**
Iron-based Metal / Alloys (IM):	
Aluminum-based Metals / Alloys (AM):	
Other Metals (OM):	
Other Inorganic Materials (OI)	
Cellulosics (C):	
Rubber (R):	
Plastics (waste materials) (XPM):	0.5
Organic Matrix (OR):	2.0
Inorganic Matrix (IN):	
Soils (S):	192.5
Total WMP Weight:	195.0

CCP Radiography Data Sheet

Waste Container ID: X10C1451626

Section 5: RTR Summary (Questions answered "Yes" will be explained in the Comment block, except for Question 1)	
Is there observable liquid?	☐ Yes ☒ No
Is there any observable liquid in internal containers, more than 60 milliliters or 3 percent by volume, whichever is greater?	☐ Yes ☒ No
Is the total volume of observable liquid in the outermost container GREATER than 1% of the container?	☐ Yes ☒ No
Is there observable liquid in payload containers with an EPA Hazardous Waste Number of U134?	☐ Yes ☒ No
Is there an indication of non-radionuclide pyrophoric materials, such as elemental potassium?	☐ Yes ☒ No
Is there an indication of hazardous wastes not occurring as co-contaminants with TRU mixed wastes (non-mixed hazardous wastes)?	☐ Yes ☒ No
Is there an indication of wastes incompatible with backfill, seal and panel closures materials, container and packaging materials, shipping container materials, or other wastes (i.e., waste does NOT match TRUCON Code[s])?	☐ Yes ☒ No
Is there an indication of wastes containing explosives or compressed gases?	☐ Yes ☒ No
Is there an indication of PCBs liquids?	☐ Yes ☒ No
Is there an indication of the waste exhibiting the characteristic of ignitability, corrosivity, or reactivity (EPA Hazardous Waste Numbers of D001, D002, or D003)?	☐ Yes ☒ No
Is the physical form of the waste inconsistent with the Waste Stream Description or the Waste Matrix Code?	☐ Yes ☒ No
CH or RH TRAMPAC	
Are there heat-sealed bags (unvented) GREATER than 4 liters and LESS than 390 square inches in the waste, or heat sealed bags not authorized in the RH TRUCON Code?	☐ Yes ☒ No
Were there Non-approved Closure Methods used on liner bags or inner bags greater than 4 liters?	☐ Yes ☒ No
Are there sealed containers GREATER than 4 liters?	☐ Yes ☒ No
Are there indications of inadequate protection for heavy and/or sharp objects?	☐ Yes ☒ No
Comments: N/A	

RTR Operator:

Eric Lyles		3/12/2015
Print Name	Signature	Date

CCP Radiography Data Sheet

Section 1: General Information	
[X] RTR Examination [ ] RTR Replicate Scan [ ] RTR Independent Observation	
Site ID:	ORNL
Batch Number:	OR-RTR6-0636
Examination Date:	3/12/2015
Waste Container ID:	X10C1451582
Video/Audio Recorded Media Number:	OR-RTR6-0636 A&B
Procedure and Revision No.:	CCP-TP-053 Rev. 15
NCR(s) associated with the container? (e.g., Prohibited Items)	[X] No [ ] Yes NCR No.: N/A NCR No.: N/A

Section 2: Waste Container Data	
Container Type:	55 Gallon Drum
TRUCON Code:	OR 227
Waste Matrix Code:	S4100
Waste Stream I.D.:	OR-NFS-CH-SOIL
Waste Container Weights:	Gross Wt.: 242.0 kg Tare Wt.: 35.2 kg Net Wt.: 206.8 kg
Rigid Liner and Liner Vent Description:	Liner: [ ] No [X] Yes Lid: [X] No [ ] Yes Type: [ ] 30-mil [X] 90-mil [ ] 110-mil [ ] 125-mil Vented: [ ] No [X] Yes [ ] N/A Punctured: [X] No [ ] Yes Mechanical Vent: [X] No [ ] Yes Fiberboard Liner: [X] No [ ] Yes Lead Lined: [X] No [ ] Yes
Number of Layers of Confinement:	Appears to be 1 layer
Volume Utilization Percentage:	85 %

CCP Radiography Data Sheet

Waste Container ID: X10C1451582

Section 3: Container Inventory and Comments (Detailed descriptions)
IM:
AM:
OM:
OI:
C:
R:
XPM:
OR: Absorbent
IN:
S: Soil

Section 4: Packaging Material and Waste Material Parameters	
Packaging Material:	**Estimated Weight (kg)**
Steel (ST):	27.8
Plastics (PP): Liner bag, Rigid Liner	7.4
Other:	0.0
Total Packaging Weight	35.2
Waste Material Parameter:	**Estimated Weight (kg)**
Iron-based Metal / Alloys (IM):	
Aluminum-based Metals / Alloys (AM):	
Other Metals (OM):	
Other Inorganic Materials (OI)	
Cellulosics (C):	
Rubber (R):	
Plastics (waste materials) (XPM):	
Organic Matrix (OR):	2.5
Inorganic Matrix (IN):	
Soils (S):	204.3
Total WMP Weight:	206.8

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CCP Radiography Data Sheet

Waste Container ID: X10C1451582

Section 5: RTR Summary (Questions answered "Yes" will be explained in the Comment block, except for Question 1)	
Is there observable liquid?	☐ Yes ☒ No
Is there any observable liquid in internal containers, more than 60 milliliters or 3 percent by volume, whichever is greater?	☐ Yes ☒ No
Is the total volume of observable liquid in the outermost container GREATER than 1% of the container?	☐ Yes ☒ No
Is there observable liquid in payload containers with an EPA Hazardous Waste Number of U134?	☐ Yes ☒ No
Is there an indication of non-radionuclide pyrophoric materials, such as elemental potassium?	☐ Yes ☒ No
Is there an indication of hazardous wastes not occurring as co-contaminants with TRU mixed wastes (non-mixed hazardous wastes)?	☐ Yes ☒ No
Is there an indication of wastes incompatible with backfill, seal and panel closures materials, container and packaging materials, shipping container materials, or other wastes (i.e., waste does NOT match TRUCON Code[s])?	☐ Yes ☒ No
Is there an indication of wastes containing explosives or compressed gases?	☐ Yes ☒ No
Is there an indication of PCBs liquids?	☐ Yes ☒ No
Is there an indication of the waste exhibiting the characteristic of ignitability, corrosivity, or reactivity (EPA Hazardous Waste Numbers of D001, D002, or D003)?	☐ Yes ☒ No
Is the physical form of the waste inconsistent with the Waste Stream Description or the Waste Matrix Code?	☐ Yes ☒ No
CH or RH TRAMPAC	
Are there heat-sealed bags (unvented) GREATER than 4 liters and LESS than 390 square inches in the waste, or heat sealed bags not authorized in the RH TRUCON Code?	☐ Yes ☒ No
Were there Non-approved Closure Methods used on liner bags or inner bags greater than 4 liters?	☐ Yes ☒ No
Are there sealed containers GREATER than 4 liters?	☐ Yes ☒ No
Are there indications of inadequate protection for heavy and/or sharp objects?	☐ Yes ☒ No
Comments: N/A	

RTR Operator:

Eric Lyles		3/12/2015
Print Name	Signature	Date

CCP Radiography Data Sheet

Section 1: General Information	
[X] RTR Examination [ ] RTR Replicate Scan [ ] RTR Independent Observation	
Site ID:	ORNL
Batch Number:	OR-RTR6-0636
Examination Date:	3/12/2015
Waste Container ID:	X10C1451631
Video/Audio Recorded Media Number:	OR-RTR6-0636 A&B
Procedure and Revision No.:	CCP-TP-053 Rev. 15
NCR(s) associated with the container? (e.g., Prohibited Items)	[X] No [ ] Yes NCR No.: N/A NCR No.: N/A

Section 2: Waste Container Data	
Container Type:	55 Gallon Drum
TRUCON Code:	OR 227
Waste Matrix Code:	S4100
Waste Stream I.D.:	OR-NFS-CH-SOIL
Waste Container Weights:	Gross Wt.: 232.4 kg Tare Wt.: 35.2 kg Net Wt.: 197.2 kg
Rigid Liner and Liner Vent Description:	Liner: [ ] No [X] Yes Lid: [X] No [ ] Yes Type: [ ] 30-mil [X] 90-mil [ ] 110-mil [ ] 125-mil Vented: [ ] No [X] Yes [ ] N/A Punctured: [X] No [ ] Yes Mechanical Vent: [X] No [ ] Yes Fiberboard Liner: [X] No [ ] Yes Lead Lined: [X] No [ ] Yes
Number of Layers of Confinement:	Appears to be 1 layer
Volume Utilization Percentage:	85 %

CCP Radiography Data Sheet

Waste Container ID: X10C1451631

Section 3: Container Inventory and Comments (Detailed descriptions)
IM:
AM:
OM:
OI:
C:
R:
XPM:
OR: Absorbent
IN:
S: Soil

Section 4: Packaging Material and Waste Material Parameters	
Packaging Material:	**Estimated Weight (kg)**
Steel (ST):	27.8
Plastics (PP): Liner bag, Rigid Liner	7.4
Other:	0.0
Total Packaging Weight	35.2
Waste Material Parameter:	**Estimated Weight (kg)**
Iron-based Metal / Alloys (IM):	
Aluminum-based Metals / Alloys (AM):	
Other Metals (OM):	
Other Inorganic Materials (OI)	
Cellulosics (C):	
Rubber (R):	
Plastics (waste materials) (XPM):	
Organic Matrix (OR):	3.0
Inorganic Matrix (IN):	
Soils (S):	194.2
Total WMP Weight:	197.2

CCP Radiography Data Sheet

Waste Container ID: X10C1451631

Section 5: RTR Summary (Questions answered "Yes" will be explained in the Comment block, except for Question 1)	
Is there observable liquid?	☐ Yes ☒ No
Is there any observable liquid in internal containers, more than 60 milliliters or 3 percent by volume, whichever is greater?	☐ Yes ☒ No
Is the total volume of observable liquid in the outermost container GREATER than 1% of the container?	☐ Yes ☒ No
Is there observable liquid in payload containers with an EPA Hazardous Waste Number of U134?	☐ Yes ☒ No
Is there an indication of non-radionuclide pyrophoric materials, such as elemental potassium?	☐ Yes ☒ No
Is there an indication of hazardous wastes not occurring as co-contaminants with TRU mixed wastes (non-mixed hazardous wastes)?	☐ Yes ☒ No
Is there an indication of wastes incompatible with backfill, seal and panel closures materials, container and packaging materials, shipping container materials, or other wastes (i.e., waste does NOT match TRUCON Code[s])?	☐ Yes ☒ No
Is there an indication of wastes containing explosives or compressed gases?	☐ Yes ☒ No
Is there an indication of PCBs liquids?	☐ Yes ☒ No
Is there an indication of the waste exhibiting the characteristic of ignitability, corrosivity, or reactivity (EPA Hazardous Waste Numbers of D001, D002, or D003)?	☐ Yes ☒ No
Is the physical form of the waste inconsistent with the Waste Stream Description or the Waste Matrix Code?	☐ Yes ☒ No
CH or RH TRAMPAC	
Are there heat-sealed bags (unvented) GREATER than 4 liters and LESS than 390 square inches in the waste, or heat sealed bags not authorized in the RH TRUCON Code?	☐ Yes ☒ No
Were there Non-approved Closure Methods used on liner bags or inner bags greater than 4 liters?	☐ Yes ☒ No
Are there sealed containers GREATER than 4 liters?	☐ Yes ☒ No
Are there indications of inadequate protection for heavy and/or sharp objects?	☐ Yes ☒ No
Comments: N/A	

RTR Operator:

Eric Lyles		3/12/2015
Print Name	Signature	Date

CCP Radiography Data Sheet

Section 1: General Information	
[X] RTR Examination [ ] RTR Replicate Scan [ ] RTR Independent Observation	
Site ID:	ORNL
Batch Number:	OR-RTR6-0636
Examination Date:	3/12/2015
Waste Container ID:	X10C1451598
Video/Audio Recorded Media Number:	OR-RTR6-0636 A&B
Procedure and Revision No.:	CCP-TP-053 Rev. 15
NCR(s) associated with the container? (e.g., Prohibited Items)	[X] No [ ] Yes NCR No.: N/A NCR No.: N/A

Section 2: Waste Container Data	
Container Type:	55 Gallon Drum
TRUCON Code:	OR 227
Waste Matrix Code:	S4100
Waste Stream I.D.:	OR-NFS-CH-SOIL
Waste Container Weights:	Gross Wt.: 232.2 kg Tare Wt.: 35.2 kg Net Wt.: 197.0 kg
Rigid Liner and Liner Vent Description:	Liner: [ ] No [X] Yes Lid: [X] No [ ] Yes Type: [ ] 30-mil [X] 90-mil [ ] 110-mil [ ] 125-mil Vented: [ ] No [X] Yes [ ] N/A Punctured: [X] No [ ] Yes Mechanical Vent: [X] No [ ] Yes Fiberboard Liner: [X] No [ ] Yes Lead Lined: [X] No [ ] Yes
Number of Layers of Confinement:	Appears to be 1 layer
Volume Utilization Percentage:	90 %

34

CCP Radiography Data Sheet

Waste Container ID: X10C1451598

Section 3: Container Inventory and Comments (Detailed descriptions)
IM:
AM:
OM:
OI:
C:
R:
XPM:
OR: Absorbent
IN:
S: Soil

Section 4: Packaging Material and Waste Material Parameters	
Packaging Material:	**Estimated Weight (kg)**
Steel (ST):	27.8
Plastics (PP): Liner bag, Rigid Liner	7.4
Other:	0.0
Total Packaging Weight	35.2
Waste Material Parameter:	**Estimated Weight (kg)**
Iron-based Metal / Alloys (IM):	
Aluminum-based Metals / Alloys (AM):	
Other Metals (OM):	
Other Inorganic Materials (OI)	
Cellulosics (C):	
Rubber (R):	
Plastics (waste materials) (XPM):	
Organic Matrix (OR):	2.0
Inorganic Matrix (IN):	
Soils (S):	195.0
Total WMP Weight:	197.0

CCP Radiography Data Sheet

Waste Container ID: X10C1451598

Section 5: RTR Summary (Questions answered "Yes" will be explained in the Comment block, except for Question 1)	
Is there observable liquid?	☐ Yes ☒ No
Is there any observable liquid in internal containers, more than 60 milliliters or 3 percent by volume, whichever is greater?	☐ Yes ☒ No
Is the total volume of observable liquid in the outermost container GREATER than 1% of the container?	☐ Yes ☒ No
Is there observable liquid in payload containers with an EPA Hazardous Waste Number of U134?	☐ Yes ☒ No
Is there an indication of non-radionuclide pyrophoric materials, such as elemental potassium?	☐ Yes ☒ No
Is there an indication of hazardous wastes not occurring as co-contaminants with TRU mixed wastes (non-mixed hazardous wastes)?	☐ Yes ☒ No
Is there an indication of wastes incompatible with backfill, seal and panel closures materials, container and packaging materials, shipping container materials, or other wastes (i.e., waste does NOT match TRUCON Code[s])?	☐ Yes ☒ No
Is there an indication of wastes containing explosives or compressed gases?	☐ Yes ☒ No
Is there an indication of PCBs liquids?	☐ Yes ☒ No
Is there an indication of the waste exhibiting the characteristic of ignitability, corrosivity, or reactivity (EPA Hazardous Waste Numbers of D001, D002, or D003)?	☐ Yes ☒ No
Is the physical form of the waste inconsistent with the Waste Stream Description or the Waste Matrix Code?	☐ Yes ☒ No
CH or RH TRAMPAC	
Are there heat-sealed bags (unvented) GREATER than 4 liters and LESS than 390 square inches in the waste, or heat sealed bags not authorized in the RH TRUCON Code?	☐ Yes ☒ No
Were there Non-approved Closure Methods used on liner bags or inner bags greater than 4 liters?	☐ Yes ☒ No
Are there sealed containers GREATER than 4 liters?	☐ Yes ☒ No
Are there indications of inadequate protection for heavy and/or sharp objects?	☐ Yes ☒ No
Comments: N/A	

RTR Operator:

Eric Lyles		3/12/2015
Print Name	Signature	Date

Attachment 3 – CCP Radiography Independent Technical Reviewer Checklist

Batch Data Report No.: OR-RTR6-0636

Description			
1.	Were data generation and reduction conducted in a technically correct manner in accordance with the methods used?	☐ NO	☑ YES
2.	Was the correct revision of the procedure used? Procedure: CCP-TP-053 Rev.: 15	☐ NO	☑ YES
3.	Are the WMPs entered correctly?	☐ NO	☑ YES
4.	Do the estimated weights in Section 4 of Attachment 2 equal the container gross weight?	☐ NO	☑ YES
5.	Is the data reported in the proper units with the correct number of significant figures (e.g., one tenth of a kilogram)?	☐ NO	☑ YES
6.	Was transcription used? If no, proceed to question 7.	☑ NO	☐ YES
	6a. Has the data been verified for transcription errors?	☐ NO	☐ YES
7.	Does the Testing Batch Report include radiography for up to 20 containers?	☐ NO	☑ YES
8.	Are BDR contents complete and do they match the CCP Waste RTR Batch Data Report Table of Contents?	☐ NO	☑ YES
9.	Is all the data signed and dated in reproducible ink and by the individual(s) generating it?	☐ NO	☑ YES
10.	Is all data recorded clearly, legibly, and accurately?	☐ NO	☑ YES
11.	Have changes been made to original data? If no, proceed to question 12.	☑ NO	☐ YES
	11a. Have all changes to original data been lined out, initialed and dated by the individual making the changes?	☐ NO	☐ YES
	11b. Was justification made for changing the original data?	☐ NO	☐ YES
	11c. Were data changes made by the individual who originally collected the data?	☐ NO	☐ YES
12.	Does the waste match the Waste Matrix Code and Waste Stream description?	☐ NO	☑ YES
13.	Are the RTR Operator's decisions regarding the Radiography documented?	☐ NO	☑ YES
14.	Is there an adequate written description of the contents of each item?	☐ NO	☑ YES
15.	Was the video/audio recording media properly prepared and labeled for each waste container?	☐ NO	☑ YES
16.	Was the video/audio recording media check performed satisfactorily and recorded on Attachment 1?	☐ NO	☑ YES

Attachment 3 – CCP Radiography Independent Technical Reviewer Checklist (Continued)

Batch Data Report No.: OR-RTR6-0636

Description		
17. Was the Image Test performed satisfactorily and recorded on Attachment 1?	☐ NO	☑ YES
18. Was the Replicate Scan performed and recorded on an Attachment 2?	☐ NO	☑ YES
19. Was the Replicate Scan RTR Operator different from the first RTR Operator?	☐ NO	☑ YES
20. Did the Replicate Scan RTR Operator and the first RTR Operator agree on the results?	☐ NO	☑ YES
21. Was the Independent Observation performed and recorded on an Attachment 2?	☐ NO	☑ YES
22. Was the Independent Observation RTR Operator different from the first RTR Operator?	☐ NO	☑ YES
23. Did the Independent Observation RTR Operator and the first RTR Operator agree on the results?	☐ NO	☑ YES
24. Was the data collection performed by qualified individuals?	☐ NO	☑ YES
25. Were NCRs initiated as required at DGL? If no, proceed to question 26.	☑ NO	☐ YES
25a. Have the NCR(s) associated with RTR been included in the BDR?	☐ NO	☐ YES
26. Is the RTR examination for CH waste? If no, proceed to question 27.	☐ NO	☑ YES
26a. Have the CH Quality Assurance Objectives (QAOs) been met (if applicable)? Precision – Precision is maintained by reconciling any discrepancies between two radiography operators with regard to identification of the waste matrix code, liquids in excess of TSDF-WAC limits, and compressed gases through independent replicate scans and independent observations. Additionally, the precision of radiography is verified prior to use by tuning precisely enough to demonstrate compliance with QAOs through viewing an image test pattern. Accuracy – Accuracy is obtained by using a target to tune the image for maximum sharpness and by requiring operators to successfully identify 100 percent of the items required to meet the DQOs for radiography specified in CCP-PO-001, Section C-4a(1) in a training container during their initial qualification and subsequent requalification. Completeness – A video and audio media recording of the radiography examination and a validated radiography data form will be obtained for 100 percent of the waste containers subject to radiography. All video and audio media recordings and radiography data forms will be subject to validation as indicated in CCP-PO-001, Section C3-4. Comparability – The comparability of radiography data from different operators shall be enhanced by using standardized radiography procedures and operator qualifications.	☐ NO	☑ YES

Attachment 3 – CCP Radiography Independent Technical Reviewer Checklist (Continued)

Batch Data Report No.: OR-RTR6-0636

Description		
27. Is the RTR examination for RH waste? If no, proceed to comment section.	☑ NO	☐ YES
27a. Have the RH QAOs been met (if applicable)? Precision – Precision is maintained by reconciling any discrepancies between two operators (during Independent Observation and Replicate scans) with regard to the identification of important waste characteristics (i.e., physical form of the waste and absence of prohibited liquids) within a single container. Accuracy – Accuracy is obtained by using a target to tune the image for maximum sharpness and by requiring operators to successfully identify prohibited liquid in a training container during their initial qualification and subsequent requalification. Representativeness – All of the relevant contents in a container selected for radiography will be described. Completeness – All of the relevant waste information must be assembled and must show that each of the containers in the waste stream belongs to the waste stream. This information must be documented on videotape or other equivalent media and data form. Comparability – Comparability is ensured by meeting the program training requirements and complying with the minimum standards used to implement the radiography process.	☐ NO	☐ YES

Comments: N/A

I have reviewed 100% of the container specific and batch data in this report and find it acceptable.

Independent Technical Reviewer:

Printed Name	Signature	Date
Fred Owey		3-12-15

DIVIDER PAGE ONLY

NOT PART OF PAGE COUNT

Attachment 2 – CCP Records Transmittal/Receiving Form

CCP Records / Records Custodian, 4021 National Parks Highway - MS: GSA 212, Carlsbad, New Mexico 88220

Telephone Number: 575-234-7523

Fax Number: 575-234-7033

Attn:	CCP RECORDS	From:	PATRICK SMITH II
Ship to:	CCP RECORDS CUSTODIAN	Site:	ORNL
	4021 NATIONAL PARKS HWY.	Company:	TFE INC.
	MS GSA 212	Telephone Number:	865-574-6002
	CARLSBAD, NM 88220-9082	Date Sent:	3-17-2015
Telephone Number:	575-234-7523		

Document Number	Title/Description	Revision	Cell or Box
OR-RTR6-0636	RTR DVD (DISC B)	3-12-2015	N/A
N/A	N/A	N/A	N/A
N/A	N/A	N/A	N/A
N/A	N/A	N/A	N/A
N/A	N/A	N/A	N/A
N/A	N/A	N/A	N/A

Comments

N/A

(When the Record accepted line has been completed, the rest of the page below may be left blank.)
Acceptance/Rejection Signature and Date

Records Accepted ☑	Signature	Greta Leos Printed Name	3-19-15 Date
Records Rejected ☐	Signature	Printed Name	Date

Reason for Rejection:

Re-submittal:

Signature	Printed Name	Date

****
*** Send Results ***
****

Sending is complete.

Job No.	2963
Address	918655768703
Name	ORNL
Start Time	03/19 02:44 PM
Call Length	00'42
Sheets	1
Result	OK

Attachment 2 – CCP Records Transmittal/Receiving Form

CCP Records / Records Custodian, 4021 National Parks Highway - MS: GSA 212, Carlsbad, New Mexico 88220

Telephone Number: 575-234-7523

Fax Number: 575-234-7033

Attn:	CCP RECORDS	From:	PATRICK SMITH II
Ship to:	CCP RECORDS CUSTODIAN	Site:	ORNL
	4021 NATIONAL PARKS HWY.	Company:	TFE INC.
	MS GSA 212	Telephone Number:	865-574-6002
	CARLSBAD, NM 88220-9082	Date Sent:	3-17-2015
Telephone Number:	575-234-7523		

OR-RTR6-0636	RTR DVD (DISC B)	3-12-2015	N/A
N/A	N/A	N/A	N/A
N/A	N/A	N/A	N/A
N/A	N/A	N/A	N/A
N/A	N/A	N/A	N/A
N/A	N/A	N/A	N/A

N/A

(When the Record accepted line has been completed, the rest of the page below may be left blank.)
Acceptance/Rejection Signature and Date

Records Accepted ☑ Signature Greta Leos Printed Name 3-19-15 Date

Records Rejected ☐ _____ _____ _____

Attachment 2 – CCP Records Transmittal/Receiving Form

CCP Records / Records Custodian, 4021 National Parks Highway - MS: GSA 212, Carlsbad, New Mexico 88220

Telephone Number: 575-234-7523

Fax Number: 575-234-7033

Attn:	CCP RECORDS	From:	PATRICK SMITH II
Ship to:	CCP RECORDS CUSTODIAN	Site:	ORNL
	4021 NATIONAL PARKS HWY.	Company:	TFE INC.
	MS GSA 212	Telephone Number:	865-574-6002
	CARLSBAD, NM 88220-9082	Date Sent:	3-24-2015
Telephone Number:	575-234-7523		

OR-RTR6-0636	RTR BDR	3-12-2015	39
OR-RTR6-0636	RTR DVD (DISK A)	3-12-2015	N/A
N/A	N/A	N/A	N/A
N/A	N/A	N/A	N/A
N/A	N/A	N/A	N/A
N/A	N/A	N/A	N/A

N/A

(When the Record accepted line has been completed, the rest of the page below may be left blank.)
Acceptance/Rejection Signature and Date

Records Accepted ☑	Greta Leos	Greta Leos	3-26-15
	Signature	Printed Name	Date
Records Rejected ☐			
	Signature	Printed Name	Date

Reason for Rejection:

Re-submittal:

Signature	Printed Name	Date

```
**********************************
***        Send Results        ***
**********************************

   Sending is complete.

Job No.          3060
Address          918655768703
Name             ORNL
Start Time       03/26 02:01 PM
Call Length      00'43
Sheets           1
Result           OK
```


Attachment 2 – CCP Records Transmittal/Receiving Form

CCP Records / Records Custodian, 4021 National Parks Highway - MS: GSA 212, Carlsbad, New Mexico 88220

Telephone Number: 575-234-7523

Fax Number: 575-234-7033

Attn:	CCP RECORDS	From:	PATRICK SMITH II
Ship to:	CCP RECORDS CUSTODIAN	Site:	ORNL
	4021 NATIONAL PARKS HWY.	Company:	TFE INC.
	MS GSA 212	Telephone Number:	865-574-6002
	CARLSBAD, NM 88220-9082	Date Sent:	3-24-2015
Telephone Number:	575-234-7523		

OR-RTR6-0636	RTR BDR	3-12-2015	39
OR-RTR6-0636	RTR DVD (DISK A)	3-12-2015	N/A
N/A	N/A	N/A	N/A
N/A	N/A	N/A	N/A
N/A	N/A	N/A	N/A
N/A	N/A	N/A	N/A

N/A

(When the Record accepted line has been completed, the rest of the page below may be left blank.)
Acceptance/Rejection Signature and Date

Records Accepted ☑ Greta Leos (Signature) Greta Leos (Printed Name) 3-26-15 (Date)

Records Rejected ☐ _____

Attachment 2 – CCP SPM Radiography Project Level Validation Checklist and Summary

BDR Number: OR-RTR7-0124				Examination Date(s): 11/17/2014
Description of Criteria Reviewed	**Criteria Met?**			**Comments/Qualifiers**
	YES	**NO**	**NA**	
1. Is the completed, signed, and dated Independent Technical Reviewer Checklist included in the BDR, and the independent technical reviewer was not involved in the generation or recording of the data under review? **Reference Source: CCP-PO-001, C3-4**	X			
2. Does the BDR contain all items addressed in the BDR Table of Contents? **Reference Source: CCP-PO-001, C3-4**	X			
3. Does the BDR include a listing of all the container numbers in the batch? **Reference Source: CCP-PO-001, C3-4**	X			
4. List all containers that have met QAOs. **Reference Source: CCP-PO-001, C3-4**				Container Numbers: X10CSATN03142A X10CSATN03203A X10C9313603A X10CSATN03123A NFS0487D NFS0689B
5. Does the BDR identify the current implementing procedure and revision number? **Reference Source: CCP-PO-001, Table C3-3**	X			
6. Is there a reference to or copy of any associated NCRs (if any) in the BDR? NA if no NCRs. **Reference Source: CCP-PO-001, Table C3-3**	X			NCR-ORNL-1040-14 Reject (NFS0663B) NCR-ORNL-1041-14 Reject (NFS0606C NFS0610A NFS0610C NFS0606B)
7. Are there 20 or fewer containers in the batch? **Reference Source: CCP-PO-001, C3-4**	X			
8. Are the data properly reported (i.e., data are reported in correct units and with correct significant figures)? **Reference Source: CCP-PO-001, C3-4**	X			
9. Is there evidence of verification that the physical form matches the Waste Matrix Code? **Reference Source: CCP-PO-001, Table C3-3**	X			

Attachment 2 – CCP SPM Radiography Project Level Validation Checklist and Summary (Continued)

BDR Number: OR-RTR7-0124				**Examination Date(s): 11/17/2014**
Description of Criteria Reviewed	**Criteria Met?**			**Comments/Qualifiers**
	YES	**NO**	**NA**	
10. Is there evidence of verification that the physical form matches the waste stream description? **Reference Source: CCP-PO-001, Table C3-3**	X			
11. Are prohibited items absent? **Reference Source: CCP-PO-001, Table C3-3**	X			
12. Does observable liquid, if present, meet the criteria of the TSDF-WAC? **Reference Source: CCP-PO-001, C-1**	X			
13. Were discrepancies between two operators with regard to identification of waste matrix code, liquids in excess of the TSDF-WAC, or compressed gases through replicate scans and independent observations reconciled? NA if no discrepancies. **Reference Source: CCP-PO-001, C3-2**			X	No discrepancies
14. Are the training qualifications for all radiography personnel acceptable? **Reference Source: CCP-PO-001, C3-8**	X			
15. Was evidence of the video/audio check included in the BDR? **Reference Source: CCP-PO-001, C1-1**	X			
16. Was the Lines-Pair Resolution Test or Sieve Test Check included in the BDR? **Reference Source: CCP Technical Procedures**	X			
17. Was a replicate scan performed once per day, or once per batch, whichever is LESS frequent? **Reference Source: CCP-PO-001, C1-1**	X			
18. Was an independent observation performed once per day, or once per batch, whichever is LESS frequent? **Reference Source: CCP-PO-001, C1-1**	X			

Attachment 2 – CCP SPM Radiography Project Level Validation Checklist and Summary (Continued)

BDR Number: OR-RTR7-0124	**Examination Date(s): 11/17/2014**			
Description of Criteria Reviewed	**Criteria Met?**			**Comments/Qualifiers**
	YES	**NO**	**NA**	
19. Were the replicate scan and independent observation performed on different waste containers? **Reference Source: CCP-PO-001, C1-1**	X			
20. Were the personnel performing the replicate scan and independent observation different from the individual who performed the original? **Reference Source: CCP-PO-001, C1-1**	X			
21. Does the BDR include an estimate of each material parameter weight in kg for each container? **Reference Source: CCP Technical Procedures**	X			
22. Does the BDR include a description of each material parameter for each container? **Reference Source: CCP Technical Procedures**	X			
23. Is the container gross weight recorded in kilograms (kg) for each container in the BDR? **Reference Source: CCP Technical Procedures**	X			
24. Was the Scale Weight Calibration Check included in the BDR? **Reference Source: CCP Technical Procedures**			X	Scale not used.
25. Was the Scale Weight Check included in the BDR? **Reference Source: CCP Technical Procedures**			X	Scale not used.
Comments: None				
The container QC checks were properly performed and meet the Quality Assurance Objectives (QAOs). Proper procedures were followed during data reduction and analysis. The batch is complete, acceptable, and includes all supporting data and documentation required by the QAPjP.				
Carolina Soaterna	Carolina Soaterna			01/08/2015
SPM Printed Name	Signature			Date

Checklist is to be re-signed only when a re-review is performed.

SPM Printed Name	Signature	Reason	Date
SPM Printed Name	Signature	Reason	Date

Attachment 5–CCP Radiography Batch Data Report Cover Sheet

Site ID: ORNL

Batch Data Report No.: OR-RTR7-0124 ☑ CH ☐ RH Date: 11/17/14

Waste Container ID Numbers	
Replicate Scan:	X10CSATN03123A
Independent Observation:	X10C9313603A
1	X10CSATN03142A
2	X10CSATN03203A
3	X10C9313603A
4	X10CSATN03123A
5	NFS0487D
6	NFS0663B
7	NFS0689B
8	NFS0606C
9	NFS0610A
10	NFS0610C
11	NFS0606B
12	N/A
13	N/A
14	N/A
15	N/A
16	N/A
17	N/A
18	N/A
19	N/A
20	N/A

RTR Operator:

Daphne Brothers — Printed Name

Daphne Brothers — Signature

11/17/14 — Date

Independent Technical Reviewer:

Fred Owey — Printed Name

Signature

11-18-14 — Date

12-29-14

NTPC RECORDS ORIGINAL

DATE REC'D 11-18-2014

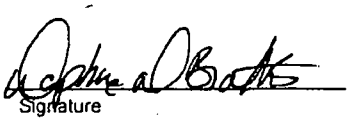
Attachment 4 – CCP Radiography Batch Data Report Table of Contents and Batch Narrative

Batch Data Report No.: OR-RTR7-0124 Date: 11/17/14

Table Of Contents		
Item	Description	Page No.
1	CCP Radiography Batch Data Report Cover Sheet	1
2	CCP Radiography Batch Data Report Table Of Contents	2
3	CCP RTR Measurement Control Report	3
4	CCP Radiography Data Sheets	4
5	Copy of NCRs (NA, If Not Applicable)	43
6	CCP Independent Technical Reviewer Checklist	49

Batch Narrative
All Quality Checks were performed and recorded on CCP-TP-053, Rev. 15 CCP Radiography Measurement Control Report.

Daphne Brothers — RTR Operator


Signature

11/17/14 — Date

Attachment 1 – CCP RTR Measurement Control Report

Site ID: ORNL		
Batch Data Report No.: OR-RTR7-0124		
Examination Date: 11/17/14		
Control Checks		
Video/Audio Recorded Media System Check	☑ SAT	☐ UNSAT
Image Test : 10 Lines (Minimum acceptable is 5 lines-pair/cm or #6 Sieve is viewable)	☑ SAT	☐ UNSAT
Comments: N/A		
RTR Operator:		
Daphne Brothers (Printed Name)	Daphne Brothers (Signature)	11/17/14 (Date)

CCP Radiography Data Sheet

Section 1: General Information	
☐ RTR Examination ☒ RTR Replicate Scan ☐ RTR Independent Observation	
Site ID:	ORNL
Batch Number:	OR-RTR7-0124
Examination Date:	11/17/2014
Waste Container ID:	X10CSATN03123A
Video/Audio Recorded Media Number:	OR-RTR7-0124 A&B
Procedure and Revision No.:	CCP-TP-053 Rev. 15
NCR(s) associated with the container? (e.g., Prohibited Items)	☒ No ☐ Yes NCR No.: N/A NCR No.: N/A

Section 2: Waste Container Data	
Container Type:	55 Gallon Drum
TRUCON Code:	OR 225
Waste Matrix Code:	S5400
Waste Stream I.D.:	OR-CHEM-CH-HET
Waste Container Weights:	Gross Wt.: 47.0 kg Tare Wt.: 33.2 kg Net Wt.: 13.8 kg
Rigid Liner and Liner Vent Description:	Liner: ☒ No ☐ Yes Lid: ☒ No ☐ Yes Type: ☐ 30-mil ☐ 90-mil ☐ 110-mil ☐ 125-mil Vented: ☐ No ☐ Yes ☒ N/A Punctured: ☒ No ☐ Yes Mechanical Vent: ☒ No ☐ Yes Fiberboard Liner: ☒ No ☐ Yes Lead Lined: ☒ No ☐ Yes
Number of Layers of Confinement:	Appears to be 1 layer
Volume Utilization Percentage:	90 %

CCP Radiography Data Sheet

Waste Container ID: X10CSATN03123A

Section 3: Container Inventory and Comments	(Detailed descriptions)
IM:	Punctured aerosol cans, metal hardware, scrap metal, hand tools
AM:	
OM:	
OI:	Glass containers, absorbent, broken glass
C:	Cloth, brush
R:	
XPM:	Plastic containers, plastic sheeting, plastic caps
OR:	
IN:	
S:	

Section 4: Packaging Material and Waste Material Parameters	
Packaging Material:	**Estimated Weight (kg)**
Steel (ST):	27.8
Plastics (PP): Liner bag	1.0
Other: Cardboard Liner (CP)	4.4
Total Packaging Weight	33.2
Waste Material Parameter:	**Estimated Weight (kg)**
Iron-based Metal / Alloys (IM):	2.0
Aluminum-based Metals / Alloys (AM):	
Other Metals (OM):	
Other Inorganic Materials (OI)	5.0
Cellulosics (C):	2.0
Rubber (R):	
Plastics (waste materials) (XPM):	4.8
Organic Matrix (OR):	
Inorganic Matrix (IN):	
Soils (S):	
Total WMP Weight:	13.8

CCP Radiography Data Sheet

Waste Container ID: X10CSATN03123A

Section 5: RTR Summary (Questions answered "Yes" will be explained in the Comment block, except for Question 1)	
Is there observable liquid?	☐ Yes ☒ No
Is there any observable liquid in internal containers, more than 60 milliliters or 3 percent by volume, whichever is greater?	☐ Yes ☒ No
Is the total volume of observable liquid in the outermost container GREATER than 1% of the container?	☐ Yes ☒ No
Is there observable liquid in payload containers with an EPA Hazardous Waste Number of U134?	☐ Yes ☒ No
Is there an indication of non-radionuclide pyrophoric materials, such as elemental potassium?	☐ Yes ☒ No
Is there an indication of hazardous wastes not occurring as co-contaminants with TRU mixed wastes (non-mixed hazardous wastes)?	☐ Yes ☒ No
Is there an indication of wastes incompatible with backfill, seal and panel closures materials, container and packaging materials, shipping container materials, or other wastes (i.e., waste does NOT match TRUCON Code[s])?	☐ Yes ☒ No
Is there an indication of wastes containing explosives or compressed gases?	☐ Yes ☒ No
Is there an indication of PCBs liquids?	☐ Yes ☒ No
Is there an indication of the waste exhibiting the characteristic of ignitability, corrosivity, or reactivity (EPA Hazardous Waste Numbers of D001, D002, or D003)?	☐ Yes ☒ No
Is the physical form of the waste inconsistent with the Waste Stream Description or the Waste Matrix Code?	☐ Yes ☒ No
CH or RH TRAMPAC	
Are there heat-sealed bags (unvented) GREATER than 4 liters and LESS than 390 square inches in the waste, or heat sealed bags not authorized in the RH TRUCON Code?	☐ Yes ☒ No
Were there Non-approved Closure Methods used on liner bags or inner bags greater than 4 liters?	☐ Yes ☒ No
Are there sealed containers GREATER than 4 liters?	☐ Yes ☒ No
Are there indications of inadequate protection for heavy and/or sharp objects?	☐ Yes ☒ No

Comments: This Replicate scan agrees with the original scan EL 11/17/14

RTR Operator:

Eric Lyles		11/17/2014
Print Name	Signature	Date

CCP Radiography Data Sheet

Section 1: General Information	
☐ RTR Examination ☐ RTR Replicate Scan ☒ RTR Independent Observation	
Site ID:	ORNL
Batch Number:	OR-RTR7-0124
Examination Date:	11/17/2014
Waste Container ID:	X10C9313603A
Video/Audio Recorded Media Number:	OR-RTR7-0124 A&B
Procedure and Revision No.:	CCP-TP-053 Rev. 15
NCR(s) associated with the container? (e.g., Prohibited Items)	☒ No ☐ Yes NCR No.: N/A NCR No.: N/A

Section 2: Waste Container Data	
Container Type:	55 Gallon Drum
TRUCON Code:	OR 225
Waste Matrix Code:	S5400
Waste Stream I.D.:	OR-RF-CH-HET
Waste Container Weights:	Gross Wt.: 92.2 kg Tare Wt.: 33.2 kg Net Wt.: 59.0 kg
Rigid Liner and Liner Vent Description:	Liner: ☒ No ☐ Yes Lid: ☒ No ☐ Yes Type: ☐ 30-mil ☐ 90-mil ☐ 110-mil ☐ 125-mil Vented: ☐ No ☐ Yes ☒ N/A Punctured: ☒ No ☐ Yes Mechanical Vent: ☒ No ☐ Yes Fiberboard Liner: ☒ No ☐ Yes Lead Lined: ☒ No ☐ Yes
Number of Layers of Confinement:	Appears to be 1 layer
Volume Utilization Percentage:	95 %

CCP Radiography Data Sheet

Waste Container ID: X10C9313603A

Section 3: Container Inventory and Comments	(Detailed descriptions)
IM:	Metal hardware, metal framed filters, scrap metal
AM:	
OM:	
OI:	Absorbent
C:	Cloth
R:	
XPM:	Plastic sheeting
OR:	
IN:	
S:	

Section 4: Packaging Material and Waste Material Parameters	
Packaging Material:	**Estimated Weight (kg)**
Steel (ST):	27.8
Plastics (PP): Liner bag	1.0
Other: Cardboard Liner (CP)	4.4
Total Packaging Weight	33.2
Waste Material Parameter:	**Estimated Weight (kg)**
Iron-based Metal / Alloys (IM):	42.0
Aluminum-based Metals / Alloys (AM):	
Other Metals (OM):	
Other Inorganic Materials (OI)	5.0
Cellulosics (C):	2.0
Rubber (R):	
Plastics (waste materials) (XPM):	10.0
Organic Matrix (OR):	
Inorganic Matrix (IN):	
Soils (S):	
Total WMP Weight:	59.0

CCP Radiography Data Sheet

Waste Container ID: X10C9313603A

Section 5: RTR Summary (Questions answered "Yes" will be explained in the Comment block, except for Question 1)	
Is there observable liquid?	☐ Yes ☒ No
Is there any observable liquid in internal containers, more than 60 milliliters or 3 percent by volume, whichever is greater?	☐ Yes ☒ No
Is the total volume of observable liquid in the outermost container GREATER than 1% of the container?	☐ Yes ☒ No
Is there observable liquid in payload containers with an EPA Hazardous Waste Number of U134?	☐ Yes ☒ No
Is there an indication of non-radionuclide pyrophoric materials, such as elemental potassium?	☐ Yes ☒ No
Is there an indication of hazardous wastes not occurring as co-contaminants with TRU mixed wastes (non-mixed hazardous wastes)?	☐ Yes ☒ No
Is there an indication of wastes incompatible with backfill, seal and panel closures materials, container and packaging materials, shipping container materials, or other wastes (i.e., waste does NOT match TRUCON Code[s])?	☐ Yes ☒ No
Is there an indication of wastes containing explosives or compressed gases?	☐ Yes ☒ No
Is there an indication of PCBs liquids?	☐ Yes ☒ No
Is there an indication of the waste exhibiting the characteristic of ignitability, corrosivity, or reactivity (EPA Hazardous Waste Numbers of D001, D002, or D003)?	☐ Yes ☒ No
Is the physical form of the waste inconsistent with the Waste Stream Description or the Waste Matrix Code?	☐ Yes ☒ No
CH or RH TRAMPAC	
Are there heat-sealed bags (unvented) GREATER than 4 liters and LESS than 390 square inches in the waste, or heat sealed bags not authorized in the RH TRUCON Code?	☐ Yes ☒ No
Were there Non-approved Closure Methods used on liner bags or inner bags greater than 4 liters?	☐ Yes ☒ No
Are there sealed containers GREATER than 4 liters?	☐ Yes ☒ No
Are there indications of inadequate protection for heavy and/or sharp objects?	☐ Yes ☒ No

Comments: This Independent observation agrees with the original scan. EL 11/17/14

RTR Operator:

Eric Lyles		11/17/2014
Print Name	Signature	Date

CCP Radiography Data Sheet

Section 1: General Information	
[X] RTR Examination [ ] RTR Replicate Scan [ ] RTR Independent Observation	
Site ID:	ORNL
Batch Number:	OR-RTR7-0124
Examination Date:	11/17/2014
Waste Container ID:	X10CSATN03142A
Video/Audio Recorded Media Number:	OR-RTR7-0124 A&B
Procedure and Revision No.:	CCP-TP-053 Rev. 15
NCR(s) associated with the container? (e.g., Prohibited Items)	[X] No [ ] Yes NCR No.: N/A NCR No.: N/A

Section 2: Waste Container Data	
Container Type:	55 Gallon Drum
TRUCON Code:	OR 225
Waste Matrix Code:	S5400
Waste Stream I.D.:	OR-REDC-CH-HET
Waste Container Weights:	Gross Wt.: 89.3 kg Tare Wt.: 33.2 kg Net Wt.: 56.1 kg
Rigid Liner and Liner Vent Description:	Liner: [X] No [ ] Yes Lid: [X] No [ ] Yes Type: [ ] 30-mil [ ] 90-mil [ ] 110-mil [ ] 125-mil Vented: [ ] No [ ] Yes [X] N/A Punctured: [X] No [ ] Yes Mechanical Vent: [X] No [ ] Yes Fiberboard Liner: [X] No [ ] Yes Lead Lined: [X] No [ ] Yes
Number of Layers of Confinement:	Appears to be 1 layer
Volume Utilization Percentage:	90 %

CCP Radiography Data Sheet

Waste Container ID: X10CSATN03142A

Section 3: Container Inventory and Comments (Detailed descriptions)	
IM:	Electrical equipment, metal hardware, metal lids, scrap metal, metal tubing, saw blade, hand tools
AM:	
OM:	
OI:	Absorbent, glassware, broken glass
C:	Cloth
R:	
XPM:	Plastic sheeting, plastic tubing, plastic containers
OR:	
IN:	
S:	

Section 4: Packaging Material and Waste Material Parameters	
Packaging Material:	**Estimated Weight (kg)**
Steel (ST):	27.8
Plastics (PP):Liner bag	1.0
Other: Cardboard liner (CP)	4.4
Total Packaging Weight	33.2
Waste Material Parameter:	**Estimated Weight (kg)**
Iron-based Metal / Alloys (IM):	44.1
Aluminum-based Metals / Alloys (AM):	
Other Metals (OM):	
Other Inorganic Materials (OI)	2.0
Cellulosics (C):	2.0
Rubber (R):	
Plastics (waste materials) (XPM):	8.0
Organic Matrix (OR):	
Inorganic Matrix (IN):	
Soils (S):	
Total WMP Weight:	56.1

CCP Radiography Data Sheet

Waste Container ID: X10CSATN03142A

Section 5: RTR Summary (Questions answered "Yes" will be explained in the Comment block, except for Question 1)	
Is there observable liquid?	☐ Yes ☒ No
Is there any observable liquid in internal containers, more than 60 milliliters or 3 percent by volume, whichever is greater?	☐ Yes ☒ No
Is the total volume of observable liquid in the outermost container GREATER than 1% of the container?	☐ Yes ☒ No
Is there observable liquid in payload containers with an EPA Hazardous Waste Number of U134?	☐ Yes ☒ No
Is there an indication of non-radionuclide pyrophoric materials, such as elemental potassium?	☐ Yes ☒ No
Is there an indication of hazardous wastes not occurring as co-contaminants with TRU mixed wastes (non-mixed hazardous wastes)?	☐ Yes ☒ No
Is there an indication of wastes incompatible with backfill, seal and panel closures materials, container and packaging materials, shipping container materials, or other wastes (i.e., waste does NOT match TRUCON Code[s])?	☐ Yes ☒ No
Is there an indication of wastes containing explosives or compressed gases?	☐ Yes ☒ No
Is there an indication of PCBs liquids?	☐ Yes ☒ No
Is there an indication of the waste exhibiting the characteristic of ignitability, corrosivity, or reactivity (EPA Hazardous Waste Numbers of D001, D002, or D003)?	☐ Yes ☒ No
Is the physical form of the waste inconsistent with the Waste Stream Description or the Waste Matrix Code?	☐ Yes ☒ No
CH or RH TRAMPAC	
Are there heat-sealed bags (unvented) GREATER than 4 liters and LESS than 390 square inches in the waste, or heat sealed bags not authorized in the RH TRUCON Code?	☐ Yes ☒ No
Were there Non-approved Closure Methods used on liner bags or inner bags greater than 4 liters?	☐ Yes ☒ No
Are there sealed containers GREATER than 4 liters?	☐ Yes ☒ No
Are there indications of inadequate protection for heavy and/or sharp objects?	☐ Yes ☒ No

Comments:N/A

RTR Operator:

Daphne Brothers	Daphne C Brothers	11/17/2014
Print Name	Signature	Date

CCP Radiography Data Sheet

Section 1: General Information	
[X] RTR Examination [ ] RTR Replicate Scan [ ] RTR Independent Observation	
Site ID:	ORNL
Batch Number:	OR-RTR7-0124
Examination Date:	11/17/2014
Waste Container ID:	X10CSATN03203A
Video/Audio Recorded Media Number:	OR-RTR7-0124 A&B
Procedure and Revision No.:	CCP-TP-053 Rev. 15
NCR(s) associated with the container? (e.g., Prohibited Items)	[X] No [ ] Yes NCR No.: N/A NCR No.: N/A

Section 2: Waste Container Data	
Container Type:	55 Gallon Drum
TRUCON Code:	OR 225
Waste Matrix Code:	S5400
Waste Stream I.D.:	OR-RF-CH-HET
Waste Container Weights:	Gross Wt.: 62.1 kg Tare Wt.: 33.2 kg Net Wt.: 28.9 kg
Rigid Liner and Liner Vent Description:	Liner: [X] No [ ] Yes Lid: [X] No [ ] Yes Type: [ ] 30-mil [ ] 90-mil [ ] 110-mil [ ] 125-mil Vented: [ ] No [ ] Yes [X] N/A Punctured: [X] No [ ] Yes Mechanical Vent: [X] No [ ] Yes Fiberboard Liner: [X] No [ ] Yes Lead Lined: [X] No [ ] Yes
Number of Layers of Confinement:	Appears to be 1 layer
Volume Utilization Percentage:	95 %

CCP Radiography Data Sheet

Waste Container ID: X10CSATN03203A

Section 3: Container Inventory and Comments (Detailed descriptions)	
IM:	Scrap metal, hand tools, metal hardware, metal cans, scissors, open metal can, utility knife, metal lids
AM:	Flashlight
OM:	Batteries
OI:	Absorbent, glassware
C:	Brush, cardboard
R:	Rubber gloves,
XPM:	Plastic sheeting, plastic containers
OR:	
IN:	
S:	

Section 4: Packaging Material and Waste Material Parameters	
Packaging Material:	**Estimated Weight (kg)**
Steel (ST):	27.8
Plastics (PP):Liner bag	1.0
Other: Cardboard liner (CP)	4.4
Total Packaging Weight	33.2
Waste Material Parameter:	**Estimated Weight (kg)**
Iron-based Metal / Alloys (IM):	18.0
Aluminum-based Metals / Alloys (AM):	0.2
Other Metals (OM):	0.5
Other Inorganic Materials (OI)	3.0
Cellulosics (C):	0.5
Rubber (R):	0.7
Plastics (waste materials) (XPM):	6.0
Organic Matrix (OR):	
Inorganic Matrix (IN):	
Soils (S):	
Total WMP Weight:	28.9

CCP Radiography Data Sheet

Waste Container ID: X10CSATN03203A

Section 5: RTR Summary (Questions answered "Yes" will be explained in the Comment block, except for Question 1)	
Is there observable liquid?	☐ Yes ☒ No
Is there any observable liquid in internal containers, more than 60 milliliters or 3 percent by volume, whichever is greater?	☐ Yes ☒ No
Is the total volume of observable liquid in the outermost container GREATER than 1% of the container?	☐ Yes ☒ No
Is there observable liquid in payload containers with an EPA Hazardous Waste Number of U134?	☐ Yes ☒ No
Is there an indication of non-radionuclide pyrophoric materials, such as elemental potassium?	☐ Yes ☒ No
Is there an indication of hazardous wastes not occurring as co-contaminants with TRU mixed wastes (non-mixed hazardous wastes)?	☐ Yes ☒ No
Is there an indication of wastes incompatible with backfill, seal and panel closures materials, container and packaging materials, shipping container materials, or other wastes (i.e., waste does NOT match TRUCON Code[s])?	☐ Yes ☒ No
Is there an indication of wastes containing explosives or compressed gases?	☐ Yes ☒ No
Is there an indication of PCBs liquids?	☐ Yes ☒ No
Is there an indication of the waste exhibiting the characteristic of ignitability, corrosivity, or reactivity (EPA Hazardous Waste Numbers of D001, D002, or D003)?	☐ Yes ☒ No
Is the physical form of the waste inconsistent with the Waste Stream Description or the Waste Matrix Code?	☐ Yes ☒ No
CH or RH TRAMPAC	
Are there heat-sealed bags (unvented) GREATER than 4 liters and LESS than 390 square inches in the waste, or heat sealed bags not authorized in the RH TRUCON Code?	☐ Yes ☒ No
Were there Non-approved Closure Methods used on liner bags or inner bags greater than 4 liters?	☐ Yes ☒ No
Are there sealed containers GREATER than 4 liters?	☐ Yes ☒ No
Are there indications of inadequate protection for heavy and/or sharp objects?	☐ Yes ☒ No
Comments:N/A	

RTR Operator:

Daphne Brothers	Daphne C Brothers	11/17/2014
Print Name	Signature	Date

CCP Radiography Data Sheet

Section 1: General Information	
[X] RTR Examination [ ] RTR Replicate Scan [ ] RTR Independent Observation	
Site ID:	ORNL
Batch Number:	OR-RTR7-0124
Examination Date:	11/17/2014
Waste Container ID:	X10C9313603A
Video/Audio Recorded Media Number:	OR-RTR7-0124 A&B
Procedure and Revision No.:	CCP-TP-053 Rev. 15
NCR(s) associated with the container? (e.g., Prohibited Items)	[X] No [ ] Yes NCR No.: N/A NCR No.: N/A

Section 2: Waste Container Data	
Container Type:	55 Gallon Drum
TRUCON Code:	OR 225
Waste Matrix Code:	S5400
Waste Stream I.D.:	OR-RF-CH-HET
Waste Container Weights:	Gross Wt.: 92.2 kg Tare Wt.: 33.2 kg Net Wt.: 59.0 kg
Rigid Liner and Liner Vent Description:	Liner: [X] No [ ] Yes Lid: [X] No [ ] Yes Type: [ ] 30-mil [ ] 90-mil [ ] 110-mil [ ] 125-mil Vented: [ ] No [ ] Yes [X] N/A Punctured: [X] No [ ] Yes Mechanical Vent: [X] No [ ] Yes Fiberboard Liner: [X] No [ ] Yes Lead Lined: [X] No [ ] Yes
Number of Layers of Confinement:	Appears to be 1 layer
Volume Utilization Percentage:	95 %

CCP Radiography Data Sheet

Waste Container ID: X10C9313603A

Section 3: Container Inventory and Comments	(Detailed descriptions)
IM:	Metal hardware, metal framed filters, scrap metal
AM:	
OM:	
OI:	Absorbent
C:	Cloth
R:	
XPM:	Plastic sheeting
OR:	
IN:	
S:	

Section 4: Packaging Material and Waste Material Parameters	
Packaging Material:	**Estimated Weight (kg)**
Steel (ST):	27.8
Plastics (PP):Liner bag	1.0
Other: Cardboard liner (CP)	4.4
Total Packaging Weight	33.2
Waste Material Parameter:	**Estimated Weight (kg)**
Iron-based Metal / Alloys (IM):	44.0
Aluminum-based Metals / Alloys (AM):	
Other Metals (OM):	
Other Inorganic Materials (OI)	5.0
Cellulosics (C):	2.0
Rubber (R):	
Plastics (waste materials) (XPM):	8.0
Organic Matrix (OR):	
Inorganic Matrix (IN):	
Soils (S):	
Total WMP Weight:	59.0

CCP Radiography Data Sheet

Waste Container ID: X10C9313603A

Section 5: RTR Summary (Questions answered "Yes" will be explained in the Comment block, except for Question 1)	
Is there observable liquid?	☐ Yes ☒ No
Is there any observable liquid in internal containers, more than 60 milliliters or 3 percent by volume, whichever is greater?	☐ Yes ☒ No
Is the total volume of observable liquid in the outermost container GREATER than 1% of the container?	☐ Yes ☒ No
Is there observable liquid in payload containers with an EPA Hazardous Waste Number of U134?	☐ Yes ☒ No
Is there an indication of non-radionuclide pyrophoric materials, such as elemental potassium?	☐ Yes ☒ No
Is there an indication of hazardous wastes not occurring as co-contaminants with TRU mixed wastes (non-mixed hazardous wastes)?	☐ Yes ☒ No
Is there an indication of wastes incompatible with backfill, seal and panel closures materials, container and packaging materials, shipping container materials, or other wastes (i.e., waste does NOT match TRUCON Code[s])?	☐ Yes ☒ No
Is there an indication of wastes containing explosives or compressed gases?	☐ Yes ☒ No
Is there an indication of PCBs liquids?	☐ Yes ☒ No
Is there an indication of the waste exhibiting the characteristic of ignitability, corrosivity, or reactivity (EPA Hazardous Waste Numbers of D001, D002, or D003)?	☐ Yes ☒ No
Is the physical form of the waste inconsistent with the Waste Stream Description or the Waste Matrix Code?	☐ Yes ☒ No
CH or RH TRAMPAC	
Are there heat-sealed bags (unvented) GREATER than 4 liters and LESS than 390 square inches in the waste, or heat sealed bags not authorized in the RH TRUCON Code?	☐ Yes ☒ No
Were there Non-approved Closure Methods used on liner bags or inner bags greater than 4 liters?	☐ Yes ☒ No
Are there sealed containers GREATER than 4 liters?	☐ Yes ☒ No
Are there indications of inadequate protection for heavy and/or sharp objects?	☐ Yes ☒ No
Comments: N/A	

RTR Operator:

Daphne Brothers	Daphne O'B Brothers	11/17/2014
Print Name	Signature	Date

CCP Radiography Data Sheet

Section 1: General Information	
[X] RTR Examination [ ] RTR Replicate Scan [ ] RTR Independent Observation	
Site ID:	ORNL
Batch Number:	OR-RTR7-0124
Examination Date:	11/17/2014
Waste Container ID:	X10CSATN03123A
Video/Audio Recorded Media Number:	OR-RTR7-0124 A&B
Procedure and Revision No.:	CCP-TP-053 Rev. 15
NCR(s) associated with the container? (e.g., Prohibited Items)	[X] No [ ] Yes NCR No.: N/A NCR No.: N/A

Section 2: Waste Container Data	
Container Type:	55 Gallon Drum
TRUCON Code:	OR 225
Waste Matrix Code:	S5400
Waste Stream I.D.:	OR-CHEM-CH-HET
Waste Container Weights:	Gross Wt.: 47.0 kg Tare Wt.: 33.2 kg Net Wt.: 13.8 kg
Rigid Liner and Liner Vent Description:	Liner: [X] No [ ] Yes Lid: [X] No [ ] Yes Type: [ ] 30-mil [ ] 90-mil [ ] 110-mil [ ] 125-mil Vented: [ ] No [ ] Yes [X] N/A Punctured: [X] No [ ] Yes Mechanical Vent: [X] No [ ] Yes Fiberboard Liner: [X] No [ ] Yes Lead Lined: [X] No [ ] Yes
Number of Layers of Confinement:	Appears to be 1 layer
Volume Utilization Percentage:	90 %

CCP Radiography Data Sheet

Waste Container ID: X10CSATN03123A

Section 3: Container Inventory and Comments	(Detailed descriptions)
IM:	Punctured aerosol cans, scrap meal, metal hardware, hand tools
AM:	
OM:	
OI:	Glassware, absorbent, broken glass
C:	Cloth, brush
R:	
XPM:	Plastic sheeting, plastic containers, plastic caps
OR:	
IN:	
S:	

Section 4: Packaging Material and Waste Material Parameters	
Packaging Material:	**Estimated Weight (kg)**
Steel (ST):	27.8
Plastics (PP):Liner bag	1.0
Other: Cardboard liner (CP)	4.4
Total Packaging Weight	33.2
Waste Material Parameter:	**Estimated Weight (kg)**
Iron-based Metal / Alloys (IM):	2.0
Aluminum-based Metals / Alloys (AM):	
Other Metals (OM):	
Other Inorganic Materials (OI)	4.8
Cellulosics (C):	2.0
Rubber (R):	
Plastics (waste materials) (XPM):	5.0
Organic Matrix (OR):	
Inorganic Matrix (IN):	
Soils (S):	
Total WMP Weight:	13.8

CCP Radiography Data Sheet

Waste Container ID: X10CSATN03123A

Section 5: RTR Summary (Questions answered "Yes" will be explained in the Comment block, except for Question 1)	
Is there observable liquid?	☐ Yes ☒ No
Is there any observable liquid in internal containers, more than 60 milliliters or 3 percent by volume, whichever is greater?	☐ Yes ☒ No
Is the total volume of observable liquid in the outermost container GREATER than 1% of the container?	☐ Yes ☒ No
Is there observable liquid in payload containers with an EPA Hazardous Waste Number of U134?	☐ Yes ☒ No
Is there an indication of non-radionuclide pyrophoric materials, such as elemental potassium?	☐ Yes ☒ No
Is there an indication of hazardous wastes not occurring as co-contaminants with TRU mixed wastes (non-mixed hazardous wastes)?	☐ Yes ☒ No
Is there an indication of wastes incompatible with backfill, seal and panel closures materials, container and packaging materials, shipping container materials, or other wastes (i.e., waste does NOT match TRUCON Code[s])?	☐ Yes ☒ No
Is there an indication of wastes containing explosives or compressed gases?	☐ Yes ☒ No
Is there an indication of PCBs liquids?	☐ Yes ☒ No
Is there an indication of the waste exhibiting the characteristic of ignitability, corrosivity, or reactivity (EPA Hazardous Waste Numbers of D001, D002, or D003)?	☐ Yes ☒ No
Is the physical form of the waste inconsistent with the Waste Stream Description or the Waste Matrix Code?	☐ Yes ☒ No
CH or RH TRAMPAC	
Are there heat-sealed bags (unvented) GREATER than 4 liters and LESS than 390 square inches in the waste, or heat sealed bags not authorized in the RH TRUCON Code?	☐ Yes ☒ No
Were there Non-approved Closure Methods used on liner bags or inner bags greater than 4 liters?	☐ Yes ☒ No
Are there sealed containers GREATER than 4 liters?	☐ Yes ☒ No
Are there indications of inadequate protection for heavy and/or sharp objects?	☐ Yes ☒ No
Comments:N/A	

RTR Operator:

Daphne Brothers	Daphne C Brothers	11/17/2014
Print Name	Signature	Date

CCP Radiography Data Sheet

Section 1: General Information	
[X] RTR Examination [ ] RTR Replicate Scan [ ] RTR Independent Observation	
Site ID:	ORNL
Batch Number:	OR-RTR7-0124
Examination Date:	11/17/2014
Waste Container ID:	NFS0487D
Video/Audio Recorded Media Number:	OR-RTR7-0124 A&B
Procedure and Revision No.:	CCP-TP-053 Rev. 15
NCR(s) associated with the container? (e.g., Prohibited Items)	[X] No [ ] Yes NCR No.: N/A NCR No.: N/A

Section 2: Waste Container Data	
Container Type:	55 Gallon Drum
TRUCON Code:	OR 225
Waste Matrix Code:	S5400
Waste Stream I.D.:	OR-NFS-CH-HET-A
Waste Container Weights:	Gross Wt.: 57.7 kg Tare Wt.: 33.2 kg Net Wt.: 24.5 kg
Rigid Liner and Liner Vent Description:	Liner: [X] No [ ] Yes Lid: [X] No [ ] Yes Type: [ ] 30-mil [ ] 90-mil [ ] 110-mil [ ] 125-mil Vented: [ ] No [ ] Yes [X] N/A Punctured: [X] No [ ] Yes Mechanical Vent: [X] No [ ] Yes Fiberboard Liner: [X] No [ ] Yes Lead Lined: [X] No [ ] Yes
Number of Layers of Confinement:	Appears to be 1 layer
Volume Utilization Percentage:	70 %

CCP Radiography Data Sheet

Waste Container ID: NFS0487D

Section 3: Container Inventory and Comments	(Detailed descriptions)
IM:	Utility knife, metal hardware
AM:	
OM:	
OI:	Absorbent
C:	Cloth, coveralls
R:	
XPM:	Plastic sheeting, plastic tubing, plastic containers
OR:	
IN:	
S:	

Section 4: Packaging Material and Waste Material Parameters	
Packaging Material:	**Estimated Weight (kg)**
Steel (ST):	27.8
Plastics (PP):Liner bag	1.0
Other: Cardboard liner (CP)	4.4
Total Packaging Weight	33.2
Waste Material Parameter:	**Estimated Weight (kg)**
Iron-based Metal / Alloys (IM):	1.0
Aluminum-based Metals / Alloys (AM):	
Other Metals (OM):	
Other Inorganic Materials (OI)	5.5
Cellulosics (C):	5.0
Rubber (R):	
Plastics (waste materials) (XPM):	13.0
Organic Matrix (OR):	
Inorganic Matrix (IN):	
Soils (S):	
Total WMP Weight:	24.5

CCP Radiography Data Sheet

Waste Container ID: NFS0487D

Section 5: RTR Summary (Questions answered "Yes" will be explained in the Comment block, except for Question 1)	
Is there observable liquid?	☐ Yes ☒ No
Is there any observable liquid in internal containers, more than 60 milliliters or 3 percent by volume, whichever is greater?	☐ Yes ☒ No
Is the total volume of observable liquid in the outermost container GREATER than 1% of the container?	☐ Yes ☒ No
Is there observable liquid in payload containers with an EPA Hazardous Waste Number of U134?	☐ Yes ☒ No
Is there an indication of non-radionuclide pyrophoric materials, such as elemental potassium?	☐ Yes ☒ No
Is there an indication of hazardous wastes not occurring as co-contaminants with TRU mixed wastes (non-mixed hazardous wastes)?	☐ Yes ☒ No
Is there an indication of wastes incompatible with backfill, seal and panel closures materials, container and packaging materials, shipping container materials, or other wastes (i.e., waste does NOT match TRUCON Code[s])?	☐ Yes ☒ No
Is there an indication of wastes containing explosives or compressed gases?	☐ Yes ☒ No
Is there an indication of PCBs liquids?	☐ Yes ☒ No
Is there an indication of the waste exhibiting the characteristic of ignitability, corrosivity, or reactivity (EPA Hazardous Waste Numbers of D001, D002, or D003)?	☐ Yes ☒ No
Is the physical form of the waste inconsistent with the Waste Stream Description or the Waste Matrix Code?	☐ Yes ☒ No
CH or RH TRAMPAC	
Are there heat-sealed bags (unvented) GREATER than 4 liters and LESS than 390 square inches in the waste, or heat sealed bags not authorized in the RH TRUCON Code?	☐ Yes ☒ No
Were there Non-approved Closure Methods used on liner bags or inner bags greater than 4 liters?	☐ Yes ☒ No
Are there sealed containers GREATER than 4 liters?	☐ Yes ☒ No
Are there indications of inadequate protection for heavy and/or sharp objects?	☐ Yes ☒ No
Comments: N/A	

RTR Operator:

Daphne Brothers	Daphne O'Brothers	11/17/2014
Print Name	Signature	Date

CCP Radiography Data Sheet

Section 1: General Information	
[X] RTR Examination [ ] RTR Replicate Scan [ ] RTR Independent Observation	
Site ID:	ORNL
Batch Number:	OR-RTR7-0124
Examination Date:	11/17/2014
Waste Container ID:	NFS0663B
Video/Audio Recorded Media Number:	OR-RTR7-0124 A&B
Procedure and Revision No.:	CCP-TP-053 Rev. 15
NCR(s) associated with the container? (e.g., Prohibited Items)	[ ] No [X] Yes NCR No.: NCR-ORNL-1040-14 NCR No.: N/A

Section 2: Waste Container Data	
Container Type:	55 Gallon Drum
TRUCON Code:	OR 225
Waste Matrix Code:	S5400
Waste Stream I.D.:	OR-NFS-CH-HET-A
Waste Container Weights:	Gross Wt.: 134.5 kg Tare Wt.: 33.2 kg Net Wt.: 101.3 kg
Rigid Liner and Liner Vent Description:	Liner: [X] No [ ] Yes Lid: [X] No [ ] Yes Type: [ ] 30-mil [ ] 90-mil [ ] 110-mil [ ] 125-mil Vented: [ ] No [ ] Yes [X] N/A Punctured: [X] No [ ] Yes Mechanical Vent: [X] No [ ] Yes Fiberboard Liner: [X] No [ ] Yes Lead Lined: [X] No [ ] Yes
Number of Layers of Confinement:	Appears to be 1 layer
Volume Utilization Percentage:	75 %

CCP Radiography Data Sheet

Waste Container ID: NFS0663B

Section 3: Container Inventory and Comments	(Detailed descriptions)
IM:	Scrap metal, metal hardware, saw blade, utility knife
AM:	
OM:	
OI:	Absorbent, concrete pieces
C:	Tape, cardboard
R:	
XPM:	Plastic sheeting,
OR:	
IN:	
S:	

Section 4: Packaging Material and Waste Material Parameters	
Packaging Material:	**Estimated Weight (kg)**
Steel (ST):	27.8
Plastics (PP):Liner bag	1.0
Other: Cardboard liner (CP)	4.4
Total Packaging Weight	33.2
Waste Material Parameter:	**Estimated Weight (kg)**
Iron-based Metal / Alloys (IM):	17.0
Aluminum-based Metals / Alloys (AM):	
Other Metals (OM):	
Other Inorganic Materials (OI)	75.3
Cellulosics (C):	3.0
Rubber (R):	
Plastics (waste materials) (XPM):	6.0
Organic Matrix (OR):	
Inorganic Matrix (IN):	
Soils (S):	
Total WMP Weight:	101.3

CCP Radiography Data Sheet

Waste Container ID: NFS0663B

Section 5: RTR Summary (Questions answered "Yes" will be explained in the Comment block, except for Question 1)	
Is there observable liquid?	☐ Yes ☐ No
Is there any observable liquid in internal containers, more than 60 milliliters or 3 percent by volume, whichever is greater?	☐ Yes ☐ No
Is the total volume of observable liquid in the outermost container GREATER than 1% of the container?	☐ Yes ☐ No
Is there observable liquid in payload containers with an EPA Hazardous Waste Number of U134?	☐ Yes ☐ No
Is there an indication of non-radionuclide pyrophoric materials, such as elemental potassium?	☐ Yes ☐ No
Is there an indication of hazardous wastes not occurring as co-contaminants with TRU mixed wastes (non-mixed hazardous wastes)?	☐ Yes ☐ No
Is there an indication of wastes incompatible with backfill, seal and panel closures materials, container and packaging materials, shipping container materials, or other wastes (i.e., waste does NOT match TRUCON Code[s])?	☐ Yes ☐ No
Is there an indication of wastes containing explosives or compressed gases?	☐ Yes ☐ No
Is there an indication of PCBs liquids?	☐ Yes ☐ No
Is there an indication of the waste exhibiting the characteristic of ignitability, corrosivity, or reactivity (EPA Hazardous Waste Numbers of D001, D002, or D003)?	☐ Yes ☐ No
Is the physical form of the waste inconsistent with the Waste Stream Description or the Waste Matrix Code?	☐ Yes ☒ No
CH or RH TRAMPAC	
Are there heat-sealed bags (unvented) GREATER than 4 liters and LESS than 390 square inches in the waste, or heat sealed bags not authorized in the RH TRUCON Code?	☐ Yes ☒ No
Were there Non-approved Closure Methods used on liner bags or inner bags greater than 4 liters?	☐ Yes ☒ No
Are there sealed containers GREATER than 4 liters?	☐ Yes ☒ No
Are there indications of inadequate protection for heavy and/or sharp objects?	☐ Yes ☒ No

Comments: Impenetrable item(s) in the container limited the ability to complete the scan on this container, all questions in section 5 could not be answered due to this limitation. The impenetrable condition is documented in NCR-ORNL-1040-14.

RTR Operator:

Daphne Brothers	Daphne D Brothers	11/17/2014
Print Name	Signature	Date

CCP Radiography Data Sheet

Section 1: General Information	
[X] RTR Examination [ ] RTR Replicate Scan [ ] RTR Independent Observation	
Site ID:	ORNL
Batch Number:	OR-RTR7-0124
Examination Date:	11/17/2014
Waste Container ID:	NFS0689B
Video/Audio Recorded Media Number:	OR-RTR7-0124 A&B
Procedure and Revision No.:	CCP-TP-053 Rev. 15
NCR(s) associated with the container? (e.g., Prohibited Items)	[X] No [ ] Yes NCR No.: N/A NCR No.: N/A

Section 2: Waste Container Data	
Container Type:	55 Gallon Drum
TRUCON Code:	OR 225
Waste Matrix Code:	S5400
Waste Stream I.D.:	OR-NFS-CH-HET-A
Waste Container Weights:	Gross Wt.: 127.9 kg Tare Wt.: 33.2 kg Net Wt.: 94.7 kg
Rigid Liner and Liner Vent Description:	Liner: [X] No [ ] Yes Lid: [X] No [ ] Yes Type: [ ] 30-mil [ ] 90-mil [ ] 110-mil [ ] 125-mil Vented: [ ] No [ ] Yes [X] N/A Punctured: [X] No [ ] Yes Mechanical Vent: [X] No [ ] Yes Fiberboard Liner: [X] No [ ] Yes Lead Lined: [X] No [ ] Yes
Number of Layers of Confinement:	Appears to be 1 layer
Volume Utilization Percentage:	90 %

CCP Radiography Data Sheet

Waste Container ID: NFS0689B

Section 3: Container Inventory and Comments	(Detailed descriptions)
IM:	Scrap metal, saw blades, utility knife
AM:	
OM:	
OI:	Absorbent, concrete pieces
C:	
R:	
XPM:	Plastic sheeting, scrap plastic
OR:	
IN:	
S:	

Section 4: Packaging Material and Waste Material Parameters	
Packaging Material:	**Estimated Weight (kg)**
Steel (ST):	27.8
Plastics (PP):Liner bag	1.0
Other: Cardboard liner (CP)	4.4
Total Packaging Weight	33.2
Waste Material Parameter:	**Estimated Weight (kg)**
Iron-based Metal / Alloys (IM):	17.0
Aluminum-based Metals / Alloys (AM):	
Other Metals (OM):	
Other Inorganic Materials (OI)	65.7
Cellulosics (C):	
Rubber (R):	
Plastics (waste materials) (XPM):	12.0
Organic Matrix (OR):	
Inorganic Matrix (IN):	
Soils (S):	
Total WMP Weight:	94.7

CCP Radiography Data Sheet

Waste Container ID: NFS0689B

Section 5: RTR Summary (Questions answered "Yes" will be explained in the Comment block, except for Question 1)	
Is there observable liquid?	[X] Yes [ ] No
Is there any observable liquid in internal containers, more than 60 milliliters or 3 percent by volume, whichever is greater?	[ ] Yes [X] No
Is the total volume of observable liquid in the outermost container GREATER than 1% of the container?	[ ] Yes [X] No
Is there observable liquid in payload containers with an EPA Hazardous Waste Number of U134?	[ ] Yes [X] No
Is there an indication of non-radionuclide pyrophoric materials, such as elemental potassium?	[ ] Yes [X] No
Is there an indication of hazardous wastes not occurring as co-contaminants with TRU mixed wastes (non-mixed hazardous wastes)?	[ ] Yes [X] No
Is there an indication of wastes incompatible with backfill, seal and panel closures materials, container and packaging materials, shipping container materials, or other wastes (i.e., waste does NOT match TRUCON Code[s])?	[ ] Yes [X] No
Is there an indication of wastes containing explosives or compressed gases?	[ ] Yes [X] No
Is there an indication of PCBs liquids?	[ ] Yes [X] No
Is there an indication of the waste exhibiting the characteristic of ignitability, corrosivity, or reactivity (EPA Hazardous Waste Numbers of D001, D002, or D003)?	[ ] Yes [X] No
Is the physical form of the waste inconsistent with the Waste Stream Description or the Waste Matrix Code?	[ ] Yes [X] No
CH or RH TRAMPAC	
Are there heat-sealed bags (unvented) GREATER than 4 liters and LESS than 390 square inches in the waste, or heat sealed bags not authorized in the RH TRUCON Code?	[ ] Yes [X] No
Were there Non-approved Closure Methods used on liner bags or inner bags greater than 4 liters?	[ ] Yes [X] No
Are there sealed containers GREATER than 4 liters?	[ ] Yes [X] No
Are there indications of inadequate protection for heavy and/or sharp objects?	[ ] Yes [X] No

Comments: N/A

RTR Operator:

Daphne Brothers		11/17/2014
Print Name	Signature	Date

CCP Radiography Data Sheet

Section 1: General Information	
[X] RTR Examination [ ] RTR Replicate Scan [ ] RTR Independent Observation	
Site ID:	ORNL
Batch Number:	OR-RTR7-0124
Examination Date:	11/17/2014
Waste Container ID:	NFS0606C
Video/Audio Recorded Media Number:	OR-RTR7-0124 A&B
Procedure and Revision No.:	CCP-TP-053 Rev. 15
NCR(s) associated with the container? (e.g., Prohibited Items)	[ ] No [X] Yes NCR No.: NCR-ORNL-1041-14 NCR No.: N/A

Section 2: Waste Container Data	
Container Type:	55 Gallon Drum
TRUCON Code:	OR 225
Waste Matrix Code:	S5400
Waste Stream I.D.:	OR-NFS-CH-HET-A
Waste Container Weights:	Gross Wt.: 143.0 kg Tare Wt.: 33.2 kg Net Wt.: 109.8 kg
Rigid Liner and Liner Vent Description:	Liner: [X] No [ ] Yes Lid: [X] No [ ] Yes Type: [ ] 30-mil [ ] 90-mil [ ] 110-mil [ ] 125-mil Vented: [ ] No [ ] Yes [X] N/A Punctured: [X] No [ ] Yes Mechanical Vent: [X] No [ ] Yes Fiberboard Liner: [X] No [ ] Yes Lead Lined: [X] No [ ] Yes
Number of Layers of Confinement:	Appears to be 1 layer
Volume Utilization Percentage:	65 %

CCP Radiography Data Sheet

Waste Container ID: NFS0606C

Section 3: Container Inventory and Comments	(Detailed descriptions)
IM:	Scrap metal, metal hardware
AM:	
OM:	
OI:	
C:	
R:	
XPM:	Plastic sheeting
OR:	
IN:	
S:	

Section 4: Packaging Material and Waste Material Parameters	
Packaging Material:	**Estimated Weight (kg)**
Steel (ST):	27.8
Plastics (PP):Liner bag	1.0
Other: Cardboard liner (CP)	4.4
Total Packaging Weight	33.2
Waste Material Parameter:	**Estimated Weight (kg)**
Iron-based Metal / Alloys (IM):	103.8
Aluminum-based Metals / Alloys (AM):	
Other Metals (OM):	
Other Inorganic Materials (OI)	
Cellulosics (C):	
Rubber (R):	
Plastics (waste materials) (XPM):	6.0
Organic Matrix (OR):	
Inorganic Matrix (IN):	
Soils (S):	
Total WMP Weight:	109.8

CCP Radiography Data Sheet

Waste Container ID: NFS0606C

Section 5: RTR Summary (Questions answered "Yes" will be explained in the Comment block, except for Question 1)	
Is there observable liquid?	☐ Yes ☐ No
Is there any observable liquid in internal containers, more than 60 milliliters or 3 percent by volume, whichever is greater?	☐ Yes ☐ No
Is the total volume of observable liquid in the outermost container GREATER than 1% of the container?	☐ Yes ☐ No
Is there observable liquid in payload containers with an EPA Hazardous Waste Number of U134?	☐ Yes ☐ No
Is there an indication of non-radionuclide pyrophoric materials, such as elemental potassium?	☐ Yes ☐ No
Is there an indication of hazardous wastes not occurring as co-contaminants with TRU mixed wastes (non-mixed hazardous wastes)?	☐ Yes ☐ No
Is there an indication of wastes incompatible with backfill, seal and panel closures materials, container and packaging materials, shipping container materials, or other wastes (i.e., waste does NOT match TRUCON Code[s])?	☐ Yes ☐ No
Is there an indication of wastes containing explosives or compressed gases?	☐ Yes ☐ No
Is there an indication of PCBs liquids?	☐ Yes ☐ No
Is there an indication of the waste exhibiting the characteristic of ignitability, corrosivity, or reactivity (EPA Hazardous Waste Numbers of D001, D002, or D003)?	☐ Yes ☐ No
Is the physical form of the waste inconsistent with the Waste Stream Description or the Waste Matrix Code?	☐ Yes ☒ No
CH or RH TRAMPAC	
Are there heat-sealed bags (unvented) GREATER than 4 liters and LESS than 390 square inches in the waste, or heat sealed bags not authorized in the RH TRUCON Code?	☐ Yes ☒ No
Were there Non-approved Closure Methods used on liner bags or inner bags greater than 4 liters?	☐ Yes ☒ No
Are there sealed containers GREATER than 4 liters?	☐ Yes ☒ No
Are there indications of inadequate protection for heavy and/or sharp objects?	☐ Yes ☒ No

Comments: Impenetrable item(s) in the container limited the ability to complete the scan on this container, all questions in section 5 could not be answered due to this limitation. The impenetrable condition is documented in NCR-ORNL-1041-14.

RTR Operator:

Daphne Brothers	Daphne Brothers	11/17/2014
Print Name	Signature	Date

CCP Radiography Data Sheet

Section 1: General Information	
[X] RTR Examination [ ] RTR Replicate Scan [ ] RTR Independent Observation	
Site ID:	ORNL
Batch Number:	OR-RTR7-0124
Examination Date:	11/17/2014
Waste Container ID:	NFS0610A
Video/Audio Recorded Media Number:	OR-RTR7-0124 A&B
Procedure and Revision No.:	CCP-TP-053 Rev. 15
NCR(s) associated with the container? (e.g., Prohibited Items)	[ ] No [X] Yes NCR No.: NCR-ORNL-1041-14 NCR No.: N/A

Section 2: Waste Container Data	
Container Type:	55 Gallon Drum
TRUCON Code:	OR 225
Waste Matrix Code:	S5400
Waste Stream I.D.:	OR-NFS-CH-HET-A
Waste Container Weights:	Gross Wt.: 141.0 kg Tare Wt.: 33.2 kg Net Wt.: 107.8 kg
Rigid Liner and Liner Vent Description:	Liner: [X] No [ ] Yes Lid: [X] No [ ] Yes Type: [ ] 30-mil [ ] 90-mil [ ] 110-mil [ ] 125-mil Vented: [ ] No [ ] Yes [X] N/A Punctured: [X] No [ ] Yes Mechanical Vent: [X] No [ ] Yes Fiberboard Liner: [X] No [ ] Yes Lead Lined: [X] No [ ] Yes
Number of Layers of Confinement:	Appears to be 1 layer
Volume Utilization Percentage:	65 %

CCP Radiography Data Sheet

Waste Container ID: NFS0610A

Section 3: Container Inventory and Comments	(Detailed descriptions)
IM:	Scrap metal, metal hardware, hand tool
AM:	
OM:	
OI:	Absorbent
C:	
R:	
XPM:	Plastic sheeting
OR:	
IN:	
S:	

Section 4: Packaging Material and Waste Material Parameters	
Packaging Material:	**Estimated Weight (kg)**
Steel (ST):	27.8
Plastics (PP):Liner bag	1.0
Other: Cardboard liner (CP)	4.4
Total Packaging Weight	33.2
Waste Material Parameter:	**Estimated Weight (kg)**
Iron-based Metal / Alloys (IM):	100.0
Aluminum-based Metals / Alloys (AM):	
Other Metals (OM):	
Other Inorganic Materials (OI)	1.0
Cellulosics (C):	
Rubber (R):	
Plastics (waste materials) (XPM):	6.8
Organic Matrix (OR):	
Inorganic Matrix (IN):	
Soils (S):	
Total WMP Weight:	107.8

CCP Radiography Data Sheet

Waste Container ID: NFS0610A

Section 5: RTR Summary (Questions answered "Yes" will be explained in the Comment block, except for Question 1)	
Is there observable liquid?	☐ Yes ☐ No
Is there any observable liquid in internal containers, more than 60 milliliters or 3 percent by volume, whichever is greater?	☐ Yes ☒ No
Is the total volume of observable liquid in the outermost container GREATER than 1% of the container?	☐ Yes ☐ No
Is there observable liquid in payload containers with an EPA Hazardous Waste Number of U134?	☐ Yes ☐ No
Is there an indication of non-radionuclide pyrophoric materials, such as elemental potassium?	☐ Yes ☐ No
Is there an indication of hazardous wastes not occurring as co-contaminants with TRU mixed wastes (non-mixed hazardous wastes)?	☐ Yes ☐ No
Is there an indication of wastes incompatible with backfill, seal and panel closures materials, container and packaging materials, shipping container materials, or other wastes (i.e., waste does NOT match TRUCON Code[s])?	☐ Yes ☐ No
Is there an indication of wastes containing explosives or compressed gases?	☐ Yes ☐ No
Is there an indication of PCBs liquids?	☐ Yes ☐ No
Is there an indication of the waste exhibiting the characteristic of ignitability, corrosivity, or reactivity (EPA Hazardous Waste Numbers of D001, D002, or D003)?	☐ Yes ☐ No
Is the physical form of the waste inconsistent with the Waste Stream Description or the Waste Matrix Code?	☐ Yes ☒ No
CH or RH TRAMPAC	
Are there heat-sealed bags (unvented) GREATER than 4 liters and LESS than 390 square inches in the waste, or heat sealed bags not authorized in the RH TRUCON Code?	☐ Yes ☒ No
Were there Non-approved Closure Methods used on liner bags or inner bags greater than 4 liters?	☐ Yes ☒ No
Are there sealed containers GREATER than 4 liters?	☐ Yes ☒ No
Are there indications of inadequate protection for heavy and/or sharp objects?	☐ Yes ☒ No

Comments: Impenetrable item(s) in the container limited the ability to complete the scan on this container, all questions in section 5 could not be answered due to this limitation. The impenetrable condition is documented in NCR-ORNL-1041-14.

RTR Operator:

Daphne Brothers	Daphne Brothers	11/17/2014
Print Name	Signature	Date

CCP Radiography Data Sheet

Section 1: General Information	
[X] RTR Examination [ ] RTR Replicate Scan [ ] RTR Independent Observation	
Site ID:	ORNL
Batch Number:	OR-RTR7-0124
Examination Date:	11/17/2014
Waste Container ID:	NFS0610C
Video/Audio Recorded Media Number:	OR-RTR7-0124 A&B
Procedure and Revision No.:	CCP-TP-053 Rev. 15
NCR(s) associated with the container? (e.g., Prohibited Items)	[ ] No [X] Yes NCR No.: NCR-ORNL-1041-14 NCR No.: N/A

Section 2: Waste Container Data	
Container Type:	55 Gallon Drum
TRUCON Code:	OR 225
Waste Matrix Code:	S5400
Waste Stream I.D.:	OR-NFS-CH-HET-A
Waste Container Weights:	Gross Wt.: 145.0 kg Tare Wt.: 33.2 kg Net Wt.: 111.8 kg
Rigid Liner and Liner Vent Description:	Liner: [X] No [ ] Yes Lid: [X] No [ ] Yes Type: [ ] 30-mil [ ] 90-mil [ ] 110-mil [ ] 125-mil Vented: [ ] No [ ] Yes [X] N/A Punctured: [X] No [ ] Yes Mechanical Vent: [X] No [ ] Yes Fiberboard Liner: [X] No [ ] Yes Lead Lined: [X] No [ ] Yes
Number of Layers of Confinement:	Appears to be 1 layer
Volume Utilization Percentage:	65 %

CCP Radiography Data Sheet

Waste Container ID: NFS0610C

Section 3: Container Inventory and Comments (Detailed descriptions)	
IM:	Scrap metal
AM:	
OM:	
OI:	
C:	Coveralls
R:	
XPM:	Plastic sheeting, plastic tubing
OR:	
IN:	
S:	

Section 4: Packaging Material and Waste Material Parameters	
Packaging Material:	**Estimated Weight (kg)**
Steel (ST):	27.8
Plastics (PP):Liner bag	1.0
Other: Cardboard liner (CP)	4.4
Total Packaging Weight	33.2
Waste Material Parameter:	**Estimated Weight (kg)**
Iron-based Metal / Alloys (IM):	101.0
Aluminum-based Metals / Alloys (AM):	
Other Metals (OM):	
Other Inorganic Materials (OI)	
Cellulosics (C):	2.0
Rubber (R):	
Plastics (waste materials) (XPM):	8.8
Organic Matrix (OR):	
Inorganic Matrix (IN):	
Soils (S):	
Total WMP Weight:	111.8

CCP Radiography Data Sheet

Waste Container ID: NFS0610C

Section 5: RTR Summary (Questions answered "Yes" will be explained in the Comment block, except for Question 1)	
Is there observable liquid?	☐ Yes ☐ No
Is there any observable liquid in internal containers, more than 60 milliliters or 3 percent by volume, whichever is greater?	☐ Yes ☐ No
Is the total volume of observable liquid in the outermost container GREATER than 1% of the container?	☐ Yes ☐ No
Is there observable liquid in payload containers with an EPA Hazardous Waste Number of U134?	☐ Yes ☐ No
Is there an indication of non-radionuclide pyrophoric materials, such as elemental potassium?	☐ Yes ☐ No
Is there an indication of hazardous wastes not occurring as co-contaminants with TRU mixed wastes (non-mixed hazardous wastes)?	☐ Yes ☐ No
Is there an indication of wastes incompatible with backfill, seal and panel closures materials, container and packaging materials, shipping container materials, or other wastes (i.e., waste does NOT match TRUCON Code[s])?	☐ Yes ☐ No
Is there an indication of wastes containing explosives or compressed gases?	☐ Yes ☐ No
Is there an indication of PCBs liquids?	☐ Yes ☐ No
Is there an indication of the waste exhibiting the characteristic of ignitability, corrosivity, or reactivity (EPA Hazardous Waste Numbers of D001, D002, or D003)?	☐ Yes ☐ No
Is the physical form of the waste inconsistent with the Waste Stream Description or the Waste Matrix Code?	☐ Yes ☒ No
CH or RH TRAMPAC	
Are there heat-sealed bags (unvented) GREATER than 4 liters and LESS than 390 square inches in the waste, or heat sealed bags not authorized in the RH TRUCON Code?	☐ Yes ☒ No
Were there Non-approved Closure Methods used on liner bags or inner bags greater than 4 liters?	☐ Yes ☒ No
Are there sealed containers GREATER than 4 liters?	☐ Yes ☒ No
Are there indications of inadequate protection for heavy and/or sharp objects?	☐ Yes ☒ No

Comments: Impenetrable item(s) in the container limited the ability to complete the scan on this container, all questions in section 5 could not be answered due to this limitation. The impenetrable condition is documented in NCR-ORNL-1041-14.

RTR Operator:

Daphne Brothers	Daphne Brothers	11/17/2014
Print Name	Signature	Date

CCP Radiography Data Sheet

Section 1: General Information	
[X] RTR Examination [ ] RTR Replicate Scan [ ] RTR Independent Observation	
Site ID:	ORNL
Batch Number:	OR-RTR7-0124
Examination Date:	11/17/2014
Waste Container ID:	NFS0606B
Video/Audio Recorded Media Number:	OR-RTR7-0124 A&B
Procedure and Revision No.:	CCP-TP-053 Rev. 15
NCR(s) associated with the container? (e.g., Prohibited Items)	[ ] No [X] Yes NCR No.: NCR-ORNL-1041-14 NCR No.: N/A

Section 2: Waste Container Data	
Container Type:	55 Gallon Drum
TRUCON Code:	OR 225
Waste Matrix Code:	S5400
Waste Stream I.D.:	OR-NFS-CH-HET-A
Waste Container Weights:	Gross Wt.: 142.0 kg Tare Wt.: 33.2 kg Net Wt.: 108.8 kg
Rigid Liner and Liner Vent Description:	Liner: [X] No [ ] Yes Lid: [X] No [ ] Yes Type: [ ] 30-mil [ ] 90-mil [ ] 110-mil [ ] 125-mil Vented: [ ] No [ ] Yes [X] N/A Punctured: [X] No [ ] Yes Mechanical Vent: [X] No [ ] Yes Fiberboard Liner: [X] No [ ] Yes Lead Lined: [X] No [ ] Yes
Number of Layers of Confinement:	Appears to be 1 layer
Volume Utilization Percentage:	65 %

CCP Radiography Data Sheet

Waste Container ID: NFS0606B

Section 3: Container Inventory and Comments	(Detailed descriptions)
IM:	Scrap metal
AM:	
OM:	
OI:	
C:	
R:	
XPM:	Plastic sheeting
OR:	
IN:	
S:	

Section 4: Packaging Material and Waste Material Parameters	
Packaging Material:	**Estimated Weight (kg)**
Steel (ST):	27.8
Plastics (PP):Liner bag	1.0
Other: Cardboard liner (CP)	4.4
Total Packaging Weight	33.2
Waste Material Parameter:	**Estimated Weight (kg)**
Iron-based Metal / Alloys (IM):	102.8
Aluminum-based Metals / Alloys (AM):	
Other Metals (OM):	
Other Inorganic Materials (OI)	
Cellulosics (C):	
Rubber (R):	
Plastics (waste materials) (XPM):	6.0
Organic Matrix (OR):	
Inorganic Matrix (IN):	
Soils (S):	
Total WMP Weight:	108.8

CCP Radiography Data Sheet

Waste Container ID: NFS0606B

Section 5: RTR Summary (Questions answered "Yes" will be explained in the Comment block, except for Question 1)	
Is there observable liquid?	☐ Yes ☐ No
Is there any observable liquid in internal containers, more than 60 milliliters or 3 percent by volume, whichever is greater?	☐ Yes ☐ No
Is the total volume of observable liquid in the outermost container GREATER than 1% of the container?	☐ Yes ☐ No
Is there observable liquid in payload containers with an EPA Hazardous Waste Number of U134?	☐ Yes ☐ No
Is there an indication of non-radionuclide pyrophoric materials, such as elemental potassium?	☐ Yes ☐ No
Is there an indication of hazardous wastes not occurring as co-contaminants with TRU mixed wastes (non-mixed hazardous wastes)?	☐ Yes ☐ No
Is there an indication of wastes incompatible with backfill, seal and panel closures materials, container and packaging materials, shipping container materials, or other wastes (i.e., waste does NOT match TRUCON Code[s])?	☐ Yes ☐ No
Is there an indication of wastes containing explosives or compressed gases?	☐ Yes ☐ No
Is there an indication of PCBs liquids?	☐ Yes ☐ No
Is there an indication of the waste exhibiting the characteristic of ignitability, corrosivity, or reactivity (EPA Hazardous Waste Numbers of D001, D002, or D003)?	☐ Yes ☐ No
Is the physical form of the waste inconsistent with the Waste Stream Description or the Waste Matrix Code?	☐ Yes ☒ No
CH or RH TRAMPAC	
Are there heat-sealed bags (unvented) GREATER than 4 liters and LESS than 390 square inches in the waste, or heat sealed bags not authorized in the RH TRUCON Code?	☐ Yes ☒ No
Were there Non-approved Closure Methods used on liner bags or inner bags greater than 4 liters?	☐ Yes ☒ No
Are there sealed containers GREATER than 4 liters?	☐ Yes ☒ No
Are there indications of inadequate protection for heavy and/or sharp objects?	☐ Yes ☒ No

Comments: Impenetrable item(s) in the container limited the ability to complete the scan on this container, all questions in section 5 could not be answered due to this limitation. The impenetrable condition is documented in NCR-ORNL-1042-14.

DB 12-29-14

RTR Operator:

Daphne Brothers		11/17/2014
Print Name	Signature	Date
	Daphne Brothers 12-29-14	

Attachment 1 – CCP Nonconformance Report (NCR)

CCP NONCONFORMANCE REPORT (NCR)

(Use NCR Continuation, Attachment 3, if necessary)

NCR No. NCR-ORNL-1040-14 Revision 0

1. Lot No., Heat No., or Serial No. (if applicable): N/A	2. Process (e.g., NDA, NDE, VE, Other): NDE	3. Batch Data Report #(s): OR-RTR7-0124
4. Order/Work Order/Job Control Number (if applicable): N/A	5. PO # (if applicable): N/A	Container #(s): NFS0663B
	6. Supplier (if applicable): N/A	

DESCRIPTION OF NONCONFORMANCE

7a. NCR Description: ☐ < 100 nCi/g ☐ Prohibited Item ☐ E-Flag ☐ Receipt Inspection ☐ Transportation ☐ WWIS/WDS ☒ Other

7b. Requirement(s) (Enter Implementing Procedure No., Revision, Section No., & Quoted Text):
CCP-TP-053 Rev.15 section 4.4.3 [E] states: **IF** a container is identified in the S5000 summary category group that CAN NOT be penetrated by the RTR method because of the presence of lead, or other shielding, **THEN** ... Initiate an NCR in accordance with CCP-QP-005, *CCP TRU Nonconforming Item Reporting and Control.*

7c. Actual Condition: Impenetrable Areas

7d. Have the CCP HOLD TAGS associated with this NCR been applied? ☒ YES ☐ NO If no is checked, explain:

8. NCR Originator:
Daphne Brothers (printed name) — Daphne D Brothers (signature) — 11/17/14 (date)

9. Does the identified condition have the potential to impact AK? If YES or INDETERMINATE, enter Trend Code L in Block 10. ☐ YES ☒ NO ☐ INDETERMINATE

10. Trend Code: **K**	11. Responsible Manager: **Beverly Schrock**
12. Significant Condition? ☐ YES ☒ NO (If Yes, enter WIPP Form No.):	13. Recurring Condition? ☐ YES ☒ NO (If Yes, list NCRs and WIPP Forms):

14. QA Engineer or QA Designee validation:
Fred Oney (printed name) — FO (signature) — 11-18-14 (date)

COPY

Attachment 1 – CCP Nonconformance Report (NCR) (Continued)

NCR No. NCR-ORNL-1040-14 Revision 0

INTERIM DISPOSITION

15a. Interim Disposition (Check Only One):

☐ N/A (See Final Disposition) ☒ Hold ☐ Conditionally Accept ☐ Conditionally Use

☐ Sort ☐ Reinspect or Retest ☐ Remediate

15b. Instructions for Completion of the Interim Disposition:
Container to be evaluated by the Host Site Planning Committee for determination of best path forward for container.
1. Responsible Manager send this NCR to the Host Site Planning Committee for Review.
2. Host Site Planning Committee determines best path forward.
3. SPM determines Final Disposition (block 19) based on results from the Host Site Planning Committee.

INTERIM DISPOSITION APPROVALS

16a. Responsible Manager or Individual:

printed name	signature	date
Andrew Stellings Beverly Schrock	for Beverly Schrock	11-18-14

16b. QA Engineer or QA Designee:

printed name	signature	date
Fred Oney		11-18-14

Additional Approval:

printed name	signature	date

Additional Approval:

printed name	signature	date

COMPLETION OF INTERIM DISPOSITION

17. Interim Disposition Complete – Responsible Manager or Individual:

printed name	signature	date

18. Interim Disposition Verified – QA Engineer:

printed name	signature	date

COPY

Attachment 1 – CCP Nonconformance Report (NCR) (Continued)

NCR No. NCR-ORNL-1040-14 Revision 0

FINAL DISPOSITION

19. Final Disposition (Check Only One: Use-As-Is, Repair, Reject, Rework, or Scrap):
☐ Use-As-Is ☐ Repair

19a. Technical Justification – Required for Use-As-Is or Repair dispositions. [☐ N/A for Reject, Rework, or Scrap]

☐ Reject ☐ Rework ☐ Scrap

19b. Instructions for Completion – Required for Reject, Repair, Rework, or Scrap [☐ N/A for Use-As-Is]

19c. Corrective Actions (Actions to Prevent Recurrence – For Repair or Rework, if applicable.
[☐ N/A if not applicable, and for Use-As-Is, Reject, and Scrap]

FINAL DISPOSITION APPROVALS

20. Responsible Manager or Individual:

printed name _____ signature _____ date _____

21. QA Engineer or QA Designee:

printed name _____ signature _____ date _____

Additional Approval:

printed name _____ signature _____ date _____

Additional Approval:

printed name _____ signature _____ date _____

CLOSURE

22. Final Disposition Complete - Responsible Manager or Individual:

printed name _____ signature _____ date _____

23. Attachments:

24a. HOLD TAG removal has been verified and reconciled for all nonconforming items on the NCR: ☐
24b. If HOLD TAG is not applicable, check: ☐ and explain:

25. Final Disposition Verified – NCR Closed QA Engineer:

printed name _____ signature _____ date _____

COPY

Attachment 1 – CCP Nonconformance Report (NCR)

CCP NONCONFORMANCE REPORT (NCR)

(Use NCR Continuation, Attachment 3, if necessary)

NCR No. NCR-ORNL-1041-14 Revision 0

1. Lot No., Heat No., or Serial No. (if applicable): N/A	2. Process (e.g., NDA, NDE, VE, Other): NDE	3. Batch Data Report #(s): OR-RTR7-0124
4. Order/Work Order/Job Control Number (if applicable): N/A	5. PO # (if applicable): N/A	Container #(s): NFS0606C, NFS0610A, NFS0610C, NFS0606B
	6. Supplier (if applicable): N/A	

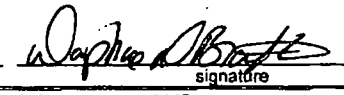
DESCRIPTION OF NONCONFORMANCE

7a. NCR Description: ☐ < 100 nCi/g ☐ Prohibited Item ☐ E-Flag ☐ Receipt Inspection ☐ Transportation ☐ WWIS/WDS ☒ Other

7b. Requirement(s) (Enter Implementing Procedure No., Revision, Section No., & Quoted Text):
CCP-TP-053 Rev.15 section 4.4.3 [E] states: **IF** a container is identified in the S5000 summary category group that CAN NOT be penetrated by the RTR method because of the presence of lead, or other shielding, **THEN ...** Initiate an NCR in accordance with CCP-QP-005, *CCP TRU Nonconforming Item Reporting and Control.*

7c. Actual Condition: Impenetrable Areas (puck drum)

7d. Have the CCP HOLD TAGS associated with this NCR been applied? ☒ YES ☐ NO If no is checked, explain:

8. NCR Originator:
Daphne Brothers (printed name)  (signature) 11/17/14 (date)

9. Does the identified condition have the potential to impact AK? If YES or INDETERMINATE, enter Trend Code L in Block 10. ☐ YES ☒ NO ☐ INDETERMINATE

10. Trend Code: **K**

11. Responsible Manager: **Beverly Schrock**

12. Significant Condition? ☐ YES ☒ NO (If Yes, enter WIPP Form No.):

13. Recurring Condition? ☐ YES ☒ NO (If Yes, list NCRs and WIPP Forms):

14. QA Engineer or QA Designee validation:
Fred Oney (printed name) (signature) 11-18-14 (date)

COPY

Attachment 1 – CCP Nonconformance Report (NCR) (Continued)

NCR No. NCR-ORNL-1041-14 Revision 0

INTERIM DISPOSITION

15a. Interim Disposition (Check Only One):

☐ N/A (See Final Disposition) ☒ Hold ☐ Conditionally Accept ☐ Conditionally Use

☐ Sort ☐ Reinspect or Retest ☐ Remediate

15b. Instructions for Completion of the Interim Disposition:
Container to be evaluated by the Host Site Planning Committee for determination of best path forward for container.
1. Responsible Manager send this NCR to the Host Site Planning Committee for Review.
2. Host Site Planning Committee determines best path forward.
3. SPM determines Final Disposition (block 19) based on results from the Host Site Planning Committee.

INTERIM DISPOSITION APPROVALS

16a. Responsible Manager or Individual:

printed name	signature	date
~~Andrew Stallings~~ Beverly Schrock	for Beverly Schrock	11-18-14

16b. QA Engineer or QA Designee:

printed name	signature	date
Fred Oney		11-18-14

Additional Approval:

printed name	signature	date

Additional Approval:

printed name	signature	date

COMPLETION OF INTERIM DISPOSITION

17. Interim Disposition Complete – Responsible Manager or Individual:

printed name	signature	date

18. Interim Disposition Verified – QA Engineer:

printed name	signature	date

COPY

Attachment 1 – CCP Nonconformance Report (NCR) (Continued)

NCR No. NCR-ORNL-1041-14 Revision 0

FINAL DISPOSITION

19. Final Disposition (Check Only One: Use-As-Is, Repair, Reject, Rework, or Scrap):
☐ Use-As-Is ☐ Repair

19a. Technical Justification – Required for Use-As-Is or Repair dispositions. [☐ N/A for Reject, Rework, or Scrap]

☐ Reject ☐ Rework ☐ Scrap

19b. Instructions for Completion – Required for Reject, Repair, Rework, or Scrap [☐ N/A for Use-As-Is]

19c. Corrective Actions (Actions to Prevent Recurrence – For Repair or Rework, if applicable.
[☐ N/A if not applicable, and for Use-As-Is, Reject, and Scrap]

FINAL DISPOSITION APPROVALS

20. Responsible Manager or Individual:

printed name _____ signature _____ date _____

21. QA Engineer or QA Designee:

printed name _____ signature _____ date _____

Additional Approval:

printed name _____ signature _____ date _____

Additional Approval:

printed name _____ signature _____ date _____

CLOSURE

22. Final Disposition Complete - Responsible Manager or Individual:

printed name _____ signature _____ date _____

23. Attachments:

24a. HOLD TAG removal has been verified and reconciled for all nonconforming items on the NCR: ☐
24b. If HOLD TAG is not applicable, check: ☐ and explain:

25. Final Disposition Verified – NCR Closed QA Engineer:

printed name _____ signature _____ date _____

COPY

Attachment 3 – CCP Radiography Independent Technical Reviewer Checklist

Batch Data Report No.: OR-RTR7-0124

Description			
1.	Were data generation and reduction conducted in a technically correct manner in accordance with the methods used?	☐ NO	☑ YES
2.	Was the correct revision of the procedure used? Procedure: CCP-TP-053 Rev.: 15	☐ NO	☑ YES
3.	Are the WMPs entered correctly?	☐ NO	☑ YES
4.	Do the estimated weights in Section 4 of Attachment 2 equal the container gross weight?	☐ NO	☑ YES
5.	Is the data reported in the proper units with the correct number of significant figures (e.g., one tenth of a kilogram)?	☐ NO	☑ YES
6.	Was transcription used? If no, proceed to question 7.	☑ NO	☐ YES
	6a. Has the data been verified for transcription errors?	☐ NO	☐ YES
7.	Does the Testing Batch Report include radiography for up to 20 containers?	☐ NO	☑ YES
8.	Are BDR contents complete and do they match the CCP Waste RTR Batch Data Report Table of Contents?	☐ NO	☑ YES
9.	Is all the data signed and dated in reproducible ink and by the individual(s) generating it?	☐ NO	☑ YES
10.	Is all data recorded clearly, legibly, and accurately?	☐ NO	☑ YES
11.	Have changes been made to original data? If no, proceed to question 12.	~~☑ NO~~ FO 12-29-14	☑ YES FO 12-29-14
	11a. Have all changes to original data been lined out, initialed and dated by the individual making the changes?	☐ NO	☑ YES FO 12-29-14
	11b. Was justification made for changing the original data?	☐ NO	☑ YES FO 12-29-14
	11c. Were data changes made by the individual who originally collected the data?	☐ NO	☑ YES FO 12-29-14
12.	Does the waste match the Waste Matrix Code and Waste Stream description?	☐ NO	☑ YES
13.	Are the RTR Operator's decisions regarding the Radiography documented?	☐ NO	☑ YES
14.	Is there an adequate written description of the contents of each item?	☐ NO	☑ YES
15.	Was the video/audio recording media properly prepared and labeled for each waste container?	☐ NO	☑ YES
16.	Was the video/audio recording media check performed satisfactorily and recorded on Attachment 1?	☐ NO	☑ YES

Attachment 3 – CCP Radiography Independent Technical Reviewer Checklist (Continued)

Batch Data Report No.: OR-RTR7-0124

Description		
17. Was the Image Test performed satisfactorily and recorded on Attachment 1?	☐ NO	☑ YES
18. Was the Replicate Scan performed and recorded on an Attachment 2?	☐ NO	☑ YES
19. Was the Replicate Scan RTR Operator different from the first RTR Operator?	☐ NO	☑ YES
20. Did the Replicate Scan RTR Operator and the first RTR Operator agree on the results?	☐ NO	☑ YES
21. Was the Independent Observation performed and recorded on an Attachment 2?	☐ NO	☑ YES
22. Was the Independent Observation RTR Operator different from the first RTR Operator?	☐ NO	☑ YES
23. Did the Independent Observation RTR Operator and the first RTR Operator agree on the results?	☐ NO	☑ YES
24. Was the data collection performed by qualified individuals?	☐ NO	☑ YES
25. Were NCRs initiated as required at DGL? If no, proceed to question 26.	☐ NO	☑ YES
25a. Have the NCR(s) associated with RTR been included in the BDR?	☐ NO	☑ YES
26. Is the RTR examination for CH waste? If no, proceed to question 27.	☐ NO	☑ YES
26a. Have the CH Quality Assurance Objectives (QAOs) been met (if applicable)? Precision – Precision is maintained by reconciling any discrepancies between two radiography operators with regard to identification of the waste matrix code, liquids in excess of TSDF-WAC limits, and compressed gases through independent replicate scans and independent observations. Additionally, the precision of radiography is verified prior to use by tuning precisely enough to demonstrate compliance with QAOs through viewing an image test pattern. Accuracy – Accuracy is obtained by using a target to tune the image for maximum sharpness and by requiring operators to successfully identify 100 percent of the items required to meet the DQOs for radiography specified in CCP-PO-001, Section C-4a(1) in a training container during their initial qualification and subsequent requalification. Completeness – A video and audio media recording of the radiography examination and a validated radiography data form will be obtained for 100 percent of the waste containers subject to radiography. All video and audio media recordings and radiography data forms will be subject to validation as indicated in CCP-PO-001, Section C3-4. Comparability – The comparability of radiography data from different operators shall be enhanced by using standardized radiography procedures and operator qualifications.	☐ NO	☑ YES

Attachment 3 – CCP Radiography Independent Technical Reviewer Checklist (Continued)

Batch Data Report No.: OR-RTR7-0124

Description		
27. Is the RTR examination for RH waste? If no, proceed to comment section.	☒ NO	☐ YES
27a. Have the RH QAOs been met (if applicable)? Precision – Precision is maintained by reconciling any discrepancies between two operators (during Independent Observation and Replicate scans) with regard to the identification of important waste characteristics (i.e., physical form of the waste and absence of prohibited liquids) within a single container. Accuracy – Accuracy is obtained by using a target to tune the image for maximum sharpness and by requiring operators to successfully identify prohibited liquid in a training container during their initial qualification and subsequent requalification. Representativeness – All of the relevant contents in a container selected for radiography will be described. Completeness – All of the relevant waste information must be assembled and must show that each of the containers in the waste stream belongs to the waste stream. This information must be documented on videotape or other equivalent media and data form. Comparability – Comparability is ensured by meeting the program training requirements and complying with the minimum standards used to implement the radiography process.	☐ NO	☐ YES

Comments:

N/A

I have reviewed 100% of the container specific and batch data in this report and find it acceptable.

Independent Technical Reviewer:

Printed Name	Signature	Date
Fred ONey		11-18-14

12-29-14

DIVIDER PAGE ONLY

Not part of page count

Attachment 2 – CCP Records Transmittal/Receiving Form

CCP Records / Records Custodian, 4021 National Parks Highway - MS: GSA 212, Carlsbad, New Mexico 88220

Telephone Number: 575-234-7523

Fax Number: 575-234-7033

[X] Original Record [ ] Copy
[ ] Fax Record
[ ] Electronic Record

Attn:	CCP RECORDS	From:	PATRICK SMITH II
Ship to:	CCP RECORDS CUSTODIAN	Site:	ORNL
	4021 NATIONAL PARKS HWY.	Company:	TFE INC.
	MS GSA 212	Telephone Number:	865-574-6002
	CARLSBAD, NM 88220-9082	Date Sent:	12-09-2014
Telephone Number:	575-234-7523		

Document Number	Title/ Data Content	Record Date	Total Pages
OR-RTR7-0124	RTR DVD (DISK B)	11-17-2014	
N/A	N/A	N/A	N/A
N/A	N/A	N/A	N/A
N/A	N/A	N/A	N/A
N/A	N/A	N/A	N/A
N/A	N/A	N/A	N/A

Comments

N/A

(When the Record accepted line has been completed, the rest of the page below may be left blank.)

Acceptance/Rejection Signature and Date

Records Accepted [✓] _____ Jewell Hurrable 12/15/14
Signature | Printed Name | Date

Records Rejected [ ] _____ _____ _____
Signature | Printed Name | Date

Reason for Rejection:

Re-submittal: _____ _____ _____
Signature | Printed Name | Date

```
**********************
***   TX REPORT    ***
**********************

TRANSMISSION OK

TX/RX NO                1504
DESTINATION TEL #       918655768703
DESTINATION ID          ORNL
ST. TIME                12/16 08:25
TIME USE                00'38
PAGES SENT                1
RESULT                  OK
```


Attachment 2 – CCP Records Transmittal/Receiving Form

CCP Records / Records Custodian, 4021 National Parks Highway - MS: GSA 212, Carlsbad, New Mexico 88220

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Attn:	CCP RECORDS	From:	PATRICK SMITH II
Ship to:	CCP RECORDS CUSTODIAN	Site:	ORNL
	4021 NATIONAL PARKS HWY.	Company:	TFE INC.
	MS GSA 212	Telephone Number:	865-574-6002
	CARLSBAD, NM 88220-9082	Date Sent:	12-09-2014
Telephone Number:	575-234-7523		

OR-RTR7-0124	RTR DVD (DISK B)	11-17-2014	
N/A	N/A	N/A	N/A
N/A	N/A	N/A	N/A
N/A	N/A	N/A	N/A
N/A	N/A	N/A	N/A
N/A	N/A	N/A	N/A

N/A

(When the Record accepted line has been completed, the rest of the page below may be left blank.)
Acceptance/Rejection Signature and Date

DIVIDER PAGE ONLY

Not Part of Page Count

Attachment 2 – CCP Records Transmittal/Receiving Form

CCP Records / Records Custodian, 4021 National Parks Highway - MS: GSA 212, Carlsbad, New Mexico 88220

Telephone Number: 575-234-7523

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[X] Original Record [ ] Copy
[ ] Fax Record
[ ] Electronic Record

Attn:	CCP RECORDS	From:	PATRICK SMITH II
Ship to:	CCP RECORDS CUSTODIAN	Site:	ORNL
	4021 NATIONAL PARKS HWY.	Company:	TFE INC.
	MS GSA 212	Telephone Number:	865-574-6002
	CARLSBAD, NM 88220-9082	Date Sent:	1-22-2012
Telephone Number:	575-234-7523		

Document Number	Title / Description	Record Date	Total Pages
OR-RTR7-0124	RTR BDR	11-17-2014	51
OR-RTR7-0124	RTR DVD (DISK A)	11-17-2014	N/A
N/A	N/A	N/A	N/A
N/A	N/A	N/A	N/A
N/A	N/A	N/A	N/A
N/A	N/A	N/A	N/A

Comments

N/A

(When the Record accepted line has been completed, the rest of the page below may be left blank.)
Acceptance/Rejection Signature and Date

Records Accepted [✓] — Signature: [signature] — Printed Name: Jesse W Hurralde — Date: 1/29/15.

Records Rejected [ ] — Signature: _____ — Printed Name: _____ — Date: _____

Reason for Rejection:

Re-submittal: Signature: _____ — Printed Name: _____ — Date: _____

****
*** Send Results ***
****

Sending is complete.

Job No.	2136
Address	918655768703
Name	ORNL
Start Time	01/29 11:01 AM
Call Length	00'45
Sheets	1
Result	OK

Controlled Copy

CCP-QP-008, Rev. 23
CCP Records Management

Effective Date: 09/03/2014
Page 34 of 34

Attachment 2 – CCP Records Transmittal/Receiving Form

CCP Records / Records Custodian, 4021 National Parks Highway - MS: GSA 212, Carlsbad, New Mexico 88220

Telephone Number: 575-234-7523

Fax Number: 575-234-7033

[X] Original Record [ ] Copy
[ ] Fax Record
[ ] Electronic Record

Attn:	CCP RECORDS	From:	PATRICK SMITH II
Ship to:	CCP RECORDS CUSTODIAN	Site:	ORNL
	4021 NATIONAL PARKS HWY.	Company:	TFE INC.
	MS GSA 212	Telephone Number:	865-574-6002
	CARLSBAD, NM 88220-9082	Date Sent:	1-22-2012
Telephone Number:	575-234-7523		

OR-RTR7-0124	RTR BDR	11-17-2014	51
OR-RTR7-0124	RTR DVD (DISK A)	11-17-2014	N/A
N/A	N/A	N/A	N/A
N/A	N/A	N/A	N/A
N/A	N/A	N/A	N/A
N/A	N/A	N/A	N/A

N/A

(When the Record accepted line has been completed, the rest of the page below may be left blank.)
Acceptance/Rejection Signature and Date

Records Accepted [✓] Signature — Printed Name: Jesse W Hurrabide — Date: 1/29/15

Records Rejected [ ] Signature — Printed Name — Date

Attachment 2 – CCP SPM Radiography Project Level Validation Checklist and Summary

BDR Number: OR-RTR6-0581 **Examination Date(s): 09/18/14**

Description of Criteria Reviewed	Criteria Met? YES	NO	NA	Comments/Qualifiers
1. Is the completed, signed, and dated Independent Technical Reviewer Checklist included in the BDR, and the independent technical reviewer was not involved in the generation or recording of the data under review? **Reference Source: CCP-PO-001, C3-4**	X			
2. Does the BDR contain all items addressed in the BDR Table of Contents? **Reference Source: CCP-PO-001, C3-4**	X			
3. Does the BDR include a listing of all the container numbers in the batch? **Reference Source: CCP-PO-001, C3-4**	X			
4. List all containers that have met QAOs. **Reference Source: CCP-PO-001, C3-4**				Container Numbers: X10C0402793E X10CSATN02450O X10CSATN03043A X10CSATN02461E X10CSATN02689E X10C9312054A1 X10C9402619A X10C0402970F X10CSATN03043F X10C9312313A X10CSATN03043C X10CSATN03210B X10C9602122A X10C9313648A
5. Does the BDR identify the current implementing procedure and revision number? **Reference Source: CCP-PO-001, Table C3-3**	X			
6. Is there a reference to or copy of any associated NCRs (if any) in the BDR? NA if no NCRs. **Reference Source: CCP-PO-001, Table C3-3**			X	None generated.
7. Are there 20 or fewer containers in the batch? **Reference Source: CCP-PO-001, C3-4**	X			
8. Are the data properly reported (i.e., data are reported in correct units and with correct significant figures)? **Reference Source: CCP-PO-001, C3-4**	X			
9. Is there evidence of verification that the physical form matches the Waste Matrix Code? **Reference Source: CCP-PO-001, Table C3-3**	X			

NTPC RECORDS ORIGINAL
DATE REC'D 9-24-14 GL

Attachment 2 – CCP SPM Radiography Project Level Validation Checklist and Summary (Continued)

BDR Number: OR-RTR6-0581	**Examination Date(s): 09/18/14**			
Description of Criteria Reviewed	**Criteria Met?**			**Comments/Qualifiers**
	YES	**NO**	**NA**	
10. Is there evidence of verification that the physical form matches the waste stream description? **Reference Source: CCP-PO-001, Table C3-3**	X			
11. Are prohibited items absent? **Reference Source: CCP-PO-001, Table C3-3**	X			
12. Does observable liquid, if present, meet the criteria of the TSDF-WAC? **Reference Source: CCP-PO-001, C-1**	X			
13. Were discrepancies between two operators with regard to identification of waste matrix code, liquids in excess of the TSDF-WAC, or compressed gases through replicate scans and independent observations reconciled? NA if no discrepancies. **Reference Source: CCP-PO-001, C3-2**			X	No discrepancies.
14. Are the training qualifications for all radiography personnel acceptable? **Reference Source: CCP-PO-001, C3-8**	X			
15. Was evidence of the video/audio check included in the BDR? **Reference Source: CCP-PO-001, C1-1**	X			
16. Was the Lines-Pair Resolution Test or Sieve Test Check included in the BDR? **Reference Source: CCP Technical Procedures**	X			
17. Was a replicate scan performed once per day, or once per batch, whichever is LESS frequent? **Reference Source: CCP-PO-001, C1-1**	X			
18. Was an independent observation performed once per day, or once per batch, whichever is LESS frequent? **Reference Source: CCP-PO-001, C1-1**	X			

Attachment 2 – CCP SPM Radiography Project Level Validation Checklist and Summary (Continued)

BDR Number: OR-RTR6-0581	Examination Date(s): 09/18/14			
Description of Criteria Reviewed	Criteria Met? YES	NO	NA	Comments/Qualifiers
19. Were the replicate scan and independent observation performed on different waste containers? **Reference Source: CCP-PO-001, C1-1**	X			
20. Were the personnel performing the replicate scan and independent observation different from the individual who performed the original? **Reference Source: CCP-PO-001, C1-1**	X			
21. Does the BDR include an estimate of each material parameter weight in kg for each container? **Reference Source: CCP Technical Procedures**	X			
22. Does the BDR include a description of each material parameter for each container? **Reference Source: CCP Technical Procedures**	X			
23. Is the container gross weight recorded in kilograms (kg) for each container in the BDR? **Reference Source: CCP Technical Procedures**	X			
24. Was the Scale Weight Calibration Check included in the BDR? **Reference Source: CCP Technical Procedures**			X	Not used.
25. Was the Scale Weight Check included in the BDR? **Reference Source: CCP Technical Procedures**			X	Not used.
Comments: None.				
The container QC checks were properly performed and meet the Quality Assurance Objectives (QAOs). Proper procedures were followed during data reduction and analysis. The batch is complete, acceptable, and includes all supporting data and documentation required by the QAPjP.				
Barbara Broomfield				09/23/14
SPM Printed Name	Signature			Date

Checklist is to be re-signed only when a re-review is performed.

SPM Printed Name	Signature	Reason	Date
SPM Printed Name	Signature	Reason	Date

Attachment 5–CCP Radiography Batch Data Report Cover Sheet

Site ID: ORNL

Batch Data Report No.: OR-RTR6-0581 ☑ CH ☐ RH Date: 9/18/14

Waste Container ID Numbers	
Replicate Scan:	X10C9402619A
Independent Observation:	X10CSATN03043A
1	X10C0402793E
2	X10CSATN02450O
3	X10CSATN03043A
4	X10CSATN02461E
5	X10CSATN02689E
6	X10C9312054A1
7	X10C9402619A
8	X10C0402970F
9	X10CSATN03043F
10	X10C9312313A
11	X10CSATN03043C
12	X10CSATN03210B
13	X10C9602122A
14	X10C9313648A
15	N/A
16	N/A
17	N/A
18	N/A
19	N/A
20	N/A

RTR Operator:

John Brookshire — Printed Name
John Brookshire — Signature
9/18/14 — Date

Independent Technical Reviewer:

Fred Owey — Printed Name
Signature
9-22-14 — Date

NTPC RECORDS ORIGINAL
DATE REC'D 9-22-2014
PII

Attachment 4 – CCP Radiography Batch Data Report Table of Contents and Batch Narrative

Batch Data Report No.: OR-RTR6-0581 Date: 9/18/14

Table Of Contents		
Item	Description	Page No.
1	CCP Radiography Batch Data Report Cover Sheet	1
2	CCP Radiography Batch Data Report Table Of Contents	2
3	CCP RTR Measurement Control Report	3
4	CCP Radiography Data Sheets	4
5	Copy of NCRs (NA, If Not Applicable)	N/A
6	CCP Independent Technical Reviewer Checklist	52

Batch Narrative
All Quality Checks were performed and recorded on CCP-TP-053, Rev. 15 CCP Radiography Measurement Control Report.

John Brookshire — RTR Operator

John Brookshire — Signature

9/18/14 — Date

Attachment 1 – CCP RTR Measurement Control Report

Site ID: ORNL		
Batch Data Report No.: OR-RTR6-0581		
Examination Date: 9/18/14		
Control Checks		
Video/Audio Recorded Media System Check	☑ SAT	☐ UNSAT
Image Test : 12 Lines (Minimum acceptable is 5 lines-pair/cm or #6 Sieve is viewable)	☑ SAT	☐ UNSAT
Comments: N/A		
RTR Operator:		
John Brookshire (Printed Name)	John Brookshire (Signature)	9/18/14 (Date)

CCP Radiography Data Sheet

Section 1: General Information	
☐ RTR Examination ☒ RTR Replicate Scan ☐ RTR Independent Observation	
Site ID:	ORNL
Batch Number:	OR-RTR6-0581
Examination Date:	9/18/2014
Waste Container ID:	X10C9402619A
Video/Audio Recorded Media Number:	OR-RTR6-0581 A&B
Procedure and Revision No.:	CCP-TP-053 Rev. 15
NCR(s) associated with the container? (e.g., Prohibited Items)	☒ No ☐ Yes NCR No.: N/A NCR No.: N/A

Section 2: Waste Container Data	
Container Type:	55 Gallon Drum
TRUCON Code:	OR 225
Waste Matrix Code:	S5400
Waste Stream I.D.:	OR-REDC-CH-HET
Waste Container Weights:	Gross Wt.: 54.6 kg Tare Wt.: 33.2 kg Net Wt.: 21.4 kg
Rigid Liner and Liner Vent Description:	Liner: ☒ No ☐ Yes Lid: ☒ No ☐ Yes Type: ☐ 30-mil ☐ 90-mil ☐ 110-mil ☐ 125-mil Vented: ☐ No ☐ Yes ☒ N/A Punctured: ☒ No ☐ Yes Mechanical Vent: ☒ No ☐ Yes Fiberboard Liner: ☒ No ☐ Yes Lead Lined: ☒ No ☐ Yes
Number of Layers of Confinement:	Appears to be 1 layer
Volume Utilization Percentage:	95 %

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CCP Radiography Data Sheet

Waste Container ID: X10C9402619A

Section 3: Container Inventory and Comments	(Detailed descriptions)
IM:	Metal hardware, hand tools, scrap metal, metal pipes
AM:	
OM:	
OI:	Glass containers, broken glass
C:	Cloth, coveralls
R:	Rubber gloves
XPM:	Plastic sheeting, plastic caps, safety glasses, plastic container
OR:	
IN:	
S:	

Section 4: Packaging Material and Waste Material Parameters	
Packaging Material:	**Estimated Weight (kg)**
Steel (ST):	27.8
Plastics (PP): Liner Bag	1.0
Other: Cardboard Liner (CP)	4.4
Total Packaging Weight	33.2
Waste Material Parameter:	**Estimated Weight (kg)**
Iron-based Metal / Alloys (IM):	6.9
Aluminum-based Metals / Alloys (AM):	
Other Metals (OM):	
Other Inorganic Materials (OI)	3.0
Cellulosics (C):	4.0
Rubber (R):	0.5
Plastics (waste materials) (XPM):	7.0
Organic Matrix (OR):	
Inorganic Matrix (IN):	
Soils (S):	
Total WMP Weight:	21.4

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CCP Radiography Data Sheet

Waste Container ID: X10C9402619A

Section 5: RTR Summary (Questions answered "Yes" will be explained in the Comment block, except for Question 1)	
Is there observable liquid?	☐ Yes ☒ No
Is there any observable liquid in internal containers, more than 60 milliliters or 3 percent by volume, whichever is greater?	☐ Yes ☒ No
Is the total volume of observable liquid in the outermost container GREATER than 1% of the container?	☐ Yes ☒ No
Is there observable liquid in payload containers with an EPA Hazardous Waste Number of U134?	☐ Yes ☒ No
Is there an indication of non-radionuclide pyrophoric materials, such as elemental potassium?	☐ Yes ☒ No
Is there an indication of hazardous wastes not occurring as co-contaminants with TRU mixed wastes (non-mixed hazardous wastes)?	☐ Yes ☒ No
Is there an indication of wastes incompatible with backfill, seal and panel closures materials, container and packaging materials, shipping container materials, or other wastes (i.e., waste does NOT match TRUCON Code[s])?	☐ Yes ☒ No
Is there an indication of wastes containing explosives or compressed gases?	☐ Yes ☒ No
Is there an indication of PCBs liquids?	☐ Yes ☒ No
Is there an indication of the waste exhibiting the characteristic of ignitability, corrosivity, or reactivity (EPA Hazardous Waste Numbers of D001, D002, or D003)?	☐ Yes ☒ No
Is the physical form of the waste inconsistent with the Waste Stream Description or the Waste Matrix Code?	☐ Yes ☒ No
CH or RH TRAMPAC	
Are there heat-sealed bags (unvented) GREATER than 4 liters and LESS than 390 square inches in the waste, or heat sealed bags not authorized in the RH TRUCON Code?	☐ Yes ☒ No
Were there Non-approved Closure Methods used on liner bags or inner bags greater than 4 liters?	☐ Yes ☒ No
Are there sealed containers GREATER than 4 liters?	☐ Yes ☒ No
Are there indications of inadequate protection for heavy and/or sharp objects?	☐ Yes ☒ No

Comments: This replicate scan agrees with the original scan. EL 9/18/14

RTR Operator:

Eric Lyles	[signature]	9/18/2014
Print Name	Signature	Date

CCP Radiography Data Sheet

Section 1: General Information	
☐ RTR Examination ☐ RTR Replicate Scan ☒ RTR Independent Observation	
Site ID:	ORNL
Batch Number:	OR-RTR6-0581
Examination Date:	9/18/2014
Waste Container ID:	X10CSATN03043A
Video/Audio Recorded Media Number:	OR-RTR6-0581 A&B
Procedure and Revision No.:	CCP-TP-053 Rev. 15
NCR(s) associated with the container? (e.g., Prohibited Items)	☒ No ☐ Yes NCR No.: N/A NCR No.: N/A

Section 2: Waste Container Data	
Container Type:	55 Gallon Drum
TRUCON Code:	OR 225
Waste Matrix Code:	S5400
Waste Stream I.D.:	OR-REDC-CH-HET
Waste Container Weights:	Gross Wt.: 48.8 kg Tare Wt.: 33.2 kg Net Wt.: 15.6 kg
Rigid Liner and Liner Vent Description:	Liner: ☒ No ☐ Yes Lid: ☒ No ☐ Yes Type: ☐ 30-mil ☐ 90-mil ☐ 110-mil ☐ 125-mil Vented: ☐ No ☐ Yes ☒ N/A Punctured: ☒ No ☐ Yes Mechanical Vent: ☒ No ☐ Yes Fiberboard Liner: ☒ No ☐ Yes Lead Lined: ☒ No ☐ Yes
Number of Layers of Confinement:	Appears to be 1 layer
Volume Utilization Percentage:	80 %

CCP Radiography Data Sheet

Waste Container ID: X10CSATN03043A

Section 3: Container Inventory and Comments (Detailed descriptions)

IM: Metal lid, paint cans, scrap metal, electrical equipment

AM:

OM:

OI: Glass containers, broken glass, absorbent

C:

R:

XPM: Plastic sheeting, plastic containers

OR:

IN:

S:

Section 4: Packaging Material and Waste Material Parameters

Packaging Material:	**Estimated Weight (kg)**
Steel (ST):	27.8
Plastics (PP): Liner Bag	1.0
Other: Cardboard Liner (CP)	4.4
Total Packaging Weight	33.2
Waste Material Parameter:	**Estimated Weight (kg)**
Iron-based Metal / Alloys (IM):	5.0
Aluminum-based Metals / Alloys (AM):	
Other Metals (OM):	
Other Inorganic Materials (OI)	3.0
Cellulosics (C):	
Rubber (R):	
Plastics (waste materials) (XPM):	7.6
Organic Matrix (OR):	
Inorganic Matrix (IN):	
Soils (S):	
Total WMP Weight:	15.6

CCP Radiography Data Sheet

Waste Container ID: X10CSATN03043A

Section 5: RTR Summary (Questions answered "Yes" will be explained in the Comment block, except for Question 1)	
Is there observable liquid?	☐ Yes ☒ No
Is there any observable liquid in internal containers, more than 60 milliliters or 3 percent by volume, whichever is greater?	☐ Yes ☒ No
Is the total volume of observable liquid in the outermost container GREATER than 1% of the container?	☐ Yes ☒ No
Is there observable liquid in payload containers with an EPA Hazardous Waste Number of U134?	☐ Yes ☒ No
Is there an indication of non-radionuclide pyrophoric materials, such as elemental potassium?	☐ Yes ☒ No
Is there an indication of hazardous wastes not occurring as co-contaminants with TRU mixed wastes (non-mixed hazardous wastes)?	☐ Yes ☒ No
Is there an indication of wastes incompatible with backfill, seal and panel closures materials, container and packaging materials, shipping container materials, or other wastes (i.e., waste does NOT match TRUCON Code[s])?	☐ Yes ☒ No
Is there an indication of wastes containing explosives or compressed gases?	☐ Yes ☒ No
Is there an indication of PCBs liquids?	☐ Yes ☒ No
Is there an indication of the waste exhibiting the characteristic of ignitability, corrosivity, or reactivity (EPA Hazardous Waste Numbers of D001, D002, or D003)?	☐ Yes ☒ No
Is the physical form of the waste inconsistent with the Waste Stream Description or the Waste Matrix Code?	☐ Yes ☒ No
CH or RH TRAMPAC	
Are there heat-sealed bags (unvented) GREATER than 4 liters and LESS than 390 square inches in the waste, or heat sealed bags not authorized in the RH TRUCON Code?	☐ Yes ☒ No
Were there Non-approved Closure Methods used on liner bags or inner bags greater than 4 liters?	☐ Yes ☒ No
Are there sealed containers GREATER than 4 liters?	☐ Yes ☒ No
Are there indications of inadequate protection for heavy and/or sharp objects?	☐ Yes ☒ No

Comments: This Independent observation agrees with the original scan. CL 9/18/14

RTR Operator:

Eric Lyles		9/18/2014
Print Name	Signature	Date

CCP Radiography Data Sheet

Section 1: General Information	
[X] RTR Examination [ ] RTR Replicate Scan [ ] RTR Independent Observation	
Site ID:	ORNL
Batch Number:	OR-RTR6-0581
Examination Date:	9/18/2014
Waste Container ID:	X10C0402793E
Video/Audio Recorded Media Number:	OR-RTR6-0581 A&B
Procedure and Revision No.:	CCP-TP-053 Rev. 15
NCR(s) associated with the container? (e.g., Prohibited Items)	[X] No [ ] Yes NCR No.: N/A NCR No.: N/A

Section 2: Waste Container Data	
Container Type:	55 Gallon Drum
TRUCON Code:	OR 225
Waste Matrix Code:	S5400
Waste Stream I.D.:	OR-REDC-CH-HET
Waste Container Weights:	Gross Wt.: 63.1 kg Tare Wt.: 33.2 kg Net Wt.: 29.9 kg
Rigid Liner and Liner Vent Description:	Liner: [X] No [ ] Yes Lid: [X] No [ ] Yes Type: [ ] 30-mil [ ] 90-mil [ ] 110-mil [ ] 125-mil Vented: [ ] No [ ] Yes [X] N/A Punctured: [X] No [ ] Yes Mechanical Vent: [X] No [ ] Yes Fiberboard Liner: [X] No [ ] Yes Lead Lined: [X] No [ ] Yes
Number of Layers of Confinement:	Appears to be 1 layer
Volume Utilization Percentage:	90 %

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CCP Radiography Data Sheet

Waste Container ID: X10C0402793E

Section 3: Container Inventory and Comments (Detailed descriptions)	
IM:	Scrap metal, metal hardware
AM:	
OM:	
OI:	Absorbent, glassware, broken glass
C:	Tape
R:	
XPM:	Plastic labware, plastic containers, scrap plastic, plastic sheeting, plastic caps
OR:	
IN:	
S:	

Section 4: Packaging Material and Waste Material Parameters	
Packaging Material:	**Estimated Weight (kg)**
Steel (ST):	27.8
Plastics (PP): Liner Bag	1.0
Other: Cardboard Liner (CP)	4.4
Total Packaging Weight	33.2
Waste Material Parameter:	**Estimated Weight (kg)**
Iron-based Metal / Alloys (IM):	1.5
Aluminum-based Metals / Alloys (AM):	
Other Metals (OM):	
Other Inorganic Materials (OI)	12.0
Cellulosics (C):	0.4
Rubber (R):	
Plastics (waste materials) (XPM):	16.0
Organic Matrix (OR):	
Inorganic Matrix (IN):	
Soils (S):	
Total WMP Weight:	29.9

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CCP Radiography Data Sheet

Waste Container ID: X10C0402793E

Section 5: RTR Summary (Questions answered "Yes" will be explained in the Comment block, except for Question 1)	
Is there observable liquid?	[X] Yes [ ] No
Is there any observable liquid in internal containers, more than 60 milliliters or 3 percent by volume, whichever is greater?	[ ] Yes [X] No
Is the total volume of observable liquid in the outermost container GREATER than 1% of the container?	[ ] Yes [X] No
Is there observable liquid in payload containers with an EPA Hazardous Waste Number of U134?	[ ] Yes [X] No
Is there an indication of non-radionuclide pyrophoric materials, such as elemental potassium?	[ ] Yes [X] No
Is there an indication of hazardous wastes not occurring as co-contaminants with TRU mixed wastes (non-mixed hazardous wastes)?	[ ] Yes [X] No
Is there an indication of wastes incompatible with backfill, seal and panel closures materials, container and packaging materials, shipping container materials, or other wastes (i.e., waste does NOT match TRUCON Code[s])?	[ ] Yes [X] No
Is there an indication of wastes containing explosives or compressed gases?	[ ] Yes [X] No
Is there an indication of PCBs liquids?	[ ] Yes [X] No
Is there an indication of the waste exhibiting the characteristic of ignitability, corrosivity, or reactivity (EPA Hazardous Waste Numbers of D001, D002, or D003)?	[ ] Yes [X] No
Is the physical form of the waste inconsistent with the Waste Stream Description or the Waste Matrix Code?	[ ] Yes [X] No
CH or RH TRAMPAC	
Are there heat-sealed bags (unvented) GREATER than 4 liters and LESS than 390 square inches in the waste, or heat sealed bags not authorized in the RH TRUCON Code?	[ ] Yes [X] No
Were there Non-approved Closure Methods used on liner bags or inner bags greater than 4 liters?	[ ] Yes [X] No
Are there sealed containers GREATER than 4 liters?	[ ] Yes [X] No
Are there indications of inadequate protection for heavy and/or sharp objects?	[ ] Yes [X] No
Comments: N/A	

RTR Operator:

John Brookshire	John Brookshire	9/18/2014
Print Name	Signature	Date

CCP Radiography Data Sheet

Section 1: General Information	
[X] RTR Examination [ ] RTR Replicate Scan [ ] RTR Independent Observation	
Site ID:	ORNL
Batch Number:	OR-RTR6-0581
Examination Date:	9/18/2014
Waste Container ID:	X10CSATN02450O
Video/Audio Recorded Media Number:	OR-RTR6-0581 A&B
Procedure and Revision No.:	CCP-TP-053 Rev. 15
NCR(s) associated with the container? (e.g., Prohibited Items)	[X] No [ ] Yes NCR No.: N/A NCR No.: N/A

Section 2: Waste Container Data	
Container Type:	55 Gallon Drum
TRUCON Code:	OR 225
Waste Matrix Code:	S5400
Waste Stream I.D.:	OR-REDC-CH-HET
Waste Container Weights:	Gross Wt.: 49.7 kg Tare Wt.: 33.2 kg Net Wt.: 16.5 kg
Rigid Liner and Liner Vent Description:	Liner: [X] No [ ] Yes Lid: [X] No [ ] Yes Type: [ ] 30-mil [ ] 90-mil [ ] 110-mil [ ] 125-mil Vented: [ ] No [ ] Yes [X] N/A Punctured: [X] No [ ] Yes Mechanical Vent: [X] No [ ] Yes Fiberboard Liner: [X] No [ ] Yes Lead Lined: [X] No [ ] Yes
Number of Layers of Confinement:	Appears to be 1 layer
Volume Utilization Percentage:	60 %

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CCP Radiography Data Sheet

Waste Container ID: X10CSATN02450O

Section 3: Container Inventory and Comments (Detailed descriptions)

IM: Scrap metal, metal tubing, metal fittings, metal hardware, metal paint cans, electrical equipment

AM:

OM: Lead sheeting

OI: Glassware, absorbent, broken glass

C: Brush, cardboard

R:

XPM: Plastic tubing, plastic sheeting, plastic containers, scrap plastic

OR:

IN:

S:

Section 4: Packaging Material and Waste Material Parameters

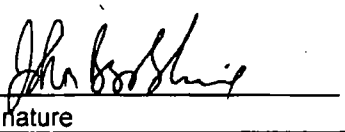
Packaging Material:	**Estimated Weight (kg)**
Steel (ST):	27.8
Plastics (PP): Liner Bag	1.0
Other: Cardboard Liner (CP)	4.4
Total Packaging Weight	33.2
Waste Material Parameter:	**Estimated Weight (kg)**
Iron-based Metal / Alloys (IM):	6.0
Aluminum-based Metals / Alloys (AM):	
Other Metals (OM):	0.5
Other Inorganic Materials (OI)	3.0
Cellulosics (C):	1.4
Rubber (R):	
Plastics (waste materials) (XPM):	5.6
Organic Matrix (OR):	
Inorganic Matrix (IN):	
Soils (S):	
Total WMP Weight:	16.5

CCP Radiography Data Sheet

Waste Container ID: X10CSATN02450O

Section 5: RTR Summary (Questions answered "Yes" will be explained in the Comment block, except for Question 1)	
Is there observable liquid?	☐ Yes ☒ No
Is there any observable liquid in internal containers, more than 60 milliliters or 3 percent by volume, whichever is greater?	☐ Yes ☒ No
Is the total volume of observable liquid in the outermost container GREATER than 1% of the container?	☐ Yes ☒ No
Is there observable liquid in payload containers with an EPA Hazardous Waste Number of U134?	☐ Yes ☒ No
Is there an indication of non-radionuclide pyrophoric materials, such as elemental potassium?	☐ Yes ☒ No
Is there an indication of hazardous wastes not occurring as co-contaminants with TRU mixed wastes (non-mixed hazardous wastes)?	☐ Yes ☒ No
Is there an indication of wastes incompatible with backfill, seal and panel closures materials, container and packaging materials, shipping container materials, or other wastes (i.e., waste does NOT match TRUCON Code[s])?	☐ Yes ☒ No
Is there an indication of wastes containing explosives or compressed gases?	☐ Yes ☒ No
Is there an indication of PCBs liquids?	☐ Yes ☒ No
Is there an indication of the waste exhibiting the characteristic of ignitability, corrosivity, or reactivity (EPA Hazardous Waste Numbers of D001, D002, or D003)?	☐ Yes ☒ No
Is the physical form of the waste inconsistent with the Waste Stream Description or the Waste Matrix Code?	☐ Yes ☒ No
CH or RH TRAMPAC	
Are there heat-sealed bags (unvented) GREATER than 4 liters and LESS than 390 square inches in the waste, or heat sealed bags not authorized in the RH TRUCON Code?	☐ Yes ☒ No
Were there Non-approved Closure Methods used on liner bags or inner bags greater than 4 liters?	☐ Yes ☒ No
Are there sealed containers GREATER than 4 liters?	☐ Yes ☒ No
Are there indications of inadequate protection for heavy and/or sharp objects?	☐ Yes ☒ No
Comments: N/A	

RTR Operator:

John Brookshire		9/18/2014
Print Name	Signature	Date

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CCP Radiography Data Sheet

Section 1: General Information	
[X] RTR Examination [ ] RTR Replicate Scan [ ] RTR Independent Observation	
Site ID:	ORNL
Batch Number:	OR-RTR6-0581
Examination Date:	9/18/2014
Waste Container ID:	X10CSATN03043A
Video/Audio Recorded Media Number:	OR-RTR6-0581 A&B
Procedure and Revision No.:	CCP-TP-053 Rev. 15
NCR(s) associated with the container? (e.g., Prohibited Items)	[X] No [ ] Yes NCR No.: N/A NCR No.: N/A

Section 2: Waste Container Data	
Container Type:	55 Gallon Drum
TRUCON Code:	OR 225
Waste Matrix Code:	S5400
Waste Stream I.D.:	OR-REDC-CH-HET
Waste Container Weights:	Gross Wt.: 48.8 kg Tare Wt.: 33.2 kg Net Wt.: 15.6 kg
Rigid Liner and Liner Vent Description:	Liner: [X] No [ ] Yes Lid: [X] No [ ] Yes Type: [ ] 30-mil [ ] 90-mil [ ] 110-mil [ ] 125-mil Vented: [ ] No [ ] Yes [X] N/A Punctured: [X] No [ ] Yes Mechanical Vent: [X] No [ ] Yes Fiberboard Liner: [X] No [ ] Yes Lead Lined: [X] No [ ] Yes
Number of Layers of Confinement:	Appears to be 1 layer
Volume Utilization Percentage:	80 %

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CCP Radiography Data Sheet

Waste Container ID: X10CSATN03043A

Section 3: Container Inventory and Comments (Detailed descriptions)	
IM:	Scrap metal, electrical equipment, metal paint cans-open
AM:	
OM:	
OI:	Glassware, broken glass, absorbent
C:	
R:	
XPM:	Scrap plastic, plastic sheeting, plastic labware
OR:	
IN:	
S:	

Section 4: Packaging Material and Waste Material Parameters	
Packaging Material:	**Estimated Weight (kg)**
Steel (ST):	27.8
Plastics (PP): Liner Bag	1.0
Other: Cardboard Liner (CP)	4.4
Total Packaging Weight	33.2
Waste Material Parameter:	**Estimated Weight (kg)**
Iron-based Metal / Alloys (IM):	5.5
Aluminum-based Metals / Alloys (AM):	
Other Metals (OM):	
Other Inorganic Materials (OI)	2.5
Cellulosics (C):	
Rubber (R):	
Plastics (waste materials) (XPM):	7.6
Organic Matrix (OR):	
Inorganic Matrix (IN):	
Soils (S):	
Total WMP Weight:	15.6

CCP Radiography Data Sheet

Waste Container ID: X10CSATN03043A

Section 5: RTR Summary (Questions answered "Yes" will be explained in the Comment block, except for Question 1)	
Is there observable liquid?	☐ Yes ☒ No
Is there any observable liquid in internal containers, more than 60 milliliters or 3 percent by volume, whichever is greater?	☐ Yes ☒ No
Is the total volume of observable liquid in the outermost container GREATER than 1% of the container?	☐ Yes ☒ No
Is there observable liquid in payload containers with an EPA Hazardous Waste Number of U134?	☐ Yes ☒ No
Is there an indication of non-radionuclide pyrophoric materials, such as elemental potassium?	☐ Yes ☒ No
Is there an indication of hazardous wastes not occurring as co-contaminants with TRU mixed wastes (non-mixed hazardous wastes)?	☐ Yes ☒ No
Is there an indication of wastes incompatible with backfill, seal and panel closures materials, container and packaging materials, shipping container materials, or other wastes (i.e., waste does NOT match TRUCON Code[s])?	☐ Yes ☒ No
Is there an indication of wastes containing explosives or compressed gases?	☐ Yes ☒ No
Is there an indication of PCBs liquids?	☐ Yes ☒ No
Is there an indication of the waste exhibiting the characteristic of ignitability, corrosivity, or reactivity (EPA Hazardous Waste Numbers of D001, D002, or D003)?	☐ Yes ☒ No
Is the physical form of the waste inconsistent with the Waste Stream Description or the Waste Matrix Code?	☐ Yes ☒ No
CH or RH TRAMPAC	
Are there heat-sealed bags (unvented) GREATER than 4 liters and LESS than 390 square inches in the waste, or heat sealed bags not authorized in the RH TRUCON Code?	☐ Yes ☒ No
Were there Non-approved Closure Methods used on liner bags or inner bags greater than 4 liters?	☐ Yes ☒ No
Are there sealed containers GREATER than 4 liters?	☐ Yes ☒ No
Are there indications of inadequate protection for heavy and/or sharp objects?	☐ Yes ☒ No
Comments: N/A	

RTR Operator:

John Brookshire	John Brookshire	9/18/2014
Print Name	Signature	Date

CCP Radiography Data Sheet

Section 1: General Information	
[X] RTR Examination [ ] RTR Replicate Scan [ ] RTR Independent Observation	
Site ID:	ORNL
Batch Number:	OR-RTR6-0581
Examination Date:	9/18/2014
Waste Container ID:	X10CSATN02461E
Video/Audio Recorded Media Number:	OR-RTR6-0581 A&B
Procedure and Revision No.:	CCP-TP-053 Rev. 15
NCR(s) associated with the container? (e.g., Prohibited Items)	[X] No [ ] Yes NCR No.: N/A NCR No.: N/A

Section 2: Waste Container Data	
Container Type:	55 Gallon Drum
TRUCON Code:	OR 225
Waste Matrix Code:	S5400
Waste Stream I.D.:	OR-REDC-CH-HET
Waste Container Weights:	Gross Wt.: 60.9 kg Tare Wt.: 33.2 kg Net Wt.: 27.7 kg
Rigid Liner and Liner Vent Description:	Liner: [X] No [ ] Yes Lid: [X] No [ ] Yes Type: [ ] 30-mil [ ] 90-mil [ ] 110-mil [ ] 125-mil Vented: [ ] No [ ] Yes [X] N/A Punctured: [X] No [ ] Yes Mechanical Vent: [X] No [ ] Yes Fiberboard Liner: [X] No [ ] Yes Lead Lined: [X] No [ ] Yes
Number of Layers of Confinement:	Appears to be 1 layer
Volume Utilization Percentage:	90 %

CCP Radiography Data Sheet

Waste Container ID: X10CSATN02461E

Section 3: Container Inventory and Comments (Detailed descriptions)	
IM:	Scrap metal
AM:	Aluminum rings
OM:	
OI:	Absorbent, glassware, broken glass
C:	Cardboard
R:	
XPM:	Plastic tubing, plastic caps
OR:	
IN:	
S:	

Section 4: Packaging Material and Waste Material Parameters	
Packaging Material:	**Estimated Weight (kg)**
Steel (ST):	27.8
Plastics (PP): Liner Bag	1.0
Other: Cardboard Liner (CP)	4.4
Total Packaging Weight	33.2
Waste Material Parameter:	**Estimated Weight (kg)**
Iron-based Metal / Alloys (IM):	0.2
Aluminum-based Metals / Alloys (AM):	10.0
Other Metals (OM):	
Other Inorganic Materials (OI)	7.5
Cellulosics (C):	3.0
Rubber (R):	
Plastics (waste materials) (XPM):	7.0
Organic Matrix (OR):	
Inorganic Matrix (IN):	
Soils (S):	
Total WMP Weight:	27.7

CCP Radiography Data Sheet

Waste Container ID: X10CSATN02461E

Section 5: RTR Summary (Questions answered "Yes" will be explained in the Comment block, except for Question 1)	
Is there observable liquid?	☐ Yes ☒ No
Is there any observable liquid in internal containers, more than 60 milliliters or 3 percent by volume, whichever is greater?	☐ Yes ☒ No
Is the total volume of observable liquid in the outermost container GREATER than 1% of the container?	☐ Yes ☒ No
Is there observable liquid in payload containers with an EPA Hazardous Waste Number of U134?	☐ Yes ☒ No
Is there an indication of non-radionuclide pyrophoric materials, such as elemental potassium?	☐ Yes ☒ No
Is there an indication of hazardous wastes not occurring as co-contaminants with TRU mixed wastes (non-mixed hazardous wastes)?	☐ Yes ☒ No
Is there an indication of wastes incompatible with backfill, seal and panel closures materials, container and packaging materials, shipping container materials, or other wastes (i.e., waste does NOT match TRUCON Code[s])?	☐ Yes ☒ No
Is there an indication of wastes containing explosives or compressed gases?	☐ Yes ☒ No
Is there an indication of PCBs liquids?	☐ Yes ☒ No
Is there an indication of the waste exhibiting the characteristic of ignitability, corrosivity, or reactivity (EPA Hazardous Waste Numbers of D001, D002, or D003)?	☐ Yes ☒ No
Is the physical form of the waste inconsistent with the Waste Stream Description or the Waste Matrix Code?	☐ Yes ☒ No
CH or RH TRAMPAC	
Are there heat-sealed bags (unvented) GREATER than 4 liters and LESS than 390 square inches in the waste, or heat sealed bags not authorized in the RH TRUCON Code?	☐ Yes ☒ No
Were there Non-approved Closure Methods used on liner bags or inner bags greater than 4 liters?	☐ Yes ☒ No
Are there sealed containers GREATER than 4 liters?	☐ Yes ☒ No
Are there indications of inadequate protection for heavy and/or sharp objects?	☐ Yes ☒ No
Comments: N/A	

RTR Operator:

John Brookshire	John Brookshire	9/18/2014
Print Name	Signature	Date

CCP Radiography Data Sheet

Section 1: General Information	
[X] RTR Examination [ ] RTR Replicate Scan [ ] RTR Independent Observation	
Site ID:	ORNL
Batch Number:	OR-RTR6-0581
Examination Date:	9/18/2014
Waste Container ID:	X10CSATN02689E
Video/Audio Recorded Media Number:	OR-RTR6-0581 A&B
Procedure and Revision No.:	CCP-TP-053 Rev. 15
NCR(s) associated with the container? (e.g., Prohibited Items)	[X] No [ ] Yes NCR No.: N/A NCR No.: N/A

Section 2: Waste Container Data	
Container Type:	55 Gallon Drum
TRUCON Code:	OR 225
Waste Matrix Code:	S5400
Waste Stream I.D.:	OR-REDC-CH-HET
Waste Container Weights:	Gross Wt.: 47.1 kg Tare Wt.: 33.2 kg Net Wt.: 13.9 kg
Rigid Liner and Liner Vent Description:	Liner: [X] No [ ] Yes Lid: [X] No [ ] Yes Type: [ ] 30-mil [ ] 90-mil [ ] 110-mil [ ] 125-mil Vented: [ ] No [ ] Yes [X] N/A Punctured: [X] No [ ] Yes Mechanical Vent: [X] No [ ] Yes Fiberboard Liner: [X] No [ ] Yes Lead Lined: [X] No [ ] Yes
Number of Layers of Confinement:	Appears to be 1 layer
Volume Utilization Percentage:	60 %

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CCP Radiography Data Sheet

Waste Container ID: X10CSATN02689E

Section 3: Container Inventory and Comments	(Detailed descriptions)
IM:	Metal hardware, scrap metal
AM:	
OM:	
OI:	Glassware, absorbent, broken glass
C:	Wood, cardboard
R:	
XPM:	Plastic sheeting, plastic containers
OR:	
IN:	
S:	

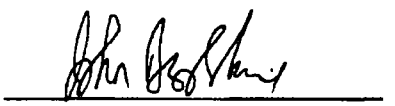
Section 4: Packaging Material and Waste Material Parameters	
Packaging Material:	**Estimated Weight (kg)**
Steel (ST):	27.8
Plastics (PP): Liner Bag	1.0
Other: Cardboard Liner (CP)	4.4
Total Packaging Weight	33.2
Waste Material Parameter:	**Estimated Weight (kg)**
Iron-based Metal / Alloys (IM):	1.0
Aluminum-based Metals / Alloys (AM):	
Other Metals (OM):	
Other Inorganic Materials (OI)	2.6
Cellulosics (C):	3.5
Rubber (R):	
Plastics (waste materials) (XPM):	6.8
Organic Matrix (OR):	
Inorganic Matrix (IN):	
Soils (S):	
Total WMP Weight:	13.9

CCP Radiography Data Sheet

Waste Container ID: X10CSATN02689E

Section 5: RTR Summary (Questions answered "Yes" will be explained in the Comment block, except for Question 1)	
Is there observable liquid?	☐ Yes ☒ No
Is there any observable liquid in internal containers, more than 60 milliliters or 3 percent by volume, whichever is greater?	☐ Yes ☒ No
Is the total volume of observable liquid in the outermost container GREATER than 1% of the container?	☐ Yes ☒ No
Is there observable liquid in payload containers with an EPA Hazardous Waste Number of U134?	☐ Yes ☒ No
Is there an indication of non-radionuclide pyrophoric materials, such as elemental potassium?	☐ Yes ☒ No
Is there an indication of hazardous wastes not occurring as co-contaminants with TRU mixed wastes (non-mixed hazardous wastes)?	☐ Yes ☒ No
Is there an indication of wastes incompatible with backfill, seal and panel closures materials, container and packaging materials, shipping container materials, or other wastes (i.e., waste does NOT match TRUCON Code[s])?	☐ Yes ☒ No
Is there an indication of wastes containing explosives or compressed gases?	☐ Yes ☒ No
Is there an indication of PCBs liquids?	☐ Yes ☒ No
Is there an indication of the waste exhibiting the characteristic of ignitability, corrosivity, or reactivity (EPA Hazardous Waste Numbers of D001, D002, or D003)?	☐ Yes ☒ No
Is the physical form of the waste inconsistent with the Waste Stream Description or the Waste Matrix Code?	☐ Yes ☒ No
CH or RH TRAMPAC	
Are there heat-sealed bags (unvented) GREATER than 4 liters and LESS than 390 square inches in the waste, or heat sealed bags not authorized in the RH TRUCON Code?	☐ Yes ☒ No
Were there Non-approved Closure Methods used on liner bags or inner bags greater than 4 liters?	☐ Yes ☒ No
Are there sealed containers GREATER than 4 liters?	☐ Yes ☒ No
Are there indications of inadequate protection for heavy and/or sharp objects?	☐ Yes ☒ No
Comments: N/A	

RTR Operator:

John Brookshire		9/18/2014
Print Name	Signature	Date

CCP Radiography Data Sheet

Section 1: General Information	
[X] RTR Examination [ ] RTR Replicate Scan [ ] RTR Independent Observation	
Site ID:	ORNL
Batch Number:	OR-RTR6-0581
Examination Date:	9/18/2014
Waste Container ID:	X10C9312054A1
Video/Audio Recorded Media Number:	OR-RTR6-0581 A&B
Procedure and Revision No.:	CCP-TP-053 Rev. 15
NCR(s) associated with the container? (e.g., Prohibited Items)	[X] No [ ] Yes NCR No.: N/A NCR No.: N/A

Section 2: Waste Container Data	
Container Type:	55 Gallon Drum
TRUCON Code:	OR 225
Waste Matrix Code:	S5400
Waste Stream I.D.:	OR-RADP-CH-HET
Waste Container Weights:	Gross Wt.: 101.4 kg Tare Wt.: 33.2 kg Net Wt.: 68.2 kg
Rigid Liner and Liner Vent Description:	Liner: [X] No [ ] Yes Lid: [X] No [ ] Yes Type: [ ] 30-mil [ ] 90-mil [ ] 110-mil [ ] 125-mil Vented: [ ] No [ ] Yes [X] N/A Punctured: [X] No [ ] Yes Mechanical Vent: [X] No [ ] Yes Fiberboard Liner: [X] No [ ] Yes Lead Lined: [X] No [ ] Yes
Number of Layers of Confinement:	Appears to be 1 layer
Volume Utilization Percentage:	95 %

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CCP Radiography Data Sheet

Waste Container ID: X10C9312054A1

Section 3: Container Inventory and Comments (Detailed descriptions)

IM: Metal tubing, scrap metal, hand tool, electrical equipment, metal hardware, metal containers-open

AM:

OM:

OI: Absorbent, broken glass, filter media, glassware

C: Cardboard

R:

XPM: Plastic containers, plastic tubing, coax cable, scrap plastic

OR:

IN:

S:

Section 4: Packaging Material and Waste Material Parameters

Packaging Material:	**Estimated Weight (kg)**
Steel (ST):	27.8
Plastics (PP): Liner Bag	1.0
Other: Cardboard Liner (CP)	4.4
Total Packaging Weight	33.2
Waste Material Parameter:	**Estimated Weight (kg)**
Iron-based Metal / Alloys (IM):	47.5
Aluminum-based Metals / Alloys (AM):	
Other Metals (OM):	
Other Inorganic Materials (OI)	9.0
Cellulosics (C):	3.0
Rubber (R):	
Plastics (waste materials) (XPM):	8.7
Organic Matrix (OR):	
Inorganic Matrix (IN):	
Soils (S):	
Total WMP Weight:	68.2

CCP Radiography Data Sheet

Waste Container ID: X10C9312054A1

Section 5: RTR Summary (Questions answered "Yes" will be explained in the Comment block, except for Question 1)	
Is there observable liquid?	☐ Yes ☒ No
Is there any observable liquid in internal containers, more than 60 milliliters or 3 percent by volume, whichever is greater?	☐ Yes ☒ No
Is the total volume of observable liquid in the outermost container GREATER than 1% of the container?	☐ Yes ☒ No
Is there observable liquid in payload containers with an EPA Hazardous Waste Number of U134?	☐ Yes ☒ No
Is there an indication of non-radionuclide pyrophoric materials, such as elemental potassium?	☐ Yes ☒ No
Is there an indication of hazardous wastes not occurring as co-contaminants with TRU mixed wastes (non-mixed hazardous wastes)?	☐ Yes ☒ No
Is there an indication of wastes incompatible with backfill, seal and panel closures materials, container and packaging materials, shipping container materials, or other wastes (i.e., waste does NOT match TRUCON Code[s])?	☐ Yes ☒ No
Is there an indication of wastes containing explosives or compressed gases?	☐ Yes ☒ No
Is there an indication of PCBs liquids?	☐ Yes ☒ No
Is there an indication of the waste exhibiting the characteristic of ignitability, corrosivity, or reactivity (EPA Hazardous Waste Numbers of D001, D002, or D003)?	☐ Yes ☒ No
Is the physical form of the waste inconsistent with the Waste Stream Description or the Waste Matrix Code?	☐ Yes ☒ No
CH or RH TRAMPAC	
Are there heat-sealed bags (unvented) GREATER than 4 liters and LESS than 390 square inches in the waste, or heat sealed bags not authorized in the RH TRUCON Code?	☐ Yes ☒ No
Were there Non-approved Closure Methods used on liner bags or inner bags greater than 4 liters?	☐ Yes ☒ No
Are there sealed containers GREATER than 4 liters?	☐ Yes ☒ No
Are there indications of inadequate protection for heavy and/or sharp objects?	☐ Yes ☒ No
Comments: N/A	

RTR Operator:

John Brookshire	John Brookshire	9/18/2014
Print Name	Signature	Date

CCP Radiography Data Sheet

Section 1: General Information	
[X] RTR Examination [ ] RTR Replicate Scan [ ] RTR Independent Observation	
Site ID:	ORNL
Batch Number:	OR-RTR6-0581
Examination Date:	9/18/2014
Waste Container ID:	X10C9402619A
Video/Audio Recorded Media Number:	OR-RTR6-0581 A&B
Procedure and Revision No.:	CCP-TP-053 Rev. 15
NCR(s) associated with the container? (e.g., Prohibited Items)	[X] No [ ] Yes NCR No.: N/A NCR No.: N/A

Section 2: Waste Container Data	
Container Type:	55 Gallon Drum
TRUCON Code:	OR 225
Waste Matrix Code:	S5400
Waste Stream I.D.:	OR-REDC-CH-HET
Waste Container Weights:	Gross Wt.: 54.6 kg Tare Wt.: 33.2 kg Net Wt.: 21.4 kg
Rigid Liner and Liner Vent Description:	Liner: [X] No [ ] Yes Lid: [X] No [ ] Yes Type: [ ] 30-mil [ ] 90-mil [ ] 110-mil [ ] 125-mil Vented: [ ] No [ ] Yes [X] N/A Punctured: [X] No [ ] Yes Mechanical Vent: [X] No [ ] Yes Fiberboard Liner: [X] No [ ] Yes Lead Lined: [X] No [ ] Yes
Number of Layers of Confinement:	Appears to be 1 layer
Volume Utilization Percentage:	95 %

CCP Radiography Data Sheet

Waste Container ID: X10C9402619A

Section 3: Container Inventory and Comments	(Detailed descriptions)
IM:	Hand tools, metal hardware, scrap metal, metal tubing, scissors
AM:	
OM:	
OI:	Glassware
C:	Coveralls
R:	Rubber gloves
XPM:	Plastic sheeting, plastic caps, plastic containers, scrap plastic
OR:	
IN:	
S:	

Section 4: Packaging Material and Waste Material Parameters	
Packaging Material:	**Estimated Weight (kg)**
Steel (ST):	27.8
Plastics (PP): Liner Bag	1.0
Other: Cardboard Liner (CP)	4.4
Total Packaging Weight	33.2
Waste Material Parameter:	**Estimated Weight (kg)**
Iron-based Metal / Alloys (IM):	7.5
Aluminum-based Metals / Alloys (AM):	
Other Metals (OM):	
Other Inorganic Materials (OI)	3.0
Cellulosics (C):	3.6
Rubber (R):	0.3
Plastics (waste materials) (XPM):	7.0
Organic Matrix (OR):	
Inorganic Matrix (IN):	
Soils (S):	
Total WMP Weight:	21.4

CCP Radiography Data Sheet

Waste Container ID: X10C9402619A

Section 5: RTR Summary (Questions answered "Yes" will be explained in the Comment block, except for Question 1)	
Is there observable liquid?	☐ Yes ☒ No
Is there any observable liquid in internal containers, more than 60 milliliters or 3 percent by volume, whichever is greater?	☐ Yes ☒ No
Is the total volume of observable liquid in the outermost container GREATER than 1% of the container?	☐ Yes ☒ No
Is there observable liquid in payload containers with an EPA Hazardous Waste Number of U134?	☐ Yes ☒ No
Is there an indication of non-radionuclide pyrophoric materials, such as elemental potassium?	☐ Yes ☒ No
Is there an indication of hazardous wastes not occurring as co-contaminants with TRU mixed wastes (non-mixed hazardous wastes)?	☐ Yes ☒ No
Is there an indication of wastes incompatible with backfill, seal and panel closures materials, container and packaging materials, shipping container materials, or other wastes (i.e., waste does NOT match TRUCON Code[s])?	☐ Yes ☒ No
Is there an indication of wastes containing explosives or compressed gases?	☐ Yes ☒ No
Is there an indication of PCBs liquids?	☐ Yes ☒ No
Is there an indication of the waste exhibiting the characteristic of ignitability, corrosivity, or reactivity (EPA Hazardous Waste Numbers of D001, D002, or D003)?	☐ Yes ☒ No
Is the physical form of the waste inconsistent with the Waste Stream Description or the Waste Matrix Code?	☐ Yes ☒ No
CH or RH TRAMPAC	
Are there heat-sealed bags (unvented) GREATER than 4 liters and LESS than 390 square inches in the waste, or heat sealed bags not authorized in the RH TRUCON Code?	☐ Yes ☒ No
Were there Non-approved Closure Methods used on liner bags or inner bags greater than 4 liters?	☐ Yes ☒ No
Are there sealed containers GREATER than 4 liters?	☐ Yes ☒ No
Are there indications of inadequate protection for heavy and/or sharp objects?	☐ Yes ☒ No
Comments: N/A	

RTR Operator:

John Brookshire	John Brookshire	9/18/2014
Print Name	Signature	Date

CCP Radiography Data Sheet

Section 1: General Information	
[X] RTR Examination [ ] RTR Replicate Scan [ ] RTR Independent Observation	
Site ID:	ORNL
Batch Number:	OR-RTR6-0581
Examination Date:	9/18/2014
Waste Container ID:	X10C0402970F
Video/Audio Recorded Media Number:	OR-RTR6-0581 A&B
Procedure and Revision No.:	CCP-TP-053 Rev. 15
NCR(s) associated with the container? (e.g., Prohibited Items)	[X] No [ ] Yes NCR No.: N/A NCR No.: N/A

Section 2: Waste Container Data	
Container Type:	55 Gallon Drum
TRUCON Code:	OR 225
Waste Matrix Code:	S5400
Waste Stream I.D.:	OR-REDC-CH-HET
Waste Container Weights:	Gross Wt.: 72.0 kg Tare Wt.: 33.2 kg Net Wt.: 38.8 kg
Rigid Liner and Liner Vent Description:	Liner: [X] No [ ] Yes Lid: [X] No [ ] Yes Type: [ ] 30-mil [ ] 90-mil [ ] 110-mil [ ] 125-mil Vented: [ ] No [ ] Yes [X] N/A Punctured: [X] No [ ] Yes Mechanical Vent: [X] No [ ] Yes Fiberboard Liner: [X] No [ ] Yes Lead Lined: [X] No [ ] Yes
Number of Layers of Confinement:	Appears to be 1 layer
Volume Utilization Percentage:	85 %

CCP Radiography Data Sheet

Waste Container ID: X10C0402970F

Section 3: Container Inventory and Comments (Detailed descriptions)	
IM:	Scrap metal, saw blades, metal tubing, electrical equipment, metal pipes-open, metal hardware
AM:	
OM:	
OI:	Absorbent
C:	Wood, cloth
R:	
XPM:	Plastic sheeting, plastic tubing, scrap plastic
OR:	
IN:	
S:	

Section 4: Packaging Material and Waste Material Parameters	
Packaging Material:	**Estimated Weight (kg)**
Steel (ST):	27.8
Plastics (PP): Liner Bag	1.0
Other: Cardboard Liner (CP)	4.4
Total Packaging Weight	33.2
Waste Material Parameter:	**Estimated Weight (kg)**
Iron-based Metal / Alloys (IM):	18.5
Aluminum-based Metals / Alloys (AM):	
Other Metals (OM):	
Other Inorganic Materials (OI)	2.0
Cellulosics (C):	10.5
Rubber (R):	
Plastics (waste materials) (XPM):	7.8
Organic Matrix (OR):	
Inorganic Matrix (IN):	
Soils (S):	
Total WMP Weight:	38.8

CCP Radiography Data Sheet

Waste Container ID: X10C0402970F

Section 5: RTR Summary (Questions answered "Yes" will be explained in the Comment block, except for Question 1)	
Is there observable liquid?	☐ Yes ☒ No
Is there any observable liquid in internal containers, more than 60 milliliters or 3 percent by volume, whichever is greater?	☐ Yes ☒ No
Is the total volume of observable liquid in the outermost container GREATER than 1% of the container?	☐ Yes ☒ No
Is there observable liquid in payload containers with an EPA Hazardous Waste Number of U134?	☐ Yes ☒ No
Is there an indication of non-radionuclide pyrophoric materials, such as elemental potassium?	☐ Yes ☒ No
Is there an indication of hazardous wastes not occurring as co-contaminants with TRU mixed wastes (non-mixed hazardous wastes)?	☐ Yes ☒ No
Is there an indication of wastes incompatible with backfill, seal and panel closures materials, container and packaging materials, shipping container materials, or other wastes (i.e., waste does NOT match TRUCON Code[s])?	☐ Yes ☒ No
Is there an indication of wastes containing explosives or compressed gases?	☐ Yes ☒ No
Is there an indication of PCBs liquids?	☐ Yes ☒ No
Is there an indication of the waste exhibiting the characteristic of ignitability, corrosivity, or reactivity (EPA Hazardous Waste Numbers of D001, D002, or D003)?	☐ Yes ☒ No
Is the physical form of the waste inconsistent with the Waste Stream Description or the Waste Matrix Code?	☐ Yes ☒ No
CH or RH TRAMPAC	
Are there heat-sealed bags (unvented) GREATER than 4 liters and LESS than 390 square inches in the waste, or heat sealed bags not authorized in the RH TRUCON Code?	☐ Yes ☒ No
Were there Non-approved Closure Methods used on liner bags or inner bags greater than 4 liters?	☐ Yes ☒ No
Are there sealed containers GREATER than 4 liters?	☐ Yes ☒ No
Are there indications of inadequate protection for heavy and/or sharp objects?	☐ Yes ☒ No
Comments: N/A	

RTR Operator:

John Brookshire	John Brookshire	9/18/2014
Print Name	Signature	Date

CCP Radiography Data Sheet

Section 1: General Information		
[X] RTR Examination	[ ] RTR Replicate Scan	[ ] RTR Independent Observation
Site ID:	ORNL	
Batch Number:	OR-RTR6-0581	
Examination Date:	9/18/2014	
Waste Container ID:	X10CSATN03043F	
Video/Audio Recorded Media Number:	OR-RTR6-0581	A&B
Procedure and Revision No.:	CCP-TP-053	Rev. 15
NCR(s) associated with the container? (e.g., Prohibited Items)	[X] No [ ] Yes NCR No.: N/A NCR No.: N/A	

Section 2: Waste Container Data	
Container Type:	55 Gallon Drum
TRUCON Code:	OR 225
Waste Matrix Code:	S5400
Waste Stream I.D.:	OR-REDC-CH-HET
Waste Container Weights:	Gross Wt.: 58.4 kg Tare Wt.: 33.2 kg Net Wt.: 25.2 kg
Rigid Liner and Liner Vent Description:	Liner: [X] No [ ] Yes Lid: [X] No [ ] Yes Type: [ ] 30-mil [ ] 90-mil [ ] 110-mil [ ] 125-mil Vented: [ ] No [ ] Yes [X] N/A Punctured: [X] No [ ] Yes Mechanical Vent: [X] No [ ] Yes Fiberboard Liner: [X] No [ ] Yes Lead Lined: [X] No [ ] Yes
Number of Layers of Confinement:	Appears to be 1 layer
Volume Utilization Percentage:	90 %

CCP Radiography Data Sheet

Waste Container ID: X10CSATN03043F

Section 3: Container Inventory and Comments (Detailed descriptions)	
IM:	Scrap metal, metal paint cans-open, metal tubing, hand tools, electrical equipment, metal hardware
AM:	
OM:	
OI:	Broken glass, glassware, absorbent
C:	Wood
R:	
XPM:	Scrap plastic, coax cables, plastic sheeting, plastic containers, plastic labware
OR:	
IN:	
S:	

Section 4: Packaging Material and Waste Material Parameters	
Packaging Material:	**Estimated Weight (kg)**
Steel (ST):	27.8
Plastics (PP): Liner Bag	1.0
Other: Cardboard Liner (CP)	4.4
Total Packaging Weight	33.2
Waste Material Parameter:	**Estimated Weight (kg)**
Iron-based Metal / Alloys (IM):	6.0
Aluminum-based Metals / Alloys (AM):	
Other Metals (OM):	
Other Inorganic Materials (OI)	4.2
Cellulosics (C):	10.0
Rubber (R):	
Plastics (waste materials) (XPM):	5.0
Organic Matrix (OR):	
Inorganic Matrix (IN):	
Soils (S):	
Total WMP Weight:	25.2

CCP Radiography Data Sheet

Waste Container ID: X10CSATN03043F

Section 5: RTR Summary (Questions answered "Yes" will be explained in the Comment block, except for Question 1)	
Is there observable liquid?	☐ Yes ☒ No
Is there any observable liquid in internal containers, more than 60 milliliters or 3 percent by volume, whichever is greater?	☐ Yes ☒ No
Is the total volume of observable liquid in the outermost container GREATER than 1% of the container?	☐ Yes ☒ No
Is there observable liquid in payload containers with an EPA Hazardous Waste Number of U134?	☐ Yes ☒ No
Is there an indication of non-radionuclide pyrophoric materials, such as elemental potassium?	☐ Yes ☒ No
Is there an indication of hazardous wastes not occurring as co-contaminants with TRU mixed wastes (non-mixed hazardous wastes)?	☐ Yes ☒ No
Is there an indication of wastes incompatible with backfill, seal and panel closures materials, container and packaging materials, shipping container materials, or other wastes (i.e., waste does NOT match TRUCON Code[s])?	☐ Yes ☒ No
Is there an indication of wastes containing explosives or compressed gases?	☐ Yes ☒ No
Is there an indication of PCBs liquids?	☐ Yes ☒ No
Is there an indication of the waste exhibiting the characteristic of ignitability, corrosivity, or reactivity (EPA Hazardous Waste Numbers of D001, D002, or D003)?	☐ Yes ☒ No
Is the physical form of the waste inconsistent with the Waste Stream Description or the Waste Matrix Code?	☐ Yes ☒ No
CH or RH TRAMPAC	
Are there heat-sealed bags (unvented) GREATER than 4 liters and LESS than 390 square inches in the waste, or heat sealed bags not authorized in the RH TRUCON Code?	☐ Yes ☒ No
Were there Non-approved Closure Methods used on liner bags or inner bags greater than 4 liters?	☐ Yes ☒ No
Are there sealed containers GREATER than 4 liters?	☐ Yes ☒ No
Are there indications of inadequate protection for heavy and/or sharp objects?	☐ Yes ☒ No
Comments: N/A	

RTR Operator:

John Brookshire	John Brookshire	9/18/2014
Print Name	Signature	Date

CCP Radiography Data Sheet

Section 1: General Information		
[X] RTR Examination	[ ] RTR Replicate Scan	[ ] RTR Independent Observation
Site ID:	ORNL	
Batch Number:	OR-RTR6-0581	
Examination Date:	9/18/2014	
Waste Container ID:	X10C9312313A	
Video/Audio Recorded Media Number:	OR-RTR6-0581	A&B
Procedure and Revision No.:	CCP-TP-053	Rev. 15
NCR(s) associated with the container? (e.g., Prohibited Items)	[X] No [ ] Yes NCR No.: N/A NCR No.: N/A	

Section 2: Waste Container Data	
Container Type:	55 Gallon Drum
TRUCON Code:	OR 225
Waste Matrix Code:	S5400
Waste Stream I.D.:	OR-REDC-CH-HET
Waste Container Weights:	Gross Wt.: 109.7 kg Tare Wt.: 33.2 kg Net Wt.: 76.5 kg
Rigid Liner and Liner Vent Description:	Liner: [X] No [ ] Yes Lid: [X] No [ ] Yes Type: [ ] 30-mil [ ] 90-mil [ ] 110-mil [ ] 125-mil Vented: [ ] No [ ] Yes [X] N/A Punctured: [X] No [ ] Yes Mechanical Vent: [X] No [ ] Yes Fiberboard Liner: [X] No [ ] Yes Lead Lined: [X] No [ ] Yes
Number of Layers of Confinement:	Appears to be 1 layer
Volume Utilization Percentage:	90 %

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CCP Radiography Data Sheet

Waste Container ID: X10C9312313A

Section 3: Container Inventory and Comments (Detailed descriptions)	
IM:	Metal tubing, scrap metal, scissors, metal hardware, metal pipes-open, saw blade, hand tool
AM:	
OM:	
OI:	Broken glass, glassware, absorbent
C:	
R:	
XPM:	Plastic containers, plastic sheeting, plastic labware, scrap plastic
OR:	
IN:	
S:	

Section 4: Packaging Material and Waste Material Parameters	
Packaging Material:	**Estimated Weight (kg)**
Steel (ST):	27.8
Plastics (PP): Liner Bag	1.0
Other: Cardboard Liner (CP)	4.4
Total Packaging Weight	33.2
Waste Material Parameter:	**Estimated Weight (kg)**
Iron-based Metal / Alloys (IM):	32.5
Aluminum-based Metals / Alloys (AM):	
Other Metals (OM):	
Other Inorganic Materials (OI)	28.4
Cellulosics (C):	
Rubber (R):	
Plastics (waste materials) (XPM):	15.6
Organic Matrix (OR):	
Inorganic Matrix (IN):	
Soils (S):	
Total WMP Weight:	76.5

CCP Radiography Data Sheet

Waste Container ID: X10C9312313A

Section 5: RTR Summary (Questions answered "Yes" will be explained in the Comment block, except for Question 1)	
Is there observable liquid?	☐ Yes ☒ No
Is there any observable liquid in internal containers, more than 60 milliliters or 3 percent by volume, whichever is greater?	☐ Yes ☒ No
Is the total volume of observable liquid in the outermost container GREATER than 1% of the container?	☐ Yes ☒ No
Is there observable liquid in payload containers with an EPA Hazardous Waste Number of U134?	☐ Yes ☒ No
Is there an indication of non-radionuclide pyrophoric materials, such as elemental potassium?	☐ Yes ☒ No
Is there an indication of hazardous wastes not occurring as co-contaminants with TRU mixed wastes (non-mixed hazardous wastes)?	☐ Yes ☒ No
Is there an indication of wastes incompatible with backfill, seal and panel closures materials, container and packaging materials, shipping container materials, or other wastes (i.e., waste does NOT match TRUCON Code[s])?	☐ Yes ☒ No
Is there an indication of wastes containing explosives or compressed gases?	☐ Yes ☒ No
Is there an indication of PCBs liquids?	☐ Yes ☒ No
Is there an indication of the waste exhibiting the characteristic of ignitability, corrosivity, or reactivity (EPA Hazardous Waste Numbers of D001, D002, or D003)?	☐ Yes ☒ No
Is the physical form of the waste inconsistent with the Waste Stream Description or the Waste Matrix Code?	☐ Yes ☒ No
CH or RH TRAMPAC	
Are there heat-sealed bags (unvented) GREATER than 4 liters and LESS than 390 square inches in the waste, or heat sealed bags not authorized in the RH TRUCON Code?	☐ Yes ☒ No
Were there Non-approved Closure Methods used on liner bags or inner bags greater than 4 liters?	☐ Yes ☒ No
Are there sealed containers GREATER than 4 liters?	☐ Yes ☒ No
Are there indications of inadequate protection for heavy and/or sharp objects?	☐ Yes ☒ No

Comments: N/A

RTR Operator:

John Brookshire	John Brookshire	9/18/2014
Print Name	Signature	Date

CCP Radiography Data Sheet

Section 1: General Information		
[X] RTR Examination	[ ] RTR Replicate Scan	[ ] RTR Independent Observation
Site ID:	ORNL	
Batch Number:	OR-RTR6-0581	
Examination Date:	9/18/2014	
Waste Container ID:	X10CSATN03043C	
Video/Audio Recorded Media Number:	OR-RTR6-0581	A&B
Procedure and Revision No.:	CCP-TP-053	Rev. 15
NCR(s) associated with the container? (e.g., Prohibited Items)	[X] No [ ] Yes NCR No.: N/A NCR No.: N/A	

Section 2: Waste Container Data	
Container Type:	55 Gallon Drum
TRUCON Code:	OR 225
Waste Matrix Code:	S5400
Waste Stream I.D.:	OR-REDC-CH-HET
Waste Container Weights:	Gross Wt.: 47.3 kg Tare Wt.: 33.2 kg Net Wt.: 14.1 kg
Rigid Liner and Liner Vent Description:	Liner: [X] No [ ] Yes Lid: [X] No [ ] Yes Type: [ ] 30-mil [ ] 90-mil [ ] 110-mil [ ] 125-mil Vented: [ ] No [ ] Yes [X] N/A Punctured: [X] No [ ] Yes Mechanical Vent: [X] No [ ] Yes Fiberboard Liner: [X] No [ ] Yes Lead Lined: [X] No [ ] Yes
Number of Layers of Confinement:	Appears to be 1 layer
Volume Utilization Percentage:	80 %

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CCP Radiography Data Sheet

Waste Container ID: X10CSATN03043C

Section 3: Container Inventory and Comments (Detailed descriptions)	
IM:	Scrap metal, metal lids, metal paint cans-open
AM:	Aluminum ring
OM:	
OI:	Absorbent
C:	
R:	
XPM:	Scrap plastic, manipulator boot, plastic sheeting
OR:	
IN:	
S:	

Section 4: Packaging Material and Waste Material Parameters	
Packaging Material:	**Estimated Weight (kg)**
Steel (ST):	27.8
Plastics (PP): Liner Bag	1.0
Other: Cardboard Liner (CP)	4.4
Total Packaging Weight	33.2
Waste Material Parameter:	**Estimated Weight (kg)**
Iron-based Metal / Alloys (IM):	5.5
Aluminum-based Metals / Alloys (AM):	2.0
Other Metals (OM):	
Other Inorganic Materials (OI)	0.8
Cellulosics (C):	
Rubber (R):	
Plastics (waste materials) (XPM):	5.8
Organic Matrix (OR):	
Inorganic Matrix (IN):	
Soils (S):	
Total WMP Weight:	14.1

CCP Radiography Data Sheet

Waste Container ID: X10CSATN03043C

Section 5: RTR Summary (Questions answered "Yes" will be explained in the Comment block, except for Question 1)	
Is there observable liquid?	☐ Yes ☒ No
Is there any observable liquid in internal containers, more than 60 milliliters or 3 percent by volume, whichever is greater?	☐ Yes ☒ No
Is the total volume of observable liquid in the outermost container GREATER than 1% of the container?	☐ Yes ☒ No
Is there observable liquid in payload containers with an EPA Hazardous Waste Number of U134?	☐ Yes ☒ No
Is there an indication of non-radionuclide pyrophoric materials, such as elemental potassium?	☐ Yes ☒ No
Is there an indication of hazardous wastes not occurring as co-contaminants with TRU mixed wastes (non-mixed hazardous wastes)?	☐ Yes ☒ No
Is there an indication of wastes incompatible with backfill, seal and panel closures materials, container and packaging materials, shipping container materials, or other wastes (i.e., waste does NOT match TRUCON Code[s])?	☐ Yes ☒ No
Is there an indication of wastes containing explosives or compressed gases?	☐ Yes ☒ No
Is there an indication of PCBs liquids?	☐ Yes ☒ No
Is there an indication of the waste exhibiting the characteristic of ignitability, corrosivity, or reactivity (EPA Hazardous Waste Numbers of D001, D002, or D003)?	☐ Yes ☒ No
Is the physical form of the waste inconsistent with the Waste Stream Description or the Waste Matrix Code?	☐ Yes ☒ No
CH or RH TRAMPAC	
Are there heat-sealed bags (unvented) GREATER than 4 liters and LESS than 390 square inches in the waste, or heat sealed bags not authorized in the RH TRUCON Code?	☐ Yes ☒ No
Were there Non-approved Closure Methods used on liner bags or inner bags greater than 4 liters?	☐ Yes ☒ No
Are there sealed containers GREATER than 4 liters?	☐ Yes ☒ No
Are there indications of inadequate protection for heavy and/or sharp objects?	☐ Yes ☒ No
Comments: N/A	

RTR Operator:

John Brookshire	John Brookshire	9/18/2014
Print Name	Signature	Date

CCP Radiography Data Sheet

Section 1: General Information		
[X] RTR Examination	[ ] RTR Replicate Scan	[ ] RTR Independent Observation
Site ID:	ORNL	
Batch Number:	OR-RTR6-0581	
Examination Date:	9/18/2014	
Waste Container ID:	X10CSATN03210B	
Video/Audio Recorded Media Number:	OR-RTR6-0581	A&B
Procedure and Revision No.:	CCP-TP-053	Rev. 15
NCR(s) associated with the container? (e.g., Prohibited Items)	[X] No [ ] Yes NCR No.: N/A NCR No.: N/A	

Section 2: Waste Container Data	
Container Type:	55 Gallon Drum
TRUCON Code:	OR 225
Waste Matrix Code:	S5400
Waste Stream I.D.:	OR-REDC-CH-HET
Waste Container Weights:	Gross Wt.: 45.3 kg Tare Wt.: 33.2 kg Net Wt.: 12.1 kg
Rigid Liner and Liner Vent Description:	Liner: [X] No [ ] Yes Lid: [X] No [ ] Yes Type: [ ] 30-mil [ ] 90-mil [ ] 110-mil [ ] 125-mil Vented: [ ] No [ ] Yes [X] N/A Punctured: [X] No [ ] Yes Mechanical Vent: [X] No [ ] Yes Fiberboard Liner: [X] No [ ] Yes Lead Lined: [X] No [ ] Yes
Number of Layers of Confinement:	Appears to be 1 layer
Volume Utilization Percentage:	90 %

CCP Radiography Data Sheet

Waste Container ID: X10CSATN03210B

Section 3: Container Inventory and Comments (Detailed descriptions)

IM: Metal paint cans-open, scrap metal, electrical equipment, metal fittings, metal lids

AM: Aluminum ring

OM:

OI:

C: Cloth

R:

XPM: Scrap plastic, plastic sheeting, plastic containers, plastic tubing, manipulator boots, plastic caps

OR:

IN:

S:

Section 4: Packaging Material and Waste Material Parameters

Packaging Material:	**Estimated Weight (kg)**
Steel (ST):	27.8
Plastics (PP): Liner Bag	1.0
Other: Cardboard Liner (CP)	4.4
Total Packaging Weight	33.2
Waste Material Parameter:	**Estimated Weight (kg)**
Iron-based Metal / Alloys (IM):	3.5
Aluminum-based Metals / Alloys (AM):	2.0
Other Metals (OM):	
Other Inorganic Materials (OI)	
Cellulosics (C):	0.5
Rubber (R):	
Plastics (waste materials) (XPM):	6.1
Organic Matrix (OR):	
Inorganic Matrix (IN):	
Soils (S):	
Total WMP Weight:	12.1

CCP Radiography Data Sheet

Waste Container ID: X10CSATN03210B

Section 5: RTR Summary (Questions answered "Yes" will be explained in the Comment block, except for Question 1)	
Is there observable liquid?	☐ Yes ☒ No
Is there any observable liquid in internal containers, more than 60 milliliters or 3 percent by volume, whichever is greater?	☐ Yes ☒ No
Is the total volume of observable liquid in the outermost container GREATER than 1% of the container?	☐ Yes ☒ No
Is there observable liquid in payload containers with an EPA Hazardous Waste Number of U134?	☐ Yes ☒ No
Is there an indication of non-radionuclide pyrophoric materials, such as elemental potassium?	☐ Yes ☒ No
Is there an indication of hazardous wastes not occurring as co-contaminants with TRU mixed wastes (non-mixed hazardous wastes)?	☐ Yes ☒ No
Is there an indication of wastes incompatible with backfill, seal and panel closures materials, container and packaging materials, shipping container materials, or other wastes (i.e., waste does NOT match TRUCON Code[s])?	☐ Yes ☒ No
Is there an indication of wastes containing explosives or compressed gases?	☐ Yes ☒ No
Is there an indication of PCBs liquids?	☐ Yes ☒ No
Is there an indication of the waste exhibiting the characteristic of ignitability, corrosivity, or reactivity (EPA Hazardous Waste Numbers of D001, D002, or D003)?	☐ Yes ☒ No
Is the physical form of the waste inconsistent with the Waste Stream Description or the Waste Matrix Code?	☐ Yes ☒ No
CH or RH TRAMPAC	
Are there heat-sealed bags (unvented) GREATER than 4 liters and LESS than 390 square inches in the waste, or heat sealed bags not authorized in the RH TRUCON Code?	☐ Yes ☒ No
Were there Non-approved Closure Methods used on liner bags or inner bags greater than 4 liters?	☐ Yes ☒ No
Are there sealed containers GREATER than 4 liters?	☐ Yes ☒ No
Are there indications of inadequate protection for heavy and/or sharp objects?	☐ Yes ☒ No
Comments: N/A	

RTR Operator:

John Brookshire	John Brookshire	9/18/2014
Print Name	Signature	Date

CCP Radiography Data Sheet

Section 1: General Information	
[X] RTR Examination [ ] RTR Replicate Scan [ ] RTR Independent Observation	
Site ID:	ORNL
Batch Number:	OR-RTR6-0581
Examination Date:	9/18/2014
Waste Container ID:	X10C9602122A
Video/Audio Recorded Media Number:	OR-RTR6-0581 A&B
Procedure and Revision No.:	CCP-TP-053 Rev. 15
NCR(s) associated with the container? (e.g., Prohibited Items)	[X] No [ ] Yes NCR No.: N/A NCR No.: N/A

Section 2: Waste Container Data	
Container Type:	55 Gallon Drum
TRUCON Code:	OR 225
Waste Matrix Code:	S5400
Waste Stream I.D.:	OR-REDC-CH-HET
Waste Container Weights:	Gross Wt.: 63.7 kg Tare Wt.: 33.2 kg Net Wt.: 30.5 kg
Rigid Liner and Liner Vent Description:	Liner: [X] No [ ] Yes Lid: [X] No [ ] Yes Type: [ ] 30-mil [ ] 90-mil [ ] 110-mil [ ] 125-mil Vented: [ ] No [ ] Yes [X] N/A Punctured: [X] No [ ] Yes Mechanical Vent: [X] No [ ] Yes Fiberboard Liner: [X] No [ ] Yes Lead Lined: [X] No [ ] Yes
Number of Layers of Confinement:	Appears to be 1 layer
Volume Utilization Percentage:	90 %

CCP Radiography Data Sheet

Waste Container ID: X10C9602122A

Section 3: Container Inventory and Comments (Detailed descriptions)

IM: Scrap metal, scissors, saw blade, hand tools, electrical equipment, metal hardware

AM:

OM:

OI: Glassware, absorbent, broken glass

C:

R:

XPM: Scrap plastic, plastic containers, plastic sheeting, plastic labware, plastic caps

OR:

IN:

S:

Section 4: Packaging Material and Waste Material Parameters

Packaging Material:	**Estimated Weight (kg)**
Steel (ST):	27.8
Plastics (PP): Liner Bag	1.0
Other: Cardboard Liner (CP)	4.4
Total Packaging Weight	33.2
Waste Material Parameter:	**Estimated Weight (kg)**
Iron-based Metal / Alloys (IM):	10.0
Aluminum-based Metals / Alloys (AM):	
Other Metals (OM):	
Other Inorganic Materials (OI)	8.0
Cellulosics (C):	
Rubber (R):	
Plastics (waste materials) (XPM):	12.5
Organic Matrix (OR):	
Inorganic Matrix (IN):	
Soils (S):	
Total WMP Weight:	30.5

CCP Radiography Data Sheet

Waste Container ID: X10C9602122A

Section 5: RTR Summary (Questions answered "Yes" will be explained in the Comment block, except for Question 1)	
Is there observable liquid?	☐ Yes ☒ No
Is there any observable liquid in internal containers, more than 60 milliliters or 3 percent by volume, whichever is greater?	☐ Yes ☒ No
Is the total volume of observable liquid in the outermost container GREATER than 1% of the container?	☐ Yes ☒ No
Is there observable liquid in payload containers with an EPA Hazardous Waste Number of U134?	☐ Yes ☒ No
Is there an indication of non-radionuclide pyrophoric materials, such as elemental potassium?	☐ Yes ☒ No
Is there an indication of hazardous wastes not occurring as co-contaminants with TRU mixed wastes (non-mixed hazardous wastes)?	☐ Yes ☒ No
Is there an indication of wastes incompatible with backfill, seal and panel closures materials, container and packaging materials, shipping container materials, or other wastes (i.e., waste does NOT match TRUCON Code[s])?	☐ Yes ☒ No
Is there an indication of wastes containing explosives or compressed gases?	☐ Yes ☒ No
Is there an indication of PCBs liquids?	☐ Yes ☒ No
Is there an indication of the waste exhibiting the characteristic of ignitability, corrosivity, or reactivity (EPA Hazardous Waste Numbers of D001, D002, or D003)?	☐ Yes ☒ No
Is the physical form of the waste inconsistent with the Waste Stream Description or the Waste Matrix Code?	☐ Yes ☒ No
CH or RH TRAMPAC	
Are there heat-sealed bags (unvented) GREATER than 4 liters and LESS than 390 square inches in the waste, or heat sealed bags not authorized in the RH TRUCON Code?	☐ Yes ☒ No
Were there Non-approved Closure Methods used on liner bags or inner bags greater than 4 liters?	☐ Yes ☒ No
Are there sealed containers GREATER than 4 liters?	☐ Yes ☒ No
Are there indications of inadequate protection for heavy and/or sharp objects?	☐ Yes ☒ No
Comments: N/A	

RTR Operator:

John Brookshire	John Brookshire	9/18/2014
Print Name	Signature	Date

CCP Radiography Data Sheet

Section 1: General Information	
[X] RTR Examination [ ] RTR Replicate Scan [ ] RTR Independent Observation	
Site ID:	ORNL
Batch Number:	OR-RTR6-0581
Examination Date:	9/18/2014
Waste Container ID:	X10C9313648A
Video/Audio Recorded Media Number:	OR-RTR6-0581 A&B
Procedure and Revision No.:	CCP-TP-053 Rev. 15
NCR(s) associated with the container? (e.g., Prohibited Items)	[X] No [ ] Yes NCR No.: N/A NCR No.: N/A

Section 2: Waste Container Data	
Container Type:	55 Gallon Drum
TRUCON Code:	OR 225
Waste Matrix Code:	S5400
Waste Stream I.D.:	OR-ISTP-CH-HET
Waste Container Weights:	Gross Wt.: 72.8 kg Tare Wt.: 33.2 kg Net Wt.: 39.6 kg
Rigid Liner and Liner Vent Description:	Liner: [X] No [ ] Yes Lid: [X] No [ ] Yes Type: [ ] 30-mil [ ] 90-mil [ ] 110-mil [ ] 125-mil Vented: [ ] No [ ] Yes [X] N/A Punctured: [X] No [ ] Yes Mechanical Vent: [X] No [ ] Yes Fiberboard Liner: [X] No [ ] Yes Lead Lined: [X] No [ ] Yes
Number of Layers of Confinement:	Appears to be 1 layer
Volume Utilization Percentage:	80 %

CCP Radiography Data Sheet

Waste Container ID: X10C9313648A

Section 3: Container Inventory and Comments (Detailed descriptions)

IM: Scrap metal, metal hardware, saw blades, metal containers, hand tools, metal framed filter

AM:

OM:

OI: Glassware, absorbent

C:

R: Leaded rubber gloves

XPM: Plastic sheeting, plastic containers, scrap plastic

OR:

IN:

S:

Section 4: Packaging Material and Waste Material Parameters

Packaging Material:	**Estimated Weight (kg)**
Steel (ST):	27.8
Plastics (PP): Liner Bag	1.0
Other: Cardboard Liner (CP)	4.4
Total Packaging Weight	33.2
Waste Material Parameter:	**Estimated Weight (kg)**
Iron-based Metal / Alloys (IM):	20.5
Aluminum-based Metals / Alloys (AM):	
Other Metals (OM):	
Other Inorganic Materials (OI)	4.3
Cellulosics (C):	
Rubber (R):	5.0
Plastics (waste materials) (XPM):	9.8
Organic Matrix (OR):	
Inorganic Matrix (IN):	
Soils (S):	
Total WMP Weight:	39.6

CCP Radiography Data Sheet

Waste Container ID: X10C9313648A

Section 5: RTR Summary (Questions answered "Yes" will be explained in the Comment block, except for Question 1)	
Is there observable liquid?	☐ Yes ☒ No
Is there any observable liquid in internal containers, more than 60 milliliters or 3 percent by volume, whichever is greater?	☐ Yes ☒ No
Is the total volume of observable liquid in the outermost container GREATER than 1% of the container?	☐ Yes ☒ No
Is there observable liquid in payload containers with an EPA Hazardous Waste Number of U134?	☐ Yes ☒ No
Is there an indication of non-radionuclide pyrophoric materials, such as elemental potassium?	☐ Yes ☒ No
Is there an indication of hazardous wastes not occurring as co-contaminants with TRU mixed wastes (non-mixed hazardous wastes)?	☐ Yes ☒ No
Is there an indication of wastes incompatible with backfill, seal and panel closures materials, container and packaging materials, shipping container materials, or other wastes (i.e., waste does NOT match TRUCON Code[s])?	☐ Yes ☒ No
Is there an indication of wastes containing explosives or compressed gases?	☐ Yes ☒ No
Is there an indication of PCBs liquids?	☐ Yes ☒ No
Is there an indication of the waste exhibiting the characteristic of ignitability, corrosivity, or reactivity (EPA Hazardous Waste Numbers of D001, D002, or D003)?	☐ Yes ☒ No
Is the physical form of the waste inconsistent with the Waste Stream Description or the Waste Matrix Code?	☐ Yes ☒ No
CH or RH TRAMPAC	
Are there heat-sealed bags (unvented) GREATER than 4 liters and LESS than 390 square inches in the waste, or heat sealed bags not authorized in the RH TRUCON Code?	☐ Yes ☒ No
Were there Non-approved Closure Methods used on liner bags or inner bags greater than 4 liters?	☐ Yes ☒ No
Are there sealed containers GREATER than 4 liters?	☐ Yes ☒ No
Are there indications of inadequate protection for heavy and/or sharp objects?	☐ Yes ☒ No
Comments: N/A	

RTR Operator:		
John Brookshire	John Brookshire	9/18/2014
Print Name	Signature	Date

Attachment 3 – CCP Radiography Independent Technical Reviewer Checklist

Batch Data Report No.: OR-RTR6-0581

Description			
1.	Were data generation and reduction conducted in a technically correct manner in accordance with the methods used?	☐ NO	☑ YES
2.	Was the correct revision of the procedure used? Procedure: CCP-TP-053 Rev.: 15	☐ NO	☑ YES
3.	Are the WMPs entered correctly?	☐ NO	☑ YES
4.	Do the estimated weights in Section 4 of Attachment 2 equal the container gross weight?	☐ NO	☑ YES
5.	Is the data reported in the proper units with the correct number of significant figures (e.g., one tenth of a kilogram)?	☐ NO	☑ YES
6.	Was transcription used? If no, proceed to question 7.	☑ NO	☐ YES
	6a. Has the data been verified for transcription errors?	☐ NO	☐ YES
7.	Does the Testing Batch Report include radiography for up to 20 containers?	☐ NO	☑ YES
8.	Are BDR contents complete and do they match the CCP Waste RTR Batch Data Report Table of Contents?	☐ NO	☑ YES
9.	Is all the data signed and dated in reproducible ink and by the individual(s) generating it?	☐ NO	☑ YES
10.	Is all data recorded clearly, legibly, and accurately?	☐ NO	☑ YES
11.	Have changes been made to original data? If no, proceed to question 12.	☑ NO	☐ YES
	11a. Have all changes to original data been lined out, initialed and dated by the individual making the changes?	☐ NO	☐ YES
	11b. Was justification made for changing the original data?	☐ NO	☐ YES
	11c. Were data changes made by the individual who originally collected the data?	☐ NO	☐ YES
12.	Does the waste match the Waste Matrix Code and Waste Stream description?	☐ NO	☑ YES
13.	Are the RTR Operator's decisions regarding the Radiography documented?	☐ NO	☑ YES
14.	Is there an adequate written description of the contents of each item?	☐ NO	☑ YES
15.	Was the video/audio recording media properly prepared and labeled for each waste container?	☐ NO	☑ YES
16.	Was the video/audio recording media check performed satisfactorily and recorded on Attachment 1?	☐ NO	☑ YES

Attachment 3 – CCP Radiography Independent Technical Reviewer Checklist (Continued)

Batch Data Report No.: OR-RTR6-0581

Description		
17. Was the Image Test performed satisfactorily and recorded on Attachment 1?	☐ NO	☑ YES
18. Was the Replicate Scan performed and recorded on an Attachment 2?	☐ NO	☑ YES
19. Was the Replicate Scan RTR Operator different from the first RTR Operator?	☐ NO	☑ YES
20. Did the Replicate Scan RTR Operator and the first RTR Operator agree on the results?	☐ NO	☑ YES
21. Was the Independent Observation performed and recorded on an Attachment 2?	☐ NO	☑ YES
22. Was the Independent Observation RTR Operator different from the first RTR Operator?	☐ NO	☑ YES
23. Did the Independent Observation RTR Operator and the first RTR Operator agree on the results?	☐ NO	☑ YES
24. Was the data collection performed by qualified individuals?	☐ NO	☑ YES
25. Were NCRs initiated as required at DGL? If no, proceed to question 26.	☑ NO	☐ YES
25a. Have the NCR(s) associated with RTR been included in the BDR?	☐ NO	☐ YES
26. Is the RTR examination for CH waste? If no, proceed to question 27.	☐ NO	☑ YES
26a. Have the CH Quality Assurance Objectives (QAOs) been met (if applicable)? Precision – Precision is maintained by reconciling any discrepancies between two radiography operators with regard to identification of the waste matrix code, liquids in excess of TSDF-WAC limits, and compressed gases through independent replicate scans and independent observations. Additionally, the precision of radiography is verified prior to use by tuning precisely enough to demonstrate compliance with QAOs through viewing an image test pattern. Accuracy – Accuracy is obtained by using a target to tune the image for maximum sharpness and by requiring operators to successfully identify 100 percent of the items required to meet the DQOs for radiography specified in CCP-PO-001, Section C-4a(1) in a training container during their initial qualification and subsequent requalification. Completeness – A video and audio media recording of the radiography examination and a validated radiography data form will be obtained for 100 percent of the waste containers subject to radiography. All video and audio media recordings and radiography data forms will be subject to validation as indicated in CCP-PO-001, Section C3-4. Comparability – The comparability of radiography data from different operators shall be enhanced by using standardized radiography procedures and operator qualifications.	☐ NO	☑ YES

Attachment 3 – CCP Radiography Independent Technical Reviewer Checklist (Continued)

Batch Data Report No.: OR-RTR6-0581

Description		
27. Is the RTR examination for RH waste? If no, proceed to comment section.	☑ NO	☐ YES
27a. Have the RH QAOs been met (if applicable)? Precision – Precision is maintained by reconciling any discrepancies between two operators (during Independent Observation and Replicate scans) with regard to the identification of important waste characteristics (i.e., physical form of the waste and absence of prohibited liquids) within a single container. Accuracy – Accuracy is obtained by using a target to tune the image for maximum sharpness and by requiring operators to successfully identify prohibited liquid in a training container during their initial qualification and subsequent requalification. Representativeness – All of the relevant contents in a container selected for radiography will be described. Completeness – All of the relevant waste information must be assembled and must show that each of the containers in the waste stream belongs to the waste stream. This information must be documented on videotape or other equivalent media and data form. Comparability – Comparability is ensured by meeting the program training requirements and complying with the minimum standards used to implement the radiography process.	☐ NO	☐ YES

Comments:
N/A

I have reviewed 100% of the container specific and batch data in this report and find it acceptable.

Independent Technical Reviewer:

Fred Olney		9-22-14
Printed Name	Signature	Date

DIVIDER PAGE ONLY

NOT PART OF PAGE COUNT

Attachment 2 – CCP Records Transmittal/Receiving Form

CCP Records / Records Custodian, 4021 National Parks Highway - MS: GSA 212, Carlsbad, New Mexico 88220

Telephone Number: 575-234-7523

Fax Number: 575-234-7033

[X] Original Record [ ] Copy
[ ] Fax Record
[ ] Electronic Record

Attn:	CCP RECORDS	From:	PATRICK SMITH II
Ship to:	CCP RECORDS CUSTODIAN	Site:	ORNL
	4021 NATIONAL PARKS HWY.	Company:	TFE INC.
	MS GSA 212	Telephone Number:	865-574-6002
	CARLSBAD, NM 88220-9082	Date Sent:	9-24-2014
Telephone Number:	575-234-7523		

Document Number	Title / Description	Record Date	Total Pages
OR-RTR6-0581	RTR DVD (DISK B)	9-18-2014	N/A
N/A	N/A	N/A	N/A
N/A	N/A	N/A	N/A
N/A	N/A	N/A	N/A
N/A	N/A	N/A	N/A
N/A	N/A	N/A	N/A

Comments

N/A

(When the Record accepted line has been completed, the rest of the page below may be left blank.)
Acceptance/Rejection Signature and Date

Records Accepted [√]	Signature	Greta Leos (Printed Name)	9-18-14 (Date)
Records Rejected [ ]	Signature	Printed Name	Date

Reason for Rejection:

Re-submittal:

Signature	Printed Name	Date

****
*** Send Results ***
****

Sending is complete.

Job No.	0678
Address	918655768703
Name	ORNL
Start Time	09/30 02:35 PM
Call Length	00'46
Sheets	1
Result	OK

Controlled Copy

CCP-QP-008, Rev. 23 **Effective Date: 09/03/2014**
CCP Records Management **Page 34 of 34**

Attachment 2 – CCP Records Transmittal/Receiving Form

CCP Records / Records Custodian, 4021 National Parks Highway - MS: GSA 212, Carlsbad, New Mexico 88220

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	CARLSBAD, NM 88220-9082	Date Sent:	9-24-2014
Telephone Number:	575-234-7523		

Document Number	Document Description	Record Date	Copy Number
OR-RTR6-0581	RTR DVD (DISK B)	9-18-2014	N/A
N/A	N/A	N/A	N/A
N/A	N/A	N/A	N/A
N/A	N/A	N/A	N/A
N/A	N/A	N/A	N/A
N/A	N/A	N/A	N/A

Comments

N/A

(When the Record accepted line has been completed, the rest of the page below may be left blank.)
Acceptance/Rejection Signature and Date

Records Accepted [✓] Signature: Greta Pics — Printed Name: Greta Leos — Date: 9-18-14

Records Rejected [ ] _____ _____ _____

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Telephone Number: 575-234-7523

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[X] Original Record [ ] Copy
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Attn:	CCP RECORDS	From:	PATRICK SMITH II
Ship to:	CCP RECORDS CUSTODIAN	Site:	ORNL
	4021 NATIONAL PARKS HWY.	Company:	TFE INC.
	MS GSA 212	Telephone Number:	865-574-6002
	CARLSBAD, NM 88220-9082	Date Sent:	10-2-2014
Telephone Number:	575-234-7523		

Document Number	Title / Description	Record Date	Total Pages
OR-RTR6-0581	RTR BDR	9-18-2014	54
OR-RTR6-0581	RTR DVD (DISK A)	9-18-2014	N/A
N/A	N/A	N/A	N/A
N/A	N/A	N/A	N/A
N/A	N/A	N/A	N/A
N/A	N/A	N/A	N/A

Comments

N/A

(When the Record accepted line has been completed, the rest of the page below may be left blank.)
Acceptance/Rejection Signature and Date

Records Accepted [✓]	Signature	Greta Leos (Printed Name)	10-07-14 (Date)
Records Rejected [ ]	Signature	Printed Name	Date

Reason for Rejection:

Re-submittal:

Signature	Printed Name	Date

****
*** TX REPORT ***
****

TRANSMISSION OK

TX/RX NO	0934
DESTINATION TEL #	918655768703
DESTINATION ID	ORNL
ST. TIME	10/07 14:39
TIME USE	00'40
PAGES SENT	1
RESULT	OK

Attachment 2 – CCP Records Transmittal/Receiving Form

CCP Records / Records Custodian, 4021 National Parks Highway - MS: GSA 212, Carlsbad, New Mexico 88220

Telephone Number: 575-234-7523

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	4021 NATIONAL PARKS HWY.	Company:	TFE INC.
	MS GSA 212	Telephone Number:	865-574-6002
	CARLSBAD, NM 88220-9082	Date Sent:	10-2-2014
Telephone Number:	575-234-7523		

OR-RTR6-0581	RTR BDR	9-18-2014	54
OR-RTR6-0581	RTR DVD (DISK A)	9-18-2014	N/A
N/A	N/A	N/A	N/A
N/A	N/A	N/A	N/A
N/A	N/A	N/A	N/A
N/A	N/A	N/A	N/A

N/A

(When the Record accepted line has been completed, the rest of the page below may be left blank.)
Acceptance/Rejection Signature and Date

CCP-AK-ORNL-013, Rev. 0, 5/4/2016

AK Summary Report
Operational Training

Oak Ridge National Laboratory
Contact-Handled Transuranic Waste
from the Curium Recovery Facility

Waste Stream OR-CRF-CH-HET

Training Overview

- Objective - To become sufficiently familiar with the generation and characteristics of waste stream OR-CRF-CH-HET in order to perform repackaging, remediation, and characterization activities
- Site Mission & Generating Process
- Physical Form
- Radiological Characteristics
- Chemical Characteristics
- Prohibited Items
- Waste Packaging

Waste Generating Facilities

- The Building 4507 High-Level Chemical Development Facility housed four concrete-shielded hot cells, and a penthouse structure above the hot cells containing alpha gloveboxes and a shielded manipulator cave. The Curium Recovery Facility (CRF) was located in Cells 3 and 4.
- The Building 4556 Ventilation and Filtration Facility housed roughing and High Efficiency Particulate Air (HEPA) filters that provided the primary line of filtration for Building 4507 prior to discharge of the air.

Facility Mission

- The mission of Building 4507 from 1957 until 1964 was radiochemical separation process studies of irradiated fuel from power reactor fuel processing, waste disposal, and fluoride volatility programs. The recovery and decontamination of plutonium from irradiated plutonium-aluminum alloy to provide material for determination of the nuclear properties of the higher isotopes of plutonium was also done during this time.
- The CRF was constructed in Cells 3 and 4 of Building 4507 for the Transuranium Element Program which tested chemical flowsheets for the separation and isolation of transuranium isotopes. Simultaneously, the Curium Program purified gram amounts of curium isotopes which were then fabricated into heat sources in another ORNL facility. The CRF operated for approximately two and a half years between 1964 and 1966.

Facility Mission

- After 1966 when the CRF in Cells 3 and 4 ceased operations, Cells 1 and 2 continued fuel processing studies, including head-end studies on Liquid-Metal Fast Breeder Reactor (LMFBR) plutonium-uranium fuel and High-Temperature Gas-Cooled Reactor (HTGR) graphite-moderated thorium-uranium fuel.
- The CRF equipment in Cells 3 and 4 was removed and the cells were decontaminated by 1977 so that new equipment could be installed to expand the LMFBR and HTGR fuel processing studies.
- Building 4507 was placed in standby in 1980.

Waste Generating Activities

- Waste stream OR-CRF-CH-HET was generated from cleanup and decontamination of Building 4507 and removal of the filter pit equipment in Building 4556.
- Cleanup of the CRF began in the early-1970s. Tools and other processing equipment were removed from Cells 3 and 4. After additional remote washing and decontamination with rags, the hot cells were entered in air-supplied suits so that structural components, piping, and other permanent fixtures could be cut and removed. Sandblasting was used to remove contaminated paint from cell access holes and the concrete walls of the hot cells. Once sandblasting was complete, the surfaces were cleaned with a vacuum cleaner and washed with a detergent-water mixture. The interior of the maintenance glovebox in the penthouse was spray-painted to fix residual loose contamination.

Waste Generating Activities

- The waste in the two parent boxes from Building 4507 was originally buried in Trench 24 in Solid Waste Storage Area (SWSA) 5 North in approximately 1979. This waste was retrieved in 2006 and placed into B-88 metal boxes. The buried containers were typically in poor condition (corroded or decomposed because of high soil moisture content) so some of the surrounding soil from the trench was also included in the B-88 boxes during waste retrieval activities. The boxes were repackaged in the Transuranic Waste Processing Center (TWPC) Box Breakdown Area (BBA).
- Removal of equipment from the Building 4556 filter pit began in July 2012. Decontamination was accomplished with wipes and a vinyl latex/poly acrylate fixative. The Building 4507 hot cell ventilation system components to the discharge penetrations on the north wall were removed. The discharge ducts were cut six inches from the pit north wall and sealed with stainless steel caps with access plates. The by-pass duct was removed to the flange closest to Building 4507 and capped with a steel blank. The duct drain piping was cut and capped at the northeast corner of the pit.

Waste Remediation Activities

- As necessary, drums containing CH-TRU waste are moved to the TWPC Processing Building (PB) glovebox airlock. The drum is then moved to the drum tipper where the lid is removed and the drum contents are emptied into sorting trays. The waste articles are manually sorted and segregated to remove prohibited items and repackaged at glovebox load-out stations.
- Boxes containing CH-TRU waste are moved into the BBA in the PB. Within the BBA, the box lid is removed. The waste is inspected, removed, size reduced, and sorted manually within the BBA, and either packaged into new drums directly from the BBA or processed through the glovebox. Prohibited items identified during repackaging are removed from the waste stream or are remediated.
- If inner containers are identified with liquids, they are absorbed with Nochar N965 which is a blend of Nochar Acid Bond and Petro Bond. Suspect PCB liquids are absorbed with the Nochar N910 Petro Bond. Environmental media (e.g., soil, groundwater) is absorbed with Quik-Solid (sodium polyacrylate) or Solid-A-Sorb (diatomaceous earth).
- Secondary wastes created during waste processing, including rubber glovebox gloves, tools, rags, and absorbed liquids, are placed into TRU waste drums along with other waste from the waste stream being repackaged.

Waste Stream Information

Waste Stream Volume: 150 55-Gallon Drums

Waste Generation Dates: 11/1970 – 10/2012

Waste Remediation Dates: 2007 – Present

Summary Category Group: S5000 – Debris

Waste Matrix Code Group: Heterogeneous Debris

Waste Matrix Code: S5400 – Heterogeneous Debris Waste

Layers of Confinement: Maximum number of layers = 3

TRUPACT-II Content Code: OR125/225

Waste Stream Description

- Waste stream OR-CRF-CH-HET is comprised primarily of organic and inorganic debris waste items. Specific waste items include:
  - Iron-based metal items including banding, caps, chain, clips, containers (e.g., buckets, cans), ductwork, filter housing, fittings, hand tools (e.g., hacksaw, hammer, knives, ratchets, scissors, screwdrivers, sockets, tin snips, tongs, wrenches), hardware (e.g., bolts, clamps, washers), labware, lids, pipe, rods, saw blades, scrap, screens, sheeting, tanks, and wire.
  - Aluminum metal items such foil and respirator cartridges.
  - Other metals such as batteries (e.g., alkaline); Hastelloy C, a nickel-chromium-molybdenum alloy (e.g., ferrules, piping, tanks); lead (e.g., bricks, shot); tantalum (e.g., coils, ferrules, piping, process vessels, tank liners); and Zircaloy, a zirconium alloy (e.g., ferrules, piping, process vessels).
  - Other inorganic materials including absorbents (e.g., Solid-a-sorb [diatomaceous earth], ceramics (e.g., filters), fire blankets, floor sweepings, and glass/broken glass (e.g., fritted glass filters, funnels, jars, mirrors, process vessels).
  - Cellulosic items such as absorbent pads, cardboard (e.g., boxes, liner inserts, tubes), cheesecloth, cloth (e.g., cotton liners, rags, skull caps, towels), coveralls, gauze, leather gloves, masking tape, mop heads, paint brushes, paper (e.g., towels), smears, and wood (e.g., broom, handles).

Waste Stream Description

- Plastic items including bags, containers (e.g., bottles, buckets), dry marker, electrical cord, foam (e.g., ear plugs, head bands, knee pads), Herculite (industrial fabric), hoods, latex gloves, manipulator boots, nylon belts, plexiglass, polypropylene-fiber cartridge filters, rope, sheeting, shoe covers, styrofoam, suits, tape, ties, trays, and tubing.
- Rubber items such as booties, gaskets, gloves, hose, mats, O-rings, and respirators.
- Organic matrix such as small amounts of liquid absorbed with Nochar N910 and N965 (polymer absorbent).
- Inorganic matrix such as small amounts of liquid absorbed with Solid-a-sorb (diatomaceous earth) absorbent.
- Soil (Solid-a-sorb and/or Nochar N965 absorbents added to soil).
  - Most of the box daughter drums from parents X10C0402972 and X10C0402973 contain soil mixed with Solid-a-sorb. Some of these drums contain both Solid-a-sorb and Nochar N965.
  - The box daughter drums from parent X10C0801888 contain Quik-Solid (organic polymer) added by the generator and Solid-a-sorb added by the TWPC.
  - Repackaged drums X10C9311541A, X10C9311728A, X10C9312045A, X10C9312755A, and X10C9312863A all contain Nochar N965 and no Solid-a-sorb.
- Other equipment and electrical devices (e.g., motors, muffle furnace, probe, pump, saw, vacuum cleaner). These equipment items may consist of multiple waste material parameters.

Waste Matrix Code

- **S5400, Heterogeneous Debris Waste** – Waste stream OR-CRF-CH-HET is comprised primarily of numerous organic and inorganic debris waste materials.
  - The waste matrix code was assigned based on the evaluation of AK information relating to the physical form of the waste recorded on waste disposal forms and TWPC VE and repackaging data forms.
- Accordingly, Waste Matrix Code S5400, Heterogeneous Debris Waste, is applied to this waste stream. This category includes waste that is at least 50 percent, by volume, debris materials.
- Some drums in this waste stream also contain soil and/or absorbed liquids. As previously described, the soil is from Trench 24 in SWSA 5 North where the waste in two boxes from Building 4507 was previously buried. Individual drums in this waste stream will contain less than 50 percent, by volume, of these materials.
  - Any drum identified by RTR as containing more than 50 percent, by volume, homogenous waste or soil will be removed from this debris waste stream.

Waste Material Parameters

Waste Material Parameter	Weight Percent	Weight Percent Range
Iron-based Metal/Alloy	54.0%	0 – 73.4%
Aluminum-based Metal/Alloy	0.1%	0 – 0.2%
Other Metals/Alloy	1.7%	0 – 2.3%
Other Inorganic Materials	2.1%	0 – 2.9%
Cellulosics	10.0%	0 – 13.6%
Plastics (waste materials)	3.9%	0 – 5.3%
Rubber	1.9%	0 – 2.6%
Organic Matrix [1]	<0.1%	0 – 5.0%
Inorganic Matrix [1]	<0.1%	0 – 5.0%
Soil [2]	26.4%	0 – 30.0%

1. Although not identified in the VE data, small amounts of organic matrix and inorganic matrix may be present in this waste stream. The TWPC uses Nochar N910 and N965 (organic polymer absorbent) and Solid-a-sorb (inorganic diatomaceous earth) to absorb liquids. Quick-Solid (organic polymer absorbent) was added to the waste from Building 4556 by the generator.
2. This soil weight includes Solid-a-sorb and/or Nochar N965 that were added to the soil by the TWPC to prevent desorption of liquid. If RTR is unable to distinguish the soil from the absorbent, "Soil/Gravel" will be assigned to the soil and absorbent mixture.

Radiological Characteristics

Mass Isotopic Distribution for Waste Stream OR-CRF-CH-HET

Radionuclide	Weight Percent	Weight Percent Range
Am-241	<0.1%	0 – 100%
Pu-238	<0.1%	0 – 100%
Pu-239	**4.7%**	0 – 98.6%
Pu-240	1.3%	0 – 22.6%
Pu-242	2.1%	0 – 0.8%
U-233	0.3%	0 – 99.9%
U-234	<0.1%	0 – 65.0%
U-238	3.6%	0 – 99.7%
Cs-137	<0.1%	0 – 1.2%
Sr-90	<0.1%	0 – 0.8%
Additional Radionuclides		
I-129	**7.1%**	0 – 99.95%
U-235	2.0%	0 – 99.8%
Cm-244	**78.5%**	0 – 61.3%

* Other radionuclides present in trace quantities (<0.1%) include Mn-54, Co-58, Co-60, Sr-89, Zr-95, Nb-94, Nb-95, Eu-152, Eu-154, Eu-155, Ra-226, Ac-227, Th-228, Th-229, Th-232, Pa-231, U-232, U-236, Np-237, Pu-241, Am-243, Cm-242, Cm-243, Cm-245, Cm-246, Cm-247, Cm-248, Bk-249, Cf-249, Cf-252.

Radiological Characteristics

- The radiological characterization of waste stream OR-CRF-CH-HET is based primarily on generator data (not decay-corrected) reported on waste disposal forms and in the *eMWaste* database for the original ten parent containers. Other nuclides not reported by the generator are included in this characterization based on previous TWPC radioassay.
- As shown in the above table, the two most prevalent radionuclide by mass in the waste stream are Cm-244 and Pu-239 at 78.5 percent and 4.7 percent, respectively.
  - I-129 is actually the second most prevalent nuclide, but I-129 is a beta emitter and cannot be directly measured by gamma NDA. However, this is of no consequence because I-129 has an unlimited A2 value and therefore will not contribute to 95 percent of the radioactive hazard.

RCRA Characterization

EPA Hazardous Waste Number	Constituent
Toxicity Characteristic Compounds	
D006	Cadmium
D008	Lead
D009	Mercury
D011	Silver

- Methanol is the only F-listed solvent identified for this waste stream. Methanol, an F003-listed solvent, was used as a reductant in historical processing in the CRF. This use of methanol does not constitute solvent use. In addition, F003-listed solvents are listed solely for ignitability, and this waste stream does not exhibit the characteristic of ignitability because the solvent is not in liquid form. Therefore, waste stream OR-CRF-CH-HET is not an F-listed hazardous waste.

RCRA Characterization

- Waste stream OR-CRF-CH-HET does not exhibit the characteristics of ignitibility, corrosivity, or reactivity, and therefore is not assigned EPA hazardous waste numbers D001, D002, or D003.
  - Processing solutions containing potentially hazardous chemical reagents in their pure form were prepared outside the hot cells in the chemical makeup area which contained tanks and pumps for feeding chemicals to equipment in the hot cells and solution addition funnel stations for transferring solutions to the cell tanks.
  - Aqueous and organic waste solutions were discharged to drains and sumps in the hot cells, collected in tanks, and transferred by pipeline to the tank farm and/or liquid waste treatment facility.
  - Cyanide and sulfide compounds were not used in Building 4507.
  - Ion-exchange resins were not identified in the waste during repackaging at the TWPC. Regardless, there would be no reactivity issue associated with these resins because based on the ion-exchange process in Building 4507, the resins would be in the chloride form and not the nitrate form.
  - Sodium-potassium liquid metal alloy was present in irradiated fuel capsules handled in Building 4507. Procedures were in place for handling this water reactive material and to extinguish fires if they occurred. As previously described, this waste stream is from cleanup and decontamination of Cells 3 and 4 when these areas were used for CRF operations. The waste stream does not include waste from the fuel processing studies. Therefore, sodium-potassium alloy will not be present in this waste stream.

RCRA Characterization

- Testing by the Nochar company has been done showing that Nochar N965 can be used to absorb concentrated acids, including nitric acid. Testing was also performed using a sample of Nochar containing concentrated nitric acid which shows the sample does not meet the RCRA definition of an oxidizer. In addition, any residue remaining in inner containers that held oxidizing solutions that have evaporated are considered empty, and therefore, are not hazardous because RCRA excludes residues of hazardous waste in empty containers. The remaining oxidizer residue is not going to be present in quantities sufficient to be a concern.
- An energetic material is any material that may undergo a spontaneous energetic chemical reaction due to age, concentration, degradation, or oxidation potential when exposed to shock, friction, temperature change, air, or other initiating events. Field evaluations are performed at the TWPC by Energetic Material Subject Matter Experts when notified by operations personnel that materials have been discovered during repackaging operations that require evaluation for the presence of potentially energetic materials. The evaluation of the characteristics of the discovered items are documented on the Field Evaluation of Potentially Energetic Materials form.
- To ensure the waste does not exhibit the characteristic of ignitability, corrosivity, or reactivity; prohibited quantities of liquids will be immobilized, compressed gases will be removed or vented, and energetic material (e.g., explosives, pyrophorics) will be removed or remediated. Compressed gases and energetic materials have not been identified during repackaging of this waste stream.

TSCA Characterization

- This waste stream does not contain regulated levels of PCBs, and therefore, is not regulated by the Toxic Substance Control Act.
  - The TWPC has been identifying PCBs during waste repackaging on the *Contact Handled Waste Repackaging Data Form* since December 2010. Beginning in June 2012, known or suspect PCB materials discovered during waste repackaging were segregated from the waste to the extent possible with the exception of PCB Bulk Product waste items. Since April 2014, the TWPC has been absorbing known and suspect PCB liquids with Nochar Petro Bond N910.
  - The final rule banning PCB manufacturing, processing, distribution in commerce, and use was promulgated in 1979 (www.epa.gov/pcb). The one box from Building 4556 contains mostly metal ductwork removed in 2012, and the UCN-2109 form indicates this is not a PCB waste. The waste from Building 4507 was generated before 1979. This entire waste stream has been repackaged at the TWPC. Most of the containers were repackaged after December 2010, and none were identified as containing PCB waste. Four drums were repackaged before December 2010. The Contact Handled Waste Repackaging Data Form for three of the drums does not identify any items that would be suspected of containing PCB waste. The other drum (X10C9311728A) is described as containing a furnace and a pump. Based on review of the RTR video for X10C9311728A, the pump is an air cooled diaphragm pump, and the furnace did not contain a motor with a capacitor.
- If RTR identifies drums containing pumps, small capacitors contained in electric motors and light ballasts, or other potential PCB-containing items, the waste will be managed as a PCB waste in accordance with the CCP TRU Waste Certification Program.

Prohibited Items

- RTR performed by ORNL as well as the TWPC identified liquids and sealed containers greater than four liters in some of the containers in this waste stream.
- Waste was sealed by twist/fold and tape or heat-sealed, but heat-sealing was the preferred sealing method. It is possible that unvented heat-sealed bags were greater than four liters (fully expanded volume) with a surface area less than 390 square inches. For this reason, every drum in this waste stream has been repackaged at the TWPC to breach heat-sealed bags and remediate other prohibited items.
- Certified RTR and/or VE are performed by CCP to ensure the waste does not contain prohibited items in accordance with the WIPP-WAC and WIPP-WAP. Prohibited items are remediated or removed from the waste stream as necessary by TWPC personnel.

Waste Packaging

- The generator packaged waste items in metal cans and plastic bags. Glass and other small pointed or sharp objects were first placed in another container (cardboard carton, metal can). Sharp points on larger equipment and materials were covered. Waste was removed from gloveboxes in two layers of plastic bags that were closed by heat-sealing or taping. Heat-sealing, which used heat to soften the bonding areas of the plastic, was the preferred sealing method used in Building 4507 in the 1970s.
- ORNL began installing filter vents in new drums in 1988. For drums generated before 1988, filter vents were installed by ORNL prior to being transferred to the TWPC. Drums being repackaged at the TWPC are vented at the time of packaging. Each container will be inspected by CCP for the presence of an approved filter vent.
- DOT Specification 7A Type A 55-gallon drums are used for waste repackaging at the TWPC. Drums are lined with a cardboard liner and a filtered 6-mil poly liner bag; lead and plastic rigid liners are not used. When a drum is ready to be closed, the liner bag is twisted, and a cable tie wrap is wrapped around the twisted section and tightened using a banding tool. Additional tape is then wrapped around the twisted section. Hydrogen diffusion rate testing of cable tie wraps indicates that they are an acceptable closure method.
- Based on a review of the TWPC VE and repackaging data forms, most of the drums in this waste stream have one or two layers of confinement, including a filtered drum liner bag. One drum was identified with three layers of confinement.

New Requirements in CCP-TP-005

- Acceptable Knowledge Assessment (AKA)
  - An AKA will be performed for existing waste streams with unshipped containers.
  - The AKA focuses on the management of potentially ignitable, corrosive, reactive, and incompatible waste materials, including the evaluation of absorbents, immobilization products, and neutralization reagents.
- Attachment 9, Interface Waste Management Documents List
  - Includes documents and procedures pertaining to waste management and packaging activities for on-going waste generation operations and for TWPC repackaging/remediation operations.
  - Includes verification of these documents with generator points of contact/subject matter experts involved directly with the generation/remediation of the waste.
  - Documents and procedures must be verified to be current prior to adding new containers to the waste stream.
- Chemical Compatibility Evaluation
  - As part of the process for characterizing and certifying TRU waste for disposal at WIPP, it is necessary to consider the range of possible chemical combinations that could occur in each waste stream.
  - Potential adverse chemical reactions that stem from combining chemicals need to be considered to support safe and compliant waste management.

QUESTIONS ?

Acknowledgement of Briefing

- Complete a CCP Attendance Sheet and send it to Jake Knox at Jake.Knox@wipp.ws.
- For questions related to this briefing, please contact Jeff Harrison at 720.977.7042 or Trash_Talk@msn.com.

COPY

CCP ATTENDANCE SHEET

COURSE NAME: CCP-AK-ORNL-013, Rev. 0 Briefing **DATE:** 5/~~16~~17/16
REW 5-17-16

LOCATION: Teleconference

	NAME (PRINT NAME)	TITLE/POSITION	SIGNATURE
1.	Beverly Schrock	SPM	BSSchrock
2.	Richard Kantrowitz	SPM	
3.	Rick Whiteley	SPM	
4.	ROGER WHITEAKER	SPM	
5.	Jake Knox	SPM	
6.	Daniel Wade	SPM	
7.			
8.			
9.		JK 5/17/16	
10.			
11.			
12.			

Jake Knox — *Instructor Name (Print)*

Signature

5/17/16 — *Date*

COPY

CCP ATTENDANCE SHEET

COURSE NAME: CCP-AK-ORNL-013, Rev. 0 Briefing DATE: 5/17/16

LOCATION: ORNL

	NAME (PRINT NAME)	TITLE/POSITION	SIGNATURE
1.	Derek Matheny	VPM/VEE	
2.	Gilbert Gutierrez	VEO	
3.	Fred Oney	RTR	
4.	Eric Lyles	RTR/NDE	
5.	Pat Tilmon	VPM/VEE	
6.	Anthony Hardey	VEO	
7.			
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11.			
12.			

Jake Knox
Instructor Name (Print)

Signature

5/17/16
Date

COPY

CCP ATTENDANCE SHEET

COURSE NAME: CCP-AK-ORNL-013, Rev. 0 Briefing

DATE: ~~5/16/16~~ 5/17/16 JK 5/17/16

LOCATION: Teleconference

	NAME (PRINT NAME)	TITLE/POSITION	SIGNATURE
1.	Thomas G. Barton	SMR	Thomas G. Barton
2.	Aaron Clements	Waste Acceptance/TWPC	Aaron Clements
3.	Don E. Coffey	TWPC/AK PKG	Don E. Coffey
4.	Sam Thomas	TWPC/EPM	
5.			
6.			
7.		JK 5/17/16	
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Jake Knox
Instructor Name (Print)

Jake
Signature

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COURSE NAME: CCP-AK-ORNL-013, Rev. 0 Briefing **DATE:** ~~5/16/16~~ 5/17/16 JK 5/17/16

LOCATION: Teleconference

	NAME (PRINT NAME)	TITLE/POSITION	SIGNATURE
1.	Kevin D. East	Ops. Proc. Supv.	Kevin D. East
2.			
3.			
4.			
5.			
6.		JK 5/17/16	
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Jake Knox — *Instructor Name (Print)*

Signature

5/17/16 — *Date*

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COURSE NAME: CCP-AK-ORNL-013, Rev. 0 Briefing DATE: ~~5/16/16~~ 5/17/16

LOCATION: Teleconference

	NAME (PRINT NAME)	TITLE/POSITION	SIGNATURE
1.	STEVE SKIBBIE	CCP AKE	
2.			
3.			
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Signature

5/17/16 — *Date*

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COURSE NAME: CCP-AK-ORNL-013, Rev. 0 Briefing

DATE: ~~5/16/16~~ 5/17/16 JK 5/17/16

LOCATION: Teleconference

	NAME (PRINT NAME)	TITLE/POSITION	SIGNATURE
1.	JEFF HARRISON	AKE	Jeffrey L. Harrison
2.			
3.			
4.			
5.			
6.			
7.		N/A JH 5/17/16	
8.			
9.			
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12.			

Jake Knox
Instructor Name (Print)

Jake Knox
Signature

5/17/16
Date

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CCP ATTENDANCE SHEET

COURSE NAME: CCP-AK-ORNL-013, Rev. 0 Briefing DATE: ~~5/16/16~~ 5/17/16

LOCATION: Teleconference

	NAME (PRINT NAME)	TITLE/POSITION	SIGNATURE
1.	Kevin J. Peters	AKE	
2.			
3.	5/17/16	5/17/16	
4.			5/17/16
5.			
6.	NA	NA	NA
7.			
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Jake Knox
Instructor Name (Print)

Signature

5/17/16
Date

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CCP ATTENDANCE SHEET

COURSE NAME: CCP-AK-ORNL-013, Rev. 0 Briefing **DATE:** 5/16/16 & 5-17-16

LOCATION: Teleconference

	NAME (PRINT NAME)	TITLE/POSITION	SIGNATURE
1.	Charles Turner	SPM	
2.			
3.			
4.			
5.			
6.			
7.		NA DC 5-17-16	
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Jake Knox		5/17/16
Instructor Name (Print)	*Signature*	*Date*

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COURSE NAME: CCP-AK-ORNL-013, Rev. 0 Briefing DATE: 5/16/16

LOCATION: Teleconference

	NAME (PRINT NAME)	TITLE/POSITION	SIGNATURE
1.	LAURA Turner	SPM	Laura Turner
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7.		5/17/16	
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Jake Knox
Instructor Name (Print)

Jake Knox
Signature

5/17/16
Date

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COURSE NAME: CCP-AK-ORNL-013, Rev. 0 Briefing

DATE: ~~5/16/16~~ 5/17/16 JK 5/17/16

LOCATION: Teleconference (LANL)

	NAME (PRINT NAME)	TITLE/POSITION	SIGNATURE
1.	Tommy Mojica	VEE/VPM/CM	
2.			
3.			
4.			
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6.		N/A	
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12.			

Jake Knox — *Instructor Name (Print)*

Signature

5/17/16 — *Date*

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COURSE NAME: CCP-AK-ORNL-013, Rev. 0 Briefing

DATE: ~~5/16/16~~ 5/17/16 JK 5/17/16

LOCATION: Teleconference

	NAME (PRINT NAME)	TITLE/POSITION	SIGNATURE
1.	MIKE SWIDES	MLLW/LLW AWCD	
2.			
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JK 5/17/16

Jake Knox
Instructor Name (Print)

Signature

5/17/16
Date

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CCP ATTENDANCE SHEET

COURSE NAME: CCP-AK-ORNL-013, Rev. 0 Briefing DATE: ~~5/16/16~~ 5/19/16 JK 5/19/16

LOCATION: Teleconference

	NAME (PRINT NAME)	TITLE/POSITION	SIGNATURE
1.	Joseph Jones	NS Mngr	Joseph M Jones
2.			
3.			
4.			
5.			
6.		JK 5/19/16	
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12.			

Jake Knox
Instructor Name (Print)

Signature

5/19/16
Date

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COURSE NAME: CCP-AK-ORNL-013, Rev. 0 Briefing DATE: ~~5/16/16~~ 5/19/16 JK 5/19/16

LOCATION: Teleconference

	NAME (PRINT NAME)	TITLE/POSITION	SIGNATURE
1.	THAD HASSELSTROM	OPERATOR/NDE	
2.	AARON ELLIOTT	OPERATOR/NDE	
3.	Kenneth Simpson	operator/NDE	
4.			
5.			
6.		N/A	
7.		KLS 5-17-2016	
8.			
9.			
10.			
11.			
12.			

Jake Knox
Instructor Name (Print)

Signature

5/19/16
Date

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COURSE NAME: CCP-AK-ORNL-013, Rev. 0 Briefing

DATE: ~~5/16/16~~ 5/23/16 JK 5/23/16

LOCATION: Teleconference

	NAME (PRINT NAME)	TITLE/POSITION	SIGNATURE
1.	James M Schoen	AKE	
2.			
3.			
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11.			
12.			

JK 5/23/16

Jake Knox
Instructor Name (Print)

Signature

5/23/16
Date

Table C6-3 Radiography Checklist
ORNL/CCP Recertification Audit
April 19 – 21, 2016

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Radiography Checklist

	WAP Requirement[1] ORNL/CCP Audit A-16-15 Table C6-3 Radiography Checklist	Procedure Documented		Example of Implementation/ Objective Evidence, as applicable		Comment (e.g., any change in procedure since last audit, etc.)
		Location	Adequate? Y/N (Why)	Item Reviewed	Adequate? Y/N	
	QUALITY ASSURANCE OBJECTIVES					
233	Are process procedures in place to meet the following Quality Assurance Objectives? <u>Precision</u> • Does the site describe in its QAPjP and SOP(s) activities to reconcile any discrepancies between two radiography operators with regard to identification of the waste matrix code, liquids in excess of TSDF-WAC limits, and compressed gases through independent replicate scans and independent observations? And additionally, activities to verify the precision of radiography prior to use by tuning precisely enough to demonstrate compliance with QAOs through viewing an image test pattern? <u>Accuracy</u> • Was accuracy obtained by using a target to tune the image for maximum sharpness and by requiring operators to successfully identify 100 percent of the required items in a training container during their initial qualification and subsequent requalification	CCP-TP-053 S. 4.3.4 S. 4.5 S. 4.6 CCP-QP-002 S. 4.8.2[H.2](a) Att. 4 & 5	Y	<u>RTR BDRs:</u> OR-RTR6-0650 OR-RTR6-0654 OR-RTR6-0676 OR-RTR6-0688 OR-RTR6-0695 OR-RTR6-0706 OR-RTR6-0713 OR-RTR6-0723 OR-RTR7-0138 OR-RTR7-0148 **(RTR-1)** Qualification Cards for 5 RTR Operators **(RTR-2)**	Y	
233a	<u>Completeness</u> • Was an audio/videotape (or equivalent media) of the radiography examination and a radiography data form validated according to the requirements in Section C3-4? • Was an audio/videotape (or equivalent media) of the radiography examination and a radiography data form obtained for 100% of the waste containers subject to radiography? <u>Comparability</u> • Is comparability ensured through the use of standardized radiography procedures and operator training and qualifications (Section C3-2a)	CCP-TP-053 S. 2.2 S. 4.3 S. 4.4 S. 4.10 Att. 2 & 3 CCP-QP-002 S. 4.8.2	Y	<u>RTR BDRs:</u> OR-RTR6-0650 OR-RTR6-0654 OR-RTR6-0676 OR-RTR6-0688 OR-RTR6-0695 OR-RTR6-0706 OR-RTR6-0713 OR-RTR6-0723 OR-RTR7-0138 OR-RTR7-0148 **(RTR-1)** Qualification Cards for 5 RTR Operators **(RTR-2)**	Y	

	WAP Requirement[1] ORNL/CCP Audit A-16-15 Table C6-3 Radiography Checklist	Procedure Documented		Example of Implementation/ Objective Evidence, as applicable		Comment (e.g., any change in procedure since last audit, etc.)
		Location	Adequate? Y/N (Why)	Item Reviewed	Adequate? Y/N	
	CHARACTERIZATION AND SYSTEM REQUIREMENTS					
234	Does the site have procedures to ensure that radiography is used to identify and verify waste container contents and verify the waste's physical form? Does the site have procedures to identify prohibited materials? (Section C-3b; C1-1)	CCP-TP-053 S. 1.0 & Table 1 Att. 2	Y	RTR BDRs: OR-RTR6-0650 OR-RTR6-0654 OR-RTR6-0676 OR-RTR6-0688 OR-RTR6-0695 OR-RTR6-0706 OR-RTR6-0713 OR-RTR6-0723 OR-RTR7-0138 OR-RTR7-0148 **(RTR-1)**	Y	
235	Do procedures or other supporting documentation ensure that every waste container will undergo radiography and/or VE as necessary to augment AK? (Section C-3b)	CCP-PO-001 S. C-3b CCP-TP-001 S. 1.0 & 4.2 CCP-TP-500 S. 1.0	Y	OR-RTR6-0650 OR-RTR6-0652 OR-RTR6-0701 OR-RTR6-0716 OR-RTR6-0723 OR-RTR6-0736 OR-RTR6-0739 OR-RTR7-0131 OR-RTR7-0149 **(GEN-1)** ORVECH0135 ORVECH0142 ORVECH0145 ORNLRHVE15002 ORNLRHVE15006 ORNLRHVE15008 ORNLRHVE16001 **(GEN-2)**	Y	
236	Do procedures ensure that containers whose contents prevent full examination are examined by visual examination rather than by radiography unless the site certifies that visual examination would provide no additional relevant information for that container based on the AK information for the waste stream? (Section C1-1)	CCP-TP-053 S. 4.4.3[D] & [E]	Y	RTR BDRs: OR-RTR6-0650 OR-RTR6-0654 OR-RTR6-0676 OR-RTR6-0688 OR-RTR6-0695 OR-RTR6-0706	Y	

	WAP Requirement[1] ORNL/CCP Audit A-16-15 Table C6-3 Radiography Checklist	Procedure Documented		Example of Implementation/ Objective Evidence, as applicable		Comment (e.g., any change in procedure since last audit, etc.)
		Location	Adequate? Y/N (Why)	Item Reviewed	Adequate? Y/N	
				OR-RTR6-0713 OR-RTR6-0723 OR-RTR7-0138 OR-RTR7-0148 **(RTR-1)**		
237	Do procedures or other supporting documentation ensure that the physical form determined by radiography is compared with the waste stream descriptions? If discrepancies are noted, will a new waste stream be identified? (Section C-3b)	**RTR** CCP-TP-053 S. 1.0 & 4.4.3[C] Att. 2 & 3 **PL** CCP-PO-001 S. C3-b CCP-TP-001 S. 1.0 & 4.2 CCP-TP-002 S. 4.7	Y	RTR BDRs: OR-RTR6-0650 OR-RTR6-0654 OR-RTR6-0676 OR-RTR6-0688 OR-RTR6-0695 OR-RTR6-0706 OR-RTR6-0713 OR-RTR6-0723 OR-RTR7-0138 OR-RTR7-0148 **(RTR-1)** OR-RTR6-0650 OR-RTR6-0652 OR-RTR6-0701 OR-RTR6-0716 OR-RTR6-0723 OR-RTR6-0736 OR-RTR6-0739 OR-RTR7-0131 OR-RTR7-0149 **(GEN-1)** CP:11:01531 – Transmittal of ORNL Site WSPF for WS OR-ISTP-CH-HET CP:15:01018 – Transmittal of ORNL CIS for WS#OR-ISTP-CH-HET Lots 4-8 CP:15:01262 – Transmittal of ORNLCIS for WS #OR-ISTP-CH-HET Lots 9-15 CP:10:01547 –	Y	

	WAP Requirement[1] ORNL/CCP Audit A-16-15 Table C6-3 Radiography Checklist	Procedure Documented		Example of Implementation/ Objective Evidence, as applicable		Comment (e.g., any change in procedure since last audit, etc.)
		Location	Adequate? Y/N (Why)	Item Reviewed	Adequate? Y/N	
				Transmittal of ORNL WSPF for WS #OR-CHEM-CH-HET CP:15:01265 – Transmittal of ORNL CIS for WS #OR-CHEM-CH-HET Lot 6 CP:16:01091 – Transmittal of ORNL CIS for WS #OR-CHEM-CH-HET Lot 7 CP:10:01051 – Transmittal of ORNL WSPF for WS #OR-RF-CH-HET CP:11:01017 – Transmittal of ORNL CIS for WS #OR-RF-CH-HET Lots 8-9 CP:09:01234 – Transmittal of WSPF for OR-REDC-RH-HET at ORNL CP:16:01076 – Transmittal of WSPF Change Notice #1 for ORNL RH WS OR-REDC-RH-HET CP:16:01060 – Transmittal of CIS for RH Lots 30-33 for WS OR-REDC-RH-HET CP:16:01086 – Transmittal of CIS for RH Lots 34-35 WS OR-REDC-RH-HET **(GEN-3)** ORNL Discrepancy Resolutions: DR027, DR045, DR046, and DR047 **(GEN-4)**		

	WAP Requirement[1] ORNL/CCP Audit A-16-15 Table C6-3 Radiography Checklist	Procedure Documented		Example of Implementation/ Objective Evidence, as applicable		Comment (e.g., any change in procedure since last audit, etc.)
		Location	Adequate? Y/N (Why)	Item Reviewed	Adequate? Y/N	
238	Are there procedures to ensure the data is obtained from an audio/video recorded scan provided by trained radiography operators? (Section C1-1)	CCP-TP-053 S. 2.2 S. 4.4.1[D] Att. 2 & 3	Y	RTR BDRs: OR-RTR6-0650 OR-RTR6-0654 OR-RTR6-0676 OR-RTR6-0688 OR-RTR6-0695 OR-RTR6-0706 OR-RTR6-0713 OR-RTR6-0723 OR-RTR7-0138 OR-RTR7-0148 **(RTR-1)**	Y	
239	Were all activities required to achieve the radiography objective described in site Quality Assurance Project Plans (QAPjPs) and Standard Operating Procedures (SOPs)? (Section C3-2)	CCP-PO-001 S. C3-2a CCP-TP-053 (ALL)	Y	RTR BDRs: OR-RTR6-0650 OR-RTR6-0654 OR-RTR6-0676 OR-RTR6-0688 OR-RTR6-0695 OR-RTR6-0706 OR-RTR6-0713 OR-RTR6-0723 OR-RTR7-0138 OR-RTR7-0148 **(RTR-1)**	Y	
240	Did the radiography system consist of the following equipment or equivalent: • an X-ray producing device? • an imaging system? • an enclosure for radiation protection? • a waste container handling system? • an audio/video recording system or equivalent? • an operator control and data acquisition station? (Section C1-1)	CCP-TP-053 S. 2.3.1 CCP-TP-164 (ALL) CCP-TP-165 (ALL)	Y	RTR BDRs: OR-RTR6-0650 OR-RTR6-0654 OR-RTR6-0676 OR-RTR6-0688 OR-RTR6-0695 OR-RTR6-0706 OR-RTR6-0713 OR-RTR6-0723 OR-RTR7-0138 OR-RTR7-0148 **(RTR-1)**	Y	The audit team verified the radiography system contained the referenced components to adequately characterize container contents.

	WAP Requirement[1] ORNL/CCP Audit A-16-15 Table C6-3 Radiography Checklist	Procedure Documented		Example of Implementation/ Objective Evidence, as applicable		Comment (e.g., any change in procedure since last audit, etc.)
		Location	Adequate? Y/N (Why)	Item Reviewed	Adequate? Y/N	
241	Did the X-ray producing device have controls which allow the operator to vary voltage, thereby controlling image quality? Was it possible to vary the voltage, typically between 150-400 kV, to provide an optimum degree of penetration through the waste? Was high-density material examined with the X-ray device set on the maximum voltage? Was low-density material examined at lower voltage settings to improve contrast and image definition? (Section C1-1)	CCP-TP-053 S. 2.3.1 S. 4.4.1[D.1]	Y	RTR BDRs: OR-RTR6-0650 OR-RTR6-0654 OR-RTR6-0676 OR-RTR6-0688 OR-RTR6-0695 OR-RTR6-0706 OR-RTR6-0713 OR-RTR6-0723 OR-RTR7-0138 OR-RTR7-0148 **(RTR-1)**	Y	The audit team verified the radiography system contained the referenced components to adequately characterize container contents.
242	Do procedures or other documentation ensure that an audio/videotape or equivalent is made of the waste container scan and maintained as a non-permanent record? (Section C1-1)	CCP-TP-053 S. 4.3 S. 5.1.2 Att. 1-3	Y	RTR BDRs: OR-RTR6-0650 OR-RTR6-0654 OR-RTR6-0676 OR-RTR6-0688 OR-RTR6-0695 OR-RTR6-0706 OR-RTR6-0713 OR-RTR6-0723 OR-RTR7-0138 OR-RTR7-0148 **(RTR-1)**	Y	
	DATA COMPILATION					
243	Are there procedures to ensure that a radiography data form is used to document the waste matrix code, ensure the waste container contains no ignitable, corrosive or reactive waste by documenting the absence of liquid in excess of TSDF-WAC limits or compressed gases, and verify that the physical form of the waste is consistent with the waste stream description documented on the WSPF? (Section C1-1)	CCP-TP-053 S. 1.0, 4.4.2 [B] S. 4.4.3 Att. 2 & 3	Y	RTR BDRs: OR-RTR6-0650 OR-RTR6-0654 OR-RTR6-0676 OR-RTR6-0688 OR-RTR6-0695 OR-RTR6-0706 OR-RTR6-0713 OR-RTR6-0723 OR-RTR7-0138 OR-RTR7-0148 **(RTR-1)**	Y	

	WAP Requirement[1] ORNL/CCP Audit A-16-15 Table C6-3 Radiography Checklist	Procedure Documented		Example of Implementation/ Objective Evidence, as applicable		Comment (e.g., any change in procedure since last audit, etc.)
		Location	Adequate? Y/N (Why)	Item Reviewed	Adequate? Y/N	
245	If radiography indicates that the waste does not match the waste stream description, do procedures ensure that the appropriate corrective action was taken? (Section C-3b)	CCP-TP-053 S. 4.4.3 [C]	Y	RTR BDRs: OR-RTR6-0650 OR-RTR6-0654 OR-RTR6-0676 OR-RTR6-0688 OR-RTR6-0695 OR-RTR6-0706 OR-RTR6-0713 OR-RTR6-0723 OR-RTR7-0138 OR-RTR7-0148 **(RTR-1)**	Y	
246	If a discrepancy is noted, do procedures ensure that the proper waste stream assignment is determined, the correct hazardous waste numbers assigned, and the resolution documented? (Section C-3b)	CCP-TP-005 S. 4.8 S. 4.9 Att. 10 & 11	Y	AK Discrepancy Resolutions at Characterization and AK Reevaluations **(AK-20)**	Y	
	TRAINING					
247	Do site procedures ensure that only trained personnel are allowed to operate radiography equipment? (Section C1-1)	CCP-TP-053 S. 2.2.1 CCP-QP-002 S. 4.8.2	Y	Qualification Cards for 5 RTR Operators **(RTR-2)**	Y	
248	Do site procedures ensure that training requirements for radiography operators is based upon existing industry standard training requirements? (Section C1-1)	CCP-QP-002 S. 4.8.2[D]	Y	Qualification Cards for 5 RTR Operators **(RTR-2)**	Y	
249	Does the documented training program provide radiography operators with both formal and on-the-job training (OJT)? (Section C1-1)	CCP-QP-002 S. 4.8.2	Y	Qualification Cards for 5 RTR Operators **(RTR-2)**	Y	
250	Does the documented training program ensure that the radiography operators are instructed in the specific waste generating practices and typical packaging configurations expected to be found in each waste stream at the site? (Section C1-1)	CCP-QP-002 S. 4.1 S. 4.7 & NOTE	Y	Qualification Cards for 5 RTR Operators **(RTR-2)**	Y	
251	Does the documented training program ensure that the OJT and apprenticeship are conducted by an experienced, qualified radiography operator prior to qualification of the candidate? (Section C1-1)	CCP-QP-002 S. 4.8.2[E]	Y	Qualification Cards for 5 RTR Operators **(RTR-2)**	Y	

	WAP Requirement[1] ORNL/CCP Audit A-16-15 Table C6-3 Radiography Checklist	Procedure Documented		Example of Implementation/ Objective Evidence, as applicable		Comment (e.g., any change in procedure since last audit, etc.)
		Location	Adequate? Y/N (Why)	Item Reviewed	Adequate? Y/N	
252	Is the documented training program site specific? (Section C1-1)	CCP-QP-002 S. 4.7 & NOTE	Y	Qualification Cards for 5 RTR Operators **(RTR-2)**	Y	
262	Does the documented training program ensure that a training drum with various container sizes is scanned by each operator on a semiannual basis? Is the videotape reviewed by a supervisor to ensure that operator's interpretations remain consistent and accurate? (Section C1-1)	CCP-QP-002 S. 4.8.2 [G.3](a) & NOTE above CCP-TP-028 (ALL)	Y	Qualification Cards for 5 RTR Operators **(RTR-2)**	Y	
263	Do site procedures ensure that the site prepares Testing Batch Data Reports or equivalent which includes all data pertaining to radiography for up to 20 waste containers without regard to waste matrix? (Section C3-4)	CCP-TP-053 S. 4.7.1	Y	RTR BDRs: OR-RTR6-0650 OR-RTR6-0654 OR-RTR6-0676 OR-RTR6-0688 OR-RTR6-0695 OR-RTR6-0706 OR-RTR6-0713 OR-RTR6-0723 OR-RTR7-0138 OR-RTR7-0148 **(RTR-1)**	Y	
	QUALITY ASSURANCE					
265	Does the documented training program ensure that the imaging system characteristics are verified on a routine basis? (Section C1-1)	CCP-TP-053 S. 4.3	Y	RTR BDRs: OR-RTR6-0650 OR-RTR6-0654 OR-RTR6-0676 OR-RTR6-0688 OR-RTR6-0695 OR-RTR6-0706 OR-RTR6-0713 OR-RTR6-0723 OR-RTR7-0138 OR-RTR7-0148 **(RTR-1)** Qualification Cards for 5 RTR Operators **(RTR-2)**	Y	

	WAP Requirement[1] ORNL/CCP Audit A-16-15 Table C6-3 Radiography Checklist	Procedure Documented		Example of Implementation/ Objective Evidence, as applicable		Comment (e.g., any change in procedure since last audit, etc.)
		Location	Adequate? Y/N (Why)	Item Reviewed	Adequate? Y/N	
266	Do procedures ensure that independent replicate scans and replicate observations of the video output of the radiography process are performed under uniform conditions and procedures? Are independent replicate scans performed on one waste container per day or per testing batch of 20 samples, which ever is less frequent, by a qualified radiography operator that was not involved in the original scan of the water container? Are independent observations of one scan (not the replicate scan) performed once per day or per testing batch, which ever is less frequent, by a qualified radiography operator that was not involved in the original scan of the waste container? (Section C1-1)	CCP-TP-053 S. 4.5 S. 4.6	Y	RTR BDRs: OR-RTR6-0650 OR-RTR6-0654 OR-RTR6-0676 OR-RTR6-0688 OR-RTR6-0695 OR-RTR6-0706 OR-RTR6-0713 OR-RTR6-0723 OR-RTR7-0138 OR-RTR7-0148 **(RTR-1)**	Y	
267	Do procedures ensure that oversight functions include periodic audio/video media reviews of accepted waste containers, are performed by qualified radiography operators that were not involved in the original scans of the waste containers? (Section C1-1)	CCP-TP-053 S. 4.5 S. 4.6	Y	RTR BDRs: OR-RTR6-0650 OR-RTR6-0654 OR-RTR6-0676 OR-RTR6-0688 OR-RTR6-0695 OR-RTR6-0706 OR-RTR6-0713 OR-RTR6-0723 OR-RTR7-0138 OR-RTR7-0148 **(RTR-1)**	Y	
268	Is the site project manager responsible for monitoring the quality of the radiography data and calling for corrective action, when necessary? (Section C1-1)	CCP-PO-001 S. C1-1 CCP-TP-001 S. 3.1.8	Y	OR-RTR6-0650 OR-RTR6-0652 OR-RTR6-0701 OR-RTR6-0716 OR-RTR6-0723 OR-RTR6-0736 OR-RTR6-0739 OR-RTR7-0131 OR-RTR7-0149 **(GEN-1)**	Y	
	DATA VALIDATION, REVIEW, VERIFICATION AND REPORTING					
277	Do procedures ensure that all applicable data generation review verification and validation activities specified in C3-4 are followed, including all signatory releases? (Section C3-4)	CCP-TP-053 S. 4.10 Att. 3	Y	RTR BDRs: OR-RTR6-0650 OR-RTR6-0654	Y	

	WAP Requirement[1] ORNL/CCP Audit A-16-15 Table C6-3 Radiography Checklist	Procedure Documented		Example of Implementation/ Objective Evidence, as applicable		Comment (e.g., any change in procedure since last audit, etc.)
		Location	Adequate? Y/N (Why)	Item Reviewed	Adequate? Y/N	
				OR-RTR6-0676 OR-RTR6-0688 OR-RTR6-0695 OR-RTR6-0706 OR-RTR6-0713 OR-RTR6-0723 OR-RTR7-0138 OR-RTR7-0148 **(RTR-1)**		
278	Do procedures ensure that radiography tapes have been reviewed at a frequency of one waste container per day or once per testing batch, whichever is less frequent, to ensure data are correct and completed? (Section C1-1)	CCP-TP-053 S. 4.6	Y	RTR BDRs: OR-RTR6-0650 OR-RTR6-0654 OR-RTR6-0676 OR-RTR6-0688 OR-RTR6-0695 OR-RTR6-0706 OR-RTR6-0713 OR-RTR6-0723 OR-RTR7-0138 OR-RTR7-0148 **(RTR-1)**	Y	
279	Do procedures ensure that all applicable project-level signatory releases and DQOs (Section C3-3) as specified in the WAP are performed? (Section C3-4b)	CCP-TP-001 S. 4.2 Att. 2	Y	OR-RTR6-0650 OR-RTR6-0652 OR-RTR6-0701 OR-RTR6-0716 OR-RTR6-0723 OR-RTR6-0736 OR-RTR6-0739 OR-RTR7-0131 OR-RTR7-0149 **(GEN-1)**	Y	
282	At the data generation level, do procedures ensure that all electronic and video data stored appropriately to ensure that waste container, sample, and associated QA data are readily retrievable? Are radiography tapes reviewed, at a frequency of one waste container per day or once per testing batch, whichever is less frequent, against the data reported on the radiography form? (Section C3-4a, C3-4a(1))	CCP-TP-053 S. 4.6 S. 5.0	Y	RTR BDRs: OR-RTR6-0650 OR-RTR6-0654 OR-RTR6-0676 OR-RTR6-0688 OR-RTR6-0695 OR-RTR6-0706 OR-RTR6-0713	Y	

	WAP Requirement[1] ORNL/CCP Audit A-16-15 Table C6-3 Radiography Checklist	Procedure Documented		Example of Implementation/ Objective Evidence, as applicable		Comment (e.g., any change in procedure since last audit, etc.)
		Location	Adequate? Y/N (Why)	Item Reviewed	Adequate? Y/N	
				OR-RTR6-0723 OR-RTR7-0138 OR-RTR7-0148 **(RTR-1)**		
283	At the project level, do procedures require the Site Project Manager to certify that the radiography data are complete and acceptable based on the videotape review of at least one waste container per testing batch or daily, whichever is less frequent? (Section C3-4b(1))	CCP-TP-001 S. 4.2 Att. 2	Y	OR-RTR6-0650 OR-RTR6-0652 OR-RTR6-0701 OR-RTR6-0716 OR-RTR6-0723 OR-RTR6-0736 OR-RTR6-0739 OR-RTR7-0131 OR-RTR7-0149 **(GEN-1)**	Y	

1. The WAP requirements should be presented in documents, such as procedures. Each of the questions posed under WAP requirements is meant to ask whether procedures are in place or whether documents are evident which demonstrate that the specific WAP requirement is or can be met.

Attachment 2 – CCP SPM Radiography Project Level Validation Checklist and Summary

BDR Number: OR-RTR6-0650				Examination Date(s): 04/27/2015
Description of Criteria Reviewed	**Criteria Met?**			**Comments/Qualifiers**
	YES	**NO**	**NA**	
1. Is the completed, signed, and dated Independent Technical Reviewer Checklist included in the BDR, and the independent technical reviewer was not involved in the generation or recording of the data under review? **Reference Source: CCP-PO-001, C3-4**	X			
2. Does the BDR contain all items addressed in the BDR Table of Contents? **Reference Source: CCP-PO-001, C3-4**	X			
3. Does the BDR include a listing of all the container numbers in the batch? **Reference Source: CCP-PO-001, C3-4**	X			
4. List all containers that have met QAOs. **Reference Source: CCP-PO-001, C3-4**				Container Numbers: X10C0402824C X10C0402824D X10C0402824E
5. Does the BDR identify the current implementing procedure and revision number? **Reference Source: CCP-PO-001, Table C3-3**	X			
6. Is there a reference to or copy of any associated NCRs (if any) in the BDR? NA if no NCRs. **Reference Source: CCP-PO-001, Table C3-3**			X	
7. Are there 20 or fewer containers in the batch? **Reference Source: CCP-PO-001, C3-4**	X			
8. Are the data properly reported (i.e., data are reported in correct units and with correct significant figures)? **Reference Source: CCP-PO-001, C3-4**	X			
9. Is there evidence of verification that the physical form matches the Waste Matrix Code? **Reference Source: CCP-PO-001, Table C3-3**	X			

CCP RECORDS ORIGINAL
DATE REC'D 5-06-15 GL

Attachment 2 – CCP SPM Radiography Project Level Validation Checklist and Summary (Continued)

BDR Number: OR-RTR6-0650				Examination Date(s): 04/27/2015
Description of Criteria Reviewed	**Criteria Met?**			**Comments/Qualifiers**
	YES	**NO**	**NA**	
10. Is there evidence of verification that the physical form matches the waste stream description? **Reference Source: CCP-PO-001, Table C3-3**	X			
11. Are prohibited items absent? **Reference Source: CCP-PO-001, Table C3-3**	X			
12. Does observable liquid, if present, meet the criteria of the TSDF-WAC? **Reference Source: CCP-PO-001, C-1**	X			
13. Were discrepancies between two operators with regard to identification of waste matrix code, liquids in excess of the TSDF-WAC, or compressed gases through replicate scans and independent observations reconciled? NA if no discrepancies. **Reference Source: CCP-PO-001, C3-2**			X	
14. Are the training qualifications for all radiography personnel acceptable? **Reference Source: CCP-PO-001, C3-8**	X			
15. Was evidence of the video/audio check included in the BDR? **Reference Source: CCP-PO-001, C1-1**	X			
16. Was the Lines-Pair Resolution Test or Sieve Test Check included in the BDR? **Reference Source: CCP Technical Procedures**	X			
17. Was a replicate scan performed once per day, or once per batch, whichever is LESS frequent? **Reference Source: CCP-PO-001, C1-1**	X			
18. Was an independent observation performed once per day, or once per batch, whichever is LESS frequent? **Reference Source: CCP-PO-001, C1-1**	X			

Attachment 2 – CCP SPM Radiography Project Level Validation Checklist and Summary (Continued)

BDR Number: OR-RTR6-0650				Examination Date(s): 04/27/2015
Description of Criteria Reviewed	**Criteria Met?**			**Comments/Qualifiers**
	YES	**NO**	**NA**	
19. Were the replicate scan and independent observation performed on different waste containers? **Reference Source: CCP-PO-001, C1-1**	X			
20. Were the personnel performing the replicate scan and independent observation different from the individual who performed the original? **Reference Source: CCP-PO-001, C1-1**	X			
21. Does the BDR include an estimate of each material parameter weight in kg for each container? **Reference Source: CCP Technical Procedures**	X			
22. Does the BDR include a description of each material parameter for each container? **Reference Source: CCP Technical Procedures**	X			
23. Is the container gross weight recorded in kilograms (kg) for each container in the BDR? **Reference Source: CCP Technical Procedures**	X			
24. Was the Scale Weight Calibration Check included in the BDR? **Reference Source: CCP Technical Procedures**			X	Not used.
25. Was the Scale Weight Check included in the BDR? **Reference Source: CCP Technical Procedures**			X	Not used.
Comments: None.				
The container QC checks were properly performed and meet the Quality Assurance Objectives (QAOs). Proper procedures were followed during data reduction and analysis. The batch is complete, acceptable, and includes all supporting data and documentation required by the QAPjP.				
Daniel Wade _____ SPM Printed Name	_____ Signature			05/06/2015 _____ Date

Checklist is to be re-signed only when a re-review is performed.

SPM Printed Name	Signature	Reason	Date

Attachment 5–CCP Radiography Batch Data Report Cover Sheet

Site ID: ORNL

Batch Data Report No.: OR-RTR6-0650 ☑ CH ☐ RH Date: 4-27-15

Waste Container ID Numbers	
Replicate Scan:	X10C0402824E
Independent Observation:	X10C0402824D
1	X10C0402824C
2	X10C0402824D
3	X10C0402824E
4	N/A
5	N/A
6	N/A
7	N/A
8	N/A
9	N/A
10	N/A
11	N/A
12	N/A
13	N/A
14	N/A
15	N/A
16	N/A
17	N/A
18	N/A
19	N/A
20	N/A

RTR Operator:

Daphne Brothers	Daphne Brothers	4-27-15
Printed Name	Signature	Date

Independent Technical Reviewer:

Fred O'Ney		4-28-15
Printed Name	Signature	Date

NTPC RECORDS ORIGINAL
DATE REC'D 4-28-2015 PM

Attachment 4 – CCP Radiography Batch Data Report Table of Contents and Batch Narrative

Batch Data Report No.: OR-RTR6-0650 Date: 4-27-15

Table Of Contents		
Item	Description	Page No.
1	CCP Radiography Batch Data Report Cover Sheet	1
2	CCP Radiography Batch Data Report Table Of Contents	2
3	CCP RTR Measurement Control Report	3
4	CCP Radiography Data Sheets	4
5	Copy of NCRs (NA, If Not Applicable)	N/A
6	CCP Independent Technical Reviewer Checklist	19

Batch Narrative
All Quality Checks were performed and recorded on CCP-TP-053, Rev.15, CCP Radiography Measurement Control Report.

Daphne Brothers — RTR Operator

Daphne J Brothers — Signature

4-27-15 — Date

Attachment 1 – CCP RTR Measurement Control Report

Site ID: ORNL		
Batch Data Report No.: OR-RTR6-0650		
Examination Date: 4-27-15		
Control Checks		
Video/Audio Recorded Media System Check	☑ SAT	☐ UNSAT
Image Test : 10 Lines (Minimum acceptable is 5 lines-pair/cm or #6 Sieve is viewable)	☑ SAT	☐ UNSAT
Comments: N/A		
RTR Operator:		
Daphne Brothers (Printed Name)	Daphne Brothers (Signature)	4-27-15 (Date)

CCP Radiography Data Sheet

Section 1: General Information	
[ ] RTR Examination [X] RTR Replicate Scan [ ] RTR Independent Observation	
Site ID:	ORNL
Batch Number:	OR-RTR6-0650
Examination Date:	4/27/2015
Waste Container ID:	X10C0402824E
Video/Audio Recorded Media Number:	OR-RTR6-0650 A&B
Procedure and Revision No.:	CCP-TP-053 Rev. 15
NCR(s) associated with the container? (e.g., Prohibited Items)	[X] No [ ] Yes NCR No.: N/A NCR No.: N/A

Section 2: Waste Container Data	
Container Type:	55 Gallon Drum
TRUCON Code:	OR 225
Waste Matrix Code:	S5400
Waste Stream I.D.:	OR-RF-CH-HET
Waste Container Weights:	Gross Wt.: 51.0 kg Tare Wt.: 33.2 kg Net Wt.: 17.8 kg
Rigid Liner and Liner Vent Description:	Liner: [X] No [ ] Yes Lid: [X] No [ ] Yes Type: [ ] 30-mil [ ] 90-mil [ ] 110-mil [ ] 125-mil Vented: [ ] No [ ] Yes [X] N/A Punctured: [X] No [ ] Yes Mechanical Vent: [X] No [ ] Yes Fiberboard Liner: [X] No [ ] Yes Lead Lined: [X] No [ ] Yes
Number of Layers of Confinement:	Appears to be 1 layer
Volume Utilization Percentage:	90 %

CCP Radiography Data Sheet

Waste Container ID: X10C0402824E

Section 3: Container Inventory and Comments	(Detailed descriptions)
IM:	Metal hardware, scissors
AM:	
OM:	
OI:	Glass container
C:	Cloth, tape roll, cardboard
R:	
XPM:	Plastic sheeting, plastic caps, plastic containers
OR:	
IN:	
S:	

Section 4: Packaging Material and Waste Material Parameters	
Packaging Material:	**Estimated Weight (kg)**
Steel (ST):	27.8
Plastics (PP): Liner bag	1.0
Other: Cardboard Liner (CP)	4.4
Total Packaging Weight	33.2
Waste Material Parameter:	**Estimated Weight (kg)**
Iron-based Metal / Alloys (IM):	0.5
Aluminum-based Metals / Alloys (AM):	
Other Metals (OM):	
Other Inorganic Materials (OI)	0.1
Cellulosics (C):	6.0
Rubber (R):	
Plastics (waste materials) (XPM):	11.2
Organic Matrix (OR):	
Inorganic Matrix (IN):	
Soils (S):	
Total WMP Weight:	17.8

CCP Radiography Data Sheet

Waste Container ID: X10C0402824E

Section 5: RTR Summary (Questions answered "Yes" will be explained in the Comment block, except for Question 1)	
Is there observable liquid?	[X] Yes [ ] No
Is there any observable liquid in internal containers, more than 60 milliliters or 3 percent by volume, whichever is greater?	[ ] Yes [X] No
Is the total volume of observable liquid in the outermost container GREATER than 1% of the container?	[ ] Yes [X] No
Is there observable liquid in payload containers with an EPA Hazardous Waste Number of U134?	[ ] Yes [X] No
Is there an indication of non-radionuclide pyrophoric materials, such as elemental potassium?	[ ] Yes [X] No
Is there an indication of hazardous wastes not occurring as co-contaminants with TRU mixed wastes (non-mixed hazardous wastes)?	[ ] Yes [X] No
Is there an indication of wastes incompatible with backfill, seal and panel closures materials, container and packaging materials, shipping container materials, or other wastes (i.e., waste does NOT match TRUCON Code[s])?	[ ] Yes [X] No
Is there an indication of wastes containing explosives or compressed gases?	[ ] Yes [X] No
Is there an indication of PCBs liquids?	[ ] Yes [X] No
Is there an indication of the waste exhibiting the characteristic of ignitability, corrosivity, or reactivity (EPA Hazardous Waste Numbers of D001, D002, or D003)?	[ ] Yes [X] No
Is the physical form of the waste inconsistent with the Waste Stream Description or the Waste Matrix Code?	[ ] Yes [X] No
CH or RH TRAMPAC	
Are there heat-sealed bags (unvented) GREATER than 4 liters and LESS than 390 square inches in the waste, or heat sealed bags not authorized in the RH TRUCON Code?	[ ] Yes [X] No
Were there Non-approved Closure Methods used on liner bags or inner bags greater than 4 liters?	[ ] Yes [X] No
Are there sealed containers GREATER than 4 liters?	[ ] Yes [X] No
Are there indications of inadequate protection for heavy and/or sharp objects?	[ ] Yes [X] No

Comments: This Replicate scan agrees with the original scan. EC 4/27/15

RTR Operator:

Eric Lyles		4/27/2015
Print Name	Signature	Date

CCP Radiography Data Sheet

Section 1: General Information	
☐ RTR Examination ☐ RTR Replicate Scan ☒ RTR Independent Observation	
Site ID:	ORNL
Batch Number:	OR-RTR6-0650
Examination Date:	4/27/2015
Waste Container ID:	X10C0402824D
Video/Audio Recorded Media Number:	OR-RTR6-0650 A&B
Procedure and Revision No.:	CCP-TP-053 Rev. 15
NCR(s) associated with the container? (e.g., Prohibited Items)	☒ No ☐ Yes NCR No.: N/A NCR No.: N/A

Section 2: Waste Container Data	
Container Type:	55 Gallon Drum
TRUCON Code:	OR 225
Waste Matrix Code:	S5400
Waste Stream I.D.:	OR-RF-CH-HET
Waste Container Weights:	Gross Wt.: 46.9 kg Tare Wt.: 33.2 kg Net Wt.: 13.7 kg
Rigid Liner and Liner Vent Description:	Liner: ☒ No ☐ Yes Lid: ☒ No ☐ Yes Type: ☐ 30-mil ☐ 90-mil ☐ 110-mil ☐ 125-mil Vented: ☐ No ☐ Yes ☒ N/A Punctured: ☒ No ☐ Yes Mechanical Vent: ☒ No ☐ Yes Fiberboard Liner: ☒ No ☐ Yes Lead Lined: ☒ No ☐ Yes
Number of Layers of Confinement:	Appears to be 1 layer
Volume Utilization Percentage:	90 %

CCP Radiography Data Sheet

Waste Container ID: X10C0402824D

Section 3: Container Inventory and Comments	(Detailed descriptions)
IM:	Electrical equipment, scrap metal, metal fittings
AM:	Aluminum ring
OM:	
OI:	Broken glass
C:	Cardboard
R:	Rubber gloves
XPM:	Plastic sheeting, plastic containers, plastic caps, manipulator boots
OR:	
IN:	
S:	

Section 4: Packaging Material and Waste Material Parameters	
Packaging Material:	**Estimated Weight (kg)**
Steel (ST):	27.8
Plastics (PP): Liner bag	1.0
Other: Cardboard Liner (CP)	4.4
Total Packaging Weight	33.2
Waste Material Parameter:	**Estimated Weight (kg)**
Iron-based Metal / Alloys (IM):	3.5
Aluminum-based Metals / Alloys (AM):	2.0
Other Metals (OM):	
Other Inorganic Materials (OI)	0.1
Cellulosics (C):	3.5
Rubber (R):	0.2
Plastics (waste materials) (XPM):	4.4
Organic Matrix (OR):	
Inorganic Matrix (IN):	
Soils (S):	
Total WMP Weight:	13.7

CCP Radiography Data Sheet

Waste Container ID: X10C0402824D

Section 5: RTR Summary (Questions answered "Yes" will be explained in the Comment block, except for Question 1)	
Is there observable liquid?	☐ Yes ☒ No
Is there any observable liquid in internal containers, more than 60 milliliters or 3 percent by volume, whichever is greater?	☐ Yes ☒ No
Is the total volume of observable liquid in the outermost container GREATER than 1% of the container?	☐ Yes ☒ No
Is there observable liquid in payload containers with an EPA Hazardous Waste Number of U134?	☐ Yes ☒ No
Is there an indication of non-radionuclide pyrophoric materials, such as elemental potassium?	☐ Yes ☒ No
Is there an indication of hazardous wastes not occurring as co-contaminants ~~with TRU mixed wastes (non-mixed hazardous wastes)?~~	☐ Yes ☒ No
Is there an indication of wastes incompatible with backfill, seal and panel closures materials, container and packaging materials, shipping container materials, or other wastes (i.e., waste does NOT match TRUCON Code[s])?	☐ Yes ☒ No
Is there an indication of wastes containing explosives or compressed gases?	☐ Yes ☒ No
Is there an indication of PCBs liquids?	☐ Yes ☒ No
Is there an indication of the waste exhibiting the characteristic of ignitability, corrosivity, or reactivity (EPA Hazardous Waste Numbers of D001, D002, or D003)?	☐ Yes ☒ No
Is the physical form of the waste inconsistent with the Waste Stream Description or the Waste Matrix Code?	☐ Yes ☒ No
CH or RH TRAMPAC	
Are there heat-sealed bags (unvented) GREATER than 4 liters and LESS than 390 square inches in the waste, or heat sealed bags not authorized in the RH TRUCON Code?	☐ Yes ☒ No
Were there Non-approved Closure Methods used on liner bags or inner bags greater than 4 liters?	☐ Yes ☒ No
Are there sealed containers GREATER than 4 liters?	☐ Yes ☒ No
Are there indications of inadequate protection for heavy and/or sharp objects?	☐ Yes ☒ No

Comments: This Independent observation agrees with the original scan. EL 4/27/15

RTR Operator:

Eric Lyles		4/27/2015
Print Name	Signature	Date

CCP Radiography Data Sheet

Section 1: General Information	
[X] RTR Examination [ ] RTR Replicate Scan [ ] RTR Independent Observation	
Site ID:	ORNL
Batch Number:	OR-RTR6-0650
Examination Date:	4/27/2015
Waste Container ID:	X10C0402824C
Video/Audio Recorded Media Number:	OR-RTR6-0650 A&B
Procedure and Revision No.:	CCP-TP-053 Rev. 15
NCR(s) associated with the container? (e.g., Prohibited Items)	[X] No [ ] Yes NCR No.: N/A NCR No.: N/A

Section 2: Waste Container Data	
Container Type:	55 Gallon Drum
TRUCON Code:	OR 225
Waste Matrix Code:	S5400
Waste Stream I.D.:	OR-RF-CH-HET
Waste Container Weights:	Gross Wt.: 57.5 kg Tare Wt.: 33.2 kg Net Wt.: 24.3 kg
Rigid Liner and Liner Vent Description:	Liner: [X] No [ ] Yes Lid: [X] No [ ] Yes Type: [ ] 30-mil [ ] 90-mil [ ] 110-mil [ ] 125-mil Vented: [ ] No [ ] Yes [X] N/A Punctured: [X] No [ ] Yes Mechanical Vent: [X] No [ ] Yes Fiberboard Liner: [X] No [ ] Yes Lead Lined: [X] No [ ] Yes
Number of Layers of Confinement:	Appears to be 1 layer
Volume Utilization Percentage:	80 %

CCP Radiography Data Sheet

Waste Container ID: X10C0402824C

Section 3: Container Inventory and Comments	(Detailed descriptions)
IM:	Electrical equipment, scrap metal
AM:	
OM:	
OI:	Glass labware
C:	Cloth, cardboard
R:	Rubber gloves
XPM:	Plastic sheeting, plastic containers
OR:	
IN:	
S:	

Section 4: Packaging Material and Waste Material Parameters	
Packaging Material:	**Estimated Weight (kg)**
Steel (ST):	27.8
Plastics (PP): Liner bag	1.0
Other: Cardboard Liner (CP)	4.4
Total Packaging Weight	33.2
Waste Material Parameter:	**Estimated Weight (kg)**
Iron-based Metal / Alloys (IM):	10.0
Aluminum-based Metals / Alloys (AM):	
Other Metals (OM):	
Other Inorganic Materials (OI)	1.0
Cellulosics (C):	6.0
Rubber (R):	0.3
Plastics (waste materials) (XPM):	7.0
Organic Matrix (OR):	
Inorganic Matrix (IN):	
Soils (S):	
Total WMP Weight:	24.3

CCP Radiography Data Sheet

Waste Container ID: X10C0402824C

Section 5: RTR Summary (Questions answered "Yes" will be explained in the Comment block, except for Question 1)	
Is there observable liquid?	☐ Yes ☒ No
Is there any observable liquid in internal containers, more than 60 milliliters or 3 percent by volume, whichever is greater?	☐ Yes ☒ No
Is the total volume of observable liquid in the outermost container GREATER than 1% of the container?	☐ Yes ☒ No
Is there observable liquid in payload containers with an EPA Hazardous Waste Number of U134?	☐ Yes ☒ No
Is there an indication of non-radionuclide pyrophoric materials, such as elemental potassium?	☐ Yes ☒ No
Is there an indication of hazardous wastes not occurring as co-contaminants with TRU mixed wastes (non-mixed hazardous wastes)?	☐ Yes ☒ No
Is there an indication of wastes incompatible with backfill, seal and panel closures materials, container and packaging materials, shipping container materials, or other wastes (i.e., waste does NOT match TRUCON Code[s])?	☐ Yes ☒ No
Is there an indication of wastes containing explosives or compressed gases?	☐ Yes ☒ No
Is there an indication of PCBs liquids?	☐ Yes ☒ No
Is there an indication of the waste exhibiting the characteristic of ignitability, corrosivity, or reactivity (EPA Hazardous Waste Numbers of D001, D002, or D003)?	☐ Yes ☒ No
Is the physical form of the waste inconsistent with the Waste Stream Description or the Waste Matrix Code?	☐ Yes ☒ No
CH or RH TRAMPAC	
Are there heat-sealed bags (unvented) GREATER than 4 liters and LESS than 390 square inches in the waste, or heat sealed bags not authorized in the RH TRUCON Code?	☐ Yes ☒ No
Were there Non-approved Closure Methods used on liner bags or inner bags greater than 4 liters?	☐ Yes ☒ No
Are there sealed containers GREATER than 4 liters?	☐ Yes ☒ No
Are there indications of inadequate protection for heavy and/or sharp objects?	☐ Yes ☒ No

Comments: N/A

RTR Operator:

Daphne Brothers	Daphne C Brothers	4/27/2015
Print Name	Signature	Date

CCP Radiography Data Sheet

Section 1: General Information		
[X] RTR Examination	[ ] RTR Replicate Scan	[ ] RTR Independent Observation
Site ID:	ORNL	
Batch Number:	OR-RTR6-0650	
Examination Date:	4/27/2015	
Waste Container ID:	X10C0402824D	
Video/Audio Recorded Media Number:	OR-RTR6-0650	A&B
Procedure and Revision No.:	CCP-TP-053	Rev. 15
NCR(s) associated with the container? (e.g., Prohibited Items)	[X] No [ ] Yes NCR No.: N/A NCR No.: N/A	

Section 2: Waste Container Data	
Container Type:	55 Gallon Drum
TRUCON Code:	OR 225
Waste Matrix Code:	S5400
Waste Stream I.D.:	OR-RF-CH-HET
Waste Container Weights:	Gross Wt.: 46.9 kg Tare Wt.: 33.2 kg Net Wt.: 13.7 kg
Rigid Liner and Liner Vent Description:	Liner: [X] No [ ] Yes Lid: [X] No [ ] Yes Type: [ ] 30-mil [ ] 90-mil [ ] 110-mil [ ] 125-mil Vented: [ ] No [ ] Yes [X] N/A Punctured: [X] No [ ] Yes Mechanical Vent: [X] No [ ] Yes Fiberboard Liner: [X] No [ ] Yes Lead Lined: [X] No [ ] Yes
Number of Layers of Confinement:	Appears to be 1 layer
Volume Utilization Percentage:	90 %

CCP Radiography Data Sheet

Waste Container ID: X10C0402824D

Section 3: Container Inventory and Comments	(Detailed descriptions)
IM:	Electrical equipment, scrap metal, metal fittings
AM:	Aluminum collar
OM:	
OI:	Broken glass
C:	Cardboard
R:	Rubber gloves
XPM:	Plastic containers, plastic sheeting, plastic caps, manipulator boots
OR:	
IN:	
S:	

Section 4: Packaging Material and Waste Material Parameters	
Packaging Material:	**Estimated Weight (kg)**
Steel (ST):	27.8
Plastics (PP): Liner bag	1.0
Other: Cardboard Liner (CP)	4.4
Total Packaging Weight	33.2
Waste Material Parameter:	**Estimated Weight (kg)**
Iron-based Metal / Alloys (IM):	3.0
Aluminum-based Metals / Alloys (AM):	2.0
Other Metals (OM):	
Other Inorganic Materials (OI)	0.1
Cellulosics (C):	3.0
Rubber (R):	0.2
Plastics (waste materials) (XPM):	5.4
Organic Matrix (OR):	
Inorganic Matrix (IN):	
Soils (S):	
Total WMP Weight:	13.7

CCP Radiography Data Sheet

Waste Container ID: X10C0402824D

Section 5: RTR Summary (Questions answered "Yes" will be explained in the Comment block, except for Question 1)	
Is there observable liquid?	☐ Yes ☒ No
Is there any observable liquid in internal containers, more than 60 milliliters or 3 percent by volume, whichever is greater?	☐ Yes ☒ No
Is the total volume of observable liquid in the outermost container GREATER than 1% of the container?	☐ Yes ☒ No
Is there observable liquid in payload containers with an EPA Hazardous Waste Number of U134?	☐ Yes ☒ No
Is there an indication of non-radionuclide pyrophoric materials, such as elemental potassium?	☐ Yes ☒ No
Is there an indication of hazardous wastes not occurring as co-contaminants ~~with TRU mixed wastes (non-mixed hazardous wastes)?~~	☐ Yes ☒ No
Is there an indication of wastes incompatible with backfill, seal and panel closures materials, container and packaging materials, shipping container materials, or other wastes (i.e., waste does NOT match TRUCON Code[s])?	☐ Yes ☒ No
Is there an indication of wastes containing explosives or compressed gases?	☐ Yes ☒ No
Is there an indication of PCBs liquids?	☐ Yes ☒ No
Is there an indication of the waste exhibiting the characteristic of ignitability, corrosivity, or reactivity (EPA Hazardous Waste Numbers of D001, D002, or D003)?	☐ Yes ☒ No
Is the physical form of the waste inconsistent with the Waste Stream Description or the Waste Matrix Code?	☐ Yes ☒ No
CH or RH TRAMPAC	
Are there heat-sealed bags (unvented) GREATER than 4 liters and LESS than 390 square inches in the waste, or heat sealed bags not authorized in the RH TRUCON Code?	☐ Yes ☒ No
Were there Non-approved Closure Methods used on liner bags or inner bags greater than 4 liters?	☐ Yes ☒ No
Are there sealed containers GREATER than 4 liters?	☐ Yes ☒ No
Are there indications of inadequate protection for heavy and/or sharp objects?	☐ Yes ☒ No
Comments: N/A	

RTR Operator:

Daphne Brothers	Daphne D Brothers	4/27/2015
Print Name	Signature	Date

CCP Radiography Data Sheet

Section 1: General Information		
[X] RTR Examination	[ ] RTR Replicate Scan	[ ] RTR Independent Observation
Site ID:	ORNL	
Batch Number:	OR-RTR6-0650	
Examination Date:	4/27/2015	
Waste Container ID:	X10C0402824E	
Video/Audio Recorded Media Number:	OR-RTR6-0650	A&B
Procedure and Revision No.:	CCP-TP-053	Rev. 15
NCR(s) associated with the container? (e.g., Prohibited Items)	[X] No [ ] Yes NCR No.: N/A NCR No.: N/A	

Section 2: Waste Container Data	
Container Type:	55 Gallon Drum
TRUCON Code:	OR 225
Waste Matrix Code:	S5400
Waste Stream I.D.:	OR-RF-CH-HET
Waste Container Weights:	Gross Wt.: 51.0 kg Tare Wt.: 33.2 kg Net Wt.: 17.8 kg
Rigid Liner and Liner Vent Description:	Liner: [X] No [ ] Yes Lid: [X] No [ ] Yes Type: [ ] 30-mil [ ] 90-mil [ ] 110-mil [ ] 125-mil Vented: [ ] No [ ] Yes [X] N/A Punctured: [X] No [ ] Yes Mechanical Vent: [X] No [ ] Yes Fiberboard Liner: [X] No [ ] Yes Lead Lined: [X] No [ ] Yes
Number of Layers of Confinement:	Appears to be 1 layer
Volume Utilization Percentage:	90 %

CCP Radiography Data Sheet

Waste Container ID: X10C0402824E

Section 3: Container Inventory and Comments (Detailed descriptions)	
IM:	Metal hardware, scissors
AM:	
OM:	
OI:	Glass container
C:	Cloth, tape, cardboard
R:	
XPM:	Plastic sheeting, plastic containers, plastic caps
OR:	
IN:	
S:	

Section 4: Packaging Material and Waste Material Parameters	
Packaging Material:	**Estimated Weight (kg)**
Steel (ST):	27.8
Plastics (PP): Liner bag	1.0
Other: Cardboard Liner (CP)	4.4
Total Packaging Weight	33.2
Waste Material Parameter:	**Estimated Weight (kg)**
Iron-based Metal / Alloys (IM):	0.7
Aluminum-based Metals / Alloys (AM):	
Other Metals (OM):	
Other Inorganic Materials (OI)	0.1
Cellulosics (C):	5.0
Rubber (R):	
Plastics (waste materials) (XPM):	12.0
Organic Matrix (OR):	
Inorganic Matrix (IN):	
Soils (S):	
Total WMP Weight:	17.8

CCP Radiography Data Sheet

Waste Container ID: X10C0402824E

Section 5: RTR Summary (Questions answered "Yes" will be explained in the Comment block, except for Question 1)	
Is there observable liquid?	[X] Yes [ ] No
Is there any observable liquid in internal containers, more than 60 milliliters or 3 percent by volume, whichever is greater?	[ ] Yes [X] No
Is the total volume of observable liquid in the outermost container GREATER than 1% of the container?	[ ] Yes [X] No
Is there observable liquid in payload containers with an EPA Hazardous Waste Number of U134?	[ ] Yes [X] No
Is there an indication of non-radionuclide pyrophoric materials, such as elemental potassium?	[ ] Yes [X] No
Is there an indication of hazardous wastes not occurring as co-contaminants with TRU mixed wastes (non-mixed hazardous wastes)?	[ ] Yes [X] No
Is there an indication of wastes incompatible with backfill, seal and panel closures materials, container and packaging materials, shipping container materials, or other wastes (i.e., waste does NOT match TRUCON Code[s])?	[ ] Yes [X] No
Is there an indication of wastes containing explosives or compressed gases?	[ ] Yes [X] No
Is there an indication of PCBs liquids?	[ ] Yes [X] No
Is there an indication of the waste exhibiting the characteristic of ignitability, corrosivity, or reactivity (EPA Hazardous Waste Numbers of D001, D002, or D003)?	[ ] Yes [X] No
Is the physical form of the waste inconsistent with the Waste Stream Description or the Waste Matrix Code?	[ ] Yes [X] No
CH or RH TRAMPAC	
Are there heat-sealed bags (unvented) GREATER than 4 liters and LESS than 390 square inches in the waste, or heat sealed bags not authorized in the RH TRUCON Code?	[ ] Yes [X] No
Were there Non-approved Closure Methods used on liner bags or inner bags greater than 4 liters?	[ ] Yes [X] No
Are there sealed containers GREATER than 4 liters?	[ ] Yes [X] No
Are there indications of inadequate protection for heavy and/or sharp objects?	[ ] Yes [X] No

Comments: N/A

RTR Operator:

Daphne Brothers	Daphne O Brothers	4/27/2015
Print Name	Signature	Date

Attachment 3 – CCP Radiography Independent Technical Reviewer Checklist

Batch Data Report No.: OR-RTR6-0650

Description			
1.	Were data generation and reduction conducted in a technically correct manner in accordance with the methods used?	☐ NO	☑ YES
2.	Was the correct revision of the procedure used? Procedure: CCP-TP-053 Rev.: 15	☐ NO	☑ YES
3.	Are the WMPs entered correctly?	☐ NO	☑ YES
4.	Do the estimated weights in Section 4 of Attachment 2 equal the container gross weight?	☐ NO	☑ YES
5.	Is the data reported in the proper units with the correct number of significant figures (e.g., one tenth of a kilogram)?	☐ NO	☑ YES
6.	Was transcription used? If no, proceed to question 7.	☑ NO	☐ YES
	6a. Has the data been verified for transcription errors?	☐ NO	☐ YES
7.	Does the Testing Batch Report include radiography for up to 20 containers?	☐ NO	☑ YES
8.	Are BDR contents complete and do they match the CCP Waste RTR Batch Data Report Table of Contents?	☐ NO	☑ YES
9.	Is all the data signed and dated in reproducible ink and by the individual(s) generating it?	☐ NO	☑ YES
10.	Is all data recorded clearly, legibly, and accurately?	☐ NO	☑ YES
11.	Have changes been made to original data? If no, proceed to question 12.	☑ NO	☐ YES
	11a. Have all changes to original data been lined out, initialed and dated by the individual making the changes?	☐ NO	☐ YES
	11b. Was justification made for changing the original data?	☐ NO	☐ YES
	11c. Were data changes made by the individual who originally collected the data?	☐ NO	☐ YES
12.	Does the waste match the Waste Matrix Code and Waste Stream description?	☐ NO	☑ YES
13.	Are the RTR Operator's decisions regarding the Radiography documented?	☐ NO	☑ YES
14.	Is there an adequate written description of the contents of each item?	☐ NO	☑ YES
15.	Was the video/audio recording media properly prepared and labeled for each waste container?	☐ NO	☑ YES
16.	Was the video/audio recording media check performed satisfactorily and recorded on Attachment 1?	☐ NO	☑ YES

Attachment 3 – CCP Radiography Independent Technical Reviewer Checklist (Continued)

Batch Data Report No.: OR-RTR6-0650

Description		
17. Was the Image Test performed satisfactorily and recorded on Attachment 1?	☐ NO	☑ YES
18. Was the Replicate Scan performed and recorded on an Attachment 2?	☐ NO	☑ YES
19. Was the Replicate Scan RTR Operator different from the first RTR Operator?	☐ NO	☑ YES
20. Did the Replicate Scan RTR Operator and the first RTR Operator agree on the results?	☐ NO	☑ YES
21. Was the Independent Observation performed and recorded on an Attachment 2?	☐ NO	☑ YES
22. Was the Independent Observation RTR Operator different from the first RTR Operator?	☐ NO	☑ YES
23. Did the Independent Observation RTR Operator and the first RTR Operator agree on the results?	☐ NO	☑ YES
24. Was the data collection performed by qualified individuals?	☐ NO	☑ YES
25. Were NCRs initiated as required at DGL? If no, proceed to question 26.	☑ NO	☐ YES
25a. Have the NCR(s) associated with RTR been included in the BDR?	☐ NO	☐ YES
26. Is the RTR examination for CH waste? If no, proceed to question 27.	☐ NO	☑ YES
26a. Have the CH Quality Assurance Objectives (QAOs) been met (if applicable)? Precision – Precision is maintained by reconciling any discrepancies between two radiography operators with regard to identification of the waste matrix code, liquids in excess of TSDF-WAC limits, and compressed gases through independent replicate scans and independent observations. Additionally, the precision of radiography is verified prior to use by tuning precisely enough to demonstrate compliance with QAOs through viewing an image test pattern. Accuracy – Accuracy is obtained by using a target to tune the image for maximum sharpness and by requiring operators to successfully identify 100 percent of the items required to meet the DQOs for radiography specified in CCP-PO-001, Section C-4a(1) in a training container during their initial qualification and subsequent requalification. Completeness – A video and audio media recording of the radiography examination and a validated radiography data form will be obtained for 100 percent of the waste containers subject to radiography. All video and audio media recordings and radiography data forms will be subject to validation as indicated in CCP-PO-001, Section C3-4. Comparability – The comparability of radiography data from different operators shall be enhanced by using standardized radiography procedures and operator qualifications.	☐ NO	☑ YES

Attachment 3 – CCP Radiography Independent Technical Reviewer Checklist (Continued)

Batch Data Report No.: OR-RTR6-0650

Description		
27. Is the RTR examination for RH waste? If no, proceed to comment section.	☑ NO	☐ YES
27a. Have the RH QAOs been met (if applicable)? Precision – Precision is maintained by reconciling any discrepancies between two operators (during Independent Observation and Replicate scans) with regard to the identification of important waste characteristics (i.e., physical form of the waste and absence of prohibited liquids) within a single container. Accuracy – Accuracy is obtained by using a target to tune the image for maximum sharpness and by requiring operators to successfully identify prohibited liquid in a training container during their initial qualification and subsequent requalification. Representativeness – All of the relevant contents in a container selected for radiography will be described. Completeness – All of the relevant waste information must be assembled and must show that each of the containers in the waste stream belongs to the waste stream. This information must be documented on videotape or other equivalent media and data form. Comparability – Comparability is ensured by meeting the program training requirements and complying with the minimum standards used to implement the radiography process.	☐ NO	☐ YES

Comments: N/A

I have reviewed 100% of the container specific and batch data in this report and find it acceptable.

Independent Technical Reviewer:

Fred Overy
Printed Name

Signature

4-28-15
Date

DIVIDER PAGE ONLY

NOT PART OF PAGE COUNT

Attachment 2 – CCP Records Transmittal/Receiving Form

CCP Records / Records Custodian, 4021 National Parks Highway - MS: GSA 212, Carlsbad, New Mexico 88220

Telephone Number: 575-234-7523

Fax Number: 575-234-7033

Attn:	CCP RECORDS	From:	PATRICK SMITH II
Ship to:	CCP RECORDS CUSTODIAN	Site:	ORNL
	4021 NATIONAL PARKS HWY.	Company:	TFE INC.
	MS GSA 212	Telephone Number:	865-574-6002
	CARLSBAD, NM 88220-9082	Date Sent:	4-29-2015
Telephone Number:	575-234-7523		

Document Number	Title/Description	Record Date	Total Pages
OR-RTR6-0650	RTR DVD (DISK B)	4-27-2015	N/A
N/A	N/A	N/A	N/A
N/A	N/A	N/A	N/A
N/A	N/A	N/A	N/A
N/A	N/A	N/A	N/A
N/A	N/A	N/A	N/A

Comments

N/A

(When the Record accepted line has been completed, the rest of the page below may be left blank.)
Acceptance/Rejection Signature and Date

	Signature	Printed Name	Date
Records Accepted ☑	[signature]	Greta Leos	5-04-15
Records Rejected ☐			

Reason for Rejection:

Re-submittal:

Signature	Printed Name	Date

****
*** Send Results ***
****

Sending is complete.

Job No.	3987
Address	918655768703
Name	ORNL
Start Time	05/04 02:33 PM
Call Length	00'20
Sheets	1
Result	OK

Attachment 2 – CCP Records Transmittal/Receiving Form

CCP Records / Records Custodian, 4021 National Parks Highway - MS: GSA 212, Carlsbad, New Mexico 88220

Telephone Number: 575-234-7523

Fax Number: 575-234-7033

Attn:	CCP RECORDS	From:	PATRICK SMITH II
Ship to:	CCP RECORDS CUSTODIAN	Site:	ORNL
	4021 NATIONAL PARKS HWY.	Company:	TFE INC.
	MS GSA 212	Telephone Number:	865-574-6002
	CARLSBAD, NM 88220-9082	Date Sent:	4-29-2015
Telephone Number:	575-234-7523		

OR-RTR6-0650	RTR DVD (DISK B)	4-27-2015	N/A
N/A	N/A	N/A	N/A
N/A	N/A	N/A	N/A
N/A	N/A	N/A	N/A
N/A	N/A	N/A	N/A
N/A	N/A	N/A	N/A

Comments

N/A

(When the Record accepted line has been completed, the rest of the page below may be left blank.)
Acceptance/Rejection Signature and Date

Records Accepted ☑ [signature] Signature — Greta Leos Printed Name — 5-04-15 Date

Records Rejected ☐ _____

Attachment 2 – CCP Records Transmittal/Receiving Form

CCP Records / Records Custodian, 4021 National Parks Highway - MS: GSA 212, Carlsbad, New Mexico 88220

Telephone Number: 575-234-7523

Fax Number: 575-234-7033

Attn:	CCP RECORDS	From:	PATRICK SMITH II
Ship to:	CCP RECORDS CUSTODIAN	Site:	ORNL
	4021 NATIONAL PARKS HWY.	Company:	TFE INC.
	MS GSA 212	Telephone Number:	865-574-6002
	CARLSBAD, NM 88220-9082	Date Sent:	5-7-2015
Telephone Number:	575-234-7523		

Document Number	Title / Description	Record Date	Total Pages
OR-RTR6-0650	RTR BDR	4-27-2015	21
OR-RTR6-0650	RTR DVD (DISK A)	4-27-2015	N/A
N/A	N/A	N/A	N/A
N/A	N/A	N/A	N/A
N/A	N/A	N/A	N/A
N/A	N/A	N/A	N/A

Comments

N/A

(When the Record accepted line has been completed, the rest of the page below may be left blank.)
Acceptance/Rejection Signature and Date

Records Accepted	☑	Signature	Greta Leos (Printed Name)	5-11-15 (Date)
Records Rejected	☐	Signature	Printed Name	Date

Reason for Rejection:

Re-submittal:

Signature	Printed Name	Date

****
*** Send Results ***
****

Sending is complete.

Job No.	4457
Address	918655768703
Name	ORNL
Start Time	05/11 01:30 PM
Call Length	00'19
Sheets	1
Result	OK

Controlled Copy

CCP-QP-008, Rev. 24
CCP Records Management

Effective Date: 02/10/2015
Page 35 of 35

Attachment 2 – CCP Records Transmittal/Receiving Form

CCP Records / Records Custodian, 4021 National Parks Highway - MS: GSA 212, Carlsbad, New Mexico 88220

Telephone Number: 575-234-7523

Fax Number: 575-234-7033

Attn:	CCP RECORDS	From:	PATRICK SMITH II
Ship to:	CCP RECORDS CUSTODIAN	Site:	ORNL
	4021 NATIONAL PARKS HWY.	Company:	TFE INC.
	MS GSA 212	Telephone Number:	865-574-6002
	CARLSBAD, NM 88220-9082	Date Sent:	5-7-2015
Telephone Number:	575-234-7523		

Document Number	Brief Description	Date	Number of Pages
OR-RTR6-0650	RTR BDR	4-27-2015	21
OR-RTR6-0650	RTR DVD (DISK A)	4-27-2015	N/A
N/A	N/A	N/A	N/A
N/A	N/A	N/A	N/A
N/A	N/A	N/A	N/A
N/A	N/A	N/A	N/A

Comments

N/A

(When the Record accepted line has been completed, the rest of the page below may be left blank.)
Acceptance/Rejection Signature and Date

Records Accepted	☑	Signature	Greta Leos (Printed Name)	5-11-15 (Date)
Records Rejected	☐	Signature	Printed Name	Date

DIVIDER

PAGE

Attachment 2 – CCP SPM Radiography Project Level Validation Checklist and Summary

BDR Number: OR-RTR6-0654				Examination Date(s): 05/13/15
Description of Criteria Reviewed	**Criteria Met?**			**Comments/Qualifiers**
	YES	**NO**	**NA**	
1. Is the completed, signed, and dated Independent Technical Reviewer Checklist included in the BDR, and the independent technical reviewer was not involved in the generation or recording of the data under review? **Reference Source: CCP-PO-001, C3-4**	X			
2. Does the BDR contain all items addressed in the BDR Table of Contents? **Reference Source: CCP-PO-001, C3-4**	X			
3. Does the BDR include a listing of all the container numbers in the batch? **Reference Source: CCP-PO-001, C3-4**	X			
4. List all containers that have met QAOs. **Reference Source: CCP-PO-001, C3-4**				Container Numbers: X10C0402903J1 X10C0402876F1 X10C0402816C1 X10C0402886I1 X10C9402627B1 X10C0402781E X10C0402892D1 X10C9311650A X10C0402903H1
5. Does the BDR identify the current implementing procedure and revision number? **Reference Source: CCP-PO-001, Table C3-3**	X			
6. Is there a reference to or copy of any associated NCRs (if any) in the BDR? NA if no NCRs. **Reference Source: CCP-PO-001, Table C3-3**			X	
7. Are there 20 or fewer containers in the batch? **Reference Source: CCP-PO-001, C3-4**	X			
8. Are the data properly reported (i.e., data are reported in correct units and with correct significant figures)? **Reference Source: CCP-PO-001, C3-4**	X			
9. Is there evidence of verification that the physical form matches the Waste Matrix Code? **Reference Source: CCP-PO-001, Table C3-3**	X			

Attachment 2 – CCP SPM Radiography Project Level Validation Checklist and Summary (Continued)

BDR Number: OR-RTR6-0654				Examination Date(s): 05/13/15
Description of Criteria Reviewed	**Criteria Met?**			**Comments/Qualifiers**
	YES	**NO**	**NA**	
10. Is there evidence of verification that the physical form matches the waste stream description? **Reference Source: CCP-PO-001, Table C3-3**	X			
11. Are prohibited items absent? **Reference Source: CCP-PO-001, Table C3-3**	X			
12. Does observable liquid, if present, meet the criteria of the TSDF-WAC? **Reference Source: CCP-PO-001, C-1**	X			
13. Were discrepancies between two operators with regard to identification of waste matrix code, liquids in excess of the TSDF-WAC, or compressed gases through replicate scans and independent observations reconciled? NA if no discrepancies. **Reference Source: CCP-PO-001, C3-2**			X	
14. Are the training qualifications for all radiography personnel acceptable? **Reference Source: CCP-PO-001, C3-8**	X			
15. Was evidence of the video/audio check included in the BDR? **Reference Source: CCP-PO-001, C1-1**	X			
16. Was the Lines-Pair Resolution Test or Sieve Test Check included in the BDR? **Reference Source: CCP Technical Procedures**	X			
17. Was a replicate scan performed once per day, or once per batch, whichever is LESS frequent? **Reference Source: CCP-PO-001, C1-1**	X			
18. Was an independent observation performed once per day, or once per batch, whichever is LESS frequent? **Reference Source: CCP-PO-001, C1-1**	X			

Attachment 2 – CCP SPM Radiography Project Level Validation Checklist and Summary (Continued)

BDR Number: OR-RTR6-0654	Examination Date(s): 05/13/15			
Description of Criteria Reviewed	**Criteria Met?**			**Comments/Qualifiers**
	YES	**NO**	**NA**	
19. Were the replicate scan and independent observation performed on different waste containers? **Reference Source: CCP-PO-001, C1-1**	X			
20. Were the personnel performing the replicate scan and independent observation different from the individual who performed the original? **Reference Source: CCP-PO-001, C1-1**	X			
21. Does the BDR include an estimate of each material parameter weight in kg for each container? **Reference Source: CCP Technical Procedures**	X			
22. Does the BDR include a description of each material parameter for each container? **Reference Source: CCP Technical Procedures**	X			
23. Is the container gross weight recorded in kilograms (kg) for each container in the BDR? **Reference Source: CCP Technical Procedures**	X			
24. Was the Scale Weight Calibration Check included in the BDR? **Reference Source: CCP Technical Procedures**			X	Scale not used.
25. Was the Scale Weight Check included in the BDR? **Reference Source: CCP Technical Procedures**			X	Scale not used.
Comments: None				
The container QC checks were properly performed and meet the Quality Assurance Objectives (QAOs). Proper procedures were followed during data reduction and analysis. The batch is complete, acceptable, and includes all supporting data and documentation required by the QAPjP.				
Barbara Broomfield				05/20/15
SPM Printed Name	Signature			Date

Checklist is to be re-signed only when a re-review is performed.

SPM Printed Name	Signature	Reason	Date
SPM Printed Name	Signature	Reason	Date

Attachment 5–CCP Radiography Batch Data Report Cover Sheet

Site ID: ORNL

Batch Data Report No.: OR-RTR6-0654 ☑ CH ☐ RH Date: 5-13-15

Waste Container ID Numbers	
Replicate Scan:	X10C040288611
Independent Observation:	X10C0402903J1
1	X10C0402903J1
2	X10C0402876F1
3	X10C0402816C1
4	X10C040288611
5	X10C9402627B1
6	X10C0402781E
7	X10C0402892D1
8	X10C9311650A
9	X10C0402903H1
10	N/A
11	N/A
12	N/A
13	N/A
14	N/A
15	N/A
16	N/A
17	N/A
18	N/A
19	N/A
20	N/A

RTR Operator:

Eric Lyles — Printed Name | Signature | 5-13-15 — Date

Independent Technical Reviewer:

Fred Owsey — Printed Name | Signature | 5-18-15 — Date

NTPC RECORDS ORIGINAL
DATE REC'D 5-18-2015

Attachment 4 – CCP Radiography Batch Data Report Table of Contents and Batch Narrative

Batch Data Report No.: OR-RTR6-0654 Date: 5-13-15

Table Of Contents		
Item	Description	Page No.
1	CCP Radiography Batch Data Report Cover Sheet	1
2	CCP Radiography Batch Data Report Table Of Contents	2
3	CCP RTR Measurement Control Report	3
4	CCP Radiography Data Sheets	4
5	Copy of NCRs (NA, If Not Applicable)	N/A
6	CCP Independent Technical Reviewer Checklist	37

Batch Narrative
All Quality Checks were performed and recorded on CCP-TP-053, Rev.15, CCP Radiography Measurement Control Report.

Eric Lyles — RTR Operator

Signature

5-13-15 — Date

2

Attachment 1 – CCP RTR Measurement Control Report

Site ID: ORNL		
Batch Data Report No.: OR-RTR6-0654		
Examination Date: 5-13-15		
Control Checks		
Video/Audio Recorded Media System Check	☑ SAT	☐ UNSAT
Image Test : 10 Lines (Minimum acceptable is 5 lines-pair/cm or #6 Sieve is viewable)	☑ SAT	☐ UNSAT
Comments: N/A		
RTR Operator: Eric Lyles (Printed Name) — Signature — 5-13-15 (Date)		

3

CCP Radiography Data Sheet

Section 1: General Information	
☐ RTR Examination ☒ RTR Replicate Scan ☐ RTR Independent Observation	
Site ID:	ORNL
Batch Number:	OR-RTR6-0654
Examination Date:	5/13/2015
Waste Container ID:	X10C0402886I1
Video/Audio Recorded Media Number:	OR-RTR6-0654 A&B
Procedure and Revision No.:	CCP-TP-053 Rev. 15
NCR(s) associated with the container? (e.g., Prohibited Items)	☒ No ☐ Yes NCR No.: N/A NCR No.: N/A

Section 2: Waste Container Data	
Container Type:	55 Gallon Drum
TRUCON Code:	OR 225
Waste Matrix Code:	S5400
Waste Stream I.D.:	OR-REDC-CH-HET
Waste Container Weights:	Gross Wt.: 57.1 kg Tare Wt.: 33.2 kg Net Wt.: 23.9 kg
Rigid Liner and Liner Vent Description:	Liner: ☒ No ☐ Yes Lid: ☒ No ☐ Yes Type: ☐ 30-mil ☐ 90-mil ☐ 110-mil ☐ 125-mil Vented: ☐ No ☐ Yes ☒ N/A Punctured: ☒ No ☐ Yes Mechanical Vent: ☒ No ☐ Yes Fiberboard Liner: ☒ No ☐ Yes Lead Lined: ☒ No ☐ Yes
Number of Layers of Confinement:	Appears to be 1 layer
Volume Utilization Percentage:	90 %

CCP Radiography Data Sheet

Waste Container ID: X10C0402886I1

Section 3: Container Inventory and Comments	(Detailed descriptions)
IM:	Scrap metal, metal hardware, metal lids
AM:	
OM:	
OI:	Absorbent, broken glass, glass containers
C:	Cardboard, cloth
R:	
XPM:	Plastic sheeting, plastic containers, open plastic containers
OR:	
IN:	
S:	

Section 4: Packaging Material and Waste Material Parameters	
Packaging Material:	**Estimated Weight (kg)**
Steel (ST):	27.8
Plastics (PP): Liner bag	1.0
Other: Cardboard Liner (CP)	4.4
Total Packaging Weight	33.2
Waste Material Parameter:	**Estimated Weight (kg)**
Iron-based Metal / Alloys (IM):	3.0
Aluminum-based Metals / Alloys (AM):	
Other Metals (OM):	
Other Inorganic Materials (OI)	6.0
Cellulosics (C):	5.9
Rubber (R):	
Plastics (waste materials) (XPM):	9.0
Organic Matrix (OR):	
Inorganic Matrix (IN):	
Soils (S):	
Total WMP Weight:	23.9

CCP Radiography Data Sheet

Waste Container ID: X10C0402886I1

Section 5: RTR Summary (Questions answered "Yes" will be explained in the Comment block, except for Question 1)	
Is there observable liquid?	☐ Yes ☒ No
Is there any observable liquid in internal containers, more than 60 milliliters or 3 percent by volume, whichever is greater?	☐ Yes ☒ No
Is the total volume of observable liquid in the outermost container GREATER than 1% of the container?	☐ Yes ☒ No
Is there observable liquid in payload containers with an EPA Hazardous Waste Number of U134?	☐ Yes ☒ No
Is there an indication of non-radionuclide pyrophoric materials, such as elemental potassium?	☐ Yes ☒ No
Is there an indication of hazardous wastes not occurring as co-contaminants with TRU mixed wastes (non-mixed hazardous wastes)?	☐ Yes ☒ No
Is there an indication of wastes incompatible with backfill, seal and panel closures materials, container and packaging materials, shipping container materials, or other wastes (i.e., waste does NOT match TRUCON Code[s])?	☐ Yes ☒ No
Is there an indication of wastes containing explosives or compressed gases?	☐ Yes ☒ No
Is there an indication of PCBs liquids?	☐ Yes ☒ No
Is there an indication of the waste exhibiting the characteristic of ignitability, corrosivity, or reactivity (EPA Hazardous Waste Numbers of D001, D002, or D003)?	☐ Yes ☒ No
Is the physical form of the waste inconsistent with the Waste Stream Description or the Waste Matrix Code?	☐ Yes ☒ No
CH or RH TRAMPAC	
Are there heat-sealed bags (unvented) GREATER than 4 liters and LESS than 390 square inches in the waste, or heat sealed bags not authorized in the RH TRUCON Code?	☐ Yes ☒ No
Were there Non-approved Closure Methods used on liner bags or inner bags greater than 4 liters?	☐ Yes ☒ No
Are there sealed containers GREATER than 4 liters?	☐ Yes ☒ No
Are there indications of inadequate protection for heavy and/or sharp objects?	☐ Yes ☒ No

Comments: This Replicate Scan agrees with the original Scan. DB 5-13-15

RTR Operator:

Daphne Brothers	Daphne G Brothers	5/13/2015
Print Name	Signature	Date

CCP Radiography Data Sheet

Section 1: General Information	
☐ RTR Examination ☐ RTR Replicate Scan ☒ RTR Independent Observation	
Site ID:	ORNL
Batch Number:	OR-RTR6-0654
Examination Date:	5/13/2015
Waste Container ID:	X10C0402903J1
Video/Audio Recorded Media Number:	OR-RTR6-0654 A&B
Procedure and Revision No.:	CCP-TP-053 Rev. 15
NCR(s) associated with the container? (e.g., Prohibited Items)	☒ No ☐ Yes NCR No.: N/A NCR No.: N/A

Section 2: Waste Container Data	
Container Type:	55 Gallon Drum
TRUCON Code:	OR 225
Waste Matrix Code:	S5400
Waste Stream I.D.:	OR-REDC-CH-HET
Waste Container Weights:	Gross Wt.: 68.0 kg Tare Wt.: 33.2 kg Net Wt.: 34.8 kg
Rigid Liner and Liner Vent Description:	Liner: ☒ No ☐ Yes Lid: ☒ No ☐ Yes Type: ☐ 30-mil ☐ 90-mil ☐ 110-mil ☐ 125-mil Vented: ☐ No ☐ Yes ☒ N/A Punctured: ☒ No ☐ Yes Mechanical Vent: ☒ No ☐ Yes Fiberboard Liner: ☒ No ☐ Yes Lead Lined: ☒ No ☐ Yes
Number of Layers of Confinement:	Appears to be 1 layer
Volume Utilization Percentage:	90 %

CCP Radiography Data Sheet

Waste Container ID: X10C0402903J1

Section 3: Container Inventory and Comments	(Detailed descriptions)
IM:	Metal framed filters, scrap metal, metal cans, metal hardware
AM:	
OM:	
OI:	Glass containers, absorbent, broken glass
C:	
R:	
XPM:	Plastic sheeting
OR:	
IN:	
S:	

Section 4: Packaging Material and Waste Material Parameters	
Packaging Material:	**Estimated Weight (kg)**
Steel (ST):	27.8
Plastics (PP): Liner bag	1.0
Other: Cardboard Liner (CP)	4.4
Total Packaging Weight	33.2
Waste Material Parameter:	**Estimated Weight (kg)**
Iron-based Metal / Alloys (IM):	20.0
Aluminum-based Metals / Alloys (AM):	
Other Metals (OM):	
Other Inorganic Materials (OI)	9.0
Cellulosics (C):	
Rubber (R):	
Plastics (waste materials) (XPM):	5.8
Organic Matrix (OR):	
Inorganic Matrix (IN):	
Soils (S):	
Total WMP Weight:	34.8

CCP Radiography Data Sheet

Waste Container ID: X10C0402903J1

Section 5: RTR Summary (Questions answered "Yes" will be explained in the Comment block, except for Question 1)	
Is there observable liquid?	☐ Yes ☒ No
Is there any observable liquid in internal containers, more than 60 milliliters or 3 percent by volume, whichever is greater?	☐ Yes ☒ No
Is the total volume of observable liquid in the outermost container GREATER than 1% of the container?	☐ Yes ☒ No
Is there observable liquid in payload containers with an EPA Hazardous Waste Number of U134?	☐ Yes ☒ No
Is there an indication of non-radionuclide pyrophoric materials, such as elemental potassium?	☐ Yes ☒ No
Is there an indication of hazardous wastes not occurring as co-contaminants with TRU mixed wastes (non-mixed hazardous wastes)?	☐ Yes ☒ No
Is there an indication of wastes incompatible with backfill, seal and panel closures materials, container and packaging materials, shipping container materials, or other wastes (i.e., waste does NOT match TRUCON Code[s])?	☐ Yes ☒ No
Is there an indication of wastes containing explosives or compressed gases?	☐ Yes ☒ No
Is there an indication of PCBs liquids?	☐ Yes ☒ No
Is there an indication of the waste exhibiting the characteristic of ignitability, corrosivity, or reactivity (EPA Hazardous Waste Numbers of D001, D002, or D003)?	☐ Yes ☒ No
Is the physical form of the waste inconsistent with the Waste Stream Description or the Waste Matrix Code?	☐ Yes ☒ No
CH or RH TRAMPAC	
Are there heat-sealed bags (unvented) GREATER than 4 liters and LESS than 390 square inches in the waste, or heat sealed bags not authorized in the RH TRUCON Code?	☐ Yes ☒ No
Were there Non-approved Closure Methods used on liner bags or inner bags greater than 4 liters?	☐ Yes ☒ No
Are there sealed containers GREATER than 4 liters?	☐ Yes ☒ No
Are there indications of inadequate protection for heavy and/or sharp objects?	☐ Yes ☒ No

Comments: This Independent observation agrees with the Original Scan. DB 5-13-15

RTR Operator:

Daphne Brothers	Daphne O'Brothers	5/13/2015
Print Name	Signature	Date

CCP Radiography Data Sheet

Section 1: General Information	
[X] RTR Examination [ ] RTR Replicate Scan [ ] RTR Independent Observation	
Site ID:	ORNL
Batch Number:	OR-RTR6-0654
Examination Date:	5/13/2015
Waste Container ID:	X10C0402903J1
Video/Audio Recorded Media Number:	OR-RTR6-0654 A&B
Procedure and Revision No.:	CCP-TP-053 Rev. 15
NCR(s) associated with the container? (e.g., Prohibited Items)	[X] No [ ] Yes NCR No.: N/A NCR No.: N/A

Section 2: Waste Container Data	
Container Type:	55 Gallon Drum
TRUCON Code:	OR 225
Waste Matrix Code:	S5400
Waste Stream I.D.:	OR-REDC-CH-HET
Waste Container Weights:	Gross Wt.: 68.0 kg Tare Wt.: 33.2 kg Net Wt.: 34.8 kg
Rigid Liner and Liner Vent Description:	Liner: [X] No [ ] Yes Lid: [X] No [ ] Yes Type: [ ] 30-mil [ ] 90-mil [ ] 110-mil [ ] 125-mil Vented: [ ] No [ ] Yes [X] N/A Punctured: [X] No [ ] Yes Mechanical Vent: [X] No [ ] Yes Fiberboard Liner: [X] No [ ] Yes Lead Lined: [X] No [ ] Yes
Number of Layers of Confinement:	Appears to be 1 layer
Volume Utilization Percentage:	90 %

CCP Radiography Data Sheet

Waste Container ID: X10C0402903J1

Section 3: Container Inventory and Comments	(Detailed descriptions)
IM:	Metal framed filters, scrap metal, paint cans, metal hardware
AM:	
OM:	
OI:	Glass containers, broken glass, absorbent
C:	
R:	
XPM:	Plastic sheeting
OR:	
IN:	
S:	

Section 4: Packaging Material and Waste Material Parameters

Packaging Material:	Estimated Weight (kg)
Steel (ST):	27.8
Plastics (PP): Liner bag	1.0
Other: Cardboard Liner (CP)	4.4
Total Packaging Weight	33.2
Waste Material Parameter:	**Estimated Weight (kg)**
Iron-based Metal / Alloys (IM):	19.8
Aluminum-based Metals / Alloys (AM):	
Other Metals (OM):	
Other Inorganic Materials (OI)	8.0
Cellulosics (C):	
Rubber (R):	
Plastics (waste materials) (XPM):	7.0
Organic Matrix (OR):	
Inorganic Matrix (IN):	
Soils (S):	
Total WMP Weight:	34.8

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CCP Radiography Data Sheet

Waste Container ID: X10C0402903J1

Section 5: RTR Summary (Questions answered "Yes" will be explained in the Comment block, except for Question 1)	
Is there observable liquid?	☐ Yes ☒ No
Is there any observable liquid in internal containers, more than 60 milliliters or 3 percent by volume, whichever is greater?	☐ Yes ☒ No
Is the total volume of observable liquid in the outermost container GREATER than 1% of the container?	☐ Yes ☒ No
Is there observable liquid in payload containers with an EPA Hazardous Waste Number of U134?	☐ Yes ☒ No
Is there an indication of non-radionuclide pyrophoric materials, such as elemental potassium?	☐ Yes ☒ No
Is there an indication of hazardous wastes not occurring as co-contaminants with TRU mixed wastes (non-mixed hazardous wastes)?	☐ Yes ☒ No
Is there an indication of wastes incompatible with backfill, seal and panel closures materials, container and packaging materials, shipping container materials, or other wastes (i.e., waste does NOT match TRUCON Code[s])?	☐ Yes ☒ No
Is there an indication of wastes containing explosives or compressed gases?	☐ Yes ☒ No
Is there an indication of PCBs liquids?	☐ Yes ☒ No
Is there an indication of the waste exhibiting the characteristic of ignitability, corrosivity, or reactivity (EPA Hazardous Waste Numbers of D001, D002, or D003)?	☐ Yes ☒ No
Is the physical form of the waste inconsistent with the Waste Stream Description or the Waste Matrix Code?	☐ Yes ☒ No
CH or RH TRAMPAC	
Are there heat-sealed bags (unvented) GREATER than 4 liters and LESS than 390 square inches in the waste, or heat sealed bags not authorized in the RH TRUCON Code?	☐ Yes ☒ No
Were there Non-approved Closure Methods used on liner bags or inner bags greater than 4 liters?	☐ Yes ☒ No
Are there sealed containers GREATER than 4 liters?	☐ Yes ☒ No
Are there indications of inadequate protection for heavy and/or sharp objects?	☐ Yes ☒ No
Comments: N/A	

RTR Operator:

Eric Lyles		5/13/2015
Print Name	Signature	Date

CCP Radiography Data Sheet

Section 1: General Information	
[X] RTR Examination [ ] RTR Replicate Scan [ ] RTR Independent Observation	
Site ID:	ORNL
Batch Number:	OR-RTR6-0654
Examination Date:	5/13/2015
Waste Container ID:	X10C0402876F1
Video/Audio Recorded Media Number:	OR-RTR6-0654 A&B
Procedure and Revision No.:	CCP-TP-053 Rev: 15
NCR(s) associated with the container? (e.g., Prohibited Items)	[X] No [ ] Yes NCR No.: N/A NCR No.: N/A

Section 2: Waste Container Data	
Container Type:	55 Gallon Drum
TRUCON Code:	OR 225
Waste Matrix Code:	S5400
Waste Stream I.D.:	OR-REDC-CH-HET
Waste Container Weights:	Gross Wt.: 99.8 kg Tare Wt.: 33.2 kg Net Wt.: 66.6 kg
Rigid Liner and Liner Vent Description:	Liner: [X] No [ ] Yes Lid: [X] No [ ] Yes Type: [ ] 30-mil [ ] 90-mil [ ] 110-mil [ ] 125-mil Vented: [ ] No [ ] Yes [X] N/A Punctured: [X] No [ ] Yes Mechanical Vent: [X] No [ ] Yes Fiberboard Liner: [X] No [ ] Yes Lead Lined: [X] No [ ] Yes
Number of Layers of Confinement:	Appears to be 1 layer
Volume Utilization Percentage:	85 %

CCP Radiography Data Sheet

Waste Container ID: X10C0402876F1

Section 3: Container Inventory and Comments	(Detailed descriptions)
IM:	Scrap metal
AM:	Aluminum rings
OM:	
OI:	Glass containers, broken glass, absorbent
C:	Cardboard, cloth
R:	
XPM:	Plastic sheeting, plastic container, plastic tubing, plastic caps
OR:	
IN:	
S:	

Section 4: Packaging Material and Waste Material Parameters	
Packaging Material:	**Estimated Weight (kg)**
Steel (ST):	27.8
Plastics (PP): Liner bag	1.0
Other: Cardboard Liner (CP)	4.4
Total Packaging Weight	33.2
Waste Material Parameter:	**Estimated Weight (kg)**
Iron-based Metal / Alloys (IM):	29.6
Aluminum-based Metals / Alloys (AM):	6.0
Other Metals (OM):	
Other Inorganic Materials (OI)	10.0
Cellulosics (C):	12.0
Rubber (R):	
Plastics (waste materials) (XPM):	9.0
Organic Matrix (OR):	
Inorganic Matrix (IN):	
Soils (S):	
Total WMP Weight:	66.6

CCP Radiography Data Sheet

Waste Container ID: X10C0402876F1

Section 5: RTR Summary (Questions answered "Yes" will be explained in the Comment block, except for Question 1)	
Is there observable liquid?	☐ Yes ☒ No
Is there any observable liquid in internal containers, more than 60 milliliters or 3 percent by volume, whichever is greater?	☐ Yes ☒ No
Is the total volume of observable liquid in the outermost container GREATER than 1% of the container?	☐ Yes ☒ No
Is there observable liquid in payload containers with an EPA Hazardous Waste Number of U134?	☐ Yes ☒ No
Is there an indication of non-radionuclide pyrophoric materials, such as elemental potassium?	☐ Yes ☒ No
Is there an indication of hazardous wastes not occurring as co-contaminants with TRU mixed wastes (non-mixed hazardous wastes)?	☐ Yes ☒ No
Is there an indication of wastes incompatible with backfill, seal and panel closures materials, container and packaging materials, shipping container materials, or other wastes (i.e., waste does NOT match TRUCON Code[s])?	☐ Yes ☒ No
Is there an indication of wastes containing explosives or compressed gases?	☐ Yes ☒ No
Is there an indication of PCBs liquids?	☐ Yes ☒ No
Is there an indication of the waste exhibiting the characteristic of ignitability, corrosivity, or reactivity (EPA Hazardous Waste Numbers of D001, D002, or D003)?	☐ Yes ☒ No
Is the physical form of the waste inconsistent with the Waste Stream Description or the Waste Matrix Code?	☐ Yes ☒ No
CH or RH TRAMPAC	
Are there heat-sealed bags (unvented) GREATER than 4 liters and LESS than 390 square inches in the waste, or heat sealed bags not authorized in the RH TRUCON Code?	☐ Yes ☒ No
Were there Non-approved Closure Methods used on liner bags or inner bags greater than 4 liters?	☐ Yes ☒ No
Are there sealed containers GREATER than 4 liters?	☐ Yes ☒ No
Are there indications of inadequate protection for heavy and/or sharp objects?	☐ Yes ☒ No
Comments: N/A	

RTR Operator:

Eric Lyles		5/13/2015
Print Name	Signature	Date

CCP Radiography Data Sheet

Section 1: General Information	
[X] RTR Examination [ ] RTR Replicate Scan [ ] RTR Independent Observation	
Site ID:	ORNL
Batch Number:	OR-RTR6-0654
Examination Date:	5/13/2015
Waste Container ID:	X10C0402816C1
Video/Audio Recorded Media Number:	OR-RTR6-0654 A&B
Procedure and Revision No.:	CCP-TP-053 Rev. 15
NCR(s) associated with the container? (e.g., Prohibited Items)	[X] No [ ] Yes NCR No.: N/A NCR No.: N/A

Section 2: Waste Container Data	
Container Type:	55 Gallon Drum
TRUCON Code:	OR 225
Waste Matrix Code:	S5400
Waste Stream I.D.:	OR-REDC-CH-HET
Waste Container Weights:	Gross Wt.: 64.5 kg Tare Wt.: 33.2 kg Net Wt.: 31.3 kg
Rigid Liner and Liner Vent Description:	Liner: [X] No [ ] Yes Lid: [X] No [ ] Yes Type: [ ] 30-mil [ ] 90-mil [ ] 110-mil [ ] 125-mil Vented: [ ] No [ ] Yes [X] N/A Punctured: [X] No [ ] Yes Mechanical Vent: [X] No [ ] Yes Fiberboard Liner: [X] No [ ] Yes Lead Lined: [X] No [ ] Yes
Number of Layers of Confinement:	Appears to be 1 layer
Volume Utilization Percentage:	85 %

CCP Radiography Data Sheet

Waste Container ID: X10C0402816C1

Section 3: Container Inventory and Comments	(Detailed descriptions)
IM:	Scrap metal, hand tool
AM:	
OM:	
OI:	Absorbent, glass containers, broken glass
C:	Cardboard
R:	Rubber stopper
XPM:	Plastic sheeting, plastic containers
OR:	
IN:	
S:	

Section 4: Packaging Material and Waste Material Parameters	
Packaging Material:	**Estimated Weight (kg)**
Steel (ST):	27.8
Plastics (PP): Liner bag	1.0
Other: Cardboard Liner (CP)	4.4
Total Packaging Weight	33.2
Waste Material Parameter:	**Estimated Weight (kg)**
Iron-based Metal / Alloys (IM):	13.2
Aluminum-based Metals / Alloys (AM):	
Other Metals (OM):	
Other Inorganic Materials (OI)	6.0
Cellulosics (C):	4.0
Rubber (R):	0.1
Plastics (waste materials) (XPM):	8.0
Organic Matrix (OR):	
Inorganic Matrix (IN):	
Soils (S):	
Total WMP Weight:	31.3

CCP Radiography Data Sheet

Waste Container ID: X10C0402816C1

Section 5: RTR Summary (Questions answered "Yes" will be explained in the Comment block, except for Question 1)	
Is there observable liquid?	☐ Yes ☒ No
Is there any observable liquid in internal containers, more than 60 milliliters or 3 percent by volume, whichever is greater?	☐ Yes ☒ No
Is the total volume of observable liquid in the outermost container GREATER than 1% of the container?	☐ Yes ☒ No
Is there observable liquid in payload containers with an EPA Hazardous Waste Number of U134?	☐ Yes ☒ No
Is there an indication of non-radionuclide pyrophoric materials, such as elemental potassium?	☐ Yes ☒ No
Is there an indication of hazardous wastes not occurring as co-contaminants with TRU mixed wastes (non-mixed hazardous wastes)?	☐ Yes ☒ No
Is there an indication of wastes incompatible with backfill, seal and panel closures materials, container and packaging materials, shipping container materials, or other wastes (i.e., waste does NOT match TRUCON Code[s])?	☐ Yes ☒ No
Is there an indication of wastes containing explosives or compressed gases?	☐ Yes ☒ No
Is there an indication of PCBs liquids?	☐ Yes ☒ No
Is there an indication of the waste exhibiting the characteristic of ignitability, corrosivity, or reactivity (EPA Hazardous Waste Numbers of D001, D002, or D003)?	☐ Yes ☒ No
Is the physical form of the waste inconsistent with the Waste Stream Description or the Waste Matrix Code?	☐ Yes ☒ No
CH or RH TRAMPAC	
Are there heat-sealed bags (unvented) GREATER than 4 liters and LESS than 390 square inches in the waste, or heat sealed bags not authorized in the RH TRUCON Code?	☐ Yes ☒ No
Were there Non-approved Closure Methods used on liner bags or inner bags greater than 4 liters?	☐ Yes ☒ No
Are there sealed containers GREATER than 4 liters?	☐ Yes ☒ No
Are there indications of inadequate protection for heavy and/or sharp objects?	☐ Yes ☒ No
Comments: N/A	

RTR Operator:

Eric Lyles		5/13/2015
Print Name	Signature	Date

CCP Radiography Data Sheet

Section 1: General Information	
[X] RTR Examination [ ] RTR Replicate Scan [ ] RTR Independent Observation	
Site ID:	ORNL
Batch Number:	OR-RTR6-0654
Examination Date:	5/13/2015
Waste Container ID:	X10C0402886I1
Video/Audio Recorded Media Number:	OR-RTR6-0654 A&B
Procedure and Revision No.:	CCP-TP-053 Rev. 15
NCR(s) associated with the container? (e.g., Prohibited Items)	[X] No [ ] Yes NCR No.: N/A NCR No.: N/A

Section 2: Waste Container Data	
Container Type:	55 Gallon Drum
TRUCON Code:	OR 225
Waste Matrix Code:	S5400
Waste Stream I.D.:	OR-REDC-CH-HET
Waste Container Weights:	Gross Wt.: 57.1 kg Tare Wt.: 33.2 kg Net Wt.: 23.9 kg
Rigid Liner and Liner Vent Description:	Liner: [X] No [ ] Yes Lid: [X] No [ ] Yes Type: [ ] 30-mil [ ] 90-mil [ ] 110-mil [ ] 125-mil Vented: [ ] No [ ] Yes [X] N/A Punctured: [X] No [ ] Yes Mechanical Vent: [X] No [ ] Yes Fiberboard Liner: [X] No [ ] Yes Lead Lined: [X] No [ ] Yes
Number of Layers of Confinement:	Appears to be 1 layer
Volume Utilization Percentage:	90 %

CCP Radiography Data Sheet

Waste Container ID: X10C0402886I1

Section 3: Container Inventory and Comments	(Detailed descriptions)
IM:	Scrap metal, metal hardware, hand tool, metal lids
AM:	
OM:	
OI:	Absorbent, glass containers, broken glass
C:	Cloth, cardboard
R:	
XPM:	Plastic sheeting, plastic containers, plastic lids, open plastic containers
OR:	
IN:	
S:	

Section 4: Packaging Material and Waste Material Parameters	
Packaging Material:	**Estimated Weight (kg)**
Steel (ST):	27.8
Plastics (PP): Liner bag	1.0
Other: Cardboard Liner (CP)	4.4
Total Packaging Weight	33.2
Waste Material Parameter:	**Estimated Weight (kg)**
Iron-based Metal / Alloys (IM):	4.0
Aluminum-based Metals / Alloys (AM):	
Other Metals (OM):	
Other Inorganic Materials (OI)	5.0
Cellulosics (C):	5.0
Rubber (R):	
Plastics (waste materials) (XPM):	9.9
Organic Matrix (OR):	
Inorganic Matrix (IN):	
Soils (S):	
Total WMP Weight:	23.9

CCP Radiography Data Sheet

Waste Container ID: X10C0402886I1

Section 5: RTR Summary (Questions answered "Yes" will be explained in the Comment block, except for Question 1)	
Is there observable liquid?	☐ Yes ☒ No
Is there any observable liquid in internal containers, more than 60 milliliters or 3 percent by volume, whichever is greater?	☐ Yes ☒ No
Is the total volume of observable liquid in the outermost container GREATER than 1% of the container?	☐ Yes ☒ No
Is there observable liquid in payload containers with an EPA Hazardous Waste Number of U134?	☐ Yes ☒ No
Is there an indication of non-radionuclide pyrophoric materials, such as elemental potassium?	☐ Yes ☒ No
Is there an indication of hazardous wastes not occurring as co-contaminants with TRU mixed wastes (non-mixed hazardous wastes)?	☐ Yes ☒ No
Is there an indication of wastes incompatible with backfill, seal and panel closures materials, container and packaging materials, shipping container materials, or other wastes (i.e., waste does NOT match TRUCON Code[s])?	☐ Yes ☒ No
Is there an indication of wastes containing explosives or compressed gases?	☐ Yes ☒ No
Is there an indication of PCBs liquids?	☐ Yes ☒ No
Is there an indication of the waste exhibiting the characteristic of ignitability, corrosivity, or reactivity (EPA Hazardous Waste Numbers of D001, D002, or D003)?	☐ Yes ☒ No
Is the physical form of the waste inconsistent with the Waste Stream Description or the Waste Matrix Code?	☐ Yes ☒ No
CH or RH TRAMPAC	
Are there heat-sealed bags (unvented) GREATER than 4 liters and LESS than 390 square inches in the waste, or heat sealed bags not authorized in the RH TRUCON Code?	☐ Yes ☒ No
Were there Non-approved Closure Methods used on liner bags or inner bags greater than 4 liters?	☐ Yes ☒ No
Are there sealed containers GREATER than 4 liters?	☐ Yes ☒ No
Are there indications of inadequate protection for heavy and/or sharp objects?	☐ Yes ☒ No
Comments: N/A	

RTR Operator:

Eric Lyles		5/13/2015
Print Name	Signature	Date

CCP Radiography Data Sheet

Section 1: General Information		
[X] RTR Examination	[ ] RTR Replicate Scan	[ ] RTR Independent Observation
Site ID:	ORNL	
Batch Number:	OR-RTR6-0654	
Examination Date:	5/13/2015	
Waste Container ID:	X10C9402627B1	
Video/Audio Recorded Media Number:	OR-RTR6-0654	A&B
Procedure and Revision No.:	CCP-TP-053	Rev. 15
NCR(s) associated with the container? (e.g., Prohibited Items)	[X] No [ ] Yes NCR No.: N/A NCR No.: N/A	

Section 2: Waste Container Data	
Container Type:	55 Gallon Drum
TRUCON Code:	OR 225
Waste Matrix Code:	S5400
Waste Stream I.D.:	OR-REDC-CH-HET
Waste Container Weights:	Gross Wt.: 55.9 kg Tare Wt.: 33.2 kg Net Wt.: 22.7 kg
Rigid Liner and Liner Vent Description:	Liner: [X] No [ ] Yes Lid: [X] No [ ] Yes Type: [ ] 30-mil [ ] 90-mil [ ] 110-mil [ ] 125-mil Vented: [ ] No [ ] Yes [X] N/A Punctured: [X] No [ ] Yes Mechanical Vent: [X] No [ ] Yes Fiberboard Liner: [X] No [ ] Yes Lead Lined: [X] No [ ] Yes
Number of Layers of Confinement:	Appears to be 1 layer
Volume Utilization Percentage:	85 %

CCP Radiography Data Sheet

Waste Container ID: X10C9402627B1

Section 3: Container Inventory and Comments	(Detailed descriptions)
IM:	Scrap metal
AM:	Aluminum ring
OM:	
OI:	
C:	Cardboard
R:	Rubber gloves
XPM:	Plastic sheeting, manipulator boots, plastic container, plastic lids
OR:	
IN:	
S:	

Section 4: Packaging Material and Waste Material Parameters	
Packaging Material:	**Estimated Weight (kg)**
Steel (ST):	27.8
Plastics (PP): Liner bag	1.0
Other: Cardboard Liner (CP)	4.4
Total Packaging Weight	33.2
Waste Material Parameter:	**Estimated Weight (kg)**
Iron-based Metal / Alloys (IM):	2.0
Aluminum-based Metals / Alloys (AM):	2.0
Other Metals (OM):	
Other Inorganic Materials (OI)	
Cellulosics (C):	4.0
Rubber (R):	2.0
Plastics (waste materials) (XPM):	12.7
Organic Matrix (OR):	
Inorganic Matrix (IN):	
Soils (S):	
Total WMP Weight:	22.7

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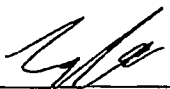
CCP Radiography Data Sheet

Waste Container ID: X10C9402627B1

Section 5: RTR Summary (Questions answered "Yes" will be explained in the Comment block, except for Question 1)	
Is there observable liquid?	☐ Yes ☒ No
Is there any observable liquid in internal containers, more than 60 milliliters or 3 percent by volume, whichever is greater?	☐ Yes ☒ No
Is the total volume of observable liquid in the outermost container GREATER than 1% of the container?	☐ Yes ☒ No
Is there observable liquid in payload containers with an EPA Hazardous Waste Number of U134?	☐ Yes ☒ No
Is there an indication of non-radionuclide pyrophoric materials, such as elemental potassium?	☐ Yes ☒ No
Is there an indication of hazardous wastes not occurring as co-contaminants with TRU mixed wastes (non-mixed hazardous wastes)?	☐ Yes ☒ No
Is there an indication of wastes incompatible with backfill, seal and panel closures materials, container and packaging materials, shipping container materials, or other wastes (i.e., waste does NOT match TRUCON Code[s])?	☐ Yes ☒ No
Is there an indication of wastes containing explosives or compressed gases?	☐ Yes ☒ No
Is there an indication of PCBs liquids?	☐ Yes ☒ No
Is there an indication of the waste exhibiting the characteristic of ignitability, corrosivity, or reactivity (EPA Hazardous Waste Numbers of D001, D002, or D003)?	☐ Yes ☒ No
Is the physical form of the waste inconsistent with the Waste Stream Description or the Waste Matrix Code?	☐ Yes ☒ No
CH or RH TRAMPAC	
Are there heat-sealed bags (unvented) GREATER than 4 liters and LESS than 390 square inches in the waste, or heat sealed bags not authorized in the RH TRUCON Code?	☐ Yes ☒ No
Were there Non-approved Closure Methods used on liner bags or inner bags greater than 4 liters?	☐ Yes ☒ No
Are there sealed containers GREATER than 4 liters?	☐ Yes ☒ No
Are there indications of inadequate protection for heavy and/or sharp objects?	☐ Yes ☒ No
Comments: N/A	

RTR Operator:

Eric Lyles		5/13/2015
Print Name	Signature	Date

CCP Radiography Data Sheet

Section 1: General Information	
[X] RTR Examination [ ] RTR Replicate Scan [ ] RTR Independent Observation	
Site ID:	ORNL
Batch Number:	OR-RTR6-0654
Examination Date:	5/13/2015
Waste Container ID:	X10C0402781E
Video/Audio Recorded Media Number:	OR-RTR6-0654 A&B
Procedure and Revision No.:	CCP-TP-053 Rev. 15
NCR(s) associated with the container? (e.g., Prohibited Items)	[X] No [ ] Yes NCR No.: N/A NCR No.: N/A

Section 2: Waste Container Data	
Container Type:	55 Gallon Drum
TRUCON Code:	OR 225
Waste Matrix Code:	S5400
Waste Stream I.D.:	OR-REDC-CH-HET
Waste Container Weights:	Gross Wt.: 60.6 kg Tare Wt.: 33.2 kg Net Wt.: 27.4 kg
Rigid Liner and Liner Vent Description:	Liner: [X] No [ ] Yes Lid: [X] No [ ] Yes Type: [ ] 30-mil [ ] 90-mil [ ] 110-mil [ ] 125-mil Vented: [ ] No [ ] Yes [X] N/A Punctured: [X] No [ ] Yes Mechanical Vent: [X] No [ ] Yes Fiberboard Liner: [X] No [ ] Yes Lead Lined: [X] No [ ] Yes
Number of Layers of Confinement:	Appears to be 1 layer
Volume Utilization Percentage:	90 %

CCP Radiography Data Sheet

Waste Container ID: X10C0402781E

Section 3: Container Inventory and Comments	(Detailed descriptions)
IM:	Scrap metal, metal hardware
AM:	
OM:	
OI:	Absorbent
C:	Wooden brush, wood
R:	
XPM:	Plastic sheeting, open plastic bucket
OR:	
IN:	
S:	

Section 4: Packaging Material and Waste Material Parameters

Packaging Material:	Estimated Weight (kg)
Steel (ST):	27.8
Plastics (PP): Liner bag	1.0
Other: Cardboard Liner (CP)	4.4
Total Packaging Weight	33.2
Waste Material Parameter:	**Estimated Weight (kg)**
Iron-based Metal / Alloys (IM):	6.0
Aluminum-based Metals / Alloys (AM):	
Other Metals (OM):	
Other Inorganic Materials (OI)	4.0
Cellulosics (C):	3.0
Rubber (R):	
Plastics (waste materials) (XPM):	14.4
Organic Matrix (OR):	
Inorganic Matrix (IN):	
Soils (S):	
Total WMP Weight:	27.4

CCP Radiography Data Sheet

Waste Container ID: X10C0402781E

Section 5: RTR Summary (Questions answered "Yes" will be explained in the Comment block, except for Question 1)	
Is there observable liquid?	☐ Yes ☒ No
Is there any observable liquid in internal containers, more than 60 milliliters or 3 percent by volume, whichever is greater?	☐ Yes ☒ No
Is the total volume of observable liquid in the outermost container GREATER than 1% of the container?	☐ Yes ☒ No
Is there observable liquid in payload containers with an EPA Hazardous Waste Number of U134?	☐ Yes ☒ No
Is there an indication of non-radionuclide pyrophoric materials, such as elemental potassium?	☐ Yes ☒ No
Is there an indication of hazardous wastes not occurring as co-contaminants with TRU mixed wastes (non-mixed hazardous wastes)?	☐ Yes ☒ No
Is there an indication of wastes incompatible with backfill, seal and panel closures materials, container and packaging materials, shipping container materials, or other wastes (i.e., waste does NOT match TRUCON Code[s])?	☐ Yes ☒ No
Is there an indication of wastes containing explosives or compressed gases?	☐ Yes ☒ No
Is there an indication of PCBs liquids?	☐ Yes ☒ No
Is there an indication of the waste exhibiting the characteristic of ignitability, corrosivity, or reactivity (EPA Hazardous Waste Numbers of D001, D002, or D003)?	☐ Yes ☒ No
Is the physical form of the waste inconsistent with the Waste Stream Description or the Waste Matrix Code?	☐ Yes ☒ No
CH or RH TRAMPAC	
Are there heat-sealed bags (unvented) GREATER than 4 liters and LESS than 390 square inches in the waste, or heat sealed bags not authorized in the RH TRUCON Code?	☐ Yes ☒ No
Were there Non-approved Closure Methods used on liner bags or inner bags greater than 4 liters?	☐ Yes ☒ No
Are there sealed containers GREATER than 4 liters?	☐ Yes ☒ No
Are there indications of inadequate protection for heavy and/or sharp objects?	☐ Yes ☒ No
Comments: N/A	
RTR Operator: Eric Lyles (Print Name) / Signature / 5/13/2015 (Date)	

CCP Radiography Data Sheet

Section 1: General Information	
[X] RTR Examination [ ] RTR Replicate Scan [ ] RTR Independent Observation	
Site ID:	ORNL
Batch Number:	OR-RTR6-0654
Examination Date:	5/13/2015
Waste Container ID:	X10C0402892D1
Video/Audio Recorded Media Number:	OR-RTR6-0654 A&B
Procedure and Revision No.:	CCP-TP-053 Rev. 15
NCR(s) associated with the container? (e.g., Prohibited Items)	[X] No [ ] Yes NCR No.: N/A NCR No.: N/A

Section 2: Waste Container Data	
Container Type:	55 Gallon Drum
TRUCON Code:	OR 225
Waste Matrix Code:	S5400
Waste Stream I.D.:	OR-REDC-CH-HET
Waste Container Weights:	Gross Wt.: 128.0 kg Tare Wt.: 33.2 kg Net Wt.: 94.8 kg
Rigid Liner and Liner Vent Description:	Liner: [X] No [ ] Yes Lid: [X] No [ ] Yes Type: [ ] 30-mil [ ] 90-mil [ ] 110-mil [ ] 125-mil Vented: [ ] No [ ] Yes [X] N/A Punctured: [X] No [ ] Yes Mechanical Vent: [X] No [ ] Yes Fiberboard Liner: [X] No [ ] Yes Lead Lined: [X] No [ ] Yes
Number of Layers of Confinement:	Appears to be 1 layer
Volume Utilization Percentage:	85 %

CCP Radiography Data Sheet

Waste Container ID: X10C0402892D1

Section 3: Container Inventory and Comments	(Detailed descriptions)
IM:	Motors, scrap metal, electrical equipment, saw blade, hand tools
AM.	
OM:	
OI:	Absorbent
C:	Cardboard, cloth, wooden brush
R:	
XPM:	Plastic sheeting, plastic containers
OR:	
IN:	
S:	

Section 4: Packaging Material and Waste Material Parameters	
Packaging Material:	**Estimated Weight (kg)**
Steel (ST):	27.8
Plastics (PP): Liner bag	1.0
Other: Cardboard Liner (CP)	4.4
Total Packaging Weight	33.2
Waste Material Parameter:	**Estimated Weight (kg)**
Iron-based Metal / Alloys (IM):	66.8
Aluminum-based Metals / Alloys (AM):	
Other Metals (OM):	
Other Inorganic Materials (OI)	7.0
Cellulosics (C):	15.0
Rubber (R):	
Plastics (waste materials) (XPM):	6.0
Organic Matrix (OR):	
Inorganic Matrix (IN):	
Soils (S):	
Total WMP Weight:	94.8

CCP Radiography Data Sheet

Waste Container ID: X10C0402892D1

Section 5: RTR Summary (Questions answered "Yes" will be explained in the Comment block, except for Question 1)	
Is there observable liquid?	☐ Yes ☒ No
Is there any observable liquid in internal containers, more than 60 milliliters or 3 percent by volume, whichever is greater?	☐ Yes ☒ No
Is the total volume of observable liquid in the outermost container GREATER than 1% of the container?	☐ Yes ☒ No
Is there observable liquid in payload containers with an EPA Hazardous Waste Number of U134?	☐ Yes ☒ No
Is there an indication of non-radionuclide pyrophoric materials, such as elemental potassium?	☐ Yes ☒ No
Is there an indication of hazardous wastes not occurring as co-contaminants with TRU mixed wastes (non-mixed hazardous wastes)?	☐ Yes ☒ No
Is there an indication of wastes incompatible with backfill, seal and panel closures materials, container and packaging materials, shipping container materials, or other wastes (i.e., waste does NOT match TRUCON Code[s])?	☐ Yes ☒ No
Is there an indication of wastes containing explosives or compressed gases?	☐ Yes ☒ No
Is there an indication of PCBs liquids?	☐ Yes ☒ No
Is there an indication of the waste exhibiting the characteristic of ignitability, corrosivity, or reactivity (EPA Hazardous Waste Numbers of D001, D002, or D003)?	☐ Yes ☒ No
Is the physical form of the waste inconsistent with the Waste Stream Description or the Waste Matrix Code?	☐ Yes ☒ No
CH or RH TRAMPAC	
Are there heat-sealed bags (unvented) GREATER than 4 liters and LESS than 390 square inches in the waste, or heat sealed bags not authorized in the RH TRUCON Code?	☐ Yes ☒ No
Were there Non-approved Closure Methods used on liner bags or inner bags greater than 4 liters?	☐ Yes ☒ No
Are there sealed containers GREATER than 4 liters?	☐ Yes ☒ No
Are there indications of inadequate protection for heavy and/or sharp objects?	☐ Yes ☒ No
Comments: N/A	

RTR Operator:

Eric Lyles		5/13/2015
Print Name	Signature	Date

CCP Radiography Data Sheet

Section 1: General Information		
[X] RTR Examination	[ ] RTR Replicate Scan	[ ] RTR Independent Observation
Site ID:	ORNL	
Batch Number:	OR-RTR6-0654	
Examination Date:	5/13/2015	
Waste Container ID:	X10C9311650A	
Video/Audio Recorded Media Number:	OR-RTR6-0654	A&B
Procedure and Revision No.:	CCP-TP-053	Rev. 15
NCR(s) associated with the container? (e.g., Prohibited Items)	[X] No [ ] Yes NCR No.: N/A NCR No.: N/A	

Section 2: Waste Container Data	
Container Type:	55 Gallon Drum
TRUCON Code:	OR 225
Waste Matrix Code:	S5400
Waste Stream I.D.:	OR-RF-CH-HET
Waste Container Weights:	Gross Wt.: 65.1 kg Tare Wt.: 33.2 kg Net Wt.: 31.9 kg
Rigid Liner and Liner Vent Description:	Liner: [X] No [ ] Yes Lid: [X] No [ ] Yes Type: [ ] 30-mil [ ] 90-mil [ ] 110-mil [ ] 125-mil Vented: [ ] No [ ] Yes [X] N/A Punctured: [X] No [ ] Yes Mechanical Vent: [X] No [ ] Yes Fiberboard Liner: [X] No [ ] Yes Lead Lined: [X] No [ ] Yes
Number of Layers of Confinement:	Appears to be 1 layer
Volume Utilization Percentage:	85 %

CCP Radiography Data Sheet

Waste Container ID: X10C9311650A

Section 3: Container Inventory and Comments	(Detailed descriptions)
IM:	Metal framed filters, scrap metal
AM:	
OM:	
OI:	Glass containers
C:	
R:	
XPM:	Plastic sheeting, plastic containers, plastic cap
OR:	
IN:	
S:	

Section 4: Packaging Material and Waste Material Parameters	
Packaging Material:	**Estimated Weight (kg)**
Steel (ST):	27.8
Plastics (PP): Liner bag	1.0
Other: Cardboard Liner (CP)	4.4
Total Packaging Weight	33.2
Waste Material Parameter:	**Estimated Weight (kg)**
Iron-based Metal / Alloys (IM):	23.5
Aluminum-based Metals / Alloys (AM):	
Other Metals (OM):	
Other Inorganic Materials (OI)	0.4
Cellulosics (C):	
Rubber (R):	
Plastics (waste materials) (XPM):	8.0
Organic Matrix (OR):	
Inorganic Matrix (IN):	
Soils (S):	
Total WMP Weight:	31.9

CCP Radiography Data Sheet

Waste Container ID: X10C9311650A

Section 5: RTR Summary (Questions answered "Yes" will be explained in the Comment block, except for Question 1)	
Is there observable liquid?	☐ Yes ☒ No
Is there any observable liquid in internal containers, more than 60 milliliters or 3 percent by volume, whichever is greater?	☐ Yes ☒ No
Is the total volume of observable liquid in the outermost container GREATER than 1% of the container?	☐ Yes ☒ No
Is there observable liquid in payload containers with an EPA Hazardous Waste Number of U134?	☐ Yes ☒ No
Is there an indication of non-radionuclide pyrophoric materials, such as elemental potassium?	☐ Yes ☒ No
Is there an indication of hazardous wastes not occurring as co-contaminants with TRU mixed wastes (non-mixed hazardous wastes)?	☐ Yes ☒ No
Is there an indication of wastes incompatible with backfill, seal and panel closures materials, container and packaging materials, shipping container materials, or other wastes (i.e., waste does NOT match TRUCON Code[s])?	☐ Yes ☒ No
Is there an indication of wastes containing explosives or compressed gases?	☐ Yes ☒ No
Is there an indication of PCBs liquids?	☐ Yes ☒ No
Is there an indication of the waste exhibiting the characteristic of ignitability, corrosivity, or reactivity (EPA Hazardous Waste Numbers of D001, D002, or D003)?	☐ Yes ☒ No
Is the physical form of the waste inconsistent with the Waste Stream Description or the Waste Matrix Code?	☐ Yes ☒ No
CH or RH TRAMPAC	
Are there heat-sealed bags (unvented) GREATER than 4 liters and LESS than 390 square inches in the waste, or heat sealed bags not authorized in the RH TRUCON Code?	☐ Yes ☒ No
Were there Non-approved Closure Methods used on liner bags or inner bags greater than 4 liters?	☐ Yes ☒ No
Are there sealed containers GREATER than 4 liters?	☐ Yes ☒ No
Are there indications of inadequate protection for heavy and/or sharp objects?	☐ Yes ☒ No
Comments: N/A	

RTR Operator:

Eric Lyles		5/13/2015
Print Name	Signature	Date

CCP Radiography Data Sheet

Section 1: General Information	
[X] RTR Examination [ ] RTR Replicate Scan [ ] RTR Independent Observation	
Site ID:	ORNL
Batch Number:	OR-RTR6-0654
Examination Date:	5/13/2015
Waste Container ID:	X10C0402903H1
Video/Audio Recorded Media Number:	OR-RTR6-0654 A&B
Procedure and Revision No.:	CCP-TP-053 Rev. 15
NCR(s) associated with the container? (e.g., Prohibited Items)	[X] No [ ] Yes NCR No.: N/A NCR No.: N/A

Section 2: Waste Container Data	
Container Type:	55 Gallon Drum
TRUCON Code:	OR 225
Waste Matrix Code:	S5400
Waste Stream I.D.:	OR-REDC-CH-HET
Waste Container Weights:	Gross Wt.: 60.1 kg Tare Wt.: 33.2 kg Net Wt.: 26.9 kg
Rigid Liner and Liner Vent Description:	Liner: [X] No [ ] Yes Lid: [X] No [ ] Yes Type: [ ] 30-mil [ ] 90-mil [ ] 110-mil [ ] 125-mil Vented: [ ] No [ ] Yes [X] N/A Punctured: [X] No [ ] Yes Mechanical Vent: [X] No [ ] Yes Fiberboard Liner: [X] No [ ] Yes Lead Lined: [X] No [ ] Yes
Number of Layers of Confinement:	Appears to be 1 layer
Volume Utilization Percentage:	85 %

CCP Radiography Data Sheet

Waste Container ID: X10C0402903H1

Section 3: Container Inventory and Comments	(Detailed descriptions)
IM:	Saw blade, scrap metal, metal lids
AM:	
OM:	
OI:	Glass containers, broken glass, absorbent
C:	Cardboard
R:	
XPM:	Plastic sheeting
OR:	
IN:	
S:	

Section 4: Packaging Material and Waste Material Parameters	
Packaging Material:	**Estimated Weight (kg)**
Steel (ST):	27.8
Plastics (PP): Liner bag	1.0
Other: Cardboard Liner (CP)	4.4
Total Packaging Weight	33.2
Waste Material Parameter:	**Estimated Weight (kg)**
Iron-based Metal / Alloys (IM):	10.9
Aluminum-based Metals / Alloys (AM):	
Other Metals (OM):	
Other Inorganic Materials (OI)	6.0
Cellulosics (C):	4.0
Rubber (R):	
Plastics (waste materials) (XPM):	6.0
Organic Matrix (OR):	
Inorganic Matrix (IN):	
Soils (S):	
Total WMP Weight:	26.9

CCP Radiography Data Sheet

Waste Container ID: X10C0402903H1

Section 5: RTR Summary (Questions answered "Yes" will be explained in the Comment block, except for Question 1)	
Is there observable liquid?	[X] Yes [ ] No
Is there any observable liquid in internal containers, more than 60 milliliters or 3 percent by volume, whichever is greater?	[ ] Yes [X] No
Is the total volume of observable liquid in the outermost container GREATER than 1% of the container?	[ ] Yes [X] No
Is there observable liquid in payload containers with an EPA Hazardous Waste Number of U134?	[ ] Yes [X] No
Is there an indication of non-radionuclide pyrophoric materials, such as elemental potassium?	[ ] Yes [X] No
Is there an indication of hazardous wastes not occurring as co-contaminants with TRU mixed wastes (non-mixed hazardous wastes)?	[ ] Yes [X] No
Is there an indication of wastes incompatible with backfill, seal and panel closures materials, container and packaging materials, shipping container materials, or other wastes (i.e., waste does NOT match TRUCON Code[s])?	[ ] Yes [X] No
Is there an indication of wastes containing explosives or compressed gases?	[ ] Yes [X] No
Is there an indication of PCBs liquids?	[ ] Yes [X] No
Is there an indication of the waste exhibiting the characteristic of ignitability, corrosivity, or reactivity (EPA Hazardous Waste Numbers of D001, D002, or D003)?	[ ] Yes [X] No
Is the physical form of the waste inconsistent with the Waste Stream Description or the Waste Matrix Code?	[ ] Yes [X] No
CH or RH TRAMPAC	
Are there heat-sealed bags (unvented) GREATER than 4 liters and LESS than 390 square inches in the waste, or heat sealed bags not authorized in the RH TRUCON Code?	[ ] Yes [X] No
Were there Non-approved Closure Methods used on liner bags or inner bags greater than 4 liters?	[ ] Yes [X] No
Are there sealed containers GREATER than 4 liters?	[ ] Yes [X] No
Are there indications of inadequate protection for heavy and/or sharp objects?	[ ] Yes [X] No
Comments: N/A	

RTR Operator:

Eric Lyles		5/13/2015
Print Name	Signature	Date

Attachment 3 – CCP Radiography Independent Technical Reviewer Checklist

Batch Data Report No.: OR-RTR6-0654

Description			
1.	Were data generation and reduction conducted in a technically correct *manner in accordance with the methods used?*	☐ NO	☑ YES
2.	Was the correct revision of the procedure used? Procedure: CCP-TP-053 Rev.: 15	☐ NO	☑ YES
3.	Are the WMPs entered correctly?	☐ NO	☑ YES
4.	Do the estimated weights in Section 4 of Attachment 2 equal the container gross weight?	☐ NO	☑ YES
5.	Is the data reported in the proper units with the correct number of significant figures (e.g., one tenth of a kilogram)?	☐ NO	☑ YES
6.	*Was transcription used? If no, proceed to question 7.*	☑ NO	☐ YES
	6a. Has the data been verified for transcription errors?	☐ NO	☐ YES
7.	Does the Testing Batch Report include radiography for up to 20 containers?	☐ NO	☑ YES
8.	Are BDR contents complete and do they match the CCP Waste RTR Batch Data Report Table of Contents?	☐ NO	☑ YES
9.	Is all the data signed and dated in reproducible ink and by the individual(s) generating it?	☐ NO	☑ YES
10.	Is all data recorded clearly, legibly, and accurately?	☐ NO	☑ YES
11.	Have changes been made to original data? If no, proceed to question 12.	☑ NO	☐ YES
	11a. Have all changes to original data been lined out, initialed and dated by the individual making the changes?	☐ NO	☐ YES
	11b. Was justification made for changing the original data?	☐ NO	☐ YES
	11c. Were data changes made by the individual who originally collected the data?	☐ NO	☐ YES
12.	Does the waste match the Waste Matrix Code and Waste Stream description?	☐ NO	☑ YES
13.	Are the RTR Operator's decisions regarding the Radiography documented?	☐ NO	☑ YES
14.	Is there an adequate written description of the contents of each item?	☐ NO	☑ YES
15.	Was the video/audio recording media properly prepared and labeled for each waste container?	☐ NO	☑ YES
16.	Was the video/audio recording media check performed satisfactorily and recorded on Attachment 1?	☐ NO	☑ YES

Attachment 3 – CCP Radiography Independent Technical Reviewer Checklist (Continued)

Batch Data Report No.: OR-RTR6-0654

Description		
17. Was the Image Test performed satisfactorily and recorded on Attachment 1?	☐ NO	☑ YES
18. Was the Replicate Scan performed and recorded on an Attachment 2?	☐ NO	☑ YES
19. Was the Replicate Scan RTR Operator different from the first RTR Operator?	☐ NO	☑ YES
20. Did the Replicate Scan RTR Operator and the first RTR Operator agree on the results?	☐ NO	☑ YES
21. Was the Independent Observation performed and recorded on an Attachment 2?	☐ NO	☑ YES
22. Was the Independent Observation RTR Operator different from the first RTR Operator?	☐ NO	☑ YES
23. Did the Independent Observation RTR Operator and the first RTR Operator agree on the results?	☐ NO	☑ YES
24. Was the data collection performed by qualified individuals?	☐ NO	☑ YES
25. Were NCRs initiated as required at DGL? If no, proceed to question 26.	☑ NO	☐ YES
25a. Have the NCR(s) associated with RTR been included in the BDR?	☐ NO	☐ YES
26. Is the RTR examination for CH waste? If no, proceed to question 27.	☐ NO	☑ YES
26a. Have the CH Quality Assurance Objectives (QAOs) been met (if applicable)? Precision – Precision is maintained by reconciling any discrepancies between two radiography operators with regard to identification of the waste matrix code, liquids in excess of TSDF-WAC limits, and compressed gases through independent replicate scans and independent observations. Additionally, the precision of radiography is verified prior to use by tuning precisely enough to demonstrate compliance with QAOs through viewing an image test pattern. Accuracy – Accuracy is obtained by using a target to tune the image for maximum sharpness and by requiring operators to successfully identify 100 percent of the items required to meet the DQOs for radiography specified in CCP-PO-001, Section C-4a(1) in a training container during their initial qualification and subsequent requalification. Completeness – A video and audio media recording of the radiography examination and a validated radiography data form will be obtained for 100 percent of the waste containers subject to radiography. All video and audio media recordings and radiography data forms will be subject to validation as indicated in CCP-PO-001, Section C3-4. Comparability – The comparability of radiography data from different operators shall be enhanced by using standardized radiography procedures and operator qualifications.	☐ NO	☑ YES

Attachment 3 – CCP Radiography Independent Technical Reviewer Checklist (Continued)

Batch Data Report No.: OR-RTR6-0654

Description		
27. Is the RTR examination for RH waste? If no, proceed to comment section.	☑ NO	☐ YES
27a. Have the RH QAOs been met (if applicable)? Precision – Precision is maintained by reconciling any discrepancies between two operators (during Independent Observation and Replicate scans) with regard to the identification of important waste characteristics (i.e., physical form of the waste and absence of prohibited liquids) within a single container. Accuracy – Accuracy is obtained by using a target to tune the image for maximum sharpness and by requiring operators to successfully identify prohibited liquid in a training container during their initial qualification and subsequent requalification. Representativeness – All of the relevant contents in a container selected for radiography will be described. Completeness – All of the relevant waste information must be assembled and must show that each of the containers in the waste stream belongs to the waste stream. This information must be documented on videotape or other equivalent media and data form. Comparability – Comparability is ensured by meeting the program training requirements and complying with the minimum standards used to implement the radiography process.	☐ NO	☐ YES

Comments: N/A

I have reviewed 100% of the container specific and batch data in this report and find it acceptable.

Independent Technical Reviewer:

Fred Ovey
Printed Name

Signature

5-18-15
Date

DIVIDER PAGE ONLY

NOT PART OF PAGE COUNT

Attachment 2 – CCP Records Transmittal/Receiving Form

CCP Records / Records Custodian, 4021 National Parks Highway - MS: GSA 212, Carlsbad, New Mexico 88220

Telephone Number: 575-234-7523

Fax Number: 575-234-7033

Attn:	CCP RECORDS	From:	PATRICK SMITH II
Ship to:	CCP RECORDS CUSTODIAN	Site:	ORNL
	4021 NATIONAL PARKS HWY.	Company:	TFE INC.
	MS GSA 212	Telephone Number:	865-574-6002
	CARLSBAD, NM 88220-9082	Date Sent:	5-20-2015
Telephone Number:	575-234-7523		

Document Number	Title/Description	Record Date	Total Pages
OR-RTR6-0654	RTR DVD (DISK B)	5-13-2015	N/A
N/A	N/A	N/A	N/A
N/A	N/A	N/A	N/A
N/A	N/A	N/A	N/A
N/A	N/A	N/A	N/A
N/A	N/A	N/A	N/A

Comments:

N/A

(When the Record accepted line has been completed, the rest of the page below may be left blank.)

Acceptance/Rejection Signature and Date

Records Accepted ☑	Signature	Greta Leos (Printed Name)	5-21-15 (Date)
Records Rejected ☐	Signature	Printed Name	Date

Reason for Rejection:

Re-submittal:	Signature	Printed Name	Date

****
*** Send Results ***
****

Sending is complete.

Job No.	4938
Address	918655768703
Name	ORNL
Start Time	05/21 02:31 PM
Call Length	00'21
Sheets	1
Result	OK

Attachment 2 – CCP Records Transmittal/Receiving Form

CCP Records / Records Custodian, 4021 National Parks Highway - MS: GSA 212, Carlsbad, New Mexico 88220

Telephone Number: 575-234-7523

Fax Number: 575-234-7033

Attn:	CCP RECORDS	From:	PATRICK SMITH II
Ship to:	CCP RECORDS CUSTODIAN	Site:	ORNL
	4021 NATIONAL PARKS HWY.	Company:	TFE INC.
	MS GSA 212	Telephone Number:	865-574-6002
	CARLSBAD, NM 88220-9082	Date Sent:	5-20-2015
Telephone Number:	575-234-7523		

OR-RTR6-0654	RTR DVD (DISK B)	5-13-2015	N/A
N/A	N/A	N/A	N/A
N/A	N/A	N/A	N/A
N/A	N/A	N/A	N/A
N/A	N/A	N/A	N/A
N/A	N/A	N/A	N/A

Comments

N/A

(When the Record accepted line has been completed, the rest of the page below may be left blank.)

Acceptance/Rejection Signature and Date

Records Accepted ☑ Signature Greta Leos Printed Name 5-21-15 Date

Records Rejected ☐

Attachment 2 – CCP Records Transmittal/Receiving Form

CCP Records / Records Custodian, 4021 National Parks Highway - MS: GSA 212, Carlsbad, New Mexico 88220

Telephone Number: 575-234-7523

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Attn:	CCP RECORDS	From:	PATRICK SMITH II
Ship to:	CCP RECORDS CUSTODIAN	Site:	ORNL
	4021 NATIONAL PARKS HWY.	Company:	TFE INC.
	MS GSA 212	Telephone Number:	865-574-6002
	CARLSBAD, NM 88220-9082	Date Sent:	5-27-2015
Telephone Number:	575-234-7523		

Document Number	Title/Description	Record Date	Total Pages
OR-RTR6-0654	RTR BDR	5-13-2015	39
OR-RTR6-0654	RTR DVD (DISK A)	5-13-2015	N/A
N/A	N/A	N/A	N/A
N/A	N/A	N/A	N/A
N/A	N/A	N/A	N/A
N/A	N/A	N/A	N/A

Comments

N/A

(When the Record accepted line has been completed, the rest of the page below may be left blank.)

Acceptance/Rejection Signature and Date

Records Accepted	☑	Greta Leos	Greta Leos	6/01/15
		Signature	Printed Name	Date
Records Rejected	☐			
		Signature	Printed Name	Date

Reason for Rejection:

Re-submittal:

Signature	Printed Name	Date

****
*** Send Results ***
****

Sending is complete.

Job No.	0114
Address	918655768703
Name	ORNL
Start Time	06/01 12:08 PM
Call Length	00'31
Sheets	1
Result	OK

Attachment 2 – CCP Records Transmittal/Receiving Form

CCP Records / Records Custodian, 4021 National Parks Highway - MS: GSA 212, Carlsbad, New Mexico 88220

Telephone Number: 575-234-7523

Fax Number: 575-234-7033

Attn:	CCP RECORDS	From:	PATRICK SMITH II
Ship to:	CCP RECORDS CUSTODIAN	Site:	ORNL
	4021 NATIONAL PARKS HWY.	Company:	TFE INC.
	MS GSA 212	Telephone Number:	865-574-6002
	CARLSBAD, NM 88220-9082	Date Sent:	5-27-2015
Telephone Number:	575-234-7523		

OR-RTR6-0654	RTR BDR	5-13-2015	39
OR-RTR6-0654	RTR DVD (DISK A)	5-13-2015	N/A
N/A	N/A	N/A	N/A
N/A	N/A	N/A	N/A
N/A	N/A	N/A	N/A
N/A	N/A	N/A	N/A

N/A

(When the Record accepted line has been completed, the rest of the page below may be left blank.)
Acceptance/Rejection Signature and Date

Records Accepted [✓] Greta Leos 6/01/15
Signature Printed Name Date

Records Rejected [ ]

DIVIDER

PAGE

Attachment 2 – CCP SPM Radiography Project Level Validation Checklist and Summary

BDR Number: OR-RTR6-0676				**Examination Date(s): 08/26/2015**
Description of Criteria Reviewed	**Criteria Met?**			**Comments/Qualifiers**
	YES	**NO**	**NA**	
1. Is the completed, signed, and dated Independent Technical Reviewer Checklist included in the BDR, and the independent technical reviewer was not involved in the generation or recording of the data under review? **Reference Source: CCP-PO-001, C3-4**	X			
2. Does the BDR contain all items addressed in the BDR Table of Contents? **Reference Source: CCP-PO-001, C3-4**	X			
3. Does the BDR include a listing of all the container numbers in the batch? **Reference Source: CCP-PO-001, C3-4**	X			
4. List all containers that have met QAOs. **Reference Source: CCP-PO-001, C3-4**				Container Numbers: X10C1250640 X10C1250786 X10C1250551 X10C1250752 X10C1250784 X10C1250755 X10C1250761
5. Does the BDR identify the current implementing procedure and revision number? **Reference Source: CCP-PO-001, Table C3-3**	X			
6. Is there a reference to or copy of any associated NCRs (if any) in the BDR? NA if no NCRs. **Reference Source: CCP-PO-001, Table C3-3**			X	
7. Are there 20 or fewer containers in the batch? **Reference Source: CCP-PO-001, C3-4**	X			
8. Are the data properly reported (i.e., data are reported in correct units and with correct significant figures)? **Reference Source: CCP-PO-001, C3-4**	X			
9. Is there evidence of verification that the physical form matches the Waste Matrix Code? **Reference Source: CCP-PO-001, Table C3-3**	X			

CCP RECORDS ORIGINAL

DATE REC'D 8-28-15 SV

Attachment 2 – CCP SPM Radiography Project Level Validation Checklist and Summary (Continued)

BDR Number: OR-RTR6-0676	**Examination Date(s): 08/26/2015**			
Description of Criteria Reviewed	**Criteria Met?**			**Comments/Qualifiers**
	YES	**NO**	**NA**	
10. Is there evidence of verification that the physical form matches the waste stream description? **Reference Source: CCP-PO-001, Table C3-3**	X			
11. Are prohibited items absent? **Reference Source: CCP-PO-001, Table C3-3**	X			
12. Does observable liquid, if present, meet the criteria of the TSDF-WAC? **Reference Source: CCP-PO-001, C-1**			X	No observable liquid.
13. Were discrepancies between two operators with regard to identification of waste matrix code, liquids in excess of the TSDF-WAC, or compressed gases through replicate scans and independent observations reconciled? NA if no discrepancies. **Reference Source: CCP-PO-001, C3-2**			X	
14. Are the training qualifications for all radiography personnel acceptable? **Reference Source: CCP-PO-001, C3-8**	X			
15. Was evidence of the video/audio check included in the BDR? **Reference Source: CCP-PO-001, C1-1**	X			
16. Was the Lines-Pair Resolution Test or Sieve Test Check included in the BDR? **Reference Source: CCP Technical Procedures**	X			
17. Was a replicate scan performed once per day, or once per batch, whichever is LESS frequent? **Reference Source: CCP-PO-001, C1-1**	X			
18. Was an independent observation performed once per day, or once per batch, whichever is LESS frequent? **Reference Source: CCP-PO-001, C1-1**	X			

Attachment 2 – CCP SPM Radiography Project Level Validation Checklist and Summary (Continued)

BDR Number: OR-RTR6-0676	Examination Date(s): 08/26/2015			
Description of Criteria Reviewed	**Criteria Met?**			**Comments/Qualifiers**
	YES	**NO**	**NA**	
19. Were the replicate scan and independent observation performed on different waste containers? **Reference Source: CCP-PO-001, C1-1**	X			
20. Were the personnel performing the replicate scan and independent observation different from the individual who performed the original? **Reference Source: CCP-PO-001, C1-1**	X			
21. Does the BDR include an estimate of each material parameter weight in kg for each container? **Reference Source: CCP Technical Procedures**	X			
22. Does the BDR include a description of each material parameter for each container? **Reference Source: CCP Technical Procedures**	X			
23. Is the container gross weight recorded in kilograms (kg) for each container in the BDR? **Reference Source: CCP Technical Procedures**	X			
24. Was the Scale Weight Calibration Check included in the BDR? **Reference Source: CCP Technical Procedures**			X	Scale not used.
25. Was the Scale Weight Check included in the BDR? **Reference Source: CCP Technical Procedures**			X	Scale not used.
Comments: None				
The container QC checks were properly performed and meet the Quality Assurance Objectives (QAOs). Proper procedures were followed during data reduction and analysis. The batch is complete, acceptable, and includes all supporting data and documentation required by the QAPjP.				
Carolina Soaterna	Carolina Soaterna			08/26/2015
SPM Printed Name	Signature			Date

Checklist is to be re-signed only when a re-review is performed.

SPM Printed Name	Signature	Reason	Date
SPM Printed Name	Signature	Reason	Date

Attachment 5–CCP Radiography Batch Data Report Cover Sheet

Site ID: ORNL

Batch Data Report No.: OR-RTR6-0676 ☑ CH ☐ RH Date: 8-26-15

Waste Container ID Numbers	
Replicate Scan:	X10C1250761
Independent Observation:	X10C1250640
1	X10C1250640
2	X10C1250786
3	X10C1250551
4	X10C1250752
5	X10C1250784
6	X10C1250755
7	X10C1250761
8	N/A
9	N/A
10	N/A
11	N/A
12	N/A
13	N/A
14	N/A
15	N/A
16	N/A
17	N/A
18	N/A
19	N/A
20	N/A

RTR Operator:

Daphne Brothers		8-26-15
Printed Name	Signature	Date

Independent Technical Reviewer:

Fred Olney		8-26-15
Printed Name	Signature	Date

NTPC RECORDS ORIGINAL
DATE REC'D 8-26-2015

Attachment 4 – CCP Radiography Batch Data Report Table of Contents and Batch Narrative

Batch Data Report No.: OR-RTR6-0676 Date: 8-26-15

Table Of Contents

Item	Description	Page No.
1	CCP Radiography Batch Data Report Cover Sheet	1
2	CCP Radiography Batch Data Report Table Of Contents	2
3	CCP RTR Measurement Control Report	3
4	CCP Radiography Data Sheets	4
5	Copy of NCRs (NA, If Not Applicable)	N/A
6	CCP Independent Technical Reviewer Checklist	31

Batch Narrative

All Quality Checks were performed and recorded on CCP-TP-053, Rev.15, CCP Radiography Measurement Control Report.

Daphne Brothers — RTR Operator

Signature

8-26-15 — Date

Attachment 1 – CCP RTR Measurement Control Report

Site ID: ORNL		
Batch Data Report No.: OR-RTR6-0676		
Examination Date: 8-26-15		
Control Checks		
Video/Audio Recorded Media System Check	☑ SAT	☐ UNSAT
Image Test : 10 Lines (Minimum acceptable is 5 lines-pair/cm or #6 Sieve is viewable)	☑ SAT	☐ UNSAT
Comments: N/A		
RTR Operator:		
Daphne Brothers (Printed Name)	Daphne O Brothers (Signature)	8-26-15 (Date)

CCP Radiography Data Sheet

Section 1: General Information	
☐ RTR Examination ☒ RTR Replicate Scan ☐ RTR Independent Observation	
Site ID:	ORNL
Batch Number:	OR-RTR6-0676
Examination Date:	8/26/2015
Waste Container ID:	X10C1250761
Video/Audio Recorded Media Number:	OR-RTR6-0676 A&B
Procedure and Revision No.:	CCP-TP-053 Rev. 15
NCR(s) associated with the container? (e.g., Prohibited Items)	☒ No ☐ Yes NCR No.: N/A NCR No.: N/A

Section 2: Waste Container Data	
Container Type:	55 Gallon Drum
TRUCON Code:	OR 227
Waste Matrix Code:	S4100
Waste Stream I.D.:	OR-NFS-CH-SOIL
Waste Container Weights:	Gross Wt.: 215.5 kg Tare Wt.: 35.2 kg Net Wt.: 180.3 kg
Rigid Liner and Liner Vent Description:	Liner: ☐ No ☒ Yes Lid: ☒ No ☐ Yes Type: ☐ 30-mil ☒ 90-mil ☐ 110-mil ☐ 125-mil Vented: ☐ No ☒ Yes ☐ N/A Punctured: ☒ No ☐ Yes Mechanical Vent: ☒ No ☐ Yes Fiberboard Liner: ☒ No ☐ Yes Lead Lined: ☒ No ☐ Yes
Number of Layers of Confinement:	Appears to be 1 layer
Volume Utilization Percentage:	90 %

CCP Radiography Data Sheet

Waste Container ID: X10C1250761

Section 3: Container Inventory and Comments (Detailed descriptions)	
IM:	
AM:	
OM:	
OI:	
C:	
R:	
XPM:	Plastic sheeting
OR:	Absorbent
IN:	
S:	Soil

Section 4: Packaging Material and Waste Material Parameters	
Packaging Material:	**Estimated Weight (kg)**
Steel (ST):	27.8
Plastics (PP): Liner bag, Rigid Liner	7.4
Other:	0.0
Total Packaging Weight	35.2
Waste Material Parameter:	**Estimated Weight (kg)**
Iron-based Metal / Alloys (IM):	
Aluminum-based Metals / Alloys (AM):	
Other Metals (OM):	
Other Inorganic Materials (OI)	
Cellulosics (C):	
Rubber (R):	
Plastics (waste materials) (XPM):	1.0
Organic Matrix (OR):	2.0
Inorganic Matrix (IN):	
Soils (S):	177.3
Total WMP Weight:	180.3

CCP Radiography Data Sheet

Waste Container ID: X10C1250761

Section 5: RTR Summary (Questions answered "Yes" will be explained in the Comment block, except for Question 1)	
Is there observable liquid?	☐ Yes ☒ No
Is there any observable liquid in internal containers, more than 60 milliliters or 3 percent by volume, whichever is greater?	☐ Yes ☒ No
Is the total volume of observable liquid in the outermost container GREATER than 1% of the container?	☐ Yes ☒ No
Is there observable liquid in payload containers with an EPA Hazardous Waste Number of U134?	☐ Yes ☒ No
Is there an indication of non-radionuclide pyrophoric materials, such as elemental potassium?	☐ Yes ☒ No
Is there an indication of hazardous wastes not occurring as co-contaminants with TRU mixed wastes (non-mixed hazardous wastes)?	☐ Yes ☒ No
Is there an indication of wastes incompatible with backfill, seal and panel closures materials, container and packaging materials, shipping container materials, or other wastes (i.e., waste does NOT match TRUCON Code[s])?	☐ Yes ☒ No
Is there an indication of wastes containing explosives or compressed gases?	☐ Yes ☒ No
Is there an indication of PCBs liquids?	☐ Yes ☒ No
Is there an indication of the waste exhibiting the characteristic of ignitability, corrosivity, or reactivity (EPA Hazardous Waste Numbers of D001, D002, or D003)?	☐ Yes ☒ No
Is the physical form of the waste inconsistent with the Waste Stream Description or the Waste Matrix Code?	☐ Yes ☒ No
CH or RH TRAMPAC	
Are there heat-sealed bags (unvented) GREATER than 4 liters and LESS than 390 square inches in the waste, or heat sealed bags not authorized in the RH TRUCON Code?	☐ Yes ☒ No
Were there Non-approved Closure Methods used on liner bags or inner bags greater than 4 liters?	☐ Yes ☒ No
Are there sealed containers GREATER than 4 liters?	☐ Yes ☒ No
Are there indications of inadequate protection for heavy and/or sharp objects?	☐ Yes ☒ No

Comments: This Replicate Scan agrees with the original scan. EL 8/26/15

RTR Operator:

Eric Lyles		8/26/2015
Print Name	Signature	Date

CCP Radiography Data Sheet

Section 1: General Information	
[ ] RTR Examination [ ] RTR Replicate Scan [X] RTR Independent Observation	
Site ID:	ORNL
Batch Number:	OR-RTR6-0676
Examination Date:	8/26/2015
Waste Container ID:	X10C1250640
Video/Audio Recorded Media Number:	OR-RTR6-0676 A&B
Procedure and Revision No.:	CCP-TP-053 Rev. 15
NCR(s) associated with the container? (e.g., Prohibited Items)	[X] No [ ] Yes NCR No.: N/A NCR No.: N/A

Section 2: Waste Container Data	
Container Type:	55 Gallon Drum
TRUCON Code:	OR 227
Waste Matrix Code:	S4100
Waste Stream I.D.:	OR-NFS-CH-SOIL
Waste Container Weights:	Gross Wt.: 258.8 kg Tare Wt.: 35.2 kg Net Wt.: 223.6 kg
Rigid Liner and Liner Vent Description:	Liner: [ ] No [X] Yes Lid: [X] No [ ] Yes Type: [ ] 30-mil [X] 90-mil [ ] 110-mil [ ] 125-mil Vented: [ ] No [X] Yes [ ] N/A Punctured: [X] No [ ] Yes Mechanical Vent: [X] No [ ] Yes Fiberboard Liner: [X] No [ ] Yes Lead Lined: [X] No [ ] Yes
Number of Layers of Confinement:	Appears to be 1 layer
Volume Utilization Percentage:	85 %

CCP Radiography Data Sheet

Waste Container ID: X10C1250640

Section 3: Container Inventory and Comments (Detailed descriptions)	
IM:	
AM:	
OM:	
OI:	
C:	
R:	
XPM:	
OR: Absorbent	
IN:	
S: Soil	

Section 4: Packaging Material and Waste Material Parameters	
Packaging Material:	**Estimated Weight (kg)**
Steel (ST):	27.8
Plastics (PP): Liner bag, Rigid Liner	7.4
Other:	0.0
Total Packaging Weight	35.2
Waste Material Parameter:	**Estimated Weight (kg)**
Iron-based Metal / Alloys (IM):	
Aluminum-based Metals / Alloys (AM):	
Other Metals (OM):	
Other Inorganic Materials (OI)	
Cellulosics (C):	
Rubber (R):	
Plastics (waste materials) (XPM):	
Organic Matrix (OR):	3.0
Inorganic Matrix (IN):	
Soils (S):	220.6
Total WMP Weight:	223.6

CCP Radiography Data Sheet

Waste Container ID: X10C1250640

Section 5: RTR Summary (Questions answered "Yes" will be explained in the Comment block, except for Question 1)	
Is there observable liquid?	☐ Yes ☒ No
Is there any observable liquid in internal containers, more than 60 milliliters or 3 percent by volume, whichever is greater?	☐ Yes ☒ No
Is the total volume of observable liquid in the outermost container GREATER than 1% of the container?	☐ Yes ☒ No
Is there observable liquid in payload containers with an EPA Hazardous Waste Number of U134?	☐ Yes ☒ No
Is there an indication of non-radionuclide pyrophoric materials, such as elemental potassium?	☐ Yes ☒ No
Is there an indication of hazardous wastes not occurring as co-contaminants with TRU mixed wastes (non-mixed hazardous wastes)?	☐ Yes ☒ No
Is there an indication of wastes incompatible with backfill, seal and panel closures materials, container and packaging materials, shipping container materials, or other wastes (i.e., waste does NOT match TRUCON Code[s])?	☐ Yes ☒ No
Is there an indication of wastes containing explosives or compressed gases?	☐ Yes ☒ No
Is there an indication of PCBs liquids?	☐ Yes ☒ No
Is there an indication of the waste exhibiting the characteristic of ignitability, corrosivity, or reactivity (EPA Hazardous Waste Numbers of D001, D002, or D003)?	☐ Yes ☒ No
Is the physical form of the waste inconsistent with the Waste Stream Description or the Waste Matrix Code?	☐ Yes ☒ No
CH or RH TRAMPAC	
Are there heat-sealed bags (unvented) GREATER than 4 liters and LESS than 390 square inches in the waste, or heat sealed bags not authorized in the RH TRUCON Code?	☐ Yes ☒ No
Were there Non-approved Closure Methods used on liner bags or inner bags greater than 4 liters?	☐ Yes ☒ No
Are there sealed containers GREATER than 4 liters?	☐ Yes ☒ No
Are there indications of inadequate protection for heavy and/or sharp objects?	☐ Yes ☒ No

Comments: 7.1.5 Independent observation agrees with the original scan. EL 8/26/15

RTR Operator:

Eric Lyles		8/26/2015
Print Name	Signature	Date

CCP Radiography Data Sheet

Section 1: General Information	
[X] RTR Examination [ ] RTR Replicate Scan [ ] RTR Independent Observation	
Site ID:	ORNL
Batch Number:	OR-RTR6-0676
Examination Date:	8/26/2015
Waste Container ID:	X10C1250640
Video/Audio Recorded Media Number:	OR-RTR6-0676 A&B
Procedure and Revision No.:	CCP-TP-053 Rev. 15
NCR(s) associated with the container? (e.g., Prohibited Items)	[X] No [ ] Yes NCR No.: N/A NCR No.: N/A

Section 2: Waste Container Data	
Container Type:	55 Gallon Drum
TRUCON Code:	OR 227
Waste Matrix Code:	S4100
Waste Stream I.D.:	OR-NFS-CH-SOIL
Waste Container Weights:	Gross Wt.: 258.8 kg Tare Wt.: 35.2 kg Net Wt.: 223.6 kg
Rigid Liner and Liner Vent Description:	Liner: [ ] No [X] Yes Lid: [X] No [ ] Yes Type: [ ] 30-mil [X] 90-mil [ ] 110-mil [ ] 125-mil Vented: [ ] No [X] Yes [ ] N/A Punctured: [X] No [ ] Yes Mechanical Vent: [X] No [ ] Yes Fiberboard Liner: [X] No [ ] Yes Lead Lined: [X] No [ ] Yes
Number of Layers of Confinement:	Appears to be 1 layer
Volume Utilization Percentage:	85 %

CCP Radiography Data Sheet

Waste Container ID: X10C1250640

Section 3: Container Inventory and Comments	(Detailed descriptions)
IM:	
AM:	
OM:	
OI:	
C:	
R:	
XPM:	
OR: Absorbent	
IN:	
S: Soil	

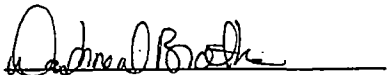
Section 4: Packaging Material and Waste Material Parameters	
Packaging Material:	**Estimated Weight (kg)**
Steel (ST):	27.8
Plastics (PP): Liner bag, Rigid Liner	7.4
Other:	0.0
Total Packaging Weight	35.2
Waste Material Parameter:	**Estimated Weight (kg)**
Iron-based Metal / Alloys (IM):	
Aluminum-based Metals / Alloys (AM):	
Other Metals (OM):	
Other Inorganic Materials (OI)	
Cellulosics (C):	
Rubber (R):	
Plastics (waste materials) (XPM):	
Organic Matrix (OR):	2.6
Inorganic Matrix (IN):	
Soils (S):	221.0
Total WMP Weight:	223.6

CCP Radiography Data Sheet

Waste Container ID: X10C1250640

Section 5: RTR Summary (Questions answered "Yes" will be explained in the Comment block, except for Question 1)	
Is there observable liquid?	☐ Yes ☒ No
Is there any observable liquid in internal containers, more than 60 milliliters or 3 percent by volume, whichever is greater?	☐ Yes ☒ No
Is the total volume of observable liquid in the outermost container GREATER than 1% of the container?	☐ Yes ☒ No
Is there observable liquid in payload containers with an EPA Hazardous Waste Number of U134?	☐ Yes ☒ No
Is there an indication of non-radionuclide pyrophoric materials, such as elemental potassium?	☐ Yes ☒ No
Is there an indication of hazardous wastes not occurring as co-contaminants with TRU mixed wastes (non-mixed hazardous wastes)?	☐ Yes ☒ No
Is there an indication of wastes incompatible with backfill, seal and panel closures materials, container and packaging materials, shipping container materials, or other wastes (i.e., waste does NOT match TRUCON Code[s])?	☐ Yes ☒ No
Is there an indication of wastes containing explosives or compressed gases?	☐ Yes ☒ No
Is there an indication of PCBs liquids?	☐ Yes ☒ No
Is there an indication of the waste exhibiting the characteristic of ignitability, corrosivity, or reactivity (EPA Hazardous Waste Numbers of D001, D002, or D003)?	☐ Yes ☒ No
Is the physical form of the waste inconsistent with the Waste Stream Description or the Waste Matrix Code?	☐ Yes ☒ No
CH or RH TRAMPAC	
Are there heat-sealed bags (unvented) GREATER than 4 liters and LESS than 390 square inches in the waste, or heat sealed bags not authorized in the RH TRUCON Code?	☐ Yes ☒ No
Were there Non-approved Closure Methods used on liner bags or inner bags greater than 4 liters?	☐ Yes ☒ No
Are there sealed containers GREATER than 4 liters?	☐ Yes ☒ No
Are there indications of inadequate protection for heavy and/or sharp objects?	☐ Yes ☒ No
Comments: N/A	

RTR Operator:

Daphne Brothers		8/26/2015
Print Name	Signature	Date

CCP Radiography Data Sheet

Section 1: General Information	
[X] RTR Examination [ ] RTR Replicate Scan [ ] RTR Independent Observation	
Site ID:	ORNL
Batch Number:	OR-RTR6-0676
Examination Date:	8/26/2015
Waste Container ID:	X10C1250786
Video/Audio Recorded Media Number:	OR-RTR6-0676 A&B
Procedure and Revision No.:	CCP-TP-053 Rev. 15
NCR(s) associated with the container? (e.g., Prohibited Items)	[X] No [ ] Yes NCR No.: N/A NCR No.: N/A

Section 2: Waste Container Data	
Container Type:	55 Gallon Drum
TRUCON Code:	OR 227
Waste Matrix Code:	S4100
Waste Stream I.D.:	OR-NFS-CH-SOIL
Waste Container Weights:	Gross Wt.: 215.6 kg Tare Wt.: 35.2 kg Net Wt.: 180.4 kg
Rigid Liner and Liner Vent Description:	Liner: [ ] No [X] Yes Lid: [X] No [ ] Yes Type: [ ] 30-mil [X] 90-mil [ ] 110-mil [ ] 125-mil Vented: [ ] No [X] Yes [ ] N/A Punctured: [X] No [ ] Yes Mechanical Vent: [X] No [ ] Yes Fiberboard Liner: [X] No [ ] Yes Lead Lined: [X] No [ ] Yes
Number of Layers of Confinement:	Appears to be 1 layer
Volume Utilization Percentage:	80 %

CCP Radiography Data Sheet

Waste Container ID: X10C1250786

Section 3: Container Inventory and Comments (Detailed descriptions)	
IM:	Scrap metal
AM:	
OM:	
OI:	
C:	
R:	
XPM:	
OR:	Absorbent
IN:	
S:	Soil

Section 4: Packaging Material and Waste Material Parameters	
Packaging Material:	**Estimated Weight (kg)**
Steel (ST):	27.8
Plastics (PP): Liner bag, Rigid Liner	7.4
Other:	0.0
Total Packaging Weight	35.2
Waste Material Parameter:	**Estimated Weight (kg)**
Iron-based Metal / Alloys (IM):	0.2
Aluminum-based Metals / Alloys (AM):	
Other Metals (OM):	
Other Inorganic Materials (OI)	
Cellulosics (C):	
Rubber (R):	
Plastics (waste materials) (XPM):	
Organic Matrix (OR):	2.2
Inorganic Matrix (IN):	
Soils (S):	178.0
Total WMP Weight:	180.4

CCP Radiography Data Sheet

Waste Container ID: X10C1250786

Section 5: RTR Summary (Questions answered "Yes" will be explained in the Comment block, except for Question 1)	
Is there observable liquid?	☐ Yes ☒ No
Is there any observable liquid in internal containers, more than 60 milliliters or 3 percent by volume, whichever is greater?	☐ Yes ☒ No
Is the total volume of observable liquid in the outermost container GREATER than 1% of the container?	☐ Yes ☒ No
Is there observable liquid in payload containers with an EPA Hazardous Waste Number of U134?	☐ Yes ☒ No
Is there an indication of non-radionuclide pyrophoric materials, such as elemental potassium?	☐ Yes ☒ No
Is there an indication of hazardous wastes not occurring as co-contaminants with TRU mixed wastes (non-mixed hazardous wastes)?	☐ Yes ☒ No
Is there an indication of wastes incompatible with backfill, seal and panel closures materials, container and packaging materials, shipping container materials, or other wastes (i.e., waste does NOT match TRUCON Code[s])?	☐ Yes ☒ No
Is there an indication of wastes containing explosives or compressed gases?	☐ Yes ☒ No
Is there an indication of PCBs liquids?	☐ Yes ☒ No
Is there an indication of the waste exhibiting the characteristic of ignitability, corrosivity, or reactivity (EPA Hazardous Waste Numbers of D001, D002, or D003)?	☐ Yes ☒ No
Is the physical form of the waste inconsistent with the Waste Stream Description or the Waste Matrix Code?	☐ Yes ☒ No
CH or RH TRAMPAC	
Are there heat-sealed bags (unvented) GREATER than 4 liters and LESS than 390 square inches in the waste, or heat sealed bags not authorized in the RH TRUCON Code?	☐ Yes ☒ No
Were there Non-approved Closure Methods used on liner bags or inner bags greater than 4 liters?	☐ Yes ☒ No
Are there sealed containers GREATER than 4 liters?	☐ Yes ☒ No
Are there indications of inadequate protection for heavy and/or sharp objects?	☐ Yes ☒ No

Comments: N/A

RTR Operator:

Daphne Brothers	Daphne Brothers	8/26/2015
Print Name	Signature	Date

CCP Radiography Data Sheet

Section 1: General Information		
[X] RTR Examination	[ ] RTR Replicate Scan	[ ] RTR Independent Observation
Site ID:	ORNL	
Batch Number:	OR-RTR6-0676	
Examination Date:	8/26/2015	
Waste Container ID:	X10C1250551	
Video/Audio Recorded Media Number:	OR-RTR6-0676	A&B
Procedure and Revision No.:	CCP-TP-053	Rev. 15
NCR(s) associated with the container? (e.g., Prohibited Items)	[X] No [ ] Yes NCR No.: N/A NCR No.: N/A	

Section 2: Waste Container Data	
Container Type:	55 Gallon Drum
TRUCON Code:	OR 227
Waste Matrix Code:	S4100
Waste Stream I.D.:	OR-NFS-CH-SOIL
Waste Container Weights:	Gross Wt.: 226.5 kg Tare Wt.: 35.2 kg Net Wt.: 191.3 kg
Rigid Liner and Liner Vent Description:	Liner: [ ] No [X] Yes Lid: [X] No [ ] Yes Type: [ ] 30-mil [X] 90-mil [ ] 110-mil [ ] 125-mil Vented: [ ] No [X] Yes [ ] N/A Punctured: [X] No [ ] Yes Mechanical Vent: [X] No [ ] Yes Fiberboard Liner: [X] No [ ] Yes Lead Lined: [X] No [ ] Yes
Number of Layers of Confinement:	Appears to be 1 layer
Volume Utilization Percentage:	80 %

CCP Radiography Data Sheet

Waste Container ID: X10C1250551

Section 3: Container Inventory and Comments (Detailed descriptions)	
IM:	
AM:	
OM:	
OI:	
C:	
R:	
XPM:	
OR: Absorbent	
IN:	
S: Soil	

Section 4: Packaging Material and Waste Material Parameters	
Packaging Material:	**Estimated Weight (kg)**
Steel (ST):	27.8
Plastics (PP): Liner bag, Rigid Liner	7.4
Other:	0.0
Total Packaging Weight	35.2
Waste Material Parameter:	**Estimated Weight (kg)**
Iron-based Metal / Alloys (IM):	
Aluminum-based Metals / Alloys (AM):	
Other Metals (OM):	
Other Inorganic Materials (OI)	
Cellulosics (C):	
Rubber (R):	
Plastics (waste materials) (XPM):	
Organic Matrix (OR):	2.3
Inorganic Matrix (IN):	
Soils (S):	189.0
Total WMP Weight:	191.3

CCP Radiography Data Sheet

Waste Container ID: X10C1250551

Section 5: RTR Summary (Questions answered "Yes" will be explained in the Comment block, except for Question 1)	
Is there observable liquid?	☐ Yes ☒ No
Is there any observable liquid in internal containers, more than 60 milliliters or 3 percent by volume, whichever is greater?	☐ Yes ☒ No
Is the total volume of observable liquid in the outermost container GREATER than 1% of the container?	☐ Yes ☒ No
Is there observable liquid in payload containers with an EPA Hazardous Waste Number of U134?	☐ Yes ☒ No
Is there an indication of non-radionuclide pyrophoric materials, such as elemental potassium?	☐ Yes ☒ No
Is there an indication of hazardous wastes not occurring as co-contaminants with TRU mixed wastes (non-mixed hazardous wastes)?	☐ Yes ☒ No
Is there an indication of wastes incompatible with backfill, seal and panel closures materials, container and packaging materials, shipping container materials, or other wastes (i.e., waste does NOT match TRUCON Code[s])?	☐ Yes ☒ No
Is there an indication of wastes containing explosives or compressed gases?	☐ Yes ☒ No
Is there an indication of PCBs liquids?	☐ Yes ☒ No
Is there an indication of the waste exhibiting the characteristic of ignitability, corrosivity, or reactivity (EPA Hazardous Waste Numbers of D001, D002, or D003)?	☐ Yes ☒ No
Is the physical form of the waste inconsistent with the Waste Stream Description or the Waste Matrix Code?	☐ Yes ☒ No
CH or RH TRAMPAC	
Are there heat-sealed bags (unvented) GREATER than 4 liters and LESS than 390 square inches in the waste, or heat sealed bags not authorized in the RH TRUCON Code?	☐ Yes ☒ No
Were there Non-approved Closure Methods used on liner bags or inner bags greater than 4 liters?	☐ Yes ☒ No
Are there sealed containers GREATER than 4 liters?	☐ Yes ☒ No
Are there indications of inadequate protection for heavy and/or sharp objects?	☐ Yes ☒ No
Comments: N/A	

RTR Operator:

Daphne Brothers	Daphne L Brothers	8/26/2015
Print Name	Signature	Date

CCP Radiography Data Sheet

Section 1: General Information	
[X] RTR Examination [ ] RTR Replicate Scan [ ] RTR Independent Observation	
Site ID:	ORNL
Batch Number:	OR-RTR6-0676
Examination Date:	8/26/2015
Waste Container ID:	X10C1250752
Video/Audio Recorded Media Number:	OR-RTR6-0676 A&B
Procedure and Revision No.:	CCP-TP-053 Rev. 15
NCR(s) associated with the container? (e.g., Prohibited Items)	[X] No [ ] Yes NCR No.: N/A NCR No.: N/A

Section 2: Waste Container Data	
Container Type:	55 Gallon Drum
TRUCON Code:	OR 227
Waste Matrix Code:	S4100
Waste Stream I.D.:	OR-NFS-CH-SOIL
Waste Container Weights:	Gross Wt.: 238.5 kg Tare Wt.: 35.2 kg Net Wt.: 203.3 kg
Rigid Liner and Liner Vent Description:	Liner: [ ] No [X] Yes Lid: [X] No [ ] Yes Type: [ ] 30-mil [X] 90-mil [ ] 110-mil [ ] 125-mil Vented: [ ] No [X] Yes [ ] N/A Punctured: [X] No [ ] Yes Mechanical Vent: [X] No [ ] Yes Fiberboard Liner: [X] No [ ] Yes Lead Lined: [X] No [ ] Yes
Number of Layers of Confinement:	Appears to be 1 layer
Volume Utilization Percentage:	80 %

CCP Radiography Data Sheet

Waste Container ID: X10C1250752

Section 3: Container Inventory and Comments (Detailed descriptions)

IM:

AM:

OM:

OI:

C:

R:

XPM:

OR: Absorbent

IN:

S: Soil

Section 4: Packaging Material and Waste Material Parameters

Packaging Material:	**Estimated Weight (kg)**
Steel (ST):	27.8
Plastics (PP): Liner bag, Rigid Liner	7.4
Other:	0.0
Total Packaging Weight	35.2
Waste Material Parameter:	**Estimated Weight (kg)**
Iron-based Metal / Alloys (IM):	
Aluminum-based Metals / Alloys (AM):	
Other Metals (OM):	
Other Inorganic Materials (OI)	
Cellulosics (C):	
Rubber (R):	
Plastics (waste materials) (XPM):	
Organic Matrix (OR):	2.3
Inorganic Matrix (IN):	
Soils (S):	201.0
Total WMP Weight:	203.3

CCP Radiography Data Sheet

Waste Container ID: X10C1250752

Section 5: RTR Summary (Questions answered "Yes" will be explained in the Comment block, except for Question 1)	
Is there observable liquid?	☐ Yes ☒ No
Is there any observable liquid in internal containers, more than 60 milliliters or 3 percent by volume, whichever is greater?	☐ Yes ☒ No
Is the total volume of observable liquid in the outermost container GREATER than 1% of the container?	☐ Yes ☒ No
Is there observable liquid in payload containers with an EPA Hazardous Waste Number of U134?	☐ Yes ☒ No
Is there an indication of non-radionuclide pyrophoric materials, such as elemental potassium?	☐ Yes ☒ No
Is there an indication of hazardous wastes not occurring as co-contaminants with TRU mixed wastes (non-mixed hazardous wastes)?	☐ Yes ☒ No
Is there an indication of wastes incompatible with backfill, seal and panel closures materials, container and packaging materials, shipping container materials, or other wastes (i.e., waste does NOT match TRUCON Code[s])?	☐ Yes ☒ No
Is there an indication of wastes containing explosives or compressed gases?	☐ Yes ☒ No
Is there an indication of PCBs liquids?	☐ Yes ☒ No
Is there an indication of the waste exhibiting the characteristic of ignitability, corrosivity, or reactivity (EPA Hazardous Waste Numbers of D001, D002, or D003)?	☐ Yes ☒ No
Is the physical form of the waste inconsistent with the Waste Stream Description or the Waste Matrix Code?	☐ Yes ☒ No
CH or RH TRAMPAC	
Are there heat-sealed bags (unvented) GREATER than 4 liters and LESS than 390 square inches in the waste, or heat sealed bags not authorized in the RH TRUCON Code?	☐ Yes ☒ No
Were there Non-approved Closure Methods used on liner bags or inner bags greater than 4 liters?	☐ Yes ☒ No
Are there sealed containers GREATER than 4 liters?	☐ Yes ☒ No
Are there indications of inadequate protection for heavy and/or sharp objects?	☐ Yes ☒ No
Comments: N/A	

RTR Operator:

Daphne Brothers		8/26/2015
Print Name	Signature	Date

CCP Radiography Data Sheet

Section 1: General Information	
[X] RTR Examination [ ] RTR Replicate Scan [ ] RTR Independent Observation	
Site ID:	ORNL
Batch Number:	OR-RTR6-0676
Examination Date:	8/26/2015
Waste Container ID:	X10C1250784
Video/Audio Recorded Media Number:	OR-RTR6-0676 A&B
Procedure and Revision No.:	CCP-TP-053 Rev. 15
NCR(s) associated with the container? (e.g., Prohibited Items)	[X] No [ ] Yes NCR No.: N/A NCR No.: N/A

Section 2: Waste Container Data	
Container Type:	55 Gallon Drum
TRUCON Code:	OR 227
Waste Matrix Code:	S4100
Waste Stream I.D.:	OR-NFS-CH-SOIL
Waste Container Weights:	Gross Wt.: 229.5 kg Tare Wt.: 35.2 kg Net Wt.: 194.3 kg
Rigid Liner and Liner Vent Description:	Liner: [ ] No [X] Yes Lid: [X] No [ ] Yes Type: [ ] 30-mil [X] 90-mil [ ] 110-mil [ ] 125-mil Vented: [ ] No [X] Yes [ ] N/A Punctured: [X] No [ ] Yes Mechanical Vent: [X] No [ ] Yes Fiberboard Liner: [X] No [ ] Yes Lead Lined: [X] No [ ] Yes
Number of Layers of Confinement:	Appears to be 1 layer
Volume Utilization Percentage:	80 %

CCP Radiography Data Sheet

Waste Container ID: X10C1250784

Section 3: Container Inventory and Comments (Detailed descriptions)

IM:

AM:

OM:

OI:

C:

R:

XPM:

OR: Absorbent

IN:

S: Soil

Section 4: Packaging Material and Waste Material Parameters

Packaging Material:	**Estimated Weight (kg)**
Steel (ST):	27.8
Plastics (PP): Liner bag, Rigid Liner	7.4
Other:	0.0
Total Packaging Weight	35.2
Waste Material Parameter:	**Estimated Weight (kg)**
Iron-based Metal / Alloys (IM):	
Aluminum-based Metals / Alloys (AM):	
Other Metals (OM):	
Other Inorganic Materials (OI)	
Cellulosics (C):	
Rubber (R):	
Plastics (waste materials) (XPM):	
Organic Matrix (OR):	2.3
Inorganic Matrix (IN):	
Soils (S):	192.0
Total WMP Weight:	194.3

CCP Radiography Data Sheet

Waste Container ID: X10C1250784

Section 5: RTR Summary (Questions answered "Yes" will be explained in the Comment block, except for Question 1)	
Is there observable liquid?	☐ Yes ☒ No
Is there any observable liquid in internal containers, more than 60 milliliters or 3 percent by volume, whichever is greater?	☐ Yes ☒ No
Is the total volume of observable liquid in the outermost container GREATER than 1% of the container?	☐ Yes ☒ No
Is there observable liquid in payload containers with an EPA Hazardous Waste Number of U134?	☐ Yes ☒ No
Is there an indication of non-radionuclide pyrophoric materials, such as elemental potassium?	☐ Yes ☒ No
Is there an indication of hazardous wastes not occurring as co-contaminants with TRU mixed wastes (non-mixed hazardous wastes)?	☐ Yes ☒ No
Is there an indication of wastes incompatible with backfill, seal and panel closures materials, container and packaging materials, shipping container materials, or other wastes (i.e., waste does NOT match TRUCON Code[s])?	☐ Yes ☒ No
Is there an indication of wastes containing explosives or compressed gases?	☐ Yes ☒ No
Is there an indication of PCBs liquids?	☐ Yes ☒ No
Is there an indication of the waste exhibiting the characteristic of ignitability, corrosivity, or reactivity (EPA Hazardous Waste Numbers of D001, D002, or D003)?	☐ Yes ☒ No
Is the physical form of the waste inconsistent with the Waste Stream Description or the Waste Matrix Code?	☐ Yes ☒ No
CH or RH TRAMPAC	
Are there heat-sealed bags (unvented) GREATER than 4 liters and LESS than 390 square inches in the waste, or heat sealed bags not authorized in the RH TRUCON Code?	☐ Yes ☒ No
Were there Non-approved Closure Methods used on liner bags or inner bags greater than 4 liters?	☐ Yes ☒ No
Are there sealed containers GREATER than 4 liters?	☐ Yes ☒ No
Are there indications of inadequate protection for heavy and/or sharp objects?	☐ Yes ☒ No
Comments: N/A	

RTR Operator:

Daphne Brothers	Daphne Brothers	8/26/2015
Print Name	Signature	Date

CCP Radiography Data Sheet

Section 1: General Information		
[X] RTR Examination	[ ] RTR Replicate Scan	[ ] RTR Independent Observation
Site ID:	ORNL	
Batch Number:	OR-RTR6-0676	
Examination Date:	8/26/2015	
Waste Container ID:	X10C1250755	
Video/Audio Recorded Media Number:	OR-RTR6-0676	A&B
Procedure and Revision No.:	CCP-TP-053	Rev. 15
NCR(s) associated with the container? (e.g., Prohibited Items)	[X] No [ ] Yes NCR No.: N/A NCR No.: N/A	

Section 2: Waste Container Data	
Container Type:	55 Gallon Drum
TRUCON Code:	OR 227
Waste Matrix Code:	S4100
Waste Stream I.D.:	OR-NFS-CH-SOIL
Waste Container Weights:	Gross Wt.: 224.6 kg Tare Wt.: 35.2 kg Net Wt.: 189.4 kg
Rigid Liner and Liner Vent Description:	Liner: [ ] No [X] Yes Lid: [X] No [ ] Yes Type: [ ] 30-mil [X] 90-mil [ ] 110-mil [ ] 125-mil Vented: [ ] No [X] Yes [ ] N/A Punctured: [X] No [ ] Yes Mechanical Vent: [X] No [ ] Yes Fiberboard Liner: [X] No [ ] Yes Lead Lined: [X] No [ ] Yes
Number of Layers of Confinement:	Appears to be 1 layer
Volume Utilization Percentage:	85 %

CCP Radiography Data Sheet

Waste Container ID: X10C1250755

Section 3: Container Inventory and Comments (Detailed descriptions)	
IM:	
AM:	
OM:	
OI:	
C:	
R:	
XPM:	
OR:	Absorbent
IN:	
S:	Soil

Section 4: Packaging Material and Waste Material Parameters	
Packaging Material:	**Estimated Weight (kg)**
Steel (ST):	27.8
Plastics (PP): Liner bag, Rigid Liner	7.4
Other:	0.0
Total Packaging Weight	35.2
Waste Material Parameter:	**Estimated Weight (kg)**
Iron-based Metal / Alloys (IM):	
Aluminum-based Metals / Alloys (AM):	
Other Metals (OM):	
Other Inorganic Materials (OI)	
Cellulosics (C):	
Rubber (R):	
Plastics (waste materials) (XPM):	
Organic Matrix (OR):	2.4
Inorganic Matrix (IN):	
Soils (S):	187.0
Total WMP Weight:	189.4

CCP Radiography Data Sheet

Waste Container ID: X10C1250755

Section 5: RTR Summary (Questions answered "Yes" will be explained in the Comment block, except for Question 1)	
Is there observable liquid?	☐ Yes ☒ No
Is there any observable liquid in internal containers, more than 60 milliliters or 3 percent by volume, whichever is greater?	☐ Yes ☒ No
Is the total volume of observable liquid in the outermost container GREATER than 1% of the container?	☐ Yes ☒ No
Is there observable liquid in payload containers with an EPA Hazardous Waste Number of U134?	☐ Yes ☒ No
Is there an indication of non-radionuclide pyrophoric materials, such as elemental potassium?	☐ Yes ☒ No
Is there an indication of hazardous wastes not occurring as co-contaminants with TRU mixed wastes (non-mixed hazardous wastes)?	☐ Yes ☒ No
Is there an indication of wastes incompatible with backfill, seal and panel closures materials, container and packaging materials, shipping container materials, or other wastes (i.e., waste does NOT match TRUCON Code[s])?	☐ Yes ☒ No
Is there an indication of wastes containing explosives or compressed gases?	☐ Yes ☒ No
Is there an indication of PCBs liquids?	☐ Yes ☒ No
Is there an indication of the waste exhibiting the characteristic of ignitability, corrosivity, or reactivity (EPA Hazardous Waste Numbers of D001, D002, or D003)?	☐ Yes ☒ No
Is the physical form of the waste inconsistent with the Waste Stream Description or the Waste Matrix Code?	☐ Yes ☒ No
CH or RH TRAMPAC	
Are there heat-sealed bags (unvented) GREATER than 4 liters and LESS than 390 square inches in the waste, or heat sealed bags not authorized in the RH TRUCON Code?	☐ Yes ☒ No
Were there Non-approved Closure Methods used on liner bags or inner bags greater than 4 liters?	☐ Yes ☒ No
Are there sealed containers GREATER than 4 liters?	☐ Yes ☒ No
Are there indications of inadequate protection for heavy and/or sharp objects?	☐ Yes ☒ No

Comments: N/A

RTR Operator:

Daphne Brothers		8/26/2015
Print Name	Signature	Date

CCP Radiography Data Sheet

Section 1: General Information	
[X] RTR Examination [ ] RTR Replicate Scan [ ] RTR Independent Observation	
Site ID:	ORNL
Batch Number:	OR-RTR6-0676
Examination Date:	8/26/2015
Waste Container ID:	X10C1250761
Video/Audio Recorded Media Number:	OR-RTR6-0676 A&B
Procedure and Revision No.:	CCP-TP-053 Rev. 15
NCR(s) associated with the container? (e.g., Prohibited Items)	[X] No [ ] Yes NCR No.: N/A NCR No.: N/A

Section 2: Waste Container Data	
Container Type:	55 Gallon Drum
TRUCON Code:	OR 227
Waste Matrix Code:	S4100
Waste Stream I.D.:	OR-NFS-CH-SOIL
Waste Container Weights:	Gross Wt.: 215.5 kg Tare Wt.: 35.2 kg Net Wt.: 180.3 kg
Rigid Liner and Liner Vent Description:	Liner: [ ] No [X] Yes Lid: [X] No [ ] Yes Type: [ ] 30-mil [X] 90-mil [ ] 110-mil [ ] 125-mil Vented: [ ] No [X] Yes [ ] N/A Punctured: [X] No [ ] Yes Mechanical Vent: [X] No [ ] Yes Fiberboard Liner: [X] No [ ] Yes Lead Lined: [X] No [ ] Yes
Number of Layers of Confinement:	Appears to be 1 layer
Volume Utilization Percentage:	90 %

CCP Radiography Data Sheet

Waste Container ID: X10C1250761

Section 3: Container Inventory and Comments (Detailed descriptions)
IM:
AM:
OM:
OI:
C:
R:
XPM: Plastic sheeting
OR: Absorbent
IN:
S: Soil

Section 4: Packaging Material and Waste Material Parameters	
Packaging Material:	**Estimated Weight (kg)**
Steel (ST):	27.8
Plastics (PP): Liner bag, Rigid Liner	7.4
Other:	0.0
Total Packaging Weight	35.2
Waste Material Parameter:	**Estimated Weight (kg)**
Iron-based Metal / Alloys (IM):	
Aluminum-based Metals / Alloys (AM):	
Other Metals (OM):	
Other Inorganic Materials (OI)	
Cellulosics (C):	
Rubber (R):	
Plastics (waste materials) (XPM):	1.0
Organic Matrix (OR):	2.3
Inorganic Matrix (IN):	
Soils (S):	177.0
Total WMP Weight:	180.3

CCP Radiography Data Sheet

Waste Container ID: X10C1250761

Section 5: RTR Summary (Questions answered "Yes" will be explained in the Comment block, except for Question 1)	
Is there observable liquid?	☐ Yes ☒ No
Is there any observable liquid in internal containers, more than 60 milliliters or 3 percent by volume, whichever is greater?	☐ Yes ☒ No
Is the total volume of observable liquid in the outermost container GREATER than 1% of the container?	☐ Yes ☒ No
Is there observable liquid in payload containers with an EPA Hazardous Waste Number of U134?	☐ Yes ☒ No
Is there an indication of non-radionuclide pyrophoric materials, such as elemental potassium?	☐ Yes ☒ No
Is there an indication of hazardous wastes not occurring as co-contaminants with TRU mixed wastes (non-mixed hazardous wastes)?	☐ Yes ☒ No
Is there an indication of wastes incompatible with backfill, seal and panel closures materials, container and packaging materials, shipping container materials, or other wastes (i.e., waste does NOT match TRUCON Code[s])?	☐ Yes ☒ No
Is there an indication of wastes containing explosives or compressed gases?	☐ Yes ☒ No
Is there an indication of PCBs liquids?	☐ Yes ☒ No
Is there an indication of the waste exhibiting the characteristic of ignitability, corrosivity, or reactivity (EPA Hazardous Waste Numbers of D001, D002, or D003)?	☐ Yes ☒ No
Is the physical form of the waste inconsistent with the Waste Stream Description or the Waste Matrix Code?	☐ Yes ☒ No
CH or RH TRAMPAC	
Are there heat-sealed bags (unvented) GREATER than 4 liters and LESS than 390 square inches in the waste, or heat sealed bags not authorized in the RH TRUCON Code?	☐ Yes ☒ No
Were there Non-approved Closure Methods used on liner bags or inner bags greater than 4 liters?	☐ Yes ☒ No
Are there sealed containers GREATER than 4 liters?	☐ Yes ☒ No
Are there indications of inadequate protection for heavy and/or sharp objects?	☐ Yes ☒ No
Comments: N/A	

RTR Operator:

Daphne Brothers		8/26/2015
Print Name	Signature	Date

Attachment 3 – CCP Radiography Independent Technical Reviewer Checklist

Batch Data Report No.: OR-RTR6-0676

Description			
1.	Were data generation and reduction conducted in a technically correct manner in accordance with the methods used?	☐ NO	☑ YES
2.	Was the correct revision of the procedure used? Procedure: CCP-TP-053 Rev.: 15	☐ NO	☑ YES
3.	Are the WMPs entered correctly?	☐ NO	☑ YES
4.	Do the estimated weights in Section 4 of Attachment 2 equal the container gross weight?	☐ NO	☑ YES
5.	Is the data reported in the proper units with the correct number of significant figures (e.g., one tenth of a kilogram)?	☐ NO	☑ YES
6.	Was transcription used? If no, proceed to question 7.	☑ NO	☐ YES
	6a. Has the data been verified for transcription errors?	☐ NO	☐ YES
7.	Does the Testing Batch Report include radiography for up to 20 containers?	☐ NO	☑ YES
8.	Are BDR contents complete and do they match the CCP Waste RTR Batch Data Report Table of Contents?	☐ NO	☑ YES
9.	Is all the data signed and dated in reproducible ink and by the individual(s) generating it?	☐ NO	☑ YES
10.	Is all data recorded clearly, legibly, and accurately?	☐ NO	☑ YES
11.	Have changes been made to original data? If no, proceed to question 12.	☑ NO	☐ YES
	11a. Have all changes to original data been lined out, initialed and dated by the individual making the changes?	☐ NO	☐ YES
	11b. Was justification made for changing the original data?	☐ NO	☐ YES
	11c. Were data changes made by the individual who originally collected the data?	☐ NO	☐ YES
12.	Does the waste match the Waste Matrix Code and Waste Stream description?	☐ NO	☑ YES
13.	Are the RTR Operator's decisions regarding the Radiography documented?	☐ NO	☑ YES
14.	Is there an adequate written description of the contents of each item?	☐ NO	☑ YES
15.	Was the video/audio recording media properly prepared and labeled for each waste container?	☐ NO	☑ YES
16.	Was the video/audio recording media check performed satisfactorily and recorded on Attachment 1?	☐ NO	☑ YES

Attachment 3 – CCP Radiography Independent Technical Reviewer Checklist (Continued)

Batch Data Report No.: OR-RTR6-0676

Description			
17.	Was the Image Test performed satisfactorily and recorded on Attachment 1?	☐ NO	☑ YES
18.	Was the Replicate Scan performed and recorded on an Attachment 2?	☐ NO	☑ YES
19.	Was the Replicate Scan RTR Operator different from the first RTR Operator?	☐ NO	☑ YES
20.	Did the Replicate Scan RTR Operator and the first RTR Operator agree on the results?	☐ NO	☑ YES
21.	Was the Independent Observation performed and recorded on an Attachment 2?	☐ NO	☑ YES
22.	Was the Independent Observation RTR Operator different from the first RTR Operator?	☐ NO	☑ YES
23.	Did the Independent Observation RTR Operator and the first RTR Operator agree on the results?	☐ NO	☑ YES
24.	Was the data collection performed by qualified individuals?	☐ NO	☑ YES
25.	Were NCRs initiated as required at DGL? If no, proceed to question 26.	☑ NO	☐ YES
	25a. Have the NCR(s) associated with RTR been included in the BDR?	☐ NO	☐ YES
26.	Is the RTR examination for CH waste? If no, proceed to question 27.	☐ NO	☑ YES
	26a. Have the CH Quality Assurance Objectives (QAOs) been met (if applicable)? Precision – Precision is maintained by reconciling any discrepancies between two radiography operators with regard to identification of the waste matrix code, liquids in excess of TSDF-WAC limits, and compressed gases through independent replicate scans and independent observations. Additionally, the precision of radiography is verified prior to use by tuning precisely enough to demonstrate compliance with QAOs through viewing an image test pattern. Accuracy – Accuracy is obtained by using a target to tune the image for maximum sharpness and by requiring operators to successfully identify 100 percent of the items required to meet the DQOs for radiography specified in CCP-PO-001, Section C-4a(1) in a training container during their initial qualification and subsequent requalification. Completeness – A video and audio media recording of the radiography examination and a validated radiography data form will be obtained for 100 percent of the waste containers subject to radiography. All video and audio media recordings and radiography data forms will be subject to validation as indicated in CCP-PO-001, Section C3-4. Comparability – The comparability of radiography data from different operators shall be enhanced by using standardized radiography procedures and operator qualifications.	☐ NO	☑ YES

Attachment 3 – CCP Radiography Independent Technical Reviewer Checklist (Continued)

Batch Data Report No.: OR-RTR6-0676

Description		
27. Is the RTR examination for RH waste? If no, proceed to comment section.	☑ NO	☐ YES
27a. Have the RH QAOs been met (if applicable)? Precision – Precision is maintained by reconciling any discrepancies between two operators (during Independent Observation and Replicate scans) with regard to the identification of important waste characteristics (i.e., physical form of the waste and absence of prohibited liquids) within a single container. Accuracy – Accuracy is obtained by using a target to tune the image for maximum sharpness and by requiring operators to successfully identify prohibited liquid in a training container during their initial qualification and subsequent requalification. Representativeness – All of the relevant contents in a container selected for radiography will be described. Completeness – All of the relevant waste information must be assembled and must show that each of the containers in the waste stream belongs to the waste stream. This information must be documented on videotape or other equivalent media and data form. Comparability – Comparability is ensured by meeting the program training requirements and complying with the minimum standards used to implement the radiography process.	☐ NO	☐ YES

Comments:

N/A

I have reviewed 100% of the container specific and batch data in this report and find it acceptable.

Independent Technical Reviewer:

Fred Owey		8-26-15
Printed Name	Signature	Date

DIVIDER PAGE ONLY

Not part of page count

Attachment 2 – CCP Records Transmittal/Receiving Form

CCP Records / Records Custodian, 4021 National Parks Highway - MS: GSA 212, Carlsbad, New Mexico 88220

Telephone Number: 575-234-7523

Fax Number: 575-234-7033

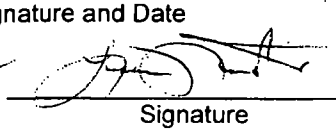
Attn:	CCP RECORDS	From:	PATRICK SMITH II
Ship to:	CCP RECORDS CUSTODIAN	Site:	ORNL
	4021 NATIONAL PARKS HWY.	Company:	TFE INC.
	MS GSA 212	Telephone Number:	865-574-6002
	CARLSBAD, NM 88220-9082	Date Sent:	8-27-2015
Telephone Number:	575-234-7523		

Document Number	Title / Description	Record Date	Total Pages
OR-RTR6-0676	RTR DVD (DISK B)	8-26-2015	N/A
N/A	N/A	N/A	N/A
N/A	N/A	N/A	N/A
N/A	N/A	N/A	N/A
N/A	N/A	N/A	N/A
N/A	N/A	N/A	N/A

Comments

N/A

(When the Record accepted line has been completed, the rest of the page below may be left blank.)
Acceptance/Rejection Signature and Date

Records Accepted ☑	 Signature	Leon Navarrete Printed Name	9/1/15 Date
Records Rejected ☐	Signature	Printed Name	Date

Reason for Rejection:

Re-submittal:	Signature	Printed Name	Date

****
*** Send Results ***
****

Sending is complete.

Job No.	1781
Address	918655768703
Name	ORNL
Start Time	09/01 06:19 AM
Call Length	00'20
Sheets	1
Result	OK

Controlled Copy

Attachment 2 – CCP Records Transmittal/Receiving Form

CCP Records / Records Custodian, 4021 National Parks Highway - MS: GSA 212, Carlsbad, New Mexico 88220

Telephone Number: 575-234-7523

Fax Number: 575-234-7033

Attn:	CCP RECORDS	From:	PATRICK SMITH II
Ship to:	CCP RECORDS CUSTODIAN	Site:	ORNL
	4021 NATIONAL PARKS HWY.	Company:	TFE INC.
	MS GSA 212	Telephone Number:	865-574-6002
	CARLSBAD, NM 88220-9082	Date Sent:	8-27-2015
Telephone Number:	575-234-7523		

OR-RTR6-0676	RTR DVD (DISK B)	8-26-2015	N/A
N/A	N/A	N/A	N/A
N/A	N/A	N/A	N/A
N/A	N/A	N/A	N/A
N/A	N/A	N/A	N/A
N/A	N/A	N/A	N/A

N/A

(When the Record accepted line has been completed, the rest of the page below may be left blank.)

Acceptance/Rejection Signature and Date

Records Accepted ☑ — Signature — Leon Navarrete (Printed Name) — 9/1/15 (Date)

Records Rejected ☐

Attachment 2 – CCP Records Transmittal/Receiving Form

CCP Records / Records Custodian, 4021 National Parks Highway - MS: GSA 212, Carlsbad, New Mexico 88220

Telephone Number: 575-234-7523

Fax Number: 575-234-7033

Attn:	CCP RECORDS	From:	PATRICK SMITH II
Ship to:	CCP RECORDS CUSTODIAN	Site:	ORNL
	4021 NATIONAL PARKS HWY.	Company:	TFE INC.
	MS GSA 212	Telephone Number:	865-574-6002
	CARLSBAD, NM 88220-9082	Date Sent:	9-10-2015
Telephone Number:	575-234-7523		

Document Number	Title / Description	Record Date	Total Pages
OR-RTR6-0676	RTR BDR	8-26-2015	33
OR-RTR6-0676	RTR DVD (DISK A)	8-26-2015	N/A
N/A	N/A	N/A	N/A
N/A	N/A	N/A	N/A
N/A	N/A	N/A	N/A
N/A	N/A	N/A	N/A

Comments:

N/A

(When the Record accepted line has been completed, the rest of the page below may be left blank.)

Acceptance/Rejection Signature and Date

Records Accepted	☑	[signature]	[signature]	9.10.15
		Signature	Printed Name	Date
Records Rejected	☐			
		Signature	Printed Name	Date

Reason for Rejection:

Re-submittal:

Signature	Printed Name	Date

****
*** Send Results ***
****

Sending is complete.

Job No.	2118
Address	918655768703
Name	ORNL
Start Time	09/16 09:57 AM
Call Length	00'20
Sheets	1
Result	OK

Attachment 2 – CCP Records Transmittal/Receiving Form

CCP Records / Records Custodian, 4021 National Parks Highway - MS: GSA 212, Carlsbad, New Mexico 88220

Telephone Number: 575-234-7523

Fax Number: 575-234-7033

Attn:	CCP RECORDS	From:	PATRICK SMITH II
Ship to:	CCP RECORDS CUSTODIAN	Site:	ORNL
	4021 NATIONAL PARKS HWY.	Company:	TFE INC.
	MS GSA 212	Telephone Number:	865-574-6002
	CARLSBAD, NM 88220-9082	Date Sent:	9-10-2015
Telephone Number:	575-234-7523		

Document Number	Title/Description	Date	Page Count
OR-RTR6-0676	RTR BDR	8-26-2015	33
OR-RTR6-0676	RTR DVD (DISK A)	8-26-2015	N/A
N/A	N/A	N/A	N/A
N/A	N/A	N/A	N/A
N/A	N/A	N/A	N/A
N/A	N/A	N/A	N/A

Comments:

N/A

(When the Record accepted line has been completed, the rest of the page below may be left blank.)

Acceptance/Rejection Signature and Date

Records Accepted [X] _____ Kenneth Hendricks 9.16.15
Signature Printed Name Date

Records Rejected [ ] _____ _____

DIVIDER

PAGE

Attachment 2 – CCP SPM Radiography Project Level Validation Checklist and Summary

BDR Number: OR-RTR6-0688	**Examination Date(s): 09/22/2015**			
Description of Criteria Reviewed	**Criteria Met?**			**Comments/Qualifiers**
	YES	**NO**	**NA**	
1. Is the completed, signed, and dated Independent Technical Reviewer Checklist included in the BDR, and the independent technical reviewer was not involved in the generation or recording of the data under review? **Reference Source: CCP-PO-001, C3-4**	X			
2. Does the BDR contain all items addressed in the BDR Table of Contents? **Reference Source: CCP-PO-001, C3-4**	X			
3. Does the BDR include a listing of all the container numbers in the batch? **Reference Source: CCP-PO-001, C3-4**	X			
4. List all containers that have met QAOs. **Reference Source: CCP-PO-001, C3-4**				Container Numbers: X10C0402812I X10C0402959J1 X10C0402959J2 X10C0506610A X10C0506610C X10C9311707A
5. Does the BDR identify the current implementing procedure and revision number? **Reference Source: CCP-PO-001, Table C3-3**	X			
6. Is there a reference to or copy of any associated NCRs (if any) in the BDR? NA if no NCRs. **Reference Source: CCP-PO-001, Table C3-3**	X			NCR-ORNL-0130-15 Reject (X10C0503017) NCR-ORNL-0131-15 Reject (X10C0503017)
7. Are there 20 or fewer containers in the batch? **Reference Source: CCP-PO-001, C3-4**	X			
8. Are the data properly reported (i.e., data are reported in correct units and with correct significant figures)? **Reference Source: CCP-PO-001, C3-4**	X			
9. Is there evidence of verification that the physical form matches the Waste Matrix Code? **Reference Source: CCP-PO-001, Table C3-3**	X			

CCP RECORDS ORIGINAL
DATE REC'D 9-28-2015 JY

Attachment 2 – CCP SPM Radiography Project Level Validation Checklist and Summary (Continued)

BDR Number: OR-RTR6-0688			Examination Date(s): 09/22/2015	
Description of Criteria Reviewed	Criteria Met? YES	NO	NA	Comments/Qualifiers
10. Is there evidence of verification that the physical form matches the waste stream description? **Reference Source: CCP-PO-001, Table C3-3**	X			
11. Are prohibited items absent? **Reference Source: CCP-PO-001, Table C3-3**	X			Except for X10C0503017
12. Does observable liquid, if present, meet the criteria of the TSDF-WAC? **Reference Source: CCP-PO-001, C-1**	X			Except for X10C0503017
13. Were discrepancies between two operators with regard to identification of waste matrix code, liquids in excess of the TSDF-WAC, or compressed gases through replicate scans and independent observations reconciled? NA if no discrepancies. **Reference Source: CCP-PO-001, C3-2**			X	
14. Are the training qualifications for all radiography personnel acceptable? **Reference Source: CCP-PO-001, C3-8**	X			
15. Was evidence of the video/audio check included in the BDR? **Reference Source: CCP-PO-001, C1-1**	X			
16. Was the Lines-Pair Resolution Test or Sieve Test Check included in the BDR? **Reference Source: CCP Technical Procedures**	X			
17. Was a replicate scan performed once per day, or once per batch, whichever is LESS frequent? **Reference Source: CCP-PO-001, C1-1**	X			
18. Was an independent observation performed once per day, or once per batch, whichever is LESS frequent? **Reference Source: CCP-PO-001, C1-1**	X			

Attachment 2 – CCP SPM Radiography Project Level Validation Checklist and Summary (Continued)

BDR Number: OR-RTR6-0688 **Examination Date(s): 09/22/2015**

Description of Criteria Reviewed	Criteria Met? YES	NO	NA	Comments/Qualifiers
19. Were the replicate scan and independent observation performed on different waste containers? **Reference Source: CCP-PO-001, C1-1**	X			
20. Were the personnel performing the replicate scan and independent observation different from the individual who performed the original? **Reference Source: CCP-PO-001, C1-1**	X			
21. Does the BDR include an estimate of each material parameter weight in kg for each container? **Reference Source: CCP Technical Procedures**	X			
22. Does the BDR include a description of each material parameter for each container? **Reference Source: CCP Technical Procedures**	X			
23. Is the container gross weight recorded in kilograms (kg) for each container in the BDR? **Reference Source: CCP Technical Procedures**	X			
24. Was the Scale Weight Calibration Check included in the BDR? **Reference Source: CCP Technical Procedures**			X	Scale not used.
25. Was the Scale Weight Check included in the BDR? **Reference Source: CCP Technical Procedures**			X	Scale not used.

Comments: None

The container QC checks were properly performed and meet the Quality Assurance Objectives (QAOs). Proper procedures were followed during data reduction and analysis. The batch is complete, acceptable, and includes all supporting data and documentation required by the QAPjP.

Carolina Soaterna	Carolina Soaterna	09/24/2015
SPM Printed Name	Signature	Date

Checklist is to be re-signed only when a re-review is performed.

SPM Printed Name	Signature	Reason	Date
SPM Printed Name	Signature	Reason	Date

Attachment 5–CCP Radiography Batch Data Report Cover Sheet

Site ID: ORNL

Batch Data Report No.: OR-RTR6-0688 ☑ CH ☐ RH Date: 9-22-15

Waste Container ID Numbers	
Replicate Scan:	X10C0402812I
Independent Observation:	X10C0402959J1
1	X10C0503017
2	X10C0402959J2
3	X10C0402959J1
4	X10C9311707A
5	X10C0402812I
6	X10C0506610A
7	X10C0506610C
8	N/A
9	N/A
10	N/A
11	N/A
12	N/A
13	N/A
14	N/A
15	N/A
16	N/A
17	N/A
18	N/A
19	N/A
20	N/A

RTR Operator:

Daphne Brothers — Printed Name

Daphne O Brothers — Signature

9-22-15 — Date

Independent Technical Reviewer:

Fred Ovey — Printed Name

Fred Ovey — Signature

9-23-15 — Date

NTPC RECORDS ORIGINAL
DATE REC'D 9-23-2015

Attachment 4 – CCP Radiography Batch Data Report Table of Contents and Batch Narrative

Batch Data Report No.: OR-RTR6-0688 Date: 9-22-15

Table Of Contents		
Item	Description	Page No.
1	CCP Radiography Batch Data Report Cover Sheet	1
2	CCP Radiography Batch Data Report Table Of Contents	2
3	CCP RTR Measurement Control Report	3
4	CCP Radiography Data Sheets	4
5	Copy of NCRs (NA, If Not Applicable)	31
6	CCP Independent Technical Reviewer Checklist	37

Batch Narrative
All Quality Checks were performed and recorded on CCP-TP-053, Rev.15, CCP Radiography Measurement Control Report.

Daphne Brothers — RTR Operator

Daphne D Brothers — Signature

9-22-15 — Date

Attachment 1 – CCP RTR Measurement Control Report

Site ID: ORNL		
Batch Data Report No.: OR-RTR6-0688		
Examination Date: 9-22-15		
Control Checks		
Video/Audio Recorded Media System Check	☑ SAT	☐ UNSAT
Image Test : 10 Lines (Minimum acceptable is 5 lines-pair/cm or #6 Sieve is viewable)	☑ SAT	☐ UNSAT
Comments: N/A		
RTR Operator:		
Daphne Brothers (Printed Name)	Daphne O Brothers (Signature)	9-22-15 (Date)

CCP Radiography Data Sheet

Section 1: General Information	
☐ RTR Examination ☒ RTR Replicate Scan ☐ RTR Independent Observation	
Site ID:	ORNL
Batch Number:	OR-RTR6-0688
Examination Date:	9/22/2015
Waste Container ID:	X10C0402812I
Video/Audio Recorded Media Number:	OR-RTR6-0688 A&B
Procedure and Revision No.:	CCP-TP-053 Rev: 15
NCR(s) associated with the container? (e.g., Prohibited Items)	☒ No ☐ Yes NCR No.: N/A NCR No.: N/A

Section 2: Waste Container Data	
Container Type:	55 Gallon Drum
TRUCON Code:	OR 225
Waste Matrix Code:	S5400
Waste Stream I.D.:	OR-REDC-CH-HET
Waste Container Weights:	Gross Wt.: 50.2 kg Tare Wt.: 33.2 kg Net Wt.: 17.0 kg
Rigid Liner and Liner Vent Description:	Liner: ☒ No ☐ Yes Lid: ☒ No ☐ Yes Type: ☐ 30-mil ☐ 90-mil ☐ 110-mil ☐ 125-mil Vented: ☐ No ☐ Yes ☒ N/A Punctured: ☒ No ☐ Yes Mechanical Vent: ☒ No ☐ Yes Fiberboard Liner: ☒ No ☐ Yes Lead Lined: ☒ No ☐ Yes
Number of Layers of Confinement:	Appears to be 1 layer
Volume Utilization Percentage:	90 %

CCP Radiography Data Sheet

Waste Container ID: X10C0402812I

Section 3: Container Inventory and Comments (Detailed descriptions)

IM: Scrap metal, metal lid

AM:

OM:

OI: Glass containers, floor sweepings, broken glass

C:

R:

XPM: Plastic lid, plastic containers, plastic sheeting, open plastic containers

OR:

IN:

S:

Section 4: Packaging Material and Waste Material Parameters

Packaging Material:	Estimated Weight (kg)
Steel (ST):	27.8
Plastics (PP): Liner bag	1.0
Other: Cardboard (CP)	4.4
Total Packaging Weight	33.2
Waste Material Parameter:	**Estimated Weight (kg)**
Iron-based Metal / Alloys (IM):	3.0
Aluminum-based Metals / Alloys (AM):	
Other Metals (OM):	
Other Inorganic Materials (OI)	3.0
Cellulosics (C):	
Rubber (R):	
Plastics (waste materials) (XPM):	11.0
Organic Matrix (OR):	
Inorganic Matrix (IN):	
Soils (S):	
Total WMP Weight:	17.0

CCP Radiography Data Sheet

Waste Container ID: X10C0402812I

Section 5: RTR Summary (Questions answered "Yes" will be explained in the Comment block, except for Question 1)	
Is there observable liquid?	☐ Yes ☒ No
Is there any observable liquid in internal containers, more than 60 milliliters or 3 percent by volume, whichever is greater?	☐ Yes ☒ No
Is the total volume of observable liquid in the outermost container GREATER than 1% of the container?	☐ Yes ☒ No
Is there observable liquid in payload containers with an EPA Hazardous Waste Number of U134?	☐ Yes ☒ No
Is there an indication of non-radionuclide pyrophoric materials, such as elemental potassium?	☐ Yes ☒ No
Is there an indication of hazardous wastes not occurring as co-contaminants with TRU mixed wastes (non-mixed hazardous wastes)?	☐ Yes ☒ No
Is there an indication of wastes incompatible with backfill, seal and panel closures materials, container and packaging materials, shipping container materials, or other wastes (i.e., waste does NOT match TRUCON Code[s])?	☐ Yes ☒ No
Is there an indication of wastes containing explosives or compressed gases?	☐ Yes ☒ No
Is there an indication of PCBs liquids?	☐ Yes ☒ No
Is there an indication of the waste exhibiting the characteristic of ignitability, corrosivity, or reactivity (EPA Hazardous Waste Numbers of D001, D002, or D003)?	☐ Yes ☒ No
Is the physical form of the waste inconsistent with the Waste Stream Description or the Waste Matrix Code?	☐ Yes ☒ No
CH or RH TRAMPAC	
Are there heat-sealed bags (unvented) GREATER than 4 liters and LESS than 390 square inches in the waste, or heat sealed bags not authorized in the RH TRUCON Code?	☐ Yes ☒ No
Were there Non-approved Closure Methods used on liner bags or inner bags greater than 4 liters?	☐ Yes ☒ No
Are there sealed containers GREATER than 4 liters?	☐ Yes ☒ No
Are there indications of inadequate protection for heavy and/or sharp objects?	☐ Yes ☒ No

Comments: This Replicate Scan Agrees with the original Scan. EC 9/22/15

RTR Operator:

Eric Lyles		9/22/2015
Print Name	Signature	Date

CCP Radiography Data Sheet

Section 1: General Information	
☐ RTR Examination ☐ RTR Replicate Scan ☒ RTR Independent Observation	
Site ID:	ORNL
Batch Number:	OR-RTR6-0688
Examination Date:	9/22/2015
Waste Container ID:	X10C0402959J1
Video/Audio Recorded Media Number:	OR-RTR6-0688 A&B
Procedure and Revision No.:	CCP-TP-053 Rev. 15
NCR(s) associated with the container? (e.g., Prohibited Items)	☒ No ☐ Yes NCR No.: N/A NCR No.: N/A

Section 2: Waste Container Data	
Container Type:	55 Gallon Drum
TRUCON Code:	OR 225
Waste Matrix Code:	S5400
Waste Stream I.D.:	OR-REDC-CH-HET
Waste Container Weights:	Gross Wt.: 58.8 kg Tare Wt.: 33.2 kg Net Wt.: 25.6 kg
Rigid Liner and Liner Vent Description:	Liner: ☒ No ☐ Yes Lid: ☒ No ☐ Yes Type: ☐ 30-mil ☐ 90-mil ☐ 110-mil ☐ 125-mil Vented: ☐ No ☐ Yes ☒ N/A Punctured: ☒ No ☐ Yes Mechanical Vent: ☒ No ☐ Yes Fiberboard Liner: ☒ No ☐ Yes Lead Lined: ☒ No ☐ Yes
Number of Layers of Confinement:	Appears to be 1 layer
Volume Utilization Percentage:	90 %

CCP Radiography Data Sheet

Waste Container ID: X10C0402959J1

Section 3: Container Inventory and Comments (Detailed descriptions)

IM: Scrap metal, electrical equipment, metal cans, open metal can

AM:

OM:

OI: Glass containers, broken glass, floor sweepings

C: Cardboard

R:

XPM: Plastic sheeting, plastic tubing

OR:

IN:

S:

Section 4: Packaging Material and Waste Material Parameters

Packaging Material:	Estimated Weight (kg)
Steel (ST):	27.8
Plastics (PP): Liner bag	1.0
Other: Cardboard (CP)	4.4
Total Packaging Weight	33.2
Waste Material Parameter:	**Estimated Weight (kg)**
Iron-based Metal / Alloys (IM):	9.0
Aluminum-based Metals / Alloys (AM):	
Other Metals (OM):	
Other Inorganic Materials (OI)	5.0
Cellulosics (C):	4.0
Rubber (R):	
Plastics (waste materials) (XPM):	7.6
Organic Matrix (OR):	
Inorganic Matrix (IN):	
Soils (S):	
Total WMP Weight:	25.6

CCP Radiography Data Sheet

Waste Container ID: X10C0402959J1

Section 5: RTR Summary (Questions answered "Yes" will be explained in the Comment block, except for Question 1)	
Is there observable liquid?	☐ Yes ☒ No
Is there any observable liquid in internal containers, more than 60 milliliters or 3 percent by volume, whichever is greater?	☐ Yes ☒ No
Is the total volume of observable liquid in the outermost container GREATER than 1% of the container?	☐ Yes ☒ No
Is there observable liquid in payload containers with an EPA Hazardous Waste Number of U134?	☐ Yes ☒ No
Is there an indication of non-radionuclide pyrophoric materials, such as elemental potassium?	☐ Yes ☒ No
Is there an indication of hazardous wastes not occurring as co-contaminants with TRU mixed wastes (non-mixed hazardous wastes)?	☐ Yes ☒ No
Is there an indication of wastes incompatible with backfill, seal and panel closures materials, container and packaging materials, shipping container materials, or other wastes (i.e., waste does NOT match TRUCON Code[s])?	☐ Yes ☒ No
Is there an indication of wastes containing explosives or compressed gases?	☐ Yes ☒ No
Is there an indication of PCBs liquids?	☐ Yes ☒ No
Is there an indication of the waste exhibiting the characteristic of ignitability, corrosivity, or reactivity (EPA Hazardous Waste Numbers of D001, D002, or D003)?	☐ Yes ☒ No
Is the physical form of the waste inconsistent with the Waste Stream Description or the Waste Matrix Code?	☐ Yes ☒ No
CH or RH TRAMPAC	
Are there heat-sealed bags (unvented) GREATER than 4 liters and LESS than 390 square inches in the waste, or heat sealed bags not authorized in the RH TRUCON Code?	☐ Yes ☒ No
Were there Non-approved Closure Methods used on liner bags or inner bags greater than 4 liters?	☐ Yes ☒ No
Are there sealed containers GREATER than 4 liters?	☐ Yes ☒ No
Are there indications of inadequate protection for heavy and/or sharp objects?	☐ Yes ☒ No

Comments: This Independent observation agrees with the original scan. EL 9/22/15

RTR Operator:

Eric Lyles	EL	9/22/2015
Print Name	Signature	Date

CCP Radiography Data Sheet

Section 1: General Information	
[X] RTR Examination [ ] RTR Replicate Scan [ ] RTR Independent Observation	
Site ID:	ORNL
Batch Number:	OR-RTR6-0688
Examination Date:	9/22/2015
Waste Container ID:	X10C0503017
Video/Audio Recorded Media Number:	OR-RTR6-0688 A&B
Procedure and Revision No.:	CCP-TP-053 Rev. 15
NCR(s) associated with the container? (e.g., Prohibited Items)	[ ] No [X] Yes NCR No.: NCR-ORNL-0130-15 NCR No.: NCR-ORNL-0131-15

Section 2: Waste Container Data	
Container Type:	55 Gallon Drum
TRUCON Code:	OR 225
Waste Matrix Code:	S5400
Waste Stream I.D.:	OR-ISTP-CH-HET
Waste Container Weights:	Gross Wt.: 75.1 kg Tare Wt.: 33.2 kg Net Wt.: 41.9 kg
Rigid Liner and Liner Vent Description:	Liner: [X] No [ ] Yes Lid: [X] No [ ] Yes Type: [ ] 30-mil [ ] 90-mil [ ] 110-mil [ ] 125-mil Vented: [ ] No [ ] Yes [X] N/A Punctured: [X] No [ ] Yes Mechanical Vent: [X] No [ ] Yes Fiberboard Liner: [X] No [ ] Yes Lead Lined: [X] No [ ] Yes
Number of Layers of Confinement:	Appears to be 1 layer
Volume Utilization Percentage:	70 %

CCP Radiography Data Sheet

Waste Container ID: X10C0503017

Section 3: Container Inventory and Comments (Detailed descriptions)

IM: Metal lid, open metal container, scrap metal, electric motorized equipment, metal containers, metal hardware,

AM:

OM:

OI: Glass containers, absorbent

C: Cloth

R:

XPM: Plastic sheeting, plastic containers

OR:

IN:

S:

Section 4: Packaging Material and Waste Material Parameters

Packaging Material:	Estimated Weight (kg)
Steel (ST):	27.8
Plastics (PP): Liner bag	1.0
Other: Cardboard (CP)	4.4
Total Packaging Weight	33.2
Waste Material Parameter:	**Estimated Weight (kg)**
Iron-based Metal / Alloys (IM):	23.0
Aluminum-based Metals / Alloys (AM):	
Other Metals (OM):	
Other Inorganic Materials (OI)	7.0
Cellulosics (C):	4.9
Rubber (R):	
Plastics (waste materials) (XPM):	7.0
Organic Matrix (OR):	
Inorganic Matrix (IN):	
Soils (S):	
Total WMP Weight:	41.9

CCP Radiography Data Sheet

Waste Container ID: X10C0503017

Section 5: RTR Summary (Questions answered "Yes" will be explained in the Comment block, except for Question 1)	
Is there observable liquid?	[X] Yes [ ] No
Is there any observable liquid in internal containers, more than 60 milliliters or 3 percent by volume, whichever is greater?	[X] Yes [ ] No
Is the total volume of observable liquid in the outermost container GREATER than 1% of the container?	[X] Yes [ ] No
Is there observable liquid in payload containers with an EPA Hazardous Waste Number of U134?	[ ] Yes [X] No
Is there an indication of non-radionuclide pyrophoric materials, such as elemental potassium?	[ ] Yes [X] No
Is there an indication of hazardous wastes not occurring as co-contaminants with TRU mixed wastes (non-mixed hazardous wastes)?	[ ] Yes [X] No
Is there an indication of wastes incompatible with backfill, seal and panel closures materials, container and packaging materials, shipping container materials, or other wastes (i.e., waste does NOT match TRUCON Code[s])?	[ ] Yes [X] No
Is there an indication of wastes containing explosives or compressed gases?	[ ] Yes [X] No
Is there an indication of PCBs liquids?	[X] Yes [ ] No
Is there an indication of the waste exhibiting the characteristic of ignitability, corrosivity, or reactivity (EPA Hazardous Waste Numbers of D001, D002, or D003)?	[ ] Yes [X] No
Is the physical form of the waste inconsistent with the Waste Stream Description or the Waste Matrix Code?	[ ] Yes [X] No
CH or RH TRAMPAC	
Are there heat-sealed bags (unvented) GREATER than 4 liters and LESS than 390 square inches in the waste, or heat sealed bags not authorized in the RH TRUCON Code?	[ ] Yes [X] No
Were there Non-approved Closure Methods used on liner bags or inner bags greater than 4 liters?	[ ] Yes [X] No
Are there sealed containers GREATER than 4 liters?	[ ] Yes [X] No
Are there indications of inadequate protection for heavy and/or sharp objects?	[ ] Yes [X] No

Comments: NCR-ORNL-0130-15, NCR-ORNL-0131-15

RTR Operator:

Daphne Brothers	Daphne Brothers	9/22/2015
Print Name	Signature	Date

CCP Radiography Data Sheet

Section 1: General Information	
[X] RTR Examination [ ] RTR Replicate Scan [ ] RTR Independent Observation	
Site ID:	ORNL
Batch Number:	OR-RTR6-0688
Examination Date:	9/22/2015
Waste Container ID:	X10C0402959J2
Video/Audio Recorded Media Number:	OR-RTR6-0688 A&B
Procedure and Revision No.:	CCP-TP-053 Rev. 15
NCR(s) associated with the container? (e.g., Prohibited Items)	[X] No [ ] Yes NCR No.: N/A NCR No.: N/A

Section 2: Waste Container Data	
Container Type:	55 Gallon Drum
TRUCON Code:	OR 225
Waste Matrix Code:	S5400
Waste Stream I.D.:	OR-REDC-CH-HET
Waste Container Weights:	Gross Wt.: 72.3 kg Tare Wt.: 33.2 kg Net Wt.: 39.1 kg
Rigid Liner and Liner Vent Description:	Liner: [X] No [ ] Yes Lid: [X] No [ ] Yes Type: [ ] 30-mil [ ] 90-mil [ ] 110-mil [ ] 125-mil Vented: [ ] No [ ] Yes [X] N/A Punctured: [X] No [ ] Yes Mechanical Vent: [X] No [ ] Yes Fiberboard Liner: [X] No [ ] Yes Lead Lined: [X] No [ ] Yes
Number of Layers of Confinement:	Appears to be 1 layer
Volume Utilization Percentage:	80 %

CCP Radiography Data Sheet

Waste Container ID: X10C0402959J2

Section 3: Container Inventory and Comments (Detailed descriptions)	
IM:	Saw blades, scrap metal, electric motor
AM:	
OM:	
OI:	Glass containers, floor sweepings
C:	Tape, cloth, cardboard
R:	
XPM:	Plastic sheeting, plastic containers
OR:	
IN:	
S:	

Section 4: Packaging Material and Waste Material Parameters	
Packaging Material:	**Estimated Weight (kg)**
Steel (ST):	27.8
Plastics (PP): Liner bag	1.0
Other: Cardboard (CP)	4.4
Total Packaging Weight	33.2
Waste Material Parameter:	**Estimated Weight (kg)**
Iron-based Metal / Alloys (IM):	17.0
Aluminum-based Metals / Alloys (AM):	
Other Metals (OM):	
Other Inorganic Materials (OI)	5.0
Cellulosics (C):	7.1
Rubber (R):	
Plastics (waste materials) (XPM):	10.0
Organic Matrix (OR):	
Inorganic Matrix (IN):	
Soils (S):	
Total WMP Weight:	39.1

CCP Radiography Data Sheet

Waste Container ID: X10C0402959J2

Section 5: RTR Summary (Questions answered "Yes" will be explained in the Comment block, except for Question 1)	
Is there observable liquid?	☐ Yes ☒ No
Is there any observable liquid in internal containers, more than 60 milliliters or 3 percent by volume, whichever is greater?	☐ Yes ☒ No
Is the total volume of observable liquid in the outermost container GREATER than 1% of the container?	☐ Yes ☒ No
Is there observable liquid in payload containers with an EPA Hazardous Waste Number of U134?	☐ Yes ☒ No
Is there an indication of non-radionuclide pyrophoric materials, such as elemental potassium?	☐ Yes ☒ No
Is there an indication of hazardous wastes not occurring as co-contaminants with TRU mixed wastes (non-mixed hazardous wastes)?	☐ Yes ☒ No
Is there an indication of wastes incompatible with backfill, seal and panel closures materials, container and packaging materials, shipping container materials, or other wastes (i.e., waste does NOT match TRUCON Code[s])?	☐ Yes ☒ No
Is there an indication of wastes containing explosives or compressed gases?	☐ Yes ☒ No
Is there an indication of PCBs liquids?	☐ Yes ☒ No
Is there an indication of the waste exhibiting the characteristic of ignitability, corrosivity, or reactivity (EPA Hazardous Waste Numbers of D001, D002, or D003)?	☐ Yes ☒ No
Is the physical form of the waste inconsistent with the Waste Stream Description or the Waste Matrix Code?	☐ Yes ☒ No
CH or RH TRAMPAC	
Are there heat-sealed bags (unvented) GREATER than 4 liters and LESS than 390 square inches in the waste, or heat sealed bags not authorized in the RH TRUCON Code?	☐ Yes ☒ No
Were there Non-approved Closure Methods used on liner bags or inner bags greater than 4 liters?	☐ Yes ☒ No
Are there sealed containers GREATER than 4 liters?	☐ Yes ☒ No
Are there indications of inadequate protection for heavy and/or sharp objects?	☐ Yes ☒ No
Comments: N/A	

RTR Operator:

Daphne Brothers	Daphne Brothers	9/22/2015
Print Name	Signature	Date

CCP Radiography Data Sheet

Section 1: General Information	
[X] RTR Examination [ ] RTR Replicate Scan [ ] RTR Independent Observation	
Site ID:	ORNL
Batch Number:	OR-RTR6-0688
Examination Date:	9/22/2015
Waste Container ID:	X10C0402959J1
Video/Audio Recorded Media Number:	OR-RTR6-0688 A&B
Procedure and Revision No.:	CCP-TP-053 Rev. 15
NCR(s) associated with the container? (e.g., Prohibited Items)	[X] No [ ] Yes NCR No.: N/A NCR No.: N/A

Section 2: Waste Container Data	
Container Type:	55 Gallon Drum
TRUCON Code:	OR 225
Waste Matrix Code:	S5400
Waste Stream I.D.:	OR-REDC-CH-HET
Waste Container Weights:	Gross Wt.: 58.8 kg Tare Wt.: 33.2 kg Net Wt.: 25.6 kg
Rigid Liner and Liner Vent Description:	Liner: [X] No [ ] Yes Lid: [X] No [ ] Yes Type: [ ] 30-mil [ ] 90-mil [ ] 110-mil [ ] 125-mil Vented: [ ] No [ ] Yes [X] N/A Punctured: [X] No [ ] Yes Mechanical Vent: [X] No [ ] Yes Fiberboard Liner: [X] No [ ] Yes Lead Lined: [X] No [ ] Yes
Number of Layers of Confinement:	Appears to be 1 layer
Volume Utilization Percentage:	90 %

CCP Radiography Data Sheet

Waste Container ID: X10C0402959J1

Section 3: Container Inventory and Comments (Detailed descriptions)

IM: Scrap metal, electric equipment, metal containers, open metal container

AM:

OM:

OI: Glass containers, floor sweepings, broken glass

C: Cardboard

R:

XPM: Plastic sheeting, plastic tubing

OR:

IN:

S:

Section 4: Packaging Material and Waste Material Parameters

Packaging Material:	**Estimated Weight (kg)**
Steel (ST):	27.8
Plastics (PP): Liner bag	1.0
Other: Cardboard (CP)	4.4
Total Packaging Weight	33.2
Waste Material Parameter:	**Estimated Weight (kg)**
Iron-based Metal / Alloys (IM):	10.0
Aluminum-based Metals / Alloys (AM):	
Other Metals (OM):	
Other Inorganic Materials (OI)	5.6
Cellulosics (C):	4.0
Rubber (R):	
Plastics (waste materials) (XPM):	6.0
Organic Matrix (OR):	
Inorganic Matrix (IN):	
Soils (S):	
Total WMP Weight:	25.6

CCP Radiography Data Sheet

Waste Container ID: X10C0402959J1

Section 5: RTR Summary (Questions answered "Yes" will be explained in the Comment block, except for Question 1)	
Is there observable liquid?	☐ Yes ☒ No
Is there any observable liquid in internal containers, more than 60 milliliters or 3 percent by volume, whichever is greater?	☐ Yes ☒ No
Is the total volume of observable liquid in the outermost container GREATER than 1% of the container?	☐ Yes ☒ No
Is there observable liquid in payload containers with an EPA Hazardous Waste Number of U134?	☐ Yes ☒ No
Is there an indication of non-radionuclide pyrophoric materials, such as elemental potassium?	☐ Yes ☒ No
Is there an indication of hazardous wastes not occurring as co-contaminants with TRU mixed wastes (non-mixed hazardous wastes)?	☐ Yes ☒ No
Is there an indication of wastes incompatible with backfill, seal and panel closures materials, container and packaging materials, shipping container materials, or other wastes (i.e., waste does NOT match TRUCON Code[s])?	☐ Yes ☒ No
Is there an indication of wastes containing explosives or compressed gases?	☐ Yes ☒ No
Is there an indication of PCBs liquids?	☐ Yes ☒ No
Is there an indication of the waste exhibiting the characteristic of ignitability, corrosivity, or reactivity (EPA Hazardous Waste Numbers of D001, D002, or D003)?	☐ Yes ☒ No
Is the physical form of the waste inconsistent with the Waste Stream Description or the Waste Matrix Code?	☐ Yes ☒ No
CH or RH TRAMPAC	
Are there heat-sealed bags (unvented) GREATER than 4 liters and LESS than 390 square inches in the waste, or heat sealed bags not authorized in the RH TRUCON Code?	☐ Yes ☒ No
Were there Non-approved Closure Methods used on liner bags or inner bags greater than 4 liters?	☐ Yes ☒ No
Are there sealed containers GREATER than 4 liters?	☐ Yes ☒ No
Are there indications of inadequate protection for heavy and/or sharp objects?	☐ Yes ☒ No
Comments: N/A	

RTR Operator:

Daphne Brothers	Daphne Brothers	9/22/2015
Print Name	Signature	Date

CCP Radiography Data Sheet

Section 1: General Information	
[X] RTR Examination [ ] RTR Replicate Scan [ ] RTR Independent Observation	
Site ID:	ORNL
Batch Number:	OR-RTR6-0688
Examination Date:	9/22/2015
Waste Container ID:	X10C9311707A
Video/Audio Recorded Media Number:	OR-RTR6-0688 A&B
Procedure and Revision No.:	CCP-TP-053 Rev. 15
NCR(s) associated with the container? (e.g., Prohibited Items)	[X] No [ ] Yes NCR No.: N/A NCR No.: N/A

Section 2: Waste Container Data	
Container Type:	55 Gallon Drum
TRUCON Code:	OR 225
Waste Matrix Code:	S5400
Waste Stream I.D.:	OR-RF-CH-HET
Waste Container Weights:	Gross Wt.: 88.7 kg Tare Wt.: 33.2 kg Net Wt.: 55.5 kg
Rigid Liner and Liner Vent Description:	Liner: [X] No [ ] Yes Lid: [X] No [ ] Yes Type: [ ] 30-mil [ ] 90-mil [ ] 110-mil [ ] 125-mil Vented: [ ] No [ ] Yes [X] N/A Punctured: [X] No [ ] Yes Mechanical Vent: [X] No [ ] Yes Fiberboard Liner: [X] No [ ] Yes Lead Lined: [X] No [ ] Yes
Number of Layers of Confinement:	Appears to be 1 layer
Volume Utilization Percentage:	95 %

CCP Radiography Data Sheet

Waste Container ID: X10C9311707A

Section 3: Container Inventory and Comments (Detailed descriptions)

IM: Open metal drum, scrap metal, metal containers, drum closure ring, drum lid

AM:

OM:

OI: Absorbent

C: Cloth

R:

XPM: Plastic sheeting

OR:

IN:

S:

Section 4: Packaging Material and Waste Material Parameters

Packaging Material:	Estimated Weight (kg)
Steel (ST):	27.8
Plastics (PP): Liner bag	1.0
Other: Cardboard (CP)	4.4
Total Packaging Weight	33.2
Waste Material Parameter:	**Estimated Weight (kg)**
Iron-based Metal / Alloys (IM):	40.0
Aluminum-based Metals / Alloys (AM):	
Other Metals (OM):	
Other Inorganic Materials (OI)	5.0
Cellulosics (C):	2.5
Rubber (R):	
Plastics (waste materials) (XPM):	8.0
Organic Matrix (OR):	
Inorganic Matrix (IN):	
Soils (S):	
Total WMP Weight:	55.5

CCP Radiography Data Sheet

Waste Container ID: X10C9311707A

Section 5: RTR Summary (Questions answered "Yes" will be explained in the Comment block, except for Question 1)	
Is there observable liquid?	☐ Yes ☒ No
Is there any observable liquid in internal containers, more than 60 milliliters or 3 percent by volume, whichever is greater?	☐ Yes ☒ No
Is the total volume of observable liquid in the outermost container GREATER than 1% of the container?	☐ Yes ☒ No
Is there observable liquid in payload containers with an EPA Hazardous Waste Number of U134?	☐ Yes ☒ No
Is there an indication of non-radionuclide pyrophoric materials, such as elemental potassium?	☐ Yes ☒ No
Is there an indication of hazardous wastes not occurring as co-contaminants with TRU mixed wastes (non-mixed hazardous wastes)?	☐ Yes ☒ No
Is there an indication of wastes incompatible with backfill, seal and panel closures materials, container and packaging materials, shipping container materials, or other wastes (i.e., waste does NOT match TRUCON Code[s])?	☐ Yes ☒ No
Is there an indication of wastes containing explosives or compressed gases?	☐ Yes ☒ No
Is there an indication of PCBs liquids?	☐ Yes ☒ No
Is there an indication of the waste exhibiting the characteristic of ignitability, corrosivity, or reactivity (EPA Hazardous Waste Numbers of D001, D002, or D003)?	☐ Yes ☒ No
Is the physical form of the waste inconsistent with the Waste Stream Description or the Waste Matrix Code?	☐ Yes ☒ No
CH or RH TRAMPAC	
Are there heat-sealed bags (unvented) GREATER than 4 liters and LESS than 390 square inches in the waste, or heat sealed bags not authorized in the RH TRUCON Code?	☐ Yes ☒ No
Were there Non-approved Closure Methods used on liner bags or inner bags greater than 4 liters?	☐ Yes ☒ No
Are there sealed containers GREATER than 4 liters?	☐ Yes ☒ No
Are there indications of inadequate protection for heavy and/or sharp objects?	☐ Yes ☒ No
Comments: N/A	

RTR Operator:

Daphne Brothers	Daphne Brothers	9/22/2015
Print Name	Signature	Date

CCP Radiography Data Sheet

Section 1: General Information		
[X] RTR Examination	[ ] RTR Replicate Scan	[ ] RTR Independent Observation
Site ID:	ORNL	
Batch Number:	OR-RTR6-0688	
Examination Date:	9/22/2015	
Waste Container ID:	X10C0402812I	
Video/Audio Recorded Media Number:	OR-RTR6-0688	A&B
Procedure and Revision No.:	CCP-TP-053	Rev. 15
NCR(s) associated with the container? (e.g., Prohibited Items)	[X] No [ ] Yes NCR No.: N/A NCR No.: N/A	

Section 2: Waste Container Data	
Container Type:	55 Gallon Drum
TRUCON Code:	OR 225
Waste Matrix Code:	S5400
Waste Stream I.D.:	OR-REDC-CH-HET
Waste Container Weights:	Gross Wt.: 50.2 kg Tare Wt.: 33.2 kg Net Wt.: 17.0 kg
Rigid Liner and Liner Vent Description:	Liner: [X] No [ ] Yes Lid: [X] No [ ] Yes Type: [ ] 30-mil [ ] 90-mil [ ] 110-mil [ ] 125-mil Vented: [ ] No [ ] Yes [X] N/A Punctured: [X] No [ ] Yes Mechanical Vent: [X] No [ ] Yes Fiberboard Liner: [X] No [ ] Yes Lead Lined: [X] No [ ] Yes
Number of Layers of Confinement:	Appears to be 1 layer
Volume Utilization Percentage:	90 %

CCP Radiography Data Sheet

Waste Container ID: X10C0402812I

Section 3: Container Inventory and Comments (Detailed descriptions)	
IM:	Scrap metal, metal lid
AM:	
OM:	
OI:	Glass containers, floor sweepings
C:	
R:	
XPM:	Plastic lid, plastic sheeting, plastic containers, open plastic containers, plastic caps
OR:	
IN:	
S:	

Section 4: Packaging Material and Waste Material Parameters	
Packaging Material:	**Estimated Weight (kg)**
Steel (ST):	27.8
Plastics (PP): Liner bag	1.0
Other: Cardboard (CP)	4.4
Total Packaging Weight	33.2
Waste Material Parameter:	**Estimated Weight (kg)**
Iron-based Metal / Alloys (IM):	2.0
Aluminum-based Metals / Alloys (AM):	
Other Metals (OM):	
Other Inorganic Materials (OI)	3.0
Cellulosics (C):	
Rubber (R):	
Plastics (waste materials) (XPM):	12.0
Organic Matrix (OR):	
Inorganic Matrix (IN):	
Soils (S):	
Total WMP Weight:	17.0

CCP Radiography Data Sheet

Waste Container ID: X10C0402812I

Section 5: RTR Summary (Questions answered "Yes" will be explained in the Comment block, except for Question 1)	
Is there observable liquid?	☐ Yes ☒ No
Is there any observable liquid in internal containers, more than 60 milliliters or 3 percent by volume, whichever is greater?	☐ Yes ☒ No
Is the total volume of observable liquid in the outermost container GREATER than 1% of the container?	☐ Yes ☒ No
Is there observable liquid in payload containers with an EPA Hazardous Waste Number of U134?	☐ Yes ☒ No
Is there an indication of non-radionuclide pyrophoric materials, such as elemental potassium?	☐ Yes ☒ No
Is there an indication of hazardous wastes not occurring as co-contaminants with TRU mixed wastes (non-mixed hazardous wastes)?	☐ Yes ☒ No
Is there an indication of wastes incompatible with backfill, seal and panel closures materials, container and packaging materials, shipping container materials, or other wastes (i.e., waste does NOT match TRUCON Code[s])?	☐ Yes ☒ No
Is there an indication of wastes containing explosives or compressed gases?	☐ Yes ☒ No
Is there an indication of PCBs liquids?	☐ Yes ☒ No
Is there an indication of the waste exhibiting the characteristic of ignitability, corrosivity, or reactivity (EPA Hazardous Waste Numbers of D001, D002, or D003)?	☐ Yes ☒ No
Is the physical form of the waste inconsistent with the Waste Stream Description or the Waste Matrix Code?	☐ Yes ☒ No
CH or RH TRAMPAC	
Are there heat-sealed bags (unvented) GREATER than 4 liters and LESS than 390 square inches in the waste, or heat sealed bags not authorized in the RH TRUCON Code?	☐ Yes ☒ No
Were there Non-approved Closure Methods used on liner bags or inner bags greater than 4 liters?	☐ Yes ☒ No
Are there sealed containers GREATER than 4 liters?	☐ Yes ☒ No
Are there indications of inadequate protection for heavy and/or sharp objects?	☐ Yes ☒ No
Comments: N/A	

RTR Operator:

Daphne Brothers	Daphne O Brothers	9/22/2015
Print Name	Signature	Date

CCP Radiography Data Sheet

Section 1: General Information	
[X] RTR Examination [ ] RTR Replicate Scan [ ] RTR Independent Observation	
Site ID:	ORNL
Batch Number:	OR-RTR6-0688
Examination Date:	9/22/2015
Waste Container ID:	X10C0506610A
Video/Audio Recorded Media Number:	OR-RTR6-0688 A&B
Procedure and Revision No.:	CCP-TP-053 Rev. 15
NCR(s) associated with the container? (e.g., Prohibited Items)	[X] No [ ] Yes NCR No.: N/A NCR No.: N/A

Section 2: Waste Container Data	
Container Type:	55 Gallon Drum
TRUCON Code:	OR 225
Waste Matrix Code:	S5400
Waste Stream I.D.:	OR-ISTP-CH-HET
Waste Container Weights:	Gross Wt.: 57.0 kg Tare Wt.: 33.2 kg Net Wt.: 23.8 kg
Rigid Liner and Liner Vent Description:	Liner: [X] No [ ] Yes Lid: [X] No [ ] Yes Type: [ ] 30-mil [ ] 90-mil [ ] 110-mil [ ] 125-mil Vented: [ ] No [ ] Yes [X] N/A Punctured: [X] No [ ] Yes Mechanical Vent: [X] No [ ] Yes Fiberboard Liner: [X] No [ ] Yes Lead Lined: [X] No [ ] Yes
Number of Layers of Confinement:	Appears to be 1 layer
Volume Utilization Percentage:	75 %

CCP Radiography Data Sheet

Waste Container ID: X10C0506610A

Section 3: Container Inventory and Comments (Detailed descriptions)	
IM:	Metal framed filter
AM:	
OM:	
OI:	Absorbent
C:	
R:	
XPM:	Plastic sheeting
OR:	
IN:	
S:	

Section 4: Packaging Material and Waste Material Parameters	
Packaging Material:	**Estimated Weight (kg)**
Steel (ST):	27.8
Plastics (PP): Liner bag	1.0
Other: Cardboard (CP)	4.4
Total Packaging Weight	33.2
Waste Material Parameter:	**Estimated Weight (kg)**
Iron-based Metal / Alloys (IM):	16.0
Aluminum-based Metals / Alloys (AM):	
Other Metals (OM):	
Other Inorganic Materials (OI)	1.8
Cellulosics (C):	
Rubber (R):	
Plastics (waste materials) (XPM):	6.0
Organic Matrix (OR):	
Inorganic Matrix (IN):	
Soils (S):	
Total WMP Weight:	23.8

CCP Radiography Data Sheet

Waste Container ID: X10C0506610A

Section 5: RTR Summary (Questions answered "Yes" will be explained in the Comment block, except for Question 1)	
Is there observable liquid?	☐ Yes ☒ No
Is there any observable liquid in internal containers, more than 60 milliliters or 3 percent by volume, whichever is greater?	☐ Yes ☒ No
Is the total volume of observable liquid in the outermost container GREATER than 1% of the container?	☐ Yes ☒ No
Is there observable liquid in payload containers with an EPA Hazardous Waste Number of U134?	☐ Yes ☒ No
Is there an indication of non-radionuclide pyrophoric materials, such as elemental potassium?	☐ Yes ☒ No
Is there an indication of hazardous wastes not occurring as co-contaminants with TRU mixed wastes (non-mixed hazardous wastes)?	☐ Yes ☒ No
Is there an indication of wastes incompatible with backfill, seal and panel closures materials, container and packaging materials, shipping container materials, or other wastes (i.e., waste does NOT match TRUCON Code[s])?	☐ Yes ☒ No
Is there an indication of wastes containing explosives or compressed gases?	☐ Yes ☒ No
Is there an indication of PCBs liquids?	☐ Yes ☒ No
Is there an indication of the waste exhibiting the characteristic of ignitability, corrosivity, or reactivity (EPA Hazardous Waste Numbers of D001, D002, or D003)?	☐ Yes ☒ No
Is the physical form of the waste inconsistent with the Waste Stream Description or the Waste Matrix Code?	☐ Yes ☒ No
CH or RH TRAMPAC	
Are there heat-sealed bags (unvented) GREATER than 4 liters and LESS than 390 square inches in the waste, or heat sealed bags not authorized in the RH TRUCON Code?	☐ Yes ☒ No
Were there Non-approved Closure Methods used on liner bags or inner bags greater than 4 liters?	☐ Yes ☒ No
Are there sealed containers GREATER than 4 liters?	☐ Yes ☒ No
Are there indications of inadequate protection for heavy and/or sharp objects?	☐ Yes ☒ No
Comments: N/A	

RTR Operator:

Daphne Brothers	Daphne Brothers	9/22/2015
Print Name	Signature	Date

CCP Radiography Data Sheet

Section 1: General Information	
[X] RTR Examination [ ] RTR Replicate Scan [ ] RTR Independent Observation	
Site ID:	ORNL
Batch Number:	OR-RTR6-0688
Examination Date:	9/22/2015
Waste Container ID:	X10C0506610C
Video/Audio Recorded Media Number:	OR-RTR6-0688 A&B
Procedure and Revision No.:	CCP-TP-053 Rev. 15
NCR(s) associated with the container? (e.g., Prohibited Items)	[X] No [ ] Yes NCR No.: N/A NCR No.: N/A

Section 2: Waste Container Data	
Container Type:	55 Gallon Drum
TRUCON Code:	OR 225
Waste Matrix Code:	S5400
Waste Stream I.D.:	OR-ISTP-CH-HET
Waste Container Weights:	Gross Wt.: 45.7 kg Tare Wt.: 33.2 kg Net Wt.: 12.5 kg
Rigid Liner and Liner Vent Description:	Liner: [X] No [ ] Yes Lid: [X] No [ ] Yes Type: [ ] 30-mil [ ] 90-mil [ ] 110-mil [ ] 125-mil Vented: [ ] No [ ] Yes [X] N/A Punctured: [X] No [ ] Yes Mechanical Vent: [X] No [ ] Yes Fiberboard Liner: [X] No [ ] Yes Lead Lined: [X] No [ ] Yes
Number of Layers of Confinement:	Appears to be 1 layer
Volume Utilization Percentage:	75 %

CCP Radiography Data Sheet

Waste Container ID: X10C0506610C

Section 3: Container Inventory and Comments (Detailed descriptions)

IM: Metal framed filter

AM:

OM:

OI: Absorbent

C:

R:

XPM: Plastic sheeting

OR:

IN:

S:

Section 4: Packaging Material and Waste Material Parameters

Packaging Material:	Estimated Weight (kg)
Steel (ST):	27.8
Plastics (PP): Liner bag	1.0
Other: Cardboard (CP)	4.4
Total Packaging Weight	33.2
Waste Material Parameter:	**Estimated Weight (kg)**
Iron-based Metal / Alloys (IM):	10.0
Aluminum-based Metals / Alloys (AM):	
Other Metals (OM):	
Other Inorganic Materials (OI)	0.5
Cellulosics (C):	
Rubber (R):	
Plastics (waste materials) (XPM):	2.0
Organic Matrix (OR):	
Inorganic Matrix (IN):	
Soils (S):	
Total WMP Weight:	12.5

CCP Radiography Data Sheet

Waste Container ID: X10C0506610C

Section 5: RTR Summary (Questions answered "Yes" will be explained in the Comment block, except for Question 1)	
Is there observable liquid?	☐ Yes ☒ No
Is there any observable liquid in internal containers, more than 60 milliliters or 3 percent by volume, whichever is greater?	☐ Yes ☒ No
Is the total volume of observable liquid in the outermost container GREATER than 1% of the container?	☐ Yes ☒ No
Is there observable liquid in payload containers with an EPA Hazardous Waste Number of U134?	☐ Yes ☒ No
Is there an indication of non-radionuclide pyrophoric materials, such as elemental potassium?	☐ Yes ☒ No
Is there an indication of hazardous wastes not occurring as co-contaminants with TRU mixed wastes (non-mixed hazardous wastes)?	☐ Yes ☒ No
Is there an indication of wastes incompatible with backfill, seal and panel closures materials, container and packaging materials, shipping container materials, or other wastes (i.e., waste does NOT match TRUCON Code[s])?	☐ Yes ☒ No
Is there an indication of wastes containing explosives or compressed gases?	☐ Yes ☒ No
Is there an indication of PCBs liquids?	☐ Yes ☒ No
Is there an indication of the waste exhibiting the characteristic of ignitability, corrosivity, or reactivity (EPA Hazardous Waste Numbers of D001, D002, or D003)?	☐ Yes ☒ No
Is the physical form of the waste inconsistent with the Waste Stream Description or the Waste Matrix Code?	☐ Yes ☒ No
CH or RH TRAMPAC	
Are there heat-sealed bags (unvented) GREATER than 4 liters and LESS than 390 square inches in the waste, or heat sealed bags not authorized in the RH TRUCON Code?	☐ Yes ☒ No
Were there Non-approved Closure Methods used on liner bags or inner bags greater than 4 liters?	☐ Yes ☒ No
Are there sealed containers GREATER than 4 liters?	☐ Yes ☒ No
Are there indications of inadequate protection for heavy and/or sharp objects?	☐ Yes ☒ No
Comments: N/A	

RTR Operator:

Daphne Brothers	Daphne D Brothers	9/22/2015
Print Name	Signature	Date

Attachment 1 – CCP Nonconformance Report (NCR)

CCP NONCONFORMANCE REPORT (NCR)

(Use NCR Continuation, Attachment 3, if necessary)

NCR No. NCR-ORNL-0130-15 Revision 0

1. Lot No., Heat No., or Serial No. (if applicable): N/A	2. Process (e.g., NDA, NDE, VE, Other): NDE	3. Batch Data Report #(s): OR-RTR6-0688
4. Order/Work Order/Job Control Number (If applicable): N/A	5. PO # (if applicable): N/A	Container #(s): X10C0503017
	6. Supplier (if applicable): N/A	

DESCRIPTION OF NONCONFORMANCE

7a. NCR Description: ☐ < 100 nCi/g ☒ Prohibited Item ☐ E-Flag ☐ Receipt Inspection ☐ Transportation ☐ WWIS/WDS ☐ Other

7b. Requirement(s) (Enter Implementing Procedure No., Revision, Section No., & Quoted Text):
CCP-TP-053, Standard Real Time Radiography (RTR) Inspection Procedure, Rev. 15, Section 4.4.3 [A] states in part "Using Table 1, Prohibited Items, as a reference, confirm there are **NO** prohibited items in the waste container. **IF** any nonconforming/prohibited items are noted during the RTR examination, **THEN** perform the following:" Initiate an NCR in accordance with CCP-QP-005, CCP *TRU Nonconforming Item Reporting and Control*. Table 1, Prohibited Items lists, in part, "PCB liquids"

7c. Actual Condition: liquid in motorized equipment at 20"

7d. Have the CCP HOLD TAGS associated with this NCR been applied? ☒ YES ☐ NO If no is checked, explain:

8. NCR Originator:
Daphne Brothers (printed name) — Daphne O'Brothers (signature) — 9/22/15 (date)

9. Does the identified condition have the potential to impact AK? If YES or INDETERMINATE, enter Trend Code L in Block 10. ☐ YES ☒ NO ☐ INDETERMINATE

10. Trend Code: **K**	11. Responsible Manager: **Fred Oney**
12. Recurring Condition? ☐ YES ☒ NO (If Yes, list NCRs and WIPP Forms):	13. Significant Condition? ☐ YES ☒ NO (If Yes, enter WIPP Form No.):

14. QA Engineer or QA Designee validation:
Eric Lyles (printed name) — (signature) — 9/23/15 (date)

COPY

Attachment 1 – CCP Nonconformance Report (NCR) (Continued)

NCR No. NCR-ORNL-0130-15 Revision 0

INTERIM DISPOSITION

15a. Interim Disposition (Check Only One):

☒ N/A (See Final Disposition) ☐ Hold ☐ Conditionally Accept ☐ Conditionally Use

☐ Sort ☐ Reinspect or Retest ☐ Remediate

15b. Instructions for Completion of the Interim Disposition:

INTERIM DISPOSITION APPROVALS

16a. Responsible Manager or Individual:

printed name _____ signature _____ date _____

16b. QA Engineer or QA Designee:

printed name _____ signature _____ date _____

Additional Approval:

printed name _____ signature _____ date _____

COMPLETION OF INTERIM DISPOSITION

17. Interim Disposition Complete – Responsible Manager or Individual:

printed name _____ signature _____ date _____

18. Interim Disposition Verified – QA Engineer:

printed name _____ signature _____ date _____

COPY

Attachment 1 – CCP Nonconformance Report (NCR) (Continued)

NCR No. NCR-ORNL-0130-15 Revision 0

FINAL DISPOSITION

19. Final Disposition (Check Only One: Use-As-Is, Repair, Reject, Rework, or Scrap):
☐ Use-As-Is ☐ Repair

19a. Technical Justification – Required for Use-As-Is or Repair dispositions. [☒ N/A for Reject, Rework, or Scrap]

☒ Reject ☐ Rework ☐ Scrap

19b. Instructions for Completion – Required for Reject, Repair, Rework, or Scrap [☐ N/A for Use-As-Is]
Return to Host Site for prohibited item remediation

19c. Corrective Actions (Actions to Prevent Recurrence – For Repair or Rework, if applicable.
[☒ N/A if not applicable, and for Use-As-Is, Reject, and Scrap]

FINAL DISPOSITION APPROVALS

20. Responsible Manager or Individual:

printed name	signature	date
Fred Oney	FO	9-23-15

21. QA Engineer or QA Designee:

printed name	signature	date
Eric Lyles		9/23/15

Additional Approval:

printed name	signature	date

CLOSURE

22. Final Disposition Complete - Responsible Manager or Individual:

printed name	signature	date

23. Attachments:

24a. HOLD TAG removal has been verified and reconciled for all nonconforming items on the NCR: ☐
24b. If HOLD TAG is not applicable, check: ☐ and explain:

25. Final Disposition Verified – NCR Closed QA Engineer:

printed name	signature	date

COPY

Attachment 1 – CCP Nonconformance Report (NCR)

CCP NONCONFORMANCE REPORT (NCR)

(Use NCR Continuation, Attachment 3, if necessary)

NCR No. NCR-ORNL-0131-15 Revision 0

1. Lot No., Heat No., or Serial No. (if applicable): N/A	2. Process (e.g., NDA, NDE, VE, Other): NDE	3. Batch Data Report #(s): OR-RTR6-0688
4. Order/Work Order/Job Control Number (if applicable): N/A	5. PO # (if applicable): N/A	Container #(s): X10C0503017
	6. Supplier (if applicable): N/A	

DESCRIPTION OF NONCONFORMANCE

7a. NCR Description: ☐ < 100 nCi/g ☒ Prohibited Item ☐ E-Flag ☐ Receipt Inspection ☐ Transportation ☐ WWIS/WDS ☐ Other

7b. Requirement(s) (Enter Implementing Procedure No., Revision, Section No., & Quoted Text):
CCP-TP-053, Standard Real Time Radiography (RTR) Inspection Procedure, Rev. 15, Section 4.4.3 [A] states in part "Using Table 1, Prohibited Items, as a reference, confirm there are **NO** prohibited items in the waste container. **IF** any nonconforming/prohibited items are noted during the RTR examination, **THEN** perform the following:" Initiate an NCR in accordance with CCP-QP-005, CCP *TRU Nonconforming Item Reporting and Control.* Table 1, Prohibited Items lists, in part, "Observable liquid shall be no more than 1 percent by volume of the outermost container.
- Internal containers with more than 60 milliliters or 3 percent by volume observable liquid, Whichever is greater, are prohibited.

7c. Actual Condition: > 1% liquid of the outermost container. A total of 9500 ml of liquid in multiple containers.

7d. Have the CCP HOLD TAGS associated with this NCR been applied? ☒ YES ☐ NO If no is checked, explain:

8. NCR Originator:

Daphne Brothers (printed name) — Daphne C Brothers (signature) — 9/22/2015 (date)

9. Does the identified condition have the potential to impact AK? If YES or INDETERMINATE, enter Trend Code L in Block 10. ☐ YES ☒ NO ☐ INDETERMINATE

10. Trend Code: **K**

11. Responsible Manager: **Fred Oney**

12. Recurring Condition? ☐ YES ☒ NO (If Yes, list NCRs and WIPP Forms):

13. Significant Condition? ☐ YES ☒ NO (If Yes, enter WIPP Form No.):

14. QA Engineer or QA Designee validation:

Eric Lyles (printed name) — (signature) — 9/23/15 (date)

COPY

Attachment 1 – CCP Nonconformance Report (NCR) (Continued)

NCR No. NCR-ORNL-0131-15 Revision 0

INTERIM DISPOSITION

15a. Interim Disposition (Check Only One):

☒ N/A (See Final Disposition) ☐ Hold ☐ Conditionally Accept ☐ Conditionally Use

☐ Sort ☐ Reinspect or Retest ☐ Remediate

15b. Instructions for Completion of the Interim Disposition:

INTERIM DISPOSITION APPROVALS

16a. Responsible Manager or Individual:

printed name _____ signature _____ date _____

16b. QA Engineer or QA Designee:

printed name _____ signature _____ date _____

Additional Approval:

printed name _____ signature _____ date _____

COMPLETION OF INTERIM DISPOSITION

17. Interim Disposition Complete – Responsible Manager or Individual:

printed name _____ signature _____ date _____

18. Interim Disposition Verified – QA Engineer:

printed name _____ signature _____ date _____

COPY

Attachment 1 – CCP Nonconformance Report (NCR) (Continued)

NCR No. NCR-ORNL-0131-15 Revision 0

FINAL DISPOSITION

19. Final Disposition (Check Only One: Use-As-Is, Repair, Reject, Rework, or Scrap):
☐ Use-As-Is ☐ Repair
19a. Technical Justification – Required for Use-As-Is or Repair dispositions. [☒ N/A for Reject, Rework, or Scrap]

☒ Reject ☐ Rework ☐ Scrap
19b. Instructions for Completion – Required for Reject, Repair, Rework, or Scrap [☐ N/A for Use-As-Is]
Return to Host Site for prohibited item remediation

19c. Corrective Actions (Actions to Prevent Recurrence – For Repair or Rework, if applicable.
[☒ N/A if not applicable, and for Use-As-Is, Reject, and Scrap]

FINAL DISPOSITION APPROVALS

20. Responsible Manager or Individual:

printed name	signature	date
Fred Oney		9-23-15

21. QA Engineer or QA Designee:

printed name	signature	date
Eric Lyles		9/23/15

Additional Approval:

printed name	signature	date

CLOSURE

22. Final Disposition Complete - Responsible Manager or Individual:

printed name	signature	date

23. Attachments:

24a. HOLD TAG removal has been verified and reconciled for all nonconforming items on the NCR: ☐
24b. If HOLD TAG is not applicable, check: ☐ and explain:

25. Final Disposition Verified – NCR Closed QA Engineer:

printed name	signature	date

COPY

Attachment 3 – CCP Radiography Independent Technical Reviewer Checklist

Batch Data Report No.: OR-RTR6-0688

Description			
1.	Were data generation and reduction conducted in a technically correct manner in accordance with the methods used?	☐ NO	☑ YES
2.	Was the correct revision of the procedure used? Procedure: CCP-TP-053 Rev.: 15	☐ NO	☑ YES
3.	Are the WMPs entered correctly?	☐ NO	☑ YES
4.	Do the estimated weights in Section 4 of Attachment 2 equal the container gross weight?	☐ NO	☑ YES
5.	Is the data reported in the proper units with the correct number of significant figures (e.g., one tenth of a kilogram)?	☐ NO	☑ YES
6.	Was transcription used? If no, proceed to question 7.	☑ NO	☐ YES
	6a. Has the data been verified for transcription errors?	☐ NO	☐ YES
7.	Does the Testing Batch Report include radiography for up to 20 containers?	☐ NO	☑ YES
8.	Are BDR contents complete and do they match the CCP Waste RTR Batch Data Report Table of Contents?	☐ NO	☑ YES
9.	Is all the data signed and dated in reproducible ink and by the individual(s) generating it?	☐ NO	☑ YES
10.	Is all data recorded clearly, legibly, and accurately?	☐ NO	☑ YES
11.	Have changes been made to original data? If no, proceed to question 12.	☑ NO	☐ YES
	11a. Have all changes to original data been lined out, initialed and dated by the individual making the changes?	☐ NO	☐ YES
	11b. Was justification made for changing the original data?	☐ NO	☐ YES
	11c. Were data changes made by the individual who originally collected the data?	☐ NO	☐ YES
12.	Does the waste match the Waste Matrix Code and Waste Stream description?	☐ NO	☑ YES
13.	Are the RTR Operator's decisions regarding the Radiography documented?	☐ NO	☑ YES
14.	Is there an adequate written description of the contents of each item?	☐ NO	☑ YES
15.	Was the video/audio recording media properly prepared and labeled for each waste container?	☐ NO	☑ YES
16.	Was the video/audio recording media check performed satisfactorily and recorded on Attachment 1?	☐ NO	☑ YES

Attachment 3 – CCP Radiography Independent Technical Reviewer Checklist (Continued)

Batch Data Report No.: OR-RTR6-0688

Description		
17. Was the Image Test performed satisfactorily and recorded on Attachment 1?	☐ NO	☑ YES
18. Was the Replicate Scan performed and recorded on an Attachment 2?	☐ NO	☑ YES
19. Was the Replicate Scan RTR Operator different from the first RTR Operator?	☐ NO	☑ YES
20. Did the Replicate Scan RTR Operator and the first RTR Operator agree on the results?	☐ NO	☑ YES
21. Was the Independent Observation performed and recorded on an Attachment 2?	☐ NO	☑ YES
22. Was the Independent Observation RTR Operator different from the first RTR Operator?	☐ NO	☑ YES
23. Did the Independent Observation RTR Operator and the first RTR Operator agree on the results?	☐ NO	☑ YES
24. Was the data collection performed by qualified individuals?	☐ NO	☑ YES
25. Were NCRs initiated as required at DGL? If no, proceed to question 26.	☐ NO	☑ YES
25a. Have the NCR(s) associated with RTR been included in the BDR?	☐ NO	☑ YES
26. Is the RTR examination for CH waste? If no, proceed to question 27.	☐ NO	☑ YES
26a. Have the CH Quality Assurance Objectives (QAOs) been met (if applicable)? Precision – Precision is maintained by reconciling any discrepancies between two radiography operators with regard to identification of the waste matrix code, liquids in excess of TSDF-WAC limits, and compressed gases through independent replicate scans and independent observations. Additionally, the precision of radiography is verified prior to use by tuning precisely enough to demonstrate compliance with QAOs through viewing an image test pattern. Accuracy – Accuracy is obtained by using a target to tune the image for maximum sharpness and by requiring operators to successfully identify 100 percent of the items required to meet the DQOs for radiography specified in CCP-PO-001, Section C-4a(1) in a training container during their initial qualification and subsequent requalification. Completeness – A video and audio media recording of the radiography examination and a validated radiography data form will be obtained for 100 percent of the waste containers subject to radiography. All video and audio media recordings and radiography data forms will be subject to validation as indicated in CCP-PO-001, Section C3-4. Comparability – The comparability of radiography data from different operators shall be enhanced by using standardized radiography procedures and operator qualifications.	☐ NO	☑ YES

Attachment 3 – CCP Radiography Independent Technical Reviewer Checklist (Continued)

Batch Data Report No.: OR-RTR6-0688

Description		
27. Is the RTR examination for RH waste? If no, proceed to comment section.	☑ NO	☐ YES
27a. Have the RH QAOs been met (if applicable)? Precision – Precision is maintained by reconciling any discrepancies between two operators (during Independent Observation and Replicate scans) with regard to the identification of important waste characteristics (i.e., physical form of the waste and absence of prohibited liquids) within a single container. Accuracy – Accuracy is obtained by using a target to tune the image for maximum sharpness and by requiring operators to successfully identify prohibited liquid in a training container during their initial qualification and subsequent requalification. Representativeness – All of the relevant contents in a container selected for radiography will be described. Completeness – All of the relevant waste information must be assembled and must show that each of the containers in the waste stream belongs to the waste stream. This information must be documented on videotape or other equivalent media and data form. Comparability – Comparability is ensured by meeting the program training requirements and complying with the minimum standards used to implement the radiography process.	☐ NO	☐ YES

Comments: N/A

I have reviewed 100% of the container specific and batch data in this report and find it acceptable.

Independent Technical Reviewer:

Fred Olney		9-23-15
Printed Name	Signature	Date

DIVIDER PAGE ONLY

Not Part of Page Count

Attachment 2 – CCP Records Transmittal/Receiving Form

CCP Records / Records Custodian, 4021 National Parks Highway - MS: GSA 212, Carlsbad, New Mexico 88220

Telephone Number: 575-234-7523

Fax Number: 575-234-7033

Attn:	CCP RECORDS	From:	PATRICK SMITH II
Ship to:	CCP RECORDS CUSTODIAN	Site:	ORNL
	4021 NATIONAL PARKS HWY.	Company:	TFE INC.
	MS GSA 212	Telephone Number:	865-574-6002
	CARLSBAD, NM 88220-9082	Date Sent:	9-24-2015
Telephone Number:	575-234-7523		

Document Number	Title / Description	Record Date	Total Pages
OR-RTR6-0688	RTR DVD (DISK B)	9-22-2015	N/A
N/A	N/A	N/A	N/A
N/A	N/A	N/A	N/A
N/A	N/A	N/A	N/A
N/A	N/A	N/A	N/A
N/A	N/A	N/A	N/A

Comments

N/A

(When the Record accepted line has been completed, the rest of the page below may be left blank.)
Acceptance/Rejection Signature and Date

Records Accepted [√] _____ Jewell Hurrable 9/23/2015
Signature | Printed Name | Date

Records Rejected [ ] _____ _____ _____
Signature | Printed Name | Date

Reason for Rejection:

Re-submittal: _____ _____ _____
Signature | Printed Name | Date

****
*** Send Results ***
****

Sending is complete.

Job No.	2276
Address	918655768703
Name	ORNL
Start Time	09/28 11:31 AM
Call Length	00'19
Sheets	1
Result	OK

Attachment 2 – CCP Records Transmittal/Receiving Form

CCP Records / Records Custodian, 4021 National Parks Highway - MS: GSA 212, Carlsbad, New Mexico 88220

Telephone Number: 575-234-7523

Fax Number: 575-234-7033

Attn:	CCP RECORDS	From:	PATRICK SMITH II
Ship to:	CCP RECORDS CUSTODIAN	Site:	ORNL
	4021 NATIONAL PARKS HWY.	Company:	TFE INC.
	MS GSA 212	Telephone Number:	865-574-6002
	CARLSBAD, NM 88220-9082	Date Sent:	9-24-2015
Telephone Number:	575-234-7523		

Document Number/Description		Revision	Date
OR-RTR6-0688	RTR DVD (DISK B)	9-22-2015	N/A
N/A	N/A	N/A	N/A
N/A	N/A	N/A	N/A
N/A	N/A	N/A	N/A
N/A	N/A	N/A	N/A
N/A	N/A	N/A	N/A

Comments
N/A

(When the Record accepted line has been completed, the rest of the page below may be left blank.)

Acceptance/Rejection Signature and Date

Records Accepted ☑ — Signature — Printed Name — Date

Records Rejected ☐

Attachment 2 – CCP Records Transmittal/Receiving Form

CCP Records / Records Custodian, 4021 National Parks Highway - MS: GSA 212, Carlsbad, New Mexico 88220

Telephone Number: 575-234-7523

Fax Number: 575-234-7033

Attn:	CCP RECORDS	From:	PATRICK SMITH II
Ship to:	CCP RECORDS CUSTODIAN	Site:	ORNL
	4021 NATIONAL PARKS HWY.	Company:	TFE INC.
	MS GSA 212	Telephone Number:	865-574-6002
	CARLSBAD, NM 88220-9082	Date Sent:	9-30-2015
Telephone Number:	575-234-7523		

Document Number	Title / Description	Report Date	Total Pages
OR-RTR6-0688	RTR BDR	9-22-2015	39
OR-RTR6-0688	RTR DVD (DISK A)	9-22-2015	N/A
N/A	N/A	N/A	N/A
N/A	N/A	N/A	N/A
N/A	N/A	N/A	N/A
N/A	N/A	N/A	N/A

Comments

N/A

(When the Record accepted line has been completed, the rest of the page below may be left blank.)

Acceptance/Rejection Signature and Date

Records Accepted	☑	[signature]	Jewell Turnable	10.2.2015
		Signature	Printed Name	Date
Records Rejected	☐	_____	_____	_____
		Signature	Printed Name	Date

Reason for Rejection:

Re-submittal:

_____	_____	_____
Signature	Printed Name	Date

****
*** Send Results ***
****

Sending is complete.

Job No.	2532
Address	918655768703
Name	ORNL
Start Time	10/02 11:30 AM
Call Length	00'20
Sheets	1
Result	OK

Attachment 2 – CCP Records Transmittal/Receiving Form

CCP Records / Records Custodian, 4021 National Parks Highway - MS: GSA 212, Carlsbad, New Mexico 88220

Telephone Number: 575-234-7523

Fax Number: 575-234-7033

Attn:	CCP RECORDS	From:	PATRICK SMITH II
Ship to:	CCP RECORDS CUSTODIAN	Site:	ORNL
	4021 NATIONAL PARKS HWY.	Company:	TFE INC.
	MS GSA 212	Telephone Number:	865-574-6002
	CARLSBAD, NM 88220-9082	Date Sent:	9-30-2015
Telephone Number:	575-234-7523		

Document Number	Description	Record Date	Quantity/Pages
OR-RTR6-0688	RTR BDR	9-22-2015	39
OR-RTR6-0688	RTR DVD (DISK A)	9-22-2015	N/A
N/A	N/A	N/A	N/A
N/A	N/A	N/A	N/A
N/A	N/A	N/A	N/A
N/A	N/A	N/A	N/A

Comments:

N/A

(When the Record accepted line has been completed, the rest of the page below may be left blank.)

Acceptance/Rejection Signature and Date

Records Accepted ☑ Signature: [signature] Printed Name: Jewell Turnable Date: 10.2.2015

Records Rejected ☐ Signature _____ Printed Name _____ Date _____

DIVIDER

PAGE

Attachment 2 – CCP SPM Radiography Project Level Validation Checklist and Summary

BDR Number: OR-RTR6-0695				Examination Date(s): 10/14/2015
Description of Criteria Reviewed	**Criteria Met?**			**Comments/Qualifiers**
	YES	**NO**	**NA**	
1. Is the completed, signed, and dated Independent Technical Reviewer Checklist included in the BDR, and the independent technical reviewer was not involved in the generation or recording of the data under review? **Reference Source: CCP-PO-001, C3-4**	X			
2. Does the BDR contain all items addressed in the BDR Table of Contents? **Reference Source: CCP-PO-001, C3-4**	X			
3. Does the BDR include a listing of all the container numbers in the batch? **Reference Source: CCP-PO-001, C3-4**	X			
4. List all containers that have met QAOs. **Reference Source: CCP-PO-001, C3-4**				Container Numbers: X10C1100210 X10C1100213 X10C1100214 X10C1100232 X10C1100236 X10C1100230 X10C1100220 X10C1100207 X10C1100234 X10C1100229
5. Does the BDR identify the current implementing procedure and revision number? **Reference Source: CCP-PO-001, Table C3-3**	X			
6. Is there a reference to or copy of any associated NCRs (if any) in the BDR? NA if no NCRs. **Reference Source: CCP-PO-001, Table C3-3**			X	
7. Are there 20 or fewer containers in the batch? **Reference Source: CCP-PO-001, C3-4**	X			
8. Are the data properly reported (i.e., data are reported in correct units and with correct significant figures)? **Reference Source: CCP-PO-001, C3-4**	X			
9. Is there evidence of verification that the physical form matches the Waste Matrix Code? **Reference Source: CCP-PO-001, Table C3-3**	X			

CCP RECORDS ORIGINAL

DATE REC'D 10-21-2015 JN

Attachment 2 – CCP SPM Radiography Project Level Validation Checklist and Summary (Continued)

BDR Number: OR-RTR6-0695			Examination Date(s): 10/14/2015	
Description of Criteria Reviewed	**Criteria Met?**			**Comments/Qualifiers**
	YES	**NO**	**NA**	
10. Is there evidence of verification that the physical form matches the waste stream description? **Reference Source: CCP-PO-001, Table C3-3**	X			
11. Are prohibited items absent? **Reference Source: CCP-PO-001, Table C3-3**	X			
12. Does observable liquid, if present, meet the criteria of the TSDF-WAC? **Reference Source: CCP-PO-001, C-1**			X	No observable liquid.
13. Were discrepancies between two operators with regard to identification of waste matrix code, liquids in excess of the TSDF-WAC, or compressed gases through replicate scans and independent observations reconciled? NA if no discrepancies. **Reference Source: CCP-PO-001, C3-2**			X	
14. Are the training qualifications for all radiography personnel acceptable? **Reference Source: CCP-PO-001, C3-8**	X			
15. Was evidence of the video/audio check included in the BDR? **Reference Source: CCP-PO-001, C1-1**	X			
16. Was the Lines-Pair Resolution Test or Sieve Test Check included in the BDR? **Reference Source: CCP Technical Procedures**	X			
17. Was a replicate scan performed once per day, or once per batch, whichever is LESS frequent? **Reference Source: CCP-PO-001, C1-1**	X			
18. Was an independent observation performed once per day, or once per batch, whichever is LESS frequent? **Reference Source: CCP-PO-001, C1-1**	X			

Attachment 2 – CCP SPM Radiography Project Level Validation Checklist and Summary (Continued)

BDR Number: OR-RTR6-0695	Examination Date(s): 10/14/2015			
Description of Criteria Reviewed	**Criteria Met?**			**Comments/Qualifiers**
	YES	**NO**	**NA**	
19. Were the replicate scan and independent observation performed on different waste containers? **Reference Source: CCP-PO-001, C1-1**	X			
20. Were the personnel performing the replicate scan and independent observation different from the individual who performed the original? **Reference Source: CCP-PO-001, C1-1**	X			
21. Does the BDR include an estimate of each material parameter weight in kg for each container? **Reference Source: CCP Technical Procedures**	X			
22. Does the BDR include a description of each material parameter for each container? **Reference Source: CCP Technical Procedures**	X			
23. Is the container gross weight recorded in kilograms (kg) for each container in the BDR? **Reference Source: CCP Technical Procedures**	X			
24. Was the Scale Weight Calibration Check included in the BDR? **Reference Source: CCP Technical Procedures**			X	Scale not used.
25. Was the Scale Weight Check included in the BDR? **Reference Source: CCP Technical Procedures**			X	Scale not used.
Comments: None				
The container QC checks were properly performed and meet the Quality Assurance Objectives (QAOs). Proper procedures were followed during data reduction and analysis. The batch is complete, acceptable, and includes all supporting data and documentation required by the QAPjP.				
Carolina Soaterna	Carolina Soaterna			10/21/2015
SPM Printed Name	Signature			Date

Checklist is to be re-signed only when a re-review is performed.

SPM Printed Name	Signature	Reason	Date
SPM Printed Name	Signature	Reason	Date

Attachment 5–CCP Radiography Batch Data Report Cover Sheet

Site ID: ORNL

Batch Data Report No.: OR-RTR6-0695 ☑ CH ☐ RH Date: 10-14-15

Waste Container ID Numbers	
Replicate Scan:	X10C1100213
Independent Observation:	X10C1100210
1	X10C1100210
2	X10C1100213
3	X10C1100214
4	X10C1100232
5	X10C1100236
6	X10C1100230
7	X10C1100220
8	X10C1100207
9	X10C1100234
10	X10C1100229
11	N/A
12	N/A
13	N/A
14	N/A
15	N/A
16	N/A
17	N/A
18	N/A
19	N/A
20	N/A

RTR Operator:

Daphne Brothers	Daphne Brothers	10-14-15
Printed Name	Signature	Date

Independent Technical Reviewer:

Eric Lyles		10/14/15
Printed Name	Signature	Date

NTPC RECORDS ORIGINAL
DATE REC'D 10-15-2015

Attachment 4 – CCP Radiography Batch Data Report Table of Contents and Batch Narrative

Batch Data Report No.: OR-RTR6-0695 Date: 10-14-15

Table Of Contents		
Item	Description	Page No.
1	CCP Radiography Batch Data Report Cover Sheet	1
2	CCP Radiography Batch Data Report Table Of Contents	2
3	CCP RTR Measurement Control Report	3
4	CCP Radiography Data Sheets	4
5	Copy of NCRs (NA, If Not Applicable)	N/A
6	CCP Independent Technical Reviewer Checklist	40

Batch Narrative

All Quality Checks were performed and recorded on CCP-TP-053, Rev.15, CCP Radiography Measurement Control Report.

Daphne Brothers — RTR Operator

Daphne C Brothers — Signature

10-14-15 — Date

Attachment 1 – CCP RTR Measurement Control Report

Site ID: ORNL		
Batch Data Report No.: OR-RTR6-0695		
Examination Date: 10-14-15		
Control Checks		
Video/Audio Recorded Media System Check	☑ SAT	☐ UNSAT
Image Test : 10 Lines (Minimum acceptable is 5 lines-pair/cm or #6 Sieve is viewable)	☑ SAT	☐ UNSAT
Comments: N/A		
RTR Operator:		
Daphne Brothers (Printed Name)	Daphne Brothers (Signature)	10-14-15 (Date)

CCP Radiography Data Sheet

Section 1: General Information	
[ ] RTR Examination [X] RTR Replicate Scan [ ] RTR Independent Observation	
Site ID:	ORNL
Batch Number:	OR-RTR6-0695
Examination Date:	10/14/2015
Waste Container ID:	X10C1100213
Video/Audio Recorded Media Number:	OR-RTR6-0695 A&B
Procedure and Revision No.:	CCP-TP-053 Rev. 15
NCR(s) associated with the container? (e.g., Prohibited Items)	[X] No [ ] Yes NCR No.: N/A NCR No.: N/A

Section 2: Waste Container Data	
Container Type:	55 Gallon Drum
TRUCON Code:	OR 227
Waste Matrix Code:	S4100
Waste Stream I.D.:	OR-NFS-CH-SOIL
Waste Container Weights:	Gross Wt.: 208.8 kg Tare Wt.: 35.2 kg Net Wt.: 173.6 kg
Rigid Liner and Liner Vent Description:	Liner: [ ] No [X] Yes Lid: [X] No [ ] Yes Type: [ ] 30-mil [X] 90-mil [ ] 110-mil [ ] 125-mil Vented: [ ] No [X] Yes [ ] N/A Punctured: [X] No [ ] Yes Mechanical Vent: [X] No [ ] Yes Fiberboard Liner: [X] No [ ] Yes Lead Lined: [X] No [ ] Yes
Number of Layers of Confinement:	Appears to be 1 layer
Volume Utilization Percentage:	80 %

CCP Radiography Data Sheet

Waste Container ID: X10C1100213

Section 3: Container Inventory and Comments (Detailed descriptions)	
IM:	
AM:	
OM:	
OI:	
C:	
R:	
XPM:	
OR: Absorbent	
IN:	
S: Soil	

Section 4: Packaging Material and Waste Material Parameters	
Packaging Material:	**Estimated Weight (kg)**
Steel (ST):	27.8
Plastics (PP): Liner bag, Rigid Liner	7.4
Other:	0.0
Total Packaging Weight	35.2
Waste Material Parameter:	**Estimated Weight (kg)**
Iron-based Metal / Alloys (IM):	
Aluminum-based Metals / Alloys (AM):	
Other Metals (OM):	
Other Inorganic Materials (OI)	
Cellulosics (C):	
Rubber (R):	
Plastics (waste materials) (XPM):	
Organic Matrix (OR):	2.0
Inorganic Matrix (IN):	
Soils (S):	171.6
Total WMP Weight:	173.6

CCP Radiography Data Sheet

Waste Container ID: X10C1100213

Section 5: RTR Summary (Questions answered "Yes" will be explained in the Comment block, except for Question 1)	
Is there observable liquid?	☐ Yes ☒ No
Is there any observable liquid in internal containers, more than 60 milliliters or 3 percent by volume, whichever is greater?	☐ Yes ☒ No
Is the total volume of observable liquid in the outermost container GREATER than 1% of the container?	☐ Yes ☒ No
Is there observable liquid in payload containers with an EPA Hazardous Waste Number of U134?	☐ Yes ☒ No
Is there an indication of non-radionuclide pyrophoric materials, such as elemental potassium?	☐ Yes ☒ No
Is there an indication of hazardous wastes not occurring as co-contaminants with TRU mixed wastes (non-mixed hazardous wastes)?	☐ Yes ☒ No
Is there an indication of wastes incompatible with backfill, seal and panel closures materials, container and packaging materials, shipping container materials, or other wastes (i.e., waste does NOT match TRUCON Code[s])?	☐ Yes ☒ No
Is there an indication of wastes containing explosives or compressed gases?	☐ Yes ☒ No
Is there an indication of PCBs liquids?	☐ Yes ☒ No
Is there an indication of the waste exhibiting the characteristic of ignitability, corrosivity, or reactivity (EPA Hazardous Waste Numbers of D001, D002, or D003)?	☐ Yes ☒ No
Is the physical form of the waste inconsistent with the Waste Stream Description or the Waste Matrix Code?	☐ Yes ☒ No
CH or RH TRAMPAC	
Are there heat-sealed bags (unvented) GREATER than 4 liters and LESS than 390 square inches in the waste, or heat sealed bags not authorized in the RH TRUCON Code?	☐ Yes ☒ No
Were there Non-approved Closure Methods used on liner bags or inner bags greater than 4 liters?	☐ Yes ☒ No
Are there sealed containers GREATER than 4 liters?	☐ Yes ☒ No
Are there indications of inadequate protection for heavy and/or sharp objects?	☐ Yes ☒ No

Comments: This Replicate Scan agrees with the Original Scan, JO 10-14-15

RTR Operator:

Fred Oney		10/14/2015
Print Name	Signature	Date

CCP Radiography Data Sheet

Section 1: General Information	
☐ RTR Examination ☐ RTR Replicate Scan ☒ RTR Independent Observation	
Site ID:	ORNL
Batch Number:	OR-RTR6-0695
Examination Date:	10/14/2015
Waste Container ID:	X10C1100210
Video/Audio Recorded Media Number:	OR-RTR6-0695 A&B
Procedure and Revision No.:	CCP-TP-053 Rev. 15
NCR(s) associated with the container? (e.g., Prohibited Items)	☒ No ☐ Yes NCR No.: N/A NCR No.: N/A

Section 2: Waste Container Data	
Container Type:	55 Gallon Drum
TRUCON Code:	OR 227
Waste Matrix Code:	S4100
Waste Stream I.D.:	OR-NFS-CH-SOIL
Waste Container Weights:	Gross Wt.: 243.8 kg Tare Wt.: 35.2 kg Net Wt.: 208.6 kg
Rigid Liner and Liner Vent Description:	Liner: ☐ No ☒ Yes Lid: ☒ No ☐ Yes Type: ☐ 30-mil ☒ 90-mil ☐ 110-mil ☐ 125-mil Vented: ☐ No ☒ Yes ☐ N/A Punctured: ☒ No ☐ Yes Mechanical Vent: ☒ No ☐ Yes Fiberboard Liner: ☒ No ☐ Yes Lead Lined: ☒ No ☐ Yes
Number of Layers of Confinement:	Appears to be 1 layer
Volume Utilization Percentage:	95 %

CCP Radiography Data Sheet

Waste Container ID: X10C1100210

Section 3: Container Inventory and Comments (Detailed descriptions)
IM:
AM:
OM:
OI:
C:
R:
XPM:
OR: Absorbent
IN:
S: Soil

Section 4: Packaging Material and Waste Material Parameters	
Packaging Material:	**Estimated Weight (kg)**
Steel (ST):	27.8
Plastics (PP): Liner bag, Rigid Liner	7.4
Other:	0.0
Total Packaging Weight	35.2
Waste Material Parameter:	**Estimated Weight (kg)**
Iron-based Metal / Alloys (IM):	
Aluminum-based Metals / Alloys (AM):	
Other Metals (OM):	
Other Inorganic Materials (OI)	
Cellulosics (C):	
Rubber (R):	
Plastics (waste materials) (XPM):	
Organic Matrix (OR):	2.0
Inorganic Matrix (IN):	
Soils (S):	206.6
Total WMP Weight:	208.6

CCP Radiography Data Sheet

Waste Container ID: X10C1100210

Section 5: RTR Summary (Questions answered "Yes" will be explained in the Comment block, except for Question 1)	
Is there observable liquid?	☐ Yes ☒ No
Is there any observable liquid in internal containers, more than 60 milliliters or 3 percent by volume, whichever is greater?	☐ Yes ☒ No
Is the total volume of observable liquid in the outermost container GREATER than 1% of the container?	☐ Yes ☒ No
Is there observable liquid in payload containers with an EPA Hazardous Waste Number of U134?	☐ Yes ☒ No
Is there an indication of non-radionuclide pyrophoric materials, such as elemental potassium?	☐ Yes ☒ No
Is there an indication of hazardous wastes not occurring as co-contaminants with TRU mixed wastes (non-mixed hazardous wastes)?	☐ Yes ☒ No
Is there an indication of wastes incompatible with backfill, seal and panel closures materials, container and packaging materials, shipping container materials, or other wastes (i.e., waste does NOT match TRUCON Code[s])?	☐ Yes ☒ No
Is there an indication of wastes containing explosives or compressed gases?	☐ Yes ☒ No
Is there an indication of PCBs liquids?	☐ Yes ☒ No
Is there an indication of the waste exhibiting the characteristic of ignitability, corrosivity, or reactivity (EPA Hazardous Waste Numbers of D001, D002, or D003)?	☐ Yes ☒ No
Is the physical form of the waste inconsistent with the Waste Stream Description or the Waste Matrix Code?	☐ Yes ☒ No
CH or RH TRAMPAC	
Are there heat-sealed bags (unvented) GREATER than 4 liters and LESS than 390 square inches in the waste, or heat sealed bags not authorized in the RH TRUCON Code?	☐ Yes ☒ No
Were there Non-approved Closure Methods used on liner bags or inner bags greater than 4 liters?	☐ Yes ☒ No
Are there sealed containers GREATER than 4 liters?	☐ Yes ☒ No
Are there indications of inadequate protection for heavy and/or sharp objects?	☐ Yes ☒ No

Comments: This Independent Observation agrees with the Original Scan.
FO 10-14-15

RTR Operator:

Fred Oney	FO	10/14/2015
Print Name	Signature	Date

CCP Radiography Data Sheet

Section 1: General Information	
[X] RTR Examination [ ] RTR Replicate Scan [ ] RTR Independent Observation	
Site ID:	ORNL
Batch Number:	OR-RTR6-0695
Examination Date:	10/14/2015
Waste Container ID:	X10C1100210
Video/Audio Recorded Media Number:	OR-RTR6-0695 A&B
Procedure and Revision No.:	CCP-TP-053 Rev. 15
NCR(s) associated with the container? (e.g., Prohibited Items)	[X] No [ ] Yes NCR No.: N/A NCR No.: N/A

Section 2: Waste Container Data	
Container Type:	55 Gallon Drum
TRUCON Code:	OR 227
Waste Matrix Code:	S4100
Waste Stream I.D.:	OR-NFS-CH-SOIL
Waste Container Weights:	Gross Wt.: 243.8 kg Tare Wt.: 35.2 kg Net Wt.: 208.6 kg
Rigid Liner and Liner Vent Description:	Liner: [ ] No [X] Yes Lid: [X] No [ ] Yes Type: [ ] 30-mil [X] 90-mil [ ] 110-mil [ ] 125-mil Vented: [ ] No [X] Yes [ ] N/A Punctured: [X] No [ ] Yes Mechanical Vent: [X] No [ ] Yes Fiberboard Liner: [X] No [ ] Yes Lead Lined: [X] No [ ] Yes
Number of Layers of Confinement:	Appears to be 1 layer
Volume Utilization Percentage:	95 %

CCP Radiography Data Sheet

Waste Container ID: X10C1100210

Section 3: Container Inventory and Comments (Detailed descriptions)
IM:
AM:
OM:
OI:
C:
R:
XPM:
OR: Absorbent
IN:
S: Soil

Section 4: Packaging Material and Waste Material Parameters	
Packaging Material:	**Estimated Weight (kg)**
Steel (ST):	27.8
Plastics (PP): Liner bag, Rigid Liner	7.4
Other:	0.0
Total Packaging Weight	35.2
Waste Material Parameter:	**Estimated Weight (kg)**
Iron-based Metal / Alloys (IM):	
Aluminum-based Metals / Alloys (AM):	
Other Metals (OM):	
Other Inorganic Materials (OI)	
Cellulosics (C):	
Rubber (R):	
Plastics (waste materials) (XPM):	
Organic Matrix (OR):	2.6
Inorganic Matrix (IN):	
Soils (S):	206.0
Total WMP Weight:	208.6

CCP Radiography Data Sheet

Waste Container ID: X10C1100210

Section 5: RTR Summary (Questions answered "Yes" will be explained in the Comment block, except for Question 1)	
Is there observable liquid?	☐ Yes ☒ No
Is there any observable liquid in internal containers, more than 60 milliliters or 3 percent by volume, whichever is greater?	☐ Yes ☒ No
Is the total volume of observable liquid in the outermost container GREATER than 1% of the container?	☐ Yes ☒ No
Is there observable liquid in payload containers with an EPA Hazardous Waste Number of U134?	☐ Yes ☒ No
Is there an indication of non-radionuclide pyrophoric materials, such as elemental potassium?	☐ Yes ☒ No
Is there an indication of hazardous wastes not occurring as co-contaminants with TRU mixed wastes (non-mixed hazardous wastes)?	☐ Yes ☒ No
Is there an indication of wastes incompatible with backfill, seal and panel closures materials, container and packaging materials, shipping container materials, or other wastes (i.e., waste does NOT match TRUCON Code[s])?	☐ Yes ☒ No
Is there an indication of wastes containing explosives or compressed gases?	☐ Yes ☒ No
Is there an indication of PCBs liquids?	☐ Yes ☒ No
Is there an indication of the waste exhibiting the characteristic of ignitability, corrosivity, or reactivity (EPA Hazardous Waste Numbers of D001, D002, or D003)?	☐ Yes ☒ No
Is the physical form of the waste inconsistent with the Waste Stream Description or the Waste Matrix Code?	☐ Yes ☒ No
CH or RH TRAMPAC	
Are there heat-sealed bags (unvented) GREATER than 4 liters and LESS than 390 square inches in the waste, or heat sealed bags not authorized in the RH TRUCON Code?	☐ Yes ☒ No
Were there Non-approved Closure Methods used on liner bags or inner bags greater than 4 liters?	☐ Yes ☒ No
Are there sealed containers GREATER than 4 liters?	☐ Yes ☒ No
Are there indications of inadequate protection for heavy and/or sharp objects?	☐ Yes ☒ No
Comments: N/A	

RTR Operator:

Daphne Brothers	Daphne Brothers	10/14/2015
Print Name	Signature	Date

CCP Radiography Data Sheet

Section 1: General Information	
[X] RTR Examination [ ] RTR Replicate Scan [ ] RTR Independent Observation	
Site ID:	ORNL
Batch Number:	OR-RTR6-0695
Examination Date:	10/14/2015
Waste Container ID:	X10C1100213
Video/Audio Recorded Media Number:	OR-RTR6-0695 A&B
Procedure and Revision No.:	CCP-TP-053 Rev. 15
NCR(s) associated with the container? (e.g., Prohibited Items)	[X] No [ ] Yes NCR No.: N/A NCR No.: N/A

Section 2: Waste Container Data	
Container Type:	55 Gallon Drum
TRUCON Code:	OR 227
Waste Matrix Code:	S4100
Waste Stream I.D.:	OR-NFS-CH-SOIL
Waste Container Weights:	Gross Wt.: 208.8 kg Tare Wt.: 35.2 kg Net Wt.: 173.6 kg
Rigid Liner and Liner Vent Description:	Liner: [ ] No [X] Yes Lid: [X] No [ ] Yes Type: [ ] 30-mil [X] 90-mil [ ] 110-mil [ ] 125-mil Vented: [ ] No [X] Yes [ ] N/A Punctured: [X] No [ ] Yes Mechanical Vent: [X] No [ ] Yes Fiberboard Liner: [X] No [ ] Yes Lead Lined: [X] No [ ] Yes
Number of Layers of Confinement:	Appears to be 1 layer
Volume Utilization Percentage:	75 %

CCP Radiography Data Sheet

Waste Container ID: X10C1100213

Section 3: Container Inventory and Comments (Detailed descriptions)	
IM:	
AM:	
OM:	
OI:	
C:	
R:	
XPM:	
OR: Absorbent	
IN:	
S: Soil	

Section 4: Packaging Material and Waste Material Parameters	
Packaging Material:	**Estimated Weight (kg)**
Steel (ST):	27.8
Plastics (PP): Liner bag, Rigid Liner	7.4
Other:	0.0
Total Packaging Weight	35.2
Waste Material Parameter:	**Estimated Weight (kg)**
Iron-based Metal / Alloys (IM):	
Aluminum-based Metals / Alloys (AM):	
Other Metals (OM):	
Other Inorganic Materials (OI)	
Cellulosics (C):	
Rubber (R):	
Plastics (waste materials) (XPM):	
Organic Matrix (OR):	2.6
Inorganic Matrix (IN):	
Soils (S):	171.0
Total WMP Weight:	173.6

CCP Radiography Data Sheet

Waste Container ID: X10C1100213

Section 5: RTR Summary (Questions answered "Yes" will be explained in the Comment block, except for Question 1)	
Is there observable liquid?	☐ Yes ☒ No
Is there any observable liquid in internal containers, more than 60 milliliters or 3 percent by volume, whichever is greater?	☐ Yes ☒ No
Is the total volume of observable liquid in the outermost container GREATER than 1% of the container?	☐ Yes ☒ No
Is there observable liquid in payload containers with an EPA Hazardous Waste Number of U134?	☐ Yes ☒ No
Is there an indication of non-radionuclide pyrophoric materials, such as elemental potassium?	☐ Yes ☒ No
Is there an indication of hazardous wastes not occurring as co-contaminants with TRU mixed wastes (non-mixed hazardous wastes)?	☐ Yes ☒ No
Is there an indication of wastes incompatible with backfill, seal and panel closures materials, container and packaging materials, shipping container materials, or other wastes (i.e., waste does NOT match TRUCON Code[s])?	☐ Yes ☒ No
Is there an indication of wastes containing explosives or compressed gases?	☐ Yes ☒ No
Is there an indication of PCBs liquids?	☐ Yes ☒ No
Is there an indication of the waste exhibiting the characteristic of ignitability, corrosivity, or reactivity (EPA Hazardous Waste Numbers of D001, D002, or D003)?	☐ Yes ☒ No
Is the physical form of the waste inconsistent with the Waste Stream Description or the Waste Matrix Code?	☐ Yes ☒ No
CH or RH TRAMPAC	
Are there heat-sealed bags (unvented) GREATER than 4 liters and LESS than 390 square inches in the waste, or heat sealed bags not authorized in the RH TRUCON Code?	☐ Yes ☒ No
Were there Non-approved Closure Methods used on liner bags or inner bags greater than 4 liters?	☐ Yes ☒ No
Are there sealed containers GREATER than 4 liters?	☐ Yes ☒ No
Are there indications of inadequate protection for heavy and/or sharp objects?	☐ Yes ☒ No
Comments: N/A	

RTR Operator:

Daphne Brothers	Daphne J Brothers	10/14/2015
Print Name	Signature	Date

CCP Radiography Data Sheet

Section 1: General Information	
[X] RTR Examination [ ] RTR Replicate Scan [ ] RTR Independent Observation	
Site ID:	ORNL
Batch Number:	OR-RTR6-0695
Examination Date:	10/14/2015
Waste Container ID:	X10C1100214
Video/Audio Recorded Media Number:	OR-RTR6-0695 A&B
Procedure and Revision No.:	CCP-TP-053 Rev. 15
NCR(s) associated with the container? (e.g., Prohibited Items)	[X] No [ ] Yes NCR No.: N/A NCR No.: N/A

Section 2: Waste Container Data	
Container Type:	55 Gallon Drum
TRUCON Code:	OR 227
Waste Matrix Code:	S4100
Waste Stream I.D.:	OR-NFS-CH-SOIL
Waste Container Weights:	Gross Wt.: 212.5 kg Tare Wt.: 35.2 kg Net Wt.: 177.3 kg
Rigid Liner and Liner Vent Description:	Liner: [ ] No [X] Yes Lid: [X] No [ ] Yes Type: [ ] 30-mil [X] 90-mil [ ] 110-mil [ ] 125-mil Vented: [ ] No [X] Yes [ ] N/A Punctured: [X] No [ ] Yes Mechanical Vent: [X] No [ ] Yes Fiberboard Liner: [X] No [ ] Yes Lead Lined: [X] No [ ] Yes
Number of Layers of Confinement:	Appears to be 1 layer
Volume Utilization Percentage:	75 %

CCP Radiography Data Sheet

Waste Container ID: X10C1100214

Section 3: Container Inventory and Comments (Detailed descriptions)
IM:
AM:
OM:
OI:
C:
R:
XPM:
OR: Absorbent
IN:
S: Soil

Section 4: Packaging Material and Waste Material Parameters	
Packaging Material:	**Estimated Weight (kg)**
Steel (ST):	27.8
Plastics (PP): Liner bag, Rigid Liner	7.4
Other:	0.0
Total Packaging Weight	35.2
Waste Material Parameter:	**Estimated Weight (kg)**
Iron-based Metal / Alloys (IM):	
Aluminum-based Metals / Alloys (AM):	
Other Metals (OM):	
Other Inorganic Materials (OI)	
Cellulosics (C):	
Rubber (R):	
Plastics (waste materials) (XPM):	
Organic Matrix (OR):	2.3
Inorganic Matrix (IN):	
Soils (S):	175.0
Total WMP Weight:	177.3

CCP Radiography Data Sheet

Waste Container ID: X10C1100214

Section 5: RTR Summary (Questions answered "Yes" will be explained in the Comment block, except for Question 1)	
Is there observable liquid?	☐ Yes ☒ No
Is there any observable liquid in internal containers, more than 60 milliliters or 3 percent by volume, whichever is greater?	☐ Yes ☒ No
Is the total volume of observable liquid in the outermost container GREATER than 1% of the container?	☐ Yes ☒ No
Is there observable liquid in payload containers with an EPA Hazardous Waste Number of U134?	☐ Yes ☒ No
Is there an indication of non-radionuclide pyrophoric materials, such as elemental potassium?	☐ Yes ☒ No
Is there an indication of hazardous wastes not occurring as co-contaminants with TRU mixed wastes (non-mixed hazardous wastes)?	☐ Yes ☒ No
Is there an indication of wastes incompatible with backfill, seal and panel closures materials, container and packaging materials, shipping container materials, or other wastes (i.e., waste does NOT match TRUCON Code[s])?	☐ Yes ☒ No
Is there an indication of wastes containing explosives or compressed gases?	☐ Yes ☒ No
Is there an indication of PCBs liquids?	☐ Yes ☒ No
Is there an indication of the waste exhibiting the characteristic of ignitability, corrosivity, or reactivity (EPA Hazardous Waste Numbers of D001, D002, or D003)?	☐ Yes ☒ No
Is the physical form of the waste inconsistent with the Waste Stream Description or the Waste Matrix Code?	☐ Yes ☒ No
CH or RH TRAMPAC	
Are there heat-sealed bags (unvented) GREATER than 4 liters and LESS than 390 square inches in the waste, or heat sealed bags not authorized in the RH TRUCON Code?	☐ Yes ☒ No
Were there Non-approved Closure Methods used on liner bags or inner bags greater than 4 liters?	☐ Yes ☒ No
Are there sealed containers GREATER than 4 liters?	☐ Yes ☒ No
Are there indications of inadequate protection for heavy and/or sharp objects?	☐ Yes ☒ No
Comments: N/A	

RTR Operator:

Daphne Brothers	Daphne Brothers	10/14/2015
Print Name	Signature	Date

CCP Radiography Data Sheet

Section 1: General Information	
[X] RTR Examination [ ] RTR Replicate Scan [ ] RTR Independent Observation	
Site ID:	ORNL
Batch Number:	OR-RTR6-0695
Examination Date:	10/14/2015
Waste Container ID:	X10C1100232
Video/Audio Recorded Media Number:	OR-RTR6-0695 A&B
Procedure and Revision No.:	CCP-TP-053 Rev. 15
NCR(s) associated with the container? (e.g., Prohibited Items)	[X] No [ ] Yes NCR No.: N/A NCR No.: N/A

Section 2: Waste Container Data	
Container Type:	55 Gallon Drum
TRUCON Code:	OR 227
Waste Matrix Code:	S4100
Waste Stream I.D.:	OR-NFS-CH-SOIL
Waste Container Weights:	Gross Wt.: 225.7 kg Tare Wt.: 35.2 kg Net Wt.: 190.5 kg
Rigid Liner and Liner Vent Description:	Liner: [ ] No [X] Yes Lid: [X] No [ ] Yes Type: [ ] 30-mil [X] 90-mil [ ] 110-mil [ ] 125-mil Vented: [ ] No [X] Yes [ ] N/A Punctured: [X] No [ ] Yes Mechanical Vent: [X] No [ ] Yes Fiberboard Liner: [X] No [ ] Yes Lead Lined: [X] No [ ] Yes
Number of Layers of Confinement:	Appears to be 1 layer
Volume Utilization Percentage:	85 %

CCP Radiography Data Sheet

Waste Container ID: X10C1100232

Section 3: Container Inventory and Comments (Detailed descriptions)
IM:
AM:
OM:
OI:
C:
R:
XPM:
OR: Absorbent
IN:
S: Soil

Section 4: Packaging Material and Waste Material Parameters	
Packaging Material:	**Estimated Weight (kg)**
Steel (ST):	27.8
Plastics (PP): Liner bag, Rigid Liner	7.4
Other:	0.0
Total Packaging Weight	35.2
Waste Material Parameter:	**Estimated Weight (kg)**
Iron-based Metal / Alloys (IM):	
Aluminum-based Metals / Alloys (AM):	
Other Metals (OM):	
Other Inorganic Materials (OI)	
Cellulosics (C):	
Rubber (R):	
Plastics (waste materials) (XPM):	
Organic Matrix (OR):	2.5
Inorganic Matrix (IN):	
Soils (S):	188.0
Total WMP Weight:	190.5

CCP Radiography Data Sheet

Waste Container ID: X10C1100232

Section 5: RTR Summary (Questions answered "Yes" will be explained in the Comment block, except for Question 1)	
Is there observable liquid?	☐ Yes ☒ No
Is there any observable liquid in internal containers, more than 60 milliliters or 3 percent by volume, whichever is greater?	☐ Yes ☒ No
Is the total volume of observable liquid in the outermost container GREATER than 1% of the container?	☐ Yes ☒ No
Is there observable liquid in payload containers with an EPA Hazardous Waste Number of U134?	☐ Yes ☒ No
Is there an indication of non-radionuclide pyrophoric materials, such as elemental potassium?	☐ Yes ☒ No
Is there an indication of hazardous wastes not occurring as co-contaminants with TRU mixed wastes (non-mixed hazardous wastes)?	☐ Yes ☒ No
Is there an indication of wastes incompatible with backfill, seal and panel closures materials, container and packaging materials, shipping container materials, or other wastes (i.e., waste does NOT match TRUCON Code[s])?	☐ Yes ☒ No
Is there an indication of wastes containing explosives or compressed gases?	☐ Yes ☒ No
Is there an indication of PCBs liquids?	☐ Yes ☒ No
Is there an indication of the waste exhibiting the characteristic of ignitability, corrosivity, or reactivity (EPA Hazardous Waste Numbers of D001, D002, or D003)?	☐ Yes ☒ No
Is the physical form of the waste inconsistent with the Waste Stream Description or the Waste Matrix Code?	☐ Yes ☒ No
CH or RH TRAMPAC	
Are there heat-sealed bags (unvented) GREATER than 4 liters and LESS than 390 square inches in the waste, or heat sealed bags not authorized in the RH TRUCON Code?	☐ Yes ☒ No
Were there Non-approved Closure Methods used on liner bags or inner bags greater than 4 liters?	☐ Yes ☒ No
Are there sealed containers GREATER than 4 liters?	☐ Yes ☒ No
Are there indications of inadequate protection for heavy and/or sharp objects?	☐ Yes ☒ No
Comments: N/A	

RTR Operator:

Daphne Brothers	Daphne O Brothers	10/14/2015
Print Name	Signature	Date

CCP Radiography Data Sheet

Section 1: General Information	
[X] RTR Examination [ ] RTR Replicate Scan [ ] RTR Independent Observation	
Site ID:	ORNL
Batch Number:	OR-RTR6-0695
Examination Date:	10/14/2015
Waste Container ID:	X10C1100236
Video/Audio Recorded Media Number:	OR-RTR6-0695 A&B
Procedure and Revision No.:	CCP-TP-053 Rev. 15
NCR(s) associated with the container? (e.g., Prohibited Items)	[X] No [ ] Yes NCR No.: N/A NCR No.: N/A

Section 2: Waste Container Data	
Container Type:	55 Gallon Drum
TRUCON Code:	OR 227
Waste Matrix Code:	S4100
Waste Stream I.D.:	OR-NFS-CH-SOIL
Waste Container Weights:	Gross Wt.: 195.6 kg Tare Wt.: 35.2 kg Net Wt.: 160.4 kg
Rigid Liner and Liner Vent Description:	Liner: [ ] No [X] Yes Lid: [X] No [ ] Yes Type: [ ] 30-mil [X] 90-mil [ ] 110-mil [ ] 125-mil Vented: [ ] No [X] Yes [ ] N/A Punctured: [X] No [ ] Yes Mechanical Vent: [X] No [ ] Yes Fiberboard Liner: [X] No [ ] Yes Lead Lined: [X] No [ ] Yes
Number of Layers of Confinement:	Appears to be 1 layer
Volume Utilization Percentage:	70 %

CCP Radiography Data Sheet

Waste Container ID: X10C1100236

Section 3: Container Inventory and Comments (Detailed descriptions)
IM:
AM:
OM:
OI:
C:
R:
XPM: Plastic sheeting
OR: Absorbent
IN:
S: Soil

Section 4: Packaging Material and Waste Material Parameters

Packaging Material:	Estimated Weight (kg)
Steel (ST):	27.8
Plastics (PP): Liner bag, Rigid Liner	7.4
Other:	0.0
Total Packaging Weight	35.2
Waste Material Parameter:	**Estimated Weight (kg)**
Iron-based Metal / Alloys (IM):	
Aluminum-based Metals / Alloys (AM):	
Other Metals (OM):	
Other Inorganic Materials (OI)	
Cellulosics (C):	
Rubber (R):	
Plastics (waste materials) (XPM):	1.0
Organic Matrix (OR):	2.0
Inorganic Matrix (IN):	
Soils (S):	157.4
Total WMP Weight:	160.4

CCP Radiography Data Sheet

Waste Container ID: X10C1100236

Section 5: RTR Summary (Questions answered "Yes" will be explained in the Comment block, except for Question 1)	
Is there observable liquid?	☐ Yes ☒ No
Is there any observable liquid in internal containers, more than 60 milliliters or 3 percent by volume, whichever is greater?	☐ Yes ☒ No
Is the total volume of observable liquid in the outermost container GREATER than 1% of the container?	☐ Yes ☒ No
Is there observable liquid in payload containers with an EPA Hazardous Waste Number of U134?	☐ Yes ☒ No
Is there an indication of non-radionuclide pyrophoric materials, such as elemental potassium?	☐ Yes ☒ No
Is there an indication of hazardous wastes not occurring as co-contaminants with TRU mixed wastes (non-mixed hazardous wastes)?	☐ Yes ☒ No
Is there an indication of wastes incompatible with backfill, seal and panel closures materials, container and packaging materials, shipping container materials, or other wastes (i.e., waste does NOT match TRUCON Code[s])?	☐ Yes ☒ No
Is there an indication of wastes containing explosives or compressed gases?	☐ Yes ☒ No
Is there an indication of PCBs liquids?	☐ Yes ☒ No
Is there an indication of the waste exhibiting the characteristic of ignitability, corrosivity, or reactivity (EPA Hazardous Waste Numbers of D001, D002, or D003)?	☐ Yes ☒ No
Is the physical form of the waste inconsistent with the Waste Stream Description or the Waste Matrix Code?	☐ Yes ☒ No
CH or RH TRAMPAC	
Are there heat-sealed bags (unvented) GREATER than 4 liters and LESS than 390 square inches in the waste, or heat sealed bags not authorized in the RH TRUCON Code?	☐ Yes ☒ No
Were there Non-approved Closure Methods used on liner bags or inner bags greater than 4 liters?	☐ Yes ☒ No
Are there sealed containers GREATER than 4 liters?	☐ Yes ☒ No
Are there indications of inadequate protection for heavy and/or sharp objects?	☐ Yes ☒ No
Comments: N/A	

RTR Operator:

Daphne Brothers	Daphne J Brothers	10/14/2015
Print Name	Signature	Date

CCP Radiography Data Sheet

Section 1: General Information	
[X] RTR Examination [ ] RTR Replicate Scan [ ] RTR Independent Observation	
Site ID:	ORNL
Batch Number:	OR-RTR6-0695
Examination Date:	10/14/2015
Waste Container ID:	X10C1100230
Video/Audio Recorded Media Number:	OR-RTR6-0695 A&B
Procedure and Revision No.:	CCP-TP-053 Rev. 15
NCR(s) associated with the container? (e.g., Prohibited Items)	[X] No [ ] Yes NCR No.: N/A NCR No.: N/A

Section 2: Waste Container Data	
Container Type:	55 Gallon Drum
TRUCON Code:	OR 227
Waste Matrix Code:	S4100
Waste Stream I.D.:	OR-NFS-CH-SOIL
Waste Container Weights:	Gross Wt.: 242.7 kg Tare Wt.: 35.2 kg Net Wt.: 207.5 kg
Rigid Liner and Liner Vent Description:	Liner: [ ] No [X] Yes Lid: [X] No [ ] Yes Type: [ ] 30-mil [X] 90-mil [ ] 110-mil [ ] 125-mil Vented: [ ] No [X] Yes [ ] N/A Punctured: [X] No [ ] Yes Mechanical Vent: [X] No [ ] Yes Fiberboard Liner: [X] No [ ] Yes Lead Lined: [X] No [ ] Yes
Number of Layers of Confinement:	Appears to be 1 layer
Volume Utilization Percentage:	90 %

CCP Radiography Data Sheet

Waste Container ID: X10C1100230

Section 3: Container Inventory and Comments (Detailed descriptions)
IM:
AM:
OM:
OI:
C:
R:
XPM:
OR: Absorbent
IN:
S: Soil

Section 4: Packaging Material and Waste Material Parameters	
Packaging Material:	**Estimated Weight (kg)**
Steel (ST):	27.8
Plastics (PP): Liner bag, Rigid Liner	7.4
Other:	0.0
Total Packaging Weight	35.2
Waste Material Parameter:	**Estimated Weight (kg)**
Iron-based Metal / Alloys (IM):	
Aluminum-based Metals / Alloys (AM):	
Other Metals (OM):	
Other Inorganic Materials (OI)	
Cellulosics (C):	
Rubber (R):	
Plastics (waste materials) (XPM):	
Organic Matrix (OR):	2.5
Inorganic Matrix (IN):	
Soils (S):	205.0
Total WMP Weight:	207.5

CCP Radiography Data Sheet

Waste Container ID: X10C1100230

Section 5: RTR Summary (Questions answered "Yes" will be explained in the Comment block, except for Question 1)	
Is there observable liquid?	☐ Yes ☒ No
Is there any observable liquid in internal containers, more than 60 milliliters or 3 percent by volume, whichever is greater?	☐ Yes ☒ No
Is the total volume of observable liquid in the outermost container GREATER than 1% of the container?	☐ Yes ☒ No
Is there observable liquid in payload containers with an EPA Hazardous Waste Number of U134?	☐ Yes ☒ No
Is there an indication of non-radionuclide pyrophoric materials, such as elemental potassium?	☐ Yes ☒ No
Is there an indication of hazardous wastes not occurring as co-contaminants with TRU mixed wastes (non-mixed hazardous wastes)?	☐ Yes ☒ No
Is there an indication of wastes incompatible with backfill, seal and panel closures materials, container and packaging materials, shipping container materials, or other wastes (i.e., waste does NOT match TRUCON Code[s])?	☐ Yes ☒ No
Is there an indication of wastes containing explosives or compressed gases?	☐ Yes ☒ No
Is there an indication of PCBs liquids?	☐ Yes ☒ No
Is there an indication of the waste exhibiting the characteristic of ignitability, corrosivity, or reactivity (EPA Hazardous Waste Numbers of D001, D002, or D003)?	☐ Yes ☒ No
Is the physical form of the waste inconsistent with the Waste Stream Description or the Waste Matrix Code?	☐ Yes ☒ No
CH or RH TRAMPAC	
Are there heat-sealed bags (unvented) GREATER than 4 liters and LESS than 390 square inches in the waste, or heat sealed bags not authorized in the RH TRUCON Code?	☐ Yes ☒ No
Were there Non-approved Closure Methods used on liner bags or inner bags greater than 4 liters?	☐ Yes ☒ No
Are there sealed containers GREATER than 4 liters?	☐ Yes ☒ No
Are there indications of inadequate protection for heavy and/or sharp objects?	☐ Yes ☒ No
Comments: N/A	

RTR Operator:

Daphne Brothers	Daphne Brothers	10/14/2015
Print Name	Signature	Date

CCP Radiography Data Sheet

Section 1: General Information	
[X] RTR Examination [ ] RTR Replicate Scan [ ] RTR Independent Observation	
Site ID:	ORNL
Batch Number:	OR-RTR6-0695
Examination Date:	10/14/2015
Waste Container ID:	X10C1100220
Video/Audio Recorded Media Number:	OR-RTR6-0695 A&B
Procedure and Revision No.:	CCP-TP-053 Rev. 15
NCR(s) associated with the container? (e.g., Prohibited Items)	[X] No [ ] Yes NCR No.: N/A NCR No.: N/A

Section 2: Waste Container Data	
Container Type:	55 Gallon Drum
TRUCON Code:	OR 227
Waste Matrix Code:	S4100
Waste Stream I.D.:	OR-NFS-CH-SOIL
Waste Container Weights:	Gross Wt.: 209.5 kg Tare Wt.: 35.2 kg Net Wt.: 174.3 kg
Rigid Liner and Liner Vent Description:	Liner: [ ] No [X] Yes Lid: [X] No [ ] Yes Type: [ ] 30-mil [X] 90-mil [ ] 110-mil [ ] 125-mil Vented: [ ] No [X] Yes [ ] N/A Punctured: [X] No [ ] Yes Mechanical Vent: [X] No [ ] Yes Fiberboard Liner: [X] No [ ] Yes Lead Lined: [X] No [ ] Yes
Number of Layers of Confinement:	Appears to be 1 layer
Volume Utilization Percentage:	75 %

CCP Radiography Data Sheet

Waste Container ID: X10C1100220

Section 3: Container Inventory and Comments (Detailed descriptions)	
IM:	
AM:	
OM:	
OI:	
C:	
R:	
XPM:	
OR: Absorbent	
IN:	
S: Soil	

Section 4: Packaging Material and Waste Material Parameters	
Packaging Material:	**Estimated Weight (kg)**
Steel (ST):	27.8
Plastics (PP): Liner bag, Rigid Liner	7.4
Other:	0.0
Total Packaging Weight	35.2
Waste Material Parameter:	**Estimated Weight (kg)**
Iron-based Metal / Alloys (IM):	
Aluminum-based Metals / Alloys (AM):	
Other Metals (OM):	
Other Inorganic Materials (OI)	
Cellulosics (C):	
Rubber (R):	
Plastics (waste materials) (XPM):	
Organic Matrix (OR):	2.0
Inorganic Matrix (IN):	
Soils (S):	172.3
Total WMP Weight:	174.3

CCP Radiography Data Sheet

Waste Container ID: X10C1100220

Section 5: RTR Summary (Questions answered "Yes" will be explained in the Comment block, except for Question 1)	
Is there observable liquid?	☐ Yes ☒ No
Is there any observable liquid in internal containers, more than 60 milliliters or 3 percent by volume, whichever is greater?	☐ Yes ☒ No
Is the total volume of observable liquid in the outermost container GREATER than 1% of the container?	☐ Yes ☒ No
Is there observable liquid in payload containers with an EPA Hazardous Waste Number of U134?	☐ Yes ☒ No
Is there an indication of non-radionuclide pyrophoric materials, such as elemental potassium?	☐ Yes ☒ No
Is there an indication of hazardous wastes not occurring as co-contaminants with TRU mixed wastes (non-mixed hazardous wastes)?	☐ Yes ☒ No
Is there an indication of wastes incompatible with backfill, seal and panel closures materials, container and packaging materials, shipping container materials, or other wastes (i.e., waste does NOT match TRUCON Code[s])?	☐ Yes ☒ No
Is there an indication of wastes containing explosives or compressed gases?	☐ Yes ☒ No
Is there an indication of PCBs liquids?	☐ Yes ☒ No
Is there an indication of the waste exhibiting the characteristic of ignitability, corrosivity, or reactivity (EPA Hazardous Waste Numbers of D001, D002, or D003)?	☐ Yes ☒ No
Is the physical form of the waste inconsistent with the Waste Stream Description or the Waste Matrix Code?	☐ Yes ☒ No
CH or RH TRAMPAC	
Are there heat-sealed bags (unvented) GREATER than 4 liters and LESS than 390 square inches in the waste, or heat sealed bags not authorized in the RH TRUCON Code?	☐ Yes ☒ No
Were there Non-approved Closure Methods used on liner bags or inner bags greater than 4 liters?	☐ Yes ☒ No
Are there sealed containers GREATER than 4 liters?	☐ Yes ☒ No
Are there indications of inadequate protection for heavy and/or sharp objects?	☐ Yes ☒ No
Comments: N/A	

RTR Operator:

Daphne Brothers	Daphne O Brothers	10/14/2015
Print Name	Signature	Date

CCP Radiography Data Sheet

Section 1: General Information	
[X] RTR Examination [ ] RTR Replicate Scan [ ] RTR Independent Observation	
Site ID:	ORNL
Batch Number:	OR-RTR6-0695
Examination Date:	10/14/2015
Waste Container ID:	X10C1100207
Video/Audio Recorded Media Number:	OR-RTR6-0695 A&B
Procedure and Revision No.:	CCP-TP-053 Rev. 15
NCR(s) associated with the container? (e.g., Prohibited Items)	[X] No [ ] Yes NCR No.: N/A NCR No.: N/A

Section 2: Waste Container Data	
Container Type:	55 Gallon Drum
TRUCON Code:	OR 227
Waste Matrix Code:	S4100
Waste Stream I.D.:	OR-NFS-CH-SOIL
Waste Container Weights:	Gross Wt.: 230.1 kg Tare Wt.: 35.2 kg Net Wt.: 194.9 kg
Rigid Liner and Liner Vent Description:	Liner: [ ] No [X] Yes Lid: [X] No [ ] Yes Type: [ ] 30-mil [X] 90-mil [ ] 110-mil [ ] 125-mil Vented: [ ] No [X] Yes [ ] N/A Punctured: [X] No [ ] Yes Mechanical Vent: [X] No [ ] Yes Fiberboard Liner: [X] No [ ] Yes Lead Lined: [X] No [ ] Yes
Number of Layers of Confinement:	Appears to be 1 layer
Volume Utilization Percentage:	85 %

CCP Radiography Data Sheet

Waste Container ID: X10C1100207

Section 3: Container Inventory and Comments (Detailed descriptions)
IM:
AM:
OM:
OI:
C:
R:
XPM:
OR: Absorbent
IN:
S: Soil

Section 4: Packaging Material and Waste Material Parameters	
Packaging Material:	**Estimated Weight (kg)**
Steel (ST):	27.8
Plastics (PP): Liner bag, Rigid Liner	7.4
Other:	0.0
Total Packaging Weight	35.2
Waste Material Parameter:	**Estimated Weight (kg)**
Iron-based Metal / Alloys (IM):	
Aluminum-based Metals / Alloys (AM):	
Other Metals (OM):	
Other Inorganic Materials (OI)	
Cellulosics (C):	
Rubber (R):	
Plastics (waste materials) (XPM):	
Organic Matrix (OR):	2.9
Inorganic Matrix (IN):	
Soils (S):	192.0
Total WMP Weight:	194.9

CCP Radiography Data Sheet

Waste Container ID: X10C1100207

Section 5: RTR Summary (Questions answered "Yes" will be explained in the Comment block, except for Question 1)	
Is there observable liquid?	☐ Yes ☒ No
Is there any observable liquid in internal containers, more than 60 milliliters or 3 percent by volume, whichever is greater?	☐ Yes ☒ No
Is the total volume of observable liquid in the outermost container GREATER than 1% of the container?	☐ Yes ☒ No
Is there observable liquid in payload containers with an EPA Hazardous Waste Number of U134?	☐ Yes ☒ No
Is there an indication of non-radionuclide pyrophoric materials, such as elemental potassium?	☐ Yes ☒ No
Is there an indication of hazardous wastes not occurring as co-contaminants with TRU mixed wastes (non-mixed hazardous wastes)?	☐ Yes ☒ No
Is there an indication of wastes incompatible with backfill, seal and panel closures materials, container and packaging materials, shipping container materials, or other wastes (i.e., waste does NOT match TRUCON Code[s])?	☐ Yes ☒ No
Is there an indication of wastes containing explosives or compressed gases?	☐ Yes ☒ No
Is there an indication of PCBs liquids?	☐ Yes ☒ No
Is there an indication of the waste exhibiting the characteristic of ignitability, corrosivity, or reactivity (EPA Hazardous Waste Numbers of D001, D002, or D003)?	☐ Yes ☒ No
Is the physical form of the waste inconsistent with the Waste Stream Description or the Waste Matrix Code?	☐ Yes ☒ No
CH or RH TRAMPAC	
Are there heat-sealed bags (unvented) GREATER than 4 liters and LESS than 390 square inches in the waste, or heat sealed bags not authorized in the RH TRUCON Code?	☐ Yes ☒ No
Were there Non-approved Closure Methods used on liner bags or inner bags greater than 4 liters?	☐ Yes ☒ No
Are there sealed containers GREATER than 4 liters?	☐ Yes ☒ No
Are there indications of inadequate protection for heavy and/or sharp objects?	☐ Yes ☒ No

Comments: N/A

RTR Operator:

Daphne Brothers	Daphne Brothers	10/14/2015
Print Name	Signature	Date

CCP Radiography Data Sheet

Section 1: General Information	
[X] RTR Examination [ ] RTR Replicate Scan [ ] RTR Independent Observation	
Site ID:	ORNL
Batch Number:	OR-RTR6-0695
Examination Date:	10/14/2015
Waste Container ID:	X10C1100234
Video/Audio Recorded Media Number:	OR-RTR6-0695 A&B
Procedure and Revision No.:	CCP-TP-053 Rev. 15
NCR(s) associated with the container? (e.g., Prohibited Items)	[X] No [ ] Yes NCR No.: N/A NCR No.: N/A

Section 2: Waste Container Data	
Container Type:	55 Gallon Drum
TRUCON Code:	OR 227
Waste Matrix Code:	S4100
Waste Stream I.D.:	OR-NFS-CH-SOIL
Waste Container Weights:	Gross Wt.: 218.9 kg Tare Wt.: 35.2 kg Net Wt.: 183.7 kg
Rigid Liner and Liner Vent Description:	Liner: [ ] No [X] Yes Lid: [X] No [ ] Yes Type: [ ] 30-mil [X] 90-mil [ ] 110-mil [ ] 125-mil Vented: [ ] No [X] Yes [ ] N/A Punctured: [X] No [ ] Yes Mechanical Vent: [X] No [ ] Yes Fiberboard Liner: [X] No [ ] Yes Lead Lined: [X] No [ ] Yes
Number of Layers of Confinement:	Appears to be 1 layer
Volume Utilization Percentage:	80 %

CCP Radiography Data Sheet

Waste Container ID: X10C1100234

Section 3: Container Inventory and Comments (Detailed descriptions)

IM:

AM:

OM:

OI:

C:

R:

XPM:

OR: Absorbent

IN:

S: Soil

Section 4: Packaging Material and Waste Material Parameters

Packaging Material:	**Estimated Weight (kg)**
Steel (ST):	27.8
Plastics (PP): Liner bag, Rigid Liner	7.4
Other:	0.0
Total Packaging Weight	35.2
Waste Material Parameter:	**Estimated Weight (kg)**
Iron-based Metal / Alloys (IM):	
Aluminum-based Metals / Alloys (AM):	
Other Metals (OM):	
Other Inorganic Materials (OI)	
Cellulosics (C):	
Rubber (R):	
Plastics (waste materials) (XPM):	
Organic Matrix (OR):	2.7
Inorganic Matrix (IN):	
Soils (S):	181.0
Total WMP Weight:	183.7

CCP Radiography Data Sheet

Waste Container ID: X10C1100234

Section 5: RTR Summary (Questions answered "Yes" will be explained in the Comment block, except for Question 1)	
Is there observable liquid?	☐ Yes ☒ No
Is there any observable liquid in internal containers, more than 60 milliliters or 3 percent by volume, whichever is greater?	☐ Yes ☒ No
Is the total volume of observable liquid in the outermost container GREATER than 1% of the container?	☐ Yes ☒ No
Is there observable liquid in payload containers with an EPA Hazardous Waste Number of U134?	☐ Yes ☒ No
Is there an indication of non-radionuclide pyrophoric materials, such as elemental potassium?	☐ Yes ☒ No
Is there an indication of hazardous wastes not occurring as co-contaminants with TRU mixed wastes (non-mixed hazardous wastes)?	☐ Yes ☒ No
Is there an indication of wastes incompatible with backfill, seal and panel closures materials, container and packaging materials, shipping container materials, or other wastes (i.e., waste does NOT match TRUCON Code[s])?	☐ Yes ☒ No
Is there an indication of wastes containing explosives or compressed gases?	☐ Yes ☒ No
Is there an indication of PCBs liquids?	☐ Yes ☒ No
Is there an indication of the waste exhibiting the characteristic of ignitability, corrosivity, or reactivity (EPA Hazardous Waste Numbers of D001, D002, or D003)?	☐ Yes ☒ No
Is the physical form of the waste inconsistent with the Waste Stream Description or the Waste Matrix Code?	☐ Yes ☒ No
CH or RH TRAMPAC	
Are there heat-sealed bags (unvented) GREATER than 4 liters and LESS than 390 square inches in the waste, or heat sealed bags not authorized in the RH TRUCON Code?	☐ Yes ☒ No
Were there Non-approved Closure Methods used on liner bags or inner bags greater than 4 liters?	☐ Yes ☒ No
Are there sealed containers GREATER than 4 liters?	☐ Yes ☒ No
Are there indications of inadequate protection for heavy and/or sharp objects?	☐ Yes ☒ No

Comments: N/A

RTR Operator:

Daphne Brothers	Daphne C Brothers	10/14/2015
Print Name	Signature	Date

CCP Radiography Data Sheet

Section 1: General Information	
[X] RTR Examination [ ] RTR Replicate Scan [ ] RTR Independent Observation	
Site ID:	ORNL
Batch Number:	OR-RTR6-0695
Examination Date:	10/14/2015
Waste Container ID:	X10C1100229
Video/Audio Recorded Media Number:	OR-RTR6-0695 A&B
Procedure and Revision No.:	CCP-TP-053 Rev. 15
NCR(s) associated with the container? (e.g., Prohibited Items)	[X] No [ ] Yes NCR No.: N/A NCR No.: N/A

Section 2: Waste Container Data	
Container Type:	55 Gallon Drum
TRUCON Code:	OR 227
Waste Matrix Code:	S4100
Waste Stream I.D.:	OR-NFS-CH-SOIL
Waste Container Weights:	Gross Wt.: 207.0 kg Tare Wt.: 35.2 kg Net Wt.: 171.8 kg
Rigid Liner and Liner Vent Description:	Liner: [ ] No [X] Yes Lid: [X] No [ ] Yes Type: [ ] 30-mil [X] 90-mil [ ] 110-mil [ ] 125-mil Vented: [ ] No [X] Yes [ ] N/A Punctured: [X] No [ ] Yes Mechanical Vent: [X] No [ ] Yes Fiberboard Liner: [X] No [ ] Yes Lead Lined: [X] No [ ] Yes
Number of Layers of Confinement:	Appears to be 1 layer
Volume Utilization Percentage:	80 %

CCP Radiography Data Sheet

Waste Container ID: X10C1100229

Section 3: Container Inventory and Comments (Detailed descriptions)
IM:
AM:
OM:
OI:
C:
R:
XPM:
OR: Absorbent
IN:
S: Soil

Section 4: Packaging Material and Waste Material Parameters	
Packaging Material:	**Estimated Weight (kg)**
Steel (ST):	27.8
Plastics (PP): Liner bag, Rigid Liner	7.4
Other:	0.0
Total Packaging Weight	35.2
Waste Material Parameter:	**Estimated Weight (kg)**
Iron-based Metal / Alloys (IM):	
Aluminum-based Metals / Alloys (AM):	
Other Metals (OM):	
Other Inorganic Materials (OI)	
Cellulosics (C):	
Rubber (R):	
Plastics (waste materials) (XPM):	
Organic Matrix (OR):	1.8
Inorganic Matrix (IN):	
Soils (S):	170.0
Total WMP Weight:	171.8

CCP Radiography Data Sheet

Waste Container ID: X10C1100229

Section 5: RTR Summary (Questions answered "Yes" will be explained in the Comment block, except for Question 1)	
Is there observable liquid?	☐ Yes ☒ No
Is there any observable liquid in internal containers, more than 60 milliliters or 3 percent by volume, whichever is greater?	☐ Yes ☒ No
Is the total volume of observable liquid in the outermost container GREATER than 1% of the container?	☐ Yes ☒ No
Is there observable liquid in payload containers with an EPA Hazardous Waste Number of U134?	☐ Yes ☒ No
Is there an indication of non-radionuclide pyrophoric materials, such as elemental potassium?	☐ Yes ☒ No
Is there an indication of hazardous wastes not occurring as co-contaminants with TRU mixed wastes (non-mixed hazardous wastes)?	☐ Yes ☒ No
Is there an indication of wastes incompatible with backfill, seal and panel closures materials, container and packaging materials, shipping container materials, or other wastes (i.e., waste does NOT match TRUCON Code[s])?	☐ Yes ☒ No
Is there an indication of wastes containing explosives or compressed gases?	☐ Yes ☒ No
Is there an indication of PCBs liquids?	☐ Yes ☒ No
Is there an indication of the waste exhibiting the characteristic of ignitability, corrosivity, or reactivity (EPA Hazardous Waste Numbers of D001, D002, or D003)?	☐ Yes ☒ No
Is the physical form of the waste inconsistent with the Waste Stream Description or the Waste Matrix Code?	☐ Yes ☒ No
CH or RH TRAMPAC	
Are there heat-sealed bags (unvented) GREATER than 4 liters and LESS than 390 square inches in the waste, or heat sealed bags not authorized in the RH TRUCON Code?	☐ Yes ☒ No
Were there Non-approved Closure Methods used on liner bags or inner bags greater than 4 liters?	☐ Yes ☒ No
Are there sealed containers GREATER than 4 liters?	☐ Yes ☒ No
Are there indications of inadequate protection for heavy and/or sharp objects?	☐ Yes ☒ No

Comments: N/A

RTR Operator:

Daphne Brothers	Daphne Brothers	10/14/2015
Print Name	Signature	Date

Attachment 3 – CCP Radiography Independent Technical Reviewer Checklist

Batch Data Report No.: OR-RTR6-0695

Description			
1.	Were data generation and reduction conducted in a technically correct manner in accordance with the methods used?	☐ NO	☑ YES
2.	Was the correct revision of the procedure used? Procedure: CCP-TP-053 Rev.: 15	☐ NO	☑ YES
3.	Are the WMPs entered correctly?	☐ NO	☑ YES
4.	Do the estimated weights in Section 4 of Attachment 2 equal the container gross weight?	☐ NO	☑ YES
5.	Is the data reported in the proper units with the correct number of significant figures (e.g., one tenth of a kilogram)?	☐ NO	☑ YES
6.	Was transcription used? If no, proceed to question 7.	☑ NO	☐ YES
	6a. Has the data been verified for transcription errors?	☐ NO	☐ YES
7.	Does the Testing Batch Report include radiography for up to 20 containers?	☐ NO	☑ YES
8.	Are BDR contents complete and do they match the CCP Waste RTR Batch Data Report Table of Contents?	☐ NO	☑ YES
9.	Is all the data signed and dated in reproducible ink and by the individual(s) generating it?	☐ NO	☑ YES
10.	Is all data recorded clearly, legibly, and accurately?	☐ NO	☑ YES
11.	Have changes been made to original data? If no, proceed to question 12.	☑ NO	☐ YES
	11a. Have all changes to original data been lined out, initialed and dated by the individual making the changes?	☐ NO	☐ YES
	11b. Was justification made for changing the original data?	☐ NO	☐ YES
	11c. Were data changes made by the individual who originally collected the data?	☐ NO	☐ YES
12.	Does the waste match the Waste Matrix Code and Waste Stream description?	☐ NO	☑ YES
13.	Are the RTR Operator's decisions regarding the Radiography documented?	☐ NO	☑ YES
14.	Is there an adequate written description of the contents of each item?	☐ NO	☑ YES
15.	Was the video/audio recording media properly prepared and labeled for each waste container?	☐ NO	☑ YES
16.	Was the video/audio recording media check performed satisfactorily and recorded on Attachment 1?	☐ NO	☑ YES

Attachment 3 – CCP Radiography Independent Technical Reviewer Checklist (Continued)

Batch Data Report No.: OR-RTR6-0695

Description		
17. Was the Image Test performed satisfactorily and recorded on Attachment 1?	☐NO	☑YES
18. Was the Replicate Scan performed and recorded on an Attachment 2?	☐NO	☑YES
19. Was the Replicate Scan RTR Operator different from the first RTR Operator?	☐NO	☑YES
20. Did the Replicate Scan RTR Operator and the first RTR Operator agree on the results?	☐NO	☑YES
21. Was the Independent Observation performed and recorded on an Attachment 2?	☐NO	☑YES
22. Was the Independent Observation RTR Operator different from the first RTR Operator?	☐NO	☑YES
23. Did the Independent Observation RTR Operator and the first RTR Operator agree on the results?	☐NO	☑YES
24. Was the data collection performed by qualified individuals?	☐NO	☑YES
25. Were NCRs initiated as required at DGL? If no, proceed to question 26.	☑NO	☐YES
25a. Have the NCR(s) associated with RTR been included in the BDR?	☐NO	☐YES
26. Is the RTR examination for CH waste? If no, proceed to question 27.	☐NO	☑YES
26a. Have the CH Quality Assurance Objectives (QAOs) been met (if applicable)? Precision – Precision is maintained by reconciling any discrepancies between two radiography operators with regard to identification of the waste matrix code, liquids in excess of TSDF-WAC limits, and compressed gases through independent replicate scans and independent observations. Additionally, the precision of radiography is verified prior to use by tuning precisely enough to demonstrate compliance with QAOs through viewing an image test pattern. Accuracy – Accuracy is obtained by using a target to tune the image for maximum sharpness and by requiring operators to successfully identify 100 percent of the items required to meet the DQOs for radiography specified in CCP-PO-001, Section C-4a(1) in a training container during their initial qualification and subsequent requalification. Completeness – A video and audio media recording of the radiography examination and a validated radiography data form will be obtained for 100 percent of the waste containers subject to radiography. All video and audio media recordings and radiography data forms will be subject to validation as indicated in CCP-PO-001, Section C3-4. Comparability – The comparability of radiography data from different operators shall be enhanced by using standardized radiography procedures and operator qualifications.	☐NO	☑YES

Attachment 3 – CCP Radiography Independent Technical Reviewer Checklist (Continued)

Batch Data Report No.: OR-RTR6-0695

Description		
27. Is the RTR examination for RH waste? If no, proceed to comment section.	☑ NO	☐ YES
27a. Have the RH QAOs been met (if applicable)? Precision – Precision is maintained by reconciling any discrepancies between two operators (during Independent Observation and Replicate scans) with regard to the identification of important waste characteristics (i.e., physical form of the waste and absence of prohibited liquids) within a single container. Accuracy – Accuracy is obtained by using a target to tune the image for maximum sharpness and by requiring operators to successfully identify prohibited liquid in a training container during their initial qualification and subsequent requalification. Representativeness – All of the relevant contents in a container selected for radiography will be described. Completeness – All of the relevant waste information must be assembled and must show that each of the containers in the waste stream belongs to the waste stream. This information must be documented on videotape or other equivalent media and data form. Comparability – Comparability is ensured by meeting the program training requirements and complying with the minimum standards used to implement the radiography process.	☐ NO	☐ YES

Comments: N/A

I have reviewed 100% of the container specific and batch data in this report and find it acceptable.

Independent Technical Reviewer:

Printed Name	Signature	Date
Eric Lyles		10/14/15

DIVIDER PAGE ONLY

Not Part of Page Count

Attachment 2 – CCP Records Transmittal/Receiving Form

CCP Records / Records Custodian, 4021 National Parks Highway - MS: GSA 212, Carlsbad, New Mexico 88220

Telephone Number: 575-234-7523

Fax Number: 575-234-7033

Attn:	CCP RECORDS	From:	PATRICK SMITH II
Ship to:	CCP RECORDS CUSTODIAN	Site:	ORNL
	4021 NATIONAL PARKS HWY.	Company:	TFE INC.
	MS GSA 212	Telephone Number:	865-574-6002
	CARLSBAD, NM 88220-9082	Date Sent:	10-21-2015
Telephone Number:	575-234-7523		

Document Number	Title / Description	Record Date	Total Pages
OR-RTR6-0695	RTR DVD (DISK B)	10-14-2015	N/A
N/A	N/A	N/A	N/A
N/A	N/A	N/A	N/A
N/A	N/A	N/A	N/A
N/A	N/A	N/A	N/A
N/A	N/A	N/A	N/A

Comments

N/A

(When the Record accepted line has been completed, the rest of the page below may be left blank.)
Acceptance/Rejection Signature and Date

Records Accepted [✓] Signature: [signature] Printed Name: Jewell Humable Date: 11-5-2015

Records Rejected [ ] Signature _____ Printed Name _____ Date _____

Reason for Rejection:

Re-submittal: Signature _____ Printed Name _____ Date _____

```
************************************
***        Send Results          ***
************************************

Sending is complete.

Job No.                     3131
Address                     918655768703
Name                        ORNL
Start Time                  11/05 03:24 PM
Call Length                 00'20
Sheets                      1
Result                      OK
```

Controlled Copy

Attachment 2 – CCP Records Transmittal/Receiving Form

CCP Records / Records Custodian, 4021 National Parks Highway - MS: GSA 212, Carlsbad, New Mexico 88220

Telephone Number: 575-234-7523

Fax Number: 575-234-7033

Attn:	CCP RECORDS	From:	PATRICK SMITH II
Ship to:	CCP RECORDS CUSTODIAN	Site:	ORNL
	4021 NATIONAL PARKS HWY.	Company:	TFE INC.
	MS GSA 212	Telephone Number:	865-574-6002
	CARLSBAD, NM 88220-9082	Date Sent:	10-21-2015
Telephone Number:	575-234-7523		

OR-RTR6-0695	RTR DVD (DISK B)	10-14-2015	N/A
N/A	N/A	N/A	N/A
N/A	N/A	N/A	N/A
N/A	N/A	N/A	N/A
N/A	N/A	N/A	N/A
N/A	N/A	N/A	N/A
[illegible]			
N/A			

(When the Record accepted line has been completed, the rest of the page below may be left blank.)
Acceptance/Rejection Signature and Date

Records Accepted [✓] [signature] Jewell Hurtado 11-5-2015
Signature Printed Name Date

Records Rejected [ ]
Signature Printed Name Date

Attachment 2 – CCP Records Transmittal/Receiving Form

CCP Records / Records Custodian, 4021 National Parks Highway - MS: GSA 212, Carlsbad, New Mexico 88220

Telephone Number: 575-234-7523

Fax Number: 575-234-7033

Attn:	CCP RECORDS	From:	PATRICK SMITH II
Ship to:	CCP RECORDS CUSTODIAN	Site:	ORNL
	4021 NATIONAL PARKS HWY.	Company:	TFE INC.
	MS GSA 212	Telephone Number:	865-574-6002
	CARLSBAD, NM 88220-9082	Date Sent:	11-04-2015
Telephone Number:	575-234-7523		

Document Number	Title / Description	Record Date	Total Pages
OR-RTR6-0695	RTR BDR	10-14-2015	42
OR-RTR6-0695	RTR DVD (DISK A)	10-14-2015	N/A
N/A	N/A	N/A	N/A
N/A	N/A	N/A	N/A
N/A	N/A	N/A	N/A
N/A	N/A	N/A	N/A

Comments

N/A

(When the Record accepted line has been completed, the rest of the page below may be left blank.)

Acceptance/Rejection Signature and Date

Records Accepted	☑	[signature]	Lowell Turnable	11-9-15
		Signature	Printed Name	Date
Records Rejected	☐			
		Signature	Printed Name	Date

Reason for Rejection:

Re-submittal:			
	Signature	Printed Name	Date

****
*** TX REPORT ***
****

TRANSMISSION OK

TX/RX NO	2653
DESTINATION TEL #	918655768703
DESTINATION ID	ORNL
ST. TIME	11/09 15:28
TIME USE	00'17
PAGES SENT	1
RESULT	OK

Attachment 2 – CCP Records Transmittal/Receiving Form

CCP Records / Records Custodian, 4021 National Parks Highway - MS: GSA 212, Carlsbad, New Mexico 88220

Telephone Number: 575-234-7523

Fax Number: 575-234-7033

Attn:	CCP RECORDS	From:	PATRICK SMITH II
Ship to:	CCP RECORDS CUSTODIAN	Site:	ORNL
	4021 NATIONAL PARKS HWY.	Company:	TFE INC.
	MS GSA 212	Telephone Number:	865-574-6002
	CARLSBAD, NM 88220-9082	Date Sent:	11-04-2015
Telephone Number:	575-234-7523		

OR-RTR6-0685	RTR BDR	10-14-2015	42
OR-RTR6-0695	RTR DVD (DISK A)	10-14-2015	N/A
N/A	N/A	N/A	N/A
N/A	N/A	N/A	N/A
N/A	N/A	N/A	N/A
N/A	N/A	N/A	N/A

N/A

(When the Record accepted line has been completed, the rest of the page below may be left blank.)
Acceptance/Rejection Signature and Date

DIVIDER

PAGE

Attachment 2 – CCP SPM Radiography Project Level Validation Checklist and Summary

BDR Number: OR-RTR6-0706				Examination Date(s): 12/14/2015
Description of Criteria Reviewed	**Criteria Met?**			**Comments/Qualifiers**
	YES	**NO**	**NA**	
1. Is the completed, signed, and dated Independent Technical Reviewer Checklist included in the BDR, and the independent technical reviewer was not involved in the generation or recording of the data under review? **Reference Source: CCP-PO-001, C3-4**	X			
2. Does the BDR contain all items addressed in the BDR Table of Contents? **Reference Source: CCP-PO-001, C3-4**	X			
3. Does the BDR include a listing of all the container numbers in the batch? **Reference Source: CCP-PO-001, C3-4**	X			
4. List all containers that have met QAOs. **Reference Source: CCP-PO-001, C3-4**				Container Numbers: X10C1351015, X10C1351175, X10C1351194, X10C1351198, X10C1351024, X10C1351187, X10C1351145, X10C1351199, X10C1351203, X10C1351202, X10C1351185, X10C1351184, X10C1351186, X10C1351189, X10C1351190, X10C1351146, X10C1351201, X10C1351171, X10C1351178, X10C1351191
5. Does the BDR identify the current implementing procedure and revision number? **Reference Source: CCP-PO-001, Table C3-3**	X			
6. Is there a reference to or copy of any associated NCRs (if any) in the BDR? NA if no NCRs. **Reference Source: CCP-PO-001, Table C3-3**			X	
7. Are there 20 or fewer containers in the batch? **Reference Source: CCP-PO-001, C3-4**	X			
8. Are the data properly reported (i.e., data are reported in correct units and with correct significant figures)? **Reference Source: CCP-PO-001, C3-4**	X			
9. Is there evidence of verification that the physical form matches the Waste Matrix Code? **Reference Source: CCP-PO-001, Table C3-3**	X			

CCP RECORDS ORIGINAL

DATE REC'D 01/06/16 JV

Attachment 2 – CCP SPM Radiography Project Level Validation Checklist and Summary (Continued)

BDR Number: OR-RTR6-0706				**Examination Date(s): 12/14/2015**
Description of Criteria Reviewed	**Criteria Met?**			**Comments/Qualifiers**
	YES	**NO**	**NA**	
10. Is there evidence of verification that the physical form matches the waste stream description? **Reference Source: CCP-PO-001, Table C3-3**	X			
11. Are prohibited items absent? **Reference Source: CCP-PO-001, Table C3-3**	X			
12. Does observable liquid, if present, meet the criteria of the TSDF-WAC? **Reference Source: CCP-PO-001, C-1**			X	No observable liquids
13. Were discrepancies between two operators with regard to identification of waste matrix code, liquids in excess of the TSDF-WAC, or compressed gases through replicate scans and independent observations reconciled? NA if no discrepancies. **Reference Source: CCP-PO-001, C3-2**			X	
14. Are the training qualifications for all radiography personnel acceptable? **Reference Source: CCP-PO-001, C3-8**	X			
15. Was evidence of the video/audio check included in the BDR? **Reference Source: CCP-PO-001, C1-1**	X			
16. Was the Lines-Pair Resolution Test or Sieve Test Check included in the BDR? **Reference Source: CCP Technical Procedures**	X			
17. Was a replicate scan performed once per day, or once per batch, whichever is LESS frequent? **Reference Source: CCP-PO-001, C1-1**	X			
18. Was an independent observation performed once per day, or once per batch, whichever is LESS frequent? **Reference Source: CCP-PO-001, C1-1**	X			

Attachment 2 – CCP SPM Radiography Project Level Validation Checklist and Summary (Continued)

BDR Number: OR-RTR6-0706 **Examination Date(s):** 12/14/2015

Description of Criteria Reviewed	Criteria Met? YES	NO	NA	Comments/Qualifiers
19. Were the replicate scan and independent observation performed on different waste containers? **Reference Source: CCP-PO-001, C1-1**	X			
20. Were the personnel performing the replicate scan and independent observation different from the individual who performed the original? **Reference Source: CCP-PO-001, C1-1**	X			
21. Does the BDR include an estimate of each material parameter weight in kg for each container? **Reference Source: CCP Technical Procedures**	X			
22. Does the BDR include a description of each material parameter for each container? **Reference Source: CCP Technical Procedures**	X			
23. Is the container gross weight recorded in kilograms (kg) for each container in the BDR? **Reference Source: CCP Technical Procedures**	X			
24. Was the Scale Weight Calibration Check included in the BDR? **Reference Source: CCP Technical Procedures**			X	Scale not used
25. Was the Scale Weight Check included in the BDR? **Reference Source: CCP Technical Procedures**			X	Scale not used

Comments: **NONE**

The container QC checks were properly performed and meet the Quality Assurance Objectives (QAOs). Proper procedures were followed during data reduction and analysis. The batch is complete, acceptable, and includes all supporting data and documentation required by the QAPjP.

Rick Whiteley	Rick Whiteley	01/06/2016
SPM Printed Name	Signature	Date

Checklist is to be re-signed only when a re-review is performed.

SPM Printed Name	Signature	Reason	Date
SPM Printed Name	Signature	Reason	Date

Attachment 5–CCP Radiography Batch Data Report Cover Sheet

Site ID: ORNL

Batch Data Report No.: OR-RTR6-0706 ☑ CH ☐ RH Date: 12-14-15

Waste Container ID Numbers	
Replicate Scan:	X10C1351199
Independent Observation:	X10C1351015
1	X10C1351015
2	X10C1351175
3	X10C1351194
4	X10C1351198
5	X10C1351024
6	X10C1351187
7	X10C1351145
8	X10C1351199
9	X10C1351203
10	X10C1351202
11	X10C1351185
12	X10C1351184
13	X10C1351186
14	X10C1351189
15	X10C1351190
16	X10C1351146
17	X10C1351201
18	X10C1351171
19	X10C1351178
20	X10C1351191

RTR Operator:

Eric Lyles — Printed Name

Signature

12-14-15 — Date

Independent Technical Reviewer:

AARON ELLIOTT — Printed Name

Signature

1/4/16 — Date

NTPC RECORDS ORIGINAL
DATE REC'D 1/4/16

Attachment 4 – CCP Radiography Batch Data Report Table of Contents and Batch Narrative

Batch Data Report No.: OR-RTR6-0706 Date: 12-14-15

Table Of Contents

Item	Description	Page No.
1	CCP Radiography Batch Data Report Cover Sheet	1
2	CCP Radiography Batch Data Report Table Of Contents	2
3	CCP RTR Measurement Control Report	3
4	CCP Radiography Data Sheets	4
5	Copy of NCRs (NA, If Not Applicable)	N/A
6	CCP Independent Technical Reviewer Checklist	70

Batch Narrative

All Quality Checks were performed and recorded on CCP-TP-053, Rev.15, CCP Radiography Measurement Control Report.

Eric Lyles — RTR Operator

Signature

12-14-15 — Date

2

Attachment 1 – CCP RTR Measurement Control Report

Site ID: ORNL		
Batch Data Report No.: OR-RTR6-0706		
Examination Date: 12-14-15		
Control Checks		
Video/Audio Recorded Media System Check	☑ SAT	☐ UNSAT
Image Test : 10 Lines (Minimum acceptable is 5 lines-pair/cm or #6 Sieve is viewable)	☑ SAT	☐ UNSAT
Comments: N/A		
RTR Operator:		
Eric Lyles (Printed Name)	(Signature)	12-14-15 (Date)

3

CCP Radiography Data Sheet

Section 1: General Information	
☐ RTR Examination ☒ RTR Replicate Scan ☐ RTR Independent Observation	
Site ID:	ORNL
Batch Number:	OR-RTR6-0706
Examination Date:	12/14/2015
Waste Container ID:	X10C1351199
Video/Audio Recorded Media Number:	OR-RTR6-0706 A&B
Procedure and Revision No.:	CCP-TP-053 Rev. 15
NCR(s) associated with the container? (e.g., Prohibited Items)	☒ No ☐ Yes NCR No.: N/A NCR No.: N/A

Section 2: Waste Container Data	
Container Type:	55 Gallon Drum
TRUCON Code:	OR 227
Waste Matrix Code:	S4100
Waste Stream I.D.:	OR-NFS-CH-SOIL
Waste Container Weights:	Gross Wt.: 228.2 kg Tare Wt.: 35.2 kg Net Wt.: 193.0 kg
Rigid Liner and Liner Vent Description:	Liner: ☐ No ☒ Yes Lid: ☒ No ☐ Yes Type: ☐ 30-mil ☒ 90-mil ☐ 110-mil ☐ 125-mil Vented: ☐ No ☒ Yes ☐ N/A Punctured: ☒ No ☐ Yes Mechanical Vent: ☒ No ☐ Yes Fiberboard Liner: ☒ No ☐ Yes Lead Lined: ☒ No ☐ Yes
Number of Layers of Confinement:	Appears to be 1 layer
Volume Utilization Percentage:	90 %

CCP Radiography Data Sheet

Waste Container ID: X10C1351199

Section 3: Container Inventory and Comments (Detailed descriptions)	
IM:	
AM:	
OM:	
OI:	
C:	
R:	
XPM:	Plastic Sheeting
OR:	Absorbent
IN:	
S:	Soil

Section 4: Packaging Material and Waste Material Parameters	
Packaging Material:	**Estimated Weight (kg)**
Steel (ST):	27.8
Plastics (PP): Liner bag, Rigid Liner	7.4
Other:	0.0
Total Packaging Weight	35.2
Waste Material Parameter:	**Estimated Weight (kg)**
Iron-based Metal / Alloys (IM):	
Aluminum-based Metals / Alloys (AM):	
Other Metals (OM):	
Other Inorganic Materials (OI)	
Cellulosics (C):	
Rubber (R):	
Plastics (waste materials) (XPM):	1.0
Organic Matrix (OR):	2.0
Inorganic Matrix (IN):	
Soils (S):	190.0
Total WMP Weight:	193.0

CCP Radiography Data Sheet

Waste Container ID: X10C1351199

Section 5: RTR Summary (Questions answered "Yes" will be explained in the Comment block, except for Question 1)	
Is there observable liquid?	☐ Yes ☒ No
Is there any observable liquid in internal containers, more than 60 milliliters or 3 percent by volume, whichever is greater?	☐ Yes ☒ No
Is the total volume of observable liquid in the outermost container GREATER than 1% of the container?	☐ Yes ☒ No
Is there observable liquid in payload containers with an EPA Hazardous Waste Number of U134?	☐ Yes ☒ No
Is there an indication of non-radionuclide pyrophoric materials, such as elemental potassium?	☐ Yes ☒ No
Is there an indication of hazardous wastes not occurring as co-contaminants with TRU mixed wastes (non-mixed hazardous wastes)?	☐ Yes ☒ No
Is there an indication of wastes incompatible with backfill, seal and panel closures materials, container and packaging materials, shipping container materials, or other wastes (i.e., waste does NOT match TRUCON Code[s])?	☐ Yes ☒ No
Is there an indication of wastes containing explosives or compressed gases?	☐ Yes ☒ No
Is there an indication of PCBs liquids?	☐ Yes ☒ No
Is there an indication of the waste exhibiting the characteristic of ignitability, corrosivity, or reactivity (EPA Hazardous Waste Numbers of D001, D002, or D003)?	☐ Yes ☒ No
Is the physical form of the waste inconsistent with the Waste Stream Description or the Waste Matrix Code?	☐ Yes ☒ No
CH or RH TRAMPAC	
Are there heat-sealed bags (unvented) GREATER than 4 liters and LESS than 390 square inches in the waste, or heat sealed bags not authorized in the RH TRUCON Code?	☐ Yes ☒ No
Were there Non-approved Closure Methods used on liner bags or inner bags greater than 4 liters?	☐ Yes ☒ No
Are there sealed containers GREATER than 4 liters?	☐ Yes ☒ No
Are there indications of inadequate protection for heavy and/or sharp objects?	☐ Yes ☒ No

Comments: This Replicate Scan Agrees with the Original Scan. FO 12-14-15

RTR Operator:

Fred Oney		12/14/2015
Print Name	Signature	Date

CCP Radiography Data Sheet

Section 1: General Information	
☐ RTR Examination ☐ RTR Replicate Scan ☒ RTR Independent Observation	
Site ID:	ORNL
Batch Number:	OR-RTR6-0706
Examination Date:	12/14/2015
Waste Container ID:	X10C1351015
Video/Audio Recorded Media Number:	OR-RTR6-0706 A&B
Procedure and Revision No.:	CCP-TP-053 Rev. 15
NCR(s) associated with the container? (e.g., Prohibited Items)	☒ No ☐ Yes NCR No.: N/A NCR No.: N/A

Section 2: Waste Container Data	
Container Type:	55 Gallon Drum
TRUCON Code:	OR 227
Waste Matrix Code:	S4100
Waste Stream I.D.:	OR-NFS-CH-SOIL
Waste Container Weights:	Gross Wt.: 220.3 kg Tare Wt.: 35.2 kg Net Wt.: 185.1 kg
Rigid Liner and Liner Vent Description:	Liner: ☐ No ☒ Yes Lid: ☒ No ☐ Yes Type: ☐ 30-mil ☒ 90-mil ☐ 110-mil ☐ 125-mil Vented: ☐ No ☒ Yes ☐ N/A Punctured: ☒ No ☐ Yes Mechanical Vent: ☒ No ☐ Yes Fiberboard Liner: ☒ No ☐ Yes Lead Lined: ☒ No ☐ Yes
Number of Layers of Confinement:	Appears to be 1 layer
Volume Utilization Percentage:	85 %

CCP Radiography Data Sheet

Waste Container ID: X10C1351015

Section 3: Container Inventory and Comments (Detailed descriptions)
IM:
AM:
OM:
OI:
C:
R:
XPM:
OR: Absorbent
IN:
S: Soil

Section 4: Packaging Material and Waste Material Parameters	
Packaging Material:	**Estimated Weight (kg)**
Steel (ST):	27.8
Plastics (PP): Liner bag, Rigid Liner	7.4
Other:	0.0
Total Packaging Weight	35.2
Waste Material Parameter:	**Estimated Weight (kg)**
Iron-based Metal / Alloys (IM):	
Aluminum-based Metals / Alloys (AM):	
Other Metals (OM):	
Other Inorganic Materials (OI)	
Cellulosics (C):	
Rubber (R):	
Plastics (waste materials) (XPM):	
Organic Matrix (OR):	2.0
Inorganic Matrix (IN):	
Soils (S):	183.1
Total WMP Weight:	185.1

CCP Radiography Data Sheet

Waste Container ID: X10C1351015

Section 5: RTR Summary (Questions answered "Yes" will be explained in the Comment block, except for Question 1)	
Is there observable liquid?	☐ Yes ☒ No
Is there any observable liquid in internal containers, more than 60 milliliters or 3 percent by volume, whichever is greater?	☐ Yes ☒ No
Is the total volume of observable liquid in the outermost container GREATER than 1% of the container?	☐ Yes ☒ No
Is there observable liquid in payload containers with an EPA Hazardous Waste Number of U134?	☐ Yes ☒ No
Is there an indication of non-radionuclide pyrophoric materials, such as elemental potassium?	☐ Yes ☒ No
Is there an indication of hazardous wastes not occurring as co-contaminants with TRU mixed wastes (non-mixed hazardous wastes)?	☐ Yes ☒ No
Is there an indication of wastes incompatible with backfill, seal and panel closures materials, container and packaging materials, shipping container materials, or other wastes (i.e., waste does NOT match TRUCON Code[s])?	☐ Yes ☒ No
Is there an indication of wastes containing explosives or compressed gases?	☐ Yes ☒ No
Is there an indication of PCBs liquids?	☐ Yes ☒ No
Is there an indication of the waste exhibiting the characteristic of ignitability, corrosivity, or reactivity (EPA Hazardous Waste Numbers of D001, D002, or D003)?	☐ Yes ☒ No
Is the physical form of the waste inconsistent with the Waste Stream Description or the Waste Matrix Code?	☐ Yes ☒ No
CH or RH TRAMPAC	
Are there heat-sealed bags (unvented) GREATER than 4 liters and LESS than 390 square inches in the waste, or heat sealed bags not authorized in the RH TRUCON Code?	☐ Yes ☒ No
Were there Non-approved Closure Methods used on liner bags or inner bags greater than 4 liters?	☐ Yes ☒ No
Are there sealed containers GREATER than 4 liters?	☐ Yes ☒ No
Are there indications of inadequate protection for heavy and/or sharp objects?	☐ Yes ☒ No

Comments: This Independent Observation agrees With the Original Scan.

FO 12-14-15

RTR Operator:

Fred Oney	FO	12/14/2015
Print Name	Signature	Date

CCP Radiography Data Sheet

Section 1: General Information	
[X] RTR Examination [ ] RTR Replicate Scan [ ] RTR Independent Observation	
Site ID:	ORNL
Batch Number:	OR-RTR6-0706
Examination Date:	12/14/2015
Waste Container ID:	X10C1351015
Video/Audio Recorded Media Number:	OR-RTR6-0706 A&B
Procedure and Revision No.:	CCP-TP-053 Rev. 15
NCR(s) associated with the container? (e.g., Prohibited Items)	[X] No [ ] Yes NCR No.: N/A NCR No.: N/A

Section 2: Waste Container Data	
Container Type:	55 Gallon Drum
TRUCON Code:	OR 227
Waste Matrix Code:	S4100
Waste Stream I.D.:	OR-NFS-CH-SOIL
Waste Container Weights:	Gross Wt.: 220.3 kg Tare Wt.: 35.2 kg Net Wt.: 185.1 kg
Rigid Liner and Liner Vent Description:	Liner: [ ] No [X] Yes Lid: [X] No [ ] Yes Type: [ ] 30-mil [X] 90-mil [ ] 110-mil [ ] 125-mil Vented: [ ] No [X] Yes [ ] N/A Punctured: [X] No [ ] Yes Mechanical Vent: [X] No [ ] Yes Fiberboard Liner: [X] No [ ] Yes Lead Lined: [X] No [ ] Yes
Number of Layers of Confinement:	Appears to be 1 layer
Volume Utilization Percentage:	85 %

CCP Radiography Data Sheet

Waste Container ID: X10C1351015

Section 3: Container Inventory and Comments (Detailed descriptions)
IM:
AM:
OM:
OI:
C:
R:
XPM:
OR: Absorbent
IN:
S: Soil

Section 4: Packaging Material and Waste Material Parameters	
Packaging Material:	**Estimated Weight (kg)**
Steel (ST):	27.8
Plastics (PP): Liner bag, Rigid Liner	7.4
Other:	0.0
Total Packaging Weight	35.2
Waste Material Parameter:	**Estimated Weight (kg)**
Iron-based Metal / Alloys (IM):	
Aluminum-based Metals / Alloys (AM):	
Other Metals (OM):	
Other Inorganic Materials (OI)	
Cellulosics (C):	
Rubber (R):	
Plastics (waste materials) (XPM):	
Organic Matrix (OR):	2.0
Inorganic Matrix (IN):	
Soils (S):	183.1
Total WMP Weight:	185.1

CCP Radiography Data Sheet

Waste Container ID: X10C1351015

Section 5: RTR Summary (Questions answered "Yes" will be explained in the Comment block, except for Question 1)	
Is there observable liquid?	☐ Yes ☒ No
Is there any observable liquid in internal containers, more than 60 milliliters or 3 percent by volume, whichever is greater?	☐ Yes ☒ No
Is the total volume of observable liquid in the outermost container GREATER than 1% of the container?	☐ Yes ☒ No
Is there observable liquid in payload containers with an EPA Hazardous Waste Number of U134?	☐ Yes ☒ No
Is there an indication of non-radionuclide pyrophoric materials, such as elemental potassium?	☐ Yes ☒ No
Is there an indication of hazardous wastes not occurring as co-contaminants with TRU mixed wastes (non-mixed hazardous wastes)?	☐ Yes ☒ No
Is there an indication of wastes incompatible with backfill, seal and panel closures materials, container and packaging materials, shipping container materials, or other wastes (i.e., waste does NOT match TRUCON Code[s])?	☐ Yes ☒ No
Is there an indication of wastes containing explosives or compressed gases?	☐ Yes ☒ No
Is there an indication of PCBs liquids?	☐ Yes ☒ No
Is there an indication of the waste exhibiting the characteristic of ignitability, corrosivity, or reactivity (EPA Hazardous Waste Numbers of D001, D002, or D003)?	☐ Yes ☒ No
Is the physical form of the waste inconsistent with the Waste Stream Description or the Waste Matrix Code?	☐ Yes ☒ No
CH or RH TRAMPAC	
Are there heat-sealed bags (unvented) GREATER than 4 liters and LESS than 390 square inches in the waste, or heat sealed bags not authorized in the RH TRUCON Code?	☐ Yes ☒ No
Were there Non-approved Closure Methods used on liner bags or inner bags greater than 4 liters?	☐ Yes ☒ No
Are there sealed containers GREATER than 4 liters?	☐ Yes ☒ No
Are there indications of inadequate protection for heavy and/or sharp objects?	☐ Yes ☒ No
Comments: N/A	

RTR Operator:

Eric Lyles		12/14/2015
Print Name	Signature	Date

CCP Radiography Data Sheet

Section 1: General Information	
[X] RTR Examination [ ] RTR Replicate Scan [ ] RTR Independent Observation	
Site ID:	ORNL
Batch Number:	OR-RTR6-0706
Examination Date:	12/14/2015
Waste Container ID:	X10C1351175
Video/Audio Recorded Media Number:	OR-RTR6-0706 A&B
Procedure and Revision No.:	CCP-TP-053 Rev. 15
NCR(s) associated with the container? (e.g., Prohibited Items)	[X] No [ ] Yes NCR No.: N/A NCR No.: N/A

Section 2: Waste Container Data	
Container Type:	55 Gallon Drum
TRUCON Code:	OR 227
Waste Matrix Code:	S4100
Waste Stream I.D.:	OR-NFS-CH-SOIL
Waste Container Weights:	Gross Wt.: 218.9 kg Tare Wt.: 35.2 kg Net Wt.: 183.7 kg
Rigid Liner and Liner Vent Description:	Liner: [ ] No [X] Yes Lid: [X] No [ ] Yes Type: [ ] 30-mil [X] 90-mil [ ] 110-mil [ ] 125-mil Vented: [ ] No [X] Yes [ ] N/A Punctured: [X] No [ ] Yes Mechanical Vent: [X] No [ ] Yes Fiberboard Liner: [X] No [ ] Yes Lead Lined: [X] No [ ] Yes
Number of Layers of Confinement:	Appears to be 1 layer
Volume Utilization Percentage:	85 %

CCP Radiography Data Sheet

Waste Container ID: X10C1351175

Section 3: Container Inventory and Comments (Detailed descriptions)

IM:

AM:

OM:

OI:

C:

R:

XPM:

OR: Absorbent

IN:

S: Soil

Section 4: Packaging Material and Waste Material Parameters

Packaging Material:	**Estimated Weight (kg)**
Steel (ST):	27.8
Plastics (PP): Liner bag, Rigid Liner	7.4
Other:	0.0
Total Packaging Weight	35.2
Waste Material Parameter:	**Estimated Weight (kg)**
Iron-based Metal / Alloys (IM):	
Aluminum-based Metals / Alloys (AM):	
Other Metals (OM):	
Other Inorganic Materials (OI)	
Cellulosics (C):	
Rubber (R):	
Plastics (waste materials) (XPM):	
Organic Matrix (OR):	3.0
Inorganic Matrix (IN):	
Soils (S):	180.7
Total WMP Weight:	183.7

CCP Radiography Data Sheet

Waste Container ID: X10C1351175

Section 5: RTR Summary (Questions answered "Yes" will be explained in the Comment block, except for Question 1)	
Is there observable liquid?	☐ Yes ☒ No
Is there any observable liquid in internal containers, more than 60 milliliters or 3 percent by volume, whichever is greater?	☐ Yes ☒ No
Is the total volume of observable liquid in the outermost container GREATER than 1% of the container?	☐ Yes ☒ No
Is there observable liquid in payload containers with an EPA Hazardous Waste Number of U134?	☐ Yes ☒ No
Is there an indication of non-radionuclide pyrophoric materials, such as elemental potassium?	☐ Yes ☒ No
Is there an indication of hazardous wastes not occurring as co-contaminants with TRU mixed wastes (non-mixed hazardous wastes)?	☐ Yes ☒ No
Is there an indication of wastes incompatible with backfill, seal and panel closures materials, container and packaging materials, shipping container materials, or other wastes (i.e., waste does NOT match TRUCON Code[s])?	☐ Yes ☒ No
Is there an indication of wastes containing explosives or compressed gases?	☐ Yes ☒ No
Is there an indication of PCBs liquids?	☐ Yes ☒ No
Is there an indication of the waste exhibiting the characteristic of ignitability, corrosivity, or reactivity (EPA Hazardous Waste Numbers of D001, D002, or D003)?	☐ Yes ☒ No
Is the physical form of the waste inconsistent with the Waste Stream Description or the Waste Matrix Code?	☐ Yes ☒ No
CH or RH TRAMPAC	
Are there heat-sealed bags (unvented) GREATER than 4 liters and LESS than 390 square inches in the waste, or heat sealed bags not authorized in the RH TRUCON Code?	☐ Yes ☒ No
Were there Non-approved Closure Methods used on liner bags or inner bags greater than 4 liters?	☐ Yes ☒ No
Are there sealed containers GREATER than 4 liters?	☐ Yes ☒ No
Are there indications of inadequate protection for heavy and/or sharp objects?	☐ Yes ☒ No
Comments: N/A	

RTR Operator:

Eric Lyles		12/14/2015
Print Name	Signature	Date

CCP Radiography Data Sheet

Section 1: General Information	
[X] RTR Examination [ ] RTR Replicate Scan [ ] RTR Independent Observation	
Site ID:	ORNL
Batch Number:	OR-RTR6-0706
Examination Date:	12/14/2015
Waste Container ID:	X10C1351194
Video/Audio Recorded Media Number:	OR-RTR6-0706 A&B
Procedure and Revision No.:	CCP-TP-053 Rev. 15
NCR(s) associated with the container? (e.g., Prohibited Items)	[X] No [ ] Yes NCR No.: N/A NCR No.: N/A

Section 2: Waste Container Data	
Container Type:	55 Gallon Drum
TRUCON Code:	OR 227
Waste Matrix Code:	S4100
Waste Stream I.D.:	OR-NFS-CH-SOIL
Waste Container Weights:	Gross Wt.: 245.4 kg Tare Wt.: 35.2 kg Net Wt.: 210.2 kg
Rigid Liner and Liner Vent Description:	Liner: [ ] No [X] Yes Lid: [X] No [ ] Yes Type: [ ] 30-mil [X] 90-mil [ ] 110-mil [ ] 125-mil Vented: [ ] No [X] Yes [ ] N/A Punctured: [X] No [ ] Yes Mechanical Vent: [X] No [ ] Yes Fiberboard Liner: [X] No [ ] Yes Lead Lined: [X] No [ ] Yes
Number of Layers of Confinement:	Appears to be 1 layer
Volume Utilization Percentage:	95 %

CCP Radiography Data Sheet

Waste Container ID: X10C1351194

Section 3: Container Inventory and Comments (Detailed descriptions)
IM:
AM:
OM:
OI:
C:
R:
XPM:
OR: Absorbent
IN:
S: Soil

Section 4: Packaging Material and Waste Material Parameters	
Packaging Material:	**Estimated Weight (kg)**
Steel (ST):	27.8
Plastics (PP): Liner bag, Rigid Liner	7.4
Other:	0.0
Total Packaging Weight	35.2
Waste Material Parameter:	**Estimated Weight (kg)**
Iron-based Metal / Alloys (IM):	
Aluminum-based Metals / Alloys (AM):	
Other Metals (OM):	
Other Inorganic Materials (OI)	
Cellulosics (C):	
Rubber (R):	
Plastics (waste materials) (XPM):	
Organic Matrix (OR):	2.0
Inorganic Matrix (IN):	
Soils (S):	208.2
Total WMP Weight:	210.2

CCP Radiography Data Sheet

Waste Container ID: X10C1351194

Section 5: RTR Summary (Questions answered "Yes" will be explained in the Comment block, except for Question 1)	
Is there observable liquid?	☐ Yes ☒ No
Is there any observable liquid in internal containers, more than 60 milliliters or 3 percent by volume, whichever is greater?	☐ Yes ☒ No
Is the total volume of observable liquid in the outermost container GREATER than 1% of the container?	☐ Yes ☒ No
Is there observable liquid in payload containers with an EPA Hazardous Waste Number of U134?	☐ Yes ☒ No
Is there an indication of non-radionuclide pyrophoric materials, such as elemental potassium?	☐ Yes ☒ No
Is there an indication of hazardous wastes not occurring as co-contaminants with TRU mixed wastes (non-mixed hazardous wastes)?	☐ Yes ☒ No
Is there an indication of wastes incompatible with backfill, seal and panel closures materials, container and packaging materials, shipping container materials, or other wastes (i.e., waste does NOT match TRUCON Code[s])?	☐ Yes ☒ No
Is there an indication of wastes containing explosives or compressed gases?	☐ Yes ☒ No
Is there an indication of PCBs liquids?	☐ Yes ☒ No
Is there an indication of the waste exhibiting the characteristic of ignitability, corrosivity, or reactivity (EPA Hazardous Waste Numbers of D001, D002, or D003)?	☐ Yes ☒ No
Is the physical form of the waste inconsistent with the Waste Stream Description or the Waste Matrix Code?	☐ Yes ☒ No
CH or RH TRAMPAC	
Are there heat-sealed bags (unvented) GREATER than 4 liters and LESS than 390 square inches in the waste, or heat sealed bags not authorized in the RH TRUCON Code?	☐ Yes ☒ No
Were there Non-approved Closure Methods used on liner bags or inner bags greater than 4 liters?	☐ Yes ☒ No
Are there sealed containers GREATER than 4 liters?	☐ Yes ☒ No
Are there indications of inadequate protection for heavy and/or sharp objects?	☐ Yes ☒ No
Comments: N/A	

RTR Operator:

Eric Lyles		12/14/2015
Print Name	Signature	Date

CCP Radiography Data Sheet

Section 1: General Information	
[X] RTR Examination [ ] RTR Replicate Scan [ ] RTR Independent Observation	
Site ID:	ORNL
Batch Number:	OR-RTR6-0706
Examination Date:	12/14/2015
Waste Container ID:	X10C1351198
Video/Audio Recorded Media Number:	OR-RTR6-0706 A&B
Procedure and Revision No.:	CCP-TP-053 Rev. 15
NCR(s) associated with the container? (e.g., Prohibited Items)	[X] No [ ] Yes NCR No.: N/A NCR No.: N/A

Section 2: Waste Container Data	
Container Type:	55 Gallon Drum
TRUCON Code:	OR 227
Waste Matrix Code:	S4100
Waste Stream I.D.:	OR-NFS-CH-SOIL
Waste Container Weights:	Gross Wt.: 214.9 kg Tare Wt.: 35.2 kg Net Wt.: 179.7 kg
Rigid Liner and Liner Vent Description:	Liner: [ ] No [X] Yes Lid: [X] No [ ] Yes Type: [ ] 30-mil [X] 90-mil [ ] 110-mil [ ] 125-mil Vented: [ ] No [X] Yes [ ] N/A Punctured: [X] No [ ] Yes Mechanical Vent: [X] No [ ] Yes Fiberboard Liner: [X] No [ ] Yes Lead Lined: [X] No [ ] Yes
Number of Layers of Confinement:	Appears to be 1 layer
Volume Utilization Percentage:	80 %

CCP Radiography Data Sheet

Waste Container ID: X10C1351198

Section 3: Container Inventory and Comments (Detailed descriptions)
IM:
AM:
OM:
OI:
C:
R:
XPM:
OR: Absorbent
IN:
S: Soil

Section 4: Packaging Material and Waste Material Parameters	
Packaging Material:	**Estimated Weight (kg)**
Steel (ST):	27.8
Plastics (PP): Liner bag, Rigid Liner	7.4
Other:	0.0
Total Packaging Weight	35.2
Waste Material Parameter:	**Estimated Weight (kg)**
Iron-based Metal / Alloys (IM):	
Aluminum-based Metals / Alloys (AM):	
Other Metals (OM):	
Other Inorganic Materials (OI)	
Cellulosics (C):	
Rubber (R):	
Plastics (waste materials) (XPM):	
Organic Matrix (OR):	3.0
Inorganic Matrix (IN):	
Soils (S):	176.7
Total WMP Weight:	179.7

CCP Radiography Data Sheet

Waste Container ID: X10C1351198

Section 5: RTR Summary (Questions answered "Yes" will be explained in the Comment block, except for Question 1)	
Is there observable liquid?	☐ Yes ☒ No
Is there any observable liquid in internal containers, more than 60 milliliters or 3 percent by volume, whichever is greater?	☐ Yes ☒ No
Is the total volume of observable liquid in the outermost container GREATER than 1% of the container?	☐ Yes ☒ No
Is there observable liquid in payload containers with an EPA Hazardous Waste Number of U134?	☐ Yes ☒ No
Is there an indication of non-radionuclide pyrophoric materials, such as elemental potassium?	☐ Yes ☒ No
Is there an indication of hazardous wastes not occurring as co-contaminants with TRU mixed wastes (non-mixed hazardous wastes)?	☐ Yes ☒ No
Is there an indication of wastes incompatible with backfill, seal and panel closures materials, container and packaging materials, shipping container materials, or other wastes (i.e., waste does NOT match TRUCON Code[s])?	☐ Yes ☒ No
Is there an indication of wastes containing explosives or compressed gases?	☐ Yes ☒ No
Is there an indication of PCBs liquids?	☐ Yes ☒ No
Is there an indication of the waste exhibiting the characteristic of ignitability, corrosivity, or reactivity (EPA Hazardous Waste Numbers of D001, D002, or D003)?	☐ Yes ☒ No
Is the physical form of the waste inconsistent with the Waste Stream Description or the Waste Matrix Code?	☐ Yes ☒ No
CH or RH TRAMPAC	
Are there heat-sealed bags (unvented) GREATER than 4 liters and LESS than 390 square inches in the waste, or heat sealed bags not authorized in the RH TRUCON Code?	☐ Yes ☒ No
Were there Non-approved Closure Methods used on liner bags or inner bags greater than 4 liters?	☐ Yes ☒ No
Are there sealed containers GREATER than 4 liters?	☐ Yes ☒ No
Are there indications of inadequate protection for heavy and/or sharp objects?	☐ Yes ☒ No
Comments: N/A	

RTR Operator:

Eric Lyles		12/14/2015
Print Name	Signature	Date

CCP Radiography Data Sheet

Section 1: General Information		
[X] RTR Examination	[ ] RTR Replicate Scan	[ ] RTR Independent Observation
Site ID:	ORNL	
Batch Number:	OR-RTR6-0706	
Examination Date:	12/14/2015	
Waste Container ID:	X10C1351024	
Video/Audio Recorded Media Number:	OR-RTR6-0706	A&B
Procedure and Revision No.:	CCP-TP-053	Rev. 15
NCR(s) associated with the container? (e.g., Prohibited Items)	[X] No [ ] Yes NCR No.: N/A NCR No.: N/A	

Section 2: Waste Container Data	
Container Type:	55 Gallon Drum
TRUCON Code:	OR 227
Waste Matrix Code:	S4100
Waste Stream I.D.:	OR-NFS-CH-SOIL
Waste Container Weights:	Gross Wt.: 247.3 kg Tare Wt.: 35.2 kg Net Wt.: 212.1 kg
Rigid Liner and Liner Vent Description:	Liner: [ ] No [X] Yes Lid: [X] No [ ] Yes Type: [ ] 30-mil [X] 90-mil [ ] 110-mil [ ] 125-mil Vented: [ ] No [X] Yes [ ] N/A Punctured: [X] No [ ] Yes Mechanical Vent: [X] No [ ] Yes Fiberboard Liner: [X] No [ ] Yes Lead Lined: [X] No [ ] Yes
Number of Layers of Confinement:	Appears to be 1 layer
Volume Utilization Percentage:	90 %

CCP Radiography Data Sheet

Waste Container ID: X10C1351024

Section 3: Container Inventory and Comments (Detailed descriptions)	
IM:	
AM:	
OM:	
OI:	
C:	
R:	
XPM:	
OR:	Absorbent
IN:	
S:	Soil

Section 4: Packaging Material and Waste Material Parameters	
Packaging Material:	**Estimated Weight (kg)**
Steel (ST):	27.8
Plastics (PP): Liner bag, Rigid Liner	7.4
Other:	0.0
Total Packaging Weight	35.2
Waste Material Parameter:	**Estimated Weight (kg)**
Iron-based Metal / Alloys (IM):	
Aluminum-based Metals / Alloys (AM):	
Other Metals (OM):	
Other Inorganic Materials (OI)	
Cellulosics (C):	
Rubber (R):	
Plastics (waste materials) (XPM):	
Organic Matrix (OR):	2.0
Inorganic Matrix (IN):	
Soils (S):	210.1
Total WMP Weight:	212.1

CCP Radiography Data Sheet

Waste Container ID: X10C1351024

Section 5: RTR Summary (Questions answered "Yes" will be explained in the Comment block, except for Question 1)	
Is there observable liquid?	☐ Yes ☒ No
Is there any observable liquid in internal containers, more than 60 milliliters or 3 percent by volume, whichever is greater?	☐ Yes ☒ No
Is the total volume of observable liquid in the outermost container GREATER than 1% of the container?	☐ Yes ☒ No
Is there observable liquid in payload containers with an EPA Hazardous Waste Number of U134?	☐ Yes ☒ No
Is there an indication of non-radionuclide pyrophoric materials, such as elemental potassium?	☐ Yes ☒ No
Is there an indication of hazardous wastes not occurring as co-contaminants with TRU mixed wastes (non-mixed hazardous wastes)?	☐ Yes ☒ No
Is there an indication of wastes incompatible with backfill, seal and panel closures materials, container and packaging materials, shipping container materials, or other wastes (i.e., waste does NOT match TRUCON Code[s])?	☐ Yes ☒ No
Is there an indication of wastes containing explosives or compressed gases?	☐ Yes ☒ No
Is there an indication of PCBs liquids?	☐ Yes ☒ No
Is there an indication of the waste exhibiting the characteristic of ignitability, corrosivity, or reactivity (EPA Hazardous Waste Numbers of D001, D002, or D003)?	☐ Yes ☒ No
Is the physical form of the waste inconsistent with the Waste Stream Description or the Waste Matrix Code?	☐ Yes ☒ No
CH or RH TRAMPAC	
Are there heat-sealed bags (unvented) GREATER than 4 liters and LESS than 390 square inches in the waste, or heat sealed bags not authorized in the RH TRUCON Code?	☐ Yes ☒ No
Were there Non-approved Closure Methods used on liner bags or inner bags greater than 4 liters?	☐ Yes ☒ No
Are there sealed containers GREATER than 4 liters?	☐ Yes ☒ No
Are there indications of inadequate protection for heavy and/or sharp objects?	☐ Yes ☒ No
Comments: N/A	

RTR Operator:

Eric Lyles		12/14/2015
Print Name	Signature	Date

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CCP Radiography Data Sheet

Section 1: General Information	
[X] RTR Examination [ ] RTR Replicate Scan [ ] RTR Independent Observation	
Site ID:	ORNL
Batch Number:	OR-RTR6-0706
Examination Date:	12/14/2015
Waste Container ID:	X10C1351187
Video/Audio Recorded Media Number:	OR-RTR6-0706 A&B
Procedure and Revision No.:	CCP-TP-053 Rev. 15
NCR(s) associated with the container? (e.g., Prohibited Items)	[X] No [ ] Yes NCR No.: N/A NCR No.: N/A

Section 2: Waste Container Data	
Container Type:	55 Gallon Drum
TRUCON Code:	OR 227
Waste Matrix Code:	S4100
Waste Stream I.D.:	OR-NFS-CH-SOIL
Waste Container Weights:	Gross Wt.: 233.8 kg Tare Wt.: 35.2 kg Net Wt.: 198.6 kg
Rigid Liner and Liner Vent Description:	Liner: [ ] No [X] Yes Lid: [X] No [ ] Yes Type: [ ] 30-mil [X] 90-mil [ ] 110-mil [ ] 125-mil Vented: [ ] No [X] Yes [ ] N/A Punctured: [X] No [ ] Yes Mechanical Vent: [X] No [ ] Yes Fiberboard Liner: [X] No [ ] Yes Lead Lined: [X] No [ ] Yes
Number of Layers of Confinement:	Appears to be 1 layer
Volume Utilization Percentage:	85 %

CCP Radiography Data Sheet

Waste Container ID: X10C1351187

Section 3: Container Inventory and Comments (Detailed descriptions)	
IM:	
AM:	
OM:	
OI:	
C:	
R:	
XPM:	
OR:	Absorbent
IN:	
S:	Soil

Section 4: Packaging Material and Waste Material Parameters	
Packaging Material:	**Estimated Weight (kg)**
Steel (ST):	27.8
Plastics (PP): Liner bag, Rigid Liner	7.4
Other:	0.0
Total Packaging Weight	35.2
Waste Material Parameter:	**Estimated Weight (kg)**
Iron-based Metal / Alloys (IM):	
Aluminum-based Metals / Alloys (AM):	
Other Metals (OM):	
Other Inorganic Materials (OI)	
Cellulosics (C):	
Rubber (R):	
Plastics (waste materials) (XPM):	
Organic Matrix (OR):	3.0
Inorganic Matrix (IN):	
Soils (S):	195.6
Total WMP Weight:	198.6

CCP Radiography Data Sheet

Waste Container ID: X10C1351187

Section 5: RTR Summary (Questions answered "Yes" will be explained in the Comment block, except for Question 1)	
Is there observable liquid?	☐ Yes ☒ No
Is there any observable liquid in internal containers, more than 60 milliliters or 3 percent by volume, whichever is greater?	☐ Yes ☒ No
Is the total volume of observable liquid in the outermost container GREATER than 1% of the container?	☐ Yes ☒ No
Is there observable liquid in payload containers with an EPA Hazardous Waste Number of U134?	☐ Yes ☒ No
Is there an indication of non-radionuclide pyrophoric materials, such as elemental potassium?	☐ Yes ☒ No
Is there an indication of hazardous wastes not occurring as co-contaminants with TRU mixed wastes (non-mixed hazardous wastes)?	☐ Yes ☒ No
Is there an indication of wastes incompatible with backfill, seal and panel closures materials, container and packaging materials, shipping container materials, or other wastes (i.e., waste does NOT match TRUCON Code[s])?	☐ Yes ☒ No
Is there an indication of wastes containing explosives or compressed gases?	☐ Yes ☒ No
Is there an indication of PCBs liquids?	☐ Yes ☒ No
Is there an indication of the waste exhibiting the characteristic of ignitability, corrosivity, or reactivity (EPA Hazardous Waste Numbers of D001, D002, or D003)?	☐ Yes ☒ No
Is the physical form of the waste inconsistent with the Waste Stream Description or the Waste Matrix Code?	☐ Yes ☒ No
CH or RH TRAMPAC	
Are there heat-sealed bags (unvented) GREATER than 4 liters and LESS than 390 square inches in the waste, or heat sealed bags not authorized in the RH TRUCON Code?	☐ Yes ☒ No
Were there Non-approved Closure Methods used on liner bags or inner bags greater than 4 liters?	☐ Yes ☒ No
Are there sealed containers GREATER than 4 liters?	☐ Yes ☒ No
Are there indications of inadequate protection for heavy and/or sharp objects?	☐ Yes ☒ No
Comments: N/A	

RTR Operator:

Eric Lyles		12/14/2015
Print Name	Signature	Date

CCP Radiography Data Sheet

Section 1: General Information		
[X] RTR Examination	[ ] RTR Replicate Scan	[ ] RTR Independent Observation
Site ID:	ORNL	
Batch Number:	OR-RTR6-0706	
Examination Date:	12/14/2015	
Waste Container ID:	X10C1351145	
Video/Audio Recorded Media Number:	OR-RTR6-0706	A&B
Procedure and Revision No.:	CCP-TP-053	Rev. 15
NCR(s) associated with the container? (e.g., Prohibited Items)	[X] No [ ] Yes NCR No.: N/A NCR No.: N/A	

Section 2: Waste Container Data	
Container Type:	55 Gallon Drum
TRUCON Code:	OR 227
Waste Matrix Code:	S4100
Waste Stream I.D.:	OR-NFS-CH-SOIL
Waste Container Weights:	Gross Wt.: 227.1 kg Tare Wt.: 35.2 kg Net Wt.: 191.9 kg
Rigid Liner and Liner Vent Description:	Liner: [ ] No [X] Yes Lid: [X] No [ ] Yes Type: [ ] 30-mil [X] 90-mil [ ] 110-mil [ ] 125-mil Vented: [ ] No [X] Yes [ ] N/A Punctured: [X] No [ ] Yes Mechanical Vent: [X] No [ ] Yes Fiberboard Liner: [X] No [ ] Yes Lead Lined: [X] No [ ] Yes
Number of Layers of Confinement:	Appears to be 1 layer
Volume Utilization Percentage:	85 %

CCP Radiography Data Sheet

Waste Container ID: X10C1351145

Section 3: Container Inventory and Comments (Detailed descriptions)
IM:
AM:
OM:
OI:
C:
R:
XPM:
OR: Absorbent
IN:
S: Soil

Section 4: Packaging Material and Waste Material Parameters	
Packaging Material:	**Estimated Weight (kg)**
Steel (ST):	27.8
Plastics (PP): Liner bag, Rigid Liner	7.4
Other:	0.0
Total Packaging Weight	35.2
Waste Material Parameter:	**Estimated Weight (kg)**
Iron-based Metal / Alloys (IM):	
Aluminum-based Metals / Alloys (AM):	
Other Metals (OM):	
Other Inorganic Materials (OI)	
Cellulosics (C):	
Rubber (R):	
Plastics (waste materials) (XPM):	
Organic Matrix (OR):	2.0
Inorganic Matrix (IN):	
Soils (S):	189.9
Total WMP Weight:	191.9

CCP Radiography Data Sheet

Waste Container ID: X10C1351145

Section 5: RTR Summary (Questions answered "Yes" will be explained in the Comment block, except for Question 1)	
Is there observable liquid?	☐ Yes ☒ No
Is there any observable liquid in internal containers, more than 60 milliliters or 3 percent by volume, whichever is greater?	☐ Yes ☒ No
Is the total volume of observable liquid in the outermost container GREATER than 1% of the container?	☐ Yes ☒ No
Is there observable liquid in payload containers with an EPA Hazardous Waste Number of U134?	☐ Yes ☒ No
Is there an indication of non-radionuclide pyrophoric materials, such as elemental potassium?	☐ Yes ☒ No
Is there an indication of hazardous wastes not occurring as co-contaminants with TRU mixed wastes (non-mixed hazardous wastes)?	☐ Yes ☒ No
Is there an indication of wastes incompatible with backfill, seal and panel closures materials, container and packaging materials, shipping container materials, or other wastes (i.e., waste does NOT match TRUCON Code[s])?	☐ Yes ☒ No
Is there an indication of wastes containing explosives or compressed gases?	☐ Yes ☒ No
Is there an indication of PCBs liquids?	☐ Yes ☒ No
Is there an indication of the waste exhibiting the characteristic of ignitability, corrosivity, or reactivity (EPA Hazardous Waste Numbers of D001, D002, or D003)?	☐ Yes ☒ No
Is the physical form of the waste inconsistent with the Waste Stream Description or the Waste Matrix Code?	☐ Yes ☒ No
CH or RH TRAMPAC	
Are there heat-sealed bags (unvented) GREATER than 4 liters and LESS than 390 square inches in the waste, or heat sealed bags not authorized in the RH TRUCON Code?	☐ Yes ☒ No
Were there Non-approved Closure Methods used on liner bags or inner bags greater than 4 liters?	☐ Yes ☒ No
Are there sealed containers GREATER than 4 liters?	☐ Yes ☒ No
Are there indications of inadequate protection for heavy and/or sharp objects?	☐ Yes ☒ No
Comments: N/A	

RTR Operator:

Eric Lyles		12/14/2015
Print Name	Signature	Date

CCP Radiography Data Sheet

CCP-TP-053 Attachment 2

Section 1: General Information	
[X] RTR Examination [ ] RTR Replicate Scan [ ] RTR Independent Observation	
Site ID:	ORNL
Batch Number:	OR-RTR6-0706
Examination Date:	12/14/2015
Waste Container ID:	X10C1351199
Video/Audio Recorded Media Number:	OR-RTR6-0706 A&B
Procedure and Revision No.:	CCP-TP-053 Rev. 15
NCR(s) associated with the container? (e.g., Prohibited Items)	[X] No [ ] Yes NCR No.: N/A NCR No.: N/A

Section 2: Waste Container Data	
Container Type:	55 Gallon Drum
TRUCON Code:	OR 227
Waste Matrix Code:	S4100
Waste Stream I.D.:	OR-NFS-CH-SOIL
Waste Container Weights:	Gross Wt.: 228.2 kg Tare Wt.: 35.2 kg Net Wt.: 193.0 kg
Rigid Liner and Liner Vent Description:	Liner: [ ] No [X] Yes Lid: [X] No [ ] Yes Type: [ ] 30-mil [X] 90-mil [ ] 110-mil [ ] 125-mil Vented: [ ] No [X] Yes [ ] N/A Punctured: [X] No [ ] Yes Mechanical Vent: [X] No [ ] Yes Fiberboard Liner: [X] No [ ] Yes Lead Lined: [X] No [ ] Yes
Number of Layers of Confinement:	Appears to be 1 layer
Volume Utilization Percentage:	90 %

CCP Radiography Data Sheet

Waste Container ID: X10C1351199

Section 3: Container Inventory and Comments (Detailed descriptions)
IM:
AM:
OM:
OI:
C:
R:
XPM: Plastic sheeting
OR: Absorbent
IN:
S: Soil

Section 4: Packaging Material and Waste Material Parameters	
Packaging Material:	**Estimated Weight (kg)**
Steel (ST):	27.8
Plastics (PP): Liner bag, Rigid Liner	7.4
Other:	0.0
Total Packaging Weight	35.2
Waste Material Parameter:	**Estimated Weight (kg)**
Iron-based Metal / Alloys (IM):	
Aluminum-based Metals / Alloys (AM):	
Other Metals (OM):	
Other Inorganic Materials (OI)	
Cellulosics (C):	
Rubber (R):	
Plastics (waste materials) (XPM):	1.0
Organic Matrix (OR):	3.0
Inorganic Matrix (IN):	
Soils (S):	189.0
Total WMP Weight:	193.0

CCP Radiography Data Sheet

Waste Container ID: X10C1351199

Section 5: RTR Summary (Questions answered "Yes" will be explained in the Comment block, except for Question 1)	
Is there observable liquid?	☐ Yes ☒ No
Is there any observable liquid in internal containers, more than 60 milliliters or 3 percent by volume, whichever is greater?	☐ Yes ☒ No
Is the total volume of observable liquid in the outermost container GREATER than 1% of the container?	☐ Yes ☒ No
Is there observable liquid in payload containers with an EPA Hazardous Waste Number of U134?	☐ Yes ☒ No
Is there an indication of non-radionuclide pyrophoric materials, such as elemental potassium?	☐ Yes ☒ No
Is there an indication of hazardous wastes not occurring as co-contaminants with TRU mixed wastes (non-mixed hazardous wastes)?	☐ Yes ☒ No
Is there an indication of wastes incompatible with backfill, seal and panel closures materials, container and packaging materials, shipping container materials, or other wastes (i.e., waste does NOT match TRUCON Code[s])?	☐ Yes ☒ No
Is there an indication of wastes containing explosives or compressed gases?	☐ Yes ☒ No
Is there an indication of PCBs liquids?	☐ Yes ☒ No
Is there an indication of the waste exhibiting the characteristic of ignitability, corrosivity, or reactivity (EPA Hazardous Waste Numbers of D001, D002, or D003)?	☐ Yes ☒ No
Is the physical form of the waste inconsistent with the Waste Stream Description or the Waste Matrix Code?	☐ Yes ☒ No
CH or RH TRAMPAC	
Are there heat-sealed bags (unvented) GREATER than 4 liters and LESS than 390 square inches in the waste, or heat sealed bags not authorized in the RH TRUCON Code?	☐ Yes ☒ No
Were there Non-approved Closure Methods used on liner bags or inner bags greater than 4 liters?	☐ Yes ☒ No
Are there sealed containers GREATER than 4 liters?	☐ Yes ☒ No
Are there indications of inadequate protection for heavy and/or sharp objects?	☐ Yes ☒ No
Comments: N/A	

RTR Operator:

Eric Lyles		12/14/2015
Print Name	Signature	Date

CCP Radiography Data Sheet

Section 1: General Information		
[X] RTR Examination	[ ] RTR Replicate Scan	[ ] RTR Independent Observation
Site ID:	ORNL	
Batch Number:	OR-RTR6-0706	
Examination Date:	12/14/2015	
Waste Container ID:	X10C1351203	
Video/Audio Recorded Media Number:	OR-RTR6-0706	A&B
Procedure and Revision No.:	CCP-TP-053	Rev. 15
NCR(s) associated with the container? (e.g., Prohibited Items)	[X] No [ ] Yes NCR No.: N/A NCR No.: N/A	

Section 2: Waste Container Data	
Container Type:	55 Gallon Drum
TRUCON Code:	OR 227
Waste Matrix Code:	S4100
Waste Stream I.D.:	OR-NFS-CH-SOIL
Waste Container Weights:	Gross Wt.: 247.3 kg Tare Wt.: 35.2 kg Net Wt.: 212.1 kg
Rigid Liner and Liner Vent Description:	Liner: [ ] No [X] Yes Lid: [X] No [ ] Yes Type: [ ] 30-mil [X] 90-mil [ ] 110-mil [ ] 125-mil Vented: [ ] No [X] Yes [ ] N/A Punctured: [X] No [ ] Yes Mechanical Vent: [X] No [ ] Yes Fiberboard Liner: [X] No [ ] Yes Lead Lined: [X] No [ ] Yes
Number of Layers of Confinement:	Appears to be 1 layer
Volume Utilization Percentage:	90 %

CCP Radiography Data Sheet

Waste Container ID: X10C1351203

Section 3: Container Inventory and Comments (Detailed descriptions)

IM:

AM:

OM:

OI:

C:

R:

XPM: Plastic sheeting

OR: Absorbent

IN:

S: Soil

Section 4: Packaging Material and Waste Material Parameters

Packaging Material:	**Estimated Weight (kg)**
Steel (ST):	27.8
Plastics (PP): Liner bag, Rigid Liner	7.4
Other:	0.0
Total Packaging Weight	35.2
Waste Material Parameter:	**Estimated Weight (kg)**
Iron-based Metal / Alloys (IM):	
Aluminum-based Metals / Alloys (AM):	
Other Metals (OM):	
Other Inorganic Materials (OI)	
Cellulosics (C):	
Rubber (R):	
Plastics (waste materials) (XPM):	1.0
Organic Matrix (OR):	3.0
Inorganic Matrix (IN):	
Soils (S):	208.1
Total WMP Weight:	212.1

CCP Radiography Data Sheet

Waste Container ID: X10C1351203

Section 5: RTR Summary (Questions answered "Yes" will be explained in the Comment block, except for Question 1)	
Is there observable liquid?	☐ Yes ☒ No
Is there any observable liquid in internal containers, more than 60 milliliters or 3 percent by volume, whichever is greater?	☐ Yes ☒ No
Is the total volume of observable liquid in the outermost container GREATER than 1% of the container?	☐ Yes ☒ No
Is there observable liquid in payload containers with an EPA Hazardous Waste Number of U134?	☐ Yes ☒ No
Is there an indication of non-radionuclide pyrophoric materials, such as elemental potassium?	☐ Yes ☒ No
Is there an indication of hazardous wastes not occurring as co-contaminants with TRU mixed wastes (non-mixed hazardous wastes)?	☐ Yes ☒ No
Is there an indication of wastes incompatible with backfill, seal and panel closures materials, container and packaging materials, shipping container materials, or other wastes (i.e., waste does NOT match TRUCON Code[s])?	☐ Yes ☒ No
Is there an indication of wastes containing explosives or compressed gases?	☐ Yes ☒ No
Is there an indication of PCBs liquids?	☐ Yes ☒ No
Is there an indication of the waste exhibiting the characteristic of ignitability, corrosivity, or reactivity (EPA Hazardous Waste Numbers of D001, D002, or D003)?	☐ Yes ☒ No
Is the physical form of the waste inconsistent with the Waste Stream Description or the Waste Matrix Code?	☐ Yes ☒ No
CH or RH TRAMPAC	
Are there heat-sealed bags (unvented) GREATER than 4 liters and LESS than 390 square inches in the waste, or heat sealed bags not authorized in the RH TRUCON Code?	☐ Yes ☒ No
Were there Non-approved Closure Methods used on liner bags or inner bags greater than 4 liters?	☐ Yes ☒ No
Are there sealed containers GREATER than 4 liters?	☐ Yes ☒ No
Are there indications of inadequate protection for heavy and/or sharp objects?	☐ Yes ☒ No
Comments: N/A	

RTR Operator:

Eric Lyles		12/14/2015
Print Name	Signature	Date

CCP Radiography Data Sheet

Section 1: General Information	
[X] RTR Examination [ ] RTR Replicate Scan [ ] RTR Independent Observation	
Site ID:	ORNL
Batch Number:	OR-RTR6-0706
Examination Date:	12/14/2015
Waste Container ID:	X10C1351202
Video/Audio Recorded Media Number:	OR-RTR6-0706 A&B
Procedure and Revision No.:	CCP-TP-053 Rev. 15
NCR(s) associated with the container? (e.g., Prohibited Items)	[X] No [ ] Yes NCR No.: N/A NCR No.: N/A

Section 2: Waste Container Data	
Container Type:	55 Gallon Drum
TRUCON Code:	OR 227
Waste Matrix Code:	S4100
Waste Stream I.D.:	OR-NFS-CH-SOIL
Waste Container Weights:	Gross Wt.: 224.9 kg Tare Wt.: 35.2 kg Net Wt.: 189.7 kg
Rigid Liner and Liner Vent Description:	Liner: [ ] No [X] Yes Lid: [X] No [ ] Yes Type: [ ] 30-mil [X] 90-mil [ ] 110-mil [ ] 125-mil Vented: [ ] No [X] Yes [ ] N/A Punctured: [X] No [ ] Yes Mechanical Vent: [X] No [ ] Yes Fiberboard Liner: [X] No [ ] Yes Lead Lined: [X] No [ ] Yes
Number of Layers of Confinement:	Appears to be 1 layer
Volume Utilization Percentage:	80 %

CCP Radiography Data Sheet

Waste Container ID: X10C1351202

Section 3: Container Inventory and Comments (Detailed descriptions)
IM:
AM:
OM:
OI:
C:
R:
XPM:
OR: Absorbent
IN:
S: Soil

Section 4: Packaging Material and Waste Material Parameters	
Packaging Material:	**Estimated Weight (kg)**
Steel (ST):	27.8
Plastics (PP): Liner bag, Rigid Liner	7.4
Other:	0.0
Total Packaging Weight	35.2
Waste Material Parameter:	**Estimated Weight (kg)**
Iron-based Metal / Alloys (IM):	
Aluminum-based Metals / Alloys (AM):	
Other Metals (OM):	
Other Inorganic Materials (OI)	
Cellulosics (C):	
Rubber (R):	
Plastics (waste materials) (XPM):	
Organic Matrix (OR):	2.0
Inorganic Matrix (IN):	
Soils (S):	187.7
Total WMP Weight:	189.7

CCP Radiography Data Sheet

Waste Container ID: X10C1351202

Section 5: RTR Summary (Questions answered "Yes" will be explained in the Comment block, except for Question 1)	
Is there observable liquid?	☐ Yes ☒ No
Is there any observable liquid in internal containers, more than 60 milliliters or 3 percent by volume, whichever is greater?	☐ Yes ☒ No
Is the total volume of observable liquid in the outermost container GREATER than 1% of the container?	☐ Yes ☒ No
Is there observable liquid in payload containers with an EPA Hazardous Waste Number of U134?	☐ Yes ☒ No
Is there an indication of non-radionuclide pyrophoric materials, such as elemental potassium?	☐ Yes ☒ No
Is there an indication of hazardous wastes not occurring as co-contaminants with TRU mixed wastes (non-mixed hazardous wastes)?	☐ Yes ☒ No
Is there an indication of wastes incompatible with backfill, seal and panel closures materials, container and packaging materials, shipping container materials, or other wastes (i.e., waste does NOT match TRUCON Code[s])?	☐ Yes ☒ No
Is there an indication of wastes containing explosives or compressed gases?	☐ Yes ☒ No
Is there an indication of PCBs liquids?	☐ Yes ☒ No
Is there an indication of the waste exhibiting the characteristic of ignitability, corrosivity, or reactivity (EPA Hazardous Waste Numbers of D001, D002, or D003)?	☐ Yes ☒ No
Is the physical form of the waste inconsistent with the Waste Stream Description or the Waste Matrix Code?	☐ Yes ☒ No
CH or RH TRAMPAC	
Are there heat-sealed bags (unvented) GREATER than 4 liters and LESS than 390 square inches in the waste, or heat sealed bags not authorized in the RH TRUCON Code?	☐ Yes ☒ No
Were there Non-approved Closure Methods used on liner bags or inner bags greater than 4 liters?	☐ Yes ☒ No
Are there sealed containers GREATER than 4 liters?	☐ Yes ☒ No
Are there indications of inadequate protection for heavy and/or sharp objects?	☐ Yes ☒ No
Comments: N/A	

RTR Operator:

Eric Lyles		12/14/2015
Print Name	Signature	Date

CCP Radiography Data Sheet

Section 1: General Information	
[X] RTR Examination [ ] RTR Replicate Scan [ ] RTR Independent Observation	
Site ID:	ORNL
Batch Number:	OR-RTR6-0706
Examination Date:	12/14/2015
Waste Container ID:	X10C1351185
Video/Audio Recorded Media Number:	OR-RTR6-0706 A&B
Procedure and Revision No.:	CCP-TP-053 Rev. 15
NCR(s) associated with the container? (e.g., Prohibited Items)	[X] No [ ] Yes NCR No.: N/A NCR No.: N/A

Section 2: Waste Container Data	
Container Type:	55 Gallon Drum
TRUCON Code:	OR 227
Waste Matrix Code:	S4100
Waste Stream I.D.:	OR-NFS-CH-SOIL
Waste Container Weights:	Gross Wt.: 236.3 kg Tare Wt.: 35.2 kg Net Wt.: 201.1 kg
Rigid Liner and Liner Vent Description:	Liner: [ ] No [X] Yes Lid: [X] No [ ] Yes Type: [ ] 30-mil [X] 90-mil [ ] 110-mil [ ] 125-mil Vented: [ ] No [X] Yes [ ] N/A Punctured: [X] No [ ] Yes Mechanical Vent: [X] No [ ] Yes Fiberboard Liner: [X] No [ ] Yes Lead Lined: [X] No [ ] Yes
Number of Layers of Confinement:	Appears to be 1 layer
Volume Utilization Percentage:	85 %

CCP Radiography Data Sheet

Waste Container ID: X10C1351185

Section 3: Container Inventory and Comments (Detailed descriptions)
IM:
AM:
OM:
OI:
C:
R:
XPM:
OR: Absorbent
IN:
S: Soil

Section 4: Packaging Material and Waste Material Parameters	
Packaging Material:	**Estimated Weight (kg)**
Steel (ST):	27.8
Plastics (PP): Liner bag, Rigid Liner	7.4
Other:	0.0
Total Packaging Weight	35.2
Waste Material Parameter:	**Estimated Weight (kg)**
Iron-based Metal / Alloys (IM):	
Aluminum-based Metals / Alloys (AM):	
Other Metals (OM):	
Other Inorganic Materials (OI)	
Cellulosics (C):	
Rubber (R):	
Plastics (waste materials) (XPM):	
Organic Matrix (OR):	3.0
Inorganic Matrix (IN):	
Soils (S):	198.1
Total WMP Weight:	201.1

CCP Radiography Data Sheet

Waste Container ID: X10C1351185

Section 5: RTR Summary (Questions answered "Yes" will be explained in the Comment block, except for Question 1)	
Is there observable liquid?	☐ Yes ☒ No
Is there any observable liquid in internal containers, more than 60 milliliters or 3 percent by volume, whichever is greater?	☐ Yes ☒ No
Is the total volume of observable liquid in the outermost container GREATER than 1% of the container?	☐ Yes ☒ No
Is there observable liquid in payload containers with an EPA Hazardous Waste Number of U134?	☐ Yes ☒ No
Is there an indication of non-radionuclide pyrophoric materials, such as elemental potassium?	☐ Yes ☒ No
Is there an indication of hazardous wastes not occurring as co-contaminants with TRU mixed wastes (non-mixed hazardous wastes)?	☐ Yes ☒ No
Is there an indication of wastes incompatible with backfill, seal and panel closures materials, container and packaging materials, shipping container materials, or other wastes (i.e., waste does NOT match TRUCON Code[s])?	☐ Yes ☒ No
Is there an indication of wastes containing explosives or compressed gases?	☐ Yes ☒ No
Is there an indication of PCBs liquids?	☐ Yes ☒ No
Is there an indication of the waste exhibiting the characteristic of ignitability, corrosivity, or reactivity (EPA Hazardous Waste Numbers of D001, D002, or D003)?	☐ Yes ☒ No
Is the physical form of the waste inconsistent with the Waste Stream Description or the Waste Matrix Code?	☐ Yes ☒ No
CH or RH TRAMPAC	
Are there heat-sealed bags (unvented) GREATER than 4 liters and LESS than 390 square inches in the waste, or heat sealed bags not authorized in the RH TRUCON Code?	☐ Yes ☒ No
Were there Non-approved Closure Methods used on liner bags or inner bags greater than 4 liters?	☐ Yes ☒ No
Are there sealed containers GREATER than 4 liters?	☐ Yes ☒ No
Are there indications of inadequate protection for heavy and/or sharp objects?	☐ Yes ☒ No
Comments: N/A	

RTR Operator:

Eric Lyles		12/14/2015
Print Name	Signature	Date

CCP Radiography Data Sheet

Section 1: General Information	
[X] RTR Examination [ ] RTR Replicate Scan [ ] RTR Independent Observation	
Site ID:	ORNL
Batch Number:	OR-RTR6-0706
Examination Date:	12/14/2015
Waste Container ID:	X10C1351184
Video/Audio Recorded Media Number:	OR-RTR6-0706 A&B
Procedure and Revision No.:	CCP-TP-053 Rev. 15
NCR(s) associated with the container? (e.g., Prohibited Items)	[X] No [ ] Yes NCR No.: N/A NCR No.: N/A

Section 2: Waste Container Data	
Container Type:	55 Gallon Drum
TRUCON Code:	OR 227
Waste Matrix Code:	S4100
Waste Stream I.D.:	OR-NFS-CH-SOIL
Waste Container Weights:	Gross Wt.: 231.5 kg Tare Wt.: 35.2 kg Net Wt.: 196.3 kg
Rigid Liner and Liner Vent Description:	Liner: [ ] No [X] Yes Lid: [X] No [ ] Yes Type: [ ] 30-mil [X] 90-mil [ ] 110-mil [ ] 125-mil Vented: [ ] No [X] Yes [ ] N/A Punctured: [X] No [ ] Yes Mechanical Vent: [X] No [ ] Yes Fiberboard Liner: [X] No [ ] Yes Lead Lined: [X] No [ ] Yes
Number of Layers of Confinement:	Appears to be 1 layer
Volume Utilization Percentage:	85 %

CCP Radiography Data Sheet

Waste Container ID: X10C1351184

Section 3: Container Inventory and Comments (Detailed descriptions)	
IM:	
AM:	
OM:	
OI:	
C:	
R:	
XPM:	
OR:	Absorbent
IN:	
S:	Soil

Section 4: Packaging Material and Waste Material Parameters	
Packaging Material:	**Estimated Weight (kg)**
Steel (ST):	27.8
Plastics (PP): Liner bag, Rigid Liner	7.4
Other:	0.0
Total Packaging Weight	35.2
Waste Material Parameter:	**Estimated Weight (kg)**
Iron-based Metal / Alloys (IM):	
Aluminum-based Metals / Alloys (AM):	
Other Metals (OM):	
Other Inorganic Materials (OI)	
Cellulosics (C):	
Rubber (R):	
Plastics (waste materials) (XPM):	
Organic Matrix (OR):	2.0
Inorganic Matrix (IN):	
Soils (S):	194.3
Total WMP Weight:	196.3

CCP Radiography Data Sheet

Waste Container ID: X10C1351184

Section 5: RTR Summary (Questions answered "Yes" will be explained in the Comment block, except for Question 1)	
Is there observable liquid?	☐ Yes ☒ No
Is there any observable liquid in internal containers, more than 60 milliliters or 3 percent by volume, whichever is greater?	☐ Yes ☒ No
Is the total volume of observable liquid in the outermost container GREATER than 1% of the container?	☐ Yes ☒ No
Is there observable liquid in payload containers with an EPA Hazardous Waste Number of U134?	☐ Yes ☒ No
Is there an indication of non-radionuclide pyrophoric materials, such as elemental potassium?	☐ Yes ☒ No
Is there an indication of hazardous wastes not occurring as co-contaminants with TRU mixed wastes (non-mixed hazardous wastes)?	☐ Yes ☒ No
Is there an indication of wastes incompatible with backfill, seal and panel closures materials, container and packaging materials, shipping container materials, or other wastes (i.e., waste does NOT match TRUCON Code[s])?	☐ Yes ☒ No
Is there an indication of wastes containing explosives or compressed gases?	☐ Yes ☒ No
Is there an indication of PCBs liquids?	☐ Yes ☒ No
Is there an indication of the waste exhibiting the characteristic of ignitability, corrosivity, or reactivity (EPA Hazardous Waste Numbers of D001, D002, or D003)?	☐ Yes ☒ No
Is the physical form of the waste inconsistent with the Waste Stream Description or the Waste Matrix Code?	☐ Yes ☒ No
CH or RH TRAMPAC	
Are there heat-sealed bags (unvented) GREATER than 4 liters and LESS than 390 square inches in the waste, or heat sealed bags not authorized in the RH TRUCON Code?	☐ Yes ☒ No
Were there Non-approved Closure Methods used on liner bags or inner bags greater than 4 liters?	☐ Yes ☒ No
Are there sealed containers GREATER than 4 liters?	☐ Yes ☒ No
Are there indications of inadequate protection for heavy and/or sharp objects?	☐ Yes ☒ No
Comments: N/A	

RTR Operator:

Eric Lyles		12/14/2015
Print Name	Signature	Date

CCP Radiography Data Sheet

Section 1: General Information	
[X] RTR Examination [ ] RTR Replicate Scan [ ] RTR Independent Observation	
Site ID:	ORNL
Batch Number:	OR-RTR6-0706
Examination Date:	12/14/2015
Waste Container ID:	X10C1351186
Video/Audio Recorded Media Number:	OR-RTR6-0706 A&B
Procedure and Revision No.:	CCP-TP-053 Rev. 15
NCR(s) associated with the container? (e.g., Prohibited Items)	[X] No [ ] Yes NCR No.: N/A NCR No.: N/A

Section 2: Waste Container Data	
Container Type:	55 Gallon Drum
TRUCON Code:	OR 227
Waste Matrix Code:	S4100
Waste Stream I.D.:	OR-NFS-CH-SOIL
Waste Container Weights:	Gross Wt.: 228.7 kg Tare Wt.: 35.2 kg Net Wt.: 193.5 kg
Rigid Liner and Liner Vent Description:	Liner: [ ] No [X] Yes Lid: [X] No [ ] Yes Type: [ ] 30-mil [X] 90-mil [ ] 110-mil [ ] 125-mil Vented: [ ] No [X] Yes [ ] N/A Punctured: [X] No [ ] Yes Mechanical Vent: [X] No [ ] Yes Fiberboard Liner: [X] No [ ] Yes Lead Lined: [X] No [ ] Yes
Number of Layers of Confinement:	Appears to be 1 layer
Volume Utilization Percentage:	85 %

CCP Radiography Data Sheet

Waste Container ID: X10C1351186

Section 3: Container Inventory and Comments (Detailed descriptions)
IM:
AM:
OM:
OI:
C:
R:
XPM:
OR: Absorbent
IN:
S: Soil

Section 4: Packaging Material and Waste Material Parameters	
Packaging Material:	**Estimated Weight (kg)**
Steel (ST):	27.8
Plastics (PP): Liner bag, Rigid Liner	7.4
Other:	0.0
Total Packaging Weight	35.2
Waste Material Parameter:	**Estimated Weight (kg)**
Iron-based Metal / Alloys (IM):	
Aluminum-based Metals / Alloys (AM):	
Other Metals (OM):	
Other Inorganic Materials (OI)	
Cellulosics (C):	
Rubber (R):	
Plastics (waste materials) (XPM):	
Organic Matrix (OR):	3.0
Inorganic Matrix (IN):	
Soils (S):	190.5
Total WMP Weight:	193.5

CCP Radiography Data Sheet

Waste Container ID: X10C1351186

Section 5: RTR Summary (Questions answered "Yes" will be explained in the Comment block, except for Question 1)	
Is there observable liquid?	☐ Yes ☒ No
Is there any observable liquid in internal containers, more than 60 milliliters or 3 percent by volume, whichever is greater?	☐ Yes ☒ No
Is the total volume of observable liquid in the outermost container GREATER than 1% of the container?	☐ Yes ☒ No
Is there observable liquid in payload containers with an EPA Hazardous Waste Number of U134?	☐ Yes ☒ No
Is there an indication of non-radionuclide pyrophoric materials, such as elemental potassium?	☐ Yes ☒ No
Is there an indication of hazardous wastes not occurring as co-contaminants with TRU mixed wastes (non-mixed hazardous wastes)?	☐ Yes ☒ No
Is there an indication of wastes incompatible with backfill, seal and panel closures materials, container and packaging materials, shipping container materials, or other wastes (i.e., waste does NOT match TRUCON Code[s])?	☐ Yes ☒ No
Is there an indication of wastes containing explosives or compressed gases?	☐ Yes ☒ No
Is there an indication of PCBs liquids?	☐ Yes ☒ No
Is there an indication of the waste exhibiting the characteristic of ignitability, corrosivity, or reactivity (EPA Hazardous Waste Numbers of D001, D002, or D003)?	☐ Yes ☒ No
Is the physical form of the waste inconsistent with the Waste Stream Description or the Waste Matrix Code?	☐ Yes ☒ No
CH or RH TRAMPAC	
Are there heat-sealed bags (unvented) GREATER than 4 liters and LESS than 390 square inches in the waste, or heat sealed bags not authorized in the RH TRUCON Code?	☐ Yes ☒ No
Were there Non-approved Closure Methods used on liner bags or inner bags greater than 4 liters?	☐ Yes ☒ No
Are there sealed containers GREATER than 4 liters?	☐ Yes ☒ No
Are there indications of inadequate protection for heavy and/or sharp objects?	☐ Yes ☒ No
Comments: N/A	

RTR Operator:

Eric Lyles		12/14/2015
Print Name	Signature	Date

CCP Radiography Data Sheet

Section 1: General Information	
[X] RTR Examination [ ] RTR Replicate Scan [ ] RTR Independent Observation	
Site ID:	ORNL
Batch Number:	OR-RTR6-0706
Examination Date:	12/14/2015
Waste Container ID:	X10C1351189
Video/Audio Recorded Media Number:	OR-RTR6-0706 A&B
Procedure and Revision No.:	CCP-TP-053 Rev. 15
NCR(s) associated with the container? (e.g., Prohibited Items)	[X] No [ ] Yes NCR No.: N/A NCR No.: N/A

Section 2: Waste Container Data	
Container Type:	55 Gallon Drum
TRUCON Code:	OR 227
Waste Matrix Code:	S4100
Waste Stream I.D.:	OR-NFS-CH-SOIL
Waste Container Weights:	Gross Wt.: 247.8 kg Tare Wt.: 35.2 kg Net Wt.: 212.6 kg
Rigid Liner and Liner Vent Description:	Liner: [ ] No [X] Yes Lid: [X] No [ ] Yes Type: [ ] 30-mil [X] 90-mil [ ] 110-mil [ ] 125-mil Vented: [ ] No [X] Yes [ ] N/A Punctured: [X] No [ ] Yes Mechanical Vent: [X] No [ ] Yes Fiberboard Liner: [X] No [ ] Yes Lead Lined: [X] No [ ] Yes
Number of Layers of Confinement:	Appears to be 1 layer
Volume Utilization Percentage:	90 %

CCP Radiography Data Sheet

Waste Container ID: X10C1351189

Section 3: Container Inventory and Comments (Detailed descriptions)	
IM:	
AM:	
OM:	
OI:	
C:	
R:	
XPM:	
OR: Absorbent	
IN:	
S: Soil	

Section 4: Packaging Material and Waste Material Parameters	
Packaging Material:	**Estimated Weight (kg)**
Steel (ST):	27.8
Plastics (PP): Liner bag, Rigid Liner	7.4
Other:	0.0
Total Packaging Weight	35.2
Waste Material Parameter:	**Estimated Weight (kg)**
Iron-based Metal / Alloys (IM):	
Aluminum-based Metals / Alloys (AM):	
Other Metals (OM):	
Other Inorganic Materials (OI)	
Cellulosics (C):	
Rubber (R):	
Plastics (waste materials) (XPM):	
Organic Matrix (OR):	2.0
Inorganic Matrix (IN):	
Soils (S):	210.6
Total WMP Weight:	212.6

CCP Radiography Data Sheet

Waste Container ID: X10C1351189

Section 5: RTR Summary (Questions answered "Yes" will be explained in the Comment block, except for Question 1)	
Is there observable liquid?	☐ Yes ☒ No
Is there any observable liquid in internal containers, more than 60 milliliters or 3 percent by volume, whichever is greater?	☐ Yes ☒ No
Is the total volume of observable liquid in the outermost container GREATER than 1% of the container?	☐ Yes ☒ No
Is there observable liquid in payload containers with an EPA Hazardous Waste Number of U134?	☐ Yes ☒ No
Is there an indication of non-radionuclide pyrophoric materials, such as elemental potassium?	☐ Yes ☒ No
Is there an indication of hazardous wastes not occurring as co-contaminants with TRU mixed wastes (non-mixed hazardous wastes)?	☐ Yes ☒ No
Is there an indication of wastes incompatible with backfill, seal and panel closures materials, container and packaging materials, shipping container materials, or other wastes (i.e., waste does NOT match TRUCON Code[s])?	☐ Yes ☒ No
Is there an indication of wastes containing explosives or compressed gases?	☐ Yes ☒ No
Is there an indication of PCBs liquids?	☐ Yes ☒ No
Is there an indication of the waste exhibiting the characteristic of ignitability, corrosivity, or reactivity (EPA Hazardous Waste Numbers of D001, D002, or D003)?	☐ Yes ☒ No
Is the physical form of the waste inconsistent with the Waste Stream Description or the Waste Matrix Code?	☐ Yes ☒ No
CH or RH TRAMPAC	
Are there heat-sealed bags (unvented) GREATER than 4 liters and LESS than 390 square inches in the waste, or heat sealed bags not authorized in the RH TRUCON Code?	☐ Yes ☒ No
Were there Non-approved Closure Methods used on liner bags or inner bags greater than 4 liters?	☐ Yes ☒ No
Are there sealed containers GREATER than 4 liters?	☐ Yes ☒ No
Are there indications of inadequate protection for heavy and/or sharp objects?	☐ Yes ☒ No

Comments: N/A

RTR Operator:

Eric Lyles		12/14/2015
Print Name	Signature	Date

CCP Radiography Data Sheet

Section 1: General Information		
[X] RTR Examination	[ ] RTR Replicate Scan	[ ] RTR Independent Observation
Site ID:	ORNL	
Batch Number:	OR-RTR6-0706	
Examination Date:	12/14/2015	
Waste Container ID:	X10C1351190	
Video/Audio Recorded Media Number:	OR-RTR6-0706	A&B
Procedure and Revision No.:	CCP-TP-053	Rev. 15
NCR(s) associated with the container?	[X] No [ ] Yes	
(e.g., Prohibited Items)	NCR No.: N/A NCR No.: N/A	

Section 2: Waste Container Data	
Container Type:	55 Gallon Drum
TRUCON Code:	OR 227
Waste Matrix Code:	S4100
Waste Stream I.D.:	OR-NFS-CH-SOIL
Waste Container Weights:	Gross Wt.: 231.2 kg Tare Wt.: 35.2 kg Net Wt.: 196.0 kg
Rigid Liner and Liner Vent Description:	Liner: [ ] No [X] Yes Lid: [X] No [ ] Yes Type: [ ] 30-mil [X] 90-mil [ ] 110-mil [ ] 125-mil Vented: [ ] No [X] Yes [ ] N/A Punctured: [X] No [ ] Yes Mechanical Vent: [X] No [ ] Yes Fiberboard Liner: [X] No [ ] Yes Lead Lined: [X] No [ ] Yes
Number of Layers of Confinement:	Appears to be 1 layer
Volume Utilization Percentage:	85 %

CCP Radiography Data Sheet

Waste Container ID: X10C1351190

Section 3: Container Inventory and Comments (Detailed descriptions)
IM:
AM:
OM:
OI:
C:
R:
XPM:
OR: Absorbent
IN:
S: Soil

Section 4: Packaging Material and Waste Material Parameters	
Packaging Material:	**Estimated Weight (kg)**
Steel (ST):	27.8
Plastics (PP): Liner bag, Rigid Liner	7.4
Other:	0.0
Total Packaging Weight	35.2
Waste Material Parameter:	**Estimated Weight (kg)**
Iron-based Metal / Alloys (IM):	
Aluminum-based Metals / Alloys (AM):	
Other Metals (OM):	
Other Inorganic Materials (OI)	
Cellulosics (C):	
Rubber (R):	
Plastics (waste materials) (XPM):	
Organic Matrix (OR):	3.0
Inorganic Matrix (IN):	
Soils (S):	193.0
Total WMP Weight:	196.0

CCP Radiography Data Sheet

Waste Container ID: X10C1351190

Section 5: RTR Summary (Questions answered "Yes" will be explained in the Comment block, except for Question 1)	
Is there observable liquid?	☐ Yes ☒ No
Is there any observable liquid in internal containers, more than 60 milliliters or 3 percent by volume, whichever is greater?	☐ Yes ☒ No
Is the total volume of observable liquid in the outermost container GREATER than 1% of the container?	☐ Yes ☒ No
Is there observable liquid in payload containers with an EPA Hazardous Waste Number of U134?	☐ Yes ☒ No
Is there an indication of non-radionuclide pyrophoric materials, such as elemental potassium?	☐ Yes ☒ No
Is there an indication of hazardous wastes not occurring as co-contaminants with TRU mixed wastes (non-mixed hazardous wastes)?	☐ Yes ☒ No
Is there an indication of wastes incompatible with backfill, seal and panel closures materials, container and packaging materials, shipping container materials, or other wastes (i.e., waste does NOT match TRUCON Code[s])?	☐ Yes ☒ No
Is there an indication of wastes containing explosives or compressed gases?	☐ Yes ☒ No
Is there an indication of PCBs liquids?	☐ Yes ☒ No
Is there an indication of the waste exhibiting the characteristic of ignitability, corrosivity, or reactivity (EPA Hazardous Waste Numbers of D001, D002, or D003)?	☐ Yes ☒ No
Is the physical form of the waste inconsistent with the Waste Stream Description or the Waste Matrix Code?	☐ Yes ☒ No
CH or RH TRAMPAC	
Are there heat-sealed bags (unvented) GREATER than 4 liters and LESS than 390 square inches in the waste, or heat sealed bags not authorized in the RH TRUCON Code?	☐ Yes ☒ No
Were there Non-approved Closure Methods used on liner bags or inner bags greater than 4 liters?	☐ Yes ☒ No
Are there sealed containers GREATER than 4 liters?	☐ Yes ☒ No
Are there indications of inadequate protection for heavy and/or sharp objects?	☐ Yes ☒ No
Comments: N/A	

RTR Operator:

Eric Lyles		12/14/2015
Print Name	Signature	Date

CCP Radiography Data Sheet

Section 1: General Information	
[X] RTR Examination [ ] RTR Replicate Scan [ ] RTR Independent Observation	
Site ID:	ORNL
Batch Number:	OR-RTR6-0706
Examination Date:	12/14/2015
Waste Container ID:	X10C1351146
Video/Audio Recorded Media Number:	OR-RTR6-0706 A&B
Procedure and Revision No.:	CCP-TP-053 Rev. 15
NCR(s) associated with the container? (e.g., Prohibited Items)	[X] No [ ] Yes NCR No.: N/A NCR No.: N/A

Section 2: Waste Container Data	
Container Type:	55 Gallon Drum
TRUCON Code:	OR 227
Waste Matrix Code:	S4100
Waste Stream I.D.:	OR-NFS-CH-SOIL
Waste Container Weights:	Gross Wt.: 236.4 kg Tare Wt.: 35.2 kg Net Wt.: 201.2 kg
Rigid Liner and Liner Vent Description:	Liner: [ ] No [X] Yes Lid: [X] No [ ] Yes Type: [ ] 30-mil [X] 90-mil [ ] 110-mil [ ] 125-mil Vented: [ ] No [X] Yes [ ] N/A Punctured: [X] No [ ] Yes Mechanical Vent: [X] No [ ] Yes Fiberboard Liner: [X] No [ ] Yes Lead Lined: [X] No [ ] Yes
Number of Layers of Confinement:	Appears to be 1 layer
Volume Utilization Percentage:	90 %

CCP Radiography Data Sheet

Waste Container ID: X10C1351146

Section 3: Container Inventory and Comments (Detailed descriptions)
IM:
AM:
OM:
OI:
C:
R:
XPM:
OR: Absorbent
IN:
S: Soil

Section 4: Packaging Material and Waste Material Parameters	
Packaging Material:	**Estimated Weight (kg)**
Steel (ST):	27.8
Plastics (PP): Liner bag, Rigid Liner	7.4
Other:	0.0
Total Packaging Weight	35.2
Waste Material Parameter:	**Estimated Weight (kg)**
Iron-based Metal / Alloys (IM):	
Aluminum-based Metals / Alloys (AM):	
Other Metals (OM):	
Other Inorganic Materials (OI)	
Cellulosics (C):	
Rubber (R):	
Plastics (waste materials) (XPM):	
Organic Matrix (OR):	2.0
Inorganic Matrix (IN):	
Soils (S):	199.2
Total WMP Weight:	201.2

CCP Radiography Data Sheet

Waste Container ID: X10C1351146

Section 5: RTR Summary (Questions answered "Yes" will be explained in the Comment block, except for Question 1)	
Is there observable liquid?	☐ Yes ☒ No
Is there any observable liquid in internal containers, more than 60 milliliters or 3 percent by volume, whichever is greater?	☐ Yes ☒ No
Is the total volume of observable liquid in the outermost container GREATER than 1% of the container?	☐ Yes ☒ No
Is there observable liquid in payload containers with an EPA Hazardous Waste Number of U134?	☐ Yes ☒ No
Is there an indication of non-radionuclide pyrophoric materials, such as elemental potassium?	☐ Yes ☒ No
Is there an indication of hazardous wastes not occurring as co-contaminants with TRU mixed wastes (non-mixed hazardous wastes)?	☐ Yes ☒ No
Is there an indication of wastes incompatible with backfill, seal and panel closures materials, container and packaging materials, shipping container materials, or other wastes (i.e., waste does NOT match TRUCON Code[s])?	☐ Yes ☒ No
Is there an indication of wastes containing explosives or compressed gases?	☐ Yes ☒ No
Is there an indication of PCBs liquids?	☐ Yes ☒ No
Is there an indication of the waste exhibiting the characteristic of ignitability, corrosivity, or reactivity (EPA Hazardous Waste Numbers of D001, D002, or D003)?	☐ Yes ☒ No
Is the physical form of the waste inconsistent with the Waste Stream Description or the Waste Matrix Code?	☐ Yes ☒ No
CH or RH TRAMPAC	
Are there heat-sealed bags (unvented) GREATER than 4 liters and LESS than 390 square inches in the waste, or heat sealed bags not authorized in the RH TRUCON Code?	☐ Yes ☒ No
Were there Non-approved Closure Methods used on liner bags or inner bags greater than 4 liters?	☐ Yes ☒ No
Are there sealed containers GREATER than 4 liters?	☐ Yes ☒ No
Are there indications of inadequate protection for heavy and/or sharp objects?	☐ Yes ☒ No
Comments: N/A	

RTR Operator:

Eric Lyles		12/14/2015
Print Name	Signature	Date

CCP Radiography Data Sheet

Section 1: General Information	
[X] RTR Examination [ ] RTR Replicate Scan [ ] RTR Independent Observation	
Site ID:	ORNL
Batch Number:	OR-RTR6-0706
Examination Date:	12/14/2015
Waste Container ID:	X10C1351201
Video/Audio Recorded Media Number:	OR-RTR6-0706 A&B
Procedure and Revision No.:	CCP-TP-053 Rev. 15
NCR(s) associated with the container? (e.g., Prohibited Items)	[X] No [ ] Yes NCR No.: N/A NCR No.: N/A

Section 2: Waste Container Data	
Container Type:	55 Gallon Drum
TRUCON Code:	OR 227
Waste Matrix Code:	S4100
Waste Stream I.D.:	OR-NFS-CH-SOIL
Waste Container Weights:	Gross Wt.: 204.3 kg Tare Wt.: 35.2 kg Net Wt.: 169.1 kg
Rigid Liner and Liner Vent Description:	Liner: [ ] No [X] Yes Lid: [X] No [ ] Yes Type: [ ] 30-mil [X] 90-mil [ ] 110-mil [ ] 125-mil Vented: [ ] No [X] Yes [ ] N/A Punctured: [X] No [ ] Yes Mechanical Vent: [X] No [ ] Yes Fiberboard Liner: [X] No [ ] Yes Lead Lined: [X] No [ ] Yes
Number of Layers of Confinement:	Appears to be 1 layer
Volume Utilization Percentage:	75 %

CCP Radiography Data Sheet

Waste Container ID: X10C1351201

Section 3: Container Inventory and Comments (Detailed descriptions)
IM:
AM:
OM:
OI:
C:
R:
XPM:
OR: Absorbent
IN:
S: Soil

Section 4: Packaging Material and Waste Material Parameters	
Packaging Material:	**Estimated Weight (kg)**
Steel (ST):	27.8
Plastics (PP): Liner bag, Rigid Liner	7.4
Other:	0.0
Total Packaging Weight	35.2
Waste Material Parameter:	**Estimated Weight (kg)**
Iron-based Metal / Alloys (IM):	
Aluminum-based Metals / Alloys (AM):	
Other Metals (OM):	
Other Inorganic Materials (OI)	
Cellulosics (C):	
Rubber (R):	
Plastics (waste materials) (XPM):	
Organic Matrix (OR):	3.0
Inorganic Matrix (IN):	
Soils (S):	166.1
Total WMP Weight:	169.1

CCP Radiography Data Sheet

Waste Container ID: X10C1351201

Section 5: RTR Summary (Questions answered "Yes" will be explained in the Comment block, except for Question 1)	
Is there observable liquid?	☐ Yes ☒ No
Is there any observable liquid in internal containers, more than 60 milliliters or 3 percent by volume, whichever is greater?	☐ Yes ☒ No
Is the total volume of observable liquid in the outermost container GREATER than 1% of the container?	☐ Yes ☒ No
Is there observable liquid in payload containers with an EPA Hazardous Waste Number of U134?	☐ Yes ☒ No
Is there an indication of non-radionuclide pyrophoric materials, such as elemental potassium?	☐ Yes ☒ No
Is there an indication of hazardous wastes not occurring as co-contaminants with TRU mixed wastes (non-mixed hazardous wastes)?	☐ Yes ☒ No
Is there an indication of wastes incompatible with backfill, seal and panel closures materials, container and packaging materials, shipping container materials, or other wastes (i.e., waste does NOT match TRUCON Code[s])?	☐ Yes ☒ No
Is there an indication of wastes containing explosives or compressed gases?	☐ Yes ☒ No
Is there an indication of PCBs liquids?	☐ Yes ☒ No
Is there an indication of the waste exhibiting the characteristic of ignitability, corrosivity, or reactivity (EPA Hazardous Waste Numbers of D001, D002, or D003)?	☐ Yes ☒ No
Is the physical form of the waste inconsistent with the Waste Stream Description or the Waste Matrix Code?	☐ Yes ☒ No
CH or RH TRAMPAC	
Are there heat-sealed bags (unvented) GREATER than 4 liters and LESS than 390 square inches in the waste, or heat sealed bags not authorized in the RH TRUCON Code?	☐ Yes ☒ No
Were there Non-approved Closure Methods used on liner bags or inner bags greater than 4 liters?	☐ Yes ☒ No
Are there sealed containers GREATER than 4 liters?	☐ Yes ☒ No
Are there indications of inadequate protection for heavy and/or sharp objects?	☐ Yes ☒ No
Comments: N/A	

RTR Operator:

Print Name	Signature	Date
Eric Lyles		12/14/2015

CCP Radiography Data Sheet

Section 1: General Information	
[X] RTR Examination [ ] RTR Replicate Scan [ ] RTR Independent Observation	
Site ID:	ORNL
Batch Number:	OR-RTR6-0706
Examination Date:	12/14/2015
Waste Container ID:	X10C1351171
Video/Audio Recorded Media Number:	OR-RTR6-0706 A&B
Procedure and Revision No.:	CCP-TP-053 Rev. 15
NCR(s) associated with the container? (e.g., Prohibited Items)	[X] No [ ] Yes NCR No.: N/A NCR No.: N/A

Section 2: Waste Container Data	
Container Type:	55 Gallon Drum
TRUCON Code:	OR 227
Waste Matrix Code:	S4100
Waste Stream I.D.:	OR-NFS-CH-SOIL
Waste Container Weights:	Gross Wt.: 230.4 kg Tare Wt.: 35.2 kg Net Wt.: 195.2 kg
Rigid Liner and Liner Vent Description:	Liner: [ ] No [X] Yes Lid: [X] No [ ] Yes Type: [ ] 30-mil [X] 90-mil [ ] 110-mil [ ] 125-mil Vented: [ ] No [X] Yes [ ] N/A Punctured: [X] No [ ] Yes Mechanical Vent: [X] No [ ] Yes Fiberboard Liner: [X] No [ ] Yes Lead Lined: [X] No [ ] Yes
Number of Layers of Confinement:	Appears to be 1 layer
Volume Utilization Percentage:	90 %

CCP Radiography Data Sheet

Waste Container ID: X10C1351171

Section 3: Container Inventory and Comments (Detailed descriptions)	
IM:	
AM:	
OM:	
OI:	
C:	
R:	
XPM:	
OR:	Absorbent
IN:	
S:	Soil

Section 4: Packaging Material and Waste Material Parameters	
Packaging Material:	**Estimated Weight (kg)**
Steel (ST):	27.8
Plastics (PP): Liner bag, Rigid Liner	7.4
Other:	0.0
Total Packaging Weight	35.2
Waste Material Parameter:	**Estimated Weight (kg)**
Iron-based Metal / Alloys (IM):	
Aluminum-based Metals / Alloys (AM):	
Other Metals (OM):	
Other Inorganic Materials (OI)	
Cellulosics (C):	
Rubber (R):	
Plastics (waste materials) (XPM):	
Organic Matrix (OR):	2.0
Inorganic Matrix (IN):	
Soils (S):	193.2
Total WMP Weight:	195.2

CCP Radiography Data Sheet

Waste Container ID: X10C1351171

Section 5: RTR Summary (Questions answered "Yes" will be explained in the Comment block, except for Question 1)	
Is there observable liquid?	☐ Yes ☒ No
Is there any observable liquid in internal containers, more than 60 milliliters or 3 percent by volume, whichever is greater?	☐ Yes ☒ No
Is the total volume of observable liquid in the outermost container GREATER than 1% of the container?	☐ Yes ☒ No
Is there observable liquid in payload containers with an EPA Hazardous Waste Number of U134?	☐ Yes ☒ No
Is there an indication of non-radionuclide pyrophoric materials, such as elemental potassium?	☐ Yes ☒ No
Is there an indication of hazardous wastes not occurring as co-contaminants with TRU mixed wastes (non-mixed hazardous wastes)?	☐ Yes ☒ No
Is there an indication of wastes incompatible with backfill, seal and panel closures materials, container and packaging materials, shipping container materials, or other wastes (i.e., waste does NOT match TRUCON Code[s])?	☐ Yes ☒ No
Is there an indication of wastes containing explosives or compressed gases?	☐ Yes ☒ No
Is there an indication of PCBs liquids?	☐ Yes ☒ No
Is there an indication of the waste exhibiting the characteristic of ignitability, corrosivity, or reactivity (EPA Hazardous Waste Numbers of D001, D002, or D003)?	☐ Yes ☒ No
Is the physical form of the waste inconsistent with the Waste Stream Description or the Waste Matrix Code?	☐ Yes ☒ No
CH or RH TRAMPAC	
Are there heat-sealed bags (unvented) GREATER than 4 liters and LESS than 390 square inches in the waste, or heat sealed bags not authorized in the RH TRUCON Code?	☐ Yes ☒ No
Were there Non-approved Closure Methods used on liner bags or inner bags greater than 4 liters?	☐ Yes ☒ No
Are there sealed containers GREATER than 4 liters?	☐ Yes ☒ No
Are there indications of inadequate protection for heavy and/or sharp objects?	☐ Yes ☒ No
Comments: N/A	

RTR Operator:

Eric Lyles		12/14/2015
Print Name	Signature	Date

CCP Radiography Data Sheet

Section 1: General Information	
[X] RTR Examination [ ] RTR Replicate Scan [ ] RTR Independent Observation	
Site ID:	ORNL
Batch Number:	OR-RTR6-0706
Examination Date:	12/14/2015
Waste Container ID:	X10C1351178
Video/Audio Recorded Media Number:	OR-RTR6-0706 A&B
Procedure and Revision No.:	CCP-TP-053 Rev. 15
NCR(s) associated with the container? (e.g., Prohibited Items)	[X] No [ ] Yes NCR No.: N/A NCR No.: N/A

Section 2: Waste Container Data	
Container Type:	55 Gallon Drum
TRUCON Code:	OR 227
Waste Matrix Code:	S4100
Waste Stream I.D.:	OR-NFS-CH-SOIL
Waste Container Weights:	Gross Wt.: 217.4 kg Tare Wt.: 35.2 kg Net Wt.: 182.2 kg
Rigid Liner and Liner Vent Description:	Liner: [ ] No [X] Yes Lid: [X] No [ ] Yes Type: [ ] 30-mil [X] 90-mil [ ] 110-mil [ ] 125-mil Vented: [ ] No [X] Yes [ ] N/A Punctured: [X] No [ ] Yes Mechanical Vent: [X] No [ ] Yes Fiberboard Liner: [X] No [ ] Yes Lead Lined: [X] No [ ] Yes
Number of Layers of Confinement:	Appears to be 1 layer
Volume Utilization Percentage:	85 %

CCP Radiography Data Sheet

Waste Container ID: X10C1351178

Section 3: Container Inventory and Comments (Detailed descriptions)
IM:
AM:
OM:
OI:
C:
R:
XPM:
OR: Absorbent
IN:
S: Soil

Section 4: Packaging Material and Waste Material Parameters	
Packaging Material:	**Estimated Weight (kg)**
Steel (ST):	27.8
Plastics (PP): Liner bag, Rigid Liner	7.4
Other:	0.0
Total Packaging Weight	35.2
Waste Material Parameter:	**Estimated Weight (kg)**
Iron-based Metal / Alloys (IM):	
Aluminum-based Metals / Alloys (AM):	
Other Metals (OM):	
Other Inorganic Materials (OI)	
Cellulosics (C):	
Rubber (R):	
Plastics (waste materials) (XPM):	
Organic Matrix (OR):	3.0
Inorganic Matrix (IN):	
Soils (S):	179.2
Total WMP Weight:	182.2

CCP Radiography Data Sheet

Waste Container ID: X10C1351178

Section 5: RTR Summary (Questions answered "Yes" will be explained in the Comment block, except for Question 1)	
Is there observable liquid?	☐ Yes ☒ No
Is there any observable liquid in internal containers, more than 60 milliliters or 3 percent by volume, whichever is greater?	☐ Yes ☒ No
Is the total volume of observable liquid in the outermost container GREATER than 1% of the container?	☐ Yes ☒ No
Is there observable liquid in payload containers with an EPA Hazardous Waste Number of U134?	☐ Yes ☒ No
Is there an indication of non-radionuclide pyrophoric materials, such as elemental potassium?	☐ Yes ☒ No
Is there an indication of hazardous wastes not occurring as co-contaminants with TRU mixed wastes (non-mixed hazardous wastes)?	☐ Yes ☒ No
Is there an indication of wastes incompatible with backfill, seal and panel closures materials, container and packaging materials, shipping container materials, or other wastes (i.e., waste does NOT match TRUCON Code[s])?	☐ Yes ☒ No
Is there an indication of wastes containing explosives or compressed gases?	☐ Yes ☒ No
Is there an indication of PCBs liquids?	☐ Yes ☒ No
Is there an indication of the waste exhibiting the characteristic of ignitability, corrosivity, or reactivity (EPA Hazardous Waste Numbers of D001, D002, or D003)?	☐ Yes ☒ No
Is the physical form of the waste inconsistent with the Waste Stream Description or the Waste Matrix Code?	☐ Yes ☒ No
CH or RH TRAMPAC	
Are there heat-sealed bags (unvented) GREATER than 4 liters and LESS than 390 square inches in the waste, or heat sealed bags not authorized in the RH TRUCON Code?	☐ Yes ☒ No
Were there Non-approved Closure Methods used on liner bags or inner bags greater than 4 liters?	☐ Yes ☒ No
Are there sealed containers GREATER than 4 liters?	☐ Yes ☒ No
Are there indications of inadequate protection for heavy and/or sharp objects?	☐ Yes ☒ No
Comments: N/A	

RTR Operator:

Eric Lyles		12/14/2015
Print Name	Signature	Date

CCP Radiography Data Sheet

Section 1: General Information		
[X] RTR Examination	[ ] RTR Replicate Scan	[ ] RTR Independent Observation
Site ID:	ORNL	
Batch Number:	OR-RTR6-0706	
Examination Date:	12/14/2015	
Waste Container ID:	X10C1351191	
Video/Audio Recorded Media Number:	OR-RTR6-0706	A&B
Procedure and Revision No.:	CCP-TP-053	Rev. 15
NCR(s) associated with the container? (e.g., Prohibited Items)	[X] No [ ] Yes NCR No.: N/A NCR No.: N/A	

Section 2: Waste Container Data	
Container Type:	55 Gallon Drum
TRUCON Code:	OR 227
Waste Matrix Code:	S4100
Waste Stream I.D.:	OR-NFS-CH-SOIL
Waste Container Weights:	Gross Wt.: 239.1 kg Tare Wt.: 35.2 kg Net Wt.: 203.9 kg
Rigid Liner and Liner Vent Description:	Liner: [ ] No [X] Yes Lid: [X] No [ ] Yes Type: [ ] 30-mil [X] 90-mil [ ] 110-mil [ ] 125-mil Vented: [ ] No [X] Yes [ ] N/A Punctured: [X] No [ ] Yes Mechanical Vent: [X] No [ ] Yes Fiberboard Liner: [X] No [ ] Yes Lead Lined: [X] No [ ] Yes
Number of Layers of Confinement:	Appears to be 1 layer
Volume Utilization Percentage:	85 %

CCP Radiography Data Sheet

Waste Container ID: X10C1351191

Section 3: Container Inventory and Comments (Detailed descriptions)	
IM:	
AM:	
OM:	
OI:	
C:	
R:	
XPM:	
OR:	Absorbent
IN:	
S:	Soil

Section 4: Packaging Material and Waste Material Parameters	
Packaging Material:	**Estimated Weight (kg)**
Steel (ST):	27.8
Plastics (PP): Liner bag, Rigid Liner	7.4
Other:	0.0
Total Packaging Weight	35.2
Waste Material Parameter:	**Estimated Weight (kg)**
Iron-based Metal / Alloys (IM):	
Aluminum-based Metals / Alloys (AM):	
Other Metals (OM):	
Other Inorganic Materials (OI)	
Cellulosics (C):	
Rubber (R):	
Plastics (waste materials) (XPM):	
Organic Matrix (OR):	2.0
Inorganic Matrix (IN):	
Soils (S):	201.9
Total WMP Weight:	203.9

CCP Radiography Data Sheet

Waste Container ID: X10C1351191

Section 5: RTR Summary (Questions answered "Yes" will be explained in the Comment block, except for Question 1)	
Is there observable liquid?	☐ Yes ☒ No
Is there any observable liquid in internal containers, more than 60 milliliters or 3 percent by volume, whichever is greater?	☐ Yes ☒ No
Is the total volume of observable liquid in the outermost container GREATER than 1% of the container?	☐ Yes ☒ No
Is there observable liquid in payload containers with an EPA Hazardous Waste Number of U134?	☐ Yes ☒ No
Is there an indication of non-radionuclide pyrophoric materials, such as elemental potassium?	☐ Yes ☒ No
Is there an indication of hazardous wastes not occurring as co-contaminants with TRU mixed wastes (non-mixed hazardous wastes)?	☐ Yes ☒ No
Is there an indication of wastes incompatible with backfill, seal and panel closures materials, container and packaging materials, shipping container materials, or other wastes (i.e., waste does NOT match TRUCON Code[s])?	☐ Yes ☒ No
Is there an indication of wastes containing explosives or compressed gases?	☐ Yes ☒ No
Is there an indication of PCBs liquids?	☐ Yes ☒ No
Is there an indication of the waste exhibiting the characteristic of ignitability, corrosivity, or reactivity (EPA Hazardous Waste Numbers of D001, D002, or D003)?	☐ Yes ☒ No
Is the physical form of the waste inconsistent with the Waste Stream Description or the Waste Matrix Code?	☐ Yes ☒ No
CH or RH TRAMPAC	
Are there heat-sealed bags (unvented) GREATER than 4 liters and LESS than 390 square inches in the waste, or heat sealed bags not authorized in the RH TRUCON Code?	☐ Yes ☒ No
Were there Non-approved Closure Methods used on liner bags or inner bags greater than 4 liters?	☐ Yes ☒ No
Are there sealed containers GREATER than 4 liters?	☐ Yes ☒ No
Are there indications of inadequate protection for heavy and/or sharp objects?	☐ Yes ☒ No
Comments: N/A	

RTR Operator:

Eric Lyles		12/14/2015
Print Name	Signature	Date

Attachment 3 – CCP Radiography Independent Technical Reviewer Checklist

Batch Data Report No.: OR-RTR6-0706

Description			
1.	Were data generation and reduction conducted in a technically correct manner in accordance with the methods used?	☐ NO	☑ YES
2.	Was the correct revision of the procedure used? Procedure: CCP-TP-053 Rev.: 15	☐ NO	☑ YES
3.	Are the WMPs entered correctly?	☐ NO	☑ YES
4.	Do the estimated weights in Section 4 of Attachment 2 equal the container gross weight?	☐ NO	☑ YES
5.	Is the data reported in the proper units with the correct number of significant figures (e.g., one tenth of a kilogram)?	☐ NO	☑ YES
6.	Was transcription used? If no, proceed to question 7.	☑ NO	☐ YES
	6a. Has the data been verified for transcription errors?	☐ NO	☐ YES
7.	Does the Testing Batch Report include radiography for up to 20 containers?	☐ NO	☑ YES
8.	Are BDR contents complete and do they match the CCP Waste RTR Batch Data Report Table of Contents?	☐ NO	☑ YES
9.	Is all the data signed and dated in reproducible ink and by the individual(s) generating it?	☐ NO	☑ YES
10.	Is all data recorded clearly, legibly, and accurately?	☐ NO	☑ YES
11.	Have changes been made to original data? If no, proceed to question 12.	☑ NO	☐ YES
	11a. Have all changes to original data been lined out, initialed and dated by the individual making the changes?	☐ NO	☐ YES
	11b. Was justification made for changing the original data?	☐ NO	☐ YES
	11c. Were data changes made by the individual who originally collected the data?	☐ NO	☐ YES
12.	Does the waste match the Waste Matrix Code and Waste Stream description?	☐ NO	☑ YES
13.	Are the RTR Operator's decisions regarding the Radiography documented?	☐ NO	☑ YES
14.	Is there an adequate written description of the contents of each item?	☐ NO	☑ YES
15.	Was the video/audio recording media properly prepared and labeled for each waste container?	☐ NO	☑ YES
16.	Was the video/audio recording media check performed satisfactorily and recorded on Attachment 1?	☐ NO	☑ YES

Attachment 3 – CCP Radiography Independent Technical Reviewer Checklist (Continued)

Batch Data Report No.: OR-RTR6-0706

Description		
17. Was the Image Test performed satisfactorily and recorded on Attachment 1?	☐ NO	☑ YES
18. Was the Replicate Scan performed and recorded on an Attachment 2?	☐ NO	☑ YES
19. Was the Replicate Scan RTR Operator different from the first RTR Operator?	☐ NO	☑ YES
20. Did the Replicate Scan RTR Operator and the first RTR Operator agree on the results?	☐ NO	☑ YES
21. Was the Independent Observation performed and recorded on an Attachment 2?	☐ NO	☑ YES
22. Was the Independent Observation RTR Operator different from the first RTR Operator?	☐ NO	☑ YES
23. Did the Independent Observation RTR Operator and the first RTR Operator agree on the results?	☐ NO	☑ YES
24. Was the data collection performed by qualified individuals?	☐ NO	☑ YES
25. Were NCRs initiated as required at DGL? If no, proceed to question 26.	☑ NO	☐ YES
25a. Have the NCR(s) associated with RTR been included in the BDR?	☐ NO	☐ YES
26. Is the RTR examination for CH waste? If no, proceed to question 27.	☐ NO	☑ YES
26a. Have the CH Quality Assurance Objectives (QAOs) been met (if applicable)? Precision – Precision is maintained by reconciling any discrepancies between two radiography operators with regard to identification of the waste matrix code, liquids in excess of TSDF-WAC limits, and compressed gases through independent replicate scans and independent observations. Additionally, the precision of radiography is verified prior to use by tuning precisely enough to demonstrate compliance with QAOs through viewing an image test pattern. Accuracy – Accuracy is obtained by using a target to tune the image for maximum sharpness and by requiring operators to successfully identify 100 percent of the items required to meet the DQOs for radiography specified in CCP-PO-001, Section C-4a(1) in a training container during their initial qualification and subsequent requalification. Completeness – A video and audio media recording of the radiography examination and a validated radiography data form will be obtained for 100 percent of the waste containers subject to radiography. All video and audio media recordings and radiography data forms will be subject to validation as indicated in CCP-PO-001, Section C3-4. Comparability – The comparability of radiography data from different operators shall be enhanced by using standardized radiography procedures and operator qualifications.	☐ NO	☑ YES

Attachment 3 – CCP Radiography Independent Technical Reviewer Checklist (Continued)

Batch Data Report No.: OR-RTR6-0706

Description		
27. Is the RTR examination for RH waste? If no, proceed to comment section.	☑ NO	☐ YES
27a. Have the RH QAOs been met (if applicable)? Precision – Precision is maintained by reconciling any discrepancies between two operators (during Independent Observation and Replicate scans) with regard to the identification of important waste characteristics (i.e., physical form of the waste and absence of prohibited liquids) within a single container. Accuracy – Accuracy is obtained by using a target to tune the image for maximum sharpness and by requiring operators to successfully identify prohibited liquid in a training container during their initial qualification and subsequent requalification. Representativeness – All of the relevant contents in a container selected for radiography will be described. Completeness – All of the relevant waste information must be assembled and must show that each of the containers in the waste stream belongs to the waste stream. This information must be documented on videotape or other equivalent media and data form. Comparability – Comparability is ensured by meeting the program training requirements and complying with the minimum standards used to implement the radiography process.	☐ NO	☐ YES

Comments: N/A

I have reviewed 100% of the container specific and batch data in this report and find it acceptable.

Independent Technical Reviewer:

Printed Name	Signature	Date
Aaron Elliott		1/4/16

DIVIDER PAGE ONLY

Not Part of Page Count

Attachment 2 – CCP Records Transmittal/Receiving Form

CCP Records / Records Custodian, 4021 National Parks Highway - MS: GSA 212, Carlsbad, New Mexico 88220

Telephone Number: 575-234-7523

Fax Number: 575-234-7033

Attn:	CCP RECORDS	From:	RANADA T BACA
Ship to:	4021 NATIONAL PARKS HWY	Site:	LANL TA-54 BLD 533 RM 1017
	CARLSBAD, NM 88220	Company:	TFE, INC
	GSA-212	Telephone Number:	505-667-0181
	N/A	Date Sent:	01-04-16
Telephone Number:	505-234-7523		

Document Number	Title / Description	Record Date	Total Pages
OR-RTR6-0706	BACKUP DVD B FOR BDR	12-14-15	N/A
	N/A		

Comments

N/A

(When the Record accepted line has been completed, the rest of the page below may be left blank.)
Acceptance/Rejection Signature and Date

Records Accepted ☑ [signature] Jewell Hurrable 1/11/16
Signature | Printed Name | Date

Records Rejected ☐ _____ _____ _____
Signature | Printed Name | Date

Reason for Rejection:

Re-submittal: _____ _____ _____
Signature | Printed Name | Date

```
**********************************
***        Send Results        ***
**********************************

   Sending is complete.

Job No.                    3763
Address                    915056656753
Name                       TERRI ANN
Start Time                 01/11 09:34 AM
Call Length                00'32
Sheets                     1
Result                     OK
```


Attachment 2 – CCP Records Transmittal/Receiving Form

CCP Records / Records Custodian, 4021 National Parks Highway - MS: GSA 212, Carlsbad, New Mexico 88220

Telephone Number: 575-234-7523

Fax Number: 575-234-7033

Attn:	CCP RECORDS	From:	RANADA T BACA
Ship to:	4021 NATIONAL PARKS HWY	Site:	LANL TA-54 BLD 533 RM 1017
	CARLSBAD, NM 88220	Company:	TFE, INC
	GSA-212	Telephone Number:	505-667-0181
	N/A	Date Sent:	01-04-16
Telephone Number:	505-234-7523		

Document Number	Title / Description	Record Date	Total Pages
OR-RTR6-0706	BACKUP DVD B FOR BDR	12-14-15	N/A
	N/A		

Comments

N/A

(When the Record accepted line has been completed, the rest of the page below may be left blank.)
Acceptance/Rejection Signature and Date

	Signature	Printed Name	Date
Records Accepted ☑	[signature]	Jewell Hurrabe	1/11/16
Records Rejected ☐			

Reason for Rejection:

Attachment 2 – CCP Records Transmittal/Receiving Form

CCP Records / Records Custodian, 4021 National Parks Highway - MS: GSA 212, Carlsbad, New Mexico 88220

Telephone Number: 575-234-7523

Fax Number: 575-234-7033

Attn:	CCP RECORDS	From:	RANADA T BACA
Ship to:	4021 NATIONAL PARKS HWY	Site:	LANL
	CARLSBAD, NM 88220	Company:	TFE, INC
	GSA-212	Telephone Number:	505-667-0181
	N/A	Date Sent:	01-12-16
Telephone Number:	505-234-7523		

Document Number	Title / Description	Record Date	Total Pages
OR-RTR6-0706	NDE BDR	12-14-15	72
OR-RTR6-0706	PRIMARY DVD A	12-14-15	N/A
	N/A		

Comments

SPM CHECKLIST WAS COMPLETED IN CARLSBAD

(When the Record accepted line has been completed, the rest of the page below may be left blank.)

Acceptance/Rejection Signature and Date

Records Accepted [✓] Signature | Jewel Hurralde (Printed Name) | 1/19/2016 (Date)

Records Rejected [ ] Signature | Printed Name | Date

Reason for Rejection:

Re-submittal: Signature | Printed Name | Date

```
**********************************
***        Send Results        ***
**********************************

   Sending is complete.

Job No.                    3912
Address                    915056656753
Name                       TERRI ANN
Start Time                 01/19 09:14 AM
Call Length                00'33
Sheets                     1
Result                     OK
```


Attachment 2 – CCP Records Transmittal/Receiving Form

CCP Records / Records Custodian, 4021 National Parks Highway - MS: GSA 212, Carlsbad, New Mexico 88220

Telephone Number: 575-234-7523

Fax Number: 575-234-7033

Attn:	CCP RECORDS	From:	RANADA T BACA
Ship to:	4021 NATIONAL PARKS HWY	Site:	LANL
	CARLSBAD, NM 88220	Company:	TFE, INC
	GSA-212	Telephone Number:	505-667-0181
	N/A	Date Sent:	01-12-16
Telephone Number:	505-234-7523		

Document Number	Title / Description	Record Date	Total Pages
OR-RTR6-0708	NDE BDR	12-14-15	72
OR-RTR6-0706	PRIMARY DVD A	12-14-15	N/A
	N/A		

Comments

SPM CHECKLIST WAS COMPLETED IN CARLSBAD

(When the Record accepted line has been completed, the rest of the page below may be left blank.)

Acceptance/Rejection Signature and Date

Records Accepted ☑	[signature]	Jewel Hurrolde	1/19/2016
	Signature	Printed Name	Date
Records Rejected ☐			
	Signature	Printed Name	Date

Reason for Rejection:

DIVIDER

PAGE

Attachment 2 – CCP SPM Radiography Project Level Validation Checklist and Summary

BDR Number: OR-RTR6-0713				Examination Date(s): 01/13/2016
Description of Criteria Reviewed	**Criteria Met?**			**Comments/Qualifiers**
	YES	**NO**	**NA**	
1. Is the completed, signed, and dated Independent Technical Reviewer Checklist included in the BDR, and the independent technical reviewer was not involved in the generation or recording of the data under review? **Reference Source: CCP-PO-001, C3-4**	X			
2. Does the BDR contain all items addressed in the BDR Table of Contents? **Reference Source: CCP-PO-001, C3-4**	X			
3. Does the BDR include a listing of all the container numbers in the batch? **Reference Source: CCP-PO-001, C3-4**	X			
4. List all containers that have met QAOs. **Reference Source: CCP-PO-001, C3-4**				Container Numbers: X10C1250255, X10C1250256, X10C1250266, X10C1250267, X10C1250268, X10C1250270, X10C1250271, X10C1250272, X10C1250273, X10C1250274, X10C1250280, X10C1250281, X10C1250290, X10C1250291, X10C1250292, X10C1250299
5. Does the BDR identify the current implementing procedure and revision number? **Reference Source: CCP-PO-001, Table C3-3**	X			
6. Is there a reference to or copy of any associated NCRs (if any) in the BDR? NA if no NCRs. **Reference Source: CCP-PO-001, Table C3-3**			X	
7. Are there 20 or fewer containers in the batch? **Reference Source: CCP-PO-001, C3-4**	X			
8. Are the data properly reported (i.e., data are reported in correct units and with correct significant figures)? **Reference Source: CCP-PO-001, C3-4**	X			
9. Is there evidence of verification that the physical form matches the Waste Matrix Code? **Reference Source: CCP-PO-001, Table C3-3**	X			

CCP RECORDS ORIGINAL
DATE REC'D 2/15/16

Attachment 2 – CCP SPM Radiography Project Level Validation Checklist and Summary (Continued)

BDR Number: OR-RTR6-0713			Examination Date(s): 01/13/2016	
Description of Criteria Reviewed	**Criteria Met?**			**Comments/Qualifiers**
	YES	**NO**	**NA**	
10. Is there evidence of verification that the physical form matches the waste stream description? **Reference Source: CCP-PO-001, Table C3-3**	X			
11. Are prohibited items absent? **Reference Source: CCP-PO-001, Table C3-3**	X			
12. Does observable liquid, if present, meet the criteria of the TSDF-WAC? **Reference Source: CCP-PO-001, C-1**			X	No observable liquids
13. Were discrepancies between two operators with regard to identification of waste matrix code, liquids in excess of the TSDF-WAC, or compressed gases through replicate scans and independent observations reconciled? NA if no discrepancies. **Reference Source: CCP-PO-001, C3-2**			X	
14. Are the training qualifications for all radiography personnel acceptable? **Reference Source: CCP-PO-001, C3-8**	X			
15. Was evidence of the video/audio check included in the BDR? **Reference Source: CCP-PO-001, C1-1**	X			
16. Was the Lines-Pair Resolution Test or Sieve Test Check included in the BDR? **Reference Source: CCP Technical Procedures**	X			
17. Was a replicate scan performed once per day, or once per batch, whichever is LESS frequent? **Reference Source: CCP-PO-001, C1-1**	X			
18. Was an independent observation performed once per day, or once per batch, whichever is LESS frequent? **Reference Source: CCP-PO-001, C1-1**	X			

Attachment 2 – CCP SPM Radiography Project Level Validation Checklist and Summary (Continued)

BDR Number: OR-RTR6-0713 **Examination Date(s): 01/13/2016**

Description of Criteria Reviewed	Criteria Met? YES	NO	NA	Comments/Qualifiers
19. Were the replicate scan and independent observation performed on different waste containers? **Reference Source: CCP-PO-001, C1-1**	X			
20. Were the personnel performing the replicate scan and independent observation different from the individual who performed the original? **Reference Source: CCP-PO-001, C1-1**	X			
21. Does the BDR include an estimate of each material parameter weight in kg for each container? **Reference Source: CCP Technical Procedures**	X			
22. Does the BDR include a description of each material parameter for each container? **Reference Source: CCP Technical Procedures**	X			
23. Is the container gross weight recorded in kilograms (kg) for each container in the BDR? **Reference Source: CCP Technical Procedures**	X			
24. Was the Scale Weight Calibration Check included in the BDR? **Reference Source: CCP Technical Procedures**			X	Scale not used
25. Was the Scale Weight Check included in the BDR? **Reference Source: CCP Technical Procedures**			X	Scale not used

Comments: **NONE**

The container QC checks were properly performed and meet the Quality Assurance Objectives (QAOs). Proper procedures were followed during data reduction and analysis. The batch is complete, acceptable, and includes all supporting data and documentation required by the QAPjP.

Rick Whiteley	Rick Whiteley	02/15/2016
SPM Printed Name	Signature	Date

Checklist is to be re-signed only when a re-review is performed.

SPM Printed Name	Signature	Reason	Date
SPM Printed Name	Signature	Reason	Date

Attachment 5–CCP Radiography Batch Data Report Cover Sheet

Site ID: ORNL

Batch Data Report No.: OR-RTR6-0713 ☑ CH ☐ RH Date: 1-13-16

Waste Container ID Numbers	
Replicate Scan:	X10C1250272
Independent Observation:	X10C1250281
1	X10C1250281
2	X10C1250273
3	X10C1250290
4	X10C1250255
5	X10C1250271
6	X10C1250267
7	X10C1250291
8	X10C1250268
9	X10C1250292
10	X10C1250272
11	X10C1250270
12	X10C1250299
13	X10C1250266
14	X10C1250256
15	X10C1250280
16	X10C1250274
17	N/A
18	N/A
19	N/A
20	N/A

RTR Operator:

Eric Lyles		1-13-16
Printed Name	Signature	Date

Independent Technical Reviewer:

Kenneth Simpson		2-1-2016
Printed Name	Signature	Date

CCP RECORDS ORIGINAL
DATE REC'D 2/1/16

Attachment 4 – CCP Radiography Batch Data Report Table of Contents and Batch Narrative

Batch Data Report No.: OR-RTR6-0713 Date: 1-13-16

Table Of Contents

Item	Description	Page No.
1	CCP Radiography Batch Data Report Cover Sheet	1
2	CCP Radiography Batch Data Report Table Of Contents	2
3	CCP RTR Measurement Control Report	3
4	CCP Radiography Data Sheets	4
5	Copy of NCRs (NA, If Not Applicable)	N/A
6	CCP Independent Technical Reviewer Checklist	58

Batch Narrative

All Quality Checks were performed and recorded on CCP-TP-053, Rev.15, CCP Radiography Measurement Control Report.

Eric Lyles — RTR Operator

Signature

1-13-16 — Date

Attachment 1 – CCP RTR Measurement Control Report

Site ID: ORNL		
Batch Data Report No.: OR-RTR6-0713		
Examination Date: 1-13-16		
Control Checks		
Video/Audio Recorded Media System Check	☑ SAT	☐ UNSAT
Image Test : 10 Lines (Minimum acceptable is 5 lines-pair/cm or #6 Sieve is viewable)	☑ SAT	☐ UNSAT
Comments: N/A		
RTR Operator:		
Eric Lyles (Printed Name)	(Signature)	1-13-16 (Date)

3

CCP Radiography Data Sheet

Section 1: General Information	
☐ RTR Examination ☒ RTR Replicate Scan ☐ RTR Independent Observation	
Site ID:	ORNL
Batch Number:	OR-RTR6-0713
Examination Date:	1/13/2016
Waste Container ID:	X10C1250272
Video/Audio Recorded Media Number:	OR-RTR6-0713 A&B
Procedure and Revision No.:	CCP-TP-053 Rev. 15
NCR(s) associated with the container? (e.g., Prohibited Items)	☒ No ☐ Yes NCR No.: N/A NCR No.: N/A

Section 2: Waste Container Data	
Container Type:	55 Gallon Drum
TRUCON Code:	OR 227
Waste Matrix Code:	S4100
Waste Stream I.D.:	OR-NFS-CH-SOIL
Waste Container Weights:	Gross Wt.: 242.9 kg Tare Wt.: 35.2 kg Net Wt.: 207.7 kg
Rigid Liner and Liner Vent Description:	Liner: ☐ No ☒ Yes Lid: ☒ No ☐ Yes Type: ☐ 30-mil ☒ 90-mil ☐ 110-mil ☐ 125-mil Vented: ☐ No ☒ Yes ☐ N/A Punctured: ☒ No ☐ Yes Mechanical Vent: ☒ No ☐ Yes Fiberboard Liner: ☒ No ☐ Yes Lead Lined: ☒ No ☐ Yes
Number of Layers of Confinement:	Appears to be 1 layer
Volume Utilization Percentage:	90 %

CCP Radiography Data Sheet

Waste Container ID: X10C1250272

Section 3: Container Inventory and Comments (Detailed descriptions)

IM:

AM:

OM:

OI:

C:

R:

XPM:

OR: Absorbent

IN:

S: Soil

Section 4: Packaging Material and Waste Material Parameters

Packaging Material:	**Estimated Weight (kg)**
Steel (ST):	27.8
Plastics (PP): Liner bag, Rigid Liner	7.4
Other:	0.0
Total Packaging Weight	35.2
Waste Material Parameter:	**Estimated Weight (kg)**
Iron-based Metal / Alloys (IM):	
Aluminum-based Metals / Alloys (AM):	
Other Metals (OM):	
Other Inorganic Materials (OI)	
Cellulosics (C):	
Rubber (R):	
Plastics (waste materials) (XPM):	
Organic Matrix (OR):	1.0
Inorganic Matrix (IN):	
Soils (S):	206.7
Total WMP Weight:	207.7

CCP Radiography Data Sheet

Waste Container ID: X10C1250272

Section 5: RTR Summary (Questions answered "Yes" will be explained in the Comment block, except for Question 1)	
Is there observable liquid?	☐ Yes ☒ No
Is there any observable liquid in internal containers, more than 60 milliliters or 3 percent by volume, whichever is greater?	☐ Yes ☒ No
Is the total volume of observable liquid in the outermost container GREATER than 1% of the container?	☐ Yes ☒ No
Is there observable liquid in payload containers with an EPA Hazardous Waste Number of U134?	☐ Yes ☒ No
Is there an indication of non-radionuclide pyrophoric materials, such as elemental potassium?	☐ Yes ☒ No
Is there an indication of hazardous wastes not occurring as co-contaminants with TRU mixed wastes (non-mixed hazardous wastes)?	☐ Yes ☒ No
Is there an indication of wastes incompatible with backfill, seal and panel closures materials, container and packaging materials, shipping container materials, or other wastes (i.e., waste does NOT match TRUCON Code[s])?	☐ Yes ☒ No
Is there an indication of wastes containing explosives or compressed gases?	☐ Yes ☒ No
Is there an indication of PCBs liquids?	☐ Yes ☒ No
Is there an indication of the waste exhibiting the characteristic of ignitability, corrosivity, or reactivity (EPA Hazardous Waste Numbers of D001, D002, or D003)?	☐ Yes ☒ No
Is the physical form of the waste inconsistent with the Waste Stream Description or the Waste Matrix Code?	☐ Yes ☒ No
CH or RH TRAMPAC	
Are there heat-sealed bags (unvented) GREATER than 4 liters and LESS than 390 square inches in the waste, or heat sealed bags not authorized in the RH TRUCON Code?	☐ Yes ☒ No
Were there Non-approved Closure Methods used on liner bags or inner bags greater than 4 liters?	☐ Yes ☒ No
Are there sealed containers GREATER than 4 liters?	☐ Yes ☒ No
Are there indications of inadequate protection for heavy and/or sharp objects?	☐ Yes ☒ No

Comments: This Replicate Scan Agrees with the ORignal Scan.
FO 1-13-16

RTR Operator:

Print Name	Signature	Date
Fred Oney	FO	1/13/2016

CCP Radiography Data Sheet

Section 1: General Information	
☐ RTR Examination ☐ RTR Replicate Scan ☒ RTR Independent Observation	
Site ID:	ORNL
Batch Number:	OR-RTR6-0713
Examination Date:	1/13/2016
Waste Container ID:	X10C1250281
Video/Audio Recorded Media Number:	OR-RTR6-0713 A&B
Procedure and Revision No.:	CCP-TP-053 Rev. 15
NCR(s) associated with the container? (e.g., Prohibited Items)	☒ No ☐ Yes NCR No.: N/A NCR No.: N/A

Section 2: Waste Container Data	
Container Type:	55 Gallon Drum
TRUCON Code:	OR 227
Waste Matrix Code:	S4100
Waste Stream I.D.:	OR-NFS-CH-SOIL
Waste Container Weights:	Gross Wt.: 224.0 kg Tare Wt.: 35.2 kg Net Wt.: 188.8 kg
Rigid Liner and Liner Vent Description:	Liner: ☐ No ☒ Yes Lid: ☒ No ☐ Yes Type: ☐ 30-mil ☒ 90-mil ☐ 110-mil ☐ 125-mil Vented: ☐ No ☒ Yes ☐ N/A Punctured: ☒ No ☐ Yes Mechanical Vent: ☒ No ☐ Yes Fiberboard Liner: ☒ No ☐ Yes Lead Lined: ☒ No ☐ Yes
Number of Layers of Confinement:	Appears to be 1 layer
Volume Utilization Percentage:	90 %

CCP Radiography Data Sheet

Waste Container ID: X10C1250281

Section 3: Container Inventory and Comments (Detailed descriptions)	
IM:	
AM:	
OM:	
OI:	
C:	
R:	
XPM:	
OR:	Absorbent
IN:	
S:	Soil

Section 4: Packaging Material and Waste Material Parameters	
Packaging Material:	**Estimated Weight (kg)**
Steel (ST):	27.8
Plastics (PP): Liner bag, Rigid Liner	7.4
Other:	0.0
Total Packaging Weight	35.2
Waste Material Parameter:	**Estimated Weight (kg)**
Iron-based Metal / Alloys (IM):	
Aluminum-based Metals / Alloys (AM):	
Other Metals (OM):	
Other Inorganic Materials (OI)	
Cellulosics (C):	
Rubber (R):	
Plastics (waste materials) (XPM):	
Organic Matrix (OR):	2.0
Inorganic Matrix (IN):	
Soils (S):	186.8
Total WMP Weight:	188.8

CCP Radiography Data Sheet

Waste Container ID: X10C1250281

Section 5: RTR Summary (Questions answered "Yes" will be explained in the Comment block, except for Question 1)	
Is there observable liquid?	☐ Yes ☒ No
Is there any observable liquid in internal containers, more than 60 milliliters or 3 percent by volume, whichever is greater?	☐ Yes ☒ No
Is the total volume of observable liquid in the outermost container GREATER than 1% of the container?	☐ Yes ☒ No
Is there observable liquid in payload containers with an EPA Hazardous Waste Number of U134?	☐ Yes ☒ No
Is there an indication of non-radionuclide pyrophoric materials, such as elemental potassium?	☐ Yes ☒ No
Is there an indication of hazardous wastes not occurring as co-contaminants with TRU mixed wastes (non-mixed hazardous wastes)?	☐ Yes ☒ No
Is there an indication of wastes incompatible with backfill, seal and panel closures materials, container and packaging materials, shipping container materials, or other wastes (i.e., waste does NOT match TRUCON Code[s])?	☐ Yes ☒ No
Is there an indication of wastes containing explosives or compressed gases?	☐ Yes ☒ No
Is there an indication of PCBs liquids?	☐ Yes ☒ No
Is there an indication of the waste exhibiting the characteristic of ignitability, corrosivity, or reactivity (EPA Hazardous Waste Numbers of D001, D002, or D003)?	☐ Yes ☒ No
Is the physical form of the waste inconsistent with the Waste Stream Description or the Waste Matrix Code?	☐ Yes ☒ No
CH or RH TRAMPAC	
Are there heat-sealed bags (unvented) GREATER than 4 liters and LESS than 390 square inches in the waste, or heat sealed bags not authorized in the RH TRUCON Code?	☐ Yes ☒ No
Were there Non-approved Closure Methods used on liner bags or inner bags greater than 4 liters?	☐ Yes ☒ No
Are there sealed containers GREATER than 4 liters?	☐ Yes ☒ No
Are there indications of inadequate protection for heavy and/or sharp objects?	☐ Yes ☒ No

Comments: This Independent Observation Agrees With the Original Scan.
FO 1-13-16

RTR Operator:

Fred Oney	FO	1/13/2016
Print Name	Signature	Date

CCP Radiography Data Sheet

Section 1: General Information	
[X] RTR Examination [ ] RTR Replicate Scan [ ] RTR Independent Observation	
Site ID:	ORNL
Batch Number:	OR-RTR6-0713
Examination Date:	1/13/2016
Waste Container ID:	X10C1250281
Video/Audio Recorded Media Number:	OR-RTR6-0713 A&B
Procedure and Revision No.:	CCP-TP-053 Rev. 15
NCR(s) associated with the container? (e.g., Prohibited Items)	[X] No [ ] Yes NCR No.: N/A NCR No.: N/A

Section 2: Waste Container Data	
Container Type:	55 Gallon Drum
TRUCON Code:	OR 227
Waste Matrix Code:	S4100
Waste Stream I.D.:	OR-NFS-CH-SOIL
Waste Container Weights:	Gross Wt.: 224.0 kg Tare Wt.: 35.2 kg Net Wt.: 188.8 kg
Rigid Liner and Liner Vent Description:	Liner: [ ] No [X] Yes Lid: [X] No [ ] Yes Type: [ ] 30-mil [X] 90-mil [ ] 110-mil [ ] 125-mil Vented: [ ] No [X] Yes [ ] N/A Punctured: [X] No [ ] Yes Mechanical Vent: [X] No [ ] Yes Fiberboard Liner: [X] No [ ] Yes Lead Lined: [X] No [ ] Yes
Number of Layers of Confinement:	Appears to be 1 layer
Volume Utilization Percentage:	90 %

CCP Radiography Data Sheet

Waste Container ID: X10C1250281

Section 3: Container Inventory and Comments (Detailed descriptions)	
IM:	
AM:	
OM:	
OI:	
C:	
R:	
XPM:	
OR: Absorbent	
IN:	
S: Soil	

Section 4: Packaging Material and Waste Material Parameters	
Packaging Material:	**Estimated Weight (kg)**
Steel (ST):	27.8
Plastics (PP): Liner bag, Rigid Liner	7.4
Other:	0.0
Total Packaging Weight	35.2
Waste Material Parameter:	**Estimated Weight (kg)**
Iron-based Metal / Alloys (IM):	
Aluminum-based Metals / Alloys (AM):	
Other Metals (OM):	
Other Inorganic Materials (OI)	
Cellulosics (C):	
Rubber (R):	
Plastics (waste materials) (XPM):	
Organic Matrix (OR):	3.0
Inorganic Matrix (IN):	
Soils (S):	185.8
Total WMP Weight:	188.8

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CCP Radiography Data Sheet

Waste Container ID: X10C1250281

Section 5: RTR Summary (Questions answered "Yes" will be explained in the Comment block, except for Question 1)	
Is there observable liquid?	☐ Yes ☒ No
Is there any observable liquid in internal containers, more than 60 milliliters or 3 percent by volume, whichever is greater?	☐ Yes ☒ No
Is the total volume of observable liquid in the outermost container GREATER than 1% of the container?	☐ Yes ☒ No
Is there observable liquid in payload containers with an EPA Hazardous Waste Number of U134?	☐ Yes ☒ No
Is there an indication of non-radionuclide pyrophoric materials, such as elemental potassium?	☐ Yes ☒ No
Is there an indication of hazardous wastes not occurring as co-contaminants with TRU mixed wastes (non-mixed hazardous wastes)?	☐ Yes ☒ No
Is there an indication of wastes incompatible with backfill, seal and panel closures materials, container and packaging materials, shipping container materials, or other wastes (i.e., waste does NOT match TRUCON Code[s])?	☐ Yes ☒ No
Is there an indication of wastes containing explosives or compressed gases?	☐ Yes ☒ No
Is there an indication of PCBs liquids?	☐ Yes ☒ No
Is there an indication of the waste exhibiting the characteristic of ignitability, corrosivity, or reactivity (EPA Hazardous Waste Numbers of D001, D002, or D003)?	☐ Yes ☒ No
Is the physical form of the waste inconsistent with the Waste Stream Description or the Waste Matrix Code?	☐ Yes ☒ No
CH or RH TRAMPAC	
Are there heat-sealed bags (unvented) GREATER than 4 liters and LESS than 390 square inches in the waste, or heat sealed bags not authorized in the RH TRUCON Code?	☐ Yes ☒ No
Were there Non-approved Closure Methods used on liner bags or inner bags greater than 4 liters?	☐ Yes ☒ No
Are there sealed containers GREATER than 4 liters?	☐ Yes ☒ No
Are there indications of inadequate protection for heavy and/or sharp objects?	☐ Yes ☒ No
Comments: N/A	

RTR Operator:

Eric Lyles		1/13/2016
Print Name	Signature	Date

CCP Radiography Data Sheet

Section 1: General Information	
[X] RTR Examination [ ] RTR Replicate Scan [ ] RTR Independent Observation	
Site ID:	ORNL
Batch Number:	OR-RTR6-0713
Examination Date:	1/13/2016
Waste Container ID:	X10C1250273
Video/Audio Recorded Media Number:	OR-RTR6-0713 A&B
Procedure and Revision No.:	CCP-TP-053 Rev. 15
NCR(s) associated with the container? (e.g., Prohibited Items)	[X] No [ ] Yes NCR No.: N/A NCR No.: N/A

Section 2: Waste Container Data	
Container Type:	55 Gallon Drum
TRUCON Code:	OR 227
Waste Matrix Code:	S4100
Waste Stream I.D.:	OR-NFS-CH-SOIL
Waste Container Weights:	Gross Wt.: 235.7 kg Tare Wt.: 35.2 kg Net Wt.: 200.5 kg
Rigid Liner and Liner Vent Description:	Liner: [ ] No [X] Yes Lid: [X] No [ ] Yes Type: [ ] 30-mil [X] 90-mil [ ] 110-mil [ ] 125-mil Vented: [ ] No [X] Yes [ ] N/A Punctured: [X] No [ ] Yes Mechanical Vent: [X] No [ ] Yes Fiberboard Liner: [X] No [ ] Yes Lead Lined: [X] No [ ] Yes
Number of Layers of Confinement:	Appears to be 1 layer
Volume Utilization Percentage:	90 %

CCP Radiography Data Sheet

Waste Container ID: X10C1250273

Section 3: Container Inventory and Comments (Detailed descriptions)
IM:
AM:
OM:
OI:
C:
R:
XPM:
OR: Absorbent
IN:
S: Soil

Section 4: Packaging Material and Waste Material Parameters	
Packaging Material:	**Estimated Weight (kg)**
Steel (ST):	27.8
Plastics (PP): Liner bag, Rigid Liner	7.4
Other:	0.0
Total Packaging Weight	35.2
Waste Material Parameter:	**Estimated Weight (kg)**
Iron-based Metal / Alloys (IM):	
Aluminum-based Metals / Alloys (AM):	
Other Metals (OM):	
Other Inorganic Materials (OI)	
Cellulosics (C):	
Rubber (R):	
Plastics (waste materials) (XPM):	
Organic Matrix (OR):	2.0
Inorganic Matrix (IN):	
Soils (S):	198.5
Total WMP Weight:	200.5

CCP Radiography Data Sheet

Waste Container ID: X10C1250273

Section 5: RTR Summary (Questions answered "Yes" will be explained in the Comment block, except for Question 1)	
Is there observable liquid?	☐ Yes ☒ No
Is there any observable liquid in internal containers, more than 60 milliliters or 3 percent by volume, whichever is greater?	☐ Yes ☒ No
Is the total volume of observable liquid in the outermost container GREATER than 1% of the container?	☐ Yes ☒ No
Is there observable liquid in payload containers with an EPA Hazardous Waste Number of U134?	☐ Yes ☒ No
Is there an indication of non-radionuclide pyrophoric materials, such as elemental potassium?	☐ Yes ☒ No
Is there an indication of hazardous wastes not occurring as co-contaminants with TRU mixed wastes (non-mixed hazardous wastes)?	☐ Yes ☒ No
Is there an indication of wastes incompatible with backfill, seal and panel closures materials, container and packaging materials, shipping container materials, or other wastes (i.e., waste does NOT match TRUCON Code[s])?	☐ Yes ☒ No
Is there an indication of wastes containing explosives or compressed gases?	☐ Yes ☒ No
Is there an indication of PCBs liquids?	☐ Yes ☒ No
Is there an indication of the waste exhibiting the characteristic of ignitability, corrosivity, or reactivity (EPA Hazardous Waste Numbers of D001, D002, or D003)?	☐ Yes ☒ No
Is the physical form of the waste inconsistent with the Waste Stream Description or the Waste Matrix Code?	☐ Yes ☒ No
CH or RH TRAMPAC	
Are there heat-sealed bags (unvented) GREATER than 4 liters and LESS than 390 square inches in the waste, or heat sealed bags not authorized in the RH TRUCON Code?	☐ Yes ☒ No
Were there Non-approved Closure Methods used on liner bags or inner bags greater than 4 liters?	☐ Yes ☒ No
Are there sealed containers GREATER than 4 liters?	☐ Yes ☒ No
Are there indications of inadequate protection for heavy and/or sharp objects?	☐ Yes ☒ No
Comments: N/A .	

RTR Operator:

Eric Lyles		1/13/2016
Print Name	Signature	Date

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CCP Radiography Data Sheet

Section 1: General Information	
[X] RTR Examination [ ] RTR Replicate Scan [ ] RTR Independent Observation	
Site ID:	ORNL
Batch Number:	OR-RTR6-0713
Examination Date:	1/13/2016
Waste Container ID:	X10C1250290
Video/Audio Recorded Media Number:	OR-RTR6-0713 A&B
Procedure and Revision No.:	CCP-TP-053 Rev. 15
NCR(s) associated with the container? (e.g., Prohibited Items)	[X] No [ ] Yes NCR No.: N/A NCR No.: N/A

Section 2: Waste Container Data	
Container Type:	55 Gallon Drum
TRUCON Code:	OR 227
Waste Matrix Code:	S4100
Waste Stream I.D.:	OR-NFS-CH-SOIL
Waste Container Weights:	Gross Wt.: 228.0 kg Tare Wt.: 35.2 kg Net Wt.: 192.8 kg
Rigid Liner and Liner Vent Description:	Liner: [ ] No [X] Yes Lid: [X] No [ ] Yes Type: [ ] 30-mil [X] 90-mil [ ] 110-mil [ ] 125-mil Vented: [ ] No [X] Yes [ ] N/A Punctured: [X] No [ ] Yes Mechanical Vent: [X] No [ ] Yes Fiberboard Liner: [X] No [ ] Yes Lead Lined: [X] No [ ] Yes
Number of Layers of Confinement:	Appears to be 1 layer
Volume Utilization Percentage:	85 %

CCP Radiography Data Sheet

Waste Container ID: X10C1250290

Section 3: Container Inventory and Comments (Detailed descriptions)	
IM:	
AM:	
OM:	
OI:	
C:	
R:	
XPM:	
OR:	Absorbent
IN:	
S:	Soil

Section 4: Packaging Material and Waste Material Parameters	
Packaging Material:	**Estimated Weight (kg)**
Steel (ST):	27.8
Plastics (PP): Liner bag, Rigid Liner	7.4
Other:	0.0
Total Packaging Weight	35.2
Waste Material Parameter:	**Estimated Weight (kg)**
Iron-based Metal / Alloys (IM):	
Aluminum-based Metals / Alloys (AM):	
Other Metals (OM):	
Other Inorganic Materials (OI)	
Cellulosics (C):	
Rubber (R):	
Plastics (waste materials) (XPM):	
Organic Matrix (OR):	3.0
Inorganic Matrix (IN):	
Soils (S):	189.8
Total WMP Weight:	192.8

CCP Radiography Data Sheet

Waste Container ID: X10C1250290

Section 5: RTR Summary (Questions answered "Yes" will be explained in the Comment block, except for Question 1)	
Is there observable liquid?	☐ Yes ☒ No
Is there any observable liquid in internal containers, more than 60 milliliters or 3 percent by volume, whichever is greater?	☐ Yes ☒ No
Is the total volume of observable liquid in the outermost container GREATER than 1% of the container?	☐ Yes ☒ No
Is there observable liquid in payload containers with an EPA Hazardous Waste Number of U134?	☐ Yes ☒ No
Is there an indication of non-radionuclide pyrophoric materials, such as elemental potassium?	☐ Yes ☒ No
Is there an indication of hazardous wastes not occurring as co-contaminants with TRU mixed wastes (non-mixed hazardous wastes)?	☐ Yes ☒ No
Is there an indication of wastes incompatible with backfill, seal and panel closures materials, container and packaging materials, shipping container materials, or other wastes (i.e., waste does NOT match TRUCON Code[s])?	☐ Yes ☒ No
Is there an indication of wastes containing explosives or compressed gases?	☐ Yes ☒ No
Is there an indication of PCBs liquids?	☐ Yes ☒ No
Is there an indication of the waste exhibiting the characteristic of ignitability, corrosivity, or reactivity (EPA Hazardous Waste Numbers of D001, D002, or D003)?	☐ Yes ☒ No
Is the physical form of the waste inconsistent with the Waste Stream Description or the Waste Matrix Code?	☐ Yes ☒ No
CH or RH TRAMPAC	
Are there heat-sealed bags (unvented) GREATER than 4 liters and LESS than 390 square inches in the waste, or heat sealed bags not authorized in the RH TRUCON Code?	☐ Yes ☒ No
Were there Non-approved Closure Methods used on liner bags or inner bags greater than 4 liters?	☐ Yes ☒ No
Are there sealed containers GREATER than 4 liters?	☐ Yes ☒ No
Are there indications of inadequate protection for heavy and/or sharp objects?	☐ Yes ☒ No
Comments: N/A	

RTR Operator:

Print Name	Signature	Date
Eric Lyles		1/13/2016

CCP Radiography Data Sheet

Section 1: General Information	
[X] RTR Examination [ ] RTR Replicate Scan [ ] RTR Independent Observation	
Site ID:	ORNL
Batch Number:	OR-RTR6-0713
Examination Date:	1/13/2016
Waste Container ID:	X10C1250255
Video/Audio Recorded Media Number:	OR-RTR6-0713 A&B
Procedure and Revision No.:	CCP-TP-053 Rev. 15
NCR(s) associated with the container? (e.g., Prohibited Items)	[X] No [ ] Yes NCR No.: N/A NCR No.: N/A

Section 2: Waste Container Data	
Container Type:	55 Gallon Drum
TRUCON Code:	OR 227
Waste Matrix Code:	S4100
Waste Stream I.D.:	OR-NFS-CH-SOIL
Waste Container Weights:	Gross Wt.: 227.5 kg Tare Wt.: 35.2 kg Net Wt.: 192.3 kg
Rigid Liner and Liner Vent Description:	Liner: [ ] No [X] Yes Lid: [X] No [ ] Yes Type: [ ] 30-mil [X] 90-mil [ ] 110-mil [ ] 125-mil Vented: [ ] No [X] Yes [ ] N/A Punctured: [X] No [ ] Yes Mechanical Vent: [X] No [ ] Yes Fiberboard Liner: [X] No [ ] Yes Lead Lined: [X] No [ ] Yes
Number of Layers of Confinement:	Appears to be 1 layer
Volume Utilization Percentage:	85 %

CCP Radiography Data Sheet

Waste Container ID: X10C1250255

Section 3: Container Inventory and Comments (Detailed descriptions)
IM:
AM:
OM:
OI:
C:
R:
XPM:
OR: Absorbent
IN:
S: Soil

Section 4: Packaging Material and Waste Material Parameters	
Packaging Material:	**Estimated Weight (kg)**
Steel (ST):	27.8
Plastics (PP): Liner bag, Rigid Liner	7.4
Other:	0.0
Total Packaging Weight	35.2
Waste Material Parameter:	**Estimated Weight (kg)**
Iron-based Metal / Alloys (IM):	
Aluminum-based Metals / Alloys (AM):	
Other Metals (OM):	
Other Inorganic Materials (OI)	
Cellulosics (C):	
Rubber (R):	
Plastics (waste materials) (XPM):	
Organic Matrix (OR):	2.0
Inorganic Matrix (IN):	
Soils (S):	190.3
Total WMP Weight:	192.3

CCP Radiography Data Sheet

Waste Container ID: X10C1250255

Section 5: RTR Summary (Questions answered "Yes" will be explained in the Comment block, except for Question 1)	
Is there observable liquid?	☐ Yes ☒ No
Is there any observable liquid in internal containers, more than 60 milliliters or 3 percent by volume, whichever is greater?	☐ Yes ☒ No
Is the total volume of observable liquid in the outermost container GREATER than 1% of the container?	☐ Yes ☒ No
Is there observable liquid in payload containers with an EPA Hazardous Waste Number of U134?	☐ Yes ☒ No
Is there an indication of non-radionuclide pyrophoric materials, such as elemental potassium?	☐ Yes ☒ No
Is there an indication of hazardous wastes not occurring as co-contaminants with TRU mixed wastes (non-mixed hazardous wastes)?	☐ Yes ☒ No
Is there an indication of wastes incompatible with backfill, seal and panel closures materials, container and packaging materials, shipping container materials, or other wastes (i.e., waste does NOT match TRUCON Code[s])?	☐ Yes ☒ No
Is there an indication of wastes containing explosives or compressed gases?	☐ Yes ☒ No
Is there an indication of PCBs liquids?	☐ Yes ☒ No
Is there an indication of the waste exhibiting the characteristic of ignitability, corrosivity, or reactivity (EPA Hazardous Waste Numbers of D001, D002, or D003)?	☐ Yes ☒ No
Is the physical form of the waste inconsistent with the Waste Stream Description or the Waste Matrix Code?	☐ Yes ☒ No
CH or RH TRAMPAC	
Are there heat-sealed bags (unvented) GREATER than 4 liters and LESS than 390 square inches in the waste, or heat sealed bags not authorized in the RH TRUCON Code?	☐ Yes ☒ No
Were there Non-approved Closure Methods used on liner bags or inner bags greater than 4 liters?	☐ Yes ☒ No
Are there sealed containers GREATER than 4 liters?	☐ Yes ☒ No
Are there indications of inadequate protection for heavy and/or sharp objects?	☐ Yes ☒ No
Comments: N/A	

RTR Operator:

Eric Lyles		1/13/2016
Print Name	Signature	Date

CCP Radiography Data Sheet

Section 1: General Information	
[X] RTR Examination [ ] RTR Replicate Scan [ ] RTR Independent Observation	
Site ID:	ORNL
Batch Number:	OR-RTR6-0713
Examination Date:	1/13/2016
Waste Container ID:	X10C1250271
Video/Audio Recorded Media Number:	OR-RTR6-0713 A&B
Procedure and Revision No.:	CCP-TP-053 Rev. 15
NCR(s) associated with the container? (e.g., Prohibited Items)	[X] No [ ] Yes NCR No.: N/A NCR No.: N/A

Section 2: Waste Container Data	
Container Type:	55 Gallon Drum
TRUCON Code:	OR 227
Waste Matrix Code:	S4100
Waste Stream I.D.:	OR-NFS-CH-SOIL
Waste Container Weights:	Gross Wt.: 214.2 kg Tare Wt.: 35.2 kg Net Wt.: 179.0 kg
Rigid Liner and Liner Vent Description:	Liner: [ ] No [X] Yes Lid: [X] No [ ] Yes Type: [ ] 30-mil [X] 90-mil [ ] 110-mil [ ] 125-mil Vented: [ ] No [X] Yes [ ] N/A Punctured: [X] No [ ] Yes Mechanical Vent: [X] No [ ] Yes Fiberboard Liner: [X] No [ ] Yes Lead Lined: [X] No [ ] Yes
Number of Layers of Confinement:	Appears to be 1 layer
Volume Utilization Percentage:	80 %

CCP Radiography Data Sheet

Waste Container ID: X10C1250271

Section 3: Container Inventory and Comments (Detailed descriptions)
IM:
AM:
OM:
OI:
C:
R:
XPM:
OR: Absorbent
IN:
S: Soil

Section 4: Packaging Material and Waste Material Parameters	
Packaging Material:	**Estimated Weight (kg)**
Steel (ST):	27.8
Plastics (PP): Liner bag, Rigid Liner	7.4
Other:	0.0
Total Packaging Weight	35.2
Waste Material Parameter:	**Estimated Weight (kg)**
Iron-based Metal / Alloys (IM):	
Aluminum-based Metals / Alloys (AM):	
Other Metals (OM):	
Other Inorganic Materials (OI)	
Cellulosics (C):	
Rubber (R):	
Plastics (waste materials) (XPM):	
Organic Matrix (OR):	3.0
Inorganic Matrix (IN):	
Soils (S):	176.0
Total WMP Weight:	179.0

CCP Radiography Data Sheet

Waste Container ID: X10C1250271

Section 5: RTR Summary (Questions answered "Yes" will be explained in the Comment block, except for Question 1)	
Is there observable liquid?	☐ Yes ☒ No
Is there any observable liquid in internal containers, more than 60 milliliters or 3 percent by volume, whichever is greater?	☐ Yes ☒ No
Is the total volume of observable liquid in the outermost container GREATER than 1% of the container?	☐ Yes ☒ No
Is there observable liquid in payload containers with an EPA Hazardous Waste Number of U134?	☐ Yes ☒ No
Is there an indication of non-radionuclide pyrophoric materials, such as elemental potassium?	☐ Yes ☒ No
Is there an indication of hazardous wastes not occurring as co-contaminants with TRU mixed wastes (non-mixed hazardous wastes)?	☐ Yes ☒ No
Is there an indication of wastes incompatible with backfill, seal and panel closures materials, container and packaging materials, shipping container materials, or other wastes (i.e., waste does NOT match TRUCON Code[s])?	☐ Yes ☒ No
Is there an indication of wastes containing explosives or compressed gases?	☐ Yes ☒ No
Is there an indication of PCBs liquids?	☐ Yes ☒ No
Is there an indication of the waste exhibiting the characteristic of ignitability, corrosivity, or reactivity (EPA Hazardous Waste Numbers of D001, D002, or D003)?	☐ Yes ☒ No
Is the physical form of the waste inconsistent with the Waste Stream Description or the Waste Matrix Code?	☐ Yes ☒ No
CH or RH TRAMPAC	
Are there heat-sealed bags (unvented) GREATER than 4 liters and LESS than 390 square inches in the waste, or heat sealed bags not authorized in the RH TRUCON Code?	☐ Yes ☒ No
Were there Non-approved Closure Methods used on liner bags or inner bags greater than 4 liters?	☐ Yes ☒ No
Are there sealed containers GREATER than 4 liters?	☐ Yes ☒ No
Are there indications of inadequate protection for heavy and/or sharp objects?	☐ Yes ☒ No
Comments: N/A	
RTR Operator: Eric Lyles (Print Name) / [signature] (Signature) / 1/13/2016 (Date)	

CCP Radiography Data Sheet

Section 1: General Information	
[X] RTR Examination [ ] RTR Replicate Scan [ ] RTR Independent Observation	
Site ID:	ORNL
Batch Number:	OR-RTR6-0713
Examination Date:	1/13/2016
Waste Container ID:	X10C1250267
Video/Audio Recorded Media Number:	OR-RTR6-0713 A&B
Procedure and Revision No.:	CCP-TP-053 Rev. 15
NCR(s) associated with the container? (e.g., Prohibited Items)	[X] No [ ] Yes NCR No.: N/A NCR No.: N/A

Section 2: Waste Container Data	
Container Type:	55 Gallon Drum
TRUCON Code:	OR 227
Waste Matrix Code:	S4100
Waste Stream I.D.:	OR-NFS-CH-SOIL
Waste Container Weights:	Gross Wt.: 237.9 kg Tare Wt.: 35.2 kg Net Wt.: 202.7 kg
Rigid Liner and Liner Vent Description:	Liner: [ ] No [X] Yes Lid: [X] No [ ] Yes Type: [ ] 30-mil [X] 90-mil [ ] 110-mil [ ] 125-mil Vented: [ ] No [X] Yes [ ] N/A Punctured: [X] No [ ] Yes Mechanical Vent: [X] No [ ] Yes Fiberboard Liner: [X] No [ ] Yes Lead Lined: [X] No [ ] Yes
Number of Layers of Confinement:	Appears to be 1 layer
Volume Utilization Percentage:	90 %

CCP Radiography Data Sheet

Waste Container ID: X10C1250267

Section 3: Container Inventory and Comments (Detailed descriptions)

IM:

AM:

OM:

OI:

C:

R:

XPM:

OR: Absorbent

IN:

S: Soil

Section 4: Packaging Material and Waste Material Parameters

Packaging Material:	**Estimated Weight (kg)**
Steel (ST):	27.8
Plastics (PP): Liner bag, Rigid Liner	7.4
Other:	0.0
Total Packaging Weight	35.2
Waste Material Parameter:	**Estimated Weight (kg)**
Iron-based Metal / Alloys (IM):	
Aluminum-based Metals / Alloys (AM):	
Other Metals (OM):	
Other Inorganic Materials (OI)	
Cellulosics (C):	
Rubber (R):	
Plastics (waste materials) (XPM):	
Organic Matrix (OR):	2.0
Inorganic Matrix (IN):	
Soils (S):	200.7
Total WMP Weight:	202.7

CCP Radiography Data Sheet

Waste Container ID: X10C1250267

Section 5: RTR Summary (Questions answered "Yes" will be explained in the Comment block, except for Question 1)	
Is there observable liquid?	☐ Yes ☒ No
Is there any observable liquid in internal containers, more than 60 milliliters or 3 percent by volume, whichever is greater?	☐ Yes ☒ No
Is the total volume of observable liquid in the outermost container GREATER than 1% of the container?	☐ Yes ☒ No
Is there observable liquid in payload containers with an EPA Hazardous Waste Number of U134?	☐ Yes ☒ No
Is there an indication of non-radionuclide pyrophoric materials, such as elemental potassium?	☐ Yes ☒ No
Is there an indication of hazardous wastes not occurring as co-contaminants with TRU mixed wastes (non-mixed hazardous wastes)?	☐ Yes ☒ No
Is there an indication of wastes incompatible with backfill, seal and panel closures materials, container and packaging materials, shipping container materials, or other wastes (i.e., waste does NOT match TRUCON Code[s])?	☐ Yes ☒ No
Is there an indication of wastes containing explosives or compressed gases?	☐ Yes ☒ No
Is there an indication of PCBs liquids?	☐ Yes ☒ No
Is there an indication of the waste exhibiting the characteristic of ignitability, corrosivity, or reactivity (EPA Hazardous Waste Numbers of D001, D002, or D003)?	☐ Yes ☒ No
Is the physical form of the waste inconsistent with the Waste Stream Description or the Waste Matrix Code?	☐ Yes ☒ No
CH or RH TRAMPAC	
Are there heat-sealed bags (unvented) GREATER than 4 liters and LESS than 390 square inches in the waste, or heat sealed bags not authorized in the RH TRUCON Code?	☐ Yes ☒ No
Were there Non-approved Closure Methods used on liner bags or inner bags greater than 4 liters?	☐ Yes ☒ No
Are there sealed containers GREATER than 4 liters?	☐ Yes ☒ No
Are there indications of inadequate protection for heavy and/or sharp objects?	☐ Yes ☒ No
Comments: N/A	

RTR Operator:

Eric Lyles		1/13/2016
Print Name	Signature	Date

CCP Radiography Data Sheet

Section 1: General Information	
[X] RTR Examination [ ] RTR Replicate Scan [ ] RTR Independent Observation	
Site ID:	ORNL
Batch Number:	OR-RTR6-0713
Examination Date:	1/13/2016
Waste Container ID:	X10C1250291
Video/Audio Recorded Media Number:	OR-RTR6-0713 A&B
Procedure and Revision No.:	CCP-TP-053 Rev. 15
NCR(s) associated with the container? (e.g., Prohibited Items)	[X] No [ ] Yes NCR No.: N/A NCR No.: N/A

Section 2: Waste Container Data	
Container Type:	55 Gallon Drum
TRUCON Code:	OR 227
Waste Matrix Code:	S4100
Waste Stream I.D.:	OR-NFS-CH-SOIL
Waste Container Weights:	Gross Wt.: 211.5 kg Tare Wt.: 35.2 kg Net Wt.: 176.3 kg
Rigid Liner and Liner Vent Description:	Liner: [ ] No [X] Yes Lid: [X] No [ ] Yes Type: [ ] 30-mil [X] 90-mil [ ] 110-mil [ ] 125-mil Vented: [ ] No [X] Yes [ ] N/A Punctured: [X] No [ ] Yes Mechanical Vent: [X] No [ ] Yes Fiberboard Liner: [X] No [ ] Yes Lead Lined: [X] No [ ] Yes
Number of Layers of Confinement:	Appears to be 1 layer
Volume Utilization Percentage:	80 %

CCP Radiography Data Sheet

Waste Container ID: X10C1250291

Section 3: Container Inventory and Comments (Detailed descriptions)	
IM:	Scrap metal
AM:	
OM:	
OI:	
C:	
R:	
XPM:	
OR:	Absorbent
IN:	
S:	Soil

Section 4: Packaging Material and Waste Material Parameters	
Packaging Material:	**Estimated Weight (kg)**
Steel (ST):	27.8
Plastics (PP): Liner bag, Rigid Liner	7.4
Other:	0.0
Total Packaging Weight	35.2
Waste Material Parameter:	**Estimated Weight (kg)**
Iron-based Metal / Alloys (IM):	0.1
Aluminum-based Metals / Alloys (AM):	
Other Metals (OM):	
Other Inorganic Materials (OI)	
Cellulosics (C):	
Rubber (R):	
Plastics (waste materials) (XPM):	
Organic Matrix (OR):	3.0
Inorganic Matrix (IN):	
Soils (S):	173.2
Total WMP Weight:	176.3

CCP Radiography Data Sheet

Waste Container ID: X10C1250291

Section 5: RTR Summary (Questions answered "Yes" will be explained in the Comment block, except for Question 1)	
Is there observable liquid?	☐ Yes ☒ No
Is there any observable liquid in internal containers, more than 60 milliliters or 3 percent by volume, whichever is greater?	☐ Yes ☒ No
Is the total volume of observable liquid in the outermost container GREATER than 1% of the container?	☐ Yes ☒ No
Is there observable liquid in payload containers with an EPA Hazardous Waste Number of U134?	☐ Yes ☒ No
Is there an indication of non-radionuclide pyrophoric materials, such as elemental potassium?	☐ Yes ☒ No
Is there an indication of hazardous wastes not occurring as co-contaminants with TRU mixed wastes (non-mixed hazardous wastes)?	☐ Yes ☒ No
Is there an indication of wastes incompatible with backfill, seal and panel closures materials, container and packaging materials, shipping container materials, or other wastes (i.e., waste does NOT match TRUCON Code[s])?	☐ Yes ☒ No
Is there an indication of wastes containing explosives or compressed gases?	☐ Yes ☒ No
Is there an indication of PCBs liquids?	☐ Yes ☒ No
Is there an indication of the waste exhibiting the characteristic of ignitability, corrosivity, or reactivity (EPA Hazardous Waste Numbers of D001, D002, or D003)?	☐ Yes ☒ No
Is the physical form of the waste inconsistent with the Waste Stream Description or the Waste Matrix Code?	☐ Yes ☒ No
CH or RH TRAMPAC	
Are there heat-sealed bags (unvented) GREATER than 4 liters and LESS than 390 square inches in the waste, or heat sealed bags not authorized in the RH TRUCON Code?	☐ Yes ☒ No
Were there Non-approved Closure Methods used on liner bags or inner bags greater than 4 liters?	☐ Yes ☒ No
Are there sealed containers GREATER than 4 liters?	☐ Yes ☒ No
Are there indications of inadequate protection for heavy and/or sharp objects?	☐ Yes ☒ No
Comments: N/A	

RTR Operator:

Eric Lyles		1/13/2016
Print Name	Signature	Date

CCP Radiography Data Sheet

Section 1: General Information		
[X] RTR Examination	[ ] RTR Replicate Scan	[ ] RTR Independent Observation
Site ID:	ORNL	
Batch Number:	OR-RTR6-0713	
Examination Date:	1/13/2016	
Waste Container ID:	X10C1250268	
Video/Audio Recorded Media Number:	OR-RTR6-0713	A&B
Procedure and Revision No.:	CCP-TP-053	Rev. 15
NCR(s) associated with the container? (e.g., Prohibited Items)	[X] No [ ] Yes NCR No.: N/A NCR No.: N/A	

Section 2: Waste Container Data	
Container Type:	55 Gallon Drum
TRUCON Code:	OR 227
Waste Matrix Code:	S4100
Waste Stream I.D.:	OR-NFS-CH-SOIL
Waste Container Weights:	Gross Wt.: 223.9 kg Tare Wt.: 35.2 kg Net Wt.: 188.7 kg
Rigid Liner and Liner Vent Description:	Liner: [ ] No [X] Yes Lid: [X] No [ ] Yes Type: [ ] 30-mil [X] 90-mil [ ] 110-mil [ ] 125-mil Vented: [ ] No [X] Yes [ ] N/A Punctured: [X] No [ ] Yes Mechanical Vent: [X] No [ ] Yes Fiberboard Liner: [X] No [ ] Yes Lead Lined: [X] No [ ] Yes
Number of Layers of Confinement:	Appears to be 1 layer
Volume Utilization Percentage:	80 %

CCP Radiography Data Sheet

Waste Container ID: X10C1250268

Section 3: Container Inventory and Comments (Detailed descriptions)
IM:
AM:
OM:
OI:
C:
R:
XPM:
OR: Absorbent
IN:
S: Soil

Section 4: Packaging Material and Waste Material Parameters	
Packaging Material:	**Estimated Weight (kg)**
Steel (ST):	27.8
Plastics (PP): Liner bag, Rigid Liner	7.4
Other:	0.0
Total Packaging Weight	35.2
Waste Material Parameter:	**Estimated Weight (kg)**
Iron-based Metal / Alloys (IM):	
Aluminum-based Metals / Alloys (AM):	
Other Metals (OM):	
Other Inorganic Materials (OI)	
Cellulosics (C):	
Rubber (R):	
Plastics (waste materials) (XPM):	
Organic Matrix (OR):	2.0
Inorganic Matrix (IN):	
Soils (S):	186.7
Total WMP Weight:	188.7

CCP Radiography Data Sheet

Waste Container ID: X10C1250268

Section 5: RTR Summary (Questions answered "Yes" will be explained in the Comment block, except for Question 1)	
Is there observable liquid?	☐ Yes ☒ No
Is there any observable liquid in internal containers, more than 60 milliliters or 3 percent by volume, whichever is greater?	☐ Yes ☒ No
Is the total volume of observable liquid in the outermost container GREATER than 1% of the container?	☐ Yes ☒ No
Is there observable liquid in payload containers with an EPA Hazardous Waste Number of U134?	☐ Yes ☒ No
Is there an indication of non-radionuclide pyrophoric materials, such as elemental potassium?	☐ Yes ☒ No
Is there an indication of hazardous wastes not occurring as co-contaminants with TRU mixed wastes (non-mixed hazardous wastes)?	☐ Yes ☒ No
Is there an indication of wastes incompatible with backfill, seal and panel closures materials, container and packaging materials, shipping container materials, or other wastes (i.e., waste does NOT match TRUCON Code[s])?	☐ Yes ☒ No
Is there an indication of wastes containing explosives or compressed gases?	☐ Yes ☒ No
Is there an indication of PCBs liquids?	☐ Yes ☒ No
Is there an indication of the waste exhibiting the characteristic of ignitability, corrosivity, or reactivity (EPA Hazardous Waste Numbers of D001, D002, or D003)?	☐ Yes ☒ No
Is the physical form of the waste inconsistent with the Waste Stream Description or the Waste Matrix Code?	☐ Yes ☒ No
CH or RH TRAMPAC	
Are there heat-sealed bags (unvented) GREATER than 4 liters and LESS than 390 square inches in the waste, or heat sealed bags not authorized in the RH TRUCON Code?	☐ Yes ☒ No
Were there Non-approved Closure Methods used on liner bags or inner bags greater than 4 liters?	☐ Yes ☒ No
Are there sealed containers GREATER than 4 liters?	☐ Yes ☒ No
Are there indications of inadequate protection for heavy and/or sharp objects?	☐ Yes ☒ No
Comments: N/A	

RTR Operator:

Eric Lyles		1/13/2016
Print Name	Signature	Date

CCP Radiography Data Sheet

Section 1: General Information	
[X] RTR Examination [ ] RTR Replicate Scan [ ] RTR Independent Observation	
Site ID:	ORNL
Batch Number:	OR-RTR6-0713
Examination Date:	1/13/2016
Waste Container ID:	X10C1250292
Video/Audio Recorded Media Number:	OR-RTR6-0713 A&B
Procedure and Revision No.:	CCP-TP-053 Rev. 15
NCR(s) associated with the container? (e.g., Prohibited Items)	[X] No [ ] Yes NCR No.: N/A NCR No.: N/A

Section 2: Waste Container Data	
Container Type:	55 Gallon Drum
TRUCON Code:	OR 227
Waste Matrix Code:	S4100
Waste Stream I.D.:	OR-NFS-CH-SOIL
Waste Container Weights:	Gross Wt.: 222.5 kg Tare Wt.: 35.2 kg Net Wt.: 187.3 kg
Rigid Liner and Liner Vent Description:	Liner: [ ] No [X] Yes Lid: [X] No [ ] Yes Type: [ ] 30-mil [X] 90-mil [ ] 110-mil [ ] 125-mil Vented: [ ] No [X] Yes [ ] N/A Punctured: [X] No [ ] Yes Mechanical Vent: [X] No [ ] Yes Fiberboard Liner: [X] No [ ] Yes Lead Lined: [X] No [ ] Yes
Number of Layers of Confinement:	Appears to be 1 layer
Volume Utilization Percentage:	85 %

CCP Radiography Data Sheet

Waste Container ID: X10C1250292

Section 3: Container Inventory and Comments (Detailed descriptions)	
IM:	Scrap metal
AM:	
OM:	
OI:	
C:	
R:	
XPM:	
OR:	Absorbent
IN:	
S:	Soil

Section 4: Packaging Material and Waste Material Parameters	
Packaging Material:	**Estimated Weight (kg)**
Steel (ST):	27.8
Plastics (PP): Liner bag, Rigid Liner	7.4
Other:	0.0
Total Packaging Weight	35.2
Waste Material Parameter:	**Estimated Weight (kg)**
Iron-based Metal / Alloys (IM):	2.0
Aluminum-based Metals / Alloys (AM):	
Other Metals (OM):	
Other Inorganic Materials (OI)	
Cellulosics (C):	
Rubber (R):	
Plastics (waste materials) (XPM):	
Organic Matrix (OR):	3.0
Inorganic Matrix (IN):	
Soils (S):	182.3
Total WMP Weight:	187.3

CCP Radiography Data Sheet

Waste Container ID: X10C1250292

Section 5: RTR Summary (Questions answered "Yes" will be explained in the Comment block, except for Question 1)	
Is there observable liquid?	☐ Yes ☒ No
Is there any observable liquid in internal containers, more than 60 milliliters or 3 percent by volume, whichever is greater?	☐ Yes ☒ No
Is the total volume of observable liquid in the outermost container GREATER than 1% of the container?	☐ Yes ☒ No
Is there observable liquid in payload containers with an EPA Hazardous Waste Number of U134?	☐ Yes ☒ No
Is there an indication of non-radionuclide pyrophoric materials, such as elemental potassium?	☐ Yes ☒ No
Is there an indication of hazardous wastes not occurring as co-contaminants with TRU mixed wastes (non-mixed hazardous wastes)?	☐ Yes ☒ No
Is there an indication of wastes incompatible with backfill, seal and panel closures materials, container and packaging materials, shipping container materials, or other wastes (i.e., waste does NOT match TRUCON Code[s])?	☐ Yes ☒ No
Is there an indication of wastes containing explosives or compressed gases?	☐ Yes ☒ No
Is there an indication of PCBs liquids?	☐ Yes ☒ No
Is there an indication of the waste exhibiting the characteristic of ignitability, corrosivity, or reactivity (EPA Hazardous Waste Numbers of D001, D002, or D003)?	☐ Yes ☒ No
Is the physical form of the waste inconsistent with the Waste Stream Description or the Waste Matrix Code?	☐ Yes ☒ No
CH or RH TRAMPAC	
Are there heat-sealed bags (unvented) GREATER than 4 liters and LESS than 390 square inches in the waste, or heat sealed bags not authorized in the RH TRUCON Code?	☐ Yes ☒ No
Were there Non-approved Closure Methods used on liner bags or inner bags greater than 4 liters?	☐ Yes ☒ No
Are there sealed containers GREATER than 4 liters?	☐ Yes ☒ No
Are there indications of inadequate protection for heavy and/or sharp objects?	☐ Yes ☒ No
Comments: N/A	

RTR Operator:

Eric Lyles		1/13/2016
Print Name	Signature	Date

CCP Radiography Data Sheet

Section 1: General Information	
[X] RTR Examination [ ] RTR Replicate Scan [ ] RTR Independent Observation	
Site ID:	ORNL
Batch Number:	OR-RTR6-0713
Examination Date:	1/13/2016
Waste Container ID:	X10C1250272
Video/Audio Recorded Media Number:	OR-RTR6-0713 A&B
Procedure and Revision No.:	CCP-TP-053 Rev. 15
NCR(s) associated with the container? (e.g., Prohibited Items)	[X] No [ ] Yes NCR No.: N/A NCR No.: N/A

Section 2: Waste Container Data	
Container Type:	55 Gallon Drum
TRUCON Code:	OR 227
Waste Matrix Code:	S4100
Waste Stream I.D.:	OR-NFS-CH-SOIL
Waste Container Weights:	Gross Wt.: 242.9 kg Tare Wt.: 35.2 kg Net Wt.: 207.7 kg
Rigid Liner and Liner Vent Description:	Liner: [ ] No [X] Yes Lid: [X] No [ ] Yes Type: [ ] 30-mil [X] 90-mil [ ] 110-mil [ ] 125-mil Vented: [ ] No [X] Yes [ ] N/A Punctured: [X] No [ ] Yes Mechanical Vent: [X] No [ ] Yes Fiberboard Liner: [X] No [ ] Yes Lead Lined: [X] No [ ] Yes
Number of Layers of Confinement:	Appears to be 1 layer
Volume Utilization Percentage:	90 %

CCP Radiography Data Sheet

Waste Container ID: X10C1250272

Section 3: Container Inventory and Comments (Detailed descriptions)	
IM:	
AM:	
OM:	
OI:	
C:	
R:	
XPM:	
OR:	Absorbent
IN:	
S:	Soil

Section 4: Packaging Material and Waste Material Parameters	
Packaging Material:	**Estimated Weight (kg)**
Steel (ST):	27.8
Plastics (PP): Liner bag, Rigid Liner	7.4
Other:	0.0
Total Packaging Weight	35.2
Waste Material Parameter:	**Estimated Weight (kg)**
Iron-based Metal / Alloys (IM):	
Aluminum-based Metals / Alloys (AM):	
Other Metals (OM):	
Other Inorganic Materials (OI)	
Cellulosics (C):	
Rubber (R):	
Plastics (waste materials) (XPM):	
Organic Matrix (OR):	2.0
Inorganic Matrix (IN):	
Soils (S):	205.7
Total WMP Weight:	207.7

CCP Radiography Data Sheet

Waste Container ID: X10C1250272

Section 5: RTR Summary (Questions answered "Yes" will be explained in the Comment block, except for Question 1)	
Is there observable liquid?	☐ Yes ☒ No
Is there any observable liquid in internal containers, more than 60 milliliters or 3 percent by volume, whichever is greater?	☐ Yes ☒ No
Is the total volume of observable liquid in the outermost container GREATER than 1% of the container?	☐ Yes ☒ No
Is there observable liquid in payload containers with an EPA Hazardous Waste Number of U134?	☐ Yes ☒ No
Is there an indication of non-radionuclide pyrophoric materials, such as elemental potassium?	☐ Yes ☒ No
Is there an indication of hazardous wastes not occurring as co-contaminants with TRU mixed wastes (non-mixed hazardous wastes)?	☐ Yes ☒ No
Is there an indication of wastes incompatible with backfill, seal and panel closures materials, container and packaging materials, shipping container materials, or other wastes (i.e., waste does NOT match TRUCON Code[s])?	☐ Yes ☒ No
Is there an indication of wastes containing explosives or compressed gases?	☐ Yes ☒ No
Is there an indication of PCBs liquids?	☐ Yes ☒ No
Is there an indication of the waste exhibiting the characteristic of ignitability, corrosivity, or reactivity (EPA Hazardous Waste Numbers of D001, D002, or D003)?	☐ Yes ☒ No
Is the physical form of the waste inconsistent with the Waste Stream Description or the Waste Matrix Code?	☐ Yes ☒ No
CH or RH TRAMPAC	
Are there heat-sealed bags (unvented) GREATER than 4 liters and LESS than 390 square inches in the waste, or heat sealed bags not authorized in the RH TRUCON Code?	☐ Yes ☒ No
Were there Non-approved Closure Methods used on liner bags or inner bags greater than 4 liters?	☐ Yes ☒ No
Are there sealed containers GREATER than 4 liters?	☐ Yes ☒ No
Are there indications of inadequate protection for heavy and/or sharp objects?	☐ Yes ☒ No

Comments: N/A

RTR Operator:

Eric Lyles		1/13/2016
Print Name	Signature	Date

CCP Radiography Data Sheet

Section 1: General Information	
[X] RTR Examination [ ] RTR Replicate Scan [ ] RTR Independent Observation	
Site ID:	ORNL
Batch Number:	OR-RTR6-0713
Examination Date:	1/13/2016
Waste Container ID:	X10C1250270
Video/Audio Recorded Media Number:	OR-RTR6-0713 A&B
Procedure and Revision No.:	CCP-TP-053 Rev. 15
NCR(s) associated with the container? (e.g., Prohibited Items)	[X] No [ ] Yes NCR No.: N/A NCR No.: N/A

Section 2: Waste Container Data	
Container Type:	55 Gallon Drum
TRUCON Code:	OR 227
Waste Matrix Code:	S4100
Waste Stream I.D.:	OR-NFS-CH-SOIL
Waste Container Weights:	Gross Wt.: 233.4 kg Tare Wt.: 35.2 kg Net Wt.: 198.2 kg
Rigid Liner and Liner Vent Description:	Liner: [ ] No [X] Yes Lid: [X] No [ ] Yes Type: [ ] 30-mil [X] 90-mil [ ] 110-mil [ ] 125-mil Vented: [ ] No [X] Yes [ ] N/A Punctured: [X] No [ ] Yes Mechanical Vent: [X] No [ ] Yes Fiberboard Liner: [X] No [ ] Yes Lead Lined: [X] No [ ] Yes
Number of Layers of Confinement:	Appears to be 1 layer
Volume Utilization Percentage:	90 %

CCP Radiography Data Sheet

Waste Container ID: X10C1250270

Section 3: Container Inventory and Comments (Detailed descriptions)
IM:
AM:
OM:
OI:
C:
R:
XPM:
OR: *Absorbent*
IN:
S: *Soil*

Section 4: Packaging Material and Waste Material Parameters	
Packaging Material:	**Estimated Weight (kg)**
Steel (ST):	27.8
Plastics (PP): Liner bag, Rigid Liner	7.4
Other:	0.0
Total Packaging Weight	35.2
Waste Material Parameter:	**Estimated Weight (kg)**
Iron-based Metal / Alloys (IM):	
Aluminum-based Metals / Alloys (AM):	
Other Metals (OM):	
Other Inorganic Materials (OI)	
Cellulosics (C):	
Rubber (R):	
Plastics (waste materials) (XPM):	
Organic Matrix (OR):	2.0
Inorganic Matrix (IN):	
Soils (S):	196.2
Total WMP Weight:	198.2

CCP Radiography Data Sheet

Waste Container ID: X10C1250270

Section 5: RTR Summary (Questions answered "Yes" will be explained in the Comment block, except for Question 1)	
Is there observable liquid?	☐ Yes ☒ No
Is there any observable liquid in internal containers, more than 60 milliliters or 3 percent by volume, whichever is greater?	☐ Yes ☒ No
Is the total volume of observable liquid in the outermost container GREATER than 1% of the container?	☐ Yes ☒ No
Is there observable liquid in payload containers with an EPA Hazardous Waste Number of U134?	☐ Yes ☒ No
Is there an indication of non-radionuclide pyrophoric materials, such as elemental potassium?	☐ Yes ☒ No
Is there an indication of hazardous wastes not occurring as co-contaminants with TRU mixed wastes (non-mixed hazardous wastes)?	☐ Yes ☒ No
Is there an indication of wastes incompatible with backfill, seal and panel closures materials, container and packaging materials, shipping container materials, or other wastes (i.e., waste does NOT match TRUCON Code[s])?	☐ Yes ☒ No
Is there an indication of wastes containing explosives or compressed gases?	☐ Yes ☒ No
Is there an indication of PCBs liquids?	☐ Yes ☒ No
Is there an indication of the waste exhibiting the characteristic of ignitability, corrosivity, or reactivity (EPA Hazardous Waste Numbers of D001, D002, or D003)?	☐ Yes ☒ No
Is the physical form of the waste inconsistent with the Waste Stream Description or the Waste Matrix Code?	☐ Yes ☒ No
CH or RH TRAMPAC	
Are there heat-sealed bags (unvented) GREATER than 4 liters and LESS than 390 square inches in the waste, or heat sealed bags not authorized in the RH TRUCON Code?	☐ Yes ☒ No
Were there Non-approved Closure Methods used on liner bags or inner bags greater than 4 liters?	☐ Yes ☒ No
Are there sealed containers GREATER than 4 liters?	☐ Yes ☒ No
Are there indications of inadequate protection for heavy and/or sharp objects?	☐ Yes ☒ No
Comments: N/A	

RTR Operator:

Eric Lyles		1/13/2016
Print Name	Signature	Date

CCP Radiography Data Sheet

Section 1: General Information	
[X] RTR Examination [ ] RTR Replicate Scan [ ] RTR Independent Observation	
Site ID:	ORNL
Batch Number:	OR-RTR6-0713
Examination Date:	1/13/2016
Waste Container ID:	X10C1250299
Video/Audio Recorded Media Number:	OR-RTR6-0713 A&B
Procedure and Revision No.:	CCP-TP-053 Rev. 15
NCR(s) associated with the container? (e.g., Prohibited Items)	[X] No [ ] Yes NCR No.: N/A NCR No.: N/A

Section 2: Waste Container Data	
Container Type:	55 Gallon Drum
TRUCON Code:	OR 227
Waste Matrix Code:	S4100
Waste Stream I.D.:	OR-NFS-CH-SOIL
Waste Container Weights:	Gross Wt.: 245.3 kg Tare Wt.: 35.2 kg Net Wt.: 210.1 kg
Rigid Liner and Liner Vent Description:	Liner: [ ] No [X] Yes Lid: [X] No [ ] Yes Type: [ ] 30-mil [X] 90-mil [ ] 110-mil [ ] 125-mil Vented: [ ] No [X] Yes [ ] N/A Punctured: [X] No [ ] Yes Mechanical Vent: [X] No [ ] Yes Fiberboard Liner: [X] No [ ] Yes Lead Lined: [X] No [ ] Yes
Number of Layers of Confinement:	Appears to be 1 layer
Volume Utilization Percentage:	90 %

CCP Radiography Data Sheet

Waste Container ID: X10C1250299

Section 3: Container Inventory and Comments (Detailed descriptions)	
IM:	
AM:	
OM:	
OI:	
C:	
R:	
XPM:	
OR:	Absorbent
IN:	
S:	Soil

Section 4: Packaging Material and Waste Material Parameters	
Packaging Material:	**Estimated Weight (kg)**
Steel (ST):	27.8
Plastics (PP): Liner bag, Rigid Liner	7.4
Other:	0.0
Total Packaging Weight	35.2
Waste Material Parameter:	**Estimated Weight (kg)**
Iron-based Metal / Alloys (IM):	
Aluminum-based Metals / Alloys (AM):	
Other Metals (OM):	
Other Inorganic Materials (OI)	
Cellulosics (C):	
Rubber (R):	
Plastics (waste materials) (XPM):	
Organic Matrix (OR):	3.0
Inorganic Matrix (IN):	
Soils (S):	207.1
Total WMP Weight:	210.1

CCP Radiography Data Sheet

Waste Container ID: X10C1250299

Section 5: RTR Summary (Questions answered "Yes" will be explained in the Comment block, except for Question 1)	
Is there observable liquid?	☐ Yes ☒ No
Is there any observable liquid in internal containers, more than 60 milliliters or 3 percent by volume, whichever is greater?	☐ Yes ☒ No
Is the total volume of observable liquid in the outermost container GREATER than 1% of the container?	☐ Yes ☒ No
Is there observable liquid in payload containers with an EPA Hazardous Waste Number of U134?	☐ Yes ☒ No
Is there an indication of non-radionuclide pyrophoric materials, such as elemental potassium?	☐ Yes ☒ No
Is there an indication of hazardous wastes not occurring as co-contaminants with TRU mixed wastes (non-mixed hazardous wastes)?	☐ Yes ☒ No
Is there an indication of wastes incompatible with backfill, seal and panel closures materials, container and packaging materials, shipping container materials, or other wastes (i.e., waste does NOT match TRUCON Code[s])?	☐ Yes ☒ No
Is there an indication of wastes containing explosives or compressed gases?	☐ Yes ☒ No
Is there an indication of PCBs liquids?	☐ Yes ☒ No
Is there an indication of the waste exhibiting the characteristic of ignitability, corrosivity, or reactivity (EPA Hazardous Waste Numbers of D001, D002, or D003)?	☐ Yes ☒ No
Is the physical form of the waste inconsistent with the Waste Stream Description or the Waste Matrix Code?	☐ Yes ☒ No
CH or RH TRAMPAC	
Are there heat-sealed bags (unvented) GREATER than 4 liters and LESS than 390 square inches in the waste, or heat sealed bags not authorized in the RH TRUCON Code?	☐ Yes ☒ No
Were there Non-approved Closure Methods used on liner bags or inner bags greater than 4 liters?	☐ Yes ☒ No
Are there sealed containers GREATER than 4 liters?	☐ Yes ☒ No
Are there indications of inadequate protection for heavy and/or sharp objects?	☐ Yes ☒ No
Comments: N/A	

RTR Operator:

Eric Lyles	[signature]	1/13/2016
Print Name	Signature	Date

CCP Radiography Data Sheet

Section 1: General Information	
[X] RTR Examination [ ] RTR Replicate Scan [ ] RTR Independent Observation	
Site ID:	ORNL
Batch Number:	OR-RTR6-0713
Examination Date:	1/13/2016
Waste Container ID:	X10C1250266
Video/Audio Recorded Media Number:	OR-RTR6-0713 A&B
Procedure and Revision No.:	CCP-TP-053 Rev. 15
NCR(s) associated with the container? (e.g., Prohibited Items)	[X] No [ ] Yes NCR No.: N/A NCR No.: N/A

Section 2: Waste Container Data	
Container Type:	55 Gallon Drum
TRUCON Code:	OR 227
Waste Matrix Code:	S4100
Waste Stream I.D.:	OR-NFS-CH-SOIL
Waste Container Weights:	Gross Wt.: 227.5 kg Tare Wt.: 35.2 kg Net Wt.: 192.3 kg
Rigid Liner and Liner Vent Description:	Liner: [ ] No [X] Yes Lid: [X] No [ ] Yes Type: [ ] 30-mil [X] 90-mil [ ] 110-mil [ ] 125-mil Vented: [ ] No [X] Yes [ ] N/A Punctured: [X] No [ ] Yes Mechanical Vent: [X] No [ ] Yes Fiberboard Liner: [X] No [ ] Yes Lead Lined: [X] No [ ] Yes
Number of Layers of Confinement:	Appears to be 1 layer
Volume Utilization Percentage:	80 %

CCP Radiography Data Sheet

Waste Container ID: X10C1250266

Section 3: Container Inventory and Comments (Detailed descriptions)
IM:
AM:
OM:
OI:
C:
R:
XPM:
OR: Absorbent
IN:
S: Soil

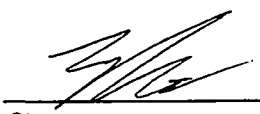
Section 4: Packaging Material and Waste Material Parameters	
Packaging Material:	**Estimated Weight (kg)**
Steel (ST):	27.8
Plastics (PP): Liner bag, Rigid Liner	7.4
Other:	0.0
Total Packaging Weight	35.2
Waste Material Parameter:	**Estimated Weight (kg)**
Iron-based Metal / Alloys (IM):	
Aluminum-based Metals / Alloys (AM):	
Other Metals (OM):	
Other Inorganic Materials (OI)	
Cellulosics (C):	
Rubber (R):	
Plastics (waste materials) (XPM):	
Organic Matrix (OR):	2.0
Inorganic Matrix (IN):	
Soils (S):	190.3
Total WMP Weight:	192.3

CCP Radiography Data Sheet

Waste Container ID: X10C1250266

Section 5: RTR Summary (Questions answered "Yes" will be explained in the Comment block, except for Question 1)	
Is there observable liquid?	☐ Yes ☒ No
Is there any observable liquid in internal containers, more than 60 milliliters or 3 percent by volume, whichever is greater?	☐ Yes ☒ No
Is the total volume of observable liquid in the outermost container GREATER than 1% of the container?	☐ Yes ☒ No
Is there observable liquid in payload containers with an EPA Hazardous Waste Number of U134?	☐ Yes ☒ No
Is there an indication of non-radionuclide pyrophoric materials, such as elemental potassium?	☐ Yes ☒ No
Is there an indication of hazardous wastes not occurring as co-contaminants with TRU mixed wastes (non-mixed hazardous wastes)?	☐ Yes ☒ No
Is there an indication of wastes incompatible with backfill, seal and panel closures materials, container and packaging materials, shipping container materials, or other wastes (i.e., waste does NOT match TRUCON Code[s])?	☐ Yes ☒ No
Is there an indication of wastes containing explosives or compressed gases?	☐ Yes ☒ No
Is there an indication of PCBs liquids?	☐ Yes ☒ No
Is there an indication of the waste exhibiting the characteristic of ignitability, corrosivity, or reactivity (EPA Hazardous Waste Numbers of D001, D002, or D003)?	☐ Yes ☒ No
Is the physical form of the waste inconsistent with the Waste Stream Description or the Waste Matrix Code?	☐ Yes ☒ No
CH or RH TRAMPAC	
Are there heat-sealed bags (unvented) GREATER than 4 liters and LESS than 390 square inches in the waste, or heat sealed bags not authorized in the RH TRUCON Code?	☐ Yes ☒ No
Were there Non-approved Closure Methods used on liner bags or inner bags greater than 4 liters?	☐ Yes ☒ No
Are there sealed containers GREATER than 4 liters?	☐ Yes ☒ No
Are there indications of inadequate protection for heavy and/or sharp objects?	☐ Yes ☒ No
Comments: N/A	

RTR Operator:

Eric Lyles		1/13/2016
Print Name	Signature	Date

CCP Radiography Data Sheet

Section 1: General Information		
[X] RTR Examination	[ ] RTR Replicate Scan	[ ] RTR Independent Observation
Site ID:	ORNL	
Batch Number:	OR-RTR6-0713	
Examination Date:	1/13/2016	
Waste Container ID:	X10C1250256	
Video/Audio Recorded Media Number:	OR-RTR6-0713	A&B
Procedure and Revision No.:	CCP-TP-053	Rev. 15
NCR(s) associated with the container? (e.g., Prohibited Items)	[X] No [ ] Yes NCR No.: N/A NCR No.: N/A	

Section 2: Waste Container Data	
Container Type:	55 Gallon Drum
TRUCON Code:	OR 227
Waste Matrix Code:	S4100
Waste Stream I.D.:	OR-NFS-CH-SOIL
Waste Container Weights:	Gross Wt.: 222.2 kg Tare Wt.: 35.2 kg Net Wt.: 187.0 kg
Rigid Liner and Liner Vent Description:	Liner: [ ] No [X] Yes Lid: [X] No [ ] Yes Type: [ ] 30-mil [X] 90-mil [ ] 110-mil [ ] 125-mil Vented: [ ] No [X] Yes [ ] N/A Punctured: [X] No [ ] Yes Mechanical Vent: [X] No [ ] Yes Fiberboard Liner: [X] No [ ] Yes Lead Lined: [X] No [ ] Yes
Number of Layers of Confinement:	Appears to be 1 layer
Volume Utilization Percentage:	85 %

CCP Radiography Data Sheet

Waste Container ID: X10C1250256

Section 3: Container Inventory and Comments (Detailed descriptions)	
IM:	
AM:	
OM:	
OI:	
C:	
R:	
XPM:	
OR: Absorbent	
IN:	
S: Soil	

Section 4: Packaging Material and Waste Material Parameters	
Packaging Material:	**Estimated Weight (kg)**
Steel (ST):	27.8
Plastics (PP): Liner bag, Rigid Liner	7.4
Other:	0.0
Total Packaging Weight	35.2
Waste Material Parameter:	**Estimated Weight (kg)**
Iron-based Metal / Alloys (IM):	
Aluminum-based Metals / Alloys (AM):	
Other Metals (OM):	
Other Inorganic Materials (OI)	
Cellulosics (C):	
Rubber (R):	
Plastics (waste materials) (XPM):	
Organic Matrix (OR):	3.0
Inorganic Matrix (IN):	
Soils (S):	184.0
Total WMP Weight:	187.0

CCP Radiography Data Sheet

Waste Container ID: X10C1250256

Section 5: RTR Summary (Questions answered "Yes" will be explained in the Comment block, except for Question 1)	
Is there observable liquid?	☐ Yes ☒ No
Is there any observable liquid in internal containers, more than 60 milliliters or 3 percent by volume, whichever is greater?	☐ Yes ☒ No
Is the total volume of observable liquid in the outermost container GREATER than 1% of the container?	☐ Yes ☒ No
Is there observable liquid in payload containers with an EPA Hazardous Waste Number of U134?	☐ Yes ☒ No
Is there an indication of non-radionuclide pyrophoric materials, such as elemental potassium?	☐ Yes ☒ No
Is there an indication of hazardous wastes not occurring as co-contaminants with TRU mixed wastes (non-mixed hazardous wastes)?	☐ Yes ☒ No
Is there an indication of wastes incompatible with backfill, seal and panel closures materials, container and packaging materials, shipping container materials, or other wastes (i.e., waste does NOT match TRUCON Code[s])?	☐ Yes ☒ No
Is there an indication of wastes containing explosives or compressed gases?	☐ Yes ☒ No
Is there an indication of PCBs liquids?	☐ Yes ☒ No
Is there an indication of the waste exhibiting the characteristic of ignitability, corrosivity, or reactivity (EPA Hazardous Waste Numbers of D001, D002, or D003)?	☐ Yes ☒ No
Is the physical form of the waste inconsistent with the Waste Stream Description or the Waste Matrix Code?	☐ Yes ☒ No
CH or RH TRAMPAC	
Are there heat-sealed bags (unvented) GREATER than 4 liters and LESS than 390 square inches in the waste, or heat sealed bags not authorized in the RH TRUCON Code?	☐ Yes ☒ No
Were there Non-approved Closure Methods used on liner bags or inner bags greater than 4 liters?	☐ Yes ☒ No
Are there sealed containers GREATER than 4 liters?	☐ Yes ☒ No
Are there indications of inadequate protection for heavy and/or sharp objects?	☐ Yes ☒ No
Comments: N/A	

RTR Operator:

Eric Lyles	[signature]	1/13/2016
Print Name	Signature	Date

CCP Radiography Data Sheet

Section 1: General Information	
[X] RTR Examination [ ] RTR Replicate Scan [ ] RTR Independent Observation	
Site ID:	ORNL
Batch Number:	OR-RTR6-0713
Examination Date:	1/13/2016
Waste Container ID:	X10C1250280
Video/Audio Recorded Media Number:	OR-RTR6-0713 A&B
Procedure and Revision No.:	CCP-TP-053 Rev. 15
NCR(s) associated with the container? (e.g., Prohibited Items)	[X] No [ ] Yes NCR No.: N/A NCR No.: N/A

Section 2: Waste Container Data	
Container Type:	55 Gallon Drum
TRUCON Code:	OR 227
Waste Matrix Code:	S4100
Waste Stream I.D.:	OR-NFS-CH-SOIL
Waste Container Weights:	Gross Wt.: 250.5 kg Tare Wt.: 35.2 kg Net Wt.: 215.3 kg
Rigid Liner and Liner Vent Description:	Liner: [ ] No [X] Yes Lid: [X] No [ ] Yes Type: [ ] 30-mil [X] 90-mil [ ] 110-mil [ ] 125-mil Vented: [ ] No [X] Yes [ ] N/A Punctured: [X] No [ ] Yes Mechanical Vent: [X] No [ ] Yes Fiberboard Liner: [X] No [ ] Yes Lead Lined: [X] No [ ] Yes
Number of Layers of Confinement:	Appears to be 1 layer
Volume Utilization Percentage:	85 %

CCP Radiography Data Sheet

Waste Container ID: X10C1250280

Section 3: Container Inventory and Comments (Detailed descriptions)	
IM:	
AM:	
OM:	
OI:	
C:	
R:	
XPM:	
OR:	Absorbent
IN:	
S:	Soil

Section 4: Packaging Material and Waste Material Parameters	
Packaging Material:	**Estimated Weight (kg)**
Steel (ST):	27.8
Plastics (PP): Liner bag, Rigid Liner	7.4
Other:	0.0
Total Packaging Weight	35.2
Waste Material Parameter:	**Estimated Weight (kg)**
Iron-based Metal / Alloys (IM):	
Aluminum-based Metals / Alloys (AM):	
Other Metals (OM):	
Other Inorganic Materials (OI)	
Cellulosics (C):	
Rubber (R):	
Plastics (waste materials) (XPM):	
Organic Matrix (OR):	2.0
Inorganic Matrix (IN):	
Soils (S):	213.3
Total WMP Weight:	215.3

CCP Radiography Data Sheet

Waste Container ID: X10C1250280

Section 5: RTR Summary (Questions answered "Yes" will be explained in the Comment block, except for Question 1)	
Is there observable liquid?	☐ Yes ☒ No
Is there any observable liquid in internal containers, more than 60 milliliters or 3 percent by volume, whichever is greater?	☐ Yes ☒ No
Is the total volume of observable liquid in the outermost container GREATER than 1% of the container?	☐ Yes ☒ No
Is there observable liquid in payload containers with an EPA Hazardous Waste Number of U134?	☐ Yes ☒ No
Is there an indication of non-radionuclide pyrophoric materials, such as elemental potassium?	☐ Yes ☒ No
Is there an indication of hazardous wastes not occurring as co-contaminants with TRU mixed wastes (non-mixed hazardous wastes)?	☐ Yes ☒ No
Is there an indication of wastes incompatible with backfill, seal and panel closures materials, container and packaging materials, shipping container materials, or other wastes (i.e., waste does NOT match TRUCON Code[s])?	☐ Yes ☒ No
Is there an indication of wastes containing explosives or compressed gases?	☐ Yes ☒ No
Is there an indication of PCBs liquids?	☐ Yes ☒ No
Is there an indication of the waste exhibiting the characteristic of ignitability, corrosivity, or reactivity (EPA Hazardous Waste Numbers of D001, D002, or D003)?	☐ Yes ☒ No
Is the physical form of the waste inconsistent with the Waste Stream Description or the Waste Matrix Code?	☐ Yes ☒ No
CH or RH TRAMPAC	
Are there heat-sealed bags (unvented) GREATER than 4 liters and LESS than 390 square inches in the waste, or heat sealed bags not authorized in the RH TRUCON Code?	☐ Yes ☒ No
Were there Non-approved Closure Methods used on liner bags or inner bags greater than 4 liters?	☐ Yes ☒ No
Are there sealed containers GREATER than 4 liters?	☐ Yes ☒ No
Are there indications of inadequate protection for heavy and/or sharp objects?	☐ Yes ☒ No
Comments: N/A	

RTR Operator:

Eric Lyles	[signature]	1/13/2016
Print Name	Signature	Date

CCP Radiography Data Sheet

Section 1: General Information	
[X] RTR Examination [ ] RTR Replicate Scan [ ] RTR Independent Observation	
Site ID:	ORNL
Batch Number:	OR-RTR6-0713
Examination Date:	1/13/2016
Waste Container ID:	X10C1250274
Video/Audio Recorded Media Number:	OR-RTR6-0713 A&B
Procedure and Revision No.:	CCP-TP-053 Rev. 15
NCR(s) associated with the container? (e.g., Prohibited Items)	[X] No [ ] Yes NCR No.: N/A NCR No.: N/A

Section 2: Waste Container Data	
Container Type:	55 Gallon Drum
TRUCON Code:	OR 227
Waste Matrix Code:	S4100
Waste Stream I.D.:	OR-NFS-CH-SOIL
Waste Container Weights:	Gross Wt.: 226.2 kg Tare Wt.: 35.2 kg Net Wt.: 191.0 kg
Rigid Liner and Liner Vent Description:	Liner: [ ] No [X] Yes Lid: [X] No [ ] Yes Type: [ ] 30-mil [X] 90-mil [ ] 110-mil [ ] 125-mil Vented: [ ] No [X] Yes [ ] N/A Punctured: [X] No [ ] Yes Mechanical Vent: [X] No [ ] Yes Fiberboard Liner: [X] No [ ] Yes Lead Lined: [X] No [ ] Yes
Number of Layers of Confinement:	Appears to be 1 layer
Volume Utilization Percentage:	85 %

CCP Radiography Data Sheet

Waste Container ID: X10C1250274

Section 3: Container Inventory and Comments (Detailed descriptions)	
IM:	
AM:	
OM:	
OI:	
C:	
R:	
XPM:	
OR:	Absorbent
IN:	
S:	Soil

Section 4: Packaging Material and Waste Material Parameters	
Packaging Material:	**Estimated Weight (kg)**
Steel (ST):	27.8
Plastics (PP): Liner bag, Rigid Liner	7.4
Other:	0.0
Total Packaging Weight	35.2
Waste Material Parameter:	**Estimated Weight (kg)**
Iron-based Metal / Alloys (IM):	
Aluminum-based Metals / Alloys (AM):	
Other Metals (OM):	
Other Inorganic Materials (OI)	
Cellulosics (C):	
Rubber (R):	
Plastics (waste materials) (XPM):	
Organic Matrix (OR):	3.0
Inorganic Matrix (IN):	
Soils (S):	188.0
Total WMP Weight:	191.0

CCP Radiography Data Sheet

Waste Container ID: X10C1250274

Section 5: RTR Summary (Questions answered "Yes" will be explained in the Comment block, except for Question 1)	
Is there observable liquid?	☐ Yes ☒ No
Is there any observable liquid in internal containers, more than 60 milliliters or 3 percent by volume, whichever is greater?	☐ Yes ☒ No
Is the total volume of observable liquid in the outermost container GREATER than 1% of the container?	☐ Yes ☒ No
Is there observable liquid in payload containers with an EPA Hazardous Waste Number of U134?	☐ Yes ☒ No
Is there an indication of non-radionuclide pyrophoric materials, such as elemental potassium?	☐ Yes ☒ No
Is there an indication of hazardous wastes not occurring as co-contaminants with TRU mixed wastes (non-mixed hazardous wastes)?	☐ Yes ☒ No
Is there an indication of wastes incompatible with backfill, seal and panel closures materials, container and packaging materials, shipping container materials, or other wastes (i.e., waste does NOT match TRUCON Code[s])?	☐ Yes ☒ No
Is there an indication of wastes containing explosives or compressed gases?	☐ Yes ☒ No
Is there an indication of PCBs liquids?	☐ Yes ☒ No
Is there an indication of the waste exhibiting the characteristic of ignitability, corrosivity, or reactivity (EPA Hazardous Waste Numbers of D001, D002, or D003)?	☐ Yes ☒ No
Is the physical form of the waste inconsistent with the Waste Stream Description or the Waste Matrix Code?	☐ Yes ☒ No
CH or RH TRAMPAC	
Are there heat-sealed bags (unvented) GREATER than 4 liters and LESS than 390 square inches in the waste, or heat sealed bags not authorized in the RH TRUCON Code?	☐ Yes ☒ No
Were there Non-approved Closure Methods used on liner bags or inner bags greater than 4 liters?	☐ Yes ☒ No
Are there sealed containers GREATER than 4 liters?	☐ Yes ☒ No
Are there indications of inadequate protection for heavy and/or sharp objects?	☐ Yes ☒ No
Comments: N/A	

RTR Operator:		
Eric Lyles		1/13/2016
Print Name	Signature	Date

Attachment 3 – CCP Radiography Independent Technical Reviewer Checklist

Batch Data Report No.: OR-RTR6-0713

Description			
1.	Were data generation and reduction conducted in a technically correct manner in accordance with the methods used?	☐ NO	☑ YES
2.	Was the correct revision of the procedure used? Procedure: CCP-TP-053 Rev.: 15	☐ NO	☑ YES
3.	Are the WMPs entered correctly?	☐ NO	☑ YES
4.	Do the estimated weights in Section 4 of Attachment 2 equal the container gross weight?	☐ NO	☑ YES
5.	Is the data reported in the proper units with the correct number of significant figures (e.g., one tenth of a kilogram)?	☐ NO	☑ YES
6.	Was transcription used? If no, proceed to question 7.	☑ NO	☐ YES
	6a. Has the data been verified for transcription errors?	☐ NO	☐ YES
7.	Does the Testing Batch Report include radiography for up to 20 containers?	☐ NO	☑ YES
8.	Are BDR contents complete and do they match the CCP Waste RTR Batch Data Report Table of Contents?	☐ NO	☑ YES
9.	Is all the data signed and dated in reproducible ink and by the individual(s) generating it?	☐ NO	☑ YES
10.	Is all data recorded clearly, legibly, and accurately?	☐ NO	☑ YES
11.	Have changes been made to original data? If no, proceed to question 12.	☑ NO	☐ YES
	11a. Have all changes to original data been lined out, initialed and dated by the individual making the changes?	☐ NO	☐ YES
	11b. Was justification made for changing the original data?	☐ NO	☐ YES
	11c. Were data changes made by the individual who originally collected the data?	☐ NO	☐ YES
12.	Does the waste match the Waste Matrix Code and Waste Stream description?	☐ NO	☑ YES
13.	Are the RTR Operator's decisions regarding the Radiography documented?	☐ NO	☑ YES
14.	Is there an adequate written description of the contents of each item?	☐ NO	☑ YES
15.	Was the video/audio recording media properly prepared and labeled for each waste container?	☐ NO	☑ YES
16.	Was the video/audio recording media check performed satisfactorily and recorded on Attachment 1?	☐ NO	☑ YES

Attachment 3 – CCP Radiography Independent Technical Reviewer Checklist (Continued)

Batch Data Report No.: OR-RTR6-0713

Description		
17. Was the Image Test performed satisfactorily and recorded on Attachment 1?	☐ NO	☑ YES
18. Was the Replicate Scan performed and recorded on an Attachment 2?	☐ NO	☑ YES
19. Was the Replicate Scan RTR Operator different from the first RTR Operator?	☐ NO	☑ YES
20. Did the Replicate Scan RTR Operator and the first RTR Operator agree on the results?	☐ NO	☑ YES
21. Was the Independent Observation performed and recorded on an Attachment 2?	☐ NO	☑ YES
22. Was the Independent Observation RTR Operator different from the first RTR Operator?	☐ NO	☑ YES
23. Did the Independent Observation RTR Operator and the first RTR Operator agree on the results?	☐ NO	☑ YES
24. Was the data collection performed by qualified individuals?	☐ NO	☑ YES
25. Were NCRs initiated as required at DGL? If no, proceed to question 26.	☑ NO	☐ YES
25a. Have the NCR(s) associated with RTR been included in the BDR?	☐ NO	☐ YES
26. Is the RTR examination for CH waste? If no, proceed to question 27.	☐ NO	☑ YES
26a. Have the CH Quality Assurance Objectives (QAOs) been met (if applicable)? Precision – Precision is maintained by reconciling any discrepancies between two radiography operators with regard to identification of the waste matrix code, liquids in excess of TSDF-WAC limits, and compressed gases through independent replicate scans and independent observations. Additionally, the precision of radiography is verified prior to use by tuning precisely enough to demonstrate compliance with QAOs through viewing an image test pattern. Accuracy – Accuracy is obtained by using a target to tune the image for maximum sharpness and by requiring operators to successfully identify 100 percent of the items required to meet the DQOs for radiography specified in CCP-PO-001, Section C-4a(1) in a training container during their initial qualification and subsequent requalification. Completeness – A video and audio media recording of the radiography examination and a validated radiography data form will be obtained for 100 percent of the waste containers subject to radiography. All video and audio media recordings and radiography data forms will be subject to validation as indicated in CCP-PO-001, Section C3-4. Comparability – The comparability of radiography data from different operators shall be enhanced by using standardized radiography procedures and operator qualifications.	☐ NO	☑ YES

Attachment 3 – CCP Radiography Independent Technical Reviewer Checklist (Continued)

Batch Data Report No.: OR-RTR6-0713

Description		
27. Is the RTR examination for RH waste? If no, proceed to comment section.	☑ NO	☐ YES
27a. Have the RH QAOs been met (if applicable)? Precision – Precision is maintained by reconciling any discrepancies between two operators (during Independent Observation and Replicate scans) with regard to the identification of important waste characteristics (i.e., physical form of the waste and absence of prohibited liquids) within a single container. Accuracy – Accuracy is obtained by using a target to tune the image for maximum sharpness and by requiring operators to successfully identify prohibited liquid in a training container during their initial qualification and subsequent requalification. Representativeness – All of the relevant contents in a container selected for radiography will be described. Completeness – All of the relevant waste information must be assembled and must show that each of the containers in the waste stream belongs to the waste stream. This information must be documented on videotape or other equivalent media and data form. Comparability – Comparability is ensured by meeting the program training requirements and complying with the minimum standards used to implement the radiography process.	☐ NO	☐ YES

Comments: N/A KKS 2-1-2016

I have reviewed 100% of the container specific and batch data in this report and find it acceptable.

Independent Technical Reviewer:

Printed Name	Signature	Date
Kenneth Simpson	Ken Simpson	2-1-2016

DIVIDER PAGE ONLY

Not part of page count

Attachment 2 – CCP Records Transmittal/Receiving Form

CCP Records / Records Custodian, 4021 National Parks Highway - MS: GSA 212, Carlsbad, New Mexico 88220

Telephone Number: 575-234-7523

Fax Number: 575-234-7033

Attn:	CCP RECORDS	From:	RANADA T BACA
Ship to:	4021 NATIONAL PARKS HWY	Site:	LANL
	CARLSBAD, NM 88220	Company:	TFE, INC
	GSA-212	Telephone Number:	505-667-0181
	N/A	Date Sent:	02-01-16
Telephone Number:	505-234-7523		

Document Number	Title / Description	Record Date	Total Pages
OR-RTR6-0713	RTR BACKUP DVD B	01-13-16	N/A
	N/A		

Comments

N/A

(When the Record accepted line has been completed, the rest of the page below may be left blank.)

Acceptance/Rejection Signature and Date

Records Accepted ☑ [signature] Jewell Humrable 2.9.16

Signature | Printed Name | Date

Records Rejected ☐ _____ _____ _____

Signature | Printed Name | Date

Reason for Rejection:

Re-submittal: _____ _____ _____

Signature | Printed Name | Date

```
**********************************
***        Send Results        ***
**********************************

   Sending is complete.

Job No.                    4065
Address                    915056656753
Name                       TERRI ANN
Start Time                 02/09 09:02 AM
Call Length                00'33
Sheets                     1
Result                     OK
```


Attachment 2 – CCP Records Transmittal/Receiving Form

CCP Records / Records Custodian, 4021 National Parks Highway - MS: GSA 212, Carlsbad, New Mexico 88220

Telephone Number: 575-234-7523

Fax Number: 575-234-7033

Attn:	CCP RECORDS	From:	RANADA T BACA
Ship to:	4021 NATIONAL PARKS HWY	Site:	LANL
	CARLSBAD, NM 88220	Company:	TFE, INC
	GSA-212	Telephone Number:	505-667-0181
	N/A	Date Sent:	02-01-16
Telephone Number:	505-234-7523		

Document Number	Title / Description	Record Date	Total Pages
OR-RTR6-0713	RTR BACKUP DVD B	01-13-16	N/A
	N/A		

Comments

N/A

(When the Record accepted line has been completed, the rest of the page below may be left blank.)

Acceptance/Rejection Signature and Date

Records Accepted ☑	[signature]	Jewell Humable	2-9-16
	Signature	Printed Name	Date
Records Rejected ☐			
	Signature	Printed Name	Date

Reason for Rejection:

Attachment 2 – CCP Records Transmittal/Receiving Form

CCP Records / Records Custodian, 4021 National Parks Highway - MS: GSA 212, Carlsbad, New Mexico 88220

Telephone Number: 575-234-7523

Fax Number: 575-234-7033

Attn:	CCP RECORDS	From:	RANADA T BACA
Ship to:	4021 NATIONAL PARKS HWY	Site:	LANL
	CARLSBAD, NM 88220	Company:	TFE, INC
	GSA-212	Telephone Number:	505-667-0181
	N/A	Date Sent:	02-24-16
Telephone Number:	505-234-7523		

Document Number	Title / Description	Record Date	Total Pages
OR-RTR6-0713	NDE BDR	01-13-16	60
OR-RTR6-0713	NDE PRIMARY DVD A	01-13-16	N/A
	N/A		

Comments

SPM CHECKLIST WAS COMPLETED IN CARLSBAD. THANKS

(When the Record accepted line has been completed, the rest of the page below may be left blank.)

Acceptance/Rejection Signature and Date

	Signature	Printed Name	Date
Records Accepted ☑	[signature]	Jarell Hurrelde	3/2/2016
Records Rejected ☐			

Reason for Rejection:

Re-submittal:

Signature	Printed Name	Date

****
*** Send Results ***
****

Sending is complete.

Job No.	4423
Address	918655768703
Name	ORNL
Start Time	03/02 03:22 PM
Call Length	00'38
Sheets	1
Result	OK

Attachment 2 – CCP Records Transmittal/Receiving Form

CCP Records / Records Custodian, 4021 National Parks Highway - MS: GSA 212, Carlsbad, New Mexico 88220

Telephone Number: 575-234-7523

Fax Number: 575-234-7033

Attn:	CCP RECORDS	From:	RANADA T BACA
Ship to:	4021 NATIONAL PARKS HWY	Site:	LANL
	CARLSBAD, NM 88220	Company:	TFE, INC
	GSA-212	Telephone Number:	505-667-0181
	N/A	Date Sent:	02-24-16
Telephone Number:	505-234-7523		

Document Number	Title / Description	Record Date	Total Pages
OR-RTR6-0713	NDE BDR	01-13-16	60
OR-RTR6-0713	NDE PRIMARY DVD A	01-13-16	N/A
	N/A		

Comments

SPM CHECKLIST WAS COMPLETED IN CARLSBAD. THANKS

(When the Record accepted line has been completed, the rest of the page below may be left blank.)
Acceptance/Rejection Signature and Date

	Signature	Printed Name	Date
Records Accepted ☑	[signature]	Laurell Hurrelde	3/2/2016
Records Rejected ☐			

Reason for Rejection:

DIVIDER

PAGE

Attachment 2 – CCP SPM Radiography Project Level Validation Checklist and Summary

BDR Number: OR-RTR6-0723 **Examination Date(s):** 02/11/2016

Description of Criteria Reviewed	Criteria Met? YES	NO	NA	Comments/Qualifiers
1. Is the completed, signed, and dated Independent Technical Reviewer Checklist included in the BDR, and the independent technical reviewer was not involved in the generation or recording of the data under review? **Reference Source: CCP-PO-001, C3-4**	X			
2. Does the BDR contain all items addressed in the BDR Table of Contents? **Reference Source: CCP-PO-001, C3-4**	X			
3. Does the BDR include a listing of all the container numbers in the batch? **Reference Source: CCP-PO-001, C3-4**	X			
4. List all containers that have met QAOs. **Reference Source: CCP-PO-001, C3-4**				Container Numbers: X10C0402810B X10C0402810G X10C0402810H X10C0402810J X10C1001131 X10C1001133 X10C1300177A X10C1300184 X10C1300185A X10C1300185C X10C9400064A
5. Does the BDR identify the current implementing procedure and revision number? **Reference Source: CCP-PO-001, Table C3-3**	X			
6. Is there a reference to or copy of any associated NCRs (if any) in the BDR? NA if no NCRs. **Reference Source: CCP-PO-001, Table C3-3**			X	
7. Are there 20 or fewer containers in the batch? **Reference Source: CCP-PO-001, C3-4**	X			
8. Are the data properly reported (i.e., data are reported in correct units and with correct significant figures)? **Reference Source: CCP-PO-001, C3-4**	X			
9. Is there evidence of verification that the physical form matches the Waste Matrix Code? **Reference Source: CCP-PO-001, Table C3-3**	X			

CCP RECORDS ORIGINAL
DATE RECD 3/2/2016 JY

Attachment 2 – CCP SPM Radiography Project Level Validation Checklist and Summary (Continued)

BDR Number: OR-RTR6-0723 **Examination Date(s):** 02/11/2016

Description of Criteria Reviewed	Criteria Met? YES	NO	NA	Comments/Qualifiers
10. Is there evidence of verification that the physical form matches the waste stream description? **Reference Source: CCP-PO-001, Table C3-3**	X			
11. Are prohibited items absent? **Reference Source: CCP-PO-001, Table C3-3**	X			
12. Does observable liquid, if present, meet the criteria of the TSDF-WAC? **Reference Source: CCP-PO-001, C-1**			X	No Observable Liquids
13. Were discrepancies between two operators with regard to identification of waste matrix code, liquids in excess of the TSDF-WAC, or compressed gases through replicate scans and independent observations reconciled? NA if no discrepancies. **Reference Source: CCP-PO-001, C3-2**			X	
14. Are the training qualifications for all radiography personnel acceptable? **Reference Source: CCP-PO-001, C3-8**	X			
15. Was evidence of the video/audio check included in the BDR? **Reference Source: CCP-PO-001, C1-1**	X			
16. Was the Lines-Pair Resolution Test or Sieve Test Check included in the BDR? **Reference Source: CCP Technical Procedures**	X			
17. Was a replicate scan performed once per day, or once per batch, whichever is LESS frequent? **Reference Source: CCP-PO-001, C1-1**	X			
18. Was an independent observation performed once per day, or once per batch, whichever is LESS frequent? **Reference Source: CCP-PO-001, C1-1**	X			

Attachment 2 – CCP SPM Radiography Project Level Validation Checklist and Summary (Continued)

BDR Number: OR-RTR6-0723 **Examination Date(s):** 02/11/2016

Description of Criteria Reviewed	Criteria Met? YES	NO	NA	Comments/Qualifiers
19. Were the replicate scan and independent observation performed on different waste containers? **Reference Source: CCP-PO-001, C1-1**	X			
20. Were the personnel performing the replicate scan and independent observation different from the individual who performed the original? **Reference Source: CCP-PO-001, C1-1**	X			
21. Does the BDR include an estimate of each material parameter weight in kg for each container? **Reference Source: CCP Technical Procedures**	X			
22. Does the BDR include a description of each material parameter for each container? **Reference Source: CCP Technical Procedures**	X			
23. Is the container gross weight recorded in kilograms (kg) for each container in the BDR? **Reference Source: CCP Technical Procedures**	X			
24. Was the Scale Weight Calibration Check included in the BDR? **Reference Source: CCP Technical Procedures**			X	Scale not used.
25. Was the Scale Weight Check included in the BDR? **Reference Source: CCP Technical Procedures**			X	Scale not used.

Comments: N/A

The container QC checks were properly performed and meet the Quality Assurance Objectives (QAOs). Proper procedures were followed during data reduction and analysis. The batch is complete, acceptable, and includes all supporting data and documentation required by the QAPjP.

Roger Whiteaker	Roger Whiteaker	03/02/2016
SPM Printed Name	Signature	Date

Checklist is to be re-signed only when a re-review is performed.

SPM Printed Name	Signature	Reason	Date
SPM Printed Name	Signature	Reason	Date

Attachment 5–CCP Radiography Batch Data Report Cover Sheet

Site ID: ORNL

Batch Data Report No.: OR-RTR6-0723 ☑ CH ☐ RH Date: 2-11-16

Waste Container ID Numbers	
Replicate Scan:	X10C1300184
Independent Observation:	X10C1001131
1	X10C1300177A
2	X10C0402810H
3	X10C1300185C
4	X10C0402810B
5	X10C1001131
6	X10C0402810G
7	X10C1300185A
8	X10C0402810J
9	X10C1001133
10	X10C9400064A
11	X10C1300184
12	N/A
13	N/A
14	N/A
15	N/A
16	N/A
17	N/A
18	N/A
19	N/A
20	N/A

RTR Operator:

Eric Lyles		2-11-16
Printed Name	Signature	Date

Independent Technical Reviewer:

Aaron Elliott		3/1/16
Printed Name	Signature	Date

CCP RECORDS ORIGINAL
DATE REC'D 3/1/16

Attachment 4 – CCP Radiography Batch Data Report Table of Contents and Batch Narrative

Batch Data Report No.: OR-RTR6-0723 Date: 2-11-16

Table Of Contents

Item	Description	Page No.
1	CCP Radiography Batch Data Report Cover Sheet	1
2	CCP Radiography Batch Data Report Table Of Contents	2
3	CCP RTR Measurement Control Report	3
4	CCP Radiography Data Sheets	4
5	Copy of NCRs (NA, If Not Applicable)	N/A
6	CCP Independent Technical Reviewer Checklist	43

Batch Narrative

All Quality Checks were performed and recorded on CCP-TP-053, Rev.15, CCP Radiography Measurement Control Report.

Eric Lyles — RTR Operator

Signature

2-11-16 — Date

Attachment 1 – CCP RTR Measurement Control Report

Site ID: ORNL		
Batch Data Report No.: OR-RTR6-0723		
Examination Date: 2-11-16		
Control Checks		
Video/Audio Recorded Media System Check	☑ SAT	☐ UNSAT
Image Test : 10 Lines (Minimum acceptable is 5 lines-pair/cm or #6 Sieve is viewable)	☑ SAT	☐ UNSAT
Comments: N/A		
RTR Operator:		
Eric Lyles (Printed Name)	(Signature)	2-11-16 (Date)

3

CCP Radiography Data Sheet

Section 1: General Information	
☐ RTR Examination ☒ RTR Replicate Scan ☐ RTR Independent Observation	
Site ID:	ORNL
Batch Number:	OR-RTR6-0723
Examination Date:	2/11/2016
Waste Container ID:	X10C1300184
Video/Audio Recorded Media Number:	OR-RTR6-0723 A&B
Procedure and Revision No.:	CCP-TP-053 Rev. 15
NCR(s) associated with the container? (e.g., Prohibited Items)	☒ No ☐ Yes NCR No.: N/A NCR No.: N/A

Section 2: Waste Container Data	
Container Type:	55 Gallon Drum
TRUCON Code:	OR 225
Waste Matrix Code:	S5400
Waste Stream I.D.:	OR-CHEM-CH-HET
Waste Container Weights:	Gross Wt.: 57.2 kg Tare Wt.: 28.8 kg Net Wt.: 28.4 kg
Rigid Liner and Liner Vent Description:	Liner: ☒ No ☐ Yes Lid: ☒ No ☐ Yes Type: ☐ 30-mil ☐ 90-mil ☐ 110-mil ☐ 125-mil Vented: ☐ No ☐ Yes ☒ N/A Punctured: ☒ No ☐ Yes Mechanical Vent: ☒ No ☐ Yes Fiberboard Liner: ☒ No ☐ Yes Lead Lined: ☒ No ☐ Yes
Number of Layers of Confinement:	Appears to be 1 layer
Volume Utilization Percentage:	90 %

CCP Radiography Data Sheet

Waste Container ID: X10C1300184

Section 3: Container Inventory and Comments (Detailed descriptions)	
IM:	Scrap metal, electrical equipment, electric motor
AM:	
OM:	
OI:	
C:	Cloth
R:	
XPM:	Plastic containers, plastic caps, plastic tubing, plastic sheeting
OR:	Absorbent
IN:	
S:	

Section 4: Packaging Material and Waste Material Parameters	
Packaging Material:	**Estimated Weight (kg)**
Steel (ST):	27.8
Plastics (PP): Liner bag	1.0
Other:	0.0
Total Packaging Weight	28.8
Waste Material Parameter:	**Estimated Weight (kg)**
Iron-based Metal / Alloys (IM):	10.5
Aluminum-based Metals / Alloys (AM):	
Other Metals (OM):	
Other Inorganic Materials (OI)	
Cellulosics (C):	4.0
Rubber (R):	
Plastics (waste materials) (XPM):	13.8
Organic Matrix (OR):	0.1
Inorganic Matrix (IN):	
Soils (S):	
Total WMP Weight:	28.4

CCP Radiography Data Sheet

Waste Container ID: X10C1300184

Section 5: RTR Summary (Questions answered "Yes" will be explained in the Comment block, except for Question 1)	
Is there observable liquid?	☐ Yes ☒ No
Is there any observable liquid in internal containers, more than 60 milliliters or 3 percent by volume, whichever is greater?	☐ Yes ☒ No
Is the total volume of observable liquid in the outermost container GREATER than 1% of the container?	☐ Yes ☒ No
Is there observable liquid in payload containers with an EPA Hazardous Waste Number of U134?	☐ Yes ☒ No
Is there an indication of non-radionuclide pyrophoric materials, such as elemental potassium?	☐ Yes ☒ No
Is there an indication of hazardous wastes not occurring as co-contaminants with TRU mixed wastes (non-mixed hazardous wastes)?	☐ Yes ☒ No
Is there an indication of wastes incompatible with backfill, seal and panel closures materials, container and packaging materials, shipping container materials, or other wastes (i.e., waste does NOT match TRUCON Code[s])?	☐ Yes ☒ No
Is there an indication of wastes containing explosives or compressed gases?	☐ Yes ☒ No
Is there an indication of PCBs liquids?	☐ Yes ☒ No
Is there an indication of the waste exhibiting the characteristic of ignitability, corrosivity, or reactivity (EPA Hazardous Waste Numbers of D001, D002, or D003)?	☐ Yes ☒ No
Is the physical form of the waste inconsistent with the Waste Stream Description or the Waste Matrix Code?	☐ Yes ☒ No
CH or RH TRAMPAC	
Are there heat-sealed bags (unvented) GREATER than 4 liters and LESS than 390 square inches in the waste, or heat sealed bags not authorized in the RH TRUCON Code?	☐ Yes ☒ No
Were there Non-approved Closure Methods used on liner bags or inner bags greater than 4 liters?	☐ Yes ☒ No
Are there sealed containers GREATER than 4 liters?	☐ Yes ☒ No
Are there indications of inadequate protection for heavy and/or sharp objects?	☐ Yes ☒ No

Comments: This Replicate Scan agrees with the ORignal Scan.
FO 2-11-16

RTR Operator:

Fred Oney		2/11/2016
Print Name	Signature	Date

CCP Radiography Data Sheet

Section 1: General Information	
☐ RTR Examination ☐ RTR Replicate Scan ☒ RTR Independent Observation	
Site ID:	ORNL
Batch Number:	OR-RTR6-0723
Examination Date:	2/11/2016
Waste Container ID:	X10C1001131
Video/Audio Recorded Media Number:	OR-RTR6-0723 A&B
Procedure and Revision No.:	CCP-TP-053 Rev. 15
NCR(s) associated with the container? (e.g., Prohibited Items)	☒ No ☐ Yes NCR No.: N/A NCR No.: N/A

Section 2: Waste Container Data	
Container Type:	55 Gallon Drum
TRUCON Code:	OR 225
Waste Matrix Code:	S5400
Waste Stream I.D.:	OR-CHEM-CH-HET
Waste Container Weights:	Gross Wt.: 42.0 kg Tare Wt.: 28.8 kg Net Wt.: 13.2 kg
Rigid Liner and Liner Vent Description:	Liner: ☒ No ☐ Yes Lid: ☒ No ☐ Yes Type: ☐ 30-mil ☐ 90-mil ☐ 110-mil ☐ 125-mil Vented: ☐ No ☐ Yes ☒ N/A Punctured: ☒ No ☐ Yes Mechanical Vent: ☒ No ☐ Yes Fiberboard Liner: ☒ No ☐ Yes Lead Lined: ☒ No ☐ Yes
Number of Layers of Confinement:	Appears to be 1 layer
Volume Utilization Percentage:	80 %

CCP Radiography Data Sheet

Waste Container ID: X10C1001131

Section 3: Container Inventory and Comments (Detailed descriptions)
IM:
AM:
OM:
OI:
C: Coveralls
R:
XPM: Plastic sheeting, plastic containers, plastic caps
OR: Absorbent
IN:
S:

Section 4: Packaging Material and Waste Material Parameters	
Packaging Material:	**Estimated Weight (kg)**
Steel (ST):	27.8
Plastics (PP): Liner bag	1.0
Other:	0.0
Total Packaging Weight	28.8
Waste Material Parameter:	**Estimated Weight (kg)**
Iron-based Metal / Alloys (IM):	
Aluminum-based Metals / Alloys (AM):	
Other Metals (OM):	
Other Inorganic Materials (OI)	
Cellulosics (C):	4.0
Rubber (R):	
Plastics (waste materials) (XPM):	8.2
Organic Matrix (OR):	1.0
Inorganic Matrix (IN):	
Soils (S):	
Total WMP Weight:	13.2

CCP Radiography Data Sheet

Waste Container ID: X10C1001131

Section 5: RTR Summary (Questions answered "Yes" will be explained in the Comment block, except for Question 1)	
Is there observable liquid?	☐ Yes ☒ No
Is there any observable liquid in internal containers, more than 60 milliliters or 3 percent by volume, whichever is greater?	☐ Yes ☒ No
Is the total volume of observable liquid in the outermost container GREATER than 1% of the container?	☐ Yes ☒ No
Is there observable liquid in payload containers with an EPA Hazardous Waste Number of U134?	☐ Yes ☒ No
Is there an indication of non-radionuclide pyrophoric materials, such as elemental potassium?	☐ Yes ☒ No
Is there an indication of hazardous wastes not occurring as co-contaminants with TRU mixed wastes (non-mixed hazardous wastes)?	☐ Yes ☒ No
Is there an indication of wastes incompatible with backfill, seal and panel closures materials, container and packaging materials, shipping container materials, or other wastes (i.e., waste does NOT match TRUCON Code[s])?	☐ Yes ☒ No
Is there an indication of wastes containing explosives or compressed gases?	☐ Yes ☒ No
Is there an indication of PCBs liquids?	☐ Yes ☒ No
Is there an indication of the waste exhibiting the characteristic of ignitability, corrosivity, or reactivity (EPA Hazardous Waste Numbers of D001, D002, or D003)?	☐ Yes ☒ No
Is the physical form of the waste inconsistent with the Waste Stream Description or the Waste Matrix Code?	☐ Yes ☒ No
CH or RH TRAMPAC	
Are there heat-sealed bags (unvented) GREATER than 4 liters and LESS than 390 square inches in the waste, or heat sealed bags not authorized in the RH TRUCON Code?	☐ Yes ☒ No
Were there Non-approved Closure Methods used on liner bags or inner bags greater than 4 liters?	☐ Yes ☒ No
Are there sealed containers GREATER than 4 liters?	☐ Yes ☒ No
Are there indications of inadequate protection for heavy and/or sharp objects?	☐ Yes ☒ No

Comments: This Independent OBSERVATION Agrees With the ORIGINAL SCAN.

FO

2-11-16

RTR Operator:

Fred Oney		2/11/2016
Print Name	Signature	Date

CCP Radiography Data Sheet

Section 1: General Information	
[X] RTR Examination [ ] RTR Replicate Scan [ ] RTR Independent Observation	
Site ID:	ORNL
Batch Number:	OR-RTR6-0723
Examination Date:	2/11/2016
Waste Container ID:	X10C1300177A
Video/Audio Recorded Media Number:	OR-RTR6-0723 A&B
Procedure and Revision No.:	CCP-TP-053 Rev. 15
NCR(s) associated with the container? (e.g., Prohibited Items)	[X] No [ ] Yes NCR No.: N/A NCR No.: N/A

Section 2: Waste Container Data	
Container Type:	55 Gallon Drum
TRUCON Code:	OR 225
Waste Matrix Code:	S5400
Waste Stream I.D.:	OR-CHEM-CH-HET
Waste Container Weights:	Gross Wt.: 62.6 kg Tare Wt.: 33.2 kg Net Wt.: 29.4 kg
Rigid Liner and Liner Vent Description:	Liner: [X] No [ ] Yes Lid: [X] No [ ] Yes Type: [ ] 30-mil [ ] 90-mil [ ] 110-mil [ ] 125-mil Vented: [ ] No [ ] Yes [X] N/A Punctured: [X] No [ ] Yes Mechanical Vent: [X] No [ ] Yes Fiberboard Liner: [X] No [ ] Yes Lead Lined: [X] No [ ] Yes
Number of Layers of Confinement:	Appears to be 1 layer
Volume Utilization Percentage:	75 %

CCP Radiography Data Sheet

Waste Container ID: X10C1300177A

Section 3: Container Inventory and Comments (Detailed descriptions)
IM: Electrical equipment, saw blade, motor, scrap metal
AM:
OM:
OI:
C:
R:
XPM: Plastic sheeting, plastic containers, plastic caps, plastic tubing
OR:
IN:
S:

Section 4: Packaging Material and Waste Material Parameters	
Packaging Material:	**Estimated Weight (kg)**
Steel (ST):	27.8
Plastics (PP): Liner bag	1.0
Other: Cardboard Liner (CP)	4.4
Total Packaging Weight	33.2
Waste Material Parameter:	**Estimated Weight (kg)**
Iron-based Metal / Alloys (IM):	19.4
Aluminum-based Metals / Alloys (AM):	
Other Metals (OM):	
Other Inorganic Materials (OI)	
Cellulosics (C):	
Rubber (R):	
Plastics (waste materials) (XPM):	10.0
Organic Matrix (OR):	
Inorganic Matrix (IN):	
Soils (S):	
Total WMP Weight:	29.4

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CCP Radiography Data Sheet

Waste Container ID: X10C1300177A

Section 5: RTR Summary (Questions answered "Yes" will be explained in the Comment block, except for Question 1)	
Is there observable liquid?	[X] Yes [ ] No
Is there any observable liquid in internal containers, more than 60 milliliters or 3 percent by volume, whichever is greater?	[ ] Yes [X] No
Is the total volume of observable liquid in the outermost container GREATER than 1% of the container?	[ ] Yes [X] No
Is there observable liquid in payload containers with an EPA Hazardous Waste Number of U134?	[ ] Yes [X] No
Is there an indication of non-radionuclide pyrophoric materials, such as elemental potassium?	[ ] Yes [X] No
Is there an indication of hazardous wastes not occurring as co-contaminants with TRU mixed wastes (non-mixed hazardous wastes)?	[ ] Yes [X] No
Is there an indication of wastes incompatible with backfill, seal and panel closures materials, container and packaging materials, shipping container materials, or other wastes (i.e., waste does NOT match TRUCON Code[s])?	[ ] Yes [X] No
Is there an indication of wastes containing explosives or compressed gases?	[ ] Yes [X] No
Is there an indication of PCBs liquids?	[ ] Yes [X] No
Is there an indication of the waste exhibiting the characteristic of ignitability, corrosivity, or reactivity (EPA Hazardous Waste Numbers of D001, D002, or D003)?	[ ] Yes [X] No
Is the physical form of the waste inconsistent with the Waste Stream Description or the Waste Matrix Code?	[ ] Yes [X] No
CH or RH TRAMPAC	
Are there heat-sealed bags (unvented) GREATER than 4 liters and LESS than 390 square inches in the waste, or heat sealed bags not authorized in the RH TRUCON Code?	[ ] Yes [X] No
Were there Non-approved Closure Methods used on liner bags or inner bags greater than 4 liters?	[ ] Yes [X] No
Are there sealed containers GREATER than 4 liters?	[ ] Yes [X] No
Are there indications of inadequate protection for heavy and/or sharp objects?	[ ] Yes [X] No
Comments: N/A	

RTR Operator:

Eric Lyles		2/11/2016
Print Name	Signature	Date

CCP Radiography Data Sheet

Section 1: General Information	
[X] RTR Examination [ ] RTR Replicate Scan [ ] RTR Independent Observation	
Site ID:	ORNL
Batch Number:	OR-RTR6-0723
Examination Date:	2/11/2016
Waste Container ID:	X10C0402810H
Video/Audio Recorded Media Number:	OR-RTR6-0723 A&B
Procedure and Revision No.:	CCP-TP-053 Rev. 15
NCR(s) associated with the container? (e.g., Prohibited Items)	[X] No [ ] Yes NCR No.: N/A NCR No.: N/A

Section 2: Waste Container Data	
Container Type:	55 Gallon Drum
TRUCON Code:	OR 225
Waste Matrix Code:	S5400
Waste Stream I.D.:	OR-CHEM-CH-HET
Waste Container Weights:	Gross Wt.: 80.2 kg Tare Wt.: 33.2 kg Net Wt.: 47.0 kg
Rigid Liner and Liner Vent Description:	Liner: [X] No [ ] Yes Lid: [X] No [ ] Yes Type: [ ] 30-mil [ ] 90-mil [ ] 110-mil [ ] 125-mil Vented: [ ] No [ ] Yes [X] N/A Punctured: [X] No [ ] Yes Mechanical Vent: [X] No [ ] Yes Fiberboard Liner: [X] No [ ] Yes Lead Lined: [X] No [ ] Yes
Number of Layers of Confinement:	Appears to be 1 layer
Volume Utilization Percentage:	75 %

CCP Radiography Data Sheet

Waste Container ID: X10C0402810H

Section 3: Container Inventory and Comments (Detailed descriptions)	
IM:	Metal hardware, scrap metal
AM:	
OM:	
OI:	
C:	Cloth, coveralls
R:	
XPM:	Plastic sheeting, plastic tubing
OR:	Absorbent
IN:	
S:	

Section 4: Packaging Material and Waste Material Parameters	
Packaging Material:	**Estimated Weight (kg)**
Steel (ST):	27.8
Plastics (PP): Liner bag	1.0
Other: Cardboard Liner (CP)	4.4
Total Packaging Weight	33.2
Waste Material Parameter:	**Estimated Weight (kg)**
Iron-based Metal / Alloys (IM):	32.0
Aluminum-based Metals / Alloys (AM):	
Other Metals (OM):	
Other Inorganic Materials (OI)	
Cellulosics (C):	7.0
Rubber (R):	
Plastics (waste materials) (XPM):	6.0
Organic Matrix (OR):	2.0
Inorganic Matrix (IN):	
Soils (S):	
Total WMP Weight:	47.0

CCP Radiography Data Sheet

Waste Container ID: X10C0402810H

Section 5: RTR Summary (Questions answered "Yes" will be explained in the Comment block, except for Question 1)	
Is there observable liquid?	☐ Yes ☒ No
Is there any observable liquid in internal containers, more than 60 milliliters or 3 percent by volume, whichever is greater?	☐ Yes ☒ No
Is the total volume of observable liquid in the outermost container GREATER than 1% of the container?	☐ Yes ☒ No
Is there observable liquid in payload containers with an EPA Hazardous Waste Number of U134?	☐ Yes ☒ No
Is there an indication of non-radionuclide pyrophoric materials, such as elemental potassium?	☐ Yes ☒ No
Is there an indication of hazardous wastes not occurring as co-contaminants with TRU mixed wastes (non-mixed hazardous wastes)?	☐ Yes ☒ No
Is there an indication of wastes incompatible with backfill, seal and panel closures materials, container and packaging materials, shipping container materials, or other wastes (i.e., waste does NOT match TRUCON Code[s])?	☐ Yes ☒ No
Is there an indication of wastes containing explosives or compressed gases?	☐ Yes ☒ No
Is there an indication of PCBs liquids?	☐ Yes ☒ No
Is there an indication of the waste exhibiting the characteristic of ignitability, corrosivity, or reactivity (EPA Hazardous Waste Numbers of D001, D002, or D003)?	☐ Yes ☒ No
Is the physical form of the waste inconsistent with the Waste Stream Description or the Waste Matrix Code?	☐ Yes ☒ No
CH or RH TRAMPAC	
Are there heat-sealed bags (unvented) GREATER than 4 liters and LESS than 390 square inches in the waste, or heat sealed bags not authorized in the RH TRUCON Code?	☐ Yes ☒ No
Were there Non-approved Closure Methods used on liner bags or inner bags greater than 4 liters?	☐ Yes ☒ No
Are there sealed containers GREATER than 4 liters?	☐ Yes ☒ No
Are there indications of inadequate protection for heavy and/or sharp objects?	☐ Yes ☒ No
Comments: N/A	

RTR Operator:

Eric Lyles		2/11/2016
Print Name	Signature	Date

CCP Radiography Data Sheet

Section 1: General Information		
[X] RTR Examination	[ ] RTR Replicate Scan	[ ] RTR Independent Observation
Site ID:	ORNL	
Batch Number:	OR-RTR6-0723	
Examination Date:	2/11/2016	
Waste Container ID:	X10C1300185C	
Video/Audio Recorded Media Number:	OR-RTR6-0723	A&B
Procedure and Revision No.:	CCP-TP-053	Rev. 15
NCR(s) associated with the container?	[X] No [ ] Yes	
(e.g., Prohibited Items)	NCR No.: N/A NCR No.: N/A	

Section 2: Waste Container Data	
Container Type:	55 Gallon Drum
TRUCON Code:	OR 225
Waste Matrix Code:	S5400
Waste Stream I.D.:	OR-CHEM-CH-HET
Waste Container Weights:	Gross Wt.: 66.3 kg Tare Wt.: 33.2 kg Net Wt.: 33.1 kg
Rigid Liner and Liner Vent Description:	Liner: [X] No [ ] Yes Lid: [X] No [ ] Yes Type: [ ] 30-mil [ ] 90-mil [ ] 110-mil [ ] 125-mil Vented: [ ] No [ ] Yes [X] N/A Punctured: [X] No [ ] Yes Mechanical Vent: [X] No [ ] Yes Fiberboard Liner: [X] No [ ] Yes Lead Lined: [X] No [ ] Yes
Number of Layers of Confinement:	Appears to be 1 layer
Volume Utilization Percentage:	100 %

CCP Radiography Data Sheet

Waste Container ID: X10C1300185C

Section 3: Container Inventory and Comments (Detailed descriptions)	
IM:	Scrap metal, metal cans, metal lids
AM:	
OM:	Scrap lead
OI:	Glass containers
C:	
R:	
XPM:	Plastic sheeting, plastic containers, plastic caps
OR:	Absorbent
IN:	
S:	

Section 4: Packaging Material and Waste Material Parameters	
Packaging Material:	**Estimated Weight (kg)**
Steel (ST):	27.8
Plastics (PP): Liner bag	1.0
Other: Cardboard Liner (CP)	4.4
Total Packaging Weight	33.2
Waste Material Parameter:	**Estimated Weight (kg)**
Iron-based Metal / Alloys (IM):	13.1
Aluminum-based Metals / Alloys (AM):	
Other Metals (OM):	2.0
Other Inorganic Materials (OI)	5.0
Cellulosics (C):	
Rubber (R):	
Plastics (waste materials) (XPM):	10.0
Organic Matrix (OR):	3.0
Inorganic Matrix (IN):	
Soils (S):	
Total WMP Weight:	33.1

CCP Radiography Data Sheet

Waste Container ID: X10C1300185C

Section 5: RTR Summary (Questions answered "Yes" will be explained in the Comment block, except for Question 1)	
Is there observable liquid?	☐ Yes ☒ No
Is there any observable liquid in internal containers, more than 60 milliliters or 3 percent by volume, whichever is greater?	☐ Yes ☒ No
Is the total volume of observable liquid in the outermost container GREATER than 1% of the container?	☐ Yes ☒ No
Is there observable liquid in payload containers with an EPA Hazardous Waste Number of U134?	☐ Yes ☒ No
Is there an indication of non-radionuclide pyrophoric materials, such as elemental potassium?	☐ Yes ☒ No
Is there an indication of hazardous wastes not occurring as co-contaminants with TRU mixed wastes (non-mixed hazardous wastes)?	☐ Yes ☒ No
Is there an indication of wastes incompatible with backfill, seal and panel closures materials, container and packaging materials, shipping container materials, or other wastes (i.e., waste does NOT match TRUCON Code[s])?	☐ Yes ☒ No
Is there an indication of wastes containing explosives or compressed gases?	☐ Yes ☒ No
Is there an indication of PCBs liquids?	☐ Yes ☒ No
Is there an indication of the waste exhibiting the characteristic of ignitability, corrosivity, or reactivity (EPA Hazardous Waste Numbers of D001, D002, or D003)?	☐ Yes ☒ No
Is the physical form of the waste inconsistent with the Waste Stream Description or the Waste Matrix Code?	☐ Yes ☒ No
CH or RH TRAMPAC	
Are there heat-sealed bags (unvented) GREATER than 4 liters and LESS than 390 square inches in the waste, or heat sealed bags not authorized in the RH TRUCON Code?	☐ Yes ☒ No
Were there Non-approved Closure Methods used on liner bags or inner bags greater than 4 liters?	☐ Yes ☒ No
Are there sealed containers GREATER than 4 liters?	☐ Yes ☒ No
Are there indications of inadequate protection for heavy and/or sharp objects?	☐ Yes ☒ No
Comments: N/A	

RTR Operator:

Eric Lyles		2/11/2016
Print Name	Signature	Date

CCP Radiography Data Sheet

Section 1: General Information		
[X] RTR Examination	[ ] RTR Replicate Scan	[ ] RTR Independent Observation
Site ID:	ORNL	
Batch Number:	OR-RTR6-0723	
Examination Date:	2/11/2016	
Waste Container ID:	X10C0402810B	
Video/Audio Recorded Media Number:	OR-RTR6-0723	A&B
Procedure and Revision No.:	CCP-TP-053	Rev. 15
NCR(s) associated with the container? (e.g., Prohibited Items)	[X] No [ ] Yes NCR No.: N/A NCR No.: N/A	

Section 2: Waste Container Data	
Container Type:	55 Gallon Drum
TRUCON Code:	OR 225
Waste Matrix Code:	S5400
Waste Stream I.D.:	OR-CHEM-CH-HET
Waste Container Weights:	Gross Wt.: 86.1 kg Tare Wt.: 33.2 kg Net Wt.: 52.9 kg
Rigid Liner and Liner Vent Description:	Liner: [X] No [ ] Yes Lid: [X] No [ ] Yes Type: [ ] 30-mil [ ] 90-mil [ ] 110-mil [ ] 125-mil Vented: [ ] No [ ] Yes [X] N/A Punctured: [X] No [ ] Yes Mechanical Vent: [X] No [ ] Yes Fiberboard Liner: [X] No [ ] Yes Lead Lined: [X] No [ ] Yes
Number of Layers of Confinement:	Appears to be 1 layer
Volume Utilization Percentage:	95 %

CCP Radiography Data Sheet

Waste Container ID: X10C0402810B

Section 3: Container Inventory and Comments (Detailed descriptions)	
IM:	Metal hardware
AM:	
OM:	
OI:	
C:	Cloth, coveralls, wood
R:	Rubber gloves
XPM:	Plastic sheeting, plastic tubing
OR:	Absorbent
IN:	
S:	

Section 4: Packaging Material and Waste Material Parameters	
Packaging Material:	**Estimated Weight (kg)**
Steel (ST):	27.8
Plastics (PP): Liner bag	1.0
Other: Cardboard Liner (CP)	4.4
Total Packaging Weight	33.2
Waste Material Parameter:	**Estimated Weight (kg)**
Iron-based Metal / Alloys (IM):	0.1
Aluminum-based Metals / Alloys (AM):	
Other Metals (OM):	
Other Inorganic Materials (OI)	
Cellulosics (C):	36.8
Rubber (R):	1.0
Plastics (waste materials) (XPM):	10.0
Organic Matrix (OR):	5.0
Inorganic Matrix (IN):	
Soils (S):	
Total WMP Weight:	52.9

CCP Radiography Data Sheet

Waste Container ID: X10C0402810B

Section 5: RTR Summary (Questions answered "Yes" will be explained in the Comment block, except for Question 1)	
Is there observable liquid?	☐ Yes ☒ No
Is there any observable liquid in internal containers, more than 60 milliliters or 3 percent by volume, whichever is greater?	☐ Yes ☒ No
Is the total volume of observable liquid in the outermost container GREATER than 1% of the container?	☐ Yes ☒ No
Is there observable liquid in payload containers with an EPA Hazardous Waste Number of U134?	☐ Yes ☒ No
Is there an indication of non-radionuclide pyrophoric materials, such as elemental potassium?	☐ Yes ☒ No
Is there an indication of hazardous wastes not occurring as co-contaminants with TRU mixed wastes (non-mixed hazardous wastes)?	☐ Yes ☒ No
Is there an indication of wastes incompatible with backfill, seal and panel closures materials, container and packaging materials, shipping container materials, or other wastes (i.e., waste does NOT match TRUCON Code[s])?	☐ Yes ☒ No
Is there an indication of wastes containing explosives or compressed gases?	☐ Yes ☒ No
Is there an indication of PCBs liquids?	☐ Yes ☒ No
Is there an indication of the waste exhibiting the characteristic of ignitability, corrosivity, or reactivity (EPA Hazardous Waste Numbers of D001, D002, or D003)?	☐ Yes ☒ No
Is the physical form of the waste inconsistent with the Waste Stream Description or the Waste Matrix Code?	☐ Yes ☒ No
CH or RH TRAMPAC	
Are there heat-sealed bags (unvented) GREATER than 4 liters and LESS than 390 square inches in the waste, or heat sealed bags not authorized in the RH TRUCON Code?	☐ Yes ☒ No
Were there Non-approved Closure Methods used on liner bags or inner bags greater than 4 liters?	☐ Yes ☒ No
Are there sealed containers GREATER than 4 liters?	☐ Yes ☒ No
Are there indications of inadequate protection for heavy and/or sharp objects?	☐ Yes ☒ No
Comments: N/A	

RTR Operator:

Eric Lyles		2/11/2016
Print Name	Signature	Date

CCP Radiography Data Sheet

Section 1: General Information	
[X] RTR Examination [ ] RTR Replicate Scan [ ] RTR Independent Observation	
Site ID:	ORNL
Batch Number:	OR-RTR6-0723
Examination Date:	2/11/2016
Waste Container ID:	X10C1001131
Video/Audio Recorded Media Number:	OR-RTR6-0723 A&B
Procedure and Revision No.:	CCP-TP-053 Rev. 15
NCR(s) associated with the container? (e.g., Prohibited Items)	[X] No [ ] Yes NCR No.: N/A NCR No.: N/A

Section 2: Waste Container Data	
Container Type:	55 Gallon Drum
TRUCON Code:	OR 225
Waste Matrix Code:	S5400
Waste Stream I.D.:	OR-CHEM-CH-HET
Waste Container Weights:	Gross Wt.: 42.0 kg Tare Wt.: 28.8 kg Net Wt.: 13.2 kg
Rigid Liner and Liner Vent Description:	Liner: [X] No [ ] Yes Lid: [X] No [ ] Yes Type: [ ] 30-mil [ ] 90-mil [ ] 110-mil [ ] 125-mil Vented: [ ] No [ ] Yes [X] N/A Punctured: [X] No [ ] Yes Mechanical Vent: [X] No [ ] Yes Fiberboard Liner: [X] No [ ] Yes Lead Lined: [X] No [ ] Yes
Number of Layers of Confinement:	Appears to be 1 layer
Volume Utilization Percentage:	80 %

CCP Radiography Data Sheet

Waste Container ID: X10C1001131

Section 3: Container Inventory and Comments (Detailed descriptions)
IM:
AM:
OM:
OI:
C: Cloth, coveralls
R:
XPM: Plastic containers, plastic sheeting, plastic caps
OR: Absorbent
IN:
S:

Section 4: Packaging Material and Waste Material Parameters	
Packaging Material:	**Estimated Weight (kg)**
Steel (ST):	27.8
Plastics (PP): Liner bag	1.0
Other:	0.0
Total Packaging Weight	28.8
Waste Material Parameter:	**Estimated Weight (kg)**
Iron-based Metal / Alloys (IM):	
Aluminum-based Metals / Alloys (AM):	
Other Metals (OM):	
Other Inorganic Materials (OI)	
Cellulosics (C):	3.5
Rubber (R):	
Plastics (waste materials) (XPM):	8.7
Organic Matrix (OR):	1.0
Inorganic Matrix (IN):	
Soils (S):	
Total WMP Weight:	13.2

CCP Radiography Data Sheet

Waste Container ID: X10C1001131

Section 5: RTR Summary (Questions answered "Yes" will be explained in the Comment block, except for Question 1)	
Is there observable liquid?	☐ Yes ☒ No
Is there any observable liquid in internal containers, more than 60 milliliters or 3 percent by volume, whichever is greater?	☐ Yes ☒ No
Is the total volume of observable liquid in the outermost container GREATER than 1% of the container?	☐ Yes ☒ No
Is there observable liquid in payload containers with an EPA Hazardous Waste Number of U134?	☐ Yes ☒ No
Is there an indication of non-radionuclide pyrophoric materials, such as elemental potassium?	☐ Yes ☒ No
Is there an indication of hazardous wastes not occurring as co-contaminants with TRU mixed wastes (non-mixed hazardous wastes)?	☐ Yes ☒ No
Is there an indication of wastes incompatible with backfill, seal and panel closures materials, container and packaging materials, shipping container materials, or other wastes (i.e., waste does NOT match TRUCON Code[s])?	☐ Yes ☒ No
Is there an indication of wastes containing explosives or compressed gases?	☐ Yes ☒ No
Is there an indication of PCBs liquids?	☐ Yes ☒ No
Is there an indication of the waste exhibiting the characteristic of ignitability, corrosivity, or reactivity (EPA Hazardous Waste Numbers of D001, D002, or D003)?	☐ Yes ☒ No
Is the physical form of the waste inconsistent with the Waste Stream Description or the Waste Matrix Code?	☐ Yes ☒ No
CH or RH TRAMPAC	
Are there heat-sealed bags (unvented) GREATER than 4 liters and LESS than 390 square inches in the waste, or heat sealed bags not authorized in the RH TRUCON Code?	☐ Yes ☒ No
Were there Non-approved Closure Methods used on liner bags or inner bags greater than 4 liters?	☐ Yes ☒ No
Are there sealed containers GREATER than 4 liters?	☐ Yes ☒ No
Are there indications of inadequate protection for heavy and/or sharp objects?	☐ Yes ☒ No
Comments: N/A	

RTR Operator:

Eric Lyles		2/11/2016
Print Name	Signature	Date

CCP Radiography Data Sheet

Section 1: General Information	
[X] RTR Examination [ ] RTR Replicate Scan [ ] RTR Independent Observation	
Site ID:	ORNL
Batch Number:	OR-RTR6-0723
Examination Date:	2/11/2016
Waste Container ID:	X10C0402810G
Video/Audio Recorded Media Number:	OR-RTR6-0723 A&B
Procedure and Revision No.:	CCP-TP-053 Rev. 15
NCR(s) associated with the container? (e.g., Prohibited Items)	[X] No [ ] Yes NCR No.: N/A NCR No.: N/A

Section 2: Waste Container Data	
Container Type:	55 Gallon Drum
TRUCON Code:	OR 225
Waste Matrix Code:	S5400
Waste Stream I.D.:	OR-CHEM-CH-HET
Waste Container Weights:	Gross Wt.: 68.0 kg Tare Wt.: 33.2 kg Net Wt.: 34.8 kg
Rigid Liner and Liner Vent Description:	Liner: [X] No [ ] Yes Lid: [X] No [ ] Yes Type: [ ] 30-mil [ ] 90-mil [ ] 110-mil [ ] 125-mil Vented: [ ] No [ ] Yes [X] N/A Punctured: [X] No [ ] Yes Mechanical Vent: [X] No [ ] Yes Fiberboard Liner: [X] No [ ] Yes Lead Lined: [X] No [ ] Yes
Number of Layers of Confinement:	Appears to be 1 layer
Volume Utilization Percentage:	90 %

CCP Radiography Data Sheet

Waste Container ID: X10C0402810G

Section 3: Container Inventory and Comments (Detailed descriptions)	
IM:	Scrap metal, metal respirator filter
AM:	
OM:	
OI:	Light bulbs, broken glass
C:	Cloth, coveralls, wood, cardboard
R:	
XPM:	Plastic tubing, plastic sheeting
OR:	Absorbent
IN:	
S:	

Section 4: Packaging Material and Waste Material Parameters	
Packaging Material:	**Estimated Weight (kg)**
Steel (ST):	27.8
Plastics (PP): Liner bag	1.0
Other: Cardboard Liner (CP)	4.4
Total Packaging Weight	33.2
Waste Material Parameter:	**Estimated Weight (kg)**
Iron-based Metal / Alloys (IM):	1.0
Aluminum-based Metals / Alloys (AM):	
Other Metals (OM):	
Other Inorganic Materials (OI)	1.0
Cellulosics (C):	21.8
Rubber (R):	
Plastics (waste materials) (XPM):	6.0
Organic Matrix (OR):	5.0
Inorganic Matrix (IN):	
Soils (S):	
Total WMP Weight:	34.8

CCP Radiography Data Sheet

Waste Container ID: X10C0402810G

Section 5: RTR Summary (Questions answered "Yes" will be explained in the Comment block, except for Question 1)	
Is there observable liquid?	☐ Yes ☒ No
Is there any observable liquid in internal containers, more than 60 milliliters or 3 percent by volume, whichever is greater?	☐ Yes ☒ No
Is the total volume of observable liquid in the outermost container GREATER than 1% of the container?	☐ Yes ☒ No
Is there observable liquid in payload containers with an EPA Hazardous Waste Number of U134?	☐ Yes ☒ No
Is there an indication of non-radionuclide pyrophoric materials, such as elemental potassium?	☐ Yes ☒ No
Is there an indication of hazardous wastes not occurring as co-contaminants with TRU mixed wastes (non-mixed hazardous wastes)?	☐ Yes ☒ No
Is there an indication of wastes incompatible with backfill, seal and panel closures materials, container and packaging materials, shipping container materials, or other wastes (i.e., waste does NOT match TRUCON Code[s])?	☐ Yes ☒ No
Is there an indication of wastes containing explosives or compressed gases?	☐ Yes ☒ No
Is there an indication of PCBs liquids?	☐ Yes ☒ No
Is there an indication of the waste exhibiting the characteristic of ignitability, corrosivity, or reactivity (EPA Hazardous Waste Numbers of D001, D002, or D003)?	☐ Yes ☒ No
Is the physical form of the waste inconsistent with the Waste Stream Description or the Waste Matrix Code?	☐ Yes ☒ No
CH or RH TRAMPAC	
Are there heat-sealed bags (unvented) GREATER than 4 liters and LESS than 390 square inches in the waste, or heat sealed bags not authorized in the RH TRUCON Code?	☐ Yes ☒ No
Were there Non-approved Closure Methods used on liner bags or inner bags greater than 4 liters?	☐ Yes ☒ No
Are there sealed containers GREATER than 4 liters?	☐ Yes ☒ No
Are there indications of inadequate protection for heavy and/or sharp objects?	☐ Yes ☒ No
Comments: N/A	

RTR Operator:

Eric Lyles		2/11/2016
Print Name	Signature	Date

CCP Radiography Data Sheet

Section 1: General Information	
[X] RTR Examination [ ] RTR Replicate Scan [ ] RTR Independent Observation	
Site ID:	ORNL
Batch Number:	OR-RTR6-0723
Examination Date:	2/11/2016
Waste Container ID:	X10C1300185A
Video/Audio Recorded Media Number:	OR-RTR6-0723 A&B
Procedure and Revision No.:	CCP-TP-053 Rev. 15
NCR(s) associated with the container? (e.g., Prohibited Items)	[X] No [ ] Yes NCR No.: N/A NCR No.: N/A

Section 2: Waste Container Data	
Container Type:	55 Gallon Drum
TRUCON Code:	OR 225
Waste Matrix Code:	S5400
Waste Stream I.D.:	OR-CHEM-CH-HET
Waste Container Weights:	Gross Wt.: 75.9 kg Tare Wt.: 33.2 kg Net Wt.: 42.7 kg
Rigid Liner and Liner Vent Description:	Liner: [X] No [ ] Yes Lid: [X] No [ ] Yes Type: [ ] 30-mil [ ] 90-mil [ ] 110-mil [ ] 125-mil Vented: [ ] No [ ] Yes [X] N/A Punctured: [X] No [ ] Yes Mechanical Vent: [X] No [ ] Yes Fiberboard Liner: [X] No [ ] Yes Lead Lined: [X] No [ ] Yes
Number of Layers of Confinement:	Appears to be 1 layer
Volume Utilization Percentage:	70 %

CCP Radiography Data Sheet

Waste Container ID: X10C1300185A

Section 3: Container Inventory and Comments (Detailed descriptions)	
IM:	Scrap metal, saw blade, hand tools, utility knife
AM:	
OM:	
OI:	Glass containers
C:	Cloth, coveralls
R:	
XPM:	Plastic sheeting, plastic tubing
OR:	
IN:	
S:	

Section 4: Packaging Material and Waste Material Parameters	
Packaging Material:	**Estimated Weight (kg)**
Steel (ST):	27.8
Plastics (PP): Liner bag	1.0
Other: Cardboard Liner (CP)	4.4
Total Packaging Weight	33.2
Waste Material Parameter:	**Estimated Weight (kg)**
Iron-based Metal / Alloys (IM):	3.0
Aluminum-based Metals / Alloys (AM):	
Other Metals (OM):	
Other Inorganic Materials (OI)	8.0
Cellulosics (C):	21.7
Rubber (R):	
Plastics (waste materials) (XPM):	10.0
Organic Matrix (OR):	
Inorganic Matrix (IN):	
Soils (S):	
Total WMP Weight:	42.7

CCP Radiography Data Sheet

Waste Container ID: X10C1300185A

Section 5: RTR Summary (Questions answered "Yes" will be explained in the Comment block, except for Question 1)	
Is there observable liquid?	☐ Yes ☒ No
Is there any observable liquid in internal containers, more than 60 milliliters or 3 percent by volume, whichever is greater?	☐ Yes ☒ No
Is the total volume of observable liquid in the outermost container GREATER than 1% of the container?	☐ Yes ☒ No
Is there observable liquid in payload containers with an EPA Hazardous Waste Number of U134?	☐ Yes ☒ No
Is there an indication of non-radionuclide pyrophoric materials, such as elemental potassium?	☐ Yes ☒ No
Is there an indication of hazardous wastes not occurring as co-contaminants with TRU mixed wastes (non-mixed hazardous wastes)?	☐ Yes ☒ No
Is there an indication of wastes incompatible with backfill, seal and panel closures materials, container and packaging materials, shipping container materials, or other wastes (i.e., waste does NOT match TRUCON Code[s])?	☐ Yes ☒ No
Is there an indication of wastes containing explosives or compressed gases?	☐ Yes ☒ No
Is there an indication of PCBs liquids?	☐ Yes ☒ No
Is there an indication of the waste exhibiting the characteristic of ignitability, corrosivity, or reactivity (EPA Hazardous Waste Numbers of D001, D002, or D003)?	☐ Yes ☒ No
Is the physical form of the waste inconsistent with the Waste Stream Description or the Waste Matrix Code?	☐ Yes ☒ No
CH or RH TRAMPAC	
Are there heat-sealed bags (unvented) GREATER than 4 liters and LESS than 390 square inches in the waste, or heat sealed bags not authorized in the RH TRUCON Code?	☐ Yes ☒ No
Were there Non-approved Closure Methods used on liner bags or inner bags greater than 4 liters?	☐ Yes ☒ No
Are there sealed containers GREATER than 4 liters?	☐ Yes ☒ No
Are there indications of inadequate protection for heavy and/or sharp objects?	☐ Yes ☒ No
Comments: N/A	

RTR Operator:

Eric Lyles		2/11/2016
Print Name	Signature	Date

CCP Radiography Data Sheet

Section 1: General Information		
[X] RTR Examination	[ ] RTR Replicate Scan	[ ] RTR Independent Observation
Site ID:	ORNL	
Batch Number:	OR-RTR6-0723	
Examination Date:	2/11/2016	
Waste Container ID:	X10C0402810J	
Video/Audio Recorded Media Number:	OR-RTR6-0723	A&B
Procedure and Revision No.:	CCP-TP-053	Rev. 15
NCR(s) associated with the container? (e.g., Prohibited Items)	[X] No [ ] Yes NCR No.: N/A NCR No.: N/A	

Section 2: Waste Container Data	
Container Type:	55 Gallon Drum
TRUCON Code:	OR 225
Waste Matrix Code:	S5400
Waste Stream I.D.:	OR-CHEM-CH-HET
Waste Container Weights:	Gross Wt.: 68.4 kg Tare Wt.: 33.2 kg Net Wt.: 35.2 kg
Rigid Liner and Liner Vent Description:	Liner: [X] No [ ] Yes Lid: [X] No [ ] Yes Type: [ ] 30-mil [ ] 90-mil [ ] 110-mil [ ] 125-mil Vented: [ ] No [ ] Yes [X] N/A Punctured: [X] No [ ] Yes Mechanical Vent: [X] No [ ] Yes Fiberboard Liner: [X] No [ ] Yes Lead Lined: [X] No [ ] Yes
Number of Layers of Confinement:	Appears to be 1 layer
Volume Utilization Percentage:	90 %

CCP Radiography Data Sheet

Waste Container ID: X10C0402810J

Section 3: Container Inventory and Comments (Detailed descriptions)	
IM:	Scrap metal, electrical equipment
AM:	
OM:	
OI:	Broken glass
C:	Cloth, coveralls, cardboard
R:	
XPM:	Plastic sheeting, plastic tubing
OR:	Absorbent
IN:	
S:	

Section 4: Packaging Material and Waste Material Parameters	
Packaging Material:	**Estimated Weight (kg)**
Steel (ST):	27.8
Plastics (PP): Liner bag	1.0
Other: Cardboard Liner (CP)	4.4
Total Packaging Weight	33.2
Waste Material Parameter:	**Estimated Weight (kg)**
Iron-based Metal / Alloys (IM):	4.0
Aluminum-based Metals / Alloys (AM):	
Other Metals (OM):	
Other Inorganic Materials (OI)	1.0
Cellulosics (C):	19.2
Rubber (R):	
Plastics (waste materials) (XPM):	8.0
Organic Matrix (OR):	3.0
Inorganic Matrix (IN):	
Soils (S):	
Total WMP Weight:	35.2

CCP Radiography Data Sheet

Waste Container ID: X10C0402810J

Section 5: RTR Summary (Questions answered "Yes" will be explained in the Comment block, except for Question 1)	
Is there observable liquid?	☐ Yes ☒ No
Is there any observable liquid in internal containers, more than 60 milliliters or 3 percent by volume, whichever is greater?	☐ Yes ☒ No
Is the total volume of observable liquid in the outermost container GREATER than 1% of the container?	☐ Yes ☒ No
Is there observable liquid in payload containers with an EPA Hazardous Waste Number of U134?	☐ Yes ☒ No
Is there an indication of non-radionuclide pyrophoric materials, such as elemental potassium?	☐ Yes ☒ No
Is there an indication of hazardous wastes not occurring as co-contaminants with TRU mixed wastes (non-mixed hazardous wastes)?	☐ Yes ☒ No
Is there an indication of wastes incompatible with backfill, seal and panel closures materials, container and packaging materials, shipping container materials, or other wastes (i.e., waste does NOT match TRUCON Code[s])?	☐ Yes ☒ No
Is there an indication of wastes containing explosives or compressed gases?	☐ Yes ☒ No
Is there an indication of PCBs liquids?	☐ Yes ☒ No
Is there an indication of the waste exhibiting the characteristic of ignitability, corrosivity, or reactivity (EPA Hazardous Waste Numbers of D001, D002, or D003)?	☐ Yes ☒ No
Is the physical form of the waste inconsistent with the Waste Stream Description or the Waste Matrix Code?	☐ Yes ☒ No
CH or RH TRAMPAC	
Are there heat-sealed bags (unvented) GREATER than 4 liters and LESS than 390 square inches in the waste, or heat sealed bags not authorized in the RH TRUCON Code?	☐ Yes ☒ No
Were there Non-approved Closure Methods used on liner bags or inner bags greater than 4 liters?	☐ Yes ☒ No
Are there sealed containers GREATER than 4 liters?	☐ Yes ☒ No
Are there indications of inadequate protection for heavy and/or sharp objects?	☐ Yes ☒ No
Comments: N/A	

RTR Operator:

Eric Lyles		2/11/2016
Print Name	Signature	Date

CCP Radiography Data Sheet

Section 1: General Information	
[X] RTR Examination [ ] RTR Replicate Scan [ ] RTR Independent Observation	
Site ID:	ORNL
Batch Number:	OR-RTR6-0723
Examination Date:	2/11/2016
Waste Container ID:	X10C1001133
Video/Audio Recorded Media Number:	OR-RTR6-0723 A&B
Procedure and Revision No.:	CCP-TP-053 Rev. 15
NCR(s) associated with the container? (e.g., Prohibited Items)	[X] No [ ] Yes NCR No.: N/A NCR No.: N/A

Section 2: Waste Container Data	
Container Type:	55 Gallon Drum
TRUCON Code:	OR 225
Waste Matrix Code:	S5400
Waste Stream I.D.:	OR-CHEM-CH-HET
Waste Container Weights:	Gross Wt.: 45.0 kg Tare Wt.: 28.8 kg Net Wt.: 16.2 kg
Rigid Liner and Liner Vent Description:	Liner: [X] No [ ] Yes Lid: [X] No [ ] Yes Type: [ ] 30-mil [ ] 90-mil [ ] 110-mil [ ] 125-mil Vented: [ ] No [ ] Yes [X] N/A Punctured: [X] No [ ] Yes Mechanical Vent: [X] No [ ] Yes Fiberboard Liner: [X] No [ ] Yes Lead Lined: [X] No [ ] Yes
Number of Layers of Confinement:	Appears to be 1 layer
Volume Utilization Percentage:	90 %

CCP Radiography Data Sheet

Waste Container ID: X10C1001133

Section 3: Container Inventory and Comments (Detailed descriptions)	
IM:	Open metal can, scrap metal
AM:	
OM:	
OI:	
C:	Cardboard, cloth, coveralls
R:	
XPM:	Plastic sheeting, plastic tubing
OR:	Absorbent
IN:	
S:	

Section 4: Packaging Material and Waste Material Parameters	
Packaging Material:	**Estimated Weight (kg)**
Steel (ST):	27.8
Plastics (PP): Liner bag	1.0
Other:	0.0
Total Packaging Weight	28.8
Waste Material Parameter:	**Estimated Weight (kg)**
Iron-based Metal / Alloys (IM):	1.0
Aluminum-based Metals / Alloys (AM):	
Other Metals (OM):	
Other Inorganic Materials (OI)	
Cellulosics (C):*	5.0
Rubber (R):	
Plastics (waste materials) (XPM):	9.7
Organic Matrix (OR):	0.5
Inorganic Matrix (IN):	
Soils (S):	
Total WMP Weight:	16.2

CCP Radiography Data Sheet

Waste Container ID: X10C1001133

Section 5: RTR Summary (Questions answered "Yes" will be explained in the Comment block, except for Question 1)	
Is there observable liquid?	☐ Yes ☒ No
Is there any observable liquid in internal containers, more than 60 milliliters or 3 percent by volume, whichever is greater?	☐ Yes ☒ No
Is the total volume of observable liquid in the outermost container GREATER than 1% of the container?	☐ Yes ☒ No
Is there observable liquid in payload containers with an EPA Hazardous Waste Number of U134?	☐ Yes ☒ No
Is there an indication of non-radionuclide pyrophoric materials, such as elemental potassium?	☐ Yes ☒ No
Is there an indication of hazardous wastes not occurring as co-contaminants with TRU mixed wastes (non-mixed hazardous wastes)?	☐ Yes ☒ No
Is there an indication of wastes incompatible with backfill, seal and panel closures materials, container and packaging materials, shipping container materials, or other wastes (i.e., waste does NOT match TRUCON Code[s])?	☐ Yes ☒ No
Is there an indication of wastes containing explosives or compressed gases?	☐ Yes ☒ No
Is there an indication of PCBs liquids?	☐ Yes ☒ No
Is there an indication of the waste exhibiting the characteristic of ignitability, corrosivity, or reactivity (EPA Hazardous Waste Numbers of D001, D002, or D003)?	☐ Yes ☒ No
Is the physical form of the waste inconsistent with the Waste Stream Description or the Waste Matrix Code?	☐ Yes ☒ No
CH or RH TRAMPAC	
Are there heat-sealed bags (unvented) GREATER than 4 liters and LESS than 390 square inches in the waste, or heat sealed bags not authorized in the RH TRUCON Code?	☐ Yes ☒ No
Were there Non-approved Closure Methods used on liner bags or inner bags greater than 4 liters?	☐ Yes ☒ No
Are there sealed containers GREATER than 4 liters?	☐ Yes ☒ No
Are there indications of inadequate protection for heavy and/or sharp objects?	☐ Yes ☒ No
Comments: N/A	

RTR Operator:

Eric Lyles		2/11/2016
Print Name	Signature	Date

CCP Radiography Data Sheet

Section 1: General Information	
[X] RTR Examination [ ] RTR Replicate Scan [ ] RTR Independent Observation	
Site ID:	ORNL
Batch Number:	OR-RTR6-0723
Examination Date:	2/11/2016
Waste Container ID:	X10C9400064A
Video/Audio Recorded Media Number:	OR-RTR6-0723 A&B
Procedure and Revision No.:	CCP-TP-053 Rev. 15
NCR(s) associated with the container? (e.g., Prohibited Items)	[X] No [ ] Yes NCR No.: N/A NCR No.: N/A

Section 2: Waste Container Data	
Container Type:	55 Gallon Drum
TRUCON Code:	OR 225
Waste Matrix Code:	S5400
Waste Stream I.D.:	OR-CHEM-CH-HET
Waste Container Weights:	Gross Wt.: 57.3 kg Tare Wt.: 33.2 kg Net Wt.: 24.1 kg
Rigid Liner and Liner Vent Description:	Liner: [X] No [ ] Yes Lid: [X] No [ ] Yes Type: [ ] 30-mil [ ] 90-mil [ ] 110-mil [ ] 125-mil Vented: [ ] No [ ] Yes [X] N/A Punctured: [X] No [ ] Yes Mechanical Vent: [X] No [ ] Yes Fiberboard Liner: [X] No [ ] Yes Lead Lined: [X] No [ ] Yes
Number of Layers of Confinement:	Appears to be 1 layer
Volume Utilization Percentage:	85 %

CCP Radiography Data Sheet

Waste Container ID: X10C9400064A

Section 3: Container Inventory and Comments (Detailed descriptions)	
IM:	Bolt, scrap metal, utility knives
AM:	
OM:	
OI:	Glass containers, light bulb, broken glass
C:	
R:	Rubber hoses
XPM:	*Vacuum cleaner, plastic sheeting, plastic containers, plastic caps*
OR:	
IN:	
S:	

Section 4: Packaging Material and Waste Material Parameters	
Packaging Material:	**Estimated Weight (kg)**
Steel (ST):	27.8
Plastics (PP): Liner bag	1.0
Other: Cardboard Liner (CP)	4.4
Total Packaging Weight	33.2
Waste Material Parameter:	**Estimated Weight (kg)**
Iron-based Metal / Alloys (IM):	2.0
Aluminum-based Metals / Alloys (AM):	
Other Metals (OM):	
Other Inorganic Materials (OI)	12.0
Cellulosics (C):	
Rubber (R):	1.0
Plastics (waste materials) (XPM):	9.1
Organic Matrix (OR):	
Inorganic Matrix (IN):	
Soils (S):	
Total WMP Weight:	24.1

CCP Radiography Data Sheet

Waste Container ID: X10C9400064A

Section 5: RTR Summary (Questions answered "Yes" will be explained in the Comment block, except for Question 1)	
Is there observable liquid?	☐ Yes ☒ No
Is there any observable liquid in internal containers, more than 60 milliliters or 3 percent by volume, whichever is greater?	☐ Yes ☒ No
Is the total volume of observable liquid in the outermost container GREATER than 1% of the container?	☐ Yes ☒ No
Is there observable liquid in payload containers with an EPA Hazardous Waste Number of U134?	☐ Yes ☒ No
Is there an indication of non-radionuclide pyrophoric materials, such as elemental potassium?	☐ Yes ☒ No
Is there an indication of hazardous wastes not occurring as co-contaminants with TRU mixed wastes (non-mixed hazardous wastes)?	☐ Yes ☒ No
Is there an indication of wastes incompatible with backfill, seal and panel closures materials, container and packaging materials, shipping container materials, or other wastes (i.e., waste does NOT match TRUCON Code[s])?	☐ Yes ☒ No
Is there an indication of wastes containing explosives or compressed gases?	☐ Yes ☒ No
Is there an indication of PCBs liquids?	☐ Yes ☒ No
Is there an indication of the waste exhibiting the characteristic of ignitability, corrosivity, or reactivity (EPA Hazardous Waste Numbers of D001, D002, or D003)?	☐ Yes ☒ No
Is the physical form of the waste inconsistent with the Waste Stream Description or the Waste Matrix Code?	☐ Yes ☒ No
CH or RH TRAMPAC	
Are there heat-sealed bags (unvented) GREATER than 4 liters and LESS than 390 square inches in the waste, or heat sealed bags not authorized in the RH TRUCON Code?	☐ Yes ☒ No
Were there Non-approved Closure Methods used on liner bags or inner bags greater than 4 liters?	☐ Yes ☒ No
Are there sealed containers GREATER than 4 liters?	☐ Yes ☒ No
Are there indications of inadequate protection for heavy and/or sharp objects?	☐ Yes ☒ No
Comments: N/A	

RTR Operator:

Eric Lyles		2/11/2016
Print Name	Signature	Date

CCP Radiography Data Sheet

Section 1: General Information	
[X] RTR Examination [ ] RTR Replicate Scan [ ] RTR Independent Observation	
Site ID:	ORNL
Batch Number:	OR-RTR6-0723
Examination Date:	2/11/2016
Waste Container ID:	X10C1300184
Video/Audio Recorded Media Number:	OR-RTR6-0723 A&B
Procedure and Revision No.:	CCP-TP-053 Rev. 15
NCR(s) associated with the container? (e.g., Prohibited Items)	[X] No [ ] Yes NCR No.: N/A NCR No.: N/A

Section 2: Waste Container Data	
Container Type:	55 Gallon Drum
TRUCON Code:	OR 225
Waste Matrix Code:	S5400
Waste Stream I.D.:	OR-CHEM-CH-HET
Waste Container Weights:	Gross Wt.: 57.2 kg Tare Wt.: 28.8 kg Net Wt.: 28.4 kg
Rigid Liner and Liner Vent Description:	Liner: [X] No [ ] Yes Lid: [X] No [ ] Yes Type: [ ] 30-mil [ ] 90-mil [ ] 110-mil [ ] 125-mil Vented: [ ] No [ ] Yes [X] N/A Punctured: [X] No [ ] Yes Mechanical Vent: [X] No [ ] Yes Fiberboard Liner: [X] No [ ] Yes Lead Lined: [X] No [ ] Yes
Number of Layers of Confinement:	Appears to be 1 layer
Volume Utilization Percentage:	90 %

CCP Radiography Data Sheet

Waste Container ID: X10C1300184

Section 3: Container Inventory and Comments (Detailed descriptions)
IM: Scrap metal, electrical equipment
AM:
OM:
OI:
C: Cloth
R:
XPM: Plastic tubing, plastic containers, plastic caps
OR: Absorbent
IN:
S:

Section 4: Packaging Material and Waste Material Parameters	
Packaging Material:	**Estimated Weight (kg)**
Steel (ST):	27.8
Plastics (PP): Liner bag	1.0
Other:	0.0
Total Packaging Weight	28.8
Waste Material Parameter:	**Estimated Weight (kg)**
Iron-based Metal / Alloys (IM):	10.0
Aluminum-based Metals / Alloys (AM):	
Other Metals (OM):	
Other Inorganic Materials (OI)	
Cellulosics (C):	5.0
Rubber (R):	
Plastics (waste materials) (XPM):	13.0
Organic Matrix (OR):	0.4
Inorganic Matrix (IN):	
Soils (S):	
Total WMP Weight:	28.4

CCP Radiography Data Sheet

Waste Container ID: X10C1300184

Section 5: RTR Summary (Questions answered "Yes" will be explained in the Comment block, except for Question 1)	
Is there observable liquid?	☐ Yes ☒ No
Is there any observable liquid in internal containers, more than 60 milliliters or 3 percent by volume, whichever is greater?	☐ Yes ☒ No
Is the total volume of observable liquid in the outermost container GREATER than 1% of the container?	☐ Yes ☒ No
Is there observable liquid in payload containers with an EPA Hazardous Waste Number of U134?	☐ Yes ☒ No
Is there an indication of non-radionuclide pyrophoric materials, such as elemental potassium?	☐ Yes ☒ No
Is there an indication of hazardous wastes not occurring as co-contaminants with TRU mixed wastes (non-mixed hazardous wastes)?	☐ Yes ☒ No
Is there an indication of wastes incompatible with backfill, seal and panel closures materials, container and packaging materials, shipping container materials, or other wastes (i.e., waste does NOT match TRUCON Code[s])?	☐ Yes ☒ No
Is there an indication of wastes containing explosives or compressed gases?	☐ Yes ☒ No
Is there an indication of PCBs liquids?	☐ Yes ☒ No
Is there an indication of the waste exhibiting the characteristic of ignitability, corrosivity, or reactivity (EPA Hazardous Waste Numbers of D001, D002, or D003)?	☐ Yes ☒ No
Is the physical form of the waste inconsistent with the Waste Stream Description or the Waste Matrix Code?	☐ Yes ☒ No
CH or RH TRAMPAC	
Are there heat-sealed bags (unvented) GREATER than 4 liters and LESS than 390 square inches in the waste, or heat sealed bags not authorized in the RH TRUCON Code?	☐ Yes ☒ No
Were there Non-approved Closure Methods used on liner bags or inner bags greater than 4 liters?	☐ Yes ☒ No
Are there sealed containers GREATER than 4 liters?	☐ Yes ☒ No
Are there indications of inadequate protection for heavy and/or sharp objects?	☐ Yes ☒ No
Comments: N/A	

RTR Operator:

Eric Lyles		2/11/2016
Print Name	Signature	Date

Attachment 3 – CCP Radiography Independent Technical Reviewer Checklist

Batch Data Report No.: OR-RTR6-0723

Description			
1.	Were data generation and reduction conducted in a technically correct manner in accordance with the methods used?	☐ NO	☑ YES
2.	Was the correct revision of the procedure used? Procedure: CCP-TP-053 Rev.: 15	☐ NO	☑ YES
3.	Are the WMPs entered correctly?	☐ NO	☑ YES
4.	Do the estimated weights in Section 4 of Attachment 2 equal the container gross weight?	☐ NO	☑ YES
5.	Is the data reported in the proper units with the correct number of significant figures (e.g., one tenth of a kilogram)?	☐ NO	☑ YES
6.	Was transcription used? If no, proceed to question 7.	☑ NO	☐ YES
	6a. Has the data been verified for transcription errors?	☐ NO	☐ YES
7.	Does the Testing Batch Report include radiography for up to 20 containers?	☐ NO	☑ YES
8.	Are BDR contents complete and do they match the CCP Waste RTR Batch Data Report Table of Contents?	☐ NO	☑ YES
9.	Is all the data signed and dated in reproducible ink and by the individual(s) generating it?	☐ NO	☑ YES
10.	Is all data recorded clearly, legibly, and accurately?	☐ NO	☑ YES
11.	Have changes been made to original data? If no, proceed to question 12.	☑ NO	☐ YES
	11a. Have all changes to original data been lined out, initialed and dated by the individual making the changes?	☐ NO	☐ YES
	11b. Was justification made for changing the original data?	☐ NO	☐ YES
	11c. Were data changes made by the individual who originally collected the data?	☐ NO	☐ YES
12.	Does the waste match the Waste Matrix Code and Waste Stream description?	☐ NO	☑ YES
13.	Are the RTR Operator's decisions regarding the Radiography documented?	☐ NO	☑ YES
14.	Is there an adequate written description of the contents of each item?	☐ NO	☑ YES
15.	Was the video/audio recording media properly prepared and labeled for each waste container?	☐ NO	☑ YES
16.	Was the video/audio recording media check performed satisfactorily and recorded on Attachment 1?	☐ NO	☑ YES

Attachment 3 – CCP Radiography Independent Technical Reviewer Checklist (Continued)

Batch Data Report No.: OR-RTR6-0723

Description		
17. Was the Image Test performed satisfactorily and recorded on Attachment 1?	☐NO	☑YES
18. Was the Replicate Scan performed and recorded on an Attachment 2?	☐NO	☑YES
19. Was the Replicate Scan RTR Operator different from the first RTR Operator?	☐NO	☑YES
20. Did the Replicate Scan RTR Operator and the first RTR Operator agree on the results?	☐NO	☑YES
21. Was the Independent Observation performed and recorded on an Attachment 2?	☐NO	☑YES
22. Was the Independent Observation RTR Operator different from the first RTR Operator?	☐NO	☑YES
23. Did the Independent Observation RTR Operator and the first RTR Operator agree on the results?	☐NO	☑YES
24. Was the data collection performed by qualified individuals?	☐NO	☑YES
25. Were NCRs initiated as required at DGL? If no, proceed to question 26.	☑NO	☐YES
25a. Have the NCR(s) associated with RTR been included in the BDR?	☐NO	☐YES
26. Is the RTR examination for CH waste? If no, proceed to question 27.	☐NO	☑YES
26a. Have the CH Quality Assurance Objectives (QAOs) been met (if applicable)? Precision – Precision is maintained by reconciling any discrepancies between two radiography operators with regard to identification of the waste matrix code, liquids in excess of TSDF-WAC limits, and compressed gases through independent replicate scans and independent observations. Additionally, the precision of radiography is verified prior to use by tuning precisely enough to demonstrate compliance with QAOs through viewing an image test pattern. Accuracy – Accuracy is obtained by using a target to tune the image for maximum sharpness and by requiring operators to successfully identify 100 percent of the items required to meet the DQOs for radiography specified in CCP-PO-001, Section C-4a(1) in a training container during their initial qualification and subsequent requalification. Completeness – A video and audio media recording of the radiography examination and a validated radiography data form will be obtained for 100 percent of the waste containers subject to radiography. All video and audio media recordings and radiography data forms will be subject to validation as indicated in CCP-PO-001, Section C3-4. Comparability – The comparability of radiography data from different operators shall be enhanced by using standardized radiography procedures and operator qualifications.	☐NO	☑YES

Attachment 3 – CCP Radiography Independent Technical Reviewer Checklist (Continued)

Batch Data Report No.: OR-RTR6-0723

Description		
27. Is the RTR examination for RH waste? If no, proceed to comment section.	☑ NO	☐ YES
27a. Have the RH QAOs been met (if applicable)? Precision – Precision is maintained by reconciling any discrepancies between two operators (during Independent Observation and Replicate scans) with regard to the identification of important waste characteristics (i.e., physical form of the waste and absence of prohibited liquids) within a single container. Accuracy – Accuracy is obtained by using a target to tune the image for maximum sharpness and by requiring operators to successfully identify prohibited liquid in a training container during their initial qualification and subsequent requalification. Representativeness – All of the relevant contents in a container selected for radiography will be described. Completeness – All of the relevant waste information must be assembled and must show that each of the containers in the waste stream belongs to the waste stream. This information must be documented on videotape or other equivalent media and data form. Comparability – Comparability is ensured by meeting the program training requirements and complying with the minimum standards used to implement the radiography process.	☐ NO	☐ YES

Comments:
N/A

I have reviewed 100% of the container specific and batch data in this report and find it acceptable.

Independent Technical Reviewer:

Printed Name	Signature	Date
Aaron Elliott		3/1/16

DIVIDER PAGE ONLY

Not part of page count

Attachment 2 – CCP Records Transmittal/Receiving Form

CCP Records / Records Custodian, 4021 National Parks Highway - MS: GSA 212, Carlsbad, New Mexico 88220

Telephone Number: 575-234-7523

Fax Number: 575-234-7033

Attn:	CCP RECORDS	From:	RANADA T BACA
Ship to:	4021 NATIONAL PARKS HWY	Site:	LANL
	CARLSBAD, NM 88220	Company:	TFE, INC
	GSA-212	Telephone Number:	505-667-0181
	N/A	Date Sent:	03-01-16
Telephone Number:	505-234-7523		

Document Number	Title / Description	Record Date	Total Pages
OR-RTR6-0723	NDE BACKUP DVD B	02-11-16	N/A
	N/A		

Comments

N/A

(When the Record accepted line has been completed, the rest of the page below may be left blank.)

Acceptance/Rejection Signature and Date

Records Accepted ☑	[signature]	Jewell Hurrelde	3/7/16
	Signature	Printed Name	Date
Records Rejected ☐			
	Signature	Printed Name	Date

Reason for Rejection:

Re-submittal:

Signature	Printed Name	Date

****
*** Send Results ***
****

Sending is complete.

Job No.	4449
Address	915056656753
Name	TERRI ANN
Start Time	03/07 12:26 PM
Call Length	00'33
Sheets	1
Result	OK

Attachment 2 – CCP Records Transmittal/Receiving Form

CCP Records / Records Custodian, 4021 National Parks Highway - MS: GSA 212, Carlsbad, New Mexico 88220

Telephone Number: 575-234-7523

Fax Number: 575-234-7033

Attn:	CCP RECORDS	From:	RANADA T BACA
Ship to:	4021 NATIONAL PARKS HWY	Site:	LANL
	CARLSBAD, NM 88220	Company:	TFE, INC
	GSA-212	Telephone Number:	505-667-0181
	N/A	Date Sent:	03-01-16
Telephone Number:	505-234-7523		

Document Number	Title / Description	Record Date	Total Pages
OR-RTR6-0723	NDE BACKUP OVD B	02-11-16	N/A
	N/A		

Comments

N/A

(When the Record accepted line has been completed, the rest of the page below may be left blank.)
Acceptance/Rejection Signature and Date

Records Accepted ☑ Jewell Hurrelde 3/7/16
Signature Printed Name Date

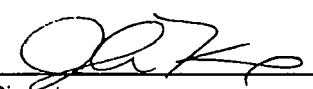
Records Rejected ☐
Signature Printed Name Date

Reason for Rejection:

DIVIDER

PAGE

Attachment 2 – CCP SPM Radiography Project Level Validation Checklist and Summary (Continued)

BDR Number: OR-RTR7-0138	**Examination Date(s): 6/22/2015**			
Description of Criteria Reviewed	**Criteria Met?**			**Comments/Qualifiers**
	YES	**NO**	**NA**	
19. Were the replicate scan and independent observation performed on different waste containers? **Reference Source: CCP-PO-001, C1-1**	X			
20. Were the personnel performing the replicate scan and independent observation different from the individual who performed the original? **Reference Source: CCP-PO-001, C1-1**	X			
21. Does the BDR include an estimate of each material parameter weight in kg for each container? **Reference Source: CCP Technical Procedures**	X			
22. Does the BDR include a description of each material parameter for each container? **Reference Source: CCP Technical Procedures**	X			
23. Is the container gross weight recorded in kilograms (kg) for each container in the BDR? **Reference Source: CCP Technical Procedures**	X			
24. Was the Scale Weight Calibration Check included in the BDR? **Reference Source: CCP Technical Procedures**			X	Not used.
25. Was the Scale Weight Check included in the BDR? **Reference Source: CCP Technical Procedures**			X	Not used.
Comments: SPM review was completed on 6-25-15, original checklist was lost.				
The container QC checks were properly performed and meet the Quality Assurance Objectives (QAOs). Proper procedures were followed during data reduction and analysis. The batch is complete, acceptable, and includes all supporting data and documentation required by the QAPjP.				
Jake Knox				7-13-15
SPM Printed Name	Signature			Date

Checklist is to be re-signed only when a re-review is performed.

SPM Printed Name	Signature	Reason	Date
SPM Printed Name	Signature	Reason	Date

Attachment 5–CCP Radiography Batch Data Report Cover Sheet

Site ID: ORNL

Batch Data Report No.: OR-RTR7-0138 ☑ CH ☐ RH Date: 6-22-15

Waste Container ID Numbers	
Replicate Scan:	X10C1351147
Independent Observation:	X10C1351023
1	X10C1351023
2	X10C1350975
3	X10C1351161
4	X10C1350963
5	X10C1351142
6	X10C1351147
7	X10C1350957
8	X10C1350960
9	X10C1350959
10	X10C1351021
11	X10C1351016
12	X10C1351020
13	N/A
14	N/A
15	N/A
16	N/A
17	N/A
18	N/A
19	N/A
20	N/A

RTR Operator:

Eric Lyles		6-22-15
Printed Name	Signature	Date

Independent Technical Reviewer:

Fred Olney		6-23-15
Printed Name	Signature	Date

NTPC RECORDS ORIGINAL
DATE REC'D 6-23-2015

Attachment 4 – CCP Radiography Batch Data Report Table of Contents and Batch Narrative

Batch Data Report No.: OR-RTR7-0138 Date: 6-22-15

Table Of Contents		
Item	Description	Page No.
1	CCP Radiography Batch Data Report Cover Sheet	1
2	CCP Radiography Batch Data Report Table Of Contents	2
3	CCP RTR Measurement Control Report	3
4	CCP Radiography Data Sheets	4
5	Copy of NCRs (NA, If Not Applicable)	N/A
6	CCP Independent Technical Reviewer Checklist	46

Batch Narrative
All Quality Checks were performed and recorded on CCP-TP-053, Rev.15, CCP Radiography Measurement Control Report.

Eric Lyles — RTR Operator

Signature

6-22-15
Date

2

Attachment 1 – CCP RTR Measurement Control Report

Site ID: ORNL		
Batch Data Report No.: OR-RTR7-0138		
Examination Date: 6-22-15		
Control Checks		
Video/Audio Recorded Media System Check	☑ SAT	☐ UNSAT
Image Test : 10 Lines (Minimum acceptable is 5 lines-pair/cm or #6 Sieve is viewable)	☑ SAT	☐ UNSAT
Comments: N/A		
RTR Operator: Eric Lyles (Printed Name) — Signature — 6-22-15 (Date)		

3

CCP Radiography Data Sheet

Section 1: General Information	
☐ RTR Examination ☒ RTR Replicate Scan ☐ RTR Independent Observation	
Site ID:	ORNL
Batch Number:	OR-RTR7-0138
Examination Date:	6/22/2015
Waste Container ID:	X10C1351147
Video/Audio Recorded Media Number:	OR-RTR7-0138 A&B
Procedure and Revision No.:	CCP-TP-053 Rev. 15
NCR(s) associated with the container? (e.g., Prohibited Items)	☒ No ☐ Yes NCR No.: N/A NCR No.: N/A

Section 2: Waste Container Data	
Container Type:	55 Gallon Drum
TRUCON Code:	OR 227
Waste Matrix Code:	S4100
Waste Stream I.D.:	OR-NFS-CH-SOIL
Waste Container Weights:	Gross Wt.: 221.4 kg Tare Wt.: 35.2 kg Net Wt.: 186.2 kg
Rigid Liner and Liner Vent Description:	Liner: ☐ No ☒ Yes Lid: ☒ No ☐ Yes Type: ☐ 30-mil ☒ 90-mil ☐ 110-mil ☐ 125-mil Vented: ☐ No ☒ Yes ☐ N/A Punctured: ☒ No ☐ Yes Mechanical Vent: ☒ No ☐ Yes Fiberboard Liner: ☒ No ☐ Yes Lead Lined: ☒ No ☐ Yes
Number of Layers of Confinement:	Appears to be 1 layer
Volume Utilization Percentage:	90 %

CCP Radiography Data Sheet

Waste Container ID: X10C1351147

Section 3: Container Inventory and Comments (Detailed descriptions)
IM:
AM:
OM:
OI:
C:
R:
XPM:
OR: Absorbent
IN:
S: Soil

Section 4: Packaging Material and Waste Material Parameters	
Packaging Material:	**Estimated Weight (kg)**
Steel (ST):	27.8
Plastics (PP): Liner bag, Rigid Liner	7.4
Other:	0.0
Total Packaging Weight	35.2
Waste Material Parameter:	**Estimated Weight (kg)**
Iron-based Metal / Alloys (IM):	
Aluminum-based Metals / Alloys (AM):	
Other Metals (OM):	
Other Inorganic Materials (OI)	
Cellulosics (C):	
Rubber (R):	
Plastics (waste materials) (XPM):	
Organic Matrix (OR):	2.2
Inorganic Matrix (IN):	
Soils (S):	184.0
Total WMP Weight:	186.2

CCP Radiography Data Sheet

Waste Container ID: X10C1351147

Section 5: RTR Summary (Questions answered "Yes" will be explained in the Comment block, except for Question 1)	
Is there observable liquid?	☐ Yes ☒ No
Is there any observable liquid in internal containers, more than 60 milliliters or 3 percent by volume, whichever is greater?	☐ Yes ☒ No
Is the total volume of observable liquid in the outermost container GREATER than 1% of the container?	☐ Yes ☒ No
Is there observable liquid in payload containers with an EPA Hazardous Waste Number of U134?	☐ Yes ☒ No
Is there an indication of non-radionuclide pyrophoric materials, such as elemental potassium?	☐ Yes ☒ No
Is there an indication of hazardous wastes not occurring as co-contaminants with TRU mixed wastes (non-mixed hazardous wastes)?	☐ Yes ☒ No
Is there an indication of wastes incompatible with backfill, seal and panel closures materials, container and packaging materials, shipping container materials, or other wastes (i.e., waste does NOT match TRUCON Code[s])?	☐ Yes ☒ No
Is there an indication of wastes containing explosives or compressed gases?	☐ Yes ☒ No
Is there an indication of PCBs liquids?	☐ Yes ☒ No
Is there an indication of the waste exhibiting the characteristic of ignitability, corrosivity, or reactivity (EPA Hazardous Waste Numbers of D001, D002, or D003)?	☐ Yes ☒ No
Is the physical form of the waste inconsistent with the Waste Stream Description or the Waste Matrix Code?	☐ Yes ☒ No
CH or RH TRAMPAC	
Are there heat-sealed bags (unvented) GREATER than 4 liters and LESS than 390 square inches in the waste, or heat sealed bags not authorized in the RH TRUCON Code?	☐ Yes ☒ No
Were there Non-approved Closure Methods used on liner bags or inner bags greater than 4 liters?	☐ Yes ☒ No
Are there sealed containers GREATER than 4 liters?	☐ Yes ☒ No
Are there indications of inadequate protection for heavy and/or sharp objects?	☐ Yes ☒ No

Comments: This Replicate Scan agrees with the Original Scan. DB 6-22-15

RTR Operator:

Daphne Brothers	Daphne Brothers	6/22/2015
Print Name	Signature	Date

CCP Radiography Data Sheet

Section 1: General Information	
☐ RTR Examination ☐ RTR Replicate Scan ☒ RTR Independent Observation	
Site ID:	ORNL
Batch Number:	OR-RTR7-0138
Examination Date:	6/22/2015
Waste Container ID:	X10C1351023
Video/Audio Recorded Media Number:	OR-RTR7-0138 A&B
Procedure and Revision No.:	CCP-TP-053 Rev. 15
NCR(s) associated with the container? (e.g., Prohibited Items)	☒ No ☐ Yes NCR No.: N/A NCR No.: N/A

Section 2: Waste Container Data	
Container Type:	55 Gallon Drum
TRUCON Code:	OR 227
Waste Matrix Code:	S4100
Waste Stream I.D.:	OR-NFS-CH-SOIL
Waste Container Weights:	Gross Wt.: 229.4 kg Tare Wt.: 35.2 kg Net Wt.: 194.2 kg
Rigid Liner and Liner Vent Description:	Liner: ☐ No ☒ Yes Lid: ☒ No ☐ Yes Type: ☐ 30-mil ☒ 90-mil ☐ 110-mil ☐ 125-mil Vented: ☐ No ☒ Yes ☐ N/A Punctured: ☒ No ☐ Yes Mechanical Vent: ☒ No ☐ Yes Fiberboard Liner: ☒ No ☐ Yes Lead Lined: ☒ No ☐ Yes
Number of Layers of Confinement:	Appears to be 1 layer
Volume Utilization Percentage:	90 %

CCP Radiography Data Sheet

Waste Container ID: X10C1351023

Section 3: Container Inventory and Comments	(Detailed descriptions)
IM:	
AM:	
OM:	
OI:	
C:	
R:	
XPM:	
OR: Absorbent	
IN:	
S: Soil	

Section 4: Packaging Material and Waste Material Parameters	
Packaging Material:	**Estimated Weight (kg)**
Steel (ST):	27.8
Plastics (PP): Liner bag, Rigid Liner	7.4
Other:	0.0
Total Packaging Weight	35.2
Waste Material Parameter:	**Estimated Weight (kg)**
Iron-based Metal / Alloys (IM):	
Aluminum-based Metals / Alloys (AM):	
Other Metals (OM):	
Other Inorganic Materials (OI)	
Cellulosics (C):	
Rubber (R):	
Plastics (waste materials) (XPM):	
Organic Matrix (OR):	2.2
Inorganic Matrix (IN):	
Soils (S):	192.0
Total WMP Weight:	194.2

8

CCP Radiography Data Sheet

Waste Container ID: X10C1351023

Section 5: RTR Summary (Questions answered "Yes" will be explained in the Comment block, except for Question 1)	
Is there observable liquid?	☐ Yes ☒ No
Is there any observable liquid in internal containers, more than 60 milliliters or 3 percent by volume, whichever is greater?	☐ Yes ☒ No
Is the total volume of observable liquid in the outermost container GREATER than 1% of the container?	☐ Yes ☒ No
Is there observable liquid in payload containers with an EPA Hazardous Waste Number of U134?	☐ Yes ☒ No
Is there an indication of non-radionuclide pyrophoric materials, such as elemental potassium?	☐ Yes ☒ No
Is there an indication of hazardous wastes not occurring as co-contaminants with TRU mixed wastes (non-mixed hazardous wastes)?	☐ Yes ☒ No
Is there an indication of wastes incompatible with backfill, seal and panel closures materials, container and packaging materials, shipping container materials, or other wastes (i.e., waste does NOT match TRUCON Code[s])?	☐ Yes ☒ No
Is there an indication of wastes containing explosives or compressed gases?	☐ Yes ☒ No
Is there an indication of PCBs liquids?	☐ Yes ☒ No
Is there an indication of the waste exhibiting the characteristic of ignitability, corrosivity, or reactivity (EPA Hazardous Waste Numbers of D001, D002, or D003)?	☐ Yes ☒ No
Is the physical form of the waste inconsistent with the Waste Stream Description or the Waste Matrix Code?	☐ Yes ☒ No
CH or RH TRAMPAC	
Are there heat-sealed bags (unvented) GREATER than 4 liters and LESS than 390 square inches in the waste, or heat sealed bags not authorized in the RH TRUCON Code?	☐ Yes ☒ No
Were there Non-approved Closure Methods used on liner bags or inner bags greater than 4 liters?	☐ Yes ☒ No
Are there sealed containers GREATER than 4 liters?	☐ Yes ☒ No
Are there indications of inadequate protection for heavy and/or sharp objects?	☐ Yes ☒ No

Comments: This Independent Observation agrees with the Original Scan. DB 6-22-15

RTR Operator:

Daphne Brothers	Daphne C Brothers	6/22/2015
Print Name	Signature	Date

CCP Radiography Data Sheet

Section 1: General Information	
[X] RTR Examination [ ] RTR Replicate Scan [ ] RTR Independent Observation	
Site ID:	ORNL
Batch Number:	OR-RTR7-0138
Examination Date:	6/22/2015
Waste Container ID:	X10C1351023
Video/Audio Recorded Media Number:	OR-RTR7-0138 A&B
Procedure and Revision No.:	CCP-TP-053 Rev. 15
NCR(s) associated with the container? (e.g., Prohibited Items)	[X] No [ ] Yes NCR No.: N/A NCR No.: N/A

Section 2: Waste Container Data	
Container Type:	55 Gallon Drum
TRUCON Code:	OR 227
Waste Matrix Code:	S4100
Waste Stream I.D.:	OR-NFS-CH-SOIL
Waste Container Weights:	Gross Wt.: 229.4 kg Tare Wt.: 35.2 kg Net Wt.: 194.2 kg
Rigid Liner and Liner Vent Description:	Liner: [ ] No [X] Yes Lid: [X] No [ ] Yes Type: [ ] 30-mil [X] 90-mil [ ] 110-mil [ ] 125-mil Vented: [ ] No [X] Yes [ ] N/A Punctured: [X] No [ ] Yes Mechanical Vent: [X] No [ ] Yes Fiberboard Liner: [X] No [ ] Yes Lead Lined: [X] No [ ] Yes
Number of Layers of Confinement:	Appears to be 1 layer
Volume Utilization Percentage:	90 %

CCP Radiography Data Sheet

Waste Container ID: X10C1351023

Section 3: Container Inventory and Comments	(Detailed descriptions)
IM:	
AM:	
OM:	
OI:	
C:	
R:	
XPM:	
OR: Absorbent	
IN:	
S: Soil	

Section 4: Packaging Material and Waste Material Parameters	
Packaging Material:	**Estimated Weight (kg)**
Steel (ST):	27.8
Plastics (PP): Liner bag, Rigid Liner	7.4
Other:	0.0
Total Packaging Weight	35.2
Waste Material Parameter:	**Estimated Weight (kg)**
Iron-based Metal / Alloys (IM):	
Aluminum-based Metals / Alloys (AM):	
Other Metals (OM):	
Other Inorganic Materials (OI)	
Cellulosics (C):	
Rubber (R):	
Plastics (waste materials) (XPM):	
Organic Matrix (OR):	2.0
Inorganic Matrix (IN):	
Soils (S):	192.2
Total WMP Weight:	194.2

CCP Radiography Data Sheet

Waste Container ID: X10C1351023

Section 5: RTR Summary (Questions answered "Yes" will be explained in the Comment block, except for Question 1)	
Is there observable liquid?	☐ Yes ☒ No
Is there any observable liquid in internal containers, more than 60 milliliters or 3 percent by volume, whichever is greater?	☐ Yes ☒ No
Is the total volume of observable liquid in the outermost container GREATER than 1% of the container?	☐ Yes ☒ No
Is there observable liquid in payload containers with an EPA Hazardous Waste Number of U134?	☐ Yes ☒ No
Is there an indication of non-radionuclide pyrophoric materials, such as elemental potassium?	☐ Yes ☒ No
Is there an indication of hazardous wastes not occurring as co-contaminants with TRU mixed wastes (non-mixed hazardous wastes)?	☐ Yes ☒ No
Is there an indication of wastes incompatible with backfill, seal and panel closures materials, container and packaging materials, shipping container materials, or other wastes (i.e., waste does NOT match TRUCON Code[s])?	☐ Yes ☒ No
Is there an indication of wastes containing explosives or compressed gases?	☐ Yes ☒ No
Is there an indication of PCBs liquids?	☐ Yes ☒ No
Is there an indication of the waste exhibiting the characteristic of ignitability, corrosivity, or reactivity (EPA Hazardous Waste Numbers of D001, D002, or D003)?	☐ Yes ☒ No
Is the physical form of the waste inconsistent with the Waste Stream Description or the Waste Matrix Code?	☐ Yes ☒ No
CH or RH TRAMPAC	
Are there heat-sealed bags (unvented) GREATER than 4 liters and LESS than 390 square inches in the waste, or heat sealed bags not authorized in the RH TRUCON Code?	☐ Yes ☒ No
Were there Non-approved Closure Methods used on liner bags or inner bags greater than 4 liters?	☐ Yes ☒ No
Are there sealed containers GREATER than 4 liters?	☐ Yes ☒ No
Are there indications of inadequate protection for heavy and/or sharp objects?	☐ Yes ☒ No
Comments: N/A	

RTR Operator:

Eric Lyles		6/22/2015
Print Name	Signature	Date

CCP Radiography Data Sheet

Section 1: General Information	
[X] RTR Examination [ ] RTR Replicate Scan [ ] RTR Independent Observation	
Site ID:	ORNL
Batch Number:	OR-RTR7-0138
Examination Date:	6/22/2015
Waste Container ID:	X10C1350975
Video/Audio Recorded Media Number:	OR-RTR7-0138 A&B
Procedure and Revision No.:	CCP-TP-053 Rev. 15
NCR(s) associated with the container? (e.g., Prohibited Items)	[X] No [ ] Yes NCR No.: N/A NCR No.: N/A

Section 2: Waste Container Data	
Container Type:	55 Gallon Drum
TRUCON Code:	OR 227
Waste Matrix Code:	S4100
Waste Stream I.D.:	OR-NFS-CH-SOIL
Waste Container Weights:	Gross Wt.: 204.1 kg Tare Wt.: 35.2 kg Net Wt.: 168.9 kg
Rigid Liner and Liner Vent Description:	Liner: [ ] No [X] Yes Lid: [X] No [ ] Yes Type: [ ] 30-mil [X] 90-mil [ ] 110-mil [ ] 125-mil Vented: [ ] No [X] Yes [ ] N/A Punctured: [X] No [ ] Yes Mechanical Vent: [X] No [ ] Yes Fiberboard Liner: [X] No [ ] Yes Lead Lined: [X] No [ ] Yes
Number of Layers of Confinement:	Appears to be 1 layer
Volume Utilization Percentage:	85 %

CCP Radiography Data Sheet

Waste Container ID: X10C1350975

Section 3: Container Inventory and Comments (Detailed descriptions)
IM:
AM:
OM:
OI:
C:
R:
XPM:
OR: Absorbent
IN:
S: Soil

Section 4: Packaging Material and Waste Material Parameters	
Packaging Material:	**Estimated Weight (kg)**
Steel (ST):	27.8
Plastics (PP): Liner bag, Rigid Liner	7.4
Other:	0.0
Total Packaging Weight	35.2
Waste Material Parameter:	**Estimated Weight (kg)**
Iron-based Metal / Alloys (IM):	
Aluminum-based Metals / Alloys (AM):	
Other Metals (OM):	
Other Inorganic Materials (OI)	
Cellulosics (C):	
Rubber (R):	
Plastics (waste materials) (XPM):	
Organic Matrix (OR):	3.0
Inorganic Matrix (IN):	
Soils (S):	165.9
Total WMP Weight:	168.9

CCP Radiography Data Sheet

Waste Container ID: X10C1350975

Section 5: RTR Summary (Questions answered "Yes" will be explained in the Comment block, except for Question 1)	
Is there observable liquid?	☐ Yes ☒ No
Is there any observable liquid in internal containers, more than 60 milliliters or 3 percent by volume, whichever is greater?	☐ Yes ☒ No
Is the total volume of observable liquid in the outermost container GREATER than 1% of the container?	☐ Yes ☒ No
Is there observable liquid in payload containers with an EPA Hazardous Waste Number of U134?	☐ Yes ☒ No
Is there an indication of non-radionuclide pyrophoric materials, such as elemental potassium?	☐ Yes ☒ No
Is there an indication of hazardous wastes not occurring as co-contaminants with TRU mixed wastes (non-mixed hazardous wastes)?	☐ Yes ☒ No
Is there an indication of wastes incompatible with backfill, seal and panel closures materials, container and packaging materials, shipping container materials, or other wastes (i.e., waste does NOT match TRUCON Code[s])?	☐ Yes ☒ No
Is there an indication of wastes containing explosives or compressed gases?	☐ Yes ☒ No
Is there an indication of PCBs liquids?	☐ Yes ☒ No
Is there an indication of the waste exhibiting the characteristic of ignitability, corrosivity, or reactivity (EPA Hazardous Waste Numbers of D001, D002, or D003)?	☐ Yes ☒ No
Is the physical form of the waste inconsistent with the Waste Stream Description or the Waste Matrix Code?	☐ Yes ☒ No
CH or RH TRAMPAC	
Are there heat-sealed bags (unvented) GREATER than 4 liters and LESS than 390 square inches in the waste, or heat sealed bags not authorized in the RH TRUCON Code?	☐ Yes ☒ No
Were there Non-approved Closure Methods used on liner bags or inner bags greater than 4 liters?	☐ Yes ☒ No
Are there sealed containers GREATER than 4 liters?	☐ Yes ☒ No
Are there indications of inadequate protection for heavy and/or sharp objects?	☐ Yes ☒ No
Comments: N/A	

RTR Operator:

Eric Lyles		6/22/2015
Print Name	Signature	Date

CCP Radiography Data Sheet

Section 1: General Information	
[X] RTR Examination [ ] RTR Replicate Scan [ ] RTR Independent Observation	
Site ID:	ORNL
Batch Number:	OR-RTR7-0138
Examination Date:	6/22/2015
Waste Container ID:	X10C1351161
Video/Audio Recorded Media Number:	OR-RTR7-0138 A&B
Procedure and Revision No.:	CCP-TP-053 Rev. 15
NCR(s) associated with the container? (e.g., Prohibited Items)	[X] No [ ] Yes NCR No.: N/A NCR No.: N/A

Section 2: Waste Container Data	
Container Type:	55 Gallon Drum
TRUCON Code:	OR 227
Waste Matrix Code:	S4100
Waste Stream I.D.:	OR-NFS-CH-SOIL
Waste Container Weights:	Gross Wt.: 244.3 kg Tare Wt.: 35.2 kg Net Wt.: 209.1 kg
Rigid Liner and Liner Vent Description:	Liner: [ ] No [X] Yes Lid: [X] No [ ] Yes Type: [ ] 30-mil [X] 90-mil [ ] 110-mil [ ] 125-mil Vented: [ ] No [X] Yes [ ] N/A Punctured: [X] No [ ] Yes Mechanical Vent: [X] No [ ] Yes Fiberboard Liner: [X] No [ ] Yes Lead Lined: [X] No [ ] Yes
Number of Layers of Confinement:	Appears to be 1 layer
Volume Utilization Percentage:	95 %

CCP Radiography Data Sheet

Waste Container ID: X10C1351161

Section 3: Container Inventory and Comments (Detailed descriptions)
IM:
AM:
OM:
OI:
C:
R:
XPM:
OR: Absorbent
IN:
S: Soil

Section 4: Packaging Material and Waste Material Parameters	
Packaging Material:	**Estimated Weight (kg)**
Steel (ST):	27.8
Plastics (PP): Liner bag, Rigid Liner	7.4
Other:	0.0
Total Packaging Weight	35.2
Waste Material Parameter:	**Estimated Weight (kg)**
Iron-based Metal / Alloys (IM):	
Aluminum-based Metals / Alloys (AM):	
Other Metals (OM):	
Other Inorganic Materials (OI)	
Cellulosics (C):	
Rubber (R):	
Plastics (waste materials) (XPM):	
Organic Matrix (OR):	2.0
Inorganic Matrix (IN):	
Soils (S):	207.1
Total WMP Weight:	209.1

CCP Radiography Data Sheet

Waste Container ID: X10C1351161

Section 5: RTR Summary (Questions answered "Yes" will be explained in the Comment block, except for Question 1)	
Is there observable liquid?	☐ Yes ☒ No
Is there any observable liquid in internal containers, more than 60 milliliters or 3 percent by volume, whichever is greater?	☐ Yes ☒ No
Is the total volume of observable liquid in the outermost container GREATER than 1% of the container?	☐ Yes ☒ No
Is there observable liquid in payload containers with an EPA Hazardous Waste Number of U134?	☐ Yes ☒ No
Is there an indication of non-radionuclide pyrophoric materials, such as elemental potassium?	☐ Yes ☒ No
Is there an indication of hazardous wastes not occurring as co-contaminants with TRU mixed wastes (non-mixed hazardous wastes)?	☐ Yes ☒ No
Is there an indication of wastes incompatible with backfill, seal and panel closures materials, container and packaging materials, shipping container materials, or other wastes (i.e., waste does NOT match TRUCON Code[s])?	☐ Yes ☒ No
Is there an indication of wastes containing explosives or compressed gases?	☐ Yes ☒ No
Is there an indication of PCBs liquids?	☐ Yes ☒ No
Is there an indication of the waste exhibiting the characteristic of ignitability, corrosivity, or reactivity (EPA Hazardous Waste Numbers of D001, D002, or D003)?	☐ Yes ☒ No
Is the physical form of the waste inconsistent with the Waste Stream Description or the Waste Matrix Code?	☐ Yes ☒ No
CH or RH TRAMPAC	
Are there heat-sealed bags (unvented) GREATER than 4 liters and LESS than 390 square inches in the waste, or heat sealed bags not authorized in the RH TRUCON Code?	☐ Yes ☒ No
Were there Non-approved Closure Methods used on liner bags or inner bags greater than 4 liters?	☐ Yes ☒ No
Are there sealed containers GREATER than 4 liters?	☐ Yes ☒ No
Are there indications of inadequate protection for heavy and/or sharp objects?	☐ Yes ☒ No
Comments: N/A	

RTR Operator:

Eric Lyles	Tyler	6/22/2015
Print Name	Signature	Date

CCP Radiography Data Sheet

Section 1: General Information	
[X] RTR Examination [ ] RTR Replicate Scan [ ] RTR Independent Observation	
Site ID:	ORNL
Batch Number:	OR-RTR7-0138
Examination Date:	6/22/2015
Waste Container ID:	X10C1350963
Video/Audio Recorded Media Number:	OR-RTR7-0138 A&B
Procedure and Revision No.:	CCP-TP-053 Rev. 15
NCR(s) associated with the container? (e.g., Prohibited Items)	[X] No [ ] Yes NCR No.: N/A NCR No.: N/A

Section 2: Waste Container Data	
Container Type:	55 Gallon Drum
TRUCON Code:	OR 227
Waste Matrix Code:	S4100
Waste Stream I.D.:	OR-NFS-CH-SOIL
Waste Container Weights:	Gross Wt.: 216.4 kg Tare Wt.: 35.2 kg Net Wt.: 181.2 kg
Rigid Liner and Liner Vent Description:	Liner: [ ] No [X] Yes Lid: [X] No [ ] Yes Type: [ ] 30-mil [X] 90-mil [ ] 110-mil [ ] 125-mil Vented: [ ] No [X] Yes [ ] N/A Punctured: [X] No [ ] Yes Mechanical Vent: [X] No [ ] Yes Fiberboard Liner: [X] No [ ] Yes Lead Lined: [X] No [ ] Yes
Number of Layers of Confinement:	Appears to be 1 layer
Volume Utilization Percentage:	85 %

CCP Radiography Data Sheet

Waste Container ID: X10C1350963

Section 3: Container Inventory and Comments (Detailed descriptions)
IM:
AM:
OM:
OI:
C:
R:
XPM:
OR: Absorbent
IN:
S: Soil

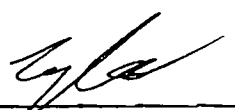
Section 4: Packaging Material and Waste Material Parameters	
Packaging Material:	**Estimated Weight (kg)**
Steel (ST):	27.8
Plastics (PP): Liner bag, Rigid Liner	7.4
Other:	0.0
Total Packaging Weight	35.2
Waste Material Parameter:	**Estimated Weight (kg)**
Iron-based Metal / Alloys (IM):	
Aluminum-based Metals / Alloys (AM):	
Other Metals (OM):	
Other Inorganic Materials (OI)	
Cellulosics (C):	
Rubber (R):	
Plastics (waste materials) (XPM):	
Organic Matrix (OR):	3.0
Inorganic Matrix (IN):	
Soils (S):	178.2
Total WMP Weight:	181.2

CCP Radiography Data Sheet

Waste Container ID: X10C1350963

Section 5: RTR Summary (Questions answered "Yes" will be explained in the Comment block, except for Question 1)	
Is there observable liquid?	☐ Yes ☒ No
Is there any observable liquid in internal containers, more than 60 milliliters or 3 percent by volume, whichever is greater?	☐ Yes ☒ No
Is the total volume of observable liquid in the outermost container GREATER than 1% of the container?	☐ Yes ☒ No
Is there observable liquid in payload containers with an EPA Hazardous Waste Number of U134?	☐ Yes ☒ No
Is there an indication of non-radionuclide pyrophoric materials, such as elemental potassium?	☐ Yes ☒ No
Is there an indication of hazardous wastes not occurring as co-contaminants with TRU mixed wastes (non-mixed hazardous wastes)?	☐ Yes ☒ No
Is there an indication of wastes incompatible with backfill, seal and panel closures materials, container and packaging materials, shipping container materials, or other wastes (i.e., waste does NOT match TRUCON Code[s])?	☐ Yes ☒ No
Is there an indication of wastes containing explosives or compressed gases?	☐ Yes ☒ No
Is there an indication of PCBs liquids?	☐ Yes ☒ No
Is there an indication of the waste exhibiting the characteristic of ignitability, corrosivity, or reactivity (EPA Hazardous Waste Numbers of D001, D002, or D003)?	☐ Yes ☒ No
Is the physical form of the waste inconsistent with the Waste Stream Description or the Waste Matrix Code?	☐ Yes ☒ No
CH or RH TRAMPAC	
Are there heat-sealed bags (unvented) GREATER than 4 liters and LESS than 390 square inches in the waste, or heat sealed bags not authorized in the RH TRUCON Code?	☐ Yes ☒ No
Were there Non-approved Closure Methods used on liner bags or inner bags greater than 4 liters?	☐ Yes ☒ No
Are there sealed containers GREATER than 4 liters?	☐ Yes ☒ No
Are there indications of inadequate protection for heavy and/or sharp objects?	☐ Yes ☒ No
Comments: N/A	

RTR Operator:

Eric Lyles		6/22/2015
Print Name	Signature	Date

CCP Radiography Data Sheet

Section 1: General Information	
[X] RTR Examination [ ] RTR Replicate Scan [ ] RTR Independent Observation	
Site ID:	ORNL
Batch Number:	OR-RTR7-0138
Examination Date:	6/22/2015
Waste Container ID:	X10C1351142
Video/Audio Recorded Media Number:	OR-RTR7-0138 A&B
Procedure and Revision No.:	CCP-TP-053 Rev. 15
NCR(s) associated with the container? (e.g., Prohibited Items)	[X] No [ ] Yes NCR No.: N/A NCR No.: N/A

Section 2: Waste Container Data	
Container Type:	55 Gallon Drum
TRUCON Code:	OR 227
Waste Matrix Code:	S4100
Waste Stream I.D.:	OR-NFS-CH-SOIL
Waste Container Weights:	Gross Wt.: 199.1 kg Tare Wt.: 35.2 kg Net Wt.: 163.9 kg
Rigid Liner and Liner Vent Description:	Liner: [ ] No [X] Yes Lid: [X] No [ ] Yes Type: [ ] 30-mil [X] 90-mil [ ] 110-mil [ ] 125-mil Vented: [ ] No [X] Yes [ ] N/A Punctured: [X] No [ ] Yes Mechanical Vent: [X] No [ ] Yes Fiberboard Liner: [X] No [ ] Yes Lead Lined: [X] No [ ] Yes
Number of Layers of Confinement:	Appears to be 1 layer
Volume Utilization Percentage:	80 %

CCP Radiography Data Sheet

Waste Container ID: X10C1351142

Section 3: Container Inventory and Comments (Detailed descriptions)
IM:
AM:
OM:
OI:
C:
R:
XPM:
OR: Absorbent
IN:
S: Soil

Section 4: Packaging Material and Waste Material Parameters	
Packaging Material:	**Estimated Weight (kg)**
Steel (ST):	27.8
Plastics (PP): Liner bag, Rigid Liner	7.4
Other:	0.0
Total Packaging Weight	35.2
Waste Material Parameter:	**Estimated Weight (kg)**
Iron-based Metal / Alloys (IM):	
Aluminum-based Metals / Alloys (AM):	
Other Metals (OM):	
Other Inorganic Materials (OI)	
Cellulosics (C):	
Rubber (R):	
Plastics (waste materials) (XPM):	
Organic Matrix (OR):	2.0
Inorganic Matrix (IN):	
Soils (S):	161.9
Total WMP Weight:	163.9

CCP Radiography Data Sheet

Waste Container ID: X10C1351142

Section 5: RTR Summary (Questions answered "Yes" will be explained in the Comment block, except for Question 1)	
Is there observable liquid?	☐ Yes ☒ No
Is there any observable liquid in internal containers, more than 60 milliliters or 3 percent by volume, whichever is greater?	☐ Yes ☒ No
Is the total volume of observable liquid in the outermost container GREATER than 1% of the container?	☐ Yes ☒ No
Is there observable liquid in payload containers with an EPA Hazardous Waste Number of U134?	☐ Yes ☒ No
Is there an indication of non-radionuclide pyrophoric materials, such as elemental potassium?	☐ Yes ☒ No
Is there an indication of hazardous wastes not occurring as co-contaminants with TRU mixed wastes (non-mixed hazardous wastes)?	☐ Yes ☒ No
Is there an indication of wastes incompatible with backfill, seal and panel closures materials, container and packaging materials, shipping container materials, or other wastes (i.e., waste does NOT match TRUCON Code[s])?	☐ Yes ☒ No
Is there an indication of wastes containing explosives or compressed gases?	☐ Yes ☒ No
Is there an indication of PCBs liquids?	☐ Yes ☒ No
Is there an indication of the waste exhibiting the characteristic of ignitability, corrosivity, or reactivity (EPA Hazardous Waste Numbers of D001, D002, or D003)?	☐ Yes ☒ No
Is the physical form of the waste inconsistent with the Waste Stream Description or the Waste Matrix Code?	☐ Yes ☒ No
CH or RH TRAMPAC	
Are there heat-sealed bags (unvented) GREATER than 4 liters and LESS than 390 square inches in the waste, or heat sealed bags not authorized in the RH TRUCON Code?	☐ Yes ☒ No
Were there Non-approved Closure Methods used on liner bags or inner bags greater than 4 liters?	☐ Yes ☒ No
Are there sealed containers GREATER than 4 liters?	☐ Yes ☒ No
Are there indications of inadequate protection for heavy and/or sharp objects?	☐ Yes ☒ No
Comments: N/A	

RTR Operator:

Eric Lyles	Eyle	6/22/2015
Print Name	Signature	Date

CCP Radiography Data Sheet

Section 1: General Information	
[X] RTR Examination [ ] RTR Replicate Scan [ ] RTR Independent Observation	
Site ID:	ORNL
Batch Number:	OR-RTR7-0138
Examination Date:	6/22/2015
Waste Container ID:	X10C1351147
Video/Audio Recorded Media Number:	OR-RTR7-0138 A&B
Procedure and Revision No.:	CCP-TP-053 Rev. 15
NCR(s) associated with the container? (e.g., Prohibited Items)	[X] No [ ] Yes NCR No.: N/A NCR No.: N/A

Section 2: Waste Container Data	
Container Type:	55 Gallon Drum
TRUCON Code:	OR 227
Waste Matrix Code:	S4100
Waste Stream I.D.:	OR-NFS-CH-SOIL
Waste Container Weights:	Gross Wt.: 221.4 kg Tare Wt.: 35.2 kg Net Wt.: 186.2 kg
Rigid Liner and Liner Vent Description:	Liner: [ ] No [X] Yes Lid: [X] No [ ] Yes Type: [ ] 30-mil [X] 90-mil [ ] 110-mil [ ] 125-mil Vented: [ ] No [X] Yes [ ] N/A Punctured: [X] No [ ] Yes Mechanical Vent: [X] No [ ] Yes Fiberboard Liner: [X] No [ ] Yes Lead Lined: [X] No [ ] Yes
Number of Layers of Confinement:	Appears to be 1 layer
Volume Utilization Percentage:	90 %

CCP Radiography Data Sheet

Waste Container ID: X10C1351147

Section 3: Container Inventory and Comments (Detailed descriptions)
IM:
AM:
OM:
OI:
C:
R:
XPM:
OR: Absorbent
IN:
S: Soil

Section 4: Packaging Material and Waste Material Parameters	
Packaging Material:	**Estimated Weight (kg)**
Steel (ST):	27.8
Plastics (PP): Liner bag, Rigid Liner	7.4
Other:	0.0
Total Packaging Weight	35.2
Waste Material Parameter:	**Estimated Weight (kg)**
Iron-based Metal / Alloys (IM):	
Aluminum-based Metals / Alloys (AM):	
Other Metals (OM):	
Other Inorganic Materials (OI)	
Cellulosics (C):	
Rubber (R):	
Plastics (waste materials) (XPM):	
Organic Matrix (OR):	3.0
Inorganic Matrix (IN):	
Soils (S):	183.2
Total WMP Weight:	186.2

CCP Radiography Data Sheet

Waste Container ID: X10C1351147

Section 5: RTR Summary (Questions answered "Yes" will be explained in the Comment block, except for Question 1)	
Is there observable liquid?	☐ Yes ☒ No
Is there any observable liquid in internal containers, more than 60 milliliters or 3 percent by volume, whichever is greater?	☐ Yes ☒ No
Is the total volume of observable liquid in the outermost container GREATER than 1% of the container?	☐ Yes ☒ No
Is there observable liquid in payload containers with an EPA Hazardous Waste Number of U134?	☐ Yes ☒ No
Is there an indication of non-radionuclide pyrophoric materials, such as elemental potassium?	☐ Yes ☒ No
Is there an indication of hazardous wastes not occurring as co-contaminants with TRU mixed wastes (non-mixed hazardous wastes)?	☐ Yes ☒ No
Is there an indication of wastes incompatible with backfill, seal and panel closures materials, container and packaging materials, shipping container materials, or other wastes (i.e., waste does NOT match TRUCON Code[s])?	☐ Yes ☒ No
Is there an indication of wastes containing explosives or compressed gases?	☐ Yes ☒ No
Is there an indication of PCBs liquids?	☐ Yes ☒ No
Is there an indication of the waste exhibiting the characteristic of ignitability, corrosivity, or reactivity (EPA Hazardous Waste Numbers of D001, D002, or D003)?	☐ Yes ☒ No
Is the physical form of the waste inconsistent with the Waste Stream Description or the Waste Matrix Code?	☐ Yes ☒ No
CH or RH TRAMPAC	
Are there heat-sealed bags (unvented) GREATER than 4 liters and LESS than 390 square inches in the waste, or heat sealed bags not authorized in the RH TRUCON Code?	☐ Yes ☒ No
Were there Non-approved Closure Methods used on liner bags or inner bags greater than 4 liters?	☐ Yes ☒ No
Are there sealed containers GREATER than 4 liters?	☐ Yes ☒ No
Are there indications of inadequate protection for heavy and/or sharp objects?	☐ Yes ☒ No
Comments: N/A	

RTR Operator:

Eric Lyles		6/22/2015
Print Name	Signature	Date

CCP Radiography Data Sheet

Section 1: General Information	
[X] RTR Examination [ ] RTR Replicate Scan [ ] RTR Independent Observation	
Site ID:	ORNL
Batch Number:	OR-RTR7-0138
Examination Date:	6/22/2015
Waste Container ID:	X10C1350957
Video/Audio Recorded Media Number:	OR-RTR7-0138 A&B
Procedure and Revision No.:	CCP-TP-053 Rev. 15
NCR(s) associated with the container? (e.g., Prohibited Items)	[X] No [ ] Yes NCR No.: N/A NCR No.: N/A

Section 2: Waste Container Data	
Container Type:	55 Gallon Drum
TRUCON Code:	OR 227
Waste Matrix Code:	S4100
Waste Stream I.D.:	OR-NFS-CH-SOIL
Waste Container Weights:	Gross Wt.: 209.0 kg Tare Wt.: 35.2 kg Net Wt.: 173.8 kg
Rigid Liner and Liner Vent Description:	Liner: [ ] No [X] Yes Lid: [X] No [ ] Yes Type: [ ] 30-mil [X] 90-mil [ ] 110-mil [ ] 125-mil Vented: [ ] No [X] Yes [ ] N/A Punctured: [X] No [ ] Yes Mechanical Vent: [X] No [ ] Yes Fiberboard Liner: [X] No [ ] Yes Lead Lined: [X] No [ ] Yes
Number of Layers of Confinement:	Appears to be 1 layer
Volume Utilization Percentage:	80 %

CCP Radiography Data Sheet

Waste Container ID: X10C1350957

Section 3: Container Inventory and Comments (Detailed descriptions)
IM:
AM:
OM:
OI:
C:
R:
XPM:
OR: Absorbent
IN:
S: Soil

Section 4: Packaging Material and Waste Material Parameters	
Packaging Material:	**Estimated Weight (kg)**
Steel (ST):	27.8
Plastics (PP): Liner bag, Rigid Liner	7.4
Other:	0.0
Total Packaging Weight	35.2
Waste Material Parameter:	**Estimated Weight (kg)**
Iron-based Metal / Alloys (IM):	
Aluminum-based Metals / Alloys (AM):	
Other Metals (OM):	
Other Inorganic Materials (OI)	
Cellulosics (C):	
Rubber (R):	
Plastics (waste materials) (XPM):	
Organic Matrix (OR):	3.0
Inorganic Matrix (IN):	
Soils (S):	170.8
Total WMP Weight:	173.8

CCP Radiography Data Sheet

Waste Container ID: X10C1350957

Section 5: RTR Summary (Questions answered "Yes" will be explained in the Comment block, except for Question 1)	
Is there observable liquid?	☐ Yes ☒ No
Is there any observable liquid in internal containers, more than 60 milliliters or 3 percent by volume, whichever is greater?	☐ Yes ☒ No
Is the total volume of observable liquid in the outermost container GREATER than 1% of the container?	☐ Yes ☒ No
Is there observable liquid in payload containers with an EPA Hazardous Waste Number of U134?	☐ Yes ☒ No
Is there an indication of non-radionuclide pyrophoric materials, such as elemental potassium?	☐ Yes ☒ No
Is there an indication of hazardous wastes not occurring as co-contaminants with TRU mixed wastes (non-mixed hazardous wastes)?	☐ Yes ☒ No
Is there an indication of wastes incompatible with backfill, seal and panel closures materials, container and packaging materials, shipping container materials, or other wastes (i.e., waste does NOT match TRUCON Code[s])?	☐ Yes ☒ No
Is there an indication of wastes containing explosives or compressed gases?	☐ Yes ☒ No
Is there an indication of PCBs liquids?	☐ Yes ☒ No
Is there an indication of the waste exhibiting the characteristic of ignitability, corrosivity, or reactivity (EPA Hazardous Waste Numbers of D001, D002, or D003)?	☐ Yes ☒ No
Is the physical form of the waste inconsistent with the Waste Stream Description or the Waste Matrix Code?	☐ Yes ☒ No
CH or RH TRAMPAC	
Are there heat-sealed bags (unvented) GREATER than 4 liters and LESS than 390 square inches in the waste, or heat sealed bags not authorized in the RH TRUCON Code?	☐ Yes ☒ No
Were there Non-approved Closure Methods used on liner bags or inner bags greater than 4 liters?	☐ Yes ☒ No
Are there sealed containers GREATER than 4 liters?	☐ Yes ☒ No
Are there indications of inadequate protection for heavy and/or sharp objects?	☐ Yes ☒ No
Comments: N/A	

RTR Operator:		
Eric Lyles		6/22/2015
Print Name	Signature	Date

CCP Radiography Data Sheet

Section 1: General Information	
[X] RTR Examination [ ] RTR Replicate Scan [ ] RTR Independent Observation	
Site ID:	ORNL
Batch Number:	OR-RTR7-0138
Examination Date:	6/22/2015
Waste Container ID:	X10C1350960
Video/Audio Recorded Media Number:	OR-RTR7-0138 A&B
Procedure and Revision No.:	CCP-TP-053 Rev. 15
NCR(s) associated with the container? (e.g., Prohibited Items)	[X] No [ ] Yes NCR No.: N/A NCR No.: N/A

Section 2: Waste Container Data	
Container Type:	55 Gallon Drum
TRUCON Code:	OR 227
Waste Matrix Code:	S4100
Waste Stream I.D.:	OR-NFS-CH-SOIL
Waste Container Weights:	Gross Wt.: 207.0 kg Tare Wt.: 35.2 kg Net Wt.: 171.8 kg
Rigid Liner and Liner Vent Description:	Liner: [ ] No [X] Yes Lid: [X] No [ ] Yes Type: [ ] 30-mil [X] 90-mil [ ] 110-mil [ ] 125-mil Vented: [ ] No [X] Yes [ ] N/A Punctured: [X] No [ ] Yes Mechanical Vent: [X] No [ ] Yes Fiberboard Liner: [X] No [ ] Yes Lead Lined: [X] No [ ] Yes
Number of Layers of Confinement:	Appears to be 1 layer
Volume Utilization Percentage:	85 %

CCP Radiography Data Sheet

Waste Container ID: X10C1350960

Section 3: Container Inventory and Comments (Detailed descriptions)	
IM:	
AM:	
OM:	
OI:	
C:	
R:	
XPM:	Plastic sheeting
OR:	Absorbent
IN:	
S:	Soil

Section 4: Packaging Material and Waste Material Parameters	
Packaging Material:	**Estimated Weight (kg)**
Steel (ST):	27.8
Plastics (PP): Liner bag, Rigid Liner	7.4
Other:	0.0
Total Packaging Weight	35.2
Waste Material Parameter:	**Estimated Weight (kg)**
Iron-based Metal / Alloys (IM):	
Aluminum-based Metals / Alloys (AM):	
Other Metals (OM):	
Other Inorganic Materials (OI)	
Cellulosics (C):	
Rubber (R):	
Plastics (waste materials) (XPM):	2.0
Organic Matrix (OR):	2.0
Inorganic Matrix (IN):	
Soils (S):	167.8
Total WMP Weight:	171.8

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CCP Radiography Data Sheet

Waste Container ID: X10C1350960

Section 5: RTR Summary (Questions answered "Yes" will be explained in the Comment block, except for Question 1)	
Is there observable liquid?	☐ Yes ☒ No
Is there any observable liquid in internal containers, more than 60 milliliters or 3 percent by volume, whichever is greater?	☐ Yes ☒ No
Is the total volume of observable liquid in the outermost container GREATER than 1% of the container?	☐ Yes ☒ No
Is there observable liquid in payload containers with an EPA Hazardous Waste Number of U134?	☐ Yes ☒ No
Is there an indication of non-radionuclide pyrophoric materials, such as elemental potassium?	☐ Yes ☒ No
Is there an indication of hazardous wastes not occurring as co-contaminants with TRU mixed wastes (non-mixed hazardous wastes)?	☐ Yes ☒ No
Is there an indication of wastes incompatible with backfill, seal and panel closures materials, container and packaging materials, shipping container materials, or other wastes (i.e., waste does NOT match TRUCON Code[s])?	☐ Yes ☒ No
Is there an indication of wastes containing explosives or compressed gases?	☐ Yes ☒ No
Is there an indication of PCBs liquids?	☐ Yes ☒ No
Is there an indication of the waste exhibiting the characteristic of ignitability, corrosivity, or reactivity (EPA Hazardous Waste Numbers of D001, D002, or D003)?	☐ Yes ☒ No
Is the physical form of the waste inconsistent with the Waste Stream Description or the Waste Matrix Code?	☐ Yes ☒ No
CH or RH TRAMPAC	
Are there heat-sealed bags (unvented) GREATER than 4 liters and LESS than 390 square inches in the waste, or heat sealed bags not authorized in the RH TRUCON Code?	☐ Yes ☒ No
Were there Non-approved Closure Methods used on liner bags or inner bags greater than 4 liters?	☐ Yes ☒ No
Are there sealed containers GREATER than 4 liters?	☐ Yes ☒ No
Are there indications of inadequate protection for heavy and/or sharp objects?	☐ Yes ☒ No
Comments: N/A	

RTR Operator:

Eric Lyles		6/22/2015
Print Name	Signature	Date

CCP Radiography Data Sheet

Section 1: General Information	
[X] RTR Examination [ ] RTR Replicate Scan [ ] RTR Independent Observation	
Site ID:	ORNL
Batch Number:	OR-RTR7-0138
Examination Date:	6/22/2015
Waste Container ID:	X10C1350959
Video/Audio Recorded Media Number:	OR-RTR7-0138 A&B
Procedure and Revision No.:	CCP-TP-053 Rev. 15
NCR(s) associated with the container? (e.g., Prohibited Items)	[X] No [ ] Yes NCR No.: N/A NCR No.: N/A

Section 2: Waste Container Data	
Container Type:	55 Gallon Drum
TRUCON Code:	OR 227
Waste Matrix Code:	S4100
Waste Stream I.D.:	OR-NFS-CH-SOIL
Waste Container Weights:	Gross Wt.: 182.0 kg Tare Wt.: 35.2 kg Net Wt.: 146.8 kg
Rigid Liner and Liner Vent Description:	Liner: [ ] No [X] Yes Lid: [X] No [ ] Yes Type: [ ] 30-mil [X] 90-mil [ ] 110-mil [ ] 125-mil Vented: [ ] No [X] Yes [ ] N/A Punctured: [X] No [ ] Yes Mechanical Vent: [X] No [ ] Yes Fiberboard Liner: [X] No [ ] Yes Lead Lined: [X] No [ ] Yes
Number of Layers of Confinement:	Appears to be 1 layer
Volume Utilization Percentage:	80 %

CCP Radiography Data Sheet

Waste Container ID: X10C1350959

Section 3: Container Inventory and Comments (Detailed descriptions)
IM:
AM:
OM:
OI:
C:
R:
XPM:
OR: Absorbent
IN:
S: Soil

Section 4: Packaging Material and Waste Material Parameters	
Packaging Material:	**Estimated Weight (kg)**
Steel (ST):	27.8
Plastics (PP): Liner bag, Rigid Liner	7.4
Other:	0.0
Total Packaging Weight	35.2
Waste Material Parameter:	**Estimated Weight (kg)**
Iron-based Metal / Alloys (IM):	
Aluminum-based Metals / Alloys (AM):	
Other Metals (OM):	
Other Inorganic Materials (OI)	
Cellulosics (C):	
Rubber (R):	
Plastics (waste materials) (XPM):	
Organic Matrix (OR):	3.0
Inorganic Matrix (IN):	
Soils (S):	143.8
Total WMP Weight:	146.8

CCP Radiography Data Sheet

Waste Container ID: X10C1350959

Section 5: RTR Summary (Questions answered "Yes" will be explained in the Comment block, except for Question 1)	
Is there observable liquid?	☐ Yes ☒ No
Is there any observable liquid in internal containers, more than 60 milliliters or 3 percent by volume, whichever is greater?	☐ Yes ☒ No
Is the total volume of observable liquid in the outermost container GREATER than 1% of the container?	☐ Yes ☒ No
Is there observable liquid in payload containers with an EPA Hazardous Waste Number of U134?	☐ Yes ☒ No
Is there an indication of non-radionuclide pyrophoric materials, such as elemental potassium?	☐ Yes ☒ No
Is there an indication of hazardous wastes not occurring as co-contaminants with TRU mixed wastes (non-mixed hazardous wastes)?	☐ Yes ☒ No
Is there an indication of wastes incompatible with backfill, seal and panel closures materials, container and packaging materials, shipping container materials, or other wastes (i.e., waste does NOT match TRUCON Code[s])?	☐ Yes ☒ No
Is there an indication of wastes containing explosives or compressed gases?	☐ Yes ☒ No
Is there an indication of PCBs liquids?	☐ Yes ☒ No
Is there an indication of the waste exhibiting the characteristic of ignitability, corrosivity, or reactivity (EPA Hazardous Waste Numbers of D001, D002, or D003)?	☐ Yes ☒ No
Is the physical form of the waste inconsistent with the Waste Stream Description or the Waste Matrix Code?	☐ Yes ☒ No
CH or RH TRAMPAC	
Are there heat-sealed bags (unvented) GREATER than 4 liters and LESS than 390 square inches in the waste, or heat sealed bags not authorized in the RH TRUCON Code?	☐ Yes ☒ No
Were there Non-approved Closure Methods used on liner bags or inner bags greater than 4 liters?	☐ Yes ☒ No
Are there sealed containers GREATER than 4 liters?	☐ Yes ☒ No
Are there indications of inadequate protection for heavy and/or sharp objects?	☐ Yes ☒ No
Comments: N/A	

RTR Operator:

Eric Lyles		6/22/2015
Print Name	Signature	Date

CCP Radiography Data Sheet

Section 1: General Information	
[X] RTR Examination [ ] RTR Replicate Scan [ ] RTR Independent Observation	
Site ID:	ORNL
Batch Number:	OR-RTR7-0138
Examination Date:	6/22/2015
Waste Container ID:	X10C1351021
Video/Audio Recorded Media Number:	OR-RTR7-0138 A&B
Procedure and Revision No.:	CCP-TP-053 Rev. 15
NCR(s) associated with the container? (e.g., Prohibited Items)	[X] No [ ] Yes NCR No.: N/A NCR No.: N/A

Section 2: Waste Container Data	
Container Type:	55 Gallon Drum
TRUCON Code:	OR 227
Waste Matrix Code:	S4100
Waste Stream I.D.:	OR-NFS-CH-SOIL
Waste Container Weights:	Gross Wt.: 221.6 kg Tare Wt.: 35.2 kg Net Wt.: 186.4 kg
Rigid Liner and Liner Vent Description:	Liner: [ ] No [X] Yes Lid: [X] No [ ] Yes Type: [ ] 30-mil [X] 90-mil [ ] 110-mil [ ] 125-mil Vented: [ ] No [X] Yes [ ] N/A Punctured: [X] No [ ] Yes Mechanical Vent: [X] No [ ] Yes Fiberboard Liner: [X] No [ ] Yes Lead Lined: [X] No [ ] Yes
Number of Layers of Confinement:	Appears to be 1 layer
Volume Utilization Percentage:	85 %

CCP Radiography Data Sheet

Waste Container ID: X10C1351021

Section 3: Container Inventory and Comments (Detailed descriptions)
IM:
AM:
OM:
OI:
C:
R:
XPM:
OR: Absorbent
IN:
S: Soil

Section 4: Packaging Material and Waste Material Parameters	
Packaging Material:	**Estimated Weight (kg)**
Steel (ST):	27.8
Plastics (PP): Liner bag, Rigid Liner	7.4
Other:	0.0
Total Packaging Weight	35.2
Waste Material Parameter:	**Estimated Weight (kg)**
Iron-based Metal / Alloys (IM):	
Aluminum-based Metals / Alloys (AM):	
Other Metals (OM):	
Other Inorganic Materials (OI)	
Cellulosics (C):	
Rubber (R):	
Plastics (waste materials) (XPM):	
Organic Matrix (OR):	2.0
Inorganic Matrix (IN):	
Soils (S):	184.4
Total WMP Weight:	186.4

CCP Radiography Data Sheet

Waste Container ID: X10C1351021

Section 5: RTR Summary (Questions answered "Yes" will be explained in the Comment block, except for Question 1)	
Is there observable liquid?	☐ Yes ☒ No
Is there any observable liquid in internal containers, more than 60 milliliters or 3 percent by volume, whichever is greater?	☐ Yes ☒ No
Is the total volume of observable liquid in the outermost container GREATER than 1% of the container?	☐ Yes ☒ No
Is there observable liquid in payload containers with an EPA Hazardous Waste Number of U134?	☐ Yes ☒ No
Is there an indication of non-radionuclide pyrophoric materials, such as elemental potassium?	☐ Yes ☒ No
Is there an indication of hazardous wastes not occurring as co-contaminants with TRU mixed wastes (non-mixed hazardous wastes)?	☐ Yes ☒ No
Is there an indication of wastes incompatible with backfill, seal and panel closures materials, container and packaging materials, shipping container materials, or other wastes (i.e., waste does NOT match TRUCON Code[s])?	☐ Yes ☒ No
Is there an indication of wastes containing explosives or compressed gases?	☐ Yes ☒ No
Is there an indication of PCBs liquids?	☐ Yes ☒ No
Is there an indication of the waste exhibiting the characteristic of ignitability, corrosivity, or reactivity (EPA Hazardous Waste Numbers of D001, D002, or D003)?	☐ Yes ☒ No
Is the physical form of the waste inconsistent with the Waste Stream Description or the Waste Matrix Code?	☐ Yes ☒ No
CH or RH TRAMPAC	
Are there heat-sealed bags (unvented) GREATER than 4 liters and LESS than 390 square inches in the waste, or heat sealed bags not authorized in the RH TRUCON Code?	☐ Yes ☒ No
Were there Non-approved Closure Methods used on liner bags or inner bags greater than 4 liters?	☐ Yes ☒ No
Are there sealed containers GREATER than 4 liters?	☐ Yes ☒ No
Are there indications of inadequate protection for heavy and/or sharp objects?	☐ Yes ☒ No
Comments: N/A	

RTR Operator:

Eric Lyles		6/22/2015
Print Name	Signature	Date

CCP Radiography Data Sheet

Section 1: General Information	
[X] RTR Examination [ ] RTR Replicate Scan [ ] RTR Independent Observation	
Site ID:	ORNL
Batch Number:	OR-RTR7-0138
Examination Date:	6/22/2015
Waste Container ID:	X10C1351016
Video/Audio Recorded Media Number:	OR-RTR7-0138 A&B
Procedure and Revision No.:	CCP-TP-053 Rev. 15
NCR(s) associated with the container? (e.g., Prohibited Items)	[X] No [ ] Yes NCR No.: N/A NCR No.: N/A

Section 2: Waste Container Data	
Container Type:	55 Gallon Drum
TRUCON Code:	OR 227
Waste Matrix Code:	S4100
Waste Stream I.D.:	OR-NFS-CH-SOIL
Waste Container Weights:	Gross Wt.: 205.8 kg Tare Wt.: 35.2 kg Net Wt.: 170.6 kg
Rigid Liner and Liner Vent Description:	Liner: [ ] No [X] Yes Lid: [X] No [ ] Yes Type: [ ] 30-mil [X] 90-mil [ ] 110-mil [ ] 125-mil Vented: [ ] No [X] Yes [ ] N/A Punctured: [X] No [ ] Yes Mechanical Vent: [X] No [ ] Yes Fiberboard Liner: [X] No [ ] Yes Lead Lined: [X] No [ ] Yes
Number of Layers of Confinement:	Appears to be 1 layer
Volume Utilization Percentage:	85 %

CCP Radiography Data Sheet

Waste Container ID: X10C1351016

Section 3: Container Inventory and Comments (Detailed descriptions)	
IM:	Nail
AM:	
OM:	
OI:	
C:	
R:	
XPM:	Plastic sheeting
OR:	Absorbent
IN:	
S:	Soil

Section 4: Packaging Material and Waste Material Parameters	
Packaging Material:	**Estimated Weight (kg)**
Steel (ST):	27.8
Plastics (PP): Liner bag, Rigid Liner	7.4
Other:	0.0
Total Packaging Weight	35.2
Waste Material Parameter:	**Estimated Weight (kg)**
Iron-based Metal / Alloys (IM):	0.1
Aluminum-based Metals / Alloys (AM):	
Other Metals (OM):	
Other Inorganic Materials (OI)	
Cellulosics (C):	
Rubber (R):	
Plastics (waste materials) (XPM):	2.0
Organic Matrix (OR):	3.0
Inorganic Matrix (IN):	
Soils (S):	165.5
Total WMP Weight:	170.6

CCP Radiography Data Sheet

Waste Container ID: X10C1351016

Section 5: RTR Summary (Questions answered "Yes" will be explained in the Comment block, except for Question 1)	
Is there observable liquid?	☐ Yes ☒ No
Is there any observable liquid in internal containers, more than 60 milliliters or 3 percent by volume, whichever is greater?	☐ Yes ☒ No
Is the total volume of observable liquid in the outermost container GREATER than 1% of the container?	☐ Yes ☒ No
Is there observable liquid in payload containers with an EPA Hazardous Waste Number of U134?	☐ Yes ☒ No
Is there an indication of non-radionuclide pyrophoric materials, such as elemental potassium?	☐ Yes ☒ No
Is there an indication of hazardous wastes not occurring as co-contaminants with TRU mixed wastes (non-mixed hazardous wastes)?	☐ Yes ☒ No
Is there an indication of wastes incompatible with backfill, seal and panel closures materials, container and packaging materials, shipping container materials, or other wastes (i.e., waste does NOT match TRUCON Code[s])?	☐ Yes ☒ No
Is there an indication of wastes containing explosives or compressed gases?	☐ Yes ☒ No
Is there an indication of PCBs liquids?	☐ Yes ☒ No
Is there an indication of the waste exhibiting the characteristic of ignitability, corrosivity, or reactivity (EPA Hazardous Waste Numbers of D001, D002, or D003)?	☐ Yes ☒ No
Is the physical form of the waste inconsistent with the Waste Stream Description or the Waste Matrix Code?	☐ Yes ☒ No
CH or RH TRAMPAC	
Are there heat-sealed bags (unvented) GREATER than 4 liters and LESS than 390 square inches in the waste, or heat sealed bags not authorized in the RH TRUCON Code?	☐ Yes ☒ No
Were there Non-approved Closure Methods used on liner bags or inner bags greater than 4 liters?	☐ Yes ☒ No
Are there sealed containers GREATER than 4 liters?	☐ Yes ☒ No
Are there indications of inadequate protection for heavy and/or sharp objects?	☐ Yes ☒ No
Comments: N/A	

RTR Operator:

Eric Lyles	Eric Lyles	6/22/2015
Print Name	Signature	Date

CCP Radiography Data Sheet

Section 1: General Information	
[X] RTR Examination [ ] RTR Replicate Scan [ ] RTR Independent Observation	
Site ID:	ORNL
Batch Number:	OR-RTR7-0138
Examination Date:	6/22/2015
Waste Container ID:	X10C1351020
Video/Audio Recorded Media Number:	OR-RTR7-0138 A&B
Procedure and Revision No.:	CCP-TP-053 Rev. 15
NCR(s) associated with the container? (e.g., Prohibited Items)	[X] No [ ] Yes NCR No.: N/A NCR No.: N/A

Section 2: Waste Container Data	
Container Type:	55 Gallon Drum
TRUCON Code:	OR 227
Waste Matrix Code:	S4100
Waste Stream I.D.:	OR-NFS-CH-SOIL
Waste Container Weights:	Gross Wt.: 209.9 kg Tare Wt.: 35.2 kg Net Wt.: 174.7 kg
Rigid Liner and Liner Vent Description:	Liner: [ ] No [X] Yes Lid: [X] No [ ] Yes Type: [ ] 30-mil [X] 90-mil [ ] 110-mil [ ] 125-mil Vented: [ ] No [X] Yes [ ] N/A Punctured: [X] No [ ] Yes Mechanical Vent: [X] No [ ] Yes Fiberboard Liner: [X] No [ ] Yes Lead Lined: [X] No [ ] Yes
Number of Layers of Confinement:	Appears to be 1 layer
Volume Utilization Percentage:	85 %

CCP Radiography Data Sheet

Waste Container ID: X10C1351020

Section 3: Container Inventory and Comments (Detailed descriptions)
IM:
AM:
OM:
OI:
C:
R:
XPM:
OR: Absorbent
IN:
S: Soil

Section 4: Packaging Material and Waste Material Parameters	
Packaging Material:	**Estimated Weight (kg)**
Steel (ST):	27.8
Plastics (PP): Liner bag, Rigid Liner	7.4
Other:	0.0
Total Packaging Weight	35.2
Waste Material Parameter:	**Estimated Weight (kg)**
Iron-based Metal / Alloys (IM):	
Aluminum-based Metals / Alloys (AM):	
Other Metals (OM):	
Other Inorganic Materials (OI)	
Cellulosics (C):	
Rubber (R):	
Plastics (waste materials) (XPM):	
Organic Matrix (OR):	2.0
Inorganic Matrix (IN):	
Soils (S):	172.7
Total WMP Weight:	174.7

CCP Radiography Data Sheet

Waste Container ID: X10C1351020

Section 5: RTR Summary (Questions answered "Yes" will be explained in the Comment block, except for Question 1)	
Is there observable liquid?	☐ Yes ☒ No
Is there any observable liquid in internal containers, more than 60 milliliters or 3 percent by volume, whichever is greater?	☐ Yes ☒ No
Is the total volume of observable liquid in the outermost container GREATER than 1% of the container?	☐ Yes ☒ No
Is there observable liquid in payload containers with an EPA Hazardous Waste Number of U134?	☐ Yes ☒ No
Is there an indication of non-radionuclide pyrophoric materials, such as elemental potassium?	☐ Yes ☒ No
Is there an indication of hazardous wastes not occurring as co-contaminants with TRU mixed wastes (non-mixed hazardous wastes)?	☐ Yes ☒ No
Is there an indication of wastes incompatible with backfill, seal and panel closures materials, container and packaging materials, shipping container materials, or other wastes (i.e., waste does NOT match TRUCON Code[s])?	☐ Yes ☒ No
Is there an indication of wastes containing explosives or compressed gases?	☐ Yes ☒ No
Is there an indication of PCBs liquids?	☐ Yes ☒ No
Is there an indication of the waste exhibiting the characteristic of ignitability, corrosivity, or reactivity (EPA Hazardous Waste Numbers of D001, D002, or D003)?	☐ Yes ☒ No
Is the physical form of the waste inconsistent with the Waste Stream Description or the Waste Matrix Code?	☐ Yes ☒ No
CH or RH TRAMPAC	
Are there heat-sealed bags (unvented) GREATER than 4 liters and LESS than 390 square inches in the waste, or heat sealed bags not authorized in the RH TRUCON Code?	☐ Yes ☒ No
Were there Non-approved Closure Methods used on liner bags or inner bags greater than 4 liters?	☐ Yes ☒ No
Are there sealed containers GREATER than 4 liters?	☐ Yes ☒ No
Are there indications of inadequate protection for heavy and/or sharp objects?	☐ Yes ☒ No
Comments: N/A	

RTR Operator:

Eric Lyles		6/22/2015
Print Name	Signature	Date

Attachment 3 – CCP Radiography Independent Technical Reviewer Checklist

Batch Data Report No.: OR-RTR7-0138

Description			
1.	Were data generation and reduction conducted in a technically correct manner in accordance with the methods used?	☐ NO	☑ YES
2.	Was the correct revision of the procedure used? Procedure: CCP-TP-053 Rev.: 15	☐ NO	☑ YES
3.	Are the WMPs entered correctly?	☐ NO	☑ YES
4.	Do the estimated weights in Section 4 of Attachment 2 equal the container gross weight?	☐ NO	☑ YES
5.	Is the data reported in the proper units with the correct number of significant figures (e.g., one tenth of a kilogram)?	☐ NO	☑ YES
6.	Was transcription used? If no, proceed to question 7.	☑ NO	☐ YES
	6a. Has the data been verified for transcription errors?	☐ NO	☐ YES
7.	Does the Testing Batch Report include radiography for up to 20 containers?	☐ NO	☑ YES
8.	Are BDR contents complete and do they match the CCP Waste RTR Batch Data Report Table of Contents?	☐ NO	☑ YES
9.	Is all the data signed and dated in reproducible ink and by the individual(s) generating it?	☐ NO	☑ YES
10.	Is all data recorded clearly, legibly, and accurately?	☐ NO	☑ YES
11.	Have changes been made to original data? If no, proceed to question 12.	☑ NO	☐ YES
	11a. Have all changes to original data been lined out, initialed and dated by the individual making the changes?	☐ NO	☐ YES
	11b. Was justification made for changing the original data?	☐ NO	☐ YES
	11c. Were data changes made by the individual who originally collected the data?	☐ NO	☐ YES
12.	Does the waste match the Waste Matrix Code and Waste Stream description?	☐ NO	☑ YES
13.	Are the RTR Operator's decisions regarding the Radiography documented?	☐ NO	☑ YES
14.	Is there an adequate written description of the contents of each item?	☐ NO	☑ YES
15.	Was the video/audio recording media properly prepared and labeled for each waste container?	☐ NO	☑ YES
16.	Was the video/audio recording media check performed satisfactorily and recorded on Attachment 1?	☐ NO	☑ YES

Attachment 3 – CCP Radiography Independent Technical Reviewer Checklist (Continued)

Batch Data Report No.: OR-RTR7-0138

Description		
17. Was the Image Test performed satisfactorily and recorded on Attachment 1?	☐ NO	☑ YES
18. Was the Replicate Scan performed and recorded on an Attachment 2?	☐ NO	☑ YES
19. Was the Replicate Scan RTR Operator different from the first RTR Operator?	☐ NO	☑ YES
20. Did the Replicate Scan RTR Operator and the first RTR Operator agree on the results?	☐ NO	☑ YES
21. Was the Independent Observation performed and recorded on an Attachment 2?	☐ NO	☑ YES
22. Was the Independent Observation RTR Operator different from the first RTR Operator?	☐ NO	☑ YES
23. Did the Independent Observation RTR Operator and the first RTR Operator agree on the results?	☐ NO	☑ YES
24. Was the data collection performed by qualified individuals?	☐ NO	☑ YES
25. Were NCRs initiated as required at DGL? If no, proceed to question 26.	☑ NO	☐ YES
25a. Have the NCR(s) associated with RTR been included in the BDR?	☐ NO	☐ YES
26. Is the RTR examination for CH waste? If no, proceed to question 27.	☐ NO	☑ YES
26a. Have the CH Quality Assurance Objectives (QAOs) been met (if applicable)? Precision – Precision is maintained by reconciling any discrepancies between two radiography operators with regard to identification of the waste matrix code, liquids in excess of TSDF-WAC limits, and compressed gases through independent replicate scans and independent observations. Additionally, the precision of radiography is verified prior to use by tuning precisely enough to demonstrate compliance with QAOs through viewing an image test pattern. Accuracy – Accuracy is obtained by using a target to tune the image for maximum sharpness and by requiring operators to successfully identify 100 percent of the items required to meet the DQOs for radiography specified in CCP-PO-001, Section C-4a(1) in a training container during their initial qualification and subsequent requalification. Completeness – A video and audio media recording of the radiography examination and a validated radiography data form will be obtained for 100 percent of the waste containers subject to radiography. All video and audio media recordings and radiography data forms will be subject to validation as indicated in CCP-PO-001, Section C3-4. Comparability – The comparability of radiography data from different operators shall be enhanced by using standardized radiography procedures and operator qualifications.	☐ NO	☑ YES

Attachment 3 – CCP Radiography Independent Technical Reviewer Checklist (Continued)

Batch Data Report No.: OR-RTR7-0138

Description		
27. Is the RTR examination for RH waste? If no, proceed to comment section.	☑ NO	☐ YES
27a. Have the RH QAOs been met (if applicable)? Precision – Precision is maintained by reconciling any discrepancies between two operators (during Independent Observation and Replicate scans) with regard to the identification of important waste characteristics (i.e., physical form of the waste and absence of prohibited liquids) within a single container. Accuracy – Accuracy is obtained by using a target to tune the image for maximum sharpness and by requiring operators to successfully identify prohibited liquid in a training container during their initial qualification and subsequent requalification. Representativeness – All of the relevant contents in a container selected for radiography will be described. Completeness – All of the relevant waste information must be assembled and must show that each of the containers in the waste stream belongs to the waste stream. This information must be documented on videotape or other equivalent media and data form. Comparability – Comparability is ensured by meeting the program training requirements and complying with the minimum standards used to implement the radiography process.	☐ NO	☐ YES

Comments: N/A

I have reviewed 100% of the container specific and batch data in this report and find it acceptable.

Independent Technical Reviewer:

Fred Olney (Printed Name) — (Signature) — 6-23-15 (Date)

DIVIDER PAGE ONLY

Not part of page count

Attachment 2 – CCP Records Transmittal/Receiving Form

CCP Records / Records Custodian, 4021 National Parks Highway - MS: GSA 212, Carlsbad, New Mexico 88220

Telephone Number: 575-234-7523

Fax Number: 575-234-7033

Attn:	CCP RECORDS	From:	PATRICK SMITH II
Ship to:	CCP RECORDS CUSTODIAN	Site:	ORNL
	4021 NATIONAL PARKS HWY.	Company:	TFE INC.
	MS GSA 212	Telephone Number:	865-574-6002
	CARLSBAD, NM 88220-9082	Date Sent:	07-01-2015
Telephone Number:	575-234-7523		

Document Number	Item Description	Record Date	Total Pages
OR-RTR7-0138	RTR DVD (DISK B)	6-22-2015	N/A
N/A	N/A	N/A	N/A
N/A	N/A	N/A	N/A
N/A	N/A	N/A	N/A
N/A	N/A	N/A	N/A
N/A	N/A	N/A	N/A

Comments:

N/A

(When the Record accepted line has been completed, the rest of the page below may be left blank.)
Acceptance/Rejection Signature and Date

Records Accepted ☑	Signature	Leon Navarrete Printed Name	7/7/15 Date
Records Rejected ☐	Signature	Printed Name	Date

Reason for Rejection:

Re-submittal:	Signature	Printed Name	Date

```
**********************************
***        Send Results        ***
**********************************

   Sending is complete.

Job No.                  0928
Address                  918655768703
Name                     ORNL
Start Time               07/07 12:35 PM
Call Length              00'20
Sheets                   1
Result                   OK
```


Attachment 2 – CCP Records Transmittal/Receiving Form

CCP Records / Records Custodian, 4021 National Parks Highway - MS: GSA 212, Carlsbad, New Mexico 88220

Telephone Number: 575-234-7523

Fax Number: 575-234-7033

Attn:	CCP RECORDS	From:	PATRICK SMITH II
Ship to:	CCP RECORDS CUSTODIAN	Site:	ORNL
	4021 NATIONAL PARKS HWY.	Company:	TFE INC.
	MS GSA 212	Telephone Number:	865-574-6002
	CARLSBAD, NM 88220-9082	Date Sent:	07-01-2015
Telephone Number:	575-234-7523		

Document Number	Description	Date	Quantity
OR-RTR7-0138	RTR DVD (DISK B)	6-22-2015	N/A
N/A	N/A	N/A	N/A
N/A	N/A	N/A	N/A
N/A	N/A	N/A	N/A
N/A	N/A	N/A	N/A
N/A	N/A	N/A	N/A

Comments

N/A

(When the Record accepted line has been completed, the rest of the page below may be left blank.)
Acceptance/Rejection Signature and Date

Records Accepted ☑ — Signature — Leon Navarrete (Printed Name) — 7/7/15 (Date)

Records Rejected ☐

Attachment 2 – CCP Records Transmittal/Receiving Form

CCP Records / Records Custodian, 4021 National Parks Highway - MS: GSA 212, Carlsbad, New Mexico 88220

Telephone Number: 575-234-7523

Fax Number: 575-234-7033

Attn:	CCP RECORDS	From:	PATRICK SMITH II
Ship to:	CCP RECORDS CUSTODIAN	Site:	ORNL
	4021 NATIONAL PARKS HWY.	Company:	TFE INC.
	MS GSA 212	Telephone Number:	865-574-6002
	CARLSBAD, NM 88220-9082	Date Sent:	7-20-2015
Telephone Number:	575-234-7523		

Document Number	RTR7 Description	Record Date	Page Count
OR-RTR7-0138	RTR BDR	6-22-2015	48
OR-RTR7-0138	RTR DVD (DISK A)	6-22-2015	N/A
N/A	N/A	N/A	N/A
N/A	N/A	N/A	N/A
N/A	N/A	N/A	N/A
N/A	N/A	N/A	N/A

Comments

N/A

(When the Record accepted line has been completed, the rest of the page below may be left blank.)
Acceptance/Rejection Signature and Date

Records Accepted	☑	Signature	Jessica Hurnaldo	7-22-15.
Records Rejected	☐	Signature	Printed Name	Date

Reason for Rejection:

Re-submittal:

Signature	Printed Name	Date

```
**********************************
***        Send Results        ***
**********************************

Sending is complete.

Job No.          1116
Address          918655768703
Name             ORNL
Start Time       07/22 09:12 AM
Call Length      00'19
Sheets           1
Result           OK
```


Attachment 2 – CCP Records Transmittal/Receiving Form

CCP Records / Records Custodian, 4021 National Parks Highway - MS: GSA 212, Carlsbad, New Mexico 88220

Telephone Number: 575-234-7523

Fax Number: 575-234-7033

Attn:	CCP RECORDS	From:	PATRICK SMITH II
Ship to:	CCP RECORDS CUSTODIAN	Site:	ORNL
	4021 NATIONAL PARKS HWY.	Company:	TFE INC.
	MS GSA 212	Telephone Number:	865-574-6002
	CARLSBAD, NM 88220-9082	Date Sent:	7-20-2015
Telephone Number:	575-234-7523		

Document Number	Title/Description	Date Records Generated	Page Number
OR-RTR7-0138	RTR BDR	6-22-2015	48
OR-RTR7-0138	RTR DVD (DISK A)	6-22-2015	N/A
N/A	N/A	N/A	N/A
N/A	N/A	N/A	N/A
N/A	N/A	N/A	N/A
N/A	N/A	N/A	N/A

Comments:

N/A

(When the Record accepted line has been completed, the rest of the page below may be left blank.)

Acceptance/Rejection Signature and Date

Records Accepted [V] _____ Jesus Hurtado 7.22.15.
Signature Printed Name Date

Records Rejected [ ] _____

DIVIDER

PAGE

Attachment 2 – CCP SPM Radiography Project Level Validation Checklist and Summary

BDR Number: OR-RTR7-0148				Examination Date(s): 07/27/2015
Description of Criteria Reviewed	**Criteria Met?**			**Comments/Qualifiers**
	YES	**NO**	**NA**	
1. Is the completed, signed, and dated Independent Technical Reviewer Checklist included in the BDR, and the independent technical reviewer was not involved in the generation or recording of the data under review? **Reference Source: CCP-PO-001, C3-4**	X			
2. Does the BDR contain all items addressed in the BDR Table of Contents? **Reference Source: CCP-PO-001, C3-4**	X			
3. Does the BDR include a listing of all the container numbers in the batch? **Reference Source: CCP-PO-001, C3-4**	X			
4. List all containers that have met QAOs. **Reference Source: CCP-PO-001, C3-4**				Container Numbers: X10C0402824E1 X10CSATN02300I X10CSATN03211O X10CSATN03211P X10CSATN03211Q X10CSATN03211S X10CSATN03211V X10CSATN03211W
5. Does the BDR identify the current implementing procedure and revision number? **Reference Source: CCP-PO-001, Table C3-3**	X			
6. Is there a reference to or copy of any associated NCRs (if any) in the BDR? NA if no NCRs. **Reference Source: CCP-PO-001, Table C3-3**			X	
7. Are there 20 or fewer containers in the batch? **Reference Source: CCP-PO-001, C3-4**	X			
8. Are the data properly reported (i.e., data are reported in correct units and with correct significant figures)? **Reference Source: CCP-PO-001, C3-4**	X			
9. Is there evidence of verification that the physical form matches the Waste Matrix Code? **Reference Source: CCP-PO-001, Table C3-3**	X			

CCP RECORDS ORIGINAL
DATE REC'D 8.5.15 JY.

Attachment 2 – CCP SPM Radiography Project Level Validation Checklist and Summary (Continued)

BDR Number: OR-RTR7-0148				Examination Date(s): 07/27/2015
Description of Criteria Reviewed	**Criteria Met?**			**Comments/Qualifiers**
	YES	**NO**	**NA**	
10. Is there evidence of verification that the physical form matches the waste stream description? **Reference Source: CCP-PO-001, Table C3-3**	X			
11. Are prohibited items absent? **Reference Source: CCP-PO-001, Table C3-3**	X			
12. Does observable liquid, if present, meet the criteria of the TSDF-WAC? **Reference Source: CCP-PO-001, C-1**			X	No observable liquid.
13. Were discrepancies between two operators with regard to identification of waste matrix code, liquids in excess of the TSDF-WAC, or compressed gases through replicate scans and independent observations reconciled? NA if no discrepancies. **Reference Source: CCP-PO-001, C3-2**			X	
14. Are the training qualifications for all radiography personnel acceptable? **Reference Source: CCP-PO-001, C3-8**	X			
15. Was evidence of the video/audio check included in the BDR? **Reference Source: CCP-PO-001, C1-1**	X			
16. Was the Lines-Pair Resolution Test or Sieve Test Check included in the BDR? **Reference Source: CCP Technical Procedures**	X			
17. Was a replicate scan performed once per day, or once per batch, whichever is LESS frequent? **Reference Source: CCP-PO-001, C1-1**	X			
18. Was an independent observation performed once per day, or once per batch, whichever is LESS frequent? **Reference Source: CCP-PO-001, C1-1**	X			

Attachment 2 – CCP SPM Radiography Project Level Validation Checklist and Summary (Continued)

BDR Number: OR-RTR7-0148 **Examination Date(s): 07/27/2015**

Description of Criteria Reviewed	Criteria Met? YES	NO	NA	Comments/Qualifiers
19. Were the replicate scan and independent observation performed on different waste containers? **Reference Source: CCP-PO-001, C1-1**	X			
20. Were the personnel performing the replicate scan and independent observation different from the individual who performed the original? **Reference Source: CCP-PO-001, C1-1**	X			
21. Does the BDR include an estimate of each material parameter weight in kg for each container? **Reference Source: CCP Technical Procedures**	X			
22. Does the BDR include a description of each material parameter for each container? **Reference Source: CCP Technical Procedures**	X			
23. Is the container gross weight recorded in kilograms (kg) for each container in the BDR? **Reference Source: CCP Technical Procedures**	X			
24. Was the Scale Weight Calibration Check included in the BDR? **Reference Source: CCP Technical Procedures**			X	Not used.
25. Was the Scale Weight Check included in the BDR? **Reference Source: CCP Technical Procedures**			X	Not used.

Comments: None.

The container QC checks were properly performed and meet the Quality Assurance Objectives (QAOs). Proper procedures were followed during data reduction and analysis. The batch is complete, acceptable, and includes all supporting data and documentation required by the QAPjP.

Daniel Wade		08/05/2015
SPM Printed Name	Signature	Date

Checklist is to be re-signed only when a re-review is performed.

SPM Printed Name	Signature	Reason	Date
SPM Printed Name	Signature	Reason	Date

Attachment 5–CCP Radiography Batch Data Report Cover Sheet

Site ID: ORNL

Batch Data Report No.: OR-RTR7-0148 ☑ CH ☐ RH Date: 7-27-15

Waste Container ID Numbers	
Replicate Scan:	X10CSATN03211W
Independent Observation:	X10CSATN03211O
1	X10C0402824E1
2	X10CSATN03211O
3	X10CSATN02300I
4	X10CSATN03211V
5	X10CSATN03211Q
6	X10CSATN03211P
7	X10CSATN03211S
8	X10CSATN03211W
9	N/A
10	N/A
11	N/A
12	N/A
13	N/A
14	N/A
15	N/A
16	N/A
17	N/A
18	N/A
19	N/A
20	N/A

RTR Operator:

Daphne Brothers		7-27-15
Printed Name	Signature	Date

Independent Technical Reviewer:

Fred Olney		8-3-15
Printed Name	Signature	Date

NTPC RECORDS ORIGINAL
DATE REC'D 8-03-2015

Attachment 4 – CCP Radiography Batch Data Report Table of Contents and Batch Narrative

Batch Data Report No.: OR-RTR7-0148 Date: 7-27-15

Table Of Contents		
Item	Description	Page No.
1	CCP Radiography Batch Data Report Cover Sheet	1
2	CCP Radiography Batch Data Report Table Of Contents	2
3	CCP RTR Measurement Control Report	3
4	CCP Radiography Data Sheets	4
5	Copy of NCRs (NA, If Not Applicable)	N/A
6	CCP Independent Technical Reviewer Checklist	34

Batch Narrative
All Quality Checks were performed and recorded on CCP-TP-053, Rev.15, CCP Radiography Measurement Control Report.

Daphne Brothers — RTR Operator
Signature
7-27-15 — Date

Attachment 1 – CCP RTR Measurement Control Report

Site ID: ORNL		
Batch Data Report No.: OR-RTR7-0148		
Examination Date: 7-27-15		
Control Checks		
Video/Audio Recorded Media System Check	☑ SAT	☐ UNSAT
Image Test : 10 Lines (Minimum acceptable is 5 lines-pair/cm or #6 Sieve is viewable)	☑ SAT	☐ UNSAT
Comments: N/A		
RTR Operator:		
Daphne Brothers (Printed Name)	Daphne Brothers (Signature)	7-27-15 (Date)

CCP Radiography Data Sheet

Section 1: General Information	
☐ RTR Examination ☒ RTR Replicate Scan ☐ RTR Independent Observation	
Site ID:	ORNL
Batch Number:	OR-RTR7-0148
Examination Date:	7/27/2015
Waste Container ID:	X10CSATN03211W
Video/Audio Recorded Media Number:	OR-RTR7-0148 A&B
Procedure and Revision No.:	CCP-TP-053 Rev. 15
NCR(s) associated with the container? (e.g., Prohibited Items)	☒ No ☐ Yes NCR No.: N/A NCR No.: N/A

Section 2: Waste Container Data	
Container Type:	55 Gallon Drum
TRUCON Code:	OR 225
Waste Matrix Code:	S5400
Waste Stream I.D.:	OR-REDC-CH-HET
Waste Container Weights:	Gross Wt.: 62.2 kg Tare Wt.: 33.2 kg Net Wt.: 29.0 kg
Rigid Liner and Liner Vent Description:	Liner: ☒ No ☐ Yes Lid: ☒ No ☐ Yes Type: ☐ 30-mil ☐ 90-mil ☐ 110-mil ☐ 125-mil Vented: ☐ No ☐ Yes ☒ N/A Punctured: ☒ No ☐ Yes Mechanical Vent: ☒ No ☐ Yes Fiberboard Liner: ☒ No ☐ Yes Lead Lined: ☒ No ☐ Yes
Number of Layers of Confinement:	Appears to be 1 layer
Volume Utilization Percentage:	80 %

CCP Radiography Data Sheet

Waste Container ID: X10CSATN03211W

Section 3: Container Inventory and Comments (Detailed descriptions)	
IM:	Scrap metal
AM:	
OM:	
OI:	
C:	Cloth, coveralls
R:	Rubber gloves
XPM:	Plastic sheeting, plastic tubing, plastic suits
OR:	
IN:	
S:	

Section 4: Packaging Material and Waste Material Parameters	
Packaging Material:	**Estimated Weight (kg)**
Steel (ST):	27.8
Plastics (PP): Liner bag	1.0
Other: Cardboard (CP)	4.4
Total Packaging Weight	33.2
Waste Material Parameter:	**Estimated Weight (kg)**
Iron-based Metal / Alloys (IM):	1.0
Aluminum-based Metals / Alloys (AM):	
Other Metals (OM):	
Other Inorganic Materials (OI)	
Cellulosics (C):	8.5
Rubber (R):	0.5
Plastics (waste materials) (XPM):	19.0
Organic Matrix (OR):	
Inorganic Matrix (IN):	
Soils (S):	
Total WMP Weight:	29.0

CCP Radiography Data Sheet

Waste Container ID: X10CSATN03211W

Section 5: RTR Summary (Questions answered "Yes" will be explained in the Comment block, except for Question 1)	
Is there observable liquid?	☐ Yes ☒ No
Is there any observable liquid in internal containers, more than 60 milliliters or 3 percent by volume, whichever is greater?	☐ Yes ☒ No
Is the total volume of observable liquid in the outermost container GREATER than 1% of the container?	☐ Yes ☒ No
Is there observable liquid in payload containers with an EPA Hazardous Waste Number of U134?	☐ Yes ☒ No
Is there an indication of non-radionuclide pyrophoric materials, such as elemental potassium?	☐ Yes ☒ No
Is there an indication of hazardous wastes not occurring as co-contaminants with TRU mixed wastes (non-mixed hazardous wastes)?	☐ Yes ☒ No
Is there an indication of wastes incompatible with backfill, seal and panel closures materials, container and packaging materials, shipping container materials, or other wastes (i.e., waste does NOT match TRUCON Code[s])?	☐ Yes ☒ No
Is there an indication of wastes containing explosives or compressed gases?	☐ Yes ☒ No
Is there an indication of PCBs liquids?	☐ Yes ☒ No
Is there an indication of the waste exhibiting the characteristic of ignitability, corrosivity, or reactivity (EPA Hazardous Waste Numbers of D001, D002, or D003)?	☐ Yes ☒ No
Is the physical form of the waste inconsistent with the Waste Stream Description or the Waste Matrix Code?	☐ Yes ☒ No
CH or RH TRAMPAC	
Are there heat-sealed bags (unvented) GREATER than 4 liters and LESS than 390 square inches in the waste, or heat sealed bags not authorized in the RH TRUCON Code?	☐ Yes ☒ No
Were there Non-approved Closure Methods used on liner bags or inner bags greater than 4 liters?	☐ Yes ☒ No
Are there sealed containers GREATER than 4 liters?	☐ Yes ☒ No
Are there indications of inadequate protection for heavy and/or sharp objects?	☐ Yes ☒ No

Comments: This Replicate scan agrees with the original scan. EL 7/27/15

RTR Operator:

Eric Lyles		7/27/2015
Print Name	Signature	Date

CCP Radiography Data Sheet

Section 1: General Information	
☐ RTR Examination ☐ RTR Replicate Scan ☒ RTR Independent Observation	
Site ID:	ORNL
Batch Number:	OR-RTR7-0148
Examination Date:	7/27/2015
Waste Container ID:	X10CSATN03211O
Video/Audio Recorded Media Number:	OR-RTR7-0148 A&B
Procedure and Revision No.:	CCP-TP-053 Rev. 15
NCR(s) associated with the container? (e.g., Prohibited Items)	☒ No ☐ Yes NCR No.: N/A NCR No.: N/A

Section 2: Waste Container Data	
Container Type:	55 Gallon Drum
TRUCON Code:	OR 225
Waste Matrix Code:	S5400
Waste Stream I.D.:	OR-REDC-CH-HET
Waste Container Weights:	Gross Wt.: 52.5 kg Tare Wt.: 33.2 kg Net Wt.: 19.3 kg
Rigid Liner and Liner Vent Description:	Liner: ☒ No ☐ Yes Lid: ☒ No ☐ Yes Type: ☐ 30-mil ☐ 90-mil ☐ 110-mil ☐ 125-mil Vented: ☐ No ☐ Yes ☒ N/A Punctured: ☒ No ☐ Yes Mechanical Vent: ☒ No ☐ Yes Fiberboard Liner: ☒ No ☐ Yes Lead Lined: ☒ No ☐ Yes
Number of Layers of Confinement:	Appears to be 1 layer
Volume Utilization Percentage:	90 %

CCP Radiography Data Sheet

Waste Container ID: X10CSATN03211O

Section 3: Container Inventory and Comments	(Detailed descriptions)
IM:	Metal hardware
AM:	
OM:	
OI:	
C:	Cloth, coveralls, tape roll
R:	Rubber gloves
XPM:	Plastic sheeting, plastic tubing, plastic suits
OR:	
IN:	
S:	

Section 4: Packaging Material and Waste Material Parameters	
Packaging Material:	**Estimated Weight (kg)**
Steel (ST):	27.8
Plastics (PP): Liner bag	1.0
Other: Cardboard (CP)	4.4
Total Packaging Weight	33.2
Waste Material Parameter:	**Estimated Weight (kg)**
Iron-based Metal / Alloys (IM):	0.3
Aluminum-based Metals / Alloys (AM):	
Other Metals (OM):	
Other Inorganic Materials (OI)	
Cellulosics (C):	6.0
Rubber (R):	0.5
Plastics (waste materials) (XPM):	12.5
Organic Matrix (OR):	
Inorganic Matrix (IN):	
Soils (S):	
Total WMP Weight:	19.3

CCP Radiography Data Sheet

Waste Container ID: X10CSATN03211O

Section 5: RTR Summary (Questions answered "Yes" will be explained in the Comment block, except for Question 1)	
Is there observable liquid?	☐ Yes ☒ No
Is there any observable liquid in internal containers, more than 60 milliliters or 3 percent by volume, whichever is greater?	☐ Yes ☒ No
Is the total volume of observable liquid in the outermost container GREATER than 1% of the container?	☐ Yes ☒ No
Is there observable liquid in payload containers with an EPA Hazardous Waste Number of U134?	☐ Yes ☒ No
Is there an indication of non-radionuclide pyrophoric materials, such as elemental potassium?	☐ Yes ☒ No
Is there an indication of hazardous wastes not occurring as co-contaminants with TRU mixed wastes (non-mixed hazardous wastes)?	☐ Yes ☒ No
Is there an indication of wastes incompatible with backfill, seal and panel closures materials, container and packaging materials, shipping container materials, or other wastes (i.e., waste does NOT match TRUCON Code[s])?	☐ Yes ☒ No
Is there an indication of wastes containing explosives or compressed gases?	☐ Yes ☒ No
Is there an indication of PCBs liquids?	☐ Yes ☒ No
Is there an indication of the waste exhibiting the characteristic of ignitability, corrosivity, or reactivity (EPA Hazardous Waste Numbers of D001, D002, or D003)?	☐ Yes ☒ No
Is the physical form of the waste inconsistent with the Waste Stream Description or the Waste Matrix Code?	☐ Yes ☒ No
CH or RH TRAMPAC	
Are there heat-sealed bags (unvented) GREATER than 4 liters and LESS than 390 square inches in the waste, or heat sealed bags not authorized in the RH TRUCON Code?	☐ Yes ☒ No
Were there Non-approved Closure Methods used on liner bags or inner bags greater than 4 liters?	☐ Yes ☒ No
Are there sealed containers GREATER than 4 liters?	☐ Yes ☒ No
Are there indications of inadequate protection for heavy and/or sharp objects?	☐ Yes ☒ No

Comments: This independent observation agrees with the original scan. EL 7/27/15

RTR Operator:

Eric Lyles		7/27/2015
Print Name	Signature	Date

CCP Radiography Data Sheet

Section 1: General Information	
[X] RTR Examination [ ] RTR Replicate Scan [ ] RTR Independent Observation	
Site ID:	ORNL
Batch Number:	OR-RTR7-0148
Examination Date:	7/27/2015
Waste Container ID:	X10C0402824E1
Video/Audio Recorded Media Number:	OR-RTR7-0148 A&B
Procedure and Revision No.:	CCP-TP-053 Rev. 15
NCR(s) associated with the container? (e.g., Prohibited Items)	[X] No [ ] Yes NCR No.: N/A NCR No.: N/A

Section 2: Waste Container Data	
Container Type:	55 Gallon Drum
TRUCON Code:	OR 225
Waste Matrix Code:	S5400
Waste Stream I.D.:	OR-RF-CH-HET
Waste Container Weights:	Gross Wt.: 66.0 kg Tare Wt.: 33.2 kg Net Wt.: 32.8 kg
Rigid Liner and Liner Vent Description:	Liner: [X] No [ ] Yes Lid: [X] No [ ] Yes Type: [ ] 30-mil [ ] 90-mil [ ] 110-mil [ ] 125-mil Vented: [ ] No [ ] Yes [X] N/A Punctured: [X] No [ ] Yes Mechanical Vent: [X] No [ ] Yes Fiberboard Liner: [X] No [ ] Yes Lead Lined: [X] No [ ] Yes
Number of Layers of Confinement:	Appears to be 2 layers
Volume Utilization Percentage:	90 %

CCP Radiography Data Sheet

Waste Container ID: X10C0402824E1

Section 3: Container Inventory and Comments (Detailed descriptions)	
IM:	Scrap metal
AM:	
OM:	
OI:	Absorbent
C:	Wood, filters, cardboard
R:	
XPM:	Plastic sheeting, plastic containers, plastic bags
OR:	
IN:	
S:	

Section 4: Packaging Material and Waste Material Parameters	
Packaging Material:	**Estimated Weight (kg)**
Steel (ST):	27.8
Plastics (PP): Liner bag	1.0
Other: Cardboard (CP)	4.4
Total Packaging Weight	33.2
Waste Material Parameter:	**Estimated Weight (kg)**
Iron-based Metal / Alloys (IM):	0.3
Aluminum-based Metals / Alloys (AM):	
Other Metals (OM):	
Other Inorganic Materials (OI)	1.5
Cellulosics (C):	22.0
Rubber (R):	
Plastics (waste materials) (XPM):	9.0
Organic Matrix (OR):	
Inorganic Matrix (IN):	
Soils (S):	
Total WMP Weight:	32.8

CCP Radiography Data Sheet

Waste Container ID: X10C0402824E1

Section 5: RTR Summary (Questions answered "Yes" will be explained in the Comment block, except for Question 1)	
Is there observable liquid?	☐ Yes ☒ No
Is there any observable liquid in internal containers, more than 60 milliliters or 3 percent by volume, whichever is greater?	☐ Yes ☒ No
Is the total volume of observable liquid in the outermost container GREATER than 1% of the container?	☐ Yes ☒ No
Is there observable liquid in payload containers with an EPA Hazardous Waste Number of U134?	☐ Yes ☒ No
Is there an indication of non-radionuclide pyrophoric materials, such as elemental potassium?	☐ Yes ☒ No
Is there an indication of hazardous wastes not occurring as co-contaminants with TRU mixed wastes (non-mixed hazardous wastes)?	☐ Yes ☒ No
Is there an indication of wastes incompatible with backfill, seal and panel closures materials, container and packaging materials, shipping container materials, or other wastes (i.e., waste does NOT match TRUCON Code[s])?	☐ Yes ☒ No
Is there an indication of wastes containing explosives or compressed gases?	☐ Yes ☒ No
Is there an indication of PCBs liquids?	☐ Yes ☒ No
Is there an indication of the waste exhibiting the characteristic of ignitability, corrosivity, or reactivity (EPA Hazardous Waste Numbers of D001, D002, or D003)?	☐ Yes ☒ No
Is the physical form of the waste inconsistent with the Waste Stream Description or the Waste Matrix Code?	☐ Yes ☒ No
CH or RH TRAMPAC	
Are there heat-sealed bags (unvented) GREATER than 4 liters and LESS than 390 square inches in the waste, or heat sealed bags not authorized in the RH TRUCON Code?	☐ Yes ☒ No
Were there Non-approved Closure Methods used on liner bags or inner bags greater than 4 liters?	☐ Yes ☒ No
Are there sealed containers GREATER than 4 liters?	☐ Yes ☒ No
Are there indications of inadequate protection for heavy and/or sharp objects?	☐ Yes ☒ No
Comments: N/A	

RTR Operator:

Daphne Brothers	Daphne O Brothers	7/27/2015
Print Name	Signature	Date

CCP Radiography Data Sheet

Section 1: General Information	
[X] RTR Examination [ ] RTR Replicate Scan [ ] RTR Independent Observation	
Site ID:	ORNL
Batch Number:	OR-RTR7-0148
Examination Date:	7/27/2015
Waste Container ID:	X10CSATN03211O
Video/Audio Recorded Media Number:	OR-RTR7-0148 A&B
Procedure and Revision No.:	CCP-TP-053 Rev. 15
NCR(s) associated with the container? (e.g., Prohibited Items)	[X] No [ ] Yes NCR No.: N/A NCR No.: N/A

Section 2: Waste Container Data	
Container Type:	55 Gallon Drum
TRUCON Code:	OR 225
Waste Matrix Code:	S5400
Waste Stream I.D.:	OR-REDC-CH-HET
Waste Container Weights:	Gross Wt.: 52.5 kg Tare Wt.: 33.2 kg Net Wt.: 19.3 kg
Rigid Liner and Liner Vent Description:	Liner: [X] No [ ] Yes Lid: [X] No [ ] Yes Type: [ ] 30-mil [ ] 90-mil [ ] 110-mil [ ] 125-mil Vented: [ ] No [ ] Yes [X] N/A Punctured: [X] No [ ] Yes Mechanical Vent: [X] No [ ] Yes Fiberboard Liner: [X] No [ ] Yes Lead Lined: [X] No [ ] Yes
Number of Layers of Confinement:	Appears to be 1 layer
Volume Utilization Percentage:	90 %

CCP Radiography Data Sheet

Waste Container ID: X10CSATN03211O

Section 3: Container Inventory and Comments (Detailed descriptions)

IM: Metal hardware

AM:

OM:

OI:

C: Coveralls,cloth, tape

R: Rubber gloves

XPM: Plastic sheeting, plastic suits, plastic tubing

OR:

IN:

S:

Section 4: Packaging Material and Waste Material Parameters

Packaging Material:	Estimated Weight (kg)
Steel (ST):	27.8
Plastics (PP): Liner bag	1.0
Other: Cardboard (CP)	4.4
Total Packaging Weight	33.2
Waste Material Parameter:	**Estimated Weight (kg)**
Iron-based Metal / Alloys (IM):	0.3
Aluminum-based Metals / Alloys (AM):	
Other Metals (OM):	
Other Inorganic Materials (OI)	
Cellulosics (C):	6.5
Rubber (R):	0.5
Plastics (waste materials) (XPM):	12.0
Organic Matrix (OR):	
Inorganic Matrix (IN):	
Soils (S):	
Total WMP Weight:	19.3

CCP Radiography Data Sheet

Waste Container ID: X10CSATN03211O

Section 5: RTR Summary (Questions answered "Yes" will be explained in the Comment block, except for Question 1)	
Is there observable liquid?	☐ Yes ☒ No
Is there any observable liquid in internal containers, more than 60 milliliters or 3 percent by volume, whichever is greater?	☐ Yes ☒ No
Is the total volume of observable liquid in the outermost container GREATER than 1% of the container?	☐ Yes ☒ No
Is there observable liquid in payload containers with an EPA Hazardous Waste Number of U134?	☐ Yes ☒ No
Is there an indication of non-radionuclide pyrophoric materials, such as elemental potassium?	☐ Yes ☒ No
Is there an indication of hazardous wastes not occurring as co-contaminants with TRU mixed wastes (non-mixed hazardous wastes)?	☐ Yes ☒ No
Is there an indication of wastes incompatible with backfill, seal and panel closures materials, container and packaging materials, shipping container materials, or other wastes (i.e., waste does NOT match TRUCON Code[s])?	☐ Yes ☒ No
Is there an indication of wastes containing explosives or compressed gases?	☐ Yes ☒ No
Is there an indication of PCBs liquids?	☐ Yes ☒ No
Is there an indication of the waste exhibiting the characteristic of ignitability, corrosivity, or reactivity (EPA Hazardous Waste Numbers of D001, D002, or D003)?	☐ Yes ☒ No
Is the physical form of the waste inconsistent with the Waste Stream Description or the Waste Matrix Code?	☐ Yes ☒ No
CH or RH TRAMPAC	
Are there heat-sealed bags (unvented) GREATER than 4 liters and LESS than 390 square inches in the waste, or heat sealed bags not authorized in the RH TRUCON Code?	☐ Yes ☒ No
Were there Non-approved Closure Methods used on liner bags or inner bags greater than 4 liters?	☐ Yes ☒ No
Are there sealed containers GREATER than 4 liters?	☐ Yes ☒ No
Are there indications of inadequate protection for heavy and/or sharp objects?	☐ Yes ☒ No
Comments: N/A	

RTR Operator:

Daphne Brothers	Daphne Brothers	7/27/2015
Print Name	Signature	Date

CCP Radiography Data Sheet

Section 1: General Information	
[X] RTR Examination [ ] RTR Replicate Scan [ ] RTR Independent Observation	
Site ID:	ORNL
Batch Number:	OR-RTR7-0148
Examination Date:	7/27/2015
Waste Container ID:	X10CSATN02300I
Video/Audio Recorded Media Number:	OR-RTR7-0148 A&B
Procedure and Revision No.:	CCP-TP-053 Rev. 15
NCR(s) associated with the container? (e.g., Prohibited Items)	[X] No [ ] Yes NCR No.: N/A NCR No.: N/A

Section 2: Waste Container Data	
Container Type:	55 Gallon Drum
TRUCON Code:	OR 225
Waste Matrix Code:	S5400
Waste Stream I.D.:	OR-RF-CH-HET
Waste Container Weights:	Gross Wt.: 54.3 kg Tare Wt.: 33.2 kg Net Wt.: 21.1 kg
Rigid Liner and Liner Vent Description:	Liner: [X] No [ ] Yes Lid: [X] No [ ] Yes Type: [ ] 30-mil [ ] 90-mil [ ] 110-mil [ ] 125-mil Vented: [ ] No [ ] Yes [X] N/A Punctured: [X] No [ ] Yes Mechanical Vent: [X] No [ ] Yes Fiberboard Liner: [X] No [ ] Yes Lead Lined: [X] No [ ] Yes
Number of Layers of Confinement:	Appears to be 1 layer
Volume Utilization Percentage:	70 %

CCP Radiography Data Sheet

Waste Container ID: X10CSATN02300I

Section 3: Container Inventory and Comments	(Detailed descriptions)
IM:	
AM:	
OM:	Scrap lead
OI:	Absorbent
C:	Coveralls, cloth
R:	Rubber gloves
XPM:	Plastic sheeting, plastic tubing
OR:	
IN:	
S:	

Section 4: Packaging Material and Waste Material Parameters	
Packaging Material:	**Estimated Weight (kg)**
Steel (ST):	27.8
Plastics (PP): Liner bag	1.0
Other: Cardboard (CP)	4.4
Total Packaging Weight	33.2
Waste Material Parameter:	**Estimated Weight (kg)**
Iron-based Metal / Alloys (IM):	
Aluminum-based Metals / Alloys (AM):	
Other Metals (OM):	1.1
Other Inorganic Materials (OI)	2.0
Cellulosics (C):	5.5
Rubber (R):	0.5
Plastics (waste materials) (XPM):	12.0
Organic Matrix (OR):	
Inorganic Matrix (IN):	
Soils (S):	
Total WMP Weight:	21.1

CCP Radiography Data Sheet

Waste Container ID: X10CSATN02300I

Section 5: RTR Summary (Questions answered "Yes" will be explained in the Comment block, except for Question 1)	
Is there observable liquid?	☐ Yes ☒ No
Is there any observable liquid in internal containers, more than 60 milliliters or 3 percent by volume, whichever is greater?	☐ Yes ☒ No
Is the total volume of observable liquid in the outermost container GREATER than 1% of the container?	☐ Yes ☒ No
Is there observable liquid in payload containers with an EPA Hazardous Waste Number of U134?	☐ Yes ☒ No
Is there an indication of non-radionuclide pyrophoric materials, such as elemental potassium?	☐ Yes ☒ No
Is there an indication of hazardous wastes not occurring as co-contaminants with TRU mixed wastes (non-mixed hazardous wastes)?	☐ Yes ☒ No
Is there an indication of wastes incompatible with backfill, seal and panel closures materials, container and packaging materials, shipping container materials, or other wastes (i.e., waste does NOT match TRUCON Code[s])?	☐ Yes ☒ No
Is there an indication of wastes containing explosives or compressed gases?	☐ Yes ☒ No
Is there an indication of PCBs liquids?	☐ Yes ☒ No
Is there an indication of the waste exhibiting the characteristic of ignitability, corrosivity, or reactivity (EPA Hazardous Waste Numbers of D001, D002, or D003)?	☐ Yes ☒ No
Is the physical form of the waste inconsistent with the Waste Stream Description or the Waste Matrix Code?	☐ Yes ☒ No
CH or RH TRAMPAC	
Are there heat-sealed bags (unvented) GREATER than 4 liters and LESS than 390 square inches in the waste, or heat sealed bags not authorized in the RH TRUCON Code?	☐ Yes ☒ No
Were there Non-approved Closure Methods used on liner bags or inner bags greater than 4 liters?	☐ Yes ☒ No
Are there sealed containers GREATER than 4 liters?	☐ Yes ☒ No
Are there indications of inadequate protection for heavy and/or sharp objects?	☐ Yes ☒ No
Comments: N/A	
RTR Operator: Daphne Brothers (Print Name) / Daphne C Brothers (Signature) / 7/27/2015 (Date)	

CCP Radiography Data Sheet

Section 1: General Information	
[X] RTR Examination [ ] RTR Replicate Scan [ ] RTR Independent Observation	
Site ID:	ORNL
Batch Number:	OR-RTR7-0148
Examination Date:	7/27/2015
Waste Container ID:	X10CSATN03211V
Video/Audio Recorded Media Number:	OR-RTR7-0148 A&B
Procedure and Revision No.:	CCP-TP-053 Rev. 15
NCR(s) associated with the container? (e.g., Prohibited Items)	[X] No [ ] Yes NCR No.: N/A NCR No.: N/A

Section 2: Waste Container Data	
Container Type:	55 Gallon Drum
TRUCON Code:	OR 225
Waste Matrix Code:	S5400
Waste Stream I.D.:	OR-REDC-CH-HET
Waste Container Weights:	Gross Wt.: 64.7 kg Tare Wt.: 33.2 kg Net Wt.: 31.5 kg
Rigid Liner and Liner Vent Description:	Liner: [X] No [ ] Yes Lid: [X] No [ ] Yes Type: [ ] 30-mil [ ] 90-mil [ ] 110-mil [ ] 125-mil Vented: [ ] No [ ] Yes [X] N/A Punctured: [X] No [ ] Yes Mechanical Vent: [X] No [ ] Yes Fiberboard Liner: [X] No [ ] Yes Lead Lined: [X] No [ ] Yes
Number of Layers of Confinement:	Appears to be 1 layer
Volume Utilization Percentage:	90 %

CCP Radiography Data Sheet

Waste Container ID: X10CSATN03211V

Section 3: Container Inventory and Comments (Detailed descriptions)	
IM:	Scrap metal,
AM:	
OM:	
OI:	
C:	Coveralls, cloth
R:	
XPM:	Plastic sheeting, plastic tubing, scrap plastic
OR:	
IN:	
S:	

Section 4: Packaging Material and Waste Material Parameters	
Packaging Material:	**Estimated Weight (kg)**
Steel (ST):	27.8
Plastics (PP): Liner bag	1.0
Other: Cardboard (CP)	4.4
Total Packaging Weight	33.2
Waste Material Parameter:	**Estimated Weight (kg)**
Iron-based Metal / Alloys (IM):	0.2
Aluminum-based Metals / Alloys (AM):	
Other Metals (OM):	
Other Inorganic Materials (OI)	
Cellulosics (C):	10.0
Rubber (R):	
Plastics (waste materials) (XPM):	21.3
Organic Matrix (OR):	
Inorganic Matrix (IN):	
Soils (S):	
Total WMP Weight:	31.5

CCP Radiography Data Sheet

Waste Container ID: X10CSATN03211V

Section 5: RTR Summary (Questions answered "Yes" will be explained in the Comment block, except for Question 1)	
Is there observable liquid?	☐ Yes ☒ No
Is there any observable liquid in internal containers, more than 60 milliliters or 3 percent by volume, whichever is greater?	☐ Yes ☒ No
Is the total volume of observable liquid in the outermost container GREATER than 1% of the container?	☐ Yes ☒ No
Is there observable liquid in payload containers with an EPA Hazardous Waste Number of U134?	☐ Yes ☒ No
Is there an indication of non-radionuclide pyrophoric materials, such as elemental potassium?	☐ Yes ☒ No
Is there an indication of hazardous wastes not occurring as co-contaminants with TRU mixed wastes (non-mixed hazardous wastes)?	☐ Yes ☒ No
Is there an indication of wastes incompatible with backfill, seal and panel closures materials, container and packaging materials, shipping container materials, or other wastes (i.e., waste does NOT match TRUCON Code[s])?	☐ Yes ☒ No
Is there an indication of wastes containing explosives or compressed gases?	☐ Yes ☒ No
Is there an indication of PCBs liquids?	☐ Yes ☒ No
Is there an indication of the waste exhibiting the characteristic of ignitability, corrosivity, or reactivity (EPA Hazardous Waste Numbers of D001, D002, or D003)?	☐ Yes ☒ No
Is the physical form of the waste inconsistent with the Waste Stream Description or the Waste Matrix Code?	☐ Yes ☒ No
CH or RH TRAMPAC	
Are there heat-sealed bags (unvented) GREATER than 4 liters and LESS than 390 square inches in the waste, or heat sealed bags not authorized in the RH TRUCON Code?	☐ Yes ☒ No
Were there Non-approved Closure Methods used on liner bags or inner bags greater than 4 liters?	☐ Yes ☒ No
Are there sealed containers GREATER than 4 liters?	☐ Yes ☒ No
Are there indications of inadequate protection for heavy and/or sharp objects?	☐ Yes ☒ No
Comments: N/A	

RTR Operator:

Daphne Brothers	Daphne Brothers	7/27/2015
Print Name	Signature	Date

CCP Radiography Data Sheet

Section 1: General Information	
[X] RTR Examination [ ] RTR Replicate Scan [ ] RTR Independent Observation	
Site ID:	ORNL
Batch Number:	OR-RTR7-0148
Examination Date:	7/27/2015
Waste Container ID:	X10CSATN03211Q
Video/Audio Recorded Media Number:	OR-RTR7-0148 A&B
Procedure and Revision No.:	CCP-TP-053 Rev. 15
NCR(s) associated with the container?	[X] No [ ] Yes
(e.g., Prohibited Items)	NCR No.: N/A NCR No.: N/A

Section 2: Waste Container Data	
Container Type:	55 Gallon Drum
TRUCON Code:	OR 225
Waste Matrix Code:	S5400
Waste Stream I.D.:	OR-REDC-CH-HET
Waste Container Weights:	Gross Wt.: 54.4 kg Tare Wt.: 33.2 kg Net Wt.: 21.2 kg
Rigid Liner and Liner Vent Description:	Liner: [X] No [ ] Yes Lid: [X] No [ ] Yes Type: [ ] 30-mil [ ] 90-mil [ ] 110-mil [ ] 125-mil Vented: [ ] No [ ] Yes [X] N/A Punctured: [X] No [ ] Yes Mechanical Vent: [X] No [ ] Yes Fiberboard Liner: [X] No [ ] Yes Lead Lined: [X] No [ ] Yes
Number of Layers of Confinement:	Appears to be 1 layer
Volume Utilization Percentage:	80 %

CCP Radiography Data Sheet

Waste Container ID: X10CSATN03211Q

Section 3: Container Inventory and Comments (Detailed descriptions)	
IM:	
AM:	
OM:	
OI:	
C:	Coveralls, cloth, cardboard
R:	Rubber gloves
XPM:	Plastic sheeting, plastic tubing, plastic suits
OR:	
IN:	
S:	

Section 4: Packaging Material and Waste Material Parameters	
Packaging Material:	**Estimated Weight (kg)**
Steel (ST):	27.8
Plastics (PP): Liner bag	1.0
Other: Cardboard (CP)	4.4
Total Packaging Weight	33.2
Waste Material Parameter:	**Estimated Weight (kg)**
Iron-based Metal / Alloys (IM):	
Aluminum-based Metals / Alloys (AM):	
Other Metals (OM):	
Other Inorganic Materials (OI)	
Cellulosics (C):	6.0
Rubber (R):	0.2
Plastics (waste materials) (XPM):	15.0
Organic Matrix (OR):	
Inorganic Matrix (IN):	
Soils (S):	
Total WMP Weight:	21.2

CCP Radiography Data Sheet

Waste Container ID: X10CSATN03211Q

Section 5: RTR Summary (Questions answered "Yes" will be explained in the Comment block, except for Question 1)	
Is there observable liquid?	☐ Yes ☒ No
Is there any observable liquid in internal containers, more than 60 milliliters or 3 percent by volume, whichever is greater?	☐ Yes ☒ No
Is the total volume of observable liquid in the outermost container GREATER than 1% of the container?	☐ Yes ☒ No
Is there observable liquid in payload containers with an EPA Hazardous Waste Number of U134?	☐ Yes ☒ No
Is there an indication of non-radionuclide pyrophoric materials, such as elemental potassium?	☐ Yes ☒ No
Is there an indication of hazardous wastes not occurring as co-contaminants with TRU mixed wastes (non-mixed hazardous wastes)?	☐ Yes ☒ No
Is there an indication of wastes incompatible with backfill, seal and panel closures materials, container and packaging materials, shipping container materials, or other wastes (i.e., waste does NOT match TRUCON Code[s])?	☐ Yes ☒ No
Is there an indication of wastes containing explosives or compressed gases?	☐ Yes ☒ No
Is there an indication of PCBs liquids?	☐ Yes ☒ No
Is there an indication of the waste exhibiting the characteristic of ignitability, corrosivity, or reactivity (EPA Hazardous Waste Numbers of D001, D002, or D003)?	☐ Yes ☒ No
Is the physical form of the waste inconsistent with the Waste Stream Description or the Waste Matrix Code?	☐ Yes ☒ No
CH or RH TRAMPAC	
Are there heat-sealed bags (unvented) GREATER than 4 liters and LESS than 390 square inches in the waste, or heat sealed bags not authorized in the RH TRUCON Code?	☐ Yes ☒ No
Were there Non-approved Closure Methods used on liner bags or inner bags greater than 4 liters?	☐ Yes ☒ No
Are there sealed containers GREATER than 4 liters?	☐ Yes ☒ No
Are there indications of inadequate protection for heavy and/or sharp objects?	☐ Yes ☒ No
Comments: N/A	

RTR Operator:

Daphne Brothers	Daphne Brothers	7/27/2015
Print Name	Signature	Date

CCP Radiography Data Sheet

Section 1: General Information	
[X] RTR Examination [ ] RTR Replicate Scan [ ] RTR Independent Observation	
Site ID:	ORNL
Batch Number:	OR-RTR7-0148
Examination Date:	7/27/2015
Waste Container ID:	X10CSATN03211P
Video/Audio Recorded Media Number:	OR-RTR7-0148 A&B
Procedure and Revision No.:	CCP-TP-053 Rev. 15
NCR(s) associated with the container? (e.g., Prohibited Items)	[X] No [ ] Yes NCR No.: N/A NCR No.: N/A

Section 2: Waste Container Data	
Container Type:	55 Gallon Drum
TRUCON Code:	OR 225
Waste Matrix Code:	S5400
Waste Stream I.D.:	OR-REDC-CH-HET
Waste Container Weights:	Gross Wt.: 67.6 kg Tare Wt.: 33.2 kg Net Wt.: 34.4 kg
Rigid Liner and Liner Vent Description:	Liner: [X] No [ ] Yes Lid: [X] No [ ] Yes Type: [ ] 30-mil [ ] 90-mil [ ] 110-mil [ ] 125-mil Vented: [ ] No [ ] Yes [X] N/A Punctured: [X] No [ ] Yes Mechanical Vent: [X] No [ ] Yes Fiberboard Liner: [X] No [ ] Yes Lead Lined: [X] No [ ] Yes
Number of Layers of Confinement:	Appears to be 1 layer
Volume Utilization Percentage:	80 %

CCP Radiography Data Sheet

Waste Container ID: X10CSATN03211P

Section 3: Container Inventory and Comments (Detailed descriptions)	
IM:	Scrap metal
AM:	
OM:	
OI:	Floor sweepings
C:	Cloth, coveralls
R:	Rubber gloves
XPM:	Plastic sheeting, plastic tubing, scrap plastic
OR:	
IN:	
S:	

Section 4: Packaging Material and Waste Material Parameters	
Packaging Material:	**Estimated Weight (kg)**
Steel (ST):	27.8
Plastics (PP): Liner bag	1.0
Other: Cardboard (CP)	4.4
Total Packaging Weight	33.2
Waste Material Parameter:	**Estimated Weight (kg)**
Iron-based Metal / Alloys (IM):	2.0
Aluminum-based Metals / Alloys (AM):	
Other Metals (OM):	
Other Inorganic Materials (OI)	2.0
Cellulosics (C):	10.0
Rubber (R):	0.4
Plastics (waste materials) (XPM):	20.0
Organic Matrix (OR):	
Inorganic Matrix (IN):	
Soils (S):	
Total WMP Weight:	34.4

CCP Radiography Data Sheet

Waste Container ID: X10CSATN03211P

Section 5: RTR Summary (Questions answered "Yes" will be explained in the Comment block, except for Question 1)	
Is there observable liquid?	☐ Yes ☒ No
Is there any observable liquid in internal containers, more than 60 milliliters or 3 percent by volume, whichever is greater?	☐ Yes ☒ No
Is the total volume of observable liquid in the outermost container GREATER than 1% of the container?	☐ Yes ☒ No
Is there observable liquid in payload containers with an EPA Hazardous Waste Number of U134?	☐ Yes ☒ No
Is there an indication of non-radionuclide pyrophoric materials, such as elemental potassium?	☐ Yes ☒ No
Is there an indication of hazardous wastes not occurring as co-contaminants with TRU mixed wastes (non-mixed hazardous wastes)?	☐ Yes ☒ No
Is there an indication of wastes incompatible with backfill, seal and panel closures materials, container and packaging materials, shipping container materials, or other wastes (i.e., waste does NOT match TRUCON Code[s])?	☐ Yes ☒ No
Is there an indication of wastes containing explosives or compressed gases?	☐ Yes ☒ No
Is there an indication of PCBs liquids?	☐ Yes ☒ No
Is there an indication of the waste exhibiting the characteristic of ignitability, corrosivity, or reactivity (EPA Hazardous Waste Numbers of D001, D002, or D003)?	☐ Yes ☒ No
Is the physical form of the waste inconsistent with the Waste Stream Description or the Waste Matrix Code?	☐ Yes ☒ No
CH or RH TRAMPAC	
Are there heat-sealed bags (unvented) GREATER than 4 liters and LESS than 390 square inches in the waste, or heat sealed bags not authorized in the RH TRUCON Code?	☐ Yes ☒ No
Were there Non-approved Closure Methods used on liner bags or inner bags greater than 4 liters?	☐ Yes ☒ No
Are there sealed containers GREATER than 4 liters?	☐ Yes ☒ No
Are there indications of inadequate protection for heavy and/or sharp objects?	☐ Yes ☒ No
Comments: N/A	

RTR Operator:

Daphne Brothers	Daphne Brothers	7/27/2015
Print Name	Signature	Date

CCP Radiography Data Sheet

Section 1: General Information	
[X] RTR Examination [ ] RTR Replicate Scan [ ] RTR Independent Observation	
Site ID:	ORNL
Batch Number:	OR-RTR7-0148
Examination Date:	7/27/2015
Waste Container ID:	X10CSATN03211S
Video/Audio Recorded Media Number:	OR-RTR7-0148 A&B
Procedure and Revision No.:	CCP-TP-053 Rev. 15
NCR(s) associated with the container?	[X] No [ ] Yes
(e.g., Prohibited Items)	NCR No.: N/A NCR No.: N/A

Section 2: Waste Container Data	
Container Type:	55 Gallon Drum
TRUCON Code:	OR 225
Waste Matrix Code:	S5400
Waste Stream I.D.:	OR-REDC-CH-HET
Waste Container Weights:	Gross Wt.: 61.0 kg Tare Wt.: 33.2 kg Net Wt.: 27.8 kg
Rigid Liner and Liner Vent Description:	Liner: [X] No [ ] Yes Lid: [X] No [ ] Yes Type: [ ] 30-mil [ ] 90-mil [ ] 110-mil [ ] 125-mil Vented: [ ] No [ ] Yes [X] N/A Punctured: [X] No [ ] Yes Mechanical Vent: [X] No [ ] Yes Fiberboard Liner: [X] No [ ] Yes Lead Lined: [X] No [ ] Yes
Number of Layers of Confinement:	Appears to be 1 layer
Volume Utilization Percentage:	90 %

CCP Radiography Data Sheet

Waste Container ID: X10CSATN03211S

Section 3: Container Inventory and Comments	(Detailed descriptions)
IM:	Metal pans, scrap metal, metal hardware, saw blade
AM:	
OM:	
OI:	
C:	Paint brushes, leather gloves
R:	
XPM:	Plastic sheeting, scrap plastic, plastic tubing
OR:	
IN:	
S:	

Section 4: Packaging Material and Waste Material Parameters	
Packaging Material:	**Estimated Weight (kg)**
Steel (ST):	27.8
Plastics (PP): Liner bag	1.0
Other: Cardboard (CP)	4.4
Total Packaging Weight	33.2
Waste Material Parameter:	**Estimated Weight (kg)**
Iron-based Metal / Alloys (IM):	5.0
Aluminum-based Metals / Alloys (AM):	
Other Metals (OM):	
Other Inorganic Materials (OI)	
Cellulosics (C):	1.8
Rubber (R):	
Plastics (waste materials) (XPM):	21.0
Organic Matrix (OR):	
Inorganic Matrix (IN):	
Soils (S):	
Total WMP Weight:	27.8

CCP Radiography Data Sheet

Waste Container ID: X10CSATN03211S

Section 5: RTR Summary (Questions answered "Yes" will be explained in the Comment block, except for Question 1)	
Is there observable liquid?	☐ Yes ☒ No
Is there any observable liquid in internal containers, more than 60 milliliters or 3 percent by volume, whichever is greater?	☐ Yes ☒ No
Is the total volume of observable liquid in the outermost container GREATER than 1% of the container?	☐ Yes ☒ No
Is there observable liquid in payload containers with an EPA Hazardous Waste Number of U134?	☐ Yes ☒ No
Is there an indication of non-radionuclide pyrophoric materials, such as elemental potassium?	☐ Yes ☒ No
Is there an indication of hazardous wastes not occurring as co-contaminants with TRU mixed wastes (non-mixed hazardous wastes)?	☐ Yes ☒ No
Is there an indication of wastes incompatible with backfill, seal and panel closures materials, container and packaging materials, shipping container materials, or other wastes (i.e., waste does NOT match TRUCON Code[s])?	☐ Yes ☒ No
Is there an indication of wastes containing explosives or compressed gases?	☐ Yes ☒ No
Is there an indication of PCBs liquids?	☐ Yes ☒ No
Is there an indication of the waste exhibiting the characteristic of ignitability, corrosivity, or reactivity (EPA Hazardous Waste Numbers of D001, D002, or D003)?	☐ Yes ☒ No
Is the physical form of the waste inconsistent with the Waste Stream Description or the Waste Matrix Code?	☐ Yes ☒ No
CH or RH TRAMPAC	
Are there heat-sealed bags (unvented) GREATER than 4 liters and LESS than 390 square inches in the waste, or heat sealed bags not authorized in the RH TRUCON Code?	☐ Yes ☒ No
Were there Non-approved Closure Methods used on liner bags or inner bags greater than 4 liters?	☐ Yes ☒ No
Are there sealed containers GREATER than 4 liters?	☐ Yes ☒ No
Are there indications of inadequate protection for heavy and/or sharp objects?	☐ Yes ☒ No

Comments: N/A

RTR Operator:

Daphne Brothers	Daphne O Brothers	7/27/2015
Print Name	Signature	Date

CCP Radiography Data Sheet

Section 1: General Information	
[X] RTR Examination [ ] RTR Replicate Scan [ ] RTR Independent Observation	
Site ID:	ORNL
Batch Number:	OR-RTR7-0148
Examination Date:	7/27/2015
Waste Container ID:	X10CSATN03211W
Video/Audio Recorded Media Number:	OR-RTR7-0148 A&B
Procedure and Revision No.:	CCP-TP-053 Rev. 15
NCR(s) associated with the container? (e.g., Prohibited Items)	[X] No [ ] Yes NCR No.: N/A NCR No.: N/A

Section 2: Waste Container Data	
Container Type:	55 Gallon Drum
TRUCON Code:	OR 225
Waste Matrix Code:	S5400
Waste Stream I.D.:	OR-REDC-CH-HET
Waste Container Weights:	Gross Wt.: 62.2 kg Tare Wt.: 33.2 kg Net Wt.: 29.0 kg
Rigid Liner and Liner Vent Description:	Liner: [X] No [ ] Yes Lid: [X] No [ ] Yes Type: [ ] 30-mil [ ] 90-mil [ ] 110-mil [ ] 125-mil Vented: [ ] No [ ] Yes [X] N/A Punctured: [X] No [ ] Yes Mechanical Vent: [X] No [ ] Yes Fiberboard Liner: [X] No [ ] Yes Lead Lined: [X] No [ ] Yes
Number of Layers of Confinement:	Appears to be 1 layer
Volume Utilization Percentage:	80 %

CCP Radiography Data Sheet

Waste Container ID: X10CSATN03211W

Section 3: Container Inventory and Comments	(Detailed descriptions)
IM:	Scrap metal
AM:	
OM:	
OI:	
C:	Cloth, coveralls
R:	Rubber gloves
XPM:	Plastic sheeting, scrap plastic, plastic tubing, plastic suits
OR:	
IN:	
S:	

Section 4: Packaging Material and Waste Material Parameters	
Packaging Material:	**Estimated Weight (kg)**
Steel (ST):	27.8
Plastics (PP): Liner bag	1.0
Other: Cardboard (CP)	4.4
Total Packaging Weight	33.2
Waste Material Parameter:	**Estimated Weight (kg)**
Iron-based Metal / Alloys (IM):	1.5
Aluminum-based Metals / Alloys (AM):	
Other Metals (OM):	
Other Inorganic Materials (OI)	
Cellulosics (C):	8.0
Rubber (R):	0.5
Plastics (waste materials) (XPM):	19.0
Organic Matrix (OR):	
Inorganic Matrix (IN):	
Soils (S):	
Total WMP Weight:	29.0

CCP Radiography Data Sheet

Waste Container ID: X10CSATN03211W

Section 5: RTR Summary (Questions answered "Yes" will be explained in the Comment block, except for Question 1)	
Is there observable liquid?	☐ Yes ☒ No
Is there any observable liquid in internal containers, more than 60 milliliters or 3 percent by volume, whichever is greater?	☐ Yes ☒ No
Is the total volume of observable liquid in the outermost container GREATER than 1% of the container?	☐ Yes ☒ No
Is there observable liquid in payload containers with an EPA Hazardous Waste Number of U134?	☐ Yes ☒ No
Is there an indication of non-radionuclide pyrophoric materials, such as elemental potassium?	☐ Yes ☒ No
Is there an indication of hazardous wastes not occurring as co-contaminants with TRU mixed wastes (non-mixed hazardous wastes)?	☐ Yes ☒ No
Is there an indication of wastes incompatible with backfill, seal and panel closures materials, container and packaging materials, shipping container materials, or other wastes (i.e., waste does NOT match TRUCON Code[s])?	☐ Yes ☒ No
Is there an indication of wastes containing explosives or compressed gases?	☐ Yes ☒ No
Is there an indication of PCBs liquids?	☐ Yes ☒ No
Is there an indication of the waste exhibiting the characteristic of ignitability, corrosivity, or reactivity (EPA Hazardous Waste Numbers of D001, D002, or D003)?	☐ Yes ☒ No
Is the physical form of the waste inconsistent with the Waste Stream Description or the Waste Matrix Code?	☐ Yes ☒ No
CH or RH TRAMPAC	
Are there heat-sealed bags (unvented) GREATER than 4 liters and LESS than 390 square inches in the waste, or heat sealed bags not authorized in the RH TRUCON Code?	☐ Yes ☒ No
Were there Non-approved Closure Methods used on liner bags or inner bags greater than 4 liters?	☐ Yes ☒ No
Are there sealed containers GREATER than 4 liters?	☐ Yes ☒ No
Are there indications of inadequate protection for heavy and/or sharp objects?	☐ Yes ☒ No
Comments: N/A	

RTR Operator:

Daphne Brothers	Daphne C Brothers	7/27/2015
Print Name	Signature	Date

Attachment 3 – CCP Radiography Independent Technical Reviewer Checklist

Batch Data Report No.: OR-RTR7-0148

Description			
1.	Were data generation and reduction conducted in a technically correct manner in accordance with the methods used?	☐ NO	☑ YES
2.	Was the correct revision of the procedure used? Procedure: CCP-TP-053 Rev.: 15	☐ NO	☑ YES
3.	Are the WMPs entered correctly?	☐ NO	☑ YES
4.	Do the estimated weights in Section 4 of Attachment 2 equal the container gross weight?	☐ NO	☑ YES
5.	Is the data reported in the proper units with the correct number of significant figures (e.g., one tenth of a kilogram)?	☐ NO	☑ YES
6.	Was transcription used? If no, proceed to question 7.	☑ NO	☐ YES
	6a. Has the data been verified for transcription errors?	☐ NO	☐ YES
7.	Does the Testing Batch Report include radiography for up to 20 containers?	☐ NO	☑ YES
8.	Are BDR contents complete and do they match the CCP Waste RTR Batch Data Report Table of Contents?	☐ NO	☑ YES
9.	Is all the data signed and dated in reproducible ink and by the individual(s) generating it?	☐ NO	☑ YES
10.	Is all data recorded clearly, legibly, and accurately?	☐ NO	☑ YES
11.	Have changes been made to original data? If no, proceed to question 12.	☑ NO	☐ YES
	11a. Have all changes to original data been lined out, initialed and dated by the individual making the changes?	☐ NO	☐ YES
	11b. Was justification made for changing the original data?	☐ NO	☐ YES
	11c. Were data changes made by the individual who originally collected the data?	☐ NO	☐ YES
12.	Does the waste match the Waste Matrix Code and Waste Stream description?	☐ NO	☑ YES
13.	Are the RTR Operator's decisions regarding the Radiography documented?	☐ NO	☑ YES
14.	Is there an adequate written description of the contents of each item?	☐ NO	☑ YES
15.	Was the video/audio recording media properly prepared and labeled for each waste container?	☐ NO	☑ YES
16.	Was the video/audio recording media check performed satisfactorily and recorded on Attachment 1?	☐ NO	☑ YES

Attachment 3 – CCP Radiography Independent Technical Reviewer Checklist (Continued)

Batch Data Report No.: OR-RTR7-0148

Description			
17.	Was the Image Test performed satisfactorily and recorded on Attachment 1?	☐ NO	☑ YES
18.	Was the Replicate Scan performed and recorded on an Attachment 2?	☐ NO	☑ YES
19.	Was the Replicate Scan RTR Operator different from the first RTR Operator?	☐ NO	☑ YES
20.	Did the Replicate Scan RTR Operator and the first RTR Operator agree on the results?	☐ NO	☑ YES
21.	Was the Independent Observation performed and recorded on an Attachment 2?	☐ NO	☑ YES
22.	Was the Independent Observation RTR Operator different from the first RTR Operator?	☐ NO	☑ YES
23.	Did the Independent Observation RTR Operator and the first RTR Operator agree on the results?	☐ NO	☑ YES
24.	Was the data collection performed by qualified individuals?	☐ NO	☑ YES
25.	Were NCRs initiated as required at DGL? If no, proceed to question 26.	☑ NO	☐ YES
	25a. Have the NCR(s) associated with RTR been included in the BDR?	☐ NO	☐ YES
26.	Is the RTR examination for CH waste? If no, proceed to question 27.	☐ NO	☑ YES
	26a. Have the CH Quality Assurance Objectives (QAOs) been met (if applicable)? Precision – Precision is maintained by reconciling any discrepancies between two radiography operators with regard to identification of the waste matrix code, liquids in excess of TSDF-WAC limits, and compressed gases through independent replicate scans and independent observations. Additionally, the precision of radiography is verified prior to use by tuning precisely enough to demonstrate compliance with QAOs through viewing an image test pattern. Accuracy – Accuracy is obtained by using a target to tune the image for maximum sharpness and by requiring operators to successfully identify 100 percent of the items required to meet the DQOs for radiography specified in CCP-PO-001, Section C-4a(1) in a training container during their initial qualification and subsequent requalification. Completeness – A video and audio media recording of the radiography examination and a validated radiography data form will be obtained for 100 percent of the waste containers subject to radiography. All video and audio media recordings and radiography data forms will be subject to validation as indicated in CCP-PO-001, Section C3-4. Comparability – The comparability of radiography data from different operators shall be enhanced by using standardized radiography procedures and operator qualifications.	☐ NO	☑ YES

Attachment 3 – CCP Radiography Independent Technical Reviewer Checklist (Continued)

Batch Data Report No.: OR-RTR7-0148

Description		
27. Is the RTR examination for RH waste? If no, proceed to comment section.	☑ NO	☐ YES
27a. Have the RH QAOs been met (if applicable)? Precision – Precision is maintained by reconciling any discrepancies between two operators (during Independent Observation and Replicate scans) with regard to the identification of important waste characteristics (i.e., physical form of the waste and absence of prohibited liquids) within a single container. Accuracy – Accuracy is obtained by using a target to tune the image for maximum sharpness and by requiring operators to successfully identify prohibited liquid in a training container during their initial qualification and subsequent requalification. Representativeness – All of the relevant contents in a container selected for radiography will be described. Completeness – All of the relevant waste information must be assembled and must show that each of the containers in the waste stream belongs to the waste stream. This information must be documented on videotape or other equivalent media and data form. Comparability – Comparability is ensured by meeting the program training requirements and complying with the minimum standards used to implement the radiography process.	☐ NO	☐ YES

Comments: N/A

I have reviewed 100% of the container specific and batch data in this report and find it acceptable.

Independent Technical Reviewer:

Printed Name	Signature	Date
Fred Covey		8-3-15

DIVIDER PAGE ONLY

Not Part of Page Count

Attachment 2 – CCP Records Transmittal/Receiving Form

CCP Records / Records Custodian, 4021 National Parks Highway - MS: GSA 212, Carlsbad, New Mexico 88220

Telephone Number: 575-234-7523

Fax Number: 575-234-7033

Attn:	CCP RECORDS	From:	PATRICK SMITH II
Ship to:	CCP RECORDS CUSTODIAN	Site:	ORNL
	4021 NATIONAL PARKS HWY.	Company:	TFE INC.
	MS GSA 212	Telephone Number:	865-574-6002
	CARLSBAD, NM 88220-9082	Date Sent:	8-04-2015
Telephone Number:	575-234-7523		

Document Number	Title / Description	Record Date	Total Pages
OR-RTR7-0148	RTR DVD (DISK B)	7-27-2015	N/A
N/A	N/A	N/A	N/A
N/A	N/A	N/A	N/A
N/A	N/A	N/A	N/A
N/A	N/A	N/A	N/A
N/A	N/A	N/A	N/A

Comments:

N/A

(When the Record accepted line has been completed, the rest of the page below may be left blank.)

Acceptance/Rejection Signature and Date

Records Accepted ☑	Signature	Jewell Humble (Printed Name)	8.11.15 (Date)
Records Rejected ☐	Signature	Printed Name	Date

Reason for Rejection:

Re-submittal:	Signature	Printed Name	Date

****
*** Send Results ***
****

Sending is complete.

Job No.	1553
Address	918655768703
Name	ORNL
Start Time	08/11 12:30 PM
Call Length	00'20
Sheets	1
Result	OK

Attachment 2 – CCP Records Transmittal/Receiving Form

CCP Records / Records Custodian, 4021 National Parks Highway - MS: GSA 212, Carlsbad, New Mexico 88220

Telephone Number: 575-234-7523

Fax Number: 575-234-7033

Attn:	CCP RECORDS	From:	PATRICK SMITH II
Ship to:	CCP RECORDS CUSTODIAN	Site:	ORNL
	4021 NATIONAL PARKS HWY.	Company:	TFE INC.
	MS GSA 212	Telephone Number:	865-574-6002
	CARLSBAD, NM 88220-9082	Date Sent:	8-04-2015
Telephone Number:	575-234-7523		

Document Number	Type/Description	Received Date	Comments
OR-RTR7-0148	RTR DVD (DISK B)	7-27-2015	N/A
N/A	N/A	N/A	N/A
N/A	N/A	N/A	N/A
N/A	N/A	N/A	N/A
N/A	N/A	N/A	N/A
N/A	N/A	N/A	N/A

Comments:

N/A

(When the Record accepted line has been completed, the rest of the page below may be left blank.)

Acceptance/Rejection Signature and Date

Records Accepted [x] Signature Jewell Trumble Printed Name 8.11.15 Date

Records Rejected [ ]

Attachment 2 – CCP Records Transmittal/Receiving Form

CCP Records / Records Custodian, 4021 National Parks Highway - MS: GSA 212, Carlsbad, New Mexico 88220

Telephone Number: 575-234-7523

Fax Number: 575-234-7033

Attn:	CCP RECORDS	From:	PATRICK SMITH II
Ship to:	CCP RECORDS CUSTODIAN	Site:	ORNL
	4021 NATIONAL PARKS HWY.	Company:	TFE INC.
	MS GSA 212	Telephone Number:	865-574-6002
	CARLSBAD, NM 88220-9082	Date Sent:	8-06-2015
Telephone Number:	575-234-7523		

Document Number	Title / Description	Record Date	Total Pages
OR-RTR7-0148	RTR BDR	7-27-2015	36
OR-RTR7-0148	RTR DVD (DISK A)	7-27-2015	N/A
N/A	N/A	N/A	N/A
N/A	N/A	N/A	N/A
N/A	N/A	N/A	N/A
N/A	N/A	N/A	N/A

Comments

N/A

(When the Record accepted line has been completed, the rest of the page below may be left blank.)

Acceptance/Rejection Signature and Date

Records Accepted ☑	[signature]	Jewell Hurnalde	8.12.15.
	Signature	Printed Name	Date
Records Rejected ☐			
	Signature	Printed Name	Date

Reason for Rejection:

Re-submittal:

Signature	Printed Name	Date

****
*** Send Results ***
****

Sending is complete.

Job No.	1566
Address	918655768703
Name	ORNL
Start Time	08/12 09:30 AM
Call Length	00'19
Sheets	1
Result	OK

Attachment 2 – CCP Records Transmittal/Receiving Form

CCP Records / Records Custodian, 4021 National Parks Highway - MS: GSA 212, Carlsbad, New Mexico 88220

Telephone Number: 575-234-7523

Fax Number: 575-234-7033

Attn:	CCP RECORDS	From:	PATRICK SMITH II
Ship to:	CCP RECORDS CUSTODIAN	Site:	ORNL
	4021 NATIONAL PARKS HWY.	Company:	TFE INC.
	MS GSA 212	Telephone Number:	865-574-6002
	CARLSBAD, NM 88220-9082	Date Sent:	8-06-2015
Telephone Number:	575-234-7523		

Document Number	Description	Record Date	Quantity
OR-RTR7-0148	RTR BDR	7-27-2015	36
OR-RTR7-0148	RTR DVD (DISK A)	7-27-2015	N/A
N/A	N/A	N/A	N/A
N/A	N/A	N/A	N/A
N/A	N/A	N/A	N/A
N/A	N/A	N/A	N/A

N/A

(When the Record accepted line has been completed, the rest of the page below may be left blank.)
Acceptance/Rejection Signature and Date

Records Accepted ☑ [signature] Signature — Jewell Hurnable Printed Name — 8.12.15. Date

Records Rejected ☐

Attachment 2 – CCP SPM Radiography Project Level Validation Checklist and Summary

BDR Number: OR-RTR7-0138				Examination Date(s): 6/22/2015
Description of Criteria Reviewed	**Criteria Met?**			**Comments/Qualifiers**
	YES	**NO**	**NA**	
1. Is the completed, signed, and dated Independent Technical Reviewer Checklist included in the BDR, and the independent technical reviewer was not involved in the generation or recording of the data under review? **Reference Source: CCP-PO-001, C3-4**	X			
2. Does the BDR contain all items addressed in the BDR Table of Contents? **Reference Source: CCP-PO-001, C3-4**	X			
3. Does the BDR include a listing of all the container numbers in the batch? **Reference Source: CCP-PO-001, C3-4**	X			
4. List all containers that have met QAOs. **Reference Source: CCP-PO-001, C3-4**				Container Numbers: X10C1350957 X10C1350959 X10C1350960 X10C1350963 X10C1350975 X10C1351016 X10C1351020 X10C1351021 X10C1351023 X10C1351142 X10C1351147 X10C1351161
5. Does the BDR identify the current implementing procedure and revision number? **Reference Source: CCP-PO-001, Table C3-3**	X			
6. Is there a reference to or copy of any associated NCRs (if any) in the BDR? NA if no NCRs. **Reference Source: CCP-PO-001, Table C3-3**			X	
7. Are there 20 or fewer containers in the batch? **Reference Source: CCP-PO-001, C3-4**	X			
8. Are the data properly reported (i.e., data are reported in correct units and with correct significant figures)? **Reference Source: CCP-PO-001, C3-4**	X			
9. Is there evidence of verification that the physical form matches the Waste Matrix Code? **Reference Source: CCP-PO-001, Table C3-3**	X			

Attachment 2 – CCP SPM Radiography Project Level Validation Checklist and Summary (Continued)

BDR Number: OR-RTR7-0138			Examination Date(s): 6/22/2015	
Description of Criteria Reviewed	**Criteria Met?**			**Comments/Qualifiers**
	YES	**NO**	**NA**	
10. Is there evidence of verification that the physical form matches the waste stream description? **Reference Source: CCP-PO-001, Table C3-3**	X			
11. Are prohibited items absent? **Reference Source: CCP-PO-001, Table C3-3**	X			
12. Does observable liquid, if present, meet the criteria of the TSDF-WAC? **Reference Source: CCP-PO-001, C-1**			X	No observable liquid.
13. Were discrepancies between two operators with regard to identification of waste matrix code, liquids in excess of the TSDF-WAC, or compressed gases through replicate scans and independent observations reconciled? NA if no discrepancies. **Reference Source: CCP-PO-001, C3-2**			X	
14. Are the training qualifications for all radiography personnel acceptable? **Reference Source: CCP-PO-001, C3-8**	X			
15. Was evidence of the video/audio check included in the BDR? **Reference Source: CCP-PO-001, C1-1**	X			
16. Was the Lines-Pair Resolution Test or Sieve Test Check included in the BDR? **Reference Source: CCP Technical Procedures**	X			
17. Was a replicate scan performed once per day, or once per batch, whichever is LESS frequent? **Reference Source: CCP-PO-001, C1-1**	X			
18. Was an independent observation performed once per day, or once per batch, whichever is LESS frequent? **Reference Source: CCP-PO-001, C1-1**	X			

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Real-Time Radiography (RTR) Operator/Independent Technical Reviewer (ITR) Qualification Card

Name: Thad Hasselstrom

Education/Experience		
Resume documenting education on file with Central Characterization Program (CCP) Training.		Cheryl Arroyo 03-06-15 CCP Training Date
National Standard Requirements		
SNT-TC-1A Requirements	1. Real-Time Radiography (RTR) NDT Level II (L) certification from an approved vendor. *(Always Required)*	Cheryl Arroyo 03-06-15 CCP Training Date
	2. Eye Examination: *(Always Required)* Jaeger Test (J-2) Date: 01-22-15 Color Vision or Gray Scale Test Date: 01-22-15	Cheryl Arroyo 03-06-15 CCP Training Date
Job Specific Training		
☐ Initial Qualification	☐ Requalification	☑ Full Requalification
Qualification Limit	**This qualification is valid for two (2) years.** If necessary, additional training may be required by the Site Project Manager (SPM) or the Manager Responsible for Training. Unsatisfactory performance will result in disqualification by the Manager Responsible for Training. The candidate must successfully complete the entire qualification card to reestablish qualification.	
Requalification Requirements	Items required for requalification are identified by text.	

Real-Time Radiography (RTR) Operator/Independent Technical Reviewer (ITR) Qualification Card

Name: Thad Hasselstrom

Indoctrination
(Required at Initial Qualification and Full Requalification)

Initial/Indoctrination Reading:

1. DOE/WIPP 02-3214, *Remote-Handled TRU Waste Characterization Program Implementation Plan*
2. WP 15-GM1002, *Issues Management Processing of WIPP Forms*
3. CCP-HSP-014, *Health and Safety Program Implementation for CCP*
4. CCP-PO-001, *CCP Transuranic Waste Characterization Quality Assurance Project Plan*
5. CCP-PO-002, *CCP Transuranic Waste Certification Plan*
6. CCP-PO-003, *CCP Transuranic Authorized Methods for Payload Control (TRAMPAC)*
7. CCP-PO-005, *CCP Conduct of Operations*
8. CCP-PO-505, *CCP Remote-Handled Transuranic Waste Authorized Methods for Payload Control*
9. CCP-QP-002, *CCP Training and Qualification Plan*
10. CCP-QP-005, *CCP TRU Nonconforming Item Reporting and Control*
11. CCP-QP-008, *CCP Records Management*
12. CCP-QP-010, *CCP Document Preparation, Approval, and Control*
13. CCP-TP-053, *CCP Standard Real-Time Radiography (RTR) Inspection Procedure*

I have read the listed Initial/Indoctrination Reading and understand my responsibilities as applicable to the procedures above.	Thad Hasselstrom Trainee	1-28-15 Date

Document	Additional Training Requirements		
CCP-PO-001	1. WAP/QAPjP Briefing & Exam *(One-time Requirement)*	Cheryl Armijo CCP Training	03-06-15 Date
CCP-RTR-101	2. Real-Time Radiography (RTR) TRU Waste Characterization Briefing. *(Always Required)*	Cheryl Armijo CCP Training	03-06-15 Date
CCP-QP-002	3. RTR Comprehensive Exam *(Always Required)*	Cheryl Armijo CCP Training	03-06-15 Date
	4. Test Drum (WAC) *(Always Required)*	Cheryl Armijo CCP Training	03-11-15 Date
	5. Training Container[1] *(Always Required)*	Cheryl Armijo CCP Training	05-05-15 Date

[1] The Training Container meets the requirements of the Test Drum defined in the WCPIP.

Real-Time Radiography (RTR) Operator/Independent Technical Reviewer (ITR) Qualification Card

Name: Thad Hasselstrom

Formal Training	On-the-Job Training (OJT) Knowledge Requirements *(Required at Initial Qualification and Full Requalification)*	Subject Matter Expert (SME)/OJT Signature/Date
CCP-PO-001	1. List the Quality Assurance Objectives (QAOs) validated by RTR.	JAElliott 2/19/15
CCP-PO-001	2. List the Data Quality Objectives (DQOs) of RTR.	JAElliott 2/19/15
CCP-QP-002	3. State the purpose of the List of Qualified Individuals (LOQI).	JAElliott 2/19/15
	4. State the requirements for performing the Test demonstration.	JAElliott 2/19/15
	5. State the requirements for performing the Training Demonstration.	JAElliott 2/19/15
CCP-QP-005	6. State when a nonconformance report (NCR) should be prepared and who is responsible to initiate it.	JAElliott 2/4/15
	7. Describe how nonconforming items are documented.	JAElliott 2/19/15
	8. Describe how nonconforming items are controlled to prevent their use.	JAElliott 2/19/15
	9. State who has the responsibility to validate the NCR once initiated.	JAElliott 2/4/15
	10. Describe how to revise an NCR.	JAElliott 2/4/15
	11. Describe how to void an NCR.	JAElliott 2/19/15
WP 15-GM1002	12. Describe the purpose of the WIPP Form process.	JAElliott 2/19/15
	13. State the person responsible for originating a WIPP Form.	JAElliott 2/19/15
	14. Describe how WIPP Forms are documented.	JAElliott 2/19/15
	15. Describe who has responsibility for processing WIPP Forms, approving Corrective Action Plans, and approving closure of WIPP Forms.	JAElliott 2/19/15
	16. Describe actions personnel may take when conditions adverse to quality are discovered.	JAElliott 2/19/15

Real-Time Radiography (RTR) Operator/Independent Technical Reviewer (ITR) Qualification Card

Name: Thad Hasselstrom

CCP-QP-008	17. List the responsibilities of record generators.	JaEElliott	2/4/15
	18. State the storage and control requirements for records.	JaEElliott	2/4/15
	19. Explain the process and proper method to make corrections or revisions to records.	JaEElliott	2/4/15
CCP-QP-010	20. State the importance of using approved documents.	JaEElliott	2/19/15
	21. State when to verify a document revision.	JaEElliott	2/4/15
CCP-TP-053/ CCP-RTR-101 Briefing	22. Explain the purpose of RTR.	JaEElliott	2/19/15
	23. State the required information on the video/audio recording media labels.	JaEElliott	2/3/15
	24. Explain when the image test pattern/lines-pairs resolution test and checking the audio recording must be performed.	JaEElliott	2/3/15
	25. State the passing requirements for the lines-pair resolution test.	JaEElliott	2/3/15
	26. Describe the unit of measurement for weights to be recorded for RTR.	JaEElliott	2/3/15
	27. Describe where to obtain the tare weight of a waste container.	JaEElliott	2/3/15
	28. Describe where to obtain the gross weight of a waste container.	JaEElliott	2/3/15
	29. Describe how to determine the Volume Utilization Percentage (VUP).	JaEElliott	2/3/15
	30. Define the increments in which the fill percent are recorded.	JaEElliott	2/3/15
	31. State the percentage of the container volume that must be examined.	JaEElliott	2/3/15
	32. State the waste material parameters (WMP).	JaEElliott	2/4/15
	33. Define "layers of confinement".	JaEElliott	2/9/15

Real-Time Radiography (RTR)
Operator/Independent Technical Reviewer (ITR)
Qualification Card

Name: Thad Hasselstrom

	34. Describe acceptable liquids.	JaElliott	2/19/15
	35. State the total volume of acceptable liquid that must not be exceeded in the characterized container.	JaElliott	2/4/15
	36. Describe the actions taken if prohibited items are found.	JaElliott	2/3/15
	37. Describe the information that should be recorded when describing waste items.	JaElliott	2/4/15
	38. Discuss the requirements for packaging of sharp or heavy objects.	JaElliott	2/3/15
	39. State when an unvented, unpunctured, internal container is allowed.	JaElliott	2/3/15
	40. State the number of waste containers allowed per Batch Data Report (BDR).	JaElliott	2/3/15
	41. State when the replicate scan occurs and who performs it.	JaElliott	2/3/15
	42. State when the independent observation occurs and who performs it.	JaElliott	2/3/15
	43. State the responsibilities and function of the Independent Technical Reviewer (ITR).	JaElliott	2/19/15
	44. Explain who is allowed to make data changes on data sheets.	JaElliott	2/4/15
	45. Describe what constitutes a data affecting change.	JaElliott	2/19/15

Real-Time Radiography (RTR)
Operator/Independent Technical Reviewer (ITR)
Qualification Card

Name: Thad Hasselstrom

Formal Training	OJT Practical Requirements *(Always Required)*	SME/OJT Signature/Date
CCP-TP-053	1. Perform image test pattern/lines-pair resolution test.	JAElliott 3/4/15
	2. Perform an RTR examination.	JAElliott 2/19/15
	3. Determine the VUP.	JAElliott 2/19/15
	4. Determine layers of confinement.	JAElliott 2/19/15
	5. Determine WMP.	JAElliott 2/19/15
	6. Estimate weight of each WMP.	JAElliott 2/19/15
	7. Verify the physical form of the waste matches the waste description.	JAElliott 2/19/15
	8. Complete an RTR data sheet.	JAElliott 2/19/15
	9. Perform an independent observation.	JAElliott 2/19/15
	10. Assemble a Batch Data Report (BDR).	JAElliott 2/19/15
	11. Complete an ITR review.	JAElliott 9/23/15
	12. Demonstrate how to make changes/corrections to a BDR.	JAElliott 2/19/15

Real-Time Radiography (RTR) Operator/Independent Technical Reviewer (ITR) Qualification Card

Name: Thad Hasselstrom

Approvals	
I have completed formal training and received OJT for this position. I fully understand my responsibilities as a RTR Operator/ITR.	THAD HASSELSTROM — Trainee *(printed name and signature)* — Date: 3-4-15
I have monitored the training of this individual and believe they are ready to perform the duties of a RTR Operator/ITR. *(Validation by the SME/OJT instructor(s) involved in the training of this individual).*	AARON ELLIOTT — SME/OJT Instructor *(printed name and signature)* — Date: 3/4/15
	N/A — SME/OJT Instructor *(printed name and signature)* — Date
I have evaluated the training documentation and determined this individual meets the requirements for certification as a RTR Operator/ITR.	Shelly Martinez — Cognizant Engineer *(printed name and signature)* — Date: 5/5/15
I approve this employee to perform the duties of a RTR Operator/ITR.	Richard Kantrowitz — SPM *(printed name and signature)* — Date: 5/5/15

Approved for Content & Format:	**Fred Oney** *(Approval on File)* — SME/OJT	**09/10/2014** — Date
Approved for Applicability, Content & Format:	**Andrew Stallings** *(Approval on File)* — Cognizant Engineer	**09/10/2014** — Date
Approved for Content:	**Mike Ramirez** *(Approval on File)* — SPM	**09/10/2014** — Date
Approved for Applicability, Content, Format, & Use:	**A.J. Fisher** *(Approval on File)* — Manager Responsible for Training	**09/10/2014** — Date

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Real-Time Radiography (RTR) Operator/Independent Technical Reviewer (ITR) Qualification Card

Name: Eric Lyles

Education/Experience		
Resume documenting education on file with Central Characterization Program (CCP) Training.		Cheryl Alonzo 01-25-16 CCP Training Date
National Standard Requirements		
SNT-TC-1A Requirements	1. Real-Time Radiography (RTR) NDT Level II (L) certification from an approved vendor. *(Always Required)*	Cheryl Alonzo 01-25-16 CCP Training Date
	2. Eye Examination: *(Always Required)* Jaeger Test (J-2) Date: 01-06-16 Color Vision or Gray Scale Test Date: 01-06-16	Cheryl Alonzo 01-25-16 CCP Training Date
Job Specific Training		
☐ Initial Qualification ☑ Requalification ☐ Full Requalification		
Qualification Limit	**This qualification is valid for two (2) years.** If necessary, additional training may be required by the Site Project Manager (SPM) or the Manager Responsible for Training. Unsatisfactory performance will result in disqualification by the Manager Responsible for Training. The candidate must successfully complete the entire qualification card to reestablish qualification.	
Requalification Requirements	Items required for requalification are identified by text.	

Real-Time Radiography (RTR) Operator/Independent Technical Reviewer (ITR) Qualification Card

Name: Eric Lyles

Indoctrination
(Required at Initial Qualification and Full Requalification)

Initial/Indoctrination Reading:

1. DOE/WIPP 02-3214, *Remote-Handled TRU Waste Characterization Program Implementation Plan*
2. WP 15-GM1002, *Issues Management Processing of WIPP Forms*
3. CCP-HSP-014, *Health and Safety Program Implementation for CCP*
4. CCP-PO-001, *CCP Transuranic Waste Characterization Quality Assurance Project Plan*
5. CCP-PO-002, *CCP Transuranic Waste Certification Plan*
6. CCP-PO-003, *CCP Transuranic Authorized Methods for Payload Control (TRAMPAC)*
7. CCP-PO-005, *CCP Conduct of Operations*
8. CCP-PO-505, *CCP Remote-Handled Transuranic Waste Authorized Methods for Payload Control*
9. CCP-QP-002, *CCP Training and Qualification Plan*
10. CCP-QP-005, *CCP TRU Nonconforming Item Reporting and Control*
11. CCP-QP-008, *CCP Records Management*
12. CCP-QP-010, *CCP Document Preparation, Approval, and Control*
13. CCP-TP-053, *CCP Standard Real-Time Radiography (RTR) Inspection Procedure*

I have read the listed Initial/Indoctrination Reading and understand my responsibilities as applicable to the procedures above.	N/A Trainee — Date

Document	Additional Training Requirements		
CCP-PO-001	1. WAP/QAPjP Briefing & Exam *(One-time Requirement)*	Cheryl Almajo CCP Training	01-25-16 Date
CCP-RTR-101	2. Real-Time Radiography (RTR) TRU Waste Characterization Briefing. *(Always Required)*	Cheryl Almajo CCP Training	01-25-16 Date
CCP-QP-002	3. RTR Comprehensive Exam *(Always Required)*	Cheryl Almajo CCP Training	01-25-16 Date
	4. Test Drum (WAC) *(Always Required)*	Cheryl Almajo CCP Training	01-25-16 Date
	5. Training Container[1] *(Always Required)*	Cheryl Almajo CCP Training	01-25-16 Date

[1] The Training Container meets the requirements of the Test Drum defined in the WCPIP.

Real-Time Radiography (RTR)
Operator/Independent Technical Reviewer (ITR)
Qualification Card

Name: Eric Lyles

Formal Training	On-the-Job Training (OJT) Knowledge Requirements (Required at Initial Qualification and Full Requalification)	Subject Matter Expert (SME)/OJT Signature/Date
CCP-PO-001	1. List the Quality Assurance Objectives (QAOs) validated by RTR.	
CCP-PO-001	2. List the Data Quality Objectives (DQOs) of RTR.	
CCP-QP-002	3. State the purpose of the List of Qualified Individuals (LOQI).	
	4. State the requirements for performing the Test demonstration.	
	5. State the requirements for performing the Training Demonstration.	
CCP-QP-005	6. State when a nonconformance report (NCR) should be prepared and who is responsible to initiate it.	N/A
	7. Describe how nonconforming items are documented.	AD
	8. Describe how nonconforming items are controlled to prevent their use.	1-20-16
	9. State who has the responsibility to validate the NCR once initiated.	
	10. Describe how to revise an NCR.	
	11. Describe how to void an NCR.	
WP 15-GM1002	12. Describe the purpose of the WIPP Form process.	
	13. State the person responsible for originating a WIPP Form.	
	14. Describe how WIPP Forms are documented.	
	15. Describe who has responsibility for processing WIPP Forms, approving Corrective Action Plans, and approving closure of WIPP Forms.	
	16. Describe actions personnel may take when conditions adverse to quality are discovered.	

Real-Time Radiography (RTR)
Operator/Independent Technical Reviewer (ITR)
Qualification Card

Name: Eric Lyles

CCP-QP-008	17. List the responsibilities of record generators.	
	18. State the storage and control requirements for records.	
	19. Explain the process and proper method to make corrections or revisions to records.	
CCP-QP-010	20. State the importance of using approved documents.	
	21. State when to verify a document revision.	
CCP-TP-053/ CCP-RTR-101 Briefing	22. Explain the purpose of RTR.	
	23. State the required information on the video/audio recording media labels.	N/A
	24. Explain when the image test pattern/lines-pairs resolution test and checking the audio recording must be performed.	QP
	25. State the passing requirements for the lines-pair resolution test.	1-20-16
	26. Describe the unit of measurement for weights to be recorded for RTR.	
	27. Describe where to obtain the tare weight of a waste container.	
	28. Describe where to obtain the gross weight of a waste container.	
	29. Describe how to determine the Volume Utilization Percentage (VUP).	
	30. Define the increments in which the fill percent are recorded.	
	31. State the percentage of the container volume that must be examined.	
	32. State the waste material parameters (WMP).	
	33. Define "layers of confinement".	

Real-Time Radiography (RTR)
Operator/Independent Technical Reviewer (ITR)
Qualification Card

Name: Eric Lyles

	34. Describe acceptable liquids.	
	35. State the total volume of acceptable liquid that must not be exceeded in the characterized container.	
	36. Describe the actions taken if prohibited items are found.	
	37. Describe the information that should be recorded when describing waste items.	
	38. Discuss the requirements for packaging of sharp or heavy objects.	N/A
	39. State when an unvented, unpunctured, internal container is allowed.	No
	40. State the number of waste containers allowed per Batch Data Report (BDR).	1-20-16
	41. State when the replicate scan occurs and who performs it.	
	42. State when the independent observation occurs and who performs it.	
	43. State the responsibilities and function of the Independent Technical Reviewer (ITR).	
	44. Explain who is allowed to make data changes on data sheets.	
	45. Describe what constitutes a data affecting change.	

Real-Time Radiography (RTR)
Operator/Independent Technical Reviewer (ITR)
Qualification Card

Name: Eric Lyles

Formal Training	OJT Practical Requirements (Always Required)	SME/OJT Signature/Date
CCP-TP-053	1. Perform image test pattern/lines-pair resolution test.	1-13-16
	2. Perform an RTR examination.	1-13-16
	3. Determine the VUP.	1-13-16
	4. Determine layers of confinement.	1-13-16
	5. Determine WMP.	1-13-16
	6. Estimate weight of each WMP.	1-13-16
	7. Verify the physical form of the waste matches the waste description.	1-13-16
	8. Complete an RTR data sheet.	1-13-16
	9. Perform an independent observation.	1-14-16
	10. Assemble a Batch Data Report (BDR).	1-13-16
	11. Complete an ITR review.	1-20-16
	12. Demonstrate how to make changes/corrections to a BDR.	1-20-16

Real-Time Radiography (RTR)
Operator/Independent Technical Reviewer (ITR)
Qualification Card

Name: Eric Lyles

Approvals		
I have completed formal training and received OJT for this position. I fully understand my responsibilities as a RTR Operator/ITR.	Eric Lyles Trainee *(printed name and signature)*	1/20/16 Date
I have monitored the training of this individual and believe they are ready to perform the duties of a RTR Operator/ITR. *(Validation by the SME/OJT instructor(s) involved in the training of this individual).*	Fred Oney SME/OJT Instructor *(printed name and signature)*	1-20-16 Date
	N/A To 1-20-16 SME/OJT Instructor *(printed name and signature)*	Date
I have evaluated the training documentation and determined this individual meets the requirements for certification as a RTR Operator/ITR.	Shelly Martinez ISM Cognizant Engineer *(printed name and signature)*	1-27-16 Date
I approve this employee to perform the duties of a RTR Operator/ITR.	Beverly Schrock BSSchrock Beverly Schrock BSSchrock SPM *(printed name and signature)*	1/27/16 1/25/16 Date

Approved for Content & Format:	**Fred Oney *(Approval on File)***	**09/10/2014**
	SME/OJT	Date
Approved for Applicability, Content & Format:	**Andrew Stallings *(Approval on File)***	**09/10/2014**
	Cognizant Engineer	Date
Approved for Content:	**Mike Ramirez *(Approval on File)***	**09/10/2014**
	SPM	Date
Approved for Applicability, Content, Format, & Use:	**A.J. Fisher *(Approval on File)***	**09/10/2014**
	Manager Responsible for Training	Date

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Real-Time Radiography (RTR) Operator/Independent Technical Reviewer (ITR) Qualification Card

Name: Fred Oney

Education/Experience

Resume documenting education on file with Central Characterization Program (CCP) Training.	Cheryl Arrigo CCP Training	04-13-16 Date

National Standard Requirements

SNT-TC-1A Requirements	1. Real-Time Radiography (RTR) NDT Level II (L) certification from an approved vendor. *(Always Required)*	Cheryl Arrigo 04-13-16 CCP Training Date
	2. Eye Examination: *(Always Required)* Jaeger Test (J-2) Date: 11-18-15 Color Vision or Gray Scale Test Date: 11-18-15	Cheryl Arrigo 04-13-16 CCP Training Date

Job Specific Training

☐ Initial Qualification ☑ Requalification ☐ Full Requalification

Qualification Limit	**This qualification is valid for two (2) years.** If necessary, additional training may be required by the Site Project Manager (SPM) or the Manager Responsible for Training. Unsatisfactory performance will result in disqualification by the Manager Responsible for Training. The candidate must successfully complete the entire qualification card to reestablish qualification.
Requalification Requirements	Items required for requalification are identified by text.

Real-Time Radiography (RTR) Operator/Independent Technical Reviewer (ITR) Qualification Card

Name: Fred Oney

Indoctrination
(Required at Initial Qualification and Full Requalification)

Initial/Indoctrination Reading:

1. DOE/WIPP 02-3214, *Remote-Handled TRU Waste Characterization Program Implementation Plan*
2. WP 15-GM1002, *Issues Management Processing of WIPP Forms*
3. CCP-HSP-014, *Health and Safety Program Implementation for CCP*
4. CCP-PO-001, *CCP Transuranic Waste Characterization Quality Assurance Project Plan*
5. CCP-PO-002, *CCP Transuranic Waste Certification Plan*
6. CCP-PO-003, *CCP Transuranic Authorized Methods for Payload Control (TRAMPAC)*
7. CCP-PO-005, *CCP Conduct of Operations*
8. CCP-PO-505, *CCP Remote-Handled Transuranic Waste Authorized Methods for Payload Control*
9. CCP-QP-002, *CCP Training and Qualification Plan*
10. CCP-QP-005, *CCP TRU Nonconforming Item Reporting and Control*
11. CCP-QP-008, *CCP Records Management*
12. CCP-QP-010, *CCP Document Preparation, Approval, and Control*
13. CCP-TP-053, *CCP Standard Real-Time Radiography (RTR) Inspection Procedure*

I have read the listed Initial/Indoctrination Reading and understand my responsibilities as applicable to the procedures above.	N/A	
	Trainee	Date

Document	Additional Training Requirements		
CCP-PO-001	1. WAP/QAPjP Briefing & Exam *(One-time Requirement)*	Cheryl Amyx	04-13-16
		CCP Training	Date
CCP-RTR-101	2. Real-Time Radiography (RTR) TRU Waste Characterization Briefing. *(Always Required)*	Cheryl Amyx	04-13-16
		CCP Training	Date
CCP-QP-002	3. RTR Comprehensive Exam *(Always Required)*	Cheryl Amyx	04-13-16
		CCP Training	Date
	4. Test Drum (WAC) *(Always Required)*	Cheryl Amyx	04-13-16
		CCP Training	Date
	5. Training Container[1] *(Always Required)*	Cheryl Amyx	04-13-16
		CCP Training	Date

[1] The Training Container meets the requirements of the Test Drum defined in the WCPIP.

Real-Time Radiography (RTR) Operator/Independent Technical Reviewer (ITR) Qualification Card

Name: Fred Oney

Formal Training	On-the-Job Training (OJT) Knowledge Requirements *(Required at Initial Qualification and Full Requalification)*	Subject Matter Expert (SME)/OJT Signature/Date
CCP-PO-001	1. List the Quality Assurance Objectives (QAOs) validated by RTR.	N/A FO 3/15/16
CCP-PO-001	2. List the Data Quality Objectives (DQOs) of RTR.	
CCP-QP-002	3. State the purpose of the List of Qualified Individuals (LOQI).	
	4. State the requirements for performing the Test demonstration.	
	5. State the requirements for performing the Training Demonstration.	
CCP-QP-005	6. State when a nonconformance report (NCR) should be prepared and who is responsible to initiate it.	
	7. Describe how nonconforming items are documented.	
	8. Describe how nonconforming items are controlled to prevent their use.	
	9. State who has the responsibility to validate the NCR once initiated.	
	10. Describe how to revise an NCR.	
	11. Describe how to void an NCR.	
WP 15-GM1002	12. Describe the purpose of the WIPP Form process.	
	13. State the person responsible for originating a WIPP Form.	
	14. Describe how WIPP Forms are documented.	
	15. Describe who has responsibility for processing WIPP Forms, approving Corrective Action Plans, and approving closure of WIPP Forms.	
	16. Describe actions personnel may take when conditions adverse to quality are discovered.	

Real-Time Radiography (RTR) Operator/Independent Technical Reviewer (ITR) Qualification Card

Name: Fred Oney

CCP-QP-008	17. List the responsibilities of record generators.	
	18. State the storage and control requirements for records.	
	19. Explain the process and proper method to make corrections or revisions to records.	
CCP-QP-010	20. State the importance of using approved documents.	
	21. State when to verify a document revision.	
CCP-TP-053/ CCP-RTR-101 Briefing	22. Explain the purpose of RTR.	
	23. State the required information on the video/audio recording media labels.	
	24. Explain when the image test pattern/lines-pairs resolution test and checking the audio recording must be performed.	
	25. State the passing requirements for the lines-pair resolution test.	
	26. Describe the unit of measurement for weights to be recorded for RTR.	
	27. Describe where to obtain the tare weight of a waste container.	
	28. Describe where to obtain the gross weight of a waste container.	
	29. Describe how to determine the Volume Utilization Percentage (VUP).	
	30. Define the increments in which the fill percent are recorded.	
	31. State the percentage of the container volume that must be examined.	
	32. State the waste material parameters (WMP).	
	33. Define "layers of confinement".	

N/A 5/13/16

Real-Time Radiography (RTR)
Operator/Independent Technical Reviewer (ITR)
Qualification Card

Name: Fred Oney

	34. Describe acceptable liquids.	
	35. State the total volume of acceptable liquid that must not be exceeded in the characterized container.	
	36. Describe the actions taken if prohibited items are found.	
	37. Describe the information that should be recorded when describing waste items.	
	38. Discuss the requirements for packaging of sharp or heavy objects.	
	39. State when an unvented, unpunctured, internal container is allowed.	
	40. State the number of waste containers allowed per Batch Data Report (BDR).	
	41. State when the replicate scan occurs and who performs it.	
	42. State when the independent observation occurs and who performs it.	
	43. State the responsibilities and function of the Independent Technical Reviewer (ITR).	
	44. Explain who is allowed to make data changes on data sheets.	
	45. Describe what constitutes a data affecting change.	

N/A EC 3/15/16

Real-Time Radiography (RTR)
Operator/Independent Technical Reviewer (ITR)
Qualification Card

Name: Fred Oney

Formal Training	OJT Practical Requirements *(Always Required)*	SME/OJT Signature/Date
CCP-TP-053	1. Perform image test pattern/lines-pair resolution test.	3/10/16
	2. Perform an RTR examination.	3/10/16
	3. Determine the VUP.	3/10/16
	4. Determine layers of confinement.	3/10/16
	5. Determine WMP.	3/10/16
	6. Estimate weight of each WMP.	3/10/16
	7. Verify the physical form of the waste matches the waste description.	3/10/16
	8. Complete an RTR data sheet.	3/10/16
	9. Perform an independent observation.	3/14/16
	10. Assemble a Batch Data Report (BDR).	3/10/16
	11. Complete an ITR review.	3/15/16
	12. Demonstrate how to make changes/corrections to a BDR.	3/14/16

Real-Time Radiography (RTR) Operator/Independent Technical Reviewer (ITR) Qualification Card

Name: Fred Oney

Approvals	
I have completed formal training and received OJT for this position. I fully understand my responsibilities as a RTR Operator/ITR.	Fred Oney 3-15-16 Trainee *(printed name and signature)* Date
I have monitored the training of this individual and believe they are ready to perform the duties of a RTR Operator/ITR. *(Validation by the SME/OJT instructor(s) involved in the training of this individual).*	Eric Lyles 3/15/16 SME/OJT Instructor *(printed name and signature)* Date N/A EL 3/15/16 SME/OJT Instructor *(printed name and signature)* Date
I have evaluated the training documentation and determined this individual meets the requirements for certification as a RTR Operator/ITR.	Shelly Martinez Shelly Martinez 4.13.16 Cognizant Engineer *(printed name and signature)* Date
I approve this employee to perform the duties of a RTR Operator/ITR.	Beverly Schrock BSSchrock 4/13/16 SPM *(printed name and signature)* Date

Approved for Content & Format:	**Fred Oney *(Approval on File)***	**09/10/2014**
	SME/OJT	Date
Approved for Applicability, Content & Format:	**Andrew Stallings *(Approval on File)***	**09/10/2014**
	Cognizant Engineer	Date
Approved for Content:	**Mike Ramirez *(Approval on File)***	**09/10/2014**
	SPM	Date
Approved for Applicability, Content, Format, & Use:	**A.J. Fisher *(Approval on File)***	**09/10/2014**
	Manager Responsible for Training	Date

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Real-Time Radiography (RTR) Operator/Independent Technical Reviewer (ITR) Qualification Card

Name: Kenneth Dale Simpson

Education/Experience

Resume documenting education on file with Central Characterization Program (CCP) Training.	CCP Training	03-06-15 Date

National Standard Requirements

SNT-TC-1A Requirements	1. Real-Time Radiography (RTR) NDT Level II (L) certification from an approved vendor. *(Always Required)*	CCP Training	03-06-15 Date
	2. Eye Examination: *(Always Required)* Jaeger Test (J-2) Date: 1-22-15 Color Vision or Gray Scale Test Date: 1-22-15	CCP Training	03-06-15 Date

Job Specific Training

☐ Initial Qualification ☐ Requalification ☑ Full Requalification

Qualification Limit	**This qualification is valid for two (2) years.** If necessary, additional training may be required by the Site Project Manager (SPM) or the Manager Responsible for Training. Unsatisfactory performance will result in disqualification by the Manager Responsible for Training. The candidate must successfully complete the entire qualification card to reestablish qualification.
Requalification Requirements	Items required for requalification are identified by text.

Real-Time Radiography (RTR) Operator/Independent Technical Reviewer (ITR) Qualification Card

Name: Kenneth Dale Simpson

Indoctrination
(Required at Initial Qualification and Full Requalification)

Initial/Indoctrination Reading:

1. DOE/WIPP 02-3214, *Remote-Handled TRU Waste Characterization Program Implementation Plan*
2. WP 15-GM1002, *Issues Management Processing of WIPP Forms*
3. CCP-HSP-014, *Health and Safety Program Implementation for CCP*
4. CCP-PO-001, *CCP Transuranic Waste Characterization Quality Assurance Project Plan*
5. CCP-PO-002, *CCP Transuranic Waste Certification Plan*
6. CCP-PO-003, *CCP Transuranic Authorized Methods for Payload Control (TRAMPAC)*
7. CCP-PO-005, *CCP Conduct of Operations*
8. CCP-PO-505, *CCP Remote-Handled Transuranic Waste Authorized Methods for Payload Control*
9. CCP-QP-002, *CCP Training and Qualification Plan*
10. CCP-QP-005, *CCP TRU Nonconforming Item Reporting and Control*
11. CCP-QP-008, *CCP Records Management*
12. CCP-QP-010, *CCP Document Preparation, Approval, and Control*
13. CCP-TP-053, *CCP Standard Real-Time Radiography (RTR) Inspection Procedure*

I have read the listed Initial/Indoctrination Reading and understand my responsibilities as applicable to the procedures above.	Kenneth Simpson Trainee	1-22-15 Date

Document	Additional Training Requirements		
CCP-PO-001	1. WAP/QAPjP Briefing & Exam *(One-time Requirement)*	CCP Training	03-06-15 Date
CCP-RTR-101	2. Real-Time Radiography (RTR) TRU Waste Characterization Briefing. *(Always Required)*	CCP Training	03-06-15 Date
CCP-QP-002	3. RTR Comprehensive Exam *(Always Required)*	CCP Training	03-06-15 Date
	4. Test Drum (WAC) *(Always Required)*	CCP Training	03-11-15 Date
	5. Training Container[1] *(Always Required)*	CCP Training	05-05-15 Date

[1] The Training Container meets the requirements of the Test Drum defined in the WCPIP.

Real-Time Radiography (RTR) Operator/Independent Technical Reviewer (ITR) Qualification Card

Name: Kenneth Dale Simpson

Formal Training	On-the-Job Training (OJT) Knowledge Requirements *(Required at Initial Qualification and Full Requalification)*	Subject Matter Expert (SME)/OJT Signature/Date	
CCP-PO-001	1. List the Quality Assurance Objectives (QAOs) validated by RTR.	JAElliott	2/18/15
CCP-PO-001	2. List the Data Quality Objectives (DQOs) of RTR.	JAElliott	2/4/15
CCP-QP-002	3. State the purpose of the List of Qualified Individuals (LOQI).	JAElliott	2/4/15
	4. State the requirements for performing the Test demonstration.	JAElliott	2/4/15
	5. State the requirements for performing the Training Demonstration.	JAElliott	2/4/15
CCP-QP-005	6. State when a nonconformance report (NCR) should be prepared and who is responsible to initiate it.	JAElliott	2/4/15
	7. Describe how nonconforming items are documented.	JAElliott	2/4/15
	8. Describe how nonconforming items are controlled to prevent their use.	JAElliott	2/4/15
	9. State who has the responsibility to validate the NCR once initiated.	JAElliott	2/4/15
	10. Describe how to revise an NCR.	JAElliott	2/4/15
	11. Describe how to void an NCR.	JAElliott	2/4/15
WP 15-GM1002	12. Describe the purpose of the WIPP Form process.	JAElliott	2/18/15
	13. State the person responsible for originating a WIPP Form.	JAElliott	2/3/15
	14. Describe how WIPP Forms are documented.	JAElliott	2/3/15
	15. Describe who has responsibility for processing WIPP Forms, approving Corrective Action Plans, and approving closure of WIPP Forms.	JAElliott	2/3/15
	16. Describe actions personnel may take when conditions adverse to quality are discovered.	JAElliott	2/3/15

Real-Time Radiography (RTR) Operator/Independent Technical Reviewer (ITR) Qualification Card

Name: Kenneth Dale Simpson

CCP-QP-008	17. List the responsibilities of record generators.	JEElliott	2/18/15
	18. State the storage and control requirements for records.	JEElliott	2/4/15
	19. Explain the process and proper method to make corrections or revisions to records.	JEElliott	2/4/15
CCP-QP-010	20. State the importance of using approved documents.	JEElliott	2/18/15
	21. State when to verify a document revision.	JEElliott	2/4/15
CCP-TP-053/ CCP-RTR-101 Briefing	22. Explain the purpose of RTR.	JEElliott	2/4/15
	23. State the required information on the video/audio recording media labels.	JEElliott	2/3/15
	24. Explain when the image test pattern/lines-pairs resolution test and checking the audio recording must be performed.	JEElliott	2/3/15
	25. State the passing requirements for the lines-pair resolution test.	JEElliott	2/3/15
	26. Describe the unit of measurement for weights to be recorded for RTR.	JEElliott	2/3/15
	27. Describe where to obtain the tare weight of a waste container.	JEElliott	2/3/15
	28. Describe where to obtain the gross weight of a waste container.	JEElliott	2/3/15
	29. Describe how to determine the Volume Utilization Percentage (VUP).	JEElliott	2/3/15
	30. Define the increments in which the fill percent are recorded.	JEElliott	2/3/15
	31. State the percentage of the container volume that must be examined.	JEElliott	2/3/15
	32. State the waste material parameters (WMP).	JEElliott	2/4/15
	33. Define "layers of confinement".	JEElliott	2/4/15

Real-Time Radiography (RTR) Operator/Independent Technical Reviewer (ITR) Qualification Card

Name: Kenneth Dale Simpson

	34. Describe acceptable liquids.	JaEllott	2/18/15
	35. State the total volume of acceptable liquid that must not be exceeded in the characterized container.	JaEllott	2/4/15
	36. Describe the actions taken if prohibited items are found.	JaEllott	2/3/15
	37. Describe the information that should be recorded when describing waste items.	JaEllott	2/4/15
	38. Discuss the requirements for packaging of sharp or heavy objects.	JaEllott	2/3/15
	39. State when an unvented, unpunctured, internal container is allowed.	JaEllott	2/3/15
	40. State the number of waste containers allowed per Batch Data Report (BDR).	JaEllott	2/3/15
	41. State when the replicate scan occurs and who performs it.	JaEllott	2/3/15
	42. State when the independent observation occurs and who performs it.	JaEllott	2/3/15
	43. State the responsibilities and function of the Independent Technical Reviewer (ITR).	JaEllott	2/18/15
	44. Explain who is allowed to make data changes on data sheets.	JaEllott	2/4/15
	45. Describe what constitutes a data affecting change.	JaEllott	2/4/15

Real-Time Radiography (RTR)
Operator/Independent Technical Reviewer (ITR)
Qualification Card

Name: Kenneth Dale Simpson

Formal Training	OJT Practical Requirements *(Always Required)*	SME/OJT Signature/Date
CCP-TP-053	1. Perform image test pattern/lines-pair resolution test.	JAElliott 3/4/15
	2. Perform an RTR examination.	JAElliott 2/18/15
	3. Determine the VUP.	JAElliott 2/18/15
	4. Determine layers of confinement.	JAElliott 2/18/15
	5. Determine WMP.	JAElliott 2/18/15
	6. Estimate weight of each WMP.	JAElliott 2/18/15
	7. Verify the physical form of the waste matches the waste description.	JAElliott 2/18/15
	8. Complete an RTR data sheet.	JAElliott 2/18/15
	9. Perform an independent observation.	JAElliott 2/18/15
	10. Assemble a Batch Data Report (BDR).	JAElliott 2/18/15
	11. Complete an ITR review.	JAElliott 2/18/15
	12. Demonstrate how to make changes/corrections to a BDR.	JAElliott 2/18/15

Real-Time Radiography (RTR) Operator/Independent Technical Reviewer (ITR) Qualification Card

Name: Kenneth Dale Simpson

	Approvals	
I have completed formal training and received OJT for this position. I fully understand my responsibilities as a RTR Operator/ITR.	Kenneth Simpson Trainee *(printed name and signature)*	3-4-15 Date
I have monitored the training of this individual and believe they are ready to perform the duties of a RTR Operator/ITR. *(Validation by the SME/OJT instructor(s) involved in the training of this individual).*	AARON Elliott SME/OJT Instructor *(printed name and signature)*	3/4/15 Date
	N/A SME/OJT Instructor *(printed name and signature)*	Date
I have evaluated the training documentation and determined this individual meets the requirements for certification as a RTR Operator/ITR.	Shelly Martinez/Shelly Martinez Cognizant Engineer *(printed name and signature)*	5/5/15 Date
I approve this employee to perform the duties of a RTR Operator/ITR.	Richard Kostrowitz SPM *(printed name and signature)*	5/5/15 Date

Approved for Content & Format:	**Fred Oney *(Approval on File)*** SME/OJT	**09/10/2014** Date
Approved for Applicability, Content & Format:	**Andrew Stallings *(Approval on File)*** Cognizant Engineer	**09/10/2014** Date
Approved for Content:	**Mike Ramirez *(Approval on File)*** SPM	**09/10/2014** Date
Approved for Applicability, Content, Format, & Use:	**A.J. Fisher *(Approval on File)*** Manager Responsible for Training	**09/10/2014** Date

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Real-Time Radiography (RTR)
Operator/Independent Technical Reviewer (ITR)
Qualification Card

Name: Aaron Elliott

Education/Experience		
Resume documenting education on file with Central Characterization Program (CCP) Training.		Cheryl Almojo 02-02-15 CCP Training Date
National Standard Requirements		
SNT-TC-1A Requirements	1. Real-Time Radiography (RTR) NDT Level II (L) certification from an approved vendor. *(Always Required)*	Cheryl Almojo 02-02-15 CCP Training Date
	2. Eye Examination: *(Always Required)* Jaeger Test (J-2) Date: 01-22-15 Color Vision or Gray Scale Test Date: 01-22-15	Cheryl Almojo 02-02-15 CCP Training Date
Job Specific Training		
☐ **Initial Qualification**	☑ **Requalification**	☐ **Full Requalification**
Qualification Limit	**This qualification is valid for two (2) years.** If necessary, additional training may be required by the Site Project Manager (SPM) or the Manager Responsible for Training. Unsatisfactory performance will result in disqualification by the Manager Responsible for Training. The candidate must successfully complete the entire qualification card to reestablish qualification.	
Requalification Requirements	Items required for requalification are identified by text.	

Real-Time Radiography (RTR) Operator/Independent Technical Reviewer (ITR) Qualification Card

Name: Aaron Elliott

Indoctrination

(Required at Initial Qualification and Full Requalification)

Initial/Indoctrination Reading:

1. DOE/WIPP 02-3214, *Remote-Handled TRU Waste Characterization Program Implementation Plan*
2. WP 15-GM1002, *Issues Management Processing of WIPP Forms*
3. CCP-HSP-014, *Health and Safety Program Implementation for CCP*
4. CCP-PO-001, *CCP Transuranic Waste Characterization Quality Assurance Project Plan*
5. CCP-PO-002, *CCP Transuranic Waste Certification Plan*
6. CCP-PO-003, *CCP Transuranic Authorized Methods for Payload Control (TRAMPAC)*
7. CCP-PO-005, *CCP Conduct of Operations*
8. CCP-PO-505, *CCP Remote-Handled Transuranic Waste Authorized Methods for Payload Control*
9. CCP-QP-002, *CCP Training and Qualification Plan*
10. CCP-QP-005, *CCP TRU Nonconforming Item Reporting and Control*
11. CCP-QP-008, *CCP Records Management*
12. CCP-QP-010, *CCP Document Preparation, Approval, and Control*
13. CCP-TP-053, *CCP Standard Real-Time Radiography (RTR) Inspection Procedure*

I have read the listed Initial/Indoctrination Reading and understand my responsibilities as applicable to the procedures above.	NA	
	Trainee	Date

Document	Additional Training Requirements		
CCP-PO-001	1. WAP/QAPjP Briefing & Exam *(One-time Requirement)*	Cheryl Arroyo	02-02-15
		CCP Training	Date
CCP-RTR-101	2. Real-Time Radiography (RTR) TRU Waste Characterization Briefing. *(Always Required)*	Cheryl Arroyo	02-02-15
		CCP Training	Date
CCP-QP-002	3. RTR Comprehensive Exam *(Always Required)*	Cheryl Arroyo	02-02-15
		CCP Training	Date
	4. Test Drum (WAC) *(Always Required)*	Cheryl Arroyo	02-02-15
		CCP Training	Date
	5. Training Container[1] *(Always Required)*	Cheryl Arroyo	02-02-15
		CCP Training	Date

[1] The Training Container meets the requirements of the Test Drum defined in the WCPIP.

Real-Time Radiography (RTR)
Operator/Independent Technical Reviewer (ITR)
Qualification Card

Name: Aaron Elliott

Formal Training	On-the-Job Training (OJT) Knowledge Requirements *(Required at Initial Qualification and Full Requalification)*	Subject Matter Expert (SME)/OJT Signature/Date
CCP-PO-001	1. List the Quality Assurance Objectives (QAOs) validated by RTR.	
CCP-PO-001	2. List the Data Quality Objectives (DQOs) of RTR.	
CCP-QP-002	3. State the purpose of the List of Qualified Individuals (LOQI).	
	4. State the requirements for performing the Test demonstration.	
	5. State the requirements for performing the Training Demonstration.	
CCP-QP-005	6. State when a nonconformance report (NCR) should be prepared and who is responsible to initiate it.	N/A
	7. Describe how nonconforming items are documented.	NO
	8. Describe how nonconforming items are controlled to prevent their use.	
	9. State who has the responsibility to validate the NCR once initiated.	1-28-15
	10. Describe how to revise an NCR.	
	11. Describe how to void an NCR.	
WP 15-GM1002	12. Describe the purpose of the WIPP Form process.	
	13. State the person responsible for originating a WIPP Form.	
	14. Describe how WIPP Forms are documented.	
	15. Describe who has responsibility for processing WIPP Forms, approving Corrective Action Plans, and approving closure of WIPP Forms.	
	16. Describe actions personnel may take when conditions adverse to quality are discovered.	

Real-Time Radiography (RTR)
Operator/Independent Technical Reviewer (ITR)
Qualification Card

Name: Aaron Elliott

CCP-QP-008	17. List the responsibilities of record generators.	
	18. State the storage and control requirements for records.	
	19. Explain the process and proper method to make corrections or revisions to records.	
CCP-QP-010	20. State the importance of using approved documents.	
	21. State when to verify a document revision.	
CCP-TP-053/ CCP-RTR-101 Briefing	22. Explain the purpose of RTR.	N/A
	23. State the required information on the video/audio recording media labels.	
	24. Explain when the image test pattern/lines-pairs resolution test and checking the audio recording must be performed.	10
	25. State the passing requirements for the lines-pair resolution test.	
	26. Describe the unit of measurement for weights to be recorded for RTR.	1-28-15
	27. Describe where to obtain the tare weight of a waste container.	
	28. Describe where to obtain the gross weight of a waste container.	
	29. Describe how to determine the Volume Utilization Percentage (VUP).	
	30. Define the increments in which the fill percent are recorded.	
	31. State the percentage of the container volume that must be examined.	
	32. State the waste material parameters (WMP).	
	33. Define "layers of confinement".	

Real-Time Radiography (RTR)
Operator/Independent Technical Reviewer (ITR)
Qualification Card

Name: Aaron Elliott

	34. Describe acceptable liquids.	N/A
	35. State the total volume of acceptable liquid that must not be exceeded in the characterized container.	No
	36. Describe the actions taken if prohibited items are found.	1-28-15
	37. Describe the information that should be recorded when describing waste items.	
	38. Discuss the requirements for packaging of sharp or heavy objects.	
	39. State when an unvented, unpunctured, internal container is allowed.	
	40. State the number of waste containers allowed per Batch Data Report (BDR).	
	41. State when the replicate scan occurs and who performs it.	
	42. State when the independent observation occurs and who performs it.	
	43. State the responsibilities and function of the Independent Technical Reviewer (ITR).	
	44. Explain who is allowed to make data changes on data sheets.	
	45. Describe what constitutes a data affecting change.	

Real-Time Radiography (RTR)
Operator/Independent Technical Reviewer (ITR)
Qualification Card

Name: Aaron Elliott

Formal Training	OJT Practical Requirements *(Always Required)*	SME/OJT Signature/Date
CCP-TP-053	1. Perform image test pattern/lines-pair resolution test.	1-27-15
	2. Perform an RTR examination.	1-28-15
	3. Determine the VUP.	1-28-15
	4. Determine layers of confinement.	1-28-15
	5. Determine WMP.	1-28-15
	6. Estimate weight of each WMP.	1-28-15
	7. Verify the physical form of the waste matches the waste description.	1-28-15
	8. Complete an RTR data sheet.	1-28-15
	9. Perform an independent observation.	1-28-15
	10. Assemble a Batch Data Report (BDR).	1-28-15
	11. Complete an ITR review.	1-28-15
	12. Demonstrate how to make changes/corrections to a BDR.	1-28-15

Real-Time Radiography (RTR) Operator/Independent Technical Reviewer (ITR) Qualification Card

Name: Aaron Elliott

	Approvals
I have completed formal training and received OJT for this position. I fully understand my responsibilities as a RTR Operator/ITR.	AARON ELLIOTT — Trainee *(printed name and signature)* — Date: 1/28/15
I have monitored the training of this individual and believe they are ready to perform the duties of a RTR Operator/ITR. *(Validation by the SME/OJT instructor(s) involved in the training of this individual).*	FRED ONEY — SME/OJT Instructor *(printed name and signature)* — Date: 1-28-15
	N/A JO — SME/OJT Instructor *(printed name and signature)* — Date: 1-28-15
I have evaluated the training documentation and determined this individual meets the requirements for certification as a RTR Operator/ITR.	Andrew Stallings — Cognizant Engineer *(printed name and signature)* — Date: 2-2-15
I approve this employee to perform the duties of a RTR Operator/ITR.	Carolina Soatema Carolina Soatema — SPM *(printed name and signature)* — Date: 2/2/15

Approved for Content & Format:	**Fred Oney *(Approval on File)***	**09/10/2014**
	SME/OJT	Date
Approved for Applicability, Content & Format:	**Andrew Stallings *(Approval on File)***	**09/10/2014**
	Cognizant Engineer	Date
Approved for Content:	**Mike Ramirez *(Approval on File)***	**09/10/2014**
	SPM	Date
Approved for Applicability, Content, Format, & Use:	**A.J. Fisher *(Approval on File)***	**09/10/2014**
	Manager Responsible for Training	Date

Table C6-4 Visual Examination (VE) Checklist
ORNL/CCP Recertification Audit A-16-15
April 19 – April 21, 2016

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Visual Examination (VE) Checklist

	WAP Requirement[1] ORNL/CCP Audit A-16-15 Table C6-4 Visual Examination (VE) Checklist	Procedure Documented		Example of Implementation/ Objective Evidence, as applicable		Comment (e.g., any change in procedure since last audit, etc.)
		Location	Adequate? Y/N (Why)	Item Reviewed	Adequate? Y/N	
	TRAINING					
296	Is there documentation which shows that a standardized training program for visual examination operators has been developed? Is it specific to the site and include the various waste configurations generated/stored at the site? (Section C1-2)	CCP-QP-002 S. 1.1 S. 4.2 S. 4.3 Att.1 CCP-TP-113 S. 2.2 CCP-TP-500 S. 2.2	Y	5 VE Operator Training Records **(VE-2)**	Y	
297	Is there documentation which shows that the visual examination operators receive training on the specific waste generating processes, typical packaging configurations, and waste material parameters expected to be found in each Waste Matrix Code at the site? (Section C1-2)	CCP-QP-002 S. 1.1 S. 4.2 S. 4.3 Att.1 CCP-TP-113 S. 2.2 CCP-TP-500 S. 2.2	Y	5 VE Operator Training Records **(VE-2)**	Y	
298	Are the visual examination personnel requalified once every two years? (Section C1-2)	CCP-QP-002 S. 4.3.1 Att. 1 CCP-TP-113 S. 2.2 CCP-TP-500 S. 2.2	Y	5 VE Operator Training Records **(VE-2)**	Y	
298a	Does the training include the following regardless of Summary Category Group? • Identifying and describing the contents of a waste container by examining all items in waste containers of previously packaged waste. • Identifying when VE cannot be used to meet the DQOs. (Section C1-2)	CCP-QP-002 S. 4.2 CCP-TP-113 S. 1.1 S. 2.6.3 CCP-TP-500 S. 1.0 S. 1.1 .	Y	5 VE Operator Training Records **(VE-2)**	Y	

	WAP Requirement[1] ORNL/CCP Audit A-16-15 Table C6-4 Visual Examination (VE) Checklist	Procedure Documented		Example of Implementation/ Objective Evidence, as applicable		Comment (e.g., any change in procedure since last audit, etc.)
		Location	Adequate? Y/N (Why)	Item Reviewed	Adequate? Y/N	
	VISUAL EXAMINATION EXPERT REQUIREMENTS					
300	Does documentation ensure that the site has designated a visual examination expert? Is the visual examination expert familiar with the waste generating processes that have taken place at the site? Is the visual examination expert familiar with all of the types of waste being characterized at that site? (Section C1-2)	CCP-QP-002 S. 4.4 & 4.7 Att. 7	Y	3 VEE Operator Training Records and VEE Appointment Letters **(VE-3)**	Y	
301	Does documentation ensure that the visual examination expert shall be responsible for the overall direction and implementation of the visual examination aspects of the program? Does the site's QAPjP specify the selection, qualification, and training requirements of the visual examination expert? (Section C1-2)	CCP-TP-113 S. 3.1 CCP-TP-500 S. 3.3	Y	3 VEE Operator Training Records and VEE Appointment Letters **(VE-3)**	Y	
	VISUAL EXAMINATION PROCEDURES					
304	Do procedures indicate that all visual examination activities are documented on video/audio media or VE performed by using a second operator to provide additional verification by reviewing the contents of the waste container to ensure correct reporting? (Section C1-2)	CCP-TP-113 S. 1.1 Att. 2 CCP-TP-500 S. 1.1 Att. 1	Y	VE BDRs: ORNLRHVE15003 ORNLRHVE15016 ORNLRHVE16002 ORNLRHVE16009 ORNLRHVE16010 ORVECH0136 ORVECH0138 ORVECH0142 ORVECH0143 ORVECH0144 ORVECH0146 ORVECH0148 ORVECH0162 **(VE-1)**	Y	
304a	Are procedures in place to ensure that when VE is performed using a second operator, each operator performing VE shall observe for themselves the waste being placed in the container or the contents within the examined waste container when waste is not removed? (Section C1-2)	CCP-TP-113 S. 1.1 S. 2.6.3 Att. 2 CCP-TP-500 S. 1.1 Att. 1	Y	VE BDRs: ORNLRHVE15003 ORNLRHVE15016 ORNLRHVE16002 ORNLRHVE16009 ORNLRHVE16010 ORVECH0136 ORVECH0138 ORVECH0142 ORVECH0143 ORVECH0144 ORVECH0146 ORVECH0148	Y	

	WAP Requirement[1] ORNL/CCP Audit A-16-15 Table C6-4 Visual Examination (VE) Checklist	Procedure Documented		Example of Implementation/ Objective Evidence, as applicable		Comment (e.g., any change in procedure since last audit, etc.)
		Location	Adequate? Y/N (Why)	Item Reviewed	Adequate? Y/N	
				ORVECH0162 **(VE-1)**		
313	Do site procedures ensure that when liquid is found, the non-transparent internal container holding the liquid will be assumed to be filled with liquid and this volume will be added to the total liquid in the container being characterized using VE? The container being characterized using VE would then be rejected and/or repackaged to exclude the internal container if it is over the TSDF-WAC limits. (Section C-3b)	CCP-TP-113 S. 1.1 Table 1 Att. 2 CCP-TP-500 S. 1.1 Table 1 Att. 1	Y	VE BDRs: ORNLRHVE15003 ORNLRHVE15016 ORNLRHVE16002 ORNLRHVE16009 ORNLRHVE16010 ORVECH0136 ORVECH0138 ORVECH0142 ORVECH0143 ORVECH0144 ORVECH0146 ORVECH0148 ORVECH0162 **(VE-1)**	Y	
	QUALITY ASSURANCE OBJECTIVES					
314	Are process procedures in place to meet the following Quality Assurance Objectives? Precision • Precision is maintained by reconciling any discrepancies between the operator and the independent technical reviewer with regard to identification of waste matrix code, liquids in excess of TSDF-WAC limits, and compressed gases. Accuracy • Accuracy is maintained by requiring operators to pass a comprehensive examination and demonstrate satisfactory performance in the presence of the VE expert during their initial qualification. VE operators shall be requalified every two years. Completeness • A validated VE data form will be obtained for 100 percent of the waste containers subject to VE. Comparability • The comparability of VE data from different operators shall be enhanced by using standardized VE procedures and operator qualifications.	Bullet 1 CCP-TP-113 Att. 2 & 3 CCP-TP-500 Att. 1-3 Bullet 2 CCP-QP-002 S. 4.3.1 CCP-TP-113 Att. 3 CCP-TP-500 Att. 2 Bullet 3 CCP-TP-113 Att. 2 & 3 CCP-TP-500 Att. 1 & 2 Bullet 4	Y	VE BDRs: ORNLRHVE15003 ORNLRHVE15016 ORNLRHVE16002 ORNLRHVE16009 ORNLRHVE16010 ORVECH0136 ORVECH0138 ORVECH0142 ORVECH0143 ORVECH0144 ORVECH0146 ORVECH0148 ORVECH0162 **(VE-1)** 5 VE Operator Training Records **(VE-2)**	Y	

	WAP Requirement[1] ORNL/CCP Audit A-16-15 Table C6-4 Visual Examination (VE) Checklist	Procedure Documented		Example of Implementation/ Objective Evidence, as applicable		Comment (e.g., any change in procedure since last audit, etc.)
		Location	Adequate? Y/N (Why)	Item Reviewed	Adequate? Y/N	
	(Section C3-2b)	CCP-QP-002 (ALL) CCP-TP-113 (ALL) CCP-TP-500 (ALL)				

1. The WAP requirements should be presented in documents, such as procedures. Each of the questions posed under WAP requirements is meant to ask whether procedures are in place or whether documents are evident which demonstrate that the specific WAP requirement is or can be met.

Attachment 1 – CCP SPM Visual Examination Project Level Validation Checklist and Summary

BDR Number: ORVECH0136				Examination Date(s): 04/13/2015
Description of Criteria Reviewed	**Criteria Met?**			**Comments/Qualifiers**
	YES	**NO**	**NA**	
1. Is the completed, signed and dated Independent Technical Reviewer Checklist included in the BDR, and the independent technical reviewer was not involved in the generation or recording of the data under review? **Reference Source: CCP-PO-001, C3-4**	X			
2. Does the BDR contain all items addressed in the BDR Table of Contents? **Reference Source: CCP-PO-001, C3-4**	X			
3. Does the BDR include a listing of all container numbers in the batch? **Reference Source: CCP-PO-001, C3-4**	X			
4. List all containers that have met QAOs. **Reference Source: CCP-PO-001, C3-4**				Container Numbers: X10C9311030A1
5. Is the current implementing procedure and revision number included in the BDR? **Reference Source: CCP-PO-001, Table C3-3**	X			
6. Is the BDR date included? **Reference Source: CCP-PO-001, Table C3-3**	X			
7. Is there a reference to or copy of any associated NCRs (if any) in the BDR? **Reference Source: CCP-PO-001, Table C3-3**			X	No NCRs.
8. Are there 20 or fewer containers in the batch? **Reference Source: CCP-PO-001 C3-4**	X			
9. Are the data properly reported (i.e., data are reported in correct units and with correct significant figures). **Reference Source: CCP-PO-001 C3-4**	X			
10. Is there evidence of verification that the physical form matches the Waste Matrix Code? **Reference Source: CCP-PO-001, Table C3-3**	X			
11. Is there evidence of verification that the physical form matches the waste stream description? **Reference Source: CCP-PO-001, Table C3-3**	X			
12. Are prohibited items absent? **Reference Source: CCP-PO-001, Table C3-3**	X			

COPY

CCP RECORD ORIGINAL
DATE R 5-11-15 GL

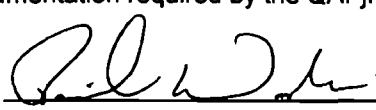
Attachment 1 – CCP SPM Visual Examination Project Level Validation Checklist and Summary (Continued)

BDR Number: ORVECH0136				Examination Date(s): 04/13/2015
Description of Criteria Reviewed	**Criteria Met?**			**Comments/Qualifiers**
	YES	**NO**	**NA**	
13. Does observable liquid, if present, meet the criteria of the TSDF-WAC? **Reference Source: CCP-PO-001, C-1**			X	No observable liquid.
14. Were discrepancies between the Visual Examination operator and the ITR with regards to identification of waste matrix code, liquids in excess of the TSDF-WAC, or compressed gases reconciled? NA if no discrepancies. **Reference Source: CCP-PO-001, C3-2**			X	
15. Are the training requirements met for the VE Expert and VE Operators who have signed the data forms? **Reference Source: CCP-PO-001, C3-8**	X			
16. Is evidence of a satisfactory audio/video test included in the BDR? NA [not applicable] for VE Method for Newly Generated Waste. **Reference Source: CCP-PO-001, C1-2**			X	
17. If the VE was not recorded using audio/video media, does the data sheet contain the signature of two qualified operators who observed for themselves the waste being placed into the container? NA if audio/video used. **Reference Source: CCP-PO-001, C1-2**	X			
18. Are the weights/estimated weights for the 12 waste material parameters reported in kilograms (kg)? **Reference Source: CCP Technical Procedures**	X			
19. Are the descriptions for each waste material parameter included in the BDR? **Reference Source: CCP-PO-001, C1-2**	X			
20. Is the gross weight reported (in kg) for each container included in the BDR? **Reference Source: CCP Technical Procedures**	X			
21. Is the number of layers of confinement recorded? **Reference Source: CCP-PO-001, C1-2**	X			
22. Is sufficient information included in the BDR to determine the packaging configuration? **Reference Source: CCP-PO-001, C1-2**	X			

Attachment 1 – CCP SPM Visual Examination Project Level Validation Checklist and Summary (Continued)

BDR Number: ORVECH0136				**Examination Date(s): 04/13/2015**
Description of Criteria Reviewed	**Criteria Met?**			**Comments/Qualifiers**
	YES	**NO**	**NA**	
23. Is the type and number of filters recorded? **Reference Source: CCP-PO-001, CCP Technical Procedures**	X			
24. Is the size of the rigid liner vent hole recorded? NA if no liner lid. **Reference Source: CCP-PO-001, CCP Technical Procedures**			X	
25. For Los Alamos National Laboratory (LANL) Sealed Sources, does the characterized waste container meet the definition of sealed sources per Title 10 Code of Federal Regulations (CFR) 30.4 and Title 10 CFR 835.2 (effective January 1, 2004) evidence of which is assembled as part of AK documentation? **Reference Source: CCP Technical Procedures**			X	Not a LANL Sealed Source.
26. For LANL Sealed Sources, are sealed sources the only non-packaging items in the waste container? **Reference Source: CCP-TP-069, 4.1.4**			X	Not a LANL Sealed Source.
27. For LANL Sealed Sources, are the sealed sources a U.S. Department of Transportation (DOT) Special Form Class 7 (Radioactive Material) per Title 49 CFR 34.27 (effective January 1, 2004) and the certification of which is assembled as part of the AK documentation? **Reference Source: CCP Technical Procedures**			X	Not a LANL Sealed Source.
28. For LANL Sealed Sources, is the integrity of each sealed source validated by documented contamination survey results to meet the requirements of Title 10 CFR 34.27 (effective January 1, 2004), and assembled as part of AK documentation? **Reference Source: CCP Technical Procedures**			X	Not a LANL Sealed Source.

Attachment 1 – CCP SPM Visual Examination Project Level Validation Checklist and Summary (Continued)

BDR Number: ORVECH0136				**Examination Date(s): 04/13/2015**
Description of Criteria Reviewed	**Criteria Met?**			**Comments/Qualifiers**
	YES	**NO**	**NA**	
29. For LANL Sealed Sources, is each sealed source a rigid sealed container less than or equal to 4 L in size or in a rigid sealed container less than or equal to 4 L? **Reference Source: CCP Technical Procedures**			X	Not a LANL Sealed Source.
30. For LANL Sealed Sources, AK documentation does not indicate the use of volatile organic compounds (VOCs) or VOC-bearing materials as constituents of sealed sources? **Reference Source: CCP Technical Procedures**			X	Not a LANL Sealed Source.
31. For LANL Sealed Sources, the outer casing of each sealed source is of a non VOC-bearing material which is verified using the VE technique at the time of packaging? **Reference Source: CCP Technical Procedures**			X	Not a LANL Sealed Source.
Comments: None.				
The container QC checks were properly performed and meet the Quality Assurance Objectives (QAOs). Proper procedures were followed during data reduction and analysis. The batch is complete, acceptable, and includes all supporting data and documentation required by the QAPjP. Daniel Wade  05/11/2015				
SPM Printed Name	Signature			Date

Checklist is to be re-signed only when a re-review is performed.

SPM Printed Name	Signature	Reason	Date
SPM Printed Name	Signature	Reason	Date

Attachment 5 – CCP Waste VE Batch Data Report Cover Sheet

Batch Data Report No.: ORVECH0136 Examination Date: 4-13-15

	Waste Container ID Number:
1	X10C9311030A1
2	
3	
4	
5	
6	
7	
8	
9	
10	
11	
12	
13	N/A
14	
15	
16	
17	
18	
19	
20	

Independent Technical Reviewer:

Pat Tilmon	Pat Tilmon	4-14-15
Print Name	Signature	Date

NTPC RECORDS ORIGINAL
DATE REC'D 4-14-2015

Attachment 4 – CCP Waste VE Batch Data Report Table of Contents

Batch Data Report No.: ORVECH0136 Examination Date: 4-13-15

Table of Contents

Item	Description	Page No.
1	CCP Waste VE Batch Data Report Cover Sheet	1
2	CCP Waste VE Batch Data Report Table of Contents	2
3	CCP Waste Visual Examination General Information Form	3
4	CCP Waste Visual Examination Data Forms	4
5	CCP Waste VE Independent Technical Reviewer Checklist	9
6	Copy of NCRs (N/A, If Not Applicable)	N/A
7	Field Records (N/A, If Not Applicable)	N/A

Attachment 1 – CCP Waste Visual Examination General Information Form

Batch Data Report No.: ORVECH0136

☑ VE for Previously Packaged Waste ☐ VE for Newly Generated Waste	
☐ Method 1 ☑ Method 2	
Site ID: OR	
Examination Date: 4-13-15	
Procedure No.: CCP-TP-113 Revision No.: 18	
Camera/Audio/Video Media Recording Check: ☑ N/A	☐ SAT
VE Scale Information: ☑ N/A	Serial/ID Number: Calibration Due Date: Operational Check: ☐ SAT ☐ UNSAT
Test Weight Information Test Weight Total: kg. Tray Weight: kg.	Serial/ID Number: Calibration Due Date: Serial/ID Number: Calibration Due Date: Serial/ID Number: Calibration Due Date:
Container Scale Information:	Serial/ID Number: WIPP002 Calibration Due Date: 6-10-15 Operational Check: ☑ SAT ☐ UNSAT

Comments:

The VEE has determined VE scale shall not be used.

Visual Examination Operator 1: Anthony Harley Print Name	Signature	4-13-15 Date
Visual Examination Operator 2: Jason Cofer Print Name	Signature	4-13-15 Date

Attachment 2 – CCP Waste Visual Examination Data Form Page 1 of 5

Batch Data Report No.: ORVECH0136

Section 1: Output Waste Container Data

Input Waste Container ID, as applicable: X10C9311030A

Output Waste Container ID: X10C9311030A1 | Waste Stream ID: OR-NBL-CH-HET

Container Type: 55 gallon drum | TRUCON Code: OR 125/225 | Waste Matrix Code: S 5400

Audio/Video Media Recording Number: ☑ N/A

Waste Container Weights:
Tare Wt: 33.2 kg. Gross Wt: 89.8 kg.

Rigid Liner Present? ☐ NO ☑ YES
Type of Liner: ☐ Lead ☐ Plastic ☑ Fiberboard ☐ Other:
Thickness: ☐ 30-mil ☑ 90-mil ☐ 110-mil ☐ 125-mil

Rigid Liner Lid Present? ☑ NO ☐ YES
Rigid Liner Lid is Vented (>0.3 in.) or Filtered? ☐ NO ☐ YES ☑ N/A
☐ Vented: Hole Size: ☑ N/A
☐ Filtered: Model No.: ☑ N/A
Serial No.: ☑ N/A

Bag Liner Present? ☐ NO ☑ YES

Volume Utilization Percentage: 40 %

Does the physical form of the waste match the Waste Stream Description (i.e., Homogeneous Solids, Soil/Gravel, or Debris Waste [including uncategorized metals])?
☐ NO ☑ YES

Does the physical form of the waste match the Waste Matrix Code?
☐ NO ☑ YES

Closure Method: TTF
Number of Layers of Confinement: 1

Filter Torque Wrench
Serial/ID No.: WIPP124
Calibration Due Date: 9-2-15
Filter: Model No.: uT94a4x
Serial No.: 00238 0302
Torque Value: 72 in/lbs

Lid Ring/Bolt Torque Wrench
Serial/ID No.: WIPP-177
Calibration Due Date: 6-5-15
Lid Ring/Bolt Torque Value: 60 ft/lbs

Is total dose rate greater than 200mrem/hr? ☑ NO ☐ YES

NCR(s) associated with the output container? ☑ NO ☐ YES
NCR No.: N/A
NCR No.: N/A

Comments:
N/A

Attachment 2 – CCP Waste Visual Examination Data Form (continued) Page 2 of 5

Batch Data Report No.: ORVECH0136 **Date:** 4-13-15

Section 2: Waste Package Data

Package and Package TID Number (as applicable)	Waste Description	WMP [Table 3]	Weight (kg) [Table 4.a]	Weighing Code(s) [Table 4.b]
N/A	absorbent pads vacuum bag cardboard pieces leather gloves	C	10.0	E
N/A	nylon rope plastic sleeves tape	PW	5.0	E
N/A	metal pump bolts nuts	IM	40.0	E
N/A	Nochar absorbent	OR	1.6	E
	N/A AH		4-13-15	

N/A	N/A	N/A
VEO 1: Print Name	Signature	Date
N/A	N/A	N/A
VEO 2: Print Name	Signature	Date

Signatures annotate the absence of prohibited items.

Output Waste Container ID: X10C9311030A1

TID Removed: N/A **TID Applied:** MP8SW 43858

N/A	N/A	N/A
VEO 1: Print Name	Signature	Date
N/A	N/A	N/A
VEO 2: Print Name	Signature	Date

Signatures of VEO's verifying the loading of the Output Waste Container.

Attachment 2 – CCP Waste Visual Examination Data Form (continued) Page 3 of 5

Batch Data Report No.: ORVECH0136

Output Waste Container ID: X1DC9311030A1

Section 3: Packaging Material and Waste Material Parameters	
Packaging Material:	Estimated Weight (kg)
Steel (ST):	27.8
Plastics (PP):	1.0
Others: (c)	4.4
Total Packaging Weight:	33.2
Waste Material Parameter:	Estimated Weight (kg)
Iron-based Metal/Alloys (IM):	40.0
Aluminum-based Metals/Alloys (AM):	N/A
Other Metals (OM):	N/A
Other Inorganic Materials (OI):	N/A
Cellulosics (C):	10.0
Rubber (R):	N/A
Plastics (waste materials) (PW):	5.0
Organic Matrix (OR):	1.6
Inorganic Matrix (IN):	N/A
Soils (S):	N/A
Total WMP Weight:	56.6

Attachment 2 – CCP Waste Visual Examination Data Form (continued) Page 4 of 5

Batch Data Report No.: ORVECH0136 **Output Waste Container ID:** X10C93110304 1

	Yes	No
Is there any observable liquid in internal containers, that is more than 60 milliliters or 3 percent by volume, whichever is greater?	☐	☑
Is the total volume of observable liquid in the outermost container **GREATER** than 1% of the container?	☐	☑
Is there detectable observable liquid in outermost containers with an EPA Hazardous Waste Number of U134?	☐	☑
Is there an indication of non-radionuclide pyrophoric materials, such as elemental potassium?	☐	☑
Is there an indication of hazardous wastes not occurring as co-contaminants with TRU mixed wastes (non-mixed hazardous wastes)?	☐	☑
Is there an indication of wastes incompatible with backfill, seal and panel closures materials, container and packaging materials, shipping container materials, or other wastes (i.e., waste does **NOT** match TRUCON Code[s])?	☐	☑
Is there an indication of wastes containing explosives or compressed gases?	☐	☑
Is there PCB liquids present?	☐	☑
Is there an indication of the waste exhibiting the characteristic of ignitability, corrosivity, or reactivity (EPA Hazardous Waste Numbers of D001, D002, or D003)?	☐	☑
Is the physical form of the waste inconsistent with the Waste Stream Description or the Waste Matrix Code?	☐	☑
Are there heat-sealed bags (unvented) **GREATER** than 4 liters and LESS than 390 square inches in the waste?	☐	☑
Were there Non-approved Closure Methods used on liner bags or inner bags greater than 4 liters?	☐	☑
Are there sealed containers **GREATER** than 4 liters?	☐	☑
Are there indications of inadequate protection (blocked or braced) for heavy and/or sharp objects?	☐	☑

Attachment 2 – CCP Waste Visual Examination Data Form (continued) Page 5 of 5

Batch Data Report No.: ORVECH0136 **Output Waste Container ID:** X10C9311030A1

Section 4: Prohibited Item(s) Summary (Continued)
(Questions answered "YES" will be explained in the Comments block)

Comments:

N/A

Section 5: Approvals

Visual Examination Operator 1:

Print Name	Signature	Date
Anthony Harley		4-13-15

Visual Examination Operator 2:

Print Name	Signature	Date
Jason Cofer		4-13-15

Attachment 3 – CCP Waste VE Independent Technical Reviewer Checklist

Batch Data Report No.: ORVECH0136

Description			
1. Data generation and reduction were conducted in a technically correct manner in accordance with the methods used?	☐ NO	☑ YES	☐ N/A
2. Was the correct revision of operating procedure used?	☐ NO	☑ YES	☐ N/A
3. Are the waste material parameters (WMPs) entered correctly?	☐ NO	☑ YES	☐ N/A
4. Verify the hand calculations on the VE Data Form for the following:			
a. WMP weight totals	☐ NO	☑ YES	☐ N/A
b. Weight totals	☐ NO	☑ YES	☐ N/A
c. Summed volume of observable liquid, as necessary	☐ NO	☐ YES	☑ N/A
d. The total of the WMP weights is within 5% of the net weight of waste of the Output Waste Container obtained from subtracting the tare weight from the gross weight.	☐ NO	☑ YES	☐ N/A
5. Is the data reported in the correct units and correct number of significant figures?	☐ NO	☑ YES	☐ N/A
6. Has the data been reviewed for transcription errors?	☐ NO	☐ YES	☑ N/A
7. Does the Testing Batch Report include VE for up to 20 containers?	☐ NO	☑ YES	☐ N/A
8. BDR contents are complete and match the CCP Waste VE Batch Data Report Table of Contents?	☐ NO	☑ YES	☐ N/A
9. Is all the data signed and dated in reproducible ink and by the individual(s) generating it?	☐ NO	☑ YES	☐ N/A
10. Is all data recorded clearly, legibly, and accurately?	☐ NO	☑ YES	☐ N/A
11. All changes to original data lined out, initialed and dated by the individual making the changes?	☐ NO	☐ YES	☑ N/A
12. Were data changes made by the individual who originally collected the data or an equally qualified individual?	☐ NO	☐ YES	☑ N/A
13. Did the physical form of the waste match the Waste Matrix Code and Waste Stream Description?	☐ NO	☑ YES	☐ N/A

Attachment 3 – CCP Waste VE Independent Technical Reviewer Checklist (continued)

Batch Data Report No.: ORVECH0136 Page 2 of 2

Description			
14. Was the waste in the Output Waste Container(s) examined for prohibited items?	☐ NO	☑ YES	☐ N/A
15. Is there an adequate written description of the contents of each item?	☐ NO	☑ YES	☐ N/A
16. Were the scale(s) in calibration prior to the VE and documented correctly?	☐ NO	☑ YES	☐ N/A
17. Were the scale checks SAT prior to the VE and documented correctly?	☐ NO	☑ YES	☐ N/A
18. Was the audio/video media recording properly prepared and labeled for each waste container?	☐ NO	☐ YES	☑ N/A
19. Was the audio/video media recording check performed satisfactorily prior to the VE?	☐ NO	☐ YES	☑ N/A
20. Precision: Was precision maintained by reconciling any discrepancies between the operator and the independent technical reviewer with regard to identification of waste matrix code, liquids in excess of TSDF-WAC limits, and compressed gases?	☐ NO	☐ YES	☑ N/A
21. Accuracy: Was accuracy maintained by requiring operators to pass a comprehensive examination and demonstrate satisfactory performance in the presence of the VE expert during their initial qualification and subsequent requalification (operators on LOQI)?	☐ NO	☑ YES	☐ N/A
22. Completeness: Is there a completed VE data form for each waste container in the BDR?	☐ NO	☑ YES	☐ N/A
23. Were NCRs initiated as required?	☐ NO	☐ YES	☑ N/A

Comments: N/A

I have reviewed 100 percent of the container-specific and batch data in this report and find it acceptable.

Independent Technical Reviewer:

Pat Tilmon	Pat Tilmon	4-14-15
Printed Name	Signature	Date

DIVIDER PAGE ONLY

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Attachment 2 – CCP Records Transmittal/Receiving Form

CCP Records / Records Custodian, 4021 National Parks Highway - MS: GSA 212, Carlsbad, New Mexico 88220

Telephone Number: 575-234-7523

Fax Number: 575-234-7033

Attn:	CCP RECORDS	From:	PATRICK SMITH II
Ship to:	CCP RECORDS CUSTODIAN	Site:	ORNL
	4021 NATIONAL PARKS HWY.	Company:	TFE INC.
	MS GSA 212	Telephone Number:	865-574-6002
	CARLSBAD, NM 88220-9082	Date Sent:	5-18-2015
Telephone Number:	575-234-7523		

ORVECH0136	VE BDR	4-13-2015	10
N/A	N/A	N/A	N/A
N/A	N/A	N/A	N/A
N/A	N/A	N/A	N/A
N/A	N/A	N/A	N/A
N/A	N/A	N/A	N/A

N/A

(When the Record accepted line has been completed, the rest of the page below may be left blank.)
Acceptance/Rejection Signature and Date

Records Accepted ☑	Signature	Greta Leos Printed Name	5-21-15 Date
Records Rejected ☐	Signature	Printed Name	Date

Reason for Rejection:

Re-submittal:

Signature	Printed Name	Date

05/21/2015 2:38 PM FAX

```
**********************************
***        Send Results        ***
**********************************

Sending is complete.

Job No.          4945
Address          918655768703
Name             ORNL
Start Time       05/21 02:37 PM
Call Length      00'30
Sheets           1
Result           OK
```


Attachment 2 – CCP Records Transmittal/Receiving Form

CCP Records / Records Custodian, 4021 National Parks Highway - MS: GSA 212, Carlsbad, New Mexico 88220

Telephone Number: 575-234-7523

Fax Number: 575-234-7033

Attn:	CCP RECORDS	From:	PATRICK SMITH II
Ship to:	CCP RECORDS CUSTODIAN	Site:	ORNL
	4021 NATIONAL PARKS HWY.	Company:	TFE INC.
	MS GSA 212	Telephone Number:	865-574-6002
	CARLSBAD, NM 88220-9082	Date Sent:	5-18-2015
Telephone Number:	575-234-7523		

ORVECH0136	VE BDR	4-13-2015	10
N/A	N/A	N/A	N/A
N/A	N/A	N/A	N/A
N/A	N/A	N/A	N/A
N/A	N/A	N/A	N/A
N/A	N/A	N/A	N/A

N/A

(When the Record accepted line has been completed, the rest of the page below may be left blank.)
Acceptance/Rejection Signature and Date

Records Accepted ☑ Signature Greta Leos Printed Name 5-21-15

Records Rejected ☐

DIVIDER

PAGE

Attachment 1 – CCP SPM Visual Examination Project Level Validation Checklist and Summary

BDR Number: ORVECH0138 **Examination Date(s):** 05/11/2015

Description of Criteria Reviewed	Criteria Met? YES	NO	NA	Comments/Qualifiers
1. Is the completed, signed and dated Independent Technical Reviewer Checklist included in the BDR, and the independent technical reviewer was not involved in the generation or recording of the data under review? **Reference Source: CCP-PO-001, C3-4**	X			
2. Does the BDR contain all items addressed in the BDR Table of Contents? **Reference Source: CCP-PO-001, C3-4**	X			
3. Does the BDR include a listing of all container numbers in the batch? **Reference Source: CCP-PO-001, C3-4**	X			
4. List all containers that have met QAOs. **Reference Source: CCP-PO-001, C3-4**				Container Numbers: X10C9312088A1
5. Is the current implementing procedure and revision number included in the BDR? **Reference Source: CCP-PO-001, Table C3-3**	X			
6. Is the BDR date included? **Reference Source: CCP-PO-001, Table C3-3**	X			
7. Is there a reference to or copy of any associated NCRs (if any) in the BDR? **Reference Source: CCP-PO-001, Table C3-3**			X	No NCRs.
8. Are there 20 or fewer containers in the batch? **Reference Source: CCP-PO-001 C3-4**	X			
9. Are the data properly reported (i.e., data are reported in correct units and with correct significant figures). **Reference Source: CCP-PO-001 C3-4**	X			
10. Is there evidence of verification that the physical form matches the Waste Matrix Code? **Reference Source: CCP-PO-001, Table C3-3**	X			
11. Is there evidence of verification that the physical form matches the waste stream description? **Reference Source: CCP-PO-001, Table C3-3**	X			
12. Are prohibited items absent? **Reference Source: CCP-PO-001, Table C3-3**	X			

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CCP RECORDS ORIGINAL
DATE REC'D 5-26-15 GL

Attachment 1 – CCP SPM Visual Examination Project Level Validation Checklist and Summary (Continued)

BDR Number: ORVECH0138				**Examination Date(s): 05/11/2015**
Description of Criteria Reviewed	**Criteria Met?**			**Comments/Qualifiers**
	YES	**NO**	**NA**	
13. Does observable liquid, if present, meet the criteria of the TSDF-WAC? **Reference Source: CCP-PO-001, C-1**			X	No observable liquid.
14. Were discrepancies between the Visual Examination operator and the ITR with regards to identification of waste matrix code, liquids in excess of the TSDF-WAC, or compressed gases reconciled? NA if no discrepancies. **Reference Source: CCP-PO-001, C3-2**			X	
15. Are the training requirements met for the VE Expert and VE Operators who have signed the data forms? **Reference Source: CCP-PO-001, C3-8**	X			
16. Is evidence of a satisfactory audio/video test included in the BDR? NA [not applicable] for VE Method for Newly Generated Waste. **Reference Source: CCP-PO-001, C1-2**			X	
17. If the VE was not recorded using audio/video media, does the data sheet contain the signature of two qualified operators who observed for themselves the waste being placed into the container? NA if audio/video used. **Reference Source: CCP-PO-001, C1-2**	X			
18. Are the weights/estimated weights for the 12 waste material parameters reported in kilograms (kg)? **Reference Source: CCP Technical Procedures**	X			
19. Are the descriptions for each waste material parameter included in the BDR? **Reference Source: CCP-PO-001, C1-2**	X			
20. Is the gross weight reported (in kg) for each container included in the BDR? **Reference Source: CCP Technical Procedures**	X			
21. Is the number of layers of confinement recorded? **Reference Source: CCP-PO-001, C1-2**	X			
22. Is sufficient information included in the BDR to determine the packaging configuration? **Reference Source: CCP-PO-001, C1-2**	X			

Attachment 1 – CCP SPM Visual Examination Project Level Validation Checklist and Summary (Continued)

BDR Number: ORVECH0138				Examination Date(s): 05/11/2015
Description of Criteria Reviewed	**Criteria Met?**			**Comments/Qualifiers**
	YES	**NO**	**NA**	
23. Is the type and number of filters recorded? **Reference Source: CCP-PO-001, CCP Technical Procedures**	X			
24. Is the size of the rigid liner vent hole recorded? NA if no liner lid. **Reference Source: CCP-PO-001, CCP Technical Procedures**			X	
25. For Los Alamos National Laboratory (LANL) Sealed Sources, does the characterized waste container meet the definition of sealed sources per Title 10 Code of Federal Regulations (CFR) 30.4 and Title 10 CFR 835.2 (effective January 1, 2004) evidence of which is assembled as part of AK documentation? **Reference Source: CCP Technical Procedures**			X	Not a LANL Sealed Source.
26. For LANL Sealed Sources, are sealed sources the only non-packaging items in the waste container? **Reference Source: CCP-TP-069, 4.1.4**			X	Not a LANL Sealed Source.
27. For LANL Sealed Sources, are the sealed sources a U.S. Department of Transportation (DOT) Special Form Class 7 (Radioactive Material) per Title 49 CFR 34.27 (effective January 1, 2004) and the certification of which is assembled as part of the AK documentation? **Reference Source: CCP Technical Procedures**			X	Not a LANL Sealed Source.
28. For LANL Sealed Sources, is the integrity of each sealed source validated by documented contamination survey results to meet the requirements of Title 10 CFR 34.27 (effective January 1, 2004), and assembled as part of AK documentation? **Reference Source: CCP Technical Procedures**			X	Not a LANL Sealed Source.

Attachment 1 – CCP SPM Visual Examination Project Level Validation Checklist and Summary (Continued)

BDR Number: ORVECH0138 **Examination Date(s): 05/11/2015**

Description of Criteria Reviewed	Criteria Met? YES	NO	NA	Comments/Qualifiers
29. For LANL Sealed Sources, is each sealed source a rigid sealed container less than or equal to 4 L in size or in a rigid sealed container less than or equal to 4 L? **Reference Source: CCP Technical Procedures**			X	Not a LANL Sealed Source.
30. For LANL Sealed Sources, AK documentation does not indicate the use of volatile organic compounds (VOCs) or VOC-bearing materials as constituents of sealed sources? **Reference Source: CCP Technical Procedures**			X	Not a LANL Sealed Source.
31. For LANL Sealed Sources, the outer casing of each sealed source is of a non VOC-bearing material which is verified using the VE technique at the time of packaging? **Reference Source: CCP Technical Procedures**			X	Not a LANL Sealed Source.

Comments: None.

The container QC checks were properly performed and meet the Quality Assurance Objectives (QAOs). Proper procedures were followed during data reduction and analysis. The batch is complete, acceptable, and includes all supporting data and documentation required by the QAPjP.

Daniel Wade		05/20/2015
SPM Printed Name	Signature	Date

Checklist is to be re-signed only when a re-review is performed.

SPM Printed Name	Signature	Reason	Date
SPM Printed Name	Signature	Reason	Date

Attachment 5 – CCP Waste VE Batch Data Report Cover Sheet

Batch Data Report No.: ORVECH0138 Examination Date: 5-11-15

	Waste Container ID Number
1	X10C93120888A1
2	
3	
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N/A AH 5-11-15

Independent Technical Reviewer:

Derek Matheny | Signature | 5/12/15

Print Name | Date

NTPC RECORDS ORIGINAL
DATE REC'D 5-12-2015

Attachment 4 – CCP Waste VE Batch Data Report Table of Contents

Batch Data Report No.: ORVECH0138 Examination Date: 5-11-15

Table of Contents

Item	Description	Page No.
1	CCP Waste VE Batch Data Report Cover Sheet	1
2	CCP Waste VE Batch Data Report Table of Contents	2
3	CCP Waste Visual Examination General Information Form	3
4	CCP Waste Visual Examination Data Forms	4
5	CCP Waste VE Independent Technical Reviewer Checklist	9
6	Copy of NCRs (N/A, If Not Applicable)	N/A
7	Field Records (N/A, If Not Applicable)	N/A

Attachment 1 – CCP Waste Visual Examination General Information Form

Batch Data Report No.: ORVECH0138

☑ VE for Previously Packaged Waste ☐ VE for Newly Generated Waste	
☐ Method 1 ☑ Method 2	
Site ID: OR	
Examination Date: 5-11-15	
Procedure No.: CCP-TP-113 Revision No.: 18	
Camera/Audio/Video Media Recording Check: ☑ N/A	☐ SAT
VE Scale Information: ☑ N/A	Serial/ID Number: Calibration Due Date: Operational Check: ☐ SAT ☐ UNSAT
Test Weight Information Test Weight Total: kg. Tray Weight: kg.	Serial/ID Number: Calibration Due Date: Serial/ID Number: Calibration Due Date: Serial/ID Number: Calibration Due Date:
Container Scale Information:	Serial/ID Number: WIPP002 Calibration Due Date: 6-10-15 Operational Check: ☑ SAT ☐ UNSAT

Comments:

The VEE has determined VE scale shall not be used.

Visual Examination Operator 1:		
Anthony Harley		5-11-15
Print Name	Signature	Date
Visual Examination Operator 2:		
Jason Cofer		5-11-15
Print Name	Signature	Date

Attachment 2 – CCP Waste Visual Examination Data Form Page 1 of 5

Batch Data Report No.: ORVECH0138

Section 1: Output Waste Container Data

Input Waste Container ID, as applicable: X10C 931208BA

Output Waste Container ID: X10C 931208BA1 | Waste Stream ID: OR-RF-CH-HET

Container Type: 55 gallon drum | TRUCON Code: OR 125/225 | Waste Matrix Code: S5400

Audio/Video Media Recording Number: ☑ N/A

Waste Container Weights:
Tare Wt: 33.2 kg. Gross Wt: 98.8 kg.

Rigid Liner Present? ☐ NO ☑ YES
Type of Liner: ☐ Lead ☐ Plastic ☑ Fiberboard ☐ Other:
Thickness: ☐ 30-mil ☑ 90-mil ☐ 110-mil ☐ 125-mil

Rigid Liner Lid Present? ☑ NO ☐ YES
Rigid Liner Lid is Vented (>0.3 in.) or Filtered? ☐ NO ☐ YES ☑ N/A
☐ Vented: Hole Size: ☑ N/A
☐ Filtered: Model No.: ☑ N/A
Serial No.: ☑ N/A

Bag Liner Present? ☐ NO ☑ YES

Volume Utilization Percentage: 65 %

Does the physical form of the waste match the Waste Stream Description (i.e., Homogeneous Solids, Soil/Gravel, or Debris Waste [including uncategorized metals])?
☐ NO ☑ YES

Does the physical form of the waste match the Waste Matrix Code?
☐ NO ☑ YES

Closure Method: TTF
Number of Layers of Confinement: 1

Filter Torque Wrench
Serial/ID No.: WIPP124
Calibration Due Date: 9-2-15
Filter: Model No.: UT9424X
Serial No.: 00238 0399
Torque Value: 72 in/lbs

Lid Ring/Bolt Torque Wrench
Serial/ID No.: WIPP177
Calibration Due Date: 6-5-15
Lid Ring/Bolt Torque Value: 60 ft/lbs

Is total dose rate greater than 200mrem/hr? ☑ NO ☐ YES

NCR(s) associated with the output container? ☑ NO ☐ YES
NCR No.: N/A
NCR No.: N/A

Comments:
N/A

Attachment 2 – CCP Waste Visual Examination Data Form (continued) Page 2 of 5

Batch Data Report No.: ORVECH0138 **Date:** 5-11-15

Section 2: Waste Package Data

Package and Package TID Number (as applicable)	Waste Description	WMP [Table 3]	Weight (kg) [Table 4.a]	Weighing Code(s) [Table 4.b]
N/A	saw blade metal bucket metal lid	IM	5.0	E
N/A	absorbent pad leather gloves cardboard vacuum bags	C	15.0	E
N/A	plastic tools plastic bags vinyl tape	PW	2.5	E
N/A	absorbent	OR	2.5	E
N/A	cloth rags	C	0.6	E
N/A	oxide powder	OI	40.0	E
		N/A	A.H. 5-11-15	

N/A	N/A	N/A
VEO 1: Print Name	Signature	Date
N/A	N/A	N/A
VEO 2: Print Name	Signature	Date

Signatures annotate the absence of prohibited items.

Output Waste Container ID: X10C9312088A1

TID Removed: N/A **TID Applied:** MP8SW 61150

N/A	N/A	N/A
VEO 1: Print Name	Signature	Date
N/A	N/A	N/A
VEO 2: Print Name	Signature	Date

Signatures of VEO's verifying the loading of the Output Waste Container.

Attachment 2 – CCP Waste Visual Examination Data Form (continued) Page 3 of 5

Batch Data Report No.: ORVECH 0138

Output Waste Container ID: X10C 93120884 1

Section 3: Packaging Material and Waste Material Parameters	
Packaging Material:	Estimated Weight (kg)
Steel (ST):	27.8
Plastics (PP):	1.0
Others: (c)	4.4
Total Packaging Weight:	33.2
Waste Material Parameter:	Estimated Weight (kg)
Iron-based Metal/Alloys (IM):	5.0
Aluminum-based Metals/Alloys (AM):	N/A
Other Metals (OM):	N/A
Other Inorganic Materials (OI):	40.0
Cellulosics (C):	15.6
Rubber (R):	N/A
Plastics (waste materials) (PW):	2.5
Organic Matrix (OR):	2.5
Inorganic Matrix (IN):	N/A
Soils (S):	N/A
Total WMP Weight:	65.6

Attachment 2 – CCP Waste Visual Examination Data Form (continued) Page 4 of 5

Batch Data Report No.: ORVECH0138 **Output Waste Container ID:** X10C931208BA1

	Yes	No
Is there any observable liquid in internal containers, that is more than 60 milliliters or 3 percent by volume, whichever is greater?	☐	☑
Is the total volume of observable liquid in the outermost container **GREATER** than 1% of the container?	☐	☑
Is there detectable observable liquid in outermost containers with an EPA Hazardous Waste Number of U134?	☐	☑
Is there an indication of non-radionuclide pyrophoric materials, such as elemental potassium?	☐	☑
Is there an indication of hazardous wastes not occurring as co-contaminants with TRU mixed wastes (non-mixed hazardous wastes)?	☐	☑
Is there an indication of wastes incompatible with backfill, seal and panel closures materials, container and packaging materials, shipping container materials, or other wastes (i.e., waste does **NOT** match TRUCON Code[s])?	☐	☑
Is there an indication of wastes containing explosives or compressed gases?	☐	☑
Is there PCB liquids present?	☐	☑
Is there an indication of the waste exhibiting the characteristic of ignitability, corrosivity, or reactivity (EPA Hazardous Waste Numbers of D001, D002, or D003)?	☐	☑
Is the physical form of the waste inconsistent with the Waste Stream Description or the Waste Matrix Code?	☐	☑
Are there heat-sealed bags (unvented) **GREATER** than 4 liters and LESS than 390 square inches in the waste?	☐	☑
Were there Non-approved Closure Methods used on liner bags or inner bags greater than 4 liters?	☐	☑
Are there sealed containers **GREATER** than 4 liters?	☐	☑
Are there indications of inadequate protection (blocked or braced) for heavy and/or sharp objects?	☐	☑

Attachment 2 – CCP Waste Visual Examination Data Form (continued) Page 5 of 5

Batch Data Report No.: ORVECH0138 **Output Waste Container ID:** X10C9312088A1

Section 4: Prohibited Item(s) Summary (Continued)
(Questions marked "Yes" are considered Non-Conformance Items)

Comments:

N/A

Section 5: Approvals

Visual Examination Operator 1:

Print Name	Signature	Date
Anthony Harley		5-11-15

Visual Examination Operator 2:

Print Name	Signature	Date
Jason Cafe		5-11-15

Attachment 3 – CCP Waste VE Independent Technical Reviewer Checklist

Batch Data Report No.: ORVECH0138

Page 1 of 2

Description			
1. Data generation and reduction were conducted in a technically correct manner in accordance with the methods used?	☐ NO	☑ YES	☐ N/A
2. Was the correct revision of operating procedure used?	☐ NO	☑ YES	☐ N/A
3. Are the waste material parameters (WMPs) entered correctly?	☐ NO	☑ YES	☐ N/A
4. Verify the hand calculations on the VE Data Form for the following:			
a. WMP weight totals	☐ NO	☑ YES	☐ N/A
b. Weight totals	☐ NO	☑ YES	☐ N/A
c. Summed volume of observable liquid, as necessary	☐ NO	☐ YES	☑ N/A
d. The total of the WMP weights is within 5% of the net weight of waste of the Output Waste Container obtained from subtracting the tare weight from the gross weight.	☐ NO	☑ YES	☐ N/A
5. Is the data reported in the correct units and correct number of significant figures?	☐ NO	☑ YES	☐ N/A
6. Has the data been reviewed for transcription errors?	☐ NO	☐ YES	☑ N/A
7. Does the Testing Batch Report include VE for up to 20 containers?	☐ NO	☑ YES	☐ N/A
8. BDR contents are complete and match the CCP Waste VE Batch Data Report Table of Contents?	☐ NO	☑ YES	☐ N/A
9. Is all the data signed and dated in reproducible ink and by the individual(s) generating it?	☐ NO	☑ YES	☐ N/A
10. Is all data recorded clearly, legibly, and accurately?	☐ NO	☑ YES	☐ N/A
11. All changes to original data lined out, initialed and dated by the individual making the changes?	☐ NO	☐ YES	☑ N/A
12. Were data changes made by the individual who originally collected the data or an equally qualified individual?	☐ NO	☐ YES	☑ N/A
13. Did the physical form of the waste match the Waste Matrix Code and Waste Stream Description?	☐ NO	☑ YES	☐ N/A

Attachment 3 – CCP Waste VE Independent Technical Reviewer Checklist (continued)

Batch Data Report No.: ORVECH0138 Page 2 of 2

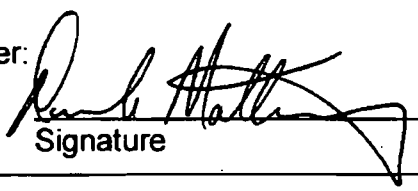
Description			
14. Was the waste in the Output Waste Container(s) examined for prohibited items?	☐ NO	☑ YES	☐ N/A
15. Is there an adequate written description of the contents of each item?	☐ NO	☑ YES	☐ N/A
16. Were the scale(s) in calibration prior to the VE and documented correctly?	☐ NO	☑ YES	☐ N/A
17. Were the scale checks SAT prior to the VE and documented correctly?	☐ NO	☑ YES	☐ N/A
18. Was the audio/video media recording properly prepared and labeled for each waste container?	☐ NO	☐ YES	☑ N/A
19. Was the audio/video media recording check performed satisfactorily prior to the VE?	☐ NO	☐ YES	☑ N/A
20. Precision: Was precision maintained by reconciling any discrepancies between the operator and the independent technical reviewer with regard to identification of waste matrix code, liquids in excess of TSDF-WAC limits, and compressed gases?	☐ NO	☐ YES	☑ N/A
21. Accuracy: Was accuracy maintained by requiring operators to pass a comprehensive examination and demonstrate satisfactory performance in the presence of the VE expert during their initial qualification and subsequent requalification (operators on LOQI)?	☐ NO	☑ YES	☐ N/A
22. Completeness: Is there a completed VE data form for each waste container in the BDR?	☐ NO	☑ YES	☐ N/A
23. Were NCRs initiated as required?	☐ NO	☐ YES	☑ N/A

Comments: N/A

I have reviewed 100 percent of the container-specific and batch data in this report and find it acceptable.

Independent Technical Reviewer:

Derek Matheny — Printed Name



Signature

5/12/15 — Date

DIVIDER

PAGE

Attachment 1 – CCP SPM Visual Examination Project Level Validation Checklist and Summary

BDR Number: ORVECH0142 **Examination Date(s):** 06/04/2015

Description of Criteria Reviewed	Criteria Met? YES	NO	NA	Comments/Qualifiers
1. Is the completed, signed and dated Independent Technical Reviewer Checklist included in the BDR, and the independent technical reviewer was not involved in the generation or recording of the data under review? **Reference Source: CCP-PO-001, C3-4**	X			
2. Does the BDR contain all items addressed in the BDR Table of Contents? **Reference Source: CCP-PO-001, C3-4**	X			
3. Does the BDR include a listing of all container numbers in the batch? **Reference Source: CCP-PO-001, C3-4**	X			
4. List all containers that have met QAOs. **Reference Source: CCP-PO-001, C3-4**				Container Numbers: X10C9311083A1
5. Is the current implementing procedure and revision number included in the BDR? **Reference Source: CCP-PO-001, Table C3-3**	X			
6. Is the BDR date included? **Reference Source: CCP-PO-001, Table C3-3**	X			
7. Is there a reference to or copy of any associated NCRs (if any) in the BDR? **Reference Source: CCP-PO-001, Table C3-3**			X	No NCRs.
8. Are there 20 or fewer containers in the batch? **Reference Source: CCP-PO-001 C3-4**	X			
9. Are the data properly reported (i.e., data are reported in correct units and with correct significant figures). **Reference Source: CCP-PO-001 C3-4**	X			
10. Is there evidence of verification that the physical form matches the Waste Matrix Code? **Reference Source: CCP-PO-001, Table C3-3**	X			
11. Is there evidence of verification that the physical form matches the waste stream description? **Reference Source: CCP-PO-001, Table C3-3**	X			
12. Are prohibited items absent? **Reference Source: CCP-PO-001, Table C3-3**	X			

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DATE REC'D 7-1-15 GL

Attachment 1 – CCP SPM Visual Examination Project Level Validation Checklist and Summary (Continued)

BDR Number: ORVECH0142				**Examination Date(s): 06/04/2015**
Description of Criteria Reviewed	**Criteria Met?**			**Comments/Qualifiers**
	YES	**NO**	**NA**	
13. Does observable liquid, if present, meet the criteria of the TSDF-WAC? **Reference Source: CCP-PO-001, C-1**			X	No observable liquid.
14. Were discrepancies between the Visual Examination operator and the ITR with regards to identification of waste matrix code, liquids in excess of the TSDF-WAC, or compressed gases reconciled? NA if no discrepancies. **Reference Source: CCP-PO-001, C3-2**			X	
15. Are the training requirements met for the VE Expert and VE Operators who have signed the data forms? **Reference Source: CCP-PO-001, C3-8**	X			
16. Is evidence of a satisfactory audio/video test included in the BDR? NA [not applicable] for VE Method for Newly Generated Waste. **Reference Source: CCP-PO-001, C1-2**			X	
17. If the VE was not recorded using audio/video media, does the data sheet contain the signature of two qualified operators who observed for themselves the waste being placed into the container? NA if audio/video used. **Reference Source: CCP-PO-001, C1-2**	X			
18. Are the weights/estimated weights for the 12 waste material parameters reported in kilograms (kg)? **Reference Source: CCP Technical Procedures**	X			
19. Are the descriptions for each waste material parameter included in the BDR? **Reference Source: CCP-PO-001, C1-2**	X			
20. Is the gross weight reported (in kg) for each container included in the BDR? **Reference Source: CCP Technical Procedures**	X			
21. Is the number of layers of confinement recorded? **Reference Source: CCP-PO-001, C1-2**	X			
22. Is sufficient information included in the BDR to determine the packaging configuration? **Reference Source: CCP-PO-001, C1-2**	X			

Attachment 1 – CCP SPM Visual Examination Project Level Validation Checklist and Summary (Continued)

BDR Number: ORVECH0142				**Examination Date(s): 06/04/2015**
Description of Criteria Reviewed	**Criteria Met?**			**Comments/Qualifiers**
	YES	**NO**	**NA**	
23. Is the type and number of filters recorded? **Reference Source: CCP-PO-001, CCP Technical Procedures**	X			
24. Is the size of the rigid liner vent hole recorded? NA if no liner lid. **Reference Source: CCP-PO-001, CCP Technical Procedures**			X	
25. For Los Alamos National Laboratory (LANL) Sealed Sources, does the characterized waste container meet the definition of sealed sources per Title 10 Code of Federal Regulations (CFR) 30.4 and Title 10 CFR 835.2 (effective January 1, 2004) evidence of which is assembled as part of AK documentation? **Reference Source: CCP Technical Procedures**			X	Not a LANL Sealed Source.
26. For LANL Sealed Sources, are sealed sources the only non-packaging items in the waste container? **Reference Source: CCP-TP-069, 4.1.4**			X	Not a LANL Sealed Source.
27. For LANL Sealed Sources, are the sealed sources a U.S. Department of Transportation (DOT) Special Form Class 7 (Radioactive Material) per Title 49 CFR 34.27 (effective January 1, 2004) and the certification of which is assembled as part of the AK documentation? **Reference Source: CCP Technical Procedures**			X	Not a LANL Sealed Source.
28. For LANL Sealed Sources, is the integrity of each sealed source validated by documented contamination survey results to meet the requirements of Title 10 CFR 34.27 (effective January 1, 2004), and assembled as part of AK documentation? **Reference Source: CCP Technical Procedures**			X	Not a LANL Sealed Source.

Attachment 1 – CCP SPM Visual Examination Project Level Validation Checklist and Summary (Continued)

BDR Number: ORVECH0142 **Examination Date(s):** 06/04/2015

Description of Criteria Reviewed	Criteria Met? YES	NO	NA	Comments/Qualifiers
29. For LANL Sealed Sources, is each sealed source a rigid sealed container less than or equal to 4 L in size or in a rigid sealed container less than or equal to 4 L? **Reference Source: CCP Technical Procedures**			X	Not a LANL Sealed Source.
30. For LANL Sealed Sources, AK documentation does not indicate the use of volatile organic compounds (VOCs) or VOC-bearing materials as constituents of sealed sources? **Reference Source: CCP Technical Procedures**			X	Not a LANL Sealed Source.
31. For LANL Sealed Sources, the outer casing of each sealed source is of a non VOC-bearing material which is verified using the VE technique at the time of packaging? **Reference Source: CCP Technical Procedures**			X	Not a LANL Sealed Source.

Comments: None.

The container QC checks were properly performed and meet the Quality Assurance Objectives (QAOs). Proper procedures were followed during data reduction and analysis. The batch is complete, acceptable, and includes all supporting data and documentation required by the QAPjP.

Daniel Wade		06/29/2015
SPM Printed Name	Signature	Date

Checklist is to be re-signed only when a re-review is performed.

SPM Printed Name	Signature	Reason	Date
SPM Printed Name	Signature	Reason	Date

Attachment 5 – CCP Waste VE Batch Data Report Cover Sheet

Batch Data Report No.: ORVECH0142 Examination Date: 6-4-15

	Waste Container ID Number
1	X10C9311083A1
2	
3	
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N/A A.H. 6-16-15

Independent Technical Reviewer:

Derek Matheny | Signature | 6/16/15
Print Name | | Date

NTPC RECORDS ORIGINAL
DATE REC'D 6-17-2015

Attachment 4 – CCP Waste VE Batch Data Report Table of Contents

Batch Data Report No.: ORVECH0142 Examination Date: 6-4-15

Table of Contents

Item	Description	Page No.
1	CCP Waste VE Batch Data Report Cover Sheet	1
2	CCP Waste VE Batch Data Report Table of Contents	2
3	CCP Waste Visual Examination General Information Form	3
4	CCP Waste Visual Examination Data Forms	4
5	CCP Waste VE Independent Technical Reviewer Checklist	9
6	Copy of NCRs (N/A, If Not Applicable)	N/A
7	Field Records (N/A, If Not Applicable)	N/A

Attachment 1 – CCP Waste Visual Examination General Information Form

Batch Data Report No.: ORVECH0142

☑ VE for Previously Packaged Waste ☐ VE for Newly Generated Waste	
☐ Method 1 ☑ Method 2	
Site ID: OR	
Examination Date: 6-4-15	
Procedure No.: CCP-TP-113	Revision No.: 18
Camera/Audio/Video Media Recording Check: ☑ N/A	☐ SAT
VE Scale Information: ☑ N/A	Serial/ID Number: Calibration Due Date: Operational Check: ☐ SAT ☐ UNSAT
Test Weight Information Test Weight Total: kg. Tray Weight: kg.	Serial/ID Number: Calibration Due Date: Serial/ID Number: Calibration Due Date: Serial/ID Number: Calibration Due Date:
Container Scale Information:	Serial/ID Number: WIPP151 Calibration Due Date: 1-7-16 Operational Check: ☑ SAT ☐ UNSAT

Comments:
The VEE has determined VE scale shall not be used.

Visual Examination Operator 1: Anthony Harley Print Name	Signature	6-16-15 Date
Visual Examination Operator 2: Jason Cofer Print Name	Signature	6-16-15 Date

Attachment 2 – CCP Waste Visual Examination Data Form Page 1 of 5

Batch Data Report No.: ORVECH0142

Section 1: Output Waste Container Data

Input Waste Container ID, as applicable: X10C9311083A

Output Waste Container ID: X10C9311083A1 | Waste Stream ID: OR-MRF-CH-HET

Container Type: 55gallon drum | TRUCON Code: OR125/225 | Waste Matrix Code: S5400

Audio/Video Media Recording Number: ☑ N/A

Waste Container Weights:
Tare Wt: 33.2 kg. Gross Wt: 179.6 kg.

Rigid Liner Present? ☐ NO ☑ YES
Type of Liner: ☐ Lead ☐ Plastic
☑ Fiberboard ☐ Other:
Thickness: ☐ 30-mil ☑ 90-mil ☐ 110-mil
☐ 125-mil

Rigid Liner Lid Present? ☑ NO ☐ YES
Rigid Liner Lid is Vented (>0.3 in.) or Filtered?
☐ NO ☐ YES ☑ N/A
☐ Vented: Hole Size: ☑ N/A
☐ Filtered: Model No.: ☑ N/A
Serial No.: ☑ N/A

Bag Liner Present? ☐ NO ☑ YES

Volume Utilization Percentage: 100 %

Does the physical form of the waste match the Waste Stream Description (i.e., Homogeneous Solids, Soil/Gravel, or Debris Waste [including uncategorized metals])?
☐ NO ☑ YES

Does the physical form of the waste match the Waste Matrix Code?
☐ NO ☑ YES

Closure Method: TTF
Number of Layers of Confinement: 1

Filter Torque Wrench
Serial/ID No.: WIPP169
Calibration Due Date: 10-7-15
Filter: Model No.: UT9424X
Serial No.: 00238 0304
Torque Value: 72 in/lbs

Lid Ring/Bolt Torque Wrench
Serial/ID No.: WIPP150
Calibration Due Date: 4-8-2016
Lid Ring/Bolt Torque Value: 60 ft/lbs

Is total dose rate greater than 200mrem/hr? ☑ NO ☐ YES

NCR(s) associated with the output container? ☑ NO ☐ YES.
NCR No.: N/A
NCR No.: N/A

Comments:
Output container was started on 6-4-15. VE was paused due to host site inventory system being disabled. Drum was removed from BBA and completed on 6-16-15. All contents of the output container were completely VE'd on 6-4-15.

Attachment 2 – CCP Waste Visual Examination Data Form (continued) Page 2 of 5

Batch Data Report No.: ORVECHO142 **Date:** 6-4-15

Section 2: Waste Package Data

Package and Package TID Number (as applicable)	Waste Description	WMP [Table 3]	Weight (kg) [Table 4.[a]]	Weighing Code(s) [Table 4[b]]
N/A	cardboard wood absorbent pads	C	10.0	E
N/A	metal bolts metal valves metal pipes metal nuts	IM	60.0	E
N/A	paper gaskets paper filters	C	1.2	E
N/A	rubber tubing	R	2.2	E
N/A	plastic bags vinyl tape	PW	3.0	E
N/A	metal filter housings metal flange	IM	70.0	E
		N/A	A.H. 6-4-15	

N/A	N/A	N/A
VEO 1: Print Name	Signature	Date
N/A	N/A	N/A
VEO 2: Print Name	Signature	Date

Signatures annotate the absence of prohibited items.

Output Waste Container ID: X10C9311083A1

TID Removed: N/A **TID Applied:** MP85W 61364

N/A	N/A	N/A
VEO 1: Print Name	Signature	Date
N/A	N/A	N/A
VEO 2: Print Name	Signature	Date

Signatures of VEO's verifying the loading of the Output Waste Container.

Attachment 2 – CCP Waste Visual Examination Data Form (continued) Page 3 of 5

Batch Data Report No.: ORVECH0142

Output Waste Container ID: X10C9311083A1

Section 3: Packaging Material and Waste Material Parameters	
Packaging Material:	Estimated Weight (kg)
Steel (ST):	27.8
Plastics (PP):	1.0
Others: (C)	4.4
Total Packaging Weight:	33.2
Waste Material Parameter:	Estimated Weight (kg)
Iron-based Metal/Alloys (IM):	130.0
Aluminum-based Metals/Alloys (AM):	N/A
Other Metals (OM):	N/A
Other Inorganic Materials (OI):	N/A
Cellulosics (C):	11.2
Rubber (R):	2.2
Plastics (waste materials) (PW):	3.0
Organic Matrix (OR):	N/A
Inorganic Matrix (IN):	N/A
Soils (S):	N/A
Total WMP Weight:	146.4

Attachment 2 – CCP Waste Visual Examination Data Form (continued) Page 4 of 5

Batch Data Report No.: ORVECH0142 **Output Waste Container ID:** X10C9311083A1

	Yes	No
Is there any observable liquid in internal containers, that is more than 60 milliliters or 3 percent by volume, whichever is greater?	☐	☑
Is the total volume of observable liquid in the outermost container **GREATER** than 1% of the container?	☐	☑
Is there detectable observable liquid in outermost containers with an EPA Hazardous Waste Number of U134?	☐	☑
Is there an indication of non-radionuclide pyrophoric materials, such as elemental potassium?	☐	☑
Is there an indication of hazardous wastes not occurring as co-contaminants with TRU mixed wastes (non-mixed hazardous wastes)?	☐	☑
Is there an indication of wastes incompatible with backfill, seal and panel closures materials, container and packaging materials, shipping container materials, or other wastes (i.e., waste does **NOT** match TRUCON Code[s])?	☐	☑
Is there an indication of wastes containing explosives or compressed gases?	☐	☑
Is there PCB liquids present?	☐	☑
Is there an indication of the waste exhibiting the characteristic of ignitability, corrosivity, or reactivity (EPA Hazardous Waste Numbers of D001, D002, or D003)?	☐	☑
Is the physical form of the waste inconsistent with the Waste Stream Description or the Waste Matrix Code?	☐	☑
Are there heat-sealed bags (unvented) **GREATER** than 4 liters and LESS than 390 square inches in the waste?	☐	☑
Were there Non-approved Closure Methods used on liner bags or inner bags greater than 4 liters?	☐	☑
Are there sealed containers **GREATER** than 4 liters?	☐	☑
Are there indications of inadequate protection (blocked or braced) for heavy and/or sharp objects?	☐	☑

Attachment 2 – CCP Waste Visual Examination Data Form (continued) Page 5 of 5

Batch Data Report No.: ORWECH0142 **Output Waste Container ID:** X10C93110831

Section 4: Prohibited Item(s) Summary (Continued)
(Questions answered 'YES' will be explained in the Comments block)

Comments:

N/A

Section 5: Approvals

Visual Examination Operator 1:

Print Name	Signature	Date
Anthony Harley		6-16-15

Visual Examination Operator 2:

Print Name	Signature	Date
Jason Cofer		6-16-15

Attachment 3 – CCP Waste VE Independent Technical Reviewer Checklist

Batch Data Report No.: ORVECH0142 Page 1 of 2

Description			
1. Data generation and reduction were conducted in a technically correct manner in accordance with the methods used?	☐ NO	☑ YES	☐ N/A
2. Was the correct revision of operating procedure used?	☐ NO	☑ YES	☐ N/A
3. Are the waste material parameters (WMPs) entered correctly?	☐ NO	☑ YES	☐ N/A
4. Verify the hand calculations on the VE Data Form for the following:			
a. WMP weight totals	☐ NO	☑ YES	☐ N/A
b. Weight totals	☐ NO	☑ YES	☐ N/A
c. Summed volume of observable liquid, as necessary	☐ NO	☐ YES	☑ N/A
d. The total of the WMP weights is within 5% of the net weight of waste of the Output Waste Container obtained from subtracting the tare weight from the gross weight.	☐ NO	☑ YES	☐ N/A
5. Is the data reported in the correct units and correct number of significant figures?	☐ NO	☑ YES	☐ N/A
6. Has the data been reviewed for transcription errors?	☐ NO	☐ YES	☑ N/A
7. Does the Testing Batch Report include VE for up to 20 containers?	☐ NO	☑ YES	☐ N/A
8. BDR contents are complete and match the CCP Waste VE Batch Data Report Table of Contents?	☐ NO	☑ YES	☐ N/A
9. Is all the data signed and dated in reproducible ink and by the individual(s) generating it?	☐ NO	☑ YES	☐ N/A
10. Is all data recorded clearly, legibly, and accurately?	☐ NO	☑ YES	☐ N/A
11. All changes to original data lined out, initialed and dated by the individual making the changes?	☐ NO	☐ YES	☑ N/A
12. Were data changes made by the individual who originally collected the data or an equally qualified individual?	☐ NO	☐ YES	☑ N/A
13. Did the physical form of the waste match the Waste Matrix Code and Waste Stream Description?	☐ NO	☑ YES	☐ N/A

Attachment 3 – CCP Waste VE Independent Technical Reviewer Checklist (continued)

Batch Data Report No.: ORVECH0142 Page 2 of 2

Description			
14. Was the waste in the Output Waste Container(s) examined for prohibited items?	☐ NO	☑ YES	☐ N/A
15. Is there an adequate written description of the contents of each item?	☐ NO	☑ YES	☐ N/A
16. Were the scale(s) in calibration prior to the VE and documented correctly?	☐ NO	☑ YES	☐ N/A
17. Were the scale checks SAT prior to the VE and documented correctly?	☐ NO	☑ YES	☐ N/A
18. Was the audio/video media recording properly prepared and labeled for each waste container?	☐ NO	☐ YES	☑ N/A
19. Was the audio/video media recording check performed satisfactorily prior to the VE?	☐ NO	☐ YES	☑ N/A
20. Precision: Was precision maintained by reconciling any discrepancies between the operator and the independent technical reviewer with regard to identification of waste matrix code, liquids in excess of TSDF-WAC limits, and compressed gases?	☐ NO	☐ YES	☑ N/A
21. Accuracy: Was accuracy maintained by requiring operators to pass a comprehensive examination and demonstrate satisfactory performance in the presence of the VE expert during their initial qualification and subsequent requalification (operators on LOQI)?	☐ NO	☑ YES	☐ N/A
22. Completeness: Is there a completed VE data form for each waste container in the BDR?	☐ NO	☑ YES	☐ N/A
23. Were NCRs initiated as required?	☐ NO	☐ YES	☑ N/A

Comments: N/A

I have reviewed 100 percent of the container-specific and batch data in this report and find it acceptable.

Independent Technical Reviewer:

Printed Name	Signature	Date
Derek Matheny	Derek Matheny	6/16/15

DIVIDER

PAGE

Attachment 1 – CCP SPM Visual Examination Project Level Validation Checklist and Summary

BDR Number: ORVECH0143				Examination Date(s): 06/18/2015
Description of Criteria Reviewed	**Criteria Met?**			**Comments/Qualifiers**
	YES	**NO**	**NA**	
1. Is the completed, signed and dated Independent Technical Reviewer Checklist included in the BDR, and the independent technical reviewer was not involved in the generation or recording of the data under review? **Reference Source: CCP-PO-001, C3-4**	X			
2. Does the BDR contain all items addressed in the BDR Table of Contents? **Reference Source: CCP-PO-001, C3-4**	X			
3. Does the BDR include a listing of all container numbers in the batch? **Reference Source: CCP-PO-001, C3-4**	X			
4. List all containers that have met QAOs. **Reference Source: CCP-PO-001, C3-4**				Container Numbers: X10C9311953A1
5. Is the current implementing procedure and revision number included in the BDR? **Reference Source: CCP-PO-001, Table C3-3**	X			
6. Is the BDR date included? **Reference Source: CCP-PO-001, Table C3-3**	X			
7. Is there a reference to or copy of any associated NCRs (if any) in the BDR? **Reference Source: CCP-PO-001, Table C3-3**			X	No NCRs.
8. Are there 20 or fewer containers in the batch? **Reference Source: CCP-PO-001 C3-4**	X			
9. Are the data properly reported (i.e., data are reported in correct units and with correct significant figures). **Reference Source: CCP-PO-001 C3-4**	X			
10. Is there evidence of verification that the physical form matches the Waste Matrix Code? **Reference Source: CCP-PO-001, Table C3-3**	X			
11. Is there evidence of verification that the physical form matches the waste stream description? **Reference Source: CCP-PO-001, Table C3-3**	X			
12. Are prohibited items absent? **Reference Source: CCP-PO-001, Table C3-3**	X			

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CCP RECORDS ORIGINAL
DATE REC'D 7-1-15 GL

Attachment 1 – CCP SPM Visual Examination Project Level Validation Checklist and Summary (Continued)

BDR Number: ORVECH0143				Examination Date(s): 06/18/2015
Description of Criteria Reviewed	**Criteria Met?**			**Comments/Qualifiers**
	YES	**NO**	**NA**	
13. Does observable liquid, if present, meet the criteria of the TSDF-WAC? **Reference Source: CCP-PO-001, C-1**			X	No observable liquid.
14. Were discrepancies between the Visual Examination operator and the ITR with regards to identification of waste matrix code, liquids in excess of the TSDF-WAC, or compressed gases reconciled? NA if no discrepancies. **Reference Source: CCP-PO-001, C3-2**			X	
15. Are the training requirements met for the VE Expert and VE Operators who have signed the data forms? **Reference Source: CCP-PO-001, C3-8**	X			
16. Is evidence of a satisfactory audio/video test included in the BDR? NA [not applicable] for VE Method for Newly Generated Waste. **Reference Source: CCP-PO-001, C1-2**			X	
17. If the VE was not recorded using audio/video media, does the data sheet contain the signature of two qualified operators who observed for themselves the waste being placed into the container? NA if audio/video used. **Reference Source: CCP-PO-001, C1-2**	X			
18. Are the weights/estimated weights for the 12 waste material parameters reported in kilograms (kg)? **Reference Source: CCP Technical Procedures**	X			
19. Are the descriptions for each waste material parameter included in the BDR? **Reference Source: CCP-PO-001, C1-2**	X			
20. Is the gross weight reported (in kg) for each container included in the BDR? **Reference Source: CCP Technical Procedures**	X			
21. Is the number of layers of confinement recorded? **Reference Source: CCP-PO-001, C1-2**	X			
22. Is sufficient information included in the BDR to determine the packaging configuration? **Reference Source: CCP-PO-001, C1-2**	X			

Attachment 1 – CCP SPM Visual Examination Project Level Validation Checklist and Summary (Continued)

BDR Number: ORVECH0143				Examination Date(s): 06/18/2015
Description of Criteria Reviewed	**Criteria Met?**			**Comments/Qualifiers**
	YES	**NO**	**NA**	
23. Is the type and number of filters recorded? **Reference Source: CCP-PO-001, CCP Technical Procedures**	X			
24. Is the size of the rigid liner vent hole recorded? NA if no liner lid. **Reference Source: CCP-PO-001, CCP Technical Procedures**			X	
25. For Los Alamos National Laboratory (LANL) Sealed Sources, does the characterized waste container meet the definition of sealed sources per Title 10 Code of Federal Regulations (CFR) 30.4 and Title 10 CFR 835.2 (effective January 1, 2004) evidence of which is assembled as part of AK documentation? **Reference Source: CCP Technical Procedures**			X	Not a LANL Sealed Source.
26. For LANL Sealed Sources, are sealed sources the only non-packaging items in the waste container? **Reference Source: CCP-TP-069, 4.1.4**			X	Not a LANL Sealed Source.
27. For LANL Sealed Sources, are the sealed sources a U.S. Department of Transportation (DOT) Special Form Class 7 (Radioactive Material) per Title 49 CFR 34.27 (effective January 1, 2004) and the certification of which is assembled as part of the AK documentation? **Reference Source: CCP Technical Procedures**			X	Not a LANL Sealed Source.
28. For LANL Sealed Sources, is the integrity of each sealed source validated by documented contamination survey results to meet the requirements of Title 10 CFR 34.27 (effective January 1, 2004), and assembled as part of AK documentation? **Reference Source: CCP Technical Procedures**			X	Not a LANL Sealed Source.

Attachment 1 – CCP SPM Visual Examination Project Level Validation Checklist and Summary (Continued)

BDR Number: ORVECH0143 **Examination Date(s): 06/18/2015**

Description of Criteria Reviewed	Criteria Met? YES	NO	NA	Comments/Qualifiers
29. For LANL Sealed Sources, is each sealed source a rigid sealed container less than or equal to 4 L in size or in a rigid sealed container less than or equal to 4 L? **Reference Source: CCP Technical Procedures**			X	Not a LANL Sealed Source.
30. For LANL Sealed Sources, AK documentation does not indicate the use of volatile organic compounds (VOCs) or VOC-bearing materials as constituents of sealed sources? **Reference Source: CCP Technical Procedures**			X	Not a LANL Sealed Source.
31. For LANL Sealed Sources, the outer casing of each sealed source is of a non VOC-bearing material which is verified using the VE technique at the time of packaging? **Reference Source: CCP Technical Procedures**			X	Not a LANL Sealed Source.

Comments: None.

The container QC checks were properly performed and meet the Quality Assurance Objectives (QAOs). Proper procedures were followed during data reduction and analysis. The batch is complete, acceptable, and includes all supporting data and documentation required by the QAPjP.

Daniel Wade		06/26/2015
SPM Printed Name	Signature	Date

Checklist is to be re-signed only when a re-review is performed.

SPM Printed Name	Signature	Reason	Date
SPM Printed Name	Signature	Reason	Date

Attachment 5 – CCP Waste VE Batch Data Report Cover Sheet

Batch Data Report No.: ORVECH0143 Examination Date: 6-18-15

	Waste Container ID Number:
1	X1DC9311953A1
2	
3	
4	
5	
6	
7	
8	
9	
10	
11	
12	N/A
13	
14	
15	
16	
17	
18	
19	
20	

Independent Technical Reviewer:

Derek Matheny — Print Name

Signature

6/18/15 — Date

NTPC RECORDS ORIGINAL
DATE REC'D 6-22-2015

Attachment 4 – CCP Waste VE Batch Data Report Table of Contents

Batch Data Report No.: ORVECH0143 Examination Date: 6-18-15

Table of Contents

Item	Description	Page No.
1	CCP Waste VE Batch Data Report Cover Sheet	1
2	CCP Waste VE Batch Data Report Table of Contents	2
3	CCP Waste Visual Examination General Information Form	3
4	CCP Waste Visual Examination Data Forms	4
5	CCP Waste VE Independent Technical Reviewer Checklist	9
6	Copy of NCRs (N/A, If Not Applicable)	N/A
7	Field Records (N/A, If Not Applicable)	N/A

Attachment 1 – CCP Waste Visual Examination General Information Form

Batch Data Report No.: ORVECH0143

☑ VE for Previously Packaged Waste ☐ VE for Newly Generated Waste	
☐ Method 1 ☑ Method 2	
Site ID: OR	
Examination Date: 6-18-15	
Procedure No.: CCP-TP-113 Revision No.: 18	
Camera/Audio/Video Media Recording Check: ☑ N/A	☐ SAT
VE Scale Information: ☑ N/A	Serial/ID Number: Calibration Due Date: Operational Check: ☐ SAT ☐ UNSAT
Test Weight Information Test Weight Total: kg. Tray Weight: kg.	Serial/ID Number: Calibration Due Date: Serial/ID Number: Calibration Due Date: Serial/ID Number: Calibration Due Date:
Container Scale Information:	Serial/ID Number: WIPP151 Calibration Due Date: 1-7-16 Operational Check: ☑ SAT ☐ UNSAT

Comments:
The VEE has determined VE scale shall not be used.

Visual Examination Operator 1: Anthony Harley Print Name	Signature	6-18-15 Date
Visual Examination Operator 2: Jason Cole Print Name	Signature	6-18-15 Date

Attachment 2 – CCP Waste Visual Examination Data Form Page 1 of 5

Batch Data Report No.: ORVECH0143

Section 1: Output Waste Container Data		
Input Waste Container ID, as applicable: X10C9311953A		
Output Waste Container ID: X10C9311953A1	Waste Stream ID: OR-RADP-CH-HET	
Container Type: 55 gallon drum	TRUCON Code: OR 125/225	Waste Matrix Code: S5400
Audio/Video Media Recording Number: ☑ N/A		
Waste Container Weights: Tare Wt: 33.2 kg.	Gross Wt: 85.2 kg.	
Rigid Liner Present? ☐ NO ☑ YES Type of Liner: ☐ Lead ☐ Plastic ☑ Fiberboard ☐ Other: Thickness: ☐ 30-mil ☑ 90-mil ☐ 110-mil ☐ 125-mil	Rigid Liner Lid Present? ☑ NO ☐ YES Rigid Liner Lid is Vented (>0.3 in.) or Filtered? ☐ NO ☐ YES ☑ N/A ☐ Vented: Hole Size: ☑ N/A ☐ Filtered: Model No.: ☑ N/A Serial No.: ☑ N/A	
Bag Liner Present? ☐ NO ☑ YES	Volume Utilization Percentage: 100 %	
Does the physical form of the waste match the Waste Stream Description (i.e., Homogeneous Solids, Soil/Gravel, or Debris Waste [including uncategorized metals])? ☐ NO ☑ YES		
Does the physical form of the waste match the Waste Matrix Code? ☐ NO ☑ YES		
Closure Method: TTF Number of Layers of Confinement: 1		
Filter Torque Wrench Serial/ID No.: WIPP 169 Calibration Due Date: 10-7-15 Filter: Model No.: UT9424X Serial No.: 00238 0080 Torque Value: 72 in/lbs	Lid Ring/Bolt Torque Wrench Serial/ID No.: WIPP150 Calibration Due Date: 4-8-16 Lid Ring/Bolt Torque Value: 60 ft/lbs	
Is total dose rate greater than 200mrem/hr? ☑ NO ☐ YES		
NCR(s) associated with the output container? ☑ NO ☐ YES NCR No.: N/A NCR No.: N/A		
Comments: N/A		

Attachment 2 – CCP Waste Visual Examination Data Form (continued) Page 2 of 5

Batch Data Report No.: ORVECH0143 **Date:** 6-18-15

Section 3: Waste Package Data

Package and Package TID Number (as applicable)	Waste Description	WMP [Table 3]	Weight (kg) [Table 4,[a]]	Weighing Code(s) [Table 4[b]]
N/A	vaccum bag paper paper cups cardboard cloth leather gloves	C	8.0	E
N/A	plastic tubing plastic bottles plastic tool plastic bags vinyl tape	PW	10.0	E
N/A	metal filter housing metal cans metal lids	Im	10.0	E
N/A	broken glass glass vials	OI	8.0	E
N/A	lead pigs	Om	15.0	E
N/A	rubber gaskets	R	0.5	E
N/A	absorbent	OI	0.5	E

N/A	N/A	N/A
VEO 1: Print Name	Signature	Date
N/A	N/A	N/A
VEO 2: Print Name	Signature	Date

Signatures annotate the absence of prohibited items.

Output Waste Container ID: X10C9311953A1

TID Removed: N/A **TID Applied:** MP85W 61355

N/A	N/A	N/A
VEO 1: Print Name	Signature	Date
N/A	N/A	N/A
VEO 2: Print Name	Signature	Date

Signatures of VEO's verifying the loading of the Output Waste Container.

Attachment 2 – CCP Waste Visual Examination Data Form (continued) Page 3 of 5

Batch Data Report No.: ORVECH0143

Output Waste Container ID: X10C 9311953A1

Section 3: Packaging Material and Waste Material Parameters	
Packaging Material:	Estimated Weight (kg)
Steel (ST):	27.8
Plastics (PP):	1.0
Others: (c)	4.4
Total Packaging Weight:	33.2
Waste Material Parameter:	Estimated Weight (kg)
Iron-based Metal/Alloys (IM):	10.0
Aluminum-based Metals/Alloys (AM):	N/A
Other Metals (OM):	15.0
Other Inorganic Materials (OI):	8.5
Cellulosics (C):	8.0
Rubber (R):	0.5
Plastics (waste materials) (PW):	10.0
Organic Matrix (OR):	N/A
Inorganic Matrix (IN):	N/A
Soils (S):	N/A
Total WMP Weight:	52.0

Attachment 2 – CCP Waste Visual Examination Data Form (continued) Page 4 of 5

Batch Data Report No.: ORVECH0143 **Output Waste Container ID:** X10C93119533A1

	Yes	No
Is there any observable liquid in internal containers, that is more than 60 milliliters or 3 percent by volume, whichever is greater?	☐	☑
Is the total volume of observable liquid in the outermost container **GREATER** than 1% of the container?	☐	☑
Is there detectable observable liquid in outermost containers with an EPA Hazardous Waste Number of U134?	☐	☑
Is there an indication of non-radionuclide pyrophoric materials, such as elemental potassium?	☐	☑
Is there an indication of hazardous wastes not occurring as co-contaminants with TRU mixed wastes (non-mixed hazardous wastes)?	☐	☑
Is there an indication of wastes incompatible with backfill, seal and panel closures materials, container and packaging materials, shipping container materials, or other wastes (i.e., waste does **NOT** match TRUCON Code[s])?	☐	☑
Is there an indication of wastes containing explosives or compressed gases?	☐	☑
Is there PCB liquids present?	☐	☑
Is there an indication of the waste exhibiting the characteristic of ignitability, corrosivity, or reactivity (EPA Hazardous Waste Numbers of D001, D002, or D003)?	☐	☑
Is the physical form of the waste inconsistent with the Waste Stream Description or the Waste Matrix Code?	☐	☑
Are there heat-sealed bags (unvented) **GREATER** than 4 liters and LESS than 390 square inches in the waste?	☐	☑
Were there Non-approved Closure Methods used on liner bags or inner bags greater than 4 liters?	☐	☑
Are there sealed containers **GREATER** than 4 liters?	☐	☑
Are there indications of inadequate protection (blocked or braced) for heavy and/or sharp objects?	☐	☑

Attachment 2 – CCP Waste Visual Examination Data Form (continued) Page 5 of 5

Batch Data Report No.: ORVECH0143 **Output Waste Container ID:** X10C9311953A1

Section 4: Prohibited Item(s) Summary (Continued)
(Questions answered "YES" will be explained in the Comments block)

Comments:

N/A

Section 5: Approvals

Visual Examination Operator 1:

Print Name	Signature	Date
Anthony Harley		6-18-15

Visual Examination Operator 2:

Print Name	Signature	Date
Jason Cafe		6-18-15

Attachment 3 – CCP Waste VE Independent Technical Reviewer Checklist

Batch Data Report No.: ORVECH0143 Page 1 of 2

Description			
1. Data generation and reduction were conducted in a technically correct manner in accordance with the methods used?	☐ NO	☑ YES	☐ N/A
2. Was the correct revision of operating procedure used?	☐ NO	☑ YES	☐ N/A
3. Are the waste material parameters (WMPs) entered correctly?	☐ NO	☑ YES	☐ N/A
4. Verify the hand calculations on the VE Data Form for the following:			
a. WMP weight totals	☐ NO	☑ YES	☐ N/A
b. Weight totals	☐ NO	☑ YES	☐ N/A
c. Summed volume of observable liquid, as necessary	☐ NO	☐ YES	☑ N/A
d. The total of the WMP weights is within 5% of the net weight of waste of the Output Waste Container obtained from subtracting the tare weight from the gross weight.	☐ NO	☑ YES	☐ N/A
5. Is the data reported in the correct units and correct number of significant figures?	☐ NO	☑ YES	☐ N/A
6. Has the data been reviewed for transcription errors?	☐ NO	☐ YES	☑ N/A
7. Does the Testing Batch Report include VE for up to 20 containers?	☐ NO	☑ YES	☐ N/A
8. BDR contents are complete and match the CCP Waste VE Batch Data Report Table of Contents?	☐ NO	☑ YES	☐ N/A
9. Is all the data signed and dated in reproducible ink and by the individual(s) generating it?	☐ NO	☑ YES	☐ N/A
10. Is all data recorded clearly, legibly, and accurately?	☐ NO	☑ YES	☐ N/A
11. All changes to original data lined out, initialed and dated by the individual making the changes?	☐ NO	☐ YES	☑ N/A
12. Were data changes made by the individual who originally collected the data or an equally qualified individual?	☐ NO	☐ YES	☑ N/A
13. Did the physical form of the waste match the Waste Matrix Code and Waste Stream Description?	☐ NO	☑ YES	☐ N/A

Attachment 3 – CCP Waste VE Independent Technical Reviewer Checklist (continued)

Batch Data Report No.: ORVECH0143 Page 2 of 2

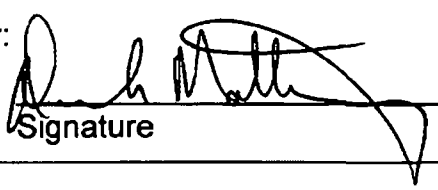
Description			
14. Was the waste in the Output Waste Container(s) examined for prohibited items?	☐ NO	☑ YES	☐ N/A
15. Is there an adequate written description of the contents of each item?	☐ NO	☑ YES	☐ N/A
16. Were the scale(s) in calibration prior to the VE and documented correctly?	☐ NO	☑ YES	☐ N/A
17. Were the scale checks SAT prior to the VE and documented correctly?	☐ NO	☑ YES	☐ N/A
18. Was the audio/video media recording properly prepared and labeled for each waste container?	☐ NO	☐ YES	☑ N/A
19. Was the audio/video media recording check performed satisfactorily prior to the VE?	☐ NO	☐ YES	☑ N/A
20. Precision: Was precision maintained by reconciling any discrepancies between the operator and the independent technical reviewer with regard to identification of waste matrix code, liquids in excess of TSDF-WAC limits, and compressed gases?	☐ NO	☐ YES	☑ N/A
21. Accuracy: Was accuracy maintained by requiring operators to pass a comprehensive examination and demonstrate satisfactory performance in the presence of the VE expert during their initial qualification and subsequent requalification (operators on LOQI)?	☐ NO	☑ YES	☐ N/A
22. Completeness: Is there a completed VE data form for each waste container in the BDR?	☐ NO	☑ YES	☐ N/A
23. Were NCRs initiated as required?	☐ NO	☐ YES	☑ N/A

Comments: N/A

I have reviewed 100 percent of the container-specific and batch data in this report and find it acceptable.

Independent Technical Reviewer:

Derek Matheny — Printed Name

 — Signature

6/18/15 — Date

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PAGE

Attachment 1 – CCP SPM Visual Examination Project Level Validation Checklist and Summary

BDR Number: ORVECH0144 **Examination Date(s):** 06/22/2015

Description of Criteria Reviewed	Criteria Met? YES	NO	NA	Comments/Qualifiers
1. Is the completed, signed and dated Independent Technical Reviewer Checklist included in the BDR, and the independent technical reviewer was not involved in the generation or recording of the data under review? **Reference Source: CCP-PO-001, C3-4**	X			
2. Does the BDR contain all items addressed in the BDR Table of Contents? **Reference Source: CCP-PO-001, C3-4**	X			
3. Does the BDR include a listing of all container numbers in the batch? **Reference Source: CCP-PO-001, C3-4**	X			
4. List all containers that have met QAOs. **Reference Source: CCP-PO-001, C3-4**				Container Numbers: X10C9313060B
5. Is the current implementing procedure and revision number included in the BDR? **Reference Source: CCP-PO-001, Table C3-3**	X			
6. Is the BDR date included? **Reference Source: CCP-PO-001, Table C3-3**	X			
7. Is there a reference to or copy of any associated NCRs (if any) in the BDR? **Reference Source: CCP-PO-001, Table C3-3**	X			NCR-ORNL-0154-15 (X10C9313060A)
8. Are there 20 or fewer containers in the batch? **Reference Source: CCP-PO-001 C3-4**	X			
9. Are the data properly reported (i.e., data are reported in correct units and with correct significant figures). **Reference Source: CCP-PO-001 C3-4**	X			
10. Is there evidence of verification that the physical form matches the Waste Matrix Code? **Reference Source: CCP-PO-001, Table C3-3**	X			Except for container X10C9313060A.
11. Is there evidence of verification that the physical form matches the waste stream description? **Reference Source: CCP-PO-001, Table C3-3**	X			Except for container X10C9313060A.
12. Are prohibited items absent? **Reference Source: CCP-PO-001, Table C3-3**	X			

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CCP RECORDS ORIGINAL
DATE REC'D 7.27.15 JY

Attachment 1 – CCP SPM Visual Examination Project Level Validation Checklist and Summary (Continued)

BDR Number: ORVECH0144 **Examination Date(s): 06/22/2015**

Description of Criteria Reviewed	Criteria Met?			Comments/Qualifiers
	YES	NO	NA	
13. Does observable liquid, if present, meet the criteria of the TSDF-WAC? **Reference Source: CCP-PO-001, C-1**			X	No observable liquid.
14. Were discrepancies between the Visual Examination operator and the ITR with regards to identification of waste matrix code, liquids in excess of the TSDF-WAC, or compressed gases reconciled? NA if no discrepancies. **Reference Source: CCP-PO-001, C3-2**			X	
15. Are the training requirements met for the VE Expert and VE Operators who have signed the data forms? **Reference Source: CCP-PO-001, C3-8**	X			
16. Is evidence of a satisfactory audio/video test included in the BDR? NA [not applicable] for VE Method for Newly Generated Waste. **Reference Source: CCP-PO-001, C1-2**			X	
17. If the VE was not recorded using audio/video media, does the data sheet contain the signature of two qualified operators who observed for themselves the waste being placed into the container? NA if audio/video used. **Reference Source: CCP-PO-001, C1-2**	X			
18. Are the weights/estimated weights for the 12 waste material parameters reported in kilograms (kg)? **Reference Source: CCP Technical Procedures**	X			
19. Are the descriptions for each waste material parameter included in the BDR? **Reference Source: CCP-PO-001, C1-2**	X			
20. Is the gross weight reported (in kg) for each container included in the BDR? **Reference Source: CCP Technical Procedures**	X			
21. Is the number of layers of confinement recorded? **Reference Source: CCP-PO-001, C1-2**	X			
22. Is sufficient information included in the BDR to determine the packaging configuration? **Reference Source: CCP-PO-001, C1-2**	X			

Attachment 1 – CCP SPM Visual Examination Project Level Validation Checklist and Summary (Continued)

BDR Number: ORVECH0144				**Examination Date(s): 06/22/2015**
Description of Criteria Reviewed	**Criteria Met?**			**Comments/Qualifiers**
	YES	**NO**	**NA**	
23. Is the type and number of filters recorded? **Reference Source: CCP-PO-001, CCP Technical Procedures**	X			
24. Is the size of the rigid liner vent hole recorded? NA if no liner lid. **Reference Source: CCP-PO-001, CCP Technical Procedures**			X	
25. For Los Alamos National Laboratory (LANL) Sealed Sources, does the characterized waste container meet the definition of sealed sources per Title 10 Code of Federal Regulations (CFR) 30.4 and Title 10 CFR 835.2 (effective January 1, 2004) evidence of which is assembled as part of AK documentation? **Reference Source: CCP Technical Procedures**			X	Not a LANL Sealed Source.
26. For LANL Sealed Sources, are sealed sources the only non-packaging items in the waste container? **Reference Source: CCP-TP-069, 4.1.4**			X	Not a LANL Sealed Source.
27. For LANL Sealed Sources, are the sealed sources a U.S. Department of Transportation (DOT) Special Form Class 7 (Radioactive Material) per Title 49 CFR 34.27 (effective January 1, 2004) and the certification of which is assembled as part of the AK documentation? **Reference Source: CCP Technical Procedures**			X	Not a LANL Sealed Source.
28. For LANL Sealed Sources, is the integrity of each sealed source validated by documented contamination survey results to meet the requirements of Title 10 CFR 34.27 (effective January 1, 2004), and assembled as part of AK documentation? **Reference Source: CCP Technical Procedures**			X	Not a LANL Sealed Source.

Attachment 1 – CCP SPM Visual Examination Project Level Validation Checklist and Summary (Continued)

BDR Number: ORVECH0144				Examination Date(s): 06/22/2015
Description of Criteria Reviewed	**Criteria Met?**			**Comments/Qualifiers**
	YES	**NO**	**NA**	
29. For LANL Sealed Sources, is each sealed source a rigid sealed container less than or equal to 4 L in size or in a rigid sealed container less than or equal to 4 L? **Reference Source: CCP Technical Procedures**			X	Not a LANL Sealed Source.
30. For LANL Sealed Sources, AK documentation does not indicate the use of volatile organic compounds (VOCs) or VOC-bearing materials as constituents of sealed sources? **Reference Source: CCP Technical Procedures**			X	Not a LANL Sealed Source.
31. For LANL Sealed Sources, the outer casing of each sealed source is of a non VOC-bearing material which is verified using the VE technique at the time of packaging? **Reference Source: CCP Technical Procedures**			X	Not a LANL Sealed Source.
Comments: None.				
The container QC checks were properly performed and meet the Quality Assurance Objectives (QAOs). Proper procedures were followed during data reduction and analysis. The batch is complete, acceptable, and includes all supporting data and documentation required by the QAPjP. Daniel Wade 07/21/2015				
SPM Printed Name	Signature			Date

Checklist is to be re-signed only when a re-review is performed.

SPM Printed Name	Signature	Reason	Date
SPM Printed Name	Signature	Reason	Date

Attachment 5 – CCP Waste VE Batch Data Report Cover Sheet

Batch Data Report No.: ORVECH0144 Examination Date: 6-22-15

	Waste Container ID Number:
1	X10C93130606A
2	X10C93130603
3	
4	
5	
6	
7	
8	
9	
10	
11	
12	N/A
13	A.H.
14	6-22-15
15	
16	
17	
18	
19	
20	

Independent Technical Reviewer:

Derek Matheny | Signature | 7/1/15
Print Name | | Date

NTPC RECORDS ORIGINAL
DATE REC'D 7-01-2015

Attachment 4 – CCP Waste VE Batch Data Report Table of Contents

Batch Data Report No.: ORVECH0144 Examination Date: 6-22-15

Table of Contents		
Item	Description	Page No.
1	CCP Waste VE Batch Data Report Cover Sheet	1
2	CCP Waste VE Batch Data Report Table of Contents	2
3	CCP Waste Visual Examination General Information Form	3
4	CCP Waste Visual Examination Data Forms	4
5	CCP Waste VE Independent Technical Reviewer Checklist	14
6	Copy of NCRs (N/A, If Not Applicable)	16
7	Field Records (N/A, If Not Applicable)	N/A

Attachment 1 – CCP Waste Visual Examination General Information Form

Batch Data Report No.: ORVECH0144

☑ VE for Previously Packaged Waste ☐ VE for Newly Generated Waste	
☐ Method 1 ☑ Method 2	
Site ID: OR	
Examination Date: 6-22-15	
Procedure No.: CCP-TP-113 Revision No.: 18	
Camera/Audio/Video Media Recording Check: ☑ N/A	☐ SAT
VE Scale Information: ☑ N/A	Serial/ID Number: Calibration Due Date: Operational Check: ☐ SAT ☐ UNSAT
Test Weight Information Test Weight Total: kg. Tray Weight: kg.	Serial/ID Number: Calibration Due Date: Serial/ID Number: Calibration Due Date: Serial/ID Number: Calibration Due Date:
Container Scale Information:	Serial/ID Number: WIPP151 Calibration Due Date: 1-7-16 Operational Check: ☑ SAT ☐ UNSAT

Comments:

The VEE has determined VE scale shall not be used.

Visual Examination Operator 1:		
Anthony Harley		6-22-15
Print Name	Signature	Date
Visual Examination Operator 2:		
Jason Cesar		6-22-15
Print Name	Signature	Date

Attachment 2 – CCP Waste Visual Examination Data Form Page 1 of 5

Batch Data Report No.: ORVECH0144

Section 1: Output Waste Container Data		
Input Waste Container ID, as applicable: X10C9313060		
Output Waste Container ID: X10C9313060A	Waste Stream ID: OR-PADP-CH-HET	
Container Type: 55gallon drum	TRUCON Code: OR 125/225	Waste Matrix Code: S5100
Audio/Video Media Recording Number: ☑ N/A		
Waste Container Weights: Tare Wt: 33.2 kg.	Gross Wt: 239.9 kg.	
Rigid Liner Present? ☐ NO ☑ YES Type of Liner: ☐ Lead ☐ Plastic ☑ Fiberboard ☐ Other: Thickness: ☐ 30-mil ☑ 90-mil ☐ 110-mil ☐ 125-mil	Rigid Liner Lid Present? ☑ NO ☐ YES Rigid Liner Lid is Vented (>0.3 in.) or Filtered? ☐ NO ☐ YES ☑ N/A ☐ Vented: Hole Size: ☑ N/A ☐ Filtered: Model No.: ☑ N/A Serial No.: ☑ N/A	
Bag Liner Present? ☐ NO ☑ YES	Volume Utilization Percentage: 100 %	
Does the physical form of the waste match the Waste Stream Description (i.e., Homogeneous Solids, Soil/Gravel, or Debris Waste [including uncategorized metals])? ☑ NO ☐ YES		
Does the physical form of the waste match the Waste Matrix Code? ☑ NO ☐ YES		
Closure Method: TTF Number of Layers of Confinement: 1		
Filter Torque Wrench Serial/ID No.: WIPP169 Calibration Due Date: 10-7-15 Filter: Model No.: UT9424X Serial No.: 00238 0076 Torque Value: 72 in/lbs	Lid Ring/Bolt Torque Wrench Serial/ID No.: WIPP150 Calibration Due Date: 4-18-16 Lid Ring/Bolt Torque Value: 60 ft/lbs	
Is total dose rate greater than 200mrem/hr? ☑ NO ☐ YES		
NCR(s) associated with the output container? ☐ NO ☑ YES NCR No.: ORNL-0154-15 NCR No.: N/A		
Comments: N/A		

Attachment 2 – CCP Waste Visual Examination Data Form (continued) Page 2 of 5

Batch Data Report No.: ORVECH0144 **Date:** 6-22-15

Section 2: Waste Package Data

Package and Package TID Number (as applicable)	Waste Description	WMP [Table 3]	Weight (kg) [Table 4.[a]]	Weighing Code(s) [Table 4[b]]
N/A	soil, gravel	S	60.0	E
N/A	twigs, leaves, grass	C	2.0	E
N/A	MgF_2 pellets	OI	144.7	E
		N/A A.H. 6-22-15		

N/A	N/A	N/A
VEO 1: Print Name	Signature	Date
N/A	N/A	N/A
VEO 2: Print Name	Signature	Date

Signatures annotate the absence of prohibited items.

Output Waste Container ID: X10C9313060A

TID Removed: N/A **TID Applied:** MP85W 61134

N/A	N/A	N/A
VEO 1: Print Name	Signature	Date
N/A	N/A	N/A
VEO 2: Print Name	Signature	Date

Signatures of VEO's verifying the loading of the Output Waste Container.

Page 1 of 1

Attachment 2 – CCP Waste Visual Examination Data Form (continued) Page 3 of 5

Batch Data Report No.: ORVECH0144

Output Waste Container ID: X10C9313060A

Section 3: Packaging Material and Waste Material Parameters	
Packaging Material:	Estimated Weight (kg)
Steel (ST):	27.8
Plastics (PP):	1.0
Others: (c)	4.4
Total Packaging Weight:	33.2
Waste Material Parameter:	Estimated Weight (kg)
Iron-based Metal/Alloys (IM):	N/A
Aluminum-based Metals/Alloys (AM):	N/A
Other Metals (OM):	N/A
Other Inorganic Materials (OI):	144.7
Cellulosics (C):	2.0
Rubber (R):	N/A
Plastics (waste materials) (PW):	N/A
Organic Matrix (OR):	N/A
Inorganic Matrix (IN):	N/A
Soils (S):	60.0
Total WMP Weight:	206.7

Attachment 2 – CCP Waste Visual Examination Data Form (continued) Page 4 of 5

Batch Data Report No.: ORVECH0144 **Output Waste Container ID:** X10C9313060A

Section 4: Prohibited Item(s) Summary (Questions answered "YES" will be explained in the Comments block)		
	Yes	No
Is there any observable liquid in internal containers, that is more than 60 milliliters or 3 percent by volume, whichever is greater?	☐	☑
Is the total volume of observable liquid in the outermost container **GREATER** than 1% of the container?	☐	☑
Is there detectable observable liquid in outermost containers with an EPA Hazardous Waste Number of U134?	☐	☑
Is there an indication of non-radionuclide pyrophoric materials, such as elemental potassium?	☐	☑
Is there an indication of hazardous wastes not occurring as co-contaminants with TRU mixed wastes (non-mixed hazardous wastes)?	☐	☑
Is there an indication of wastes incompatible with backfill, seal and panel closures materials, container and packaging materials, shipping container materials, or other wastes (i.e., waste does **NOT** match TRUCON Code[s])?	☐	☑
Is there an indication of wastes containing explosives or compressed gases?	☐	☑
Is there PCB liquids present?	☐	☑
Is there an indication of the waste exhibiting the characteristic of ignitability, corrosivity, or reactivity (EPA Hazardous Waste Numbers of D001, D002, or D003)?	☐	☑
Is the physical form of the waste inconsistent with the Waste Stream Description or the Waste Matrix Code?	☑	☐
TRUPACT-II Criteria		
Are there heat-sealed bags (unvented) **GREATER** than 4 liters and LESS than 390 square inches in the waste?	☐	☑
Were there Non-approved Closure Methods used on liner bags or inner bags greater than 4 liters?	☐	☑
Are there sealed containers **GREATER** than 4 liters?	☐	☑
Are there indications of inadequate protection (blocked or braced) for heavy and/or sharp objects?	☐	☑

Attachment 2 – CCP Waste Visual Examination Data Form (continued) Page 5 of 5

Batch Data Report No.: ORVECH0144 **Output Waste Container ID:** X10C9313060A

Section 4: Prohibited Item(s) Summary (Continued)

(Questions answered "YES" will be explained in the Comments block)

Comments:

Drum # X10C9313060A did not meet the Waste Stream Description or the Waste matrix Code due to soil, gravel, and grass being found during the VE process. An NCR was initiated for this container.

Section 5: Approvals

Visual Examination Operator 1:

Anthony Harley — Print Name

Signature

6-22-15 — Date

Visual Examination Operator 2:

Jason Cafe — Print Name

Signature

6-22-15 — Date

Attachment 2 – CCP Waste Visual Examination Data Form Page 1 of 5

Batch Data Report No.: ORVECH0144

Section 1: Output Waste Container Data		
Input Waste Container ID, as applicable: X10C 9313060		
Output Waste Container ID: X10C 9313060 B	Waste Stream ID: OR-PGDP-CH-HET	
Container Type:	TRUCON Code: OR 125/225	Waste Matrix Code: S5100
Audio/Video Media Recording Number: ☑ N/A		
Waste Container Weights: Tare Wt: 33.2 kg.	Gross Wt: 68.5 kg.	
Rigid Liner Present? ☐ NO ☑ YES Type of Liner: ☐ Lead ☐ Plastic ☑ Fiberboard ☐ Other: Thickness: ☐ 30-mil ☑ 90-mil ☐ 110-mil ☐ 125-mil	Rigid Liner Lid Present? ☑ NO ☐ YES Rigid Liner Lid is Vented (>0.3 in.) or Filtered? ☐ NO ☐ YES ☑ N/A ☐ Vented: Hole Size: ☑ N/A ☐ Filtered: Model No.: ☑ N/A Serial No.: ☑ N/A	
Bag Liner Present? ☐ NO ☑ YES	Volume Utilization Percentage: 95 %	
Does the physical form of the waste match the Waste Stream Description (i.e., Homogeneous Solids, Soil/Gravel, or Debris Waste [including uncategorized metals])? ☐ NO ☑ YES		
Does the physical form of the waste match the Waste Matrix Code? ☐ NO ☑ YES		
Closure Method: TTF Number of Layers of Confinement: 1		
Filter Torque Wrench Serial/ID No.: WIPP 169 Calibration Due Date: 10-7-15 Filter: Model No.: UT9424X Serial No.: 06240 0392 Torque Value: 72 in/lbs	Lid Ring/Bolt Torque Wrench Serial/ID No.: WIPP 150 Calibration Due Date: 4-8-16 Lid Ring/Bolt Torque Value: 60 ft/lbs	
Is total dose rate greater than 200mrem/hr? ☑ NO ☐ YES		
NCR(s) associated with the output container? ☑ NO ☐ YES NCR No.: N/A NCR No.: N/A		
Comments: N/A		

Attachment 2 – CCP Waste Visual Examination Data Form (continued) Page 2 of 5

Batch Data Report No.: ORVECH0144 **Date:** 6-22-15

Section 2: Waste Package Data

Package and Package TID Number (as applicable)	Waste Description	WMP [Table 3]	Weight (kg) [Table 4,[a]]	Weighing Code(s) [Table 4[b]]
N/A	mg Fe pellets	OI	22.0	E
N/A	foam kneepads bubble suits tyvek suits plastic bags	PW	10.0	E
N/A	rubber booties latex gloves	R	1.7	E
N/A	cloth rags	C	1.6	E
		N/A		

N/A A.H. 6-22-15

N/A	N/A	N/A
VEO 1: Print Name	Signature	Date
N/A	N/A	N/A
VEO 2: Print Name	Signature	Date

Signatures annotate the absence of prohibited items.

Output Waste Container ID: X10C9313060B

TID Removed: N/A **TID Applied:** MP85W61143

N/A	N/A	N/A
VEO 1: Print Name	Signature	Date
N/A	N/A	N/A
VEO 2: Print Name	Signature	Date

Signatures of VEO's verifying the loading of the Output Waste Container.

Attachment 2 – CCP Waste Visual Examination Data Form (continued) Page 3 of 5

Batch Data Report No.: ORVECH0144

Output Waste Container ID: X10C931306013

Section 3: Packaging Material and Waste Material Parameters	
Packaging Material:	Estimated Weight (kg)
Steel (ST):	27.8
Plastics (PP):	1.0
Others: (c)	4.4
Total Packaging Weight:	33.2
Waste Material Parameter:	Estimated Weight (kg)
Iron-based Metal/Alloys (IM):	N/A
Aluminum-based Metals/Alloys (AM):	N/A
Other Metals (OM):	N/A
Other Inorganic Materials (OI):	22.0
Cellulosics (C):	1.6
Rubber (R):	1.7
Plastics (waste materials) (PW):	10.0
Organic Matrix (OR):	N/A
Inorganic Matrix (IN):	N/A
Soils (S):	N/A
Total WMP Weight:	35.3

Attachment 2 – CCP Waste Visual Examination Data Form (continued) Page 4 of 5

Batch Data Report No.: ORVECH0144 **Output Waste Container ID:** X10C9313060013

Section 4: Prohibited Item(s) Summary (Questions answered "YES" will be explained in the Comments block)	Yes	No
Is there any observable liquid in internal containers, that is more than 60 milliliters or 3 percent by volume, whichever is greater?	☐	☑
Is the total volume of observable liquid in the outermost container **GREATER** than 1% of the container?	☐	☑
Is there detectable observable liquid in outermost containers with an EPA Hazardous Waste Number of U134?	☐	☑
Is there an indication of non-radionuclide pyrophoric materials, such as elemental potassium?	☐	☑
Is there an indication of hazardous wastes not occurring as co-contaminants with TRU mixed wastes (non-mixed hazardous wastes)?	☐	☑
Is there an indication of wastes incompatible with backfill, seal and panel closures materials, container and packaging materials, shipping container materials, or other wastes (i.e., waste does **NOT** match TRUCON Code[s])?	☐	☑
Is there an indication of wastes containing explosives or compressed gases?	☐	☑
Is there PCB liquids present?	☐	☑
Is there an indication of the waste exhibiting the characteristic of ignitability, corrosivity, or reactivity (EPA Hazardous Waste Numbers of D001, D002, or D003)?	☐	☑
Is the physical form of the waste inconsistent with the Waste Stream Description or the Waste Matrix Code?	☐	☑
TRUPACT-II Criteria		
Are there heat-sealed bags (unvented) **GREATER** than 4 liters and LESS than 390 square inches in the waste?	☐	☑
Were there Non-approved Closure Methods used on liner bags or inner bags greater than 4 liters?	☐	☑
Are there sealed containers **GREATER** than 4 liters?	☐	☑
Are there indications of inadequate protection (blocked or braced) for heavy and/or sharp objects?	☐	☑

Attachment 2 – CCP Waste Visual Examination Data Form (continued) Page 5 of 5

Batch Data Report No.: ORVECH0144 **Output Waste Container ID:** X10C 9313060 B

Section 4: Prohibited Item(s) Summary (Continued)

(Questions answered "YES" will be explained in the Comments block)

Comments:

N/A

Section 5: Approvals

Visual Examination Operator 1: Anthony Harley (Print Name)	Signature	6-22-15 (Date)
Visual Examination Operator 2: Jason Cole (Print Name)	Signature	6-22-15 (Date)

Attachment 3 – CCP Waste VE Independent Technical Reviewer Checklist

Batch Data Report No.: ORVECH0144 Page 1 of 2

Description		
1. Were data generation and reduction conducted in a technically correct manner in accordance with the methods used?	☐ NO	☑ YES
2. Was the correct revision of operating procedure used?	☐ NO	☑ YES
3. Are the waste material parameters (WMPs) entered correctly?	☐ NO	☑ YES
4. Are the calculations performed on the VE Data Form correct?	☐ NO	☑ YES
5. Is the data reported in the correct units and correct number of significant figures?	☐ NO	☑ YES
6. Has the data been reviewed for transcription errors?	☐ NO	☑ YES
7. Does the Testing Batch Report include VE for 20 containers or less?	☐ NO	☑ YES
8. Are BDR contents complete and do they match BDR Table of Contents?	☐ NO	☑ YES
9. Is all the data signed and dated in reproducible ink and by the individual(s) generating it?	☐ NO	☑ YES
10. Is all data recorded clearly, legibly, and accurately?	☐ NO	☑ YES
11. Were changes made to original data? If NO, proceed to question 14.	☑ NO	☐ YES
12. Have all changes to original data been lined out, initialed and dated by the individual making the changes?	☐ NO	☐ YES
13. Were the data changes made by the individual who originally collected the data or by an equally qualified individual?	☐ NO	☐ YES
14. Did the physical form of the waste match the Waste Matrix Code and Waste Stream Description?	☐ NO	☑ YES
15. Has each container in this BDR been evaluated for the presence of prohibited items?	☐ NO	☑ YES
16. Is there an adequate written description of the contents of each container?	☐ NO	☑ YES
17. Was a scale(s) used? If NO, proceed to question 20.	☐ NO	☑ YES
18. Were the scale(s) in calibration prior to the VE and documented correctly?	☐ NO	☑ YES
19. Were the scale(s) checks SAT prior to the VE and documented correctly?	☐ NO	☑ YES
20. Was VE of each container performed by at least two qualified VEO's or was an Audio/Video recording properly prepared for each container?	☐ NO	☑ YES

Attachment 3 – CCP Waste VE Independent Technical Reviewer Checklist (continued)

Batch Data Report No.: ORVECH 0144 Page 2 of 2

Description		
21. Was an NCR required at the data generation level? If NO, proceed to question 23.	☐ NO	☑ YES
22. Is a copy of the NCR included in the BDR?	☐ NO	☑ YES
23. Were the QAO's (precision, accuracy, completeness, comparability) met?	☐ NO	☑ YES
Precision – Precision is maintained by reconciling any discrepancies between the operator and the independent technical reviewer with regard to identification of waste matrix code, liquids in excess of TSDF-WAC limits, and compressed gases. Accuracy – Accuracy is maintained by requiring operators to pass a comprehensive examination and demonstrate satisfactory performance in the presence of the VE expert during their initial qualification. VE operators shall be re-qualified every two years. Completeness – A validated VE data form will be obtained for 100 percent of the waste containers subject to VE. Comparability – The comparability of VE data from different operators shall be enhanced by using standardized VE procedures and operator qualifications.		

Comments: In regards to question 14. Input container X10C9313060 generated 2 output containers, X10C9313060A and X10C9313060B. The physical form of X10C9313060A did not match the Waste Matrix Code and Waste Stream Description. The physical form of X10C9313060B however, did match the Waste Matrix Code and Waste Stream Description. NCR-ORNL-0154-15 has been initiated to resolve the issue of container X10C9313060A physical form being inconsistant with the Waste Matrix Code and Waste Stream Description.

I have reviewed 100 percent of the container-specific and batch data in this report and find it acceptable.

Independent Technical Reviewer:

Printed Name	Signature	Date
Derek Matheny		7/1/15

Attachment 1 – CCP Nonconformance Report (NCR)

CCP NONCONFORMANCE REPORT (NCR)

(Use NCR Continuation, Attachment 3, if necessary)

NCR No. NCR-ORNL-0154-15 Revision 0

1. Lot No., Heat No., or Serial No. (if applicable): N/A	2. Process (e.g., NDA, NDE, VE, Other): VE	3. Batch Data Report #(s): ORVECH0144
4. Order/Work Order/Job Control Number (if applicable): N/A	5. PO # (if applicable): N/A	Container #(s): X10C9313060A
	6. Supplier (if applicable): N/A	

DESCRIPTION OF NONCONFORMANCE

7a. NCR Description: ☒ < 100 nCi/g ☐ Prohibited Item ☐ E-Flag ☐ Receipt Inspection ☐ Transportation ☐ WWIS/WDS ☑ Other

7b. Requirement(s) (Enter Implementing Procedure No., Revision, Section No., & Quoted Text):

CCP-TP-113, Rev. 18, "CCP Standard Contact-Handled Waste Visual Examination, Step 4.4.12, [B.2] Record NO or YES to indicate whether the waste is consistent with the assigned Waste Stream Description and Waste Matrix Code.

(a) IF NO, THEN Initiate a Nonconformance Report (NCR) in accordance with CCP-QP-005, AND record the NCR No in Section 1 of Attachment 2.

7c. Actual Condition: Drum contents did not match Waste Stream Description or Waste Matrix Code.

7d. Have the CCP HOLD TAGS associated with this NCR been applied? ☑ YES ☐ NO If no is checked, explain:

8. NCR Originator: Anthony Harley (printed name) [signature] 6-23-2015 (date)

9. Does the identified condition have the potential to impact AK? If YES or INDETERMINATE, enter Trend Code L in Block 10. ☒ YES ☐ NO ☐ INDETERMINATE

10. Trend Code: L	11. Responsible Manager: **Beverly Schrock**
12. Significant Condition? ☐ YES ☒ NO (If Yes, enter WIPP Form No.):	13. Recurring Condition? ☐ YES ☒ NO (If Yes, list NCRs and WIPP Forms):

14. QA Engineer or QA Designee validation: Laura R Jones (printed name) [signature] Laura Rawn Jones 06/24/2015 (date)

Attachment 1 – CCP Nonconformance Report (NCR) (Continued)

NCR No. NCR-ORNL-0154-15 **Revision 0**

INTERIM DISPOSITION

15a. Interim Disposition (Check Only One):

☐ N/A (See Final Disposition) ☑ Hold ☐ Conditionally Accept ☐ Conditionally Use

☐ Sort ☐ Reinspect or Retest ☐ Remediate

15b. Instructions for Completion of the Interim Disposition:

1. Responsible Manager send this NCR to the AK Expert for re-evaluation in accordance with CCP-TP-005.
2. AK Expert perform the AK re-evaluation and include a copy of documented results as an attachment to this NCR.
3. SPM determine Final Disposition based on these results.

INTERIM DISPOSITION APPROVALS

16a. Responsible Manager or Individual:

BSSchrock (printed name) BSSchrock (signature) 6/24/15 (date)

16b. QA Engineer or QA Designee:

Laura L Jones (printed name) Laura Lauren Jones (signature) 6/24/2015 (date)

Additional Approval:

printed name signature date

Additional Approval:

printed name signature date

COMPLETION OF INTERIM DISPOSITION

17. Interim Disposition Complete – Responsible Manager or Individual:

printed name signature date

18. Interim Disposition Verified – QA Engineer:

printed name signature date

Attachment 1 – CCP Nonconformance Report (NCR) (Continued)

NCR No. NCR-ORNL-0154-15 Revision 0

FINAL DISPOSITION

19. Final Disposition (Check Only One: Use-As-Is, Repair, Reject, Rework, or Scrap):
☒ Use-As-Is ☐ Repair

19a. Technical Justification – Required for Use-As-Is or Repair dispositions: [☒ N/A for Reject, Rework, or Scrap]

☐ Reject ☐ Rework ☐ Scrap

19b. Instructions for Completion – Required for Reject, Repair, Rework, or Scrap [☐ N/A for Use-As-Is]

19c. Corrective Actions (Actions to Prevent Recurrence – For Repair or Rework, if applicable.
[☐ N/A if not applicable, and for Use-As-Is, Reject, and Scrap]

FINAL DISPOSITION APPROVALS

20. Responsible Manager or Individual:

printed name signature date

21. QA Engineer or QA Designee:

printed name signature date

Additional Approval:

printed name signature date

Additional Approval:

printed name signature date

CLOSURE

22. Final Disposition Complete - Responsible Manager or Individual:

printed name signature date

23. Attachments:

24a. HOLD TAG removal has been verified and reconciled for all nonconforming items on the NCR: ☒
24b. If HOLD TAG is not applicable, check: ☐ and explain:

25. Final Disposition Verified – NCR Closed QA Engineer:

printed name signature date

REV 18
113

Attachment 1 – CCP Nonconformance Report (NCR) (Continued)

NCR No. NCR-ORNL-0154-15 Revision 0

FINAL DISPOSITION

19. Final Disposition (Check Only One: Use-As-Is, Repair, Reject, Rework, or Scrap):
☒ Use-As-Is ☐ Repair

19a. Technical Justification – Required for Use-As-Is or Repair dispositions. [☒ N/A for Reject, Rework, or Scrap]

☐ Reject ☐ Rework ☐ Scrap

19b. Instructions for Completion – Required for Reject, Repair, Rework, or Scrap [☐ N/A for Use-As-Is]

19c. Corrective Actions (Actions to Prevent Recurrence – For Repair or Rework, if applicable.
[☐ N/A if not applicable, and for Use-As-Is, Reject, and Scrap]

FINAL DISPOSITION APPROVALS

20. Responsible Manager or Individual:

printed name signature date

21. QA Engineer or QA Designee:

printed name signature date

Additional Approval:

printed name signature date

Additional Approval:

printed name signature date

CLOSURE

22. Final Disposition Complete - Responsible Manager or Individual:

printed name signature date

23. Attachments:

24a. HOLD TAG removal has been verified and reconciled for all nonconforming items on the NCR: ☒
24b. If HOLD TAG is not applicable, check: ☐ and explain:

25. Final Disposition Verified – NCR Closed QA Engineer:

printed name signature date

DIVIDER

PAGE

Attachment 1 – CCP SPM Visual Examination Project Level Validation Checklist and Summary

BDR Number: ORVECH0146				Examination Date(s): 07/06/2015
Description of Criteria Reviewed	**Criteria Met?**			**Comments/Qualifiers**
	YES	**NO**	**NA**	
1. Is the completed, signed and dated Independent Technical Reviewer Checklist included in the BDR, and the independent technical reviewer was not involved in the generation or recording of the data under review? **Reference Source: CCP-PO-001, C3-4**	X			
2. Does the BDR contain all items addressed in the BDR Table of Contents? **Reference Source: CCP-PO-001, C3-4**	X			
3. Does the BDR include a listing of all container numbers in the batch? **Reference Source: CCP-PO-001, C3-4**	X			
4. List all containers that have met QAOs. **Reference Source: CCP-PO-001, C3-4**				Container Numbers: X10CSATN02632K1
5. Is the current implementing procedure and revision number included in the BDR? **Reference Source: CCP-PO-001, Table C3-3**	X			
6. Is the BDR date included? **Reference Source: CCP-PO-001, Table C3-3**	X			
7. Is there a reference to or copy of any associated NCRs (if any) in the BDR? **Reference Source: CCP-PO-001, Table C3-3**	X			NCR-ORNL-0058-15
8. Are there 20 or fewer containers in the batch? **Reference Source: CCP-PO-001 C3-4**	X			
9. Are the data properly reported (i.e., data are reported in correct units and with correct significant figures). **Reference Source: CCP-PO-001 C3-4**	X			
10. Is there evidence of verification that the physical form matches the Waste Matrix Code? **Reference Source: CCP-PO-001, Table C3-3**	X			
11. Is there evidence of verification that the physical form matches the waste stream description? **Reference Source: CCP-PO-001, Table C3-3**	X			
12. Are prohibited items absent? **Reference Source: CCP-PO-001, Table C3-3**	X			

COPY

CCP RECORDS ORIGINAL
DATE REC'D 8.14.15 JN

Attachment 1 – CCP SPM Visual Examination Project Level Validation Checklist and Summary (Continued)

BDR Number: ORVECH0146				Examination Date(s): 07/06/2015
Description of Criteria Reviewed	**Criteria Met?**			**Comments/Qualifiers**
	YES	**NO**	**NA**	
13. Does observable liquid, if present, meet the criteria of the TSDF-WAC? **Reference Source: CCP-PO-001, C-1**			X	No observable liquid.
14. Were discrepancies between the Visual Examination operator and the ITR with regards to identification of waste matrix code, liquids in excess of the TSDF-WAC, or compressed gases reconciled? NA if no discrepancies. **Reference Source: CCP-PO-001, C3-2**			X	
15. Are the training requirements met for the VE Expert and VE Operators who have signed the data forms? **Reference Source: CCP-PO-001, C3-8**	X			
16. Is evidence of a satisfactory audio/video test included in the BDR? NA [not applicable] for VE Method for Newly Generated Waste. **Reference Source: CCP-PO-001, C1-2**			X	
17. If the VE was not recorded using audio/video media, does the data sheet contain the signature of two qualified operators who observed for themselves the waste being placed into the container? NA if audio/video used. **Reference Source: CCP-PO-001, C1-2**	X			
18. Are the weights/estimated weights for the 12 waste material parameters reported in kilograms (kg)? **Reference Source: CCP Technical Procedures**	X			
19. Are the descriptions for each waste material parameter included in the BDR? **Reference Source: CCP-PO-001, C1-2**	X			
20. Is the gross weight reported (in kg) for each container included in the BDR? **Reference Source: CCP Technical Procedures**	X			
21. Is the number of layers of confinement recorded? **Reference Source: CCP-PO-001, C1-2**	X			
22. Is sufficient information included in the BDR to determine the packaging configuration? **Reference Source: CCP-PO-001, C1-2**	X			

Attachment 1 – CCP SPM Visual Examination Project Level Validation Checklist and Summary (Continued)

BDR Number: ORVECH0146				**Examination Date(s): 07/06/2015**
Description of Criteria Reviewed	**Criteria Met?**			**Comments/Qualifiers**
	YES	**NO**	**NA**	
23. Is the type and number of filters recorded? **Reference Source: CCP-PO-001, CCP Technical Procedures**	X			
24. Is the size of the rigid liner vent hole recorded? NA if no liner lid. **Reference Source: CCP-PO-001, CCP Technical Procedures**			X	
25. For Los Alamos National Laboratory (LANL) Sealed Sources, does the characterized waste container meet the definition of sealed sources per Title 10 Code of Federal Regulations (CFR) 30.4 and Title 10 CFR 835.2 (effective January 1, 2004) evidence of which is assembled as part of AK documentation? **Reference Source: CCP Technical Procedures**			X	Not a LANL Sealed Source.
26. For LANL Sealed Sources, are sealed sources the only non-packaging items in the waste container? **Reference Source: CCP-TP-069, 4.1.4**			X	Not a LANL Sealed Source.
27. For LANL Sealed Sources, are the sealed sources a U.S. Department of Transportation (DOT) Special Form Class 7 (Radioactive Material) per Title 49 CFR 34.27 (effective January 1, 2004) and the certification of which is assembled as part of the AK documentation? **Reference Source: CCP Technical Procedures**			X	Not a LANL Sealed Source.
28. For LANL Sealed Sources, is the integrity of each sealed source validated by documented contamination survey results to meet the requirements of Title 10 CFR 34.27 (effective January 1, 2004), and assembled as part of AK documentation? **Reference Source: CCP Technical Procedures**			X	Not a LANL Sealed Source.

Attachment 1 – CCP SPM Visual Examination Project Level Validation Checklist and Summary (Continued)

BDR Number: ORVECH0146 **Examination Date(s): 07/06/2015**

Description of Criteria Reviewed	Criteria Met? YES	NO	NA	Comments/Qualifiers
29. For LANL Sealed Sources, is each sealed source a rigid sealed container less than or equal to 4 L in size or in a rigid sealed container less than or equal to 4 L? **Reference Source: CCP Technical Procedures**			X	Not a LANL Sealed Source.
30. For LANL Sealed Sources, AK documentation does not indicate the use of volatile organic compounds (VOCs) or VOC-bearing materials as constituents of sealed sources? **Reference Source: CCP Technical Procedures**			X	Not a LANL Sealed Source.
31. For LANL Sealed Sources, the outer casing of each sealed source is of a non VOC-bearing material which is verified, using the VE technique at the time of packaging? **Reference Source: CCP Technical Procedures**			X	Not a LANL Sealed Source.

Comments: None.

The container QC checks were properly performed and meet the Quality Assurance Objectives (QAOs). Proper procedures were followed during data reduction and analysis. The batch is complete, acceptable, and includes all supporting data and documentation required by the QAPjP.

Daniel Wade — 08/17/2015

SPM Printed Name | Signature | Date

Checklist is to be re-signed only when a re-review is performed.

SPM Printed Name	Signature	Reason	Date

Attachment 5 – CCP Waste VE Batch Data Report Cover Sheet

Batch Data Report No.: ORVECH0146 Examination Date: 7/6/15

	Waste Container ID Number:
1	X1DCSATN02632K1
2	
3	
4	
5	
6	
7	
8	
9	
10	
11	
12	
13	
14	
15	
16	
17	
18	
19	
20	

Independent Technical Reviewer:

Print Name	Signature	Date
Anthony Harley		7-7-15
		7-22-15

NTPC RECORDS ORIGINAL
DATE REC'D 7-7-15 JV

Attachment 4 – CCP Waste VE Batch Data Report Table of Contents

Batch Data Report No.: ORVECH0146 Examination Date: 7/6/15

Table of Contents

Item	Description	Page No.
1	CCP Waste VE Batch Data Report Cover Sheet	1
2	CCP Waste VE Batch Data Report Table of Contents	2
3	CCP Waste Visual Examination General Information Form	3
4	CCP Waste Visual Examination Data Forms	4
5	CCP Waste VE Independent Technical Reviewer Checklist	9
6	Copy of NCRs (N/A, If Not Applicable)	DM 7/22/15 ~~N/A~~ 11
7	Field Records (N/A, If Not Applicable)	N/A

Attachment 1 – CCP Waste Visual Examination General Information Form

Batch Data Report No.: ORVECH0146

☑ VE for Previously Packaged Waste ☐ VE for Newly Generated Waste	
☐ Method 1 ☑ Method 2	
Site ID: OR	
Examination Date: 7/6/15	
Procedure No.: CCP-TP-113 Revision No.: 19	
Camera/Audio/Video Media Recording Check: ☑ N/A ☐ SAT	
VE Scale Information: ☑ N/A	Serial/ID Number: Calibration Due Date: Operational Check: ☐ SAT
Test Weight Information Test Weight Total: kg. Tray Weight: kg.	Serial/ID Number: Calibration Due Date: Serial/ID Number: Calibration Due Date: Serial/ID Number: Calibration Due Date:
Container Scale Information:	Serial/ID Number: WIPP002 Calibration Due Date: 12/18/15 Operational Check: ☑ SAT ☐ UNSAT
Comments: N/A	
Visual Examination Operator 1: Derek Matheny (Print Name)	Signature: [signature] Date: 7/6/15
Visual Examination Operator 2: Jason Cole (Print Name)	Signature: [signature] Date: 7-6-15

Attachment 2 – CCP Waste Visual Examination Data Form Page 1 of 5

Batch Data Report No.: ORVECH0146

Section 1: Output Waste Container Data

Input Waste Container ID, as applicable: X10CSATN02632K

Output Waste Container ID: X10CSATN02632K1 (2nd Waste Stream ID: OR-REDC-CH-HET

Container Type: 55 Gal. | TRUCON Code: OR125/225 | Waste Matrix Code: S5400

Audio/Video Media Recording Number: ☒ N/A Output Container Verified Empty ☐ NO ☒ YES

Waste Container Weights:
Tare Wt: 33.2 kg. Gross Wt: 60.0 kg.

Poly Rigid Liner Present? ☒ NO ☐ YES

Thickness: ☐ 30-mil ☐ 90-mil ☐ 110-mil ☐ 125-mil

Other liner: ☐ Lead ☒ Fiberboard/Cardboard ☐ Other:

Poly Rigid Liner Lid Present? ☒ NO ☐ YES

Poly Rigid Liner Lid is Vented (>0.3 in.) or Filtered? ☐ NO ☐ YES ☒ N/A

☐ Vented: Hole Size: ☒ N/A
☐ Filtered: Model No.: ☒ N/A

Serial No.: ☒ N/A

Bag Liner Present? ☐ NO ☒ YES

Volume Utilization Percentage: 100 %

Does the physical form of the waste match the Waste Stream Description (i.e., Homogeneous Solids, Soil/Gravel, or Debris Waste [including uncategorized metals])?
☐ NO ☒ YES

Does the physical form of the waste match the Waste Matrix Code?
☐ NO ☒ YES

Closure Method: TTF
Number of Layers of Confinement: 1

Filter Torque Wrench
Serial/ID No.: WIPP169
Calibration Due Date: 10/7/15
Filter: Model No.: UT9424X
Serial No.: 00240 0318
Torque Value: 72 in./lbs.

Lid Ring/Bolt Torque Wrench
Serial/ID No.: WIPP 150
Calibration Due Date: 4/8/16
Lid Ring/Bolt Torque Value: 60 ft./lbs.

Is total dose rate greater than 200mrem/hr? ☒ NO ☐ YES

NCR(s) associated with the output container? ☒ NO ☐ YES
NCR No.: N/A
NCR No.: N/A

Comments: N/A

4

Attachment 2 – CCP Waste Visual Examination Data Form (continued) Page 2 of 5

Batch Data Report No.: ORVECH0146 **Date:** 7/6/15 7/6/15 7/6/15

Section 2: Waste Package Data

Package and Package TID Number (as applicable)	Waste Description	WMP [Table 3]	Weight (kg) [Table 4,[a]]	Weighing Code(s) [Table 4[b]]
N/A	Cardboard, Wooden Handles, Plywood Absorbent Pads, Paper Towel, Masking Tape, Cotton Liners	C	13.8	E
N/A	Metal Lid Ring Nuts Bolts	1M	3.5	E
N/A	Plastic, Latex Gloves Labware	PW	4.0	E
N/A	Rubber Gloves	R	0.5	E
N/A	Lead Pig, Copper Tubing Small electric Motor	OM	4.5	E
N/A	Nochar	OR	0.5	E
	N/A DRM			

Are there any indirect load containers associated with this BDR? Yes ☐ No ☑

N/A	N/A	N/A
VEO 1: Print Name	Signature	Date
N/A	N/A	N/A
VEO 2: Print Name	Signature	Date

VEO's signatures verify the absence of prohibited items in indirect load containers.

Output Waste Container ID: X10CSATN02632K1

TID Removed: N/A **TID Applied:** MP85W 61173

N/A	N/A	N/A
VEO 1: Print Name	Signature	Date
N/A	N/A	N/A
VEO 2: Print Name	Signature	Date

VEO's signatures verify the loading of the indirect load container(s) into the output waste container.

Attachment 2 – CCP Waste Visual Examination Data Form (continued) Page 3 of 5

Batch Data Report No.: ORVECH0146

Output Waste Container ID: X10CSATN02632K1

Section 3: Packaging Material and Waste Material Parameters	
Packaging Material:	Estimated Weight (kg)
Steel (ST):	27.8
Plastics (PP):	1.0
Cellulosic (C):	4.4
Others:	N/A
Total Packaging Weight:	33.2
Waste Material Parameter:	Estimated Weight (kg)
Iron-based Metal/Alloys (IM):	3.5
Aluminum-based Metals/Alloys (AM):	N/A
Other Metals (OM):	4.5
Other Inorganic Materials (OI):	N/A
Cellulosics (C):	13.8
Rubber (R):	0.5
Plastics (waste materials) (PW):	4.0
Organic Matrix (OR):	0.5
Inorganic Matrix (IN):	N/A
Soils (S):	N/A
Total WMP Weight:	26.8

Attachment 2 – CCP Waste Visual Examination Data Form (continued) Page 4 of 5

Batch Data Report No.: ORVECH0146 – Output Waste Container ID: X10CSATN02632K1

Section 4: Prohibited Item(s) Summary (Questions answered "YES" will be explained in the Comments block)	Yes	No
1. Is there any observable liquid present? If no, proceed to question 5	☐	☑
2. Is there any observable liquid in internal containers, that is more than 60 milliliters or 3 percent by volume, whichever is greater?	☐	☐
3. Is the total volume of observable liquid in the outermost container **GREATER** than 1% of the container?	☐	☐
4. Is there detectable observable liquid in containers with an EPA Hazardous Waste Number of U134?	☐	☐
5. Is there an indication of non-radionuclide pyrophoric materials, such as elemental potassium?	☐	☑
6. Is there an indication of hazardous wastes not occurring as co-contaminants with TRU mixed wastes (non-mixed hazardous wastes)?	☐	☑
7. Is there an indication of wastes incompatible with backfill, seal and panel closures materials, container and packaging materials, shipping container materials, or other wastes (i.e., waste does **NOT** match TRUCON Code[s])?	☐	☑
8. Is there an indication of wastes containing explosives or compressed gases?	☐	☑
9. Is there PCB liquids present?	☐	☑
10. Is there an indication of the waste exhibiting the characteristic of ignitability, corrosivity, or reactivity (EPA Hazardous Waste Numbers of D001, D002, or D003)?	☐	☑
11. Is the physical form of the waste inconsistent with the Waste Stream Description or the Waste Matrix Code?	☐	☑
TRUPACT-II Criteria		
12. Are there heat-sealed bags (unvented) **GREATER** than 4 liters and LESS than 390 square inches in the waste?	☐	☑
13. Were there Non-approved Closure Methods used on liner bags or inner bags greater than 4 liters?	☐	☑
14. Are there sealed containers **GREATER** than 4 liters?	☐	☑
15. Are there indications of inadequate protection (blocked or braced) for heavy and/or sharp objects?	☐	☑

7

Attachment 2 – CCP Waste Visual Examination Data Form (continued) Page 5 of 5

Batch Data Report No.: ORVECH0146 **Output Waste Container ID:** X10CSATN02632K1

Section 4: Prohibited Item(s) Summary (Continued)

(Questions answered "YES" will be explained in the Comments block)

Comments: N/A

Section 5: Approvals

Visual Examination Operator 1:

Print Name	Signature	Date
Derek Mathews		7/6/15

Visual Examination Operator 2:

Print Name	Signature	Date
Jason Cole		7-6-15

7/22/15

7-22-15

Attachment 3 – CCP Waste VE Independent Technical Reviewer Checklist

Batch Data Report No.: ORVECH0146

	Description		
1.	Were data generation and reduction conducted in a technically correct manner in accordance with the methods used?	☐ NO	☑ YES
2.	Was the correct revision of operating procedure used?	☐ NO	☑ YES
3.	Are the waste material parameters (WMPs) entered correctly?	☐ NO	☑ YES
4.	Are the calculations performed on the VE Data Form correct?	☐ NO	☑ YES
5.	Is the data reported in the correct units and correct number of significant figures?	☐ NO	☑ YES
6.	Has the data been reviewed for transcription errors?	☐ NO	☑ YES
7.	Does the Testing Batch Report include VE for 20 containers or less?	☐ NO	☑ YES
8.	Are BDR contents complete and do they match BDR Table of Contents?	☐ NO	☑ YES
9.	Is all the data signed and dated in reproducible ink and by the individual(s) generating it?	☐ NO	☑ YES
10.	Is all data recorded clearly, legibly, and accurately?	☐ NO	☑ YES
11.	Were changes made to original data? If NO, proceed to question 14.	☐ NO	☑ YES
12.	Have all changes to original data been lined out, initialed and dated by the individual making the changes?	☐ NO	☑ YES
13.	Were the data changes made by the individual who originally collected the data or by an equally qualified individual?	☐ NO	☑ YES
14.	Did the physical form of the waste match the Waste Matrix Code and Waste Stream Description?	☐ NO	☑ YES
15.	Has each container in this BDR been evaluated for the presence of prohibited items?	☐ NO	☑ YES
16.	Is there an adequate written description of the contents of each container?	☐ NO	☑ YES
17.	Was a scale(s) used? If NO, proceed to question 20.	☐ NO	☑ YES
18.	Were the scale(s) in calibration prior to the VE and documented correctly?	☐ NO	☑ YES
19.	Were the scale(s) checks SAT prior to the VE and documented correctly?	☐ NO	☑ YES
20.	Was VE of each container performed by at least two qualified VEO's or was an Audio/Video recording properly prepared for each container?	☐ NO	☑ YES

Attachment 3 – CCP Waste VE Independent Technical Reviewer Checklist (continued)

Batch Data Report No.: ORVECH0146 Page 2 of 2

Description		
21. Was an NCR required at the data generation level? If NO, proceed to question 23.	☑ NO	☑ YES
22. Is a copy of the NCR included in the BDR?	☐ NO	☑ YES
23. Were the QAO's (precision, accuracy, completeness, comparability) met?	☐ NO	☑ YES
Precision – Precision is maintained by reconciling any discrepancies between the operator and the independent technical reviewer with regard to identification of waste matrix code, liquids in excess of TSDF-WAC limits, and compressed gases. Accuracy – Accuracy is maintained by requiring operators to pass a comprehensive examination and demonstrate satisfactory performance in the presence of the VE expert during their initial qualification. VE operators shall be re-qualified every two years. Completeness – A validated VE data form will be obtained for 100 percent of the waste containers subject to VE. Comparability – The comparability of VE data from different operators shall be enhanced by using standardized VE procedures and operator qualifications.		

Comments:

N/A

I have reviewed 100 percent of the container-specific and batch data in this report and find it acceptable.

Independent Technical Reviewer:

Printed Name	Signature	Date
Anthony Harley		7-7-15 7-22-15

Attachment 1 – CCP Nonconformance Report (NCR)

CCP NONCONFORMANCE REPORT (NCR)

(Use NCR Continuation, Attachment 3, if necessary)

NCR No. NCR-ORNL-0058-15 Revision 0

1. Lot No., Heat No., or Serial No. (if applicable): N/A	2. Process (e.g., NDA, NDE, VE, Other): VE	3. Batch Data Report #(s): ORVECH0146 Container #(s): X10CSATN02632K1
4. Order/Work Order/Job Control Number (if applicable): N/A	5. PO # (if applicable): N/A	
	6. Supplier (if applicable): N/A	

DESCRIPTION OF NONCONFORMANCE

7a. NCR Description: ☐ < 100 nCi/g ☐ Prohibited Item ☐ E-Flag ☐ Receipt Inspection ☐ Transportation ☐ WWIS/WDS ☒ Other

7b. Requirement(s) (Enter Implementing Procedure No., Revision, Section No., & Quoted Text):
CCP-TP-113, Rev. 19, "CCP Standard Contact-Handled Waste Visual Examination", Step 4.3.2, instructs the operator to "Record the following data for the Output Waste Container in Section 1 of Attachment 2:
- Output Waste Container ID..."

7c. Actual Condition:
The operator did not enter the entire Output Waste Container ID. The operator entered X10CSATN02632K instead of the complete X10CSATN02632K1.

7d. Have the CCP HOLD TAGS associated with this NCR been applied? ☐ YES ☐ NO If no is checked, explain:

8. NCR Originator:
Daniel Wade (printed name) D. L. Wade (signature) 07/21/2015 (date)

9. Does the identified condition have the potential to impact AK? If YES or INDETERMINATE, enter Trend Code L in Block 10. ☐ YES ☒ NO ☐ INDETERMINATE

10. Trend Code: A

11. Responsible Manager: **Daniel Wade**

12. Significant Condition? ☐ YES ☒ NO (If Yes, enter WIPP Form No.):

13. Recurring Condition? ☐ YES ☒ NO (If Yes, list NCRs and WIPP Forms):

14. QA Engineer or QA Designee validation:
Laura R. Jones (printed name) Laura Rauen Jones (signature) 07/21/2015 (date)

DTM 7/22/15
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Attachment 1 – CCP Nonconformance Report (NCR) (Continued)

NCR No. NCR-ORNL-0058-15 Revision 0

INTERIM DISPOSITION

15a. Interim Disposition (Check Only One):

☒ N/A (See Final Disposition) ☐ Hold ☐ Conditionally Accept ☐ Conditionally Use

☐ Sort ☐ Reinspect or Retest ☐ Remediate

15b. Instructions for Completion of the Interim Disposition:

INTERIM DISPOSITION APPROVALS

16a. Responsible Manager or Individual:

printed name signature date

16b. QA Engineer or QA Designee:

printed name signature date

Additional Approval:

printed name signature date

Additional Approval:

printed name signature date

COMPLETION OF INTERIM DISPOSITION

17. Interim Disposition Complete – Responsible Manager or Individual:

printed name signature date

18. Interim Disposition Verified – QA Engineer:

printed name signature date

DTM 7/22/15
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Attachment 1 – CCP Nonconformance Report (NCR) (Continued)

NCR No. NCR-ORNL-0058-15 Revision 0

FINAL DISPOSITION

19. Final Disposition (Check Only One: Use-As-Is, Repair, Reject, Rework, or Scrap):
☐ Use-As-Is ☐ Repair

19a. Technical Justification – Required for Use-As-Is or Repair dispositions. [☒ N/A for Reject, Rework, or Scrap]

☐ Reject ☒ Rework ☐ Scrap

19b. Instructions for Completion – Required for Reject, Repair, Rework, or Scrap [☐ N/A for Use-As-Is]

1.) VE Operator, make needed corrections.
2.) VE-ITR re-review
3.) SPM, review.

19c. Corrective Actions (Actions to Prevent Recurrence – For Repair or Rework, if applicable.
[☒ N/A if not applicable, and for Use-As-Is, Reject, and Scrap]

FINAL DISPOSITION APPROVALS

20. Responsible Manager or Individual:

Daniel Wade	D. Wade	7/21/2015
printed name	signature	date

21. QA Engineer or QA Designee:

Laura P. Jones	Laura Power Jones	7/21/2015
printed name	signature	date

Additional Approval:

printed name	signature	date

Additional Approval:

printed name	signature	date

CLOSURE

22. Final Disposition Complete - Responsible Manager or Individual:

printed name	signature	date

23. Attachments:

24a. HOLD TAG removal has been verified and reconciled for all nonconforming items on the NCR: ☐
24b. If HOLD TAG is not applicable, check: ☐ and explain:

25. Final Disposition Verified – NCR Closed QA Engineer:

printed name	signature	date

7/22
13

DIVIDER

PAGE

Attachment 1 – CCP SPM Visual Examination Project Level Validation Checklist and Summary

BDR Number: ORVECH0148				Examination Date(s): 07/16/2015
Description of Criteria Reviewed	**Criteria Met?**			**Comments/Qualifiers**
	YES	**NO**	**NA**	
1. Is the completed, signed and dated Independent Technical Reviewer Checklist included in the BDR, and the independent technical reviewer was not involved in the generation or recording of the data under review? **Reference Source: CCP-PO-001, C3-4**	X			
2. Does the BDR contain all items addressed in the BDR Table of Contents? **Reference Source: CCP-PO-001, C3-4**	X			
3. Does the BDR include a listing of all container numbers in the batch? **Reference Source: CCP-PO-001, C3-4**	X			
4. List all containers that have met QAOs. **Reference Source: CCP-PO-001, C3-4**				Container Numbers: X10C9312807A1
5. Is the current implementing procedure and revision number included in the BDR? **Reference Source: CCP-PO-001, Table C3-3**	X			
6. Is the BDR date included? **Reference Source: CCP-PO-001, Table C3-3**	X			
7. Is there a reference to or copy of any associated NCRs (if any) in the BDR? **Reference Source: CCP-PO-001, Table C3-3**			X	
8. Are there 20 or fewer containers in the batch? **Reference Source: CCP-PO-001 C3-4**	X			
9. Are the data properly reported (i.e., data are reported in correct units and with correct significant figures). **Reference Source: CCP-PO-001 C3-4**	X			
10. Is there evidence of verification that the physical form matches the Waste Matrix Code? **Reference Source: CCP-PO-001, Table C3-3**	X			
11. Is there evidence of verification that the physical form matches the waste stream description? **Reference Source: CCP-PO-001, Table C3-3**	X			
12. Are prohibited items absent? **Reference Source: CCP-PO-001, Table C3-3**	X			

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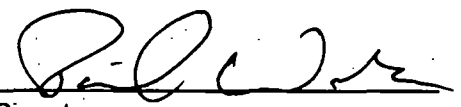
Attachment 1 – CCP SPM Visual Examination Project Level Validation Checklist and Summary (Continued)

BDR Number: ORVECH0148				Examination Date(s): 07/16/2015
Description of Criteria Reviewed	**Criteria Met?**			**Comments/Qualifiers**
	YES	**NO**	**NA**	
13. Does observable liquid, if present, meet the criteria of the TSDF-WAC? **Reference Source: CCP-PO-001, C-1**			X	No observable liquid.
14. Were discrepancies between the Visual Examination operator and the ITR with regards to identification of waste matrix code, liquids in excess of the TSDF-WAC, or compressed gases reconciled? NA if no discrepancies. **Reference Source: CCP-PO-001, C3-2**			X	
15. Are the training requirements met for the VE Expert and VE Operators who have signed the data forms? **Reference Source: CCP-PO-001, C3-8**	X			
16. Is evidence of a satisfactory audio/video test included in the BDR? NA [not applicable] for VE Method for Newly Generated Waste. **Reference Source: CCP-PO-001, C1-2**			X	
17. If the VE was not recorded using audio/video media, does the data sheet contain the signature of two qualified operators who observed for themselves the waste being placed into the container? NA if audio/video used. **Reference Source: CCP-PO-001, C1-2**	X			
18. Are the weights/estimated weights for the 12 waste material parameters reported in kilograms (kg)? **Reference Source: CCP Technical Procedures**	X			
19. Are the descriptions for each waste material parameter included in the BDR? **Reference Source: CCP-PO-001, C1-2**	X			
20. Is the gross weight reported (in kg) for each container included in the BDR? **Reference Source: CCP Technical Procedures**	X			
21. Is the number of layers of confinement recorded? **Reference Source: CCP-PO-001, C1-2**	X			
22. Is sufficient information included in the BDR to determine the packaging configuration? **Reference Source: CCP-PO-001, C1-2**	X			

Attachment 1 – CCP SPM Visual Examination Project Level Validation Checklist and Summary (Continued)

BDR Number: ORVECH0148				Examination Date(s): 07/16/2015
Description of Criteria Reviewed	Criteria Met?			Comments/Qualifiers
	YES	NO	NA	
23. Is the type and number of filters recorded? **Reference Source: CCP-PO-001, CCP Technical Procedures**	X			
24. Is the size of the rigid liner vent hole recorded? NA if no liner lid. **Reference Source: CCP-PO-001, CCP Technical Procedures**			X	
25. For Los Alamos National Laboratory (LANL) Sealed Sources, does the characterized waste container meet the definition of sealed sources per Title 10 Code of Federal Regulations (CFR) 30.4 and Title 10 CFR 835.2 (effective January 1, 2004) evidence of which is assembled as part of AK documentation? **Reference Source: CCP Technical Procedures**			X	Not a LANL Sealed Source.
26. For LANL Sealed Sources, are sealed sources the only non-packaging items in the waste container? **Reference Source: CCP-TP-069, 4.1.4**			X	Not a LANL Sealed Source.
27. For LANL Sealed Sources, are the sealed sources a U.S. Department of Transportation (DOT) Special Form Class 7 (Radioactive Material) per Title 49 CFR 34.27 (effective January 1, 2004) and the certification of which is assembled as part of the AK documentation? **Reference Source: CCP Technical Procedures**			X	Not a LANL Sealed Source.
28. For LANL Sealed Sources, is the integrity of each sealed source validated by documented contamination survey results to meet the requirements of Title 10 CFR 34.27 (effective January 1, 2004), and assembled as part of AK documentation? **Reference Source: CCP Technical Procedures**			X	Not a LANL Sealed Source.

Attachment 1 – CCP SPM Visual Examination Project Level Validation Checklist and Summary (Continued)

BDR Number: ORVECH0148				**Examination Date(s): 07/16/2015**
Description of Criteria Reviewed	**Criteria Met?**			**Comments/Qualifiers**
	YES	**NO**	**NA**	
29. For LANL Sealed Sources, is each sealed source a rigid sealed container less than or equal to 4 L in size or in a rigid sealed container less than or equal to 4 L? **Reference Source: CCP Technical Procedures**			X	Not a LANL Sealed Source.
30. For LANL Sealed Sources, AK documentation does not indicate the use of volatile organic compounds (VOCs) or VOC-bearing materials as constituents of sealed sources? **Reference Source: CCP Technical Procedures**			X	Not a LANL Sealed Source.
31. For LANL Sealed Sources, the outer casing of each sealed source is of a non VOC-bearing material which is verified using the VE technique at the time of packaging? **Reference Source: CCP Technical Procedures**			X	Not a LANL Sealed Source.
Comments: None.				
The container QC checks were properly performed and meet the Quality Assurance Objectives (QAOs). Proper procedures were followed during data reduction and analysis. The batch is complete, acceptable, and includes all supporting data and documentation required by the QAPjP.				
Daniel Wade  07/28/2015				
SPM Printed Name Signature Date				

Checklist is to be re-signed only when a re-review is performed.

SPM Printed Name	Signature	Reason	Date
SPM Printed Name	Signature	Reason	Date

Attachment 5 – CCP Waste VE Batch Data Report Cover Sheet

Batch Data Report No.: ORVECH0148 Examination Date: 7-16-15

	Waste Container ID Number:
1	X10C9312807A1
2	
3	
4	
5	
6	
7	
8	
9	
10	
11	
12	
13	
14	
15	
16	
17	
18	
19	
20	

N/A A.H. 7-16-15

Independent Technical Reviewer:

Derek Matheny 7/20/15
Print Name Signature Date

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DATE REC'D 7-20-2015

Attachment 4 – CCP Waste VE Batch Data Report Table of Contents

Batch Data Report No.: ORVECH0148 Examination Date: 7-16-15

Table of Contents

Item	Description	Page No.
1	CCP Waste VE Batch Data Report Cover Sheet	1
2	CCP Waste VE Batch Data Report Table of Contents	2
3	CCP Waste Visual Examination General Information Form	3
4	CCP Waste Visual Examination Data Forms	4
5	CCP Waste VE Independent Technical Reviewer Checklist	9
6	Copy of NCRs (N/A, If Not Applicable)	N/A
7	Field Records (N/A, If Not Applicable)	N/A

Attachment 1 – CCP Waste Visual Examination General Information Form

Batch Data Report No.: ORVECH0148

☑ VE for Previously Packaged Waste ☐ VE for Newly Generated Waste	
☐ Method 1 ☑ Method 2	
Site ID: OR	
Examination Date: 7-16-15	
Procedure No.: CCP-TP-113 Revision No.: 19	
Camera/Audio/Video Media Recording Check: ☑ N/A ☐ SAT	
VE Scale Information: ☑ N/A	Serial/ID Number: Calibration Due Date: Operational Check: ☐ SAT
Test Weight Information Test Weight Total: - kg. Tray Weight: kg.	Serial/ID Number: Calibration Due Date: Serial/ID Number: Calibration Due Date: Serial/ID Number: Calibration Due Date:
Container Scale Information:	Serial/ID Number: WIPP002 Calibration Due Date: 12-8-15 Operational Check: ☑ SAT ☐ UNSAT
Comments: N/A	
Visual Examination Operator 1: Anthony Harley (Print Name) — Signature — 7-16-15 (Date)	
Visual Examination Operator 2: Jason Cole (Print Name) — Signature — 7-16-15 (Date)	

Attachment 2 – CCP Waste Visual Examination Data Form Page 1 of 5

Batch Data Report No.: ORVECH0148

Section 1: Output Waste Container Data		
Input Waste Container ID, as applicable: X10C931280707A		
Output Waste Container ID: X10C931280707A1	Waste Stream ID: OR-ISTP-CH-HET	
Container Type: 55 gallon drum	TRUCON Code: OR125/225	Waste Matrix Code: S5400
Audio/Video Media Recording Number: ☑ N/A	Output Container Verified Empty ☐ NO ☑ YES	
Waste Container Weights: Tare Wt: 33.2 kg.	Gross Wt: 126.0 kg.	
Poly Rigid Liner Present? ☑ NO ☐ YES Thickness: ☐ 30-mil ☐ 90-mil ☐ 110-mil ☐ 125-mil Other liner: ☐ Lead ☑ Fiberboard/Cardboard ☐ Other:	Poly Rigid Liner Lid Present? ☑ NO ☐ YES Poly Rigid Liner Lid is Vented (>0.3 in.) or Filtered? ☐ NO ☐ YES ☑ N/A ☐ Vented: Hole Size: ☑ N/A ☐ Filtered: Model No.: ☑ N/A Serial No.: ☑ N/A	
Bag Liner Present? ☐ NO ☑ YES	Volume Utilization Percentage: 100 %	
Does the physical form of the waste match the Waste Stream Description (i.e., Homogeneous Solids, Soil/Gravel, or Debris Waste [including uncategorized metals])? ☐ NO ☑ YES		
Does the physical form of the waste match the Waste Matrix Code? ☐ NO ☑ YES		
Closure Method: TTF Number of Layers of Confinement: 1		
Filter Torque Wrench Serial/ID No.: WIPP124 Calibration Due Date: 9-2-15 Filter: Model No.: UT9424X Serial No.: 00240 0309 Torque Value: 72 in/lbs	Lid Ring/Bolt Torque Wrench Serial/ID No.: WIPP150 Calibration Due Date: 4-8-16 Lid Ring/Bolt Torque Value: 60 ft/lbs	
Is total dose rate greater than 200mrem/hr? ☑ NO ☐ YES		
NCR(s) associated with the output container? ☑ NO ☐ YES NCR No.: N/A NCR No.: N/A		
Comments: N/A		

Attachment 2 – CCP Waste Visual Examination Data Form (continued) Page 2 of 5

Batch Data Report No.: ORIECH0148 **Date:** 7-16-15

Section 2: Waste Package Data

Package and Package TID Number (as applicable)	Waste Description	WMP [Table 3]	Weight (kg) [Table 4,[a]]	Weighing Code(s) [Table 4[b]]
N/A	metal heat exchanger metal probe metal valve caltron source unit	IM	35.0	E
N/A	metal pump metal furnace	IM	30.0	E
N/A	leather gloves cardboard cloth rags absorbent pads	C	10.0	E
N/A	plastic bags vinyl tape	PW	8.8	E
N/A	electrical wires	OM	5.0	E
N/A	absorbent	OI	2.0	E
N/A	rubber gaskets	R	2.0	E

Are there any indirect load containers associated with this BDR? Yes ☐ No ☑

N/A	N/A	N/A
VEO 1: Print Name	Signature	Date
N/A	N/A	N/A
VEO 2: Print Name	Signature	Date

VEO's signatures verify the absence of prohibited items in indirect load containers.

Output Waste Container ID: X10C93128074I

TID Removed: N/A **TID Applied:** MP85W 61430

N/A	N/A	N/A
VEO 1: Print Name	Signature	Date
N/A	N/A	N/A
VEO 2: Print Name	Signature	Date

VEO's signatures verify the loading of the indirect load container(s) into the output waste container.

Attachment 2 – CCP Waste Visual Examination Data Form (continued) Page 3 of 5

Batch Data Report No.: ORVECH0148

Output Waste Container ID: X10C93128O7A1

Section 3: Packaging Material and Waste Material Parameters	
Packaging Material:	Estimated Weight (kg)
Steel (ST):	27.8
Plastics (PP):	1.0
Cellulosic (C):	4.4
Others:	N/A
Total Packaging Weight:	33.2
Waste Material Parameter:	Estimated Weight (kg)
Iron-based Metal/Alloys (IM):	65.0
Aluminum-based Metals/Alloys (AM):	N/A
Other Metals (OM):	5.0
Other Inorganic Materials (OI):	2.0
Cellulosics (C):	10.0
Rubber (R):	2.0
Plastics (waste materials) (PW):	8.8
Organic Matrix (OR):	N/A
Inorganic Matrix (IN):	N/A
Soils (S):	N/A
Total WMP Weight:	92.8

Attachment 2 – CCP Waste Visual Examination Data Form (continued) Page 4 of 5

Batch Data Report No.: ORVECH0148 **Output Waste Container ID:** X10C93128074 1

Section 4: Prohibited Item(s) Summary (Questions answered YES will be explained in the Comments block)		
	Yes	No
1. Is there any observable liquid present? If no, proceed to question 5	☐	☑
2. Is there any observable liquid in internal containers, that is more than 60 milliliters or 3 percent by volume, whichever is greater?	☐	☐
3. Is the total volume of observable liquid in the outermost container **GREATER** than 1% of the container?	☐	☐
4. Is there detectable observable liquid in containers with an EPA Hazardous Waste Number of U134?	☐	☐
5. Is there an indication of non-radionuclide pyrophoric materials, such as elemental potassium?	☐	☑
6. Is there an indication of hazardous wastes not occurring as co-contaminants with TRU mixed wastes (non-mixed hazardous wastes)?	☐	☑
7. Is there an indication of wastes incompatible with backfill, seal and panel closures materials, container and packaging materials, shipping container materials, or other wastes (i.e., waste does **NOT** match TRUCON Code[s])?	☐	☑
8. Is there an indication of wastes containing explosives or compressed gases?	☐	☑
9. Is there PCB liquids present?	☐	☑
10. Is there an indication of the waste exhibiting the characteristic of ignitability, corrosivity, or reactivity (EPA Hazardous Waste Numbers of D001, D002, or D003)?	☐	☑
11. Is the physical form of the waste inconsistent with the Waste Stream Description or the Waste Matrix Code?	☐	☑
TRUPACT-II Criteria		
12. Are there heat-sealed bags (unvented) **GREATER** than 4 liters and LESS than 390 square inches in the waste?	☐	☑
13. Were there Non-approved Closure Methods used on liner bags or inner bags greater than 4 liters?	☐	☑
14. Are there sealed containers **GREATER** than 4 liters?	☐	☑
15. Are there indications of inadequate protection (blocked or braced) for heavy and/or sharp objects?	☐	☑

Attachment 2 – CCP Waste Visual Examination Data Form (continued) Page 5 of 5

Batch Data Report No.: ORVECH0148 **Output Waste Container ID:** X10C931280741

Section 4: Prohibited Item(s) Summary (Continued)

(Questions answered "YES" will be explained in the Comments block)

Comments:

N/A

Section 5: Approvals

Visual Examination Operator 1: Anthony Harley (Print Name)	Signature	7-16-15 (Date)
Visual Examination Operator 2: Jason Cofer (Print Name)	Signature	7-16-15 (Date)

Attachment 3 – CCP Waste VE Independent Technical Reviewer Checklist

Batch Data Report No.: ORVECH0148

Description		
1. Were data generation and reduction conducted in a technically correct manner in accordance with the methods used?	☐ NO	☑ YES
2. Was the correct revision of operating procedure used?	☐ NO	☑ YES
3. Are the waste material parameters (WMPs) entered correctly?	☐ NO	☑ YES
4. Are the calculations performed on the VE Data Form correct?	☐ NO	☑ YES
5. Is the data reported in the correct units and correct number of significant figures?	☐ NO	☑ YES
6. Has the data been reviewed for transcription errors?	☐ NO	☑ YES
7. Does the Testing Batch Report include VE for 20 containers or less?	☐ NO	☑ YES
8. Are BDR contents complete and do they match BDR Table of Contents?	☐ NO	☑ YES
9. Is all the data signed and dated in reproducible ink and by the individual(s) generating it?	☐ NO	☑ YES
10. Is all data recorded clearly, legibly, and accurately?	☐ NO	☑ YES
11. Were changes made to original data? If NO, proceed to question 14.	☑ NO	☐ YES
12. Have all changes to original data been lined out, initialed and dated by the individual making the changes?	☐ NO	☐ YES
13. Were the data changes made by the individual who originally collected the data or by an equally qualified individual?	☐ NO	☐ YES
14. Did the physical form of the waste match the Waste Matrix Code and Waste Stream Description?	☐ NO	☑ YES
15. Has each container in this BDR been evaluated for the presence of prohibited items?	☐ NO	☑ YES
16. Is there an adequate written description of the contents of each container?	☐ NO	☑ YES
17. Was a scale(s) used? If NO, proceed to question 20.	☐ NO	☑ YES
18. Were the scale(s) in calibration prior to the VE and documented correctly?	☐ NO	☑ YES
19. Were the scale(s) checks SAT prior to the VE and documented correctly?	☐ NO	☑ YES
20. Was VE of each container performed by at least two qualified VEO's or was an Audio/Video recording properly prepared for each container?	☐ NO	☑ YES

Attachment 3 – CCP Waste VE Independent Technical Reviewer Checklist (continued)

Batch Data Report No.: ORVECH0148 Page 2 of 2

Description		
21. Was an NCR required at the data generation level? If NO, proceed to question 23.	☑ NO	☐ YES
22. Is a copy of the NCR included in the BDR?	☐ NO	☐ YES
23. Were the QAO's (precision, accuracy, completeness, comparability) met?	☐ NO	☑ YES
Precision – Precision is maintained by reconciling any discrepancies between the operator and the independent technical reviewer with regard to identification of waste matrix code, liquids in excess of TSDF-WAC limits, and compressed gases. Accuracy – Accuracy is maintained by requiring operators to pass a comprehensive examination and demonstrate satisfactory performance in the presence of the VE expert during their initial qualification. VE operators shall be re-qualified every two years. Completeness – A validated VE data form will be obtained for 100 percent of the waste containers subject to VE. Comparability – The comparability of VE data from different operators shall be enhanced by using standardized VE procedures and operator qualifications.		

Comments: N/A

I have reviewed 100 percent of the container-specific and batch data in this report and find it acceptable.

Independent Technical Reviewer:

Printed Name	Signature	Date
Derek Matheny		7/20/15

DIVIDER

PAGE

Attachment 1 – CCP SPM Visual Examination Project Level Validation Checklist and Summary

BDR Number: ORVECH0162				Examination Date(s): 02/11/2016
Description of Criteria Reviewed	**Criteria Met?**			**Comments/Qualifiers**
	YES	**NO**	**NA**	
1. Is the completed, signed and dated Independent Technical Reviewer Checklist included in the BDR, and the independent technical reviewer was not involved in the generation or recording of the data under review? **Reference Source: CCP-PO-001, C3-4**	X			
2. Does the BDR contain all items addressed in the BDR Table of Contents? **Reference Source: CCP-PO-001, C3-4**	X			
3. Does the BDR include a listing of all container numbers in the batch? **Reference Source: CCP-PO-001, C3-4**	X			
4. List all containers that have met QAOs. **Reference Source: CCP-PO-001, C3-4**				Container Numbers: X10C0402810A1
5. Is the current implementing procedure and revision number included in the BDR? **Reference Source: CCP-PO-001, Table C3-3**	X			
6. Is the BDR date included? **Reference Source: CCP-PO-001, Table C3-3**	X			
7. Is there a reference to or copy of any associated NCRs (if any) in the BDR? **Reference Source: CCP-PO-001, Table C3-3**			X	No NCRs
8. Are there 20 or fewer containers in the batch? **Reference Source: CCP-PO-001 C3-4**	X			
9. Are the data properly reported (i.e., data are reported in correct units and with correct significant figures). **Reference Source: CCP-PO-001 C3-4**	X			
10. Is there evidence of verification that the physical form matches the Waste Matrix Code? **Reference Source: CCP-PO-001, Table C3-3**	X			
11. Is there evidence of verification that the physical form matches the waste stream description? **Reference Source: CCP-PO-001, Table C3-3**	X			
12. Are prohibited items absent? **Reference Source: CCP-PO-001, Table C3-3**	X			

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Attachment 1 – CCP SPM Visual Examination Project Level Validation Checklist and Summary (Continued)

BDR Number: ORVECH0162				Examination Date(s): 02/11/2016
Description of Criteria Reviewed	**Criteria Met?**			**Comments/Qualifiers**
	YES	**NO**	**NA**	
13. Does observable liquid, if present, meet the criteria of the TSDF-WAC? **Reference Source: CCP-PO-001, C-1**			X	No liquids identified in the BDR
14. Were discrepancies between the Visual Examination operator and the ITR with regards to identification of waste matrix code, liquids in excess of the TSDF-WAC, or compressed gases reconciled? NA if no discrepancies. **Reference Source: CCP-PO-001, C3-2**			X	
15. Are the training requirements met for the VE Expert and VE Operators who have signed the data forms? **Reference Source: CCP-PO-001, C3-8**	X			
16. Is evidence of a satisfactory audio/video test included in the BDR? NA [not applicable] for VE Method for Newly Generated Waste. **Reference Source: CCP-PO-001, C1-2**			X	
17. If the VE was not recorded using audio/video media, does the data sheet contain the signature of two qualified operators who observed for themselves the waste being placed into the container? NA if audio/video used. **Reference Source: CCP-PO-001, C1-2**	X			
18. Are the weights/estimated weights for the 12 waste material parameters reported in kilograms (kg)? **Reference Source: CCP Technical Procedures**	X			
19. Are the descriptions for each waste material parameter included in the BDR? **Reference Source: CCP-PO-001, C1-2**	X			
20. Is the gross weight reported (in kg) for each container included in the BDR? **Reference Source: CCP Technical Procedures**	X			
21. Is the number of layers of confinement recorded? **Reference Source: CCP-PO-001, C1-2**	X			
22. Is sufficient information included in the BDR to determine the packaging configuration? **Reference Source: CCP-PO-001, C1-2**	X			

Attachment 1 – CCP SPM Visual Examination Project Level Validation Checklist and Summary (Continued)

BDR Number: ORVECH0162				Examination Date(s): 02/11/2016
Description of Criteria Reviewed	**Criteria Met?**			**Comments/Qualifiers**
	YES	**NO**	**NA**	
23. Is the type and number of filters recorded? **Reference Source: CCP-PO-001, CCP Technical Procedures**			X	
24. Is the size of the rigid liner vent hole recorded? NA if no liner lid. **Reference Source: CCP-PO-001, CCP Technical Procedures**			X	
25. For Los Alamos National Laboratory (LANL) Sealed Sources, does the characterized waste container meet the definition of sealed sources per Title 10 Code of Federal Regulations (CFR) 30.4 and Title 10 CFR 835.2 (effective January 1, 2004) evidence of which is assembled as part of AK documentation? **Reference Source: CCP Technical Procedures**			X	Not LANL Sealed Sources
26. For LANL Sealed Sources, are sealed sources the only non-packaging items in the waste container? **Reference Source: CCP-TP-069, 4.1.4**			X	Not LANL Sealed Sources
27. For LANL Sealed Sources, are the sealed sources a U.S. Department of Transportation (DOT) Special Form Class 7 (Radioactive Material) per Title 49 CFR 34.27 (effective January 1, 2004) and the certification of which is assembled as part of the AK documentation? **Reference Source: CCP Technical Procedures**			X	Not LANL Sealed Sources
28. For LANL Sealed Sources, is the integrity of each sealed source validated by documented contamination survey results to meet the requirements of Title 10 CFR 34.27 (effective January 1, 2004), and assembled as part of AK documentation? **Reference Source: CCP Technical Procedures**			X	Not LANL Sealed Sources

Attachment 1 – CCP SPM Visual Examination Project Level Validation Checklist and Summary (Continued)

BDR Number: ORVECH0162				Examination Date(s): 02/11/2016
Description of Criteria Reviewed	**Criteria Met?**			**Comments/Qualifiers**
	YES	**NO**	**NA**	
29. For LANL Sealed Sources, is each sealed source a rigid sealed container less than or equal to 4 L in size or in a rigid sealed container less than or equal to 4 L? **Reference Source: CCP Technical Procedures**			X	Not LANL Sealed Sources
30. For LANL Sealed Sources, AK documentation does not indicate the use of volatile organic compounds (VOCs) or VOC-bearing materials as constituents of sealed sources? **Reference Source: CCP Technical Procedures**			X	Not LANL Sealed Sources
31. For LANL Sealed Sources, the outer casing of each sealed source is of a non VOC-bearing material which is verified using the VE technique at the time of packaging? **Reference Source: CCP Technical Procedures**			X	Not LANL Sealed Sources
Comments: **NONE**				
The container QC checks were properly performed and meet the Quality Assurance Objectives (QAOs). Proper procedures were followed during data reduction and analysis. The batch is complete, acceptable, and includes all supporting data and documentation required by the QAPjP.				
Rick Whiteley	Rick Whiteley			02/29/2016
SPM Printed Name	Signature			Date

Checklist is to be re-signed only when a re-review is performed.

SPM Printed Name	Signature	Reason	Date
SPM Printed Name	Signature	Reason	Date

Attachment 5 – CCP Waste VE Batch Data Report Cover Sheet

Batch Data Report No.: ORVECH0162 Examination Date: 2-11-16

	Waste Container ID Number:
1	X1DC0402810A1
2	
3	
4	
5	
6	
7	
8	
9	
10	
11	N/A D.H. 2-11-16
12	
13	
14	
15	
16	
17	
18	
19	
20	

Independent Technical Reviewer:

Derek Matheny Derek Matheny 2/11/16

Print Name Signature Date

NTPC RECORDS ORIGINAL
DATE REC'D 2-16-2016

Attachment 4 – CCP Waste VE Batch Data Report Table of Contents

Batch Data Report No.: ORVECH0162 Examination Date: 2-11-16

Table of Contents

Item	Description	Page No.
1	CCP Waste VE Batch Data Report Cover Sheet	1
2	CCP Waste VE Batch Data Report Table of Contents	2
3	CCP Waste Visual Examination General Information Form	3
4	CCP Waste Visual Examination Data Forms	4
5	CCP Waste VE Independent Technical Reviewer Checklist	9
6	Copy of NCRs (N/A, If Not Applicable)	N/A
7	Field Records (N/A, If Not Applicable)	N/A

Attachment 1 – CCP Waste Visual Examination General Information Form

Batch Data Report No.: ORVECH0116 2

☑ VE for Previously Packaged Waste ☐ VE for Newly Generated Waste	
☐ Method 1 ☑ Method 2	
Site ID: OR	
Examination Date: 2-11-16	
Procedure No.: CCP-TP-113 Revision No.: 19	
Camera/Audio/Video Media Recording Check: ☑ N/A ☐ SAT	
VE Scale Information: ☑ N/A	Serial/ID Number: Calibration Due Date: Operational Check: ☐ SAT
Test Weight Information Test Weight Total: kg. Tray Weight: kg.	Serial/ID Number: Calibration Due Date: Serial/ID Number: Calibration Due Date: Serial/ID Number: Calibration Due Date:
Container Scale Information:	Serial/ID Number: WIPP002 Calibration Due Date: 6-8-16 Operational Check: ☑ SAT ☐ UNSAT
Comments: N/A	
Visual Examination Operator 1: Anthony Harley (Print Name) — (Signature) — 2-11-16 (Date)	
Visual Examination Operator 2: Gilbert Gutierrez (Print Name) — (Signature) — 2-11-16 (Date)	

Attachment 2 – CCP Waste Visual Examination Data Form Page 1 of 5

Batch Data Report No.: ORVECH0162

Section 1: Output Waste Container Data

Input Waste Container ID, as applicable: X10C040 2810A

Output Waste Container ID: X10C040 2810A1 | Waste Stream ID: OR-CHEM-CH-HET

Container Type: 55 gallon drum | TRUCON Code: OR 125/225 | Waste Matrix Code: S5400

Audio/Video Media Recording Number: ☑ N/A Output Container Verified Empty ☐ NO ☑ YES

Waste Container Weights:
Tare Wt: 33.2 kg. Gross Wt: 96.4 kg.

Poly Rigid Liner Present? ☑ NO ☐ YES

Thickness: ☐ 30-mil ☐ 90-mil ☐ 110-mil ☐ 125-mil

Other liner: ☐ Lead ☑ Fiberboard/Cardboard ☐ Other:

Poly Rigid Liner Lid Present? ☑ NO ☐ YES

Poly Rigid Liner Lid is Vented (>0.3 in.) or Filtered? ☐ NO ☐ YES ☑ N/A

☐ Vented: Hole Size: ☑ N/A
☐ Filtered: Model No.: ☑ N/A
Serial No.: ☑ N/A

Bag Liner Present? ☐ NO ☑ YES

Volume Utilization Percentage: 100 %

Does the physical form of the waste match the Waste Stream Description (i.e., Homogeneous Solids, Soil/Gravel, or Debris Waste [including uncategorized metals])?
☐ NO ☑ YES

Does the physical form of the waste match the Waste Matrix Code?
☐ NO ☑ YES

Closure Method: TTF
Number of Layers of Confinement: 1

Filter Torque Wrench
Serial/ID No.: WIPP168
Calibration Due Date: 12-22-16
Filter: Model No.: UT9424X
Serial No.: 00234 0270
Torque Value: 72 in / lbs

Lid Ring/Bolt Torque Wrench
Serial/ID No.: WIPP178
Calibration Due Date: 6-3-16
Lid Ring/Bolt Torque Value: 60 ft/lbs

Is total dose rate greater than 200mrem/hr? ☑ NO ☐ YES

NCR(s) associated with the output container? ☑ NO ☐ YES
NCR No.: N/A
NCR No.: N/A

Comments:
N/A

Attachment 2 – CCP Waste Visual Examination Data Form (continued) Page 2 of 5

Batch Data Report No.: ORIECH0162 **Date:** 2-11-16

Section 2: Waste Package Data

Package and Package TID Number (as applicable)	Waste Description	WMP [Table 3]	Weight (kg) [Table 4,a]	Weighing Code(s) [Table 4b]
N/A	paper, absorbent pad, filter paper, rags cardboard liner insert, cardboard	C	18.0	E
N/A	plastic bags, Herculite, tape	PW	4.0	E
N/A	metal screen metal tools, metal scrap,	IM	20.0	E
N/A	Solid-A-Sorb	IN	20.0	E
N/A	absorbent	OR	1.2	E
	N/A	A.H.	2-11-16	

Are there any indirect load containers associated with this BDR? Yes ☐ No ☑

N/A	N/A	N/A
VEO 1: Print Name	Signature	Date
N/A	N/A	N/A
VEO 2: Print Name	Signature	Date

VEO's signatures verify the absence of prohibited items in indirect load containers.

Output Waste Container ID: X10C0402810A1

TID Removed: N/A **TID Applied:** MP85W 77172

N/A	N/A	N/A
VEO 1: Print Name	Signature	Date
N/A	N/A	N/A
VEO 2: Print Name	Signature	Date

VEO's signatures verify the loading of the indirect load container(s) into the output waste container.

Attachment 2 – CCP Waste Visual Examination Data Form (continued) Page 3 of 5

Batch Data Report No.: ORVECH0162

Output Waste Container ID: X10C0402810A1

Section 3: Packaging Material and Waste Material Parameters	
Packaging Material:	Estimated Weight (kg)
Steel (ST):	27.8
Plastics (PP):	1.0
Cellulosic (C):	4.4
Others:	N/A
Total Packaging Weight:	33.2
Waste Material Parameter:	Estimated Weight (kg)
Iron-based Metal/Alloys (IM):	20.0
Aluminum-based Metals/Alloys (AM):	N/A
Other Metals (OM):	N/A
Other Inorganic Materials (OI):	N/A
Cellulosics (C):	18.0
Rubber (R):	N/A
Plastics (waste materials) (PW):	4.0
Organic Matrix (OR):	1.2
Inorganic Matrix (IN):	20.0
Soils (S):	N/A
Total WMP Weight:	63.2

Attachment 2 – CCP Waste Visual Examination Data Form (continued) Page 4 of 5

Batch Data Report No.: DRVECH01162 **Output Waste Container ID:** X10C040281OAL

Section 4: Prohibited Item(s) Summary (Questions answered "YES" will be explained in the Comments block)	Yes	No
1. Is there any observable liquid present? If no, proceed to question 5	☐	☑
2. Is there any observable liquid in internal containers, that is more than 60 milliliters or 3 percent by volume, whichever is greater?	☐	☐
3. Is the total volume of observable liquid in the outermost container **GREATER** than 1% of the container?	☐	☐
4. Is there detectable observable liquid in containers with an EPA Hazardous Waste Number of U134?	☐	☐
5. Is there an indication of non-radionuclide pyrophoric materials, such as elemental potassium?	☐	☑
6. Is there an indication of hazardous wastes not occurring as co-contaminants with TRU mixed wastes (non-mixed hazardous wastes)?	☐	☑
7. Is there an indication of wastes incompatible with backfill, seal and panel closures materials, container and packaging materials, shipping container materials, or other wastes (i.e., waste does **NOT** match TRUCON Code[s])?	☐	☑
8. Is there an indication of wastes containing explosives or compressed gases?	☐	☑
9. Is there PCB liquids present?	☐	☑
10. Is there an indication of the waste exhibiting the characteristic of ignitability, corrosivity, or reactivity (EPA Hazardous Waste Numbers of D001, D002, or D003)?	☐	☑
11. Is the physical form of the waste inconsistent with the Waste Stream Description or the Waste Matrix Code?	☐	☑
TRUPACT-II Criteria		
12. Are there heat-sealed bags (unvented) **GREATER** than 4 liters and LESS than 390 square inches in the waste?	☐	☑
13. *Were there Non-approved Closure Methods used on liner bags or inner bags greater* than 4 liters?	☐	☑
14. Are there sealed containers **GREATER** than 4 liters?	☐	☑
15. Are there indications of inadequate protection (blocked or braced) for heavy and/or sharp objects?	☐	☑

Attachment 2 – CCP Waste Visual Examination Data Form (continued) Page 5 of 5

Batch Data Report No.: ORVECH0162 **Output Waste Container ID:** X10C0402810A1

Section 4: Prohibited Item(s) Summary (Continued)

(Questions answered "YES" will be explained in the Comments block)

Comments:

N/A

Section 5: Approvals

Visual Examination Operator 1:

Anthony Harley — Print Name | Signature | 2-11-16 — Date

Visual Examination Operator 2:

Gilbert Gutierrez — Print Name | Signature | 2-11-16 — Date

Attachment 3 – CCP Waste VE Independent Technical Reviewer Checklist

Batch Data Report No.: ORVECH0162 Page 1 of 2

Description		
1. Were data generation and reduction conducted in a technically correct manner in accordance with the methods used?	☐ NO	☑ YES
2. Was the correct revision of operating procedure used?	☐ NO	☑ YES
3. Are the waste material parameters (WMPs) entered correctly?	☐ NO	☑ YES
4. Are the calculations performed on the VE Data Form correct?	☐ NO	☑ YES
5. Is the data reported in the correct units and correct number of significant figures?	☐ NO	☑ YES
6. Has the data been reviewed for transcription errors?	☐ NO	☑ YES
7. Does the Testing Batch Report include VE for 20 containers or less?	☐ NO	☑ YES
8. Are BDR contents complete and do they match BDR Table of Contents?	☐ NO	☑ YES
9. Is all the data signed and dated in reproducible ink and by the individual(s) generating it?	☐ NO	☑ YES
10. Is all data recorded clearly, legibly, and accurately?	☐ NO	☑ YES
11. Were changes made to original data? If NO, proceed to question 14.	☑ NO	☐ YES
12. Have all changes to original data been lined out, initialed and dated by the individual making the changes?	☐ NO	☐ YES
13. Were the data changes made by the individual who originally collected the data or by an equally qualified individual?	☐ NO	☐ YES
14. Did the physical form of the waste match the Waste Matrix Code and Waste Stream Description?	☐ NO	☑ YES
15. Has each container in this BDR been evaluated for the presence of prohibited items?	☐ NO	☑ YES
16. Is there an adequate written description of the contents of each container?	☐ NO	☑ YES
17. Was a scale(s) used? If NO, proceed to question 20.	☐ NO	☑ YES
18. Were the scale(s) in calibration prior to the VE and documented correctly?	☐ NO	☑ YES
19. Were the scale(s) checks SAT prior to the VE and documented correctly?	☐ NO	☑ YES
20. Was VE of each container performed by at least two qualified VEO's or was an Audio/Video recording properly prepared for each container?	☐ NO	☑ YES

Attachment 3 – CCP Waste VE Independent Technical Reviewer Checklist (continued)

Batch Data Report No.: ORVECH0162 Page 2 of 2

Description		
21. Was an NCR required at the data generation level? If NO, proceed to question 23.	☑ NO	☐ YES
22. Is a copy of the NCR included in the BDR?	☐ NO	☐ YES
23. Were the QAO's (precision, accuracy, completeness, comparability) met?	☐ NO	☑ YES
Precision – Precision is maintained by reconciling any discrepancies between the operator and the independent technical reviewer with regard to identification of waste matrix code, liquids in excess of TSDF-WAC limits, and compressed gases. Accuracy – Accuracy is maintained by requiring operators to pass a comprehensive examination and demonstrate satisfactory performance in the presence of the VE expert during their initial qualification. VE operators shall be re-qualified every two years. Completeness – A validated VE data form will be obtained for 100 percent of the waste containers subject to VE. Comparability – The comparability of VE data from different operators shall be enhanced by using standardized VE procedures and operator qualifications.		

Comments: N/A

I have reviewed 100 percent of the container-specific and batch data in this report and find it acceptable.

Independent Technical Reviewer:

Printed Name	Signature	Date
Derek Mathews	[signature]	2/11/16

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PAGE

Attachment 3 – Visual Examination Site Project Manager Checklist

Batch Data Report No.: ORNLRHVE15003

1.	Has all the data received an independent technical review as evidenced by a completed checklist (Attachment 2) and the appropriate ITR signature?	☐ NO	☒ YES
2.	Are BDR contents complete and match the Visual Examination Batch Data Report Table of Contents?	☐ NO	☒ YES
3.	Is the BDR complete (appropriately filled in forms for each container)?	☐ NO	☒ YES
4.	Have the RH Quality Assurance Objectives (QAOs) for VE been met?		
	Precision – reconciled discrepancies between operators	☐ NO	☒ YES
	Accuracy – trained operators	☐ NO	☒ YES
	Representativeness – description of container contents	☐ NO	☒ YES
	Completeness – completed data form and/or recording	☐ NO	☒ YES
	Comparability – proper training and adequate AK for unopened containers	☐ NO	☒ YES
5.	Were NCRs generated included in the BDR? ☐ NO	☐ YES	☒ N/A

Comments: None

SPM:

David W. Moody
Printed Name

Signature

14 September 2015
Date

CCP RECORDS ORIGINAL
DATE REC'D 10/13/15

COPY

Attachment 4 – Visual Examination Batch Data Report Cover Sheet

Batch Data Report No.: ORNLRHVE15003 Date: 9-10-15

	Waste Container ID Number:
1	ORRH00710
2	ORRH00711
3	
4	
5	
6	
7	
8	
9	
10	
11	N/A
12	A.H. 9-10-15
13	
14	
15	
16	
17	
18	
19	
20	

COPY

NTPC RECORDS ORIGINAL
DATE REC'D 9-14-2015

Attachment 5 – Visual Examination Batch Data Report Table of Contents

Batch Data Report No.: ORNLRHVE1500 3 Date: 9-10-15

Item	Description	Page No.
1	Visual Examination Batch Data Report Cover Sheet (Attachment 4)	1
2	Visual Examination Batch Data Report Table of Contents (Attachment 5)	2
3	Visual Examination Data Forms (Attachment 1)	3
4	Visual Examination Independent Technical Reviewer Checklist (Attachment 2)	7
5	Copy of NCRs (N/A [if not applicable])	N/A

Attachment 1 – Visual Examination Data Form

Site ID: RHORNL			
Examination Date: 9-10-15	Batch Number: ORNLRHVE15003		
Procedure #: CCP-TP-500	Revision #: 15	Video #: N/A	
Recording Equipment Check: ☐SAT ☐UNSAT ☑N/A	Recording Start: N/A	Recording Stop: N/A	
Inspection of Container to be loaded during VE: ☑SAT ☐UNSAT			

Indirect load Container ☑N/A	Final Output Container ☐ N/A
Container ID Number:	Container ID Number: ORRH00710
Container Type:	Container Type: 55 gallon drum
Waste Matrix Code:	Waste Matrix Code: S5400
Waste Stream:	Waste Stream: OR-REDC-RH-HET
	Poly Rigid Liner: ☐Y ☑N Thickness: / Poly Rigid Liner Lid: ☐Y ☑N
	Poly Rigid Liner Vented or Hole Size: N/A
Percent Fill: / Percent Organic Waste:	Percent Fill: 100% / Percent Organic Waste: 40%
Layers of Confinement: / Closure Method:	Layers of Confinement: 0 / Closure Method: N/A

Comments (e.g., filter information, NCRs):
Nucfil-0190S BK-37
cask# X10C94026044

Waste Description:

super sak (P)
cardboard liner (C)
plastic buckets (P)
aluminum gear (Am)
absorbent pads (C)
poly block (P)
plastic bags (P)
floor sweepings (Im) (OIm) (Am) (P) (C) (R)
smears (C)
paint cans (Im)
glass vials (OIm)
broken light bulbs (OIm)
String (C)
aluminum capacitor (Am)
cloth suits (C)
plastic suits (P)

No char (OIm)

Attachment 1 – Visual Examination Data Form (continued)

Container ID Number ORRH00710

Prohibited Item(s) Summary	YES	NO
Does the container have observable liquid equal to or greater than 1 percent by volume of the outermost container at the time of RTR or VE?	☐	☑
Does the container have observable liquid more than 60 milliliters or 3 percent by volume, whichever is greater in an internal container?	☐	☑
Does the container have observable liquid with an EPA hazardous waste number (HWN) U134 assigned?	☐	☑
Does the container have observable liquid containing PCBs?	☐	☑
Is there an indication of non-radionuclide pyrophoric materials, such as elemental potassium?	☐	☑
Is there an indication of hazardous wastes not occurring as co-contaminants with TRU mixed wastes (non-mixed hazardous wastes)?	☐	☑
Is there an indication of wastes incompatible with backfill, seal and panel closures materials, container and packaging materials, shipping container materials, or other wastes (i.e., waste does **NOT** match Table of Allowable Materials for RH-TRU Waste in the RH-TRAMPAC)?	☐	☑
Is there an indication of wastes containing explosives or compressed gases?	☐	☑
Is there an indication of polychlorinated biphenyls (PCBs) not authorized under an EPA PCB waste disposal authorization?	☐	☑
Is there an indication of the waste exhibiting the characteristic of ignitability, corrosivity, or reactivity (EPA Hazardous Waste Numbers of D001, D002, or D003)?	☐	☑
Is the physical form of the waste inconsistent with the Waste Stream Description or the Waste Matrix Code?	☐	☑
RH-72B Criteria		
Were there Non-approved Closure Methods used on liner bags or inner bags greater than 4 liters?	☐	☑
Are there sealed containers GREATER than 4 liters or heat sealed bags **NOT** defined in the applicable TRUCON Code?	☐	☑
Are there indications of inadequate protection (blocked or braced) for heavy and/or sharp objects?	☐	☑
Is the waste consistent with the TRUCON Code?	☑	☐

Comments: N/A

Visual Examination Operator 1:

Print Name	Signature	Date
Anthony Harley		9-10-15

Visual Examination Operator 2:

Print Name	Signature	Date
Jason Cofer		9-10-15

Attachment 1 – Visual Examination Data Form

Site ID: RHORNL			
Examination Date: 9-10-15		Batch Number: ORNL RHVE 15003	
Procedure #: CCP-TP-500		Revision #: 15	Video #: N/A
Recording Equipment Check: ☐SAT ☐UNSAT ☑N/A		Recording Start: N/A	Recording Stop: N/A
Inspection of Container to be loaded during VE: ☑SAT ☐UNSAT			
Indirect load Container ☑N/A		Final Output Container ☐ N/A	
Container ID Number:		Container ID Number: ORRH00711	
Container Type:		Container Type: 55 gallon drum	
Waste Matrix Code:		Waste Matrix Code: S 5400	
Waste Stream:		Waste Stream: OR-REDC-RH-HET	
		Poly Rigid Liner: ☐Y ☑N Thickness:	Poly Rigid Liner Lid: ☐ Y ☑N
		Poly Rigid Liner Vented or Hole Size: N/A	
Percent Fill:	Percent Organic Waste:	Percent Fill: 90%	Percent Organic Waste: 20%
Layers of Confinement:	Closure Method:	Layers of Confinement: 0	Closure Method: N/A

Comments (e.g., filter information, NCRs):
Nucfil-019DS BK-38
cask # X10C 9402644

Waste Description:
plastic buckets (P)
plastic valve (P)
poly blocks (P)
plastic bags (P)
cloth rags (C)
floor sweepings (IM)(AM)(OIM)(P)(C)(R)
metal lids (IM)
saw blade (IM)
cardboard liner (C)
super sak (P)
plastic lids (P)
paint cans (IM)
String (C)
plastic pieces (P)

Attachment 1 – Visual Examination Data Form (continued)

Container ID Number ORRH00711

Prohibited Item(s) Summary	YES	NO
Does the container have observable liquid equal to or greater than 1 percent by volume of the outermost container at the time of RTR or VE?	☐	☑
Does the container have observable liquid more than 60 milliliters or 3 percent by volume, whichever is greater in an internal container?	☐	☑
Does the container have observable liquid with an EPA hazardous waste number (HWN) U134 assigned?	☐	☑
Does the container have observable liquid containing PCBs?	☐	☑
Is there an indication of non-radionuclide pyrophoric materials, such as elemental potassium?	☐	☑
Is there an indication of hazardous wastes not occurring as co-contaminants with TRU mixed wastes (non-mixed hazardous wastes)?	☐	☑
Is there an indication of wastes incompatible with backfill, seal and panel closures materials, container and packaging materials, shipping container materials, or other wastes (i.e., waste does NOT match Table of Allowable Materials for RH-TRU Waste in the RH-TRAMPAC)?	☐	☑
Is there an indication of wastes containing explosives or compressed gases?	☐	☑
Is there an indication of polychlorinated biphenyls (PCBs) not authorized under an EPA PCB waste disposal authorization?	☐	☑
Is there an indication of the waste exhibiting the characteristic of ignitability, corrosivity, or reactivity (EPA Hazardous Waste Numbers of D001, D002, or D003)?	☐	☑
Is the physical form of the waste inconsistent with the Waste Stream Description or the Waste Matrix Code?	☐	☑
RH-72B Criteria		
Were there Non-approved Closure Methods used on liner bags or inner bags greater than 4 liters?	☐	☑
Are there sealed containers GREATER than 4 liters or heat sealed bags **NOT** defined in the applicable TRUCON Code?	☐	☑
Are there indications of inadequate protection (blocked or braced) for heavy and/or sharp objects?	☐	☑
Is the waste consistent with the TRUCON Code?	☑	☐

Comments: N/A

Visual Examination Operator 1:
Anthony Harley (Print Name) — (Signature) — 9-10-15 (Date)

Visual Examination Operator 2:
Jason Cofer (Print Name) — (Signature) — 9-10-15 (Date)

Attachment 2 – Visual Examination Independent Technical Reviewer Checklist

Batch Data Report No.: ORNLRHVE15003

1. Were data generation and reduction conducted in a technically correct manner in accordance with the methods (procedure) used?	☐ NO	☑ YES
2. Was the correct revision of the operating procedure used?	☐ NO	☑ YES
3. Has the data been reviewed for errors?	☐ NO	☑ YES
4. Are BDR contents complete and do they match CCP waste VE Batch Data report Table of Contents?	☐ NO	☑ YES
5. Does the testing batch report include VE for up to 20 containers?	☐ NO	☑ YES
6. Is all data signed and dated in reproducible ink by the individual(s) generating it?	☐ NO	☑ YES
7. Is all data recorded clearly, legibly, and accurately?	☐ NO	☑ YES
8. Were changes made to original data? If NO, proceed to question 11.	☑ NO	☐ YES
9. Have all changes made to original data been lined out, initialed and dated by the individual making the changes?	☐ NO	☐ YES
10. Were the data changes made by the individual who originally collected the data or by an equally qualified individual?	☐ NO	☐ YES
11. Is there an adequate written description of the contents of each container?	☐ NO	☑ YES
12. Was VE of each container performed by at least two qualified VEO's or was an Audio/Video recording properly prepared for each container?	☐ NO	☑ YES
13. Has each container in this BDR been evaluated for the presence of prohibited wastes?	☐ NO	☑ YES
14. Did the physical form of the waste match the waste matrix code and waste stream description?	☐ NO	☑ YES
15. Was an NCR required at the data generation level? If NO, proceed to question 17.	☑ NO	☐ YES
16. Is a copy of the NCR included in the BDR?	☐ NO	☐ YES
17. Have the RH Quality Assurance Objectives (QAOs) for VE been met?	☐ NO	☑ YES
Precision – Precision is maintained by reconciling any discrepancies between two operators (or between the operator and the Independent Technical Reviewer) with regard to the identification of important waste characteristics (i.e., physical form of the waste and absence of prohibited liquids) within a single container.		
Accuracy – Accuracy is maintained by requiring operators to pass a comprehensive examination with a score of 80% and demonstrate satisfactory performance in the presence of the VE expert during their initial qualification and subsequent requalification.		
Representativeness – The contents placed in a container will be described on the data forms.		

Attachment 2 – Visual Examination Independent Technical Reviewer Checklist (Continued)

Batch Data Report No.: ORNLRHVE15003

Completeness – The relevant waste information must be collected. This information must be documented on a videotape and/or data form, or other unalterable media. **Comparability** – Comparability is ensured by the characterization program meeting the training requirements and complying with the minimum standards used to implement this characterization process. In some instances, waste will be contained in opaque containers and not all items will be visible to the operator (e.g., sealed paint cans or 5-gallon buckets). If these containers are not opened during VE, source documents must be available in the AK record that allow the operator to identify the contents of the closed containers.		
Comments: N/A		
Independent Technical Reviewer Derek Matheny (Printed Name)	(Signature)	9/14/15 (Date)

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Attachment 3 – Visual Examination Site Project Manager Checklist

Batch Data Report No.: ORNLRHVE15016

1. Has all the data received an independent technical review as evidenced by a completed checklist (Attachment 2) and the appropriate ITR signature?		☐ NO	☒ YES
2. Are BDR contents complete and match the Visual Examination Batch Data Report Table of Contents?		☐ NO	☒ YES
3. Is the BDR complete (appropriately filled in forms for each container)?		☐ NO	☒ YES
4. Have the RH Quality Assurance Objectives (QAOs) for VE been met?			
Precision – reconciled discrepancies between operators		☐ NO	☒ YES
Accuracy – trained operators		☐ NO	☒ YES
Representativeness – description of container contents		☐ NO	☒ YES
Completeness – completed data form and/or recording		☐ NO	☒ YES
Comparability – proper training and adequate AK for unopened containers		☐ NO	☒ YES
5. Were NCRs generated included in the BDR?	☐ NO	☐ YES	☒ N/A

Comments: None

SPM:

David W. Moody
Printed Name

David W Moody
Signature

30 December 2015
Date

COPY

CCP RECORDS ORIGINAL
DATE REC'D 12.30.15 JV

Attachment 4 – Visual Examination Batch Data Report Cover Sheet

Batch Data Report No.: ORNLRHVE15016 Date: 12/29/15

	Waste Container ID Number:
1	ORRH00732
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12/29/15

COPY

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DATE REC'D 12-29-2015

Attachment 5 – Visual Examination Batch Data Report Table of Contents

Batch Data Report No.: ORNLRHVE15016 Date: 12/29/15

Item	Description	Page No.
1	Visual Examination Batch Data Report Cover Sheet (Attachment 4)	1
2	Visual Examination Batch Data Report Table of Contents (Attachment 5)	2
3	Visual Examination Data Forms (Attachment 1)	3
4	Visual Examination Independent Technical Reviewer Checklist (Attachment 2)	5
5	Copy of NCRs (N/A [if not applicable])	N/A

Attachment 1 – Visual Examination Data Form

Site ID: RHORNL			
Examination Date: 12/29/15	Batch Number: ORNLRHVE15016		
Procedure #: CCP-TP-500	Revision #: 15	Video #: N/A	
Recording Equipment Check: ☐SAT ☐UNSAT ☒N/A	Recording Start: N/A	Recording Stop: N/A	
Inspection of Container to be loaded during VE: ☒SAT ☐UNSAT			
Indirect load Container ☒N/A	Final Output Container ☐ N/A		
Container ID Number:	Container ID Number: ORRH00732		
Container Type:	Container Type: 55 Gal. Drum		
Waste Matrix Code:	Waste Matrix Code: 55400		
Waste Stream:	Waste Stream: OR-REDC-RH-HET		
	Poly Rigid Liner: ☐Y ☒N Thickness: N/A	Poly Rigid Liner Lid: ☐Y ☒N	
	Poly Rigid Liner Vented or Hole Size: N/A		
Percent Fill: / Percent Organic Waste:	Percent Fill: 100% / Percent Organic Waste: 10%		
Layers of Confinement: / Closure Method:	Layers of Confinement: 0 / Closure Method: N/A		
Comments (e.g., filter information, NCRs): Cask # X10C0505647 NUCFIL-019DS KS-613			

Waste Description:

Super Sack (P)
Cardboard Liner (C)
Saw Blades (IM)
Plastic Bags (P)
Metal Cans (IM)
Metal Lids (IM)
Poly Blocks (P)
Poly Bag (P)
String (C)
Metal Pieces (IM)
Glass Vials (OIM)
Cloth (C)
Gauze (C)

Floor Sweepings (C)(IM)(OIM)(P)
Plywood (C)
Paper (C)
Aluminum Disc (AM)

Attachment 1 – Visual Examination Data Form (continued)

Container ID Number ORRH00732

Prohibited Item(s) Summary	YES	NO
Does the container have observable liquid equal to or greater than 1 percent by volume of the outermost container at the time of RTR or VE?	☐	☑
Does the container have observable liquid more than 60 milliliters or 3 percent by volume, whichever is greater in an internal container?	☐	☑
Does the container have observable liquid with an EPA hazardous waste number (HWN) U134 assigned?	☐	☑
Does the container have observable liquid containing PCBs?	☐	☑
Is there an indication of non-radionuclide pyrophoric materials, such as elemental potassium?	☐	☑
Is there an indication of hazardous wastes not occurring as co-contaminants with TRU mixed wastes (non-mixed hazardous wastes)?	☐	☑
Is there an indication of wastes incompatible with backfill, seal and panel closures materials, container and packaging materials, shipping container materials, or other wastes (i.e., waste does **NOT** match Table of Allowable Materials for RH-TRU Waste in the RH-TRAMPAC)?	☐	☑
Is there an indication of wastes containing explosives or compressed gases?	☐	☑
Is there an indication of polychlorinated biphenyls (PCBs) not authorized under an EPA PCB waste disposal authorization?	☐	☑
Is there an indication of the waste exhibiting the characteristic of ignitability, corrosivity, or reactivity (EPA Hazardous Waste Numbers of D001, D002, or D003)?	☐	☑
Is the physical form of the waste inconsistent with the Waste Stream Description or the Waste Matrix Code?	☐	☑
RH-72B Criteria		
Were there Non-approved Closure Methods used on liner bags or inner bags greater than 4 liters?	☐	☑
Are there sealed containers GREATER than 4 liters or heat sealed bags **NOT** defined in the applicable TRUCON Code?	☐	☑
Are there indications of inadequate protection (blocked or braced) for heavy and/or sharp objects?	☐	☑
Is the waste consistent with the TRUCON Code?	☑	☐

Comments: N/A

Visual Examination Operator 1:		
Derek Matheny		12/29/15
Print Name	Signature	Date
Visual Examination Operator 2:		
Anthony Harley		12-29-15
Print Name	Signature	Date

Attachment 2 – Visual Examination Independent Technical Reviewer Checklist

Batch Data Report No.: ORNLRHVE15016

1. Were data generation and reduction conducted in a technically correct manner in accordance with the methods (procedure) used?	☐ NO	☒ YES
2. Was the correct revision of the operating procedure used?	☐ NO	☒ YES
3. Has the data been reviewed for errors?	☐ NO	☒ YES
4. Are BDR contents complete and do they match CCP waste VE Batch Data report Table of Contents?	☐ NO	☒ YES
5. Does the testing batch report include VE for up to 20 containers?	☐ NO	☒ YES
6. Is all data signed and dated in reproducible ink by the individual(s) generating it?	☐ NO	☒ YES
7. Is all data recorded clearly, legibly, and accurately?	☐ NO	☒ YES
8. Were changes made to original data? If NO, proceed to question 11.	☒ NO	☐ YES
9. Have all changes made to original data been lined out, initialed and dated by the individual making the changes?	☐ NO	☐ YES
10. Were the data changes made by the individual who originally collected the data or by an equally qualified individual?	☐ NO	☐ YES
11. Is there an adequate written description of the contents of each container?	☐ NO	☒ YES
12. Was VE of each container performed by at least two qualified VEO's or was an Audio/Video recording properly prepared for each container?	☐ NO	☒ YES
13. Has each container in this BDR been evaluated for the presence of prohibited wastes?	☐ NO	☒ YES
14. Did the physical form of the waste match the waste matrix code and waste stream description?	☐ NO	☒ YES
15. Was an NCR required at the data generation level? If NO, proceed to question 17.	☒ NO	☐ YES
16. Is a copy of the NCR included in the BDR?	☐ NO	☐ YES
17. Have the RH Quality Assurance Objectives (QAOs) for VE been met? **Precision** – Precision is maintained by reconciling any discrepancies between two operators (or between the operator and the Independent Technical Reviewer) with regard to the identification of important waste characteristics (i.e., physical form of the waste and absence of prohibited liquids) within a single container. **Accuracy** – Accuracy is maintained by requiring operators to pass a comprehensive examination with a score of 80% and demonstrate satisfactory performance in the presence of the VE expert during their initial qualification and subsequent requalification. **Representativeness** – The contents placed in a container will be described on the data forms.	☐ NO	☒ YES

Attachment 2 – Visual Examination Independent Technical Reviewer Checklist (Continued)

Batch Data Report No.: ORNL RH VE 150/6

Completeness – The relevant waste information must be collected. This information must be documented on a videotape and/or data form, or other unalterable media. **Comparability** – Comparability is ensured by the characterization program meeting the training requirements and complying with the minimum standards used to implement this characterization process. In some instances, waste will be contained in opaque containers and not all items will be visible to the operator (e.g., sealed paint cans or 5-gallon buckets). If these containers are not opened during VE, source documents must be available in the AK record that allow the operator to identify the contents of the closed containers.		
Comments: N/A		
Independent Technical Reviewer Gilbert Gutierrez Printed Name	Signature	12-29-15 Date

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PAGE

Attachment 3 – Visual Examination Site Project Manager Checklist

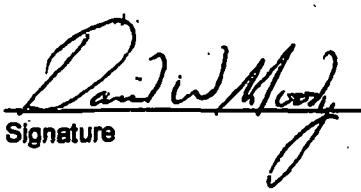
Batch Data Report No.: ORNLRHVE16002

1.	Has all the data received an independent technical review as evidenced by a completed checklist (Attachment 2) and the appropriate ITR signature?		☐ NO	☒ YES
2.	Are BDR contents complete and match the Visual Examination Batch Data Report Table of Contents?		☐ NO	☒ YES
3.	Is the BDR complete (appropriately filled in forms for each container)?		☐ NO	☒ YES
4.	Have the RH Quality Assurance Objectives (QAOs) for VE been met?			
	Precision – reconciled discrepancies between operators		☐ NO	☒ YES
	Accuracy – trained operators		☐ NO	☒ YES
	Representativeness – description of container contents		☐ NO	☒ YES
	Completeness – completed data form and/or recording		☐ NO	☒ YES
	Comparability – proper training and adequate AK for unopened containers		☐ NO	☒ YES
5.	Were NCRs generated included in the BDR?	☐ NO	☐ YES	☒ N/A

Comments: None

SPM:

David W. Moody
Printed Name


Signature

25 January 2016
Date

COPY

CCP RECORDS ORIGINAL
DATE REC'D 1/26/2016

Attachment 4 – Visual Examination Batch Data Report Cover Sheet

Batch Data Report No.: ORNLRHVE16002 Date: 1-21-16

	Waste Container ID Number:
1	ORRH00735
2	
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10	N/A
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DATE REC'D 1-25-2016

Attachment 5 – Visual Examination Batch Data Report Table of Contents

Batch Data Report No.: ORNLRHVE16002 Date: 1-21-16

Item	Description	Page No.
1	Visual Examination Batch Data Report Cover Sheet (Attachment 4)	1
2	Visual Examination Batch Data Report Table of Contents (Attachment 5)	2
3	Visual Examination Data Forms (Attachment 1)	3
4	Visual Examination Independent Technical Reviewer Checklist (Attachment 2)	5
5	Copy of NCRs (N/A [if not applicable])	N/A

Attachment 1 – Visual Examination Data Form

Site ID: RHORNL			
Examination Date: 1-21-16		Batch Number: ORNLRHVE160002	
Procedure #: CCP-TP-500		Revision #: 15	Video #: N/A
Recording Equipment Check: ☐SAT ☐UNSAT ☑N/A		Recording Start: N/A	Recording Stop: N/A
Inspection of Container to be loaded during VE: ☑SAT ☐UNSAT			
Indirect load Container ☑N/A		Final Output Container ☐ N/A	
Container ID Number:		Container ID Number: ORRH00735	
Container Type:		Container Type: 55 gallon drum	
Waste Matrix Code:		Waste Matrix Code: 55400	
Waste Stream:		Waste Stream: OR-REDC-RH-HET	
		Poly Rigid Liner: ☐Y ☑N Thickness: N/A	Poly Rigid Liner Lid: ☐ Y ☑N
		Poly Rigid Liner Vented or Hole Size: N/A	
Percent Fill:	Percent Organic Waste:	Percent Fill: 100%	Percent Organic Waste: 10%
Layers of Confinement:	Closure Method:	Layers of Confinement: 0	Closure Method: N/A

Comments (e.g., filter information, NCRs):
Nucfil-019DS KJ-616
cask# X10C9802684

Waste Description:
cardboard liner (C)
Super sack (P)
plastic sheeting (P)
metal cans (IM)
electrical wire (OM) (P) (IM)
metal pieces (IM)
poly blocks (P)
string (C)
floor sweepings (IM) (C) (P)
paper (C)
glass vials (OIM)
plastic bags (P)

Attachment 1 – Visual Examination Data Form (continued)

Container ID Number ORRH00735

Prohibited Item(s) Summary	YES	NO
Does the container have observable liquid equal to or greater than 1 percent by volume of the outermost container at the time of RTR or VE?	☐	☑
Does the container have observable liquid more than 60 milliliters or 3 percent by volume, whichever is greater in an internal container?	☐	☑
Does the container have observable liquid with an EPA hazardous waste number (HWN) U134 assigned?	☐	☑
Does the container have observable liquid containing PCBs?	☐	☑
Is there an indication of non-radionuclide pyrophoric materials, such as elemental potassium?	☐	☑
Is there an indication of hazardous wastes not occurring as co-contaminants with TRU mixed wastes (non-mixed hazardous wastes)?	☐	☑
Is there an indication of wastes incompatible with backfill, seal and panel closures materials, container and packaging materials, shipping container materials, or other wastes (i.e., waste does **NOT** match Table of Allowable Materials for RH-TRU Waste in the RH-TRAMPAC)?	☐	☑
Is there an indication of wastes containing explosives or compressed gases?	☐	☑
Is there an indication of polychlorinated biphenyls (PCBs) not authorized under an EPA PCB waste disposal authorization?	☐	☑
Is there an indication of the waste exhibiting the characteristic of ignitability, corrosivity, or reactivity (EPA Hazardous Waste Numbers of D001, D002, or D003)?	☐	☑
Is the physical form of the waste inconsistent with the Waste Stream Description or the Waste Matrix Code?	☐	☑
RH/2B Criteria		
Were there Non-approved Closure Methods used on liner bags or inner bags greater than 4 liters?	☐	☑
Are there sealed containers GREATER than 4 liters or heat sealed bags **NOT** defined in the applicable TRUCON Code?	☐	☑
Are there indications of inadequate protection (blocked or braced) for heavy and/or sharp objects?	☐	☑
Is the waste consistent with the TRUCON Code?	☑	☐

Comments: N/A

Visual Examination Operator 1:
Anthony Herley — Print Name
[signature] — Signature
1-21-16 — Date

Visual Examination Operator 2:
Gilbert Gutierrez — Print Name
[signature] — Signature
1-21-16 — Date

Attachment 2 – Visual Examination Independent Technical Reviewer Checklist

Batch Data Report No.: ORNLRHVE16002

1. Were data generation and reduction conducted in a technically correct manner in accordance with the methods (procedure) used?	☐ NO	☑ YES
2. Was the correct revision of the operating procedure used?	☐ NO	☑ YES
3. Has the data been reviewed for errors?	☐ NO	☑ YES
4. Are BDR contents complete and do they match CCP waste VE Batch Data report Table of Contents?	☐ NO	☑ YES
5. Does the testing batch report include VE for up to 20 containers?	☐ NO	☑ YES
6. Is all data signed and dated in reproducible ink by the individual(s) generating it?	☐ NO	☑ YES
7. Is all data recorded clearly, legibly, and accurately?	☐ NO	☑ YES
8. Were changes made to original data? If NO, proceed to question 11.	☑ NO	☐ YES
9. Have all changes made to original data been lined out, initialed and dated by the individual making the changes?	☐ NO	☐ YES
10. Were the data changes made by the individual who originally collected the data or by an equally qualified individual?	☐ NO	☐ YES
11. Is there an adequate written description of the contents of each container?	☐ NO	☑ YES
12. Was VE of each container performed by at least two qualified VEO's or was an Audio/Video recording properly prepared for each container?	☐ NO	☑ YES
13. Has each container in this BDR been evaluated for the presence of prohibited wastes?	☐ NO	☑ YES
14. Did the physical form of the waste match the waste matrix code and waste stream description?	☐ NO	☑ YES
15. Was an NCR required at the data generation level? If NO, proceed to question 17.	☑ NO	☐ YES
16. Is a copy of the NCR included in the BDR?	☐ NO	☐ YES
17. Have the RH Quality Assurance Objectives (QAOs) for VE been met? **Precision** – Precision is maintained by reconciling any discrepancies between two operators (or between the operator and the Independent Technical Reviewer) with regard to the identification of important waste characteristics (i.e., physical form of the waste and absence of prohibited liquids) within a single container. **Accuracy** – Accuracy is maintained by requiring operators to pass a comprehensive examination with a score of 80% and demonstrate satisfactory performance in the presence of the VE expert during their initial qualification and subsequent requalification. **Representativeness** – The contents placed in a container will be described on the data forms.	☐ NO	☑ YES

Attachment 2 – Visual Examination Independent Technical Reviewer Checklist (Continued)

Batch Data Report No.: ORNL RHVE 16002

Completeness – The relevant waste information must be collected. This information must be documented on a videotape and/or data form, or other unalterable media. **Comparability** – Comparability is ensured by the characterization program meeting the training requirements and complying with the minimum standards used to implement this characterization process. In some instances, waste will be contained in opaque containers and not all items will be visible to the operator (e.g., sealed paint cans or 5-gallon buckets). If these containers are not opened during VE, source documents must be available in the AK record that allow the operator to identify the contents of the closed containers.		
Comments: N/A		
Independent Technical Reviewer Derek Matheny Printed Name	Signature	1/25/16 Date

DIVIDER

PAGE

Attachment 3 – Visual Examination Site Project Manager Checklist

Batch Data Report No.: ORNLRHVE16009

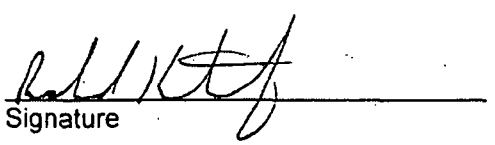
1. Has all the data received an independent technical review as evidenced by a completed checklist (Attachment 2) and the appropriate ITR signature?		☐ NO	☒ YES
2. Are BDR contents complete and match the Visual Examination Batch Data Report Table of Contents?		☐ NO	☒ YES
3. Is the BDR complete (appropriately filled in forms for each container)?		☐ NO	☒ YES
4. Have the RH Quality Assurance Objectives (QAOs) for VE been met?			
Precision – reconciled discrepancies between operators		☐ NO	☒ YES
Accuracy – trained operators		☐ NO	☒ YES
Representativeness – description of container contents		☐ NO	☒ YES
Completeness – completed data form and/or recording		☐ NO	☒ YES
Comparability – proper training and adequate AK for unopened containers		☐ NO	☒ YES
5. Were NCRs generated included in the BDR?	☐ NO	☐ YES	☒ N/A

Comments

None

SPM:

Richard Kantrowitz
Printed Name


Signature

March 3, 2016
Date

COPY

CCP RECORDS ORIGINAL
DATE REC'D 3/3/16

Attachment 4 – Visual Examination Batch Data Report Cover Sheet

Batch Data Report No.: ORNLRHVE16009 Date: 2-29-16

	Waste Container ID Number:
1	ORRH00746
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11	N/A R.H. 2-29-16
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NTPC RECORDS ORIGINAL
DATE REC'D 3-1-2016

Attachment 5 – Visual Examination Batch Data Report Table of Contents

Batch Data Report No.: ORNLRHVE16009 Date: 2-29-16

Item	Description	Page No.
1	Visual Examination Batch Data Report Cover Sheet (Attachment 4)	1
2	Visual Examination Batch Data Report Table of Contents (Attachment 5)	2
3	Visual Examination Data Forms (Attachment 1)	3
4	Visual Examination Independent Technical Reviewer Checklist (Attachment 2)	5
5	Copy of NCRs (N/A [if not applicable])	N/A

Attachment 1 – Visual Examination Data Form

Site ID: RHORNL			
Examination Date: 2-29-16	Batch Number: ORNLRHVE16009		
Procedure #: CCP-TP-500	Revision #: 15	Video #: N/A	
Recording Equipment Check: ☐SAT ☐UNSAT ☑N/A	Recording Start: N/A	Recording Stop: N/A	
Inspection of Container to be loaded during VE: ☑SAT ☐UNSAT			

Indirect load Container ☑N/A		Final Output Container ☐ N/A	
Container ID Number:		Container ID Number: ORRH00746	
Container Type:		Container Type: 55 gallon drum	
Waste Matrix Code:		Waste Matrix Code: S5400	
Waste Stream:		Waste Stream: OR-REDC-RH-HET	
		Poly Rigid Liner: ☐Y ☑N Thickness: N/A	Poly Rigid Liner Lid: ☐Y ☑N
		Poly Rigid Liner Vented or Hole Size: N/A	
Percent Fill:	Percent Organic Waste:	Percent Fill: 95%	Percent Organic Waste: 20%
Layers of Confinement:	Closure Method:	Layers of Confinement: 0	Closure Method: N/A

Comments (e.g., filter information, NCRs):
Nucfil-0190S FK-770
cask # X10C040205S

Waste Description:
metal filter components (IM)
filter media (C)
saw blades (IM)
glass vials (OIM)
Nylon straps (P)
plastic bags (P)

Attachment 1 – Visual Examination Data Form (continued)

Container ID Number ORRH00746

Prohibited Item(s) Summary	YES	NO
Does the container have observable liquid equal to or greater than 1 percent by volume of the outermost container at the time of RTR or VE?	☐	☑
Does the container have observable liquid more than 60 milliliters or 3 percent by volume, whichever is greater in an internal container?	☐	☑
Does the container have observable liquid with an EPA hazardous waste number (HWN) U134 assigned?	☐	☑
Does the container have observable liquid containing PCBs?	☐	☑
Is there an indication of non-radionuclide pyrophoric materials, such as elemental potassium?	☐	☑
Is there an indication of hazardous wastes not occurring as co-contaminants with TRU mixed wastes (non-mixed hazardous wastes)?	☐	☑
Is there an indication of wastes incompatible with backfill, seal and panel closures materials, container and packaging materials, shipping container materials, or other wastes (i.e., waste does **NOT** match Table of Allowable Materials for RH-TRU Waste in the RH-TRAMPAC)?	☐	☑
Is there an indication of wastes containing explosives or compressed gases?	☐	☑
Is there an indication of polychlorinated biphenyls (PCBs) not authorized under an EPA PCB waste disposal authorization?	☐	☑
Is there an indication of the waste exhibiting the characteristic of ignitability, corrosivity, or reactivity (EPA Hazardous Waste Numbers of D001, D002, or D003)?	☐	☑
Is the physical form of the waste inconsistent with the Waste Stream Description or the Waste Matrix Code?	☐	☑
RH-72B Criteria		
Were there Non-approved Closure Methods used on liner bags or inner bags greater than 4 liters?	☐	☑
Are there sealed containers GREATER than 4 liters or heat sealed bags **NOT** defined in the applicable TRUCON Code?	☐	☑
Are there indications of inadequate protection (blocked or braced) for heavy and/or sharp objects?	☐	☑
Is the waste consistent with the TRUCON Code?	☑	☐

Comments: N/A

Visual Examination Operator 1:
Anthony Harley — Print Name
Signature
2-29-16 — Date

Visual Examination Operator 2:
Gilbert Gutierrez — Print Name
Signature
2-29-16 — Date

Attachment 2 – Visual Examination Independent Technical Reviewer Checklist

Batch Data Report No.: ORNL RHVE16009

1. Were data generation and reduction conducted in a technically correct manner in accordance with the methods (procedure) used?	☐ NO	☑ YES
2. Was the correct revision of the operating procedure used?	☐ NO	☑ YES
3. Has the data been reviewed for errors?	☐ NO	☑ YES
4. Are BDR contents complete and do they match CCP waste VE Batch Data report Table of Contents?	☐ NO	☑ YES
5. Does the testing batch report include VE for up to 20 containers?	☐ NO	☑ YES
6. Is all data signed and dated in reproducible ink by the individual(s) generating it?	☐ NO	☑ YES
7. Is all data recorded clearly, legibly, and accurately?	☐ NO	☑ YES
8. Were changes made to original data? If NO, proceed to question 11.	☑ NO	☐ YES
9. Have all changes made to original data been lined out, initialed and dated by the individual making the changes?	☐ NO	☐ YES
10. Were the data changes made by the individual who originally collected the data or by an equally qualified individual?	☐ NO	☐ YES
11. Is there an adequate written description of the contents of each container?	☐ NO	☑ YES
12. Was VE of each container performed by at least two qualified VEO's or was an Audio/Video recording properly prepared for each container?	☐ NO	☑ YES
13. Has each container in this BDR been evaluated for the presence of prohibited wastes?	☐ NO	☑ YES
14. Did the physical form of the waste match the waste matrix code and waste stream description?	☐ NO	☑ YES
15. Was an NCR required at the data generation level? If NO, proceed to question 17.	☑ NO	☐ YES
16. Is a copy of the NCR included in the BDR?	☐ NO	☐ YES
17. Have the RH Quality Assurance Objectives (QAOs) for VE been met? **Precision** – Precision is maintained by reconciling any discrepancies between two operators (or between the operator and the Independent Technical Reviewer) with regard to the identification of important waste characteristics (i.e., physical form of the waste and absence of prohibited liquids) within a single container. **Accuracy** – Accuracy is maintained by requiring operators to pass a comprehensive examination with a score of 80% and demonstrate satisfactory performance in the presence of the VE expert during their initial qualification and subsequent requalification. **Representativeness** – The contents placed in a container will be described on the data forms.	☐ NO	☑ YES

Attachment 2 – Visual Examination Independent Technical Reviewer Checklist (Continued)

Batch Data Report No.: ORNLRHVE16009

Completeness – The relevant waste information must be collected. This information must be documented on a videotape and/or data form, or other unalterable media. **Comparability** – Comparability is ensured by the characterization program meeting the training requirements and complying with the minimum standards used to implement this characterization process. In some instances, waste will be contained in opaque containers and not all items will be visible to the operator (e.g., sealed paint cans or 5-gallon buckets). If these containers are not opened during VE, source documents must be available in the AK record that allow the operator to identify the contents of the closed containers.		
Comments: N/A		
Independent Technical Reviewer Derek Mathews (Printed Name) — (Signature) — 3/1/16 (Date)		

DIVIDER

PAGE

Attachment 3 – Visual Examination Site Project Manager Checklist

Batch Data Report No.: ORNLRHVE16010

1. Has all the data received an independent technical review as evidenced by a completed checklist (Attachment 2) and the appropriate ITR signature?		☐ NO	☒ YES
2. Are BDR contents complete and match the Visual Examination Batch Data Report Table of Contents?		☐ NO	☒ YES
3. Is the BDR complete (appropriately filled in forms for each container)?		☐ NO	☒ YES
4. Have the RH Quality Assurance Objectives (QAOs) for VE been met?			
Precision – reconciled discrepancies between operators		☐ NO	☒ YES
Accuracy – trained operators		☐ NO	☒ YES
Representativeness – description of container contents		☐ NO	☒ YES
Completeness – completed data form and/or recording		☐ NO	☒ YES
Comparability – proper training and adequate AK for unopened containers		☐ NO	☒ YES
5. Were NCRs generated included in the BDR?	☐ NO	☐ YES	☒ N/A
Comments None			

SPM:

Richard Kantrowitz
Printed Name

Signature

March 3, 2016
Date

COPY

CCP RECORDS ORIGINAL
DATE REC'D 3/3/16 QK

Attachment 4 – Visual Examination Batch Data Report Cover Sheet

Batch Data Report No.: ORNLRHVE16010 Date: 3-1-16

	Waste Container ID Number
1	ORRH00747
2	ORRH00748
3	
4	
5	
6	
7	
8	
9	
10	
11	N/A RH 3-1-16
12	
13	
14	
15	
16	
17	
18	
19	
20	

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NTPC RECORDS ORIGINAL
DATE REC'D 3-02-2016

Attachment 5 – Visual Examination Batch Data Report Table of Contents

Batch Data Report No.: ORNLRHWE16010 Date: 3-1-16

Item	Description	Page No.
1	Visual Examination Batch Data Report Cover Sheet (Attachment 4)	1
2	Visual Examination Batch Data Report Table of Contents (Attachment 5)	2
3	Visual Examination Data Forms (Attachment 1)	3
4	Visual Examination Independent Technical Reviewer Checklist (Attachment 2)	7
5	Copy of NCRs (N/A [If not applicable])	N/A

Attachment 1 – Visual Examination Data Form

Site ID: RH ORNL			
Examination Date: 3-1-16	Batch Number: ORNLRHVE16010		
Procedure #: CCP-TP-500	Revision #: 15	Video #: N/A	
Recording Equipment Check: ☐SAT ☐UNSAT ☑N/A	Recording Start: N/A	Recording Stop: N/A	
Inspection of Container to be loaded during VE: ☑SAT ☐UNSAT			

Indirect load Container ☑N/A		Final Output Container ☐ N/A	
Container ID Number:		Container ID Number: ORRH00747	
Container Type:		Container Type: 55 gallon drum	
Waste Matrix Code:		Waste Matrix Code: S5400	
Waste Stream:		Waste Stream: OR-REDC-RH-HET	
		Poly Rigid Liner: ☐Y ☑N Thickness: N/A	Poly Rigid Liner Lid: ☐Y ☑N
		Poly Rigid Liner Vented or Hole Size: N/A	
Percent Fill:	Percent Organic Waste:	Percent Fill: 100%	Percent Organic Waste: 20%
Layers of Confinement:	Closure Method:	Layers of Confinement: 0	Closure Method: N/A

Comments (e.g., filter information, NCRs):
Nucfil-0190S FK-766

cask# X10C0402055

Waste Description:
metal filter components (IM)
insulation (OIM)
cardboard liner (C)
super sack (P)

Attachment 1 – Visual Examination Data Form (continued)

Container ID Number ORRH00747

Prohibited Item(s) Summary	YES	NO
Does the container have observable liquid equal to or greater than 1 percent by volume of the outermost container at the time of RTR or VE?	☐	☑
Does the container have observable liquid more than 60 milliliters or 3 percent by volume, whichever is greater in an internal container?	☐	☑
Does the container have observable liquid with an EPA hazardous waste number (HWN) U134 assigned?	☐	☑
Does the container have observable liquid containing PCBs?	☐	☑
Is there an indication of non-radionuclide pyrophoric materials, such as elemental potassium?	☐	☑
Is there an indication of hazardous wastes not occurring as co-contaminants with TRU mixed wastes (non-mixed hazardous wastes)?	☐	☑
Is there an indication of wastes incompatible with backfill, seal and panel closures materials, container and packaging materials, shipping container materials, or other wastes (i.e., waste does **NOT** match Table of Allowable Materials for RH-TRU Waste in the RH-TRAMPAC)?	☐	☑
Is there an indication of wastes containing explosives or compressed gases?	☐	☑
Is there an indication of polychlorinated biphenyls (PCBs) not authorized under an EPA PCB waste disposal authorization?	☐	☑
Is there an indication of the waste exhibiting the characteristic of ignitability, corrosivity, or reactivity (EPA Hazardous Waste Numbers of D001, D002, or D003)?	☐	☑
Is the physical form of the waste inconsistent with the Waste Stream Description or the Waste Matrix Code?	☐	☑
RH-72B Criteria		
Were there Non-approved Closure Methods used on liner bags or inner bags greater than 4 liters?	☐	☑
Are there sealed containers GREATER than 4 liters or heat sealed bags **NOT** defined in the applicable TRUCON Code?	☐	☑
Are there indications of inadequate protection (blocked or braced) for heavy and/or sharp objects?	☐	☑
Is the waste consistent with the TRUCON Code?	☑	☐

Comments: N/A

Visual Examination Operator 1:
Anthony Harley (Print Name) — Signature — 3-1-16 (Date)

Visual Examination Operator 2:
Gilbert Gutierrez (Print Name) — Signature — 3-1-16 (Date)

Attachment 1 – Visual Examination Data Form

Site ID: RHORNL			
Examination Date: 3-1-16	Batch Number: ORNLRHVE16010		
Procedure #: CCP-TP-500	Revision #: 15	Video #: N/A	
Recording Equipment Check: ☐SAT ☐UNSAT ☑N/A	Recording Start: N/A	Recording Stop: N/A	
Inspection of Container to be loaded during VE: ☑SAT ☐UNSAT			

Indirect load Container ☑N/A		Final Output Container ☐ N/A	
Container ID Number:		Container ID Number:	ORRH00748
Container Type:		Container Type:	55 gallon drum
Waste Matrix Code:		Waste Matrix Code:	S5400
Waste Stream:		Waste Stream:	OR-REDC-RH-HET
		Poly Rigid Liner: ☐Y ☑N Thickness: N/A	Poly Rigid Liner Lid: ☐ Y ☑N
		Poly Rigid Liner Vented or Hole Size:	N/A
Percent Fill:	Percent Organic Waste:	Percent Fill: 100%	Percent Organic Waste: 20%
Layers of Confinement:	Closure Method:	Layers of Confinement: 0	Closure Method: N/A

Comments (e.g., filter information, NCRs):
Nucfil-019DS FK-750

cask # X10C040205S

Waste Description:

metal filter components	(IM)
floor sweepings	(IM) (OIM) (C)
filter media	(C)
card board	(C)
metal tools	(IM)
wood	(C)
insulation	(OIM)

Attachment 1 – Visual Examination Data Form (continued)

Container ID Number ORRH00748

Prohibited Item(s) Summary	YES	NO
Does the container have observable liquid equal to or greater than 1 percent by volume of the outermost container at the time of RTR or VE?	☐	☑
Does the container have observable liquid more than 60 milliliters or 3 percent by volume, whichever is greater in an internal container?	☐	☑
Does the container have observable liquid with an EPA hazardous waste number (HWN) U134 assigned?	☐	☑
Does the container have observable liquid containing PCBs?	☐	☑
Is there an indication of non-radionuclide pyrophoric materials, such as elemental potassium?	☐	☑
Is there an indication of hazardous wastes not occurring as co-contaminants with TRU mixed wastes (non-mixed hazardous wastes)?	☐	☑
Is there an indication of wastes incompatible with backfill, seal and panel closures materials, container and packaging materials, shipping container materials, or other wastes (i.e., waste does **NOT** match Table of Allowable Materials for RH-TRU Waste in the RH-TRAMPAC)?	☐	☑
Is there an indication of wastes containing explosives or compressed gases?	☐	☑
Is there an indication of polychlorinated biphenyls (PCBs) not authorized under an EPA PCB waste disposal authorization?	☐	☑
Is there an indication of the waste exhibiting the characteristic of ignitability, corrosivity, or reactivity (EPA Hazardous Waste Numbers of D001, D002, or D003)?	☐	☑
Is the physical form of the waste inconsistent with the Waste Stream Description or the Waste Matrix Code?	☐	☑
RH-72B Criteria		
Were there Non-approved Closure Methods used on liner bags or inner bags greater than 4 liters?	☐	☑
Are there sealed containers GREATER than 4 liters or heat sealed bags **NOT** defined in the applicable TRUCON Code?	☐	☑
Are there indications of inadequate protection (blocked or braced) for heavy and/or sharp objects?	☐	☑
Is the waste consistent with the TRUCON Code?	☑	☐

Comments:
N/A

Visual Examination Operator 1:
Anthony Harley (Print Name) — Signature — 3-1-16 (Date)

Visual Examination Operator 2:
Gilbert Gutierrez (Print Name) — Signature — 3-1-16 (Date)

Attachment 2 – Visual Examination Independent Technical Reviewer Checklist

Batch Data Report No.: ORNLRHVE16010

1. Were data generation and reduction conducted in a technically correct manner in accordance with the methods (procedure) used?	☐ NO	☑ YES
2. Was the correct revision of the operating procedure used?	☐ NO	☑ YES
3. Has the data been reviewed for errors?	☐ NO	☑ YES
4. Are BDR contents complete and do they match CCP waste VE Batch Data report Table of Contents?	☐ NO	☑ YES
5. Does the testing batch report include VE for up to 20 containers?	☐ NO	☑ YES
6. Is all data signed and dated in reproducible ink by the individual(s) generating it?	☐ NO	☑ YES
7. Is all data recorded clearly, legibly, and accurately?	☐ NO	☑ YES
8. Were changes made to original data? If NO, proceed to question 11.	☑ NO	☐ YES
9. Have all changes made to original data been lined out, initialed and dated by the individual making the changes?	☐ NO	☐ YES
10. Were the data changes made by the individual who originally collected the data or by an equally qualified individual?	☐ NO	☐ YES
11. Is there an adequate written description of the contents of each container?	☐ NO	☑ YES
12. Was VE of each container performed by at least two qualified VEO's or was an Audio/Video recording properly prepared for each container?	☐ NO	☑ YES
13. Has each container in this BDR been evaluated for the presence of prohibited wastes?	☐ NO	☑ YES
14. Did the physical form of the waste match the waste matrix code and waste stream description?	☐ NO	☑ YES
15. Was an NCR required at the data generation level? If NO, proceed to question 17.	☑ NO	☐ YES
16. Is a copy of the NCR included in the BDR?	☐ NO	☐ YES
17. Have the RH Quality Assurance Objectives (QAOs) for VE been met? **Precision** – Precision is maintained by reconciling any discrepancies between two operators (or between the operator and the Independent Technical Reviewer) with regard to the identification of important waste characteristics (i.e., physical form of the waste and absence of prohibited liquids) within a single container. **Accuracy** – Accuracy is maintained by requiring operators to pass a comprehensive examination with a score of 80% and demonstrate satisfactory performance in the presence of the VE expert during their initial qualification and subsequent requalification. **Representativeness** – The contents placed in a container will be described on the data forms.	☐ NO	☑ YES

Attachment 2 – Visual Examination Independent Technical Reviewer Checklist (Continued)

Batch Data Report No.: ORNLRHVE16010

Completeness – The relevant waste information must be collected. This information must be documented on a videotape and/or data form, or other unalterable media. **Comparability** – Comparability is ensured by the characterization program meeting the training requirements and complying with the minimum standards used to implement this characterization process. In some instances, waste will be contained in opaque containers and not all items will be visible to the operator (e.g., sealed paint cans or 5-gallon buckets). If these containers are not opened during VE, source documents must be available in the AK record that allow the operator to identify the contents of the closed containers.		
Comments: N/A		
Independent Technical Reviewer Derek Matheny (Printed Name)	(Signature)	3/2/16 (Date)

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VE2

National TRU Program Certification
Effective Date: 09/23/2013

VE-01, Rev. 5
Page 1 of 6

Visual Examination (VE) Operator/Independent Technical Reviewer (ITR) for Contact-Handled (CH) Waste Qualification Card

Name: Jason Cofer

Education/Experience

Resume documenting education and experience on file with National TRU Program Certification (NTPC) Training.	NTPC Training 04-01-14 Date

Job Specific Training

☑ Initial Qualification ☐ Requalification ☐ Full Requalification

Qualification Limit	**This qualification is valid for two (2) years.** If necessary, additional training may be required by the Site Project Manager (SPM) or the Manager Responsible for Training. Unsatisfactory performance will result in disqualification by the Manager Responsible for Training. The candidate must successfully complete the entire qualification card to reestablish qualification. This qualification card applies to all CH sites except for Idaho National Laboratory (INL) and Los Alamos National Laboratory (LANL) Off Site Source Recovery Program (OSRP). The qualification cards for these sites are VE-PIT-01 and VE-OSRP-01, respectively.
Requalification Requirements	Items required for requalification are identified by text.

Indoctrination

(Required at Initial Qualification and Full Requalification)

Initial/Indoctrination Reading:

1. WP 15-GM1002, *Issues Management Processing of WIPP Forms*
2. CCP-HSP-014, *Health and Safety Program Implementation for CCP*
3. CCP-PO-001, *CCP Transuranic Waste Characterization Quality Assurance Project Plan*
4. CCP-PO-002, *CCP Transuranic Waste Certification Plan*
5. CCP-PO-003, *CCP Transuranic Authorized Methods for Payload Control (CCP CH-TRAMPAC)*
6. CCP-PO-050, *CCP TRUPACT-III TRU Waste Authorized Methods for Payload Control (CCP TRUPACT-III TRAMPAC)*
7. CCP-QP-002, *CCP Training and Qualification Plan*
8. CCP-QP-005, *CCP TRU Nonconforming Item Reporting and Control*
9. CCP-QP-008, *CCP Records Management*
10. CCP-QP-010, *CCP Document Preparation, Approval, and Control*
11. CCP-QP-016, *CCP Control of Measuring and Testing Equipment*
12. CCP-QP-023, *CCP Handling, Storage, and Shipping*
13. CCP-TP-113, *CCP Standard Contact-Handled Waste Visual Examination*

I have read the listed Initial/Indoctrination Reading and understand my responsibilities as applicable to the procedures above.	Trainee 3-25-14 Date

Visual Examination (VE) Operator/Independent Technical Reviewer (ITR) for Contact-Handled (CH) Waste Qualification Card

Name: Jason Cofer

Additional Training Requirements		
1. WAP/QAPjP Briefing and Test *(One-time Requirement)*	Cheryl Arrigo NTPC Training	04-01-14 Date
2. CCP-VE-101, *Visual Examination (VE) TRU Waste Characterization Briefing* *(Always Required)*	Cheryl Arrigo NTPC Training	04-01-14 Date
3. VE-TEST-01, *Visual Examination (VE) Operator/ITR Comprehensive Examination* *(Always Required)*	Cheryl Arrigo NTPC Training	04-01-14 Date

Formal Training	On-the-Job Training (OJT) Knowledge Requirements *(Required at Initial Qualification and Full Requalification)*		Visual Examination Expert (VEE) Subject Matter Expert (SME)/OJT Signature/Date
CCP-PO-001	1.	List the Quality Assurance objectives validated by VE.	3-25-14
CCP-QP-002	2.	State the purpose of the List of Qualified Individuals (LOQI).	3-25-14
CCP-QP-005	3.	State when a nonconformance report (NCR) should be prepared and who is responsible to initiate it.	3-25-14
	4.	Describe how nonconforming items are documented.	3-25-14
	5.	Describe how nonconforming items are controlled to prevent their use.	3-25-14
	6.	State who has the responsibility to validate the NCR once initiated.	3-25-14
	7.	Describe how to revise an NCR.	3-25-14
	8.	Describe how to void an NCR.	3-25-14
WP 15-GM1002	9.	Describe the purpose of the WIPP Form process.	3-25-14
	10.	State the person responsible for originating a WIPP Form.	3-25-14
	11.	Describe how WIPP Forms are documented.	3-25-14

Visual Examination (VE) Operator/Independent Technical Reviewer (ITR) for Contact-Handled (CH) Waste Qualification Card

Name: Jason Cofer

CCP-QP-008	12.	Describe who has responsibility for processing WIPP Forms, approving Corrective Action Plans, and approving closure of WIPP Forms.	3-25-14
	13.	Describe actions personnel may take when conditions adverse to quality are discovered.	3-25-14
	14.	List the responsibilities of record generators.	3-25-14
	15.	State the storage and control requirements for records.	3-25-14
	16.	Explain the process and proper method to make corrections or revisions to records.	3-25-14
CCP-QP-010	17.	State the importance of using approved documents.	3-25-14
	18.	State when to verify a document revision.	3-25-14
CCP-QP-016	19.	List the Measuring & Testing Equipment (M&TE) items used during VE.	3-25-14
CCP-TP-113/ CCP-VE-101 Briefing	20.	Explain the purpose of VE.	3-25-14
	21.	What are the 2 methods used in the VE process?	3-25-14
	22.	Who makes the determination of the method used?	3-25-14
	23.	Describe the unit of measurement for weights to be recorded for VE.	3-25-14
	24.	Describe where to obtain the tare weight of a waste container.	3-25-14
	25.	Describe where to obtain the gross weight of a waste container.	3-25-14
	26.	State the number of waste containers allowed per Batch Data Report (BDR).	3-25-14
	27.	State how often a camera check is performed when using Method #1.	3-25-14
	28.	Define "layers of confinement."	3-25-14
	29.	Describe how to determine "maximum" layers of confinement.	3-25-14

Visual Examination (VE) Operator/Independent Technical Reviewer (ITR) for Contact-Handled (CH) Waste Qualification Card

Name: Jason Cofer

30.	Describe authorized methods of closure of a liner bag.	3-25-14
31.	Describe how to determine Volume Utilization Percentage (VUP).	3-25-14
32.	Describe the actions taken if prohibited items are found.	3-25-14
33.	Discuss the requirements for packaging of sharp or heavy objects.	3-25-14
34.	State the waste material parameters (WMP).	3-25-14
35.	State how often a scale operational check is performed.	3-25-14
36.	Describe the information that should be recorded when describing waste items.	3-25-14
37.	State the criteria for a rigid liner to be considered vented.	3-25-14
38.	State three examples of potentially "unsafe" packages/items that may be found within a waste container.	3-25-14
39.	State five examples of prohibited items.	3-25-14
40.	Describe how a non-transparent container is handled when liquid is suspected.	3-25-14
41.	State the acceptable liquid limits in a characterized container.	3-25-14
42.	Explain the responsibilities and functions of the Independent Technical Reviewer (ITR).	3-25-14
43.	Describe the conditions that would generate an NCR during the VE process.	3-25-14
44.	Define how often calibration due dates should be checked on certified equipment.	3-25-14
45.	Define the increments in which the fill percent are recorded.	3-25-14
46.	Explain who is allowed to make data changes on data sheets.	3-25-14

Visual Examination (VE) Operator/Independent Technical Reviewer (ITR) for Contact-Handled (CH) Waste Qualification Card

Name: Jason Cofer

Formal Training	OJT Practical Requirements[1] (This section must be performed in the presence of a VEE) (Always Required)			VEE SME/OJT Signature/Date
CCP-TP-113	1. Perform audio/video equipment operational checks.	P	(S)	3-25-14
	2. Perform pre-use scale calibration verification.	P	(S)	3-25-14
	3. Determine layers of confinement.	(P)	S	3-25-14
	4. Verify the physical form of the waste matches the waste description.	(P)	S	3-25-14
	5. Determine the WMP(s).	(P)	S	3-25-14
	6. Estimate the weight of each WMP.	(P)	S	3-25-14
	7. Obtain weight of each WMP.	(P)	S	3-25-14
	8. Determine the VUP.	(P)	S	3-25-14
	9. Obtain the output weight for the waste container.	(P)	S	3-25-14
	10. Prepare a BDR.	(P)	S	3-25-14
	11. Demonstrate how to make changes/corrections to a BDR.	(P)	S	3-25-14
	12. Complete an ITR.	(P)	S	3-25-14

[1] For simulated steps that involve the recording of information, the steps can be satisfied by the trainee's ability to identify the specific location in the correct record form where actual data would be entered; and explain where the information would be obtained. All required calculations will actually be performed for simulations, representative data will be used in lieu of actual data. Circle "P" if actually performed or "S" if requirement was simulated.

Visual Examination (VE) Operator/Independent Technical Reviewer (ITR) for Contact-Handled (CH) Waste Qualification Card

Name: Jason Cofer

Approvals	
I have completed formal training and received OJT for this position. I fully understand my responsibilities as a CH VE Operator/ITR.	Jason Cofer 04-01-14 Trainee *(printed name and signature)* — Date: 3-25-14
I have monitored the training of this individual and believe they are ready to perform the duties of a CH VE Operator/ITR. *(Validation by the VEE SME/OJT instructor(s) involved in the training of this individual)*	Anthony Hurley — VEE SME/OJT Instructor *(printed name and signature)* — Date: 3-25-14 NA VEE SME/OJT Instructor *(printed name and signature)* — Date
I approve this employee to perform the duties of a CH VE Operator/ITR.	Beverly S. Schrock BSSchrock — SPM *(printed name and signature)* — Date: 4/1/14

Approved for Content & Format:	**Tommy Mojica** *(Approval on File)* SME/OJT	**09/23/2013** Date
Approved for Applicability, Content & Format:	**Andrew Stallings** *(Approval on File)* Cognizant Engineer	**09/23/2013** Date
Approved for Content:	**Richard Kantrowitz** *(Approval on File)* SPM	**09/23/2013** Date
Approved for Applicability, Content, Format, & Use:	**A.J. Fisher** *(Approval on File)* Manager Responsible for Training	**09/23/2013** Date

DIVIDER

PAGE

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Visual Examination (VE) Operator/Independent Technical Reviewer (ITR) for Remote-Handled (RH) Waste Qualification Card

Name: Jason Cofer

Education/Experience

Resume documenting education and experience on file with National TRU Program Certification (NTPC) Training.	Cheryl Amis 11-14-13 NTPC Training Date

Job Specific Training

☑ Initial Qualification ☐ Requalification ☐ Full Requalification

Qualification Limit	**This qualification is valid for two (2) years.** If necessary, additional training may be required by the Site Project Manager (SPM) or the Manager Responsible for Training. Unsatisfactory performance will result in disqualification by the Manager Responsible for Training. The candidate must successfully complete the entire qualification card to reestablish qualification.
Requalification Requirements	Items required for requalification are identified by text.

Indoctrination
(Required at Initial Qualification and Full Requalification)

Initial/Indoctrination Reading:

1. DOE/WIPP 02-3214, *Remote-Handled TRU Waste Characterization Program Implementation Plan*
2. WP 15-GM1002, *Issues Management Processing of WIPP Forms*
3. CCP-HSP-014, *Health and Safety Program Implementation for CCP*
4. CCP-PO-001, *CCP Transuranic Waste Characterization Quality Assurance Project Plan*
5. CCP-PO-002, *CCP Transuranic Waste Certification Plan*
6. CCP-PO-005, *CCP Conduct of Operations*
7. CCP-PO-505, *CCP Remote-Handled Transuranic Waste Authorized Methods for Payload Control (CCP RH-TRAMPAC)*
8. CCP-QP-002, *CCP Training and Qualification Plan*
9. CCP-QP-005, *CCP TRU Nonconforming Item Reporting and Control*
10. CCP-QP-008, *CCP Records Management*
11. CCP-QP-010, *CCP Document Preparation, Approval, and Control*
12. CCP-QP-016, *CCP Control of Measuring and Testing Equipment*
13. CCP-QP-023, *CCP Handling, Storage, and Shipping*
14. CCP-TP-163, *CCP Evaluation of Waste Packaging Records for Visual Examination of Records*
15. CCP-TP-500, *CCP Remote-Handled Waste Visual Examination*
16. CCP-TP-513, *CCP Procedure for Dimensional or Gravimetric Measurements for Radiological Characterization of Remote-Handled Transuranic Waste*

I have read the listed Initial/Indoctrination Reading and understand my responsibilities as applicable to the procedures above.	Trainee 10-28-13 Date

Visual Examination (VE) Operator/Independent Technical Reviewer (ITR) for Remote-Handled (RH) Waste Qualification Card

Name: Jason Cofer

Additional Training Requirements		
1. WAP/QAPjP Briefing & Exam *(One-time Requirement)*	Cheryl Arrujo NTPC Training	11-14-13 Date
2. CCP-VE-101, *Visual Examination (VE) TRU Waste Characterization Briefing (Always Required)*	Cheryl Arrujo NTPC Training	11-18-13 Date
3. VE Comprehensive Exam *(Always Required)*	Cheryl Arrujo NTPC Training	11-14-13 Date

Formal Training	On-the-Job Training (OJT) Knowledge Requirements *(Required at Initial Qualification and Full Requalification)*	Visual Examination Expert (VEE) Subject Matter Expert (SME)/OJT Signature/Date
CCP-PO-001	1. List the VE Quality Assurance Objectives (QAOs) per the WAP.	Curtis Hart 10-23-13
	2. List the VE Data Quality Objectives (DQOs) per the WAP.	Curtis Hart 10-23-13
DOE/WIPP 02-3214	3. List the VE QAOs per the PIP.	Curtis Hart 10-23-13
	4. List the VE DQOs per the PIP.	Curtis Hart 10-23-13
CCP-QP-002	5. State the purpose of the List of Qualified Individuals (LOQI).	Curtis Hart 10-23-13
CCP-QP-005	6. State when a nonconformance report (NCR) should be prepared and who is responsible to initiate it.	Curtis Hart 10-23-13
	7. Describe how nonconforming items are documented.	Curtis Hart 10-23-13
	8. Describe how nonconforming items are controlled to prevent their use.	Curtis Hart 10-23-13
	9. State who has the responsibility to validate the NCR once initiated.	Curtis Hart 10-23-13
	10. Describe how to revise a NCR.	Curtis Hart 10-23-13
	11. Describe how to void a NCR.	Curtis Hart 10-23-13
WP 15-GM1002	12. Describe the purpose of the WIPP Form process.	Curtis Hart 10-23-13

Visual Examination (VE) Operator/Independent Technical Reviewer (ITR) for Remote-Handled (RH) Waste Qualification Card

Name: Jason Cofer

	13. State the person responsible for originating a WIPP Form.	10-23-13
	14. Describe how WIPP Forms are documented.	10-23-13
	15. Describe who has responsibility for processing WIPP Forms, approving Corrective Action Plans, and approving closure of WIPP Forms.	10-23-13
	16. Describe actions personnel may take when conditions adverse to quality are discovered.	10-23-13
CCP-QP-008	17. List the responsibilities of record generators.	10-23-13
	18. State the storage and control requirements for records.	10-23-13
	19. Explain the process and proper method to make corrections or revisions to records.	10-23-13
CCP-QP-010	20. State the importance of using approved documents.	10-23-13
	21. State when to verify a document revision.	10-23-13
CCP-QP-016	22. List the Measuring & Testing Equipment (M&TE) items used during VE.	10-23-13
CCP-TP-500/ CCP-VE-101 Briefing	23. Explain the purpose of VE and the roles and responsibilities of the VE Operator.	10-23-13
	24. Identify who is responsible for overall direction and implementation of the VE of that facility.	10-23-13
	25. Define the two phases of VE technique for remote-handled waste.	10-23-13
	26. State the number of waste containers allowed per Batch Data Report (BDR).	10-23-13
	27. Define "layers of confinement."	10-23-13
	28. State the authorized methods to close a liner bag.	10-23-13
	29. State the action to be taken if a condition adverse to quality arises.	10-23-13
	30. State the waste material parameters (WMP).	10-23-13
	31. Describe the information that should be recorded when describing waste items.	10-23-13
	32. State five (5) examples of prohibited items.	10-23-13

Visual Examination (VE) Operator/Independent Technical Reviewer (ITR) for Remote-Handled (RH) Waste Qualification Card

Name: Jason Cofer

	33. Describe how a non-transparent container is handled when liquid is suspected.			10-23-13
	34. State the acceptable liquid limits in a characterized container.			10-23-13
	35. Explain the responsibilities and functions of the Independent Technical Review (ITR).			10-23-13
	36. Define layers of confinement.			10-23-13
	37. Describe how to determine Volume Utilization Percentage (VUP).			10-23-13
	38. State the allowable fill percent increments.			10-23-13
Formal Training	**OJT Practical Requirements[1]** *(This section must be performed in the presence of a VEE) (Always Required)*			**VEE SME/OJT Signature/Date**
CCP-TP-500	1. Prepare the recording equipment. *(This activity is at the discretion of the SME instructor)*	P	S	N/A 11-14-13
	2. Complete CCP-TP-500 Attachment 1.	(P)	S	11-14-13
	3. Prepare a BDR.	(P)	S	11-14-13
	4. Determine the VUP.	(P)	S	11-14-13
	5. Complete an ITR.	(P)	S	11-14-13
	6. Determine Waste Material Parameter (WMP).	(P)	S	11-14-13
	7. Verify the physical form of the waste matches the waste stream ID.	(P)	S	11-14-13
CCP-TP-513	8. Perform a dimensional or gravimetric measurement and determine the measurement acceptability[2].	P	S	N/A 11-14-13

[1] For simulated steps that involve the recording of information, the steps can be satisfied by the trainee's ability to identify the specific location in the correct record form where actual data would be entered, and explain where the information would be obtained. All required calculations will actually be performed: for simulations, representative data will be used in lieu of actual data. Circle "P" if actually performed or "S" if requirement was simulated.

[2] Procedure CCP-TP-513 is not applicable at all sites. The OJT Practical Requirement for this procedure is only required if the procedure is invoked.

Visual Examination (VE) Operator/Independent Technical Reviewer (ITR) for Remote-Handled (RH) Waste Qualification Card

Name: Jason Cofer

Approvals	
I have completed formal training and received OJT for this position. I fully understand my responsibilities as a RH VE Operator/ITR.	Jason Cofer Jason E Cofer 11-14-13 Trainee *(printed name and signature)* Date
I have monitored the training of this individual and believe they are ready to perform the duties of a RH VE Operator/ITR. *(Validation by the RH VEE SME/OJT instructor(s) involved in the training of this individual).*	Anthony Harley 11-14-13 RH VEE SME/OJT Instructor *(printed name and signature)* Date NA RH VEE SME/OJT Instructor *(printed name and signature)* Date
I approve this employee to perform the duties of a RH VE Operator/ITR.	Richard Kantrowitz 11/18/13 SPM *(printed name and signature)* Date

Approved for Content & Format:	**Wes Root *(Approval on File)***	**10/07/2013**
	SME/OJT	Date
Approved for Applicability, Content & Format:	**Andrew Stallings *(Approval on File)***	**10/07/2013**
	Cognizant Engineer	Date
Approved for Content:	**Irene Joo *(Approval on File)***	**10/07/2013**
	SPM	Date
Approved for Applicability, Content, Format, & Use:	**A.J. Fisher *(Approval on File)***	**10/07/2013**
	Manager Responsible for Training	Date

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Central Characterization Program — RH-VE-01 Rev 11
Effective Date: 09/02/2014 — Page 1 of 5

Visual Examination (VE) Operator/Independent Technical Reviewer (ITR) for Remote-Handled (RH) Waste Qualification Card

Name: Gilbert Gutierrez

Education/Experience

Resume documenting education and experience on file with Central Characterization (CCP) Training.	Cheryl Almager 11-09-15 CCP Training — Date

Job Specific Training

☑ Initial Qualification ☐ Requalification ☐ Full Requalification

Qualification Limit	**This qualification is valid for two (2) years.** If necessary, additional training may be required by the Site Project Manager (SPM) or the Manager Responsible for Training. Unsatisfactory performance will result in disqualification by the Manager Responsible for Training. The candidate must successfully complete the entire qualification card to reestablish qualification.
Requalification Requirements	Items required for requalification are identified by text.

Indoctrination

(Required at Initial Qualification and Full Requalification)

Initial/Indoctrination Reading:

1. DOE/WIPP 02-3214, *Remote-Handled TRU Waste Characterization Program Implementation Plan*
2. WP 15-GM1002, *Issues Management Processing of WIPP Forms*
3. CCP-HSP-014, *Health and Safety Program Implementation for CCP*
4. CCP-PO-001, *CCP Transuranic Waste Characterization Quality Assurance Project Plan*
5. CCP-PO-002, *CCP Transuranic Waste Certification Plan*
6. CCP-PO-005, *CCP Conduct of Operations*
7. CCP-PO-505, *CCP Remote-Handled Transuranic Waste Authorized Methods for Payload Control (CCP RH-TRAMPAC)*
8. CCP-QP-002, *CCP Training and Qualification Plan*
9. CCP-QP-005, *CCP TRU Nonconforming Item Reporting and Control*
10. CCP-QP-008, *CCP Records Management*
11. CCP-QP-010, *CCP Document Preparation, Approval, and Control*
12. CCP-QP-016, *CCP Control of Measuring and Testing Equipment*
13. CCP-QP-023, *CCP Handling, Storage, and Shipping*
14. CCP-TP-163, *CCP Evaluation of Waste Packaging Records for Visual Examination of Records*
15. CCP-TP-500, *CCP Remote-Handled Waste Visual Examination*
16. CCP-TP-509, *CCP Remote-Handled Transuranic Container Tracking*
17. CCP-TP-513, *CCP Procedure for Dimensional or Gravimetric Measurements for Radiological Characterization of Remote-Handled Transuranic Waste*

I have read the listed Initial/Indoctrination Reading and understand my responsibilities as applicable to the procedures above.	Gilbert Gutierrez Trainee — 11-4-15 Date

Visual Examination (VE) Operator/Independent Technical Reviewer (ITR) for Remote-Handled (RH) Waste Qualification Card

Name: Gilbert Gutierrez

Additional Training Requirements		
1. WAP/QAPjP Briefing & Exam *(One-time Requirement)*	CCP Training	11-09-15 Date
2. CCP-VE-101, *Visual Examination (VE) TRU Waste Characterization Briefing (Always Required)*	CCP Training	11-09-15 Date
3. VE Comprehensive Exam *(Always Required)*	CCP Training	11-09-15 Date

Formal Training	On-the-Job Training (OJT) Knowledge Requirements *(Required at Initial Qualification and Full Requalification)*	Visual Examination Expert (VEE) Subject Matter Expert (SME)/OJT Signature/Date
CCP-PO-001	1. List the VE Quality Assurance Objectives (QAOs) per the WAP.	11-4-15
	2. List the VE Data Quality Objectives (DQOs) per the WAP.	11-4-15
DOE/WIPP 02-3214	3. List the VE QAOs per the PIP.	11-4-15
	4. List the VE DQOs per the PIP.	11-4-15
CCP-QP-002	5. State the purpose of the List of Qualified Individuals (LOQI).	11-4-15
CCP-QP-005	6. State when a nonconformance report (NCR) should be prepared and who is responsible to initiate it.	11-4-15
	7. Describe how nonconforming items are documented.	11-4-15
	8. Describe how nonconforming items are controlled to prevent their use.	11-4-15
	9. State who has the responsibility to validate the NCR once initiated.	11-4-15
	10. Describe how to revise a NCR.	11-4-15
	11. Describe how to void a NCR.	11-4-15
WP 15-GM1002	12. Describe the purpose of the WIPP Form process.	11-4-15
	13. State the person responsible for originating a WIPP Form.	11-4-15

Visual Examination (VE) Operator/Independent Technical Reviewer (ITR) for Remote-Handled (RH) Waste Qualification Card

Name: Gilbert Gutierrez

CCP-QP-008	14. Describe how WIPP Forms are documented.	[signature] 11-4-15
	15. Describe who has responsibility for processing WIPP Forms, approving Corrective Action Plans, and approving closure of WIPP Forms.	[signature] 11-4-15
	16. Describe actions personnel may take when conditions adverse to quality are discovered.	[signature] 11-4-15
	17. List the responsibilities of record generators.	[signature] 11-4-15
	18. State the storage and control requirements for records.	[signature] 11-4-15
	19. Explain the process and proper method to make corrections or revisions to records.	[signature] 11-4-15
CCP-QP-010	20. State the importance of using approved documents.	[signature] 11-4-15
	21. State when to verify a document revision.	[signature] 11-9-15
CCP-TP-500/ CCP-VE-101 Briefing	22. List the Measuring & Testing Equipment (M&TE) items used during VE.	[signature] 11-9-15
	23. Explain the purpose of VE and the roles and responsibilities of the VE Operator.	[signature] 11-9-15
	24. Identify who is responsible for overall direction and implementation of the VE of that facility.	[signature] 11-9-15
	25. Define the two phases of VE technique for remote-handled waste.	[signature] 11-9-15
	26. State the number of waste containers allowed per Batch Data Report (BDR).	[signature] 11-9-15
	27. Define "layers of confinement."	[signature] 11-9-15
	28. State the authorized methods to close a liner bag.	[signature] 11-9-15
	29. State the action to be taken if a condition adverse to quality arises.	[signature] 11-9-15
	30. State the waste material parameters (WMP).	[signature] 11-9-15
	31. Describe the information that should be recorded when describing waste items.	[signature] 11-9-15
	32. State five (5) examples of prohibited items.	[signature] 11-9-15
	33. Describe how a non-transparent container is handled when liquid is suspected.	[signature] 11-9-15

Visual Examination (VE) Operator/Independent Technical Reviewer (ITR) for Remote-Handled (RH) Waste Qualification Card

Name: Gilbert Gutierrez

	34. State the acceptable liquid limits in a characterized container.			[signature] 11-9-15
	35. Explain the responsibilities and functions of the Independent Technical Review (ITR).			[signature] 11-9-15
	36. Describe how to determine Volume Utilization Percentage (VUP).			[signature] 11-9-15
	37. State the allowable fill percent increments.			[signature] 11-9-15
Formal Training	**OJT Practical Requirements[1]** *(This section must be performed in the presence of a VEE)* *(Always Required)*			**VEE SME/OJE Signature/Date**
CCP-TP-500	1. Prepare the recording equipment. *(This activity is at the discretion of the SME instructor)*	P	(S)	[signature] 11-9-15
	2. Complete CCP-TP-500 Attachment 1.	P	(S)	[signature] 11-9-15
	3. Prepare a BDR.	P	(S)	[signature] 11-9-15
	4. Determine the VUP.	P	(S)	[signature] 11-9-15
	5. Complete an ITR.	P	(S)	[signature] 11-9-15
	6. Determine Waste Material Parameter (WMP).	P	(S)	[signature] 11-9-15
	7. Verify the physical form of the waste matches the waste stream ID.	P	(S)	[signature] 11-9-15
CCP-TP-513	8. Perform a dimensional or gravimetric measurement and determine the measurement acceptability[2].	P	S	N/A

[1] For simulated steps that involve the recording of information, the steps can be satisfied by the trainee's ability to identify the specific location in the correct record form where actual data would be entered, and explain where the information would be obtained. All required calculations will actually be performed: for simulations, representative data will be used in lieu of actual data. Circle "P" if actually performed or "S" if requirement was simulated.

[2] Procedure CCP-TP-513 is not applicable at all sites. The OJT Practical Requirement for this procedure is only required if the procedure is invoked.

Visual Examination (VE) Operator/Independent Technical Reviewer (ITR) for Remote-Handled (RH) Waste Qualification Card

Name: Gilbert Gutierrez

	Approvals
I have completed formal training and received OJT for this position. I fully understand my responsibilities as a RH VE Operator/ITR.	Gilbert Gutierrez 11-9-15 Trainee *(printed name and signature)* Date
I have monitored the training of this individual and believe they are ready to perform the duties of a RH VE Operator/ITR. *(Validation by the RH VEE SME/OJT instructor(s) involved in the training of this individual).*	Pat Tilman 11-9-15 RH VEE SME/OJT Instructor *(printed name and signature)* Date N/A RH VEE SME/OJT Instructor *(printed name and signature)* Date
I approve this employee to perform the duties of a RH VE Operator/ITR.	Richard Kantrowitz 11/9/15 SPM *(printed name and signature)* Date

Approved for Content & Format:	**Wes Root *(Approval on File)***	**09/02/2014**
	SME/OJT	Date
Approved for Applicability, Content & Format:	**Andrew Stallings *(Approval on File)***	**09/02/2014**
	Cognizant Engineer	Date
Approved for Content:	**Charlie Turner *(Approval on File)***	**09/02/2014**
	SPM	Date
Approved for Applicability, Content, Format, & Use:	**A.J. Fisher *(Approval on File)***	**09/02/2014**
	Manager Responsible for Training	Date

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Visual Examination (VE) Operator/Independent Technical Reviewer (ITR) for Contact-Handled (CH) Waste Qualification Card

Name: Gilbert Gutierrez

Education/Experience	
Resume documenting education and experience on file with Central Characterization Program (CCP) Training.	Cheryl Alonzo 07-09-15 CCP Training Date

Job Specific Training

☐ **Initial Qualification** ☐ **Requalification** ☑ **Full Requalification**

Qualification Limit	**This qualification is valid for two (2) years.** If necessary, additional training may be required by the Site Project Manager (SPM) or the Manager Responsible for Training. Unsatisfactory performance will result in disqualification by the Manager Responsible for Training. The candidate must successfully complete the entire qualification card to reestablish qualification. This qualification card applies to all CH sites except for Idaho National Laboratory (INL) and Los Alamos National Laboratory (LANL) Off Site Source Recovery Program (OSRP). The qualification cards for these sites are VE-PIT-01 and VE-OSRP-01, respectively.
Requalification Requirements	Items required for requalification are identified by text.

Indoctrination
(Required at Initial Qualification and Full Requalification)

Initial/Indoctrination Reading:

1. WP 15-GM1002, *Issues Management Processing of WIPP Forms*
2. CCP-HSP-014, *Health and Safety Program Implementation for CCP*
3. CCP-PO-001, *CCP Transuranic Waste Characterization Quality Assurance Project Plan*
4. CCP-PO-002, *CCP Transuranic Waste Certification Plan*
5. CCP-PO-003, *CCP Transuranic Authorized Methods for Payload Control (CCP CH-TRAMPAC)*
6. CCP-PO-005, *CCP Conduct of Operations*
7. CCP-PO-050, *CCP TRUPACT-III TRU Waste Authorized Methods for Payload Control (CCP TRUPACT-III TRAMPAC)*
8. CCP-QP-002, *CCP Training and Qualification Plan*
9. CCP-QP-005, *CCP TRU Nonconforming Item Reporting and Control*
10. CCP-QP-008, *CCP Records Management*
11. CCP-QP-010, *CCP Document Preparation, Approval, and Control*
12. CCP-QP-016, *CCP Control of Measuring and Testing Equipment*
13. CCP-QP-023, *CCP Handling, Storage, and Shipping*
14. CCP-TP-113 , *CCP Standard Contact-Handled Waste Visual Examination*

I have read the listed Initial/Indoctrination Reading and understand my responsibilities as applicable to the procedures above.	Trainee 6-4-15 Date

Visual Examination (VE) Operator/Independent Technical Reviewer (ITR) for Contact-Handled (CH) Waste Qualification Card

Name: Gilbert Gutierrez

Additional Training Requirements		
1. WAP/QAPjP Briefing and Test *(One-time Requirement)*	Cheryl Almijo CCP Training	07-09-15 Date
2. CCP-VE-101, *Visual Examination (VE) TRU Waste Characterization Briefing (Always Required)*	Cheryl Almijo CCP Training	07-09-15 Date
3. VE-TEST-01, *Visual Examination (VE) Operator/ITR Comprehensive Examination (Always Required)*	Cheryl Almijo CCP Training	07-09-15 Date

Formal Training	On-the-Job Training (OJT) Knowledge Requirements *(Required at Initial Qualification and Full Requalification)*	Visual Examination Expert (VEE) Subject Matter Expert (SME)/OJT Signature/Date
CCP-PO-001	1. List the Quality Assurance objectives validated by VE.	Peggy Quintana 7-9-15
	2. List the VE DQO's	Peggy Quintana 7-9-15
CCP-QP-002	3. State the purpose of the List of Qualified Individuals (LOQI).	Peggy Quintana 7-9-15
CCP-QP-005	4. State when a nonconformance report (NCR) should be prepared and who is responsible to initiate it.	Peggy Quintana 7-9-15
	5. Describe how nonconforming items are documented.	Peggy Quintana 7-9-15
	6. Describe how nonconforming items are controlled to prevent their use.	Peggy Quintana 7-9-15
	7. State who has the responsibility to validate the NCR once initiated.	Peggy Quintana 7-9-15
	8. Describe how to revise an NCR.	Peggy Quintana 7-9-15
	9. Describe how to void an NCR.	Peggy Quintana 7-9-15
WP 15-GM1002	10. Describe the purpose of the WIPP Form process.	Peggy Quintana 7-9-15
	11. State the person responsible for originating a WIPP Form.	Peggy Quintana 7-9-15

Visual Examination (VE) Operator/Independent Technical Reviewer (ITR) for Contact-Handled (CH) Waste Qualification Card

Name: Gilbert Gutierrez

	12. Describe how WIPP Forms are documented.	PA 7-9-15 Peggy Quomes 8a-7-9-15
	13. Describe who has responsibility for processing WIPP Forms, approving Corrective Action Plans, and approving closure of WIPP Forms.	Peggy Quomes 7-9-15
	14. Describe actions personnel may take when conditions adverse to quality are discovered.	Peggy Quomes 7-9-15
CCP-QP-008	15. List the responsibilities of record generators.	Peggy Quomes 7-9-15
	16. State the storage and control requirements for records.	Peggy Quomes 7-9-15
	17. Explain the process and proper method to make corrections or revisions to records.	Peggy Quomes 7-9-15
CCP-QP-010	18. State the importance of using approved documents.	Peggy Quomes 7-9-15
	19. State when to verify a document revision.	Peggy Quomes 7-9-15
CCP-QP-016	20. List the Measuring & Testing Equipment (M&TE) items used during VE.	Peggy Quomes 7-9-15
CCP-TP-113/ CCP-VE-101 Briefing	21. Explain the purpose of VE.	Peggy Quomes 6-11-15
	22. What are the 2 methods used in the VE process?	Peggy Quomes 6-11-15
	23. Who makes the determination of the method used?	Peggy Quomes 6-11-15
	24. Describe the unit of measurement for weights to be recorded for VE.	Peggy Quomes 6-11-15
	25. Describe where to obtain the tare weight of a waste container.	Peggy Quomes 6-11-15
	26. Describe where to obtain the gross weight of a waste container.	Peggy Quomes 6-11-15
	27. State the number of waste containers allowed per Batch Data Report (BDR).	Peggy Quomes 6-11-15
	28. State how often a camera check is performed when using Method #1.	Peggy Quomes 6-11-15
	29. Define "layers of confinement."	~~Peggy Quomes~~ PA 6-11-15 Peggy Quomes 7-9-15

Visual Examination (VE) Operator/Independent Technical Reviewer (ITR) for Contact-Handled (CH) Waste Qualification Card

Name: Gilbert Gutierrez

	30. Describe how to determine "maximum" layers of confinement.	Peggy Chavez 6-11-15
	31. Describe authorized methods of closure of a liner bag.	Peggy Chavez 6-11-15
	32. Describe how to determine Volume Utilization Percentage (VUP).	Peggy Chavez 6-11-15
	33. Describe the actions taken if prohibited items are found.	Peggy Chavez 6-11-15
	34. Discuss the requirements for packaging of sharp or heavy objects.	6-4-15
	35. State the waste material parameters (WMP).	6-4-15
	36. State how often a scale operational check is performed.	6-4-15
	37. Describe the information that should be recorded when describing waste items.	6-4-15
	38. State the criteria for a rigid liner to be considered vented.	6-4-15
	39. State three examples of potentially "unsafe" packages/items that may be found within a waste container.	6-4-15
	40. State five examples of prohibited items.	6-4-15
	41. Describe how a non-transparent container is handled when liquid is suspected.	6-4-15
	42. State the acceptable liquid limits in a characterized container.	6-4-15
	43. Explain the responsibilities and functions of the Independent Technical Reviewer (ITR).	6-4-15
	44. Describe the conditions that would generate an NCR during the VE process.	6-4-15
	45. Define how often calibration due dates should be checked on certified equipment.	6-4-15
	46. Define the increments in which the fill percent are recorded.	6-4-15
	47. Explain who is allowed to make data changes on data sheets.	6-4-15

Visual Examination (VE)
Operator/Independent Technical Reviewer (ITR) for
Contact-Handled (CH) Waste
Qualification Card

Name: Gilbert Gutierrez

Formal Training	OJT Practical Requirements[1] *(This section must be performed in the presence of a VEE) (Always Required)*			VEE SME/OJT Signature/Date
CCP-TP-113	1. Perform audio/video equipment operational checks.	P	(S)	Peggy Quomus 7-9-15
	2. Perform pre-use scale calibration verification.	P	(S)	Peggy Quomus 7-9-15
	3. Determine layers of confinement.	P	(S)	Peggy Quomus 7-9-15
	4. Verify the physical form of the waste matches the waste description.	P	(S)	Peggy Quomus 7-9-15
	5. Determine the Packaging Configuration	P	(S)	Peggy Quomus 7-9-15
	6. Determine the WMP(s).	P	(S)	Peggy Quomus 7-9-15
	7. Estimate the weight of each WMP.	P	(S)	Peggy Quomus 7-9-15
	8. Obtain weight of each WMP.	P	(S)	Peggy Quomus 7-9-15
	9. Determine the VUP.	P	(S)	Peggy Quomus 7-9-15
	10. Obtain the output weight for the waste container.	P	(S)	Peggy Quomus 7-9-15
	11. Prepare a BDR.	P	(S)	Peggy Quomus 7-9-15
	12. Demonstrate how to make changes/corrections to a BDR.	P	(S)	Peggy Quomus 7-9-15
	13. Complete an ITR.	P	(S)	Peggy Quomus 7-9-15

[1] For simulated steps that involve the recording of information, the steps can be satisfied by the trainee's ability to identify the specific location in the correct record form where actual data would be entered, and explain where the information would be obtained. All required calculations will actually be performed: for simulations, representative data will be used in lieu of actual data. Circle "P" if actually performed or "S" if requirement was simulated.

Visual Examination (VE) Operator/Independent Technical Reviewer (ITR) for Contact-Handled (CH) Waste Qualification Card

Name: Gilbert Gutierrez

Approvals		
I have completed formal training and received OJT for this position. I fully understand my responsibilities as a CH VE Operator/ITR.	Gilbert Gutierrez Trainee *(printed name and signature)*	7-9-15 Date
I have monitored the training of this individual and believe they are ready to perform the duties of a CH VE Operator/ITR. *(Validation by the VEE SME/OJT instructor(s) involved in the training of this individual).*	Peggy Ausmus VEE SME/OJT Instructor *(printed name and signature)*	7-9-15 Date
	7-9-15 N/A James E. Thompson VEE SME/OJT Instructor *(printed name and signature)*	7-9-15 Date
I approve this employee to perform the duties of a CH VE Operator/ITR.	Barbara Broomfield SPM *(printed name and signature)*	7/09/15 Date

Approved for Content & Format:	**Tommy Mojica** ***(Approval on File)*** SME/OJT	**07/15/2014** Date
Approved for Applicability, Content & Format:	**Andrew Stallings** ***(Approval on File)*** Cognizant Engineer	**07/15/2014** Date
Approved for Content:	**Mike Ramirez** ***(Approval on File)*** SPM	**07/15/2014** Date
Approved for Applicability, Content, Format, & Use:	**A.J. Fisher** ***(Approval on File)*** Manager Responsible for Training	**07/15/2014** Date

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Visual Examination (VE) Operator/Independent Technical Reviewer (ITR) for Contact-Handled (CH) Waste Qualification Card

Name: Anthony Harley

Education/Experience

Resume documenting education and experience on file with Central Characterization Program (CCP) Training.	Michele Billett 9/25/15 CCP Training Date

Job Specific Training

☐ Initial Qualification ☑ Requalification ☐ Full Requalification

Qualification Limit	**This qualification is valid for two (2) years.** If necessary, additional training may be required by the Site Project Manager (SPM) or the Manager Responsible for Training. Unsatisfactory performance will result in disqualification by the Manager Responsible for Training. The candidate must successfully complete the entire qualification card to reestablish qualification. This qualification card applies to all CH sites except for Idaho National Laboratory (INL) and Los Alamos National Laboratory (LANL) Off Site Source Recovery Program (OSRP). The qualification cards for these sites are VE-PIT-01 and VE-OSRP-01, respectively.
Requalification Requirements	Items required for requalification are identified by text.

Indoctrination

(Required at Initial Qualification and Full Requalification)

Initial/Indoctrination Reading:

1. WP 15-GM1002, *Issues Management Processing of WIPP Forms*
2. CCP-HSP-014, *Health and Safety Program Implementation for CCP*
3. CCP-PO-001, *CCP Transuranic Waste Characterization Quality Assurance Project Plan*
4. CCP-PO-002, *CCP Transuranic Waste Certification Plan*
5. CCP-PO-003, *CCP Transuranic Authorized Methods for Payload Control (CCP CH-TRAMPAC)*
6. CCP-PO-005, *CCP Conduct of Operations*
7. CCP-PO-050, *CCP TRUPACT-III TRU Waste Authorized Methods for Payload Control (CCP TRUPACT-III TRAMPAC)*
8. CCP-QP-002, *CCP Training and Qualification Plan*
9. CCP-QP-005, *CCP TRU Nonconforming Item Reporting and Control*
10. CCP-QP-008, *CCP Records Management*
11. CCP-QP-010, *CCP Document Preparation, Approval, and Control*
12. CCP-QP-016, *CCP Control of Measuring and Testing Equipment*
13. CCP-QP-023, *CCP Handling, Storage, and Shipping*
14. CCP-TP-113, *CCP Standard Contact-Handled Waste Visual Examination*

I have read the listed Initial/Indoctrination Reading and understand my responsibilities as applicable to the procedures above.	[signature] 9-10-15 Trainee Date

Visual Examination (VE) Operator/Independent Technical Reviewer (ITR) for Contact-Handled (CH) Waste Qualification Card

Name: Anthony Harley

Additional Training Requirements

1. WAP/QAPjP Briefing and Test *(One-time Requirement)*	Cheryl Almajo CCP Training	09-29-15 Date
2. CCP-VE-101, *Visual Examination (VE) TRU Waste Characterization Briefing (Always Required)*	Cheryl Almajo CCP Training	09-29-15 Date
3. VE-TEST-01, *Visual Examination (VE) Operator/ITR Comprehensive Examination (Always Required)*	Cheryl Almajo CCP Training	09-29-15 Date

Formal Training	On-the-Job Training (OJT) Knowledge Requirements *(Required at Initial Qualification and Full Requalification)*	Visual Examination Expert (VEE) Subject Matter Expert (SME)/OJT Signature/Date
CCP-PO-001	1. List the Quality Assurance objectives validated by VE.	9/14/15
	2. List the VE DQO's	9/14/15
CCP-QP-002	3. State the purpose of the List of Qualified Individuals (LOQI).	9/14/15
CCP-QP-005	4. State when a nonconformance report (NCR) should be prepared and who is responsible to initiate it.	9/14/15
	5. Describe how nonconforming items are documented.	9/14/15
	6. Describe how nonconforming items are controlled to prevent their use.	9/14/15
	7. State who has the responsibility to validate the NCR once initiated.	9/14/15
	8. Describe how to revise an NCR.	9/14/15
	9. Describe how to void an NCR.	9/14/15
WP 15-GM1002	10. Describe the purpose of the WIPP Form process.	9/14/15
	11. State the person responsible for originating a WIPP Form.	9/14/15

Visual Examination (VE) Operator/Independent Technical Reviewer (ITR) for Contact-Handled (CH) Waste Qualification Card

Name: Anthony Harley

Additional Training Requirements		
1. WAP/QAPjP Briefing and Test *(One-time Requirement)*	Michele Bellett CCP Training	9/25/15 Date
2. CCP-VE-101, *Visual Examination (VE) TRU Waste Characterization Briefing (Always Required)*	Cheryl Munyer CCP Training	09-28-15 Date
3. VE-TEST-01, *Visual Examination (VE) Operator/ITR Comprehensive Examination (Always Required)*	Cheryl Munyer CCP Training	09-28-15 Date

Formal Training	On-the-Job Training (OJT) Knowledge Requirements *(Required at Initial Qualification and Full Requalification)*	Visual Examination Expert (VEE) Subject Matter Expert (SME)/OJT Signature/Date
CCP-PO-001	1. List the Quality Assurance objectives validated by VE.	9/14/15
	2. List the VE DQO's	9/14/15
CCP-QP-002	3. State the purpose of the List of Qualified Individuals (LOQI).	9/14/15
CCP-QP-005	4. State when a nonconformance report (NCR) should be prepared and who is responsible to initiate it.	9/14/15
	5. Describe how nonconforming items are documented.	9/14/15
	6. Describe how nonconforming items are controlled to prevent their use.	9/14/15
	7. State who has the responsibility to validate the NCR once initiated.	9/14/15
	8. Describe how to revise an NCR.	9/14/15
	9. Describe how to void an NCR.	9/14/15
WP 15-GM1002	10. Describe the purpose of the WIPP Form process.	9/14/15
	11. State the person responsible for originating a WIPP Form.	9/14/15

Visual Examination (VE) Operator/Independent Technical Reviewer (ITR) for Contact-Handled (CH) Waste Qualification Card

Name: Anthony Harley

	12. Describe how WIPP Forms are documented.	9/14/15
	13. Describe who has responsibility for processing WIPP Forms, approving Corrective Action Plans, and approving closure of WIPP Forms.	9/14/15
	14. Describe actions personnel may take when conditions adverse to quality are discovered.	9/14/15
CCP-QP-008	15. List the responsibilities of record generators.	9/14/15
	16. State the storage and control requirements for records.	9/14/15
	17. Explain the process and proper method to make corrections or revisions to records.	9/14/15
CCP-QP-010	18. State the importance of using approved documents.	9/14/15
	19. State when to verify a document revision.	9/14/15
CCP-QP-016	20. List the Measuring & Testing Equipment (M&TE) items used during VE.	9/14/15
CCP-TP-113/ CCP-VE-101 Briefing	21. Explain the purpose of VE.	9/14/15
	22. What are the 2 methods used in the VE process?	9/14/15
	23. Who makes the determination of the method used?	9/14/15
	24. Describe the unit of measurement for weights to be recorded for VE.	9/14/15
	25. Describe where to obtain the tare weight of a waste container.	9/14/15
	26. Describe where to obtain the gross weight of a waste container.	9/14/15
	27. State the number of waste containers allowed per Batch Data Report (BDR).	9/14/15
	28. State how often a camera check is performed when using Method #1.	9/14/15
	29. Define "layers of confinement."	9/14/15

Visual Examination (VE) Operator/Independent Technical Reviewer (ITR) for Contact-Handled (CH) Waste Qualification Card

Name: Anthony Harley

	30. Describe how to determine "maximum" layers of confinement.	Pat Tilman 9-17-15
	31. Describe authorized methods of closure of a liner bag.	Pat Tilman 9-17-15
	32. Describe how to determine Volume Utilization Percentage (VUP).	Pat Tilman 9-17-15
	33. Describe the actions taken if prohibited items are found.	Pat Tilman 9-17-15
	34. Discuss the requirements for packaging of sharp or heavy objects.	Pat Tilman 9-17-15
	35. State the waste material parameters (WMP).	Pat Tilman 9-17-15
	36. State how often a scale operational check is performed.	Pat Tilman 9-17-15
	37. Describe the information that should be recorded when describing waste items.	Pat Tilman 9-17-15
	38. State the criteria for a rigid liner to be considered vented.	Pat Tilman 9-17-15
	39. State three examples of potentially "unsafe" packages/items that may be found within a waste container.	Pat Tilman 9-17-15
	40. State five examples of prohibited items.	Pat Tilman 9-17-15
	41. Describe how a non-transparent container is handled when liquid is suspected.	Pat Tilman 9-17-15
	42. State the acceptable liquid limits in a characterized container.	Pat Tilman 9-17-15
	43. Explain the responsibilities and functions of the Independent Technical Reviewer (ITR).	Pat Tilman 9-17-15
	44. Describe the conditions that would generate an NCR during the VE process.	Pat Tilman 9-17-15
	45. Define how often calibration due dates should be checked on certified equipment.	Pat Tilman 9-17-15
	46. Define the increments in which the fill percent are recorded.	Pat Tilman 9-17-15
	47. Explain who is allowed to make data changes on data sheets.	Pat Tilman 9-17-15

Visual Examination (VE)
Operator/Independent Technical Reviewer (ITR) for Contact-Handled (CH) Waste
Qualification Card

Name: Anthony Harley

Formal Training	OJT Practical Requirements[1] *(This section must be performed in the presence of a VEE) (Always Required)*			VEE SME/OJT Signature/Date
CCP-TP-113	1. Perform audio/video equipment operational checks.	P	(S)	Pat Tillman 9-24-15
	2. Perform pre-use scale calibration verification.	P	(S)	Pat Tillman 9-24-15
	3. Determine layers of confinement.	P	(S)	Pat Tillman 9-24-15
	4. Verify the physical form of the waste matches the waste description.	P	(S)	Pat Tillman 9-24-15
	5. Determine the Packaging Configuration	P	(S)	Pat Tillman 9-24-15
	6. Determine the WMP(s).	P	(S)	Pat Tillman 9-24-15
	7. Estimate the weight of each WMP.	P	(S)	Pat Tillman 9-24-15
	8. Obtain weight of each WMP.	P	(S)	Pat Tillman 9-24-15
	9. Determine the VUP.	P	(S)	Pat Tillman 9-24-15
	10. Obtain the output weight for the waste container.	P	(S)	Pat Tillman 9-24-15
	11. Prepare a BDR.	P	(S)	Pat Tillman 9-24-15
	12. Demonstrate how to make changes/corrections to a BDR.	P	(S)	Pat Tillman 9-24-15
	13. Complete an ITR.	P	(S)	Pat Tillman 9-24-15

[1] For simulated steps that involve the recording of information, the steps can be satisfied by the trainee's ability to identify the specific location in the correct record form where actual data would be entered, and explain where the information would be obtained. All required calculations will actually be performed: for simulations, representative data will be used in lieu of actual data. Circle "P" if actually performed or "S" if requirement was simulated.

Visual Examination (VE) Operator/Independent Technical Reviewer (ITR) for Contact-Handled (CH) Waste Qualification Card

Name: Anthony Harley

Approvals	
I have completed formal training and received OJT for this position. I fully understand my responsibilities as a CH VE Operator/ITR.	Anthony Harley 9-24-15 Trainee *(printed name and signature)* Date
I have monitored the training of this individual and believe they are ready to perform the duties of a CH VE Operator/ITR. *(Validation by the VEE SME/OJT instructor(s) involved in the training of this individual).*	Derek Matheny 9-24-15 VEE SME/OJT Instructor *(printed name and signature)* Date Pat Tilmon 9-24-15 VEE SME/OJT Instructor *(printed name and signature)* Date
I approve this employee to perform the duties of a CH VE Operator/ITR.	Richard Kantrowitz 9/29/15 SPM *(printed name and signature)* Date

Approved for Content & Format:	**Tommy Mojica** ***(Approval on File)***	**07/15/2014**
	SME/OJT	Date
Approved for Applicability, Content & Format:	**Andrew Stallings** ***(Approval on File)***	**07/15/2014**
	Cognizant Engineer	Date
Approved for Content:	**Mike Ramirez** ***(Approval on File)***	**07/15/2014**
	SPM	Date
Approved for Applicability, Content, Format, & Use:	**A.J. Fisher** ***(Approval on File)***	**07/15/2014**
	Manager Responsible for Training	Date

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Effective Date: 09/02/2014 — Page 1 of 5

Visual Examination (VE) Operator/Independent Technical Reviewer (ITR) for Remote-Handled (RH) Waste Qualification Card

Name: Anthony Harley

Education/Experience

Resume documenting education and experience on file with Central Characterization (CCP) Training.	Cheryl Hong — CCP Training — 06-24-15 — Date

Job Specific Training

☐ Initial Qualification ☑ Requalification ☐ Full Requalification

Qualification Limit	This qualification is valid for two (2) years. If necessary, additional training may be required by the Site Project Manager (SPM) or the Manager Responsible for Training. Unsatisfactory performance will result in disqualification by the Manager Responsible for Training. The candidate must successfully complete the entire qualification card to reestablish qualification.
Requalification Requirements	Items required for requalification are identified by text.

Indoctrination

(Required at Initial Qualification and Full Requalification)

Initial/Indoctrination Reading:

1. DOE/WIPP 02-3214, *Remote-Handled TRU Waste Characterization Program Implementation Plan*
2. WP 15-GM1002, *Issues Management Processing of WIPP Forms*
3. CCP-HSP-014, *Health and Safety Program Implementation for CCP*
4. CCP-PO-001, *CCP Transuranic Waste Characterization Quality Assurance Project Plan*
5. CCP-PO-002, *CCP Transuranic Waste Certification Plan*
6. CCP-PO-005, *CCP Conduct of Operations*
7. CCP-PO-505, *CCP Remote-Handled Transuranic Waste Authorized Methods for Payload Control (CCP RH-TRAMPAC)*
8. CCP-QP-002, *CCP Training and Qualification Plan*
9. CCP-QP-005, *CCP TRU Nonconforming Item Reporting and Control*
10. CCP-QP-008, *CCP Records Management*
11. CCP-QP-010, *CCP Document Preparation, Approval, and Control*
12. CCP-QP-016, *CCP Control of Measuring and Testing Equipment*
13. CCP-QP-023, *CCP Handling, Storage, and Shipping*
14. CCP-TP-163, *CCP Evaluation of Waste Packaging Records for Visual Examination of Records*
15. CCP-TP-500, *CCP Remote-Handled Waste Visual Examination*
16. CCP-TP-509, *CCP Remote-Handled Transuranic Container Tracking*
17. CCP-TP-513, *CCP Procedure for Dimensional or Gravimetric Measurements for Radiological Characterization of Remote-Handled Transuranic Waste*

I have read the listed Initial/Indoctrination Reading and understand my responsibilities as applicable to the procedures above.	Anthony Harley — Trainee — 6-8-15 — Date

Visual Examination (VE) Operator/Independent Technical Reviewer (ITR) for Remote-Handled (RH) Waste Qualification Card

Name: Anthony Harley

Additional Training Requirements	
1. WAP/QAPjP Briefing & Exam *(One-time Requirement)*	Cheryl Munyo 06-24-15 CCP Training Date
2. CCP-VE-101, *Visual Examination (VE) TRU Waste Characterization Briefing (Always Required)*	Cheryl Munyo 06-24-15 CCP Training Date
3. VE Comprehensive Exam *(Always Required)*	Cheryl Munyo 06-24-15 CCP Training Date

Formal Training	On-the-Job Training (OJT) Knowledge Requirements *(Required at Initial Qualification and Full Requalification)*		Visual Examination Expert (VEE) Subject Matter Expert (SME)/OJT Signature/Date
CCP-PO-001	1.	List the VE Quality Assurance Objectives (QAOs) per the WAP.	Pat Tilman 6-8-15
	2.	List the VE Data Quality Objectives (DQOs) per the WAP.	Pat Tilman 6-8-15
DOE/WIPP 02-3214	3.	List the VE QAOs per the PIP.	Pat Tilman 6-8-15
	4.	List the VE DQOs per the PIP.	Pat Tilman 6-8-15
CCP-QP-002	5.	State the purpose of the List of Qualified Individuals (LOQI).	Pat Tilman 6-8-15
CCP-QP-005	6.	State when a nonconformance report (NCR) should be prepared and who is responsible to initiate it.	Pat Tilman 6-8-15
	7.	Describe how nonconforming items are documented.	Pat Tilman 6-8-15
	8.	Describe how nonconforming items are controlled to prevent their use.	Pat Tilman 6-8-15
	9.	State who has the responsibility to validate the NCR once initiated.	Pat Tilman 6-8-15
	10.	Describe how to revise a NCR.	Pat Tilman 6-8-15
	11.	Describe how to void a NCR.	Pat Tilman 6-8-15
WP 15-GM1002	12.	Describe the purpose of the WIPP Form process.	Pat Tilman 6-8-15
	13.	State the person responsible for originating a WIPP Form.	Pat Tilman 6-8-15

Visual Examination (VE) Operator/Independent Technical Reviewer (ITR) for Remote-Handled (RH) Waste Qualification Card

Name: Anthony Harley

	14.	Describe how WIPP Forms are documented.	6-8-15
	15.	Describe who has responsibility for processing WIPP Forms, approving Corrective Action Plans, and approving closure of WIPP Forms.	6-5-15
	16.	Describe actions personnel may take when conditions adverse to quality are discovered.	6-5-15
CCP-QP-008	17.	List the responsibilities of record generators.	6-16-15
	18.	State the storage and control requirements for records.	6-16-15
	19.	Explain the process and proper method to make corrections or revisions to records.	6-16-15
CCP-QP-010	20.	State the importance of using approved documents.	6-16-15
	21.	State when to verify a document revision.	6-16-15
CCP-TP-500/ CCP-VE-101 Briefing	22.	List the Measuring & Testing Equipment (M&TE) items used during VE.	6-16-15
	23.	Explain the purpose of VE and the roles and responsibilities of the VE Operator.	6-16-15
	24.	Identify who is responsible for overall direction and implementation of the VE of that facility.	6-16-15
	25.	Define the two phases of VE technique for remote-handled waste.	6-16-15
	26.	State the number of waste containers allowed per Batch Data Report (BDR).	6-16-15
	27.	Define "layers of confinement."	6-16-15
	28.	State the authorized methods to close a liner bag.	6-16-15
	29.	State the action to be taken if a condition adverse to quality arises.	6-16-15
	30.	State the waste material parameters (WMP).	6-23-15
	31.	Describe the information that should be recorded when describing waste items.	6-23-15
	32.	State five (5) examples of prohibited items.	6-23-15
	33.	Describe how a non-transparent container is handled when liquid is suspected.	6-23-15

Visual Examination (VE) Operator/Independent Technical Reviewer (ITR) for Remote-Handled (RH) Waste Qualification Card

Name: Anthony Harley

	34. State the acceptable liquid limits in a characterized container.			[signature] 6-23-15
	35. Explain the responsibilities and functions of the Independent Technical Review (ITR).			[signature] 6-23-15
	36. Describe how to determine Volume Utilization Percentage (VUP).			[signature] 6-23-15
	37. State the allowable fill percent increments.			[signature] 6-23-15
Formal Training	**OJT Practical Requirements[1]** *(This section must be performed in the presence of a VEE)* *(Always Required)*			**VEE SME/OJT Signature/Date**
CCP-TP-500	1. Prepare the recording equipment. *(This activity is at the discretion of the SME instructor)*	P	S	we do not use recording equipment at ORNL QE 6-23-15
	2. Complete CCP-TP-500 Attachment 1.	P	(S)	[signature] 6-23-15
	3. Prepare a BDR.	P	(S)	[signature] 6-23-15
	4. Determine the VUP.	P	(S)	[signature] 6-23-15
	5. Complete an ITR.	P	(S)	[signature] 6-23-15
	6. Determine Waste Material Parameter (WMP).	P	(S)	[signature] 6-23-15
	7. Verify the physical form of the waste matches the waste stream ID.	P	(S)	[signature] 6-23-15
CCP-TP-513	8. Perform a dimensional or gravimetric measurement and determine the measurement acceptability[2]	P	S	The SME Instructor is not Qualified for gravimetrics QE 6-23-15

[1] For simulated steps that involve the recording of information, the steps can be satisfied by the trainee's ability to identify the specific location in the correct record form where actual data would be entered, and explain where the information would be obtained. All required calculations will actually be performed. for simulations, representative data will be used in lieu of actual data. Circle "P" if actually performed or "S" if requirement was simulated.
[2] Procedure CCP-TP-513 is not applicable at all sites. The OJT Practical Requirement for this procedure is only required if the procedure is invoked.

Visual Examination (VE) Operator/Independent Technical Reviewer (ITR) for Remote-Handled (RH) Waste Qualification Card

Name: Anthony Harley

Approvals	
I have completed formal training and received OJT for this position. I fully understand my responsibilities as a RH VE Operator/ITR.	Anthony Harley 6-23-15 Trainee *(printed name and signature)* Date
I have monitored the training of this individual and believe they are ready to perform the duties of a RH VE Operator/ITR. *(Validation by the RH VEE SME/OJT instructor(s) involved in the training of this individual).*	Pat Tilmon 6-23-15 RH VEE SME/OJT Instructor *(printed name and signature)* Date NA RH VEE SME/OJT Instructor *(printed name and signature)* Date
I approve this employee to perform the duties of a RH VE Operator/ITR.	Richard Kantrowitz 6/24/15 SPM *(printed name and signature)* Date

Approved for Content & Format: **Wes Root *(Approval on File)*** — SME/OJT — **09/02/2014** Date

Approved for Applicability, Content & Format: **Andrew Stallings *(Approval on File)*** — Cognizant Engineer — **09/02/2014** Date

Approved for Content: **Charlie Turner *(Approval on File)*** — SPM — **09/02/2014** Date

Approved for Applicability, Content, Format, & Use: **A.J. Fisher *(Approval on File)*** — Manager Responsible for Training — **09/02/2014** Date

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Visual Examination (VE)
Operator/Independent Technical Reviewer (ITR) for
Contact-Handled (CH) Waste
Qualification Card

Name: Derek Matheny

Education/Experience

Resume documenting education and experience on file with Central Characterization Program (CCP) Training.	CCP Training: [signature] Date: 4-14-16

Job Specific Training

☐ Initial Qualification ☑ Requalification ☐ Full Requalification

Qualification Limit	**This qualification is valid for two (2) years.** If necessary, additional training may be required by the Site Project Manager (SPM) or the Manager Responsible for Training. Unsatisfactory performance will result in disqualification by the Manager Responsible for Training. The candidate must successfully complete the entire qualification card to reestablish qualification. This qualification card applies to all CH sites except for Idaho National Laboratory (INL) and Los Alamos National Laboratory (LANL) Off-Site Source Recovery Program (OSRP). The qualification cards for these sites are VE-PIT-01 and VE-OSRP-01, respectively.
Requalification Requirements	Items required for requalification are identified by text.

Indoctrination
(Required at Initial Qualification and Full Requalification)

Initial/Indoctrination Reading:

1. WP 15-GM1002, *Issues Management Processing of WIPP Forms*
2. CCP-HSP-014, *Health and Safety Program Implementation for CCP*
3. CCP-PO-001, *CCP Transuranic Waste Characterization Quality Assurance Project Plan*
4. CCP-PO-002, *CCP Transuranic Waste Certification Plan*
5. CCP-PO-003, *CCP Transuranic Authorized Methods for Payload Control (CCP CH-TRAMPAC)*
6. CCP-PO-005, *CCP Conduct of Operations*
7. CCP-PO-050, *CCP TRUPACT-III TRU Waste Authorized Methods for Payload Control (CCP TRUPACT-III TRAMPAC)*
8. CCP-QP-002, *CCP Training and Qualification Plan*
9. CCP-QP-005, *CCP TRU Nonconforming Item Reporting and Control*
10. CCP-QP-008, *CCP Records Management*
11. CCP-QP-010, *CCP Document Preparation, Approval, and Control*
12. CCP-QP-016, *CCP Control of Measuring and Testing Equipment*
13. CCP-QP-023, *CCP Handling, Storage, and Shipping*
14. CCP-TP-113, *CCP Standard Contact-Handled Waste Visual Examination*

I have read the listed Initial/Indoctrination Reading and understand my responsibilities as applicable to the procedures above.	Trainee: [signature] Date: 4/11/16

Visual Examination (VE) Operator/Independent Technical Reviewer (ITR) for Contact-Handled (CH) Waste Qualification Card

Name: Derek Matheny

Additional Training Requirements		
1. WAP/QAPjP Briefing and Test *(One-time Requirement)*	Cheryl Arroyo CCP Training	04-14-16 Date
2. CCP-VE-101, *Visual Examination (VE) TRU Waste Characterization Briefing (Always Required)*	Cheryl Arroyo CCP Training	04-14-16 Date
3. VE-TEST-01, *Visual Examination (VE) Operator/ITR Comprehensive Examination (Always Required)*	Cheryl Arroyo CCP Training	04-14-16 Date

Formal Training	On-the-Job Training (OJT) Knowledge Requirements *(Required at Initial Qualification and Full Requalification)*	Visual Examination Expert (VEE) Subject Matter Expert (SME)/OJT Signature/Date
CCP-PO-001	1. List the Quality Assurance objectives validated by VE.	
	2. List the VE DQO's	
CCP-QP-002	3. State the purpose of the List of Qualified Individuals (LOQI).	
CCP-QP-005	4. State when a nonconformance report (NCR) should be prepared and who is responsible to initiate it.	
	5. Describe how nonconforming items are documented.	
	6. Describe how nonconforming items are controlled to prevent their use.	
	7. State who has the responsibility to validate the NCR once initiated.	
	8. Describe how to revise an NCR.	
	9. Describe how to void an NCR.	
WP 15-GM1002	10. Describe the purpose of the WIPP Form process.	
	11. State the person responsible for originating a WIPP Form.	

Visual Examination (VE) Operator/Independent Technical Reviewer (ITR) for Contact-Handled (CH) Waste Qualification Card

Name: Derek Matheny

	12. Describe how WIPP Forms are documented.	
	13. Describe who has responsibility for processing WIPP Forms, approving Corrective Action Plans, and approving closure of WIPP Forms.	
	14. Describe actions personnel may take when conditions adverse to quality are discovered.	
CCP-QP-008	15. List the responsibilities of record generators.	
	16. State the storage and control requirements for records.	
	17. Explain the process and proper method to make corrections or revisions to records.	
CCP-QP-010	18. State the importance of using approved documents.	
	19. State when to verify a document revision.	N
CCP-QP-016	20. List the Measuring & Testing Equipment (M&TE) items used during VE.	
CCP-TP-113/ CCP-VE-101 Briefing	21. Explain the purpose of VE.	A
	22. What are the 2 methods used in the VE process?	
	23. Who makes the determination of the method used?	
	24. Describe the unit of measurement for weights to be recorded for VE.	
	25. Describe where to obtain the tare weight of a waste container.	
	26. Describe where to obtain the gross weight of a waste container.	
	27. State the number of waste containers allowed per Batch Data Report (BDR).	
	28. State how often a camera check is performed when using Method #1.	
	29. Define "layers of confinement."	

Visual Examination (VE)
Operator/Independent Technical Reviewer (ITR) for Contact-Handled (CH) Waste
Qualification Card

Name: Derek Matheny

	30. Describe how to determine "maximum" layers of confinement.	
	31. Describe authorized methods of closure of a liner bag.	
	32. Describe how to determine Volume Utilization Percentage (VUP).	
	33. Describe the actions taken if prohibited items are found.	
	34. Discuss the requirements for packaging of sharp or heavy objects.	
	35. State the waste material parameters (WMP).	
	36. State how often a scale operational check is performed.	
	37. Describe the information that should be recorded when describing waste items.	N
	38. State the criteria for a rigid liner to be considered vented.	
	39. State three examples of potentially "unsafe" packages/items that may be found within a waste container.	A
	40. State five examples of prohibited items.	
	41. Describe how a non-transparent container is handled when liquid is suspected.	
	42. State the acceptable liquid limits in a characterized container.	
	43. Explain the responsibilities and functions of the Independent Technical Reviewer (ITR).	
	44. Describe the conditions that would generate an NCR during the VE process.	
	45. Define how often calibration due dates should be checked on certified equipment.	
	46. Define the increments in which the fill percent are recorded.	
	47. Explain who is allowed to make data changes on data sheets.	

Visual Examination (VE) Operator/Independent Technical Reviewer (ITR) for Contact-Handled (CH) Waste Qualification Card

Name: Derek Matheny

Formal Training	OJT Practical Requirements[1] *(This section must be performed in the presence of a VEE) (Always Required)*			VEE-SME/OJT Signature/Date
CCP-TP-113	1. Perform audio/video equipment operational checks.	P	S	4-14-16
	2. Perform pre-use scale calibration verification.	P	S	4-14-16
	3. Determine layers of confinement.	P	S	4-14-16
	4. Verify the physical form of the waste matches the waste description.	P	S	4-14-16
	5. Determine the Packaging Configuration	P	S	4-14-16
	6. Determine the WMP(s).	P	S	4-14-16
	7. Estimate the weight of each WMP.	P	S	4-14-16
	8. Obtain weight of each WMP.	P	S	4-14-16
	9. Determine the VUP.	P	S	4-14-16
	10. Obtain the output weight for the waste container.	P	S	4-14-16
	11. Prepare a BDR.	P	S	4-14-16
	12. Demonstrate how to make changes/corrections to a BDR.	P	S	4-14-16
	13. Complete an ITR.	P	S	4-14-16

[1] For simulated steps that involve the recording of information, the steps can be satisfied by the trainee's ability to identify the specific location in the correct record form where actual data would be entered, and explain where the information would be obtained. All required calculations will actually be performed: for simulations, representative data will be used in lieu of actual data. Circle "P" if actually performed or "S" if requirement was simulated.

Visual Examination (VE) Operator/Independent Technical Reviewer (ITR) for Contact-Handled (CH) Waste Qualification Card

Name: Derek Matheny

Approvals	
I have completed formal training and received OJT for this position. I fully understand my responsibilities as a CH VE Operator/ITR.	Derek Matheny — Trainee *(printed name and signature)* — Date: 4/14/16
I have monitored the training of this individual and believe they are ready to perform the duties of a CH VE Operator/ITR. *(Validation by the VEE SME/OJT instructor(s) involved in the training of this individual).*	Pat Tilman — VEE SME/OJT Instructor *(printed name and signature)* — Date: 4-14-16
	N/A — VEE SME/OJT Instructor *(printed name and signature)* — Date
I approve this employee to perform the duties of a CH VE Operator/ITR.	Beverly Schrock BSSchrock — SPM *(printed name and signature)* — Date: 4/14/16

Approved for Content & Format:	**Tommy Mojica** *(Approval on File)* — SME/OJT	**07/15/2014** — Date
Approved for Applicability, Content & Format:	**Andrew Stallings** *(Approval on File)* — Cognizant Engineer	**07/15/2014** — Date
Approved for Content:	**Mike Ramirez** *(Approval on File)* — SPM	**07/15/2014** — Date
Approved for Applicability, Content, Format, & Use:	**A.J. Fisher** *(Approval on File)* — Manager Responsible for Training	**07/15/2014** — Date

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Visual Examination (VE) Operator/Independent Technical Reviewer (ITR) for Contact-Handled (CH) Waste Qualification Card

Name: Derek Matheny

Education/Experience

Resume documenting education and experience on file with National TRU Program Certification (NTPC) Training.	Cheryl Hughes 04-01-14 NTPC Training Date

Job Specific Training

☑ Initial Qualification ☐ Requalification ☐ Full Requalification

Qualification Limit	**This qualification is valid for two (2) years.** If necessary, additional training may be required by the Site Project Manager (SPM) or the Manager Responsible for Training. Unsatisfactory performance will result in disqualification by the Manager Responsible for Training. The candidate must successfully complete the entire qualification card to reestablish qualification. This qualification card applies to all CH sites except for Idaho National Laboratory (INL) and Los Alamos National Laboratory (LANL) Off Site Source Recovery Program (OSRP). The qualification cards for these sites are VE-PIT-01 and VE-OSRP-01, respectively.
Requalification Requirements	Items required for requalification are identified by text.

Indoctrination

(Required at Initial Qualification and Full Requalification)

Initial/Indoctrination Reading:

1. WP 15-GM1002, *Issues Management Processing of WIPP Forms*
2. CCP-HSP-014, *Health and Safety Program Implementation for CCP*
3. CCP-PO-001, *CCP Transuranic Waste Characterization Quality Assurance Project Plan*
4. CCP-PO-002, *CCP Transuranic Waste Certification Plan*
5. CCP-PO-003, *CCP Transuranic Authorized Methods for Payload Control (CCP CH-TRAMPAC)*
6. CCP-PO-050, *CCP TRUPACT-III TRU Waste Authorized Methods for Payload Control (CCP TRUPACT-III TRAMPAC)*
7. CCP-QP-002, *CCP Training and Qualification Plan*
8. CCP-QP-005, *CCP TRU Nonconforming Item Reporting and Control*
9. CCP-QP-008, *CCP Records Management*
10. CCP-QP-010, *CCP Document Preparation, Approval, and Control*
11. CCP-QP-016, *CCP Control of Measuring and Testing Equipment*
12. CCP-QP-023, *CCP Handling, Storage, and Shipping*
13. CCP-TP-113, *CCP Standard Contact-Handled Waste Visual Examination*

I have read the listed Initial/Indoctrination Reading and understand my responsibilities as applicable to the procedures above.	Derek Matheny 3/25/14 Trainee Date

Visual Examination (VE) Operator/Independent Technical Reviewer (ITR) for Contact-Handled (CH) Waste Qualification Card

Name: Derek Matheny

Additional Training Requirements		
1. WAP/QAPjP Briefing and Test *(One-time Requirement)*	Cheryl Mingo / NTPC Training	04-01-14 / Date
2. CCP-VE-101, *Visual Examination (VE) TRU Waste Characterization Briefing (Always Required)*	Cheryl Mingo / NTPC Training	04-01-14 / Date
3. VE-TEST-01, *Visual Examination (VE) Operator/ITR Comprehensive Examination (Always Required)*	Cheryl Mingo / NTPC Training	04-01-14 / Date

Formal Training	On-the-Job Training (OJT) Knowledge Requirements *(Required at Initial Qualification and Full Requalification)*	Visual Examination Expert (VEE) Subject Matter Expert (SME)/OJT Signature/Date
CCP-PO-001	1. List the Quality Assurance objectives validated by VE.	3-25-14
CCP-QP-002	2. State the purpose of the List of Qualified Individuals (LOQI).	3-25-14
CCP-QP-005	3. State when a nonconformance report (NCR) should be prepared and who is responsible to initiate it.	3-25-14
	4. Describe how nonconforming items are documented.	3-25-14
	5. Describe how nonconforming items are controlled to prevent their use.	3-25-14
	6. State who has the responsibility to validate the NCR once initiated.	3-25-14
	7. Describe how to revise an NCR.	3-25-14
	8. Describe how to void an NCR.	3-25-14
WP 15-GM1002	9. Describe the purpose of the WIPP Form process.	3-25-14
	10. State the person responsible for originating a WIPP Form.	3-25-14
	11. Describe how WIPP Forms are documented.	3-25-14

Visual Examination (VE)
Operator/Independent Technical Reviewer (ITR) for Contact-Handled (CH) Waste
Qualification Card

Name: Derek Matheny

	12.	Describe who has responsibility for processing WIPP Forms, approving Corrective Action Plans, and approving closure of WIPP Forms.	3-25-14
	13.	Describe actions personnel may take when conditions adverse to quality are discovered.	3-25-14
CCP-QP-008	14.	List the responsibilities of record generators.	3-25-14
	15.	State the storage and control requirements for records.	3-25-14
	16.	Explain the process and proper method to make corrections or revisions to records.	3-25-14
CCP-QP-010	17.	State the importance of using approved documents.	3-25-14
	18.	State when to verify a document revision.	3-25-14
CCP-QP-016	19.	List the Measuring & Testing Equipment (M&TE) items used during VE.	3-25-14
CCP-TP-113/ CCP-VE-101 Briefing	20.	Explain the purpose of VE.	3-25-14
	21.	What are the 2 methods used in the VE process?	3-25-14
	22.	Who makes the determination of the method used?	3-25-14
	23.	Describe the unit of measurement for weights to be recorded for VE.	3-25-14
	24.	Describe where to obtain the tare weight of a waste container.	3-25-14
	25.	Describe where to obtain the gross weight of a waste container.	3-25-14
	26.	State the number of waste containers allowed per Batch Data Report (BDR).	3-25-14
	27.	State how often a camera check is performed when using Method #1.	3-25-14
	28.	Define "layers of confinement."	3-25-14
	29.	Describe how to determine "maximum" layers of confinement.	3-25-14

Visual Examination (VE) Operator/Independent Technical Reviewer (ITR) for Contact-Handled (CH) Waste Qualification Card

Name: Derek Matheny

30.	Describe authorized methods of closure of a liner bag.	3-25-14
31.	Describe how to determine Volume Utilization Percentage (VUP).	3-25-14
32.	Describe the actions taken if prohibited items are found.	3-25-14
33.	Discuss the requirements for packaging of sharp or heavy objects.	3-25-14
34.	State the waste material parameters (WMP).	3-25-14
35.	State how often a scale operational check is performed.	3-25-14
36.	Describe the information that should be recorded when describing waste items.	3-25-14
37.	State the criteria for a rigid liner to be considered vented.	3-25-14
38.	State three examples of potentially "unsafe" packages/items that may be found within a waste container.	3-25-14
39.	State five examples of prohibited items.	3-25-14
40.	Describe how a non-transparent container is handled when liquid is suspected.	3-25-14
41.	State the acceptable liquid limits in a characterized container.	3-25-14
42.	Explain the responsibilities and functions of the Independent Technical Reviewer (ITR).	3-25-14
43.	Describe the conditions that would generate an NCR during the VE process.	3-25-14
44.	Define how often calibration due dates should be checked on certified equipment.	3-25-14
45.	Define the increments in which the fill percent are recorded.	3-25-14
46.	Explain who is allowed to make data changes on data sheets.	3-25-14

Visual Examination (VE) Operator/Independent Technical Reviewer (ITR) for Contact-Handled (CH) Waste Qualification Card

Name: Derek Matheny

Formal Training	OJT Practical Requirements[1] *(This section must be performed in the presence of a VEE) (Always Required)*			VEE SME/OJT Signature/Date
CCP-TP-113	1. Perform audio/video equipment operational checks.	(P)	S	3-25-14
	2. Perform pre-use scale calibration verification.	(P)	S	3-25-14
	3. Determine layers of confinement.	(P)	S	3-25-14
	4. Verify the physical form of the waste matches the waste description.	(P)	S	3-25-14
	5. Determine the WMP(s).	(P)	S	3-25-14
	6. Estimate the weight of each WMP.	(P)	S	3-25-14
	7. Obtain weight of each WMP.	(P)	S	3-25-14
	8. Determine the VUP.	(P)	S	3-25-14
	9. Obtain the output weight for the waste container.	(P)	S	3-25-14
	10. Prepare a BDR.	(P)	S	3-25-14
	11. Demonstrate how to make changes/corrections to a BDR.	(P)	S	3-25-14
	12. Complete an ITR.	(P)	S	3-25-14

[1] For simulated steps that involve the recording of information, the steps can be satisfied by the trainee's ability to identify the specific location in the correct record form where actual data would be entered, and explain where the information would be obtained. All required calculations will actually be performed; for simulations, representative data will be used in lieu of actual data. Circle "P" if actually performed or "S" if requirement was simulated.

Visual Examination (VE) Operator/Independent Technical Reviewer (ITR) for Contact-Handled (CH) Waste Qualification Card

Name: Derek Matheny

	Approvals
I have completed formal training and received OJT for this position. I fully understand my responsibilities as a CH VE Operator/ITR.	Derek Matheny 3/25/14 Trainee *(printed name and signature)* Date
I have monitored the training of this individual and believe they are ready to perform the duties of a CH VE Operator/ITR. *(Validation by the VEE SME/OJT instructor(s) involved in the training of this individual).*	Anthony Harley 3-25-14 VEE SME/OJT Instructor *(printed name and signature)* Date NA VEE SME/OJT Instructor *(printed name and signature)* Date
I approve this employee to perform the duties of a CH VE Operator/ITR.	Beverly S. Schrock BSSchrock 4/1/14 SPM *(printed name and signature)* Date

Approved for Content & Format:	**Tommy Mojica** *(Approval on File)* SME/OJT	**09/23/2013** Date
Approved for Applicability, Content & Format:	**Andrew Stallings** *(Approval on File)* Cognizant Engineer	**09/23/2013** Date
Approved for Content:	**Richard Kantrowitz** *(Approval on File)* SPM	**09/23/2013** Date
Approved for Applicability, Content, Format, & Use:	**A.J. Fisher** *(Approval on File)* Manager Responsible for Training	**09/23/2013** Date

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Visual Examination (VE) Operator/Independent Technical Reviewer (ITR) for Remote-Handled (RH) Waste Qualification Card

Name: Derek Matheny

Education/Experience

Resume documenting education and experience on file with Central Characterization (CCP) Training.

Michelle Billett — CCP Training — 12/29/15 — Date

Job Specific Training

☐ Initial Qualification ☑ Requalification ☐ Full Requalification

Qualification Limit	**This qualification is valid for two (2) years.** If necessary, additional training may be required by the Site Project Manager (SPM) or the Manager Responsible for Training. Unsatisfactory performance will result in disqualification by the Manager Responsible for Training. The candidate must successfully complete the entire qualification card to reestablish qualification.
Requalification Requirements	Items required for requalification are identified by text.

Indoctrination

(Required at Initial Qualification and Full Requalification)

Initial/Indoctrination Reading:

1. DOE/WIPP 02-3214, *Remote-Handled TRU Waste Characterization Program Implementation Plan*
2. WP 15-GM1002, *Issues Management Processing of WIPP Forms*
3. CCP-HSP-014, *Health and Safety Program Implementation for CCP*
4. CCP-PO-001, *CCP Transuranic Waste Characterization Quality Assurance Project Plan*
5. CCP-PO-002, *CCP Transuranic Waste Certification Plan*
6. CCP-PO-005, *CCP Conduct of Operations*
7. CCP-PO-505, *CCP Remote-Handled Transuranic Waste Authorized Methods for Payload Control (CCP RH-TRAMPAC)*
8. CCP-QP-002, *CCP Training and Qualification Plan*
9. CCP-QP-005, *CCP TRU Nonconforming Item Reporting and Control*
10. CCP-QP-008, *CCP Records Management*
11. CCP-QP-010, *CCP Document Preparation, Approval, and Control*
12. CCP-QP-016, *CCP Control of Measuring and Testing Equipment*
13. CCP-QP-023, *CCP Handling, Storage, and Shipping*
14. CCP-TP-163, *CCP Evaluation of Waste Packaging Records for Visual Examination of Records*
15. CCP-TP-500, *CCP Remote-Handled Waste Visual Examination*
16. CCP-TP-509, *CCP Remote-Handled Transuranic Container Tracking*
17. CCP-TP-513, *CCP Procedure for Dimensional or Gravimetric Measurements for Radiological Characterization of Remote-Handled Transuranic Waste*

I have read the listed Initial/Indoctrination Reading and understand my responsibilities as applicable to the procedures above.

Derek Matheny — Trainee — 12/29/15 — Date

Visual Examination (VE) Operator/Independent Technical Reviewer (ITR) for Remote-Handled (RH) Waste Qualification Card

Name: Derek Matheny

Additional Training Requirements		
1. WAP/QAPjP Briefing & Exam *(One-time Requirement)*	Michele Billett CCP Training	12/29/15 Date
2. CCP-VE-101, *Visual Examination (VE) TRU Waste Characterization Briefing (Always Required)*	Michele Billett CCP Training	12/29/15 Date
3. VE Comprehensive Exam *(Always Required)*	Michele Billett CCP Training	12/29/15 Date

Formal Training	On-the-Job Training (OJT) Knowledge Requirements *(Required at Initial Qualification and Full Requalification)*	Visual Examination Expert (VEE) Subject Matter Expert (SME)/OJT Signature/Date
CCP-PO-001	1. List the VE Quality Assurance Objectives (QAOs) per the WAP.	
	2. List the VE Data Quality Objectives (DQOs) per the WAP.	
DOE/WIPP 02-3214	3. List the VE QAOs per the PIP.	
	4. List the VE DQOs per the PIP.	
CCP-QP-002	5. State the purpose of the List of Qualified Individuals (LOQI).	
CCP-QP-005	6. State when a nonconformance report (NCR) should be prepared and who is responsible to initiate it.	N
	7. Describe how nonconforming items are documented.	A
	8. Describe how nonconforming items are controlled to prevent their use.	
	9. State who has the responsibility to validate the NCR once initiated.	
	10. Describe how to revise a NCR.	
	11. Describe how to void a NCR.	
WP 15-GM1002	12. Describe the purpose of the WIPP Form process.	
	13. State the person responsible for originating a WIPP Form.	

Visual Examination (VE) Operator/Independent Technical Reviewer (ITR) for Remote-Handled (RH) Waste Qualification Card

Name: Derek Matheny

	14. Describe how WIPP Forms are documented.	
	15. Describe who has responsibility for processing WIPP Forms, approving Corrective Action Plans, and approving closure of WIPP Forms.	
	16. Describe actions personnel may take when conditions adverse to quality are discovered.	
CCP-QP-008	17. List the responsibilities of record generators.	
	18. State the storage and control requirements for records.	
	19. Explain the process and proper method to make corrections or revisions to records.	
CCP-QP-010	20. State the importance of using approved documents.	
	21. State when to verify a document revision.	
CCP-TP-500/ CCP-VE-101 Briefing	22. List the Measuring & Testing Equipment (M&TE) items used during VE.	N
	23. Explain the purpose of VE and the roles and responsibilities of the VE Operator.	A
	24. Identify who is responsible for overall direction and implementation of the VE of that facility.	
	25. Define the two phases of VE technique for remote-handled waste.	
	26. State the number of waste containers allowed per Batch Data Report (BDR).	
	27. Define "layers of confinement."	
	28. State the authorized methods to close a liner bag.	
	29. State the action to be taken if a condition adverse to quality arises.	
	30. State the waste material parameters (WMP).	
	31. Describe the information that should be recorded when describing waste items.	
	32. State five (5) examples of prohibited items.	
	33. Describe how a non-transparent container is handled when liquid is suspected.	

Visual Examination (VE) Operator/Independent Technical Reviewer (ITR) for Remote-Handled (RH) Waste Qualification Card

Name: Derek Matheny

	34. State the acceptable liquid limits in a characterized container.			
	35. Explain the responsibilities and functions of the Independent Technical Review (ITR).			N
	36. Describe how to determine Volume Utilization Percentage (VUP).			A
	37. State the allowable fill percent increments.			
Formal Training	**OJT Practical Requirements** *(This section must be performed in the presence of a VEE)* *(Always Required)*			**VEE SME/OJT Signature/Date**
CCP-TP-500	1. Prepare the recording equipment. *(This activity is at the discretion of the SME instructor)*	P	(S)	Pat Tillman 12-29-15
	2. Complete CCP-TP-500 Attachment 1.	(P)	S	Pat Tillman 12-29-15
	3. Prepare a BDR.	(P)	S	Pat Tillman 12-29-15
	4. Determine the VUP.	(P)	S	Pat Tillman 12-29-15
	5. Complete an ITR.	(P)	S	Pat Tillman 12-29-15
	6. Determine Waste Material Parameter (WMP).	(P)	S	Pat Tillman 12-29-15
	7. Verify the physical form of the waste matches the waste stream ID.	(P)	S	Pat Tillman 12-29-15
CCP-TP-513	8. Perform a dimensional or gravimetric measurement and determine the measurement acceptability[2].	P	S	N/A

[1] For simulated steps that involve the recording of information, the steps can be satisfied by the trainee's ability to identify the specific location in the correct record form where actual data would be entered, and explain where the information would be obtained. All required calculations will actually be performed: for simulations, representative data will be used in lieu of actual data. Circle "P" if actually performed or "S" if requirement was simulated.

[2] Procedure CCP-TP-513 is not applicable at all sites. The OJT Practical Requirement for this procedure is only required if the procedure is invoked.

Visual Examination (VE) Operator/Independent Technical Reviewer (ITR) for Remote-Handled (RH) Waste Qualification Card

Name: Derek Matheny

	Approvals
I have completed formal training and received OJT for this position. I fully understand my responsibilities as a RH VE Operator/ITR.	Derek Matheny 12/29/15 Trainee *(printed name and signature)* Date
I have monitored the training of this individual and believe they are ready to perform the duties of a RH VE Operator/ITR. *(Validation by the RH VEE SME/OJT instructor(s) involved in the training of this individual).*	Pat Tilmon 12.29.15 RH VEE SME/OJT Instructor *(printed name and signature)* Date
	N/A RH VEE SME/OJT Instructor *(printed name and signature)* Date
I approve this employee to perform the duties of a RH VE Operator/ITR.	Barbara Broomfield 12/29/15 SPM *(printed name and signature)* Date

Approved for Content & Format: **Wes Root *(Approval on File)*** **09/02/2014**
SME/OJT Date

Approved for Applicability, Content & Format: **Andrew Stallings *(Approval on File)*** **09/02/2014**
Cognizant Engineer Date

Approved for Content: **Charlie Turner *(Approval on File)*** **09/02/2014**
SPM Date

Approved for Applicability, Content, Format, & Use: **A.J. Fisher *(Approval on File)*** **09/02/2014**
Manager Responsible for Training Date

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Visual Examination (VE) Operator/Independent Technical Reviewer (ITR) for Contact-Handled (CH) Waste Qualification Card

Name: Pat Timon 03-26-15 P. Timon

Education/Experience

Resume documenting education and experience on file with Central Characterization Program (CCP) Training	Cheryl Mayo CCP Training	03-26-15 Date

Job Specific Training

☐ Initial Qualification ☐ Requalification ☑ Full Requalification

Qualification Limit	This qualification is valid for two (2) years. If necessary, additional training may be required by the Site Project Manager (SPM) or the Manager Responsible for Training. Unsatisfactory performance will result in disqualification by the Manager Responsible for Training. The candidate must successfully complete the entire qualification card to reestablish qualification. This qualification card applies to all CH sites except for Idaho National Laboratory (INL) and Los Alamos National Laboratory (LANL) Off Site Source Recovery Program (OSRP). The qualification cards for these sites are VE-PIT-01 and VE-OSRP-01, respectively.
Requalification Requirements	Items required for requalification are identified by text.

Indoctrination

(Required at Initial Qualification and Full Requalification)

Initial/Indoctrination Reading:

1. WP 15-GM1002, *Issues Management Processing of WIPP Forms*
2. CCP-HSP-014, *Health and Safety Program Implementation for CCP*
3. CCP-PO-001, *CCP Transuranic Waste Characterization Quality Assurance Project Plan*
4. CCP-PO-002, *CCP Transuranic Waste Certification Plan*
5. CCP-PO-003, *CCP Transuranic Authorized Methods for Payload Control (CCP CH-TRAMPAC)*
6. CCP-PO-005, *CCP Conduct of Operations*
7. CCP-PO-050, *CCP TRUPACT-III TRU Waste Authorized Methods for Payload Control (CCP TRUPACT-III TRAMPAC)*
8. CCP-QP-002, *CCP Training and Qualification Plan*
9. CCP-QP-005, *CCP TRU Nonconforming Item Reporting and Control*
10. CCP-QP-008, *CCP Records Management*
11. CCP-QP-010, *CCP Document Preparation, Approval, and Control*
12. CCP-QP-016, *CCP Control of Measuring and Testing Equipment*
13. CCP-QP-023, *CCP Handling, Storage, and Shipping*
14. CCP-TP-113, *CCP Standard Contact-Handled Waste Visual Examination*

I have read the listed Initial/Indoctrination Reading and understand my responsibilities as applicable to the procedures above.	P. Timon Trainee	3-9-15 Date

Visual Examination (VE) Operator/Independent Technical Reviewer (ITR) for Contact-Handled (CH) Waste Qualification Card

Name: Pat Timon 3-25-15 T. Timon

Additional Training Requirements		
1. WAP/QAPjP Briefing and Test *(One-time Requirement)*	Cheryl Amago / CCP Training	03-26-15 / Date
2. CCP-VE-101, *Visual Examination (VE) TRU Waste Characterization Briefing (Always Required)*	Cheryl Amago / CCP Training	03-26-15 / Date
3. VE-TEST-01, *Visual Examination (VE) Operator/ITR Comprehensive Examination (Always Required)*	Cheryl Amago / CCP Training	03-26-15 / Date

Formal Training	On-the-Job Training (OJT) Knowledge Requirements *(Required at Initial Qualification and Full Requalification)*	Visual Examination Expert (VEE) Subject Matter Expert (SME)/OJT Signature/Date
CCP-PO-001	1. List the Quality Assurance objectives validated by VE	3-25-15
	2. List the VE DQO's	3-25-15
CCP-QP-002	3. State the purpose of the List of Qualified Individuals (LOQI).	3-25-15
CCP-QP-005	4. State when a nonconformance report (NCR) should be prepared and who is responsible to initiate it.	3-25-15
	5. Describe how nonconforming items are documented.	3-25-15
	6. Describe how nonconforming items are controlled to prevent their use.	3-25-15
	7. State who has the responsibility to validate the NCR once initiated.	3-25-15
	8. Describe how to revise an NCR.	3-25-15
	9. Describe how to void an NCR.	3-25-15
WP 15-GM1002	10. Describe the purpose of the WIPP Form process.	3-25-15
	11. State the person responsible for originating a WIPP Form.	3-25-15

Visual Examination (VE)
Operator/Independent Technical Reviewer (ITR) for Contact-Handled (CH) Waste
Qualification Card

Name: Pat ~~Timon~~ 3-25-15 T. Timon

	12.	Describe how WIPP Forms are documented.	3-25-15
	13.	Describe who has responsibility for processing WIPP Forms, approving Corrective Action Plans, and approving closure of WIPP Forms.	3-25-15
	14.	Describe actions personnel may take when conditions adverse to quality are discovered.	3-25-15
CCP-QP-008	15.	List the responsibilities of record generators.	3-25-15
	16.	State the storage and control requirements for records.	3-25-15
	17.	Explain the process and proper method to make corrections or revisions to records.	3-25-15
CCP-QP-010	18.	State the importance of using approved documents.	3-25-15
	19.	State when to verify a document revision.	3-25-15
CCP-QP-016	20.	List the Measuring & Testing Equipment (M&TE) items used during VE.	3-25-15
CCP-TP-113/ CCP-VE-101 Briefing	21.	Explain the purpose of VE.	3-24-15
	22.	What are the 2 methods used in the VE process?	3-24-15
	23.	Who makes the determination of the method used?	3-24-15
	24.	Describe the unit of measurement for weights to be recorded for VE.	3-24-15
	25.	Describe where to obtain the tare weight of a waste container.	3-24-15
	26.	Describe where to obtain the gross weight of a waste container.	3-24-15
	27.	State the number of waste containers allowed per Batch Data Report (BDR).	3-24-15
	28.	State how often a camera check is performed when using Method #1.	3-24-15
	29.	Define "layers of confinement."	3-24-15

Visual Examination (VE) Operator/Independent Technical Reviewer (ITR) for Contact-Handled (CH) Waste Qualification Card

Name: Pat Timon 02.J.25.15 T. Timon

30.	Describe how to determine "maximum" layers of confinement.	3-24-15
31.	Describe authorized methods of closure of a liner bag.	3-24-15
32.	Describe how to determine Volume Utilization Percentage (VUP).	3-24-15
33.	Describe the actions taken if prohibited items are found.	3-24-15
34.	Discuss the requirements for packaging of sharp or heavy objects.	3-24-15
35.	State the waste material parameters (WMP).	3-24-15
36.	State how often a scale operational check is performed.	3-24-15
37.	Describe the information that should be recorded when describing waste items.	3-24-15
38.	State the criteria for a rigid liner to be considered vented.	3-24-15
39.	State three examples of potentially "unsafe" packages/items that may be found within a waste container.	3-24-15
40.	State five examples of prohibited items.	3-24-15
41.	Describe how a non-transparent container is handled when liquid is suspected.	3-24-15
42.	State the acceptable liquid limits in a characterized container.	3-24-15
43.	Explain the responsibilities and functions of the Independent Technical Reviewer (ITR).	3-24-15
44.	Describe the conditions that would generate an NCR during the VE process.	3-24-15
45.	Define how often calibration due dates should be checked on certified equipment.	3-24-15
46.	Define the increments in which the fill percent are recorded.	3-24-15
47.	Explain who is allowed to make data changes on data sheets.	3-24-15

Visual Examination (VE) Operator/Independent Technical Reviewer (ITR) for Contact-Handled (CH) Waste Qualification Card

Name: Pat Timon

Formal Training	OJT Practical Requirements[1] (This section must be performed in the presence of a VEE) (Always Required)			VEE SME/OJT Signature/Date
CCP-TP-113	1. Perform audio/video equipment operational checks.	P	S	3-25-15
	2. Perform pre-use scale calibration verification.	P	S	3-25-15
	3. Determine layers of confinement.	P	S	3-25-15
	4. Verify the physical form of the waste matches the waste description.	P	S	3-25-15
	5. Determine the Packaging Configuration	P	S	3-25-15
	6. Determine the WMP(s).	P	S	3-25-15
	7. Estimate the weight of each WMP.	P	S	3-25-15
	8. Obtain weight of each WMP.	P	S	3-25-15
	9. Determine the VUP.	P	S	3-25-15
	10. Obtain the output weight for the waste container.	P	S	3-25-15
	11. Prepare a BDR.	P	S	3-25-15
	12. Demonstrate how to make changes/corrections to a BDR.	P	S	3-25-15
	13. Complete an ITR.	P	S	3-25-15

[1] For simulated steps that involve the recording of information, the steps can be satisfied by the trainee's ability to identify the specific location in the correct record form where actual data would be entered, and explain where the information would be obtained. All required calculations will actually be performed. For simulations, representative data will be used in lieu of actual data. Circle "P" if actually performed or "S" if requirement was simulated.

Visual Examination (VE) Operator/Independent Technical Reviewer (ITR) for Contact-Handled (CH) Waste Qualification Card

Name: Pat ~~Timon~~ T. Timon

Approvals	
I have completed formal training and received OJT for this position. I fully understand my responsibilities as a CH VE Operator/ITR.	Pat T. Timon 3-25-15 Trainee *(printed name and signature)* Date
I have monitored the training of this individual and believe they are ready to perform the duties of a CH VE Operator/ITR. *(Validation by the VEE SME/OJT instructor(s) involved in the training of this individual)*	Tommy Mojica 3-25-15 VEE SME/OJT Instructor *(printed name and signature)* Date NA VEE SME/OJT Instructor *(printed name and signature)* Date
I approve this employee to perform the duties of a CH VE Operator/ITR.	Beverly Schrock BSSchrock 3-26-15 SPM *(printed name and signature)* Date

Approved for Content & Format:	**Tommy Mojica *(Approval on File)*** SME/OJT	**07/15/2014** Date
Approved for Applicability, Content & Format:	**Andrew Stallings *(Approval on File)*** Cognizant Engineer	**07/15/2014** Date
Approved for Content:	**Mike Ramirez *(Approval on File)*** SPM	**07/15/2014** Date
Approved for Applicability, Content, Format, & Use:	**A.J. Fisher *(Approval on File)*** Manager Responsible for Training	**07/15/2014** Date

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Visual Examination (VE) Operator/Independent Technical Reviewer (ITR) for Remote-Handled (RH) Waste Qualification Card

Name: Pat Tilmon

Education/Experience

Resume documenting education and experience on file with Central Characterization (CCP) Training.	Cheryl Kamp 04-06-15 CCP Training / Date

Job Specific Training

☐ Initial Qualification ☐ Requalification ☑ Full Requalification

Qualification Limit	**This qualification is valid for two (2) years.** If necessary, additional training may be required by the Site Project Manager (SPM) or the Manager Responsible for Training. Unsatisfactory performance will result in disqualification by the Manager Responsible for Training. The candidate must successfully complete the entire qualification card to reestablish qualification.
Requalification Requirements	Items required for requalification are identified by text.

Indoctrination

(Required at Initial Qualification and Full Requalification)

Initial/Indoctrination Reading:

1. DOE/WIPP-02-3214, *Remote-Handled TRU Waste Characterization Program Implementation Plan*
2. WP 15-GM1002, *Issues Management Processing of WIPP Forms*
3. CCP-HSP-014, *Health and Safety Program Implementation for CCP*
4. CCP-PO-001, *CCP Transuranic Waste Characterization Quality Assurance Project Plan*
5. CCP-PO-002, *CCP Transuranic Waste Certification Plan*
6. CCP-PO-005, *CCP Conduct of Operations*
7. CCP-PO-505, *CCP Remote-Handled Transuranic Waste Authorized Methods for Payload Control (CCP RH-TRAMPAC)*
8. CCP-QP-002, *CCP Training and Qualification Plan*
9. CCP-QP-005, *CCP TRU Nonconforming Item Reporting and Control*
10. CCP-QP-008, *CCP Records Management*
11. CCP-QP-010, *CCP Document Preparation, Approval, and Control*
12. CCP-QP-016, *CCP Control of Measuring and Testing Equipment*
13. CCP-QP-023, *CCP Handling, Storage, and Shipping*
14. CCP-TP-163, *CCP Evaluation of Waste Packaging Records for Visual Examination of Records*
15. CCP-TP-500, *CCP Remote-Handled Waste Visual Examination*
16. CCP-TP-509, *CCP Remote-Handled Transuranic Container Tracking*
17. CCP-TP-513, *CCP Procedure for Dimensional or Gravimetric Measurements for Radiological Characterization of Remote-Handled Transuranic Waste*

I have read the listed Initial/Indoctrination Reading and understand my responsibilities as applicable to the procedures above.	Pat Tilmon 3-25-15 Trainee / Date

Visual Examination (VE) Operator/Independent Technical Reviewer (ITR) for Remote-Handled (RH) Waste Qualification Card

Name: Pat Tilmon

Additional Training Requirements		
1. WAP/QAPjP Briefing & Exam *(One-time Requirement)*	Cheryl Amigo CCP Training	04-06-15 Date
2. CCP-VE-101, *Visual Examination (VE) TRU Waste Characterization Briefing* *(Always Required)*	Cheryl Amigo CCP Training	04-06-15 Date
3. VE Comprehensive Exam *(Always Required)*	Cheryl Amigo CCP Training	04-06-15 Date

Formal Training	On-the-Job Training (OJT) Knowledge Requirements *(Required at Initial Qualification and Full Requalification)*		Visual Examination Expert (VEE) Subject Matter Expert (SME)/OJT Signature/Date
CCP-PO-001	1.	List the VE Quality Assurance Objectives (QAOs) per the WAP.	3-26-15
	2.	List the VE Data Quality Objectives (DQOs) per the WAP.	3-26-15
DOE/WIPP 02-3214	3.	List the VE QAOs per the PIP.	3-26-15
	4.	List the VE DQOs per the PIP.	3-26-15
CCP-QP-002	5.	State the purpose of the List of Qualified Individuals (LOQI).	3-26-15
CCP-QP-005	6.	State when a nonconformance report (NCR) should be prepared and who is responsible to initiate it.	3-26-15
	7.	Describe how nonconforming items are documented.	3-26-15
	8.	Describe how nonconforming items are controlled to prevent their use.	3-26-15
	9.	State who has the responsibility to validate the NCR once initiated.	3-26-15
	10.	Describe how to revise a NCR.	3-26-15
	11.	Describe how to void a NCR.	3-26-15
WP 15-GM1002	12.	Describe the purpose of the WIPP Form process.	3-26-15
	13.	State the person responsible for originating a WIPP Form.	3-26-15

Visual Examination (VE) Operator/Independent Technical Reviewer (ITR) for Remote-Handled (RH) Waste Qualification Card

Name: Pat Tilmon

CCP-QP-008	14.	Describe how WIPP Forms are documented.	3-26-15
	15.	Describe who has responsibility for processing WIPP Forms, approving Corrective Action Plans, and approving closure of WIPP Forms.	3-26-15
	16.	Describe actions personnel may take when conditions adverse to quality are discovered.	3-26-15
	17.	List the responsibilities of record generators.	3-26-15
	18.	State the storage and control requirements for records.	3-26-15
	19.	Explain the process and proper method to make corrections or revisions to records.	3-26-15
CCP-QP-010	20.	State the importance of using approved documents.	3-26-15
	21.	State when to verify a document revision.	3-26-15
CCP-TP-500/ CCP-VE-101 Briefing	22.	List the Measuring & Testing Equipment (M&TE) items used during VE.	3-31-15
	23.	Explain the purpose of VE and the roles and responsibilities of the VE Operator.	3-31-15
	24.	Identify who is responsible for overall direction and implementation of the VE of that facility.	3-31-15
	25.	Define the two phases of VE technique for remote-handled waste.	3-31-15
	26.	State the number of waste containers allowed per Batch Data Report (BDR).	3-31-15
	27.	Define "layers of confinement."	3-31-15
	28.	State the authorized methods to close a liner bag.	3-31-15
	29.	State the action to be taken if a condition adverse to quality arises.	3-31-15
	30.	State the waste material parameters (WMP).	3-31-15
	31.	Describe the information that should be recorded when describing waste items.	3-31-15
	32.	State five (5) examples of prohibited items.	3-31-15
	33.	Describe how a non-transparent container is handled when liquid is suspected.	3-31-15

Visual Examination (VE) Operator/Independent Technical Reviewer (ITR) for Remote-Handled (RH) Waste Qualification Card

Name: Pat Tilmon

	34. State the acceptable liquid limits in a characterized container.			3-31-15
	35. Explain the responsibilities and functions of the Independent Technical Review (ITR).			3-31-15
	36. Describe how to determine Volume Utilization Percentage (VUP).			3-31-15
	37. State the allowable fill percent increments.			3-31-15
Formal Training	**OJT Practical Requirements** *(This section must be performed in the presence of a VEE)* *(Always Required)*			**VEE SME/OJT Signature/Date**
CCP-TP-500	1. Prepare the recording equipment. *(This activity is at the discretion of the SME instructor)*	(P)	S	4-2-15
	2. Complete CCP-TP-500 Attachment 1.	(P)	S	4-2-15
	3. Prepare a BDR.	(P)	S	4-2-15
	4. Determine the VUP.	(P)	S	4-2-15
	5. Complete an ITR.	(P)	S	4-2-15
	6. Determine Waste Material Parameter (WMP).	(P)	S	4-2-15
	7. Verify the physical form of the waste matches the waste stream ID.	(P)	S	4-2-15
CCP-TP-513	8. Perform a dimensional or gravimetric measurement and determine the measurement acceptability[2].	N/A P	S	4-2-15 N/A

[1] For simulated steps that involve the recording of information, the steps can be satisfied by the trainee's ability to identify the specific location in the correct record form where actual data would be entered, and explain where the information would be obtained. All required calculations will actually be performed; for simulations, representative data will be used in lieu of actual data. Circle "P" if actually performed or "S" if requirement was simulated.
[2] Procedure CCP-TP-513 is not applicable at all sites. The OJT Practical Requirement for this procedure is only required if the procedure is invoked.

Visual Examination (VE) Operator/Independent Technical Reviewer (ITR) for Remote-Handled (RH) Waste Qualification Card

Name: Pat Tilmon

Approvals	
I have completed formal training and received OJT for this position. I fully understand my responsibilities as a RH VE Operator/ITR.	Pat Tilmon 4-2-15 Trainee *(printed name and signature)* Date
I have monitored the training of this individual and believe they are ready to perform the duties of a RH VE Operator/ITR. *(Validation by the RH VEE SME/OJT instructor(s) involved in the training of this individual).*	Tommy Modica 4-2-15 RH VEE SME/OJT Instructor *(printed name and signature)* Date NA RH VEE SME/OJT Instructor *(printed name and signature)* Date
I approve this employee to perform the duties of a RH VE Operator/ITR.	Richard Kentowitz 4/7/15 SPM *(printed name and signature)* Date

Approved for Content & Format: **Wes Root *(Approval on File)*** **09/02/2014**
SME/OJT Date

Approved for Applicability, Content & Format: **Andrew Stallings *(Approval on File)*** **09/02/2014**
Cognizant Engineer Date

Approved for Content: **Charlie Turner *(Approval on File)*** **09/02/2014**
SPM Date

Approved for Applicability, Content, Format, & Use: **A.J. Fisher *(Approval on File)*** **09/02/2014**
Manager Responsible for Training Date

Attachment 7 – SPM Appointment

Date: June 23, 2015

Subject: Appointment for Derek Matheny for the position of Visual Examination Expert (VEE) and Subject Matter Expert (SME)

Based on Derek Matheny's resume and personal knowledge of Mr. Matheny's work history, I have determined he has suitable education and experience in accordance with CCP-QP-002, *CCP Training and Qualification Plan*, for the position of:

- ☑ Subject Matter Expert (SME) for Visual examination
- ☑ Visual Examination Expert (VEE) for the TWPC located at ORNL. This is a RH function. I have reviewed Derek Matheny's training file for qualification/familiarity to the applicable waste streams, experience handling TRU waste, and VE Operator qualifications.

Please initiate, as applicable, the CCP-specific training. David Matheny will not be considered qualified for these positions until all applicable/required training is complete, on file with CCP Training, and listed on the applicable LOQI(s).

If you have any questions, please contact me.

Thank you,

Irene Joo
Site Project Manager

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Attachment 7 – SPM Appointment Letter

Date: June 23, 2015

Subject: Appointment letter for Derek Matheny for the position of Visual Examination Expert (VEE) and Subject Matter Expert (SME) for Visual Examination.

Based on Derek Matheny's resume and/or personal knowledge of Derek Matheny's work history, I have determined he has suitable education and experience in accordance with CCP-QP-002, *CCP Training and Qualification Plan*, for the position of:

☒ Subject Matter Expert (SME) for Visual Examination.

☒ Visual Examination Expert (VEE) for the TRU Waste Processing Center Process Building at the Oak Ridge National Laboratory (ORNL). This is a CH function. I have reviewed Derek Matheny's training file for qualification/familiarity to the applicable waste stream, experience handling TRU waste and VE Operator qualifications. Derek has been a Visual Examination Lead at the ORNL and is familiar with the waste and processes at this site.

If you have any questions, please contact me.

Thank you,

Beverly S. Schrock

Beverly S. Schrock
Site Project Manager
Central Characterization Program
Nuclear Waste Partnership, LLC
Contractor for the U.S. Department of Energy
575-234-7444
575-706-0809 Cell

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Attachment 7 – SPM Appointment Letter

Date: March 19, 2015

Subject: Appointment letter for Tommy Mojica for the position of Visual Examination Expert (VEE).

Based on Tommy's resume and/or personal knowledge of Tommy's work history, I have determined he has suitable education and experience in accordance with CCP-QP-002, *CCP Training and Qualification Plan*, for the position of:

- ☐ Expert Analyst for (insert specific NDA equipment and location)
- ☐ RH Technical Staff
- ☐ (Initial) Subject Matter Expert (SME) for (insert operation or NDA unit).
- ☒ Visual Examination Expert (VEE) for the TRU Waste Processing Center Process Building at the Oak Ridge National Laboratory. This is a CH function. I have reviewed Tommy Mojica's training file for qualification/familiarity to the applicable waste streams, experience handling TRU waste, and VE Operator qualifications.

If you have any questions, please contact me.

Thank you,

BSSchrock

Beverly S. Schrock
Site Project Manager
Central Characterization Program
Nuclear Waste Partnership, LLC
Contractor for the U.S. Department of Energy
(575) 234-7444
(575) 706-0809 Cell

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Attachment 7 – SPM Appointment Letter

Date: March 19, 2015

Subject: Appointment letter for Tommy Mojica for the position of Remote-Handled Visual Examination Expert at Oak Ridge National Laboratory TWPC facility.

Based on Tommy Mojica's resume and personal knowledge of Visual Examination Expert (VEE) work history, I have determined he has suitable education and experience in accordance with CCP-QP-002, *CCP Training and Qualification Plan*, for the position of:

☑ Visual Examination Expert (VEE) for the TWPC facility at Oak Ridge National Laboratory. This is a RH function. I have reviewed Tommy Mojica's training file for qualification/familiarity to the applicable waste streams, experience handling TRU waste, and VE Operator qualifications.

Please initiate, as applicable, the CCP-specific training. Tommy Mojica will not be considered qualified for this position until all applicable/required training is complete, on file with CCP Training, and listed on the applicable LOQI(s).

If you have any questions, please contact me.

Thank you,
Irene Joo
Site Project Manager

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Attachment 7 – SPM Appointment Letter

Date: April 6, 2015

Subject: Appointment letter for Pat Tilmon for the position of Remote-Handled (RH) Visual Examination Expert (VEE) at the TWPC facility at Oak Ridge National Laboratory and Subject Matter Expert (SME) for Remote-Handled (RH) Visual Examination.

Based on Pat Tilmon's resume and/or personal knowledge of Pat Tilmon's work history, I have determined he has suitable education and experience in accordance with CCP-QP-002, *CCP Training and Qualification Plan*, for the position of:

- ☑ Subject Matter Expert (SME) for RH VE.
- ☑ Visual Examination Expert (VEE) for the TWPC at the Oak Ridge National Laboratory. This is a RH function. I have reviewed Pat Tilmon's training file for qualification/familiarity to the applicable waste streams, experience handling TRU waste, and VE Operator qualifications.

Please initiate, as applicable, the CCP-specific training. Pat Tilmon will not be considered qualified for these positions until all applicable/required training is complete, on file with CCP Training, and listed on the applicable LOQI(s).

If you have any questions, please contact me.

Thank you,

Irene Joo
Site Project Manager

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Attachment 7 – SPM Appointment Letter

Date: April 6, 2015

Subject: Appointment letter for Pat Tilmon for the position of Visual Examination Expert (VEE) and Subject Matter Expert (SME) for Visual Examination.

Based on Pat Tilmon's resume and/or personal knowledge of Pat Tilmon's work history, I have determined he has suitable education and experience in accordance with CCP-QP-002, *CCP Training and Qualification Plan*, for the position of:

☒ Subject Matter Expert (SME) for Visual Examination.

☒ Visual Examination Expert (VEE) for the TRU Waste Processing Center Process Building at the Oak Ridge National Laboratory (ORNL). This is a CH function. I have reviewed Pat Tilmon's training file for qualification/familiarity to the applicable waste stream, experience handling TRU waste and VE Operator qualifications. Pat has been a Project Manager and Vendor Project Manager at the ORNL and is familiar with the waste and processes at this site.

If you have any questions, please contact me.

Thank you,

Beverly S. Schrock

Beverly S. Schrock
Site Project Manager
Central Characterization Program
Nuclear Waste Partnership, LLC
Contractor for the U.S. Department of Energy
575-234-7444
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TABLE OF AUDITED DOCUMENTS			
NUMBER	**PROCEDURE NUMBER**	**REV**	**PROCEDURE TITLE**
1.	CCP-PO-001	22	CCP Transuranic Waste Characterization Quality Assurance Project Plan
2.	CCP-PO-002	27	CCP Transuranic Waste Certification Plan
3.	CCP-PO-027	6	CCP/TRU Waste Processing Center/Oak Ridge National Laboratory Interface Document
4.	CCP-QP-002	39	CCP Training and Qualification Plan
5.	CCP-QP-005	25	CCP TRU Nonconforming Item Reporting and Control
6.	CCP-QP-008	25	CCP Records Management
7.	CCP-QP-028	16	CCP Records Filing, Inventorying, Scheduling, and Dispositioning
8.	CCP-TP-001	21	CCP Project Level Data Validation and Verification
9.	CCP-TP-002	26	CCP Reconciliation of DQOs and Reporting Characterization Data
10.	CCP-TP-005	28	CCP Acceptable Knowledge Documentation
11.	CCP-TP-028	9	CCP Radiographic Test Drum and Training Container Construction
12.	CCP-TP-030	34	CCP CH TRU Waste Certification and WWIS/WDS Data Entry
13.	CCP-TP-033	22	CCP Shipping of CH TRU Waste
14.	CCP-TP-053	15	CCP Standard Real-Time Radiography (RTR) Inspection Procedure
15.	CCP-TP-068	12	CCP Standardized Container Management
16.	CCP-TP-113	19	CCP Standard Contact-Handled Waste Visual Examination
17.	CCP-TP-164	1	CCP Real-Time Radiography #7 Operating Procedure
18.	CCP-TP-165	3	CCP Real-Time Radiography #6 Operating Procedure
19.	CCP-TP-500	15	CCP Remote-Handled Waste Visual Examination
20.	CCP-TP-506	5	CCP Preparation of the Remote-Handled Transuranic Waste Acceptable Knowledge Characterization Reconciliation Report
21.	CCP-TP-507	8	CCP Shipping of Remote-Handled Transuranic Waste
22.	CCP-TP-530	12	CCP RH TRU Waste Certification and WWIS/WDS Data Entry
23.	WP 13-QA.03	25	QA Independent Assessment Program
24.	WP 15-GM1002	4	Issues Management Processing of WIPP Forms

Controlled
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Effective Date: JAN 13 2016

CCP-PO-001
Revision 22

CCP Transuranic Waste Characterization Quality Assurance Project Plan

Approved by: _____ Date: 1/5/2016
CCP Site Project Manager
Mike Ramirez

Approved by: _____ Date: 1/4/2016
Quality Assurance
Ronald Kuhn

Approved by: _____ Date: 1/5/2016
CCP Manager
Ed Gulbransen

Approved by: _____ Date: 1/12/2016
DOE-CBFO
Office of Quality Assurance Director
Michael R. Brown

Approved by: _____ Date: 1-13-16
DOE-CBFO
TRU Sites and Transportation Division Director
J.R. Stroble

Nuclear Waste Partnership
Carlsbad, NM

RECORD OF REVISION

Revision Number	Date Approved	Description of Revision
3	01/14/2002	Added Tables B-9, B-10, and B-11; Revised the CCP Organization Chart, Figure A-1; and made numerous editorial corrections.
4	05/31/2002	Revised the CCP Organization Chart, Figure A-1 and added 3 new positions in the responsibilities Section A-4; corrected an error in Table B3-1; revised Section B4-2; revised Sections B3-10, B3-12,B-4, and subsections, and revised Tables B3-11, B3-12, and B3-13 to reflect the current WAP.
5	02/05/2003	Revised the CCP Organization Chart, Figure A-1 and section A-4c to update to the Vice President of National TRU Program Division title. Changes made to implement the Drum Age Criteria (DAC) permit Modification.
6	06/11/2003	Updated to Revision 5 of the QAPD.
7	01/08/2004	Added procedures to Table B-9 and Table B-11.
8	03/15/2004	Added procedures to Table B-9, Table B-10 and Table B-11. Modified Site Project Quality Assurance Officer description and CCP Organization chart. Updated Table B1-2, Table B3-3, Section B3-5 to reflect the WAP. Updated Table B3-6, Table B4, Table B1-4, Section B-3a(2), B-3d(1)(a), Table B-1, and Table B-8 to delete PCBs. Section B-1c, 6th bullet revised to reflect the language of the WAP.
9	01/14/05	Revised to add procedures to Table B-9, Table B-10, and Table B-11. Incorporated CBFO DRR comments.
10	02/24/05	Revised to add procedure to table B-11, to incorporate LANL Off-Site Recovery Program Project Scope.
11	03/10/2005	Revised to add procedures to Section B1-2a and Table B-11. Added new table, Table B-9A, Solids Sampling Procedures Used by CCP.
12	03/22/2006	Revised procedures tables, Added new Table B-9, Listing of Permitted hazardous waste numbers and updated responsibilities.

RECORD OF REVISION (Continued)

Revision Number	Date Approved	Description of Revision
13	11/16/2006	Revised to implement changes to the Waste Isolation Pilot Plant Hazardous Waste Facility Permit requirements resulting from the Section 311/RH PMR.
14	03/28/2007	Revised procedure tables to add references to sections implemented by the procedure, and to align the wording of Section B7-2 with the wording in the permit.
15	08/10/2007	Revised to remove Visual Examination (VE) Expert decisions and signature and date from Table B3-11, Testing Batch Data Report Contents. Added the Idaho National Laboratory (INL) procedures to Attachment 1, Implementing Procedures.
16	10/31/2007	Revised to incorporate statistical terminology and text changes included in September 2007 Class 1 Permit Notifications and update Attachment 1, Implementing Procedures.
17	06/23/2009	Updated to agree with the Waste Isolation Pilot Plant (WIPP) Hazardous Waste Facility Permit Class 1 Modification dated July 2008.
18	06/30/2010	Revised to incorporate modifications to the Hazardous Waste Facility Permit. To make editorial changes that are needed and to change the Waste Isolation Pilot Plant (WIPP), Waste Information System (WWIS) to WWIS/Waste Data System (WDS).
19	12/29/2010	Revised to include changes from Permit Renewal.
20	06/16/2011	Revised to incorporate Class 2 Permit Modification (Transuranic Package Transporter Model III and Standard Large Box 2).
21	05/31/2013	Revised to clarify hierarchy of documents, adding Nuclear Waste Partnership (NWP) LLC, 13-1, *Quality Assurance Program Description*, also revised due to the Class 2 permit modification request (PMR) to the Waste Isolation Pilot Plant (WIPP) Permit, and made other administrative changes as needed.

RECORD OF REVISION (Continued)

Revision Number	Date Approved	Description of Revision
22	01/13/2016	Revised procedure to address New Mexico Environment Department (NMED) Compliance Order (CO) HWB-14021 (December 6, 2014). Changes include: strengthening and clarifying the requirements for implementation of characterization methods Acceptable Knowledge (AK), real-time radiography (RTR), and visual examination (VE), to ensure compliance with the Waste Acceptance Criteria (WAC) and to make administrative changes as needed.

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A INTRODUCTION

The Central Characterization Program (CCP) is tasked with characterizing and certifying transuranic (TRU) waste for disposal at the Waste Isolation Pilot Plant (WIPP). Characterization consists of acceptable knowledge (AK), radiography and visual examination (VE). This work is conducted in accordance with the Nuclear Waste Partnership, LLC (NWP), *Quality Assurance Program Description* (QAPD) and this Quality Assurance Project Plan (QAPjP).

This QAPjP describes how waste characterization and certification by the CCP comply with *Waste Isolation Pilot Plant Hazardous Waste Facility Permit* (HWFP), Attachment C - C6, *Waste Analysis Plan* (WAP) (New Mexico Environment Department [NMED]) and WP 13-1, *Nuclear Waste Partnership LLC Quality Assurance Program Description* (QAPD). The format of this QAPjP parallels that of the WAP.

NOTE

Throughout this document, there are references to procedures that implement the requirements. These references appear as a letter and one to three digits in parenthesis where the requirement is stated. Document users should then be able to refer to Attachment 1, Implementing Procedures, where these references list the procedure number and title.

A-1 Background

The WAP is organized such that it specifies that the generator/storage sites (hereinafter referred to as “sites”) conduct their own TRU waste characterization and certification, including their own data generation level and project level data validation and verification. However, some sites (typically small quantity sites) do not have the resources necessary to characterize and certify their TRU waste. Additionally, other sites have expressed interest in using subcontractors to augment their existing capabilities. The CCP was established to assist these sites as well as to provide cost-effective TRU waste characterization, confirmation, and certification, including data generation level and project level data validation and verification.

The CCP may provide its services to a site by contracting directly with that site. If this is the case, the scope of services provided by CCP are specified in a Statement of Work (SOW) issued by the site. The SOW also specifies health and safety requirements, quality requirements, and other requirements specific to that site. A site-specific interface document may also be prepared which provides more detail on the site-CCP interface.

The site has general management oversight responsibility for work performed by the CCP at the site. The site is responsible for ensuring that CCP conducts its activities in compliance with site requirements.

A-2 Scope

This QAPjP specifies quality requirements, management activities, and procedures necessary to meet the specific data quality objectives (DQOs) for TRU waste characterization as defined in the WAP and QAPD. Only TRU waste that has been characterized and certified in accordance with the WAP is shipped to the WIPP facility. TRU waste characterization and certification activities conducted by the CCP are performed in accordance with the requirements and implementing procedures identified in this QAPjP. In some cases, some characterization or certification activities are shared between the CCP and the Host site. The applicable implementing site documentation is specified in a SOW and supplemented by a site interface document, if required.

This QAPjP meets WAP characterization and certification requirements for contact-handled (CH) and remote-handled (RH) TRU waste. As used in this document, the term TRU waste includes TRU and TRU-mixed wastes. The term “characterization” is used where applicable to indicate the entire characterization process. Additionally, the WAP allows waste streams to be divided into waste stream lots. Therefore, the term waste stream may be used to indicate waste stream lots.

B PROJECT DESCRIPTION

Consistent with requirements in the WAP, CCP uses AK to initially characterize TRU waste. Section C4 of this QAPjP outlines the process used to characterize TRU waste using AK. AK documentation provides the basis for identifying the TRU waste eligible for WIPP disposal. The characterization process is based on the following:

- Waste considered for characterization is defense-related and has a TRU alpha activity greater than 100 nanocuries (nCi) per gram (g)
- Resource Conservation and Recovery Act (RCRA) hazardous waste determinations are made initially using AK for TRU waste streams

AK information for each waste stream is compiled in AK reports and supporting documentation. Based on AK, waste streams are delineated according to Summary Category Group, and waste matrix codes are assigned to each waste stream.

The CCP evaluates the characterization necessary to certify a particular waste stream. If additional characterization is needed to supplement site capabilities, the CCP uses mobile characterization facilities to perform characterization activities. Mobile characterization support is provided in accordance with this QAPjP. The CCP has the option to use data or transportation services from established TRU waste characterization activities at a U.S. Department of Energy (DOE)-Carlsbad Field Office (CBFO)-certified site.

B-1 Central Characterization Program Organization and Responsibilities

The CCP organization is shown in Figure B-1, CCP Organization, and responsibilities are described in the following sections. Figure B-1 includes generic CCP positions. More specific positions are described in the SOW or site interface plan.

B-2 Central Characterization Program (CCP) Manager

The CCP Manager is responsible for the day-to-day management and direction of CCP activities related to the characterization, certification, transportation, and disposal of TRU waste for DOE-CBFO. The CCP Manager is responsible for the following:

- Ensuring successful CCP/site interface
- Ensuring CCP plans and operations are coordinated, integrated, and consistent with DOE-CBFO programs, policies, and guidance
- Coordinating CCP activities and functioning as principal point of contact with DOE-CBFO and other regulating agencies
- Reviewing and approving this QAPjP

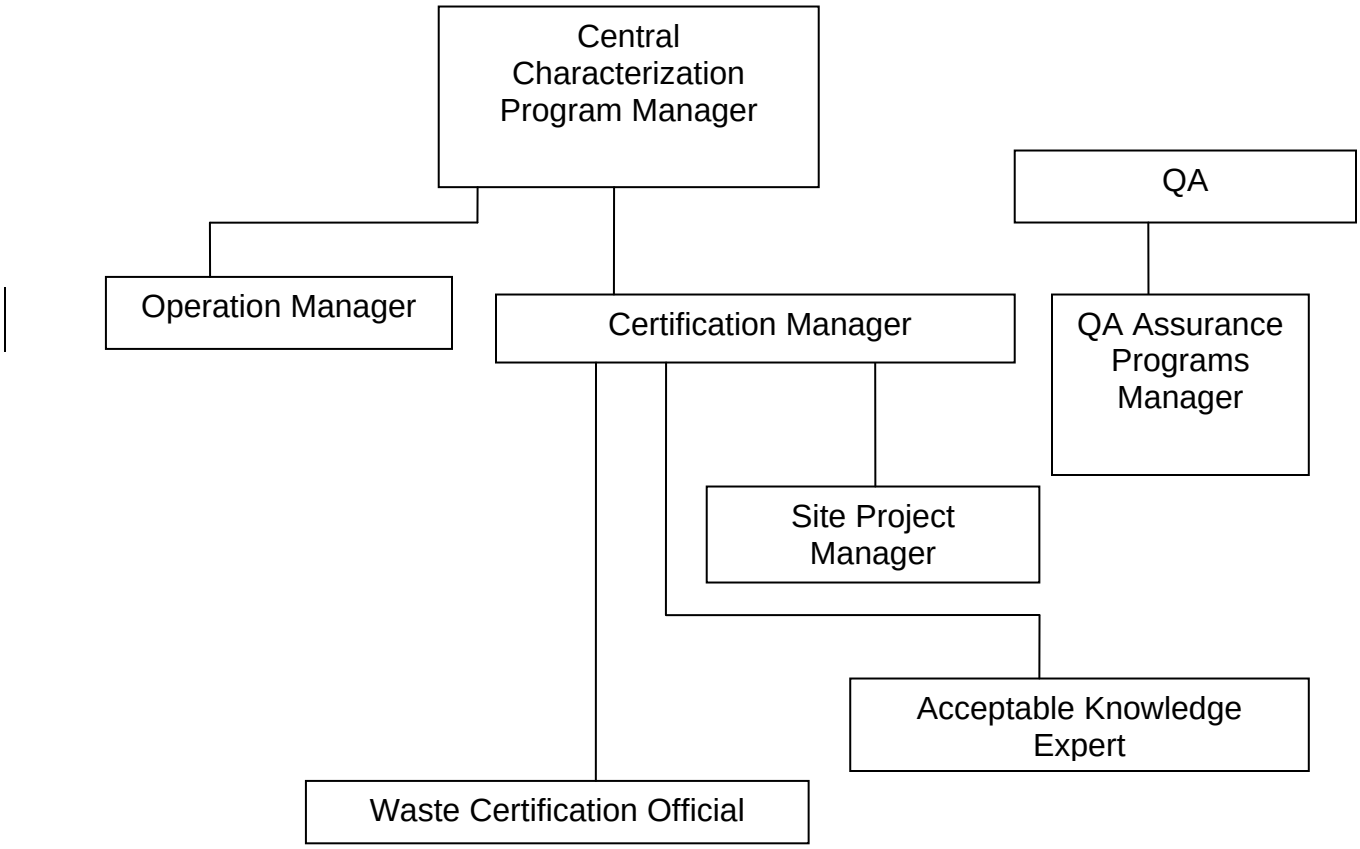
B-3 Site Project Manager

The Site Project Manager (SPM) oversees TRU waste characterization and certification activities and is responsible for the following:

- Developing, maintaining, reviewing, approving, and implementing CCP procedures and plans
- Scheduling revisions and distribution of CCP procedures and plans and forwarding these documents (if significantly revised) to DOE-CBFO for review and approval before implementation
- Reviewing and approving site interface documents (if used)
- Participating in internal audits and assessments
- Assisting quality assurance (QA) in developing project assessment criteria and responses to deficiency reports
- Halting characterization or certification activities if problems affecting the quality of the certification or work processes exist

- Ensuring CCP personnel receive appropriate training and orientation and maintain proficiency in work assignments
- Evaluating AK reports
- Reconciling AK information with characterization data
- Reconciling verified data with DQOs
- Ensuring that conditions adverse to quality are resolved and that corrective actions are implemented in a timely manner
- Preparing and submitting SPM Data Validation Summaries, Waste Stream Profile Forms (WSPFs), Characterization Information Summaries, and Waste Stream Characterization Packages (if requested by DOE-CBFO)
- Reviewing semi-annual QA/Quality Control (QC) summary reports and forwarding them and comments to the DOE-CBFO

Figure B-1. CCP Organization



C WASTE ANALYSIS PLAN

C-0 Introduction and Attachment Highlights

This QAPjP has been prepared for waste characterization activities to be conducted to meet requirements set forth in 20.4.1.500 New Mexico Administrative Code (NMAC) (incorporating 40 Code of Federal Regulation [CFR] §264.13) for waste disposal at the WIPP. This QAPjP includes test methods for complying with the general waste analysis requirements of 20.4.1.500 NMAC (incorporating 40 CFR §264.13), and a description of the QA/QC program. Before the CCP offers waste for shipment to the WIPP, the CCP implements the applicable requirements of this QAPjP.

TRU waste contains TRU radioactive components and may contain hazardous components, as defined in the New Mexico Hazardous Waste Act (HWA) and 20.4.1.200 NMAC (incorporating 40 CFR, §268.35). TRU waste is designated and separately packaged as either CH or RH, based on the radiological dose rate at the surface of the waste container.

The hazardous components of the TRU waste to be managed at the WIPP facility are designated in Table C-5, Listing of Permitted Hazardous Waste Numbers. Some of the waste is also identified by unique state hazardous waste numbers and is certified by the CCP if it meets the conditions of the WIPP Hazardous Waste Permit, Part 2, Table 2.3.4. This document describes the measures that will be taken to ensure that the TRU mixed wastes received at the WIPP facility are within the scope of Table C-5 as established by 20.4.1.500 NMAC (incorporating 40 CFR §264), and that they comply with unit-specific requirements of 20.4.1.500 NMAC (incorporating 40 CFR §264.600), Miscellaneous Units.

The CCP has developed this QAPjP to comply with the requirements of the WAP for characterizing CH/RH TRU wastes. The hazardous components of the TRU waste disposed at the WIPP facility are described on a WSPF for each waste stream (T2). TRU waste that may be certified by the CCP are generated at DOE facilities by defense activities, including the following:

- Production of nuclear products
- Plutonium recovery
- Research and development
- Decontamination and decommissioning

Some TRU waste is retrievably stored at the DOE sites. Additional TRU waste is generated and packaged into containers at these sites. Retrievably stored waste is defined as TRU waste generated after 1970 and before NMED notifies the Permittees, by approval of the final audit report, that the characterization requirements of the WAP

at a site have been implemented. Newly-generated waste is defined as TRU waste generated after NMED approves the final audit report for a site. Waste characterization of retrievably stored TRU waste is performed on an ongoing basis, as the waste is retrieved. AK information is assembled for both the retrievably stored and newly generated waste. Waste characterization of newly generated TRU waste is performed as it is generated, although some characterization occurs post-generation.

Waste characterization is defined in Part 1 as the activities performed by the waste generator to satisfy the general waste analysis requirements of 20.4.1.500 NMAC (incorporating 40 CFR §264.13[a]) before waste containers have been certified for disposal at WIPP. The characterization process for WIPP waste is presented in Figure C-2, Waste Characterization Process. CCP waste characterization programs are first audited by DOE, with the NMED approving the final audit report. After this, CCP determines whether AK alone is sufficient for characterization, or whether a radiography or VE in conjunction with AK is necessary to adequately characterize wastes. If an AK Sufficiency Determination is sought, information is provided to the Permittees for their review and DOE's provisional approval; NMED determination of adequacy of the AK information is required before final approval by DOE. If the radiography or VE route is chosen, sites proceed to perform radiography or VE in conjunction with AK and in accordance with this QAPjP. Once an AK Sufficiency Determination is obtained, or when required radiography or VE data are obtained, sites would then prepare and submit the WSPF for DOE's approval. Once the WSPF is approved, CCP may ship waste to WIPP. The Permittees will perform waste confirmation prior to shipment of the waste from the generator/storage site to WIPP pursuant to Section C7, performing radiography or VE of a representative subpopulation of certified waste containers, to ensure that the wastes meet the applicable requirements of the *Treatment, Storage, and Disposal Facility Waste Acceptance Criteria* (TSDF-WAC).

C-0a Waste Characterization

Characterization requirements for individual containers of TRU waste are specified on a waste stream basis. The WAP defines a waste stream as waste materials that have common physical form, that contain similar hazardous constituents, and that are generated from a single process or activity. Waste streams are grouped by waste matrix code groups related to the physical and chemical properties of the waste. The CCP uses the characterization techniques described in this QAPjP to assign the appropriate waste matrix code groups to waste streams for WIPP disposal. The waste matrix code groups are solidified inorganics, solidified organics, salt waste, soils, lead/cadmium metal, inorganic nonmetal waste, combustible waste, graphite, filters, heterogeneous debris waste, and uncategorized metal. Waste matrix code groups are grouped into three Summary Category Groups: Homogeneous Solids (Summary Category Group S3000), Soil/Gravel (Summary Category Group S4000), and Debris Waste (Summary Category Group S5000).

TRU wastes are initially categorized into the three broad Summary Category Groups that are related to the final physical form of the wastes. This categorization is based on the Summary Category Group constituting the greatest volume of waste for a waste stream. Waste characterization requirements for these groups are specified in Section C-2. Each of the three groups is described below.

S3000 - Homogeneous Solids

Homogeneous solids, are defined as solid materials, excluding soil, that do not meet the NMED criteria for classification as debris (20.4.1.800 NMAC [incorporating 40 CFR §268.2(g) and (h)]). Included in the series of homogeneous solids are inorganic process residues, inorganic sludges, salt waste, and pyrochemical salt waste. Other waste streams are included in this Summary Category Group based on the specific waste stream types and final waste form. This Summary Category Group is expected to contain toxic metals and spent solvents. This category includes wastes that are at least 50 percent by volume homogeneous solids.

S4000 - Soils/Gravel

This Summary Category Group includes S4000 waste streams that are at least 50 percent by volume soil/gravel. This Summary Category Group is expected to contain toxic metals.

S5000 - Debris Wastes

This Summary Category Group includes heterogenous waste that is at least 50 percent by volume materials that meet the criteria specified in 20.4.1.800 NMAC (incorporating 40 CFR §268.2 [g]). Debris means solid material exceeding a 2.36 inch (in.) (60 millimeter [mm]) particle size that is intended for disposal and that is:

1. a manufactured object, or

2. plant or animal matter, or

3. natural geologic material.

Particles smaller than 2.36 inches in size may be considered debris if the debris is a manufactured object and if it is not a particle of S3000 or S4000 material.

The most common hazardous constituents in the TRU waste to be managed in the WIPP facility consist of the following:

Metals

Some of the TRU waste to be emplaced in the WIPP facility contains metals for which 20.4.1.200 NMAC (incorporating 40 CFR §261.24), toxicity characteristics were established (Environmental Protection Agency [EPA] Hazardous Waste Numbers D004 through D011). Cadmium, chromium, lead, mercury, selenium, and silver are present in discarded tools and equipment, solidified sludges, cemented laboratory liquids, and waste from decontamination and decommissioning activities. A large percentage of the waste consists of lead-lined gloveboxes, leaded rubber gloves and aprons, lead bricks and piping, lead tape, and other lead items. Lead, because of its radiation-shielding applications, is the most prevalent toxicity-characteristic metal present.

Halogenated Volatile Organic Compounds

Some of the TRU waste to be emplaced in the WIPP facility contains spent halogenated volatile organic compound (VOC) solvents identified in 20.4.1.200 NMAC (incorporating 40 CFR §261.31) (EPA Hazardous Waste Numbers F001 through F005). Tetrachloroethylene; trichloroethylene; methylene chloride; carbon tetrachloride; 1,1,1-trichloroethane; and 1,1,2-trichloro-1,2,2,-trifluoroethane (EPA Hazardous Waste Numbers F001 and F002) are the most prevalent halogenated organic compounds identified in TRU waste that may be managed at the WIPP facility during the Disposal Phase. These compounds are commonly used to clean metal surfaces prior to plating, polishing, or fabrication; to dissolve other compounds; or as coolants. Because they are highly volatile, only small amounts typically remain on equipment after cleaning or, in the case of treated waste waters, in the sludges after clarification and flocculation. Radiolysis may also generate halogenated volatile organic compounds.

Nonhalogenated Volatile Organic Compounds

Xylene, methanol, and n-butanol are the most prevalent nonhalogenated VOCs in TRU waste that may be managed at the WIPP facility during the Disposal Phase. Like the halogenated VOCs, they are used as degreasers and solvents and are similarly volatile. The same analytical methods that are used for halogenated VOCs are used to detect the presence of nonhalogenated VOCs. Radiolysis may also generate non-halogenated volatile organic compounds.

The CCP will characterize waste in accordance with this QAPjP, and ensure that waste proposed for storage and disposal at WIPP meets the applicable requirements of the

TSDF-WAC in Part 2. The CCP will assemble the AK information in an auditable record[1] for the waste stream as described in Section C4. For those waste streams with an approved AK Sufficiency Determination (see below), radiography or VE per the methods described in Section C1 are not required.

All waste characterization activities specified in this QAPjP and associated attachments shall be carried out at generator/storage sites and DOE approved laboratories in accordance with this QAPjP. The DOE will audit the CCP waste characterization programs and activities as described in Section C-3. Waste characterization activities at the generator/storage sites include the following, although not all these techniques will be used on each container, as discussed in Section C-3:

- Radiography, an x-ray technique used to determine the physical contents of containers.
- VE of the contents of opened containers as an alternative way to determine their physical contents.
- Compilation of AK documentation into an auditable record.

C-0b AK Sufficiency Determination

CCP may submit a request to the Permittees for an AK Sufficiency Determination (Determination Request) to be exempt from the requirement to perform radiography or VE based on AK (T5). The contents of the Determination Request are specified in Section C4-3d.

The Permittees shall evaluate the Determination Request for completeness and technical adequacy. This evaluation shall include, but not be limited to whether the Determination Request is technically sufficient for the following:

- The Determination Request must include all information specified in Section C4-3d.
- The AK Summary must identify relevant hazardous constituents, and must correctly identify all toxicity characteristic and listed hazardous waste numbers.
- All hazardous waste number assignments must be substantiated by supporting data and, if not, whether this lack of substantiation compromises the interpretation.

[1]"Auditable records" means those records which allow the Permittees to conduct a systematic assessment, analysis, and evaluation of the Permittees' compliance with the WAP and the Permit.

- Resolution of data discrepancies between different AK sources must be technically correct and documented.

- The AK Summary must include all the identification of waste material parameter weights by percentage of the material in the waste stream, and determinations must be technically correct and substantiated by supporting information.

- All prohibited items specified in the TSDF-WAC should be addressed and conclusions drawn and must be substantiated by supporting information.

- If the AK record includes process control information specified in Section C4-3b, the information should include procedures, waste manifests, or other documentation demonstrating that the controls were adequate and sufficient.

- The site must provide the supporting information necessary to substantiate technical conclusions within the Determination Request, and this information must be correctly interpreted.

The Permittees will review the Determination Request for technical adequacy and compliance with the requirements of the Permit, using trained and qualified individuals in accordance with standard operating procedures that shall, at a minimum, address all of the technical and procedural requirements listed above. The Permittees shall resolve comments with the CCP.

If DOE determines that the AK is sufficient, it shall inform the public of the Determination Request, the Permittees' evaluation of it, and the date and time of a public meeting to provide information to and solicit comments from interested members of the public regarding the Determination Request. Notice of the meeting and comment period shall be provided by the following methods:

1. Written notice to all individuals on the facility mailing list;

2. Public notice in area newspapers, including the Carlsbad Current-Argus, Albuquerque Journal, and Santa Fe New Mexican;

3. Notice on the WIPP Home Page;

4. E-mail notification as specified In Permit Section 1.11.

DOE shall take written comment on the Determination Request for at least 30 days following the public meeting. DOE shall compile all such comments, including any disagreement between the DOE and commenters.

If DOE provisionally approves the Determination Request, it may forward it along with all relevant information submitted with the Determination Request to NMED for an evaluation that the provisional approval made by the DOE is adequate. DOE shall also provide to NMED, as a separate appendix to the Determination Request, the compilation of all comments and DOE's response to each comment. After submitting a Determination Request to NMED, the Permittees will post a link to the transmittal letter to NMED on the WIPP Home Page and inform those on the e-mail notification list as specified in Permit Section 1.11. Based on the results of NMED's evaluation, the Permittees will notify the CCP whether the AK information is sufficient and the Determination Request is approved. The DOE will not approve a Determination Request that NMED has determined to be inadequate unless the CCP resolves the inadequacies and provides the resolution to NMED for evaluation of adequacy. Should the inadequacies not be resolved to NMED's satisfaction, the DOE shall not submit a Determination Request for the same waste stream at a later date. DOE shall not submit a Determination Request, if a previous Determination Request is pending evaluation by NMED.

In the event the DOE disagrees, in whole or in part, with an evaluation performed by NMED resulting in a determination by NMED that the DOE's provisional approval for a particular waste stream is inadequate, the DOE may seek dispute resolution. The dispute resolution process is specified in Part 1. The Secretary's final decision under Permit Section 1.16.4 shall constitute a final agency action.

By July 1 of each year, the Permittees shall submit to NMED a list of waste streams the Permittees may submit for an AK Sufficiency Determination during the upcoming federal fiscal year. The Permittees will post a link to the transmittal letter to NMED and announce a public meeting to discuss the list with interested members of the public on the WIPP Home Page and inform those on the e-mail notification list as specified in Permit Section 1.11.

If the CCP does not submit a Determination Request, or if the DOE does not approve a Determination Request, or if NMED finds that the DOE's provisional approval of a Determination Request is inadequate, the CCP shall perform radiography or VE on 100 percent of the containers in a waste stream.

If the CCP submits a Determination Request, the DOE provisionally approves the Determination Request and NMED finds that the DOE's provisional approval is adequate, neither radiography nor VE of the waste stream is required.

C-0c Waste Stream Profile Form Completion

After a complete AK record has been compiled and either a Determination Request has been approved by the DOE or the CCP has completed the applicable representative testing requirements specified in Section C1, the CCP will complete a WSPF and

Characterization Information Summary (CIS) (T2). The requirements for the completion of a WSPF and a CIS are specified in Sections C3-6b(1) and C3-6b(2) respectively.

The WSPF and the CIS for the waste stream resulting from waste characterization activities are transmitted to the Permittees, who shall review them for completeness, and screen them for acceptance before the CCP proceeds with payload assembly of TRU waste into the CH or RH Packaging. The review and approval process will ensure that the submitted waste analysis information is sufficient to meet the DQOs for AK in Section C-4a(1) and allow the Permittees to demonstrate compliance with the requirements of the WIPP-WAP. Only TRU waste that meets the characterization requirements of the WAP is certified by the CCP. Only waste certified to meet the TSDF-WAC, specified in the WAP, is accepted at the WIPP facility for disposal in the permitted Underground Hazardous Waste Disposal Unit (HWDU). DOE will approve and provide NMED with copies of the approved WSPF and accompanying CIS prior to waste stream shipment. Upon notification of DOE's approval of the WSPF, the CCP may be authorized to ship waste to WIPP.

In the event that the Permittees request detailed information on a waste stream, the CCP provides a Waste Stream Characterization Package, as described in Section C3-6b(3). For each waste stream, this package will include the WSPF, the CIS, and the AK summary. The Waste Stream Characterization Package will also include specific Batch Data Reports (BDRs), and raw data associated with waste container characterization as requested by the Permittees.

C-0d Waste Confirmation

The Permittees will perform waste confirmation on a representative subpopulation of each waste stream shipment after certification and prior to shipment pursuant to Section C7. The Permittees will use radiography, review of radiography audio/video recordings, VE, or review of VE records (e.g., VE data sheets or packaging logs) to examine at least 7 percent of each waste stream shipment to confirm that the waste does not contain ignitable, corrosive, or reactive waste. Waste confirmation will be performed by the Permittees prior to shipment of the waste from the generator/storage site to WIPP.

C-1 Identification of TRU Waste to be Managed at the WIPP Facility

C-1a Waste Stream Identification

TRU waste destined for disposal at WIPP is characterized on a waste stream basis. The waste streams are delineated using AK. Required AK is specified in Section C-3a and Section C-4 of this QAPjP.

C-1b Waste Summary Category Groups and Hazardous Waste Accepted at the WIPP Facility

Once a waste stream is delineated, a waste matrix code is assigned to the waste stream based on its physical form. Waste streams are then assigned to one of the Summary Category Groups; S3000-Homogeneous Solids, S4000-Soils/Gravel, and S5000-Debris Wastes. These Summary Category Groups are then used to determine further characterization requirements.

The CCP considers only those TRU waste streams that are assigned EPA hazardous waste numbers listed in Table C-5. Waste identified by unique state hazardous waste numbers is acceptable at WIPP provided they meet the requirements of the TSDF-WAC. The CCP performs characterization of all waste streams as required by the WAP. If during the characterization process, new hazardous waste numbers are identified, those wastes are prohibited for disposal at the WIPP facility until a permit modification has been submitted and approved by NMED.

C-1c Waste Prohibited at the WIPP Facility

The following TRU wastes are prohibited for disposal at the WIPP facility:

- Liquid waste is not acceptable at WIPP. Liquid in the quantities delineated below is acceptable.
    - Observable liquid shall be no more than 1 percent by volume of the outermost container at the time of radiography or visual examination
    - Internal containers with more than 60 milliliters or 3 percent by volume observable liquid, whichever is greater, are prohibited
    - Containers with hazardous waste number U134 assigned shall have no observable liquid
    - Overpacking the outermost container that was examined during radiography or VE or redistributing untreated liquid within the container shall not be used to meet the volume limits

- Non-radionuclide pyrophoric materials, such as elemental potassium.
- Hazardous wastes not occurring as co-contaminants with TRU waste (non-mixed hazardous waste).
- Wastes incompatible with backfill, seal and panel closure materials, container and packaging materials, shipping container materials, or other wastes.
- Wastes containing explosives or compressed gases.
- Wastes with polychlorinated biphenyls (PCBs) not authorized under an EPA PCB waste disposal authorization.
- Wastes exhibiting the characteristic of ignitability, corrosivity, or reactivity (Hazardous Waste Numbers D001, D002, or D003).
- Any waste container from a waste stream (or waste stream lot) that has not undergone either radiographic or VE of a statistically representative subpopulation of the waste stream in each shipment, pursuant to Section C7.
- Any waste container from a waste stream which has not been preceded by an appropriate, certified WSPF (see Section C-1d).
- Waste that has ever been managed as high-level waste and waste from tanks specified in Table C-4, Waste Tanks Subject to Exclusion, unless specifically approved through a Class 3 permit modification.

Before accepting a container holding TRU waste, the Permittees will perform waste confirmation activities pursuant to Section C7 on each waste stream shipped to confirm that the waste does not contain ignitable, corrosive, or reactive waste and the assigned EPA hazardous waste numbers are allowed for storage and disposal by this QAPjP. Waste confirmation activities will be performed on at least 7 percent of each waste stream shipment. If a waste stream shipment contains fewer than 14 containers, one container will be examined to satisfy waste confirmation requirements. Section C-4 and Section C7 include descriptions of the waste confirmation processes that the Permittees will conduct prior to receiving a shipment at the WIPP facility.

Containers are vented through filters allowing any gases that are generated by radiolytic and microbial processes within a waste container to escape, thereby preventing over pressurization or development of conditions within the container that would lead to the formation of ignitable, corrosive, reactive, or other characteristic wastes. To ensure the integrity of the WIPP facility, waste streams identified to contain incompatible materials or materials incompatible with waste containers are not shipped to WIPP unless they are treated to remove the incompatibility. The CCP does not certify waste streams

identified to contain incompatible materials or materials incompatible with waste containers or backfill.

C-1d Control of Waste Acceptance

The CCP will provide a WSPF and CIS to the Permittee for each waste stream prior to shipment of the waste (T2). The WSPF and CIS elements are found in Section C3-6b(1) and Section C3-6b(2). The CCP will provide the WSPF to the Permittees for each waste stream prior to its acceptance for disposal at WIPP. The WSPF and the CIS will be transmitted to the Permittees for each waste stream. After WSPF submittal, if continued waste characterization activities reveal discrepancies that identify different hazardous waste numbers or indicate that the waste belongs to a different waste stream, the waste is redefined to a separate waste stream and a new WSPF is submitted.

The Permittees are responsible for the review of the WSPF and CISs to verify compliance with the restrictions on TRU wastes for WIPP disposal. Waste characterization data ensures the absence of prohibited items specified in Section C-1c. CCP determines by procedure the specific circumstances under which a WSPF is to be revised versus when a new WSPF is required.

The CCP provides a Waste Stream Characterization Package (as described in Section C3-6b(3)) to the Permittees upon request. The option for the Permittees to request additional information ensures that the waste being offered for disposal is adequately characterized and accurately described on the WSPF.

C-1e Waste Generating Processes at the WIPP Facility

Not applicable. This section applies to the Permittee.

C-2 Waste Characterization Program Requirements and Waste Characterization Parameters

The CCP has developed the procedures which specify the programmatic waste characterization requirements (Q10). DOE will evaluate the procedures during audits and as part of the review and approve of the WSPF.

CCP must notify the Permittees and obtain DOE approval prior to making data-affecting modifications to procedures (Q10). Program procedures shall address the following minimum elements:

- Waste characterization and certification procedures for retrievably stored and newly generated wastes to be sent to the WIPP facility.

- Methods used to ensure prohibited items are documented and managed. These will include procedures for performing radiography, VE, or treatment, if these methods are used to ensure prohibited items are not present in the waste prior to shipment of the waste to WIPP.

- Identify the organization(s) responsible for compliance with waste characterization and certification procedures.

- Identify the oversight procedures and frequency of actions to verify compliance with waste characterization and certification procedures.

- Develop training specific to waste characterization and certification procedures.

- Ensure that personnel may stop work if noncompliance with waste characterization or certification procedures is identified.

- Develop a nonconformance process that complies with the requirements in Section C3 to document and establish corrective actions.

- As part of the corrective action process, assess the potential time frame of the noncompliance, the potentially affected waste population(s), and the reassessment and recertification of those wastes.

- A listing of all approved hazardous waste numbers which are acceptable at WIPP are included in Table C-5.

For those waste streams or containers that are not amenable to radiography (e.g., RH TRU waste, direct loaded ten-drum overpacks [TDOPs]) for waste confirmation by the Permittees pursuant to Section C7, CCP VE data may be used for waste acceptance. In those cases, the Permittees will review the CCP VE procedures to ensure that data sufficient for the Permittees' waste acceptance activities pursuant to Section C7 will be obtained and the procedures meet the minimum requirements for VE specified in Section C1-2.

The following waste characterization parameters are obtained from the CCP prior to waste certification:

- Determination whether TRU waste streams comply with the applicable provisions of the TSDF-WAC.

- Determination whether TRU mixed wastes exhibit a hazardous characteristic (20.4.1.200 NMAC, incorporating 40 CFR §261 Subpart C).

- Determination whether TRU mixed wastes are listed (20.4.1.200 NMAC, incorporating 40 CFR §261 Subpart D).

- Estimation of waste material parameter weights.

Table C-1, Summary of Parameters, Characterization Methods, and Rationale for Transuranic Mixed Waste, provides the parameters of interest for the constituent groupings and testing methodologies.

C-3 Generator Waste Characterization Methods

The characterization techniques used by the CCP include AK and may also include, as necessary, VE, and radiography. Characterization activities are performed in accordance with this QAPjP. Table C-1, provides a summary of the characterization requirements for TRU waste.

C-3a Acceptable Knowledge

AK is used in TRU waste characterization activities in five ways:

- To delineate TRU waste streams

- To assess whether TRU mixed wastes comply with the TSDF-WAC

- To assess whether TRU wastes exhibit a hazardous characteristic (New Mexico Hazardous Waste Management Regulations in 20.4.1.200 NMAC incorporating 40 CFR §261 Subpart C)

- To assess whether TRU wastes are listed (20.4.1.200 NMAC, incorporating 40 CFR §261 Subpart D)

- To estimate waste material parameter weights

AK is discussed in detail in Section C4, which outlines the minimum set of requirements and DQOs met by the CCP in order to use AK.

C-3b Radiography and Visual Examination

Radiography and VE are nondestructive qualitative and quantitative techniques used to identify and verify waste container contents as specified in Section C1. The CCP performs radiography or VE of 100 percent of CH-TRU waste containers in waste streams except for those waste streams for which the DOE approves a Determination Request. No RH-TRU waste will be shipped to WIPP for storage or disposal without documentation of radiography or VE of 100 percent of the containers as specified in

Section C1. VE consists of either observing the filling of waste containers or opening full containers and physically examining their contents. Radiography and/or VE are used, when necessary, to examine a waste container to verify the physical form of the waste matches its waste stream description as determined by AK. These techniques detect observable liquid in excess of TSDF-WAC limits and containerized gases which are prohibited for WIPP disposal. The prohibition of liquid in excess of TSDF-WAC limits and containerized gases prevents the shipment of corrosive, ignitable, or reactive wastes. Radiography and/or VE are also able to verify the physical form of the waste matches its waste stream description (i.e., Homogeneous Solids, Soil/Gravel, or Debris Waste [including uncategorized metals]).

If the physical form does not match the waste stream description, the waste is designated as another waste stream and assigned the preliminary hazardous waste numbers associated with that new waste stream assignment. That is, if radiography and/or VE indicate that the waste does not match the waste stream description produced by AK characterization, a nonconformance report (NCR) is completed and the inconsistency resolved as specified in Section C4 (Q5), and the NCR will be dispositioned as specified in Section C3-7. The proper waste stream assignment is determined (including preparation of a new WSPF), the correct hazardous waste numbers are assigned, and the resolution is documented. The AK verification process is discussed in Section C4.

If CCP uses VE, the detection of any liquid in non-transparent internal containers, detected from shaking the internal container, is handled by assuming that the internal container is filled with liquid and adding this volume to the total liquid in the container being characterized using VE. The container being characterized using VE is then repackaged or rejected to exclude the internal container if it does not meet the requirements of the TSDF-WAC. When radiography is used or VE of transparent containers is performed, if any liquid in internal containers is detected, the volume of liquid is added to the total for the container being characterized using radiography or VE. Radiography, or the equivalent, is used as necessary on the existing or stored waste containers to verify the physical characteristics of the TRU waste corresponding with its waste stream identification and waste matrix code and to identify prohibited items. Radiographic examination protocols and QA/QC methods are provided in Section C1. Radiography and VE shall be subject to the Audit and Surveillance Program.

C-4 Data Verification and Quality Assurance

The CCP ensures that its applicable waste characterization process performance for generator/storage sites sending TRU waste to the WIPP for disposal meets WAP requirements through data validation, verification, usability and reporting controls. Verification occurs at three levels: 1) the CCP data generation level, 2) the CCP project level, which consists of verification and validation by the CCP to ensure that applicable WAP requirements are met and; 3) the Permittee level. The validation and verification process and requirements at each level are described in Section C3-4. The validation verification process at the Permittee Level is also described in C-5.

C-4a Data Generation and Project Level Verification Requirements

C-4a(1) Data Quality Objectives

The waste characterization data obtained through implementation of this QAPjP are used by the Permittees to ensure that the regulatory requirements of the WAP are met with regard to compliance and to ensure that TRU wastes are properly managed during the disposal phase.

To satisfy the RCRA regulatory compliance requirements, the following are DQOs established by the WAP and flowed down to this QAPjP (T2):

Acceptable Knowledge

- To delineate TRU waste streams.
- To assess whether TRU mixed wastes comply with the applicable requirements of the TSDF-WAC.
- To assess whether TRU mixed wastes exhibit a hazardous characteristic (20.4.1.200 NMAC, incorporating 40 CFR §261, Subpart C).
- To assess whether TRU mixed wastes are listed (20.4.1.200 NMAC, incorporating 40 CFR §261, Subpart D).
- To estimate waste material parameter weights.

Radiography and VE

- Verify the TRU mixed waste streams contain no prohibited items and to verify the physical form of the waste matches the waste stream description as to be determined by AK.

Reconciliation of these DQOs by the SPM as applicable, is addressed in Section C3-5a. Reconciliation requires determining whether sufficient types, quality, and quantity of data have been collected to ensure that the DQOs cited above can be achieved.

C-4a(2) Quality Assurance Objectives

The CCP shall demonstrate compliance with each quality assurance objective (QAO) associated with the characterization methods in Section C3. The SPM performs reconciliation of the data with the DQOs established in this QAPjP. The SPM concludes that all of the DQOs have been met for the characterization of the waste stream prior to submitting a WSPF to the DOE for approval (T2).

The following QAO elements are considered for each technique, as a minimum:

- Precision - a measure of the mutual agreement among multiple measurements
- Accuracy - the degree of agreement between a measurement result and the true or known value
- Completeness - a measure of the amount of valid data obtained from a method compared to the total amount of data obtained (expressed as a percentage)
- Comparability - the degree to which one data set can be compared to another
- Representativeness - the degree to which sample data represent characteristics of a population

A more detailed discussion of the QAOs can be found in Section C3, which describes the QAOs associated with each test method.

C-4a(3) Data Generation

BDRs, in a format approved by the DOE, are used by CCP for reporting waste characterization data. The CCP formats for reporting waste characterization data in BDRs are specified in several procedures. These procedures comply with the waste characterization data reporting requirements described in Section C3.

C-4a(4) Data Verification

BDRs document the testing, and on-line results from required characterization activities, and required QA/QC activities. Data validation, review, and verification are performed at the data generation level and the CCP project level before the required data are transmitted to the Permittees (T1). Section C3 discusses the data validation process in

greater detail. NMED may request, through the Permittees, copies of any BDR and/or the raw data validated by the CCP to check the DOE's audit of the validation and verification process.

C-4a(5) Data Transmittal

As part of the waste characterization data submittal, the CCP transmits the data electronically to the Permittees via the WIPP Waste Information System (WWIS)/Waste Data System (WDS) (T30, T530). Data will be entered into the WWIS/WDS in the exact format required by the data base as specified in Section C-5a(1) for WWIS/WDS reporting requirements and the DOE/WIPP-09-3427, *Waste Data System User's Manual* for the WWIS/WDS data fields and format requirements. BDRs include the information required by Section C3-4 and are transmitted by hard copy or electronically (provided a hard copy is available on demand) from the data generation level to the CCP project level.

Once a waste stream is fully characterized the SPM submits a WSPF, accompanied by a CIS for that waste stream to the Permittees, which includes a record of reconciliation with DQOs as described in Sections C3-6b(1) and C3-6b(2).

The WSPF, the CIS, and information from the WWIS/WDS is used as the basis for acceptance of waste characterization information on TRU wastes to be disposed of at WIPP.

C-4a(6) Records Management

Records related to waste characterization activities performed by the generator/storage sites will be maintained in the testing facility files or generator/storage site project files or at the WIPP Records Archive facility. Raw data obtained by testing TRU mixed waste in support of the WAP will be identifiable, legible, and provide documentary evidence of quality. TRU mixed waste characterization records submitted to the Permittees shall be maintained in the WIPP facility operating record and be available for inspection by NMED. A detailed description of CCP site-specific records management activities is provided in Section C7.

Records inventory and disposition schedule (RIDS) or an equivalent system shall be prepared and approved by CCP. All records relevant to an enforcement action under this Permit, regardless of disposition, shall be maintained in CCP Records at the generator/storage site or at the WIPP Records Archive facility until NMED determines they are no longer needed for enforcement action, and then dispositioned as specified in the approved RIDS. All waste characterization data and related QA/QC records for TRU mixed waste to be shipped to the WIPP facility are designated as either Lifetime Records or Non-Permanent Records. Records that are designated as Lifetime Records shall be maintained for the life of the waste characterization program by CCP Records

or generator/storage sites plus six years or transferred for permanent archival storage to the WIPP Records Archive facility.

Waste characterization records include characterization records (i.e., headspace gas sampling and homogeneous solids and soil/gravel sampling/analysis) generated through implementation of previous requirements in this WAP. Those waste characterization records designated as Non-Permanent Records shall be maintained for 10 years from the date of (record) generation by CCP Records or at the participating generator/storage site or at the WIPP Records Archive facility and then dispositioned according to their approved RIDS. If a generator/storage site ceases to operate, all records shall be transferred before closeout to the Permittees for management at the WIPP Records Archive facility. Table C-2, Required Program Records Maintained in Generator/Storage Site Project Files, is a listing of records designated as Lifetime Records and Non-Permanent Records.

Classified information will not be transferred to WIPP. Notations will be provided to the Permittees indicating the absence of classified information. The approved CCP RIDS will identify the appropriate disposition of classified information. Nothing in the WIPP Permit is intended to, nor should it be interpreted to, require disclosure of any DOE classified information to persons without appropriate clearance to view such information.

C-5 Permittee Level Waste Screening and Verification of TRU Mixed Waste

This section is not applicable to CCP. This section applies to the Permittees.

C-5a Phase I Waste Stream Screening and Verification

The first phase of the waste screening and verification process occurs before TRU waste is shipped to the WIPP facility. Before the Permittees begin the process of accepting TRU waste from the CCP, an initial audit is conducted as part of the Audit and Surveillance Program. The audit of CCP provides verification of characterization procedures; BDR preparation; and recordkeeping that ensures that all applicable provisions of the WAP requirements are met. Another portion of the Phase I verification is the WSPF approval process. At the WIPP facility, this process includes verification that all of the required elements of a WSPF and CIS are present and that the summarized waste characterization information meets acceptance criteria required for compliance with the WAP (Section C3-6b(1)).

The CCP has prepared this QAPjP, which includes applicable WAP requirements. This document is submitted to DOE for review and approval. The CCP implements the specific parameters of this QAPjP after Permittee approval. An initial audit is performed after QAPjP implementation and prior to the CCP being certified for shipment of waste to WIPP. Additional audits, focusing on the results of waste characterization, are

performed at least annually. The DOE has the right to conduct unannounced audits and to examine any records that are related to the scope of the audit. See Section C-5a(3) for further information regarding audits.

When the required waste stream characterization data have been collected by the CCP and the initial audit is successfully completed, the SPM will verify that the waste stream characterization meets the applicable WAP requirements as part of the project level verification (T2). If the waste characterization does not meet the applicable requirements of the WAP, the waste stream cannot be managed, stored, or disposed of at the WIPP until those requirements are met. The SPM will then complete the WSPF and submit it to the Permittees, along with the accompanying CIS for that waste stream. All data necessary to check the accuracy of the WSPF is transmitted to the Permittees. This provides notification that the CCP considers that the waste stream (identified by the waste stream identification number) has been adequately characterized for disposal prior to shipment to WIPP. The Permittees then compare radiography and VE data obtained subsequent to submittal and approval of the WSPF (and prior to submittal) with characterization information presented on this form. If the Permittees determine (through the data comparison) that the characterization information is adequate, DOE will approve the WSPF. Prior to the first shipment of containers from the approved waste stream, the approved WSPF and accompanying CIS is provided to NMED. If the data comparison indicates that analyzed containers have hazardous wastes not present on the WSPF, or a different waste matrix code applies, the WSPF is in error and is resubmitted. Ongoing WSPF examination is discussed in detail in Section C-5a(2).

Audits of CCP will be conducted as part of the Audit and Surveillance Program. The RCRA portion of the CCP audit program will provide on-site verification of waste characterization procedures; BDR preparation; and record keeping to ensure that all applicable provisions of the WAP requirements are met. As part of the waste characterization data submittal, the CCP also transmits the data on a container basis via the WWIS/WDS prior to shipment of that container. This data submittal occurs at any time as the data are being collected, but is complete for each container prior to shipment of that container. The WWIS/WDS conducts internal edit/limit checks based on the approved WSPF. The Permittees compare ongoing characterization data obtained and submitted via the WWIS/WDS to the approved WSPF. If this comparison shows that containers have hazardous wastes not reported on the WSPF, or a different waste matrix code applies, the data are rejected and the waste containers are not accepted for shipment until a new or revised WSPF is submitted to Permittees' and approved by the DOE.

If discrepancies regarding hazardous waste number assignment or Waste Matrix Code designation arise as a result of the Phase I review, the CCP is contacted by the Permittees and provides the necessary additional information to resolve the discrepancy before that waste stream is approved for disposal at the WIPP facility. If the discrepancy is not resolved, the waste stream is not approved for shipment.

C-5a(1) WWIS/WDS Description

The CCP supplies the required data to the Permittees via the WWIS/WDS (T30, T530). The WWIS/WDS Data Dictionary includes all of the data fields, the field format and the limits associated with the data as established by the WIPP WAP. These data will be subjected to edit and limit checks that are performed automatically by the database, as defined in the DOE/WIPP-09-3427. The Permittees will coordinate the data transmission with CCP. Actual data transmission will use appropriate technology to ensure the integrity of the data transmissions. The Permittees will require sites with large waste inventories and large databases to populate a data structure provided by the Permittees that contains the required data dictionary fields that are appropriate for the waste stream (or waste streams) at the site. The Permittees will access these data via the Internet to ensure an efficient transfer of this data. Small quantity sites will be given a similar data structure by the Permittees that is tailored to their types of waste. Sites with very small quantities of waste will be provided with the ability to assemble the data interactively to this data structure on the WWIS/WDS.

The Permittees will use the WWIS/WDS to verify that all of the supplied data meet the applicable edit and limit checks prior to the shipment of any TRU waste to WIPP. The WWIS/WDS automatically notifies the CCP if any of the supplied data fails to meet the requirements of the edit and limit checks via an appropriate error message. The CCP corrects the discrepancy with the waste or the waste data and re-transmits the corrected data prior to acceptance of the data by the WWIS/WDS. The Permittees review data reported for each container of each shipment prior to providing notification to the CCP that the shipment is acceptable.

Access to the WWIS/WDS is controlled by the Permittees' Data Administrator (DA) who controls the WWIS/WDS users based on approval from management personnel.

The CCP only has access to CCP data supplied to WWIS/WDS, and only until the data have been formally accepted by the Permittees. After the data have been accepted, the data are protected from indiscriminate change and only changed by an authorized DA.

C-5a(2) Examination of the Waste Stream Profile Form and Container Data Checks

The Permittees verify the completeness and accuracy of the WSPF (Section C3-6b(1)). The assignment of the waste stream description, waste matrix code group, and Summary Category Groups; the AK summary documentation; the methods used for characterization; the DOE certification, and appropriate designation of hazardous waste number(s) are examined by the Permittees. If the WSPF is inaccurate, efforts are made to resolve discrepancies by contacting the CCP in order for the waste stream to be eligible for shipment to the WIPP facility. If discrepancies in the waste stream are detected, the CCP implements a non-conformance action to identify, document, and report discrepancies.

The WSPF shall pass all verification checks by the Permittees in order for the waste stream to be approved by DOE for shipment to the WIPP facility. The WSPF check against waste container data will occur during the initial WSPF process (Section C-5a). Waste data transferred via the WWIS/WDS after WSPF approval is compared with the approved WSPF. Any container from an approved hazardous waste stream with a description different from its WSPF is not shipped to the WIPP for disposal.

The CCP verifies that the three different types of data specified below are available for every container holding TRU waste before that waste is managed, stored, or disposed at WIPP: 1) an assignment of the waste stream's waste description (by waste matrix codes) and waste matrix code group; 2) a determination of ignitability, reactivity, and corrosivity; and 3) a determination of compatibility. The CIS indicates if the waste was checked for the characteristics of ignitability, corrosivity, and reactivity.

Any container with unresolved discrepancies associated with hazardous waste characterization will not be managed, stored, or disposed at the WIPP facility until the discrepancies are resolved. If discrepancies cannot be resolved, the DOE will revoke the approval status of the waste stream and CCP will suspend shipments of the waste stream. Waste stream approval will not be reinstated until the CCP demonstrates all corrective actions have been implemented and the CCP waste characterization program is reassessed by the DOE.

C-5a(3) Audit and Surveillance Program

This section is not applicable to the CCP. It applies to the Permittees.

C-5b Phase II Waste Shipment Screening and Verification

For each container shipped, the CCP provides the following information (T86):

Hazardous Waste Manifest Information:

- Generator/storage site name and EPA Identification Number
- CCP contact name and phone number
- Quantity of waste
- List of up to six state and/or federal hazardous waste numbers in each line item
- Listing of all shipping container identification numbers (IDs) (Shipping Package serial number)

- Signature of authorized generator representative

Specific Waste Container information:

- Waste Stream Identification Number
- List of hazardous Waste Numbers per Container
- Certification Data
- Shipping Data (assembly numbers, ship date, shipping category, etc.)

This information is also supplied electronically to the WWIS/WDS. The container-specific information will be supplied electronically as described in Section C-5a(1), and is supplied prior to shipment.

C-5b(1) Examination of the EPA Uniform Hazardous Waste Manifest and Associated Waste Tracking Information

Manifest discrepancies will be identified during manifest examination and container bar-code WWIS/WDS data comparison. A manifest discrepancy is a difference between the quantity or type of hazardous waste designated on the manifest and the quantity or type of hazardous waste the WIPP facility actually receives. The CCP technical contact (as listed on the manifest) is contacted to resolve the discrepancy. Errors on the manifest are corrected by the WIPP facility with a verbal (followed by a mandatory written) concurrence by the CCP technical contact. If the manifest discrepancies are not resolved in thirty (30) days of waste receipt, the shipment is returned to the facility where the CCP performed the characterization.

C-5b(2) Examination of the Land Disposal Restriction Notice

TRU waste designated by the Secretary of Energy for disposal at WIPP is exempt from the Land Disposal Restrictions (LDRs) by the *WIPP Land Withdrawal Act Amendment* (Public Law 104-201). This amendment states that WIPP “Waste is exempted from treatment standards promulgated pursuant to section 3004(m) of the Solid Waste Disposal Act (42 U.S.C. 6924[m]) and shall not be subjected to the Land Disposal prohibitions in section 3004(d), (e), (f), and (g) of the Solid Waste Disposal Act.”

Therefore, with the initial shipment of a TRU waste stream, the CCP provides the Permittees with a onetime written notice. The notice includes the information listed below:

Land Disposal Restriction Notice Information:

- EPA hazardous waste numbers and Manifest Numbers of first shipment of a mixed waste stream
- Statement: this waste is not prohibited from land disposal
- Date the waste is subject to prohibition

This information is the applicable information taken from column "268.7(a)(4)" of the "Generator Paperwork Requirements Table" in 20.4.1.800 NMAC (incorporating 40 CFR §268.7(a)(4)). Note that item "5" from the "Generator Paperwork Requirements Table" is not applicable since waste analysis data are provided electronically via the WWIS/WDS and item "7" is not applicable since waste designated by the Secretary of Energy for disposal at WIPP is exempted from the treatment standards.

The Permittees review the LDR notice for accuracy and completeness. The CCP prepares this notice in accordance with the applicable requirements of 20.4.1.800 NMAC (incorporating 40 CFR §268.7(a)(4)).

C-5b(3) Verification

This section is not applicable to CCP. This section applies to the Permittees.

C-6 Permittees' Waste Shipment Screening QA/QC

This section is not applicable to CCP. This section applies to the Permittees.

C-7 Records Management and Reporting

All waste characterization data for each TRU waste container transmitted to WIPP shall be maintained by the Permittees for the active life of the WIPP facility plus two years (Q8). The active life of the WIPP facility is defined as the period from the initial receipt of TRU waste at the facility until NMED receives certification of final closure of the facility. After their active life, the records shall be retired to the WIPP Records Archive facility and maintained for 30 years. These records will then be offered to the National Archives. However, this disposition requirement does not preclude the inclusion of these records in the permanent marker system or other requirements for institutional control.

Waste characterization and waste confirmation data and documents related to waste characterization that are part of the WIPP facility operating record are managed in accordance with the following guidelines:

C-7a General Requirements

- Records shall be legible
- Corrections shall be made with a single line through the incorrect information, and the date and initial of the person making the correction shall be added
- Black ink is encouraged, unless a copy test has been conducted to ensure the other color ink will copy
- Use of highlighters on records is discouraged
- Records shall be reviewed for completeness
- Records shall be validated by the cognizant manager or designee

C-7b Records Storage

- Active records shall be stored when not in use
- Quality records shall be kept in a one-hour (certified) fire-rated container or a copy of a record shall be stored separately (sufficiently remote from the original) in order to prevent destruction of both copies as a result of a single event such as fire or natural disaster
- Unauthorized access to the records is controlled by locking the storage container or controlling personnel access to the storage area

C-8 Reporting

This section is not applicable to CCP. This section applies to the Permittees.

Table C-1. Summary of Parameters, Characterization Methods, and Rationale for Transuranic Mixed Waste

Waste Matrix Code Summary Categories	Waste Matrix Code Groups	Characterization Parameter	Method	Rationale
S3000-Homogeneous Solids	• Solidified inorganics • Salt waste • Solidified organics	Physical waste form	Acceptable knowledge, radiography and/or visual examination	• Determine waste matrix • Demonstrate compliance with waste acceptance criteria (e.g., no liquid in excess of TSDF-WAC limits, no incompatible wastes, no compressed gases)
S4000-Soil/Gravel	• Contaminated soil/debris			
S5000-Debris Waste	• Uncategorized metal (metal waste other than lead/cadmium) • Lead/cadmium waste • Inorganic nonmetal waste • Combustible waste • Graphite waste • Heterogeneous debris waste • Composite filter waste	Hazardous constituents • Listed • Characteristic	Acceptable knowledge	• Determine assignment of EPA hazardous waste numbers

Table C-2. Required Program Records Maintained in Generator/Storage Site Project Files

Lifetime Records
• Field sampling data forms • Field and laboratory chain-of-custody forms • Test facility and laboratory batch data reports • Waste Stream Characterization Packages • Sampling plans • Data reduction, validation, and reporting documentation • AK documentation • WSPFs and CIS
Non-Permanent Records
• Nonconformance documentation • Variance documentation • Assessment documentation • Gas canister tags • Methods performance documentation • Performance Demonstration Program documentation • Sampling equipment certifications • Calculations and related software documentation • Training/qualification records • QAPjPs documentation (all revisions) • Calibration documentation • Analytical raw data • Procurement records • QA and technical procedures (all revisions) • Audio/video recordings (radiography, VE)

Table C-3. WIPP Waste Information System Data Fields[a]

Characterization Module Data Fields [b]	
Container ID [c] Generator EPA ID Generator Address Generator Name Generator Contact Hazardous Code Layers of Packaging Liner Exists Liner Hole Size Filter Model Number of Filters Installed Item Description Code Haz. Manifest Number NDE Complete [e]	Transporter EPA ID Transporter Name Visual Exam Container [e] Waste Material Parameter [d] Waste Material Weight [d] Waste Matrix Code Waste Matrix Code Group Waste Stream Profile Number
Certification Module Data Fields	
Container ID [c] Container type Container Weight Contact Dose Rate Container Certification date Container Closure Date Handling Code	
Transportation Data Module	
Contact Handled Package Number Assembly Number [f] Container IDs [c,d] ICV Closure Date Ship Date Receive Date	
Disposal Module Data	
Container ID [c] Disposal Date Disposal Location	

[a] This is not a complete list of the WWIS/WDS data fields.
[b] Some of the fields required for characterization are also required for certification and/or transportation.
[c] Container ID is the main relational field in the WWIS/WDS Database.
[d] This is a multiple occurring field for each waste material parameter, nuclide, etc.
[e] These are logical fields requiring only a yes/no.
[f] Required for 7-Packs of 55-gallon drums, 4-packs of 85-gallon drums, or 3-packs of 100-gallon drums to tie all of the drums in that assembly together. This facilitates the identification of waste containers in a shipment without need to breakup the assembly.

Table C-4. Waste Tanks Subject to Exclusion

Hanford Site - 177 Tanks	
A-101 through A-106	C-201 through C-204
AN-101 through AN-107	S-101 through S-112
AP-101 through AP-108	SX-101 through SX-115
AW-101 through AW-106	SY-101 through SY-103
AX-101 through AX-104	T-101 through T-112
AY-101 through AY-102	T-201 through T-204
B-101 through B-112	TX-101 through TX-118
B-201 through B-204	TY-101 through TY-106
BX-101 through BX-112	U-101 through U-112
BY-101 through BY-112	U-201 through U-204
C-101 through C-112	
Savannah River Site - 51 Tanks	
Tank 1 through 51	
Idaho National Laboratory - 15 Tanks	
WM-103 through WM-106	WM-180 through WM-190

Table C-5. Listing of Permitted Hazardous Waste Numbers

EPA Hazardous Waste Numbers			
F001	D019	D043	U079
F002	D021	P015	U103
F003	D022	P030	U105
F004	D026	P098	U108
F005	D027	P099	U122
F006	D028	P106	U133*
F007	D029	P120	U134*
F009	D030	U002*	U151
D004	D032	U003*	U154*
D005	D033	U019*	U159*
D006	D034	U037	U196
D007	D035	U043	U209
D008	D036	U044	U210
D009	D037	U052	U220
D010	D038	U070	U226
D011	D039	U072	U228
D018	D040	U078	U239*

* Acceptance of U-numbered wastes listed for reactivity, ignitability, or corrosivity characteristics is contingent upon a demonstration that the wastes no longer exhibit the characteristic of reactivity, ignitability, or corrosivity.

Figure C-1. Waste Stream Profile Form (Example Only)

(1) Waste Stream Profile Number:							
(2) Generator site name:						(3) Generator site EPA ID:	
(4) Technical contact:						(5) Technical contact phone number:	
(6) Date of audit report approval by New Mexico Environment Department (NMED):							
(7) Title, version number, and date of documents used for WIPP-WAP Certification:							
(8) Did your facility generate this waste?	YES		NO				
(9) If no, provide the name and EPA ID of the original generator:							
Waste Stream Information[1]							
(10) WIPP ID:						(11) Summary Category Group:	
(12) Waste Matrix Code Group:						(13) Waste Stream Name:	
(14) Description from the ATWIR:							
(15) Defense TRU Waste:	YES		NO				
(16) Check One:	CH		RH				
(17) Number of standard waste boxes (SWBs) (17a) Number of standard large box 2 (SLB2)		(18) Number of Drums				(19) Number of Canisters	
(20) Batch Data Report numbers supporting this waste stream characterization:							
(21) List applicable EPA Hazardous Waste Numbers:[2]							
(22) Applicable TRUCON Content Numbers:							
(23)**Acceptable Knowledge Information**[1]							
(For the following, enter the supporting documentation used [i.e., references and dates])							
Required Program Information							
(23A) Map of site:							
(23B) Facility mission description:							
(23C) Description of operations that generate waste:							
(23D) Waste identification/categorization schemes:							
(23E) Types and quantities of waste generated:							
(23F) Correlation of waste streams generated from the same building and process, as applicable:							
(24) Waste certification procedures:							
(25) Required Waste Stream Information							
(25A) Area(s) and building(s) from which the waste stream was generated:							
(25B) Waste stream volume and time period of generation:							
(25C) Waste generating process description for each building:							
(25D) Waste Process flow diagrams:							
(25E) Material inputs or other information identifying chemical/radionuclide content and physical waste form:							
(25F) Waste Material Parameter Weight Estimates per unit of waste							
(26) Which Defense Activity generated the waste:							
	Weapons activities including defense inertial confinement fusion						Naval Reactors development
	Verification and control technology						Defense research and development
	Defense nuclear waste and material by products management						Defense nuclear material production
	Defense nuclear waste and materials security and safeguards and security investigations						

Figure C-1. Waste Stream Profile Form (Example Only) (continued)

(27) Supplemental Documentation:	
(27A) Process design documents:	
(27B) Standard operating procedures:	
(27C) Safety Analysis Reports:	
(27D) Waste packaging logs:	
(27E) Test plans/research project reports:	
(27F) Site databases:	
(27G) Information from site personnel:	
(27H) Standard industry documents:	
(27I) Previous analytical data:	
(27J) Material safety data sheets:	
(27K) Sampling and analysis data from comparable/surrogate Waste:	
(27L) Laboratory notebooks:	
Confirmation Information[2]	
For the following, when applicable, enter procedure title(s), number(s) and date(s)	
(28)	Radiography:
	Visual Examination:
(29) Comments: For a list of the waste characterization procedures used and date of respective procedures see the list of procedures on the attached CIS.	

Reviewed by AK Expert: **YES** ☐ **Date:** _____

Reviewed by STR (if necessary): **YES** ☐ **N/A** ☐ **Date:** _____

Waste Stream Profile Form Certification:

I hereby certify that I have reviewed the information in this Waste Stream Profile Form, and it is complete and accurate to the best of my knowledge. I understand that this information will be made available to regulatory agencies and that there are significant penalties for submitting false information, including the possibility of fines and imprisonment for knowing violations.

Signature of Site Project Manager	Printed Name	Date

Controlled
Copy

Figure C-2. Waste Characterization Process (Reprinted from the WAP, Figure C-2)

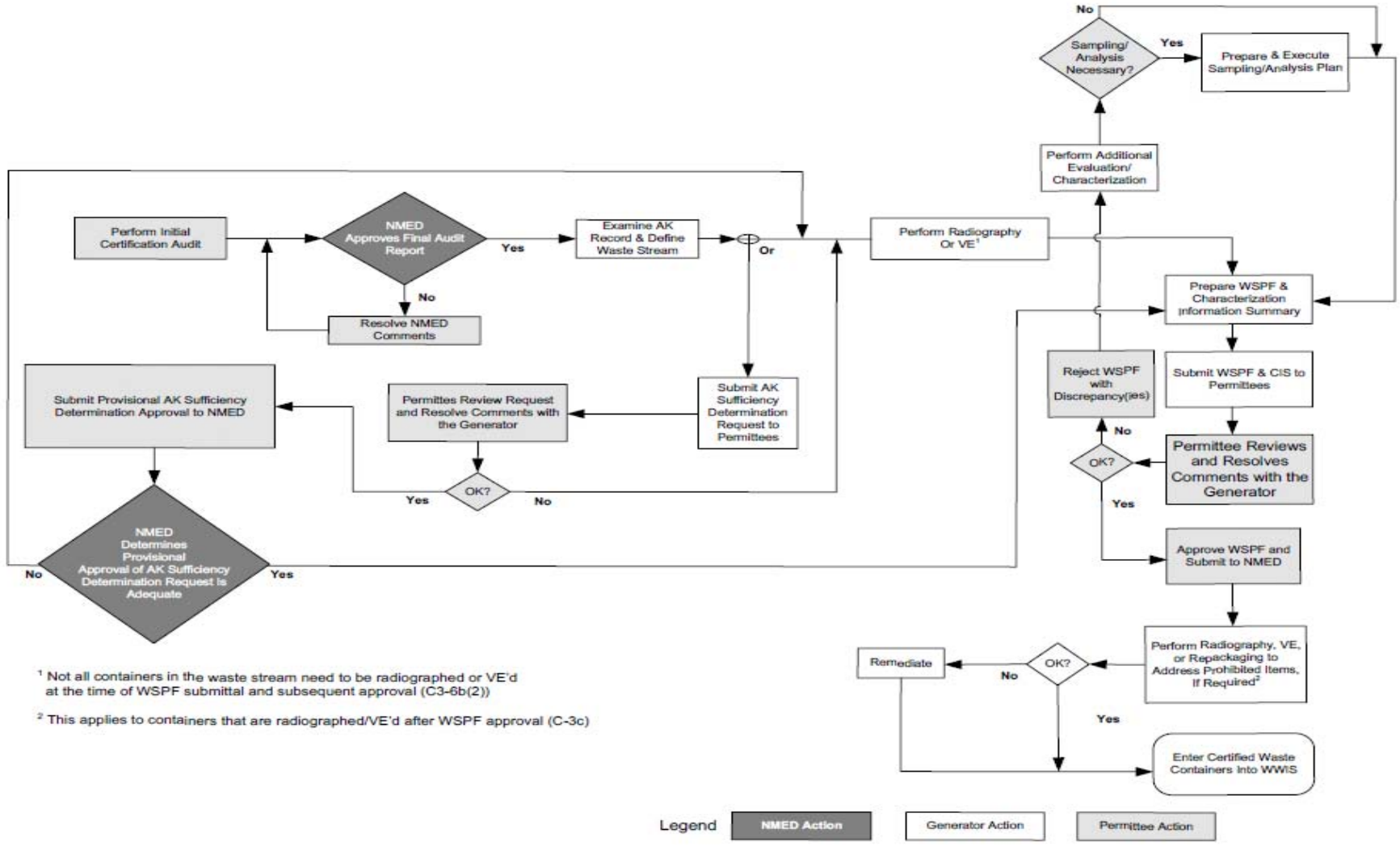


Figure C-3. TRU Mixed Waste Screening and Verification Flow Diagram

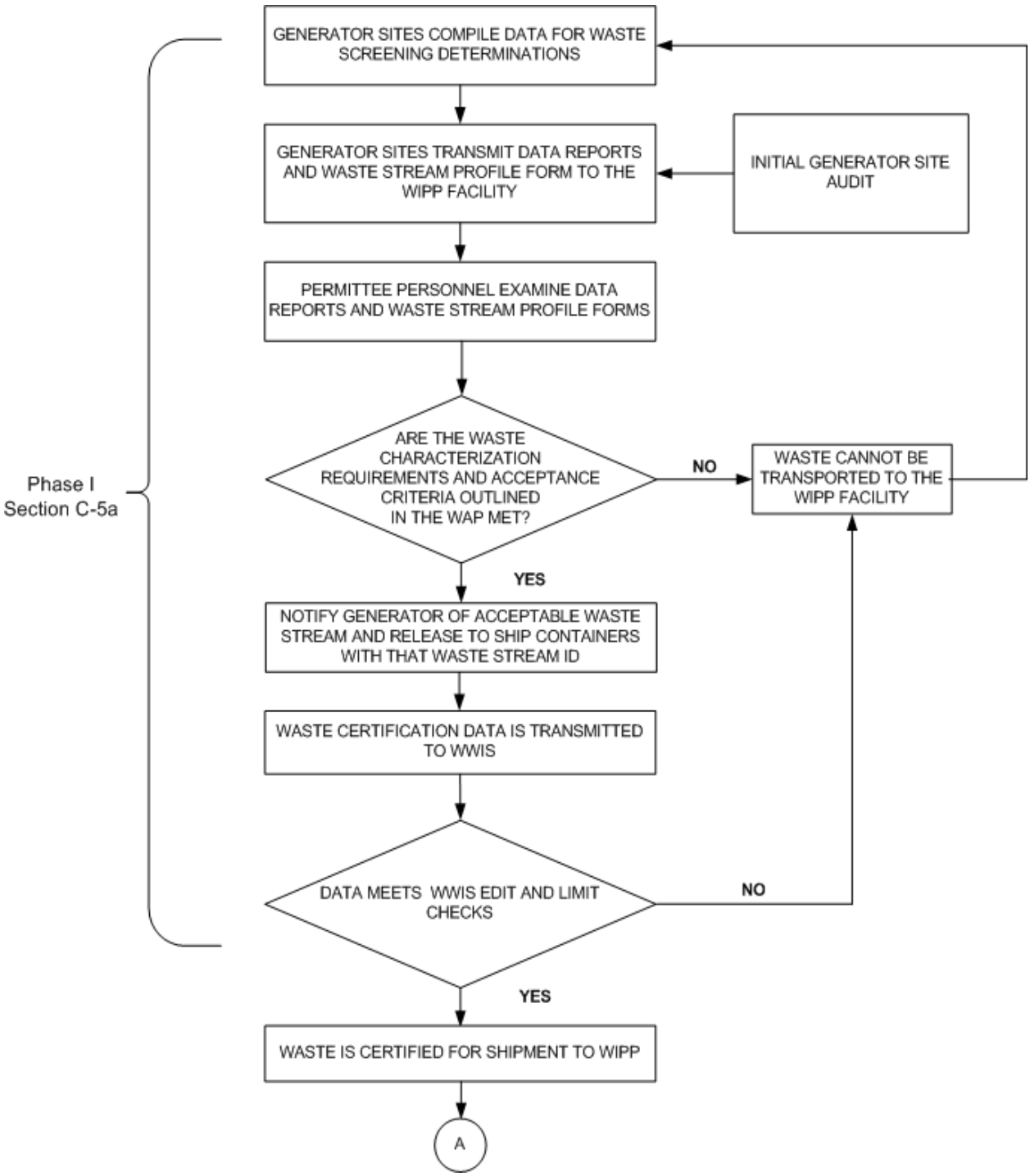
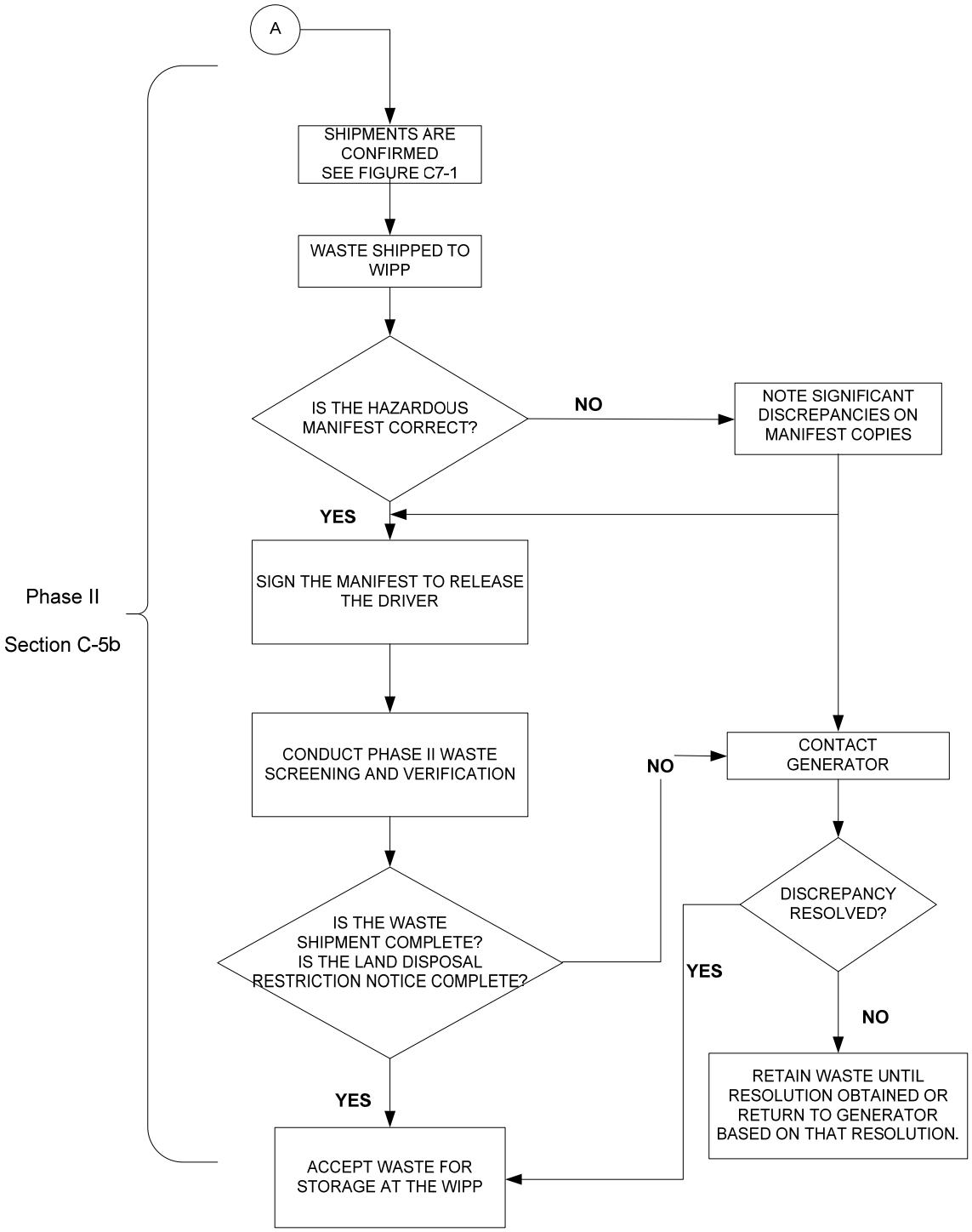


Figure C-3. TRU Mixed Waste Screening and Verification Flow Diagram (continued)



C1 WASTE CHARACTERIZATION TESTING METHODS

CCP characterizes TRU waste for shipment to WIPP by using the following methods, if applicable, for characterization of TRU waste. These methods include requirements for radiography or VE. This section describes these methods, QC requirements.

C1-1 Radiography

Radiography aids in the examination and identification of containerized waste. There is no equivalent EPA method. Personnel perform radiography in accordance with the procedures to meet the WAP requirements described in the following sections (T53, T508). Additionally, these procedures include instructions specific to the radiography method used. For example, details about moving the drum in a specific way in order to detect liquids are included in the radiography procedures. QAOs for radiography are contained in Section C3-2a.

All activities required to achieve the radiography objectives are described in the QAPjP and radiography-related standard operating procedures (SOPs). A radiography system (e.g., real time radiography, digital radiography/computed tomography) normally consists of the following components: x-ray-producing device; imaging system; an enclosure for radiation protection; a waste container handling system; an audio/visual recording system; and an operator control and data acquisition station. The radiography equipment has controls (or an equivalent process) that allow the operator to control image quality for materials of varying density. On some radiography systems, it should be possible to vary the voltage, typically between 150-400 kilovolts (kV), to provide an optimum degree of penetration through the waste. For example, high-density material is examined with the x-ray device set on the maximum voltage. This ensures maximum penetration through the waste container. Low-density material is examined at lower voltage settings to improve contrast and image definition. The imaging system utilizes a fluorescent screen, a low-light television camera, or x-ray detectors to generate the image.

To perform radiography, the waste container is scanned while the operator views the television screen. A video and audio recording is made of the waste container scan and is maintained as a Non-Permanent Record. A radiography data form is also used to document the waste matrix code, to ensure that the waste container contains no ignitable, corrosive, or reactive waste by documenting the absence of liquids in excess of TSDF-WAC limits or compressed gases, and verify that the physical form of the waste is consistent with the waste stream description documented in the AK Summary Report. Containers whose contents prevent full examination of the remaining contents are subject to VE unless the CCP certifies that VE would provide no additional relevant information for that container based on the acceptable knowledge information for the waste stream. Such certification shall be documented in CCP records.

For containers which contain classified shapes and undergo radiography, the radiography video and audio recording will be considered classified. The radiography data forms will not contain classified information.

The radiography system involves qualitative and semi-quantitative evaluations of visual displays. Operator training and experience are the most important considerations for ensuring QC in regard to the operation of the radiography system and for interpretation and disposition of radiography results. Only trained personnel are allowed to operate radiography equipment.

Standardized training requirements for radiographic operators are based on existing industry standard training requirements.

Formal and on-the-job training (OJT) elements are listed below. In addition, radiography personnel are instructed in the specific waste generating practices, typical packaging configurations, and associated waste material parameters expected to be found in the waste matrix code. OJT and apprenticeship of radiography personnel are conducted by experienced, qualified radiography operators prior to qualification of training candidates. Training describes the site equipment, waste configurations, and the level of waste characterization efforts for the CCP. In addition, radiography operators are trained on the types of waste, physical forms, packaging configurations, and QC requirements for site waste characterized by the CCP.

All of the radiography QC requirements specified in the QAPjP shall be incorporated into the CCP training programs and radiography operations, so that data quality and comparability will not be affected (T28). The radiography training program is subject to the audit and surveillance program. The training program includes items required by CCP-QP-002, *CCP Training and Qualification Plan,* and the required elements listed below.

One or more training containers with items (including prohibited items) common to the waste streams to be characterized and internal containers of various sizes is scanned semi-annually by each operator. The audio and video media are then reviewed by a supervisor to ensure that operators' interpretations remain consistent and accurate. Imaging system characteristics are verified on a routine basis.

Independent replicate scans and replicate observations of the video output of the radiography process are performed under uniform conditions and procedures. Independent replicate scans are performed on one waste container per day or once per testing batch, whichever is less frequent by a qualified radiography operator that was not involved in the original scan of the waste container. Independent observations of one scan (not the replicate scan) are made once per day or once per testing batch, whichever is less frequent, by a qualified radiography operator that was not involved in the original scan of the waste container. A testing batch is a suite of waste containers

undergoing radiography using the same testing equipment. A testing batch can be up to 20 waste containers without regard to waste matrix.

Oversight functions include periodic audio/video media reviews of accepted waste containers and are performed by qualified radiography operators that were not involved in the original scans of the waste containers. The results of this independent verification are available to the radiography operators who performed the original scans. The SPM is responsible for monitoring the quality of the radiography data and calling for corrective action, when necessary.

C1-2 Visual Examination

The CCP may use VE to verify container's contents. VE is performed by physically examining the contents of waste containers to verify the Waste Matrix Code and to verify that the container is properly included in the appropriate waste stream (T6, T113, T163, T500).

VE is conducted on a waste container to identify and describe all waste items, packaging materials, and waste material parameters in the waste containers. VE activities are documented on video/audio media or by using a second operator to provide additional verification by reviewing the contents of the waste container to ensure correct reporting. When VE is performed using a second operator, each operator performing the VE will observe for themselves the waste being placed in the waste container or the contents within the examined waste container when waste is not removed. The results of all VE are documented on VE data forms, which are used to document the Waste Matrix Code, ensure that the waste container contains no ignitable, corrosive, or reactive waste by documenting the absence of liquids in excess of TSDF-WAC limits or compressed gases, and verify that the physical form of the waste is consistent with the waste stream description documented in the AK Summary.

VE recorded on video/audio media shall meet the following minimum requirements:

- The video/audio media shall record the waste packaging event for the container such that all waste items placed into the container are recorded in sufficient detail and shall contain an inventory of waste items in sufficient detail that another trained VE operator can identify the associated waste material parameters.
- The video/audio media shall capture the waste container identification number.
- The personnel loading the waste container shall be identified on the video/audio media or on packaging records traceable to the loading of the waste container.

- The date of loading of the waste container will be recorded on the video/audio media or on packaging records traceable to the loading of the waste container.

VE performed using two generator site personnel shall meet the following minimum requirements:

- At least two generator site personnel who witnessed the packaging of the waste shall approve the data forms or packaging records attesting to the contents of the waste container.

- The data forms or packaging records shall contain an inventory of waste items in sufficient detail that another trained VE operator can identify the associated waste material parameters.

- The waste container identification number shall be recorded on the data forms or packaging records.

VE video/audio media of containers which contain classified shapes, shall be considered classified information. VE data forms or packaging records will not contain classified information.

Waste container packaging records may be used to meet the VE DQOs, Sections C-4a(1). These records must meet the minimum requirements listed above for either VE recorded on video/audio media or VE performed by two generator site personnel, and shall be reviewed by operators trained and qualified to the requirements listed below. The operators will prepare data forms based on the VE records. VE BDRs will be prepared, reviewed, and approved as described in Section C-4 and Section C3.

There will be standardized training for VE. VE operators are instructed in the specific waste-generating processes, typical packaging configurations, and waste material parameters expected to be found in each waste matrix code at the site. The training covers the various waste configurations generated/stored at the site. The particular physical forms and packaging configurations will vary at each site, so operators will be trained to examine the types of waste that are generated, stored and/or characterized at that site. Training will include the following regardless of Summary Category Group:

- Identifying and describing the contents of a waste container by examining all items in waste containers of previously packaged waste

- Identifying when VE cannot be used to meet the DQOs

VE personnel are requalified once every two years.

The SPM designates VE experts. Designated VE experts are familiar with the waste-generating processes that have taken place at the site and waste types for wastes being characterized at a particular site. VE experts are responsible for the overall direction and implementation of VE activities for the CCP at that site. VE experts meet the qualification and training requirements specified in CCP-QP-002 and make decisions based on training, previous experience, and knowledge of the waste stream.

C2 RESERVED

C3 QUALITY ASSURANCE OBJECTIVES AND DATA VALIDATION TECHNIQUES FOR WASTE CHARACTERIZATION METHODS

C3-1 Validation Methods

The CCP performs validation of qualitative and quantitative data so that characterization data are of known and acceptable quality.

The qualitative data or descriptive information generated by radiography and VE are not amenable to statistical data quality analysis. However, radiography and VE are complementary techniques yielding similar data for determining the waste matrix code. The waste matrix code is determined to ensure that the container is properly included in the appropriate waste stream.

Data validation is used to assess the quality of waste characterization data collected based on project precision, accuracy, completeness, comparability, and representativeness objectives. These objectives are described below:

Precision

Precision is a measure of the mutual agreement among multiple measurements.

Accuracy

Accuracy is the degree of agreement between a measured result and the true or known value.

Completeness

Completeness is a measure of the amount of valid data obtained from a method compared to the total amount of data collected.

Comparability

Comparability is the degree to which one data set can be compared to another.

Representativeness

Representativeness is the degree to which sample data represent a characteristic of a population.

C3-2 Nondestructive Examination Methods

Quality Assurance Objectives

The QAOs for nondestructive examination (NDE) are detailed in this section. NDE can be either radiography or VE. If the QAOs in this section are not met, then corrective actions are taken. NDE is a primary qualitative determination. The objective of NDE for the program is to verify that the physical form of waste matches the waste stream description as determined by AK and the absence of prohibited items. CCP describes all of the activities required to achieve these objectives in this QAPjP and the operating procedures listed in Section C1.

C3-2a Radiography (T53, T508)

Data to meet the QAOs for radiography are obtained from a video and audio recorded scan provided by trained radiography operators at the Host site. Results are also recorded on a radiography data form. The precision, accuracy, completeness, and comparability objectives for radiography data follow.

Precision

Precision is maintained by reconciling any discrepancies between two radiography operators with regard to identification of the waste matrix code, liquids in excess of TSDF-WAC limits, and compressed gases through independent replicate scans and independent observations. The precision of radiography is also verified prior to use by tuning precisely enough to demonstrate compliance with QAOs listed in Section C-4a through viewing an image test pattern.

Accuracy

Accuracy is obtained by using a target to tune the image for maximum sharpness and by requiring operators to successfully identify 100 percent of the items required to meet the DQOs for radiography specified in Section C. Section C-4a(1) in a training container during their initial qualification and subsequent requalification.

Completeness

To ensure completeness, video and audio media recording of the radiography of the radiography examination and a validated radiography data form are obtained for 100 percent of waste containers that are examined by radiography. All video and audio media recordings and radiography data forms are subject to validation as indicated in Section C3-7.

Comparability

The comparability of radiography data from different operators is enhanced by using standardized radiography procedures and operator qualifications.

C3-2b Visual Examination (T6, T113, T163, T500)

Results must be recorded on a VE data form. The precision, accuracy, completeness, and comparability objectives for VE data are presented below.

Precision

Precision is maintained by reconciling any discrepancies between the operator and the independent technical reviewer with regard to identification of waste matrix code, liquids in excess of TSDF-WAC limits, and compressed gases.

Accuracy

Accuracy is maintained by requiring operators to pass a comprehensive examination and demonstrate satisfactory performance in the presence of the VE expert during their initial qualification. VE operators shall be requalified every two years.

Completeness

A validated VE data form will be obtained for 100 percent of the waste containers subject to VE.

Comparability

The comparability of VE data from different operators shall be enhanced by using standardized VE procedures and operator qualifications.

C3-3 Acceptable Knowledge (T5)

AK documentation provides qualitative information that cannot be assessed according to specific data quality goals that may be used for quantitative techniques. To ensure that the AK process is consistently applied, the CCP complies with the following data quality requirements for AK documentation.

- Precision - The qualitative determinations, such as compiling and assessing AK documentation, do not lend themselves to statistical evaluations of precision. However, the AK information is assessed by independent review during internal and external audits.

- Accuracy - The percentage of waste containers which require reassignment to a new waste matrix code and/or designation of a different hazardous waste number, based on testing data and discrepancies identified during waste confirmation is reported as a measure of AK accuracy. The CCP calculates the AK accuracy in accordance with CCP-TP-005, *CCP Acceptable Knowledge Documentation*.

- Completeness - The AK record contains 100 percent of the required information (Section C4-3). The usability of the AK information is assessed for completeness during audits.

- Comparability - The CCP ensures comparability by meeting the training requirements and complying with the minimum standards outlined for procedures that are used to implement the AK process. The CCP assigns hazardous waste numbers in accordance with Section C4-3b and will provide the information regarding the waste being characterized to other sites that store or generate a similar waste stream.

- Representativeness - Representativeness is a qualitative parameter that is satisfied by ensuring that the process of obtaining, evaluating, and documenting AK information is performed in accordance with the minimum standards established in Section C4. The CCP assesses and documents the limitations of the AK information used to assign hazardous waste numbers (e.g., purpose and scope of information, date of publication, type and extent to which waste parameters are addressed).

The CCP complies with the nonconformance notification and reporting requirements of Section C3-7 of this QAPjP if the results of testing specified in this QAPjP are inconsistent with AK documentation.

In addition, performance with regard to the use of AK information is tracked by assessing the frequency of inconsistencies among information, and documenting AK inconsistencies identified through radiography and VE. The AK process and waste stream documentation are evaluated through internal assessments by QA and assessments by auditors external to the organization (i.e. the Permittees).

C3-4 Data Review, Validation, and Verification Requirements

Data review, validation, and verification are performed at the CCP data generation level in accordance with CCP data generation level characterization procedures. Data validation and verification are performed at the project level by the CCP project staff.

Data review determines whether raw data was properly collected and ensures that it was properly reduced. Data validation verifies that the reported data satisfy the

WAP requirements and are accompanied by signature release. Data verification authenticates that the data are presented accurately, represent the testing activities performed, and have been subject to the appropriate level of review. By meeting the requirements in this section, the CCP ensures that records furnish documentary evidence of quality.

The following types of BDRs (as applicable to the characterization process in use) are required for data validation and verification, and quality assurance activities:

- The Testing BDR or equivalent includes all data pertaining to radiography or VE for up to 20 waste containers without regard to waste matrix. Table C3-3, Testing Batch Data Report Contents, lists the information required in Testing BDRs (identified with an "X") and other information necessary for data validation but optional for inclusion in the Testing BDR (identified with an "O")

C3-4a Data Generation Level (T6, T53, T113, T500, T508)

The minimum requirements for raw data collection and management include the following:

- All data are signed and dated in reproducible ink by the individual generating the data, or by use of unalterable electronic signature.
- All data are recorded clearly, legibly, and accurately in field records.
- All changes to original data are lined out, initialed, and dated by the individual making the change. A justification for changing the original data may also be included. Original data are not obliterated or otherwise disfigured so as to be unreadable. Data changes are made only by the individual who originally collected the data, or by an individual authorized to change the data.
- All data are transferred and reduced from field records completely and accurately.
- All field records are maintained as specified in Table C-2.
- All data are organized in standard formats (i.e., BDRs) specified in procedures.
- All electronic and video data are stored appropriately to ensure that waste container and associated QC data are readily retrievable. In the case of classified information, additional security provisions may apply that could restrict retrievability. The additional security provisions will be documented in CCP procedures when required.

Data review, validation, and verification at this level involves scrutiny and signature release from qualified independent technical reviewers not involved in the generation or recording of the data under review as specified below. Individuals conducting the data review, validation, and verification use checklists that address the items in this section. Checklists are forwarded with BDRs to the CCP Project Office.

C3-4a(1) Independent Technical Review (T6, T53, T113, T500, T508)

The independent technical reviewer ensures by review of raw data that data generation and reduction are technically correct, calculations are verified correct, deviations are documented, and QA/QC results are complete, documented correctly, and compared against the criteria specified in this QAPjP. This review is to validate and verify all of the work done by the originator.

One hundred percent of the BDRs must receive an independent technical review. This review is performed by an individual by a trained and qualified individual who was not involved in the generation or recording of the data under review. The independent technical review is performed as soon as practicably possible in order to determine and correct negative quality trends in the testing, process. However at a minimum, the independent technical review must be performed before any waste associated with the data reviewed is managed, stored, or disposed at WIPP. The reviewer(s) must release the data as evidenced by signature, and as a consequence ensure the following:

- Data generation and reduction were conducted in a technically correct manner in accordance with the methods used (procedure revision) and data were reported in the proper units and correct number of significant figures.

- Calculations were verified by a valid calculation program, a spot check of verified calculation programs, and/or 100 percent check of all hand calculations. Values that are not verifiable to within rounding or significant difference discrepancies are rectified prior to completion of independent technical review.

- The data were reviewed for transcription errors.

- The testing, data QA documentation for BDRs is complete and includes, as applicable, raw data, calculation records, calibration records, (or reference to an available calibration package), and corrective action is taken to ensure that all BDRs are complete and include all necessary raw data prior to completion of the independent technical review.

- Radiography tapes were reviewed (independent observation) on a waste container basis at a minimum of once per testing batch or once per day of operation, whichever is less frequent (Section C1-3). The radiography tape was

reviewed against the data reported on the radiography form to ensure that the data are correct and complete.

- QAOs have been met according to the methods outlined in Sections C3-2 and C3-3.

C3-4b Project Level

Data validation and verification at this level involves scrutiny and signature release from the SPM (T1, T500, T508). Any nonconformance identified during this process is documented on an NCR (Section C3-7).

The SPM ensures that a repeat of the data generation level review, verification and validation is performed on the data for a minimum of one randomly chosen waste container quarterly (every three months). This exercise documents that the data generation level review, verification, and validation are being performed in accordance with implementing procedures.

C3-4b(1) Site Project Manager Review

The SPM review is the final validation that all of the data contained in BDRs from the data generation level are complete and are properly reviewed, as evidenced by signature release and completed checklists.

One hundred percent of the BDRs have SPM signature release. At a minimum, the SPM signature release is performed before any waste associated with data reviewed is shipped to the WIPP. This signature release ensures the following (T1, T500, T508):

- Data generation level independent technical review, validation, and verification are performed as evidenced by completed review checklists and by the appropriate signature releases.
- Independent technical reviewers were not involved in the generation or recording of the data under review.
- Batch data review checklists are complete.
- BDRs are complete and data are properly reported (i.e., data are reported in the correct units, with the correct significant figures.
- Data are within established data assessment criteria and meet all applicable QAOs as described in Sections C3-2 through C3-3.

- Testing batch QC checks (e.g., replicate scans, measurement system checks) were properly performed. Radiography data are complete and acceptable based on evidence of videotape review of one waste container per day or once per testing batch, whichever is less frequent, as specified in C1-1.

C3-4b(2) Preparing SPM Summary and Data Validation Summary

To document the project level validation and verification described above, the SPM (or designee) prepares an SPM Summary, and Data Validation Summary (T1). These reports may be combined to eliminate redundancy. The SPM Summary includes a validation checklist for each BDR. Checklists for the SPM Summary are of sufficient detail to validate all aspects of a BDR that affect data quality.

The SPM Data Validation Summary provides verification that, on a per waste container as evidenced by BDR reviews, all data have been validated in accordance with this QAPjP. The SPM Data Validation Summary identifies each BDR data report reviewed (including all waste container numbers), describes how the validation was performed and whether or not problems were detected (e.g., nonconformance reports), and includes a statement indicating that data are acceptable. Summaries must include release signatures.

C3-4b(3) Preparing Waste Stream Characterization Packages

If requested by the Permittee, the SPM provides a Waste Stream Characterization Package. The SPM must ensure that the Waste Stream Characterization Package (described in Section C3-6b(3)) supports the waste characterization determinations.

C3-4c Permittee Level

Not applicable to CCP. This is a Permittee function.

C3-5 Reconciliation with Data Quality Objectives

Reconciling the results of waste testing with DQOs ensures that data are of adequate quality to support regulatory compliance programs. When waste is characterized by CCP, reconciliation with the DQOs is the responsibility of the SPM and occurs prior to waste shipment (T2).

C3-5a Reconciliation at the Project Level

The SPM ensures that all data generated and used in decision making meet the DQOs providing in Section C-4a(1). DQO reconciliation is the responsibility of the SPM, who assesses whether data of sufficient type, quality, and quantity to meet the DQOs (Section C-4a(1)) have been collected.

The SPM determines for each waste stream characterized, whether sufficient data have been collected to determine the following required waste parameters (T2):

- Waste matrix code.
- Waste material parameter weights.
- That each container of waste is transuranic radioactive waste.
- Whether the waste stream exhibits a toxic characteristic or is listed under 20.4.1.200 NMAC incorporating 40 CFR §261, Subpart C.
- Whether the waste stream contains listed waste found in 20.1.4.200 NMAC incorporating 40 CFR §261, Subpart D.
- Whether the waste stream can be classified as hazardous or nonhazardous.
- Whether the overall completeness, comparability, and representativeness QAOs were met for the testing procedures specified in Sections C3-2 and C3-3 prior to submittal of a WSPF for a waste stream or waste stream lot.

If the SPM determines that insufficient data have been collected to make the determinations listed above, additional data collection efforts are undertaken. The reconciliation of a waste stream is performed, as described in Section C4, prior to submittal of the WSPF and CIS to the Permittees for that waste stream. The CCP does not ship TRU waste stream to the WIPP unless the SPM determines that the WAP-required waste parameters listed above are met for that waste stream.

C3-5b Reconciliation at the Permittee Level

Not applicable to the CCP. This is a Permittee function.

C3-6 Data Reporting Requirements

Data reporting requirements define the type of information and the method of transmittal for data transfer from the data generation level to the CCP Project Office and from the CCP Project Office to the Permittee.

C3-6a Data Generation Level

Data are transmitted by hard copy or electronically (with hard copies available on demand) from the data generation level to the CCP Project Office. Transmitted data include all BDRs, and data review checklists. The BDR forms and checklists must contain all the information required by the testing techniques described in Sections C1

through C6, as well as the signature releases to document the review, validation, and verification as described in Section C3-4. BDRs and checklists are on approved forms as provided in procedures.

BDRs are forwarded to the SPM. All BDRs are assigned serial numbers, and each page is numbered. The serial number is the same as the batch number. QA documentation, including raw data, is maintained in either testing facility files, or the CCP files in accordance with CCP-QP-008, *CCP Records Management*.

C3-6b Project Level

The CCP Project Office prepares a WSPF for each waste stream certified for shipment to the WIPP based on information obtained from AK and BDRs, if applicable (T2). The CCP Project Office ensures that the CIS and Waste Stream Characterization Package (when requested by the Permittee) are prepared as appropriate. The SPM verifies these reports are consistent with information found in BDRs. Summarized testing are included in the CIS. The contents of the WSPF, the CIS, and the Waste Stream Characterization Package are discussed in the following sections.

A Waste Stream Characterization Package is submitted only when requested by the Permittee. These reports are reviewed, validated, and verified by the SPM (T2).

After approval of a WSPF and the associated CIS by the DOE, CCP will maintain a cross reference of container identification number to each BDR.

A Waste Stream Characterization Package will be transmitted by hard copy or electronically from the SPM to the Permittees when requested.

C3-6b(1) Waste Stream Profile Form (T2)

The WSPF shall include the following information:

- Site name
- Site EPA ID
- Date of audit report approval by NMED (if obtained)
- Original generator of waste stream
- Whether waste is CH or RH
- The Waste Stream WIPP Identification Number

- Summary category group
- Waste matrix code group
- Waste Material Parameter Weight Estimates per unit of waste
- Waste stream name
- A description of the waste stream
- Applicable U.S. EPA Hazardous Waste Numbers
- Applicable TRUPACT Content (TRUCON) codes
- A listing of AK documentation used to identify the waste stream
- The waste characterization procedures used and the reference and date of the procedure
- Certification signature of SPM, name, title, and date signed

C3-6b(2) Characterization Information Summary (T2)

The CIS shall include the following elements, if applicable:

- Data reconciliation with DQOs.
- Radiography and VE summary to document that prohibited items are not present, and to verify that the physical form of the waste matches the waste stream description as determined by AK.
- A justification for the selection of radiography and/or VE as an appropriate method for characterization of the waste.
- A complete listing of all container identification numbers used to generate the WSPF, cross-referenced to each BDR.
- Complete AK summary, including waste stream name and number, the point of generation, waste stream volume (current or projected), generation dates, TRUCON codes, Summary Category Group, Waste Matrix Code(s) and Waste Matrix Code Group, other DOE/TRU-14-3425, *Annual Transuranic Waste Inventory Report 2014* (ATWIR) information, waste stream description, areas of operation, generation processes, RCRA determinations, radionuclide information,

all references used to generate the AK summary, and any other information required by Section C4-2b.

- Method for determining Waste Material Parameter Weights per unit of waste.
- List of any AK Sufficiency Determinations requested for the waste stream.
- Certification through acceptable knowledge or testing that any waste assigned the Hazardous Waste Number of U134 (hydrofluoric acid) no longer exhibits the characteristic of corrosivity. This is verified by ensuring that no liquid is present in U134 waste.

C3-6b(3) Waste Stream Characterization Package (T2)

The waste stream characterization package is submitted when requested by the Permittee and includes the following information:

- WSPF (Section C3-6b(1))
- Applicable CIS (Section C3-6b(2))
- Complete AK summary (Section C3-6b(2))
- BDRs supporting the characterization of the waste stream and any others requested by the Permittee
- Raw testing data requested by the Permittee

C3-6b(4) WIPP Waste Information System Data Reporting (T30)

The WWIS/WDS data dictionary includes the data, field formats, and limits associated with waste characterization data established by the WAP. These data are subject to edit and limit checks that are performed automatically by the database, as defined in the "DOE/WIPP-09-3427."

C3-7 Nonconformances (Q5)

The status of CCP activities are monitored and controlled by the SPM in accordance with the nonconformance and procurement procedures identified below. This includes nonconformance identification, documentation, and reporting.

Nonconformances

Nonconformances are uncontrolled and unapproved deviations from an approved plan or procedure (e.g., this QAPjP). In the context of this QAPjP, deficiencies and nonconformances are synonymous. Nonconforming items and activities are those that do not meet the CCP requirements, procurement document criteria, or approved work procedures. The CCP personnel are responsible for promptly reporting any nonconformance to management. The CCP reconciles and corrects nonconformance items, as appropriate, in accordance with the DOE-CBFO QAPD. The disposition of nonconforming items is identified and documented and nonconforming items are identified by marking, tagging, or segregating and appropriate notifications are made to the site. When a nonconformance related to the CCP is observed or detected, the QA is notified, and affected management reviews the content of the NCRs and assists the QA in processing the NCR. For each container selected for confirmation pursuant to Section C7, the Permittees will examine the respective NCR documentation to verify NCRs have been dispositioned for the selected container.

The CCP identifies and documents nonconformances as follows:

- The NCR procedure establishes the method for CCP personnel to identify, document, control, and disposition nonconforming activities, processes, items, and materials. NCRs are initiated by any individual identifying a nonconformance during performance of work tasks, random observations, inspections, or any other review of CCP procedures, operations, and activities. The CCP personnel identify deficient items by marking, tagging, or segregating them. This procedure implements the requirements of Section 1.3.2 (Nonconformances) of the DOE-CBFO QAPD.

- Corrective Action Reporting and Control procedures establishes the method for personnel to identify and correct potential problems and conditions adverse to quality, in addition to precluding their recurrence, and if necessary, stopping associated work activities (Q8). Any person may temporarily stop work prior to evaluation of the condition by the responsible CCP supervisor. The CCP supervisor then evaluates and reports the condition, as necessary, in accordance with WP 15-GM1002, *Issues Management Processing of WIPP Forms (WP-1).* This procedure implements the requirements of Section 1.3.3 (Corrective Action) of the DOE-CBFO QAPD.

Management at all levels fosters a "no-fault" attitude to encourage the identification of nonconforming items and processes within the CCP. Nonconformances may be detected and identified by anyone performing activities in support of this QAPjP, including:

- The CCP project staff - during field operations, supervision of subcontractors, data validation and verification, and self-assessment
- Testing Facility staff - during the preparation for and performance of testing; calibration of equipment; QC activities; data review, validation, and verification; and self-assessment
- QA personnel - during oversight activities or audits

An NCR is prepared for each nonconformance identified. Each NCR is initiated by the individual(s) identifying the nonconformance. The NCR is then processed by knowledgeable and appropriate personnel. The NCR includes or references results of, QC tests, audit reports, internal memoranda, or letters, as appropriate. The NCR provides the following information:

- Identification of the individual(s) identifying or originating the nonconformance
- Description of the nonconformance
- Method(s) or suggestions for correcting the nonconformance (corrective action)
- Schedule for completing the corrective action
- An indication of the potential ramifications and overall usability of the data, if applicable
- Any approval signatures specified in the nonconformance procedures.

The SPM oversees the NCR process for the CCP, identifies and tracks the status of deficiencies, reports this information to the Permittees, and is responsible for verifying the close-out of the NCRs.

Nonconformances are tracked and trended in accordance with procedures (Q5, Q14) that establish the method for evaluating trends in nonconformances and identifying appropriate corrective actions.

The SPM ensures that relevant project personnel are notified of nonconformances and verifying completion of corrective action for nonconformances.

Nonconformance to DQOs

For any non-administrative nonconformance related to applicable requirements specified in this QAPjP which are first identified at the SPM signature release level (i.e., a failure to meet a DQO), the SPM will provide a written notification to the Permittees within seven (7) calendar days of identification and shall also provide a nonconformance report within 30 calendar days of identification of the incident. The CCP implements a corrective action process and resolves identified nonconformances prior to shipment of any affected waste to the WIPP.

DOE Corrective Action Process

This section is not applicable to the CCP.

C3-8 Special Training Requirements and Certifications (Q2)

The SPM is responsible for ensuring that all personnel maintain proficiency in the work performed and identifies additional training if required. The training and qualification process for CCP personnel and subcontracted personnel who perform work to support the CCP is documented and controlled. In accordance with these plans, only personnel trained to applicable CCP-related plans and procedures perform CCP activities. Before performing CCP-related activities, assigned staff receive indoctrination into the scope, purpose, and objectives of the WAP and the specific QAOs of assigned tasks. Personnel assigned to perform activities under this QAPjP have the education, experience, and training applicable to the functions associated with the work.

Evidence of personnel proficiency and demonstration of competence in the task(s) assigned are demonstrated and documented. All personnel designated to work on specific aspects of the WAP maintain qualification (i.e., training and certification) throughout the duration of the work as specified in this QAPjP and applicable procedures. Job performance is evaluated and documented at periodic intervals, as specified in the appropriate implementing procedures.

CCP personnel involved in WAP activities (as flowed down in this QAPjP) receive continuing training to ensure that job proficiency is maintained and documented. The due date for required continuing training courses and requalification shall be the end of the month of the anniversary date when the training was previously completed. Training includes both education in principles and enhancement of skills. Job performance is evaluated and documented at periodic intervals, as specified in the implementing procedures or in CCP-QP-002. Documentation of training, consisting of training records that specify the scope of training, dates of completion, and job proficiency are maintained by the CCP Project Office and/or the site records system as QA records.

The minimum qualifications for certain specified positions for the WAP are summarized see in this document CCP-PO-001, Table C3-2. This QAPjP specifies the titles and minimum training and qualification requirements for personnel performing QAPjP activities.

Evaluation of CCP personnel qualifications includes a comparison of the job description to the skills, training, and experience included in the individual's resume, training records, and other documented bases for job assignment. This evaluation is also performed for personnel who change positions because of a transfer or promotion as well as personnel assigned to short-term or temporary work assignments that may affect the quality of CCP activities. Procedures identify the responsible persons for ensuring all personnel maintain proficiency in the work performed and identify any additional training that may be required.

C3-9 Changes to WAP Related Plans or Procedures

Controlled changes to WAP-related CCP plans or procedures are managed through the document control process (Q10). The SPM reviews all nonadministrative changes and evaluates whether those changes could impact DQOs specified in the WAP. Any changes to the WAP-related plans or procedures that could impact DQOs (i.e., those changes that require prior approval of the DOE as defined in Section C5-2) are reported to the DOE within five days of identification by the project level review.

Table C3-1. Waste Material Parameters and Descriptions

Waste Material Parameter	Description
Iron-Based Metals/Alloys	Iron and steel alloys in the waste; does not include the waste container materials.
Aluminum-Based Metals/Alloys	Aluminum or aluminum-based alloys in the waste materials.
Other Metals	All other metals found in the waste materials (*e.g., copper, lead, lead blankets).
Other Inorganic Materials	Non-metallic inorganic waste, including concrete, glass, firebrick, ceramics, sand, and inorganic sorbents.
Cellulosics	Materials generally derived from high polymer plant carbohydrates (e.g., paper, cardboard, wood, and cloth).
Rubber	Natural or man-made elastic latex materials (e.g., surgeon's gloves and leaded rubber gloves).
Plastics (Waste Materials)	Generally man-made materials, often derived from petroleum feedstock (e.g., polyethylene and polyvinylchloride).
Organic Matrix	Cemented organic resins, solidified organic liquids and sludges.
Inorganic Matrix	Any homogeneous materials consisting of sludge or aqueous-based liquids that are solidified with cement, calcium silicate, or other solidification agents; (e.g., waste water treatment sludge, cemented aqueous liquids, and inorganic particulates).
Soils/Gravel	Generally consists of naturally-occurring soils that have been contaminated with inorganic waste materials.
Steel (Packaging Materials)	208-liter (55-gallon) drums (*e.g., Steel Drums (55- and 85-gallon).
Plastics (Packaging Materials)	90-mil polyethylene drum liner and plastic bags.

* Added for clarity

Table C3-2. Minimum Training and Qualification Requirements

Personnel	Requirements
Radiography Operators[a]	Site-specific training based on waste matrix codes and waste material parameters as described in Section C3-4; requalification every 2 years

[a] Operators are responsible for the actual operation of testing equipment.

Table C3-3. Testing Batch Data Report Contents

Required Information	Radiography	VE	Comment
Batch Data Report Date	X	X	
Batch number	X	X	
Waste container number	X	X	
Waste stream name and/or number	O	O	
Waste matrix code	X	X	Summary Category Group included in waste matrix code.
Implementing procedure (specific version used)	X	X	If procedure cited contains more than one method, the method used must also be cited. Can use revision number, date, or other means to track specific version used.
Container type	O	O	Drums, Pipe Overpack, SWB, TDOP, etc.
Video media reference	X	X	Reference to video media applicable to each container. For VE for newly generated waste, video media is not required if two trained operators review the contents of the waste container to ensure correct reporting.
Imaging check	O	N/A	
Camera check	N/A	O	
Audio check	O	O	
QC documentation	X	X	

Table C3-3. Testing Batch Data Report Contents (continued)

Required Information	Radiography	VE	Comment
Verification that the physical form matches the waste stream description and waste matrix code	X	X	Summary Category Group included in waste matrix code.
Comments	X	X	
Reference to or copy of associated NCRs, if any	X	X	Copies of associated NCRs must be available.
Verify absence of prohibited items	X	X	
Operator signature and date of test	X	X	Signatures of both operators required for visual verification of AK.
Data review checklists	X	X	All data review checklists will be identified.

LEGEND:
X = Required in Batch Data Report
O = Information must be documented and traceable; inclusion in Batch Data Report is optional.

C4 ACCEPTABLE KNOWLEDGE

C4-1 Introduction

The RCRA regulations codified inTitle 40 Code of Federal Regulations (CFR), *Protection of Environment,* and the New Mexico Hazardous Waste Management Regulations in 20.4.1.200 NMAC, Subparts 100 through 600, Subpart 800, and Subpart 900, authorize the use of AK in appropriate circumstances by waste generators or treatment, storage, or disposal facilities to characterize hazardous waste. AK is described in *Waste Analysis at Facilities that Generate, Treat, Store and Dispose of Hazardous Waste: A Guidance Manual* (EPA 1994a). AK, as an alternative to waste sampling and analysis, is used to meet all or part of RCRA waste characterization requirements (EPA 1994a).

EPA's 1994 Waste Analysis Guidance Manual broadly defines the term "acceptable knowledge" to include process knowledge, whereby detailed information on the wastes is obtained from existing published or documented waste analysis data or studies conducted on hazardous waste generated by processes similar to that which generated the waste; facility records of analysis performed before the effective date of RCRA; and sampling and waste analysis data obtained from generators of similar wastes that send their wastes off-site for treatment, storage, or disposal (EPA 1994a). If it is determined that AK alone is insufficient to accurately characterize a waste, radiography and/or VE, may be used to complete the waste characterization process and satisfy the requirements of the WAP. AK is used in TRU waste characterization activities in five ways:

- To delineate TRU waste streams
- To assess whether TRU mixed wastes comply with the applicable requirements of the Treatment, Storage, and Disposal Facility Waste Acceptance Criteria (TSDF-WAC)
- To assess whether TRU mixed wastes exhibit hazardous characteristic (20 NMAC 4.1.200, incorporating 40 CFR § 261 Subpart C)
- To assess whether TRU mixed wastes are listed wastes (20.4.1.200 NMAC, incorporating 40 CFR § 261 Subpart D)
- To estimate waste material parameter weights

Radiography and/or VE may be performed to augment the characterization of wastes based on AK when an AK Sufficiency Determination has not been requested by the generator/storage site or, if requested, has not been granted by the DOE (see Section C4-3d). TRU waste streams undergo applicable provisions of the AK process prior to shipment of the waste to WIPP.

C4-2 Acceptable Knowledge Documentation

The CCP collects and compiles, in a logical sequence, AK information that progresses from general facility information (TRU waste management program information) to more detailed waste-specific information (TRU waste stream information).

The CCP implements the AK process as specified in the WAP to characterize TRU waste (T5). The AK information is then compiled into the AK report (and supporting documentation), as shown in Figure C4-1, Compilation of Acceptable Knowledge Documentation, in Attachment C-4 of the WAP.

The following sections include the information the Permittee will require for the CCP to characterize TRU waste using AK. Because waste generating processes are site-specific, CCP will, as necessary, augment the required AK records with additional supporting information as discussed in Section C4-2c. If the required information is not available for a particular waste stream, the waste stream is not eligible for an AK Sufficiency Determination as specified in Section C4-3d.

C4-2a Required TRU Waste Management Program Information

TRU waste management program information clearly defines waste categorization schemes and terminology, provides a breakdown of the types and quantities of TRU waste that are generated and stored by the site (and processed by the CCP), and describes how waste is tracked and managed, including historical and current operations. Information related to TRU waste certification procedures and the types of documentation (e.g., WSPFs) used to summarize AK are also provided.

The following information is included as part of the AK written record:

- A map of the site with the areas and facilities involved in TRU waste generation, treatment, and storage identified
- Facility mission description as related to TRU waste generation and management
- Description of the operations that generate TRU waste at the site
- Description of waste identification and characterization schemes used at the site or facility (e.g., content codes, item description codes)
- Types and quantities of TRU waste generated, including historical generation through future projections. Includes time and facility/site of generation
- Description of correlation of waste streams generated from the same building and process (e.g., sludge, combustibles, metals, and glass)
- Waste certification procedures for TRU wastes to be shipped to the WIPP

C4-2b Required TRU Waste Stream Information

The CCP uses AK to delineate site-specific waste streams for shipment to the WIPP. The available process information and data that supports the AK used to characterize waste streams are compiled in AK summary reports and supporting documentation in accordance with CCP-TP-005. The type and quantity of supporting documentation may vary by waste stream, depending on the waste generating process and site specific requirements imposed by the Permittee. At a minimum, the waste process information on each waste stream includes the following written information:

- Areas and buildings from which the waste stream was or is generated
- The waste stream volume and time period of waste generation
- Waste generating process described for each building (e.g., batch waste stream generated during decommissioning operations of glove boxes), including processes associated with U134 waste generation, if applicable
- Documentation regarding how the site has historically managed the waste, including the historical regulatory status of the waste (i.e., TRU mixed versus TRU non-mixed waste)
- Process flow diagrams. In the event that a process flow diagram cannot be created, a description of the waste generating process, rather than a formal process flow diagram, is used to satisfy this requirement. The use of the waste generating process description is justified, and the justification is placed in the AK record
- Material inputs or other information that identify the chemical content of the waste stream and physical waste form (e.g., glove box materials and chemicals handled during glove box operations; events or processes that may have modified the chemical or physical properties of the waste stream after generation; data obtained through VE of newly generated waste that later undergoes radiography; information demonstrating neutralization of U134 [hydrofluoric acid] and waste compatibility)

The AK written record includes a summary that identifies all sources of waste characterization information used to delineate the waste stream. The basis and rationale for delineating each waste stream, based on the parameters of interest, is clearly summarized and traceable to referenced documents. Assumptions made in delineating each waste stream also are identified and justified. If discrepancies exist between required information, then the CCP may consider applying all hazardous waste numbers indicated by the information to the subject waste stream but must assess and evaluate the information to determine the appropriate hazardous waste numbers consistent with RCRA requirements.

Implementing procedures address the following AK processes:

- Identifying and assigning the physical waste form of the waste
- Delineating waste streams and assigning Summary Category Groups and waste matrix codes
- Resolving inconsistencies in AK documentation
- Radiography and VE, if applicable
- For newly generated waste, procedures describing process controls used to ensure prohibited items (specified in Section C) are documented and managed
- Procedures to ensure that radiography and VE include a list of prohibited items that the operator verifies are not present in each container (e.g., liquid exceeding TSDF-WAC limits, corrosives, ignitables, reactives, and incompatible wastes)
- Procedures for documenting how changes to waste matrix code, waste stream assignment, and associated hazardous waste numbers based on material composition are documented for any waste
- Procedures that ensure the assignment of EPA hazardous waste numbers is appropriate, consistent with RCRA requirements, and considers site historical waste management
- Procedures for estimating waste material parameter weights

C4-2c Additional Acceptable Knowledge Information

CCP shall obtain additional acceptable knowledge information. CCP shall collect information as appropriate to augment required information and provide any other information obtained to further delineate waste stream. Adequacy of this information shall be assessed by DOE during audits. CCP will use this information to compile the acceptable knowledge written record.

All additional specific, relevant acceptable knowledge documentation assembled and used in the acceptable knowledge process, whether it supports or contradicts any required acceptable knowledge documentation, shall be identified and an explanation provided for its use (e.g., identification of a toxicity characteristic). Additional documentation may be used to further document the rationale for the hazardous characterization results. The collection and use of additional information shall be assessed by DOE during site audits to ensure that hazardous waste characterization is supported, as necessary, by such information. Similar to required information, if discrepancies exist between additional information and the required information, then

CCP may consider applying all hazardous waste numbers indicated by the additional information to the subject waste stream, but must assess and evaluate the information to determine the appropriate hazardous waste numbers consistent with RCRA requirements. All information considered must be documented and placed in the auditable record, including applicable discrepancy resolution documentation.

Additional AK documentation includes, but is not limited to, the following information:

- Process design documents (e.g., Title II Design)
- Standard operating procedures that may include a list of raw materials or reagents, a description of the process or experiment generating the waste, and a description of wastes generated and how the wastes are managed at the point of generation.
- Preliminary and final safety analysis reports and technical safety requirements
- Waste packaging records
- Test plans or research project reports that describe reagents and other raw materials used in experiments
- Site databases (e.g., chemical inventory database for Superfund Amendments and Reauthorization Act Title III requirements)
- Information from site personnel (e.g., documented interviews)
- Standard industry documents (e.g., vendor information)
- Analytical data relevant to the waste stream, including results from fingerprint analyses, spot checks, routine verification sampling or other processes that collected information pertinent to the waste stream. This may also include new information which augments required information (e.g., VE not performed in compliance with the WAP, radiography screening for prohibited items)
- Material Safety Data Sheet (MSDS), product labels, or other product package information
- Sampling and analysis data from comparable or surrogate waste streams (e.g., residues, equivalent nonradioactive materials)
- Laboratory notebooks that detail the research processes and raw materials used in an experiment

C4-3 Acceptable Knowledge Training, Procedures, and Other Requirements

The CCP uses the following to characterize TRU waste by means of AK information:

1) compiling the required and supporting additional AK documentation in an auditable record;

2) auditing AK records; and

3) WSPF approval and waste confirmation.

C4-3a Qualifications and Training Requirements (Q2)

The CCP and site personnel responsible for compiling AK, assessing AK, and resolving discrepancies associated with AK are qualified and trained in the following areas, at a minimum:

- WAP and TSDF-WAC requirements;
- State and Federal RCRA regulations associated with solid and hazardous waste characterization;
- Discrepancy resolution and reporting; and
- CCP and site-specific procedures associated with waste characterization using AK.

Position-specific qualification and training requirements such as those listed above for functional positions within the CCP are established by the SPM and documented (Q2). The SPM ensures that personnel conducting AK activities are qualified and trained as specified.

C4-3b Acceptable Knowledge Assembly and Compilation

The CCP process allows for the consistent application of the AK process and requirements, and addresses the following requirements (T5):

- Written procedures outlining the specific methodology used to assemble AK records, including the origin of the documentation, how it is used, and any limitations associated with the information (e.g., identify the purpose and scope of a study that included limited sampling and analysis data).
- Written procedures to compile the required AK record.

- Written procedures ensuring that unacceptable wastes (e.g., reactive, ignitable, corrosive) are identified and segregated from TRU waste populations sent to the WIPP.

- Procedures to evaluate AK and resolve discrepancies. For example, if different sources of information indicate hazardous wastes are present in a waste stream, the CCP includes all sources of information in its records and may choose to either conservatively assign hazardous waste numbers or assign only those numbers deemed appropriate and consistent with RCRA requirements. All information used to justify assignment of hazardous waste numbers must be placed in the auditable record. Further the assignment of hazardous waste numbers is traceable in the AK record to required documentation.

- Procedures to identify hazardous wastes and assign the appropriate hazardous waste numbers to each waste stream in accordance with the following minimum baseline requirements:

    - Compiling all of the required information in an auditable AK record.

    - Reviewing the compiled information and delineating waste streams. Delineation of waste streams must comply with the definition in C-0a and justify combining waste historically managed separately as TRU mixed and TRU non-mixed waste streams into a single waste stream.

    - Reviewing the compiled information to determine if the waste stream is compliant with the TSDF-WAC.

    - Reviewing the required information to determine whether the waste is listed under 20.4.1.200 NMAC (incorporating 40 CFR §261), Subpart D. Assigning all the hazardous waste numbers unless the CCP chooses to justify an alternative assignment and documents the justification in an auditable record.

    - Reviewing the required information to determine if the waste exhibits a hazardous characteristic or contains toxicity characteristic hazardous constituents specified in 20.4.1.200 NMAC (incorporating 40 CFR §261), Subpart C. If a toxicity characteristic contaminant is identified and is not included as a listed waste, sites may evaluate available data and assign the toxicity characteristic hazardous waste number consistent with RCRA requirements. All data examined to reach the hazardous waste number determination must be placed in the auditable record and must present a clear justification for the hazardous waste number analyses.

NOTE
The following paragraph has been added to show the enhancement to the AK process due to the Addendum to the Radiological Release Event Correction Plan (i.e., the AIB Report and Judgement of Needs).

- To ensure that the AK documentation relating to the management of potentially reactive, corrosive, ignitable, and incompatible TRU waste materials is adequate, current, and accurately described in existing AK Summary Reports, a onetime AK Assessment (AKA) will be performed for each new waste stream and existing waste streams with unshipped containers. The primary focus of the AKA will be to review and verify the AK documentation associated with the historic and current use of absorbents, immobilization products, and neutralization agents used in the management of potentially corrosive, ignitable, or reactive liquids. In addition the AKA will assess the specific management of other potentially incompatible or reactive materials generated at each site (e.g., reactive metals, nitrate salts).

- Reviewing the compiled information to provide an estimate of material parameter weights for each container to be stored or disposed of at WIPP.

- For newly generated wastes, procedures are developed and implemented to characterize hazardous waste using AK prior to packaging the waste.

- The CCP ensures that results of other audits of the CCP TRU waste characterization activities are available in the CCP files.

- The CCP identifies all process controls (implemented to ensure that the waste contains no prohibited items and to control hazardous waste content and/or physical form) that may have been applied to retrievably stored waste and/or may presently be applied to newly generated waste. Process controls are applied at the time of waste generation/packaging to control waste content, whereas any activities performed after waste generation/packaging to identify prohibited items, hazardous waste content, or physical form are waste characterization activities not process controls. The AK record must contain specific process controls and supporting documentation identifying when these process controls are used to control waste content. See Section C-2 for programmatic requirements related to process controls.

C4-3c Criteria for Assembling an Acceptable Knowledge Record and Delineating the Waste Stream

CCP-TP-005 describes the process for assembling AK documentation into an auditable record. The first step is to assemble the required AK information and any additional

information regarding the materials and processes that generate a specific waste stream. AK records are generated in compliance with the following criteria (T5):

- AK information is compiled in an auditable record, including a road map for applicable information.
- The overview of the facility and TRU waste management operations in the context of the facility's mission is correlated to specific waste stream information.
- Correlations between waste streams, with regard to time of generation, waste generating processes, and site-facilities are described in the AK summary report (Section C4-2b). For newly generated wastes, the rate (or schedule) and quantity of waste to be generated are also maintained in the AK process descriptions compiled in the AK summary report.

NOTE
The following paragraph has been added to show the enhancement to the AK process due to the Addendum to the Radiological Release Event Correction Plan (i.e., the AIB Report and Judgement of Needs).

- An Interface Waste Management Documents List will be initiated and maintained for each waste stream. The purpose of this form is to identify and maintain a current list of generator site plans, procedures, and reports associated with waste management, generation, treatment, packaging, repackaging, remediation, waste stream delineation, and characterization activities to be reviewed before containers are added to the Waste Containers List or Container Tracking Spreadsheet. In addition, the form identifies the point of contacts (POCs) consisting of subject matter experts (SMEs) and/or site representatives from the groups directly involved with the generation, characterization, and management of containers in the waste stream.
- A reference list provided in Section C4-3b that identifies documents, databases, QA protocols, and other sources of information that support AK information.

Container inventories are delineated into waste streams by correlating the container identifications to all of the required AK information and additional information (T5). The CCP assigns a waste matrix code and waste stream description to each container of waste using AK.

C4-3d AK Sufficiency Determination Request Contents (T5)

The CCP may submit an AK Sufficiency Determination Request (Determination Request). The Determination Request shall include, at a minimum.

- A complete AK Summary that addresses the following technical requirements:
  - Executive Summary
  - Waste Stream Identification Summary including a demonstration that the waste stream has been properly delineated and meets the Permit definition of waste stream (Attachment C, Introduction);
  - Mandatory Program Information (including, but not limited to, facility location and description, mission, defense waste assessment, spent nuclear fuel and high-level waste assessment, description of waste generating processes, research/development [as necessary], facility support operations [as applicable], types and quantities of TRU waste generated, correlation of waste streams to buildings/processes, waste identification and categorization, physical form identifiers);
  - Mandatory Waste Stream Information (including, but not limited to, Area and Building of Generation, waste stream volume/period of generation) (including, for newly generated waste, the rate and quantity of waste to be generated), waste generating activities, types of waste generated, material input related to physical form and identification of percentage of each waste material parameter in the waste stream, chemical content information including hazardous constituents and hazardous waste identification, prohibited item content (including documented evidence that the waste meets the TSDF-WAC Permit Sections 2.3.3.1 through 2.3.3.10), waste packaging, presence of filter vents, number of layers of confinement;
  - Types of supporting information gathered;
  - Container specific data (if available and relevant); and
  - A complete reference list including all mandatory and additional information.
- An AK roadmap (defined as a cross reference between mandatory programmatic and mandatory waste stream information, with references supporting these requirements).
- A complete reference list including all mandatory and additional documentation.
- Additional relevant information for the required programmatic and waste stream data addressed in the AK Summary, examples of which are presented in Section C4-2c.

- Identification of any mandatory requirements supported only by upper tier documents (i.e., there is insufficient supporting data).

- Description or other means of demonstrating that the AK process described in the Permit was followed (for example, AK personnel were appropriately trained; discrepancies were documented, etc.).

- Information showing that CCP has developed a written procedure for compiling the AK information and assigning hazardous waste numbers as required in Section C4-3b.

- Information showing that CCP has assessed the AK process (e.g., internal audits, Section C4-3b).

C4-3e Requirements for Re-evaluating Acceptable Knowledge Information (T5)

NOTE
The following next 7 paragraphs and the note below have been added to show the enhancement to the AK process due to the Addendum to the Radiological Release Event Correction Plan (i.e., the AIB Report and Judgement of Needs).

Procedures and documents listed in the Interface Waste Management Documents List, including current revisions of all procedures/documents on the list will be collected and reviewed.

The existing AK documentation associated with the historic and current waste management activities relating specifically to TRU waste generation, packaging, treatment, remediation, and characterization, focusing on the use of absorbents, immobilization products, and neutralization reagents for the waste stream will be reviewed.

The existing AK for the special testing and management activities associated with other suspect materials (e.g., met mount testing, nitrate salts, swarf conditioning, and sodium treatment) or unknown waste (e.g., unknown liquids and unlabeled chemicals) included in each waste stream will be reviewed.

Current revisions of waste management procedures collected to identify any relevant changes associated with these activities described in the AK Summary Report will be assessed.

The AK Record associated with commercial products used during these activities (e.g., MSDSs and other manufactures information), as applicable will be reviewed and updated. If necessary, obtain procurement records to verify products used.

NOTE

Procedure verification will include the review of waste management activities performed under the procedures listed on the Interface Waste Management Documents List. This "walk down" will involve discussing and/or observing the performance of procedural steps implemented by the generator relating to waste stream delineation or packaging with the appropriate site POCs/SMEs.

For the procedures listed on the Interface Waste Management Documents List, these activities will be reviewed with the cognizant POCs/SMEs to confirm procedures accurately reflect the site waste management practices, including:

- Specific products and reagents used for waste management (e.g., absorbent, immobilization, and neutralization reagents),
- Non-routine activities (e.g., unknown items) and management of unanticipated conditions

The Acceptable Knowledge Assessment Memorandum to the SPM will document the AKA. Any documented interviews on Records of Communications, as necessary, will be included.

AK includes information on the waste physical form, base materials composing the waste, and the waste generating process. Waste testing (i.e., radiography/VE) may be used to augment AK information prior to waste shipment. If retrievably stored waste must be repackaged, either VE prior to or during waste packaging or radiography after waste packaging, shall be used to confirm acceptable knowledge information.

The WSPF and CIS (including the AK summary) will be reviewed by the Permittees for each waste stream prior to DOE approval of the WSPF. The Permittees review will ensure that the submitted AK information was collected under procedures that ensure implementation of the WAP, provides data sufficient to meet the DQOs in Section C-4a(1), and allow the Permittees to demonstrate compliance with the waste analysis requirements of the Permit. A detailed discussion of the Permittees' waste stream review and DOE's WSPF approval process is provided in Section C-1d.

Re-Evaluation Based on Visual Examination and Radiography

The CCP has established procedures for re-evaluating AK if the results of waste confirmation indicate that the waste to be shipped does not match the approved waste stream, or if data obtained from VE or radiography for waste streams without an AK Sufficiency Determination exhibit this discrepancy. The CCP procedures describe how waste AK is re-evaluated, the waste is reassigned, and appropriate hazardous waste numbers assigned. If the re-evaluation requires that the waste matrix code be changed

for the waste stream or the waste does not match the approved waste stream, the following minimum steps are taken to re-evaluate AK:

- Existing information is reviewed based on the container identification number and all differences in hazardous waste number assignments are documented
- If differences exist between the hazardous waste numbers that were assigned, the information is re-assessed, and required AK information associated with the new designation is documented
- Reassess and document all testing data associated with the waste
- The reassignment of the waste matrix code is documented and verified (e.g., verification that the waste was generated within the specified time period, area, and building and waste generating process, and that the process material inputs are consistent with the waste material parameters of waste identified during VE or radiography)
- Changes to AK records are recorded
- If discrepancies exist in the AK information for the revised waste matrix code, the discrepancies are documented in an NCR in accordance with CCP-QP-005, *CCP TRU Nonconforming Item Reporting and Control*. The NCR documents the segregation of the affected portion of the waste stream, and defines the corrective actions necessary to fully characterize the waste.

C4-3f Acceptable Knowledge Data Quality Requirements (T5)

DQOs for testing techniques are described in Section C3. Testing results are used to augment the characterization of wastes based on AK. To ensure the process is consistently applied and ensure that AK information is accurate, complete, and is representative of the waste stream being evaluated, the CCP complies with data quality requirements for AK documentation in Section C3.

The CCP addresses quality control by tracking its performance with regard to the use of AK by:

- Assessing the frequency of inconsistencies among information
- Documenting the results of waste discrepancies identified by CCP during waste confirmation using radiography, review of radiography audio/video recordings, VE, or review of VE records

In addition, the AK process and waste stream documentation is evaluated through internal assessments by QA organizations and assessment by auditors or observers external to the CCP (i.e., DOE-CBFO, NMED, EPA).

C4-3g Audits of Acceptable Knowledge

The DOE conducts an initial audit of the CCP prior to certifying the CCP for shipment of waste to the WIPP. This audit establishes an approved baseline that is reassessed annually by the DOE. The CCP does not certify waste for disposal until all corrective actions have been completed.

C5 QUALITY ASSURANCE PROJECT PLAN REQUIREMENTS

C5-1 Quality Assurance Project Plans

The CCP has developed and implemented this QAPjP to address the applicable waste characterization requirements specified in the WAP. This QAPjP includes the qualitative or quantitative criteria to ensure that waste characterization activities are being performed satisfactorily. The organization(s) and position(s) responsible for implementation of this QAPjP are identified in Section B. Throughout this QAPjP, CCP documents are referenced that detail how each of the required elements of the characterization project are performed.

This QAPjP follows the format of the WAP and is implemented by the CCP through procedures that address TRU waste characterization activities. Compliance with CCP documents ensures that tasks are performed in a consistent manner that results in achieving the quality required under the QA program. The organization, format, content, and designation of the CCP procedures is described in the CCP-QP-010, *CCP Document Preparation, Approval, and Control*.

C5-2 Document Review, Approval, and Control (Q10)

Prior to the implementation of characterization activities, the SPM ensures that written procedures have been developed for implementing the requirements of this QAPjP. Procedures ensure that tasks are performed in a consistent manner and achieve the quality required for the quality assurance program. The SPM is responsible for ensuring that the procedures meet the organization, format, content, and designation of standard operating procedures. CCP procedures are written so that they may be implemented at several sites simultaneously. Site-specific issues such as safety policies, technical specification requirements, or organizational necessities, may require the CCP to prepare site-specific procedures to supplement the procedures used to ensure WAP compliance. These procedures are identified in the SOW or site interface document. These procedures are prepared and controlled as are the other existing CCP operating procedures and are subject to site specific review requirements. As a minimum, the following requirements are addressed in CCP procedures:

- Responsibilities of the organizations affected by the document,
- Technical, regulatory, quality assurance, or other program requirements,
- Sequential description of work to be performed,
- Quantitative or qualitative acceptance criteria sufficient for determining that activities were satisfactorily accomplished.

- Prerequisites, limits, precautions, process parameters, and environmental conditions,
- Special qualifications and training requirements,
- Verification points and hold points,
- Methods for demonstrating that the work was performed as required (such as provisions for recording inspection and test results, checklists, or sign-off blocks), and
- Identification and classification of QA records to be generated by the implementing procedure.

Procedures also include examples of data (e.g., reports, forms, and data validation checklists), as appropriate. Internal review and approval requirements are specified. In addition, CCP procedures are formatted, as follows:

- Purpose
- Scope
- Requirements
- Responsibilities
- Procedures
- Records

CCP procedures are reviewed for consistency with the QAPjP in accordance with the above listed requirements. The SPM is responsible for ensuring that the most current version of all procedures is readily available for use as needed by project personnel after procedures have been reviewed and approved for use.

The SPM ensures that the preparation, issuance, and change to documents that specify quality requirements or prescribe activities affecting quality for the CCP program be controlled to assure that correct and current documents are used and referenced. The CCP uses a document control format consisting of a unique document identification number, current revision number, data, and page number, which will be placed in the header on the individual pages of the document. CCP documents are delineated into five areas: quality procedures, denoted by CCP-QP-XXX; technical procedures, denoted by CCP-TP-XXX; health and safety plans denoted by CCP-HSP-XXX; configuration management denoted by CCP-CM-XXX; and CCP Project Office documents (i.e., this QAPjP), denoted by CCP-PO-XXX. “XXX” denotes a sequential number.

Qualified and independent personnel review all CCP documents (including this QAPjP) prior to approval and issuance. Reviews consider the technical adequacy, completeness, and correctness of CCP documents and the inclusion of and compliance

with the requirements established by the WAP. Approval is indicated by a signature and date page included in the front of the document. The SPM ensures that:

- Revisions to site implementing documents are denoted by including the current revision number and date on the document title page and each page of the document.
- Revised pages are marked in redline/strikeout for expeditious review of the entire document.
- A vertical bar, indicating the change to the text, is included along the left-hand margin of the page, except in the case of full document revisions.
- Revised document submittals identify the changes, the reason for the changes, and the justification for concluding that the revised contents continue to satisfy the requirements of the QA program.
- Revisions that affect performance criteria or data quality (e.g., sampling or analytical methods, QAO, calibration requirements), other than editorial or minor changes, undergo the same level of review and approval as the baseline version of each document. These documents are reviewed and approved by the same functional organizations that performed the original review/approval, unless other organizations are specifically designated in accordance with approved procedures. Editorial or minor changes may be made without the same level of review and approval as the original or otherwise changed documents. The following items are considered editorial or minor changes:
    - Correcting grammar or spelling (provided the meaning has not changed),
    - Renumbering sections or attachments,
    - Updating organizational titles (*A change in an organizational title accompanied by a change in responsibilities is not considered an editorial change*),
    - Changes to non-quality-affecting schedules,
    - Revised or reformatted forms, providing the original intent is not altered, and
    - Attachments marked “Example” or exhibits clearly intended to be representative only
- CCP personnel are responsible for reporting any obsolete or superseded information to the SPM

- All CCP changes are evaluated and approved by the SPM, the appropriate personnel are notified before implementation, and the affected documents are revised as necessary

- Changes that affect performance criteria or data quality, and would take the activity out of compliance because they alter a requirement are not made without prior approval by DOE.

In addition, the SPM is responsible for ensuring that non-administrative changes, non-editorial changes, or changes that could affect performance criteria or data quality, such as sample handling and custody requirements, sampling and analytical testing procedures, quality assurance objectives, calibration requirements, or QC sample acceptance criteria (i.e., those changes that require prior approval of DOE as defined in Section C5-2) shall be reported to DOE within five days of identification by the project level review. The SPM ensures that the document control system is implemented to control the process for initiating, revising, modifying, reviewing, and distributing project documents and changes to project documents. As potential changes to project information are identified by the SPM, documents are revised as necessary and distributed to affected organizations in accordance with this procedure.

C6 AUDIT AND SURVEILLANCE PROGRAM

C6-1 Introduction

The WIPP audit and surveillance program ensures that the CCP conducts testing of wastes in accordance with the current WAP and that waste certification information is being managed properly. The CCP addresses deficiencies identified during the audits. A deficiency is any failure to comply with an applicable requirement of the WAP.

C6-2 Audit Procedures

This section does not apply to the CCP.

C6-3 Audit Position Functions

This section does not apply to the CCP.

C6-4 Audit Conduct

During audit interviews or audit meetings, CCP may be advised of deficiencies identified within their areas of responsibility to establish a clear understanding of the identified condition.

The personnel will be given the opportunity to correct any deficiency that can be corrected during the audit period.

When a deficiency is identified by the DOE audit team, a Corrective Action Report (CAR) is issued to the CCP. The CCP reviews the CAR which is used to evaluate the extent and cause of the deficiency, and submits an approved response to the Permittees indicating remedial actions and actions taken to preclude recurrence. If these responses to the CAR are acceptable, DOE communicates the acceptance to the CCP.

The CCP completes the remedial actions and actions to preclude recurrence and requests DOE to close the CAR. Following the completion of corrective actions, the Permittees may schedule and perform a verification visit to assure that corrective actions have been completed and are effective.

The corrective action response includes a discussion of the investigation performed to determine the extent and impact of the deficiency, a description of the remedial actions taken, determination of root cause, and action taken to preclude recurrence.

The CCP responds to any deficiencies and observations within thirty (30) days of receipt of any CARs and indicates the corrective action taken or to be taken. If the corrective action has not been completed, the response indicates the expected date the action will be completed. CARs applicable to WAP requirements are resolved prior to waste shipment.

C7 TRU WASTE CONFIRMATION

Introduction

This section of the QAPjP describes the actions that the Permittees will take to approve and accept waste for and disposal at the WIPP, including waste confirmation activities. Discussion of the Permittees' actions that are relevant to CCP will be included here. The Permittees demonstrate compliance with the WIPP-WAP by ensuring that the waste characterization processes performed by CCP produce data compliant with the WIPP-WAP and through the waste screening and verification processes. Verification occurs at three levels: 1) the data generation level, 2) the project level, and 3) the Permittee level. The Permittees also examine a representative subpopulation of waste prior to shipment to confirm that the waste contains no ignitable, corrosive, or reactive waste; and that assigned EPA Hazardous Waste Numbers are allowed by the WIPP RCRA Permit. The waste confirmation activities described herein occur prior to shipment of the waste from the CCP to WIPP.

C7-1 Permittee Confirmation of TRU Mixed Waste

This section does not apply to CCP.

C7-1a Permittee Confirmation of a Representative Subpopulation of the Waste

The Permittees will confirm that the waste contains no ignitable, corrosive, or reactive waste through radiography or the use of VE of a statistically representative subpopulation of the waste. Prior to shipment to WIPP, waste confirmation will be performed on randomly selected containers from each CH- and RH-TRU waste stream shipment.

C7-1b Radiography Methods Requirements

This section describes the portion of the Permittees' confirmation program that applies to CCP.

For containers that have been characterized using radiography by CCP in accordance with the method in Section C1-1, the Permittees may perform confirmation by review of CCP's radiography audio/video recordings.

When confirmation is performed by review of audio/video recorded scans produced by CCP as specified in Section C1-1, independent observations will be performed on two waste containers per shipment or two containers per day, whichever is less frequent.

C7-1c Visual Examination Methods Requirements

This section describes the portion of the Permittees' confirmation program that applies to CCP.

VE may also be used as a waste confirmation method by the Permittees. VE shall be conducted by the Permittees in accordance with written standard operating procedures to describe the contents of a waste container. VE shall be conducted to identify and describe all waste items, packaging materials, and waste material parameters. VE may be used by the Permittees to examine a statistically representative subpopulation of the waste certified for shipment to WIPP to confirm that the waste contains no ignitable, corrosive, or reactive waste. This is achieved by confirming that the waste contains no liquid in excess of TSDF-WAC limits or compressed gases, and that the physical form of the waste matches the waste stream description documented on the WSPF. During packaging, the waste container contents are directly examined by trained personnel. This form of waste confirmation may be performed by the Permittees at the waste generator/storage site. VE may be documented on video and audio media, or by using a second operator to provide additional verification by reviewing the contents of the waste container to ensure correct reporting. When VE is performed using a second operator, each operator performing the VE shall observe for themselves the waste being placed in the waste container or the contents within the examined waste container when waste is not removed. The results of all VE shall be documented on data forms.

In order to keep radiation doses as low as reasonably achievable, the Permittees may use their own trained VE operators to perform VE for waste confirmation by reviewing CCP VE data, which includes VE data forms, waste packaging records, and may also include audio/video media. If the Permittees perform waste confirmation by review of video media, the video record of the VE must be sufficiently complete for the Permittees to confirm the Waste Matrix Code and waste stream description, and verify the waste contains no liquid in excess of TSDF-WAC limits or compressed gases. CCP VE video/audio media subject to review by the Permittees shall meet the following minimum requirements:

- The video/audio media shall record the waste packaging event for the container such that all waste items placed into the container are recorded in sufficient detail and shall contain an inventory of waste items in sufficient detail that a trained Permittee VE operator can identify the associated waste material parameters.
- The video/audio media shall capture the waste container identification number.
- The personnel loading the waste container shall be identified on the video/audio media or on packaging records traceable to the loading of the waste container.
- The date of loading of the waste container will be recorded on the video/audio media or on packaging records traceable to the loading of the waste container.

The Permittees may also use their own trained VE operators to perform VE for waste confirmation by reviewing VE data forms or packaging logs prepared by the generator during their packaging of the waste. To be acceptable, the CCP VE data must be signed by two CCP personnel who witnessed the packaging of the waste and must provide sufficient information for the Permittees to determine that the waste container contents match the waste stream description on the WSPF and the waste contains no liquid in excess of TSDF-WAC limits or compressed gases. The Permittees will document their review of CCP VE data on Permittee VE data forms. CCP VE forms or packaging records subject to review by the Permittees shall meet the following minimum requirements:

- At least two generator site personnel shall approve the data forms or packaging records attesting to the contents of the waste container.

- The data forms or packaging records shall contain an inventory of waste items in sufficient detail that a trained Permittee VE operator can identify the associated waste material parameters.

- The waste container identification number shall be recorded on the data forms or packaging records.

VE video media of containers which contain classified shapes shall be considered classified information. VE data forms will not contain classified information.

C7-2 Noncompliant Waste Identified During Waste Confirmation

This section describes the portion of the Permittees' confirmation program that applies to CCP.

If the Permittee identifies noncompliant waste during waste confirmation at a CCP site, (i.e., the waste does not match the waste stream description documented in the WSPF or there is liquid in excess of TSDF-WAC limits or compressed gases) the waste will not be shipped.

The DOE will suspend further shipments of the affected waste stream and issue a CAR to CCP. Shipments of affected waste streams will not resume until the CAR has been closed.

As part of the corrective action plan in response to the CAR, CCP will evaluate whether the waste characterization information documented in the CIS or WSPF for the waste stream must be updated because the results of waste confirmation for the waste stream indicated that the TRU waste being examined did not match the waste stream description. CCP will thoroughly evaluate the potential impacts on waste that has been shipped to WIPP. The DOE will evaluate the potential that prohibited items were shipped to WIPP and what remedial actions should occur, if any. The results of these

evaluations will be provided to NMED before shipments of affected waste stream resume. If the CIS and/or WSPF requires revision, shipments of the affected waste stream shall not resume until the revised waste stream waste characterization information has been reviewed and approved by the DOE. If CCP certifies noncompliant waste at a site more than once during a running 90-day period, the DOE will suspend acceptance of CCP's waste from that CCP site until the DOE finds that all corrective actions have been implemented and the site complies with all applicable requirements of the WIPP-WAP.

C8 REFERENCES

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13. Public Law 102-579, *The Waste Isolation Pilot Plant Land Withdrawal Act,* October 30, 1992 as amended by Public Law 104-201, September 23, 1996

14. CCP-QP-002, *CCP Training and Qualification Plan*

15. CCP-QP-005, *CCP TRU Nonconforming Item Reporting and Control*

16. CCP-QP-008, *CCP Records Management*

17. CCP-QP-010, *CCP Document Preparation, Approval, and Control*

18. CCP-TP-005, *CCP Acceptable Knowledge Documentation*

ACRONYMS AND ABBREVIATIONS

AK	Acceptable Knowledge
AKA	Acceptable Knowledge Assessment
ATWIR	*Annual Transuranic Waste Inventory Report*
BDR	Batch Data Report
CAR	Corrective Action Report
CBFO	Carlsbad Field Office
CCP	Central Characterization Program
CFR	Code of Federal Regulations
CH	contact-handled
CIS	Characterization Information Summary
DA	data administrator
DOE	U.S. Department of Energy
DQO	data quality objective
EPA	U.S. Environmental Protection Agency
g	gram
HWA	New Mexico Hazardous Waste Act
HWDU	Hazardous Waste Disposal Unit
HWFP	*WIPP Hazardous Waste Facility Permit*
ID	identification number
in	inches
INL	Idaho National Laboratory
kV	kilovolts
LDR	Land Disposal Restrictions
Mm	millimeter
nCi	nanocuries
NCR	nonconformance report
NDE	nondestructive examination
NMAC	New Mexico Administrative Code
NMED	New Mexico Environment Department
NWP	Nuclear Waste Partnership
OJT	on-the-job training
PCB	polychlorinated biphenyls
PDP	Performance Demonstration Program
POC	point of contact
QA	quality assurance
QAO	quality assurance objective
QAPD	Quality Assurance Program Description
QAPjP	quality assurance project plan
QC	quality control
RCRA	Resource Conservation and Recovery Act
RH	remote-handled
RIDS	records inventory and disposition schedule
SLB2	standard large box 2
SME	Subject Matter Expert

ACRONYMS AND ABBREVIATIONS (Continued)

SOP	standard operating procedure
SOW	Statement of Work
SPM	Site Project Manager
SRS	Savannah River Site
SWB	standard waste box
TDOP	ten-drum overpack
TRU	transuranic
TRUCON	*TRUPACT Content Code*
TSDF-WAC	*Treatment, Storage, and Disposal Facility Waste Acceptance Criteria*
VE	visual examination
VOC	volatile organic compound
WAP	Waste Analysis Plan
WDS	Waste Data System
WIPP	Waste Isolation Pilot Plant
WSPF	Waste Stream Profile Form
WWIS	WIPP Waste Information System

Attachment 1 – Implementing Procedures

Reference Number	Procedure Number	Procedure Title
Q1	CCP-QP-001	CCP Graded Approach
Q2	CCP-QP-002	CCP Training and Qualification Plan
Q5	CCP-QP-005	CCP TRU Nonconforming Item Reporting and Control
Q8	CCP-QP-008	CCP Records Management
Q10	CCP-QP-010	CCP Document Preparation, Approval, and Control
Q14	CCP-QP-014	CCP Quality Assurance Trend Analysis and Reporting
Q15	CCP-QP-015	CCP Procurement
Q16	CCP-QP-016	CCP Control of Measuring and Testing Equipment
Q17	CCP-QP-017	CCP Identification and Control of Items
Q18	CCP-QP-018	CCP Management Assessment
Q19	CCP-QP-019	CCP Quality Assurance Reporting to Management
Q22	CCP-QP-022	CCP Software Quality Assurance Plan
Q23	CCP-QP-023	CCP Handling, Storage and Shipping
Q26	CCP-QP-026	CCP Inspection Control
Q27	CCP-QP-027	CCP Test Control
Q28	CCP-QP-028	CCP Records Filing, Inventorying, Scheduling, and Dispositioning
Q30	CCP-QP-030	CCP Written Practice for the Qualification of CCP Helium Leak Detection Personnel
Q40	CCP-QP-040	Support Training
T1	CCP-TP-001	CCP Project Level Data Validation and Verification

Attachment 1 – Implementing Procedures (Continued)

Reference Number	Procedure Number	Procedure Title
T2	CCP-TP-002	CCP Reconciliation of DQOs and Reporting Characterization Data
T5	CCP-TP-005	CCP Acceptable Knowledge Documentation
T6	CCP-TP-006	CCP Visual Examination Technique for Idaho National Laboratory (INL) Newly Generated TRU Waste
T28	CCP-TP-028	CCP Radiographic Test Drum and Training Container Construction
T30	CCP-TP-030	CCP CH TRU Waste Certification and WWIS/WDS Data Entry
T53	CCP-TP-053	CCP Standard Real-Time Radiography (RTR) Inspection Procedure
T86	CCP-TP-086	CCP CH Packaging Payload Assembly
T113	CCP-TP-113	CCP Standard Contact-Handled Waste Visual Examination
T163	CCP-TP-163	CCP Evaluation of Waste Packaging Records for Visual Examination of Records
T500	CCP-TP-500	CCP Remote-Handled Waste Visual Examination
T508	CCP-TP-508	CCP RH Standard Real-Time Radiography Inspection Procedure
T512	CCP-TP-512	CCP Remote-Handled Waste Sampling
T530	CCP-TP-530	CCP RH TRU Waste Certification and WWIS/WDS Data Entry
WP1	WP 15-GM1002	Issues Management Processing of WIPP Forms
WP2	WP 13-QA.03	Quality Assurance Independent Assessment Program

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Effective Date: MAY 3 1 2013

CCP-PO-002
Revision 27

CCP
Transuranic
Waste Certification Plan

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RECORD OF REVISION

Revision Number	Date Approved	Description of Revision
4	05/17/2002	Revised to reflect requirements of new Department of Energy (DOE)/WIPP 02-3122, *Contact-Handled Transuranic Waste Acceptance Criteria for the Waste Isolation Pilot Plant* (CH-WAC) (WIPP).
5	02/12/2003	Added CCP-TP-046, CCP-TP-047 AND CCP-TP-048 to Attachment 1, Table A.3-3, NDA Procedures.
6	06/11/2003	Updated to Revision 5 of the Quality Assurance Program Description (QAPD).
7	11/20/2003	Supplemented the description of the CCP organization in Section 4.1.1; added work planning criteria to Section 4.1.2[B]; revised Sections 4.10 and 4.10.2 to better describe how independent assessments are scheduled and conducted; updated procedure references.
8	01/08/2004	Added Procedures into Tables A-3.3, B-1, B-3, and B-4. Removed cancelled procedure (CCP-TP-080) from Table B-4.
9	03/15/2004	Incorporate changes to Revision 1 of DOE/WIPP-02-3122, Contact-Handled Transuranic Waste Acceptance Criteria for the Waste Isolation Pilot Plant and other editorial changes. Changed references to match WAC.
10	11/15/2004	Revised to add procedures into Tables B-1, B-2, B-3 and B-4 in Attachment 4: Procedure Tables. Editorial changes throughout document. Incorporated Revision 20 of the Transuranic Package Transporter Modell II (TRUPACT-II) Safety Analysis Report (SAR), Revision 3 of the HalfPACT SAR, Revision 2 of the WIPP Waste Acceptance Criteria. Incorporated Carlsbad Field Office (CBFO) Document Release Record (DRR) comments.
11	02/24/2005	Revised to incorporate LANL Off-Site Source Recovery (OSR) Project. The Facility Quality Assurance Officer (FQAO) responsibilities were removed from this document to address Environmental Protection Agency (EPA) concerns regarding document consistency.
12	03/10/2005	Added procedures to Table A-3.3, Table B-1, and Table B-3. Added new Table B-3A, Solids Sampling Procedures.
13	05/09/2005	Incorporated changes to Revision 3 of DOE/WIPP-02-3122, CH-WAC for the WIPP. Updated 2.0 in Attachment 8. Updated web links in Section 5.
14	12/29/2005	Incorporated changes to Table 3.3.22, ^{239}Pu FGE Limits for Packages and Rev. 2 of the CH-TRAMPAC and editorial changes.

RECORD OF REVISION (Continued)

Revision Number	Date Approved	Description of Revision
15	03/22/2006	Revised to add procedures to Attachment 1, Radioassay Requirements for Contact-Handled Transuranic Waste, Table A-3.3, NDA Procedures and Attachment 4, Procedure Tables, and editorial corrections throughout. Updated Figure 2-1, Central Characterization Project (CCP) Organization. Changed all references to DOE O 414.1A to DOE O 414.1. Updated step 3.2.2(B) (B.1) and step 3.2.6(B)(B.2) to address Carlsbad Field Office (CBFO) Document Review Record (DRR) comments.
16	11/16/2006	Revised to incorporate Revision 5 of DOE/WIPP 02-3122, *Transuranic Waste Acceptance Criteria for the Waste Isolation Pilot Plant.*
17	11/16/2006	Revised in response to concerns raised during the Idaho National Laboratory (INL) Remote-Handled (RH) Audit A-06-21. Corrected Section 4.4.1[B] and Attachment 11.
18	11/16/2006	Revised to incorporate Revision 6.0 of DOE/WIPP 02-3122, *Transuranic Waste Acceptance Criteria for the Waste Isolation Pilot Plant.*
19	05/22/2007	Revised to change the references for quality planning, list CCP special processes, and add a new Section 5.7 addressing configuration management of CCP equipment.
20	11/02/2007	Revised for the addition of Remote Handled Waste shipments.
21	01/26/2009	Revised procedure lists to include new and modified procedures/titles. Also, revised to incorporate Revision 6.2 of DOE/WIPP 02-3122, *Transuranic Waste Acceptance Criteria for the Waste Isolation Pilot Plant*.
22	01/12/2010	Revised to incorporate Revision 6.4 of DOE/WIPP-02-3122, *Transuranic Waste Acceptance Criteria for the Waste Isolation Pilot Plant*.
23	04/07/2010	Revised to add Hanford Non-Destructive Assay (NDA) equipment.
24	06/30/2010	Revised to incorporate Revision 6.5 of DOE/WIPP-02-3122, *Transuranic Waste Acceptance Criteria for the Waste Isolation Pilot Plant*.
25	12/29/2010	Revised to incorporate Revision 7.0 of DOE/WIPP-02-3122, *Transuranic Waste Acceptance Criteria for the Waste Isolation Pilot Plant* and minor editorial changes.
26	07/14/2011	Revised to incorporate revision 7.1 and 7.2 of DOE/WIPP-02-3122, *Transuranic Waste Acceptance Criteria for the Waste Isolation Pilot Plant*, minor editorial changes, and delete Appendix 11.

RECORD OF REVISION (Continued)

Revision Number	Date Approved	Description of Revision
27	05/31/2013	Revised to incorporate Revision 7.3 and Revision 7.4 of DOE/WIPP-02-3122, *Transuranic Waste Acceptance Criteria for the Waste Isolation Pilot Plant*, which incorporates the changes resulting for the Class 2 Permit modification entitled “Revised Waste Analysis Plan Waste Characterization Methods” which was approved by New Mexico Environment Department (NMED) on March 13, 2013, incorporate organizational changes to reflect the transition to Nuclear Waste Partnership (NWP), to clarify the hierarchy of quality assurance (QA) program documents, and minor editorial changes.

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1.0 INTRODUCTION

The Central Characterization Program (CCP) is tasked with characterizing and certifying Transuranic (TRU) waste for disposal at the Waste Isolation Pilot Plant (WIPP). Accordingly, the CCP must comply with DOE/WIPP 02-3122, *Transuranic Waste Acceptance Criteria for the Waste Isolation Pilot Plant* (WAC). The WAC establishes the specific physical, chemical, radiological, and packaging criteria for acceptance of defense TRU waste shipments at WIPP. The WAC also requires that the CCP produce documents, including a certification plan, that addresses applicable requirements and criteria pertaining to packaging, characterization, certification, and shipping of defense TRU waste to WIPP for disposal.

The CCP may provide its services to a site by contracting directly with that site. If this is the case, the scope of services provided by CCP is specified in a Statement of Work (SOW) issued by the site. The SOW also specifies health and safety requirements, quality requirements, and other requirements specific to that site. A site-specific interface document may also be prepared which provides more detail on the site-CCP interface. The CCP has the option to use data from established TRU waste characterization activities at a U.S. Department of Energy (DOE)-Carlsbad Field Office (CBFO)-certified site, per site-specific interface documents. Transportation services may be provided through the CCP Certified Program or by other DOE-CBFO certified sites.

The site has general management oversight responsibility for work performed by the CCP at the site. The site is responsible for ensuring that CCP conducts its activities in compliance with site requirements, as defined in the site-specific interface document for that location.

Figure 1-1, CCP Document Hierarchy for TRU Waste Characterization, Certification, and Transportation illustrates the hierarchy of regulatory requirements for TRU waste characterization, certification, and transportation, and reflects the flow-down of requirements from higher-level documents to site-level program documents and implementing procedures. To ensure that future changes to the WAC and other relevant requirements documents are appropriately reflected, this CCP Transuranic Waste Certification Plan (hereinafter referred to as the Plan) will be reviewed at least annually and updated as necessary.

This Plan establishes the programmatic framework and criteria within which the CCP ensures that TRU wastes can be certified as compliant with the WAC. This Plan includes the following sections:

- Section 2.0, ORGANIZATION OF THE CCP, describes the interaction between the characterization, certification, and transportation personnel, and lists the responsibilities of key CCP officials.

- Section 3.0, COMPLIANCE PLAN FOR CH-WAC, describes CCP activities and specific documents that implement and verify compliance with each requirement.

- Section 4.0, WASTE ACCEPTANCE REQUIREMENTS AND CRITERIA FOR RH WASTE, describes CCP activities and specific documents that implement and verify compliance with each requirement.

- Section 5.0, QUALITY ASSURANCE PLAN, describes how the CCP complies with DOE/CBFO-94-1012, *U.S. Department of Energy Carlsbad Field Office Quality Assurance Program Document* (QAPD) (Reference 18), the WAC (Reference 47), DOE/WIPP-02-3214, *Remote-Handled TRU Waste Characterization Program Implementation Plan* (WCPIP) (Reference 17), and provides the QA Plan for transportation as required by Title 10 *Code of Federal Regulations* (CFR), *Energy,* Part 71, *Packaging and Transportation of Radioactive Material,* Subpart H, *Quality Assurance*.

This Plan and associated Quality Assurance (QA) Plan (Section 5.0), CCP-PO-001, *CCP Transuranic Waste Characterization Quality Assurance Project Plan* (QAPjP), CCP-PO-003, *CCP Transuranic Authorized Methods for Payload Control (CCP CH-TRAMPAC),* and CCP-PO-505, *Remote-Handled Transuranic Waste Authorized Methods for Payload Control* establish the programmatic framework for the CCP's waste characterization, certification, and transportation activities. The QA Plan (Section 5.0) within this Plan implements all of the applicable CBFO QAPD requirements. These documents are submitted to the CBFO for review and approval. CCP will not characterize, certify, or ship TRU wastes to the WIPP before CBFO approval of this Plan.

1.1 CBFO Organization and Responsibilities

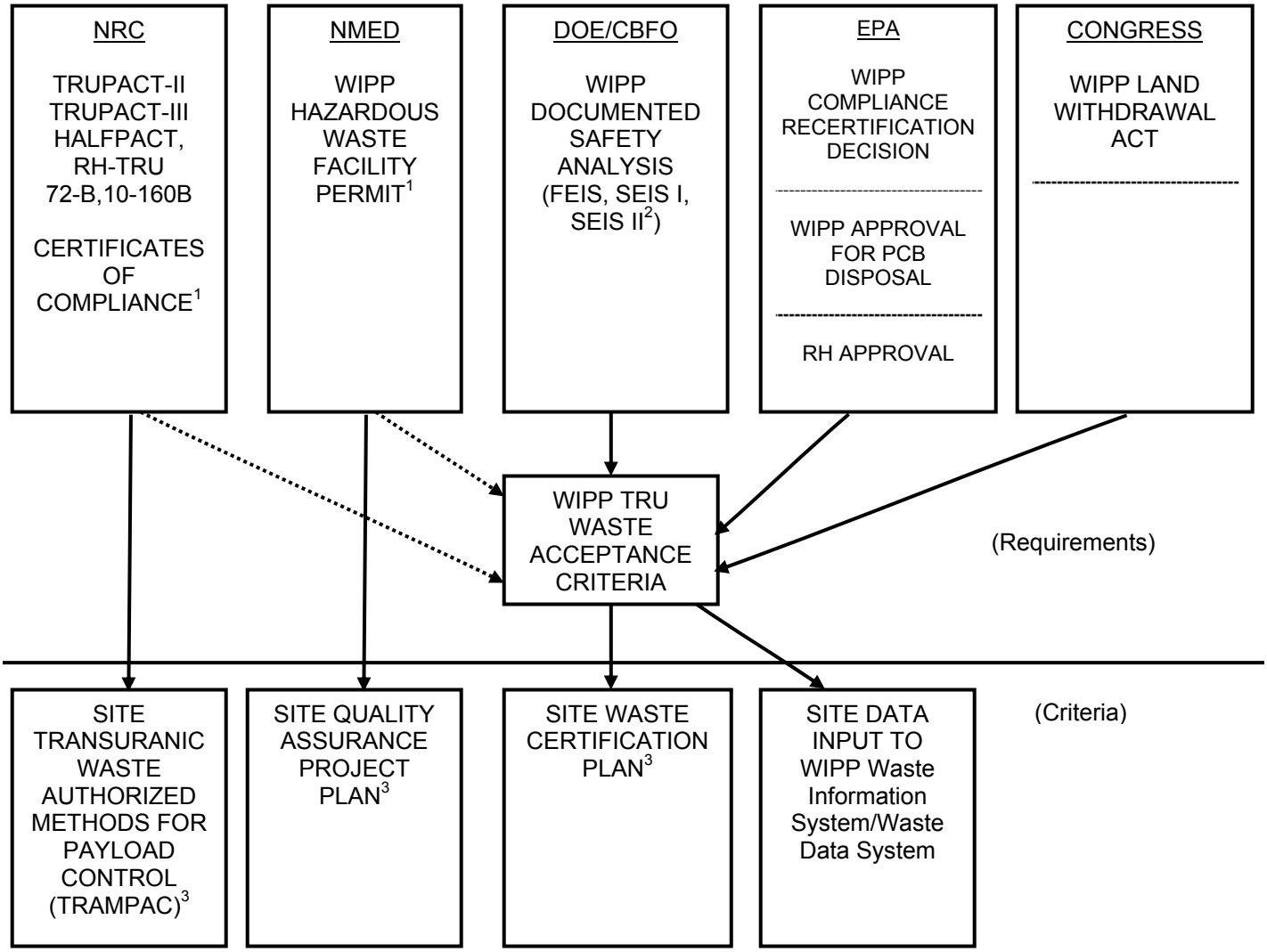
1.1.1 DOE-CBFO Office Director, Office of (Quality Assurance Manager)

[A] The DOE-CBFO QA Manager provides independent oversight of QA activities of the CCP and approves this Plan. This will include audits and surveillances to ensure that CCP is in compliance with this Plan.

1.1.2 DOE-CBFO Office Director, Office of National TRU Program

[A] The DOE-CBFO Office Director, Office of National TRU Program provides overall policy direction and oversees the CCP characterization and certification activities and approves this Plan.

Figure 1-1. CCP Document Hierarchy for TRU Waste Characterization, Certification, and Transportation



Note 1: The TRAMPACs as referenced by the TRUPACT-II, TRUPACT-III, HalfPACT, and RH-TRU 72-B Certificates of Compliance, the Safety Analysis Report (SAR) as referenced by the 10-160B Certificate of Compliance, and the WIPP Hazardous Waste Facility Permit (HWFP) provide detailed requirements. This Plan provides only an overview of these requirements.

Note 2: Final Environmental Impact Statement (FEIS), Supplemental Environmental Impact Statement (SEIS).

Note 3: All work performed by the site for the CBFO must be performed under an approved QA program. The site-specific Transuranic Waste Authorized Methods for Payload Control (TRAMPAC) can be a separate document or can be embodied in the site waste certification plan. The 10-160B SAR does not require the preparation of a site-specific TRAMPAC. Instead, acceptable methods for payload compliance for the 10-160B package are implemented by a Nuclear Regulatory Commission (NRC)-approved site-specific Appendix to the 10-160B SAR.

2.0 ORGANIZATION OF THE CCP

The responsibilities for TRU waste management of the CCP are distributed within various organizations. This section identifies the organizations involved in the CCP and describes the responsibilities of and interactions between these organizations.

2.1 Organization and Responsibilities

2.1.1 CCP Management

[A] CCP management has overall responsibility for successfully accomplishing activities subject to the QAPD. Management provides the necessary planning, organization, direction, control, resources, and support to achieve their defined objectives. Management is responsible for planning, performing, assessing, and improving the work.

[B] CCP management is responsible for establishing and implementing policies, plans, and procedures that control the quality of work, consistent with the provisions of the CBFO QAPD.

[C] Ensuring that adequate technical and QA training is provided for personnel performing activities subject to the CBFO QAPD.

[D] CCP management is responsible for ensuring that individual workers are knowledgeable of requirements for work they perform and are provided the necessary resources and administrative controls needed to accomplish assigned tasks.

[E] Ensuring compliance with all applicable regulations, DOE orders and requirements, and applicable federal, state, and local laws.

[F] Ensuring that personnel adhere to procedures for the generation, identification, control, and protection of QA records.

[G] Exercising the authority and responsibility to STOP unsatisfactory work such that cost and schedule do not override environmental, safety, or health considerations.

[H] Developing, implementing, and maintaining plans, policies, and procedures that implement the CBFO QAPD.

[I] Identifying, investigating, reporting, and correcting quality problems.

[J] Members of CCP management are responsible for achieving and maintaining quality in their area. Quality achievement is the responsibility of those performing the work. Quality achievement is verified by persons or organizations not directly responsible for performing the work.

[K] CCP management empowers employees by delegating authority and decision making to the lowest appropriate level in the organization.

[L] Figure 2-1, CCP Organization, is a functional organization chart pertaining to TRU waste characterization and certification activities at the CCP. The following subsections identify the organizations that oversee the CCP and describe the roles and responsibilities of key positions within the CCP charged with implementing the requirements defined in this Plan.

2.1.2 NTPC Certification Manager

[A] The National TRU Program Certification (NTPC) Manager is responsible for the day-to-day management and direction of CCP activities. The NTPC Certification Manager is responsible for:

[A.1] Ensuring successful CCP/site interface.

[A.2] Ensuring CCP plans and operations are coordinated, integrated, and consistent with DOE-CBFO programs, policies, and guidance.

[A.3] Coordinating CCP activities and functioning as principal point-of-contact (POC) with DOE-CBFO and other regulating agencies.

[A.4] Reviewing and approving this Plan.

2.1.3 CCP Certification Manager

[A] The CCP Certification Manager is the principal POC with DOE (including CBFO and National TRU Program [NTP]) for technical activities associated with TRU waste. The CCP Certification Manager performs the Site Project Manager (SPM) duties described in Appendix E of the CBFO QAPD. The CCP Certification Manager may delegate specific individuals within CCP to perform functions that are the responsibility of an SPM. The use of the term “SPM” in this Certification Plan refers to those delegated individuals. This delegation is documented by the completion and approval of an SPM Qualification Card in accordance with CCP-QP-002.

The CCP Certification Manager coordinates with the CCP Waste Certification Official (WCO) and Transportation Certification Official (TCO) and oversees CCP activities to ensure that TRU waste is characterized and certified compliant with WIPP requirements. Specific responsibilities assigned to the CCP Certification Manager include the following:

[A.1] Reviewing and approving this Plan.

[A.2] Developing, maintaining, reviewing, approving, and implementing CCP procedures and plans. Development, approval, and implementation of procedures and plans will occur at the earliest time consistent with the schedule for accomplishing the activities.

[A.3] Scheduling revisions and distributing CCP procedures and plans and forwarding these documents (if significantly revised) to DOE-CBFO for review and approval before implementation. The term "significantly revised" means non-editorial changes in accordance with the CBFO QAPD, Section 1.4.3.

[A.4] Ensuring CCP personnel receive appropriate training and are properly qualified, so that suitable proficiency is achieved and maintained.

[A.5] Obtaining Acceptable Knowledge (AK) information from waste generators regarding U.S. Environmental Protection Agency (EPA) hazardous waste numbers.

[A.6] Reviewing and approving interface documents.

[A.7] Waste selection and tracking.

[A.8] Halting characterization or certification activities if problems affecting the quality of certification processes or work products exist.

[A.9] Validating and verifying characterization data.

[A.10] Reconciling verified data with data quality objectives (DQOs).

[A.11] Evaluating and reconciling AK information with characterization data.

[A.12] Preparing and submitting SPM Data Validation Summaries, Waste Stream Profile Forms (WSPFs), Characterization Information Summaries, Waste Stream Characterization Packages, and QA/Quality Control (QC) reports to DOE-CBFO.

[B] The CCP Certification Manager may delegate any of these activities to another individual; however, the CCP Certification Manager retains ultimate responsibility for ensuring that CCP certification requirements are met.

2.1.4 CCP Transportation Certification Official (TCO)

[A] The CCP TCO documents and certifies that payload containers and assemblies to be transported meet the requirements of CCP-PO-003. Specific responsibilities of the TCO include the following:

[A.1] Reviewing the applicable CCP transportation plans and transportation procedures.

[A.2] Interfacing with the SPM, CCP Certification Manager, WCO, and QA on matters associated with waste transportation.

[A.3] Reviewing and maintaining CCP-PO-003.

[A.4] Ensuring that data used in completion of the transportation documents are accurate and demonstrate that the waste is acceptable for transportation.

[A.5] Preparing and signing Payload Container Transportation Certification Documents (PCTCDs) and Overpack Payload Container Transportation Certification Documents (OPCTCDs).

[A.6] Preparing and signing Payload Assembly Transportation Certification Documents (PATCDs).

[A.7] Assisting QA with preparation of responses to deficiency reports in transportation matters.

[A.8] Ensuring that the transportation data entered into the WIPP Waste Information System/Waste Data System (WWIS/WDS) are accurate and demonstrate that waste is acceptable for disposal at WIPP.

[A.9] Reviewing interface documents.

[A.10] Halting transportation certification activities if problems affecting the certification or work process exist.

2.1.5 NWP Quality Assurance (QA) Manager

[A] The (NWP) Nuclear Waste Partnership QA Manager has the overall responsibility and authority to perform independent assessments to verify the organization's achievement of quality and assure the effective implementation of the QA program. The NWP QA Manager has the responsibilities and authorities described in Section 1.1.5 of WP 13-1, Nuclear Waste Partnership LLC Quality Assurance Program Description (NWP QAPD).

2.1.6 Quality Assurance (QA)

[A] QA provides QA oversight and planning for TRU waste characterization and certification, verifies the implementation of the QAPjP and the QA requirements of this Plan, and provides day-to-day guidance to CCP staff on quality-related matters. QA has the authority to STOP CCP work activities if quality is not assured or controlled. QA has no assigned responsibilities unrelated to the QA Program that would prevent appropriate attention to QA matters. QA is responsible for verifying the achievement of quality by those performing the work. As shown in the organization chart in Figure 2-1, the Assurance Programs Manager reports to the NWP QA Manager, so that required authority and organizational freedom are provided, including sufficient independence from cost and schedule considerations. The Assurance Programs Manager performs the duties and has the responsibilities and authorities described for the site project QA manager in Appendix E of the CBFO QAPD. QA specific responsibilities include the following:

[A.1] Reviewing and approving CCP procedures and plans including this Plan.

[A.2] Coordinating and participating in internal and external audits and assessments to verify compliance.

[A.3] Tracking compliance and evaluating trends in compliance with QA objectives (QAOs).

[A.4] Performing assessments of testing facilities.

[A.5] Tracking and trending CCP nonconformances and corrective action reports (CARs).

[A.6] Verifying CCP corrective actions.

[A.7] Submitting semi-annual and other QA/QC reports to the CCP Certification Manager and DOE-CBFO.

[A.8] Participating in the development of responses to Corrective Action Reports generated by DOE-CBFO or other external assessment organizations.

[A.9] Reviewing and approving supplier and subcontractor QA Plans.

[A.10] Reviewing interface documents.

[A.11] Providing guidance to all CCP organizations concerning identification, control, and protection of QA records.

[A.12] STOPPING work if quality is not ensured or controlled.

[A.13] Providing day-to-day guidance on quality-related matters to CCP staff.

[A.14] Maintaining liaison with participant QA organizations and other affected organizations.

[A.15] Developing, establishing, and interpreting QA policy and ensuring effective implementation.

[A.16] Interfacing, as appropriate, with the DOE-CBFO staff, participants, and other stakeholders on QA matters.

[A.17] Assisting CCP organizations with quality planning, documentation, quality measurement, and problem identification and resolution.

[A.18] Initiating, recommending, or providing solutions to quality problems through designated channels.

[A.19] Ensuring that further processing, delivery, installation, or use is controlled until proper disposition of a nonconformance, deficiency, or unsatisfactory condition has occurred.

[A.20] Coordinating with responsible management on resolution of differences of opinion involving the definition and implementation of QA Program requirements. If not resolved, progressively elevating

the issues to successively higher levels of management as necessary.

[A.21] Ensuring that a graded approach is used to exercise control over activities affecting quality to an extent consistent with their importance.

[A.22] Interfacing with the CCP WCO and TCO on matters related to waste certification and transportation.

[A.23] Providing inspection services for procurement, including source inspections

[A.24] Providing vendor qualification and maintenance of the NWP Qualified Suppliers List (QSL) for vendors used by the CCP.

[B] QA may delegate one or more individuals to perform the above functional responsibilities; however, QA retains ultimate responsibility for ensuring compliance with QA requirements.

2.1.7 CCP Waste Certification Official (WCO)

[A] The CCP WCO is responsible for reviewing data and information necessary to document TRU waste payload containers prepared for shipment to WIPP meet specified criteria. The WCO coordinates activities related to waste certification. Specific duties and responsibilities of the WCO include the following:

[A.1] Certifying that waste packages meet WAC requirements.

[A.2] Interfacing with the CCP Certification Manager, SPM, TCO, and QA on matters related to waste certification.

[A.3] Stopping waste certification activities if problems affecting the quality of certification processes or work products exist.

[A.4] Ensuring that certification data entered into the WIPP WWIS/WDS are accurate and demonstrate the acceptability of the waste for transport to and disposal at the WIPP.

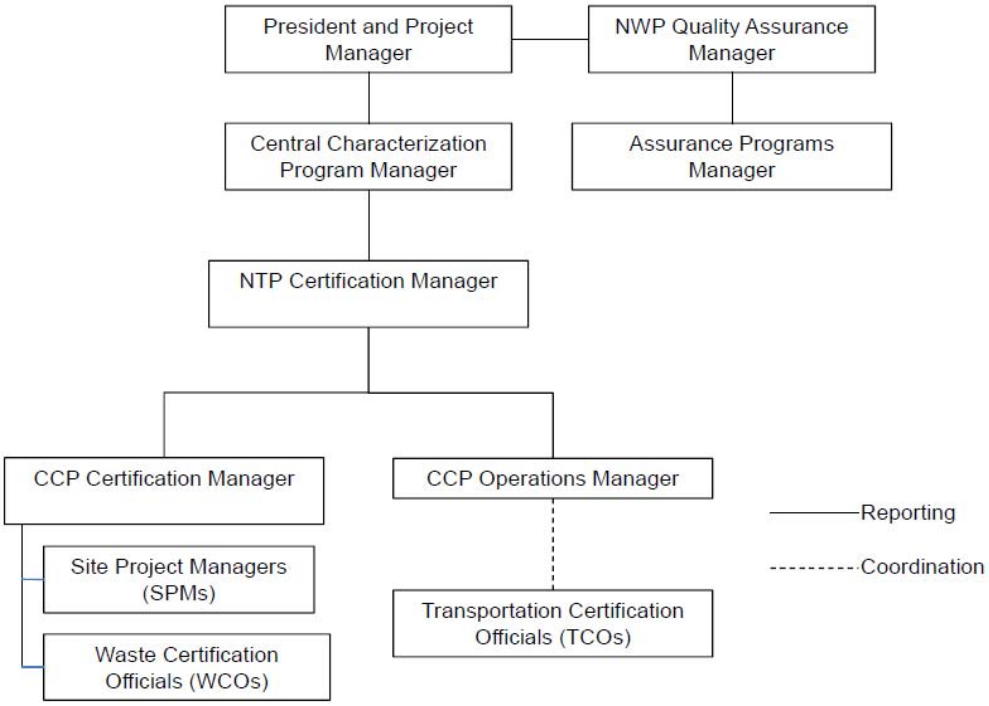
[A.5] Reviewing the applicable CCP plans and procedures and any other waste certification-related documents.

[A.6] Reviewing this Plan.

[A.7] Preparing responses to deficiency reports.

[B] The WCO may delegate one or more individuals to perform the above responsibilities; however, the WCO retains ultimate responsibility for ensuring compliance with WAC requirements.

Figure 2-1. CCP Organization



3.0 COMPLIANCE PLAN FOR CH-WAC

This section describes how the CCP complies with the requirements of the WIPP WAC and associated requirements contained in the WIPP Documented Safety Analysis (DSA) (Reference 4), the Transuranic Package Transporter II (TRUPACT-II), Transuranic Package Transporter III (TRUPACT-III), and/or HalfPACT Certificates of Compliance (References 5 and 6), the WIPP Land Withdrawal Act (LWA) (Reference 2) the WIPP HWFP (Reference 9), the Compliance Recertification Decision (Reference 10), the Initial Report for Polychlorinated Biphenyl (PCB) Disposal Authorization (Reference 11), the EPA letter of approval to land dispose non-liquid PCBs at WIPP (References 12 and 13), and the Revision to the Record of Decision for the DOE's WIPP Disposal Phase and associated WIPP National Environmental Policy Act (NEPA) database (References 14 and 15).

3.1 Organization of Requirements

WAC requirements are organized under five major categories: container properties, radiological properties, physical properties, chemical properties, and data package contents. Sections 3.2 through 3.6 correlate with the organization in the WAC for Contact-Handled (CH) TRU waste requirements and identify methods of compliance to meet each requirement. Procedures that implement the process controls, techniques, tests, and other actions to be applied to each TRU payload container, waste stream, and shipment are also identified. Revisions of requirements in referenced documents controlled by agencies or organizations other than DOE (e.g., EPA, NMED, and NRC) shall have precedence over values quoted in this Plan. Changes incorporated in future revisions of the CH-WAC will be reflected in future revisions of this Plan.

Regarding any discussions of compliance and verification methods, if a requirement is not met, personnel will initiate a Nonconformance Report (NCR) or a CAR in accordance with CCP-QP-005, *CCP TRU Nonconforming Item Reporting and Control*. Corrective action will be taken in accordance with CCP-QP-029, *CCP Corrective Action Management,* to resolve nonconformances. Section 5.3 of this Plan provides additional details about the NCR/CAR process. Only waste from a properly characterized waste stream will be certified as meeting the requirements and associated criteria contained in this Plan. Waste containers for a waste stream that has not been represented by an approved WSPF will not be shipped to WIPP for disposal (Reference 9, Part 2, Section 2.3.3.10). The required characterization, certification, and shipment data will be transmitted to WIPP using the WWIS/WDS.

3.1.1 DOE Operations and Safety Requirements for WIPP

[A] The WIPP DSA (Reference 4) addresses TRU waste handling and emplacement operations. The waste acceptance for emplacement in the WIPP will conform to the WAC.

3.1.2 NRC Transportation Safety Requirements for Type B Packages

[A] Acceptable methods for payload compliance control are defined in the TRUPACT-II, TRUPACT-III and HalfPACT Certificates of Compliance and implemented by the CH-TRAMPAC (References 23a and 23b). For shipments to WIPP, the CCP has prepared a CCP CH-TRAMPAC (CCP-PO-003) and a CCP TRUPACT-III TRAMPAC (CCP-PO-050 *CCP Trupact-III TRU Waste Authorized Methods For Payload Control [CCP TRUPACT-III TRAMPAC]*) describing compliance with each payload parameter. The CCP CH-TRAMPAC and CCP TRUPACT-III TRAMPAC will contain sufficient detail to allow reviewers to adequately understand and evaluate the compliance methodology for each payload parameter.

[B] The QA Program in Section 5.0 of this Plan defines the QA activities that apply to the use of NRC-approved transportation packaging in accordance with Title 10 CFR Part 71, Subpart H (Reference 24).

3.1.3 NMED Hazardous Waste Facility Permit Requirements

[A] TRU waste is classified as TRU mixed waste if it contains hazardous constituents regulated under the New Mexico Hazardous Waste Act (Reference 25). Only TRU mixed waste and TRU waste that have been characterized in accordance with WIPP Waste Analysis Plan (WIPP WAP) and that meet the treatment, storage, and disposal facility waste acceptance criteria as presented in permit Sections 2.3.3.1 through 2.3.3.10 will be shipped to WIPP for disposal. The CCP QAPjP describes compliance with the WIPP WAP.

3.1.4 EPA Compliance Recertification Decision Requirements

[A] Title 40 CFR §194.24(c) (Reference 26) requires the DOE to specify the limiting values for waste components to be emplaced in the repository. The EPA's Recertification Decision specifies waste components (including free water,

metals, and cellulose, plastic, and rubber) and their limits that are associated with the waste proposed for disposal at WIPP.

[B] CCP estimates or determines the weight of cellulose, plastics, and rubber, and reports this estimate in the WWIS/WDS on a container basis. In addition, CCP quantifies and reports the activity values of each of the following radionuclides for purposes of tracking the inventory curie content: ^{241}Am, ^{238}Pu, ^{239}Pu, ^{240}Pu, ^{242}Pu, ^{233}U, ^{234}U, ^{238}U, ^{90}Sr, and ^{137}Cs. The presence or absence of these radionuclides is determined using AK documentation and radioassay in accordance with Appendix A of the WAC. The results of these determinations are reported in the WWIS/WDS on a payload container basis. TRU waste payload containers shall contain more than 100 nanocuries per gram (nCi/g) of waste of alpha-emitting TRU isotopes with half-lives greater than 20 years, as specified in Section 3.3.3.

3.1.5 EPA Approval for PCB Disposal

PCB contaminated TRU and PCB contaminated TRU waste mixed with a hazardous waste including PCB remediation waste, PCB Articles, and PCB bulk product waste may be stored and disposed at the WIPP (References 11, 12, 13, 14, and 15). Waste streams identified as containing PCBs shall be brought to the attention of the CBFO in order that a determination can be made regarding their acceptability at WIPP. Applicable waste acceptance criteria are addressed in Sections 3.2.5, 3.4.1, and 3.5.6.

3.1.6 Land Withdrawal Act Requirements (Public Law 102-579)

[A] WIPP can only accept radioactive waste generated by atomic energy defense activities of the United States (Reference 1). A TRU waste is eligible for disposal at the WIPP if it has been generated in whole or in part by one or more of the following functions (References 27 and 28):

- Naval reactors development
- Weapons activities, including defense inertial confinement fusion
- Verification and control technology

- Defense nuclear materials production
- Defense nuclear waste and materials by-products management
- Defense nuclear materials security and safeguards and security investigations
- Defense research and development

Using AK, CCP determines that each waste stream to be disposed at WIPP is “defense” TRU waste.

[B] High-level radioactive waste or spent nuclear fuel shall neither be transported, emplaced, nor disposed of at the WIPP. Also, no TRU waste may be transported by or for the DOE to or from the WIPP, except in Type B packages:

- the design of which has been certified by the NRC, **AND**
- that have been determined by the NRC to satisfy its QA requirements.

3.2 Container Properties Criteria and Requirements

3.2.1 Payload Container Description

[A] Requirements

[A.1] Each payload container shall be assigned to a payload shipping category (References 23a and 23b). Authorized payload containers are listed in Table 1, Authorized Payload Container Contents. Payload containers shall meet U.S. Department of Transportation (DOT) Specification 7A, Type A, packaging requirements delineated in 49 CFR 173.465 (Reference 4, Section 2.6.2; Reference 9, Attachment A1, Section A1-1b, Reference 12, Section VI.F). Payload containers must be made of steel and be in good and unimpaired condition prior to shipment from the generator/storage sites. To demonstrate compliance with the requirement that payload containers be in good and unimpaired condition, the exterior of all payload containers shall undergo 100 percent visual inspection prior to loading into a Type B package. The results of this visual inspection

shall be documented using Appendix 7, Payload Container Integrity Checklist, of this Plan. A payload container in good and unimpaired condition, 1) does not have significant rusting, 2) is of sound structural integrity, and, 3) does not show signs of leakage. Significant rusting is a readily observable loss of metal due to oxidation (e.g., flaking, bubbling, or pitting) that causes degradation of the payload container's structural integrity. Rusting that causes discoloration of the payload container surface or consists of minor flaking is not considered significant. A payload container is not of sound structural integrity if it has breaches or significant denting/deformation. Breaching is defined as a penetration in the payload container that exposes the internals of the container. Significant denting/deformation is defined as damage to the payload container that results in creasing, cracking, or gouging of the metal, or damage that affects payload container closure. Dents or deformations that do not result in creasing, cracking, or gouging or affect payload container closure are not considered significant. CCP will report to the WWIS/WDS the number and types of payload containers planned for shipment to the WIPP.

[B] Compliance and Verification

[B.1] The CCP procures payload containers (e.g., drums, Standard Waste Box [SWBs], Standard Large Box2 [SLB2] and Ten-Drum Overpack [TDOPs]) that meet the following requirements:

(a) SWBs, SLB2s, and TDOPs are procured to the same standards and specifications as the containers used in Type A testing.

(b) New 55-gallon drums are procured as UN1A2 reusable drums, in accordance with applicable requirements of 49 CFR 173, which is allowable per CBFO memo CBFO:NTP:JFS97-1144UFC5822. Drums may also be procured to the same standards and specifications as the drums used in Type A testing.

[B.2] Recovered drums are inspected to ensure that they are DOT Specification 17C or 17H or meet

UN1A2 requirements for reusable drums. Permanent markings embossed on the bottom of the drums are used to verify the drum type if procurement records are not available. Alternatively, if the markings are not visible (e.g., drums that are galvanized through a dipping process, which obscures the embossing), the drums are inspected and inspection results are compared to requirements for 17C, 17H, or UN1A2 drums. Personnel examine retrievably stored containers for compliance with the applicable requirements and verify that the containers are in good condition in accordance with site-specific container management procedures (See Appendix 4, Procedure Tables, Table B-1), and CCP-TP-033, *CCP Shipping of CH-TRU Waste*. CCP-TP-033 contains Appendix D from the WAC, and is used to document compliance with the Payload Container Integrity Checklists.

[B.3] Personnel document their procurement acceptance and/or visual inspections. If packages cannot be shown to meet the above requirements by procurement records and/or physical examination, CCP personnel take corrective action (e.g., repackage the waste into a certifiable container) to resolve the nonconformance.

[B.4] Personnel will report the number and types of containers to WIPP using WWIS/WDS, in accordance with CCP-TP-030, *CCP CH-TRU Waste Certification and WWIS/WDS Data Entry*.

Table 1. Authorized Payload Container Contents

Payload Container	Contents
55-gallon drum	Either direct loaded or containing a pipe component (commonly referred to as a pipe overpack container [POC])
85-gallon drum[1]	Either direct loaded or containing a 55-gallon drum
100-gallon drum	Direct loaded
Shielded container	Containing a 30-gallon steel drum
SWB	Either direct loaded or containing up to four 55-gallon drums, up to three 85-gallon drums, up to two 100-gallon drums, or one bin
SLB2	Direct loaded or containing various individual containers (4 x 4 x 7-foot boxes and 5 x 5 x 8-foot boxes as well as other containers of smaller sizes)
TDOP	Either direct loaded or containing up to ten 55-gallon drums or up to six 85-gallon drums or one SWB

[1]The term "85-gallon drum" includes 75-gallon to 88-gallon drums.

3.2.2 Container Weight and Center-of-Gravity

[A] Requirements

[A.1] See the CH-TRAMPAC for weight limits and center-of-gravity requirements (Reference 23a). See the TRUPACT-III TRAMPAC for applicable weight limits (Reference 23b).

3.2.3 Assembly Configurations

[A] Requirements

[A.1] See the CCP CH-TRAMPAC and TRUPACT-III TRAMPAC for payload assembly configuration requirements (References 23a and 23b).

3.2.4 Removable Surface Contamination (Payload Containers)

[A] Requirements

[A.1] The removable surface contamination for each CH-TRU waste payload container, payload assembly and packaging must be measured and documented prior to shipment. Removable surface contamination

on CH-TRU waste payload containers, container assemblies, and packaging shall not be greater than 20 disintegrations per minute (dpm) per 100 square centimeters (cm^2) for alpha-emitting radionuclides and 200 dpm per 100 cm^2 for beta-gamma-emitting radionuclides (Reference 9, Attachment A1, Section A1-1d[2]; References 29 and 30).

[A.2] Fixing surface contamination to meet the above criterion is not permitted.

[B] Compliance and Verification

[B.1] A Host site Radiological Control Technician (RCT) surveys TRU waste payload containers, payload assemblies and packaging, for removable surface contamination before they are loaded for shipment. The RCT assesses removable contamination and documents the results in accordance with Host site radiological survey procedures. If the RCT determines that removable contamination exceeds 20 dpm per 100 cm^2 for alpha-emitting radionuclides or 200 dpm per 100 cm^2 for beta-gamma-emitting radionuclides, personnel determine whether surface contamination can be removed to meet established limits. If compliance with removable surface contamination limits cannot be achieved, personnel segregate and disposition noncompliant container(s) in accordance with CCP-QP-005. The survey results are added to the container data package. The WCO confirms removable surface contamination survey results in accordance with Host site radiological survey procedures. CCP-TP-033 is utilized to comply with requirements of this section.

3.2.5 Container Identification/Labeling

[A] Requirements

[A.1] Each CH-TRU waste payload container shall be uniquely identified by means of bar code labels permanently attached in conspicuous locations. (Reference 23a, Section 2.4; Reference 23b, Section 2.3). The unique payload container identification number shall include a site identifier as a prefix (References 23a and 23b, Section 6.2.1).

[A.2] The container identification number shall be in medium to low density Code 39 bar code symbology as required by American National Standards Institute (ANSI) Standard ANSI/Association for Automatic Identification and Mobility (AIM) BC1-1995 (Reference 31) in characters at least 1-in. high, and alphanumeric characters at least 0.5-in. [inch] high. In the case of a 55-gallon, 85-gallon, or 100-gallon drum, or a shielded container, a minimum of three bar code identification labels shall be placed at approximately equal intervals around the circumference of the drum or shielded container (e.g.,120 degrees for three labels, 90 degrees for four labels) so that at least one label is clearly visible when drums or shielded containers are assembled into a payload assembly (e.g., a label must be visible after slip sheets and wrapping are applied). The bar code labels are required on the flat sides of SWBs. For TDOPs and SLB2s, a minimum of one bar code is required.

[A.3] Payload containers shall be marked “Caution Radioactive Material” using a yellow and magenta label as specified in 10 CFR Part 835 (Reference 30).

[A.4] Payload containers whose content are also Resource Conservation and Recovery Act (RCRA) regulated (mixed-TRU) shall be additionally marked “Hazardous Waste” as specified in 40 CFR §262.32 (Reference 33).

[A.5] For TRU and mixed-TRU wastes containing PCBs, the payload containers shall be marked in accordance with 40 CFR §761.40 (Reference 13).

[A.6] Additionally, DOT Type B packages (i.e., the TRUPACT-II, TRUPACT-III and HalfPACT) containing PCBs must be properly marked in accordance with the EPA letter of approval and 40 CFR §761.40 (References 12 and 13).

[A.7] If an empty drum or shielded container is used as dunnage to complete a shipment to the WIPP, the drum shall be labeled with a unique payload identification number and “EMPTY” or “DUNNAGE.”

[A.8] If a seven-pack of 55-gallon drums, a four-pack of 85-gallon drums, a three-pack of 100-gallon drums, or a SWB is shipped as dunnage to fill a TRUPACT-II, the drums or SWB will be labeled as "EMPTY" or "DUNNAGE" but will not be labeled with the unique site-specific payload container identification numbers (CINs) or included in WWIS/WDS data.

[B] Compliance and Verification

[B.1] Fifty-five gallon, 85-gallon, 100-gallon drums or shielded container certified will have a minimum of three bar code labels equally spaced around the drum that identify the site and contain a unique identification number in accordance with the Host site-specific container management procedure(s). Bar code labels will be affixed on the flat side of SWBs, while on a TDOP, a minimum of one bar code will be affixed.

[B.2] After verifying payload parameters, personnel ensure each container is marked with the appropriate site and container identification number in accordance with the host site-specific container management procedures. The TCO verifies the container marking (e.g., barcode, Radiation Material, PCB, or Hazardous Waste labels) in accordance with CCP-TP-033.

[B.3] Refer to Section 3.2.6[B] of this Plan for compliance with the dunnage requirements and verifications.

3.2.6 Dunnage

[A] Requirements

[A.1] See the CCP CH-TRAMPAC for dunnage requirements (Reference 23a).

[A.2] The use of dunnage shall be minimized.

[A.3] In the event the use of dunnage cannot be avoided, the preferred practice for maximizing the efficiency of waste handling and the utilization of disposal room capacity is to ship them in assemblies (e.g., a seven-pack assembly of 55-gallon drums).

[B] Compliance and Verification

[B.1] The minimization of the use of dunnage is through load management. The use of dunnage drums is reviewed and approved concurrently with the review and approval of shipment assemblies by the WWIS/WDS Data Administrator on a case-by-case basis.

3.2.7 Filter Vents

[A] Requirements

[A.1] Payload containers that have been stored in an unvented condition (i.e., no filters and/or unpunctured liner) shall be aspirated for a specific length of time as described in the CH-TRAMPAC to ensure equilibration of any gases that may have accumulated in the closed payload container (References 23a and 23b, Section 5.3.1). All payload containers (including overpacks, but not dunnage containers) shall be vented with one or more filters to control gas concentration and pressure (Reference 4, Section 2.6.2; Reference 47, Reference 23a, Section 2.5.1; Reference 23b, Section 2.4.1; Reference 9, Attachment A1, Section A1-1b[2]). Filters shall meet the specifications described in the WIPP Hazardous Waste Facility Permit and the CH-TRAMPAC, and TRUPACT-III TRAMPAC (Reference 9, Attachment A1, Section A1-1d [1]; Reference 23a, Section 2.5.1; Reference 23b, Section 2.4.1). The model number of each filter vent or combination of filter vents will be reported using the WWIS/WDS.

[B] Compliance and Verification

[B.1] Personnel will procure approved filters for use on TRU waste containers. Filters will be selected from the DOE-CBFO-approved filter list. Filters will be procured in accordance with CCP-QP-015, *CCP Procurement*.

[B.2] The personnel visually verify that filter vents, if present, have been installed properly. If filter vents are not installed, personnel procure filter vents that meet specifications and install the correct number of

filter vents. The WCO confirms payload venting in accordance with CCP-TP-030. When a payload container does not meet the payload container filter requirements, an NCR is initiated. Nonconforming filters are replaced as necessary.

3.3 Radiological Properties

3.3.1 Radionuclide Composition

[A] Requirements

[A.1] The radionuclide composition of each waste container being characterized must be quantified and reported for purposes of tracking the inventory curie content. The activities and masses of the following radionuclides must be reported: ^{241}Am, ^{238}Pu, ^{239}Pu, ^{240}Pu, ^{242}Pu, ^{233}U, ^{234}U, ^{238}U, ^{90}Sr, and ^{137}Cs. The estimated activities and masses, including their associated total measurement uncertainties (TMU) expressed in terms of one standard deviation for these ten radionuclides shall be reported to the WWIS/WDS on a payload container basis. For any of these ten radionuclides whose presence can be substantiated from AK, direct measurement, computations, or a combination thereof, and whose measured data are determined to be below the lower limit of detection (LLD) for that radionuclide, the site shall report the character string "< LLD" to the WWIS/WDS for the activity and mass of that radionuclide; otherwise a value of zero shall be reported. Quantitative estimates for LLD shall not be used when calculating related radiological properties of the waste such as TRU alpha activity concentration, ^{239}Pu Fissile Gram Equivalent (FGE), decay heat, etc.

[A.2] In addition, all radionuclides other than the ten WIPP-tracked radionuclides (i.e., ^{241}Am, ^{238}Pu, ^{239}Pu, ^{240}Pu, ^{242}Pu, ^{233}U, ^{234}U, ^{238}U, ^{90}Sr, and ^{137}Cs) that contribute to 95 percent of the radioactive hazard for the payload container shall be reported on the bill of lading or manifest in accordance with Title 49 CFR, *Transportation* §172.203, (Reference 36) and Title 49 CFR §173.433, (Reference 37). The activities and masses of these other radioisotopes shall also be reported to the WWIS/WDS along with their

associated TMU, expressed in terms of one standard deviation for each waste container.

[B] Compliance and Verification

[B.1] CCP uses AK and measurements to determine radionuclide composition. The requirements for nondestructive assay (NDA) are presented in Appendix 1, Radioassay Requirements for Contact-Handled Transuranic Waste. NDA personnel quantify radionuclide values in accordance with the applicable procedures listed in Appendix 1, Table A-2.1, NDA Procedures. NDA personnel use AK data and assay measurements and calculations to create an isotopic profile of each waste container. The activities and masses of the ten WIPP-tracked radionuclides including TMU (one standard deviation) and all radionuclides other than the ten WIPP-tracked radionuclides including TMU (one standard deviation) that contribute to 95 percent of the radioactive hazard for the payload container being characterized will be reported for each container using WWIS/WDS in accordance with procedure CCP-TP-030. In addition, all radionuclides other than the ten WIPP-tracked radionuclides that contribute to 95 percent of the radioactive hazard for the payload container shall be reported on the bill of lading or manifest in accordance procedure CCP-TP-033.

[B.2] For any of the ten WIPP-tracked radionuclides whose presence can be substantiated from AK, direct measurement, or a combination thereof, and whose measured data are determined to be below the LLD for that radionuclide, the CCP will report the character string “< LLD” to the WWIS/WDS for the activity and mass of that radionuclide; otherwise a value of zero will be reported.

3.3.2 Fissile Material Quantity (^{239}Pu FGEs)

[A] Requirements

[A.1] For each payload container, the sum of ^{239}Pu FGE plus two times its associated TMU, expressed in terms of one standard deviation, shall comply with the limits in Table 2, ^{239}Pu FGE Limits for Payload Containers (Reference 4, Section 6.4.2 References 23a and 23b, Section 3.1.1). The values calculated for ^{239}Pu FGE and its associated TMU, expressed in terms of one standard deviation, shall be reported to the WWIS/WDS for each payload container.

[A.2] See the CCP CH-TRAMPAC for ^{239}Pu FGE limits applicable to the TRUPACT-II and/or HalfPACT packaging (Reference 23a).

[A.3] See the CCP CH-TRUPACT-III TRAMPAC for ^{239}Pu FGE limits applicable to the TRUPACT-III packaging (Reference 23b).

Table 2. ^{239}Pu FGE Limits for Payload Containers

Waste Container Type	Be/BeO Limits	Special Waste Container Geometry/Material Requirements	^{239}Pu FGE Limit
Non-Machine Compacted Waste			
55- (excluding pipe overpacks), 85-, and 100-gallon drums	≤ 1% by weight of the waste	None	≤ 200
55-gallon drum configured as a pipe overpack (i.e., a standard, S100, S200, or S300 pipe overpack)	≤ 1% by weight of the waste	None	≤ 200
Shielded Container	≤ 1% by weight of the waste	None	≤ 200
SLB2	≤ 1% by weight of the waste	The minimum ^{240}Pu content in grams for the SLB2 waste container, denoted in the adjacent ^{239}Pu FGE Limit column as a parenthetical, shall be determined after the subtraction of two times the error (i.e., two standard deviations)	≤ 325 ≤ 340 (5) ≤ 360 (15) ≤ 380 (25)
SWB	≤ 1% by weight of the waste	None	≤ 325
TDOP	≤ 1% by weight of the waste	None	≤ 325
55- (excluding pipe overpacks), 85-, and 100-gallon drums	>1% by weight of the waste up to 100 kg	None	≤ 100
SWB	>1% by weight of the waste	None	≤ 100
TDOP	>1% by weight of the waste	None	≤ 100

Table 2. ^{239}Pu FGE Limits for Payload Containers (Continued)

Waste Container Type	Be/BeO Limits	Special Waste Container Geometry/Material Requirements	^{239}Pu FGE Limit
Machine Compacted Waste			
Pipe overpacks (i.e., a standard, S100, S200 , or S300 pipe overpack)	> 1% by weight of the waste	None	≤ 140
55- (excluding pipe overpacks), 85-, and 100-gallon drums	≤ 1% by weight of the waste	Partially compacted waste. Applies to waste that has been compacted such that the distribution and form of polyethylene in the waste does not exceed 0.646 gram/cubic centimeter (g/cm^3), i.e., 70% of the theoretical full density of polyethylene (0.923 g/cm^3).	≤ 200
55- (excluding pipe overpacks), 85-, and 100-gallon drums	≤ 1% by weight of the waste	Fully compacted waste without design vertical spacing. Applies to waste that has been compacted such that the distribution and form of polyethylene in the waste exceeds 0.646 g/cm^3, i.e., 70% of the theoretical full density of polyethylene (0.923 g/cm^3).	≤ 170
55- (excluding pipe overpacks), 85-, and 100-gallon drums	≤ 1% by weight of the waste	Fully compacted waste with design vertical spacing. Applies to waste that has been compacted such that the distribution and form of polyethylene in the waste exceeds 0.646 g/cm^3, i.e., 70% of the theoretical full density of polyethylene (0.923 g/cm^3), and the dimensions of the payload containers (e.g., 100-gallon drums) ensure a minimum 0.5-in. separation between their compacted waste contents and other axially adjacent payload containers.	≤ 200
Shielded Container	≤ 1% by weight of the waste	None	≤ 200

Table 2. ^{239}Pu FGE Limits for Payload Containers (Continued)

Waste Container Type	Be/BeO Limits	Special Waste Container Geometry/Material Requirements	Waste Container
Machine Compacted Waste			
SWB/TDOP	≤ 1% by weight of the waste	Fully compacted waste with design vertical spacing. Applies to waste that has been compacted such that the distribution and form of polyethylene in the waste exceeds 0.646 g/cm^3, i.e., 70% of the theoretical full density of polyethylene (0.923 g/cm^3), and contains one 16-gauge steel 100-gallon drum having a top and bottom design spacing of 0.75 and 0.50-inches, respectively, with no loose material or other drums of waste in the SWB/TDOP.	≤ 250
SWB/TDOP	≤ 1% by weight of the waste	Fully compacted waste with design vertical spacing. Containing one 55-, 85-, or 100-gallon drum whose design ensures a minimum of 0.5-in. vertical spacing between drum contents and the exterior top and bottom of the drum (e.g., a recessed lid) with no loose material or other drums of waste in the SWB/TDOP.	≤ 200
SWB/TDOP	≤ 1% by weight of the waste	Partially compacted waste. Containing one 55-, 85-, or 100-gallon drum whose contents have been compacted such that the distribution and form of polyethylene in the waste does not exceed 0.646 g/cm^3, i.e., 70% of the theoretical full density of polyethylene (0.923 g/cm^3) with no loose material or other drums of waste in the SWB/TDOP.	≤ 200
SWB/TDOP	≤ 1% by weight of the waste	Fully compacted waste with design vertical spacing. Applies to waste that has been compacted such that the distribution and form of polyethylene in the waste exceeds 0.646 g/cm^3, i.e., 70% of the theoretical full density of polyethylene (0.923 g/cm^3).	≤ 185

[B] Compliance and Verification

[B.1] Personnel obtain the CH-TRU waste fissile content in accordance with the processes described in Appendix 1, Radioassay equipment is qualified under the corresponding Performance Demonstration Program (PDP) requirements. CCP calculates the fissile or fissionable radionuclide content of the CH-TRU waste container as ^{239}Pu FGE according to approved calculation methods in accordance with CCP-TP-033.

[B.2] Personnel compile and review AK to make initial determinations about radionuclide content and concentrations. CCP confirms AK by obtaining information on the isotopic composition of the waste through radioassay of the filled payload container.

[B.3] Personnel compute the container ^{239}Pu FGE and container ^{239}Pu FGE TMU manually or using a computational algorithm. Individual radionuclide mass quantities and TMUs are converted to ^{239}Pu FGE by multiplying the mass value (g) by ^{239}Pu FGE conversion factors (FGE/g) listed in Table 3.1.2 of the CH-TRAMPAC (Reference 23a) and Table 3.1-1 of the TRUPACT-III TRAMPAC (Reference 23b). The ^{239}Pu FGE of each payload container shall be calculated from the isotopic composition and quantity of radionuclides. The ^{239}Pu FGE value plus two times the measurement error shall be less than the applicable limit for each payload container.

[B.4] The total ^{239}Pu FGE error is the square root of the sum of the squares of the individual ^{239}Pu FGE TMUs. Two times this error shall be added to the ^{239}Pu FGE of the Type B package payload and compared to the limit. The ^{239}Pu FGE of the radionuclides in each payload container will be reported to the WIPP using the WWIS/WDS and the TRUPACT-II and TRUPACT-III payload total FGE will be recorded on the PATCD. Payload containers shipped to the WIPP will meet both the Type B package and the WIPP repository requirements for criticality.

3.3.3 TRU Alpha Activity Concentration

[A] Requirements

[A.1] TRU waste containers to be disposed of at the WIPP shall contain greater than 100 nCi/g of waste of alpha-emitting TRU isotopes, with half-lives greater than 20 years. Without taking into consideration the TMU, the TRU alpha activity concentration for a payload container is determined by dividing the TRU alpha activity of the waste by the weight of the waste. The weight of the waste is the weight of the material placed into the payload container (i.e., the net weight of the container). The weight of the waste is typically determined by subtracting the tare weight of the payload container (including the weight of the rigid liner and any shielding external from the waste, if applicable) from the gross weight of the payload container. In the event waste containers (e.g., 55-gallon, 85-gallon or 100-gallon drums) that have been radioassayed are overpacked in a payload container (e.g., in a SWB), CCP shall sum the

individual TRU alpha activity values of the individual waste containers and divide by the sum of the individual net waste weights (i.e., less container, shielding, and liner weights as appropriate) to determine the activity per gram for the payload container. Should CCP utilize load management by overpacking waste containers, the determination of the payload container's TRU alpha activity concentration shall be in accordance with Appendix 8, Payload Management of TRU Alpha Activity Concentration. Loading a 55-gallon pipe-overpack with cans is considered direct loading, not overpacking for the purposes of calculating the weight of the container. The TRU alpha activity concentration shall be reported to the WWIS/WDS; however, there are no reporting requirements for its associated TMU (Reference 35, Chapter 4).

[B] Compliance and Verification

[B.1] Personnel measure TRU alpha activity concentration in accordance with the NDA processes described in Appendix 1. Personnel calculate the TRU alpha activity concentration of the CH TRU waste container manually or using computational algorithms. Personnel will subtract the tare weight of the containers before calculating the TRU alpha activity concentration. Personnel validate and verify calculation programs, before the data are used in accordance with CCP-QP-022, *CCP Software Quality Assurance Plan*. Assay data are validated and verified, and submitted in batch data reports (BDRs) to the CCP Project Office. The WCO confirms the reported TRU alpha activity concentration is appropriately calculated and above the specified limit.

3.3.4 ^{239}Pu Equivalent Activity

[A] Requirements

[A.1] ^{239}Pu equivalent curie (PE-Ci) limits are shown in Table 3, PE-Ci Limits. PE-Ci quantities shall be calculated in accordance with Appendix 5 for each payload container and reported to the WIPP using the WWIS/WDS (Reference 4, Section 3.3.2.3.1 and Table 3.3-6). There are no reporting requirements for the associated TMU.

Table 3. PE-Ci Limits

Payload Container	Packing Configuration	PE-Ci Limit
55-, 85-, and 100-gallon drum	Direct loaded – all approved waste forms other than solidified/vitrified waste	≤ 80 PE-Ci
Shielded Container	Direct loaded – vented 30-gallon inner steel drum – all approved waste forms other than solidified/vitrified waste	≤ 80 PE-Ci
SLB2	Direct loaded – all approved waste forms other than solidified/vitrified waste	≤560 PE-Ci
SWB	Direct loaded (or a bin) – all approved waste forms other than solidified/vitrified waste	≤ 560 PE-Ci
TDOP	Direct loaded – all approved waste forms other than solidified/vitrified waste	≤ 800 PE-Ci
85-gallon drum	Overpacking an undamaged[1] 55-gallon drum – all approved waste forms other than solidified/vitrified waste	≤ 1100 PE-Ci
SWB, TDOP	Overpacking an assembly of undamaged[1] 55- or 85-gallon drums with no single payload container within the assembly exceeding 1100 PE-Ci – all approved waste forms other than solidified/vitrified waste	≤ 1200 PE-Ci
TDOP	Overpacking an undamaged[1] SWB – all approved waste forms other than solidified/vitrified waste	≤ 1200 PE-Ci
Pipe Overpacks (Standard, S100, S200, and S300)	All approved waste forms	≤ 1800 PE-Ci
All	Solidified/vitrified waste	≤ 1800 PE-Ci

[1] An undamaged container provides an additional barrier should a breach occur in the overpack. When overpacking one or more damaged waste containers, direct loaded PE-Ci limits apply.

[B] Compliance and Verification

[B.1] Personnel calculate the activity of the CH-TRU waste container as PE-Ci according to the methodology in Appendix 5 of this Plan and CCP-TP-030. Personnel identify payload containers exceeding limits stated in Table 2, segregate them, and disposition them in accordance with approved nonconformance and corrective action management procedures. The WCO verifies compliance of the PE-Ci limits. Personnel will report the PE-Ci activity to the WIPP using the WWIS/WDS.

3.3.5 Radiation Dose Equivalent Rate

[A] Requirements

[A.1] The external radiation dose equivalent rate of individual payload containers shall be:

[A.2] ≤200 milliroentgen equivalent man (mrem)/hour (hr) at the surface with the exception of the S100 and S300 pipe overpacks which are limited to ≤179 mrem/hr and ≤155 mrem/hr, respectively, at the surface (References 23a and 23b, Section 3.2; Reference 4, Sections E1 and 2.1). Internal payload container shielding shall not be used to meet this criterion, except for authorized shielded payload container configurations such as the use of 55-gallon drums containing a pipe component or a shielded container (Reference 23a, Section 2.9). Total dose equivalent rate and the neutron contribution to the total dose equivalent rate shall be reported for each payload container in the WWIS/WDS.

[A.3] See the CCP CH-TRAMPAC and TRUPACT-III TRAMPAC for associated package requirements (References 23a and 23b).

[B] Compliance and Verification

[B.1] A Host site RCT measures surface dose rates of the individual payload containers in accordance with site radiological survey procedures using the beta-gamma and neutron dose rates for each container at the surface, and records the results for each payload container. If the combined beta-gamma and neutron dose rate exceeds the dose rate specified in step 3.3.5[A] at the surface for any container, the container is rejected, marked, and segregated. Total dose equivalent rate and the neutron contributions to the total payload container dose rate will be reported separately using the WWIS/WDS in accordance with CCP-TP-030.

3.3.6 Decay Heat

[A] Requirements

[A.1] See the CCP CH-TRAMPAC and TRUPACT-III TRAMPAC for decay heat requirements (References 23a and 23b).

[B] Compliance and Verification

[B.1] Personnel will compute the payload container decay heat and the measurement error manually or using a computational algorithm in accordance with CCP-TP-030. Personnel will ensure that the results of the calculations are equal to or less than the limits of the assigned shipping category. Individual radionuclide mass quantities and errors are converted to decay heat by multiplying the mass values (g) by decay heat conversion factors (W/g). Table 3.1-2 in the CH-TRAMPAC and TRUPACT-III TRAMPAC (References 23a and 23b) lists ^{239}Pu FGE, decay heat, and specific activity for many radionuclides. The values calculated for decay heat and its associated TMU (expressed in terms of one standard deviation) shall be reported to the WWIS/WDS for each payload container in accordance with CCP-TP-030.

3.4 Physical Properties

3.4.1 Observable Liquid

[A] Requirements

[A.1] Liquid waste is not acceptable at the WIPP. Observable liquid containing PCBs is prohibited at the WIPP.

Liquid in the quantities delineated below is acceptable:

- Observable liquid shall be less than 1 percent[1] by volume of the outermost container at the time of radiography or visual examination (VE) (Reference 9).

[1]The limit of “less than 1 percent” is taken from the CH-TRAMPAC and TRUPACT-III TRAMPAC and is more restrictive than the limit of “no more than 1 percent” in the HWFP.

- Internal containers with more than 60 milliliters (ml) or 3 percent by volume observable liquid, whichever is greater, are prohibited.

- Containers with Hazardous Waste Number U134 assigned shall have no observable liquid.

- Overpacking the outermost container that was examined during radiography or visual examination or redistributing untreated liquid within the container shall not be used to meet the liquid volume limits.

(Reference 9, Part 2, Section 2.3.3.1, Attachment C, Sections C-1c and C-3b; Reference 23a, Section 2.6.1; Reference 23b, Section 2.5.1; Reference 35, Appendix TRU Waste; Reference 12, Conditions of Approval, II.A.2).

[B] Compliance and Verification

[B.1] Initially, AK is used to determine container contents. Personnel estimate liquid volume by radiography and/or VE, in accordance with site-specific radiography and VE procedures (See Appendix 4, Tables B-2 and B-3). During VE, if personnel detect any liquid waste in non-transparent internal containers by shaking the internal container, they will assume that the internal container is completely filled and add the entire volume of the internal container to the total liquid in the container being characterized using VE. Personnel reject payload containers whose liquid volumes exceed the limits defined in 3.4.1 [A.1]. If necessary, personnel repackage noncompliant waste containers in accordance with site-specific VE procedures (See Appendix 4, Table B-3).

3.4.2 Sealed Containers

[A] Requirements

[A.1] Sealed containers that are greater than four liters (L) (nominal) are prohibited except for solid inorganic waste (Waste Material Type II.2) packaged in a metal container (Reference 23a, Section 2.8.1; Reference 23b, Section 2.7.1).

[B] Compliance and Verification

[B.1] Personnel will ensure that payload containers are verified to be free of sealed containers greater than four liters. Personnel use VE and/or Real-Time Radiography to ensure prohibited physical waste forms are not present in waste containers (See Appendix 4, Table B-2 through B-3).

Payload containers rejected for sealed containers greater than four liters or more are marked and segregated. The container is repackaged and reprocessed to verify the criteria are met. The WCO confirms the sealed container criteria in accordance with CCP-TP-030.

3.5 Chemical Properties

3.5.1 Pyrophoric Materials

[A] Requirements

[A.1] Radioactive pyrophoric materials shall be present only in small residual amounts (<1 percent by weight) in payload containers and shall be generally dispersed in the waste. Radioactive pyrophorics in concentrations greater than 1 percent by weight and all nonradioactive pyrophorics shall be reacted (or oxidized) and/or otherwise rendered nonreactive prior to placement in the payload container (References 23a and 23b, Section 4.1.1). Nonradionuclide pyrophoric materials are not acceptable at the WIPP (Reference 4, Section 11.4.1; Reference 9, Attachment C, Section C-1c; Reference 9, Part 2, Section 2.3.3.2; References 23a and 23b, Section 4.1.4).

[B] Compliance and Verification

[B.1] Personnel verify compliance with pyrophorics restriction by obtaining information documented in AK. VE and radiography verify there is no indication and document that waste does not contain pyrophorics or other prohibited material (See list of real-time radiography [RTR] and VE procedures in Appendix 4, Tables B-2 and B-3). Personnel review and evaluate AK to verify that waste-producing processes included

no pyrophorics or other prohibited materials. AK includes sampling and analysis data, documentation of waste stream descriptions, or actions to treat or stabilize the waste to eliminate specific characteristics.

3.5.2 Hazardous Waste

[A] Requirements

[A.1] Hazardous wastes not occurring as co-contaminants with TRU wastes (non-mixed hazardous wastes) are not acceptable at the WIPP. Each CH-TRU-mixed waste container shall be assigned one or more EPA hazardous waste codes as appropriate. Only EPA hazardous waste codes listed as allowable in the WIPP Hazardous Waste Facility Permit may be managed at the WIPP. Some of the waste may also be identified by unique state hazardous waste codes. These wastes are acceptable at the WIPP as long as the Treatment, Storage, and Disposal Facility WAC are met (Reference 9, Attachment C, Section C-1b; Reference 9, Part 2, Section 2.3.4). Wastes exhibiting the characteristic of ignitability, corrosivity, or reactivity (EPA hazardous waste numbers of D001, D002, or D003) are not acceptable at WIPP. In the context of this Plan, hazardous waste codes are synonymous with hazardous waste numbers (Reference 9, Attachment C, Section C-1c; Reference 9, Part 2, Sections 2.3.3.3, 2.3.3.7, and 2.3.4).

[B] Compliance and Verification

[B.1] Personnel will ensure that each individual waste payload container is assigned to a waste stream identified by acceptable EPA hazardous waste codes and documented on a DOE-approved WSPF. Personnel will report the hazardous waste codes for each container to the WIPP via the WWIS/WDS in accordance with CCP-TP-030. EPA hazardous waste codes are assigned based on AK. CCP uses CCP-TP-005, CCP Acceptable Knowledge Documentation, to compile, review, evaluate, confirm and report AK documentation. The AK Summary Report delineates waste streams and assigns hazardous waste codes. If data are insufficient to

demonstrate that the concentration of the constituent is less than the regulatory level, the EPA hazardous waste number for the identified constituent is applied to the waste stream. CCP will report hazardous waste codes in accordance with CCP-TP-002, *CCP Reconciliation of DQOs and Reporting Characterization Data*; CCP-TP-005 and CCP-TP-030.

3.5.3 Chemical Compatibility

[A] Requirements

[A.1] TRU waste containing incompatible materials or materials incompatible with payload container and packaging materials, shipping container materials, other wastes, repository backfill, or seal and panel closure materials are not acceptable for transport in the TRUPACT-II, TRUPACT-III, or HalfPACT or for disposal at the WIPP. Chemical constituents shall conform to the lists of allowable materials in Tables 4.3-1 through 4.3-8 of the CH-TRAMPAC. Other chemicals or materials not identified in these tables are allowed provided that they meet the requirements as specified in Section 4.3.1 of the CH-TRAMPAC and TRUPACT-III TRAMPAC (Reference 9, Attachment C, Section C-1c; Reference 9, Part 2, Section 2.3.3.4; References 23a and 23b, Sections 4.3 and 4.4).

[B] Compliance and Verification

[B.1] Personnel ensure compliance with the chemical compatibility requirements based on AK. Only wastes that have been shown to meet the approved chemical lists in Tables 4.3-1 through 4.3-8 of the CH-TRAMPAC and Tables 4.3-1 through 4.3-7 of the TRUPACT-III TRAMPAC are acceptable at the WIPP. The WCO confirms compliance with the chemical compatibility criteria in accordance with CCP-TP-030. If necessary, personnel repackage CH TRU waste containers not meeting the chemical compatibility requirement.

3.5.4 Explosives, Corrosives, and Compressed Gases

[A] Requirements

[A.1] Waste shall contain no explosives, corrosives, or compressed gases (pressurized containers) (Reference 9, Attachment C, Section C-1c; Reference 9, Part 2, Sections 2.3.3.5 and 2.3.3.7; References 23a and 23b, Section 4.2.1).

[B] Compliance and Verification

[B.1] Personnel ensure that explosives, compressed gases, and corrosive liquids are not present in payload containers. Chemicals (e.g., oxidizers) capable of forming explosive mixtures under some conditions are also prohibited from the waste. Waste-generation processes are assessed for safety hazards such as potential explosion hazards and potential inadvertent production of explosive materials in accordance with CCP-TP-005. Corrosives must be either excluded from the payload container or processed to neutralize the corrosive material or otherwise render it noncorrosive. CCP operating procedures describe the specific actions taken to ensure compliance with the corrosive material prohibition, (e.g., site-specific radiography and VE procedures [See Appendix 4, Tables B-2 and B-3]).

[B.2] Personnel verify compliance with the prohibited items requirement by obtaining AK information (e.g., administrative, operating, QA procedures, and safety assessments) documenting that waste does not contain explosives, corrosives, or pressurized containers. Personnel review and evaluate AK to verify that waste-producing processes included no prohibited or restricted materials. AK includes sampling and analysis data, documentation of waste stream descriptions, or actions to treat or stabilize the waste to eliminate specific characteristics. Personnel verify that prohibited materials are not in the waste container through radiography or VE (See list of RTR and VE procedures in Appendix 4, Tables B-2 and B-3).

3.5.5 HSG VOC Concentrations

[A] Requirements

[A.1] The headspace gas (HSG) of payload containers shall be determined in accordance with a site-specific TRAMPAC (References 23a and 23b, Section 5.2), as required.

[B] Compliance and Verification

[B.1] CCP Personnel ensure that the required QAOs meet the requirements specified for gas generation rates in the Gas Generation QAPjP. For those payload containers that exceed the flammable volatile organic compound (VOC) limit, a determination of compliance with the flammable (gas/VOC) concentration limit as described in the CH-TRAMPAC allows the payload container to be shipped in the Type B package under the test category.

[B.2] Test category payload containers are tested by direct measurement in accordance with gas generation testing (GGT) procedures (See Appendix 4, Table B-4) to quantify the hydrogen/methane, VOC, and total gas generation rates (as appropriate) for purposes of determining if all applicable limits are met in accordance with CCP-TP-030.

[B.3] Representative sampling of HSG may be used to quantify the hydrogen/methane, VOC, and total gas generation rates (as appropriate) for purposes of determining if all applicable limits are met in accordance with CCP-TP-030.

3.5.6 Polychlorinated Biphenyl (PCB) Concentration

[A] Requirements

[A.1] For TRU and mixed-TRU wastes containing PCBs meeting the condition of approval in Reference 12, the payload container data entered into the WWIS/WDS shall include the earliest date of waste generation (i.e., the date of removal from service for disposal), the date of waste certification for disposal, and the date the waste was sent to the WIPP for disposal (Reference 12, Section III.D.4). Additionally,

the estimated weight of the PCBs in kilograms (kg) (as recorded on the Uniform Hazardous Waste Manifest [UHWM]) and a description of the type of PCB waste (e.g., PCB Articles, PCB remediation waste), shall be entered into the WWIS/WDS (Reference 13, § 761.207 [a][2] and § 761.180). Hanford, Idaho National Laboratory, Savannah River Site, Oak Ridge National Laboratory, Knolls Atomic Power Laboratory, and Los Alamos National Laboratory are authorized to ship their TRU and TRU-mixed wastes containing PCBs to WIPP (References 14 and 15).

[B] Compliance and Verification

[B.1] Personnel use AK obtained from CCP-TP-005, and/or verification, and testing to demonstrate compliance with the PCB requirement. Personnel use nondestructive examination (NDE) (VE and RTR) procedures (See Appendix 4, Tables B-2 and B-3) during packaging of newly generated waste to identify the presence of PCBs. For retrievably stored debris waste, personnel compile, record, and evaluate AK to demonstrate compliance with the PCB limitation. The WCO verifies compliance with the PCB requirements.

3.6 Data Package Contents

3.6.1 Characterization and Certification Data

[A] Requirements

[A.1] Sites shall prepare a WSPF for each waste stream. Each WSPF shall be approved by the DOE-CBFO prior to the first shipment of that waste stream. Characterization and certification information for each payload container shall be submitted to the WWIS/WDS and approved by the WWIS/WDS Data Administrator. Sites are required to estimate the cellulose, plastics, and rubber (CPR) weights and report these estimates in the WWIS/WDS on a payload container basis. Any payload container from a waste stream that has not been preceded by an appropriate certified WSPF is not acceptable at the WIPP (Reference 9, Part 2, Section 2.3.3.10).

[B] Compliance and Verification

[B.1] Personnel will verify compliance with the data package requirements by reviewing data packages in accordance with CCP-TP-001, *CCP Project Level Data Validation and Verification,* and CCP-TP-005. Personnel will prepare and submit the WSPF to DOE-CBFO in accordance with procedure CCP-TP-002. The WCO ensures that the WWIS/WDS data are entered into the system and transmitted to the DOE-CBFO for approval before waste shipment in accordance with CCP-TP-030. Waste containers will be certified under an approved WSPF prior to shipment.

3.6.2 Shipping Data

[A] Requirements

[A.1] Sites shall prepare either a Bill of Lading or a UHWM for CH-TRU waste shipments as required by the transportation requirements. The Land Disposal Restriction (LDR) notification for CH-TRU mixed waste shipments shall state that the waste is not prohibited from land disposal (Reference 9, Attachment C, Section C-5b(2); References 23a and 23b, Section 6).

[B] Compliance and Verification

[B.1] Personnel verify compliance with the data package requirements by reviewing the data packages in accordance with CCP-TP-001 and CCP-TP-005. The TCO and WCO ensure that the WWIS/WDS data are entered into the system and transmitted to DOE-CBFO for approval before waste shipment in accordance with CCP-TP-030 and CCP-TP-033.

[B.2] The TCO prepares a PCTCD/OPCTCD for each payload container and a PATCD for each payload assembly in accordance with the CCP CH-TRAMPAC prior to loading the container into a Type B package. The TCO completes the PCTCD/OPCTCD and PATCD to certify an individual payload container and a PATCD to certify the payload assembly for shipping in accordance with CCP-TP-033, which is based on

Section 6.0 of the CCP CH-TRAMPAC. The PCTCDs, OPCTCDs, and the PATCDs are completed prior to shipping the Type B package. The LDR Exemption Notification form is completed for mixed waste shipments in accordance with CCP-TP-033. The shipping site's transportation personnel or personnel prepare a bill of lading or UHWM. For non-mixed waste shipments, a Bill of Lading is prepared. A UHWM is prepared for mixed waste shipments. If the TCO is the shipper of record, shipping data are prepared in accordance with CCP-TP-033.

[B.3] CCP Transportation is tasked with the final review of the payload assembly and documentation. The final approval of the assembly and documentation (UHWM or Bill of Lading) is done by CCP Transportation or other certified Host site program.

4.0 WASTE ACCEPTANCE REQUIREMENTS AND CRITERIA FOR RH WASTE

This section describes how the CCP complies with the requirements of the WIPP WAC for RH waste and associated requirements contained in the WIPP DSA (Reference 4), RH TRU 72-B and 10-160B Certificates of Compliance (References 7 and 8), WIPP LWA (Reference 2), WIPP Hazardous Waste Facility Permit (Reference 9), Compliance Recertification Decision (Reference 10), Initial Report for PCB Disposal Authorization (Reference 11), EPA letter of approval to land dispose non-liquid PCBs at WIPP (References 12 and 13), Revision to the Record of Decision for the DOE's WIPP Disposal Phase and associated WIPP NEPA database (References 14 and 15), EPA's letter of approval of DOE's RH TRU Waste Characterization Program (Reference 16), and the WCPIP (Reference 17).

4.1 Organization of Requirements

The purpose of Section 4.0 and related appendices is to describe the compliance methods and rationale for the requirements and associated criteria that must be met for RH TRU waste to be transported to, managed at, and disposed of in the WIPP. The requirements/criteria and associated compliance methods are organized under five major headings: Container Properties, Radiological Properties, Physical Properties, Chemical Properties, and Data Package Contents. Sections 4.7 through 4.11 correlate with the organization in the WIPP WAC for RH TRU waste requirements and identify methods of compliance to meet each requirement. Procedures that implement the process controls, techniques, tests, and other actions to be applied to each RH-TRU payload container, waste stream, and shipment are also identified. Revisions of requirements in referenced documents controlled by agencies or organizations other than DOE (e.g., EPA, NMED and NRC) shall have precedence over values quoted in this Plan. Changes incorporated in future revisions of the WIPP WAC for RH waste will be reflected in future revisions of this Plan.

In addition to the discussion described in this section, a CCP RH-TRU Waste Certification Plan for 40 CFR Part 194 compliance is presented in Appendix 11, CCP RH TRU Waste Certification Plan for 40 CFR Part 194 Compliance to this Plan. This Appendix satisfies the WCPIP requirement for a waste certification plan that provides, among other things, a listing of the DQOs specified in the WCPIP and the identification of methods and a description of the rationale that will be used to assess compliance with those DQOs.

Regarding any discussions of compliance and verification methods, if a requirement is not met, personnel will initiate an NCR or a CAR in accordance with CCP-QP-005. Corrective action will be taken in accordance with CCP-QP-029 to resolve nonconformances. Section 5.3

provides additional details about the NCR/CAR process. Only waste from a properly characterized waste stream will be certified as meeting the requirements and associated criteria contained in this Plan. Waste containers for a waste stream which has not been represented by an approved WSPF will not be shipped to WIPP for disposal (Reference 9, Part 2, Section 2.3.3.10). The required characterization, certification, and shipping data will be transmitted to the WIPP using the WWIS/WDS.

4.2 DOE Operations and Safety Requirements for WIPP

4.2.1 The WIPP DSA addresses waste handling and emplacement operations. Waste acceptance for emplacement in the WIPP will conform to the WAC to meet the DSA (Reference 4).

4.3 NRC Transportation Safety Requirements

4.3.1 Acceptable methods for payload compliance are defined in the RH-TRU 72-B and 10-160B Certificates of Compliance (References 7 and 8).

Acceptable methods for payload compliance for the RH-TRU 72-B are implemented by the RH-TRAMPAC (Reference 41). CCP-PO-505 describes how CCP will ensure compliance with each payload parameter. The CCP RH-TRAMPAC contains sufficient detail to allow reviewers to adequately understand and evaluate the compliance methodology for each payload parameter.

The payload requirements for the 10-160B package and site-specific compliance are specified by the 10-160B SAR (Reference 38). Prior to use of the 10-160B package, CCP will prepare a CCP Appendix if applicable. For shipments in the 10-160B package, CCP verifies compliance to the requirements for the applicable site-specific appendix to the 10-160B SAR. The 10-160B SAR does not require the preparation of a site-specific "TRAMPAC."

4.3.2 The QA Program described in Section 5.0 defines the QA activities that apply to the use of NRC-approved transportation packaging in accordance with 10 CFR Part 71, Subpart H (Reference 24).

4.4 NMED Hazardous Waste Facility Permit Requirements

4.4.1 TRU waste is classified as TRU-mixed waste if it contains hazardous constituents regulated under the New Mexico Hazardous Waste Act (Reference 25). Only TRU-mixed waste and TRU waste that have been characterized in accordance with the WIPP WAP and that meet the Treatment, Storage and Disposal Facility (TSDF) WAC as presented in permit Sections 2.3.3.1 through 2.3.3.10 will be shipped to WIPP for disposal. The CCP QAPjP describes compliance with the WIPP WAP.

4.5 EPA Compliance Recertification Decision Requirements

4.5.1 Title 40 CFR § 194.24(c) requires the DOE to specify the limiting values for waste components to be emplaced in the repository (Reference 26). The EPA's Compliance Recertification Decision (Reference 10) identifies the repository limits for several waste components including free water, metals, and CPR.

4.5.2 CCP estimates or determines the weight of CPR and reports this estimate in the WWIS/WDS on a container basis. The repository limit for CPR is a maximum of 2.2×10^7 kg. In addition, CCP quantifies and reports the activity values of each of the following radionuclides for purposes of tracking the inventory curie content: ^{241}Am, ^{238}Pu, ^{239}Pu, ^{240}Pu, ^{242}Pu, ^{233}U, ^{234}U, ^{238}U, ^{90}Sr, and ^{137}Cs. The presence or absence of these radionuclides is determined using AK documentation and radiological characterization techniques performed in accordance with the WCPIP. The results of these determinations are reported in the WWIS/WDS on a payload container basis. TRU waste payload containers shall contain more than 100 nCi/g of alpha-emitting TRU isotopes with half-lives greater than 20 years, as specified in Section 4.8.3 (Reference 47).

4.5.3 EPA Approval for PCB Disposal

PCB-contaminated TRU and PCB-contaminated TRU waste mixed with a hazardous waste including PCB remediation waste, PCB articles, and PCB bulk product waste may be stored and disposed at the WIPP (References 11, 12, 13, 14 and 15). Applicable waste acceptance criteria are addressed in Sections 4.7.5 (Identification/Labeling), 4.9.1 (Observable Liquids), and 4.10.6 (Polychlorinated Biphenyls).

Waste streams identified as containing PCBs shall be brought to the attention of the CBFO in order that a determination can be made regarding their acceptability at WIPP.

4.6 WIPP Land Withdrawal Act Requirements (Public Law 102-579)

4.6.1 WIPP can accept only radioactive waste generated by atomic energy defense activities of the United States (Reference 2, Section 2[19]). A TRU waste is eligible for disposal at WIPP if it has been generated in whole or in part by one or more of the following functions (References 27 and 28):

- naval reactors development
- weapons activities, including defense inertial confinement fusion
- verification and control technology
- defense nuclear materials production
- defense nuclear waste and materials by-products management
- defense nuclear materials security and safeguards and security investigations
- defense research and development

Using AK, CCP determines that each waste stream to be disposed of at WIPP is "defense" TRU waste (Reference 2).

4.6.2 High-level radioactive waste or spent nuclear fuel shall neither be transported, emplaced, nor disposed of at WIPP (Reference 2, Section 12). Also, no TRU waste may be transported by or for the DOE to or from WIPP, except in packages:

- the design of which has been certified by the NRC, and
- that have been determined by the NRC to satisfy its QA requirements.

4.7 Container Properties

4.7.1 Description

[A] Requirements

[A.1] The only payload containers authorized for receipt of RH-TRU waste in the RH bay of the Waste Handling Building at WIPP include 55-gallon drums and RH-TRU waste canisters shipped in 10-160B and RH-TRU 72-B packaging, respectively (references 7 and 8). The site shall report the number and type of payload containers to WIPP using the WWIS/WDS.

[A.2] Payload containers must meet DOT Type 7A standards (Reference 4, Section 2.5.2). Prior to loading in the transportation packaging, the exterior of a payload container must undergo 100 percent visual inspection to ensure compliance with the requirement that payload containers be in good and unimpaired condition. The results of this visual inspection must be documented. Inspection of 55-gallon drums shall be documented using the payload container integrity checklist contained in Appendix 7. A payload container is in good and unimpaired condition if it does not have significant rusting, is of sound structural integrity, and does not show signs of leakage.

The RH-TRU waste canister shall comply with the specifications in the CCP RH-TRAMPAC (Reference 7).

[B] Compliance and Verification

[B.1] CCP only uses RH-TRU 72-B waste canisters for use in the RH-TRU 72-B cask as payload containers for RH waste. The only authorized payload container of RH-TRU waste for shipment in the 10-160B to WIPP is a 55-gallon drum. CCP reports the number and type of payload containers to WIPP using the WWIS/WDS in accordance with procedure CCP-TP-530, *CCP RH TRU Waste Certification and WWIS/WDS Data Entry*.

[B.2] The CCP procures canisters in accordance with procedure CCP-QP-015 to comply with specifications

of Appendix 1.3.4 of the DSA for the RH-TRU 72-B Cask.

One hundred percent visual inspection of the exterior of the payload container is performed to ensure that the payload container is in good and unimpaired condition. The results of this inspection are documented. Inspection of payload containers for compliance to requirements is performed in accordance with CCP-TP-507, *CCP Shipping of Remote-Handled Transuranic Waste*.

All payload containers are assigned to a Content Code per procedure CCP-TP-530.

4.7.2 Weight Limits

[A] Requirements

[A.1] Each payload container shall comply with the following maximum weight limit:

- Removable Lid Canister (direct loaded or drum loaded) – 4,240 lbs (Reference 39)
- Welded Lid Canister (direct loaded) – 5,250 lbs (Reference 40)
- Welded Lid Canister (drum loaded) – 5,980 lbs (Reference 40)
- NS15 Neutron Shielded Canister – 3100 lbs (Reference 41)
- NS30 Neutron Shielded Canister – 3100 lbs (Reference 41)
- 1,000 lbs (453.59 kg) per 55-gallon drum (Reference 17, Section 2.4.1; Reference 4, Section 2.5.2.2)

See the RH-TRU 72-B and/or 10-160B packaging Certificates of Compliance for applicable package weight limits (References 7 and 8).

[B] Compliance and Verification

[B.1] CCP verifies the weight limits of the canister and the RH-TRU 72-B cask are within tolerance using DOE/WIPP 02-3284, *RH Packaging Operations Manual.* The TCO certifies compliance to applicable weight limits on the Packaging Transportation Certification Document (PTCD) in accordance with CCP-TP-507.

[B.2] CCP verifies the weight limits of the payload containers and the 10-160B cask are within tolerance using DOE/WIPP 06-3336, 10-160B RH Cask Program Guidance. The TCO certifies compliance to applicable weight limits in accordance with CCP-TP-507.

4.7.3 Assembly Configurations

[A] Requirements

[A.1] See the RH-TRU 72-B and/or 10-160B packaging Certificates of Compliance for assembly configuration requirements (References 7 and 8).

[B] Compliance and Verification

[B.1] Loading of waste, either direct loading or loading with drums, into RH-TRU canisters is performed in accordance with site-specific canister loading procedures.

[B.2] Loading of waste drums, into a 10-160B Cask is performed in accordance with 10-160B loading procedures.

4.7.4 Removable Surface Contamination

[A] Requirements

[A.1] Removable surface contamination on TRU waste payload containers, payload assemblies, and packagings shall not exceed 20 dpm/100 cm^2 alpha and 200 dpm/100 cm^2 beta-gamma (Reference 9, Attachment A1, Section A1-1d[2]; References 29 and 30). The fixing of surface contamination to meet these criteria is not allowed by WIPP in accordance

with best management practices for ensuring worker radiation dose is within the as low as reasonably achievable (ALARA) guidelines.

[B] Compliance and Verification

[B.1] Compliance is achieved by measurement using radiological contamination surveys. Specifically, a Host site RCT surveys RH-TRU waste canisters for removable surface contamination prior to loading into the cask. Packaging (i.e., cask) is surveyed for removable surface contamination after completion of cask loading and prior to shipment. Survey results are then compared to removable surface contamination limits to determine compliance per procedure CCP-TP-530. If removable contamination exceeds limits, surfaces may be wiped and cleaned and resurveyed to achieve compliance. Fixing of surface contamination is prohibited.

4.7.5 Identification/Labeling

[A] Requirements

[A.1] Each payload container shall be labeled with a unique payload container identification number permanently applied in a conspicuous location. The unique payload container identification number shall include a site identifier as a prefix.

[A.2] For the RH-TRU waste canisters, payload container labeling shall be as follows:

- Each canister shall be labeled with a unique payload container identification number (ID) that includes a site identifier as a prefix.
- The characters composing the canister ID number shall be approximately 2-inches high and of a color contrasting with their background.
- A minimum of three canister ID numbers shall be placed at approximately equal intervals around the circumference of the canister and within 18-inches of the top of the canister.

[A.3] Exceptions to the labeling/identification requirements may be granted upon request to and approval from the CBFO.

[A.4] The 10-160B 55-gallon payload container identification shall be in medium to low density Code 39 bar code symbology as required by ANSI, standard ANSI/AIM BC1-1995 (Reference 31) in characters at least 1-in. high and alphanumeric characters at least ½-in. high. In the case of 55-gallon drums, the labels must be placed approximately 120 degrees apart so that one label is visible once the containers are assembled into a 5-drum carriage.

[A.5] Payload containers shall be marked "Caution Radioactive Material" using a yellow and magenta label as specified in 10 CFR Part 835 (Reference 30). Those payload containers whose contents are also RCRA regulated (mixed-TRU), shall be additionally marked "Hazardous Waste" as specified in 40 CFR §262.32 (Reference 33). For TRU and TRU-mixed wastes containing PCBs, the payload containers shall be marked in accordance with 40 CFR §761.40 (References 12 and 13). Additionally, DOT Type B packages containing PCBs must be properly marked in accordance with 40 CFR §761.40 (References 12 and 13).

[A.6] If an empty 55-gallon drum is used as dunnage to complete a payload configuration in the 10-160B package, the dunnage container shall be labeled with the following information:

- Unique payload container identification number
- “EMPTY” or “DUNNAGE”

[A.7] If a five-drum carriage of only dunnage 55-gallon drums is used in the 10-160B, the containers shall be labeled only “EMPTY” or “DUNNAGE,” and the unique container identification number label is not required for these containers.

[B] Compliance and Verification

[B.1] CCP verifies canisters are labeled in accordance with CCP-TP-507 procedure. This procedure must include instructions to satisfy the following requirements:

- Each canister is labeled with a unique ID that includes a site identifier as a prefix.
- Characters composing the canister ID number on labels are approximately 2-inches high and of a color contrasting with their background.
- A minimum of three canister ID labels are placed on a canister at approximately equal intervals around the circumference of the canister and within 18-inches of the top of the canister.
- Alternate labeling of payload containers may be used only after a request to use an alternate labeling approach is submitted and approved by CBFO on a case-specific basis.

[B.2] CCP verifies payload containers are marked in accordance with CCP-TP-507 procedure. These procedures must contain instructions to ensure the following:

- All RH-TRU and TRU mixed payload containers are marked “Caution Radioactive Material” using a yellow and magenta label.
- All RH-TRU mixed waste payload containers are marked “Hazardous Waste.”
- All RH-TRU DOT Type B packages containing PCBs are marked in accordance with 40 CFR § 761.40.

[B.3] CCP verifies 10-160B 55-gallon payload containers are labeled in accordance with procedure CCP-TP-507.

4.7.6 Dunnage

[A] Requirements

[A.1] See the 10-160B packaging Certificate of Compliance for dunnage requirements (Reference 8).

To maximize the efficiency of operations at the WIPP, CCP will minimize the use of dunnage drums.

[B] Compliance and Verification

[B.1] The use of dunnage is not applicable to the RH-TRU 72-B shipping package. The minimization of the use of dunnage for the 10-160B Cask is through payload configuration. The use of dunnage drums is reviewed and approved concurrently with the review and approval of shipment assemblies by the WWIS/WDS Data Administrator on a case-by-case basis.

[B.2] CCP verifies 10-160B 55-gallon dunnage containers are labeled in accordance with procedure CCP-TP-507.

4.7.7 Filter Vents

[A] Requirements

[A.1] Each payload container and any sealed secondary or internal containers (greater than four liters in size), in the payload container shall meet the filter vent specifications of Reference 4, Section 2.5.2; Reference 7; Reference 8; Reference 9, Attachment A1, Section A1-1b[2]; and Reference 41; Section 2.4.1. These filter vents shall meet the specification of the 10-160B SAR and RH-TRAMPAC (Reference 38; Reference 41, Section 2.4.1).

The model number of each filter vent or combination of filter vents installed on a payload container shall be reported to the WWIS/WDS database (Reference 48).

[B] Compliance and Verification

[B.1] The TCO verifies the presence and model of filter(s) installed on individual payload containers in accordance with CCP-TP-507. CCP verifies any sealed secondary or internal containers (greater than

four liters in size), overpacked in the payload container shall be either vented or filtered to meet the specifications of Reference 7 or Appendix 1.3.5 of Reference 8 by VE using CCP-TP-500, *CCP Remote-Handled Waste Visual Examination,* or an evaluation of the AK record. CCP procures filters in accordance with CCP-QP-015 to specifications that comply with all applicable requirements for filter vents. Only filters identified on the listing of approved CBFO filter vent models are procured by CCP.

[B.2] The model numbers of each filter vent or combination of filter vents installed on a payload container (and internal containers, as applicable) are reported to the WWIS/WDS in accordance with procedure CCP-TP-530.

4.8 Radiological Properties

With respect to the required radiological properties identified within this Section, they can be divided into two distinct groups.

The first group includes the activities and masses of the ten WIPP-tracked radionuclides (i.e., ^{241}Am, ^{238}Pu, ^{239}Pu, ^{240}Pu, ^{242}Pu, ^{233}U, ^{234}U, ^{238}U, ^{90}Sr, and ^{137}Cs), and the TRU alpha activity concentration (i.e., >100 nCi/g of alpha-emitting TRU isotopes with half lives greater than 20 years), of the waste. Total activity will be quantified and tracked to ensure compliance with the LWA limits for RH-TRU waste including limiting activity to 23 curies per liter (Ci/l) per canister, limiting disposed RH-TRU waste to 5.1 million curies, and limiting surface dose rates of canister to 1000 roentgen equivalent man per hour (rem/hr). No more than 5 percent by volume of the RH-TRU waste received at WIPP may have a surface dose rate in excess of 100 rem/hr. Estimates of their activities and masses shall be derived from a system of controls certified by CBFO that includes AK, computations, measurements, and sampling (Reference 35). CCP RH-TRU Waste Certification Plan for 40 CFR Part 194, Compliance, provides the methods and requirements used to characterize the radiological composition of the RH-TRU waste.

The second group includes the remaining radionuclides contributing to the FGE, the PE-Ci, and the decay heat of the payload container. This set of radiological data is regulated both by the NRC as specified in the RH transportation documentation (References 7 and 8), and the CBFO as required by the WIPP DSA (Reference 4). PE-Ci quantities shall be calculated for each payload container in accordance with Appendix 5. Any method that complies with the Certificate of Compliance may be used to quantify the remaining radiological properties at the discretion of the shipping facility.

However, the resulting data (e.g., AK from Safeguards and Security data), the source and method from which the data was generated, and the basis for the reliability of the data shall be submitted to and approved by CBFO prior to use.

4.8.1 Radionuclide Composition

[A] Requirements

[A.1] RH-TRU waste received at the WIPP shall not exceed 23 curies per liter maximum activity level (averaged over the volume of the canister) (Reference 2, Section 7).

[A.2] Contents of the 10-160B may include fissile material contaminants provided the mass limits of the 10 CFR 71.15 are not exceeded and the plutonium content does not exceed 0.74 tera-bequerel (20 curies) (Reference 8). The quantity of radioactive material must not exceed 3,000 times the Type A quantity (Reference 8).

[A.3] The activities and masses of ^{241}Am, ^{238}Pu, ^{239}Pu, ^{240}Pu, ^{242}Pu, ^{233}U, ^{234}U, ^{238}U, ^{90}Sr, and ^{137}Cs shall be established on a payload container basis for purposes of tracking their contributions to the total WIPP radionuclide inventory (Reference 35). The estimated activities and masses, including their associated TMU expressed in terms of one standard deviation, for these ten radionuclides shall be reported to the WWIS/WDS on a payload container basis. For any of these ten radionuclides whose presence can be substantiated from AK, direct measurement, computations, or a combination thereof, and for which measured data are determined to be below the LLD for that radionuclide, the site shall report the character string "< LLD" to the WWIS/WDS for the activity and mass of that radionuclide; otherwise a value of zero shall be reported (Reference 17, Section 2.4.6).

[A.4] In addition, all radionuclides other than the ten WIPP-tracked radionuclides (i.e., ^{241}Am, ^{238}Pu, ^{239}Pu, ^{240}Pu, ^{242}Pu, ^{233}U, ^{234}U, ^{238}U, ^{90}Sr, and ^{137}Cs), that contribute to 95 percent of the radioactive hazard for the payload container shall be reported on the RH-TRU 72-B or 10-160B bill of lading or manifest. The activities and masses of these other

radioisotopes shall also be reported to the WWIS/WDS along with their associated TMU, expressed in terms of one standard deviation, for each waste container (Reference 35).

[B] Compliance and Verification

[B.1] CCP determines the radionuclide composition and quantity through a combination of AK and established radionuclide measurement methods (e.g., CCP-TP-504, *CCP Dose-to-Curie Survey Procedure for Remote-Handled Transuranic Waste*). The radionuclide measurement methods that may be used are described in greater detail in Appendix 11. Radionuclide measurement is either performed directly on the payload container or on all of the smaller waste containers composing the payload container. If radionuclide measurement is not performed directly on the payload container itself, then, the measurement values (and uncertainties) for the payload container are calculated from the associated measurement results for all of the smaller containers composing the payload container.

CCP uses radionuclide measurement results to calculate and quantitate the total activity averaged over the volume of the payload container in the RH-TRU 72-B Cask to determine compliance with the 23 Ci/l limit.

CCP uses radionuclide measurement results to quantitate the activity and masses of the ten WIPP-tracked radionuclides and all other radionuclides that contribute to 95 percent of the radioactive hazard in a payload container. The activities and masses of these radionuclides, including their associated TMU (expressed in terms of one standard deviation), are reported to the WWIS/WDS on a payload container basis per procedure CCP-TP-530 and are reported on the Bill of Lading or UHWM. For any of the ten WIPP-tracked radionuclides that are measured below the LLD and whose presence can be substantiated from AK, direct measurement, computations, or a combination thereof, are reported as “< LLD” for its activity and mass to the WWIS/WDS.

[B.2] The contents of the 10-160B may include fissile material contaminants provided the mass limits of the 10 CFR 71.15 are not exceeded and the plutonium content does not exceed 0.74 tera-bequerel (20 curies) (Reference 8). The quantity of radioactive material must not exceed 3,000 times the Type A quantity (Reference 8). Compliance to these requirements are accomplished and verified through procedures CCP-TP-507 and 10-160B loading procedures.

4.8.2 ^{239}Pu Fissile Gram Equivalent/^{235}U Fissile Equivalent Mass (FEM)

[A] Requirements

[A.1] Each canister must comply with the limits in either Table 4 or Table 6. For a canister, either the sum of the ^{239}Pu FGE plus two times its associated TMU, expressed as one standard deviation, shall comply with the applicable limits in Table 4 or the ^{235}U Fissile Equivalent Mass (FEM) weight percentage plus two times is associated TMU, with TMU expressed in terms of one standard deviation, shall comply with the applicable limit in Table 6 (Reference 7).

[A.2] See the 10-160B packaging Certificates of Compliance for applicable ^{239}Pu FGE requirements (Reference 8 and Table 5 for associated drum requirements).

[A.3] The values calculated for the ^{239}Pu FGE or ^{235}U FEM and their associated TMUs (expressed in terms of one standard deviation) shall be reported to the WWIS/WDS for each payload container.

Table 4. ^{239}Pu FGE Limits for a Canister Shipped in an RH-TRU 72-B Package

Payload Contents	^{239}Pu FGE Limit (Removable/Welded Lid Canister)	^{239}Pu FGE Limit (Neutron Shielded Canister)
Non-Machine-Compacted Waste		
Be/BeO limited to ≤ 1 percent by weight of the waste	≤ 315	≤ 245
Be/BeO limited to ≤ 1 percent by weight of the waste including credit taken for ≥ 5g of ^{240} Pu Poisoning[1]	≤ 325	≤ 245
Be/BeO limited to ≤ 1 percent by weight of the waste including credit taken for ≥ 15g of ^{240}Pu Poisioning[1]	≤ 350	≤ 245
Be/BeO limited to ≤ 1 percent by weight of the waste including credit taken for ≥ 25g of ^{240}Pu Poisioning[1]	≤ 370	≤ 245
Be/BeO > 1 percent by weight of the waste and is chemically or mechanically bound	≤ 305	Unauthorized
Be/BeO > 1 percent by weight of the waste and is not chemically or mechanically bound	≤ 100	Unauthorized
Machine-Compacted Waste		
Be/BeO limited to ≤ 1 percent by weight of the waste	≤ 245	≤ 245
Be/BeO > 1 percent by weight of the waste	Unauthorized	Unauthorized

[1]The minimum ^{240} Pu content for the RH-TRU waste canister shall be determined after the subtraction of two times the error.

Table 5. ^{239}Pu FGE Limits for Drums Shipped in a 10-160B Package

Payload Contents	^{239}Pu FGE Limit
Non-Machine-Compacted Waste	
55-gallon drum (Be/BeO limited to ≤ 1 percent by weight of the waste)	≤ 200 g
55-gallon drum (Be/BeO > 1 percent by weight of the waste)	≤100 g
Machine-Compacted Waste	
55-gallon drum (Be/BeO limited to ≤1 percent of the weight of the waste)	≤ 170 g
55-gallon drum (Be/BeO limited ≤ 1 percent of the weight of the waste). 1.0-in. design spacing must be maintained between drum content and exterior top and bottom	≤ 200 g

Table 6. ^{235}U FEM Limit for a Canister Shipped in an RH-TRU 72-B Package

Payload Contents	Weight % ^{235}U FEM (Removable/Welded Lid Canister)	Weight % ^{235}U FEM (Neutron Shielded Canister)
Non-machine compacted homogenous solid/sludge with a particle size characteristic dimension of 1 in. or less that is primarily uranium (in terms of heavy metal component) with waste matrix distributed to not exceed enrichment limit (Reference 41).	≤ 0.96	Not Applicable

[B] Compliance and Verification

[B.1] CCP determines the quantity of fissile material in a payload container using established radionuclide measurement methods performed on the contents of the payload container as described in Appendix 11. Radionuclide measurement results are used to calculate the ^{239}PuFGE and associated uncertainty (expressed as one standard deviation) for a payload container.

[B.2] CCP determines the presence and quantity of beryllium on a waste stream basis by AK and is documented in the associated waste stream AK Summary Report. AK documentation is collected, evaluated and reported in accordance with CCP-TP- 005 and is summarized on a waste stream basis in AK Summary Reports.

[B.3] CCP compares the measured/calculated FGE plus two times uncertainty for a payload container and cask to the applicable FGE limits based on beryllium content.

[B.4] CCP reports the values calculated for the FGE and its associated uncertainty for each payload container to the WWIS/WDS as two separate items in accordance with CCP-TP-530.

4.8.3 TRU Alpha Activity Concentration

[A] Requirements

[A.1] TRU waste payload containers shall contain more than 100 nCi/g of alpha-emitting TRU isotopes with half-lives greater than 20 years (Reference 2, Section 2 [18]). Without taking into consideration the TMU, the TRU alpha activity concentration for a payload container is determined by dividing the TRU alpha activity of the waste by the weight of the waste.

The TRU alpha activity concentration shall be reported to the WWIS/WDS (Reference 35, Chapter 4; Reference 17, Section 2.4.5).

[B] Compliance and Verification

[B.1] CCP uses established radionuclide measurement methods (see Appendix 11) to quantitate the amount of alpha-emitting TRU isotopes with half-lives greater than 20 years (i.e., TRU alpha activity) in the waste contents of payload containers. Calibrated scales are used to determine the weight of waste material in payload containers (i.e., determine the net weight). The TRU alpha activity concentration is calculated by dividing the measured TRU alpha activity (without uncertainty) in a payload container by its net weight. Calculations are performed either manually or with the use of validated computational algorithms. If containers (e.g., 55-gallon or 30-gallon drums) are loaded into a canister, the TRU alpha activity concentration for the canister is determined by dividing the summation of the individual TRU alpha activity values of the individual waste containers by the summation of the individual net weights. Methods used to determine the TRU alpha activity

concentration have a lower limit of detection of 100 nCi/g or less.

The TRU alpha activity concentration for a payload container is reported to the WWIS/WDS in accordance with CCP-TP-530.

4.8.4 ^{239}Pu Equivalent Activity

[A] Requirements

[A.1] PE-Ci limits are shown in Table 7.

[A.2] PE-Ci quantities shall be calculated for each payload container (see Appendix B), and reported to WIPP using the WWIS/WDS (Reference 4, Section 3.3.2.3.1 and Table 3.3-6). There are no reporting requirements for the associated TMU (Reference 44).

Table 7. PE-Ci Limits

Payload Container	Packing Configuration	PE-Ci Limit
RH TRU Waste Canister	All approved waste forms other than solidified/vitrified waste	≤ 240
55-Gallon Drum (shipped in a 10-160B)		≤ 80
RH TRU Waste Canister 55-Gallon Drum (shipped in a 10-160B)	Solidified/vitrified waste	≤ 1,800

[B] Compliance and Verification

[B.1] CCP uses established radionuclide measurement methods (see Appendix 11) to quantitate the amount of radioactive material in payload containers. The measurement results are used to calculate the PE-Ci for each payload container as specified in Appendix 5. CCP compares the calculated PE-Ci (without uncertainty) value to the applicable PE-Ci limits for a payload container, assembly or drum to determine compliance with applicable limits.

CCP reports the calculated PE-Ci quantities for each payload container to WIPP using the WWIS/WDS in accordance with CCP-TP-530.

4.8.5 Radiation Dose Equivalent Rate

[A] Requirements

[A.1] The external surface radiation dose equivalent rate of individual containers must be ≥ 200 mrem/hr and ≤ 1,000 rem/hr (Reference 2, Sections 2 and 7).

[A.2] Total dose equivalent rate and the neutron contribution to the total dose equivalent rate shall be reported for each payload container in the WWIS/WDS (Reference 2, Section 16 and Reference 17, Section 2.4.4).

[A.3] See the RH-TRU 72-B and/or 10-160B packaging Certificates of Compliance for applicable radiation dose equivalent rate requirements (References 7 and 8).

[B] Compliance and Verification

[B.1] CCP using Host site personnel or records, measure container dose equivalent rates in accordance with site radiological survey procedures. The measurements are compared to applicable radiation dose equivalent rate limits and restrictions to determine compliance. The total dose equivalent rate and the neutron contribution to the total dose equivalent rate for each payload container are reported to the WWIS/WDS in accordance with CCP-TP-530.

4.8.6 Decay Heat

[A] Requirements

[A.1] See the RH-TRU 72-B and/or 10-160B packaging Certificates of Compliance for applicable decay heat requirements (References 7 and 8).

[B] Compliance and Verification

[B.1] CCP uses established radionuclide measurement methods (see Appendix 11) to quantitate the activity and mass of the radionuclides contained within the payload container. The measurement results are used to calculate the total decay heat (and TMU) for each payload container and payload assembly.

CCP compares the calculated decay heat value plus TMU (expressed in terms of one standard deviation) to the applicable decay heat limit for a payload container and payload assembly, as applicable, to determine compliance.

CCP reports the calculated decay heat values and associated TMU (expressed in terms of one standard deviation) for each payload container to WIPP using the WWIS/WDS in accordance with CCP-TP-530.

4.9 Physical Properties

4.9.1 Observable Liquid

[A] Requirements

[A.1] Liquid waste is not acceptable at the WIPP. Observable liquid containing PCBs is prohibited at the WIPP. Liquid in the quantities delineated below is acceptable.

- Observable liquid shall be less than 1 percent[1] by volume of the outermost container at the time of radiography or visual examination (Reference 9).
- Internal containers with more than 60 ml or 3 percent by volume observable liquid, whichever is greater, are prohibited.
- Containers with Hazardous Waste Number U134 assigned shall have no observable liquid.

[1]The limit of “less than 1 percent” is taken from the RH-TRAMPAC and is more restrictive than the limit of “no more than 1 percent” in the HWFP.

- Overpacking the outermost container that was examined during radiography or visual examination or redistributing untreated liquid within the container shall not be used to meet the liquid volume limits.

For sites that use VE, the detection of any liquid in non-transparent internal containers, detected from shaking the internal container, will be handled by assuming that the internal container is filled with liquid and adding this volume to the total liquid in the container being characterized using VE (Reference 9, Part 2, Section 2.3.3.1; Reference 9, Attachment C, Sections C-1c and C-3b; Reference 41, Section 2.5.1; Reference 35; Reference 12, Conditions of Approval, II.A.2).

[B] Compliance and Verification

CCP initially uses AK to determine container contents. AK documentation is collected and compiled in accordance with DOE/WIPP-02-3214 and/or CCP-TP-005. Personnel estimate liquid volume by AK, radiography or VE of the waste. Personnel reject payload containers found to exceed the criteria in 4.9.1[A.1].

4.9.2 Sealed Containers

[A] Requirements

[A.1] Sealed containers that are greater than four liters (nominal), are prohibited except for metal containers packaging solid inorganic waste: this packaging configuration does not generate flammable gas (Reference 41, Section 2.7.1).

[B] Compliance and Verification

[B.1] CCP achieves compliance through AK, radiography or VE of the waste contents of payload containers. VE is performed in accordance with procedure CCP-TP-500 and radiography is performed in accordance with procedure CCP-TP-508, *CCP RH Standard Real-Time Radiography Inspection Procedure*. Unvented rigid containers greater than four liters in volume are identified and controlled by an

NCR in accordance with CCP-QP-005 and dispositioned appropriately.

4.9.3 Physical Form

[A] Requirements

[A.1] Debris waste (S5000), shall be reported in WWIS/WDS as plastic using the volume of the waste container multiplied by 620 kg/cubic meters (m^3), up to the net weight of the waste. Soils and gravel (S4000) shall be reported to WWIS/WDS as the net weight of the waste with the waste material parameter type of "soil." Homogeneous solids (S3000) shall be reported to the WWIS/WDS as the net weight of the waste with the waste material parameter type appropriate to the waste. Debris included in containers of S3000 or S4000 waste shall be reported to WWIS/WDS as plastic with an estimated weight. Plastic packaging will also be reported to WWIS/WDS (as packaging), (Reference 17, Section 2.4.3).

[B] Compliance and Verification

[B.1] CCP using CCP-TP-530, reports the data to WWIS/WDS as follows: Debris waste (S5000), as plastic using the volume of the waste container multiplied by 620 kg/m^3, up to the net weight of the waste. If the net weight of the waste is greater than the calculated plastic, the excess is assigned to the material parameters by the percentages described in the AK Report. Soils and gravel (S4000), as the net weight of the waste with the waste material parameter type of "soil." Homogenous solids (S3000), as the net weight of the waste with the waste material parameter type appropriate to the waste. Debris included in containers of S3000 or S4000 waste shall be reported to WWIS/WDS as plastic with an estimated weight. Plastic packaging will also be reported to WWIS/WDS (as packaging).

4.10 Chemical Properties

4.10.1 Pyrophoric Materials

[A] Requirements

[A.1] Radioactive pyrophoric materials shall be limited to residual amounts (<1 percent by weight), in payload containers and shall be generally dispersed in the waste. Radioactive pyrophorics in concentrations ≥1 percent by weight and all nonradioactive pyrophorics shall be reacted (or oxidized), and rendered nonreactive prior to placement in the payload container (Reference 41, Section 4.4.1). Nonradionuclide pyrophoric materials are not acceptable at WIPP (Reference 4, Section 11.4.1; Reference 9, Attachment C, Section C-1c; Reference 9, Part 2, Section 2.3.3.2.

[B] Compliance and Verification

[B.1] CCP demonstrates compliance through acceptable knowledge documentation. Radiography and VE will be used, when necessary, to examine a waste container to verify its physical form. Specifically, AK is used to demonstrate that nonradionuclide pyrophoric materials are not present in a waste stream and that pyrophoric radioactive materials are limited to residual amounts. Waste streams for which AK documentation indicates the possible presence of radioactive pyrophorics in concentrations greater than or equal to 1 percent by weight are reacted (or oxidized), and rendered nonreactive. AK documentation is collected and compiled in accordance with DOE/WIPP-02-3214 and CCP-TP-005 and is summarized on a waste stream basis in AK Summary Reports.

4.10.2 Hazardous Waste

[A] Requirements

[A.1] Hazardous wastes not occurring as co-contaminants with TRU wastes (non-mixed hazardous wastes), are not acceptable at WIPP. Each RH-TRU mixed waste container shall be assigned one or more hazardous waste numbers as appropriate. Only EPA hazardous waste numbers listed as allowable in the Hazardous Waste Facility Permit may be managed at WIPP. Some of the waste may also be identified by unique state hazardous waste codes. These wastes are acceptable at WIPP as long as the TSDF waste acceptance criteria are met (Reference 9, Attachment C, Section C-1b; Reference 9, Part 2, Sections 2.3.3.3 and 2.3.4). Wastes exhibiting the characteristic of ignitability, corrosivity, or reactivity (EPA hazardous waste numbers of D001, D002, or D003), are not acceptable at WIPP (Reference 9, Attachment C, Section C-1c; Reference 9, Part 2, Sections 2.3.3.7 and 2.3.4).

[B] Compliance and Verification

[B.1] CCP assigns EPA hazardous waste numbers to waste streams based on AK. AK is the basis for demonstrating compliance that hazardous waste, if present in TRU waste, occurs only as co-contaminants with the TRU waste. A more detailed description of the AK process used to assign EPA hazardous waste numbers to a waste stream is presented in the QAPjP. AK documentation is compiled, evaluated and reported in accordance with DOE/WIPP-02-3214 and CCP-TP-005 and is summarized by waste stream in an AK Summary Report.

4.10.3 Chemical Compatibility

[A] Requirements

[A.1] TRU waste containing incompatible materials or materials incompatible with payload container and packaging materials, shipping container materials, other wastes, repository backfill, or seal and panel closure materials are not acceptable for transport in

the RH-TRU 72-B or 10-160B packages or for disposal at the WIPP. Chemical constituents shall conform to the lists of allowable materials in the RH-TRU 72-B RH-TRAMPAC and Appendix 4.10.2 of the 10-160B SAR (References 41 and 38).

[A.2] The total quantity of the trace chemicals/materials (materials that occur in the waste in quantities less than 1 percent [weight]), not listed in Table 4.3-1, in the payload container is restricted to less than 5 percent weight (Reference 41). Chemical constituents in a payload of a particular waste-specific content code shall conform to the allowable chemical list for that content code. The content code must be reported to the WWIS/WDS for each payload container (References 7 and 8).

[B] Compliance and Verification

[B.1] Personnel ensure compliance with the chemical compatibility requirements based on AK. The WCO confirms compliance with the chemical compatibility criteria in accordance with CCP-TP-530. If necessary, personnel repackage waste containers not meeting the chemical compatibility requirement.

4.10.4 Explosives, Corrosives, and Compressed Gases

[A] Requirements

[A.1] Waste shall contain no explosives, corrosives, or compressed gases (pressurized containers), (Reference 9, Attachment C, Section C-1c; Reference 9, Part 2, Sections 2.3.3.5 and 2.3.3.7; Reference 41, Section 4.2.1).

[B] Compliance and Verification

[B.1] CCP assesses compliance through acceptable knowledge documentation. Specifically, AK is used to determine if explosives, corrosives, and/or compressed gases may be present in a waste stream. Radiography and VE will be used, when necessary, to examine a waste container to verify its physical form. AK documentation is collected and compiled in accordance with procedure CCP-TP-005 and is

summarized on a waste stream basis in AK Summary Reports.

4.10.5 Headspace Gas Concentrations

[A] Requirements

[A.1] The headspace gas of payload containers shall meet the requirements of the TRAMPAC (if shipping in RH-TRU 72-B packaging), or Appendix 4.10.2 (if shipping in the 10-160B packaging) (References 9, 41, and 38 respectively).

[B] Compliance and Verification

[B.1] CCP demonstrates compliance through the following methods:

- AK that demonstrates that the concentration of flammable VOCs in the headspace of waste containers of a waste stream is less than 500 parts per million (ppm).

AK documentation is collected, evaluated and reported in accordance with DOE/WIPP-02-3214 and CCP-TP-005 and is summarized on a waste stream basis in AK Summary Reports. Headspace gas sampling is performed in accordance with approved procedures.

4.10.6 Polychlorinated Biphenyls (PCBs)

[A] Requirements

[A.1] For TRU and TRU-mixed wastes containing PCBs meeting the conditions of approval in Reference 12, the payload container data entered into the WWIS/WDS shall include the earliest date of waste generation (i.e., the date of removal from service for disposal), the date of waste certification for disposal, and the date the waste was sent to the WIPP for disposal (Reference 12, Section III.D.4). Additionally, the estimated weight of the PCBs in kilograms (as recorded on the UHWM) and a description of the type of PCB waste (e.g., PCB remediation waste, PCB bulk product waste, etc.), shall be entered into the WWIS/WDS (Reference 13, §761.207(a)(2) and

§761.180). Hanford, Idaho National Laboratory, Savannah River Site, Oak Ridge Reservation, Knolls Atomic Power Laboratory, and Los Alamos National Laboratory are authorized to ship their TRU and TRU-mixed wastes containing PCBs to WIPP (References 14 and 15).

[B] Compliance and Verification

[B.1] CCP uses AK (which may include results of sampling and analysis) to identify waste streams that may contain PCBs. For waste streams that are identified as PCB contaminated, the AK record also includes a description of the type of PCB waste present (e.g., PCB remediation waste, PCB bulk product waste). AK documentation is collected, evaluated and reported in accordance with DOE/WIPP-02-3214 and CCP-TP-005 and is summarized on a waste stream basis in AK Summary Reports. Special information identified below is entered into the WWIS/WDS for each affected payload container in accordance with procedure CCP-TP-530.

1. Date of removal from service.
2. Date of waste certification for disposal.
3. Date the waste was sent to the WIPP for disposal.
4. The estimated weight of the PCBs in kilograms.
5. Description of the type of PCB waste.

CCP only certifies and ships PCB contaminated TRU waste from sites with an approved EPA PCB waste disposal authorization.

4.11 Data Package Contents

4.11.1 Characterization and Certification Data

[A] Requirements

[A.1] Sites shall prepare a WSPF for each waste stream. Each WSPF shall be approved by the Permittees prior to the first shipment of that waste stream.

Characterization and certification information for each payload container shall be submitted to the WWIS/WDS and approved by the Data Administrator. Any payload container from a waste stream that has not been preceded by an appropriate certified WSPF is not acceptable at WIPP (Reference 9, Part 2, Section 2.3.3.10).

[A.2] See the WCPIP (Reference 17) for additional characterization and certification data requirements.

[B] Compliance and Verification

[B.1] CCP prepares and submits WSPFs to the Permittees for review and approval per the instructions given in procedure CCP-TP-002. Characterization data for each payload container used to prepare the WSPF and the Characterization Reconciliation Report is submitted to the WWIS/WDS in accordance with procedure CCP-TP-530. CPR weights are estimated and input into the WWIS/WDS as described in Section 4.5.

4.11.2 Shipping Data

[A] Requirements

[A.1] Sites shall prepare either a bill of lading or a UHWM for RH TRU waste shipments as required by the transportation requirements. The land disposal restriction notification for RH TRU mixed waste shipments shall state that the waste is not prohibited from land disposal (Reference 9, Attachment C, Section C-5b(2); Reference 41).

[B] Compliance and Verification

[B.1] CCP prepares and completes the UHWM and/or Bill of Lading in accordance with CCP-TP-507. The Land Disposal Restriction Exemption Notification is completed for mixed waste shipments in accordance with procedure CCP-TP-507 and states that the waste is not prohibited from land disposal.

5.0 QUALITY ASSURANCE PLAN

The CBFO QAPD establishes QA program requirements for the programs, projects, and activities sponsored by CBFO. The NWP QAPD describes how NWP applies the QA program requirements of the CBFO QAPD to NWP activities, including CCP. This QA plan describes and implements the NWP QAPD requirements for the CCP. It is based on the NWP QAPD as it applies to the characterization, certification, and transportation of TRU waste as performed by CCP, and therefore incorporates the applicable requirements from the regulatory and commitment QA program source documents identified in the CBFO QAPD. This QA plan also fulfills the requirements for a transportation QA plan as required in 10 CFR Part 71, Subpart H. The scope of the integrated Quality Assurance Program Requirements for Nuclear Facilities (NQA)-1 Program is to ensure that all items and activities that are important to the safe containment of TRU Waste in the WIPP are in compliance with Program objectives. Applicable criteria are also identified in the individual element descriptions contained in this QA Plan.

The QA program is developed and maintained through an ongoing process that selectively applies QA criteria as appropriate to the function or work activity being performed. The organization of this QA Plan is generally based on the CBFO QAPD elements.

The QA program is implemented in accordance with a set of Quality Procedures that are applicable to all CCP activities, independent of the location where these activities are performed. The QA program also includes Technical Procedures and other documentation, some of which are site-specific and some of which are applicable across CCP. Implementing Technical Procedures are listed in the tables in Appendix 4.

QA program document references are included, as applicable, in each of the individual QA element descriptions throughout this QA Plan.

5.1 Organization and Quality Assurance Program

(Applicable Criteria: 10 CFR 830.122 Criterion 1
40 CFR 194.22(a)(2)(i)
ASME NQA-1-1989, Criterion 1
DOE O 414.1 Criterion 1
CBFO QAPD, Section 1.1
NWP QAPD, Section 1.1)

This QA program applies to items and activities affecting waste characterization, certification, and transportation by the CCP. The QA program elements are integrated into CCP items and activities through reviews, assessments, inspections, and approval and control of records and documents. The CCP has identified the Program Manager, the

Certification Program Manager, SPM, Assurance Programs Manager, TCO, and WCO as being responsible for ensuring QA within CCP. The responsibilities of each of these positions, as well as other personnel involved with TRU waste characterization and certification, are summarized in this Plan (Section 2.1).

Figure 1-1 (see Section 1.0) illustrates the hierarchy and interrelationships of QA documents governing the QA program. Quality management documents are audited and/or assessed to ensure they meet CCP requirements.

Personnel plan certification activities and document the planning process. Planning documentation is subject to review by subject matter experts (SMEs). CCP planning documentation consists of this Plan, the WIPP WAP, the WAC, the QAPjP, the CH-TRAMPAC, RH-TRAMPAC, the GGT QAPjP, implementing procedures, QA plans, training plans, and facility and certification process designs.

5.1.1 Organization

(Applicable criteria: 10 CFR Part 830.122 Criterion 1
DOE O 414.1 Criterion 1
ASME NQA-1-1989, Criterion 1
CBFO QAPD Section 1.1.1
NWP QAPD, Section 1.1)

The organization structure, functional responsibilities, levels of authority, and lines of communication for activities affecting quality are documented in this Plan, and CCP implementing procedures. Specific duties and responsibilities assigned to CCP management are summarized in the Plan, Section 2.1.1, and in CCP-PO-001.

The QA organization is responsible for ensuring the implementation of the QA program and verifying that activities affecting quality have been correctly performed. They have sufficient authority, access to work areas, and organizational freedom to identify quality problems; initiate, recommend, or provide solutions to quality problems; verify implementation of solutions; and ensure that further processing, delivery, installation, or use is controlled until proper disposition of nonconformances, deficiencies, or unsatisfactory conditions has occurred. QA personnel have direct access to responsible management at a level where appropriate action can be effected. They report to a management level such that required authority and organizational freedom are provided, including sufficient independence from cost and schedule considerations. Specific duties and responsibilities assigned to QA are summarized in the Plan, Section 2.1.4, and in CCP-PO-001.

The organizational structure of CCP, and the assignment of responsibilities, is based on the following QA principles, such that:

- Quality is achieved and maintained by those who have been assigned responsibility for performing work.
- Quality achievement is verified by personnel or organizations that are not directly responsible for performing the work.
- The individuals or organizations responsible for establishing and executing the QA program may delegate any or all of the work, but shall retain responsibility therefore.
- Responsibility for the control of further processing, delivery, installation, or operation of nonconforming items shall be designated in writing.
- When more than one organization is involved in the execution of activities covered by this document, the responsibility and authority of each organization shall be clearly established and documented.
- The external interfaces between organizations and the internal interfaces between organizational units, and changes thereto, shall be documented.
- Interface responsibilities shall be defined and documented.

All personnel involved with TRU waste certification and packaging are responsible for achieving and maintaining the quality of their activities and products. All personnel are responsible for promptly reporting existing, developing, or potential conditions adverse to quality to responsible management for evaluation and action. Management personnel are responsible for achieving and maintaining quality in the work activities under their control.

[A] Communication and Interface Responsibilities

(Applicable Criteria: CBFO QAPD Section 1.1.1.4
NWP QAPD, Section 1.1.10 and 1.1.11)

CCP management communicates to all levels of the organization timely information pertinent to quality performance, including status of the quality program, status and resolution of significant quality problems, lessons learned, quality management practices and improvements, and trend analysis results.

The responsibility and authority of the CCP and each participating organization are clearly established and documented in an interface document for each site. The external interfaces between CCP participant organizations, the internal interfaces between organizational units, and interface changes are documented. Interface responsibilities are defined and documented and include the requirements for management, performance, and assessment. Interfaces between CCP and the waste generating sites are detailed in project-level Interface Agreement documents specifically written for each site. Interfaces between CCP and NWP support organizations are defined in CCP implementing procedures.

[B] Reports to Management

(*Applicable Criteria: CBFO QAPD Appendix E, Section 8*
NWP QAPD, Section 1.1.8)

QA provides the QA interface between facilities and the CCP Certification Manager and SPM. QA oversees the NCR/CAR process for CCP related deficiencies and coordinates with the CCP Certification Manager and SPM to track and notify the appropriate personnel of nonconformances, and verify corrective action completion in accordance with CCP-QP-005. QA at project sites report the results of their surveillance assessments to the Assurance Programs Manager, and together they track assessment results and corrective actions. QA prepares and transmits a semi-annual QA report to the CCP Certification Manager and the DOE.

[C] Delegation of Work

(Applicable Criteria: CBFO QAPD Section 1.1.1.5
NWP QAPD, Section 1.1.6)

Management empowers employees by delegating authority and decision making to the lowest appropriate level in the organization. If work is delegated, the individual making the delegation retains responsibility for the delegated work. QA is responsible for determining the effectiveness of the QA program, which is accomplished through internal reporting procedures, audits, and assessments.

[D] Resolution of Disputes

(Applicable Criteria: CBFO QAPD Section 1.1.1.6
NWP QAPD, Section 1.1.7)

Disputes related to QA program requirements will be resolved by QA and cognizant personnel. If not resolved, the issues will be elevated progressively to successively higher levels of management as necessary.

[E] QA Management

(Applicable Criteria: CBFO QAPD, Section 1.1.3.A
NWP QAPD, Section 1.1.5)

QA Management shall:

[E.1] Schedule and conduct QA assessments.

[E.2] Maintain liaison with participant QA organizations and other affected organizations.

[E.3] Ensure preparation, review, and issuance of QA plans and procedures that implement the provisions of the NWP QAPD.

[E.4] Review and approve supplier and subcontractor QA plans.

[E.5] Track or perform trend analysis of quality problems, and report quality problem areas.

[E.6] Provide for the administrative processing of documentation of concerning conditions adverse to quality.

[E.7] Have direct access to responsible management at a level where appropriate action can be effected.

[E.8] Be sufficiently independent from cost and schedule considerations.

[E.9] Have the organizational freedom to communicate with management.

[E.10] Have no assigned responsibilities unrelated to the QA program that would prevent appropriate attention to QA matters.

[E.11] Develop, establish, and interpret QA policy and ensure effective implementation.

[E.12] Interface, as appropriate, with the CBFO staff, participants, and other stakeholders on QA matters.

[E.13] Assist subordinate organizations with quality planning, documentation, quality measurement, and problem identification and resolution.

[E.14] Provide guidance to all applicable subordinate organizations concerning identification, control, and protection of QA records.

[F] The QA organization shall have sufficient authority, access to work areas, and organizational freedom to:

(Applicable Criteria: CBFO QAPD, Section 1.1.1.3.B
NWP QAPD, Section 1.1.5)

[F.1] Identify quality problems.

[F.2] Recommend solutions.

[F.3] Verify implementation of solutions.

[F.4] Ensure that unsatisfactory conditions are controlled until proper disposition has occurred.

5.1.2 Implementation of the QA Program

(Applicable criteria: 40 CFR 194.22(a)(1)
ASME NQA-1-1989, Criterion 2
CBFO QAPD Section 1.1.2
NWP QAPD, Section 1.1.8)

The QA program is planned, implemented, and maintained in accordance with the requirements found in the CBFO QAPD, NWP QAPD, American Society of Mechanical Engineers (ASME) NQA-1-1989, 40 CFR § 194.22, and 10 CFR § 830.122. The QA program identifies the activities and items to which it applies, and provides control over activities affecting quality to an extent consistent with their importance. The QA program has been implemented during the process of program development, start-up, and operation.

The QA program provides for the planning and accomplishment of activities affecting quality under suitable controlled conditions.

Controlled conditions include the use of appropriate equipment, suitable environmental conditions for performing waste characterization and transportation activities, and assurance that prerequisites have been satisfied. This program also provides for special controls, processes, test equipment, tools, and skills to attain the required quality and for verification of quality.

[A] Grading Items and Activities and Applying Management Controls

(Applicable Criteria: CBFO QAPD Section 1.1.2.3
NWP QAPD, Section 1.1.8.2)

The graded approach to application of QA controls is used by the CCP to determine the importance of the item or activity with respect to the CCP mission, regulatory requirements, hazards, and life-cycle of the item or activity. Management controls are applied commensurate with the determined importance of the item or activity. The CCP uses the graded approach in accordance with CCP-QP-001, *CCP Graded Approach*, to comply with CBFO QAPD and NWP QAPD requirements for grading items and activities and applying management controls. Revisions to CCP-QP-001 are submitted to CBFO for approval prior to implementation.

[B] Work Planning

(Applicable Criteria: CBFO QAPD Section 1.1.2.4
NWP QAPD, Section 1.1.12)

CCP performs and documents planning to ensure that work is accomplished under suitably controlled conditions. CCP implements planning in accordance with CCP-QP-010, *CCP Document Preparation, Approval and Control,* and CCP-QP-026*, CCP Inspection Control*. As appropriate, planning elements include:

[B.1] Definition of work scope, objectives, and a listing of the primary tasks involved.

[B.2] Identification of scientific approaches or technical methods used to collect, analyze or study results of applicable work.

[B.3] Identification of field and testing standards and quality criteria.

[B.4] Identification of applicable implementation documents; appropriate nationally recognized standards will be used whenever possible.

[B.5] Identification of field and testing equipment or other equipment.

[B.6] Identification of, or provisions for the identification of, required records and the recording of objective evidence of the results of the work performed.

[B.7] Identification of prerequisites, special controls, specific environmental conditions, processes, or skills.

[B.8] Identification of computer software.

[C] Peer Review

(Applicable criteria: CBFO QAPD Section 1.1.2.5
NWP QAPD, Section 1.1.12)

When peer reviews are required, they are accomplished in accordance with CCP-TP-511, *CCP Peer Review*.

5.2 Personnel Qualification and Training

(Applicable criteria: 10 CFR 830.122 Criterion 2
ASME NQA-1-1989, Criterion 2
DOE O 414.1 Criterion 2
CBFO QAPD Section 1.2
NWP QAPD, Section 1.2)

The QA program provides for training and qualification, as necessary, of personnel performing activities affecting quality to ensure that suitable proficiency is achieved and maintained. Personnel performing work in support of CCP receive QA training and are qualified to ensure that proficiency is achieved and maintained in the performance of their assigned tasks. Records documenting qualifications and completed training programs are maintained and controlled. Training and qualification are performed in accordance with CCP-QP-002, *CCP Training and Qualification Plan* and CCP-QP-040, *Support Training.*

5.2.1 Qualification Requirements

(*Applicable criteria: CBFO QAPD Section 1.2.1*
NWP QAPD, Section 1.2.1)

The CCP Certification Manager and Training determine qualification standards for each job category relevant to the CCP and ensure that qualifications of personnel, including minimum education and experience, have been verified. Personnel maintain minimum qualifications in accordance with CCP-QP-002. The CCP Certification Manager determines which positions relevant to the CCP require minimum qualifications. The period of effectiveness for qualification associated with special processes and operations that require special skills and the requalification criteria are specified or referenced in CCP-QP-002. The CCP Certification Manager ensures that auditable records documenting personnel qualifications are maintained as described in CCP-QP-008, *CCP Records Management*. Records of qualified personnel, their areas of qualification, and qualification periods (as appropriate) are retained in the records files.

5.2.2 Training Requirements

(Applicable criteria: CBFO QAPD Section 1.2.2
NWP QAPD, Section 1.2.2)

The CCP Certification Manager and Training ensure that personnel receive indoctrination and training on the scope, purpose, and objectives and the specific QAOs of the tasks being performed. Personnel performing activities affecting quality are trained according to the training plan to ensure they achieve and maintain proficiency. Personnel receive initial and continuing training requisite with their activities and level of responsibility, as described in CCP-QP-002.

Training is designed, developed, conducted, and evaluated in accordance with requirements described in CCP-QP-002. Training programs may include classroom instruction; practical hands-on experience; supervised on-the-job training (OJT); self-paced individual study; and written, oral, or practical demonstration of worker competence. The CCP Certification Manager analyzes job positions and determines task responsibilities for personnel to ensure education, experience, and training is commensurate with minimum requirements specified. The CCP Certification Manager is responsible for ensuring that auditable records documenting the required training and qualifications are maintained in accordance with CCP-QP-002.

5.3 Quality Improvement

(Applicable Criteria: 10 CFR 830.122 Criterion 3
ASME NQA-1-1989, Criteria 15 & 16
DOE O 414.1 Criterion 3
CBFO QAPD Section 1.3
NWP QAPD, Section 1.3)

Quality improvement is a management process, carried out to improve items, services, products, or processes. All aspects of quality work activities and the management system are subject to continuous improvement through the assessment and feedback processes.

Conditions adverse to quality are identified promptly and corrected as soon as practical. In the case of a significant condition adverse to quality, the cause of the condition is determined and corrective action taken to preclude recurrence. The identification, cause, and corrective action for significant conditions adverse to quality are documented and reported to appropriate levels of management. Follow-up action is taken to verify implementation of corrective actions.

Items that do not conform to specified requirements are controlled to prevent inadvertent installation or use. Controls are provided for identification, documentation, evaluation, segregation when practical, and disposition of nonconforming items, and for notification to affected organizations.

Personnel continually evaluate and improve project activities. QA ensures that quality improvement is achieved by identifying and controlling conditions adverse to quality, analyzing trends, reporting and tracking nonconformances, and implementing corrective actions. These quality improvement activities detect and prevent unacceptable quality problems and thereby increase accuracy and reliability, and reduce variability. Data analysis and trending are performed in accordance with CCP-QP-014, *CCP Quality Assurance Trend Analysis and Reporting.*

A condition adverse to quality is an all-inclusive term used in reference to failures; malfunctions; deficiencies; and nonconforming items, materials, parts, or components, and processes. Personnel ensure that nonconforming items, materials, parts, or components are adequately identified and segregated from acceptable items and materials to preclude their inadvertent use. CCP and Host site personnel have the authority to stop certification, packaging, and transportation activities and/or refuse to accept work products or services (e.g., procured items, documentation, packaging, and waste shipments) that do not conform to requirements. Personnel report conditions adverse to quality to QA personnel, who ensure that the condition adverse to quality is investigated and that corrective action is taken as described in this section. Employees have

the responsibility to stop work that poses a clear and imminent danger to the safety and health of employees, subcontractors, visitors, or the environment.

Personnel notify QA of conditions adverse to quality affecting waste to be shipped to WIPP and forward CARs related to violations of the WIPP Hazardous Waste Facility Permit to QA for tracking. Conditions adverse to quality are documented, evaluated for significance, corrected, tracked, and reported in accordance with CCP-QP-029 and CCP-QP-005. All violations of the WIPP Hazardous Waste Facility Permit will be managed as significant conditions adverse to quality.

Deficiencies are uncontrolled and unapproved deviations from an approved plan, procedure, or expected result. Deficiencies specific to the CCP also include documentation or management practices that do not meet the requirements related to waste certification or payload container preparation, which are identified in the WIPP WAP, RH-TRAMPAC, CH-TRAMPAC, WAC, QAPD, and applicable federal and state regulations. Personnel are responsible for identifying any condition that affects compliance with these requirements. Assessments may often identify systems, processes, products, or services that do not meet performance criteria established in planning documents. When deficiencies are found, personnel take prompt action to rectify the situation.

Any individual who identifies a condition adverse to quality initiates an NCR or CAR in accordance with CCP-QP-005 or CCP-QP-029. If the safety or quality of the certification process could be compromised by continued use of a nonconforming item, the item is taken out of service and tagged or otherwise identified to prevent reuse or acceptance until the nonconformance is corrected. QA or the QA personnel at the facility where the nonconformance is identified ensures that an NCR is initiated and that corrective action is taken to resolve the nonconformance.

NCRs and CARs are forwarded to the CCP Project Office QA personnel. QA is responsible for validating and tracking CCP-related deficiencies to ensure that corrective action is implemented and that the corrective action resolves the nonconformance. Significant conditions adverse to quality are evaluated by QA and other affected organizations to determine if a work suspension is necessary. If necessary, work will be suspended until the condition is corrected and verified by QA. Personnel notify DOE-CBFO within seven calendar days of identification of any non-administrative nonconformance related to applicable requirements specified in the WIPP WAP, which are first identified at the SPM's signature release level. Personnel submit the NCR to DOE-CBFO within 30 calendar days of identification of the deficiency. QA ensures dissemination of information that may prevent problems or help improve

parallel processes in other waste generator or activities and re-evaluates system performance after corrective actions have been implemented. The CCP Certification Manager provides the resources necessary to accomplish corrective actions. Any containers with unresolved discrepancies associated with waste characterization cannot be certified for disposal; this includes containers affected by CAR's applicable to WIPP WAP and WAC requirements.

QA and the CCP Certification Manager are jointly responsible for identifying the following:

- Trends in nonconformances
- Root causes of nonconformances
- Specific, measurable corrective actions to resolve current problems and prevent recurrence
- Personnel responsible for implementing corrective actions
- Schedules for completing corrective actions

5.4 Documents

(Applicable Criteria: 10 CFR 830.122 Criterion 4
ASME NQA-1-1989, Criteria 6
DOE O 414.1 Criterion 4
CBFO QAPD Section 1.4
NWP QAPD, Section 1.4)

The preparation, issue, and change of documents that specify quality requirements or prescribe activities affecting quality are controlled to assure that correct documents are being employed. These documents, including changes, are reviewed for adequacy and approved for release by authorized personnel.

Personnel prepare and control documents supporting the quality of the CCP in accordance with CCP-QP-010. Document control coordinators will ensure that:

- Documents are controlled during the review and approval process.
- Applicable criteria for the review are identified. Criteria will consider technical adequacy, accuracy, completeness and compliance with requirements.
- Pertinent background information or data is made available to the reviewer.

- Reviews are performed by individuals other than the originator, who are also technically competent in the subject area.
- Organizations or technical disciplines affected by the document review the document.
- QA reviews documents that translate CBFO QAPD, WAC, WIPP WAP, CH-TRAMPAC, RH-TRAMPAC and WCPIP requirements.
- Review comments are resolved and evidence of review comment resolution is maintained.
- Documents are approved for release and distributed in accordance with CCP-QP-010. These documents include:
  - Program planning documents such as this Plan, the QAPjP, the TRAMPAC
  - Plans and procedures implementing TRU waste characterization, certification and packaging
  - Procedures implementing QA requirements
- Changes to documents, other than those designated as editorial changes, are reviewed by the same organizations that performed the original review and approval.

NWP controlled procedures are used for functions that NWP performs in support of CCP. These functions include procurement support, source inspection support, independent assessments, vendor audits, and QSL maintenance.

5.5 Records

(Applicable Criteria: 10 CFR Part 21
10 CFR Part 71
10 CFR 830.122 Criterion 4
ASME NQA-1-1989, Criterion 17
ASME NQA-2a-1990, Addenda, Part 2.7
ASME NQA-3 1989
Waste Isolation Pilot Plant Hazardous Waste Facility Permit
DOE O 414.1 Criterion 4
CBFO QAPD Section 1.5
NWP QAPD, Section 1.5
DOE O 414.1
DOE O 266.1
DOE G-414.1-2A
SNT-TC-1A-1980
NRC Certificate Number 9212
NRC Certificate Number 9218
NRC Certificate Number 9279
NRC Certificate Number 9204
NUREG-1297 (1988)
NUREG/BR-0167 (1993)
40 CFR Part 191
40 CFR Part 194)

Records that furnish documentary evidence of quality are specified, prepared, and maintained. Records are legible, identifiable, and retrievable. Records are protected against damage, deterioration, or loss. Requirements and responsibilities for record transmittal, distribution, retention, maintenance, and disposition are established and documented.

A QA record is an authenticated record that provides objective evidence of the quality of items and/or activities. The minimum lifetime and nonpermanent QA records are identified in the QAPjP. QA records are controlled and maintained to certify compliance with requirements and to reflect completed work. QA records are indexed, classified, controlled, and maintained by records management personnel as described in CCP-QP-008. The Records Inventory and Disposition Schedule (RIDS) is also defined in CCP-QP-028, *CCP Records Filing, Inventorying, Scheduling, and Dispositioning*.

Waste characterization data and QA/QC records related to TRU waste to be shipped to WIPP are designated as either Lifetime Records, or Non-Permanent Records. Records that are designated as Lifetime Records are maintained for the life of the waste characterization program

plus six years; **OR** transferred for permanent archival storage to the WIPP Records Archive. Waste characterization records designated as Non-Permanent Records will be maintained for ten years from the date of record generation and then dispositioned according to their approved RIDS.

5.6 Work Process

(Applicable Criteria: 10 CFR 830.122 Criterion 5
DOE O 414.1 Criterion 5
CBFO QAPD Section 2.1
NWP QAPD, Section 2.1)

The work processes and items supporting and affecting quality are controlled through plans and procedures identified in this Plan, the QAPjP, and the TRAMPAC.

Characterization, fabrication, installation, and inspection processes affecting the quality of items or services are controlled by procedures. Special processes that control or verify quality, such as those used in welding, heat treating, and nondestructive examination, are performed by qualified personnel using qualified procedures in accordance with specified requirements.

5.6.1 Work

(Applicable Criteria: CBFO QAPD Section 2.1.1
ASME NQA-1-1989, Criterion 1
NWP QAPD, Section 2.1.1)

The CCP Certification Manager ensures that activities are controlled and conducted in accordance with facility-specific procedures that describe and control work processes applicable to TRU waste characterization or certification.

Individual operating procedures provide controls for performance of special processes. Special process training and qualification requirements are described in CCP-QP-002.

Each individual performing work is responsible for ensuring that work processes are controlled and comply with established criteria. The CCP Certification Manager is responsible for ensuring that workers have the correct procedures, materials, and training to perform the required work. Instructions and procedures are maintained current with a documented and controlled method of revision. Instructions, procedures, and drawings are readily

available to personnel at locations requiring their use through either hard copy or electronic media.

5.6.2 Implementing Procedures

(Applicable criteria: ASME NQA-1-1989, Criterion 5
CBFO QAPD Section 2.1.2
NWP QAPD, Section 2.1.2)

Activities affecting quality are prescribed by and performed in accordance with documented instructions, procedures, or drawings of a type appropriate to the circumstances. These documents include or reference appropriate quantitative or qualitative acceptance criteria for determining that the prescribed activities have been satisfactorily accomplished.

Procedures and plans are developed, reviewed, approved, revised, and distributed in accordance with CCP-QP-010. CCP technical and QA personnel comply with the applicable technical standards and administrative controls described in procedures, which are reviewed and approved by the CCP Certification Manager and QA in accordance with CCP-QP-010. The CCP Certification Manager ensures personnel perform work following established procedures. For work processes such as procurement, source inspection, and independent assessments, applicable NWP non-CCP specific procedures are also used. CCP specific implementing procedures describe the required interfaces with applicable NWP general use procedures.

The procedures identified in this Plan, the QAPjP, and the TRAMPAC provide the following information:

- organizational and individual responsibilities
- training and qualification requirements
- technical, regulatory, and QA requirements
- step-by-step instructions for the process
- equipment specifications
- identification and control of items used or installed
- prevention of damage or loss and minimization of deterioration of items and materials during handling, storage, and shipment of items

- methods and criteria for ensuring and verifying the acceptability of equipment and materials used in the process (e.g., calibration)
- prerequisites, precautions, process parameters, and other limiting conditions
- products of the process
- quantitative and/or qualitative criteria for determining that prescribed process activities have been performed satisfactorily
- records generated by the process
- package and design control of equipment and materials

5.6.3 Item Identification and Control

(Applicable Criteria: ASME NQA-1-1989, Criterion 8
CBFO QAPD Section 2.1.3
NWP QAPD, Section 2.1.3)

Controls have been established to assure that only correct and accepted items are used or installed. Identification is maintained on items or in documents traceable to the items, or in a manner which assures that identification is established and maintained.

Items are identified and traced from time of receipt through end use. Physical markings, labels, tags or segregation are used to provide item identification and status. Specific details are provided in CCP-QP-017, *CCP Identification and Control of Items*.

5.6.4 Special Processes

(Applicable Criteria: ASME NQA-1-1989, Criterion 9
CBFO QAPD Section 2.1.4
NWP QAPD, Section 2.1.5)

Special processes that control or verify quality, such as those used in nondestructive examination, are performed by qualified personnel using qualified procedures in accordance with specified requirements.

Processes are considered to be special processes if:

- results are highly dependent on the control of the process
- results are highly dependent on the skill of the operator, or

- quality of the results cannot be readily determined by inspection or test of the product.

Implementing procedures have been developed to control special processes: NDE, NDA, DTC, Flammable Gas Analysis, GGT, and Helium Leak Detection. Training and qualification requirements for operators are identified in CCP-QP-002.

5.6.5 Handling, Storage, and Shipping

(Applicable Criteria: ASME NQA-1-1989, Criterion 13
CBFO QAPD Section 2.1.5
NWP QAPD, Section 2.1.6)

Handling, storage, cleaning, packaging, shipping, and preservation of items are controlled to prevent damage or loss and to minimize deterioration. Controls are provided through work and inspection procedures, shipping instructions, or other appropriate documents.

Measures are established in CCP-QP-015 and CCP-QP-023, *CCP Handling, Storage and Shipping*, to ensure that systems, components and items used for repair work for maintenance purposes or packaging purposes are adequately identified to preclude the use of incorrect or defective items. Also, where replacement of limited shelf life items is specified, measures are established to preclude use of items whose shelf life or time in operation has expired. Handling, storage, cleaning, shipping, and other means of preserving, transporting, and packaging of items are controlled in accordance with CCP-QP-023.

5.7 Configuration Management

(Applicable Criteria: CBFO QAPD Section 2.2
NWP QAPD, Section 2.2)

5.7.1 Equipment Configuration

CCP applies configuration management controls to characterization equipment, including vendor owned equipment, operated by CCP and its subcontractors on behalf of CBFO. In accordance with CCP-CM-001, *CCP Equipment Change Authorization and Documentation*, personnel:

- Coordinate the reviews of new equipment and changes/modifications/repairs to existing equipment.
- Establish and apply unique equipment numbering.

- Develop all required equipment change/modification/repair requests.
- Determine training needs due to equipment changes/modifications/repairs.
- Obtain appropriate approvals for equipment modifications, changes, repairs, and process drawing and document changes when required.
- Coordinate with host facility representatives in their reviews to ensure that proposed modifications comply with host facility Authorization Basis requirements.
- Oversee the implementation of approved changes.
- Ensure appropriate technical documentation is maintained on equipment changes/modifications/repairs.

5.7.2 Software Configuration

CCP applies configuration management controls to computer software and hardware/software configurations in accordance with the requirements of CCP-QP-022, as described in Section 5.14 of the Plan.

5.8 Procurement

(Applicable Criteria: 10 CFR 830.122 Criterion 7
ASME NQA-1-1989 Criteria 4 & 7
DOE O 414.1 Criterion 7
CBFO QAPD Section 2.3
NWP QAPD, Section 2.3)

Applicable design bases and other requirements necessary to ensure adequate quality are included or referenced in documents for procurement of items and services. Procurement documents require suppliers to have a QA program consistent with the graded application of quality requirements. Procurements are controlled to ensure conformance with specified requirements. Procurement controls provide for source evaluation and selection, evaluation of objective evidence of quality furnished by the supplier, source inspection, audit, and examination of items or services upon delivery or completion.

CCP implements procedures to ensure that procurement of items and services important to safety and quality meet requirements and perform as intended. Procurement controls are applicable to equipment and services,

including commercial grade items that directly affect testing, and data quality. Other NWP organizations provide support to the CCP for procurement process elements such as procurement planning, supplier selection and evaluation, bid evaluation, supplier performance evaluation, requisition review and processing, and procurement records. Personnel adhere to procurement and record keeping practices established in written procedures. The procurement criteria are implemented according to CCP-QP-015, NWP procedure WP 15-PC3609, *Preparation of Purchase Requisitions and Purchase Requisition Change Notices*, and the procedures specified in the following subsections.

When deemed appropriate, CCP may permit some or all supplier work to be performed under the NWP QA program, provided that the requirements are adequately implemented. In these cases, procurement documents shall specify the NWP QA implementing procedures, including CCP specific procedures that are applicable to the supplier and that CCP will provide these applicable documents to the supplier.

5.8.1 Procurement Document Review and Approval

(Applicable Criteria: CBFO QAPD Section 2.3.5
NWP QAPD, Section 2.3.2)

The CCP Certification Manager ensures that personnel control procurement documents in accordance with CCP-QP-015. Procurements are planned and controlled to ensure that suppliers have QA programs consistent with the intended use of the item being procured. Procurement activities shall be planned as early as possible. At a minimum, the activities shall be planned no later than the start of those procurement activities that are required to be controlled. Procurement documents supporting waste management and packaging and transportation activities must include required specifications and acceptance criteria. Procurement documents are reviewed by appropriate organizations and engineering disciplines to ensure that they contain adequate scope of work, technical requirements, supplier QA program requirements, and provisions for acceptance. Qualified personnel verify suppliers' conformance to procurement document requirements.

5.8.2 Acceptance of Items or Services
(Applicable Criteria: CBFO QAPD Section 2.3.7
NWP QAPD, Section 2.3.4)

The SPM ensures that personnel control items and services purchased (including supplier evaluations and inspections) in accordance with CCP-QP-015, NWP Procedure

WP 15-PC3609, and CCP-QP-001. Methods shall be established for the acceptance of an item or service being furnished by a supplier. Prior to offering an item or service for acceptance, the supplier shall verify that the item or service complies with the procurement requirements. Documentary evidence of conformance to the procurement specifications is provided before installation or use of systems, components, items, and services, and is retained in accordance with CCP-QP-015. Acceptance of quality related systems, components, items and services will be through source verification, receipt inspection, post-installation testing, or supplier certificate of conformance as appropriate to the quality level. Supplier nonconformances will be documented, tracked, and dispositioned in accordance with CCP-QP-015. An example of conditions requiring a report of nonconformance include: The item does not conform to the original requirement even though the item can be restored to a condition such that its capability to function is unimpaired (i.e., a waiver is requested).

5.8.3 Control of Supplier Nonconformances

(Applicable Criteria: CBFO QAPD Section 2.3.8
NWP QAPD, Section 2.3.5)

Subcontractors perform work that directly affects the quality of characterization and certification data. CCP-QP-015, describes how personnel control subcontractor services. Subcontractors may support activities under a “staff augmentation” role or for procurement of products and services. Staff augmentation subcontractors operate under the umbrella of the QA program and are subject to applicable requirements for functions that they perform. Subcontractors who support the CCP will be informed of the need to perform operations in compliance with requirements.

If subcontractors are authorized to perform procurements of quality-affecting items and services, they are required to establish procurement controls and a QA program to ensure that purchased materials, equipment, and services conform to the procurement and QA program documents. NWP adds and maintains such subcontractors on the NWP QSL, to support the scope of work and ensure that the appropriate subcontractor QA controls are applied. The controls must include provisions, as appropriate, for source evaluation and selection, objective evidence of quality furnished by the contractor or subcontractor, inspection at the contractor or subcontractor source, and examination of products on delivery. Subcontractors are subject to periodic assessments and audits at intervals consistent with the importance, complexity, and quantity of the product or services provided to ensure compliance with

procurement requirements. Subcontractors shall submit copies of CCP-related, quality affecting documents to the CCP Certification Manager.

Items and services procured are subject to control of nonconformances. Quality Levels are determined for items and services procured for use, and quality-affecting items are evaluated for adequacy prior to use through receipt inspection, source inspection, functional testing, or other appropriate means. Items that are found deficient are documented, controlled to prevent use, evaluated, and corrective actions performed.

A combination of CCP specific and NWP general use procedures are used to exercise controls over supplier nonconformances. They include:

- CCP-QP-015, *CCP Procurement*
- CCP-QP-029, *CCP Corrective Action Management*
- CCP-QP-005, *CCP TRU Nonconforming Item Reporting and Control*
- WP 15-PC3609, *Preparation of Purchase Requisitions and Purchase Requisition Change Notices*

5.8.4 Commercial Grade Items

(Applicable Criteria: CBFO QAPD Section 2.3.9
NWP QAPD, Section 2.3.6 and 2.3.7)

Commercial grade items may be used when specified by design. Commercial grade items are identified in procurement documents using manufacturer or distributor catalog numbers or descriptions. Data collection and test instruments procured as commercial grade items that are intended for use in quality related applications are calibrated by qualified suppliers of calibration services prior to use. Commercial grade items are procured in accordance with CCP-QP-015, CCP-QP-026, WP 13-QA1003, *Quality Assurance Receipt/Source Inspections*, WP 15-PC3609, WP 13-QA3012, *Supplier Evaluation and Qualification,* and NWP Procurement Services Commercial Instruction C1015 *Supplier Selection*.

5.9 Inspection and Testing

(Applicable Criteria: 10 CFR 830.122 Criterion 8
ASME NQA-1-1989, Criteria 10 & 14
DOE O 414.1 Criterion 8
CBFO QAPD Section 2.4
NWP QAPD, Section 2.4)

Inspections required to, verify conformance of an item or activity to specified requirements are planned and executed. Characteristics to be inspected and inspection methods to be employed are specified. Inspection results are documented. Inspection for acceptance is performed by persons other than those who performed or directly supervised the work being inspected.

The status of inspection and test activities is identified either on the items or in documents traceable to the items where it is necessary to assure that required inspections and tests are performed and to assure that items which have not passed the required inspections and tests are not inadvertently installed, used, or operated. Status is maintained through indicators appropriate to the activity or item, such as physical location and tags, markings, travelers, stamps, inspection records, or other suitable means. The authority for application and removal of tags, markings, labels, and stamps is specified.

Equipment is tested, inspected, and maintained in accordance CCP-QP-016*, CCP Control of Measuring, Testing, and Data Collection Equipment*; CCP-QP-026, and CCP-QP-027, *CCP Test Control*. CCP personnel identify and control items (e.g., items with limited shelf or operating lives, materials, equipment, and samples) and ensure that only correct and accepted items are used according to CCP-QP-026. These procedures and documents address planning, parameters for evaluation, techniques to be used qualifications of inspection and test personnel, hold points, documentation, acceptance criteria, and organizational responsibilities.

Personnel routinely test and inspect items and processes and control, calibrate, and maintain equipment to ensure proper operation and data quality. Procedures identified above implement an inspection program that establishes criteria for inspection of activities affecting quality by, or for, the organization performing the activity, and to verify conformance with the requirements for accomplishing the activity. The verification is performed in accordance with written procedures, instructions, or drawings. Personnel performing the inspections are independent from the individuals performing the activity being inspected. Equipment modifications, repairs, and replacement are inspected in accordance with the original design and inspection requirements unless an approved

alternative exists. The inspection program also provides for identification and documentation of deficiencies discovered during the inspection. Measures are established to indicate, by the use of markings, tags, stamps, labels, routing cards, or other suitable means, the status of inspections and tests performed. These measures provide for the identification of items that have satisfactorily passed required inspections and tests, where necessary, to preclude inadvertent bypassing of the inspections and tests.

Quality related procured items are inspected by qualified personnel at receipt or at the source prior to shipment. These inspections may include dimensional verification, functional testing, verification of documentation or other appropriate methods.

5.9.1 Qualification of Inspection and Test Personnel

(Applicable Criteria: CBFO QAPD Section 2.4.1
NWP QAPD, Section 2.4.1)

Inspection and test personnel are trained and qualified in accordance with CCP-QP-002, CCP-QP-030, *CCP Written Practice for the Qualification of CCP Helium Leak Detection Personnel*, and CCP-QP-032, *CCP Written Practice for the Qualification of CCP Pressure Change Leak Testing Personnel*. Candidates for inspection and test positions are evaluated for previous education, experience, training, and testing as appropriate. Minimum qualifications are established, and personnel selected for these activities are documented to have experience or training commensurate with the scope, complexity, or special nature of the inspections or tests performed. Inspection and test personnel are indoctrinated in the technical and QA objectives, requirements, and controls, and formal or OJT is performed as appropriate. Qualifications are documented, and records maintained in the Records System.

Job performance of inspection and test personnel is evaluated at periodic intervals, and is performed through review of evidence of continued satisfactory performance or redetermination of capability. If personnel are found to not perform adequately, they are removed from that function until the required capability is demonstrated. Personnel that have not performed inspection or testing activities in their qualified area for more than a year are re-evaluated for the required capability.

5.9.2 Qualification of Nondestructive Examination Personnel

(Applicable Criteria: CBFO QAPD Section 2.4.2.A
NWP QAPD, Section 2.4.1.2)

Personnel performing NDE are trained and certified in accordance with CCP-QP-002. This procedure implements the requirements of the American Society of Nondestructive Testing (ASNT) Recommended Practice No. SNT-TC-1A, June 1980 edition. Training and certification of NDE personnel are documented and records maintained in the Records System.

5.9.3 Inspection Planning

(Applicable Criteria: CBFO QAPD Section 2.4.3.1
NWP QAPD, Section 2.4.2.1)

Inspections are planned, performed and documented in accordance with CCP-QP-026. Inspection planning includes identification of work operations to be inspected, inspection hold points, identification of characteristics to be inspected, inspection methods, acceptance criteria, sampling requirements, method of documentation of inspection results, Measuring and Testing Equipment (M&TE) to be used, and identification of statistical methods for sampling.

The types of inspections that may be performed include:

- in-process inspections and monitoring
- final inspection
- in-service inspections

Each of these types of inspections may include review of documentation, examination or verification of physical characteristics, performance of tests, or other means of verifying quality and conformance to the applicable requirements. Inspections are documented and records maintained as part of the Records System.

5.9.4 Test Requirements

(Applicable Criteria: ASME NQA-1-1989, Criterion 11
CBFO QAPD Section 2.4.4
NWP QAPD, Section 2.4.3)

Tests required to verify conformance of an item or computer program to specified requirements and to demonstrate satisfactory

performance for service shall be planned and executed. Characteristics to be tested and test methods to be employed are specified. Test results are documented and their conformance with acceptance criteria are evaluated.

Tests required to collect data are planned, executed, documented and evaluated. Test planning includes identification of test procedures, test requirements and acceptance limits, including required levels of precision and accuracy, identification of M&TE, test prerequisites, hold points, and test and data documentation requirements. Test results are documented and their conformance with acceptance criteria are evaluated by qualified personnel.

Testing is performed in accordance with CCP-QP-027.

5.9.5 Monitoring, Measuring, Testing, and Data Collection Equipment

(Applicable Criteria: 10 CFR 830.122, Criterion 5
ASME NQA-1-1989, Criterion 12
CBFO QAPD Section 2.4.5
NWP QAPD, Section 2.5)

Tools, gages, instruments, and other measuring and test equipment used for activities affecting quality are controlled and at specified periods calibrated and adjusted to maintain accuracy within necessary limits. This equipment is controlled in accordance with CCP-QP-016.

[A] Use and Control of M&TE

(Applicable Criteria: CBFO QAPD Section 2.4.6
NWP QAPD, Section 2.5.1)

Measuring and test equipment with the necessary range and accuracy is provided to qualified personnel for the inspection, test, and acceptance of material, parts, components, and systems. The specific controls imposed on measuring and test equipment are described in procedure CCP-QP-016, and CCP-QP-026. M&TE are labeled, and any that are found to be out of calibration are reviewed to determine the impact. Records are maintained in the Records System.

[B] Calibration

(*Applicable Criteria: CBFO QAPD Section 2.4.7*
NWP QAPD, Section 2.5.1)

Equipment accuracy is ensured by periodic calibration that is traceable to national standards or a documented equivalent basis for calibration. M&TE shall be calibrated to provide traceability of the calibration against certified equipment having known valid relationships to nationally recognized standards. If nationally recognized standards do not exist, the basis for calibration shall be documented. The specific controls imposed on measuring and test equipment are described in procedure CCP-QP-016, and CCP-QP-026.

5.10 Management Assessments

(Applicable Criteria: 10 CFR 820.122 Criterion 9
ASME NQA-1-1989 Criterion 2
DOE O 414.1 Criterion 9
CBFO QAPD Section 3.1
NWP QAPD, Section 3.1)

Management regularly assess the adequacy of that part of the QA program for which they are responsible to assure its effective implementation, and ensure compliance with applicable requirements. Management assessments are conducted according to CCP-QP-018, *CCP Management Assessment*. CBFO and external regulatory agencies also conduct assessments. QA tracks deficiencies identified during assessments; identifies corrective actions to resolve deficiencies according to CCP-QP-029 and CCP-QP-005, and ensures the resolutions are reported to the CCP Certification Manager and CBFO. Documentation of deficiencies identified in activities conducted at waste generating sites are also reported to the appropriate organizations at those sites, in accordance with interface documents.

Management periodically assesses the performance of its organization to determine the effectiveness of QA Program provisions that enable the organization to comply with requirements of the WIPP WAP, QAPD, WAC, and applicable procedures and documents. Managers evaluate QA Program effectiveness by focusing on the identification and resolution of both systemic and management issues and problems, and identifying strengths and weaknesses to facilitate actions to improve quality efficiency and cost-effectiveness. Management assessments may include an introspective evaluation to determine whether the entire integrated management system effectively focuses on meeting strategic goals. Management assessments are conducted as described in CCP-QP-018.

Management is responsible for the conduct of these assessments and reports at least annually on relevant findings.

5.11 Independent Assessments

(Applicable Criteria: 10 CFR 830.122, Criterion 10
ASME NQA-1-1989, Criterion 18
DOE O 414.1, Criterion 10
CBFO QAPD Section 3.2
NWP QAPD, Section 3.2)

Planned and scheduled audits are performed to verify compliance with all aspects of the QA program and to determine its effectiveness. These audits and surveillances are performed in accordance with written procedures or checklists by personnel who do not have direct responsibility for performing the activities being audited. Audit and surveillance results are documented and reported to and reviewed by responsible management. Follow-up actions are taken where indicated.

Documented independent assessments (audits and surveillances) are used to measure item service and quality, process adequacy and effectiveness, and to promote improvement.

5.11.1 Surveillances

(Applicable Criteria: CBFO QAPD Section 3.2.1
NWP QAPD, Section 3.2)

Surveillances are conducted primarily to monitor work in progress and to follow up on corrective actions. Surveillance results are reported and monitored similar to other assessment activities. At each host location, surveillances are scheduled as early in the project as practical. Surveillances are performed in accordance with CCP-QP-021, *CCP Surveillance Program*.

5.11.2 Audits

(Applicable Criteria: CBFO QAPD Section 3.2.2
NWP QAPD, Section 3.2)

Internal and external audits are planned and scheduled throughout the life of the CCP and are conducted by qualified personnel.

The CCP is subject to CBFO certification audits. A CBFO audit of is conducted before any waste characterized by the CCP is shipped to the WIPP and annually thereafter. In addition, the CBFO may conduct audits on a random basis. These audits are scheduled

through the CBFO QA Manager who coordinates the plans and schedule through the CCP Certification Manager.

5.12 Sample Control Requirements

(Applicable Criteria: CBFO QAPD Section 4.1
NWP QAPD, Section 4.1)

This section identifies the requirements for controlling samples of waste and environmental media. Control measures stated in site specific container management procedures (see Appendix 4, Table B-1) and analysis procedures include provisions for the identification, handling, storage and shipping, archiving, and identification of nonconforming drums.

Samples/drums are controlled and identified in a manner consistent with their intended use in accordance with container management procedures specific to each site (See Appendix 4, Table B-1).

5.12.1 Sample Identification

(Applicable Criteria: CBFO QAPD Section 4.2
NWP QAPD, Section 2)

[A] Waste containers used as samples are labeled and tracked in accordance with site specific container management procedures. Each waste container used as a sample is checked for physical marking that:

[A.1] Are applied using materials and methods that provide a clear and legible identification.

[A.2] Are not obliterated or hidden on the surface.

[B] If samples/waste containers used as samples are stored, they are controlled in accordance with container management procedures and the method requirements for characterization.

5.12.2 Handling, Storing, and Shipping Samples

(Applicable Criteria: CBFO QAPD Section 4.3
NWP QAPD, Section 4.3)

[A] Handling, storing, cleaning, packaging, and shipping waste containers used as samples is conducted in accordance with

established work and inspection implementing procedures, CCP-QP-023.

5.12.3 Disposition of Nonconforming Samples

(Applicable Criteria: CBFO QAPD Section 4.4
NWP QAPD, Section 4.4)

[A] Waste containers used as samples that do not conform to requirements are reported on an NCR in accordance with CCP-QP-005.

[B] The disposition of waste containers used as samples is identified and documented in accordance with CCP-QP-005.

5.13 Data Documentation, Control, and Validation

(Applicable Criteria: CBFO QAPD Section 5.3
NWP QAPD, Section 4.6 and 4.7)

5.13.1 Data are controlled to prevent loss and ensure integrity, security and freedom from error. Erroneous, rejected or superseded data are controlled to prevent use. Data uncertainty levels are determined prior to use. Data reduction methods are prescribed in technical procedures to allow validation of the reduction process. Data verification and validation is performed to assure accuracy, completeness and traceability in accordance with QA and technical procedures. These procedures include CCP-TP-001 and CCP-TP-002.

5.13.2 Data validation is a systematic process used to review data to ensure that the required data quality characteristics have been obtained. Results of the review may require that qualifiers be placed on the use of the data.

5.13.3 Validation methods shall be planned and documented. The documentation shall include the acceptance criteria used to determine if the data are valid.

5.13.4 All applicable data collected shall be validated. Validation shall include the following:

[A] The relevant documentation is reviewed to evaluate the technical adequacy, the suitability for the intended use, and the adequacy of the QA record.

[B] The results of the data review shall be documented.

[C] The reviewer shall be independent of the collection activities.

5.13.5 Data validation shall be controlled to permit independent reproducibility by another qualified individual.

5.13.6 Data considered as established fact by the scientific and engineering community, such as engineering handbook data, critical tables, etc., do not require validation.

5.14 Software

(Applicable Criteria: ASME NQA-2a-1990 Part 2.7
CBFO QAPD Section 6
NWP QAPD, Section 6)

Computer software and hardware/software configurations used in activities are developed, documented, verified, validated, and tested prior to use in compliance with requirements contained in the QAPD, QAPjP, and NQA-1, Subpart 2.7, *Quality Assurance Requirements of Computer Software for Nuclear Facility Applications* (ASME 1989). CCP-QP-022 describes the processes for computer software development, validation, and verification.

Software used are identified and controlled through inventory and categorization, and configuration management is maintained. CCP-QP-022 provides the controls for configuration management; software procurement and development; software life-cycle management including installation, testing, verification and validation, operation, and retirement; access controls; and required documentation. Software problems are identified and reported, and changes to software are controlled.

5.15 Performance Demonstration Program (PDP)

The CCP participates in the PDP. PDP samples are processed according to procedures applicable to the specific testing and CCP-TP-058, *CCP NDA Performance Demonstration Plan*.

6.0 REFERENCES

NOTE
The current revision of these reference documents is applicable. The Internet links are provided for informational purposes only and may change.

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3. 42 U.S.C. 6901 et seq. Resource Conservation and Recovery Act (RCRA) of 1976. (http://www.epa.gov/epawaste/inforesources/online/index.htm)

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12. U.S. Environmental Protection Agency, Letter and enclosed *Conditions of Approval* from Carl E. Edlund (Director, Multimedia Planning and Permitting Division, EPA) to Edward Ziemanski (Acting Manager, Carlsbad Field Office, DOE), dated January 5, 2011, granting approval for WIPP to dispose of TRU and TRU-mixed wastes containing PCBs. (http://www.wipp.energy.gov/rcradox/final/EPA_Letter_to_DOE_2011-0105.pdf)

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Appendix 1 – Radioassay Requirements for Contact-Handled Transuranic Waste

A.1 Introduction

Radioassay techniques are used to determine the radionuclide content of waste. Radioassay methods include both nondestructive and destructive techniques. The term "radioassay" includes all types of assay techniques. NDA refers only to nonintrusive assay techniques, whereas radiochemistry (RC) is used to refer to destructive assay techniques. This appendix is intended to apply to NDA activities conducted within the WIPP CCP.

Common NDA techniques rely on detection of gamma rays, neutrons, or heat generated by the waste. NDA is performed on a waste container basis.

RC will not be performed by CCP. If plans change, then RC will be performed in compliance with the requirements of the current WAC, and this Plan will be revised.

The DOE is required to collect radiological characterization data to:

- Track the WIPP radionuclide inventory, by isotopic activity and mass, for those radionuclides listed in Section 3.3.1,
- Demonstrate that each payload container disposed of at the WIPP contains TRU waste as specified in Section 3.3.3, and
- Verify that applicable transportation and facility limits on individual payload containers and assemblies for FGE, PE-Ci, and decay heat are not exceeded, as specified in Section 3.3.2, 3.3.4 and 3.3.6.

The radioassay process quantifies at least one of the more prevalent radionuclides known to be present in the waste. The remaining listed radionuclides present in the waste in significant quantities will be identified by direct measurement of isotopic ratios as discussed in Section A.2. The isotopic ratios are then used to quantify radionuclides based on the assay value.

The requisite data on isotopic ratios and quantities will be derived from AK (see Section A.2), radioassay or both using CBFO approved NDA or RC techniques, instruments and procedures. Each site must technically justify that the AK and/or radioassay techniques, instruments and procedures used:

- Are appropriate for the specific waste stream and waste content code descriptions being assayed, and
- Will result in unbiased values for the cumulative activity and mass of the WIPP radionuclide inventory.

Appendix 1 – Radioassay Requirements for Contact-Handled Transuranic Waste (Continued)

Existing radioassay data collected prior to the implementation of a QA program pursuant to 40 CFR §194.22(a)(1) may only be qualified in accordance with an alternate methodology that is approved by CBFO and employs one or more of the following methods:

- Peer review in accordance with NUREG-1297 (Reference A1),
- Corroborating data,
- Confirmatory testing (i.e., testing made on a representative sub-population of payload containers within a waste stream), or
- Demonstrating the equivalence of an alternative QA program (as described in Reference A2, Section 5.4).

Proposals for alternative approaches to identification and quantification of radioisotopes (e.g., quantification of isotopic ratio AK on a waste stream basis) must be submitted to CBFO for review and approval. CBFO will report such proposals to the EPA for consideration prior to issuing approval.

Controlled changes to radioassay (NDA or RC) related plans or procedures are managed through the document control process described in CCP-PO-001, *CCP Transuranic Waste Characterization Quality Assurance Project Plan*. The CCP Certification Manager and QA shall review all such changes and report to the CBFO those changes that could impact compliance with the criteria in this document. The CCP Certification Manager shall ensure that site approved changes to radioassay related plans or procedures affecting either the performance criteria or data quality of certified systems/processes are not used in the collection of waste certification data prior to CBFO's review and approval. Related testing, calibration, and training performed in accordance with these site-approved changes, however, are not precluded from being conducted prior to CBFO's review and approval. (Memorandum from CBFO to Distribution, CBFO:NTP:RMK:VW:02-2734: UFC:5822, July 29, 2002.)

The CCP program will establish or confirm isotopic ratios by direct measurements and these ratios will be used in conjunction with measured or AK data to calculate WIPP-reportable values.

Appendix 1 – Radioassay Requirements for Contact-Handled Transuranic Waste (Continued)

A.2 Radionuclide Isotopic Ratios

Establishing isotopic ratios for use in quantifying radionuclides is performed by direct measurement of the containers using WIPP-certified systems. Sites may opt to qualify AK as permitted by 40 CFR §194.22(b) by performing confirmatory testing using WIPP-certified radioassay systems. When a site performs direct measurements of isotopic ratios, it is expected that all containers in the waste stream will be measured, with the understanding that, in some cases, valid data may not be obtainable for given containers for technical reasons (e.g., lack of sufficient signal or poor counting statistics). All such instances will be documented and appropriately dispositioned by the measurement facility. For those few waste containers for which direct measurement does not yield useable isotopic ratio information, AK may be used. The assay programs will establish or confirm isotopic ratios by direct measurement and these ratios will be used in conjunction with the reported data to calculate WIPP-reportable values.

A.2.1 Methods for Confirmation of Isotopic Ratio AK

As a minimum, to confirm existing AK data, it is necessary to compare ratios of the two most prevalent radionuclides in the isotopic mix. For weapons and reactor grade plutonium, these are typically ^{239}Pu and ^{240}Pu. For heat source waste, the predominant radionuclides are typically ^{238}Pu and ^{239}Pu. Measured isotopic ratios for ^{241}Am may confirm existing AK by waste stream.

However, due to the fluctuation of ^{241}Am in certain waste streams, it may become necessary to measure ^{239}Pu to ^{241}Am isotopic ratios on all containers in that waste stream.

^{241}Am is the daughter of ^{241}Pu, which decays with a half-life of about 14 years. If the time since the chemical separation of the plutonium is known, the quantity of measured ^{241}Am can be used to calculate the quantity of ^{241}Pu. This assumes there was no ^{241}Am in the waste just after the chemical separation and that no ^{241}Am was added to or removed from the waste during the time since the separation. Since ^{241}Am is an indirect measurement of ^{241}Pu, it could be compared (by ratio) to any plutonium isotope (^{239}Pu or ^{240}Pu) associated with weapons and reactor grade plutonium.

For weapons grade and reactor grade waste, isotopic ratio values for ^{238}Pu can be assumed to be valid in AK data if the values for ^{239}Pu and ^{240}Pu have been confirmed. Because ^{242}Pu cannot be measured using NDA methods, the contribution of ^{242}Pu isotopic ratio is calculated by correlation techniques.

Appendix 1 – Radioassay Requirements for Contact-Handled Transuranic Waste (Continued)

For some of the generator sites that were involved primarily in weapons production, the fissile isotopes ^{235}U and ^{233}U and the fissionable isotope ^{238}U may not have been measured when the transuranic waste was originally assayed (i.e., using non-WIPP-certified systems), primarily because the plutonium isotopes were the radionuclides of interest to the generator site. However, other forms of AK may be available. If so, then the AK can be confirmed by data generated on a WIPP-certified system. If valid AK does not exist, then the data generated on a WIPP-certified system can only be used to detect or calculate ^{238}U, ^{235}U, and ^{233}U or to confirm their absence. Because ^{234}U cannot be measured using NDA methods, the isotopic ratios for ^{234}U may be calculated from the ^{235}U enrichment. Values or lack thereof, for ^{137}Cs can be confirmed by the data generated on a WIPP-certified system. This is typically done by measuring ^{137}Cs directly, or by comparing the NDA measured ^{241}Am 662 kiloelectron volt (keV) peak to the other ^{241}Am peaks (e.g., the 125 keV or 721 keV peaks) to determine if the 662 keV peak's intensity is consistent with the expected ^{241}Am intensity. A disproportionate response for the 662 keV peak relative to the other ^{241}Am peaks may indicate the presence of ^{137}Cs. ^{90}Sr may be calculated from the value for ^{137}Cs and AK. If detected, a waste container's concentration of ^{137}Cs can be used to derive a value of ^{90}Sr through the application of the appropriate scaling factor(s). All scaling factors used will be technically sound and based on known, documented relationships or correlations. The data report for the waste containers for which the ^{90}Sr, value is derived in this manner shall reflect the use of a scaling factor(s) and provide sufficient documentation to enable its independent calculation. Finally, the gamma spectra must be carefully examined for significant presence of other radionuclides to ensure compliance with transportation requirements. Data obtained for radionuclides other than the WIPP-tracked radionuclides presented above are required to address confounding isotope issues (i.e., masking) with regard to NDA. When RC is used for confirmation radioassay instead of NDA, less reliance on calculated isotopics is required.

CCP will technically justify that the techniques used to confirm the absence or the ratio of non-measurable radionuclides are valid for the particular radioassay method used to confirm AK.

Appendix 1 – Radioassay Requirements for Contact-Handled Transuranic Waste (Continued)

A.2.2 Acceptable Knowledge (AK) Documentation

The use of AK information concerning the radiological composition of a waste stream will be documented either in the AK Summary Report for the waste characterization of the waste stream or in another controlled document approved by the SPM. Should this information be contained in AK package(s) prepared to meet other general waste characterization requirements, it need not be duplicated in other controlled documents that address the radiological properties of the waste stream; however, all relevant information must be included in the AK record. CCP uses procedure CCP-TP-005, *CCP Acceptable Knowledge Documentation*, to compile, review, evaluate, confirm, and report AK documentation.

The following discussion is included for the sake of completeness.

A.2.2.1 Required Elements

This section identifies the required radiological information that each TRU waste site or measurement facility must maintain for a waste stream. A TRU waste generator site or waste characterization facility may use AK to delineate the distribution of the 10 WIPP-tracked radioisotopes within a TRU waste stream and the presence or absence of isotopes. The type and quantity of supporting documentation may vary by waste stream and shall be compiled in a written record that shall include a summary identifying all sources of information used to delineate the waste stream's isotopic distribution. The basis and rationale for the delineation shall be clearly summarized in an AK report and traceable to referenced documents. Assumptions made in this delineation shall be identified. The following information shall be included as part of the AK written record:

- Map of the site with the areas and facilities involved in TRU mixed waste generation, treatment, and storage identified
- Facility mission description as related to radionuclide-bearing materials and their management, e.g., routine weapons production, fuel research and development, and experimental processes
- Description of the specific site locations (such as the area or building) and operations relative to the isotopic composition of the TRU wastes they generated, e.g., plutonium recovery, weapons fabrication, pyrochemical operations and waste incineration

Appendix 1 – Radioassay Requirements for Contact-Handled Transuranic Waste (Continued)

- Waste identification or categorization schemes used at the facility relevant to the waste material's isotopic distribution, e.g., the use of codes that correlate to a specific isotopic distribution, and a description of the isotopic composition of each waste stream

- Information regarding the waste's physical and chemical composition that could affect the isotopic distribution, e.g., processes used to remove ingrown ^{241}Am or alter its expected contribution based solely on radioactive decay kinetics

- Statement of all numerical adjustments applied to derive the material's isotopic distribution, e.g., scaling factors, decay/ingrowth corrections and secular equilibrium considerations

- Specification of the isotopic ratios for the ten WIPP-tracked radionuclides (^{241}Am, ^{238}Pu, ^{239}Pu, ^{240}Pu, ^{242}Pu, ^{233}U, ^{234}U, ^{238}U, ^{90}Sr, and ^{137}Cs) and, if applicable, the radionuclides that comprise 95 percent of the radiological hazard on a waste stream, waste stream subpopulation, or container basis

A.2.2.2 Supplemental AK Information

Each generator site or measurement facility shall obtain supplemental AK information, dependent on availability. The amount and type of this information cannot be mandated, but sites shall collect information as appropriate to support their contention regarding the waste's isotopic distribution. This information will be used to compile the waste's AK written record. Supplemental AK documentation that may be used includes, but is not limited to, information from the following sources:

- Safeguards & Security, Materials Control & Accountability, and other nuclear materials control systems or programs and the data they generated

- Reports of nuclear safety or criticality, or accidents/excursions involving the use of special nuclear material (SNM) or nuclear material

- Waste packaging, waste disposal, building or nuclear material management area (NMMA) logs or inventory records, and site databases that provide information on SNM or nuclear materials

- Test plans, research project reports, or laboratory notebooks that describe the radionuclide content of materials used in experiments

- Information from site personnel (e.g., documented interviews)

- Historical analytical data relevant to the isotopic distribution of the waste stream

Appendix 1 – Radioassay Requirements for Contact-Handled Transuranic Waste (Continued)

A.2.2.3 Discrepancy Resolution

If there is a discrepancy between AK information related to isotopic ratios or composition, the site will evaluate the sources of the discrepancy to determine if the discrepant information is credible. Information that is not credible or information that is limited in its applicability to WIPP characterization will be identified as such and the reasons for dismissing it will be justified in writing. Limitations concerning the information will be documented in the AK record and summarized in the AK Summary Report. In the event that the discrepancy cannot be resolved, the site will perform direct measurements for the impacted population of containers.

If discrepancies result in a change to the original determinations, the AK summary will be updated in accordance with procedure CCP-TP-005.

A.3 Data Quality Objectives (DQOs)

The DQOs for WIPP certifiable radiological characterization data are established in Section 3.3 of this Plan. They are summarized below in Table A-1, Data Quality Objectives (DQOs) for Radioassay, as they apply to individual payload containers.

Table A-1. Data Quality Objectives (DQOs) for Radioassay

Requirement	DQO	Confidence[a]
TRU α-activity concentration > 100 nCi/g[b]	A > LLD	N/A
Fissile mass ≤ FGE limit	$FGE + 2\sigma_{TMU}(FGE) \leq$ FGE limit	97.5%
Decay heat (DH) ≤ CH-TRAMPAC limit	$DH + 1\sigma_{TMU}(DH) \leq L_{CH\text{-}TRAMPAC}$[c]	84%

[a]Confidence means the statistical level of confidence that the limit is exceeded or not exceeded depending on the requirements of the individual data quality objectives (DQOs). The confidence is derived from the specified DQOs which assume contributions to TMU are normally distributed.
[b]TRU waste determinations shall be in accordance with the Policy for the Management of TRU Alpha Activity Concentration when overpacking waste containers (see Appendix 8).
[c]TRAMPAC includes both the CH-TRAMPAC and the TRUPACT-III TRAMPAC.

Appendix 1 – Radioassay Requirements for Contact-Handled Transuranic Waste (Continued)

There are no stipulated DQOs for PE-Ci or individual isotope activities (except as they impact the requirements listed above). However, at a minimum, radioassay programs must be capable of identifying, measuring, and reporting the presence or absence of:

- the ten radionuclides identified in Section 3.3.1 for tracking of the WIPP radionuclide inventory (see Section A.2.1),
- ^{235}U, in order to calculate FGE, as required in Section 3.3.2 for compliance with transportation requirements, and
- other radionuclides whose presence contribute to 95 percent of the radioactive hazard, as specified in Section 3.3.1, for compliance with transportation requirements.

In support of the above requirements, each site must evaluate, document and technically justify the following determinations:

Lower Limit of Detection (LLD): The LLD for each radioassay system must be determined. Instruments performing TRU/low-level waste discrimination measurements must have an LLD of 100 nCi/g or less. Site specific environmental background and container specific interferences must be factored into LLD determinations. The LLD is that level of radioactivity which, if present, yields a measured value greater than the critical level with a 95 percent probability, where the critical level is defined as that value which measurements of the background will exceed with 5 percent probability. Because the LLD is a measurement-based parameter, it is not feasible to calculate LLDs for radionuclides that are not determined primarily by measurement, e.g., ^{90}Sr. In such cases, the site shall derive the equivalent of an LLD, i.e., a reporting threshold for a radionuclide(s), when it is technically justified. This value may be based on decay kinetics, scaling factors or other scientifically based relationships and must be adequately documented in site records. For purposes of reporting radionuclide data in the WWIS/WDS, this value will be the equivalent of an LLD. References A3 and A4 provide information in developing the LLD.

Total Measurement Uncertainty (TMU): The method used to calculate the TMU for the quantities in Table A-1 must be documented and technically justified for each CBFO certified radioassay system. Compliance with this requirement will be evaluated in reviews of the TMU documentation package for each assay system by CBFO. General guidance for determining the TMU is provided in References A5 and A6.

Appendix 1 – Radioassay Requirements for Contact-Handled Transuranic Waste (Continued)

Calibration Procedures and Frequencies: Each radioassay measurement system shall be calibrated before initial use. During calibration or re-calibration, system correction factors shall be established and algorithms adjusted such that the value of percent recovery (%R) is set equal to 100 percent; i.e., the system is calibrated to 100%R. The range of applicability of system calibrations must be specified in site procedures. The matrix/source surrogate waste combination(s) used for calibration shall be representative of the:

- activity range(s) or gram loading(s), and
- relevant waste matrix characteristics (e.g., densities, moderator content, container size) planned for measurement by the system.

Calibration(s) shall be performed in accordance with consensus standards, when such standards exist. If consensus standards are not used, full documentation of the calibration technique must be provided to and approved by CBFO prior to performing WIPP-related assays. Primary calibration standards shall be obtained from suppliers maintaining a nationally accredited measurement program. When primary standards are not available, the standards used shall be correlated with primary standards obtained from a nationally accredited measurement program. For calorimetry, calibration shall be performed in accordance with Reference A9.

Calibration Verification: Notwithstanding the need to calibrate individual components for replacement, changes or adjustments (e.g., energy calibration of a detector), verification of the radioassay measurement system's calibration shall be performed after any one of the following occurs:

- major system repairs and/or modifications
- replacement of the measurement system's components, e.g., detector, neutron generator or supporting electronic components that have the capacity to affect data
- significant changes to the system's software
- relocation of the system

Appendix 1 – Radioassay Requirements for Contact-Handled Transuranic Waste (Continued)

Calibration verification shall consist of demonstrating that the system is within the range of acceptable operation. Secondary standards can be used for the calibration verification if their performance has been correlated with the calibration standard. If a verification of the measurement system's calibration or other test demonstrates that the system's response has significantly changed, a re-calibration of the system shall be performed.

Calibration Confirmation: In order to confirm that the calibration of the NDA system was correctly established, the accuracy and precision of the system are determined after each calibration or re-calibration by performing replicate measurements of a non-interfering matrix. Calibration confirmation replicate measurements shall be performed on containers of the same nominal size as those in which actual waste is assayed and according to approved waste assay procedures. The number of replicate measurements to be performed shall be documented and technically justified. The replicate measurements shall be performed using nationally recognized standards, or certified standards derived from nationally recognized standards that span the range of use. The standards used to calculate accuracy shall not be the same as those used for the system calibration. Accuracy is reported as percent recovery (%R). The applicable range for accuracy shall not exceed ± 30 percent on a non-interfering matrix. Precision is reported as percent relative standard deviation (%RSD). The %RSD shall not exceed the values listed in Table A-2, Upper Limits for %RSD vs. Number of Replicates, for the corresponding number of replicate measurements in a non-interfering matrix.

Table A-2. Upper Limits for %RSD vs. Number of Replicates

Number of Replicates	2	3	4	5	6	7	8	9	10	11	12	13	14	15
Max %RSD	1.8	6.6	10.0	12.3	14.0	15.2	16.2	17.1	17.7	18.3	18.8	19.3	19.7	20.0

[a] The values listed are derived from the measured standard deviation of the replicate measurements using $\frac{s}{\mu} \bullet 100\% < \sqrt{\frac{(0.292) \bullet \chi^2_{0.05,n-1}}{n-1}} \bullet 100\%$ where s is the measured standard deviation, n is the number of replicates, Φ is the true value, $\chi^2_{0.05,n-1}$ is the critical value for the upper 5 percent tail of a one-sided chi-squared distribution with n-1 degrees of freedom, and 0.292 corresponds to a 95 percent upper confidence bound on the true system precision limit of 29.2 percent.

Measurement facilities may develop alternate limits for accuracy and precision subject to approval by CBFO prior to certification of waste.

Appendix 1 – Radioassay Requirements for Contact-Handled Transuranic Waste (Continued)

The CCP NDA standard operating procedures (Table A-2.1) demonstrate and justify that the radioassay techniques used are appropriate for specific waste streams.

Table A-2.1. NDA Procedures

Procedure Title	Procedure Number
CCP Waste Assay Gamma Spectrometer (WAGS) and SWEPP Gamma-Ray Spectrometer (SGRS) Calibration Procedure	CCP-TP-010
CCP Waste Assay Gamma Spectrometer (WAGS) Operating Procedure	CCP-TP-019
CCP Mobile IQ3 System Calibration Procedure	CCP-TP-046
CCP Mobile IQ3 Gamma Scanner Operation	CCP-TP-047
CCP Mobile IQ3 System Data Reviewing, Validating and Reporting Procedure	CCP-TP-048
CCP Operating the High Efficiency Neutron Counter Using NDA 2000	CCP-TP-063
CCP Calibrating the High Efficiency Neutron Counter Using NDA 2000	CCP-TP-064
CCP Gamma Energy Assay (GEA) Calibration, Confirmation, and Verification Procedure	CCP-TP-070
CCP Gamma Energy Assay (GEA) Operating Procedure	CCP-TP-071
CCP Gamma Energy Assay (GEA) Data Review, Validation, and Reporting Procedure	CCP-TP-072
CCP Off-Site Source Recovery Project Sealed Source Radiological Characterization	CCP-TP-101
CCP Data Reviewing, Validating and Reporting Procedure for the High Efficiency Neutron Counter Using NDA 2000	CCP-TP-103
Operating the CCP High Efficiency Neutron Counter Using NDA 2000	CCP-TP-107
Calibrating the CCP High Efficiency Neutron Counter Using NDA 2000	CCP-TP-108
CCP Data Reviewing, Validating and Reporting Procedure	CCP-TP-109
CCP SWEPP Gamma-Ray Spectrometer (SGRS) Operating Procedure	CCP-TP-115
CCP SuperHENC Operating Procedure	CCP-TP-146
CCP SuperHENC Data Reviewing, Validating and Reporting Procedure	CCP-TP-148
CCP Drum Waste Assay System Imaging Passive/Active Neutron Operations	CCP-TP-166
CCP Drum Waste Assay Imaging Passive/Active Neutron Calibration	CCP-TP-167
CCP Drum Waste Assay System Imaging Passive/Active Neutron/Segmented Gamma Scanner Data Generation Level Validation	CCP-TP-168
CCP Operating the Mobile Segmented Gamma Scanner	CCP-TP-169

Appendix 1 – Radioassay Requirements for Contact-Handled Transuranic Waste (Continued)

Table A-2.1. NDA Procedures (Continued)

CCP SuperHENC Calibration Procedure	CCP-TP-170
CCP Calibrating the Mobile Segmented Gamma Scanner	CCP-TP-172
CCP Box Segmented Gamma System (BSGS) Operating Procedure	CCP-TP-189
CCP Box Segmented Gamma System (BSGS) Calibration Procedure	CCP-TP-190
CCP Box Neutron Assay System (BNAS) Operating Procedure	CCP-TP-191
CCP Box Neutron Assay System (BNAS) Calibration Procedure	CCP-TP-192
CCP Data Reviewing, Validating, and Reporting Procedure for the Nondestructive Assay Box Counters	CCP-TP-193
Peer Review – Sealed Sources Peer Review Report	Record TWCP-18562

A.4 Quality Control (QC)

To ensure that data of known and documented quality are generated, each participating measurement facility shall implement a documented facility QA program. Any radioassay technique used for TRU waste must be performed in accordance with calibration and operating procedures that have been written, approved, and controlled by the site or testing facility. Laboratory procedures must contain applicable QCs. Facility QA programs shall specify qualitative and quantitative acceptance criteria for the QC checks of this program and corrective action measures to be taken when these criteria are not satisfied. NDA standard operating procedures address QC elements and are listed in Table A-2.1.

A.4.1 General Requirements

Radioassay Training: Only appropriately trained and qualified personnel shall be allowed to perform radioassay and data validation/review. Standardized Training requirements for radioassay personnel shall be based upon existing industry standardized training requirements (e.g., American Society for Testing and Materials [ASTM] C1490, *Standard Guide for Selection, Training and Qualification of Nondestructive Assay [NDA] Personnel* [Reference A8]; American National Standards Institute [ANSI] N15.54, *Radiometric Calorimeters - Measurement Control Program* [Reference A9]) and shall meet the specifications in the QAPD.

Requalification of radioassay personnel shall be based upon evidence of continued satisfactory performance and must be performed at least every two years. The training program is conducted in accordance with procedure CCP-QP-002, *CCP Training and Qualification Plan*.

Appendix 1 – Radioassay Requirements for Contact-Handled Transuranic Waste (Continued)

Software QC Requirements: All computer programs and revisions thereof used for radioassay shall meet the applicable requirements in Section 6.0 of the QAPD (Reference A2) and in accordance with procedure CCP-QP-022, *CCP Software Quality Assurance Plan*.

*Comparison Program*s: Sites using radioassay systems shall participate in any relevant measurement comparison program(s) sponsored or approved by the CBFO. Such programs may be conducted as part of the NDA PDP (References A7 and A10) or through other third parties (Reference: WIPP Compliance Recertification Application including Annual Reports to the EPA).

A.4.2 NDA QC Requirements

The assay procedures cited in various ASTM and ANSI standards (References A9, A11-A15) and NRC standard practices and guidelines (Reference A16) as referenced in this appendix are recommended for use at all testing facilities.

Background Measurements: Background measurements must be performed and recorded daily, unless otherwise approved by CBFO. Contributions to background due to radiation from nearby radiation producing equipment, standards or wastes must be carefully controlled or more frequent background checks must be performed. For calorimeters, basepower or baseline measurements shall be conducted at a frequency determined by each site and approved by CBFO.

Instrument Performance Measurements: Performance checks on calibrated and operable gamma and neutron NDA instruments must be performed and recorded once per operational day. Performance checks shall include efficiency checks (when applicable), matrix correction checks and, for spectrometric instruments, peak position and resolution checks.

Both radioactive sources and surrogate waste matrix containers (both non-interfering and interfering) are used. At least once per operational week an interfering matrix must be used to assess the long-term stability of the NDA instrument's matrix correction. Surrogate waste containers must reflect the type of waste, (e.g., debris, sludge) currently being assayed. To verify calibration, radioactivity standards must be selected such that, over a six-month period, the operating range of the assay system is tested in each applicable surrogate waste matrix. The use of interfering and non-interfering matrices provides a realistic assessment of the assay system's performance over time, and will assist measurement personnel in detecting potential problems relative to the matrices currently assayed by the measurement system.

Appendix 1 – Radioassay Requirements for Contact-Handled Transuranic Waste (Continued)

Interfering surrogate matrix containers must be constructed in such a way that the waste characteristics do not change over time.

Radioactive sources should be long-lived, easy to position relative to the detector(s), and of sufficient radioactivity to obtain good results with relatively short count times.

Performance checks for calorimetry shall be performed with electrical and/or heat standards traceable to a nationally accredited measurement program at a frequency determined by each site, consistent with Reference A17. This information is specified in site operating procedures and approved by CBFO.

Data Checks: Background (for calorimetry: baseline or base power) and performance measurements shall be reviewed and evaluated at least weekly to determine continued acceptability of the assay system and to monitor performance trends. If daily performance checks result in data that are outside the acceptable range, the required responses in Table A-3 shall be followed.

Table A-3. Range of Applicability

Category	Acceptability Range[a]	Required Response
Acceptable Range	$\ast Data \ast^{c} \# 2\sigma^{b}$	No action required.
Warning Range	$2\sigma^{b} < \ast Data \ast \# 3\sigma^{b}$	The performance check standard shall be rerun no more than two times. If the rerun performance check(s) result in data within ± 2σ, then the additional performance checks shall be documented and work may continue. If the system does not fall within ± 2σ after two rerun performance checks, then the required response for the Action Range shall be followed.
Action Range	$\ast Data \ast > 3\sigma^{b}$	Work shall stop and the occurrence shall be documented and appropriately dispositioned (e.g., initiating a non-conformance report). The radioassay system shall be removed from service pending successful resolution of all necessary actions, and all assays performed since the last acceptable performance check are suspect, pending satisfactory resolution. Recalibration or calibration verification is required prior to returning the system back to service.

[a]Reference A15
[b]"σ" - the standard deviation is only based on the reproducibility of the data check measurements themselves. This is not TMU.
[c]Absolute Value

Appendix 1 – Radioassay Requirements for Contact-Handled Transuranic Waste (Continued)

A.5 Data Management

A.5.1 Data Review and Validation

All radioassay data must be reviewed and approved by qualified personnel prior to being reported. At a minimum, the data must be reviewed by a technical reviewer and approved by the SPM. The validation process includes verification that the applicable QCs specified in Section A.4 have been met. Radioassay data is reviewed at the data generation level in accordance with NDA operating procedures listed in Table A-2.1, while data validation and verification at the Project Office is performed in accordance with procedure CCP-TP-001, *CCP Project Level Data Validation and Verification*.

A.5.2 Data Reporting

Radioassay data must be reported to the Site Project Office on a testing batch basis. Batches are defined, for the purpose of the program, as a suite of waste containers undergoing radioassay using the same testing equipment. For NDA, the sites shall specify the size of the testing batch as needed, without regard to waste matrix.

Each radioassay testing facility is required to submit testing BDRs for each testing batch to the site project office on standard forms (either hard copy or electronic equivalent), as provided in approved site-specific documentation. Radioassay testing BDRs shall consist of the following:

- testing facility name, testing batch number, container numbers included in that testing batch, and signature release by the SPM
- table of contents
- background and performance data or control charts for the relevant time period
- data validation per the QAPD (Reference A2, Section 5.3.2) and as described in site procedures (Reference Table A-2.1)
- separate testing report sheet(s) for each container in the testing batch that includes:
  - title “Radioassay Data Sheet”
  - method used for radioassay (i.e., procedure identification)
  - date of radioassay

Appendix 1 – Radioassay Requirements for Contact-Handled Transuranic Waste (Continued)

- activities and/or masses of individual radioisotopes present and their associated TMUs (curies and/or grams)
- operator signature/date
- reviewer signature/date

Other radiological properties to be documented for each container include:

- decay heat expressed in Watts (W) and its associated TMU
- total ^{239}Pu FGE expressed in grams (g) and its associated TMU
- TRU alpha activity concentration expressed in curies/gram (Ci/g) and its associated TMU, and
- total ^{239}Pu equivalent activity expressed in Ci

These calculated quantities shall be included in the radioassay BDR or other QA record or database.

When TMU is reported differently on the testing report sheet than in WWIS/WDS, the method of expressing TMU shall be specified on the testing report sheet or associated procedures/QAPjP.

Radioassay data reporting at the data generation level is performed in accordance with NDA operating procedures listed in Table A-2.1, while data validation and verification at the Project Office is performed in accordance with procedure CCP-TP-001. Data reporting in WWIS/WDS is performed in accordance with procedure CCP-TP-030.

A.5.3 Data and Records Retention

QA records are indexed, classified, controlled, and maintained by records management personnel as described in procedure CCP-QP-008, *CCP Records Management*, and the site Records System. Records management is addressed in Section 5.5 of this Plan.

Appendix 1 – Radioassay Requirements for Contact-Handled Transuranic Waste (Continued)

The following nonpermanent records shall be maintained at the radioassay-testing facilities or shall be forwarded to the Site Project Office for maintenance, and shall be documented and retrievable by testing batch number, in accordance with the QAPD:

- testing batch reports
- all raw data, including instrument readouts, calculation records, and radioassay QC results
- all instrument calibration reports, as applicable

A.6 Quality Characteristics Assessment

Per 40 CFR §194.22(c), there are five "quality characteristics" that must be assessed. These quality characteristics and the method by which they are assessed are described in the following sections.

A.6.1 Data Accuracy

Per 40 CFR §194.22(c)(1), *Data Accuracy* is defined as "the degree to which data agree with an acceptable reference or true value." For NDA methods, this quality characteristic is met and maintained as described in Section A.3.

A.6.2 Data Precision

Per 40 CFR §194.22(c)(2), *Data Precision* is defined as "a measure of the mutual agreement between comparable data gathered or developed under similar conditions expressed in terms of standard deviation." For NDA methods, this quality characteristic is met and maintained as described in Section A.3.

A.6.3 Data Representativeness

Per 40 CFR §194.22(c)(3), *Data Representativeness* is defined as "the degree to which data can accurately and precisely represent a characteristic of a population, a parameter, variations at a sampling point, or environmental conditions." For NDA methods, this quality characteristic for the waste stream is met and maintained through 100 percent measurement confirmation on a payload container basis. For NDA, since the entire waste container is subjected to measurement, representativeness pertaining to the actual measurement is not applicable.

Appendix 1 – Radioassay Requirements for Contact-Handled Transuranic Waste (Continued)

A.6.4 Data Completeness

Per 40 CFR §194.22(c)(4), *Data Completeness* is defined as "a measure of the amount of valid data obtained compared to the amount that was expected." For NDA methods, this quality characteristic is met and maintained by requiring 100 percent valid results. Any results indicating the NDA measurement was invalid require re-measurement.

A.6.5 Data Comparability

Per 40 CFR §194.22(c)(5), *Data Comparability* is defined as "a measure of confidence with which one data set can be compared to another." For NDA and RC methods, this quality characteristic is addressed by ensuring that all data are produced under the same system of controls. These controls apply to all aspects of the data generation process, including: procurement of analytical instruments; calibration and operation of assay equipment according to industry standards; preparation and use of standardized instrument and data review procedures; and, training of equipment operators and technical/data review personnel to the QAPD, as specified in Section A.4.1. All NDA systems and methods are approved by CBFO prior to use in generating waste characterization data. Additionally, comparison of measured data with AK derived or based values, as applicable, provides a means to assess comparability on a waste stream basis. Although no specific confidence level is specified, these controls provide comparability among all data generated under this program. Sites using radioassay systems shall participate in measurement comparison programs as specified in Section A.4.1.

Appendix 2 – Appendix 1 References

A1 U.S. Nuclear Regulatory Commission. *Peer Review for High-Level Nuclear Waste Repositories,* NUREG-1297, Washington D.C., Office of Nuclear Material Safety and Safeguards, U.S. Nuclear Regulatory Commission

A2 U.S. Department of Energy. *Quality Assurance Program Document*. DOE/CBFO-94-1012. Carlsbad, New Mexico, Carlsbad Field Office, U.S. Department of Energy. (http://www.wipp.energy.gov/library/qapd/qapd.pdf)

A3 Currie, Lloyd A., 1968. *Limits for Qualitative Detection and Quantitative Determination*. *Anal.Chem.* 40: 586-93

A4 EPA, 1980. *Upgrading Environmental Radiation Data.* EPA 520/1-80-012, Washington D.C., Office of Radiation Programs, U. S. Environmental Protection Agency

A5 K. C. Smith, R. A. Stroud, K. L. Coop, and J. F. Bresson. 1998. *Total Measurement Uncertainty Assessment for Transuranic Waste Shipments to the Waste Isolation Pilot Plant*. Proceedings of the 6th Nondestructive Assay Waste Characterization Conference, Salt Lake City, Utah, Nov. 17-19, 1998, pp. 21-37

A6 K. L. Coop, J. F. Bresson, M. E. Doherty, B. M. Gillespie, and D. R. Davidson. *Standardized Total Measurement Uncertainty Reporting for WIPP*. Nondestructive Assay Interface Working Group, Salt Lake City, Utah, May 22, 2000

A7 U.S. Department of Energy. *Performance Demonstration Program Plan for Nondestructive Assay of Boxed Wastes for the TRU Waste Characterization Program*. DOE/CBFO-01-1006, Current Revision. Carlsbad, New Mexico, Carlsbad Field Office, U.S. Department of Energy. (http://www.wipp.energy.gov/Documents NTP.htm)

A8 American Society for Testing and Materials. *Standard Guide for Selection, Training and Qualification of Nondestructive Assay (NDA) Personne*l, ASTM C1490, Annual Book of ASTM Standards, Philadelphia, Pennsylvania, American Society for Testing and Materials

A9 American National Standards Institute. *Radiometric Calorimeters - Measurement Control Program*, ANSI N15.54, American National Standards Institute, Inc., 1430 Broadway, New York, NY 10018

Appendix 2 – Appendix 1 References (Continued)

A10 U.S. Department of Energy. *Performance Demonstration Program Plan for Nondestructive Assay of Drummed Wastes for the TRU Waste Characterization Program*. DOE/CBFO-01-1005, Current Revision. Carlsbad, New Mexico, Carlsbad Field Office, U.S. Department of Energy. (http://www.wipp.energy.gov/Documents_NTP.htm)

A11 American Society for Testing and Materials. *Standard Test Method for Determination of Plutonium Isotopic Composition by Gamma-Ray Spectrometry*. ASTM C1030, Annual Book of ASTM Standards, Philadelphia, Pennsylvania, American Society for Testing and Materials

A12 American Society for Testing and Materials. *Standard Test Method for Nondestructive Assay of Nuclear Material in Scrap and Waste by Passive-Active Neutron Counting Using a 252Cf Shuffler*. ASTM C1316, Philadelphia, Pennsylvania, American Society for Testing and Materials

A13 American Society for Testing and Materials. *Standard Test Method for Nondestructive Assay of Special Nuclear Material in Low Density Scrap and Waste by Segmented Passive Gamma-Ray Scanning*. ASTM C1133, Annual Book of ASTM Standards, Philadelphia, Pennsylvania, American Society for Testing and Materials

A14 American Society for Testing and Materials. *Standard Test Method for Nondestructive Assay of Plutonium, Tritium and 241 Am by Calorimetric Assay*. ASTM C1458, Annual Book of ASTM Standards, Philadelphia, Pennsylvania, American Society for Testing and Materials

A15 American National Standards Institute. *Nondestructive Assay Measurement Control and Assurance*, ANSI N15.36. American National Standards Institute, Inc., 1430 Broadway, New York, NY 10018

A16 U.S. Nuclear Regulatory Commission. 1984. *Nondestructive Assay of Special* Nuclear *Material Contained in Scrap and Waste.* Regulatory Guide 5.11, Washington, DC, Office of Nuclear Regulatory Research, U.S. Nuclear Regulatory Commission

A17 American National Standards Institute. *Plutonium-Bearing Solids Calibration Techniques for Calorimetric Assay.* ANSI N15.22, American National Standards Institute, Inc., 1430 Broadway, New York, NY 10018

Appendix 3 – Acronyms and Abbreviations

AK	Acceptable Knowledge
ALARA	as low as reasonably achievable
AMAD	activity mean aerodynamic diameter
ANSI	American National Standards Institute
ASME	American Society of Mechanical Engineers
ASTM	American Society for Testing and Materials
BDR	Batch Data Report
CBFO	Carlsbad Field Office
CAR	Corrective Action Report
CCP	Central Characterization Program
CFR	Code of Federal Regulations
CH	Contact-Handled
CH-TRAMPAC	Contact-Handled Transuranic Waste Authorized Methods for Payload Control
CH-TRU	Contact-Handled Transuranic
Ci	curies
Ci/g	curies/gram
CIN	Container Identification Number
cm^2	Square centimeters
cm^3	Cubic centimeters
CPR	cellulose, plastic, and rubber
DA	Destructive assay
DSA	Documented Safety Analysis
DOE	U.S. Department of Energy
DOT	U.S. Department of Transportation
DPM	disintegrations per minute
DQO	Data Quality Objective
DSA	Documented Safety Analysis
EPA	U.S. Environmental Protection Agency
FEIS	Final Environmental Impact Statement
FEM	fissile equivalent mass
FGE	fissile gram equivalent
g	gram
GGT	gas generation testing
hr	hour
HSG	Headspace Gas
HWFP	Hazardous Waste Facility Permit
ID	identification number
in.	inch
keV	Kiloelectron Volt
kg	kilogram(s)
L	Liter
LLD	lower limit of detection

Appendix 3 – Acronyms and Abbreviations (Continued)

LDR	Land Disposal Restriction
LWA	Land Withdrawal Act
M^3	cubic meter(s)
ml	milliliter(s)
mrem	milliroentogen equivalent man
M&TE	Measuring and Testing Equipment
nCi/g	nanocurie(s) per gram
NDA	nondestructive assay
NCR	Nonconformance Report
NDE	Nondestructive Examination
NEPA	National Environmental Policy Act
NMAC	New Mexico Administrative Code
NMED	New Mexico Environment Department
NMMA	nuclear material management area
NRC	U.S. Nuclear Regulatory Commission
NTP	National TRU Program
NWP	Nuclear Waste Partnership
OJT	on-the-job training
OPCTCD	Overpack Payload Container Transportation Certification Document
PATCD	Payload Assembly Transportation Certification Document
PCB	polychlorinated biphenyl
PCTCD	Payload Container Transportation Certification Document
PDP	Performance Demonstration Program
PE-Ci	^{239}Pu equivalent curie(s)
POC	point-of-contact
ppm	parts per million
QA	Quality Assurance
QAO	Quality Assurance Objective
QAPD	Quality Assurance Program Document
QAPjP	Quality Assurance Project Plan
QC	Quality Control
QSL	Qualified Suppliers List
%R	Percent Recovery
%RSD	percent relative standard deviation
RC	radiochemistry
RCRA	Resource Conservation and Recovery Act
RCT	Radiological Control Technician
rem	roentgen equivalent man
RH	Remote-Handled
RH-TRAMPAC	Remote-Handled Transuranic Waste Authorized Methods for Payload Control
RIDS	Records Inventory and Disposition Schedule

Appendix 3 – Acronyms and Abbreviations (Continued)

RPD	relative percent difference
RSD	relative standard deviation
RTR	Real-Time Radiography
SAR	Safety Analysis Report
SEIS	Supplemental Environmental Impact Statement
SLB2	standard large box 2
SME	subject matter expert(s)
SNM	Special Nuclear Material
SOW	Statement of Work
SPM	Site Project Manager
SWB	Standard Waste Box
TCO	Transportation Certification Official
TDOP	ten-drum overpack
TMU	total measurement uncertainty
TRAMPAC	Transuranic Authorized Methods for Payload Control
TRU	Transuranic
TRUPACT-II	Transuranic Package Transporter-II
TRUPACT-III	Transuranic Package Transporter-III
TSDF	Treatment, Storage, and Disposal Facility
VE	visual examination
VOC	volatile organic compound
UHWM	Uniform Hazardous Waste Manifest
VEE	Visual Examination Expert(s)
WAC	Waste Acceptance Criteria
WCO	Waste Certification Official
WDS	Waste Data System
WCPIP	*Remote-Handled TRU Waste Characterization Program Implementation Plan*
WIPP	Waste Isolation Pilot Plant
WIPP WAP	Waste Isolation Pilot Plant Waste Analysis Plan
WSPF	Waste Stream Profile Form
WWIS	WIPP Waste Information System

Appendix 4 – Procedure Tables

Table B-1. Container Management Procedures

Procedure Title	Procedure Number
CCP Container Management	CCP-TP-035
CCP Standardized Container Management	CCP-TP-068
CCP Container Management	CCP-TP-120

Table B-2. Radiography Procedures

Procedure Title	Procedure Number
CCP Standard Real-Time Radiography (RTR) Inspection Procedure	CCP-TP-053

Table B-3. VE Procedures

Procedure Title	Procedure Number
CCP Visual Examination Technique for Idaho National Laboratory (INL) Newly Generated TRU Waste	CCP-TP-006
CCP Sealed Source Visual Examination and Packaging	CCP-TP-069
CCP Standard Contact-Handled Waste Visual Examination	CCP-TP-113

Table B-4. GGT Procedures

Procedure Title	Procedure Number
CCP Gas Generation Testing	CCP-TP-083
CCP Execution of Long-Term Objective for the Unified Flammable Gas Test Procedure	CCP-TP-138

Table B-5. Certification Procedures

Procedure Title	Procedure Number
CCP Transuranic Authorized Methods For Payload Control (CCP-CH-TRAMPAC)	CCP-PO-003
CCP Remote-Handled Transuranic Waste Authorized Methods for Payload Control (CCP RH-TRAMPAC)	CCP-PO-505
CCP CH-TRU Waste Certification and WWIS/WDS Data Entry	CCP-TP-030
CCP RH-TRU Waste Certification and WWIS/WDS Data Entry	CCP-TP-530

Appendix 4 – Procedure Tables (Continued)

Table B-6. Remote-Handled Procedures

Procedure Title	Procedure Number
CCP Remote-Handled Waste Visual Examination	CCP-TP-500
CCP Dose-to-Curie Survey Procedure for Remote-Handled Transuranic Waste	CCP-TP-504
CCP Removable Lid Canister Loading	CCP-TP-505
CCP Shipping of Remote-Handled Transuranic Waste	CCP-TP-507
CCP RH Standard Real-Time Radiography Inspection Procedure	CCP-TP-508
CCP Remote-Handled Waste Sampling	CCP-TP-512

Appendix 5 – PE-Ci Activity

The concept of PE-Ci is intended to eliminate the dependency of radiological analyses on specific knowledge of the radionuclide composition of a TRU waste stream. A unique radionuclide composition and/or distribution are associated with most TRU waste streams at each site. By normalizing all radionuclides to a common radiotoxic hazard index, radiological analyses that are essentially independent of these variations can be conducted for the WIPP facility. ^{239}Pu, as a common component of most defense TRU wastes, was selected as the radionuclide to which the radiotoxic hazard of other TRU radionuclides could be indexed.

Modeled operational releases from the WIPP facility, including both routine and accident-related, are airborne. There are no known significant liquid release pathways during the operational phase of the facility. This, and the fact that TRU radionuclides primarily represent inhalation hazards, allows a valid relationship to be established, which normalizes the inhalation hazard of a TRU radionuclide to that of ^{239}Pu for the purpose of the WIPP radiological analyses. In effect, the radiological dose consequences of an airborne release of a quantity of TRU radioactivity with a known radionuclide distribution will be essentially identical to that of a release of that material expressed in terms of a quantity of ^{239}Pu. To obtain this correlation, the 50-year effective whole-body dose commitment or dose conversion factor for a unit intake of each radionuclide will be used.

For a known radioactivity quantity and radionuclide distribution, the ^{239}Pu equivalent activity is determined using radionuclide-specific weighting factors. The ^{239}Pu equivalent activity (AM) can be characterized by:

$$AM = \sum_{i=1}^{K} A_i / WF_i$$

where K is the number of TRU[1] radionuclides, A_i is the activity of radionuclide i, and WF_i is the PE-Ci weighting factor for radionuclide i.

WF_i is further defined as the ratio

$$WF_i = E_o / E_i$$

where E_o (roentgen equivalent man [rem]/µCi) is the 50-year effective whole-body dose commitment due to the inhalation of ^{239}Pu particulates with a 1.0 µm activity median aerodynamic diameter (AMAD) and a weekly pulmonary clearance class, and E_i

[1]TRU as designated in this equation refers to any radionuclide with an atomic number greater than 92 and including ^{233}U.

Appendix 5 – PE-Ci Activity (Continued)

(rem/µCi) is the 50-year effective whole-body dose commitment due to the inhalation of radionuclide (*i*) particulates with a 1.0 µm activity median aerodynamic diameter and the pulmonary clearance class resulting in the highest 50-year effective whole-body dose commitment.

Weighting factors calculated in this manner are presented in Table C-1 for radionuclides typically present in CH-TRU waste. If other TRU radionuclides are determined to be present in the payload container, their weighting factors can be obtained from the values of E_o and E_i contained in DOE/EH-0071 (Reference B1).

Table C-1. PE-Ci Weighting Factors for Selected Radionuclides

Radionuclide	Pulmonary Clearance Class[a]	Weighting Factor
^{233}U	Y	3.9
^{237}Np	W	1.0
^{236}Pu	W	3.2
^{238}Pu	W	1.1
^{239}Pu	W	1.0
^{240}Pu	W	1.0
^{241}Pu	W	51.0
^{242}Pu	W	1.1
^{241}Am	W	1.0
^{243}Am	W	1.0
^{242}Cm	W	30.0
^{244}Cm	W	1.9
^{252}Cf	Y	3.9

[a](W) Weekly, (Y) Yearly

Reference for Appendix 5

B1. U.S. Department of Energy. *Internal Dose Conversion Factors for Calculation of Dose to the Public.* DOE/EH-0071, July 1988.

Appendix 6 – Glossary

10-160B Packaging – An NRC-certified Type B transportation packaging used for transportation of TRU wastes.

Acceptable knowledge (AK) – Any information about the process used to generate waste, material inputs to the process, and the time period during which the waste was generated, as well as data resulting from the analysis of waste, conducted prior to or separate from the waste certification process authorized by EPA's Certification Decision, to show compliance with Condition 3 of the certification decision (Appendix A of this part) (40 CFR §194.2 and 194.67).

Activity – A measure of the rate at which a material emits nuclear radiation, usually given in terms of the number of nuclear disintegrations occurring in a given length of time. The common unit of activity is the curie, which amounts to 37 billion (3.7×10^{10}) disintegrations per second. The International Standard unit of activity is the becquerel and is equal to one disintegration per second.

Administrative controls – Provisions relating to organization and management, procedures, record keeping, assessment, and reporting necessary to ensure the safe operation of the facility.

Atomic energy defense activities – Activities of the Secretary of Energy (and predecessor agencies) performed in whole or in part in carrying out any of the following functions: naval reactors development; weapons activities, including defense inertial confinement fusion; verification and control technology; defense nuclear material production; defense nuclear waste and materials by-product management; defense nuclear materials security investigations; and defense research and development.

Authorization basis – Those aspects of the facility design and operational requirements relied upon by DOE to authorize the operation of nuclear facilities and processes.

Characterization – Sampling, monitoring, and analysis - whether by review of AK, nondestructive examination, NDA, or RC - to identify and quantify the constituents of a waste material.

Chemical compatibility – Assessing the properties of chemicals in a payload container (>1 weight percent); there must be no adverse safety or health hazards produced as a result of any mixtures that occur.

Appendix 6 – Glossary (Continued)

Completeness – The percentage of measurements made that are judged to be valid measurements. The completeness goal is to generate a sufficient amount of valid data based on program needs. Valid results for radioassay, and radiography data are those that were obtained when the laboratory or testing facility demonstrated that the instrumentation and method were in control; that is, that all calibration, verification, interference, and zero matrix checks met acceptance criteria.

Compressed gas – Compressed gases are those materials defined as such by 49 CFR Part 173, Subpart G.

Contact-Handled transuranic waste – Transuranic waste with a surface radiation dose equivalent rate not greater than 200 mrem/h.

Contact-Handled Transuranic Waste Authorized Methods for Payload Control (CH-TRAMPAC) – The governing document for shipments in the TRUPACT-II and the HalfPACT packagings.

Content code – A uniform system applied to waste forms to group those with similar characteristics for purposes of shipment in the TRUPACT-II, TRUPACT-III, HalfPACT, and RH-TRU 72-B packagings.

Corrosive/Corrosivity – A solid waste exhibits corrosivity if a sample of the waste is either aqueous and has a pH $\leq$2 or $\geq$ 12.5, or it is a liquid and corrodes steel at a rate >6.35 millimeter (0.250 in.) per year at a test temperature of 55°Celsius (130°Fahrenheit) (40 CFR §261.22).

Curie – A unit of activity equal to 37 billion (3.7×10^{10}) disintegrations per second.

Disposal – Permanent isolation of TRU waste from the accessible environment with no intent of recovery, whether or not such isolation permits the recovery of such waste (Reference 2, Section 2[5]).

Dose conversion factor – A numerical factor used in converting radionuclide uptake (curies) in the body to the resultant radiation dose (rem).

Dose equivalent rate – The radiation dose equivalent delivered per unit time (e.g., rem per hour).

Drum – Includes 55-gallon, 85-gallon, and 100-gallon drums as described in the CH-TRAMPAC and HWFP.

Fissile gram equivalent – An isotopic mass of radionuclide normalized to ^{239}Pu.

Appendix 6 – Glossary (Continued)

Fissile material – Any material consisting of or containing one or more radionuclides that can undergo neutron-induced fission with neutrons of essentially zero kinetic energy (e.g., thermal neutrons) such as ^{233}U, ^{235}U, and ^{239}Pu.

HalfPACT – An NRC-certified Type B transportation packaging used for transportation of CH-TRU wastes.

Hazardous waste – Those wastes which are designated hazardous by EPA (or state) regulations. For a detailed description, see 40 CFR § 261.3. Hazardous wastes are listed in 20.4.1 New Mexico Administrative Code (NMAC), subpart II (40 CFR Part 261) and/or exhibit one of the four characteristics in 20.4.1 NMAC, subpart II (40 CFR Part 261) (i.e., ignitability, corrosivity, reactivity, and toxicity).

Headspace – The total contained volume of a container minus the volume occupied by the waste material.

Headspace gas – The gas within the headspace of a container.

Internal container – A container inside the outermost container examined during radiography or VE. Drum liners, liner bags, plastic bags used for contamination control, capillary-type lab ware, and debris not designed to hold liquid at the time of original waste packaging are not internal containers (Reference 9, Part 1, Section 1.5.17).

Lower Limit of Detection – The level of radioactivity which, if present, will yield a measured value greater than the critical limit with a 95 percent probability. The critical limit is defined as that value which measurements of the background will exceed with a 5 percent probability.

Machine-Compacted Waste – Waste whose volume has been reduced using a mechanical process.

Observable liquid – Liquid that is observable using radiography or VE (Reference 9, Part 1, Section 1.5.18)

Overpack - A container put around another container.

Package – (1) A packaging plus its contents. (2) The reusable Type B shipping container (i.e., TRUPACT-II, TRUPACT-III, HalfPACT, RH-TRU 72-B, and 10-160B) loaded with TRU waste payload containers, which has been prepared for shipment in accordance with the package QA program. (3) In the regulations governing the transportation of radioactive materials, the packaging, together with its radioactive contents, as presented for transport.

Appendix 6 – Glossary (Continued)

Packaging – The reusable Type B shipping container for transport of TRU waste payload containers (i.e., TRUPACT-II, TRUPACT-III, HalfPACT, RH-TRU 72-B, and 10-160B).

Packaging Quality Assurance Program – A site-specific document that defines the quality assurance and quality control activities applicable to usage of the NRC-approved packaging. This program shall meet the requirements of 10 CFR Part 71, Subpart H.

Payload container – The outermost container (i.e., a drum, shielded container, SLB2, SWB, TDOP, or canister) for TRU waste material that is placed in a reusable Type B shipping container (i.e., a TRUPACT-II, TRUPACT-III, HalfPACT, RH-TRU 72-B, and 10-160B) for transport.

Payload assembly – An assembly of payload containers qualified for transport in a TRUPACT-II, HalfPACT, or 10-160B.

Pipe overpack – A packaging configuration consisting of a vented cylindrical pipe component surrounded by dunnage within a vented 55-gallon drum with a rigid polyethylene liner and vented lid.

Plutonium-239 equivalent activity – An equivalent radiotoxic hazard of a radionuclide normalized to ^{239}Pu.

Precision – A measure of mutual agreement among individual measurements of the same property made under prescribed similar conditions; often expressed as a standard deviation or relative percent difference (RPD).

Pyrophoric – Materials that may ignite spontaneously in air or that emit sparks when scratched or struck, especially with materials such as steel. A flammable solid that, under transport conditions, might cause fires through friction or retained heat or that can be ignited readily and, when ignited, burns vigorously and persistently so as to create a serious transportation hazard. Included in the pyrophoric definition are spontaneously combustible materials, water reactive materials, and oxidizers. Examples of nonradioactive pyrophorics are organic peroxides, sodium metal, and chlorates.

Radioassay – Methods used to identify and quantify radionuclides in TRU waste. Radioassay includes NDA and RC.

Radiography – A nondestructive testing method that uses x-rays to inspect and determine the physical form of waste.

Radionuclide – A nuclide that emits radiation by spontaneous transformation.

Remote-Handled transuranic waste – Transuranic waste with a surface dose rate of 200 millirem per hour or greater (Reference 2, Section 2[12]).

Appendix 6 – Glossary (Continued)

Remote-Handled Transuranic Waste Authorized Methods for Payload Control (RH-TRAMPAC) – The governing document for shipments in the RH-TRU 72-B packaging (Reference 41).

RH-TRU Waste Canister – Container that is transported in the RH-TRU 72B Cask.

RH-TRU 72-B Packaging – An NRC-certified Type B transportation packaging used for transportation of RH TRU wastes.

Shielded container – A metal payload container authorized for use within the HalfPACT packaging, that has been tested by DOE to meet DOT Specification 7A Type A requirements. It is approximately the same size as a standard 55-gallon drum, contains one 30-gallon steel drum, and incorporates a nominal 1-inch layer of lead lining to shield waste forms with high gamma energies. Although the shielded container is managed during handling, shipment, storage, and disposal as a CH payload container, the waste contained in a shielded container is characterized and inventoried in the WWIS as RH waste.

Shipper – A TRU waste site that releases an NRC-approved packaging to a carrier for shipment.

Shipping category – A shipping category is defined by the following parameters: chemical composition of the waste (waste type), gas generation potential of the waste material type (quantified by the g-value for hydrogen), and gas release resistance (type of payload container and type and maximum number of confinement layers used).

Sites – Department of Energy TRU waste generator/storage sites.

Standard large box 2 – A specialized metal payload container with a top-loading and a bottom-loading option for use within the TRUPACT-III packaging, that has been tested by DOE to meet DOT Specification 7A Type A requirements.

Standard waste box – A metal payload container authorized for use within the TRUPACT-II or HalfPACT packaging, that has been tested by DOE to meet DOT Specification 7A Type A requirements.

Summary Category Group – Used to segregate TRU mixed wastes into broad groups having similar physical forms. The summary category groups include homogeneous solids (S3000) that are at least 50 percent by volume solid process residues, soil/gravel (S4000) that is at least 50 percent by volume soil/gravel, and debris (S5000) that is at least 50 percent by volume materials that meet the criteria specified in 20.4.1.800 New Mexico Administrative Code (incorporating 40 CFR §268.2[g]). Categorization is based on the Summary Category Group constituting the greatest volume of waste for a waste stream (Reference 9, Attachment C).

Appendix 6 – Glossary (Continued)

Ten-drum overpack – A metal payload container authorized for use within the TRUPACT-II packaging, that has been tested by DOE to meet DOT Specification 7A Type A requirements.

Test Category – Payload containers that do not meet the analytical category decay heat limits or whose concentration of flammable volatile organic compounds (VOCs) in the headspace exceeds 500 ppm are classified as test category (References 23a and 23b, Section 5.2.2).

Trace chemicals/materials – Chemicals/materials that occur individually in the waste in quantities less than 1 weight percent. The total quantity of trace chemicals/materials not listed as allowed materials for a given waste material type in any payload container is restricted to less than 5 weight percent (References 23a and 23b, Section 4.3.1, Reference 41, Section 4.3.1).

TRU isotope – An isotope of any element having an atomic number greater than uranium (i.e., 92).

TRU waste – Waste containing more than 100 nCi of alpha-emitting TRU isotopes per gram of waste, with half-lives greater than 20 years, except for (1) high-level radioactive waste, (2) waste that the Secretary has determined, with the concurrence of the Administrator, does not need the degree of isolation required by the disposal regulations, or (3) waste that the NRC has approved for disposal on a case-by-case basis in accordance with 10 CFR Part 61 (Reference 2, Section 2[18]).

TRU mixed waste – TRU waste that is also a hazardous waste as defined by the Hazardous Waste Act and 20.4.1.200 NMAC (incorporating 40 CFR § 261.3) (Reference 9, Part 1, Section 1.5.7).

TRUPACT-II – An NRC-certified Type B transportation packaging used for transportation of CH-TRU wastes.

TRUPACT-III – An NRC-certified Type B transportation packaging used for transportation of CH-TRU wastes in the SLB2 container.

TRUPACT-III Transuranic Waste Authorized Methods for Payload Control (TRUPACT-III TRAMPAC) – The governing document for shipments in the TRUPACT-III packaging (Reference 23b, Section 1).

Verification – The act of authenticating or formally asserting the truth that a process, item, data set, or service is, in fact, that which is claimed. Data verification is the process used to confirm that all review and validation procedures have been completed.

Appendix 6 – Glossary (Continued)

Volatile organic compounds – For the purposes of the TRU waste program, those RCRA-regulated VOCs listed in the WIPP WAP and any additional compounds tentatively identified by VOC analytical procedures used to satisfy program requirements (i.e., any compound containing carbon and hydrogen with any other element that has a vapor pressure of 77.6 milliliters (ml) of mercury (1.5 psia) or greater under actual storage conditions).

Waste Acceptance Criteria – Constraints (limits) on the physical, chemical, and radiological properties of TRU waste and its packaging as determined by WIPP's authorization basis requirements. TRU waste will not be approved for shipment to and disposal at the WIPP until it has been certified as meeting these criteria. Waste Acceptance Criteria ensure that TRU waste is managed and disposed of in a manner that protects human health and safety and the environment.

Waste Analysis Plan – The waste analysis plan includes test methods, details of planned waste analysis for complying with the general waste analysis requirements of 20.4.1.500 NMAC (incorporating 40 CFR 264.13), a description of the waste shipment screening and verification process, and a description of the QA/QC program. Sites are required to implement the applicable requirements of the WIPP WAP.

Waste characterization – The process of determining that TRU waste meets the requirements of the WAC by the acceptable performance of the activities defined by CBFO-approved site-specific plans.

Waste certification – Formal and documented declaration by sites that waste has been characterized and meets the requirements of the WAC.

Waste matrix code – A DOE-developed coding system for grouping waste streams that have similar matrix constituents, especially for treatment objectives. This coding system allows waste streams within the DOE TRU waste system that have similar physical and chemical waste form properties to be categorized together (Transuranic Waste Baseline Inventory Report - 2004, DOE/TRU-2006-3344).

Waste stream – A waste stream is waste materials that have common physical form, that contain similar hazardous constituents and that are generated from a single process or activity (Reference 9, Appendix C).

WIPP Waste Information System – A computerized data management system used by WIPP to gather, store, and process information pertaining to CH and RH-TRU waste destined for or disposed of at WIPP. The WWIS database is a subsystem of the WDS.

Appendix 7 – Payload Container Integrity Checklist

The Operator is to visually examine 100 percent of the payload container exterior to determine if the payload container meets the criteria of Section 3.2.1. At a minimum, sites shall incorporate the questions and criteria contained in the following checklist into applicable site procedures (see CCP-TP-033, *CCP Shipping of CH-TRU Waste*). This payload container inspection shall be performed and documented as a part of the TRUPACT-II, TRUPACT-III, or HalfPACT loading process. Any YES answer on the inspection checklist will result in the operator discontinuing the inspection, marking the payload container as unacceptable for shipment, and removal of the payload container from the shippable inventory. Before the rejected container can be shipped, it must undergo appropriate corrective actions (e.g., evaluation, repackaging, overpacking), as applicable. All containers must have an acceptable and complete inspection checklist documenting that it meets the DOT 7A criteria. Personnel complete the following payload container integrity checklist in accordance with procedure CCP-TP-033.

CONTAINER EXAMINATION		DISCUSSION OF CRITERIA	COMPLIANCE	
1.	Is the payload container obviously degraded?	Obviously degraded means clearly visible and potentially significant defects in the payload container or payload container surface.	YES	NO
2.	Is there evidence that the payload container is, or has been, pressurized?	Pressurization can be indicated by a fairly uniform expansion of the sidewalls, bottom or top. Past pressurization can be indicated by a notable outward deflection of the bottom or top. Verify that the payload container is not warped.	YES	NO

Appendix 7 – Payload Container Integrity Checklist (Continued)

CONTAINER EXAMINATION		DISCUSSION OF CRITERIA	COMPLIANCE	
3.	Is there any potentially significant rust or corrosion such that wall thinning, pin holes, or breaches are likely or the load bearing capacity is suspect?	Rust shall be assessed in terms of its type, extent, and location. Pitting, pocking, flaking, or dark coloration characterizes potentially significant rust or corrosion. This includes the extent of the payload container surface area covered, thickness, and, if it occurs in large flakes or built-up (caked) areas. Rusted payload containers may not be accepted if: A.1 Rust is present in caked layers or deposits A.2 Rust is present in the form of deep metal flaking, or built-up areas of corrosion products In addition, the location of rust should be noted; for example on a drum: top lid; filter region; locking chine; top one-third, above the second rolling hoop; middle one-third, between the first and second rolling hoops; bottom one-third, below the second rolling hoop; and on the bottom. Payload containers may still be considered acceptable if the signs of rust show up as: A.1 Some discoloration on the payload container A.2 If rubbed would produce fine grit or dust or minor flaking (such that wall thinning does not occur).	YES	NO
4.	Are any of the following apparent? A.1 wall thinning A.2 pin holes A.3 breaches	Wall thinning, pin holes, and breaches can be a result of rust/corrosion (see discussion for #3).	YES	NO
5.	Are there any split seams, tears, obvious holes, punctures (of any size), creases, broken welds, or cracks?	Payload containers with obvious leaks, holes or openings, cracks, deep crevices, creases, tears, broken welds, sharp edges or pits, are either breached or on the verge of being breached. Verify that there is no warpage that could cause the container to be unstable or prevent it from fitting properly in the applicable package.	YES	NO
6.	Is the load-bearing capacity suspect?	The load-bearing capacity could be reduced for excessive rust (see discussion for #3), wall thinning (see discussion for #4), breaches, cracks, creases, broken welds, etc. (see discussion for #5).	YES	NO

Appendix 7 – Payload Container Integrity Checklist (Continued)

CONTAINER EXAMINATION		DISCUSSION OF CRITERIA	COMPLIANCE	
7.	Is the payload container improperly closed?	Inspect the fastener and fastener ring (chine) if applicable for damage or excessive corrosion. Check the alignment of the fastener to ensure that it is in firm contact around the entire lid and the payload container will not open during transportation.	YES	NO
8.	Are there any dents, scrapes, or scratches that make the payload container's structural integrity questionable or prevent the top and bottom surfaces from being parallel?	Deep gouges, scratches, or abrasions over wide areas are not acceptable. If top and bottom surfaces are not parallel, this would indicate that the container is warped. Dents should be less than 1/4 in. deep by 3-inches long and between ½ in. to 6-inches wide. All other dents must be examined to determine impact of structural integrity.	YES	NO
9.	Is there discoloration which would indicate leakage or other evidence of leakage of material from the payload container?	Examine the payload container regions near vents, top lid fittings, bottom fittings, welds, seams and intersections of one or more metal sheets or plates. Payload containers must be rejected if evidence of leakage is present.	YES	NO
10.	Is the payload container bulged?	For the purposes of this examination, bulging is indicated by: A.1 A fairly uniform expansion of the sidewalls, bottom, or top (e.g., in the case of a drum, either the top or bottom surface protrudes beyond the planar surface of the top or bottom ring. A.2 A protrusion of the side wall (e.g., in the case of a drum, beyond a line connecting the peaks of the surrounding rolling hoops or a line between a surrounding rolling hoop and the bottom or top ring), or A.3 Expansion of the sidewall (e.g., in the case of a drum, such that it deforms any portion of a rolling hoop).	YES	NO

Appendix 7 – Payload Container Integrity Checklist (Continued)

References to Appendix 7

1. INEEL Engineering Design File "*Waste Container Integrity Evaluation for Storage"*, EDF-RWMC-705, September 25, 1996. Idaho National Engineering and Environmental Laboratory, Idaho Falls, ID

2. Title 49 CFR Part 173, Subpart 475. *"Quality Control Requirements Prior to Each Shipment of Class 7 (Radioactive) Materials." Code of Federal Regulations,* Washington, D.C., Office of the Federal Register, National Archives and Records Administration. (http://www.ecfr.gov)

3. DOE/RL-96-57, Section 2.5.5. *"Test & Evaluation Document for the U. S. Department of Transportation Specification 7A type to Packaging"* (Formerly WHC-EP-0558) (http://rampac.energy.gov/certinfo/special/noncertified/dot7a/pdot7a.aspx)

Appendix 8 – Payload Management of TRU Alpha Activity Concentration

1.0 Scope

The policies and methods for the management of TRU alpha activity concentration within each TRU waste payload container disposed of at the WIPP are set out in this appendix. They are based on the definition of TRU waste in the *WIPP LWA*, Public Law 102-579. The LWA defines TRU waste as:

"…waste containing more than 100 nanocuries of alpha emitting transuranic isotopes per gram of waste, with half lives greater than 20 years…" (Sec. 2[18]).

This appendix pertains specifically to the payload management of TRU alpha activity concentration of waste containers selected for overpacking.

2.0 Policies

The Office of National TRU Program has established the following policies for managing TRU alpha activity concentration in compliance with the LWA: (References 1, 2, and 3)

- The TRU alpha activity concentration limit for TRU waste (> 100 nCi/g) applies to the TRU waste stream as a whole.

- Waste containers belonging to a TRU waste stream may vary in their TRU alpha activity concentration, some containing > 100 nCi/g and some containing < 100 nCi/g. Using process knowledge in combination with radioassay measurements to determine the presence of TRU isotopes within the waste stream, generator sites define a TRU waste stream based on its potential to include waste containers with a TRU alpha activity concentration in excess of 100 nCi/g.

- Waste containers belonging to the same TRU waste stream may be overpacked into a payload container (e.g., SWB or TDOP) provided the TRU alpha activity concentration of the payload container exceeds 100 nCi/g.

Appendix 8 – Payload Management of Transuranic (TRU) Alpha Activity Concentration (Continued)

3.0 Prerequisites for Implementation

- Each waste container selected for payload management must be part of the TRU waste stream identified in the AK Summary Report for that waste stream (References 2 and 3).

- Sites shall submit to the CBFO, for its review and approval, applicable plans and procedures for making TRU waste determinations based on payload management practices that involve the overpacking of waste containers (Reference 2).

- CBFO will notify the EPA of sites seeking such authorization prior to CBFO's approval of a site to manage TRU alpha activity concentration using payload management. The WIPP will not accept payload managed waste for disposal until EPA has received notice (Reference 3).

4.0 Implementation and Practice

- Each TRU waste stream selected for payload management must include in its AK Summary Report an estimate of the total waste volume and the percentage of the waste volume that is above and below 100 nCi/g (It should be noted that this information, although based on the best available AK information, is preliminary and subject to the performance of WIPP certified NDA measurements and cannot and will not be used as a measure of AK accuracy) (Reference 3).

- Each waste container selected for payload management must contain at least one TRU isotope (e.g., Pu-238, Pu-239, Pu-240, Pu-242) whose activity exceeds the LLD of the radioassay system used to characterize the waste (References 2 and 3). The applicability of LLD will vary from system to system and may be on a container basis. Sections 3.3.1 and A.3 of this document provide the applicable requirements for determining and reporting LLDs.

- Each waste container selected for payload management may only be overpacked into a payload container (e.g., SWB or TDOP) with other waste containers from the same TRU waste stream.

- The TRU alpha activity concentration of the payload container is determined according to Sections 3.3.3 and 4.3.3 of this document.

Appendix 8 – Payload Management of Transuranic (TRU) Alpha Activity Concentration (Continued)

5.0 References

1. Public Law 102-579, 106 Stat.4777, 1992 (as amended by Public Law 104-201, 1996). *Waste Isolation Pilot Plant Land Withdrawal Act* (http://www.wipp.energy.gov/library/cra/baselinetool/documents/regulatory%20tools/10%20WIPPLWA1996.pdf)

2. Letter to Mr. Frank Marcinowski (Director, Office of Radiation and Indoor Air, U.S. Environmental Protection Agency) from Dr. Ines R. Triay (Manager, Carlsbad Field Office, U.S. Department of Energy), August 4, 2003

3. Letter to Dr. Ines R. Triay (Manager, Carlsbad Field Office, U.S. Department of Energy) from Mr. Frank Marcinowski (Director, Office of Radiation and Indoor Air, U.S. Environmental Protection Agency), August 8, 2003

Appendix 9 – Radiography Requirements for Contact-Handled Transuranic Waste

9.1 Radiography Requirements for Contact-Handled Waste

Radiography aids in the examination and identification of containerized waste. All activities required to achieve radiography objectives shall be described in site Program documents as identified in Appendix 4, Table B-2. These documents shall include instructions specific to the radiography systems used at the site. This appendix applies to radiography of CH waste; requirements for radiography of RH waste are found in the WCPIP.

A radiography system (e.g., real-time radiography or digital radiography/computed tomography), normally consists of an x-ray producing device, an imaging system, an enclosure for radiation protection, a waste container handling system, an audio/video recording system, and an operator control and data acquisition station. Although these six components are required, it is expected there will be some variation within a given component between sites. The radiography system shall have controls or an equivalent process which allow the operator to control image quality. On some radiography systems, it should be possible to vary the voltage between 150 and 400 kilovolts to provide an optimum degree of penetration through the waste.

To perform radiography, the waste container is scanned while the operator views the video monitor. An audio/video recording shall be made of the waste container scan and is maintained as a non-permanent record. A radiography data form shall also be used to document the Waste Matrix Code; verify there are no ignitable, reactive, or corrosive wastes present by verification that there is no observable liquid in excess of the waste acceptance criteria and there are no compressed gases; and estimated waste material parameter weights of the waste.

The estimated waste material parameter and weights for CH waste should be determined by compiling an inventory of waste items and packaging materials. The items on this inventory should be sorted by waste material parameter and combined with a standard weight look-up table to provide an estimate of waste material parameter weights.

Containers whose contents prevent full examination of the remaining contents shall be subject to visual examination unless the site certifies that visual examination would provide no additional relevant information for that container using acceptable knowledge for the waste stream.

For containers which contain classified shapes and undergo radiography, the radiography recording shall be considered classified information. The radiography data forms will not contain classified information.

Appendix 9 – Radiography Requirements for Contact-Handled Waste (Continued)

9.2 Radiography Training

The radiography system involves qualitative and semi-quantitative evaluations of visual displays. Operator training and experience are the most important considerations for assuring quality controls in regard to the operation of the radiography system and for interpretation and disposition position of radiography results. Only trained and qualified radiography operators shall be allowed to operate radiography equipment.

Standardized training and qualification requirements for radiography operators shall be based upon existing industry standard training requirements and shall comply with the training and qualification requirements of this document and the QAPD.

The site shall develop a training program that provides radiography operators with both formal and OJT. Radiography operators shall be instructed in the specific waste generating practices, typical packaging configurations, and associated waste material parameters expected to be found in each Waste Matrix Code at the site.
The OJT and apprenticeship shall be conducted by an experienced, qualified radiography operator prior to qualification of the training candidate. The training programs shall be site-specific due to differences in equipment, waste configurations, and the level of waste characterization efforts. For example, certain sites use digital radiography equipment, which is more sensitive than real-time radiography equipment. In addition, the particular physical forms and packaging configurations at each site will vary; therefore, radiography operators shall be trained on the types of waste that are generated, stored, or characterized at that particular site.

The training program shall contain the following elements:

- Project Requirements
- State and Federal Regulations
- Basic Principles of Radiography
- Radiographic Image Quality
- Radiographic Scanning Techniques
- Application Techniques
- Radiography of Waste Forms
- Standards, Codes, and Procedures for Radiography
- Site-Specific Instruction

Appendix 9 – Radiography Requirements for Contact-Handled Waste (Continued)

The training program shall also contain OJT which addresses:

- System Operation
- Identification of Packaging Configurations
- Identification of Waste Material Parameters
- Weight and Volume Estimation
- Identification of Prohibited Items

Radiography test drums shall contain items common to the waste streams to be generated and stored at the site. The test drums shall be divided into layers with varying packing densities or different drums may be used to represent different situations that may occur during radiography examination at the site. Test drums shall be representative of the waste matrix codes for which WSPF approval is sought. Test drums shall be examined and successfully identified prior to waste stream shipment. The following is a list of required elements of a radiography test drum:

- A punctured aerosol can
- Pigtails on polyliners (horsetail bag)
- Pair of coveralls
- Empty bottle
- Irregular shaped pieces of wood
- Empty one-gallon paint can
- Full container
- Aerosol can with fluid
- One-gallon bottle with three tablespoons of fluid
- One-gallon bottle with one cup of fluid (upside down)
- Leaded glove or leaded apron
- Wrench

These items shall be successfully identified by the operator as part of the qualification process. Qualifications of radiography operators shall, at a minimum, encompass the following requirements:

- Successfully pass a comprehensive exam based upon training enabling objectives. The comprehensive exam will address all of the radiography operations, documentation, characterization and procedural elements stipulated in this WAC.

- Perform a practical capability demonstration in the presence of appointed site radiography SME. The person will be an experienced radiography operator who is also qualified as an OJT trainer.

Appendix 9 – Radiography Requirements for Contact-Handled Waste (Continued)

Re-qualifications of operators are based on evidence of continued satisfactory performance (primarily audio/video recording reviews), and shall be done at least every two years. Unsatisfactory performance will result in disqualification. Unsatisfactory performance is defined as the misidentification of a prohibited item in a training drum or a score of less than 80 percent on the comprehensive exam. Retraining and demonstration of satisfactory performance are required before a disqualified operator is again allowed to operate the radiography system.

A training drum with internal containers of various sizes shall be scanned semiannually by each operator. The audio/video recording shall then be reviewed by a supervisor to ensure that operator's interpretations remain consistent and accurate. Imaging system characteristic shall be verified on a routine basis.

9.3 Quality Control

Independent replicate scans and replicate observations of the video output of the radiography process shall be performed under uniform conditions and procedures. Independent replicate scans shall be performed on one waste container per day or once per testing batch, whichever is less frequent. Independent observation of one scan (not the replicate scan), shall be made once per day or once per testing batch, whichever is less frequent, by a qualified radiography operator other than the individual who performed the first examination. A testing batch is a suite of waste containers undergoing radiography using the same testing equipment. A testing batch can be up to 20 waste containers without regard to waste matrix.

Oversight functions include periodic audio/video recording reviews of accepted waste containers by a qualified radiography operator other than the operator who dispositioned the waste container. The results of this independent verification shall be made available to the radiography operator.

9.4 Data Review and Validation

A testing BDR for data validation and QA purposes is required when radiography is used to characterize waste. A testing BDR (or equivalent), includes data pertaining to radiography for up to 20 waste containers or samples.

Appendix 9 – Radiography Requirements for Contact-Handled Waste (Continued)

All measurement data is reviewed and approved by qualified personnel prior to being reported. Reviews shall meet the requirements of the QAPD. At a minimum, the data is reviewed by an independent technical reviewer and approved by the SPM. This review is performed by an individual other than the data generator who is qualified to have performed the initial work. The independent technical reviewer shall verify, at a minimum, the following information:

- Data generation and reduction is conducted in a technically correct manner in accordance with the methods used (verification of procedure and revision).
- Data is reported in the proper units and correct number of significant figures.
- Calculations are verified by a valid calculation program, a spot check of verified calculation programs, and/or 100 percent check of all hand calculations.
- Values that are not verifiable to within rounding or significant difference discrepancies shall be rectified prior to completion of independent technical review.
- The data is reviewed for transcription errors.
- The testing QA documentation for BDRs is complete and includes, as applicable, raw data, calculation records, calibration records (or references to an available calibration package), list of containers in the batch, and QC sample results. Corrective action is taken to ensure that all BDRs are complete and include all necessary raw data prior to completion of the independent technical review.
- QC sample results are within established control limits and, if not, the data have been appropriately dispositioned using the nonconformance process. This includes complete summarized qualitative and quantitative data for all waste containers with data flags or qualifiers.
- Radiography tapes are reviewed (independent observation) on a waste container basis at a minimum of once per testing batch or once per day of operation, whichever is less frequent.
- The container contains no indication that there is liquid in excess of this waste acceptance criteria, no indication of compressed gas, no indication of incompatible wastes, and the physical form matches the Waste Matrix Code.
- The appropriate QAOs have been met.

Appendix 9 – Radiography Requirements for Contact-Handled Waste (Continued)

All data must be approved by the SPM. The SPM shall verify, at a minimum, the following information:

- Data generation-level independent technical review, validation, and verification have been performed as evidenced by the completed review checklists and appropriate signature release. Batch data review checklists are complete.

- BDRs are complete and data are properly reported (e.g., data are reported in the correct units and with the correct number of significant figures).

- Data meet all applicable Quality Assurance Objectives.

The SPM shall provide a SPM Summary and a Data Validation Summary for each BDR. These reports may be combined and shall consist of a detailed checklist documenting that the batch has been adequately reviewed and that the data meet program objectives.

To ensure that data of known and documented quality are generated, each participating measurement facility shall implement a documented facility QA program. Facility QA programs shall specify qualitative and quantitative acceptance criteria for the QC checks of this program, and corrective actions to be taken when these criteria are not satisfied. Only appropriately trained and qualified personnel shall be allowed to perform data validation/review.

Appendix 10 – Visual Examination Requirements for Contact-Handled Transuranic Waste

10.1 Visual Examination Requirements for Contact-Handled Waste

This appendix applies to visual examination requirements for CH waste; requirements for visual examination of RH waste are found in the WCPIP.

Contact handled waste container contents may be verified directly by performing VE on the waste container contents. Visual examination may also be performed during packaging or repackaging of waste. The CCP performs VE in accordance with the procedures found in Appendix 4, Table B-3.

VE does not require audio/video recordings of the examination; the examination is documented on a data form and certified with signatures from two qualified VE operators. If the second operator cannot verify the descriptions of the first operator, corrective actions will be taken in accordance with the established QA Program.

VE shall be conducted to describe all contents of a waste container and includes estimated or measured weights of the contents. The description shall clearly identify all discernible waste items, packaging materials, and waste material parameters in the waste container. VE activities are documented on VE data forms.

VE video/audio recordings of containers that contain classified shapes shall be considered classified information. Visual examination data forms will not contain classified information.

Appendix 10 – Visual Examination Requirements for Contact-Handled Transuranic Waste (Continued)

10.2 Visual Examination Training

VE shall consist of a semi-quantitative and qualitative evaluation of the waste container contents and may be recorded on audio/video recording media. Standardized training for VE includes both formal classroom training and OJT. Personnel performing VE shall be instructed in the specific waste generating processes, typical packaging configurations, and the waste material parameters expected to be found in each Waste Matrix Code at the site. The OJT and apprenticeship shall be conducted by an operator experienced and qualified in VE prior to qualification of the candidate. The training shall be site-specific to include the various waste configurations at the site. For example, the particular physical forms and packaging configurations at each site will vary so operators shall be trained on types of waste that are generated, stored, or characterized at that particular site. VE operators need only be trained to the physical forms and packaging configurations used on the waste stream that they are examining and packaging. VE personnel shall be requalified once every two years.

Training shall address the following required elements:

- Project Requirements
- State and Federal Regulations
- Application Techniques
- Site-Specific Instruction

Training shall also include OJT that addresses:

- Identification of Packaging Configurations
- Identification of Waste Material Parameters
- Weight and Volume Estimation
- Identification of Prohibited Items

The SPM appoints each Visual Examination Expert (VEE) and ensures the appointment is facility-specific. The VEE shall be familiar with the waste generating processes that have taken place at the site and will also be familiar with all types of waste being characterized at that site. The VEE shall be responsible for the overall direction and implementation of the visual examination at that facility. The VEE shall receive training in the same elements as the visual examination personnel, including both formal training and OJT. Qualification of a VEE shall be based on familiarity with waste generating processes, familiarity with the types of waste being characterized, and meeting the training requirements discussed above. Consistent with other VE personnel, the VEE shall be requalified once every two years. CCP-QP-002 specifies the selection, qualification and training requirements for the VEE.

Appendix 10 – Visual Examination Requirements for Contact-Handled Transuranic Waste (Continued)

10.3 Method

Visual examination recorded on video/audio media meet the following minimum requirements:

- The audio/video media shall record the waste packaging event for the container such that all waste items placed into the container are recorded in sufficient detail and shall contain an inventory of waste items in sufficient detail that another trained VE operator can identify the associated waste material parameters.

- The video/audio media shall capture the waste container identification number.

- The personnel loading the waste container shall be identified on the video/audio media or on packaging records traceable to the loading of the waste container.

- The date of loading of the waste container will be recorded on the video/audio media or on packaging records traceable to the loading of the waste container.

VE performed using two operators shall meet the following minimum requirements:

- At least two site personnel who witnessed the packaging of the waste shall approve the data forms or packaging records attesting to the contents of the waste container.

- The data forms or packaging records shall contain an inventory of waste items in sufficient detail that a trained VE operator can identify the associated waste material parameters.

- The container identification number shall be recorded on the data forms or packaging records.

A description of the waste container contents is recorded on a VE data form. The description clearly identifies all waste material parameters and provides enough information to estimate weights of waste material parameters. In cases where bags are not opened, a brief written description of the contents of the bags shall contain an estimate of the amount of each waste type in the bags. The written records of VE are supplemented with the audio/videotape recording, if applicable.

Appendix 10 – Visual Examination Requirements for Contact-Handled Transuranic Waste (Continued)

10.4 Data Review and Validation

A testing BDR for data validation and QA purposes is required when VE is used to characterize waste. A BDR (or equivalent), includes data pertaining to VE for up to 20 waste containers or samples.

All measurement data is reviewed and approved by qualified personnel prior to being reported. Reviews meet the requirements of the QAPD. At a minimum, the data is reviewed by an independent technical reviewer and approved by the SPM. This review is performed by an individual other than the data generator who is qualified to have performed the initial work. The independent technical reviewer shall verify, at a minimum, the following information:

- Data generation and reduction were conducted in a technically correct manner in accordance with the methods used (verification of procedure and revision).
- Data were reported in the proper units and correct number of significant figures.
- Calculations have been verified by a valid calculation program, a spot check of verified calculation programs, and/or 100 percent check of all hand calculations.
- Values that are not verifiable to within rounding or significant difference discrepancies must be rectified prior to completion of independent technical review.
- The data have been reviewed for transcription errors.
- The testing QA documentation for BDRs is complete and includes, as applicable, raw data, calculation records and list of containers in the batch. Corrective action will be taken to ensure that all BDRs are complete and include all necessary raw data prior to completion of the independent technical review.
- The container contains no indication that there is liquid in excess of this waste acceptance criteria, no indication of compressed gas, no indication of incompatible wastes, and the physical form matches the Waste Matrix Code.
- The appropriate QAOs have been met.

Appendix 10 – Visual Examination Requirements for Contact-Handled Transuranic Waste (Continued)

All data must be approved by the SPM. The SPM shall verify, at a minimum, the following information:

- Data generation-level independent technical review, validation, and verification were performed as evidenced by the completed review checklists and appropriate signature release. Batch data review checklists are complete.

- BDRs are complete and data are properly reported (e.g., data are reported in the correct units and with the correct number of significant figures).

- Data meet all applicable Quality Assurance Objectives.

The SPM shall provide a SPM Summary and a Data Validation Summary for each BDR. These reports may be combined and shall consist of a detailed checklist documenting that the batch has been adequately reviewed and that the data meet program objectives.

To ensure that data of known and documented quality are generated, each participating measurement facility shall implement a documented facility QA program. Facility QA programs shall specify qualitative and quantitative acceptance criteria for the QC checks of this program, and corrective actions to be taken when these criteria are not satisfied. Only appropriately trained and qualified personnel shall be allowed to perform data validation/review.

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CCP-PO-027

Revision 6

CCP/TRU Waste Processing Center/Oak Ridge National Laboratory Interface Document

EFFECTIVE DATE: 02/02/2016

Mike Ramirez

PRINTED NAME

APPROVED FOR USE

RECORD OF REVISION

Revision Number	Date Approved	Description of Revision
0	10/02/2007	Initial issue.
1	02/17/2010	Revised due to the deployment of the Mobile IQ3 Nondestructive Assay (NDA) system to the transuranic (TRU) Waste Processing Center (TWPC).
2	04/22/2010	Revised to remove the requirement to apply Central Characterization Project (CCP) hold tags to containers which are returned to the host facility as permanent rejects.
3	12/29/2010	Minor revision to update references to the *Waste Isolation Pilot Plant Hazardous Waste Facility Permit.*
4	10/01/2012	Revised to incorporate Nuclear Waste Partnership (NWP) transition changes.
5	10/02/2013	Revised to incorporate Class 2 Permit Modification changes, dated March 13, 2013 and to include the freeze file as of 11/20/2012. Changes in the freeze file include: 1. Measuring and testing equipment (M&TE) changes proposed by S. Burns to make CCP-PO-027 similar to other interface documents that were affected by CAR-LANL-003-12. 2. An “Any documentation required for Central Characterization Program (CCP) to perform its scope” added. 3. Training information in Section 4.1.3 revised. 4. Removed references to drum venting system (DVS) as equipment is no longer on site. 5. Section 4.13.6 [A] revised to generalize CCP Project Manager (PM’s) approval of CCP-CM-001, *CCP Equipment Change Authorization and Documentation* information. 6. “CCP or CCP Vendor owned equipment” added where needed.
6	02/02/2016	Revised format and content to better align with a standardized Central Characterization Program (CCP) interface document format and to address enhancements pertaining to the Acceptable Knowledge (AK) process.

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1.0 PURPOSE

This document establishes the interfaces between the Nuclear Waste Partnership LLC (NWP) Central Characterization Program (CCP), and the Oak Ridge National Laboratory (ORNL) TRU Waste Processing Center (TWPC) for implementing services described in the applicable Statement of Work (SOW) and program documents. The CCP is operated by NWP at the direction of the U.S. Department of Energy (DOE) Carlsbad Field Office (CBFO).

It is not intended to be used in lieu of a task-specific subcontract. Specifically, this document identifies CCP and Host site/generator responsibilities for implementing requirements and deliverables.

1.1 Background

The ORNL is a transuranic (TRU) waste generator site in the DOE complex. The TWPC is the centralized facility at ORNL for processing, characterizing and shipping TRU waste off site for disposal. The DOE Oak Ridge Operations Office (ORO) manages all activities at the ORNL, including waste management, for the DOE.

The DOE/CBFO has deployed the CCP to the TWPC to characterize, certify, and ship legacy contact-handled (CH) and remote-handled (RH) TRU waste for disposal at the Waste Isolation Pilot Plant (WIPP). CBFO has audited and certified CCP to perform these activities at the ORNL.

1.2 Scope

This document applies to the CCP, the Host site, and generators whose waste is characterized and certified by CCP for the TWPC. Unless specifically stated otherwise, the TWPC is the Host site in this document. “Generator” may refer to the TWPC or it may refer to the facility that originally generated and/or treated and packaged the waste.

This document addresses CCP and Host site/generator responsibilities for the following areas:

- Facilities/equipment for TRU waste characterization and shipping
- Safety Programs
- Training and qualification
- Container management

- Deficiencies and nonconformances
- Nondestructive examination (NDE) including visual examination (VE) and real-time radiography (RTR)
- Nondestructive assay (NDA)
- Radiological Characterization (RC) including dose-to-curie (DTC) and sampling and analysis, if required
- Chemical Sampling and Analysis
- Flammable Gas Analysis (FGA) for transportation requirements
- Performance Demonstration Program (PDP)
- Source control
- Acceptable Knowledge (AK)
- Data validation and reconciliation
- Measuring and Test Equipment (M&TE)
- Work standards
- Quality Assurance (QA)
- Project Control
- Procedures
- Document Transmittals
- Procurements
- Records
- TRU Waste Certification and WIPP Waste Information System/Waste Data System (WWIS/WDS) data entry
- Transportation
- Configuration Management

These services will be performed with CCP and/or Host site equipment with appropriate DOE/CBFO-certified procedures. The Host site may augment CCP characterization efforts as requested by CCP. Augmented services provided by the Host site shall comply with applicable CCP procedures.

CCP will also support TWPC in their mission to dispose of Low Level and Mixed Low Level Waste (LLW/MLLW). This support will primarily be providing NDE and NDA data collected during CCP certified activities for containers that are subsequently determined by CCP to be LLW/MLLW waste containers.

The Host site maintains ownership of the waste and responsibility for its disposal. This responsibility includes additional chemical sampling analysis deemed necessary by the WIPP Co-Permitees.

The Host site/generator services covered by this document include programs for Radiological Controls, Occupational Safety and Health, Industrial Hygiene, Nuclear Safety/Authorization Basis (AB), Emergency Management, and Environment/Hazardous Waste Management.

2.0 REQUIREMENTS

All services provided by CCP will comply with DOE/WIPP-02-3122, *Transuranic Waste Acceptance Criteria for the Waste Isolation Pilot Plan* (WIPP-WAC), the *Waste Isolation Pilot Plant Hazardous Waste Facility Permit* (WIPP-WAP), DOE/WIPP-02-3214, *Remote-Handled TRU Waste Characterization Program Implementation Plan* (WCPIP), WP 13-1, *Nuclear Waste Partnership LLC, Quality Assurance Program Description,* and Certificates of Compliance (COCs) for Type B Packages issued by the Nuclear Regulatory Commission (NRC).

Requirements from this upper-tier document flow down to the following program documents:

- CCP-PO-001, *CCP Transuranic Waste Characterization Quality Assurance Project Plan*
- CCP-PO-002, CCP *Transuranic Waste Certification Plan*
- CCP-PO-003, *CCP Transuranic Authorized Methods for Payload Control (CCP CH-TRAMPAC)*
- CCP-PO-005, *CCP Conduct of Operations*
- CCP-PO-026, *CCP Configuration Management*
- CCP-PO-505, *CCP Remote-Handled Transuranic Waste Authorized Methods for Payload Control (CCP RH-TRAMPAC)*
- CM-A-IS-001, *Worker Safety and Health Program*
- CM-P-RP-316, *Radiological Worker Training*
- DOE/WIPP-02-3183, *CH Packaging Program Guidance*
- DOE/WIPP-02-3283, *RH Packaging Program Guidance*
- DOE/WIPP-06-3345, *Waste Isolation Pilot Plant Flammable Gas Analysis*
- DOE/WIPP-94-1012, *U. S. Department of Energy Carlsbad Field Office Quality Assurance Program Document (QAPD)*

This work will be performed under a DOE/CBFO-certified QA program that meets the requirements defined in DOE/CBFO-94-1012, *U.S. Department of Energy Carlsbad Field Office Quality Assurance Program Document (QAPD).*

A more comprehensive list of documents included in the CCP System of Controls is provided in Section 4.23.

3.0 RESPONSIBILITIES

CCP has primary responsibility for performing TRU waste characterization, certification, and transportation activities in accordance with governing requirements described herein. CCP services include compilation, reporting, and confirmation of AK, NDE, VE, NDA, RC, FGA for transportation, data validation and verification, waste certification, WWIS/WDS data entry, and transportation activities.

The Host site Management and Operating (M&O) Contractors' responsibilities are limited to the CCP activities described herein being performed on their behalf and for performing TRU waste management activities in accordance with Host site/generator documents provided by CCP.

3.1 Operations

3.1.1 CCP performs the following operations activities:

[A] Obtains Host site management daily release/approval prior to performing CCP operations.

[B] Performs system start-up and calibration of characterization equipment at the Host site.

[C] Operates CCP equipment in accordance with approved procedures including CCP-PO-005, *CCP Conduct of Operations*.

[D] Performs safety walk-downs prior to operation.

[E] Responds to and resolves assessment and surveillance findings for CCP activities.

[F] Ensures CCP and Host site personnel are trained and qualified in accordance with the requirements specified in Section 4.3.

[G] Demonstrates CCP operations during DOE/CBFO certification/recertification audits.

[H] Performs Management Assessments and QA Surveillances on: 1) CCP Operations, and 2) Host site waste management activities referenced in active CCP AK Summaries/Waste Stream Profiles.

[I] Performs inspection of containers provided by the Host site to ensure they are safe and ready for CCP characterization.

3.1.2 The Host site provides the following operations support for CCP activities:

[A] Radiological controls as needed to support characterization activities, including:

- Radiological postings.
- Radiation protection surveys, both initial and routine, on characterization equipment and provide approved survey reports to the CCP Vendor Project Manager (VPM) as required.
- Personnel dosimetry.
- Dose assessments and dosimetry reports.
- Calibrated and source checked survey instrumentation, as required.
- Radiological Work Permits (RWP) to support CCP activities, as required.
- Bioassay sample collection, evaluation, and reporting, if applicable. The CCP TWPC Project Manager or CCP VPM will be notified of any positive bioassay results as soon as is reasonably possible.
- Radiological source controls.

[B] Provides adequate facilities for the safe performance of characterization and transportation activities.

[C] Provides site-specific training, as needed, to ensure safe operations within the Host site.

[D] Provides Industrial Safety and Health (IS&H) support, as needed.

[E] Provides Fire Protection and Emergency Management support, as needed.

[F] Provides AB oversight, including Unreviewed Safety Question (USQ) evaluations.

[G] Provides environmental impact oversight and support, as needed.

[H] Provides on-site container transportation.

[I] Provides container handling, inventory control, and storage location tracking using the TWPC Container Tracking system.

[J] Provides personnel to be trained and qualified under the CCP program as needed to support CCP activities such as VE, RC (DTC), etc., if applicable.

[K] Coordinates and obtains document classification reviews as required to allow the public release of documents such as the AK Summary Report.

[L] Provides calibrated M&TE for use in characterization or obtains calibration service for CCP provided M&TE.

[M] Provides waste packaging materials and other equipment/materials purchased and inspected in accordance with the Qualified Supplier List (QSL) approved program.

[N] Provides hazardous waste manifesting, bill of lading, and notifications for transportation.

[O] Provides qualified personnel to support maintenance of CCP equipment.

[P] Responds to and resolves CCP management assessment and CCP QA surveillance findings related to Host site waste management activities.

3.2 CCP ORNL Project Manager

3.2.1 Functions as CCP's primary interface and point-of-contact (POC) between CCP and the Site Management Representative (SMR)/Designee for waste characterization.

3.2.2 Unless otherwise assigned herein, ensures documents listed in step 4.23.3 are provided to the Host site.

3.2.3 Ensures sufficient characterization equipment and personnel are available to perform the required characterization activities at the Host site.

3.2.4 Provides status on CCP characterization operations to the SMR/Designee, as requested.

3.2.5 Works in conjunction with SMR/Designee to establish and maintain reasonable and appropriate throughput of waste containers.

3.2.6 Ensures CCP management and CBFO are informed of safety, compliance, or production issues impacting CCP ORNL activities.

3.2.7 Ensures the CCP Management Assessment program is implemented for CCP Operations and Host site waste management activities related to active CCP AK Summaries/Waste Stream Profiles.

3.2.8 Work with the SMR to schedule and ensure access to areas to perform visual observation of selected waste streams.

3.3 CCP Site Project Manager (SPM)

3.3.1 Functions as CCP's primary interface and POC between CCP and the SMR/Designee for all waste certification activities and WIPP Waste Acceptance Criteria (WAC) and Waste Analysis Plan (WAP) subject matter expert (SME) and compliance authority.

3.3.2 Ensures the AK Summary Report for TRU waste characterized by the CCP are prepared, approved, issued, and provided to the SMR/Designee.

3.3.3 Ensures Waste Stream Profile Forms (WSPFs) are prepared, reviewed, and approved.

3.3.4 Ensures that project level verification and validation of batch data reports (BDRs) are completed.

3.3.5 Provides evidence to the SMR/Designee of PDP participation and successful completion.

3.3.6 Ensures software used by CCP characterization at ORNL is controlled in accordance with CCP-QP-022, *CCP Software Quality Assurance Plan.*

3.3.7 Coordinate presentation of AK briefings to CCP characterization personnel, generator site SMR, POCs/SMEs or Cognizant Designees directly involved with the generation of each waste stream.

3.3.8 Provides AKE and SMR quarterly notifications that the Interface Waste Management Document List (IWMDL) are current.

3.3.9 Transmit the Acceptable Knowledge Assessment (AKA) to SMR for distribution to site POCs/SME to verify accuracy and completeness and obtain concurrence signature from SMR.

3.3.10 Perform visual observation of waste generators performing activities that change the physical and/or chemical properties of waste during or prior to the waste being packaged for CCP characterization for waste streams identified by the SMR.

3.4 Acceptable Knowledge Expert (AKE)

3.4.1 Collects, compiles reviews, and documents AK in accordance with CCP-TP-005, *CCP Acceptable Knowledge Documentation*.

3.4.2 Ensures CCP has obtained necessary container information prior to characterization.

3.4.3 Prepares and maintains the IWMDL for each waste stream, including the identification of the applicable procedure POCs/SMEs involved directly with the generation of each waste stream (identified by the SMR).

3.4.4 Performs an AKA for each waste stream.

3.4.5 Performs Chemical Comparability Evaluations.

3.4.6 Submit IWMDL and associated quarterly SMR notifications to the Site Project Manager (SPM) to submit to records.

3.4.7 Document the AKA in an Assessment Memorandum to the SPM.

3.5 CCP Quality Assurance (QA) Engineer

3.5.1 Functions as NWP's primary interface and POC for QA matters between CCP, Host site, DOE/ORNL, and DOE/CBFO.

3.5.2 Validates the Nonconformance Reports (NCRs) generated by CCP personnel performing characterization activities at the Host site.

3.5.3 Provides copies of NCRs for information to the Host site SMR/Designee as requested.

3.5.4 Ensures that NCRs are dispositioned in a timely manner in accordance with CCP-QP-005, *CCP TRU Nonconforming Item Reporting, and Control.*

3.5.5 Ensures performance of receipt inspection in accordance with CCP-QP-026, *CCP Inspection Control,* for items and services procured by CCP.

3.5.6 Provides the SMR/Designee with a copy of the semi-annual trending summary reports in accordance with CCP-QP-014, *CCP Quality Assurance Trend Analysis and Reporting*.

3.6 Site Management Representative (SMR) (Host Facility Management Position)

3.6.1 Functions as the Host site primary interface and POC between the Host site and CCP.

3.6.2 Ensures cognizant Host site and generator POCs/SMEs are identified and available as necessary to support the review of CCP documents defined in step 4.23.3.

3.6.3 Coordinates review, provides comments, and approves comments resolutions on documents listed in step 4.23.3. This includes facilitating generator document review and comment resolution as necessary. The review and comment resolution will be documented in accordance with CCP-QP-010, *CCP Document Preparation, Approval, and Control.*

3.6.4 Facilitates workflow between CCP and ORNL TRU waste generators as necessary to allow CCP to fulfill program requirements. This includes CCP access to generator processes and documentation as necessary.

3.6.5 Ensures unreviewed safety question determination (USQDs) needed for proposed modifications to CCP hardware, software, or procedures are prepared and approved by qualified Host site personnel prior to CCP implementing the proposed modification.

3.6.6 Ensures CCP is provided appropriate facilities, construction services, utilities, phone services, network services and office services necessary to perform their activities at the TWPC.

3.6.7 Notifies the CCP Project Manager (PM) and VPM of any safety basis changes to action levels that will impact CCP initiated notifications.

3.6.8 Ensures site support (e.g., Radiological, IS&H, waste handling, etc.) is available for waste characterization.

3.6.9 Ensures documentation of completed Host site-specific training is delivered to CCP Training.

3.6.10 Provides local personnel to support characterization operations such as VE. Also provides personnel to support the CCP AK Experts (AKE) in the collection of documents.

3.6.11 Works in conjunction with the CCP PM and VPM to maintain reasonable and appropriate throughput of waste containers.

3.6.12 Ensures that periodic QA surveillances of CCP operations by the Host site are conducted and reported to CCP.

3.6.13 Ensures CCP personnel have access to facilities to observe operations and interview personnel associated with generation, packaging, repackaging, or treatment of TRU waste.

3.6.14 Performs quarterly reviews of the IWMDL and notifies SPM that the list is complete and includes the most current revision of the relevant procedures.

3.6.15 Work with CCP PM/Designee to schedule and ensure access requirements are met for visual observation of selected waste streams.

3.7 CCP Vendor Project Manager (VPM)

3.7.1 Obtains Host site management daily release/approval prior to performing CCP operations.

3.7.2 Ensures CCP and Host site personnel are trained and qualified to perform WIPP-compliant TRU waste characterization activities at the Host site prior to commencement of work activities.

3.7.3 Monitors the List of Qualified Individuals (LOQI) daily to confirm that only qualified personnel perform waste characterization activities.

3.7.4 Works in conjunction with CCP PM and Host site SMR/designee to maintain reasonable and appropriate throughput of waste containers.

3.7.5 Provides daily pre-operations briefing to CCP personnel. The daily pre-operations briefing may be combined with the Host site's pre-operations briefing as agreed between the CCP TWPC Project Manager and Host site operations management.

3.7.6 Ensures applicable manufacturers Material Safety Data Sheets and/or Safety Data Sheets (MSDSs/SDSs) for products brought to the facility by the CCP are provided, maintained, and available to support operations and meet the requirements of the TWPC chemicals management program.

3.7.7 Provides oversight of CCP field operations to ensure safe, compliant and efficient operations.

3.7.8 Notifies the CCP ORNL Project Manager and the Host site Facility Manager/Operations Manager of any abnormal events associated with safe and compliant operation of CCP characterization activities for reporting purposes.

3.7.9 Ensures CCP notifications required to comply with the Host site safety basis are incorporated into appropriate CCP work documents and appropriate CCP personnel (including offsite personnel such as Independent Technical Reviewers [ITRs], NDA Expert Analyst [EA], and SPMs) are aware of their responsibility to make such notifications.

3.7.10 Obtains SMR and Facility Site Representative (FSR) review and concurrence prior to issuance/approval of CCP Operator Aids or Standing Orders that could affect changes to equipment operation or configuration.

3.8 Waste Certification Official (WCO)

3.8.1 Obtains approved WSPF for containers to be certified.

3.8.2 Will document and certify that all TRU waste payload containers meet the requirements of the WAC,TRAMPAC, and submits the data to the WWIS/WDS for approval.

3.9 Transportation Certification Official (TCO)

3.9.1 Ensures CCP Transportation personnel are trained and qualified to perform WIPP-complaint CH and RH TRU waste packaging and loading operations at the Host site prior to starting work activities and are listed on the current LOQI.

3.9.2 Provides oversight of CCP Transportation personnel for payload and Overpack assembly and loading.

3.9.3 Builds payloads from certified containers and Overpacks provided by Waste Certification Officials (WCOs) in WWIS/WDS.

3.9.4 Certifies payloads for transportation to and disposal at WIPP.

3.9.5 Builds shipments from approved payloads in WWIS/WDS.

4.0 INTERFACE

4.1 Initial Setup for Operations

4.1.1 CCP is responsible for the following during initial setup:

[A] Providing information and procedures to the Host site SMR/Designee, who will coordinate facility, QA, and Environmental Safety & Health (ES&H) reviews to determine satisfactory compliance with Host site safety basis requirements, radiological controls requirements, and other safety and operational requirements.

[B] Completing readiness activities as needed to support authorization of CCP activities at the Host site.

[C] Providing project support to complete administrative reviews and approvals of technical and administrative procedures and processes.

[D] Mobilization of project staff and equipment.

4.1.2 The Host site is responsible for the following during initial setup:

[A] Providing office space for CCP personnel and locations and utilities for CCP equipment.

[B] Reviewing and approving work packages for CCP equipment setup.

[C] Providing CCP personnel with computer access, badging, and Host site required reading.

[D] Defining and coordinating readiness activities as needed to support authorization of CCP activities at the Host site.

4.2 Routine Operations

4.2.1 Routine CCP operations will be conducted in accordance with approved CCP and Host site procedures.

4.3 Training and Qualification

4.3.1 CCP personnel or Host site personnel who perform work under CCP procedures will be trained and qualified to WIPP requirements in accordance with CCP-QP-002, *CCP Training and Qualification Plan* and/or CCP-QP-040, *Support Training,* as applicable.

4.3.2 Host site will schedule and provide forms as necessary for individuals that are required to take HAZWOPER physical. CCP will be responsible for the cost of the physicals.

4.3.3 Administrative work, such as BDR reviews that require no access to characterization activities or processes, may be completed by personnel who have not completed the Host site required site-specific training. Personnel who have not completed Host site required site-specific training will not be allowed unescorted access to the characterization activities.

4.3.4 CCP and Host site personnel assigned to field operations must complete the Host site required site-specific training. The SMR will ensure that the Oak Ridge site-specific training documentation is sent to CCP Training and notification is made to the VPM.

4.3.5 Both the CCP training and Host site required site-specific training must be completed prior to the individual being assigned to perform independent work at the Host site.

4.3.6 A LOQI will be monitored by the CCP VPM to confirm CCP and Host site personnel assigned to CCP to perform work are qualified.

4.4 Employee Monitoring

4.4.1 CCP employees will be monitored in accordance with Host site radiation protection program and TWPC procedure CM-P-RP-316, *Radiological Worker Training*.

4.4.2 CCP employee health and safety will be monitored by Host site Health and Safety program in accordance with 10 Code of Federal Regulation (CFR) Part 851, *Worker Safety and Health Program* and TWPC procedure, CM-A-IS-001, *Worker Safety and Health Program*.

4.5 Container Management

4.5.1 The Host site provides container movement and storage compliant with the Documented Safety Analysis (DSA).

4.5.2 The Host site provides the dose rate and surface contamination information necessary to certify TRU waste containers for disposal.

4.5.3 CCP performs container management throughout the CCP characterization process in accordance with CCP-TP-068*, CCP Standardized Container Management,* or CCP-TP-509, *CCP Remote-Handled Transuranic Container Tracking*.

4.5.4 CCP AK personnel will maintain a list of characterization-eligible containers from each waste stream identified. When repackaging or VE of a waste container is required, the following container Identification (ID) scheme will be followed as applicable.

[A] When the waste from one TRU input container results in one TRU output container, the container ID from the Input container is to be used with the addition of an “A” suffix as the ID number on the output container (e.g., input container is X10C0057, the output container will be labeled as X10C0057A). This scheme is also to be applied to re-label waste containers that do not require repackaging or VE.

[B] When the waste from one TRU input container results in the creation of two or more TRU output containers, a standard convention of adding a sequential single or, if required, double letter suffix to the input container’s ID number is used to label the TRU output containers produced (e.g., input container is X10C0057, the first output container is X10C0057A, and the second output container is X10C0057B).

[C] When the waste from two or more TRU input containers from the same waste stream are combined into one output container, the container ID number from the first input container is used with the addition of an “A” suffix as the ID number on the TRU output container (e.g., X10C0057 and X10C0059 are combined into one output container. X10C0059 was the first drum repackaged. The output container is X10C0059A).

[D] When prohibited items are segregated and placed into a separate output container from the bulk of the waste, a new container ID is applied to the segregated waste container. Prohibited items from more than one input waste container may be placed into the segregated waste container provided the input containers are from the same waste stream.

[E] CCP AK personnel are to be notified as soon as is practical of waste container ID number changes resulting from the actions in steps 4.5.4[A] through [D].

4.5.5 Host site will notify CCP when any drum configuration is changed externally or internally.

4.6 Deficiencies and Nonconformances

4.6.1 CCP-Identified Deficiencies and Nonconformances

NOTE

The NWP QA Engineer will confirm appropriate closure of the deficiencies that are resolved by CCP.

[A] If CCP personnel identify a nonconformance condition associated with a waste container during the CCP characterization or certification process, CCP personnel will initiate an NCR in accordance with CCP-QP-005.

[B] If the deficiency or nonconformance is an issue that will be resolved by CCP, CCP will provide notification (e.g., verbal, or e-mail as requested by the Host site) to the Host site SMR/Designee. The Host site SMR/Designee may request any supporting documentation needed by the Host site. CCP will ensure appropriate closure of the deficiency. A copy of any CCP NCR related to DOE TRU waste at the TWPC will be provided to the Host site SMR/Designee upon request.

[C] If the deficiency or nonconformance cannot be resolved by the CCP (e.g., does not meet TRU waste acceptance criteria), then the specific container will be returned with all required documentation to the Host site for disposition. Once the specific container(s) have been returned to the Host site, the NCR will remain open if the container will be remediated and returned to CCP or will be closed if the

condition is such that the container will not be returned to CCP (e.g., NDA indicates the container is less than 100 nanocuries per gram [nCi/g] TRU alpha activity concentration). CCP will not apply CCP HOLD TAGS to those containers which are returned as permanent rejects from CCP. Instead, CCP will affix a physical indicator (sticker or tag) that the container is returned and not certifiable for shipment to WIPP.

4.6.2 Host Site-Identified Deficiencies and Nonconformances

[A] If Host site personnel identify a nonconforming condition during container movement or handling (e.g., missing container identification tag, duplicate container number), Host site personnel will initiate nonconformance documentation in accordance with the Host site QA Program.

[B] The SMR will ensure a copy of any NCR affecting the CCP program is provided to the SPM for incorporation into the CCP Nonconformance Tracking System (as required).

[C] The SMR will notify the CCP ORNL PM and VPM of any procedure deficiencies, identified by TWPC personnel, which relate to characterization activities.

[D] The SMR will notify the Transportation Certification Official (TCO) or Mobile Loading Unit Team Lead and the VPM of any procedure deficiencies, identified by Host site personnel, which relate to payload assembly or loading activities.

4.7 Visual Examination (VE)

4.7.1 CCP will conduct VE Operations in accordance with CCP-TP-113, *CCP Standard Contact-Handled Waste Visual Examination*, as needed, or CCP-TP-500, *CCP Remote-Handled Waste Visual Examination* using a facility provided by the Host site.

4.7.2 Qualified Host site personnel will manipulate waste as requested by the CCP VE operator(s) during the VE process.

4.7.3 VE operators will make notifications to the Host site as necessary to comply with the Host site safety basis. These Notifications will be made to Host site management and the VPM.

4.7.4 The Host site will perform all maintenance and repairs to the VE facility.

4.7.5 The Host site will provide personnel to qualify and perform VE in accordance with CCP-TP-113 or CCP-TP-500, if applicable.

4.8 Real-Time Radiography (RTR)

4.8.1 CCP will perform RTR using a CCP-provided unit(s). Containers rejected by RTR will be dispositioned consistent with the requirements of Section 4.6.

4.8.2 CCP may perform screening services using a CCP provided unit(s) to provide information on prohibited items for use in TWPC repackaging operations. CCP-TP-066, *CCP Radiography Screening Procedure for Prohibited Items*, will be used for RTR screening operations. The report provided from CCP-TP-066 will include any prohibited items or conditions, including all liquids identified, during the scan.

4.8.3 RTR operators will make notification to the Host site as necessary to comply with the Host site Safety Basis. These Notifications will be made to Host site management and the VPM.

4.8.4 The Host site is to support the CCP VPM with the construction of RTR capability demonstration drums as required.

4.9 Filter Inspection/Filter Change Out

4.9.1 CCP Personnel will inspect container filters as part of container acceptance and will document whether the filter is a WIPP-approved filter and provide the documentation to the CCP VPM.

4.9.2 If required, filter change out will be performed by Host site personnel and documentation will be provided to the CCP VPM.

4.10 Nondestructive Assay (NDA)

4.10.1 The Host site will provide support for CCP participation in the PDP. This support includes preparation of the test drums, delivery and pick-up of the drums to/from the CCP NDA equipment, and responsibility for PDP source control.

4.10.2 CCP will perform NDA using a CCP-provided unit or multiple units as required. Containers rejected by NDA will be dispositioned consistent with the requirements of Section 4.6.

4.10.3 NDA operators will make notifications to the Host site as necessary to comply with the Host site safety basis. These Notifications will be made to Host site management and the VPM.

4.10.4 CCP will provide TWPC with access to validated BDRs for disposal of LLW/MLLW from the certified program.

4.11 Radiological Characterization (Dose-to-Curie [DTC])

4.11.1 The Host site will provide technical support for RC efforts based on the use of AK for stored RH TRU waste or sampling and analysis.

4.11.2 CCP will provide qualified personnel, including Host site personnel, to perform RC activities.

4.11.3 DTC operators will make notifications to the Host site as necessary to comply with the Host site safety basis. These notifications will be made to Host site management and the VPM.

4.11.4 The Host site will provide support to the CCP for performing calibration of RC instrumentation. This support includes delivery of surrogate drums and source control as needed.

4.12 Chemical Waste Sampling and Analysis Methods

4.12.1 If the Permittees determine that additional characterization is necessary using chemical sampling and analysis, the Permittees shall direct the generator/storage site to provide the Permittees with the following documentation:

- Sampling and analysis plan
- EPA SW-846 test method(s), or functionally equivalent test method(s) to be used
- Identification of the laboratory(ies) that will be performing the test(s)

4.12.2 Upon the Permittees written approval of the sampling and analysis plan, the generator/storage site shall implement the sampling and analysis plan.

4.13 Flammable Gas Analysis (FGA)

4.13.1 FGA is for transportation only and will be performed using approved DOE/WIPP procedures by personnel trained under the CCP Qualification Program.

4.13.2 FGA operators will make notifications to the Host site as necessary to comply with the Host site Safety Basis. These notifications will be made to Host site management and the VPM.

4.14 Source Control

4.14.1 CCP will provide a list of reference sources required for calibration of NDA systems used by CCP.

4.14.2 The Host site will be responsible for all reference sources. Responsibilities consist of inventory control, storage, shipment, and usage. The Host site will provide CCP the number of sources, location, isotopic distribution with activity levels, and the names of the custodian and authorized users, as required.

4.14.3 The Host site will be responsible for providing radiological control support associated with the reference sources. This support consists of maintaining the radioactive materials area (RMA) postings, periodic surveys and performing a semi-annual leak check on the sources.

4.14.4 The Host site personnel will deliver the sources to qualified CCP personnel for loading into the matrix drums. CCP personnel will be trained as users of the sources to the Host site procedures.

4.14.5 The Host site will provide support for the CCP participation in the PDP. This support includes maintaining trained PDP coordinators, preparation of the test drums, delivery and pick-up of the drums to/from the CCP NDA equipment, and responsibility for PDP source control. Host site support will be coordinated by the Host site SMR/Designee.

4.15 Acceptable Knowledge (AK)

4.15.1 CCP records personnel will maintain the auditable AK record necessary to support the AK Summary Report in accordance with the Hazardous Waste Facility Permit (HWFP), Attachment C, WAP, WCPIP, and the QAPD.

4.15.2 CCP AK personnel collect, compile, and review AK documentation in accordance with CCP-TP-005 and/or DOE/WIPP-02-3214.

4.15.3 Host site/generator personnel assist CCP AK personnel with AK collection.

4.15.4 CCP AK personnel and Host site/generator personnel develop an IWMDL for each waste stream. Each IWMDL will include facility processes, plans, and procedures that control the following waste management activities as applicable:

- Waste generating activities
- Waste retrieval activities
- Waste packaging/repackaging
- Waste treatment/processing (e.g., neutralization, deactivation, and solidification/immobilization
- Waste inspection, testing, and characterization
- Decontamination and decommissioning (D&D) operations
- Any other activity that changes the physical, chemical, or radiological properties of waste to be characterized by CCP

4.15.5 The SMR ensures POCs/SMEs are assigned to review the new or revised IWMDLs for accuracy and completeness and provide written comments as appropriate.

4.15.6 The AKE and cognizant personnel (CP) resolve comments and questions.

4.15.7 CCP posts the new revised IWMDL on the CCP secure file transfer protocol (sftp) site.

NOTE
The activities of step 4.15.8 may be initiated as necessary by the AKE for each new waste stream and existing waste streams with unshipped containers.

4.15.8 AKA are performed in accordance with CCP-TP-005.

[A] SPM provides SMR with the AKA results.

[B] SMR distributes results of the AKA to designated CPs for review and comment.

[C] AKE resolves comments with SMR and CPs.

[D] SMR concurs with final AKA in writing.

4.15.9 CCP submits new or revised AK Summary Reports to the SMR/Designee for review and concurrence.

[A] The SMR ensures CP review the AK Summary Report for accuracy and completeness providing comments in accordance with CCP-QP-010.

4.15.10 Host site/generator CP attends a briefing on new or revised AK Summary Reports.

4.15.11 Host site/generator personnel notifies the SPM and AKE in writing of any new revised waste management activities that would necessitate a change to the IWMDL.

4.15.12 The SPM and AKE evaluate new or revised waste management activities and determine if revision to the IWMDL and/or AK Summary Report is needed.

4.15.13 SPM request CCP Management Assessment to review and verify new or revised waste management activities that require revision to IWMDL and/or AK Summary Report.

4.15.14 The Host site will not provide any waste container to CCP for characterization until the AKE has received the latest version of the work document (including field changes, other immediate procedure changes, Timely Orders/Standing Order, Operator Aids, etc.) used to generate, package, and/or repackage the container.

[A] The work document(s) provided to the AKE will contain the following information at a miniumum:

- Identification (including revision) of the work document(s) used to generate the container
- Type of activity (e.g., packaging/repackaging only, remediation, treatment)
- Amount (estimated) and type (if known) of liquids
- Type and quantity (estimated) of absorbents used
- Type and quantity (estimated) of neutralization agents used
- Any unexpected conditions or reactions encountered
- General description of waste items
- Packaging configuration (e.g., 55-gallon drum with 20 mil liner bag)
- Filter data including model and quantity used
- Parent container identification

4.15.15 The AKE will ensure they have obtained and reviewed the correct version of IWMDL documentation used to generate/manage a container before adding it to the AK Tracking Spread Sheet.

4.15.16 At a minimum of once per calendar quarter, Host site/generator management will review the current IWMDL and provide written assurance to the CCP SPM that the list is up to date **OR** provide necessary documentation to revise the list.

4.16 Data Validation and Reconciliation

4.16.1 Wherever CCP has obtained the services of another CBFO-certified TRU Waste Program, that program will provide CCP with BDRs completed through data generation level (DGL) reviews in accordance with their own programmatic documents.

4.16.2 CCP will provide project level validated data packages for NDE, NDA, VE, RC, and FGA.

4.16.3 The CCP SPM, and AKE will perform data reconciliation with applicable data quality objectives (DQOs) using CCP-TP-002, *CCP Reconciliation of DQOs and Reporting Characterization Data,* and CCP-TP-506, *CCP Preparation of the Remote-Handled Transuranic Waste Acceptable Knowledge Characterization Reconciliation Report*.

4.17 Measuring and Test Equipment (M&TE)

4.17.1 M&TE used by the CCP will be controlled and maintained in accordance with CCP-QP-016, *CCP Control of Measuring and Testing Equipment.*

4.17.2 The Host site will make available National Institute for Standards and Technology (NIST)-traceable calibration services for M&TE to the CCP. The Host site will maintain records on M&TE calibration in accordance with the Records Inventory and Disposition Schedule (RIDS). Copies of the Certificates of Calibration will be made available to the CCP VPM and CCP M&TE Custodian prior to issuing M&TE to CCP for use.

4.17.3 For Host site M&TE furnished for use in the CCP program, the Host site SMR or Designee will provide notification to the CCP M&TE Custodian when M&TE are added, deleted, found out-of-tolerance/defective, or failed calibration.

4.17.4 When notified of an as found, failed calibration CCP will perform an extent of condition review to assess its impact on any of the characterization processes, initiate an NCR (if applicable) and provide this info to the Host site SMR/Host site M&TE Custodian.

4.17.5 The Host site SMR/Designee will make calibration documentation and processes accessible as needed for internal and external audits.

4.17.6 The CCP M&TE Custodian will provide a recall notification for CCP M&TE that requires calibration to the Host site SMR/M&TE Custodian.

4.18 Work Standards

4.18.1 CCP operations personnel will work under the Host site Lockout/Tagout procedure.

4.18.2 CCP and Host site-provided personnel will perform quality-affecting work under CCP procedures for TRU waste characterization and certification activities.

4.18.3 Host site procedures and work packages will be used for non-waste characterization activities (e.g., equipment repairs).

4.18.4 CCP operations personnel will operate in accordance with CCP-PO-005.

4.18.5 CCP personnel will comply with applicable Host site procedures for activities they perform outside of the CCP system of controls.

4.18.6 CCP personnel will work under the Host site safety basis and work control standards. Maintenance work control activities on Host site-supplied equipment and CCP owned/leased equipment will be controlled using Host site work authorization procedures.

4.18.7 CCP-CM-001, *CCP Equipment Change Authorization and Documentation,* CCP-PO-026, *CCP Configuration Management,* and CCP-TP-140, *CCP Equipment Maintenance* will be followed in addition to the requirements of step 4.18.6 for CCP owned/leased equipment.

4.18.8 The Host site will not change the configuration of any characterization equipment used by CCP – regardless of ownership – without first obtaining written concurrence from the CCP VPM.

4.18.9 CCP personnel will participate in the Host site bioassay program. CCP personnel involved in VE of waste will provide routine samples at a frequency agreed upon between the Host site and NWP Radiological Safety organization. All other CCP personnel will provide samples as requested under the routine/random program established by the Host site. All CCP personnel will submit bioassay samples if required by the Host site Radiation Protection Program (RPP) to establish a baseline for activities at the Host site.

4.18.10 The CCP ORNL Project Manager or CCP VPM will notify the Host site SMR/Designee when new CCP personnel (NWP and subcontractors) are assigned to work at the TWPC. This notification will occur as soon as is practical.

4.18.11 The CCP ORNL Project Manager or CCP VPM will notify the Host site SMR when CCP personnel, NWP and subcontractors leave the TWPC as a result of reassignment or resignation. This notification will occur as soon as is practical.

4.18.12 The Host site SMR will notify affected organizations to support the arrival or departure of CCP personnel.

4.18.13 The CCP ORNL Project Manager or CCP VPM will be notified if any bioassay sample provided by CCP personnel indicates that an uptake of any radioactive isotopes may have occurred as soon as is reasonably possible.

4.18.14 Host site Radiological Controls personnel will perform routine surveys for contamination and radiation as specified in Host site policies or procedures. The CCP ORNL Project Manager or CCP VPM and appropriate Host site management personnel will be notified immediately upon the discovery of any loose surface contamination in any CCP-occupied areas. Access to and copies of routine survey results will be made available to CCP upon request.

4.18.15 The Host site will immediately notify the CCP ORNL Project Manager or CCP VPM and appropriate Host site management personnel of any abnormal continuous or fixed air sample filter analysis results from any area routinely occupied by CCP personnel.

4.18.16 CCP will provide historical information on the operation of any CCP equipment deployed at the Host site for the purpose of lessons learned and the implementation of any mitigating actions from these lessons learned.

4.18.17 For Host site-supplied equipment and facilities, the Host site is the Design Authority. It is expected that CCP will participate in review of hazards analysis for this equipment and facilities being provided.

4.18.18 For non-Host site-provided equipment, CCP will provide the Host site with information and documentation necessary for evaluation of compliance with the Host site's safety basis. CCP will be the Design Authority for the equipment. The programmatic limits for the operation of the characterization equipment are the responsibility of CCP as part of their Design Authority responsibilities.

4.18.19 CCP will control the procurement, development, maintenance, configuration management, and use of software used on all Host site and non-Host site-provided equipment used to develop quality-affecting data for waste characterization in accordance with CCP-QP-022.

4.19 Project Office TRU Waste Certification and WIPP Waste Information System/Waste Data System (WWIS/WDS) Data Entry

4.19.1 CCP will prepare WSPFs for the subject Host site waste in accordance with CCP-TP-002.

4.19.2 CCP will transmit characterization and certification data using the WWIS/WDS and CCP procedures CCP-TP-030, *CCP CH TRU Waste Certification and WWIS/WDS Data Entry* or CCP-TP-530, *CCP RH TRU Waste Certification and WWIS/WDS Data Entry*.

4.19.3 CCP shall submit WSPFs to the Host site for information before submittal to CBFO. The Host site will provide written concurrence on the basis of continued compliance with procedures and programs, and CBFO-certification of the CCP program.

4.19.4 The CCP WCO will document and certify that all TRU waste payload containers meet the requirements of the WAC, and submit the data to the WWIS/WDS for approval.

4.20 Transportation of Contact-Handled (CH) Waste and Remote-Handled (RH) Waste

4.20.1 CCP Transportation is responsible for meeting all requirements for loading and shipping TRU waste certified by the CCP as approved in the WWIS/WDS.

4.20.2 CCP transportation will direct TWPC loading of containers into overpacks according to CCP WCO listings and will provide the CCP WCO with the necessary data to complete the process, if required.

4.20.3 The TWPC provides and signs on behalf of DOE the Uniform Hazardous Waste Manifest, bill of lading, make notifications as required, and required markings, labels and placards for each TRU waste shipment.

4.20.4 The Host site will provide and maintain CH and RH Package Loading facilities.

4.20.5 CCP Transportation will provide technical resources, TCO and qualified personnel to perform the transportation certification, preparation of the shipment and loading of the waste for shipments.

4.20.6 The Host site will provide the equipment and trained personnel required to handle waste containers for payload assembly and loading operations.

4.20.7 CCP Transportation will provide documentation to the SMR certifying the waste for shipment according to CCP procedures.

4.20.8 The Host site will coordinate the shipment including providing prerequisite surveys.

4.21 Quality Assurance (QA)

4.21.1 All quality affecting work performed in the completion of this waste characterization, certification, and transportation scope will be in compliance with applicable DOE/CBFO-certified CCP procedures.

4.21.2 NWP QA will conduct periodic surveillances to assess compliance with applicable WIPP requirements.

4.21.3 The Host site will conduct surveillances to assess compliance with applicable procedures.

4.22 Project Control

4.22.1 CCP and the Host site will provide routine status for their respective scheduled activities.

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4.22.2 CCP will maintain and provide the Host site with an up-to-date organization chart listing CCP personnel, along with associated roles and responsibilities.

4.23 Procedures

4.23.1 CCP will develop new or revised procedures in accordance with CCP-QP-010.

4.23.2 New technical operating procedures (procedures that operate equipment) developed by the CCP and scheduled to be used at the Host site, shall be evaluated by the Host site SMR to determine if the procedure shall be added to the Host site review list provided in Section 4.23.3.

4.23.3 The following documents and revisions to these documents will be provided to the SMR for review by SMEs/CP: If the procedure is an operational procedure that CCP is not currently operating to, the SMR may waive his review until CCP operations commence on site. When CCP operations return to the site the SMR will be provided all procedures listed below for review:

- CCP ORNL AK Summary Reports
- CCP Interface Waste Management Documents Lists
- CCP AK Assessments
- CCP ORNL WSPFs
- CCP-CM-001, *CCP Equipment Change Authorization and Documentation*
- CCP-CM-013, *CCP Transportation Flammable Gas Analysis (FGA)*
- CCP-HSP-014, *Health and Safety Program Implementation for CCP*
- CCP-PO-026, *CCP Configuration Management*
- CCP-QP-005, *CCP TRU Nonconforming Item Reporting and Control*
- CCP-QP-018, *CCP Management Assessment*
- CCP-TP-033, *CCP Shipping of CH TRU Waste*

- CCP-TP-047, *CCP Mobile IQ3 Gamma Scanner Operation*
- CCP-TP-053, *CCP Standard Real-Time Radiography (RTR) Inspection Procedure*
- CCP-TP-054, *CCP Adjustable Center of Gravity Lift Fixture Preoperational Checks and Shutdown*
- CCP-TP-055, CCP *Varian Porta-Test Leak Detector Operations*
- CCP-TP-066, *CCP Radiography Screening Procedure for Prohibited Items*
- CCP-TP-068, *CCP Standardized Container Management*
- CCP-TP-076, *CCP Operating the Mobile ISOCS Large Container Counter Using NDA 2000*
- CCP-TP-086, *CCP CH Packaging Payload Assembly*
- CCP-TP-113, *CCP Standard Contact-Handled Waste Visual Examination*
- CCP-TP-164, *CCP Real-Time Radiography #7 Operating Procedure*
- CCP-TP-165, *CCP Real-Time Radiography #6 Operating Procedure*
- CCP-TP-500, *CCP Remote-Handled Waste Visual Examination*
- CCP-TP-504, *CCP Dose-to-Curie Survey Procedure for Remote-Handled Transuranic Waste*
- CCP-TP-505, *CCP Removable Lid Canister/Neutron Shielded Canister Loading*
- CCP-TP-507, *CCP Shipping of Remote-Handled Transuranic Waste*
- CCP-TP-509, *CCP Remote-Handled Transuranic Container Tracking*
- CCP-TP-512, *CCP Remote-Handled Waste Sampling*

- CCP-TP-554, *CCP Remote-Handled Grapple Pre-Operational Checks and Operation*

NOTE

Examples of CP may include, but is limited to SMEs for the following as applicable to the document reviewed:

- Waste generating/packaging/repackaging processes
- Chemical and physical characteristics of waste streams
- Chemical compatibilities
- Radiological properties of waste streams
- Treatment permits
- Nuclear Safety
- Environmental compliance
- Facility operations

4.23.4 Upon receipt of a document listed in step 4.23.3 the SMR/Designee will ensure the document is reviewed by CP responsible for the waste management activities relevant to the scope of the document.

4.23.5 As warranted, the SMR/Designee will provide written comments to CCP using Document Review Record (DRR) in accordance with CCP-QP-010.

4.23.6 CCP, at its direction, may request objective evidence to support the competency of Host site/generator reviewers.

4.23.7 The CCP SPM will confirm that the SMR/Designee written comments are resolved with the Host site SMR/Designee concurrence prior to proceeding with CCP operations under the scope of the document being reviewed.

4.23.8 The following documents, and all revisions to these documents, will be provided to the SMR/Designee as “Notify Only” during the review process:

- CCP-PO-005, *CCP Conduct of Operations*
- CCP-TP-046, *CCP Mobile IQ3 System Calibration Procedure*
- CCP-TP-048, *CCP ORNL NDA System Data Reviewing, Validating, and Reporting Procedure.*

- DOE/WIPP-02-3183, *CH Packaging Program Guidance*
- DOE/WIPP-02-3184, *CH Packaging Operations Manual*
- DOE/WIPP-02-3185, *CH Packaging Maintenance Manual*
- DOE/WIPP-02-3284, *RH Packaging Operations Manual*
- DOE/WIPP-02-3283, *RH Packaging Program Guidance*

4.23.9 The following document and all revisions are controlled by CBFO. Upon receiving notification of issue/revision, CCP will notify the Host site for USQ screening prior to implementation at the Host site.

- DOE/WIPP-06-3345, *Waste Isolation Pilot Plant Flammable Gas Analysis*

4.23.10 Other controlled documents used by CCP are available to the Host site SMR/Designee for information purposes at the sftp site.

4.24 Document/Records Transmittals

4.24.1 Documents listed in this section, which are provided from one organization to the other as information copies, may be transmitted via memo, fax, e-mail, or formal correspondence. Documents identified as QA records will be transmitted in accordance with CCP-QP-008, *CCP Records Management*.

4.24.2 Information copies of documents to be provided to the Host site by CCP include but not limited to:

[A] Copies of NCRs and Corrective Action Requests (CARs), as applicable.

[B] Copies of ORNL AK Summary Reports.

[C] Copies of ORNL AK source documents and source document summaries, as requested.

[D] Copies of semi-annual trending summary reports.

[E] Copies of QA surveillance reports.

[F] Copies of ORNL WSPFs.

[G] Copies of VE, NDE, and NDA data, as requested.

[H] Copies of CCP Source/Receipt Inspection Verification Sheets and associated objective evidence for each shipment.

[I] Information on chemical usage and copies of applicable MSDSs/SDSs as requested for inventory or reporting reasons.

[J] Copies of training requirements and associated training records for Host site personnel supporting CCP.

[K] A copy of the RIDS developed by CCP.

[L] Results of all DOE/CBFO/New Mexico Environment Department (NMED)/U.S. Environmental Protection Agency (EPA) or other regulatory audit or compliance/enforcement actions that may impact CCP's ability to characterize and transport TRU waste.

[M] Copy of final data package to WIPP via WWIS/WDS, as requested.

[N] Documented evidence of participating in and passing the CBFO PDP.

[O] NMED approval of the CBFO Certification Audit Report.

[P] EPA Tier 1 approval of CCP processes and activities at ORNL.

[Q] List of equipment requiring calibration (M&TE List)

4.24.3 Documents to be provided to CCP by Host site include:

[A] Documentation of required training.

[B] Documentation of training completion for CCP and Host site personnel for training received from the Host site.

[C] Copies of AK source documentation requested by CCP.

[D] Radiological dose rate and surface contamination results on waste drums as needed to support WWIS/WDS data entry.

[E] Radiological information as described in Section 3.1.2[A].

[F] Copies of NCRs, deficiency reports, or other nonconformance documentation per Section 4.6.

[G] Copies of the results of Host site assessments pertaining to CCP.

[H] Copies of calibration certifications for M&TE used by CCP.

[I] Copies of QA surveillance reports.

[J] Copies of the Uniform Hazardous Waste Manifest, bill of lading and Shipment Notifications.

[K] Any documentation required by CCP to perform its scope of work, including correspondence pertaining to characterization activities, and Host site/generator waste management activities.

[L] Host site generated AB documentation concerning CCP related activities and equipment, including USQ's.

4.25 Authorization Basis (AB) and Configuration Management

4.25.1 The Host site has primary responsibility to ensure that CCP equipment and processes have been appropriately considered within the DOE-approved, Host site DSA.

4.25.2 CCP has primary responsibility to control CCP operations and CCP equipment configurations to ensure compliance with Host site procedures that protect the personnel, public, and environment.

4.25.3 For CCP provided equipment, CCP will provide the documentation necessary for Host site to perform the evaluation against its safety analysis. This documentation may include health and safety plans, hazard assessments, system descriptions, equipment drawings, or other information deemed necessary through mutual agreement between CCP and the Host site.

4.25.4 For Host site provided equipment, CCP will review operational and AB documentation, including USQs, to ensure the safety of CCP personnel while operating the equipment.

4.25.5 All changes to Host site equipment operated by CCP and CCP Vendor owned equipment will be controlled by the Host site Configuration Management and Work Control Program to ensure appropriate AB evaluations are conducted and associated controls are established.

4.25.6 The Host site will submit all changes to AB requirements that affect CCP operations for review and concurrence by CCP prior to implementation.

4.26 Notification

4.26.1 The Host site has primary responsibility to notify CCP prior to changes in the Host sites used by CCP for characterization activities or changes that may impact operations.

4.26.2 The Host site has primary responsibility to notify CCP prior to changes to Host site/generator policies, processes, or procedures that may affect CCP characterization activities or operations.

4.26.3 CCP has primary responsibility to ensure changes to equipment are in accordance with CCP-CM-001.

4.26.4 CCP has primary responsibility to notify the Host site prior to configuration changes to CCP or CCP vendor-owned equipment.

4.26.5 The Host site has primary responsibility to notify CCP when repairs or modifications are needed on the CH or RH transportation trailers, packaging equipment, or casks.

4.26.6 CCP is responsible for performing or coordinating repairs and modifications to the CH or RH transportation trailers, packaging equipment, or casks.

4.27 Procurement

4.27.1 TWPC is shown as a supplier of procurement services on the NWP QSL. TWPC may procure, inspect, and perform receipt inspection of whatever items are listed in the most current NWP QSL for the CCP scope of work. TWPC will perform these activities in accordance with its QSL-accepted program.

4.27.2 TWPC shall use the specifications found on the CCP sftp site when ordering gas standards used for FGA operations.

4.28 Occurrence Reporting and Processing System (ORPS) and Price-Anderson Amendments Act (PAAA)

4.28.1 CCP, through NWP established programs, maintains the responsibility for reporting potential Price Anderson Amendments Act (PAAA) issues resulting from the certification and transportation of TRU waste by CCP. This includes filing any Occurrence Reporting and Processing System (ORPS) reports resulting from the certification or transportation of TRU waste by CCP at the Host site.

4.28.2 The Host site maintains the responsibility for reporting potential PAAA issues resulting from issues with safe operation of CCP characterization activities (e.g., Radiation Safety, IS&H, Industrial Hygiene, Maintenance, Lockout/Tagout, Conduct of Operations, etc.) at the Host site. This includes filing any ORPS reports resulting from issues with safe operations of CCP characterization activities at the Host site.

4.28.3 Both the Host site and CCP reserve the right to file ORPS and PAAA reports, as they deem appropriate, upon coordination and consultation with one another concerning certification or safe operation of characterization activities by CCP at the Host site.

4.28.4 Both the Host site and CCP shall invite the other to participate in the investigation of any waste characterization event that results in an ORPS or PAAA report.

4.28.5 Both the Host site and CCP shall support and participate in investigations when CCP characterization activities result in an ORPS or PAAA report.

5.0 RECORDS

5.1 Records generated during the performance of the waste characterization and certification scope are controlled by CCP.

5.2 QA records generated by CCP will be maintained in accordance with CCP-QP-008 and dispositioned in accordance with and CCP-QP-028, *CCP Records Filing, Inventorying, Scheduling, and Dispositioning*.

5.3 The Host site will maintain the following records in accordance with Host site requirements. The list includes, but is not limited to, the following:

5.3.1 MSDS/SDS

5.3.2 Calibration Certifications

6.0 OVERSIGHT

NOTE

Through the Inter-Entity Work Order (IEWO) contract between ORO and NWP, and the associated SOW, the ORO has delegated the authority to characterize and certify TRU waste to be shipped to the WIPP. Nonetheless, the Host site retains the responsibility for proper disposal as the waste generator on behalf of DOE. Accordingly, the following actions will define the level of oversight of the CCP by Host site personnel.

6.1 The Host site will accept successful completion of the CBFO certification audit as adequate evidence that the CCP implementation at the Host site is fully compliant with waste disposal requirements as set forth in the CH and RH WAC and WAP.

6.2 Following successful completion of the CBFO certification audit, the Host site QA will conduct periodic surveillances to ensure CCP work is conducted in accordance with CCP procedures. These surveillances will be conducted in accordance with Host site QA procedures.

6.3 The Host site QA will provide copies of its surveillance reports to the CCP SPM. The CCP SPM and NWP QA will take the following actions:

6.3.1 Review the Host site surveillance reports for any finding or other deficiencies against the CCP scope of work.

6.3.2 Document and perform corrective actions in accordance with applicable NWP issues management procedures.

6.3.3 Provide Host site QA with CCP actions to correct the identified deficiencies.

6.3.4 NWP QA will maintain an information file of the Host site surveillance reports conducted on the CCP scope of work.

Figure 1 – Nuclear Waste Partnership – TWPC

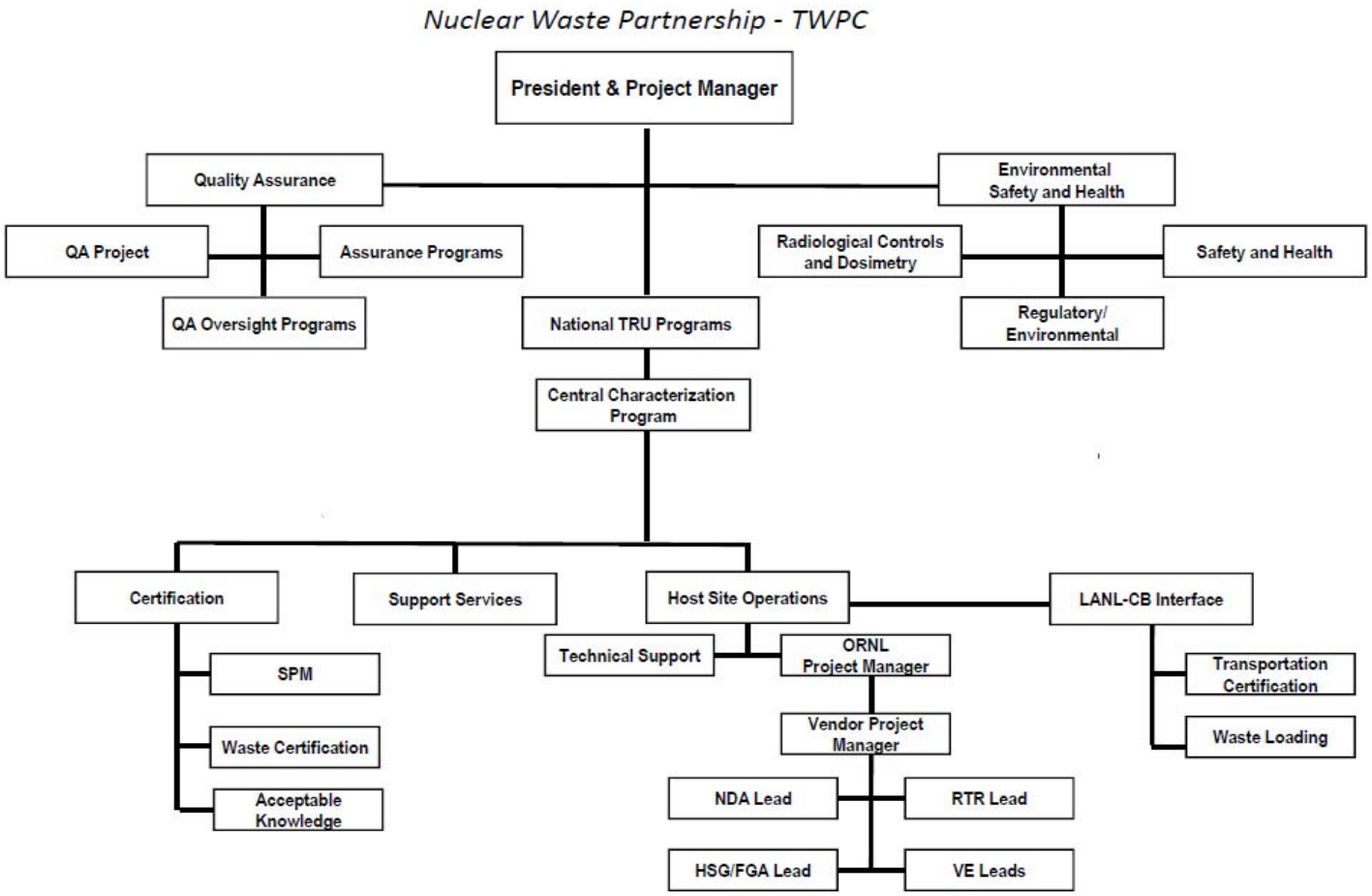
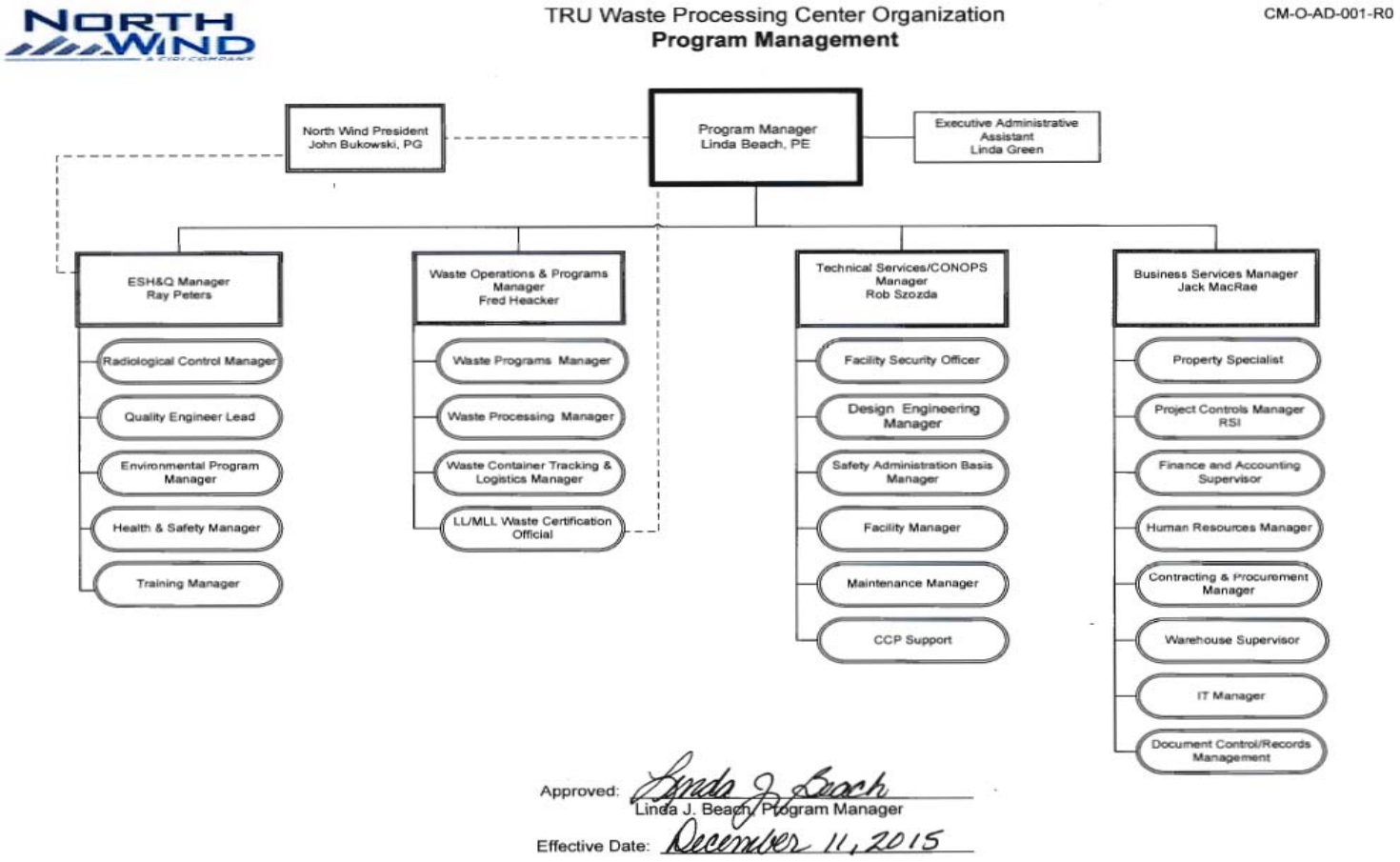


Figure 2 – TWPC Management Organization Chart



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CCP-QP-002

Revision 39

CCP
Training and Qualification Plan

EFFECTIVE DATE: 04/14/2015

Mike Ramirez

PRINTED NAME

APPROVED FOR USE

RECORD OF REVISION

Revision Number	Date Approved	Description of Revision
9	02/20/2002	Major rewrite to streamline and create a more concise procedure. Document reduced from 57 pages to 16 pages.
10	06/05/2002	Added References. Changes to CCP Technical Supervisor responsibilities. Added Training Evaluations to Records section. Deleted 4.2.5 Audit Personnel Qualifications. Other changes for clarification and consistency.
11	09/12/2002	Deleted Sections 3.3.2 and 3.3.3.
12	10/24/2002	Added Steps 3.8.2 and 3.8.3 in response to SRS Recertification Audit.
13	06/30/2003	Added NDE RTR Section, revised qualification letter and other minor editorial changes. Separated electronically fillable forms and updated references in procedure.
14	12/02/2003	Revision initiated to address CAR# 04-002 identified during CBFO audit A-04-03 and CAR# CCP-0009-03. Added information about RTR audio/videotapes and Capability Demonstrations. Added paragraph 4.2.3[A.5] discussing qualification card addenda. Added section 4.2.4[C] discussing FQAO appointment requirements.
15	03/10/2004	Added Capability Demonstration Instructions (Attachment 2) and CCP Capability Demonstration Data Sheet (Attachment 3 or CCP-QP-002-A1).
16	12/07/2004	Deleted the Technical Supervisor responsibilities section and incorporated them into the Vendor Project Manager responsibilities. Added partial qualification section. Removed requirement for the Site Project Manager to appoint the Facility Quality Assurance Officer by letter.
17	06/06/2005	Addressed CAR 05-029 and CAR 05-033 identified during Carlsbad Field Office (CBFO) Audits A-05-09 and A-05-12. Areas modified were qualification requirements for Nondestructive Assay (NDA) Expert Analyst and examination requirements for Central Characterization Project (CCP) Helium Leak Detection (HLD) Level III.
18	12/13/2005	Clarified roles and responsibilities in reviewing Capability Demonstration training audio/video media and modified Attachment 3 – CCP Capability Demonstration Data Sheet.
19	12/15/2005	Clarification for Level of Qualification in step 4.2.2[B.1].

RECORD OF REVISION (Continued)

Revision Number	Date Approved	Description of Revision
20	05/03/2006	Addressed CAR-RHINL-0001-06. Incorporated Remote-Handled waste training and position requirements. Restructured for improved flow.
21	06/13/2006	Updated step 4.2.5 to delete the word “training” from the requirements for VE Operator/ITR/TS/FQAO.
22	11/16/2006	Revised to implement the Waste Isolation Pilot Plant Hazardous Waste Facility Permit requirements resulting from the Section 311/Remote-Handled (RH) Permit Modification Request (PMR). Addressed Carlsbad Field Office (CBFO) Document Review Record (DRR) comments.
23	02/01/2007	Revised to address CCP Quality Assurance Surveillance Number SUR-CCP-0005-06.
24	02/27/2007	Revised to address concern raised during Surveillance #S-07-18.
25	05/08/2007	Revised to address Corrective Action Report (CAR) SRS-0002-07.
26	02/07/2008	Revised to address U.S. Department of Energy (DOE) Carlsbad Field Office (CBFO) Corrective Action Report (CAR) 08-004.
27	09/30/2008	Revised to change nondestructive examination (NDE) to comply with Management Assessment MA-CCP-0023-08. Also revised Section 5.1.1[J] in response to Carlsbad Field Office (CBFO) Corrective Action Report (CAR) 08-036.
28	05/26/2010	Revised to address Corrective Action Report (CAR)-CCP-0012-09, to clarify Acceptable Knowledge (AK) briefings, training for solids lab, and approval process for training material. References to Central Characterization Project (CCP) Program Manager/Project Manager were removed and the responsibilities assigned to the Lead Site Project Manager and CCP Manager responsible for Training.
29	07/08/2010	Revised to incorporate changes into Attachment 4, CCP Test Drum Data Sheet for Contact-Handled Waste, and other minor editorial changes.
30	12/29/2010	Revised to bring into compliance with the revision of the Waste *Isolation Pilot Plant Hazardous Waste Facility Permit.*

RECORD OF REVISION (Continued)

Revision Number	Date Approved	Description of Revision
31	04/21/2011	Revised based on Revision 2 of the DOE/WIPP 02-3214, *Remote-Handled TRU Waste Characterization Program Implementation Plan*.
32	04/03/2012	Revised to simplify the process for tracking waste stream Summary Training in Section 4.2. Added full requalification as an option in Section 4.1.2 [l]. Added the Training Module in Integrated Data Center (IDC) as a source of Training information to the note in Section 4.1. Incorporated Standing Orders CCP-SO-051 in Section 4.4.1[C], CCP-SO-069 in Section 4.2, and CCP-SO-078 in Section 4.1.2[F]. Expanded Section 4.1.1 to add a documented analysis of positions requiring qualification, in response to Carlsbad Field Office (CBFO) Corrective Action Report (CAR) 12-010.
33	08/30/2012	As a corrective action in response to CBFO CAR 12-033, revised the document to remove references to Lead SPMs and Alternate SPMs, so that any qualified SPM may perform the actions in Section 3.1.
34	01/30/2013	Revised to incorporate Standing Order CCP-SO-086, *Clarification of the Time Period for Performance of the RTR Semiannual Training Container Required by CCP-QP-002*; incorporate changes to DOE/WIPP-02-3214, *Remote-Handled TRU Waste Characterization Program Implementation Plan*; update the title of the organization, as appropriate; and minor editorial changes.
35	06/06/2013	Revised to implement the Permit Modification Request Class 2 approved by New Mexico Environment Department (NMED) dated March 13, 2013 and CAR-CCP-0003-13.
36	03/31/2014	Revised to incorporate changes in response to U.S. Environmental Protection Agency (EPA) Issue Tracking Form ORNL-CCP-CC-RTR-2014-02CR: adding a requirement for a written record for the Training Container, to be filled out by the operator for the review by the Cognizant Engineer (CE), and adding a place on the Training Container evaluation sheet for operator acknowledgement of counseling for any missed items. Also incorporated Standing Order CCP-SO-110.

RECORD OF REVISION (Continued)

Revision Number	Date Approved	Description of Revision
37	05/12/2014	In response to Carlsbad Field Office of the Department of Energy (CBFO) corrective active report (CAR) 14-030, revised the NOTE in Section 3.4 to clarify that the preferred method for determining an Subject Matter Expert (SME)/On-the-Job Training (OJT) candidate's education and experience is by reviewing the individual's resume, but whatever method is used must be explicitly stated in the documentation provided to Training by the site project manager (SPM). Also added a new Attachment 7 as a template for appointment letters to be issued by the SPM, which may be customized as necessary.
38	08/07/2014	Update the title of the organization from National TRU Program Certification (NTPC) to Central Characterization Program (CCP), clarify when Attachment 7, SPM Appointed Letter, is to be used, allow the acceptable knowledge expert (AKE) to give the waste stream summary training in addition to the Site Project Manager (SPM), add written notifications to the Records Section, delete the Operator/Independent Technical Reviewer (ITR) box in Attachment 7. Reorganized Section 4.3.2 to improve the flow of the sequence in steps.
39	04/14/2015	Revised to expand the section on training material, which now requires prior Central Characterization Program (CCP) Training review of training materials developed in response to conditions adverse to quality identified in Carlsbad Field Office (CBFO) Corrective Action Reports (CARs) and Nuclear Waste Partnership (NWP) Waste Isolation Pilot Plant (WIPP) Forms. Revised Attachment 1, Minimum Training and Education Requirements, to reflect upper-tier documents governing training-related requirements. Re-organized Sections 4.3 and 4.4 to improve process flow.

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1.0 PURPOSE

NOTE

CCP-QP-040, *Support Training,* applies to those activities that do not fall under the scope of CCP-QP-002, *CCP Training and Qualification Plan* as defined herein. CCP-QP-040 applies to those positions which are not covered by the baseline documents listed in Section 2.1 of this document.

This plan describes the responsibilities of personnel involved in the Central Characterization Program (CCP) Qualification and Training Program. This plan also describes the process for identifying qualification and training requirements for all personnel and technical support personnel, who perform characterization, packaging, certification, and activities.

1.1 Scope

This plan applies to all personnel who conduct quality-affecting activities associated with transuranic (TRU) waste under the CCP, including characterization, packaging, certification, and transportation.

Personnel under this plan are qualified and trained to ensure suitable proficiency is achieved and maintained for assigned tasks. Training and qualification requirements are commensurate with the nature of the activities and level of responsibility.

Training will emphasize the correct performance of work, provide a description of why quality, safety, and TRU waste characterization and certification requirements exist, and describe the fundamentals of the work and its context.

Training will be subject to an on-going evaluation to determine instruction and training program effectiveness and will be upgraded whenever needed improvements or enhancements are identified.

2.0 REQUIREMENTS

2.1 References

Baseline Documents

- DOE/WIPP 02-3183, *CH Packaging Program Guidance*
- DOE/WIPP 02-3184, *CH Packaging Operations Manual*
- DOE/WIPP 02-3185, *CH Packaging Maintenance Manual*
- NRC Docket 71-9212, *RH-TRU 72-B Safety Analysis Report*, Rev. 3, November 2002
- CCP-PO-001, *CCP Transuranic Waste Characterization Quality Assurance Project Plan*
- CCP-PO-003, *CCP Transuranic Authorized Methods For Payload Control (CCP CH-TRAMPAC)*

Referenced Documents

- DOE/WIPP 02-3214, *Remote-Handled TRU Waste Characterization Program Implementation Plan*
- ASNT SNT-TC-1A, *Recommended Practice for Personnel Qualification and Certification in Nondestructive Testing,* American Society for Nondestructive Testing (1980 Edition)
- ASTM C1490, *Standard Guide for the Selection, Training, and Qualification of Nondestructive Assay (NDA) Personnel*
- CCP-PO-002, *CCP Transuranic Waste Certification Plan*
- CCP-QP-005, *CCP TRU Nonconforming Item Reporting and Control*
- CCP-QP-008, *CCP Records Management*
- CCP-QP-030, *CCP Written Practice for the Qualification of CCP Helium Leak Detection Personnel*
- CCP-QP-032, *CCP Written Practice for the Qualification of CCP Pressure Change Leak Testing Personnel*

- CCP-QP-040*, Support Training*
- CCP-TP-028, *CCP Radiographic Test Drum and Training Container Construction*
- WP 15-GM1002, *Issues Management Processing of WIPP Forms, Management Control Procedure*

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3.0 RESPONSIBILITIES

3.1 Site Project Manager (SPM)

3.1.1 Oversees planning, characterization, and certification activities.

3.1.2 Ensures personnel are qualified and trained to perform their assigned job functions.

3.1.3 Determines initial and continuing qualification and training requirements in cooperation with appropriate Cognizant Engineer (CE), Manager Responsible for Training, and Training to ensure job proficiency is maintained.

NOTE

Staffing changes includes situations where individuals are brought into or re-assigned in the program (these qualified positions can be either project level or operational level).

3.1.4 Notifies Training of staffing changes and candidates for job positions and provides supporting documentation (e.g., resumes, certificates, diplomas, training records).

3.1.5 Verifies education/experience requirements for Nondestructive Assay (NDA) Expert Analysts (EA).

NOTE

Attachment 7, SPM Appointment, is a template to be used by the Site Project Manager (SPM) when appointing NDA EA(s), Remote-Handled (RH) Technical Staff, Subject Matter Experts (SME), or Visual Examination Experts (VEE). As a template/outline, it may be customized by the SPM, as necessary.

3.1.6 Using Attachment 7, appoints the following based on education and experience, as applicable:

[A] NDA EA

[B] RH Technical Staff

[C] Qualified personnel as SME/On-the-Job Training (OJT) Instructors

[D] VEE

3.1.7 Reviews and approves qualification cards.

3.1.8 Ensures project personnel who are assigned to perform project activities that affect quality:

[A] Are cognizant of the qualification and training requirements of this plan.

[B] Satisfy qualification and training requirements for the tasks associated with their assigned job classification(s).

3.1.9 Ensures the requirements of this plan are implemented, as follows:

[A] Personnel receive training and qualification, as necessary, to achieve initial proficiency, maintain proficiency, and adapt to changes in technology, methods, job responsibilities, and quality implementing procedures, prior to performing or verifying any waste characterization, certification, or transportation activities.

3.1.10 Ensures qualification and training documentation is complete and is submitted to Training.

3.1.11 Evaluates and documents personnel job performance at periodic intervals (as a minimum, during requalification).

3.1.12 Notifies the Manager Responsible for Training when full requalification is required (e.g., when an individual has been disqualified for unsatisfactory performance).

3.1.13 Analyzes positions to determine major job/task responsibilities as a basis for preparation of qualifications cards (shared responsibility).

3.2 Vendor Project Manager (VPM)

3.2.1 May administer the annual eye examination.

3.2.2 Ensures Training will be notified when qualified operations personnel leave the program (e.g., a subcontractor's employment has been terminated).

3.3 Training

3.3.1 Determines initial and continuing qualification and training requirements for positions in cooperation with an appropriate SME/OJT Instructor, the CE, a SPM, and the Manager Responsible for Training using a graded approach that is commensurate with scope, complexity, and nature of the work to include:

[A] Descriptions of the fundamentals of the work and the context in which the work is performed.

[B] Identification of the applicable quality and safety requirements related to job performance.

[C] Emphasis on the correct performance of work in accordance with established procedures and/or other relevant technical documents.

[D] Inclusion of education in both principles and enhancement of skills.

3.3.2 Supports an SPM in evaluating training and qualification requirements of each position. This may be done by, but is not limited to, evaluating training requirements using a training analysis. The analysis will result in an approved task list from which tasks may or may not be selected for training. When completed, the analysis will be signed by participants.

3.3.3 Develops, implements, and monitors training required to maintain qualification of personnel.

3.3.4 Ensures project-required training effectiveness is reviewed when the need for improvements or enhancements is identified, and ensures the training program is updated.

3.3.5 Maintains documentation of current personnel training status.

3.3.6 Issues approved training materials and assists in the completion of qualifications and training activities.

3.3.7 Prepares qualification cards.

3.3.8 Returns incomplete/incorrect training materials to candidate's manager, as applicable.

3.3.9 Provides qualification cards to an SPM for review and approval.

3.3.10 Ensures qualification/training records and supporting documentation (including audio/video recorded media for test drums and training containers) are maintained, secured, and controlled in accordance with CCP-QP-008, *CCP Records Management*.

3.3.11 Prepares list of qualified individuals (LOQIs) delineating those individuals who have completed qualification cards, and distributes to the applicable site.

3.3.12 Reviews, develops, and approves Comprehensive Examinations for thoroughness and adequacy.

3.3.13 Analyzes positions to determine major job/task responsibilities as a basis for preparation of Qualifications Cards (shared responsibility).

3.4 SME/OJT Instructor

NOTE

Before any OJT can be performed, it is necessary to initially qualify one SME/OJT Instructor for each discipline based on education and experience. The basis for SME/OJT Instructor qualification will be provided by an SPM and documented in the applicable Training files. The normal and preferred method for determining an SME/OJT candidate's education and experience is by reviewing the individual's resume, but whatever the method, it must be explicitly stated on Attachment 7, which is provided to Training by the SPM. The qualification is by discipline and is non-site specific. The basis for qualification will be used to complete a qualification card for the candidate as an SME/OJT Instructor. The successful candidate will be added to the appropriate LOQI(s) once the qualification card is complete.

The SME/OJT Instructor will have adequate education and/or technical knowledge in the applicable discipline, communication skills, and ability to provide trainees with hands-on experience, as determined by an SPM. Technical knowledge may be based on experience with the applicable process or involvement in development of operational procedures or qualification requirements for the applicable process.

The Mobile Loading Unit (MLU) Field Operations Manager (or designee) will appoint SME/OJTs for Transportation activities.

All SME/OJT candidates must complete the SME/OJT briefing and pass the SME/OJT exam.

3.4.1 Provides supervised hands-on training in the work environment to accomplish performance objectives of the training tasks.

3.4.2 Determines initial and continuing qualification and training requirements for CCP positions in cooperation with an SPM, the CE, the Manager Responsible for Training, and Training.

3.4.3 Ensures trainee(s) have satisfactory knowledge of and competence in skills requirements, as defined on the qualification card.

3.4.4 Verifies the correct revision of the qualification card is being used.

3.4.5 Signs and dates qualification card, indicating acceptable performance levels are met.

3.4.6 Provides all training documentation generated to Training in accordance with CCP-QP-008.

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3.4.7 Analyzes positions to determine major job/task responsibilities as a basis for preparation of Qualifications Cards (shared responsibility).

3.5 Personnel

3.5.1 Provides copies of their qualification documents (e.g., resumes, education, and experience) to an SPM or Training, as applicable.

3.5.2 Completes initial training in accordance with this procedure, as stated on each individual's qualification card.

3.5.3 Ensures qualification requirements are completed and signed off before performing assigned tasks without supervision.

3.5.4 Maintains requisite qualifications throughout the duration of work.

3.5.5 Attends CCP and site-specific training, as necessary.

3.6 Trainee

3.6.1 Completes qualification card(s) in a timely manner.

3.6.2 Works only under the supervision of a qualified operator or a SME/OJT Instructor.

3.7 Manager Responsible for Training

3.7.1 Reviews and approves all training material for applicability and technical content.

3.7.2 Determines when full requalification is required.

3.8 Cognizant Engineer (CE)

NOTE

A CE is not required for Transportation or acceptable knowledge (AK).

3.8.1 The CE is designated for each specific process by the CCP Manager based on their education, knowledge, and experience for the characterization process.

3.8.2 The CE has overall responsibility for the implementation and quality of the characterization activity.

3.8.3 The CE reviews material developed by Training for applicability and technical content.

3.8.4 Analyzes positions to determine major job/task responsibilities as a basis for preparation of qualifications cards (shared responsibility).

3.8.5 Reviews and evaluates training containers for real-time radiography (RTR) personnel, as applicable.

3.8.6 Evaluates the training documentation for RTR personnel and determines if they meet the requirements for certification, as applicable.

4.0 PROCEDURE

4.1 General Training Requirements

NOTE

The Training Module in the Integrated Data Center (IDC) provides information that may be used to update and maintain the information in documents provided by training, such as the LOQI. Such usage will be described in the applicable sections of this procedure.

4.1.1 Personnel selected to perform or verify CCP activities will have the education, experience, and training commensurate with job position requirements. The need for job position qualification cards will be determined by an SPM, the CE (if applicable), and Training.

4.1.2 Job position requirements will be analyzed and documented to determine the major duties and tasks associated with the position, as a basis for developing the qualification card for each activity requiring qualification. The analyses will be performed by an SPM, a SME/OJT Instructor, the CE (if applicable), and Training.

4.1.3 A separate analysis may not be required for new positions where the major duties and tasks are closely-related to those for an existing, already-analyzed position. This determination will be made and documented by the performers identified above.

4.2 Qualification Cards

4.2.1 For those positions that require a qualification card, training candidates are required to complete a qualification card to verify they possess the knowledge and skills necessary to competently perform specified tasks.

4.2.2 Qualification cards technical content will be determined by a SME/OJT Instructor, the CE (if applicable), the Manager Responsible for Training, and an SPM based on project requirements and federal and state regulations to verify training candidates possess the knowledge and skills necessary to competently perform specified tasks.

NOTE

The qualification cards for Helium Leak Detection Personnel are issued in accordance with CCP-QP-030, *CCP Written Practice for the Qualification of CCP Helium Leak Detection Personnel*. The qualification cards for Pressure Change Leak Testing (PCLT) personnel are issued in accordance with CCP-QP-032, *CCP Written Practice for the Qualification of CCP Pressure Change Leak Testing Personnel*.

4.2.3 All qualification cards shall be issued by Training.

4.2.4 The SME will verify current revision.

4.2.5 Training will verify that prerequisites are met.

4.2.6 Upon completion of the qualification card, candidates are considered qualified to perform their respective duties.

4.2.7 The qualification cards will contain the following information:

[A] Name of job position.

[B] Revision number and effective date.

[C] Trainee's name.

[D] Signature spaces for approvals of format, technical content, and use by a SME/OJT, the CE, an SPM, and the Manager Responsible for Training, as applicable.

4.2.8 The qualification card will be divided into the following parts, as applicable:

[A] Education/Experience.

[B] Job Specific Training (which may include):

- Indoctrination/Orientation
- Initial Reading
- Formal Training
- National Standards Certifications
- OJT
- Signature line and date for trainee
- Approval section for a SME/OJT
- Approval section for an SPM

4.2.9 If a qualification card requires changes, the following is performed:

[A] Training, prepare the revised qualification card, using the next sequential revision number.

[B] Training, route the revised qualification card to the following for review and approval: a SME/OJT, the CE (if applicable), an SPM, and the Manager Responsible for Training.

[C] Training, upon approval, place a new effective date on the qualification card and issue the qualification card.

4.3 Requalification

NOTE

Requalifications are due by the end of the month in which the qualification period falls, unless a specific date is listed on the qualification card.

4.3.1 Operational Positions (e.g., RTR, NDA, etc.) require requalification every two (2) years. Exceptions are: Helium Leak Detection (HLD) Level III (Limited) and Pressure Change Leak Testing (PCLT) Level III (Limited) have a three year requalification requirement. If necessary, additional training may be required by an SPM, or the Manager Responsible for Training. The sections of the qualification card that must be performed during each requalification are identified on the qualification cards.

4.3.2 Requalification of Project Office positions is not required.

4.4 Disqualification

4.4.1 Unsatisfactory performance will result in disqualification by the SPM.

4.4.2 The SPM will notify the Manager Responsible for Training.

4.4.3 The Manager Responsible for Training will direct CCP Training to remove the individual from the LOQI (if required) and to update the training file and IDC.

4.5 Requalification after Disqualification or Extended Absence

NOTE

Full requalification is required when an individual has not been performing the qualified function for a significant period of time, or has been disqualified. Typically, full requalification would apply after an absence from the position of more than one year; however, there may be extenuating circumstances and each occurrence is reviewed and documented on a case-by-case basis by the SPM and the Manager Responsible for Training.

4.5.1 The SPM notifies training to issue the qualification card.

4.5.2 The trainee must successfully complete a full requalification (i.e., repeat the entire qualification card) to re-establish qualification.

4.6 Training Material

NOTE

Completion of the Waste Isolation Pilot Plant (WIPP) Waste Acceptance Plan (WAP)/Quality Assurance Project Plan (QAPjP) Briefing is a pre-requisite for all personnel before they perform *Waste Isolation Pilot Plan-Waste Analysis Plan* (WIPP-WAP) specific tasks.

4.6.1 Approved training material shall be maintained, secured, and controlled by Training.

4.6.2 New or revised formal training materials, (e.g., the WAP/QAPjP Briefing) shall be approved for format, technical content, and use by an SPM, the Manager Responsible for Training, and the CE, if applicable.

4.6.3 Training material required as a result of a condition adverse to qualify identified in Carlsbad Field Office (CBFO) Corrective Action Reports (CARs) or Nuclear Waste Partnership (NWP) WIPP Forms shall be reviewed by CCP Training prior to being approved by the assigned Responsible Manager.

4.6.4 Informal briefings and waste stream summary training briefings do not require prior review or approval.

4.7 Waste Stream Summary Training

NOTE
RTR and visual examination (VE) personnel shall be trained on newly developed and revised waste stream reports which change the waste generating processes, packaging, and waste material parameters (WMP) expected to be found in each Waste Matrix.

4.7.1 SPM, forward the newly-issued or revised AK to the Vendor Project Manager (VPM) at the Host location where the AK applies.

4.7.2 SPM, in conjunction with Acceptable Knowledge Expert (AKE), develop the AK training in the form of a briefing which identifies as a minimum the following:

- Specific waste generating processes
- Packaging
- WMP for the waste matrix code

4.7.3 SPM or AKE, provide the briefing to the required RTR and VE personnel.

4.7.4 SPM or AKE, submit the briefing materials and the completed briefing sheet(s) (or personnel can send individual e-mail acknowledgements) to Training.

4.7.5 Training, update the LOQI for all personnel who received the briefing, showing that they are qualified to perform work on the identified waste stream.

[A] Remove the qualified status for the identified waste stream from the LOQI when either:

[A.1] The SPM so directs, because the waste stream is no longer active, or

[A.2] The Training Module in the IDC shows that the waste stream is no longer active.

4.8 Specific Training, Qualification and Requalification (if applicable) Requirements.

4.8.1 AKE's are personnel assigned to compile, evaluate, and resolve discrepancies associated with AK information. AKE's require the following:

[A] WIPP-WAP Briefing.

[B] CCP-PO-002, *CCP Transuranic Waste Certification Plan* knowledge.

[C] DOE/WIPP 02-3214, *Remote-Handled TRU Waste Characterization Program Implementation Plan* knowledge.

[D] Training on Federal and State Resource Conservation and Recovery Act (RCRA) regulations associated with solid and hazardous waste determinations. Training requirement will be satisfied by documented completion of a formal RCRA training program (e.g., a commercially available RCRA seminar), or an SPM's documented evaluation of adequate training and/or experience.

[E] Knowledge of procedures associated with:

(a) Waste characterization using AK.

(b) AK records development including AK discrepancy resolution.

(c) Nonconformance Report (NCR) process in accordance with CCP-QP-005, *CCP TRU Nonconforming Item Reporting and Control*.

(d) WIPP Form process, in accordance with WP 15-GM1002, *Issues Management Processing of WIPP Forms, Management Control Procedure*.

[F] Knowledge of resolving and managing prohibited items as noted in nonconformance reporting.

4.8.2 RTR Operator/Independent Technical Reviewer (ITR)

[A] Personnel considered for qualification in RTR must have sufficient education, training, and experience to ensure understanding of the principles and procedures.

[B] Education requirements are listed in Attachment 1, Minimum Training and Education Requirements. Personnel being considered for qualification as an RTR Operator/Independent Technical Reviewer (ITR) will complete training to become familiar with the principles and practices of the applicable RTR method.

[C] Any previous training and experience gained in a position similar to the RTR Operator/ITR position may be considered in satisfying the qualification criteria of this procedure and shall be documented in the Training file (i.e., resume).

[D] All RTR personnel will be trained to the guidance of American Society for Nondestructive Testing (ASNT) Recommended Practice Number SNT-TC-1A, *Recommended Practice for Personnel Qualification and Certification in Nondestructive Testing,* modified to suit the RTR application/method.

[D.1] A certificate from an approved vendor, stating that the individual operator is a certified RTR operator Level II (L) SNT-TC-1A, will be provided to Training.

[E] An individual qualifying as an RTR Operator/ITR is considered a trainee. A trainee will work only under the supervision of a qualified operator or SME/OJT Instructor.

[F] To be considered for qualification as an RTR Operator/ITR, the trainee must pass the required examinations (as listed in Section 4.8.2 [G]below) and complete the qualification card.

[G] Examinations

NOTE

Eye Exams are due by the end of the month in which the examination was given.

[G.1] Eye Examination: All trainees will pass an initial eye examination to ensure natural or corrected near-distance acuity in at least one eye.

(a) The trainee must be capable of reading Jaeger Number 2 at a distance of not less than twelve (12) inches on a standard Jaeger test chart.

(b) The eye examination will demonstrate the capability of distinguishing and differentiating contrast used in RTR.

(c) The eye examination will be administered on an annual basis and the results maintained in the Training files.

(d) VPMs at each site may administer the eye examination.

[G.2] Comprehensive Examination: Pass a program-specific comprehensive exam with an 80 percent or better grade that addresses radiography operations, documentation, characterization, and procedural elements.

[G.3] Training Container

NOTE

A Training Container is required by contact-handled (CH) and RH operators at initial qualification, requalification, and semi-annually. The nominal period for performance of the Training Container is every six months, due by the end of the month of the sixth month from the date the Training Container was successfully passed.

The Training Container will contain items which can be identified by RTR, are representative of the physical properties of the waste based on AK documentation reviewed, and prohibited items.

(a) At initial qualification, requalification, and semiannually, successfully examine a Training Container and identify 100 percent of the items required to meet the Data Quality Objectives (DQO's). The Nondestructive Examination (NDE) CE will review the audio/video recording to ensure the operator's interpretations remain consistent and accurate.

(b) Instructions and documentation required for Training Containers is as follows:

(b.1) Attachment 4, Training Container Instructions

(b.2) Attachment 2, CCP NDE Training Container Inventory Sheet (from CCP-TP-028, *CCP Radiographic Test Drum and Training Container Construction*)

(b.3) Attachment 5, Training Container Data & Evaluation Sheet

(b.4) Audio/video recorded media of the Training Container

(c) The NDE CE or an SPM may request an extension of the period between performances of the Training Container for up to one additional month (for a total of seven months between Training Containers, beginning with the date the examination was reviewed and approved by the CE).

(c.1) Upon receipt of a written request from the SPM or NDE CE, Training will extend the Training Container due date for the operator on the LOQI.

(c.2) The request will be retained by Training.

(c.3) When Training receives evidence the operator has satisfactorily completed the Training Container, Training will enter a due date for the next Training Container that takes into account the earlier extension (e.g., five month due date, not six month).

(c.4) If the operator exceeds the one month extension due date on the LOQI, Training will remove the individual from the LOQI until the Training Container has been successfully completed.

(c.5) Extension is not permitted at the time of requalification.

[G.4] Test Drum

NOTE

The requirement for completing the test drum defined in the Waste Characterization Program Implementation Plan (WCPIP) is met by successfully completing the Training Container.

Test Drums are due by the end of the month in which the qualification period falls.

(a) At initial qualification and subsequent requalification, successfully examine a test drum that includes items common to the waste

streams and is representative of the waste matrix codes and WAC required items.

(b) Instructions and documentation required for test drums are as follows:

(b.1) Attachment 2, Test Drum Instructions for Contact-Handled Waste Drums.
(b.2) Attachment 1, CCP NDE Test Drum Inventory Sheet (from CCP-TP-028).

(b.3) Attachment 3, Test Drum Data Sheet for Contact-Handled Waste.

(b.4) Audio/video recorded media of the test drum.

NOTE
Certification of RTR Operator/ITR personnel is documented on the completed qualification card.

[H] Qualification

[H.1] Successful qualification of the RTR Operator/ITR is documented by completing the qualification card.

[H.2] To maintain qualifications, the CH and RH RTR Operator/ITR must:

(a) Successfully perform a Training Container semiannually, documented on Attachment 5.

(b) Successfully complete an annual eye examination.

[I] Requalification

[I.1] Requalification is based on evidence of satisfactory performance of a test drum, a training container, and passing a comprehensive exam with a grade of 80 percent or better once every two years.

[I.2] If necessary, additional training may be required by a SME/OJT, an SPM, the CE, or the Manager Responsible for Training.

[J] Upon successful qualification, an RTR Operator/ITR will:

[J.1] Be able to set up and operate equipment, and be qualified to interpret and evaluate results with respect to applicable codes, standards, and specifications.

[J.2] Be thoroughly familiar with the scope and limitations of RTR.

[J.3] Exercise the responsibility for OJT and apprenticeship of trainees.

[J.4] Be able to prepare written instructions.

[J.5] Be able to organize Batch Data Reports (BDRs) with the results of RTR.

4.8.3 Transportation personnel who require qualification in HLD are trained in accordance with CCP-QP-030 and documented on Attachment 1, CCP HLD Qualification Card of CCP-QP-030.

4.8.4 Transportation personnel who require qualification in PCLT are trained in accordance with CCP-QP-032 and documented on Attachment 1, CCP PCLT Qualification Card of CCP-QP-032.

4.8.5 VE Operator/ITR

[A] For the initial qualification and subsequent requalification, the Operator/ITR must:

[A.1] Pass comprehensive exam with an 80 percent or better grade that addresses VE operations, documentation, characterization, formal training elements, and procedural elements.

[A.2] Demonstrate capability in the presence of the VEE during OJT. However, the formal and OJT training is conducted by a qualified SME.

4.9 Appointments

4.9.1 For NDA EA candidate(s), an SPM will perform the following:

[A] Review the training files for an undergraduate degree in physical science or engineering and five years NDA experience; or ten equivalent years of experience in the NDA field, in accordance with ASTM C1940, *Standard Guide for*

the Selection, Training and Qualification of Nondestructive Assay (NDA) Personnel.

[B] Provide written notification to Training delineating the candidate's qualifications and experience, using Attachment 7.

4.9.2 For RH Technical Staff candidate(s), an SPM will perform the following:

[A] Provide written notification to Training delineating the candidate's qualifications and experience, using Attachment 7.

4.9.3 For SME candidate(s), an SPM will perform the following:

[A] Review the training files for education and experience.

[B] Provide written notification to Training delineating the candidate's qualifications and experience, using Attachment 7.

4.9.4 For VEE candidate(s), an SPM will performs the following:

[A] Review the training files for qualification/familiarity to waste stream, experience handling TRU waste, and VE Operator qualifications.

[B] Provide written notification to Training delineating the candidate's qualifications and experience, using Attachment 7.

[C] Ensures that the appointments are facility–specific.

5.0 RECORDS

5.1 Records generated during the performance of this plan are maintained as quality assurance (QA) records in accordance with CCP-QP-008. The records are the following:

5.1.1 QA/Nonpermanent Records

[A] Written Notifications

[B] Attachment 7, SPM Appointment

[C] Letters to Training

[D] Certificates of Completion

[E] Training Analysis

[F] Qualification and training records

[F.1] OJT records

[F.2] Completed exams

[F.3] Qualification Card

[G] Training materials (e.g., course presentation, exam)

[H] Completed attendance/briefing forms,

[I] Attachment 3, Test Drum Data Sheet for Contact-Handled Waste

[I.1] Audio/video recording media (primary and backup)

[J] Attachment 5, Training Container Data & Evaluation Sheet

[J.1] Audio/video recording media (primary and backup)

[K] Resumes as applicable

[L] Comprehensive Examinations

[M] WAP Briefing

[N] Eye Examination (Medical)

[N.1] Attachment 6, Annual Record of Eye Examination, when applicable

[N.2] Independent Eye Examination (from medical facility), when applicable

[O] Training Module (Electronic)

Attachment 1 – Minimum Training and Education Requirements

Nondestructive Assay (NDA)	
NDA Personnel	In accordance with ASTM C1490, *Standard Guide for Selection, Training, and Qualification of Nondestructive Assay (NDA) Personnel.*
Nondestructive Examination (NDE)	
Helium Leak Detection Operators	In accordance with ASNT SNT-TC-1A, June 1980 edition. See CCP-QP-030.
Pressure Change Leak Testing Operators	In accordance with ASNT SNT-TC-1A, June 1980 edition. See CCP-QP-032.
Radiography Operators/ITRs	Site specific training based on waste matrix codes, waste material parameters, and packaging configurations; requalification every two years. Certification in accordance with ASNT SNT-TC-1A, June 1980 edition.
Visual Examination Operators/ITRs	Site specific training based on waste matrix codes, waste material parameters, and packaging configurations; requalification every two years.

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Attachment 2 – Test Drum Instructions for Contact-Handled Waste Drums

OPERATOR

1.0 In the presence of an RTR SME/OJT Instructor, perform the following:

1.1 Pre-start operations and audio/video recording media system setup of the RTR equipment per site approved radiography operating procedure.

1.2 Load the test drum into the RTR unit.

1.3 Ensure the audio/video recording identifies the following information:

[A] The identifying test drum container (e.g., NDE-TEST-01)
[B] Exam date
[C] Operator's name

1.4 Complete Blocks 1 through 4 of Attachment 3.

1.5 Perform scan of the test drum, identifying test drum container, and complete Block 5 of Attachment 3. Provide a detailed description (including content) of all items found within the container.

1.6 Complete Block 6 of Attachment 3.

1.7 Label the audio/video media with the following information:

[A] The identifying training container (e.g., NDE-TEST-01)
[B] Exam date
[C] Operator's name
[D] "A" for primary or "B" for backup

1.8 Provide the audio/video recording media and Attachment 3 to an RTR SME/OJT Instructor.

SME/OJT INSTRUCTOR

2.0 Observe the test drum and complete Attachment 3 as follows:

2.1 Complete Blocks 7 and 8 of Attachment 3.

2.2 **IF** the Operator has correctly identified the items within the test drum, **THEN** perform the following:

2.2.1 Enter N/A in Block 9 of Attachment 3.

2.2.2 Check PASS in Block 10 of Attachment 3.

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Attachment 2 – Test Drum Instructions for Contact-Handled Waste Drums (Continued)

2.2.3 Print name, sign, and date in Block 11 of Attachment 3.

2.2.4 Forward the audio/video recording media and Attachment 3 to Training in accordance with CCP-QP-008.

2.3 **IF** the Operator DOES **NOT** identify all WAC required items in Block 8 of Attachment 3 correctly,
THEN perform the following:

2.3.1 If applicable, document unidentified non-WAC required items in Block 9 of Attachment 3, **ELSE** enter N/A.

2.3.2 Check FAIL in Block 10 of Attachment 3.

2.3.3 Print name, sign, and date in Block 11 of Attachment 3.

2.3.4 Notify an SPM and Training.

2.3.5 Forward Attachment 3 and the audio/video recording media to Training in accordance with CCP-QP-008.

NOTE

RTR Personnel who fail the test drum will be requalified after meeting initial qualification requirements.

2.4 **IF** any items (other than WAC-required items) were not identified,
THEN discuss and document the noted discrepancies with the Operator.

2.4.1 Document unidentified items in Block 9 of Attachment 3, **AND** discuss with the Operator.

2.4.2 Check PASS in Block 10 of Attachment 3.

2.4.3 Print name, sign, and date in Block 11 of Attachment 3.

2.4.4 Forward Attachment 3 with the audio/video recording media to Training in accordance with CCP-QP-008.

Attachment 2 – Test Drum Instructions for Contact-Handled Waste Drums (Continued)

TRAINING

3.0 Ensure receipt of all required test drum documentation.

4.0 **IF** notified by the RTR SME/OJT Instructor that a currently qualified Operator has failed the test drum,
THEN remove the Operator from the LOQI **AND** update the Training files.

5.0 **IF** Attachment 3 indicates PASS,
THEN update the LOQI and the Training files.

Attachment 3 – Test Drum Data Sheet for Contact-Handled Waste

1. Operator Name:	
2. Test Drum #:	**3. Date of Demonstration:**
4. Audio/Video Recording Media Label:	
5. Container Inventory (Provide detailed description)	
6. Operator Signature:_____ **Date:**_____	

Attachment 3 – Test Drum Data Sheet for Contact-Handled Waste (Continued)

7. Operator Name:			
8. WAC Required Items (SME check items identified by operator)			
	Aerosol can with puncture		Full container
	Horsetail bag		Aerosol can with fluid
	Pair of coveralls		One gallon bottle with three tablespoons of fluid
	Empty bottle		One gallon bottle with one cup of fluid (upside down)
	Irregular shaped pieces of wood		Leaded glove or leaded apron
	Empty one gallon paint can		Wrench
9. Additional items not identified:			

10. As SME/OJT Instructor, I observed the above demonstration and have discussed any missed items with the Operator. I have assigned a grade based on the review above.	**PASS**		**FAIL**	

11. SME Printed Name:_____

SME Signature:_____ **Date:**_____

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Attachment 4 – Training Container Instructions

OPERATOR

1.0 Perform the following:

1.1 Complete Blocks 1 through 4 of Attachment 5.

1.2 Verify the RTR unit and audio/video system is configured to run the training container.

1.3 Load the training container into the RTR unit.

1.4 Ensure the audio/video recording identifies the following information:

[A] The identifying training container (e.g., NDE-TRAINING-01)
[B] Exam date
[C] Operator's name

1.5 Perform scan of the training container, identifying training container, detailed description of contents including container sizes and volumes of liquid.

1.6 Document the scan information in Block 5 of Attachment 5.

1.7 Complete Block 6 of Attachment 5.

1.8 Label the audio/video media with the following information:

[A] The identifying training container (e.g., NDE-TRAINING-01)
[B] Exam date
[C] Operator's name
[D] "A" for primary or "B" for backup

1.9 Make a copy of training audio/video for the NDE CE. (Labeled the same add "Copy".)

2.0 Forward the audio/video (primary and backup) recording media and Attachment 5 to Training, in accordance with CCP-QP-008.

3.0 Forward the copy of the training audio/video to the NDE CE.

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Attachment 4 – Training Container Instruction (Continued)

Training

4.0 Provide Attachment 5 to the NDE CE.

NDE CE

5.0 Review the Training Container scan and document discrepancies (accuracy and consistency) in Block 5 of Attachment 5.

6.0 Record in Block 8 of Attachment 5 if the operator passed or failed based on identification of the DQOs.

7.0 Print name, sign, and date in Block 9, of Attachment 5.

8.0 If the Operator fails to identify an item that is not a DQO, counsel the operator on the item(s) missed.

8.1 If counseling was required, have the operator acknowledge receipt of the counseling in Block 10 of Attachment 5. The acknowledgement can be either with the operator signature, or via Telecon.

9.0 If additional actions are required in response to an operator's performance, the CE will coordinate with Manager Responsible for Training.

10.0 Forward Attachment 5 to Training in accordance with CCP-QP-008.

TRAINING

11.0 Ensure receipt of all required documentation,
THEN update the LOQI and the Training files.

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Attachment 5 – Training Container Data & Evaluation Sheet

1. Operator Name:		**2. Demonstration Date:**		
3. Training Container #:		☐ **Box**	☐ **Drum**	
4. Audio/Video Recording Media Label:				
5. Container Inventory (Provide detailed description)				
6. Operator Signature:_____ **Date:**_____				
7. I have counseled the operator on the following interpretation issues:				
8. I have assigned a grade based on the review above.	**PASS**		**FAIL**	
9. NDE CE Printed Name: _____ **NDE CE Signature:**_____ **Date:**_____				
10. Acknowledgement by the Operator of Counseling Received (if required): **Operator Printed Name:** _____ **Operator Signature:**_____ **Date:**_____				

Attachment 6 – Annual Record of Eye Examination

Employee Name:		
Examination Date:		
Examined By:		
	Printed Name and Title	
	Signature	
Examination Type:	**Jaeger-near acuity**	
Jaeger Level Tested:	**J-2**	
Results: (circle one)	**Pass**	**Fail**
Contrast Proficient: (circle one)	**Yes**	**No**

Note:

A visual acuity examination shall be administered to the candidate prior to the initial qualification and annually thereafter.

A professional optometrist, medical doctor, nurse, or personnel designee by procedure shall administer this examination.

The candidates shall have natural or corrected near-distance acuity in at least one eye, capable of reading J-2 letters on a standard Jaeger test chart at a distance of not less then 30.5 centimeters (12 inches).

The examination shall demonstrate the capability of distinguishing and differentiating contrast between colors used in the method.

Attachment 7 – SPM Appointment

Date:

Subject: Appointment for (candidate's name) for the position of (name of position)

Based on (candidate's name) resume and/or personal knowledge of (name's) work history, I have determined (he/she) has suitable education and experience in accordance with CCP-QP-002, *CCP Training and Qualification Plan*, for the position of:

- ☐ Expert Analyst for (insert specific NDA equipment and Host site)
- ☐ RH Technical Staff
- ☐ (Initial) Subject Matter Expert (SME) for (insert operation or NDA unit).
- ☐ Visual Examination Expert (VEE) for the (name facility and Host site). This is a (CH or RH) function. I have reviewed (candidate's name) training file for qualification/familiarity to the applicable waste streams, experience handling TRU waste, and VE Operator qualifications.

For Initial SMEs: (Candidate's Name) will assist (assisted) with the set-up of (equipment name) at (site). As the initial SME, (Name) will assist (also assisted) with the development of procedures and a qualification card specific to the (unit/site).

Please initiate, as applicable, the CCP-specific training. (Candidate's name) will not be considered qualified for this(these) position(s) until all applicable/required training is complete, on file with CCP Training, and listed on the applicable LOQI(s).

If you have any questions, please contact me.

Thank you,

(SPM Name)
Site Project Manager

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CCP-QP-005

Revision 25

CCP
TRU Nonconforming Item Reporting and Control

EFFECTIVE DATE: 07/29/2015

Mike Ramirez

PRINTED NAME

APPROVED FOR USE

RECORD OF REVISION

Revision Number	Date Approved	Description of Revision
17	08/27/2008	Revised to include language describing the process the Central Characterization Project (CCP) personnel use when performing open Nonconformance Report (NCR) checks and whether the NCR is "resolved" for a particular container in conjunction with software changes to the Progress Tracking System (PT-S) (NCR status) portion of the CCP Datacenter. Also included additional language with respect to reconciliation of HOLD Tags once the NCR's are cleared for containers and incorporated the directive in Standing Order CCP-SO-30, Clarification of Rework and Reject. This is in response to U.S. Department of Energy-Carlsbad Field Office (DOE/CBFO) Corrective Action Report (CAR) CAR-08-025.
18	08/13/2009	Revised to incorporate freeze file editorial changes, clarify the ability to delete/remove containers from the Batch Data Report (BDR)/Container ID list when revising a nonconformance report (NCR) per CAR-LANL-0001-09, and incorporate Central Rev. Characterization Project (CCP) Standing Order (SO) CCP-SO-024, 1.
19	10/14/2010	Revised to: clarify hold tag application; Carlsbad Field Office (CBFO) notification requirements including responsibility, incorporate CCP-SO-054, 1 and CCP-SO-065, 0; revisions to Attachment 1, CCP Nonconformance Report (NCR); and other minor editorial changes.
20	04/26/2011	Revised to incorporate relevant steps from CCP-QP-004, *CCP Corrective Action Management,* and other editorial changes.
21	03/05/2012	Revised to incorporate clarification of K-trend code designees signature authority and other editorial changes and freeze file items.
22	09/27/2012	Revised to add definitions; to move 2.5.1 to 4.2.1 [F]; to clarify 4.4.15 and Attachment 1, 4.2.10, and Carlsbad Field Office (CBFO) notification in 4.3.1; to add new 4.9.3 to address removal of Hold Tags when voiding a Nonconformance Report (NCR); to incorporate freeze file changes; to modify Attachment 1; to correct some typos and editorial mistakes.

RECORD OF REVISION (CONTINUED)

Revision Number	Date Approved	Description of Revision
23	06/25/2013	Revised to incorporate Nuclear Waste Partnership (NWP) transition changes; ensure chronological order; to change Notes that include action steps to action steps; to remove contradiction with CCP-PO-024, *CCP/INL Interface Document,* in 4.5.10 [A.2]; to add Attachment 2, Instructions for Completing Attachment 1, CCP Nonconformance Report, and Attachment 6, NCR Hold Tag Guidance, incorporating portions of Standing Order CCP-SO-036 and to implement the Permit Modification Request Class 2 approved by New Mexico Environment Department (NMED) dated March 13, 2013.
24	04/29/2014	Revised determination of recurring condition; deleted all references to CCP-QP-029 and internal Corrective Action Reports (CARs) which was obsoleted and replaced with WP 15-GM1002; replaced reference Carlsbad Field Office (CBFO) Quality Assurance Program Description (QAPD) with Nuclear Waste Partnership (NWP) QAPD; rearranged 4.1.6, 4.2.10 and 4.2.11 for better chronological order; revised definitions “Repair” and “Rework”; corrected various editorial mistakes.
25	07/29/2015	Revised to address Carlsbad Field Office (CBFO) CAR 15-035 and other editorial changes.

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1.0 PURPOSE

This procedure establishes the requirements and responsibilities for identifying, documenting, reporting, and dispositioning items and services that do not meet established requirements.

1.1 Scope

1.1.1 This procedure applies to Central Characterization Program (CCP) waste characterization, certification, packaging, and transportation. It establishes the process for identifying, documenting, controlling, evaluating, dispositioning, and verifying completion of dispositioning of nonconforming conditions associated with items, equipment, and Batch Data Reports (BDRs).

1.1.2 Nonconforming items will be controlled to prevent any adverse impact on test, installation, use, waste certification, or waste shipment. Organizations affected by the nonconformance will be notified.

1.1.3 Personnel evaluating and determining the disposition of nonconforming items will have demonstrated competence in the specific area they evaluate, adequate understanding of the requirements, and access to pertinent background information.

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2.0 REQUIREMENTS

2.1 References

Baseline Documents

- WP13-1, *Nuclear Waste Partnership, LLC, Quality Assurance Program Description* (QAPD)
- CCP-PO-002, *CCP Transuranic Waste Certification Plan*
- CCP-PO-003, *CCP Transuranic Authorized Methods For Payload Control (CCP CH-TRAMPAC)*
- CCP-QP-010, *CCP Document Preparation, Approval, and Control*

Referenced Documents

- DOE/WIPP-02-3214, *Remote-Handled TRU Waste Characterization Program Implementation Plan*
- CCP-PO-001, *CCP Transuranic Waste Characterization Quality Assurance Project Plan*
- CCP-QP-008, *CCP Records Management*
- CCP-QP-014, *CCP Quality Assurance Trend Analysis and Reporting*
- CCP-QP-019, *CCP Quality Assurance Reporting to Management*
- CCP-TP-001, *CCP Project Level Data Validation and Verification*
- CCP-TP-068, *CCP Standardized Container Management*
- CCP-TP-120, *CCP Container Management*
- WP 15-GM1002, *Issues Management Processing of WIPP Forms*
- 10 Code of Federal Regulations (CFR) Part 71, *Packaging And Transportation Of Radioactive Material*

2.2 Definitions

As Low As Reasonably Achievable (ALARA)	A principle of all work at the site in the use or handling of radioactive materials in which personnel radiation exposure, including the work force and public, is kept at a level as low as possible by reasonable means.
Condition Adverse to Quality (CAQ)	An all-inclusive term used in reference to any of the following: failures, malfunctions, deficiencies, defective items, nonconformances, and technical inadequacies.
Data Quality Objective (DQO) Process	A strategic planning approach based on the scientific method used to prepare for data collection. The Data Quality Objective (DQO) process provides a systematic procedure for defining the criteria that a data collection design should satisfy, including when and where to collect samples, the tolerable level of decision errors for the study, and how many samples to collect.
Item	An all-inclusive term used in place of any of the following: appurtenance, assembly, component, equipment, material, module, part, structure, subassembly, subsystem, system, unit, support system, or data.
Nonconformance Report Module (NCRM)	Nonconformance Report Module (NCRM), an electronic database that is part of the Integrated Data Center (IDC).
Nonconformance	A deficiency in a characteristic or record that renders the quality of an item or sample unacceptable or indeterminate.
Orphaned HOLD TAG	A HOLD TAG no longer attached to its associated nonconforming item.

Price-Anderson Amendments Act (PAAA)	Law passed by Congress intended to minimize the risk to workers and the public by ensuring that U.S. Department of Energy (DOE) nuclear work is conducted so that human health and safety and the environment are protected adequately.
Repair	The process of restoring an item to a condition such that the capability of the item to function reliably and safely is unimpaired even though that item still does not conform to the original requirement. In container management, “repair” refers to nonconforming characteristics for which the container(s) must be rerun through characterization and the associated BDR that will be superseded by a new one.
Reject	A disposition for nonconforming items for which no resolution that meets the given requirements is possible, and the item cannot be accepted, requiring discarding, replacement, or recharacterization.
Rework	The process by which an item is restored to original specifications by completion or correction. In container management, “rework” refers to nonconforming characteristics that may be corrected without rerunning the container(s) through characterization and the BDR will be completed or corrected.
Scrap	A disposition for nonconforming items which requires discarding or return to supplier.
Supplier	Any individual or organization who furnishes items or services in accordance with a contract. An all-inclusive term used in place of any of the following: vendor, seller, source, participant, contractor, or subcontractor.

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Technical Change	Changes to container or BDR identifications, Interim or Final Dispositions, Actual Conditions, or Requirements.
Traceability	The ability to trace the history, application, and location of an item, data, or sample using documentation. As related to metrology, traceability means the ability to relate individual measurement results through an unbroken chain of calibrations to one or more of the following: • U.S. national standards maintained by National Institute of Standards and Technology (NIST) or the U.S. Naval Observatory • Fundamental or natural physical constants with values assigned or accepted by NIST • National standards of other countries which are correlated with NIST
Use-As-Is	A disposition permitted for a nonconforming item when it can be established that the item is satisfactory for its intended use.
Work	The process of completing a defined task. Examples include; research and development, operations, maintenance and repair, administration, software development and use, inspection, safeguards and security, and data collection and analysis.

2.3 Nonconformance Report Module (NCRM)

2.3.1 The NCRM provides the capability for an accurate and timely assessment of the status of all Nonconformance Reports (NCRs).

2.3.2 The NCRM provides the capability to trend NCRs for conditions adverse to quality.

2.3.3 The NCRM provides, as a minimum, the following:

- NCR Number and Revision
- Initiation Date
- NCR Originator

- Responsible Manager
- BDR/Container (as applicable)
- Actual Condition
- Final Disposition
- Trend Code
- Closure Date
- NCR Log

2.3.4 The NCRM is maintained in the CCP Project Office. The NCRM may also be updated by authorized quality assurance (QA) personnel at specified Host sites.

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3.0 RESPONSIBILITIES

3.1 NCR Originator

3.1.1 CCP personnel who identify nonconformances are responsible for originating an NCR or ensuring an NCR is initiated.

3.1.2 Applies or ensures application of a CCP HOLD TAG or provides other segregation or control methods.

3.2 QA

3.2.1 Validates the NCR.

3.2.2 Evaluates NCRs in accordance with this procedure.

3.2.3 Approves interim and final dispositions.

3.2.4 Ensures that NCRs are entered into the NCRM.

3.2.5 Verifies interim and final disposition completion and closes NCRs.

3.2.6 Applies, removes, or ensures application or removal of CCP HOLD TAGS (as applicable).

3.2.7 Immediately notifies the Site Project Manager (SPM) or Vendor Project Manager (VPM) when HOLD TAGS DO **NOT** reconcile or when orphaned HOLD TAGS are found in process areas.

3.2.8 Provides CCP Training with a notification of individuals who are designated to validate and approve dispositions for NCRs that are Trend Code K. These individuals will have been briefed and designated for this function by QA.

3.2.9 Assists the NCR Originator as needed to determine status of all affected containers associated with NCRs initiated at the Project level.

3.3 QA Designee

3.3.1 Validates Trend Code K NCRs.

3.3.2 Approves interim and final dispositions for Trend Code K NCRs.

3.3.3 Ensures that NCRs are forwarded to the Host site QA NCR Coordinator or the CCP Project Office NCR Coordinator for entry into the NCRM.

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3.3.4 Applies, removes, or ensures application or removal of CCP HOLD TAGS (if applicable) for Trend Code K NCRs and delivers removed HOLD TAGS to QA for confirmation of removal.

3.4 Responsible Manager

3.4.1 Provides interim and final dispositions to correct identified deficiencies.

3.4.2 Identifies resolutions to deficiencies and (when applicable) identifies actions to preclude recurrence.

3.4.3 Monitors progress of nonconformance resolution, including completion of dispositions in a timely manner.

3.4.4 Provides for the control of further processing, delivery, installation, or operation of nonconforming items or equipment.

3.5 CCP Site Project Manager (SPM)

3.5.1 Ensures NCR process is followed in accordance with this procedure and is accountable for the implementation of the nonconformance program.

3.5.2 Coordinates Carlsbad Field Office (CBFO) notification between the Certification Manager and the NCR Coordinator.

3.5.3 Prepares interim and final dispositions.

3.5.4 Verifies interim and final disposition completion.

3.5.5 Ensures forwarding of validated and in-process NCRs to the CCP Project Office for NCRM updates, as necessary.

3.5.6 Ensures distribution of completed NCRs as required by applicable interface documents.

3.5.7 Notifies CBFO of nonconformances as required by this procedure.

3.5.8 Monitors to ensure timely completion of NCRs in their area of responsibility, developing a plan to identify and track all nonconformances and reporting this information (approval of this procedure fulfills development of the plan).

3.5.9 Carries out responsibilities of the Responsible Manager, when an NCR so specifies.

3.6 Vendor Project Manager (VPM)

3.6.1 Ensures site personnel evaluating and dispositioning NCRs have demonstrated competence in the specific area they evaluate, have an adequate understanding of the requirements, and have access to pertinent background information.

3.6.2 Monitors to ensure timely completion of NCRs in their area of responsibility.

3.6.3 Carries out responsibilities of the Responsible Manager, when an NCR so specifies.

3.6.4 Concurs with interim and final dispositions (as requested).

3.6.5 Ensures the application of CCP HOLD TAGS and, in coordination with QA, ensures their removal, as required, and will assure removed CCP HOLD TAGS are delivered to QA for verification of removal.

3.6.6 Notifies the Host site representative of drums that are inaccessible with a request to make them available as soon as possible so that the drums may be monitored and tagged as soon as they are available.

3.7 NCR Coordinator (Site QA serves as the NCR Coordinator for the assigned site)

3.7.1 Maintains the NCR Log.

3.7.2 Distributes NCRs in accordance with this procedure.

3.7.3 Submits closed NCRs to CCP Records.

3.7.4 Updates the NCRM.

3.8 CCP Training

3.8.1 Annotates each site-specific List of Qualified Individuals (LOQI) with a qualified statement for individuals who have been designated by QA.

3.8.2 Maintains designation notifications in each individual’s training file.

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3.9 Certification Manager

3.9.1 Ensures a consistent review for all NCRs that have the potential to require CBFO notification according to the seven (7) calendar days notification requirement.

3.10 Waste Certification Official (WCO)

3.10.1 Assists the NCR Originator as needed to determine status of all affected containers associated with NCRs initiated at the Project level.

3.11 Packaging Manager

3.11.1 Reviews NCRs whose description is Transportation for 10 CFR, Part 71, *Packaging And Transportation Of Radioactive Material,* applicability.

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NOTE
Action steps need not be completed in the order given, unless otherwise directed.

4.0 PROCEDURE

4.1 NCR Initiation

QA

4.1.1 Maintain an NCR log (either manual or electronic at the Host site or CCP Project Office), identifying the following as a minimum:

- NCR number
- Initiation date
- NCR Originator

[A] Account for all NCRs issued during a calendar year, including voided NCRs. Number and log NCRs uniquely.

[B] The NCR number is composed of:

NCR-xxxxxx-yyyy-zz, where:

- "NCR" represents "Nonconformance Report"
- "xxxxxx" represents Site Designator (when applicable to remote-handled [RH] waste, include "RH" as a prefix to the site designator [e.g., Savannah River Site remote-handled waste = "RHSRS"])
- "yyyy" represents numerical digits beginning at 0001
- and "zz" represents the final two digits of the calendar year in which the NCR is initiated

Revision control applies.

[C] Examples of NCR Numbers:

- NCR-INL-0001-12, Rev. 0
- NCR-SRS-0361-12, Rev. 1
- NCR-LANL-2841-12, Rev. 2
- NCR-CCP-0015-12, Rev. 0
- NCR-RHLANL-0001-12, Rev. 0

NOTE

Trend Code K NCRs Interim and Final Disposition can be approved by designated personnel, CCP Training maintains the list of designated personnel.

- However, QA must validate and approve NCRs which are not Trend Code K.

QA SHALL verify disposition completion and closing of ALL NCRs.

NCR Originator

4.1.2 CCP personnel who discover nonconforming items or processes are responsible for initiating NCRs or to notify their managers for assistance in ensuring that an NCR is initiated. Personnel are encouraged to suggest improvements. Nonconformances are documented, evaluated, and dispositioned with a no-fault attitude fostered by management at all levels. On identifying a nonconforming item, obtain the current issued revision of Attachment 1, CCP Nonconformance Report (NCR), from the sftp site.

[A] Document nonconforming items by NCR, including those found by CCP personnel at a supplier's facility or during receipt inspection.

4.1.3 Obtain an NCR number from the NCR Coordinator or QA Designee, **AND** enter the number and revision on all pages of Attachment 1.

[A] Complete Blocks 1 through 7, as applicable, of the NCR (see Attachment 2, Instructions for Completing Attachment 1, Nonconformance Report [NCR]; see also 4.1.5 in regard to Block 7d).

[A.1] Enter "N/A" (Not Applicable) for those blocks **NOT** applicable to the NCR. Use Attachment 3, CCP Nonconformance Report (NCR) Continuation Sheet, whenever available space is inadequate.

[B] **IF** the NCR is documented against a container and a BDR, **THEN** ensure that Block 3 correctly identifies the container number and BDR number, matching exactly the identifications (IDs) identified in the BDR (see also 4.2.1[C.1]).

NCR Originator/Waste Certification Official (WCO)/QA

[C] Determine the status of all affected container(s) associated with NCRs initiated at the Project level as follows:

[C.1] **IF** the containers are not in a shipping lot,
THEN go to 4.1.4.

[C.2] **IF** the containers are in a shipping lot,
THEN it must be determined whether the container is in Waste Data System (WDS).

(a) **IF** the containers are in WDS **AND** the NCR is not data-affecting,
THEN go to 4.1.4.

(b) **IF** the containers are in WDS **AND** the NCR is data-affecting,
THEN the container(s) must be moved into assigned pre-sub certification before the NCR can be validated by QA.

NCR Originator or QA Designee

4.1.4 Select method(s) to be used to control nonconforming items, but they SHALL **NOT** be solely reliant on a single administrative control to differentiate waste containers that are acceptable for shipment to the Waste Isolation Pilot Plant (WIPP).

[A] DO **NOT** use NCRs as administrative holds (e.g., to stop a shipment when there is **NO** nonconformance). Refer to the container management procedures at the specific sites for more details on the proper use of administrative holds.

4.1.5 Determine whether CCP HOLD TAGS will be applied **OR** whether other methods will be used to control the affected items that do not affect end use, **AND** document in Block 7d of the NCR as applicable. Verify CCP HOLD TAGS by physically placing or confirming tag placement on the container by VPM's or QA Designee's confirmation in writing. If NCRs are initiated at the Project Office, they may be issued with Block 7d incomplete. Once notification is received by QA that NCR HOLD TAGS have been applied, update the NCR by completing Block 7d. Completion of this block does not require NCR revision.

[A] Ensure CCP HOLD TAGS are applied **AND** document in Block 7d (see Attachment 6, NCR HOLD TAG Guidance) UNLESS one or more of the following conditions exist:

- **IF** containers are physically inaccessible, **THEN** inform the VPM to notify the Host site representative of drums that are inaccessible with a request to make them available as soon as possible so that the drums are monitored and tagged as soon as they are available
- Container is an RH container
- Other physical identification methods (i.e., Permanent Reject Labels Not Certifiable to WIPP)
- If Final Disposition is already specified, is “Use-As-Is” with no action pending, and is QA approved

[B] Enter the following minimum information on the CCP HOLD TAG:

- NCR number
- Container or Item number
- BDR number (if applicable)
- Brief description of nonconforming condition
- Name, date, and signature of individual who applies the CCP HOLD TAG
- Any limitations on further processing

[C] When they are applied, the CCP HOLD TAGS SHALL remain on the containers until the nonconforming condition has been resolved and the disposition has been implemented and verified under the QA Program.

[D] Other methods used to control the affected items may include segregation or the use of dual, independent check systems (for noncompliant RH waste packages based on the ALARA principle), which use two separate and distinct processes and data sets for verifying waste packages are acceptable for shipment.

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[E] **IF** marking or tagging of a nonconforming item is impractical, **OR** segregation is impractical or impossible because of physical conditions,
THEN employ other precautions to preclude inadvertent use or shipment.

[F] Control nonconforming items to prevent adverse impact on test, installation, use, waste certification, or waste shipment.

[G] Notify organizations affected by the nonconformance.

4.1.6 Complete Blocks 7a, 7b, and 7c of Attachment 1

[A] Check the Transportation box in Block 7a only when issues with TRUPACT-II *TRU Waste Authorized Methods for Payload Control*, TRUPACT-III *TRU Waste Authorized Methods for Payload* Control, TRAMPAC limits, and packaging materials or conditions for shipped containers are identified.

[B] Ensure the 7b Requirement(s) correctly includes the procedure, revision, section, and quoted text, and the 7c Actual Condition is accurate.

[C] Print name, sign, and date Block 8.

4.1.7 Forward the NCR to the QA Engineer or QA Designee (Trend Code K NCRs only).

4.1.8 **IF** the NCR is initiated at the Host site, **AND** there is **NO** SPM, QA Engineer or QA Designee available,
THEN:

[A] Copy the NCR and forward it to the responsible individual at the Host site for NCR Log update, if needed.

[B] Forward the NCR to the NCR Coordinator in the CCP Project Office for review, processing and distribution.

4.2 NCR Review

QA Engineer or QA Designee

4.2.1 Review the NCR for the following, at a minimum:

[A] Verify that the identified condition and requirement meet the criteria for an NCR (i.e., hardware items or BDRs, or both) and do **NOT** represent a programmatic or process failure,

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malfunction, or deficiency as specified in WP 15-GM1002, *Issues Management Processing of WIPP Forms*.

[B] **IF** the nonconformance is determined to meet the criteria for a WIPP Form,
THEN void the NCR in accordance with Section 4.9, **AND** instruct the NCR Originator to initiate a WIPP Form in accordance with WP 15-GM1002.

[B.1] When control of nonconforming items **AND** programmatic issues related to the nonconformance both apply, initiate both an NCR **AND** a WIPP Form.

[C] **IF** the NCR is documented against a container and a BDR, **THEN** verify that Block 3 correctly identifies the container number and BDR number, matching exactly the IDs identified in the BDR.

[C.1] **IF** the IDs do not match,
THEN ensure there is a valid reason for the difference, such as WDS number prefixes, historical ID number differences, etc., **OR** ensure the numbers in question are captured on the acceptable knowledge (AK) Tracking spreadsheet and show a clear correlation between the two.

[D] Verify that the current revision of Attachment 1 has been used, the NCR number and revision are on all pages of the NCR, **AND** the form is filled out correctly.

[E] Verify that the identified requirement (procedure no., revision no., section, and quoted text) is correct and applies to the actual condition requiring disposition.

[F] Verify the disposition, if already documented in Block 19, was not completed prior to the date of NCR validation.

4.2.2 Resolve any inconsistencies, clarifications, or other concerns identified with the NCR Originator, then return to 4.1.2[A] **AND** repeat the process in accordance with Section 4.1.3.

4.2.3 **IF** the NCR is determined to be invalid,
THEN void the NCR in accordance with Section 4.9.

4.2.4 Identify the Trend Code using NCR Trend Codes in Attachment 5, Trend Codes, **AND** enter the Trend Code in Block 10.

4.2.5 **IF** Trend Code is determined to be K,
THEN GO TO Section 4.2.8.

4.2.6 Determine whether the identified condition has the potential to impact AK (i.e., related to waste stream variance, waste matrix code, etc.), and, if "Yes" or "indeterminate" mark "Yes" in Block 9 and enter Trend Code L in Block 10. Examples of possible changes to the AK of a waste stream include:

- Incorrect assignment of a waste container to a waste stream (e.g., sludge matrix in a debris container)
- Identification of unanticipated waste material parameters (WMPs) in a container (e.g., metal in a combustibles-only debris container)

4.2.7 Forward NCRs that identify possible changes to the AK of a waste stream (Trend Code L) to the SPM as the Responsible Manager.

[A] **IF** reevaluation is warranted as a result of:

- Inconsistencies noted during the process of comparing AK information to characterization results, **OR**
- The initiation of an NCR identifies potential changes to the AK of a waste stream,

THEN the SPM notifies the AK Expert.

4.2.8 Verify that the HOLD TAGS have been applied as needed, **AND** complete Block 7d, if not addressed by NCR Originator or QA Designee (see 4.1.5).

NOTE

The Responsible Manager determination is based on agreements between the SPM, QA Engineer, and applicable Responsible Managers.

4.2.9 Determine the manager responsible for resolution.

4.2.10 Except for Trend Code K and L NCRs, determine whether a Significant Condition Adverse to Quality exists by comparing with the following criteria:

[A] Does the noncompliance adversely impact the capability to characterize, certify, or ship waste?

[B] Is the noncompliance a violation of the Hazardous Waste Facility Permit (HWFP)?

[C] Could the noncompliance have a serious effect on health and safety of employees, the public, or the environment?

4.2.11 Except for Trend Code K and L NCRs, search the NCRM in IDC to determine whether there are previous violations of the same requirement and the Actual Condition is the same or similar, that is, one that involves the same process (nondestructive assay [NDA], real-time radiography [RTR], visual examination [VE], etc.), the same organization or personnel (Operations, AK Support, Transportation, Packaging & Logistics, etc.), elements of the QA Program (measuring and test equipment, inspection, document control, etc.), or individual vendors within a length of time that infers a potential connection. Upon evaluation of recurring condition, complete NCR Block 12.

4.2.12 **IF** a recurring condition is identified,
THEN discuss with the Assurance Programs Manager, who will determine whether the recurring nature of the conditions represents a Significant Condition Adverse to Quality. If directed, initiate a WIPP Form in accordance with WP 15-GM1002, control as a Significant Condition, cite the NCR number and revision in the WIPP Form, **AND** document the determination in an email to the NCR Coordinator, who will include it as part of the NCR QA record file.

[A] If the determination of a Significant Condition Adverse to Quality is affirmed, check “yes” in NCR Block 13, and enter in the NCRM.

4.2.13 The recurring conditions will be cited in the Semiannual Report required by CCP-QP-019, *CCP Quality Assurance Reporting to Management,* and include any corrective and preventive actions taken as a result.

4.2.14 Enter the Responsible Manager's name in Block 11.

4.3 NCR Validation

4.3.1 Before validation (Block 14), line through incorrect technical information and enter correct information, initial, and date.

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4.3.2 Correct editorial mistakes (grammar or spelling, renumbering sections, attachments or pagination; transcription errors and date) that DO **NOT** affect technical content by lining through, entering correct data, initialing, and dating at any time during the life cycle of the NCR.

4.3.3 QA Engineer or Designee to sign in Block 14 to validate NCR and forward NCR to responsible manager to enter disposition.

4.4 Disposition Determination

Responsible Manager

4.4.1 Determine the need for interim disposition, **AND**, if applicable, identify any additional approval requirements.

[A] Use Interim Dispositions only when necessary to determine the Final Disposition.

NOTE
Types of Interim Disposition: N/A (see Final Disposition), Hold, Conditionally Accept, Sort, Reinspect or Retest, Remediate.

4.4.2 **IF** interim disposition is **NOT** required,
THEN check “N/A” in Block 15a.

4.4.3 **IF** Interim Disposition is required,
THEN complete Block 15a and 15b of the NCR, **AND** print name, sign, and date Block 16a.

4.4.4 Forward NCR to QA Engineer or designee for processing and distribution.

4.4.5 Evaluate the nonconforming condition, **AND** provide a final disposition to correct the identified deficiency(ies).

4.4.6 For Final Dispositions, address all items and deficiencies identified in Block 7c of the NCR. Final Dispositions are limited to Use-As-Is, Reject, Repair, Rework, and Scrap. DO NOT close validated NCRs until completion and verification of the Final Disposition. Limit further processing, delivery, installation, or use of a nonconforming item, pending evaluation and approval of the disposition.

4.4.7 Check the Final Disposition Type in the appropriate box in Block 19. Limit Interim or Final Dispositions to only one type in each NCR.

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4.4.8 For Use-As-Is dispositions, provide Technical Justification in Block 19a.

4.4.9 For Repair dispositions, provide Technical Justification in Block 19a and instructions for completion in Block 19b.

[A] Items that do not meet original design requirements that are dispositioned Use-As-Is or Repair are subject to design control measures commensurate with those applied to the original design.

4.4.10 For Reject or Scrap dispositions, provide instructions for completion in Block 19b.

[A] **IF** containers that have been characterized are identified on an NCR, and the disposition specifies that the containers are to be returned to the Host site for correction of the nonconforming condition,
THEN the Final Disposition SHALL BE Reject, and include Instructions for Completion "Return to Host site for remediation or repackaging, or both," or similar.

[A.1] DO NOT **CLOSE** the NCR in such a case. The container is returned to the Host site with the CCP HOLD TAG attached to the container (e.g., a container has a prohibited item and requires remediation to bring it into compliance with CCP-PO-001, *CCP Transuranic Waste Characterization Quality Assurance Project Plan*, acceptance criteria). For such containers, DO NOT **REMOVE** CCP HOLD TAGS until nonconforming conditions have been corrected **AND** verified by CCP under the QA Program.

[A.2] There may be circumstances when a nonconforming container is returned to the Host site for remediation or repackaging under the Host site's management system. When the container is removed from the AK tracking spreadsheet for return to the Host site, CCP will follow the Host site Interface Agreement in regard to application and removal of CCP HOLD TAGS. Close the associated NCR(s) and update the NCRM according to this procedure.

4.4.11 Any orphaned tags found SHALL BE presented to QA for action to be taken in accordance with 4.7.6 [A].

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4.4.12 **IF** the nonconforming condition is data which requires that the container be rerun through that characterization (e.g., NDA, RTR or VE, Flammable Gas Analysis [FGA], Gas Generation Testing [GGT]),
THEN the NCR will disposition the container Reject.

4.4.13 **IF** the nonconforming condition is data for the container that will be corrected without rerunning the container through characterization,
THEN the NCR will disposition the container Rework.

4.4.14 For Rework dispositions, provide instructions for completion in Block 19b.

[A] In the disposition of an item to be reworked or repaired, include requirements to reexamine, reinspect, retest, or conduct nondestructive examination (NDE) to verify acceptability. Reexamine repaired or reworked items using the original process and acceptance criteria, unless alternative acceptance criteria or methods have been established and approved as part of the nonconforming item disposition.

4.4.15 **IF** changes to the specifying document are required to agree with the as-built condition,
THEN ensure the disposition requires action to change the specifying document to agree with the as-built condition.

4.4.16 **IF** a document or QA record change is required by the disposition,
THEN specify the change in the disposition **AND** ensure that the document or record cites the NCR number.

4.4.17 Evaluate the need for Actions to Prevent Recurrence (Repair or Rework), **AND** document corrective action(s) or “N/A” in Block 19c.

4.4.18 For Reject Dispositions, include instructions for the disposal of the item(s), such as “scrap,” or “return to vendor,” according to applicable procedures.

4.4.19 Identify any additional approval requirement, if applicable, **AND** document in appropriate block(s).

4.4.20 Print name, sign, and date Block 20, **AND** forward the NCR to the QA Engineer or QA Designee.

QA Engineer or QA Designee

4.4.21 Review the NCR and determine the following:

[A] The disposition (Interim or Final) adequately addresses measures to be taken to correct the identified deficiency.

[B] The disposition (Interim or Final) has been completed in accordance with this Section.

[C] Actions to prevent recurrence (as applicable) address adequate measures to control recurrence.

[D] Assure any attachments have been completed as required by Section 4.10.

4.4.22 **IF** disposition is deemed appropriate,
THEN approve by completing Block 16b (Interim) or Block 21 (Final), **AND** GO TO step 4.4.24.

4.4.23 **IF** disposition is deemed to be deficient,
THEN recommend changes, resolve with the Responsible Manager, **AND** reprocess according to Section 4.4.

4.4.24 **IF** the NCR is initiated by the Data Generation Level (DGL) against a container or BDR,
THEN copy the validated and dispositioned NCR, **AND** submit it to the appropriate DGL process to be included in the BDR, **OR,** if an NCR revision, to be submitted with the corrected data as an update to the BDR.

4.4.25 **IF** the NCR is initiated by the CCP Project Office against a container or BDR during CCP-TP-001, *CCP Project Level Data Validation and Verification,* review,
THEN copy the validated and dispositioned NCR, **OR,** if an NCR revision, forward a copy to the SPM to be included in the BDR.

4.5 NCR Process

NCR Coordinator

4.5.1 At receipt of the NCR:

[A] Verify the information in the NCR log matches that on the NCR.

[B] Enter the NCR information in the NCRM.

[C] **IF** the NCR Description in Block 7a is Transportation,
THEN forward a copy of the NCR to the Packaging Manager or designee for consideration of 10 CFR, Part 71, applicability and request the results of the review.

Packaging Manager

[C.1] Review NCRs whose description is Transportation (in Block 7a) for 10 CFR, Part 71, applicability and email the NCR Coordinator the results of the review.

NCR Coordinator

[D] File a copy of the email from the Packaging Manager with the NCR.

[D.1] **IF** the NCR was generated at or after the SPM signature level,
THEN forward a copy of the project-level NCR to the Certification Manager for review.

Certification Manager

[D.2] Review the project-level NCR to determine whether any nonconformance first identified at or after the SPM signature release level (e.g., CCP-TP-001) does not meet applicable requirements of CCP-PO-001, or DOE/WIPP-02-3214, *Remote-Handled TRU Waste Characterization Program Implementation Plan* (i.e., a failure to meet a DQO), and if so,
THEN inform in writing or by email the NCR Coordinator and SPM, the latter of whom notifies the CBFO as required.

SPM

[D.3] Notify the CBFO in accordance with Attachment 4, Additional CBFO Notification Details, and as follows:

- **IF** the Certification Manager determined that the project-level NCR is reportable,
  THEN notify CBFO within seven (7) calendar days of identification of the deficiency.

- Copy the NCR Coordinator on the CBFO notification.

[D.4] **IF** the NCR was not ready for submittal when the notification was made,
THEN submit the NCR to DOE CBFO within thirty (30) calendar days of identification of the deficiency.

Certification Manager

[D.5] **IF** the project-level NCR is determined not to be reportable,
THEN the NCR Coordinator receives an IDC notification that the NCR is not reportable.

NCR Coordinator

[D.6] The NCRM is updated automatically. File a copy of the CBFO notification and related e-mails with the NCR.

[D.7] Retain the NCR and any attachments in a working file until NCR closure.

4.6 Disposition Completion

Responsible Manager/VPM/SPM

4.6.1 Monitor disposition completion to assure timely completion.

Responsible Manager

4.6.2 At completion of the required dispositions (Interim or Final), request the original (if necessary) from the NCR Coordinator.

4.6.3 Provide objective evidence of completion of disposition (Interim, Final, and Actions to Prevent Recurrence as applicable) by one or more of the following:

[A] Prepare attachments as required by Section 4.10.

[B] Cite traceable documentation that substantiates completion of dispositions and actions to prevent recurrence.

[C] Sign and date statement(s) of fact or include as attachment.

[D] If desired, discuss with SPM and/or Originator, reviewing the documentation that substantiates completion of dispositions prior to formal submittal to ensure adequacy.

4.6.4 Document in an attachment prepared as required by Section 4.10 that substantiates completion of dispositions (as applicable).

4.6.5 Print name, sign, and date Block 17 (Interim) or Block 22 (Final), or both, **AND** submit original NCR with attachments (as applicable) to the QA Engineer.

4.7 Completion Verification and Closeout

QA Engineer

4.7.1 If desired, allow nonconforming items to continue through the normal process under certain controlled circumstances while their NCR is open, but always implement and verify the approved disposition(s) prior to NCR's closing.

4.7.2 **IF** the NCR is initiated by the CCP Project Office against a container or BDR, **AND** the disposition is required to be completed at DGL that corrects data in an existing BDR,
THEN, at DGL, include a copy of the validated and dispositioned NCR, **OR,** if an NCR revision, with the corrected data as an update to the BDR.

4.7.3 Review the NCR and verify the following:

- Attachments provide traceability to objective evidence substantiating completion of disposition.
- Documentation provides adequate objective evidence of completion of disposition.
- Attachments (if applicable) have been completed as required by Section 4.10.
- Review the NCR and all attachments (if applicable) to assure conformance to applicable requirements.

4.7.4 Document the Attachment number(s) in Block 23 as needed. If no attachments, enter "N/A."

4.7.5 **IF** Interim disposition **AND** other requirements in accordance with 4.7.3 are satisfactorily completed,
THEN print name, sign, and date in Block 18, **OR** continue to 4.7.6 for Final Disposition.

4.7.6 **IF** Final Disposition, verify the acceptable resolution of the disposition for individual containers **AND** release the "Resolved" container(s) for shipping to WIPP **AND**, the container(s) with "Returned" resolution to be return to the Host site,
THEN ensure removal of all CCP HOLD TAGS as required, either by removing them personally **OR** in coordination with the VPM or QA Designee. Verification will be so noted by checking the box in Block 24a. If not applicable check Block 24b and enter a comment, in Attachment 1 prior to closing the NCR.

[A] **IF** verification identifies missing tags,
THEN immediately notify the SPM or VPM.

4.7.7 **IF** disposition (Interim **OR** Final) **AND** other requirements in accordance with 4.7.3 are **NOT** satisfactorily completed,
THEN return to Responsible Manager (with detailed reasons for return) for correction and resubmittal.

4.7.8 Print name, sign, and date Block 25.

4.7.9 Determine any distribution requirements as identified in applicable interface documents.

4.8 Closeout

NCR Coordinator

4.8.1 At receipt of the NCR:

[A] Update the NCR in the NCRM.

[B] Distribute as required.

[C] Submit the completed NCR with attachments, if applicable, to CCP Records in accordance with CCP-QP-008, *CCP Records Management*.

4.9 Voiding the NCR

NCR Originator or QA Engineer

4.9.1 **IF** an NCR is determined to be invalid during the review in accordance with Section 4.2 (prior to NCR validation),
THEN:

[A] On the open NCR, document the detailed justification for voiding. Write anywhere on the NCR as long as it does not

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obliterate existing information, **OR** use Attachment 3, or create an attachment according to CCP-QP-008.

Ensure that the NCR Originator and the QA Engineer print name, sign, and date.

[B] Stamp or write “Void” on the first page of the NCR, initial, and date.

[C] Forward the NCR to the NCR Coordinator.

[D] GO TO step 4.9.3.

Responsible Manager, SPM, QA Engineer, or NCR Originator

4.9.2 **IF**, after NCR validation when the NCR is still open, the NCR Originator, the SPM, the Responsible Manager, and the QA Engineer agree that it is appropriate to void a validated NCR, **THEN**:

[A] On the NCR, document the technical justification for voiding, **AND** ensure that the NCR Originator, the SPM, the Responsible Manager, and the QA Engineer print name, sign, and date.

[B] Stamp or write “Void” on the first page of the NCR, initial, and date.

[C] Forward the NCR to the NCR Coordinator **AND** copy the SPM.

NCR Coordinator

4.9.3 Verify Block 24a or Block 24b of Attachment 1 (NCR) has been completed.

4.9.4 Input the NCR into NCRM.

4.9.5 Submit voided NCR to CCP Records in accordance with CCP-QP-008.

4.9.6 Ensure a copy of the NCR is submitted to the appropriate DGL personnel as required by CCP-TP-001.

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4.10 Attachments

NCR Originator/SPM/QA Engineer/Responsible Manager

4.10.1 When using attachments to an NCR:

[A] Identify the NCR number and revision number on each page of the attachment.

[B] Identify the attachment number.

[C] Paginate each page of the attachment.

EXAMPLE:
NCR-LANL-0700-12, Rev 0, Attachment 1,
Page 1 of 1

NCR-SRS-0800-12, Rev 1, Attachment 3, Page 1 of 6,
2 of 6, etc.

4.11 Revisions

NCR Originator/SPM/Responsible Manager

4.11.1 After validation of the NCR, change technical content by revising the NCR as follows:

[A] Obtain a blank copy of the current revision of the NCR from the sftp site.

[B] Apply next sequential revision number to all pages of the NCR and all attachments.

[C] Document the reason for revision in Block 7c.

NCR Originator, SPM, Responsible Manager, or NCR Coordinator

[D] Supersede the previous revision by drawing a diagonal line across the first page of the NCR, **AND** adding a statement, "Superseded by Revision # (next sequential revision #)," **AND** initial and date.

[E] Attach the superseded revision to the new revision.

[F] Submit new revision for review and approval in accordance with Section 4.2.

4.12 NCR Log Reconciliation - CCP Project Office and Host Site

NCR Coordinators/QA Engineer

4.12.1 At the end of the calendar year, reconcile NCR numbers issued with NCR logs maintained at Host sites (where applicable), the NCR Log, and the NCRM, as follows:

QA Engineer:

[A] Verify that all NCR numbers issued and that appear in the Host site Log, are accounted for in the NCRM.

[B] Resolve all discrepancies identified with the NCR Coordinator.

[C] Prepare and submit a report to the CCP Project Office NCR Coordinator that documents the reconciliation effort.

CCP Project Office NCR Coordinator

4.12.2 Reconcile NCR numbers issued to the QA Engineer at Host sites with the NCR Log, based on the report submitted by the QA Engineer.

4.12.3 Note any NCR numbers **NOT** used during the year as “Number Not Used” in the Report.

4.12.4 Submit the NCR Reconciliation Report to CCP Records in accordance with CCP-QP-008.

4.13 Work Suspension and CBFO Stop Work Orders

Personnel Working

4.13.1 During Normal Work

[A] All CCP employees shall be responsible and authorized to suspend work if concerned with employee safety, the safety of the environment, or the quality of the work.

[B] **IF** work CAN **NOT** be carried out as specified in a procedure **OR** continuing work would result in an undesirable situation, a condition adverse to quality or the environment, or an unacceptable safety risk,
THEN suspend work in a safe configuration **AND**, inform the Lead Operator (LO) or VPM.

Lead Operator or Vendor Project Manager

[C] Resolve the concerns of the employee or inform the SPM of the work suspension and the reason it is suspended.

CCP Management

[D] Resolve the concerns prior to resuming operation **OR** initiate actions to correct the condition using existing procedures. In either event, keep the employee who raised the concern informed of actions taken in response.

[E] Initiate the appropriate documentation in accordance with WP 15-GM1002, and CCP-QP-005, *CCP TRU Nonconforming Item Reporting and Control* as applicable to the situation.

SPM

[F] **WHEN** all corrective actions have been completed and verified,
THEN direct restart of suspended work.

4.13.2 CBFO Stop Work Orders

CCP Personnel

[A] Immediately comply with the terms of any Stop Work Order issued by the CBFO, which is authorized to issue Stop Work Orders for the protection of the environment and health and safety of CCP employees and the public.

CCP Management

[B] Accept direction set forth in CBFO Stop Work Orders and carry out such directives in a safe and responsible manner in accordance with established procedures.

[C] Submit Stop Work Orders and related documentation to CCP Records according to CCP-QP-008.

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5.0 RECORDS

5.1 Records generated in Section 5.1.1 during implementation of this procedure are maintained and controlled as QA records, as well as Section 5.1.2 record will be maintained as a record in accordance with CCP-QP-008. The records are the following:

5.1.1 QA/Nonpermanent Records

- Attachment 1, CCP Nonconformance Report (NCR) (including related emails and supporting documentation [if applicable])
  - Attachment 3, CCP Nonconformance Report (NCR) Continuation Sheet (if applicable)
  - CBFO Notifications (if applicable)
- NCR Reconciliation Report
- CCP NCRM Database

5.1.2 NON-QA Records

- Internal Written Directive to suspend work (e.g., memo, email [if applicable])
- External Written Directive to suspend work (e.g., memo, email [if applicable])

Attachment 1 – CCP Nonconformance Report (NCR)

CCP NONCONFORMANCE REPORT (NCR)

(Use NCR Continuation, Attachment 3, if necessary)

NCR No. NCR-		Revision
1. Lot No., Heat No., or Serial No. (if applicable):	2. Process (e.g., NDA, NDE, VE, Other):	3. Batch Data Report #(s):
4. Order/Work Order/Job Control Number (if applicable):	5. PO # (if applicable):	Container #(s):
	6. Supplier (if applicable):	

DESCRIPTION OF NONCONFORMANCE

7a. NCR Description: ☐ < 100 nCi/g ☐ Prohibited Item ☐ E-Flag ☐ Receipt Inspection ☐ Transportation ☐ WWIS/WDS ☐ Other

7b. Requirement(s) (Enter Implementing Procedure No., Revision, Section No., & Quoted Text):

7c. Actual Condition:

7d. Have the CCP HOLD TAGS associated with this NCR been applied? ☐ YES ☐ NO If no is checked, explain:

8. NCR Originator:

printed name _____ signature _____ date _____

9. Does the identified condition have the potential to impact AK? If YES or INDETERMINATE, enter Trend Code L in Block 10. ☐ YES ☐ NO ☐ INDETERMINATE

10. Trend Code:	11. Responsible Manager:
12. Recurring Condition? ☐ YES ☐ NO (If Yes, list NCRs and WIPP Forms):	13. Significant Condition? ☐ YES ☐ NO (If Yes, enter WIPP Form No.):

14. QA Engineer or QA Designee validation:

printed name _____ signature _____ date _____

Attachment 1 – CCP Nonconformance Report (NCR) (Continued)

NCR No. NCR- Revision

INTERIM DISPOSITION

15a. Interim Disposition (Check Only One):

☐ N/A (See Final Disposition) ☐ Hold ☐ Conditionally Accept ☐ Conditionally Use

☐ Sort ☐ Reinspect or Retest ☐ Remediate

15b. Instructions for Completion of the Interim Disposition:

INTERIM DISPOSITION APPROVALS

16a. Responsible Manager or Individual:

printed name signature date

16b. QA Engineer or QA Designee:

printed name signature date

Additional Approval:

printed name signature date

COMPLETION OF INTERIM DISPOSITION

17. Interim Disposition Complete – Responsible Manager or Individual:

printed name signature date

18. Interim Disposition Verified – QA Engineer:

printed name signature date

Attachment 1 – CCP Nonconformance Report (NCR) (Continued)

NCR No. NCR- Revision

FINAL DISPOSITION

19. Final Disposition (Check Only One: Use-As-Is, Repair, Reject, Rework, or Scrap):
☐ Use-As-Is ☐ Repair

19a. Technical Justification – Required for Use-As-Is or Repair dispositions. [☐ N/A for Reject, Rework, or Scrap]

☐ Reject ☐ Rework ☐ Scrap

19b. Instructions for Completion – Required for Reject, Repair, Rework, or Scrap [☐ N/A for Use-As-Is]

19c. Corrective Actions (Actions to Prevent Recurrence – For Repair or Rework, if applicable.
[☐ N/A if not applicable, and for Use-As-Is, Reject, and Scrap]

FINAL DISPOSITION APPROVALS

20. Responsible Manager or Individual:

printed name _____ signature _____ date _____

21. QA Engineer or QA Designee:

printed name _____ signature _____ date _____

Additional Approval:

printed name _____ signature _____ date _____

CLOSURE

22. Final Disposition Complete - Responsible Manager or Individual:

printed name _____ signature _____ date _____

23. Attachments:

24a. HOLD TAG removal has been verified and reconciled for all nonconforming items on the NCR: ☐
24b. If HOLD TAG is not applicable, check: ☐ and explain:

25. Final Disposition Verified – NCR Closed QA Engineer:

printed name _____ signature _____ date _____

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Attachment 2 – Instructions for Completing Attachment 1, Nonconformance Report (NCR)

Block	Responsible Individual(s)	Instructions
1	NCR Originator	Enter Heat no., Lot no., or Serial no. (as applicable) of material or item, measuring or test equipment, or item purchased from a supplier. If not applicable, enter "N/A."
2	NCR Originator	Enter kind of process(e.g., AK, CRMU Project, DA, Dimensional/Gravimetric [RH-DG], Exterior Surface Radiological Survey, FGA, GGTP, HE-RTR, Lot Evaluation, MOVER, NDA, NDE, OSRP, Radiochemistry, Receipt Inspection, RH-DTC, RH-NDE, RH-RTR, RH-Sampling, RH-VE, Solids Analysis, Surface Finish, Testing, Transportation, VE, WCO, WWIS/WDS, Other). If not applicable, enter "N/A." NOTE: If additional applicable process codes are identified that are not on the example list, they may be added to IDC using the Data Change Request process.
3	NCR Originator	Enter Batch Data Report number(s) as well as Container number(s) if applicable. If not applicable, enter "N/A." Enter Container number(s) if applicable. If not applicable, enter "N/A."
4	NCR Originator	Enter Order, Work Order, or Job Control Number if applicable. If not applicable, enter "N/A."
5	NCR Originator	Enter Purchase Order number if applicable. If not applicable, enter "N/A."
6	NCR Originator	Enter Supplier if applicable. A Host site is not a supplier. If not applicable, enter "N/A."
7a	NCR Originator	Check applicable box to match NCR Description.
7b	NCR Originator	Enter the requirement that applies to the nonconforming condition. Include implementing procedure number, its revision, the applicable section or paragraph number, and quote the text.
7c	NCR Originator	Enter the actual, nonconforming condition. Provide enough detail so that a disposition can be developed to correct it.

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Attachment 2 – Instructions for Completing Attachment 1, Nonconformance Report (NCR) (Continued)

Block	Responsible Individual(s)	Instructions
7d	NCR Originator or QA or QA Designee	Check "Yes" if HOLD TAGS have been applied or "No" if another method has been selected to control the item(s). If HOLD TAGS were not applied because of the Remote-Handled ALARA principle, enter the following: "HOLD TAGS will not be applied to items identified on this NCR because of ALARA consideration. Container management will apply through administrative control. In addition, these containers have been identified on the CCP sftp site. Container information from this NCR has been included in the list, which is to alert Mobile Loading Unit personnel as a second method of control of non-tagged containers." If NCR was originated at the Project Office, the site will be advised to apply HOLD TAGS and confirm when done. At that time, QA or QA Designee may check Block 7d "Yes." The NCR does not require revision as a result.
8	NCR Originator	Print name, sign, and date.
9	QA or QA Designee	Determine whether the Block 7c Actual Condition impacts or may impact AK. If "Yes" or "Indeterminate" enter Trend Code "L" in Block 10, and mark the appropriate box in Block 9. If not, check "No".
10	QA or QA Designee	If no Trend Code is entered in Block 10, determine the applicable code and enter it.
11	QA or QA Designee	Determine the Responsible Manager and enter (see Note before 4.2.9). Trend Code L requires an SPM be the responsible manager.
12	QA or QA Designee	Determine whether a recurring condition exists (see 4.2.11) and check box accordingly. If "Yes" is checked, enter applicable NCR or WIPP Form numbers.
13	QA or QA Designee	After discussion with Assurance Manager, determine whether a Significant Condition Adverse to Quality exists (see 4.2.12) and check box accordingly. If "Yes" is checked, enter applicable WIPP Form number.

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Attachment 2 – Instructions for Completing Attachment 1, Nonconformance Report (NCR) (Continued)

Block	Responsible Individual(s)	Instructions
14	QA or QA Designee	If NCR is determined valid, print name, sign, and date.
15a	Responsible Manager	If Interim Disposition is needed, check one box: "Hold," "Conditionally Accept," "Conditionally Use," "Sort," "Reinspect or Retest," or "Remediate." Proceed to Block 15b. If Interim Disposition is not needed, check "N/A" and proceed to Block 19.
15b	Responsible Manager	Enter instructions for completion of the Interim Disposition.
16a	Responsible Manager or Individual	Print name, sign, and date.
16b	QA Engineer or QA Designee	Print name, sign, and date.
17	Responsible Manager or Individual	When Interim Disposition is to be closed, print name, sign, and date.
18	QA Engineer or QA Designee	If verified adequate, print name, sign, and date.
19	Responsible Manager or Individual	Check only one box: "Use-as-is," "Repair," "Reject," "Rework," or "Scrap."
19a	Responsible Manager or Individual	Enter Technical Justification if Disposition is "Use-as-is" or "Repair." If not, enter "N/A," and proceed to 19b.
19b	Responsible Manager or Individual	Enter Instructions for Completion if Disposition is "Reject," "Repair," "Rework," or "Scrap."
19c	Responsible Manager or Individual	Enter Action(s) to prevent recurrence, if applicable. Enter "N/A" if not applicable, or for "Use-as-is," "Reject," and "Scrap" dispositions.
20	Responsible Manager or Individual	Print name, sign, and date.
21	QA or QA Designee	If Final Disposition is acceptable, print name, sign, and date.
22	Responsible Manager or Individual	When Final Disposition is completed, print name, sign, and date.
23	QA or QA Designee	If there are any Attachments, enter number and title or description of each.
24a	QA or QA Designee	If HOLD TAG removal was verified for all nonconforming items on the NCR, check box.

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Attachment 2 – Instructions for Completing Attachment 1, Nonconformance Report (NCR) (Continued)

Block	Responsible Individual(s)	Instructions
24b	QA or QA Designee	If HOLD TAGS are not applicable, check box and enter explanation.
25	QA Engineer	When Final Disposition is verified, print name, sign, and date for closure of NCR.

Attachment 3 – CCP Nonconformance Report (NCR) Continuation Sheet

NCR No. NCR-	Revision	Attachment #	Page	of
Continuation from Section Number:				

Attachment 4 – Additional CBFO Notification Details

This attachment details reporting notification requirements for CCP-generated Nonconformance Reports (NCRs) which meet the condition identified in CCP-PO-001, Section C3-7, and 4.5.1[D.2] of this procedure.

WIPP e-mail Address: wipp.notify@wipp.ws

Electronic notification is strongly encouraged. If electronic notification is used, the following criteria are required:

On the subject line, preceding the subject, [ncr]. The term “ncr” in brackets [ ] allows the automatic transfer into the proper folder of the receiving system.

Include the NCR number, description of the deficiency, and the date identified.

CCP must email an NCR containing CCP’s procedurally required information thirty (30) days after the nonconformance was identified.

CCP may choose to transmit the NCR within the required seven (7) days, and satisfy both notification requirements, provided the following information is submitted:

- Site NCR #
- Responsible Organization
- Date initiated
- Individual who identified the NCR
- Deficiency
- Requirement violated
- Actions
- Date closed, if applicable

General Notification

If CCP does not have the capability of transmitting documents by e-mail, or elects not to, hard-copy transmittal may be used instead. Correspondence must be sent to the following address:

[Assigned CBFO Contact]
Carlsbad Field Office
U.S. Department of Energy
P.O. Box 3090
Carlsbad, NM 88221-3090

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Attachment 5 – Trend Codes

Trend Codes	Descriptions	Definitions and Examples
A*	Personnel Error and Failure to Follow Procedure	Personnel wrongly entered data or transposed figures or letters; inattention to detail; lack of understanding; use of superseded or incorrect version of specifying document; used procedure, but before required approval(s); required review missed problem(s); failed to follow procedure(s); deliberate violation.
C	Engineering Deficiency	Inadequate or erroneous engineering design, design input, or design output.
D	Procedure Less Than Adequate	Procedure erred or was vague in specifying requirements; failure to revise procedure when work processes change; no procedure to control QA work.
E	Software Deficiency	Software error resulted in deficient data; unqualified software used to obtain QA data; failure to initiate software qualification process; failure to verify software following software or operating system upgrade.
F	Vendor Deficiency	Deficiencies related to a vendor (i.e., procured item including hardware does not meet a requirement prescribed in the purchase order); wrong or less than adequate vendor documentation.
H	Material or Equipment Control Deficiency	Failure of material, equipment, or items because of damage, failure of a component, inadequate maintenance, etc.

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Attachment 5 – Trend Codes (Continued)

Trend Codes	Descriptions	Definitions and Examples
I	Calibration Deficiency	Calibration was inadequate, resulting in nonconforming or indeterminate data; use of out-of-calibration M&TE.
J	Inadequate Documentation	Record is nonconforming: does not include required data; required data are incorrect; record(s) improperly stored.
K	WAP/WAC Deficiency	Noncompliance with a Waste Analysis Plan or Waste Acceptance Criteria requirement **(Exempt from trending)**.
L	Acceptable Knowledge Deficiency	Possible changes to the AK of a waste stream (e.g., assignment of waste container to wrong waste stream; identification (ID) of unanticipated waste material parameters in a waste container) **(Exempt from trending)**.
M	Inadequate Communication	Personnel were given ambiguous or incorrect information or instructions to do their work; inadequate or lack of planning.
O	Ineffective Control of Corrective Action	Actions intended to correct deficiencies or preclude recurrence proved ineffective; identification of nonconforming item(s) less than adequate.
P	Inadequate Training	Condition Adverse to Quality resulted from lack of or inadequate indoctrination, training, or qualification; work done before indoctrination, training, or qualification or after qualification expired.
Q	Deficiency Caused by Others	The deficiency was caused by non NWP personnel working to non NWP QA program or none at all.
R	Control of Electronic Data Less Than Adequate	Inadequate security access control; inadequate protection of data; failure to backup data; inadequate traceability of data; failure to verify transferred data.

* Former Trend Code B was combined with A.

Attachment 6 – NCR HOLD TAGS Guidance

Applicability

This Attachment applies to all CCP personnel applying or removing CCP Nonconformance Report (NCR) HOLD TAGS.

Vendor Project Manager (VPM) Administrative HOLD TAGS are addressed in Container Management procedures CCP-TP-068, *CCP Standardized Container Management,* and CCP-TP-120, *CCP Container Management*.

When PLACING an NCR HOLD TAG on waste container:

- Use only CCP-provided NCR HOLD TAG.
- When applying the NCR HOLD TAG, enter the information using a Sharpie permanent marker or equivalent.
- The NCR HOLD TAG when possible should be applied so that the drum number, BDR number, etc. face out.
- Place the NCR HOLD TAG on the waste container locking ring bolt or lifting handle, using the cable tie in accordance with the following:
    - Use a separate cable tie for each Hold Tag placed on a waste container
    - Ensure the the cable tie locks and does not protrude past the bottom of the device
    - If the wire protrudes past the bottom of the device, wrap the exposed wire with tape

When REMOVING an NCR HOLD TAG from a waste container:

- Wrap the area where the cable is to be cut with tape prior to cutting to prevent the cable wires from splaying. Cut the cable tie holding the NCR HOLD TAG to the container using CCP-approved cable cutters.
- DO NOT cut or pull the tag off the cable tie.
- Return the NCR HOLD TAG to the VPM or SPM directing removal of the tag. The VPM or SPM will then turn the tags over to the QA Engineer for tracking with the corresponding NCR.
- DO NOT remove Host site tags or tamper-indicating devices (TID). Immediately report accidental removal of these to the VPM.

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Attachment 6 – NCR HOLD TAGS Guidance (Continued)

When a cable or wire is found on a waste container without an NCR HOLD TAG attached, or when an NCR HOLD TAG is damaged or faded:

- Treat the container as though it has an NCR HOLD TAG applied.
- If the NCR HOLD TAG is found damaged or faded, document the container number and any information from the remaining Tag and notify the VPM or SPM.
- If a loose tag is found on a waste container or on the ground, turn the tag over to the VPM or SPM.
- Replace loose, damaged, faded, or missing NCR HOLD TAGS as directed by the VPM or SPM.

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CCP-QP-008

Revision 25

CCP
Records Management

EFFECTIVE DATE: 01/05/2016

Mike Ramirez

PRINTED NAME

APPROVED FOR USE

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RECORD OF REVISION

Revision Number	Date Approved	Description of Revision
6	03/11/2002	Additions for use of e-QA system
7	06/07/2002	Incorporation of instructions for pagination and removal of text in Attachments.
8	09/04/2002	Added the definition of magnetic tape and incorporated text to clarify the requirements of computer generated electronic records (clarified steps 2.3.7 and 4.8.3). Updated Attachment 2 to reflect new fax machine number. Added new steps regarding duties for the CCP Site Project Manager and the release of records (steps 3.1 and 4.7).
9	08/27/2003	Updated to reflect issuance of Revision 5 of the QAPD. Made other editorial changes. Separated electronically fillable forms and updated references in the procedure.
10	10/15/2004	Clarified CCP Personnel and Facility Records Custodian responsibilities. Editorial changes throughout.
11	08/22/2005	Reorganized sections for improved flow and added clarifications. Deleted Attachments 3 through 6.
12	11/16/2006	Revised to implement the Waste Isolation Pilot Plant Hazardous Waste Facility Permit requirements resulting from the Section 311/Remote-Handled (RH) Permit Modification Request (PMR).
13	04/24/2007	Revised to change title in responsibilities and body of procedure and to add statement (Note) from QAPD and remove verbiage about in-process records.
14	09/19/2007	Revised to address finding from U.S. Department of Energy, Carlsbad Field Office, Corrective Action Report 07-016, Audit A-07-24. Also revised to provide some clarifications within the procedure, added a step to address superseding and voiding of documents (i.e., Batch Data Reports, Nonconformance Reports), and added a note at the beginning of section 4.9 to address computer modeling results methods.
15	10/28/2009	Revised to make personnel title changes and name changes to organizations. Added section 4.7.1[G] for lost records as well as a section for receipt and handling of Official Use Only (OUO) and Unclassified Controlled Nuclear (UCN) documents.
16	07/06/2010	Revised to clarify and address the submittal of historical source documents.

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RECORD OF REVISION (Continued)

Revision Number	Date Approved	Description of Revision
17	11/02/2010	Revised to change the submittal process for Acceptable Knowledge (AK) documentation and section on historical source documents.
18	03/30/2011	Revised to support corrective action report (CAR)-LANL-0004-10.
19	08/02/2011	Revised to change the number of the form in the definition of retention period. Change to Section 4.8 for clarification.
20	08/10/2012	Revised to clarify editorial changes, transmitting of records, and destruction of QA records.
21	02/28/2013	Revised to incorporate Nuclear Waste Partnership (NWP) transition changes.
22	03/24/2014	Revised to include steps for the Record Index Module,addresses editorial guidelines for records, and to updaterecords section.
23	09/03/2014	Revised Sections 3.4 and 3.5 to clarify the responsibilities of Records personnel for verification of records. Updated Section 3.6 to agree with the actions assigned to the WIPP Records Management Services (WRMS) Manager in Section 4.15. Added Section 4.1.2. Revised Step 4.4.1[B] in response to Waste Isolation Pilot Plant (WIPP) Form 14-239. Added Step 4.4.1[E] clarifying that “Remarks” and “Comments” spaces may normally be left blank.
24	02/10/2015	Revised to add Sections 3.4.7 and 4.10.2[C] to require validation of PDFs to ensure that the hardcopy record matches the scanned image. Replaced the title “Lead Records Custodian” with “CCP Records Manager” throughout the document. Added a NOTE to Section 4.10.2[C] stating that the requirement to validate hardcopy records applies only to characterization records completed on or after the effective date of this revision. Updated information in Attachment 1, Written Request for Records Destruction (Example). Deleted Section 3.6, WIPP Records Management Services (WRMS).

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RECORD OF REVISION (Continued)

Revision Number	Date Approved	Description of Revision
25	01/05/2016	Revised to delete Section 4.10.2[C], which was added in anticipation that Central Characterization Program (CCP) Records would begin verifying scans of newer hardcopy records. It has now been determined that CCP Records will not perform this function, since it is already being performed by another organization. Also, deleted the definition of Medium in Section 2.3.13, since it is repeated verbatim in Section 2.3.26, Record Medium. Refined and expanded the descriptions of editorial changes in Section 4.7.1.

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1.0 PURPOSE

This document outlines the Central Characterization Program (CCP) Records Management Program. The records program involves CCP Records and interaction with the Waste Isolation Pilot Plant (WIPP) and Records Management Services (WRMS) as outlined in this procedure.

1.1 Scope

This procedure applies to the creation, maintenance, use, and disposition of records generated by the CCP.

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2.0 REQUIREMENTS

2.1 References

Baseline Documents

- DOE/CBFO-94-1012, *U.S. Department of Energy Carlsbad Field Office Quality Assurance Program Document* (QAPD)

Referenced Documents

- *National Archives and Records Administration (NARA) Approved Record Schedules*
- CCP-QP-002, *CCP Training and Qualification Plan*
- CCP-QP-028, *CCP Records Filing, Inventorying, Scheduling, and Dispositioning*
- DOE M 471.1-1, *Identification and Protection of Unclassified Controlled Nuclear Information Manual*
- DOE M 471.3-1, *Manual for Identifying and Protecting Official Use Only Information*
- EA15RM3002-2-0, *Records Inventory and Disposition Schedules (RIDS)*

2.2 Training Requirements

2.2.1 Personnel performing this procedure will be trained and qualified in accordance with CCP-QP-002, *CCP Training and Qualification Plan,* prior to performing this procedure.

2.3 Definitions

2.3.1 **Authentication** - Synonymous with validation.

2.3.2 **Computer System** - A configuration, or working combination, of hardware, software, and data communication devices.

2.3.3 **Destruction** - The physical destruction of records by shredding, incinerating, or other permanent means.

2.3.4 **Disposition** - The action taken regarding records no longer needed for current government business. Actions may include transfer to the Carlsbad Field Office (CBFO) Records Holding Facility or

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Federal Records Center, transfer from one federal agency to another, transfer of permanent records to the National Archives and Records Administration (NARA), or destruction of nonpermanent records.

2.3.5 **Electronic Record** - A record in a form that is readable only by a computer. Electronic records are most frequently recorded on media such as disk, diskette, tape, and tape cartridges.

2.3.6 **External Records** - Records generated by the waste generating sites (e.g., procurement records, procedures, radiological surveys, facility operating logs, container packaging records, historical source documents, etc.). These records are not subject to the requirements of this procedure concerning legibility, pagination, accuracy, completeness, or revision.

2.3.7 **Inactive Record** - A record no longer required to conduct government business and therefore dispositioned in accordance with approved records schedules and stored for authorized retention periods.

2.3.8 **Index** - A listing of records and cross-reference information. At a minimum, an index will indicate record location within the record filing and storage system.

2.3.9 **Internal Use Only (IUO)** - A document that has been identified as Internal Use Only (IUO) and is considered proprietary, which is not to be disseminated beyond the organization.

2.3.10 **Legible** - For the purpose of this document, legible means that the characters, letters, and numbers making up data or information contained in a record can be read without difficulty or magnification.

2.3.11 **Lifetime Quality Assurance (QA) Records** - Records that are required to be retained and preserved in an acceptable condition for the operating life of the repository (i.e., until termination of the repository permit). Prior to destruction of any lifetime record, it shall be evaluated for upgrade to a post-closure record.

2.3.12 **Magnetic Tape** - A tape with a magnetizable surface on which data can be stored and retrieved. A tape or ribbon of any material impregnated or coated with magnetic or other material on which information may be placed in the form of magnetically polarized spots.

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2.3.13 **Microfilming** - A photographic process used to record images of records on a fine-grain, high-resolution film in sizes greatly reduced from the original. Formats in general use are rolls of 16 millimeter (mm) images, pages of 16 mm images called microfiche, and 35 mm images mounted in aperture cards. Microform is a generic term for all microfilm formats.

2.3.14 **Migrate** - In electronic records, the process of moving from one computer system to another.

2.3.15 **National Archives and Records Administration (NARA)** - An independent government agency responsible for establishing policies and procedures for managing the records of the federal government. NARA exercises final authority for approving the disposition of government records.

2.3.16 **Nonpermanent Records** - Records having value for a specific, limited time and authorized by NARA (via approved disposition schedules) to be destroyed after that time. Nonpermanent records are sometimes referred to as temporary records.

2.3.17 **No Foreign National (NOFORN)** - No Foreign National (NOFORN) is a marking that identifies a document is not to be given to a person who is a foreign national – not a United States citizen.

2.3.18 **Nonrecord Material** - Those classes of documentary or other material that fail to meet the general definition of a record or fall under one of the following categories: (a) library or museum material made or acquired for reference or exhibition purposes; (b) extra copies of documents preserved only for convenience of reference on which no action is recorded or taken; (c) stocks of publications or other processed documents that require no action and are not part of a case on which action is taken; (d) routing slips and transmittal sheets adding no information to that contained in the transmitted material (i.e., concurrences or direction on how to proceed or implement); and (e) papers of a private or nonofficial character that pertain to an individual's private affairs.

2.3.19 **Official Use Only (OUO) Information** - Certain unclassified information that may be exempt from public release under the Freedom of Information Act and has the potential to damage governmental, commercial, or private interests if disseminated to persons who do not need to know the information to perform their jobs or other U.S. Department of Energy (DOE) authorized activities.

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2.3.20 **Personal Papers** - Materials of a private nature maintained by personnel at their work place that DO **NOT** relate to, or have an effect on, the conduct of business or activities related to the CCP. Personal papers maintained in desks and file drawers in the work place must at all times be segregated and stored separately from records.

2.3.21 **Post-closure Records**

- Records that assist in preventing action that could impair the long-term isolation of the waste.
- Records preserving information that would prevent inadvertent human intrusion, such as the nature and hazard of the waste and locations of the geologic repository operation area, the underground facility, bore holes, shafts, and boundaries of the controlled area.
- Records providing information relevant to post-closure monitoring and assessment of performance of the repository system.
- Records preserving, for future generations, information regarding the geologic setting relevant to mitigation of releases of radioactive materials.
- Records which would be of significant value after decommissioning and closure of the repository.

2.3.22 **Privacy Record** - Any item, collection, or grouping of information about an individual that contains his or her name or other personal identifier.

2.3.23 **Project Participant** - Any DOE site, generator site, or contractor organization that participates in a CBFO program. Subcontractor's records are the responsibility of the participant.

2.3.24 **Project Records** - Records created or received in support of the CCP.

2.3.25 **QA Record** - An authenticated record that provides objective evidence of the quality of items or activities.

2.3.26 **Record Medium** - Refers to the physical form of recorded information such as paper, film, disk, magnetic tape, or other materials on which information can be recorded.

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2.3.27 **Records** - Those classes of documentary materials which may be disposed of only after the archival authority is obtained. The statutory definition of records (44 United States Code §3301, Definition of Records), "...includes all books, papers, maps, photographs, machine-readable materials or other documentary materials, regardless of physical form or characteristics, made or received by an agency of the United States government under federal law or in connection with the transaction of public business and preserved or appropriate for preservation by that agency or its legitimate successor as evidence of the organization, functions, policies, decisions, procedures, operations or other activities of the government or because of the informational value of the data in them." This definition applies to all departmental records including those created, received, and maintained by contractors pursuant to their contracts. Virtually all recorded information in the custody of the government (including information held by contractors which is considered by contract to be government information) regardless of its' media (hard copy, machine-readable, microform), is considered "government records." For the CCP, information meeting the above criteria is considered to be a record, unless it can be clearly identified as a nonrecord.

2.3.28 **Records Custodian** - An individual identified within an organization who is assigned the responsibility of, and trained for, assisting record originators regarding records management issues.

2.3.29 **WIPP Records Archive (WRA)** - A facility that meets the regulatory requirements for the storage of noncurrent records pending their destruction or transfer to a Federal Records Center or the NARA. The WIPP Records Archive (WRA) is located in Carlsbad, New Mexico.

2.3.30 **Records Inventory and Disposition Schedule (RIDS)** - The DOE form used to indicate the appropriate disposition of records. The purpose and content of the form may be placed in electronic media as long as all the requirements of the form are met.

2.3.31 **Record Series** - File units or documents arranged according to a filing system or kept together because they relate to a particular subject or function; result from the same activity; document a specific kind of transaction; take a particular physical form; or have some other relationship arising out of their creation, receipt, or use, such as restrictions on access and use. A record series may also include related elements physically separated from it such as finding indexes or large documents (also sometimes called a file series). These records are generally handled as a unit for disposition purposes.

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2.3.32 **Software Generated** - A form that is generated by controlled software that performs approved calculations.

2.3.33 **Unclassified Controlled Nuclear Information (UCNI)** - Certain unclassified but sensitive Government information concerning nuclear material, weapons, and components whose dissemination is controlled under section 148 of the Atomic Energy Act.

2.3.34 **Record Systems** - A common, integrated set of manual and/or automated activities for creating and identifying; collecting and controlling; processing and organizing; distributing; microfilming; storing and preserving; retrieving; and disposing of records applicable to preparation for storage, as well as the storage of machine readable records such as magnetic tapes, floppy disks, etc.

2.3.35 **Retention Period** - The period of time approved by NARA for records to be retained, whether in the originating office, Records Storage Facility or a Federal Records Center. The retention period is indicated on EA15RM3002-2-0, *Records Inventory and Disposition Schedules (RIDS)*.

2.3.36 **Uniform File Code** - A standard filing system for correspondence records required by the DOE.

2.3.37 **Unscheduled Records** - Records for which no disposition authority has been identified on an approved disposition schedule.

2.3.38 **Validation/Authentication** - An activity that certifies the content of a document as being authentic and complete. This certification is documented by signing (or initialing) and dating the document unless otherwise authenticated. Validation/authentication may be made by the author, assigned reviewers, or individual(s) specifically assigned to review and validate documents.

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3.0 RESPONSIBILITIES

3.1 CCP Manager or Designee

3.1.1 CCP Manager has the overall responsibility and authority for the content of records generated.

3.1.2 Verifies that the organization has a current approved Records Inventory and Disposition Schedule (RIDS).

3.1.3 Verifies that records are retained in accordance with retention requirements and not inadvertently or prematurely destroyed.

3.1.4 Verifies the timely disposition of records through in-house destruction.

3.1.5 Verifies that personnel are aware of the requirements to retain records according to approved retention requirements.

3.1.6 Provides adequate records management resources in the form of staff, equipment, and dedicated time to verify good record keeping practices.

3.1.7 Obtains written concurrence to destroy records exceeding their retention periods.

3.2 Cognizant Manager

3.2.1 Identifies those documents that become records.

3.2.2 Determines if the work activities are quality-affecting.

3.2.3 Identifies records in the implementing procedures.

3.3 CCP Records Manager or Designee

3.3.1 Acts as the liaison between the CCP and WRMS for records management.

3.3.2 Carries out the records management duties in accordance with approved implementing procedures.

3.3.3 Determines which nonpermanent records series are eligible for destruction.

3.3.4 Informs the CCP Manager or designee of the records that have expired retention periods.

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3.3.5 After receiving approved written concurrence, dispositions the quality assurance (QA) and/or non-QA records.

3.3.6 Prepares and revises the RIDS in accordance with CCP-QP-028, *CCP Records Filing, Inventorying, Scheduling, and Dispositioning,* and verifies the RIDS remain current.

3.3.7 Identifies records that are eligible for in-house destruction.

3.3.8 Assists personnel with record retrieval from CCP Records as required.

3.3.9 Assists in obtaining approved disposition authorities for unscheduled records from NARA.

3.4 Records Custodian

3.4.1 Carries out the records management duties in accordance with approved implementing procedures.

3.4.2 Transmits completed QA records to the Host (generator/storage) site records centers or WIPP Records Archives (if applicable).

3.4.3 Assists personnel with record retrieval from CCP Records, as required.

3.4.4 Verifies that Records are legible and that there are no missing signatures.

3.4.5 Ensure that the Attachment 2, CCP Records Transmittal/Receiving Form, is in agreement with the transmitted record.

3.4.6 Enter all QA records into the Records Index Module.

3.5 Facility Records Custodian

3.5.1 Coordinates the compilation and the transfer of records generated at the Host (generator/storage) sites.

3.5.2 Verifies that records are legible and that there are no missing signatures.

3.5.3 Ensure that the Attachment 2 is in agreement with the transmitted record.

3.5.4 Enter all QA records into the Records Index Module.

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3.5.5 Manages the transfer of completed and in-process records to CCP Records.

3.5.6 Assists personnel with record retrieval from CCP Records where applicable.

3.5.7 Carries out the records management duties in accordance with approved implementing procedures.

3.6 Personnel

3.6.1 Generates the necessary records that document the activities assigned to them. Each individual who creates records must verify the record(s) are legible, accurate, and complete, appropriate to the work accomplished.

3.6.2 Are aware of, and provide reasonable protection during the generation and processing of records intended to become QA Records.

3.6.3 Ensures that records are legible, accurate and complete, accurate to the work accomplished, when generating, reviewing, and validating records.

3.6.4 Ensures that records are not inadvertently or prematurely destroyed.

3.6.5 Coordinates records issues with the respective Records Custodian(s)/Facility Records Custodian(s).

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4.0 PROCEDURE

4.1 Generation of Records

Cognizant Managers

4.1.1 Prior to conducting a work activity:

[A] Identify those documents that become records.

[B] Determine if the work activities are quality-affecting.

[C] Identify records in the implementing procedures.

NOTE

Records may be originals **OR** reproducible copies; however, original documents are preferred.

4.1.2 Documents referenced by final reports, except readily available references such as encyclopedias, dictionaries, engineering handbooks, national codes and standards shall be retrievable from records files. Preparers of such records shall ensure that the documents are entered into the record system.

4.2 Legibility

Personnel

NOTE

Reproducible ink should be used whenever possible to verify maximum contrast on printed records. Records created in black ink typically produce better quality copies than do records printed in other color inks.

NOTE

Highlighter marking pens SHALL **NOT** be used on records. Bolding or underlining text are preferred alternatives to highlighting.

4.2.1 Verify that the records generated are legible and reproducible. If there is doubt, copy the record and then recopy the copied record (copy-a-copy test) to check the copied copy for legibility.

4.3 Accuracy

4.3.1 Verify that records are accurate to the work accomplished.

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4.4 Completeness

4.4.1 Verify that records are complete per the following:

[A] Blank spaces are filled in where information is required to be entered making the document complete.

[B] Not Applicable (N/A or NA) is entered in spaces where information is not applicable or as otherwise indicated.

[C] Blank spaces are acceptable when a record is a software generated page/form which performs calculations.

[D] The document's intent is clear, even with some blanks not filled in. If so, the record is acceptable as is. A blank space in a record does not, in itself, make the record incomplete. For example:

Is the indicator light illuminated?
___✓___ YES _____ NO

This is an acceptable method of recording information, even when the NO space is blank.

[E] "Remarks" and/or "Comments" spaces may be left blank, unless a condition identified during the associated activity necessitates further explanation by way of a remark or comment.

NOTE

Individuals handling documents intended to become QA Records shall provide reasonable protection for the records from damage or loss until the records are submitted to the records system (this includes documents generated during field operations).

4.5 Storage, Maintenance, Control, and Protection of QA Records

4.5.1 Store, maintain, and protect completed QA records as follows:

[A] In an Underwriter Laboratories-listed one-hour fire rated (or equivalent) container, or a container certified by a person competent in the technical field of fire protection,

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[B] Retain a copy in a location sufficiently remote from the original to preclude destruction as a result of a single event such as fire or natural disaster,

ALSO

[C] Provide adequate protection of the QA records within the storage location to minimize the risk of damage or loss from humidity, natural disasters, adverse weather conditions, mold or infestations of insects or rodents.

[D] DO **NOT** store QA records where they may be exposed to water or heat sources, **OR** where food is kept.

4.5.2 Access

[A] Prevent access to QA records by unauthorized personnel as follows:

NOTE

Authorization must be documented either by signature and date on posted list, **OR** by letter on file. Authorization will be done by the CCP Manager or designee. The authorization list must be kept current.

[A.1] Generate, post, and maintain a list designating the personnel who are authorized and permitted access to the QA records.

NOTE

Provisions for installation of locking mechanisms will be made for storage areas requiring controlled access. Authorized personnel allowed access to the storage areas will be given the lock code **OR** controlled location of the keys.

[A.2] Protect locking mechanisms for storage cabinets/areas that require controlled access.

[A.3] Store all records not currently being used in appropriate storage equipment (e.g., file cabinets, shelving, desks).

[A.4] Lock file cabinets and offices as appropriate when leaving controlled access areas.

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4.6 Records Separation and Availability

NOTE
Records will be separated from non-records and personal papers.

4.6.1 Provide a means to retrieve records by indexing with one of the following methods:

[A] Numerically (such as audit case files):

OR

[B] By subject, with guides dividing different subjects.

4.7 Corrections, Additions, Revisions, Supplements, and Lost Records

NOTE
When in-process record/records intended to become QA Records are being generated they shall be maintained (do not remove or destroy) and if corrections are required, then perform this by proper correction, superseding, or voiding as directed in the following sections of this procedure.

4.7.1 Make necessary changes, additions, revisions and supplements in accordance with the following guidelines:

[A] Corrections

[A.1] Correct errors by drawing a single line through the incorrect information (leaving the original text readable), entering the correct information, **AND** initialing and dating each correction made.

[A.2] DO **NOT** use correction fluid (white-out) or correction tape on records.

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NOTE

Editorial changes may be made to records without the same level of review and approval as the original record. Editorial changes include ONLY the following:

- Correcting grammar or spelling (the meaning has not changed);
- Renumbering sections, attachments, or pagination, providing the original intent of the record has not been altered
- Clarification statements that do not affect the technical or quality content of the record
- Sections without an "N/A" entry, for which "N/A" is the appropriate notation for the record.

[A.3] Provide corrected or changed records (except for editorial changes) that have been validated back to the originating organization for review and revalidation.

NOTE

Original records may not be available for remote personnel to make necessary changes; therefore a printed copy of the scanned image from CCP Records may be used to make the changes. Changes will be transmitted in accordance with step 4.10.1.

[A.4] **IF** the original document is unavailable to the individual making a change to a record,
THEN use a printed copy of the scanned image from CCP Records and make the change. This will then become the original.

[B] Additional Notations

[B.1] **IF** any additional information needs to be added to a record after validation,
THEN enter the notation, **AND** initial and date each notation(s) made.

[C] Revisions, Regeneration, and Supplements

[C.1] **IF** a record needs to be revised due to illegibility or damage,
THEN transcribe **OR** enhance the illegible, or damaged, portion of the record **AND** initial and date each part transcribed or enhanced.

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[C.2] **IF** a record must be regenerated due to damage, **THEN** regenerate the record and place a notation at the bottom of the regenerated page, "This record has been regenerated because of damage," sign, and date. Place the regenerated record in front or on top of the original damaged record.

[C.3] **IF** a record has already been sent to CCP Records, **AND** needs a supplement or revision, **THEN** contact CCP Records.

NOTE

The following is a standard way to add new pages to a document, to supersede a page, and to add a corrected page.

[D] Adding Pages to Documents

[D.1] When adding pages to a document, place new pages behind the page within the document that they will follow.

Example: The new pages are to be added right after page 35 within the document. Place the new pages behind page 35, **AND** number the new pages 35A, 35B, 35C.

[D.2] **IF** the pages are added to the end of the document, **THEN** number them in sequential order.

Example: The last page of the document is page 40. Place the new pages after page 40, **AND** number the new pages as 41, 42, 43.

[E] Superseding Pages

[E.1] When superseding a page with a new, corrected page, draw a single, diagonal line through the entire page to be superseded **AND** initial and date.

[E.2] Place the new, corrected page to the front of the superseded page. Using the page number on the now superseded page, number the new, corrected page with the same number, then renumber the superseded page with the same number and an additional character (i.e., A, B, C).

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Example: Superseded page was numbered 35. The new, corrected page will now be numbered 35, **AND** the superseded page will change to 35A.

[F] Superseding or Voiding of Whole Documents

[F.1] When superseding or voiding a whole document (not just pages within a document [i.e., BDRs, Nonconformance Reports [NCR]]) stamp or write "superseded" or "void" on the first page of the document **AND** initial and date.

[G] Lost Records

[G.1] **IF** replacement or restoration of the record is **NOT** practical,
THEN action should be taken to ensure the quality of the items or activities affecting quality, by using re-examination, investigation, or by other means.

4.8 QA Record Authentication/Validation

NOTE
Records become QA records when they are completed and authenticated/validated.

NOTE
Individuals who review and authenticate/validate records are responsible for the completeness and accuracy of those records.

[A] Authenticate/validate QA records through one of the following methods:

[A.1] Initial **OR** sign and date hard copy records, unless otherwise authenticated/validated.

[A.2] **IF** the nature of the record precludes signing,
THEN validate the QA record using any reasonable form which clearly indicates that an authorized individual believes the record to be complete and accurate.

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4.9 Protection and Preservation of Computer Generated Electronic Records

NOTE

There are two types of electronic records:

- Electronic records that can be printed in a hard copy format.
- Electronic records that cannot be printed in a hard copy format.

Where the electronic copy is not converted to hard copies it must be managed in accordance with the guidelines contained in this section. Properly performing these steps will ensure that electronic records are in compliance with the applicable requirements.

NOTE

Computer modeling results (e.g., Monte Carlo N Particle [MCNP], Origen2.2) that perform statistical and random computer runs of radionuclide distributions will not be maintained but summarized in the hardcopy calculation packages. The calculation packages document these computer runs and shall define the range of possible values, the methodology for randomly selecting from this range, and a representative example of the input values and output result.

NOTE

Electronic media for historical source documents transmitting Adobe PDF files or electronic databases may be compact discs (CDs) or digital video discs (DVDs).

4.9.1 Protection

[A] To minimize the risk of unauthorized additions, deletions, or alterations to electronic files, use power-on, file passwords, or control lists to control any unauthorized access.

[A.1] Place electronic records, when complete to read/write protection.

[B] Provide access of electronic records to authorized staff.

[C] Provide access in the work area of electronic file indices printouts, logs, disk labeling, **OR** other means to facilitate retrieval of active records by authorized users. Indicate the method used (including the directory path, if applicable) to transfer the information, the date compressed (if applicable), and file encryption information.

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4.9.2 Preservation

[A] Preserve records for the duration of their authorized retention period to verify their availability and provide verification of work performed by the facility and its supporting agencies.

4.9.3 Storage

[A] Label all electronic media (computer generated) used to store records properly with the following: originating organization, filename, retention period (obtain from CCP Records), original software used, and the version of the software.

4.9.4 Media Backup

[A] Back up electronic records on a regular basis to safeguard against the loss of information due to equipment malfunctions or human error.

4.9.5 Hardware/Software Changes

[A] Protect records media **AND** migrate information before the media is no longer useful.

[A.1] As software programs change, transfer existing records to the newer software program.

[A.2] As hardware is phased out or upgraded, verify that all existing records can be read utilizing the new hardware.

(a) **IF** new software and hardware will **NOT** read the current electronic record(s),
THEN migrate the records to a more accessible media.

(b) **IF** migration is **NOT** possible,
THEN retain either the old software and hardware **OR** make a printout of the data **AND** file the hard copy.

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4.10 Transmitting Records

NOTE
Transmitting completed QA records is for records going from one location or site to another.

NOTE
Records being forwarded within a Host site location or between Project-Office personnel DO NOT need an Attachment 2. Completed QA Records being sent from one location or site to another will be sent using Attachment 2.

4.10.1 Transmitting Completed QA Records

[A] Send completed QA records (e.g., BDRs) via Attachment 2 to the Records Custodians/Facility Records Custodians.

[B] Before the completed QA record is transmitted, make a copy of Attachment 2 and the record, **AND** retain until receipt acknowledgement is received from the recipient.

NOTE
Transmittal of completed characterization records to the Host (generator/storage) site (when available) is performed according to the site-specific procedure regarding the submittal of characterization records to their records center. These characterization records will be maintained in accordance with their site-specific records procedures.

NOTE
Records that are designated as lifetime records shall be maintained for the life of the waste characterization program at a participating generator/storage site plus six years, or transferred to the WIPP Records Archive facility. Records designated as non-permanent records shall be maintained for 10 years from the date of record/generation at the participating generator/storage site, or at the WIPP Records Archive facility.

Records Custodian

4.10.2 Transmitting of Completed Characterization Records to the Host (generator/storage) Site or WIPP Records Archive (as applicable)

[A] Return characterization records to the Host (generator/storage) site location or WIPP Records Archive (as applicable) either at pre-determined intervals **OR** at that end of the waste characterization process in accordance with approved RIDS.

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[B] **IF** the Host (generator/storage) site is closed and will no longer be in operation,
THEN submit the documentation pertaining to that site to CBFO for permanent archiving, **OR** the WIPP Records Archive at the end of the waste characterization process in accordance with approved RIDS.

NOTE

The Waste Confirmation Organization represents the permittees and is required to confirm that waste shipments comply with permit requirements prior to shipment.

4.10.3 Transmitting of Waste Confirmation Video and Audio Media Recording

[A] Transmit one copy of the video and audio recording media to the Waste Confirmation Organization.

4.11 Unclassified Controlled Nuclear Information (UCNI) and Official Use Only (OUO) Documentation

NOTE

Transmission of Unclassified Controlled Nuclear Information (UCNI) or Official Use Only (OUO) documents must be by means that preclude unauthorized disclosure or dissemination.

NOTE

UCNI documentation must include the required release and markings identified in DOE M 471.1-1, *Identification and Protection of Unclassified Controlled Nuclear Information Manual*. OUO documentation must include the required release and markings identified in DOE M 471.3-1, *Manual for Identifying and Protecting Official Use Only Information*.

4.11.1 Transmitting of UCNI and OUO Documents

[A] Documents identified as UCNI must be transmitted to CCP Records with an Attachment 2 and the transmittal must have the following statement placed in the comment section:

Matter transmitted contains Unclassified Controlled Nuclear Information. When separated from enclosures, this transmittal document does not contain UCNI.

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[B] Documents identified as OUO must be transmitted to CCP Records with an Attachment 2 and the transmittal must have the following statement placed in the comment section:

Document transmitted contains OUO information.

[C] When transmitting externally:

[C.1] The UCNI or OUO matter must be contained in a single opaque envelope or wrapping with the recipient's address, a return address, and the words "To Be Opened by Addressee Only."

[C.2] Must be sent by the following U.S. mail methods: First Class, Express, Certified, or Registered Mail,

OR

[C.3] Any commercial carrier, FedEx is preferred.

[D] When transmitting internally the documents may be hand carried as long as the transmitter can maintain control over access to the document being transmitted.

4.11.2 Access and Protection of UCNI and OUO Documents

NOTE

When giving an authorized individual a copy of an UCNI or OUO document, the requirements they will be expected to perform while the document is in their possession must be made clear to the individual, see requirements below.

NOTE

Only authorized individuals may have access to UCNI or OUO documents (e.g., an individual with an official need to know in connection with the performance of official DOE-authorized activities).

[A] Disseminate UCNI or OUO documentation to only authorized individuals.

[B] Must maintain physical control of UCNI or OUO documentation to preclude unauthorized disclosure; store in locked receptacles, such as file cabinets, desks, or bookcases.

[C] Reproduce only to the minimum extent necessary.

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[D] When a copy machine malfunctions during the copying of an UCNI or OUO document the copier must be cleared and all paper paths checked to verify that no UCNI or OUO material remains in the machine.

[E] After its necessary use by an authorized individual, all copies of UCNI or OUO documentation must be destroyed by using strip cut shredders that result in particles of no more than ¼- inch wide strips or if on a CD the shredding of the disc.

[F] Electronic UCNI or OUO documentation (e.g., PDF) maintained by CCP Records will be stored on a protected server and the files will be properly marked as UCNI or OUO.

4.12 Internal Use Only (IUO) and No Foreign National (NOFORN)

4.12.1 Transmitting of IUO and NOFORN Documents

[A] Documents identified as IUO or NOFORN must be transmitted to CCP with an Attachment 2 and the transmittal must have it clearly identified in the Comments section that the document being transmitted is IUO or NOFORN.

4.12.2 Access and Protection of IUO and NOFORN

NOTE

Only individuals within the project may have access to IUO documents. Dissemination outside of the project will not be permitted.

[A] Disseminate IUO to internal project participants only. NOFORN is not to be disseminated to any Foreign National.

[B] Must maintain physical control of IUO or NOFORN to preclude unauthorized disclosure; store in locked receptacles, such as file cabinets, desks, or bookcases.

[C] Reproduce only to the minimum extent necessary.

[D] After its necessary use by an authorized individual, all copies of IUO and NOFORN must be destroyed by a paper shredder or if on a CD the shredding of the disc.

[E] Electronic IUO or NOFORN documentation (e.g., PDF) maintained by the CCP Records will be stored on a protected server and the files will be properly marked as IUO or NOFORN.

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4.13 Receiving QA Records

4.13.1 Receipt process provides the following:

[A] Provisions to permit a current and accurate assessment of the status of QA records.

[B] A method for identifying the records required to be included in the records system.

[C] A method for identifying the records that have been received.

[D] Procedures for receipt and inspection of incoming records, including verification that the QA records are received in agreement with the transmittal document and that the records are legible.

[E] Provisions to control and protect the records from damage or loss during the receiving processes.

[F] A method for submittal of completed records to the storage facility without unnecessary delay.

4.13.2 The Facility Records Custodian assigned at each Host (generator/storage) site is responsible for receipt and transmittal of QA records. In the event that a Facility Records Custodian has not been assigned to a Host site, the CCP Records Manager will designate the person or organization responsible for receiving records.

4.13.3 Ensure that the Attachment 2 is in agreement with the transmitted record and that it is legible.

[A] **IF NOT**,
THEN notify the sender and perform the following:

[A.1] Work to resolve the issues with the sender.

[A.2] **IF** unable to resolve the issues,
THEN identify the record was rejected on Attachment 2 and return Attachment 2 and record to the sender.

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4.13.4 Enter all QA records into the Records Index Module.

NOTE

Once QA records have been received in CCP Records, original records will **NOT** be removed without a specific need for the original record to be released. If an original record is removed from CCP Records, it is to be returned within fourteen (14) calendar days.

4.14 Retrieval of Original Records from CCP Records at the Project Office

4.14.1 Requests for retrieval of **ORIGINAL** records are handled as follows:

[A] Requestor, provide a written request to CCP Records providing the reason for the request and when the record will be returned.

Records Custodian/Facility Records Custodian

4.14.2 Process requests for retrieval of records already placed into CCP Records as follows:

[A] Pull the requested record.

[B] Make a copy of the record or assure that there is a PDF copy of the record.

[C] **IF** there is not a PDF scanned copy of the record, **THEN** place a copy of record into the records file.

[D] Place a completed Check Out Card in the record file.

[E] Notify requestor of availability of the requested record for pick-up **OR** deliver the **ORIGINAL** requested record to the person who made the request.

4.15 Destruction of QA and Non-QA Records

4.15.1 Destruction of QA Records

[A] DO **NOT** destroy QA records until each of the following conditions are met:

[A.1] Expiration of the NARA approved retention, as noted in the CCP RIDS, has occurred.

[A.2] Evaluation of lifetime records for the potential need to upgrade them to post-closure records has been performed by the CCP Manager or designee.

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[A.3] CCP Manager or designee determines if regulatory requirements are satisfied, operational status permits the disposal of such records, and the related contractual requirements have been satisfied.

[A.4] In cases of conflicting requirements concerning records retention requirements, the most stringent requirements shall be used in determining the final disposition.

AND

[A.5] CCP Manager or designee determines that there are no enforcement actions against the CCP.

NOTE

QA records that may be relevant to an enforcement action, regardless of disposition, will be maintained until the New Mexico Environment Department (NMED) determines they are no longer needed for enforcement action, and then the records may be dispositioned as directed in step 4.15.2.

[B] **IF** all of the listed conditions are **NOT** met,
THEN DO **NOT** destroy the affected records series, **AND** CCP Manager or designee, follow step 4.15.3.

[C] **IF** all of the listed conditions are met,
THEN CCP Manager or designee complete the Written Request for Records Destruction, (See Attachment 1, Written Request for Records Destruction for an example), **AND** submit to the WRMS Manager before destroying QA records.

[D] Upon receipt of the approved written concurrence, CCP Manager or designee forward the approval to the CCP Records Manager or designee.

CCP Records Manager or Designee

[E] Receive the approved written concurrence and disposition the QA records.

4.15.2 Destruction of Nonpermanent, Non-QA Records

CCP Records Manager or Designee

[A] Determine which nonpermanent records series are eligible for destruction by reviewing the RIDS to determine the length of time the records series is to be retained.

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[B] Inform the CCP Manager or designee of the records which have expired retention periods.

CCP Manager or Designee

[C] **IF** in agreement,
THEN the CCP Manager or designee, completes and forwards Written Request for Records Destruction, including a reference to the current RIDS, to the WRMS Manager before destroying the nonpermanent, non-QA records.

CCP Records Manager or Designee

[D] After receiving the approved written concurrence, disposition identified non-permanent or non-QA records.

4.15.3 Requesting an Extension of the Record Retention Period

[A] **IF** the CCP Manager or designee determines that the approved record retention period needs to be extended,
THEN CCP Manager or designee, perform the following:

[A.1] Send a memorandum to the WRMS Manager with a request and justification of an extension.

[A.2] Maintain the memorandum with the respective RIDS.

[A.3] Take the appropriate action, depending on the response to the memorandum.

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5.0 RECORDS

5.1 Records generated during the performance of this procedure are maintained as QA records in accordance with the requirements of this procedure. The records are the following:

5.1.1 Non-QA

[A] Written Request for Records Destruction

[B] Written Request for Retrieval of Original Record

[C] Request for Extension Memorandum

5.1.2 QA/Nonpermanent

[A] Attachment 2 – CCP Records Transmittal/Receiving Form

[B] Records Index Module

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Attachment 1 – Written Request for Records Destruction (Example)

Nuclear Waste Partnership

John Smith
Technical & Field Engineering, Incorporated
2101A South Canal
Carlsbad, NM 88220

SUBJECT: REQUEST FOR CONCURRENCE TO DISPOSE OF RECORDS

Dear Mr. Smith:

This is a request for concurrence to dispose of the following record series according to our current Records Inventory and Disposition Schedule dated April 10, 2004.

RECORD SERIES	RETENTION PERIOD	INCLUSIVE DATES
Landlord Housekeeping Pre-checklists - Item #24	1 year	January, 2003 through July, 2003
Key Inventory Logs - Item #17	2 years	January, 2002 through June, 2002

If you have any questions, please contact Ms. Jane Smith, of my staff, at (575)555-5555.

Sincerely,

David Doe
Characterization Project Manager

CONCURRENCE:

John Smith, Manager
WIPP Records Management Services (WRMS)

SP: ab

cc: J. Smith, Technical & Field Enginnering

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Attachment 2 – CCP Records Transmittal/Receiving Form

CCP Records / Records Custodian, 4021 National Parks Highway - MS: GSA 212, Carlsbad, New Mexico 88220

Telephone Number: 575-234-7523

Fax Number: 575-234-7033

Attn:		From:	
Ship to:		Site:	
		Company:	
		Telephone Number:	
		Date Sent:	
Telephone Number:			

Document Number	Title / Description	Record Date	Total Pages

Comments

(When the Record accepted line has been completed, the rest of the page below may be left blank.)
Acceptance/Rejection Signature and Date

Records Accepted ☐ _____ _____ _____
Signature Printed Name Date

Records Rejected ☐ _____ _____ _____
Signature Printed Name Date

Reason for Rejection:

Re-submittal: _____ _____ _____
Signature Printed Name Date

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CCP-QP-028

Revision 16

CCP
Records Filing, Inventorying, Scheduling, and Dispositioning

EFFECTIVE DATE: 02/06/2015

Mike Ramirez

PRINTED NAME

APPROVED FOR USE

RECORD OF REVISION

Revision Number	Date Approved	Description of Revision
3	08/20/2002	Added steps 4.3.3 through 4.3.6. Added a Table of Contents. Added a Record of Revision. Other editorial changes.
4	10/24/2002	Added new Step 3.1.2 and revised Step 4.2.4.[B] making the Project Manager responsible for signing RIDS; added as result of a comment during the SRS Recertification Audit.
5	09/25/2003	Separated electronically fillable forms and updated references in procedure. Added responsibilities for CCP personnel. Other editorial changes.
6	07/25/2006	Revised to change the CCP Project Manager's responsibility to the CCP Project Support Manager.
7	04/18/2007	Revised to change CCP Project Support Manager responsibilities to the CCP Program Development Manager.
8	09/11/2007	Revised to make minor editorial changes and to replace Attachment 1, Records Inventory and Disposition Schedule with new DOE form, DOE F 1324.10 (06-96).
9	02/24/2009	Revised to incorporate changes to titles of personnel and names for organizations. Also, a step was added to Section 4.2 (step 4.2.5) to complete the process performed. Section 4.4 was deleted since the requirements are not applicable to the CCP scope of work (they are implemented at the RCT level).
10	04/08/2010	Revised to incorporate changes to Attachment 2, Instructions for Filling Out the Records Inventory and Disposition Schedule.
11	05/19/2010	Revised to bring instructions regarding location in Attachment 4, Instructions for Filling Out the Records Inventory and Disposition Schedule, in line with current practice.
12	11/09/2010	Revised to remove examples form and re-number remaining attachments and update Attachment 2.
13	09/09/2011	Revised to correct reference section of the procedure and remove a reference that is no longer active.

RECORD OF REVISION

Revision Number	Date Approved	Description of Revision
14	01/16/2012	Revised to bring into line with the Waste Isolation Pilot Plant (WIPP) Inventory Worksheets and general editing of the procedure.
15	01/22/2013	Revised to incorporate Nuclear Waste Partnership (NWP) transition changes.
16	02/06/2015	Revised to address the form number identification in the procedure. Replaced the title “Lead Records Custodian” with “Central Characterization Program (CCP) Records Manager” throughout the document. Deleted Section 3.3, WIPP Records Management Services (WRMS). In Section 4.2.4, added a step for the CCP Manager.

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1.0 PURPOSE

This procedure provides direction and instruction for generating, issuing, and using a Records Inventory and Disposition Schedule (RIDS).

1.1 Scope

The procedure applies to Central Characterization Program (CCP), CCP Manager, and CCP Records Manager responsible for inventory, scheduling, and disposing of CCP records under their cognizance, regardless of media, in order to document the activities related to the CCP.

2.0 REQUIREMENTS

2.1 References

Baseline Documents

- 44 USC 3301, *Definition of Records*
- DOE/CBFO-94-1012, *U.S. Department of Energy Carlsbad Field Office* (CBFO) *Quality Assurance Program Document* (QAPD)

Referenced Documents

- EA15RM3002-1-0, *WIPP Records Inventory Work Sheet*
- EA15RM3002-2-0, *Records Inventory and Disposition Schedule (RIDS)*
- WP 15-RM3002, *Records Filing, Inventorying, Scheduling, and Dispositioning*
- CCP-QP-008, *CCP Records Management*

3.0 RESPONSIBILITIES

3.1 CCP Manager or Designee

3.1.1 Approves the RIDS.

3.2 CCP Records Manager or Designee

3.2.1 Develops new RIDS.

3.2.2 Performs annual review and revision of RIDS.

4.0 PROCEDURE

4.1 Developing a New Inventory and RIDS

CCP Records Manager or Designee

NOTE
The CCP Records Manager or Designee may request assistance from WIPP Records Management Services (WRMS) for performance of steps 4.1.1 and 4.1.2.

4.1.1 Complete EA15RM3002-1-0, *WIPP Records Inventory Work Sheet* for each record and non-record series, using the instructions contained in WP 15-RM3002, *Records Filing, Inventorying, Scheduling, and Dispositioning*.

4.1.2 Complete the RIDS on form EA15RM3002-2-0, *Records Inventory and Disposition Schedule (RIDS),* using the instructions contained in WP 15-RM3002.

4.2 RIDS Review and Approval

4.2.1 Forward the draft RIDS and all EA15RM3002-1-0 to WRMS for review and comments.

4.2.2 **IF** WRMS returns the RIDS with comments,
THEN resolve the comments.

4.2.3 **WHEN** notified by WRMS that the RIDS is acceptable,
THEN print out a final copy of the RIDS for signatures.

4.2.4 Obtain the required signatures in Block 5, RIDS, as follows:

[A] Prepared by - Signature of the CCP Records Manager or Designee who prepared the RIDS

CCP Manager or Designee

[B] Approve the RIDS by signing in Block 5

CCP Records Manager

[C] Record Liaison Officer - Enter “N/A”

4.2.5 Submit signed RIDS to WRMS for final approval by obtaining WRMS signature.

4.3 Revising and Reviewing the RIDS

4.3.1 Review files annually, at a minimum.

NOTE

Take into consideration organization changes that may affect record series custodianship, location, or when new record series are created.

4.3.2 Check all record and non-record material on the current RIDS.

4.3.3 **IF** a new series is added,
THEN complete an EA15RM3002-1-0, with the instructions in WP 15-RM3002, **AND** add the new record series to a draft CCP RIDS.

4.3.4 **IF** a record series is no longer generated and maintained,
THEN complete an EA15RM3002-1-0, with the instructions in WP 15-RM3002, **AND** delete the item on a draft RIDS.

4.3.5 Forward the draft RIDS, **AND** any new EA15RM3002-1-0 to the WRMS annually at a minimum.

4.3.6 Follow steps 4.2.2 through 4.2.5.

4.3.7 **IF** an interim RIDS change is needed to make an immediate change of information on the RIDS,
THEN complete an EA15RM3002-1-0, with the instructions in WP 15-RM3002.

4.3.8 Send copy to WRMS and add changes to a draft RIDS to be submitted in the next RIDS review.

5.0 RECORDS

5.1 Records generated during the performance of this procedure are maintained in accordance with CCP-QP-008, *CCP Records Management.* The records are the following:

Non-Records

5.1.1 Records Inventory and Disposition Schedule (records held in accordance with WP 15-RM3002)

5.1.2 WIPP Records Inventory Worksheet (records held in accordance with WP 15-RM3002)

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CCP-TP-001

Revision 21

CCP
Project Level
Data Validation and Verification

EFFECTIVE DATE: 06/06/2013

Mike Ramirez

PRINTED NAME

APPROVED FOR USE

RECORD OF REVISION

Revision Number	Date Approved	Description of Revision
4	12/14/2001	Revised to reflect the use of an electronic data management system at some sites. A new Section 4.4 was created; minor changes to Section 4.7; references and records updated, and Attachments 1 through 4 revised.
5	03/08/2002	Minor editorial changes; added a new Section 4.8, and a new Attachments 7 through 11.
6	05/15/2002	Description of Revision: Changes made due to the Revision of DOE/WIPP-02-3122, *Contact-Handled Transuranic Waste Acceptance Criteria for the Waste Isolation Pilot Plant* (CH-WAC) and changes to the Permit Modification to be implemented June 1, 2002. Plus planned changes due to process improvement. Multiple section changes as well as Attachment changes.
7	01/13/2003	Updated title of CCP-PO-005. Updated attachments 1 through 12.
8	02/03/2003	Additions to Attachment 4 and Attachment 5, DAC requirements. Resolved CBFO comments.
9	07/10/2003	Text and attachments to include Homogeneous Solid/Soil Waste Sampling and Checklists. Added steps to validate BDRs through P-TS. Separated electronically fillable forms and updated references in procedure.
10	08/28/2003	Revised sections 2.1, 2.6, 3.2, 4.3, and 5.1.
11	03/23/2005	Revised to incorporate LANL Off-Site Source Recovery Project (OSRP) requirements. Deleted Section 4.5, e-QA forms, Attachments 1 through 4 due to closure of Argonne National Laboratory (ANL)-East. Revised CCP Records Custodian and Facility Records Custodian responsibilities and actions.
12	05/25/2006	Revised to address Carlsbad Field Office (CBFO) Document Review Record (DRR) comments.
13	07/21/2006	Revised Attachments 10, 11, 13, 14, and 15 in response to Corrective Action Report (CAR) Number CAR-LANL-0006-06.
14	11/16/2006	Revised to implement the Waste Isolation Pilot Plant Hazardous Waste Facility Permit requirements resulting from the Section 311/Remote-Handled (RH) Permit Modification Request (PMR). Addressed Carlsbad Field Office (CBFO) Document Review Record (DRR) comments.
15	11/22/2006	Minor revision to correct header in Attachment 12.

RECORD OF REVISION (Continued)

Revision Number	Date Approved	Description of Revision
16	04/26/2007	Clarification of note in Section 4.3 for quarterly reports.
17	09/24/2007	Revised to clarify the references in the attachments and to remove the 25%RPD limit for solids/soils co-located cores/samples from Attachments 6, 7, 8 and 9. Revised to remove Visual Examination (VE) Expert decisions and signature and date. Modifications were made to Sections 4.4, 4.5, and Attachments 6 through 9 to discuss the F-test and control charts.
18	08/09/2010	Revised to address Hazardous Waste Facility Permit modification, and other editorial and freeze file changes.
19	12/29/2010	Revised to clarify independent technical reviewer (ITR) Independence and to update references to the *Waste Isolation Pilot Plant Hazardous Waste Facility Permit.*
20	09/27/2012	Revised to remove references to P-TS. Also revised due to CAR-LANL-0005-12 and CBFO CAR 12-033.
21	06/06/2013	Revised to address Class 2 Hazardous Waste Facility Permit Modification, which was approved by New Mexico Environmental Department (NMED) on March 13, 2013.

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Attachment 4 – CCP SPM Off-Site Source Recovery Sealed Source Radiological Characterization Project Level Validation Checklist and Summary 30

1.0 PURPOSE

Waste characterization data generated by characterization activities are validated and verified in compliance with CCP-PO-001, *CCP Transuranic Waste Characterization Quality Assurance Project Plan* (QAPjP) and CCP-PO-002, *CCP Transuranic Waste Certification Plan*. The format of CCP-PO-001 parallels that of the *Waste Isolation Pilot Plant Hazardous Waste Facility Permit,* NM 4890139088 TSDF, Attachment C, *Waste Analysis Plan* (WAP). Characterization data requiring review, validation and verification includes Nondestructive Examination (NDE), Nondestructive Assay (NDA), Sealed Sources Radiological Characterization Data, and Visual Examination (VE).

1.1 Scope

NOTE

Remote-handled data review and validation is addressed in the appropriate TP-500 series procedure.

Gas Generation Testing (GGT) data review and validation are not addressed in this procedure. Refer to CCP-PO-016, *CCP Gas Generation Testing Program Quality Assurance Project Plan* for guidance.

This procedure defines the activities required to perform data validation and verification at the Central Characterization Program (CCP) Project Office. This procedure is applicable to all personnel performing data validation and verification. The Site Project Manager (SPM) is responsible for conducting the data validation and verification activities described in this procedure. Compliance with this procedure ensures that each batch data report (BDR) complies with the requirements of the CCP-PO-001 and CCP-PO-002.

2.0 REQUIREMENTS

2.1 References

Referenced Documents

- *Waste Isolation Pilot Plant Hazardous Waste Facility Permit*, NM 4890139088-TSDF, Attachment C, *Waste Analysis Plan*
- CCP-PO-001, *CCP Transuranic Waste Characterization Quality Assurance Project Plan*
- CCP-PO-002, *CCP Transuranic Waste Certification Plan*
- CCP-PO-003, *CCP Transuranic Authorized Methods for Payload Control (CCP CH-TRAMPAC)*
- CCP-PO-016, *CCP Gas Generation Testing Program Quality Assurance Project Plan*
- CCP-QP-002, *CCP Training and Qualification Plan*
- CCP-QP-005, *CCP TRU Nonconforming Item Reporting and Control*
- CCP-QP-008, *CCP Records Management*
- CCP-QP-029, *CCP Corrective Action Management*

2.2 Training Requirements

Personnel performing this procedure will be trained and qualified in accordance with CCP-QP-002, *CCP Training and Qualification Plan* prior to performing this procedure.

2.3 Equipment List

2.3.1 None.

2.4 Precautions and Limitations

2.4.1 None.

2.5 Prerequisite Actions

2.5.1 None.

2.6 Definitions

2.6.1 None.

2.7 Project Office Integrated Data Center (IDC) (where available)

2.7.1 The IDC provides the capability of tracking BDRs for review.

2.7.2 The IDC provides, as a minimum, the following:

[A] Link to a scanned copy of the BDR.

[B] Status of the BDR.

[C] HOLD status of the BDR.

[D] Status of Nonconformance Reports (NCRs).

3.0 RESPONSIBILITIES

NOTE

Implementation of this procedure requires the following positions: Data Generation Level (DGL) Personnel, SPM, CCP Records Custodian, and Facility Records Custodian.

3.1 SPM

3.1.1 Reviews 100 percent of the BDRs generated as a result of waste characterization activities prior to any of the waste associated with the data reviewed being shipped to the Waste Isolation Pilot Plant (WIPP).

3.1.2 Ensures the DGL Independent Technical Reviewer (ITR) reviews, validations, and verifications have been performed by verifying completed review checklists and appropriate signatures.

3.1.3 Ensures BDR review checklists are complete.

3.1.4 Ensures data are within established data assessment criteria and meet all applicable Quality Assurance Objectives (QAOs) as defined by CCP-PO-001.

3.1.5 Ensures BDRs are complete and data are properly reported (e.g., data are reported in the correct units, and correct significant figures).

3.1.6 Prepares the applicable CCP SPM Project Level Data Validation Summary.

3.1.7 Releases, by signature and date, the BDR upon completion of the SPM review.

3.1.8 Generates NCRs in accordance with CCP-QP-005, *CCP TRU Nonconforming Item Reporting and Control* and Corrective Action Reports (CARs) in accordance with CCP-QP-029, *CCP Corrective Action Management* as required.

3.1.9 Reviews NCRs and verifies corrective actions, as needed.

3.1.10 Determines if U.S. Department of Energy (DOE)/Carlsbad Field Office (CBFO) reporting is required for NCRs/CARs generated at the SPM level.

[A] Makes notifications to DOE/CBFO, and ensures actions are completed as required.

3.2 CCP Records Custodian

3.2.1 Receives corrected BDR or BDR pages from the Facility Records Custodian, as necessary, in accordance with CCP-QP-008, *CCP Records Management*.

3.3 Facility Records Custodian

3.3.1 Enters BDR into the IDC.

3.3.2 Receives, processes, and transmits corrected BDR or BDR pages to CCP Records Custodian, when applicable, in accordance with CCP-QP-008.

4.0 PROCEDURE

4.1 BDR Receipt

Facility Records Custodian

4.1.1 Enter BDR into the IDC.

NOTE
Steps in Section 4.2 may be performed in any order.

4.2 SPM BDR Review

NOTE
Section 4.2 must be completed for 100 percent of the BDRs transmitted to the SPM.

The SPM must perform a comprehensive review of the data (e.g., correct units, significant figures, as well as ensuring that data assessment criteria are met).

SPM

4.2.1 Initiate BDR review in the IDC as follows:

[A] Log into the IDC.

[B] Select BDR to review (e.g., the IDC Daily Hot Lists).

[C] Click on START SPM REVIEW.

[D] Compare Container Identifications (IDs) in the BDR to the Container IDs included in the IDC.

[E] **IF** any Container IDs from the BDR are missing from the IDC **OR** DO **NOT** match those entered into the IDC, **THEN** contact the CCP Records Custodian/Facility Records Custodian, **AND** resolve the problem.

[E.1] Place BDR on HOLD by selecting, PLACE BDR ON HOLD, if necessary, **AND** enter reason for HOLD in the Comments/Qualifiers Section by selecting ADD/EDIT COMMENTS.

[E.2] **WHEN** the problem is resolved,
THEN select REMOVE HOLD FROM BDR in the IDC.

[E.3] Compare NCRs included in the BDR to the NCRs in the IDC, if applicable.

[E.4] **IF** any NCRs are missing from the IDC **OR** DO **NOT** match those entered into the IDC for the BDR,
THEN contact the NCR Coordinator, **AND** resolve the problem.

[E.5] Place BDR on HOLD by selecting, PLACE BDR ON HOLD, if necessary, **AND** enter reason for HOLD in the Comments/Qualifiers Section by selecting ADD/EDIT COMMENTS.

[E.6] **WHEN** the problem is resolved,
THEN select REMOVE HOLD FROM BDR in the IDC.

NOTE

Containers for Newly Generated Waste will **NOT** appear in the Acceptable Knowledge (AK) Tracking Spreadsheet on the CCP secure file transfer protocol (sftp) site for VE Technique BDRs. All Newly Generated Waste containers should be listed in the AK Tracking Spreadsheet at the time of validation for all other BDR types.

NOTE

Reports derived from the IDC Search function use the AK Tracking Spreadsheets and can be used to verify Container IDs.

[F] Compare Container IDs in the BDR to the approved AK Tracking Spreadsheet on the CCP sftp site.

[G] **IF** any Container IDs are included in the BDR that are **NOT** on the approved and posted AK Tracking Spreadsheet,
THEN contact the AK Expert.

[G.1] Place BDR on HOLD by selecting, PLACE BDR ON HOLD, if necessary, **AND** enter reason for HOLD in the Comments/Qualifiers Section by selecting ADD/EDIT COMMENTS.

[G.2] **WHEN** the problem is resolved,
THEN select REMOVE HOLD FROM BDR in the IDC.

4.2.2 Select the appropriate SPM checklist for the BDR being reviewed.

4.2.3 Record the BDR Number at the top of the appropriate SPM checklist.

4.2.4 Record the Examination Date(s) at the top of the appropriate SPM checklist.

4.2.5 Verify that the DGL ITR reviews, validations, and verifications have been performed as evidenced by the completed review checklist and appropriate signature release.

4.2.6 Verify the BDR is complete.

4.2.7 Verify that data are within established data assessment criteria and meet all applicable QAOs: Precision, Accuracy, Completeness, Comparability, and Representativeness.

NOTE

To answer questions regarding specific criteria being met, (i.e., QAOs, QCs), the SPM must ensure that the information presented in the BDR meets the requirements identified in CCP-PO-001, CCP-PO-002, and CCP-PO-003, *CCP Transuranic Authorized Methods for Payload Control (CCP CH-TRAMPAC)*.

4.2.8 Answer each question on the appropriate SPM checklist after verifying that the specific criteria have been met.

NOTE

All containers listed in the BDR will be listed on the SPM checklist.

4.2.9 **IF** any question is answered NO,
THEN evaluate the impact, **AND** perform steps 4.2.11 and 4.2.14, as appropriate.

4.2.10 **IF** any question is answered NA or NO,
THEN provide justification in the Comments/Qualifiers Section of the appropriate SPM checklist, as applicable. If a question includes criteria for “NA,” a comment is not required.

NOTE

Editorial corrections may be made to the BDR by the Operator, ITR, SPM or a Designee as directed by these personnel. The extent of editorial corrections permitted by a Designee is identified in CCP-QP-008. Data affecting changes are ONLY made by DGL personnel. Any data affecting changes made by DGL personnel will require a re-review by the Operator, ITR, and SPM.

4.2.11 **IF** editorial inconsistencies, mistakes, omissions, etc., are noted during the SPM review, that DO **NOT** change the characterization data,
THEN notify DGL personnel of required corrections, **AND** edit the BDR in accordance with CCP-QP-008.

[A] Place BDR on HOLD by selecting, PLACE BDR ON HOLD, if necessary, **AND** enter reason for HOLD in the Comments/Qualifiers Section by selecting ADD/EDIT COMMENTS.

DGL Personnel

[B] Perform editorial corrections, as needed.

[C] Resubmit corrected BDR or BDR pages to the Facility Records Custodian in accordance with CCP-QP-008.

Facility Records Custodian

[D] Receive, process, and transmit or maintain corrected BDR or BDR pages in accordance with CCP-QP-008.

[E] Notify SPM to continue review.

4.2.12 **IF** required changes CAN **NOT** be adequately documented on the SPM checklist,
THEN include additional information on an additional sheet of paper as needed.

4.2.13 **IF** additional information is placed after an SPM checklist,
THEN indicate, on the appropriate SPM checklist, that additional information is being provided, **AND** paginate the inserted documentation to show which checklist it is associated with (e.g., SPM-1).

NOTE

Corrections to BDRs mandated by Project Office NCRs will not proceed until DGL has been provided a copy of the validated and dispositioned Project Office NCR.

4.2.14 **IF** data affecting inconsistencies, mistakes, omissions, etc., are noted during the SPM review, that impact or change the characterization data,
THEN Initiate an NCR in accordance with CCP-QP-005:

[A] Ensure copy of approved Project Office NCR is provided to DGL documenting required changes in the NCR disposition.

DGL Personnel

[B] Correct the deficiency.

[C] ITR Re-review in accordance with the applicable procedure, **AND** resubmit corrected BDR or BDR pages, and copy of the NCR, to CCP Records for processing in accordance with CCP-QP-008.

4.2.15 Record comments in the box at the end of the appropriate SPM checklist or record NA.

4.2.16 Print name, sign, and date the appropriate SPM checklist.

4.2.17 End SPM review in IDC.

4.2.18 Submit completed SPM checklist to CCP Records for processing in accordance with CCP-QP-008.

4.2.19 If SPM re-review is required,

[A] Insert corrections.

[A.1] **IF** revised page contains correction or additional information,
THEN replace the BDR record page with the corrected page.

OR

[A.2] **IF** additional corrected pages are inserted in the numbered section of the BDR,
THEN supercede pages, **AND** properly paginate the inserted documentation in accordance with CCP-QP-008.

[B] Select RE-REVIEW button in the IDC, if necessary.

[C] Perform a re-review of the corrected BDR.

[D] Verify that all criteria have been met and the review is complete.

[E] Select REMOVE HOLD ON BDR in the IDC, if necessary, **AND** complete review in the IDC.

4.2.20 Print name, sign name, enter reason for re-review, and enter date completed on the appropriate SPM checklist in the re-review signature area.

4.2.21 **WHEN** all criteria have been verified, **AND** the review is complete, **THEN** select END SPM BDR REVIEW in the IDC.

NOTE

Additional information is information that is added to the back of the SPM checklist after receipt at the Project Level. Additional information can be in the form of e-mail authorizations for administrative changes, letters or e-mails of clarification to posed questions (This list is not all inclusive).

4.2.22 **IF** additional information is placed after an SPM checklist, **THEN** indicate, on the appropriate SPM checklist, that additional information is being provided, **AND** paginate the inserted documentation to show which checklist it is associated with (e.g., SPM-1).

4.2.23 Forward the completed SPM checklist, and any additional information, to the CCP Records Custodian/Facility Records Custodian.

CCP Records Custodian/Facility Records Custodian

4.2.24 Receive, process, and transmit or maintain in accordance with CCP-QP-008.

4.3 Quarterly Repeat of DGL Data Review, Validation, and Verification

NOTE

The SPM shall ensure that a repeat of the DGL data review, validation, and verification of data generated to meet the requirements of CCP-PO-001 is performed quarterly for a minimum of one randomly chosen waste container. The SPM uses this exercise to document that the DGL data review, validation, and verification is being performed in accordance with applicable procedures.

SPM

4.3.1 Randomly select one waste container for a repeat of the DGL data review, validation, and verification for one RTR and VE BDR generated in the last quarter.

NOTE

The following documents will be included in the quarterly DGL data review, validation, and verification: the original data reported, any nonconformances generated prior to ITR, reviews, and QC Data Sheets. The BDR Batch Narrative will **NOT** be included.

4.3.2 Retrieve a copy of the BDR from CCP Records.

NOTE

When possible, a different ITR will be used for the quarterly DGL data review, validation, and verification of the selected waste container.

4.3.3 Assemble the mini-container package.

4.3.4 Document the container selection and the assignment of the DGL ITR by interoffice memorandum.

4.3.5 Submit a copy of the mini-container package to the Host site for re-review.

NOTE

DGL Personnel will review submitted data and generate new Tables of Contents, BDR Batch Narratives and DGL Checklists. Any discrepancies will be noted in the BDR Batch Narrative.

SPM

4.3.6 Perform a review of the re-submitted data in accordance with Section 4.2.

4.3.7 Compare the original BDR submitted for the selected container with the re-submitted data.

4.3.8 Document the comparison, by interoffice memorandum, to CCP Records.

4.3.9 **IF** discrepancies or problems that affect data quality are noted during the review,
THEN perform the following:

[A] Initiate an NCR in accordance with CCP-QP-005.

[B] Notify the appropriate facility personnel.

4.3.10 Submit the re-reviewed package, associated information, and copy of interoffice memorandum to CCP Records.

Facility Records Custodian/CCP Records Custodian

4.3.11 Receive, process, and transmit the reviewed package, associated information, and copy of interoffice memoradum in accordance with CCP-QP-008.

5.0 RECORDS

5.1 Records generated during the performance of this procedure are maintained as Quality Assurance (QA) records in accordance with CCP-QP-008. The records are the following:

5.1.1 QA/Lifetime

[A] Attachment 1, CCP SPM Visual Examination Project Level Validation Checklist and Summary

[B] Attachment 2, CCP SPM Radiography Project Level Validation Checklist and Summary

[C] Attachment 3, CCP SPM Nondestructive Assay Project Level Validation Checklist and Summary

[D] Attachment 4, CCP SPM Off-Site Source Recovery Sealed Source Radiological Characterization Project Level Validation Checklist and Summary

[E] Interoffice memorandum for the Quarterly Repeat of DGL Data Review BDR

[F] Container selection and the assignment of the DGL ITR interoffice memoramdum

5.1.2 QA/Nonpermanent

[A] Project Office Integrated Data Center (IDC)

Attachment 1 – CCP SPM Visual Examination Project Level Validation Checklist and Summary

BDR Number: _____ **Examination Date(s):** _____

Description of Criteria Reviewed	Criteria Met?			Comments/Qualifiers
	YES	NO	NA	
1. Is the completed, signed and dated Independent Technical Reviewer Checklist included in the BDR, and the independent technical reviewer was not involved in the generation or recording of the data under review? **Reference Source: CCP-PO-001, C3-4**				
2. Does the BDR contain all items addressed in the BDR Table of Contents? **Reference Source: CCP-PO-001, C3-4**				
3. Does the BDR include a listing of all container numbers in the batch? **Reference Source: CCP-PO-001, C3-4**				
4. List all containers that have met QAOs. **Reference Source: CCP-PO-001, C3-4**				Container Numbers:
5. Is the current implementing procedure and revision number included in the BDR? **Reference Source: CCP-PO-001, Table C3-3**				
6. Is the BDR date included? **Reference Source: CCP-PO-001, Table C3-3**				
7. Is there a reference to or copy of any associated NCRs (if any) in the BDR? **Reference Source: CCP-PO-001, Table C3-3**				
8. Are there 20 or fewer containers in the batch? **Reference Source: CCP-PO-001 C3-4**				
9. Are the data properly reported (i.e., data are reported in correct units and with correct significant figures). **Reference Source: CCP-PO-001 C3-4**				
10. Is there evidence of verification that the physical form matches the Waste Matrix Code? **Reference Source: CCP-PO-001, Table C3-3**				
11. Is there evidence of verification that the physical form matches the waste stream description? **Reference Source: CCP-PO-001, Table C3-3**				
12. Are prohibited items absent? **Reference Source: CCP-PO-001, Table C3-3**				

Attachment 1 – CCP SPM Visual Examination Project Level Validation Checklist and Summary (Continued)

BDR Number: _____ **Examination Date(s):** _____

Description of Criteria Reviewed	Criteria Met?			Comments/Qualifiers
	YES	NO	NA	
13. Does observable liquid, if present, meet the criteria of the TSDF-WAC? **Reference Source: CCP-PO-001, C-1**				
14. Were discrepancies between the Visual Examination operator and the ITR with regards to identification of waste matrix code, liquids in excess of the TSDF-WAC, or compressed gases reconciled? NA if no discrepancies. **Reference Source: CCP-PO-001, C3-2**				
15. Are the training requirements met for the VE Expert and VE Operators who have signed the data forms? **Reference Source: CCP-PO-001, C3-8**				
16. Is evidence of a satisfactory audio/video test included in the BDR? NA [not applicable] for VE Method for Newly Generated Waste. **Reference Source: CCP-PO-001, C1-2**				
17. If the VE was not recorded using audio/video media, does the data sheet contain the signature of two qualified operators who observed for themselves the waste being placed into the container? NA if audio/video used. **Reference Source: CCP-PO-001, C1-2**				
18. Are the weights/estimated weights for the 12 waste material parameters reported in kilograms (kg)? **Reference Source: CCP Technical Procedures**				
19. Are the descriptions for each waste material parameter included in the BDR? **Reference Source: CCP-PO-001, C1-2**				
20. Is the gross weight reported (in kg) for each container included in the BDR? **Reference Source: CCP Technical Procedures**				
21. Is the number of layers of confinement recorded? **Reference Source: CCP-PO-001, C1-2**				
22. Is sufficient information included in the BDR to determine the packaging configuration? **Reference Source: CCP-PO-001, C1-2**				

Attachment 1 – CCP SPM Visual Examination Project Level Validation Checklist and Summary (Continued)

BDR Number: _____ **Examination Date(s):** _____

Description of Criteria Reviewed	Criteria Met?			Comments/Qualifiers
	YES	NO	NA	
23. Is the type and number of filters recorded? **Reference Source: CCP-PO-001, CCP Technical Procedures**				
24. Is the size of the rigid liner vent hole recorded? NA if no liner lid. **Reference Source: CCP-PO-001, CCP Technical Procedures**				
25. For Los Alamos National Laboratory (LANL) Sealed Sources, does the characterized waste container meet the definition of sealed sources per Title 10 Code of Federal Regulations (CFR) 30.4 and Title 10 CFR 835.2 (effective January 1, 2004) evidence of which is assembled as part of AK documentation? **Reference Source: CCP Technical Procedures**				
26. For LANL Sealed Sources, are sealed sources the only non-packaging items in the waste container? **Reference Source: CCP-TP-069, 4.1.4**				
27. For LANL Sealed Sources, are the sealed sources a U.S. Department of Transportation (DOT) Special Form Class 7 (Radioactive Material) per Title 49 CFR 34.27 (effective January 1, 2004) and the certification of which is assembled as part of the AK documentation? **Reference Source: CCP Technical Procedures**				
28. For LANL Sealed Sources, is the integrity of each sealed source validated by documented contamination survey results to meet the requirements of Title 10 CFR 34.27 (effective January 1, 2004), and assembled as part of AK documentation? **Reference Source: CCP Technical Procedures**				

Attachment 1 – CCP SPM Visual Examination Project Level Validation Checklist and Summary (Continued)

BDR Number: _____ **Examination Date(s):** _____

Description of Criteria Reviewed	Criteria Met? YES	NO	NA	Comments/Qualifiers
29. For LANL Sealed Sources, is each sealed source a rigid sealed container less than or equal to 4 L in size or in a rigid sealed container less than or equal to 4 L? **Reference Source: CCP Technical Procedures**				
30. For LANL Sealed Sources, AK documentation does not indicate the use of volatile organic compounds (VOCs) or VOC-bearing materials as constituents of sealed sources? **Reference Source: CCP Technical Procedures**				
31. For LANL Sealed Sources, the outer casing of each sealed source is of a non VOC-bearing material which is verified using the VE technique at the time of packaging? **Reference Source: CCP Technical Procedures**				

Comments:

The container QC checks were properly performed and meet the Quality Assurance Objectives (QAOs). Proper procedures were followed during data reduction and analysis. The batch is complete, acceptable, and includes all supporting data and documentation required by the QAPjP.

SPM Printed Name Signature Date

Checklist is to be re-signed only when a re-review is performed.

SPM Printed Name	Signature	Reason	Date
SPM Printed Name	Signature	Reason	Date

Attachment 2 – CCP SPM Radiography Project Level Validation Checklist and Summary

BDR Number: _____ **Examination Date(s):** _____

Description of Criteria Reviewed	Criteria Met?			Comments/Qualifiers
	YES	NO	NA	
1. Is the completed, signed, and dated Independent Technical Reviewer Checklist included in the BDR, and the independent technical reviewer was not involved in the generation or recording of the data under review? **Reference Source: CCP-PO-001, C3-4**				
2. Does the BDR contain all items addressed in the BDR Table of Contents? **Reference Source: CCP-PO-001, C3-4**				
3. Does the BDR include a listing of all the container numbers in the batch? **Reference Source: CCP-PO-001, C3-4**				
4. List all containers that have met QAOs. **Reference Source: CCP-PO-001, C3-4**				Container Numbers:
5. Does the BDR identify the current implementing procedure and revision number? **Reference Source: CCP-PO-001, Table C3-3**				
6. Is there a reference to or copy of any associated NCRs (if any) in the BDR? NA if no NCRs. **Reference Source: CCP-PO-001, Table C3-3**				
7. Are there 20 or fewer containers in the batch? **Reference Source: CCP-PO-001, C3-4**				
8. Are the data properly reported (i.e., data are reported in correct units and with correct significant figures)? **Reference Source: CCP-PO-001, C3-4**				
9. Is there evidence of verification that the physical form matches the Waste Matrix Code? **Reference Source: CCP-PO-001, Table C3-3**				

Attachment 2 – CCP SPM Radiography Project Level Validation Checklist and Summary (Continued)

BDR Number: _____ **Examination Date(s):** _____

Description of Criteria Reviewed	Criteria Met?			Comments/Qualifiers
	YES	NO	NA	
10. Is there evidence of verification that the physical form matches the waste stream description? **Reference Source: CCP-PO-001, Table C3-3**				
11. Are prohibited items absent? **Reference Source: CCP-PO-001, Table C3-3**				
12. Does observable liquid, if present, meet the criteria of the TSDF-WAC? **Reference Source: CCP-PO-001, C-1**				
13. Were discrepancies between two operators with regard to identification of waste matrix code, liquids in excess of the TSDF-WAC, or compressed gases through replicate scans and independent observations reconciled? NA if no discrepancies. **Reference Source: CCP-PO-001, C3-2**				
14. Are the training qualifications for all radiography personnel acceptable? **Reference Source: CCP-PO-001, C3-8**				
15. Was evidence of the video/audio check included in the BDR? **Reference Source: CCP-PO-001, C1-1**				
16. Was the Lines-Pair Resolution Test or Sieve Test Check included in the BDR? **Reference Source: CCP Technical Procedures**				
17. Was a replicate scan performed once per day, or once per batch, whichever is LESS frequent? **Reference Source: CCP-PO-001, C1-1**				
18. Was an independent observation performed once per day, or once per batch, whichever is LESS frequent? **Reference Source: CCP-PO-001, C1-1**				

Attachment 2 – CCP SPM Radiography Project Level Validation Checklist and Summary (Continued)

BDR Number: _____ **Examination Date(s):** _____

Description of Criteria Reviewed	Criteria Met? YES	NO	NA	Comments/Qualifiers
19. Were the replicate scan and independent observation performed on different waste containers? **Reference Source: CCP-PO-001, C1-1**				
20. Were the personnel performing the replicate scan and independent observation different from the individual who performed the original? **Reference Source: CCP-PO-001, C1-1**				
21. Does the BDR include an estimate of each material parameter weight in kg for each container? **Reference Source: CCP Technical Procedures**				
22. Does the BDR include a description of each material parameter for each container? **Reference Source: CCP Technical Procedures**				
23. Is the container gross weight recorded in kilograms (kg) for each container in the BDR? **Reference Source: CCP Technical Procedures**				
24. Was the Scale Weight Calibration Check included in the BDR? **Reference Source: CCP Technical Procedures**				
25. Was the Scale Weight Check included in the BDR? **Reference Source: CCP Technical Procedures**				

Comments:

The container QC checks were properly performed and meet the Quality Assurance Objectives (QAOs). Proper procedures were followed during data reduction and analysis. The batch is complete, acceptable, and includes all supporting data and documentation required by the QAPjP.

SPM Printed Name Signature Date

Checklist is to be re-signed only when a re-review is performed.

SPM Printed Name	Signature	Reason	Date
SPM Printed Name	Signature	Reason	Date

Attachment 3 – CCP SPM Nondestructive Assay Project Level Validation Checklist and Summary

BDR Number: _____ **Examination Date(s):** _____

Description of Criteria Reviewed	Criteria Met? YES	NO	NA	Comments/Qualifiers
1. Are the background measurements performed and recorded daily and included in the BDR? **Reference Source: CCP-PO-002, Attachment 1, A.4.2**				
2. Is the efficiency/energy calibration and resolution check performed and recorded daily and included in the BDR? **Reference Source: CCP-PO-002, Attachment 1, A.4.2**				
3. Were the performance checks and backgrounds done prior to the analysis of the samples? **Reference Source: CCP-PO-002, Attachment 1, A.4.2**				
4. Are the required QC checks specified on the ITR checklist within acceptable limits? **Reference Source: CCP-PO-002, Attachment 1, A.4.2**				
5. Is the matrix drum performed at least once per operational week? **Reference Source: CCP-PO-002, Attachment 1, A.4.2**				
6. List all containers that have met all QC criteria thresholds. **Reference Source: CCP-PO-002, Attachment 1, A.5.2**				Container Numbers:
7. Is there evidence of participation in the PDP program or any relevant approved comparison program? **Reference Source: CCP-PO-002, Attachment 1, A.4.1**				
8. Are the personnel training records acceptable? **Reference Source: CCP-PO-002, Attachment 1, A.4.1**				
9. Is a standard cover sheet included in the BDR? **Reference Source: CCP Technical Procedures**				
10. Is there reference to or copy of associated NCRs included in the BDR? NA if no NCRs associated with BDR. **Reference Source: CCP-QP-005**				

Attachment 3 – CCP SPM Nondestructive Assay Project Level Validation Checklist and Summary (Continued)

BDR Number: _____ **Examination Date(s):** _____

Description of Criteria Reviewed	Criteria Met?			Comments/Qualifiers
	YES	NO	NA	
11. Is the method used for radioassay identified by the implementing procedure(s) and revision number(s) referenced for each container in the BDR? **Reference Source: CCP Technical Procedures**				
12. Is the current software revision number correct for each container in the BDR? **Reference Source: CCP-QP-022**				
13. Is the completed, signed, and dated Independent Technical Reviewer Checklist included in the BDR, and the independent technical reviewer was not involved in the generation or recording of the data under review? **Reference Source: CCP-PO-002, Attachment 1, A.5.1**				
14. Is the correct Waste Matrix Code referenced in the BDR? **Reference Source: CCP Technical Procedures**				
15. Is the method of expressing TMU specified in the BDR? **Reference Source: CCP-PO-002, 3.3.1**				
16. Does the instrument performing TRU/low-level waste measurement have an LLD of 100 nCi/g or less? **Reference Source: CCP-PO-002, Attachment 1, A.3**				
17. Are the ten WIPP tracked radionuclides of 241Am, 238Pu, 239Pu, 240Pu, 242Pu, 233U, 234U, 238U, 90Sr, 137Cs estimated activities and masses, including their associated TMU reported on each radioassay data sheet? **Reference Source: CCP-PO-002, 3.3.1**				
18. Is 235U (in order to calculate FGE) reported as present or absent on each radioassay data sheet? **Reference Source: CCP-PO-002, Attachment 1, A.3**				
19. If 235U is reported as present, is 234U reported as present? NA, if 235U is not present. **Reference Source: CCP Technical Procedures**				
20. Is the TRU alpha activity concentration and associated TMU reported for each container in the BDR? **Reference Source: CCP-PO-002, 3.3.1**				

Attachment 3 – CCP SPM Nondestructive Assay Project Level Validation Checklist and Summary (Continued)

BDR Number: _____ **Examination Date(s):** _____

Description of Criteria Reviewed	Criteria Met?			Comments/Qualifiers
	YES	NO	NA	
21. Is the TRU alpha activity concentration limit of >100 nCi/g met for containers in the BDR? **Reference Source: CCP-PO-002, 3.3.3**				
22. Is the Total Pu239 FGE (g) and associated TMU reported for each container in the BDR? **Reference Source: CCP-PO-002, 3.3.1**				
23. Is the FGE plus two times the TMU less than or equal to the limits for containers in this BDR? 200 FGE for 55-gal drums/325 FGE for SWBs. Note: TMU equals one standard deviation. **Reference Source: CCP-PO-002, Table A-3**				
24. Is the decay heat reported for each container in the BDR? **Reference Source: CCP-PO-002, 3.3.1**				
25. Are all the appropriate QC forms (background, efficiency checks, control charts, and matrix drum) included in the BDR? **Reference Source: CCP-PO-002, Attachment 1, A.5.2**				
26. Is the name of the testing facility included in the BDR? **Reference Source: CCP-PO-002, Attachment 1, A.5.2**				
27. Is the batch number included in the BDR? **Reference Source: CCP-PO-002, Attachment 1, A.5.2**				
28. Is a listing of all container numbers in the BDR? **Reference Source: CCP-PO-002, Attachment 1, A.5.2**				
29. Does the BDR contain a BDR Table of Contents? **Reference Source: CCP-PO-002, Attachment 1, A.5.2**				
30. Are the testing report data sheets including the waste container number for each container included in the BDR? **Reference Source: CCP-PO-002, Attachment 1, A.5.2**				
31. Is the title “Radioassay Data Sheet” included for each container in the BDR? **Reference Source: CCP-PO-002, Attachment 1, A.5.2**				

Attachment 3 – CCP SPM Nondestructive Assay Project Level Validation Checklist and Summary (Continued)

BDR Number: _____ **Examination Date(s):** _____

Description of Criteria Reviewed	Criteria Met? YES	NO	NA	Comments/Qualifiers
32. Is the date of radioassay included for each container in the BDR? **Reference Source: CCP-PO-002, Attachment 1, A.5.2**				
33. Is the operator and reviewer signature release and date included for each container in the BDR? **Reference Source: CCP-PO-002, Attachment 1, A.5.2**				
34. Is the total Pu239 equivalent activity (Ci) reported for each container in the BDR? **Reference Source: CCP-PO-002, Attachment 1, A.5.2**				
35. Are the NDA net weights within 5% of the NDE net weight or the VE net weight, whichever is applicable, for each container in the BDR? **Reference Source: CCP Technical Procedures**				

Comments:

The container QC checks were properly performed and meet the Quality Assurance Objectives (QAOs). Proper procedures were followed during data reduction and analysis. The batch is complete, acceptable, and includes all supporting data and documentation required by CCP-PO-002.

SPM Printed Name Signature Date

Checklist is to be re-signed only when a re-review is performed.

SPM Printed Name	Signature	Reason	Date
SPM Printed Name	Signature	Reason	Date

Attachment 4 – CCP SPM Off-Site Source Recovery Sealed Source Radiological Characterization Project Level Validation Checklist and Summary

BDR Number: _____ **Examination Date(s):** _____

Description of Criteria Reviewed	Criteria Met? YES	NO	NA	Comments/Qualifiers
1. Are the personnel training records acceptable? **Reference Source: Site applicable LOQI**				
2. Does the Batch Data Report (BDR) include the name of the facility? **Reference Source: CCP-PO-002**				
3. Does the BDR include a standard cover sheet? **Reference Source: CCP-PO-002**				
4. Does the BDR include a Table of Contents? **Reference Source: CCP-PO-002**				
5. Does the BDR include a batch number? **Reference Source: CCP-PO-002**				
6. Does the BDR include a listing of all waste container numbers in the batch? **Reference Source: CCP-PO-002**				
7. List all containers. **Reference Source: CCP-PO-002**				Container Numbers:
8. Does the BDR include a Container Characterization Report sheet(s) for each container in the batch? **Reference Source: CCP-PO-002**				
9. Is there a reference to or copy of associated NCRs (if any) in the BDR? NA if no NCRs associated with the BDR. **Reference Source: CCP-PO-002**				
10. Does the BDR include the implementing procedure and revision numbers? **Reference Source: CCP-PO-002**				
11. Does the BDR include a completed, signed, and dated Independent Technical Review Checklist, and the independent technical reviewer was not involved in the generation or recording of the data under review? **Reference Source: CCP-PO-002**				
12. Does the waste meet the definition of sealed sources per 10 CFR 30.4 and 10 CFR 835.2 (effective January 1, 2004) and documentation included with the AK information? **Reference Source: CCP-PO-001, C4-2**				

Attachment 4 – CCP SPM Off-Site Source Recovery Sealed Source Radiological Characterization Project Level Validation Checklist and Summary (Continued)

BDR Number: _____ **Examination Date(s):** _____

Description of Criteria Reviewed	Criteria Met?			Comments/Qualifiers
	YES	NO	NA	
13. Is the sealed source a US DOT Special Form Class 7 (Radioactive Material) per 49 CFR 34.27 (effective January 1, 2004) and is this documented in the AK information? **Reference Source: CCP-PO-001, C4-2**				
14. Is the integrity of each sealed source validated by documented contamination survey results to meet the requirements of 10 CFR 34.27 (effective January 1, 2004), and is assembled as part of AK documentation? **Reference Source: CCP-PO-001, C4-2**				
15. Does the AK information document that no VOC or VOC-bearing material are constituents of the waste? **Reference Source: CCP-PO-001, C4-2**				
16. Does the AK information document that the outer casing of the sealed source is a non-VOC bearing material and is this verified during VE? **Reference Source: CCP-PO-001, C4-2**				
17. Is the Title "Characterization Data Sheet" included on each data sheet? **Reference Source: CCP-PO-002**				
18. Is the waste container number included on each data sheet? **Reference Source: CCP-PO-002**				
19. Is the run date included on each data sheet? **Reference Source: CCP-PO-002**				
20. Is the TRU alpha activity concentration (Ci/g) included on each data sheet? **Reference Source: CCP-PO-002**				
21. Is the Total Pu-239 equivalent activity (PE-Ci) included on each data sheet? **Reference Source: CCP-PO-002**				
22. Is the Total FGE (g) and associated TMU included on each data sheet? **Reference Source: CCP-PO-002**				
23. Is the Decay Heat (W) and associated TMU included on each data sheet? **Reference Source: CCP-PO-002**				
24. Are the activities and/or masses of individual radioisotopes and associated TMUs (curies and/or grams) included on each data sheet? **Reference Source: CCP-PO-002**				

Attachment 4 – CCP SPM Off-Site Source Recovery Sealed Source Radiological Characterization Project Level Validation Checklist and Summary (Continued)

BDR Number: _____ **Examination Date(s):** _____

Description of Criteria Reviewed	Criteria Met? YES	NO	NA	Comments/Qualifiers
25. Is the method of expressing TMU specified? **Reference Source: CCP-PO-002**				
26. Are the ten WIPP tracked radionuclides of 241Am, 238Pu, 239Pu, 240Pu, 242Pu, 233U, 234U, 238U, 90Sr, 137Cs identified and reported as present or absent? **Reference Source: CCP-PO-002**				
27. Is 235U (in order to calculate FGE) reported as present or absent? **Reference Source: CCP-PO-002**				
28. Is the TRU Alpha activity concentration >100 nCi/g? **Reference Source: CCP-PO-002**				
29. Is the Fissile Mass $\leq$ FGE limit? **Reference Source: CCP-PO-002**				
30. If 235U is reported as present, is 234U reported as present? NA if 235U is not present. **Reference Source: CCP-PO-002**				

Comments:

The container QC checks were properly performed and meet the Quality Assurance Objectives (QAOs). Proper procedures were followed during data reduction and analysis. The batch is complete, acceptable, and includes all supporting data and documentation required by CCP-PO-002.

SPM Printed Name Signature Date

Checklist is to be re-signed only when a re-review is performed.

SPM Printed Name	Signature	Reason	Date
SPM Printed Name	Signature	Reason	Date

Controlled
Copy

CCP-TP-002

Revision 26

CCP
Reconciliation of DQOs and Reporting Characterization Data

EFFECTIVE DATE: 06/19/2013

Mike Ramirez

PRINTED NAME

APPROVED FOR USE

RECORD OF REVISION

Revision Number	Date Approved	Description of Revision
18	11/16/2006	Revised to implement the Waste Isolation Pilot Plant Hazardous Waste Facility Permit requirements resulting from the Section 311/Remote-Handled (RH) Permit Modification Request (PMR). Addressed Carlsbad Field Office (CBFO) Document Review Record (DRR) comments.
19	12/22/2006	Revised to clarify Waste Stream Profile Form contents.
20	08/18/2008	Revised Section 4.2.1 to incorporate Central Characterization Project (CCP) Standing Order CCP-SO-32. Updated several document/procedure titles. Minor changes to Section 5.0.
21	08/04/2009	Revised to answer Waste Isolation Pilot Plant (WIPP) Form 09-050, and add changes to Sections 3 and 4 and make any other editorial changes needed.
22	06/30/2010	Revised for Class 2 Modification Request WIPP Hazardous Waste Facility Permit EPA I.D. Number NM4890139088.
23	12/29/2010	Revised to implement the revision of the *Waste Isolation Pilot Plant Hazardous Waste Facility Permit*.
24	12/28/2011	Revised to make editorial changes. Replacing Waste Stream Profile Form (WSPF) change notice with revision to WSPF. Revising instructions for completing WSPF package.
25	02/11/2013	Revised to include timeframe for transmitting the waste stream profile form package to records. Also revised to make editorial changes needed.
26	06/19/2013	Revised to implement the Permit Modification Request Class 2 approved by New Mexico Environment Department (NMED) dated March 13, 2013.

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1.0 PURPOSE

Upon completion of waste characterization activities, and prior to shipment of waste, the Central Characterization Program (CCP) is required to reconcile the data in accordance with the requirements of CCP-PO-001, *CCP Transuranic Waste Characterization Quality Assurance Project Plan* (QAPjP). Data reconciliation is required in order for the CCP Site Project Manager (SPM) to complete and submit a Waste Stream Profile Form (WSPF) (see Attachment 2, CCP Waste Stream Profile Form, for an example).

1.1 Scope

This procedure provides data reconciliation with the data quality objectives (DQOs) following data validation and verification at the CCP Project Office. This reconciliation is performed at the waste stream or waste stream lot level. This procedure provides the instructions for the completion of the WSPF Package for submittal to the U.S. Department of Energy (DOE) Carlsbad Field Office (CBFO) for permittee review and CBFO approval prior to shipment.

2.0 REQUIREMENTS

2.1 References

Baseline Documents

- DOE/WIPP 01-3194, *CH-TRU Waste Content Codes* (*CH-TRUCON*)
- DOE/WIPP 90-045, *RH-TRU Waste Content Codes* (*RH-TRUCON*)
- CCP-PO-002, *CCP Transuranic Waste Certification Plan*
- CCP-PO-003, *CCP Transuranic Authorized Methods For Payload Control* (*CCP CH-TRAMPAC*)
- CCP-PO-505, *CCP Remote-Handled Transuranic Waste Authorized Methods for Payload Control* (*CCP RH-TRAMPAC*)

Referenced Documents

- *Waste Isolation Pilot Plant Hazardous Waste Facility Permit, Waste Analysis Plan*
- DOE/WIPP-02-3122, *Transuranic Waste Acceptance Criteria For The Waste Isolation Pilot Plan*
- 40 CFR 261, *Identification and Listing of Hazardous Waste,* Subpart C, *Characteristics of Hazardous Waste.*
- 40 CFR 261, *Identification and Listing of Hazardous Waste,* Subpart D, *Lists of Hazardous Wastes*
- DOE/TRU-11-3425, *Annual Transuranic Waste Inventory Report – 2011*
- CCP-PO-001, *CCP Transuranic Waste Characterization Quality Assurance Project Plan*
- CCP-QP-002, *CCP Training and Qualification Plan*
- CCP-QP-005, *CCP TRU Nonconforming Item Reporting and Control*
- CCP-QP-008, *CCP Records Management*
- CCP-TP-005, *CCP Acceptable Knowledge Documentation*

2.2 Training Requirements

2.2.1 Personnel performing this procedure will be trained and qualified in accordance with CCP-QP-002, *CCP Training and Qualification Plan*, prior to performing this procedure.

3.0 RESPONSIBILITIES

3.1 Site Project Manager (SPM)

3.1.1 Ensures that all data generated and used in decision making meet the DQOs

[A] Assesses whether data of sufficient type, quality, and quantity have been collected.

NOTE

The WSPF Package consists of the WSPF, the Characterization Information Summary (CIS) and the Summation of Aspects of the Acceptable Knowledge (AK) Summary.

3.1.2 Completes and submits the WSPF package and required revisions.

3.1.3 Prepares the Waste Stream Characterization Package per CCP-PO-001, Section C3-6b(3) upon request from the DOE CBFO.

3.2 Acceptable Knowledge Expert (AKE)

NOTE

As the waste stream is characterized, the Acceptable Knowledge Expert (AKE) is responsible for corroborating the AK information with the characterization data collected. For the final data reconciliation (conducted in accordance with this procedure), the AKE provides assistance to the SPM.

3.2.1 Compiles the AK information for the waste stream being characterized.

3.2.2 Creates the AK summary which is used to create the Summation of Aspects of the AK summary.

3.2.3 Assigns a unique waste stream number for each waste stream based on information in the DOE/TRU-11-3425, *Annual Transuranic Waste Inventory Report* (ATWIR) and/or information from the Host site.

3.2.4 Reviews and concurs with the WSPF Package and subsequent revisions.

3.3 Host Site Subcontract Technical Representative (STR)

3.3.1 If required by the site-specific interface document, reviews, and concurs with the WSPF Package.

4.0 PROCEDURE

NOTE
The attachments in this document are examples of the requirements. The examples identify the minimum information required in the final approved report.

NOTE
Steps DO **NOT** need to be followed in sequence.

SPM

4.1 Assigning the WSPF Number

NOTE
The unique number will be limited to a maximum of 20 alpha-numeric characters. The first two characters will be the two letter site designator, and the remaining characters should coincide, to the maximum extent possible, with the title page of the AK Summary Report.

4.1.1 Assign the Waste Stream Number to the WSPF per the AK Summary Report.

NOTE
The Waste Stream Number is recorded on all applicable attachments.

4.2 Compilation and Evaluation of DQO Parameters

4.2.1 For the lot to be processed, select an appropriate number of containers that have completed CCP Project Office verification and validation from the waste stream population.

[A] Ensure that all of the containers selected are from the same waste stream by comparing the container numbers/waste stream identification numbers with the AK Tracking Spreadsheet for the subject site.

[B] Ensure all containers from any waste stream that requires Gas Generation Testing (GGT) meet one of the following requirements:

[B.1] The container is on an approved GGT Batch Data Report (BDR) and that the BDR is the most recent.

[B.2] The container is included in an approved Long Term Objective population.

[C] Ensure all containers from any waste stream that require Flammable Gas Analysis (FGA) for Transportation Sampling are on an approved FGA for transportation BDR and that the BDR is the most recent:

[D] Ensure all data to be used for certification was generated using certified equipment.

[E] Ensure that each of the BDRs chosen to certify the containers is the most recent BDR available for that characterization process (i.e., real-time radiography [RTR] or visual examination [VE], nondestructive assay [NDA], FGA, Dose-to-Curie [DTC]), Radiological Characterization.

4.2.2 Obtain copies of the following documents from CCP Records, as applicable:

- Documentation of Radiological Properties (e.g., NDA BDR), VE, RTR, FGA **AND/OR** an AK Sufficiency Determination
- Previous records of data completion and reconciliation with DQOs (see Attachment 1, CCP Reconciliation with Data Quality Objectives for an example)
- Previously completed CIS submitted to records on interoffice memo

4.2.3 Determine if sufficient data have been collected to determine if program-required waste parameters have been met, by completing the CCP Reconciliation with Data Quality Objective Attachment 1, using the attached instructions.

4.2.4 **IF** sufficient data has been collected,
THEN enter the Waste Stream Number and Lot Number on the CCP Reconciliation with Data Quality Objective.

4.2.5 **IF** data DOES **NOT** meet the criteria on the CCP Reconciliation with Data Quality Objective,
THEN sufficient data has **NOT** been collected to fully characterize the waste stream, therefore, determine the additional waste characterization that needs to be performed **AND** direct the appropriate site facility to collect the additional data.

NOTE

The CCP Reconciliation with Data Quality Objective contains multiple questions for each entry. If there are discrepancies between questions or if entries are Not Applicable (N/A), comments will be added to the form explaining how criteria are met.

4.2.6 Complete the CCP Reconciliation with Data Quality Objective, using the attached questions.

4.2.7 Print name, sign, and date the CCP Reconciliation with Data Quality Objective.

4.2.8 Place the CCP Reconciliation with Data Quality Objective in the holding file.

4.3 Preparing Waste Stream Profile Form (WSPF)

NOTE

The current approved revision of the waste stream AK Summary should be used in preparing or revising the WSPF.

4.3.1 **IF** a WSPF exists for the waste characterization data being reconciled,
THEN GO TO Section 4.7.

4.3.2 Ensure all characterization data obtained from CCP Records for the waste stream in question have gone through project level validation (i.e., signed SPM checklists).

4.3.3 Prepare a CCP WSPF (see CCP Waste Stream Profile Form, for an example) using the instructions included in Attachment 2.

4.3.4 Review, print name, sign, and date the WSPF.

4.4 Completing the Characterization Information Summary (CIS)

4.4.1 Record the Waste Stream Number and Lot Number, including the list of site specific/CCP procedures, revisions, and dates used in characterizing the containers in the lot, on the CCP Characterization Information Summary Cover Page (see Attachment 3, CCP Characterization Information Summary Cover Page for an example).

4.4.2 Complete the cross-reference listing the container numbers to each BDR (see Attachment 4, CCP Correlation of Container Identification Numbers to Batch Data Report Numbers for an example).

[A] For items **NOT** analyzed enter N/A.

[B] Print name, sign, and date the CCP Correlation of Container Identification Numbers to Batch Data Report Numbers.

4.4.3 **IF** the AK Summary for the waste stream identified the U.S. Environmental Protection Agency (EPA) Hazardous Waste Number (HWN) U134 (hydrofluoric acid),
THEN address in CCP RTR/VE Summary of Prohibited Items (see Attachment 5, CCP RTR/VE Summary of Prohibited Items for an example) that any liquid identified is a prohibited item per the applicable operating procedure and is **NOT** acceptable by the Treatment, Storage, and Disposal Facility (TSDF).

4.4.4 Complete the CCP RTR/VE Summary of Prohibited Items to document that prohibited items are **NOT** present in the waste stream or waste stream lot and to verify the physical form of the waste matches the waste stream description as determined by AK.

NOTE
If CBFO approves, VE may be performed on S3000 and S4000 when the material is not removed from the characterized container.

4.4.5 Complete the justification for the selection of radiography and/or VE as the appropriate method for characterizing the waste.

4.4.6 Print name, sign, and date CCP RTR/VE Summary of Prohibited Items.

4.5 Summation of Aspects of the AK Summary

4.5.1 Obtain an approved copy of the AK Summary for the subject waste stream in order to create a summary level version of the AK Summary, entitled the Summation of Aspects of the AK Summary (Summation).

4.5.2 Create the Summation and include the following information: waste stream name and number, point of generation, waste stream volume (current and projected), generation dates, TRUCON codes, Summary Category Group, Waste Matrix Code(s) (WMC) and Waste Matrix Code Group, other ATWIR information, waste stream description, areas of operation, generating processes, Resource Conservation and Recovery Act (RCRA) determinations, radionuclide information, method for determining Waste Material Parameter (WMP) weights per unit of waste contact-handled ([CH] only), all references used to generate the Summation, and any other information required by CCP-PO-001.

4.5.3 Include a list of any approved AK Sufficiency Determinations for the waste stream.

4.6 Submitting the WSPF Package to DOE CBFO

4.6.1 Compile the WSPF Package consisting of the following:

- WSPF
- CIS
- Summation

4.6.2 Forward a copy to the AKE for review and concurrence.

4.6.3 **IF** required by the appropriate site-specific Interface Document, **THEN** forward a copy to the STR for review and concurrence.

4.6.4 **IF** comments are received from the AKE **AND/OR** STR, **THEN** resolve the comments, **AND** forward a copy of the resolution to the reviewer(s) for concurrence.

4.6.5 **AFTER** concurrence(s) is/are received, **THEN** continue with this section.

4.6.6 Transmit the WSPF Package via e-mail to the DOE CBFO electronic mail (email) site at site.documents@wipp.ws for permittee review and CBFO approval.

4.6.7 **IF** comments are received from the permittees, **THEN** repeat steps 4.6.2 through 4.6.6 until comments have been resolved.

4.6.8 Submit approved WSPF Package to CCP Records in accordance with CCP-QP-008, *CCP Records Management,* with an interoffice memo within 30 calendar days of WSPF approval.

4.7 Subsequent Data Reconciliation

4.7.1 Obtain a copy of the WSPF Package from CCP Records.

4.7.2 Perform applicable steps of Sections 4.2 and 4.4.

NOTE
A revision required to the WSPF package that results in the addition of EPA HWNs will require the waste stream to be suspended until DOE approves the revised WSPF.

4.7.3 **IF** the waste DOES **NOT** meet the WSPF Package description, **THEN** revise the WSPF Package, **OR** assign the waste to a new waste stream.

[A] **IF** subsequent data collection reveals discrepancies that identify different EPA HWNs,
THEN the Waste Stream Profile will be revised.

[B] **IF** subsequent data collection reveals discrepancies that indicate the waste belongs to a different waste stream,
THEN initiate a nonconformance report (NCR) in accordance with CCP-QP-005, *CCP TRU Nonconforming Item Reporting and Control*.

NOTE
A revision required to the WSPF Package that DOES **NOT** result in addition of EPA HWNs (application of additional TRUCON Content codes, or addition of material parameter weight estimates per unit of waste) will not require the waste stream to be suspended.

[C] **IF** the WSPF Package requires a revision,
THEN make the appropriate changes in accordance with guidance provided in the CCPWSPF, **AND** submit the WSPF revision to CCP Records and DOE CBFO in accordance with the applicable steps in Section 4.6.

[D] **IF** the waste DOES **NOT** match the subject WSPF Package (i.e., have common physical form, contain similar hazardous constituents, and were generated from a single process or activity discrepancies are noted that identify different EPA HWNs or indicate that the waste belongs to a different waste stream),
THEN perform the following:

[D.1] Notify the AKE that the subject waste must be redefined to a separate waste stream in accordance with the applicable steps of CCP-TP-005, *CCP Acceptable Knowledge Documentation*, Section 4.8.

[D.2] Generate a new WSPF Package in accordance with Sections 4.2 through 4.6.

4.7.4 Provide documentation of the waste stream lot data reconciliation to CCP Records that includes the CCP CIS and CCP Reconciliation with Data Quality Objective.

4.8 Completing the Waste Stream Characterization Package

4.8.1 When requested by DOE CBFO, prepare the Waste Stream Characterization Package for the requested waste stream.

4.8.2 Obtain a copy of the subject WSPF Package from CCP Records.

4.8.3 Obtain copies of the subject CISs for each of the waste stream lots associated with the subject waste stream from CCP Records.

4.8.4 Obtain a complete copy of the AK Summary for the subject waste stream from CCP Records.

4.8.5 Obtain copies of the BDRs as requested by DOE CBFO from CCP Records.

4.8.6 Obtain copies of other data requested by DOE CBFO from CCP Records.

4.8.7 Assemble the information, **AND** transmit to DOE CBFO.

5.0 RECORDS

5.1 Records generated during the performance of this procedure are maintained as quality assurance (QA) Records in accordance with CCP-QP-008. The records are the following:

QA/Lifetime

[A] Characterization Information Summary with attached interoffice memorandum

[A.1] Attachment 1 – CCP Reconciliation with Data Quality Objective

[A.2] Attachment 3 – CCP Characterization Information Summary Cover Page

[A.3] Attachment 4 – CCP Correlation of Container Identification Number to Batch Data Report Numbers

[A.4] Attachment 5 – CCP RTR/VE Summary of Prohibited Items

[B] Waste Stream Profile Form Package

[B.1] Attachment 2 – CCP Waste Stream Profile Form – includes Interoffice Memorandum of Submittal from the SPM

[B.2] CIS for the lot addressing the applicable analysis data

[B.3] Summation of Aspects of the AK Summary, if applicable

Attachment 1 – CCP Reconciliation with Data Quality Objective (Example)

Sampling Completeness

RTR:
Number of valid samples: _____ Number of total samples analyzed: _____
Percent Complete: _____ (QAO is 100%)

NDA:
Number of valid samples: _____ Number of total samples analyzed: _____
Percent Complete: _____ (QAO is 100%)

Attachment 1 – CCP Reconciliation with Data Quality Objective (Example) (Continued)

Waste Stream#: _____ Lot #: _____

	Y/N/NA	Reconciliation Parameter			
1.		Waste Matrix Code.			
2.		Waste Material Parameter Weights.			
3.		The transuranic (TRU) activity reported in the BDRs for each container demonstrates with a 95 percent probability that the container of waste contains TRU radioactive waste.			
4.		AK Sufficiency. Is there an approved AK sufficiency Determination for this waste stream?			
5.		The data demonstrates whether the waste stream exhibits a toxicity characteristic under Title 40 *Code of Federal Regulations* (CFR), Part 261, *Identification and Listing of Hazardous Waste,* Subpart C, *Characteristics of Hazardous Waste*.			
6.		Does the waste stream contain listed waste found in 20.4.1.200 NMAC incorporating 40 CFR Part 261, Subpart D, *Lists of Hazardous Wastes*?			
7.		Waste stream can be classified as hazardous or nonhazardous.			
8.		The overall completeness, comparability, and representativeness quality assurance objectives (QAOs) were met for each of the testing procedures as specified in CCP-PO-001Sections C3-1 through C3-2 prior to submittal of a WSPF for a waste steam or waste stream lot.			
			Completeness	**Comparability**	**Representativeness**
		Radiography			
		VE			
Comments					

SPM Printed Name _____ Signature _____ Date _____

Attachment 1 – CCP Reconciliation with Data Quality Objective (Example) (Continued)

Instructions for completing form:

Prior to completing Blocks 1 through 13, the SPM or Designee shall complete the Sampling Completeness portion of Attachment 1.

For each waste container and process, verify that:

- The waste container, by serial number, is included in the BDR shown for each characterization methodology listed in Attachment 4, CCP Correlation of Container Identification Numbers to Batch Data Report Number.
- The BDR has gone through project level validation and verification and has received SPM approval.
- The waste container was not removed from the BDR via NCR.

This information is recorded on Attachment 1 under the Sampling Completeness.

This process confirms that the samples are valid and that there is analysis data in the BDRs to support the determination, by the SPM, of program-required waste parameters for the total number of samples collected.

1. Waste Matrix Code. Is the waste matrix code assigned to the waste stream in the AK Summary Report supported by the radiography and/or VE testing BDRs?
2. Waste Material Parameter Weights. Are the waste material parameters listed in the AK Summary reported in kilograms for each of the waste material parameters identified in the waste stream?
3. TRU Radioactive Waste. Does the TRU activity reported in the BDR for each container demonstrate compliance with CCP-PO-002, *CCP Transuranic Waste Certification Plan*?
4. AK Sufficiency Determinations requested for the waste stream? If the answer is Yes, record request in comments field and document the use of the AK Sufficiency Determination as objective evidence for answering Yes to other DQOs.
5. Toxicity Characteristic. Does the waste exhibit a toxicity characteristic under 40 CFR Part 261, Subpart C?
6. Listed Waste. Does the waste stream contain listed waste found in 20.4.1.200 NMAC incorporating 40 CFR Part 261, Subpart D?
7. Hazardous Waste Determination. Can the waste stream be classified as hazardous or nonhazardous?

Attachment 1 – CCP Reconciliation with Data Quality Objective (Example) (Continued)

8. Completeness, Comparability, and Representativeness. Have the overall completeness, comparability, and representativeness quality assurance objective (QAOs) for each of the testing, processes been met for the waste stream or waste stream lot by answering each of the following questions:

   - Completeness:

     o RTR: Is there an audio/videotape (or equivalent media) of the radiography examination and a validated radiography data form for 100 percent of the containers subject to radiography?

     o VE: A validated VE data form will be obtained for 100 percent of the waste containers subject to VE.

   - Comparability: RTR and VE:

     o Was the correct approved version of the procedure used by qualified operators to acquire, verify, and validate the data?

   - Representativeness: Was the correct approved version of the procedure used to control:

     o RTR: Viewing test image, resolving discrepancies between two operators

     o VE: Reconciling any discrepancies between the operator and the Independent Technical Reviewer

Attachment 2 – CCP Waste Stream Profile Form (Example)

(1) Waste Stream Profile Number:								
(2) Generator site name:							(3) Generator site EPA ID:	
(4) Technical contact:							(5) Technical contact phone number:	
(6) Date of audit report approval by New Mexico Environment Department (NMED):								
(7) Title, version number, and date of documents used for WIPP-WAP Certification:								
(8) Did your facility generate this waste?	YES		NO					
(9) If no, provide the name and EPA ID of the original generator:								
Waste Stream Information								
(10) WIPP ID:							(11) Summary Category Group:	
(12) Waste Matrix Code Group:							(13) Waste Stream Name:	
(14) Description from the ATWIR:								
(15) Defense TRU Waste:	YES		NO					
(16) Check One:	CH		RH					
(17) Number of SWBs (17a) Number of SLB2		(18) Number of Drums					(19) Number of Canisters	
(20) Batch Data Report numbers supporting this waste stream characterization:								
(21) List applicable EPA Hazardous Waste Numbers:								
(22) Applicable TRUCON Content Numbers:								
(23)**Acceptable Knowledge Information**								
(For the following, enter the supporting documentation used [i.e., references and dates])								
Required Program Information								
(23A) Map of site:								
(23B) Facility mission description:								
(23C) Description of operations that generate waste:								
(23D) Waste identification/categorization schemes:								
(23E) Types and quantities of waste generated:								
(23F) Correlation of waste streams generated from the same building and process, as applicable:								
(24) Waste certification procedures:								
(25) Required Waste Stream Information								
(25A) Area(s) and building(s) from which the waste stream was generated:								
(25B) Waste stream volume and time period of generation:								
(25C) Waste generating process description for each building:								
(25D) Waste Process flow diagrams:								
(25E) Material inputs or other information identifying chemical/radionuclide content and physical waste form:								
(25F) Waste Material Parameter Weight Estimates per unit of waste								
(26) Which Defense Activity generated the waste:								
	Weapons activities including defense inertial confinement fusion							Naval Reactors development
	Verification and control technology							Defense research and development
	Defense nuclear waste and material by products management							Defense nuclear material production
	Defense nuclear waste and materials security and safeguards and security investigations							

Attachment 2 – CCP Waste Stream Profile Form (Example) (Continued)

(27) Supplemental Documentation:	
(27A) Process design documents:	
(27B) Standard operating procedures:	
(27C) Safety Analysis Reports:	
(27D) Waste packaging logs:	
(27E) Test plans/research project reports:	
(27F) Site databases:	
(27G) Information from site personnel:	
(27H) Standard industry documents:	
(27I) Previous analytical data:	
(27J) Material safety data sheets:	
(27K) Sampling and analysis data from comparable/surrogate Waste:	
(27L) Laboratory notebooks:	
Confirmation Information	
For the following, when applicable, enter procedure title(s), number(s) and date(s)	
(28)	Radiography:
	Visual Examination:

(29) Comments: For a list of the waste characterization procedures used and date of respective procedures see the list of procedures on the attached CIS.

Reviewed by AK Expert: **YES** ☐ **Date:** _____

Reviewed by STR (if necessary): **YES** ☐ **N/A** ☐ **Date:** _____

Waste Stream Profile Form Certification:

I hereby certify that I have reviewed the information in this Waste Stream Profile Form, and it is complete and accurate to the best of my knowledge. I understand that this information will be made available to regulatory agencies and that there are significant penalties for submitting false information, including the possibility of fines and imprisonment for knowing violations.

Signature of Site Project Manager	Printed Name	Date

Attachment 2 – CCP Waste Stream Profile Form (Example) (Continued)

CCP WASTE STREAM PROFILE PACKAGE

A WSPF Package should be completed as early as possible (once sufficient data has been obtained [e.g., at least one lot]) and submitted to DOE CBFO for approval.

The SPM, in completing the WSPF, should seek the assistance and participation of the AKE in the preparation of the form and attachments.

The WSPF package submitted to DOE CBFO for approval contains three parts. The first part is the WSPF itself. The second part is the CIS Report for the waste stream or waste stream lot used to support the WSPF. The last part is the *Summation of Aspects of the AK Summary Report*, to support the WSPF. The completion of the first and third parts of the package is addressed in these instructions. Completion of the CIS is addressed in CCP-TP-002, *CCP Reconciliation of DQOs and Reporting Characterization Data*, and associated forms.

Instructions for completing the Waste Steam Profile Form:

Obtain an approved copy of the current WSPF Package from CCP Records; for new WSPFs, it will be blank.

Line numbers indicated below refer to the number in the parenthesis on the CCP WSPF.

The brackets [ ] indicate the primary source of the information requested if not otherwise referred to within the instruction.

Line 1:

Assign a site-specific waste stream profile number to each form generated. The number should normally coincide, to the extent possible, as it appears on the title page of the AK Summary Report. The SPM is responsible for selecting the number after referring to the AK Summary Report. The number should start with the applicable two-digit site designator. The number should be limited to 20 alpha-numeric characters maximum. Indicate waste stream lots with a period and sequentially numbered digits added to the waste stream profile number.

Line 2:

Enter the name of the site where the waste is currently stored. [AK Summary Report]

Attachment 2 – CCP Waste Stream Profile Form (Example) (Continued)

Line 3:

Enter the EPA Identification (ID) Number of the site listed in Line 2. The ID number, if not included in the AK Summary Report, can be obtained from the EPA Regional office in which the site is located. The AKE should assist in the acquisition of this information.

Line 4:

Enter the name of the technical contact for this site. This is the individual to be contacted if there are questions concerning the data reported on the form, usually the SPM.

Line 5:

Provide the telephone number of the person identified in Line 4.

Line 6:

Enter the date of the most recently approved audit report approval by NMED. If the site has been audited but an audit report has not yet been approved by DOE CBFO, contact the CCP Project Manager. If DOE CBFO has approved the audit report and is awaiting approval by New Mexico Environmental Department (NMED), submit the WSPF package to DOE CBFO for distribution to the Waste Isolation Pilot Plant (WIPP) Review Team.

Line 7:

List the site-specific waste program documents (such as CCP-PO-001, the CCP-PO-003, Interface, etc.) listing the current revision.

Line 8:

Check the appropriate box. [AK Summary Report]

Line 9:

If the site where the waste is currently stored is not the site where the waste was generated, then provide the name and EPA identification number of the site where the waste was generated. [The AK Summary Report should provide the information as to where the waste was generated. The ID number, if not included in the AK Summary Report, can be obtained from the EPA Regional Office in which the site is located. The AKE should assist in the acquisition of this information.]

Attachment 2 – CCP Waste Stream Profile Form (Example) (Continued)

If the waste was generated at the site where it is currently stored, place an N/A in this box.

Line 10:

Enter the WIPP identification number from the current revision of the Annual Transuranic Waste Inventory Report (ATWIR) that best describes the waste stream being certified. CCP may split or combine ATWIR waste streams for the purposes of defining waste sampling populations. If CCP has split or combined ATWIR waste streams, all contributing ATWIR waste streams listed on the WSPF should also be indicated on the Summation of Aspects of AK Summary Report.

If there is no corresponding WIPP ID number listed in the ATWIR or if the ATWIR information is in error or no longer applies, enter None Available. If there is no corresponding WIPP ID number listed in the ATWIR, contact the AKE for assistance. (A copy of the ATWIR may be found in the WIPP Technical Library in the Skeen Whitlock Building.)

Line 11:

Enter the Summary Category Group identified in the AK Summary Report as representing this waste stream.

Line 12:

Enter the Waste Matrix Code (WMC) Group identified in the AK Summary Report as representing this waste stream. Use only WMC Groups identified in the *Waste Isolation Pilot Plant Hazardous Waste Facility Permit, Waste Analysis Plan* (WIPP-WAP).

Line 13:

Enter the name of the waste stream from the AK Summary Report.

Line 14:

Enter the waste stream description from the ATWIR (preferred) or AK Summary Report.

Attachment 2 – CCP Waste Stream Profile Form (Example) (Continued)

Line 15:

Check the appropriate box. [AK Summary Report]

If the answer to this question is NO, stop work and notify the CCP Program Manager immediately. This waste can not be disposed of at the WIPP Site.

Line 16:

Check the appropriate box.

CH=contact-handled TRU waste
RH=remote-handled TRU waste

[AK Summary Report for the waste stream identified above.]

Line 17:

Enter the number of standard waste boxes in this waste stream (current and projected). [AK Summary Report] If there are no standard waste boxes in the waste stream, N/A should be entered.

Line 17a:

Enter the number of standard large box 2s (SLB2s) in this waste stream (current and projected). [AK Summary Report] If there are no SLB2s in the waste stream, N/A should be entered.

Line 18:

Enter the total number of drums in the waste stream (current and projected). Enter the number of Ten-Drum Overpacks (TDOPs), 85-gallon drums and 100-gallon drums if applicable (current and projected). [AK Summary Report]

If there are no drums (e.g., only SWBs, SLB2s, or Canisters) in the waste stream, N/A should be entered.

Line 19:

Enter the number of canisters in this waste stream (current and projected). [AK Summary Report]

If there are no canisters in the waste stream, N/A should be entered.

Attachment 2 – CCP Waste Stream Profile Form (Example) (Continued)

Line 20:

List the TRU Waste BDR numbers used to support the completion of this WSPF. This list shall include every container and the associated BDRs from each process in the waste stream OR every container in the waste stream lot and the associated BDRs from each process used in that characterization (for example NDA, RTR, HSG, VE, etc). Reference may be made to the CIS (Attachment 3 and contents) (The CIS for the waste stream, or waste stream lot associated with the WSPF, is submitted as part of the WSPF package to DOE CBFO for approval).

Line 21:

List each EPA HWN that is present in the waste stream. Each EPA HWN must be listed in the WIPP Hazardous Waste Facility Permit, Attachment C, Table C-9, Hazardous Waste Permit Application, Part A. Each EPA HWN must be justified in the Waste stream specific AK Summary Report. The AKE should assist in this determination.

Line 22:

Enter all of the TRUCON Content Numbers, from the current revision of the content codes document applicable to this waste stream. [AK Summary Report]

Line 23: A-F

Reference all of the appropriate sections, figures, or pages in the current revision of the AK Summary Document (including the document title, number, revision number, and effective date) for this waste stream where the listed information can be found in the AK document.

Line 24:

List all of the waste stream certification procedures applicable to this waste stream. Include procedure numbers, revision numbers, titles, and effective date. This list should contain all revisions of a document that were used during the characterization of the waste. References may be made to the CIS, Attachment 3.

Attachment 2 – CCP Waste Stream Profile Form (Example) (Continued)

Line 25 A-F:

Reference all of the appropriate sections, figures, or pages in the current revision of the AK Summary Document (including the document title, number, revision number, and effective date) for this waste stream where information listed can be found in the AK document.

Line 26:

Check all that apply that describes the defense activities that generated the waste.
[AK Summary Report]

Line 27 A-L:

Sites must provide the appropriate references to the site-specific documents that contain documentation that is used to support the use of AK for TRU waste characterization. Items in this section must be given the same level of consideration as the items in the Required Program Information and Required Waste Stream Information sections. This information may either be inserted into the block or referenced as listed on a continuation sheet. The AKE should provide appropriate lists of documents for use in completing Line 27. Only those documents referenced in the AK Source Documents List in the Summation of Aspects should be included in these lists.

Using information from the AK Record or from a document that is traceable to the AK record, provide a reference for the following parameters:

(A) Process design document (e.g., Title II Design).

(B) Standard operating procedures, including procedure date and reference number, that may include a list of raw materials or reagents, a description of the process or experiment generating the waste, and a description of the process or experiment generating the waste, and a description of waste generated and how the wastes are managed at the point of generation.

(C) Preliminary and final safety analysis reports and technical safety requirements.

(D) Waste packaging records.

(E) Test plans or research project reports that describe reagents and other raw materials used in experiments.

(F) Site databases (e.g., chemical inventory database for Superfund Amendments and Reauthorization Act Title III requirements).

(G) Information from site personnel (e.g., documented interviews).

Attachment 2 – CCP Waste Stream Profile Form (Example) (Continued)

(H) Standard industry documents (e.g., vendor information).

(I) Analytical data relevant to the waste stream, including results from fingerprint analyses, spot checks, routine verification sampling, or other processes that collect information pertinent to the waste stream. This may also include new information acquired apart from the confirmatory process, which supplements required information (e.g., visual examination not performed in compliance with the WIPP-WAP, radiography screening for prohibited items).

(J) MSDSs, product labels, or other product package information.

(K) Sampling and analysis data from comparable or surrogate waste streams (e.g., equivalent nonradioactive materials).

(L) Laboratory notebooks that detail the research processes and raw materials used in an experiment.

Line 28:

List the most current revisions of the approved applicable procedure(s) by the title, number, revision number, and effective date in the appropriate block.

Line 29:

For a list of the waste characterization procedures used and date of respective procedures, see the list of procedures on the attached CIS.

Instructions for completing the Summation of Aspects of the AK Summary Report:

This summation should be as succinct as possible and consistent with the AK Summary Report.

Example:

SUMMATION OF ASPECTS OF AK SUMMARY REPORT: WASTE STREAM NTXXXXXXX

Overview

The overview is an executive summary of the summation. It should contain general information about where the waste was generated, where it is stored, reference to the WSPF number and the AK Summary Report from which the information is compiled, etc. In addition, the overview should contain summary level information that the waste stream is derived from defense related activities.

Waste Stream Identification Summary

This section should contain, as a table, the information identified below, if applicable.

Waste Stream Name
Waste Stream Number

Attachment 2 – CCP Waste Stream Profile Form (Example) (Continued)

Dates of Waste Generation
Waste Stream Volume (current and projected by container)
Summary Category Group
Waste Matrix Code Group
Waste Matrix Code
TRUPACT-II Content code (TRUCON)
TRUPACT-III Content Code
ATWIR ID Number

Waste Stream Description and Physical Form

This section should contain information regarding what the waste consists of generally. For instance: the source of the waste - nonline laboratory trash that is heterogeneous debris and includes plastics, rubber, paper, glass, etc.

Point of Generation

Location

Specifically where the waste was generated:
Facility, description of the site, state, area designation, building number, production line, etc.

Area and/or Buildings of Generation

Short summary regarding the buildings or areas or productions lines, etc. that generated the waste.

Generating Processes

Description of Waste Generating Processes

This section should be a more detailed description of where and how the waste is generated. It can be building by building, process line by process line, or any other grouping that makes sense. These descriptions should be complete enough for understanding yet still striving for brevity.

Waste Stream Material and Chemical Inputs

A Table of Chemicals, for which an EPA HWN has been assigned. Include at least one identified use for each chemical.

Attachment 2 – CCP Waste Stream Profile Form (Example) (Continued)

RCRA Determinations

Historical Waste Management

The Historical Waste Management section is used to explain site policies or previous RCRA designation of the waste and how CCP uses those determinations. Explanations of how the site physically managed the waste and discussion of waste tracking or other management programs are optional. Include a discussion of duplicated CBFO approved waste streams generated under other certified programs.

Hazardous Waste Determinations

The AKE should assist in the hazardous waste determination. Include discussions in appropriate section below for instances where EPA HWNs are added as a result of confirmation activities.

The following text should be used to begin the discussions of ignitable, corrosive, and reactive characteristics.

Ignitability, Corrosivity, Reactivity

The waste material in this waste stream does not meet the definition of ignitable, corrosive, and reactive as defined in 40 CFR 261.21.

The waste in this waste stream is not liquid and does not contain unreacted corrosive chemicals; therefore, it does not meet the definition of corrosivity found in 40 CFR 261.22.

The waste material in the waste stream does not meet the definition of reactivity in 40 CFR 261.23. The materials are stable and will not undergo violent chemical change without detonating. The materials will not react violently with water, form potentially explosive mixtures with water, nor generate toxic gases, vapors, or fumes when mixed with water. Include other text such as the absence of sulfides and cyanides as appropriate.

Provide adequate detail to describe the absence of ignitable, corrosive, or reactive waste in the waste stream. Ensure the discussion closes with a statement such as, “The containers in the waste stream will be evaluated in accordance with the WIPP-WAP using radiography (and/or VE) prior to shipment to ensure the waste is not ignitable, reactive, or corrosive.

Ignitable (D001) wastes are prohibited from disposal at WIPP. Any potential D001 wastes in the waste stream must be evaluated and a determination of whether or not to apply the D001 number must be made.

Attachment 2 – CCP Waste Stream Profile Form (Example) (Continued)

Special care must be taken to address items such as metal powders which are not normally thought of as ignitable.

Some chemicals, to which the D001 EPA HWN is applied, may be identified in the AK. The D001 number is applied due to ignitability. The SPM must be able to address the ignitability of these wastes and determine that the characteristic of ignitability does not apply.

If the SPM can not positively state at the conclusion of this section that "The waste number for ignitability (D001) does not apply to this waste stream," contact the CCP Project Manager.

Corrosive (D002) wastes are prohibited from disposal at WIPP. Any potential D002 wastes in the waste stream must be evaluated and a determination of whether or not to apply the D002 number must be made.

If the SPM can not positively state at the conclusion of this section that "The waste number for Corrosivity (D002) does not apply to this waste stream," contact the CCP Project Manager.

Reactive (D003) wastes are prohibited from disposal at WIPP. Any potential D003 wastes in the waste stream must be evaluated and a determination of where or not to apply the D003 number must be made.

If the SPM can not positively state at the conclusion of this section that "The waste number for Reactivity (D003) does not apply to this waste stream," contact the CCP Project Manager.

Toxicity Characteristic

Determine if the waste in this waste stream meets the definition of toxicity as defined in 40 CFR 261.24. For each chemical listed in CFR 261.24, determine if the EPA HWN should be applied to the waste stream.

If it is not possible to identify a specific source of the chemical, but the determination is made to apply the number, state that the number is being applied based on the information available.

Listed Waste

F-Listed Waste

Determine if the waste in this waste stream meets the requirements for listing as an F-Listed (Hazardous Waste from Non-Specific Sources) as defined in 40 CFR 261.31. For each chemical listed in CFR 261.31, determine if the EPA HWN should be applied to the waste stream.

Attachment 2 – CCP Waste Stream Profile Form (Example) (Continued)

If it is not possible to identify a specific reason to apply the number for a chemical, but never the less the determination is made to apply the number, state that the number is being applied based on the information available.

K-Listed Waste

K-Listed wastes (Hazardous Waste from Specific Sources) are unlikely in waste to be shipped to WIPP. If K wastes are included, document as below for P- and U-Listed wastes.

P- and U-Listed Wastes

P- and U-Listed wastes are lists of chemicals that if present in the waste as pure un-used commercial chemical products would require the application of the EPA HWN.

Determine if the waste in this waste stream meets the requirements for listing as a P- or U-Listed as defined in 40 CFR 261.33. For each chemical listed in CFR 261.33, determine if the EPA HWN should be applied to the waste stream.

If it is not possible to identify a specific reason to apply the number for a chemical, but never the less the determination is made to apply the number, state that the number is being applied based on the information available.

Hydrofluoric acid (U134) and Beryllium (P015) are of special interest and must be addressed in every WSPF.

Polychlorinated Biphenyls

Evaluate the presence of Polychlorinated Biphenyls (PCBs) in the waste.

Prohibited Items

Include the appropriate prohibited items discussion from the AK Summary Report including a discussion as to how the prohibited items will be identified and remediated prior to shipment (such as radiography or VE).

Method for Determining Waste Material Parameter Weights per Unit of Waste

Describe the method used for determining waste material parameter weight estimates per unit of waste and include the WMP estimates table.

List of Any AK Sufficiency Determinations Requested for the Waste Stream

List applicable AK sufficiency determinations.

Attachment 2 – CCP Waste Stream Profile Form (Example) (Continued)

Transportation

Briefly discuss DOE/WIPP-02-3122, *Transuranic Waste Acceptance Criteria For The Waste Isolation Pilot Plant* (WIPP-WAC) transportation requirements as they pertain to identified TRUCON codes as dictated by the waste stream.

Beryllium

Address the WIPP-WAC requirements for beryllium.

Radionuclide Information

Present the two most prevalent isotopes expected from the waste stream (CH only). Insert radionuclide table from the AK Summary Report.

Include a brief discussion on payload management per the WIPP-WAC, Appendix E.

Source Documents

Insert reference list from AK Summary Report.

Revision to the Waste Stream Profile Form Package

If a revision to the WSPF Package is needed, a revised WSPF is created. Reasons for revising the WSPF Package include:

- Addition of EPA HWNs
- Application of additional TRUCON Content codes
- Addition of material parameter weight estimates per unit of waste

Attachment 3 – CCP Characterization Information Summary Cover Page (Example)

Waste Stream: #: _____ Lot #: _____

AK Expert Review: _____ Date: _____

SPM Review: _____ Date: _____

SPM signature certifies that through Acceptable Knowledge testing and/or analysis that the waste identified in this summary is not corrosive, ignitable, reactive, or incompatible with the TSDF.

A summary of the Acceptable Knowledge regarding this waste stream containing specific information about the corrosivity, reactivity, and ignitability of the waste stream is included as an attachment to the Waste Stream Profile Form. By reference, that information is included in this lot.

List of procedures used:

Controlled Copy

Attachment 4 – CCP Correlation of Container Identification Number to Batch Data Report Numbers (Example)

Waste Stream #: ______________________________ Lot #: __________

Container ID Number	NDA BDR	RTR BDR	VE BDR	Payload Management/ Overpack Yes

Signature of Site Project Manager | Printed Name | Date

Attachment 5 – CCP RTR/VE Summary of Prohibited Items (Example)

CCP RTR/VE Summary of Prohibited Items

Waste Stream Number: _____ Lot(s)#: _____

Container Number	RTR Prohibited Items [a,b]	Visual Examination Prohibited Items [a,b]	Does the Physical Form of the Waste Match the Waste Stream Description as Determined by AK
a. See Batch Data Reports b. If AK has assigned U134 to this waste stream, then any liquids in these containers are prohibited items (not acceptable by the TSDF)			
Justification for the selection of RTR and/or VE:			

Site Project Manager Signature Printed Name Date

Controlled
Copy

CCP-TP-005

Revision 28

CCP
Acceptable Knowledge Documentation

EFFECTIVE DATE: 02/29/2016

Mike Ramirez

PRINTED NAME

APPROVED FOR USE

RECORD OF REVISION

Revision Number	Date Approved	Description of Revision
4	01/17/2002	Revised to delete the requirement for signing the AK Summary and other minor changes. Added cis & trans-1,2-Dichloroethylene, Attachment 5.
5	01/24/2002	Minor change to Attachment 14 due to the following: Signature lines were struck and approved by all levels of review in previous revision. When preparing document to be issued signature lines were inadvertently left in and must now be removed. Printed name and "approved for use" are being inserted to reflect the CCP Procedure format.
6	07/23/2002	Revised document to: • Comments based on CH-WAC revision • Accommodate comments from an assessment at SRS Document Review Record for Technical and Quality Assurance • Comments from a Program Evaluation at ANL-E
7	09/06/2002	Revised document to: • Minor editorial changes to 2.1, 4.2, 4.3, and 4.4 Changes to 4.4.17 to comply with WAP requirements and Program Evaluation Changes to 4.4.26 to comply with Program Evaluations for NTS.
8	09/19/2002	Revised document based on comments from the ANLE Certification Audit and a CBFO Adequacy Review; revised Sections 3.1, 4.2, 4.3, 4.4, 4.5 and Attachments 7, 10, and 11.
9	09/26/2002	Revised document based on comments from the NTS Certification Audit; revised Sections 4.3, 4.4, 4.5, and 4.6.
10	10/24/2002	Revised step 3.2.13; added Section 3.6 and steps 4.7.18 and 4.7.19; and revised Attachment 10 based on comments from the SRS Recertification Audit.
11	02/05/2003	Revised document to address CAR #02-087 and CAR # 02-088 from the ANL-E Certification Audit. Revised steps 4.4.1 and added NOTE. Revised steps 4.4.17, 4.4.20, 4.4.24, 4.4.26, and 4.5.1 [D.2]

RECORD OF REVISION (Continued)

Revision Number	Date Approved	Description of Revision
12	03/26/2003	Revised step 4.4.8 and preceding NOTE.
13	11/18/2003	Revised document to: - Perform minor editorial changes throughout document. Clarify that Attachments are example forms. Remove Attachments 11 and 12 to create electronically fillable forms of these attachments. Add Section 3.7 to include responsibility of Nondestructive Assay (NDA) Subject Matter Expert (SME) to perform assessment with the Acceptable Knowledge Expert. Update steps 4.4.17 and 4.4.18 to require that the uses and limitations of the radionuclide Acceptable Knowledge information is reviewed by the NDA SME. Add Section 4.9 to address CAR-SRS-006-03 for the process used to document the addition of containers to existing waste streams. Added a new Section 4.3.3 identifying the use of Memorandum to CCP Central Records. Added a new Section 4.6.3 to incorporate preparation of a letter/memorandum to Site Project Manager summarizing AK information; revision of Sections 4.6.4 and 5.1.1[J] to incorporate the addition of 4.6.3. Deleted Section 4.1.3 Process Equipment Description from the AK Summary Report Content Guide. - Modified Attachment 5.
14	11/19/2004	Revised document to: - Perform minor editorial changes and technical clarifications throughout document. - Revised procedure to address WIPP WAC Revision 1 and 2 changes relating to beryllium, payload container management, high plutonium content waste/material, and PCB requirements (Sections 1.0 and 4.4.24). - Revised Section 4.8.1 to allow for resolution of discrepancies within the AK Summary Report. - Deleted redundant records management requirement to attach copies of the AK Source Document Discrepancy reports to all affected sources. - Deleted step 4.4.8[B].

RECORD OF REVISION (Continued)

Revision Number	Date Approved	Description of Revision
15	03/31/2005	Revised document to incorporate WIPP WAP AK requirements for LANL sealed sources. Addressed CBFO comments.
16	02/27/2006	Revised document to: Incorporate minor editorial changes and technical clarifications throughout the document. Add Sections 4.10 and 4.11 to address creation and maintenance of the Container Tracking Spreadsheet on the FTP (CAR-INL-0003-05). Replace revised Attachments 5 and 10 based on recent audit discussions.
17	06/05/2006	Revised to allow the use of attachments to this procedure during the management of Remote-Handled (RH) Acceptable Knowledge (AK) in accordance with DOE/WIPP-02-3214, *Remote-Handled TRU Waste Characterization Program Implementation Plan* (WCPIP). Revised Attachment 6, Waste Form, Waste Material Parameters, Prohibited Items, and Packaging – Example Form per Los Alamos National Laboratory (LANL) Certification Audit A-06-11.
18	11/16/2006	Revised to implement the Waste Isolation Pilot Plant Hazardous Waste Facility Permit requirements resulting from the Section 311/Remote-Handled (RH) Permit Modification Request (PMR). Addressed Carlsbad Field Office (CBFO) Document Review Record (DRR) comments.
19	07/06/2010	Revised document to address the Waste Isolation Pilot Plant (WIPP) Form WF09-171 from an internal Central Characterization Project (CCP) audit and to incorporate minor editorial changes and technical clarifications noted as a result of various Acceptable Knowledge audits.
20	11/01/2010	Revised to allow new and updated attachments and source documents to be submitted anytime after the initial submittal.
21	12/29/2010	Revised to implement the revision of the *Waste Isolation Pilot Plant Hazardous Waste Facility Permit*.
22	04/21/2011	Revised to address changes in Revision 2 of the *Remote-Handled TRU Waste Characterization Program Implementation Plan* (WCPIP). Incorporated editorial changes and technical clarifications throughout procedure.
23	06/30/2011	Revised to clarify what constitutes a record as part of the resolution to resolve CBFO CAR11-043.

RECORD OF REVISION (Continued)

Revision Number	Date Approved	Description of Revision
24	11/28/2011	Revised to address comments from inspectors during U.S. Environmental Protection Agency (EPA) Baseline Inspection EPA-SNL-CCP-RH-06.11-8 (June 6/8, 2011). Also revised to incorporated lessons learned from Carlsbad Field Office (CBFO) records surveillance.
25	06/19/2013	Revised to incorporate Nuclear Waste Partnership (NWP) transition changes and to implement the Permit Modification Request Class 2 approved by New Mexico Environment Department (NMED) dated March 13, 2013.
26	08/12/2013	To clarify the evaluation of nondestructive assay (NDA) results by the site project manager (SPM) and acceptable knowledge expert (AKE). Also, to incorporate changes as a result of CAR-LANL-0003-13.

RECORD OF REVISION (Continued)

Revision Number	Date Approved	Description of Revision
27	08/26/2015	Revised procedure to address New Mexico Environment Department (NMED) Compliance Order (CO) HWB-14-21 (December 6, 2014). Changes included: • Preparation and maintenance of Interface Waste Management Documents List (Attachment 9) in steps 4.2.9 through 4.2.17. • Verification of new and revised procedures during acceptable knowledge (AK) document review and summary in Steps 4.3.9 through 4.3.13 and during the addition of containers to the waste stream in steps 4.10.3 through 4.10.6. • Added Section 4.13 describing the steps to perform an AK Assessment to ensure that the existing Central Characterization Program (CCP) AK documentation relating to the management of potentially energetic transuranic (TRU) waste forms (reactive, ignitable, and incompatible materials) is adequate, current, and accurately described in existing AK Summary Reports. • Added Section 4.14 to formally describe AK Briefings currently being performed for CCP personnel to include cognizant generator site Points-of-Contact (POCs) involved directly with the generation of the waste streams. • Added Section 4.4.21 for the preparation of Chemical Compatibility Evaluation Memorandum. • Updated the responsibilities in Section 3.0 to address these changes. • Revised Section 4.6 to provide clarification for the preparation of the Accuracy Reports required for both NMED and U.S. Environmental Protection Agency (EPA) and to clarify that accuracy will be tracked using all CCP certified testing data. • Addressed miscellaneous freeze file changes.

RECORD OF REVISION (Continued)

Revision Number	Date Approved	Description of Revision
28	02/29/2016	Revised to provide additional detail and clarify the procedural steps for the new activities included in Revision 27. Changes include: • Revised and clarified the responsibilities for the Acceptable Knowledge Expert (AKE) (Section 3.3) and Site Project Manager (SPM) (Section 3.1) and removed the Transportation Engineer (Section 3.7). • Moved procedural steps and notes from Section 4.3 relating the Interface Waste Management Documents List to Section 4.2. • Deleted the chemical compatibility evaluation steps in Section 4.4 and expanded the procedural steps and guidance in new Section 4.15. • Added a specific step to review the Nondestructive Assay (NDA) Memorandum (Section 4.4.26), the Waste Material Parameter Memorandum (Section 4.4.31), and Chemical Compatibility Evaluation Memorandum (Section 4.4.22) during revision of the Acceptable Knowledge (AK) Summary Report. • Updated note to clarify the intended purpose of the Acceptable Knowledge Assessment (AKA) (Section 4.13), including the clarification that AKAs are not required for new AK Summary Reports. • Added bullet list for the recommended content of the AKA Memorandum (Section 4.13.6). • Clarified that the SMR review is conducted for procedures under their purview when reviewing the AKA Memorandum (Section 4.13.9 and 4.13.10). • Added SPM review of the AKA Memorandum (Section 4.13.8). • Added Attachment 16 - Example Form and Content Guide for the Chemical Compatibility Evaluation Memorandum. • Incorporated numerous editorial changes to address freeze file comments and format consistency.

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1.0 PURPOSE

The *Waste Isolation Pilot Plant Hazardous Waste Facility Permit, Waste Analysis Plan* (WIPP-WAP), authorizes the use of Acceptable Knowledge (AK) in appropriate circumstances to delineate waste streams and to characterize hazardous waste. WIPP-WAP AK requirements are addressed in CCP-PO-001, *CCP Transuranic Waste Characterization Quality Assurance Project Plan*, and implemented through this procedure. DOE/WIPP-02-3122, *Transuranic Waste Acceptance Criteria for the Waste Isolation Pilot Plant* (WIPP-WAC), AK requirements are addressed in CCP-PO-002, *CCP Transuranic Waste Certification Plan*.

Additionally, implementation of this procedure will generate information required by:

- CCP-PO-003, *CCP Transuranic Authorized Methods for Payload Control* (*CCP CH-TRAMPAC*);
- CCP-PO-505, *CCP Remote-Handled Transuranic Waste Authorized Methods for Payload Control* (*CCP RH-TRAMPAC*);
- CCP-PO-050, *CCP TRUPACT-III Waste Authorized Methods for Payload Control (CCP TRUPACT-III TRAMPAC)*; and
- CCP-PO-401, *CCP Transuranic Authorized Methods for Payload Control for Intersite Shipments*.

This procedure applies to Central Characterization Program (CCP) personnel who perform AK activities for retrievably stored and newly generated transuranic (TRU) waste streams that may be eligible for disposal at the Waste Isolation Pilot Plant (WIPP).

1.1 Scope

This procedure describes the processes the CCP uses to compile, review, evaluate, update, and report AK documentation. The procedure also describes how the CCP determines AK Sufficiency, AK accuracy, re-evaluates AK documentation when necessary, resolves AK documentation discrepancies, and uses AK to delineate waste streams and determine whether the waste is hazardous. A waste stream is defined as waste materials that have common physical form, that contain similar hazardous constituents (similar radiological properties for DOE/WIPP-02-3214, *Remote-Handled TRU Waste Characterization Program Implementation Plan* [WCPIP] compliance), and that are generated from a single process or activity.

Only CCP personnel trained in accordance with CCP-QP-002, *CCP Training and Qualification Plan,* will compile, evaluate, and document AK

information in accordance with this procedure. Sites hosting the CCP may assist CCP personnel in the collection of AK information; however, this procedure will be used by the CCP to generate the required AK in accordance with CCP-PO-001, CCP-PO-002, CCP-PO-003, CCP-PO-050, CCP-PO-401, and CCP-PO-505.

AK includes any documentation that describes or verifies site history, mission, and operations, in addition to waste stream-specific information used to define the generating process, waste matrix, waste quantities, and contaminants (radiological and chemical).

The information acquired in the performance of this procedure is used to prepare an AK Summary Report or an AK Sufficiency Determination.

This information is provided in the following attachments:

- Attachment 1 – Acceptable Knowledge Documentation Checklist – Example Form
- Attachment 2 – Record of Communication – Example Form
- Attachment 3 – Acceptable Knowledge Source Document Summary – Example Form
- Attachment 4 – Acceptable Knowledge Information List – Example Form
- Attachment 5 – Hazardous Constituents – Example Form
- Attachment 6 – Waste Form, Waste Material Parameters, Prohibited Items, and Packaging – Example Form
- Attachment 7 – Radionuclides – Example Form (CH only)
- Attachment 8 – Waste Containers List – Example Form
- Attachment 9 – Interface Waste Management Documents List – Example Form
- Attachment 10 – Acceptable Knowledge Re-evaluation Checklist – Example Form
- Attachment 11 – Acceptable Knowledge Source Document Discrepancy Resolution – Example Form
- Attachment 12 – Example Form and Content Guide for AK Summary Reports

- Attachment 13 – CCP Waste Stream Characterization Checklist – Example Form
- Attachment 14 – CCP Acceptable Knowledge Accuracy Report – Example Form
- Attachment 15 – CCP TRU Waste Correlation and Surrogate Summary Form – Example Form
- Attachment 16 – Example Form and Content Guide for the Chemical Compatibility Evaluation Memorandum

The attached forms are provided as examples for the required AK information to be prepared for CCP Records. The forms identify the minimum information that will be prepared to document the AK collection and review process described in this procedure. Attachment 4, Acceptable Knowledge Information List – Example Form, lists all of the information that was collected and considered during the preparation of an AK Summary Report. Only those sources of information that are referenced in the AK Summary Report are considered source documents and submitted to CCP Records.

Remote-Handled (RH) TRU AK management will be performed in accordance with WCPIP to address U.S. Environmental Protection Agency (EPA) requirements and CCP-PO-001 to address WIPP-WAP requirements. The attachments for AK management in this procedure were reviewed and determined to meet or exceed the information requirements described for AK management in the WCPIP, and will be used, as appropriate, during the compilation, review, evaluation, and reporting associated with RH AK information.

2.0 REQUIREMENTS

2.1 References

Baseline Documents

- DOE/WIPP 89-004, *TRUPACT-II Content Codes* (TRUCON)

Referenced Documents

- DOE/LLW-217, *DOE Waste Treatability Group Guidance.* Idaho Falls, Idaho, INEL-Lockheed Idaho Technologies
- DOE/TRU-14-3425, *Annual Transuranic Waste Inventory Report – 2014,* (or current revision), Carlsbad, New Mexico, U.S. DOE Carlsbad Field Office
- DOE/WIPP-02-3122, *Transuranic Waste Acceptance Criteria For the Waste Isolation Pilot Plant*
- DOE/WIPP 01-3194, *CH-TRU Waste Content Codes (CH-TRUCON)*
- DOE/WIPP-02-3214, *Remote-Handled TRU Waste Characterization Program Implementation Plan*
- DOE/WIPP 90-045, *RH-TRU Waste Content Codes (RH-TRUCON)*
- 20.4.1 NMAC, Hazardous Waste Management
- 40 CFR Part 261, *Identification and Listing of Hazardous Waste*
- CCP-PO-001, *CCP Transuranic Waste Characterization Quality Assurance Project Plan*
- CCP-PO-002, *CCP Transuranic Waste Certification Plan*
- CCP-PO-003, *CCP Transuranic Authorized Methods for Payload Control* (*CCP CH-TRAMPAC*)
- CCP-PO-505, *CCP Remote-Handled Transuranic Waste Authorized Methods for Payload Control* (*CCP RH-TRAMPAC*)
- CCP-PO-050, *CCP TRUPACT-III TRU Waste Authorized Methods for Payload Control (CCP TRUPACT-III TRAMPAC)*
- CCP-PO-401, *CCP Transuranic Authorized Methods for Payload Control for Intersite Shipments*

- CCP-QP-002, *CCP Training and Qualification Plan*
- CCP-QP-005, *CCP TRU Nonconforming Item Reporting and Control*
- CCP-QP-008, *CCP Records Management*
- CCP-QP-010, *CCP Document Preparation, Approval, and Control*
- CCP-TP-002, *CCP Reconciliation of DQOs and Reporting Characterization Data*
- CCP-TP-069, *CCP Sealed Source Visual Examination and Packaging*
- CCP-TP-101, *CCP Off-Site Source Recovery Project Sealed Source Radiological Characterization*
- 42 U.S.C. 10101, *Nuclear Waste Policy Act of 1982*, U.S. Congress
- 40 CFR part 761*, Polychlorinated Biphenyls (PCBs) Manufacturing, Processing, Distribution in Commerce, and Use Prohibitions,* U.S. EPA
- EPA-600/2-80-076*, A Method for Determining the Compatibility of Hazardous Wastes,* U.S. EPA

2.2 Training Requirements

2.2.1 All CCP personnel performing this procedure will be trained and qualified in accordance with CCP-QP-002, prior to performing this procedure.

3.0 RESPONSIBILITIES

3.1 Site Project Manager (SPM)

3.1.1 Ensures that trained AK Experts (AKE) are available to implement this procedure in coordination with the Host site.

3.1.2 Approves, resolves, and requests re-evaluation of AK as necessary.

3.1.3 Makes final waste stream determinations, EPA Hazardous Waste Number (HWN) assignments, and compares, confirms, and approves the AK documentation.

3.1.4 Prepares AK Accuracy Reports in conjunction with the AKE.

3.1.5 Requests and approves the assignment of TRUCON codes developed by the Payload Engineer Team and reviews the characterization data for each waste stream.

3.1.6 Transmits Site Management Representative (SMR) quarterly notifications to the AKE that the Interface Waste Management Documents List are current.

3.1.7 Coordinates the presentation of AK Briefings to CCP characterization personnel (per CCP-QP-002) and generator site SMR, point of contacts (POCs)/Subject Matter Experts (SMEs), or cognizant designees, directly involved with the generation of each waste stream.

3.1.8 Reviews and approves Chemical Compatibility Evaluation Memorandum (CCEM).

3.1.9 Reviews the Acceptable Knowledge Assessment (AKA) and resolves any comments from the SMR with the AKE, **AND** transmits the SMR written notice of concurrence to the AKE.

3.2 CCP Inventory and AK Support Manager

3.2.1 Manages and directs AKEs to ensure qualified individuals are performing tasks specified.

3.2.2 Coordinates between AKE and SPM for development of AK Summary Reports and Waste Stream Profile Forms (WSPFs).

3.2.3 Provides site-by-site tracking of AK development to allocate AK resources as needed.

3.3 AK Expert (AKE)

3.3.1 Identifies, locates, compiles, documents, summarizes, and evaluates required AK information.

3.3.2 Delineates waste streams and assigns waste stream numbers.

3.3.3 Recommends hazardous waste determinations to the SPM.

3.3.4 Prepares and revises AK Summary Reports.

3.3.5 Collects, reviews, prepares, and submits source documents as necessary.

3.3.6 Prepares and revises the AK Sufficiency Determination Request.

3.3.7 Documents and resolves discrepancies with AK information and discrepancies identified during characterization.

3.3.8 Records meetings, telecommunications, interviews, and other communications.

3.3.9 Completes and maintains AK Source Document Summary forms and Acceptable Knowledge Information Lists.

3.3.10 Reviews and verifies AK information.

3.3.11 Develops waste stream descriptions.

3.3.12 Assigns Summary Category Groups and Waste Matrix Codes, and estimates waste material parameter (WMP) weights.

3.3.13 Prepares auditable file of AK information.

3.3.14 Re-evaluates and updates AK as needed.

3.3.15 Reviews and concurs on the WSPF.

3.3.16 Supports the development of the AK qualification method(s) and compliance with the applicable Data Quality Objectives (DQOs) for RH waste streams in accordance with the WCPIP.

3.3.17 Prepares and maintains the Interface Waste Management Documents List for each waste stream, including the identification of the applicable generator POCs/SMEs involved directly with the generation of each waste stream (Identified by the SMR). Updates the Interface Waste Management Documents List with new or revised procedures affecting waste stream management and

packaging prior to implementation of the procedure as they are identified and provided by the SMR.

3.3.18 Provides the Interface Waste Management Documents List to the SMR for concurrence.

3.3.19 Verifies new and revised procedures/documents with the generator POCs/SMEs on the Interface Waste Management Documents List **AND** ensures that the procedure/documents are current prior to adding new containers to the waste stream.

3.3.20 Performs an AKA to ensure that the AK documentation relating to the management of potentially reactive, ignitable, and incompatible TRU waste materials is adequate, current, and accurately described in existing AK Summary Reports.

3.3.21 Prepares and presents (in conjunction with the SPM) AK Briefings for CCP characterization personnel in accordance with CCP-QP-002 and generator POCs/SMEs, or cognizant designees.

3.3.22 Supports the SPM in the preparation of AK Accuracy Reports and approves AK Accuracy Reports.

3.3.23 Provides completed Interface Waste Management Documents List to SPM.

3.3.24 Submits copy of completed Interface Waste Management Documents List to CCP Records.

3.3.25 Performs chemical compatibility evaluations and prepares the CCEM.

3.4 Off-Site Source Recovery (OSR) Program

3.4.1 For Los Alamos National Laboratory (LANL) sealed sources, assists the AKE in preparing the nondestructive assay (NDA) Memorandum discussed in step 4.4.27.

3.5 Nondestructive Assay (NDA) Expert Analyst (EA)

3.5.1 Performs the assessment for the NDA Memorandum discussed in step 4.4.25 with the AKE.

3.6 Site Management Representative (SMR)

NOTE
The general SMR responsibilities to support the development of AK are listed below. The specific responsibilities are identified in and will be performed in accordance with the site Interface Document.

3.6.1 Supports the AKE with the preparation and approval of the Interface Waste Management Documents List including the identification of the applicable generator POCs/SMEs involved directly with the generation of each waste stream.

3.6.2 Provides revisions to procedures on the Interface Waste Management Documents List, and provides new procedures affecting waste stream management and packaging to CCP prior to implementation of the procedure.

3.6.3 Performs quarterly reviews of the Interface Waste Management Documents List and notifies the SPM that the list is complete and includes the most current revision of the relevant procedures.

3.6.4 Identifies the appropriate generator POCs/SMEs for the review of the AK Summary Reports and to attend AK Briefings.

4.0 PROCEDURE

NOTE

The data collection, documentation, and AK preparation steps can be performed in any sequence as long as the AK data collection requirements found in CCP-PO-001 are met.

NOTE

The attached forms referenced in this section are provided as examples for the required AK information to be prepared for CCP Records. The forms identify the minimum information that will be prepared to document the AK collection and review process described in this procedure. All attachments submitted must contain a header with the procedure number, revision number, procedure title, effective date, and page number as displayed in the Example Attachments. Attachments must also contain the Attachment number and title immediately following the header, as shown on the Example Attachments. The waste stream description on the attachments may be abbreviated, as needed.

4.1 AK Documentation Management

AKE

4.1.1 As they are collected, maintain the compiled AK documents with reasonable care (protection from damage or loss).

4.1.2 Assign a unique tracking number to each document collected as AK information using the Acceptable Knowledge Information List (see Attachment 4 for an example), for each waste stream. Describe the specific convention used to assign the unique identifiers to the source documents in the AK Summary Report. Examples of source document categories are as follows:

(EXAMPLE)

C – Correspondence
D – Documents
M – Miscellaneous
P – Procedures and Published Documents
DR – Discrepancy Resolution
U – Unpublished Documents

4.2 Compiling AK Documentation

4.2.1 Locate and obtain source documents with assistance of the Host site for documents with reference sections, as applicable.

4.2.2 Compile (i.e., gather) source documents that identify TRU waste management program information in the Acceptable Knowledge

Documentation Checklist , AK #s PR1-PR8 (see Attachment 1, Acceptable Knowledge Documentation Checklist - Example Form for facilities that generated the waste stream.

NOTE

Information collected must be sufficient to accurately characterize the waste stream.

NOTE

Source documents may include published or unpublished documents, correspondence, databases, quality assurance (QA) protocols, operating procedures, work instructions, waste storage/disposal records, waste certification summaries, process flow diagrams, analytical and testing data packages from previous waste characterization activities, and other sources of information descriptive of elements on the Checklist.

4.2.3 Apply a unique waste stream number based on the information in the current revision of the *Annual Transuranic Waste Inventory Report* (ATWIR), and/or information from the Host site for each waste stream (Refer to CCP-TP-002, *CCP Reconciliation of DQOs and Reporting Characterization Data*, for appropriate numbering format).

4.2.4 Compile and record source documents that identify TRU waste stream-specific information specified in the Acceptable Knowledge Documentation Checklist, AK #s WS1-WS12 for each waste stream.

4.2.5 Compile and record source documents that identify additional AK documentation specified in the Acceptable Knowledge Documentation Checklist, AK #s S1-S16.

[A] Obtain additional AK information as appropriate to augment required information and provide any other information obtained to further characterize the waste stream.

[B] All additional specific, relevant AK documentation assembled and used in the AK process, whether it supports or contradicts any required AK documentation, shall be identified and an explanation provided for its use (e.g., identification of a toxicity characteristic). Document the resolutions of discrepancies associated with waste stream delineation on an Acceptable Knowledge Source Document Discrepancy Resolution form (see Attachment 11), or in the AK Summary Report. Additional documentation may be used to further document the rationale for the hazardous characterization results. If discrepancies exist between additional information and the required information, assess

and evaluate the information to determine the appropriate HWNs consistent with Resource Conservation and Recovery Act (RCRA) requirements. Document the resolution of RCRA HWN assignment discrepancies on an Acceptable Knowledge Source Document Discrepancy Resolution form (see Attachment 11), or in the AK Summary Report.

4.2.6 For LANL sealed sources, compile source documents that identify OSR-specific documentation specified in the Acceptable Knowledge Documentation Checklist, AK #s O1-O16.

[A] If source markings are needed to support radiological characterization, the SPM must verify that they have been documented in accordance with CCP-TP-069, *CCP Sealed Source Visual Examination and Packaging.*

NOTE

For RH waste streams, the documentation collected and compiled in Sections 4.1 and 4.2 may not be sufficient to meet the DQOs established for the selected parameters in accordance with the WCPIP. If there is insufficient AK information to address each of the DQOs, then either additional AK will be collected and/or the characterization methods described in the WCPIP will be initiated. A combination of AK and other characterization methods may be used to meet the WCPIP DQO requirements.

4.2.7 For RH waste, review the documentation compiled and determine which of the WCPIP DQOs can be met using the AK information collected.

4.2.8 Collect additional AK documentation and/or identify the characterization method(s) recommended to meet the DQO in accordance with the WCPIP (see step 4.4.38[O]).

NOTE

The Interface Waste Management Documents List (see Attachment 9) will be initiated and maintained as described in the site Interface Document for each waste stream (steps 4.2.9 through 4.2.19). The purpose of this form is to identify and maintain a current list of generator site plans, procedures, and reports associated with current waste management and packaging (e.g., waste management, waste generation, waste treatment, waste packaging, waste repackaging, waste remediation, waste stream delineation, and waste characterization procedures) to be reviewed before containers are added to the Waste Containers List (see Section 4.4.32[C]) or Container Tracking Spreadsheet (See Section 4.11). In addition, the form identifies the generator POCs/SMEs from the groups directly involved with the generation, characterization, and management of containers in the waste stream.

4.2.9 Identify active and planned site operations with input from the SMR that directly affect the waste stream management and packaging of the waste stream; including, as applicable:

- Waste packaging and repackaging processes (including the remediation of prohibited items),
- Waste treatment/processing (e.g., waste neutralization, deactivation, and solidification/immobilization),
- Waste inspection, testing, and characterization activities,

4.2.10 Record the relevant generator site documents associated with activities identified in step 4.2.9 for active waste streams on the Interface Waste Management Documents List; including, as applicable:

- Facility Safety and Analysis Reports,
- Standard operating procedures,
- Work and test plans,
- Work/field instructions (e.g., field changes, intermediate field changes, and timely orders/standing orders),
- Sampling and analysis plans, and
- Physical and chemical studies/evaluations.

4.2.11 Verify with the SMR that the list is complete **AND** that the list identifies the most current revision for each document.

NOTE

For CCP active waste streams which include unshipped containers generated prior to implementation of Revision 27 of this procedure, the initial Interface Waste Management Documents List will be verified.

4.2.12 **IF** any identified document has not already been collected for the waste stream or the current revision of the document has not been provided,
THEN obtain the document to be included in the AK record for the waste stream.

4.2.13 Contact the SMR to identify the generator POCs/SMEs for each document/procedure and include the contact information in the Interface Waste Management Documents List.

NOTE

Procedure verification will include the review of waste management and packaging activities performed under the procedures listed on the Interface Waste Management Documents List. This “walk down” for the initial list of documents included in the list, and new procedures added to the list, will involve discussing and/or observing the performance of procedural steps implemented by the generator relating to the management of prohibited items, including potentially reactive, corrosive, ignitable, and incompatible TRU waste materials with the appropriate generator POCs/SMEs. Subsequent revisions to documents on the list will be reviewed by the AKE. Changes affecting waste management or packaging will be verified with the cognizant POCs/SMEs on the Interface Waste Management Documents List.

4.2.14 For the procedures listed on the Interface Waste Management Documents List, review (walk down) these activities with the cognizant generator POCs/SMEs to confirm procedures accurately reflect the site waste management and packaging activities identified in Section 4.2.9.

4.2.15 Summarize the verification (including the identification of the POCs/SMEs and verification date) on the Attachment 3, Acceptable Knowledge Source Document Summary form (see Section 4.3).

NOTE

Containers packaged to a new procedure or revision that could result in a change to waste stream management and packaging, cannot be added to the Waste Container List or Acceptable Knowledge Tracking Spread Sheet (AKTSS) until the changes have been evaluated by the AKE to determine if the procedure change requires a revision to the AK Summary Report for the waste stream. If a revision is required the AK Summary Report must be revised and approved before any containers are added to the AKTSS for characterization.

4.2.16 Review new and revised procedures or documents potentially affecting the waste stream management and packaging associated with the activities listed in Section 4.2.9 and ensure the Interface Waste Management Documents List is updated, as needed.

4.2.17 **IF** it is determined that a new procedure or revision affects waste stream management or packaging,
THEN update the interface Waste Management Documents List to include the procedure **AND** include the following additional verification information in the Acceptable Knowledge Source Document Summary form (see Section 4.3), as applicable:

[A] Description of activities affecting waste stream management or packaging, and

[B] Interface Waste Management Documents List POCs/SMEs contacted by the AKE to verify (walk down) the procedure.

IF it is determined that the changes in a revision to a procedure currently listed on the Interface Waste Management Documents List do **NOT** affect waste stream management or packaging,
THEN update the Interface Waste Management Documents List to include the procedure revision **AND** note in the Acceptable Knowledge Source Document Summary form that the review did not identify any relevant changes to waste management from the previous revision(s). Include the identification of the POCs/SMEs and verification date on the Acceptable Knowledge Source Document Summary form (see Section 4.3).

4.2.18 Print name, sign, and date the Interface Waste Management Documents List.

NOTE

As specified in the site Interface Document, it is the responsibility of the SMR to only submit Quarterly SMR Notifications for waste streams expected to generate additional containers of TRU waste or if containers in the waste stream will be repackaged or remediated. Revision to the Interface Waste Management Documents List can serve to meet the Quarterly SMR Notification requirement.

4.2.19 Submit Interface Waste Management Documents List and associated Quarterly SMR Notifications to the SPM AND CCP Records.

4.3 Recording AK Documentation

NOTE

There are two categories of source documents used to document AK for a waste stream. Documentation generated by CCP and documents and/or other media supplied by the generator site. Generator site provided documents and/or other media are external records created by the waste generator sites and are identified in this procedure as “historical source documents.”

4.3.1 Copy the document or the pertinent information from the document that defines source document contents, including cover sheets, executive summaries, introductions, and table of contents, if available **AND** maintain this information in the working files.

NOTE

Classified material CAN **NOT** be copied. If source documents are classified, an unclassified summary will need to be provided by the Host site or the document will be developed and summarized on an Acceptable Knowledge Source Document Summary form (see Attachment 3), by the AKE **AND** reviewed by the Site’s Authorized Derivative Classifier for release.

4.3.2 Record meetings, telecommunications, interviews, and other communication on a Record of Communication form (see Attachment 2), including a detailed summary of the content of the communication and data limitations.

NOTE

To avoid redundancy, a Record of Communication form may **NOT** be required if the information is already provided on an interview-related source document. Verification of new or revised procedures with generator POCs/SMEs may be recorded on the Acceptable Knowledge Source Document Summary form.

4.3.3 As necessary, prepare a memorandum or letter to CCP Records and Record of Communication, as appropriate, documenting the method used by the AKE to review AK source documents for the purpose of evaluating required AK parameters such as radionuclides, Waste Matrix Codes, assignment of HWNs, estimating waste material parameter weights, AK Assessments, chemical compatibility evaluations, etc. The memorandum must identify the sources of AK used during the evaluation and clearly document the AKE assumptions and conclusions.

NOTE

Collection and review of AK source documents is an ongoing activity. It is conducted initially during the development of the AK Summary Report and continues as additional information becomes available during subsequent waste stream characterization and management activities. Completion of the Acceptable Knowledge Source Document Summary form for the source documents is an iterative process performed during these activities.

If the source document is a collection of information (i.e., container data sheets, material safety data sheets [MSDS] and Safety Data Sheets [SDS], etc.) provide a description in the Title field of the Acceptable Knowledge Source Document Summary form and ensure that it matches the Title field in the AK Source Document section of the AK Summary Report.

Information documents collected but not referenced in the AK Summary Report are not required to be summarized on an Acceptable Knowledge Source Document Summary form.

4.3.4 Initiate an Acceptable Knowledge Source Document Summary form for each source document that includes detail sufficient to justify the use of the information. The Acceptable Knowledge Source Document Summary must be completed by the time the associated AK Summary Report is finalized for all AK source documents referenced within the report. Identify the specific waste stream or streams that correspond to the source document in the Waste Stream Number field on the Acceptable Knowledge Source Document Summary form. If a comprehensive library is used for all streams at the site, note this in this field.

[A] Source documents referenced in the AK Summary Report and their applicable attachments must be submitted to CCP

Records on or before the date of issuance of the AK Summary Report as final.

4.3.5 **IF** the summary consists of multiple pages, **THEN** provide the unique source document tracking number on each page **AND** paginate the number of pages (e.g., 2 of 6 pages).

4.3.6 Print name, sign, and date the Acceptable Knowledge Source Document Summary before submitting to CCP Records.

4.3.7 For source documents that **CAN NOT** be reproduced or removed from the source (e.g., classified documents or databases), indicate on the Acceptable Knowledge Source Document Summary that a copy of the source document is **NOT** available, and state the reason.

4.3.8 Include a note on the limitations of the information (e.g., if a document covers a specific period of time) on the Acceptable Knowledge Source Document Summary.

NOTE

Acceptable Knowledge Information List is a listing of relevant documents collected during the investigative process. Documents collected must be categorized in accordance with step 4.1.2.

4.3.9 Create and maintain an Acceptable Knowledge Information List that includes the following:

- Site, waste stream number, and waste stream description
- Source document tracking number
- Source document title or description
- Name of author
- Original document number, or publisher's document number (if available)
- Revision number and document date (if applicable)

4.3.10 Print name, sign, and date the Acceptable Knowledge Information List before submitting to CCP Records.

4.4 Review and Submittal of AK Documentation

4.4.1 Evaluate the waste stream to verify that the waste materials do not meet the definition of spent nuclear fuel or high-level waste as

defined in the in Section 10101(3) of the *Nuclear Waste Policy Act of 1982.*

4.4.2 Evaluate the waste stream to verify that the waste materials meet the definition of defense waste defined in CCP-PO-002.

NOTE

According to CCP-PO-002, a TRU waste is eligible for disposal at WIPP if it has been generated in whole or in part by one or more of the following functions:

- Naval reactors development
- Weapons activities including defense inertial confinement fusion
- Verification and control technology
- Defense nuclear materials production
- Defense nuclear waste and materials by-products management
- Defense nuclear materials security and safeguards and security investigations
- Defense research and development

4.4.3 **IF** there is no information linking the waste stream to defense related activities or commingled with defense materials, **OR** if the waste stream contains spent nuclear fuel or high-level waste, **THEN** notify the SPM that the waste is **NOT** eligible for disposal at WIPP.

4.4.4 Document the defense determination, high-level waste and spent nuclear fuel assessments in the AK Summary Report.

4.4.5 Verify that 100 percent of the information specified in Acceptable Knowledge Documentation Checklist from AK #s PR1 through PR8 and WS1 through WS12 has been compiled.

4.4.6 **IF** 100 percent of this information is **NOT** available for a particular waste stream,
THEN notify the SPM that waste is **NOT** eligible for disposal at WIPP without the collection of additional information to augment the existing AK.

4.4.7 For LANL sealed sources waste containers, verify that the information on Acceptable Knowledge Documentation Checklist, AK #s O1-O16 has been compiled.

4.4.8 Review all AK information compiled in Section 4.2 of this procedure.

4.4.9 Document and resolve discrepancies regarding AK information among AK source documents as described in Section 4.9 of this procedure.

4.4.10 Print name, sign, and date the Acceptable Knowledge Documentation Checklist once the collection and review of the required AK information has been completed.

NOTE

A waste stream is defined as waste materials that have common physical form, that contain similar hazardous constituents (similar radiological properties for WCPIP compliance), and that are generated from a single process or activity. This definition will be used to obtain information for the waste stream specific description to be written in step 4.4.39 .

4.4.11 Using the definition of a waste stream from above, the waste stream-specific documentation from the Acceptable Knowledge Documentation Checklist, and, if applicable, the description from the ATWIR, define the waste stream represented by the compiled AK information, **AND** provide this description in the AK Summary Report (see Attachment 12, Example Form and Content Guide for AK Summary Reports). Provide a discussion to justify combining previously identified (i.e., ATWIR or site designations), TRU mixed waste and TRU non-mixed waste streams.

NOTE

A Waste Matrix Code will be assigned based on the physical form of the waste. DOE/LLW-217, *DOE Waste Treatability Group Guidance*, describes the convention for assignment of Waste Matrix Codes for low-level waste treatability groups, and can be used as the basis for the assignment of Waste Matrix Codes that bound the waste stream.

4.4.12 Assign and describe the Waste Matrix Code assigned to each waste stream identified.

NOTE

The Waste Matrix Code Groups identified in CCP-PO-001 are:

- Solidified inorganics
- Solidified organics
- Salt waste
- Soils
- Lead/cadmium metal
- Inorganic nonmetal waste
- Combustive waste
- Graphite
- Filters
- Heterogeneous debris waste
- Uncategorized metals

4.4.13 Assign the waste stream to the appropriate Waste Matrix Code Group.

4.4.14 Assign the waste stream to the appropriate Summary Category Group as defined below:

- S3000 Homogeneous Solids – Homogeneous solids are defined as solid material, excluding soil, that does not meet the New Mexico Environment Department (NMED) criteria for classification as debris (20.4.1.800 New Mexico Administrative Code [NMAC] [incorporating 40 CFR §268.2(g) and (h)]). Included in the series of homogeneous solids are inorganic process residues, inorganic sludges, salt waste, and pyrochemical salt waste. Other waste streams are included in this Summary Category Group based on the specific waste stream types and final waste form. This Summary Category Group is expected to contain toxic metal and spent solvents. This category includes wastes that are at least 50 percent by volume homogeneous solids.

- S4000 Soil/Gravel – This Summary Category Group includes S4000 waste streams that are at least 50 percent by volume soil/gravel. This Summary Category Group is expected to contain toxic metals.

- S5000 Debris Wastes – This Summary Category Group includes heterogeneous waste that is at least 50 percent by volume material that meets the criteria specified in 20.4.1.800 NMAC (incorporating 40 CFR §268.2[g]). Debris means solid material exceeding a 2.36 inch (60 millimeter) particle size that is intended for disposal and that is a manufactured object, plant or animal matter, or natural geologic material. Particles smaller than 2.36 inches in size may be considered debris if the debris

is a manufactured object and if it is **NOT** a particle of S3000 or S4000 material.

4.4.15 **IF** waste DOES **NOT** include at least 50 percent of any given Summary Category Group by volume,
THEN assign the Summary Category Group constituting the greatest volume of waste for that waste stream.

4.4.16 Review the AK information to determine if the waste is listed under 20.4.1.200 NMAC (incorporating 40 CFR 261.30), Subpart D. If so, assign the appropriate HWNs.

4.4.17 Review the AK information to determine if a toxicity characteristic 20.4.1.200 NMAC (incorporating 40 CFR 261.20), Subpart C contaminant is identified and has **NOT** been assigned a listed HWN from step 4.4.16. Evaluate the available data and assign the toxicity characteristic HWN consistent with RCRA requirements.

4.4.18 Compare the HWNs assigned from steps 4.4.16 and 4.4.17 to the HWNs listed in CCP-PO-001, Table C-5.

4.4.19 **IF** any HWNs are **NOT** included in CCP-PO-001, Table C-5,
THEN notify the SPM.

4.4.20 Include the justification and basis for steps 4.4.16 and 4.4.17 in the TRU waste stream-specific description of AK Summary Report, **AND** complete the Attachment 5 Hazardous Constituents form.

4.4.21 Print name, sign, and date Hazardous Constituents form. Include the CCEM described in Section 4.15 as an addendum to the Hazardous Constituents form.

4.4.22 During revisions to the AK Summary Report, evaluate the adequacy of the current Hazardous Constituents form and CCEM **AND** revise, if necessary. This review is documented by completing a new Hazardous Constituents form. Revisions to AK Summary Reports must include a description of the results described in the CCEM in the Chemical Content Identification section.

4.4.23 Assess available AK radionuclide data.

NOTE

For LANL sealed sources, the SPM must confirm sufficient radionuclide data is available in accordance with CCP-TP-101, *CCP Off-Site Source Recovery Project Sealed Source Radiological Characterization.*

4.4.24 For contact-handled (CH) waste streams and RH waste streams characterized using NDA techniques, review all source documents

to determine the two most prevalent radionuclides for the waste stream, and estimated isotopic ratios for the following 10 WIPP-required radionuclides: Sr-90; Cs-137; U-233; U-234; U-238; Pu-238; Pu-239; Pu-240; Pu-242; and Am-241.

AKE/NDA EA/OSR

4.4.25 Prepare an NDA Memorandum to CCP Records (CH waste only), evaluating the radionuclide characterization of the waste stream. The NDA Memorandum must include a section for an assessment written with the NDA EA determining how the AK will be applied during assay.

4.4.26 During revisions to the AK Summary Report evaluate the adequacy of the current NDA Memorandum **AND** revise, if necessary. This review is documented by completing a new Radionuclides form.

4.4.27 For LANL sealed sources waste, the NDA Memorandum must be written with input from the OSR group. This assessment should include a discussion of the limitations of the radiological characterization in the AK document and a description of the required assay methods, if any.

4.4.28 Any NDA issues for both measured and calculated radionuclides should be discussed and resolved in the NDA Memorandum.

4.4.29 **IF** AK is intended as the sole basis for meeting the radiological characterization requirements in CCP-PO-002,
THEN state so in the AK Summary Report.

AKE

4.4.30 Prepare a Waste Material Parameter Evaluation Memorandum to CCP Records that estimates the waste material parameter weights for the waste stream. The expected weight percent for each waste material parameter will be calculated using historical waste generator information for the materials in the waste stream or industry documentation for similar waste inventories. This evaluation should include the technical assumptions, justification, and limitations for the estimated weight percentages.

4.4.31 During revisions to the AK Summary Report evaluate the adequacy of the current Waste Material Parameter Evaluation Memorandum **AND** revise, if necessary. This review is documented by completing a new Waste Form, Waste Material Parameters, Prohibited Items, and Packaging form (Attachment 6).

NOTE

The WIPP-WAP allows the generator to utilize visual examination (VE) and real-time radiography (RTR) to augment initial estimates for the waste material parameter weight percentages.

4.4.32 Complete the following forms as appropriate:

[A] Attachment 6, Waste Form, Waste Material Parameters, Prohibited Items, and Packaging form. Include the Waste Material Parameter Evaluation Memorandum described in step 4.4.30 as an addendum to the Waste Form, Waste Material Parameters, Prohibited Items, and Packaging form.

[B] Attachment 7, Radionuclides form (CH only). Include the NDA Memorandum (signed by the AKE and NDA EA) described in step 4.4.25 as an addendum to Radionuclides form.

[C] Attachment 8, Waste Containers List (or an equivalent form, e.g., spreadsheet) for the containers determined to be bounded by the Hazardous Constituents, Waste Form, Waste Material Parameters, Prohibited Items, and Packaging, and Radionuclide forms. Prepare or update the Container Tracking Spreadsheet as described in Section 4.11 for the containers identified in Waste Containers List and corresponding Waste Stream Container Evaluation Memorandum prepared in steps 4.10.3 and 4.10.5.

4.4.33 Print name, sign, and date all forms generated in step 4.4.32.

4.4.34 Review the waste management program AK documentation specified on the Acceptable Knowledge Documentation Checklist, **AND** write a TRU Waste Management Program Description that addresses AK #s PR1-PR8 in Acceptable Knowledge Documentation Checklist. Include the following:

- Correlation to the waste stream identification and description found in the ATWIR or indication that the waste stream was not included in the ATWIR.

- Determination of whether the TRU waste materials were generated as a result of, or mixed with materials from, defense-related activities as specified in CCP-PO-002.

4.4.35 **IF** prohibited items or incompatible materials are listed on the Waste Form, Waste Material Parameters, Prohibited Items, and Packaging,
THEN perform the following:

[A] Notify the SPM.

SPM

[B] Notify the Host site as directed in the site Interface Document between CCP and that site.

AKE

4.4.36 Correlate TRU waste management program information (AK #s PR1 - PR8) and TRU waste stream-specific information (AK #s WS1 - WS12) with regard to the time of generation, waste generation processes, rate and quantity of newly generated waste (when appropriate), and areas and building or facility where the waste stream was generated (Acceptable Knowledge Documentation Checklist).

4.4.37 Identify AK source document tracking numbers, as applicable, in the TRU waste management program description and TRU waste stream-specific description.

4.4.38 Review the waste stream-specific AK documentation specified on the Acceptable Knowledge Documentation Checklist and information developed in steps 4.4.11 through 4.4.37), **AND** describe the waste stream in the AK Summary Report, including the following:

[A] Waste stream description and waste stream number. The waste stream number is limited to 20 alpha-numeric characters.

[B] Explain the selection of the Waste Matrix Code in the TRU waste stream-specific description of the AK Summary Report.

[C] Ensure the description of the waste stream is sufficient to allow the radiography and VE Operators to determine whether the waste in individual containers is included in the waste stream and the physical form of the waste matches the waste stream description.

[D] Include the justification and basis for determination of waste material parameters weights expected in the waste stream.

[E] Include the justification and basis for the method by which the radionuclide AK has been compiled.

[F] For waste streams characterized using NDA, state the method for determination of the two most prevalent radionuclides (see CCP-PO-002).

[G] Include the following assessment information:

- Waste identification and categorization schemes relevant to the isotopic composition of the waste
- Description of the isotopic composition of waste streams
- Physical/chemical composition that could affect isotopic distributions
- Numerical adjustments (e.g., scaling factors, decay/ingrowth corrections and secular equilibrium consideration) applied to derive isotopic compositions
- Specification of the isotopic ratios for the 10 WIPP - tracked radionuclides
- Radionuclides other than the ten WIPP-tracked radionuclides that contribute to 95 percent of the radioactive hazard for a payload container

[H] Provide justification for the assumption that the waste stream is TRU waste (i.e., it contains more than 100 nanocuries [nCi] of alpha-emitting radionuclides with half-lives greater than 20 years per gram of waste), as specified in CCP-PO-002.

[I] For waste streams with containers selected for payload management, include an assessment estimating the percentage of the TRU waste stream volume above and below 100 nanocuries per gram (nCi/g) in accordance with CCP-PO-002. The AK Summary Report must demonstrate that the waste stream has been historically managed as TRU waste, as applicable for payload management.

[J] Provide justification for determining the estimated concentration (less than or equal to 1 percent or greater than 1 percent by weight) of beryllium (metal and oxides) for each payload container within the waste stream as required in CCP-PO-002.

[K] Provide justification for determining that prohibited items are not present in the waste stream or describe the potential prohibited items and how they will be identified and remediated. Identify process controls associated with the management of prohibited items, physical form, and hazardous waste content.

[L] Provide justification for determining if any waste in the waste stream contains polychlorinated biphenyls (PCBs) in concentrations equal to or greater than 50 parts per million (ppm). Identify the type of waste containing PCB contamination (e.g., remediation, bulk product), **AND** provide justification for determining that the waste stream will **NOT** contain residual PCB liquids as defined in CCP-PO-002.

[M] For waste streams assigned the EPA HWN U134 for hydrofluoric acid, provide information demonstrating neutralization of this acid, if available, as required by CCP-PO-001.

[N] **IF** correlating or surrogate information from similar materials or waste streams generated at the same site or other sites is used to support the characterization of an RH waste stream, **THEN** complete the CCP TRU Waste Correlation and Surrogate Summary Form (see Attachment 15) **AND** describe the use of the information in the AK Summary Report.

[O] For RH waste streams, identify the AK and/or characterization methods to be used to meet the DQOs. Identify how each DQO will be met and describe the qualification method(s) selected for AK used solely to meet a specific DQO in the AK Summary Report.

NOTE

Use the Example Form and Content Guide for AK Summary Reports (see Attachment 12) to prepare the AK Summary Report. This guide provides the recommended format for preparation of the reports. However, the format of the report and content of the sections may vary, as long as the required AK elements are presented.

4.4.39 Summarize the waste stream-specific description in Section 2.0 of the AK Summary Report. Provide a physical, chemical, and radiological description of the waste stream in Section 5.0 (or subsequent sections for multiple waste stream reports) of the AK Summary Report.

4.4.40 Prepare the AK Summary Report by combining the TRU waste management program description and each of the completed TRU waste stream-specific descriptions, as well as the information from the forms in Attachments 1 through 8 and Acceptable Knowledge Source Document Discrepancy Resolution forms, if applicable.

4.4.41 Submit the AK Summary Report to Document Services to initiate the review and approval process in accordance to CCP-QP-010, *CCP Document Preparation, Approval, and Control.*

NOTE

Electronic media for historical source documents shall be managed in accordance with CCP-QP-008, *CCP Records Management*.

4.4.42 Submit records identified in Section 5.0 to CCP Records in accordance with CCP-QP-008.

NOTE

As the AK Summary Report is revised, resubmit report to CCP Document Services.

4.5 Waste Stream Characterization

SPM

4.5.1 **IF** any AK Sufficiency Determination Request has been approved by Carlsbad Field Office (CBFO) for any characterization parameter (see Section 4.7),
THEN note the approval for that parameter on the CCP Waste Stream Characterization Checklist (see Attachment 13).

NOTE

The following comparison may be performed for a waste stream or a waste stream lot.

4.5.2 Compare the testing results from VE and Radiography, and NDA characterization activities to the waste stream AK by completing a CCP Waste Stream Characterization Checklist, to certify a waste stream (or lot) for disposal at WIPP.

[A] Radiography and VE Data

[A.1] Compare Radiography and VE results (obtained from CCP Records) in VE Data Forms, and Radiography Data Sheets to AK information in Waste Form, Waste Material Parameters, Prohibited Items, and Packaging of this procedure to verify the physical form of the waste stream and absence of prohibited items.

[A.2] **IF** AK information CAN **NOT** be resolved upon completion of these comparisons,
THEN note any inconsistencies on CCP Waste Stream Characterization Checklist, **AND** proceed with Section 4.8 of this procedure.

[B] NDA Data – CH Waste

[B.1] Compare radionuclides reported on the Radionuclides form by Weight percent, Activity, or other parameters justified in the AK Summary Report with NDA Radioassay results.

[B.2] Compare the two most prevalent radionuclides in AK with those identified in the NDA results for the waste stream and waste stream lot.

[B.3] Compare the radionuclides identified by the AK as expected to be present with those reported in the NDA results.

[B.4] Report the differences between NDA results and those expected from AK in the Comments section of the CCP Waste Stream Characterization Checklist.

[B.5] Provide rationale in the Comment section of CCP Waste Stream Characterization Checklist, if any of these conditions were anticipated based on AK.

[B.6] Attach applicable data and description to CCP Waste Stream Characterization Checklist.

[B.7] **IF** AK information CAN **NOT** be resolved upon completion of these comparisons,
THEN note any inconsistencies on CCP Waste Stream Characterization Checklist, **AND** proceed with Section 4.8 of this procedure.

[C] Radiological Characterization – RH Waste

[C.1] Identify the characterization method (e.g., Dose-to-Curie) on the CCP Waste Characterization Checklist.

[C.2] Identify the drums in which the radiological characterization differ from that expected; provide rationale in the Comments section of the CCP Waste Stream Characterization Checklist, if this condition was anticipated, otherwise notify the AKE to perform a re-evaluation as described in Section 4.8 of this procedure.

[C.3] Attach data and applicable description to CCP Waste Stream Characterization Checklist.

4.5.3 **IF** AK information can be resolved upon completion of the comparisons with the testing results,
THEN print name, sign, and date CCP Waste Stream Characterization Checklist, **AND** forward it to the AKE for signature **AND** submit to CCP Records.

4.6 Determining AK Documentation Accuracy

NOTE

The quality assurance objectives (QAOs) and their applicability to AK are discussed in CCP-PO-001. The WIPP-WAP AK accuracy evaluation is required for both RH and CH waste streams and the WCPIP AK accuracy evaluation is required for RH waste streams only. The measurement of AK accuracy begins once the waste stream is delineated in an approved AK Summary Report.

SPM

4.6.1 Obtain a copy of the completed CCP Waste Stream Characterization Checklist, **AND** any Acceptable Knowledge Re-evaluation Checklists (see Attachment 10), applicable to the waste stream or waste stream lot, and any related supporting documentation from CCP Records (e.g., Discrepancy Resolutions and Non-conformance reports [NCRs]).

NOTE

The AK Accuracy Memorandum is used to document the percentage of containers reassigned to a new Waste Matrix Code, designated with a HWN assignment different from AK, or inconsistent with anticipated radionuclide composition determined from AK when compared to CCP testing and Permittee confirmation testing results.

NOTE

The WCPIP does not require the evaluation of AK accuracy relating to HWN assignment; however, the reassignment of a container to another RH waste stream or new RH waste stream based on CCP testing or Permittee confirmation testing results will count against the AK accuracy for TRU waste streams.

NOTE

For AK Accuracy Memoranda that are prepared for waste stream lots within a waste stream, updates to AK accuracy shall be issued periodically. At a minimum AK Accuracy Memoranda will be prepared following the characterization of all containers in a waste stream or annually for waste streams generated on an on-going basis.

4.6.2 Complete the CCP Acceptable Knowledge Accuracy Report (see Attachment 14), after characterization has been completed for a subset of containers in the subject CH or RH waste stream or waste stream lot.

4.6.3 Prepare an NMED (RH and CH) and EPA (RH only) AK Accuracy Memorandum summarizing the following AK accuracy information:

[A] Purpose

[B] Methodology

[C] Results of accuracy determination

[D] Other considerations, if applicable

[E] Summary

4.6.4 For RH waste, **IF** the AK accuracy falls below 90 percent for assigning containers to a Summary Category Group, **THEN** CBFO shall be notified.

NOTE

For RH waste, significant discrepancies between the radionuclide information in the AK record and measured values will be assessed during preparation of the CCP Acceptable Knowledge Accuracy Report. What constitutes a significant discrepancy will depend on site- and waste stream-specific considerations for each waste stream.

4.6.5 For RH waste, describe any significant discrepancies between the radionuclide information in the AK record and measured values in the Acceptable Knowledge Accuracy Memorandum.

4.6.6 Review, print name, sign, and date the CCP Acceptable Knowledge Accuracy Report. At the option of the SPM, CCP Acceptable Knowledge Accuracy Report may list only the containers with accuracy issues, as long as the complete list of containers represented by the accuracy report is included by attachment to, or referenced in, the cover memorandum or letter.

4.6.7 Attach the following to the AK Accuracy Memorandum:

[A] CCP Acceptable Knowledge Accuracy Report prepared for the NMED AK Accuracy Memorandum only.

[B] CCP Correlation of Container Identification Numbers to BDR numbers prepared in accordance with CCP-TP-002.

4.6.8 Transmit AK Accuracy Memorandum and attachments to the AKE.

AKE/SPM

4.6.9 For NMED AK Accuracy Memoranda (CH and RH), review the AK Accuracy Memorandum and attachment, resolve any comments with the SPM, **AND** approve by printing name, signing, and dating the CCP Acceptable Knowledge Accuracy Report form **AND** return to the SPM to submit to CCP Records.

4.6.10 For EPA AK Accuracy Memoranda (RH only), review the AK Accuracy Memorandum and attachments, resolve any comments with the SPM, **AND** approve by printing name, signing, and dating the CCP AK Accuracy Memorandum form **AND** return to the SPM to submit to CCP Records.

4.7 AK Sufficiency Determination

SPM/AKE

4.7.1 Evaluate the AK information available for a waste stream to determine if an AK Sufficiency Determination is possible or desirable.

4.7.2 Prepare an AK Sufficiency Determination Request that includes the following information:

[A] An introduction that briefly describes the waste stream, the type of AK Information available, whether AK alone can be used to meet the characterization requirements.

[B] Identification of any mandatory requirements supported only by upper tier documents (i.e., there is insufficient supporting data).

[C] Description demonstrating that the AK process described in CCP-PO-001 was followed (for example, AK personnel were appropriately trained; discrepancies were documented).

[D] Information demonstrating that CCP has assessed the AK process (e.g., internal audits).

4.7.3 Obtain copies of the following information from CCP Records and attach to the AK Sufficiency Determination Request:

[A] AK Summary Report for the waste stream;

[B] Acceptable Knowledge Documentation Checklist providing an AK roadmap and cross reference between mandatory programmatic and waste stream information with references supporting these requirements.

[C] Acceptable Knowledge Information List, providing a complete reference list including all mandatory and additional AK documentation.

[D] Current revision of this procedure to demonstrate that CCP has developed a written procedure for compiling AK information and assigning HWNs.

[E] Relevant additional information for the required programmatic and waste stream data addressed in the AK Summary Report, as applicable or if requested by CBFO.

4.7.4 Submit the AK Sufficiency Determination Request and attachments to the SPM for approval and submittal to CBFO.

4.7.5 **IF** comments are received from CBFO,
THEN address the comments and resubmit the AK Sufficiency Determination Request.

4.8 Re-evaluating AK Documentation

NOTE

Differences in Waste Matrix Codes, state hazardous waste codes/numbers (if applicable) and EPA HWNs, and NDA results may exist between those previously assigned in the AK documentation and those indicated as a result of waste characterization activities performed to certify waste for disposal at the WIPP or during the confirmation performed by the Permittee. Under these circumstances, the AK information is re-evaluated and the required AK information associated with the new designation is documented. Characterization data associated with the waste are re-evaluated and changes in AK resulting from the re-evaluation are documented.

SPM

4.8.1 **IF** re-evaluation is warranted as a result of 1) inconsistencies noted during the process of comparing AK information to characterization results **OR** 2) the initiation of an NCRs that identifies potential changes to the AK of a waste stream (including NCRs generated as a result of discrepancies identified during confirmation performed by the Permittee),
THEN notify the AKE.

AKE

4.8.2 Retrieve copies of applicable characterization data and AK information from CCP Records.

4.8.3 **IF** a waste must be assigned to a different Waste Matrix Code (i.e., different waste stream or waste stream lot) based on Radiography or VE,
THEN perform the following:

[A] Review existing information based on the waste container identification number and document all differences in HWN assignments. Consider all generator specific waste streams and HWN assignments; original site-specific permit requirements; and other state-enforced agreements in this analysis.

[B] **IF** differences exist in the HWNs that were assigned, **THEN** reassess **AND** document required applicable AK information associated with the new designation.

[C] Reassess **AND** document applicable testing data associated with the waste.

[D] Verify **AND** document that waste with a reassigned Waste Matrix Code was generated within the specified time period, area buildings and waste generating process; **AND** that the process material inputs are consistent with the waste material parameters identified during Radiography or VE.

[E] Record all changes to the AK records on the appropriate forms **AND** resubmit to CCP Records.

[F] **IF** unresolved discrepancies exist in the AK information for the reassigned Waste Matrix Code, HWNs, or radionuclides, **THEN** document the segregation of this container, **AND** define the actions necessary to fully characterize the waste.

4.8.4 **IF** testing results indicate that additional or different HWNs may apply to the waste,
THEN review the existing AK and characterization information, **AND** perform the following:

[A] **IF** a hazardous waste, not originally identified by AK, has been identified during testing (lead items, circuit boards, etc.),
THEN assign the applicable state hazardous waste codes/numbers and HWNs unless an alternative assignment can be justified or representative quantitative data are available to preclude the assignment.

4.8.5 **IF** NDA results indicate the presence of additional radionuclides or different prevalent radionuclides in the waste,
THEN review existing AK and characterization information.

4.8.6 **IF** changes are required,
THEN document the need for changes in the appropriate comment section of the Acceptable Knowledge Re-evaluation Checklist.

4.8.7 Resolve all AK documentation discrepancies, if applicable, as described in Section 4.9 of this procedure.

4.8.8 Modify the AK Summary Report as appropriate.

4.8.9 Forward the completed Acceptable Knowledge Re-evaluation Checklist to the SPM for review and approval.

4.8.10 Submit changes to the AK Summary Report to CCP Document Services for distribution and approval.

[A] Any new source documents referenced in the revised AK Summary Report must be submitted to CCP Records on or before the date of issuance of the revised AK Summary Report as final.

SPM

4.8.11 Review the Acceptable Knowledge Re-evaluation Checklist and the revised AK Summary Report.

4.8.12 **IF** the AK Summary Report requires correction,
THEN return to AKE.

4.8.13 **IF** no correction is required,
THEN approve the Acceptable Knowledge Re-evaluation Checklist by printing name, signing, and dating the checklist.

4.8.14 Approve the revised AK Summary Report.

4.8.15 Review the WSPF to see if the change to the AK Summary Report affects the WSPF.

4.8.16 **IF** the WSPF requires change,
THEN revise the WSPF in accordance with CCP-TP-002.

4.8.17 Submit the Acceptable Knowledge Re-evaluation Checklist and revised AK Summary Report to CCP Records.

4.8.18 Once the re-evaluation is approved, complete the CCP Waste Stream Characterization Checklist, as described in step 4.5.2.

4.9 Resolving AK Discrepancies

NOTE
AK discrepancies may be identified during AK source document compilation, review, characterization, confirmation, AKA, CCEM, and re-evaluation activities.

AKE

4.9.1 Document the nature of the discrepancy **AND** identify the documents involved for the particular waste stream or waste container on the Acceptable Knowledge Source Document

Discrepancy Resolution or in the appropriate section of the AK Summary Report.

4.9.2 Use information from interviews, telephone contacts, or other correspondence or other supporting information to resolve the discrepancy.

4.9.3 Record interviews, telephone conversations, and correspondence needed to resolve discrepancy issues on a Record of Communication.

4.9.4 Print name, sign, and date a Record of Communication.

4.9.5 Complete an Acceptable Knowledge Source Document Summary for each Record of Communication form.

4.9.6 Print name, sign, and date Acceptable Knowledge Source Document Summary, attach to the Record of Communication form, **AND** submit to CCP Records.

4.9.7 Verify that process inputs (hazardous constituents and waste material parameters) are consistent with waste material parameters identified during Radiography and VE.

4.9.8 Assign **OR** revise the AK identified waste material parameters, as necessary, **AND** document the change and the assumptions made on the Acceptable Knowledge Source Document Discrepancy Resolution.

4.9.9 Assign **OR** reassign Waste Matrix Codes, as necessary, using guidance specified in the DOE/LLW-217, **AND** document the assignment and assumptions made on the Acceptable Knowledge Source Document Discrepancy Resolution.

4.9.10 Evaluate the sources of discrepancies among sources of isotopic distribution data to determine whether the sources are credible. Identify limitations of data **AND**, if the data are **NOT** used, provide a justification on the Acceptable Knowledge Source Document Discrepancy Resolution. Otherwise, describe data limitations in the AK Summary Report, as applicable.

4.9.11 Assign or revise the identified radionuclides present, as necessary, **AND** document the change and the assumptions made on the Acceptable Knowledge Source Document Discrepancy Resolution.

4.9.12 Assign or revise state hazardous waste codes/numbers (if applicable) and HWNs, as necessary. Assign the HWNs consistent with RCRA requirements. Document the assignment and the

assumptions and justifications made on the Acceptable Knowledge Source Document Discrepancy Resolution.

4.9.13 Obtain the affected AK source documentation, as necessary.

4.9.14 Make necessary changes to Acceptable Knowledge Source Document Summary, as appropriate.

4.9.15 Complete, print name, sign, and date the Acceptable Knowledge Source Document Discrepancy Resolution form documenting final disposition of resolved discrepancies.

4.9.16 **IF** the discrepancy cannot be resolved by the AKE,
THEN prepare an Acceptable Knowledge Source Document Discrepancy Resolution checking "No" for the Discrepancy Resolved question of the form, forward to the SPM **AND** proceed to step 4.9.25.

4.9.17 Complete, print name, sign, and date an Acceptable Knowledge Source Document Summary for each Acceptable Knowledge Source Document Discrepancy Resolution.

4.9.18 Attach the Acceptable Knowledge Source Document Summary to the Acceptable Knowledge Source Document Discrepancy Resolution.

4.9.19 **IF** the form consists of multiple pages,
THEN add a footer identifying the page number and total number of pages.

4.9.20 Forward the form and supporting documentation (if requested) to the SPM for review and concurrence.

SPM

4.9.21 Review the Acceptable Knowledge Source Document Discrepancy Resolution and supporting documentation, as applicable, print name, sign, and date the form if the discrepancy has been resolved, **AND** forward the completed form to the AKE.

AKE

4.9.22 Confirm that the Acceptable Knowledge Source Document Discrepancy Resolution is signed and dated by the SPM.

4.9.23 Submit the original Acceptable Knowledge Source Document Discrepancy Resolution and supporting documentation, as applicable, to CCP Records.

4.9.24 Revise the AK Summary Report as needed.

NOTE

Discrepancies which CAN **NOT** be resolved by CCP will result in the container being returned to the Host site. If the discrepancy is **NOT** container-specific, containers from the subject waste stream will **NOT** be shipped to WIPP until such time as the discrepancy has been resolved. If the discrepancy is related to radiological characterization, notify the SPM that direct measurements of the impacted waste population may be required.

SPM

4.9.25 **IF** the discrepancy **CAN NOT** be resolved,
THEN issue an NCR (if not already identified in an NCR) and manage corrective actions in accordance with CCP-QP-005, *CCP TRU Nonconforming Item Reporting and Control.*

4.9.26 Record the NCR number on the Acceptable Knowledge Source Document Discrepancy Resolution.

4.9.27 Coordinate with the Host site to place a hold tag on, **AND** segregate waste containers associated with the NCR, if applicable, in accordance with applicable procedures.

4.9.28 Assess the potential timeframe of the noncompliance, the potentially affected waste populations, and the reassessment and recertification of the waste, if applicable.

4.9.29 Coordinate resolution of the nonconforming condition with the AKE.

4.9.30 Document information identified during the corrective action process as described in CCP-QP-005.

4.9.31 Once the discrepancy is resolved, applicable NCR(s) closed, and corrective action is completed, sign and date the Acceptable Knowledge Source Document Discrepancy Resolution **AND** forward the form to the AKE.

AKE

4.9.32 **WHEN** discrepancies are resolved, applicable NCRs are closed, **AND** corrective actions completed,
THEN review the discrepancy form, document any supporting AK information generated, assign the appropriate waste material parameters, Waste Matrix Code, radionuclides or HWNs as applicable, **OR** justify the use of alternates and confirm that it has been signed.

4.9.33 Submit the Acceptable Knowledge Source Document Discrepancy Resolution to CCP Records.

4.10 Updating AK for Additional Waste Stream Containers

NOTE

The following process is followed when the SPM identifies additional containers to be included in a waste stream defined in an existing AK Summary Report. The Waste Containers List identifies the AK source document number(s) designated for the Waste Stream Container Evaluation Memorandum, adding containers, if applicable.

SPM

4.10.1 Provide the AKE with a list of containers to be assessed for inclusion in an existing waste stream.

AKE

4.10.2 Collect container-specific documentation and evaluate the following information for each container:

- Waste generation location and process
- Time period of generation
- Physical form compared to the assigned Waste Material Parameters and Waste Matrix Code
- Chemical content
- Prohibited items
- Radionuclides

4.10.3 Review the current Interface Waste Management Documents List to ensure that the containers were generated by verified procedures.

4.10.4 **IF** the containers are bounded by the current AK Summary Report and Interface Waste Management Documents List for the waste stream,
THEN notify the SPM **AND** submit a Waste Stream Container Evaluation Memorandum documenting the evaluation to CCP Records.

4.10.5 **IF** the containers are not bounded by the current Interface Waste Management Documents List for the waste stream, but the waste was generated by a procedure revision that does **NOT** affect waste stream management or packaging,
THEN,

[A] Obtain the current procedure revision **AND** incorporate into the AK Record,

[B] Update the Interface Waste Management Documents List, **AND**

[C] Submit the Waste Stream Container Evaluation Memorandum documenting the evaluation to CCP Records.

NOTE

Containers packaged to a new procedure or revision that results in any change to the waste stream management or packaging, cannot be added to the AKTSS until the changes have been evaluated by the AKE to determine if the procedure change requires a revision to the AK Summary Report. If a revision is required the AK Summary Report must be revised and approved before any containers are added to the AKTSS for characterization.

4.10.6 **IF** the containers are not bounded by the current Interface Waste Management Documents List for the waste stream **AND** the waste was generated by a procedure revision that would affect waste stream management or packaging,
THEN notify the SPM to initiate an NCR.

4.10.7 **IF** the containers are **NOT** bounded by the existing AK Summary Report, but should be included in the waste stream,
THEN revise the AK Summary Report for the waste stream; update the Waste Containers List; notify the SPM, **AND** revise and submit the updated Waste Containers List and Waste Stream Container Evaluation Memorandum documenting the evaluation to CCP Records.

4.11 Container Tracking Spreadsheet Development

AKE or Designee

4.11.1 Develop a spreadsheet which identifies the following minimum criteria for each container listed on Waste Containers List:

- Container I.D.
- Waste Stream I.D.

- Generation Date
- Vent Date
- Associated Defense Determination (required for OSRP containers only)
- Special Information, when necessary (e.g., inner or parent container identification)
- New Closure Date
- New Vent Date
- Container Type

4.11.2 Post the copy of the Container Tracking Spreadsheet to the secure file transfer protocol (sftp) site.

4.12 Container Tracking Spreadsheet Maintenance

4.12.1 **WHEN** notified of a change to the status of a container(s) identified by the SPM, CCP personnel, Host site personnel, or during the addition of containers to the waste stream inventory,
THEN evaluate the change based on the data provided.

[A] **IF** the change is routine and DOES **NOT** adversely affect data,
THEN GO TO step 4.12.2.

[B] **IF** the change is non-routine or adversely affects data,
THEN notify the SPM to take the appropriate actions prior to proceeding to step 4.12.2.

4.12.2 Update the Container Tracking Spreadsheet and post the change to the sftp site.

4.12.3 Notify the SPM of the change.

4.13 Acceptable Knowledge Assessments

NOTE

To ensure that the AK documentation relating to the management of potentially reactive, corrosive, ignitable, and incompatible TRU waste materials is adequate, current, and accurately described in existing AK Summary Reports, a onetime AKA will be performed for existing AK Summary Report waste streams (or waste stream subpopulations) with unshipped containers, not to be included in a new AK Summary Report (Revision 0). New AK Summary Reports and the supporting documentation must address all of the evaluation parameters described in this section or an AKA must be performed.

AKE

4.13.1 Review the existing AK documentation associated with the historic and current waste management activities relating specifically to TRU waste generation, packaging, treatment, remediation, and characterization, focusing on the use of absorbents, immobilization products, and neutralization reagents for the waste stream.

4.13.2 Review existing AK for the special testing and management activities associated with other suspect materials (e.g., unidentified materials, unlabeled chemicals, metmount testing, nitrate salts, swarf conditioning, and sodium treatment) included in each waste stream.

4.13.3 Collect and assess revisions of waste management and packaging procedures bounded by the inventory to identify any relevant changes associated with these activities described in the AK Summary Report.

4.13.4 Review and update AK Record associated with commercial products used during these activities (e.g., MSDSs, SDSs, and other manufacture's information), as applicable.

4.13.5 Document the AKA in an Acceptable Knowledge Assessment Memorandum that includes the following, as applicable:

- Waste stream summary (brief description of the waste stream and generating activities),
- Historic waste management practices,
- Current waste management practices,
- Waste remediation and repackaging practices,
- Absorbent, immobilization, and neutralization reagents,

- Container specific documentation collected and reviewed,
- New and revised AK source documents,
- AKA conclusions, assumptions, and limitations, and
- List of containers bounded by the evaluation.

4.13.6 Submit the AKA to the SPM for review.

SPM

4.13.7 Review the AKA, **AND** resolve any comments with the AKE.

4.13.8 Transmit the AKA to the SMR to distribute to designated generator site POCs/SMEs to review the accuracy and completeness of practices and procedures under their purview controlling the generation and management (e.g., waste repackaging, remediation, treatment) of the subject waste containers described by the AKA.

4.13.9 Resolve any comments provided by the SMR with the AKE, **AND** transmit the SMR's written notice of concurrence, as required by the site Interface Document, to the AKE.

AKE

4.13.10 Submit completed AKA and Memorandum and SMR written notice of concurrence to CCP Records.

4.13.11 Update the Acceptable Knowledge Summary Report and related attachments, as necessary.

4.14 AK Briefings

NOTE

AK Briefings are prepared and presented to CCP characterization personnel in accordance with CCP-QP-002. In addition, the generator POCs/SMEs, or cognizant designees, will be required to attend the AK Briefings. The participation of these site representatives from the groups directly involved with the generation, characterization, and management of containers in the waste stream will further ensure that the description of the waste streams in the AK Summary Reports are complete and accurate.

AKE/SPM

4.14.1 Prepare AK Briefing presentations that include the following topics for each new waste stream:

- Mission and Generating Facility Information, including process(es) generating the waste
- Waste Stream Description and Information, including description of physical waste composition, WMPs, Waste Matrix Code
- Radiological Characteristics
- Chemical Characteristics
- Suspected Prohibited Items
- Waste Packaging

4.14.2 Prepare AK Briefing updates when the AK Summary Report requires revision due to changes in the waste stream characteristics (physical, chemical, or radiological composition) or packaging configuration. Include a discussion of the waste management and packaging activities verified during preparation of the current Interface Waste Management Documents Checklist prepared for the waste stream. The AKE/SPM must emphasize the importance of maintaining current procedures in the AK record.

4.15 Chemical Compatibility Evaluation

NOTE

As part of the process for characterizing and certifying TRU waste for disposal at WIPP, it is necessary to consider the range of possible chemical combinations that could occur in each waste stream. Potential adverse chemical reactions (e.g., generation of fire, explosion, heat, or fumes) that stem from combining chemicals need to be considered to support safe and compliant waste management. To expand on the assessment of the compatibility of waste materials and chemicals performed to assess the RCRA characteristics for ignitable (D001), corrosive (D002), and reactive (D003) wastes, a chemical compatibility evaluation will be performed based on the method described in the 1980 EPA method EPA-600/2-80-076, "*A Method for Determining the Compatibility of Hazardous Wastes*" (EPA Method). Attachment 16, Example Form and Content Guide for the Chemical Compatibility Evaluation Memorandum, provides a template for the preparation of a CCEM to document this assessment.

AKE

4.15.1 Compile a comprehensive list of chemicals and materials identified during the preparation of the AK Summary Report for the waste stream.

4.15.2 Review the existing AK documentation associated with the identified chemicals and materials.

NOTE

Quantity estimations for the chemicals/materials identified in a waste stream are based on the AKE's best judgment of the maximum amount of a chemical or material that could be present in the waste stream, resulting from the review of the AK source documents collected in accordance with this procedure. Concentrations typically represent a qualitative and conservative estimate of the highest potential amount of a chemical/material in any individual container. When the AK is not conclusive to make this categorization, the more conservative (higher) quantity shall be assigned. Quantity estimations for the chemicals/materials identified in a waste stream may also be based on quantitative data if available.

4.15.3 Estimate the maximum concentration and assign to one of the following categories for each chemical and material:

- Trace – less than 1 weight percent
- Minor – 1 to 10 weight percent
- Dominant – greater than 10 weight percent

NOTE
The determination of which Trace chemicals and materials are present in insignificant quantities is based on the AKE's best judgment.

4.15.4 Based on the specific chemical/material use and management described in the AK record, assess the "Trace" chemical materials to determine those that are insignificant and do not require additional evaluation AND document the justification and assumptions for this determination in the CCEM. The justification(s) for this determination for each chemical and material may include, but are not limited to the following examples:

- Chemicals/materials included only in historical waste already emplaced at WIPP.
- Chemicals/materials not in the waste stream based on review of waste management and container documentation.
- Chemicals/materials that have been segregated from the waste stream resulting in only incidental insignificant contamination.
- Process chemicals and products introduced in such minute quantities (e.g., drops of indicators and dilute analytical standard solutions) that they would result in only insignificant waste contamination.
- Ingredients in process chemicals and products present in low ppm concentrations.
- Chemicals present in the waste stream in low ppm concentrations based on analytical or other characterization data.
- Process chemicals and products that inherently could not be present in quantities of concern when used for their intended purpose (e.g., volatile spray paint solvents and glass cleaner).
- Process chemicals that are reacted or consumed during use (e.g., experiment oxidants, reductants, and buffers). The AKE must consider the use of excess reagents in these instances.
- Compounds present as low ppm contaminants in process samples, products, and waste solutions.

NOTE

Assignment of Reactivity Group Numbers (RGNs) to chemicals and materials of concern will be coordinated with the Payload Engineer Team responsible for RGN assignment during TRUCON code development. The Payload Engineer Team is responsible for maintaining the List of RGNs for Chemicals/Materials in the TRU Waste Inventory (Master RGN List). The Master RGN List will be updated as chemicals and materials are evaluated during the development of the CCEMs and subsequent TRUCON code development.

The primary focus of this evaluation is to assess potential reactions between dominant and minor constituents. However, some trace components could produce significant exothermic reactions even in small quantities without the proper actions being taken to mitigate the hazards associated with these compounds. For this reason, all trace chemicals that could not be determined to be insignificant in step 4.15.4 must be evaluated for compatibility regardless of concentration.

4.15.5 Assign the appropriate EPA Method RGN(s) to the remaining chemicals and materials of concern by searching for the compounds in the Master RGN List.

4.15.6 **IF** the compound is not included in the Master RGN List,
THEN search for it in the EPA Method.

4.15.7 **IF** the compound cannot be found in the EPA Method,
THEN coordinate with the Payload Engineer Team to assign the most appropriate RGN(s) based on its chemical class (functional group) or reactive properties based on review of chemical literature, MSDS, SDS, or industry documentation and reports.

4.15.8 **IF** a inorganic chemical or material is determined to be a non-reactive compound that is not listed in the EPA Method or Listed in the Master RGN list,
THEN identify that the RGN is Not Applicable (NA) and document the justification for this determination in the CCEM.

4.15.9 Using the Hazardous Wastes Compatibility Chart in the EPA Method, evaluate the potential for reaction between the RGNs assigned to the chemicals and materials of concern in the waste stream by assigning Reaction Codes, as applicable, to each RGN combination.

NOTE

For purposes of this evaluation, “incompatible” refers to chemicals and materials that when mixed can lead to adverse hazardous chemical reactions described in 40 CFR 264.17(b) (General Requirements for Ignitable, Reactive, or Incompatible Wastes) and the 1980 EPA method. Thus, compatible chemicals and materials (including those referred to as non-reactive in this evaluation) may react slowly over time, and even generate heat, but will not lead to unanticipated or disastrous effects such as (1) generate extreme heat or pressure, fire or explosions, or violent reactions, (2) produce uncontrolled toxic mists, fumes, dusts, or gases in sufficient quantities to threaten human health or the environment; (3) produce uncontrolled flammable fumes or gases in sufficient quantities to pose a risk of fire or explosions; (4) damage the structural integrity of the device or facility; (5) through other like means threaten human health or the environment.

4.15.10 For each Reaction Code identified in step 4.15.9, assess the potential for incompatible waste reaction consequences specifically for the combination of chemicals and/or materials of concern assigned to each RGN.

4.15.11 Document the technical assumptions, conclusions, and limitations associated with each combination assessed in step 4.15.10 to justify that the waste stream is incapable of initiating an unexpected or incompatible hazardous reaction.

4.15.12 **IF** the potential for an incompatible adverse waste reaction is identified in the waste stream **OR** the conclusions in the CCEM would result in changing the waste stream characterization (i.e., addition of HWNs or waste material parameters), **THEN** initiate an Acceptable Knowledge Source Document Discrepancy Resolution (see Section 4.9).

4.15.13 Document the CCEM in a draft memorandum to the SPM, **AND** transmit the draft CCEM to the SPM for review and concurrence.

SPM

4.15.14 Review the CCEM, resolve any comments with the AKE.

AKE

4.15.15 Incorporate the resolutions of the SPM's comments in the final CCEM, sign, date, **AND** submit to CCP Records as an AK Source Document.

5.0 RECORDS

5.1 Records generated during the performance of this procedure in Section 5.1.1 are maintained as QA records. The following records will be maintained in accordance with CCP-QP-008. The records are the following:

5.1.1 QA/Lifetime Records

[A] Acceptable Knowledge Documentation Checklist (Attachment 1)

[B] Records of Communication (Attachment 2), submitted to records as a CCP AK source document attached to an Acceptable Knowledge Source Document Summary form

[C] Acceptable Knowledge Source Document Summary forms, (Attachment 3) and when applicable attached CCP generated source documents

[D] Acceptable Knowledge Information List (Attachment 4)

[E] Hazardous Constituents forms (Attachment 5)

- Chemical Compatibility Evaluation Memorandum (see Attachment 16)

[F] Waste Form, Waste Material Parameters, Prohibited Items, and Packaging forms (Attachment 6)

- Waste Material Parameter Evaluation Memorandum

[G] Radionuclides forms (Attachment 7)

- NDA Memorandum

[H] Waste Containers List (Attachment 8)

[I] Interface Waste Management Documents List (Attachment 9)

- SMR Quarterly Review Notification

[J] Acceptable Knowledge Re-evaluation Checklist (Attachment 10)

[K] Acceptable Knowledge Source Document Discrepancy Resolution (Attachment 11), submitted to records as a CCP

AK source document attached to an Acceptable Knowledge Source Document Summary form

[L] CCP Waste Stream Characterization Checklist (Attachment 13)

[M] CCP Acceptable Knowledge Accuracy Memorandum

- CCP Acceptable Knowledge Accuracy Report (Attachment 14)
- Correlation of Container Numbers to Batch Data Report Numbers

[N] CCP TRU Waste Correlation and Surrogate Summary Form (Attachment 15)

[O] AK Summary Reports (see Attachment 12)

[P] AK Sufficiency Determination Request

[Q] SPM Notifications (emails, letters, memorandums, etc.), submitted to records as a CCP AK source document attached to an Acceptable Knowledge Source Document Summary form

[R] Waste Stream Container Evaluation Memorandum, submitted to records as a CCP AK source document attached to an Acceptable Knowledge Source Document Summary form

[S] Acceptable Knowledge Assessment Memorandum, submitted to records as a CCP AK source document attached to an Acceptable Knowledge Source Document Summary form

[T] AK Container Tracking Spreadsheet (submitted to CCP Records after notification by the site SPM that waste shipments to WIPP have been completed)

[U] Acceptable Knowledge Briefings generated in CCP-QP-002

5.1.2 Non-QA

[A] Historical Source Documents

Attachment 1 – Acceptable Knowledge Documentation Checklist - Example Form

Site(s): _____

Waste Stream Description:_____

Waste Stream Number(s): _____

Acceptable Knowledge Information	AK#	Compiled? (Y/N)	Source Document Tracking Number
Mandatory generator site TRU waste program (PR) information:			
Map of the generator site that identifies TRU waste generation, treatment, and storage areas.	PR1		
Generator site mission descriptions related to TRU waste generation and management identifying defense and non-defense operations.	PR2		
Overview of the generator site and generator site TRU waste management operations in the context of the facility's mission.	PR3		
Descriptions of historical and current TRU waste generating operations, including how waste is tracked and managed and/or how operations relative to isotopic composition were tracked.	PR4		
Waste identification and/or categorization schemes and terminology used at the generator site, including codes correlating to specific isotopic distributions.	PR5		
Types and quantities of TRU waste generated, including historical generation through future projections.	PR6		
Correlation of waste streams and description of time of generation, waste generating processes, and area and building/facility where each waste stream was generated.	PR7		
Certification procedures for waste to be sent to the WIPP facility (i.e., procedures to ensure that prohibited items are documented and managed in accordance with site-specific certification plans).	PR8		
Mandatory generator site TRU waste stream (WS)-specific information:			
Waste stream designation	WS1		
Area(s) and building(s) from which the waste stream was or is generated.	WS2		
Waste stream volume and time period of generation	WS3		
Waste generating process (describe for each building) including processes associated with U134 waste generation, if applicable.	WS4		

Attachment 1 – Acceptable Knowledge Documentation Checklist - Example Form (Continued)

Waste Stream Number(s): _____

Acceptable Knowledge Information	AK#	Compiled? (Y/N)	Source Document Tracking Number
Process flow diagrams. For research/development, analytical laboratory waste, or other similar processes where process flow diagrams cannot be created, a description of the waste generating processes, rather than a formal process flow diagram, may be included, if justified.	WS5		
Summary of basis and rationale for delineating each waste stream including justification for combining waste historically managed separately as TRU mixed and TRU non-mixed waste streams into a single waste stream, that is traceable to referenced documents.	WS6		
Generator site mission descriptions related to TRU waste generation and management identifying defense and non-defense operations.	WS7		
Material inputs or other information that identified the chemical contents of the waste and the stream. Includes events or processes that may have modified the chemical properties of the waste stream after generation.	WS8		
Physical waste form (e.g., glovebox materials and chemicals handled during glovebox operations, if applicable), assigned Summary Category Group, Waste Matrix Code and materials inputs, including waste material parameters present in the waste stream. Includes events or processes that may have modified the physical properties of the waste stream after generation.	WS9		
Waste identifiers assigned by the generator site (e.g., item description code, packaging identification numbers).	WS10		
Specification of the isotopic ratios for the ten WIPP-tracked radionuclides and all radionuclides other than the ten WIPP-tracked radionuclides that contribute to 95 percent of the radioactive hazard for a payload container. Chemical and physical information that could affect the waste isotopic distribution, as well as calculations used to derive the isotopic distribution.	WS11		

Attachment 1 – Acceptable Knowledge Documentation Checklist - Example Form (Continued)

Waste Stream Number(s): _____

Acceptable Knowledge Information	AK#	Compiled? (Y/N)	Source Document Tracking Number
State and EPA hazardous waste constituents in the waste stream and state codes/numbers and EPA Hazardous Waste Numbers assigned, including documentation regarding how the site has historically managed the waste, including the historical regulatory status of the waste (i.e., TRU mixed versus TRU non-mixed waste).	WS12		
Additional acceptable knowledge documentation (briefly describe):			
Process design documents (e.g., Title II Design)	S1		
Standard operating procedures that may include a list of raw materials or reagents, a description of the process or experiment generating the waste, and a description of the waste generated and how the wastes are managed at the point of generation.	S2		
Preliminary and Final Safety Analysis Reports and technical safety requirements.	S3		
Waste Packaging records.	S4		
Test plans or research project reports that describe the reagents, radionuclides, and other raw materials used in experiments.	S5		
Site databases (e.g., chemical inventory database for SARA Title III requirements, SNM or nuclear material databases).	S6		
Information from site personnel (e.g., documented interviews).	S7		
Standard industry documents (e.g., industry specification sheets, handbooks, reference materials, or other vendor information).	S8		
Analytical data relevant to the waste stream, including results from fingerprint analyses, spot checks, routine verification sampling or other processes that collected information pertinent to the waste stream. This may include new information (or previously collected data) which augments required information (e.g., visual examination not performed in compliance with CCP-PO-001, radiography screening for prohibited items).	S9		
Material Safety Data Sheets, product labels, or other product information.	S10		
Laboratory notebooks that detail the research processes and raw materials used in an experiment.	S11		
Comparable or surrogate sampling and analysis data.	S12		
Other (describe).	S13		

Attachment 1 – Acceptable Knowledge Documentation Checklist - Example Form (Continued)

Waste Stream Number(s): _____

Acceptable Knowledge Information	AK#	Compiled? (Y/N)	Source Document Tracking Number	
Safeguards and security, Materials Control and Accountability, and other nuclear material control system data Reports of nuclear safety or criticality accidents involving special nuclear materials (SNM) .	S14			
NMMA logs or inventory records or waste disposal logs providing SNM or nuclear material information.	S15			
Packaging	S16			
OSR-Specific Information (Applies only to sealed sources)				
Evidence that the waste meets the definition of a sealed source reference 10CFR30.4 and 10CFR835.2.	O1			
Documentation that sources are Special Form, such as certificates DOT Special Form Class 7 per 49CFR173.403.	O2			
Contamination survey results for each source reference requirements of 10CFR34.27.	O3			
Source manufacturer's sales catalogues.	O4			
Source purchase records.	O5			
Manufacturer fabrication documents.	O6			
Manufacturer drawings.	O7			
Fuel capsule assembly reports.	O8			
Manufacturer's operational procedures for meeting cleanliness requirements.	O9			
Manufacturer's shipping documents or records.	O10			
Manufacturer welding records.	O11			
TRU batch material records.	O12			
National database radiological information (e.g., NMMSS, NRC Device Registry).	O13			
NRC or agreement state regulatory licensing information.	O14			
Documentation of physical markings on the outer source casing or labels attached to devices housing sources.	O15			
Unique physical description attributed to specific source models.	O16			

Attachment 1 – Acceptable Knowledge Documentation Checklist - Example Form (Continued)

Waste Stream Number(s): _____

Acceptable Knowledge Information	AK#	Compiled? (Y/N)	Source Document Tracking Number
Acceptable knowledge information regarding waste generated off-site or from similar process:			

Additional comments:

_____

_____

_____

_____

_____

All required AK information has been compiled and source document tracking numbers assigned.

Acceptable Knowledge Expert: _____ / _____ Date: _____
Print Sign

Attachment 2 – Record of Communication – Example Form

Corresponding Source Document Tracking No:		
Interviewer:	Date:	Time:
Interviewee:	Group/Organization: Job Title:	Phone: E-mail:
Subject:		
Summary:		
Data Limitations:		

Acceptable Knowledge Expert: _____ / _____ Date: _____
Print Sign

Attachment 3 – Acceptable Knowledge Source Document Summary – Example Form

Site(s):	Source Document Tracking Number:
Waste Stream Number: (Applicable only when site library is not in use)	
Acceptable Knowledge Documentation Type: ☐ TRU Waste Management Program Information ☐ Waste Stream-Specific Information ☐ Additional Information	Category: ☐ C - Correspondence ☐ D - Documents ☐ M - Miscellaneous ☐ P - Procedure ☐ DR - Discrepancy Resolution ☐ U - Unpublished Documents
Title or Description of Source Document [a]:	
Source Document Reference Information (author(s), document and revision number, date, publisher):	

AK # [b]	Source Doc. Page # [b]	AK Information Summary

Source Document Data Limitations (if any):
Acceptable Knowledge Expert: _____ / _____ Date: _____ Print Sign

[a] Provide description for non-titled information (i.e., container paperwork, MSDS sheets, etc)
[b] For microfilm or microfiche, identify box, tape, reel number and location.

Controlled
Copy

Attachment 4 – Acceptable Knowledge Information List – Example Form

Site(s): _____

Waste Stream Number(s): _____

Waste Stream Description: _____

Source Document Tracking Number	Title or Description	Author	Document #	Document Revision # and Date

Acceptable Knowledge Expert: _____ / _____ Date: _____
Print Sign

Attachment 5 – Hazardous Constituents – Example Form

Site(s): _____

Waste Stream Number: _____

Waste Stream Description: _____

Compound	Suspected Present? (Y/N)	Used as a solvent? [a] (Y/N/NA)	TC constituent concentration less than regulatory level? [a] (Y/N/NA)	TC Hazardous Waste Number [a]	F-Listed Hazardous Waste Number [a]	U- or P-Listed Hazardous Waste Number [a]	EPA Hazardous Waste Number Assigned (N/Specify HWN)	State Hazardous Waste Number/ Code [b]
Toxicity Characteristic Metal Compounds (40 CFR Part 261)								
Arsenic		N/A		D004	N/A	N/A		
Barium		N/A		D005	N/A	N/A		
Cadmium		N/A		D006	N/A	N/A		
Chromium		N/A		D007	N/A	N/A		
Lead		N/A		D008	N/A	N/A		
Mercury		N/A		D009	N/A	U151		
Selenium		N/A		D010	N/A	N/A		
Silver		N/A		D011	N/A	N/A		
Volatile Organic Compounds (40 CFR Part 261)								
1,1,1-Trichloroethane			N/A	N/A	F001/F002	U226		
1,1,2,2-Tetrachloroethane		N/A	N/A	N/A	N/A	U209		
1,1,2-Trichloro-1,2,2-trifluoroethane			N/A	N/A	F001/F002	N/A		
1,1,2-Trichloroethane			N/A	N/A	F002	U227 [c]		
1,1-Dichloroethylene		N/A		D029	N/A	U078		
1,2-Dichlorobenzene			N/A	N/A	F002	U070		
1,2-Dichloroethane		N/A		D028	N/A	U077 [c]		
1,4-Dichlorobenzene		N/A		D027	N/A	U072		
1, 4-Dioxane		N/A	N/A	N/A	N/A	U108		
2-Ethoxyethanol			N/A	N/A	F005	U359 [c]		
2-Nitropropane			N/A	N/A	F005	U171 [c]		
Acetone			N/A	N/A	F003	U002		

Attachment 5 – Hazardous Constituents – Example Form (Continued)

Compound	Suspected Present? (Y/N)	Used as a solvent? [a] (Y/N/NA)	TC constituent concentration less than regulatory level? [a] (Y/N/NA)	TC Hazardous Waste Number [a]	F-Listed Hazardous Waste Number [a]	U- or P-Listed Hazardous Waste Number [a]	EPA Hazardous Waste Number Assigned (N/Specify HWN)	State Hazardous Waste Number/ Code [b]
Volatile Organic Compounds (continued)								
Acetonitrile		N/A	N/A	N/A	N/A	U003		
Benzene				D018	F005	U019		
Butanol (n-Butyl alcohol)			N/A	N/A	F003	U031 [c]		
Carbon disulfide			N/A	N/A	F005	P022 [c]		
Carbon tetrachloride				D019	F001	U211 [c]		
Chlorobenzene				D021	F002	U037		
Chloroform		N/A		D022	N/A	U044		
Cyclohexanone			N/A	N/A	F003	U057 [c]		
Ethyl acetate			N/A	N/A	F003	U112 [c]		
Ethyl benzene			N/A	N/A	F003	N/A		
Ethyl ether			N/A	N/A	F003	U117 [c]		
Formaldehyde		N/A	N/A	N/A	N/A	U122		
Hydrazine		N/A	N/A	N/A	N/A	U133		
Isobutanol			N/A	N/A	F005	U140 [c]		
Methanol			N/A	N/A	F003	U154		
Methyl ethyl ketone				D035	F005	U159		
Methyl isobutyl ketone			N/A	N/A	F003	U161 [c]		
Methylene chloride			N/A	N/A	F001/F002	U080 [c]		
Pyridine				D038	F005	U196		
Tetrachloroethylene				D039	F001/F002	U210		
Toluene			N/A	N/A	F005	U220		
trans-1,2-Dichloroethylene		N/A	N/A	N/A	N/A	U079		
Trichloroethylene				D040	F001/F002	U228		
Trichlorofluoromethane			N/A	N/A	F001/F002	U121 [c]		
Vinyl Chloride		N/A		D043	N/A	U043		
Xylenes			N/A	N/A	F003	U239		

Attachment 5 – Hazardous Constituents – Example Form (Continued)

Compound	Suspected Present? (Y/N)	Used as a solvent? [a] (Y/N/NA)	TC constituent concentration less than regulatory level? [a] (Y/N/NA)	TC Hazardous Waste Number [a]	F-Listed Hazardous Waste Number [a]	U- or P-Listed Hazardous Waste Number [a]	EPA Hazardous Waste Number Assigned (N/Specify HWN)	State Hazardous Waste Number/ Code [b]
Semivolatile Organic Compound (40 CFR Part 261)								
2,4-Dinitrotoluene		N/A		D030	N/A	U105		
Cresols				D026	F004	U052		
Dimethyl sulfate		N/A	N/A	N/A	N/A	U103		
Hexachlorobenzene		N/A		D032	N/A	U127 [c]		
Hexachlorobutadiene		N/A		D033	N/A	U128 [c]		
Hexachloroethane		N/A		D034	N/A	U131 [c]		
Nitrobenzene				D036	F004	U169 [c]		
Pentachlorophenol		N/A		D037	F027 [c]	N/A		

Attachment 5 – Hazardous Constituents – Example Form (Continued)

Compound	Suspected Present? (Y/N)	Used as a solvent? [a] (Y/N/NA)	TC constituent concentration less than regulatory level? [a] (Y/N/NA)	TC Hazardous Waste Number [a]	F-Listed Hazardous Waste Number [a]	U- or P-Listed Hazardous Waste Number [a]	EPA Hazardous Waste Number Assigned (N/Specify HWN)	State Hazardous Waste Number/ Code [b]
Other Constituents								
Wastewater treatment sludges from electroplating operations		N/A	N/A	N/A	F006	N/A		
Spent cyanide plating bath solutions from electroplating operations		N/A	N/A	N/A	F007	N/A		
Spent cyanides stripping and cleaning bath solutions from electroplating operations		N/A	N/A	N/A	F009	N/A		
Beryllium powder		N/A	N/A	N/A	N/A	P015		
Cyanide (soluble cyanide salts)		N/A	N/A	N/A	N/A	P030		
Potassium cyanide		N/A	N/A	N/A	N/A	P098		
Potassium silver cyanide		N/A	N/A	N/A	N/A	P099		
Sodium cyanide		N/A	N/A	N/A	N/A	P106		
Vanadium pentoxide		N/A	N/A	N/A	N/A	P120		
Hydrofluoric acid		N/A	N/A	N/A	N/A	U134		
Total PCB Concentration [d]		N/A	N/A	N/A	N/A	N/A	N/A	
Additional EPA Hazardous Constituents (List)								
Additional State Hazardous Constituents [b] (List) [e]								
Potentially Flammable VOCs (List) [e,f]		N/A						

Attachment 5 – Hazardous Constituents – Example Form (Continued)

a. Source: Title 40 Code of Federal Regulations Part 261, Identification and Listing of Hazardous Waste
b. Source: Cite applicable state regulation
c. This EPA Hazardous Waste Number is not permitted for WIPP disposal.
d. Source: Title 40 Code of Federal Regulation Part 761, Polychlorinated Biphenyls (PCBs) Manufacturing, Processing, Distribution in Commerce, and Use Prohibitions.
e. Add rows or attach additional sheets as necessary
f. Flammable VOCs included in the CH-TRAMPAC

NOTE: If any of the information requested on this form is not available or not applicable, enter N/A in the appropriate box.

Acceptable Knowledge Expert: _____ / _____ Date: _____
Print Sign

Attachment 6 – Waste Form, Waste Material Parameters, Prohibited Items, and Packaging – Example Form

Site(s): _____

Waste Stream Description: _____

Container ID Numbers: _____

Waste Stream Number:	
Physical Waste Form (e.g., debris, solidified waste)	
Summary Category Group[a]	
Waste Matrix Code Group[a]	
Waste Matrix Code[b]	
Waste Material Parameter Weights[c]	Estimated Waste Stream Weight Percent Average (attach evaluation justifying percentages)
Iron-based metals/alloys	
Aluminum-based metals/alloys	
Other metals	
Other inorganic materials	
Cellulosics	
Rubber	
Plastics (waste materials)	
Organic matrix	
Inorganic matrix	
Soils/Gravels	
Packaging materials	Present (Y/N)?
Steel	
Plastics	
Prohibited Wastes[d, e, f, g]	Present (Y/N)?
Observable liquid shall be no more than 1 percent by volume of the outermost container at the time of RTR or VE. Observable liquid shall be no more than 60 milliliters or 3 percent by volume, whichever is greater, in an internal container. Observable liquid shall not be present in a container with EPA HWN U134 assigned.	
Non-radionuclide pyrophoric materials	

Attachment 6 – Waste Form, Waste Material Parameters, Prohibited Items, and Packaging – Example Form (Continued)

Sealed containers > 4 liters	
Hazardous waste not occurring as co-contaminants with TRU mixed waste (non-mixed hazardous waste)	

Waste Stream Number: _____

Explosives	
Compressed gases	
Residual hydrofluoric acid (if U134 assigned to stream)	
Residual PCB liquids[j]	
Ignitables (EPA Hazardous Waste Number D001)	
Corrosives (EPA Hazardous Waste Number D002)	
Reactives (EPA Hazardous Waste Number D003)	
Waste incompatible with backfill, seal and panel closure materials, container and packaging materials, shipping container materials, or other wastes[h]	
Spent Nuclear fuel or high-level waste[i]	
Any unvented plastic bags > 4 liters that have been heat-sealed	
Additional Information (if available)	
Packaging	
Waste container type?	
Liner type?	
Is liner punctured?	
Is filter vent installed?	
Maximum number of confinement layers	

a. Source: *CCP Transuranic Waste Characterization Quality Assurance Project Plan* (CCP-PO-001) Introduction.
b. Source: *Transuranic Waste Baseline Inventory Report* (DOE/CAO-95-1121) or DOE Waste Treatability Group Guidance (DOE/LLW-217). Note: the Waste Matrix Code should not be assigned at the Summary Category Group level.
c. Source: CCP-PO-001 - Table C3-1. Attach the Waste Material Parameter Evaluation Memorandum used to estimate values included in this Table.
d. Source: CCP-PO-001 - Section C-1c.
e. Source: *Transuranic Waste Acceptance Criteria for the Waste Isolation Pilot Plant* (WAC)(DOE/WIPP-02-3122), Section 3
f. Source: *TRUPACT-II Content Codes* (TRUCON) (DOE/WIPP 89-004)
g. Source: *TRUPACT-II Authorized Methods for Payload Control (TRAMPAC),* Nuclear Waste Partnership, LLC
h. This waste has been approved for disposal at the WIPP by the Permittee as documented by Appendix C1 of the WIPP RCRA Part B Permit Application and the Permittee's approval and assignment of the applicable TRUCON Codes for this waste stream.
i. Source: *Nuclear Waste Policy Act of 1982* (42 U.S.C. 10101)
j. Source: Polychlorinated Biphenyls (PCBs) Manufacturing, Processing, Distribution and Commerce, and Use Prohibitions (40 CFR Part 761)

Acceptable Knowledge Expert: _____ / _____ Date: _____
Print Sign

Attachment 7 – Radionuclides – Example Form

*Attach current Radiological Characterization or NDA Memorandum

Site(s): _____

Waste Stream Number(s): _____

Waste Stream Description: _____

Radionuclide	Wt %[b]	Ci[b]	Suspected Present (Yes/No)
From CCP-PO-002			
Sr-90			
Cs-137			
U-233			
U-234			
U-238			
Pu-238			
Pu-239			
Pu-240			
Pu-242			
Am-241			
Other Radionuclides (List)			
[a]Source: *Transuranic Waste Acceptance Criteria for the Waste Isolation Pilot Plant* (WAC) (DOE/WIPP-02-3122), Section 3 [b]If available			

Acceptable Knowledge Expert: _____ / _____ Date: _____
Print Sign

Attachment 8 – Waste Containers List – Example Form

(This attachment may be provided in a different format)

Site(s): _____

Waste Stream Number(s): _____

Waste Stream Description: _____

Number of Waste Containers in Waste Stream: _____

Total Existing Volume (m^3): _____

Is waste expected to be generated in the future?: _____

If yes, Estimated Future Volume (m^3): _____

Assumptions: _____

Waste Stream Container Evaluation Memo(s) for Added Containers: _____

Container Identification Number	Generation Date	Generation Point

Acceptable Knowledge Expert: _____ / _____ Date: _____
Print Sign

Controlled
Copy

Attachment 9 – Interface Waste Management Documents List – Example Form

Site: _____

Waste Stream Number: _____

Waste Stream Description: _____

Document #	Revision	Date	Document Title/Description	Generator SME(s)/POC(s)[a]	Verification Date[b]	AK Source Document Tracking #

POC/SME Contact Information

Contact Name	Organization/Company Affiliation	Title/Position/Description	Phone Number(s)	Email

[a] For active procedures POCs must include representatives directly involved with waste generation, characterization, certification, and verification activities described in the procedure. This may include responsible generator site contractor/subcontractor personnel.
[b] Enter verification date or date procedure added to this attachment (date on the revised Attachment 3).

Acceptable Knowledge Expert: _____ / _____ Date: _____
Print Sign

Site Management Representative: _____ / _____ Date: _____
Print Sign

Attachment 10 – Acceptable Knowledge Re-evaluation Checklist – Example Form Page 1 of 1

Site(s): _____
Waste Stream Number(s): _____
Waste Stream Description: _____
NCR numbers(s) if applicable: _____
Inconsistency between waste characterization and acceptable knowledge information (describe): _____
_____

Requirements	Completed? Yes/No	Additional Documentation [a]
Review existing information based on the container identification number and document all differences in EPA Hazardous Waste Number assignments. [c]		
If differences exist in the EPA Hazardous Waste Numbers that were assigned, reassess and document all required AK information associated with the new designation. [b,c]		
Reassess and document all testing data associated with the waste. [c]		
Verify and document that the reassigned Waste Matrix Code was generated within the specified time period, area and buildings, waste generating process, and that the process material inputs are consistent with the waste material parameters identified during RTR or VE.		
If NDA results indicate the presence of additional or different radionuclides in the waste, reassess and document AK and characterization information associated with the new information. [c]		
Record all changes to the AK records on the appropriate Attachments and resubmit to the CCP Facility Records Custodian.		
If unresolved discrepancies exist in the AK information for the reassigned Waste Matrix Code, EPA Hazardous Waste Numbers, or radionuclides, document the segregation of this container, and define the actions necessary to fully characterize the waste.		

a. Cite the source document, nonconformance report number, attachment, or other documentation used to support a change or no change.
b. If a toxicity characteristic contaminant is identified, it is not included as a listed waste, and analytical data regarding the concentration are not available, the corresponding EPA Hazardous Waste Number is applied.
c. Not applicable for LANL sealed source waste stream.

Acceptable Knowledge Expert:

_____ Date: _____
Print Sign

Site Project Manager:

_____ Date: _____
Print Sign

Attachment 11 – Acceptable Knowledge Source Document Discrepancy Resolution – Example Form

Waste Stream Number(s): _____

Waste Stream Description: _____

AK Source Document Discrepancy Form Tracking Number:

Tracking #		Title	Document/Rev#	Author	Date		Page #

Nature of Discrepancy:

Resolution:

Discrepancy Resolved: [ ] Yes [ ] No

Acceptable Knowledge Expert: _____ / _____ Date: _____
Print Sign

Site Project Manager: _____ / _____ Date: _____
Print Sign

Attachment 12 – Example Form and Content Guide for AK Summary Reports

CCP-AK-SITE-XXX

Central Characterization Program
Acceptable Knowledge Summary Report
For

NAME OF THE SITE
NAME OF THE PROCESS

REVISION NUMBER
DATE

Printed Name

APPROVED FOR USE

Attachment 12 – Example Form and Content Guide for AK Summary Reports (Continued)

TABLE OF CONTENTS
LIST OF TABLES
LIST OF FIGURES
LIST OF ATTACHMENTS
LIST OF ACRONYMS AND ABBREVIATIONS

Attachment 12 – Example Form and Content Guide for AK Summary Reports (Continued)

1.0 EXECUTIVE SUMMARY

This Acceptable Knowledge (AK) Summary Report has been prepared for the Central Characterization Program (CCP) for Contact-Handled (CH) (Remote-Handled [RH]) Transuranic (TRU) waste generated and managed by *(NAME THE SITE[s])*. The waste described in this report was generated by (Building/Facility), (and the waste will be repackaged in [Building/Facility]). This report was prepared in accordance with CCP-TP-005, *CCP Acceptable Knowledge Documentation* (Reference 1), to implement the AK requirements of (**RH only** -DOE/WIPP-02-3214, *Remote-Handled TRU Waste Characterization Program Implementation Plan* [WCPIP] [Reference __]); *Waste Isolation Pilot Plant Hazardous Waste Facility Permit, Waste Analysis Plan* (WIPP-WAP) (Reference __); and DOE/WIPP-02-3122, Transuranic Waste Acceptance Criteria for the Waste Isolation Pilot Plant (WIPP-WAC) (References __).

The WIPP WAP AK requirements are addressed in CCP-PO-001, *CCP Transuranic Waste Characterization Quality Assurance Project Plan* (Reference __). The WIPP-WAC AK requirements are addressed in CCP-PO-002, *CCP Transuranic Waste Certification Plan* (Reference __). Additionally, this report provides the AK information required by (**CH only** - CCP-PO-003, *CCP Transuranic Authorized Methods for Payload Control [*CCP CH-TRAMPAC] [Reference __]) **OR** (**RH only -** CCP-PO-505, *CCP Remote-Handled Transuranic Waste Authorized Methods for Payload Control* [CCP RH-TRAMPAC] [Reference __]).

The CCP is tasked with certification of TRU waste for transportation to and disposal at the Waste Isolation Pilot Plant (WIPP). This report was developed in accordance with CCP-TP-005 (Reference 1) and describes how AK is collected, reviewed, and managed by the CCP. The CCP is responsible for collection, review, and management of AK documentation in accordance CCP-TP-005 and reviews and approves this AK Summary Report. CCP maintains responsibility for this AK Summary Report and all CCP-TP-005 generated forms and records as quality assurance (QA) records. In addition, CCP maintains a copy of the “historical source documents” as non-QA records.

(Brief description of the waste stream, facility[ies], and generating process/activity).

Attachment 12 – Example Form and Content Guide for AK Summary Reports (Continued)

This AK Summary Report, along with referenced supporting documents, provides a defensible and auditable record of AK for designated waste streams from the *NAME THE (FACILITY/PROCESS/ACTIVITY)*. The references and AK source documents used to prepare this report are listed in Sections 7.0 (8.0 for RH) and 8.0 (9.0 for RH). The source documents cited throughout this report are identified by alphanumeric designations corresponding to a unique Source Document Tracking Number (i.e., C001, D001, DR001, M001, P001, and U001 (as applicable to match Section 3).

This AK report includes information relating to the facility's history, mission, process operations, waste identification, characterization, and waste management practices. Information contained in this report was obtained from numerous sources, including facility safety basis documentation, historical document archives, generator and storage facility waste records and documents, and interviews with cognizant personnel.

This report and supporting source documentation provide the mandatory waste program and waste stream-specific information required by the WIPP-WAP (Reference 3). (**RH only -** This report also compiles data relevant to the applicable U.S. Environmental Protection Agency [EPA] requirements and presents the documentation necessary to satisfy each WCPIP data quality objective [DQO] and quality assurance objective [QAO] for RH TRU waste streams [Reference 2]).

Attachment 12 – Example Form and Content Guide for AK Summary Reports (Continued)

2.0 WASTE STREAM IDENTIFICATION SUMMARY

Site Where TRU Waste Was Generated and Stored: *SITE ADDRESS and EPA ID*

Facility Where TRU Waste Was Generated: *NAME OF FACILITY*

Facility Mission: *DESCRIBE THE MISSION AND HOW THE WASTE WAS GENERATED*

2.1 Waste Stream #1 (Identifier and Name)

2.2 Waste Stream #2 (Identifier and Name) (repeat following for each waste stream)

Summary Category Group: (Assign per Section 4.4.11)

Waste Matrix Code Group: (Assign per Section 4.4.10)

Waste Matrix Code: (Assign per section 4.4.9)

TRUPACT-II Content Code (TRUCON): (Obtain TRUCON Code(s) from SPM

TRUPACT-III Content Code (TRUCON): (Obtain TRUCON Code(s) from SPM

Waste Stream Description:

As described in Section 5.4.1, waste stream (number) is comprised primarily of (describe type of waste).

(Describe any other specific waste items in the waste stream, equipment, items not included above, secondary waste/chemicals introduced during packaging/repackaging.)

This waste stream was determined to contain Resource Conservation and Recovery Act (RCRA)-regulated constituents and is assigned the following EPA hazardous waste numbers (HWNs): (list HWNs) (Refer to Section 5.4.3).

(Identify the two predominant radionuclides by mass and activity for waste characterized using NDA techniques) (Refer to Section 5.4.2)

(Identify potential prohibited items and characterization method[s] selected to ensure the absence of these items in the final packaging) (Refer to Section 5.4.5).

(Describe waste packaging/repackaging and final waste container configuration) (Refer to Section 5.5).

Attachment 12 – Example Form and Content Guide for AK Summary Reports (Continued)

For CH - Waste Stream (number) meets the WIPP-WAP waste stream definition. The waste stream consists of waste materials that have common physical form, that contain similar hazardous constituents, and that are generated from a single process or activity.

For RH - Waste Stream (number) meets the WIPP-WAP and the WCPIP waste stream definitions. The waste is similar in material, physical form, hazardous constituents, and radiological properties and generated from a single process or activity.

3.0 ACCEPTABLE KNOWLEDGE DATA and INFORMATION

TRU waste destined for disposal at the WIPP must be characterized prior to shipment. Development of knowledge of the waste materials and processes that generate and control the waste is required to provide a clear and convincing argument about the characteristics of each waste stream. The AK characterization documented herein complies with the requirements of the WIPP-WAP (Reference__) (**RH only** - and the WCPIP [Reference 1]) and was developed in accordance with of CCP-PO-001, (Reference ___), and CCP-TP-005 (Reference 1).

RH only - The WCPIP identifies waste characterization requirements and methods to satisfy requirements in:

- 40 Code of Federal Regulations (CFR) Part 191, *Environmental Radiation Protection Standards for the Management and Disposal of Spent Nuclear Fuel, High-Level and Transuranic Radioactive Wastes* (Reference __).
- 40 CFR Part 194, *Criteria for the Certification and Re-Certification of the Waste Isolation Pilot Plant's Compliance with the 40 CFR 191 Disposal Regulations* (Reference __).
- *Criteria for the Certification and Re-Certification of the Waste Isolation Pilot Plant's Compliance with the 40 CFR Part 191 Disposal Regulations: Certification Decision* (Reference __).

Public Law 102-579, *The WIPP Land Withdrawal Act (LWA)* (Reference __).

[Include a summary of the types and sources of AK information used].

Attachment 12 – Example Form and Content Guide for AK Summary Reports (Continued)

The references and AK sources used to prepare this report are listed in Sections 7.0 (8.0 for RH) and 8.0 (9.0 for RH), respectively. The AK sources referenced within this report by alphanumeric designations (e.g., C001, D001, DR001, M001, P001, and U001) correspond to the Source Document Tracking Number using the following convention: (include as applicable)

- C – Correspondence
- D – Documents
- DR – Discrepancy resolution
- M – Miscellaneous
- P – Procedures and Published documents
- U – Unpublished documents

Attachment 12 – Example Form and Content Guide for AK Summary Reports (Continued)

4.0 REQUIRED PROGRAM INFORMATION

This section presents the mandatory TRU waste program information required by the WIPP-WAP and the WCPIP for waste stream (number)(References __ and __). This section provides a description of the facility and operations associated with the generation of (facility/building/operation) TRU waste. Included is a description of the (facility/building/operation), summary of the mission, defense determination, and descriptions of (other operations including D&D, maintenance, repackaging, etc.) operations associated with the generation of waste stream (number) are provided.

4.1 Facility Location
4.2 Facility Description
4.3 Facility Mission
4.4 Defense Waste Assessment
4.5 High-Level Waste and Spent Nuclear Fuel Assessment
4.6 TRU Waste Management
4.6.1 Types and Quantity of TRU Waste Generated
4.6.2 Correlation of Waste Streams Generated from the Same Building and Process
4.6.3 Waste Stream Identification, Categorization, and Delineation
4.7 Description of Waste Generating Process

4.8 Waste Certification Procedures

5.0 REQUIRED WASTE STREAM INFORMATION
(Repeat the following information in additional waste stream sections, as needed)

This section presents the mandatory TRU waste stream specific information required by the WIPP-WAP (**RH only -** and the WCPIP) for waste stream (number) (References __ and __). The area of generation, waste stream volume, period of generation, prohibited items, waste packaging, and the physical, chemical, and radiological composition of the waste stream are described.

5.1 Area and Building of Generation

5.2 Waste Stream Volume and Period of Generation

5.3 Waste Generating Activities

Attachment 12 – Example Form and Content Guide for AK Summary Reports (Continued)

5.4 Type of Waste Generated
5.4.1 Materials Related to Physical Form
5.4.1.1Waste Matrix Code
5.4.1.2Waste Material Parameters
5.4.2 Radiological Characterization
5.4.3 Chemical Content Identification - Hazardous Constituents
5.4.3.1F-Listed Constituents
5.4.3.2Toxicity Characteristic Constituents
5.4.3.3U- and P-Listed Constituents
5.4.3.4K-Listed Constituents
5.4.3.5Ignitables, Reactives, and Corrosives
5.4.3.6State Hazardous Waste Code or Number Assignment (if applicable)
5.4.4 Polychlorinated Biphenyls
5.4.5 Prohibited Items
5.5 Waste Packaging

6.0 QUALIFICATION OF AK – (**RH Only)**

As stated in CCP-PO-002, *CCP Waste Certification Plan,* (Reference __), this AK Summary Report provides a description of the characterization of this RH waste stream. CCP-AK-ORNL-XXX, *CCP RH TRU Waste Certification Plan for 40 CFR 194 Compliance and Confirmation Test Plan for Waste Stream (number)* (Reference __), describes how each DQO and QAO is met along with the rationale for selection of the AK qualification methods used. As required by the WCPIP (Reference __), the description of waste stream (number) is provided in Sections 4.0 and 5.0. The description of the confirmatory testing process, the percentage of containers that are subjected to the process, a discussion of why the process is considered representative of the waste stream, and quantitative acceptance criteria is presented in CCP-AK-ORNL-XXX (Reference __).

The CCP intends to use a combination of methods to qualify the AK information associated with the [site/facility/building] waste stream because this will make the best use of the information available (such as existing sampling and analytical data). Table XX, Waste Stream (number) Determination Summary, lists the DQOs to be addressed using AK associated with waste stream [number] relating to the defense waste, radiological, and physical waste stream determinations. The location (page number, section, etc.) of the relevant information is identified in the AK source identified in Table XX.

Table XX. Waste Stream (number) DQO Determination Summary
(Provide a summary of the AK and identify the AK sources and the characterization method for each WCPIP DQO).

Attachment 12 – Example Form and Content Guide for AK Summary Reports (Continued)

6.0 CONTAINER-SPECIFIC INFORMATION **(Section 7.0 for RH)**

(Provide a list of the container-specific documentation generated by the procedures reviewed during the AKA performed in Section 4.13 that will be reviewed and maintained in the AK Record as containers are added to the waste stream).

In accordance with procedure CCP-TP-005 (Reference 1), a CCP Waste Containers List (Attachment 8 of the procedure) is completed and maintained as a quality record for waste tracking purposes. Information tracked includes container identification number, waste stream number, and the closure date for each container.

Attachment 12 – Example Form and Content Guide for AK Summary Reports
(Continued)

7.0 REFERENCE INFORMATION **[Section 8.0 for RH]**

1. CCP-TP-005, *CCP Acceptable Knowledge Documentation,* Carlsbad, New Mexico, Nuclear Waste Partnership, LLC.

2. DOE/WIPP-02-3214, *Remote-Handled TRU Waste Characterization Program Implementation Plan*, Carlsbad, New Mexico, U.S. DOE Carlsbad Field Office

3. *Waste Isolation Pilot Plant Hazardous Waste Facility Permit, Waste Analysis Plan,* New Mexico Environment Department, Santa Fe, New Mexico

4. DOE/WIPP-02-3122, *Transuranic Waste Acceptance Criteria For the Waste Isolation Pilot Plant,* Carlsbad, New Mexico, U.S. DOE Carlsbad Field Office

5. CCP-PO-001, *CCP Transuranic Waste Characterization Quality Assurance Project Plan,* Carlsbad, New Mexico, Nuclear Waste Partnership, LLC.

6. CCP-PO-002, *CCP Transuranic Waste Certification Plan,* Carlsbad, New Mexico, Nuclear Waste Partnership, LLC.

7. CCP-PO-003, *CCP Transuranic Authorized Methods for Payload Control (CCP CH-TRAMPAC),* Carlsbad, New Mexico, Nuclear Waste Partnership, LLC.

8. CCP-PO-505, *CCP Remote-Handled Transuranic Waste Authorized Methods for Payload Control (CCP RH-TRAMPAC),* Carlsbad, New Mexico, Nuclear Waste Partnerhsip, LLC.

10. DOE/LLW-217, *DOE Waste Treatability Group Guidance*, Idaho Falls, Idaho, INEL-Lockheed Idaho Technologies

11. 40 CFR Part 191, *Environmental Radiation Protection Standards for Management and Disposal of Spent Nuclear Fuel, High-Level and Transuranic Radioactive Wastes*, Washington, D.C., U.S. EPA

12. 40 CFR Part 194, *Criteria for the Certification and Re-Certification of the Waste Isolation Pilot Plant's Compliance with the 40 CFR Part 191 Disposal Regulations*, Washington, D.C., U.S. EPA

Attachment 12 – Example Form and Content Guide for AK Summary Reports (Continued)

13. *Criteria for the Certification and Re-Certification of the Waste Isolation Pilot Plant's Compliance with the 40 CFR Part 191 Disposal Regulations: Certification Decision*, Washington, D.C., U.S. EPA

14. Public Law 102-579, *The Waste Isolation Pilot Plant Land Withdrawal Act*, October 30, 1992 as amended by Public Law 104-201

15. 42 U.S.C 10101, *Nuclear Waste Policy Act of 1982*, U.S. Congress

Attachment 12 – Example Form and Content Guide for AK Summary Reports
(Continued)

8.0 AK SOURCE DOCUMENTS **[Section 9.0 for RH]**

Document Number	Title

[INSERT ALL REFERENCED FIGURES]

Controlled
Copy

Attachment 13 – CCP Waste Stream Characterization Checklist – Example Form

CCP Waste Stream Characterization Checklist

Site(s):

Waste Stream Number: Lot # (if applicable)

Waste Stream Description:

Acceptable Knowledge Information or other data points[a]	Characterization Method(s)	Acceptable Knowledge Re-evaluation Required? Yes/No[b]?	Comments[c]
Physical waste form/description			
Waste material parameters weights			
Waste percent volume consistent with nondestructive examination or visual examination data and audio/video tapes or equivalent media			
Summary Category Group assignment			
Waste Matrix Code assignment			
Absence of prohibited items			
EPA Hazardous Waste Number assignment[d]			
Toxicity characteristic code assignment			
VOCs from packaging materials or radiolysis present			
State Hazardous Waste Number assignment			
Radionuclides present			
Other radiological parameters: (specify)			

Controlled
Copy

Attachment 13 – CCP Waste Stream Characterization Checklist – Example Form (Continued)

CCP Waste Stream Characterization Checklist

Additional Comments:_____

a. Identified in the AK Summary Report or included in the in-process record documentation (e.g., BDR's)
b. If "yes," AKE completes an *Acceptable Knowledge Re-evaluation Checklist.*
c. Identify the source of the waste testing information (e.g., VE or RTR batch data reports). Note if an AK Sufficiency Determination has been approved to meet any characterization parameter.
d. Ensure that, if a toxicity characteristic contaminant is identified, it is not included as a listed waste, and if analytical data regarding the concentration are not available, the corresponding EPA Hazardous Waste Number is applied.

Site Project Manager:

Date:

Print Sign

Acceptable Knowledge Expert:

Date:

Print Sign

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Attachment 14 – CCP Acceptable Knowledge Accuracy Report – Example Form

CCP Acceptable Knowledge Accuracy Report

Site(s):_____

Waste Stream Number(s):_____

Waste Stream Description:_____

Waste Containers:	Waste Matrix Code Reassigned? (Y/N)	EPA Hazardous Waste Number Reassigned? (Y/N)	Radiological Data Consistent with AK? (Y/N)

* The WCPIP does not require the evaluation of AK accuracy relating to EPA Hazardous Waste Number assignment; however, the reassignment of a container to another RH waste stream or new RH waste stream based on CCP testing or Permittee confirmation testing results will count against the AK accuracy for TRU (RH and CH) waste streams.

Total containers in this report:_____
Total containers consistent with AK:_____
Percent containers consistent with AK:_____

Site Project Manager:

_____ / _____ Date: _____
Print Sign

Acceptable Knowledge Expert:

_____ / _____ Date: _____
Print Sign

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Attachment 15 – CCP TRU Waste Correlation and Surrogate Summary Form – Example Form

CCP TRU Waste Correlation and Surrogate Summary Form

Generator/Storage Site(s): _____

Waste Stream(s): _____

Waste Used to Correlate: _____

Waste Used as Surrogate: _____

Information	Y/N	Source of Information
Is physical form identified?		
Are chemicals identified?		
Is the absence of prohibited items confirmed?		
Are radiological data described?		

Explain/Justify the Use of Correlating/Surrogate Waste Stream Information:
(Attach additional supporting information, as applicable)

Attachment 16 – Example Form and Content Guide for the Chemical Compatibility Evaluation Memorandum

WASTE STREAM CHEMICAL COMPATIBILITY EVALUATION MEMORANDUM

To: **[SPM]**, CCP SPM

From: **[*AKE Name*]**, CCP AKE

Date: XX/XX/20XX

RE: Chemical Compatibility Evaluation for Waste Stream [***Waste Stream Number***] AK Source Document CXXX

The purpose of this memorandum is to document the chemical compatibility evaluation required by CCP-TP-005, *CCP Acceptable Knowledge Documentation* for waste stream [**Waste Stream Number**]. As described in CCP-AK-XXX-XXX, [***AKSR Title***] (AKSR - Revision X, dated February XX, 20XX), waste stream [***Waste Stream Number***] consists of [***identify the type of waste stream (e.g., heterogeneous RH debris) and generating site(s)***].

[***Brief description of the waste stream, facility[ies], and generating process/activity.]***

As part of the process for characterizing and certifying TRU waste for disposal at WIPP, it is necessary to consider the range of possible chemical combinations that could occur in each waste stream. Potential adverse chemical reactions (e.g., generation of fire, explosion, heat, or fumes) that stem from combining chemicals need to be considered to support safe and compliant waste management.

The evaluation is limited to only the chemicals, materials, and waste management practices discussed in the AKSR and referenced acceptable knowledge (AK) source documentation. Any future changes to the AKSR resulting in a change to waste stream delineation or composition will be evaluated to ensure compatibility before the waste is added to the waste stream inventory. Additionally, this evaluation is limited to verifying the compatibility of the chemicals and materials within the waste stream, including the packaging materials. However, this evaluation provides information adequate to verify compatibility with other waste streams during TRUCON Code development.

Methodology/Approach

The list of chemicals and materials contained in the waste stream was compiled primarily from the AKSR (Table X, [***Table Title***] and other waste stream constituents identified in the AKSR), and AK source documents reviewed during this evaluation. The AK source documents were reviewed for each chemical and material to estimate the maximum quantity that could be expected in any individual container and verify the chemical/material use and management, as necessary. The chemicals/materials were then assigned to one of the following quantity categories:

Attachment 16 – Example Form and Content Guide for the Chemical Compatibility Evaluation Memorandum (Continued)

- Trace – less than 1 weight percent
- Minor – 1 to 10 weight percent
- Dominant – greater than 10 weight percent

The quantity estimations for the chemicals/materials identified in waste stream [***Waste Stream Number***] are based on the AKE's best judgment of the maximum amount of a chemical or material that could be expected in any container in waste stream [***Waste Stream Number***], based on a review of the AK source documents collected in accordance with CCP-TP-005. Concentrations typically represent a qualitative and conservative estimate of the highest potential amount of a chemical/material in any individual container. When the AK was not conclusive to make this categorization, the more conservative concentration/quantity was assigned.

The chemicals/materials of concern were identified and compiled in the table in Attachment 1. This table identifies the use and management for each chemical/material of concern, based on the AK sources referenced in the table. The Reactivity Group Numbers (RGNs) assigned to each chemical/material are consistent with the guidance provided in the 1980 EPA method EPA-600/2-80-076, "A Method for Determining the Compatibility of Hazardous Wastes". The EPA approach is a binary comparison of chemical species that may result in spontaneous reaction. The EPA method uses a two-dimensional matrix that identifies potential energetic reactions from combining pairs of various chemical types. The primary focus of this evaluation is to assess potential reactions between dominant and minor constituents. However, some trace components could produce significant exothermic reactions even in small quantities without the proper actions being taken to mitigate the hazards associated with these compounds, and therefore some Trace chemicals are included in Attachment 1.

All of the chemicals/materials of concern listed in Attachment 1 were evaluated to identify any potential for incompatible adverse waste reaction consequences corresponding to the assigned RGN, based on the EPA Hazardous Waste Compatibility Chart in EPA-600/2-80-076 (see the compatibility chart prepared for the RGNs assigned to waste stream [***Waste Stream Number***] chemicals/materials in Attachment 3). The table listing the waste stream RGNs in Attachment 2 was prepared to provide the justification used to determine the compatibility between the RGNs based on waste management practices and/or physical form of the specific materials/chemicals in the waste stream included in Attachment 1.

Based on this evaluation and the following assumptions, it was determined that the chemicals and materials of concern in waste stream [***Waste Stream Number***] are non-reactive, or rendered non-reactive in the final waste form. The final waste form has been determined to be incapable of initiating unexpected or adverse hazardous chemical reactions.

Attachment 16 – Example Form and Content Guide for the Chemical Compatibility Evaluation Memorandum (Continued)

Technical Assumptions and Conclusions - Examples

- Attachment 4 lists the chemicals/materials that were determined to be insignificant or not currently in the waste stream inventory. Insignificant chemicals/materials represent those determined not to be present in a quantity or form available for any significant chemical reaction. The justification and assumptions for these determinations are provided in the notes after the table in Attachment 4.
- Consistent with the 1980 EPA method, this evaluation assesses the potential range of binary combinations of chemicals for potential reactions. In the binary method the potential for occurrence of any one of the twelve identified reactions was taken as an indication of incompatibility. The determination of the occurrence of incompatible reactions was based on the assumption that the waste reactions are results of pure chemical components of the wastes reacting at ambient temperature and pressure.
- For purposes of this evaluation, “incompatible” refers to chemicals/materials that when mixed can lead to the reactions described in 40 CFR 264.17(b)(General Requirements for Ignitable, Reactive, or Incompatible Wastes) and the 1980 EPA method. Thus, compatible chemicals/materials (including those referred to as non-reactive in this evaluation) may react slowly over time, and even generate heat, but will not lead to unanticipated or disastrous effects such as (1) generate extreme heat or pressure, fire or explosions, or violent reactions, (2) produce uncontrolled toxic mists, fumes, dusts, or gases in sufficient quantities to threaten human health or the environment; (3) produce uncontrolled flammable fumes or gases in sufficient quantities to pose a risk of fire or explosions; (4) damage the structural integrity of the device or facility; (5) through other like means threaten human health or the environment.
- Materials not assigned an RGN consist of inorganic non-reactive materials not covered under the EPA Method RGNs. These materials have been identified as NA to reflect a complete analysis for all chemicals/materials. Chemicals/materials assigned NA are not in a potentially reactive form (dust or powders) and do not present a compatibility concern.
- Waste stream [***Waste Stream Number***] does not contain waste assigned EPA Hazardous Waste Numbers D001, D002, and D003 for the characteristics of ignitability, corrosivity, or reactivity.
- [Document assumptions and conclusions relating to the compatibility of sorbents, immobilization, neutralization, and passivation agents in the waste stream.]
- [Include expanded discussions of assumptions and conclusions associated with reactions of concern identified in Attachments 2 or 3, if necessary.]
- [Document assumptions and conclusions relating to the compatibility of radiological materials and contamination.]

Attachment 16 – Example Form and Content Guide for the Chemical Compatibility Evaluation Memorandum (Continued)

Attachment 1. Waste Stream [*Waste Stream Number*] Chemicals/Materials of Concern

Chemical/Material	Use/Description/Location (AK Source)	Concent-ration	RGN Number	Chemical/Material Evaluation

Attachments 1 Notes - Examples

Provide notes relating to the concentration estimates (primarily for Trace chemicals of concern), if necessary or not described within the table.

Attachment 16 – Example Form and Content Guide for the Chemical Compatibility Evaluation Memorandum (Continued)

Attachment 2. Waste Stream [*Waste Stream Number*] Reactivity Group Number Compatibility Evaluation

RGN #	Group Name	RGNs of Concern (Reaction Codes)	Evaluation of Potential Incompatibility
NA	*Non-reactive inorganic chemicals/materials.*		
1	Acids, Mineral, Non-Oxidizing		
2	Acids, Mineral, Oxidizing		
3	Acids, Organic		
4	Alcohols and Glycols		
5	Aldehydes		
6	Amides		
7	Amines, Aliphatic and Aromatic		
8	Azo Compounds, Diazo Compounds, and Hydrazines		
9	Carbamates		
10	Caustics		
11	Cyanides		
12	Dithiocarbamates		
13	Esters		
14	Ethers		
15	Fluorides, Inorganic		
16	Hydrocarbons, Aromatic		
17	Halogenated Organics		
18	Isocyanates		
19	Ketones		
20	Mercaptans and Other Organic Sulfides		
21	Metals, Alkali and Alkaline Earth, Elemental		
22	Metals, Other Elemental and Alloys as Powders, Vapors, or Sponges		
23	Metals, Other Elemental and Alloys as Sheets, Rods, Drops, Moldings, etc.		

Attachment 16 – Example Form and Content Guide for the Chemical Compatibility Evaluation Memorandum (Continued)

Attachment 2. Waste Stream [*Waste Stream Number*] Reactivity Group Number Compatibility Evaluation

RGN #	Group Name	RGNs of Concern (Reaction Codes)	Evaluation of Potential Incompatibility
24	Metals and Metal Compounds, Toxic		
25	Nitrides		
26	Nitriles		
27	Nitro Compounds		
28	Hydrocarbons, Aliphatic, Unsaturated		
29	Hydrocarbons, Aliphatic, Saturated		
30	Peroxides and Hydroperoxides, Organic		
31	Phenols and Creosols		
32	Organophosphates, Phosphothioates, Phosphodithioates		
33	Sulfides, Inorganic		
34	Epoxides		
101	Combustible and Flammable Materials, Miscellaneous		
102	Explosives		
103	Polymerizable Compounds		
104	Oxidizing Agents, Strong		
105	Reducing Agents, Strong		
106	Water and Mixtures Containing Water		
107	Water Reactive Substances		

Include RGNs identified in Attachment 1 and Reaction Codes identified in Attachment 3.

Waste Stream [*Waste Stream Number*] Reaction Codes:

H	Heat Generation	GF	Flammable Gas Generation
F	Fire	E	Explosion
G	Innocuous and Non-Flammable Gas Generation	P	Violent Polymerization
GT	Toxic Gas Generation	S	Solubilization of Toxic Substances

Attachment 16 – Example Form and Content Guide for the Chemical Compatibility Evaluation Memorandum (Continued)

Attachment 3. Example EPA Hazardous Waste Compatibility Chart for Waste Stream [***Waste Stream Number***]

Group No.	Reactivity Group Name	4	7	10	14	16	17	19	23	24	29	31	32	101	106
4	Alcohols and Glycols	**4**													
7	Amines, Aliphatic and Aromatic		**7**												
10	Caustics			**10**											
14	Ethers				**14**										
16	Hydrocarbons, Aromatic					**16**									
17	Halogenated Organics		H,GT	H, GF			**17**								
19	Ketones			H				**19**							
23	Metals, Other Elemental and Alloys as Sheets, Rods, Drops, Moldings, etc.						H, F		**23**						
24	Metals and Metal Compounds, Toxic		S	S						**24**					
29	Hydrocarbons, Aliphatic, Saturated										**29**				
31	Phenols and Creosols											**31**			
32	Organophosphates, Phosphothioates, Phosphodithioates			H, E									**32**		
101	Combustible and Flammable Materials, Miscellaneous													**101**	
106	Water and Mixtures Containing Water									S					**106**
		4	**7**	**10**	**14**	**16**	**17**	**19**	**23**	**24**	**29**	**31**	**32**	**101**	**106**

Source: Hatayama, H.K., J.J. Chen, E.R. deVera, R.D. Stephens, and D.L. Storm, 1980, "A Method for Determining the Compatibility of Hazardous Wastes," EPA-600/2-80-076, U.S. Environmental Protection Agency, Cincinnati, Ohio.

Include only RGNs identified in Attachment 1.

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Attachment 16 – Example Form and Content Guide for the Chemical Compatibility Evaluation Memorandum (Continued)

Attachment 4. Waste Stream [*Waste Stream Number*] Insignificant Trace Chemicals/Material

Chemical/Material	Use/Description/Location (AK Source)	Justification & Assumptions

Attachment 4 Notes - Examples

1. *Identify chemicals/materials not in or segregated from (in total) the waste stream:*
   - *Materials Included only in historical waste already emplaced at WIPP.*
   - *Materials not in the waste stream based on review of waste management and container documentation.*
2. *Identify chemicals/materials that have been segregated from the waste stream resulting in only incidental insignificant contamination.*
   - *Materials segregated and managed in another low-level, RH or CH waste stream, as applicable.*
   - *Materials identified as only being generated outside of the waste generation area and not included in the waste stream.*
   - *Chemicals that have been removed by evaporation or by other management practices.*
   - *Residues in empty containers where the contents have been segregated from the waste stream or treated for inclusion in the waste stream.*
3. *Chemicals present in negligible amounts.*
   - *Process chemicals used or introduced into the hot cell in drop quantities (phenolphthalein indicator, polishing compounds, mounting wax, acetyl cellulose film).*
   - *Process chemicals introduced in dilute solutions (low ppm concentrations, metallurgical standard solutions).*
   - *Trace ingredient of trace chemicals/materials (hexane, ethyl benzene, xylene, and heptane in spray paint).*
   - *Process products or chemicals that inherently could not be present in quantities of concern when used for their intended purpose (dried spray paint, glass cleaner).*
   - *Process products or chemicals that are reacted or consumed during use (process oxidants/reductants/buffers, neutralization/ passivation reagents). NOTE: Must consider neutralization/passivation products and the use of excess reagents.*
   - *Contaminants present in only low ppm concentrations (ground water sample and corrosion study leachate solution ionic and metal contaminants).*

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CCP-TP-028

Revision 9

CCP
Radiographic Test Drum and Training Container Construction

EFFECTIVE DATE: 06/16/2014

Mike Ramirez

PRINTED NAME

APPROVED FOR USE

RECORD OF REVISION

Revision Number	Date Approved	Description of Revision
2	02/04/2004	In response to CAR No: CAR-CCP-010-03, revision change to create electronically fillable form and update references. Change FQAO to CCP Training and add Facility Records Custodian in Responsibilities section of procedure. Minor editorial corrections throughout procedure. Revision to Waste codes on Attachment 1 and fillable form.
3	01/19/2006	Revised procedure steps and Attachment 1, CCP NDE Test Drum Inventory Sheet to allow for multiple Summary Category Groups to be represented in a test/training drum. Revised Drum Contents section of Attachment 1 to include WAP-required items and other non-WAP items.
4	05/26/2010	Revised to clarify the difference between a Test Drum and a Training Drum and how they are to be constructed.
5	07/27/2010	Revised to correct editorial errors.
6	12/29/2010	Revised to incorporate training containers in place of training drums. Also revised training container assembly procedures to meet the requirements of the revised *Waste Isolation Pilot Plant Hazardous Waste Facility Permit.*
7	07/13/2012	Revised to allow Vendor Project Manager (VPM) to assemble Training Containers.
8	06/17/2013	Revised to include section 4.3 Reconfiguration of Previously Assembled Training Containers.
9	06/16/2014	Revised to add steps to check boxes to indicate whether a training container inventory is for a standard waste box or a drum.

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Attachment 2 – CCP NDE Training Container Inventory Sheet 14

1.0 PURPOSE

The purpose of this procedure is to provide the requirements for the assembly of nondestructive examination (NDE) test drums and training containers, required by CCP-PO-002*, CCP Transuranic Waste Certification Plan* and training containers, required by CCP-PO-001, *CCP Transuranic Waste Characterization Quality Assurance Project Plan,* and the *CH-TRU Payload Appendices* which are used to qualify Radiography Operators in accordance with CCP-QP-002, *CCP Training and Qualification Plan.*

1.1 Scope

This procedure provides the instruction for assembling test drums and training containers. Test drums are representative of the Waste Matrix Codes (WMC) for which the Waste Stream Profile Form approval is being sought. Training containers are required to be scanned semi-annually.

2.0 REQUIREMENTS

2.1 References

Baseline Documents

- CCP-PO-001, *CCP Transuranic Waste Characterization Quality Assurance Project Plan*
- CCP-PO-002, *CCP Transuranic Waste Certification Plan*
- *CH-TRU Payload Appendices*

Referenced Documents

- CCP-QP-002, *CCP Training and Qualification Plan*
- CCP-QP-008, *CCP Records Management*

3.0 RESPONSIBILITIES

3.1 Vendor Project Manager (VPM) or Cognizant Engineer (CE)

3.1.1 Ensures that test drums and training containers are constructed in accordance with the requirements of this procedure.

3.1.2 Completes Attachment 1, CCP NDE Test Drum Inventory Sheet, and Attachment 2, CCP NDE Training Container Inventory Sheet.

3.2 CCP Training

3.2.1 Tracks the use of test drums and training containers to ensure that testing and evaluation of NDE Operators are conducted on test drums and training containers, as specified in CCP-QP-002.

4.0 PROCEDURE

4.1 Test Drum Assembly

NOTE

Test Drums are to be assembled representing all three Summary Category Groups, with the bottom ¼ being sludge, a spacer (e.g., cardboard), next ¼ being naturally occurring soil, and the top half containing debris using the listed required items and other material representing all the waste material parameters for debris.

VPM

4.1.1 Identify **AND** obtain the items needed to match the WMCs (items common to the waste streams to be characterized).

4.1.2 Obtain the following required items for each drum to be constructed:

[A] US Department of Transportation Type A 55-gallon drum

[B] Aerosol can with puncture

[C] Horsetail bag (Liner Bag)

[D] Pair of coveralls

[E] Empty bottle

[F] Irregular-shaped pieces of wood

[G] Empty one-gallon paint can

[H] Full container

[I] Aerosol can with fluid

[J] One-gallon bottle with three tablespoons of fluid

[K] One-gallon bottle with one cup of fluid

[L] Leaded glove or leaded apron

[M] Wrench

4.1.3 Construct the test drum(s) as follows:

NOTE
NDE test drum identification number format is NDE-TEST-01, NDE-TEST-02.

[A] Label the test drum with a unique identification number obtained from Central Characterization Program (CCP) Training.

[B] Record the test drum identification number and date on Attachment 1.

[C] Place sludge and spacer in drum.

[D] Place soil in drum.

NOTE
The one-gallon bottle with one cup of fluid (step [K]) MUST be placed upside down in the test drum. In addition, the test drum will be divided into layers with varying densities to represent different situations that may occur during radiography examinations.

[E] Place the remaining items listed in Section 4.1.2 (steps [B] through [M]), along with items common to the waste stream(s) (step 4.1.1), in the test drum.

[F] Record the placement of items (step 4.1.3[E]) on Attachment 1.

[G] Secure the lid to the test drum using the outside ring.

[H] Place a tamper indicating device/lock on the test drum.

[I] Complete Attachment 1, print name, sign, **AND** date on Attachment 1.

4.1.4 Repeat steps in Section 4.1.3 for each NDE test drum constructed.

4.1.5 Submit Attachment 1, in accordance with CCP-QP-008, *CCP Records Management*.

4.2 Reconfiguration of Previously Assembled Test Drums

VPM

4.2.1 Obtain the following for each container to be reconfigured:

- Test Drum to be reconfigured
- Current inventory sheet for Test Drum
- Any additional items common to the waste stream to be added to the Test Drum

4.2.2 Remove all items from the Test Drum EXCEPT the soil and sludge.

4.2.3 Label the Test Drum with a unique identification number obtained from the CCP Training department.

4.2.4 Ensure required inner containers with liquid have the correct amount of liquid.

4.2.5 Place the remaining items listed in Section 4.1.2 (steps 4.1.2[B] through 4.1.2[M]), along with items common to the waste stream(s) (step 4.1.1), in the test drum.

4.2.6 Record the placement of items (step 4.2.5) on Attachment 1.

4.2.7 Secure the lid to the test drum using the outside ring.

4.2.8 Place a tamper indicating device/lock on the test drum.

4.2.9 Complete Attachment 1, print name, sign, AND date on Attachment 1.

4.2.10 Repeat steps in Section 4.1.3 for each NDE test drum constructed.

4.2.11 Submit Attachment 1, in accordance with CCP-QP-008.

4.3 Assembling Training Containers

CE or VPM

4.3.1 Obtain the following items for each training container to be constructed:

- Container type regularly examined, for example a 55-gallon drum or standard waste box

- Items which can be identified by real-time radiography, items that are representative of the physical properties of the waste based on acceptable knowledge documentation reviewed (including internal containers of various sizes with various amounts of liquid), and prohibited items (for example, liquids in excess of one percent)

NOTE
NDE Training container identification number format is NDE-TRAINING-01.

4.3.2 Label the training container with a unique identification number obtained from the training department.

4.3.3 Place the items in the containers.

4.3.4 Record training container identification number on Attachment 2.

4.3.5 Record date of construction on Attachment 2.

4.3.6 Record if it is a box or drum on Attachment 2.

4.3.7 Record the inventory of the items on Attachment 2.

4.3.8 Install the container lid.

4.3.9 Install tamper indicating device/lock on the training container.

4.3.10 Print name, sign, and date Attachment 2.

4.3.11 Repeat steps in Section 4.2 for each NDE training container constructed.

4.3.12 Forward Attachment 2 to CCP Training.

4.4 Reconfiguration of Previously Assembled Training Containers

CE or VPM

4.4.1 Obtain the following items for each container to be reconfigured.

- Container to be reconfigured
- Current inventory list of the container
- New waste stream specific items listed in the site's AK documents

4.4.2 Empty contents of the training container EXCEPT for the soil and sludge.

4.4.3 Label the training container with a unique identification number obtained from the training department.

4.4.4 Empty liquid from internal containers.

4.4.5 Refill internal containers with an amount of liquid different than previous inventory sheet indicates with some being prohibited amounts.

4.4.6 Place items back into the container EXCEPT any waste stream specific items previously included on the inventory.

4.4.7 Place new waste stream specific items in the container.

4.4.8 Record training container identification number on Attachment 2.

4.4.9 Record date of construction on Attachment 2.

4.4.10 Record if it is a box or drum on Attachment 2.

4.4.11 Record the inventory of the items on Attachment 2.

4.4.12 Install the container lid.

4.4.13 Install tamper indicating device/lock on the training container.

4.4.14 Print name, sign, and date Attachment 2.

4.4.15 Forward Attachment 2 to CCP Training.

5.0 RECORDS

5.1 Records generated during the performance of this procedure are maintained as quality assurance records in accordance with CCP-QP-008. The records are the following:

5.1.1 QA/Nonpermanent Records

[A] Attachment 1 – CCP NDE Test Drum Inventory Sheet

[B] Attachment 2 – CCP NDE Training Container Inventory Sheet

Attachment 1 – CCP NDE Test Drum Inventory Sheet

Test Drum Identification Number:	**Date:**
Drum Contents:	
CCP-PO-002 Required Items	**Other Items**
1. Aerosol can with puncture	1.
2. Horsetail bag (Liner Bag)	2.
3. Pair of coveralls	3.
4. Empty bottle	4.
5. Irregular-shaped pieces of wood	5.
6. Empty one-gallon paint can	6.
7. Full container	7.
8. Aerosol can with fluid	8.
9. One-gallon bottle with three (3) tablespoons of fluid	9.
10. One-gallon bottle with one (1) cup of fluid (upside down)	10.
11. Leaded glove or leaded apron (circle one)	11.
12. Wrench	12.
Comments:	
VPM Printed Name: _____ **Date:** _____ **VPM Signature:** _____	

Attachment 2 – CCP NDE Training Container Inventory Sheet

Training Container Identification Number:	**Date:**
Container Contents:	Box ☐ Drum ☐
1.	14.
2.	15.
3.	16.
4.	17.
5.	18.
6.	19.
7.	20.
8.	21.
9.	22.
10.	23.
11.	24.
12.	25.
13.	26.
Comments:	
CE or VPM Printed Name: _____ **Date:** _____ **CE or VPM Signature:** _____	

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CCP-TP-030

Revision 34

CCP
CH TRU Waste Certification and WWIS/WDS Data Entry

EFFECTIVE DATE: 02/02/2015

Mike Ramirez

PRINTED NAME

APPROVED FOR USE

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RECORD OF REVISION

Revision Number	Date Approved	Description of Revision
24	08/20/2008	Revised in response to Central Characterization Project Corrective Active Report CAR 08-025, deleted Characterization Data System Waste Certification Official review form, and made editorial changes.
25	01/22/2009	Revised to update data sources for the Waste Isolation Pilot Plant (WIPP) Waste Information System (WWIS) Data Spreadsheet (SS). Also made minor editorial changes.
26	05/27/2009	Revised to implement changes made to the *Contact-Handled Transuranic Waste Authorized Methods for Payload Control* (CH-TRAMPAC).
27	12/14/2009	Revised to allow use of the Waste Data System (WDS).
28	05/12/2010	Revised to include steps for direct load 100-Gallon drums that require characterization prior to placement in a direct load Standard Waste Box (SWB) and for minor editorial changes.
29	04/26/2011	Revised Attachment 2, WCO Waste Certification Requirements, to include Standard Large Box 2 (SLB2) Waste Certification Official (WCO) Waste Certification Requirements. Also revised Sections 3.1.6, 4.2.6, and Attachment 1 of the Data Sources for the WDS Master Template.
30	05/21/2012	Revise Table 1, Data Sources for the WDS Master Template, to include the acceptable knowledge (AK) Tracking Spreadsheet (SS) for another source for Layers of Confinement; added the reference for the Transuranic Package Transporter (TRUPACT)-III; added new records section for waste data system (WDS) flammable gas analysis (FGA) Certification.
31	11/19/2012	Revised to address CAR-CCP-0003-12 and various editorial changes. Also revised to better streamline the nonconformance report (NCR)/Corrective Action Report (CAR) quality assurance (QA) request.
32	06/20/2013	Revised to implement the Permit Modification Request Class 2 approved by New Mexico Environment Department (NMED) dated March 13, 2013 and *Contact-Handled Transuranic Waste Authorized Methods for Payload Control* (CH-TRAMPAC) changes.

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RECORD OF REVISION

Revision Number	Date Approved	Description of Revision
33	11/19/2013	Revised to implement Shielded Container Assembly information and various editorial changes. Also revised to change the (WDS) Master Template to WDS Spreadsheet. Revised Attachment 2, WCO Waste Certification Requirements to include more acceptable container types, as well as more detail within the entire attachment. Also revised to implement a corrective action from WF13-245.
34	02/02/2015	Revised to implement the waste certification process and the Advanced Mixed Waste Treatment Project (AMWTP) flammable gas certification process using the Integrated Data Center (IDC); to implement a corrective action from WF14-285 to generate electronic records instead of signed paper copy records; and to remove the procedure steps for entering data into the WIPP Waste Information System/Waste Data System (WWIS/WDS) for Site-to-Site shipments.

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1.0 PURPOSE

The purpose of this procedure is to describe the steps the Central Characterization Program (CCP) uses for certifying contact-handled (CH) transuranic (TRU) waste for disposal at the Waste Isolation Pilot Plant (WIPP). This procedure also describes the process for entering data into the WIPP Waste Information System (WWIS)/Waste Data System (WDS) and reporting data on containers for disposal at the WIPP.

1.1 Scope

This procedure defines the parameters necessary for certification of CH TRU waste for disposal at the WIPP. This procedure includes the records that are generated to document that the CCP Waste Certification Official (WCO) has performed the necessary verifications and has certified the waste for disposal.

This procedure also describes how to obtain access and enter data into the WWIS/WDS for containers to be certified for disposal at the WIPP.

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2.0 REQUIREMENTS

2.1 References

Baseline Documents

- CCP-TP-035, *CCP Container Management*
- CCP-TP-068, *CCP Standardized Container Management*
- CCP-PO-001, *CCP Transuranic Waste Characterization Quality Assurance Project Plan*
- CCP-PO-002, *CCP Transuranic Waste Certification Plan*
- CCP-PO-003, *CCP Transuranic Authorized Methods for Payload Control (CCP CH-TRAMPAC)*
- CCP-PO-050, *CCP TRUPACT-III TRU Waste Authorized Methods for Payload Control (CCP TRUPACT-III TRAMPAC)*
- *CH-TRU Payload Appendices*

Referenced Documents

- DOE/WIPP-09-3427*, Waste Data System User's Manual*
- DOE/WIPP-02-3122, *Transuranic Waste Acceptance Criteria for the Waste Isolation Pilot Plant*
- DOE/WIPP-01-3194, *CH-TRU Waste Content Codes (CH-TRUCON)*
- DOE/WIPP-11-3458, *TRUPACT-III CONTENT CODES (TRUCON-III)*
- CCP-QP-002, *CCP Training and Qualification Plan*
- CCP-QP-005, *CCP TRU Nonconforming Item Reporting and Control*
- CCP-QP-008, *CCP Records Management*
- CCP-TP-002, *CCP Reconciliation of DQOs and Reporting Characterization Data*
- CCP-TP-120, *CCP Container Management*

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2.2 Training Requirements

2.2.1 Personnel who use this procedure to certify waste will be trained and qualified to the requirements for the WCO in accordance with CCP-QP-002, *CCP Training and Qualification Plan*.

2.2.2 Personnel who use this procedure to enter data will be trained and qualified to the requirements for the Waste Certification Assistant (WCA) in accordance with CCP-QP-002*.*

2.2.3 Personnel who use this procedure to enter data into the WWIS/WDS will refer to DOE/WIPP-09-3427, *Waste Data System User's Manual.*

2.3 Equipment List

2.3.1 Computer.

2.4 Software

2.4.1 Integrated Data Center (IDC) WDS Spreadsheet (controlled by IDC).

2.4.2 concat_wds_files.bat

2.4.3 clean_container_files.bat

2.4.4 WDS flammable gas analysis (FGA) Template.XLSM.

2.4.5 IDC WDS FGA Spreadsheet (controlled by IDC).

2.5 Precautions and Limitations

2.5.1 None.

2.6 Prerequisite Actions

2.6.1 None.

2.7 Definitions

2.7.1 None.

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NOTE
The Data Administrator (DA) in this document refers to the WWIS/WDS DA.

3.0 RESPONSIBILITIES

3.1 Site Project Manager (SPM) or Designee

3.1.1 Confirms that personnel performing this procedure are trained and qualified in accordance with applicable requirements in CCP-QP-002.

3.1.2 Notifies the WCO and WCA of completed Lot Characterization Information Summary (CIS) when used for new or revised Waste Stream Profile Forms (WSPF).

3.1.3 Serves as focal point for resolution of data issues.

3.2 Quality Assurance (QA)

3.2.1 Provides assistance in verifying data, completing documentation, and reviewing requirements and provides status of applicable Nonconformance Reports (NCRs).

3.3 Waste Certification Official (WCO) or Designee

3.3.1 Confirms that WCOs and WCAs are granted access to the WWIS/WDS.

3.3.2 Obtains a copy of the approved WSPF for applicable containers to be certified.

3.3.3 Certifies container(s) meet requirements for disposal in the WIPP repository.

3.3.4 Submits certified container(s) to WDS.

3.4 Waste Certification Assistant (WCA)

3.4.1 Works with the WCO to obtain access to the WWIS/WDS.

3.4.2 Obtains copies of data for each container from CCP Records, IDC or the Site Project Manager (SPM) that show data to be entered into the WDS Spreadsheet.

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3.4.3 Generates the WDS Spreadsheet using IDC and has a second WCA confirm the data are transferred correctly within IDC. The second data entry person verifies the data prior to certification by the WCO.

3.4.4 Submits applicable records to CCP Records Custodian in accordance with CCP-QP-008, *CCP Records Management* via IDC electronic records.

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NOTE

Throughout the procedure, "WDS Spreadsheet" is a generic term used to refer to the "IDC WDS Spreadsheet " Similarly, "WDS FGA Spreadsheet" refers to the "IDC WDS FGA Spreadsheet."

4.0 PROCEDURE

4.1 Obtaining and Changing Access to the WWIS/WDS

WCO

4.1.1 Determine which personnel need access to the WWIS/WDS (see Section 4.0 of DOE/WIPP-09-3427).

4.1.2 Request WWIS/WDS access for each person by filling out a WIPP/WDS access request form and submitting it to a DA.

4.1.3 Notify the DA when personnel who have received WWIS/WDS access:

[A] Leave the project;

[B] No longer need WWIS/WDS access; **OR**

[C] Need to change the type of WWIS/WDS access.

CCP Personnel

4.1.4 Once the DA has been notified by the WCO that access is to be granted, contact the DA to receive WWIS/WDS training and a WWIS/WDS username in accordance with the DOE/WIPP-09-3427.

4.2 Verifying the WSPF in WWIS/WDS Tables and Developing Container Listings

SPM

4.2.1 Obtain the WSPF Number in accordance with CCP-TP-002, *CCP Reconciliation of DQOs and Reporting Characterization Data*.

4.2.2 Request the DA establish the WSPF Number in the WWIS/WDS.

4.2.3 Confirm that the WSPF Number is correct in the WWIS/WDS Reference Table upon notification that the DA has added the WSPF Number to the WWIS/WDS.

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4.2.4 Inform the WCO and WCA that the WSPF has been added to the WWIS/WDS.

4.2.5 Develop a list of containers for certification under the appropriate WSPF.

4.2.6 Review the list of containers for certification, revise as necessary, **AND** submit the list to the WCO and WCA via the IDC when the CIS is complete.

4.3 Entering and Verifying WDS Characterization Data

WCA

4.3.1 Using the "Edit WCO Data" module in IDC and appropriate data sources as listed in Table 1, Data Sources for the WDS Spreadsheet, check the container(s) out for entry **AND** enter characterization data for each container record used to support the WSPF.

NOTE
The WSPF is only needed for the first Lot of a new or revised waste stream.

4.3.2 **ONCE** the characterization data is entered,
THEN select "done/update."

WCA (Verifier)

4.3.3 Using the "Edit WCO Data" module, check the container(s) out for validation **AND** verify each container record for accuracy and completeness.

4.3.4 **IF** there are any discrepancies that **CANNOT** be resolved,
THEN inform the WCO or SPM for resolution.

4.3.5 **ONCE** the data is complete and verified,
THEN check the container(s) in for validation.

4.4 Precertifying WDS Characterization Data

WCO

4.4.1 Using the "Edit WCO Data" module in IDC check out the container(s) **AND** perform a precursory certification review on each container used to support the WSPF.

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4.4.2 Using the “Certify WCO Data” module in IDC select “Final Publish.”

4.4.3 Using the “Certify WCO Data” module in IDC select “Generate Charz WDS File” to generate the Characterization flat file to be used for WDS Characterization Submittal.

4.4.4 Save the flat file into the TempTables Folder.

4.5 WDS Characterization Data Submittal

WCO/WCA

4.5.1 **OPEN** TempTables Folder to run batch programs, **AND** run concat_wds_files to copy all containers into upload files readable by WWIS/WDS.

4.5.2 LOG ON to the WWIS/WDS.

4.5.3 Upload the container(s) to the Characterization module.

[A] **IF** container(s) upload is successful,
THEN GO TO step 4.5.4.

[B] **IF** container(s) fails and errors **CANNOT** be fixed,
THEN initiate an NCR in accordance with CCP-QP-005, *CCP TRU Nonconforming Item Reporting and Control*, if applicable.

4.5.4 **ONCE** complete,
THEN Open the TempTables Folder **AND** RUN clean_container_files to clear the TempTables Folder of all uploaded file data.

4.6 Entering and Verifying WDS Certification Data using IDC

WCA

4.6.1 Using the “Edit WCO Data” module in IDC and appropriate as listed in Table 1 check out the container(s) for entry **AND** enter the certification data for container(s).

4.6.2 **ONCE** the certification data is entered,
THEN select “done/update.”

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WCA (Verifier)

4.6.3 Using the "Edit WCO Data" module, check the container(s) out for validation **AND** verify each container record for accuracy and completeness.

4.6.4 **ONCE** the data is complete and verified,
THEN check the container(s) in for validation.

4.6.5 **IF** there are any discrepancies that **CANNOT** be resolved,
THEN inform the WCO or SPM for resolution.

WCO

4.6.6 Resolve discrepancy or initiate an NCR in accordance with CCP-QP-005, as applicable.

4.7 Waste Certification using IDC

4.7.1 Within the "Edit WCO Data" module, navigate to the "Check In/Check Out."

4.7.2 Request that QA confirms that each container being certified has NO unresolved NCRs, if applicable.

4.7.3 **IF** container is QA Certified, check the containers out for certification and proceed to step 4.7.5.

QA

4.7.4 Using IDC, confirm that each container requested for an NCR check has NO unresolved NCRs, if applicable.

NOTE

For waste streams that are approved for load management, TRU alpha activity concentrations of less than 100 nanocuries per gram (nCi/g) are allowed if containers meet step 4.7.13 and are assigned an overpack status.

WCO

4.7.5 Navigate to the "Container Edit" tab **AND** select container(s) to certify.

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4.7.6 **IF** there are any open NCRs,
THEN using IDC, verify that each container certified has no unresolved NCRs.

4.7.7 Confirm that the data in IDC matches the batch data report (BDR) data and is accurate and complete.

4.7.8 Confirm that the TRU alpha activity concentration is greater than 100 nCi/g for each container.

4.7.9 **IF** container is less than 100 nCi/g, and not eligible for load management,
THEN initiate an NCR in accordance with CCP-QP-005, if applicable.

4.7.10 Confirm that the applicable criteria on Attachment 2, WCO Waste Certification Requirements, have been met.

4.7.11 Review the waste stream information against the applicable Content Code and data sources to confirm the waste is **NOT** an incompatible waste.

4.7.12 **IF** a container does not have an approved/proper TRUCON code,
THEN have the container put on an electronic exclusion in IDC
AND flag the container, if applicable.

4.7.13 Verify at least one TRU isotope is greater than the lower limit of detection (LLD) for waste containers.

4.7.14 **IF** the Methane concentration is greater than or equal to 1,250 parts per million (ppm),
THEN the container is **NOT** eligible for certification.

4.7.15 **IF** the hydrogen concentration is greater than 50,000 ppm,
THEN the container is **NOT** eligible for certification.

4.7.16 **IF** the Methane concentration is less than the minimum detectable limit (MDL) as indicated by a “U” flag,
THEN adjust the Methane concentration to 2.5 percent of the Hydrogen concentration, as appropriate.

4.7.17 **IF** Gas Generation Testing (GGT) is indicated for the waste container,
THEN ensure that the shipping period of the selected Shipping Category is valid for the testing period of GGT.

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NOTE
The designator "BN" must be added to the beginning of the Container number for all data sets for waste containers from Advanced Mixed Waste Treatment Project (AMWTP) CCP waste streams and containers **NOT** designated to be overpacked. This designator is only required to be applied to the Container number for submittal to the WWIS/WDS.

4.7.18 **IF** a deficiency in data is identified,
THEN flag the container in IDC **AND** initiate an NCR in accordance with CCP-QP-005, if applicable.

4.7.19 **IF** no deficiencies are identified,
THEN select "Certify."

4.8 Waste Certification Data Submittal Using IDC

NOTE
Containers must have a valid QA NCR check before submitting to WDS.

4.8.1 Within the "Certify WCO Data" module navigate to the "Final Publish" tab.

4.8.2 Verify a valid QA NCR check is complete.

4.8.3 Select "WDS Submit."

4.8.4 In the "WDS Submittal" popup window enter the appropriate WDS Credentials **AND** select "Perform Evaluations" to upload the container(s) to WDS.

[A] **IF** container fails and errors **CANNOT** be fixed,
THEN exit the system, **AND** initiate an NCR in accordance with CCP-QP-005, if applicable.

4.9 WDS Deficiencies

4.9.1 **IF** a deficiency is identified after the container data is submitted to the WWIS/WDS,
THEN:

[A] Request in writing CCP management approval for the WCO to reject the container from the WWIS/WDS, if applicable, **AND** obtain confirmation that the container is rejected, if applicable.

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[B] Initiate an NCR in accordance with CCP-QP-005, if applicable.

4.10 Data Entry and Verification for Transportation Data Only, Generated by CCP for Non-CCP Waste Containers Using IDC

WCO or WCA

4.10.1 Within the "Edit WCO Data" module navigate to the "Check In/Out" tab **AND** in the task field select "Assign FG Lot."

4.10.2 Filter out the following **AND** select available container(s) and assign to an FG lot:

[A] FGA SPM Status – Complete

[B] Has FGA data – checked

[C] Flag – Unchecked

[D] NCRs – NO

4.10.3 Request that QA confirms that each container certified has NO unresolved NCRs, if applicable.

QA

4.10.4 Using IDC, confirm that each container requested for an NCR check has NO unresolved NCRs, if applicable.

WCA

4.10.5 Within the "Edit WCO Data" module, navigate to the "Check in/Check out tab **AND** select "CO for Entry."

4.10.6 Navigate to the "Container Edit" tab **AND** enter and verify Transportation data for container(s) using appropriate sources as listed in Table 1.

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4.10.7 Enter aspiration based on the criteria below:

[A] **IF** the closure/vent dates are the same,
THEN use "N" for aspiration.

OR

[B] **IF** the closure/vent dates are different,
THEN use "3" for aspiration.

4.10.8 For additional filters, select "Edit Filter Data" and enter additional filters.

4.10.9 Enter DOE/WIPP-01-3194, *CH TRU Waste Content Codes (CH-TRUCON)* or DOE/WIPP-11-3458, *TRUPACT-III Content Codes (TRUCON III)*, as described in Attachment 1, Entering of Content Code and Shipping Category into the WWIS/WDS.

4.10.10 **ONCE** the appropriate data is complete
THEN select "done."

NOTE

Step 4.10.10 [A] is for data entry of waste that requires characterization prior to placement in a direct loaded standard waste box (SWB).

NOTE

Use an FGA sample date one day after the closure and vent.

[A] For SWBs Direct Loaded, the volatile organic compound (VOC) concentration values for each 100-gallon drum packaged in the SWB shall be compared and the highest single value for each flammable VOC shall be selected for reporting as the SWB values on the WDS FGA Spreadsheet.

WCA (Verifier)

4.10.11 Within the "Edit WCO Data" module navigate to the "Check in/Check out" tab **AND** select "CO for Validation."

4.10.12 Navigate to the "Container Edit" tab and verify the container for completeness and accuracy.

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4.10.13 **ONCE** the data is verified,
THEN navigate to the "Check in/Check out" tab **AND** select "CI for Validation."

4.10.14 **IF** there are any discrepancies,
THEN forward to a WCA for correction **AND** repeat step 4.10.12.

4.10.15 **IF** there are discrepancies that **CANNOT** be resolved
THEN forward to the WCO for resolution.

WCO

4.10.16 Resolve discrepancy **OR** initiate an NCR in accordance with CCP-QP-005, as applicable.

4.11 Waste Certification and WDS Submittal for Transportation Data Only, Generated by CCP for Non-CCP Waste Containers Using IDC

4.11.1 Within the "Edit WCO Data" module navigate to the "Check in/Check out" tab **AND** select "CO for Certification."

4.11.2 Navigate to the "Container Edit" tab **AND** certify Transportation data to confirm they are accurate and complete.

NOTE
Steps [4.11.3] and [4.11.4] shall only be performed for 100-gallon drums containing 55-gallon puck drums.

4.11.3 **IF** the hydrogen/methane concentration is greater than 5,883 ppm, but less than 17,150 ppm,
THEN designate container(s) for a 10-day controlled shipment.

4.11.4 **IF** the hydrogen/methane concentration is greater than or equal to 17,150 ppm,
THEN place the non-CCP waste container on hold, **AND** initiate an NCR in accordance with CCP-QP-005.

4.11.5 **IF** the methane concentration is greater than or equal to 1,250 ppm,
THEN the container is NOT eligible for certification.

4.11.6 **IF** the Methane concentration is less than the MDL as indicated by a "U" flag,
THEN adjust the Methane concentration to 2.5 percent of the Hydrogen concentration, as appropriate.

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4.11.7 **IF** a deficiency in data is identified before submitting to WDS,
THEN place the waste container on hold, **AND** initiate an NCR in accordance with CCP-QP-005, if applicable.

4.11.8 **ONCE** the container is complete,
THEN navigate to the "Certify WCO" module **AND** certify the container(s).

4.11.9 **IF** the container is certifiable,
THEN submit the container to WWIS/WDS.

4.11.10 Navigate to the "Final Publish" tab in the "Certify WCO Data" module **AND** select "WDS Submit."

4.11.11 In the WDS Submittal popup window, enter the appropriate WDS Credentials; **DO NOT** select "Perform Evaluations,"
THEN upload the container(s) to Presubmittal Certification in WDS.

4.11.12 Using WDS, search for FGA submitted container(s) **AND** perform eTRAMPAC evaluation.

4.11.13 **IF** the container fails the eTRAMPAC evaluation and errors CANNOT be fixed,
THEN put the containers(s) on hold in IDC, **AND** initiate an NCR in accordance with CCP-QP-005, if applicable.

NOTE

The WWIS/WDS Overpack Data Entry Module utilizes edit limit checks when data are entered and selected. The WWIS/WDS steps in the following section may be repeated until Overpack compliance is satisfied. Default data may be used to generate the build list for the Transportation Certification Officials (TCOs).

4.12 Container Selection and certification for Overpacks/Load Management Containers using the WWIS/WDS.

4.12.1 LOGON to the WWIS/WDS.

4.12.2 Enter the Overpack Planning and Completion Module.

4.12.3 Select New **OR** Overpack Assistant.

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4.12.4 Enter the data for the Overpack information, as applicable **AND** select search.

[A] Select Overpack Configuration

[B] Select Certification Program ID

[C] Select Current Location

[D] Select Destination Site ID

[E] Select Shipping Program

[F] Select Waste Stream Profile Code

[G] Select Search

4.12.5 Select the Containers for the Overpack.

4.12.6 Perform evaluation checks.

4.12.7 Select Accept **AND** Enter Overpack number.

NOTE

To have the WWIS/WDS perform the edit and limit checks on the Overpack/Load Management Container without submitting the Overpack/Load Management Container for approval as in step 4.12.19, the WCO can select all evaluations as applicable and select execute checks.

4.12.8 Enter Beta/Gamma and Neutron dose rate, if applicable.

4.12.9 Enter Shipping Purpose.

4.12.10 Enter the Closure and Vent Date of the Overpack/Load Management Container, if applicable.

4.12.11 Verify the correct WAC revision number.

4.12.12 Enter Alpha Surface and Beta/Gamma Surface Contamination, if applicable.

4.12.13 Enter filter model number, number of filters, and date of filter installation, **AND** add as applicable. Select “All Evaluation” checkbox and execute checks.

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4.12.14 **ONCE** overpack passes the checks,
THEN Generate the Overpack Build List.

4.12.15 Send Overpack Build List to applicable TCO's.

4.12.16 Receive the Loading Form from the TCO and enter the required certification data, **AND** enter certification date.

4.12.17 Verify the container numbers in the Overpack/Load Management Container match those on the Loading Form received from the TCO.

4.12.18 For the ten-drum overpacks (TDOPs), verify that the heavier drums are on the bottom layer and the lighter drums are on the top layer.

4.12.19 Submit the Overpack/Load Management Container for approval.

4.12.20 After successful submittal for approval, print the Overpack Data Report and sign the cover page.

WCA

4.12.21 Compile the following items used in the submission of data to the WWIS/WDS, **AND** submit to CCP Records in accordance with CCP-QP-008:

[A] Copies of the data containing the Overpack/Load Management Container, radiological survey, and filter information used to enter data above.

[B] The Waste Container Data Report for the data submitted.

[C] Correspondence (e.g., memorandum/E-mail notifications).

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5.0 RECORDS

5.1 Records generated during the performance of this procedure are maintained as QA records in accordance with CCP-QP-008. The records are the following:

5.1.1 QA/Lifetime

[A] Container Certification:

[A.1] Correspondence (memorandum/E-mail notifications)

[A.2] WCO Certified WDS Spreadsheets will be electronic only and will reside in the IDC WCO Module

[B] Overpack Certification:

[B.1] Overpack Data Report (for Overpacks only, e.g., TDOP, SWB)

[B.2] Radiological Survey Information, if applicable

[B.3] Correspondence (memorandum/E-mail notifications)

[C] WDS FGA Certification

[C.1] Correspondence (memorandum/E-mail notifications)

[C.2] WCO Certified WDS FGA Spreadsheets will be electronic only and will reside in the IDC WCO Module

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Table 1. Data Sources for the WDS Spreadsheet

Field Label	Source
Characterization, Certification, and Shipping Data	
Shipper Site ID or Site ID Location ID Destination Program ID Shipping Purpose	WDS reference table
Waste Stream Profile	Acceptable knowledge (AK) Summary Report
Container Number	Completed CIS (Add "BN" to front of ID Number for the Advanced Mixed Waste Treatment Project [AMWTP] containers not being Overpacked); AK Tracking Spreadsheet
Container Type	Packaging records; visual inspection; AK Summary Report; or designate for Overpacking, AK Tracking Spreadsheet
Waste Acceptance Criteria (WAC) Rev #	DOE/WIPP-02-3122, *Transuranic Waste Acceptance Criteria for the Waste Isolation Pilot Plant*
Cert Site	WDS reference table
Cert Date	Date WCO certifies payload container
Waste Handling Code	CH Radioassay BDR; Radiological Characterization BDR; WSPF
Waste Type Code	WSPF or AK Summary Report (TRU or mixed transuranic (waste) [MTRU]) (if no Hazardous Waste Numbers, enter TRU)
Waste Stream Baseline Inventory Report (BIR) ID	WSPF or AK Summary Report
Generator Site ID Item Description Code Code Matrix Code	WSPF or AK Summary Report AK Summary Report (not applicable [NA] if no Item Description Code available) WDS reference table
TRUCON Code	AK Summary Report, WSPF. See Attachment 1, Entering of Content Code and Shipping Category into the WWIS/WDS and the CH-TRUCON or TRUCON-III.
Shipping Category	CH-TRU Waste Content Codes (CH-TRUCON) or TRU Waste Content Codes (TRUCON-III)
TRU Alpha Act TRU Alpha Act Uncertainty TRU Alpha Act Concentration (conc.) Pu-239 Fissile Gram Equivalent Pu-239 Fissile Gram Equivalent Uncertainty Pu-239 eq. act. Decay Heat Decay Heat Uncertainty	Radioassay BDR, Radiological Characterization BDR Note – Nondestructive Assay (NDA) uncertainties must be reported to the WWIS/WDS at 1-sigma. Verify the data to be submitted to WWIS/WDS is at 1-sigma.
Layers of Packaging	Visual Examination (VE) BDR, real time radiography (RTR) BDR, AK Tracking Spreadsheet or AK Summary Report
Fill Factor	VE BDR, RTR BDR or AK Summary Report
Liner Type or Liner Exists	VE BDR, RTR BDR or AK Summary Report
Liner Lid Present	VE BDR, RTR BDR or AK Summary Report

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Table 1. Data Sources for the WDS Spreadsheet (Continued)

Field Label	Source
Liner Punctured, Liner Hole Size	VE BDR, RTR BDR, or AK Summary Report. No liner lid indicates liner is vented with default hole size of 478 mm for a 55-gallon drum
PCB Waste PCB Concentration PCB Mass PCB Out-Of-Service Date	WSPF or AK Summary Report VE BDR, RTR BDR, or AK Tracking Spreadsheet (Remediated/no liquid allowed – Bulk/liquid allowed)
Aqueous Material Beryllium (Be) < or equal to 100 kg Be < or equal to 1% Be Present Machine Compacted	AK Tracking Spreadsheet or AK Summary Report
Closure Date	AK Tracking Spreadsheet, Remediated Drum Spreadsheet, IDC, FGA BDR
Vent Date	AK Tracking Spreadsheet, Remediated Drum Spreadsheet, IDC, FGA BDR
Filter Install Date Filter Manufacturer Filter Model Number Number of Filters Installed	FGA BDR, VE BDR, AK Tracking Spreadsheet, Remediated Drum Sheet, Drum Filter Change Out Form, or Container Inspection Report, SLB2 Vent Configuration Sheet
Waste Gen Date Filter Reduction Date Reduced Filter Model	AK Tracking Spreadsheet
Aspiration Method ID	FGA BDR, TRAMPAC-II, TRAMPAC-III Default Method IDs: T – LTO containers and 3 – general containers
Gas Generation Rate Hydrogen/Methane Gen. Rate Generation Completion Date	GGT BDR, Long Term Objective (LTO) as applicable
Gross Weight	VE BDR, Radiography BDR, CCP-TP-120, *CCP Container Management* (Operational Readiness Review [OSR] only),
Gross Weight Uncertainty	2.3 kg for drums, 16.3 kg for SWBs, and 90.7 kg for (Standard Large Box 2) SLBs may be entered as the bounding case where actual measurement data are not readily available
Alpha Surf Cont Beta/Gamma Surf Cont Neutron Dose Rate Beta/Gamma Dose Rate	Radiological Control Technician (RCT) Report (When either NDA, MDA, or ND is recorded for Alpha and Beta/Gamma surface contamination, record 19 and 199 respectively on the spreadsheet)
Radionuclide Data Radionuclide Activity (curie [Ci] Activity Uncertainty (Ci) **Assay Method Data** Radioassay Method Data Package Number Assay Date (actual assay date)	 Radioassay BDR, Radiological Characterization BDR Note – NDA uncertainties must be reported to the WWIS/WDS at 1-sigma. Verify the data to be submitted to WWIS/WDS is at 1-sigma. Certification Letters or Certified Equipment List, Radioassay BDR, Radiological Characterization BDR
Material Parameter Data WMP Weight of Material Parameter	 VE BDR or Radiography BDR, AK Summary Report

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Table 1. Data Sources for the WDS Spreadsheet (Continued)

Field Label	Source
Characterization Method Data Charz Method ID Data Package Number Charz Method Date	RTR, VE BDR, Certification Letters or Certified Equipment List
Hazardous Waste Numbers Data Hazardous Waste Numbers	WSPF or AK Summary Report
Sample Type Layer No. Sampled Date Sampled Method ID Data Package Number	FGA BDR, OSR AK Summary Report, Certification Letter, Certification Equipment List
Analyte	FGA BDR, OSR AK Summary Report, Certification Letters, or Certified Equipment List Analytical BDR
Concentration (% volume [vol.], milligram/kilogram [mg/kg], parts per million [ppm]) Date Analyzed	FGA BDR, OSR AK Summary Report
Reporting Flag D Reporting Flag U Reporting Flag N/A	FGA BDR, OSR AK Summary Report

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Attachment 1 – Entering of Content Code and Shipping Category into the WWIS/WDS

1. INTRODUCTION

This attachment describes the steps used to enter assigned Content Codes into the WDS Spreadsheet using various sources of characterization data. Entering the Content Code is performed by the waste certification staff based on the waste material contents and the layers of packaging used for each container. Content Code assignment is reviewed and approved by the WCO during container certification.

2. ASSIGNING THE NUMERIC VALUE

Assign the Content Code based on the container waste stream assignment. The Content Code identified in AK will be confirmed by RTR and VE when performed, and to confirm the absence of incompatible waste in the waste stream. Enter the Content Code in WDS Spreadsheet.

3. ASSIGNING A LETTER DESIGNATOR FOR LEGACY WASTE

For retrievably-stored waste, the letter designator of the Content Code is assigned using packaging information from the following sources which are listed in order of priority of usage:

- VE BDRs, if available
- If RTR information is undetermined, use the default assignment given in (or determined from) the AK Summary Report for the applicable waste stream

4. OTHER

For waste packaged under a DOE CBFO audited and approved certification program (newly generated waste exempted from RTR), use the Content Code assigned in the packaging documents.

5. SHIPPING CATEGORY

After selection of appropriate Content Code using the CH-TRUCON or TRUCON-III, assign the Shipping Category number and document on the WDS Spreadsheet.

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Attachment 2 – WCO Waste Certification Requirements

Acceptable Container 55-gallon drums 85-gallon drums 100-gallon drums S100 POC S200 POC S300 POC SWB TDOP Standard Large Box 2 (SLB2) Shielded Container Assembly (SCA)
Gross Weight Limit 55-, 85- and 100-gallon drum – 1000lbs (453.6kg) 6" pipe POC- 328lbs (148.7kg) 12" pipe POC and gamma neutron shielded 12" pipe - 547lbs (248.7kg) S100 POC- neutron shielded 6" pipe - 550lbs (249.4kg) S200, S200B and S300 POC-547lbs (248kg) SWB – 4000lbs (1814.1kg) TDOP – 6700lbs (3038.5kg) SLB2 – 10500lbs (4761.9kg) SCA-2260lbs (1024.9kg)
Surface Contamination <20 (dpm)/100 cm^2 alpha & <200 dpm/100 cm^2 beta-gamma
Liner (if present) punctured filtered
Properly aspirated/ filter vents See CH-TRUCON document for all container types except SLB2 See TRUCON-III document for SLB2
Ten Required Isotopes AM-241; PU-238, -239, -240, -242; U-233, -234, -238; Sr-90; Cs-137. -1 value for LLD if expected. 0 value for LLD if not expected.
Pu-239 FGE + 2X error (Be ≤ 1 wt. %) ≤ 200 55-(excluding pipe overpacks), 85-, 100-gallon drum or SCA ≤ 325 SWB, TDOP, SLB2 ≤ 5 Kg Be & ≤ 200 55-gallon drum pipe overpack See WAC for machine compacted limits
Pu-239 FGE + 2X error (Be > 1 wt. %) ≤ 100 55- (excluding pipe overpacks), 85-, 100-gallon drum (up to 100kg) ≤ 100 SWB, TDOP, SLB2 (Be from AK) ≤ 140 Pipe overpacks (S100, S200 or S300 pipe overpack) See WAC for machine compacted limits
Be prohibited > 100 Kg/55-gallon Be > 18.14kg SWB, TDOP, SLB2 (Be from AK) >1% by weight SCA
Pu-239 Equiv. Activity (PE-Ci) ≤ 80 Drum (55-, 85-. and 100-gallon), Shielded Container ≤ 560 (SWB, SLB2 direct load) ≤ 800 (TDOP Direct Load) ≤ 1100 (good 55-gallon drum overpacked into 85-gallon drum) ≤ 1200 (good SWB into TDOP) ≤ 1200 (overpacked 55, 85 undamaged into SWB, TDOP) ≤ 1800 (pipe overpacks, S100, S200, S300) ≤ 1800 all solidified/vitrified waste

Attachment 2 – WCO Waste Certification Requirements (Continued)

Radiation Dose Equivalent < 200 millirem per hour (mrem/hr) contact <179 mrem/hr S100 pipe overpack <155 mrem/hr S300 pipe
Pyrophorics ≤1 % by weight (Radioactive) Non-radioactive pyrophorics – prohibited
Hazardous Waste Codes permitted for disposal at WIPP D001, D002 or D003 are not acceptable at WIPP
No explosives
No corrosives
No pressurized containers
PCBs Not all sites approved removed service date (Out-of-Service date), mass, type of waste (remediated or bulk)

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CCP-TP-033

Revision 22

CCP
Shipping of
CH TRU Waste

EFFECTIVE DATE: 05/29/2014

Mike Ramirez

PRINTED NAME

APPROVED FOR USE

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RECORD OF REVISION

Revision Number	Date Approved	Description of Revision
2	12/17/2001	Addition of Attachment 6 - Container Integrity Checklist and other minor changes throughout procedure.
3	05/20/2002	The procedure is updated to the requirements of Rev 19 of the TRAMPAC and compatibility to the WAC DOE/WIPP 02-3122
4	06/26/2003	Revised sections 3.1.4, 4.1, and 4.2, added section 3.4, and other minor editorial changes. Revised CCP-TP-033-A1. Separated electronically fillable forms and updated references in procedure.
5	09/19/2003	Added reference DOE/WIPP 02-3220, *CH Packaging Operations for High Wattage Waste at LANL.*
6	10/12/2004	Revised to incorporate more generic title descriptions to accommodate the use of different titles at the sites. Added fillable forms back into procedure.
7	11/22/2004	Incorporation of CH-TRAMPAC Revision 1 requirements.
8	01/25/2005	Incorporation of requirements for controlled shipments.
9	03/23/2005	Incorporated changes to support the newly required requirements in DOE/WIPP 02-3184 Rev. 2.
10	02/01/2006	Revised to incorporate *CH-TRAMPAC*, Revision 2 requirements and *TRUPACT-II Safety Analysis Report*, Revision 21 requirements, and other editorial changes throughout procedure.
11	11/16/2006	Revised to implement the Waste Isolation Pilot Plant Hazardous Waste Facility Permit-requirements resulting from the Section 311/Remote-Handled (RH) Permit Modification Request (PMR). Revised to implement confirmation activities and to consolidate transportation Waste Isolation Pilot Plant Waste Information System (WWIS) steps from CCP-TP-030, *CCP TRU Waste Certification and WWIS Data Entry.* Addressed Carlsbad Field Office (CBFO) Document Review Record (DRR) comments.
12	03/07/2007	Added reference to 40 CFR Part 761, Subpart C § 761.40, Marking of PCBs and PCB Items.

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RECORD OF REVISION (Continued)

Revision Number	Date Approved	Description of Revision
13	03/28/2008	Revised to implement the new Waste Isolation Pilot Plant (WIPP) Waste Acceptance Criteria (WAC) requirements and editorial changes. Also for the implementation of Advanced Mixed Waste Treatment Project (AMWTP) process.
14	11/05/2008	Revised to incorporate a second drum label verification as required by Central Characterization Project (CCP) Corrective Action Report (CAR)-LANL-0004-08. Also, revised to incorporate editorial changes and updates from shipping requirements.
15	07/08/2009	Revised based on changes in Revision 3 of the *CH-TRAMPAC* from the U.S. Nuclear Regulatory Commission (NRC). Editorial changes were also made. Polychlorinated Biphenyls (PCBs) checks added.
16	12/11/2009	Revised to incorporate Waste Data System (WDS) operations. Editorial changes were also made.
17	05/18/2010	Revised to align procedure with modifications made to the WDS system, and editorial corrections.
18	12/29/2010	Minor revision to update references to the *Waste Isolation Pilot Plant Hazardous Waste Facility Permit*.
19	05/23/2011	Revised to incorporate TRUPACT-III Shipping Certification
20	06/19/2013	Revised to incorporate Nuclear Waste Partnership (NWP) transition changes.
21	02/18/2014	Revised to incorporate action required by Waste Isolation Pilot Plan (WIPP) Form ACT 13-304-6.
22	05/29/2014	Revised to incorporate action required by Waste Isolation Pilot Plant (WIPP) Form ACT 14-051.

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1.0 PURPOSE

This procedure establishes requirements for assembling transuranic (TRU) waste payloads and performance of shipments in contact-handled (CH) packaging containers and ensures that the requirements of one of the following are met (as applicable):

- CCP-PO-003, *CCP Transuranic Authorized Methods for Payload Control (CCP CH-TRAMPAC)*
- CCP-PO-050, CCP TRUPACT-III, *TRU Waste Authorized Methods for Payload Control (CCP TRUPACT-III TRAMPAC)*
- U.S. Department of Energy (DOE) Carlsbad Field Office (CBFO) audited/approved site-specific CH TRU Waste Authorized Methods Payload Control (CH-TRAMPAC)

1.1 Scope

This procedure applies to the personnel who conduct the following transportation functions:

- CH packaging payload container and assembly verification.
- Assembling and loading the CH packaging containers.
- Reviewing shipping paper, marking, labeling, and placarding associated with each shipment of CH TRU waste transported in CH packaging containers by the Central Characterization Program (CCP).
- Radiological Control Technician (RCT) or equivalent position functions associated with CH packaging and transportation operations.

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2.0 REQUIREMENTS

2.1 References

Baseline Documents

- Appendix to 40 *Code of Federal Regulations* (CFR), *Protection of Environment,* Part 262, *Standards Applicable to Generators of Hazardous Waste, Uniform Hazardous Waste Manifest and Instructions* (EPA Forms 8700-22 and 8700-22A and their instructions)
- CCP-PO-001, *CCP Transuranic Waste Characterization Quality Assurance Project Plan*
- CCP-PO-002, *CCP Transuranic Waste Certification Plan*
- CCP-TP-030, *CCP CH TRU Waste Certification and WWIS/WDS Data Entry*
- DOE/WIPP 01-3194, *CH-TRU Waste Content Codes* (*CH-TRUCON*)
- DOE/WIPP 02-3122, *Transuranic Waste Acceptance Criteria for the Waste Isolation Pilot Plant*
- DOE/WIPP 02-3183, *CH Packaging Program Guidance*
- DOE/WIPP 02-3185, *CH Packaging Maintenance Manual*
- DOE/WIPP 11-3456, *TRUPACT-III Program Guidance*
- DOE/WIPP 11-3458, *TRUPACT-III Content Codes (TRUCON-III)*
- 40 CFR Part 262, *Standards Applicable to Generators of Hazardous Waste*
- 40 CFR Part 262, Subpart B, *The Manifest* § 262.20, *General Requirements*
- 40 CFR Part 262, Subpart C*, Pre-Transport Requirements*
- 40 CFR Part 761, *Polychlorinated Biphenyls (PCBs) Manufacturing, Processing, Distribution in Commerce, and Use Prohibitions: Subpart C Marking of PCB's and PCB Items* § 761.40

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- 49 CFR, *Transportation,* Part 172, *Hazardous Materials Table, Special Provisions, Hazardous Materials Communications, Emergency Response Information, Training Requirements, and Security Plans Subpart C* § 172.200, *Applicability*

- 49 CFR Part 172 Subpart H § 172.704, *Training Requirements*

- 49 CFR 172, Subpart G, *Emergency Response Information*

- 49 CFR Part 173, *Shippers – General Requirements for Shipments and Packagings,* Subpart I, *Class 7 Radioactive Materials* § 173.401 through 173.476

- *Safety Analysis Report for the TRUPACT-II Shipping Package* (SARP) (Docket 9218, Washington, D.C., U.S. Nuclear Regulatory Commission [NRC])

- *Safety Analysis Report for the HalfPACT Shipping Package* (SARP) (Docket 9279, Washington, D.C., U.S. NRC)

- Safety Analysis Report for the TRUPACT-III Shipping Package (SARP) (Docket 71-9305, Washington, D.C., U.S. NRC)

Referenced Documents

- CCP-PO-003, *CCP Transuranic Authorized Methods for Payload Control (CCP CH-TRAMPAC)*

- CCP-PO-050, *CCP* TRUPACT-III*, TRU Waste Authorized Methods for Payload Control (CCP TRUPACT-III TRAMPAC)*

- CCP-QP-002, *CCP Training and Qualification Plan*

- CCP-QP-008, *CCP Records Management*

- *CH TRU Payload Appendices*

- DOE/WIPP 02-3184, *CH Packaging Operations Manual*

- DOE/WIPP 11-3451, *TRUPACT-III Operations Manual*

- DOE/WIPP 02-3220, *CH Packaging Operations for High-Wattage Waste*

- 10 CFR Part 21, *Reporting of Defects and Noncompliance*

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- 10 CFR Part 71, *Packaging and Transportation of Radioactive Materials*
- 40 CFR Part 262, Subpart B, *The Manifest*
- 40 CFR Part 262, Subpart C § 262.31, *Labeling*
- 40 CFR Part 262, Subpart C § 262.32, *Marking*
- 40 CFR Part 262, Subpart C § 262.33, *Placarding*
- 40 CFR Part 268, *Land Disposal Restrictions*, Subpart A, *General*
- 40 CFR Part 761, Subpart C § 761.40, *Marking Requirements*
- 49 CFR Part 172, Subpart C, *Shipping Papers* § 172.201 through 172.205
- 49 CFR Part 172, Subpart D, *Marking* § 172.300 through 172.338
- 49 CFR Part 172, Subpart E, *Labeling* § 172.400 through 172.450
- 49 CFR Part 172, Subpart F, *Placarding* § 172.500 through 172.560
- TRANSCOM 2000 Designated User Handbook
- DOE/WIPP-09-3427, *Waste Data System User's Manual*

2.2 Training Requirements

2.2.1 Personnel performing this procedure will be trained and qualified in accordance with CCP-QP-002, *CCP Training and Qualification Plan,* prior to performing this procedure.

2.2.2 CCP Transportation Certification Officials (TCOs) completing the Payload Container Transportation Certification Documents (PCTCDs), Overpack Payload Container Transportation Certification Documents (OPCTCDs), and Payload Assembly Transportation Certification Documents (PATCDs), Payload Transportation Certification Documents (PTCD), as required by this procedure, are qualified in accordance with CCP-QP-002 prior to performing this procedure.

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2.3 Equipment List

2.3.1 None.

2.4 Precautions and Limitations

2.4.1 Nonconformances related to defects or failure to comply with requirements applicable to NRC-licensed packaging (e.g., TRUPACT-II, TRUPACT-III, HalfPACT) shall be reported to the CBFO Office of National TRU Program. The Waste Isolation Pilot Plant (WIPP) management and operating (M&O) contractor will evaluate issues and nonconformances for reporting to the NRC under 10 CFR Part 21, *Reporting of Defects and Noncompliance*, or 10 CFR Part 71, *Packaging and Transportation of Radioactive Materials*, and provide the results of this evaluation to CBFO.

2.4.2 TRUPACT-II/HalfPACT payload containers must have filter vents installed as specified in Section 2.5 of CCP-PO-003.

2.4.3 TRUPACT-III, Standard Large Box 2 (SLB2) payloads must have filter vents installed as specified in Section 2.4 of CCP-PO-050.

2.4.4 TRUPACT-II/HalfPACT Dunnage Containers

[A] Dunnage containers used for payload assembly shall have open vent ports (not filtered or plugged).

[B] Dunnage containers used for payload assembly shall be labeled either Dunnage or Empty.

[C] Dunnage shall have a unique serial number. If dunnage constitutes any of the following: seven packs, four packs, three packs, or standard waste box (SWBs), then the unique serial number is **NOT** required.

[D] Dunnage containers shall meet the requirements of Section 2.2 of CCP-PO-003.

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2.4.5 Radiation Dose Rates and Removable Surface Contamination

[A] The external radiation dose rates of individual payload containers and a loaded CH package to be shipped shall be less than or equal to 200 millirem/hour (mrem/hr) at the surface, and less than or equal to 10 mrem/hr at two meters for beta/gamma and neutron.

[B] Removable surface contamination of individual payload containers and a loaded CH package to be shipped to the WIPP shall **NOT** be greater than 20 disintegrations per minute (dpm)/100 centimeters square (cm^2) for alpha emitting radionuclides and 200 dpm/100 cm^2 for beta/gamma emitting radionuclides.

2.4.6 Controlled Shipments

[A] TRUPACT-II, For High-Wattage Waste Shipments, attachments from DOE/WIPP-02-3220, *CH Packaging Operations for High-Wattage Waste,* will be used to control and document loading, transport, and unloading times.

[B] For all other CCP Controlled TRUPACT-II Shipments, Attachment 1, CCP Shipping Site Control Checklist for Controlled Shipments, and Attachment 2 or equivalent, CCP Receiving Site Control Checklist for Receipt of Controlled Shipments, will be used to control and document loading, transport, and unloading times.

[C] For CCP Controlled TRUPACT-III Shipments, (Attachment 7, [TRUPACT-III] CCP Shipping Site Control Checklist for Controlled Shipments, and Attachment 8, [TRUPACT-III] CCP Receiving Site Control Checklist for Controlled Shipments), or equivalent, CCP Receiving Site Control Checklist for Receipt of Controlled Shipments, will be used to control and document loading, transport, and unloading times.

[D] Receipt sites may use CBFO-approved site-specific Controlled Shipment Receipt Forms in place of Attachment 2 and/or 8 (as applicable), provided that the same information is recorded and a completed copy is returned to the applicable TCO.

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2.5 Prerequisite Actions

2.5.1 Ensure that workers who will be working in a radiation area have read the applicable Radiation Work Permit (RWP) or equivalent site-specific document.

2.6 Definitions

2.6.1 **CH Package** – TRUPACT-II, TRUPACT-III, or HalfPACT

2.6.2 **Generator** – The organization/individual that generated the waste and/or is offering the waste for transport.

2.6.3 **Land Disposal Restrictions (LDR) Notification** – Notification to a receiving facility that the waste is subject to Land Disposal Restrictions (LDR) (from 40 CFR, Part 268, *Land Disposal Restrictions*, Subpart A, *General*).

2.6.4 **Shipper** – Authorized personnel who declare, by signing the shipping paper, that the contents of the package are fully and accurately described, packaged, labeled/placarded, and proper for conditions of transport per appropriate regulations.

2.6.5 **Shipping Paper** – Uniform Hazardous Waste Manifest (UHWM) or Straight Bill of Lading-Short Form. The shipping paper accompanies the waste during transportation.

2.6.6 **Straight Bill of Lading-Short Form** – Shipping paper used to transport non-mixed radioactive TRU waste.

2.6.7 **Uniform Hazardous Waste Manifest (UHWM)** – The U.S. Environmental Protection Agency (EPA) Form 8700-22 prepared by a generator who transports or offers for transportation hazardous waste for off-site treatment, storage, or disposal (from 40 CFR Part 262, Subpart B, *The Manifest*).

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3.0 RESPONSIBILITIES

3.1 Transportation Certification Official (TCO)

3.1.1 Interfaces and coordinates with the generator, shipper, Site Project Manager (SPM), Waste Certification Official (WCO), CCP Quality Assurance (QA), and CCP Operations Leaders to plan payloads for shipment.

3.1.2 Documents and certifies that containers prepared for shipments in CH packaging meet specified shipping criteria using the PCTCD, PATCD, PTCD, and OPCTCD spreadsheets and the Waste Data System (WDS) as appropriate.

3.1.3 Reviews payload certification documentation to ensure compliance with the applicable CCP CH-TRAMPAC requirements or a CBFO audited/approved site-specific CH-TRAMPAC.

3.1.4 Requests and obtains approval/authority from WIPP to effect WIPP shipments.

3.1.5 Provides the necessary TRU waste shipping data to the Host site Shipping Coordinator.

3.1.6 Ensures all manifests and shipping papers are correct, as required.

3.1.7 Ensures all labeling, marking, and placarding is correct, as required.

3.1.8 Provides PATCDs, PTCDs, and/or WDS Reports to the CCP CH Packaging and Transportation Team.

3.2 Radiological Control Technician (RCT) or Equivalent Position

3.2.1 Provides contamination and radiation surveys to the TCO for shipment certification purposes.

3.3 CCP CH Packaging and Transportation Team

3.3.1 Ensures the payload assembly and CH Packaging Containers are prepared in accordance with this procedure.

3.3.2 Ensures visible container identification (ID) labels, within a payload assembly, are an exact match to the ID numbers listed on the applicable PATCD or PTCD (as applicable).

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3.4 Host Site Shipping Coordinator

3.4.1 Interfaces with TCO and acts as the site point-of-contact (POC) for operations, manifesting, and release of shipments.

3.4.2 Assists TCO in scheduling and facilitating TRU waste shipments.

3.4.3 Provides data received from TCO to the Host site transportation and material control/accountability groups (as applicable).

3.5 State Motor Vehicle Department (SMVD)

3.5.1 Performs Commercial Vehicle Safety Alliance (CVSA) inspections of the tractor, trailer, and CH packages.

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4.0 PROCEDURE

NOTE

The WDS utilizes edit and limit checks when data is entered and selected. The WDS steps in Section 4.1 may be repeated until payloads and shipping compliance is satisfied.

NOTE

Steps in this procedure may be performed in parallel as applicable.

NOTE

Steps in this procedure are performed by the TCO, unless another group/discipline is mentioned in the step or a note preceding the step.

NOTE

Trained and qualified TCOs perform the WDS operation per the guidance found in DOE/WIPP-09-3427, *Waste Data System User's Manual*. The WDS manual is NOT required to be opened when performing the task listed below, but shall be available if questions arise.

NOTE

Contact Information of organizations called out in this procedure are listed as follows. Specific email addresses can be obtained by contacting the numbers below:

WIPP Shipment Scheduler 575-234-8993 or 575-234-8230

WIPP Transportation Group 575-234-8993 or 575-234-8230

WIPP RCT Group 575-234-8657

WIPP Central Monitoring Room (CMR) 575-234-8863 or 575-234-8640

FAX notifications can be made in lieu of emails if needed. FAX numbers can be obtained by contacting the specific group.

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4.1 WDS Data Entry/CH Shipment Certification

NOTE
Step 4.1.1 is only performed if dunnage is required for the payload. No dunnage is required for SLB2, TRUPACT-III shipments.

4.1.1 Creating Dunnage Container(s) using WDS

[A] Enter the following information into the WDS for each dunnage container:

- Unique container number
- Current Location (Site ID)
- Shipping Program (Site ID)
- Container Type

4.1.2 Creating Payloads Using the WDS

[A] Select the NEW button to create/generate a Payload Plan ID.

[B] For each payload enter the following information in the WDS:

- Payload Number
- Payload Container Type
- Current Location (Site ID)
- Destination Site (Site ID)
- Shipping Program (Site ID)

[C] For TRUPACT-II/HalfPACT, select payload container(s) until a CCP-PO-003 compliant payload is obtained.

[D] For TRUPACT-III, select payload container (SLB2) until a CCP-PO-050 compliant payload is obtained.

[E] Select the accept button.

[F] Select the submit button.

[G] Generate PCTCDs, preliminary PATCDs, PTCD, and OPCTCDs (as applicable).

[H] Review PCTCD, preliminary PATCD, PTCD, and OPCTCD reports (as applicable), **AND** confirm that all container/payload certification parameters have been met.

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[I] Generate Payload Certification Parameter Details (PCPD) report.

[J] Review PCPD report, and confirm that all payload certification parameters have been met.

NOTE

Containers designated for Controlled Shipment must be marked accordingly on PCTCD and applicable PATCD or PTCD (Controlled Shipment designated container(s) assigned to payload); Attachment 1 or 7 will be initiated for the applicable CH package/shipment (as applicable).

NOTE

The applicable certification document; PATCD or PTCD are signed after the TRUPACT-IIs/HalfPACTs or TRUPACT-IIIs are loaded so that the final information is entered into the WDS.

[K] For TRUPACT-II/HalfPACTs, once container/payload parameter requirements have been met, sign and initial the PCTCD and OPCTCD (if applicable) reports, as required, certifying that CCP-PO-003 requirements have been satisfied.

NOTE

For TRUPACT-II/HalfPACTs, once a CCP-PO-003 compliant payload assembly is approved, the payload is physically assembled (SWBs, drums, and shielded containers) in accordance with DOE/WIPP 02-3184, *CH Packaging Operations Manual,* or DOE/WIPP 02-3220, as applicable, and this procedure.

4.1.3 Creating Shipments Using the WDS

[A] Enter the following information into the WDS:

- Shipment Number (From WIPP 8-week Rolling Schedule)
- Shipping Program (Site ID)
- Current Location (Site ID)
- Destination Site (Site ID)

[B] For TRUPACT-II/HalfPACTs, select payloads until a CCP-PO-003 compliant payload set is obtained.

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[C] For TRUPACT-III, select payload (SLB2) compliant with CCP-PO-050.

NOTE
Once the submit button is selected, the confirmation process for the shipment, is activated.

[D] Once the virtual CCP-PO-003 or CCP-PO-050 (as applicable) compliant shipment is built, select Save then select the submit button.

NOTE
Transporter, Tractor, Trailer, and CH Package numbers are obtained from the WIPP Equipment Assignment email, generated by the WIPP Transportation Group. Default values contained in the WDS system are used for Handling Material Weights and Uncertainty. Handling Material weights uncertainty is left blank in the WDS system.

[E] When the following becomes available, enter the information into the WDS:

- Transporter Name
- Tractor Number
- Trailer Number
- CH Package Number(s)
- Handling Material Weights (if applicable)

[F] For controlled or High Wattage Shipment, email the WIPP Shipment Scheduler of impending shipment.

4.1.4 Finalizing Shipments Using the WDS

[A] Enter the following information into the WDS:

- Manifest Number

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- Outer Containment Assembly (OCA) Lid Number (for each TRUPACT-II or HalfPACT) from DOE/WIPP-02-3184, Attachment 2, CH Packaging Loading Data Sheet, or DOE/WIPP-02-3220, Attachment 2, High-Wattage CH Packaging Loading Data Sheet, as applicable.

- Closure Lid (CL) number for TRUPACT-III, from DOE/WIPP-11-3451, *TRUPACT-III Operations Manual,* Attachment 2, TRUPACT-III (Loaded) Shipment data sheet.

- Inner Containment Vessel (ICV) closure date and time for each TRUPACT-II or HalfPACT, from DOE/WIPP-02-3184 Attachment 2, CH Packaging Loading Data Sheet, or DOE/WIPP-02-3220, Attachment 2, High-Wattage CH Packaging Loading Data Sheet, as applicable.

- CL closure date and time for TRUPACT-III, from DOE/WIPP 11-3451, Attachment 2, TRUPACT-III (Loaded) Shipment data sheet.

- Dose Rate Surface (mrem/hr) (for each CH Package) from Radiological Survey Report.

- Dose Rate 1-meter (mrem/hr) (for each CH Package) from Radiological Survey Report.

- Dose Rate 2-meters (mrem/hr) (for each CH Package) from Radiological Survey Report.

- Alpha contamination survey results in dpm (for each CH Package) from Radiological Survey Report.

- Beta/gamma contamination survey results in dpm (for each CH Package) from Radiological Survey Report.

- U.S. Department of Transportation (DOT) Description (for each CH Package) from Bill of Lading or UHWM.

- Reportable Quantity (RQ) or Highway Route Control Quantity (HRCQ) flag(s) (as applicable) from Bill of Lading or UHWM.

[B] Select Save.

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[C] Print final PATCD(s) or PTCD (as applicable).

[D] Review PATCDs or PTCD (as applicable), **AND** sign reports if all parameters are correct and in compliance with the appropriate TRAMPAC; CCP-PO-003 or CCP-PO-050.

[E] Enter the send date and time in WDS.

[F] Select the Finalize button to complete the WDS process.

4.2 Shipping Preparations

NOTE
E-mail notifications may be performed by Host site Shipping Coordinator.

4.2.1 Transmit the draft PATCDs or PTCD (as applicable), WDS Shipment Summary Report, and WDS Shipment Data report to the Host site Shipping Coordinator for preparation of shipping papers.

4.2.2 Host site Transportation Personnel, develop shipping papers.

4.2.3 Host site Shipping Coordinator, provide TCO with draft copy of shipping paper and RadCalc work sheets (or equivalent).

4.2.4 Review the shipping documentation (Bill of Lading or UHWM) in accordance with 49 CFR Part 172, Subpart C, *Shipping Papers*.

NOTE
Completion of an LDR is necessary only for each initial shipment of a mixed waste stream. The LDR is completed in accordance with 40 CFR Part 268.

4.2.5 Complete Attachment 3, Land Disposal Restriction Exemption Notification.

4.2.6 Print name, sign, date, and initial Attachment 3.

4.2.7 Provide copy of Attachment 3 to Host site Shipping Coordinator.

4.2.8 Host site Shipping Coordinator, attach copy of Attachment 3 to the shipping papers.

4.2.9 As soon as available, prior to releasing the shipment, email a copy of the Draft Manifest to the WIPP Transportation group.

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NOTE
If the Transportation Tracking and Communications (TRANSCOM) system is out of service, secondary shipment protocol is followed, as directed by the WIPP Transportation group. Step 4.2.10 can be omitted.

4.2.10 Prior to releasing the shipment to the carrier prepare the TRANSCOM system by entering a Draft Bill of Lading or UHWM in TRANSCOM per the guidance found in the TRANSCOM 2000 Designated User Handbook.

4.2.11 E-mail Draft Bill of Lading or UHWM to TRANSCOM. TRANSCOM email is transcom@transcom.energy.gov.

4.2.12 Host site Shipping Coordinator, notify the applicable State Motor Vehicle Department (SMVD) at least 24-hours prior to releasing a shipment.

[A] Request the performance of a (CVSA) inspection at the Host site of the trailer, tractor, and loaded CH Packaging Containers.

4.3 Inspections and Loading Operations

4.3.1 Verify that the payload containers are DOT Type 7A or equivalent (17C, 17H, UN1A2).

NOTE
The specific filter information is listed on the applicable PCTCD or OPCTCD.

4.3.2 For TRUPACT-II/HalfPACTs, verify filter vents, as specified in Section 2.5 of CCP-PO-003 and Section 6.12 of *CH TRU Payload Appendices* (as applicable), are installed in payload containers.

4.3.3 For TRUPACT-III verify filter vents as specified in Section 2.4 of CCP-PO-050 are installed in the SLB2.

4.3.4 Perform Container Integrity Inspection on each payload container identified for shipment per Attachment 5, CCP Container Integrity Checklist.

4.3.5 Print name, sign, and date Attachment 5.

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4.3.6 Ensure the following labels are clearly marked on each payload container:

[A] Unique Identification Number (Bar Code)

- Minimum three (3) per 55-gal., 85-gal., 100-gal. drum, and shielded overpack
- Minimum two (2) per SWB
- Minimum one (1) per ten-drum overpack (TDOP)
- Minimum one (1) per SLB2

[B] Caution Radioactive Material Label

[C] Hazardous Waste label, if applicable

[D] Polychlorinated Biphenyls (PCB) label, if applicable

NOTE

The dunnage container(s) SHALL be labeled with a unique identification number. Exception: seven packs, four packs, three packs, or SWBs, are **NOT** required to be numbered uniquely. All dunnage containers SHALL also be labeled Dunnage or Empty. Dunnage containers are labeled in accordance with site-specific procedures.

4.3.7 For each TRUPACT-II/HalfPACT CH Package that has a dunnage container, complete Attachment 4, CCP Dunnage Certification Statement.

4.3.8 Print name, sign, date, and initial Attachment 4.

4.3.9 Ensure that each waste container is checked to see that there are **NO** Hold Tags attached.

[A] **IF** a Hold Tag is found,
THEN determine the disposition to ensure that the container is acceptable for shipping.

4.3.10 Host site RCT **OR** equivalent position, provide Container Contamination Survey Report(s) to the TCO.

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NOTE
Host site personnel may assemble payload containers under the direction of the TCO or a CCP CH Packaging and Transportation team member.

4.3.11 Provide the PATCDs or PTCD to the CH Packaging and Transportation Team.

4.3.12 For TRUPACT-II/HalfPACT, record applicable Payload Pallet Identification Number or SWB Ratchet Strap Serial Numbers and inspection date on Attachment 6, Payload Accessories.

4.3.13 For TRUPACT-II/HalfPACT, CH Packaging and Transportation Team assemble the payload containers into a payload assembly in accordance with DOE/WIPP-02-3184, or DOE/WIPP-02-3220 (as applicable) or approved site-specific procedures.

4.3.14 Host site RCT **OR** equivalent position, provide dose rate survey of the payload assembly.

4.3.15 Perform the following:

[A] Verify from the applicable PATCD or PTCD (as applicable) that the selected container(s) within a payload are correct for the designated CH Packaging Container to be loaded.

[B] Verify that all of the visible container ID labels are an exact match to the ID numbers listed on the PATCD or PTCD (as applicable).

[C] Verify the absence of moisture (i.e., water, ice, snow) from the exterior of all payload containers within the assembled payload.

[D] Record on the payload the designated CH Packaging number, payload ID number, initial, and date.

[E] **IF** not already performed,
THEN provide PATCDs or PTCD (as applicable) to the CCP CH Packaging and Transportation Team.

4.3.16 CCP CH Packaging and Transportation Team, perform the following:

[A] Verify from the applicable PATCD or PTCD (as applicable) that the selected container(s) within a payload are correct for the designated CH Packaging Container to be loaded.

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[B] Verify that all of the visible container ID labels are an exact match to the ID numbers listed on the PATCD or PTCD (as applicable).

[C] Verify the absence of moisture (i.e., water, ice, snow) from the exterior of all payload containers within the assembled payload.

4.3.17 CH Packaging and Transportation Team, load the payload assembly into the CH Packaging Container(s) in accordance with DOE/WIPP 02-3184, DOE/WIPP 02-3220, or DOE/WIPP 11-3451 (as applicable).

NOTE

If High-Wattage shipments are loaded per DOE/WIPP 02-3220, then the attachments found in DOE/WIPP 02-3220 will be used.

4.3.18 Controlled Shipment Processing

[A] **IF** Controlled Shipment Payload, other than High-Wattage, **THEN** record applicable dates and times of ICV or CL lid (as applicable) installation on Attachment 1 or 7 (as applicable), **AND** ensure 24-hour Loading Time will not be exceeded.

[B] **IF** total loading time is calculated to be $\geq$ 24-hours, **THEN** vent the package, **AND** repeat the lid installation process.

4.3.19 Host site RCT **OR** equivalent position, provide the dose rate and contamination surveys of CH Packaging Container(s) exteriors to the TCO. Dose Rates readings: on Contact, 1-meter, and 2-meter, including Neutron contribution.

4.3.20 Review the survey report of the loaded CH Packaging Container(s), **AND** verify that the survey data meets applicable radiation/contamination requirements.

4.4 Shipping Completion

4.4.1 Host site Transportation personnel, perform marking, labeling, and placarding (if applicable) of the CH Packages and Transport Trailer.

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4.4.2 Ensure correct marking, labeling, and placarding (if applicable) per the following:

[A] Marking of CH Packaging Container shipments of CH TRU waste is conducted in accordance with 49 CFR Part 172, Subpart D, *Marking*, § 172.300 through 172.338; 40 CFR Part 262, Subpart C, § 262.32, *Marking*; and 40 CFR Part 761.40, Subpart C, *Marking Requirements.*

[B] Labeling of CH Packaging Container shipments of CH TRU waste is conducted in accordance with 49 CFR Part 172,Subpart E, *Labeling*, § 172.400 through 172.450; and 40 CFR Part 262, Subpart C, § 262.31, *Labeling.*

[C] Placarding of CH Packaging Container transport vehicles of CH TRU waste is conducted in accordance with 49 CFR Part 172, Subpart F, *Placarding*, § 172.500 through 172.560; and 40 CFR Part 262, Subpart C, § 262.33, *Placarding.*

4.4.3 Trucking company, attach tractor to trailer.

4.4.4 **IF** the shipment contains Controlled Shipment Packages, **THEN** provide the following to the Host site Transportation personnel (as applicable):

[A] For High-Wattage Shipments, a copy of Attachment 9 from procedure DOE/WIPP 02-3220.

[B] For Controlled Shipments, a copy of Attachment 1 or 7 (as applicable), from this procedure.

4.4.5 **IF** the shipment contains High Wattage Packages, **THEN** TCO's should contact the WIPP CMR for notification of impending High Wattage Shipment.

4.4.6 Host site Transportation personnel, sign the shipping documentation (Bill of Lading or UHWM) in accordance with 49 CFR Subpart C.

4.4.7 Host site Transportation personnel, provide carrier with appropriate shipping documentation package, including LDR (if applicable), and controlled shipment package attachments (if applicable).

4.4.8 SMVD, perform CVSA inspection of the tractor, trailer, and CH packages.

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4.4.9 Host site Transportation personnel, provide TCO with a signed copy of the shipping documentation (Bill of Lading or UHWM).

4.4.10 Ensure Shipment Radiological Information is emailed to WIPP RCT group.

4.4.11 **IF** the shipment contains Controlled Shipment Packages, **THEN** ensure Attachment 9 from DOE/WIPP 02-3220 or Attachment 1 or 7 (as applicable), from this procedure is emailed to WIPP Transportation.

4.4.12 For TRUPACT-II/HalfPACT, ensure Attachment 6 is emailed to WIPP Transportation.

4.4.13 For shipment finalization, complete Sections 4.1.4.

4.4.14 For TRUPACT-II/HalfPACT, ensure the PATCD's are signed to certify that the payload in each CH Packaging Container meets the requirements of the CCP CH-TRAMPAC, CCP-PO-003.

4.4.15 For TRUPACT-III, ensure the PTCD is signed to certify that the SLB2 in the CH Package meets the requirements of CCP CH-TRAMPAC, CCP-PO-050.

4.4.16 TCO **OR** Host Site Shipping Coordinator, contact WIPP CMR **AND** request to release shipment.

4.4.17 Once approval is granted, TCO or Host Site Shipping Coordinator, release shipment.

4.4.18 Change WDS status to "In Transit."

4.5 Shipment Receipt

NOTE

Receipt sites may use CBFO-approved site-specific Controlled Shipment or High-Wattage Receipt Attachments, provided that the same information is recorded **AND** a completed copy is returned to the applicable TCO.

4.5.1 **IF** the shipment contains Controlled Shipment Packages, **THEN** request the Receipt Site to email the following (as applicable) once the payloads are unloaded:

[A] For High-Wattage Shipments, completed Attachment 10 from procedure DOE/WIPP 02-3220, or site equivalent form.

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[B] For TRUPACT-II/HalfPACT controlled Shipments, completed Attachment 2 from this procedure, or site equivalent form.

[C] For TRUPACT-III controlled Shipments, completed Attachment 8 from this procedure, or site equivalent form.

4.5.2 **ONCE** the shipment status in WDS is “Shipment Received,” **THEN** send an email to the Host site Shipping Coordinator, stating shipment received with the date of receipt.

4.5.3 **ONCE** the shipping data entry is complete, **THEN** compile and submit items listed in Section 5.1.1, to CCP Records.

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5.0 RECORDS

5.1 Records generated during the performance of this procedure are maintained as QA records in accordance with CCP-QP-008, *CCP Records Management*. The records are the following:

NOTE

Records generated by DOE/WIPP 02-3184 or DOE/WIPP 02-3220 (see Section 3.1.5), as applicable are included in the Shipping Documentation Package.

QA/Nonpermanent

5.1.1 Shipping Documentation Package:

- PATCD, PCTCD, PTCD, OPCTCD Spreadsheet(s), as applicable
- WDS Shipment Summary Report
- Attachment 1, CCP Shipping Site Control Checklist for Controlled Shipments, if applicable
- Attachment 2, CCP Receiving Site Control Checklist for Receipt of Controlled Shipments (Receipt sites may use CBFO-approved site-specific Controlled Shipment Receipt Forms in place of Attachment 2), if applicable
- Attachment 3, Land Disposal Restriction Exemption Notification (initial shipment of a waste stream only)
- Attachment 4, CCP Dunnage Certification Statement (complete one statement for each group of dunnage containers)
- Attachment 5, CCP Container Integrity Checklist
- Attachment 6, Payload Accessories
- Attachment 7, (TRUPACT-III) CCP Shipping Site Control Checklist for Controlled Shipments
- Attachment 8, (TRUPACT-III) CCP Receiving Site Control Checklist for Controlled Shipments

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- Fax or email correspondence, if applicable
- Draft Bill of Lading or UHWM, if applicable

5.1.2 Radiological Surveys

- Dose Rate Survey Report
- Contamination Survey

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Attachment 1 – CCP Shipping Site Control Checklist for Controlled Shipments*

Shipment No. _____ Packaging No. _____

To be completed by CCP Transportation Certification Official, or designee, for each package designated as a controlled shipment.

Activity	Date	Time	Completion of Activity (Indicate by initials)
Record date and time of ICV lid installation from Attachment 2, DOE/WIPP 02-3184 *CH Packaging Operations Manual*.			
Record date and time the shipment containing the loaded package is ready to depart from the site.			
Calculate and record total Loading Time. (Limit = 24-hours)			
Total Loading time ≤ 1 day, sign and date below. *Total Loading Time > 1 day, STOP, vent package, and repeat closure process.*			
I certify the above data is accurate and compliant with the Loading Time limit of 24-hours, as specified in Section 6.2.3 of the CCP CH-TRAMPAC.			
Printed Name Signature Date Initials CCP Transportation Certification Official (or designee)			

*Control shipments (10 days) shall be made in accordance with the conditions specified in Appendix 3.6 of the *CH-TRU Payload Appendices* and CCP CH-TRAMPAC Section 6.2.3.

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Attachment 2 – CCP Receiving Site Control Checklist for Receipt of Controlled Shipments*

Shipment No. _____ Packaging No. _____

To be completed by designated Receiving Site Operations personnel for each package designated as a controlled shipment:

Activity	Date	Time	Completion of Activity (Indicate by initials)
Record date and time that the package was ready to depart from the shipping site (from data recorded on Attachment 1).			
Vent package within 9-days of date and time recorded above and record vent date and time.			
I certify the above data is accurate and compliant with the Unloading Time of 9-days, as specified in Section 6.2.3 of the CCP CH-TRAMPAC.			
Printed Name Receiving Site Personnel	Signature	Date	Initials

*Control shipments (10 days) shall be made in accordance with the conditions specified in Appendix 3.6 of the *CH-TRU Payload Appendices* and Section 6.2.3 of the CCP CH-TRAMPAC.

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Attachment 3 – Land Disposal Restriction Exemption Notification

The non-waste water identified in this shipment, Manifest Number _____, and bearing the EPA Hazardous Waste Number(s) listed below are exempted from the land disposal prohibitions of 20 NMAC 4.1, 268 because the waste is exempted by the WIPP Land Withdrawal Act. The Land Withdrawal Act also exempts this waste from the treatment standards in 20 NMAC 4.1, 268. This waste is **NOT** prohibited from land disposal.

EPA Hazardous Waste Number (No additional codes to those listed below can be accepted at the WIPP. Check only those that are included in this shipment.):

Waste Stream Profile Number: _____

☐	D004	Arsenic	05/08/92	☐	D038	Pyridine	09/19/96
☐	D005	Barium	08/08/90	☐	D039	Tetrachloroethylene	09/19/96
☐	D006	Cadmium	08/08/90	☐	D040	Trichloroethylene	09/19/96
☐	D007	Chromium	08/08/90	☐	D043	Vinyl Chloride	09/19/96
☐	D008	Lead	08/08/90	☐	F001	Spent Solvents	11/08/86
☐	D009	Mercury	05/08/92	☐	F002	Spent Solvents	11/08/86
☐	D010	Selenium	08/08/90	☐	F003	Spent Solvents	11/08/86
☐	D011	Silver	08/08/90	☐	F004	Spent Solvents	11/08/86
☐	D018	Benzene	09/19/96	☐	F005	Spent Solvents	11/08/86
☐	D019	Carbon Tetrachloride	09/19/96	☐	F006	Sludges	09/08/88
☐	D021	Chlorobenzene	09/19/96	☐	F007	cyanide salts	07/08/89
☐	D022	Chloroform	09/19/96	☐	F009	cyanide salts	07/08/89
☐	D026	Cresol	09/19/96	☐	P015	Beryllium Powder	08/08/90
☐	D027	1,4-Dichlorobenzene	09/19/96	☐	P030	Cyanides (soluble cyanide salts), not otherwise specified (H)	06/08/89
☐	D028	1,2-Dichloroethane	09/19/96	☐	P098	Potassium Cyanide (H)	06/08/89
☐	D029	1,1-Dichloroethylene	09/19/96	☐	P099	Potassium Silver Cyanide (H)	08/08/90
☐	D030	2,4-Dinitrotolune	09/19/96	☐	P106	Sodium Cyanide (H)	06/08/89
☐	D032	Hexachlorobenzene	09/19/96	☐	P120	Vanadium Pentoxide	08/08/90
☐	D033	Hexachlorobutadiene	09/19/96	☐	U002	Acetone	08/08/90
☐	D034	Hexachloroethane	09/19/96	☐	U003	Acetonitrile (I,T)	08/08/90
☐	D035	Methyl ethyl ketone	09/19/96	☐	U019	Benzene	08/08/90
☐	D036	Nitrobenzene	09/19/96	☐	U037	Chlorobenzene	08/08/90
☐	D037	Pentachlorophenol	09/19/96	☐	U043	Vinyl Chloride	08/08/90

Attachment 3 – Land Disposal Restriction Exemption Notification (Continued)

Waste Stream Profile Number: _____

☐	U044	Chloroform	08/08/90	☐	U226	1,1,1-Trichloroethane	08/08/90
☐	U052	Cresol	08/08/90	☐	U228	Trichloroethylene	08/08/90
☐	U070	1,2-Dichlorobenzene	08/08/90	☐	U239	Xylene	08/08/90
☐	U072	1,4-Dichlorobenzene	08/08/90	☐	[redacted]		
☐	U078	1,1-Dichloroethylene	08/08/90	☐			
☐	U079	1,2-Dichloroethylene (T) 156-60-5	08/08/90	☐			
☐	U103	Dimethyl Sulfate (T)	08/08/90	☐			
☐	U105	2,4-Dinitrotoluene (T) 121-14-2	08/08/90	☐			
☐	U108	1,4-Dioxane (T)		☐			
☐	U122	Formaldehyde	08/08/90	☐			
☐	U133	Hydrazine	08/08/90	☐			
☐	U134	Hydrofluoric Acid	08/08/90	☐			
☐	U151	Mercury	08/08/90	☐			
☐	U154	Methanol	08/08/90	☐			
☐	U159	Methyl Ethyl Ketone	08/08/90	☐			
☐	U196	Pyridine	08/08/90	☐			
☐	U209	1,1,2,2-Tetrachloroethane	08/08/90	☐			
☐	U210	Tetrachloroethylene	08/08/90	☐			
☐	U220	Toluene	08/08/90	☐			

TCO:

Printed Name/Signature	Date	Initials

REFERENCE:

20 NMAC 4.1, 268.7(a) (3)
OCT. 30, 1992–Public Law 102-579 as amended Sept. 23, 1996–Public Law 104-201, Subtitle F
WIPP Hazardous Waste Facility Permit, Attachment C-5a (2)
WIPP Hazardous Waste Facility Permit, Part 2, Table 2.3.4, Permitted TRU Mixed Wastes

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Attachment 4 – CCP Dunnage Certification Statement

Payload ID _____

Record dunnage container numbers.

_____	_____
_____	_____
_____	_____
_____	_____
_____	_____
_____	_____
_____	_____

	Acceptance Criteria	**Initials**
Container Type	55-gal. drum, 85-gal. drum, 100-gal. drum, or SWB (circle one)	
Surface Contamination	<20 dpm/100 cm^2 alpha <200 dpm/100 cm^2 beta-gamma	
Container Marking	"Dunnage or Empty"	
Liquids	Dry	
Pu-239 FGE	Zero	
Thermal Power	Zero	
Dunnage Properly Vented?	Minimum one open vent port	
Comments:		

I certify that I have reviewed the data for this assembly dunnage and have determined that it meets the requirements stated in the current revision of CCP-PO-003.

TCO:

_____ _____ _____
Printed Name/Signature Date Initials

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Attachment 5 – CCP Container Integrity Checklist

Payload ID _____

Record container numbers for the selected payload assembly.

_____	_____
_____	_____
_____	_____
_____	_____
_____	_____
_____	_____
_____	_____

NOTE

Any YES answer on the inspection checklist will result in the operator immediately contacting the TCO. The TCO will have the drum segregated **AND** the appropriate site-specific corrective actions invoked. The TCO will provide another waste container **OR** dunnage for the selected payload assembly. The new waste container will require the same inspection per the checklist.

Visually examine 100% of each container for selected payload assembly per the checklist below.

CONTAINER EXAMINATION		DISCUSSION OF CRITERIA	CHECK ONE	
1.	Is the payload container obviously degraded?	Obviously degraded means clearly visible and potentially significant defects in the payload container or payload container surface.	YES ☐	NO ☐
2.	Is there evidence that the payload container is, or has been, pressurized?	Pressurization can be indicated by a fairly uniform expansion of the sidewalls, bottom or top. Past pressurization can be indicated by a notable outward deflection of the bottom or top. Verify that the drum payload container is not warped.	YES ☐	NO ☐

Attachment 5 – CCP Container Integrity Checklist (Continued)

CONTAINER EXAMINATION		DISCUSSION OF CRITERIA	CHECK ONE	
3.	Is there any potentially significant rust or corrosion such that wall thinning, pin holes, or breaches are likely or the load bearing capacity is suspect?	Rust shall be assessed in terms of its type, extent, and location. Pitting, pocking, flaking, or dark coloration characterizes potentially significant rust or corrosion. This includes the extent of the payload container surface area covered, thickness, and, if it occurs in large flakes or built-up (caked) areas. Rusted payload containers may not be accepted if: • Rust is present in caked layers or deposits • Rust is present in the form of deep metal flaking, or built-up areas of corrosion products In addition, the location of rust should be noted; for example on a drum: top lid; filter region; locking chine; top one-third, above the second rolling hoop; middle one-third, between the first and second rolling hoops; bottom one-third, below the second rolling hoop; and on the bottom. Payload containers may still be considered acceptable if the signs of rust show up as: • Some discoloration on the payload container • If rubbed would produce fine grit or dust or minor flaking (such that wall thinning does not occur)	YES ☐	NO ☐
4.	Are any of the following apparent? • wall thinning • pin holes • breaches	Wall thinning, pin holes, and breaches can be a result of rust/corrosion (see discussion for #3).	YES ☐	NO ☐
5.	Are there any split seams, tears, obvious holes, punctures (of any size), creases, broken welds, or cracks?	Payload containers with obvious leaks, holes or openings, cracks, deep crevices, creases, tears, broken welds, sharp edges or pits, are either breached or on the verge of being breached. Verify that there is no warpage that could cause the container to be unstable or prevent it from fitting properly in the applicable package.	YES ☐	NO ☐
6.	Is the load-bearing capacity suspect?	The load-bearing capacity could be reduced for excessive rust (see discussion for #3), wall thinning (see discussion for #4), breaches, cracks, creases, broken welds, etc. (see discussion for #5).	YES ☐	NO ☐
7.	Is the payload container improperly closed?	Inspect the fastener and fastener ring (chine) if applicable for damage or excessive corrosion. Check the alignment of the fastener to ensure that it is in firm contact around the entire lid and the payload container will not open during transportation.	YES ☐	NO ☐

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Attachment 5 – CCP Container Integrity Checklist (Continued)

CONTAINER EXAMINATION		DISCUSSION OF CRITERIA	CHECK ONE	
8.	Are there any dents, scrapes, or scratches that make the payload container's structural integrity questionable or prevent the top and bottom surfaces from being parallel?	Deep gouges, scratches, or abrasions over wide areas are not acceptable. If top and bottom surfaces are not parallel, this would indicate that the container is warped. Dents should be less than ¼ inch deep by 3 inches long and between ½ inch to 6 inches wide. All other dents must be examined to determine impact of structural integrity.	YES ☐	NO ☐
9.	Is there discoloration which would indicate leakage or other evidence of leakage of material from the payload container?	Examine the payload container regions near vents, top lid fittings, bottom fittings, welds, seams and intersections of one or more metal sheets or plates. Payload containers must be rejected if evidence of leakage is present.	YES ☐	NO ☐
10.	Is the payload container bulged?	For the purposes of this examination, bulging is indicated by: • A fairly uniform expansion of the sidewalls, bottom, or top (e.g., in the case of a drum, either the top or bottom surface protrudes beyond the planar surface of the top or bottom ring, • A protrusion of the side wall (e.g., in the case of a drum, beyond a line connecting the peaks of the surrounding rolling hoops or a line between a surrounding rolling hoop and the bottom or top ring), or • Expansion of the sidewall (e.g., in the case of a drum, such that it deforms any portion of a rolling hoop).	YES ☐	NO ☐

Comments: _____
_____
_____
_____

Inspected By:

_____ _____ _____
Printed Name Signature Date

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Attachment 6 – Payload Accessories

CH Package S/N	Payload Pallet ID# and Inspection Date	SWB Ratchet Strap S/N and Inspection Date	SWB Ratchet Strap S/N and Inspection Date	SWB Ratchet Strap S/N and Inspection Date
Position #1:_____				
Position #2:_____				
Position #3:_____				

Shipment Number: _____

Trailer Number: _____

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Attachment 7 – (TRUPACT-III) CCP Shipping Site Control Checklist for Controlled Shipments

Shipment No. _____ Packaging No. _____

To be completed by Shipping Site Transportation Certification Official, or designee, for each package designated as a controlled shipment:

TRUPACT-III TRAMPAC Section No.	**Activity**	**Recorded Date**	**Recorded Time**	**Completion of Activity (Indicate by checkmark [√])**
6.2.3.1	Record date and time of TRUPACT-III closure			
6.2.3.2	Record date and time the shipment containing the loaded package is scheduled to depart from the site			
6.2.3.3	Calculate and record total **Loading Time** [Limit = 24 hours]			
	Total Loading Time <u>≤</u> 1 day, proceed to No. 6.2.3.4 *Total Loading Time > 1 day,* ***STOP.*** *Vent package and repeat closure process.*			
6.2.3.4	I certify that the above data is accurate and compliant with the Loading Time limit of 24 hours, as specified in Section 6.2.3 of the TRUPACT-III TRAMPAC. _____ / _____ TRANSPORTATION CERTIFICATION OFFICIAL (OR DESIGNEE) DATE			

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Attachment 8 – (TRUPACT-III) CCP Receiving Site Control Checklist for Controlled Shipments

Shipment No. _____ Packaging No. _____

To be completed by designated Receiving Site Operations Personnel for each package designated as a controlled shipment:

TRUPACT-III TRAMPAC Section No.	Activity	Recorded Date	Recorded Time	Completion of Activity (Indicate by checkmark [√])
6.2.3.5	Record date and time that The package was scheduled to depart from the shipping site			
6.2.3.6	Vent package within 9 days of date and time Recorded above and record vent date and time			
6.2.3.7	I certify that the above data is accurate and compliant with the Transport and Unloading Time Limit of 9 days, as specified in Section 6.2.3 of the TRUPACT-III TRAMPAC. _____ / _____ RECEIVING SITE OPERATIONS PERSONNEL DATE			

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CCP-TP-053

Revision 15

CCP
Standard Real-Time Radiography (RTR) Inspection Procedure

EFFECTIVE DATE: 09/11/2014

Mike Ramirez

PRINTED NAME

APPROVED FOR USE

RECORD OF REVISION

Revision Number	Date Approved	Description of Revision
9	09/30/2010	Revised to incorporate another test image type.
10	03/04/2011	Revised to address Carlsbad Field Office (CBFO) Corrective Action Report (CAR)-11-015. Deleted requirement to identify locations of dense waste material, sharp/heavy objects. Deleted requirement of identification of block and/or bracing of sharp/heavy objects and heterogeneity of the waste (e.g., DO **NOT** just list plastic, describe it as small plastic bottles, plastic tubing, plastic sheeting, or plastic coveralls etc.). Deleted requirement of recording of liquid amounts on attachments. All prohibited conditions will be addressed in the Nonconformance Report (NCR) process. Added the ability to use procedure to Real-Time Radiography (RTR) Remote-Handled (RH) waste.
11	07/20/2011	Revised to add checklist question based on agreement with New Mexico Environmental Department (NMED).
12	08/22/2012	Revised to change format of attachments. Clarified format of container weights and clarified steps for documenting nonconformance reports (NCRs) on Attachment 2, CCP Radiography Data Sheet (Example).
13	05/14/2013	Revised to incorporate Nuclear Waste Partnership (NWP) transition changes, to add software used, and other editorial changes.
14	09/25/2013	Revised to address Carlsbad Field Office (CBFO) CAR 13-034, CBFO CAR 13-051, and Central Characterization Program (CCP) CAR-SRS-0001-13.
15	09/11/2014	Revised to be more user friendly as required by WF14-084, to include Standing Order CCP-SO-080 Revision 1 and to clarify contact-handled (CH) and remote-handled (RH) quality assurance objectives (QAOs).

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1.0 PURPOSE

Real-time radiography (RTR) inspection is used to identify prohibited items within a waste container and to estimate Waste Material Parameter (WMP) weights. The system is also used to verify that the physical form of the waste and currently assigned Waste Matrix Code (WMC) of the container are consistent with the Waste Stream Description as described in the Acceptable Knowledge (AK) Summary Report.

This procedure contains the requirements for the collection of data and the generation level review of data from the RTR process.

1.1 Scope

This procedure applies to non-destructive examination of S3000 homogeneous solids, S4000 soils/gravel and S5000 debris transuranic (TRU) waste streams. This procedure specifies instructions for performing nondestructive examination (NDE) of waste containers using a RTR system. It also specifies methods for documenting the examination results as required by CCP-PO-001, CCP *Transuranic Waste Characterization Quality Assurance Project Plan;* CCP-PO-002, *CCP Transuranic Waste Certification Plan;* DOE/WIPP-02-3214, *Remote-Handled TRU Waste Characterization Program Implementation Plan*; and CCP-PO-505, *CCP Remote-Handled Transuranic Waste Authorized Methods for Payload Control (CCP RH-TRAMPAC)*.

2.0 REQUIREMENTS

2.1 References

Baseline Documents

- CCP-PO-003, *CCP Transuranic Authorized Methods for Payload Control (CCP CH-TRAMPAC)*

Referenced Documents

- DOE/WIPP-02-3214, *Remote-Handled TRU Waste Characterization Program Implementation Plan*
- CCP-PO-001*, CCP Transuranic Waste Characterization Quality Assurance Project Plan*
- CCP-PO-002, *CCP Transuranic Waste Certification Plan*
- CCP-PO-505, *CCP Remote-Handled Transuranic Waste Authorized Methods for Payload Control (CCP RH-TRAMPAC)*
- CCP-QP-002, *CCP Training and Qualification Plan*
- CCP-QP-005, CCP *TRU Nonconforming Item Reporting and Control*
- CCP-QP-008, *CCP Records Management*

2.2 Training Requirements

2.2.1 Personnel performing this procedure will be trained and qualified in accordance with CCP-QP-002, *CCP Training and Qualification Plan,* prior to performing this procedure.

2.3 Equipment List

2.3.1 RTR system which normally consists of the following:

- an X-ray producing device
- an imaging system
- an enclosure for radiation protection
- a waste container handling system

- an audio/video recording system or equivalent
- an operator control and data acquisition station controls or an equivalent process which allow the operator to control image quality

2.3.2 Test Image Device

2.4 Software

2.4.1 RTR Data Sheet.xls

2.5 Precautions and Limitations

2.5.1 If this procedure CAN **NOT** be implemented as written, RTR personnel shall notify appropriate supervisors. If it is determined that a portion of the work CAN **NOT** be accomplished as described in this procedure, or would result in an undesirable situation, work shall be STOPPED. Work will **NOT** be resumed until this procedure is modified or replaced by a new document that reflects the current work practice.

2.5.2 Workers who will be working in a radiation area must have met the Host site requirements prior to entering the area.

2.5.3 Review the Job Hazards Analysis/Integrated Work Document.

2.6 Prerequisite Actions

2.6.1 None

2.7 Definitions

2.7.1 **Internal Container** – A container inside the outermost container examined during radiography or visual examination (VE). Drum liners, liner bags, plastic bags used for contamination control, capillary-type labware, and debris not designed to hold liquid at the time of original waste packaging are not internal containers.

2.7.2 **Observable Liquid** – Liquid that is observable using radiography or VE as specified in the Waste Isolation Pilot Plant (WIPP) Hazardous Waste Facility Permit.

3.0 RESPONSIBILITIES

3.1 RTR Operator

3.1.1 Operates the RTR system to determine the attributes of the waste content of a waste container.

3.1.2 Produces video/audio recorded media.

3.1.3 Completes the attachments as required by this procedure.

3.1.4 Performs the initial review of the data generated.

3.1.5 A second and independent qualified RTR Operator performs a Replicate Scan on one waste container. A Batch Data Report (BDR) completed in one calendar day shall contain a Replicate Scan. BDRs that span more than one day shall contain a unique Replicate Scan. In this context, independence means the individual did not perform, nor review the original work.

3.1.6 A second and independent qualified RTR Operator other than any RTR Operator involved in the original scan of the container selected performs an Independent Observation (IO) on a waste container, from a recorded media of the radiography. A BDR completed in one calendar day shall contain an IO. BDRs that span more than one day shall contain a unique IO.

3.1.7 Assembles the BDR.

3.2 Independent Technical Reviewer (ITR)

NOTE

While the Replicate Scan and independent Observation operator can be the same individual, the Independent Technical Reviewer (ITR) will be performed by a third independent qualified RTR Operator.

3.2.1 Reviews the Batch Data Report.

3.2.2 Completes Attachment 3, CCP Radiography Independent Technical Reviewer Checklist.

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4.0 PROCEDURE

RTR Operator

4.1 RTR System Startup

4.1.1 Startup the RTR system for operation in accordance with the appropriate Central Characterization Program (CCP) procedure.

4.2 Waste Container Preparation

4.2.1 Prepare the waste containers for examination in accordance with the appropriate Host site and/or CCP procedures.

4.3 Video/Audio Recorded Media System Startup/Image Test

NOTE

Video/audio recording of the RTR examination **MUST** be produced for all waste containers. The Image Test is performed once per day, and after system power loss.

Attachments are found on the CCP secure file transfer protocol (sftp) site.

4.3.1 Install the Image Test device as applicable.

4.3.2 Record the following on Attachment 1, CCP RTR Measurement Control Report:

[A] Site

[B] BDR Number

[C] Examination Date

4.3.3 Prepare the video/audio media recording systems for operation in accordance with the manufacturer's instructions.

[A] Ensure all video/audio media system components and monitors are powered on.

4.3.4 Perform a video/audio media recording system check as follows, **AND** record the results on Attachment 1:

[A] Perform the Image Test.

[A.1] **IF** the test image is correctly observed (Minimum acceptable is five lines-pair/centimeters [cm] or the #6 sieve is viewable),
THEN record the results of the test, **AND** mark SAT on Attachment 1.

[A.2] **IF** the test image is **NOT** correctly observed,
THEN record the results of the test **AND** mark UNSAT on Attachment 1, STOP WORK **AND** notify the Lead Operator (LO).

[B] Replay the video/audio recording media, **AND** verify the video/audio recorded media checks are satisfactory.

[B.1] **IF** the results of the video/audio recording media check are satisfactory,
THEN mark SAT on Attachment 1.

[B.2] **IF** the results of the video/audio recorded media checks are **NOT** satisfactory,
THEN record the results of the test **AND** mark UNSAT on Attachment 1, STOP WORK, **AND** notify the LO.

NOTE
Image Test device may be removed when it is conducive to operations.

4.3.5 Record comments if necessary.

4.3.6 Print, sign, and date Attachment 1.

4.3.7 Place Attachment 1 in holding file.

4.4 RTR System Operation

4.4.1 Waste Container Scanning

NOTE
Steps 4.4.2 and 4.4.3 occur alongside step 4.4, addressing the minimum required data entries. These steps may be used for reference during performance of 4.4.1.

[A] Obtain Waste Container Identification (ID) Number and weight (in Kg) by visual observation of the container.

[B] Load container(s) into unit in accordance with the appropriate CCP procedure.

[C] Enter the appropriate scan information (e.g., Container ID No., Date) on the video display.

[D] Start recording the examination scan.

[D.1] Manipulate the container and x-ray controls such that 100 percent of the container volume is examined.

[D.2] Record the results verbally **AND** on Attachment 2, CCP Radiography Data Sheet.

[E] Stop recording after examination of the container is complete.

[F] Ensure that the required entries for 4.4.2 are completed.

[G] Ensure the data has been evaluated for non-conformance as described in 4.4.3.

[H] Print Attachment 2 and review for completeness and accuracy.

[H.1] **IF** Attachment 2 appears satisfactorily completed, **THEN** sign the attachment **AND** place in holding file, **ELSE** perform [H.2].

[H.2] Make the required changes to the digital file, adding explanatory comments to the comments block in Section 5 of Attachment 2 as necessary, **THEN** repeat steps 4.4.1 [F] through [H].

[I] Repeat step 4.4.1 for all containers to be certified, loading additional containers as necessary and in accordance with the appropriate CCP procedure.

[I.1] **IF** the most recent container is the last container of the BDR, **THEN** proceed to 4.7.

4.4.2 Data Entry for Attachment 2, Sections 1 through 4

NOTE

The data required on Attachment 2 may be entered as the information becomes available to the operator, during both the loading and examination stages of operation.

[A] Ensure the following data are recorded or displayed in Section 1 of Attachment 2:

- Applicable type of RTR examination.
- Site ID.
- Batch Number.
- Examination Date.
- Waste Container ID.
- Ensure the Waste Container ID is correct at the top of Page 2 and Page 3 of Attachment 2.
- Video/Audio Recorded Media Identification.
- Procedure and Revision Number.
- Yes or No for nonconformance report (NCR) and if Yes, record the NCR number(s).

[B] Ensure the following data are recorded or displayed in Section 2 of Attachment 2.

- Container Type.
- Content (TRUCON) Code.
- Waste Matrix Code.
- Waste Stream ID.
- Gross Weight (Obtained from the CCP Container Traveler or in accordance with the Host site Interface Document).

- Tare Weight (Total Packaging Weight from Section 4: Packaging Material and Waste Material Parameters, of Attachment 2).
- Net Weight (subtract Tare Weight from Gross Weight).
- Check the appropriate Rigid Liner and Liner Vent Description boxes to accurately describe the packaging content of the container.
- Estimated number of Layers of Confinement.

NOTE
The fill percent of the container is to be recorded in five percent increments (e.g., 35%, 40%, 45%) and is based on the highest level of the bulk of the waste. Items (e.g., pipe, scrap angle, plastic bags) that protrude above the bulk of the waste are not to be included in the fill percent determination.

- Record the estimated Volume Utilization Percentage (VUP).

NOTE
Additional weight information for waste items and packaging commonly found in waste streams at each site may be provided with a controlled Operator Aid.

All fractional weights will be recorded to 1/10 of a kilogram (kg). Waste Material Parameters with no recorded items and the corresponding section weights may be left blank.

[C] Ensure that the itemized description of the waste inventory in the container in Section 3 of Attachment 2 is complete, accurate to the scan, and representative of the waste content of the container**.**

[D] Ensure that the estimated weight (kg) for, and brief description of, the packaging materials is recorded in Section 4 of Attachment 2.

[E] Ensure that the estimated weight for each utilized Waste Material Parameter is recorded in Section 4 of Attachment 2.

4.4.3 Evaluation of Nonconforming Conditions

NOTE

The potential exists for prohibited items to be present in the waste container based upon shapes seen in the image and the RTR Operator's knowledge of the waste stream. For example; if the AK for the waste stream DOES NOT indicate the presence of Polychlorinated Biphenyl (PCB) free light ballasts, and a ballast is present in the container, the RTR Operator will have reason to believe that PCBs are present.

Internal containers (e.g., bottles, cans, etc.) shall have no more than 60 milliliters or 3 percent by volume, whichever is greater, observable liquid AND in no case, shall the total observable liquid volume (i.e., the sum of all internal and/or outermost container volumes) exceed >1%.

[A] Using Table 1, Prohibited Items, as a reference, confirm there are **NO** prohibited items in the waste container.
IF any nonconforming/prohibited items are noted during the RTR examination,
THEN perform the following:

[A.1] Initiate an NCR in accordance with CCP-QP-005, CCP *TRU Nonconforming Item Reporting and Control*.

[A.2] Check yes and record the NCR number in Section 1 of Attachment 2.

[A.3] Check appropriate boxes in Section 5 of Attachment 2 to describe the non-conforming condition.

[A.4] Record NCR number in the comments block of Section 5 of Attachment 2.

NOTE

Potential hazardous wastes identifiable by radiography include:

- Batteries
- Circuit Boards (may be contained in electrical equipment)
- Cathode Ray Tube (CRT)-based computer monitors or televisions
- Lead
- Mercury, mercury containing equipment (e.g., barometers, switches, thermometers, thermostats)
- Light Bulbs (both incandescent and fluorescent)

[B] **IF** any hazardous waste(s) NOT identified in the AK Summary Report for the waste stream being characterized OR any nonconforming/prohibited items are noted during the RTR examination,
THEN perform the following:

[B.1] Initiate an NCR in accordance with CCP-QP-005.

[B.2] Check yes and record the NCR number in Section 1 of Attachment 2.

[B.3] Check appropriate boxes in Section 5 of Attachment 2 to describe the non-conforming condition.

[B.4] Record NCR number in the comments block of Section 5 of Attachment 2.

NOTE

The physical waste form requirements and waste stream descriptions for the waste stream being evaluated are found in the AK Summary Report. The AK Summary MUST be available in the work area and referenced as needed.

[C] **IF** the physical form of the waste DOES NOT match the Waste Stream Description and/or the Waste Matrix Code,
THEN perform the following:

[C.1] Initiate an NCR in accordance with CCP-QP-005.

[C.2] Check yes, and record the NCR number in Section 1 of Attachment 2.

[C.3] Check appropriate boxes in Section 5 of Attachment 2 to describe the non-conforming condition.

[C.4] Record NCR number in the comments block of Section 5 of Attachment 2.

[D] **IF** a container is identified in the S3000 or S4000 summary category group, **AND** RTR is NOT capable of penetrating the container so that any liquid present on the top, sides, or bottom of the waste form is identifiable,
THEN perform the following:

[D.1] Initiate an NCR in accordance with CCP-QP-005.

[D.2] Check yes, and record the NCR number in Section 1 of Attachment 2.

[D.3] Check appropriate boxes in Section 5 of Attachment 2 to describe the non-conforming condition.

[D.4] Record NCR number in the comments block of Section 5 of Attachment 2.

[E] **IF** a container is identified in the S5000 summary category group that CAN NOT be penetrated by the RTR method because of the presence of lead, or other shielding,
THEN perform the following:

[E.1] Initiate an NCR in accordance with CCP-QP-005.

[E.2] Check yes, and record the NCR number in Section 1 of Attachment 2.

[E.3] Check appropriate boxes in Section 5 of Attachment 2 to describe the non-conforming condition.

[E.4] Record NCR number in the comments block of Section 5 of Attachment 2.

4.5 Replicate Scan

NOTE

A BDR completed in one calendar day shall contain a Replicate Scan. BDRs that span over more than one day shall contain a unique Replicate Scan. The Replicate Scan is performed by a second and independent qualified RTR Operator who was not involved in the original scan of the waste container. The Replicate Scan will be performed under the same uniform conditions as a routine scan of a waste container in Section 4.4.

Second RTR Operator

4.5.1 Prior to reviewing the initial, Attachment 2, scan the replicate waste container per Section 4.4, **AND** record the results on a new Attachment 2.

4.5.2 Review the original Attachment 2, **AND** compare the results with the second Attachment 2.

4.5.3 Perform the following when identification of the waste matrix code, liquids in excess of Treatment, Storage, Disposal Facility (TSDF)-Waste Acceptance Criteria (WAC) limits, and compressed gases differ between the two operators:

[A] Reconcile the results with the initial RTR Operator as follows:

[A.1] Jointly perform a real-time review of the Attachment 2(s).

[A.2] Jointly review the video/audio recording media **OR** re-scan the container, **AND** make corrections, as required, to the Attachment 2(s).

[B] **IF** the results CAN **NOT** be reconciled, **THEN** STOP WORK **AND** notify the LO.

4.6 Independent Observations

NOTE

A BDR completed in one calendar day shall contain an IO. BDRs that span over more than one day shall contain a unique IO. The IO will be performed by a second and independent qualified RTR Operator who was not involved in the original scan of the waste container. The IO will be performed by observing the video recording of the original scan with no audio.

Second RTR Operator

4.6.1 Review the video/audio recording media of the original scan, **AND** complete a second Attachment 2.

4.6.2 Review the original Attachment 2 for the subject container, **AND** compare the results with the IO Attachment 2.

4.6.3 Perform the following when identification of the waste matrix code, liquids in excess of TSDF-WAC limits, and compressed gases differ between the two operators.

[A] Reconcile the results with the initial RTR Operator as follows:

[A.1] Jointly perform a real-time review of Attachment 2(s).

[A.2] Jointly review the video/audio recording media, **OR** re-scan the container, **AND** make corrections, as required, to the Attachment 2(s).

[B] **IF** the results CAN **NOT** be reconciled,
THEN STOP WORK **AND** notify the LO.

4.7 Batch Data Report Preparation

NOTE

Attachment 5, CCP Radiography Batch Data Report Cover Sheet may be filled out at any time after the batch is opened and the remaining data may be entered during the BDR assembly.

4.7.1 Assemble Attachment 2(s) for up to 20 waste containers (regardless of matrix) that have been processed from a single RTR unit.

4.7.2 Ensure the following is recorded or displayed on Attachment 5:

- Site ID
- BDR No.
- Contact-handled (CH) or remote-handled (RH) waste
- Date
- Waste Container ID Numbers
- Record which containers are by designation, Replicate Scan and Independent Observation

[A] Print, sign, and date

4.7.3 Ensure the following is recorded or displayed on Attachment 4, Attachment 4 – CCP Radiography Batch Data Report Table of Contents and Batch Narrative:

- BDR No.
- Date
- Index of applicable pagination values
- Batch Narrative

[A] Print, sign, and date

4.7.4 Preparing primary and duplicate copies of recorded media

NOTE
Some RTR systems possess the capability to create MPEG encoded recorded media copies, which allow for the creation of a digital media file which is then subsequently "burned" to physical media. If the system in use provides this operational capacity, the operator may perform 4.7.4 at their discretion, or as physical media is filled to its maximum data capacity.

[A] Ensure, as necessary, media to be "finalized" contains the appropriate media files.

[B] Finalize recorded media.

[C] Label each video/audio media pair with the following information:

[C.1] Record the BDR Number

[C.2] A unique identifier (e.g., A/B, C/D…), where the second letter is applied to the duplicate media copy

[C.3] The date for which the corresponding Attachment 2's were generated

[C.4] Operator name

[C.5] **IF** additional recording media is required to complete a BDR,
THEN label the additional media with the BDR number followed by another unique identifier as described in step 4.7.4 [C.1] through [C.4].

4.7.5 Assemble the following data for the BDR:

[A] Attachment 5, CCP Radiography Batch Data Report Cover Sheet.

[B] Attachment 4, CCP Radiography Batch Data Report Table of Contents and Batch Narrative.

[C] Attachment 1, CCP RTR Measurement Control Report.

[D] All Attachment 2(s), CCP Radiography Data Sheet(s).

[E] Copy of NCRs, if applicable.

[F] Attachment 3, CCP Radiography Independent Technical Reviewer Checklist.

[G] Two copies of each Audio/Video Media.

4.7.6 Paginate the BDR

4.7.7 Forward the BDR package to the ITR at earliest convenience

4.8 RTR System Shutdown

4.8.1 Shutdown the RTR system in accordance with the appropriate CCP procedure.

4.9 Video/Audio Recording Media System Shutdown

4.9.1 Ensure all recording media have been finalized if necessary and removed from the recording components.

4.9.2 Ensure the video/audio media recording systems are turned off in accordance with the manufacturer's instructions.

4.10 RTR Independent Technical Review

NOTE

The independent technical review is conducted by a third and independent qualified RTR Operator who was not involved in the generation or recording of the data under review. The ITR CAN **NOT** review his/her own work.

Attachments are found on the CCP sftp site.

ITR

4.10.1 Review all attachments (Except attachment 3), and associated video/audio media recordings, **AND** resolve any comments with the RTR Operator(s).

4.10.2 Review the BDR to the criteria in the checklist of Attachment 3, **AND** document the results.

4.10.3 Print name, sign, and date Attachment 3 and Attachment 5 and any additional Attachments to be inserted in the BDR.

4.10.4 Insert completed Attachment 3 into the BDR.

4.10.5 Insert any additional attachments generated during ITR into the BDR.

4.10.6 Submit the BDR package to CCP Records in accordance with CCP-QP-008.

5.0 RECORDS

5.1 Records generated during the performance of this procedure are maintained as QA records in accordance with CCP-QP-008. The records are the following:

5.1.1 QA/Lifetime

[A] Batch Data Report (BDR):

[A.1] Attachment 1, CCP RTR Measurement Control Report

[A.2] Attachment 2, CCP Radiography Data Sheet

[A.3] Attachment 3, CCP Radiography Independent Technical Reviewer Checklist

[A.4] Attachment 4, CCP Radiography Batch Data Report Table of Contents and Batch Narrative

[A.5] Attachment 5, CCP Radiography Batch Data Report Cover Sheet

[A.6] Copies of NCRs, if applicable

5.1.2 QA/Non-permanent

[A] Two sets RTR media VHS or DVD

Table 1. Prohibited Items

LIST OF PROHIBITED ITEMS
Liquid waste - Observable liquid shall be no more than 1 percent by volume of the outermost container. - Internal containers with more than 60 milliliters or 3 percent by volume observable liquid, whichever is greater, are prohibited. - Containers with Hazardous Waste Number U134 assigned shall have no observable liquid.
Nonradioactive pyrophorics
Non-mixed hazardous waste
Incompatible wastes (Wastes that are incompatible with backfill, seal and panel closure materials, container and packaging materials, shipping container materials, and/or other wastes).
Explosives
Compressed Gases/Pressurized containers (e.g., aerosol cans)
PCB liquids
Ignitables
Corrosives
Reactive waste
Sealed containers greater than 4 liters
Heat Sealed Bags (unvented) with surface area less than 390 square inches and greater than 4 liters, or heat sealed bags not authorized in the RH TRUCON Code.
Sharp or heavy objects, that could reasonably be expected to cause a breach of the container during transport because it is not adequately blocked, braced, or packaged.

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Table 2. Waste Material Parameters

Waste Material Parameter	Description
Iron-based metals/alloys (IM)	Iron and steel alloys in the waste; does not include the waste container materials
Aluminum-based metals/alloys (AM)	Aluminum or aluminum-based alloys in the waste materials
Other metals (OM)	All other metals found in the waste materials (e.g., lead, lead blankets)
Other inorganic materials (OI)	Nonmetallic inorganic waste, including concrete, glass, firebrick, ceramics, sand, and inorganic sorbents
Cellulosics (C)	Materials generally derived from high polymer plant carbohydrates (e.g., paper, cardboard, wood, cloth)
Rubber (R)	Natural or man-made elastic Latex materials (e.g., surgeon's gloves, leaded rubber gloves)
Plastics (waste materials) (XPM)	Generally man-made materials, often derived from petroleum feedstock (e.g., polyethylene, polyvinylchloride)
Organic matrix (OR)	Cemented organic resins, solidified organic liquids, and sludges
Inorganic matrix (IN)	Any homogeneous materials consisting of sludge, or aqueous-based liquids which are solidified with cement, calcium silicate, or other solidification agents (e.g., waste water treatment sludge, cemented aqueous liquids, and inorganic particulate)
Soils (S)	Generally consists of naturally occurring soils which have been contaminated with inorganic waste materials
Steel (packaging materials) (ST)	Steel Drums (55- and 85- Gallon)
Plastics (packaging materials) (PP)	90-mil polyethylene drum liner and plastic bags

Table 3. Waste Item Weights[a] Page 1 of 2

ITEM	WEIGHT
Electric Drill Motor	2.2 kg
Electric 4” Side Grinder	2.5 kg
Plastic bag for waste	0.6 kg
Fiber pack	13.0 kg
Fiber pack lead-lined	66.0 kg
Lead brick (5.1 x 10 x 20 cm)	12.0 kg
Leaded Rubber Glove	2.5 kg
Aluminum Sphincter Can	0.2 kg
Leaded Rubber Apron	2.4 kg
Vermiculite	0.1 kg/liter
Oil-Dry	0.4 kg/liter
Poly Bottles (1 gallon)	2.2 kg
Poly Bottles (1 liter)	0.5 kg
Metal Can (for salt wastes)	1.1 kg
Metal Can	0.2 kg
Uncured Portland Cement	2.9 kg/liter
Setup Portland Cement	1.1 kg/liter
High-Efficiency Particulate Air (HEPA) Filter (8 x 8 3-1/16)	1.0 kg
HEPA Filter (8 x 8 x 5-7/8)	1.9 kg
HEPA Filter (12 x 12 x 5-7/8)	2.5 kg
HEPA Filter (24 x 24 x 5- 7/8)	7.2 kg
HEPA Filter (24 x 24 x 11-1/2)	14.1 kg
10’ Tape Measure	0.1 kg
13 Oz. Aerosol Can ¼ Full	0.2 kg
17 Oz. Aerosol Can Full of Liquid	0.5 kg
17" Section of 1" Electrical Conduit	0.5 kg
17" Section of 1" Sch 40 S/s Pipe	1.1 kg
2-Gallon Car-boy ½ Full of Water	5.8 kg
2’ X 4’ Board 20" long	0.7 kg
25’ Plastic Suit Hose	2.3 kg
3" Roll of Duct Tape	0.7 kg
3" Roll of Masking Tape	0.4 kg
5-Gallon Metal Bucket	1.3 kg
50’ Plastic Suit Hose	5.0 kg
6-Gallon Car-boy ½ Full of Water	14.0 kg

Table 3. Waste Items Weights[a] (Continued) Page 2 of 2

ITEM	WEIGHT
Channel Lock Pliers	0.3 kg
Coveralls	0.9 kg
Crescent Wrench	0.2 kg
Empty 2-Gallon Car-boy	0.7 kg
Empty 6-Gallon Car-boy	2.0 kg
Flashlight with Batteries	0.5 kg
Flashlight Without Batteries	0.1 kg
Flat File	0.4 kg
Hacksaw with Blade	0.5 kg
Hammer	0.6 kg
Large Open End Wrench	0.5 kg
Plastic Suit Top and Pants	2.3 kg
Razor Knife	0.1 kg
Sand Bag ½ Full of Gravel	12.7 kg
Scissors	0.2 kg
Vice Grip Pliers	0.5 kg
Welder's Chipping Hammer	0.4 kg
Wire Brush	0.1 kg
Wooden Folding Ruler	0.2 kg
Wooden Wedge	0.2 kg
Liner Bags – Large	0.5 kg
Rad Bags – Medium and Small	0.1 kg

[a]The weights for waste packaging and containers will use the nominal values except where identified by the program. Additional Host site/AK specification weights for waste items shall be provided in accordance with an approved Operator Aid.

Table 4. Nominal Packaging Weights

ITEM	WEIGHT
55 Gallon drum	27.7 kg
55 gallon drum, Heavy Galvanized	30.0 kg
Baked on liner	6.4 kg
90mil Rigid Liner	6.4 kg
90mil Rigid Liner Lid	1.0 kg
Repackaging Rigid Liner (SRS)	4.9 kg
110mil Rigid Liner	6.5 kg
110 Rigid Liner Lid	1.0 kg
Fiberboard Liner	3.7 kg
Fiber Pack	2.7 kg
One trip drum (RL)	32.0 kg
Liner Bag 5mil	0.5 kg
Liner Bag 12mil	2.0 kg
SWB 10 mil Liner Bag (RL)	5.0 kg
Universal Polypropylene Pads (Rad Pads)	1.0 kg

Attachment 1 – CCP RTR Measurement Control Report

Site ID:		
Batch Data Report No.:		
Examination Date:		
Control Checks		
Image Test: _____ (Minimum acceptable is 5 lines-pair/cm or #6 Sieve is viewable)	☐ SAT	☐ UNSAT
Video/Audio Recorded Media System Check	☐ SAT	☐ UNSAT
Comments:		
RTR Operator:		
Printed Name	Signature	Date

Attachment 2 – CCP Radiography Data Sheet (Example)

Section 1: General Information	
☐ RTR Examination ☐ RTR Replicate Scan ☐ RTR Independent Observation	
Site ID:	
Batch Number:	
Examination Date:	
Waste Container ID:	
Video/Audio Recorded Media Number:	
Procedure and Revision No.:	Rev.
NCR(s) associated with the container? (e.g., Prohibited Items)	☐ NO ☐ YES NCR No.: _____ NCR No.:
Section 2: Waste Container Data	
Container Type:	
TRUCON Code:	
Waste Matrix Code:	
Waste Stream I.D.:	
Waste Container Weights:	Gross Wt.: _____ kg Tare Wt.: _____ kg Net Wt.: kg
Rigid Liner and Liner Vent Description:	Liner Present: ☐ NO ☐ YES Lid: ☐ NO ☐ YES Type: ☐ 30-mil ☐ 90-mil ☐ 110-mil ☐ 125-mil Vented: ☐ NO ☐ YES Fiberboard: ☐ NO ☐ YES
Number of Layers of Confinement:	
Volume Utilization Percentage:	

Attachment 2 – CCP Radiography Data Sheet (Example) (Continued)

Waste Container ID:

Section 3: Container Inventory and Comments (Detailed descriptions)
IM:
AM:
OM:
OI:
C:
R:
XPM:
OR:
IN:
S:

Section 4: Packaging Material and Waste Material Parameters	
Packaging Material:	Estimated Weight (kg)
Steel (ST):	
Plastics (PP):	
Others:	
Total Packaging Weight	
Waste Material Parameter:	Estimated Weight (kg)
Iron-based Metal / Alloys (IM):	
Aluminum-based Metals / Alloys (AM):	
Other Metals (OM):	
Other Inorganic Materials (OI):	
Cellulosics (C):	
Rubber (R):	
Plastics (waste materials) (XPM):	
Organic Matrix (OR):	
Inorganic Matrix (IN):	
Soils (S):	
Total WMP Weight:	

Attachment 2 – CCP Radiography Data Sheet (Example) (Continued)

Waste Container ID:

Section 5: RTR Summary (Questions answered "Yes" will be explained in the Comment block, except for Question 1)	
Is there observable liquid?	☐ Yes ☐ No
Is there any observable liquid in internal containers, more than 60 milliliters or 3 percent by volume, whichever is greater?	☐ Yes ☐ No
Is the total volume of observable liquid in the outermost container GREATER than 1% of the container?	☐ Yes ☐ No
Is there observable liquid in payload containers with an EPA Hazardous Waste Number of U134?	☐ Yes ☐ No
Is there an indication of non-radionuclide pyrophoric materials, such as elemental potassium?	☐ Yes ☐ No
Is there an indication of hazardous wastes not occurring as co-contaminants with TRU mixed wastes (non-mixed hazardous wastes)?	☐ Yes ☐ No
Is there an indication of wastes incompatible with backfill, seal and panel closures materials, container and packaging materials, shipping container materials, or other wastes (i.e., waste does NOT match TRUCON Code[s])?	☐ Yes ☐ No
Is there an indication of wastes containing explosives or compressed gases?	☐ Yes ☐ No
Is there an indication of PCBs liquids?	☐ Yes ☐ No
Is there an indication of the waste exhibiting the characteristic of ignitability, corrosivity, or reactivity (EPA Hazardous Waste Numbers of D001, D002, or D003)?	☐ Yes ☐ No
Is the physical form of the waste inconsistent with the Waste Stream Description or the Waste Matrix Code?	☐ Yes ☐ No
CH or RH TRAMPAC	
Are there heat-sealed bags (unvented) GREATER than 4 liters and LESS than 390 square inches in the waste, or heat sealed bags not authorized in the RH TRUCON Code?	☐ Yes ☐ No
Were there Non-approved Closure Methods used on liner bags or inner bags greater than 4 liters?	☐ Yes ☐ No
Are there sealed containers GREATER than 4 liters?	☐ Yes ☐ No
Are there indications of inadequate blocking or bracing for heavy and/or sharp objects?	☐ Yes ☐ No
Comments:	
RTR Operator: Print Name _____ Signature _____ Date _____	

Attachment 3 – CCP Radiography Independent Technical Reviewer Checklist

Batch Data Report No.:_____

Description			
1.	Were data generation and reduction conducted in a technically correct manner in accordance with the methods used?	□ NO	□ YES
2.	Was the correct revision of the procedure used? Procedure: Rev.:	□ NO	□ YES
3.	Are the WMPs entered correctly?	□ NO	□ YES
4.	Do the estimated weights in Section 4 of Attachment 2 equal the container gross weight?	□ NO	□ YES
5.	Is the data reported in the proper units with the correct number of significant figures (e.g., one tenth of a kilogram)?	□ NO	□ YES
6.	Was transcription used? If no, proceed to question 7.	□ NO	□ YES
	6a. Has the data been verified for transcription errors?	□ NO	□ YES
7.	Does the Testing Batch Report include radiography for up to 20 containers?	□ NO	□ YES
8.	Are BDR contents complete and do they match the CCP Waste RTR Batch Data Report Table of Contents?	□ NO	□ YES
9.	Is all the data signed and dated in reproducible ink and by the individual(s) generating it?	□ NO	□ YES
10.	Is all data recorded clearly, legibly, and accurately?	□ NO	□ YES
11.	Have changes been made to original data? If no, proceed to question 12.	□ NO	□ YES
	11a. Have all changes to original data been lined out, initialed and dated by the individual making the changes?	□ NO	□ YES
	11b. Was justification made for changing the original data?	□ NO	□ YES
	11c. Were data changes made by the individual who originally collected the data?	□ NO	□ YES
12.	Does the waste match the Waste Matrix Code and Waste Stream description?	□ NO	□ YES
13.	Are the RTR Operator's decisions regarding the Radiography documented?	□ NO	□ YES
14.	Is there an adequate written description of the contents of each item?	□ NO	□ YES
15.	Was the video/audio recording media properly prepared and labeled for each waste container?	□ NO	□ YES
16.	Was the video/audio recording media check performed satisfactorily and recorded on Attachment 1?	□ NO	□ YES

Attachment 3 – CCP Radiography Independent Technical Reviewer Checklist (Continued)

Batch Data Report No.:_____

Description		
17. Was the Image Test performed satisfactorily and recorded on Attachment 1?	□ NO	□ YES
18. Was the Replicate Scan performed and recorded on an Attachment 2?	□ NO	□ YES
19. Was the Replicate Scan RTR Operator different from the first RTR Operator?	□ NO	□ YES
20. Did the Replicate Scan RTR Operator and the first RTR Operator agree on the results?	□ NO	□ YES
21. Was the Independent Observation performed and recorded on an Attachment 2?	□ NO	□ YES
22. Was the Independent Observation RTR Operator different from the first RTR Operator?	□ NO	□ YES
23. Did the Independent Observation RTR Operator and the first RTR Operator agree on the results?	□ NO	□ YES
24. Was the data collection performed by qualified individuals?	□ NO	□ YES
25. Were NCRs initiated as required at DGL? If no, proceed to question 26.	□ NO	□ YES
25a. Have the NCR(s) associated with RTR been included in the BDR?	□ NO	□ YES
26. Is the RTR examination for CH waste? If no, proceed to question 27.	□ NO	□ YES
26a. Have the CH Quality Assurance Objectives (QAOs) been met (if applicable)? Precision – Precision is maintained by reconciling any discrepancies between two radiography operators with regard to identification of the waste matrix code, liquids in excess of TSDF-WAC limits, and compressed gases through independent replicate scans and independent observations. Additionally, the precision of radiography is verified prior to use by tuning precisely enough to demonstrate compliance with QAOs through viewing an image test pattern. Accuracy – Accuracy is obtained by using a target to tune the image for maximum sharpness and by requiring operators to successfully identify 100 percent of the items required to meet the DQOs for radiography specified in CCP-PO-001, Section C-4a(1) in a training container during their initial qualification and subsequent requalification. Completeness – A video and audio media recording of the radiography examination and a validated radiography data form will be obtained for 100 percent of the waste containers subject to radiography. All video and audio media recordings and radiography data forms will be subject to validation as indicated in CCP-PO-001, Section C3-4. Comparability – The comparability of radiography data from different operators shall be enhanced by using standardized radiography procedures and operator qualifications.	□ NO	□ YES

Attachment 3 – CCP Radiography Independent Technical Reviewer Checklist (Continued)

Batch Data Report No.:_____

Description		
27. Is the RTR examination for RH waste? If no, proceed to comment section.	□ NO	□ YES
27a. Have the RH QAOs been met (if applicable)? Precision – Precision is maintained by reconciling any discrepancies between two operators (during Independent Observation and Replicate scans) with regard to the identification of important waste characteristics (i.e., physical form of the waste and absence of prohibited liquids) within a single container. Accuracy – Accuracy is obtained by using a target to tune the image for maximum sharpness and by requiring operators to successfully identify prohibited liquid in a training container during their initial qualification and subsequent requalification. Representativeness – All of the relevant contents in a container selected for radiography will be described. Completeness – All of the relevant waste information must be assembled and must show that each of the containers in the waste stream belongs to the waste stream. This information must be documented on videotape or other equivalent media and data form. Comparability – Comparability is ensured by meeting the program training requirements and complying with the minimum standards used to implement the radiography process.	□ NO	□ YES

Comments:

I have reviewed 100% of the container specific and batch data in this report and find it acceptable.

Independent Technical Reviewer:

Printed Name	Signature	Date

Attachment 4 – CCP Radiography Batch Data Report Table of Contents and Batch Narrative

Batch Data Report No.:_____ Date:_____

Table Of Contents		
Item	Description	Page No.
1	CCP Radiography Batch Data Report Cover Sheet	
2	CCP Radiography Batch Data Report Table Of Contents	
3	CCP RTR Measurement Control Report	
4	CCP Radiography Data Sheets	
5	Copy of NCRs (NA, If Not Applicable)	
6	CCP Independent Technical Reviewer Checklist	

Batch Narrative

RTR Operator _____ Signature _____ Date

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Attachment 5 – CCP Radiography Batch Data Report Cover Sheet

Site ID:_____

Batch Data Report No.:_____ ☐ CH ☐ RH _____ Date:_____

Waste Container ID Numbers	
Replicate Scan:	
Independent Observation:	
1	
2	
3	
4	
5	
6	
7	
8	
9	
10	
11	
12	
13	
14	
15	
16	
17	
18	
19	
20	

RTR Operator:

Printed Name	Signature	Date

Independent Technical Reviewer:

Printed Name	Signature	Date

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CCP-TP-068

Revision 12

CCP
Standardized Container Management

EFFECTIVE DATE: 12/08/2015

Mike Ramirez

PRINTED NAME

APPROVED FOR USE

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RECORD OF REVISION

Revision Number	Date Approved	Description of Revision
0	03/23/2005	Initial issue.
1	04/15/2005	Revised to incorporate changes to address CBFO DRR comments.
2	04/13/2006	Revised to provide a consistent and standardized container management procedure.
3	10/19/2006	Revised in response to CAR No.: 06-037.
4	12/14/2006	Revised to address United States Department of Energy (DOE) Carlsbad Field Office (CBFO) Document Review Record (DRR) comments to Revision 3.
5	09/20/2007	Revised to incorporate changes to Attachment 1 and add Oakridge National Laboratory (ORNL) requirements.
6	07/13/2008	Revised to clarify the order of performance for efficiency and to reflect the fact that waste containers will be sampled by SUMMA® and Flammable Gas Analysis (FGA) as the Idaho National Laboratory (INL) Laboratory no longer provides hydrogen or methane results for SUMMA® samples.
7	05/28/2010	Revised in response to Corrective Action Report (CAR)-Los Alamos National Laboratory (LANL)-0006-09 and to clarify when a waste container must be put through container management.
8	09/28/2010	Revised to clarify instructions.
9	01/30/2013	Revised to incorporate elements of Central Characterization Program (CCP) Standing Order CCP-SO-096 Rev. 0 for the application of administrative hold on containers when applying a Vender Project Manager (VPM) HOLD indicator tag and clarified visual examination (VE) operator requirements for traveler and VE data sheet.
10	06/06/2013	Revised in response to Corrective Action CAR-INL-0001-13 and permit modification changes.
11	11/01/2013	Revised to incorporate changes for Los Alamos National Laboratory (LANL), Savannah River Site (SRS), and Oak Ridge National Laboratory (ORNL).

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RECORD OF REVISION (Continued)

Revision Number	Date Approved	Description of Revision
12	12/08/2015	• Revised to address issues identified in Waste Isolation Pilot Plant (WIPP) Form WF14-199. • Revised to clarify when not applicable (N/A) should be entered in Sections of Attachment 1, Container Traveler. • Clarified that Attachment 1 is not always required to be attached to the container as long as it is managed and traceable to the specific container. • Deleted unnecessary steps in Section 3.0. • Deleted notes rendered unnecessary as a result of this revision. • Added notes for operational flexibility as appropriate. • Revised step 4.1.6 to allow deletion of step 4.1.7 entirely. • Deleted requirement to apply Vendor Project Manager (VPM) Administrative Hold Indicator for Flammable Gas Analysis (FGA) and Gas Generation Testing (GGT) because they are not “certified” systems. • Changed “VPM/Designee Verification” to VPM/Designee Review” on Attachment 2, Container Inspection/Weight Report, to match procedure step. • Revised process for removing VPM Administrative Hold Tags and added Attachment 4, CCP VPM Administrative Hold Tag Requirements.

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1.0 PURPOSE

This procedure describes and implements the Central Characterization Program (CCP) management, control, and tracking of contact-handled (CH) transuranic (TRU) waste containers during the characterization process.

1.1 Scope

This procedure applies to personnel who support CCP CH TRU waste characterization activities at various Host sites. The Host site shall use their procedures for container movement and handling. Container tracking and management through CCP activities will be conducted using this procedure.

1.2 This procedure does not apply to CCP Characterization performed on containers managed by the Advanced Mixed Waste Treatment Facility (AMWTP) Waste Tracking System (WTS).

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2.0 REQUIREMENTS

2.1 References

Baseline Documents

- DOE/CBFO-94-1012, *U.S. Department Of Energy Carlsbad Field Office Quality Assurance Program Document*
- CCP-PO-001, *CCP Transuranic Waste Characterization Quality Assurance Project Plan*
- CCP-PO-002, *CCP Transuranic Waste Certification Plan*
- CCP-PO-003, *CCP Transuranic Authorized Methods for Payload Control (CCP CH-TRAMPAC)*

Referenced Documents

- CCP-QP-005, CCP *TRU Nonconforming Item Reporting and Control*
- CCP-QP-008, *CCP Records Management*
- CCP-QP-040, *Support Training*
- DOE/WIPP 11-3384, *CBFO Approved Filter Vents*

2.2 Training Requirements

2.2.1 Container management personnel will be trained in accordance with CCP-QP-040, *Support Training*.

2.3 Procedure Implementation Requirements

2.3.1 Within the constraints of this procedure and in order to meet operational needs, the Vendor Project Manager (VPM)/Designee may direct containers as required to allow for process efficiencies or corrective action for nonconforming conditions. Attachment 1, Container Traveler, serves as the container status indicator throughout characterization activities.

2.3.2 If a Nonconformance Report (NCR) is initiated at any time in the CCP process (from the initial introduction of the container into the CCP process to shipment of the container to the Waste Isolation Pilot Plant [WIPP]), the affected containers shall have a NCR Hold Tag applied and be physically segregated if practical. Normally, the container(s) will not continue through the characterization process. If this is **NOT** the case, limitations or actions required in the approved NCR disposition shall be included on the NCR Hold Tag. In NO case, shall the container(s) proceed to shipment until the NCR disposition is complete.

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2.3.3 NO waste container may enter the CCP normal characterization process (i.e., real-time radiography [RTR], nondestructive assay [NDA], flammable gas analysis [FGA]) without a completed Attachment 2, Container Inspection/Weight Report. Waste containers must be characterized at nondestructive examination (NDE) first, unless otherwise directed by the VPM/Designee.

2.3.4 The inspection criteria in Attachment 3, Structural Integrity and Distortion Inspections Criteria, are used as a guide to determine if the container can be safely handled in the characterization activities. Containers that DO **NOT** meet container integrity requirements and are **NOT** safe to handle, shall be returned to the Host site. Containers that are unsatisfactory for Structural Integrity and Distortion Inspection, but are safe to handle, may be processed through the characterization activities.

2.3.5 Not all characterization activities listed on Attachment 1 are performed for every container. Not applicable (N/A) will be entered on Attachment 1 for characterization activities **NOT** performed by CCP.

2.3.6 Attachment 1 may be an adhesive label affixed directly to the container or a paper copy. The paper copy may be in a protective sheet holder attached to the container or managed by other means so as to be traceable to the specific container. An Attachment 1 is required before performing any characterization process.

2.3.7 Containers that require re-characterization through a process due to an NCR do not require a new container traveler. However, the operator will note the new completion date and initial the Attachment 1 per the applicable step.

2.4 Equipment List

2.4.1 Calibrated scale.

2.4.2 Calibrated check weight(s).

2.5 Precautions and Limitations

2.5.1 **IF** steps in this procedure **CANNOT** be completed as written, **THEN** work must be STOPPED, equipment placed in a safe configuration, **AND** the VPM/Designee notified.

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2.5.2 The VPM/Designee will ensure containers characterized on Non-Certified equipment or under non-certified conditions (e.g., a higher calibration limit requiring a Tier 1 approval) at a certified site are controlled by a VPM Hold Indicator.

2.6 Prerequisite Actions

2.6.1 None.

2.7 Definitions

2.7.1 None.

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3.0 RESPONSIBILITIES

3.1 Container Management Personnel

NOTE
Container Management personnel may be CCP and/or Host site personnel as determined by CCP and the Host facility.

3.1.1 Verify containers are on the Acceptable Knowledge (AK) Tracking Spreadsheet.

3.1.2 Verifies containers have a legible radiological label/tag with a radiation dose equivalent rate of less than 200 millirem/hour (mrem/hr).

3.1.3 Performs container integrity inspection using Attachment 3, as a guide and documents on Attachment 2.

3.1.4 Performs container filter inspection and documents results on Attachment 2.

3.1.5 Performs scale calibration check and container weighing.

3.1.6 Records container weight information on Attachment 2.

3.1.7 Completes and provides Attachment 2 to the VPM/Designee.

3.1.8 Initiates an Attachment 1 for containers designated for CCP characterization activities.

3.1.9 Enters the Gross Weight, Waste Stream identification (ID), and the Container ID Number on Attachment 1.

3.1.10 Provides direction to move containers, as required.

3.1.11 Assists with the segregation of deficient containers.

3.1.12 Assists with the segregation of CERTIFIED containers ready to be shipped for final disposal.

3.2 VPM/Designee

3.2.1 Schedules container movements with the Host site.

3.2.2 Reviews Attachment 2.

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3.3 Site Project Manager (SPM)

3.3.1 Helps administer Administrative Hold Indicators.

3.4 Real Time-Radiography (RTR) Operator

3.4.1 Records and updates the applicable RTR information on Attachment 1.

3.5 Nondestructive Assay (NDA) Operator

3.5.1 Records and updates the applicable NDA information on Attachment 1.

3.6 Flammable Gas Analysis (FGA) Operator

3.6.1 Records and updates the applicable FGA information on Attachment 1.

3.7 Gas Generation Testing Program (GGTP) Operator

3.7.1 Records that Gas Generation Testing (GGT) Sampling and Analysis is complete on Attachment 1.

3.8 Visual Examination (VE) Operator

3.8.1 Records and updates the applicable visual examination (VE) information on Attachment 1.

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4.0 PROCEDURE

NOTE

A VPM Administrative Hold Indicator(s) is used to administratively control container(s) or item(s) when there is **NO** nonconformance.

A VPM Administrative Hold Indicator is initiated by applying a VPM Administrative Hold Tag(s) to the affected container(s) or item(s) as instructed by procedure or VPM/Designee. Containers that are physically inaccessible or should not be approached by personnel due to as low as reasonably achievable (ALARA) concerns may be controlled by other methods as determined by the VPM/Designee. Other methods used to control the affected items may include segregation or the use of dual, independent check systems (e.g., a VPM HOLD Exclusion within Integrated Data Center [IDC] and a separate data set provided to the Waste Certification Official).

When a VPM Administrative Hold Indicator(s) is applied to a container(s), the VPM/Designee and SPM must be notified.

4.1 Waste Container Acceptance

Container Management Personnel

4.1.1 **IF** a container is entering CCP characterization through VE,
THEN go to step 4.4.10.

4.1.2 **IF** the container entering container management is a non CCP waste container,
THEN proceed to step 4.1.4.

4.1.3 Verify Container ID is on the AK Tracking Spreadsheet.

[A] **IF** Container ID is **NOT** on the AK Tracking Spreadsheet, **THEN** DO **NOT** accept the container, contact the VPM/Designee, **AND** return the container to the Host site.

4.1.4 Record Container ID on Attachment 2.

NOTE

Steps 4.1.5, 4.1.6, and 4.1.7 may be performed in any order and on multiple containers in series to make the inspection more efficient. When performing step 4.1.5, it is not necessary to inspect the bottom of containers that have been pre-staged by the Host site for FGA only.

4.1.5 Determine that the container is safe to handle by performing a container integrity inspection, using Attachment 3 as a guide.

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[A] **IF** NO can be applied to all of the questions on Attachment 3,
THEN circle YES on Attachment 2, **AND** proceed with the inspection.

[B] **IF** YES can be applied to any question on Attachment 3,
THEN notify the VPM.

VPM/Designee

[B.1] Inspect the suspect container in coordination with appropriate Host site personnel **AND** determine if the container can be safely handled in the characterization activities.

[B.2] **IF** the container can be safely handled in the characterization activities,
THEN circle YES on Attachment 2, document the VPM/Designee determination in the Comments section, **AND** proceed with the inspection.

[B.3] **IF** the container CAN **NOT** be safely handled,
THEN circle NO on Attachment 2, **AND** return the container to the Host site.

[B.4] If appropriate, ensure an NCR is initiated in accordance with CCP-QP-005, *CCP TRU Nonconforming Item Reporting and Control,* **AND** exit this procedure for the container.

4.1.6 Perform container filter inspection as follows:

[A] For drums, verify that the filter is seated below the drum ring.

[B] **IF** performing FGA only on NON CCP containers,
THEN enter N/A in Filter Information block on Attachment 2
AND Go to 4.1.7.

[C] Check container filter vent(s) for manufacturer markings:

[C.1] Record all data available on Attachment 2 (e.g., manufacturer, model number, date of manufacturer, Lot number, serial number).

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[C.2] For containers at the Los Alamos National Laboratory (LANL), **IF** the model number is not clearly marked on the filter,
THEN verify the filter is a NucFil Model 013, 072, or 073.

[C.3] Confirm the filter is a Carlsbad Field Office (CBFO) approved filter vent, **AND** is listed on Attachment 2 of DOE/WIPP 11-3384, *CBFO Approved Filter Vents*.

[D] For Drums, check filter for proper gasket seating, tightness, as follows:

[D.1] Filter gasket is slightly compressed, when visible.

[D.2] Filter is snug against container.

[E] **IF** the filter vent(s) meets the criteria listed in steps 4.1.6[A] through 4.1.6[D],
THEN circle YES on Attachment 2, **AND** proceed with the inspection.

[F] **IF** the filter vent(s) DOES **NOT** meet the criteria listed in steps 4.1.6[A] through 4.1.6[D],
THEN DO **NOT** accept the container **AND** return the container to Host site, if applicable.

4.1.7 Perform radiological label inspection as follows:

[A] Inspect each container for a completed radiological label/tag, **AND** verify the completed radiological label/tag is legible and records a radiation dose equivalent of less than 200 mrem/hr.

[B] **IF** radiological label/tag or survey reports less than 200 mrem/hr and is legible and complete,
THEN circle SAT on Attachment 2, **AND** proceed with the inspection.

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[C] **IF** NO radiological label/tag is attached to the container, **THEN** SUSPEND WORK on the container, and perform the following:

[C.1] Notify the VPM/Designee

[C.2] Request a radiation survey be performed

[C.3] Verify that a new radiological label/tag is attached

[C.4] Go to step 4.1.7[A].

[D] **IF** radiological label/tag or survey reports greater than or equal to 200 mrem/hr,
THEN SUSPEND WORK on the container, notify the VPM/Designee, return the container to the Host site, **AND** circle UNSAT on Attachment 2.

[D.1] If appropriate, ensure an NCR is initiated in accordance with CCP-QP-005, **AND** exit this procedure for the container.

[E] Repeat steps 4.1.1 through 4.1.7 as required for additional containers.

NOTE
Section 4.2 may be performed any time prior to weighing the first container of the day to make the inspection more efficient.

4.2 Scale Calibration Check

4.2.1 **IF** performing FGA only on non-CCP containers,
THEN enter N/A on Attachment 2 for the information in steps 4.2.2[B], [E], and [F] **AND** proceed to 4.2.2[H].

4.2.2 On each day the scale is used, perform the following before weighing the first container:

[A] **IF** the scale is an electronic scale,
THEN either verify the scale is turned ON, **OR** turn the power ON to the scale.

[B] Verify the following, **AND** record on Attachment 2:

[B.1] Scale ID #

[B.2] Location

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[B.3] Scale Calibration Due Date

[B.4] Scale Calibration Date Valid (Circle YES or NO)

[C] Check that the scale reads zero when **NOT** loaded.

[C.1] **IF** the scale DOES **NOT** read zero,
THEN re-zero the scale in accordance with the manufacturer's instructions.

[D] Perform a calibration check to verify the scale response is satisfactory as follows:

[D.1] Place a Calibrated Check Weight(s) on the scale, **AND** verify the scale reads within the accuracy of the calibration (as listed on the calibration sticker or data sheet, as applicable).

[E] **IF** the scale calibration check is satisfactory,
THEN circle SAT on Attachment 2.

[F] **IF** the scale reads outside of the calibration range,
THEN SUSPEND WORK, circle UNSAT on Attachment 2,
AND notify the VPM.

[G] Return the Check Weight(s) to its storage location.

[H] Initial and date Attachment 2.

NOTE

This information must be available before characterization of the container through NDA.

NOTE

Steps 4.3.2 through 4.4.5 may be performed in any order to make the inspection more efficient.

4.3 Container Weighing

4.3.1 **IF** performing FGA only on non-CCP containers,
THEN proceed to Section 4.4.

4.3.2 Load the container onto the scale, **AND** allow the scale reading to stabilize.

4.3.3 Record the container's Gross Weight (kilogram [kg]) on Attachment 2.

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4.3.4 Initial and date Attachment 2 for obtaining the gross weight.

4.3.5 Remove the container from the scale.

4.3.6 Repeat steps 4.3.2 through 4.3.5 as required for additional containers.

4.4 Container Traveler Initiation

4.4.1 Enter the Container ID Number on Attachment 1, **AND** initial and date.

4.4.2 **IF** CCP is performing limited characterization activities on a waste container (e.g., FGA only),
THEN N/A blocks on Attachment 1 that are not required.

4.4.3 Enter Waste Stream ID on Attachment 1, **AND** initial and date Attachment 1.

4.4.4 Record the container's Gross Weight (kg) on Attachment 1 from Attachment 2, **AND** initial and date.

4.4.5 Ensure Attachment 1 is on the container **OR** is managed by other means so as to be traceable to the specific container.

4.4.6 Repeat steps 4.4.1 through 4.4.5 as required for additional containers.

4.4.7 Print name, sign, and date Attachment 2.

4.4.8 Submit Attachment 2 to the VPM/Designee for review.

VPM

4.4.9 Review, print name, sign, and date all Attachment 2s **AND** submit to CCP records in accordance with CCP-QP-008, *CCP Records Management*.

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VE Operator

NOTE
Steps 4.4.10[A] through [I] may be performed in any order to make the process more efficient

4.4.10 **IF** the container was characterized by VE,
THEN perform the following:

[A] Make a copy of the VE Data Sheet ensuring the weight and percent fill data is available for Host site personnel labeling containers as necessary.

[B] Verify that a legible, completed radiological label/tag is attached to the waste container, **AND** that it records a radiation dose equivalent of less than 200 mrem/hr.

[B.1] **IF** no radiological label/tag is attached to the container,
THEN request that the Radiological Control Technician (RCT) perform the required survey, **AND** attach a completed radiological label/tag.

[B.2] **IF** the radiological label/tag or survey reports a radiation dose equivalent of greater than or equal to 200 mrem/hr,
THEN suspend work on the container, notify VPM **AND** return the container to the Host site.

(a) If appropriate, ensure an NCR is initiated in accordance with CCP-QP-005 **AND** exit this procedure for the container.

[C] Enter the Container ID, Gross Weight (kg), Waste Stream ID, from the VE data, **AND** initial and date Attachment 1.

[D] Enter N/A in the RTR section data and associated Initial/Date blanks on Attachment 1.

[E] Document the VE Completion Date on Attachment 1, **AND** initial and date.

[F] **IF** the process is not certified,
THEN apply a VPM Administrative Hold Tag on the container **AND** communicate the container number to the Site Project Manager (SPM) and VPM.

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[G] **IF** there is a Non-conforming condition,
THEN initiate a NCR in accordance with CCP-QP-005 .

[H] Ensure Attachment 1 is attached to the container or is managed by other means as to be traceable to the specific container.

[I] If requested, place a copy of the VE Data Sheet in a protective sheet holder, and attach to the container as necessary.

4.5 RTR Process

NOTE
This section DOES **NOT** apply to waste that has been processed through VE.

RTR Operator

4.5.1 Verify an Attachment 1 is available for the container.

[A] **IF** Attachment 1 is not available,
THEN SUSPEND WORK on container, **AND** notify the VPM

[B] **IF** an Attachment 1 is available,
THEN:

- Ensure container is above the freezing temperature of water (32ºF).
- Perform RTR in accordance with approved procedures.

4.5.2 Document the RTR completion date on Attachment 1, **AND** initial and date.

4.5.3 **IF** the system is not certified,
THEN apply a VPM Administrative Hold Tag on the container **AND** communicate the container number to the SPM and VPM.

4.5.4 **IF** there is a Non-conforming condition,
THEN initiate a NCR in accordance with CCP-QP-005.

4.5.5 If requested, place a copy of the Radiography Data Sheet in a protective sheet holder attached to the waste container.

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4.6 NDA Process

NDA Operator

4.6.1 Verify an Attachment 1 is available for the container, **AND** a copy of the VE or Radiography Data Sheet is available as applicable.

[A] **IF** Attachment 1 is not available,
THEN SUSPEND WORK on container, **AND** notify the VPM/Designee.

[B] **IF** an Attachment 1 is available,
THEN perform NDA in accordance with approved procedures.

4.6.2 Document the NDA completion date on Attachment 1, **AND** initial and date.

4.6.3 **IF** the system is not certified,
THEN apply a VPM Administrative Hold Tag on the container AND communicate the container number to the SPM and VPM.

4.6.4 Document the Preliminary Plutonium (Pu)-239 fissile gram equivalent (FGE) value (plus 2-sigma) on Attachment 1, **AND** initial and date on Attachment 1.

[A] **IF** the preliminary Pu-239 FGE value (plus 2-sigma) is **NOT** immediately available,
THEN record N/A on Attachment 1, **AND** initial and date on Attachment 1.

4.6.5 **IF** there is a Non-conforming condition,
THEN initiate a NCR in accordance with CCP-QP-005.

FGA Personnel

4.7 Flammable Gas Analysis (FGA)

4.7.1 **IF** a waste container is identified for FGA sampling and analysis,
THEN perform the following:

[A] Verify an Attachment 1 is available for the container.

[A.1] **IF** Attachment 1 is not available,
THEN SUSPEND WORK on the waste container,
AND notify the VPM/Designee.

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[B] **WHEN** FGA is ready to sample the waste container, **THEN** ensure the waste container is located in the FGA sampling area.

4.7.2 Perform FGA Sampling in accordance with approved procedures.

4.7.3 Document FGA Sampling completion date on Attachment 1, **AND** initial and date.

4.7.4 **IF** there is a Non-conforming condition, **THEN** initiate a NCR in accordance with CCP-QP-005.

4.8 Gas Generation Testing (GGT)

NOTE

Waste containers are selected for GGT based on waste stream, implementation of the Long-Term Objective for the Unified Flammable Gas Test procedure, or other factors. The VPM/Designee will designate waste containers for GGT as directed by the SPM.

Container Management Personnel

4.8.1 Ensure waste containers identified for GGT Sampling and Analysis are moved to the Designated Staging Area, **AND** provide an Attachment 1 for each container to the GGT Operator.

GGT Operator

4.8.2 Verify an Attachment 1 is available for each container staged for GGT.

[A] **IF** Attachment 1 is missing for a container, **THEN** SUSPEND WORK on container, **AND** notify the VPM/Designee.

4.8.3 Perform GGT in accordance with approved procedures.

4.8.4 Document the GGT completion date on Attachment 1, **AND** initial and date.

4.8.5 **IF** there is a Non-conforming condition, **THEN** initiate a NCR in accordance with CCP-QP-005.

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4.9 Characterization Completion

Container Management Personnel

4.9.1 **IF** Attachment 1 is a label on the container,
THEN remove all paper copies of characterization data sheets as applicable, **AND** forward to the VPM/Designee for disposition.

4.9.2 **IF** Attachment 1 is a paper copy,
THEN ensure the Attachment 1 and all copies of characterization data sheets are removed **AND** forward to the VPM/Designee for disposition.

VPM/Designee

4.9.3 Submit the records generated by this procedure to CCP records to be managed in accordance with CCP-QP-008.

4.10 VPM Administrative Hold Indicators Reporting and Control

VPM/Designee

4.10.1 WHEN initiating a VPM Administrative Hold, determine whether VPM Administrative Hold Tag(s) will be applied OR whether other methods will be used to control the affected items(s).

4.10.2 Ensure affected item(s) are controlled by a VPM Hold Indicator(s) and if used, that VPM Administrative Hold Tag(s) is applied (see Attachment 4, CCP VPM Administrative Hold Tag Requirements).

SPM

4.10.3 **WHEN** notified by Characterization Personnel that a VPM Administrative Hold Tag(s) has been applied to administratively control containers characterized using a non-certified system,
THEN place the container(s) on hold within IDC by generating a VPM HOLD Exclusion OR adding the affected container(s) to an exclusion that already exists.

4.10.4 Send an e-mail notification to the VPM/Designee that the container(s) have been placed on hold within IDC.

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SPM

4.10.5 **WHEN** a VPM Administrative hold within IDC is no longer required,
THEN send an e-mail notification to the VPM/Designee to remove VPM administrative hold Tag(s) from the affected containers.

VPM/Designee

4.10.6 Ensure VPM administrative hold indicator(s) is removed from affected item(s) and if used, that VPM Administrative Hold Tag(s) is removed (see Attachment 4).

4.10.7 **IF** container(s) are physically inaccessible or should not be approached by personnel due to ALARA concerns,
THEN coordinate with Host site to remove CCP VPM Administrative Hold Tags as soon as practical and inform SPM.

4.10.8 **WHEN** VPM Administrative Hold Tag(s) has been removed from the container(s),
THEN send an e-mail notification to the SPM/Designee that the VPM Administrative Hold Tag(s) has been removed.

SPM

4.10.9 Remove affected container(s) from the VPM Hold Exclusion in the IDC.

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5.0 RECORDS

5.1 Records generated during the performance of this procedure are maintained as quality assurance (QA) records in accordance with CCP-QP-008. The records are the following:

5.1.1. QA/Nonpermanent

[A] Attachment 1 – Container Traveler (paper copy only)

[B] Attachment 2 – Container Inspection/Weight Report

[C] Notification e-mails for hold as well as release of containers.

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Attachment 1 – Container Traveler

Container Management Personnel:

Container ID:_____ _____ / _____
Date Initials

Waste Stream ID:_____ _____ / _____
Date Initials

Gross Weight:_____kg. _____ / _____
Date Initials

RTR

RTR: _____ _____ / _____
(Completion Date) Date Initials

NDA

NDA:_____ _____ / _____
(Completion Date) Date Initials

Preliminary Pu-239 FGE: _____ _____ / _____
Value (Plus 2-sigma) Date Initials

FGA

FGA:_____ _____ / _____
(Completion Date) Date Initials

GGT

GGT:_____ _____ / _____
(Completion Date) Date Initials

VE

VE:_____ _____ /_____
(Completion Date) Date Initials

Attachment 2 – Container Inspection/Weight Report

Structural Integrity / Safe to Handle YES / NO		Container ID Number	Filters meet requirements YES / NO		Filter Information (Manufacturer model number, date of manufacture, lot number, unique serial number, as applicable)	Rad Survey Label (Circle)		Gross Container Weight (kg)	Initials	Date
YES	NO		YES	NO		SAT	UNSAT			
YES	NO		YES	NO		SAT	UNSAT			
YES	NO		YES	NO		SAT	UNSAT			
YES	NO		YES	NO		SAT	UNSAT			
YES	NO		YES	NO		SAT	UNSAT			
YES	NO		YES	NO		SAT	UNSAT			
YES	NO		YES	NO		SAT	UNSAT			
YES	NO		YES	NO		SAT	UNSAT			
YES	NO		YES	NO		SAT	UNSAT			
YES	NO		YES	NO		SAT	UNSAT			

Scale ID #	Location	Scale Calibration Due Date	Scale Calibration Due Date Valid (Circle)		Scale Calibration Check (Circle)		Initials	Date
			YES	NO	SAT	UNSAT		

Comments:

Completed by: _____ _____ _____
Print Name Signature Date

VPM/Designee Review: _____ _____ _____
Print Name Signature Date

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Attachment 3 – Structural Integrity and Distortion Inspections Criteria

CONTAINER EXAMINATION		DISCUSSION OF CRITERIA
1.	Is the payload container obviously degraded?	Obviously degraded means clearly visible and potentially significant defects in the payload container or payload container surface.
2.	Is there evidence that the payload container is, or has been, pressurized?	Pressurization can be indicated by a fairly uniform expansion of the sidewalls, bottom or top. Past pressurization can be indicated by a notable outward deflection of the bottom or top. Verify that the waste container is not warped.
3.	Is there any potentially significant rust or corrosion such that wall thinning, pin holes, or breaches are likely or the load-bearing capacity is suspect?	Rust shall be assessed in terms of its type, extent, and location. Pitting, pocking, flaking, or dark coloration characterizes potentially significant rust or corrosion. This includes the extent of the payload container surface area covered, thickness, and, if it occurs in large flakes or built-up (caked) areas. Rusted payload containers may **NOT** be accepted if: • Rust is present in caked layers or deposits. • Rust is present in the form of deep metal flaking, or built-up areas of corrosion products. In addition, the location of rust should be noted; for example on a waste container: top lid; filter region; locking chine; top one-third, above the second rolling hoop; middle one-third, between the first and second rolling hoops; bottom one-third, below the second rolling hoop; and on the bottom. Payload containers may still be considered acceptable if the signs of rust show up as: • Some discoloration on the payload container. • If rubbed would produce fine grit or dust or minor flaking (such that wall thinning does not occur).
4.	Are any of the following apparent? • wall thinning • pin holes • breaches	Wall thinning, pin holes, and breaches can be a result of rust/corrosion (see discussion for #3).
5.	Are there any split seams, tears, obvious holes, punctures (of any size), creases, broken welds, or cracks?	Payload containers with obvious leaks, holes or openings, cracks, deep crevices, creases, tears, broken welds, sharp edges or pits, are either breached or on the verge of being breached. Verify that there is no warpage that could cause the container to be unstable or prevent it from fitting properly in the applicable package.
6.	Is the load-bearing capacity suspect?	The load-bearing capacity could be reduced for excessive rust (see discussion for #3), wall thinning (see discussion for #4), breaches, cracks, creases, broken welds, etc. (see discussion for #5).

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Attachment 3 – Structural Integrity and Distortion Inspections Criteria (Continued)

CONTAINER EXAMINATION		DISCUSSION OF CRITERIA
7.	Is the payload container improperly closed?	Inspect the fastener and fastener ring (chine), if applicable, for damage or excessive corrosion. Check the alignment of the fastener to ensure that it is in firm contact around the entire lid and the payload container will not open during transportation.
8.	Are there any dents, scrapes, or scratches that make the payload container's structural integrity questionable or prevent the top and bottom surfaces from being parallel?	Deep gouges, scratches, or abrasions over wide areas are not acceptable. If top and bottom surfaces are not parallel, this would indicate that the container is warped. Dents should be less than ¼-inch deep by 3 inches long and between ½-inch to 6 inches wide. All other dents must be examined to determine impact of structural integrity.
9.	Is there discoloration which would indicate leakage or other evidence of leakage of material from the payload container?	Examine the payload container regions near vents, top lid fittings, bottom fittings, welds, seams and intersections of one or more metal sheets or plates. Payload containers must be rejected if evidence of leakage is present.
10.	Is the payload container bulged?	For the purposes of this examination, bulging is indicated by: • A fairly uniform expansion of the sidewalls, bottom, or top (e.g., in the case of a waste container, either the top or bottom surface protrudes beyond the planar surface of the top or bottom ring); • A protrusion of the side wall (e.g., in the case of a waste container, beyond a line connecting the peaks of the surrounding rolling hoops or a line between a surrounding rolling hoop and the bottom or top ring); or • Expansion of the sidewall (e.g., in the case of a waste container, such that it deforms any portion of a rolling hoop).

Attachment 4 – CCP VPM Administrative Hold Tag Requirements

Applicability

This Attachment applies to all CCP Personnel applying or removing CCP VPM Administrative Hold Tags.

When PLACING A VPM Administrative Hold Tag On A Waste Container:

- Use only CCP-provided VPM Hold Tag.
- When applying the VPM Hold Tag, enter the information using a Sharpie, permanent marker, or equivalent.
- The VPM Hold Tag when possible should be applied so that the drum number, BDR number, etc. face out.
- Place the VPM Hold Tag on the waste container locking ring bolt or lifting handle, using the cable tie in accordance with the following:
    - Use a separate cable tie for each Hold Tag placed on a waste container.
    - Ensure the cable tie locks and does not protrude past the bottom of the device.
    - If the wire protrudes past the bottom of the device, wrap the exposed wire with tape.

When REMOVING A VPM Administrative Hold Tag From A Waste Container:

- Wrap the area where the cable is to be cut with tape prior to cutting to prevent the cable wires from splaying. Cut the cable tie holding the VPM Hold Tag to the container using CCP-approved cable cutters. If the cable cannot be wrapped with tape, then ensure puncture resistant gloves are worn when cutting cable.
- DO NOT cut or pull the tag off the cable tie.
- Return the VPM Hold Tag to the VPM/Designee directing removal of the tag.
- DO NOT remove Host site tags or tamper-indicating devices (TID). Immediately report accidental removal of these to the VPM.

Attachment 4 – CCP VPM Administrative Hold Tag Requirements (Continued)

When A Cable Or Wire Is Found On A Waste Container Without A VPM Hold Tag Attached, Or When A VPM Hold Tag Is Damaged Or Faded:

- Treat the container as though it has a VPM Hold Tag applied.
- If the VPM Hold Tag is found damaged or faded, document the container number and any information from the remaining Tag and notifiy the VPM/Designee.
- If a loose tag is found on a waste container or on the ground, turn the tag over to the VPM/Designee.
- Replace loose, damaged, faded, or missing VPM Hold Tags as directed by the VPM.

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CCP-TP-113

Revision 19

CCP
Standard Contact-Handled Waste Visual Examination

EFFECTIVE DATE: 06/23/2015

Mike Ramirez

PRINTED NAME

APPROVED FOR USE

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RECORD OF REVISION

Revision Number	Date Approved	Description of Revision
0	03/26/2004	Initial Issue.
1	04/02/2004	Incorporated Facility Oversight Review Committee Comment resolutions, from Los Alamos National Laboratory, into Sections 1.0, 2.0 and 4.0.
2	07/15/2004	Revised in response to CBFO CAR #04-026. The change in this document involved addition of a note for clarification and implementation on percent fill of a drum. As such, this change is data quality affecting.
3	01/25/2005	Made corrections to procedure per LANL, to comply with the MSA review.
4	12/22/2005	Revised Table 4 to add the weight of an 85- and 110-Gallon Drum as well as a 55-Gallon 12-mil. Plastic Bag. Revised responsibility for pagination of the BDR.
5	08/28/2006	Revised to address CAR LANL-0006-06.
6	11/16/2006	Revised to implement changes to the Waste Isolation Pilot Plant Hazardous Waste Facility Permit requirements resulting from the Section 311/RH PMR.
7	03/19/2007	Revised to clarify notes and procedural steps. Revised to record Output Drum information in Section 4 of Attachment 1. Revised to record Waste Container ID on each page of Attachment 1.
8	09/04/2007	Revised to separate and clarify each Visual Examination (VE) process. Revised Attachment 1, CCP Waste Visual Examination Data Form and Attachment 2, CCP Waste VE Independent Technical Reviewer Checklist, to support the changes. Added new Section 4.11, Newly Generated Waste Container Data Submission, and Attachment 5, CCP Newly Generated Waste Container Data, to assist in container tracking. Incorporated additional editorial changes.
9	03/05/2008	Revised to add a step to Section 2.4 for use of Host site procedures for anomalous conditions. Attachment 1, Section 5, Prohibited Items revised to be consistent with Central Characterization Project (CCP) Nondestructive Examination (NDE) procedures and made additional editorial changes.

RECORD OF REVISION (Continued)

Revision Number	Date Approved	Description of Revision
10	07/09/2008	Revised to address U.S. Department of Energy (DOE) Carlsbad Field Office (CBFO) Corrective Action Request (CAR) Number CAR-08-021 and New Mexico Environmental Department (NMED) Observer Inquiry from Audit A-08-16. Also, revised to maintain control of internal package/items so that payload containers are surveyed at <200 millirem per hour (mrem/hr).
11	11/12/2008	Revised to incorporate concurrent use with CCP-TP-163, *CCP Standard Visual Examination of Records*.
12	12/01/2008	Minor revision to add notes for clarification of visual examination (VE) of record.
13	03/11/2009	Revised to address the U.S. Department of Energy (DOE) Carlsbad Field Office (CBFO) Corrective Action Report (CAR) Number 09-015 and Environmental Protection Agency (EPA) Issue Numbers INL-CCP-RH-VE-T1-002CR, 003CR, and 007CR.
14	06/30/2010	Revised to incorporate modifications to Hazardous Waste Facility Permit. Revised to address CBFO Corrective Action Report (CAR) 10-019. Revised to address procedural steps, to accommodate the visual examination (VE) process for newly generated waste and to make additional editorial changes.
15	12/29/2010	Revised to clarify independent technical reviewer (ITR) independence.
16	04/25/2011	Revised to remove recording location and clarify transportation packaging requirements.
17	06/04/2013	Revised to incorporate the Nuclear Waste Partnership (NWP) transition changes.
18	09/25/2013	Revised to address Carlsbad Field Office (CBFO) Corrective Action Report (CAR) 13-051.
19	06/23/2015	Revised to incorporate information from standing order CCP-SO-35 and to clarify independent technical reviewer (ITR) questions related to Quality Assurance Objectives (QAOs).

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1.0 PURPOSE

CCP-PO-001, *CCP Transuranic Waste Characterization Quality Assurance Project Plan*, Section C-3b, requires that containers be examined to verify the physical form of the waste and to identify items that are prohibited from disposal at the Waste Isolation Pilot Plant (WIPP). This procedure establishes how to perform visual examination (VE) of contact-handled (CH) transuranic (TRU) waste containers, which may include the removal of prohibited items; and how to prepare and review Batch Data Reports (BDRs) generated from the VE process. This procedure is designed to be accomplished in conjunction with Host site facility operating procedures that address the use of those facilities for VE. All Host site requirements for health, safety, and operations in the work place will be addressed in a Host site procedure.

1.1 Scope

This procedure applies to retrievably stored and newly generated S3000 homogeneous solids, S4000 soils/gravel, and S5000 debris waste streams. VE will be used when necessary to examine a waste container to verify its physical form and to detect and remediate items that are prohibited from disposal at the WIPP.

There are two methods allowed for performing a VE process. Method 1 uses one VE Operator (VEO) with audio/video recording of the process, and Method 2 uses two VEOs (without audio/video recording of the process).

VE will not be used as the Nondestructive Examination (NDE) process for certification of S3000 Retrievably Stored waste unless a surveillance on the process has been performed by Carlsbad Field Office (CBFO) identifying why VE is the preferred method over real-time radiography (RTR).

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2.0 REQUIREMENTS

2.1 References

Baseline Documents

- CCP-PO-002, *CCP Transuranic Waste Certification Plan*
- CCP-PO-003, *CCP Transuranic Authorized Methods for Payload Control (CCP CH-TRAMPAC)*

Referenced Documents

- CCP-PO-001, *CCP Transuranic Waste Characterization Quality Assurance Project Plan*
- CCP-QP-002, *CCP Training and Qualification Plan*
- CCP-QP-005, *CCP TRU Nonconforming Item Reporting and Control*
- CCP-QP-008, *CCP Records Management*

2.2 Training Requirements

2.2.1 Personnel performing this procedure will be trained and qualified in accordance with CCP-QP-002, *CCP Training and Qualification Plan*, prior to performing this procedure.

2.3 Equipment List

2.3.1 Torque Wrenches

2.3.2 Certified VE Scale, as needed

2.3.3 Certified Container Scale

2.3.4 Certified Weights

2.4 Precautions and Limitations

2.4.1 Containers with a total dose rate >200 millirem per hour (mrem/hr) at surface SHALL **NOT** be processed under this procedure.

2.4.2 VE of homogeneous solid waste containers is NOT authorized at Los Alamos National Laboratory (LANL) at this time.

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2.5 Prerequisite Actions

2.5.1 Prepare containers for VE in accordance with Host site procedures.

2.5.2 Ensure **NO** hold tags that would prevent the performance of VE are on the containers before proceeding.

2.5.3 Review the radiation levels of the containers before proceeding.

2.5.4 Ensure Method 1 or Method 2 for performing the VE has been determined by the Site Project Manager (SPM).

2.5.5 Ensure Input Waste Container(s) is on the Acceptable Knowledge (AK) Tracking Spreadsheet (if applicable).

2.5.6 For Newly Generated waste processing, confirm that the waste stream is described in an approved AK Summary Report.

2.5.7 Ensure Certified Torque Wrenches, Certified Container Scale, Certified Weights, and Certified VE Scale are on the current and approved measuring and test equipment (M&TE) list (as applicable).

2.6 Definitions

2.6.1 **Calibration Due Date** – The date recorded on a tool's or scale's sticker/label that indicates the date due for calibration.

2.6.2 **Method 1** – One VEO with audio/video recording of the process created during VE.

2.6.3 **Method 2** – Two VEOs (without audio/video recording of the process) performing VE. Each VEO shall observe for themselves the waste being placed in the waste container or the contents within the examined waste container when the waste is not removed.

2.6.4 **Outermost Container** – Outer container that holds waste at time of VE.

2.6.5 **Internal Container** – A container inside the outermost container examined during visual examination. Drum liners, liner bag, plastic bags used for contamination control, capillary-type labware, and debris not designed to hold liquid at the time of original waste packaging are not internal containers.

2.6.6 **Observable Liquid** – Liquid that is observable by a qualified operator performing VE of the waste.

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2.6.7 **Field Records** – Records which are generated in the field under adverse conditions (i.e., personnel are wearing Anti Cs), which need to be transcribed into a final format for legibility. Field records shall be obtained using the forms from this procedure to ensure the required information is obtained. The field record shall be signed and dated by the operator(s) performing the task. Field records that are transcribed will be included in the BDRs to ensure the absence of transcription errors.

2.6.8 **Tamper Indicating Device (TID)** – A device with a unique identifier that is used when a package is not under control of a qualified VE Operator.

2.6.9 **Indirect Load** – Any package, item or material to be placed in an output container that has previously undergone the VE process and was controlled by the use of a tamper indicating device (TID) or other administrative control prior to being loaded into the output container.

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3.0 RESPONSIBILITIES

3.1 Visual Examination Expert (VEE)

3.1.1 Responsible for the overall direction and implementation of the VE operations.

3.1.2 Ensures Nonconformance Reports (NCR) are written as required per CCP-QP-005, *CCP TRU Nonconforming Item Reporting and Control*.

3.2 Visual Examination Operator (VEO)

3.2.1 Performs the VE.

3.2.2 Assembles, paginates, and reviews the BDR.

3.3 Independent Technical Reviewer (ITR)

NOTE
The Independent Technical Reviewer (ITR) will be someone, other than the VEO, who is qualified to have performed the work and who was not involved in the generation or recording of the data under review.

3.3.1 Reviews the BDR.

3.4 Vendor Project Manager (VPM)

3.4.1 Ensures the safe operation of the VE process.

3.4.2 Ensures all personnel maintain proficiency and identifies any additional training that may be required.

3.4.3 Coordinates remediation of prohibited items with the Host site.

3.4.4 Facilitates container tracking and management.

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4.0 PROCEDURE

NOTE

A Testing Batch includes all data pertaining to VE for up to 20 waste containers without regard to waste matrix.

If, during the performance of VE, multiple Input Waste Containers are used to produce an Output Waste Container or multiple Output Waste Containers are generated from an Input Waste Container, separate data sections shall be completed for each waste container, as applicable.

N/A shall be marked in all fields of the Attachments that are not applicable, unless the document's intent is clear with some blanks.

The sections of this procedure may be performed independently and concurrently to accommodate the VE process.

VEE will ensure NCR's are initiated by the individual(s) identifying non-conforming conditions in accordance with CCP-QP-005.

Remediation of prohibited items (e.g., removal, absorption, etc.) may be performed in unison with Waste Material Parameter (WMP) identification (ID).

Prohibited items are listed in Table 1, Prohibited Items, are remediated per Host site procedures, as necessary.

Any liquid in non-transparent internal containers, detected from shaking the internal container, will be handled by assuming that the internal container is filled with liquid.

Data changes and requisite approvals SHALL be made by the individual or individuals who originally collected the data, **OR** by an equally-qualified individual or individuals authorized to change data.

Host site operators and procedures may be used to handle anomalous conditions, as necessary.

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VEO

4.1 General Information and Performance Checks

NOTE
The steps in 4.1.1 may be performed in any order.

4.1.1 Record Batch Data Report No. on Attachment 1, CCP Waste Visual Examination General Information Form, and Attachment 2, CCP Waste Visual Examination Data Form, (xxVEzzyyyy - where xx is the Site Identifier [e.g., LA for LANL], zz is the VE area identifier, and yyyy is a sequential number for that site).

[A] Record the following information on Attachment 1:

[A.1] Mark applicable VE process to be performed.

[A.2] Mark VE Method used.

[A.3] Site ID.

[A.4] Examination Date.

[A.5] Procedure No.

[A.6] Revision No.

4.1.2 Camera(s) Check (Method 1)

NOTE
If the VE continues for more than one day, a camera check will be conducted prior to continuing the VE for the new day. The results of the second camera check will be recorded on the audio/video media and noted in the Comments block on Attachment 1. The audio/video camera will be checked prior to each VE BDR to ensure proper operation of the camera. The test image segment SHALL remain intact without being erased or recorded over.

[A] **IF** audio/video recording will **NOT** be created, **THEN** mark N/A on Attachment 1, **AND** GO TO Section 4.1.3.

[B] Record the Date, Container ID Number(s), BDR Number, and the Audio/Video Media Recording Number on the Audio/Video Media Label.

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[C] Ensure the audio/video media is at its beginning or at the point where recording was stopped the previous day.

[D] Start the camera(s).

[E] Record a test image and narrative.

[F] Review the test segment by playing the audio/video media, **AND** verify the image is in focus and the narration is clear.

[G] Save the test recording (i.e., stop the audio/video media at the end of the playback).

[G.1] **IF** the results are UNSAT,
THEN notify the Visual Examination Expert (VEE) and Vendor Project Manager (VPM).

(a) **WHEN** the camera/audio/video media recording system is operational,
THEN repeat steps 4.1.2[D] through 4.1.2[H].

[H] Record the results of the camera/audio/video media recording check as SAT on Attachment 1.

NOTE

When VE is being performed, a Scale Operational Check and an Attachment 1 must be done daily.

4.1.3 Scale Operational Check

NOTE

The VEE will determine when VE Scales or Container Scales will be used.

Weights will be recorded in kilograms (kg) out to one tenth of a kg.

[A] VE Scale

[A.1] **IF** VE Scale is **NOT** used, as determined by VEE,
THEN mark N/A on Attachment 1, **AND** GO TO step 4.1.3[B].

[A.2] Record the Scale Serial/ID Number and the Calibration Due Date on Attachment 1.

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[A.3] Record the following Test Weight Information data on Attachment 1:

(a) Test Weight Serial/ID Number and Calibration Due Date for each weight used.

(b) Test Weight Total placed on the scale.

(c) Tray Weight, as required.

[A.4] Place test weight(s) on the scale to verify the scale's operability.

(a) **IF** the reading is within the scales calibration tolerance,
THEN record as SAT on Attachment 1.

(b) **IF** the reading is **NOT** within the scales calibration tolerance,
THEN STOP WORK, **AND** notify the VPM.

[A.5] With the tray placed on the scale, set the Tare to zero, as required.

[B] Container Scale

[B.1] Record the Scale Serial/ID Number and the Calibration Due Date on Attachment 1.

[B.2] Perform an operational check of the scale as follows:

(a) Place a known check weight(s) on the scale, **AND** verify the scale reads within 1.0 percent of the check weight used.

(a.1) **IF** the scale reads within the operational range,
THEN record SAT on Attachment 1.

(a.2) **IF** the scale reads outside of the operational range,
THEN, SUSPEND WORK, **AND** notify the VPM.

[C] **IF** a substitute scale is to be used,
THEN ensure substitute scale is on the current M&TE list, **AND** repeat steps 4.1.3 [A.2 through A.4] or 4.1.3 [B.1 through B.2], as required.

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4.1.4 Record the following on Attachment 1:

[A] Method 1

VEO 1

[A.1] Print name, sign, and date.

[A.2] Mark VEO 2 as N/A.

[B] Method 2

VEO 1

[B.1] Print name, sign, and date.

VEO 2

[B.2] Print name, sign, and date.

4.2 Previously Packaged Input Waste Container Preparation.

NOTE
Section 4.2 is not performed for VE of Newly Generated Waste.

4.2.1 Record the Input Waste Container ID in Section 1, Output Waste Container Data, of Attachment 2.

NOTE
When performing Method 1, audio/video media recording is created to document activities that manipulate waste during the VE. It is expected that recording will be halted whenever VE is suspended. If recording is suspended, the reason is verbally documented on the audio/video media.

4.2.2 Position the camera(s) to record the VE of the Input Waste Container and its contents, **AND** start the camera(s) (if using Method 1).

4.2.3 Record verbally the Input Waste Container ID (if using Method 1).

NOTE
The Radiological Control Technician (RCT) SHALL be present to conduct radiological surveys in accordance with the Host site Interface Document and Host site procedures.

4.2.4 Ensure removal of the input waste container lid in accordance with Host site procedures.

[A] **IF** a rigid liner lid is present, **AND** the rigid liner lid is **NOT** vented (>0.3 inches [in.]) or filtered,
THEN SUSPEND WORK, **AND** notify the VPM.

[B] Ensure removal of the rigid liner lid, if applicable, in accordance with Host site procedures.

NOTE

VE on large or heavy packages/items SHALL be performed as they are removed from the container.

Waste from the Input Waste Container may be segregated for VE as determined by the VEO.

4.2.5 Remove/verify removal of the waste from the Input Waste Container, as appropriate.

4.2.6 Open/verify opening of waste package/items, as appropriate.

4.3 Output Waste Container Verification

4.3.1 Ensure the container is empty of waste, **AND** record on Section 1 of Attachment 2.

[A] **IF** the container is not empty,
THEN STOP WORK **AND** notify the VEE.

NOTE

Step 4.3.2 may be performed at any time during the VE process.

4.3.2 Record the following data for the Output Waste Container in Section 1 of Attachment 2:

- Output Waste Container ID
- Waste Stream ID
- Container Type (e.g., 55-gallon drum)
- TRUCON Code
- Waste Matrix Code
- Audio/Video Media Recording Number (if applicable)

NOTE
The RCT SHALL be present to conduct radiological surveys in accordance with the Host site Interface Document and Host site procedures.

4.3.3 Perform the following, **AND** record the applicable data for the Output Waste Container in Section 1 of Attachment 2:

[A] Record Output Waste Container Tare Weight.

[B] Ensure the container lid is removed in accordance with Host site procedures, as applicable.

[C] **IF** a Poly rigid liner is **NOT** present,
THEN perform the following:

[C.1] Record NO, Poly Rigid Liner Present

[C.2] Record NO, Poly Rigid Liner Lid Present

[C.3] Record N/A for Poly Rigid Liner Lid is Vented (>0.3 in.) or Filtered, Vented, Filtered, and Serial No.

[C.4] GO TO step 4.3.3[G].

[D] **IF** a Poly rigid liner is present,
THEN record YES, and liner Thickness.

[E] **IF** a Poly rigid liner lid is NOT present,
THEN record NO **AND** perform the following**:**

[E.1] Record N/A for Poly Rigid Liner Lid is Vented (>0.3 in.) or Filtered, Vented, Filtered, and Serial No.

[E.2] GO TO step 4.3.3[G]

[F] **IF** a Poly rigid liner lid is present,
THEN record YES, **AND** perform the following**:**

[F.1] **IF** the Poly rigid liner lid is vented (punctured) **AND** the puncture is >0.3 in.,
THEN record Yes, Vented, **AND** measure and record the Hole Size.

(a) Record N/A for Filtered, Model No., and Serial No.

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[F.2] **IF** the Poly rigid liner lid is filtered,
THEN record Filtered, **AND** the Model No. and Serial No.

(a) Record N/A for Vented and Hole Size.

[F.3] Remove the Poly rigid liner lid, if applicable, in accordance with Host site procedures.

[G] **IF** other liner is present,
THEN record liner type (i.e. Lead, Fiberboard/Cardboard) or Other liner type.

[H] **IF** a bag liner is used,
THEN record YES.

[I] **IF** NO bag liner is used,
THEN record NO.

4.4 Visual Examination (VE)

NOTE

Steps 4.4.1 through 4.4.8 may be repeated, as necessary, until loading of the Output Waste Container is complete.

Steps 4.4.1 through 4.4.5 may be performed in any order to accommodate the process.

Waste container(s) SHALL be administratively controlled by CCP VEO when unattended. This may be accomplished thru application of a TID or other method.

A new Section 2 of Attachment 2 SHALL be used each time the waste container is opened, the TID is removed, and waste is added.

Individual package/item(s) may be inspected and have a Section 2 of Attachment 2 completed for each, prior to bag out. A TID may be applied to these package/item(s) for verification purposes.

4.4.1 **IF** a container TID is applied to the output waste container,
THEN remove TID in accordance with Host site procedures,
AND record Removed Container TID Number in Section 2 of Attachment 2, as required.

4.4.2 Ensure removal of output container lid in accordance with Host site procedures, as required.

4.4.3 Position the camera(s) to record the VE of the Output Waste Container and its contents, **AND** start the camera(s), as applicable.

4.4.4 Record verbally the Output Waste Container ID, as applicable.

NOTE

When performing Method 1, the camera(s) may require repositioning to record (audio/video) the weighing and final weight of each package from the container.

NOTE

Potential hazardous wastes identified by visual examination include:

- Batteries
- Circuit Boards (may be contained in electrical equipment)
- Cathode Ray Tube (CRT)-based computer monitors or televisions
- Lead
- Mercury, mercury containing equipment (e.g., barometers, switches, thermometers, thermostats)
- Light Bulbs (both incandescent and fluorescent)

4.4.5 Examine the waste, **AND** record the following data in Section 2 of Attachment 2:

- Date.
- Record Package Number, as applicable.
- Record Package TID Number, as applicable.

NOTE

VEE will make determination on the disposition of waste > 200 mrem/hr at the surface.

[A] **IF** the waste is > 200 mrem/hr at the surface, **AND** is going to be placed into the Output Drum,
THEN perform the following:

[A.1] When loading the waste, position as close as reasonably achievable to the side of the output container.

[A.2] **IF** the waste is a can with material in it,
THEN document it in the Comments block of Section 1 of Attachment 2.

[B] Record Waste Description.

[C] Determine the contents by Waste Material Parameter category, using Table 3, Waste Material Parameters, as a guide **AND** document on Attachment 2 as follows:

[C.1] Ensure that there are no prohibited items present in the waste package/item.

NOTE

WMP weight and the method used to determine the weight of the WMP from Table 4, Waste Item Weights and Weighing Codes, may be recorded when performing steps 4.4.5[C.2] **OR** 4.4.9 **OR** 4.4.14[A] to accommodate the process.

[C.2] Weight of each WMP and the method used to determine the weight of the WMP from Table 4, as required.

[D] **IF** no indirect load items/containers, record NO,
THEN record N/A in the VEO 1 and 2 signature lines, **AND** proceed to step 4.4.7.

NOTE

Use of Administration Control in lieu of TID SHALL be as directed by the VPM and recorded in the operational logbook.

[E] For indirect Load Items/containers record YES.

[F] A separate Section 2 of Attachment 2 must be recorded for each indirect load output container.

[G] Place a TID on the package/item **AND** record the number on Attachment 2, as required.

[H] Place the package/item into the Output Waste Container as needed.

VEO 1

[H.1] Print name, sign, and date to annotate VE of package/item(s) is complete, **AND** NO Prohibited Items, listed in Table 1, are present.

(a) **IF** Method 1 is being performed,
THEN mark VEO 2 as N/A.

VEO 2

[H.2] **IF** Method 2 is being performed on indirect loaded items,
THEN print name, sign, and date to annotate VE of package/item(s) is complete, **AND** NO Prohibited Items, listed in Table 1, are present.

4.4.6 **IF** loading Output Waste Container(s) with package/items(s) that were previously inspected,
THEN obtain appropriate Section 2(s) for items being loaded **AND** verify the information recorded on the Section 2(s) matches the package/items.

[A] **IF** package/item information recorded DOES **NOT** match the package/item,
THEN SUSPEND work and notify VPM.

NOTE
The following applies to direct and indirect load containers.

4.4.7 Record Output Waste Container ID in Section 2 of Attachment 2.

4.4.8 Place the package/item into the Output Waste Container, as needed.

4.4.9 Record the weight of each WMP and the method used to determine the weight of the WMP using Table 4 as a guide in Section 2 of Attachment 2, as required.

4.4.10 **IF** additional waste packages/item(s) are to be added at a later time and the waste container is not visually controlled by CCP VEOs,
THEN perform the following:

[A] Apply a TID in accordance with Host site procedures, **AND** record the applied TID Number on Section 2 of Attachment 2, as required.

VEO

4.4.11 **IF** loading Output Waste Container(s) with package/item(s) that were previously inspected, **AND** the loading is completed for the day,
THEN record the following on Section 2 of Attachment 2:

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VEO 1

[A.1] Print name, sign, and date to annotate loading of Output Waste Container is complete.

(a) **IF** Method 1 is being performed,
THEN mark VEO 2 as N/A.

VEO 2

[A.2] **IF** Method 2 is being performed,
THEN print name, sign and date.

4.4.12 **WHEN** loading of the Output Waste Container is complete,
THEN perform the following:

[A] Paginate page(s) of Section 2 of Attachment 2.

[B] Record the data listed below for the Output Waste Container in Section 1 of Attachment 2 as follows:

NOTE

The Volume Utilization Percentage (VUP) of the container is based on the highest level of the bulk of the waste. Items (e.g., pipe, scrap angle, plastic bags) which protrude above the bulk of the waste are **NOT** to be included in the fill percent determination. The fill percent is to be recorded in five percent increments (e.g., 35%, 40%, 45%).

[B.1] Estimate the VUP.

[B.2] Record NO or YES, to indicate whether the waste is consistent with the assigned Waste Stream Description and Waste Matrix Code.

(a) **IF** NO,
THEN initiate a Nonconformance Report (NCR) in accordance with CCP-QP-005, **AND** record the NCR No. in Section 1 of Attachment 2.

[B.3] Record Closure Method for layers of confinement, if applicable (see Table 2, Layers of Confinement).

[B.4] Determine the number of layers of confinement and record, using Table 2 as applicable.

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[C] **IF** container lid installation and closure verification is to be performed at the time,
THEN GO TO Section 4.5 for Output Waste Container Lid Installation and Closure Verification.

4.4.13 Apply the TID to the waste container **AND** record the applied TID Number on Section 2 of Attachment 2, as required.

4.4.14 Record the Gross Weight by weighing the Output Waste Container after it is released to be moved to its staging area, in Section 1 of Attachment 2.

[A] Record the weight of each WMP and the method used to determine the weight of the WMP, using Table 4 as a guide, in Section 2 of Attachment 2, as required.

4.4.15 Perform the following, **AND** record the data in Section 3 of Attachment 2:

[A] Record Output container ID.

[B] Weigh or use Table 4 as a guide to estimate the weight of the Packaging Materials of the Output Waste Container, **AND** Total Packaging Weight.

[C] Review the WMPs listed in Section 2(s) of Attachment 2, **AND** verify/record the total weight for each WMP.

[D] Sum the WMP weights, **AND** record the Total WMP Weight.

[E] Ensure the total of the WMP weights (Section 3, Attachment 2) is within five percent of the net weight of waste of the Output Waste Container obtained from subtracting the tare weight from the gross weight (Section 1, Attachment 2).

[E.1] **IF** the total of the WMP weights is not within five percent of the net weight as specified in step [E], **THEN** STOP WORK **AND** notify the VEE/VPM.

4.4.16 Record the following information in Section 4, Prohibited Item(s) Summary, of Attachment 2:

[A] Output Waste Container ID.

[B] **IF** Section 2(s) of Attachment 2 were completed for individual package/items(s),
THEN verify signatures in Section 2(s) of Attachment 2, answer questions in Section 4 of Attachment 2.

[C] **IF** packaged/item(s) were direct loaded into Output Waste Container,
THEN answer the questions in Section 4 with all explanations (as needed) annotated in the Comments block of Section 4 of Attachment 2.

[C.1] **IF** YES is marked in Section 4,
THEN initiate an NCR in accordance with CCP-QP-005, **AND** record the NCR No. in Section 1 of Attachment 2.

4.4.17 Determine (e.g., via Radiological Label or Dose Rate Survey) if the total dose rate of the waste container is >200 mrem/hr at the surface, **AND** record YES or NO in Section 1 of Attachment 2.

[A] **IF** the total dose rate is >200 mrem/hr at the surface,
THEN initiate an NCR in accordance with CCP-QP-005,
AND record NCR No. in Section 1 of Attachment 2.

4.4.18 STOP the camera(s) recording when VE is complete, as applicable.

4.4.19 Ensure YES or NO is recorded in Section 1 of Attachment 2 to indicate if any NCRs are associated with the applicable waste container.

[A] **IF** YES,
THEN ensure the appropriate NCR number(s) are recorded.

NOTE

All areas in the attachments that DO **NOT** have completed information SHALL be marked N/A, unless the documents intent is clear per CCP-QP-008, *CCP Records Management*.

4.4.20 Record the following in Section 5, Approvals, of Attachment 2:

[A] Method 1

VEO 1

[A.1] Print name, sign, and date to annotate that the VE process has been completed.

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[A.2] Mark VEO 2 as N/A.

[A.3] Prepare two (2) audio/video media recordings.

[B] Method 2

VEO 1

[B.1] Print name, sign, and date to annotate that the VE process has been completed.

VEO 2

[B.2] Print name, sign, and date to annotate that the VE process has been completed.

VEO

4.4.21 Affix new CCP Container Traveler(s) (Labels) to the Output Waste Container(s) in accordance with appropriate CCP Site Container Management procedure, as necessary.

4.4.22 **WHEN** all containers for a batch are complete,
THEN GO TO Section 4.6.

4.5 Container Lid Installation and Closure Verification

NOTE

Steps 4.5.1[A], [B], [C], [D], and [E] may be performed at any time during or after, Output Waste Container setup.

4.5.1 Perform the following, **AND** record the applicable data, for the Output Waste Container, in Section 1 of Attachment 2:

[A] Verify the Filter and Lid Ring/Bolt Torque Wrenches to be used are in calibration.

[B] Filter Torque Wrench Serial/ID Number and Calibration Due Date.

[C] Container Filter Model(s) and Serial Number(s).

[D] Ensure the filter is installed in accordance with the manufacturer's instructions.

[E] Ensure the filters are torqued to the manufacturer's specifications, **AND** record the Torque Value.

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[F] Ensure the container lid is installed in accordance with the manufacturer's instructions.

[G] Lid Ring/Bolt Torque Wrench Serial/ID Number and Calibration Due Date.

[H] Ensure the Container Lid Ring/Bolt(s) is torqued to the manufacturer's specifications, **AND** record the Torque Value.

4.5.2 GO TO step 4.4.13 as applicable.

4.6 Batch Data Report Preparation

4.6.1 Verify Field Records have been accurately transcribed into the appropriate forms.

4.6.2 Assemble the following data for the BDR ensuring that the BDR number and, Examination Date, and Output Waste Container ID(s), as needed, are recorded on each Attachment:

[A] Attachment 5, CCP Waste VE Batch Data Report Cover Sheet

[B] Attachment 4, CCP Waste VE Batch Data Report Table of Contents

[C] Attachment 1, CCP Waste VE General Information Form

[D] Attachment 2, CCP Waste Visual Examination Data Form

[E] Attachment 3, CCP Waste VE Independent Technical Reviewer Checklist

[F] Copies of NCRs, if applicable

[G] Field Records, if applicable

4.6.3 Paginate the BDR.

4.6.4 Complete Attachment 4.

4.6.5 Forward the BDR package and the audio/video media, if applicable, to the ITR.

4.7 VE Independent Technical Review

NOTE
The independent technical review is conducted by an individual who is qualified to have performed the initial work, but who is **NOT** directly responsible for performing the work. The ITR can **NOT** review his/her own work.

Independent Technical Reviewer (ITR)

4.7.1 Review the BDR to the criteria in Attachment 3, **AND** document the answers appropriately.

4.7.2 Items marked NO may require explanation in the Comments block.

4.7.3 Print, sign, and date Attachment 3 and Attachment 5.

4.7.4 Submit the BDR and the audio/video media, if applicable, to CCP Records in accordance with CCP-QP-008.

4.8 Newly Generated Waste Container Data Submission

VPM/Designee

4.8.1 Complete Attachment 6, CCP Newly Generated Waste Container Data, for newly generated waste containers generated during the performance of VE for the BDR.

4.8.2 Print name, sign, and date Attachment 6.

4.8.3 Submit the Attachment 6 to CCP records in accordance with CCP-QP-008. Transmit a copy of Attachment 6 to the cognizant Acceptable Knowledge Expert (AKE).

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5.0 RECORDS

5.1 Records generated during the performance of this procedure are maintained as quality assurance (QA) records in accordance with CCP-QP-008. The records are the following:

5.1.1 QA/Lifetime

[A] Batch Data Report (BDR)

[A.1] Attachment 1 – CCP Waste Visual Examination General Information Form

[A.2] Attachment 2 – CCP Waste Visual Examination Data Form

[A.3] Attachment 3 – CCP Waste VE Independent Technical Reviewer Checklist

[A.4] Attachment 4 – CCP Waste VE Batch Data Report Table of Contents

[A.5] Attachment 5 – CCP Waste VE Batch Data Report Cover Sheet

[A.6] Copies of NCRs, if applicable

[A.7] Field Records, if applicable

[B] Attachment 6 – CCP Newly Generated Waste Container Data

5.1.2 QA/Nonpermanent

[A] Two (2) Audio/Video Media Recordings (VHS Tape or DVD), if applicable

Table 1. Prohibited Items

LIST OF PROHIBITED ITEMS
Liquid waste is not acceptable at WIPP - Observable liquid shall be no more than 1 percent by volume of the outermost container. - Internal containers with more than 60 milliliters or 3 percent by volume observable liquid, whichever is greater, are prohibited. - Containers with Hazardous Waste Number U134 assigned shall have no observable liquid. - Overpacking the outermost container that was examined or redistributing untreated liquid within the container shall not be used to meet the liquid volume limits.
Non-Radionuclide Pyrophorics
Non-mixed hazardous waste
Incompatible wastes (Wastes that are incompatible with backfill, seal and panel closure materials, container and packaging materials, shipping container materials, and/or other wastes.)
Explosives
Compressed Gases/Pressurized containers (e.g., aerosol cans)
Polychlorinated Biphenyl (PCB) Liquids
Ignitables
Corrosives
Reactive waste
Sealed containers greater than 4 liters
Heat-sealed bags (unvented) with a surface area <390 square inches
Sharp or heavy objects (Large, bulky dense objects with sharp and obtrusive members or components with dispersible Form 1 and 2) (e.g., steel or concrete boxes, steel plate, electric motors, steel pipe, or concrete blocks) not adequately blocked, braced, or packaged.
Waste that has ever been managed as high-level waste and waste from tanks specified in Table C-4 of CCP-PO-001.

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Table 2. Layers of Confinement

Container [a]		Plastic Bags		Metal Cans	
Twist and Tape	CTT/STT	Twist and Tape	TT	Sealed	C
Fold and Tape	CFT/SFT	Fold and Tape	FT		
Other Closure	COC/SOC	Other Closure	OC		
Vented	(add) F	Vented	(add) F	Vented	(add) F

[a] Container: "C" - Container
"S" - Standard Waste Box (SWB)

Liner lids and packaging layers are distinguished as follows:

Layers of confinement are defined, per Section 3.8 of the *CH-TRU Payload Appendices*, as any boundary that restricts, but does not prohibit, the release of hydrogen gas across the boundary.

Examples of confinement layers are plastic bags (smaller inner bags or larger container liner bags) with the allowable closure methods described below and metal containers fitted with filter vents.

- Fold and tape closure
- Twist and tape closure
- Heat-seal closure or twist and tape closure with a minimum of one filter vent
- Unvented heat-seal closure for a bag with a minimum surface area of approximately 390 square inches

NOTE

Punctured plastic bags, liner bags open at the end, pieces of plastic sheeting wrapped around the waste for handling, and metal containers with lid closures that allow free hydrogen release are not considered as confinement layers.

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Table 3. Waste Material Parameters

Waste Material Parameter	Description
Iron-based metals/alloys (IM)	Iron and steel alloys in the waste; does not include the waste container materials
Aluminum-based metals/alloys (AM)	Aluminum or aluminum-based alloys in the waste materials
Other metals (OM)	All other metals found in the waste materials
Other inorganic materials (OI)	Nonmetallic inorganic waste, including concrete, glass, firebrick, ceramics, sand, and inorganic sorbents
Cellulosics (C)	Materials generally derived from high polymer plant carbohydrates (e.g., paper, cardboard, wood, cloth)
Rubber (R)	Natural or man-made elastic Latex materials (e.g., surgeon's gloves, leaded rubber gloves)
Plastics (waste materials) (PW)	Generally man-made materials, often derived from petroleum feedstock (e.g., polyethylene, polyvinylchloride)
Organic matrix (OR)	Cemented organic resins, solidified organic liquids, and sludges
Inorganic matrix (IN)	Any homogeneous materials consisting of sludge, or aqueous-based liquids which are solidified with cement, calcium silicate, or other solidification agents (e.g., waste water treatment sludge, cemented aqueous liquids, and inorganic particulate)
Soils (S)	Generally consists of naturally occurring soils which have been contaminated with inorganic waste materials
Steel (packaging materials) (ST)	Container (e.g., 208-liter [55-gal.] drums)
Plastics (packaging materials) (PP)	Liner (e.g., 90-mil polyethylene drum liner and plastic bags)

Table 4. Waste Item Weights and Weighing Codes Page 1 of 3

ITEM	WEIGHT
3" Roll of Duct Tape	0.7 kg
3" Roll of Masking Tape	0.4 kg
10’ Tape Measure	0.1 kg
Channel Lock Pliers	0.3 kg
Crescent Wrench	0.2 kg
Flashlight With Batteries	0.5 kg
Flashlight Without Batteries	0.1 kg
Flat File	0.4 kg
Hacksaw With Blade	0.5 kg
Hammer	0.6 kg
Large Open-End Wrench	0.5 kg
Razor Knife	0.1kg
Scissors	0.2 kg
Vice Grip Pliers	0.5 kg
Welder’s Chipping Hammer	0.4 kg
Wire Brush	0.1 kg
Wooden Folding Ruler	0.2 kg
Wooden Wedge	0.2 kg
13 oz. Aerosol Can ¼ Full	0.2 kg
17 oz. Aerosol Can Full of Liquid	0.5 kg
17" Section of 1" Electrical Conduit	0.5 kg
17" Section of 1" Sch 40 S/s Pipe	1.1 kg
2’ X 4’ Board 20" long	0.7 kg
Empty 2-Gallon Car-boy	0.7 kg
Empty 6-Gallon Car-boy	2.0 kg
Empty POC (Black Poly Liner)	154.2 kg
Empty POC (White Poly Liner)	145.1 kg
Empty SWB	290.3 kg
2-Gallon Car-boy ½ Full of Water	5.8 kg
6-Gallon Car-boy ½ Full of Water	14.0 kg
5-Gallon Metal Bucket	1.3 kg
Metal Can	0.2 kg
Metal Can (for salt wastes)	1.1 kg
Aluminum Sphincter Can	0.2 kg
Sand Bag ½ Full of Gravel	12.7 kg
Plastic Bag for Waste	0.6 kg
Liner Bags – Large	0.5 kg
Rad Bags – Medium and Small	0.1 kg
55-Gallon 10-mil Plastic Bag (each)	1.8 kg
55-Gallon 5-mil Plastic Bag (each)	0.3 kg
55-Gallon 12-mil Plastic Bag (each)	2.1 kg
O-ring Plastic Bag (e.g., sludge, organic setups)	9.0 kg

Table 4. Waste Item Weights and Weighing Codes (Continued) Page 2 of 3

ITEM	WEIGHT
55-Gallon Drum PVC O-ring Bag (60.96 x 213.36 cm)	22.0 kg
55-Gallon Fiberboard Disk	48.0 kg
55-Gallon Drum Round Bottom 10-mil Liner	9.0 kg
(White) 55-Gallon Drum 90-mil Rigid Liner No Lid, used at LANL	4.3 kg
55-Gallon Drum 110-mil Rigid Liner	7.6 kg
(Black) 55-Gallon Drum 125-mil Rigid Liner No Lid, used at LANL	7.6 kg
55-Gallon Drum Poly Liner (122 x 122 x 213 cm)	12.0 kg
55-Gallon Cardboard Liner (graphite mold waste)	9.0 kg
55-Gallon Fiberboard Drum Liner (122 x 122 x 213 cm)	9.0 kg
55-Gallon Lead Liner, 180 cm long, 0.16 cm thick	23.0 kg
55-Gallon Lead Liner, 180 cm long, 0.32 cm thick	46.0 kg
Fiber Pack	13.0 kg
Fiber Pack Lead-Lined	66.0 kg
HEPA Filter (8 x 8 3-1/16)	1.0 kg
HEPA Filter (8 x 8 x 5-7/8)	1.9 kg
HEPA Filter (12 x 12 x 5-7/8)	2.5 kg
Lead Brick (5.1 x 10 x 20 cm)	12.0 kg
Oil-Dry	0.4 kg/liter
Vermiculite	0.1 kg/liter
Poly Bottles (1 gallon)	2.2 kg
Poly Bottles (1 liter)	0.5 kg
Setup Portland Cement	1.1 kg/liter
Uncured Portland Cement	2.9 kg/liter
Leaded Glovebox Glove	0.8 kg
Leaded Rubber Glove	2.5 kg
Leaded Rubber Glove	12.0 kg
Leaded Rubber Apron	2.4 kg
Leaded Rubber Apron	11.5 kg
Coveralls	0.9 kg
25’ Plastic Suit Hose	2.3 kg
50’ Plastic Suit Hose	5.0 kg
Plastic Suit Top and Pants	2.3 kg
55-Gallon Drum (painted – tan or white)	27.7 kg
55-Gallon Drum (painted – mustard yellow)	24.0 kg
55-Gallon Drum (painted – green)	30.0 kg
55-Gallon Drum (painted – grey)	26.3 kg
55-Gallon Drum (galvanized)	29.0 kg
85-Gallon Drum (painted)	37.2 kg

Table 4. Waste Item Weights and Weighing Codes (Continued) Page 3 of 3

ITEM	WEIGHT
Item Description (1 lb = 0.454 kgs) (All containers are 55-gal drums, unless otherwise noted)	
110-Gallon Drum (painted)	45.0 kg
Lead-Lined Drum (1/16" thick, 28" high by 72" long)	22.7 kg
Lead-Lined Drum (1/8" thick, 28" high by 72" long) (.4 lb/in.^{3})	45.4 kg
Galvanized DOT 17C (Dull Finish) [Drum Bottom Labels 00040-00705]	31.7 kg
Galvanized (Shiny Drum and Lid Finish) [Drum Bottom Labels 01391 - 01568]	24.2 kg
Hanford Galvanized (Speckled Dull Finish - UNA1A2) [Drum Bottom Labels 00754 - 00933]	30.0 kg
Myers Galvanized (Shiny Finish - Labeled G5501) [Drum Bottom Labels 01200 - 01384]	22.7 kg
Myers Galvanized (Shiny Drum/Shiny Speckled Lid - Labeled G5501) [Drum Bottom Labels 00950 - 01150]	24.0 kg
Myers Yellow Painted	21.5 kg
Rocky Flats White Painted	27.2 kg
Black 90-mil Slip Fit Lid	7.4 kg
Black 110-mil Inner Lid	7.7 kg
Black 110-mil Beveled Top	7.4 kg
White 90-mil Slip Fit Lid	7.5 kg
125-mil Rigid Liner Lid	1.3 kg
B251 Bag - Tare Weight	0.1 kg
55-Gallon Fiberboard Liner (90 Mil)	3.7 kg
5-Gallon drum (LANL)	2.3 kg
7-Gallon drum (LANL)	2.8 kg
10-Gallon drum (LANL)	7.5 kg
30-Gallon drum (LANL)	16.4 kg

Weighing Notes and Codes	
Record weights in kg out to one-tenth of a kg.	
Method of Weighing Codes:	
E	Estimated by Operator.
W	Weight measured by the Operator.

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Attachment 1 – CCP Waste Visual Examination General Information Form

Batch Data Report No.:_____

☐ VE for Previously Packaged Waste ☐ VE for Newly Generated Waste	
☐ Method 1 ☐ Method 2	
Site ID:	
Examination Date:	
Procedure No.:	Revision No.:
Camera/Audio/Video Media Recording Check: ☐ N/A	☐ SAT
VE Scale Information: ☐ N/A	Serial/ID Number: Calibration Due Date: Operational Check: ☐ SAT
Test Weight Information Test Weight Total: kg. Tray Weight: kg.	Serial/ID Number: Calibration Due Date: Serial/ID Number: Calibration Due Date: Serial/ID Number: Calibration Due Date:
Container Scale Information:	Serial/ID Number: Calibration Due Date: Operational Check: ☐ SAT ☐ UNSAT
Comments:	
Visual Examination Operator 1: _____ _____ _____ Print Name Signature Date	
Visual Examination Operator 2: _____ _____ _____ Print Name Signature Date	

Attachment 2 – CCP Waste Visual Examination Data Form Page 1 of 5

Batch Data Report No.:_____

Section 1: Output Waste Container Data

Input Waste Container ID, as applicable:

Output Waste Container ID:	Waste Stream ID:

Container Type:	TRUCON Code:	Waste Matrix Code:

Audio/Video Media Recording Number: ☐ N/A Output Container Verified Empty ☐ NO ☐YES

Waste Container Weights:
Tare Wt: kg. Gross Wt: kg.

Poly Rigid Liner Present? ☐ NO ☐ YES Thickness: ☐ 30-mil ☐ 90-mil ☐ 110-mil ☐125-mil Other liner: ☐ Lead ☐ Fiberboard/Cardboard ☐ Other:	Poly Rigid Liner Lid Present? ☐ NO ☐ YES Poly Rigid Liner Lid is Vented (>0.3 in.) or Filtered? ☐ NO ☐ YES ☐ N/A ☐ Vented: Hole Size: ☐ N/A ☐ Filtered: Model No.: ☐ N/A Serial No.: ☐ N/A
Bag Liner Present? ☐ NO ☐ YES	Volume Utilization Percentage: %

Does the physical form of the waste match the Waste Stream Description (i.e., Homogeneous Solids, Soil/Gravel, or Debris Waste [including uncategorized metals])?
☐ NO ☐ YES

Does the physical form of the waste match the Waste Matrix Code?
☐ NO ☐ YES

Closure Method:
Number of Layers of Confinement:

Filter Torque Wrench	Lid Ring/Bolt Torque Wrench
Serial/ID No.: Calibration Due Date: Filter: Model No.: Serial No.: Torque Value:	Serial/ID No.: Calibration Due Date: Lid Ring/Bolt Torque Value:

Is total dose rate greater than 200mrem/hr? ☐ NO ☐ YES

NCR(s) associated with the output container? ☐ NO ☐ YES
NCR No.:_____
NCR No.:_____

Comments:

Attachment 2 – CCP Waste Visual Examination Data Form (continued) Page 2 of 5

Batch Data Report No.:_____ **Date:**_____

Section 2: Waste Package Data				
Package and Package TID Number (as applicable)	Waste Description	WMP [Table 3]	Weight (kg) [Table 4,[a]]	Weighing Code(s) [Table 4[b]]

Are there any indirect load containers associated with this BDR? Yes ☐ No ☐

_____ _____ _____
VEO 1: Print Name Signature Date

_____ _____ _____
VEO 2: Print Name Signature Date

VEO's signatures verify the absence of prohibited items in indirect load containers.

Output Waste Container ID:_____

TID Removed:_____ **TID Applied:**_____

_____ _____ _____
VEO 1: Print Name Signature Date

_____ _____ _____
VEO 2: Print Name Signature Date

VEO's signatures verify the loading of the indirect load container(s) into the output waste container.

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Attachment 2 – CCP Waste Visual Examination Data Form (continued) Page 3 of 5

Batch Data Report No.:_____

Output Waste Container ID:_____

Section 3: Packaging Material and Waste Material Parameters	
Packaging Material:	Estimated Weight (kg)
Steel (ST):	
Plastics (PP):	
Cellulosic (C):	
Others:	
Total Packaging Weight:	
Waste Material Parameter:	Estimated Weight (kg)
Iron-based Metal/Alloys (IM):	
Aluminum-based Metals/Alloys (AM):	
Other Metals (OM):	
Other Inorganic Materials (OI):	
Cellulosics (C):	
Rubber (R):	
Plastics (waste materials) (PW):	
Organic Matrix (OR):	
Inorganic Matrix (IN):	
Soils (S):	
Total WMP Weight:	

Attachment 2 – CCP Waste Visual Examination Data Form (continued) Page 4 of 5

Batch Data Report No.:_____ Output Waste Container ID:_____

Section 4: Prohibited Item(s) Summary (Questions answered "YES" will be explained in the Comments block)		
	Yes	No
1. Is there any observable liquid present? If no, proceed to question 5	☐	☐
2. Is there any observable liquid in internal containers, that is more than 60 milliliters or 3 percent by volume, whichever is greater?	☐	☐
3. Is the total volume of observable liquid in the outermost container **GREATER** than 1% of the container?	☐	☐
4. Is there detectable observable liquid in containers with an EPA Hazardous Waste Number of U134?	☐	☐
5. Is there an indication of non-radionuclide pyrophoric materials, such as elemental potassium?	☐	☐
6. Is there an indication of hazardous wastes not occurring as co-contaminants with TRU mixed wastes (non-mixed hazardous wastes)?	☐	☐
7. Is there an indication of wastes incompatible with backfill, seal and panel closures materials, container and packaging materials, shipping container materials, or other wastes (i.e., waste does **NOT** match TRUCON Code[s])?	☐	☐
8. Is there an indication of wastes containing explosives or compressed gases?	☐	☐
9. Is there PCB liquids present?	☐	☐
10. Is there an indication of the waste exhibiting the characteristic of ignitability, corrosivity, or reactivity (EPA Hazardous Waste Numbers of D001, D002, or D003)?	☐	☐
11. Is the physical form of the waste inconsistent with the Waste Stream Description or the Waste Matrix Code?	☐	☐
TRUPACT II Criteria		
12. Are there heat-sealed bags (unvented) **GREATER** than 4 liters and LESS than 390 square inches in the waste?	☐	☐
13. Were there Non-approved Closure Methods used on liner bags or inner bags greater than 4 liters?	☐	☐
14. Are there sealed containers **GREATER** than 4 liters?	☐	☐
15. Are there indications of inadequate protection (blocked or braced) for heavy and/or sharp objects?	☐	☐

Attachment 2 – CCP Waste Visual Examination Data Form (continued) Page 5 of 5

Batch Data Report No.:_____ Output Waste Container ID:_____

Section 4: Prohibited Item(s) Summary (Continued)

(Questions answered "YES" will be explained in the Comments block)

Comments:

Section 5: Approvals

Visual Examination Operator 1:

Print Name	Signature	Date

Visual Examination Operator 2:

Print Name	Signature	Date

Attachment 3 – CCP Waste VE Independent Technical Reviewer Checklist

Batch Data Report No.:_____ Page 1 of 2

Description		
1. Were data generation and reduction conducted in a technically correct manner in accordance with the methods used?	☐ NO	☐ YES
2. Was the correct revision of operating procedure used?	☐ NO	☐ YES
3. Are the waste material parameters (WMPs) entered correctly?	☐ NO	☐ YES
4. Are the calculations performed on the VE Data Form correct?	☐ NO	☐ YES
5. Is the data reported in the correct units and correct number of significant figures?	☐ NO	☐ YES
6. Has the data been reviewed for transcription errors?	☐ NO	☐ YES
7. Does the Testing Batch Report include VE for 20 containers or less?	☐ NO	☐ YES
8. Are BDR contents complete and do they match BDR Table of Contents?	☐ NO	☐ YES
9. Is all the data signed and dated in reproducible ink and by the individual(s) generating it?	☐ NO	☐ YES
10. Is all data recorded clearly, legibly, and accurately?	☐ NO	☐ YES
11. Were changes made to original data? If NO, proceed to question 14.	☐ NO	☐ YES
12. Have all changes to original data been lined out, initialed and dated by the individual making the changes?	☐ NO	☐ YES
13. Were the data changes made by the individual who originally collected the data or by an equally qualified individual?	☐ NO	☐ YES
14. Did the physical form of the waste match the Waste Matrix Code and Waste Stream Description?	☐ NO	☐ YES
15. Has each container in this BDR been evaluated for the presence of prohibited items?	☐ NO	☐ YES
16. Is there an adequate written description of the contents of each container?	☐ NO	☐ YES
17. Was a scale(s) used? If NO, proceed to question 20.	☐ NO	☐ YES
18. Were the scale(s) in calibration prior to the VE and documented correctly?	☐ NO	☐ YES
19. Were the scale(s) checks SAT prior to the VE and documented correctly?	☐ NO	☐ YES
20. Was VE of each container performed by at least two qualified VEO's or was an Audio/Video recording properly prepared for each container?	☐ NO	☐ YES

Attachment 3 – CCP Waste VE Independent Technical Reviewer Checklist (continued)

Batch Data Report No.: _____ Page 2 of 2

Description		
21. Was an NCR required at the data generation level? If NO, proceed to question 23.	☐ NO	☐ YES
22. Is a copy of the NCR included in the BDR?	☐ NO	☐ YES
23. Were the QAO's (precision, accuracy, completeness, comparability) met?	☐ NO	☐ YES
Precision – Precision is maintained by reconciling any discrepancies between the operator and the independent technical reviewer with regard to identification of waste matrix code, liquids in excess of TSDF-WAC limits, and compressed gases. Accuracy – Accuracy is maintained by requiring operators to pass a comprehensive examination and demonstrate satisfactory performance in the presence of the VE expert during their initial qualification. VE operators shall be re-qualified every two years. Completeness – A validated VE data form will be obtained for 100 percent of the waste containers subject to VE. Comparability – The comparability of VE data from different operators shall be enhanced by using standardized VE procedures and operator qualifications.		

Comments:

I have reviewed 100 percent of the container-specific and batch data in this report and find it acceptable.

Independent Technical Reviewer:

Printed Name	Signature	Date

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Attachment 4 – CCP Waste VE Batch Data Report Table of Contents

Batch Data Report No.: _____ Examination Date: _____

Table of Contents		
Item	Description	Page No.
1	CCP Waste VE Batch Data Report Cover Sheet	
2	CCP Waste VE Batch Data Report Table of Contents	
3	CCP Waste Visual Examination General Information Form	
4	CCP Waste Visual Examination Data Forms	
5	CCP Waste VE Independent Technical Reviewer Checklist	
6	Copy of NCRs (N/A, If Not Applicable)	
7	Field Records (N/A, If Not Applicable)	

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Attachment 5 – CCP Waste VE Batch Data Report Cover Sheet

Batch Data Report No.: _____ Examination Date: _____

	Waste Container ID Number:
1	
2	
3	
4	
5	
6	
7	
8	
9	
10	
11	
12	
13	
14	
15	
16	
17	
18	
19	
20	

Independent Technical Reviewer:

_____	_____	_____
Print Name	Signature	Date

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Attachment 6 – CCP Newly Generated Waste Container Data

Batch Data Report No.: _____ Examination Date: _____

Container ID	Waste Stream ID	Generation Date	Closure Date	Vent Date	Container Type

VPM/Designee:

_____ _____ _____
Print Name Signature Date

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CCP-TP-164

Revision 1

CCP
Real-Time Radiography #7
Operating Procedure

EFFECTIVE DATE: 02/21/2014

Mike Ramirez

PRINTED NAME

APPROVED FOR USE

RECORD OF REVISION

Revision Number	Date Approved	Description of Revision
0	11/06/2013	Initial issue.
1	02/21/2014	Revised to accommodate operation of new chiller unit.

TABLE OF CONTENTS

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1.0 PURPOSE

The purpose of this procedure is to provide instructions for safe start-up, operation, and shut-down of the mobile real-time radiography (RTR) System RTR #7 at Oak Ridge National Laboratory (ORNL). This procedure is used with CCP-TP-053, *CCP Standard Real-Time Radiography (RTR) Inspection Procedure*, for performing certified scanning of waste containers. This procedure is also used with CCP-TP-066, *CCP Radiography Screening Procedure for Prohibited Items*.

1.1 Scope

This procedure applies to operation of the RTR #7 radiographic examination unit. Maintenance activities are outside the scope of this procedure.

2.0 REQUIREMENTS

2.1 References

Referenced Documents

- CCP-QP-002, *CCP Training and Qualification Plan*
- CCP-QP-008, *CCP Records Management*
- CCP-PO-005, *CCP Conduct of Operations*
- CCP-TP-053, *CCP Standard Real-Time Radiography (RTR) Inspection Procedure*
- CCP-TP-066, *CCP Radiography Screening Procedure for Prohibited Items*

2.2 Training Requirements

2.2.1. Personnel performing this procedure will be trained and qualified in accordance with CCP-QP-002, *CCP Training and Qualification Plan*, prior to performing this procedure.

2.3 Equipment List

- RTR System
- Personal Protective Equipment (PPE)

2.4 Precautions and Limitations

2.4.1. **IF** during the course of performing this procedure an abnormal situation occurs that causes deviation from the normal process, and this abnormal condition CAN **NOT** be corrected as directed in this procedure,
THEN RTR Operators shall IMMEDIATELY STOP WORK and notify the Vendor Project Manager (VPM), Lead Operator (LO), or designee.

2.4.2. The PPE for normal operations consists of leather gloves (when handling containers), safety shoes, and Thermoluminescent Dosimeters (TLDs). Safety glasses must be worn in transit between the Control Point and the RTR #7 unit. PPE for abnormal conditions will be specified by the Radiological Control Technician (RCT) or in a Radiological Work Permit (RWP). The required or specified PPE will be donned prior to starting RTR operations.

2.4.3. High-energy X-rays, high voltages (kV), and pinch points are potential hazards associated with the mobile RTR System. These hazards are addressed in safety training for personnel that operate the mobile RTR System.

2.4.4. Personnel will remain clear of all moving doors and equipment.

2.4.5. The RTR System generates X-rays and high voltages (up to 450 kV). Personnel will avoid radiation exposure by observing all warning devices and personnel barriers.

2.4.6. RTR Operators will ensure the X-ray vault is clear of personnel prior to each start-up of the X-ray System. To facilitate this, a Closed-Circuit Television system (CCTV) has been installed.

2.4.7. By design, there is **NO** exposed lead. However, precautions should be taken **NOT** to damage the steel vault lining as this may cause exposure to lead.

2.4.8. RTR Operators will ensure all electrical panels and junction boxes are closed, equipment and moving parts are clear of foreign objects, and personnel are clear of the equipment prior to start-up of the RTR System.

2.4.9. Workers who will be working in RTR #7 must have read and signed that they understand the applicable Activity Hazard Analysis (AHAs) and RWPs.

2.5 Prerequisite Actions

2.5.1. Conduct Operational checks at the beginning of each shift.

2.5.2. Verify the X-ray Compliance Label or Certificate is current. Document results in Operational Logbook.

[A] **IF** the radiation leak check has expired, **OR** maintenance has been performed on designed shielding components, **THEN** DO **NOT** proceed with RTR operations until Radiation Protection Services personnel perform **AND** document a radiation leak check, **AND** certify the RTR system is operating within allowable limits.

3.0 RESPONSIBILITIES

3.1 RTR Operator

3.11 Operates the RTR System.

4.0 PROCEDURE

NOTE

The RTR Operator performs all steps within this procedure unless otherwise indicated.

Section 4.0 is divided into multiple subsections. Steps within those subsections are followed in the sequence written unless stated otherwise. Nondestructive examination (NDE) personnel may enter specific subsections as needed to start a new work activity or resume work activities (i.e., directed by other procedures, after shift turnover, returning from weekend, holiday, etc.), only after applicable safety prerequisites are verified to be satisfied or implemented.

4.1 RTR System Start-up

4.1.1 Document time of system start-up in the RTR Operational Logbook.

4.1.2 Obtain the Power key and the X-ray key from the Lock Box.

4.1.3 Insert the Power key into the Power key switch on operator Panel **AND** turn the switch to the start position to provide power to the RTR System.

[A] Verify the power light has illuminated.

4.1.4 Turn on the X-ray Chiller unit.

4.1.5 Turn on video recording, display, and processing equipment as indicated.

[A] Verify each component power indication light illuminates.

[B] Verify the video surveillance monitor displays an image from the surveillance cameras.

4.1.6 Verify the II shutters are CLOSED.

4.1.7 Verify there are **NO** personnel in the X-ray vault.

NOTE

The X-ray key switch on the MP1 Controller has three positions:

1. OFF (O)
2. Main is ON – Stand-by Mode (~)
3. X-rays Enabled (lightning bolt symbol)

4.1.8 Insert the X-ray key into the X-ray key switch, **AND** turn the key switch to position 2.

4.1.9 Verify the operability of door interlocks, **AND** document results in the RTR Operational Logbook (in accordance with CCP-PO-005, *Conduct of Operations*).

NOTE

The X-ray system contains three Emergency Stop push buttons. These push buttons are wired in series such that any one tests the ability of the emergency deactivation. As such, the operator will rotate the testing of the Emergency Stop push buttons so that each push button is tested every third day of operations.

4.1.10 Depress and reset the Emergency Stop push button selected for testing.

4.1.11 Verify that power has been removed from the Operator and X-ray Control Panels, **AND** document the results in the RTR Operational Logbook.

4.1.12 Reset the Operator and X-ray Control Panels.

4.1.13 **IF** any abnormal condition is noted,
THEN STOP WORK, **AND** notify RTR LO.

4.1.14 Initiate warm-up cycle per MP1 controller manufacturer's recommendations.

4.1.15 Turn the X-ray key switch to Position 3.

NOTE

An audible alarm will sound for 20 seconds before X-rays are generated. The 20-second prewarning time begins immediately on pushing the green X-ray ON button.

4.1.16 Push the X-ray ON button to start the X-ray warm-up cycle.

[A] Verify the X-ray warm-up light illuminates.

CAUTION

If any of the X-ray warning lights fail to come ON, the RTR system SHALL be shut-down by pushing the X-ray OFF button, turning the X-ray key switch to the (0) OFF position and removing the X-ray key. The RTR LO and VPM will be notified and RTR operations will **NOT** be performed until the failed RTR system(s) has been repaired or replaced.

NOTE

There are three X-ray warning lights in the following locations:

- Above the control panel desk in the control room.
- Above the X-ray vault personnel door in the Equipment Room.
- Above the X-ray vault door at the rear of the RTR trailer.

4.1.17 Verify all X-ray warning lights are ON after the 20 second prewarning.

NOTE

Warm-up is complete when all X-ray warning lights turn OFF and the MP1 returns to operation status.

4.1.18 Upon completion of the warm-up cycle, record status of 20 second audible and visual signals, X-ray ON warning lights, and completion of the warm-up cycle in the RTR Operational Logbook **AND** turn the X-ray key switch to position 2.

4.1.19 Open Vault doors to accept drum from infeed conveyor.

4.1.20 Open the II shutters.

4.2 RTR System Operations

NOTE

Drums are directly loaded onto the conveyor rollers with appropriate handling equipment in accordance with governing Host site procedures.

To assist the RTR Operator in determining height and volume estimations, measuring devices with graduated scales may be placed on the drum(s).

4.2.1 Drum Loading

[A] Verify that a drum is loaded onto the conveyor by Waste Operator by observing the conveyor monitor.

[B] Transport the drum into the X-ray vault.

[C] Close the Vault doors while maintaining Visual Surveillance on the video monitor.

4.2.2 Drum Scanning

[A] Turn the X-ray key switch to position 3.

[B] Push the X-RAY ON button to start the X-ray unit.

[B.1] Verify all X-ray warning lights are ON.

[C] Adjust the kV and milliamps knobs until the image on the video monitor has the desired display.

[D] Rotate the drum to the desired rotation start position using the turntable joystick to make a detailed inspection of items in the drum in accordance with the applicable procedure.

[E] **WHEN** the desired X-ray examination is completed, **THEN** terminate X-rays by pushing the X-ray OFF button.

[F] Turn the X-ray key switch to position 2.

4.2.3 Drum Unloading

[A] Open the Vault doors while maintaining Visual Surveillance on the video monitor.

[B] Move the drum to the Out Feed Conveyor.

[C] **IF** additional drum(s) are to be examined, **THEN** return to step 4.2.1[A], **ELSE** close the Vault doors while maintaining Visual Surveillance on the video monitor.

NOTE
It is recommended to leave the X-ray system in position 2 for at least 20 minutes prior to shutdown of the RTR system to allow the cooling system to remove excess heat from the X-ray tube.

4.3 RTR System Shut-down

4.3.1 Turn the X-ray key switch to position 1, AND remove the X-ray key from the key switch.

[A] Return the X-ray key to the lock box.

4.3.2 Completely close the II shutters.

4.3.3 Remove all audio/video media from the recording system.

4.3.4 Shut-down all imaging and recording equipment by pressing the appropriate switches.

4.3.5 Turn the Power key switch to the OFF position, **AND** remove the key from the key switch.

[A] Return the Power key to the lock box.

4.3.6 Turn off the X-ray Chiller unit.

4.3.7 Document the completion of system shutdown in the Operational Log book.

NOTE
Section 4.4 is a stand-alone section and may be performed at any time in accordance to Host site procedure.

4.4 Contamination Surveys

4.4.1 Record in the RTR Operational Logbook the date, time, and results of any RCT surveys.

5.0 RECORDS

5.1 Records generated during the performance of this procedure are maintained as quality assurance (QA) records in accordance with CCP-QP-008, *CCP Records Management*.

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CCP-TP-165

Revision 3

CCP
Real-Time Radiography #6
Operating Procedure

EFFECTIVE DATE: 11/05/2013

Mike Ramirez

PRINTED NAME

APPROVED FOR USE

RECORD OF REVISION

Revision Number	Date Approved	Description of Revision
0	09/20/2007	Initial issue.
1	06/19/2008	Revised to allow use of procedure in conjunction with CCP-TP-066, *CCP Radiography Screening Procedure for Prohibited Items*.
2	01/07/2011	Revised to remove Section 2.4.10 requirement for two people to be present during drum movements. Corrected references to CCP-QP-011, *CCP Laboratory Logbooks*, and CCP-PO-005, *Conduct of Operations*. Made minor changes to correct document formatting.
3	11/05/2013	Revised to reflect changes in real-time radiography (RTR) equipment and to align with other RTR procedures.

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1.0 PURPOSE

The purpose of this procedure is to provide instructions for safe start-up, operation, and shut-down of the mobile real-time radiography (RTR) System RTR #6 at Oak Ridge National Laboratory (ORNL). This procedure is used with CCP-TP-053, *CCP Standard Real-Time Radiography (RTR) Inspection Procedure*, for performing certified scanning of waste containers. This procedure is also used with CCP-TP-066, *CCP Radiography Screening Procedure for Prohibited Items*.

1.1 Scope

This procedure applies to operation of the RTR #6 radiographic examination unit. Maintenance activities are outside the scope of this procedure.

2.0 REQUIREMENTS

2.1 References

Referenced Documents

- CCP-QP-002, *CCP Training and Qualification Plan*
- CCP-QP-008, *CCP Records Management*
- CCP-PO-005, *CCP Conduct of Operations*
- CCP-TP-053, *CCP Standard Real-Time Radiography (RTR) Inspection Procedure*
- CCP-TP-066, *CCP Radiography Screening Procedure for Prohibited Items*

2.2 Training Requirements

2.2.1 Personnel performing this procedure will be trained and qualified in accordance with CCP-QP-002, *CCP Training and Qualification Plan*, prior to performing this procedure.

2.3 Equipment List

- RTR System
- Personal Protective Equipment (PPE)

2.4 Precautions and Limitations

2.4.1 If during the course of performing this procedure an abnormal situation occurs that causes deviation from the normal process, and this abnormal condition CAN **NOT** be corrected as directed in this procedure, RTR Operators shall IMMEDIATELY STOP WORK and notify the Vendor Project Manager (VPM), Lead Operator (LO), or designee.

2.4.2 The PPE for normal operations consists of leather gloves (when handling containers), safety shoes, and Thermoluminescent Dosimeters (TLDs). Safety glasses must be worn in transit between the Control Point and the RTR #6 unit. PPE for abnormal conditions will be specified by the Radiological Control Technician (RCT) or in a Radiological Work Permit (RWP). The required or specified PPE will be donned prior to starting RTR operations.

2.4.3 High-energy X-rays, high voltages (kV), and pinch points are potential hazards associated with the mobile RTR System. These hazards are addressed in safety training for personnel that operate the mobile RTR System.

2.4.4 Personnel will remain clear of all moving doors and equipment.

2.4.5 The RTR System generates X-rays and high voltages (up to 320 kV). Personnel will avoid radiation exposure by observing all warning devices and personnel barriers.

2.4.6 RTR Operators will ensure the X-ray vault is clear of personnel prior to each start-up of the X-ray System. To facilitate this, a Closed-Circuit Television system (CCTV) has been installed.

2.4.7 By design, there is **NO** exposed lead. However, precautions should be taken **NOT** to damage the steel vault lining as this may cause exposure to lead.

2.4.8 RTR Operators will ensure all electrical panels and junction boxes are closed, equipment and moving parts are clear of foreign objects, and personnel are clear of the equipment prior to start-up of the RTR System.

2.4.9 Workers who will be working in RTR #6 must have read and signed that they understand the applicable Activity Hazard Analysis (AHAs) and RWPs.

2.5 Prerequisite Actions

2.5.1 Conduct Operational checks at the beginning of each shift.

2.5.2 Verify the X-ray Compliance Certificate is current. Document results in operational log book.

[A] **IF** the radiation leak check has expired, **OR** maintenance has been performed on designed shielding components, **THEN** DO **NOT** proceed with RTR operations until Radiation Protection Services personnel perform **AND** document a radiation leak check, **AND** certify the RTR system is operating within allowable limits.

3.0 RESPONSIBILITIES

3.1 RTR Operator

3.1.1 Operates the RTR System.

4.0 PROCEDURE

NOTE
The RTR Operator performs all steps within this procedure unless otherwise indicated.

4.1 RTR System Start-up

4.1.1 Obtain the Power key and the X-ray key from the lock box.

4.1.2 Insert the Power key into the Power key switch on the left side of the center Control Panel desk, **AND** turn the switch to the ON position to provide power to the RTR System.

[A] Verify the white light adjacent to the key switch has illuminated.

4.1.3 Turn on video recording, display, and processing equipment as indicated.

[A] Verify each component power indication light illuminates.

[B] Verify the video surveillance monitor displays an image from all four surveillance cameras.

4.1.4 Verify the X-ray Tube shutters are CLOSED.

4.1.5 Verify there are **NO** personnel in the X-ray vault.

NOTE
The X-ray key switch on the MP1 Controller has three positions:

1. OFF
2. Main is ON – Stand-by Mode
3. X-rays Enabled

4.1.6 Insert the X-ray key into the X-ray key switch, **AND** turn the key switch to position 2.

4.1.7 Verify the operability of door interlocks, **AND** document results in the RTR Operational Logbook (in accordance with CCP-PO-005, *Conduct of Operations*).

NOTE

The X-ray system contains three Emergency Stop push buttons. These push buttons are wired in series such that any one tests the ability of the emergency deactivation. As such, the operator will rotate the testing of the Emergency Stop push buttons so that each push button is tested every third day of operations.

4.1.8 Verify the X-ray key switch is in position 2.

4.1.9 Depress and reset the Emergency Stop push button selected for testing.

4.1.10 Verify that power has been removed from the Operator and X-ray Control Panels, **AND** document the results in the RTR Operational Logbook.

4.1.11 Reset the Operator and X-ray Control Panels.

4.1.12 **IF** any abnormal condition is noted,
THEN STOP WORK, **AND** notify RTR LO and VPM.

4.1.13 Turn the X-ray key switch to Position 3.

NOTE

Initiate warm-up cycle per MP1 controller manufacturer's recommendations. An audible alarm will sound for 20 seconds before X-rays are generated. The 20-second prewarning time begins immediately on pushing the green X-ray On button.

4.1.14 Push the green X-ray On button to start the X-ray warm-up cycle.

[A] Verify the X-ray warm-up light illuminates.

CAUTION

If any of the X-ray warning lights fail to come ON, the RTR system SHALL be shut-down by pushing the X-ray Off button, turning the X-ray key switch to the (0) Off position and removing the X-ray key. The RTR LO and VPM will be notified and RTR operations will **NOT** be performed until the failed RTR system(s) has been repaired or replaced.

NOTE

There are two X-ray warning lights in the following locations:

- Above the X-ray vault personnel door in the Equipment Room.
- Above the loading door on the in-feed conveyor of the RTR trailer.

4.1.15 Verify all X-ray warning lights are ON.

NOTE

Warm-up is complete when all X-ray warning lights turn OFF and the MP1 returns to operation status.

4.1.16 Upon completion of the warm-up cycle, record status of 20 second audible and visual signals, X-ray On warning signals, and completion of the warm-up cycle in the RTR Operational Logbook **AND** turn the X-ray key switch to position 2.

4.1.17 Using the image intensifier (II) and X-ray tube manipulator joystick, ensure the horizontal movement of the II and X-ray tube is operating properly.

4.1.18 Push the Doors Open/Close green button located on the Operator Panel to open door to accept drum from conveyor.

[A] Verify the conveyor rollers move freely.

4.1.19 Hold the shutter X-ray in the OPEN position for 20 to 35 seconds.

4.1.20 Verify the shutters are OPEN by viewing the red indicator lights on the right-hand side of the control panel.

4.2 RTR System Operations

NOTE

Drums are directly loaded onto the conveyor rollers with appropriate handling equipment in accordance with governing host site procedures.

To assist the RTR Operator in determining height and volume estimations, measuring devices with graduated scales may be placed on the drum(s).

4.2.1 Drum Loading

[A] Verify that a drum is loaded onto the conveyor by Waste Operator by observing the conveyor monitor.

[B] Transport the drum into the X-ray vault, utilizing the Conveyor In and Out joystick at the Operator's Control Console.

[C] Close the infeed/outfeed door using the Door Open/Close button on the Operator's Control Console while maintaining a visual on the video monitor.

[D] Center drum on the turntable using the drum centering device.

4.2.2 Drum Scanning

[A] Turn the X-ray key switch to position 3.

[B] Push the green X-RAY ON button to start the X-ray unit.

[C] Adjust the kV and milliamps knobs until the image on the video monitor has the desired display.

[D] Rotate the drum to the desired rotation start position using the turntable joystick on the Operator's Control Console to make a detailed inspection of items in the drum in accordance with the applicable procedure.

[E] **WHEN** the desired X-ray examination is completed, **THEN** terminate X-rays by pushing the red X-ray Off button on the controller.

[F] Turn the X-ray key switch to position 2.

4.2.3 Drum Unloading

[A] Open the infeed/outfeed door using the Doors Open/Close button on the Operator's Control Console while maintaining visual on the X-ray vault video monitor.

[B] Move the drum to the unload position with the Conveyor In and Out joystick on the Operator's Control Console.

[C] **IF** additional drum(s) are to be examined, **THEN** return to step 4.2.1[A], **ELSE** close the infeed/outfeed door using the Doors Open/Close button at the Operator's Control Console while maintaining visual on the X-ray vault video monitor.

NOTE

It is recommended to leave the X-ray system in position 2 for at least 20 minutes prior to shutdown of the RTR system to allow the cooling system to remove excess heat from the X-ray tube.

4.3 RTR System Shut-down

4.3.1 Turn the X-ray key switch to position 1, AND remove the X-ray key from the key switch.

[A] Return the X-ray key to the lock box.

4.3.2 Completely close the X-ray shutters.

4.3.3 Remove all audio/video media from the recording system.

4.3.4 Shut-down all imaging and recording equipment by pressing the appropriate switches.

4.3.5 Turn the Power key switch to the OFF position, **AND** remove the key from the key switch.

[A] Return the Power key to the lock box.

NOTE

Section 4.4 is a stand-alone section and may be performed at any time in accordance to Host site procedure.

4.4 Contamination Surveys

4.4.1 Record in the RTR Operational Logbook the date, time, and results of any RCT surveys.

5.0 RECORDS

5.1 Records generated during the performance of this procedure are maintained as quality assurance (QA) records in accordance with CCP-QP-008, *CCP Records Management*.

5.1.1 QA/Nonpermanent

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CCP-TP-500

Revision 15

CCP
Remote-Handled Waste
Visual Examination

EFFECTIVE DATE: 05/06/2015

Irene Joo

PRINTED NAME

APPROVED FOR USE

RECORD OF REVISION

Revision Number	Date Approved	Description of Revision
0	02/15/2006	Initial issue.
1	04/27/2006	Revised in response to CBFO comments.
2	06/19/2006	Revised to address concerns raised during the Idaho National Laboratory (INL) Remote-Handled (RH) Audit A-06-21.
3	10/12/2006	Revised to resolve issue identified in EPA Concern ANL-CCP-RH-VE-06-001CR.
4	11/16/2006	Revised to incorporate Visual Examination Expert (VEE) decisions and signature.
5	06/01/2007	Revised to incorporate February 27, 2007, modification of the Waste Isolation Pilot Plant Hazardous Waste Facility Permit (HWFP), Attachment B-B6, Waste Analysis Plan (WAP).
6	10/25/2007	Revised in response to Central Characterization Project (CCP) Corrective Action Report (CAR) CAR-RHBCL-00002-07, to clarify questions 11 and 12 on Attachment 2, Visual Examination Independent Technical Review Checklist.
7	02/27/2008	Revised to address Carlsbad Field Office (CBFO) Corrective Action Report (CAR) 08-005.
8	07/24/2008	Clarification changes for ease of operations.
9	06/30/2010	Revised to make changes for a two shift operation and two different sets of qualified operators to be able to work on the same Remote-Handled (RH)-Visual Examination (VE). Added Table 1, Prohibited Items List, and updated language to reflect the permit modification.
10	12/29/2010	Revised to incorporate Permit Modification Independent Technical Review (ITR) language.
11	04/21/2011	Implement Revision 2 of Remote-Handled Transuranic (TRU) Waste Characterization Program Implementation Plan DOE/WIPP-02-3214.
12	07/18/2013	Revised to incorporate Nuclear Waste Partnership (NWP) transition changes.
13	09/23/2013	Revised to include the allowable closure methods Table 2.5-1 from the remote-handled (RH) transuranic (TRU) Payload Appendices.

RECORD OF REVISION (Continued)

Revision Number	Date Approved	Description of Revision
14	04/14/2015	Revised to clarify independent technical reviewer (ITR) questions related to Quality Assurance Objectives (QAOs). Removed N/A option from ITR checklist and made procedure more user friendly.
15	05/06/2015	Revised in response to Central Characterization Program (CCP) Carlsbad Field Office (CBFO) Corrective Action Report (CAR) 15-033 to ensure Site Project Manager (SPM) generates an nonconformance report (NCR) when requesting data changes at the data generation level (DGL).

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1.0 PURPOSE

CCP-PO-001, *CCP Transuranic Waste Characterization Quality Assurance Project Plan*, Section C-3b, requires that containers be examined to verify the physical form of the waste and to identify items that are prohibited from disposal at the Waste Isolation Pilot Plant (WIPP). This procedure establishes how to perform the visual examination (VE) of remote-handled (RH) transuranic (TRU) waste containers, which may include the removal of prohibited items; and how to prepare and review batch data reports (BDRs) generated from the VE process.

This procedure provides the actions for collection of VE data and information required by CCP-PO-001, CCP-PO-002, *CCP Transuranic Waste Certification Plan;* and DOE/WIPP-02-3214, *Remote-Handled TRU Waste Characterization Program Implementation Plan* (WCPIP).

This procedure is designed to be accomplished in conjunction with Host site facility operating procedures that address the use of those facilities for VE. All Host site requirements for health, safety, and operations in the work place will be addressed in a Host site procedure.

1.1 Scope

This procedure applies to retrievably stored and newly generated S3000 homogeneous solids, S4000 soils/gravel, and S5000 debris waste streams.

VE verifies the physical waste form, confirms the Waste Stream Description and Waste Matrix Codes provided by Acceptable Knowledge (AK), and confirms that no prohibited items are present. VE may be used to detect and remediate items that are prohibited from disposal at the WIPP.

There are two methods allowed for performing VE.

- Method 1 – VE using at least one qualified operator with audio/video recording of the VE.
- Method 2 – VE using two qualified operators without audio/video recording of the VE.

VE cannot identify prohibited items imbedded in forms, such as soils and solids, when the material is not removed from the characterized container.

VE may be performed on S3000 or S4000 when the material is not removed from the characterized container if Carlsbad Field Office (CBFO) approves the method for the specific waste form, typically from a surveillance.

VE will not be used as the Nondestructive Examination (NDE) process for certification of S3000 retrievably stored waste unless surveillance on the process has been performed by CBFO identifying why VE is the preferred method over real-time radiography (RTR).

If waste is not directly loaded into the final output container the VE may be performed in two phases. In the first phase, VE is performed by two qualified operators where the waste is visually inspected, identified, and placed into containers. Once waste has been placed into containers the waste may no longer be visible in its packaging. These containers, known as indirect load containers, will eventually be packaged into a larger container or a final output container. In the second phase, VE is performed when indirect load containers are placed into a larger container or the final output container.

In addition to being used to perform VE at the time waste is actually being placed into the waste container, this procedure may also be used to perform VE of video media of waste being placed into waste containers. In the case of VE being performed using video tapes of waste contents, the VE operators are not in direct control of the waste examination and packaging process. Consequently, the video recordings must be adequate and complete to identify waste materials and verify the absence of prohibited items as required in the execution of this procedure. Attachment 1, Visual Examination Data Form, for the individual containers, is completed based on the review of the video media.

2.0 REQUIREMENTS

2.1 References

Baseline Documents

- *Safety Analysis Report for the RH-TRU 72-B Waste Shipping Package,* U.S. Department of Energy Carlsbad Field Office
- CCP-PO-505, CCP *Remote-Handled Transuranic Waste Authorized Methods for Payload Control (CCP RH-TRAMPAC)*
- DOE/WIPP 90-045, *RH-TRU Waste Content Codes (RH-TRUCON)*

Referenced Documents

- DOE/WIPP-02-3214*, Remote-Handled TRU Waste Characterization Program Implementation Plan*
- CCP-PO-001, *CCP Transuranic Waste Characterization Quality Assurance Project Plan*
- CCP-PO-002, *CCP Transuranic Waste Certification Plan*
- CCP-QP-002, *CCP Training and Qualification Plan*
- CCP-QP-005, *CCP TRU Nonconforming Item Reporting and Control*
- CCP-QP-008, *CCP Records Management*

2.2 Training Requirements

2.2.1 Personnel performing this procedure will be trained and qualified in accordance with CCP-QP-002, *CCP Training and Qualification Plan,* prior to performing this procedure.

2.3 Equipment List

2.3.1 None.

2.4 Precautions and Limitations

2.4.1 Facility Requirements

[A] This procedure augments, but DOES **NOT** supersede, applicable requirements of the facilities in which the activities are conducted.

[B] This procedure DOES **NOT** address radiological protection requirements. All activities described SHALL be conducted in accordance with work plans, procedures, or other process controls generated by the facility where the work is performed.

[C] Prior to performing work, personnel will comply with all facility requirements for visitors, as established by each Host site.

2.4.2 Conditions Adverse to Quality

[A] If a condition adverse to quality is identified, the individual(s) identifying the condition SHALL initiate a nonconformance report (NCR) in accordance with CCP-QP-005, *CCP TRU Nonconforming Item Reporting and Control*.

2.5 Definitions

2.5.1 Indirect Load – Any container, package, item or material to be placed in an output container that has previously undergone the VE process and was controlled by the use of a tamper indicating device (TID) or other administrative control prior to being loaded into the output container.

3.0 RESPONSIBILITIES

3.1 Visual Examination Operator (VEO)

3.1.1 Performs the VE.

3.1.2 Assembles, paginates, and reviews the BDR.

3.2 Independent Technical Reviewer (ITR)

3.2.1 Reviews the BDR.

3.2.2 Completes Attachment 2(s), Visual Examination Independent Technical Reviewer Checklist.

3.3 Visual Examination Expert (VEE)

3.3.1 Responsible for overall direction and implementation of the VE at that facility.

3.4 Site Project Manager (SPM)

3.4.1 Reviews and approves the BDR.

3.4.2 Completes Attachment 3, Visual Examination Site Project Manager Checklist.

3.5 Vendor Project Manager (VPM)

3.5.1 Ensures the safe operation of the VE process.

3.5.2 Ensures all personnel maintain proficiency and identifies any additional training that may be required.

3.5.3 Coordinates remediation of prohibited items with the Host site.

3.5.4 Facilitates container tracking and management.

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4.0 PROCEDURE

NOTE

A separate Attachment 1 will be used for each indirect load container or package used to contain waste, **AND** an Attachment 1 will be used when combining indirect load containers into a larger container.

A Testing Batch includes all data pertaining to VE for up to 20 containers without regard to waste matrix.

A separate Attachment 1 will be used if the original operators that started the VE could not complete the container (e.g., end of the shift), **AND** two different qualified operators had to resume or finish VE of the container.

Two VEOs are required if performing VE and not video recording. Only one VEO is required if performing VE and video recording.

Not applicable (NA) shall be marked in all fields of the Attachments that are not applicable, unless the document's intent is clear with some blanks.

VEO

4.1 VE for Indirect Load or Final Output Containers

4.1.1 Preparations

[A] Record the following information on Attachment 1:

[A.1] Site Identification (ID) (e.g., RHANL)

[A.2] Examination Date

[A.3] Batch Number if known, otherwise mark as N/A

[A.4] Procedure and Revision Number

[B] Prepare the recording equipment as follows (optional):

[B.1] **IF** recording equipment is to be used,
THEN operate the recording equipment in accordance with site procedures.

[B.2] Ensure the recording media is labeled with the container number and date, **AND** annotate the video number on Attachment 1.

[B.3] To ensure the recording equipment is operating satisfactorily, record a short segment, **AND** review segment for clarity of image and audio, if applicable.

[B.4] Check SAT (Satisfactory), UNSAT (Unsatisfactory), or N/A on Attachment 1 to record the result of the Recording Equipment Check.

NOTE

If using video/audio media, record the waste packaging event for the container such that the waste placed into the containers are recorded in sufficient detail that a trained VEO can determine what the waste is and its associated waste material parameter.

[B.5] **IF** recording the VE,
THEN enter the Recording Start time on Attachment 1, **AND** begin recording.

[C] Inspect the container(s) to be loaded during VE.

[C.1] **IF** container(s) are empty of waste or contain waste that will be visually examined,
THEN check SAT on Attachment 1.

[C.2] **IF** container(s) are NOT empty of waste that will be visually examined,
THEN check UNSAT on Attachment 1, stop work and notify the VEE.

4.1.2 Visual Examination (VE)

[A] **IF** a single container will be used for all of the waste to be packaged,
THEN check the Indirect Load Container field N/A, **AND** use the Final Output Container fields to record steps 4.1.2[B.1] through 4.1.2[J.2].

[B] **IF** the waste will be packaged in indirect load containers and later combined in a final output container,
THEN check the Final Output Container field N/A, **AND** record the following in the Indirect Load Container fields on a separate Attachment 1 for each container:

NOTE

The Container ID Number is user defined (must be unique to the package or container) but shall be such that the indirect load containers in a final container can be distinguished from each other.

[B.1] Container ID Number

[B.2] Container Type (e.g., less than 4-liter plastic bottle, plastic bag, filtered plastic bag, unsealed 5-gallon pail, 55-gallon drum)

[B.3] Waste Matrix Code as identified from AK

[B.4] Waste Stream as listed in the AK Summary Report

NOTE

The description of the material to be placed in the container or package shall be sufficiently detailed to allow a reviewer to evaluate the Waste Material Parameters (e.g., crescent wrench Iron-based Metals/Alloys [IM]). The material parameters are listed in Table 2, Waste Material Parameters. All items within the container are considered waste and must be accounted for.

[C] Examine the container packaging and waste, **AND** record the description of the material in the Waste Description field on Attachment 1.

[D] Ensure the waste is placed into the package or container.

[E] **IF** combining indirect load containers into a larger container,
THEN GO TO Section 4.2.

[F] **IF** VE of the container can **NOT** be completed by the original qualified operators that started the waste container for any reason,
THEN STOP and notify the VE Expert.

[G] Complete comment section of on Attachment 1, initial and date comments. New qualified operators SHALL initial and

date comments for acceptance of waste previously placed into the waste container.

[H] **IF** different qualified operators resume or complete the VE **THEN** the operators will start a separate Attachment 1 at step 4.1.2[C], complete Attachment 1 per CCP-TP-500, *CCP Remote-Handled Waste Visual Examination*.

NOTE

Waste may be VE'd and loaded in larger container **AND** indirect load containers VE'd and loaded into same larger container.

[I] **WHEN** VE is complete,
THEN perform the following and document on Attachment 1:

[I.1] **IF** recording,
THEN STOP the recording device, **AND** enter the Recording Stop time.

[I.2] **IF** packaging waste in indirect load containers that will be combined into a larger container,
THEN GO TO step 4.1.2[I.6].

[I.3] Check Y (Yes) or N (No) to record use of a Poly Rigid Liner and enter Poly Rigid Liner thickness.

[I.4] Check Y or N to record use of a Poly Rigid Liner Lid.

[I.5] **IF** a Poly Rigid Liner Lid is used,
THEN record hole size in Poly Rigid Liner Lid.

NOTE

The fill percent of the container is based on the highest level of the bulk of the waste. Items (e.g., pipe, plastic bags) that protrude above the bulk of the waste are **NOT** to be included in the fill percent determination.

[I.6] Estimate, **AND** record the fill percent in 5% increments (e.g., 35%, 40%, 45%).

[I.7] Determine and record the amount of organic waste in 10 percent increments by volume.

[I.8] Ensure the bag liner is closed by either VE or AK record, if applicable.

[I.9] Enter the number of Layers of Confinement for the package.

[I.10] Enter the Closure Method(s) for the individual Layers of Confinement, using Table 3, Allowable Closure Methods, as a guide (use the Comments field on Attachment 1 if additional room is needed). N/A if there are no Layers of Confinement.

[I.11] Ensure the lid of the waste container is installed in accordance with Host site procedures, if applicable.

[I.12] **IF** the waste stream is S3000 **OR** S4000 waste that also contains debris,
THEN visually estimate the total weight of debris in the container of waste, **AND** record the debris weight in the Comments field of Attachment 1.

[I.13] Answer the Prohibited Item/RH 72B Criteria questions on Attachment 1, using Table 1, Prohibited Items List, as a guide.

NOTE
Packaging material applies to the final output container only.

[J] Certify the contents of the container by performing the following:

[J.1] Method 1

VEO 1

(a) Print name, sign, **AND** date Attachment 1 to annotate that the VE has been completed.

(b) Mark VEO 2 as N/A.

[J.2] Method 2

VEO 1

(a) Print name, sign, **AND** date Attachment 1 to annotate that the VE has been completed.

VEO 2

(b) Print name, sign, **AND** date Attachment 1 to annotate that the VE has been completed.

VEO

[K] Ensure the waste container is stored with reasonable protection from tampering.

4.2 VE for Final Packaging of Indirect Load Containers

NOTE

VE for Final Packaging applies when Indirect Load Container(s) are to be placed into a larger container. For packages VE'd by tape review, the applicable steps in Section 4.2 are completed using AK information.

VEO

4.2.1 Prepare indirect load containers for loading as follows:

[A] Identify the containers to be placed in the larger container, **AND** obtain the Attachment 1 for those containers.

[B] Ensure all of the Attachment 1s show that the waste belongs to the same waste stream, there are NO prohibited items present, **AND** there are NO NCRs open that would require additional handling of the waste.

4.2.2 Verify each Indirect Load Container ID Number against the Attachment 1 prior to loading into the larger container.

4.2.3 For each Indirect Load Container to be loaded into the larger container, perform the following:

[A] Record the Container ID Number(s) in the Waste Description field on Attachment 1.

[B] Ensure the container is placed into the larger container.

[C] Repeat steps 4.2.3[A] and 4.2.3[B] for each container to be loaded.

[D] **IF** VE of the larger waste container can NOT be completed by the original qualified Operators that started the waste container for any reason,
THEN STOP **AND** Notify the VE Expert.

[E] Complete comment section of Attachment 1, initial and date comments. New qualified operators SHALL initial and date comments for acceptance of waste previously placed into the waste container.

[F] **IF** different qualified operators resume or complete the VE,
THEN the operators will start with a separate Attachment 1 at step 4.1.2[C] and complete Attachment 1 per CCP-TP-500.

4.2.4 **WHEN** VE is complete,
THEN perform the following:

[A] **IF** recording,
THEN STOP the recording device,
AND enter the Recording Stop time on Attachment 1.

[B] **IF** packaging indirect load containers into larger indirect load containers,
THEN GO TO step 4.2.4[F].

[C] Check Y or N to record use of a Poly Rigid Liner, **IF** Y,
THEN enter liner thickness.

[D] Check Y or N to record use of a Poly Rigid Liner Lid.

[E] **IF** Poly Rigid Liner Lid is used,
THEN record hole size in Poly Rigid Liner Lid.

NOTE

The fill percent of the container is based on the highest level of the bulk of the waste. Items (e.g., pipe, plastic bags) that protrude above the bulk of the waste are **NOT** to be included in the fill percent determination.

[F] Estimate, **AND** record the fill percent in 5% increments (e.g., 35%, 40%, 45%).

[G] Determine and record the amount of organic waste in 10 percent increments by volume.

[H] Ensure the bag liner is closed by either VE or AK record, if applicable.

[I] Enter the number of Layers of Confinement for the package.

[J] Record the Closure Methods(s) for the individual Layers of Confinement. Use the Comments field on Attachment 1 if additional room is needed. N/A if there are no Layers of Confinement.

[K] Ensure the lid of the waste container is installed in accordance with Host site procedures, if applicable.

[L] **IF** the waste stream is S3000 OR S4000 waste that also contains debris,
THEN visually estimate the total weight of debris in the container of waste and record the debris weight in the comment field of Attachment 1.

[M] Answer the Prohibited Item/RH 72B questions on Attachment 1.

NOTE

Potential hazardous wastes identified by visual examination include:

- Batteries
- Circuit Boards (may be contained in electrical equipment)
- Cathode Ray Tube (CRT)-based computer monitors or televisions
- Lead
- Mercury, mercury containing equipment (e.g., barometers, switches, thermometers, thermostats)
- Light Bulbs (both incandescent and fluorescent)

4.2.5 Certify the contents of the container by performing the following:

[A] Method 1

VEO 1

[A.1] Print name, sign, **AND** date Attachment 1 to annotate that the VE has been completed.

[A.2] Mark VEO 2 as N/A.

[B] Method 2

VEO 1

[B.1] Print name, sign, **AND** date Attachment 1 to annotate that the VE has been completed.

VEO 2

[B.2] Print name, sign, **AND** date Attachment 1 to annotate that the VE has been completed.

VEO

4.2.6 Ensure the waste container is stored with reasonable protection from tampering.

4.3 Batch Data Report Preparation

NOTE

The Testing BDR will contain Attachment 1s for no more than 20 Final Output Containers. Each container may hold several indirect load containers or packages, and each of those may potentially also hold indirect load containers or packages, resulting in a number of Attachment 1s for each Final Output Container.

BDR numbering will be as follows: Site ID, process, year, next sequential number to start back at one at the beginning of the new year (e.g., ANLRHVE05001).

VEO

NOTE

For containers VE'd by tape review, the original packaging data sheet, if available (obtained from AK), is included in the BDR and placed behind the corresponding Attachment 1 (See Attachment 6, Waste Package Data Sheet, for an example).

4.3.1 Complete Attachment 4, Visual Examination Batch Data Report Cover Sheet.

4.3.2 Assemble the following data for the BDR:

[A] Attachment 5, Visual Examination Batch Data Report Table of Contents.

[B] Attachment 1 for each Final Output Container, original packaging data sheet, and the associated Attachment 1s for the indirect load container(s) within the Final Output Container (if applicable).

[C] Attachment 2, Visual Examination Independent Technical Reviewer Checklist.

[D] Copy of NCRs, if applicable.

4.3.3 Prepare the BDR as follows:

[A] Assemble and organize the BDR.

[B] Place the Indirect Load Container Attachment 1s and original packaging data sheet if applicable, behind the Final Output Container Attachment 1 in which it resides.

[C] Paginate the BDR.

[D] Complete Attachment 5.

NOTE

The independent technical review is conducted by an individual who is qualified to have performed the initial work, but who is **NOT** directly responsible for performing the work. The ITR shall not be involved in the generation or recording of the data.

ITR

4.3.4 Enter the BDR Number on Attachment 2.

4.3.5 Review the BDR to the criteria in Attachment 2, **AND** document on Attachment 2.

4.3.6 Print name, sign, and date Attachment 2.

4.3.7 Submit the completed BDR and audio/video media, when applicable, in accordance with CCP-QP-008, *CCP Records Management*.

NOTE

The historical audio/media records from generation sites may be pre-submitted to Central Characterization Program (CCP) Records.

4.4 Site Project Manager (SPM) Review

SPM

4.4.1 Obtain copy of BDR.

4.4.2 Enter the BDR Number on Attachment 3.

4.4.3 Review the BDR to the criteria in Attachment 3, **AND** document on Attachment 3.

[A] **IF** data affecting inconsistencies, mistakes, omissions, etc., are noted during the SPM review, that impact or change the characterization data,
THEN initiate an NCR in accordance with CCP-QP-005.

[A.1] Ensure copy of approved Project Office NCR is provided to data generation level (DGL) documenting required changes in the NCR disposition.

4.4.4 Print name, sign, and date Attachment 3.

4.4.5 Submit the completed Attachment 3 to CCP Records in accordance with CCP-QP-008.

5.0 RECORDS

5.1 Records generated during the performance of this procedure are maintained as quality assurance (QA) records in accordance with CCP-QP-008. The records are the following:

5.1.1 QA/Lifetime

[A] Batch Data Report (BDR):

[A.1] Attachment 1, Visual Examination Data Form(s) (There will be multiple Attachment 1s to each BDR package.)

(a) Attachment 6, Waste Package Data Sheet, if applicable.

[A.2] Attachment 2, Visual Examination Independent Technical Reviewer Checklist

[A.3] Attachment 3, Visual Examination Site Project Manager Checklist

[A.4] Attachment 4, Visual Examination Batch Data Report Cover Sheet

[A.5] Attachment 5, Visual Examination Batch Data Report Table of Contents

[A.6] Copy of NCRs, if applicable

5.1.2 QA/Nonpermanent

[A] VHS Tape or DVD, as applicable (primary and backup)

Table 1. Prohibited Items List

LIST OF PROHIBITED ITEMS
Liquid Wastes Observable liquid shall be less than 1 percent by volume of the outermost container at the time of RTR or VE. Observable liquid shall be no more than 60 milliliters or 3 percent by volume, whichever is greater, in an internal container. Observable liquid shall not be present in a container with EPA HWN U134 assigned.
Non-Radionuclide Pyrophorics
Non-mixed hazardous waste
Incompatible wastes (Wastes that are incompatible with backfill, seal and panel closure materials, container and packaging materials, shipping container materials, and/or other wastes).
Explosives
Compressed Gases/Pressurized containers (e.g., aerosol cans)
Observable liquid containing Polychlorinated Biphenyls
Ignitables
Corrosives
Reactive waste
Sealed containers greater than 4 liters
Heat-sealed bags not defined in the applicable RH-TRU Payload Appendices, Table 2.5.1
Sharp or heavy objects not adequately blocked, braced, or packaged
Waste that has ever been managed as high-level waste and waste from tanks specified in Table C-4 of CCP-PO-001.

Table 2. Waste Material Parameters

Waste Material Parameter	Description
Iron-based Metals/Alloys (IM)	Iron and steel alloys in the waste; does not include the waste container materials
Aluminum-based Metals/Alloys (AM)	Aluminum or aluminum-based alloys in the waste materials
Other Metals (OM)	All other metals found in the waste materials
Other Inorganic Materials (OIM)	Nonmetallic inorganic waste including concrete, glass, firebrick, ceramics, sand, and inorganic sorbents
Cellulosics (C)	Materials generally derived from high-polymer plant carbohydrates; (e.g., paper, cardboard, wood, and cloth)
Rubber (R)	Natural or man-made elastic rubber gloves, latex materials; (e.g., surgeons' gloves, and leaded rubber gloves)
Plastics (waste materials) (P)	Generally man-made materials, often derived from petroleum feedstock; (e.g., polyethylene and polyvinylchloride)
Organic Matrix (OGM)	Cemented organic resins, solidified organic liquids and sludges
Inorganic Matrix (IGM)	Any homogeneous materials consisting of sludge or aqueous-based liquids that are solidified with cement, calcium silicate, or other solidification agents; (e.g., wastewater treatment sludge, cemented aqueous liquids, and inorganic particulates)
Soils/gravel (S)	Generally consists of naturally occurring soils that have been contaminated with inorganic waste materials

Table 3. Allowable Closure Methods

Confinement Layer	Release Rate (mole/sec/mol fraction) at 298 K (25°C)
Breather vent on can	5.18E-6
Filtered bag	1.075E-5
Fold-and-tape or twist-and-tape liner bag	4.67E-6[Φ]
Heat-sealed bag	$RR = \frac{\rho A_p P_g}{x_p} \frac{mole}{22{,}400\,cm^3\,(STP)}$ where, RR = Release rate of hydrogen, mole/sec/mol fraction H_2 ρ = Hydrogen permeability, cm^3 (STP) cm^{-1} $(cm\ Hg)^{-1}$ s^{-1} [3.6E-10 for polyvinylchloride and 8.6E-10 for polyethylene] A_p = Permeable surface area, cm^2 P_g = Gas pressure, 76 cm Hg x_p = Bag thickness, cm
Inner drum liner filter	3.70E-6
Drum filter	3.70E-6
Fixed lid canister filter (high diffusivity)[Φ]	9.34E-5
Fixed lid canister filter[Φ]	1.48E-5
Removable lid canister filter[Φ]	1.48E-5
NS15 neutron shielded canister open-cell urethane foam gaskets (2 ea. – combined)	7.38E-4[③]
NS30 neutron shielded canister open-cell urethane foam gaskets (2 ea. – combined)	7.96E-4[③]
NS15 neutron shielded canister filter[Φ]	1.48E-5
NS30 neutron shielded canister filter[Φ]	1.48E-5

[Φ] Release rate meets the minimum filter specifications of Section 2.4 of the RH-TRAMPAC.

[Φ] Release rate is valid for all temperatures.

[③] Shaw Environmental, Inc., "Diffusivity and Flow Rates of PORON® Gaskets in RH-TRU Neutron Shielded Canisters," Shaw Environmental, Inc., December 2009.

Attachment 1 – Visual Examination Data Form

	Site ID:			
	Examination Date:	Batch Number:		
	Procedure #:	Revision #:	Video #:	
	Recording Equipment Check: ☐SAT ☐UNSAT ☐N/A	Recording Start:	Recording Stop:	
	Inspection of Container to be loaded during VE: ☐SAT ☐UNSAT			
Indirect load Container ☐ N/A		Final Output Container ☐ N/A		
	Container ID Number:		Container ID Number:	
	Container Type:		Container Type:	
	Waste Matrix Code:		Waste Matrix Code:	
	Waste Stream:		Waste Stream:	
			Poly Rigid Liner: ☐Y ☐N Thickness:	Poly Rigid Liner Lid: ☐ Y ☐N
			Poly Rigid Liner Vented or Hole Size:	
	Percent Fill:	Percent Organic Waste:	Percent Fill:	Percent Organic Waste:
	Layers of Confinement:	Closure Method:	Layers of Confinement:	Closure Method:
	Comments (e.g., filter information, NCRs):			
Waste Description:				

Attachment 1 – Visual Examination Data Form (continued)

Container ID Number _____

Prohibited Item(s) Summary		
	YES	NO
Does the container have observable liquid equal to or greater than 1 percent by volume of the outermost container at the time of RTR or VE?	☐	☐
Does the container have observable liquid more than 60 milliliters or 3 percent by volume, whichever is greater in an internal container?	☐	☐
Does the container have observable liquid with an EPA hazardous waste number (HWN) U134 assigned?	☐	☐
Does the container have observable liquid containing PCBs?	☐	☐
Is there an indication of non-radionuclide pyrophoric materials, such as elemental potassium?	☐	☐
Is there an indication of hazardous wastes not occurring as co-contaminants with TRU mixed wastes (non-mixed hazardous wastes)?	☐	☐
Is there an indication of wastes incompatible with backfill, seal and panel closures materials, container and packaging materials, shipping container materials, or other wastes (i.e., waste does **NOT** match Table of Allowable Materials for RH-TRU Waste in the RH-TRAMPAC)?	☐	☐
Is there an indication of wastes containing explosives or compressed gases?	☐	☐
Is there an indication of polychlorinated biphenyls (PCBs) not authorized under an EPA PCB waste disposal authorization?	☐	☐
Is there an indication of the waste exhibiting the characteristic of ignitability, corrosivity, or reactivity (EPA Hazardous Waste Numbers of D001, D002, or D003)?	☐	☐
Is the physical form of the waste inconsistent with the Waste Stream Description or the Waste Matrix Code?	☐	☐
RH 72B Criteria		
Were there Non-approved Closure Methods used on liner bags or inner bags greater than 4 liters?	☐	☐
Are there sealed containers GREATER than 4 liters or heat sealed bags **NOT** defined in the applicable TRUCON Code?	☐	☐
Are there indications of inadequate protection (blocked or braced) for heavy and/or sharp objects?	☐	☐
Is the waste consistent with the TRUCON Code?	☐	☐
Comments:		
Visual Examination Operator 1: _____ _____ _____ Print Name Signature Date		
Visual Examination Operator 2: _____ _____ _____ Print Name Signature Date		

Attachment 2 – Visual Examination Independent Technical Reviewer Checklist

Batch Data Report No.: _____

1. Were data generation and reduction conducted in a technically correct manner in accordance with the methods (procedure) used?	☐ NO	☐ YES
2. Was the correct revision of the operating procedure used?	☐ NO	☐ YES
3. Has the data been reviewed for errors?	☐ NO	☐ YES
4. Are BDR contents complete and do they match CCP waste VE Batch Data report Table of Contents?	☐ NO	☐ YES
5. Does the testing batch report include VE for up to 20 containers?	☐ NO	☐ YES
6. Is all data signed and dated in reproducible ink by the individual(s) generating it?	☐ NO	☐ YES
7. Is all data recorded clearly, legibly, and accurately?	☐ NO	☐ YES
8. Were changes made to original data? If NO, proceed to question 11.	☐ NO	☐ YES
9. Have all changes made to original data been lined out, initialed and dated by the individual making the changes?	☐ NO	☐ YES
10. Were the data changes made by the individual who originally collected the data or by an equally qualified individual?	☐ NO	☐ YES
11. Is there an adequate written description of the contents of each container?	☐ NO	☐ YES
12. Was VE of each container performed by at least two qualified VEO's or was an Audio/Video recording properly prepared for each container?	☐ NO	☐ YES
13. Has each container in this BDR been evaluated for the presence of prohibited wastes?	☐ NO	☐ YES
14. Did the physical form of the waste match the waste matrix code and waste stream description?	☐ NO	☐ YES
15. Was an NCR required at the data generation level? If NO, proceed to question 17.	☐ NO	☐ YES
16. Is a copy of the NCR included in the BDR?	☐ NO	☐ YES
17. Have the RH Quality Assurance Objectives (QAOs) for VE been met? **Precision –** Precision is maintained by reconciling any discrepancies between two operators (or between the operator and the Independent Technical Reviewer) with regard to the identification of important waste characteristics (i.e., physical form of the waste and absence of prohibited liquids) within a single container. **Accuracy –** Accuracy is maintained by requiring operators to pass a comprehensive examination with a score of 80% and demonstrate satisfactory performance in the presence of the VE expert during their initial qualification and subsequent requalification. **Representativeness –** The contents placed in a container will be described on the data forms.	☐ NO	☐ YES

Attachment 2 – Visual Examination Independent Technical Reviewer Checklist (Continued)

Batch Data Report No.: _____

Completeness – The relevant waste information must be collected. This information must be documented on a videotape and/or data form, or other unalterable media. **Comparability –** Comparability is ensured by the characterization program meeting the training requirements and complying with the minimum standards used to implement this characterization process. In some instances, waste will be contained in opaque containers and not all items will be visible to the operator (e.g., sealed paint cans or 5-gallon buckets). If these containers are not opened during VE, source documents must be available in the AK record that allow the operator to identify the contents of the closed containers.		
Comments:		
Independent Technical Reviewer _____ _____ _____ Printed Name Signature Date		

Attachment 3 – Visual Examination Site Project Manager Checklist

Batch Data Report No.: _____

1.	Has all the data received an independent technical review as evidenced by a completed checklist (Attachment 2) and the appropriate ITR signature?		☐ NO	☐ YES
2.	Are BDR contents complete and match the Visual Examination Batch Data Report Table of Contents?		☐ NO	☐ YES
3.	Is the BDR complete (appropriately filled in forms for each container)?		☐ NO	☐ YES
4.	Have the RH Quality Assurance Objectives (QAOs) for VE been met? Precision – reconciled discrepancies between operators Accuracy – trained operators Representativeness – description of container contents Completeness – completed data form and/or recording Comparability – proper training and adequate AK for unopened containers		☐ NO ☐ NO ☐ NO ☐ NO ☐ NO ☐ NO	☐ YES ☐ YES ☐ YES ☐ YES ☐ YES ☐ YES
5.	Were NCRs generated included in the BDR?	☐ NO	☐ YES	☐ N/A
Comments:				

SPM:

_____ _____ _____

Printed Name Signature Date

Attachment 4 – Visual Examination Batch Data Report Cover Sheet

Batch Data Report No.: _____ Date: _____

Waste Container ID Number:	
1	
2	
3	
4	
5	
6	
7	
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10	
11	
12	
13	
14	
15	
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17	
18	
19	
20	

Attachment 5 – Visual Examination Batch Data Report Table of Contents

Batch Data Report No.: _____ Date: _____

Item	Description	Page No.
1	Visual Examination Batch Data Report Cover Sheet (Attachment 4)	
2	Visual Examination Batch Data Report Table of Contents (Attachment 5)	
3	Visual Examination Data Forms (Attachment 1)	
4	Visual Examination Independent Technical Reviewer Checklist (Attachment 2)	
5	Copy of NCRs (N/A [if not applicable])	

Attachment 6 – Waste Package Data Sheet (Example)

RH-TRU (30 Gallon Drum)
Waste Package Data Sheet

RW 81798
AGHCF Drum #: 849

Date Loaded: 6/4/02
Seal No.: 00849
Drum Vent No.: ANL-176

Combustible: (check)
Noncombustible: ✓ (check)
Loaded By: DPM

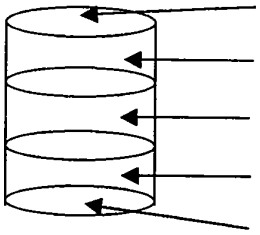
Top Waste Can No.: 324
Bottom Waste Can No.: 323
Drum packaging materials inspected by:
Total Weight of Loaded Drum: 115 lbs

Inner Pouch Vent No.: A-31-94
Outer Pouch Vent No.: A-56-94

Acceptable Smearable Levels: <20 dpm/100cm^2 alpha and 1000 dpm/100 cm^2 beta-gamma:

Inner Pouch Primary Seal (dpm/100 cm^2)	NCD	alpha	NCD	beta-gamma
Outer Pouch Secondary Seal (dpm/100 cm^2)	NCD	alpha	NCD	beta-gamma
Exterior of 30-gal Drum (dpm/900 cm^2) (large area smear)	NCD	alpha	NCD	beta-gamma

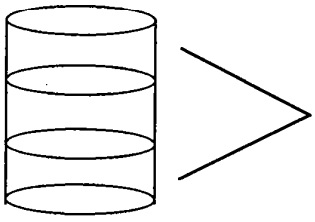
Radiation Levels from 30-gal Drum at 6 cm, R/hr, gamma:



top	~~0.785~~ 1.5
top third	4.4
middle third	4.4
bottom third	5.3
bottom	1.8

Survey meter used: RMS 3
Serial Number: 263
Last Calibration: 3/02

Radiation Levels at Various Distances from Drum:



	1 m (3 ft)	.78 m (6 ft)
Distance from Drum:		
Gamma Rad. Level (mR/hr)	600	300
Survey Meter Used:	RMS 3	RMS 3
Serial No.:	263	263
Last Calibration:	3/02	3/02

Surveyed at the AGHCF by: S Yan Location: AGHCF Date: 6.4.02

Controlled
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CCP-TP-506

Revision 5

CCP Preparation of the Remote-Handled Transuranic Waste Acceptable Knowledge Characterization Reconciliation Report

EFFECTIVE DATE: 07/10/2014

Irene Joo

PRINTED NAME

APPROVED FOR USE

RECORD OF REVISION

Revision Number	Date Approved	Description of Revision
0	04/28/2006	Initial issue.
1	05/05/2006	Revised to address Carlsbad Field Office (CBFO) Document Review Record (DRR) comments.
2	06/08/2006	Revised to reference the correct line numbers for completing the attachments.
3	08/05/2013	Revised to incorporate the Nuclear Waste Partnership (NWP) transition changes.
4	11/21/2013	Revised to include administrative control limits prompting further evaluation of the container for shipping acceptability based on Cs-137 and Co-60 curie content and contact dose rate of 100 R/hr.
5	07/10/2014	Revised to streamline the procedure and forms and to eliminate redundancies.

Controlled
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1.0 PURPOSE

Prior to shipment of remote-handled (RH) transuranic (TRU) waste, the Central Characterization Program (CCP) will reconcile the data in accordance with the requirements of DOE/WIPP-02-3214, *Remote-Handled TRU Waste Characterization Program Implementation Plan* (WCPIP). Data reconciliation is required in order for the Site Project Manager (SPM) to complete the Acceptable Knowledge (AK) Characterization Reconciliation Report (CRR).

1.1 Scope

This procedure provides the methodology for data reconciliation with the Data Quality Objectives (DQOs) provided in the WCPIP, following data validation and verification by the SPM. This reconciliation is performed at the waste stream or waste stream lot level. This procedure provides instructions for the completion of the CRR. The CRR for an RH TRU waste stream shall be submitted to the U.S. Department of Energy (DOE)/Carlsbad Field Office (CBFO) for approval prior to shipment of that RH TRU waste stream to the Waste Isolation Pilot Plant (WIPP).

2.0 REQUIREMENTS

2.1 References

Baseline Documents

- *Waste Isolation Pilot Plant Land Withdrawal Act* (Public Law 102-579)

Referenced Documents

- DOE/WIPP 02-3214, *Remote-Handled TRU Waste Characterization Program Implementation Plan*
- DOE/WIPP 94-1012, *Quality Assurance Program Document*
- CCP-QP-002, *CCP Training and Qualification Plan*
- CCP-QP-005, *CCP TRU Nonconforming Item Reporting and Control*
- CCP-QP-008, *CCP Records Management*
- CCP-TP-005, *CCP Acceptable Knowledge Documentation*

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2.2 Training Requirements

2.2.1 Personnel performing this procedure will be trained and qualified in accordance with CCP-QP-002, *CCP Training and Qualification Plan*, prior to performing this procedure.

2.3 Equipment List

2.3.1 None.

2.4 Precautions and Limitations

2.4.1 None.

2.5 Prerequisite Actions

2.5.1 Ensure the AK Summary Report for the subject waste stream of the CRR is approved.

2.6 Definitions

2.6.1 None.

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3.0 RESPONSIBILITIES

3.1 Site Project Manager (SPM)

3.1.1 Ensures that all data generated and used in decision making meet the DQOs provided in the WCPIP.

[A] Assesses whether data of sufficient type, quality, and quantity have been collected.

[B] Determines that all DQOs and Quality Assurance Objectives (QAOs) have been met.

[C] Documents DQO and QAO compliance in the CRR and provides the CRR to DOE/CBFO prior to shipment of the waste to the WIPP.

4.0 PROCEDURE

4.1 Establishing CRR Scope

SPM

NOTE

The CRR scope is an objective determination based on the size of the waste stream and the number of containers for which characterization has been completed and which are available to be included in the CRR.

4.1.1 Determine which containers will be included in the CRR.

4.1.2 Identify the data necessary to complete the CRR (e.g., AK Summary Report, Confirmatory Test Plan applicable to the waste stream, Batch Data Reports [BDRs], source documents), **AND** request any necessary documents from the CCP Records Custodian in accordance with CCP-QP-008.

SPM

NOTE

The CRR number is a unique sequential number that will identify the CRR, site, waste stream, and sequential four-digit lot number (e.g., CRR-ANLE-AERHDM-0001).

4.2 Summary of Characterization by Container Number (Attachment 1)

4.2.1 Waste Stream Lot Information

[A] Record the following waste stream lot information in the associated fields:

- CRR Number,
- Waste Stream,
- Radiological Characterization Method, and
- Acceptable Knowledge Qualification

NOTE
An Integrated Data Center (IDC) reference table will populate the Waste Matrix Code (WMC) and Waste Characterization Site.

4.2.2 Container Information

[A] Obtain the following information from IDC for each container in the waste stream lot and record it in the associated fields:

- Container ID Number,
- Radiological BDR Number,
- Nondestructive examination (NDE) BDR Number,
- TRU Alpha Activity Concentration (TAAC) reported in nanocuries per gram (nCi/g),
- Volume Activity and one-sigma (1σ) standard deviation reported in curies per liter (Ci/l), and
- Surface Dose Rates reported in rem per hour (rem/hr).

NOTE
Logic statements within the Attachment 1 will evaluate the TAAC, Volume Activity, and RH Waste Determination.

4.2.3 SPM Approval

[A] The SPM will document any additional information related to the waste stream lot or to the container(s) in the Comments section. Otherwise, the SPM will document as not applicable.

[B] When all applicable waste stream lot information and container data have been recorded completely and accurately, the SPM will approve by printing their name, signing, and dating the Attachment 1.

4.3 Remote-Handled Characterization Reconciliation Report Data Quality Objectives (DQOs) and Quality Assurance Objectives (QAOs) (Attachment 2).

4.3.1 Data Quality Objectives (DQOs)

NOTE
The AK Summary is previously submitted and is addressed in CCP-TP-005, *CCP Acceptable Knowledge Documentation.*

[A] Evaluate and document the results for each DQO by completing the DQO section of Attachment 2 by performing the following steps.

[A.1] Record Yes or NO.

[A.2] Record the AK source document or reference to the AK source document in the SOURCE DOCUMENT column for each DQO.

[A.3] If applicable, record the AK record discrepancy resolution for each DQO.

[A.4] **IF** the DQO for any category has **NOT** been met, **THEN** generate a nonconformance report (NCR) in accordance with CCP-QP-005, *CCP TRU Nonconforming Item Reporting and Control*.

4.3.2 Quality Assurance Objectives (QAOs)

[A] Verify if the QAO have been met by completing the QAO sections of Attachment 2 by performing the following steps:

NOTE
A summary of applicable QAOs is listed in Table 4.1 Summary of Applicable QAOs by Characterization Method.

NOTE
Radiochemistry QAO criteria are listed Table 4.2, 4.3, and 4.4. However, laboratories may use QC criteria specified in an approved QA program for evaluation of the radiochemistry QAOs.

NOTE
If multiple characterization methods are used, such as RTR and VE, all the applicable DQOs and QAOs for each characterization method will be evaluated and documented on the Attachment 2.

[A.1] Record YES, NO, OR NA as applicable.

[A.2] **IF** any QAO has **NOT** been met,
THEN generate a nonconformance report (NCR) in accordance with CCP-QP-005, *CCP TRU Nonconforming Item Reporting and Control*.

4.3.3 **AFTER** the QA Engineer or QA designee has approved the DESCRIPTION OF NONCONFORMANCE section of any applicable DQO or QAO NCR,
THEN print name, sign, and date Attachment 2.

Table 4.1. Summary of Applicable QAOs by Characterization Method

Characterization Method	WCPIP Section	Precision	Accuracy	Representativeness	Completeness	Comparability
Acceptable Knowledge (AK)	4.1	N/A				
Visual Examination (VE)	4.2.1					
Real-Time Radiography (RTR)	4.2.2					
Dose-to-Curie (DTC)	4.3.2	N/A				N/A
Dose Rate Measurements associated with DTC	4.3.2			N/A	N/A	N/A
Nondestructive Assay (NDA)	4.3.3					
Sampling	4.3.4.1	N/A				N/A
Sample Collection	4.3.4.2	N/A		N/A	N/A	N/A
Radiochemistry Analysis	4.3.4.3			N/A	N/A	N/A
Modeling to Confirm or Derive Radionuclide Distributions	4.3.5	N/A			N/A	N/A
Surface Dose Rate	4.3.7					N/A
Gravimetric *or* Dimensional Measurements	4.3.8			N/A		N/A
Gravimetric *and* Dimensional Measurements	4.3.8	N/A				N/A

Table 4.2. Upper Limits for %RSD vs. Number of Replicates

Number of Replicates	2	3	4	5	6	7	8	9	10	11	12	13	14	15
Max %RSD	1.8	6.6	10.0	12.3	14.0	15.2	16.2	17.1	17.7	18.3	18.8	19.3	19.7	20.0

Table 4.3. Quality Control Requirements for Radiochemistry

QC Sample	Minimum Frequency	Acceptance Criteria	Corrective Action
Laboratory control samples (LCS)	One per analytical batch	75% to 125%R	See Laboratory Control Sample[a]
Method blank	One per analytical batch	Site-specific statistical control limits	See Method Blanks[b]
Laboratory duplicate	One per analytical batch	RPD 40	See Laboratory Duplicate[c]
Matrix spike (MS)	One per analytical batch for ICP-MS, as required by the test performed	50 to 150%R	See Matrix Spike and Matrix Spike Duplicate[d]
Matrix spike duplicate (MSD)	One per analytical batch, as required by the test performed	50 to 150%R RPD 40	See Matrix Spike and Matrix Spike Duplicate[d]
Radioisotopic tracers	Every sample	Site-specific statistical control limits	See Radioisotopic Tracer[e]

[a]**Laboratory Control Sample (LCS)**: An LCS is analyzed at least once per analytical batch. If a solid matrix with established control limits is used as the LCS, the established limits may be used for the acceptance criteria. The control limits will meet the criteria in Table 4-4.

[b]**Method Blanks**: A method blank is analyzed at least once per analytical batch. It contains all reagents in proportions equal to those in the samples and is carried through the analytical procedure to identify if contamination is present. Each site establishes the acceptance criteria for method blanks; if they are expressed as statistical control limits they shall meet the requirements in Table 4-4. Criteria may be absolute values, multiples of background variation, fractions of activity concentrations observed in samples, or other appropriate units.

[c]**Laboratory Duplicates**: A laboratory duplicate is analyzed at least once per analytical batch. A laboratory duplicate is a separate aliquot from the same field sample carried through the entire analytical procedure. The RPD between duplicate results is compared with the criteria.

[d]**Matrix Spike and Matrix Spike Duplicate**: Duplicate MSs on individual field samples are performed for inductively couple plasma-mass spectrometry (ICP-MS) analysis at a minimum frequency of one pair (MS plus MSD) per analytical batch. The MSDs are preferred for any analytical procedure not using radioactive tracers. The MS and MSD results are acceptable if the criteria given above for percent recovery and RPD are met.

[e]**Radioisotopic Tracer**: Some methods require that all samples, blanks, LCSs, and laboratory duplicates be spiked with radioisotopic tracers to determine chemical recoveries, counting efficiencies, or a combination thereof. Each site establishes the acceptance criteria for method blanks; if they are expressed as statistical control limits they shall meet the requirements in Table 4-4.

Table 4.4. Statistical Control Limits

	Acceptability Range	**Required Response**
Acceptable Range	Data[b] $2\sigma^a$	No action required.
Warning Range	$2\sigma^a$ < Data $3\sigma^a$	The QC measurement shall be run no more than twice. If the rerun QC measurement results in data within $\pm$ 2σ, then the QC measurements shall be documented and work may continue. If the system does not fall within $\pm$ 2σ after two QC measurements, then the required response for the Action Range shall be followed.
Action Range	Data > $3\sigma^a$	Work shall stop and the occurrence shall be documented and appropriately dispositioned (e.g., initiating an NCR). The measurement system shall be removed from service pending successful resolution of all necessary actions, and all assays performed since the last acceptable QC measurement are suspect, pending satisfactory resolution.

[a]σ – The standard deviation is only based on the reproducibility of the data check measurements themselves. This is not TMU.

[b] – Absolute Value

4.4 Sum of Fractions Evaluation (Attachment 3)

4.4.1 On Attachment 3, *Sum of Fractions Evaluation* (Example), record the drum identification number for each drum.

4.4.2 Obtain the Cs-137 activity from a radiological characterization method.

4.4.3 **IF** Co-60 and/or Eu-154 activities are contributors,
THEN obtain their activity from a radiological characterization method, **ELSE** enter zero in the equation for these radionuclides.

4.4.4 Calculate and record on Attachment 3 the sum of the fractions (fs) for each drum.

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4.4.5 Mark as “NA” any blank boxes on Attachment 3.

4.4.6 **IF** the $f_s > 1$,
THEN perform an evaluation of the drum(s) to determine if shippable.

4.4.7 **IF** the evaluation determines the drum(s) is un-shippable,
THEN initiate an NCR.

4.5 Submittal of Records

4.5.1 SPM

[A] Ensure all attachments are complete and accurate. Ensure Attachment 1, Summary of Characterization by Container Number, has printed name, is signed, and dated.

[B] Compile Attachments 1, 2, and 3 and submit to CCP Records in accordance with CCP-QP-008.

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5.0 RECORDS

5.1 Records generated during the performance of this procedure are maintained as quality assurance (QA) records in accordance with CCP-QP-008. The records are the following:

5.1.1 QA/Lifetime

[A] CRR:

[A.1] Attachment 1, Summary of Characterization by Container Number.

[A.2] Attachment 2, Remote-Handled Characterization Reconciliation Report Data Quality Objectives (DQOs) and Quality Assurance Objectives (QAOs).

[A.3] Attachment 3, Sum of Fractions Evaluation.

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Attachment 1 – Summary of Characterization by Container Number EXAMPLE

CRR Number:
Waste Stream:
Summary Category Group (SCG):
Waste Matrix Code (WMC):
Waste Characterization Site:

Radiological Characterization Method:
(e.g. AK, DTC, DA, NDA, D&G)
Acceptable Knowledge Qualification:
(e.g. Peer Review, Corroborating data, Confirmatory testing, as applicable)

			TRU Alpha Activity Concentration (TAAC)		Volume Acitivity (Ci/L)			RH Waste Determination: Surface Dose (SD) Rate Measurements	
Container ID Number	Radiological BDR Number	NDE BDR Number	TAAC (nCi/g)	TAAC (≥ 100 nCi/g)	Value	1σ Unc.	Evaluation (≤ 23 Ci/L)	SD Rate (rem / hr)	SD rate >200 mrem/hr and ≤ 1,000 rem/hr

Comments:

Example

SPM Name (*print*) SPM Signature (*sign*) Date

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Attachment 2 – Remote-Handled Characterization Reconciliation Report Data Quality Objectives (DQOs) and Quality Assurance Objectives (QAOs) EXAMPLE

EXAMPLE

CRR Number: CRR-ID-ANLE-S5000-0039
Waste Stream: ID-ANLE-S5000
Site: INL

Data Quality Objectives (DQOs)	Yes	No	N/A	Source Document(s) (List BDRs, reports, AK documents, etc.)
Defense Waste, High Level, and Spent Nuclear Fuel Determination - WCPIP Section				
Was the waste generated by, or comingled with, atomic energy defense activities? Is the waste verified not to be high-level waste or spent nuclear fuel?	X			CCP-AK-INL-500, Rev. 11, Sections 4.1.4 and 5.4.5 & Source Documents C001, C036, C125, C381, C1031, U001, U013, U1003, P001, P002 and P025
TRU Waste Determination - WCPIP Section 2.1.2.1				
Does the waste contain more than 100 nCi of TRU isotopes per gram of waste?	X			INLRHDTC13010 Waste container Dose-to-Curie conversion record sheets
RH Waste Determination - WCPIP Section 2.1.2.2				
Is the surface dose rate equal to or greater than 200 mrem/hr and less than 1000 rem/hr?	X			Radiological survey report provided by INL
Activity Determination - WCPIP Section 2.1.2.3				
Is the volume activity of the container less than 23 Ci/L per canister? (SPM evaluation is on container basis)	X			INLRHDTC13010 Waste container Dose-to-Curie conversion record sheets
Liquids - WCPIP Section 2.1.3.1				
Is the amount of liquids in the container less than one percent by volume?	X			INLRHRTR13009 RTR examination data sheets
Physical Form - WCPIP Section 2.1.3.2				
Does the physical form of the waste accurately delineate the waste stream?	X			INLRHRTR13009 RTR examination data sheets

Quality Assurance Objectives (QAOs)	Yes	No	N/A
Acceptable Knowledge (AK) - WCPIP Section 4.1			
Precision - Not applicable QAO for this method			X
Accuracy - AK accuracy assesses the percentage of waste containers that require reassignment to a new Summary Category Group or new waste stream based on the reevaluation of AK or on obtaining testing, sampling and/or analysis data. Is the percentage of waste containers that confirm the physical and radiological properties greater than or equal to 90%?	X		
Representativeness - Does the process of obtaining, evaluating, and documenting the AK information ensure it was performed in accordance with the minimum standards established in AK procedure CCP-TP-005?	X		
Completeness - Does the AK record contain 100% of the information required for each container in the waste stream? (Usability of the AK information will be assessed for completeness during audits.)	X		
Comparability – Was the AK compiled in compliance with AK procedure(s) and associated training requirements?	X		

Attachment 2 –Remote-Handled Characterization Reconciliation Report Data Quality Objectives (DQOs) and Quality Assurance Objectives (QAOs) EXAMPLE, (Continued)

Physical Characterization Methods

Quality Assurance Objectives (QAOs)	Yes	No	N/A
Visual Examination (VE) - WCPIP Section 4.2.1			
Was VE used in the physical characterization?		X	
Precision - Were discrepancies, if any, regarding important waste characteristics (i.e., physical form of the waste and absence of prohibited liquids) within a single container reconciled between two operators?			X
Accuracy - Have VE operators passed a comprehensive examination with a score of 80% and demonstrated satisfactory performance in the presence of the VE expert during initial qualification and requalification?			X
Representativeness – Are the waste contents placed in the waste containers described on the data forms?			X
Completeness – Has the relevant waste information been collected and documented?			X
Comparability – Was the VE information compiled in compliance with VE procedure(s) and associated training requirements?			X

Real-Time Radiography (RTR) - WCPIP Section 4.2.2			
Was RTR used in the physical characterization?	X		
Precision - Were discrepancies, if any, regarding important waste characteristics (i.e., physical form of the waste and absence of prohibited liquids) within a single container reconciled between two operators (during independent observations and replicate scans)?	X		
Accuracy – Was a target used to tune the image for maximum sharpness and were operators required to identify prohibited liquid in a training container during qualification and requalification?	X		
Representativeness – Were all the relevant waste contents in each container described?	X		
Completeness – Was relevant waste information assembled to show that each of the containers in the waste stream belongs to the waste stream? This information must be documented on videotape or other equivalent media and data form.	X		
Comparability – Was the RTR information compiled in compliance with RTR procedure(s) and associated training requirements?	X		

EXAMPLE

Attachment 2 –Remote-Handled Characterization Reconciliation Report Data Quality Objectives (DQOs) and Quality Assurance Objectives (QAOs) EXAMPLE, (Continued)

Radiological Characterization Methods

Quality Assurance Objectives (QAOs)	Yes	No	N/A
Dose-to-Curie (DTC) - WCPIP Section 4.3.2			
Was DTC used for radiological characterization?	X		
Precision - Not applicable QAO for this method			X
Accuracy – Were standardized and benchmarked radiation transport computer codes used?	X		
Representativeness – Was an appropriate model of the actual physical drum dose rate configuration used and documented by an independent review of the DTC correlation?	X		
Completeness – Were calculations used that span the full range of important parameter values (such as density) which are expected to be encountered with the actual RH TRU containers?	X		
Comparability - Not applicable QAO for this method			X
Dose Rate Measurements associated with DTC - WCPIP Section 4.3.2			
Precision – Was the reported relative percent difference (RPD) less than or equal to 40%?	X		
Accuracy – Has a calibration for the dose-rate instrument used been established, maintained, and documented within the recommendations of the manufacturer?	X		
Representativeness - Not applicable QAO for this method			X
Completeness - Not applicable QAO for this method			X
Comparability - Not applicable QAO for this method			X

Nondestructive Assay (NDA) - WCPIP Section 4.3.3			
Was NDA used for radiological characterization?		X	
Precision – Does the reported %RSD comply with CCP-TP-506, Table 4.2?			X
Accuracy – Is the reported %R less than or equal to ± 30% on non-interfering matrix?			X
Representativeness – Has each waste container been assayed?			X
Completeness – Is 100% of the NDA data valid and usable?			X
Comparability – Was the NDA process implemented in accordance to NDA standards and were associated training requirements met?			X

EXAMPLE

Attachment 2 –Remote-Handled Characterization Reconciliation Report Data Quality Objectives (DQOs) and Quality Assurance Objectives (QAOs) EXAMPLE, (Continued)

Radiological Characterization Methods, continued

Quality Assurance Objectives (QAOs)	Yes	No	N/A
Sampling - WCPIP Section 4.3.4.1			
Was sampling used for radiological characterization?		X	
Precision - Not applicable QAO for this method			X
Accuracy – Was an appropriate sample design developed and approved by CBFO for collecting an adequate number of samples such that the one-sigma uncertainty in the mean value of the sample-generated scaling factor is within a factor of two?			X
Representativeness – Was representativeness described in the associated sampling plan?			X
Completeness – Was the QAO for a minimum set of radionuclides specified in the sampling plan?			X
Comparability - Not applicable QAO for this method			X
Sample Collection - WCPIP Section 4.3.4.2			
Accuracy – Was sampling equipment verified as clean by the use of standard radiological control survey methods?			X
Radiochemistry Analysis - WCPIP Section 4.3.4.3			
Precision – Was the RPD less than or equal to 40% or laboratory acceptable precision criteria?			X
Accuracy – Was the reported %R LCS within ±25%; Was the reported MS ±50%?			X
Representativeness - Not applicable QAO for this method			X
Completeness -Not applicable QAO for this method			X
Comparability: Not applicable QAO for this method			X
Modeling to Confirm or Derive Radionuclide Distributions - WCPIP Section 4.3.5			
Was modeling used for radiological characterization?	X		
Precision - Not applicable QAO for this method			X
Accuracy – Do the modeling results compare to sample results within a factor of two?	X		
Representativeness – Was the composition and burnup information for a minimum of 50% of the radioactive materials identified in the AK record involved in the generation of the waste included in the modeling?	X		
Completeness - Not applicable QAO for this method			X
Comparability - Not applicable QAO for this method			X

EXAMPLE

Attachment 2 –Remote-Handled Characterization Reconciliation Report Data Quality Objectives (DQOs) and Quality Assurance Objectives (QAOs) EXAMPLE, (Continued)

Radiological Characterization Methods, continued

Quality Assurance Objectives (QAOs)	Yes	No	N/A
Surface Dose Rate - WCPIP Section 4.3.7			
Were surface dose rates used for radiological characterization?	X		
Precision – Was the reported RPD equal or less than 40%?	X		
Accuracy - Manufacturer typically specifies a flat energy response of 10 to 20% across the applicable energy range. Was the repeatability of the measurement within about 10% at the higher gamma dose rates?	X		
Representativeness – Was the measurement is applied to the entire waste container?	X		
Completeness – Were 100% of the measurements, needed to determine surface dose rate, performed and useable?	X		
Comparability - Not applicable QAO for this method			X
Gravimetric *or* Dimensional Measurements - WCPIP Section 4.3.8			
Was Gravimetric or Dimensional measurement used?		X	
Precision – Was the measurement equipment maintained according to manufacturer's recommendation?			X
Accuracy – Was the balance readout within 2% of the check weight. Was the length measurement within 0.1 of an inch as verified by a second operator?			X
Representativeness - Not applicable QAO for this method			X
Completeness – Was every quantity of fuel test specimen loaded into container is measured?			X
Comparability - Not applicable QAO for this method			X
Gravimetric *and* Dimensional Method - WCPIP Section 4.3.8			
Was Gravimetric and Dimensional method used?		X	
Precision - Not applicable QAO for this method			X
Accuracy - Fuel test specimen design and irradiated information is used for individual fuel test specimen pins in combination of the length and gravimetric measurement. Were scaling factors developed from isotope depletion			X
Representativeness – Is the design information representative for each specific fuel test specimen quantity loaded into container?			X
Completeness – Was every quantity of fuel test specimen loaded into container is measured?			X
Comparability - Not applicable QAO for this method			X

EXAMPLE

Attachment 3 – Sum of Fractions Evaluation (EXAMPLE)

Drum Identification Number	f_s value

EXAMPLE

$$fs = \frac{A_{Cs}}{288} + \frac{A_{Eu}}{3.52} + \frac{A_{Co}}{4.26}$$

Where fs is the sum fractions, A_{Cs} is the Cs-137 activity in the drum, A_{Eu} is the Eu-154 activity, and A_{Co} is the Co-60 activity.

If $fs < 1$ then the drum is shippable. If $fs > 1$ then the drum needs further evaluation to determine if it is shippable.

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CCP-TP-507

Revision 8

CCP
Shipping of
Remote-Handled
Transuranic Waste

EFFECTIVE DATE: 06/27/2013

Irene Joo

PRINTED NAME

APPROVED FOR USE

RECORD OF REVISION

Revision Number	Date Approved	Description of Revision
0	11/14/2006	Initial issue.
1	05/03/2007	Revised to include 40 CFR part 761, Polychlorinated Biphenyls (PCBs) Manufacturing, Processing, Distribution in commerce, and use prohibitions: Marking of PCB's and PCB Items § 761.40 and 40 CFR 761.40, Marking as references.
2	12/04/2007	Revised to incorporate CNS 10-160B requirements and to implement new Waste Isolation Pilot Plant (WIPP) Waste Acceptance Criteria (WAC) requirements.
3	12/12/2007	Minor editorial change to correct error in section cross references.
4	09/02/2009	Revised to incorporate corrective actions from Waste Isolation Pilot Plant (WIPP) Form 09-120 (Controlled Shipment Notifications), Corrective Action Report (CAR)-RHLANL-0001-09, Land Disposal Restrictions (LDR) Form code updates, and peer verifications steps.
5	12/11/09	Revised to incorporate Waste Data System (WDS) operations, remove 10-160B steps, and various editorial changes.
6	04/20/2010	Alignment of the procedure with modifications made to the Waste Data Systems (WDS), and editorial corrections.
7	12/29/2010	Minor revision to update references to the *Waste Isolation Pilot Plant Hazardous Waste Facility Permit*.
8	06/27/2013	Revised to incorporate the Nuclear Waste Partnership (NWP) transition changes.

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1.0 PURPOSE

This procedure establishes requirements for certifying and assembling Transuranic (TRU) waste payloads and performance of shipments in the Remote-Handled (RH) TRU 72-B shipping container and ensures that the requirements of CCP-PO-505, *CCP Remote-Handled Transuranic Authorized Methods for Payload Control (CCP RH-TRAMPAC),* are met.

1.1 Scope

This procedure applies to the personnel who conduct the following transportation functions:

- The Waste Data System (WDS) data entry for transportation certification of RH TRU waste in the RH TRU 72-B.
- RH TRU 72-B payload canister verification.
- Verification of the assembled payload to be loaded into the RH TRU 72-B shipping cask.
- Preparing and certifying shipping paper, marking, labeling, and placarding associated with each shipment of RH TRU waste transported in the RH TRU 72-B shipping cask by the Central Characterization Program (CCP).
- Radiological Control Technician (RCT) or equivalent position functions associated with RH TRU 72-B packaging and transportation operations.

2.0 REQUIREMENTS

2.1 References

Baseline Documents

- CCP-PO-002, *CCP Transuranic Waste Certification Plan*
- CCP-TP-530*, CCP RH TRU Waste Certification and WWIS/WDS Data Entry*
- DOE/WIPP 90-045*, Remote-Handled Transuranic Waste Content Codes, RH TRUCON*
- DOE/WIPP 02-3122, *Transuranic Waste Acceptance Criteria for the Waste Isolation Pilot Plant*

- DOE/WIPP 02-3283, *RH Packaging Program Guidance*
- DOE/WIPP 02-3285, *RH Packaging Maintenance Manual*
- 40 CFR Part 761, *Polychlorinated Biphenyls (PCBs) Manufacturing, Processing, Distibution in commerce, and use prohibitions: Marking of PCB's and PCB Items* § 761.40
- 49 CFR, *Transportation,* Part 172, *Hazardous Materials Table, Special Provisions, Hazardous Materials Communications, Emergency Response Information, Training Requirements, and Security Plans* § 172.200, *Applicability*
- 49 CFR Part 173, *Shippers—General Requirements for Shipments and Packagings,* Subpart I, *Class 7 Radioactive Materials* § 173.401 through 173.476
- *Safety Analysis Report for the RH-TRU 72B Waste Shipping Package* (SARP) (Docket 9212, Washington, D.C., U.S. Nuclear Regulatory Commission [NRC], 2002)

Referenced Documents

- 40 CFR 262, Subpart B*, The Manifest,* and Subpart C*, Pre-Transport Requirements.*
- 40 CFR 262.31*, Labeling*
- 40 CFR 262.32*, Marking*
- 40 CFR 761.40, *Marking requirements*
- 40 CFR 268*,* Subpart A*, Land Disposal Restrictions*
- 49 CFR 172.200 through 172.205 *(Subpart C, Shipping Papers)*
- 49 CFR 172.300 through 172.338 *(Subpart D, Marking)*
- 49 CFR 172.400 through 172.450 *(Subpart E, Labeling)*
- 49 CFR 172.500 through 172.560 *(Subpart F, Placarding)*
- CCP-PO-505*, CCP Remote-Handled Transuranic Waste Authorized Methods for Payload Control (CCP RH-TRAMPAC)*
- CCP-QP-002*, CCP Training and Qualification Plan*

- CCP-QP-005, *CCP TRU Nonconforming Item Reporting and Control*
- CCP-QP-008*, CCP Records Management*
- DOE/WIPP 02-3284*, RH Packaging Operations Manual*
- *TRANSCOM 2000 Designated User Handbook*
- DOE/WIPP-09-3427, *Waste Data System User's Manual*
- *Waste Isolation Pilot Plant Hazardous Waste Facility Permit*, Attachments C-C6, *Waste Analysis Plan*

2.2 Training Requirements

2.2.1 CCP personnel performing this procedure will be trained and qualified in accordance with CCP-QP-002, *CCP Training and Qualification Plan,* prior to performing this procedure.

2.3 Equipment List

2.3.1 None.

2.4 Precautions and Limitations

2.4.1 Nonconformances related to defects or failure to comply with requirements applicable to Nuclear Regulatory Commission (NRC)-licensed packaging (e.g., RH TRU 72-B cask) shall be reported to the Carlsbad Field Office (CBFO) Office of the National TRU Program. The Waste Isolation Pilot Plant (WIPP) maintenance and operating (M&O) contractor will evaluate issues and nonconformances for reporting to the NRC under 10 CFR Part 21 or Part 71 and provide the results of this evaluation to CBFO.

[A] CCP personnel writing nonconformance reports (NCRs) identified as Transportation-related will provide a copy of these NCRs to the NWP Manager of Transportation in accordance with CCP-QP-005, *CCP TRU Nonconforming Item Reporting and Control*.

2.4.2 Filter vents, as specified in Section 2.4 of the CCP RH-TRAMPAC must be installed in payload containers and canisters (as applicable).

2.4.3 Radiation Dose Rates and Removable Surface Contamination

[A] The external radiation dose rate of a loaded RH TRU 72-B shipping cask to be shipped, shall be less than or equal to 200 millirem per hour (mrem/hr) at the surface, and less than or equal to 10 mrem/hr at two meters for beta/gamma and neutron.

[B] Removable surface contamination of individual payload canisters and a loaded RH TRU 72-B shipping cask to be shipped to WIPP shall **NOT** be greater than 20 disintegrations per minute (dpm)/100 centimeters square (cm^2) for alpha emitting radionuclides and 200 dpm/100 cm^2 for beta/gamma emitting radionuclides.

2.4.4 Controlled Shipments

NOTE

Receipt sites may use CBFO-approved site-specific Controlled Shipment Receipt Forms in place of Attachment 6, CCP Control Checklist for Receipt of RH Controlled Shipments, provided that the same information is recorded and a completed copy is returned to the applicable Transportation Certification Official (TCO).

[A] CCP RH Controlled Shipments, (Attachment 5, CCP Control Checklist for RH Controlled Shipments, and Attachment 6), will be used to control and document loading and shipping times.

2.5 Prerequisite Actions

2.5.1 Ensure that workers who will be working in a radiation area have read the applicable Radiation Work Permit (RWP) or equivalent site-specific document.

2.6 Definitions

2.6.1 **Generator** - The organization/individual that generated the waste and/or are offering the waste for transport.

2.6.2 **Land Disposal Restrictions (LDR) Notification** - Notification to a receiving facility that the waste is subject to LDR (from 40 *Code of Federal Regulations* [CFR] 268, Subpart A, *Land Disposal Restrictions*).

2.6.3 **Shipper** - Authorized personnel who declare by signing the shipping paper that the contents of the package are fully and accurately described, packaged, labeled/placarded, and proper for conditions of transport per appropriate regulations.

2.6.4 **Shipping Paper** – Uniform Hazardous Waste Manifest (UHWM) or Straight Bill of Lading-Short Form. The shipping paper accompanies the waste during transportation.

2.6.5 **Straight Bill of Lading-Short Form** - Shipping paper used to transport non-mixed radioactive TRU waste.

2.6.6 **Uniform Hazardous Waste Manifest (UHWM)** - The U.S. Environmental Protection Agency (EPA) form 8700-22 prepared by a generator who transports, or offers for transportation, hazardous waste for off-site treatment, storage, or disposal (from 40 CFR 262, Subpart B, *The Manifest*.)

2.6.7 **Payload Canister/Container** – A fixed lid or removable lid canister (RLC) that contains waste drums or direct loaded waste that is used to ship waste in the RH TRU 72-B or a 55-gallon drum that is used to ship waste in the CNS 10-160B. These packages have Type A certifications.

2.6.8 **RH TRU 72-B Cask** – The cask used to ship the payload canister to the WIPP or other remote sites. This package has Type B certifications.

2.6.9 **Controlled Shipment** – Shipments that are controlled to a 10 day shipping period in accordance with conditions specified in Appendix 2.4 of the *RH-TRU Payload Appendices* and Section 6.2.3 of the CCP *RH-TRAMPAC*.

NOTE

More detailed, specific interface responsibilities between CCP and the Host site are contained in site-specific interface documents, Statements of Work, etc.

3.0 RESPONSIBILITIES

3.1 CCP Transportation Certification Official (TCO)

3.1.1 Interfaces and coordinates with the generator, shipper, Site Project Manager (SPM), Waste Certification Official (WCO), and CCP Operations Leaders to plan payloads and shipments.

3.1.2 Documents and certifies that containers prepared for shipments in RH packaging meet specified shipping criteria using the Payload Transportation Certification Document (PTCD), and the WDS, as appropriate.

3.1.3 Reviews payload certification documentation to ensure compliance with applicable governing documents (associated Safety Analysis Reports, Certificates of Compliance, WIPP WAC, TRAMPAC's etc.).

3.1.4 Requests and obtains approval/authority from the WIPP to effect WIPP shipments.

NOTE

TRU waste shipping documentation includes a number of data sheets required by DOE/WIPP 02-3284, *RH Packaging Operations Manual*. CCP treats these data sheets as Quality Assurance (QA) nonpermanent records, and they form part of the overall Transportation and Shipping Packages for TRU waste. However, because the format and content of these data sheets are controlled by DOE/WIPP 02-3284, they are not included as attachments to this procedure.

3.1.5 Provides the necessary TRU waste shipping data to the Host site Shipping Coordinator.

3.1.6 Ensures all manifests and shipping papers are correct, as required.

3.1.7 Ensures all labeling, marking, and placarding is correct, as required.

3.2 Radiological Control Technician (RCT) or Equivalent Position

3.2.1 Provides contamination and radiation surveys to the TCO for shipment certification purposes.

3.3 CCP RH Packaging and Transportation Team

3.3.1 Ensures the payload canister and the RH TRU 72-B shipping cask are prepared in accordance with the associated approved procedures.

3.3.2 Ensures visible canister/container ID labels, within a payload assembly, are an exact match to the ID numbers listed on the applicable PTCD.

3.4 Host Site Shipping Coordinator

3.4.1 Interfaces with TCO and acts as the Host site point-of-contact (POC) for operations, manifesting, and release of shipments.

3.4.2 Assists TCO in scheduling and facilitating TRU waste shipments.

3.4.3 Provides data received from TCO to the Host site transportation and material control/accountability groups (as applicable).

4.0 PROCEDURE

NOTE
The WDS utilizes edit and limit checks when data is entered and selected. The WDS steps in Section 4.1 may be repeated until payloads and shipping compliance is satisfied.

NOTE
Steps in this procedure may be performed in parallel as applicable.

NOTE
Steps in this procedure are performed by the TCO, unless another group/discipline is mentioned in the step or a note preceding the step.

NOTE
Trained and qualified TCO's perform the WDS operation per the guidance found in DOE/WIPP-09-3427, *Waste Data System User's Manual*. The WDS manual is **NOT** required to be opened when performing the task listed below, but shall be available for reference if questions arise.

NOTE
Contact Information of organizations called out in this procedure are listed as follows. Specific email addresses can be obtained by contacting the numbers below:

WIPP Shipment Scheduler 575-234-8993 or 575-234-8230
WIPP Transportation group 575-234-8993 or 575-234-8230
WIPP RCT group 575-234-8657
WIPP Central Monitoring Room (CMR) 575-234-8863 or 575-234-8640

FAX notifications can be made in lieu of emails if needed. FAX numbers can be obtained by contacting the specific group.

4.1 WDS Data Entry/RH Shipment Certification

4.1.1 Creating Payloads Using the WDS

[A] Select the new button to create/generate a Payload Plan ID

[B] For each payload enter the following information into the WDS:

- Payload Number
- Payload Container Type
- Current Location (Site ID)

- Destination Site (Site ID)
- Shipping Program (Site ID)

[C] Select canister until a CCP-PO-505 compliant payload is obtained.

[D] **ONCE** the virtual CCP-PO-505 compliant payload is built, **THEN** select the accept button.

[E] Select the submit button.

[F] Generate PTCD.

NOTE
Canisters designated for Controlled Shipment must be marked accordingly on PTCD. Attachment 5 will be initiated for the applicable RH TRU 72-B.

[G] Print report.

NOTE
The PTCD is signed after the RH TRU 72-B is loaded so that the final information is entered into the WDS.

[H] Review PTCD report, **AND** confirm that all payload certification parameters have been met.

4.1.2 Creating Shipments Using the WDS

[A] Enter the following information into the WDS:

- Shipment Number (From WIPP 8-week Rolling Schedule)
- Shipping Program (Site ID)
- Current Location (Site ID)
- Destination Site (Site ID)

[B] Select payload until a CCP-PO-505 compliant shipment is obtained.

NOTE
Once the submit button is selected, the confirmation process for the shipment is activated.

[C] **ONCE** the virtual CCP-PO-505 compliant shipment is built, **THEN** select save **AND** the submit button.

NOTE
Transporter, Tractor, Trailer, and CH Package numbers are obtained from the WIPP Equipment Assignment email, generated by the WIPP Transportation Group. Default values contained in the WDS system are used for Handling Material Weights and Uncertainty. Handling Material weights uncertainty is left blank in the WDS system.

[D] **WHEN** the following becomes available, **THEN** enter the information into the WDS:

- Transporter Name
- Tractor Number
- Trailer Number
- RH Package Number(s)
- Handling Material Weights

[E] For controlled shipments, email the WIPP Shipment Scheduler of impending shipment.

4.1.3 Finalizing Shipments Using the WDS

[A] Enter the following information into the WDS:

- Manifest Number
- Outer Containment (OC) Lid Number (from DOE/WIPP 02-3284, Attachment 2, Packaging Loading Data Sheet)
- Inner Vessel (IV) closure date and time (from DOE/WIPP 02-3284, Attachment 2, Packaging Loading Data Sheet)
- Dose Rate Surface (mrem/hr) from Radiological Survey Report
- Dose Rate 1-meter (mrem/hr) from Radiological Survey Report

- Dose Rate 2-meter (mrem/hr) from Radiological Survey Report
- Alpha contamination survey results in dpm from Radiological Survey Report
- Beta/gamma contamination survey results in dpm from Radiological Survey Report
- U.S. Department of Transportation (DOT) Description from Bill of Lading or UHWM.
- RQ or HRCQ flag(s) (as applicable) from Bill of Lading or UHWM.

[B] Select SAVE.

[C] Print final PTCD.

[D] Review PTCD, **AND** sign report if all parameters are in compliance with CCP-PO-505.

[E] Enter the send date and time in WDS.

[F] Select the Finalize Button to complete the WDS process.

4.2 Shipping Preparations

NOTE
Email notifications may be performed by Host site Shipping Coordinator.

4.2.1 Transmit the draft PTCDs (if applicable), WDS Shipment Summary Report, and WDS Shipment Data report to the Host site Shipping Coordinator for preparation of shipping papers.

4.2.2 Host site Transportation Personnel, develop shipping papers.

4.2.3 Host site Shipping Coordinator, provide TCO with draft copy of shipping paper and RadCalc work sheets (or equivalent).

4.2.4 Review the shipping documentation (Bill of Lading or UHWM) in accordance with 49 CFR Part 172, Subpart C, *Shipping Papers*.

NOTE

Completion of an LDR is necessary only for each initial shipment of a mixed waste stream. The LDR is completed in accordance with 40 CFR Part 268.

4.2.5 Complete Attachment 3, Land Disposal Restriction Exemption Notification.

4.2.6 Print name, sign, date, and initial Attachment 3.

4.2.7 Provide copy of Attachment 3 to Host site Shipping Coordinator.

4.2.8 Host site Shipping Coordinator, attach copy of Attachment 3 to the shipping papers.

4.2.9 As soon as available, prior to releasing the shipment, email a copy of the Draft Manifest and LDR (if applicable), to the WIPP Transportation Group.

NOTE

If the Transportation Tracking and Communications (TRANSCOM) system is out of service, secondary shipment protocol is followed as directed by the WIPP Transportation group. Step 4.2.10 can be omitted.

4.2.10 Prior to releasing the shipment to the carrier, prepare the TRANSCOM system by entering a Draft Bill of Lading or UHWM in TRANSCOM per the guidance found in the TRANSCOM 2000 Designated User Handbook.

4.2.11 Email Draft Bill of Lading or UHWM to TRANSCOM. TRANSCOM email transcom@transcom.energy.gov.

4.2.12 Host site Shipping Coordinator, notify the applicable State Motor Vehicle Department (SMVD) at least 24-hours prior to releasing a shipment.

[A] Request the performance of a Commercial Vehicle Safety Alliance (CVSA) inspection at the Host site of the trailer, tractor, and loaded RH Packaging Containers.

4.3 Inspections and Loading Operations

4.3.1 Verify that payload canisters or containers are DOT Type 7A or equivalent by reviewing the procurement record, specific certification report, or actual canister markings.

NOTE

Evidence of specific filter information is listed on the applicable site Canister Loading Record.

NOTE

Canister Integrity inspections, Marking/Labeling and/or Filter verification, may be performed by reviewing remote camera inspections or by reviewing recent recorded video.

4.3.2 Verify filter vents, as specified in Section 2.4 of the CCP RH-TRAMPAC, are installed in payload containers.

4.3.3 Perform Integrity Inspection on the payload canister identified for shipment per Attachment 4, CCP RH Canister Integrity Checklist.

4.3.4 Print name, sign, and date Attachment 4.

NOTE

Each canister shall be labeled with a unique payload canister identification (ID) number that includes a site identifier as a prefix. The characters composing the canister ID number shall be approximately 2 inches high and of a color contrasting with their background. Canister ID numbers shall be placed at approximately equal intervals around the circumference of the canister and within 18-inches of the top of the canister.

NOTE

Variances from the marking and labeling requirements listed in step 4.3.5, require CBFO approval. CCP will develop and transmit a formal letter requesting the variance to CBFO. CBFO will respond in writing of approval on specific deviation from these requirements.

4.3.5 Ensure the following Marking and Labeling is clearly legible on the payload canister:

[A] Minimum of three canister ID number labels spaced equally around canister

[B] Minimum of one “Caution Radioactive Material" label

[C] Minimum of one, when applicable, “Hazardous Waste” label

[D] Minimum of one, when applicable, PCB label

4.3.6 Ensure that each payload canister is checked to see that there are NO HOLD TAGS attached.

[A] **IF** a HOLD TAG is found,
THEN determine the disposition to ensure that the canister is acceptable for shipment.

4.3.7 Host site RCT or equivalent position, provide Canister Contamination Survey Report to the TCO.

4.3.8 Host site RCT or equivalent position, provide a Dose Rate Survey Report of the payload canister to the TCO (dose rate readings: on contact, including Neutron contribution).

NOTE

Host site personnel will provide payload canister/containers to loading area under the direction of the TCO.

4.3.9 Perform the following:

[A] Verify from the applicable PTCD that the selected payload canister is correct for the designated RH TRU 72-B to be loaded.

[B] Verify that all of the visible container ID labels are an exact match to the ID numbers listed on the PTCD.

[C] **IF** not already performed,
THEN provide PTCD CCP RH Packaging and Transportation Team.

4.3.10 CCP RH Packaging and Transportation Team, perform the following:

[A] Verify from the applicable PTCD that the selected canister is correct for the designated RH TRU 72-B to be loaded.

[B] Verify that all of the visible container ID labels are an exact match to the ID numbers listed on the PTCD.

[C] Load the payload canister/containers into the RH TRU 72-B in accordance with DOE/WIPP-02-3284.

[D] Provide TCO with completed loading documentation.

4.3.11 Host site RCT or equivalent position, provide the dose rate and contamination surveys of the RH TRU 72-B exterior to the TCO (dose rate readings: on contact, 1-meter, and 2-meter, including Neutron contribution).

4.3.12 Review the Radiological Survey Report of the loaded RH TRU 72-B, **AND** verify that the survey data meets applicable radiation/contamination requirements in step 2.4.3.

4.3.13 Controlled Shipment Processing

[A] **IF** Controlled Shipment Payload,
THEN record applicable dates and times of IV lid installation on Attachment 5, **AND** ensure 24-hour Loading Time will not be exceeded.

[B] **IF** total loading time is calculated to be $\geq$ 24-hours,
THEN vent the package, **AND** repeat the lid installation process.

[C] Provide a copy of completed Attachment 5, to the Host Site Shipping Coordinator.

4.4 Shipping Completion

4.4.1 Host site Transportation personnel, perform marking, labeling, and placarding (if applicable) of the RH Package and Transport Trailer.

4.4.2 Ensure correct marking, labeling, and placarding (if applicable) per the following:

[A] Marking of RH Packaging Container shipments of RH TRU waste is conducted in accordance with 49 CFR Part 172, Subpart D, *Marking*, § 172.300 through 172.338; 40 CFR Part 262, Subpart C, § 262.32, *Marking*; and 40 CFR 761.40, Subpart C, *Marking of PCBs and PCB Items*.

[B] Labeling of RH Packaging Container shipments of RH TRU waste is conducted in accordance with 49 CFR Part 172,Subpart E, *Labeling*, § 172.400 through 172.450; and 40 CFR Part 262, Subpart C, § 262.31, *Labeling*.

[C] Placarding of RH Packaging Container transport vehicles of RH TRU waste is conducted in accordance with 49 CFR Part 172, Subpart F, *Placarding*, § 172.500 through 172.560; and 40 CFR Part 262, Subpart C, § 262.33, *Placarding.*

4.4.3 Trucking company, attach tractor and trailer.

4.4.4 Host site Transportation personnel, sign the shipping documentation (Bill of Lading or UHWM) in accordance with 49 CFR Subpart C.

4.4.5 Host site Transportation personnel, provide carrier with appropriate shipping documentation package, including LDR (if applicable), and controlled shipment package Attachment 5 (if applicable).

4.4.6 SMVD, perform CVSA inspection of the tractor, trailer, and RH package.

4.4.7 Host site Transportation personnel, provide TCO with a signed copy of the shipping documentation (Bill of Lading or UHWM).

4.4.8 Ensure Shipment Radiological Information is emailed to WIPP RCT group.

4.4.9 **IF** the shipment contains a Controlled Shipment Package, **THEN** ensure Attachment 5, is emailed to WIPP Transportation.

4.4.10 Ensure the PTCD is signed to certify that the payload in the RH Packaging Container meets the requirements of CCP-PO-505.

4.4.11 TCO **OR** Host Site Shipping Coordinator, contact WIPP Central Monitoring Room **AND** request to release shipment.

4.4.12 **ONCE** approval is granted, **THEN** TCO or Host Site Shipping Coordinator, release shipment.

4.4.13 Change WDS status to “In Transit.”

4.5 Shipment Receipt

NOTE

Receipt sites may use CBFO-approved site-specific Controlled Shipment forms in place of CCP-TP-507, Attachment 6, provided that the same information is recorded **AND** a completed copy is returned to the applicable TCO.

4.5.1 **IF** the shipment contains a Controlled Shipment Package, **THEN** request the Receipt Site to fax/email the completed Attachment 6, or a site equivalent form, once the payloads are unloaded.

4.5.2 **ONCE** the shipment status in WDS is “Shipment Received,” **THEN** send a fax/email to the Host site Shipping Coordinator, stating shipment received with the date of receipt.

4.5.3 **ONCE** the shipping data entry is complete, **THEN** compile and submit items listed in Section 5.1.1, to CCP Records.

5.0 RECORDS

5.1 Records generated during the performance of this procedure are maintained as QA records in accordance with CCP-QP-008, *CCP Records Management.* The records are the following:

NOTE

Records generated by DOE/WIPP 02-3284 (see Section 3.1.4) as applicable, are included in the Shipping Documentation Package.

QA/Nonpermanent

5.1.1 Shipping Documentation Package:

- PTCD Spreadsheet(s), as applicable
- WDS Shipment Summary Report
- Copy of Attachment 1 - Uniform Hazardous Waste Manifest (mixed waste only), if applicable
- Copy of Attachment 2 - Straight Bill of Lading - Short Form (non-mixed waste only), if applicable
- Attachment 3 - Land Disposal Restriction Exemption Notification (initial shipment of a waste stream only)
- Attachment 4 - CCP RH Canister Integrity Checklist
- Attachment 5 - CCP Control Checklist for RH Controlled Shipments
- Attachment 6 - CCP Control Checklist for Receipt of RH Controlled Shipments
- Fax or e-mail correspondence, if applicable

5.1.2 Radiological Surveys

[A] Dose Rate Survey Report

[B] Contamination Survey

Attachment 1 – Uniform Hazardous Waste Manifest (EXAMPLE)

Please print or type. (Form designed for use on elite (12-pitch) typewriter.) Form Approved. OMB No. 2050-0039

UNIFORM HAZARDOUS WASTE MANIFEST

1. Generator ID Number	2. Page 1 of	3. Emergency Response Phone	4. Manifest Tracking Number

GENERATOR

5. Generator's Name and Mailing Address — Generator's Site Address (if different than mailing address)

Generator's Phone:

6. Transporter 1 Company Name — U.S. EPA ID Number

7. Transporter 2 Company Name — U.S. EPA ID Number

8. Designated Facility Name and Site Address — U.S. EPA ID Number

Facility's Phone:

9a. HM	9b. U.S. DOT Description (including Proper Shipping Name, Hazard Class, ID Number, and Packing Group (if any))	10. Containers No.	10. Containers Type	11. Total Quantity	12. Unit Wt./Vol.	13. Waste Codes
	1.					
	2.					
	3.					
	4.					

14. Special Handling Instructions and Additional Information

15. **GENERATOR'S/OFFEROR'S CERTIFICATION:** I hereby declare that the contents of this consignment are fully and accurately described above by the proper shipping name, and are classified, packaged, marked and labeled/placarded, and are in all respects in proper condition for transport according to applicable international and national governmental regulations. If export shipment and I am the Primary Exporter, I certify that the contents of this consignment conform to the terms of the attached EPA Acknowledgment of Consent.
I certify that the waste minimization statement identified in 40 CFR 262.27(a) (if I am a large quantity generator) or (b) (if I am a small quantity generator) is true.

Generator's/Offeror's Printed/Typed Name — Signature — Month Day Year

INT'L

16. International Shipments ☐ Import to U.S. ☐ Export from U.S. Port of entry/exit:
Transporter signature (for exports only): Date leaving U.S.:

TRANSPORTER

17. Transporter Acknowledgment of Receipt of Materials

Transporter 1 Printed/Typed Name — Signature — Month Day Year

Transporter 2 Printed/Typed Name — Signature — Month Day Year

DESIGNATED FACILITY

18. Discrepancy

18a. Discrepancy Indication Space ☐ Quantity ☐ Type ☐ Residue ☐ Partial Rejection ☐ Full Rejection

Manifest Reference Number:

18b. Alternate Facility (or Generator) — U.S. EPA ID Number

Facility's Phone:

18c. Signature of Alternate Facility (or Generator) — Month Day Year

19. Hazardous Waste Report Management Method Codes (i.e., codes for hazardous waste treatment, disposal, and recycling systems)

1.	2.	3.	4.

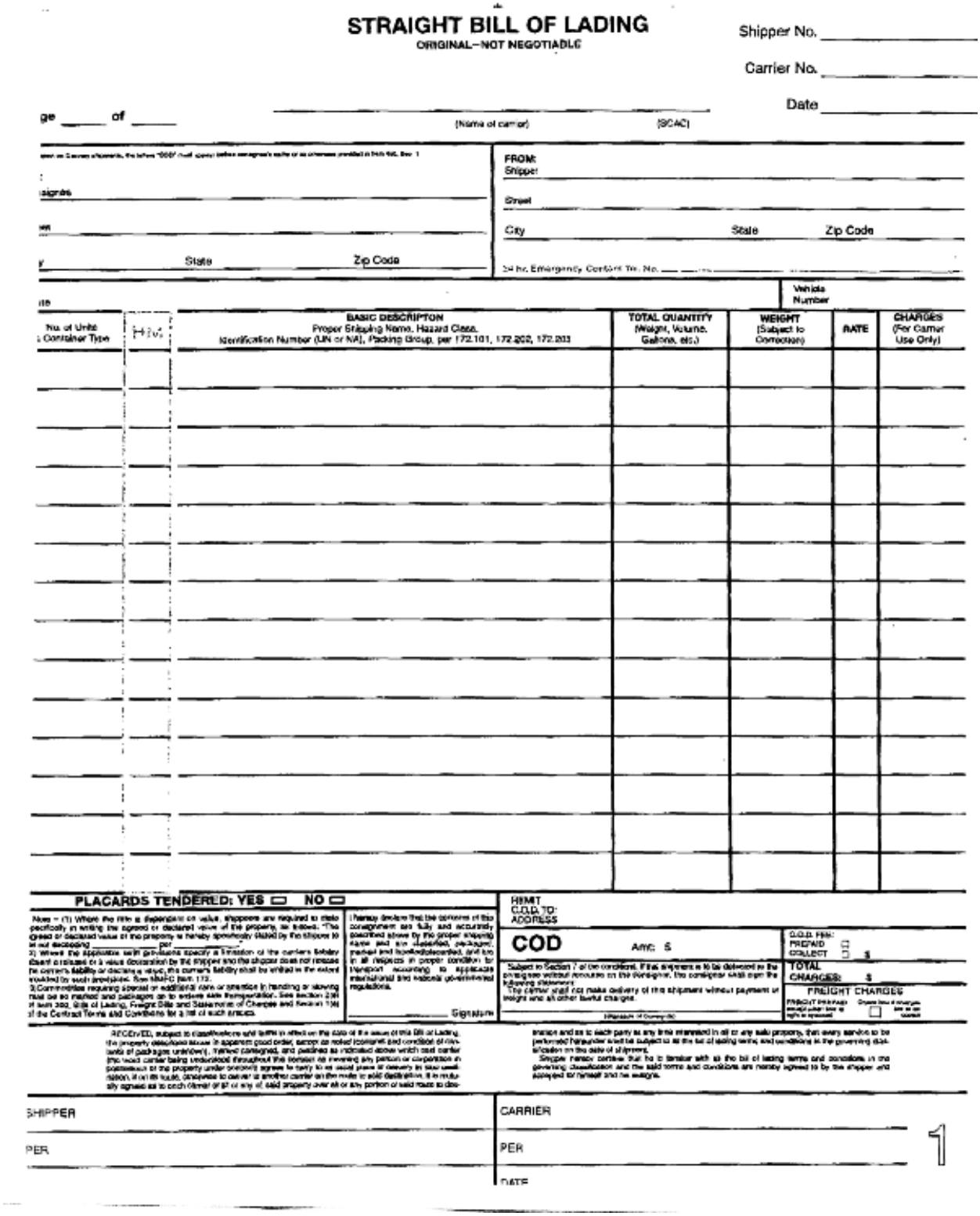
20. Designated Facility Owner or Operator: Certification of receipt of hazardous materials covered by the manifest except as noted in Item 18a

Printed/Typed Name — Signature — Month Day Year

EPA Form 8700-22 (Rev. 3-05) Previous editions are obsolete.

DESIGNATED FACILITY TO DESTINATION STATE (IF REQUIRED)

Attachment 2 – Straight Bill of Lading – Short Forms (EXAMPLE)



STRAIGHT BILL OF LADING
ORIGINAL—NOT NEGOTIABLE

Shipper No. _____
Carrier No. _____
Date _____

ge _____ of _____ (Name of carrier) (SCAC)

FROM:
Shipper
Street
City State Zip Code
24 hr. Emergency Contact Tel. No.

Vehicle Number

No. of Units & Container Type	HM?	BASIC DESCRIPTION Proper Shipping Name, Hazard Class, Identification Number (UN or NA), Packing Group, per 172.101, 172.202, 172.203	TOTAL QUANTITY (Weight, Volume, Gallons, etc.)	WEIGHT (Subject to Correction)	RATE	CHARGES (For Carrier Use Only)

PLACARDS TENDERED: YES ☐ NO ☐

Note – (1) Where the rate is dependent on value, shippers are required to state specifically in writing the agreed or declared value of the property as follows: "The agreed or declared value of the property is hereby specifically stated by the shipper to be not exceeding _____ per _____."
2) Where the Applicable tariff publishes specific limitation of the carrier's liability absent a release or a value declaration by the shipper and the shipper does not release the carrier's liability or declare a value, the carrier's liability shall be limited to the extent provided by such provisions. See NMFC Item 172.
3) Commodities requiring special or additional care or attention in handling or stowing must be so marked and packaged as to ensure safe transportation. See Section 2(e) of Item 360, Bills of Lading, Freight Bills and Statements of Charges and Section 7(a) of the Contract Terms and Conditions for a list of such articles.

I hereby declare that the contents of this consignment are fully and accurately described above by the proper shipping name and are classified, packaged, marked and labeled/placarded, and are in all respects in proper condition for transport according to applicable international and national governmental regulations.

_____ Signature

HMIT
C.O.D. TO:
ADDRESS

COD Amt: $

C.O.D. Fee: PREPAID ☐ COLLECT ☐ $

Subject to Section 7 of the conditions, if this shipment is to be delivered to the consignee without recourse on the consignor, the consignor shall sign the following statement:
The carrier shall not make delivery of this shipment without payment of freight and all other lawful charges.

_____ Signature of Consignor

TOTAL CHARGES: $

FREIGHT CHARGES
FREIGHT CHARGES are ☐ Prepaid ☐ Collect ☐ Charges to be prepaid unless marked otherwise

RECEIVED, subject to classifications and tariffs in effect on the date of the issue of this Bill of Lading, the property described above in apparent good order, except as noted (contents and condition of contents of packages unknown), marked consigned, and destined as indicated above which said carrier (the word carrier being understood throughout this contract as meaning any person or corporation in possession of the property under contract) agrees to carry to its usual place of delivery at said destination, if on its own route, otherwise to deliver to another carrier on the route to said destination. It is mutually agreed, as to each carrier of all or any of said property over all or any portion of said route to destination and as to each party at any time interested in all or any said property, that every service to be performed hereunder shall be subject to all the terms and conditions in the governing classification on the date of shipment.
Shipper hereby certifies that he is familiar with all the bill of lading terms and conditions in the governing classification and the said terms and conditions are hereby agreed to by the shipper and accepted for himself and his assigns.

SHIPPER
PER
DATE

CARRIER
PER
DATE

1

Attachment 3 – Land Disposal Restriction Exemption Notification

The non-waste water identified in this shipment, Manifest Number_____, and bearing the EPA hazardous waste number(s) listed below are exempted from the land disposal prohibitions of 20 NMAC 4.1, 268 because the waste is exempted by the WIPP Land Withdrawal Act. The Land Withdrawal Act also exempts this waste from the treatment standards in 20 NMAC 4.1, 268. This waste is **NOT** prohibited from land disposal.

EPA Hazardous Waste Number (No additional codes to those listed below can be accepted at the WIPP, Check only those that are included in this shipment.):

Waste Stream Profile Number: _____

☐	D004	Arsenic	05/08/92	☐	D038	Pyridine	09/19/96
☐	D005	Barium	08/08/90	☐	D039	Tetrachloroethylene	09/19/96
☐	D006	Cadmium	08/08/90	☐	D040	Trichloroethylene	09/19/96
☐	D007	Chromium	08/08/90	☐	D043	Vinyl Chloride	09/19/96
☐	D008	Lead	08/08/90	☐	F001	Spent Solvents	11/08/86
☐	D009	Mercury	05/08/92	☐	F002	Spent Solvents	11/08/86
☐	D010	Selenium	08/08/90	☐	F003	Spent Solvents	11/08/86
☐	D011	Silver	08/08/90	☐	F004	Spent Solvents	11/08/86
☐	D018	Benzene	09/19/96	☐	F005	Spent Solvents	11/08/86
☐	D019	Carbon Tetrachloride	09/19/96	☐	F006	Sludges	09/08/88
☐	D021	Chlorobenzene	09/19/96	☐	F007	cyanide salts	07/08/89
☐	D022	Chloroform	09/19/96	☐	F009	cyanide salts	07/08/89
☐	D026	Cresol	09/19/96	☐	P015	Beryllium Powder	08/08/90
☐	D027	1,4-Dichlorobenzene	09/19/96	☐	P030	Cyanides (soluble cyanide salts), not otherwise specified (H)	06/08/89
☐	D028	1,2-Dichloroethane	09/19/96	☐	P098	Potassium Cyanide (H)	06/08/89
☐	D029	1,1-Dichloroethylene	09/19/96	☐	P099	Potassium Silver Cyanide (H)	08/08/90
☐	D030	2,4-Dinitrotolune	09/19/96	☐	P106	Sodium Cyanide (H)	06/08/89
☐	D032	Hexachlorobenzene	09/19/96	☐	P120	Vanadium Pentoxide	08/08/90
☐	D033	Hexachlorobutadiene	09/19/96	☐	U002	Acetone	08/08/90
☐	D034	Hexachloroethane	09/19/96	☐	U003	Acetonitrile (I,T)	08/08/90
☐	D035	Methyl ethyl ketone	09/19/96	☐	U019	Benzene	08/08/90
☐	D036	Nitrobenzene	09/19/96	☐	U037	Chlorobenzene	08/08/90
☐	D037	Pentachlorophenol	09/19/96	☐	U043	Vinyl Chloride	08/08/90

Attachment 3 – Land Disposal Restriction Exemption Notification (Continued)

Waste Stream Profile Number: _____

☐	U044	Chloroform	08/08/90	☐	U226	1,1,1-Trichloroethane	08/08/90
☐	U052	Cresol	08/08/90	☐	U228	Trichloroethylene	08/08/90
☐	U070	1,2-Dichlorobenzene	08/08/90	☐	U239	Xylene	08/08/90
☐	U072	1,4-Dichlorobenzene	08/08/90	☐	N/A	N/A	N/A
☐	U078	1,1-Dichloroethylene	08/08/90	☐	N/A	N/A	N/A
☐	U079	1,2-Dichloroethylene (T) 156-60-5	08/08/90	☐	N/A	N/A	N/A
☐	U103	Dimethyl Sulfate (T)	08/08/90	☐	N/A	N/A	N/A
☐	U105	2,4-Dinitrotoluene (T) 121-14-2	08/08/90	☐	N/A	N/A	N/A
☐	U108	1,4-Dioxane (T)		☐	N/A	N/A	N/A
☐	U122	Formaldehyde	08/08/90	☐	N/A	N/A	N/A
☐	U133	Hydrazine	08/08/90	☐	N/A	N/A	N/A
☐	U134	Hydrofluoric Acid	08/08/90	☐	N/A	N/A	N/A
☐	U151	Mercury	08/08/90	☐	N/A	N/A	N/A
☐	U154	Methanol	08/08/90	☐	N/A	N/A	N/A
☐	U159	Methyl Ethyl Ketone	08/08/90	☐	N/A	N/A	N/A
☐	U196	Pyridine	08/08/90	☐	N/A	N/A	N/A
☐	U209	1,1,2,2-Tetrachloroethane	08/08/90	☐	N/A	N/A	N/A
☐	U210	Tetrachloroethylene	08/08/90	☐	N/A	N/A	N/A
☐	U220	Toluene	08/08/90	☐	N/A	N/A	N/A

_____/_____/_____/_____
TCO Printed Name Signature Date Initials

REFERENCE:

20 NMAC 4.1, 268.7(a) (3)
OCT. 30, 1992–PUBLIC LAW 102-579 as amended Sept. 23, 1996–PUBLIC LAW 104-201, Subtitle F
WIPP Hazardous Waste Facility Permit, Attachment C-5b(2)
WIPP Hazardous Waste Facility Permit, Table 2.3.4

Attachment 4 – CCP RH Canister Integrity Checklist

Record Canister ID number_____

RH TRU 72-B Cask Number (if applicable) _____

Any YES answer on the inspection checklist will result in the TCO immediately contacting the facility supervisor. The facility supervisor will have the canister/container segregated **AND** the appropriate site-specific corrective actions invoked. The TCO will select a new waste canister/container for shipment. The new waste canister/container will require the same inspection per the checklist.

Visually examine 100% of each canister/container for selected payload assembly per the checklist below.

CANISTER/CONTAINER EXAMINATION		**DISCUSSION OF CRITERIA**	**CHECK ONE**	
1.	Is the canister/container obviously degraded?	Obviously degraded means clearly visible and potentially significant defects in the canister/container or canister/container surface.	YES ☐	NO ☐
2.	Is there evidence that the canister/container is, or has been, pressurized?	Pressurization can be indicated by a fairly uniform expansion of the sidewalls, bottom or top. Past pressurization can be indicated by a notable outward deflection of the bottom or top. Verify that the canister/container is not warped.	YES ☐	NO ☐
3.	Is there any potentially significant rust or corrosion such that wall thinning, pin holes, or breaches are likely or the load bearing capacity is suspect?	Rust shall be assessed in terms of its type, extent, and location. Pitting, pocking, flaking, or dark coloration characterizes potentially significant rust or corrosion. This includes the extent of the canister/container surface area covered, thickness, and, if it occurs in large flakes or built-up (caked) areas. Rusted canisters/containers may not be accepted if: • Rust is present in caked layers or deposits • Rust is present in the form of deep metal flaking, or built-up areas of corrosion products In addition, the location of rust should be noted; for example on a drum: top lid; filter region; locking chine; top one-third, above the second rolling hoop; middle one-third, between the first and second rolling hoops; bottom one-third, below the second rolling hoop; and on the bottom. Canisters/containers may still be considered acceptable if the signs of rust show up as: • Some discoloration on the canister/container • If rubbed would produce fine grit or dust or minor flaking (such that wall thinning does not occur)	YES ☐	NO ☐

Attachment 4 – CCP RH Canister Integrity Checklist (Continued)

CANISTER/**CONTAINER EXAMINATION**		**DISCUSSION OF CRITERIA**	**CHECK ONE**	
4.	Are any of the following apparent? • wall thinning • pin holes • breaches	Wall thinning, pin holes, and breaches can be a result of rust/corrosion (see discussion for #3).	YES ☐	NO ☐
5.	Are there any split seams, tears, obvious holes, punctures (of any size), creases, broken welds, or cracks?	Canisters/containers with obvious leaks, holes or openings, cracks, deep crevices, creases, tears, broken welds, sharp edges or pits, are either breached or on the verge of being breached. Verify that there is no warpage that could cause the canister/container to be unstable or prevent it from fitting properly in the applicable package.	YES ☐	NO ☐
6.	Is the load-bearing capacity suspect?	The load-bearing capacity could be reduced for excessive rust (see discussion for #3), wall thinning (see discussion for #4), breaches, cracks, creases, broken welds, etc. (see discussion for #5).	YES ☐	NO ☐
7.	Is the canister/container improperly closed?	Inspect the fastener and fastener ring (chine) if applicable for damage or excessive corrosion. Check the alignment of the fastener to ensure that it is in firm contact around the entire lid and the canister/container will not open during transportation.	YES ☐	NO ☐
8.	Are there any dents, scrapes, or scratches that make the canister's/container's structural integrity questionable or prevent the top and bottom surfaces from being parallel?	Deep gouges, scratches, or abrasions over wide areas are not acceptable. If top and bottom surfaces are not parallel, this would indicate that the container is warped. Dents should be less than ¼ inch deep by 3 inches long and between ½ inch to 6 inches wide. All other dents must be examined to determine impact of structural integrity.	YES ☐	NO ☐
9.	Is there discoloration which would indicate leakage or other evidence of leakage of material from the canister/container?	Examine the canister/container regions near vents, top lid fittings, bottom fittings, welds, seams and intersections of one or more metal sheets or plates. Canisters/containers must be rejected if evidence of leakage is present.	YES ☐	NO ☐
10.	Is the canister/container bulged?	For the purposes of this examination, bulging is indicated by: • A fairly uniform expansion of the sidewalls, bottom, or top (e.g., in the case of a drum, either the top or bottom surface protrudes beyond the planar surface of the top or bottom ring, • A protrusion of the side wall (e.g., in the case of a drum, beyond a line connecting the peaks of the surrounding rolling hoops or a line between a surrounding rolling hoop and the bottom or top ring), or Expansion of the sidewall (e.g., in the case of a drum, such that it deforms any portion of a rolling hoop).	YES ☐	NO ☐

Note: Remote Camera Inspections can be performed by reviewing recent recorded video.

Attachment 4 – CCP RH Canister Integrity Checklist (Continued)

Comments: _____
_____
_____
_____

Inspected by: _____/_____/_____
TCO Printed Name Signature Date

Attachment 5 – CCP Control Checklist for RH Controlled Shipments*

Shipment No. _____ Packaging No. _____

To be completed by CCP Transportation Certification Official, or designee, for package designated as a controlled shipment.

Activity	Recorded Date	Recorded Time	Completion of Activity (√)
Record date and time of IV closure and installation of IV vent port plug, DOE/WIPP 02-3284, *RH Packaging Operations Manual.*			
Record date and time the shipment containing the loaded package is ready to depart from site to destination			
Calculate and record total Loading Time (Limit = 24 hours)			
Total Loading time ≤ 1day, proceed to certification signature block *Total Loading time > 1, STOP. Vent package and repeat closure process*			
I certify the above data is accurate and compliant with the Loading Time limit of 24 hours, as specified in Section 6.2.3 of the RH-TRAMPAC.			
Transportation Certification Official (or designee)		Date	

*Controlled shipments (10 days) shall be made in accordance with the conditions specified in RH-TRAMPAC Section 6.2.3

_____/_____/_____/_____

TCO Printed Name Signature Date Initials

Attachment 6 – CCP Control Checklist for Receipt of RH Controlled Shipments*

Shipment No. _____ Packaging No. _____

To be completed by Site Operations personnel for package designated as a controlled shipment:

Activity	Recorded Date	Recorded Time	Completion of Activity (√)
Record date and time of package receipt			
Vent package within 24 hours of date and time recorded above and record vent date and time			
I certify the above data is accurate and compliant with the Unloading Time limit of 24 hours, as specified in Section 6.2.3 of the RH-TRAMPAC.			
Designated Site Personnel	Site	Date	

*Controlled shipments (10 days) shall be made in accordance with the conditions specified in RH-TRAMPAC Section 6.2.3. This attachment may be reformatted for Receipt Site use provided that the same information is recorded.

Contact TCO _____, at Ph# _____, upon completion of attachment for notification of completion of 24 hour unloading time, completion of 10 day controlled shipment and to arrange return email/FAX of “Attachment 6” copy, for Shipping Documentation Package.

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CCP-TP-530

Revision 12

CCP
RH TRU Waste Certification and WWIS/WDS Data Entry

EFFECTIVE DATE: 11/05/2015

Irene Joo

APPROVED FOR USE

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RECORD OF REVISION

Revision Number	Date Approved	Description of Revision
0	04/25/2006	Initial issue.
1	05/05/2006	Revised to address CBFO comments.
2	06/15/2006	Revised to address concerns raised during the Idaho National Laboratory (INL) Remote-Handled (RH) Audit A-06-21.
3	11/16/2006	Revised to implement the Waste Isolation Pilot Plant Hazardous Waste Facility Permit requirements resulting from the Section 311/Remote-Handled (RH) Permit Modification Request (PMR) and to remove Transportation Certification Official (TCO) activities.
4	04/20/2007	Revised to incorporate guidance for assignment of packaging material weight for RH canister assembly and to perform miscellaneous editing.
5	07/23/2007	Revised to include the CNS 10-160B information.
6	06/25/2008	Revised to include the process for submitting transportation data only for the Battelle Columbus Laboratory (BCL) waste at Savannah River Site (SRS) using the CNS 10-160B.
7	07/11/2008	Revised to address comments from the Remote-Handled (RH)-Oak Ridge National Laboratory (ORNL) Audit as well as remove any reference to the Characterization Data System (CDS) Waste Certification Official (WCO) Review Form.
8	09/09/2009	Revised to remove Section 4.4.24 in response to CAR-RHLANL-0001-09 as well as minor editorial changes.
9	12/11/2009	Revised to allow use of the Waste Data System (WDS) as well as include steps for canisters measuring <200 millirem (mRem) per Central Characterization Project (CCP)-Standing Order (SO)-042.
10	04/25/2011	Revised Table 1, Data Sources for the RH WDS Master Template, to include a new source for Gross Weight and a new field label and source for remote-handled (RH) nondestructive assay (NDA).
11	06/19/2013	Revised to implement new Permit Modification Request Class 2 approved by New Mexico Environment Department (NMED) dated March 13, 2013 and *Contact-Handled Transuranic Waste Authorized Methods for Payload Control* (CH-TRAMPAC) changes.

RECORD OF REVISION (CONTINUED)

Revision Number	Date Approved	Description of Revision
12	11/05/2015	Revised to implement the remote-handled (RH) waste certification process using the Integrated Data Center (IDC). To implement the generating of electronic records instead of signed paper copy records and to remove the procedure steps for entering data into the Waste Isolation Pilot Plant (WIPP) Waste Information System/Waste Data System (WWIS/WDS) for Site to Site shipments as well as the 10-160B procedure steps.

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1.0 PURPOSE

The purpose of this procedure is to describe the steps the Central Characterization Program (CCP) uses for certifying remote-handled (RH) transuranic (TRU) waste for disposal at the Waste Isolation Pilot Plant (WIPP).

1.1 Scope

This procedure defines the parameters necessary for certification of RH TRU waste for disposal at the WIPP. This procedure includes the records that are generated to document that the CCP Waste Certification Official (WCO) has performed the necessary verifications and has certified the waste for disposal.

This procedure also describes how to obtain access and enter data into the WIPP Waste Information System (WWIS)/Waste Data System (WDS) for containers to be certified.

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2.0 REQUIREMENTS

2.1 References

Baseline Documents

- CCP-QP-022, *CCP Software Quality Assurance Plan*
- CCP-PO-001, *CCP Transuranic Waste Characterization Quality Assurance Project Plan*
- CCP-PO-002, *CCP Transuranic Waste Certification Plan*
- CCP-PO-505, *CCP Remote-Handled Transuranic Waste Authorized Methods for Payload Control* (CCP RH-TRAMPAC)

Referenced Documents

- DOE/WIPP 09-3427, *Waste Data System User's Manual*
- DOE/WIPP 90-045, *RH-TRU Waste Content Codes* (*RH-TRUCON*)
- CCP-QP-002, *CCP Training and Qualification Plan*
- CCP-QP-005, *CCP TRU Nonconforming Item Reporting and Control*
- CCP-QP-008, *CCP Records Management*
- CCP-TP-002, *CCP Reconciliation of DQOs and Reporting Characterization Data*
- CCP-TP-500, *CCP Remote-Handled Waste Visual Examination*
- CCP-TP-506, *CCP Preparation of the Remote-Handled Transuranic Waste Acceptable Knowledge Characterization Reconciliation Report*

2.2 Training Requirements

2.2.1 Personnel who use this procedure to certify waste will be trained and qualified to the requirements for the WCO in accordance with CCP-QP-002, *CCP Training and Qualification Plan*.

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2.2.2 Personnel who use this procedure to enter data will be trained and qualified to the requirements for the Waste Certification Assistant (WCA) in accordance with CCP-QP-002.

2.2.3 Personnel who use this procedure to enter data into the WWIS/WDS will refer to DOE/WIPP-09-3427, *Waste Data System User's Manual*.

2.3 Equipment List

2.3.1 Computer.

2.4 Software

2.4.1 concat_wds_files.bat

2.4.2 clean_container_files.bat

2.5 Precautions and Limitations

2.5.1 None.

2.6 Prerequisite Actions

2.6.1 None.

2.7 Definitions

2.7.1 WDS Spreadsheet – a generic term used to refer to the "IDC WDS Spreadsheet."

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3.0 RESPONSIBILITIES

3.1 Site Project Manager (SPM) or Designee

3.1.1 Confirms that personnel performing this procedure are trained and qualified in accordance with applicable requirements in CCP-QP-002.

3.1.2 Notifies the WCO and WCA of completed Lot Characterization Information Summary (CIS) when used for new or revised Waste Stream Profile Forms (WSPF).

3.1.3 Serves as focal point for resolution of data issues.

3.2 Quality Assurance (QA)

3.2.1 Provides assistance in verifying data, completing documentation, and reviewing requirements and provides status of applicable nonconformance reports (NCRs).

3.3 Waste Certification Official (WCO) or Designee

3.3.1 Confirms that the WCOs and WCAs are granted access to the WWIS/WDS.

3.3.2 Obtains a copy of the approved WSPF for applicable containers to be certified.

3.3.3 Certifies container(s) meet requirements for disposal in the WIPP repository.

3.3.4 Notifies Transportation Certification Official (TCO) of the WWIS/WDS Certification Module approval, if necessary.

3.3.5 Notifies the TCO of containers that are approved for Controlled Shipment, if necessary.

3.4 Waste Certification Assistant (WCA)

3.4.1 Works with the WCO to obtain access to the WWIS/WDS.

3.4.2 Obtains copies of data for each container from CCP Records, Integrated Data Center (IDC), and the Site Project Manager (SPM) that show data to be entered into the WDS Spreadsheet.

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3.4.3 Generates the WDS Spreadsheet using IDC and has a second WCA confirm the data is transferred correctly within IDC. The second data entry person verifies the data prior to certification by the WCO.

3.4.4 Submits applicable records to CCP Records in accordance with CCP-QP-008, *CCP Records Management*.

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4.0 PROCEDURE

4.1 Obtaining and Changing Access to the WWIS/WDS

WCO

4.1.1 Determine which personnel need access to the WWIS/WDS (see Section 4.0 of DOE/WIPP-09-3427).

4.1.2 Request WWIS/WDS access for each person by filling out a WIPP/WDS access request form and submitting it to a Database Administrator (DA).

4.1.3 Notify the DA when personnel who have received WWIS/WDS access:

[A] Leave the project;

[B] No longer need WWIS/WDS access; **OR**

[C] Need to change the type of WWIS/WDS access.

CCP Personnel

4.1.4 Once the DA has been notified by the WCO that access is to be granted, contact the DA to receive WWIS/WDS training and a WWIS/WDS username in accordance with the DOE/WIPP-09-3427.

4.2 Verifying the WSPF in WWIS/WDS Tables and Developing Container Listings

SPM

4.2.1 Obtain the WSPF Number in accordance with CCP-TP-002, *CCP Reconciliation of DQOs and Reporting Characterization Data*.

4.2.2 Request the DA to establish the WSPF Number in the WWIS/WDS.

4.2.3 Confirm that the WSPF Number is correct in the WWIS/WDS Reference Table upon notification that the DA has added the WSPF Number to the WWIS/WDS.

4.2.4 Inform the WCO and WCA that the WSPF has been added to the WWIS/WDS.

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4.2.5 Develop a list of containers for certification under the appropriate WSPF.

4.2.6 Review the list of containers for certification, revise as necessary, **AND** submit the list to the WCO and WCA via the IDC when the CIS is complete.

4.3 Entering and Verifying WDS Characterization Data

WCA

4.3.1 Using the "Edit WCO Data" module in IDC and appropriate data sources as listed in Table 1, Data Sources for the WDS Spreadsheet, check the container(s) out for entry **AND** enter characterization data for each container record used to support the WSPF.

NOTE
The WSPF is only needed for the first Lot of a new or revised WSPF.

4.3.2 **ONCE** the characterization data is entered,
THEN select "done/update."

WCA (Verifier)

4.3.3 Using the "Edit WCO Data" module, check the container(s) out for validation **AND** verify each container record for accuracy and completeness.

NOTE
The designator "H" must be added to the end of the Container Identification (ID) Number for all waste containers overpacked into a 55-gallon drum as identified on the applicable acceptable knowledge (AK) Tracking Spread Sheet if applicable. This will be the new Container ID Number.

4.3.4 Enter RH TRU Waste Content Codes (Content Codes) as described in Attachment 1, Entering of Content Codes into WWIS/WDS, as required.

4.3.5 **IF** a 30-gallon container is packaged into a 55-gallon container, **AND** the Dose-to-Curie (DTC) was performed on the 30-gallon container,
THEN add the tare weight of the 55-gallon container to the gross weight of the 30-gallon container to obtain the new gross weight.

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4.3.6 **IF** there are any discrepancies that CANNOT be resolved,
THEN inform the WCO or SPM for resolution.

WCO/SPM

4.3.7 Resolve discrepancy or initiate an NCR in accordance with CCP-QP-005, as applicable.

WCA

4.3.8 **ONCE** the data is complete and verified,
THEN check the container(s) in for validation.

4.4 Precertifying WDS Characterization Data

WCO

NOTE
Step 4.4.2 is for a direct load canister only when a rollup of the DTC is required.

4.4.1 Using the “Edit WCO Data” module in IDC check out the container(s) **AND** perform a precursory certification review on each container used to support the WSPF.

4.4.2 **IF** rollup of DTC data is required,
THEN the weight of the plastic will be the total of the gross weights of the inner containers.

4.4.3 Using the “Certify WCO Data” module in IDC select “Final Publish.”

4.4.4 Using the “Certify WCO Data” module in IDC select “Generate Charz WDS File” to generate the Characterization flat file to be used for WDS Characterization Submittal.

4.4.5 Save the flat file into the TempTables Folder located on the user’s desktop.

4.5 WDS Characterization Data Submittal

WCO/WCA

4.5.1 Open TempTables Folder to run batch programs, **AND** run concat_wds_files to copy all containers into upload files readable to WWIS/WDS.

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4.5.2 LOG ON to the WWIS/WDS

4.5.3 Upload the container(s) to the Characterization module.

[A] **IF** container(s) upload is successful,
THEN GO TO step 4.5.4.

[B] **IF** container(s) fail and errors CANNOT be fixed,
THEN inform the SPM **AND** initiate an NCR in accordance with CCP-QP-005, *CCP TRU Nonconforming Item Reporting and Control*, as applicable.

4.5.4 **ONCE** complete,
THEN open the TempTables Folder **AND** RUN clean_container-files to clear the TempTables Folder of all uploaded file data.

4.6 Entering and Verifying WDS Certification Data using IDC

WCA

4.6.1 Using the “Edit WCO Data” module in IDC and appropriate sources as listed in Table 1, check out the container(s) for entry **AND** enter the certification data for container(s).

4.6.2 **ONCE** the certification data is entered,
THEN select “done/update.”

WCA (Verifier)

4.6.3 Using the “Edit WCO Data” module, check the container(s) out for validation **AND** verify each container record for accuracy and completeness.

4.6.4 **ONCE** the data is complete and verified,
THEN check the container(s) in for validation.

4.6.5 **IF** there are any discrepancies that CANNOT be resolved,
THEN inform the WCO or SPM for resolution.

WCO/SPM

4.6.6 Resolve discrepancy or initiate an NCR in accordance with CCP-QP-005, as applicable.

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4.7 Waste Certification using IDC (By Container of Waste)

4.7.1 Within the “Edit WCO Data” module, navigate to the “Check In/Check Out.”

4.7.2 Request that Quality Assurance (QA) confirms that each container being certified has NO unresolved NCRs, if applicable.

4.7.3 **WHEN** container is QA Certified,
THEN check the containers out for certification and proceed to step 4.7.5.

QA

4.7.4 Using IDC, confirm that each container requested for an NCR check has NO unresolved NCRs, if applicable.

WCO

4.7.5 Navigate to the “Container Edit” tab AND select container(s) to certify.

4.7.6 **IF** there are open NCRs,
THEN using IDC, verify that each container to be certified has no unresolved NCRs.

4.7.7 Confirm that the data in IDC matches the batch data report (BDR) data and is accurate and complete.

4.7.8 Confirm that the TRU alpha activity concentration is greater than 100 nanocuries per gram (nCi/g) for each container.

4.7.9 **IF** the container is less than 100 nCi/g,
THEN initiate an NCR in accordance with CCP-QP-005, if applicable.

4.7.10 Review the waste stream information against the applicable Content Code and data sources to confirm the waste is **NOT** an incompatible waste.

4.7.11 **IF** a container does not have an approved/proper TRUCON code,
THEN have the container put on an electronic exclusion in IDC
AND flag the container, if applicable.

4.7.12 Verify at least one TRU isotope is greater than lower limit of detection (LLD).

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4.7.13 **IF** flammable gas analysis (FGA) was performed,
THEN verify the Methane concentration is less than or equal to 1,250 parts per million (ppm).

4.7.14 **IF** FGA is performed,
THEN verify the Hydrogen concentration is less than 50,000 ppm.

NOTE

For debris waste (S5000), the WCO will assess the data for the container to assign the material parameter weights. In steps 4.7.15 and 4.7.16, the WCO will compare the material parameter data (waste weights in kilogram [kg]) to the number obtained by multiplying the volume of the waste container by the maximum loading density of plastic (620 kg/cubic meter [m^3]).

4.7.15 **IF** the calculated weight of the plastic is greater than or equal to the waste weight (kg) of the container,
THEN enter the waste weight of the container as “Plastic.”

4.7.16 **IF** the calculated weight of the plastic is less than the waste weight (kg) of the container,
THEN enter the calculated weight as “Plastic”, **AND** assign the remaining waste weight to the waste material per the percentages as identified in the applicable waste stream AK Summary Report.

NOTE

For soil/gravel waste (S4000), the WCO will assess the data for the container to determine the estimated weight of cellulose, plastics, and rubber (CPR) for any reported debris material. In steps 4.7.17 and 4.7.18, the WCO will review the data and confirm that the derived weight for any debris material reported will have a waste material parameter type of “Plastic.”

4.7.17 **IF** the container (S4000) DOES **NOT** contain any debris material,
THEN assign the net weight of the container as waste material parameters of “Soil.”

4.7.18 **IF** the container (S4000) does contain any debris material,
THEN enter the estimated weight of the debris as “Plastic” and the remaining net weight of the container as “Soil.”

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NOTE

For homogeneous solid waste (S3000), the WCO will assess the data for the container to determine the estimated weight of CPR for any reported debris material. In steps 4.7.19 and 4.7.20, the WCO will review the data and confirm that the derived weight for any debris material reported will have a waste material parameter type of "Plastic."

4.7.19 **IF** the container (S3000) DOES **NOT** contain any debris material,
THEN assign the net weight of the container as waste material parameter type appropriate to the waste (e.g., solidified inorganic material, solidified organic material, and cement).

4.7.20 **IF** the container (S3000) does contain debris material,
THEN enter the estimated weight of the debris as "Plastic" and the remaining net weight of the container as the waste material parameter type appropriate to the waste (e.g., solidified inorganic material, solidified organic material, and cement).

4.7.21 **IF** a deficiency in data is identified,
THEN flag the container in IDC **AND** initiate an NCR in accordance with CCP-QP-005, if applicable.

4.7.22 **IF** no deficiencies are identified,
THEN select "Certify."

NOTE

Containers must have a valid QA NCR check before submitting to WDS.

4.7.23 Within the "Certify WCO Data" module navigate to the "Final Publish" tab.

4.7.24 Verify a valid QA NCR check is complete.

4.7.25 Select "WDS Submit."

4.7.26 In the "WDS Submittal" popup window enter the appropriate WDS Credentials **AND** select "Perform Evaluations" to upload the container(s) to WDS.

[A] **IF** container fails and errors CANNOT be fixed,
THEN exit the system, **AND** initiate an NCR in accordance with CCP-QP-005, if applicable.

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4.8 WDS Deficiencies

4.8.1 **IF** a deficiency is identified after the container data is submitted to the WWIS/WDS,
THEN,

[A] Request in writing CCP management approval for the WCO to reject the container from the WWIS/WDS, if applicable, **AND** obtain confirmation that the container is rejected, if applicable.

[B] Initiate an NCR in accordance with CCP-QP-005, if applicable.

NOTE

If required, for filtered waste containers or containers requiring inner can data, the data required by WWIS/WDS for the inner cans will be entered as applicable based on an individual container basis (inner can ID, decay heat, decay heat uncertainty, closure date, vent date, filter diffusivity, flammable gas generation rate or hydrogen concentration, and sample date) after the waste containers are entered into the WWIS/WDS.

NOTE

Step 4.8.2 is for containers with inner can data and/or data for a 30-gallon container overpacked into a 55-gallon container.

NOTE

A unique Inner Container ID must be entered using the 55-gallon number with an H suffix when a 30-gallon container is overpacked into a 55-gallon container in the Inner Can Data in WWIS/WDS.

4.8.2 Select CONTAINER CERTIFICATION DATA SUBMITTAL/CONTAINER CHARACTERIZATION DATA SUBMITTAL based on whether or not the waste stream is approved.

[A] Select SEARCH and enter the container number and select SEARCH.

[B] Select applicable container.

[C] Select INNER LAYER and enter the applicable data.

[D] Select SUBMIT for approval.

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4.8.3 Compile the applicable records used in the submission of data to the WWIS/WDS, **AND** submit to CCP Records in accordance with CCP-QP-008.

NOTE

The WWIS/WDS Canister Planning and Completion Module utilizes edit and limit checks when data is entered and selected. The WWIS/WDS steps in the following section may be repeated until overpack compliance is satisfied. Default data may be used to generate the build list for the TCOs.

NOTE

The recommended container selection for the canister can either be provided by the Host site, based on As Low As Reasonably Achievable (ALARA) needs for movement of the drums and container retrievability, or determined by the SPM or the WCO.

WCO

4.9 Container Selection and certification for RH TRU 72-B waste canister using the WWIS/WDS.

4.9.1 LOGON to the WWIS/WDS.

4.9.2 Select CANISTER PLANNING and COMPLETION.

4.9.3 Select NEW.

4.9.4 **ENTER** applicable data in the Canister Information Section as follows,
THEN select SEARCH.

[A] Canister Configuration Type

[B] Certification Program ID

[C] Current Location

[D] Destination Site ID

[E] Shipping Program ID

[F] Waste Stream Profile Code

4.9.5 Select the appropriate containers from the Candidate Containers Section.

4.9.6 Select ACCEPT.

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4.9.7 Enter the Canister number in the Enter Container Number field **AND** select ACCEPT.

4.9.8 **ONCE** the Canister Plan is accepted,
THEN enter the remaining applicable canister information for Certification.

4.9.9 Generate the Build List and provide, via email, to the TCO as applicable.

NOTE

Some 55-gallon containers loaded into the Removable Lid Canister use an RH TRU Drum Handling Bag (lift bag). The lift bag weighs 1.42 kg and is made of polyester fabric. The lift bag cannot be retrieved from the canister after loading.

4.9.10 Receive the Loading Form from the TCO and enter the required certification data including the lift bag data if applicable.

4.9.11 **IF** the canister dose rate from the TCOs is < 200 millirem (mRem), **AND** all inner containers are > 200 mRem,
THEN use the highest dose rate from the inner containers.

4.9.12 SUBMIT the canister for approval.

4.9.13 After successful submittal for approval, print the Canister Data Report, date, and sign with title.

4.9.14 Compile the applicable records used in the submission of data to the WWIS/WDS **AND** submit to CCP Records in accordance with CCP-QP-008.

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5.0 RECORDS

5.1 Records generated during the performance of this procedure are maintained as QA records in accordance with CCP-QP-008. The records are the following:

5.1.1 QA/Lifetime Records

[A] Container Certification:

[A.1] Correspondence (memorandum/e-mail notifications)

[A.2] Radiological Survey Information, if applicable

[A.3] WCO Certified WDS Spreadsheets will be electronic only and will reside in the IDC WCO Module.

[B] Canister Certification:

[B.1] Correspondence (memorandum/e-mail notifications)

[B.2] Waste Canister Data Report

[B.3] Waste Canister Loading Sheet, if applicable

[B.4] Radiological Survey Information, if applicable

Table 1. Data Sources for the WDS Spreadsheet

Field Label	**Source**
Characterization, Certification and Shipping Data	
Shipper Site ID or Site ID	AK Summary Report
Location ID Destination Program ID Shipping Purpose	AK Summary Report
Waste Stream Profile	AK Summary Report; WSPF
Container ID Number or Container Number	Completed CIS (Ensure payload container has a unique site-identifier prefix). For all waste containers overpacked into a 55-gallon drum as identified on the applicable AK Tracking Spread Sheet, include an "H" at the end of the drum number.
Container Type	Packaging records; visual inspection; AK Summary Report; Associated BDRs
WAC Rev #	DOE/WIPP-02-3122, *Transuranic Waste Acceptance Criteria for the Waste Isolation Pilot Plant*
WAC Ex #	Executive Order Letter from the U.S. Department of Energy (DOE) Carlsbad Field Office (CBFO) in CCP Records
Cert Site or Certified Site	WSPF or AK Summary Report
Cert Date or Certification Date	Date WCO certifies payload container
Waste Handling Code or Handling Code	RH from Dose to Curie BDR; Radiological Characterization Report; WSPF; AK Summary Report
Waste Type Number or Waste Type	WSPF or AK Summary Report (If no hazardous waste numbers, enter TRU) If hazardous number(s) apply, enter "MTRU."
Waste Stream Baseline Inventory Report (BIR) ID Waste Stream Mixed Waste Inventory Report (MWIR) ID	WSPF or AK Summary Report (If not applicable, enter NONE)
Generator Site ID or Generator Site Item Description Code (IDC) Code or IDC Waste Matrix (parameter) Code or Matrix Code	WSPF or AK Summary Report (NONE if no IDC available)
Content Code or TRUCON Code	Remote-Handled Transuranic Content Codes, AK Summary Report, WSPF, Characterization Info. Summary. See Attachment 1.
TRU Alpha Act TRU Alpha Act Uncertainty TRU Alpha Act Concentration (conc.) TRU Alpha Act Conc. Uncertainty Pu-239 fissile Gram Equivalent Pu-239 Fissile Gram Equivalent Uncertainty Pu-239 eq. act. Decay Heat Decay Heat Uncertainty	Waste Container Dose-to-Curie Conversion Record (DTC BDR), Radiological Characterization Report, Waste Container Radiological Characterization Record AK record for BCL waste
Layers of Packaging	Visual Examination (VE) BDR; Radiography BDR; AK Summary Report; WSPF
Fill Factor	Dose-to-Curie BDR, Radiological Characterization Report, VE BDR
Liner Type or Liner Exists	VE BDR. Radiography BDR; AK Summary Report; RH Content Code Document
Liner Punctured or Liner Hole Size Liner Lid Present	VE BDR. Radiography BDR or AK Summary Report. No liner lid indicates liner is vented with default hole size of 457.2 mm for 30-gallon drum and 478 mm for 55-gallon drum.

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Table 1. Data Sources for the WDS Spreadsheet (Continued)

Field Label	**Source**
Polychlorinated Biphenyl (PCB) Waste, PCB Concentration, PCB Mass PCB Out-Of-Service Date	WSPF or AK Summary Report. If yes, then PCB mass = net weight and PCB out-of-service = Closure date unless otherwise stated in other documentation.
Aqueous Material Beryllium Present Beryllium less than or equal to 100 kg Beryllium less than or equal to 1% Machine Compacted Beryllium chemically/mechanically bound	AK Tracking Spreadsheet or AK Summary Report
Closure Date	AK Tracking Spreadsheet, Remediated Drum Spreadsheet, or AK Summary Report, Canister Loading Data Sheet
Vent Date	AK Tracking Spreadsheet, Remediated Drum Spreadsheet, or AK Summary Report, Canister Loading Data Sheet
Filter Install Date Filter Model Number of filters installed	Flammable Gas Analysis BDR, VE BDR, RTR BDR, AK Tracking Spreadsheet or Remediated Drum Sheet, Canister Loading Data Sheet, AK Summary Report
Aspiration Method ID	AK Tracking Spreadsheet, Remediated Drum Spreadsheet, AK Summary Report, Flammable Gas Analysis BDR, Project AK Summary Report
Gross Weight	Waste Container Dose-to-Curie Conversion Record (DTC BDR) or Scale Certification Data, Canister Loading Data Sheet, Radiological Characterization Report, Waste Container Radiological Characterization Record.
Gross Weight Uncertainty	VE BDR, Radiography BDR, or Scale Certification Data, Canister Loading Data Sheet, Bounding Case for drums loaded in canisters (2.3 kg)
Alpha Surf Cont Beta/Gamma Surf Cont Neutron Dose Rate Beta/Gamma Dose Rate	Host Site Radiological Contamination Report(s) (When either NDA, MDA, or ND is recorded for Alpha and Beta/Gamma surface contamination record 19 and 199 respectively on the SS
Radionuclide Data	
Radionuclide Activity (Ci) Activity Uncertainty (Ci)	Waste Container Dose-to-Curie Conversion Record (DTC BDR), Canister loading data sheet, Radioassay BDR, Radiological Characterization BDR/Radiological Characterization Report, Waste Container Radiological Characterization Record
Assay Method Data	
Radioassay Method	WWIS/WDS Reference Tables/Library; Certification Letters
Data Package Number	Dose-to-Curie BDR, Radiological Characterization Report, Waste Container Radiological Characterization Record, Radioassay BDR
Assay Date (actual assay date)	Dose-to-Curie BDR, Radiological Characterization Report, Waste Container Radiological Characterization Record, Radioassay BDR
Material Parameter Data	
Waste Material Parameter	VE BDR or Real-Time Radiography (RTR) BDR
Waste Weight	Waste Container Dose-to-Curie Conversion Record (DTC BDR), Radiological Characterization Report, Waste Container Radiological Characterization Record
Characterization Method Data	
Charz Method ID	WWIS/WDS Reference Table/Library; Certification Letters
Data Package Number	VE or RTR BDR
Charz Method Date	VE or RTR BDR

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Table 1. Data Sources for the WDS Spreadsheet (Continued)

Field Label	**Source**
Hazardous Waste Numbers Data Hazardous Waste Numbers	 WSPF or AK Summary Report
Date Sampled	Flammable Gas Analysis BDR, N/A for canister, AK Sufficiency
Method ID Data Package # Analyte Sample ID Sample Type Layer Sampled	WWIS/WDS Reference Table/Library; Certification Letters Flammable Gas Analysis BDR, AK Sufficiency
Units (% vol., mg/kg, ppm) Concentration Date Analyzed	Flammable Gas Analysis BDR, AK Sufficiency
Cas # Reporting Flag D Reporting Flag U Reporting Flag N/A	Flammable Gas Analysis BDR
Flammable VOCs < 500 ppm	AK Summary Report, Content Code, Process Knowledge Summary Report

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Attachment 1 – Entering of Content Codes into WWIS/WDS

NOTE
The Content Code may be assigned by the WWIS/WDS based on the information submitted on the WDS Spreadsheet.

1. INTRODUCTION

This appendix describes the steps used to enter assigned RH Content Codes into the WDS Spreadsheet using various sources of characterization data. Entering the Content Code is performed by the waste certification staff based on the waste material contents and the layers of packaging used for each container. Content Code assignment is reviewed and approved by the WCO during container certification unless the Content Code is assigned by the WWIS/WDS.

2. ASSIGNING THE NUMERIC VALUE

Assign the Content Code based on the container waste stream assignment. The Content Code identified in AK may be confirmed by RTR or VE. Enter the Content Code in WDS Spreadsheet.

3. ASSIGNING A LETTER DESIGNATOR

The letter designator of the Content Code is assigned using packaging information from the RH TRUCON Code document.

4. OTHER

For waste packaged under a U.S. Department of Energy (DOE) Carlsbad Field Office (CBFO) audited and approved certification program (newly generated waste exempted from RTR), use the Content Code assigned in the packaging documents.

ISSUED

Effective Date: 01/22/16

WP 13-QA.03
Revision 25

Quality Assurance Independent Assessment Program

Cognizant Department: Quality Assurance

Approved by: Val Cannon

An AECOM-led partnership with B&W and AREVA

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CHANGE HISTORY SUMMARY

REVISION NUMBER	DATE ISSUED	DESCRIPTION OF CHANGES
24	3/25/15	• The following corrective actions associated with WIPP Forms (WF): WF14-256-S000, WF14-256-S001, WF14-450, WF15-005, WF15-067-S005, WF15-067-S007: — Deleted, at Introduction p. 2, the language “Assessment Checklist.” — Revised wording at p. 11 to clarify timeliness of requirement. — Insert, at p. 12, two paragraphs regarding timeliness of assessment and extension requests. — Insert at 4.2, paragraph ensuring assessment period deadlines are scheduled for completion on time. — Deleted, at fifth bullet under Assessor responsibilities, page 15, the language “to be filed with the assessment.” — Deleted, at 9.0, “Completed Assessment Checklist” from required items in assessment file. — Removed, in Attachment 6, Assessment Checklist from list.
25	01/22/16	• Added actions from the NWP QA Step Change - Time Out, and minor clarifications. • Insert at Section 4.3, Page 15 after 4th paragraph from top, the language “Consider pre-job briefings and job hazard analysis applicable to field activity being assessed.” • Insert at Section 4.3, page 15 below entry above, the language “Consider core knowledge of assessed personnel in areas such as quality assurance, and basic safety requirements (e.g. when to contact CMR, correction of errors in procedures, etc.).” • Insert at section 5.0, page 17 after 2nd bullet under “The assessment team will: Review applicable Lessons Learned and Nonconformance Reports to assess continuous improvement.” • Insert on page 6, “EFCOG Energy Facility Contractor’s Group.” • Deleted Attachment 8, *Example of NWP QA Independent Assessment Log,* along with any references to this attachment throughout the procedure.

ABBREVIATIONS/ACRONYMS

ALARA	as low as reasonably achievable
CAM	continuous air monitor
CAQ	condition adverse to quality
CBFO	Carlsbad Field Office
CDA	corrected during assessment
CFR	Code of Federal Regulations
CH	contact-handled
CMS	Central Monitoring System
CTS	commitment tracking system
DNFSB	Defense Nuclear Facilities Safety Board
DOE	U.S. Department of Energy
EFCOG	Energy Facility Contractor's Group
HEPA	high-efficiency particulate air (filter)
HVAC	Heating, Ventilation, and Air Conditioning
ISM	Integrated Safety Management
NRC	U.S. Nuclear Regulatory Commission
NWP	Nuclear Waste Partnership LLC
P-A	Price-Anderson
PPE	personal protective equipment
QA	Quality Assurance
QAPD	Quality Assurance Program Description
QSL	Qualified Suppliers List
RH	remote-handled
SDD	System Design Description
VSS	Vital Safety System
WHB	Waste Handling Building
WIPP	Waste Isolation Pilot Plant

1.0 INTRODUCTION[1]

The purpose of this document is to define and prescribe quality assurance (QA) methods and techniques used to identify, schedule, plan, perform, report, and close independent assessments, and to identify the resulting records.

This document applies to Nuclear Waste Partnership LLC (NWP) QA personnel qualified to lead and/or perform independent assessments. It also applies to cognizant managers of organizations being assessed.

Independent assessments may be performed as audits or surveillances. Audits are generally larger, more formal assessments of quality program elements or supplier programs. Surveillances are generally smaller assessments of specific activities, but may also be expanded and performed on quality program elements. Where the term "assessment" is used in this document, it applies to both audits and surveillances. Where actions apply only to an audit or surveillance, it will be so stated.

Commercial grade surveys are performed in accordance with this procedure and WP 09-CN3040, *Commercial Grade Item Dedication*.

Effectiveness reviews are conducted as surveillances to verify the effectiveness of corrective actions implemented to prevent the recurrence of significant issues, problems, or events.

Assessments may contain elements of inspections, testing, monitoring work in progress, and checking to support the reviews that comprise assessment activities.

Assessments evaluate the adequacy of program documents and implementation, including effectiveness of established programs, and processes for compliance with WP 13-1, *Nuclear Waste Partnership LLC Quality Assurance Program Description* (NWP QAPD), other QA program documents, and purchase order requirements, as applicable. Assessments focus on improving items, services, and processes by emphasizing the achievement of quality by line organizations. Regularly scheduled program assessments may be supplemented by or integrated with additional technical assessments (e.g., surveillances and limited scope audits).

Assessments are performed using reviews, interviews, observation and monitoring, and checks. Actual and/or potential deficiencies are noted. Supplier assessments verify conformance to applicable purchase orders and the QA requirements imposed by contract, or evaluate potential for providing products or services in compliance with NWP QA requirements. Scheduling is based on frequency required by regulation, ongoing project activities (e.g., previous audit results, adverse trends, or requests from other line organizations), and capabilities. Internal assessment findings and associated corrective actions are entered and tracked in the Issues Management (WIPP Form) System in accordance with WP 15-GM1002, *Issues Management Processing of WIPP Forms*.

Implementation of the program generates the following record(s), as applicable. Any records generated are handled in accordance with departmental Records Inventory and Disposition Schedules.

- NWP QA Independent Assessment Subject Master Table
- Audit Plan
- Audit Report
- Audit follow-up documentation
- Surveillance Report
- Surveillance follow-up documentation
- Independent Assessment Record File Completion Checklist
- Technical Specialist/Auditor Participation Indoctrination for Quality Assurance Audits

2.0 RESPONSIBILITIES

The Assurance Programs manager is responsible for:

- Implementation of this document.
- Ensuring that assessment personnel have sufficient authority and organizational freedom to carry out their assigned responsibilities.
- Qualification of lead auditors and QA Surveillors (surveillors) in accordance with WP 13-QA.04, *Quality Assurance Department Administrative Program*.
- Assignment of assessment team leaders.
- Concurrence with assessment team selection.
- Assignment of surveillors.

The lead assessor is responsible for:

- Selecting the assessment team.
- Identifying the need for technical assistance when performing assessments.
- Approving assessment checklists.
- Organizing and directing the assessment.
- Reporting the assessment results.

The surveillor is responsible for:

- Performing surveillances.
- Identifying the need for technical assistance when performing assessments.
- Organizing and directing the surveillance.
- Reporting the surveillance results.

3.0 DEFINITIONS

Corrected During the Assessment (CDA) – An isolated condition adverse to quality (CAQ) requiring only remedial action to correct and for which resolution can be verified through review of objective evidence prior to the exit meeting.

Finding – A condition, applicable to the program or process being audited, that deviates from specified requirements defined by codes, standards, or other established specifications (a clear violation of a clear requirement).

Observation – A condition that, if left unattended, could become a deviation from established acceptance criteria; or a suggestion that, if enacted, could strengthen the existing program.

4.0 PREPARATION FOR ASSESSMENTS

4.1 QA Independent Assessment Identification

Waste Isolation Pilot Plant (WIPP) program elements or activities requiring independent assessment are found in:

- WP 13-1, *Nuclear Waste Partnership LLC Quality Assurance Program Description*
- DOE/CBFO 94-1012, *U.S. Department of Energy Carlsbad Field Office Quality Assurance Program Document*
- Hazardous Waste Facility Permit NM4890139088-TSDF

Additional programs, processes, or activities important to compliance application, nuclear safety, waste characterization, or the isolation of waste within the disposal system require independent assessments to verify adequate and effective performance. These programs are found in:

- Defense Nuclear Facilities Safety Board (DNFSB) Recommendation 2000-2, *Configuration Management Vital Safety Systems*
- DOE/WIPP-04-3310, *WIPP Environmental Policy Statement*
- DOE/WIPP-07-3372, *Waste Isolation Pilot Plant Documented Safety Analysis*
- DOE/WIPP-07-3373, *Waste Isolation Pilot Plant Technical Safety Requirements*
- EFCOG Contractor Guide For Performance of Effectiveness Reviews
- NWP procedures that prescribe assessments

Supplier audits are based on requests for new suppliers to be added to the NWP Qualified Suppliers List (QSL); those suppliers currently on the QSL which are due for reevaluation, or have their authorized scope changed; and suppliers providing products or services under Title 10 *Code of Federal Regulations* (CFR) Part 71, that require a facility audit every three years. These requests and reevaluations are processed in accordance with WP 13-QA3012, *Supplier Evaluation/Qualification*.

The Assurance Programs manager or assigned cognizant individual will:

- Review WIPP requirements documents and identify needs for independent assessments based on both written requirements for independent assessments and other programs or processes that affect safety, storage of waste, or the environment, the importance of which necessitates assurance of compliance.
- Upon notification from a QA procurement reviewer or a NWP Contracting Officer that a project is scheduled to begin or is ongoing, evaluate the need for initial and follow-on independent assessments based on this section 4.0.
- Review the potential assessment to be added using the criteria in the Assessment Priority Determination Tables (provided in attachment 1). Document a decision for either an audit or a surveillance on the NWP QA Independent Assessment Subject Master Table (example provided in attachment 2).
- Determine a frequency at which the assessment should be performed. If established by the requirement, that frequency is to be used. If not established by requirement, determine an adequate frequency based on relative risk, hazards, and complexity of the processes and activities to be evaluated. Also consider the scope and coverage of previous oversight activities, and historical

performance. Document the frequency on the NWP QA Independent Assessment Subject Master Table.

— Ensure assessments required by Code of Federal Regulations (CFRs) or DOE Orders and that provide for a specific assessment period (i.e., complete process assessed every 3 years) are completed within the required period. As required, Technical Specialists shall meet all qualifications.

— Ensure appropriate notifications are made to request exemption or extension in the event any assessments required by CFR or DOE Orders and that provide for a specific completion period cannot be completed due to unforeseen circumstances.

4.2 QA Independent Assessment Scheduling

Assessments will be scheduled to begin as early in the life of a project or activity as practicable, and will continue at intervals consistent with the schedule for accomplishing the work.

The Assurance Programs manager or assigned cognizant individual will:

- Evaluate the timing of the first, or next, occurrence for the assessment to be scheduled against all current or planned assessments. Consider resources, date required, time available, known regulatory oversight preparedness needs, associated historical issues, and client expectations, then schedule the assessment to best accommodate the need.

- Document internal and external (supplier) audits on the NWP QA Fiscal Year Electronic Audit Schedule. Suppliers of parts and materials, and services regulated by 10 CFR 71, Subpart H, will require the performance of a site audit on a triennial basis. (Reg. Guide 7.10, section 18.2)

- Develop additional informal schedule tools to track assessments, as necessary.

  — Ensure assessments required by CFRs or DOE Orders that provide for a specific assessment period (i.e., complete process assessed every 3 years) are scheduled for completion within the required period.

- Revise or update QA assessment schedules, as applicable, to reflect current needs.

- Make schedule(s) available to Carlsbad Field Office (CBFO) via the NWP QA webpage link.

4.3 QA Independent Assessment Planning

Assessments include audits and surveillances. Direction regarding assessments applies to both audits and surveillances. The term "assessor" denotes the person performing either the audit or surveillance, as appropriate. Any direction specific to either audits or surveillances is indicated where applicable.

The Assurance Programs manager or delegate will:

- Assign a qualified lead auditor to lead/perform audits. Determine if an audit team is necessary due to size or complexity of the scope.

- Assign a qualified surveillor or qualified lead auditor to perform surveillances.

The lead auditor/surveillor will:

- Obtain from the assessment coordinator an audit or surveillance number that denotes the type of assessment ("I" or "E" for internal or external audit, or "S" for surveillance, the fiscal year, and a sequential number beginning with 01 (e.g., I06-01, E06-01,S06-01).

- Contact the cognizant individual for internal audits/surveillances or the supplier for external audits/surveillances to determine any safety/security issues and precautions of which the team should be aware. This includes Personal Protective Equipment (PPE), badging, logistics information, etc. Document the safety/security issues and precautions in the audit plan.

- Select an assessment team, if a team is needed, based on the scope, complexity, or special nature of the work being assessed, technical qualifications, knowledge of the items and activities being assessed, availability, experience, and the prospective assessor's ability to provide an objective contribution.

- Ensure the following, as applicable:

    — Personnel having direct responsibility for performing the activities being assessed shall not be involved in the selection of the team. Team members shall have the authority to carry out their assigned responsibilities and be independent from the items and/or processes being assessed. Assessors shall be authorized in accordance with WP 13-QA.04, and/or perform under the supervision of a lead auditor.

    — During assessments, Technical Specialists may be used when evaluating the adequacy of technical processes. The lead assessor will determine when technical specialist support is needed and will document the determination in the body of the report. Technical Specialists will be indoctrinated by the lead assessor commensurate with the scope, complexity, or special nature of the work being assessed, and of the

assessments process associated with their duties. The indoctrination will be documented using a format similar to that defined in attachment 9. Attachment 9 may also be used to indoctrinate other assessors from the assessment group, at the discretion of the lead assessor.

— External peers or subject matter experts may be used as necessary to support assessment activities.

- Ensure that the team members collectively have appropriate training and experience commensurate with the scope of the assessment.

- Indoctrinate the audit team to the audit process, as needed, and their associated tasks before the audit. Include a review of potential hazards and plan accordingly for proper PPE (personal protective equipment), ALARA (as low as reasonably achievable), and additional controls deemed necessary. Document the indoctrination using a format similar to that defined in attachment 9.

- Prepare the audit plan, for both internal audits and external supplier audits, using guidance in attachment 3, and obtain QA management approval. The audit plan will include purpose, scope (including the work to be assessed and related corrective actions since previous assessments), requirements, audit personnel, organizations to be notified, applicable documents, written procedures to be used, schedule, safety/security issues and precautions, and background. Background should include previous findings, Corrective Action Requests, and weaknesses noted within the intended scope. For external supplier assessments, obtain supplier history from the QSL file or Coordinator.

- Review, with team members, any plan generated, pertinent background information that includes previous audit or oversight results, applicable procedures, and applicable technical documents so that team members are familiar with the work being assessed.

- If the assessment is external, notify the affected organization or company management by correspondence of the scheduled assessment, identifying the scope of the assessment. The notification need not include the audit checklist.

- Determine, with QA management, when internal surveillances are to be formally announced prior to performance. In such cases, notify the organization to be surveilled by correspondence of the surveillance, its scope, and schedule.

Assessor(s) will:

- Refer to the NWP QA Independent Assessment Subject Master Table for identification of requirements documents from which assessment criteria should be developed.

- Develop the criteria to be used during the assessment based on approved requirements; will also consider the following when developing criteria:

  — For internal assessments, include criteria, as applicable, to assess application of Integrated Safety Management (ISM) in accordance with Management Policy MP 1.28, *Integrated Safety Management*, and WP 15-GM.03, *Integrated Safety Management System Description*. The Safety Management Responsibilities section of the latter document provides a source from which criteria can be generated. For internal assessments, the intention is to review the ISM controls in evidence or exhibited in the activity being assessed. For external assessments, ISM controls may be considered regarding the hazards that the assessor could encounter (e.g., anticipated hazards mitigated by adequate PPE).

  — Although Graded Approach is assessed separately, consider possible criteria in accordance with WP 09-CN3005, *Graded Approach to Application of QA Controls*.

  — Consider Conduct of Operations criteria applicable to the activity being assessed.

  — Consider environmental controls or environmental response to unusual occurrences applicable to the activity being assessed.

  — Consider software controls applicable to the activity being assessed.

  — Consider pre-job briefings and job hazard analysis applicable to field activity being assessed.

  — Consider core knowledge of assessed personnel in areas such as quality assurance, and basic safety requirements (e.g. when to contact CMR, correction of errors in records, etc.).

- When assessing a WIPP Vital Safety System (VSS), develop criteria from the following:

  — Applicable portion of WP 09-CN3025, Annual System Health/Walkdown/Requalification, Attachment 1, Assessment Boundary for Vital Safety System Definitions

  — General for VSS assessments - Timely closure of modifications, Cognizant Engineer walkdowns, periodic maintenance performed as required in System Design Descriptions (SDDs), maintenance performed in accordance with manufacturer recommendations, combustible materials in the disposal circuit in the underground, software QA

- For an audit, develop the audit checklist(s) under the direction of the lead auditor using the guidance in attachment 4. Checklist line items are generally written as directions to verify conformance of the activity being evaluated with established requirements, or as questions whether or not the activity being evaluated conforms with the requirement.

- For a surveillance, the criteria may be identified briefly on the Surveillance Report or on a detailed checklist. Examples of brief criteria include, "observe actions based on steps XX through and including YY," or "observe waste hoist lifting activity for adherence to Procedure XXX, Revision Y, Section ZZ," or "review 15 WIPP Forms for adequacy, completeness, and implementation of corrective actions," etc. Criteria typically are found in QA manuals and program plans, procedures, previous assessments and corrective action documents, and contract requirements.

- For Effectiveness Reviews of completed corrective actions for 'significant' WIPP Forms, P-A externally-reportable issues, etc., develop criteria considering the following:

  — Effectiveness reviews are performed to verify the effectiveness of corrective actions that have been implemented to prevent the recurrence of significant issues.

  — Effectiveness is measured by a significant change in one or more of these four measures:

    1. The probability of the original event recurring

    2. The frequency of the problem recurring

    3. Reduction in the magnitude or severity of the problem

    4. Elimination of the original problem

5.0 ASSESSMENT PERFORMANCE

The lead auditor/surveillor will:

- For audits and external surveillances (optional for internal surveillances), conduct an entrance meeting with the assessment team and appropriate personnel representing the assessed organization(s). The entrance meeting is intended to introduce the assessors, explain the purpose, scope, and schedule for the assessment, and establish interfaces and contacts with the organization being assessed.

- For Effectiveness Reviews of completed corrective actions for 'significant' WIPP Forms, Price-Anderson (P-A) externally reportable issues, etc., perform the assessment using one or more of the following methods. The method selected

should be appropriate for the specific corrective/preventive actions. The direct observation method is the method of preference, but other methods should also be applied, as necessary.

— Observe the work or performance of an evolution.

— Conduct facility inspections or activity monitoring.

— Utilize past performance indicators to track any ongoing recurrences.

— Review databases or similar problems.

— Run a test to challenge the system or process (if applicable).

— Run a mock item through the process, or complete a performance test (if applicable).

— Perform a walkthrough of the work, process, or evolution.

— Interview impacted managers and workers on their understanding of, and involvement with, the implemented corrective actions.

— Review a documented, previously completed equivalent evaluation of the original problem prior to initiating the effectiveness review.

The assessment team will:

- Evaluate the applicable quality program element(s) by examining objective evidence, observing activities in progress, examining items (including components, specimens, and machinery, etc.), and/or interviewing personnel responsible for the activity. Include technical evaluations of the applicable procedures, instructions, activities, and items, as appropriate. Objective evidence related to the planning and technical aspects of the work performance is to be examined to the depth necessary to determine if these elements are being implemented effectively.

- Review previous corrective actions, as applicable, to evaluate implementation and effectiveness when recurring problems are found.

- Review applicable Lessons Learned and Nonconformance Reports to assess continuous improvement.

- Observe, to the extent possible, actual operations to verify conformance to requirements.

- Record the results of the evaluations performed on the assessment checklist or surveillance report, as applicable.

- Record, on the assessment checklist or surveillance report, as applicable, objective evidence examined, including all documents reviewed, with sufficient detail so that any conditions or practices may be noted in the report with adequate detail. Include, as applicable, document number, title, and revision.

- Record, on the assessment checklist or surveillance report, as applicable, the results of observations of processes or items, including the quantity of items examined to indicate the size or breadth of the examination. Identify the items, where possible.

- Record, on the assessment checklist or surveillance report, as applicable, the names of personnel interviewed.

- Inform the lead auditor/surveillor of progress and/or problems with assigned tasks periodically during the assessment.

- Notify immediately the lead auditor/surveillor if conditions are identified during an internal audit or surveillance that qualify as an event or potentially reportable occurrence under the requirements of 10 CFR Part 21, 10 CFR Part 71, WP 12-ES3918, Reporting Occurrences in Accordance with DOE Order 232.2, etc.

- Notify immediately the lead auditor/surveillor if conditions are identified that are believed to be unsafe. If an internal assessment condition requires immediate work stoppage, proceed as directed in MP 1.2, *Stop-Work Policy*. During external assessments, notify the supplier management, or their designated point-of-contact.

- Acknowledge and track any CDAs. Verify that the actions completed correct the condition. Document CDAs on a WIPP Form, in accordance with WP 15-GM1002, for trending.

The lead auditor/surveillor will:

- Notify QA management and the management of the assessed organization as soon as practicable if conditions are discovered that could have a significant adverse impact on prior work or affect work in progress, or if conditions require prompt attention. If conditions require immediate attention as defined in WP 12-ES3918 or MP 1.2, perform action as directed by the appropriate document.

- Notify the management of the assessed organization as soon as practicable of any issues identified, to assure accuracy, and allow opportunity for resolution during the assessment.

- Notify Packaging Manager of issues that affect nuclear packaging (TRUPACTs, HalfPACTs, etc.) or are otherwise potentially reportable to the U.S. Nuclear

Regulatory Commission (NRC), to allow them to screen for reportability under 10 CFR Part 21 or 10 CFR Part 71, etc.

- For audits and external surveillances, conduct an exit meeting with appropriate personnel representing the assessed organization(s). The exit meeting is intended to provide a general overview of the evaluation of the program element and any issues requiring attention. Issues identified as audit findings or CDA shall be entered into the Issues Management Processing System the next business day.

6.0 ASSESSMENT REPORTING

The reporting of the assessment, if performed as an audit or external surveillance, will follow the guidance provided in attachment 5 and, if performed as an internal surveillance, will use the example provided in attachment 7.

Assessments that involve sensitive (e.g., permit- or personnel-related) information are to be coordinated through the NWP Legal Counsel. The lead auditor/surveillor and QA management will determine the necessary reviewers (i.e., NWP Legal Counsel, etc.) for proper processing of such assessment information.

The lead auditor/surveillor/manager will:

- Prepare the assessment report with the assistance, as necessary, of the assessment team, and sign the report.

- Ensure that the assessment report includes the following, as appropriate:

  — Assessment purpose and scope (surveillances to include criteria used)

  — Identification of assessors

  — Identification of personnel contacted

  — Identification of documents reviewed, including revision indicator

  — Summary statement(s) indicating program (or program element) adequacy, implementation, effectiveness (applicable to scope), and a brief statement of ISM evaluations performed

  — Commendable practices or situations (if any are identified)

  — Findings (conditions adverse to quality, if any are identified) – Enter internal (NWP) conditions adverse to quality into the Issues Management System using the WIPP form in accordance with WP 15-GM1002. Identify findings in the report as directed in attachments 5 and 7. Concisely describe in the report (and on the WIPP Form for internal findings) the specific condition that deviates from the

requirements, with sufficient detail to enable remedial actions to be taken by the audited organization, and subsequent closure by QA. Clearly quote or state the requirement from which the deviation was noted. Group findings of a common nature together whenever possible so that systematic breakdowns can be identified. Evaluate findings based on the relative importance to indicate the degree of impact on compliance application, waste characterization, repository performance assessment, waste isolation, waste transportation, nuclear safety, environmental protection, or management and operation of the WIPP facility.

— Observations (if any are identified) - Concisely state either the condition observed that, if left unaddressed, could deteriorate into a finding, or the suggestion that could strengthen the existing program or process.

— Corrected During Assessment (CDA) - Concisely describe the CAQ found, the requirement from which the condition deviated, and the action(s) taken to resolve the condition. Document CDAs on a WIPP Form, in accordance with WP 15-GM1002, for trending.

— Include the following statement in external supplier audit reports:

(Name of Company) will be (select "retained on," "added to," "added to pending successful resolution of finding," or "removed from") the NWP QSL for (state the scope or limitations of products or services authorized).

— Include the following statement in audit reports for suppliers currently on the NWP QSL:

If the agreements and commitments contained herein are deemed by the supplier to involve a change in the order concerning work scope, price, or schedule, it is agreed that such work will not commence or continue until authorized by a written change notice. It is understood that if the supplier commences such work without a written change notice, it is at the supplier's risk.

- Using cover correspondence, issue the assessment report to all affected entities within 45 calendar days of conclusion of the audit. The 45 calendar day time limit may be extended at the discretion of the Assurance Programs manager.

— Cognizant department manager (all reports)

— Compliance Coordinator (all reports)

— Commitment Tracking System (CTS) Coordinator (external reports containing findings)

— Facility point-of-contact (external reports)

— QSL Coordinator (external qualification or requalification audits)

— Packaging Manager (reports affecting packaging)

— Assessment Coordinator (all reports)

— Lessons Learned Coordinator (reports containing findings determined by the lead auditor/surveillor/management to be potential Lessons Learned issues)

— QA assessment file for this assessment

— Others as designated by QA management

Because internal findings are transferred to WIPP Forms, internal reports are considered closed at the time of issue. For external audit reports, include direction to the supplier for responding to any findings.

- Document internal CDAs on a WIPP Form, in accordance with WP 15-GM1002, for trending.

- For external supplier qualification audits, complete the Supplier Evaluation/QSL Update Request Form in accordance with WP 13-QA3012, and forward to the QSL Coordinator.

It is recommended to electronically file a copy of the completed checklist and the report in the applicable assessment folder within "Assessment Reports" in the shared folder WQNRA on the Torreon server.

7.0 ASSESSMENT RESPONSE

The cognizant manager of the assessed WIPP organization will review the assessment (audit or surveillance) results assigned to their organization on the WIPP Form, and respond using the Issues Management (WIPP Form) process in accordance with WP 15-GM1002.

The facility contact (for external assessments) is expected to respond as directed in the issuing cover letter and report. Any request for extension of corrective action due date shall be reviewed by the Assurance Programs Manager or designee.

8.0 ASSESSMENT FOLLOW-UP

In accordance with WP 15-GM1002, the WIPP Form screening committee will assign the lead auditor/surveillor/manager as a technical reviewer of actions/corrective action plans developed in response to a WIPP Form issued as the result of an internal audit/surveillance finding. As a technical reviewer, the lead auditor/surveillor/manager

will be responsible for determining the long-term effectiveness of the corrective actions, and will be expected to sign the Corrective Action Plan, so indicating, in accordance with WP 15-GM1002. Issues that cannot be resolved will be referred to management.

For external supplier audit or surveillance findings and the resulting supplier's committed actions will be tracked in CTS; the lead auditor/surveillor/manager will review the supplier's actions, and report completion based on the supplier's approved commitment(s).

9.0 ASSESSMENT CLOSURE AND FILING

The lead auditor/surveillor/manager will:

- For external supplier audits or surveillances with findings, verify that the corrective actions were completed as committed, issue a closure letter to the supplier and any other affected organizations, and ensure that copies are distributed to the QSL Coordinator (if applicable) and the Compliance Coordinator.

- Review, using the file checklist (attachment 6), the assessment file for completeness: purge working documents, sign the checklist, notify the assessment coordinator, and forward the complete file to the QA file. The assessment file is to include:

  — Audit Plan (for audits)

  — Completed Assessment Report (including identification of documents reviewed and personnel contacted)

  — Assessment response (for external assessments)

  — Corrective Action completion, follow-up, and verification (for external assessments)

  — Other documentation determined to be necessary to support the assessment (closure correspondence, etc.)

REFERENCES	
DOCUMENT NUMBER AND TITLE	KEY STEP
10 CFR Part 21, "Reporting of Defects and Noncompliance"	
10 CFR Part 71, "Packaging and Transportation of Radioactive Material"	
Reg. Guide 7.10, *Establishing Quality Assurance Programs for Packaging Used in Transport of Radioactive Material (NRC)*	
DNFSB Recommendation 2000-2, *Configuration Management Vital Safety Systems*	
DOE O 226.1B, *Implementation of Department of Energy Oversight Policy*	
Hazardous Waste Facility Permit, Waste Isolation Pilot Plant, Permit #NM4890139088 TSDF, Issued by New Mexico Environment Department	
DOE/CBFO 94-1012, *Carlsbad Field Office Quality Assurance Program Document*	
DOE/WIPP 04-3310, *WIPP Environmental Policy Statement*	
DOE/WIPP-07-3372, *Waste Isolation Pilot Plant Documented Safety Analysis*	
DOE/WIPP-07-3373, *Waste Isolation Pilot Plant Technical Safety Requirements*	
EFCOG Contractor Guide for Performance of Effectiveness Reviews	
MP 1.28, *Integrated Safety Management*	
WP 09-CN3005, *Graded Approach to Application of QA Controls*	
WP 09-CN3025, *Annual System Health/Walkdown/Requalification*	
WP 09-CN3040, *Commercial Grade Item Dedication*	
WP 12-ES3918, *Reporting Occurrences in Accordance with DOE Order 232.2*	
WP 13-1, *Nuclear Waste Partnership LLC Quality Assurance Program Description*	**1**
WP 13-QA.04, *Quality Assurance Department Administrative Program*	
WP 13-QA3012, *Supplier Evaluation/Qualification*	
WP 15-GM.03, *Integrated Safety Management System Description*	
WP 15-GM1002, *Issues Management Processing of WIPP Forms*	
WP 15-GM1003, *Stop Work Process*	

Attachment 1 – NWP QA Internal Assessment Priority Determination Tables

Determine whether the assessment will be performed as an audit or surveillance using the tables below:

- Review the assessment to be performed against the criteria in the Risk and Hazard Table to determine a numeric value.
- Review the assessment also against the criteria in the Importance and Complexity Table to determine a numeric value.
- Multiply the two numeric values.
- Use the Assessment Priority Table and the number derived from the previous bullet to determine the priority of the assessment to be performed and schedule the type of assessment indicated.

Risk and Hazard Table	
Description	Probability and Consequence Level
If not performed, improbable undetected impact on environment safety, health, safeguards and security, emergency management, cyber security, or QA	1
If not performed, possible minor undetected impact on environment, safety, health, safeguards, and security, emergency management, cyber security, or QA	2
If not performed, possible major undetected impact on environment, safety, health, safeguards, and security, emergency management, cyber security, or unknown status of QA program, or possible continuation of negative trend or repetitive nonconformance	3

Importance and Complexity Table	
Description	Importance and Complexity Level
Necessary to verify actions in document other than a requirement-source or implementing procedure	1
Necessary to verify an action required by an implementing procedure	2
Necessary to complete an assessment required by an implementing procedure	3
Necessary to complete an assessment required by an implementing procedure, and complex in nature	4
Necessary to complete a specific program assessment requirement, or commitment (both non-complex and complex in nature)	4

Attachment 1 – NWP QA Internal Assessment Priority Determination Tables

Assessment Priority Table		
Derived Numeric Value	Priority	Action
1-4	Low	Schedule Surveillance
5-8	Medium	Schedule Surveillance or Audit
9-12	High	Schedule Audit

Attachment 2 –Example of NWP QA Independent Assessment Subject Master Table

NWP QA INDEPENDENT ASSESSMENT SUBJECT MASTER TABLE							
Area of Interest	**Source/Reference**	**Risk/Hazard**	**Complexity**	**Priority**	**Audit**	**Surv**	**Frequency**
Management System NWP Organization Facility Ops Chain of Command QA Organization	Source WP 13-1, R.27, §1.1 Reference DSA/TSR 10 CFR 71 Subpart H	3	4	12	**X**		Biennial (frequency not specified in 830.122, NQA-1, WP 13-1, R.27, or WP 13-QA.03)
Personnel Qualification and Training **Facility Staff Qualifications Training** **Qualified Operators**	Source WP 13-1, R.27, §1.2 Reference DSA/TSR 10 CFR 71 Subpart H DSA/TSR	3	4	12	**X**		Biennial

Attachment 3 – Audit Plan Guidance

NUCLEAR WASTE PARTNERSHIP LLC
QUALITY ASSURANCE AUDIT PLAN
Title of audit (subject)

Audit number

Audited organization(s) (and location if supplier audit)

1. Purpose and Scope of the audit

2. Applicable Requirements Documents
   WP 13-1, *NWP Quality Assurance Program Description*
   (Any others, including regulatory documents containing requirements)

3. Procedure(s) to be used to perform the audit
   WP 13-QA.03, *Quality Assurance Independent Assessment Program*

4. Hazards, Safety/security issues
   Precautions
   Badging, logistics information
   PPE (if any)

5. Audit Team
   Lead Auditor
   Team Auditors (if any)
   Technical Expertise (if any)
   Anticipated Observers (if any)

6. Schedule
   Pre-Audit Meeting
   Audit Activities
   Post-Audit Meeting

7. Background
   Previously reported findings (if any)
   Previous corrective action issues (if any)
   Previously reported weaknesses (if any)

8. Signatures:

Prepared by: _____ Approved by: _____
(Printed Name) (Printed Name)
Lead Auditor Manager, Assurance Programs

Attachment 4 – Example of NWP Quality Assurance Assessment Checklist

(The following table is shown on first page only, followed by the second table as space allows.)

NWP Quality Assurance Assessment Checklist	
Organization Assessed: _____	Assessment Number: _____
Requirements Documents: _____	Dates of Assessment: _____
Assessor(s): _____	**Key: S=Satis., U=Unsat., N=N/A**

(The top row of the following table is a header to be shown on each page to which this table expands with usage.)

Item	[Type in Assessment # here] Assessment Item	Reference Document(s)	**Key**	Assessor Comments
	(Add rows as needed)			

(The following signature line is shown on the last page only, following the end of the above table.)

Approved by: _____ _____
Lead Auditor/Surveillor (print name and sign) Date:

Notes: Refer to the NWP QA Independent Assessment Subject Master Table for identification of requirements documents from which assessment criteria should be developed.
Review any corrective actions committed as a result of the previous assessment; develop criteria to evaluate their effectiveness.
Develop criteria that evaluate a broad range of the requirements with enough detail to be meaningful in verifying compliance and effectiveness.
Develop criteria to evaluate effectiveness of Graded Approach and the ISM system.

Attachment 5 – Audit Report Guidance

Nuclear Waste Partnership LLC
Quality Assurance (select either **Internal** or **External**) **Audit Report**
[Descriptive, yet concise **title** - if external, provide company and address]
[**Audit Number**]

I. Executive Summary: Concise summary (generally one page or less), written in paragraph format including brief mention of organization audited (include location for external supplier) and audit date, abbreviated purpose and scope, results in general terms, conclusion of program adequacy (including ISM), any commendable situations noted, and any major issues requiring further action.

II. Audit Details

Purpose and Scope (more detailed than the Executive Summary)
Criteria used (identify or make reference to checklist, and specifically address ISM)
Audit Team
Inclusive dates of audit
Location(s) of audit
Conclusion(s) regarding compliance, effectiveness, and ISM evaluations performed.
Include a statement addressing the number of findings, observations, and/or "CDAs."
An acceptable method would be, "The assessment resulted in 2 Findings, 0 Observations, and 3 issues closed during the assessment."
Commendable practices or activities (if applicable)

[Include the following statement, as applicable, in assessment reports containing findings.]

Response to Findings (external supplier audits only) - When responding to audit findings, the following elements are required to be addressed:

- Cause of nonconformance
- Interim actions planned to correct the nonconformance
- Evaluation of the extent of the condition beyond that cited in the report
- Actions planned to prevent recurrence
- Schedule of implementation/completion

Findings (are to be numbered as [audit no.]-F-[sequential number beginning with 01], and internal findings are to also cross-reference to the WIPP Form Number. Example – "S04-027-F-01 issued as WF04-120")

- Condition noted
- Requirement not met

Observations (numbered as [assessment no.]-O-[sequential number beginning with 01])

- Condition (noted, or considered to be an improvement)

Attachment 5 – Audit Report Guidance

Conditions corrected during the assessment (numbered as [assessment no.]-CDA-[sequential number beginning with 01])

- Condition noted
- Requirement from which condition deviated
- Action taken, and verification of completion
- Initiate WIPP Form for CDA

[Include the following statements in external supplier audit reports]

[Name of company] will be [select "retained on," "added to," "added to, pending successful resolution of findings," or "removed from"] the NWP Qualified Suppliers List for [state the scope or limitations of products or services authorized].

If the agreements and commitments contained herein are deemed by the supplier to involve a change in the order concerning work scope, price, or schedule, it is agreed that such work will not commence until authorized by a written change notice. It is understood that if the supplier commences such work without a written change notice, it is at the supplier's expense.

III. Attachments:

1. Table of Personnel Contacted
2. Table of Documents Reviewed
3. (Any other information deemed appropriate for attachment)

IV. Signatures:

Prepared by: _____ _____
(Printed Name) Date

Approved by: _____ _____
(Printed Name) Date
Manager, Assurance Programs

Attachment 5 – Audit Report Guidance

Attachment 1 Table of Personnel Contacted

[A] Attended Audit Entrance Meeting
[B] Contacted During the Audit
[C] Attended Audit Exit Meeting

Personnel Contacted	A	B	C
(Added rows as needed)			

Attachment 2 Table of Documents Reviewed

Document Identification	Document Title or Description
(Add rows as needed)	

Attachment 6 – Example of Independent Assessment Record File Completion Checklist

INDEPENDENT ASSESSMENT RECORD FILE COMPLETION CHECKLIST	
Assessment No. _____	
	Complete
Audit Team/Technical Specialist Indoctrination	☐
Assessment Plan (required for audit, optional for surveillance)	☐
Assessment report	☐
Assessment response (if external assessment contained findings)	☐
Closure letter (if external assessment contained findings)	☐
Other	
_____	☐
_____	☐
_____	☐
_____	☐
I have reviewed the above listed records and verified their completeness and legibility.	
_____	
Lead Auditor/Surveillor Signature Date	

Attachment 7 – Example of Surveillance Report

Nuclear Waste Partnership LLC Quality Assurance **(make this a header row)** **Surveillance Report Number:** **Date:**	
Subject	Organization(s) Surveilled
Scope Surveillor(s)	
Requirement References (include revision no.)	
Surveillance Criteria [ ] Checklist on file in QA	
Personnel Contacted (* indicates persons to whom a copy of this report is to be distributed)	
Documents reviewed [ ] See attachment	
Details/Results/Conclusions [ ] WIPP Form(s) identified in Findings	
[Print and Sign] Date Lead Auditor/Surveillor	[Print and Sign] Date Manager, Assurance Programs
cc: Manager of assessed organization, WIPP Form Coordinator (if containing findings), Compliance Coordinator, Assessment Coordinator, Packaging Manager (if containing packaging issues) Page 1 of (total)	

Make the top row a header to appear on every page.
Insert pagination (page X of Y) at the bottom center.

Attachment 8 – Technical Specialist/Auditor Participation Indoctrination for Quality Assurance Audits Example

Technical Specialist/Auditor Participation Indoctrination
for Quality Assurance Audits
Audit XXX0XX
(Audit Title)

In preparation for participation as a Technical specialist/Auditor, this documentation serves as a record that the below listed individual has been indoctrinated per the requirements of the NWP QAPD, and procedure WP 13-QA.03.

Items discussed:

- Applicable portion of the NWP QAPD
- Applicable section of WP 13-QA.03, which includes audit checklist preparation and completion, documentation required during the audit process, and the audit report format.
- Applicable requirements documentation associated with this audit.
- Expectations of an Auditor.
- Potential hazards. Plan accordingly for proper PPE, ALARA, and additional controls deemed necessary, i.e., badging, logistics, etc.

Experience Background:

(Enter short biography for each specialist [auditor as desired] detailing previous experience and qualifications.)

Technical Specialist/Auditor:

Print Name	Signature

Lead Auditor:

Print Name	Signature

ISSUED

WP 15-GM1002

Revision 4

Issues Management Processing of WIPP Forms

Management Control Procedure

EFFECTIVE DATE: 06/09/15

R. L. McQuinn
APPROVED FOR USE

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CHANGE HISTORY SUMMARY

REVISION NUMBER	DATE ISSUED	DESCRIPTION OF CHANGES
0	07/29/13	• This document replaces WP 04-IM1000.
1	09/30/13	• Removed all references to CCP-QP-029 from document. • Added to the Introduction: — Statement that CARs issued by CBFO will be processed in accordance with WP 13-QA3007. — Issues with equipment or material condition of structures or systems will not normally be processed using IMPS. — The WIPP Form Screening Committee Chairperson may screen WIPP Forms identifying issues that cannot use IMPS. • Added to the Note above step 2.1 that a subordinate WIPP Form may address issues identified multiple times. • Added the WIPP Form Screening Committee Chairperson to step 3.1. • Added the Note above step 4.1 on Cause Codes not needing to be assigned to a CAP that are identified as process improvements. • Added to step 2.0 of attachment 1 a statement on No cause-Process Improvement is entered for WIPP Forms identified as process improvement.
2	04/03/14	• Added Note above substep 3.3.10 regarding the IMPS. • Revised substep 3.3.10[B] for instructions if an issue is determined to be a SCAQ. • Added substep 3.3.10[C] regarding if an issue is NTS reportable. • Deleted susbsteps 4.1.2[B], 4.1.3, 4.1.4[B]. 4.1.6, and 4.1.7 regarding instructions to obtain signatures. • Changed in Note above step 4.2, "CARs" to "WIPP Forms." • Revised step 5.1.3 to correct the method of providing objective evidence for CAP closure. • Minor editorial changes throughout.
3	01/05/15	• This revision incorporates changes needed to move the WIPP Form process to the IMPS and is driven by WF 13-337/WF14-030-S021.

REVISION NUMBER	DATE ISSUED	DESCRIPTION OF CHANGES
4	06/09/15	This revision is driven by WIPP Forms WF15-135 and WF 15-207. • Added verbiage to Definitions section to clarify definition of Action Level 3 designation. • Added verbiage to substep 2.1.1 and substep 2.1.2 regarding information that should not be included on the WIPP Form. • Revised in Definitions section Extent of Condition definition. • Changed the wording in last bullet of step 6.2 for clarification. • Revised section 7.0 for AL 3 WIPP Form closure to remove WIPP FORM Coordinator review of objective evidence, reinforcing the responsibility of the Responsible Manager. • Updated attachment 4 to provide instructions for entering compensatory measures.

INTRODUCTION [1, 2]

This procedure prescribes the process for initiation, tracking, resolution, and closure of issues or process improvements identified on Waste Isolation Pilot Plant (WIPP) Forms.

Any WIPP Employee working under the Nuclear Waste Partnership LLC (NWP) Quality Assurance (QA) Program can generate and submit a WIPP Form. WIPP Forms will be submitted for any issue that is a Condition Adverse to Quality (CAQ) regardless of significance, including safety and quality issues. NWP employees are encouraged to submit WIPP Forms when process improvements are identified. If one of the following conditions is met, a WIPP Form should be generated for a process improvement:

- Documentation of completion of the process improvement is needed by the cognizant manager.
- The process improvement involves the commitment and coordination of more than one work group to complete (this includes the need for formal training to implement the improvement)

In addition to submitting a WIPP Form, issues may require reporting to meet the requirements of the following programs:

- The Price-Anderson Amendments Act (PAAA)
- Worker Safety and Health Program (10 *Code of Federal Regulations* [CFR] 851)
- Occurrence Reporting and Processing System (ORPS)
- Reports required by oversight and regulatory agencies (e.g., Department of Energy, Environmental Protection Agency, New Mexico Environment Department)

Issues identified through the External Oversight Activities per WIPP Procedure (WP) 13-QA3007, *External Oversight Activities*, will be processed through the Issues Management Processing System (IMPS) with the exception of Carlsbad Field Office (CBFO) Corrective Action Requests (CARs). CARs issued by CBFO will be processed in accordance with WP 13-QA3007. WIPP Forms generated to document issues from External Oversight Activity reports will not be entered into IMPS until the report has been finalized and issued by the agency performing the oversight activity.

CAQs that are corrected during an assessment (CDA) (e.g., Management Assessments, Independent Assessments [audits or surveillances], Monitored Operational Evolutions, Accident Investigations, External Oversight issues) will be identified on WIPP Forms for trending purposes only.

The WIPP Form does not take the place of nor can it be used to circumvent the following approved/authorized processes:

- The Stop Work process
- Required notifications to the Central Monitoring Room (CMR) including the stop work process when immediate safety issues occur
- Human Resources employee concerns process
- Grievances
- Routine communications or the open door policy

The WIPP Form Screening Committee Chairperson may refer and close WIPP Forms identifying issues or containing personal identification information (PII) that should be addressed by Human Resources (e.g. employee concerns, grievances). When this action is performed, the WIPP Form Screening Committee Chairperson will document the determination and disposition on the WIPP Forms after ensuring that the issue has been entered appropriately in the correct WIPP process. The WIPP Form Screening Committee Chairperson will report these actions to the WIPP Form Screening Committee.

Managers will foster a "no-fault" attitude and encourage their staff to report issues and suggest improvements. Prompt notification of issues allows management to prioritize and focus resources in a manner to best address the issues having the greatest potential for:

- Posing adverse risks to human health or the environment.
- Adversely impacting the quality, safety, and reliability of WIPP operations.
- Affecting the ability to meet quality requirements.

The WIPP Form Screening Committee typically meets weekly or as deemed necessary by the WIPP Form Screening Committee Chairperson. Committee members are identified in accordance with Management Charter 1.7, *WIPP Form Screening Committee*, and will screen WIPP Form(s) to ensure that the issue is assigned to the appropriate manager(s) for resolution, that the issue is assigned an appropriate significance level, and that the issue is assigned appropriate disposition and trend codes. The Committee will also ensure that the proposed corrective actions appropriately address the issue and that closure documentation provides objective evidence that the corrective actions have been completed for Significance Level 1 WIPP Forms.

Performance of this procedure generates the following record(s), as applicable. Any records generated are handled in accordance with departmental Records Inventory and Disposition Schedules.

- Closure Screening Package for each WIPP Form printed from IMPS
- Signed Closure Signature Sheet for each WIPP Form
- Additional supporting documentation

REFERENCES			
DOCUMENT NUMBER AND TITLE	BASELINE DOCUMENT	REFERENCED DOCUMENT	KEY STEP
10 CFR Part 21, "Reporting of Defects and Noncompliance"		✓	
10 CFR Part 71, "Packaging and Transportation of Radioactive Material"	✓		
10 CFR Part 851, "Worker Safety and Health Program"	✓		
DOE O 226.1B, "Implementation of Department of Energy Oversight Policy"	✓		
DOE G 226.1-2A, "Federal Line Management Oversight of Department of Energy Nuclear Facilities"	✓		
DOE-STD-1197-2011, "Occurrence Reporting Causal Analysis"		✓	
DOE/WIPP-07-3372, *Waste Isolation Pilot Plant Documented Safety Analysis*	✓		
DOE/WIPP-07-3373, *Waste Isolation Pilot Plant Technical Safety Requirements*	✓		
Hazardous Waste Facility Permit, EPA Identification Number NM4890139088-TSDF	✓		
WP 10-WC3011, *Work Control Process*		✓	
WP 12-ES3918, *Reporting Occurrences in Accordance with DOE Order 232.2*		✓	
WP 13-1, *Nuclear Waste Partnership LLC Quality Assurance Program Description*	✓		**1**
WP 13-QA3004, *Nonconformance Report*		✓	
WP 13-QA3007, *External Oversight Activities*		✓	
WP 15-GM.02, *Worker Safety & Health Program Description*	✓		**2**
WP 15-GM1001, *Root Cause Analysis*		✓	
WP 15-MD3102, *Event Investigation*		✓	
WP 15-PA.02, *Causal Analysis Guidance*		✓	
WP 15-RA.01, *Nuclear Safety & Worker Safety and Health Compliance Program*	✓		

DEFINITIONS

Action Level (AL) – The level and type of causal analysis and corrective action response required to an issue documented on a WIPP Form based on the risk posed to safe operation of the facility, ability to dispose/isolate waste, maintain compliant Safety Management Programs (SMP), and effectively implement the NWP Quality Assurance Program. The levels are as follows:

- **AL-1 – A significant Issue:** An occurrence or issue screened and determined to involve a significant non-adherence of requirements or an unacceptable situation that the facility will need to dedicate the resources necessary to help ensure the issue will be resolved and the chance of recurrence will be remote. These issues will typically result in formal reviews and defined actions and must include a Root Cause Analysis, Corrective Action Plan (CAP) development, be screened for regulatory reportability, and are screened by Quality Assurance for possible Significant Conditions Adverse to Quality (SCAQ).

- **AL-2 – An Adverse Condition:** An occurrence or issue screened as adverse is one which requires an understanding of what happened and why. Actions taken for adverse conditions should result in a significant reduction in the chances of the issue recurring. The need for the rigor and formality associated with an AL-1 issue is not warranted or needed to resolve the issue. An apparent cause analysis and a CAP will be necessary and the issue may be designated as a CAQ. However, a formal root cause analysis and/or a detailed CAP most likely will not be utilized. If recurrence does happen and that recurrence is subsequently deemed undesirable, then this issue may be considered for re-characterization as an AL-1 issue.

NOTE

Items identified as a process improvement will be discussed between the WIPP Screening Committee Chairperson and the responsible manager for the action to ensure that proper categorization of actions and action level is attained.

- **AL-3 – Track Until Fix Issue:** Any performance issue, procedural weakness, work document weakness, process improvement, minor equipment or task discrepancy or other condition that would present low consequences to safe operations of the WIPP facility even if it reoccurs. The cause for these issues is readily discernible. The need for analysis is lowered and the corrective action is generally obvious. The extent is limited to the issue documented and the impact is minor as determined by the WIPP Form Screening Committee. Focus most often is given to immediately resolve or fix the issue and to determine if additional opportunities to mitigate or prevent additional issues of similar nature may be available. Root Cause Analyses or CAPs are not necessary. If recurrence of the issue results in continued adverse and undesirable consequences, then this may be elevated to a more significant level of action (i.e. AL-2 or AL-1).

- **AL-4 – Trend Only:** Any minor issue identified and already corrected, any issue where no further action is necessary, issues corrected during assessments or process improvements that are not feasible to implement.

Compensatory Actions – Those controls put in place to ensure the issue is controlled and does not recur while programmatic or procedural changes are being developed and implemented.

Condition(s) Adverse to Quality (CAQs) – Noncompliance with QA program requirements.

Corrected during the Assessment (CDA) – CAQs, which are isolated events of low consequence, that are corrected during the course of an assessment or immediately after identification and are documented on WIPP Forms for trending purposes.

Equipment malfunction/maintenance issues – Maintenance issues that are resolved in accordance with WP 10-WC3011.

Extent of Condition – The extent to which an identified issue has the potential to impact other items or processes or has done so in the past (e.g., is of a repetitive nature).

Human Resources Issues – Issues that are related to potentially proprietary employee information or processes that support employee relations. The Human Resources issues are typically routed to the Human Resources department for resolution through their program(s).

HWFP-noncompliant – Noncompliance with the Hazardous Waste Facility Permit (HWFP). If the issue requires immediate notification of regulatory entities it is a Significant Condition Adverse to Quality (SCAQ).

Impact – The significance or effect of the issue to the program or operation.

Issue – Generic term used to refer to any item documented on a WIPP Form. This includes, but is not limited to, a failure, defect, deviation, malfunction, deficiency, nonconformance of plant equipment, materials, procedures, personnel safety concerns or events which have or could have an effect on the safe, reliable, or efficient operation of the plant, or which involve a failure to be in compliance with requirements or management expectations. In addition, it may be a question, request for evaluation, suggestion for improvement, or management or department initiative.

Nonconformance – A deficiency in characteristic, documentation, or record which renders the quality of an item unacceptable or indeterminate. These issues are controlled by procedure WP 13-QA3004.

Potential SCAQ – Issues of a severity that would require additional review by QA Manager to determine if a SCAQ exists and/or Work Suspension is required.

Process Improvement – An action or series of actions that, when implemented, makes a process safer, more compliant, more productive, etc.

Program Enhancement – Issues developed during the conduct of Management Assessments, opportunities for program enhancement submitted by plant staff.

Quality Assurance Assessment –The performance of a QA Audit/Surveillance that may result in WIPP Forms.

Responsible Manager – The manager responsible for the process, equipment or employees involved in the issue. The Responsible Manager may or may not be assigned as the CAP Manager for determining corrective actions.

Safety Issue – Issues relevant to the WIPP Safety Program.

Significant Condition Adverse to Quality (SCAQ) – A significant condition adverse to quality is one that:

- If uncorrected, could lead to a serious effect on safety/operability, the ability to isolate waste, TRU waste site certification, regulatory compliance demonstration, or effective implementation of the QA program; or
- Is noncompliant with the Compliance Recertification Application; or
- Requires immediate notification of regulatory entities (e.g., 10 CFR Part 21, HWFP Module I.E.13); or
- Indicates a significant failure or breakdown in the implementation of QA program requirements; or
- Has not been resolved after repeated attempts; or
- Is identified in items or activities important to safety or waste isolation and compromises the ability to prevent or mitigate the consequences of an accident, thereby presenting a significant hazard to safety and health of workers and/or the public; or
- Constitutes an adverse trend or inclination, as determined by formal performance evaluation and trend analysis.

Trend Only – Issues where no activities are required for closure. These may include issues generated as a result of work performed at generator sites, issues that are outside the scope of the WIPP QA program, or CAQs corrected during an assessment or immediately after identification.

PREREQUISITE ACTIONS

1.0 Personnel responsible for preparing a Corrective Action Plan (CAP) to correct an AL-1or AL-2 issue must complete Apparent Cause Analysis Training (e.g., QAP-104, *Apparent Cause Analysis and Corrective Action Planning*) prior to preparing the CAP. Documentation of formal Root Cause Training (e.g. Phoenix Method, TapRoot®) can be used in lieu of QAP-104. Personnel responsible for responding to other issues are not required to complete QAP-104.

2.0 Managers shall make a computer and time available to an employee who has identified an issue and needs to submit a WIPP Form under this procedure. Computer time will also be made available for an employee to check their email for IMPS notifications when it is practical to do so.

PERFORMANCE

1.0 WIPP FORM INITIATION

NOTE

Any WIPP employee who works under the NWP Quality Assurance Program can generate a WIPP Form. WIPP Forms are generated electronically in IMPS. Personnel who need assistance with generating a WIPP Form may contact the WIPP Form Screening Committee Chairperson, the WIPP Form Coordinator, or any member of the WIPP Form Screening Committee. Issues associated with abnormal events and personnel injuries should be documented on a WIPP Form as soon as possible, although the generation of the WIPP Form does not take precedence over any immediate actions to stabilize a situation or notify the Central Monitoring Room Operator. While the concurrence of the originator's manager is not mandatory, employees are encouraged to discuss issues with their manager prior to submitting a WIPP Form.

NOTE

A “master” WIPP Form will be designated in IMPS by the WIPP Form Coordinator or WIPP Form Screening Committee Chairperson during prescreening or committee screening. Master WIPP Forms are used by the WIPP Form Committee Chairperson, WIPP Form Coordinator, responsible manager, or champion to address audits or assessments which identify multiple, differing issues (e.g., external audit findings, management assessments, etc.). Responsible managers or champions will ensure that the WIPP Form Coordinator or WIPP Form Screening Committee Chairperson is notified when a WIPP Form must be designated as a master WIPP Form. Individual issues that are identified in such audits or assessments should be entered in IMPS on “subordinate” WIPP Forms with the help of the WIPP Form Coordinator. These “subordinate” WIPP Forms will be linked to the master WIPP Form in IMPS so that all issues related to an audit or assessment may be better grouped and tracked. One Subordinate WIPP Form may address an issue that is identified multiple times, even when the issue crosses Section/Department line of responsibility. The Corrective Action Plan will address the actions to correct the issues identified within each Section/Department.

NOTE

A WIPP Form may be submitted anonymously in IMPS. The WIPP Form Coordinator cannot ensure that the Originator receives feedback on the status of the WIPP Form or actions taken to address the issue identified on the anonymous WIPP Form.

NOTE

IMPS provides automatic notifications to the originator, WIPP Form Screening Committee members, managers, reviewers, etc. as the WIPP Form progresses through the process.

1.1 Originator, electronically complete the WIPP Form in IMPS using the guidance found in attachment 4.

1.2 Originator, submit WIPP Form electronically by clicking on the Submit WIPP Form box on the electronic form in IMPS.

1.3 Originator, consult with the Responsible Manager and document a cause code for a CDA WIPP Form or a WIPP Form representing a CAQ that has been corrected and is being submitted for trending purposes only.

2.0 WIPP FORM PRESCREENING AND SCREENING

2.1 WIPP Form Coordinator/WIPP Form Screening Committee Chairperson, perform the following:

2.1.1 Prescreen WIPP Forms with other screening committee members as necessary to ensure that personal information, information that may compromise the security of the site, and inappropriate language do not appear on WIPP Forms.

2.1.2 Reject the WIPP Form to allow the Originator to make corrections under the following conditions:

- Personal information is contained in the WIPP Form
- The WIPP Form contains inappropriate language
- The WIPP Form contains information that could compromise the security of the site
- The Originator requests that the WIPP Form be rejected to make editorial changes to the description
- The Originator requests that the WIPP Form be rejected because it was submitted prematurely

The WIPP Form Screening Committee Chairperson will make these corrections if the WIPP Form is submitted anonymously.

2.1.3 Ensure the WIPP Form originator is notified that the WIPP Form has been accepted for screening.

NOTE

ORPS and PAAA/10 CFR 851 screenings can be completed concurrently. It is required that these screenings occur prior to review by the WIPP Form Screening Committee so that the appropriate action level is assigned to the WIPP Form.

2.2 Perform WIPP Form screenings as follows:

2.2.1 RPS Coordinator, make the appropriate entries onto the WIPP Form to indicate whether the issue is reportable, the ORPS number, the ORPS reported discovery date, and target dates for completion of the root cause analysis or causal analysis and the CAP to ensure that a CAP can be developed and approved to meet the 45-day time frame for corrective actions to be entered into ORPS in accordance with WP 12-ES3918.

2.2.2 Compliance Coordinator, make the appropriate entries onto the WIPP Form to indicate whether or not the issue is NTS reportable.

NOTE

The collective knowledge and experience of the WIPP Form Screening Committee is applied in determining the type of issue and the risk it presents to the safe, compliant operation of the facility resulting in an Action Level. Issues may be presented where the documented condition or the requirement driving the condition isn't clear. The WIPP Form Screening Committee will request clarification or more information from the WIPP Form originator or other knowledgeable site personnel if the issue to be addressed is not clear to ensure that appropriate determinations are made.

NOTE

The WIPP Form Screening Committee Chairperson may close WIPP Forms that identify issues that cannot be addressed using IMPS (Human Resources issues) and document the determination and disposition the WIPP Forms. The WIPP Form Screening Committee Chairperson will report these actions to the WIPP Form Screening Committee.

2.3 WIPP Form Screening Committee, review new WIPP Forms and proceed as follows:

- If the issue has been identified on a previous WIPP Form that has not been closed, annotate the earlier WIPP Form number on the new WIPP Form and close the new WIPP Form with no further action by the WIPP Form Screening Committee.

- If the issue requires no further action, annotate the committee's decision and disposition the WIPP Form as No Further Action Required with a determination of Trend Only.

- If the issue is unclear or requires additional information, request more information from the originator or a Responsible Manager to establish a clear understanding of the issue prior to determining the issue type.

- If the issue involves employee behaviors or interactions best addressed by Human Resources or the responsible manager, indicate that the issue is being routed to Human Resources and/or the responsible manager and close the WIPP Form with no further action by the WIPP Form Screening Committee.

NOTE

The WIPP Form Screening Committee will defer determinations and assignments for a Potential SCAQ WIPP Form until the QA Manager makes a determination and, if required, the root cause analysis (RCA) is complete. The WIPP Form Screening Committee will resume making determinations for a SCAQ WIPP Form once the RCA is complete.

2.3.1 If there is no need to obtain additional information, make the following determinations:

- Determine if the WIPP Form was self-identified (NWP or its subcontractors) or identified by an external agency (e.g., CBFO, DOE-HQ, NMED, EPA, etc.).

- Determine if the issue on the WIPP Form represents a potential SCAQ, CAQ, CDA or Process Improvement.

NOTE

The WIPP Form Screening Committee must determine that the extent and impact of an issue meet the definition on page 8 prior to designating any WIPP Form issue determined to be a CAQ as an action level 3. Otherwise the action level must be assigned as a 1 or 2.

- Determine the action level (1 to 4) to be assigned to the WIPP Form.

- Determine if a WIPP Form is to be routed to management for action as required by the action level, deferred for SCAQ determination, or trended and closed.

- Determine a responsible manager for corrective actions, if required, and the Approving Manager for AL-3 corrective actions.

- Determine the appropriate manager to assign to development of a CAP for AL-1 and AL-2 WIPP Forms.

- Determine the trend codes to be assigned to the WIPP Form using attachment 2.

- Verify that CDA WIPP Forms have a cause code assigned. Request the originator and Responsible Manager reconsider the cause code if the committee does not agree with the cause code(s) entered on the WIPP Form.

NOTE

IMPS is an electronic system designed to process WIPP Forms through all aspects of this procedure with the exception of closure signatures. An individual assigned the responsibility for an action in a CAP is added as a reviewer by the system. Any other reviewers required by this procedure or requested by the WIPP Form Screening Committee are added by the WIPP Form Coordinator. Reviews are completed by electronic approval or rejection of the CAP in IMPS.

2.3.2 Determine required reviewers for AL-1 and AL-2 CAPs.

- If the issue is related to QA assessment findings, add appropriate QA personnel (Lead Assessor and/or QA management) as a required CAP reviewer.

- If the WIPP Form is determined to be an AL-1, add the Cognizant Department Manager and the QA Manager as required reviewers.

- If the issue is NTS reportable, add the Compliance Coordinator as a required reviewer.

- If the issue is ORPS Reportable, add the ORPS Coordinator as a required reviewer.

- If the issue requires training at any level, add the Technical Training manager.

- Determine additional reviewer(s) to ensure that corrective actions correctly address the issue identified in a WIPP Form, if required.

NOTE

A WIPP Form sent to the QA Manager for a SCAQ determination will have the determination "Potential SCAQ" documented on the WIPP Form. If the QA Manager determines that the issue is not SCAQ, the WIPP Form Coordinator will revise the determination on the WIPP Form to CAQ.

NOTE

Typically, personnel assigned to provide additional information, develop corrective actions, etc. are given 10 working days to complete their action. The QA Manager is given 10 working days to complete an SCAQ determination. RCA teams are given until the date in their appointment letter to complete their analysis and report. If additional time is required to complete an SCAQ determination, request for additional information, etc., the responsible individual can request an extension from the WIPP Form Screening Committee Chairperson. Extension requests and approvals/rejections will be placed in the WIPP Form record file.

2.4 WIPP Form Coordinator, perform the following:

- Enter WIPP Form Screening Committee determinations and due dates on each WIPP Form screened by the committee, as required, in IMPS.
- Enter a static action in IMPS for the QA Manager to complete a SCAQ determination for WIPP Forms determined to be potential SCAQ by the committee
- Enter a static action in IMPS for each request for additional information requested by the committee.
- **IF** any WIPP Forms are determined to be AL-4, **GO TO** section 5.0 for closure.
- If a CAP is required, ensure the WIPP Form originator is notified when the CAP has been assigned.

2.5 Perform the following for potential SCAQ determinations:

2.5.1 QA Manager, perform the following when notified of the assignment to make an SCAQ determination:

[A] Determine if the issue meets the criteria for SCAQ.

[B] Document the determination.

[C] QA Manager, upload the document as an Adobe Acrobat (.pdf) file to the static action in IMPS and click on the Submit for Review button.

2.5.2 WIPP Form Coordinator, perform the following when the potential SCAQ determination is submitted for review:

[A] If the submittal is attached, approve the action.

[B] If the issue is not an SCAQ, schedule the WIPP Form to return to the WIPP Form Screening Committee to complete screening.

[C] If the issue is determined to be an SCAQ, enter static actions in IMPS for the Cognizant Department Manager to appoint an RCA Team and complete the RCA.

2.5.3 Cognizant Department Manager, perform the following when notified of the need to assign an RCA Team:

[A] Assign an RCA Team and document the assignment in an appointment letter.

[B] Upload the document as an Adobe Acrobat (.pdf) file to the static action in IMPS and click on the Submit to Review button.

2.5.4 WIPP Form Coordinator, perform the following when the RCA Team appointment letter is submitted for review:

[A] If the submittal is attached, approve the action.

[B] Assign a static action to the appointed RCA Team Leader to complete the RCA.

[C] Enter the due date from the appointment letter for the static action.

2.5.5 RCA Team Leader, upload the document as an Adobe Acrobat (.pdf) file to the static action in IMPS and click on the Submit to Review button.

2.5.6 WIPP Form Coordinator, perform the following when the RCA is submitted for review:

[A] If the submittal is attached, approve the action.

[B] Schedule the WIPP Form to return to the WIPP Form Screening Committee to complete screening actions.

2.6 Perform the following for a request for more information:

2.6.1 Assigned Individual, when requested information is available, perform the following:

[A] If the information is a document, upload the document as an Adobe Acrobat (.pdf) file to the static action in IMPS.

[B] If the information is not a document, enter and upload the information in the comment field for the static action.

2.6.2 WIPP Form Coordinator, perform the following when the requested information is submitted for review:

[A] If the information submittal is attached, approve the action.

[B] Schedule the WIPP Form to return to the WIPP Form Screening Committee to complete screening actions.

3.0 RESOLUTION AND CORRECTIVE ACTION DEVELOPMENT FOR AL-1 AND AL-2 WIPP FORMS

NOTE

Due dates for CAPs are typically assigned to CAP managers to allow 10 working days from the date of committee approval for preparation and submittal. Due dates for complex or serious issues (e.g., those requiring SCAQ determination or requiring a RCA) will not be entered until after the predecessor actions are complete. The length of time allowed for evaluation may be limited when external reporting is necessary (45 days for submittal of corrective actions associated with events reported in accordance with WP 12-ES3918; 60 days maximum for events reportable to the U.S. Nuclear Regulatory Commission under 10 CFR Part 21). If additional time is required, the Responsible Manager can request an initial extension from the WIPP Form Screening Committee Chairperson. Additional extensions that may be needed must be pre-approved by the Department Manager responsible for the issue. Extension requests and approvals/rejections will be placed in the WIPP Form record file.

NOTE

Responsible Managers should request clarification or more information from the WIPP Form originator if the issue to be addressed is not clear to ensure that appropriate corrective actions are taken.

NOTE

WP 15-PA.02 provides useful information for preparing a CAP and associated corrective actions.

3.1 Responsible Manager, develop a CAP in accordance with attachment 1 in IMPS and ensure that the CAP adequately addresses the issue(s) identified in the WIPP Form.

3.2 Responsible Manager, ensure that the CAP addresses the issue(s) identified in the WIPP Form as follows:

- If the WIPP Form is designated as an AL-1, the root and contributing causes from the RCA have been documented in the CAP.
- There is at least one corrective action for each cause listed in the CAP.

3.3 Responsible Manager, ensure that the CAP is complete and then submit the CAP for review by clicking on the Submit for Approval box at the bottom of the CAP.

3.4 Designated Approvers, complete reviews of the CAP as follows:

3.4.1 Review the CAP in IMPS.

3.4.2 If the CAP is acceptable, approve the CAP in IMPS.

3.4.3 If the CAP is not acceptable, enter specific comments for the issues in the CAP in the Add Comments box and reject the CAP in IMPS.

3.5 Responsible Manager, determine the changes in the CAP necessary to respond to the comments from the reviewers and revise the CAP.

3.6 Perform steps 3.3 through 3.5 until all reviewers have approved the CAP.

NOTE

CAPs written in response to External Oversight or CCP WIPP Forms may require submittal to the governing agency or authority in an acceptable alternate format in addition to the format utilized by this procedure.

3.7 WIPP Form Screening Committee, perform the following:

3.7.1 Review the furnished CAP to ensure that the CAP adequately addresses the issue(s) identified on the WIPP Form.

NOTE

The WIPP Form Screening Committee will review each CAP using attachment 1 as guidance to ensure that the CAP is complete.

3.7.2 If the CAP does not adequately address the issues identified on the WIPP Form, then reject the CAP and assign a member of the committee to resolve the committee's issues with the Responsible Manager.

3.7.3 If the CAP adequately addresses the issues identified on the WIPP Form, approve the CAP.

3.8 WIPP Form Coordinator, document the WIPP Form Screening Committee's approval/rejection of the CAP in IMPS.

3.9 Responsible Manager, if the WIPP Form Screening Committee rejects the CAP, determine the changes in the CAP necessary to respond to the comments from the reviewers and revise the CAP.

3.10 Perform steps 3.1through 3.9 until the WIPP Form Screening Committee approves the CAP.

4.0 CORRECTIONS/CHANGES TO APPROVED CAPS FOR AL-1 OR AL-2 WIPP FORMS

NOTE

The situation may arise that changes to approved corrective actions are needed due to changing conditions, changes in the operation, changes in equipment, etc. The manager responsible for the CAP will evaluate the options contained in section 4.0 and determine which option is most appropriate. The CAP Manager will then discuss this with the WIPP Form Screening Committee Chairperson to obtain concurrence and start the correction process.

4.1 If a change occurs that significantly impacts an approved WIPP Form CAP (e.g. new equipment is purchased to implement a process, a procedure revision is issued that changes the process, etc.) and the change does not alleviate the issue documented in the WIPP Form, the approved CAP is corrected by performing the following:

4.1.1 Responsible Manager, develop a new WIPP Form capturing the existing issue and the changes that occurred.

4.1.2 Responsible Manager, enter "This WIPP Form replaces WFXX-XXX" in the Description box of the new WIPP Form.

4.1.3 WIPP Form Screening Committee Chairperson, direct that the existing WIPP Form be closed if the committee approves the action.

4.1.4 WIPP Form Coordinator, close the existing WIPP Form in IMPS citing the new WIPP Form for closure.

4.2 If a change occurs that significantly impacts an approved WIPP Form CAP (e.g. new equipment is purchased to implement a process, a procedure revision is issued that changes the process, etc.) and the change alleviates the issue documented in the WIPP Form, perform the following:

4.2.1 Responsible Manager, provide a written statement to the WIPP Form Screening Committee Chairperson requesting that the existing WIPP Form be closed with an explanation supporting the closure.

4.2.2 WIPP Form Screening Committee Chairperson, direct that the WIPP Form be closed if the committee approves the action.

4.2.3 WIPP Form Coordinator, attach the documentation provided by the Responsible Manager and close the WIPP Form in IMPS.

4.3 If the actions are determined to be wrong or direction is received to change an action or actions in the CAP after it is approved, perform the following:

4.3.1 Responsible Manager, notify the WIPP Form Screening Committee Chairperson that a CAP must be changed/corrected providing the reason for the change/correction.

4.3.2 WIPP Form Screening Committee Chairperson, direct that the WIPP Form CAP be rejected if the committee approves the action.

4.3.3 WIPP Form Coordinator, reject the WIPP Form CAP in IMPS.

5.0 AL-1 OR AL-2 WIPP FORM CLOSURE

5.1 Assigned Responsible Manager or Action Party, perform the following:

5.1.1 Complete assigned corrective actions and assemble objective evidence of completion.

5.1.2 Ensure that objective evidence of completion is free of personal information. While copies of safety meeting/training attendance sheets are considered acceptable, training records are considered personally identifiable information (PII) and are not acceptable.

5.1.3 Attach Adobe Acrobat files containing objective evidence of the completed commitments or actions in IMPS.

5.1.4 Submit corrective actions for closure by clicking on the Submit Corrective Action for Review button.

5.2 WIPP Form Coordinator, review the issue package to ensure objective evidence for required commitments is in IMPS.

5.3 WIPP Form Coordinator, print the WIPP Form Closure Screening package and Signature Sheet. Obtain closure signatures as follows:

5.3.1 The Cognizant Department Manager and the QA Manager for WIPP Forms designated as AL-1.

5.3.2 The Compliance Coordinator for WIPP Forms designated as NTS Reportable.

5.3.3 The Lead Assessor and/or QA Management for WIPP Forms that were developed for issues from QA audits or surveillances.

5.4 WIPP Form Coordinator, submit the AL-1 or AL-2 WIPP Form and associated documentation (either hard copy or electronically) to the WIPP Form Screening Committee for closure.

5.5 WIPP Form Screening Committee, review the closure documentation and determine if the documentation is sufficient for WIPP Form Closure.

5.6 If the WIPP Form Screening Committee approves closure of the WIPP Form, WIPP Form Screening Committee Chairperson, perform the following:

5.6.1 WIPP Form Screening Chairperson, ensure any open issues have been resolved.

5.6.2 Sign and date the WIPP Form, signifying the consensus of the committee for closure.

5.7 WIPP Form Coordinator, perform the following:

5.7.1 For AL-1 WIPP Forms, assign an action in the electronic tracking system for QA to perform an effectiveness review 3 to 12 months after the WIPP Form closure to determine the effectiveness of the corrective actions.

5.7.2 Ensure that the WIPP Form originator is notified that actions are complete and the WIPP Form is closed.

5.7.3 Route electronic notification of closure to the Lessons Learned Coordinator.

5.7.4 File the completed WIPP Form Package.

6.0 RESOLUTION AND CORRECTIVE ACTION DEVELOPMENT FOR AL-3 WIPP FORMS

NOTE

Items identified as a process improvement will be discussed between the WIPP Screening Committee Chairperson and the responsible manager for the action to ensure that proper categorization of actions and action level is attained.

NOTE

Process improvements are intended to make work processes safer, more efficient and/or more cost effective. A process improvement may also be used to identify a potential issue that could become quality affecting, allowing for preemptive action to be taken to prevent the issue from becoming a condition adverse to quality. A process improvement WIPP Form does not require a cause code.

6.1 Responsible Manager, determine the action(s) necessary to correct the AL-3 WIPP Form issue.

6.2 Responsible Manager, document the following in IMPS:

- Action or actions to correct the issue
- Action party for each action
- Due date for each action
- Cause code from attachment 3 for issues determined to be CAQs

6.3 Responsible Manager, review the corrective action(s), action parties, and due date with the Approving Manager and obtain concurrence or changes to facilitate approval.

6.4 Responsible Manager, upload the corrective actions in IMPS.

6.5 Approving Manager, review the corrective action(s), action party for each action, and due date for each action to ensure what was agreed on.

6.6 Approving Manager, approve the corrective actions.

7.0 AL-3 WIPP FORM CLOSURE

7.1 Assigned Responsible Manager or Action Party, perform the following:

7.1.1 Complete assigned corrective actions and assemble objective evidence of completion.

7.1.2 Ensure that objective evidence of completion is free of personal information. While copies of safety meeting/training attendance sheets are considered acceptable, training records are considered PII and are not acceptable.

7.1.3 Attach Adobe Acrobat files containing objective evidence of the completed commitments or actions in IMPS.

7.1.4 Submit corrective actions for closure by clicking on the Submit Corrective Action for Review button.

7.2 WIPP Form Coordinator, ensure that the WIPP Form originator is notified that actions are complete and the WIPP Form is closed.

7.3 WIPP Form Coordinator, close the WIPP Form in IMPS.

7.4 Print the Closure Screening Package and file the completed WIPP Form.

8.0 RESOLUTION FOR AL-4 WIPP FORMS

8.1 WIPP Form Coordinator, enter appropriate data in IMPS.

8.2 WIPP Form Coordinator, close the AL-4 WIPP Form.

8.3 WIPP Form Coordinator, pprint the Closure Screening Package and file the completed WIPP Form.

8.4 WIPP Form Coordinator, eensure that the WIPP Form originator is notified that the WIPP Form is closed.

9.0 DATA COLLECTION FOR PERFORMANCE TRENDING

9.1 WIPP Form Coordinator, each month collect the data to support trending of the following performance indicators.

- Number of WIPP Forms submitted
- Percentage of submitted WIPP Forms that are self-identified
- Number of WIPP Form Actions that are past due
- Number of Anonymous WIPP Forms submitted
- Average age of open WIPP Forms
- Average age of closed WIPP Forms
- Number of WIPP Forms assigned to each trend code

9.2 Submit the data to the Issues Management and Performance Monitoring Manager.

Attachment 1 – Corrective Action Plan (CAP) Content

General

AL-1 WIPP Forms require performance of a formal root cause analysis in accordance with WP 15-GM1001. AL-2 WIPP Forms require a formal causal analysis, but not necessarily a RCA. The CAP will incorporate the recommendations from the RCA or causal analysis, unless an action or actions from an RCA is specifically rejected by the Executive Safety and Quality Review Board (ESQRB). Recommended corrective actions from debriefs and critiques should also be considered for inclusion in the CAP unless the corrective actions identified in the RCA or causal analysis are more comprehensive than those identified early in an investigation.

During the development of the extent of condition for a CAP, additional occurrences of the condition may be identified. The specific instances of this condition occurring need to be well documented in the Extent of Condition if this is the initial identification of the condition and the previous occurrences of this condition are linked to the same cause. If the condition was previously identified on a corrective action document, with corrective actions completed, and then additional occurrences of the condition with the same cause are found, each instance will be documented on a separate WIPP Form. If additional occurrences of the condition are found during the investigation of the Extent of Condition that have been created by a different cause or causes, a separate WIPP Form needs to be generated for each uniquely caused event.

The CAP shall address the following:

1.0 Describe the issue being addressed

Summarize the problem. This wording is derived from the WIPP Form issue description.

2.0 Cause of the issue:

Determine/document the cause(s) of the issue, using the three-tiered (i.e., AxBxCxx) cause codes listed in attachment 3. If more than one cause code applies, identify each of the applicable codes.

DOE-STD-1197-2011, Attachment 4, Causal Analysis Node Description, provides guidance with useful examples on applying the cause codes to events or conditions.

Attachment 1 – Corrective Action Plan (CAP) Content

3.0 Extent and Impact:

Describe the extent and impact of the issue being addressed. To adequately identify the extent and impact it may be necessary to review other WIPP Forms, NCRs, WOs, ECOs, past assessments, etc. The extent and impact may be identified in the debrief, critique, causal analysis, and/or RCA for issues that were investigated in accordance with WP 15-MD3102 and WP 15-GM1001. The extent of condition should specifically identify if the issue is a recurring condition. While a specific issue may be new to a particular group or individual, the issue may have been previously identified such that the past corrective actions did not cross organizational lines and were not adequate to prevent recurrence.

4.0 Corrective/Preventive Actions Planned or Taken:

Document planned or completed actions to resolve the issue and prevent its reoccurrence. Corrective actions can include immediate, compensatory, short term and long-term actions, depending on the nature of the issue being addressed. If the issue is a recurring condition, the corrective actions may need to be more comprehensive than previous actions taken. If the issue was investigated through a debrief, critique or RCA, include recommended corrective actions from the debrief and/or critique, causal analysis (WP 15-MD3102); and/or RCA (WP 15-GM1001), as appropriate, including any compensatory actions that were taken immediately following the incident. Additionally, corrective actions should be sufficiently comprehensive to address each cause code identified for the issue. Corrective actions should specify which cause they address to ensure that all causes are corrected. Corrective actions must be written to perform the following:

- Specify what the primary action is (e.g., develop a procedure, revise a procedure)
- Specify how the action is approved (e.g., the revision of the procedure will be approved in Q&MIS)
- Specify any training actions required as a result of the corrective action (e.g., revise the XX-01 qualification card to reflect the procedure change)
- Complete the training required to implement the action (e.g., all XX personnel will complete section Y of qualification card XX-01 after it is revised). This could be briefings, required reading, etc. based on the complexity of the change.

Action parties and target completion dates are required for CAPs. If the corrective actions extend beyond the assigned Responsible Manager's organization, the assigned Responsible Manager should coordinate with the other manager(s)/action parties to establish expected completion dates.

Attachment 1 – Corrective Action Plan (CAP) Content

If no corrective/preventive actions are planned or required, provide a justification. If an action has been completed at the time the CAP is generated, objective evidence of the completed action should be submitted with the CAP to avoid the action being past due.

If the CAP has been written in response to a condition that was determined to be AL-1, ensure that the recommended corrective actions from the RCA or causal analysis are addressed except those specifically rejected by the ESQRB.

Attachment 2 – Determination and Trend Codes

Issue Identification

Self-Identified – The issue was identified by an NWP or subcontract employee other than a representative of the Quality Assurance Department during the performance of a surveillance, independent assessment, or audit or a representative of the Contractor Assurance System (CAS) Department during the performance of an independent Safety Management Program (SMP) evaluation.

Identified by an External Agency – The issue was identified by an individual from an external organization (CBFO or its representatives, Environmental Protection Agency, New Mexico Environment Department, Mine Safety and Health Administration representatives, etc.) during the course of an audit, surveillance, inspection, etc.; QA Department representative during the performance of an surveillance, independent assessment, or audit; or CAS Department representative during the performance of an independent SMP evaluation.

Determination

CAQ – Noncompliance with QA program requirements.

CDA – CAQs that are corrected during the course of an assessment, surveillance, management assessment, etc. and are documented on WIPP Forms for trending purposes only.

Potential SCAQ – CAQs that appear to meet the criteria established for an SCAQ. The WIPP Form Screening Committee sends a WIPP Form designated as a Potential SCAQ to the QA Manager for formal determination.

Process Improvement – A process enhancement assigned to a Responsible Manager for further evaluation and action.

Attachment 2 – Determination and Trend Codes

Trend Codes

RH

CH

Underground

Surface

Electrical

Mechanical

Environmental

Mobile Equipment

Transportation

Prevention of Inadvertent Criticality

Criticality Passive Design Feature

Criticality Administrative Controls

Criticality Safety Program

Radiation Protection

Radiation Protection Program

Radiation Surveys, Contamination Surveys

Posting and Radiological Area Control

Dose Monitoring

Airborne Radioactivity Continuous Air Monitoring, Air Sampling

Portable Instrumentation

ALARA Program Implementation

Radiological Work Permits

Radioactive Source/Material Control

Hazardous Material Protection

Hazardous Material Exposure Control Program

Hazardous Material Control

Hazardous Material Monitoring

Hazardous Material Protection Instrumentation

Hazardous Communication

Attachment 2 – Determination and Trend Codes

Radioactive and Hazardous Waste Management

Radioactive and Hazardous Waste Management Program

Waste Management Process

Waste Sources and Characteristics

Waste Handling or Treatment Systems

Testing, Surveillance, Maintenance

Initial Testing Program

Testing Program

Calibration Program

Inspection Program

Work Control Program

Work Planning

Work Documentation

Conduct of Maintenance

Post Maintenance Testing

Operational Safety

Shift Routines and Operating Practices

Control Area Access

Control Area Discipline

Communications – Public Address and Alarm System Use

Communications – Public Address and Alarm System Operability

Communications – Radio Use

Communications – Radio Operability

Communications – Telephone/Mine Phone System Use

Communications – Telephone/Mine Phone System Operability

Communications – Terminology and Methodology

Control of/On-Shift Training

Timely Notification of Events

Control of Equipment and System Status/Change Authorization

Equipment/System Line-Up

Attachment 2 – Determination and Trend Codes

Lockout/Tagout Preparation
Lockout/Tagout Authorization
Lockout/Tagout Placement
Lockout/Tagout Verification or Effectiveness
Lockout/Tagout Removal
Log Keeping
Shift Turnover – Plant/Equipment Status
Shift Turnover – Planned or In-Progress Activities
Shift Turnover – Special Instructions
Required Reading
Timely Order Use
Timely Order Content
Use of Procedures
Operator Aid
System/Equipment Labeling
Fire Protection Program
Combustible Loading Control
Firefighting Capabilities
Firefighting Readiness Assurance

Procedures and Training

Procedure Development
Maintenance of Procedures
Procedure Change Control
Control of Procedures
Training Development
Training Methods
Maintenance of Training
Training Material Change Control

Attachment 2 – Determination and Trend Codes

Human Factors

Identification of Human/Machine Interfaces

Optimization of Human/Machine Interfaces

Quality Assurance

Quality Assurance Program

Records Development

Records Validation

Records Storage

Records Disposition

Work Processes

Design Control

Procurement

Inspection/Acceptance Testing

Independent Assessment

Management Assessment

Emergency Preparedness

Emergency Preparedness Planning

Emergency Response Organization

Recognition of Emergencies

Categorization of Emergencies

Acquisition of Emergency Information/Data

Processing of Emergency Information/Data

Emergency facilities

Protective Action Development

Protective Action Implementation

Drill/Exercise Approval

Drill/Exercise Execution

Attachment 2 – Determination and Trend Codes

Management Organization, Institutional Safety

Organizational Structure
Organizational Responsibilities
Organizational Qualification
Lessons Learned
Personal Safety Culture
Nuclear Safety Culture
Industrial Safety Program
Industrial Health Program

Human Performance Improvement Factor

Human Resources
CCP – Characterization
CCP – Certification
CCP – Mobile Loading
CCP – Engineering
CCP – Packaging (includes NRC Reportable Issues)
Nuclear Safety
TSR Violation
Security
Hazardous Waste Disposal Permit Noncompliance
Information Technology (WITS/WDS/IFMS/etc.)
Other

Attachment 3 – Cause Codes

Category A1			**Design/Engineering Problem**	An event or condition that can be traced to a defect in design or other factors related to configuration.
A1	**Subc B1**		**Design input Less Than Adequate (LTA)**	Input to a design was lacking adequate information that was necessary for the design.
A1	B1	C01	Design input cannot be met	The criteria and other requirements were so stringent that they could not be met. There were conflicting criteria. Not all of the necessary references were included.
A1	B1	C02	Design input obsolete	The criteria were out-of-date. An old version of a requirement or specification was used. Process requirements/conditions changed and the changes were omitted from the input.
A1	B1	C03	Design input not correct	The wrong standards or requirements were used. The requirements were transcribed in error.
A1	B1	C04	Necessary design input not available	The necessary requirements, codes, standards, etc., were not available to the designer.
A1	**Subc B2**		**Design output LTA**	Inadequate design output that did not meet the customer's expectations or design requirements.
A1	B2	C01	Design output scope LTA	The design did not consider all the possible scenarios. All the operating conditions, normal and emergency were not included in the design.
A1	B2	C02	Design output not clear	The drawings were difficult to read. The specifications were difficult to understand. The specification could be interpreted in more than one way.
A1	B2	C03	Design output not correct	The drawings and other specifications were incorrect. The final design output did not include all changes.
A1	B2	C04	Inconsistent design output	There were differences between different output documents. The drawings and other design documents did not agree.
A1	B2	C05	Design output not addressed in design output	The specifications did not include all the requirements. Some criteria were left out of the design output.
A1	B2	C06	Drawing, specification or data error	The latest drawing revision was not referenced. The latest vendor information was not included in the design documentation. The correct data was not noted on the design documentation request.
A1	B2	C07	Error in equipment or material selection	The correct vendor identification number was not used for procurement of equipment. For example, the correct grade of stainless steel was not specified for the material.
A1	B2	C08	Errors not detectable	Personnel were unable to detect errors by way of alarms or instrument readings during or after the occurrence. A serious error went unnoticed because there was no way to monitor system status.
A1	B2	C09	Errors not recoverable	The system was designed such that personnel were unable to recover from error discovered before a failure occurred.

Attachment 3 – Cause Codes

A1	**Subc B3**		**Design/Documentation LTA**	Design or documentation that did not include all of the required information and did not comply with document control and records requirements.
A1	B3	C01	Design/Documentation not complete	The designs and other documentation for equipment were incomplete. Items were missing from the documentation. A complete baseline did not exist.
A1	B3	C02	Design/Documentation not up to date	Drawings and documents were not updated when changes were made. Documents/drawings did not reflect the current status.
A1	B3	C03	Design/Documentation not controlled	The design documentation was not controlled per site requirements for document control and records.
A1	**Subc B4**		**Design Verification/Installation Verification LTA**	Design reviews, testing, independent inspections, and acceptance were not in compliance with customer expectations and/or site requirements.
A1	B4	C01	Independent review of design/documentation LTA	A required review was not performed on the design. The review was not performed by an independent reviewer.
A1	B4	C02	Testing of design/documentation LTA	Testing was not included as part of the design acceptance process. The testing did not verify the operability of the design. Design parameters did not successfully pass all testing criteria.
A1	B4	C03	Independent inspection of design/documentation LTA	Independent Inspection attributes were not included in the design installation. Required hold/witness points were not verified by QA. Hold/Witness points did not pass the acceptance criteria. Commercial grade material was not adequately dedicated or documented.
A1	B4	C04	Acceptance of design/documentation LTA	The customer had problems with acceptance of the design, testing, and/or verification.
A1	**Subc B5**		**Operability of Design/Environment LTA**	Personnel or environmental factors were not considered as part of the design.
A1	B5	C01	Ergonomics LTA	Inadequate ergonomic design contributed to the occurrence. The operator was physically incapable of performing the required task. The operator had to go too far to respond to the alarm. Personnel mobility or vision was restricted. An individual had difficulty reaching the equipment or assumed an awkward position to complete a task. The event was caused because illumination levels were not sufficient for task performance.
A1	B5	C02	Physical environment LTA	Inadequate equipment controls or control systems [e.g., push-buttons, rotary controls, j-handles, key-operated controls] contributed to the occurrence. The control failed to provide an adequate range of control for the function it performs. The control was inadequately protected from accidental activation. Similar controls were indistinguishable from on e another. Controls were in too close proximity of each other. Operating conditions affected performance of the task. Lighting was inadequate. Noise was a factor.
A1	B5	C03	Natural environment LTA	Exposure to heat, cold, wind, and rain was not included in the design. Earthquake tested devices were not included in the design. System was not designed to withstand flooding, freezing, or high wind conditions. Lightning suppressing devices were not included in the design. The event was caused by excessive exposure of personnel to a hot or cold environment.

Attachment 3 – Cause Codes

Category A2			**Equipment/Material Problem**	Is defined as an event or condition resulting from the failure, malfunction, or deterioration of equipment or parts, including instruments or material.
A2	**Subc B1**		**Calibration for Instruments LTA**	Calibrations did not include all the essential elements. Equipment as-found condition was less than adequate.
A2	B1	C01	Calibration LTA	The equipment involved in the incident was not included in a routine calibration program. Calibrations were performed too infrequently. The calibration did not include all the essential elements.
A2	B1	C02	Equipment found outside acceptance criteria	An event occurred as a result of equipment that was found outside of the specified acceptance criteria. The instrument calibration drift was outside of the acceptable range. Process instrumentation was outside of acceptable range criteria due to a standard that was out of calibration.
A2	**Subc B2**		**Periodic/Corrective Maintenance LTA**	Periodic maintenance was not established for the equipment or component. The periodic or corrective maintenance was inadequate. Equipment history did not exist or was incomplete for the instrument or component.
A2	B2	C01	Preventive maintenance for equipment LTA	An equipment malfunction was caused by a failure to carry out scheduled preventive maintenance. Preventive maintenance was not established for the equipment or component that failed. Preventive maintenance was scheduled too infrequently. The preventive maintenance was incomplete. Preventive maintenance was performed on some of the components but not on others.
A2	B2	C02	Predictive maintenance LTA	Predictive maintenance was not established for the equipment. The established frequency was inadequate to prevent or detect equipment degradation. The established method used to prevent or detect equipment degradations was inadequate.
A2	B2	C03	Corrective maintenance LTA	Corrective maintenance was performed but failed to correct the originating problem. The equipment or component was reassembled improperly during corrective maintenance. Other problems were noted during maintenance activities that were not corrected. The actual job of performing a maintenance activity was complete, but was not performed correctly.
A2	B2	C04	Equipment history LTA	Equipment history/records did not exist for the equipment that malfunctioned. The history for the equipment that malfunctioned was incomplete/inadequate. The history did not contain all the information necessary to assure equipment reliability. Knowledge of equipment history would have prevented the incident or lessened its severity.
A2	**Subc B3**		**Inspection/Testing LTA**	Scheduled inspection/testing did not exist for the equipment or component. The inspection/testing was inadequate or not performed as required or did not include all the essential elements. Note A1B4 should be used for design testing.
A2	B3	C01	Startup Testing LTA	Functional testing did not exist for the equipment or system prior to placing them in service. Start-up testing was inadequate for the equipment or system being placed into service.

A2	B3	C02	Inspection/Testing LTA	Required testing inspection was not established or performed for the equipment involved in the incident. The required testing/inspection was performed at an incorrect frequency. The acceptance criteria for the required testing/inspection were inadequately defined. All essential components were not included in the required testing/inspection.
A2	B3	C03	Post-maintenance/Post-modification testing LTA	The post-maintenance or post-modification testing specified was not performed or was performed incorrectly. The post-maintenance or post-modification testing was completed, but the testing requirements were less than adequate. The post-maintenance or post-modification testing was not performed in accordance with the schedule for testing.
A2	**Subc B4**		**Material control LTA**	The problem was due to the inadequate handling, storage, packaging or shipping of materials or equipment. The shelf life for material was exceeded. An unauthorized material or equipment substitution was made. Spare parts were inadequately stored. There was an error made in the labeling or marking.
A2	B4	C01	Material handling LTA	Material or equipment was damaged or mixed up during handling.
A2	B4	C02	Material storage LTA	The material or equipment was stored improperly. The material or equipment was damaged in storage or had weather damage or was stored in an environment that damaged it (heat, cold, acid fumes, etc.) or there was inadequate preventive maintenance performed during storage.
A2	B4	C03	Material packaging LTA	The material or equipment was packaged improperly; the material or equipment was damaged due to improper packaging; the material or equipment was damaged as a result of damage to the packaging.
A2	B4	C04	Material shipping LTA	The material or equipment was transported improperly. The material or equipment was damaged during shipping.
A2	B4	C05	Shelf life exceeded	Material, equipment, or parts that had exceeded the shelf life were installed. Materials continued in use after the shelf life was exceeded.
A2	B4	C06	Unauthorized material substitution	Incorrect materials or parts were substituted. Materials or parts were substituted without authorization. The requirements specified no substitutions.
A2	B4	C07	Marking/Labeling LTA	There was an error made in the labeling or marking. Equipment identification, labeling, or marking was less than adequate.
A2	**Subc B5**		**Procurement control LTA**	The error was due to inadequate control of changes to procurement specifications or purchase orders. A fabricated item failed to meet requirements or an incorrect item was received. Product acceptance requirements failed to match design requirements or were otherwise unacceptable. Note that procured services are addressed A4B2C10.
A2	B5	C01	Control of change to procurement specification/purchase order LTA	Changes were made to purchase orders or procurement specifications without the proper reviews and approvals. The changes resulted in purchase of the wrong material, equipment, or parts.
A2	B5	C02	Fabrication item does not meet requirements	The item of concern was not fabricated according to the requirements specified in the procurement specifications or purchase requisition.

Attachment 3 – Cause Codes

A2	B5	C03	Incorrect item received	An item received was not the one ordered. The inconsistency was not recognized. The item was accepted rather than returned.
A2	B5	C04	Product acceptance requirements LTA	The product acceptance requirements were incomplete. The product acceptance requirements did not address all the safety concerns for the item. The requirements did not address all the concerns for efficiency.
A2	**Subc B6**		**Defective, Failed or Contaminated**	An event was caused by a failed or defective part. The material used was defective or flawed. The weld, braze or soldered joint was defective. The component reached the end of its expected service life. There was electrical or instrument noise interference or interaction. Foreign material or contaminant caused the equipment or component to fail.
A2	B6	C01	Defective or failed part	A part/instrument that lacked something essential to perform its intended function. The degraded performance of a part or component contributed to the failure of the component, equipment or system. Note – use of this code does not explain why the item failed. Therefore, this node should be multiple coded.
A2	B6	C02	Defective or failed material	A component failed because the material used was not adequate for the application. The material used was found to be defective, flawed or damaged. Note – use of this code does not explain why the item failed. Therefore, this node should be multiple coded.
A2	B6	C03	Defective weld, braze, or soldering joint	A specific weld joint defect or failure. Note – use of this code does not explain why the item failed. Therefore, this node should be multiple coded.
A2	B6	C04	End of life failure	The failure resulted from equipment or material having reached the end of its expected or normal service life.
A2	B6	C05	Electrical or instrument noise	An unwanted signal or disturbance that interfered with the operation of equipment.
A2	B6	C06	Contamination	Failure or degradation of a system or component due to foreign material (i.e., dirt, impurities, salt buildup) or radiation damage due to excessive exposure.
Category A3			**Human Performance LTA**	An event or condition resulting from the failure, malfunction, or deterioration of the human performance associated with the process. Note that A3B1, A3B2, A3B3 are only applicable to problem solving. If the error occurs due to medications, look to A3B4C01 or A5B4C06. If there are multiple cases of A3C nodes, look for other rationale behind the behavior.
A3	**Subc B1**		**Skill Based Errors**	Inattention or over-attention to performance of work affected the event.
A3	B1	C01	Check of work was LTA	An individual made an error that would have been detectable and correctable if a check of the completed or partially completed work was performed.
A3	B1	C02	Step was omitted due to distraction	Attention was diverted to another issue during performance of the task and the individual committed an error in performance due to the distraction.
A3	B1	C03	Incorrect performance due to mental lapse	The individual knew appropriate action(s) to take, but failed to initiate the correct action(s) based on inattention/over-attention.
A3	B1	C04	Infrequently performed steps are performed incorrectly	An individual was not completely familiar with the tasks required based on not frequently performing the tasks and not operating at a fluency level.

A3	B1	C05	Delay in time cause LTA actions	An individual performed the wrong actions based on an extended length of time expiring between the time the task was defined and the time the task was completed.
A3	B1	C06	Wrong action selected based on similarity with other actions	An individual selected a wrong action out of a series of actions that appeared to be the same but are not.
A3	B1	C07	Omission/repeating of steps based on assumptions for completion	Individual, based on assumptions, concluded that activity steps were not completed. An error occurred because the incorrect decision or assumption was made.
A3	**Subc B2**		**Rule Based Error**	A misapplication of a good rule for behavior or application of a bad rule applied for behavior during the work process impacted the event.
A3	B2	C01	Strong rule incorrectly chosen over other rules	Individual chose behavior rules based on the number of times the rule(s) had been used successfully in the past. The more times the rule(s) have been used successfully, the stronger the desire to apply the rule(s) become.
A3	B2	C02	Signs to stop were ignored and step performed incorrectly	Most activities generate indication of status both positive and negative. The human tendency is to focus on the indications of success rather than all the indicators. The negative indicators are the signs to stop. "Signs" are not necessarily physical.
A3	B2	C03	Too much activity was occurring and error made in problem solving	The error was initiated when the individuals committing the error experience information overload. The right set of decisions was not made based on too many details to process mentally.
A3	B2	C04	Previous success in use of rules reinforces continued use of rule	If a rule for behavior has been used successfully in the past, there is an overwhelming tendency to apply the rule again, even though circumstances no longer warrant the use of the rule.
A3	B2	C05	Situation incorrectly identified or represented results in wrong rule used	Individual interpreted facts based on training and experience that helped form stored mental knowledge from which the individual interpreted the facts. When the individual used the stored knowledge, the right set of training and experience was sometimes not selected based on the existing facts. A broader search of the stored knowledge would have been necessary to explain the existing facts.
A3	**Subc B3**		**Knowledge Based Error**	The problem was solved without using stored rules for behavior. The involved personnel were in a problem solving troubleshooting mode.
A3	B3	C01	Attention was given to wrong issues	Selective mental processing of information was targeted at the wrong issues and was not focused on the right issues. Often the individual focus was centered around what was psychologically important instead of targeted on what was logically important.
A3	B3	C02	LTA conclusion based on sequence of facts	An individual when establishing a timeline or recalling step-by-step compilation of facts as they occurred in an event, sometimes reordered the sequence which affected the conclusion based on the facts.
A3	B3	C03	Individual justified action by focusing on biased evidence	An individual was overconfident in evaluating the correctness of his/her knowledge. The chosen course of action was selected based on evidence that favored it and contradictory evidence was overlooked.

Attachment 3 – Cause Codes

A3	B3	C04	LTA review based on assumption that process will not change	Individual believed that no variability existed in the process and overlooked the fact that a change has occurred leading to differing results than normally realized.
A3	B3	C05	Incorrect assumption that a correlation exists between two or more facts	Wrong assumptions were made based on the belief that two or more facts are related to each other and incorrect actions were taken based on the assumption.
A3	B3	C06	Individual underestimated the problem by using past events as basis	Individuals tend to oversimplify events. Based on stored knowledge of past events, the individual underestimated problems with the existing event and plans for fewer contingencies than will actually be needed.
A3	**Subc B4**		**Work Practices LTA**	The capacity to perform work was impaired. The act to incorrectly perform work was deliberate.
A3	B4	C01	Individual capabilities to perform work LTA	a. Sensory/Perceptual Capabilities LTA b. Motor/Physical Capabilities LTA c. Attitude/Psychological Profile LTA. Signs may include horseplay; absence from work location; failure to perform expected work; maliciousness; poor performance under stress; poor psychological health; use of drugs or alcohol; insubordination; failure to work well or communicate with others; disregard for safety rules.
A3	B4	C02	Deliberate violation	The action on the part of the individual was a deliberate action to commit human error.
Category A4			**Management Problem**	An event or condition that could be directly traced to managerial actions or methodology (or lack thereof).
A4	**Subc B1**		**Management methods LTA**	The processes used to control or direct work-related plant activities, including how manpower and material was allocated for a particular objective.
A4	B1	C01	Management policy guidance/expectations not well-defined, understood, or enforced	Personnel exhibited a lack of understanding of existing policy and/or expectations, or policy/expectations were not well-defined or policy/expectation is not enforced.
A4	B1	C02	Job performance standards not adequately defined	Measurement of effectiveness could not be performed for a specific job function due to lack of defined standards.
A4	B1	C03	Management direction created insufficient awareness of the impact of actions on safety/reliability	Management failed to provide direction regarding safeguards against non-conservative actions by personnel concerning quality, safety, or reliability.
A4	B1	C04	Management follow-up or monitoring of activities did not identify problems	Management methods for monitoring the success of initiatives were ineffective in identifying shortcomings in the implementation.
A4	B1	C05	Management assessment did not determine causes of previous event or known problem	Analysis methods failed to uncover the causal factors of consequential or nonconsequential events.
A4	B1	C06	Previous industry or in-house experience was not effectively used to prevent recurrence	Industry or in house experience relating to a current problem that existed prior to the event but was not assimilated by the organization.
A4	B1	C07	Responsibility of personnel not well defined or personnel not held accountable	Responsibility for process elements such as procedures, engineering, training, etc. was not placed with individuals or accountability for failures of those process elements was not placed with individuals.

A4	B1	C08	Corrective action responses to a known or repetitive problem was untimely	Corrective action for known or recurring problem was not performed at the proper time or was not performed within the proper time.
A4	B1	C09	Corrective action for previously identified problem or event was not adequate to prevent recurrence	Meaningful corrective action was not taken. Extent of the corrective actions was not provided to more individuals.
A4	**Subc B2**		**Resource Management LTA**	Manpower and material allocation is insufficient to successfully perform assigned tasks.
A4	B2	C01	Too many administrative duties assigned to immediate supervisors	The administrative load on immediate supervisors adversely affects their ability to supervise ongoing activities.
A4	B2	C02	Insufficient supervisory resources to provide necessary supervision	Supervision resource is less than that required by task analysis considering the balance of procedures, supervision and training.
A4	B2	C03	Insufficient manpower to support identified goal/objective	Personnel were not available as required by task analysis of goal or objective.
A4	B2	C04	Resources not provided to assure adequate training was provided/maintained	Training resources were not available as required by task analysis.
A4	B2	C05	Needed resource changes not approved/funded	Corrective actions for existing deficiencies that were previously identified were not approved or funded.
A4	B2	C06	Means not provided to assure procedures/documents/records were of adequate quality and up-to-date	A process for changing procedures or other work documents to assure quality and timeliness was nonexistent or inadequate.
A4	B2	C07	Means not provided for assuring adequate availability of appropriate materials/operability	A process for supplying personnel with appropriate materials or tools did not exist.
A4	B2	C08	Means not provided for assuring adequate equipment quality, reliability, or operability	A process for assuring personnel's equipment was satisfactory did not exist.
A4	B2	C09	Personnel selection did not assure match of worker motivations or job descriptions.	Personnel selection processes failed to determine a mismatch between motivation and job description prior to task.
A4	B2	C10	Means/Method not provided for assuring adequate quality of contract services	A process for assuring quality contract services was being provided was nonexistent or inadequate.
A4	**Subc B3**		**Work Organization & Planning LTA**	Problems in how the work to be performed was organized, including work scope, planning, assignment and scheduling of a task to be performed. Failures in this node usually imply related failures in supervisory methods addressed in B4.
A4	B3	C01	Insufficient time for worker to prepare task	Scheduling of the task did not adequately address the time frame required for accepted worker preparation practices to occur.
A4	B3	C02	Insufficient time allotted for task	Scheduled duration of the task did not adequately address known conditions or account for reasonable emergent issues.
A4	B3	C03	Duties not well-distributed among personnel	The work loading individuals within a group or team did not adequately address training, experience, task frequency and duration, or other situational factors such that responsibility was inappropriately distributed.

A4	B3	C04	Too few workers assigned to task	Job planning did not allot a realistic number of man hours or the number of people necessary to complete the task based on the scope of work described.
A4	B3	C05	Insufficient number of trained or experienced workers assigned to task	Though the overall number of personnel assigned matched the planned man hour allotment, organization methods failed to identify that the personnel assigned did not have adequate experience or training to perform the work.
A4	B3	C06	Planning not coordinated with inputs from walkdowns/task analysis	The job plan did not incorporate information gathered during field visits or task analysis concerning the steps and conditions required for successful completion of the task.
A4	B3	C07	Job scoping did not identify potential task interruptions and/or environmental stress	The work scoping process was not effective in detecting reasonable obstructions to work flow (e.g., shift changes) or the impact of environmental conditions.
A4	B3	C08	Job scoping did not identify special circumstances and/or conditions	The work scoping process was not effective in detecting work process elements having a dependency upon other circumstances or conditions.
A4	B3	C09	Work planning not coordinated with all departments involved in task	Interdepartmental communication and teamwork did not support the work flow being planned.
A4	B3	C10	Problem performing repetitive tasks and/or subtasks	The work flow plan repeated tasks or sub-tasks to the detriment of successful completion of the evolution.
A4	B3	C11	Inadequate work package preparation	Though scoping and planning were adequately performed, the work package did not reflect the information gathered from these activities.
A4	**Subc B4**		**Supervisory Methods LTA**	Causes that can be traced back to the <u>immediate</u> supervision and evaluated techniques that were used to monitor, direct and control work assignments. Supervision is a function not a title.
A4	B4	C01	Tasks and individual accountability not made clear to worker	Task and accountability for the task were outside written guidance or training was not made clear to the worker.
A4	B4	C02	Progress/status of task not adequately tracked	Supervision did not take the appropriate actions to monitor the task progress or status.
A4	B4	C03	Appropriate level of in-task supervision not determined prior to task	Supervision did not adequately assess the task for points of supervisory interaction prior to assignment to workers.
A4	B4	C04	Direct supervisory involvement in task interfered with overview role	Supervision became so involved with the actual task steps that overall command and control were adversely affected.
A4	B4	C05	Emphasis on schedule exceeded emphasis on methods/doing a good job	Accepted standards for methods were not met due to supervision's focus on completing the activity within a certain time frame.
A4	B4	C06	Job Performance and self-checking standards not properly communicated	Supervision failed to adequately communicate how standards for job performance and self-checking could be applied to the actual job at hand.
A4	B4	C07	Too many concurrent tasks assigned to worker	Supervision failed to detect that concurrent job assignments for an individual exceeded the individual's abilities.
A4	B4	C08	Frequent job or task "shuffling"	Supervision transferred a worker from one task to another without adequate time to shift attention away from previous task.

A4	B4	C09	Assignment did not consider worker's need to use higher-order skills	Supervision did not consider the worker's talents or innovative strengths that could be used to perform more challenging work.
A4	B4	C10	Assignment did not consider effects of worker's previous task	Supervision did not adequately assess the previous task's impact upon the worker's ability to implement the current task.
A4	B4	C11	Assignment did not consider worker's ingrained work patterns	Supervision failed to assess the incompatibility between worker's ingrained work patterns and necessary work patterns for successful completion of the current task.
A4	B4	C12	Contact with personnel too infrequent to detect work habit/attitude changes	Supervision not aware of deviation from desired work habits/attitudes due to lack of interaction with personnel.
A4	B4	C13	Provided feedback on negative performance but not on positive performance	Worker's performance adversely affected by supervision's focus on negative performance feedback.
A4	**Subc B5**		**Change Management LTA**	Problems caused the process by which changes are controlled and implemented by management as organizational needs change to accommodate new business needs.
A4	B5	C01	Problem identification methods did not identify need for change	Existing problem identification methods did not recognize the difference between actual practices and expectations.
A4	B5	C02	Change not implemented in a timely manner	A change in expectations was not realized in practices within an acceptable time period.
A4	B5	C03	Inadequate vendor support of change	Management failed to adequately assess the ability of vendors to supply products or services in support of changing expectations for a particular objective.
A4	B5	C04	Risks/consequences associated with change not adequately reviewed/assessed	Elements of the process change were not recognized as having adverse impact or increased risk of adverse impact prior to implementing the change.
A4	B5	C05	System interactions not considered	Changes to processes or physical systems caused interactions with other processes or physical systems that were not identified prior to implementation.
A4	B5	C06	Personnel/department interactions not considered	Changes to processes created new requirements for interaction between personnel or departments that were not considered in the implementation phase of the change.
A4	B5	C07	Effects of change on schedules not adequately addressed	Changes to processes that resulted in scheduled changes had effects on personnel or equipment that were not addressed in the change implementation.
A4	B5	C08	Change related training/retraining not performed or not adequate	Changes to processes resulted in a need for new training or revisions to existing training activities that were not performed or were not adequate to meet the needs of the new process.
A4	B5	C09	Change related documents not developed or revised	Changes to processes resulted in a need for new training or revisions to existing training activities that were not performed or were not adequate to meet the needs of the new process.
A4	B5	C10	Change related equipment not provided or not revised	Changes to processes resulting in a need for new or revised software/hardware that was not provided or revised.
A4	B5	C11	Change not adequately communicated	Changes to processes were not communicated to affected personnel effectively.
A4	B5	C12	Change not identifiable during task	Changes to processes were not distinguishable from the previous process such that personnel did not modify how they performed the process.

A4	B5	C13	Accuracy/effectiveness of change not verified or not validated	Verification/validation practices for process changes failed to identify inaccurate or ineffective methods.
Category A5			**Communications LTA**	Inadequate presentation or exchange of information. Persons on all sides of a communication link should be questioned regarding known or suspected problems.
A5	**Subc B1**		**Written Communication Method of Presentation LTA**	Problems with visual attributes of accurate information.
A5	B1	C01	Format deficiencies	The layout of the written communication made it difficult to follow. The format differed from that which the user was accustomed to using. The steps of the procedure were not logically grouped. Steps in the written communication had more than one action or direction to perform. Some steps stated one action, which in practice required several steps to perform.
A5	B1	C02	Improper referencing or branching	The written communication referred to an excessive number of additional procedures; contained numerous steps of the type Calculate limits per procedure XYZ; the written communication was difficult to follow because of excessive branching to other procedures. References to different processes and areas contributed to the event.
A5	B1	C03	Checklist LTA	An error was made because each separate action in a step did not have a check off space provided; the checklist was confusing. Each instruction did not clearly indicate what was required. Insufficient room was provided for the response; The checklist required unique responses for each step.
A5	B1	C04	Deficiencies in user aid (charts, etc.)	An error was made because graphics or drawings were of poor quality. The graphics or drawings were unclear, confusing, or misleading. Graphics, including datasheets, were not legible.
A5	B1	C05	Recent change not made apparent to user	The written communication user was required to carry out an action different from those he was accustomed to doing. The written communication did not identify that the step for this action had been revised. The written communication user performed the action as the previous revision specified rather than the current revision.
A5	B1	C06	Instruction step/information in wrong sequence	The instructions in the written communication were out of sequence.
A5	B1	C07	Unclear/complex wording or grammar	Wording, grammar or symbols fail to clearly and concisely specify the required action: instructions provided for team of users failed to specify roles of each user. Considering the training and experience of the user, the written communication was too difficult to understand or follow. There was insufficient information to identify the appropriate written communication. The written communication was not designed for the less practiced user.
A5	**Subc B2**		**Written Communication Content LTA**	Any written document used to perform work such as procedures, work orders, memos, standing orders, manuals, surveillance, etc.
A5	B2	C01	Limit accuracies	Limits were not expressed clearly and concisely. Limits or permissible operating ranges were expressed in a +/- format instead of absolute numbers.
A5	B2	C02	Difficult to implement	Standards, Policies, or Administrative Controls were not followed because no practical way of implementing them existed. Implementation would have hindered production.

A5	B2	C03	Data/computations wrong/incomplete	The error was made because of a mistake in recording or transferring data. Calculations were made incorrectly. The formula or equation was confusing or had multiple steps.
A5	B2	C04	Equipment identification LTA	The equipment identification was too generic. Equipment identification or labeling in the field did not agree with the identification in the procedure.
A5	B2	C05	Ambiguous instructions/requirements	The instructions in the written communication were unclear, uncertain, or interpretable in more than one way. Different procedures related to the same task contained different requirements. There were conflicting or inconsistent requirements stated in different steps of the same procedure. Requirements were stated in different units.
A5	B2	C06	Typographical error	A typographical error in the written communication caused the event.
A5	B2	C07	Facts wrong/requirements not correct	Specific information in the written communication was incorrect. The written communication contained outdated requirements. The written communication did not reflect the current status of equipment.
A5	B2	C08	Incomplete/situation not covered	Details of the written communication were incomplete. Insufficient information was presented. The written communication did not address situations likely to occur during the completion of the procedure.
A5	B2	C09	Wrong revision used	The wrong revision of the written communication used.
A5	**Subc B3**		**Written Communications Not Used**	Written communication was not used to do the job. Written communication did not exist for the job. The written communication system was required to be used and was not just for training.
A5	B3	C01	Lack of written communication	Some form of written communication did not exist for the job task being performed.
A5	B3	C02	Not available or inconvenient for use	The written communication was not readily available. A copy of the written communication was not available in the designated file or rack. A master copy of the written communication was not available for reproductions. Use of the written communication was inconvenient because of working conditions (e.g., radiation areas, tight quarters, plastic suits).
A5	**Subc B4**		**Verbal Communications LTA**	The problem was caused by the transmission or receiving of information by voice or signal (e.g., face-to-face, telephone, and radio).
A5	B4	C01	Communication between workgroups LTA	Lack of communication between work groups contributed to the incident.
A5	B4	C02	Shift communication LTA	Lack of communication between management and the shifts, between employees and management, or communication between workers during the shift change contributed to the incident.
A5	B4	C03	Correct terminology not used	Standard or accepted terminology was not used; the communication could be interpreted in more than one way; a piece of equipment had two or more commonly used names or the terminology could apply to more than one item.
A5	B4	C04	Verification/repeat back not used	The communication error was caused by failure to repeat back a message to the sender for the purposes of verifying that the message was heard and understood correctly.
A5	B4	C05	Information sent but not understood	The message or instruction was misunderstood because of noise interference or the message was too long and should have either been shortened or should have been written.

A5	B4	C06	Suspected problem not communicated to supervision	There was incorrect, incomplete, or an otherwise lack of communication between personnel and their supervision.
A5	B4	C07	No communication method available	A method or system did not exist for communicating the necessary message or information. The communication system was out of service or otherwise unavailable at the time of the incident.
Category A6			**Training deficiency**	An event or condition that could be traced to a lack of training or insufficient training to enable a person to perform a desired task adequately.
A6	**Subc B1**		**No training provided**	A lack of appropriate training. The task had not been identified for training.
A6	B1	C01	Decision not to train	The decision was made not to provide specific training on a task or training was only provided to some of the employees.
A6	B1	C02	Training requirements not identified	Training on the task was not part of the employee's training requirements. The necessary training had not been defined for the job description.
A6	B1	C03	Work incorrectly considered "skill-of-craft"	The work was not a skill that could be developed through job experience.
A6	**Subc B2**		**Training Methods LTA**	The correct training setting was not used; there was not enough practice or hands-on time allotted; testing did not adequately measure the employee's ability to perform the task, the task was not identified for refresher training; the training had inadequate instructors and facilities.
A6	B2	C01	Practice or "Hands-on" experience LTA	The on the job training did not provide opportunities to learn skills necessary to perform the job; there was insufficient OJT; there was inadequate preparation before performing the activity; the employee had not previously performed the task under direct supervision.
A6	B2	C02	Testing LTA	Testing did not cover all the knowledge and skills necessary to do the job. Testing did not adequately reflect the trainee's ability to perform the job.
A6	B2	C03	Refresher training LTA	Training updates were not performed; continuing training was not performed to keep employees equipped to perform non-routine tasks. The frequency of continuing training was inadequate. The frequency of refresher training was not sufficient to maintain the required knowledge and skills.
A6	B2	C04	Inadequate presentation	The qualifications for the instructor were inadequate; the qualification did not include all that is necessary to perform training on this task; the instructor who performed the training was not qualified on this task. The training equipment was inadequate. Simulators were not used. The equipment used in training was not like that used on the job.
A6	**Subc B3**		**Training Material LTA**	The training material content was inadequate; did not adequately address new work methods; did not address normal and abnormal working conditions; did not adequately address performance standards for the job.
A6	B3	C01	Training Objectives LTA	The objectives were not written to accurately represent the task analysis; they did not satisfy the needs identified in task analysis; did not cover all the requirements necessary to successfully complete the task.

Attachment 3 – Cause Codes

A6	B3	C02	Inadequate content	The training content did not address the objectives, did not identify the knowledge and skills required to perform the task or did not contain all the information necessary to perform the task.
A6	B3	C03	Training on new work methods LTA	Training was not provided when the work methods for this task were changed, training on procedure changes was not provided; training on the new equipment used to perform the task was not provided.
A6	B3	C04	Performance standards LTA	The requirements for performance were not stringent enough or did not address performing the task under normal, abnormal, and emergency conditions.
Category A7			**Other Problem**	The problem was caused by factors beyond the control of the organization such as natural phenomena or legacy issues.
A7	**Subc B1**		**External Phenomena**	Caused by factors not under the control of the reporting organization.
A7	B1	C01	Weather or ambient conditions LTA	Unusual weather conditions such as hurricanes, tornadoes, flooding, earthquake, and lightning.
A7	B1	C02	Power failure or transient	Loss of off-site or partial on-site power.
A7	B1	C03	External fire or explosion	Event outside the facility affects equipment systems or personnel inside the facility.
A7	B1	C04	Other natural phenomena LTA	Phenomena that could include animal intrusion.
A7	**Subc B2**		**Radiological/Hazardous material problem**	Problems related to radiological or hazardous material contamination that could not be attributed to any of the other causes.
A7	B2	C01	Legacy contamination	Radiological or hazardous material contamination attributed to past practices.
A7	B2	C02	Source unknown	Radiological or hazardous material contamination where the source cannot be reasonably determined.

Attachment 4 – WIPP Form Initiation Instructions

NOTE

The draft of a WIPP Form may be saved at any time to allow the Originator to leave and return to finish entering information at a later time. When saving a draft WIPP Form, click on the Save as Draft box at the bottom of the electronic WIPP Form. Do not click on the Submit WIPP Form button until the draft of the electronic WIPP Form is complete and ready for screening.

1.0 Enter the Originator's name by starting to type the name in the box labeled as "Originator."

1.1 Select your name when IMPS matches it.

OR

In lieu of entering your name, click on the box labeled "Submit this WIPP Form Anonymously" located immediately above the Originator's box.

2.0 Enter the date that the issue was identified using the MM/DD/YY format in the Date Identified Box.

3.0 Enter the equipment identification number (e.g., 41-B-836) if the issue involves specific plant equipment.

3.1 If no specific equipment is involved, enter N/A.

4.0 Select a location from the drop down menu if the issue involves a specific location on the site (e.g., 411 Waste Handling Building – CH)

4.1 If no specific location is involved, enter N/A.

NOTE

The description needs to be complete and provide sufficient information for the WIPP Form screeners and the WIPP Form Screening Committee to make informed determinations concerning reporting requirements and determining the type of issue and who best to take corrective action on the issue. (For example, "Housekeeping needs to be improved." doesn't provide the information necessary to make any determinations on the issue. "Tools, equipment, and miscellaneous materials are improperly stored on and around the 41-B-836 exhaust fan. Log readings cannot be obtained from fan instrumentation and inspections cannot be completed as required." is a more complete description of the issue.

5.0 Enter the description of the issue in the Description of Issue/Condition Block.

5.1 If the issue/condition is the violation of a procedural or regulatory requirement, identify the procedure number and step or regulatory identifier and the nature of the violation.

5.2 If the issue/condition is a process improvement, identify the condition as such.

5.3 Do not include personal information in the description of the issue/condition, use job titles instead.

6.0 If the WIPP Form is being entered to document a CDA issue, coordinate with the manager responsible for the issue and determine a cause code for the issue.

6.1 Enter the determined cause code in the Description of Issue/Condition box.

7.0 Enter any actions taken to initially mitigate the issue/condition in the Immediate Actions Taken box.

7.1 Enter N/A or none if no actions were required or taken.

7.2 **IF** the WIPP Form is written as a result of an event AND compensatory actions are identified as a result of conducting a critique of the event,
THEN enter each compensatory action as a non-CAP action on the WIPP Form.

8.0 Enter any CAP actions that you would recommend being included by the CAP Manager in the Recommended Corrective Action box.

8.1 Enter N/A if you have no actions to recommend for the CAP.

Attachment 4 – WIPP Form Initiation Instructions

NOTE

Pictures or additional information such as a critique, drawings, etc. may be uploaded to the WIPP Form by attaching an Adobe Acrobat (.pdf) file to the WIPP Form using the optional .pdf file uploading box. The WIPP Form Coordinator or the WIPP Form Screening Committee Chairperson can provide additional help with uploading the files.

9.0 Upload pictures or additional information such as a critique, drawings, etc. to the WIPP Form by attaching an Adobe Acrobat (.pdf) file.

Attachment 5 – Example of Process Improvement Rejection/Approval

WIPP Form Number: _____

Process Improvement Description:

_____

_____

_____

Justification for Rejection of Process Improvement:

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_____

_____

_____

Responsible Manager:

_____ / _____ / _____

Printed Name Signature Date

Department Manager Concurrence:

_____ / _____ / _____

Printed Name Signature Date

List of Processes and Equipment Reviewed

WIPP #	Process/Equipment Description	Applicable to the Following Waste Streams/Groups of Waste Streams
PREVIOUSLY APPROVED PROCESSES OR EQUIPMENT		
N/A	Acceptable Knowledge Procedures – CCP-TP-002, CCP-TP-005, & CCP-TP-506	Solids (S3000) Soils (S4000) Debris (S5000)
N/A	Data Generation and Project-Level Validation & Verification (V&V) Procedures – CCP-TP-001, CCP-TP-002, CCP-TP-500	Solids (S3000) Soils (S4000) Debris (S5000)
N/A	WIPP Waste Information System (WWIS) Procedures – CCP-TP-030, CCP-TP-033, & CCP-TP-530	Solids (S3000) Soils (S4000) Debris (S5000)
16VE1	Visual Examination (VE) Procedures – CCP-TP-113	Soils (S4000) Debris (S5000)
16RHVE1	Visual Examination (VE) Procedures – CCP-TP-500	Debris (S5000)
16RR1	Real-Time Radiography Mobile Characterization System (MCS) RTR #6 Procedures – CCP-TP-053 & CCP-TP-165	Solids (S3000) Soils (S4000) Debris (S5000)
16RR2	Real-Time Radiography Mobile Characterization System (MCS) RTR #7 Procedures – CCP-TP-053 & CCP-TP-164 NOTE: BDRs were generated since the previous ORNL audit utilizing RTR #7 until its deactivation on November 17, 2015.	Solids (S3000) Soils/Gravel (S4000) Debris (S5000)
N/A	Quality Assurance Program	Solids (S3000) Soils/Gravel (S4000) Debris (S5000)
NEW PROCESSES OR EQUIPMENT		
NONE		
DEACTIVATED PROCESSES OR EQUIPMENT		
NONE		

PROCEDURE REVISION MATRIX

Previous ORNL/CCP Annual Audit A-15-09 Current ORNL/CCP Annual Audit A-16-15

No.	Procedure Number	Procedure Title	Revision During Last Annual Audit	Revision During Current Annual Audit	Brief Description of Procedure Changes
1	CCP-PO-001	CCP Transuranic Waste Characterization Quality Assurance Project Plan (QAPjP)	R21	R22	22 - Revised procedure to address New Mexico Environment Department (NMED) Compliance Order (CO) HWB-14021 (December 6, 2014). Changes include: strengthening and clarifying the requirements for implementation of characterization methods Acceptable Knowledge (AK), real-time radiography (RTR), and visual examination (VE), to ensure compliance with the Waste Acceptance Criteria (WAC) and to make administrative changes as needed.
2	CCP-PO-002	CCP Transuranic Waste Certification Plan	R27	R27	N/A
3	CCP-PO-027	CCP/TRU Waste Processing Center/Oak Ridge National laboratory Interface Document	R5	R6	6 - Revised format and content to better align with a standardized Central Characterization Program (CCP) interface document format and to address enhancements pertaining to the Acceptable Knowledge (AK) process.
4	CCP-QP-002	CCP Training and Qualification Plan	R38	R39	39 - Revised to expand the section on training material, which now requires prior Central Characterization Program (CCP) Training review of training materials developed in response to conditions adverse to quality identified in Carlsbad Field Office (CBFO) Corrective Action Reports (CARs) and Nuclear Waste Partnership (NWP) Waste Isolation Pilot Plant (WIPP) Forms. Revised Attachment 1, Minimum Training and Education Requirements, to reflect upper-tier documents governing training-related requirements. Re-organized Sections 4.3 and 4.4 to improve process flow.
5	CCP-QP-005	CCP TRU Nonconforming Item Reporting and Control	R24	R25	25 - Revised to address Carlsbad Field Office (CBFO) CAR 15-035 and other editorial changes.

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6	CCP-QP-008	CCP Records Management	R24	R25	25 - Revised to delete Section 4.10.2[C], which was added in anticipation that Central Characterization Program (CCP) Records would begin verifying scans of newer hardcopy records. It has now been determined that CCP Records will not perform this function, since it is already being performed by another organization. Also, deleted the definition of Medium in Section 2.3.13, since it is repeated verbatim in Section 2.3.26, Record Medium. Refined and expanded the descriptions of editorial changes in Section 4.7.1.
7	CCP-QP-028	CCP Records Filing, Inventorying, Scheduling and Dispositioning	R16	R16	N/A
8	CCP-TP-001	CCP Project Level Data Validation and Verification	R21	R21	N/A
9	CCP-TP-002	CCP Reconciliation of DQOs and Reporting Characterization Data	R26	R26	N/A
10	CCP-TP-005	CCP Acceptable Knowledge Documentation	R26	R28	27 - Revised procedure to address New Mexico Environment Department (NMED) Compliance Order (CO) HWB-14-21 (December 6, 2014). Changes included: • Preparation and maintenance of Interface Waste Management Documents List (Attachment 9) in steps 4.2.9 through 4.2.17. • Verification of new and revised procedures during acceptable knowledge (AK) document review and summary in Steps 4.3.9 through 4.3.13 and during the addition of containers to the waste stream in steps 4.10.3 through 4.10.6. • Added Section 4.13 describing the steps to perform an AK Assessment to ensure that the existing Central Characterization Program (CCP) AK documentation relating to the management of potentially energetic transuranic (TRU) waste

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					forms (reactive, ignitable, and incompatible materials) is adequate, current, and accurately described in existing AK Summary Reports. • Added Section 4.14 to formally describe AK Briefings currently being performed for CCP personnel to include cognizant generator site Points-of-Contact (POCs) involved directly with the generation of the waste streams. • Added Section 4.4.21 for the preparation of Chemical Compatibility Evaluation Memorandum. • Updated the responsibilities in Section 3.0 to address these changes. • Revised Section 4.6 to provide clarification for the preparation of the Accuracy Reports required for both NMED and U.S. Environmental Protection Agency (EPA) and to clarify that accuracy will be tracked using all CCP certified testing data. • Addressed miscellaneous freeze file changes. 28 - Revised to provide additional detail and clarify the procedural steps for the new activities included in Rev. 27. Changes include: • Revised and clarified the responsibilities for the Acceptable Knowledge Expert (AKE) (Section 3.3) and Site Project Manager (SPM) (Section 3.1) and removed the Transportation Engineer (Section 3.7). • Moved procedural steps and notes from Section 4.3 relating the Interface Waste Management Documents List to Section 4.2.

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					• Deleted the chemical compatibility evaluation steps in Section 4.4 and expanded the procedural steps and guidance in new Section 4.15. • Added a specific step to review the Nondestructive Assay (NDA) Memorandum (Section 4.4.26), the Waste Material Parameter Memorandum (Section 4.4.31), and Chemical Compatibility Evaluation Memorandum (Section 4.4.22) during revision of the Acceptable Knowledge (AK) Summary Report. • Updated note to clarify the intended purpose of the Acceptable Knowledge Assessment (AKA) (Section 4.13), including the clarification that AKAs are not required for new AK Summary Reports. • Added bullet list for the recommended content of the AKA Memorandum (Section 4.13.6). • Clarified that the SMR review is conducted for procedures under their purview when reviewing the AKA Memorandum (Section 4.13.9 and 4.13.10). • Added SPM review of the AKA Memorandum (Section 4.13.8). • Added Attachment 16 - Example Form and Content Guide for the Chemical Compatibility Evaluation Memorandum. • Incorporated numerous editorial changes to address freeze file comments and format consistency.
11	CCP-TP-028	CCP Radiographic Test Drum and Training Container Construction	R9	R9	N/A
12	CCP-TP-030	CCP CH TRU Waste Certification and WWIS/WDS Data Entry	R34	R34	N/A

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13	CCP-TP-033	CCP Shipping of CH TRU Waste	R22	R22	N/A
14	CCP-TP-053	CCP Standard Real-Time Radiography (RTR) Inspection Procedure	R15	R15	N/A
15	CCP-TP-068	CCP Standardized Container Management	R11	R12	12 - • Revised to address issues identified in Waste Isolation Pilot Plant (WIPP) Form WF14-199. • Revised to clarify when not applicable (N/A) should be entered in Sections of Attachment 1, Container Traveler. • Clarified that Attachment 1 is not always required to be attached to the container as long as it is managed and traceable to the specific container. • Deleted unnecessary steps in Section 3.0. • Deleted notes rendered unnecessary as a result of this revision. • Added notes for operational flexibility as appropriate. • Revised step 4.1.6 to allow deletion of step 4.1.7 entirely. • Deleted requirement to apply Vendor Project Manager (VPM) Administrative Hold Indicator for Flammable Gas Analysis (FGA) and Gas Generation Testing (GGT) because they are not “certified” systems. • Changed “VPM/Designee Verification” to VPM/Designee Review” on Attachment 2, Container Inspection/Weight Report, to match procedure step. • Revised process for removing VPM Administrative

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					Hold Tags and added Attachment 4, CCP VPM Administrative Hold Tag Requirements.
16	CCP-TP-113	CCP Standard Contract-Handled Waste Visual Examination	R18	R19	19 - Revised to incorporate information from standing order CCP-SO-35 and to clarify independent technical reviewer (ITR) questions related to Quality Assurance Objectives (QAOs).
17	CCP-TP-164	CCP Real-Time Radiography #7 Operating Procedure	R1	R1	N/A
18	CCP-TP-165	CCP Real-Time Radiography #6 Operating Procedure	R3	R3	N/A
19	CCP-TP-500	CCP Remote-Handled Waste Visual Examination	R13	R15	14 - Revised to clarify independent technical reviewer (ITR) questions related to Quality Assurance Objectives (QAOs). Removed N/A option from ITR checklist and made procedure more user friendly. 15 - Revised in response to Central Characterization Program (CCP) Carlsbad Field Office (CBFO) Corrective Action Report (CAR) 15-033 to ensure Site Project Manager (SPM) generates an nonconformance report (NCR) when requesting data changes at the data generation level (DGL).
20	CCP-TP-506	CCP Preparation of the Remote-Handled Transuranic Waste Acceptable Knowledge Characterization Reconciliation Report	R5	R5	N/A
21	CCP-TP-507	CCP Shipping of Remote-Handled Transuranic	R8	R8	N/A
22	CCP-TP-530	CCP RH TRU Waste Certification and WWIS/WDS Data Entry	R11	R12	12 - Revised to implement the remote-handled (RH) waste certification process using the Integrated Data Center

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					(IDC). To implement the generating of electronic records instead of signed paper copy records and to remove the procedure steps for entering data into the Waste Isolation Pilot Plant (WIPP) Waste Information System/Waste Data System (WWIS/WDS) for Site to Site shipments as well as the 10-160B procedure steps.
23	WP 13-QA.03	Quality Assurance Independent Assessment Program	R24	R25	25 - • Added actions from the NWP QA Step Change - Time Out, and minor clarifications. • Insert at Section 4.3, Page 15 after 4th paragraph from top, the language "Consider pre-job briefings and job hazard analysis applicable to field activity being assessed." • Insert at Section 4.3, page 15 below entry above, the language "Consider core knowledge of assessed personnel in areas such as quality assurance, and basic safety requirements (e.g. when to contact CMR, correction of errors in procedures, etc.)." • Insert at section 5.0, page 17 after 2nd bullet under "The assessment team will: Review applicable Lessons Learned and Nonconformance Reports to assess continuous improvement." • Insert on page 6, "EFCOG Energy Facility Contractor's Group." • Deleted Attachment 8, *Example of NWP QA Independent Assessment Log,* along with any references to this attachment throughout the procedure.

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24	WP 15-GM1002	Issues Management Processing of WIPP Forms	R3	R4	4 - • This revision is driven by WIPP Forms WF15-135 and WF 15-207. • Added verbiage to Definitions section to clarify definition of Action Level 3 designation. • Added verbiage to substep 2.1.1 and substep 2.1.2 regarding information that should not be included on the WIPP Form. • Revised in Definitions section Extent of Condition definition. • Changed the wording in last bullet of step 6.2 for clarification. • Revised section 7.0 for AL 3 WIPP Form closure to remove WIPP FORM Coordinator review of objective evidence, reinforcing the responsibility of the Responsible Manager. • Updated attachment 4 to provide instructions for entering compensatory measures.